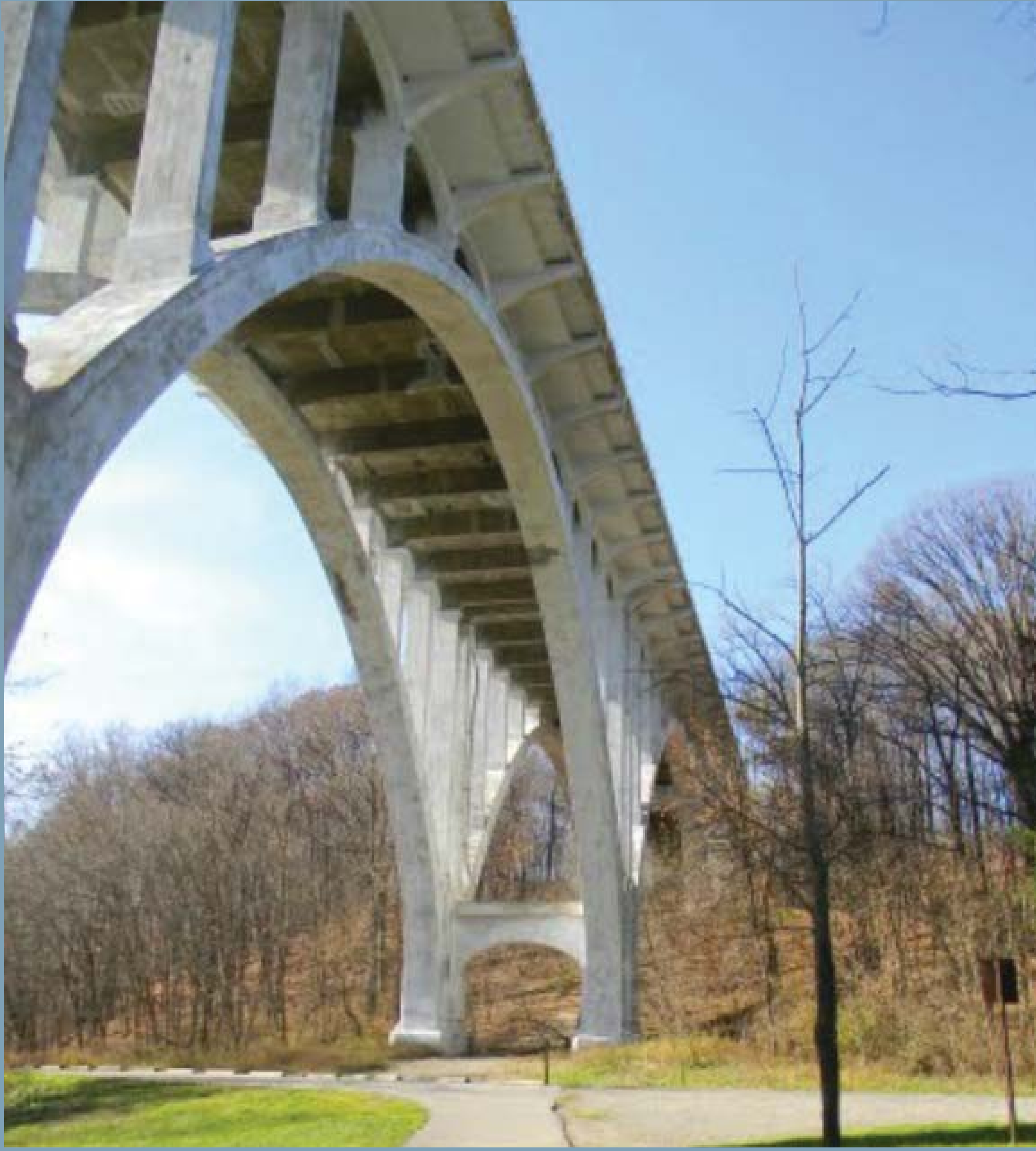


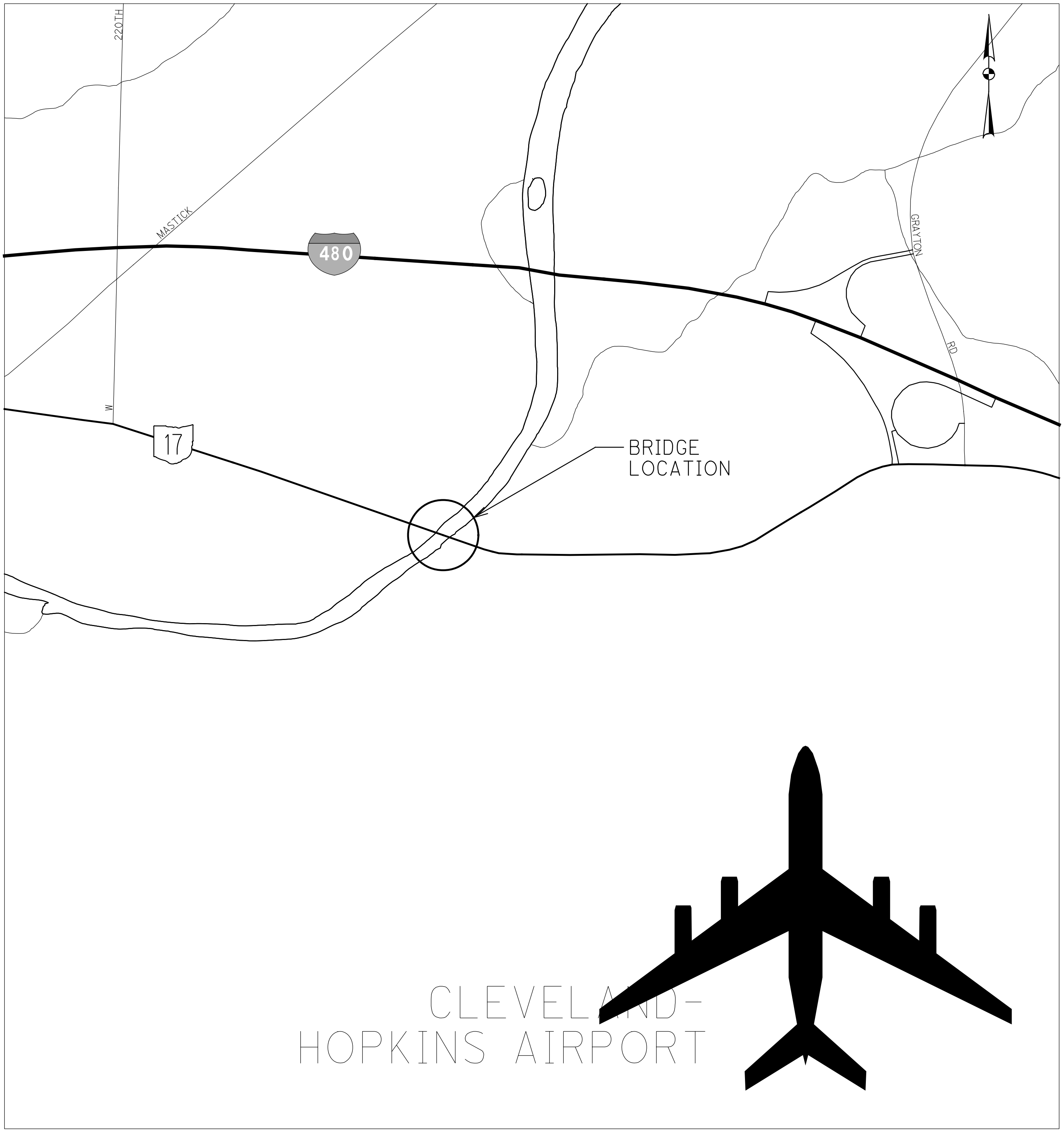
BRIDGE LOAD RATING REPORT FOR:

SFN: 1802046
CUY-17-0283

Brookpark Road (SR-17) over Rocky River

ODOT District 12

Hatch Mott MacDonald



LOCATION MAP

SFN: 1802046
CUY-17-0283
Brookpark Road over Rocky River

Bridge Load Rating Report

for

CUY-17-0283

SFN: 1802046

Brookpark Road (SR-17) over Rocky River

Fairview Park

Ohio Department of Transportation

District 12

5500 Transportation Boulevard

Garfield Heights, Ohio 44125

by

Hatch Mott MacDonald

Hatch Mott MacDonald
18013 Cleveland Parkway
Cleveland, Ohio 44135

Table of Contents

Rating Report Form (BR100)

BRIDGE LOAD RATING SUMMARY REPORT

PROGRAM RESPONSIBLILITY	OHIO DEPARTMENT OF TRANSPORTATION	
MAINTENANCE RESPONSIBLILITY	OHIO DEPARTMENT OF TRANSPORTATION	
SFN	**BRIDGE NUMBER**	**DISTRICT**
1802046	CUY-17-0283	12
ORIGINAL CONSTRUCTION YEAR	**REHABILITATION YEAR**	**OVERALL STRUCTURE LENGTH (FT. xxxx.xx)**
1933	NA	1898.60

FIPS	FEATURE INTERSECTED:	FACILITY CARRIED
Fairview Park	Rocky River	SR 17

SPECIAL ASSUMPTIONS & COMMENTS:	Using construction drawings dated November 22, 1932. Eight span open spandrel RC arch, with six and three span RC T-beam approaches. 0° skew. Assumed strengths: f'c = 3.0 ksi based upon year designed, and fy = 40.0 ksi based upon plan reference to billet steel reinforcing.

PLEASE SELECT ON RIGHT, WHERE APPROPRIATE, BY USING UP-DOWN ARROW BUTTONS

LOAD RATING PURPOSE:	1- Initial Load Rating
LOAD RATING SOFTWARE:	7 - Combination
RATING SOURCE:	1 - Plan information available for load rating analysis (Default)
METHOD OF RATING:	D - Assigned Load Factor Rating (LFR) using HS20 loadings
ORIGINAL DESIGN LOADING:	4 - H20

STRUCTURE RATING SUMMARY

LOADING TYPE	GVW (TONS)	RATING FACTOR - RF (x.xxx)	SAFE GVW (TONS)	Current Design Loading
INVENTORY RATING		0.800		2 - HS20 Loading
OPERATING RATING		1.330		2 - HS20 Loading
OHIO LEGAL - 2F1	15	2.130	32	**OHIO LEGAL LOADS OVERALL MINIMUM RATING FACTOR**
OHIO LEGAL - 3F1	23	1.480	34	*140%*
OHIO LEGAL - 4F1	27	1.380	37	**OHIO LEGAL LOADS OVERALL CONTROLLING TRUCK**
OHIO LEGAL - 5C1	40	1.540	62	*OHIO LEGAL - 4F1*

LOAD RESTRICTIONS RECOMMENDATION	**NO ACTION IS NEEDED**

RATED BY, PE#	REVIEWED BY, PE#	REPORT DATE
Michael A. Russell (63230)	Kevin W. Bollinger (77561)	
AGENCY/FIRM	**PHONE NUMBER**	**EMAIL**
Hatch Mott MacDonald	216-535-3653	Michael.Russell@HatchMott.com

BR-100 (REV 4/2012)

Bridge Description and Summary of Load Rating

Summary

The bridge is located in Fairview Park, and carries Brookpark Road (SR-17) over the Cleveland Metroparks Rocky River Reservation, the Rocky River, and Valley Parkway.

This bridge is an eight span reinforced concrete open spandrel arch bridge, with continuous reinforced concrete beam approaches. Span lengths for the middle six spans of the arches are 192’-3”. The end arches are shortened to accommodate the valley walls, but follow the same parabolic profile of the middle spans. The west and approaches consist of six and three spans respectively of varying span length; but these are in the 34’ to 50’ range.

The bridge was originally built in 1933, and rehabilitated in 1989. Rehab work included widening the bridge, replacing the deck joints, installing new monolithic overlay on the deck, and various repairs to the concrete arches, spandrel columns, and approach structures. Record plans are dated 1932, and rehabilitation plans are dated 1986.

Of note: this bridge was designed in-house by ODOT’s Bridge Office, as was the nearby steel open spandrel arch Lorain Avenue (SR-10) Bridge also over the Rocky River Reservation.

The bridge's overall condition is fair. The bridge shows some signs of distress. These issues are described and summarized in the attached Inspection Reports, but, in consultation with District 12, were not deemed detrimental to the overall structural integrity of the bridge, so they are not considered in the load rating.

The present load rating was performed per the Ohio DOT, *Bridge Design Manual*, 2004, augmented by the AASHTO, *Standard Specifications for Bridge Design*, 2000, and the AASHTO, *Manual for Bridge Evaluation*, 2011.

Design Loads and Stresses

The original design load for the 1933 work is unknown, but was performed per the State’s 1932 standards. The 1989 work used HS-20 design loads. The rating live loads are HS-20, and the Ohio legal loads: 2F1, 3F1, 4F1, & 5C1.

The concrete for the 1933 work is unknown, but the reinforcing is called out as “billet steel”. The presumptive values of 3,000 psi for and 40,000 psi found in the reference documents were used for the load rating of those components. The 1989 work used 4,500 psi concrete and 60,000 psi reinforcing steel.

Modeling

We used a combination of analytical tools to model the bridge. For the open spandrel arches and spandrel columns, we built a three dimensional, finite element model of an arch unit in STAAD.proV8i. This model consists of beam elements for the arch ribs, spandrel columns, and floor beams, and slab elements of the deck slab. The segments between arch ribs, or the length of a spandrel column, were broken into generally four separate beam elements to capture the curvature effects. The actual dimensions of the elements are included, so the self weight of these elements is accurate. Additional loads due to the 1998 deck overlay and replacement railings were determined and added separately. The difference in modulus of elasticity between the new and old work is trivial and was not considered.

The HS-20 lane load, with its combination of distributed lane load and moving concentrated load, was determined for each condition and added manually. The wheel loads for the remaining loads (HS-20 truck, HS-20 tandem, & Ohio Legal Loads) were added as moving loads and load cases generated by the program. All lanes were loaded to capture the maximum load effects on the arch ribs and spandrel columns.

The output from this model was processed through spreadsheet calculations that determined the member capacity and executed the load rating. Each segment of the arch ribs, and each spandrel column, was evaluated to determine their bi-axial axial-moment capacity curve, and to determine the axial and moment capacities associated with the specific load effects from the various design loads.

We used LARS (BARS) for the analysis and rating of the main arches' slab deck and floorbeams, as well as the approaches' beams.

Controlling Members

The controlling member for the load rating is the main arches' floorbeam (HS-20 Inventory Rating of 0.80), followed by the spandrel columns at the top of the arch (HS-20 Inventory Rating of 1.07).

The Inventory Rating for the arch ribs themselves is 1.58 (HS-31.6), and occurs mid-way between the springline and the first spandrel column.

Except for the 4F1 load on the main arch floorbeams, all the bridge members' ratings are 150% of Ohio Legal Loads. The rating factor for 4F1 is 1.38 (140%). All of these meet ODOT's minimum threshold of 100% of Ohio Legal Loads therefore requiring no action per the *Bridge Design Manual* (2004), 918.3.

Record Plans

10	OHIO	E 683-4	1932

CUYAHOGA COUNTY
S.H. 460 SEC. E-1
CLEVELAND-CANTON ROAD

STATE OF OHIO DEPARTMENT OF HIGHWAYS

BROOKPARK VIADUCT

AND APPROACHES

CLEVELAND-CANTON ROAD

S.H. 460 SEC. E-1 PET. NO.

CUYAHOGA COUNTY

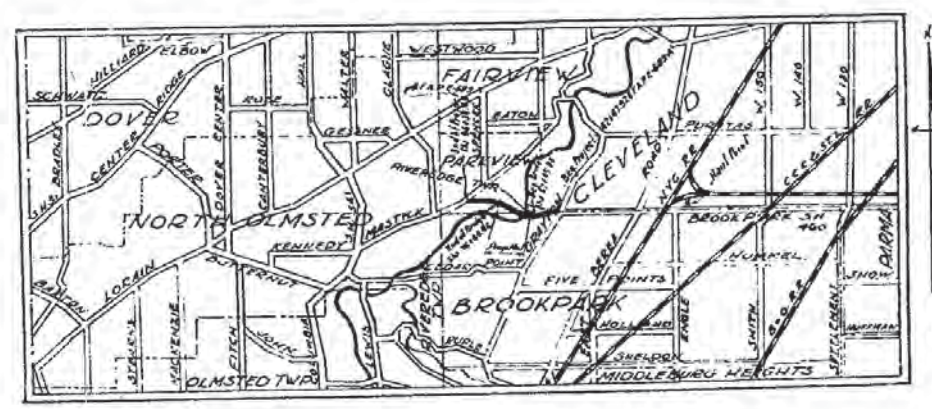
PARKVIEW VILLAGE - BROOKPARK VILLAGE
RIVEREDGE TOWNSHIP

This project will be governed by the "General Specifications" of the State of Ohio Department of Highways as revised on June 25, 1932 and adopted on August 1, 1932, "Supplemental Specifications for Emergency Construction Highway Projects (August 24 1932)", and the "Special Specifications and Pay Item Provisions (October 10, 1932) Drawing No. WBC-32-R" (as per sheet number 24 of these plans)

I hereby approve these plans and declare that the making of this improvement will not require the closing to traffic of the highway

INDEX OF SHEETS

APPROACH PLANS



SCALES

Plan	1" = 100'
Profile - Vertical	1" = 10'
Profile - Horizontal	1" = 100'
Cross Sections	1" = 5'
Intersections	1" = 30'
Typical Sections	3/8" = 1'-0"
Drainage Structures as shown	

LOCATION PLAN
SCALE OF MILES

0 1 2 3

PORTION TO BE IMPROVED

Note :-
When suspending paving operations for the Winter, the Contractor shall place and maintain the traveled highway in a passable condition satisfactory to the Director.

Approved: ________
Date: ______ Resident District Deputy Director

Approved: John O. McWilliams
Date: 12-24-32 Resident Division Deputy Director

Approved: Elmer Kelly
Date: 12-24-32 Chief Engineer Bureau of Construction

Approved: ________
Date: ______ Chief Engineer Bureau of Maintenance

Approved: J R Burkey
Date: 12-24-32 Chief Engineer Bureau of Bridges

Approved: H P Chapman
Date: 12-24-32 Chief Engineer & First Assistant Director

Approved: O W Merrell
Date: 12-24-32 Director of Highways

Recommended for Approval: ________
Date: ______ District Engineer Bureau of Public Roads

Recommended for Approval: ________
Date: ______ Chief Engineer Bureau of Public Roads

Approved: ________
Date: ______ Chief of Bureau

We, the Commissioners of Cuyahoga County, hereby ~~[illegible]~~ certify that the right-of-way 100 ft wide is available for the construction, maintenance and repair of the above highway.

____
____
____

Date: Dec 23, 1932 County Commissioners

BRIDGE No. 39

1802046

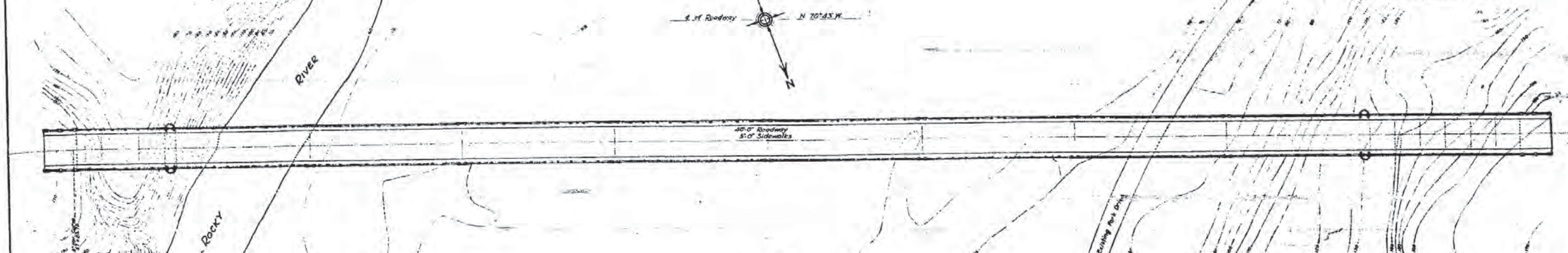
SUPPLEMENTAL PRINTS OF STRUCTURAL STANDARDS DRAWINGS NO. 55 + 100

Cuyahoga 460 E-1
1932
Contract No. 5699 (Cont. #1), 5700 (Cont. #2&3)
Letting Date 11-22-32

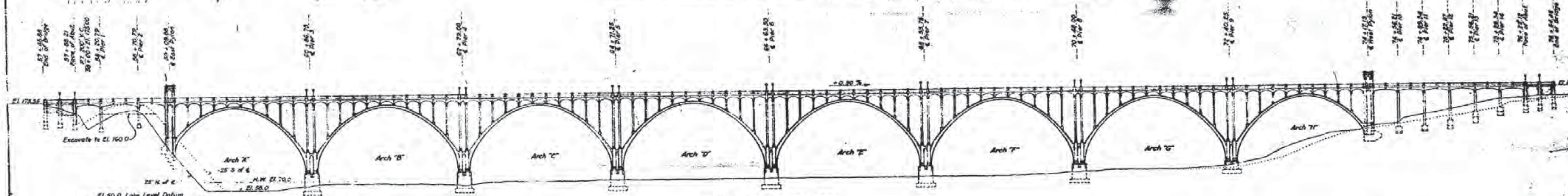
FED. RD. DIST. NO.	STATE	FED. AID PROJECT	FISCAL YEAR
10	OHIO	E-653-A	1932

25 / 50

CUYAHOGA COUNTY
S.H. 460 SEC. E-1



PLAN



NORTH SIDE ELEVATION

SPECIFICATIONS. The General Specifications of the Department of Highways in force on date of contract together with the Supplemental Specifications for Emergency Construction Aug. 24, 1932, Special Specifications and Pay Item Provisions, Oct. 10, 1932, Dr. No. WBC-32 (Revised), Sheet No. 24 and all other specifications shown on these plans and on the proposal shall govern the construction of this project.

LOADING. This bridge designed for H-20 Loading according to Specifications for Design of Highway Structures in force Oct. 1932.

EXCAVATION AND BACKFILL. Earth excavation includes all excavation required above top of shale. Earth excavation for footings computed as prisms bounded by vertical planes 1'-0" from edges of footings.

Shale excavation includes all excavation below top of shale and is computed to neat lines of footings. Entire excavation in shale, below top of footings, shall be filled with concrete unless otherwise indicated on plans.

All excavated materials shall be disposed of as directed by the Engineer. Excavated materials from east approach shall not be wasted in river.

Backfill for end abutments shall be made as soon as possible to permit settlement before approach slabs are placed. Fill shall be made on both sides of wing walls simultaneously. All shoring for superstructure, intended to rest on footings, must be in place before backfill is made.

GENERAL CONSTRUCTION. East and west end abutments shall be built first and backfill completed at the earliest possible date to permit settlement.

Construction joints, other than those shown on plans, will not be permitted except by special permission of the Director.

Special care must be taken to conceal all construction joints in exposed surfaces of concrete. All horizontal joints in exposed surfaces must be made truly straight by tacking a temporary straight edge on inside face of forms.

ARCH RIB CONSTRUCTION. No concrete shall be placed in arch ribs until adjacent piers are entirely completed to skewbacks and centers and forms are in place for adjacent spans.

Order of placing arch ribs shall be as follows: 1-end sections from skewbacks to first construction joints simultaneously, 2-crown section between construction joints, simultaneously from each end toward crown, 3-remaining section on each side of crown section simultaneously.

Centering and shoring for any arch rib shall not be released until after the arch ribs in each adjacent span have been placed as well as the crown sections in the following spans.

Tops of arch ribs shall be given a Rubbed Surface Finish. Form liner shall be used on bottoms of ribs and surface rubbed as specified under Surface Finish.

ARCH DECK CONSTRUCTION. Arch deck shall be placed full width (except sidewalks and fascia) between construction joints as shown on plans. Order of placing sections shall be the same as specified for arch ribs.

Sidewalks and fascia shall not be placed until after centering and shoring have been released. Two construction joints will be permitted in each sidewalk on each arch span. If construction joints are used, they shall be placed midway between brackets. Sidewalks shall be marked off in blocks with a line at the center of each railing post and midway between posts unless otherwise indicated on plans.

SURFACE FINISH. All exposed surfaces below sidewalk level, except bottoms of slabs, arch floor beams between jack-arches, and interior approach beams, shall be given a "Rubbed Surface Finish." Forms for bottoms of arch ribs, brackets, fascia, jack-arches, pier struts and outside approach beams shall be carefully lined with three-ply wood liner. After forms are removed, these surfaces shall be rubbed once. All railing and pylons above sidewalk level, shall be given a "Special Rubbed Surface Finish."

CONCRETE CLASSIFICATION. Class "A" Concrete (1-5½ mix) includes all concrete in arch ribs, arch columns, arch deck, pier columns, beam approach spans and pylons above bridge seats except railing.

Class "B" Concrete (1-5½ mix) includes all concrete in arch piers and approach columns above footings, pylons between bridge seats and footings as shown on details, and end abutments above footings, except approach slabs.

Class "C" Concrete (1-6½ mix) includes all concrete in footings except S.E. pylon.

APPROACH SLABS. Payment for approach slabs includes all reinforcing steel.

CONCRETE RAILING (1-5½ mix). Payment for railing includes all materials and labor required, except dowels.

STRUCTURAL STEEL includes all structural expansion joints (except copper gutters), manhole frames, and pylon ladders and supports. All structural steel shall be "copper steel" containing at least 0.2 % copper.

A certified copy of analysis and mill tests must be furnished the Dept. of Highways.

All structural steel, except portions imbedded in concrete, shall be painted aluminum.

REINFORCING STEEL. All reinforcing bars shall be deformed and shall conform to Sec. M-7.1-Billet-Steel Concrete Reinforcing Bars of "Material Details." A certified copy of analysis shall be furnished the Dept. of Highways.

ESTIMATED QUANTITIES.

Earth Excavation	4,200	Cu. Yds.
Shale Excavation	2,130	Cu. Yds.
Class "A" Concrete (1-5½ mix)	11,156	Cu. Yds.
Class "B" Concrete (1-5½ mix)	6,440 ~~[illegible]~~	Cu. Yds.
Class "C" Concrete (1-6½ mix)	1,714	Cu. Yds.
Type "B" Waterproofing (36" wide)	555	Sq. Yds.
Reinforcing Steel	2,738,830 ~~[illegible]~~	Lbs.
Reinforced Concrete Railing (special) 1-5½ mix	3,840	Lin. Ft.
Balcony Drains, complete (4 Units)	Lump Sum	~~Units~~
Structural Steel (copper bearing)	41,800	Lbs.
Folded Copper Strip, 16 oz., 24" wide	520	Lin. Ft.
Cast Bronze Expansion Plates (15½)	1,912	Lbs.
*Reinf. Conc. Approach Slabs, ~~12½~~ thick, 1-5½ mix	186.7	Sq. Yds.
Bridge Lighting System, except conduits and hand holes	Lump Sum	
2½" Galvanized Steel Conduit, complete in place	2,300	Lin. Ft.
2" Galvanized Steel Conduit, complete in place	1,000	Lin. Ft.
Hand Holes, cast aluminum, covers and frames	32	Units
Name Plates (cast aluminum)	Lump Sum	
6" Standard Wrought Iron Pipe, as detailed	1,740	Lin. Ft.
10" V.S. Pipe, encased as detailed	22	Lin. Ft.
8" V.S. Pipe, encased as detailed	210	Lin. Ft.
24" Plain Cement Concrete Pipe	1,490	Lin. Ft.
Rip-rap, hand laid with mortar joints	250	Sq. Yds.
Cast Iron Scuppers, special	18	Units
Brick Wearing Surface, 3" brick, ¾" cushion	8,500	Sq. Yds.

* Approach slab is paid for in sq. yds. for a thickness of 12½". The additional 3" of concrete is included in the item Class "B" concrete.

ALUMINUM SPECIFICATIONS.

Entire aluminum content of all aluminum alloys for this project shall be composed of virgin aluminum ingot. All castings shall be made of Alcoa 43 ingot. Lugs shall be cast integral with all castings for testing purposes. Extruded and bar stock, if used, shall be Alcoa 43 S alloy. All bolts and screws shall be Alcoa 17 ST alloy. Certified copies of mill analysis for all aluminum shall be submitted to Dept. of Highways.

Wherever aluminum contacts any other metal or concrete it shall be thoroughly coated with bituminous paint.

All lighting units shall be given a uniform sand blast finish before deplating and high-lighting. Name plates shall be sand blasted before high-lighting. Satin high-lighted finish shall be obtained with about #180 emery. Fabrication and finish shall conform to recommendations of Aluminum Co. of America.

A protection coat of Rust Veto #ZA shall be applied to lighting units and name plates before leaving fabricators.

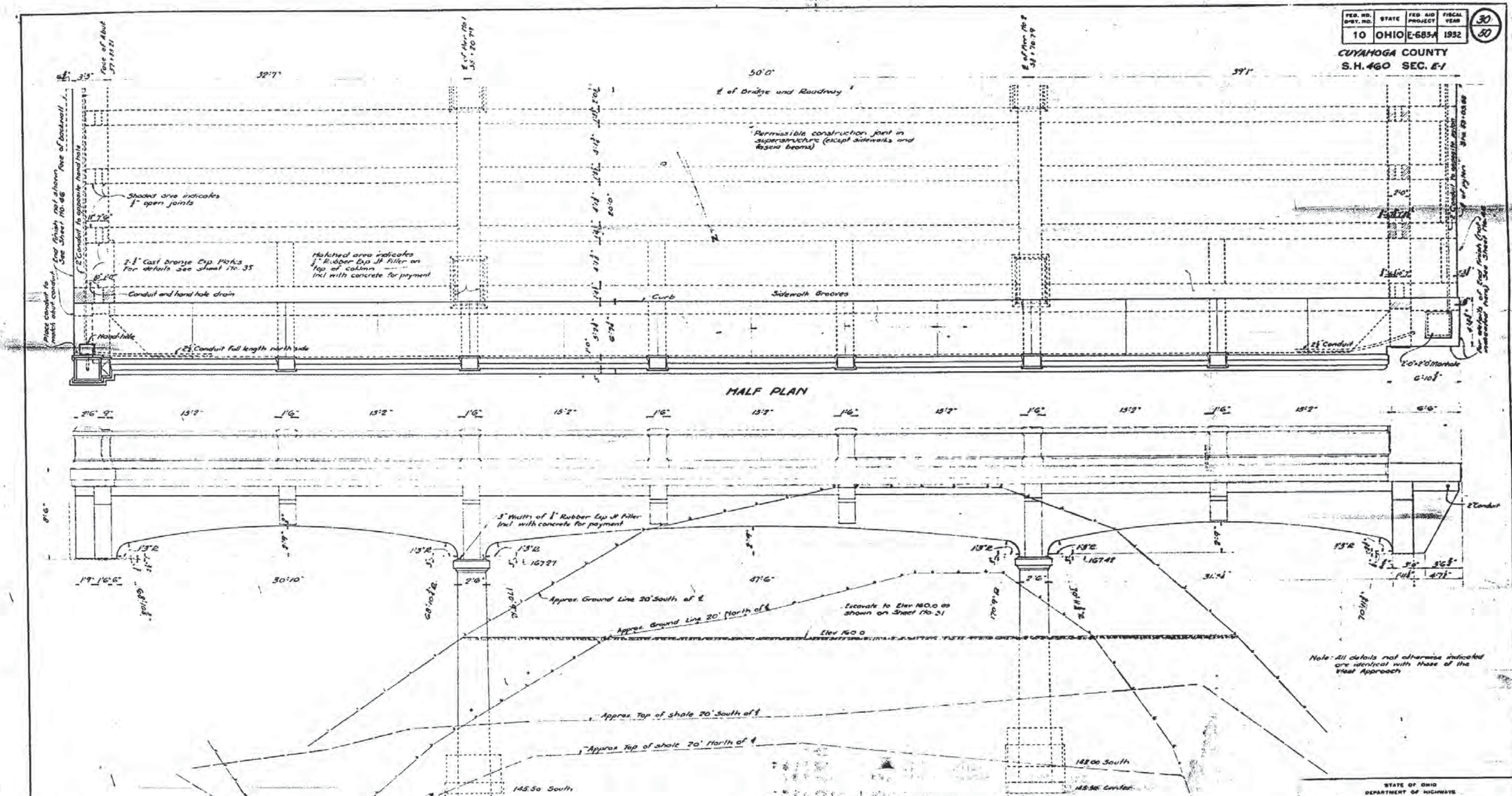
STATE OF OHIO
DEPARTMENT OF HIGHWAYS
BUREAU OF BRIDGES

GENERAL PLAN AND ELEVATION NOTES AND QUANTITIES

BROOKPARK VIADUCT OVER ROCKY RIVER

S.H. 460 SEC. E-1 CUYAHOGA COUNTY

DESIGNED	DRAWN	TRACED	CHECKED	APPROVED	DATE	REVISED
[illegible]	RBK. [illegible]	RBK	W.F.	[illegible]	[illegible]	[illegible]



ESTIMATED QUANTITIES

SUPERSTRUCTURE AND PIERS

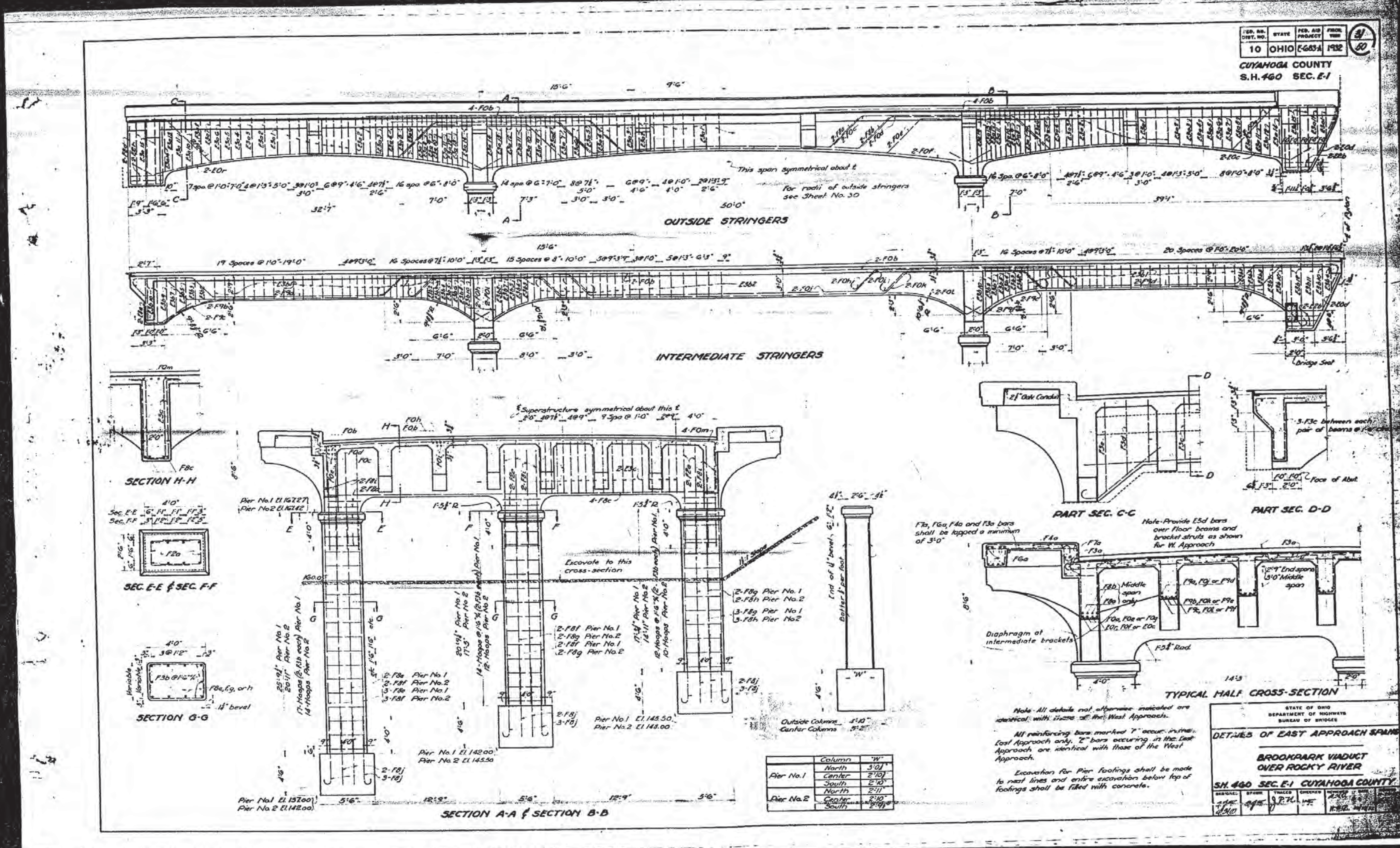
Concrete Class "A"	396	Cu. Yds.
Concrete Class "B"	48	Cu. Yds.
Concrete Class "C"	27	Cu. Yds.
Shale Excavation	42	Cu. Yds.
Earth Excavation	1,150	Cu. Yds.
Type B Waterproofing	13.5	Sq. Yds.

STATE OF OHIO
DEPARTMENT OF HIGHWAYS
BUREAU OF BRIDGES

GENERAL PLAN AND ELEVATION OF EAST APPROACH

BROOKPARK VIADUCT OVER ROCKY RIVER

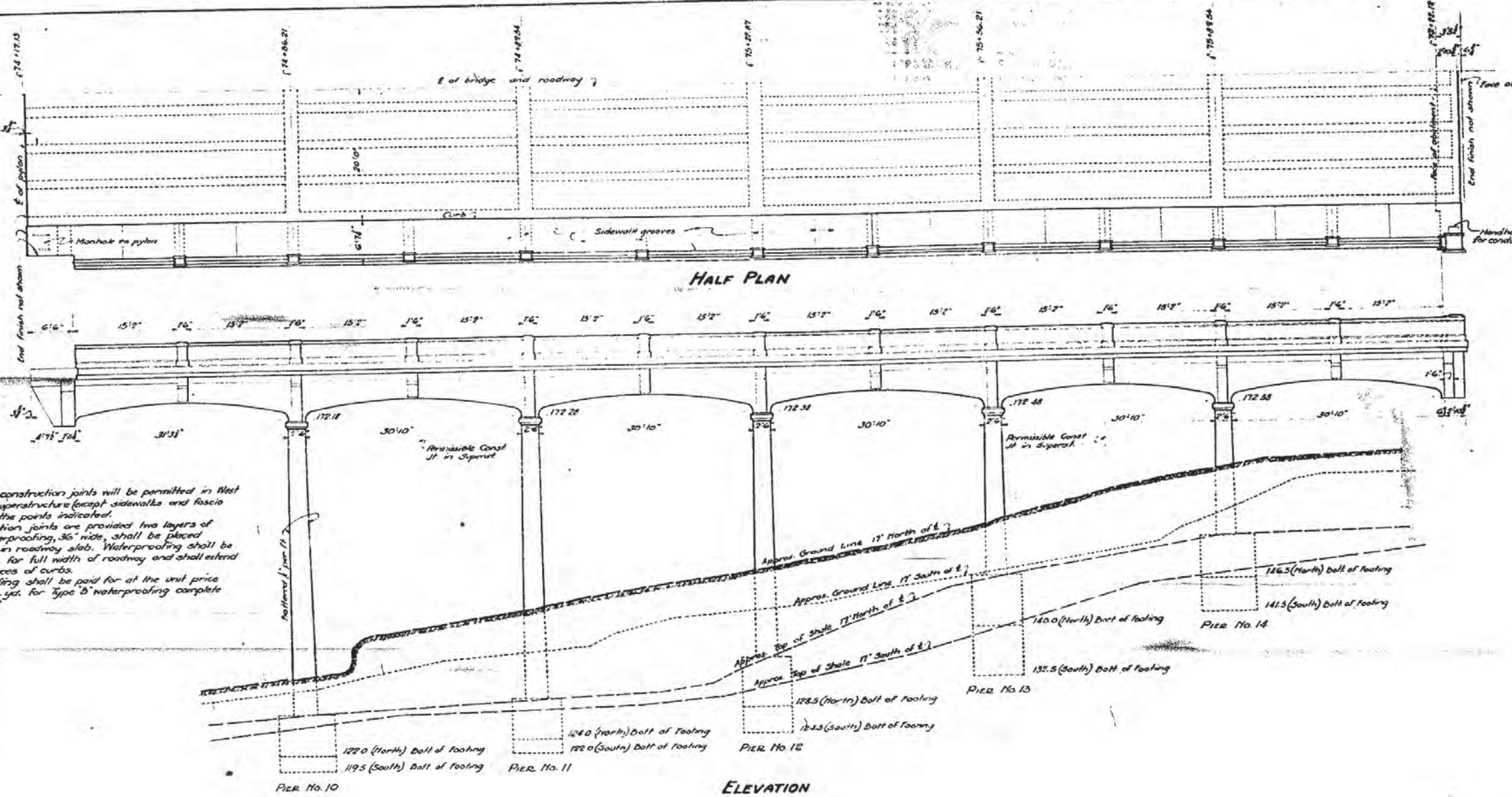
SH-460 SEC-E-1 CUYAHOGA COUNTY



	Column	"W"
Pier No.1	North	3'-0"
	Center	2'-10"
	South	2'-10"
Pier No.2	North	2'-11"
	Center	2'-10"
	South	2'-11"

FED. RD. DIST. NO.	STATE	FED. AID PROJECT	FISCAL YEAR	
10	OHIO	E-683A	1932	32/80

CUYAHOGA COUNTY
S.H. 460 SEC. E-1



Transverse construction joints will be permitted in West Approach superstructure (except sidewalks and fascia beams) at the points indicated.
If construction joints are provided two layers of Type "B" waterproofing, 36" wide, shall be placed over joint in roadway slab. Waterproofing shall be continuous for full width of roadway and shall extend 3" up on faces of curbs.
Waterproofing shall be paid for at the unit price bid per sq. yd. for Type "B" waterproofing complete in place.

ESTIMATED QUANTITIES

SUPERSTRUCTURE AND PIERS

Concrete Class "A"	673	Cu. Yds.
Concrete Class "B"	229	Cu. Yds.
Concrete Class "C"	178	Cu. Yds.
Shale Excavation	175	Cu. Yds.
Earth Excavation	386	Cu. Yds.
Type "B" Waterproofing	27	Sq. Yds.

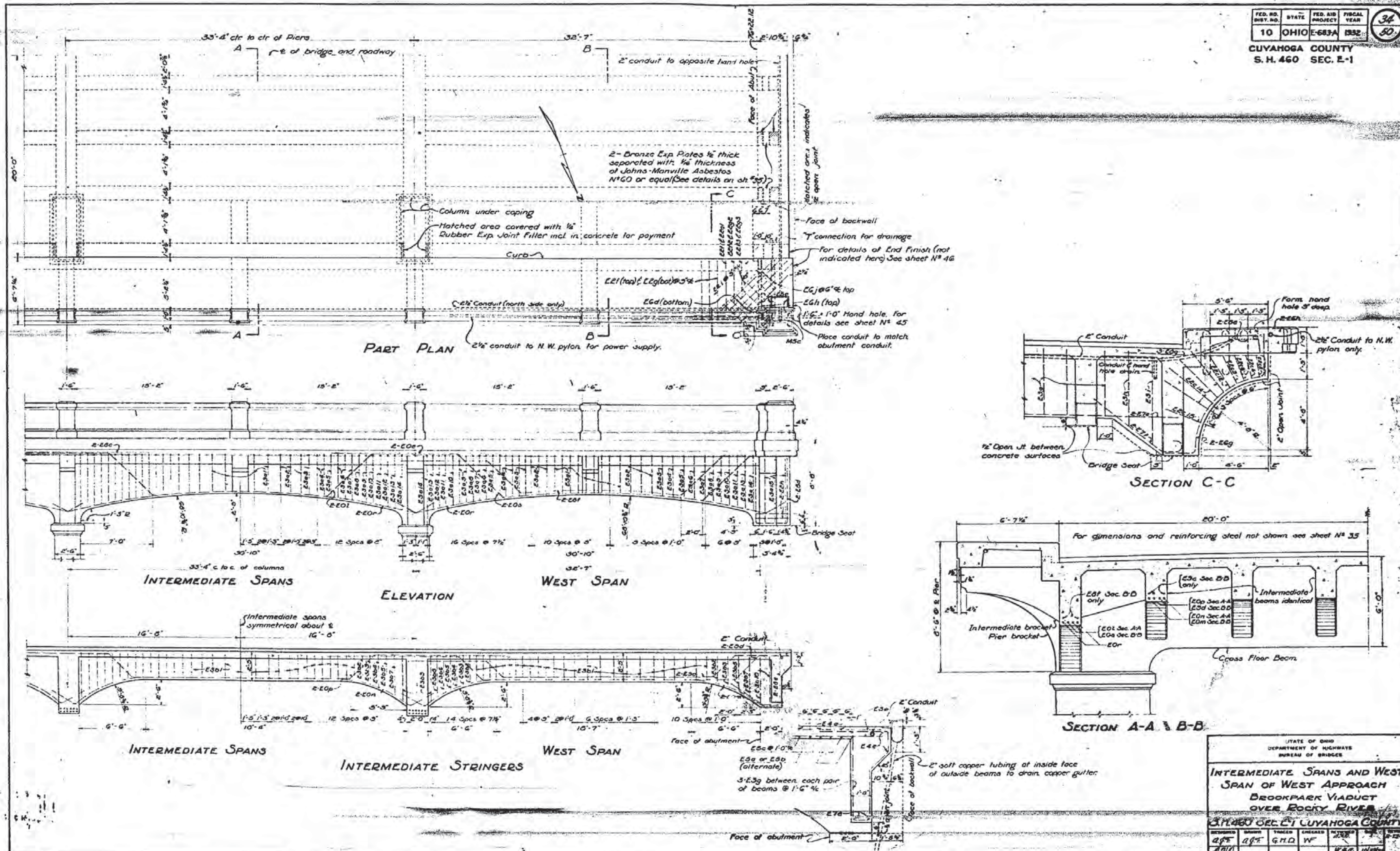
STATE OF OHIO
DEPARTMENT OF HIGHWAYS
BUREAU OF BRIDGES

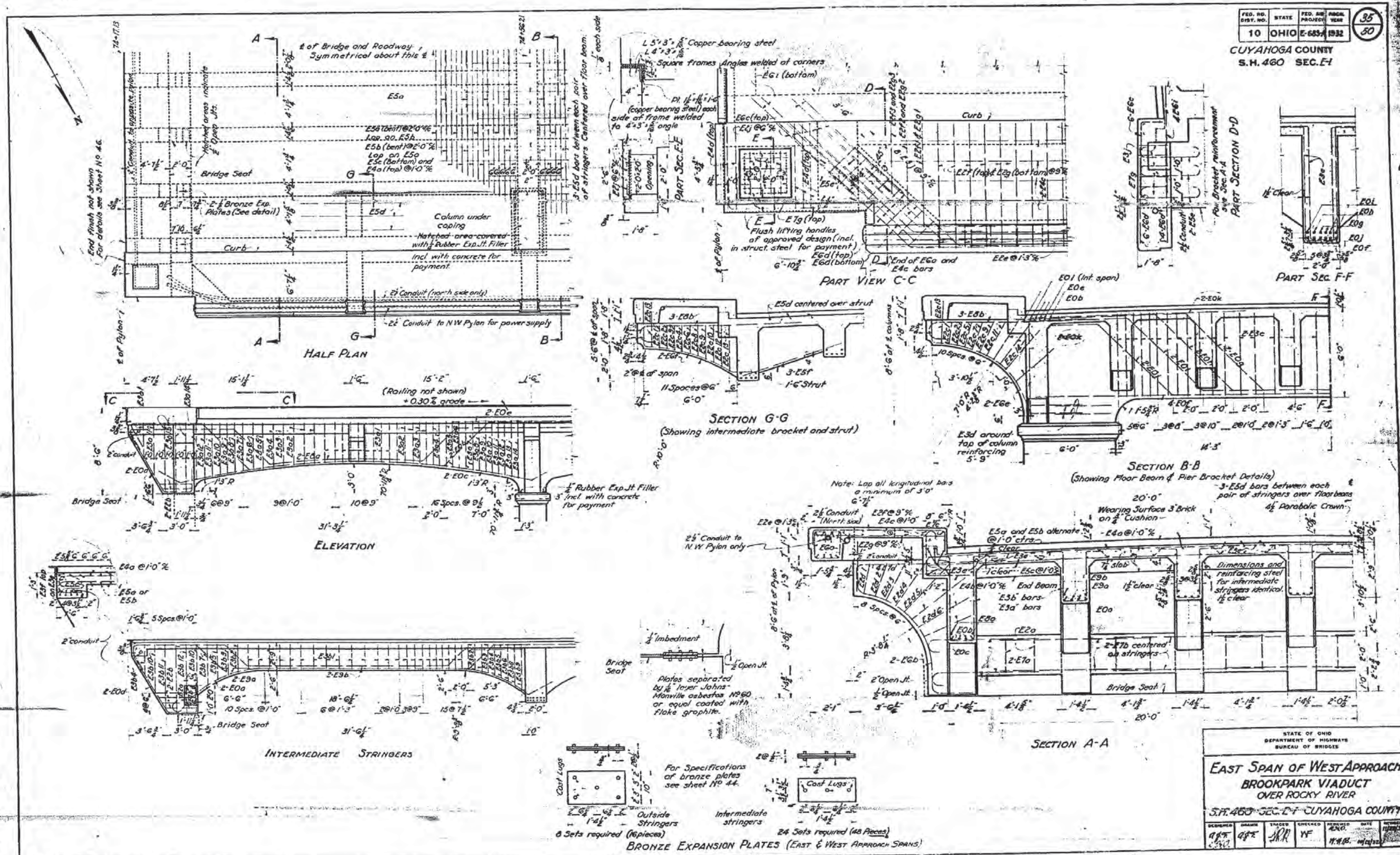
GENERAL PLAN AND ELEVATION OF WEST APPROACH

BROOKPARK VIADUCT OVER ROCKY RIVER

S.H. 460 SEC. E-1 CUYAHOGA COUNTY

DESIGNED	DRAWN	TRACED	CHECKED	REVIEWED	DATE
A.G.F.	A.G.F.	J.P.N.	W.F.	W.H.G.	10/28/32


FED. RD. DIST. NO. 10 | STATE OHIO | FED. AID PROJECT E-683-A | FISCAL YEAR 1932
34/50
CUYAHOGA COUNTY
S. H. 460 SEC. E-1
PART PLAN
33'-4" ctr to ctr of Piers
℄ of bridge and roadway
2" conduit to opposite hand hole
2 - Bronze Exp Plates ½" thick separated with ⅛" thickness of Johns-Manville Asbestos Nº 60 or equal (See details on sh 35)
Column under coping
Hatched area covered with ½" Rubber Exp. Joint Filler incl. in concrete for payment
Curb
Face of backwall
"T" connection for drainage
For details of End Finish (not indicated here) See sheet Nº 46
1'-6" x 1'-0" Hand hole. For details see sheet Nº 45
Place conduit to match abutment conduit.
2½" conduit to N. W. pylon for power supply.
ELEVATION
INTERMEDIATE SPANS
WEST SPAN
Bridge Seat
33'-4" c to c of columns
INTERMEDIATE STRINGERS
Intermediate spans symmetrical about ℄
Face of abutment
3-E3g between each pair of beams @ 1'-6" c/c
2" soft copper tubing at inside face of outside beams to drain copper gutter
SECTION C-C
2" Conduit
Form hand hole 3" deep
2½" Conduit to N.W. pylon only
½" Open Jt between concrete surfaces
2" Open Joint
SECTION A-A & B-B
For dimensions and reinforcing steel not shown see sheet Nº 35
Intermediate beams identical
Intermediate bracket
Pier bracket
Cross Floor Beam
STATE OF OHIO
DEPARTMENT OF HIGHWAYS
BUREAU OF BRIDGES
INTERMEDIATE SPANS AND WEST SPAN OF WEST APPROACH
BROOKPARK VIADUCT
OVER ROCKY RIVER
S.H. 460 SEC. E-1 CUYAHOGA COUNTY



FED. RD. DIST. NO. 10 STATE OHIO FED. AID PROJECT E-683-A FISCAL YEAR 1932 35/50
CUYAHOGA COUNTY
S.H. 460 SEC. E-1
HALF PLAN
ELEVATION
INTERMEDIATE STRINGERS
SECTION G-G
(Showing intermediate bracket and strut)
PART VIEW C-C
PART SECTION D-D
PART SEC. F-F
PART SEC. E-E
SECTION B-B
(Showing Floor Beam & Pier Bracket Details)
SECTION A-A
BRONZE EXPANSION PLATES (EAST & WEST APPROACH SPANS)
6 Sets required (16 pieces)
24 Sets required (48 Pieces)
For Specifications of bronze plates see sheet No 44.
Plates separated by 1/8" layer Johns-Manville asbestos No 60 or equal coated with flake graphite.
Note: Lap all longitudinal bars a minimum of 3'-0"
STATE OF OHIO
DEPARTMENT OF HIGHWAYS
BUREAU OF BRIDGES
EAST SPAN OF WEST APPROACH
BROOKPARK VIADUCT
OVER ROCKY RIVER
S.H. 460 SEC. E-1 CUYAHOGA COUNTY

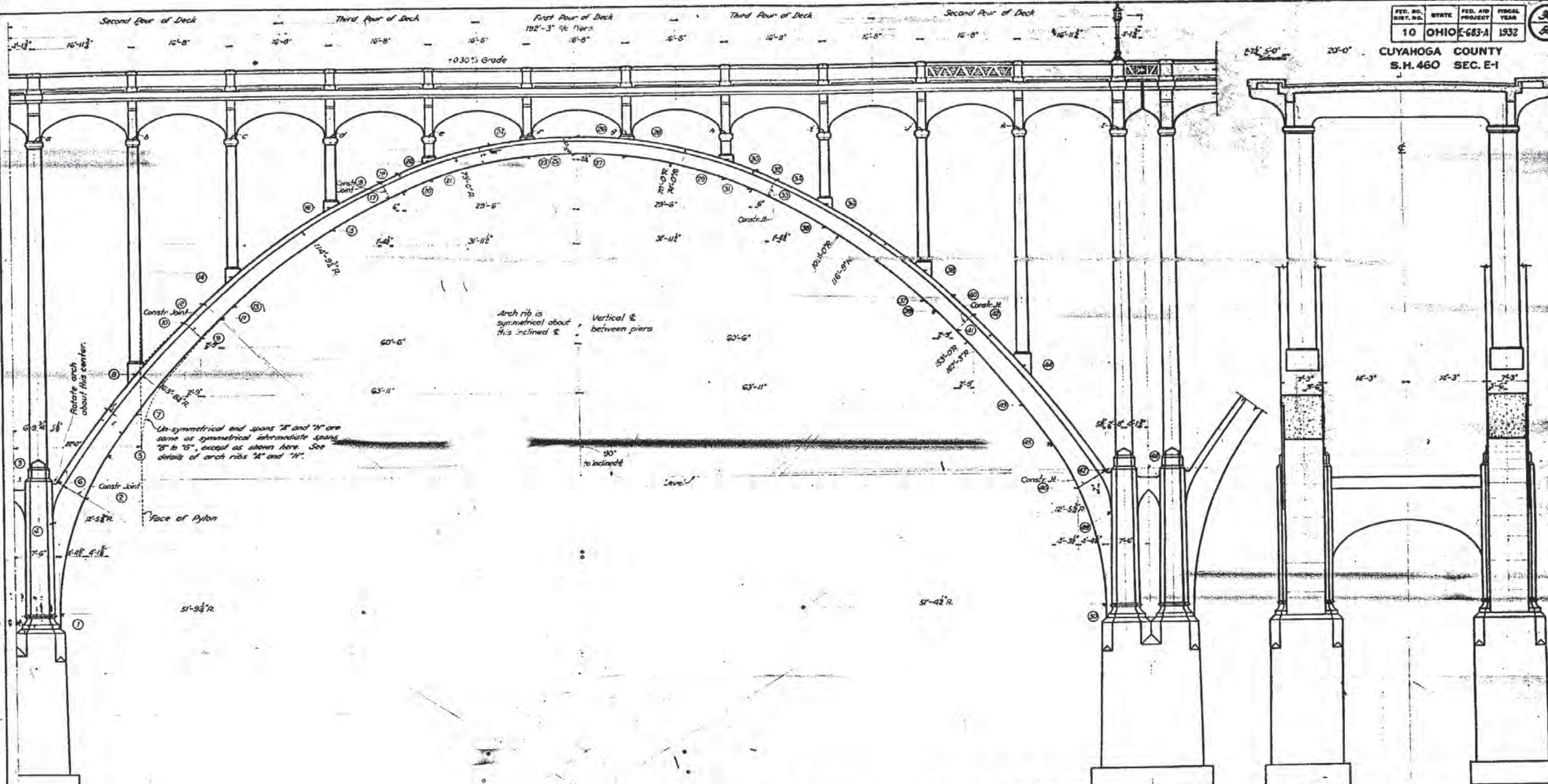


TABLE OF ELEVATIONS – ARCHES "B" TO "G" INCL.

Elev. No.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
Arch "B"	94.37	105.20	108.35	100.69	112.80	108.06	120.12	126.97	133.28	135.99	136.81	139.36	139.01	143.90	151.97	155.78	157.96	160.16	161.71	158.56	160.53	163.79	164.86	167.68	165.16
Arch "C"	84.95	105.78	108.93	101.27	113.38	108.66	120.69	127.55	133.86	136.57	137.39	139.93	139.59	144.48	152.54	156.36	157.93	160.73	162.28	159.12	161.11	164.37	165.23	168.26	165.73
Arch "D"	85.52	106.35	109.50	101.85	113.95	109.24	121.27	128.13	134.43	137.14	137.96	140.51	140.16	145.05	153.12	156.93	158.51	161.31	162.86	159.70	161.68	164.94	165.81	168.83	166.31
Arch "E"	86.10	106.93	110.08	102.42	114.58	109.81	121.85	128.70	135.01	137.72	138.54	141.09	140.74	145.63	153.70	157.51	159.09	161.89	163.44	160.27	162.26	165.52	166.39	169.41	166.89
Arch "F"	88.68	107.51	110.66	103.00	115.11	110.39	122.42	129.28	135.59	138.30	139.12	141.66	141.32	146.21	154.27	158.09	159.66	162.46	164.01	160.85	162.84	166.10	166.96	169.98	167.46
Arch "G"	87.25	108.08	111.23	103.58	115.69	110.97	123.00	129.86	136.17	138.88	139.69	142.24	141.89	146.79	154.85	158.67	160.24	163.04	164.59	161.43	163.41	166.67	167.54	170.57	168.04

Elev. No.	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50
Arch "B"	168.16	164.66	167.69	160.55	163.82	158.73	161.90	157.56	160.37	152.06	155.87	139.20	144.08	137.20	139.77	133.69	136.42	120.49	127.37	113.50	105.69	108.66	108.93	101.27	84.95
Arch "C"	168.73	165.24	168.27	161.13	164.40	159.31	162.48	158.14	160.95	152.64	156.45	139.78	144.66	137.78	140.34	134.27	132.00	121.07	127.95	114.08	106.27	109.24	109.50	101.85	85.52
Arch "D"	169.31	165.82	168.85	161.71	164.98	159.89	163.05	158.72	161.52	153.21	157.02	140.35	145.23	138.35	140.92	134.85	137.58	121.64	128.52	114.65	106.85	109.81	110.08	102.42	86.10
Arch "E"	169.89	166.39	169.42	162.28	165.55	160.46	163.63	159.29	162.10	153.79	157.60	140.93	145.81	138.93	141.50	135.42	138.15	122.22	129.10	115.23	107.42	110.39	110.66	103.00	86.68
Arch "F"	[illegible]	[illegible]	[illegible]	162.86	166.13	161.04	164.21	159.87	162.68	154.37	158.18	141.51	146.39	139.51	142.07	136.00	138.73	122.80	129.68	115.81	108.00	110.97	111.23	103.58	87.25
Arch "G"	171.04	[illegible]	170.58	163.44	166.71	161.62	164.78	160.45	163.25	154.94	158.75	142.08	146.97	140.08	142.65	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

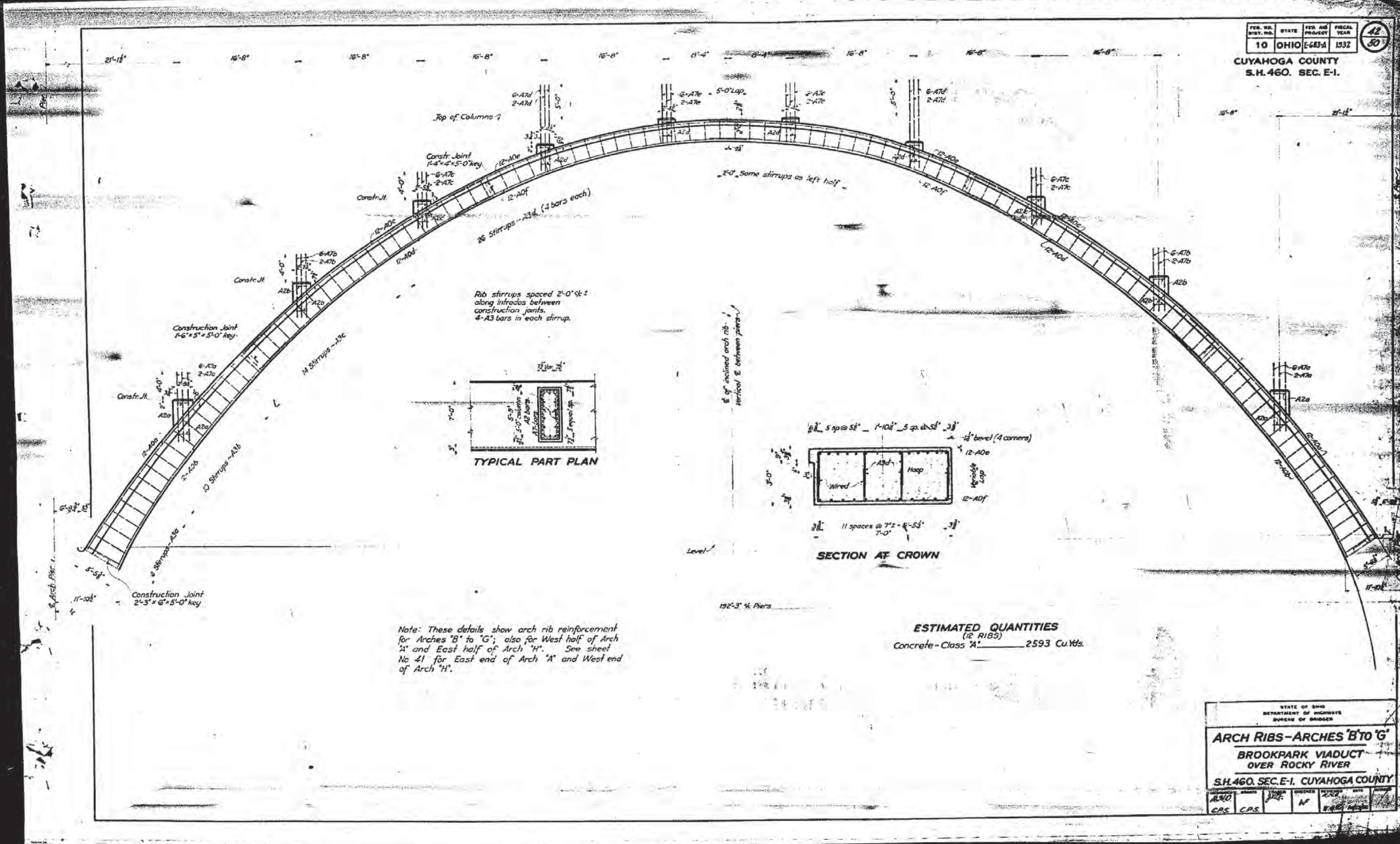
STATE OF OHIO
DEPARTMENT OF HIGHWAYS
BUREAU OF BRIDGES

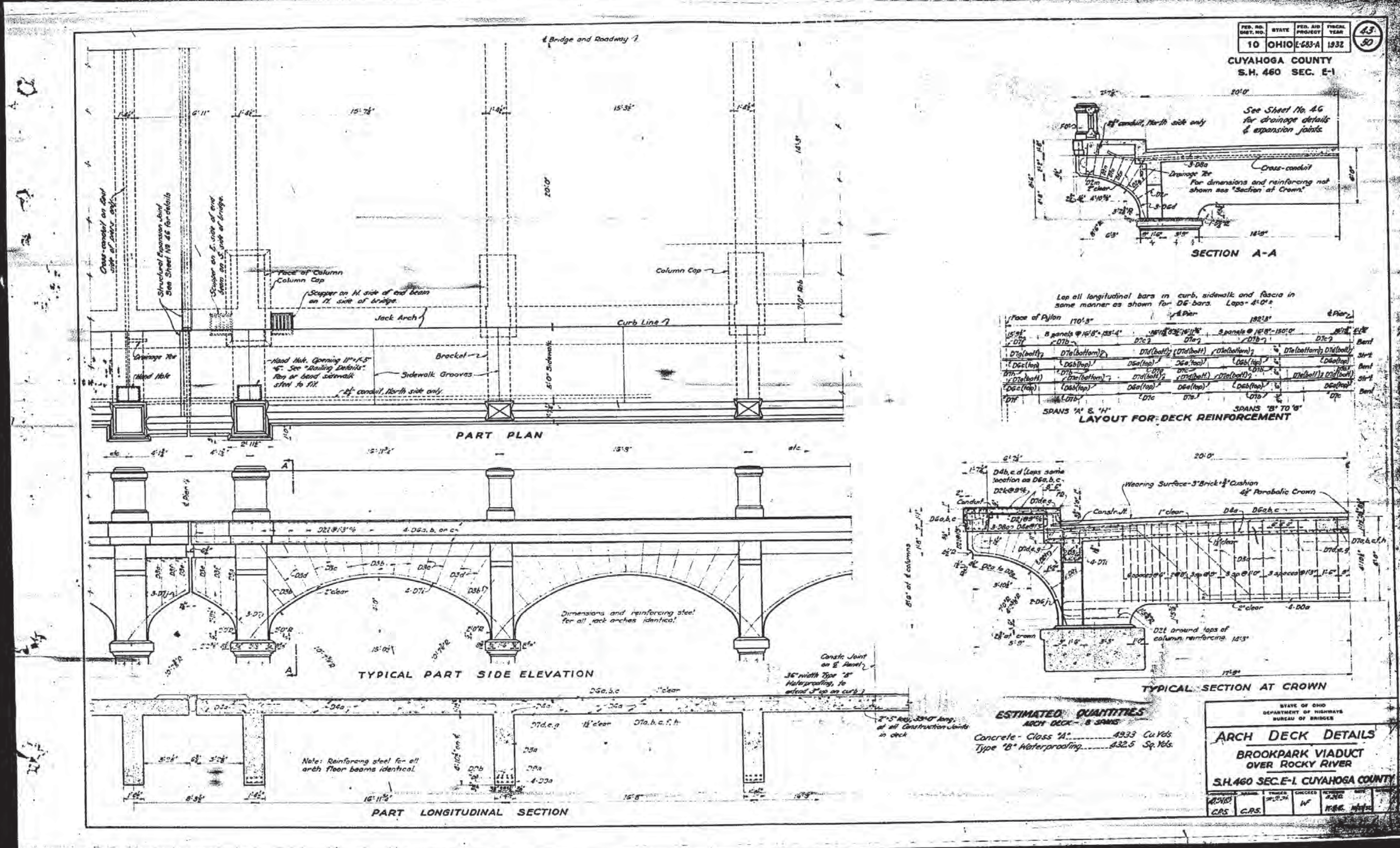
ELEVATION – ARCHES "B" TO "G"

BROOKPARK VIADUCT OVER ROCKY RIVER

S.H. 460 SEC. E-1. CUYAHOGA COUNTY

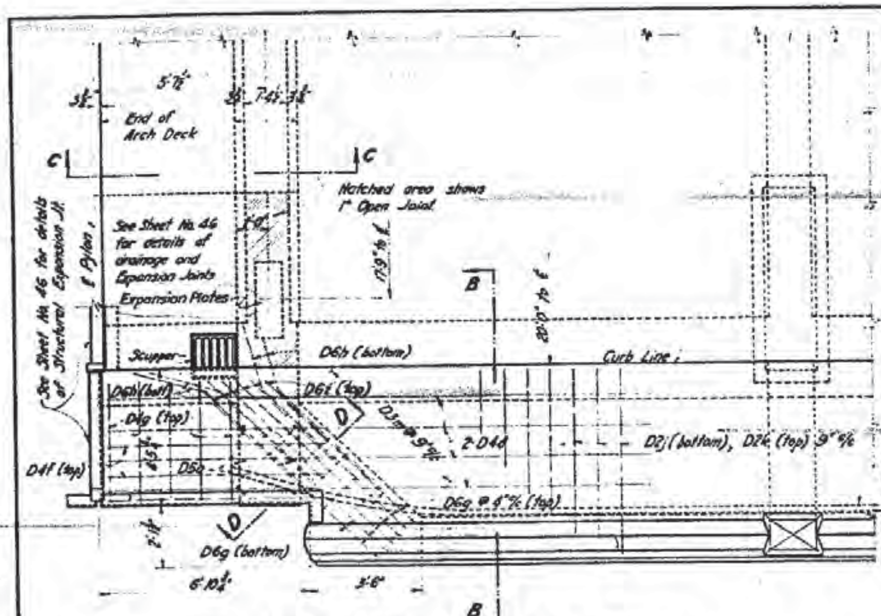
DESIGNED	DRAWN	TRACED	CHECKED	REVIEWED	DATE	REVISED
C.P.S.	C.P.S.	[illegible]	W	[illegible]	[illegible]	[illegible]


FED. RD. DIST. NO. 10
STATE OHIO
FED. AID PROJECT E-683-A
FISCAL YEAR 1932
42
50
CUYAHOGA COUNTY
S.H. 460. SEC. E-1.
Top of Columns
Constr. Joint 1'-4" × 4" × 5'-0" key.
Constr. Jt.
Construction Joint 1'-6" × 5" × 5'-0" key
Construction Joint 2'-3" × 6" × 5'-0" key
26 Stirrups – A3d (4 bars each)
14 Stirrups – A3c
10 Stirrups – A3b
2'-0" Same stirrups as left half
Rib stirrups spaced 2'-0" c/c ± along intrados between construction joints. 4-A3 bars in each stirrup.
TYPICAL PART PLAN
SECTION AT CROWN
℄ of inclined arch rib - vertical ℄ between piers
Level
192'-3" ℄ Piers
Note: These details show arch rib reinforcement for Arches "B" to "G"; also for West half of Arch "A" and East half of Arch "H". See sheet No 41 for East end of Arch "A" and West end of Arch "H".
ESTIMATED QUANTITIES
(12 RIBS)
Concrete - Class "A" 2593 Cu. Yds.
STATE OF OHIO
DEPARTMENT OF HIGHWAYS
BUREAU OF BRIDGES
ARCH RIBS - ARCHES "B" TO "G"
BROOKPARK VIADUCT
OVER ROCKY RIVER
S.H. 460. SEC. E-1. CUYAHOGA COUNTY


FED. RD. DIST. NO. 10
STATE OHIO
FED. AID PROJECT E-683-A
FISCAL YEAR 1932
43
50
CUYAHOGA COUNTY
S.H. 460 SEC. E-1
℄ Bridge and Roadway
PART PLAN
TYPICAL PART SIDE ELEVATION
PART LONGITUDINAL SECTION
Note: Reinforcing steel for all arch floor beams identical.
Dimensions and reinforcing steel for all jack arches identical.
SECTION A-A
See Sheet No. 46 for drainage details & expansion joints.
Lap all longitudinal bars in curb, sidewalk and fascia in same manner as shown for D6 bars. Laps- 4'-0"±
LAYOUT FOR DECK REINFORCEMENT
SPANS "A" & "H"
SPANS "B" TO "G"
TYPICAL SECTION AT CROWN
Wearing Surface-3" Brick+½" Cushion
4½" Parabolic Crown
ESTIMATED QUANTITIES
ARCH DECK - 8 SPANS
Concrete - Class "A" 4933 Cu.Yds.
Type "B" Waterproofing 432.5 Sq.Yds.
STATE OF OHIO
DEPARTMENT OF HIGHWAYS
BUREAU OF BRIDGES
ARCH DECK DETAILS
BROOKPARK VIADUCT
OVER ROCKY RIVER
S.H.460 SEC.E-1 CUYAHOGA COUNTY

FED. RD. DIST. NO.	STATE	FED. AID PROJECT	FISCAL YEAR	
10	OHIO	E-683-A	1932	44/60

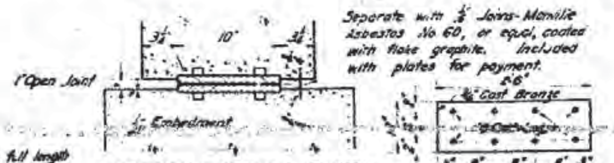
CUYAHOGA COUNTY
S.H. 460 SEC. E-1



PART PLAN - ARCH DECK AT PYLONS

PART SEC. D-D

PART SECTION C-C



Separate with 1/8" Johns-Manville Asbestos No 60, or equal, coated with flake graphite. Included with plates for payment.

SECTION THROUGH PLATES

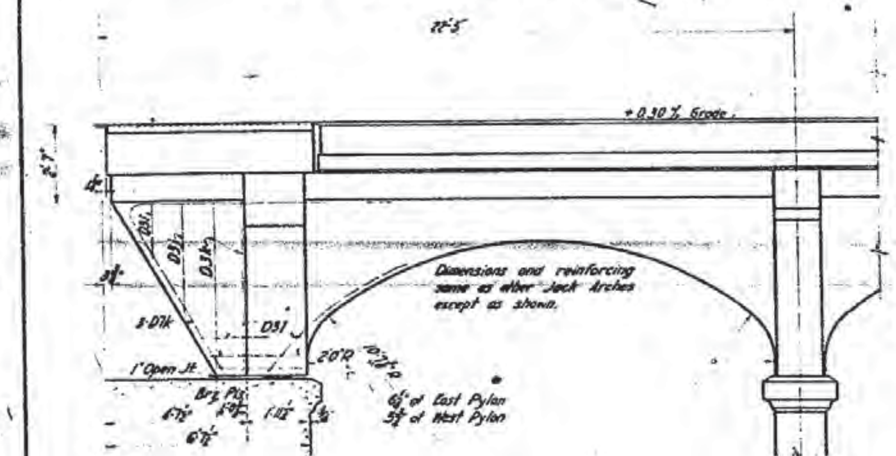
Recess may be made in bridge seat and bottom plate embedded with neat cement. 4 sets (8 plates) required.

Bronze Plates shall comply with Item S-10, except that the composition shall be as follows:

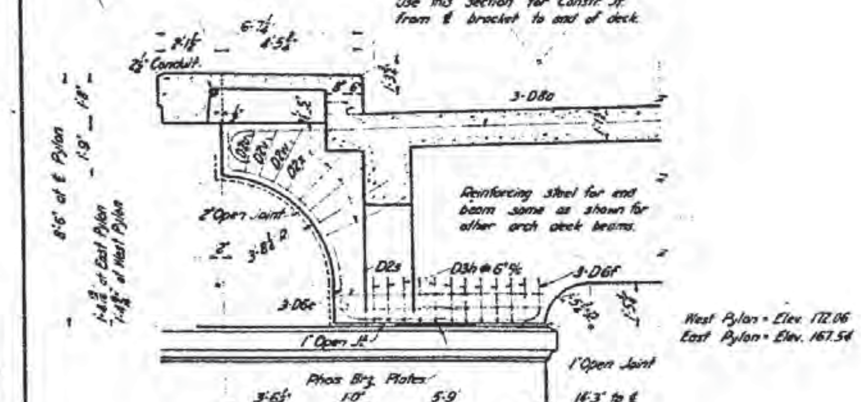
Copper........................78.5 % to 81.5 %
Tin........................9.0 % to 11.0 %
Lead........................9.0 % to 11.0 %
Phosphorus........................0.05 % to 0.25 %
Zinc........................0.75 %
Other Properties (max)........................0.25 %

Particular care shall be taken to set plates level in all directions, and to bring base plates to full bearing at all points.

BRONZE EXPANSION PLATES



Dimensions and reinforcing same as other "Jack Arches" except as shown.

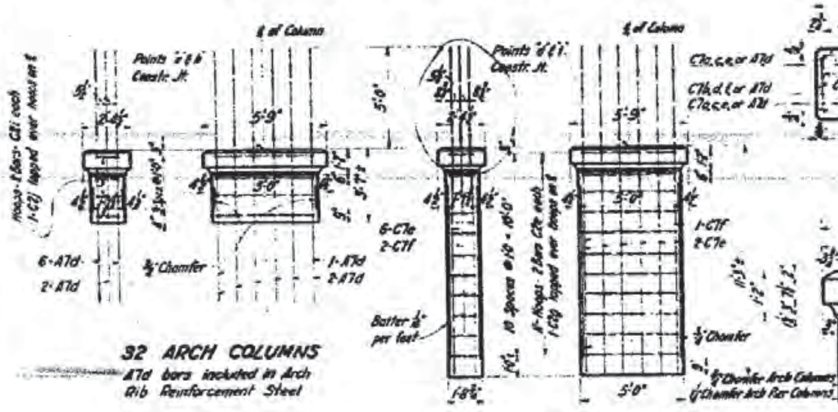


Use this section for Constr. Jt. from ℄ bracket to end of deck.

Reinforcing steel for end beam same as shown for other arch deck beams.

West Pylon - Elev. 172.06
East Pylon - Elev. 167.54

PART SECTION B-B

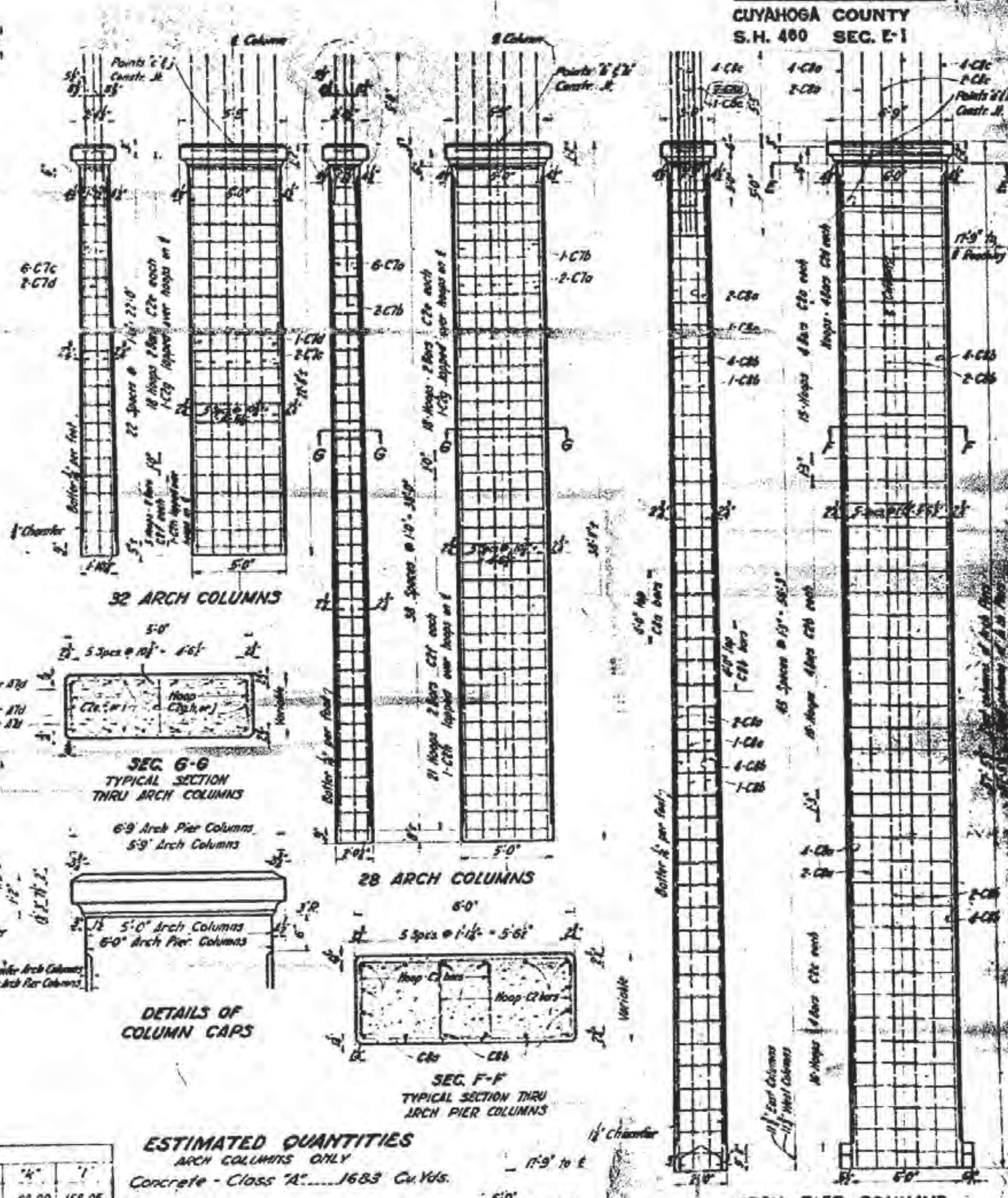


32 ARCH COLUMNS

A7d bars included in Arch Rib Reinforcement Steel

32 ARCH COLUMNS

DETAILS OF COLUMN CAPS



32 ARCH COLUMNS

SEC. G-G
TYPICAL SECTION THRU ARCH COLUMNS

28 ARCH COLUMNS

SEC. F-F
TYPICAL SECTION THRU ARCH PIER COLUMNS

ARCH PIER COLUMNS
14 EAST COLUMNS - 14 WEST COLUMNS

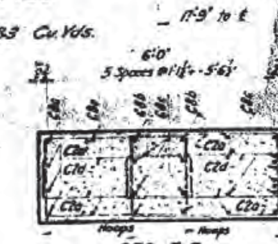
TABLE OF ELEVATIONS
TOP OF ARCH & ARCH PIER COLUMNS

ARCH	Points "a"	"b"	"c"	"d"	"e"	"f"	"g"	"h"	"i"	"j"	"k"	"l"
"A"	....	167.55	167.60	167.65	167.70	167.75	167.80	167.85	167.90	167.95	168.00	168.05
"B"	168.08	168.13	168.18	168.23	168.28	168.33	168.38	168.43	168.48	168.53	168.58	168.63
"C"	168.66	168.71	168.76	168.81	168.86	168.91	168.95	169.01	169.06	169.11	169.16	169.21
"D"	169.24	169.29	169.34	169.39	169.44	169.49	169.54	169.59	169.64	169.69	169.74	169.78
"E"	169.81	169.86	169.91	169.96	170.01	170.06	170.11	170.16	170.21	170.26	170.31	170.36
"F"	170.39	170.44	170.49	170.54	170.59	170.64	170.69	170.74	170.79	170.84	170.89	170.94
"G"	170.97	171.02	171.07	171.12	171.17	171.22	171.27	171.32	171.37	171.42	171.47	171.51
"H"	171.54	171.59	171.64	171.69	171.74	171.79	171.84	171.89	171.94	171.99	172.04	....

Note: For location of points see Sheet No. 50

ESTIMATED QUANTITIES
ARCH COLUMNS ONLY

Concrete - Class "A"......1683 Cu. Yds.



SEC. E-E
Section at bottom of Column Cap of Arch Pier Columns

STATE OF OHIO
DEPARTMENT OF HIGHWAYS
BUREAU OF BRIDGES

ARCH DECK ENDS & ARCH COLUMNS
BROOKPARK VIADUCT
OVER ROCKY RIVER

SH 460 SEC. E-I CUYAHOGA COUNTY

DESIGNED	DRAWN	TRACED	CHECKED		
CRS	C.P.S	C.E.E	W.F.		

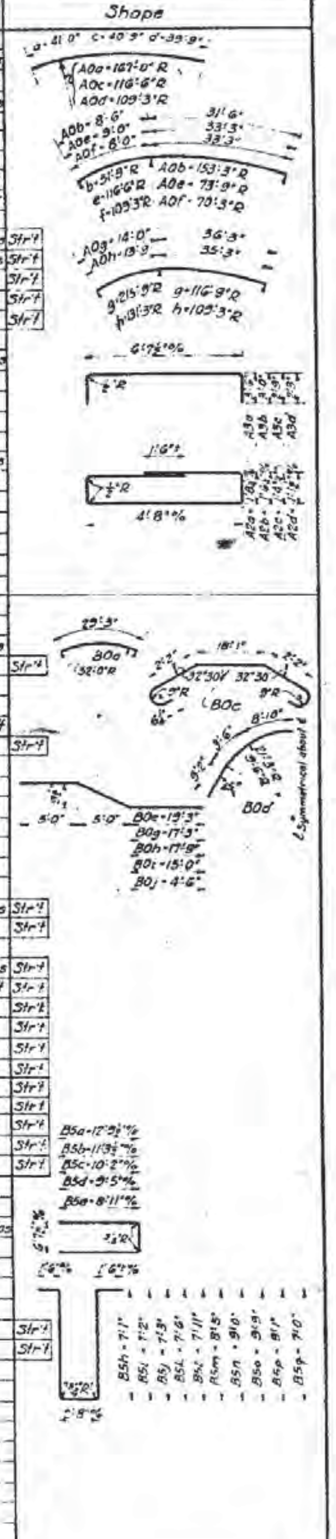
FED. RD. DIST. NO.	STATE	FED AID PROJECT	FISCAL YEAR
10	OHIO	E-683-A	1932

47/50

CUYAHOGA COUNTY
S.H.460 SEC. E-1

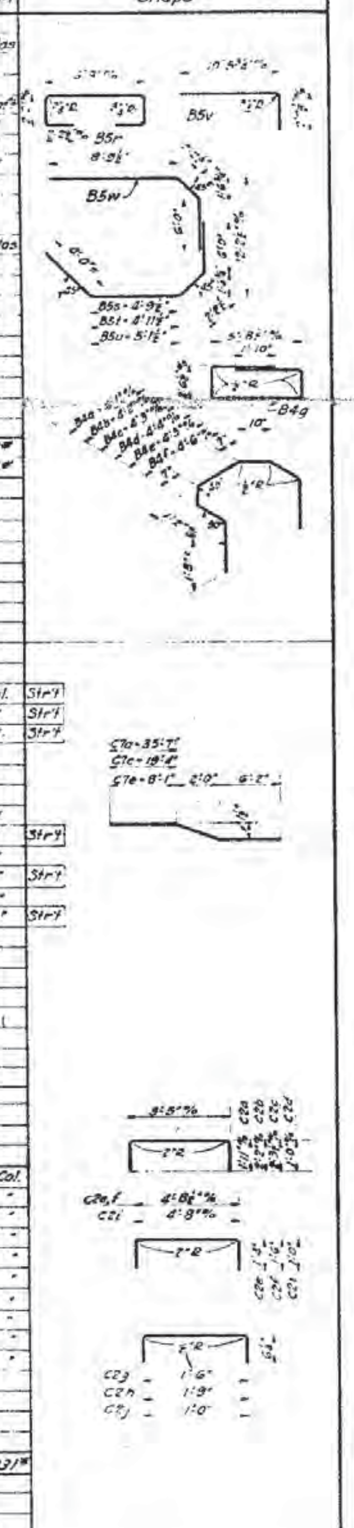
Mark	Size	No	Length	Weight	Location	
A0a	1⅛"φ	336	41'-0"	73,247	All Arches	
A0b	1¼"φ	336	40'-0"	71,461	All Arches	
A0c	1¼"φ	336	40'-9"	72,800	All Arches	
A0d	1¼"φ	336	39'-9"	71,014	" "	
A0e	1¼"φ	384	42'-3"	86,263	" "	
A0f	1¼"φ	384	41'-3"	84,221	" "	
A0g	1¼"φ	48	50'-3"	12,825	"A" & "H"	
A0h	1¼"φ	48	49'-0"	12,506	"A" & "H"	
A7a	1"φ	392	10'-0"	10,478	All Arches	Str't
A7b	1"φ	448	9'-0"	10,777	All Arches	Str't
A7c	1"φ	448	8'-0"	9,580	" "	Str't
A7d	1"φ	448	12'-6"	14,969	" "	Str't
A7e	1"φ	448	8'-6"	10,179	" "	Str't
A3a	½"φ	672	13'-6"	7,720	All Arches	
A3b	½"φ	1200	12'-6"	12,765	" "	
A3c	½"φ	1760	12'-0"	17,973	" "	
A3d	½"φ	3328	11'-0"	31,153	" "	
A2a	½"φ	56	14'-0"	524	All Arches	
A2b	½"φ	64	13'-6"	577	" "	
A2c	½"φ	64	13'-3"	567	" "	
A2d	½"φ	128	13'-0"	1112	" "	
TOTAL STEEL-ARCH RIBS = 612,711#						
B0a	1¼"φ	336	29'-3"	52,255	Umbrellas	
B0b	1¼"φ	336	15'-0"	26,798	"	Str't
B0c	1¼"φ	140	28'-6"	21,215	"	
B0d	1¼"φ	56	43'-0"	12,803	"	
B0e	1¼"φ	48	29'-3"	7,465	Pier Shaft	
B0f	1¼"φ	308	10'-0"	16,376	" "	Str't
B0g	1¼"φ	144	27'-3"	20,864	" "	
B0h	1¼"φ	48	27'-9"	7,082	" "	
B0i	1¼"φ	48	25'-0"	6,380	" "	
B0j	1¼"φ	48	14'-6"	3,701	" "	
B9a	1⅛"φ	112	26'-3"	12,663	Umbrellas	Str't
B9b	1⅛"φ	112	39'-0"	18,813	"	Str't
B8a	1"φ	448	11'-6"	17,532	Umbrellas	Str't
B8b	1"φ	8	19'-0"	517	Pier Shaft	Str't
B8c	1"φ	224	8'-0"	6,038	" "	Str't
B8d	1"φ	24	24'-0"	1,990	" "	Str't
B8e	1"φ	24	17'-0"	1388	" "	Str't
B8f	1"φ	72	22'-0"	5390	" "	Str't
B8g	1"φ	8	17'-9"	483	" "	Str't
B8h	1"φ	24	22'-9"	1858	" "	Str't
B8i	1"φ	8	14'-9"	405	" "	Str't
B8j	1"φ	24	19'-9"	1613	" "	Str't
B8k	1"φ	24	9'-6"	776	" "	Str't
B5a	¾"φ	56	32'-0"	2693	Umbrellas	
B5b	¾"φ	56	29'-0"	2441	"	
B5c	¾"φ	56	26'-9"	2251	"	
B5d	¾"φ	56	25'-3"	2125	"	
B5e	¾"φ	112	24'-3"	4082	"	
B5f	¾"φ	70	6'-9	710	"	Str't
B5g	¾"φ	112	23'-0"	3872	"	Str't
B5h	¾"φ	7	19'-6"	205	"	
B5i	¾"φ	14	19'-6"	410	"	
B5j	¾"φ	14	19'-9"	416	"	
B5k	¾"φ	14	20'-3"	426	"	
B5l	¾"φ	14	21'-0"	442	"	
B5m	¾"φ	14	22'-0"	463	"	
B5n	¾"φ	14	23'-3"	489	"	
B5o	¾"φ	14	24'-9"	521	"	

Shape



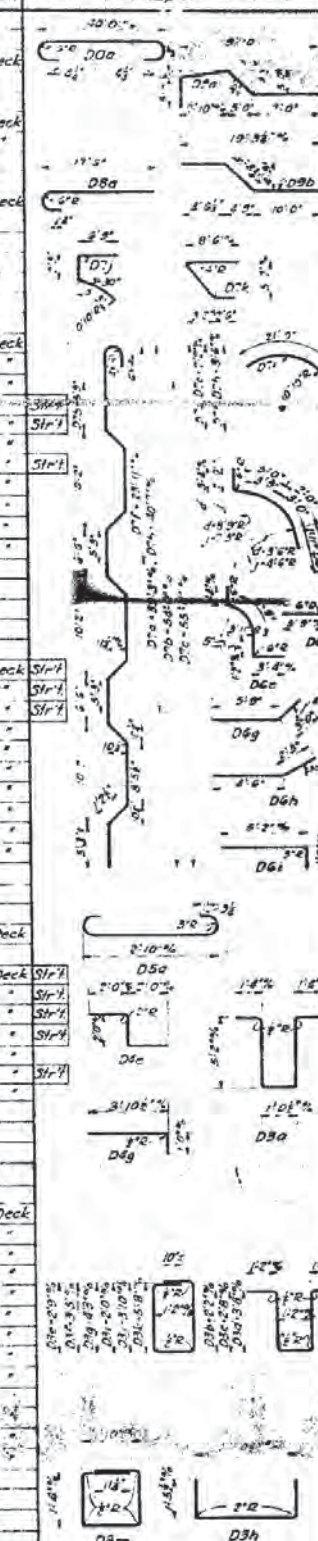
Mark	Size	No	Length	Weight	Location	
B5p	¾"φ	14	23'-6"	494	Umbrellas	
B5q	¾"φ	28	19'-6"	821	"	
B5r	¾"φ	140	15'-0"	3156	"	
B5s	¾"φ	28	17'-0"	715	Pier Shaft	
B5t	¾"φ	28	17'-3"	726	" "	
B5u	¾"φ	28	17'-3"	726	" "	
B5v	¾"φ	504	18'-0"	13635	" "	
B5w	¾"φ	84	17'-0"	2146	" "	
B4a	⅝"φ	28	8'-3"	241	Umbrellas	
B4b	⅝"φ	28	8'-3"	241	"	
B4c	⅝"φ	28	8'-3"	241	"	
B4d	⅝"φ	28	8'-6"	248	"	
B4e	⅝"φ	28	8'-6"	248	"	
B4f	⅝"φ	28	8'-6"	248	"	
B4g	⅝"φ	112	18'-0"	2105	"	
TOTAL STEEL-UMBRELLAS = 191,668#						
TOTAL STEEL-SHAFTS = 100,304#						
C8a	1"φ	336	33'-3"	38,018	Arch Col.	Str't
C8b	1"φ	560	30'-6"	58,123	" "	Str't
C8c	1"φ	280	10'-3"	9,767	" "	Str't
C7a	1"φ	336	43'-9"	39,293	Arch Col.	
C7b	1"φ	56	43'-9"	6,549	" "	Str't
C7c	1"φ	384	27'-6"	28,227	" "	
C7d	1"φ	64	27'-6"	4,704	" "	Str't
C7e	1"φ	384	16'-3"	16,680	" "	
C7f	1"φ	64	16'-3"	2,780	" "	Str't
C2a	½"φ	1680	7'-0"	7,856	Arch Col.	
C2b	½"φ	1680	7'-6"	8,417	" "	
C2c	½"φ	1792	7'-9"	9,277	" "	
C2d	½"φ	224	6'-3"	786	" "	
C2e	½"φ	2864	7'-2"	13,711	" "	
C2f	½"φ	1496	7'-6"	7,495	" "	
C2g	½"φ	1432	2'-6"	2,391	" "	
C2h	½"φ	748	2'-9"	1,374	" "	
C2i	½"φ	256	6'-6"	1,112	" "	
C2j	½"φ	128	2'-0"	171	" "	
TOTAL STEEL-ARCH COLUMNS = 256,231#						

Shape



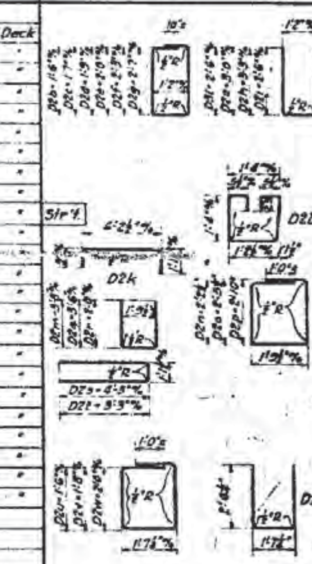
Mark	Size	No	Length	Weight	Location	
D0a	1¼"φ	376	43'-0"	85,965	Arch Deck	
D9a	1⅛"φ	188	54'-0"	43,725	Arch Deck	
D9b	1⅛"φ	188	42'-6"	34,413	" "	
D8a	1"φ	564	19'-0"	36,447	Arch Deck	
D7a	1"φ	266	42'-0"	29,863	Arch Deck	
D7b	1"φ	608	56'-0"	91,010	" "	
D7c	1"φ	266	59'-3"	42,128	" "	
D7d	1"φ	[illegible]	[illegible]	[illegible]	" "	Str't
D7e	1"φ	1034	54'-0"	149,250	" "	Str't
D7f	1"φ	38	26'-0"	2,641	" "	
D7g	1"φ	94	57'-3"	14,385	" "	Str't
D7h	1"φ	38	43'-3"	4,393	" "	
D7i	1"φ	688	21'-0"	38,620	" "	
D7j	1"φ	84	17'-3"	3,873	" "	
D7k	1"φ	12	17'-0"	545	" "	
D6a	⅞"φ	798	47'-6"	77,554	Arch Deck	Str't
D6b	⅞"φ	912	54'-0"	100,761	" "	Str't
D6c	⅞"φ	114	32'-3"	7,522	" "	Str't
D6d	⅞"φ	84	12'-3"	2,105	" "	
D6e	⅞"φ	12	11'-6"	282	" "	
D6f	⅞"φ	12	7'-0"	172	" "	
D6g	⅞"φ	40	8'-9"	716	" "	
D6h	⅞"φ	16	6'-9"	221	" "	
D6i	⅞"φ	24	6'-0"	295	" "	
D6j	⅞"φ	312	11'-9"	7501	" "	
D5a	¾"φ	24	4'-6"	162	Arch Deck	
D4a	⅝"φ	2716	22'-3"	63,090	Arch Deck	Str't
D4b	⅝"φ	224	47'-0"	10,991	" "	Str't
D4c	⅝"φ	256	53'-0"	14,165	" "	Str't
D4d	⅝"φ	32	31'-9"	1,061	" "	Str't
D4e	⅝"φ	2416	5'-9"	14,503	" "	
D4f	⅝"φ	12	7'-3"	91	" "	Str't
D4g	⅝"φ	20	4'-9"	99	" "	
D3a	½"φ	3572	19'-9"	41,797	Arch Deck	
D3b	½"φ	1204	7'-6"	7,685	" "	
D3c	½"φ	688	8'-6"	4,977	" "	
D3d	½"φ	688	10'-6"	6,148	" "	
D3e	½"φ	28	8'-3"	203	" "	
D3f	½"φ	28	9'-9"	232	" "	
D3g	½"φ	28	11'-6"	274	" "	
D3h	½"φ	44	3'-9"	140	" "	
D3i	½"φ	6	[illegible]	34	" "	
D3j	½"φ	4	10'-6"	36	" "	
D3k	½"φ	8	14'-3"	97	" "	
D3l	½"φ	16	6'-0"	82	" "	
D3m	½"φ	32	7'-0"	191	" "	

Shape



Mark	Size	No	Length	Weight	Location	
D2a	½"φ	156	7'-0"	729	Arch Deck	
D2b	½"φ	156	6'-0"	625	" "	
D2c	½"φ	156	6'-0"	625	" "	
D2d	½"φ	156	6'-6"	677	" "	
D2e	½"φ	156	7'-0"	729	" "	
D2f	½"φ	156	7'-6"	782	" "	
D2g	½"φ	156	8'-0"	834	" "	
D2h	½"φ	468	7'-6"	2345	" "	
D2i	½"φ	156	6'-0"	625	" "	
D2j	½"φ	3980	6'-3"	16,617	" "	Str't
D2k	½"φ	3980	8'-0"	21,269	" "	
D2l	[illegible]	[illegible]	[illegible]	[illegible]	" "	
D2m	½"φ	56	8'-3"	309	" "	
D2n	½"φ	28	8'-9"	164	" "	
D2o	½"φ	28	9'-3"	173	" "	
D2p	½"φ	28	10'-0"	187	" "	
D2q	½"φ	84	8'-9"	491	" "	
D2r	½"φ	28	5'-9"	108	" "	
D2s	½"φ	16	9'-6"	102	" "	
D2t	½"φ	736	7'-6"	3687	" "	
D2u	½"φ	4	7'-0"	19	" "	
D2v	½"φ	4	7'-3"	19	" "	
D2w	½"φ	4	8'-0"	21	" "	
D2x	½"φ	20	6'-6"	87	" "	
TOTAL STEEL-ARCH DECK = 1,039,648#						
TOTAL STEEL-ARCH SYSTEM = 2201,056#						

Shape



Radii shown are for inside of bend. Lengths measured along ℄ of bar.

STATE OF OHIO
DEPARTMENT OF HIGHWAYS
BUREAU OF BRIDGES

STEEL LIST
FOR ARCH SYSTEM

BROOKPARK VIADUCT
OVER ROCKY RIVER

S.H. 460 ~~SEC. E-1~~ CUYAHOGA COUNTY

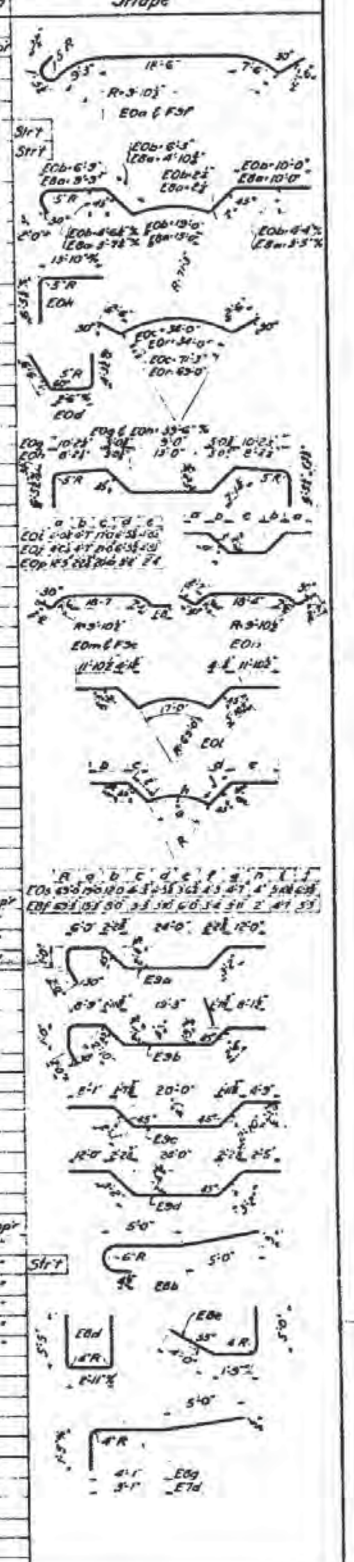
DESIGNED	DRAWN	TRACED	CHECKED	REVIEWED	DATE
C.P.S.	D.W.W.	[illegible]	W / C.P.S.	[illegible]	[illegible]

FED. RD. DIST. NO.	STATE	FED. AID PROJECT	FISCAL YEAR	SHEET
10	OHIO	E-683A	1932	48 / 50

CUYAHOGA COUNTY
S.H. 460 SEC. E-1

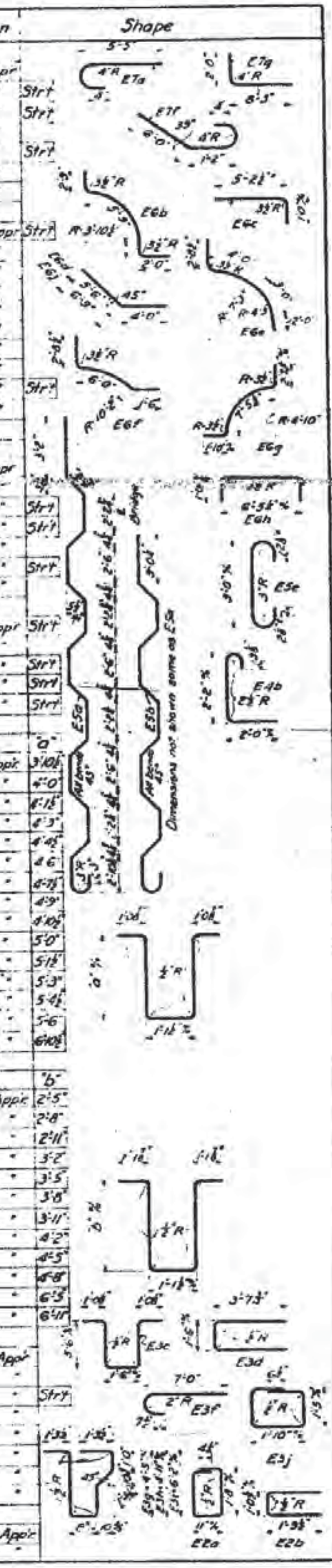
Mark	Size	No	Length	Weight	Location	
E0a	1¼"□	12	39'-6"	2520	West Appr	
E0b	1¼"□	4	50'-6"	1074	" "	
E0c	1¼"□	4	39'-0"	829	" "	
E0d	1¼"□	16	13'-0"	1106	" "	
E0e	1¼"□	8	20'-0"	851	" "	Strt
E0f	1¼"□	20	39'-0"	4147	" "	Strt
E0g	1¼"□	10	56'-0"	2978	" "	
E0h	1¼"□	10	56'-0"	2978	" "	
E0i	1¼"□	10	42'-0"	2233	" "	
E0j	1¼"□	10	42'-0"	2233	" "	
E0k	1¼"□	20	20'-0"	2127	" "	
E0l	1¼"□	16	52'-6"	4466	" "	
E0m	1¼"□	12	37'-6"	2393	" "	
E0n	1¼"□	48	38'-6"	9826	" "	
E0p	1¼"□	48	52'-0"	13271	" "	
E0r	1¼"□	20	39'-0"	4147	" "	
E0s	1¼"□	4	46'-9"	994	" "	
E9a	1⅛"□	12	51'-0"	2636	West Appr	
E9b	1⅛"□	12	44'-0"	2274	" "	
E9c	1⅛"□	12	38'-0"	1964	" "	
E9d	1⅛"□	12	44'-9"	2313	" "	
E8a	1"□	4	47'-0"	640	West Appr	
E8b	1"□	66	11'-6"	2503	" "	
E8c	1"□	12	16'-0"	653	" "	Strt
E8d	1"□	4	13'-3"	180	" "	
E8e	1"□	12	10'-6"	429	" "	
E8f	1"□	4	39'-3"	534	" "	
E8g	1"□	6	10'-3"	209	" "	

Shape



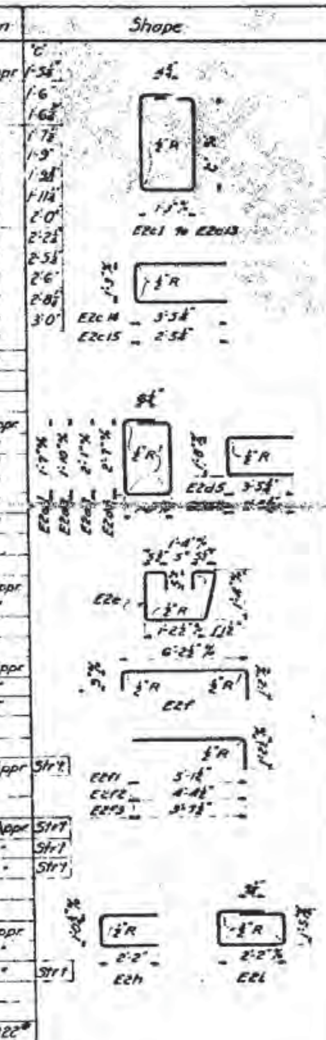
Mark	Size	No	Length	Weight	Location	
E7a	1"⌀	8	6'-6"	139	West Appr	
E7b	1"⌀	24	7'-6"	481	" "	Strt
E7c	1"⌀	12	37'-0"	1187	" "	Strt
E7d	1"⌀	8	9'-3"	198	" "	
E7e	1"⌀	2	39'-0"	208	" "	Strt
E7f	1"⌀	4	8'-3"	88	" "	
E7g	1"⌀	4	10'-0"	107	" "	
E6a	⅞"⌀	96	36'-6"	7169	West Appr	Strt
E6b	⅞"⌀	4	11'-3"	92	" "	
E6c	⅞"⌀	12	6'-0"	147	" "	
E6d	⅞"⌀	28	9'-6"	544	" "	
E6e	⅞"⌀	20	11'-6"	471	" "	
E6f	⅞"⌀	24	10'-0"	491	" "	
E6g	⅞"⌀	4	11'-6"	94	" "	
E6h	⅞"⌀	4	8'-0"	65	" "	
E6i	⅞"⌀	8	7'-0"	115	" "	Strt
E6j	⅞"⌀	10	10'-9"	220	" "	
E5a	¾"⌀	193	27'-9"	8050	West Appr	
E5b	¾"⌀	193	21'-9"	6309		
E5c	¾"⌀	206	41'-6"	12,849	" "	Strt
E5d	¾"⌀	141	10'-0"	2119	" "	Strt
E5e	¾"⌀	24	4'-6"	162	" "	
E5f	¾"⌀	36	6'-9"	365	" "	Strt
E4a	⅝"⌀	198	41'-6"	8579	West Appr	Strt
E4b	⅝"⌀	404	4'-9"	2003	" "	
E4c	⅝"⌀	96	36'-6"	3658	" "	Strt
E4d	⅝"⌀	10	4'-0"	42	" "	Strt
E4e	⅝"⌀	2	39'-0"	81	" "	Strt
						"a"
E3a1	½"□	78	10'-9"	714	West Appr	3'-10½"
E3a2	½"□	72	11'-0"	674	" "	4'-0"
E3a3	½"□	28	11'-3"	268	" "	4'-1½"
E3a4	½"□	44	11'-6"	431	" "	4'-3"
E3a5	½"□	28	11'-9"	280	" "	4'-4½"
E3a6	½"□	40	12'-0"	408	" "	4'-6"
E3a7	½"□	26	12'-3"	271	" "	4'-7½"
E3a8	½"□	24	12'-6"	255	" "	4'-9"
E3a9	½"□	26	12'-9"	282	" "	4'-10½"
E3a10	½"□	24	13'-0"	266	" "	5'-0"
E3a11	½"□	26	13'-3"	293	" "	5'-1½"
E3a12	½"□	22	13'-6"	253	" "	5'-3"
E3a13	½"□	22	13'-9"	257	" "	5'-4½"
E3a14	½"□	24	14'-0"	286	" "	5'-6"
E3a15	½"□	12	16'-9"	171	" "	6'-10½"
						"b"
E3b1	½"□	888	8'-0"	6046	West Appr	2'-5"
E3b2	½"□	84	8'-6"	608	" "	2'-8"
E3b3	½"□	72	9'-0"	551	" "	2'-11"
E3b4	½"□	66	9'-6"	534	" "	3'-2"
E3b5	½"□	72	10'-0"	613	" "	3'-5"
E3b6	½"□	12	10'-6"	107	" "	3'-8"
E3b7	½"□	60	11'-0"	562	" "	3'-11"
E3b8	½"□	12	11'-6"	117	" "	4'-2"
E3b9	½"□	60	12'-0"	613	" "	4'-5"
E3b10	½"□	24	12'-6"	255	" "	4'-8"
E3b11	½"□	6	16'-0"	82	" "	6'-5"
E3b12	½"□	12	17'-0"	174	" "	6'-11"
E3c	½"□	340	14'-3"	4123	West Appr	
E3d	½"□	40	8'-9"	298	" "	
E3e	½"□	450	36'-6"	13978	" "	Strt
E3f	½"□	75	8'-0"	511	" "	
E3g	½"□	17	12'-3"	177	" "	
E3h	½"□	2	13'-3"	23	" "	
E3i	½"□	2	15'-9"	27	" "	
E3j	½"□	16	6'-9"	92	" "	
E2a	½"⌀	14	5'-3"	49	West Appr	
E2b	½"⌀	56	4'-6"	168	" "	

Shape



Mark	Size	No	Length	Weight	Location	
						"c"
E2c1	½"⌀	22	5'-6"	81	West Appr	1'-5¼"
E2c2	½"⌀	24	5'-7½"	90	" "	1'-6"
E2c3	½"⌀	12	5'-9"	46	" "	1'-6¾"
E2c4	½"⌀	14	5'-10½"	55	" "	1'-7½"
E2c5	½"⌀	10	6'-1½"	41	" "	1'-9"
E2c6	½"⌀	14	6'-3"	58	" "	1'-9¾"
E2c7	½"⌀	10	6'-6"	43	" "	1'-11¼"
E2c8	½"⌀	12	6'-7½"	53	" "	2'-0"
E2c9	½"⌀	24	7'-0"	112	" "	2'-2¼"
E2c10	½"⌀	12	7'-6"	60	" "	2'-5¼"
E2c11	½"⌀	10	7'-7½"	51	" "	2'-6"
E2c12	½"⌀	14	8'-0"	75	" "	2'-8¼"
E2c13	½"⌀	34	8'-7½"	196	" "	3'-0"
E2c14	½"⌀	48	5'-0"	257	" "	
E2c15	½"⌀	2	6'-0"	8	" "	
E2d1	½"⌀	2	6'-9"	9	West Appr	
E2d2	½"⌀	2	7'-3"	10	" "	
E2d3	½"⌀	2	7'-9"	10	" "	
E2d4	½"⌀	2	8'-9"	12	" "	
E2d5	[illegible]	[illegible]	[illegible]	[illegible]	" "	
E2d6	½"⌀	4	6'-6"	17	" "	
E2e	½"⌀	320	5'-3"	1122	West Appr	
E2f	½"⌀	512	8'-0"	2736	" "	
E2f1	½"⌀	4	6'-3"	17	West Appr	
E2f2	½"⌀	4	5'-6"	15	" "	
E2f3	½"⌀	4	4'-9"	13	" "	
E2a	½"⌀	512	6'-3"	2139	West Appr	Strt
E2g1	½"⌀	4	5'-0"	13	West Appr	Strt
E2g2	½"⌀	4	4'-3"	11	" "	Strt
E2g3	½"⌀	4	3'-6"	9	" "	Strt
E2h	½"⌀	8	5'-3"	28	West Appr	
E2i	½"⌀	14	5'-6"	51	" "	
E2j	½"⌀	16	2'-3"	24	" "	Strt
TOTAL West Approach Spans				170,922#		

Shape



Note:
Radii shown are for inside of bend.
Lengths are measured along ℄ of bar.

STATE OF OHIO
DEPARTMENT OF HIGHWAYS
BUREAU OF BRIDGES

STEEL LIST
WEST APPROACH SPANS
BROOKPARK VIADUCT
OVER ROCKY RIVER
S.H. 460 SEC. E-1 CUYAHOGA COUNTY

DESIGNED	DRAWN	TRACED	CHECKED		DATE	
a.g.t.	B.W.W.	a.g.t.	W. C.P.S.			

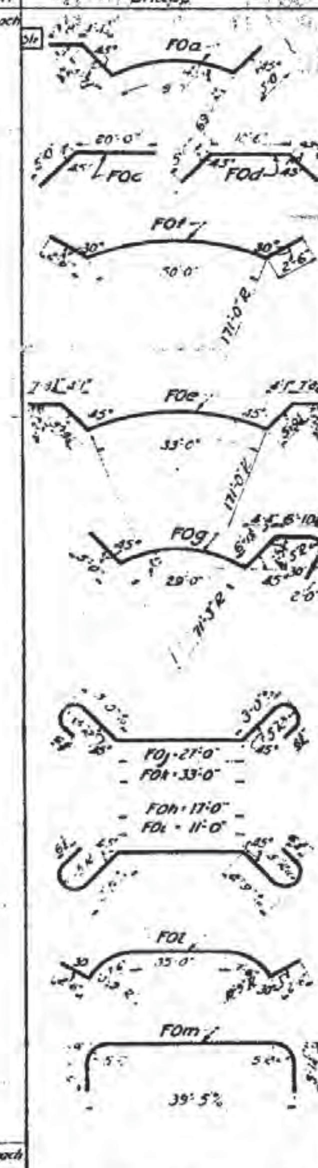
Mark	Size	No.	Length	Weight	Location	Shape.
E0c	1¼"	4	33'-0"	829	E. Approach	
E0d	1¼"	16	13'-0"	1,106	"	
		1			"	
E0r	1¼"	4	33'-0"	823	"	
E8b	1"	36	11'-6"	1,409	"	
E8e	1"	12	10'-6"	429	"	
E8g	1"	6	10'-3"	209	"	
E7a	⅞"	8	6'-6"	139	"	
E7b	⅞"	24	7'-6"	481	"	Str.
E7d	⅞"	8	9'-3"	198	"	
E7e	⅞"	2	39'-0"	208	"	Str.
E7f	⅞"	4	8'-3"	88	"	
E7g	⅞"	4	10'-0"	107	"	
E6b	¾"	4	11'-3"	92	"	
E6c	¾"	12	6'-0"	147	"	
E6d	¾"	28	9'-6"	544	"	
E6e	¾"	8	11'-6"	188	"	
E6f	¾"	16	10'-0"	327	"	
E6g	¾"	4	11'-6"	94	"	
E6h	¾"	4	8'-0"	65	"	
E6i	¾"	8	7'-0"	115	"	
E6j	¾"	10	10'-9"	220	"	
E5a	⅝"	117	27'-9"	4,880	"	
E5b	⅝"	117	21'-9"	3,825	"	
E5c	⅝"	127	41'-6"	7,922	"	Str.
E5d	⅝"	66	10'-0"	992	"	Str.
E5e	⅝"	24	4'-6"	162	"	
E5f	⅝"	24	6'-9"	243	"	Str.
E4a	½"	119	4'-6"	5,156	"	Str.
E4b	½"	239	4'-9"	1,160	"	
E4d	½"	10	4'-0"	32	"	Str.
E4e	½"	2	39'-0"	81	"	Str.
E3a1	⅜"	62	10'-9"	567	"	
E3a2	⅜"	28	11'-0"	202	"	
E3a3	⅜"	24	11'-3"	230	"	
E3a4	⅜"	24	11'-6"	235	"	
E3a5	⅜"	20	11'-9"	200	"	
E3a6	⅜"	20	12'-0"	204	"	
E3a7	⅜"	20	12'-3"	208	"	
E3a8	⅜"	20	12'-6"	213	"	
E3a9	⅜"	14	12'-9"	152	"	
E3a10	⅜"	18	13'-0"	198	"	
E3a11	⅜"	18	13'-3"	203	"	
E3a12	⅜"	14	13'-6"	161	"	
E3a13	⅜"	14	13'-9"	164	"	
E3a14	⅜"	16	14'-0"	191	"	
E3a15	⅜"	12	16'-9"	171	"	
E3b1	⅜"	324	8'-0"	2,206	"	
E3b2	⅜"	288	8'-6"	2,083	"	
E3b3	⅜"	48	9'-0"	368	"	
E3b4	⅜"	30	9'-6"	243	"	
E3b5	⅜"	36	10'-0"	306	"	
E3b6	⅜"	6	10'-6"	54	"	
E3b7	⅜"	30	11'-0"	281	"	
E3b8	⅜"	24	11'-6"	235	"	
E3b9	⅜"	6	12'-0"	61	"	
E3b10	⅜"	48	12'-6"	511	"	
E3b11	⅜"	6	16'-0"	82	"	
E3b12	⅜"	12	17'-0"	174	"	

Bending — diagrams — same — as — for — West — Approach

Mark	Size	No.	Length	Weight	Location	Shape
E3c	⅜"	144	4'-3"	1,146	E. Approach	
E3f	⅜"	75	8'-0"	511	"	
E3j	⅜"	16	6'-9"	92	"	
E2a	¼"	14	5'-3"	49	"	
E2b	¼"	56	4'-6"	168	"	
E2c1	¼"	12	5'-6"	44	"	
E2c2	¼"	14	5'-7½"	53	"	
E2c3	¼"	8	5'-9"	31	"	
E2c4	¼"	10	5'-10½"	39	"	
E2c5	¼"	4	6'-1½"	16	"	
E2c6	¼"	10	6'-3"	42	"	
E2c7	¼"	4	6'-6"	17	"	
E2c8	¼"	8	6'-7½"	35	"	
E2c9	¼"	14	7'-0"	65	"	
E2c10	¼"	8	7'-6"	40	"	
E2c11	¼"	4	7'-7½"	20	"	
E2c12	¼"	10	8'-0"	53	"	
E2c13	¼"	20	8'-7½"	115	"	
E2c14	¼"	24	8'-0"	128	"	
E2c15	¼"	2	6'-0"	8	"	
E2d1	¼"	2	6'-9"	9	"	
E2d2	¼"	2	7'-3"	10	"	
E2d3	¼"	2	7'-9"	10	"	
E2d4	¼"	2	8'-9"	12	"	
E2d5	¼"	4	8'-6"	23	"	
E2d6	¼"	4	6'-6"	17	"	
E2e	¼"	176	5'-3"	617	"	
E2f	¼"	292	8'-0"	1,560	"	
E2f1	¼"	4	6'-3"	17	"	
E2f2	¼"	4	5'-6"	15	"	
E2f3	¼"	4	4'-9"	13	"	
E2g	¼"	292	6'-3"	1,219	"	Str.
E2g1	¼"	4	5'-0"	13	"	
E2g2	¼"	4	4'-3"	11	"	
E2g3	¼"	4	3'-6"	9	"	
E2h	¼"	8	5'-3"	28	"	
E2i	¼"	14	5'-6"	51	"	
E2j	½"	16	2'-3"	24	"	Str.

Bending — diagrams — same — as — for — West — Approach

Mark	Size	No.	Length	Weight	Location	Shape
F0a	1¼"	4	34'-0"	723	E. Approach	Str.
F0b	1¼"	40	27'-0"	5,742	"	
F0c	1¼"	8	25'-0"	1,063	"	
F0d	1¼"	8	22'-6"	957	"	
F0e	1¼"	4	60'-0"	1,276	"	
F0f	1¼"	4	55'-0"	1,170	"	
F0g	1¼"	4	49'-6"	1,053	"	
F0h	1¼"	24	25'-6"	3,254	"	
F0i	1¼"	24	19'-6"	2,498	"	
F0j	1¼"	12	36'-0"	2,297	"	
F0k	1¼"	12	42'-0"	2,690	"	
F0l	1¼"	12	55'-0"	3,509	"	
F0m	1¼"	8	49'-0"	2,091	"	
F9a	1⅛"	12	33'-0"	1,706	E. Approach	
F9b	1⅛"	12	36'-0"	1,861	"	
F9c	1⅛"	12	37'-6"	1,938	"	
F9d	1⅛"	12	36'-0"	1,861	"	
F9e	1⅛"	12	39'-0"	2,016	"	
F9f	1⅛"	12	39'-6"	2,042	"	

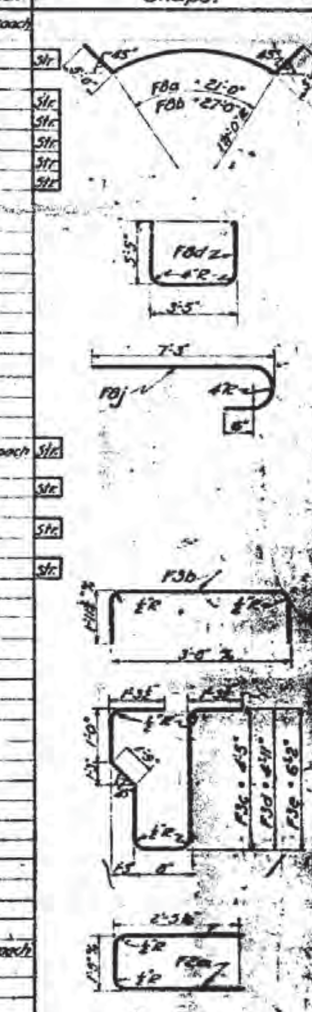


F9c same diagram as E0m

F9f same diagram as E0a

	"a"	"b"	"c"	"d"	"e"
F9a	17'-6"	2'-9½"	6'-0"	2'-0½"	1'-11½"
F9b	23'-0"	3'-1½"	3'-3"	2'-4"	2'-2½"
F9d	17'-6"	2'-9½"	9'-0"	2'-0½"	1'-11½"
F9e	23'-0"	3'-1½"	6'-3"	2'-4"	2'-2½"

Mark	Size	No.	Length	Weight	Location	Shape.
F8a	1"	4	31'-0"	422	E. Approach	
F8b	1"	4	37'-0"	504	"	
F8c	1"	8	39'-0"	1,062	"	Str.
F8d	1"	4	13'-9"	187	"	
F8e	1"	10	25'-3"	859	"	Str.
F8f	1"	10	20'-3"	1,378	"	Str.
F8g	1"	20	16'-9"	1,140	"	Str.
F8h	1"	10	14'-6"	493	"	Str.
F8i	1"	48	11'-0"	1,797	"	Str.
F8j	1"	68	8'-6"	1,736	"	
F7a	⅞"	6	42'-0"	674	E. Approach	Str.
F6a	¾"	48	42'-0"	4,125	"	Str.
F4a	½"	48	41'-6"	2,080	"	Str.
F3a	⅜"	225	41'-6"	7,946	"	Str.
F3b	⅜"	158	7'-6"	1,008	"	
F3c	⅜"	17	12'-9"	184	"	
F3d	⅜"	2	13'-9"	23	"	
F3e	⅜"	2	16'-3"	28	"	
F2a	¼"	48	6'-6"	208	E. Approach	
TOTAL E. APPROACH				114,775		



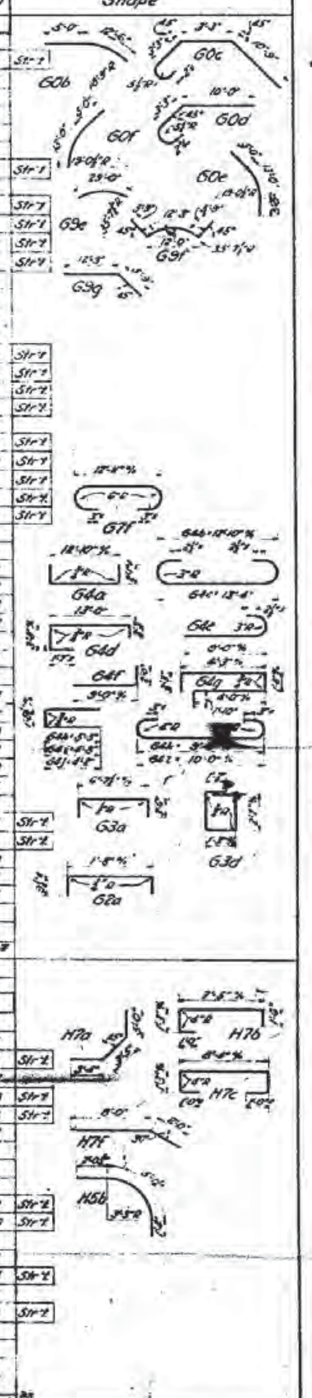
Note: Radii shown are for inside of bar.
Lengths are measured along ℄ of bar.

STATE OF OHIO
DEPARTMENT OF HIGHWAYS
BUREAU OF BRIDGES

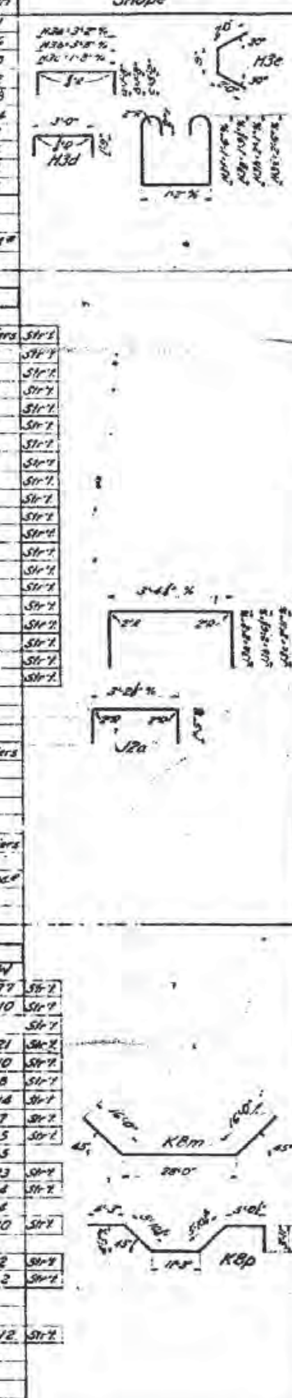
STEEL LIST
EAST APPROACH
BROOKPARK VIA[illegible]
OVER ROCKY RI[illegible]
S.H. 460 SEC. E-1 — CUY[illegible]

4[illegible]		C.C.S.	W[illegible]

Mark	Size	No.	Length	Weight	Location E	Location W	Shape
PYLONS - BELOW BRIDGE SEAT							
					E	W	
G0a	1¼"	122	10'-0"	6487	48	74	Str't
G0b	1¼"	24	17'-6"	2233		24	
G0c	1¼"	30	19'-0"	3030	10	20	
G0d	1¼"	10	15'-0"	798	10		
G0e	1¼"	12	23'-0"	1467	12		
G0f	1¼"	12	18'-0"	1148	12		
G0g	1¼"	15	31'-0"	2472	15		Str't
					E	W	
G9a	1¼"	12	44'-0"	2274	6	6	Str't
G9b	1¼"	8	38'-0"	1309	4	4	Str't
G9c	1¼"	32	12'-0"	1654	16	16	Str't
G9d	1¼"	24	9'-0"	930	12	12	Str't
G9e	1¼"	12	29'-0"	1499	6	6	
G9f	1¼"	4	23'-9"	409	2	2	
G9g	1¼"	8	18'-0"	620	4	4	
					E	W	
G8a	1"	156	9'-0"	4777	82	74	Str't
G8b	1"	84	13'-0"	3716	28	56	Str't
G8c	1"	9	19'-6"	597	3	6	Str't
G8d	1"	3	24'-6"	250	3		Str't
					E	W	
G7a	1"	96	43'-0"	11,034	48	48	Str't
G7b	1"	80	38'-3"	8179	40	40	Str't
G7c	1"	16	29'-3"	1251	8	8	Str't
G7d	1"	10	16'-0"	428	10		Str't
G7e	1"	16	12'-6"	535	8	8	Str't
G7f	1"	36	15'-9"	1516	18	18	
					E	W	
G4a	⅞"	226	17'-0"	4011	114	112	
G4b	⅞"	250	14'-6"	3777	138	112	
G4c	⅞"	237	15'-0"	3712	119	118	
G4d	⅞"	243	20'-6"	5202	121	122	
G4e	⅞"	18	9'-9"	183	6	12	
G4f	⅞"	18	11'-0"	207	6	12	
G4g	⅞"	32	14'-0"	468	16	16	
G4h	⅞"	80	12'-6"	1044	40	40	
G4i	⅞"	64	11'-0"	735	32	32	
G4j	⅞"	56	10'-0"	585	28	28	
G4k	⅞"	44	11'-3"	505	22	22	
G4l	⅞"	40	12'-0"	501	20	20	
					E	W	
G3a	⅞"	16	13'-6"	184	8	8	
G3b	⅞"	42	6'-6"	299	18	24	Str't
G3c	⅞"	24	13'-0"	258	16	8	Str't
G3d	⅞"	78	8'-9"	581	39	39	
					E	W	
G2a	⅝"	132	3'-3"	287	66	66	
TOTAL - PYLONS BELOW BR. ST. = 61,101#							
PYLONS - ABOVE BRIDGE SEAT							
					E	W	
H0a	1¼"	16	15'-0"	1276	8	8	Str't
H8a	1"	56	13'-0"	2477	28	28	Str't
H8b	1"	32	8'-3"	888	16	16	Str't
					E	W	
H7a	1"	16	11'-9"	503	8	8	
H7b	1"	8	10'-8"	230	4	4	
H7c	1"	8	12'-3"	262	4	4	
H7d	1"	80	18'-9"	4010	40	40	Str't
H7e	1"	40	12'-6"	1337	20	20	Str't
H7f	1"	16	10'-0"	428	8	8	
					E	W	
H5a	⅝"	48	12'-9"	320	24	24	Str't
H5b	⅝"	16	8'-6"	204	8	8	
H5c	⅝"	16	4'-6"	108	8	8	Str't



Mark	Size	No.	Length	Weight	Location E	Location W	Shape
					E	W	
H3a	⅞"	272	6'-6"	1505	136	136	
H3b	⅞"	96	7'-0"	572	48	48	
H3c	⅞"	24	12'-0"	245	12	12	
H3d	⅞"	176	6'-6"	974	88	88	
H3e	⅞"	88	4'-9"	356	44	44	
H3f	⅞"	4	5'-6"	19	2	2	
H3g	⅞"	8	6'-3"	43	4	4	
H3h	⅞"	8	6'-9"	46	4	4	
H3i	⅞"	8	7'-6"	51	4	4	
TOTAL - PYLONS ABOVE BR. SEAT = 16,464#							
WEST APPROACH PIERS							
J8a	1"	18	45'-3"	2772	W. Appr. Piers		Str't
J8b	1"	18	43'-9"	2680			Str't
J8c	1"	4	21'-0"	286	"		Str't
J8d	1"	220	12'-0"	8984	"		Str't
J8e	1"	8	20'-0"	544	"		Str't
J8f	1"	180	8'-6"	5207	"		Str't
J8g	1"	18	43'-3"	2649	"		Str't
J8h	1"	18	42'-0"	2573	"		Str't
J8i	1"	8	19'-0"	517	"		Str't
J8k	1"	18	40'-6"	2481	"		Str't
J8l	1"	18	36'-0"	2205	"		Str't
J8m	1"	4	16'-6"	225	"		Str't
J8n	1"	18	32'-0"	1960	"		Str't
J8o	1"	18	24'-6"	1501	"		Str't
J8p	1"	4	15'-0"	204	"		Str't
J8q	1"	4	11'-6"	157	"		Str't
J8r	1"	18	24'-9"	1516	"		Str't
J8s	1"	18	19'-3"	1179	"		Str't
J8t	1"	4	11'-0"	150	"		Str't
J8u	1"	4	9'-0"	123	"		Str't
J3a	⅞"	440	7'-6"	2808	W. Appr. Piers		
J3b	⅞"	340	8'-3"	2?87	"		
J3c	⅞"	180	9'-0"	1379	"		
J2a	⅝"	80	5'-9"	307	W. Appr. Piers		
TOTAL - WEST APPROACH PIERS = 44,796#							
END ABUTMENTS							
					E	W	
K8a	1"	154	8'-0"	4192	77	77	Str't
K8b	1"	24	28'-0"	2287	14	10	Str't
K8c	1"	10	26'-9"	911	10		Str't
K8d	1"	21	26'-0"	1859		21	Str't
K8e	1"	20	25'-6"	1736	10	10	Str't
K8f	1"	30	26'-3"	2676	22	8	Str't
K8g	1"	28	23'-6"	2239	14	14	Str't
K8h	1"	7	23'-0"	548		7	Str't
K8k	1"	10	21'-9"	740	5	5	Str't
K8m	1"	10	60'-0"	2042	5	5	
K8n	1"	46	53'-9"	8,414	23	23	Str't
K8o	1"	8	16'-0"	435	4	4	Str't
K8p	1"	8	36'-9"	1000	4	4	
K8r	1"	20	21'-0"	1429	10	10	Str't
K7a	1"	4	17'-3"	184	2	2	Str't
K7b	1"	4	20'-6"	219	2	2	Str't
K6a	¾"	224	17'-3"	7906	112	112	Str't



Mark	Size	No.	Length	Weight	Location E	Location W	Shape
					E	W	
K5a	¾"	244	8'-0"	2934	122	122	Str't
K5b	¾"	32	12'-0"	577	32		Str't
K5c	¾"	24	21'-6"	776	24		Str't
K5d	¾"	8	19'-6"	234	8		Str't
K5e	¾"	64	14'-0"	1347		64	Str't
K5f	¾"	187	24'-3"	6816	97	90	
K5g	¾"	20	25'-9"	774	6	14	
K5h	¾"	16	27'-0"	649		16	
K4a	⅝"	236	2'-0"	493	118	118	Str't
K4b	⅝"	28	17'-3"	504	14	14	Str't
K4c	⅝"	28	20'-6"	599	14	14	Str't
K4d	⅝"	8	23'-9"	198	4	4	
K4e	⅝"	32	11'-6"	384		32	Str't
K4f	⅝"	40	53'-9"	2245	20	20	Str't
K4g	⅝"	28	21'-6"	628	15	13	Str't
K4h	⅝"	8	19'-6"	163	8		Str't
K4k	⅝"	6	20'-0"	125		6	Str't
K4m	⅝"	4	18'-0"	75		4	Str't
K4n	⅝"	6	30'-0"	188	2	4	Str't
K4o	⅝"	8	6'-6"	54	4	4	Str't
K4p	⅝"	80	6'-9"	564	40	40	
K4r	⅝"	28	7'-3"	212	14	14	
K4s	⅝"	46	8'-0"	384	23	23	Str't
					E	W	
K3a	½"	4	17'-3"	59	2	2	Str't
K3b	½"	125	10'-3"	1090	63	62	
K3c	½"	8	15'-3"	104	4	4	
K3d	½"	4	13'-3"	45	2	2	
K3e	½"	44	7'-3"	271	22	22	
K3f	½"	170	8'-3"	1194	84	86	
K3g	½"	47	6'-6"	260	24	23	
K3h	½"	34	8'-9"	253	17	17	
K3k	½"	143	12'-9"	1552	72	71	
K3m	½"	8	8'-6"	58		8	Str't
K3n	½"	8	10'-9"	73		8	Str't
K3o	½"	16	11'-6"	157	16		Str't
K3p	½"	8	13'-0"	89		8	Str't
K3r	½"	16	14'-0"	191	16		Str't
K3s	½"	24	15'-3"	311	16	8	Str't
K3t	½"	4	16'-3"	56	4		Str't
K3u	½"	16	17'-6"	238		16	Str't
K3v	½"	4	18'-9"	64	4		Str't
K3w	½"	4	21'-0"	71	4		Str't
K3x	½"	20	23'-0"	391	4	16	Str't
K3y	½"	100	8'-6"	723	50	50	
K2a	⅜"	30	42'-0"	842	15	15	Str't
K2b	⅜"	200	7'-9"	1035	100	100	
K2c	⅜"	200	6'-3"	835	100	100	Str't
K2d	⅜"	56	6'-6"	243	28	28	
K2e	⅜"	32	3'-0"	64	16	16	Str't
K2f	⅜"	32	2'-3"	48	16	16	Str't. For Manholes
TOTAL - END ABUTMENTS = ~~69,908#~~ 69,856#							
APPROACH SLABS							
					E	W	
L7a	1"	144	21'-6"	Incl. with Appr. Slab	72	72	
L2a	⅜"	14	35'-6"	for payment	7	7	Str't

10 OHIO ...
CUYAHOGA COUNTY
S.H. 460 SEC. ...

Mark	Size	No.	Length	Weight	Location
RAILING DOWELS					
M7a	1"	450	6'-9"	8119	
M6a	¾"	112	6'-0"	1375	
M6b	¾"	436	7'-0"	6244	
M6c	¾"	14	7'-9"	208	
M5a	⅝"	380	9'-9"	5569	
M5b	⅝"	946	5'-3"	7465	
M5c	⅝"	112	8'-9"	968	
[illegible]	[illegible]	32	3'-[illegible]	2[illegible]	
TOTAL - RAILING DOWELS = 30,185#					
RAILING BARS					
M6a	¾"	872	16'-6"	Included in weight of railing	
M6b	¾"	56	7'-6"		
M6c	¾"	16	8'-3"		
M6d	¾"	16	7'-6"		
M5a	⅝"	1332	5'-0"		
M5b	⅝"	458	4'-6"		
M5c	⅝"	28	4'-3"		
M4a	½"	436	14'-3"		Str't
M4b	½"	28	5'-9"		Str't
M4c	½"	16	8'-0"		

Mark	Size	No.	Length	Weight	S...
REPLACEMENT ...					
RE0	1¼"	86	12'-0"	5482	Str't
RE9	[illegible]	14	11'-0"	668	
RE8	[illegible]	30	10'-0"	1020	
RE7	[illegible]	62	10'-0"	1653	
RE6	[illegible]	24	9'-0"	442	
RE5	[illegible]	14	8'-0"	168	
RE4	[illegible]	16	9'-0"	117	
RE3	[illegible]	22	6'-0"	112	
RE2	[illegible]	[illegible]	6'-0"	56	
TOTAL - REPLACEMENT BARS = 9722#					

Bars under "Replacement Steel" shall be furnished by the ... replace those cut from pieces designated by the ... purposes. Test specimen shall be ... obtaining straight portion 26" long ... Replacement bars may be used as test specimens for ... 10% of their total number. Replacement bars shall be ... as needed, in the shape of the piece ...

TOTAL - THIS SHEET = 252,077#

STEEL [illegible]
BROOK[illegible]
OVER [illegible]
S.H. 460 S[illegible]

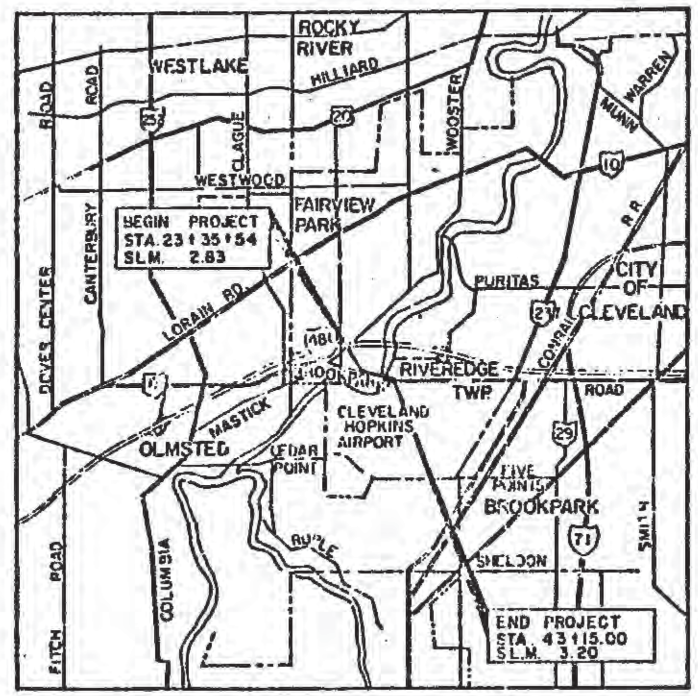
CONVENTIONAL SIGNS

ED ACCESS	WATER LINE
SED R/W	GAS LINE
SED EASEMENT	UNDERGROUND ELECTRICAL
R LINE	RAILROADS
ING R/W	EXISTING RETAINING WALL
RTY LINE	EXISTING SEWER
Y LINE	PROPOSED SEWER
RATION LINE	EXISTING GUARD RAIL
ING FENCE	PROPOSED GUARD RAIL
SED FENCE	
S	
ING MANHOLES	TREES AND STUMPS
SED MANHOLES	TREES AND STUMPS TO BE REMOVED
LES ADJUSTED TO GRADE	TELEPHONE OR TELEGRAPH POLE
LES REMOVED OR ABANDONED	LIGHT POLE
ING INLETS OR CATCH BASINS	POWER POLE
SED INLETS OR CATCH BASINS	WATER HYDRANT
BASINS ADJUSTED TO GRADE	EXISTING TRAFFIC SIGNAL
BASINS REMOVED OR ABAND.	PROPOSED TRAFFIC SIGNAL

INDEX OF SHEETS

STATE OF OHIO
DEPARTMENT OF TRANSPORTATION
CUY-17- 2.83
CUYAHOGA COUNTY

RIVEREDGE TOWNSHIP
CITY OF FAIRVIEW PARK
CITY OF CLEVELAND



LOCATION PLAN

SCALE IN MILES 0 1 2

PORTION TO BE IMPROVED
STATE & FEDERAL ROADS
OTHER ROADS

PLAN 0 10 20 40

CROSS SECTIONS__HORIZONTAL 0 5 10 __VERTICAL 0 5 10

CALC. BY / DATE / CHKD. BY / DATE

CUYAHOGA COUNTY
CUY - 17 - 2.83

OHIO
FHWA REGION 5

1/82

BHM - IA19 (7)

WE THE COMMISSIONERS OF CUYAHOGA COUNTY IN FORMAL SESSION HEREBY APPROVE THESE PLANS AND CERTIFY THAT THE NECESSARY RIGHT-OF-WAY IS AVAILABLE. WE AGREE TO MAINTAIN THE PROJECT IN A MANNER SATISFACTORY TO THE DIRECTOR, DEPARTMENT OF TRANSPORTATION, STATE OF OHIO OR HIS DULY AUTHORIZED REPRESENTATIVES AND WILL MAKE AMPLE PROVISIONS EACH YEAR FOR SUCH MAINTENANCE.
DONE UNDER AUTHORITY OF SECTIONS 5555.02 ET SEQ. & 5535.01 OF THE REVISED CODE OF OHIO.

From CDOT

BOARD OF COMMISSIONERS
CUYAHOGA COUNTY

DATE 6/30/86 Virgil E. Brown
Timothy F. Hagan
Mary O. Boyle

1985 SPECIFICATIONS

THE STANDARD SPECIFICATIONS OF THE STATE OF OHIO, DEPARTMENT OF TRANSPORTATION, INCLUDING CHANGES AND SUPPLEMENTAL SPECIFICATIONS LISTED IN THE PROPOSAL, SHALL GOVERN THIS IMPROVEMENT.

I HEREBY APPROVE THESE PLANS AND DECLARE THAT THE MAKING OF THIS IMPROVEMENT WILL REQUIRE THE CLOSING OF THE HIGHWAY TO TRAFFIC AND THAT DETOURS WILL BE PROVIDED AS INDICATED ON THE PLANS.

APPROVED Thomas J. Neff, P.E., P.S.
DATE 5/2/86 COUNTY ENGINEER

APPROVED Mart A. Gallo
DATE 7-8-86 DISTRICT DEPUTY DIRECTOR OF TRANSPORTATION

APPROVED Walter J. J...
DATE 7-23-86 ENGINEER, BUREAU OF BRIDGES AND STRUCTURAL DESIGN

APPROVED Wayne H. Kauble
DATE 10-8-86 CHIEF ENGINEER, PLANNING AND DESIGN

APPROVED [illegible]
DATE [illegible] DIRECTOR, DEPARTMENT OF TRANSPORTATION

LINE DATA

	FAIRVIEW PARK	RIVEREDGE TOWNSHIP	CLEVELAND	TOTAL
EGIN PROJECT ID PROJECT	STA. 23+35.54 STA. 39+42.87	STA. 39+42.87 STA. 43+15.00		STA. 23+35.54 STA 43+15.00
NGTH OF PROJECT	1607.33 L.F. OR 0.304 MI.	372.13 L.F. OR 0.071 MI.		1979.46 L.F. OR 0.375 MI.
DDITIONAL WORK A. 21+50.00 TO STA 23+35.54 A 43+15.00 TO STA 43+46.06 A. 43+46.06 TO STA. 45+00.00	185.54 L.F.	31.06 L.F.	153.94 L.F.	185.54 L.F. 31.06 L.F. 153.94 L.F.
NGTH OF WORK	1792.87 L.F. OR 0.340 MI.	403.19 L.F. OR 0.076 MI.	153.94 L.F. OR 0.029 MI.	2350.00 L.F. OR 0.445 MI.

UNDERGROUND UTILITIES
2 WORKING DAYS
BEFORE YOU DIG
CALL 800-362-2764 (TOLL FREE)
OHIO UTILITIES PROTECTION SERVICE
NON-MEMBERS
MUST BE CALLED DIRECTLY

FILE Nº | CUYAHOGA COUNTY Nº ____
DATE OF LETTING ____ 19__
CONTRACT Nº ____

CHECKED BY ____ DATE ____
APPROVED BY David J. Szabo, P.E.
DATE 4/29/86 ENGINEER OF DESIGN
APPROVED BY [illegible]

PLANS PREPARED BY
STILSON & ASSOCIATES INC.

STANDARD DRAWINGS

		GR-1	1-11-85	MH-1	12-18-84	HL-1	12-26-84	
BP-2	1-11-85	GR-2B	2-5-82			HL-2	7-27-73	
BP-3	12-6-76			MH-3	12-18-84	HL-3	12-28-84	
BP-4	1-11-85			MH-5	6-12-75	HL-4	1-21-76	
BP-5	1-11-85	GR-4	2-5-82			HL-5	9-6-73	
		GR-4A	1-30-84	AS-1-81	11-27-81	HL-7	1-21-76	
BP-7	12-6-76					HL-8	1-21-76	
BP-11	1-30-84	I-1	12-18-84			HL-9	3-22-77	

SUPPLEMENTAL SPECIFICATIONS

NUMBER	DATE	NUMBER	DATE
824	10-8-82		
836	11-12-85		
845	2-25-86		
849	12-24-85		
853	6-26-78		
953	8-21-80		
921	12-4-72		
956	6-25-78		
949	12-24-85		
932	3-25-75		

DESIGN DESIGNATION

CURRENT A.D.T. (1985)	15,800
DESIGN YEAR A.D.T. (2005)	27,900
D.H.V.	1,674
D	50%
T	3.2%
V	45 MPH

DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION

APPROVED:

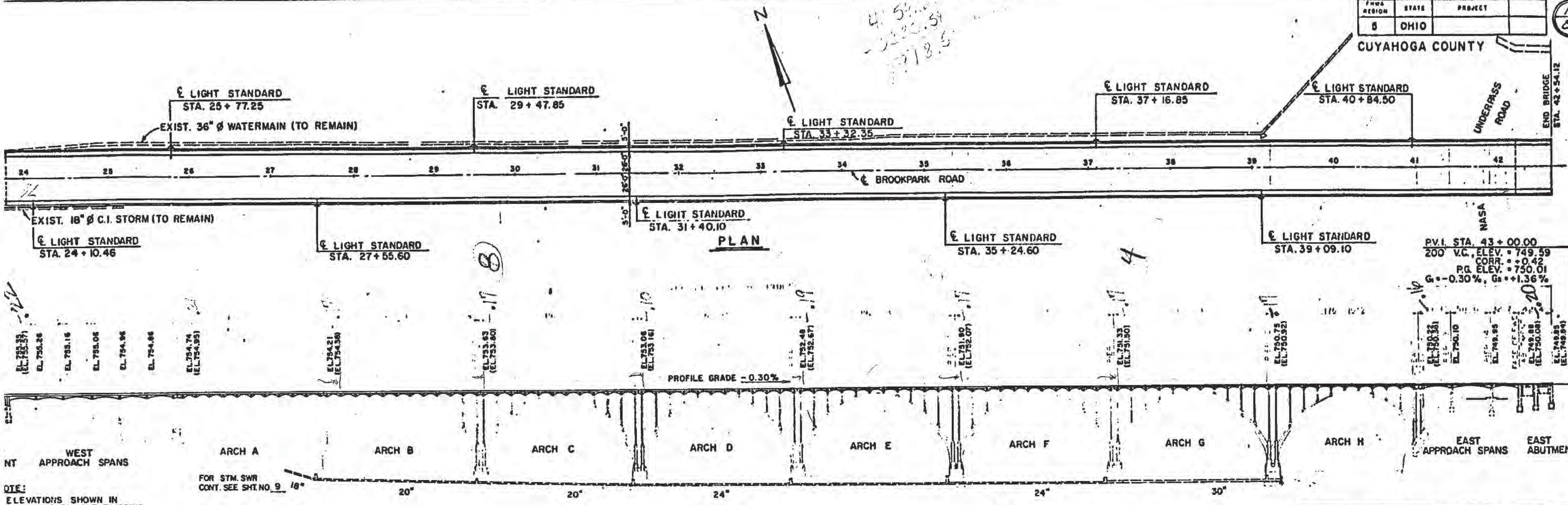
0000FY - 00163

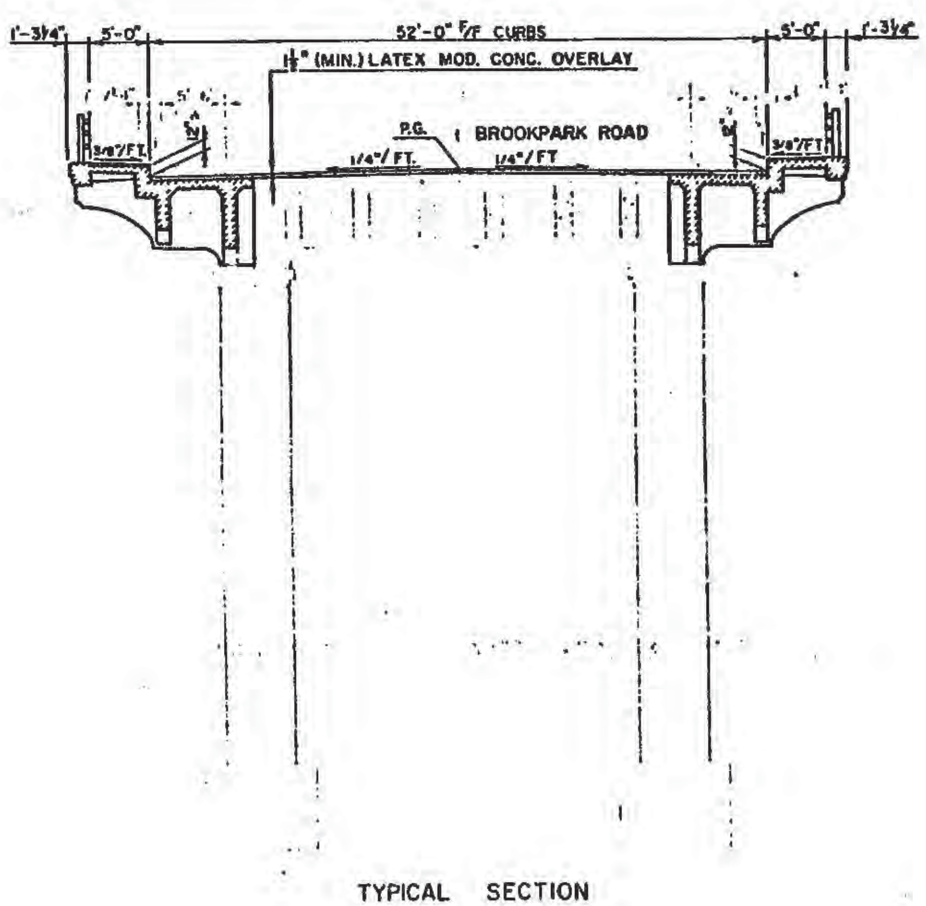
191

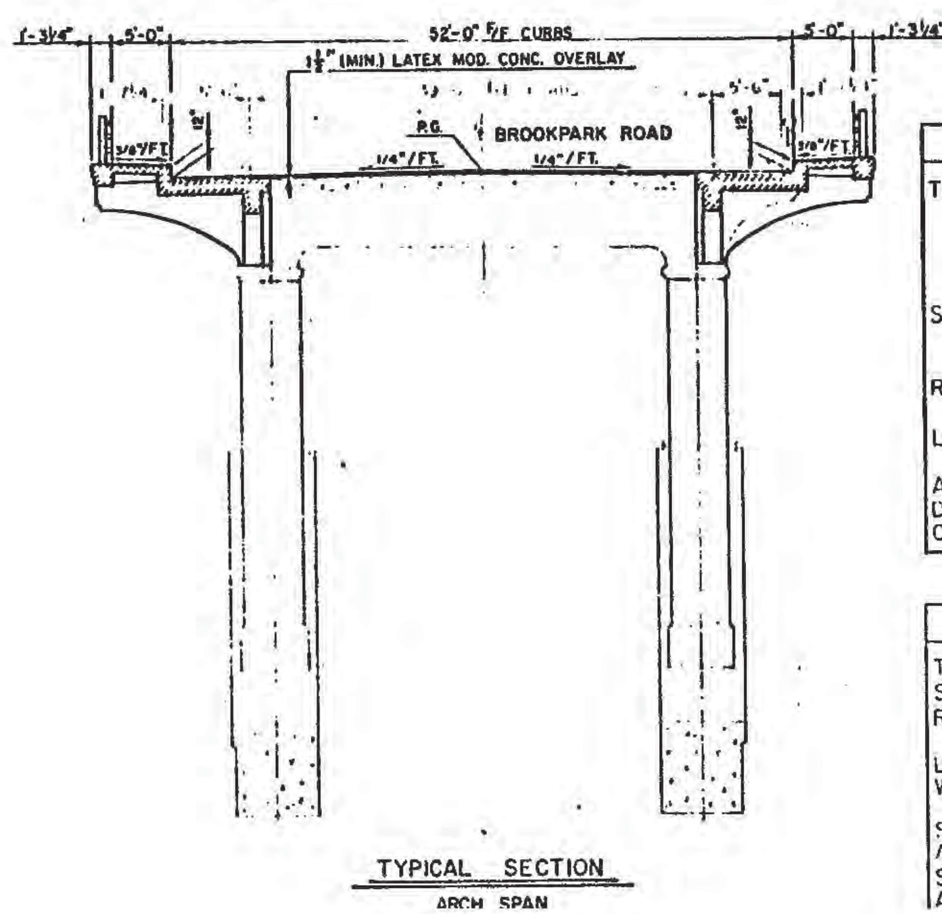
FHWA REGION	STATE	PROJECT	
5	OHIO		

15/82

CUYAHOGA COUNTY







EXISTING STRUCTURE

TYPE: Open spandrel reinforced concrete arches with continuous reinforced concrete beam approach spans. Reinforced concrete deck and substructure both arch and approach spans.

SPANS: West Approach: 32'-7", 4 @ 33'-4", 39'-1"
Arch Spans: 176'-10½", 6 @ 192'-3", 176'-10½"
East Approach: 39'-1", 50'-0", 32'-7"

ROADWAY: 39'-0" f/f curbs, 5'-6" sidewalks, reinforced concrete railings

LOADING: H-20 (Specification current October 1932)

ALIGNMENT: Tangent and 6° curve left

DATE BUILT: C 1932

CONDITION:

PROPOSED STRUCTURE

TYPE: Same as existing, with widened deck

SPANS: Same as existing

ROADWAY: 52'-0" f/f curbs, 5'-0" sidewalks, tubular steel railings (as per plan)

LOADING: HS 20-44

WEARING SURFACE: 1½" (min.) Latex Modified Concrete

SKEW: None

ALIGNMENT: Tangent and 6° curve left

SUPERELEVATION: None

APPROACH SLABS: As - 1 - 81 (Modified as

STRUCTURE SHEET INDEX

ALDEN E. STILSON & ASSOCIATES, LIMITED
CONSULTING ENGINEERS
CLEVELAND, OHIO   COLUMBUS, OHIO   WHEELING, W. VA.

CUYAHOGA COUNTY ENGINEER
CLEVELAND OHIO

BROOKPARK ROAD

BRIDGE NO. CUY-17-0283
OVER ROCKY RIVER
CITIES OF CLEVELAND & FAIRVIEW PARK

GENERAL PLAN AND ELEVATION
TYPICAL SECTIONS

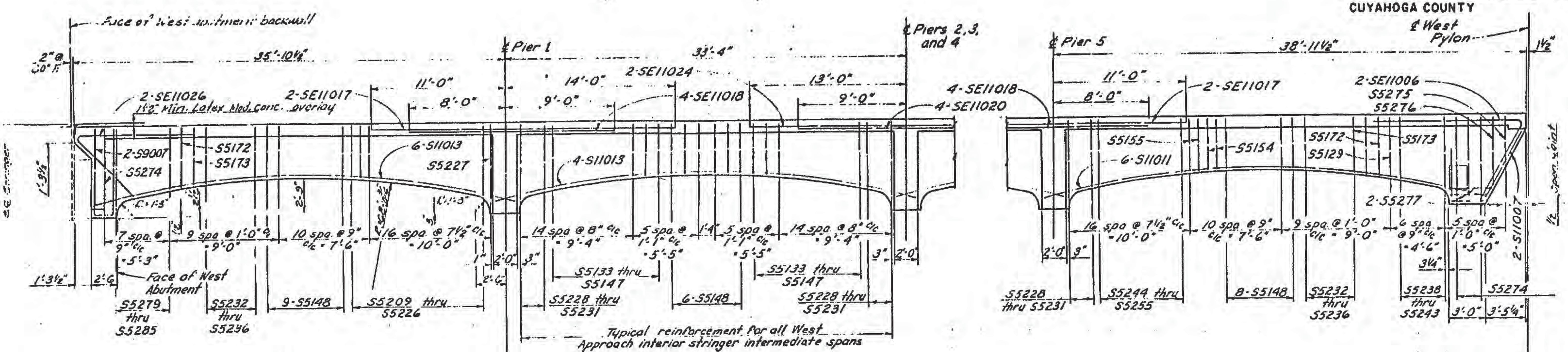
COUNTY BRIDGE NO. 39   REPORT NO. 7068   DATE 3-21-76

NO. B-191

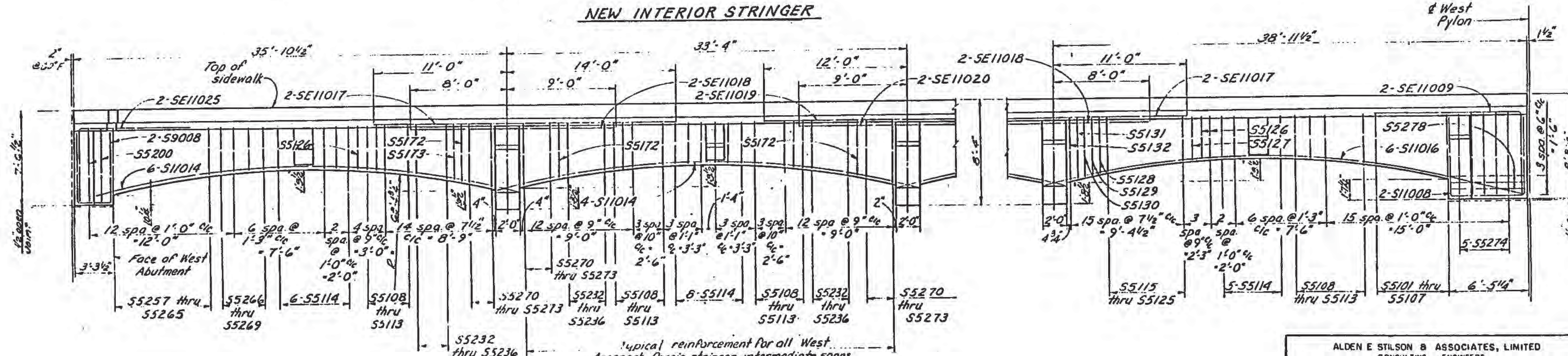
FHWA REGION	STATE	PROJECT	
5	OHIO		

31/82

CUYAHOGA COUNTY



NEW INTERIOR STRINGER



NEW FASCIA STRINGER

WEST APPROACH STRINGER DETAILS

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CUYAHOGA COUNTY ENGINEER
CLEVELAND OHIO

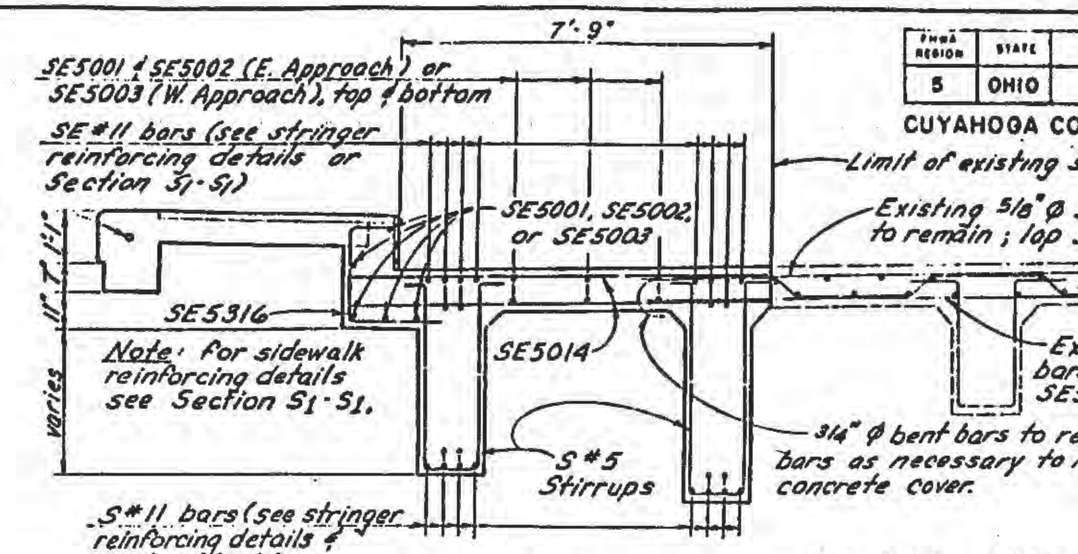
BROOKPARK ROAD

BRIDGE NO. CUY-17-0283
OVER ROCKY RIVER
CITIES OF CLEVELAND & FAIRVIEW PARK

WEST APPROACH SPANS
WIDENING DETAILS

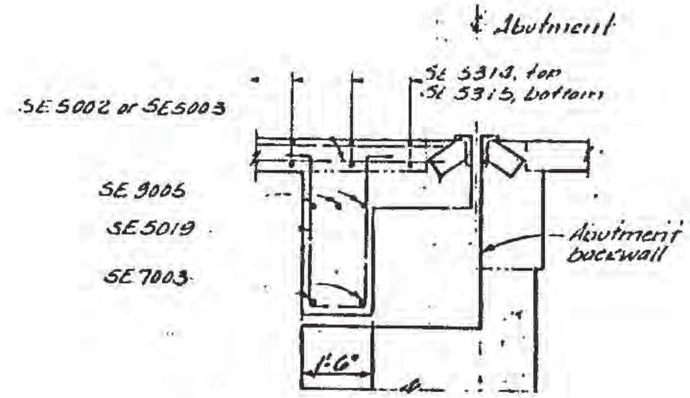
COUNTY BRIDGE NO 39 REPORT NO. 7068 DATE 3-31-86

NO. B-191

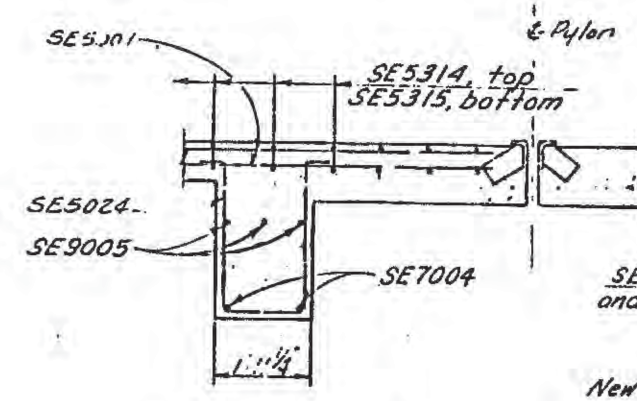


SECTION S7 - S7

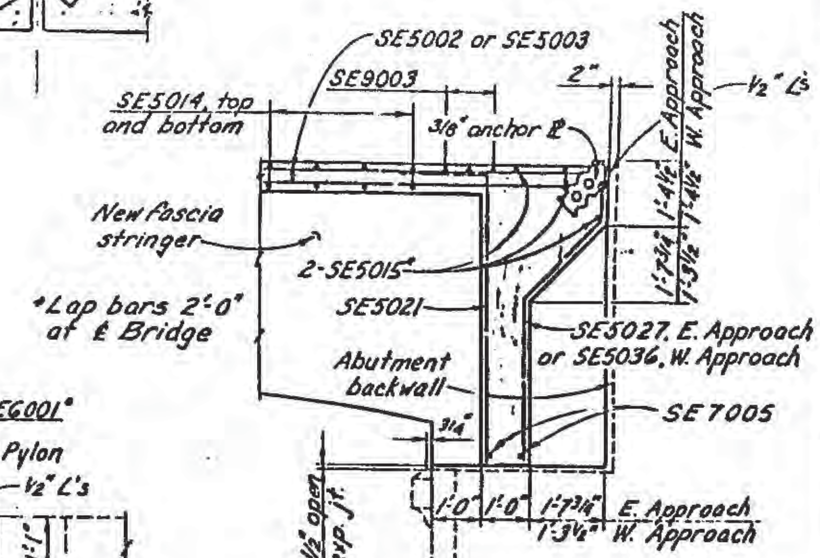
For details and dimensions not shown see Typical Approach Span Widening Detail, Sht. 35.
For East Approach span stringer reinforcing details, see Sht 34.
For West Approach span stringer reinforcing details, see Sht. 31.



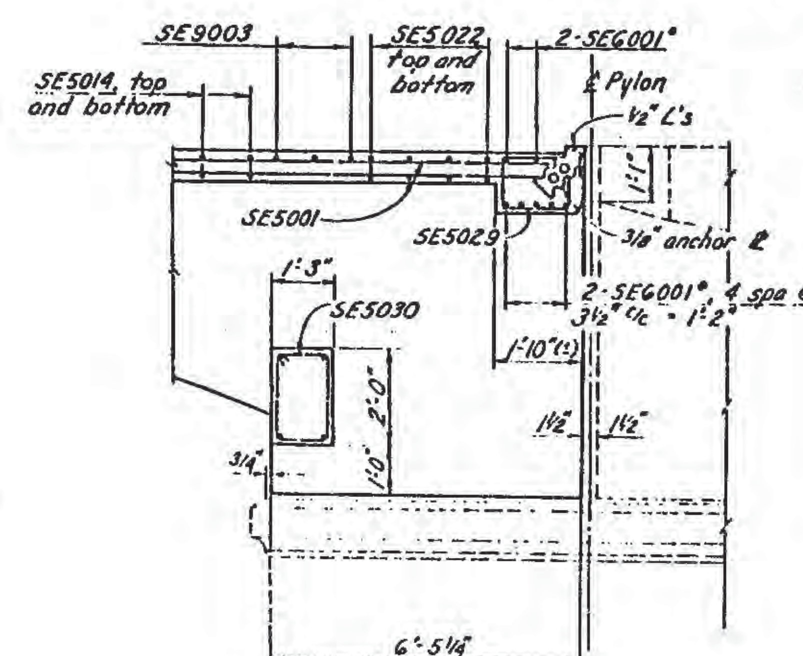
SECTION S25 - S25



SECTION S10 - S10



SECTION S8 - S8



SECTION S9 - S9

Note:
For location of section S? S? see sheet 30.
For location of [illegible] S4-S4, [illegible]
[illegible] see sheet 34.

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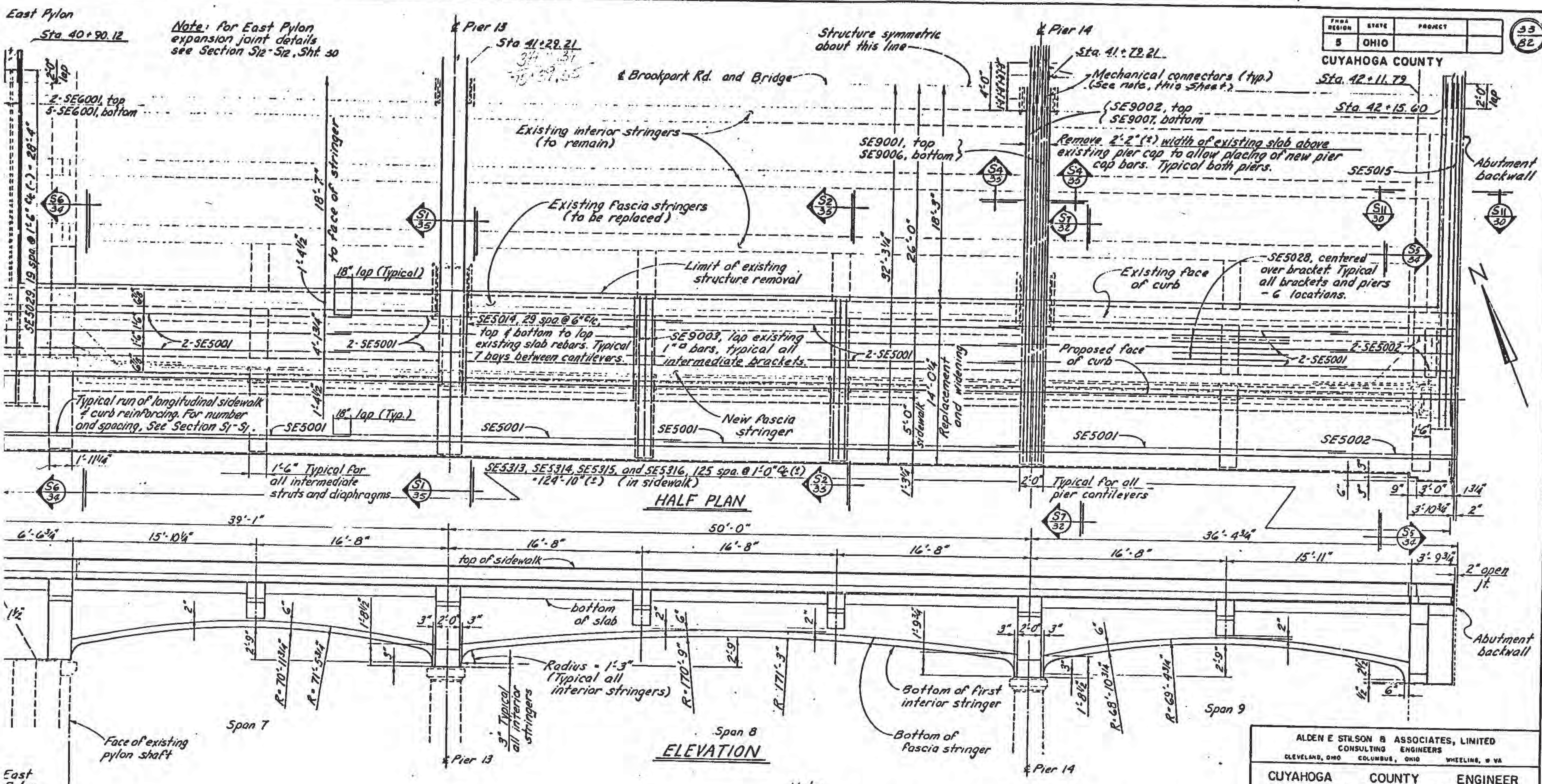
CUYAHOGA COUNTY ENGINEER
CLEVELAND OHIO

BROOKPARK ROAD
BRIDGE NO CUY-17-0283
OVER ROCKY RIVER
CITIES OF CLEVELAND & FAIRVIEW PARK

WEST APPROACH SPANS
WIDENING DETAILS

COUNTY BRIDGE NO. 39 REPORT NO 7068 DATE 3-31-84

NO. B-191



Note:
Mechanical connectors shall be an approved, Epoxy Coated, threaded type as manufactured by Erico Products Inc. Solon, Ohio, Fox-Howlett Industries Inc. Berkeley, Calif. or approved equal. Cost of Connectors shall be included in Unit Price Bid for Item 824 Epoxy Coated Reinforcing steel, Grade 60.

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CUYAHOGA COUNTY ENGINEER
CLEVELAND OHIO

BROOKPARK ROAD
BRIDGE NO. CUY-17-0283
OVER ROCKY RIVER
CITIES OF CLEVELAND & FAIRVIEW PARK

EAST APPROACH SPANS
WIDENING DETAILS

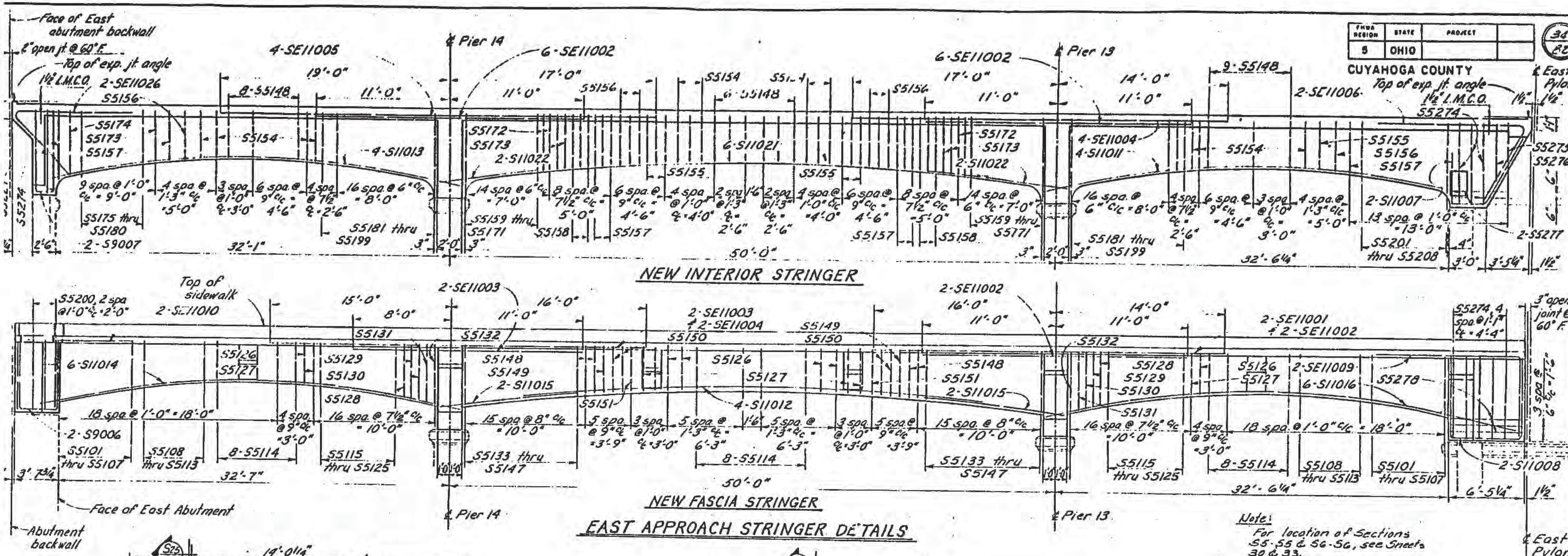
COUNTY BRIDGE NO. 39 REPORT NO. 7068 DATE 3-31-81

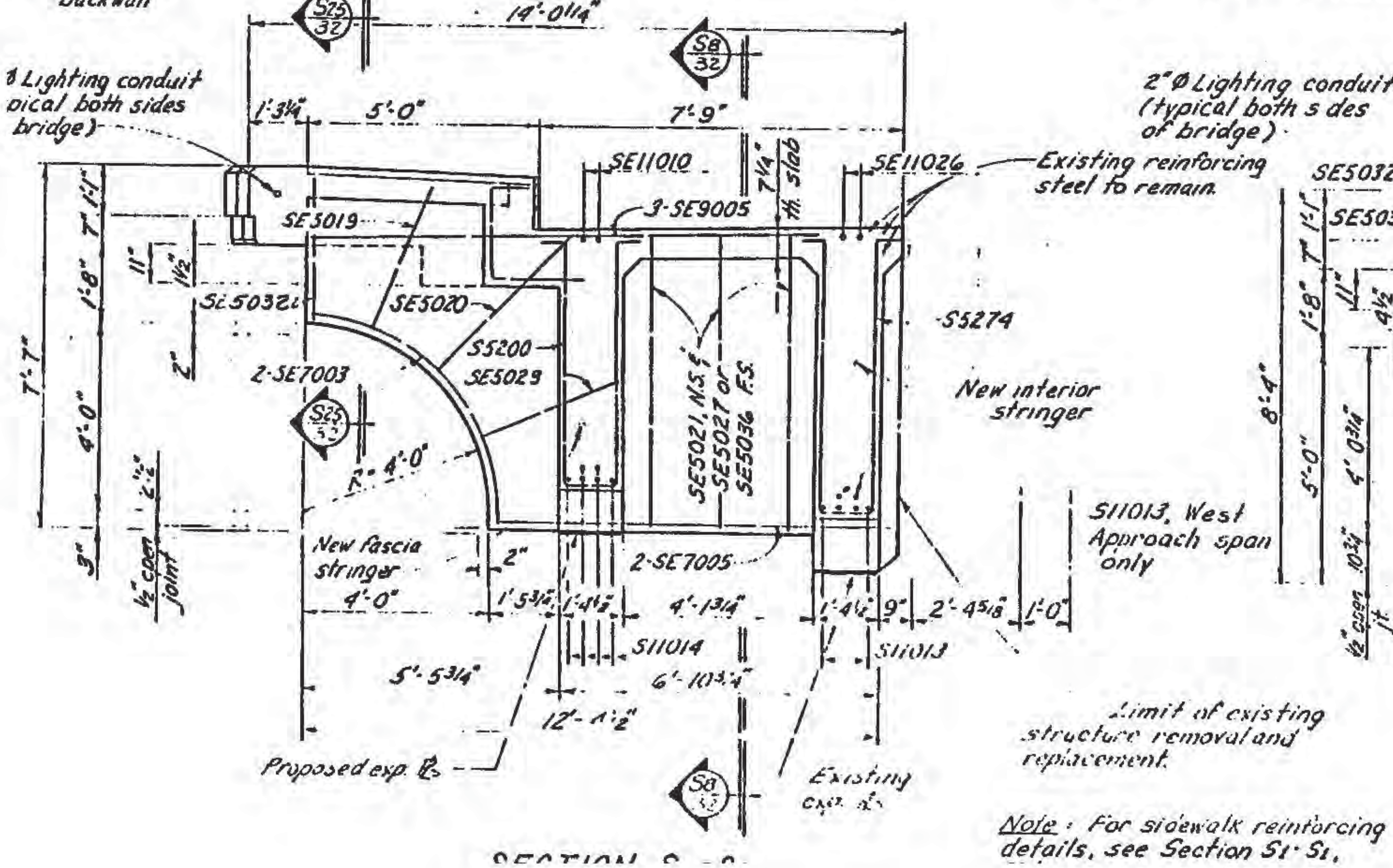
NO. B-181

FHWA REGION	STATE	PROJECT	
5	OHIO		

34/82

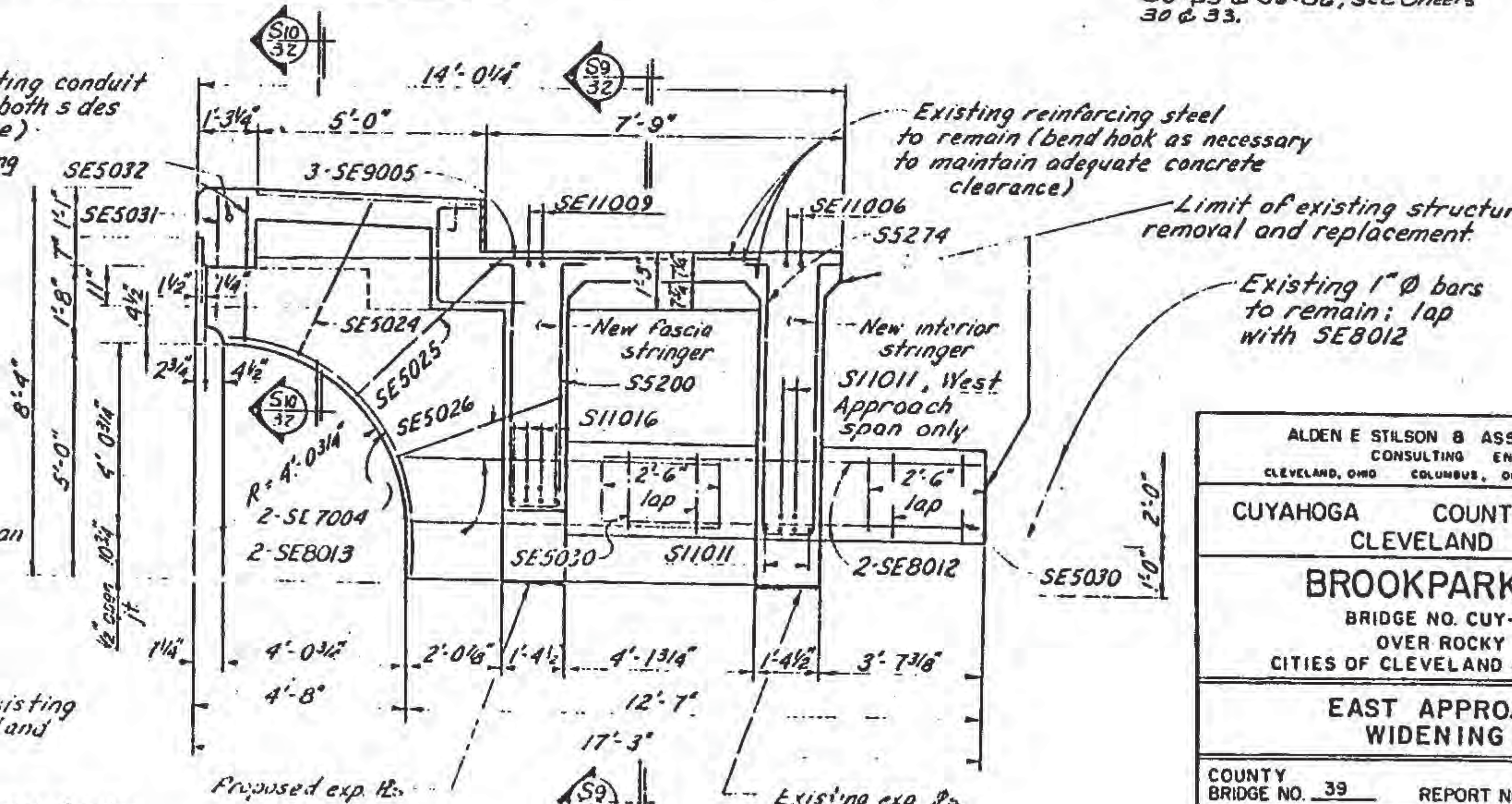
CUYAHOGA COUNTY





2"Ø Lighting conduit (typical both sides of bridge)

Note: For sidewalk reinforcing details, see Section S1-S1.



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CLEVELAND OHIO

BROOKPARK ROAD
BRIDGE NO. CUY-17-0283
OVER ROCKY RIVER
CITIES OF CLEVELAND & FAIRVIEW PARK

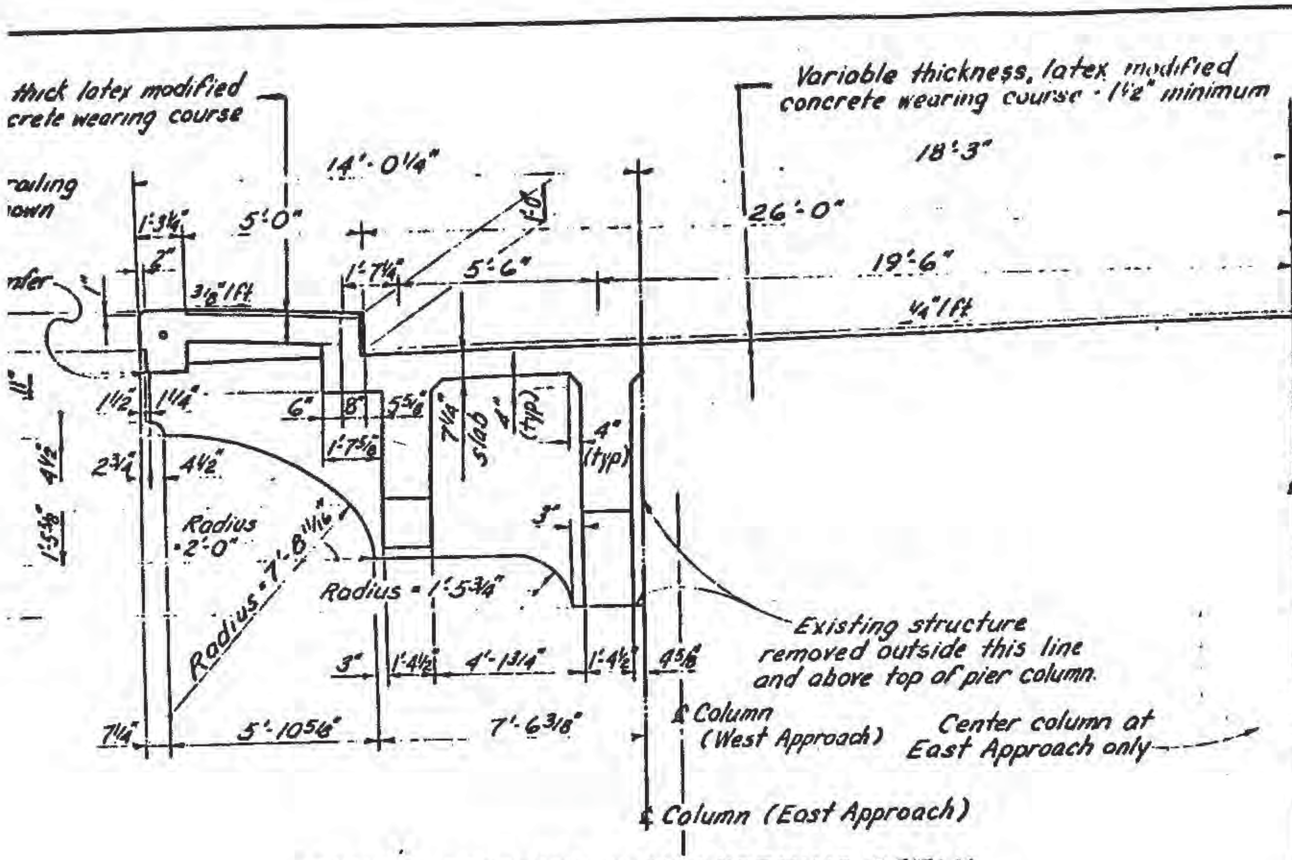
EAST APPROACH SPANS WIDENING DETAILS

COUNTY BRIDGE NO. 39 REPORT NO. 7068 DATE 5-31-

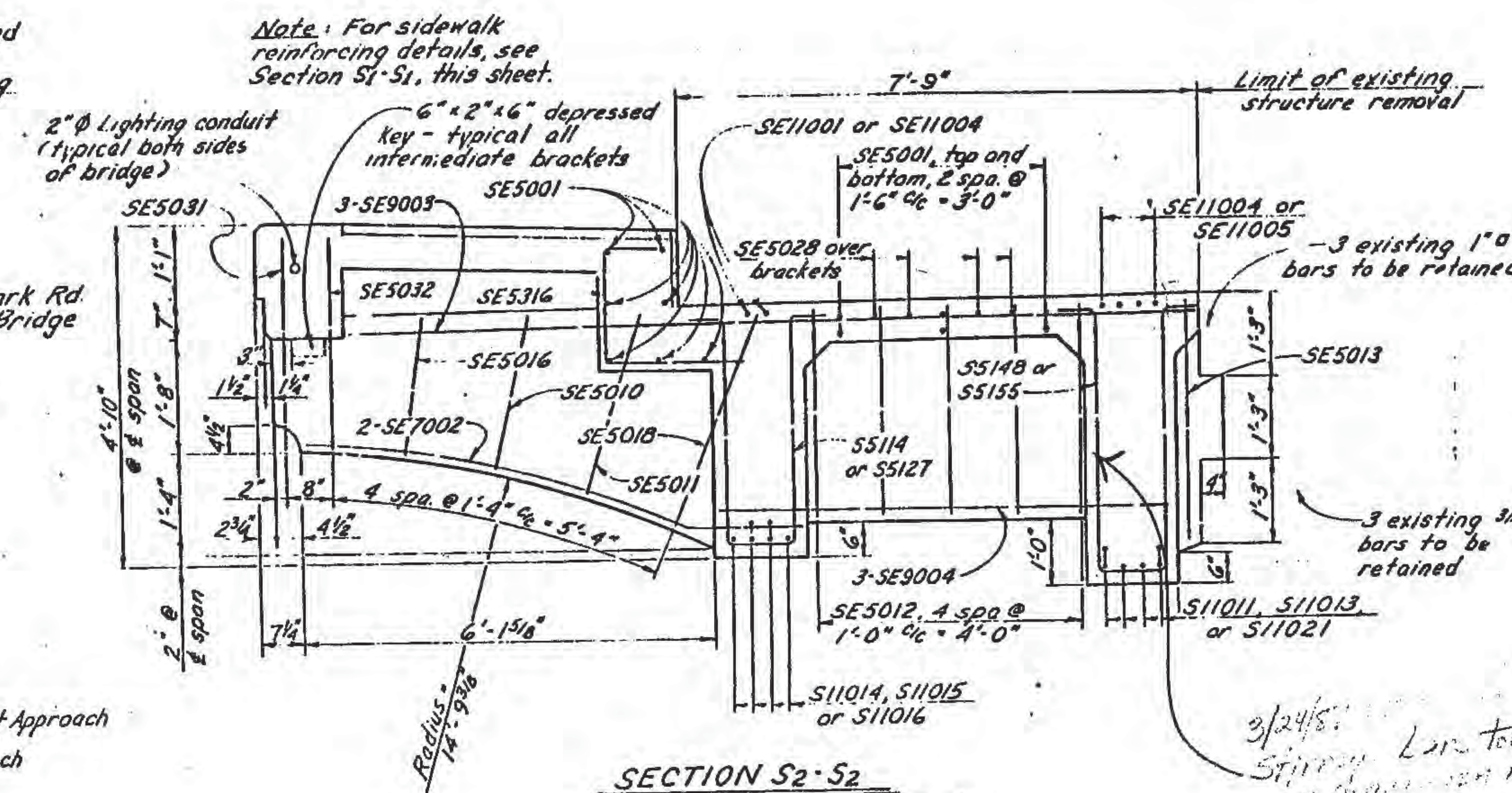
NO. B-191

FHWA REGION 5 | STATE OHIO | PROJECT

CUYAHOGA COUNTY



TYPICAL APPROACH SPAN WIDENING DETAIL

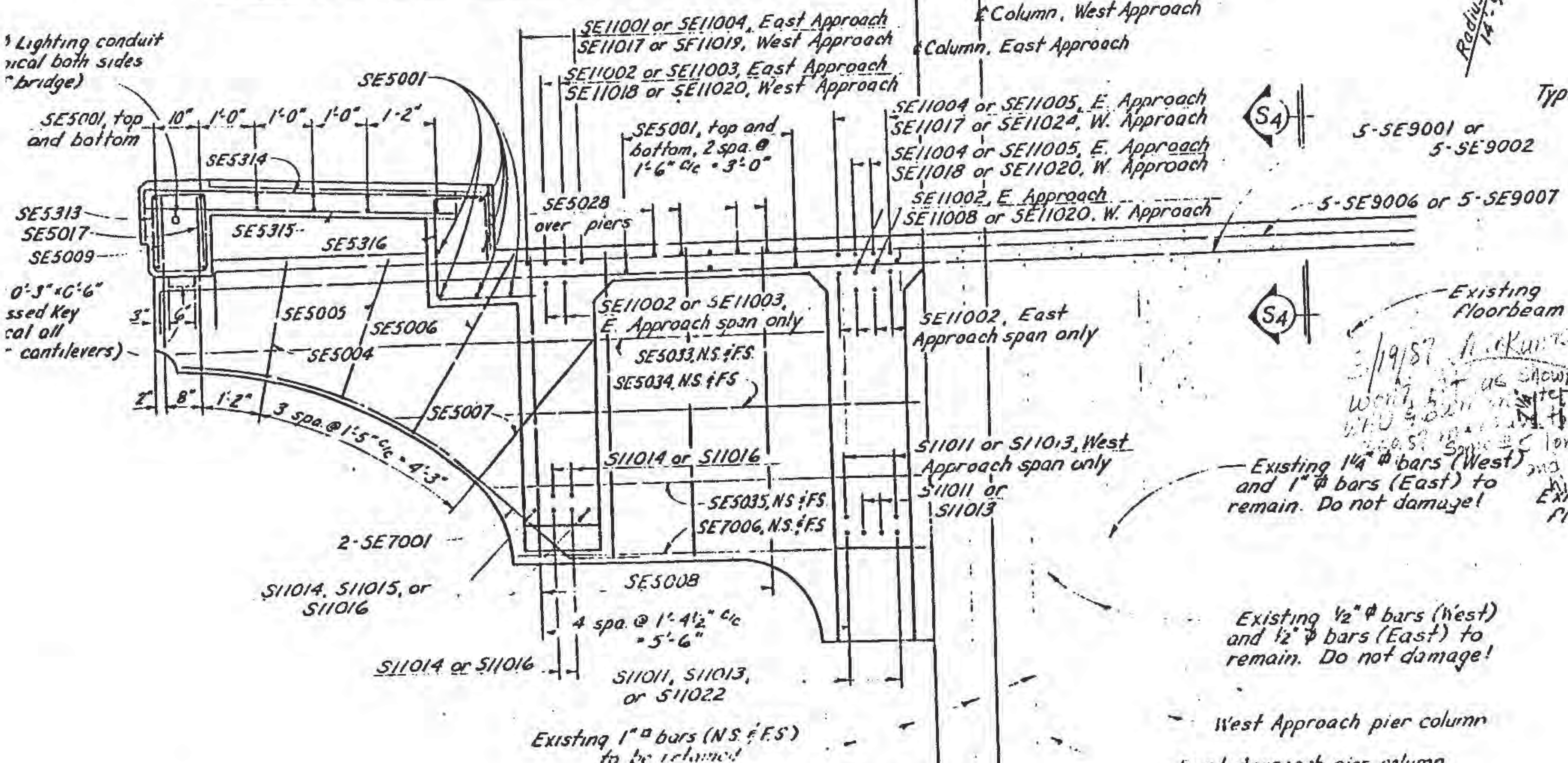


SECTION S2-S2

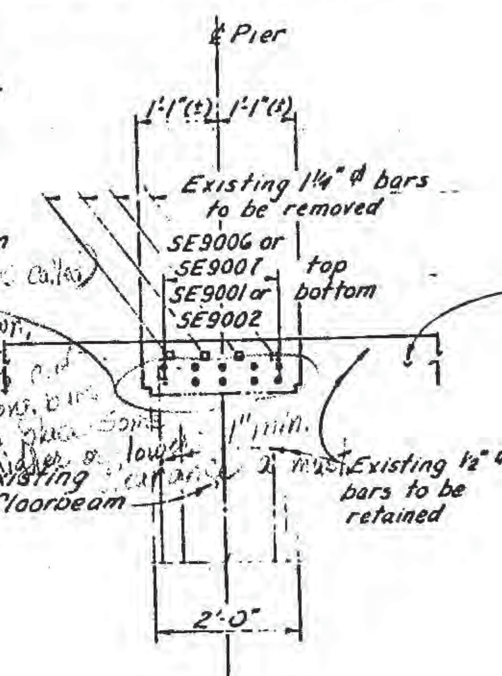
Typical Intermediate Bracket Detail

Note.
Each run of longitudinal deck reinforcing shall consist of the following:
On East Approach: 4-SE5001 and 1-SE5002 (lap 1'-6")
On West Approach: 7-SE5001 and 1-SE5003 (lap 1'-6")
For location of Section S1-S1, S2-S2 & S4-S4 see Sheets 30 & 33.

3/24/87 ... Stirrup bars too long ... not right ...



SECTION S1-S1



SECTION S4-S4

Typical at all Approach Piers

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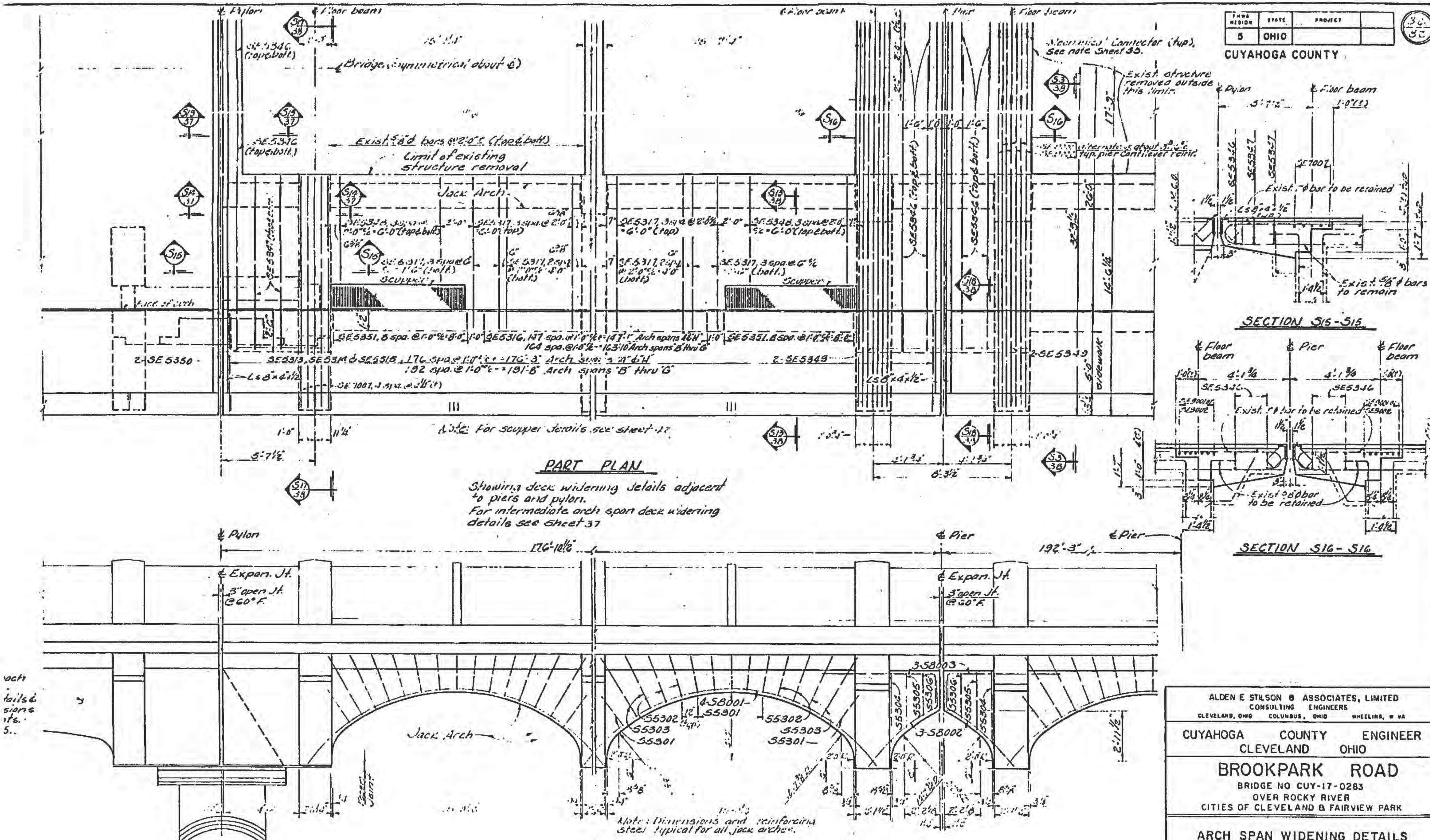
BROOKPARK ROAD
BRIDGE NO. CUY-17-0283
OVER ROCKY RIVER
CITIES OF CLEVELAND & FAIRVIEW PARK

APPROACH SPAN DETAILS

COUNTY BRIDGE NO. 39 | REPORT NO. 7068 | DATE 3-31-84

NO. B-191

DESIGN | DRAWN | CHECKED | REVISED TO AS BUILT



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CUYAHOGA COUNTY ENGINEER
CLEVELAND OHIO

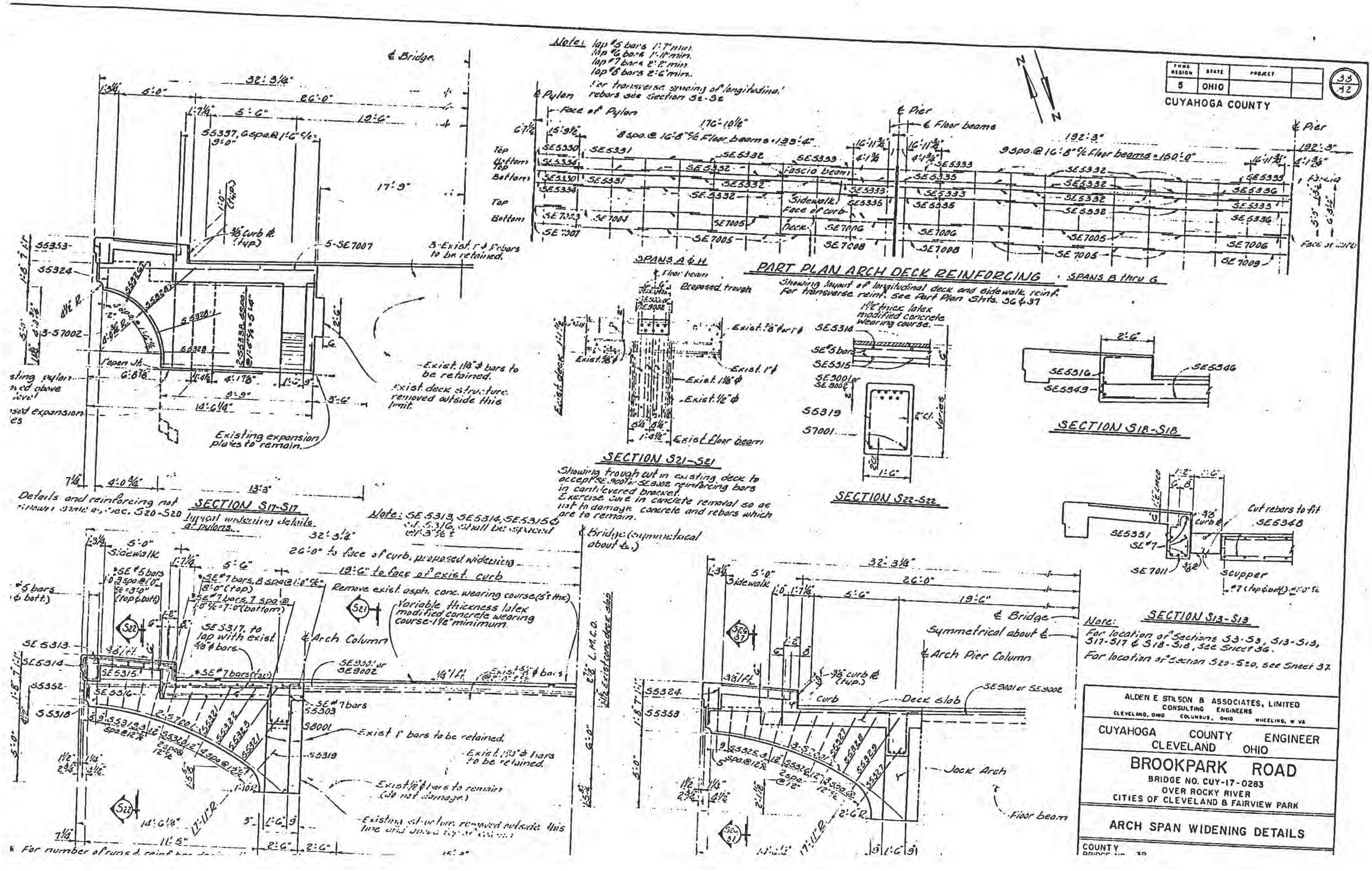
BROOKPARK ROAD

BRIDGE NO CUY-17-0283
OVER ROCKY RIVER
CITIES OF CLEVELAND & FAIRVIEW PARK

ARCH SPAN WIDENING DETAILS

COUNTY BRIDGE NO. 39 REPORT NO. 7068 DATE 5-3-86

NO. B-191


FHWA REGION 5
STATE OHIO
PROJECT
CUYAHOGA COUNTY
33
42
PART PLAN ARCH DECK REINFORCING
Showing layout of longitudinal deck and sidewalk reinf.
For transverse reinf. see Part Plan Shts. 36 & 37
SPANS A & H
SPANS B thru G
Note: lap #5 bars 1'-7" min.
lap #6 bars 1'-11" min.
lap #7 bars 2'-2" min.
lap #8 bars 2'-6" min.
For transverse spacing of longitudinal rebars see Section S2-S2
SECTION S21-S21
Showing trough cut in existing deck to accept SE9001 or SE9002 reinforcing bars in cantilevered bracket.
Exercise care in concrete removal so as not to damage concrete and rebars which are to remain.
SECTION S22-S22
SECTION S18-S18
SECTION S13-S13
SECTION S17-S17
Typical widening details at pylons.
Details and reinforcing not shown same as Sec. S20-S20
Note: SE5313, SE5314, SE5315 & SE5316 shall be spaced at 3'-6"
Note:
For location of Sections S3-S3, S13-S13, S17-S17 & S18-S18, see Sheet 36.
For location of Section S20-S20, see Sheet 37.
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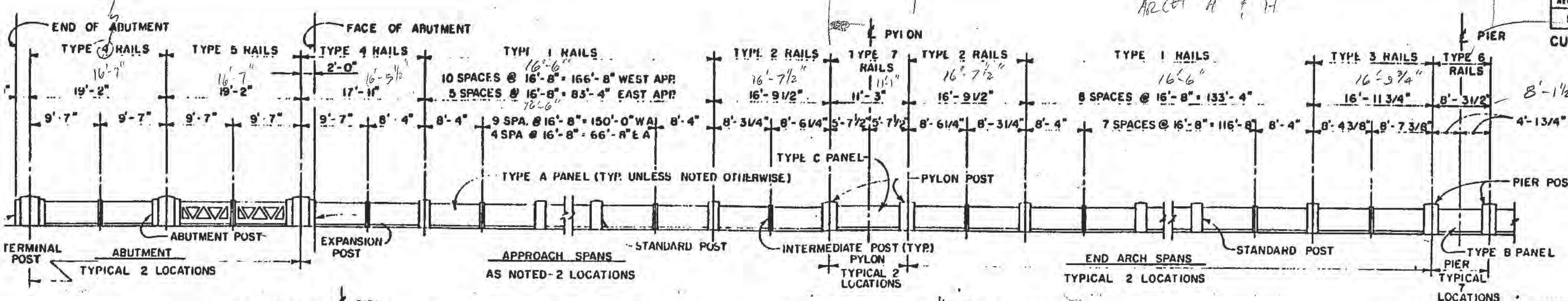
CUYAHOGA COUNTY ENGINEER
CLEVELAND OHIO
BROOKPARK ROAD
BRIDGE NO. CUY-17-0283
OVER ROCKY RIVER
CITIES OF CLEVELAND & FAIRVIEW PARK
ARCH SPAN WIDENING DETAILS

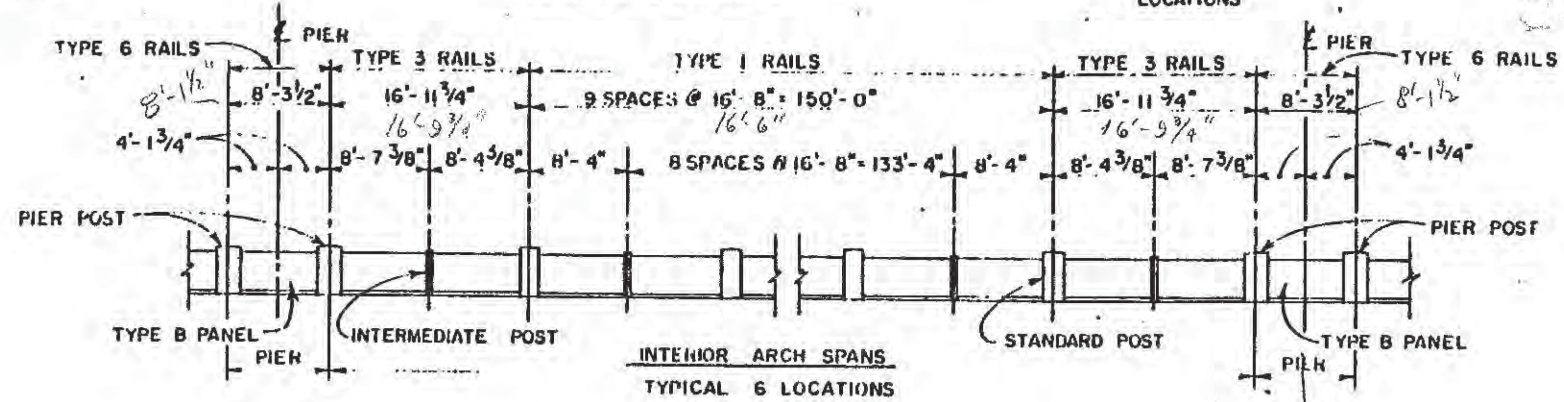
FHWA REGION	STATE	PROJECT	
5	OHIO		

35/82

CUYAHOGA COUNTY

ARCH A & H





RAILING POST SPACING

NOTE: RAILS NOT SHOWN
SPACING SHOWN FOR ONE SIDE

℄ Symmetry

NOTES

ALL RAILING POSTS, RAILS, AND PANELS SHALL BE FABRICATED FROM STANDARD COLD FORMED WELDED STRUCTURAL STEEL TUBING. (ASTM A500, GRADE B). POST BASE PLATES SHALL BE MADE OF A36 STEEL. THE PLATES SHALL BE CAST IN PLACE WITH THE SIDEWALK CONCRETE AND SHALL BE LOCATED TO BE LEVEL IN ALL DIRECTIONS.

THE POSTS SHALL BE ACCURATELY LOCATED ON THE BASE PLATES, TO ASSURE TRUE VERTICAL AND HORIZONTAL ALIGNMENT AND SHALL BE FIELD WELDED TO THE BASE PLATES.

THE RAILS ARE CONSIDERED FIXED AT EACH INTERMEDIATE POST. SLOTTED HOLES ALLOW THERMAL MOVEMENT AT EACH END.

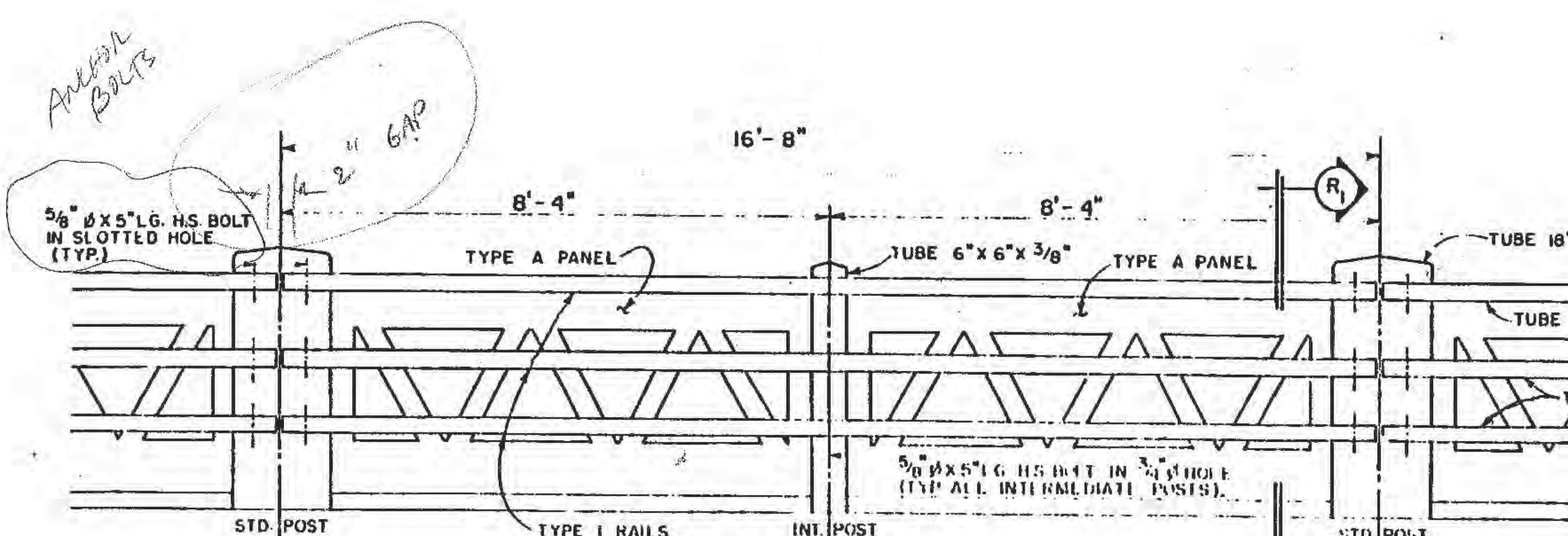
WITH THE EXCEPTION OF THE BOTTOM ONE INCH OF THE POSTS, ALL RAILING POSTS, RAILS, AND PANELS SHALL BE GIVEN THREE COATS OF PAINT IN THE SHOP CONSISTING OF ONE PRIME COAT OF 708.17 AND ONE INTERMEDIATE COAT AND ONE FINISH COAT OF 708.18 MODIFIED TO MATCH THE COLOR OF CLEAN CONCRETE.

AFTER FIELD WELDING OF THE POSTS IS COMPLETE, THE UNPAINTED AREAS AND ANY DAMAGED AREAS, AS DIRECTED BY THE ENGINEER, SHALL RECEIVE THREE COATS OF FIELD APPLIED PAINT MATCHING THAT APPLIED IN THE SHOP.

ALL PAINT SHALL BE SUPPLIED BY THE SAME MANUFACTURER AND SHALL BE CERTIFIED BY HIM TO BE COMPATIBLE.

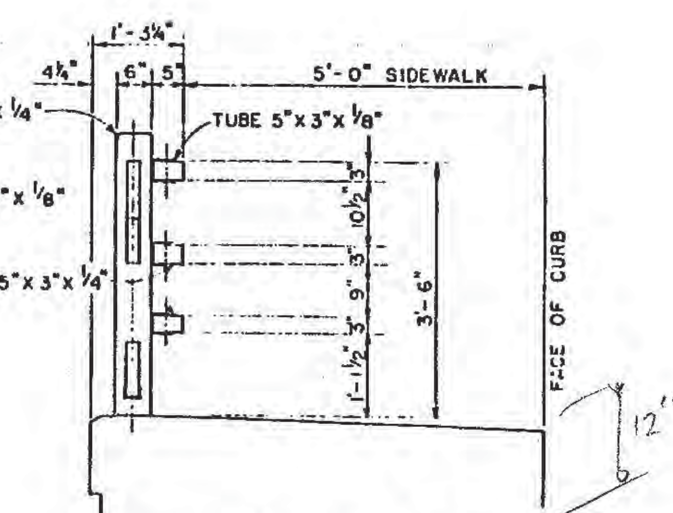
SURFACE PREPARATION AND PAINT APPLICATION SHALL BE IN ACCORDANCE WITH ITEM 514 AND THE MANUFACTURERS INSTRUCTIONS.

COST OF PAINTING SHALL BE INCLUDED IN THE UNIT PRICE BID FOR ITEM 517 RAILING, AS PER PLAN.



RAILING PANEL DETAIL

TYPICAL FOR 16'-8" POST SPACING SIMILAR OTHER LOCATIONS



SECTION R1-R1

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CUYAHOGA COUNTY ENGINEER
CLEVELAND OHIO

BROOKPARK ROAD
BRIDGE NO. CUY-17-0283
OVER ROCKY RIVER
CITIES OF CLEVELAND & FAIRVIEW PARK

RAILING DETAILS

COUNTY BRIDGE NO. 39 REPORT NO. 7068 DATE 3-31-84

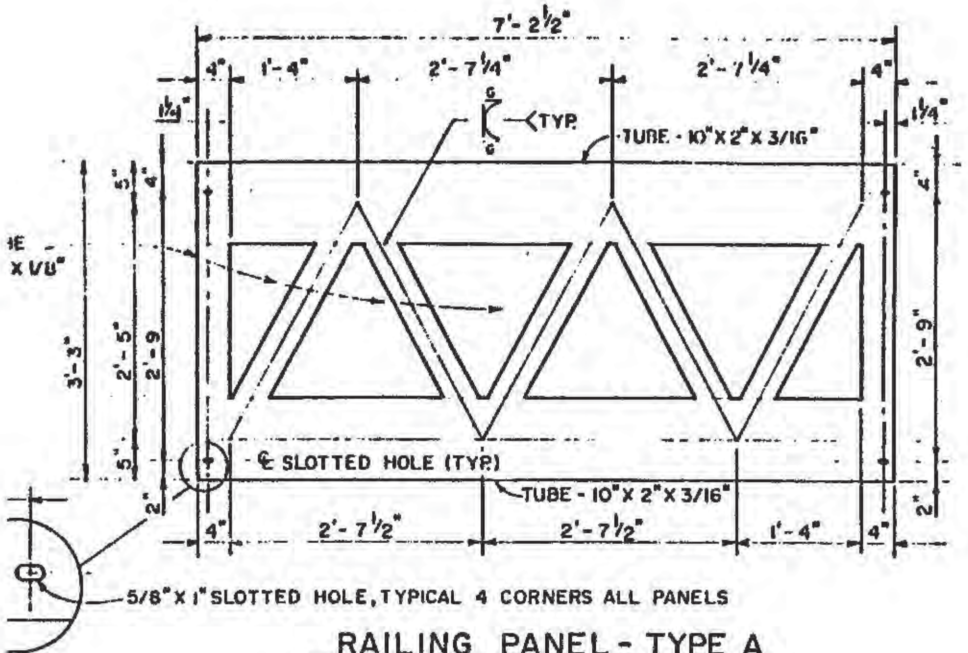
NO. B-191

DESIGN	DRAWN	CHECKED	REVISED TO AS BUILT

FHWA REGION	STATE	PROJECT	
5	OHIO		

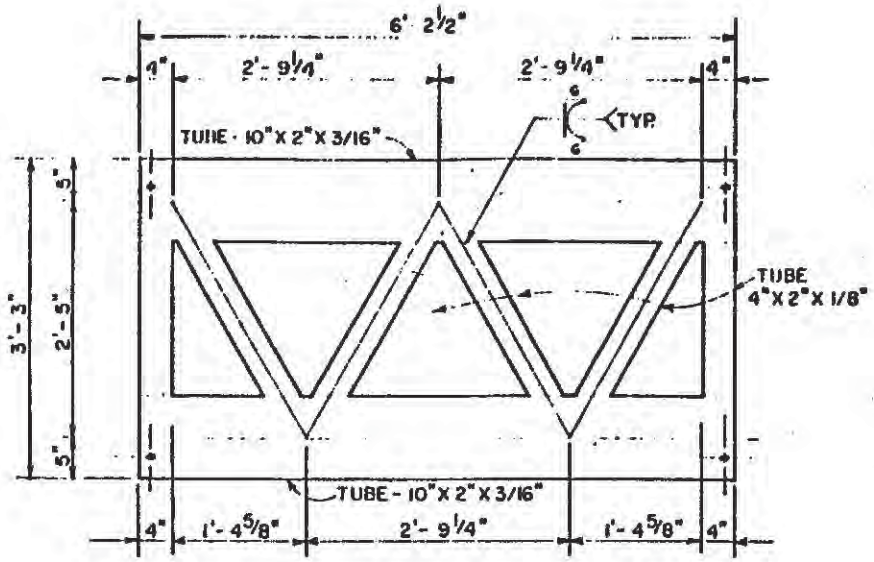
41/82

CUYAHOGA COUNTY



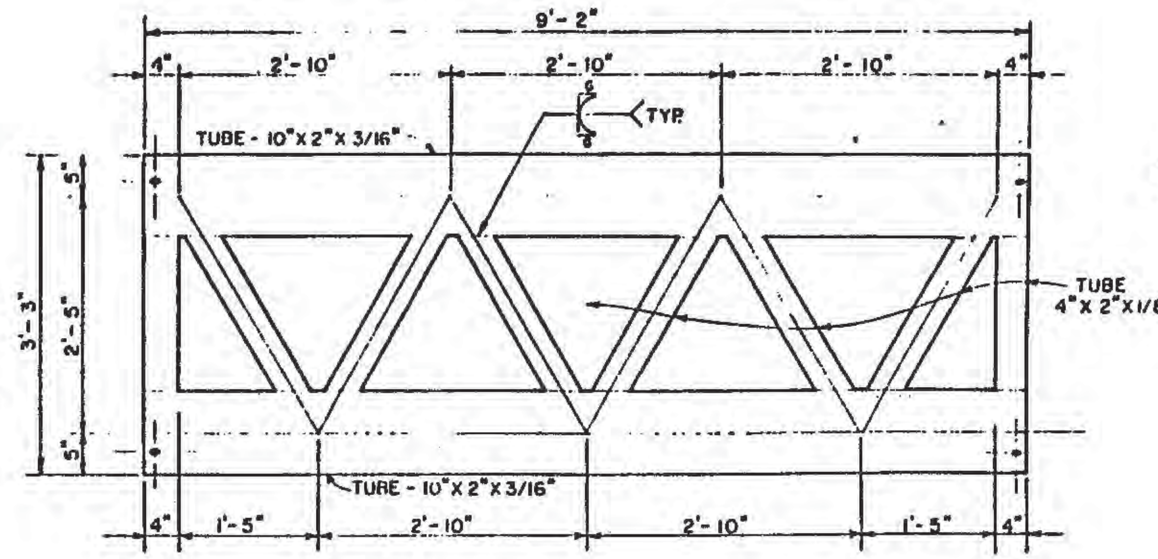
RAILING PANEL - TYPE A

436 REQ'D.



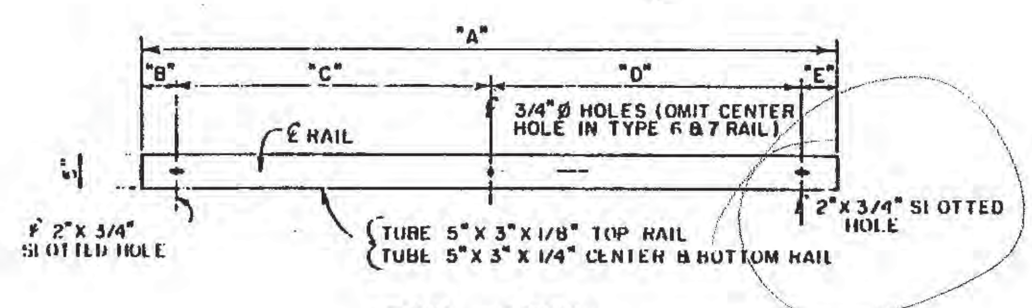
RAILING PANEL - TYPE B

USE AT PIERS - 14 REQ'D.



RAILING PANEL - TYPE C

USE AT PYLONS - 4 REQ'D.



RAIL DETAIL

TABLE OF RAIL DIMENSIONS

RAIL TYPE	DIMENSION "A"	"B"	"C"	"D"	"E"	NO. REQ'D. TOP	CENTER	BOT
1	16'- 6"	3 1/2"	7'- 11 1/2"	7'- 11 1/2"	3 1/2"	170	170	170
2	16'-7 1/2"	3 1/2"	7'- 10 3/4	8'- 0 1/4"	5"	8	8	8
3	16'- 10"	3 1/2"	7'- 11 7/8"	8'- 1 3/8"	5"	28	28	28
4	17'- 9"	3 1/2"	7'- 11 1/2"	8'- 8 1/2"	9 1/2"	8	8	8
5	19'- 0"	9 1/2"	8'- 8 1/2"	8'- 8 1/2"	9 1/2"	4	4	4
6	8'- 11/2"	5"			5"	14	14	14
7	11'- 1"	5"			5"	4	4	4

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CUYAHOGA COUNTY ENGINEER
CLEVELAND OHIO

BROOKPARK ROAD
BRIDGE NO. CUY-17-0283
OVER ROCKY RIVER
CITIES OF CLEVELAND & FAIRVIEW PARK

RAILING DETAILS

COUNTY BRIDGE NO. 39 REPORT NO. 7068 DATE 3-31-84

NO. B-191

Supporting Calculations

MRussell

Arch and Spandrel Column Rating Geometry, Model, Analysis, and Rating Calculations

MRussell

Hatch Mott MacDonald

Project Name 287366 - ODOT D12 GES - 2012 Bridge Load Ratings
Project # CUY-17-0283 Page ______ of ______
Subject Load Rating Stresses Sheet # NA
Calculated by MAR Date 14-Sep-12
Checked by [signature] Date 2-27-13

(Input values are shown underlined and in italics.)

Brookpark Road Bridge - Original Bridge's Material Properties References

Tabulate the Material Properties for the Load Rating

Year Built: *1933*

Reference

ODOT, *Bridge Design Manual*, 2004, Figs. 906 & 907.

Reinforced Concrete

Unknown 1931 to 1950

Plan Sheet Reference: *NA*

f'_c	f_b^{INV}	f_b^{OPR}	f_v^{INV}	f_v^{OPR}
3.0 ksi	1.0 ksi	1.5 ksi	1.0 ksi	1.5 ksi

Reference

AASHTO, *Manual for Condition Evaluation of Bridges*, 1994, 6.6.2.1, 6.6.2.3, & 6.6.2.4.

Reinforcing Steel

Billet

Plan Sheet Reference: *25/50*

f_y	f_b^{INV}	f_b^{OPR}
40.0 ksi	20.0 ksi	28.0 ksi

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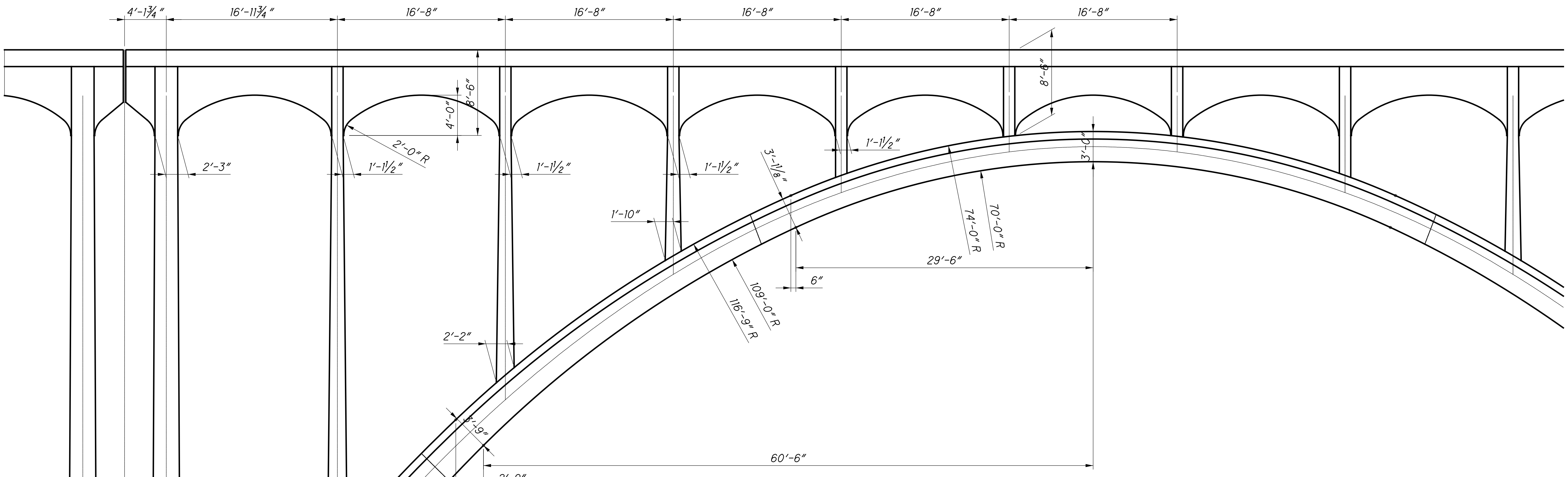
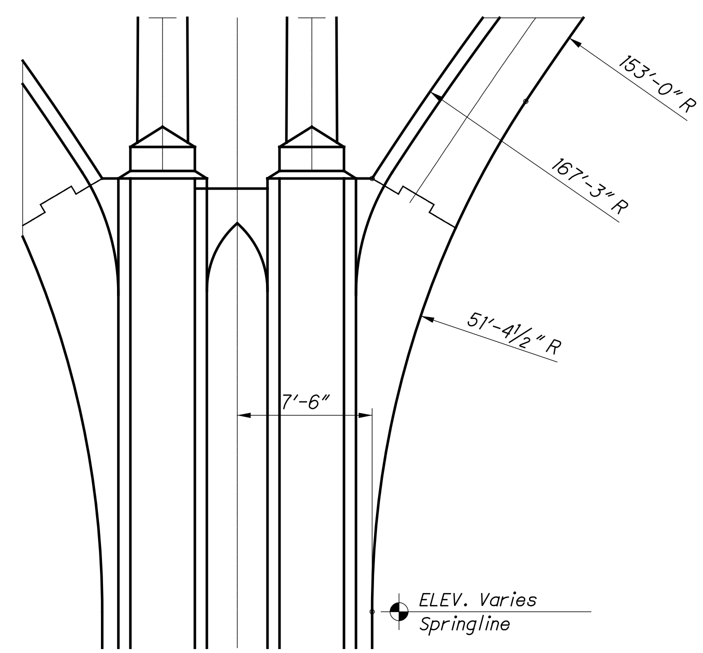
Hatch Mott MacDonald

PROJECT NAME ODOT, D12 GES - CUY-17-0283
PROJECT # 287366 PAGE __ OF __
SUBJECT Load Rating SHEET #
CALCULATED BY MAR DATE 27-Aug-12
CHECKED BY [signature] DATE 2-27-13



HALF-ELEVATION
SHOWING GEOMETRY



DETAIL - SPRINGLINE AT PIER
SHOWING GEOMETRY

Design Data:

Date Built: 1933
f'c = 3,000 psi (Assumed)
fy = 32,000 psi (Assumed)

Development Lengths0
x" ?? = x" (Top) x" (All Other Cases)
x" ?? = x" (Top) x" (All Other Cases)

0' 4' 8'
3/32"=1'-0"

P:\CLE\ODOT\Projects\287366 - 2012 Bridge Load Ratings\1802046 - CUY-17-0283\Load Rating\Sketches_1802046.dgn 10/29/2012 11:01:31 AM RUS61365

Hatch Mott MacDonald

PROJECT NAME ODOT, D12 GES - CUY-17-0283

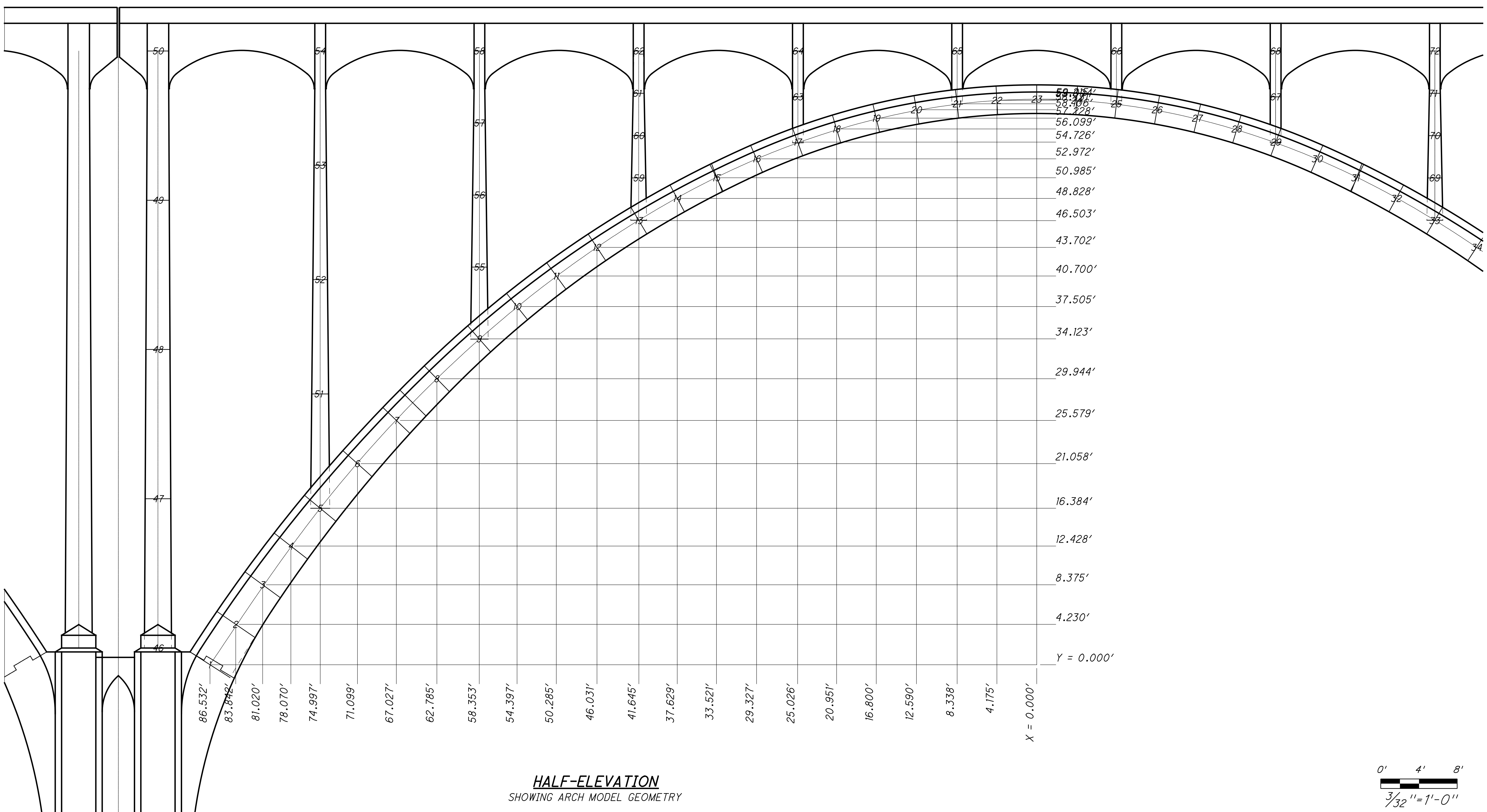
PROJECT # 287366 PAGE ____ OF ____

SUBJECT Load Rating SHEET # ____

CALCULATED BY MAR DATE 27-Aug-12

CHECKED BY [signature] DATE 2-27-13

MRussell



HALF-ELEVATION

SHOWING ARCH MODEL GEOMETRY

0′ 4′ 8′

3/32″=1′-0″

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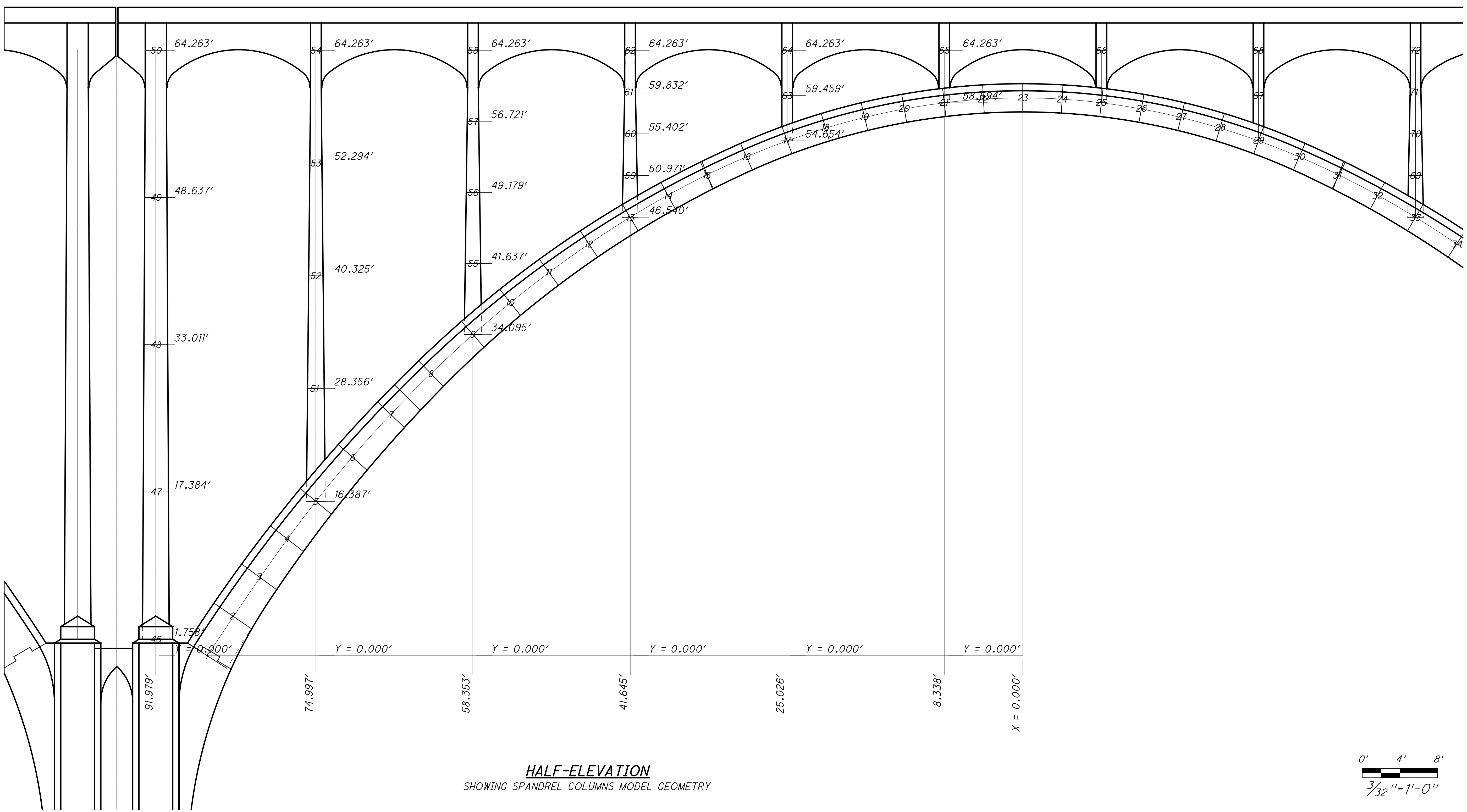
MRussell

Hatch Mott MacDonald

PROJECT NAME ODOT, D12 GES - CUY-17-0283
PROJECT # 287366 PAGE ___ OF ___
SUBJECT Load Rating SHEET # ___
CALCULATED BY MAR DATE 27-Aug-12
CHECKED BY [signature] DATE 2-27-13



HALF-ELEVATION

SHOWING SPANDREL COLUMNS MODEL GEOMETRY

0' 4' 8'
3/32"=1'-0"

MRussell

Hatch Mott MacDonald

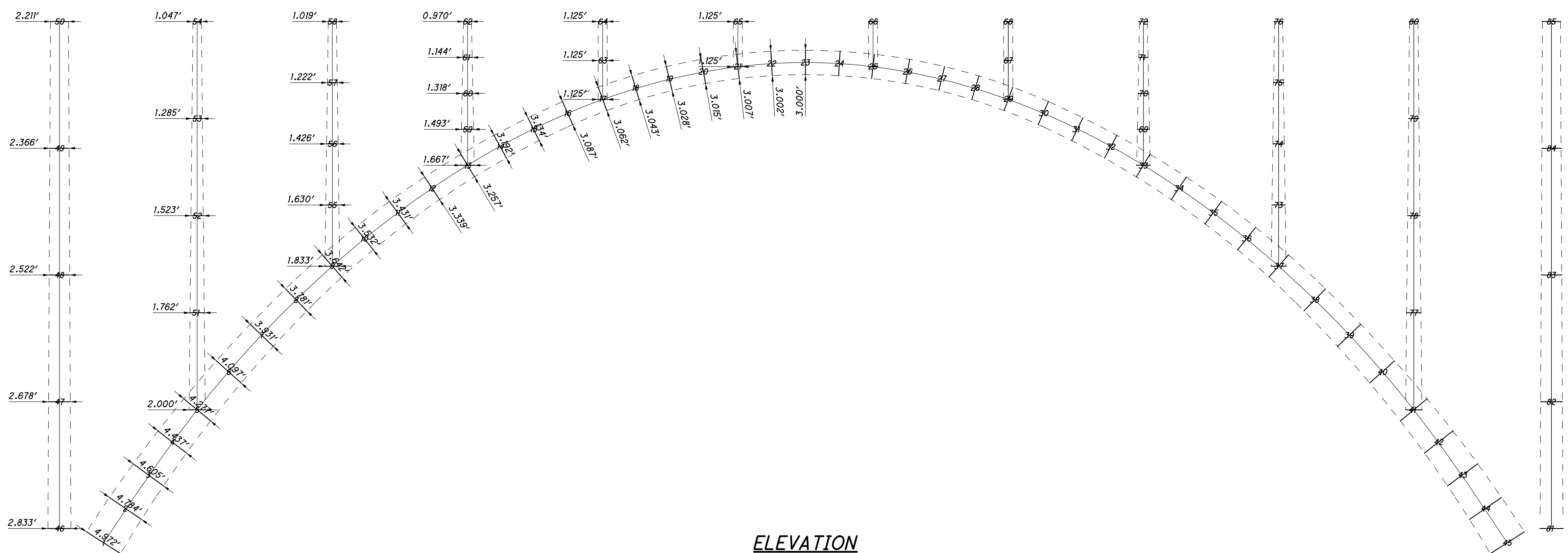
PROJECT NAME ODOT, D12 GES - CUY-17-0283

PROJECT # 287366 PAGE ___ OF ___

SUBJECT Load Rating SHEET #

CALCULATED BY MAR DATE 27-Aug-12

CHECKED BY [signature] DATE 2-27-13



ELEVATION

SHOWING ARCH MODEL PROPERTIES

Note:

The supports are fixed at Nodes 1, 45, 46, & 81.

Nodes for the other arch begin at Node 86 and progress similarly.

The floorbeams' nodes and members are sequential across the top of the columns. See the transverse sections for details and the STAAD run for confirmation.

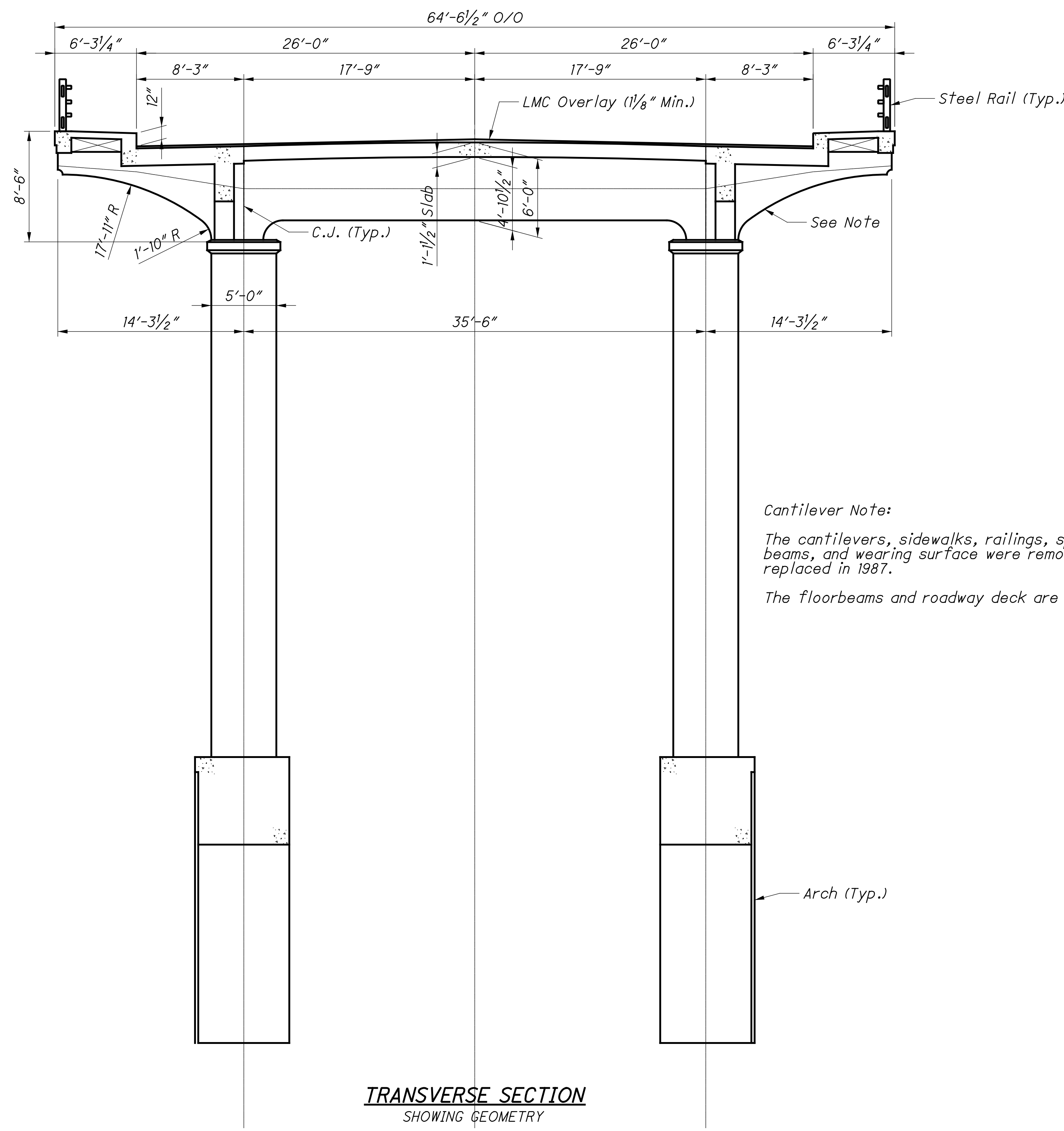
0' 8' 16'

1/16"=1'-0"

Hatch Mott MacDonald

PROJECT NAME ODOT, D12 GES - CUY-17-0283
PROJECT # 287366 PAGE ____ OF ____
SUBJECT Load Rating SHEET #
CALCULATED BY MAR DATE 27-Aug-12
CHECKED BY [signature] DATE 2-27-13

MRussell

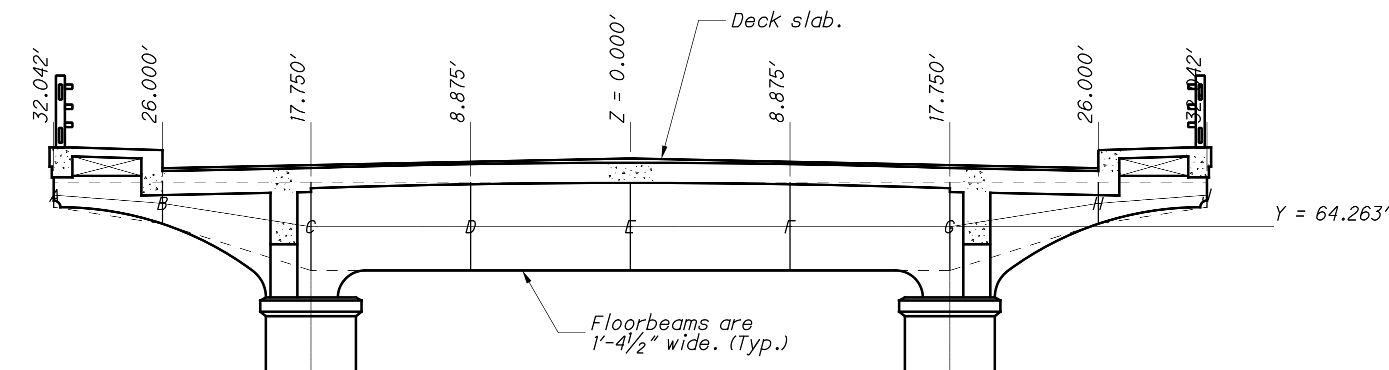


TRANSVERSE SECTION
SHOWING GEOMETRY

Cantilever Note:

The cantilevers, sidewalks, railings, spandrel beams, and wearing surface were removed and replaced in 1987.

The floorbeams and roadway deck are original.

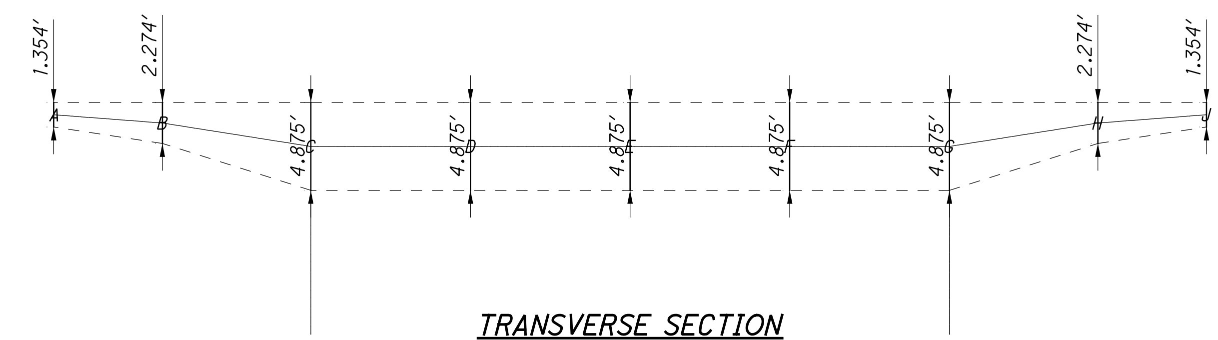


TRANSVERSE SECTION
SHOWING FLOOBEAM MODEL GEOMETRY

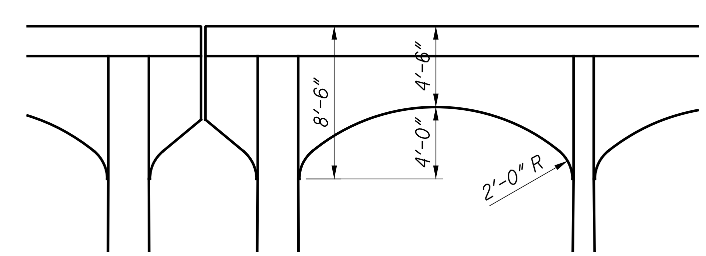
Deck Slab Note:

The original slab was 13½". The LMC overlay was 1½" min. and likely involved 1½" scarification. The variable thickness overlay is up to 3" thick.

The result is that the structural slab should be considered to be 12" and already carrying a 2½" overlay.



TRANSVERSE SECTION
SHOWING FLOOBEAM MODEL PROPERTIES



ELEVATION
SHOWING SPADREL BEAMS

0' 4' 8'
3/32"=1'-0"

P:\CLE\ODOT\Projects\287366 - 2012 Bridge Load Ratings\1802046 - CUY-17-0283\Load Rating\Sketches_1802046.dgn 10/29/2012 11:03:36 AM RUS61365

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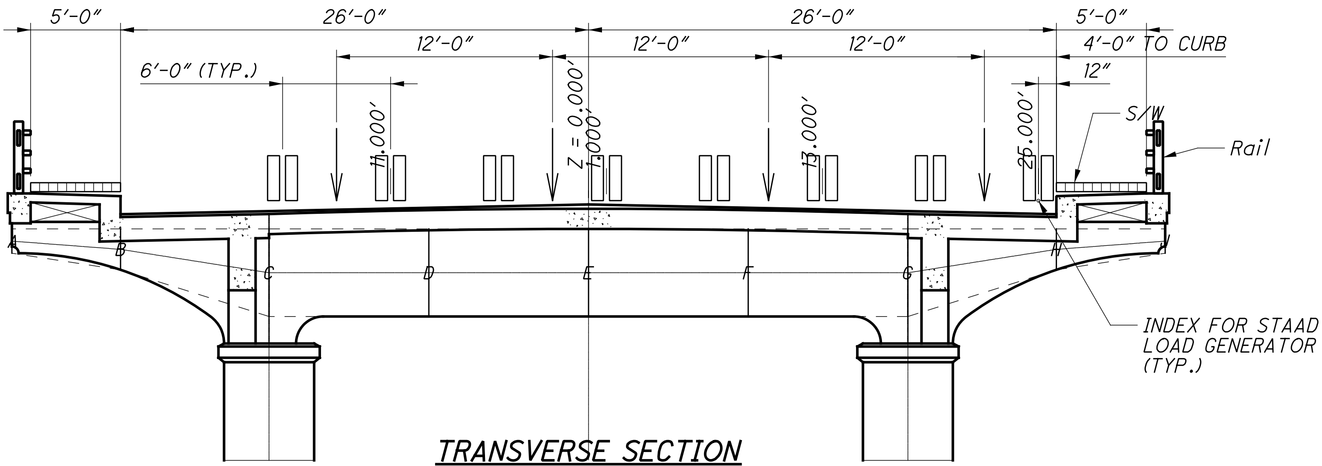
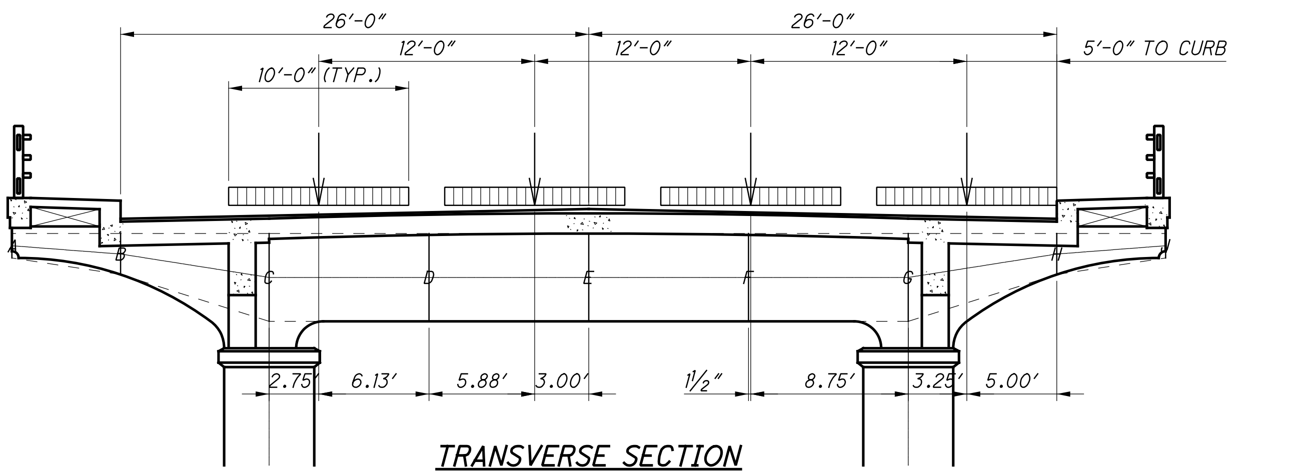
PROJECT NAME ODOT, D12 GES - CUY-17-0283
PROJECT # 287366 PAGE ___ OF ___
SUBJECT Load Rating SHEET # ___
CALCULATED BY MAR DATE 27-Aug-12
CHECKED BY [signature] DATE 2-27-13



TRANSVERSE SECTION
SHOWING LANE & WHEEL LOCATIONS AND SIDEWALK LOAD



TRANSVERSE SECTION
SHOWING LANE LOAD DETAILS

Notes:

Truck loads can be input into STAAD as defined moving loads and then the critical loads generated during the analysis.

The lane loads will be entered as member loads based on lever-rule distribution to the "deck" elements. The point load will be added as a discrete member load on the various floor beams.

0' 4' 8'
3/32"=1'-0"

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Arch and Spandrel Column Model

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Project Name	*287366 - ODOT D12 GES - 2012 Bridge Load Ratings*		
Project #	*CUY-17-0283*	Page	of
Subject	*Arch and Column Rating*	Sheet #	*NA*
Calculated by	*MAR*	Date	*18-Sep-12*
Checked by	[illegible]	Date	2-27-13

(Input values are shown underlined and in italics.)

Determine the Applied Loads on the Bridge

References

Overlay Loads

t	*3* "	Thickness of existing overlay.	
γ	145 pcf	Asphalt unit weight.	
DC	36.3 psf	Existing overlay load.	(ODOT, *BDM*, 2004, 916)
B	*4.13* feet	Tributary width for stringer lines B & H.	
	8.56 feet	Tributary width for stringer lines C & G.	
	8.75 feet	Tributary width for stringer lines D, E, & F.	
1.3 DC	**194** plf	Loads along stringer lines B & H.	
	404 plf	Loads along stringer lines C & G.	
	412 plf	Loads along stringer lines D, E, & F.	

Rail

Element	w plf	#	DC plf
TS10x2x3/16	*14.5*	*2*	29.0
TS4x2x1/8	*4.8*	*2*	9.6
TS5x3x1/4	*12.2*	*3*	36.6
		1.3 DC	**97.8**

Pedestrian Loads

PL	*75* psf	Sidwalk load.	(ODOT, *BDM*, 2004, 916)
B	*5.00* feet	Sidwalk width.	
2.17 w	**0.41** plf	Load at stringer lines A, B, H & J	

Lane Loads

Load

w	*640* plf	HS20 lane load.	(*BDM*, 2004, 916)
P	*26* kip	Point load.	

Lanes

Distances	Applied Loads w/Impact
2.75' to stringer line C	**3** to stringer line C
6.13' to stringer line D	**2** to stringer line D
5.88' to stringer line D	**2** to stringer line D
3.00' to stringer line E	**3** to stringer line E
0.13' to stringer line F	**5** to stringer line F
8.75' to stringer line G	**0** to stringer line G
3.25' to stringer line G	**3** to stringer line G
5.00' to stringer line H	**2** to stringer line H

Point Loads

26.0 kip at

6.13' along member DC
3.00' along member ED
8.75' along member GF
5.00' along member HG

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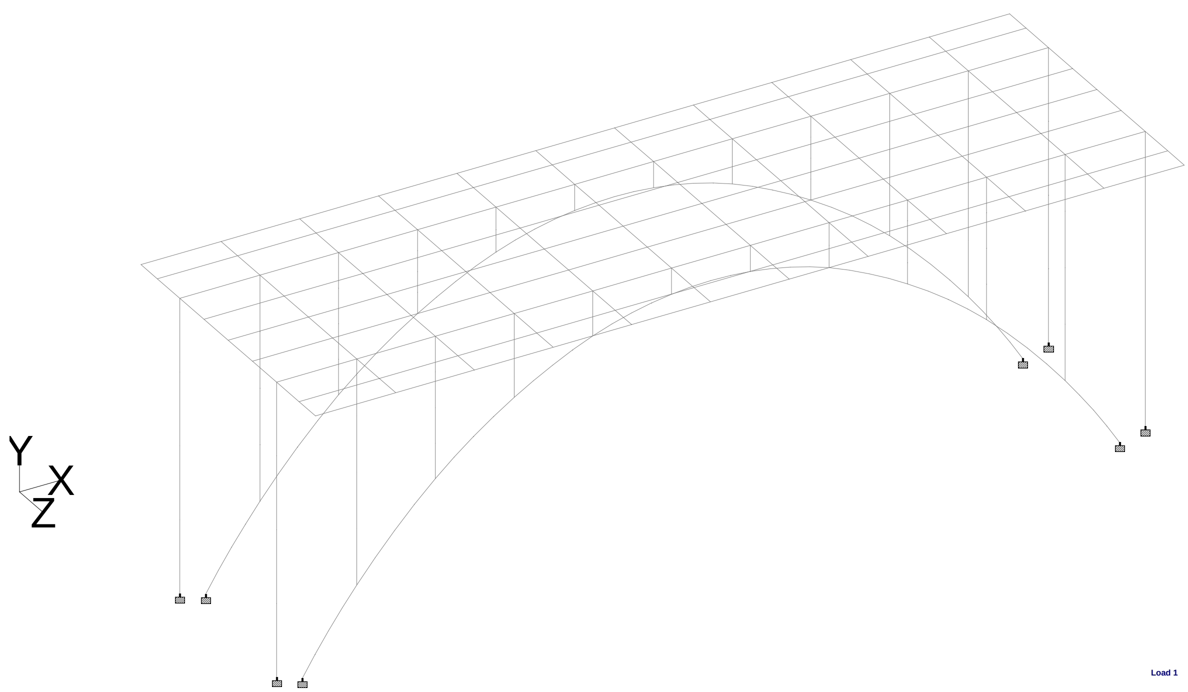
	Part		
Job Title 2012 Bridge Load Ratings	Ref CUY-17-0283		
	By MARussell	Date 12-Sep-12	Chd
Client Ohio DOT	File 1802046.std	Date/Time 20-Sep-2012 16:01	



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	Part		
Job Title 2012 Bridge Load Ratings	Ref CUY-17-0283		
	By MARussell	Date 12-Sep-12	Chd
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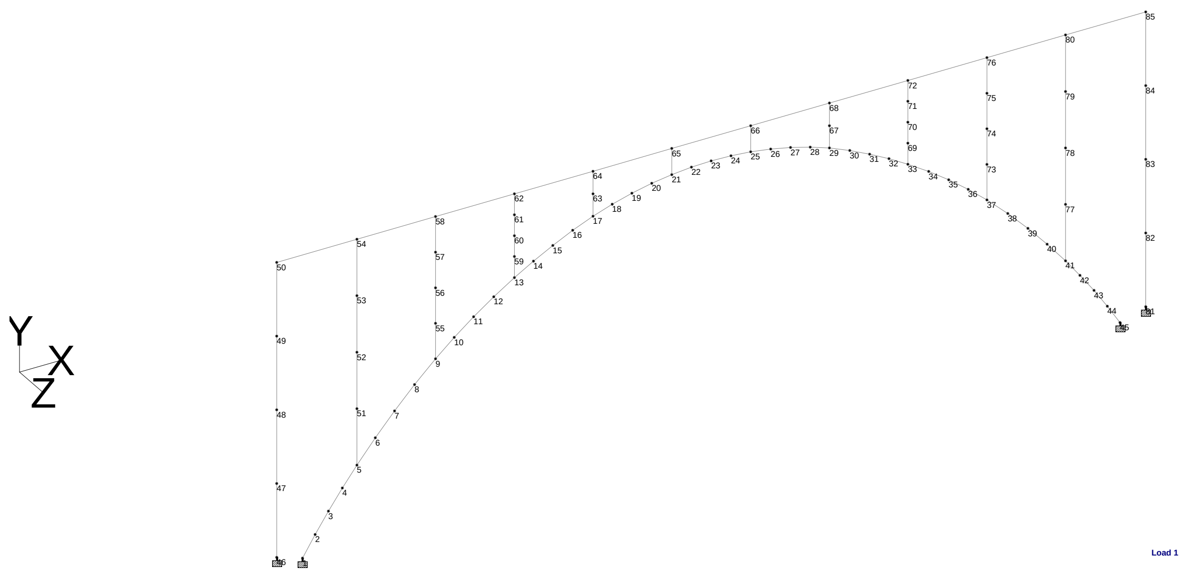

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Hatch Mott MacDonald Software licensed to Hatch Mott MacDonald	Job No **287366**	Sheet No **1**		Rev
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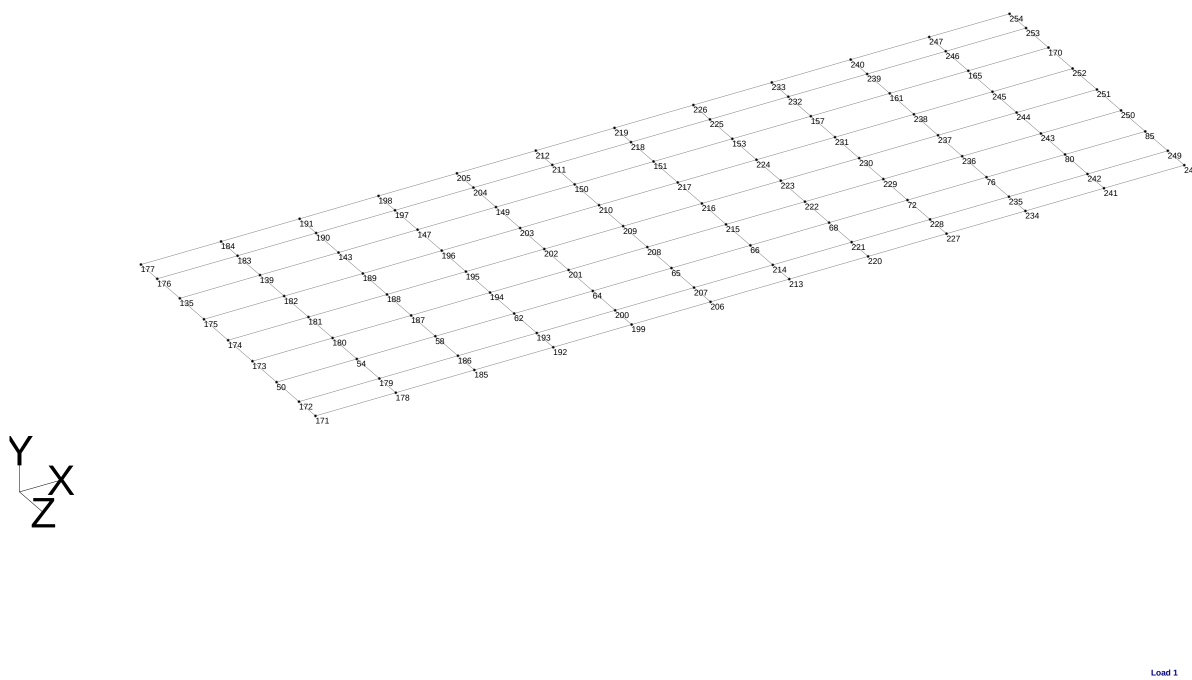
Job Title 2012 Bridge Load Ratings	Ref CUY-17-0283			
	By MARussell	Date 12-Sep-12		Chd
Client Ohio DOT	File 1802046.std		Date/Time 20-Sep-2012 16:01	



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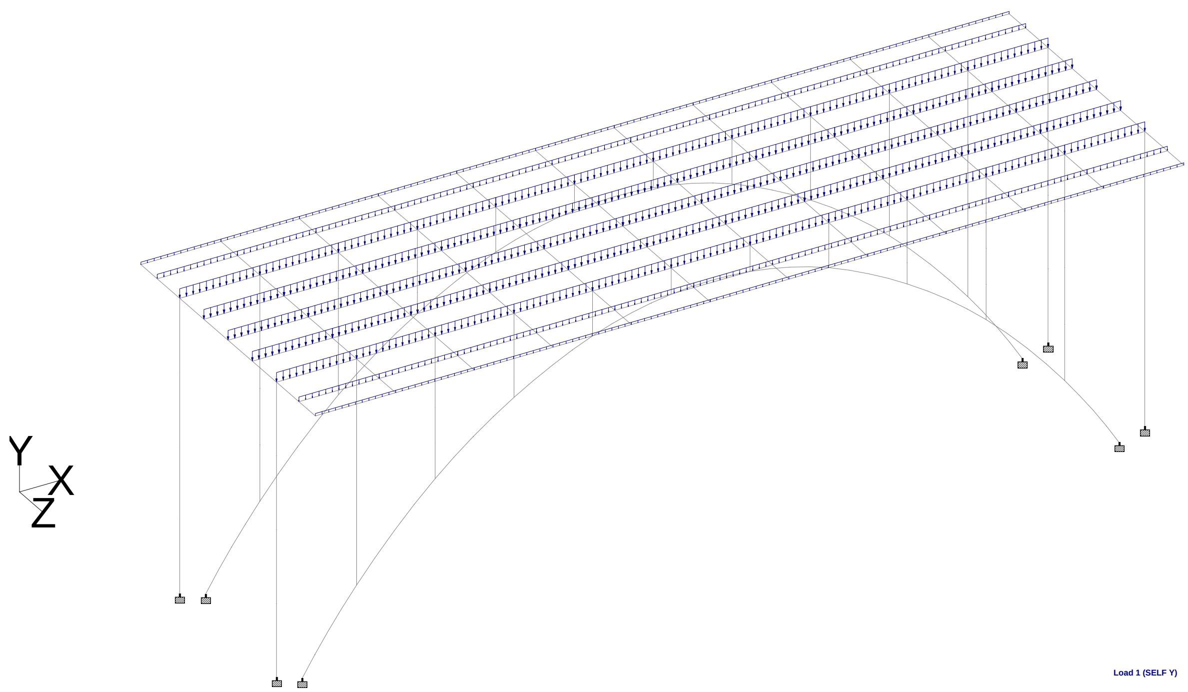
Job No	Sheet No	Rev
287366	1	
Part		

Job Title 2012 Bridge Load Ratings	Ref CUY-17-0283		
	By MARussell	Date 12-Sep-12	Chd
Client Ohio DOT	File 1802046.std	Date/Time 20-Sep-2012 16:01	

Dead Loads - MR



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Software licensed to Hatch Mott MacDonald	Job No **287366**	Sheet No **1**	Rev
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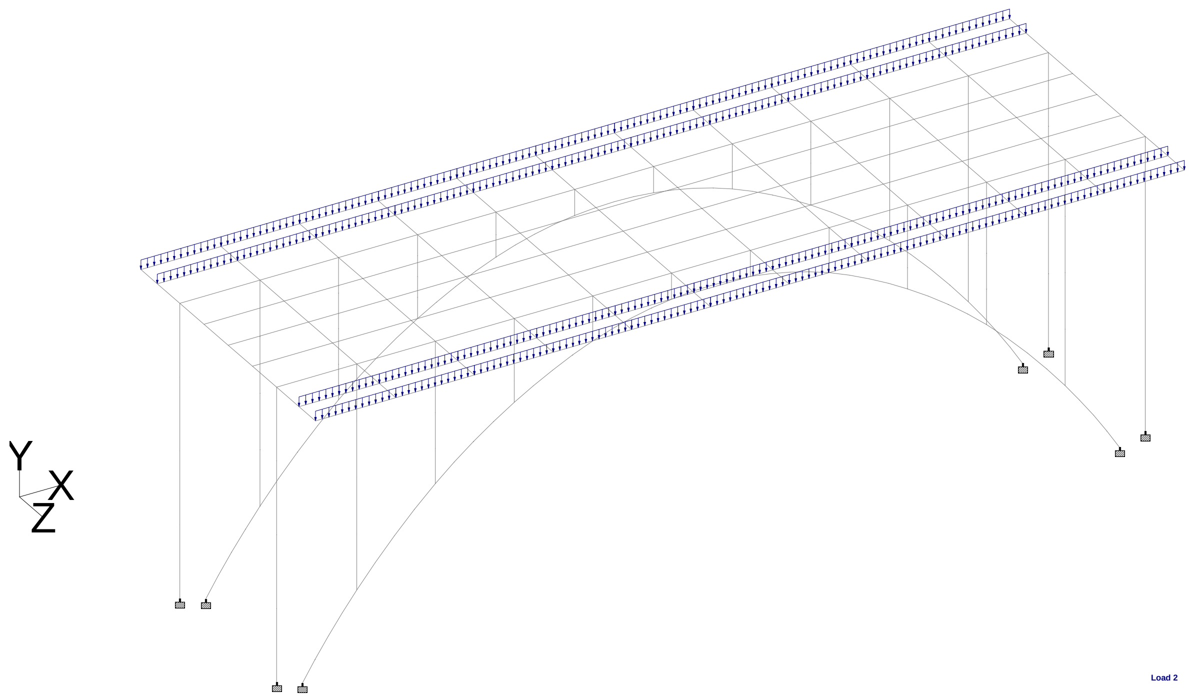
Job Title 2012 Bridge Load Ratings	Ref CUY-17-0283		
	By MARussell	Date 12-Sep-12	Chd
Client Ohio DOT	File 1802046.std	Date/Time 20-Sep-2012 16:01	

Sidewalk Live Load - MR



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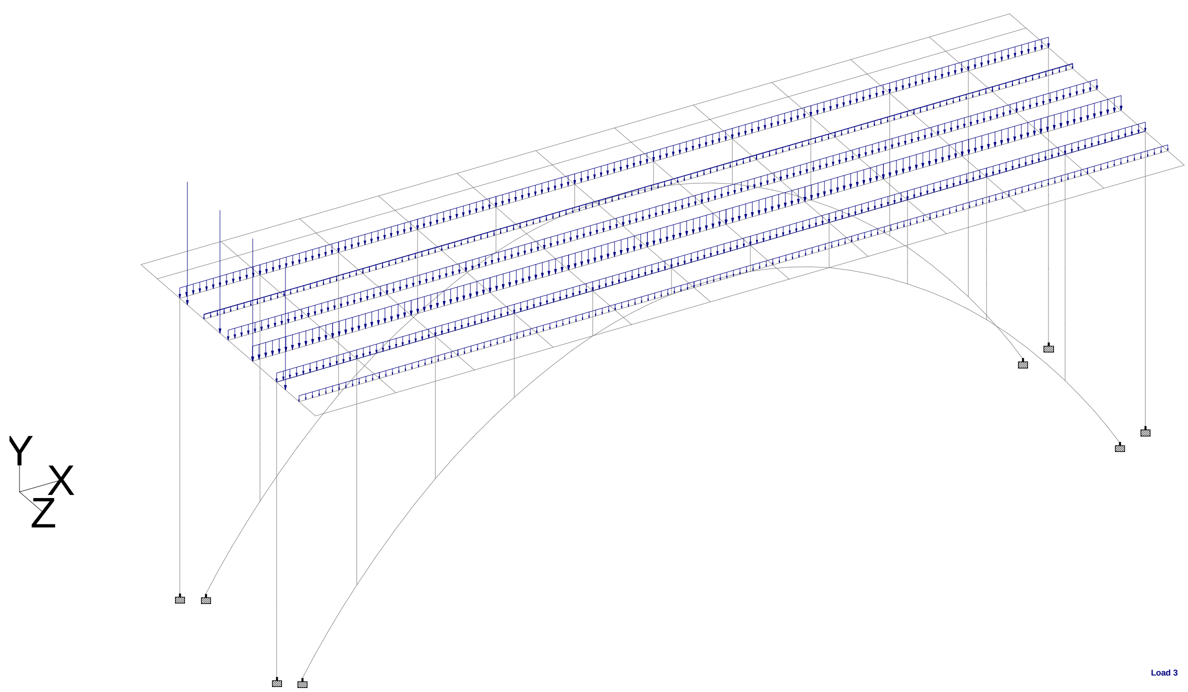
Software licensed to Hatch Mott MacDonald	Job No 287366	Sheet No 1	Rev
	Part		
Job Title 2012 Bridge Load Ratings	Ref CUY-17-0283		
	By MARussell	Date 12-Sep-12	Chd
Client Ohio DOT	File 1802046.std	Date/Time 20-Sep-2012 16:01	

Generated Moving Load:
HS20 Lane
Start - MR



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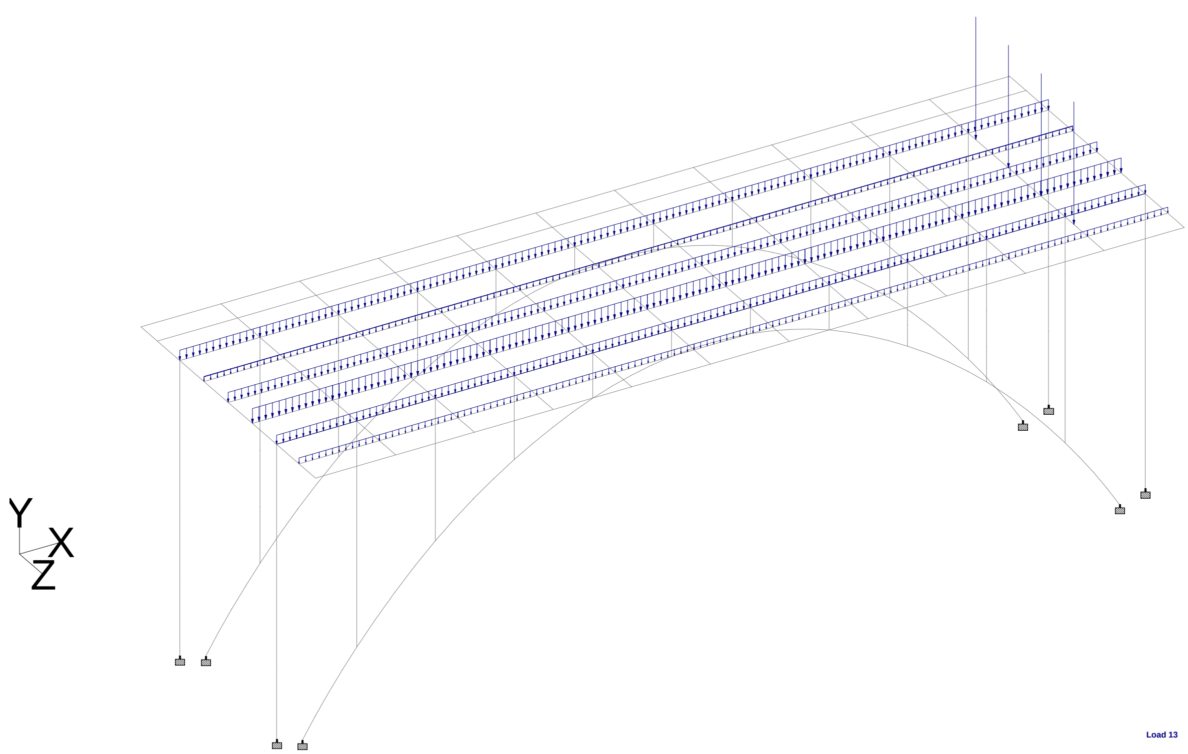
Job No **287366**	Sheet No **1**		Rev
Part			
Job Title 2012 Bridge Load Ratings	Ref CUY-17-0283		
	By MARussell	Date 12-Sep-12	Chd
Client Ohio DOT	File 1802046.std	Date/Time 20-Sep-2012 16:01	

Generated Moving Load:
HS20 Lane
Finish - MR



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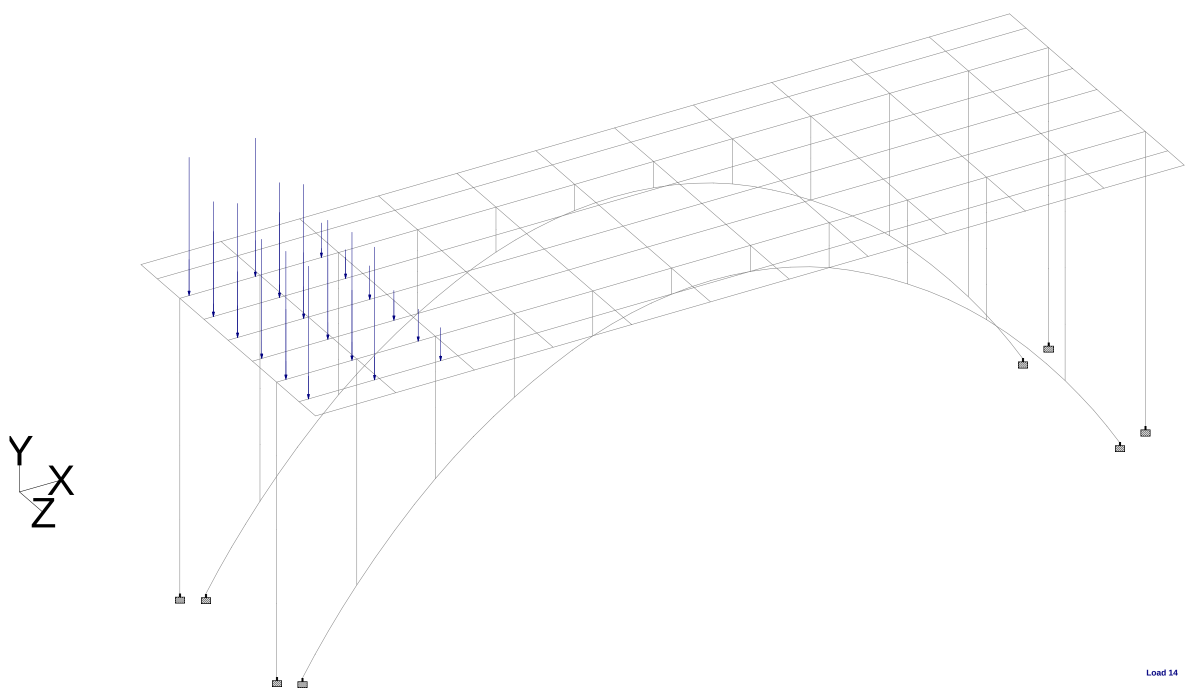
Software licensed to Hatch Mott MacDonald	Job No 287366	Sheet No 1	Rev
	Part		
Job Title 2012 Bridge Load Ratings	Ref CUY-17-0283		
	By MARussell	Date 12-Sep-12	Chd
Client Ohio DOT	File 1802046.std	Date/Time 20-Sep-2012 16:01	

Generated Moving Load:
HS20 Truck
Start - MR



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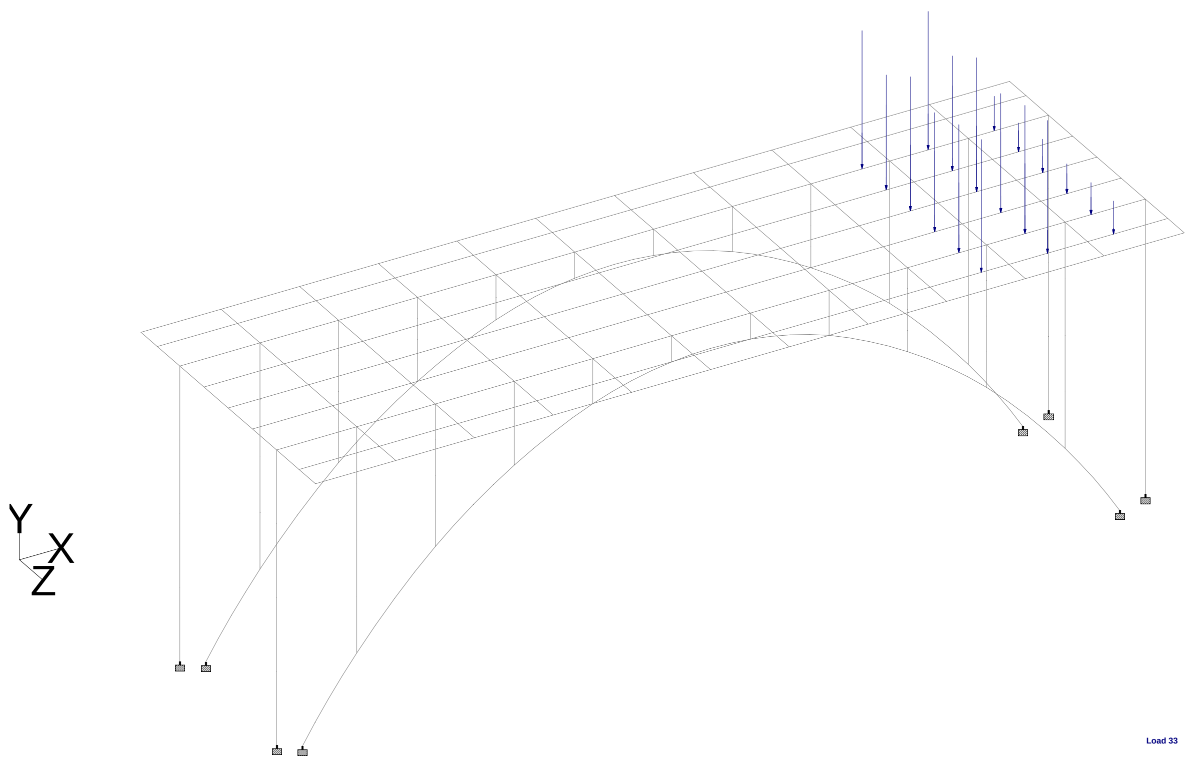
	Part		
Job Title 2012 Bridge Load Ratings	Ref CUY-17-0283		
	By MARussell	Date 12-Sep-12	Chd
Client Ohio DOT	File 1802046.std	Date/Time 20-Sep-2012 16:01	

Generated Moving Load:
HS20 Truck
Finish - MR



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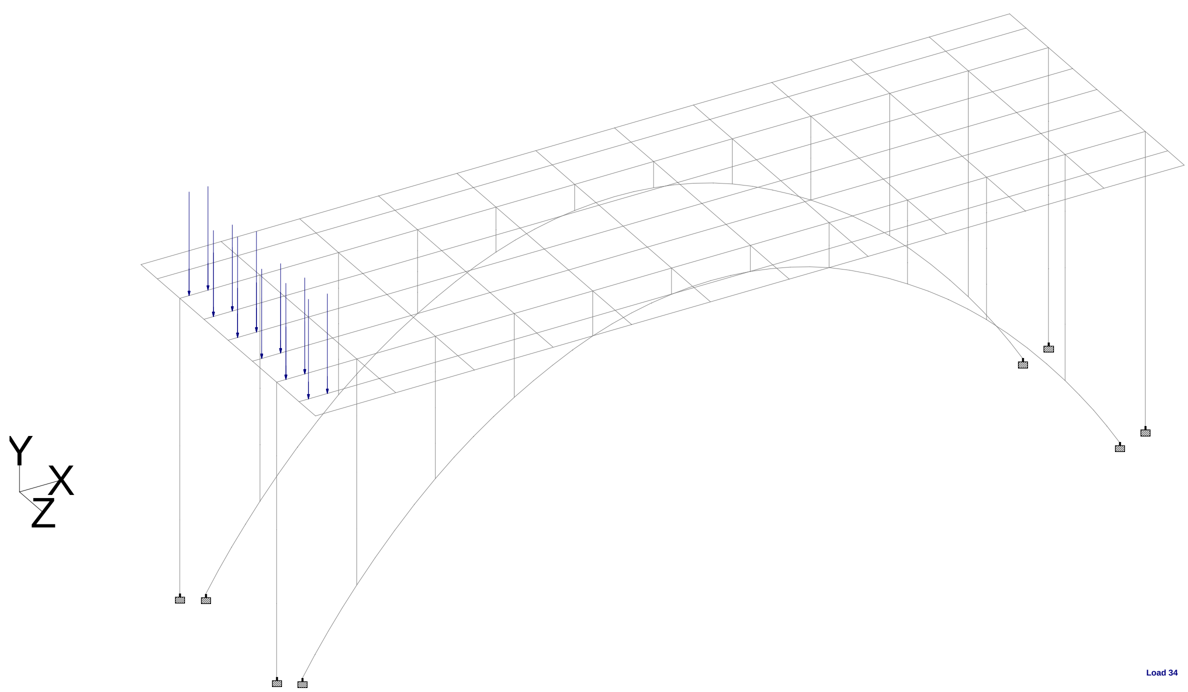
Job Title 2012 Bridge Load Ratings	Ref CUY-17-0283		
	By MARussell	Date 12-Sep-12	Chd
Client Ohio DOT	File 1802046.std	Date/Time 20-Sep-2012 16:01	

Generated Moving Load:
HS20 Tandem
Start - MR



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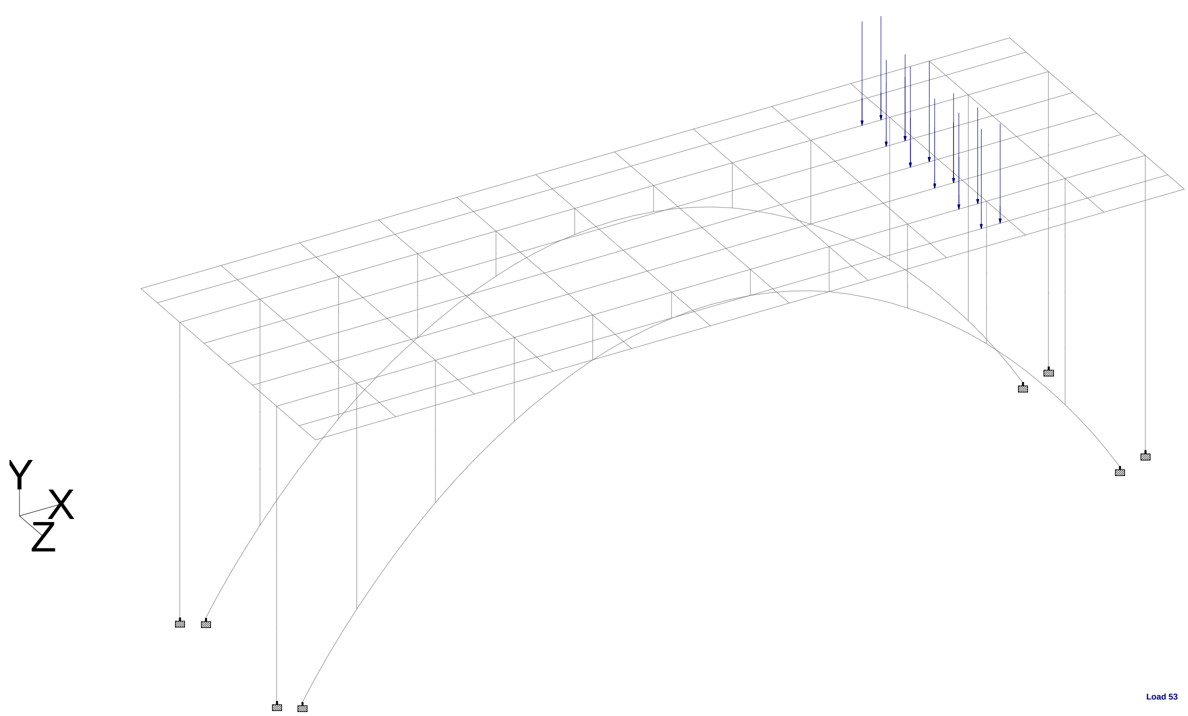
Job Title 2012 Bridge Load Ratings	Ref CUY-17-0283		
	By MARussell	Date 12-Sep-12	Chd
Client Ohio DOT	File 1802046.std	Date/Time 20-Sep-2012 16:01	

Generated Moving Load:
HS20 Tandem
Finish - MR



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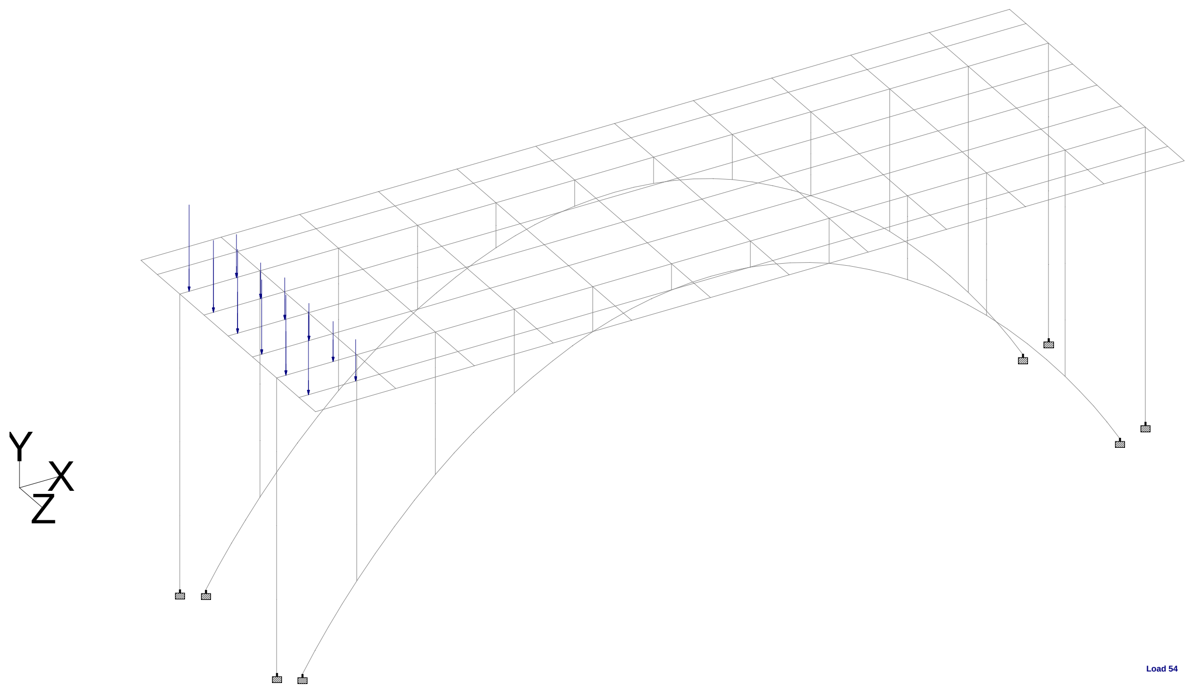
	Part		
Job Title 2012 Bridge Load Ratings	Ref CUY-17-0283		
	By MARussell	Date 12-Sep-12	Chd
Client Ohio DOT	File 1802046.std	Date/Time 20-Sep-2012 16:01	

Generated Moving Load:
2F1
Start - MR



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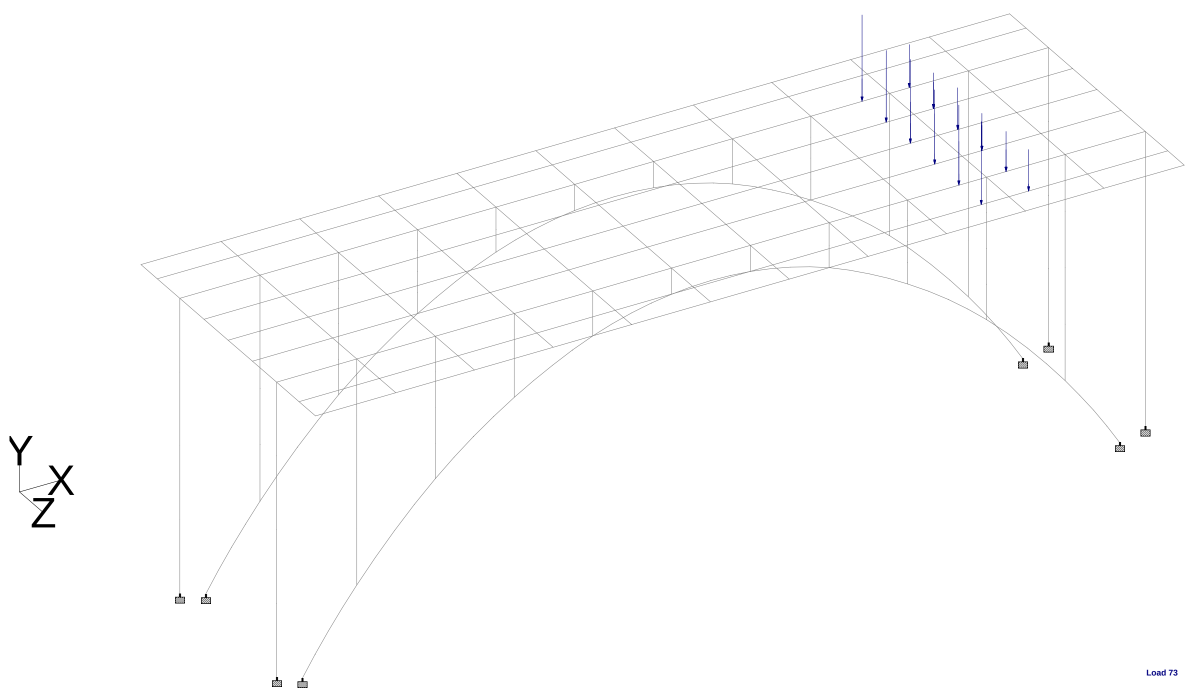
Job Title 2012 Bridge Load Ratings	Ref CUY-17-0283		
	By MARussell	Date 12-Sep-12	Chd
Client Ohio DOT	File 1802046.std	Date/Time 20-Sep-2012 16:01	

Generated Moving Load:
2F1
Finish - MR



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Job Title 2012 Bridge Load Ratings	Ref CUY-17-0283		
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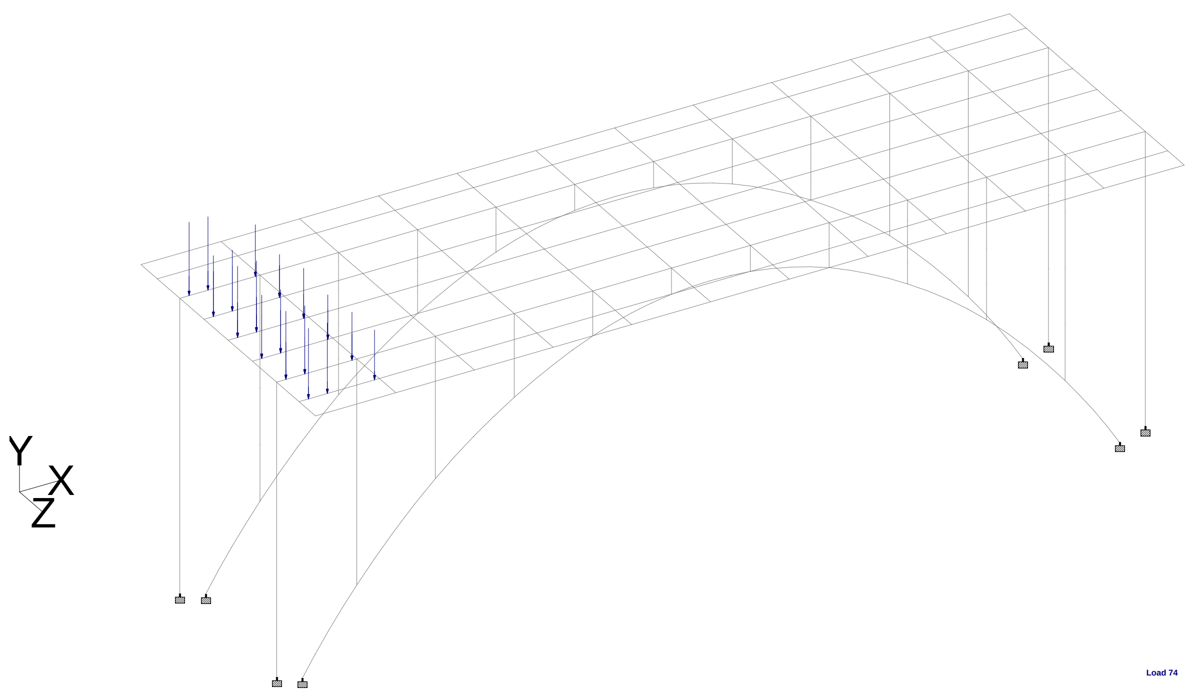
Client Ohio DOT	File 1802046.std	Date/Time 20-Sep-2012 16:01	

Generated Moving Load:
3F1
Start - MR



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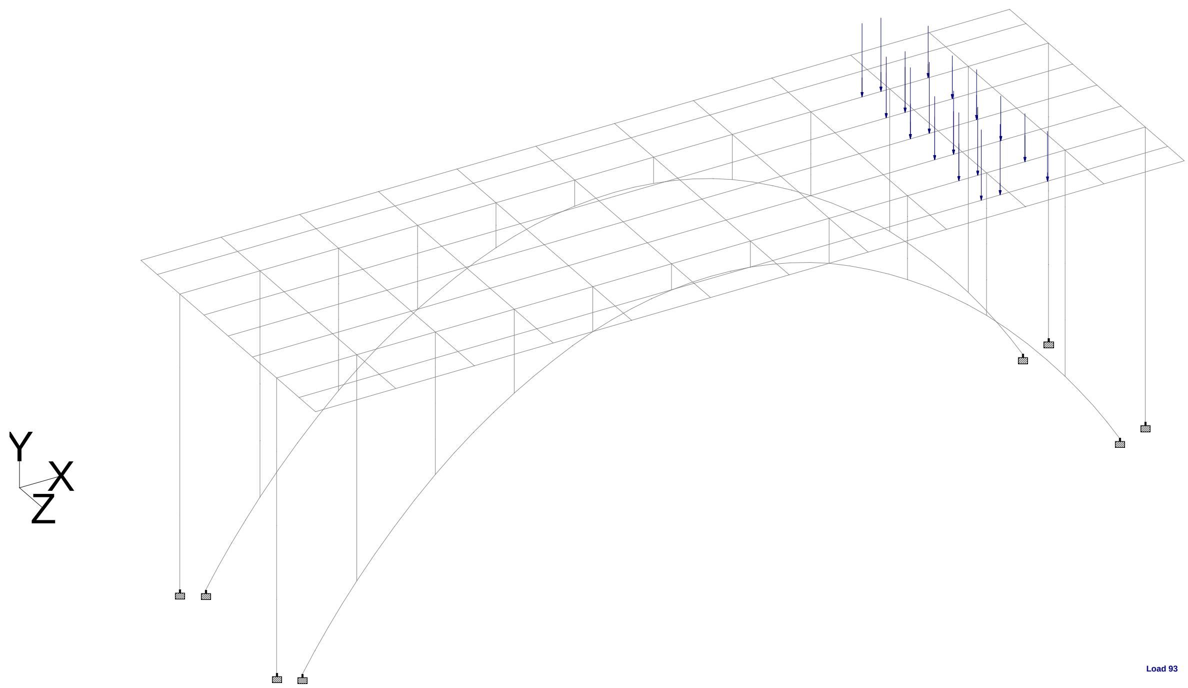
Hatch Mott MacDonald	Job No 287366	Sheet No 1	Rev
	Part		
Job Title 2012 Bridge Load Ratings	Ref CUY-17-0283		
	By MARussell	Date 12-Sep-12	Chd
Client Ohio DOT	File 1802046.std	Date/Time 20-Sep-2012 16:01	

Generated Moving Load: 3F1
Finish - MR



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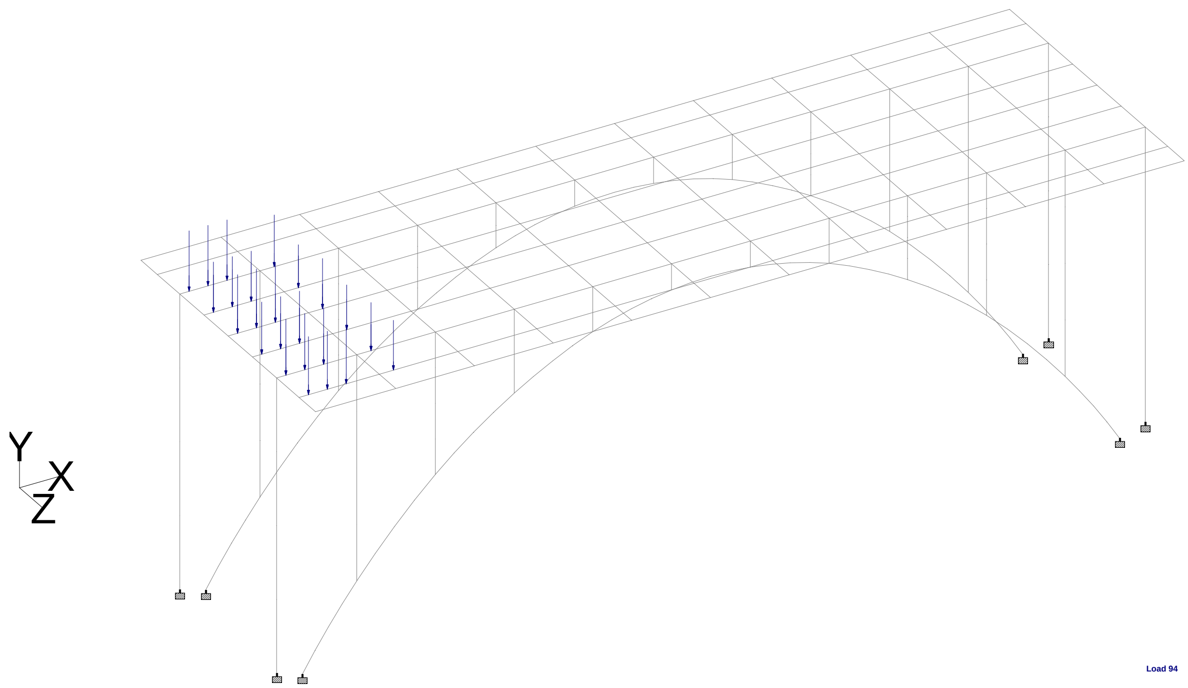
Job Title 2012 Bridge Load Ratings	Ref CUY-17-0283		
	By MARussell	Date 12-Sep-12	Chd
Client Ohio DOT	File 1802046.std	Date/Time 20-Sep-2012 16:01	

Generated Moving Load:
4F1
Start - MR



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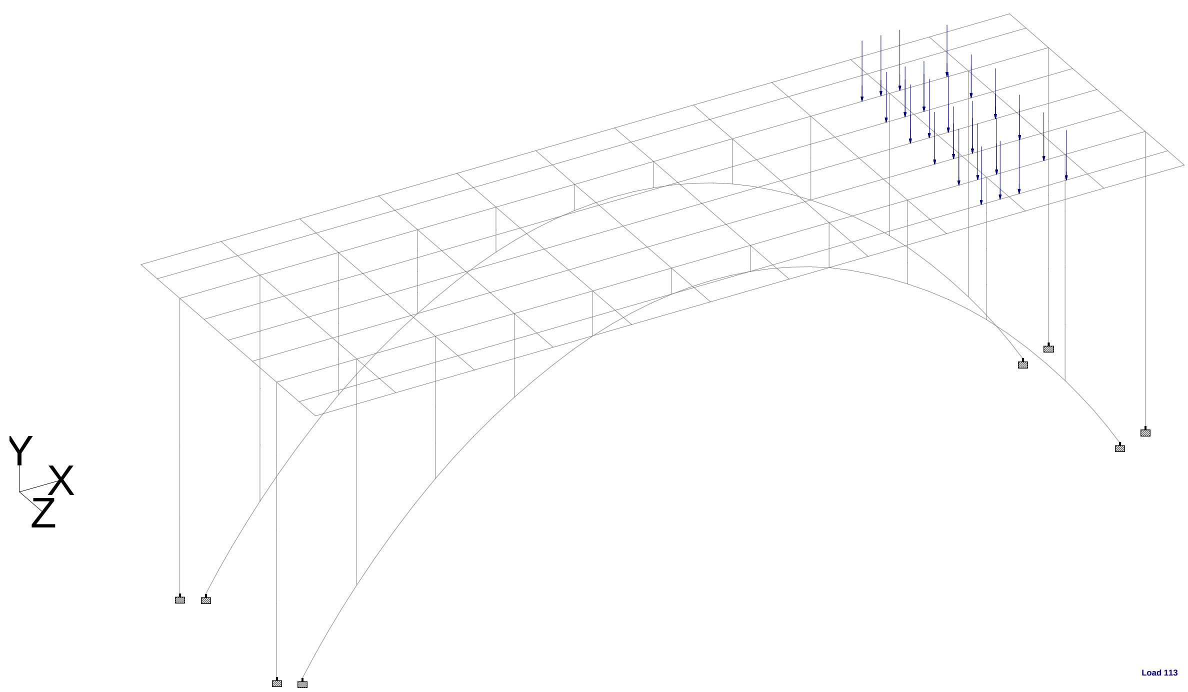
	Part		
Job Title 2012 Bridge Load Ratings	Ref CUY-17-0283		
	By MARussell	Date 12-Sep-12	Chd
Client Ohio DOT	File 1802046.std	Date/Time 20-Sep-2012 16:01	

Generated Moving Load:
4F1
Finish - MR



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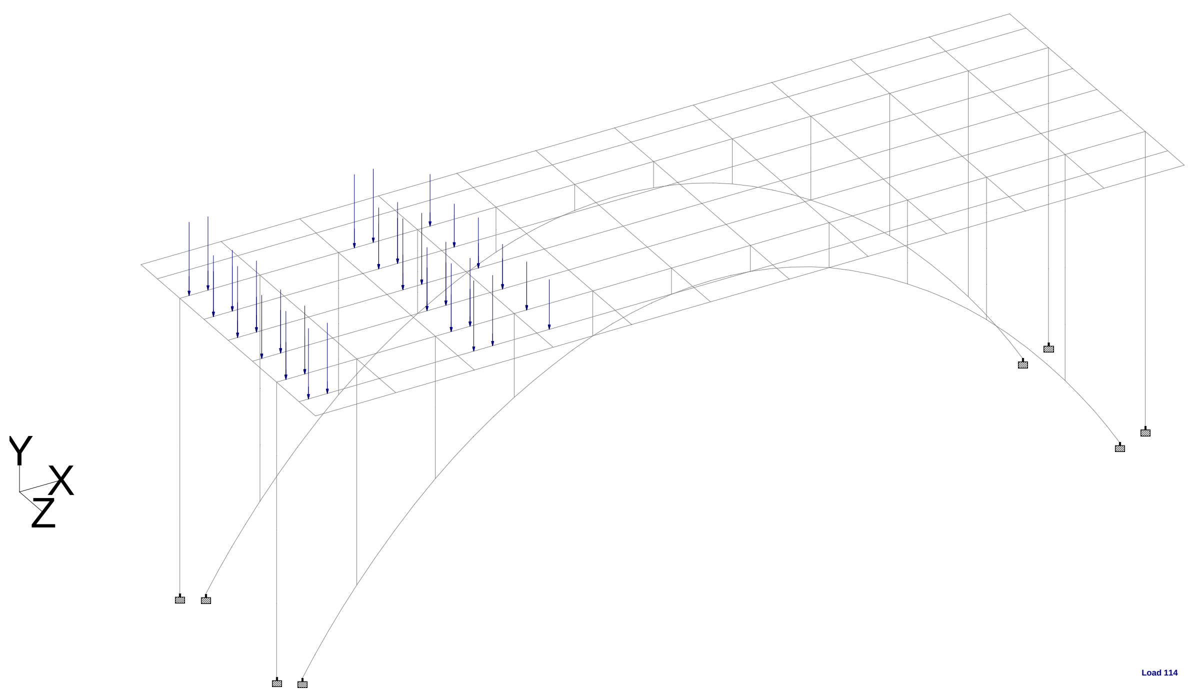
	Part		
Job Title 2012 Bridge Load Ratings	Ref CUY-17-0283		
	By MARussell	Date 12-Sep-12	Chd
Client Ohio DOT	File 1802046.std	Date/Time 20-Sep-2012 16:01	

Generated Moving Load:
5C1
Start - MR



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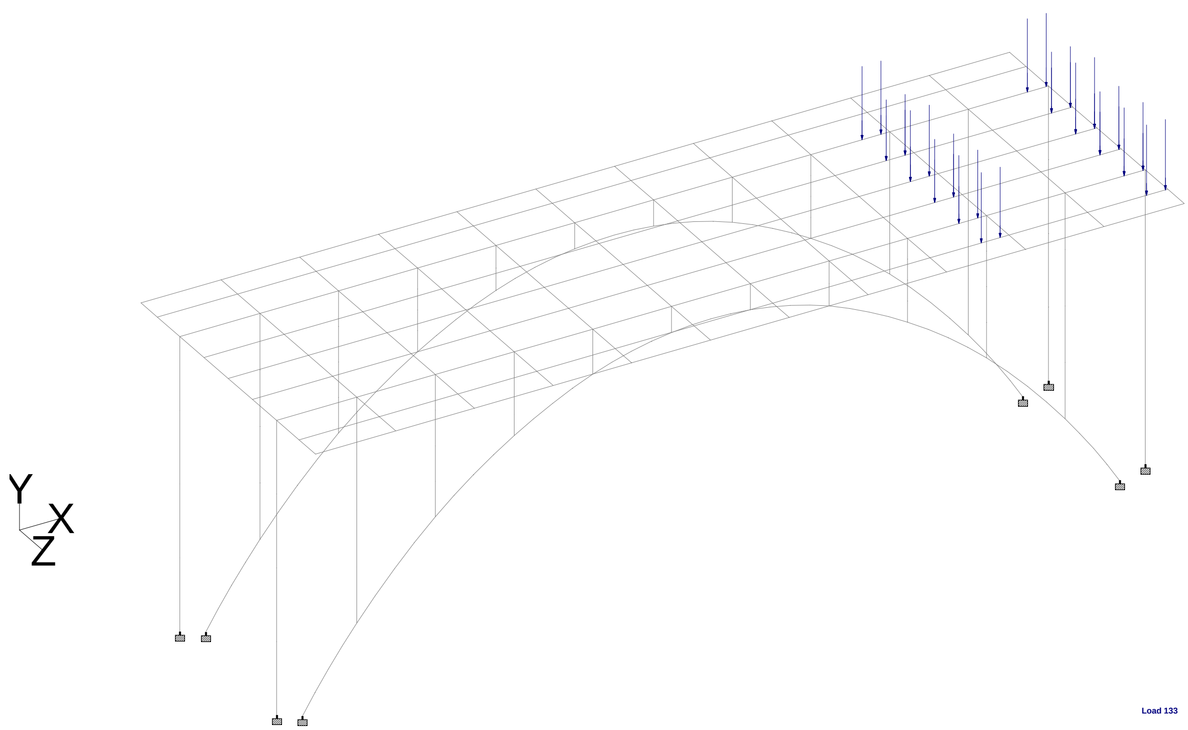
Software licensed to Hatch Mott MacDonald	Job No 287366	Sheet No 1	Rev
	Part		
Job Title 2012 Bridge Load Ratings	Ref CUY-17-0283		
	By MARussell	Date 12-Sep-12	Chd
Client Ohio DOT	File 1802046.std	Date/Time 20-Sep-2012 16:01	

Generated Moving Load:
5C1
Finish - MR



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Software licensed to Hatch Mott MacDonald	Job No 287366	Sheet No 1	Rev
	Part		
Job Title 2012 Bridge Load Ratings	Ref CUY-17-0283		
	By MARussell	Date 29-Oct-12	Chd
Client Ohio DOT	File 1802046.std	Date/Time 14-Feb-2013 16:08	

Job Information

	Engineer	Checked	Approved
Name:	MARussell		
Date:	29-Oct-12		

Comments

Load Rating model for:
CUY-17-0283
Brookpark Rd. over the Rocky River
SFN: 1802046
Main Arch Spans B - G

Structure Type	SPACE FRAME

Number of Nodes	254	Highest Node	254
Number of Elements	359	Highest Beam	359

Number of Basic Load Cases	13
Number of Combination Load Cases	182

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 LOADS
Primary	2	SIDEWALK LOADS
Primary	3	LANE LOADS
Primary	4	LANE LOADS
Primary	5	LANE LOADS
Primary	6	LANE LOADS
Primary	7	LANE LOADS
Primary	8	LANE LOADS
Primary	9	LANE LOADS
Primary	10	LANE LOADS
Primary	11	LANE LOADS
Primary	12	LANE LOADS
Primary	13	LANE LOADS
Generation	14	LOAD GENERATION, LOAD #14, (1 of 20)
Generation	15	LOAD GENERATION, LOAD #15, (2 of 20)
Generation	16	LOAD GENERATION, LOAD #16, (3 of 20)
Generation	17	LOAD GENERATION, LOAD #17, (4 of 20)
Generation	18	LOAD GENERATION, LOAD #18, (5 of 20)
Generation	19	LOAD GENERATION, LOAD #19, (6 of 20)
Generation	20	LOAD GENERATION, LOAD #20, (7 of 20)
Generation	21	LOAD GENERATION, LOAD #21, (8 of 20)
Generation	22	LOAD GENERATION, LOAD #22, (9 of 20)

Job Information Cont...

Type	L/C	Name
Generation	23	LOAD GENERATION, LOAD #23, (10 of 2(
Generation	24	LOAD GENERATION, LOAD #24, (11 of 2(
Generation	25	LOAD GENERATION, LOAD #25, (12 of 2(
Generation	26	LOAD GENERATION, LOAD #26, (13 of 2(
Generation	27	LOAD GENERATION, LOAD #27, (14 of 2(
Generation	28	LOAD GENERATION, LOAD #28, (15 of 2(
Generation	29	LOAD GENERATION, LOAD #29, (16 of 2(
Generation	30	LOAD GENERATION, LOAD #30, (17 of 2(
Generation	31	LOAD GENERATION, LOAD #31, (18 of 2(
Generation	32	LOAD GENERATION, LOAD #32, (19 of 2(
Generation	33	LOAD GENERATION, LOAD #33, (20 of 2(
Generation	34	LOAD GENERATION, LOAD #34, (1 of 20)
Generation	35	LOAD GENERATION, LOAD #35, (2 of 20)
Generation	36	LOAD GENERATION, LOAD #36, (3 of 20)
Generation	37	LOAD GENERATION, LOAD #37, (4 of 20)
Generation	38	LOAD GENERATION, LOAD #38, (5 of 20)
Generation	39	LOAD GENERATION, LOAD #39, (6 of 20)
Generation	40	LOAD GENERATION, LOAD #40, (7 of 20)
Generation	41	LOAD GENERATION, LOAD #41, (8 of 20)
Generation	42	LOAD GENERATION, LOAD #42, (9 of 20)
Generation	43	LOAD GENERATION, LOAD #43, (10 of 2(
Generation	44	LOAD GENERATION, LOAD #44, (11 of 2(
Generation	45	LOAD GENERATION, LOAD #45, (12 of 2(
Generation	46	LOAD GENERATION, LOAD #46, (13 of 2(
Generation	47	LOAD GENERATION, LOAD #47, (14 of 2(
Generation	48	LOAD GENERATION, LOAD #48, (15 of 2(
Generation	49	LOAD GENERATION, LOAD #49, (16 of 2(
Generation	50	LOAD GENERATION, LOAD #50, (17 of 2(
Generation	51	LOAD GENERATION, LOAD #51, (18 of 2(
Generation	52	LOAD GENERATION, LOAD #52, (19 of 2(
Generation	53	LOAD GENERATION, LOAD #53, (20 of 2(
Generation	54	LOAD GENERATION, LOAD #54, (1 of 20)
Generation	55	LOAD GENERATION, LOAD #55, (2 of 20)
Generation	56	LOAD GENERATION, LOAD #56, (3 of 20)
Generation	57	LOAD GENERATION, LOAD #57, (4 of 20)
Generation	58	LOAD GENERATION, LOAD #58, (5 of 20)
Generation	59	LOAD GENERATION, LOAD #59, (6 of 20)
Generation	60	LOAD GENERATION, LOAD #60, (7 of 20)
Generation	61	LOAD GENERATION, LOAD #61, (8 of 20)
Generation	62	LOAD GENERATION, LOAD #62, (9 of 20)
Generation	63	LOAD GENERATION, LOAD #63, (10 of 2(
Generation	64	LOAD GENERATION, LOAD #64, (11 of 2(
Generation	65	LOAD GENERATION, LOAD #65, (12 of 2(
Generation	66	LOAD GENERATION, LOAD #66, (13 of 2(
Generation	67	LOAD GENERATION, LOAD #67, (14 of 2(

Job Information Cont...

Type	L/C	Name
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Generation	69	LOAD GENERATION, LOAD #69, (16 of 2(
Generation	70	LOAD GENERATION, LOAD #70, (17 of 2(
Generation	71	LOAD GENERATION, LOAD #71, (18 of 2(
Generation	72	LOAD GENERATION, LOAD #72, (19 of 2(
Generation	73	LOAD GENERATION, LOAD #73, (20 of 2(
Generation	74	LOAD GENERATION, LOAD #74, (1 of 20)
Generation	75	LOAD GENERATION, LOAD #75, (2 of 20)
Generation	76	LOAD GENERATION, LOAD #76, (3 of 20)
Generation	77	LOAD GENERATION, LOAD #77, (4 of 20)
Generation	78	LOAD GENERATION, LOAD #78, (5 of 20)
Generation	79	LOAD GENERATION, LOAD #79, (6 of 20)
Generation	80	LOAD GENERATION, LOAD #80, (7 of 20)
Generation	81	LOAD GENERATION, LOAD #81, (8 of 20)
Generation	82	LOAD GENERATION, LOAD #82, (9 of 20)
Generation	83	LOAD GENERATION, LOAD #83, (10 of 2(
Generation	84	LOAD GENERATION, LOAD #84, (11 of 2(
Generation	85	LOAD GENERATION, LOAD #85, (12 of 2(
Generation	86	LOAD GENERATION, LOAD #86, (13 of 2(
Generation	87	LOAD GENERATION, LOAD #87, (14 of 2(
Generation	88	LOAD GENERATION, LOAD #88, (15 of 2(
Generation	89	LOAD GENERATION, LOAD #89, (16 of 2(
Generation	90	LOAD GENERATION, LOAD #90, (17 of 2(
Generation	91	LOAD GENERATION, LOAD #91, (18 of 2(
Generation	92	LOAD GENERATION, LOAD #92, (19 of 2(
Generation	93	LOAD GENERATION, LOAD #93, (20 of 2(
Generation	94	LOAD GENERATION, LOAD #94, (1 of 20)
Generation	95	LOAD GENERATION, LOAD #95, (2 of 20)
Generation	96	LOAD GENERATION, LOAD #96, (3 of 20)
Generation	97	LOAD GENERATION, LOAD #97, (4 of 20)
Generation	98	LOAD GENERATION, LOAD #98, (5 of 20)
Generation	99	LOAD GENERATION, LOAD #99, (6 of 20)
Generation	100	LOAD GENERATION, LOAD #100, (7 of 2(
Generation	101	LOAD GENERATION, LOAD #101, (8 of 2(
Generation	102	LOAD GENERATION, LOAD #102, (9 of 2(
Generation	103	LOAD GENERATION, LOAD #103, (10 of :
Generation	104	LOAD GENERATION, LOAD #104, (11 of :
Generation	105	LOAD GENERATION, LOAD #105, (12 of :
Generation	106	LOAD GENERATION, LOAD #106, (13 of :
Generation	107	LOAD GENERATION, LOAD #107, (14 of :
Generation	108	LOAD GENERATION, LOAD #108, (15 of :
Generation	109	LOAD GENERATION, LOAD #109, (16 of :
Generation	110	LOAD GENERATION, LOAD #110, (17 of :
Generation	111	LOAD GENERATION, LOAD #111, (18 of 2
Generation	112	LOAD GENERATION, LOAD #112, (19 of 2

Job Information Cont...

Type	L/C	Name
Generation	112	LOAD GENERATION, LOAD #112, (19 of 2
Generation	113	LOAD GENERATION, LOAD #113, (20 of 2
Generation	114	LOAD GENERATION, LOAD #114, (1 of 2(
Generation	115	LOAD GENERATION, LOAD #115, (2 of 2(
Generation	116	LOAD GENERATION, LOAD #116, (3 of 2(
Generation	117	LOAD GENERATION, LOAD #117, (4 of 2(
Generation	118	LOAD GENERATION, LOAD #118, (5 of 2(
Generation	119	LOAD GENERATION, LOAD #119, (6 of 2(
Generation	120	LOAD GENERATION, LOAD #120, (7 of 2(
Generation	121	LOAD GENERATION, LOAD #121, (8 of 2(
Generation	122	LOAD GENERATION, LOAD #122, (9 of 2(
Generation	123	LOAD GENERATION, LOAD #123, (10 of 2
Generation	124	LOAD GENERATION, LOAD #124, (11 of 2
Generation	125	LOAD GENERATION, LOAD #125, (12 of 2
Generation	126	LOAD GENERATION, LOAD #126, (13 of 2
Generation	127	LOAD GENERATION, LOAD #127, (14 of 2
Generation	128	LOAD GENERATION, LOAD #128, (15 of 2
Generation	129	LOAD GENERATION, LOAD #129, (16 of 2
Generation	130	LOAD GENERATION, LOAD #130, (17 of 2
Generation	131	LOAD GENERATION, LOAD #131, (18 of 2
Generation	132	LOAD GENERATION, LOAD #132, (19 of 2
Generation	133	LOAD GENERATION, LOAD #133, (20 of 2
Combination	201	COMBINATION LOAD CASE 201
Combination	202	COMBINATION LOAD CASE 202
Combination	203	COMBINATION LOAD CASE 203
Combination	204	COMBINATION LOAD CASE 204
Combination	205	COMBINATION LOAD CASE 205
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Combination	226	COMBINATION LOAD CASE 226
Combination	227	COMBINATION LOAD CASE 227
Combination	228	COMBINATION LOAD CASE 228
Combination	229	COMBINATION LOAD CASE 229
Combination	230	COMBINATION LOAD CASE 230
Combination	231	COMBINATION LOAD CASE 231
Combination	232	COMBINATION LOAD CASE 232

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Job Information Cont...

Type	L/C	Name
Combination	232	COMBINATION LOAD CASE 232
Combination	233	COMBINATION LOAD CASE 233
Combination	234	COMBINATION LOAD CASE 234
Combination	235	COMBINATION LOAD CASE 235
Combination	236	COMBINATION LOAD CASE 236
Combination	237	COMBINATION LOAD CASE 237
Combination	238	COMBINATION LOAD CASE 238
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Combination	267	COMBINATION LOAD CASE 267
Combination	268	COMBINATION LOAD CASE 268
Combination	269	COMBINATION LOAD CASE 269
Combination	270	COMBINATION LOAD CASE 270
Combination	271	COMBINATION LOAD CASE 271
Combination	281	COMBINATION LOAD CASE 281
Combination	282	COMBINATION LOAD CASE 282
Combination	283	COMBINATION LOAD CASE 283
Combination	284	COMBINATION LOAD CASE 284
Combination	285	COMBINATION LOAD CASE 285

Job Information Cont...

Type	L/C	Name
Combination	285	COMBINATION LOAD CASE 285
Combination	286	COMBINATION LOAD CASE 286
Combination	287	COMBINATION LOAD CASE 287
Combination	288	COMBINATION LOAD CASE 288
Combination	289	COMBINATION LOAD CASE 289
Combination	290	COMBINATION LOAD CASE 290
Combination	291	COMBINATION LOAD CASE 291
Combination	292	COMBINATION LOAD CASE 292
Combination	293	COMBINATION LOAD CASE 293
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Combination	324	COMBINATION LOAD CASE 324
Combination	325	COMBINATION LOAD CASE 325
Combination	326	COMBINATION LOAD CASE 326
Combination	327	COMBINATION LOAD CASE 327
Combination	328	COMBINATION LOAD CASE 328
Combination	329	COMBINATION LOAD CASE 329

Job Information Cont...

Type	L/C	Name
Combination	329	COMBINATION LOAD CASE 329
Combination	330	COMBINATION LOAD CASE 330
Combination	331	COMBINATION LOAD CASE 331
Combination	332	COMBINATION LOAD CASE 332
Combination	333	COMBINATION LOAD CASE 333
Combination	334	COMBINATION LOAD CASE 334
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Combination	354	COMBINATION LOAD CASE 354
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Combination	356	COMBINATION LOAD CASE 356
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Combination	367	COMBINATION LOAD CASE 367
Combination	368	COMBINATION LOAD CASE 368
Combination	369	COMBINATION LOAD CASE 369
Combination	370	COMBINATION LOAD CASE 370
Combination	371	COMBINATION LOAD CASE 371
Combination	372	COMBINATION LOAD CASE 372
Combination	373	COMBINATION LOAD CASE 373

Job Information Cont...

Type	L/C	Name
Combination	373	COMBINATION LOAD CASE 373
Combination	374	COMBINATION LOAD CASE 374
Combination	375	COMBINATION LOAD CASE 375
Combination	376	COMBINATION LOAD CASE 376
Combination	377	COMBINATION LOAD CASE 377
Combination	378	COMBINATION LOAD CASE 378
Combination	379	COMBINATION LOAD CASE 379
Combination	380	COMBINATION LOAD CASE 380
Combination	381	COMBINATION LOAD CASE 381
Combination	382	COMBINATION LOAD CASE 382
Combination	383	COMBINATION LOAD CASE 383
Combination	384	COMBINATION LOAD CASE 384
Combination	385	COMBINATION LOAD CASE 385
Combination	386	COMBINATION LOAD CASE 386
Combination	387	COMBINATION LOAD CASE 387
Combination	388	COMBINATION LOAD CASE 388
Combination	389	COMBINATION LOAD CASE 389
Combination	390	COMBINATION LOAD CASE 390
Combination	391	COMBINATION LOAD CASE 391
Combination	392	COMBINATION LOAD CASE 392
Combination	393	COMBINATION LOAD CASE 393
Combination	394	COMBINATION LOAD CASE 394
Combination	395	COMBINATION LOAD CASE 395
Combination	396	COMBINATION LOAD CASE 396
Combination	397	COMBINATION LOAD CASE 397
Combination	398	COMBINATION LOAD CASE 398
Combination	399	COMBINATION LOAD CASE 399
Combination	400	COMBINATION LOAD CASE 400

Nodes

Node	X (ft)	Y (ft)	Z (ft)
1	-86.532	0.000	17.750
2	-83.842	4.230	17.750
3	-81.020	8.375	17.750
4	-78.070	12.428	17.750
5	-74.997	16.384	17.750
6	-71.099	21.058	17.750
7	-67.027	25.579	17.750
8	-62.785	29.944	17.750
9	-58.353	34.123	17.750
10	-54.397	37.505	17.750
11	-50.285	40.700	17.750
12	-46.031	43.702	17.750
13	-41.645	46.503	17.750
14	-37.629	48.828	17.750
15	-33.521	50.985	17.750
16	-29.327	52.972	17.750
17	-25.026	54.726	17.750
18	-20.951	56.099	17.750
19	-16.800	57.228	17.750
20	-12.590	58.106	17.750
21	-8.338	58.731	17.750
22	-4.175	59.094	17.750
23	0.000	59.215	17.750
24	4.175	59.094	17.750
25	8.338	58.731	17.750
26	12.590	58.106	17.750
27	16.800	57.228	17.750
28	20.951	56.099	17.750
29	25.026	54.726	17.750
30	29.327	52.972	17.750
31	33.521	50.985	17.750
32	37.629	48.828	17.750
33	41.645	46.503	17.750
34	46.031	43.702	17.750
35	50.285	40.700	17.750
36	54.397	37.505	17.750
37	58.353	34.123	17.750
38	62.785	29.944	17.750
39	67.027	25.579	17.750
40	71.099	21.058	17.750
41	74.997	16.384	17.750
42	78.070	12.428	17.750
43	81.020	8.375	17.750
44	83.842	4.230	17.750
45	86.532	0.000	17.750

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Software licensed to Hatch Mott MacDonald	Job No 287366	Sheet No 10	Rev
	Part		
Job Title 2012 Bridge Load Ratings	Ref CUY-17-0283		
	By MARussell	Date 29-Oct-12	Chd
Client Ohio DOT	File 1802046.std	Date/Time 14-Feb-2013 16:08	

Nodes Cont...

Node	X (ft)	Y (ft)	Z (ft)
46	-91.979	1.758	17.750
47	-91.979	17.384	17.750
48	-91.979	33.011	17.750
49	-91.979	48.637	17.750
50	-91.979	64.260	17.750
51	-74.997	28.356	17.750
52	-74.997	40.325	17.750
53	-74.997	52.294	17.750
54	-74.997	64.260	17.750
55	-58.353	41.637	17.750
56	-58.353	49.179	17.750
57	-58.353	56.721	17.750
58	-58.353	64.260	17.750
59	-41.645	50.971	17.750
60	-41.645	55.402	17.750
61	-41.645	59.832	17.750
62	-41.645	64.260	17.750
63	-25.026	59.459	17.750
64	-25.026	64.260	17.750
65	-8.338	64.260	17.750
66	8.338	64.260	17.750
67	25.026	59.459	17.750
68	25.026	64.260	17.750
69	41.645	50.971	17.750
70	41.645	55.402	17.750
71	41.645	59.832	17.750
72	41.645	64.260	17.750
73	58.353	41.637	17.750
74	58.353	49.179	17.750
75	58.353	56.721	17.750
76	58.353	64.260	17.750
77	74.997	28.356	17.750
78	74.997	40.325	17.750
79	74.997	52.294	17.750
80	74.997	64.260	17.750
81	91.979	1.758	17.750
82	91.979	17.384	17.750
83	91.979	33.011	17.750
84	91.979	48.637	17.750
85	91.979	64.260	17.750
86	-86.532	0.000	-17.750
87	-83.842	4.230	-17.750
88	-81.020	8.375	-17.750
89	-78.070	12.428	-17.750
90	-74.997	16.384	-17.750

Nodes Cont...

Node	X (ft)	Y (ft)	Z (ft)
91	-71.099	21.058	-17.750
92	-67.027	25.579	-17.750
93	-62.785	29.944	-17.750
94	-58.353	34.123	-17.750
95	-54.397	37.505	-17.750
96	-50.285	40.700	-17.750
97	-46.031	43.702	-17.750
98	-41.645	46.503	-17.750
99	-37.629	48.828	-17.750
100	-33.521	50.985	-17.750
101	-29.327	52.972	-17.750
102	-25.026	54.726	-17.750
103	-20.951	56.099	-17.750
104	-16.800	57.228	-17.750
105	-12.590	58.106	-17.750
106	-8.338	58.731	-17.750
107	-4.175	59.094	-17.750
108	0.000	59.215	-17.750
109	4.175	59.094	-17.750
110	8.338	58.731	-17.750
111	12.590	58.106	-17.750
112	16.800	57.228	-17.750
113	20.951	56.099	-17.750
114	25.026	54.726	-17.750
115	29.327	52.972	-17.750
116	33.521	50.985	-17.750
117	37.629	48.828	-17.750
118	41.645	46.503	-17.750
119	46.031	43.702	-17.750
120	50.285	40.700	-17.750
121	54.397	37.505	-17.750
122	58.353	34.123	-17.750
123	62.785	29.944	-17.750
124	67.027	25.579	-17.750
125	71.099	21.058	-17.750
126	74.997	16.384	-17.750
127	78.070	12.428	-17.750
128	81.020	8.375	-17.750
129	83.842	4.230	-17.750
130	86.532	0.000	-17.750
131	-91.979	1.758	-17.750
132	-91.979	17.384	-17.750
133	-91.979	33.011	-17.750
134	-91.979	48.637	-17.750
135	-91.979	64.260	-17.750

Nodes Cont...

Node	X (ft)	Y (ft)	Z (ft)
136	-74.997	28.356	-17.750
137	-74.997	40.325	-17.750
138	-74.997	52.294	-17.750
139	-74.997	64.260	-17.750
140	-58.353	41.637	-17.750
141	-58.353	49.179	-17.750
142	-58.353	56.721	-17.750
143	-58.353	64.260	-17.750
144	-41.645	50.971	-17.750
145	-41.645	55.402	-17.750
146	-41.645	59.832	-17.750
147	-41.645	64.260	-17.750
148	-25.026	59.459	-17.750
149	-25.026	64.260	-17.750
150	-8.338	64.260	-17.750
151	8.338	64.260	-17.750
152	25.026	59.459	-17.750
153	25.026	64.260	-17.750
154	41.645	50.971	-17.750
155	41.645	55.402	-17.750
156	41.645	59.832	-17.750
157	41.645	64.260	-17.750
158	58.353	41.637	-17.750
159	58.353	49.179	-17.750
160	58.353	56.721	-17.750
161	58.353	64.260	-17.750
162	74.997	28.356	-17.750
163	74.997	40.325	-17.750
164	74.997	52.294	-17.750
165	74.997	64.260	-17.750
166	91.979	1.758	-17.750
167	91.979	17.384	-17.750
168	91.979	33.011	-17.750
169	91.979	48.637	-17.750
170	91.979	64.260	-17.750
171	-91.979	64.260	32.042
172	-91.979	64.260	26.000
173	-91.979	64.260	8.875
174	-91.979	64.260	0.000
175	-91.979	64.260	-8.875
176	-91.979	64.260	-26.000
177	-91.979	64.260	-32.042
178	-74.997	64.260	32.042
179	-74.997	64.260	26.000
180	-74.997	64.260	8.875

Nodes Cont...

Node	X (ft)	Y (ft)	Z (ft)
181	-74.997	64.260	0.000
182	-74.997	64.260	-8.875
183	-74.997	64.260	-26.000
184	-74.997	64.260	-32.042
185	-58.353	64.260	32.042
186	-58.353	64.260	26.000
187	-58.353	64.260	8.875
188	-58.353	64.260	0.000
189	-58.353	64.260	-8.875
190	-58.353	64.260	-26.000
191	-58.353	64.260	-32.042
192	-41.645	64.260	32.042
193	-41.645	64.260	26.000
194	-41.645	64.260	8.875
195	-41.645	64.260	0.000
196	-41.645	64.260	-8.875
197	-41.645	64.260	-26.000
198	-41.645	64.260	-32.042
199	-25.026	64.260	32.042
200	-25.026	64.260	26.000
201	-25.026	64.260	8.875
202	-25.026	64.260	0.000
203	-25.026	64.260	-8.875
204	-25.026	64.260	-26.000
205	-25.026	64.260	-32.042
206	-8.338	64.260	32.042
207	-8.338	64.260	26.000
208	-8.338	64.260	8.875
209	-8.338	64.260	0.000
210	-8.338	64.260	-8.875
211	-8.338	64.260	-26.000
212	-8.338	64.260	-32.042
213	8.338	64.260	32.042
214	8.338	64.260	26.000
215	8.338	64.260	8.875
216	8.338	64.260	0.000
217	8.338	64.260	-8.875
218	8.338	64.260	-26.000
219	8.338	64.260	-32.042
220	25.026	64.260	32.042
221	25.026	64.260	26.000
222	25.026	64.260	8.875
223	25.026	64.260	0.000
224	25.026	64.260	-8.875
225	25.026	64.260	-26.000

Nodes Cont...

Node	X (ft)	Y (ft)	Z (ft)
226	25.026	64.260	-32.042
227	41.645	64.260	32.042
228	41.645	64.260	26.000
229	41.645	64.260	8.875
230	41.645	64.260	0.000
231	41.645	64.260	-8.875
232	41.645	64.260	-26.000
233	41.645	64.260	-32.042
234	58.353	64.260	32.042
235	58.353	64.260	26.000
236	58.353	64.260	8.875
237	58.353	64.260	0.000
238	58.353	64.260	-8.875
239	58.353	64.260	-26.000
240	58.353	64.260	-32.042
241	74.997	64.260	32.042
242	74.997	64.260	26.000
243	74.997	64.260	8.875
244	74.997	64.260	0.000
245	74.997	64.260	-8.875
246	74.997	64.260	-26.000
247	74.997	64.260	-32.042
248	91.979	64.260	32.042
249	91.979	64.260	26.000
250	91.979	64.260	8.875
251	91.979	64.260	0.000
252	91.979	64.260	-8.875
253	91.979	64.260	-26.000
254	91.979	64.260	-32.042

Beams

Beam	Node A	Node B	Length (ft)	Property	β (degrees)
1	1	2	5.013	1	0
2	2	3	5.014	2	0
3	3	4	5.013	3	0
4	4	5	5.009	4	0
5	5	6	6.086	5	0
6	6	7	6.084	6	0
7	7	8	6.087	7	0
8	8	9	6.092	8	0
9	9	10	5.205	9	0
10	10	11	5.207	10	0
11	11	12	5.207	11	0
12	12	13	5.204	12	0
13	13	14	4.640	13	0
14	14	15	4.640	14	0
15	15	16	4.641	15	0
16	16	17	4.645	16	0
17	17	18	4.300	17	0
18	18	19	4.302	18	0
19	19	20	4.301	19	0
20	20	21	4.298	20	0
21	21	22	4.179	21	0
22	22	23	4.177	22	0
23	23	24	4.177	23	0
24	24	25	4.179	24	0
25	25	26	4.298	25	0
26	26	27	4.301	26	0
27	27	28	4.302	27	0
28	28	29	4.300	28	0
29	29	30	4.645	29	0
30	30	31	4.641	30	0
31	31	32	4.640	31	0
32	32	33	4.640	32	0
33	33	34	5.204	33	0
34	34	35	5.207	34	0
35	35	36	5.207	35	0
36	36	37	5.205	36	0
37	37	38	6.092	37	0
38	38	39	6.087	38	0
39	39	40	6.084	39	0
40	40	41	6.086	40	0
41	41	42	5.009	41	0
42	42	43	5.013	42	0
43	43	44	5.014	43	0
44	44	45	5.013	44	0
45	46	47	15.626	45	0

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Beams Cont...

Beam	Node A	Node B	Length (ft)	Property	β (degrees)
46	47	48	15.627	46	0
47	48	49	15.626	47	0
48	49	50	15.623	48	0
49	5	51	11.972	49	0
50	51	52	11.969	50	0
51	52	53	11.969	51	0
52	53	54	11.966	52	0
53	9	55	7.514	53	0
54	55	56	7.542	54	0
55	56	57	7.542	55	0
56	57	58	7.539	56	0
57	13	59	4.468	57	0
58	59	60	4.431	58	0
59	60	61	4.430	59	0
60	61	62	4.428	60	0
61	17	63	4.733	61	0
62	63	64	4.801	62	0
63	21	65	5.529	63	0
64	25	66	5.529	64	0
65	29	67	4.733	65	0
66	67	68	4.801	66	0
67	33	69	4.468	67	0
68	69	70	4.431	68	0
69	70	71	4.430	69	0
70	71	72	4.428	70	0
71	37	73	7.514	71	0
72	73	74	7.542	72	0
73	74	75	7.542	73	0
74	75	76	7.539	74	0
75	41	77	11.972	75	0
76	77	78	11.969	76	0
77	78	79	11.969	77	0
78	79	80	11.966	78	0
79	81	82	15.626	79	0
80	82	83	15.627	80	0
81	83	84	15.626	81	0
82	84	85	15.623	82	0
83	86	87	5.013	83	0
84	87	88	5.014	84	0
85	88	89	5.013	85	0
86	89	90	5.009	86	0
87	90	91	6.086	87	0
88	91	92	6.084	88	0
89	92	93	6.087	89	0
90	93	94	6.092	90	0

Beams Cont...

Beam	Node A	Node B	Length (ft)	Property	β (degrees)
91	94	95	5.205	91	0
92	95	96	5.207	92	0
93	96	97	5.207	93	0
94	97	98	5.204	94	0
95	98	99	4.640	95	0
96	99	100	4.640	96	0
97	100	101	4.641	97	0
98	101	102	4.645	98	0
99	102	103	4.300	99	0
100	103	104	4.302	100	0
101	104	105	4.301	101	0
102	105	106	4.298	102	0
103	106	107	4.179	103	0
104	107	108	4.177	104	0
105	108	109	4.177	105	0
106	109	110	4.179	106	0
107	110	111	4.298	107	0
108	111	112	4.301	108	0
109	112	113	4.302	109	0
110	113	114	4.300	110	0
111	114	115	4.645	111	0
112	115	116	4.641	112	0
113	116	117	4.640	113	0
114	117	118	4.640	114	0
115	118	119	5.204	115	0
116	119	120	5.207	116	0
117	120	121	5.207	117	0
118	121	122	5.205	118	0
119	122	123	6.092	119	0
120	123	124	6.087	120	0
121	124	125	6.084	121	0
122	125	126	6.086	122	0
123	126	127	5.009	123	0
124	127	128	5.013	124	0
125	128	129	5.014	125	0
126	129	130	5.013	126	0
127	131	132	15.626	127	0
128	132	133	15.627	128	0
129	133	134	15.626	129	0
130	134	135	15.623	130	0
131	90	136	11.972	131	0
132	136	137	11.969	132	0
133	137	138	11.969	133	0
134	138	139	11.966	134	0
135	94	140	7.514	135	0

Beams Cont...

Beam	Node A	Node B	Length (ft)	Property	β (degrees)
136	140	141	7.542	136	0
137	141	142	7.542	137	0
138	142	143	7.539	138	0
139	98	144	4.468	139	0
140	144	145	4.431	140	0
141	145	146	4.430	141	0
142	146	147	4.428	142	0
143	102	148	4.733	143	0
144	148	149	4.801	144	0
145	106	150	5.529	145	0
146	110	151	5.529	146	0
147	114	152	4.733	147	0
148	152	153	4.801	148	0
149	118	154	4.468	149	0
150	154	155	4.431	150	0
151	155	156	4.430	151	0
152	156	157	4.428	152	0
153	122	158	7.514	153	0
154	158	159	7.542	154	0
155	159	160	7.542	155	0
156	160	161	7.539	156	0
157	126	162	11.972	157	0
158	162	163	11.969	158	0
159	163	164	11.969	159	0
160	164	165	11.966	160	0
161	166	167	15.626	161	0
162	167	168	15.627	162	0
163	168	169	15.626	163	0
164	169	170	15.623	164	0
165	171	172	6.042	165	0
166	172	50	8.250	166	0
167	50	173	8.875	167	0
168	173	174	8.875	168	0
169	174	175	8.875	169	0
170	175	135	8.875	170	0
171	135	176	8.250	171	0
172	176	177	6.042	172	0
173	178	179	6.042	173	0
174	179	54	8.250	174	0
175	54	180	8.875	175	0
176	180	181	8.875	176	0
177	181	182	8.875	177	0
178	182	139	8.875	178	0
179	139	183	8.250	179	0
180	183	184	6.042	180	0

MRussell

Beams Cont...

Beam	Node A	Node B	Length (ft)	Property	β (degrees)
181	185	186	6.042	181	0
182	186	58	8.250	182	0
183	58	187	8.875	183	0
184	187	188	8.875	184	0
185	188	189	8.875	185	0
186	189	143	8.875	186	0
187	143	190	8.250	187	0
188	190	191	6.042	188	0
189	192	193	6.042	189	0
190	193	62	8.250	190	0
191	62	194	8.875	191	0
192	194	195	8.875	192	0
193	195	196	8.875	193	0
194	196	147	8.875	194	0
195	147	197	8.250	195	0
196	197	198	6.042	196	0
197	199	200	6.042	197	0
198	200	64	8.250	198	0
199	64	201	8.875	199	0
200	201	202	8.875	200	0
201	202	203	8.875	201	0
202	203	149	8.875	202	0
203	149	204	8.250	203	0
204	204	205	6.042	204	0
205	206	207	6.042	205	0
206	207	65	8.250	206	0
207	65	208	8.875	207	0
208	208	209	8.875	208	0
209	209	210	8.875	209	0
210	210	150	8.875	210	0
211	150	211	8.250	211	0
212	211	212	6.042	212	0
213	213	214	6.042	213	0
214	214	66	8.250	214	0
215	66	215	8.875	215	0
216	215	216	8.875	216	0
217	216	217	8.875	217	0
218	217	151	8.875	218	0
219	151	218	8.250	219	0
220	218	219	6.042	220	0
221	220	221	6.042	221	0
222	221	68	8.250	222	0
223	68	222	8.875	223	0
224	222	223	8.875	224	0
225	223	224	8.875	225	0

Beams Cont...

Beam	Node A	Node B	Length (ft)	Property	β (degrees)
226	224	153	8.875	226	0
227	153	225	8.250	227	0
228	225	226	6.042	228	0
229	227	228	6.042	229	0
230	228	72	8.250	230	0
231	72	229	8.875	231	0
232	229	230	8.875	232	0
233	230	231	8.875	233	0
234	231	157	8.875	234	0
235	157	232	8.250	235	0
236	232	233	6.042	236	0
237	234	235	6.042	237	0
238	235	76	8.250	238	0
239	76	236	8.875	239	0
240	236	237	8.875	240	0
241	237	238	8.875	241	0
242	238	161	8.875	242	0
243	161	239	8.250	243	0
244	239	240	6.042	244	0
245	241	242	6.042	245	0
246	242	80	8.250	246	0
247	80	243	8.875	247	0
248	243	244	8.875	248	0
249	244	245	8.875	249	0
250	245	165	8.875	250	0
251	165	246	8.250	251	0
252	246	247	6.042	252	0
253	248	249	6.042	253	0
254	249	85	8.250	254	0
255	85	250	8.875	255	0
256	250	251	8.875	256	0
257	251	252	8.875	257	0
258	252	170	8.875	258	0
259	170	253	8.250	259	0
260	253	254	6.042	260	0
261	171	178	16.982	261	0
262	178	185	16.644	262	0
263	185	192	16.708	263	0
264	192	199	16.619	264	0
265	199	206	16.688	265	0
266	206	213	16.676	266	0
267	213	220	16.688	267	0
268	220	227	16.619	268	0
269	227	234	16.708	269	0
270	234	241	16.644	270	0

Beams Cont...

Beam	Node A	Node B	Length (ft)	Property	β (degrees)
271	241	248	16.982	271	0
272	172	179	16.982	272	0
273	179	186	16.644	273	0
274	186	193	16.708	274	0
275	193	200	16.619	275	0
276	200	207	16.688	276	0
277	207	214	16.676	277	0
278	214	221	16.688	278	0
279	221	228	16.619	279	0
280	228	235	16.708	280	0
281	235	242	16.644	281	0
282	242	249	16.982	282	0
283	50	54	16.982	283	0
284	54	58	16.644	284	0
285	58	62	16.708	285	0
286	62	64	16.619	286	0
287	64	65	16.688	287	0
288	65	66	16.676	288	0
289	66	68	16.688	289	0
290	68	72	16.619	290	0
291	72	76	16.708	291	0
292	76	80	16.644	292	0
293	80	85	16.982	293	0
294	173	180	16.982	294	0
295	180	187	16.644	295	0
296	187	194	16.708	296	0
297	194	201	16.619	297	0
298	201	208	16.688	298	0
299	208	215	16.676	299	0
300	215	222	16.688	300	0
301	222	229	16.619	301	0
302	229	236	16.708	302	0
303	236	243	16.644	303	0
304	243	250	16.982	304	0
305	174	181	16.982	305	0
306	181	188	16.644	306	0
307	188	195	16.708	307	0
308	195	202	16.619	308	0
309	202	209	16.688	309	0
310	209	216	16.676	310	0
311	216	223	16.688	311	0
312	223	230	16.619	312	0
313	230	237	16.708	313	0
314	237	244	16.644	314	0
315	244	251	16.982	315	0

Beams Cont...

Beam	Node A	Node B	Length (ft)	Property	β (degrees)
316	175	182	16.982	316	0
317	182	189	16.644	317	0
318	189	196	16.708	318	0
319	196	203	16.619	319	0
320	203	210	16.688	320	0
321	210	217	16.676	321	0
322	217	224	16.688	322	0
323	224	231	16.619	323	0
324	231	238	16.708	324	0
325	238	245	16.644	325	0
326	245	252	16.982	326	0
327	135	139	16.982	327	0
328	139	143	16.644	328	0
329	143	147	16.708	329	0
330	147	149	16.619	330	0
331	149	150	16.688	331	0
332	150	151	16.676	332	0
333	151	153	16.688	333	0
334	153	157	16.619	334	0
335	157	161	16.708	335	0
336	161	165	16.644	336	0
337	165	170	16.982	337	0
338	176	183	16.982	338	0
339	183	190	16.644	339	0
340	190	197	16.708	340	0
341	197	204	16.619	341	0
342	204	211	16.688	342	0
343	211	218	16.676	343	0
344	218	225	16.688	344	0
345	225	232	16.619	345	0
346	232	239	16.708	346	0
347	239	246	16.644	347	0
348	246	253	16.982	348	0
349	177	184	16.982	349	0
350	184	191	16.644	350	0
351	191	198	16.708	351	0
352	198	205	16.619	352	0
353	205	212	16.688	353	0
354	212	219	16.676	354	0
355	219	226	16.688	355	0
356	226	233	16.619	356	0
357	233	240	16.708	357	0
358	240	247	16.644	358	0
359	247	254	16.982	359	0

Section Properties

Prop	Section	Area (in²)	I_{yy} (in⁴)	I_{zz} (in⁴)	J (in⁴)	Material
1	Rect 58.54x84.00	4.92E+3	2.89E+6	1.4E+6	3.2E+6	CONCRETE
2	Rect 56.34x84.00	4.73E+3	2.78E+6	1.25E+6	2.93E+6	CONCRETE
3	Rect 54.25x84.00	4.56E+3	2.68E+6	1.12E+6	2.68E+6	CONCRETE
4	Rect 52.28x84.00	4.39E+3	2.58E+6	1E+6	2.45E+6	CONCRETE
5	Rect 50.24x84.00	4.22E+3	2.48E+6	888E+3	2.23E+6	CONCRETE
6	Rect 48.17x84.00	4.05E+3	2.38E+6	782E+3	2.01E+6	CONCRETE
7	Rect 46.27x84.00	3.89E+3	2.29E+6	694E+3	1.82E+6	CONCRETE
8	Rect 44.54x84.00	3.74E+3	2.2E+6	619E+3	1.65E+6	CONCRETE
9	Rect 43.04x84.00	3.62E+3	2.13E+6	558E+3	1.52E+6	CONCRETE
10	Rect 41.78x84.00	3.51E+3	2.06E+6	511E+3	1.41E+6	CONCRETE
11	Rect 40.62x84.00	3.41E+3	2.01E+6	469E+3	1.31E+6	CONCRETE
12	Rect 39.58x84.00	3.32E+3	1.95E+6	434E+3	1.22E+6	CONCRETE
13	Rect 38.70x84.00	3.25E+3	1.91E+6	406E+3	1.15E+6	CONCRETE
14	Rect 37.96x84.00	3.19E+3	1.87E+6	383E+3	1.1E+6	CONCRETE
15	Rect 37.33x84.00	3.14E+3	1.84E+6	364E+3	1.05E+6	CONCRETE
16	Rect 36.90x84.00	3.1E+3	1.82E+6	352E+3	1.02E+6	CONCRETE
17	Rect 36.64x84.00	3.08E+3	1.81E+6	344E+3	e+003E+3	CONCRETE
18	Rect 36.43x84.00	3.06E+3	1.8E+6	338E+3	985E+3	CONCRETE
19	Rect 36.26x84.00	3.05E+3	1.79E+6	334E+3	973E+3	CONCRETE
20	Rect 36.13x84.00	3.04E+3	1.78E+6	330E+3	964E+3	CONCRETE
21	Rect 36.06x84.00	3.03E+3	1.78E+6	328E+3	959E+3	CONCRETE
22	Rect 36.01x84.00	3.03E+3	1.78E+6	327E+3	955E+3	CONCRETE
23	Rect 36.01x84.00	3.03E+3	1.78E+6	327E+3	955E+3	CONCRETE
24	Rect 36.06x84.00	3.03E+3	1.78E+6	328E+3	959E+3	CONCRETE
25	Rect 36.13x84.00	3.04E+3	1.78E+6	330E+3	964E+3	CONCRETE
26	Rect 36.26x84.00	3.05E+3	1.79E+6	334E+3	973E+3	CONCRETE
27	Rect 36.43x84.00	3.06E+3	1.8E+6	338E+3	985E+3	CONCRETE
28	Rect 36.64x84.00	3.08E+3	1.81E+6	344E+3	e+003E+3	CONCRETE
29	Rect 36.90x84.00	3.1E+3	1.82E+6	352E+3	1.02E+6	CONCRETE
30	Rect 37.33x84.00	3.14E+3	1.84E+6	364E+3	1.05E+6	CONCRETE
31	Rect 37.96x84.00	3.19E+3	1.87E+6	383E+3	1.1E+6	CONCRETE
32	Rect 38.70x84.00	3.25E+3	1.91E+6	406E+3	1.15E+6	CONCRETE
33	Rect 39.58x84.00	3.32E+3	1.95E+6	434E+3	1.22E+6	CONCRETE
34	Rect 40.62x84.00	3.41E+3	2.01E+6	469E+3	1.31E+6	CONCRETE
35	Rect 41.78x84.00	3.51E+3	2.06E+6	511E+3	1.41E+6	CONCRETE
36	Rect 43.04x84.00	3.62E+3	2.13E+6	558E+3	1.52E+6	CONCRETE
37	Rect 44.54x84.00	3.74E+3	2.2E+6	619E+3	1.65E+6	CONCRETE
38	Rect 46.27x84.00	3.89E+3	2.29E+6	694E+3	1.82E+6	CONCRETE
39	Rect 48.17x84.00	4.05E+3	2.38E+6	782E+3	2.01E+6	CONCRETE
40	Rect 50.24x84.00	4.22E+3	2.48E+6	888E+3	2.23E+6	CONCRETE
41	Rect 52.28x84.00	4.39E+3	2.58E+6	1E+6	2.45E+6	CONCRETE
42	Rect 54.25x84.00	4.56E+3	2.68E+6	1.12E+6	2.68E+6	CONCRETE
43	Rect 56.34x84.00	4.73E+3	2.78E+6	1.25E+6	2.93E+6	CONCRETE
44	Rect 58.54x84.00	4.92E+3	2.89E+6	1.4E+6	3.2E+6	CONCRETE
45	Rect 33.07x60.00	1.98E+3	595E+3	181E+3	474E+3	CONCRETE

Section Properties Cont...

Prop	Section	Area (in^2)	I_{yy} (in^4)	I_{zz} (in^4)	J (in^4)	Material
46	Rect 31.20x60.00	1.87E+3	562E+3	152E+3	410E+3	CONCRETE
47	Rect 29.33x60.00	1.76E+3	528E+3	126E+3	350E+3	CONCRETE
48	Rect 27.47x60.00	1.65E+3	494E+3	104E+3	295E+3	CONCRETE
49	Rect 18.29x60.00	1.1E+3	329E+3	30.6E+3	98.9E+3	CONCRETE
50	Rect 22.57x60.00	1.35E+3	406E+3	57.5E+3	176E+3	CONCRETE
51	Rect 19.72x60.00	1.18E+3	355E+3	38.3E+3	122E+3	CONCRETE
52	Rect 16.85x60.00	1.01E+3	303E+3	23.9E+3	78.7E+3	CONCRETE
53	Rect 17.11x60.00	1.03E+3	308E+3	25.1E+3	82.2E+3	CONCRETE
54	Rect 20.78x60.00	1.25E+3	374E+3	44.9E+3	140E+3	CONCRETE
55	Rect 18.34x60.00	1.1E+3	330E+3	30.8E+3	99.6E+3	CONCRETE
56	Rect 15.89x60.00	953.280	286E+3	20.1E+3	66.8E+3	CONCRETE
57	Rect 15.83x60.00	949.680	285E+3	19.8E+3	66.1E+3	CONCRETE
58	Rect 18.96x60.00	1.14E+3	341E+3	34.1E+3	109E+3	CONCRETE
59	Rect 16.87x60.00	1.01E+3	304E+3	24E+3	79E+3	CONCRETE
60	Rect 14.77x60.00	886.320	266E+3	16.1E+3	54.5E+3	CONCRETE
61	Rect 13.50x60.00	810.000	243E+3	12.3E+3	42.2E+3	CONCRETE
62	Rect 13.50x60.00	810.000	243E+3	12.3E+3	42.2E+3	CONCRETE
63	Rect 13.50x60.00	810.000	243E+3	12.3E+3	42.2E+3	CONCRETE
64	Rect 13.50x60.00	810.000	243E+3	12.3E+3	42.2E+3	CONCRETE
65	Rect 13.50x60.00	810.000	243E+3	12.3E+3	42.2E+3	CONCRETE
66	Rect 13.50x60.00	810.000	243E+3	12.3E+3	42.2E+3	CONCRETE
67	Rect 15.83x60.00	949.680	285E+3	19.8E+3	66.1E+3	CONCRETE
68	Rect 18.96x60.00	1.14E+3	341E+3	34.1E+3	109E+3	CONCRETE
69	Rect 16.87x60.00	1.01E+3	304E+3	24E+3	79E+3	CONCRETE
70	Rect 14.77x60.00	886.320	266E+3	16.1E+3	54.5E+3	CONCRETE
71	Rect 17.11x60.00	1.03E+3	308E+3	25.1E+3	82.2E+3	CONCRETE
72	Rect 20.78x60.00	1.25E+3	374E+3	44.9E+3	140E+3	CONCRETE
73	Rect 18.34x60.00	1.1E+3	330E+3	30.8E+3	99.6E+3	CONCRETE
74	Rect 15.89x60.00	953.280	286E+3	20.1E+3	66.8E+3	CONCRETE
75	Rect 18.29x60.00	1.1E+3	329E+3	30.6E+3	98.9E+3	CONCRETE
76	Rect 22.57x60.00	1.35E+3	406E+3	57.5E+3	176E+3	CONCRETE
77	Rect 19.72x60.00	1.18E+3	355E+3	38.3E+3	122E+3	CONCRETE
78	Rect 16.85x60.00	1.01E+3	303E+3	23.9E+3	78.7E+3	CONCRETE
79	Rect 33.07x60.00	1.98E+3	595E+3	181E+3	474E+3	CONCRETE
80	Rect 31.20x60.00	1.87E+3	562E+3	152E+3	410E+3	CONCRETE
81	Rect 29.33x60.00	1.76E+3	528E+3	126E+3	350E+3	CONCRETE
82	Rect 27.47x60.00	1.65E+3	494E+3	104E+3	295E+3	CONCRETE
83	Rect 58.54x84.00	4.92E+3	2.89E+6	1.4E+6	3.2E+6	CONCRETE
84	Rect 56.34x84.00	4.73E+3	2.78E+6	1.25E+6	2.93E+6	CONCRETE
85	Rect 54.25x84.00	4.56E+3	2.68E+6	1.12E+6	2.68E+6	CONCRETE
86	Rect 52.28x84.00	4.39E+3	2.58E+6	1E+6	2.45E+6	CONCRETE
87	Rect 50.24x84.00	4.22E+3	2.48E+6	888E+3	2.23E+6	CONCRETE
88	Rect 48.17x84.00	4.05E+3	2.38E+6	782E+3	2.01E+6	CONCRETE
89	Rect 46.27x84.00	3.89E+3	2.29E+6	694E+3	1.82E+6	CONCRETE
90	Rect 44.54x84.00	3.74E+3	2.2E+6	619E+3	1.65E+6	CONCRETE

Section Properties Cont...

Prop	Section	Area (in^2)	I_{yy} (in^4)	I_{zz} (in^4)	J (in^4)	Material
91	Rect 43.04x84.00	3.62E+3	2.13E+6	558E+3	1.52E+6	CONCRETE
92	Rect 41.78x84.00	3.51E+3	2.06E+6	511E+3	1.41E+6	CONCRETE
93	Rect 40.62x84.00	3.41E+3	2.01E+6	469E+3	1.31E+6	CONCRETE
94	Rect 39.58x84.00	3.32E+3	1.95E+6	434E+3	1.22E+6	CONCRETE
95	Rect 38.70x84.00	3.25E+3	1.91E+6	406E+3	1.15E+6	CONCRETE
96	Rect 37.96x84.00	3.19E+3	1.87E+6	383E+3	1.1E+6	CONCRETE
97	Rect 37.33x84.00	3.14E+3	1.84E+6	364E+3	1.05E+6	CONCRETE
98	Rect 36.90x84.00	3.1E+3	1.82E+6	352E+3	1.02E+6	CONCRETE
99	Rect 36.64x84.00	3.08E+3	1.81E+6	344E+3	e+003E+3	CONCRETE
100	Rect 36.43x84.00	3.06E+3	1.8E+6	338E+3	985E+3	CONCRETE
101	Rect 36.26x84.00	3.05E+3	1.79E+6	334E+3	973E+3	CONCRETE
102	Rect 36.13x84.00	3.04E+3	1.78E+6	330E+3	964E+3	CONCRETE
103	Rect 36.06x84.00	3.03E+3	1.78E+6	328E+3	959E+3	CONCRETE
104	Rect 36.01x84.00	3.03E+3	1.78E+6	327E+3	955E+3	CONCRETE
105	Rect 36.01x84.00	3.03E+3	1.78E+6	327E+3	955E+3	CONCRETE
106	Rect 36.06x84.00	3.03E+3	1.78E+6	328E+3	959E+3	CONCRETE
107	Rect 36.13x84.00	3.04E+3	1.78E+6	330E+3	964E+3	CONCRETE
108	Rect 36.26x84.00	3.05E+3	1.79E+6	334E+3	973E+3	CONCRETE
109	Rect 36.43x84.00	3.06E+3	1.8E+6	338E+3	985E+3	CONCRETE
110	Rect 36.64x84.00	3.08E+3	1.81E+6	344E+3	e+003E+3	CONCRETE
111	Rect 36.90x84.00	3.1E+3	1.82E+6	352E+3	1.02E+6	CONCRETE
112	Rect 37.33x84.00	3.14E+3	1.84E+6	364E+3	1.05E+6	CONCRETE
113	Rect 37.96x84.00	3.19E+3	1.87E+6	383E+3	1.1E+6	CONCRETE
114	Rect 38.70x84.00	3.25E+3	1.91E+6	406E+3	1.15E+6	CONCRETE
115	Rect 39.58x84.00	3.32E+3	1.95E+6	434E+3	1.22E+6	CONCRETE
116	Rect 40.62x84.00	3.41E+3	2.01E+6	469E+3	1.31E+6	CONCRETE
117	Rect 41.78x84.00	3.51E+3	2.06E+6	511E+3	1.41E+6	CONCRETE
118	Rect 43.04x84.00	3.62E+3	2.13E+6	558E+3	1.52E+6	CONCRETE
119	Rect 44.54x84.00	3.74E+3	2.2E+6	619E+3	1.65E+6	CONCRETE
120	Rect 46.27x84.00	3.89E+3	2.29E+6	694E+3	1.82E+6	CONCRETE
121	Rect 48.17x84.00	4.05E+3	2.38E+6	782E+3	2.01E+6	CONCRETE
122	Rect 50.24x84.00	4.22E+3	2.48E+6	888E+3	2.23E+6	CONCRETE
123	Rect 52.28x84.00	4.39E+3	2.58E+6	1E+6	2.45E+6	CONCRETE
124	Rect 54.25x84.00	4.56E+3	2.68E+6	1.12E+6	2.68E+6	CONCRETE
125	Rect 56.34x84.00	4.73E+3	2.78E+6	1.25E+6	2.93E+6	CONCRETE
126	Rect 58.54x84.00	4.92E+3	2.89E+6	1.4E+6	3.2E+6	CONCRETE
127	Rect 33.07x60.00	1.98E+3	595E+3	181E+3	474E+3	CONCRETE
128	Rect 31.20x60.00	1.87E+3	562E+3	152E+3	410E+3	CONCRETE
129	Rect 29.33x60.00	1.76E+3	528E+3	126E+3	350E+3	CONCRETE
130	Rect 27.47x60.00	1.65E+3	494E+3	104E+3	295E+3	CONCRETE
131	Rect 18.29x60.00	1.1E+3	329E+3	30.6E+3	98.9E+3	CONCRETE
132	Rect 22.57x60.00	1.35E+3	406E+3	57.5E+3	176E+3	CONCRETE
133	Rect 19.72x60.00	1.18E+3	355E+3	38.3E+3	122E+3	CONCRETE
134	Rect 16.85x60.00	1.01E+3	303E+3	23.9E+3	78.7E+3	CONCRETE
135	Rect 17.11x60.00	1.03E+3	308E+3	25.1E+3	82.2E+3	CONCRETE

Section Properties Cont...

Prop	Section	Area (in^2)	I_{yy} (in^4)	I_{zz} (in^4)	J (in^4)	Material
136	Rect 20.78x60.00	1.25E+3	374E+3	44.9E+3	140E+3	CONCRETE
137	Rect 18.34x60.00	1.1E+3	330E+3	30.8E+3	99.6E+3	CONCRETE
138	Rect 15.89x60.00	953.280	286E+3	20.1E+3	66.8E+3	CONCRETE
139	Rect 15.83x60.00	949.680	285E+3	19.8E+3	66.1E+3	CONCRETE
140	Rect 18.96x60.00	1.14E+3	341E+3	34.1E+3	109E+3	CONCRETE
141	Rect 16.87x60.00	1.01E+3	304E+3	24E+3	79E+3	CONCRETE
142	Rect 14.77x60.00	886.320	266E+3	16.1E+3	54.5E+3	CONCRETE
143	Rect 13.50x60.00	810.000	243E+3	12.3E+3	42.2E+3	CONCRETE
144	Rect 13.50x60.00	810.000	243E+3	12.3E+3	42.2E+3	CONCRETE
145	Rect 13.50x60.00	810.000	243E+3	12.3E+3	42.2E+3	CONCRETE
146	Rect 13.50x60.00	810.000	243E+3	12.3E+3	42.2E+3	CONCRETE
147	Rect 13.50x60.00	810.000	243E+3	12.3E+3	42.2E+3	CONCRETE
148	Rect 13.50x60.00	810.000	243E+3	12.3E+3	42.2E+3	CONCRETE
149	Rect 15.83x60.00	949.680	285E+3	19.8E+3	66.1E+3	CONCRETE
150	Rect 18.96x60.00	1.14E+3	341E+3	34.1E+3	109E+3	CONCRETE
151	Rect 16.87x60.00	1.01E+3	304E+3	24E+3	79E+3	CONCRETE
152	Rect 14.77x60.00	886.320	266E+3	16.1E+3	54.5E+3	CONCRETE
153	Rect 17.11x60.00	1.03E+3	308E+3	25.1E+3	82.2E+3	CONCRETE
154	Rect 20.78x60.00	1.25E+3	374E+3	44.9E+3	140E+3	CONCRETE
155	Rect 18.34x60.00	1.1E+3	330E+3	30.8E+3	99.6E+3	CONCRETE
156	Rect 15.89x60.00	953.280	286E+3	20.1E+3	66.8E+3	CONCRETE
157	Rect 18.29x60.00	1.1E+3	329E+3	30.6E+3	98.9E+3	CONCRETE
158	Rect 22.57x60.00	1.35E+3	406E+3	57.5E+3	176E+3	CONCRETE
159	Rect 19.72x60.00	1.18E+3	355E+3	38.3E+3	122E+3	CONCRETE
160	Rect 16.85x60.00	1.01E+3	303E+3	23.9E+3	78.7E+3	CONCRETE
161	Rect 33.07x60.00	1.98E+3	595E+3	181E+3	474E+3	CONCRETE
162	Rect 31.20x60.00	1.87E+3	562E+3	152E+3	410E+3	CONCRETE
163	Rect 29.33x60.00	1.76E+3	528E+3	126E+3	350E+3	CONCRETE
164	Rect 27.47x60.00	1.65E+3	494E+3	104E+3	295E+3	CONCRETE
165	Rect 21.77x16.80	365.702	8.6E+3	14.4E+3	18.2E+3	CONCRETE
166	Rect 42.90x16.80	720.720	17E+3	111E+3	51.1E+3	CONCRETE
167	Rect 58.50x16.80	982.800	23.1E+3	280E+3	75.7E+3	CONCRETE
168	Rect 58.50x16.80	982.800	23.1E+3	280E+3	75.7E+3	CONCRETE
169	Rect 58.50x16.80	982.800	23.1E+3	280E+3	75.7E+3	CONCRETE
170	Rect 58.50x16.80	982.800	23.1E+3	280E+3	75.7E+3	CONCRETE
171	Rect 42.90x16.80	720.720	17E+3	111E+3	51.1E+3	CONCRETE
172	Rect 21.77x16.80	365.702	8.6E+3	14.4E+3	18.2E+3	CONCRETE
173	Rect 21.77x16.80	365.702	8.6E+3	14.4E+3	18.2E+3	CONCRETE
174	Rect 42.90x16.80	720.720	17E+3	111E+3	51.1E+3	CONCRETE
175	Rect 58.50x16.80	982.800	23.1E+3	280E+3	75.7E+3	CONCRETE
176	Rect 58.50x16.80	982.800	23.1E+3	280E+3	75.7E+3	CONCRETE
177	Rect 58.50x16.80	982.800	23.1E+3	280E+3	75.7E+3	CONCRETE
178	Rect 58.50x16.80	982.800	23.1E+3	280E+3	75.7E+3	CONCRETE
179	Rect 42.90x16.80	720.720	17E+3	111E+3	51.1E+3	CONCRETE
180	Rect 21.77x16.80	365.702	8.6E+3	14.4E+3	18.2E+3	CONCRETE

Section Properties Cont...

Prop	Section	Area (in^2)	I_{yy} (in^4)	I_{zz} (in^4)	J (in^4)	Material
181	Rect 21.77x16.80	365.702	8.6E+3	14.4E+3	18.2E+3	CONCRETE
182	Rect 42.90x16.80	720.720	17E+3	111E+3	51.1E+3	CONCRETE
183	Rect 58.50x16.80	982.800	23.1E+3	280E+3	75.7E+3	CONCRETE
184	Rect 58.50x16.80	982.800	23.1E+3	280E+3	75.7E+3	CONCRETE
185	Rect 58.50x16.80	982.800	23.1E+3	280E+3	75.7E+3	CONCRETE
186	Rect 58.50x16.80	982.800	23.1E+3	280E+3	75.7E+3	CONCRETE
187	Rect 42.90x16.80	720.720	17E+3	111E+3	51.1E+3	CONCRETE
188	Rect 21.77x16.80	365.702	8.6E+3	14.4E+3	18.2E+3	CONCRETE
189	Rect 21.77x16.80	365.702	8.6E+3	14.4E+3	18.2E+3	CONCRETE
190	Rect 42.90x16.80	720.720	17E+3	111E+3	51.1E+3	CONCRETE
191	Rect 58.50x16.80	982.800	23.1E+3	280E+3	75.7E+3	CONCRETE
192	Rect 58.50x16.80	982.800	23.1E+3	280E+3	75.7E+3	CONCRETE
193	Rect 58.50x16.80	982.800	23.1E+3	280E+3	75.7E+3	CONCRETE
194	Rect 58.50x16.80	982.800	23.1E+3	280E+3	75.7E+3	CONCRETE
195	Rect 42.90x16.80	720.720	17E+3	111E+3	51.1E+3	CONCRETE
196	Rect 21.77x16.80	365.702	8.6E+3	14.4E+3	18.2E+3	CONCRETE
197	Rect 21.77x16.80	365.702	8.6E+3	14.4E+3	18.2E+3	CONCRETE
198	Rect 42.90x16.80	720.720	17E+3	111E+3	51.1E+3	CONCRETE
199	Rect 58.50x16.80	982.800	23.1E+3	280E+3	75.7E+3	CONCRETE
200	Rect 58.50x16.80	982.800	23.1E+3	280E+3	75.7E+3	CONCRETE
201	Rect 58.50x16.80	982.800	23.1E+3	280E+3	75.7E+3	CONCRETE
202	Rect 58.50x16.80	982.800	23.1E+3	280E+3	75.7E+3	CONCRETE
203	Rect 42.90x16.80	720.720	17E+3	111E+3	51.1E+3	CONCRETE
204	Rect 21.77x16.80	365.702	8.6E+3	14.4E+3	18.2E+3	CONCRETE
205	Rect 21.77x16.80	365.702	8.6E+3	14.4E+3	18.2E+3	CONCRETE
206	Rect 42.90x16.80	720.720	17E+3	111E+3	51.1E+3	CONCRETE
207	Rect 58.50x16.80	982.800	23.1E+3	280E+3	75.7E+3	CONCRETE
208	Rect 58.50x16.80	982.800	23.1E+3	280E+3	75.7E+3	CONCRETE
209	Rect 58.50x16.80	982.800	23.1E+3	280E+3	75.7E+3	CONCRETE
210	Rect 58.50x16.80	982.800	23.1E+3	280E+3	75.7E+3	CONCRETE
211	Rect 42.90x16.80	720.720	17E+3	111E+3	51.1E+3	CONCRETE
212	Rect 21.77x16.80	365.702	8.6E+3	14.4E+3	18.2E+3	CONCRETE
213	Rect 21.77x16.80	365.702	8.6E+3	14.4E+3	18.2E+3	CONCRETE
214	Rect 42.90x16.80	720.720	17E+3	111E+3	51.1E+3	CONCRETE
215	Rect 58.50x16.80	982.800	23.1E+3	280E+3	75.7E+3	CONCRETE
216	Rect 58.50x16.80	982.800	23.1E+3	280E+3	75.7E+3	CONCRETE
217	Rect 58.50x16.80	982.800	23.1E+3	280E+3	75.7E+3	CONCRETE
218	Rect 58.50x16.80	982.800	23.1E+3	280E+3	75.7E+3	CONCRETE
219	Rect 42.90x16.80	720.720	17E+3	111E+3	51.1E+3	CONCRETE
220	Rect 21.77x16.80	365.702	8.6E+3	14.4E+3	18.2E+3	CONCRETE
221	Rect 21.77x16.80	365.702	8.6E+3	14.4E+3	18.2E+3	CONCRETE
222	Rect 42.90x16.80	720.720	17E+3	111E+3	51.1E+3	CONCRETE
223	Rect 58.50x16.80	982.800	23.1E+3	280E+3	75.7E+3	CONCRETE
224	Rect 58.50x16.80	982.800	23.1E+3	280E+3	75.7E+3	CONCRETE
225	Rect 58.50x16.80	982.800	23.1E+3	280E+3	75.7E+3	CONCRETE

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Section Properties Cont...

Prop	Section	Area (in^2)	I_{yy} (in^4)	I_{zz} (in^4)	J (in^4)	Material
226	Rect 58.50x16.80	982.800	23.1E+3	280E+3	75.7E+3	CONCRETE
227	Rect 42.90x16.80	720.720	17E+3	111E+3	51.1E+3	CONCRETE
228	Rect 21.77x16.80	365.702	8.6E+3	14.4E+3	18.2E+3	CONCRETE
229	Rect 21.77x16.80	365.702	8.6E+3	14.4E+3	18.2E+3	CONCRETE
230	Rect 42.90x16.80	720.720	17E+3	111E+3	51.1E+3	CONCRETE
231	Rect 58.50x16.80	982.800	23.1E+3	280E+3	75.7E+3	CONCRETE
232	Rect 58.50x16.80	982.800	23.1E+3	280E+3	75.7E+3	CONCRETE
233	Rect 58.50x16.80	982.800	23.1E+3	280E+3	75.7E+3	CONCRETE
234	Rect 58.50x16.80	982.800	23.1E+3	280E+3	75.7E+3	CONCRETE
235	Rect 42.90x16.80	720.720	17E+3	111E+3	51.1E+3	CONCRETE
236	Rect 21.77x16.80	365.702	8.6E+3	14.4E+3	18.2E+3	CONCRETE
237	Rect 21.77x16.80	365.702	8.6E+3	14.4E+3	18.2E+3	CONCRETE
238	Rect 42.90x16.80	720.720	17E+3	111E+3	51.1E+3	CONCRETE
239	Rect 58.50x16.80	982.800	23.1E+3	280E+3	75.7E+3	CONCRETE
240	Rect 58.50x16.80	982.800	23.1E+3	280E+3	75.7E+3	CONCRETE
241	Rect 58.50x16.80	982.800	23.1E+3	280E+3	75.7E+3	CONCRETE
242	Rect 58.50x16.80	982.800	23.1E+3	280E+3	75.7E+3	CONCRETE
243	Rect 42.90x16.80	720.720	17E+3	111E+3	51.1E+3	CONCRETE
244	Rect 21.77x16.80	365.702	8.6E+3	14.4E+3	18.2E+3	CONCRETE
245	Rect 21.77x16.80	365.702	8.6E+3	14.4E+3	18.2E+3	CONCRETE
246	Rect 42.90x16.80	720.720	17E+3	111E+3	51.1E+3	CONCRETE
247	Rect 58.50x16.80	982.800	23.1E+3	280E+3	75.7E+3	CONCRETE
248	Rect 58.50x16.80	982.800	23.1E+3	280E+3	75.7E+3	CONCRETE
249	Rect 58.50x16.80	982.800	23.1E+3	280E+3	75.7E+3	CONCRETE
250	Rect 58.50x16.80	982.800	23.1E+3	280E+3	75.7E+3	CONCRETE
251	Rect 42.90x16.80	720.720	17E+3	111E+3	51.1E+3	CONCRETE
252	Rect 21.77x16.80	365.702	8.6E+3	14.4E+3	18.2E+3	CONCRETE
253	Rect 21.77x16.80	365.702	8.6E+3	14.4E+3	18.2E+3	CONCRETE
254	Rect 42.90x16.80	720.720	17E+3	111E+3	51.1E+3	CONCRETE
255	Rect 58.50x16.80	982.800	23.1E+3	280E+3	75.7E+3	CONCRETE
256	Rect 58.50x16.80	982.800	23.1E+3	280E+3	75.7E+3	CONCRETE
257	Rect 58.50x16.80	982.800	23.1E+3	280E+3	75.7E+3	CONCRETE
258	Rect 58.50x16.80	982.800	23.1E+3	280E+3	75.7E+3	CONCRETE
259	Rect 42.90x16.80	720.720	17E+3	111E+3	51.1E+3	CONCRETE
260	Rect 21.77x16.80	365.702	8.6E+3	14.4E+3	18.2E+3	CONCRETE
261	Rect 6.00x36.25	217.512	23.8E+3	652.536	2.34E+3	CONCRETE
262	Rect 6.00x36.25	217.512	23.8E+3	652.536	2.34E+3	CONCRETE
263	Rect 6.00x36.25	217.512	23.8E+3	652.536	2.34E+3	CONCRETE
264	Rect 6.00x36.25	217.512	23.8E+3	652.536	2.34E+3	CONCRETE
265	Rect 6.00x36.25	217.512	23.8E+3	652.536	2.34E+3	CONCRETE
266	Rect 6.00x36.25	217.512	23.8E+3	652.536	2.34E+3	CONCRETE
267	Rect 6.00x36.25	217.512	23.8E+3	652.536	2.34E+3	CONCRETE
268	Rect 6.00x36.25	217.512	23.8E+3	652.536	2.34E+3	CONCRETE
269	Rect 6.00x36.25	217.512	23.8E+3	652.536	2.34E+3	CONCRETE
270	Rect 6.00x36.25	217.512	23.8E+3	652.536	2.34E+3	CONCRETE

Section Properties Cont...

Prop	Section	Area (in^2)	I_{yy} (in^4)	I_{zz} (in^4)	J (in^4)	Material
271	Rect 6.00x36.25	217.512	23.8E+3	652.536	2.34E+3	CONCRETE
272	Rect 12.00x85.75	1.03E+3	631E+3	12.3E+3	45E+3	CONCRETE
273	Rect 12.00x85.75	1.03E+3	631E+3	12.3E+3	45E+3	CONCRETE
274	Rect 12.00x85.75	1.03E+3	631E+3	12.3E+3	45E+3	CONCRETE
275	Rect 12.00x85.75	1.03E+3	631E+3	12.3E+3	45E+3	CONCRETE
276	Rect 12.00x85.75	1.03E+3	631E+3	12.3E+3	45E+3	CONCRETE
277	Rect 12.00x85.75	1.03E+3	631E+3	12.3E+3	45E+3	CONCRETE
278	Rect 12.00x85.75	1.03E+3	631E+3	12.3E+3	45E+3	CONCRETE
279	Rect 12.00x85.75	1.03E+3	631E+3	12.3E+3	45E+3	CONCRETE
280	Rect 12.00x85.75	1.03E+3	631E+3	12.3E+3	45E+3	CONCRETE
281	Rect 12.00x85.75	1.03E+3	631E+3	12.3E+3	45E+3	CONCRETE
282	Rect 12.00x85.75	1.03E+3	631E+3	12.3E+3	45E+3	CONCRETE
283	Prismatic Tee	1.77E+3	1.1E+6	221E+3	129E+3	CONCRETE
284	Prismatic Tee	1.77E+3	1.1E+6	221E+3	129E+3	CONCRETE
285	Prismatic Tee	1.77E+3	1.1E+6	221E+3	129E+3	CONCRETE
286	Prismatic Tee	1.77E+3	1.1E+6	221E+3	129E+3	CONCRETE
287	Prismatic Tee	1.77E+3	1.1E+6	221E+3	129E+3	CONCRETE
288	Prismatic Tee	1.77E+3	1.1E+6	221E+3	129E+3	CONCRETE
289	Prismatic Tee	1.77E+3	1.1E+6	221E+3	129E+3	CONCRETE
290	Prismatic Tee	1.77E+3	1.1E+6	221E+3	129E+3	CONCRETE
291	Prismatic Tee	1.77E+3	1.1E+6	221E+3	129E+3	CONCRETE
292	Prismatic Tee	1.77E+3	1.1E+6	221E+3	129E+3	CONCRETE
293	Prismatic Tee	1.77E+3	1.1E+6	221E+3	129E+3	CONCRETE
294	Rect 54.00x106.50	5.75E+3	5.44E+6	1.4E+6	3.81E+6	CONCRETE
295	Rect 54.00x106.50	5.75E+3	5.44E+6	1.4E+6	3.81E+6	CONCRETE
296	Rect 54.00x106.50	5.75E+3	5.44E+6	1.4E+6	3.81E+6	CONCRETE
297	Rect 54.00x106.50	5.75E+3	5.44E+6	1.4E+6	3.81E+6	CONCRETE
298	Rect 54.00x106.50	5.75E+3	5.44E+6	1.4E+6	3.81E+6	CONCRETE
299	Rect 54.00x106.50	5.75E+3	5.44E+6	1.4E+6	3.81E+6	CONCRETE
300	Rect 54.00x106.50	5.75E+3	5.44E+6	1.4E+6	3.81E+6	CONCRETE
301	Rect 54.00x106.50	5.75E+3	5.44E+6	1.4E+6	3.81E+6	CONCRETE
302	Rect 54.00x106.50	5.75E+3	5.44E+6	1.4E+6	3.81E+6	CONCRETE
303	Rect 54.00x106.50	5.75E+3	5.44E+6	1.4E+6	3.81E+6	CONCRETE
304	Rect 54.00x106.50	5.75E+3	5.44E+6	1.4E+6	3.81E+6	CONCRETE
305	Rect 54.00x106.50	5.75E+3	5.44E+6	1.4E+6	3.81E+6	CONCRETE
306	Rect 54.00x106.50	5.75E+3	5.44E+6	1.4E+6	3.81E+6	CONCRETE
307	Rect 54.00x106.50	5.75E+3	5.44E+6	1.4E+6	3.81E+6	CONCRETE
308	Rect 54.00x106.50	5.75E+3	5.44E+6	1.4E+6	3.81E+6	CONCRETE
309	Rect 54.00x106.50	5.75E+3	5.44E+6	1.4E+6	3.81E+6	CONCRETE
310	Rect 54.00x106.50	5.75E+3	5.44E+6	1.4E+6	3.81E+6	CONCRETE
311	Rect 54.00x106.50	5.75E+3	5.44E+6	1.4E+6	3.81E+6	CONCRETE
312	Rect 54.00x106.50	5.75E+3	5.44E+6	1.4E+6	3.81E+6	CONCRETE
313	Rect 54.00x106.50	5.75E+3	5.44E+6	1.4E+6	3.81E+6	CONCRETE
314	Rect 54.00x106.50	5.75E+3	5.44E+6	1.4E+6	3.81E+6	CONCRETE
315	Rect 54.00x106.50	5.75E+3	5.44E+6	1.4E+6	3.81E+6	CONCRETE

Section Properties Cont...

Prop	Section	Area (in²)	I_{yy} (in⁴)	I_{zz} (in⁴)	J (in⁴)	Material
316	Rect 54.00x106.50	5.75E+3	5.44E+6	1.4E+6	3.81E+6	CONCRETE
317	Rect 54.00x106.50	5.75E+3	5.44E+6	1.4E+6	3.81E+6	CONCRETE
318	Rect 54.00x106.50	5.75E+3	5.44E+6	1.4E+6	3.81E+6	CONCRETE
319	Rect 54.00x106.50	5.75E+3	5.44E+6	1.4E+6	3.81E+6	CONCRETE
320	Rect 54.00x106.50	5.75E+3	5.44E+6	1.4E+6	3.81E+6	CONCRETE
321	Rect 54.00x106.50	5.75E+3	5.44E+6	1.4E+6	3.81E+6	CONCRETE
322	Rect 54.00x106.50	5.75E+3	5.44E+6	1.4E+6	3.81E+6	CONCRETE
323	Rect 54.00x106.50	5.75E+3	5.44E+6	1.4E+6	3.81E+6	CONCRETE
324	Rect 54.00x106.50	5.75E+3	5.44E+6	1.4E+6	3.81E+6	CONCRETE
325	Rect 54.00x106.50	5.75E+3	5.44E+6	1.4E+6	3.81E+6	CONCRETE
326	Rect 54.00x106.50	5.75E+3	5.44E+6	1.4E+6	3.81E+6	CONCRETE
327	Prismatic Tee	1.77E+3	1.1E+6	221E+3	129E+3	CONCRETE
328	Prismatic Tee	1.77E+3	1.1E+6	221E+3	129E+3	CONCRETE
329	Prismatic Tee	1.77E+3	1.1E+6	221E+3	129E+3	CONCRETE
330	Prismatic Tee	1.77E+3	1.1E+6	221E+3	129E+3	CONCRETE
331	Prismatic Tee	1.77E+3	1.1E+6	221E+3	129E+3	CONCRETE
332	Prismatic Tee	1.77E+3	1.1E+6	221E+3	129E+3	CONCRETE
333	Prismatic Tee	1.77E+3	1.1E+6	221E+3	129E+3	CONCRETE
334	Prismatic Tee	1.77E+3	1.1E+6	221E+3	129E+3	CONCRETE
335	Prismatic Tee	1.77E+3	1.1E+6	221E+3	129E+3	CONCRETE
336	Prismatic Tee	1.77E+3	1.1E+6	221E+3	129E+3	CONCRETE
337	Prismatic Tee	1.77E+3	1.1E+6	221E+3	129E+3	CONCRETE
338	Rect 12.00x85.75	1.03E+3	631E+3	12.3E+3	45E+3	CONCRETE
339	Rect 12.00x85.75	1.03E+3	631E+3	12.3E+3	45E+3	CONCRETE
340	Rect 12.00x85.75	1.03E+3	631E+3	12.3E+3	45E+3	CONCRETE
341	Rect 12.00x85.75	1.03E+3	631E+3	12.3E+3	45E+3	CONCRETE
342	Rect 12.00x85.75	1.03E+3	631E+3	12.3E+3	45E+3	CONCRETE
343	Rect 12.00x85.75	1.03E+3	631E+3	12.3E+3	45E+3	CONCRETE
344	Rect 12.00x85.75	1.03E+3	631E+3	12.3E+3	45E+3	CONCRETE
345	Rect 12.00x85.75	1.03E+3	631E+3	12.3E+3	45E+3	CONCRETE
346	Rect 12.00x85.75	1.03E+3	631E+3	12.3E+3	45E+3	CONCRETE
347	Rect 12.00x85.75	1.03E+3	631E+3	12.3E+3	45E+3	CONCRETE
348	Rect 12.00x85.75	1.03E+3	631E+3	12.3E+3	45E+3	CONCRETE
349	Rect 6.00x36.25	217.512	23.8E+3	652.536	2.34E+3	CONCRETE
350	Rect 6.00x36.25	217.512	23.8E+3	652.536	2.34E+3	CONCRETE
351	Rect 6.00x36.25	217.512	23.8E+3	652.536	2.34E+3	CONCRETE
352	Rect 6.00x36.25	217.512	23.8E+3	652.536	2.34E+3	CONCRETE
353	Rect 6.00x36.25	217.512	23.8E+3	652.536	2.34E+3	CONCRETE
354	Rect 6.00x36.25	217.512	23.8E+3	652.536	2.34E+3	CONCRETE
355	Rect 6.00x36.25	217.512	23.8E+3	652.536	2.34E+3	CONCRETE
356	Rect 6.00x36.25	217.512	23.8E+3	652.536	2.34E+3	CONCRETE
357	Rect 6.00x36.25	217.512	23.8E+3	652.536	2.34E+3	CONCRETE
358	Rect 6.00x36.25	217.512	23.8E+3	652.536	2.34E+3	CONCRETE
359	Rect 6.00x36.25	217.512	23.8E+3	652.536	2.34E+3	CONCRETE

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Materials

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

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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
45	Fixed	Fixed	Fixed	Fixed	Fixed	Fixed
46	Fixed	Fixed	Fixed	Fixed	Fixed	Fixed
81	Fixed	Fixed	Fixed	Fixed	Fixed	Fixed
86	Fixed	Fixed	Fixed	Fixed	Fixed	Fixed
130	Fixed	Fixed	Fixed	Fixed	Fixed	Fixed
131	Fixed	Fixed	Fixed	Fixed	Fixed	Fixed
166	Fixed	Fixed	Fixed	Fixed	Fixed	Fixed

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Moving Load Definition : Type 1

Width (ft)
6.000

Force (kip)	Distance (ft)
16.000	-
16.000	14.000
4.000	14.000

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Moving Load Definition : Type 2

Width (ft)
6.000

Force (kip)	Distance (ft)
12.000	-
12.000	4.000

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Moving Load Definition : Type 3

Width (ft)
6.000

Force (kip)	Distance (ft)
10.000	-
5.000	10.000

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Moving Load Definition : Type 4

Width (ft)
6.000

Force (kip)	Distance (ft)
8.500	-
8.500	4.000
6.000	10.000

Moving Load Definition : Type 5

Width (ft)
6.000

Force (kip)	Distance (ft)
7.000	-
7.000	4.000
7.000	4.000
6.000	10.000

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Software licensed to Hatch Mott MacDonald	Job No 287366	Sheet No 38	Rev
	Part		
Job Title 2012 Bridge Load Ratings	Ref CUY-17-0283		
	By MARussell	Date 29-Oct-12	Chd
Client Ohio DOT	File 1802046.std	Date/Time 14-Feb-2013 16:08	

Moving Load Definition : Type 6

Width (ft)
6.000

Force (kip)	Distance (ft)
8.500	-
8.500	4.000
8.500	31.000
8.500	4.000
6.000	12.000

MRussell

Basic Load Cases

Number	Name
1	DEAD LOADS
2	SIDEWALK LOADS
3	LANE LOADS
4	LANE LOADS
5	LANE LOADS
6	LANE LOADS
7	LANE LOADS
8	LANE LOADS
9	LANE LOADS
10	LANE LOADS
11	LANE LOADS
12	LANE LOADS
13	LANE LOADS

Beam Loads : 1 DEAD LOADS

Beam	Type		Direction	Fa	Da (ft)	Fb	Db	Ecc. (ft)
261	UNI	lbf/ft	GY	-100.000	-	-	-	-
262	UNI	lbf/ft	GY	-100.000	-	-	-	-
263	UNI	lbf/ft	GY	-100.000	-	-	-	-
264	UNI	lbf/ft	GY	-100.000	-	-	-	-
265	UNI	lbf/ft	GY	-100.000	-	-	-	-
266	UNI	lbf/ft	GY	-100.000	-	-	-	-
267	UNI	lbf/ft	GY	-100.000	-	-	-	-
268	UNI	lbf/ft	GY	-100.000	-	-	-	-
269	UNI	lbf/ft	GY	-100.000	-	-	-	-
270	UNI	lbf/ft	GY	-100.000	-	-	-	-
271	UNI	lbf/ft	GY	-100.000	-	-	-	-
272	UNI	lbf/ft	GY	-194.000	-	-	-	-
273	UNI	lbf/ft	GY	-194.000	-	-	-	-
274	UNI	lbf/ft	GY	-194.000	-	-	-	-
275	UNI	lbf/ft	GY	-194.000	-	-	-	-
276	UNI	lbf/ft	GY	-194.000	-	-	-	-
277	UNI	lbf/ft	GY	-194.000	-	-	-	-
278	UNI	lbf/ft	GY	-194.000	-	-	-	-
279	UNI	lbf/ft	GY	-194.000	-	-	-	-
280	UNI	lbf/ft	GY	-194.000	-	-	-	-
281	UNI	lbf/ft	GY	-194.000	-	-	-	-
282	UNI	lbf/ft	GY	-194.000	-	-	-	-
283	UNI	lbf/ft	GY	-404.000	-	-	-	-
284	UNI	lbf/ft	GY	-404.000	-	-	-	-
285	UNI	lbf/ft	GY	-404.000	-	-	-	-
286	UNI	lbf/ft	GY	-404.000	-	-	-	-
287	UNI	lbf/ft	GY	-404.000	-	-	-	-
288	UNI	lbf/ft	GY	-404.000	-	-	-	-
289	UNI	lbf/ft	GY	-404.000	-	-	-	-
290	UNI	lbf/ft	GY	-404.000	-	-	-	-
291	UNI	lbf/ft	GY	-404.000	-	-	-	-
292	UNI	lbf/ft	GY	-404.000	-	-	-	-
293	UNI	lbf/ft	GY	-404.000	-	-	-	-
294	UNI	lbf/ft	GY	-412.000	-	-	-	-
295	UNI	lbf/ft	GY	-412.000	-	-	-	-
296	UNI	lbf/ft	GY	-412.000	-	-	-	-
297	UNI	lbf/ft	GY	-412.000	-	-	-	-
298	UNI	lbf/ft	GY	-412.000	-	-	-	-
299	UNI	lbf/ft	GY	-412.000	-	-	-	-
300	UNI	lbf/ft	GY	-412.000	-	-	-	-
301	UNI	lbf/ft	GY	-412.000	-	-	-	-
302	UNI	lbf/ft	GY	-412.000	-	-	-	-
303	UNI	lbf/ft	GY	-412.000	-	-	-	-
304	UNI	lbf/ft	GY	-412.000	-	-	-	-
305	UNI	lbf/ft	GY	-412.000	-	-	-	-

Beam Loads : 1 DEAD LOADS Cont...

Beam	Type		Direction	Fa	Da (ft)	Fb	Db	Ecc. (ft)
306	UNI	lbf/ft	GY	-412.000	-	-	-	-
307	UNI	lbf/ft	GY	-412.000	-	-	-	-
308	UNI	lbf/ft	GY	-412.000	-	-	-	-
309	UNI	lbf/ft	GY	-412.000	-	-	-	-
310	UNI	lbf/ft	GY	-412.000	-	-	-	-
311	UNI	lbf/ft	GY	-412.000	-	-	-	-
312	UNI	lbf/ft	GY	-412.000	-	-	-	-
313	UNI	lbf/ft	GY	-412.000	-	-	-	-
314	UNI	lbf/ft	GY	-412.000	-	-	-	-
315	UNI	lbf/ft	GY	-412.000	-	-	-	-
316	UNI	lbf/ft	GY	-412.000	-	-	-	-
317	UNI	lbf/ft	GY	-412.000	-	-	-	-
318	UNI	lbf/ft	GY	-412.000	-	-	-	-
319	UNI	lbf/ft	GY	-412.000	-	-	-	-
320	UNI	lbf/ft	GY	-412.000	-	-	-	-
321	UNI	lbf/ft	GY	-412.000	-	-	-	-
322	UNI	lbf/ft	GY	-412.000	-	-	-	-
323	UNI	lbf/ft	GY	-412.000	-	-	-	-
324	UNI	lbf/ft	GY	-412.000	-	-	-	-
325	UNI	lbf/ft	GY	-412.000	-	-	-	-
326	UNI	lbf/ft	GY	-412.000	-	-	-	-
327	UNI	lbf/ft	GY	-404.000	-	-	-	-
328	UNI	lbf/ft	GY	-404.000	-	-	-	-
329	UNI	lbf/ft	GY	-404.000	-	-	-	-
330	UNI	lbf/ft	GY	-404.000	-	-	-	-
331	UNI	lbf/ft	GY	-404.000	-	-	-	-
332	UNI	lbf/ft	GY	-404.000	-	-	-	-
333	UNI	lbf/ft	GY	-404.000	-	-	-	-
334	UNI	lbf/ft	GY	-404.000	-	-	-	-
335	UNI	lbf/ft	GY	-404.000	-	-	-	-
336	UNI	lbf/ft	GY	-404.000	-	-	-	-
337	UNI	lbf/ft	GY	-404.000	-	-	-	-
338	UNI	lbf/ft	GY	-194.000	-	-	-	-
339	UNI	lbf/ft	GY	-194.000	-	-	-	-
340	UNI	lbf/ft	GY	-194.000	-	-	-	-
341	UNI	lbf/ft	GY	-194.000	-	-	-	-
342	UNI	lbf/ft	GY	-194.000	-	-	-	-
343	UNI	lbf/ft	GY	-194.000	-	-	-	-
344	UNI	lbf/ft	GY	-194.000	-	-	-	-
345	UNI	lbf/ft	GY	-194.000	-	-	-	-
346	UNI	lbf/ft	GY	-194.000	-	-	-	-
347	UNI	lbf/ft	GY	-194.000	-	-	-	-
348	UNI	lbf/ft	GY	-194.000	-	-	-	-
349	UNI	lbf/ft	GY	-100.000	-	-	-	-
350	UNI	lbf/ft	GY	-100.000	-	-	-	-

Beam Loads : 1 DEAD LOADS Cont...

Beam	Type		Direction	Fa	Da (ft)	Fb	Db	Ecc. (ft)
351	UNI	lbf/ft	GY	-100.000	-	-	-	-
352	UNI	lbf/ft	GY	-100.000	-	-	-	-
353	UNI	lbf/ft	GY	-100.000	-	-	-	-
354	UNI	lbf/ft	GY	-100.000	-	-	-	-
355	UNI	lbf/ft	GY	-100.000	-	-	-	-
356	UNI	lbf/ft	GY	-100.000	-	-	-	-
357	UNI	lbf/ft	GY	-100.000	-	-	-	-
358	UNI	lbf/ft	GY	-100.000	-	-	-	-
359	UNI	lbf/ft	GY	-100.000	-	-	-	-

Selfweight : 1 DEAD LOADS

Direction	Factor
Y	-1.300

MRussell

Software licensed to Hatch Mott MacDonald	Job No 287366	Sheet No 44	Rev
	Part		
Job Title 2012 Bridge Load Ratings	Ref CUY-17-0283		
	By MARussell	Date 29-Oct-12	Chd
Client Ohio DOT	File 1802046.std	Date/Time 14-Feb-2013 16:08	

Beam Loads : 2 SIDEWALK LOADS

Beam	Type		Direction	Fa	Da (ft)	Fb	Db	Ecc. (ft)
261	UNI	lbf/ft	GY	-410.000	-	-	-	-
262	UNI	lbf/ft	GY	-410.000	-	-	-	-
263	UNI	lbf/ft	GY	-410.000	-	-	-	-
264	UNI	lbf/ft	GY	-410.000	-	-	-	-
265	UNI	lbf/ft	GY	-410.000	-	-	-	-
266	UNI	lbf/ft	GY	-410.000	-	-	-	-
267	UNI	lbf/ft	GY	-410.000	-	-	-	-
268	UNI	lbf/ft	GY	-410.000	-	-	-	-
269	UNI	lbf/ft	GY	-410.000	-	-	-	-
270	UNI	lbf/ft	GY	-410.000	-	-	-	-
271	UNI	lbf/ft	GY	-410.000	-	-	-	-
272	UNI	lbf/ft	GY	-410.000	-	-	-	-
273	UNI	lbf/ft	GY	-410.000	-	-	-	-
274	UNI	lbf/ft	GY	-410.000	-	-	-	-
275	UNI	lbf/ft	GY	-410.000	-	-	-	-
276	UNI	lbf/ft	GY	-410.000	-	-	-	-
277	UNI	lbf/ft	GY	-410.000	-	-	-	-
278	UNI	lbf/ft	GY	-410.000	-	-	-	-
279	UNI	lbf/ft	GY	-410.000	-	-	-	-
280	UNI	lbf/ft	GY	-410.000	-	-	-	-
281	UNI	lbf/ft	GY	-410.000	-	-	-	-
282	UNI	lbf/ft	GY	-410.000	-	-	-	-
338	UNI	lbf/ft	GY	-410.000	-	-	-	-
339	UNI	lbf/ft	GY	-410.000	-	-	-	-
340	UNI	lbf/ft	GY	-410.000	-	-	-	-
341	UNI	lbf/ft	GY	-410.000	-	-	-	-
342	UNI	lbf/ft	GY	-410.000	-	-	-	-
343	UNI	lbf/ft	GY	-410.000	-	-	-	-
344	UNI	lbf/ft	GY	-410.000	-	-	-	-
345	UNI	lbf/ft	GY	-410.000	-	-	-	-
346	UNI	lbf/ft	GY	-410.000	-	-	-	-
347	UNI	lbf/ft	GY	-410.000	-	-	-	-
348	UNI	lbf/ft	GY	-410.000	-	-	-	-
349	UNI	lbf/ft	GY	-410.000	-	-	-	-
350	UNI	lbf/ft	GY	-410.000	-	-	-	-
351	UNI	lbf/ft	GY	-410.000	-	-	-	-
352	UNI	lbf/ft	GY	-410.000	-	-	-	-
353	UNI	lbf/ft	GY	-410.000	-	-	-	-
354	UNI	lbf/ft	GY	-410.000	-	-	-	-
355	UNI	lbf/ft	GY	-410.000	-	-	-	-
356	UNI	lbf/ft	GY	-410.000	-	-	-	-
357	UNI	lbf/ft	GY	-410.000	-	-	-	-
358	UNI	lbf/ft	GY	-410.000	-	-	-	-
359	UNI	lbf/ft	GY	-410.000	-	-	-	-

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		Job No 287366	Sheet No 45	Rev
Software licensed to Hatch Mott MacDonald		Part		
Job Title 2012 Bridge Load Ratings		Ref CUY-17-0283		
		By MARussell	Date 29-Oct-12	Chd
Client Ohio DOT		File 1802046.std	Date/Time 14-Feb-2013 16:08	

Beam Loads : 3 LANE LOADS

Beam	Type		Direction	Fa	Da (ft)	Fb	Db	Ecc. (ft)
166	CON	kip	GY	-26.000	5.000	-	-	-
167	CON	kip	GY	-26.000	8.750	-	-	-
169	CON	kip	GY	-26.000	3.000	-	-	-
170	CON	kip	GY	-26.000	6.130	-	-	-
272	UNI	lbf/ft	GY	-252.000	-	-	-	-
273	UNI	lbf/ft	GY	-252.000	-	-	-	-
274	UNI	lbf/ft	GY	-252.000	-	-	-	-
275	UNI	lbf/ft	GY	-252.000	-	-	-	-
276	UNI	lbf/ft	GY	-252.000	-	-	-	-
277	UNI	lbf/ft	GY	-252.000	-	-	-	-
278	UNI	lbf/ft	GY	-252.000	-	-	-	-
279	UNI	lbf/ft	GY	-252.000	-	-	-	-
280	UNI	lbf/ft	GY	-252.000	-	-	-	-
281	UNI	lbf/ft	GY	-252.000	-	-	-	-
282	UNI	lbf/ft	GY	-252.000	-	-	-	-
283	UNI	lbf/ft	GY	-9.000	-	-	-	-
	UNI	lbf/ft	GY	-388.000	-	-	-	-
284	UNI	lbf/ft	GY	-9.000	-	-	-	-
	UNI	lbf/ft	GY	-388.000	-	-	-	-
285	UNI	lbf/ft	GY	-9.000	-	-	-	-
	UNI	lbf/ft	GY	-388.000	-	-	-	-
286	UNI	lbf/ft	GY	-388.000	-	-	-	-
	UNI	lbf/ft	GY	-9.000	-	-	-	-
287	UNI	lbf/ft	GY	-388.000	-	-	-	-
	UNI	lbf/ft	GY	-9.000	-	-	-	-
288	UNI	lbf/ft	GY	-388.000	-	-	-	-
	UNI	lbf/ft	GY	-9.000	-	-	-	-
289	UNI	lbf/ft	GY	-9.000	-	-	-	-
	UNI	lbf/ft	GY	-388.000	-	-	-	-
290	UNI	lbf/ft	GY	-9.000	-	-	-	-
	UNI	lbf/ft	GY	-388.000	-	-	-	-
291	UNI	lbf/ft	GY	-9.000	-	-	-	-
	UNI	lbf/ft	GY	-388.000	-	-	-	-
292	UNI	lbf/ft	GY	-9.000	-	-	-	-
	UNI	lbf/ft	GY	-388.000	-	-	-	-
293	UNI	lbf/ft	GY	-388.000	-	-	-	-
	UNI	lbf/ft	GY	-9.000	-	-	-	-
294	UNI	lbf/ft	GY	-631.000	-	-	-	-
295	UNI	lbf/ft	GY	-631.000	-	-	-	-
296	UNI	lbf/ft	GY	-631.000	-	-	-	-
297	UNI	lbf/ft	GY	-631.000	-	-	-	-
298	UNI	lbf/ft	GY	-631.000	-	-	-	-
299	UNI	lbf/ft	GY	-631.000	-	-	-	-
300	UNI	lbf/ft	GY	-631.000	-	-	-	-
301	UNI	lbf/ft	GY	-631.000	-	-	-	-

Beam Loads : 3 LANE LOADS Cont...

Beam	Type		Direction	Fa	Da (ft)	Fb	Db	Ecc. (ft)
302	UNI	lbf/ft	GY	-631.000	-	-	-	-
303	UNI	lbf/ft	GY	-631.000	-	-	-	-
304	UNI	lbf/ft	GY	-631.000	-	-	-	-
305	UNI	lbf/ft	GY	-424.000	-	-	-	-
306	UNI	lbf/ft	GY	-424.000	-	-	-	-
307	UNI	lbf/ft	GY	-424.000	-	-	-	-
308	UNI	lbf/ft	GY	-424.000	-	-	-	-
309	UNI	lbf/ft	GY	-424.000	-	-	-	-
310	UNI	lbf/ft	GY	-424.000	-	-	-	-
311	UNI	lbf/ft	GY	-424.000	-	-	-	-
312	UNI	lbf/ft	GY	-424.000	-	-	-	-
313	UNI	lbf/ft	GY	-424.000	-	-	-	-
314	UNI	lbf/ft	GY	-424.000	-	-	-	-
315	UNI	lbf/ft	GY	-424.000	-	-	-	-
316	UNI	lbf/ft	GY	-198.000	-	-	-	-
	UNI	lbf/ft	GY	-216.000	-	-	-	-
317	UNI	lbf/ft	GY	-198.000	-	-	-	-
	UNI	lbf/ft	GY	-216.000	-	-	-	-
318	UNI	lbf/ft	GY	-216.000	-	-	-	-
	UNI	lbf/ft	GY	-198.000	-	-	-	-
319	UNI	lbf/ft	GY	-198.000	-	-	-	-
	UNI	lbf/ft	GY	-216.000	-	-	-	-
320	UNI	lbf/ft	GY	-198.000	-	-	-	-
	UNI	lbf/ft	GY	-216.000	-	-	-	-
321	UNI	lbf/ft	GY	-216.000	-	-	-	-
	UNI	lbf/ft	GY	-198.000	-	-	-	-
322	UNI	lbf/ft	GY	-216.000	-	-	-	-
	UNI	lbf/ft	GY	-198.000	-	-	-	-
323	UNI	lbf/ft	GY	-216.000	-	-	-	-
	UNI	lbf/ft	GY	-198.000	-	-	-	-
324	UNI	lbf/ft	GY	-216.000	-	-	-	-
	UNI	lbf/ft	GY	-198.000	-	-	-	-
325	UNI	lbf/ft	GY	-198.000	-	-	-	-
	UNI	lbf/ft	GY	-216.000	-	-	-	-
326	UNI	lbf/ft	GY	-216.000	-	-	-	-
	UNI	lbf/ft	GY	-198.000	-	-	-	-
327	UNI	lbf/ft	GY	-442.000	-	-	-	-
328	UNI	lbf/ft	GY	-442.000	-	-	-	-
329	UNI	lbf/ft	GY	-442.000	-	-	-	-
330	UNI	lbf/ft	GY	-442.000	-	-	-	-
331	UNI	lbf/ft	GY	-442.000	-	-	-	-
332	UNI	lbf/ft	GY	-442.000	-	-	-	-
333	UNI	lbf/ft	GY	-442.000	-	-	-	-
334	UNI	lbf/ft	GY	-442.000	-	-	-	-
335	UNI	lbf/ft	GY	-442.000	-	-	-	-

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Beam Loads : 3 LANE LOADS Cont...

Beam	Type		Direction	Fa	Da (ft)	Fb	Db	Ecc. (ft)
336	UNI	lbf/ft	GY	-442.000	-	-	-	-
337	UNI	lbf/ft	GY	-442.000	-	-	-	-

Beam Loads : 4 LANE LOADS

Beam	Type		Direction	Fa	Da (ft)	Fb	Db	Ecc. (ft)
174	CON	kip	GY	-26.000	5.000	-	-	-
175	CON	kip	GY	-26.000	8.750	-	-	-
177	CON	kip	GY	-26.000	3.000	-	-	-
178	CON	kip	GY	-26.000	6.130	-	-	-
272	UNI	lbf/ft	GY	-252.000	-	-	-	-
273	UNI	lbf/ft	GY	-252.000	-	-	-	-
274	UNI	lbf/ft	GY	-252.000	-	-	-	-
275	UNI	lbf/ft	GY	-252.000	-	-	-	-
276	UNI	lbf/ft	GY	-252.000	-	-	-	-
277	UNI	lbf/ft	GY	-252.000	-	-	-	-
278	UNI	lbf/ft	GY	-252.000	-	-	-	-
279	UNI	lbf/ft	GY	-252.000	-	-	-	-
280	UNI	lbf/ft	GY	-252.000	-	-	-	-
281	UNI	lbf/ft	GY	-252.000	-	-	-	-
282	UNI	lbf/ft	GY	-252.000	-	-	-	-
283	UNI	lbf/ft	GY	-9.000	-	-	-	-
	UNI	lbf/ft	GY	-388.000	-	-	-	-
284	UNI	lbf/ft	GY	-9.000	-	-	-	-
	UNI	lbf/ft	GY	-388.000	-	-	-	-
285	UNI	lbf/ft	GY	-9.000	-	-	-	-
	UNI	lbf/ft	GY	-388.000	-	-	-	-
286	UNI	lbf/ft	GY	-388.000	-	-	-	-
	UNI	lbf/ft	GY	-9.000	-	-	-	-
287	UNI	lbf/ft	GY	-388.000	-	-	-	-
	UNI	lbf/ft	GY	-9.000	-	-	-	-
288	UNI	lbf/ft	GY	-388.000	-	-	-	-
	UNI	lbf/ft	GY	-9.000	-	-	-	-
289	UNI	lbf/ft	GY	-9.000	-	-	-	-
	UNI	lbf/ft	GY	-388.000	-	-	-	-
290	UNI	lbf/ft	GY	-9.000	-	-	-	-
	UNI	lbf/ft	GY	-388.000	-	-	-	-
291	UNI	lbf/ft	GY	-9.000	-	-	-	-
	UNI	lbf/ft	GY	-388.000	-	-	-	-
292	UNI	lbf/ft	GY	-9.000	-	-	-	-
	UNI	lbf/ft	GY	-388.000	-	-	-	-
293	UNI	lbf/ft	GY	-388.000	-	-	-	-
	UNI	lbf/ft	GY	-9.000	-	-	-	-
294	UNI	lbf/ft	GY	-631.000	-	-	-	-
295	UNI	lbf/ft	GY	-631.000	-	-	-	-
296	UNI	lbf/ft	GY	-631.000	-	-	-	-
297	UNI	lbf/ft	GY	-631.000	-	-	-	-
298	UNI	lbf/ft	GY	-631.000	-	-	-	-
299	UNI	lbf/ft	GY	-631.000	-	-	-	-
300	UNI	lbf/ft	GY	-631.000	-	-	-	-
301	UNI	lbf/ft	GY	-631.000	-	-	-	-

Beam Loads : 4 LANE LOADS Cont...

Beam	Type		Direction	Fa	Da (ft)	Fb	Db	Ecc. (ft)
302	UNI	lbf/ft	GY	-631.000	-	-	-	-
303	UNI	lbf/ft	GY	-631.000	-	-	-	-
304	UNI	lbf/ft	GY	-631.000	-	-	-	-
305	UNI	lbf/ft	GY	-424.000	-	-	-	-
306	UNI	lbf/ft	GY	-424.000	-	-	-	-
307	UNI	lbf/ft	GY	-424.000	-	-	-	-
308	UNI	lbf/ft	GY	-424.000	-	-	-	-
309	UNI	lbf/ft	GY	-424.000	-	-	-	-
310	UNI	lbf/ft	GY	-424.000	-	-	-	-
311	UNI	lbf/ft	GY	-424.000	-	-	-	-
312	UNI	lbf/ft	GY	-424.000	-	-	-	-
313	UNI	lbf/ft	GY	-424.000	-	-	-	-
314	UNI	lbf/ft	GY	-424.000	-	-	-	-
315	UNI	lbf/ft	GY	-424.000	-	-	-	-
316	UNI	lbf/ft	GY	-198.000	-	-	-	-
	UNI	lbf/ft	GY	-216.000	-	-	-	-
317	UNI	lbf/ft	GY	-198.000	-	-	-	-
	UNI	lbf/ft	GY	-216.000	-	-	-	-
318	UNI	lbf/ft	GY	-216.000	-	-	-	-
	UNI	lbf/ft	GY	-198.000	-	-	-	-
319	UNI	lbf/ft	GY	-198.000	-	-	-	-
	UNI	lbf/ft	GY	-216.000	-	-	-	-
320	UNI	lbf/ft	GY	-198.000	-	-	-	-
	UNI	lbf/ft	GY	-216.000	-	-	-	-
321	UNI	lbf/ft	GY	-216.000	-	-	-	-
	UNI	lbf/ft	GY	-198.000	-	-	-	-
322	UNI	lbf/ft	GY	-216.000	-	-	-	-
	UNI	lbf/ft	GY	-198.000	-	-	-	-
323	UNI	lbf/ft	GY	-216.000	-	-	-	-
	UNI	lbf/ft	GY	-198.000	-	-	-	-
324	UNI	lbf/ft	GY	-216.000	-	-	-	-
	UNI	lbf/ft	GY	-198.000	-	-	-	-
325	UNI	lbf/ft	GY	-198.000	-	-	-	-
	UNI	lbf/ft	GY	-216.000	-	-	-	-
326	UNI	lbf/ft	GY	-216.000	-	-	-	-
	UNI	lbf/ft	GY	-198.000	-	-	-	-
327	UNI	lbf/ft	GY	-442.000	-	-	-	-
328	UNI	lbf/ft	GY	-442.000	-	-	-	-
329	UNI	lbf/ft	GY	-442.000	-	-	-	-
330	UNI	lbf/ft	GY	-442.000	-	-	-	-
331	UNI	lbf/ft	GY	-442.000	-	-	-	-
332	UNI	lbf/ft	GY	-442.000	-	-	-	-
333	UNI	lbf/ft	GY	-442.000	-	-	-	-
334	UNI	lbf/ft	GY	-442.000	-	-	-	-
335	UNI	lbf/ft	GY	-442.000	-	-	-	-

Beam Loads : 4 LANE LOADS Cont...

Beam	Type		Direction	Fa	Da (ft)	Fb	Db	Ecc. (ft)
336	UNI	lbf/ft	GY	-442.000	-	-	-	-
337	UNI	lbf/ft	GY	-442.000	-	-	-	-

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Beam Loads : 5 LANE LOADS

Beam	Type		Direction	Fa	Da (ft)	Fb	Db	Ecc. (ft)
182	CON	kip	GY	-26.000	5.000	-	-	-
183	CON	kip	GY	-26.000	8.750	-	-	-
185	CON	kip	GY	-26.000	3.000	-	-	-
186	CON	kip	GY	-26.000	6.130	-	-	-
272	UNI	lbf/ft	GY	-252.000	-	-	-	-
273	UNI	lbf/ft	GY	-252.000	-	-	-	-
274	UNI	lbf/ft	GY	-252.000	-	-	-	-
275	UNI	lbf/ft	GY	-252.000	-	-	-	-
276	UNI	lbf/ft	GY	-252.000	-	-	-	-
277	UNI	lbf/ft	GY	-252.000	-	-	-	-
278	UNI	lbf/ft	GY	-252.000	-	-	-	-
279	UNI	lbf/ft	GY	-252.000	-	-	-	-
280	UNI	lbf/ft	GY	-252.000	-	-	-	-
281	UNI	lbf/ft	GY	-252.000	-	-	-	-
282	UNI	lbf/ft	GY	-252.000	-	-	-	-
283	UNI	lbf/ft	GY	-9.000	-	-	-	-
	UNI	lbf/ft	GY	-388.000	-	-	-	-
284	UNI	lbf/ft	GY	-9.000	-	-	-	-
	UNI	lbf/ft	GY	-388.000	-	-	-	-
285	UNI	lbf/ft	GY	-9.000	-	-	-	-
	UNI	lbf/ft	GY	-388.000	-	-	-	-
286	UNI	lbf/ft	GY	-388.000	-	-	-	-
	UNI	lbf/ft	GY	-9.000	-	-	-	-
287	UNI	lbf/ft	GY	-388.000	-	-	-	-
	UNI	lbf/ft	GY	-9.000	-	-	-	-
288	UNI	lbf/ft	GY	-388.000	-	-	-	-
	UNI	lbf/ft	GY	-9.000	-	-	-	-
289	UNI	lbf/ft	GY	-9.000	-	-	-	-
	UNI	lbf/ft	GY	-388.000	-	-	-	-
290	UNI	lbf/ft	GY	-9.000	-	-	-	-
	UNI	lbf/ft	GY	-388.000	-	-	-	-
291	UNI	lbf/ft	GY	-9.000	-	-	-	-
	UNI	lbf/ft	GY	-388.000	-	-	-	-
292	UNI	lbf/ft	GY	-9.000	-	-	-	-
	UNI	lbf/ft	GY	-388.000	-	-	-	-
293	UNI	lbf/ft	GY	-388.000	-	-	-	-
	UNI	lbf/ft	GY	-9.000	-	-	-	-
294	UNI	lbf/ft	GY	-631.000	-	-	-	-
295	UNI	lbf/ft	GY	-631.000	-	-	-	-
296	UNI	lbf/ft	GY	-631.000	-	-	-	-
297	UNI	lbf/ft	GY	-631.000	-	-	-	-
298	UNI	lbf/ft	GY	-631.000	-	-	-	-
299	UNI	lbf/ft	GY	-631.000	-	-	-	-
300	UNI	lbf/ft	GY	-631.000	-	-	-	-
301	UNI	lbf/ft	GY	-631.000	-	-	-	-

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Beam Loads : 5 LANE LOADS Cont...

Beam	Type		Direction	Fa	Da (ft)	Fb	Db	Ecc. (ft)
302	UNI	lbf/ft	GY	-631.000	-	-	-	-
303	UNI	lbf/ft	GY	-631.000	-	-	-	-
304	UNI	lbf/ft	GY	-631.000	-	-	-	-
305	UNI	lbf/ft	GY	-424.000	-	-	-	-
306	UNI	lbf/ft	GY	-424.000	-	-	-	-
307	UNI	lbf/ft	GY	-424.000	-	-	-	-
308	UNI	lbf/ft	GY	-424.000	-	-	-	-
309	UNI	lbf/ft	GY	-424.000	-	-	-	-
310	UNI	lbf/ft	GY	-424.000	-	-	-	-
311	UNI	lbf/ft	GY	-424.000	-	-	-	-
312	UNI	lbf/ft	GY	-424.000	-	-	-	-
313	UNI	lbf/ft	GY	-424.000	-	-	-	-
314	UNI	lbf/ft	GY	-424.000	-	-	-	-
315	UNI	lbf/ft	GY	-424.000	-	-	-	-
316	UNI	lbf/ft	GY	-198.000	-	-	-	-
	UNI	lbf/ft	GY	-216.000	-	-	-	-
317	UNI	lbf/ft	GY	-198.000	-	-	-	-
	UNI	lbf/ft	GY	-216.000	-	-	-	-
318	UNI	lbf/ft	GY	-216.000	-	-	-	-
	UNI	lbf/ft	GY	-198.000	-	-	-	-
319	UNI	lbf/ft	GY	-198.000	-	-	-	-
	UNI	lbf/ft	GY	-216.000	-	-	-	-
320	UNI	lbf/ft	GY	-198.000	-	-	-	-
	UNI	lbf/ft	GY	-216.000	-	-	-	-
321	UNI	lbf/ft	GY	-216.000	-	-	-	-
	UNI	lbf/ft	GY	-198.000	-	-	-	-
322	UNI	lbf/ft	GY	-216.000	-	-	-	-
	UNI	lbf/ft	GY	-198.000	-	-	-	-
323	UNI	lbf/ft	GY	-216.000	-	-	-	-
	UNI	lbf/ft	GY	-198.000	-	-	-	-
324	UNI	lbf/ft	GY	-216.000	-	-	-	-
	UNI	lbf/ft	GY	-198.000	-	-	-	-
325	UNI	lbf/ft	GY	-198.000	-	-	-	-
	UNI	lbf/ft	GY	-216.000	-	-	-	-
326	UNI	lbf/ft	GY	-216.000	-	-	-	-
	UNI	lbf/ft	GY	-198.000	-	-	-	-
327	UNI	lbf/ft	GY	-442.000	-	-	-	-
328	UNI	lbf/ft	GY	-442.000	-	-	-	-
329	UNI	lbf/ft	GY	-442.000	-	-	-	-
330	UNI	lbf/ft	GY	-442.000	-	-	-	-
331	UNI	lbf/ft	GY	-442.000	-	-	-	-
332	UNI	lbf/ft	GY	-442.000	-	-	-	-
333	UNI	lbf/ft	GY	-442.000	-	-	-	-
334	UNI	lbf/ft	GY	-442.000	-	-	-	-
335	UNI	lbf/ft	GY	-442.000	-	-	-	-

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Beam Loads : 5 LANE LOADS Cont...

Beam	Type		Direction	Fa	Da (ft)	Fb	Db	Ecc. (ft)
336	UNI	lbf/ft	GY	-442.000	-	-	-	-
337	UNI	lbf/ft	GY	-442.000	-	-	-	-

Beam Loads : 6 LANE LOADS

Beam	Type		Direction	Fa	Da (ft)	Fb	Db	Ecc. (ft)
190	CON	kip	GY	-26.000	5.000	-	-	-
191	CON	kip	GY	-26.000	8.750	-	-	-
193	CON	kip	GY	-26.000	3.000	-	-	-
194	CON	kip	GY	-26.000	6.130	-	-	-
272	UNI	lbf/ft	GY	-252.000	-	-	-	-
273	UNI	lbf/ft	GY	-252.000	-	-	-	-
274	UNI	lbf/ft	GY	-252.000	-	-	-	-
275	UNI	lbf/ft	GY	-252.000	-	-	-	-
276	UNI	lbf/ft	GY	-252.000	-	-	-	-
277	UNI	lbf/ft	GY	-252.000	-	-	-	-
278	UNI	lbf/ft	GY	-252.000	-	-	-	-
279	UNI	lbf/ft	GY	-252.000	-	-	-	-
280	UNI	lbf/ft	GY	-252.000	-	-	-	-
281	UNI	lbf/ft	GY	-252.000	-	-	-	-
282	UNI	lbf/ft	GY	-252.000	-	-	-	-
283	UNI	lbf/ft	GY	-9.000	-	-	-	-
	UNI	lbf/ft	GY	-388.000	-	-	-	-
284	UNI	lbf/ft	GY	-9.000	-	-	-	-
	UNI	lbf/ft	GY	-388.000	-	-	-	-
285	UNI	lbf/ft	GY	-9.000	-	-	-	-
	UNI	lbf/ft	GY	-388.000	-	-	-	-
286	UNI	lbf/ft	GY	-388.000	-	-	-	-
	UNI	lbf/ft	GY	-9.000	-	-	-	-
287	UNI	lbf/ft	GY	-388.000	-	-	-	-
	UNI	lbf/ft	GY	-9.000	-	-	-	-
288	UNI	lbf/ft	GY	-388.000	-	-	-	-
	UNI	lbf/ft	GY	-9.000	-	-	-	-
289	UNI	lbf/ft	GY	-9.000	-	-	-	-
	UNI	lbf/ft	GY	-388.000	-	-	-	-
290	UNI	lbf/ft	GY	-9.000	-	-	-	-
	UNI	lbf/ft	GY	-388.000	-	-	-	-
291	UNI	lbf/ft	GY	-9.000	-	-	-	-
	UNI	lbf/ft	GY	-388.000	-	-	-	-
292	UNI	lbf/ft	GY	-9.000	-	-	-	-
	UNI	lbf/ft	GY	-388.000	-	-	-	-
293	UNI	lbf/ft	GY	-388.000	-	-	-	-
	UNI	lbf/ft	GY	-9.000	-	-	-	-
294	UNI	lbf/ft	GY	-631.000	-	-	-	-
295	UNI	lbf/ft	GY	-631.000	-	-	-	-
296	UNI	lbf/ft	GY	-631.000	-	-	-	-
297	UNI	lbf/ft	GY	-631.000	-	-	-	-
298	UNI	lbf/ft	GY	-631.000	-	-	-	-
299	UNI	lbf/ft	GY	-631.000	-	-	-	-
300	UNI	lbf/ft	GY	-631.000	-	-	-	-
301	UNI	lbf/ft	GY	-631.000	-	-	-	-

Beam Loads : 6 LANE LOADS Cont...

Beam	Type		Direction	Fa	Da (ft)	Fb	Db	Ecc. (ft)
302	UNI	lbf/ft	GY	-631.000	-	-	-	-
303	UNI	lbf/ft	GY	-631.000	-	-	-	-
304	UNI	lbf/ft	GY	-631.000	-	-	-	-
305	UNI	lbf/ft	GY	-424.000	-	-	-	-
306	UNI	lbf/ft	GY	-424.000	-	-	-	-
307	UNI	lbf/ft	GY	-424.000	-	-	-	-
308	UNI	lbf/ft	GY	-424.000	-	-	-	-
309	UNI	lbf/ft	GY	-424.000	-	-	-	-
310	UNI	lbf/ft	GY	-424.000	-	-	-	-
311	UNI	lbf/ft	GY	-424.000	-	-	-	-
312	UNI	lbf/ft	GY	-424.000	-	-	-	-
313	UNI	lbf/ft	GY	-424.000	-	-	-	-
314	UNI	lbf/ft	GY	-424.000	-	-	-	-
315	UNI	lbf/ft	GY	-424.000	-	-	-	-
316	UNI	lbf/ft	GY	-198.000	-	-	-	-
	UNI	lbf/ft	GY	-216.000	-	-	-	-
317	UNI	lbf/ft	GY	-198.000	-	-	-	-
	UNI	lbf/ft	GY	-216.000	-	-	-	-
318	UNI	lbf/ft	GY	-216.000	-	-	-	-
	UNI	lbf/ft	GY	-198.000	-	-	-	-
319	UNI	lbf/ft	GY	-198.000	-	-	-	-
	UNI	lbf/ft	GY	-216.000	-	-	-	-
320	UNI	lbf/ft	GY	-198.000	-	-	-	-
	UNI	lbf/ft	GY	-216.000	-	-	-	-
321	UNI	lbf/ft	GY	-216.000	-	-	-	-
	UNI	lbf/ft	GY	-198.000	-	-	-	-
322	UNI	lbf/ft	GY	-216.000	-	-	-	-
	UNI	lbf/ft	GY	-198.000	-	-	-	-
323	UNI	lbf/ft	GY	-216.000	-	-	-	-
	UNI	lbf/ft	GY	-198.000	-	-	-	-
324	UNI	lbf/ft	GY	-216.000	-	-	-	-
	UNI	lbf/ft	GY	-198.000	-	-	-	-
325	UNI	lbf/ft	GY	-198.000	-	-	-	-
	UNI	lbf/ft	GY	-216.000	-	-	-	-
326	UNI	lbf/ft	GY	-216.000	-	-	-	-
	UNI	lbf/ft	GY	-198.000	-	-	-	-
327	UNI	lbf/ft	GY	-442.000	-	-	-	-
328	UNI	lbf/ft	GY	-442.000	-	-	-	-
329	UNI	lbf/ft	GY	-442.000	-	-	-	-
330	UNI	lbf/ft	GY	-442.000	-	-	-	-
331	UNI	lbf/ft	GY	-442.000	-	-	-	-
332	UNI	lbf/ft	GY	-442.000	-	-	-	-
333	UNI	lbf/ft	GY	-442.000	-	-	-	-
334	UNI	lbf/ft	GY	-442.000	-	-	-	-
335	UNI	lbf/ft	GY	-442.000	-	-	-	-

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Beam Loads : 6 LANE LOADS Cont...

Beam	Type		Direction	Fa	Da (ft)	Fb	Db	Ecc. (ft)
336	UNI	lbf/ft	GY	-442.000	-	-	-	-
337	UNI	lbf/ft	GY	-442.000	-	-	-	-

Beam Loads : 7 LANE LOADS

Beam	Type		Direction	Fa	Da (ft)	Fb	Db	Ecc. (ft)
198	CON	kip	GY	-26.000	5.000	-	-	-
199	CON	kip	GY	-26.000	8.750	-	-	-
201	CON	kip	GY	-26.000	3.000	-	-	-
202	CON	kip	GY	-26.000	6.130	-	-	-
272	UNI	lbf/ft	GY	-252.000	-	-	-	-
273	UNI	lbf/ft	GY	-252.000	-	-	-	-
274	UNI	lbf/ft	GY	-252.000	-	-	-	-
275	UNI	lbf/ft	GY	-252.000	-	-	-	-
276	UNI	lbf/ft	GY	-252.000	-	-	-	-
277	UNI	lbf/ft	GY	-252.000	-	-	-	-
278	UNI	lbf/ft	GY	-252.000	-	-	-	-
279	UNI	lbf/ft	GY	-252.000	-	-	-	-
280	UNI	lbf/ft	GY	-252.000	-	-	-	-
281	UNI	lbf/ft	GY	-252.000	-	-	-	-
282	UNI	lbf/ft	GY	-252.000	-	-	-	-
283	UNI	lbf/ft	GY	-9.000	-	-	-	-
	UNI	lbf/ft	GY	-388.000	-	-	-	-
284	UNI	lbf/ft	GY	-9.000	-	-	-	-
	UNI	lbf/ft	GY	-388.000	-	-	-	-
285	UNI	lbf/ft	GY	-9.000	-	-	-	-
	UNI	lbf/ft	GY	-388.000	-	-	-	-
286	UNI	lbf/ft	GY	-388.000	-	-	-	-
	UNI	lbf/ft	GY	-9.000	-	-	-	-
287	UNI	lbf/ft	GY	-388.000	-	-	-	-
	UNI	lbf/ft	GY	-9.000	-	-	-	-
288	UNI	lbf/ft	GY	-388.000	-	-	-	-
	UNI	lbf/ft	GY	-9.000	-	-	-	-
289	UNI	lbf/ft	GY	-9.000	-	-	-	-
	UNI	lbf/ft	GY	-388.000	-	-	-	-
290	UNI	lbf/ft	GY	-9.000	-	-	-	-
	UNI	lbf/ft	GY	-388.000	-	-	-	-
291	UNI	lbf/ft	GY	-9.000	-	-	-	-
	UNI	lbf/ft	GY	-388.000	-	-	-	-
292	UNI	lbf/ft	GY	-9.000	-	-	-	-
	UNI	lbf/ft	GY	-388.000	-	-	-	-
293	UNI	lbf/ft	GY	-388.000	-	-	-	-
	UNI	lbf/ft	GY	-9.000	-	-	-	-
294	UNI	lbf/ft	GY	-631.000	-	-	-	-
295	UNI	lbf/ft	GY	-631.000	-	-	-	-
296	UNI	lbf/ft	GY	-631.000	-	-	-	-
297	UNI	lbf/ft	GY	-631.000	-	-	-	-
298	UNI	lbf/ft	GY	-631.000	-	-	-	-
299	UNI	lbf/ft	GY	-631.000	-	-	-	-
300	UNI	lbf/ft	GY	-631.000	-	-	-	-
301	UNI	lbf/ft	GY	-631.000	-	-	-	-

Beam Loads : 7 LANE LOADS Cont...

Beam	Type		Direction	Fa	Da (ft)	Fb	Db	Ecc. (ft)
302	UNI	lbf/ft	GY	-631.000	-	-	-	-
303	UNI	lbf/ft	GY	-631.000	-	-	-	-
304	UNI	lbf/ft	GY	-631.000	-	-	-	-
305	UNI	lbf/ft	GY	-424.000	-	-	-	-
306	UNI	lbf/ft	GY	-424.000	-	-	-	-
307	UNI	lbf/ft	GY	-424.000	-	-	-	-
308	UNI	lbf/ft	GY	-424.000	-	-	-	-
309	UNI	lbf/ft	GY	-424.000	-	-	-	-
310	UNI	lbf/ft	GY	-424.000	-	-	-	-
311	UNI	lbf/ft	GY	-424.000	-	-	-	-
312	UNI	lbf/ft	GY	-424.000	-	-	-	-
313	UNI	lbf/ft	GY	-424.000	-	-	-	-
314	UNI	lbf/ft	GY	-424.000	-	-	-	-
315	UNI	lbf/ft	GY	-424.000	-	-	-	-
316	UNI	lbf/ft	GY	-198.000	-	-	-	-
	UNI	lbf/ft	GY	-216.000	-	-	-	-
317	UNI	lbf/ft	GY	-198.000	-	-	-	-
	UNI	lbf/ft	GY	-216.000	-	-	-	-
318	UNI	lbf/ft	GY	-216.000	-	-	-	-
	UNI	lbf/ft	GY	-198.000	-	-	-	-
319	UNI	lbf/ft	GY	-198.000	-	-	-	-
	UNI	lbf/ft	GY	-216.000	-	-	-	-
320	UNI	lbf/ft	GY	-198.000	-	-	-	-
	UNI	lbf/ft	GY	-216.000	-	-	-	-
321	UNI	lbf/ft	GY	-216.000	-	-	-	-
	UNI	lbf/ft	GY	-198.000	-	-	-	-
322	UNI	lbf/ft	GY	-216.000	-	-	-	-
	UNI	lbf/ft	GY	-198.000	-	-	-	-
323	UNI	lbf/ft	GY	-216.000	-	-	-	-
	UNI	lbf/ft	GY	-198.000	-	-	-	-
324	UNI	lbf/ft	GY	-216.000	-	-	-	-
	UNI	lbf/ft	GY	-198.000	-	-	-	-
325	UNI	lbf/ft	GY	-198.000	-	-	-	-
	UNI	lbf/ft	GY	-216.000	-	-	-	-
326	UNI	lbf/ft	GY	-216.000	-	-	-	-
	UNI	lbf/ft	GY	-198.000	-	-	-	-
327	UNI	lbf/ft	GY	-442.000	-	-	-	-
328	UNI	lbf/ft	GY	-442.000	-	-	-	-
329	UNI	lbf/ft	GY	-442.000	-	-	-	-
330	UNI	lbf/ft	GY	-442.000	-	-	-	-
331	UNI	lbf/ft	GY	-442.000	-	-	-	-
332	UNI	lbf/ft	GY	-442.000	-	-	-	-
333	UNI	lbf/ft	GY	-442.000	-	-	-	-
334	UNI	lbf/ft	GY	-442.000	-	-	-	-
335	UNI	lbf/ft	GY	-442.000	-	-	-	-

Beam Loads : 7 LANE LOADS Cont...

Beam	Type		Direction	Fa	Da (ft)	Fb	Db	Ecc. (ft)
336	UNI	lbf/ft	GY	-442.000	-	-	-	-
337	UNI	lbf/ft	GY	-442.000	-	-	-	-

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Beam Loads : 8 LANE LOADS

Beam	Type		Direction	Fa	Da (ft)	Fb	Db	Ecc. (ft)
206	CON	kip	GY	-26.000	5.000	-	-	-
207	CON	kip	GY	-26.000	8.750	-	-	-
209	CON	kip	GY	-26.000	3.000	-	-	-
210	CON	kip	GY	-26.000	6.130	-	-	-
272	UNI	lbf/ft	GY	-252.000	-	-	-	-
273	UNI	lbf/ft	GY	-252.000	-	-	-	-
274	UNI	lbf/ft	GY	-252.000	-	-	-	-
275	UNI	lbf/ft	GY	-252.000	-	-	-	-
276	UNI	lbf/ft	GY	-252.000	-	-	-	-
277	UNI	lbf/ft	GY	-252.000	-	-	-	-
278	UNI	lbf/ft	GY	-252.000	-	-	-	-
279	UNI	lbf/ft	GY	-252.000	-	-	-	-
280	UNI	lbf/ft	GY	-252.000	-	-	-	-
281	UNI	lbf/ft	GY	-252.000	-	-	-	-
282	UNI	lbf/ft	GY	-252.000	-	-	-	-
283	UNI	lbf/ft	GY	-9.000	-	-	-	-
	UNI	lbf/ft	GY	-388.000	-	-	-	-
284	UNI	lbf/ft	GY	-9.000	-	-	-	-
	UNI	lbf/ft	GY	-388.000	-	-	-	-
285	UNI	lbf/ft	GY	-9.000	-	-	-	-
	UNI	lbf/ft	GY	-388.000	-	-	-	-
286	UNI	lbf/ft	GY	-388.000	-	-	-	-
	UNI	lbf/ft	GY	-9.000	-	-	-	-
287	UNI	lbf/ft	GY	-388.000	-	-	-	-
	UNI	lbf/ft	GY	-9.000	-	-	-	-
288	UNI	lbf/ft	GY	-388.000	-	-	-	-
	UNI	lbf/ft	GY	-9.000	-	-	-	-
289	UNI	lbf/ft	GY	-9.000	-	-	-	-
	UNI	lbf/ft	GY	-388.000	-	-	-	-
290	UNI	lbf/ft	GY	-9.000	-	-	-	-
	UNI	lbf/ft	GY	-388.000	-	-	-	-
291	UNI	lbf/ft	GY	-9.000	-	-	-	-
	UNI	lbf/ft	GY	-388.000	-	-	-	-
292	UNI	lbf/ft	GY	-9.000	-	-	-	-
	UNI	lbf/ft	GY	-388.000	-	-	-	-
293	UNI	lbf/ft	GY	-388.000	-	-	-	-
	UNI	lbf/ft	GY	-9.000	-	-	-	-
294	UNI	lbf/ft	GY	-631.000	-	-	-	-
295	UNI	lbf/ft	GY	-631.000	-	-	-	-
296	UNI	lbf/ft	GY	-631.000	-	-	-	-
297	UNI	lbf/ft	GY	-631.000	-	-	-	-
298	UNI	lbf/ft	GY	-631.000	-	-	-	-
299	UNI	lbf/ft	GY	-631.000	-	-	-	-
300	UNI	lbf/ft	GY	-631.000	-	-	-	-
301	UNI	lbf/ft	GY	-631.000	-	-	-	-

Beam Loads : 8 LANE LOADS Cont...

Beam	Type		Direction	Fa	Da (ft)	Fb	Db	Ecc. (ft)
302	UNI	lbf/ft	GY	-631.000	-	-	-	-
303	UNI	lbf/ft	GY	-631.000	-	-	-	-
304	UNI	lbf/ft	GY	-631.000	-	-	-	-
305	UNI	lbf/ft	GY	-424.000	-	-	-	-
306	UNI	lbf/ft	GY	-424.000	-	-	-	-
307	UNI	lbf/ft	GY	-424.000	-	-	-	-
308	UNI	lbf/ft	GY	-424.000	-	-	-	-
309	UNI	lbf/ft	GY	-424.000	-	-	-	-
310	UNI	lbf/ft	GY	-424.000	-	-	-	-
311	UNI	lbf/ft	GY	-424.000	-	-	-	-
312	UNI	lbf/ft	GY	-424.000	-	-	-	-
313	UNI	lbf/ft	GY	-424.000	-	-	-	-
314	UNI	lbf/ft	GY	-424.000	-	-	-	-
315	UNI	lbf/ft	GY	-424.000	-	-	-	-
316	UNI	lbf/ft	GY	-198.000	-	-	-	-
	UNI	lbf/ft	GY	-216.000	-	-	-	-
317	UNI	lbf/ft	GY	-198.000	-	-	-	-
	UNI	lbf/ft	GY	-216.000	-	-	-	-
318	UNI	lbf/ft	GY	-216.000	-	-	-	-
	UNI	lbf/ft	GY	-198.000	-	-	-	-
319	UNI	lbf/ft	GY	-198.000	-	-	-	-
	UNI	lbf/ft	GY	-216.000	-	-	-	-
320	UNI	lbf/ft	GY	-198.000	-	-	-	-
	UNI	lbf/ft	GY	-216.000	-	-	-	-
321	UNI	lbf/ft	GY	-216.000	-	-	-	-
	UNI	lbf/ft	GY	-198.000	-	-	-	-
322	UNI	lbf/ft	GY	-216.000	-	-	-	-
	UNI	lbf/ft	GY	-198.000	-	-	-	-
323	UNI	lbf/ft	GY	-216.000	-	-	-	-
	UNI	lbf/ft	GY	-198.000	-	-	-	-
324	UNI	lbf/ft	GY	-216.000	-	-	-	-
	UNI	lbf/ft	GY	-198.000	-	-	-	-
325	UNI	lbf/ft	GY	-198.000	-	-	-	-
	UNI	lbf/ft	GY	-216.000	-	-	-	-
326	UNI	lbf/ft	GY	-216.000	-	-	-	-
	UNI	lbf/ft	GY	-198.000	-	-	-	-
327	UNI	lbf/ft	GY	-442.000	-	-	-	-
328	UNI	lbf/ft	GY	-442.000	-	-	-	-
329	UNI	lbf/ft	GY	-442.000	-	-	-	-
330	UNI	lbf/ft	GY	-442.000	-	-	-	-
331	UNI	lbf/ft	GY	-442.000	-	-	-	-
332	UNI	lbf/ft	GY	-442.000	-	-	-	-
333	UNI	lbf/ft	GY	-442.000	-	-	-	-
334	UNI	lbf/ft	GY	-442.000	-	-	-	-
335	UNI	lbf/ft	GY	-442.000	-	-	-	-

Beam Loads : 8 LANE LOADS Cont...

Beam	Type		Direction	Fa	Da (ft)	Fb	Db	Ecc. (ft)
336	UNI	lbf/ft	GY	-442.000	-	-	-	-
337	UNI	lbf/ft	GY	-442.000	-	-	-	-

Beam Loads : 9 LANE LOADS

Beam	Type		Direction	Fa	Da (ft)	Fb	Db	Ecc. (ft)
214	CON	kip	GY	-26.000	5.000	-	-	-
215	CON	kip	GY	-26.000	8.750	-	-	-
217	CON	kip	GY	-26.000	3.000	-	-	-
218	CON	kip	GY	-26.000	6.130	-	-	-
272	UNI	lbf/ft	GY	-252.000	-	-	-	-
273	UNI	lbf/ft	GY	-252.000	-	-	-	-
274	UNI	lbf/ft	GY	-252.000	-	-	-	-
275	UNI	lbf/ft	GY	-252.000	-	-	-	-
276	UNI	lbf/ft	GY	-252.000	-	-	-	-
277	UNI	lbf/ft	GY	-252.000	-	-	-	-
278	UNI	lbf/ft	GY	-252.000	-	-	-	-
279	UNI	lbf/ft	GY	-252.000	-	-	-	-
280	UNI	lbf/ft	GY	-252.000	-	-	-	-
281	UNI	lbf/ft	GY	-252.000	-	-	-	-
282	UNI	lbf/ft	GY	-252.000	-	-	-	-
283	UNI	lbf/ft	GY	-9.000	-	-	-	-
	UNI	lbf/ft	GY	-388.000	-	-	-	-
284	UNI	lbf/ft	GY	-9.000	-	-	-	-
	UNI	lbf/ft	GY	-388.000	-	-	-	-
285	UNI	lbf/ft	GY	-9.000	-	-	-	-
	UNI	lbf/ft	GY	-388.000	-	-	-	-
286	UNI	lbf/ft	GY	-388.000	-	-	-	-
	UNI	lbf/ft	GY	-9.000	-	-	-	-
287	UNI	lbf/ft	GY	-388.000	-	-	-	-
	UNI	lbf/ft	GY	-9.000	-	-	-	-
288	UNI	lbf/ft	GY	-388.000	-	-	-	-
	UNI	lbf/ft	GY	-9.000	-	-	-	-
289	UNI	lbf/ft	GY	-9.000	-	-	-	-
	UNI	lbf/ft	GY	-388.000	-	-	-	-
290	UNI	lbf/ft	GY	-9.000	-	-	-	-
	UNI	lbf/ft	GY	-388.000	-	-	-	-
291	UNI	lbf/ft	GY	-9.000	-	-	-	-
	UNI	lbf/ft	GY	-388.000	-	-	-	-
292	UNI	lbf/ft	GY	-9.000	-	-	-	-
	UNI	lbf/ft	GY	-388.000	-	-	-	-
293	UNI	lbf/ft	GY	-388.000	-	-	-	-
	UNI	lbf/ft	GY	-9.000	-	-	-	-
294	UNI	lbf/ft	GY	-631.000	-	-	-	-
295	UNI	lbf/ft	GY	-631.000	-	-	-	-
296	UNI	lbf/ft	GY	-631.000	-	-	-	-
297	UNI	lbf/ft	GY	-631.000	-	-	-	-
298	UNI	lbf/ft	GY	-631.000	-	-	-	-
299	UNI	lbf/ft	GY	-631.000	-	-	-	-
300	UNI	lbf/ft	GY	-631.000	-	-	-	-
301	UNI	lbf/ft	GY	-631.000	-	-	-	-

Beam Loads : 9 LANE LOADS Cont...

Beam	Type		Direction	Fa	Da (ft)	Fb	Db	Ecc. (ft)
302	UNI	lbf/ft	GY	-631.000	-	-	-	-
303	UNI	lbf/ft	GY	-631.000	-	-	-	-
304	UNI	lbf/ft	GY	-631.000	-	-	-	-
305	UNI	lbf/ft	GY	-424.000	-	-	-	-
306	UNI	lbf/ft	GY	-424.000	-	-	-	-
307	UNI	lbf/ft	GY	-424.000	-	-	-	-
308	UNI	lbf/ft	GY	-424.000	-	-	-	-
309	UNI	lbf/ft	GY	-424.000	-	-	-	-
310	UNI	lbf/ft	GY	-424.000	-	-	-	-
311	UNI	lbf/ft	GY	-424.000	-	-	-	-
312	UNI	lbf/ft	GY	-424.000	-	-	-	-
313	UNI	lbf/ft	GY	-424.000	-	-	-	-
314	UNI	lbf/ft	GY	-424.000	-	-	-	-
315	UNI	lbf/ft	GY	-424.000	-	-	-	-
316	UNI	lbf/ft	GY	-198.000	-	-	-	-
	UNI	lbf/ft	GY	-216.000	-	-	-	-
317	UNI	lbf/ft	GY	-198.000	-	-	-	-
	UNI	lbf/ft	GY	-216.000	-	-	-	-
318	UNI	lbf/ft	GY	-216.000	-	-	-	-
	UNI	lbf/ft	GY	-198.000	-	-	-	-
319	UNI	lbf/ft	GY	-198.000	-	-	-	-
	UNI	lbf/ft	GY	-216.000	-	-	-	-
320	UNI	lbf/ft	GY	-198.000	-	-	-	-
	UNI	lbf/ft	GY	-216.000	-	-	-	-
321	UNI	lbf/ft	GY	-216.000	-	-	-	-
	UNI	lbf/ft	GY	-198.000	-	-	-	-
322	UNI	lbf/ft	GY	-216.000	-	-	-	-
	UNI	lbf/ft	GY	-198.000	-	-	-	-
323	UNI	lbf/ft	GY	-216.000	-	-	-	-
	UNI	lbf/ft	GY	-198.000	-	-	-	-
324	UNI	lbf/ft	GY	-216.000	-	-	-	-
	UNI	lbf/ft	GY	-198.000	-	-	-	-
325	UNI	lbf/ft	GY	-198.000	-	-	-	-
	UNI	lbf/ft	GY	-216.000	-	-	-	-
326	UNI	lbf/ft	GY	-216.000	-	-	-	-
	UNI	lbf/ft	GY	-198.000	-	-	-	-
327	UNI	lbf/ft	GY	-442.000	-	-	-	-
328	UNI	lbf/ft	GY	-442.000	-	-	-	-
329	UNI	lbf/ft	GY	-442.000	-	-	-	-
330	UNI	lbf/ft	GY	-442.000	-	-	-	-
331	UNI	lbf/ft	GY	-442.000	-	-	-	-
332	UNI	lbf/ft	GY	-442.000	-	-	-	-
333	UNI	lbf/ft	GY	-442.000	-	-	-	-
334	UNI	lbf/ft	GY	-442.000	-	-	-	-
335	UNI	lbf/ft	GY	-442.000	-	-	-	-

MRussell

Beam Loads : 9 LANE LOADS Cont...

Beam	Type		Direction	Fa	Da (ft)	Fb	Db	Ecc. (ft)
336	UNI	lbf/ft	GY	-442.000	-	-	-	-
337	UNI	lbf/ft	GY	-442.000	-	-	-	-

MRussell

Beam Loads : 10 LANE LOADS

Beam	Type		Direction	Fa	Da (ft)	Fb	Db	Ecc. (ft)
222	CON	kip	GY	-26.000	5.000	-	-	-
223	CON	kip	GY	-26.000	8.750	-	-	-
225	CON	kip	GY	-26.000	3.000	-	-	-
226	CON	kip	GY	-26.000	6.130	-	-	-
272	UNI	lbf/ft	GY	-252.000	-	-	-	-
273	UNI	lbf/ft	GY	-252.000	-	-	-	-
274	UNI	lbf/ft	GY	-252.000	-	-	-	-
275	UNI	lbf/ft	GY	-252.000	-	-	-	-
276	UNI	lbf/ft	GY	-252.000	-	-	-	-
277	UNI	lbf/ft	GY	-252.000	-	-	-	-
278	UNI	lbf/ft	GY	-252.000	-	-	-	-
279	UNI	lbf/ft	GY	-252.000	-	-	-	-
280	UNI	lbf/ft	GY	-252.000	-	-	-	-
281	UNI	lbf/ft	GY	-252.000	-	-	-	-
282	UNI	lbf/ft	GY	-252.000	-	-	-	-
283	UNI	lbf/ft	GY	-9.000	-	-	-	-
	UNI	lbf/ft	GY	-388.000	-	-	-	-
284	UNI	lbf/ft	GY	-9.000	-	-	-	-
	UNI	lbf/ft	GY	-388.000	-	-	-	-
285	UNI	lbf/ft	GY	-9.000	-	-	-	-
	UNI	lbf/ft	GY	-388.000	-	-	-	-
286	UNI	lbf/ft	GY	-388.000	-	-	-	-
	UNI	lbf/ft	GY	-9.000	-	-	-	-
287	UNI	lbf/ft	GY	-388.000	-	-	-	-
	UNI	lbf/ft	GY	-9.000	-	-	-	-
288	UNI	lbf/ft	GY	-388.000	-	-	-	-
	UNI	lbf/ft	GY	-9.000	-	-	-	-
289	UNI	lbf/ft	GY	-9.000	-	-	-	-
	UNI	lbf/ft	GY	-388.000	-	-	-	-
290	UNI	lbf/ft	GY	-9.000	-	-	-	-
	UNI	lbf/ft	GY	-388.000	-	-	-	-
291	UNI	lbf/ft	GY	-9.000	-	-	-	-
	UNI	lbf/ft	GY	-388.000	-	-	-	-
292	UNI	lbf/ft	GY	-9.000	-	-	-	-
	UNI	lbf/ft	GY	-388.000	-	-	-	-
293	UNI	lbf/ft	GY	-388.000	-	-	-	-
	UNI	lbf/ft	GY	-9.000	-	-	-	-
294	UNI	lbf/ft	GY	-631.000	-	-	-	-
295	UNI	lbf/ft	GY	-631.000	-	-	-	-
296	UNI	lbf/ft	GY	-631.000	-	-	-	-
297	UNI	lbf/ft	GY	-631.000	-	-	-	-
298	UNI	lbf/ft	GY	-631.000	-	-	-	-
299	UNI	lbf/ft	GY	-631.000	-	-	-	-
300	UNI	lbf/ft	GY	-631.000	-	-	-	-
301	UNI	lbf/ft	GY	-631.000	-	-	-	-

MRussell

Job No 287366	Sheet No 67	Rev
Software licensed to Hatch Mott MacDonald	Part	
Job Title 2012 Bridge Load Ratings	Ref CUY-17-0283	
	By MARussell	Date 29-Oct-12 Chd
Client Ohio DOT	File 1802046.std	Date/Time 14-Feb-2013 16:08

Beam Loads : 10 LANE LOADS Cont...

Beam	Type		Direction	Fa	Da (ft)	Fb	Db	Ecc. (ft)
302	UNI	lbf/ft	GY	-631.000	-	-	-	-
303	UNI	lbf/ft	GY	-631.000	-	-	-	-
304	UNI	lbf/ft	GY	-631.000	-	-	-	-
305	UNI	lbf/ft	GY	-424.000	-	-	-	-
306	UNI	lbf/ft	GY	-424.000	-	-	-	-
307	UNI	lbf/ft	GY	-424.000	-	-	-	-
308	UNI	lbf/ft	GY	-424.000	-	-	-	-
309	UNI	lbf/ft	GY	-424.000	-	-	-	-
310	UNI	lbf/ft	GY	-424.000	-	-	-	-
311	UNI	lbf/ft	GY	-424.000	-	-	-	-
312	UNI	lbf/ft	GY	-424.000	-	-	-	-
313	UNI	lbf/ft	GY	-424.000	-	-	-	-
314	UNI	lbf/ft	GY	-424.000	-	-	-	-
315	UNI	lbf/ft	GY	-424.000	-	-	-	-
316	UNI	lbf/ft	GY	-198.000	-	-	-	-
	UNI	lbf/ft	GY	-216.000	-	-	-	-
317	UNI	lbf/ft	GY	-198.000	-	-	-	-
	UNI	lbf/ft	GY	-216.000	-	-	-	-
318	UNI	lbf/ft	GY	-216.000	-	-	-	-
	UNI	lbf/ft	GY	-198.000	-	-	-	-
319	UNI	lbf/ft	GY	-198.000	-	-	-	-
	UNI	lbf/ft	GY	-216.000	-	-	-	-
320	UNI	lbf/ft	GY	-198.000	-	-	-	-
	UNI	lbf/ft	GY	-216.000	-	-	-	-
321	UNI	lbf/ft	GY	-216.000	-	-	-	-
	UNI	lbf/ft	GY	-198.000	-	-	-	-
322	UNI	lbf/ft	GY	-216.000	-	-	-	-
	UNI	lbf/ft	GY	-198.000	-	-	-	-
323	UNI	lbf/ft	GY	-216.000	-	-	-	-
	UNI	lbf/ft	GY	-198.000	-	-	-	-
324	UNI	lbf/ft	GY	-216.000	-	-	-	-
	UNI	lbf/ft	GY	-198.000	-	-	-	-
325	UNI	lbf/ft	GY	-198.000	-	-	-	-
	UNI	lbf/ft	GY	-216.000	-	-	-	-
326	UNI	lbf/ft	GY	-216.000	-	-	-	-
	UNI	lbf/ft	GY	-198.000	-	-	-	-
327	UNI	lbf/ft	GY	-442.000	-	-	-	-
328	UNI	lbf/ft	GY	-442.000	-	-	-	-
329	UNI	lbf/ft	GY	-442.000	-	-	-	-
330	UNI	lbf/ft	GY	-442.000	-	-	-	-
331	UNI	lbf/ft	GY	-442.000	-	-	-	-
332	UNI	lbf/ft	GY	-442.000	-	-	-	-
333	UNI	lbf/ft	GY	-442.000	-	-	-	-
334	UNI	lbf/ft	GY	-442.000	-	-	-	-
335	UNI	lbf/ft	GY	-442.000	-	-	-	-

Beam Loads : 10 LANE LOADS Cont...

Beam	Type		Direction	Fa	Da (ft)	Fb	Db	Ecc. (ft)
336	UNI	lbf/ft	GY	-442.000	-	-	-	-
337	UNI	lbf/ft	GY	-442.000	-	-	-	-

MRussell

Job No 287366	Sheet No 69	Rev
Software licensed to Hatch Mott MacDonald	Part	
Job Title 2012 Bridge Load Ratings	Ref CUY-17-0283	
	By MARussell	Date 29-Oct-12 Chd
Client Ohio DOT	File 1802046.std	Date/Time 14-Feb-2013 16:08

Beam Loads : 11 LANE LOADS

Beam	Type		Direction	Fa	Da (ft)	Fb	Db	Ecc. (ft)
230	CON	kip	GY	-26.000	5.000	-	-	-
231	CON	kip	GY	-26.000	8.750	-	-	-
233	CON	kip	GY	-26.000	3.000	-	-	-
234	CON	kip	GY	-26.000	6.130	-	-	-
272	UNI	lbf/ft	GY	-252.000	-	-	-	-
273	UNI	lbf/ft	GY	-252.000	-	-	-	-
274	UNI	lbf/ft	GY	-252.000	-	-	-	-
275	UNI	lbf/ft	GY	-252.000	-	-	-	-
276	UNI	lbf/ft	GY	-252.000	-	-	-	-
277	UNI	lbf/ft	GY	-252.000	-	-	-	-
278	UNI	lbf/ft	GY	-252.000	-	-	-	-
279	UNI	lbf/ft	GY	-252.000	-	-	-	-
280	UNI	lbf/ft	GY	-252.000	-	-	-	-
281	UNI	lbf/ft	GY	-252.000	-	-	-	-
282	UNI	lbf/ft	GY	-252.000	-	-	-	-
283	UNI	lbf/ft	GY	-9.000	-	-	-	-
	UNI	lbf/ft	GY	-388.000	-	-	-	-
284	UNI	lbf/ft	GY	-9.000	-	-	-	-
	UNI	lbf/ft	GY	-388.000	-	-	-	-
285	UNI	lbf/ft	GY	-9.000	-	-	-	-
	UNI	lbf/ft	GY	-388.000	-	-	-	-
286	UNI	lbf/ft	GY	-388.000	-	-	-	-
	UNI	lbf/ft	GY	-9.000	-	-	-	-
287	UNI	lbf/ft	GY	-388.000	-	-	-	-
	UNI	lbf/ft	GY	-9.000	-	-	-	-
288	UNI	lbf/ft	GY	-388.000	-	-	-	-
	UNI	lbf/ft	GY	-9.000	-	-	-	-
289	UNI	lbf/ft	GY	-9.000	-	-	-	-
	UNI	lbf/ft	GY	-388.000	-	-	-	-
290	UNI	lbf/ft	GY	-9.000	-	-	-	-
	UNI	lbf/ft	GY	-388.000	-	-	-	-
291	UNI	lbf/ft	GY	-9.000	-	-	-	-
	UNI	lbf/ft	GY	-388.000	-	-	-	-
292	UNI	lbf/ft	GY	-9.000	-	-	-	-
	UNI	lbf/ft	GY	-388.000	-	-	-	-
293	UNI	lbf/ft	GY	-388.000	-	-	-	-
	UNI	lbf/ft	GY	-9.000	-	-	-	-
294	UNI	lbf/ft	GY	-631.000	-	-	-	-
295	UNI	lbf/ft	GY	-631.000	-	-	-	-
296	UNI	lbf/ft	GY	-631.000	-	-	-	-
297	UNI	lbf/ft	GY	-631.000	-	-	-	-
298	UNI	lbf/ft	GY	-631.000	-	-	-	-
299	UNI	lbf/ft	GY	-631.000	-	-	-	-
300	UNI	lbf/ft	GY	-631.000	-	-	-	-
301	UNI	lbf/ft	GY	-631.000	-	-	-	-

MRussell

Software licensed to Hatch Mott MacDonald	Job No 287366	Sheet No 70	Rev
	Part		
Job Title 2012 Bridge Load Ratings	Ref CUY-17-0283		
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Client Ohio DOT	File 1802046.std	Date/Time 14-Feb-2013 16:08	

Beam Loads : 11 LANE LOADS Cont...

Beam	Type		Direction	Fa	Da (ft)	Fb	Db	Ecc. (ft)
302	UNI	lbf/ft	GY	-631.000	-	-	-	-
303	UNI	lbf/ft	GY	-631.000	-	-	-	-
304	UNI	lbf/ft	GY	-631.000	-	-	-	-
305	UNI	lbf/ft	GY	-424.000	-	-	-	-
306	UNI	lbf/ft	GY	-424.000	-	-	-	-
307	UNI	lbf/ft	GY	-424.000	-	-	-	-
308	UNI	lbf/ft	GY	-424.000	-	-	-	-
309	UNI	lbf/ft	GY	-424.000	-	-	-	-
310	UNI	lbf/ft	GY	-424.000	-	-	-	-
311	UNI	lbf/ft	GY	-424.000	-	-	-	-
312	UNI	lbf/ft	GY	-424.000	-	-	-	-
313	UNI	lbf/ft	GY	-424.000	-	-	-	-
314	UNI	lbf/ft	GY	-424.000	-	-	-	-
315	UNI	lbf/ft	GY	-424.000	-	-	-	-
316	UNI	lbf/ft	GY	-198.000	-	-	-	-
	UNI	lbf/ft	GY	-216.000	-	-	-	-
317	UNI	lbf/ft	GY	-198.000	-	-	-	-
	UNI	lbf/ft	GY	-216.000	-	-	-	-
318	UNI	lbf/ft	GY	-216.000	-	-	-	-
	UNI	lbf/ft	GY	-198.000	-	-	-	-
319	UNI	lbf/ft	GY	-198.000	-	-	-	-
	UNI	lbf/ft	GY	-216.000	-	-	-	-
320	UNI	lbf/ft	GY	-198.000	-	-	-	-
	UNI	lbf/ft	GY	-216.000	-	-	-	-
321	UNI	lbf/ft	GY	-216.000	-	-	-	-
	UNI	lbf/ft	GY	-198.000	-	-	-	-
322	UNI	lbf/ft	GY	-216.000	-	-	-	-
	UNI	lbf/ft	GY	-198.000	-	-	-	-
323	UNI	lbf/ft	GY	-216.000	-	-	-	-
	UNI	lbf/ft	GY	-198.000	-	-	-	-
324	UNI	lbf/ft	GY	-216.000	-	-	-	-
	UNI	lbf/ft	GY	-198.000	-	-	-	-
325	UNI	lbf/ft	GY	-198.000	-	-	-	-
	UNI	lbf/ft	GY	-216.000	-	-	-	-
326	UNI	lbf/ft	GY	-216.000	-	-	-	-
	UNI	lbf/ft	GY	-198.000	-	-	-	-
327	UNI	lbf/ft	GY	-442.000	-	-	-	-
328	UNI	lbf/ft	GY	-442.000	-	-	-	-
329	UNI	lbf/ft	GY	-442.000	-	-	-	-
330	UNI	lbf/ft	GY	-442.000	-	-	-	-
331	UNI	lbf/ft	GY	-442.000	-	-	-	-
332	UNI	lbf/ft	GY	-442.000	-	-	-	-
333	UNI	lbf/ft	GY	-442.000	-	-	-	-
334	UNI	lbf/ft	GY	-442.000	-	-	-	-
335	UNI	lbf/ft	GY	-442.000	-	-	-	-

Beam Loads : 11 LANE LOADS Cont...

Beam	Type		Direction	Fa	Da (ft)	Fb	Db	Ecc. (ft)
336	UNI	lbf/ft	GY	-442.000	-	-	-	-
337	UNI	lbf/ft	GY	-442.000	-	-	-	-

Beam Loads : 12 LANE LOADS

Beam	Type		Direction	Fa	Da (ft)	Fb	Db	Ecc. (ft)
238	CON	kip	GY	-26.000	5.000	-	-	-
239	CON	kip	GY	-26.000	8.750	-	-	-
241	CON	kip	GY	-26.000	3.000	-	-	-
242	CON	kip	GY	-26.000	6.130	-	-	-
272	UNI	lbf/ft	GY	-252.000	-	-	-	-
273	UNI	lbf/ft	GY	-252.000	-	-	-	-
274	UNI	lbf/ft	GY	-252.000	-	-	-	-
275	UNI	lbf/ft	GY	-252.000	-	-	-	-
276	UNI	lbf/ft	GY	-252.000	-	-	-	-
277	UNI	lbf/ft	GY	-252.000	-	-	-	-
278	UNI	lbf/ft	GY	-252.000	-	-	-	-
279	UNI	lbf/ft	GY	-252.000	-	-	-	-
280	UNI	lbf/ft	GY	-252.000	-	-	-	-
281	UNI	lbf/ft	GY	-252.000	-	-	-	-
282	UNI	lbf/ft	GY	-252.000	-	-	-	-
283	UNI	lbf/ft	GY	-9.000	-	-	-	-
	UNI	lbf/ft	GY	-388.000	-	-	-	-
284	UNI	lbf/ft	GY	-9.000	-	-	-	-
	UNI	lbf/ft	GY	-388.000	-	-	-	-
285	UNI	lbf/ft	GY	-9.000	-	-	-	-
	UNI	lbf/ft	GY	-388.000	-	-	-	-
286	UNI	lbf/ft	GY	-388.000	-	-	-	-
	UNI	lbf/ft	GY	-9.000	-	-	-	-
287	UNI	lbf/ft	GY	-388.000	-	-	-	-
	UNI	lbf/ft	GY	-9.000	-	-	-	-
288	UNI	lbf/ft	GY	-388.000	-	-	-	-
	UNI	lbf/ft	GY	-9.000	-	-	-	-
289	UNI	lbf/ft	GY	-9.000	-	-	-	-
	UNI	lbf/ft	GY	-388.000	-	-	-	-
290	UNI	lbf/ft	GY	-9.000	-	-	-	-
	UNI	lbf/ft	GY	-388.000	-	-	-	-
291	UNI	lbf/ft	GY	-9.000	-	-	-	-
	UNI	lbf/ft	GY	-388.000	-	-	-	-
292	UNI	lbf/ft	GY	-9.000	-	-	-	-
	UNI	lbf/ft	GY	-388.000	-	-	-	-
293	UNI	lbf/ft	GY	-388.000	-	-	-	-
	UNI	lbf/ft	GY	-9.000	-	-	-	-
294	UNI	lbf/ft	GY	-631.000	-	-	-	-
295	UNI	lbf/ft	GY	-631.000	-	-	-	-
296	UNI	lbf/ft	GY	-631.000	-	-	-	-
297	UNI	lbf/ft	GY	-631.000	-	-	-	-
298	UNI	lbf/ft	GY	-631.000	-	-	-	-
299	UNI	lbf/ft	GY	-631.000	-	-	-	-
300	UNI	lbf/ft	GY	-631.000	-	-	-	-
301	UNI	lbf/ft	GY	-631.000	-	-	-	-

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Software licensed to Hatch Mott MacDonald	Job No 287366	Sheet No 73	Rev
	Part		
Job Title 2012 Bridge Load Ratings	Ref CUY-17-0283		
	By MARussell	Date 29-Oct-12	Chd
Client Ohio DOT	File 1802046.std	Date/Time 14-Feb-2013 16:08	

Beam Loads : 12 LANE LOADS Cont...

Beam	Type		Direction	Fa	Da (ft)	Fb	Db	Ecc. (ft)
302	UNI	lbf/ft	GY	-631.000	-	-	-	-
303	UNI	lbf/ft	GY	-631.000	-	-	-	-
304	UNI	lbf/ft	GY	-631.000	-	-	-	-
305	UNI	lbf/ft	GY	-424.000	-	-	-	-
306	UNI	lbf/ft	GY	-424.000	-	-	-	-
307	UNI	lbf/ft	GY	-424.000	-	-	-	-
308	UNI	lbf/ft	GY	-424.000	-	-	-	-
309	UNI	lbf/ft	GY	-424.000	-	-	-	-
310	UNI	lbf/ft	GY	-424.000	-	-	-	-
311	UNI	lbf/ft	GY	-424.000	-	-	-	-
312	UNI	lbf/ft	GY	-424.000	-	-	-	-
313	UNI	lbf/ft	GY	-424.000	-	-	-	-
314	UNI	lbf/ft	GY	-424.000	-	-	-	-
315	UNI	lbf/ft	GY	-424.000	-	-	-	-
316	UNI	lbf/ft	GY	-198.000	-	-	-	-
	UNI	lbf/ft	GY	-216.000	-	-	-	-
317	UNI	lbf/ft	GY	-198.000	-	-	-	-
	UNI	lbf/ft	GY	-216.000	-	-	-	-
318	UNI	lbf/ft	GY	-216.000	-	-	-	-
	UNI	lbf/ft	GY	-198.000	-	-	-	-
319	UNI	lbf/ft	GY	-198.000	-	-	-	-
	UNI	lbf/ft	GY	-216.000	-	-	-	-
320	UNI	lbf/ft	GY	-198.000	-	-	-	-
	UNI	lbf/ft	GY	-216.000	-	-	-	-
321	UNI	lbf/ft	GY	-216.000	-	-	-	-
	UNI	lbf/ft	GY	-198.000	-	-	-	-
322	UNI	lbf/ft	GY	-216.000	-	-	-	-
	UNI	lbf/ft	GY	-198.000	-	-	-	-
323	UNI	lbf/ft	GY	-216.000	-	-	-	-
	UNI	lbf/ft	GY	-198.000	-	-	-	-
324	UNI	lbf/ft	GY	-216.000	-	-	-	-
	UNI	lbf/ft	GY	-198.000	-	-	-	-
325	UNI	lbf/ft	GY	-198.000	-	-	-	-
	UNI	lbf/ft	GY	-216.000	-	-	-	-
326	UNI	lbf/ft	GY	-216.000	-	-	-	-
	UNI	lbf/ft	GY	-198.000	-	-	-	-
327	UNI	lbf/ft	GY	-442.000	-	-	-	-
328	UNI	lbf/ft	GY	-442.000	-	-	-	-
329	UNI	lbf/ft	GY	-442.000	-	-	-	-
330	UNI	lbf/ft	GY	-442.000	-	-	-	-
331	UNI	lbf/ft	GY	-442.000	-	-	-	-
332	UNI	lbf/ft	GY	-442.000	-	-	-	-
333	UNI	lbf/ft	GY	-442.000	-	-	-	-
334	UNI	lbf/ft	GY	-442.000	-	-	-	-
335	UNI	lbf/ft	GY	-442.000	-	-	-	-

Beam Loads : 12 LANE LOADS Cont...

Beam	Type		Direction	Fa	Da (ft)	Fb	Db	Ecc. (ft)
336	UNI	lbf/ft	GY	-442.000	-	-	-	-
337	UNI	lbf/ft	GY	-442.000	-	-	-	-

Beam Loads : 13 LANE LOADS

Beam	Type		Direction	Fa	Da (ft)	Fb	Db	Ecc. (ft)
246	CON	kip	GY	-26.000	5.000	-	-	-
247	CON	kip	GY	-26.000	8.750	-	-	-
249	CON	kip	GY	-26.000	3.000	-	-	-
250	CON	kip	GY	-26.000	6.130	-	-	-
272	UNI	lbf/ft	GY	-252.000	-	-	-	-
273	UNI	lbf/ft	GY	-252.000	-	-	-	-
274	UNI	lbf/ft	GY	-252.000	-	-	-	-
275	UNI	lbf/ft	GY	-252.000	-	-	-	-
276	UNI	lbf/ft	GY	-252.000	-	-	-	-
277	UNI	lbf/ft	GY	-252.000	-	-	-	-
278	UNI	lbf/ft	GY	-252.000	-	-	-	-
279	UNI	lbf/ft	GY	-252.000	-	-	-	-
280	UNI	lbf/ft	GY	-252.000	-	-	-	-
281	UNI	lbf/ft	GY	-252.000	-	-	-	-
282	UNI	lbf/ft	GY	-252.000	-	-	-	-
283	UNI	lbf/ft	GY	-9.000	-	-	-	-
	UNI	lbf/ft	GY	-388.000	-	-	-	-
284	UNI	lbf/ft	GY	-9.000	-	-	-	-
	UNI	lbf/ft	GY	-388.000	-	-	-	-
285	UNI	lbf/ft	GY	-9.000	-	-	-	-
	UNI	lbf/ft	GY	-388.000	-	-	-	-
286	UNI	lbf/ft	GY	-388.000	-	-	-	-
	UNI	lbf/ft	GY	-9.000	-	-	-	-
287	UNI	lbf/ft	GY	-388.000	-	-	-	-
	UNI	lbf/ft	GY	-9.000	-	-	-	-
288	UNI	lbf/ft	GY	-388.000	-	-	-	-
	UNI	lbf/ft	GY	-9.000	-	-	-	-
289	UNI	lbf/ft	GY	-9.000	-	-	-	-
	UNI	lbf/ft	GY	-388.000	-	-	-	-
290	UNI	lbf/ft	GY	-9.000	-	-	-	-
	UNI	lbf/ft	GY	-388.000	-	-	-	-
291	UNI	lbf/ft	GY	-9.000	-	-	-	-
	UNI	lbf/ft	GY	-388.000	-	-	-	-
292	UNI	lbf/ft	GY	-9.000	-	-	-	-
	UNI	lbf/ft	GY	-388.000	-	-	-	-
293	UNI	lbf/ft	GY	-388.000	-	-	-	-
	UNI	lbf/ft	GY	-9.000	-	-	-	-
294	UNI	lbf/ft	GY	-631.000	-	-	-	-
295	UNI	lbf/ft	GY	-631.000	-	-	-	-
296	UNI	lbf/ft	GY	-631.000	-	-	-	-
297	UNI	lbf/ft	GY	-631.000	-	-	-	-
298	UNI	lbf/ft	GY	-631.000	-	-	-	-
299	UNI	lbf/ft	GY	-631.000	-	-	-	-
300	UNI	lbf/ft	GY	-631.000	-	-	-	-
301	UNI	lbf/ft	GY	-631.000	-	-	-	-

Beam Loads : 13 LANE LOADS Cont...

Beam	Type		Direction	Fa	Da (ft)	Fb	Db	Ecc. (ft)
302	UNI	lbf/ft	GY	-631.000	-	-	-	-
303	UNI	lbf/ft	GY	-631.000	-	-	-	-
304	UNI	lbf/ft	GY	-631.000	-	-	-	-
305	UNI	lbf/ft	GY	-424.000	-	-	-	-
306	UNI	lbf/ft	GY	-424.000	-	-	-	-
307	UNI	lbf/ft	GY	-424.000	-	-	-	-
308	UNI	lbf/ft	GY	-424.000	-	-	-	-
309	UNI	lbf/ft	GY	-424.000	-	-	-	-
310	UNI	lbf/ft	GY	-424.000	-	-	-	-
311	UNI	lbf/ft	GY	-424.000	-	-	-	-
312	UNI	lbf/ft	GY	-424.000	-	-	-	-
313	UNI	lbf/ft	GY	-424.000	-	-	-	-
314	UNI	lbf/ft	GY	-424.000	-	-	-	-
315	UNI	lbf/ft	GY	-424.000	-	-	-	-
316	UNI	lbf/ft	GY	-198.000	-	-	-	-
	UNI	lbf/ft	GY	-216.000	-	-	-	-
317	UNI	lbf/ft	GY	-198.000	-	-	-	-
	UNI	lbf/ft	GY	-216.000	-	-	-	-
318	UNI	lbf/ft	GY	-216.000	-	-	-	-
	UNI	lbf/ft	GY	-198.000	-	-	-	-
319	UNI	lbf/ft	GY	-198.000	-	-	-	-
	UNI	lbf/ft	GY	-216.000	-	-	-	-
320	UNI	lbf/ft	GY	-198.000	-	-	-	-
	UNI	lbf/ft	GY	-216.000	-	-	-	-
321	UNI	lbf/ft	GY	-216.000	-	-	-	-
	UNI	lbf/ft	GY	-198.000	-	-	-	-
322	UNI	lbf/ft	GY	-216.000	-	-	-	-
	UNI	lbf/ft	GY	-198.000	-	-	-	-
323	UNI	lbf/ft	GY	-216.000	-	-	-	-
	UNI	lbf/ft	GY	-198.000	-	-	-	-
324	UNI	lbf/ft	GY	-216.000	-	-	-	-
	UNI	lbf/ft	GY	-198.000	-	-	-	-
325	UNI	lbf/ft	GY	-198.000	-	-	-	-
	UNI	lbf/ft	GY	-216.000	-	-	-	-
326	UNI	lbf/ft	GY	-216.000	-	-	-	-
	UNI	lbf/ft	GY	-198.000	-	-	-	-
327	UNI	lbf/ft	GY	-442.000	-	-	-	-
328	UNI	lbf/ft	GY	-442.000	-	-	-	-
329	UNI	lbf/ft	GY	-442.000	-	-	-	-
330	UNI	lbf/ft	GY	-442.000	-	-	-	-
331	UNI	lbf/ft	GY	-442.000	-	-	-	-
332	UNI	lbf/ft	GY	-442.000	-	-	-	-
333	UNI	lbf/ft	GY	-442.000	-	-	-	-
334	UNI	lbf/ft	GY	-442.000	-	-	-	-
335	UNI	lbf/ft	GY	-442.000	-	-	-	-

Beam Loads : 13 LANE LOADS Cont...

Beam	Type		Direction	Fa	Da (ft)	Fb	Db	Ecc. (ft)
336	UNI	lbf/ft	GY	-442.000	-	-	-	-
337	UNI	lbf/ft	GY	-442.000	-	-	-	-

Moving Loads: Loads 14 to 33

	Initial Position			Increment			
Type	X (ft)	Y (ft)	Z (ft)	X (ft)	Y (ft)	Z (ft)	Range (ft)
1	-90.000	64.260	25.000	7.500	-	-	-
1	-90.000	64.260	13.000	7.500	-	-	-
1	-90.000	64.260	1.000	7.500	-	-	-
1	-90.000	64.260	-11.000	7.500	-	-	-

Moving Loads: Loads 34 to 53

There is no data of this type - Analysis results are not available

Moving Loads: Loads 54 to 73

There is no data of this type - Analysis results are not available

Moving Loads: Loads 74 to 93

There is no data of this type - Analysis results are not available

Moving Loads: Loads 94 to 113

There is no data of this type - Analysis results are not available

Moving Loads: Loads 114 to 133

There is no data of this type - Analysis results are not available

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Software licensed to Hatch Mott MacDonald		Job No 287366	Sheet No 78	Rev
		Part		
Job Title 2012 Bridge Load Ratings		Ref CUY-17-0283		
		By MARussell	Date 29-Oct-12	Chd
Client Ohio DOT		File 1802046.std	Date/Time 14-Feb-2013 16:08	

Combination Load Cases

Comb.	Combination L/C Name	Primary	Primary L/C Name	Factor
201	COMBINATION LOAD CASE 201	1	DEAD LOADS	1.00
		2	SIDEWALK LOADS	1.30
		3	LANE LOADS	2.17
202	COMBINATION LOAD CASE 202	1	DEAD LOADS	1.00
		2	SIDEWALK LOADS	1.30
		4	LANE LOADS	2.17
203	COMBINATION LOAD CASE 203	1	DEAD LOADS	1.00
		2	SIDEWALK LOADS	1.30
		5	LANE LOADS	2.17
204	COMBINATION LOAD CASE 204	1	DEAD LOADS	1.00
		2	SIDEWALK LOADS	1.30
		6	LANE LOADS	2.17
205	COMBINATION LOAD CASE 205	1	DEAD LOADS	1.00
		2	SIDEWALK LOADS	1.30
		7	LANE LOADS	2.17
206	COMBINATION LOAD CASE 206	1	DEAD LOADS	1.00
		2	SIDEWALK LOADS	1.30
		8	LANE LOADS	2.17
207	COMBINATION LOAD CASE 207	1	DEAD LOADS	1.00
		2	SIDEWALK LOADS	1.30
		9	LANE LOADS	2.17
208	COMBINATION LOAD CASE 208	1	DEAD LOADS	1.00
		2	SIDEWALK LOADS	1.30
		10	LANE LOADS	2.17
209	COMBINATION LOAD CASE 209	1	DEAD LOADS	1.00
		2	SIDEWALK LOADS	1.30
		11	LANE LOADS	2.17
210	COMBINATION LOAD CASE 210	1	DEAD LOADS	1.00
		2	SIDEWALK LOADS	1.30
		12	LANE LOADS	2.17
211	COMBINATION LOAD CASE 211	1	DEAD LOADS	1.00
		2	SIDEWALK LOADS	1.30
		13	LANE LOADS	2.17
221	COMBINATION LOAD CASE 221	1	DEAD LOADS	1.00
		2	SIDEWALK LOADS	1.30
		14	LOAD GENERATION, LOAD #14, (1 of 20)	2.17
222	COMBINATION LOAD CASE 222	1	DEAD LOADS	1.00
		2	SIDEWALK LOADS	1.30
		15	LOAD GENERATION, LOAD #15, (2 of 20)	2.17
223	COMBINATION LOAD CASE 223	1	DEAD LOADS	1.00
		2	SIDEWALK LOADS	1.30
		16	LOAD GENERATION, LOAD #16, (3 of 20)	2.17
224	COMBINATION LOAD CASE 224	1	DEAD LOADS	1.00
		2	SIDEWALK LOADS	1.30
		17	LOAD GENERATION, LOAD #17, (4 of 20)	2.17

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Combination Load Cases Cont...

Comb.	Combination L/C Name	Primary	Primary L/C Name	Factor
225	COMBINATION LOAD CASE 225	1	DEAD LOADS	1.00
		2	SIDEWALK LOADS	1.30
		18	LOAD GENERATION, LOAD #18, (5 of 20)	2.17
226	COMBINATION LOAD CASE 226	1	DEAD LOADS	1.00
		2	SIDEWALK LOADS	1.30
		19	LOAD GENERATION, LOAD #19, (6 of 20)	2.17
227	COMBINATION LOAD CASE 227	1	DEAD LOADS	1.00
		2	SIDEWALK LOADS	1.30
		20	LOAD GENERATION, LOAD #20, (7 of 20)	2.17
228	COMBINATION LOAD CASE 228	1	DEAD LOADS	1.00
		2	SIDEWALK LOADS	1.30
		21	LOAD GENERATION, LOAD #21, (8 of 20)	2.17
229	COMBINATION LOAD CASE 229	1	DEAD LOADS	1.00
		2	SIDEWALK LOADS	1.30
		22	LOAD GENERATION, LOAD #22, (9 of 20)	2.17
230	COMBINATION LOAD CASE 230	1	DEAD LOADS	1.00
		2	SIDEWALK LOADS	1.30
		23	LOAD GENERATION, LOAD #23, (10 of 2(	2.17
231	COMBINATION LOAD CASE 231	1	DEAD LOADS	1.00
		2	SIDEWALK LOADS	1.30
		24	LOAD GENERATION, LOAD #24, (11 of 2(	2.17
232	COMBINATION LOAD CASE 232	1	DEAD LOADS	1.00
		2	SIDEWALK LOADS	1.30
		25	LOAD GENERATION, LOAD #25, (12 of 2(	2.17
233	COMBINATION LOAD CASE 233	1	DEAD LOADS	1.00
		2	SIDEWALK LOADS	1.30
		26	LOAD GENERATION, LOAD #26, (13 of 2(	2.17
234	COMBINATION LOAD CASE 234	1	DEAD LOADS	1.00
		2	SIDEWALK LOADS	1.30
		27	LOAD GENERATION, LOAD #27, (14 of 2(	2.17
235	COMBINATION LOAD CASE 235	1	DEAD LOADS	1.00
		2	SIDEWALK LOADS	1.30
		28	LOAD GENERATION, LOAD #28, (15 of 2(	2.17
236	COMBINATION LOAD CASE 236	1	DEAD LOADS	1.00
		2	SIDEWALK LOADS	1.30
		29	LOAD GENERATION, LOAD #29, (16 of 2(	2.17
237	COMBINATION LOAD CASE 237	1	DEAD LOADS	1.00
		2	SIDEWALK LOADS	1.30
		30	LOAD GENERATION, LOAD #30, (17 of 2(	2.17
238	COMBINATION LOAD CASE 238	1	DEAD LOADS	1.00
		2	SIDEWALK LOADS	1.30
		31	LOAD GENERATION, LOAD #31, (18 of 2(	2.17
239	COMBINATION LOAD CASE 239	1	DEAD LOADS	1.00
		2	SIDEWALK LOADS	1.30
		32	LOAD GENERATION, LOAD #32, (19 of 2(	2.17

Combination Load Cases Cont...

Comb.	Combination L/C Name	Primary	Primary L/C Name	Factor
240	COMBINATION LOAD CASE 240	1	DEAD LOADS	1.00
		2	SIDEWALK LOADS	1.30
		33	LOAD GENERATION, LOAD #33, (20 of 2(	2.17
241	COMBINATION LOAD CASE 241	1	DEAD LOADS	1.00
		2	SIDEWALK LOADS	1.30
		34	LOAD GENERATION, LOAD #34, (1 of 20)	2.17
242	COMBINATION LOAD CASE 242	1	DEAD LOADS	1.00
		2	SIDEWALK LOADS	1.30
		35	LOAD GENERATION, LOAD #35, (2 of 20)	2.17
243	COMBINATION LOAD CASE 243	1	DEAD LOADS	1.00
		2	SIDEWALK LOADS	1.30
		36	LOAD GENERATION, LOAD #36, (3 of 20)	2.17
244	COMBINATION LOAD CASE 244	1	DEAD LOADS	1.00
		2	SIDEWALK LOADS	1.30
		37	LOAD GENERATION, LOAD #37, (4 of 20)	2.17
245	COMBINATION LOAD CASE 245	1	DEAD LOADS	1.00
		2	SIDEWALK LOADS	1.30
		38	LOAD GENERATION, LOAD #38, (5 of 20)	2.17
246	COMBINATION LOAD CASE 246	1	DEAD LOADS	1.00
		2	SIDEWALK LOADS	1.30
		39	LOAD GENERATION, LOAD #39, (6 of 20)	2.17
247	COMBINATION LOAD CASE 247	1	DEAD LOADS	1.00
		2	SIDEWALK LOADS	1.30
		40	LOAD GENERATION, LOAD #40, (7 of 20)	2.17
248	COMBINATION LOAD CASE 248	1	DEAD LOADS	1.00
		2	SIDEWALK LOADS	1.30
		41	LOAD GENERATION, LOAD #41, (8 of 20)	2.17
249	COMBINATION LOAD CASE 249	1	DEAD LOADS	1.00
		2	SIDEWALK LOADS	1.30
		42	LOAD GENERATION, LOAD #42, (9 of 20)	2.17
250	COMBINATION LOAD CASE 250	1	DEAD LOADS	1.00
		2	SIDEWALK LOADS	1.30
		43	LOAD GENERATION, LOAD #43, (10 of 2(	2.17
251	COMBINATION LOAD CASE 251	1	DEAD LOADS	1.00
		2	SIDEWALK LOADS	1.30
		44	LOAD GENERATION, LOAD #44, (11 of 2(	2.17
252	COMBINATION LOAD CASE 252	1	DEAD LOADS	1.00
		2	SIDEWALK LOADS	1.30
		45	LOAD GENERATION, LOAD #45, (12 of 2(	2.17
253	COMBINATION LOAD CASE 253	1	DEAD LOADS	1.00
		2	SIDEWALK LOADS	1.30
		46	LOAD GENERATION, LOAD #46, (13 of 2(	2.17
254	COMBINATION LOAD CASE 254	1	DEAD LOADS	1.00
		2	SIDEWALK LOADS	1.30
		47	LOAD GENERATION, LOAD #47, (14 of 2(	2.17

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Combination Load Cases Cont...

Comb.	Combination L/C Name	Primary	Primary L/C Name	Factor
255	COMBINATION LOAD CASE 255	1	DEAD LOADS	1.00
		2	SIDEWALK LOADS	1.30
		48	LOAD GENERATION, LOAD #48, (15 of 2(	2.17
256	COMBINATION LOAD CASE 256	1	DEAD LOADS	1.00
		2	SIDEWALK LOADS	1.30
		49	LOAD GENERATION, LOAD #49, (16 of 2(	2.17
257	COMBINATION LOAD CASE 257	1	DEAD LOADS	1.00
		2	SIDEWALK LOADS	1.30
		50	LOAD GENERATION, LOAD #50, (17 of 2(	2.17
258	COMBINATION LOAD CASE 258	1	DEAD LOADS	1.00
		2	SIDEWALK LOADS	1.30
		51	LOAD GENERATION, LOAD #51, (18 of 2(	2.17
259	COMBINATION LOAD CASE 259	1	DEAD LOADS	1.00
		2	SIDEWALK LOADS	1.30
		52	LOAD GENERATION, LOAD #52, (19 of 2(	2.17
260	COMBINATION LOAD CASE 260	1	DEAD LOADS	1.00
		2	SIDEWALK LOADS	1.30
		53	LOAD GENERATION, LOAD #53, (20 of 2(	2.17
261	COMBINATION LOAD CASE 261	1	DEAD LOADS	1.00
		2	SIDEWALK LOADS	1.30
		3	LANE LOADS	1.30
262	COMBINATION LOAD CASE 262	1	DEAD LOADS	1.00
		2	SIDEWALK LOADS	1.30
		4	LANE LOADS	1.30
263	COMBINATION LOAD CASE 263	1	DEAD LOADS	1.00
		2	SIDEWALK LOADS	1.30
		5	LANE LOADS	1.30
264	COMBINATION LOAD CASE 264	1	DEAD LOADS	1.00
		2	SIDEWALK LOADS	1.30
		6	LANE LOADS	1.30
265	COMBINATION LOAD CASE 265	1	DEAD LOADS	1.00
		2	SIDEWALK LOADS	1.30
		7	LANE LOADS	1.30
266	COMBINATION LOAD CASE 266	1	DEAD LOADS	1.00
		2	SIDEWALK LOADS	1.30
		8	LANE LOADS	1.30
267	COMBINATION LOAD CASE 267	1	DEAD LOADS	1.00
		2	SIDEWALK LOADS	1.30
		9	LANE LOADS	1.30
268	COMBINATION LOAD CASE 268	1	DEAD LOADS	1.00
		2	SIDEWALK LOADS	1.30
		10	LANE LOADS	1.30
269	COMBINATION LOAD CASE 269	1	DEAD LOADS	1.00
		2	SIDEWALK LOADS	1.30
		11	LANE LOADS	1.30

Combination Load Cases Cont...

Comb.	Combination L/C Name	Primary	Primary L/C Name	Factor
270	COMBINATION LOAD CASE 270	1	DEAD LOADS	1.00
		2	SIDEWALK LOADS	1.30
		12	LANE LOADS	1.30
271	COMBINATION LOAD CASE 271	1	DEAD LOADS	1.00
		2	SIDEWALK LOADS	1.30
		13	LANE LOADS	1.30
281	COMBINATION LOAD CASE 281	1	DEAD LOADS	1.00
		2	SIDEWALK LOADS	1.30
		14	LOAD GENERATION, LOAD #14, (1 of 20)	1.30
282	COMBINATION LOAD CASE 282	1	DEAD LOADS	1.00
		2	SIDEWALK LOADS	1.30
		15	LOAD GENERATION, LOAD #15, (2 of 20)	1.30
283	COMBINATION LOAD CASE 283	1	DEAD LOADS	1.00
		2	SIDEWALK LOADS	1.30
		16	LOAD GENERATION, LOAD #16, (3 of 20)	1.30
284	COMBINATION LOAD CASE 284	1	DEAD LOADS	1.00
		2	SIDEWALK LOADS	1.30
		17	LOAD GENERATION, LOAD #17, (4 of 20)	1.30
285	COMBINATION LOAD CASE 285	1	DEAD LOADS	1.00
		2	SIDEWALK LOADS	1.30
		18	LOAD GENERATION, LOAD #18, (5 of 20)	1.30
286	COMBINATION LOAD CASE 286	1	DEAD LOADS	1.00
		2	SIDEWALK LOADS	1.30
		19	LOAD GENERATION, LOAD #19, (6 of 20)	1.30
287	COMBINATION LOAD CASE 287	1	DEAD LOADS	1.00
		2	SIDEWALK LOADS	1.30
		20	LOAD GENERATION, LOAD #20, (7 of 20)	1.30
288	COMBINATION LOAD CASE 288	1	DEAD LOADS	1.00
		2	SIDEWALK LOADS	1.30
		21	LOAD GENERATION, LOAD #21, (8 of 20)	1.30
289	COMBINATION LOAD CASE 289	1	DEAD LOADS	1.00
		2	SIDEWALK LOADS	1.30
		22	LOAD GENERATION, LOAD #22, (9 of 20)	1.30
290	COMBINATION LOAD CASE 290	1	DEAD LOADS	1.00
		2	SIDEWALK LOADS	1.30
		23	LOAD GENERATION, LOAD #23, (10 of 2(	1.30
291	COMBINATION LOAD CASE 291	1	DEAD LOADS	1.00
		2	SIDEWALK LOADS	1.30
		24	LOAD GENERATION, LOAD #24, (11 of 2(	1.30
292	COMBINATION LOAD CASE 292	1	DEAD LOADS	1.00
		2	SIDEWALK LOADS	1.30
		25	LOAD GENERATION, LOAD #25, (12 of 2(	1.30
293	COMBINATION LOAD CASE 293	1	DEAD LOADS	1.00
		2	SIDEWALK LOADS	1.30
		26	LOAD GENERATION, LOAD #26, (13 of 2(	1.30

Combination Load Cases Cont...

Comb.	Combination L/C Name	Primary	Primary L/C Name	Factor
294	COMBINATION LOAD CASE 294	1	DEAD LOADS	1.00
		2	SIDEWALK LOADS	1.30
		27	LOAD GENERATION, LOAD #27, (14 of 2(	1.30
295	COMBINATION LOAD CASE 295	1	DEAD LOADS	1.00
		2	SIDEWALK LOADS	1.30
		28	LOAD GENERATION, LOAD #28, (15 of 2(	1.30
296	COMBINATION LOAD CASE 296	1	DEAD LOADS	1.00
		2	SIDEWALK LOADS	1.30
		29	LOAD GENERATION, LOAD #29, (16 of 2(	1.30
297	COMBINATION LOAD CASE 297	1	DEAD LOADS	1.00
		2	SIDEWALK LOADS	1.30
		30	LOAD GENERATION, LOAD #30, (17 of 2(	1.30
298	COMBINATION LOAD CASE 298	1	DEAD LOADS	1.00
		2	SIDEWALK LOADS	1.30
		31	LOAD GENERATION, LOAD #31, (18 of 2(	1.30
299	COMBINATION LOAD CASE 299	1	DEAD LOADS	1.00
		2	SIDEWALK LOADS	1.30
		32	LOAD GENERATION, LOAD #32, (19 of 2(	1.30
300	COMBINATION LOAD CASE 300	1	DEAD LOADS	1.00
		2	SIDEWALK LOADS	1.30
		33	LOAD GENERATION, LOAD #33, (20 of 2(	1.30
301	COMBINATION LOAD CASE 301	1	DEAD LOADS	1.00
		2	SIDEWALK LOADS	1.30
		34	LOAD GENERATION, LOAD #34, (1 of 20)	1.30
302	COMBINATION LOAD CASE 302	1	DEAD LOADS	1.00
		2	SIDEWALK LOADS	1.30
		35	LOAD GENERATION, LOAD #35, (2 of 20)	1.30
303	COMBINATION LOAD CASE 303	1	DEAD LOADS	1.00
		2	SIDEWALK LOADS	1.30
		36	LOAD GENERATION, LOAD #36, (3 of 20)	1.30
304	COMBINATION LOAD CASE 304	1	DEAD LOADS	1.00
		2	SIDEWALK LOADS	1.30
		37	LOAD GENERATION, LOAD #37, (4 of 20)	1.30
305	COMBINATION LOAD CASE 305	1	DEAD LOADS	1.00
		2	SIDEWALK LOADS	1.30
		38	LOAD GENERATION, LOAD #38, (5 of 20)	1.30
306	COMBINATION LOAD CASE 306	1	DEAD LOADS	1.00
		2	SIDEWALK LOADS	1.30
		39	LOAD GENERATION, LOAD #39, (6 of 20)	1.30
307	COMBINATION LOAD CASE 307	1	DEAD LOADS	1.00
		2	SIDEWALK LOADS	1.30
		40	LOAD GENERATION, LOAD #40, (7 of 20)	1.30
308	COMBINATION LOAD CASE 308	1	DEAD LOADS	1.00
		2	SIDEWALK LOADS	1.30
		41	LOAD GENERATION, LOAD #41, (8 of 20)	1.30

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Combination Load Cases Cont...

Comb.	Combination L/C Name	Primary	Primary L/C Name	Factor
309	COMBINATION LOAD CASE 309	1	DEAD LOADS	1.00
		2	SIDEWALK LOADS	1.30
		42	LOAD GENERATION, LOAD #42, (9 of 20)	1.30
310	COMBINATION LOAD CASE 310	1	DEAD LOADS	1.00
		2	SIDEWALK LOADS	1.30
		43	LOAD GENERATION, LOAD #43, (10 of 2(	1.30
311	COMBINATION LOAD CASE 311	1	DEAD LOADS	1.00
		2	SIDEWALK LOADS	1.30
		44	LOAD GENERATION, LOAD #44, (11 of 2(	1.30
312	COMBINATION LOAD CASE 312	1	DEAD LOADS	1.00
		2	SIDEWALK LOADS	1.30
		45	LOAD GENERATION, LOAD #45, (12 of 2(	1.30
313	COMBINATION LOAD CASE 313	1	DEAD LOADS	1.00
		2	SIDEWALK LOADS	1.30
		46	LOAD GENERATION, LOAD #46, (13 of 2(	1.30
314	COMBINATION LOAD CASE 314	1	DEAD LOADS	1.00
		2	SIDEWALK LOADS	1.30
		47	LOAD GENERATION, LOAD #47, (14 of 2(	1.30
315	COMBINATION LOAD CASE 315	1	DEAD LOADS	1.00
		2	SIDEWALK LOADS	1.30
		48	LOAD GENERATION, LOAD #48, (15 of 2(	1.30
316	COMBINATION LOAD CASE 316	1	DEAD LOADS	1.00
		2	SIDEWALK LOADS	1.30
		49	LOAD GENERATION, LOAD #49, (16 of 2(	1.30
317	COMBINATION LOAD CASE 317	1	DEAD LOADS	1.00
		2	SIDEWALK LOADS	1.30
		50	LOAD GENERATION, LOAD #50, (17 of 2(	1.30
318	COMBINATION LOAD CASE 318	1	DEAD LOADS	1.00
		2	SIDEWALK LOADS	1.30
		51	LOAD GENERATION, LOAD #51, (18 of 2(	1.30
319	COMBINATION LOAD CASE 319	1	DEAD LOADS	1.00
		2	SIDEWALK LOADS	1.30
		52	LOAD GENERATION, LOAD #52, (19 of 2(	1.30
320	COMBINATION LOAD CASE 320	1	DEAD LOADS	1.00
		2	SIDEWALK LOADS	1.30
		53	LOAD GENERATION, LOAD #53, (20 of 2(	1.30
321	COMBINATION LOAD CASE 321	1	DEAD LOADS	1.00
		2	SIDEWALK LOADS	1.30
		54	LOAD GENERATION, LOAD #54, (1 of 20)	1.30
322	COMBINATION LOAD CASE 322	1	DEAD LOADS	1.00
		2	SIDEWALK LOADS	1.30
		55	LOAD GENERATION, LOAD #55, (2 of 20)	1.30
323	COMBINATION LOAD CASE 323	1	DEAD LOADS	1.00
		2	SIDEWALK LOADS	1.30
		56	LOAD GENERATION, LOAD #56, (3 of 20)	1.30

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Combination Load Cases Cont...

Comb.	Combination L/C Name	Primary	Primary L/C Name	Factor
324	COMBINATION LOAD CASE 324	1	DEAD LOADS	1.00
		2	SIDEWALK LOADS	1.30
		57	LOAD GENERATION, LOAD #57, (4 of 20)	1.30
325	COMBINATION LOAD CASE 325	1	DEAD LOADS	1.00
		2	SIDEWALK LOADS	1.30
		58	LOAD GENERATION, LOAD #58, (5 of 20)	1.30
326	COMBINATION LOAD CASE 326	1	DEAD LOADS	1.00
		2	SIDEWALK LOADS	1.30
		59	LOAD GENERATION, LOAD #59, (6 of 20)	1.30
327	COMBINATION LOAD CASE 327	1	DEAD LOADS	1.00
		2	SIDEWALK LOADS	1.30
		60	LOAD GENERATION, LOAD #60, (7 of 20)	1.30
328	COMBINATION LOAD CASE 328	1	DEAD LOADS	1.00
		2	SIDEWALK LOADS	1.30
		61	LOAD GENERATION, LOAD #61, (8 of 20)	1.30
329	COMBINATION LOAD CASE 329	1	DEAD LOADS	1.00
		2	SIDEWALK LOADS	1.30
		62	LOAD GENERATION, LOAD #62, (9 of 20)	1.30
330	COMBINATION LOAD CASE 330	1	DEAD LOADS	1.00
		2	SIDEWALK LOADS	1.30
		63	LOAD GENERATION, LOAD #63, (10 of 2(	1.30
331	COMBINATION LOAD CASE 331	1	DEAD LOADS	1.00
		2	SIDEWALK LOADS	1.30
		64	LOAD GENERATION, LOAD #64, (11 of 2(	1.30
332	COMBINATION LOAD CASE 332	1	DEAD LOADS	1.00
		2	SIDEWALK LOADS	1.30
		65	LOAD GENERATION, LOAD #65, (12 of 2(	1.30
333	COMBINATION LOAD CASE 333	1	DEAD LOADS	1.00
		2	SIDEWALK LOADS	1.30
		66	LOAD GENERATION, LOAD #66, (13 of 2(	1.30
334	COMBINATION LOAD CASE 334	1	DEAD LOADS	1.00
		2	SIDEWALK LOADS	1.30
		67	LOAD GENERATION, LOAD #67, (14 of 2(	1.30
335	COMBINATION LOAD CASE 335	1	DEAD LOADS	1.00
		2	SIDEWALK LOADS	1.30
		68	LOAD GENERATION, LOAD #68, (15 of 2(	1.30
336	COMBINATION LOAD CASE 336	1	DEAD LOADS	1.00
		2	SIDEWALK LOADS	1.30
		69	LOAD GENERATION, LOAD #69, (16 of 2(	1.30
337	COMBINATION LOAD CASE 337	1	DEAD LOADS	1.00
		2	SIDEWALK LOADS	1.30
		70	LOAD GENERATION, LOAD #70, (17 of 2(	1.30
338	COMBINATION LOAD CASE 338	1	DEAD LOADS	1.00
		2	SIDEWALK LOADS	1.30
		71	LOAD GENERATION, LOAD #71, (18 of 2(	1.30

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Combination Load Cases Cont...

Comb.	Combination L/C Name	Primary	Primary L/C Name	Factor
339	COMBINATION LOAD CASE 339	1	DEAD LOADS	1.00
		2	SIDEWALK LOADS	1.30
		72	LOAD GENERATION, LOAD #72, (19 of 2(	1.30
340	COMBINATION LOAD CASE 340	1	DEAD LOADS	1.00
		2	SIDEWALK LOADS	1.30
		73	LOAD GENERATION, LOAD #73, (20 of 2(	1.30
341	COMBINATION LOAD CASE 341	1	DEAD LOADS	1.00
		2	SIDEWALK LOADS	1.30
		74	LOAD GENERATION, LOAD #74, (1 of 20)	1.30
342	COMBINATION LOAD CASE 342	1	DEAD LOADS	1.00
		2	SIDEWALK LOADS	1.30
		75	LOAD GENERATION, LOAD #75, (2 of 20)	1.30
343	COMBINATION LOAD CASE 343	1	DEAD LOADS	1.00
		2	SIDEWALK LOADS	1.30
		76	LOAD GENERATION, LOAD #76, (3 of 20)	1.30
344	COMBINATION LOAD CASE 344	1	DEAD LOADS	1.00
		2	SIDEWALK LOADS	1.30
		77	LOAD GENERATION, LOAD #77, (4 of 20)	1.30
345	COMBINATION LOAD CASE 345	1	DEAD LOADS	1.00
		2	SIDEWALK LOADS	1.30
		78	LOAD GENERATION, LOAD #78, (5 of 20)	1.30
346	COMBINATION LOAD CASE 346	1	DEAD LOADS	1.00
		2	SIDEWALK LOADS	1.30
		79	LOAD GENERATION, LOAD #79, (6 of 20)	1.30
347	COMBINATION LOAD CASE 347	1	DEAD LOADS	1.00
		2	SIDEWALK LOADS	1.30
		80	LOAD GENERATION, LOAD #80, (7 of 20)	1.30
348	COMBINATION LOAD CASE 348	1	DEAD LOADS	1.00
		2	SIDEWALK LOADS	1.30
		81	LOAD GENERATION, LOAD #81, (8 of 20)	1.30
349	COMBINATION LOAD CASE 349	1	DEAD LOADS	1.00
		2	SIDEWALK LOADS	1.30
		82	LOAD GENERATION, LOAD #82, (9 of 20)	1.30
350	COMBINATION LOAD CASE 350	1	DEAD LOADS	1.00
		2	SIDEWALK LOADS	1.30
		83	LOAD GENERATION, LOAD #83, (10 of 2(	1.30
351	COMBINATION LOAD CASE 351	1	DEAD LOADS	1.00
		2	SIDEWALK LOADS	1.30
		84	LOAD GENERATION, LOAD #84, (11 of 2(	1.30
352	COMBINATION LOAD CASE 352	1	DEAD LOADS	1.00
		2	SIDEWALK LOADS	1.30
		85	LOAD GENERATION, LOAD #85, (12 of 2(	1.30
353	COMBINATION LOAD CASE 353	1	DEAD LOADS	1.00
		2	SIDEWALK LOADS	1.30
		86	LOAD GENERATION, LOAD #86, (13 of 2(	1.30

Combination Load Cases Cont...

Comb.	Combination L/C Name	Primary	Primary L/C Name	Factor
354	COMBINATION LOAD CASE 354	1	DEAD LOADS	1.00
		2	SIDEWALK LOADS	1.30
		87	LOAD GENERATION, LOAD #87, (14 of 2(	1.30
355	COMBINATION LOAD CASE 355	1	DEAD LOADS	1.00
		2	SIDEWALK LOADS	1.30
		88	LOAD GENERATION, LOAD #88, (15 of 2(	1.30
356	COMBINATION LOAD CASE 356	1	DEAD LOADS	1.00
		2	SIDEWALK LOADS	1.30
		89	LOAD GENERATION, LOAD #89, (16 of 2(	1.30
357	COMBINATION LOAD CASE 357	1	DEAD LOADS	1.00
		2	SIDEWALK LOADS	1.30
		90	LOAD GENERATION, LOAD #90, (17 of 2(	1.30
358	COMBINATION LOAD CASE 358	1	DEAD LOADS	1.00
		2	SIDEWALK LOADS	1.30
		91	LOAD GENERATION, LOAD #91, (18 of 2(	1.30
359	COMBINATION LOAD CASE 359	1	DEAD LOADS	1.00
		2	SIDEWALK LOADS	1.30
		92	LOAD GENERATION, LOAD #92, (19 of 2(	1.30
360	COMBINATION LOAD CASE 360	1	DEAD LOADS	1.00
		2	SIDEWALK LOADS	1.30
		93	LOAD GENERATION, LOAD #93, (20 of 2(	1.30
361	COMBINATION LOAD CASE 361	1	DEAD LOADS	1.00
		2	SIDEWALK LOADS	1.30
		94	LOAD GENERATION, LOAD #94, (1 of 20)	1.30
362	COMBINATION LOAD CASE 362	1	DEAD LOADS	1.00
		2	SIDEWALK LOADS	1.30
		95	LOAD GENERATION, LOAD #95, (2 of 20)	1.30
363	COMBINATION LOAD CASE 363	1	DEAD LOADS	1.00
		2	SIDEWALK LOADS	1.30
		96	LOAD GENERATION, LOAD #96, (3 of 20)	1.30
364	COMBINATION LOAD CASE 364	1	DEAD LOADS	1.00
		2	SIDEWALK LOADS	1.30
		97	LOAD GENERATION, LOAD #97, (4 of 20)	1.30
365	COMBINATION LOAD CASE 365	1	DEAD LOADS	1.00
		2	SIDEWALK LOADS	1.30
		98	LOAD GENERATION, LOAD #98, (5 of 20)	1.30
366	COMBINATION LOAD CASE 366	1	DEAD LOADS	1.00
		2	SIDEWALK LOADS	1.30
		99	LOAD GENERATION, LOAD #99, (6 of 20)	1.30
367	COMBINATION LOAD CASE 367	1	DEAD LOADS	1.00
		2	SIDEWALK LOADS	1.30
		100	LOAD GENERATION, LOAD #100, (7 of 2(	1.30
368	COMBINATION LOAD CASE 368	1	DEAD LOADS	1.00
		2	SIDEWALK LOADS	1.30
		101	LOAD GENERATION, LOAD #101, (8 of 2(	1.30

Combination Load Cases Cont...

Comb.	Combination L/C Name	Primary	Primary L/C Name	Factor
369	COMBINATION LOAD CASE 369	1	DEAD LOADS	1.00
		2	SIDEWALK LOADS	1.30
		102	LOAD GENERATION, LOAD #102, (9 of 2(	1.30
370	COMBINATION LOAD CASE 370	1	DEAD LOADS	1.00
		2	SIDEWALK LOADS	1.30
		103	LOAD GENERATION, LOAD #103, (10 of :	1.30
371	COMBINATION LOAD CASE 371	1	DEAD LOADS	1.00
		2	SIDEWALK LOADS	1.30
		104	LOAD GENERATION, LOAD #104, (11 of :	1.30
372	COMBINATION LOAD CASE 372	1	DEAD LOADS	1.00
		2	SIDEWALK LOADS	1.30
		105	LOAD GENERATION, LOAD #105, (12 of :	1.30
373	COMBINATION LOAD CASE 373	1	DEAD LOADS	1.00
		2	SIDEWALK LOADS	1.30
		106	LOAD GENERATION, LOAD #106, (13 of :	1.30
374	COMBINATION LOAD CASE 374	1	DEAD LOADS	1.00
		2	SIDEWALK LOADS	1.30
		107	LOAD GENERATION, LOAD #107, (14 of :	1.30
375	COMBINATION LOAD CASE 375	1	DEAD LOADS	1.00
		2	SIDEWALK LOADS	1.30
		108	LOAD GENERATION, LOAD #108, (15 of :	1.30
376	COMBINATION LOAD CASE 376	1	DEAD LOADS	1.00
		2	SIDEWALK LOADS	1.30
		109	LOAD GENERATION, LOAD #109, (16 of :	1.30
377	COMBINATION LOAD CASE 377	1	DEAD LOADS	1.00
		2	SIDEWALK LOADS	1.30
		110	LOAD GENERATION, LOAD #110, (17 of :	1.30
378	COMBINATION LOAD CASE 378	1	DEAD LOADS	1.00
		2	SIDEWALK LOADS	1.30
		111	LOAD GENERATION, LOAD #111, (18 of 2	1.30
379	COMBINATION LOAD CASE 379	1	DEAD LOADS	1.00
		2	SIDEWALK LOADS	1.30
		112	LOAD GENERATION, LOAD #112, (19 of :	1.30
380	COMBINATION LOAD CASE 380	1	DEAD LOADS	1.00
		2	SIDEWALK LOADS	1.30
		113	LOAD GENERATION, LOAD #113, (20 of :	1.30
381	COMBINATION LOAD CASE 381	1	DEAD LOADS	1.00
		2	SIDEWALK LOADS	1.30
		114	LOAD GENERATION, LOAD #114, (1 of 2(	1.30
382	COMBINATION LOAD CASE 382	1	DEAD LOADS	1.00
		2	SIDEWALK LOADS	1.30
		115	LOAD GENERATION, LOAD #115, (2 of 2(	1.30
383	COMBINATION LOAD CASE 383	1	DEAD LOADS	1.00
		2	SIDEWALK LOADS	1.30
		116	LOAD GENERATION, LOAD #116, (3 of 2(	1.30

Combination Load Cases Cont...

Comb.	Combination L/C Name	Primary	Primary L/C Name	Factor
384	COMBINATION LOAD CASE 384	1	DEAD LOADS	1.00
		2	SIDEWALK LOADS	1.30
		117	LOAD GENERATION, LOAD #117, (4 of 2(	1.30
385	COMBINATION LOAD CASE 385	1	DEAD LOADS	1.00
		2	SIDEWALK LOADS	1.30
		118	LOAD GENERATION, LOAD #118, (5 of 2(	1.30
386	COMBINATION LOAD CASE 386	1	DEAD LOADS	1.00
		2	SIDEWALK LOADS	1.30
		119	LOAD GENERATION, LOAD #119, (6 of 2(	1.30
387	COMBINATION LOAD CASE 387	1	DEAD LOADS	1.00
		2	SIDEWALK LOADS	1.30
		120	LOAD GENERATION, LOAD #120, (7 of 2(	1.30
388	COMBINATION LOAD CASE 388	1	DEAD LOADS	1.00
		2	SIDEWALK LOADS	1.30
		121	LOAD GENERATION, LOAD #121, (8 of 2(	1.30
389	COMBINATION LOAD CASE 389	1	DEAD LOADS	1.00
		2	SIDEWALK LOADS	1.30
		122	LOAD GENERATION, LOAD #122, (9 of 2(	1.30
390	COMBINATION LOAD CASE 390	1	DEAD LOADS	1.00
		2	SIDEWALK LOADS	1.30
		123	LOAD GENERATION, LOAD #123, (10 of :	1.30
391	COMBINATION LOAD CASE 391	1	DEAD LOADS	1.00
		2	SIDEWALK LOADS	1.30
		124	LOAD GENERATION, LOAD #124, (11 of :	1.30
392	COMBINATION LOAD CASE 392	1	DEAD LOADS	1.00
		2	SIDEWALK LOADS	1.30
		125	LOAD GENERATION, LOAD #125, (12 of :	1.30
393	COMBINATION LOAD CASE 393	1	DEAD LOADS	1.00
		2	SIDEWALK LOADS	1.30
		126	LOAD GENERATION, LOAD #126, (13 of :	1.30
394	COMBINATION LOAD CASE 394	1	DEAD LOADS	1.00
		2	SIDEWALK LOADS	1.30
		127	LOAD GENERATION, LOAD #127, (14 of :	1.30
395	COMBINATION LOAD CASE 395	1	DEAD LOADS	1.00
		2	SIDEWALK LOADS	1.30
		128	LOAD GENERATION, LOAD #128, (15 of :	1.30
396	COMBINATION LOAD CASE 396	1	DEAD LOADS	1.00
		2	SIDEWALK LOADS	1.30
		129	LOAD GENERATION, LOAD #129, (16 of :	1.30
397	COMBINATION LOAD CASE 397	1	DEAD LOADS	1.00
		2	SIDEWALK LOADS	1.30
		130	LOAD GENERATION, LOAD #130, (17 of :	1.30
398	COMBINATION LOAD CASE 398	1	DEAD LOADS	1.00
		2	SIDEWALK LOADS	1.30
		131	LOAD GENERATION, LOAD #131, (18 of :	1.30

Combination Load Cases Cont...

Comb.	Combination L/C Name	Primary	Primary L/C Name	Factor
399	COMBINATION LOAD CASE 399	1	DEAD LOADS	1.00
		2	SIDEWALK LOADS	1.30
		132	LOAD GENERATION, LOAD #132, (19 of :	1.30
400	COMBINATION LOAD CASE 400	1	DEAD LOADS	1.00
		2	SIDEWALK LOADS	1.30
		133	LOAD GENERATION, LOAD #133, (20 of :	1.30

MRussell

Arch and Spandrel Column Model
Raw Input, and Detailed Output

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***************************************************
*                                                 *
*           STAAD.Pro V8i SELECTseries1           *
*           Version  20.07.06.35                  *
*           Proprietary Program of                *
*           Bentley Systems, Inc.                 *
*           Date=    FEB 14, 2013                 *
*           Time=    16: 9: 0                     *
*                                                 *
*      USER ID: Hatch Mott MacDonald              *
***************************************************



     1. STAAD SPACE
INPUT FILE: 1802046.STD
     2. START JOB INFORMATION
     3. ENGINEER NAME MARUSSELL
     4. ENGINEER DATE 29-OCT-12
     5. JOB NAME 2012 BRIDGE LOAD RATINGS
     6. JOB CLIENT OHIO DOT
     7. JOB NO 287366
     8. JOB COMMENT LOAD RATING MODEL FOR:
     9. JOB COMMENT CUY-17-0283
    10. JOB COMMENT BROOKPARK RD. OVER THE ROCKY RIVER
    11. JOB COMMENT SFN: 1802046
    12. JOB COMMENT MAIN ARCH SPANS B - G
    13. JOB REF CUY-17-0283
    14. END JOB INFORMATION
    15. INPUT WIDTH 79
    16. UNIT FEET KIP
    17. JOINT COORDINATES
    18. 1 -86.532 0 17.75; 2 -83.842 4.23 17.75; 3 -81.02 8.375 17.75
    19. 4 -78.07 12.428 17.75; 5 -74.997 16.384 17.75; 6 -71.099 21.058 17.75
    20. 7 -67.027 25.579 17.75; 8 -62.785 29.944 17.75; 9 -58.353 34.123 17.75
    21. 10 -54.397 37.505 17.75; 11 -50.285 40.7 17.75; 12 -46.031 43.702 17.75
    22. 13 -41.645 46.503 17.75; 14 -37.629 48.828 17.75; 15 -33.521 50.985 17.75
    23. 16 -29.327 52.972 17.75; 17 -25.026 54.726 17.75; 18 -20.951 56.099 17.75
    24. 19 -16.8 57.228 17.75; 20 -12.59 58.106 17.75; 21 -8.338 58.731 17.75
    25. 22 -4.175 59.094 17.75; 23 0 59.215 17.75; 24 4.175 59.094 17.75
    26. 25 8.338 58.731 17.75; 26 12.59 58.106 17.75; 27 16.8 57.228 17.75
    27. 28 20.951 56.099 17.75; 29 25.026 54.726 17.75; 30 29.327 52.972 17.75
    28. 31 33.521 50.985 17.75; 32 37.629 48.828 17.75; 33 41.645 46.503 17.75
    29. 34 46.031 43.702 17.75; 35 50.285 40.7 17.75; 36 54.397 37.505 17.75
    30. 37 58.353 34.123 17.75; 38 62.785 29.944 17.75; 39 67.027 25.579 17.75
    31. 40 71.099 21.058 17.75; 41 74.997 16.384 17.75; 42 78.07 12.428 17.75
    32. 43 81.02 8.375 17.75; 44 83.842 4.23 17.75; 45 86.532 0 17.75
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    35. 52 -74.997 40.325 17.75; 53 -74.997 52.294 17.75; 54 -74.997 64.26 17.75
    36. 55 -58.353 41.637 17.75; 56 -58.353 49.179 17.75; 57 -58.353 56.721 17.75
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    38. 61 -41.645 59.832 17.75; 62 -41.645 64.26 17.75; 63 -25.026 59.459 17.75
    39. 64 -25.026 64.26 17.75; 65 -8.338 64.26 17.75; 66 8.338 64.26 17.75
    40. 67 25.026 59.459 17.75; 68 25.026 64.26 17.75; 69 41.645 50.971 17.75
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43. 76 58.353 64.26 17.75; 77 74.997 28.356 17.75; 78 74.997 40.325 17.75
44. 79 74.997 52.294 17.75; 80 74.997 64.26 17.75; 81 91.979 1.758 17.75
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161. DEFINE MATERIAL START
162. ISOTROPIC CONCRETE
163. E 453600
164. POISSON 0.17
165. DENSITY 0.150336
166. ALPHA 5E-006
167. DAMP 0.05
168. END DEFINE MATERIAL
169. MEMBER PROPERTY AMERICAN
170. * RIGHT ARCH
171. 1 PRIS YD 4.878 ZD 7
172. 2 PRIS YD 4.695 ZD 7
173. 3 PRIS YD 4.521 ZD 7
174. 4 PRIS YD 4.357 ZD 7
175. 5 PRIS YD 4.187 ZD 7
176. 6 PRIS YD 4.014 ZD 7
177. 7 PRIS YD 3.856 ZD 7
178. 8 PRIS YD 3.712 ZD 7
179. 9 PRIS YD 3.587 ZD 7
180. 10 PRIS YD 3.482 ZD 7
181. 11 PRIS YD 3.385 ZD 7
182. 12 PRIS YD 3.298 ZD 7
183. 13 PRIS YD 3.225 ZD 7
184. 14 PRIS YD 3.163 ZD 7
185. 15 PRIS YD 3.111 ZD 7
186. 16 PRIS YD 3.075 ZD 7
187. 17 PRIS YD 3.053 ZD 7
188. 18 PRIS YD 3.036 ZD 7
189. 19 PRIS YD 3.022 ZD 7
190. 20 PRIS YD 3.011 ZD 7
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212. 42 PRIS YD 4.521 ZD 7
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214. 44 PRIS YD 4.878 ZD 7
215. * RIGHT REAR COLUMNS
216. 45 PRIS YD 2.756 ZD 5
217. 46 PRIS YD 2.6 ZD 5
218. 47 PRIS YD 2.444 ZD 5
219. 48 PRIS YD 2.289 ZD 5
220. 49 PRIS YD 1.524 ZD 5
221. 50 PRIS YD 1.881 ZD 5
222. 51 PRIS YD 1.643 ZD 5
223. 52 PRIS YD 1.404 ZD 5
224. 53 PRIS YD 1.426 ZD 5
225. 54 PRIS YD 1.732 ZD 5
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227. 56 PRIS YD 1.324 ZD 5
228. 57 PRIS YD 1.319 ZD 5
229. 58 PRIS YD 1.58 ZD 5
230. 59 PRIS YD 1.406 ZD 5
231. 60 PRIS YD 1.231 ZD 5
232. 61 PRIS YD 1.125 ZD 5
233. 62 PRIS YD 1.125 ZD 5
234. 63 PRIS YD 1.125 ZD 5
235. * RIGHT FWD. COLUMNS
236. 64 PRIS YD 1.125 ZD 5
237. 65 PRIS YD 1.125 ZD 5
238. 66 PRIS YD 1.125 ZD 5
239. 67 PRIS YD 1.319 ZD 5
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253. 81 PRIS YD 2.444 ZD 5
254. 82 PRIS YD 2.289 ZD 5
255. * LEFT ARCH
256. 83 PRIS YD 4.878 ZD 7
257. 84 PRIS YD 4.695 ZD 7
258. 85 PRIS YD 4.521 ZD 7
259. 86 PRIS YD 4.357 ZD 7
260. 87 PRIS YD 4.187 ZD 7
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262. 89 PRIS YD 3.856 ZD 7
263. 90 PRIS YD 3.712 ZD 7
264. 91 PRIS YD 3.587 ZD 7
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299. 126 PRIS YD 4.878 ZD 7
300. * LEFT REAR COLUMNS
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304. 130 PRIS YD 2.289 ZD 5
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319. 145 PRIS YD 1.125 ZD 5
320. * LEFT FWD. COLUMNS
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340. * FLOORBEAM 1
341. 165 PRIS YD 1.814 ZD 1.4
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349. * FLOORBEAM 2
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357. 180 PRIS YD 1.814 ZD 1.4
358. * FLOORBEAM 3
359. 181 PRIS YD 1.814 ZD 1.4
360. 182 PRIS YD 3.575 ZD 1.4
361. 183 PRIS YD 4.875 ZD 1.4
362. 184 PRIS YD 4.875 ZD 1.4
363. 185 PRIS YD 4.875 ZD 1.4
364. 186 PRIS YD 4.875 ZD 1.4
365. 187 PRIS YD 3.575 ZD 1.4
366. 188 PRIS YD 1.814 ZD 1.4
367. * FLOORBEAM 4
368. 189 PRIS YD 1.814 ZD 1.4
369. 190 PRIS YD 3.575 ZD 1.4
370. 191 PRIS YD 4.875 ZD 1.4
371. 192 PRIS YD 4.875 ZD 1.4
372. 193 PRIS YD 4.875 ZD 1.4
373. 194 PRIS YD 4.875 ZD 1.4
374. 195 PRIS YD 3.575 ZD 1.4
375. 196 PRIS YD 1.814 ZD 1.4
376. * FLOORBEAM 5
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377. 197 PRIS YD 1.814 ZD 1.4
378. 198 PRIS YD 3.575 ZD 1.4
379. 199 PRIS YD 4.875 ZD 1.4
380. 200 PRIS YD 4.875 ZD 1.4
381. 201 PRIS YD 4.875 ZD 1.4
382. 202 PRIS YD 4.875 ZD 1.4
383. 203 PRIS YD 3.575 ZD 1.4
384. 204 PRIS YD 1.814 ZD 1.4
385. * FLOORBEAM 6
386. 205 PRIS YD 1.814 ZD 1.4
387. 206 PRIS YD 3.575 ZD 1.4
388. 207 PRIS YD 4.875 ZD 1.4
389. 208 PRIS YD 4.875 ZD 1.4
390. 209 PRIS YD 4.875 ZD 1.4
391. 210 PRIS YD 4.875 ZD 1.4
392. 211 PRIS YD 3.575 ZD 1.4
393. 212 PRIS YD 1.814 ZD 1.4
394. * FLOORBEAM 7
395. 213 PRIS YD 1.814 ZD 1.4
396. 214 PRIS YD 3.575 ZD 1.4
397. 215 PRIS YD 4.875 ZD 1.4
398. 216 PRIS YD 4.875 ZD 1.4
399. 217 PRIS YD 4.875 ZD 1.4
400. 218 PRIS YD 4.875 ZD 1.4
401. 219 PRIS YD 3.575 ZD 1.4
402. 220 PRIS YD 1.814 ZD 1.4
403. * FLOORBEAM 8
404. 221 PRIS YD 1.814 ZD 1.4
405. 222 PRIS YD 3.575 ZD 1.4
406. 223 PRIS YD 4.875 ZD 1.4
407. 224 PRIS YD 4.875 ZD 1.4
408. 225 PRIS YD 4.875 ZD 1.4
409. 226 PRIS YD 4.875 ZD 1.4
410. 227 PRIS YD 3.575 ZD 1.4
411. 228 PRIS YD 1.814 ZD 1.4
412. * FLOORBEAM 9
413. 229 PRIS YD 1.814 ZD 1.4
414. 230 PRIS YD 3.575 ZD 1.4
415. 231 PRIS YD 4.875 ZD 1.4
416. 232 PRIS YD 4.875 ZD 1.4
417. 233 PRIS YD 4.875 ZD 1.4
418. 234 PRIS YD 4.875 ZD 1.4
419. 235 PRIS YD 3.575 ZD 1.4
420. 236 PRIS YD 1.814 ZD 1.4
421. * FLOORBEAM 10
422. 237 PRIS YD 1.814 ZD 1.4
423. 238 PRIS YD 3.575 ZD 1.4
424. 239 PRIS YD 4.875 ZD 1.4
425. 240 PRIS YD 4.875 ZD 1.4
426. 241 PRIS YD 4.875 ZD 1.4
427. 242 PRIS YD 4.875 ZD 1.4
428. 243 PRIS YD 3.575 ZD 1.4
429. 244 PRIS YD 1.814 ZD 1.4
430. * FLOORBEAM 11
431. 245 PRIS YD 1.814 ZD 1.4
432. 246 PRIS YD 3.575 ZD 1.4
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433. 247 PRIS YD 4.875 ZD 1.4
434. 248 PRIS YD 4.875 ZD 1.4
435. 249 PRIS YD 4.875 ZD 1.4
436. 250 PRIS YD 4.875 ZD 1.4
437. 251 PRIS YD 3.575 ZD 1.4
438. 252 PRIS YD 1.814 ZD 1.4
439. * FLOORBEAM 12
440. 253 PRIS YD 1.814 ZD 1.4
441. 254 PRIS YD 3.575 ZD 1.4
442. 255 PRIS YD 4.875 ZD 1.4
443. 256 PRIS YD 4.875 ZD 1.4
444. 257 PRIS YD 4.875 ZD 1.4
445. 258 PRIS YD 4.875 ZD 1.4
446. 259 PRIS YD 3.575 ZD 1.4
447. 260 PRIS YD 1.814 ZD 1.4
448. * DECK SLAB BEAM ELEMENTS
449. 261 PRIS YD 0.5 ZD 3.021
450. 262 PRIS YD 0.5 ZD 3.021
451. 263 PRIS YD 0.5 ZD 3.021
452. 264 PRIS YD 0.5 ZD 3.021
453. 265 PRIS YD 0.5 ZD 3.021
454. 266 PRIS YD 0.5 ZD 3.021
455. 267 PRIS YD 0.5 ZD 3.021
456. 268 PRIS YD 0.5 ZD 3.021
457. 269 PRIS YD 0.5 ZD 3.021
458. 270 PRIS YD 0.5 ZD 3.021
459. 271 PRIS YD 0.5 ZD 3.021
460. * DECK SLAB BEAM ELEMENTS
461. 272 PRIS YD 1 ZD 7.146
462. 273 PRIS YD 1 ZD 7.146
463. 274 PRIS YD 1 ZD 7.146
464. 275 PRIS YD 1 ZD 7.146
465. 276 PRIS YD 1 ZD 7.146
466. 277 PRIS YD 1 ZD 7.146
467. 278 PRIS YD 1 ZD 7.146
468. 279 PRIS YD 1 ZD 7.146
469. 280 PRIS YD 1 ZD 7.146
470. 281 PRIS YD 1 ZD 7.146
471. 282 PRIS YD 1 ZD 7.146
472. * DECK SLAB BEAM ELEMENTS
473. 283 PRIS YD 3.5 ZD 8.563 YB 2.5 ZB 1.5
474. 284 PRIS YD 3.5 ZD 8.563 YB 2.5 ZB 1.5
475. 285 PRIS YD 3.5 ZD 8.563 YB 2.5 ZB 1.5
476. 286 PRIS YD 3.5 ZD 8.563 YB 2.5 ZB 1.5
477. 287 PRIS YD 3.5 ZD 8.563 YB 2.5 ZB 1.5
478. 288 PRIS YD 3.5 ZD 8.563 YB 2.5 ZB 1.5
479. 289 PRIS YD 3.5 ZD 8.563 YB 2.5 ZB 1.5
480. 290 PRIS YD 3.5 ZD 8.563 YB 2.5 ZB 1.5
481. 291 PRIS YD 3.5 ZD 8.563 YB 2.5 ZB 1.5
482. 292 PRIS YD 3.5 ZD 8.563 YB 2.5 ZB 1.5
483. 293 PRIS YD 3.5 ZD 8.563 YB 2.5 ZB 1.5
484. * DECK SLAB BEAM ELEMENTS
485. 294 PRIS YD 4.5 ZD 8.875
486. 295 PRIS YD 4.5 ZD 8.875
487. 296 PRIS YD 4.5 ZD 8.875
488. 297 PRIS YD 4.5 ZD 8.875
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489. 298 PRIS YD 4.5 ZD 8.875
490. 299 PRIS YD 4.5 ZD 8.875
491. 300 PRIS YD 4.5 ZD 8.875
492. 301 PRIS YD 4.5 ZD 8.875
493. 302 PRIS YD 4.5 ZD 8.875
494. 303 PRIS YD 4.5 ZD 8.875
495. 304 PRIS YD 4.5 ZD 8.875
496. * DECK SLAB BEAM ELEMENTS
497. 305 PRIS YD 4.5 ZD 8.875
498. 306 PRIS YD 4.5 ZD 8.875
499. 307 PRIS YD 4.5 ZD 8.875
500. 308 PRIS YD 4.5 ZD 8.875
501. 309 PRIS YD 4.5 ZD 8.875
502. 310 PRIS YD 4.5 ZD 8.875
503. 311 PRIS YD 4.5 ZD 8.875
504. 312 PRIS YD 4.5 ZD 8.875
505. 313 PRIS YD 4.5 ZD 8.875
506. 314 PRIS YD 4.5 ZD 8.875
507. 315 PRIS YD 4.5 ZD 8.875
508. * DECK SLAB BEAM ELEMENTS
509. 316 PRIS YD 4.5 ZD 8.875
510. 317 PRIS YD 4.5 ZD 8.875
511. 318 PRIS YD 4.5 ZD 8.875
512. 319 PRIS YD 4.5 ZD 8.875
513. 320 PRIS YD 4.5 ZD 8.875
514. 321 PRIS YD 4.5 ZD 8.875
515. 322 PRIS YD 4.5 ZD 8.875
516. 323 PRIS YD 4.5 ZD 8.875
517. 324 PRIS YD 4.5 ZD 8.875
518. 325 PRIS YD 4.5 ZD 8.875
519. 326 PRIS YD 4.5 ZD 8.875
520. * DECK SLAB BEAM ELEMENTS
521. 327 PRIS YD 3.5 ZD 8.563 YB 2.5 ZB 1.5
522. 328 PRIS YD 3.5 ZD 8.563 YB 2.5 ZB 1.5
523. 329 PRIS YD 3.5 ZD 8.563 YB 2.5 ZB 1.5
524. 330 PRIS YD 3.5 ZD 8.563 YB 2.5 ZB 1.5
525. 331 PRIS YD 3.5 ZD 8.563 YB 2.5 ZB 1.5
526. 332 PRIS YD 3.5 ZD 8.563 YB 2.5 ZB 1.5
527. 333 PRIS YD 3.5 ZD 8.563 YB 2.5 ZB 1.5
528. 334 PRIS YD 3.5 ZD 8.563 YB 2.5 ZB 1.5
529. 335 PRIS YD 3.5 ZD 8.563 YB 2.5 ZB 1.5
530. 336 PRIS YD 3.5 ZD 8.563 YB 2.5 ZB 1.5
531. 337 PRIS YD 3.5 ZD 8.563 YB 2.5 ZB 1.5
532. * DECK SLAB BEAM ELEMENTS
533. 338 PRIS YD 1 ZD 7.146
534. 339 PRIS YD 1 ZD 7.146
535. 340 PRIS YD 1 ZD 7.146
536. 341 PRIS YD 1 ZD 7.146
537. 342 PRIS YD 1 ZD 7.146
538. 343 PRIS YD 1 ZD 7.146
539. 344 PRIS YD 1 ZD 7.146
540. 345 PRIS YD 1 ZD 7.146
541. 346 PRIS YD 1 ZD 7.146
542. 347 PRIS YD 1 ZD 7.146
543. 348 PRIS YD 1 ZD 7.146
544. * DECK SLAB BEAM ELEMENTS
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545. 349 PRIS YD 0.5 ZD 3.021
546. 350 PRIS YD 0.5 ZD 3.021
547. 351 PRIS YD 0.5 ZD 3.021
548. 352 PRIS YD 0.5 ZD 3.021
549. 353 PRIS YD 0.5 ZD 3.021
550. 354 PRIS YD 0.5 ZD 3.021
551. 355 PRIS YD 0.5 ZD 3.021
552. 356 PRIS YD 0.5 ZD 3.021
553. 357 PRIS YD 0.5 ZD 3.021
554. 358 PRIS YD 0.5 ZD 3.021
555. 359 PRIS YD 0.5 ZD 3.021
556. CONSTANTS
557. MATERIAL CONCRETE ALL
558. SUPPORTS
559. 1 45 46 81 86 130 131 166 FIXED
560. DEFINE MOVING LOAD
561. * SINGLE HS20 TRUCK
562. TYPE 1 LOAD 16 16 4
563. DIST 14 14 WID 6
564. * SINGLE MIL
565. TYPE 2 LOAD 12 12
566. DIST 4 WID 6
567. * SINGLE 2F1
568. TYPE 3 LOAD 10 5
569. DIST 10 WID 6
570. * SINGLE 3F1
571. TYPE 4 LOAD 8.5 8.5 6
572. DIST 4 10 WID 6
573. * SINGLE 4F1
574. TYPE 5 LOAD 7 7 7 6
575. DIST 4 4 10 WID 6
576. * SINGLE 5C1
577. TYPE 6 LOAD 8.5 8.5 8.5 8.5 6
578. DIST 4 31 4 12 WID 6
579. * PRIMARY LOAD CASES
580. LOAD 1 LOADTYPE DEAD  TITLE DEAD LOADS
581. * SELFWEIGHT (1.3 DC)
582. SELFWEIGHT Y -1.3
583. MEMBER LOAD
584. * CURRENT WEARING SURFACE (3" ASPHALT)
585. 272 TO 282 338 TO 348 UNI GY -0.194
586. 283 TO 293 327 TO 337 UNI GY -0.404
587. 294 TO 326 UNI GY -0.412
588. * RAIL
589. 261 TO 271 349 TO 359 UNI GY -0.1
590. * SIDEWALK 75 (PSF) (2.17 PL)
591. LOAD 2 LOADTYPE LIVE  TITLE SIDEWALK LOADS
592. MEMBER LOAD
593. 261 TO 282 338 TO 359 UNI GY -0.41
594. * LIVE LOADS (UNFACTORED)
595. * LANE LOADS
596. * @ FLOORBEAM 1
597. LOAD 3 LOADTYPE LIVE  TITLE LANE LOADS
598. MEMBER LOAD
599. 166 CON GY -26 5
600. 272 TO 282 UNI GY -0.252
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601. 283 TO 293 UNI GY -0.388
602. 167 CON GY -26 8.75
603. 283 TO 293 UNI GY -0.009
604. 294 TO 304 UNI GY -0.631
605. 169 CON GY -26 3
606. 305 TO 315 UNI GY -0.424
607. 316 TO 326 UNI GY -0.216
608. 170 CON GY -26 6.13
609. 316 TO 326 UNI GY -0.198
610. 327 TO 337 UNI GY -0.442
611. * @ FLOORBEAM 2
612. LOAD 4 LOADTYPE LIVE  TITLE LANE LOADS
613. MEMBER LOAD
614. 174 CON GY -26 5
615. 272 TO 282 UNI GY -0.252
616. 283 TO 293 UNI GY -0.388
617. 175 CON GY -26 8.75
618. 283 TO 293 UNI GY -0.009
619. 294 TO 304 UNI GY -0.631
620. 177 CON GY -26 3
621. 305 TO 315 UNI GY -0.424
622. 316 TO 326 UNI GY -0.216
623. 178 CON GY -26 6.13
624. 316 TO 326 UNI GY -0.198
625. 327 TO 337 UNI GY -0.442
626. * @ FLOORBEAM 3
627. LOAD 5 LOADTYPE LIVE  TITLE LANE LOADS
628. MEMBER LOAD
629. 182 CON GY -26 5
630. 272 TO 282 UNI GY -0.252
631. 283 TO 293 UNI GY -0.388
632. 183 CON GY -26 8.75
633. 283 TO 293 UNI GY -0.009
634. 294 TO 304 UNI GY -0.631
635. 185 CON GY -26 3
636. 305 TO 315 UNI GY -0.424
637. 316 TO 326 UNI GY -0.216
638. 186 CON GY -26 6.13
639. 316 TO 326 UNI GY -0.198
640. 327 TO 337 UNI GY -0.442
641. * @ FLOORBEAM 4
642. LOAD 6 LOADTYPE LIVE  TITLE LANE LOADS
643. MEMBER LOAD
644. 190 CON GY -26 5
645. 272 TO 282 UNI GY -0.252
646. 283 TO 293 UNI GY -0.388
647. 191 CON GY -26 8.75
648. 283 TO 293 UNI GY -0.009
649. 294 TO 304 UNI GY -0.631
650. 193 CON GY -26 3
651. 305 TO 315 UNI GY -0.424
652. 316 TO 326 UNI GY -0.216
653. 194 CON GY -26 6.13
654. 316 TO 326 UNI GY -0.198
655. 327 TO 337 UNI GY -0.442
656. * @ FLOORBEAM 5
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657. LOAD 7 LOADTYPE LIVE  TITLE LANE LOADS
658. MEMBER LOAD
659. 198 CON GY -26 5
660. 272 TO 282 UNI GY -0.252
661. 283 TO 293 UNI GY -0.388
662. 199 CON GY -26 8.75
663. 283 TO 293 UNI GY -0.009
664. 294 TO 304 UNI GY -0.631
665. 201 CON GY -26 3
666. 305 TO 315 UNI GY -0.424
667. 316 TO 326 UNI GY -0.216
668. 202 CON GY -26 6.13
669. 316 TO 326 UNI GY -0.198
670. 327 TO 337 UNI GY -0.442
671. * @ FLOORBEAM 6
672. LOAD 8 LOADTYPE LIVE  TITLE LANE LOADS
673. MEMBER LOAD
674. 206 CON GY -26 5
675. 272 TO 282 UNI GY -0.252
676. 283 TO 293 UNI GY -0.388
677. 207 CON GY -26 8.75
678. 283 TO 293 UNI GY -0.009
679. 294 TO 304 UNI GY -0.631
680. 209 CON GY -26 3
681. 305 TO 315 UNI GY -0.424
682. 316 TO 326 UNI GY -0.216
683. 210 CON GY -26 6.13
684. 316 TO 326 UNI GY -0.198
685. 327 TO 337 UNI GY -0.442
686. * @ FLOORBEAM 7
687. LOAD 9 LOADTYPE LIVE  TITLE LANE LOADS
688. MEMBER LOAD
689. 214 CON GY -26 5
690. 272 TO 282 UNI GY -0.252
691. 283 TO 293 UNI GY -0.388
692. 215 CON GY -26 8.75
693. 283 TO 293 UNI GY -0.009
694. 294 TO 304 UNI GY -0.631
695. 217 CON GY -26 3
696. 305 TO 315 UNI GY -0.424
697. 316 TO 326 UNI GY -0.216
698. 218 CON GY -26 6.13
699. 316 TO 326 UNI GY -0.198
700. 327 TO 337 UNI GY -0.442
701. * @ FLOORBEAM 8
702. LOAD 10 LOADTYPE LIVE  TITLE LANE LOADS
703. MEMBER LOAD
704. 222 CON GY -26 5
705. 272 TO 282 UNI GY -0.252
706. 283 TO 293 UNI GY -0.388
707. 223 CON GY -26 8.75
708. 283 TO 293 UNI GY -0.009
709. 294 TO 304 UNI GY -0.631
710. 225 CON GY -26 3
711. 305 TO 315 UNI GY -0.424
712. 316 TO 326 UNI GY -0.216
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713. 226 CON GY -26 6.13
714. 316 TO 326 UNI GY -0.198
715. 327 TO 337 UNI GY -0.442
716. * @ FLOORBEAM 9
717. LOAD 11 LOADTYPE LIVE  TITLE LANE LOADS
718. MEMBER LOAD
719. 230 CON GY -26 5
720. 272 TO 282 UNI GY -0.252
721. 283 TO 293 UNI GY -0.388
722. 231 CON GY -26 8.75
723. 283 TO 293 UNI GY -0.009
724. 294 TO 304 UNI GY -0.631
725. 233 CON GY -26 3
726. 305 TO 315 UNI GY -0.424
727. 316 TO 326 UNI GY -0.216
728. 234 CON GY -26 6.13
729. 316 TO 326 UNI GY -0.198
730. 327 TO 337 UNI GY -0.442
731. * @ FLOORBEAM 10
732. LOAD 12 LOADTYPE LIVE  TITLE LANE LOADS
733. MEMBER LOAD
734. 238 CON GY -26 5
735. 272 TO 282 UNI GY -0.252
736. 283 TO 293 UNI GY -0.388
737. 239 CON GY -26 8.75
738. 283 TO 293 UNI GY -0.009
739. 294 TO 304 UNI GY -0.631
740. 241 CON GY -26 3
741. 305 TO 315 UNI GY -0.424
742. 316 TO 326 UNI GY -0.216
743. 242 CON GY -26 6.13
744. 316 TO 326 UNI GY -0.198
745. 327 TO 337 UNI GY -0.442
746. * @ FLOORBEAM 11
747. LOAD 13 LOADTYPE LIVE  TITLE LANE LOADS
748. MEMBER LOAD
749. 246 CON GY -26 5
750. 272 TO 282 UNI GY -0.252
751. 283 TO 293 UNI GY -0.388
752. 247 CON GY -26 8.75
753. 283 TO 293 UNI GY -0.009
754. 294 TO 304 UNI GY -0.631
755. 249 CON GY -26 3
756. 305 TO 315 UNI GY -0.424
757. 316 TO 326 UNI GY -0.216
758. 250 CON GY -26 6.13
759. 316 TO 326 UNI GY -0.198
760. 327 TO 337 UNI GY -0.442
761. * LIVE LOAD GENERATION
762. * SINGLE HS20 TRUCK
763. LOAD GENERATION 20
764. TYPE 1 -90 64.26 25 XINC 7.5
765. TYPE 1 -90 64.26 13 XINC 7.5
766. TYPE 1 -90 64.26 1 XINC 7.5
767. TYPE 1 -90 64.26 -11 XINC 7.5
768. * SINGLE MIL
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769. LOAD GENERATION 20
770. TYPE 2 -90 64.26 25 XINC 7.5
771. TYPE 2 -90 64.26 13 XINC 7.5
772. TYPE 2 -90 64.26 1 XINC 7.5
773. TYPE 2 -90 64.26 -11 XINC 7.5
774. * SINGLE 2F1
775. LOAD GENERATION 20
776. TYPE 3 -90 64.26 25 XINC 7.5
777. TYPE 3 -90 64.26 13 XINC 7.5
778. TYPE 3 -90 64.26 1 XINC 7.5
779. TYPE 3 -90 64.26 -11 XINC 7.5
780. * SINGLE 3F1
781. LOAD GENERATION 20
782. TYPE 4 -90 64.26 25 XINC 7.5
783. TYPE 4 -90 64.26 13 XINC 7.5
784. TYPE 4 -90 64.26 1 XINC 7.5
785. TYPE 4 -90 64.26 -11 XINC 7.5
786. * SINGLE 4F1
787. LOAD GENERATION 20
788. TYPE 5 -90 64.26 25 XINC 7.5
789. TYPE 5 -90 64.26 13 XINC 7.5
790. TYPE 5 -90 64.26 1 XINC 7.5
791. TYPE 5 -90 64.26 -11 XINC 7.5
792. * SINGLE 5C1
793. LOAD GENERATION 20
794. TYPE 6 -90 64.26 25 XINC 7.5
795. TYPE 6 -90 64.26 13 XINC 7.5
796. TYPE 6 -90 64.26 1 XINC 7.5
797. TYPE 6 -90 64.26 -11 XINC 7.5
798. * LOAD COMBINATIONS
799. * LANE (INV)
800. LOAD COMB 201 COMBINATION LOAD CASE 201
**WARNING-A MOVING LOAD THAT WOULD HAVE BEEN APPLIED BEYOND THE X AND Z RANGES
          OF THE STRUCTURE HAS BEEN IGNORED. CASE=  132 WHEEL   9 OF  10
**WARNING-A MOVING LOAD THAT WOULD HAVE BEEN APPLIED BEYOND THE X AND Z RANGES
          OF THE STRUCTURE HAS BEEN IGNORED. CASE=  132 WHEEL  10 OF  10
**WARNING-A MOVING LOAD THAT WOULD HAVE BEEN APPLIED BEYOND THE X AND Z RANGES
          OF THE STRUCTURE HAS BEEN IGNORED. CASE=  132 WHEEL   9 OF  10
**WARNING-A MOVING LOAD THAT WOULD HAVE BEEN APPLIED BEYOND THE X AND Z RANGES
          OF THE STRUCTURE HAS BEEN IGNORED. CASE=  132 WHEEL  10 OF  10
**WARNING-A MOVING LOAD THAT WOULD HAVE BEEN APPLIED BEYOND THE X AND Z RANGES
          OF THE STRUCTURE HAS BEEN IGNORED. CASE=  132 WHEEL   9 OF  10
**WARNING-A MOVING LOAD THAT WOULD HAVE BEEN APPLIED BEYOND THE X AND Z RANGES
          OF THE STRUCTURE HAS BEEN IGNORED. CASE=  132 WHEEL  10 OF  10
**WARNING-A MOVING LOAD THAT WOULD HAVE BEEN APPLIED BEYOND THE X AND Z RANGES
          OF THE STRUCTURE HAS BEEN IGNORED. CASE=  132 WHEEL   9 OF  10
**WARNING-A MOVING LOAD THAT WOULD HAVE BEEN APPLIED BEYOND THE X AND Z RANGES
          OF THE STRUCTURE HAS BEEN IGNORED. CASE=  132 WHEEL  10 OF  10
**WARNING-A MOVING LOAD THAT WOULD HAVE BEEN APPLIED BEYOND THE X AND Z RANGES
          OF THE STRUCTURE HAS BEEN IGNORED. CASE=  133 WHEEL   9 OF  10
**WARNING-A MOVING LOAD THAT WOULD HAVE BEEN APPLIED BEYOND THE X AND Z RANGES
          OF THE STRUCTURE HAS BEEN IGNORED. CASE=  133 WHEEL  10 OF  10
*ADDITIONAL MOVING LOAD MESSAGES SUPPRESSED
*ADDITIONAL MOVING LOAD MESSAGES SUPPRESSED
801. 1 1.0 2 1.3 3 2.17
802. LOAD COMB 202 COMBINATION LOAD CASE 202
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803. 1 1.0 2 1.3 4 2.17
804. LOAD COMB 203 COMBINATION LOAD CASE 203
805. 1 1.0 2 1.3 5 2.17
806. LOAD COMB 204 COMBINATION LOAD CASE 204
807. 1 1.0 2 1.3 6 2.17
808. LOAD COMB 205 COMBINATION LOAD CASE 205
809. 1 1.0 2 1.3 7 2.17
810. LOAD COMB 206 COMBINATION LOAD CASE 206
811. 1 1.0 2 1.3 8 2.17
812. LOAD COMB 207 COMBINATION LOAD CASE 207
813. 1 1.0 2 1.3 9 2.17
814. LOAD COMB 208 COMBINATION LOAD CASE 208
815. 1 1.0 2 1.3 10 2.17
816. LOAD COMB 209 COMBINATION LOAD CASE 209
817. 1 1.0 2 1.3 11 2.17
818. LOAD COMB 210 COMBINATION LOAD CASE 210
819. 1 1.0 2 1.3 12 2.17
820. LOAD COMB 211 COMBINATION LOAD CASE 211
821. 1 1.0 2 1.3 13 2.17
822. * SINGLE HS20 TRUCK (INV)
823. LOAD COMB 221 COMBINATION LOAD CASE 221
824. 1 1.0 2 1.3 14 2.17
825. LOAD COMB 222 COMBINATION LOAD CASE 222
826. 1 1.0 2 1.3 15 2.17
827. LOAD COMB 223 COMBINATION LOAD CASE 223
828. 1 1.0 2 1.3 16 2.17
829. LOAD COMB 224 COMBINATION LOAD CASE 224
830. 1 1.0 2 1.3 17 2.17
831. LOAD COMB 225 COMBINATION LOAD CASE 225
832. 1 1.0 2 1.3 18 2.17
833. LOAD COMB 226 COMBINATION LOAD CASE 226
834. 1 1.0 2 1.3 19 2.17
835. LOAD COMB 227 COMBINATION LOAD CASE 227
836. 1 1.0 2 1.3 20 2.17
837. LOAD COMB 228 COMBINATION LOAD CASE 228
838. 1 1.0 2 1.3 21 2.17
839. LOAD COMB 229 COMBINATION LOAD CASE 229
840. 1 1.0 2 1.3 22 2.17
841. LOAD COMB 230 COMBINATION LOAD CASE 230
842. 1 1.0 2 1.3 23 2.17
843. LOAD COMB 231 COMBINATION LOAD CASE 231
844. 1 1.0 2 1.3 24 2.17
845. LOAD COMB 232 COMBINATION LOAD CASE 232
846. 1 1.0 2 1.3 25 2.17
847. LOAD COMB 233 COMBINATION LOAD CASE 233
848. 1 1.0 2 1.3 26 2.17
849. LOAD COMB 234 COMBINATION LOAD CASE 234
850. 1 1.0 2 1.3 27 2.17
851. LOAD COMB 235 COMBINATION LOAD CASE 235
852. 1 1.0 2 1.3 28 2.17
853. LOAD COMB 236 COMBINATION LOAD CASE 236
854. 1 1.0 2 1.3 29 2.17
855. LOAD COMB 237 COMBINATION LOAD CASE 237
856. 1 1.0 2 1.3 30 2.17
857. LOAD COMB 238 COMBINATION LOAD CASE 238
858. 1 1.0 2 1.3 31 2.17
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859. LOAD COMB 239 COMBINATION LOAD CASE 239
860. 1 1.0 2 1.3 32 2.17
861. LOAD COMB 240 COMBINATION LOAD CASE 240
862. 1 1.0 2 1.3 33 2.17
863. * SINGLE MIL (INV)
864. LOAD COMB 241 COMBINATION LOAD CASE 241
865. 1 1.0 2 1.3 34 2.17
866. LOAD COMB 242 COMBINATION LOAD CASE 242
867. 1 1.0 2 1.3 35 2.17
868. LOAD COMB 243 COMBINATION LOAD CASE 243
869. 1 1.0 2 1.3 36 2.17
870. LOAD COMB 244 COMBINATION LOAD CASE 244
871. 1 1.0 2 1.3 37 2.17
872. LOAD COMB 245 COMBINATION LOAD CASE 245
873. 1 1.0 2 1.3 38 2.17
874. LOAD COMB 246 COMBINATION LOAD CASE 246
875. 1 1.0 2 1.3 39 2.17
876. LOAD COMB 247 COMBINATION LOAD CASE 247
877. 1 1.0 2 1.3 40 2.17
878. LOAD COMB 248 COMBINATION LOAD CASE 248
879. 1 1.0 2 1.3 41 2.17
880. LOAD COMB 249 COMBINATION LOAD CASE 249
881. 1 1.0 2 1.3 42 2.17
882. LOAD COMB 250 COMBINATION LOAD CASE 250
883. 1 1.0 2 1.3 43 2.17
884. LOAD COMB 251 COMBINATION LOAD CASE 251
885. 1 1.0 2 1.3 44 2.17
886. LOAD COMB 252 COMBINATION LOAD CASE 252
887. 1 1.0 2 1.3 45 2.17
888. LOAD COMB 253 COMBINATION LOAD CASE 253
889. 1 1.0 2 1.3 46 2.17
890. LOAD COMB 254 COMBINATION LOAD CASE 254
891. 1 1.0 2 1.3 47 2.17
892. LOAD COMB 255 COMBINATION LOAD CASE 255
893. 1 1.0 2 1.3 48 2.17
894. LOAD COMB 256 COMBINATION LOAD CASE 256
895. 1 1.0 2 1.3 49 2.17
896. LOAD COMB 257 COMBINATION LOAD CASE 257
897. 1 1.0 2 1.3 50 2.17
898. LOAD COMB 258 COMBINATION LOAD CASE 258
899. 1 1.0 2 1.3 51 2.17
900. LOAD COMB 259 COMBINATION LOAD CASE 259
901. 1 1.0 2 1.3 52 2.17
902. LOAD COMB 260 COMBINATION LOAD CASE 260
903. 1 1.0 2 1.3 53 2.17
904. * LANE (OPR)
905. LOAD COMB 261 COMBINATION LOAD CASE 261
906. 1 1.0 2 1.3 3 1.3
907. LOAD COMB 262 COMBINATION LOAD CASE 262
908. 1 1.0 2 1.3 4 1.3
909. LOAD COMB 263 COMBINATION LOAD CASE 263
910. 1 1.0 2 1.3 5 1.3
911. LOAD COMB 264 COMBINATION LOAD CASE 264
912. 1 1.0 2 1.3 6 1.3
913. LOAD COMB 265 COMBINATION LOAD CASE 265
914. 1 1.0 2 1.3 7 1.3
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915. LOAD COMB 266 COMBINATION LOAD CASE 266
916. 1 1.0 2 1.3 8 1.3
917. LOAD COMB 267 COMBINATION LOAD CASE 267
918. 1 1.0 2 1.3 9 1.3
919. LOAD COMB 268 COMBINATION LOAD CASE 268
920. 1 1.0 2 1.3 10 1.3
921. LOAD COMB 269 COMBINATION LOAD CASE 269
922. 1 1.0 2 1.3 11 1.3
923. LOAD COMB 270 COMBINATION LOAD CASE 270
924. 1 1.0 2 1.3 12 1.3
925. LOAD COMB 271 COMBINATION LOAD CASE 271
926. 1 1.0 2 1.3 13 1.3
927. * SINGLE HS20 TRUCK (OPR)
928. LOAD COMB 281 COMBINATION LOAD CASE 281
929. 1 1.0 2 1.3 14 1.3
930. LOAD COMB 282 COMBINATION LOAD CASE 282
931. 1 1.0 2 1.3 15 1.3
932. LOAD COMB 283 COMBINATION LOAD CASE 283
933. 1 1.0 2 1.3 16 1.3
934. LOAD COMB 284 COMBINATION LOAD CASE 284
935. 1 1.0 2 1.3 17 1.3
936. LOAD COMB 285 COMBINATION LOAD CASE 285
937. 1 1.0 2 1.3 18 1.3
938. LOAD COMB 286 COMBINATION LOAD CASE 286
939. 1 1.0 2 1.3 19 1.3
940. LOAD COMB 287 COMBINATION LOAD CASE 287
941. 1 1.0 2 1.3 20 1.3
942. LOAD COMB 288 COMBINATION LOAD CASE 288
943. 1 1.0 2 1.3 21 1.3
944. LOAD COMB 289 COMBINATION LOAD CASE 289
945. 1 1.0 2 1.3 22 1.3
946. LOAD COMB 290 COMBINATION LOAD CASE 290
947. 1 1.0 2 1.3 23 1.3
948. LOAD COMB 291 COMBINATION LOAD CASE 291
949. 1 1.0 2 1.3 24 1.3
950. LOAD COMB 292 COMBINATION LOAD CASE 292
951. 1 1.0 2 1.3 25 1.3
952. LOAD COMB 293 COMBINATION LOAD CASE 293
953. 1 1.0 2 1.3 26 1.3
954. LOAD COMB 294 COMBINATION LOAD CASE 294
955. 1 1.0 2 1.3 27 1.3
956. LOAD COMB 295 COMBINATION LOAD CASE 295
957. 1 1.0 2 1.3 28 1.3
958. LOAD COMB 296 COMBINATION LOAD CASE 296
959. 1 1.0 2 1.3 29 1.3
960. LOAD COMB 297 COMBINATION LOAD CASE 297
961. 1 1.0 2 1.3 30 1.3
962. LOAD COMB 298 COMBINATION LOAD CASE 298
963. 1 1.0 2 1.3 31 1.3
964. LOAD COMB 299 COMBINATION LOAD CASE 299
965. 1 1.0 2 1.3 32 1.3
966. LOAD COMB 300 COMBINATION LOAD CASE 300
967. 1 1.0 2 1.3 33 1.3
968. * SINGLE MIL (OPR)
969. LOAD COMB 301 COMBINATION LOAD CASE 301
970. 1 1.0 2 1.3 34 1.3
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 971. LOAD COMB 302 COMBINATION LOAD CASE 302
 972. 1 1.0 2 1.3 35 1.3
 973. LOAD COMB 303 COMBINATION LOAD CASE 303
 974. 1 1.0 2 1.3 36 1.3
 975. LOAD COMB 304 COMBINATION LOAD CASE 304
 976. 1 1.0 2 1.3 37 1.3
 977. LOAD COMB 305 COMBINATION LOAD CASE 305
 978. 1 1.0 2 1.3 38 1.3
 979. LOAD COMB 306 COMBINATION LOAD CASE 306
 980. 1 1.0 2 1.3 39 1.3
 981. LOAD COMB 307 COMBINATION LOAD CASE 307
 982. 1 1.0 2 1.3 40 1.3
 983. LOAD COMB 308 COMBINATION LOAD CASE 308
 984. 1 1.0 2 1.3 41 1.3
 985. LOAD COMB 309 COMBINATION LOAD CASE 309
 986. 1 1.0 2 1.3 42 1.3
 987. LOAD COMB 310 COMBINATION LOAD CASE 310
 988. 1 1.0 2 1.3 43 1.3
 989. LOAD COMB 311 COMBINATION LOAD CASE 311
 990. 1 1.0 2 1.3 44 1.3
 991. LOAD COMB 312 COMBINATION LOAD CASE 312
 992. 1 1.0 2 1.3 45 1.3
 993. LOAD COMB 313 COMBINATION LOAD CASE 313
 994. 1 1.0 2 1.3 46 1.3
 995. LOAD COMB 314 COMBINATION LOAD CASE 314
 996. 1 1.0 2 1.3 47 1.3
 997. LOAD COMB 315 COMBINATION LOAD CASE 315
 998. 1 1.0 2 1.3 48 1.3
 999. LOAD COMB 316 COMBINATION LOAD CASE 316
1000. 1 1.0 2 1.3 49 1.3
1001. LOAD COMB 317 COMBINATION LOAD CASE 317
1002. 1 1.0 2 1.3 50 1.3
1003. LOAD COMB 318 COMBINATION LOAD CASE 318
1004. 1 1.0 2 1.3 51 1.3
1005. LOAD COMB 319 COMBINATION LOAD CASE 319
1006. 1 1.0 2 1.3 52 1.3
1007. LOAD COMB 320 COMBINATION LOAD CASE 320
1008. 1 1.0 2 1.3 53 1.3
1009. * SINGLE 2F1 (OPR)
1010. LOAD COMB 321 COMBINATION LOAD CASE 321
1011. 1 1.0 2 1.3 54 1.3
1012. LOAD COMB 322 COMBINATION LOAD CASE 322
1013. 1 1.0 2 1.3 55 1.3
1014. LOAD COMB 323 COMBINATION LOAD CASE 323
1015. 1 1.0 2 1.3 56 1.3
1016. LOAD COMB 324 COMBINATION LOAD CASE 324
1017. 1 1.0 2 1.3 57 1.3
1018. LOAD COMB 325 COMBINATION LOAD CASE 325
1019. 1 1.0 2 1.3 58 1.3
1020. LOAD COMB 326 COMBINATION LOAD CASE 326
1021. 1 1.0 2 1.3 59 1.3
1022. LOAD COMB 327 COMBINATION LOAD CASE 327
1023. 1 1.0 2 1.3 60 1.3
1024. LOAD COMB 328 COMBINATION LOAD CASE 328
1025. 1 1.0 2 1.3 61 1.3
1026. LOAD COMB 329 COMBINATION LOAD CASE 329
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1027. 1 1.0 2 1.3 62 1.3
1028. LOAD COMB 330 COMBINATION LOAD CASE 330
1029. 1 1.0 2 1.3 63 1.3
1030. LOAD COMB 331 COMBINATION LOAD CASE 331
1031. 1 1.0 2 1.3 64 1.3
1032. LOAD COMB 332 COMBINATION LOAD CASE 332
1033. 1 1.0 2 1.3 65 1.3
1034. LOAD COMB 333 COMBINATION LOAD CASE 333
1035. 1 1.0 2 1.3 66 1.3
1036. LOAD COMB 334 COMBINATION LOAD CASE 334
1037. 1 1.0 2 1.3 67 1.3
1038. LOAD COMB 335 COMBINATION LOAD CASE 335
1039. 1 1.0 2 1.3 68 1.3
1040. LOAD COMB 336 COMBINATION LOAD CASE 336
1041. 1 1.0 2 1.3 69 1.3
1042. LOAD COMB 337 COMBINATION LOAD CASE 337
1043. 1 1.0 2 1.3 70 1.3
1044. LOAD COMB 338 COMBINATION LOAD CASE 338
1045. 1 1.0 2 1.3 71 1.3
1046. LOAD COMB 339 COMBINATION LOAD CASE 339
1047. 1 1.0 2 1.3 72 1.3
1048. LOAD COMB 340 COMBINATION LOAD CASE 340
1049. 1 1.0 2 1.3 73 1.3
1050. * SINGLE 3F1 (OPR)
1051. LOAD COMB 341 COMBINATION LOAD CASE 341
1052. 1 1.0 2 1.3 74 1.3
1053. LOAD COMB 342 COMBINATION LOAD CASE 342
1054. 1 1.0 2 1.3 75 1.3
1055. LOAD COMB 343 COMBINATION LOAD CASE 343
1056. 1 1.0 2 1.3 76 1.3
1057. LOAD COMB 344 COMBINATION LOAD CASE 344
1058. 1 1.0 2 1.3 77 1.3
1059. LOAD COMB 345 COMBINATION LOAD CASE 345
1060. 1 1.0 2 1.3 78 1.3
1061. LOAD COMB 346 COMBINATION LOAD CASE 346
1062. 1 1.0 2 1.3 79 1.3
1063. LOAD COMB 347 COMBINATION LOAD CASE 347
1064. 1 1.0 2 1.3 80 1.3
1065. LOAD COMB 348 COMBINATION LOAD CASE 348
1066. 1 1.0 2 1.3 81 1.3
1067. LOAD COMB 349 COMBINATION LOAD CASE 349
1068. 1 1.0 2 1.3 82 1.3
1069. LOAD COMB 350 COMBINATION LOAD CASE 350
1070. 1 1.0 2 1.3 83 1.3
1071. LOAD COMB 351 COMBINATION LOAD CASE 351
1072. 1 1.0 2 1.3 84 1.3
1073. LOAD COMB 352 COMBINATION LOAD CASE 352
1074. 1 1.0 2 1.3 85 1.3
1075. LOAD COMB 353 COMBINATION LOAD CASE 353
1076. 1 1.0 2 1.3 86 1.3
1077. LOAD COMB 354 COMBINATION LOAD CASE 354
1078. 1 1.0 2 1.3 87 1.3
1079. LOAD COMB 355 COMBINATION LOAD CASE 355
1080. 1 1.0 2 1.3 88 1.3
1081. LOAD COMB 356 COMBINATION LOAD CASE 356
1082. 1 1.0 2 1.3 89 1.3
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1083. LOAD COMB 357 COMBINATION LOAD CASE 357
1084. 1 1.0 2 1.3 90 1.3
1085. LOAD COMB 358 COMBINATION LOAD CASE 358
1086. 1 1.0 2 1.3 91 1.3
1087. LOAD COMB 359 COMBINATION LOAD CASE 359
1088. 1 1.0 2 1.3 92 1.3
1089. LOAD COMB 360 COMBINATION LOAD CASE 360
1090. 1 1.0 2 1.3 93 1.3
1091. * SINGLE 4F1 (OPR)
1092. LOAD COMB 361 COMBINATION LOAD CASE 361
1093. 1 1.0 2 1.3 94 1.3
1094. LOAD COMB 362 COMBINATION LOAD CASE 362
1095. 1 1.0 2 1.3 95 1.3
1096. LOAD COMB 363 COMBINATION LOAD CASE 363
1097. 1 1.0 2 1.3 96 1.3
1098. LOAD COMB 364 COMBINATION LOAD CASE 364
1099. 1 1.0 2 1.3 97 1.3
1100. LOAD COMB 365 COMBINATION LOAD CASE 365
1101. 1 1.0 2 1.3 98 1.3
1102. LOAD COMB 366 COMBINATION LOAD CASE 366
1103. 1 1.0 2 1.3 99 1.3
1104. LOAD COMB 367 COMBINATION LOAD CASE 367
1105. 1 1.0 2 1.3 100 1.3
1106. LOAD COMB 368 COMBINATION LOAD CASE 368
1107. 1 1.0 2 1.3 101 1.3
1108. LOAD COMB 369 COMBINATION LOAD CASE 369
1109. 1 1.0 2 1.3 102 1.3
1110. LOAD COMB 370 COMBINATION LOAD CASE 370
1111. 1 1.0 2 1.3 103 1.3
1112. LOAD COMB 371 COMBINATION LOAD CASE 371
1113. 1 1.0 2 1.3 104 1.3
1114. LOAD COMB 372 COMBINATION LOAD CASE 372
1115. 1 1.0 2 1.3 105 1.3
1116. LOAD COMB 373 COMBINATION LOAD CASE 373
1117. 1 1.0 2 1.3 106 1.3
1118. LOAD COMB 374 COMBINATION LOAD CASE 374
1119. 1 1.0 2 1.3 107 1.3
1120. LOAD COMB 375 COMBINATION LOAD CASE 375
1121. 1 1.0 2 1.3 108 1.3
1122. LOAD COMB 376 COMBINATION LOAD CASE 376
1123. 1 1.0 2 1.3 109 1.3
1124. LOAD COMB 377 COMBINATION LOAD CASE 377
1125. 1 1.0 2 1.3 110 1.3
1126. LOAD COMB 378 COMBINATION LOAD CASE 378
1127. 1 1.0 2 1.3 111 1.3
1128. LOAD COMB 379 COMBINATION LOAD CASE 379
1129. 1 1.0 2 1.3 112 1.3
1130. LOAD COMB 380 COMBINATION LOAD CASE 380
1131. 1 1.0 2 1.3 113 1.3
1132. * SINGLE 5C1 (OPR)
1133. LOAD COMB 381 COMBINATION LOAD CASE 381
1134. 1 1.0 2 1.3 114 1.3
1135. LOAD COMB 382 COMBINATION LOAD CASE 382
1136. 1 1.0 2 1.3 115 1.3
1137. LOAD COMB 383 COMBINATION LOAD CASE 383
1138. 1 1.0 2 1.3 116 1.3
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1139. LOAD COMB 384 COMBINATION LOAD CASE 384
1140. 1 1.0 2 1.3 117 1.3
1141. LOAD COMB 385 COMBINATION LOAD CASE 385
1142. 1 1.0 2 1.3 118 1.3
1143. LOAD COMB 386 COMBINATION LOAD CASE 386
1144. 1 1.0 2 1.3 119 1.3
1145. LOAD COMB 387 COMBINATION LOAD CASE 387
1146. 1 1.0 2 1.3 120 1.3
1147. LOAD COMB 388 COMBINATION LOAD CASE 388
1148. 1 1.0 2 1.3 121 1.3
1149. LOAD COMB 389 COMBINATION LOAD CASE 389
1150. 1 1.0 2 1.3 122 1.3
1151. LOAD COMB 390 COMBINATION LOAD CASE 390
1152. 1 1.0 2 1.3 123 1.3
1153. LOAD COMB 391 COMBINATION LOAD CASE 391
1154. 1 1.0 2 1.3 124 1.3
1155. LOAD COMB 392 COMBINATION LOAD CASE 392
1156. 1 1.0 2 1.3 125 1.3
1157. LOAD COMB 393 COMBINATION LOAD CASE 393
1158. 1 1.0 2 1.3 126 1.3
1159. LOAD COMB 394 COMBINATION LOAD CASE 394
1160. 1 1.0 2 1.3 127 1.3
1161. LOAD COMB 395 COMBINATION LOAD CASE 395
1162. 1 1.0 2 1.3 128 1.3
1163. LOAD COMB 396 COMBINATION LOAD CASE 396
1164. 1 1.0 2 1.3 129 1.3
1165. LOAD COMB 397 COMBINATION LOAD CASE 397
1166. 1 1.0 2 1.3 130 1.3
1167. LOAD COMB 398 COMBINATION LOAD CASE 398
1168. 1 1.0 2 1.3 131 1.3
1169. LOAD COMB 399 COMBINATION LOAD CASE 399
1170. 1 1.0 2 1.3 132 1.3
1171. LOAD COMB 400 COMBINATION LOAD CASE 400
1172. 1 1.0 2 1.3 133 1.3
1173. * ANALYSIS AND OUTPUT
1174. PERFORM ANALYSIS
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P R O B L E M   S T A T I S T I C S

NUMBER OF JOINTS/MEMBER+ELEMENTS/SUPPORTS =   254/   359/   8

SOLVER USED IS THE IN-CORE ADVANCED SOLVER

TOTAL PRIMARY LOAD CASES = 133, TOTAL DEGREES OF FREEDOM =   1476

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1175. * OUTPUT
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1176. * DEAD _SIDEWALK
1177. LOAD LIST 1 2
1178. PRINT SUPPORT REACTION

SUPPORT REACTIONS -UNIT KIP FEET STRUCTURE TYPE = SPACE

JOINT	LOAD	FORCE-X	FORCE-Y	FORCE-Z	MOM-X	MOM-Y	MOM Z
1	1	1600.83	2317.38	-66.75	-1450.04	1189.25	-429.52
	2	52.06	70.70	8.00	173.11	-144.52	-46.25
45	1	-1600.83	2317.38	-66.75	-1450.04	-1189.25	429.52
	2	-52.06	70.70	8.00	173.11	144.52	46.25
46	1	1.51	321.55	-15.80	-338.33	-0.08	-34.87
	2	0.08	4.72	1.76	37.62	0.01	-1.88
81	1	-1.51	321.55	-15.80	-338.33	0.08	34.87
	2	-0.08	4.72	1.76	37.62	-0.01	1.88
86	1	1600.83	2317.38	66.75	1450.04	-1189.25	-429.52
	2	52.06	70.70	-8.00	-173.11	144.52	-46.25
130	1	-1600.83	2317.38	66.75	1450.04	1189.25	429.52
	2	-52.06	70.70	-8.00	-173.11	-144.52	46.25
131	1	1.51	321.55	15.80	338.33	0.08	-34.87
	2	0.08	4.72	-1.76	-37.62	-0.01	-1.88
166	1	-1.51	321.55	15.80	338.33	-0.08	34.87
	2	-0.08	4.72	-1.76	-37.62	0.01	1.88

************** END OF LATEST ANALYSIS RESULT **************

1179. * ARCHES
1180. PRINT MEMBER FORCES LIST 1 3 5 7 9 13 17 21 38 40 42 44

MEMBER END FORCES STRUCTURE TYPE = SPACE

ALL UNITS ARE -- KIP FEET (LOCAL)

MEMBER	LOAD	JT	AXIAL	SHEAR-Y	SHEAR-Z	TORSION	MOM-Y	MOM-Z
1	1	1	2814.50	-107.28	-66.75	225.40	1861.75	-429.52
		2	-2786.27	125.23	66.75	-225.40	-1527.14	-153.23
	2	1	87.59	-5.99	8.00	-29.05	-223.63	-46.25
		2	-87.59	5.99	-8.00	29.05	183.53	16.25
3	1	3	2762.60	30.80	-66.75	139.71	1203.71	388.88
		4	-2737.53	-12.55	66.75	-139.71	-869.10	-280.22
	2	3	87.80	-0.48	8.00	-18.75	-144.89	0.00
		4	-87.80	0.48	-8.00	18.75	104.79	-2.41
5	1	5	2398.70	-83.23	-49.77	193.36	433.67	-153.76
		6	-2371.93	105.56	49.77	-193.36	-130.79	-420.75
	2	5	75.92	-4.49	5.91	-25.80	-51.99	-9.54
		6	-75.92	4.49	-5.91	25.80	16.00	-17.77
7	1	7	2349.14	51.53	-49.77	194.35	-157.49	581.19
		8	-2326.11	-29.15	49.77	-194.35	460.39	-335.64
	2	7	76.04	1.29	5.91	-25.87	18.05	27.47
		8	-76.04	-1.29	-5.91	25.87	-54.04	-19.63
9	1	9	2025.78	-87.60	-24.34	250.54	-726.13	-335.97
		10	-2009.18	107.02	24.34	-250.54	852.82	-170.49
	2	9	65.00	-4.03	3.31	-30.21	83.25	-7.70
		10	-65.00	4.03	-3.31	30.21	-100.46	-13.28
13	1	13	1785.79	-81.38	1.08	278.27	-1063.04	-501.16
		14	-1775.53	99.10	-1.08	-278.27	1058.03	82.39
	2	13	57.70	-3.46	0.09	-34.45	131.92	-14.75
		14	-57.70	3.46	-0.09	34.45	-132.36	-1.32
17	1	17	1619.32	-102.56	19.38	214.34	-865.88	-388.39
		18	-1613.58	119.58	-19.38	-214.34	782.54	-89.23
	2	17	52.18	-4.02	-2.48	-27.23	111.65	-16.04
		18	-52.18	4.02	2.48	27.23	-100.98	-1.25
21	1	21	1536.83	-99.55	0.00	-36.71	-420.97	-437.45
		22	-1535.33	116.66	0.00	36.71	420.97	-14.31
	2	21	49.07	-4.28	0.00	4.77	54.69	-23.13
		22	-49.07	4.28	0.00	-4.77	-54.69	5.25
38	1	38	2326.11	-29.15	49.77	-194.35	-460.39	335.64
		39	-2349.14	51.53	-49.77	194.35	157.49	-581.19
	2	38	76.04	-1.29	-5.91	25.87	54.04	19.63
		39	-76.04	1.29	5.91	-25.87	-18.05	-27.47

MEMBER END FORCES STRUCTURE TYPE = SPACE

ALL UNITS ARE -- KIP FEET (LOCAL)

MEMBER	LOAD	JT	AXIAL	SHEAR-Y	SHEAR-Z	TORSION	MOM-Y	MOM-Z
40	1	40	2371.93	105.56	49.77	-193.36	130.79	420.75
		41	-2398.70	-83.23	-49.77	193.36	-433.67	153.76
	2	40	75.92	4.49	-5.91	25.80	-16.00	17.77
		41	-75.92	-4.49	5.91	-25.80	51.99	9.54
42	1	42	2737.53	-12.55	66.75	-139.71	869.10	280.22
		43	-2762.60	30.80	-66.75	139.71	-1203.71	-388.88
	2	42	87.80	0.48	-8.00	18.75	-104.79	2.41
		43	-87.80	-0.48	8.00	-18.75	144.89	0.00
44	1	44	2786.27	125.23	66.75	-225.40	1527.14	153.23
		45	-2814.50	-107.28	-66.75	225.40	-1861.75	429.52
	2	44	87.59	5.99	-8.00	29.05	-183.53	-16.25
		45	-87.59	-5.99	8.00	-29.05	223.63	46.25

************** END OF LATEST ANALYSIS RESULT **************

1181. * COLUMNS
1182. PRINT MEMBER FORCES LIST 45 49 53 57 61 63

MEMBER END FORCES STRUCTURE TYPE = SPACE

ALL UNITS ARE -- KIP FEET (LOCAL)

MEMBER	LOAD	JT	AXIAL	SHEAR-Y	SHEAR-Z	TORSION	MOM-Y	MOM-Z
45	1	46	321.55	-1.51	-15.80	-0.08	338.33	-34.87
		47	-279.47	1.51	15.80	0.08	-91.47	11.30
	2	46	4.72	-0.08	1.76	0.01	-37.62	-1.88
		47	-4.72	0.08	-1.76	-0.01	10.17	0.61
49	1	5	402.01	-0.60	-16.99	-6.97	147.20	-11.52
		51	-384.18	0.60	16.99	6.97	56.15	4.32
	2	5	15.27	0.02	2.09	0.86	-18.65	0.62
		51	-15.27	-0.02	-2.09	-0.86	-6.33	-0.42
53	1	9	407.74	-3.51	-25.42	-12.92	-11.30	-55.74
		55	-397.27	3.51	25.42	12.92	202.33	29.32
	2	9	16.26	-0.05	2.61	1.67	4.44	-0.73
		55	-16.26	0.05	-2.61	-1.67	-24.02	0.39
57	1	13	327.55	-10.46	-25.42	-15.26	-190.20	-98.82
		59	-321.79	10.46	25.42	15.26	303.79	52.08
	2	13	13.27	-0.36	3.21	1.99	22.09	-3.40
		59	-13.27	0.36	-3.21	-1.99	-36.44	1.81
61	1	17	324.61	-18.95	-18.30	-10.52	-284.97	-88.66
		63	-319.40	18.95	18.30	10.52	371.59	-1.05
	2	17	13.06	-0.94	2.58	1.37	35.23	-4.44
		63	-13.06	0.94	-2.58	-1.37	-47.43	0.00
63	1	21	314.21	-27.64	19.38	-6.12	-401.98	-78.27
		65	-308.13	27.64	-19.38	6.12	294.82	-74.54
	2	21	12.85	-1.48	-2.48	0.79	51.51	-4.17
		65	-12.85	1.48	2.48	-0.79	-37.78	-4.00

************** END OF LATEST ANALYSIS RESULT **************

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1183. * LL ENVELOPES
1184. * SINGLE HS20 TRUCK
1185. LOAD LIST 14 TO 33
1186. *  ARCHES
1187. PRINT MAXFORCE ENVELOPE LIST 1 3 5 7 9 13 17 21 38 40 42 44
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MEMBER FORCE ENVELOPE

ALL UNITS ARE KIP FEET

MAX AND MIN FORCE VALUES AMONGST ALL SECTION LOCATIONS

MEMB		FY/ FZ	DIST DIST	LD LD	MZ/ MY	DIST DIST	LD LD	FX	DIST	LD
1	MAX	47.80	0.00	16	1012.36	0.00	16			
		-0.51	0.00	33	92.32	0.00	14	167.65 C	0.00	20
	MIN	-45.20	5.01	28	-851.03	0.00	29			
		-3.01	5.01	22	16.94	5.01	33	29.38 C	5.01	33
3	MAX	56.34	0.00	16	556.12	0.00	17			
		-0.51	0.00	33	63.25	0.00	14	166.77 C	0.00	20
	MIN	-39.15	5.01	28	-422.82	0.00	29			
		-3.01	5.01	22	13.34	5.01	33	30.82 C	5.01	33
5	MAX	10.44	0.00	18	159.30	0.00	19			
		0.73	0.00	18	44.21	0.00	28	150.50 C	0.00	24
	MIN	-14.44	6.09	28	-132.76	0.00	14			
		-3.24	6.09	27	-15.25	0.00	19	14.57 C	6.09	14
7	MAX	18.34	0.00	18	141.46	0.00	23			
		0.73	0.00	18	10.07	0.00	31	150.87 C	0.00	24
	MIN	-5.52	6.09	30	-187.92	6.09	16			
		-3.24	6.09	27	-21.61	6.09	23	14.68 C	6.09	14
9	MAX	2.94	0.00	20	137.44	5.20	27			
		3.05	0.00	20	4.73	0.00	17	132.83 C	0.00	24
	MIN	-9.23	5.20	16	-260.06	0.00	17			
		-2.64	5.20	29	-44.39	5.20	25	9.78 C	5.20	14
13	MAX	2.45	0.00	22	97.71	4.64	28			
		4.55	0.00	23	36.34	0.00	20	118.59 C	0.00	25
	MIN	-11.08	4.64	18	-227.86	0.00	19			
		-3.07	4.64	18	-69.69	0.00	27	10.82 C	4.64	14
17	MAX	2.27	0.00	25	84.86	4.30	29			
		5.19	0.00	25	64.18	0.00	22	105.70 C	0.00	26
	MIN	-14.20	4.30	20	-194.34	0.00	21			
		-4.07	4.30	21	-58.43	0.00	29	11.01 C	4.30	14
21	MAX	3.96	0.00	27	54.16	4.18	31			
		4.29	0.00	27	81.72	0.00	24	85.88 C	0.00	27
	MIN	-17.10	4.18	23	-191.08	0.00	24			
		-3.71	4.18	23	-49.59	0.00	19	12.97 C	4.18	14
38	MAX	5.54	0.00	20	140.58	6.09	26			
		3.23	0.00	23	10.01	6.09	19	150.90 C	0.00	26

MIN	-17.31	6.09	32	-192.30	0.00	33			
	-0.60	6.09	31	-21.65	0.00	26	14.65 C	6.09	14
40 MAX	14.49	0.00	22	153.10	6.09	30			
	3.23	0.00	23	43.94	6.09	22	150.61 C	0.00	26
MIN	-10.16	6.09	32	-70.50	6.09	19			
	-0.60	6.09	31	-14.48	6.09	31	14.51 C	6.09	14
42 MAX	39.18	0.00	21	552.32	5.01	32			
	3.01	0.00	27	58.28	5.01	33	166.89 C	0.00	29
MIN	-52.88	5.01	33	-419.94	5.01	21			
	0.23	5.01	14	7.95	0.00	14	8.73 C	5.01	14
44 MAX	45.04	0.00	22	1007.28	5.01	33			
	3.01	0.00	27	87.95	5.01	27	167.41 C	0.00	29
MIN	-43.89	5.01	33	-854.87	5.01	21			
	0.23	5.01	14	9.61	0.00	14	8.26 C	5.01	14

********** END OF FORCE ENVELOPE FROM INTERNAL STORAGE **********

1188. * COLUMNS
1189. PRINT MAXFORCE ENVELOPE LIST 45 49 53 57 61 63

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      MEMBER FORCE ENVELOPE
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      ALL UNITS ARE KIP  FEET


 MAX AND MIN FORCE VALUES AMONGST ALL SECTION LOCATIONS

MEMB          FY/    DIST  LD        MZ/    DIST  LD
              FZ     DIST  LD        MY     DIST  LD        FX     DIST  LD

  45 MAX      0.56   0.00   21      23.98   0.00   20
              0.69   0.00   28      77.70   0.00   14     85.27 C   0.00   14
     MIN     -0.51  15.63   31     -24.18   0.00   31
             -3.15  15.63   14     -21.44   0.00   29     13.95 T  15.63   22

  49 MAX      0.69   0.00   28      19.46   0.00   28
              1.37   0.00   30      55.08   0.00   18     94.17 C   0.00   16
     MIN     -1.08  11.97   17     -28.60   0.00   17
             -3.36  11.97   18     -25.71   0.00   29     31.07 T  11.97   29

  53 MAX      1.86   0.00   29      30.41   0.00   29
              0.93   0.00   17      27.83   0.00   20     45.44 C   0.00   18
     MIN     -3.01   7.51   19     -48.20   0.00   19
             -3.65   7.51   21     -14.29   7.51   26      5.28 C   7.51   33

  57 MAX      2.90   0.00   30      27.47   0.00   30
              4.67   0.00   19      17.33   4.47   19     37.17 C   0.00   20
     MIN     -5.71   4.47   21     -53.30   0.00   21
             -3.94   4.47   24     -28.09   4.47   26      0.90 T   4.47   14

  61 MAX      3.21   0.00   31      15.42   0.00   31
              6.33   0.00   22      48.02   4.73   21     38.96 C   0.00   22
     MIN     -9.57   4.73   23     -44.99   0.00   23
             -2.99   4.73   26     -43.00   4.73   27      2.06 C   4.73   14

  63 MAX      7.29   0.00   19      45.45   5.53   26
              6.55   0.00   24      77.22   5.53   24     39.09 C   0.00   24
     MIN    -16.15   5.53   26     -43.84   0.00   26
             -3.82   5.53   20     -40.81   5.53   28      2.31 C   5.53   14


 ********** END OF FORCE ENVELOPE FROM INTERNAL STORAGE **********


1190. * SINGLE MIL
1191. LOAD LIST 34 TO 53
1192. *  ARCHES
1193. PRINT MAXFORCE ENVELOPE LIST 1 3 5 7 9 13 17 21 38 40 42 44
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MEMBER FORCE ENVELOPE

ALL UNITS ARE KIP FEET

MAX AND MIN FORCE VALUES AMONGST ALL SECTION LOCATIONS

MEMB		FY/ FZ	DIST DIST	LD LD	MZ/ MY	DIST DIST	LD LD	FX	DIST	LD
1	MAX	36.94	0.00	36	738.11	0.00	37			
		-0.44	0.00	53	66.90	0.00	34	113.40 C	0.00	41
	MIN	-31.08	5.01	49	-588.45	0.00	49			
		-2.18	5.01	34	13.83	5.01	53	26.34 C	5.01	34
3	MAX	42.07	0.00	36	410.99	0.00	38			
		-0.44	0.00	53	44.46	0.00	34	112.83 C	0.00	41
	MIN	-27.07	5.01	49	-293.86	0.00	50			
		-2.18	5.01	34	10.70	5.01	53	25.32 C	5.01	34
5	MAX	10.22	0.00	38	115.40	0.00	40			
		0.77	0.00	39	30.43	0.00	49	101.95 C	0.00	45
	MIN	-9.91	6.09	48	-136.99	0.00	35			
		-2.22	6.09	48	-13.43	0.00	39	1.28 T	6.09	34
7	MAX	14.78	0.00	38	96.81	0.00	44			
		0.77	0.00	39	7.05	0.00	52	102.22 C	0.00	45
	MIN	-3.87	6.09	50	-157.32	6.09	38			
		-2.22	6.09	48	-15.22	6.09	44	1.09 T	6.09	34
9	MAX	4.43	0.00	41	94.34	5.20	48			
		2.69	0.00	41	15.62	0.00	38	90.29 C	0.00	45
	MIN	-9.09	5.20	38	-233.93	0.00	38			
		-1.83	5.20	50	-30.54	5.20	46	0.69 C	5.20	34
13	MAX	5.11	0.00	43	67.76	4.64	49			
		3.97	0.00	43	40.15	0.00	40	80.24 C	0.00	46
	MIN	-11.28	4.64	40	-209.17	0.00	40			
		-3.34	4.64	40	-48.25	0.00	48	1.14 C	4.64	34
17	MAX	5.16	0.00	45	59.33	4.30	50			
		4.76	0.00	45	62.07	0.00	43	71.58 C	0.00	46
	MIN	-13.91	4.30	42	-182.93	0.00	42			
		-4.95	4.30	42	-40.71	0.00	50	1.50 C	4.30	34
21	MAX	5.53	0.00	47	38.81	4.18	51			
		4.76	0.00	47	83.26	0.00	45	59.35 C	0.00	48
	MIN	-15.85	4.18	44	-173.52	0.00	44			
		-4.66	4.18	44	-39.28	0.00	40	2.27 C	4.18	34
38	MAX	3.89	0.00	41	96.40	6.09	48			
		2.23	0.00	44	7.06	6.09	40	102.31 C	0.00	47

MIN	-15.29	6.09	53	-135.86	0.00	53			
	-0.77	6.09	53	-15.21	0.00	47	2.78 C	6.09	34
40 MAX	9.95	0.00	43	116.57	6.09	52			
	2.23	0.00	44	30.38	6.09	43	102.11 C	0.00	47
MIN	-10.21	6.09	53	-50.15	6.09	40			
	-0.77	6.09	53	-13.59	6.09	52	2.75 C	6.09	34
42 MAX	27.10	0.00	42	406.43	5.01	53			
	2.04	0.00	48	38.39	5.01	47	112.89 C	0.00	50
MIN	-31.27	5.01	53	-292.27	5.01	42			
	0.11	5.01	34	4.35	0.00	34	1.54 C	5.01	34
44 MAX	31.00	0.00	43	670.49	5.01	53			
	2.04	0.00	48	59.29	5.01	48	113.24 C	0.00	50
MIN	-24.68	5.01	53	-592.20	5.01	42			
	0.11	5.01	34	5.19	0.00	34	1.45 C	5.01	34

********** END OF FORCE ENVELOPE FROM INTERNAL STORAGE **********

1194. * COLUMNS
1195. PRINT MAXFORCE ENVELOPE LIST 45 49 53 57 61 63

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      MEMBER FORCE ENVELOPE
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      ALL UNITS ARE KIP  FEET


  MAX AND MIN FORCE VALUES AMONGST ALL SECTION LOCATIONS

 MEMB          FY/    DIST  LD        MZ/    DIST  LD
               FZ     DIST  LD        MY     DIST  LD        FX     DIST  LD

   45 MAX      0.41   0.00   42      17.22   0.00   41
               0.48   0.00   49      55.40   0.00   36     85.59 C   0.00   34
      MIN     -0.53  15.63   35     -17.22   0.00   52
              -2.24  15.63   36     -14.79   0.00   50      9.88 T  15.63   42

   49 MAX      0.48   0.00   48      13.53   0.00   48
               0.96   0.00   51      41.49   0.00   39     76.40 C   0.00   36
      MIN     -0.80  11.97   37     -21.28   0.00   38
              -2.53  11.97   39     -17.93   0.00   50     21.75 T  11.97   50

   53 MAX      1.30   0.00   50      21.20   0.00   50
               1.92   0.00   38      24.34   0.00   41     40.07 C   0.00   38
      MIN     -2.30   7.51   39     -36.30   0.00   39
              -2.68   7.51   41     -10.25   0.00   38      2.44 T   7.51   34

   57 MAX      2.04   0.00   51      19.29   0.00   51
               5.60   0.00   40      16.35   4.47   40     32.80 C   0.00   40
      MIN     -4.41   4.47   41     -40.35   0.00   41
              -2.93   4.47   44     -19.66   4.47   47      2.40 T   4.47   37

   61 MAX      2.36   0.00   52      11.32   0.00   52
               7.56   0.00   42      52.01   4.73   42     33.01 C   0.00   42
      MIN     -7.65   4.73   44     -35.69   0.00   44
              -2.85   4.73   39     -30.30   4.73   47      0.06 C   4.73   34

   63 MAX      5.52   0.00   41      38.55   5.53   46
               8.29   0.00   45      84.81   5.53   45     34.58 C   0.00   45
      MIN    -13.34   5.53   46     -35.23   0.00   46
              -4.57   5.53   42     -31.10   5.53   48      0.30 C   5.53   34


  ********** END OF FORCE ENVELOPE FROM INTERNAL STORAGE **********


 1196. * LANE
 1197. LOAD LIST 3 TO 13
 1198. *  ARCHES
 1199. PRINT MAXFORCE ENVELOPE LIST 1 3 5 7 9 13 17 21 38 40 42 44
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MEMBER FORCE ENVELOPE

ALL UNITS ARE KIP FEET

MAX AND MIN FORCE VALUES AMONGST ALL SECTION LOCATIONS

MEMB		FY/ FZ	DIST DIST	LD LD	MZ/ MY	DIST DIST	LD LD	FX	DIST	LD
1	MAX	6.95	0.00	4	282.17	0.00	5			
		-3.80	0.00	13	150.60	0.00	6	214.72 C	0.00	6
	MIN	-28.02	5.01	10	-402.25	0.00	10			
		-5.09	5.01	6	95.85	5.01	13	160.33 C	5.01	13
3	MAX	19.25	0.00	4	216.34	0.00	5			
		-3.80	0.00	13	99.98	0.00	5	214.66 C	0.00	7
	MIN	-16.13	5.01	10	-151.01	0.00	10			
		-5.09	5.01	6	58.36	5.01	13	160.99 C	5.01	13
5	MAX	-2.23	0.00	5	91.25	6.09	7			
		-2.79	0.00	5	46.37	0.00	10	190.37 C	0.00	8
	MIN	-12.70	6.09	10	-74.29	0.00	4			
		-4.04	6.09	9	9.13	6.09	6	135.48 C	6.09	3
7	MAX	10.53	0.00	5	103.57	0.00	8			
		-2.79	0.00	5	0.16	0.00	11	190.66 C	0.00	8
	MIN	0.92	6.09	11	-46.61	6.09	5			
		-4.04	6.09	9	-29.56	6.09	7	135.71 C	6.09	3
9	MAX	-4.72	0.00	6	68.99	5.20	9			
		-0.21	0.00	6	-36.88	0.00	5	163.75 C	0.00	8
	MIN	-11.72	5.20	5	-137.81	0.00	5			
		-2.19	5.20	10	-61.71	5.20	8	116.11 C	5.20	3
13	MAX	-4.18	0.00	7	32.81	4.64	10			
		1.88	0.00	7	-43.15	0.00	6	144.98 C	0.00	9
	MIN	-12.06	4.64	6	-141.26	0.00	6			
		-1.03	4.64	6	-81.13	0.00	9	102.94 C	4.64	3
17	MAX	-5.51	0.00	8	32.82	4.30	11			
		3.14	0.00	8	-18.43	0.00	7	131.14 C	0.00	9
	MIN	-14.40	4.30	7	-126.20	0.00	7			
		-0.88	4.30	7	-63.25	0.00	10	93.48 C	4.30	3
21	MAX	-5.26	0.00	9	16.73	4.18	11			
		2.08	0.00	9	16.42	0.00	8	119.26 C	0.00	10
	MIN	-15.35	4.18	8	-131.34	0.00	8			
		-2.08	4.18	8	-35.06	0.00	6	88.73 C	4.18	3
38	MAX	-0.92	0.00	6	103.57	6.09	9			
		4.04	0.00	8	0.16	6.09	6	190.66 C	0.00	9

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    MIN    -10.53   6.09   12     -46.61   0.00   12
             2.79   6.09   12     -29.56   0.00   10    137.21 C   6.09    3

 40 MAX     12.70   0.00    7      91.25   0.00   10
             4.04   0.00    8      46.37   6.09    7    190.37 C   0.00    9
    MIN      2.23   6.09   12     -74.29   6.09   13
             2.79   6.09   12       9.13   0.00   11    137.04 C   6.09    3

 42 MAX     16.13   0.00    7     216.34   5.01   12
             5.09   0.00   11      99.98   5.01   12    214.66 C   0.00   10
    MIN    -19.25   5.01   13    -151.01   5.01    7
             3.75   5.01    3      57.10   0.00    3    156.43 C   5.01    3

 44 MAX     28.02   0.00    7     282.17   5.01   12
             5.09   0.00   11     150.60   5.01   11    214.72 C   0.00   11
    MIN     -6.95   5.01   13    -402.25   5.01    7
             3.75   5.01    3      94.27   0.00    3    156.01 C   5.01    3


********** END OF FORCE ENVELOPE FROM INTERNAL STORAGE **********


1200. *  COLUMNS
1201. PRINT MAXFORCE ENVELOPE LIST 45 49 53 57 61 63
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MEMBER FORCE ENVELOPE

ALL UNITS ARE KIP FEET

MAX AND MIN FORCE VALUES AMONGST ALL SECTION LOCATIONS

MEMB		FY/ FZ	DIST DIST	LD LD	MZ/ MY	DIST DIST	LD LD	FX	DIST	LD
45	MAX	0.12	0.00	7	6.47	0.00	7			
		-0.71	0.00	10	57.56	0.00	3	65.69 C	0.00	3
	MIN	-0.29	15.63	11	-11.44	0.00	11			
		-2.44	15.63	3	4.90	15.63	11	5.83 C	15.63	7
49	MAX	0.27	0.00	10	7.97	0.00	10			
		-0.45	0.00	11	29.65	0.00	5	63.85 C	0.00	4
	MIN	-0.39	11.97	5	-10.14	0.00	5			
		-2.24	11.97	5	-4.77	11.97	10	13.70 C	11.97	11
53	MAX	0.53	0.00	10	8.69	0.00	10			
		-1.00	0.00	5	12.09	0.00	6	50.46 C	0.00	5
	MIN	-1.27	7.51	6	-20.59	0.00	6			
		-2.84	7.51	7	-14.95	7.51	9	28.83 C	7.51	3
57	MAX	0.37	0.00	11	3.47	0.00	11			
		0.82	0.00	6	-6.51	0.00	7	41.73 C	0.00	6
	MIN	-2.76	4.47	7	-26.21	0.00	7			
		-2.82	4.47	8	-25.85	4.47	9	24.01 C	4.47	3
61	MAX	-0.30	0.00	11	0.12	4.73	5			
		2.76	0.00	7	2.63	4.73	7	41.63 C	0.00	7
	MIN	-4.88	4.73	8	-23.25	0.00	8			
		-1.81	4.73	8	-33.02	4.73	9	23.35 C	4.73	3
63	MAX	0.86	0.00	6	22.95	5.53	9			
		5.22	0.00	8	25.83	5.53	8	41.00 C	0.00	8
	MIN	-8.43	5.53	9	-23.65	0.00	9			
		-0.54	5.53	7	-31.86	0.00	10	22.53 C	5.53	3

********** END OF FORCE ENVELOPE FROM INTERNAL STORAGE **********

1202. * SINGLE 2F1
1203. LOAD LIST 54 TO 73
1204. * ARCHES
1205. PRINT MAXFORCE ENVELOPE LIST 1 3 5 7 9 13 17 21 38 40 42 44

MEMBER FORCE ENVELOPE

ALL UNITS ARE KIP FEET

MAX AND MIN FORCE VALUES AMONGST ALL SECTION LOCATIONS

MEMB		FY/ FZ	DIST DIST	LD LD	MZ/ MY	DIST DIST	LD LD	FX	DIST	LD
1	MAX	22.37	0.00	56	453.63	0.00	57			
		-0.26	0.00	73	40.78	0.00	54	70.65 C	0.00	61
	MIN	-19.25	5.01	69	-365.98	0.00	69			
		-1.31	5.01	54	8.34	5.01	73	15.66 C	5.01	73
3	MAX	25.64	0.00	56	250.81	0.00	58			
		-0.26	0.00	73	27.33	0.00	54	70.35 C	0.00	61
	MIN	-16.81	5.01	69	-181.76	0.00	70			
		-1.31	5.01	54	6.47	5.01	73	16.40 C	5.01	73
5	MAX	5.86	0.00	58	70.64	0.00	60			
		0.43	0.00	59	18.85	0.00	69	63.47 C	0.00	64
	MIN	-6.17	6.09	68	-78.72	0.00	55			
		-1.38	6.09	67	-8.02	0.00	59	0.12 C	6.09	54
7	MAX	8.79	0.00	58	60.10	0.00	64			
		0.43	0.00	59	4.34	0.00	72	63.57 C	0.00	64
	MIN	-2.40	6.09	70	-93.95	6.09	57			
		-1.38	6.09	67	-9.40	6.09	64	0.24 C	6.09	54
9	MAX	2.22	0.00	61	58.47	5.20	67			
		1.58	0.00	61	7.30	0.00	58	56.24 C	0.00	65
	MIN	-5.28	5.20	57	-133.15	0.00	58			
		-1.14	5.20	69	-18.94	5.20	66	1.06 C	5.20	54
13	MAX	2.56	0.00	63	41.96	4.64	69			
		2.33	0.00	63	22.57	0.00	60	49.95 C	0.00	66
	MIN	-6.04	4.64	59	-119.68	0.00	60			
		-1.80	4.64	59	-29.95	0.00	68	1.35 C	4.64	54
17	MAX	2.56	0.00	65	36.72	4.30	70			
		2.73	0.00	65	34.69	0.00	63	44.68 C	0.00	66
	MIN	-7.59	4.30	62	-105.45	0.00	62			
		-2.57	4.30	62	-25.10	0.00	69	1.55 C	4.30	54
21	MAX	2.88	0.00	67	24.01	4.18	71			
		2.63	0.00	67	45.95	0.00	65	36.91 C	0.00	68
	MIN	-8.96	4.18	64	-102.44	0.00	64			
		-2.51	4.18	64	-24.01	0.00	60	2.07 C	4.18	54
38	MAX	2.40	0.00	61	60.05	6.09	67			
		1.38	0.00	64	4.33	6.09	60	63.65 C	0.00	67

MIN	-8.77	6.09	73	-83.98	0.00	73			
	-0.41	6.09	72	-9.39	0.00	67	2.42 C	6.09	54
40 MAX	6.18	0.00	63	69.90	6.09	71			
	1.38	0.00	64	18.80	6.09	62	63.54 C	0.00	67
MIN	-5.78	6.09	73	-30.96	6.09	60			
	-0.41	6.09	72	-8.00	6.09	72	2.40 C	6.09	54
42 MAX	16.82	0.00	62	249.59	5.01	73			
	1.27	0.00	68	23.86	5.01	67	70.36 C	0.00	70
MIN	-20.28	5.01	73	-181.32	5.01	61			
	0.07	5.01	54	2.81	0.00	54	1.37 C	5.01	54
44 MAX	19.21	0.00	62	422.40	5.01	73			
	1.27	0.00	68	37.00	5.01	68	70.63 C	0.00	70
MIN	-16.21	5.01	73	-366.60	5.01	62			
	0.07	5.01	54	3.35	0.00	54	1.29 C	5.01	54

********** END OF FORCE ENVELOPE FROM INTERNAL STORAGE **********

1206. * COLUMNS
1207. PRINT MAXFORCE ENVELOPE LIST 45 49 53 57 61 63

MEMBER FORCE ENVELOPE

ALL UNITS ARE KIP FEET

MAX AND MIN FORCE VALUES AMONGST ALL SECTION LOCATIONS

MEMB		FY/ FZ	DIST DIST	LD LD	MZ/ MY	DIST DIST	LD LD	FX	DIST	LD
45	MAX	0.25	0.00	62	10.66	0.00	61			
		0.30	0.00	69	34.00	0.00	56	49.56 C	0.00	54
	MIN	-0.30	15.63	55	-10.55	0.00	72			
		-1.37	15.63	55	-9.18	0.00	70	6.12 T	15.63	62
49	MAX	0.30	0.00	68	8.41	0.00	68			
		0.59	0.00	70	25.18	0.00	59	45.42 C	0.00	56
	MIN	-0.49	11.97	57	-12.89	0.00	57			
		-1.54	11.97	59	-11.13	0.00	70	13.49 T	11.97	70
53	MAX	0.80	0.00	70	13.06	0.00	70			
		0.90	0.00	58	14.33	0.00	61	23.21 C	0.00	58
	MIN	-1.40	7.51	59	-22.23	0.00	59			
		-1.63	7.51	61	-6.18	7.51	66	1.11 T	7.51	54
57	MAX	1.25	0.00	71	11.86	0.00	71			
		3.00	0.00	60	9.38	4.47	60	18.98 C	0.00	60
	MIN	-2.67	4.47	61	-24.67	0.00	61			
		-1.79	4.47	64	-12.11	4.47	66	0.74 T	4.47	56
61	MAX	1.44	0.00	72	6.92	0.00	72			
		4.17	0.00	62	29.22	4.73	62	19.44 C	0.00	62
	MIN	-4.52	4.73	64	-21.15	0.00	64			
		-1.56	4.73	59	-18.72	4.73	67	0.18 C	4.73	54
63	MAX	3.38	0.00	61	22.54	5.53	66			
		4.24	0.00	65	45.03	5.53	64	19.56 C	0.00	65
	MIN	-7.86	5.53	66	-20.94	0.00	66			
		-2.40	5.53	61	-18.66	5.53	68	0.31 C	5.53	54

********** END OF FORCE ENVELOPE FROM INTERNAL STORAGE **********

1208. * SINGLE 3F1
1209. LOAD LIST 74 TO 93
1210. * ARCHES
1211. PRINT MAXFORCE ENVELOPE LIST 1 3 5 7 9 13 17 21 38 40 42 44

MEMBER FORCE ENVELOPE

ALL UNITS ARE KIP FEET

MAX AND MIN FORCE VALUES AMONGST ALL SECTION LOCATIONS

MEMB		FY/ FZ	DIST DIST	LD LD	MZ/ MY	DIST DIST	LD LD	FX	DIST	LD
1	MAX	33.90	0.00	76	687.61	0.00	77			
		-0.37	0.00	93	61.50	0.00	74	108.08 C	0.00	81
	MIN	-29.39	5.01	88	-560.48	0.00	89			
		-1.94	5.01	83	12.06	5.01	93	22.26 C	5.01	93
3	MAX	39.10	0.00	76	379.02	0.00	78			
		-0.37	0.00	93	41.60	0.00	74	107.71 C	0.00	81
	MIN	-25.68	5.01	89	-276.24	0.00	90			
		-1.94	5.01	83	9.42	5.01	93	23.33 C	5.01	93
5	MAX	8.74	0.00	78	107.16	0.00	79			
		0.61	0.00	78	28.76	0.00	88	97.30 C	0.00	84
	MIN	-9.45	6.09	88	-114.99	0.00	75			
		-2.12	6.09	87	-12.06	0.00	79	1.99 C	6.09	74
7	MAX	13.45	0.00	78	91.60	0.00	84			
		0.61	0.00	78	6.64	0.00	91	97.48 C	0.00	84
	MIN	-3.67	6.09	90	-141.72	6.09	77			
		-2.12	6.09	87	-14.36	6.09	84	2.18 C	6.09	74
9	MAX	3.38	0.00	80	89.70	5.20	87			
		2.31	0.00	81	9.12	0.00	78	86.09 C	0.00	85
	MIN	-7.83	5.20	77	-192.21	0.00	77			
		-1.74	5.20	89	-28.90	5.20	86	2.82 C	5.20	74
13	MAX	3.32	0.00	83	63.92	4.64	89			
		3.47	0.00	83	33.77	0.00	80	76.52 C	0.00	85
	MIN	-9.17	4.64	79	-174.83	0.00	80			
		-2.68	4.64	79	-45.72	0.00	88	3.28 C	4.64	74
17	MAX	3.45	0.00	85	55.88	4.30	90			
		4.08	0.00	85	52.19	0.00	82	68.43 C	0.00	86
	MIN	-11.12	4.30	81	-156.63	0.00	82			
		-3.51	4.30	81	-38.53	0.00	89	3.55 C	4.30	74
21	MAX	4.31	0.00	87	36.62	4.18	91			
		3.88	0.00	87	65.81	0.00	84	56.38 C	0.00	88
	MIN	-12.78	4.18	84	-155.15	0.00	84			
		-3.49	4.18	84	-35.92	0.00	80	4.50 C	4.18	74
38	MAX	3.65	0.00	81	92.00	6.09	87			
		2.11	0.00	83	6.64	6.09	79	97.37 C	0.00	86

MIN	-12.68	6.09	93	-134.10	0.00	93			
	-0.62	6.09	92	-14.31	0.00	87	5.19 C	6.09	74
40 MAX	9.41	0.00	83	106.90	6.09	91			
	2.11	0.00	83	28.83	6.09	82	97.11 C	0.00	86
MIN	-8.39	6.09	93	-47.07	6.09	80			
	-0.62	6.09	92	-11.62	6.09	92	5.14 C	6.09	74
42 MAX	25.66	0.00	82	379.76	5.01	93			
	1.94	0.00	88	36.69	5.01	93	107.64 C	0.00	90
MIN	-32.52	5.01	93	-277.68	5.01	81			
	0.12	5.01	74	4.49	0.00	74	2.98 C	5.01	74
44 MAX	29.47	0.00	82	659.73	5.01	93			
	1.94	0.00	88	56.60	5.01	88	108.17 C	0.00	90
MIN	-26.38	5.01	93	-557.82	5.01	82			
	0.12	5.01	74	5.38	0.00	74	2.81 C	5.01	74

********** END OF FORCE ENVELOPE FROM INTERNAL STORAGE **********

1212. * COLUMNS
1213. PRINT MAXFORCE ENVELOPE LIST 45 49 53 57 61 63

MRussell

MEMBER FORCE ENVELOPE

ALL UNITS ARE KIP FEET

MAX AND MIN FORCE VALUES AMONGST ALL SECTION LOCATIONS

MEMB		FY/ FZ	DIST DIST	LD LD	MZ/ MY	DIST DIST	LD LD	FX	DIST	LD
45	MAX	0.38	0.00	82	16.28	0.00	81			
		0.45	0.00	89	51.79	0.00	75	68.29 C	0.00	74
	MIN	-0.41	15.63	75	-16.14	0.00	91			
		-2.11	15.63	75	-14.02	0.00	90	9.37 T	15.63	82
49	MAX	0.46	0.00	88	12.85	0.00	88			
		0.91	0.00	90	37.75	0.00	79	67.77 C	0.00	76
	MIN	-0.75	11.97	77	-19.79	0.00	77			
		-2.32	11.97	79	-17.00	0.00	90	20.60 T	11.97	90
53	MAX	1.22	0.00	89	20.04	0.00	89			
		1.15	0.00	77	21.11	0.00	81	34.48 C	0.00	78
	MIN	-2.13	7.51	79	-33.89	0.00	79			
		-2.51	7.51	81	-9.45	7.51	86	0.83 T	7.51	74
57	MAX	1.92	0.00	90	18.20	0.00	90			
		4.24	0.00	80	13.73	4.47	80	28.67 C	0.00	80
	MIN	-4.09	4.47	81	-37.77	0.00	81			
		-2.68	4.47	84	-18.57	4.47	86	0.97 T	4.47	76
61	MAX	2.18	0.00	92	10.45	0.00	92			
		6.23	0.00	82	43.00	4.73	82	29.74 C	0.00	82
	MIN	-6.86	4.73	83	-31.79	0.00	83			
		-2.29	4.73	85	-28.62	4.73	87	0.54 C	4.73	74
63	MAX	5.09	0.00	81	33.88	5.53	86			
		6.18	0.00	84	69.20	5.53	84	29.47 C	0.00	84
	MIN	-11.93	5.53	86	-32.05	0.00	86			
		-3.54	5.53	81	-28.53	5.53	88	0.73 C	5.53	74

********** END OF FORCE ENVELOPE FROM INTERNAL STORAGE **********

1214. * SINGLE 4F1
1215. LOAD LIST 94 TO 113
1216. * ARCHES
1217. PRINT MAXFORCE ENVELOPE LIST 1 3 5 7 9 13 17 21 38 40 42 44

MEMBER FORCE ENVELOPE

ALL UNITS ARE KIP FEET

MAX AND MIN FORCE VALUES AMONGST ALL SECTION LOCATIONS

MEMB		FY/ FZ	DIST DIST	LD LD	MZ/ MY	DIST DIST	LD LD	FX	DIST	LD
1	MAX	38.80	0.00	96	790.42	0.00	97			
		-0.40	0.00	113	70.87	0.00	94	126.53 C	0.00	100
	MIN	-34.46	5.01	108	-654.34	0.00	109			
		-2.27	5.01	102	13.29	5.01	113	23.97 C	5.01	113
3	MAX	45.11	0.00	96	433.81	0.00	97			
		-0.40	0.00	113	48.35	0.00	94	126.04 C	0.00	101
	MIN	-29.91	5.01	109	-323.84	0.00	109			
		-2.27	5.01	102	10.46	5.01	113	25.15 C	5.01	113
5	MAX	9.63	0.00	98	125.56	0.00	99			
		0.72	0.00	98	33.73	0.00	108	114.00 C	0.00	104
	MIN	-11.04	6.09	108	-122.78	0.00	95			
		-2.47	6.09	107	-13.52	0.00	99	5.35 C	6.09	94
7	MAX	15.40	0.00	98	107.45	0.00	103			
		0.72	0.00	98	7.77	0.00	111	114.26 C	0.00	104
	MIN	-4.27	6.09	110	-159.78	6.09	97			
		-2.47	6.09	107	-16.68	6.09	104	5.54 C	6.09	94
9	MAX	3.79	0.00	100	105.01	5.20	107			
		2.63	0.00	100	8.61	0.00	97	100.67 C	0.00	105
	MIN	-8.53	5.20	97	-224.31	0.00	97			
		-2.03	5.20	109	-33.73	5.20	105	4.93 C	5.20	94
13	MAX	3.51	0.00	102	74.50	4.64	108			
		3.87	0.00	103	36.73	0.00	100	89.74 C	0.00	105
	MIN	-10.26	4.64	99	-192.72	0.00	99			
		-2.88	4.64	99	-53.22	0.00	108	5.58 C	4.64	94
17	MAX	3.25	0.00	105	64.97	4.30	109			
		4.56	0.00	105	60.09	0.00	102	80.08 C	0.00	106
	MIN	-12.69	4.30	101	-171.82	0.00	102			
		-4.00	4.30	101	-45.04	0.00	109	5.83 C	4.30	94
21	MAX	4.58	0.00	107	42.46	4.18	111			
		4.20	0.00	107	76.55	0.00	104	65.63 C	0.00	108
	MIN	-14.66	4.18	103	-174.41	0.00	104			
		-3.49	4.18	103	-40.43	0.00	99	7.14 C	4.18	94
38	MAX	4.26	0.00	100	107.58	6.09	107			
		2.47	0.00	103	7.76	6.09	99	114.23 C	0.00	106

MIN	-14.57	6.09	112	-159.88	0.00	113			
	-0.67	6.09	112	-16.58	0.00	107	8.14 C	6.09	94
40 MAX	11.03	0.00	102	122.63	6.09	111			
	2.47	0.00	103	33.72	6.09	102	113.97 C	0.00	106
MIN	-8.92	6.09	113	-54.30	6.09	100			
	-0.67	6.09	112	-13.04	6.09	111	8.06 C	6.09	94
42 MAX	29.82	0.00	101	437.46	5.01	113			
	2.28	0.00	107	43.31	5.01	113	125.92 C	0.00	109
MIN	-39.67	5.01	113	-324.03	5.01	101			
	0.15	5.01	94	5.54	0.00	94	4.74 C	5.01	94
44 MAX	34.48	0.00	102	782.28	5.01	113			
	2.28	0.00	107	66.47	5.01	107	126.60 C	0.00	110
MIN	-32.62	5.01	113	-653.12	5.01	101			
	0.15	5.01	94	6.65	0.00	94	4.48 C	5.01	94

********** END OF FORCE ENVELOPE FROM INTERNAL STORAGE **********

1218. * COLUMNS
1219. PRINT MAXFORCE ENVELOPE LIST 45 49 53 57 61 63

MEMBER FORCE ENVELOPE

ALL UNITS ARE KIP FEET

MAX AND MIN FORCE VALUES AMONGST ALL SECTION LOCATIONS

MEMB		FY/ FZ	DIST	LD	MZ/ MY	DIST	LD	FX	DIST	LD
45	MAX	0.44	0.00	102	18.84	0.00	101			
		0.53	0.00	109	60.65	0.00	95	71.02 C	0.00	94
	MIN	-0.42	15.63	95	-18.86	0.00	111			
		-2.45	15.63	95	-16.31	0.00	110	10.90 T	15.63	102
49	MAX	0.53	0.00	108	14.95	0.00	108			
		1.06	0.00	110	43.85	0.00	98	76.49 C	0.00	96
	MIN	-0.87	11.97	97	-22.95	0.00	97			
		-2.66	11.97	98	-19.77	0.00	110	23.93 T	11.97	110
53	MAX	1.43	0.00	109	23.44	0.00	109			
		1.30	0.00	97	23.78	0.00	100	38.37 C	0.00	98
	MIN	-2.44	7.51	99	-38.99	0.00	99			
		-2.91	7.51	101	-11.00	7.51	106	0.95 C	7.51	94
57	MAX	2.24	0.00	110	21.25	0.00	110			
		4.38	0.00	99	14.81	4.47	99	32.20 C	0.00	100
	MIN	-4.70	4.47	101	-43.54	0.00	101			
		-3.09	4.47	103	-21.68	4.47	106	0.80 T	4.47	95
61	MAX	2.51	0.00	111	12.06	0.00	111			
		6.72	0.00	102	46.13	4.73	102	33.87 C	0.00	102
	MIN	-7.99	4.73	103	-37.09	0.00	103			
		-2.70	4.73	105	-33.33	4.73	107	1.04 C	4.73	94
63	MAX	5.89	0.00	100	38.08	5.53	106			
		7.03	0.00	104	77.87	5.53	104	34.02 C	0.00	104
	MIN	-13.54	5.53	106	-36.77	0.00	106			
		-3.58	5.53	101	-32.63	5.53	108	1.20 C	5.53	94

********** END OF FORCE ENVELOPE FROM INTERNAL STORAGE **********

1220. * SINGLE 5C1
1221. LOAD LIST 114 TO 133
1222. * ARCHES
1223. PRINT MAXFORCE ENVELOPE LIST 1 3 5 7 9 13 17 21 38 40 42 44

MEMBER FORCE ENVELOPE

ALL UNITS ARE KIP FEET

MAX AND MIN FORCE VALUES AMONGST ALL SECTION LOCATIONS

MEMB		FY/ FZ	DIST DIST	LD LD	MZ/ MY	DIST DIST	LD LD	FX	DIST	LD
1	MAX	32.62	0.00	115	784.88	0.00	115			
		-0.38	0.00	133	101.29	0.00	114	176.84 C	0.00	118
	MIN	-44.33	5.01	126	-819.78	0.00	127			
		-3.24	5.01	114	13.36	5.01	133	19.24 C	5.01	133
3	MAX	41.87	0.00	115	434.56	0.00	115			
		-0.38	0.00	133	67.27	0.00	114	175.84 C	0.00	118
	MIN	-37.68	5.01	127	-398.55	0.00	127			
		-3.24	5.01	114	10.56	5.01	133	20.16 C	5.01	133
5	MAX	5.65	0.00	114	131.81	6.09	120			
		-0.09	0.00	114	43.05	0.00	126	157.53 C	0.00	122
	MIN	-14.27	6.09	126	-60.47	0.00	129			
		-3.15	6.09	125	-5.95	6.09	114	31.01 C	6.09	133
7	MAX	13.74	0.00	118	140.68	0.00	122			
		-0.09	0.00	114	9.11	0.00	129	157.86 C	0.00	122
	MIN	-4.99	6.09	128	-106.57	6.09	114			
		-3.15	6.09	125	-20.00	6.09	122	31.28 C	6.09	133
9	MAX	0.68	0.00	115	135.81	5.20	125			
		1.85	0.00	116	-1.47	0.00	133	139.42 C	0.00	122
	MIN	-8.50	5.20	118	-157.53	0.00	114			
		-2.47	5.20	127	-43.21	5.20	124	29.61 C	5.20	133
13	MAX	-0.44	0.00	123	92.58	4.64	126			
		2.96	0.00	123	16.00	0.00	115	124.82 C	0.00	123
	MIN	-9.84	4.64	120	-179.16	0.00	115			
		-2.19	4.64	114	-66.85	0.00	126	27.94 C	4.64	133
17	MAX	-0.17	0.00	125	76.95	4.30	128			
		4.05	0.00	125	23.34	0.00	118	107.29 C	0.00	124
	MIN	-12.93	4.30	117	-156.60	0.00	117			
		-2.95	4.30	117	-52.51	0.00	128	27.65 C	4.30	133
21	MAX	2.34	0.00	127	43.69	4.18	130			
		3.23	0.00	122	38.60	0.00	120	97.28 C	0.00	123
	MIN	-16.41	4.18	119	-147.34	0.00	120			
		-2.67	4.18	119	-38.48	0.00	115	26.90 C	4.18	133
38	MAX	5.01	0.00	118	141.37	6.09	124			
		3.18	0.00	120	9.30	6.09	116	158.04 C	0.00	124

MIN	-14.49	6.09	128	-114.98	0.00	133			
	0.09	6.09	133	-20.22	0.00	123	45.53 C	6.09	133
40 MAX	14.33	0.00	120	133.43	0.00	126			
	3.18	0.00	120	43.34	6.09	119	157.79 C	0.00	124
MIN	-5.74	6.09	133	-61.14	6.09	117			
	0.09	6.09	133	-4.30	0.00	133	46.10 C	6.09	133
42 MAX	37.99	0.00	119	447.21	5.01	130			
	3.15	0.00	126	65.41	5.01	131	176.20 C	0.00	127
MIN	-45.03	5.01	131	-398.07	5.01	118			
	0.61	5.01	114	15.16	0.00	114	33.41 C	5.01	114
44 MAX	44.21	0.00	120	813.72	5.01	130			
	3.15	0.00	126	96.85	5.01	131	176.84 C	0.00	127
MIN	-36.19	5.01	131	-822.57	5.01	119			
	0.61	5.01	114	19.84	0.00	114	32.00 C	5.01	114

********** END OF FORCE ENVELOPE FROM INTERNAL STORAGE **********

1224. * COLUMNS
1225. PRINT MAXFORCE ENVELOPE LIST 45 49 53 57 61 63

MEMBER FORCE ENVELOPE

ALL UNITS ARE KIP FEET

MAX AND MIN FORCE VALUES AMONGST ALL SECTION LOCATIONS

MEMB		FY/ FZ	DIST DIST	LD LD	MZ/ MY	DIST DIST	LD LD	FX	DIST	LD
45	MAX	0.44	0.00	119	20.03	0.00	118			
		0.67	0.00	127	69.15	0.00	114	58.41 C	0.00	114
	MIN	-0.42	15.63	129	-20.55	0.00	129			
		-2.59	15.63	114	-20.47	0.00	127	11.55 T	15.63	121
49	MAX	0.66	0.00	126	18.61	0.00	126			
		1.24	0.00	128	50.20	0.00	114	82.15 C	0.00	116
	MIN	-0.69	11.97	116	-18.76	0.00	114			
		-3.15	11.97	114	-23.81	0.00	128	28.51 T	11.97	128
53	MAX	1.72	0.00	127	28.15	0.00	127			
		0.08	0.00	133	23.47	0.00	116	47.41 C	0.00	118
	MIN	-2.20	7.51	115	-35.36	0.00	115			
		-2.91	7.51	121	-13.57	7.51	125	3.47 C	7.51	133
57	MAX	2.50	0.00	128	23.68	0.00	128			
		3.73	0.00	115	9.50	4.47	115	39.35 C	0.00	120
	MIN	-4.16	4.47	117	-38.54	0.00	117			
		-3.70	4.47	124	-25.60	4.47	125	5.37 C	4.47	133
61	MAX	2.43	0.00	130	11.67	0.00	130			
		4.56	0.00	117	32.86	4.73	117	37.86 C	0.00	123
	MIN	-6.36	4.73	119	-29.26	0.00	119			
		-3.24	4.73	120	-39.23	4.73	126	5.02 C	4.73	114
63	MAX	6.49	0.00	116	32.58	5.53	126			
		6.67	0.00	125	46.18	5.53	120	36.28 C	0.00	125
	MIN	-11.38	5.53	126	-30.35	0.00	126			
		-4.49	5.53	122	-33.86	5.53	128	5.35 C	5.53	133

********** END OF FORCE ENVELOPE FROM INTERNAL STORAGE **********

1226. * INDEX OF ALL LL FORCES
1227. LOAD LIST 3 TO 133
1228. * ARCHES
1229. PRINT MEMBER FORCES LIST 1 3 5 7 9 13 17 21 38 40 42 44

MEMBER END FORCES STRUCTURE TYPE = SPACE

ALL UNITS ARE -- KIP FEET (LOCAL)

MEMBER	LOAD	JT	AXIAL	SHEAR-Y	SHEAR-Z	TORSION	MOM-Y	MOM-Z
1	3	1	161.26	-7.76	-5.02	2.77	148.05	-32.75
		2	-161.26	7.76	5.02	-2.77	-122.87	-6.18
	4	1	196.37	6.95	-4.90	7.35	147.92	243.42
		2	-196.37	-6.95	4.90	-7.35	-123.33	-208.57
	5	1	209.51	3.29	-5.03	3.83	150.42	282.17
		2	-209.51	-3.29	5.03	-3.83	-125.20	-265.70
	6	1	214.72	-5.09	-5.09	0.18	150.60	147.60
		2	-214.72	5.09	5.09	-0.18	-125.09	-173.12
	7	1	214.20	-13.96	-5.07	2.16	149.81	-39.51
		2	-214.20	13.96	5.07	-2.16	-124.38	-30.50
	8	1	208.65	-21.64	-4.95	9.65	147.22	-218.11
		2	-208.65	21.64	4.95	-9.65	-122.39	109.63
	9	1	199.54	-26.57	-4.72	17.48	141.47	-346.78
		2	-199.54	26.57	4.72	-17.48	-117.80	213.61
	10	1	188.69	-28.02	-4.42	21.43	133.43	-402.25
		2	-188.69	28.02	4.42	-21.43	-111.27	261.81
	11	1	177.76	-26.04	-4.13	21.30	125.29	-379.81
		2	-177.76	26.04	4.13	-21.30	-104.57	249.29
	12	1	167.86	-21.32	-3.92	18.12	118.73	-291.77
		2	-167.86	21.32	3.92	-18.12	-99.08	184.87
	13	1	160.33	-15.64	-3.80	13.34	114.92	-175.66
		2	-160.33	15.64	3.80	-13.34	-95.85	97.25
	14	1	78.45	36.53	-2.83	-8.07	92.32	658.70
		2	-78.45	-36.53	2.83	8.07	-78.11	-475.60
	15	1	112.85	46.27	-2.57	-6.61	87.55	894.60
		2	-112.85	-46.27	2.57	6.61	-74.66	-662.63
	16	1	137.72	47.80	-2.43	-9.36	83.71	1012.36
		2	-137.72	-47.80	2.43	9.36	-71.55	-772.76
	17	1	152.35	41.57	-2.50	-15.92	83.70	996.81
		2	-152.35	-41.57	2.50	15.92	-71.19	-788.40
	18	1	160.59	31.17	-2.63	-24.11	84.10	879.01
		2	-160.59	-31.17	2.63	24.11	-70.93	-722.76
	19	1	165.55	20.07	-2.75	-29.51	85.04	696.91
		2	-165.55	-20.07	2.75	29.51	-71.23	-596.32
	20	1	167.65	8.80	-2.88	-32.23	86.13	474.30
		2	-167.65	-8.80	2.88	32.23	-71.69	-430.20
	21	1	166.54	-2.21	-2.95	-30.11	86.95	239.64
		2	-166.54	2.21	2.95	30.11	-72.14	-250.70
	22	1	162.34	-12.74	-3.01	-23.76	87.94	4.90
		2	-162.34	12.74	3.01	23.76	-72.84	-68.74
	23	1	155.47	-22.26	-2.99	-14.35	87.49	-216.15
		2	-155.47	22.26	2.99	14.35	-72.51	104.58
	24	1	146.20	-30.43	-2.90	-2.81	85.62	-414.84
		2	-146.20	30.43	2.90	2.81	-71.08	262.28

MEMBER END FORCES STRUCTURE TYPE = SPACE

ALL UNITS ARE -- KIP FEET (LOCAL)

MEMBER	LOAD	JT	AXIAL	SHEAR-Y	SHEAR-Z	TORSION	MOM-Y	MOM-Z
	25	1	135.05	-36.99	-2.74	8.83	81.86	-583.02
		2	-135.05	36.99	2.74	-8.83	-68.11	397.61
	26	1	122.52	-41.68	-2.51	18.98	75.91	-713.59
		2	-122.52	41.68	2.51	-18.98	-63.34	504.66
	27	1	108.87	-44.42	-2.22	27.31	68.42	-803.19
		2	-108.87	44.42	2.22	-27.31	-57.27	580.53
	28	1	94.91	-45.20	-1.90	32.44	59.66	-849.44
		2	-94.91	45.20	1.90	-32.44	-50.15	622.88
	29	1	80.61	-43.98	-1.56	35.21	50.40	-851.03
		2	-80.61	43.98	1.56	-35.21	-42.56	630.58
	30	1	66.72	-41.03	-1.24	35.32	41.22	-812.18
		2	-66.72	41.03	1.24	-35.32	-35.00	606.50
	31	1	53.26	-36.41	-0.95	33.31	32.77	-733.70
		2	-53.26	36.41	0.95	-33.31	-28.01	551.20
	32	1	40.74	-30.60	-0.70	29.50	25.40	-625.73
		2	-40.74	30.60	0.70	-29.50	-21.88	472.33
	33	1	29.38	-23.94	-0.51	24.32	19.48	-495.33
		2	-29.38	23.94	0.51	-24.32	-16.94	375.30
	34	1	26.34	15.35	-2.18	-8.15	66.90	248.28
		2	-26.34	-15.35	2.18	8.15	-55.99	-171.35
	35	1	58.65	29.74	-1.78	-2.54	59.96	505.10
		2	-58.65	-29.74	1.78	2.54	-51.05	-356.01
	36	1	83.01	36.94	-1.56	-0.80	55.91	678.78
		2	-83.01	-36.94	1.56	0.80	-48.11	-493.62
	37	1	96.07	34.73	-1.57	-4.96	55.24	738.11
		2	-96.07	-34.73	1.57	4.96	-47.38	-564.03
	38	1	103.15	28.06	-1.66	-11.01	55.66	708.47
		2	-103.15	-28.06	1.66	11.01	-47.35	-567.82
	39	1	108.48	20.76	-1.76	-17.27	56.20	611.63
		2	-108.48	-20.76	1.76	17.27	-47.37	-507.57
	40	1	112.09	13.26	-1.85	-22.23	56.37	473.01
		2	-112.09	-13.26	1.85	22.23	-47.11	-406.52
	41	1	113.40	5.63	-1.93	-23.70	57.24	316.92
		2	-113.40	-5.63	1.93	23.70	-47.58	-288.70
	42	1	112.49	-1.99	-2.01	-22.34	58.46	153.20
		2	-112.49	1.99	2.01	22.34	-48.40	-163.18
	43	1	109.46	-9.17	-2.03	-17.46	59.00	-7.57
		2	-109.46	9.17	2.03	17.46	-48.81	-38.39
	44	1	104.59	-15.71	-2.04	-9.85	59.42	-160.39
		2	-104.59	15.71	2.04	9.85	-49.21	81.62
	45	1	98.27	-21.26	-1.97	-1.66	58.16	-295.78
		2	-98.27	21.26	1.97	1.66	-48.27	189.20
	46	1	90.46	-25.67	-1.86	7.03	55.45	-410.02
		2	-90.46	25.67	1.86	-7.03	-46.13	281.33
	47	1	81.88	-28.85	-1.70	14.27	51.41	-499.05
		2	-81.88	28.85	1.70	-14.27	-42.89	354.42
	48	1	72.63	-30.64	-1.49	19.58	46.02	-558.52
		2	-72.63	30.64	1.49	-19.58	-38.54	404.93

MEMBER END FORCES   STRUCTURE TYPE = SPACE

ALL UNITS ARE -- KIP FEET   (LOCAL)

MEMBER	LOAD	JT	AXIAL	SHEAR-Y	SHEAR-Z	TORSION	MOM-Y	MOM-Z
	49	1	63.00	-31.08	-1.26	23.12	39.78	-588.45
		2	-63.00	31.08	1.26	-23.12	-33.46	432.66
	50	1	53.41	-30.19	-1.03	24.63	33.28	-588.15
		2	-53.41	30.19	1.03	-24.63	-28.13	436.80
	51	1	43.94	-28.06	-0.80	24.58	26.96	-558.90
		2	-43.94	28.06	0.80	-24.58	-22.93	418.25
	52	1	34.90	-24.85	-0.60	23.06	21.08	-503.86
		2	-34.90	24.85	0.60	-23.06	-18.05	379.30
	53	1	26.36	-20.68	-0.44	20.29	16.02	-425.37
		2	-26.36	20.68	0.44	-20.29	-13.83	321.72
	54	1	19.98	11.05	-1.31	-4.47	40.78	182.22
		2	-19.98	-11.05	1.31	4.47	-34.23	-126.83
	55	1	38.71	18.84	-1.11	-1.72	37.44	328.62
		2	-38.71	-18.84	1.11	1.72	-31.89	-234.17
	56	1	52.77	22.37	-0.98	-1.25	34.91	424.87
		2	-52.77	-22.37	0.98	1.25	-29.99	-312.72
	57	1	60.62	20.83	-0.99	-3.76	34.65	453.63
		2	-60.62	-20.83	0.99	3.76	-29.67	-349.20
	58	1	65.00	16.71	-1.05	-7.64	34.80	428.54
		2	-65.00	-16.71	1.05	7.64	-29.54	-344.77
	59	1	68.09	12.13	-1.11	-11.20	35.14	365.14
		2	-68.09	-12.13	1.11	11.20	-29.58	-304.32
	60	1	70.07	7.43	-1.17	-13.88	35.40	277.53
		2	-70.07	-7.43	1.17	13.88	-29.56	-240.28
	61	1	70.65	2.68	-1.21	-14.50	35.90	179.68
		2	-70.65	-2.68	1.21	14.50	-29.82	-166.24
	62	1	69.85	-2.01	-1.25	-13.20	36.57	78.18
		2	-69.85	2.01	1.25	13.20	-30.28	-88.27
	63	1	67.78	-6.42	-1.27	-9.96	36.90	-21.12
		2	-67.78	6.42	1.27	9.96	-30.54	-11.04
	64	1	64.59	-10.37	-1.26	-5.25	36.86	-114.12
		2	-64.59	10.37	1.26	5.25	-30.55	62.12
	65	1	60.47	-13.72	-1.22	-0.05	35.99	-196.36
		2	-60.47	13.72	1.22	0.05	-29.88	127.61
	66	1	55.57	-16.33	-1.14	5.05	34.12	-264.65
		2	-55.57	16.33	1.14	-5.05	-28.41	182.80
	67	1	50.10	-18.15	-1.04	9.44	31.47	-316.82
		2	-50.10	18.15	1.04	-9.44	-26.27	225.84
	68	1	44.32	-19.13	-0.91	12.51	28.03	-350.80
		2	-44.32	19.13	0.91	-12.51	-23.49	254.92
	69	1	38.30	-19.25	-0.76	14.52	24.14	-365.98
		2	-38.30	19.25	0.76	-14.52	-20.32	269.50
	70	1	32.34	-18.57	-0.62	15.30	20.11	-362.83
		2	-32.34	18.57	0.62	-15.30	-17.02	269.75
	71	1	26.48	-17.12	-0.48	15.12	16.23	-341.73
		2	-26.48	17.12	0.48	-15.12	-13.81	255.92
	72	1	20.90	-15.02	-0.36	14.04	12.66	-305.03
		2	-20.90	15.02	0.36	-14.04	-10.86	229.74

MEMBER END FORCES STRUCTURE TYPE = SPACE

ALL UNITS ARE -- KIP FEET (LOCAL)

MEMBER	LOAD	JT	AXIAL	SHEAR-Y	SHEAR-Z	TORSION	MOM-Y	MOM-Z
	73	1	15.66	-12.36	-0.26	12.19	9.65	-254.58
		2	-15.66	12.36	0.26	-12.19	-8.34	192.61
	74	1	37.46	19.80	-1.94	-5.88	61.50	332.95
		2	-37.46	-19.80	1.94	5.88	-51.79	-233.71
	75	1	64.60	30.25	-1.65	-2.46	56.32	540.31
		2	-64.60	-30.25	1.65	2.46	-48.07	-388.69
	76	1	83.98	33.90	-1.51	-2.73	53.43	663.79
		2	-83.98	-33.90	1.51	2.73	-45.88	-493.87
	77	1	94.69	30.53	-1.54	-7.18	53.16	687.61
		2	-94.69	-30.53	1.54	7.18	-45.43	-534.57
	78	1	100.81	23.94	-1.63	-13.00	53.49	634.89
		2	-100.81	-23.94	1.63	13.00	-45.33	-514.86
	79	1	105.15	16.88	-1.72	-18.12	53.99	528.58
		2	-105.15	-16.88	1.72	18.12	-45.36	-443.95
	80	1	107.69	9.65	-1.80	-21.59	54.45	389.75
		2	-107.69	-9.65	1.80	21.59	-45.40	-341.38
	81	1	108.08	2.39	-1.87	-21.78	55.24	238.49
		2	-108.08	-2.39	1.87	21.78	-45.85	-226.49
	82	1	106.37	-4.72	-1.93	-19.10	56.26	83.19
		2	-106.37	4.72	1.93	19.10	-46.57	-106.83
	83	1	102.79	-11.30	-1.94	-13.62	56.53	-66.58
		2	-102.79	11.30	1.94	13.62	-46.80	9.94
	84	1	97.53	-17.15	-1.92	-6.08	56.27	-205.58
		2	-97.53	17.15	1.92	6.08	-46.64	119.59
	85	1	90.95	-22.01	-1.84	1.77	54.51	-326.47
		2	-90.95	22.01	1.84	-1.77	-45.29	216.15
	86	1	83.19	-25.72	-1.71	9.40	51.37	-425.28
		2	-83.19	25.72	1.71	-9.40	-42.78	296.35
	87	1	74.71	-28.21	-1.54	15.62	47.01	-498.73
		2	-74.71	28.21	1.54	-15.62	-39.27	357.31
	88	1	65.76	-29.39	-1.34	19.94	41.57	-543.90
		2	-65.76	29.39	1.34	-19.94	-34.86	396.56
	89	1	56.54	-29.28	-1.12	22.59	35.54	-560.48
		2	-56.54	29.28	1.12	-22.59	-29.94	413.69
	90	1	47.44	-27.96	-0.90	23.42	29.41	-549.11
		2	-47.44	27.96	0.90	-23.42	-24.91	408.94
	91	1	38.54	-25.49	-0.69	22.81	23.57	-510.81
		2	-38.54	25.49	0.69	-22.81	-20.09	383.04
	92	1	30.11	-22.07	-0.52	20.87	18.30	-449.65
		2	-30.11	22.07	0.52	-20.87	-15.71	338.99
	93	1	22.26	-17.86	-0.37	17.80	13.92	-368.57
		2	-22.26	17.86	0.37	-17.80	-12.06	279.05
	94	1	52.18	26.32	-2.20	-5.96	70.87	453.28
		2	-52.18	-26.32	2.20	5.96	-59.86	-321.35
	95	1	81.79	36.59	-1.89	-3.01	65.14	672.04
		2	-81.79	-36.59	1.89	3.01	-55.68	-488.63
	96	1	101.94	38.80	-1.78	-4.49	62.68	786.46
		2	-101.94	-38.80	1.78	4.49	-53.77	-591.98

MEMBER END FORCES STRUCTURE TYPE = SPACE

ALL UNITS ARE -- KIP FEET (LOCAL)

MEMBER	LOAD	JT	AXIAL	SHEAR-Y	SHEAR-Z	TORSION	MOM-Y	MOM-Z
97		1	113.07	33.80	-1.84	-10.31	62.46	790.42
		2	-113.07	-33.80	1.84	10.31	-53.25	-620.98
98		1	119.67	25.92	-1.94	-16.78	62.95	712.43
		2	-119.67	-25.92	1.94	16.78	-53.22	-582.48
99		1	124.21	17.57	-2.05	-22.35	63.56	577.39
		2	-124.21	-17.57	2.05	22.35	-53.29	-489.33
100		1	126.53	9.08	-2.14	-25.39	64.15	410.67
		2	-126.53	-9.08	2.14	25.39	-53.43	-365.15
101		1	126.33	0.61	-2.22	-24.69	65.17	231.85
		2	-126.33	-0.61	2.22	24.69	-54.06	-228.80
102		1	123.76	-7.57	-2.27	-20.72	66.13	51.29
		2	-123.76	7.57	2.27	20.72	-54.74	-89.25
103		1	119.04	-15.07	-2.27	-13.68	66.23	-121.02
		2	-119.04	15.07	2.27	13.68	-54.85	45.48
104		1	112.44	-21.64	-2.23	-4.68	65.51	-278.72
		2	-112.44	21.64	2.23	4.68	-54.34	170.26
105		1	104.39	-26.98	-2.12	4.36	63.00	-413.71
		2	-104.39	26.98	2.12	-4.36	-52.37	278.46
106		1	95.01	-30.95	-1.96	12.99	58.94	-521.82
		2	-95.01	30.95	1.96	-12.99	-49.13	366.65
107		1	84.94	-33.48	-1.75	19.65	53.49	-599.39
		2	-84.94	33.48	1.75	-19.65	-44.73	431.55
108		1	74.33	-34.46	-1.50	24.23	46.94	-643.36
		2	-74.33	34.46	1.50	-24.23	-39.41	470.63
109		1	63.56	-33.96	-1.24	26.76	39.82	-654.34
		2	-63.56	33.96	1.24	-26.76	-33.59	484.09
110		1	52.93	-32.05	-0.99	27.29	32.72	-632.51
		2	-52.93	32.05	0.99	-27.29	-27.75	471.85
111		1	42.63	-28.86	-0.76	26.17	26.04	-580.59
		2	-42.63	28.86	0.76	-26.17	-22.23	435.93
112		1	32.92	-24.60	-0.56	23.54	20.14	-502.58
		2	-32.92	24.60	0.56	-23.54	-17.32	379.26
113		1	23.97	-19.54	-0.40	19.71	15.32	-404.26
		2	-23.97	19.54	0.40	-19.71	-13.29	306.29
114		1	122.63	29.63	-3.24	-22.35	101.29	734.34
		2	-122.63	-29.63	3.24	22.35	-85.06	-585.83
115		1	148.58	32.62	-3.04	-22.52	96.85	784.88
		2	-148.58	-32.62	3.04	22.52	-81.58	-621.37
116		1	166.80	30.49	-2.95	-22.31	94.54	759.80
		2	-166.80	-30.49	2.95	22.31	-79.74	-606.94
117		1	174.90	21.77	-3.03	-23.31	95.15	647.27
		2	-174.90	-21.77	3.03	23.31	-79.96	-538.16
118		1	176.84	10.32	-3.11	-22.98	95.86	475.03
		2	-176.84	-10.32	3.11	22.98	-80.25	-423.30
119		1	175.77	-0.90	-3.17	-20.37	96.10	264.59
		2	-175.77	0.90	3.17	20.37	-80.20	-269.09
120		1	172.10	-11.34	-3.17	-16.06	94.96	40.36
		2	-172.10	11.34	3.17	16.06	-79.06	-97.20

MEMBER END FORCES STRUCTURE TYPE = SPACE

ALL UNITS ARE -- KIP FEET (LOCAL)

MEMBER	LOAD	JT	AXIAL	SHEAR-Y	SHEAR-Z	TORSION	MOM-Y	MOM-Z
	121	1	165.61	-20.76	-3.11	-9.51	92.74	-174.66
		2	-165.61	20.76	3.11	9.51	-77.14	70.62
	122	1	156.62	-28.97	-3.01	-1.78	89.59	-370.96
		2	-156.62	28.97	3.01	1.78	-74.50	225.74
	123	1	145.70	-35.59	-2.83	6.40	84.82	-537.63
		2	-145.70	35.59	2.83	-6.40	-70.63	359.21
	124	1	133.06	-40.45	-2.62	14.96	79.25	-669.83
		2	-133.06	40.45	2.62	-14.96	-66.13	467.07
	125	1	119.47	-43.39	-2.35	22.04	72.23	-762.09
		2	-119.47	43.39	2.35	-22.04	-60.44	544.56
	126	1	104.97	-44.33	-2.06	27.97	64.40	-811.53
		2	-104.97	44.33	2.06	-27.97	-54.05	589.29
	127	1	90.34	-43.43	-1.77	31.51	56.11	-819.78
		2	-90.34	43.43	1.77	-31.51	-47.26	602.05
	128	1	75.78	-40.69	-1.47	32.50	47.68	-785.94
		2	-75.78	40.69	1.47	-32.50	-40.33	581.97
	129	1	61.75	-36.53	-1.19	31.40	39.63	-718.63
		2	-61.75	36.53	1.19	-31.40	-33.69	535.52
	130	1	48.83	-31.38	-0.94	28.48	32.44	-626.40
		2	-48.83	31.38	0.94	-28.48	-27.75	469.08
	131	1	37.21	-25.74	-0.72	24.70	26.18	-520.12
		2	-37.21	25.74	0.72	-24.70	-22.57	391.07
	132	1	27.59	-20.50	-0.52	20.41	19.57	-418.61
		2	-27.59	20.50	0.52	-20.41	-16.96	315.86
	133	1	19.24	-15.31	-0.38	16.52	15.26	-315.95
		2	-19.24	15.31	0.38	-16.52	-13.36	239.19
3	3	3	161.43	2.36	-5.02	-4.15	97.63	19.78
		4	-161.43	-2.36	5.02	4.15	-72.45	-7.93
	4	3	195.55	19.25	-4.90	0.38	98.98	142.90
		4	-195.55	-19.25	4.90	-0.38	-74.39	-46.38
	5	3	208.89	16.42	-5.03	-3.24	99.98	216.34
		4	-208.89	-16.42	5.03	3.24	-74.76	-134.04
	6	3	214.62	8.38	-5.09	-6.87	99.35	164.93
		4	-214.62	-8.38	5.09	6.87	-73.83	-122.91
	7	3	214.66	-0.50	-5.07	-4.84	98.85	66.86
		4	-214.66	0.50	5.07	4.84	-73.42	-69.39
	8	3	209.60	-8.51	-4.95	2.74	97.93	-33.93
		4	-209.60	8.51	4.95	-2.74	-73.09	-8.74
	9	3	200.82	-14.00	-4.72	10.80	95.00	-111.79
		4	-200.82	14.00	4.72	-10.80	-71.33	41.62
	10	3	190.08	-16.13	-4.42	15.10	90.24	-151.01
		4	-190.08	16.13	4.42	-15.10	-68.08	70.16
	11	3	179.05	-14.84	-4.13	15.35	84.99	-146.69
		4	-179.05	14.84	4.13	-15.35	-64.28	72.31
	12	3	168.87	-10.76	-3.92	12.49	80.38	-104.35
		4	-168.87	10.76	3.92	-12.49	-60.74	50.43

MEMBER END FORCES STRUCTURE TYPE = SPACE

ALL UNITS ARE -- KIP FEET (LOCAL)

MEMBER	LOAD	JT	AXIAL	SHEAR-Y	SHEAR-Z	TORSION	MOM-Y	MOM-Z
	13	3	160.99	-5.56	-3.80	7.91	77.43	-44.03
		4	-160.99	5.56	3.80	-7.91	-58.36	16.18
	14	3	76.00	41.37	-2.83	-12.51	63.25	280.21
		4	-76.00	-41.37	2.83	12.51	-49.04	-72.80
	15	3	109.73	53.26	-2.57	-10.87	61.20	412.99
		4	-109.73	-53.26	2.57	10.87	-48.31	-145.99
	16	3	134.45	56.34	-2.43	-13.44	58.67	511.57
		4	-134.45	-56.34	2.43	13.44	-46.51	-229.14
	17	3	149.44	51.05	-2.50	-19.96	57.55	556.12
		4	-149.44	-51.05	2.50	19.96	-45.04	-300.23
	18	3	158.32	41.18	-2.63	-28.09	56.11	541.33
		4	-158.32	-41.18	2.63	28.09	-42.94	-334.89
	19	3	163.97	30.41	-2.75	-33.48	55.43	469.76
		4	-163.97	-30.41	2.75	33.48	-41.62	-317.33
	20	3	166.77	19.29	-2.88	-36.20	55.08	359.79
		4	-166.77	-19.29	2.88	36.20	-40.63	-263.07
	21	3	166.35	8.24	-2.95	-34.11	55.30	235.61
		4	-166.35	-8.24	2.95	34.11	-40.49	-194.29
	22	3	162.82	-2.53	-3.01	-27.81	56.12	107.09
		4	-162.82	2.53	3.01	27.81	-41.02	-119.77
	23	3	156.56	-12.46	-2.99	-18.40	56.49	-17.44
		4	-156.56	12.46	2.99	18.40	-41.50	-45.03
	24	3	147.82	-21.21	-2.90	-6.80	56.21	-132.70
		4	-147.82	21.21	2.90	6.80	-41.66	26.40
	25	3	137.11	-28.44	-2.74	4.98	54.77	-233.44
		4	-137.11	28.44	2.74	-4.98	-41.02	90.85
	26	3	124.89	-33.91	-2.51	15.36	51.83	-315.01
		4	-124.89	33.91	2.51	-15.36	-39.26	145.00
	27	3	111.44	-37.50	-2.22	24.01	47.73	-375.01
		4	-111.44	37.50	2.22	-24.01	-36.58	187.02
	28	3	97.56	-39.15	-1.90	29.53	42.57	-411.26
		4	-97.56	39.15	1.90	-29.53	-33.05	214.99
	29	3	83.21	-38.83	-1.56	32.72	36.85	-422.82
		4	-83.21	38.83	1.56	-32.72	-29.01	228.15
	30	3	69.16	-36.77	-1.24	33.25	30.93	-411.33
		4	-69.16	36.77	1.24	-33.25	-24.71	227.02
	31	3	55.44	-33.00	-0.95	31.64	25.29	-377.08
		4	-55.44	33.00	0.95	-31.64	-20.53	211.67
	32	3	42.58	-27.99	-0.70	28.18	20.17	-325.35
		4	-42.58	27.99	0.70	-28.18	-16.65	185.05
	33	3	30.82	-22.05	-0.51	23.29	15.88	-259.91
		4	-30.82	22.05	0.51	-23.29	-13.34	149.35
	34	3	25.32	16.97	-2.18	-11.30	44.46	90.29
		4	-25.32	-16.97	2.18	11.30	-33.55	-5.23
	35	3	56.67	33.36	-1.78	-5.45	41.88	197.74
		4	-56.67	-33.36	1.78	5.45	-32.96	-30.51
	36	3	80.53	42.07	-1.56	-3.57	40.16	295.47
		4	-80.53	-42.07	1.56	3.57	-32.36	-84.58

MEMBER END FORCES STRUCTURE TYPE = SPACE

ALL UNITS ARE -- KIP FEET (LOCAL)

MEMBER	LOAD	JT	AXIAL	SHEAR-Y	SHEAR-Z	TORSION	MOM-Y	MOM-Z
	37	3	93.71	40.68	-1.57	-7.67	39.11	374.89
		4	-93.71	-40.68	1.57	7.67	-31.25	-170.95
	38	3	101.19	34.47	-1.66	-13.69	38.25	410.99
		4	-101.19	-34.47	1.66	13.69	-29.94	-238.18
	39	3	106.96	27.52	-1.76	-19.93	37.36	386.50
		4	-106.96	-27.52	1.76	19.93	-28.53	-248.54
	40	3	111.04	20.27	-1.85	-24.85	36.36	322.44
		4	-111.04	-20.27	1.85	24.85	-27.11	-220.84
	41	3	112.83	12.73	-1.93	-26.33	36.33	242.68
		4	-112.83	-12.73	1.93	26.33	-26.66	-178.86
	42	3	112.39	5.07	-2.01	-25.01	36.84	155.50
		4	-112.39	-5.07	2.01	25.01	-26.78	-130.10
	43	3	109.82	-2.29	-2.03	-20.17	37.44	67.16
		4	-109.82	2.29	2.03	20.17	-27.26	-78.62
	44	3	105.37	-9.12	-2.04	-12.60	38.29	-19.29
		4	-105.37	9.12	2.04	12.60	-28.08	-26.45
	45	3	99.41	-15.06	-1.97	-4.38	38.19	-98.06
		4	-99.41	15.06	1.97	4.38	-28.30	22.58
	46	3	91.90	-19.95	-1.86	4.42	37.17	-166.87
		4	-91.90	19.95	1.86	-4.42	-27.85	66.87
	47	3	83.53	-23.66	-1.70	11.82	35.19	-222.67
		4	-83.53	23.66	1.70	-11.82	-26.68	104.07
	48	3	74.41	-26.02	-1.49	17.36	32.21	-262.77
		4	-74.41	26.02	1.49	-17.36	-24.73	132.32
	49	3	64.83	-27.07	-1.26	21.17	28.51	-286.79
		4	-64.83	27.07	1.26	-21.17	-22.19	151.12
	50	3	55.19	-26.78	-1.03	22.98	24.48	-293.86
		4	-55.19	26.78	1.03	-22.98	-19.33	159.60
	51	3	45.61	-25.25	-0.80	23.23	20.40	-284.53
		4	-45.61	25.25	0.80	-23.23	-16.37	157.97
	52	3	36.39	-22.61	-0.60	21.98	16.44	-260.24
		4	-36.39	22.61	0.60	-21.98	-13.41	146.90
	53	3	27.60	-18.98	-0.44	19.45	12.89	-222.23
		4	-27.60	18.98	0.44	-19.45	-10.70	127.07
	54	3	19.24	12.28	-1.31	-6.41	27.33	68.32
		4	-19.24	-12.28	1.31	6.41	-20.78	-6.75
	55	3	37.46	21.23	-1.11	-3.55	26.16	133.65
		4	-37.46	-21.23	1.11	3.55	-20.61	-27.20
	56	3	51.26	25.64	-0.98	-2.97	24.94	192.30
		4	-51.26	-25.64	0.98	2.97	-20.02	-63.78
	57	3	59.19	24.59	-0.99	-5.46	24.40	235.27
		4	-59.19	-24.59	0.99	5.46	-19.42	-111.99
	58	3	63.82	20.75	-1.05	-9.31	23.76	250.81
		4	-63.82	-20.75	1.05	9.31	-18.50	-146.77
	59	3	67.19	16.38	-1.11	-12.85	23.26	232.81
		4	-67.19	-16.38	1.11	12.85	-17.70	-150.70
	60	3	69.47	11.81	-1.17	-15.53	22.79	192.05
		4	-69.47	-11.81	1.17	15.53	-16.95	-132.85

MEMBER END FORCES STRUCTURE TYPE = SPACE

ALL UNITS ARE -- KIP FEET (LOCAL)

MEMBER	LOAD	JT	AXIAL	SHEAR-Y	SHEAR-Z	TORSION	MOM-Y	MOM-Z
	61	3	70.35	7.11	-1.21	-16.15	22.78	141.70
		4	-70.35	-7.11	1.21	16.15	-16.70	-106.08
	62	3	69.84	2.37	-1.25	-14.88	23.10	87.38
		4	-69.84	-2.37	1.25	14.88	-16.82	-75.49
	63	3	68.05	-2.15	-1.27	-11.65	23.49	32.56
		4	-68.05	2.15	1.27	11.65	-17.13	-43.36
	64	3	65.12	-6.30	-1.26	-6.96	23.84	-20.26
		4	-65.12	6.30	1.26	6.96	-17.52	-11.33
	65	3	61.21	-9.90	-1.22	-1.73	23.71	-68.36
		4	-61.21	9.90	1.22	1.73	-17.61	18.76
	66	3	56.48	-12.81	-1.14	3.44	22.95	-109.69
		4	-56.48	12.81	1.14	-3.44	-17.23	45.47
	67	3	51.14	-14.97	-1.04	7.94	21.61	-142.73
		4	-51.14	14.97	1.04	-7.94	-16.42	67.68
	68	3	45.43	-16.31	-0.91	11.16	19.69	-166.01
		4	-45.43	16.31	0.91	-11.16	-15.14	84.26
	69	3	39.44	-16.81	-0.76	13.34	17.36	-179.04
		4	-39.44	16.81	0.76	-13.34	-13.54	94.79
	70	3	33.44	-16.50	-0.62	14.30	14.84	-181.76
		4	-33.44	16.50	0.62	-14.30	-11.75	99.03
	71	3	27.50	-15.42	-0.48	14.30	12.32	-174.28
		4	-27.50	15.42	0.48	-14.30	-9.91	96.97
	72	3	21.80	-13.68	-0.36	13.39	9.91	-157.74
		4	-21.80	13.68	0.36	-13.39	-8.10	89.17
	73	3	16.40	-11.36	-0.26	11.69	7.78	-133.10
		4	-16.40	11.36	0.26	-11.69	-6.47	76.17
	74	3	36.15	22.11	-1.94	-8.82	41.60	128.61
		4	-36.15	-22.11	1.94	8.82	-31.88	-17.80
	75	3	62.57	34.24	-1.65	-5.21	39.57	226.96
		4	-62.57	-34.24	1.65	5.21	-31.31	-55.34
	76	3	81.69	39.10	-1.51	-5.37	38.06	310.79
		4	-81.69	-39.10	1.51	5.37	-30.51	-114.80
	77	3	92.59	36.41	-1.54	-9.77	37.16	366.70
		4	-92.59	-36.41	1.54	9.77	-29.44	-184.20
	78	3	99.11	30.22	-1.63	-15.56	36.26	379.02
		4	-99.11	-30.22	1.63	15.56	-28.09	-227.54
	79	3	103.88	23.44	-1.72	-20.65	35.52	342.82
		4	-103.88	-23.44	1.72	20.65	-26.89	-225.31
	80	3	106.88	16.38	-1.80	-24.11	34.91	276.12
		4	-106.88	-16.38	1.80	24.11	-25.87	-193.99
	81	3	107.71	9.17	-1.87	-24.32	35.01	197.53
		4	-107.71	-9.17	1.87	24.32	-25.63	-151.58
	82	3	106.46	1.96	-1.93	-21.68	35.60	113.77
		4	-106.46	-1.96	1.93	21.68	-25.91	-103.92
	83	3	103.30	-4.83	-1.94	-16.22	36.13	30.55
		4	-103.30	4.83	1.94	16.22	-26.40	-54.77
	84	3	98.41	-11.00	-1.92	-8.69	36.55	-48.93
		4	-98.41	11.00	1.92	8.69	-26.92	-6.22

MEMBER END FORCES STRUCTURE TYPE = SPACE

ALL UNITS ARE -- KIP FEET (LOCAL)

MEMBER	LOAD	JT	AXIAL	SHEAR-Y	SHEAR-Z	TORSION	MOM-Y	MOM-Z
	85	3	92.16	-16.26	-1.84	-0.78	36.09	-120.14
		4	-92.16	16.26	1.84	0.78	-26.87	38.63
	86	3	84.64	-20.45	-1.71	6.97	34.71	-180.51
		4	-84.64	20.45	1.71	-6.97	-26.13	77.98
	87	3	76.33	-23.47	-1.54	13.37	32.45	-227.65
		4	-76.33	23.47	1.54	-13.37	-24.72	110.00
	88	3	67.47	-25.21	-1.34	17.93	29.34	-259.57
		4	-67.47	25.21	1.34	-17.93	-22.64	133.20
	89	3	58.27	-25.68	-1.12	20.84	25.70	-275.79
		4	-58.27	25.68	1.12	-20.84	-20.11	147.06
	90	3	49.10	-24.93	-0.90	21.95	21.83	-276.24
		4	-49.10	24.93	0.90	-21.95	-17.34	151.26
	91	3	40.06	-23.02	-0.69	21.61	18.00	-261.34
		4	-40.06	23.02	0.69	-21.61	-14.53	145.93
	92	3	31.44	-20.14	-0.52	19.92	14.40	-233.09
		4	-31.44	20.14	0.52	-19.92	-11.81	132.12
	93	3	23.33	-16.43	-0.37	17.07	11.29	-193.04
		4	-23.33	16.43	0.37	-17.07	-9.42	110.70
	94	3	50.42	29.54	-2.20	-9.36	48.35	181.26
		4	-50.42	-29.54	2.20	9.36	-37.34	-33.19
	95	3	79.33	41.64	-1.89	-6.20	45.92	292.41
		4	-79.33	-41.64	1.89	6.20	-36.46	-83.65
	96	3	99.31	45.11	-1.78	-7.57	44.46	381.52
		4	-99.31	-45.11	1.78	7.57	-35.54	-155.37
	97	3	110.73	40.83	-1.84	-13.34	43.30	433.81
		4	-110.73	-40.83	1.84	13.34	-34.09	-229.16
	98	3	117.81	33.38	-1.94	-19.78	42.35	433.77
		4	-117.81	-33.38	1.94	19.78	-32.62	-266.46
	99	3	122.86	25.32	-2.05	-25.33	41.52	381.78
		4	-122.86	-25.32	2.05	25.33	-31.26	-254.85
	100	3	125.71	17.00	-2.14	-28.36	41.01	299.77
		4	-125.71	-17.00	2.14	28.36	-30.29	-214.57
	101	3	126.04	8.53	-2.22	-27.68	41.30	205.92
		4	-126.04	-8.53	2.22	27.68	-30.18	-163.16
	102	3	123.99	0.20	-2.27	-23.75	41.95	107.78
		4	-123.99	-0.20	2.27	23.75	-30.57	-106.76
	103	3	119.75	-7.57	-2.27	-16.73	42.51	11.35
		4	-119.75	7.57	2.27	16.73	-31.13	-49.31
	104	3	113.58	-14.54	-2.23	-7.73	42.77	-79.48
		4	-113.58	14.54	2.23	7.73	-31.59	6.59
	105	3	105.87	-20.38	-2.12	1.41	41.92	-159.63
		4	-105.87	20.38	2.12	-1.41	-31.30	57.47
	106	3	96.76	-24.94	-1.96	10.19	40.04	-226.42
		4	-96.76	24.94	1.96	-10.19	-30.23	101.42
	107	3	86.88	-28.09	-1.75	17.08	37.12	-277.08
		4	-86.88	28.09	1.75	-17.08	-28.37	136.28
	108	3	76.34	-29.73	-1.50	21.95	33.32	-309.60
		4	-76.34	29.73	1.50	-21.95	-25.80	160.58

MEMBER END FORCES STRUCTURE TYPE = SPACE

ALL UNITS ARE -- KIP FEET (LOCAL)

MEMBER	LOAD	JT	AXIAL	SHEAR-Y	SHEAR-Z	TORSION	MOM-Y	MOM-Z
	109	3	65.56	-29.91	-1.24	24.80	28.97	-323.84
		4	-65.56	29.91	1.24	-24.80	-22.74	173.91
	110	3	54.84	-28.67	-0.99	25.66	24.44	-319.54
		4	-54.84	28.67	0.99	-25.66	-19.48	175.84
	111	3	44.36	-26.13	-0.76	24.84	20.02	-297.98
		4	-44.36	26.13	0.76	-24.84	-16.22	166.99
	112	3	34.40	-22.49	-0.56	22.49	15.95	-261.13
		4	-34.40	22.49	0.56	-22.49	-13.13	148.40
	113	3	25.15	-18.00	-0.40	18.90	12.48	-212.10
		4	-25.15	18.00	0.40	-18.90	-10.46	121.87
	114	3	120.53	37.26	-3.24	-27.13	67.27	418.10
		4	-120.53	-37.26	3.24	27.13	-51.05	-231.33
	115	3	146.24	41.87	-3.04	-27.12	64.75	434.56
		4	-146.24	-41.87	3.04	27.12	-49.48	-224.66
	116	3	164.56	40.89	-2.95	-26.80	63.38	427.93
		4	-164.56	-40.89	2.95	26.80	-48.58	-222.94
	117	3	173.19	32.69	-3.03	-27.80	63.16	401.61
		4	-173.19	-32.69	3.03	27.80	-47.98	-237.73
	118	3	175.84	21.39	-3.11	-27.48	63.05	343.81
		4	-175.84	-21.39	3.11	27.48	-47.45	-236.59
	119	3	175.49	10.13	-3.17	-24.86	62.86	245.98
		4	-175.49	-10.13	3.17	24.86	-46.97	-195.21
	120	3	172.48	-0.52	-3.17	-20.48	62.00	127.01
		4	-172.48	0.52	3.17	20.48	-46.10	-129.64
	121	3	166.59	-10.33	-3.11	-13.84	60.80	7.41
		4	-166.59	10.33	3.11	13.84	-45.20	-59.18
	122	3	158.12	-19.09	-3.01	-5.97	59.16	-105.13
		4	-158.12	19.09	3.01	5.97	-44.07	9.43
	123	3	147.65	-26.39	-2.83	2.41	56.70	-203.70
		4	-147.65	26.39	2.83	-2.41	-42.51	71.43
	124	3	135.33	-32.02	-2.62	11.19	53.81	-285.24
		4	-135.33	32.02	2.62	-11.19	-40.69	124.71
	125	3	121.96	-35.82	-2.35	18.57	49.91	-345.83
		4	-121.96	35.82	2.35	-18.57	-38.12	166.29
	126	3	107.54	-37.66	-2.06	24.85	45.35	-383.57
		4	-107.54	37.66	2.06	-24.85	-35.00	194.77
	127	3	92.89	-37.68	-1.77	28.76	40.29	-398.55
		4	-92.89	37.68	1.77	-28.76	-31.44	209.65
	128	3	78.18	-35.86	-1.47	30.13	34.93	-389.94
		4	-78.18	35.86	1.47	-30.13	-27.58	210.20
	129	3	63.92	-32.58	-1.19	29.42	29.65	-362.15
		4	-63.92	32.58	1.19	-29.42	-23.70	198.81
	130	3	50.71	-28.26	-0.94	26.84	24.79	-319.46
		4	-50.71	28.26	0.94	-26.84	-20.10	177.81
	131	3	38.75	-23.36	-0.72	23.35	20.46	-267.88
		4	-38.75	23.36	0.72	-23.35	-16.85	150.78
	132	3	28.82	-18.73	-0.52	19.39	15.60	-217.47
		4	-28.82	18.73	0.52	-19.39	-12.99	123.59

MEMBER END FORCES STRUCTURE TYPE = SPACE

ALL UNITS ARE -- KIP FEET (LOCAL)

MEMBER	LOAD	JT	AXIAL	SHEAR-Y	SHEAR-Z	TORSION	MOM-Y	MOM-Z
	133	3	20.16	-14.08	-0.38	15.71	12.46	-165.47
		4	-20.16	14.08	0.38	-15.71	-10.56	94.91
5	3	5	135.48	-8.25	-3.13	7.07	29.40	-29.50
		6	-135.48	8.25	3.13	-7.07	-10.36	-20.68
	4	5	144.68	-8.62	-3.54	6.81	37.90	-74.29
		6	-144.68	8.62	3.54	-6.81	-16.38	21.85
	5	5	167.93	-2.23	-2.79	12.07	26.74	29.28
		6	-167.93	2.23	2.79	-12.07	-9.73	-42.83
	6	5	179.46	-5.67	-2.99	6.71	27.36	53.01
		6	-179.46	5.67	2.99	-6.71	-9.13	-87.49
	7	5	187.37	-8.75	-3.49	3.14	33.88	38.02
		6	-187.37	8.75	3.49	-3.14	-12.66	-91.25
	8	5	190.37	-11.03	-3.89	5.34	41.17	13.51
		6	-190.37	11.03	3.89	-5.34	-17.52	-80.62
	9	5	187.71	-12.41	-4.04	9.72	45.64	-10.55
		6	-187.71	12.41	4.04	-9.72	-21.06	-64.98
	10	5	180.20	-12.70	-3.94	12.35	46.37	-27.13
		6	-180.20	12.70	3.94	-12.35	-22.38	-50.16
	11	5	169.25	-11.96	-3.68	12.72	44.05	-32.74
		6	-169.25	11.96	3.68	-12.72	-21.64	-40.04
	12	5	156.45	-10.44	-3.35	11.49	39.61	-27.55
		6	-156.45	10.44	3.35	-11.49	-19.25	-35.99
	13	5	144.63	-8.69	-3.03	9.35	34.70	-15.87
		6	-144.63	8.69	3.03	-9.35	-16.28	-37.02
	14	5	14.57	-1.94	-1.45	-0.83	17.23	-132.76
		6	-14.57	1.94	1.45	0.83	-8.42	120.94
	15	5	33.56	0.95	-1.18	1.85	16.74	-116.85
		6	-33.56	-0.95	1.18	-1.85	-9.53	122.63
	16	5	57.50	5.51	-0.50	5.38	8.29	-47.51
		6	-57.50	-5.51	0.50	-5.38	-5.22	81.06
	17	5	82.62	9.54	0.25	7.26	-3.97	49.85
		6	-82.62	-9.54	-0.25	-7.26	2.48	8.21
	18	5	104.49	10.44	0.73	5.05	-14.31	129.67
		6	-104.49	-10.44	-0.73	-5.05	9.86	-66.16
	19	5	119.78	7.23	0.56	-1.47	-15.25	159.30
		6	-119.78	-7.23	-0.56	1.47	11.86	-115.29
	20	5	130.68	2.13	-0.03	-9.77	-10.37	152.93
		6	-130.68	-2.13	0.03	9.77	10.54	-139.98
	21	5	139.42	-2.25	-0.73	-14.88	-2.11	132.15
		6	-139.42	2.25	0.73	14.88	6.53	-145.86
	22	5	146.20	-5.56	-1.47	-16.39	7.90	105.25
		6	-146.20	5.56	1.47	16.39	1.02	-139.09
	23	5	150.04	-8.30	-2.10	-14.31	17.90	75.22
		6	-150.04	8.30	2.10	14.31	-5.09	-125.74
	24	5	150.50	-10.66	-2.63	-9.29	27.19	44.13
		6	-150.50	10.66	2.63	9.29	-11.19	-108.99

MEMBER END FORCES STRUCTURE TYPE = SPACE

ALL UNITS ARE -- KIP FEET (LOCAL)

MEMBER	LOAD	JT	AXIAL	SHEAR-Y	SHEAR-Z	TORSION	MOM-Y	MOM-Z
	25	5	147.78	-12.51	-3.00	-3.03	34.82	14.02
		6	-147.78	12.51	3.00	3.03	-16.57	-90.15
	26	5	142.08	-13.77	-3.19	3.11	40.14	-13.16
		6	-142.08	13.77	3.19	-3.11	-20.71	-70.62
	27	5	133.55	-14.40	-3.24	8.65	43.36	-36.12
		6	-133.55	14.40	3.24	-8.65	-23.66	-51.49
	28	5	122.83	-14.44	-3.13	12.31	44.21	-53.67
		6	-122.83	14.44	3.13	-12.31	-25.16	-34.20
	29	5	109.87	-13.87	-2.91	14.74	43.17	-65.15
		6	-109.87	13.87	2.91	-14.74	-25.45	-19.28
	30	5	95.52	-12.81	-2.61	15.55	40.39	-70.48
		6	-95.52	12.81	2.61	-15.55	-24.53	-7.46
	31	5	79.89	-11.26	-2.24	15.19	36.24	-69.51
		6	-79.89	11.26	2.24	-15.19	-22.61	1.00
	32	5	63.84	-9.38	-1.84	13.80	31.09	-63.30
		6	-63.84	9.38	1.84	-13.80	-19.89	6.19
	33	5	47.91	-7.29	-1.43	11.62	25.35	-52.63
		6	-47.91	7.29	1.43	-11.62	-16.64	8.27
	34	5	-1.28	-2.53	-1.00	-1.85	8.63	-80.51
		6	1.28	2.53	1.00	1.85	-2.57	65.14
	35	5	5.04	-3.79	-1.37	-2.65	18.47	-136.99
		6	-5.04	3.79	1.37	2.65	-10.16	113.91
	36	5	18.53	-1.19	-1.17	-0.25	18.55	-122.69
		6	-18.53	1.19	1.17	0.25	-11.40	115.42
	37	5	40.09	5.50	-0.20	5.99	4.75	-26.48
		6	-40.09	-5.50	0.20	-5.99	-3.53	59.95
	38	5	60.47	10.22	0.64	9.48	-8.74	71.03
		6	-60.47	-10.22	-0.64	-9.48	4.83	-8.81
	39	5	72.92	8.70	0.77	5.23	-13.43	112.25
		6	-72.92	-8.70	-0.77	-5.23	8.77	-59.28
	40	5	80.65	4.17	0.48	-2.23	-12.54	115.40
		6	-80.65	-4.17	-0.48	2.23	9.62	-90.04
	41	5	87.82	0.59	0.01	-8.28	-8.02	105.62
		6	-87.82	-0.59	-0.01	8.28	7.95	-102.05
	42	5	94.50	-1.82	-0.53	-12.39	-1.74	90.09
		6	-94.50	1.82	0.53	12.39	4.95	-101.19
	43	5	99.23	-3.87	-1.02	-12.89	5.34	71.12
		6	-99.23	3.87	1.02	12.89	0.89	-94.70
	44	5	101.70	-5.80	-1.49	-10.52	12.86	49.84
		6	-101.70	5.80	1.49	10.52	-3.77	-85.12
	45	5	101.95	-7.43	-1.84	-6.69	19.23	28.15
		6	-101.95	7.43	1.84	6.69	-8.02	-73.36
	46	5	99.87	-8.66	-2.09	-1.60	24.44	7.24
		6	-99.87	8.66	2.09	1.60	-11.74	-59.95
	47	5	95.94	-9.50	-2.21	2.96	28.06	-11.58
		6	-95.94	9.50	2.21	-2.96	-14.58	-46.26
	48	5	90.09	-9.91	-2.22	6.53	29.98	-27.21
		6	-90.09	9.91	2.22	-6.53	-16.45	-33.10

MEMBER END FORCES   STRUCTURE TYPE = SPACE

ALL UNITS ARE -- KIP FEET   (LOCAL)

MEMBER	LOAD	JT	AXIAL	SHEAR-Y	SHEAR-Z	TORSION	MOM-Y	MOM-Z
	49	5	82.60	-9.90	-2.14	9.12	30.43	-39.13
		6	-82.60	9.90	2.14	-9.12	-17.42	-21.13
	50	5	73.83	-9.50	-1.98	10.49	29.54	-46.77
		6	-73.83	9.50	1.98	-10.49	-17.51	-11.05
	51	5	63.93	-8.73	-1.76	10.97	27.55	-50.05
		6	-63.93	8.73	1.76	-10.97	-16.85	-3.09
	52	5	53.33	-7.66	-1.50	10.61	24.59	-49.11
		6	-53.33	7.66	1.50	-10.61	-15.44	2.50
	53	5	42.18	-6.32	-1.22	9.57	20.89	-44.15
		6	-42.18	6.32	1.22	-9.57	-13.44	5.71
	54	5	0.12	-1.63	-0.65	-1.18	6.35	-55.08
		6	-0.12	1.63	0.65	1.18	-2.40	45.14
	55	5	5.15	-1.79	-0.79	-1.15	10.79	-78.72
		6	-5.15	1.79	0.79	1.15	-5.97	67.81
	56	5	14.34	0.16	-0.59	0.70	9.39	-62.37
		6	-14.34	-0.16	0.59	-0.70	-5.82	63.33
	57	5	27.03	3.71	-0.06	3.82	1.88	-7.53
		6	-27.03	-3.71	0.06	-3.82	-1.48	30.11
	58	5	38.72	5.86	0.38	5.01	-5.58	45.67
		6	-38.72	-5.86	-0.38	-5.01	3.27	-9.99
	59	5	46.27	4.86	0.43	2.40	-8.02	68.97
		6	-46.27	-4.86	-0.43	-2.40	5.40	-39.37
	60	5	51.23	2.31	0.24	-1.98	-7.18	70.64
		6	-51.23	-2.31	-0.24	1.98	5.72	-56.60
	61	5	55.57	0.15	-0.05	-5.49	-4.24	64.02
		6	-55.57	-0.15	0.05	5.49	4.57	-63.12
	62	5	59.45	-1.36	-0.38	-7.57	-0.26	54.04
		6	-59.45	1.36	0.38	7.57	2.58	-62.33
	63	5	62.17	-2.63	-0.69	-7.66	4.17	41.99
		6	-62.17	2.63	0.69	7.66	0.02	-57.96
	64	5	63.47	-3.78	-0.96	-6.09	8.65	28.76
		6	-63.47	3.78	0.96	6.09	-2.79	-51.79
	65	5	63.36	-4.76	-1.17	-3.55	12.54	15.33
		6	-63.36	4.76	1.17	3.55	-5.40	-44.28
	66	5	61.90	-5.49	-1.31	-0.58	15.57	2.58
		6	-61.90	5.49	1.31	0.58	-7.59	-35.97
	67	5	59.19	-5.96	-1.38	2.22	17.67	-8.78
		6	-59.19	5.96	1.38	-2.22	-9.28	-27.48
	68	5	55.40	-6.17	-1.37	4.30	18.71	-18.12
		6	-55.40	6.17	1.37	-4.30	-10.34	-19.45
	69	5	50.57	-6.12	-1.31	5.80	18.85	-25.06
		6	-50.57	6.12	1.31	-5.80	-10.85	-12.20
	70	5	44.99	-5.83	-1.21	6.56	18.18	-29.36
		6	-44.99	5.83	1.21	-6.56	-10.83	-6.15
	71	5	38.74	-5.32	-1.07	6.77	16.84	-30.94
		6	-38.74	5.32	1.07	-6.77	-10.33	-1.45
	72	5	32.07	-4.62	-0.91	6.48	14.92	-29.94
		6	-32.07	4.62	0.91	-6.48	-9.40	1.79

MEMBER END FORCES STRUCTURE TYPE = SPACE

ALL UNITS ARE -- KIP FEET (LOCAL)

MEMBER	LOAD	JT	AXIAL	SHEAR-Y	SHEAR-Z	TORSION	MOM-Y	MOM-Z
	73	5	25.14	-3.78	-0.73	5.76	12.58	-26.53
		6	-25.14	3.78	0.73	-5.76	-8.12	3.56
	74	5	1.99	-2.56	-1.05	-1.80	11.36	-93.10
		6	-1.99	2.56	1.05	1.80	-4.96	77.50
	75	5	11.28	-2.03	-1.13	-1.04	15.96	-114.99
		6	-11.28	2.03	1.13	1.04	-9.07	102.63
	76	5	26.49	1.46	-0.73	2.13	11.92	-76.98
		6	-26.49	-1.46	0.73	-2.13	-7.51	85.90
	77	5	45.65	6.43	0.06	6.23	0.23	7.21
		6	-45.65	-6.43	-0.06	-6.23	-0.58	31.92
	78	5	62.30	8.74	0.61	6.88	-9.59	79.66
		6	-62.30	-8.74	-0.61	-6.88	5.86	-26.44
	79	5	72.88	6.61	0.60	2.19	-12.06	107.16
		6	-72.88	-6.61	-0.60	-2.19	8.43	-66.94
	80	5	80.14	2.71	0.26	-4.38	-9.98	105.98
		6	-80.14	-2.71	-0.26	4.38	8.39	-89.49
	81	5	86.63	-0.35	-0.20	-9.18	-5.09	94.61
		6	-86.63	0.35	0.20	9.18	6.30	-96.74
	82	5	92.20	-2.56	-0.70	-11.72	1.25	78.45
		6	-92.20	2.56	0.70	11.72	3.03	-94.01
	83	5	95.84	-4.45	-1.16	-11.24	8.01	59.57
		6	-95.84	4.45	1.16	11.24	-0.98	-86.67
	84	5	97.30	-6.16	-1.56	-8.38	14.75	39.15
		6	-97.30	6.16	1.56	8.38	-5.26	-76.66
	85	5	96.65	-7.57	-1.85	-4.39	20.35	18.81
		6	-96.65	7.57	1.85	4.39	-9.09	-64.88
	86	5	93.93	-8.59	-2.04	0.17	24.67	-0.24
		6	-93.93	8.59	2.04	-0.17	-12.27	-52.03
	87	5	89.40	-9.22	-2.12	4.17	27.50	-16.95
		6	-89.40	9.22	2.12	-4.17	-14.63	-39.18
	88	5	83.20	-9.45	-2.09	7.15	28.76	-30.38
		6	-83.20	9.45	2.09	-7.15	-16.05	-27.14
	89	5	75.51	-9.29	-1.98	9.19	28.68	-40.07
		6	-75.51	9.29	1.98	-9.19	-16.65	-16.45
	90	5	66.72	-8.76	-1.80	10.14	27.40	-45.67
		6	-66.72	8.76	1.80	-10.14	-16.43	-7.67
	91	5	56.95	-7.91	-1.58	10.29	25.13	-47.12
		6	-56.95	7.91	1.58	-10.29	-15.51	-0.99
	92	5	46.65	-6.78	-1.33	9.68	22.03	-44.73
		6	-46.65	6.78	1.33	-9.68	-13.95	3.44
	93	5	36.01	-5.45	-1.06	8.45	18.34	-38.78
		6	-36.01	5.45	1.06	-8.45	-11.91	5.64
	94	5	5.35	-2.75	-1.25	-1.81	14.53	-114.40
		6	-5.35	2.75	1.25	1.81	-6.93	97.67
	95	5	18.01	-1.28	-1.19	-0.20	17.36	-122.78
		6	-18.01	1.28	1.19	0.20	-10.09	115.01
	96	5	36.89	3.16	-0.63	3.66	10.69	-65.46
		6	-36.89	-3.16	0.63	-3.66	-6.85	84.70

MEMBER END FORCES STRUCTURE TYPE = SPACE

ALL UNITS ARE -- KIP FEET (LOCAL)

MEMBER	LOAD	JT	AXIAL	SHEAR-Y	SHEAR-Z	TORSION	MOM-Y	MOM-Z
	97	5	58.67	8.20	0.24	7.42	-2.80	30.37
		6	-58.67	-8.20	-0.24	-7.42	1.35	19.51
	98	5	76.42	9.63	0.72	6.69	-12.01	102.09
		6	-76.42	-9.63	-0.72	-6.69	7.65	-43.49
	99	5	87.85	6.59	0.60	0.52	-13.52	125.56
		6	-87.85	-6.59	-0.60	-0.52	9.89	-85.44
	100	5	96.08	2.23	0.17	-6.61	-10.21	120.88
		6	-96.08	-2.23	-0.17	6.61	9.20	-107.28
	101	5	103.39	-1.10	-0.39	-11.51	-4.00	106.05
		6	-103.39	1.10	0.39	11.51	6.37	-112.77
	102	5	109.35	-3.59	-0.97	-13.60	3.56	86.24
		6	-109.35	3.59	0.97	13.60	2.31	-108.07
	103	5	112.95	-5.75	-1.48	-12.31	11.45	63.62
		6	-112.95	5.75	1.48	12.31	-2.46	-98.63
	104	5	114.00	-7.67	-1.92	-8.59	19.06	39.66
		6	-114.00	7.67	1.92	8.59	-7.36	-86.33
	105	5	112.63	-9.20	-2.23	-3.80	25.20	16.20
		6	-112.63	9.20	2.23	3.80	-11.64	-72.20
	106	5	108.83	-10.27	-2.42	1.46	29.84	-5.44
		6	-108.83	10.27	2.42	-1.46	-15.14	-57.09
	107	5	103.04	-10.90	-2.47	5.80	32.66	-24.04
		6	-103.04	10.90	2.47	-5.80	-17.60	-42.28
	108	5	95.27	-11.04	-2.42	9.03	33.73	-38.63
		6	-95.27	11.04	2.42	-9.03	-19.03	-28.56
	109	5	85.92	-10.74	-2.27	11.08	33.27	-48.76
		6	-85.92	10.74	2.27	-11.08	-19.47	-16.60
	110	5	75.29	-10.02	-2.05	11.95	31.45	-54.03
		6	-75.29	10.02	2.05	-11.95	-19.00	-6.95
	111	5	63.66	-8.93	-1.78	11.89	28.54	-54.56
		6	-63.66	8.93	1.78	-11.89	-17.72	0.20
	112	5	51.46	-7.55	-1.48	10.98	24.72	-50.64
		6	-51.46	7.55	1.48	-10.98	-15.74	4.70
	113	5	39.09	-5.95	-1.16	9.40	20.32	-42.94
		6	-39.09	5.95	1.16	-9.40	-13.27	6.72
	114	5	69.46	5.65	-0.09	2.49	-5.43	44.67
		6	-69.46	-5.65	0.09	-2.49	5.95	-10.28
	115	5	81.92	1.15	-0.61	-4.49	2.42	10.12
		6	-81.92	-1.15	0.61	4.49	1.29	-3.13
	116	5	97.97	-0.44	-0.90	-8.04	6.67	10.87
		6	-97.97	0.44	0.90	8.04	-1.19	-13.56
	117	5	119.09	1.89	-0.71	-6.78	2.93	64.06
		6	-119.09	-1.89	0.71	6.78	1.40	-52.57
	118	5	137.74	3.29	-0.58	-4.75	-0.02	114.94
		6	-137.74	-3.29	0.58	4.75	3.55	-94.91
	119	5	148.57	0.46	-0.91	-5.48	3.41	124.14
		6	-148.57	-0.46	0.91	5.48	2.11	-121.34
	120	5	153.97	-4.25	-1.44	-7.06	10.02	105.96
		6	-153.97	4.25	1.44	7.06	-1.28	-131.81

MEMBER END FORCES STRUCTURE TYPE = SPACE

ALL UNITS ARE -- KIP FEET (LOCAL)

MEMBER	LOAD	JT	AXIAL	SHEAR-Y	SHEAR-Z	TORSION	MOM-Y	MOM-Z
	121	5	156.89	-7.91	-1.98	-7.00	17.82	79.65
		6	-156.89	7.91	1.98	7.00	-5.79	-127.78
	122	5	157.53	-10.35	-2.47	-5.62	25.55	51.28
		6	-157.53	10.35	2.47	5.62	-10.52	-114.26
	123	5	155.18	-12.14	-2.82	-2.80	32.21	23.54
		6	-155.18	12.14	2.82	2.80	-15.05	-97.43
	124	5	149.58	-13.44	-3.07	1.23	37.84	-2.21
		6	-149.58	13.44	3.07	-1.23	-19.18	-79.56
	125	5	141.29	-14.17	-3.15	5.16	41.37	-24.31
		6	-141.29	14.17	3.15	-5.16	-22.18	-61.94
	126	5	130.28	-14.27	-3.12	9.13	43.05	-41.63
		6	-130.28	14.27	3.12	-9.13	-24.08	-45.21
	127	5	117.35	-13.82	-2.96	11.95	42.75	-53.63
		6	-117.35	13.82	2.96	-11.95	-24.71	-30.47
	128	5	102.65	-12.82	-2.70	13.41	40.57	-59.68
		6	-102.65	12.82	2.70	-13.41	-24.11	-18.37
	129	5	86.99	-11.42	-2.38	13.70	37.04	-60.47
		6	-86.99	11.42	2.38	-13.70	-22.58	-9.03
	130	5	71.27	-9.74	-2.01	12.85	32.63	-56.74
		6	-71.27	9.74	2.01	-12.85	-20.40	-2.56
	131	5	56.12	-7.94	-1.64	11.46	27.87	-49.90
		6	-56.12	7.94	1.64	-11.46	-17.91	1.56
	132	5	43.01	-6.29	-1.28	9.63	22.43	-42.15
		6	-43.01	6.29	1.28	-9.63	-14.64	3.90
	133	5	31.01	-4.66	-0.97	8.01	18.11	-33.24
		6	-31.01	4.66	0.97	-8.01	-12.21	4.87
7	3	7	135.71	2.06	-3.13	6.99	-8.14	39.43
		8	-135.71	-2.06	3.13	-6.99	27.18	-26.87
	4	7	144.91	2.39	-3.54	6.37	-4.64	-2.97
		8	-144.91	-2.39	3.54	-6.37	26.16	17.53
	5	7	167.61	10.53	-2.79	11.94	-6.37	17.47
		8	-167.61	-10.53	2.79	-11.94	23.38	46.61
	6	7	179.37	7.98	-2.99	6.69	-8.59	80.37
		8	-179.37	-7.98	2.99	-6.69	26.82	-31.83
	7	7	187.49	5.50	-3.49	2.97	-8.34	101.03
		8	-187.49	-5.50	3.49	-2.97	29.56	-67.53
	8	7	190.66	3.46	-3.89	4.89	-5.75	103.57
		8	-190.66	-3.46	3.89	-4.89	29.39	-82.52
	9	7	188.11	1.88	-4.04	9.03	-2.81	96.96
		8	-188.11	-1.88	4.04	-9.03	27.39	-85.54
	10	7	180.65	1.02	-3.94	11.52	-0.71	85.64
		8	-180.65	-1.02	3.94	-11.52	24.69	-79.45
	11	7	169.67	0.92	-3.68	11.89	0.16	73.56
		8	-169.67	-0.92	3.68	-11.89	22.25	-67.93
	12	7	156.79	1.47	-3.35	10.77	-0.28	63.23
		8	-156.79	-1.47	3.35	-10.77	20.65	-54.30

MEMBER END FORCES STRUCTURE TYPE = SPACE

ALL UNITS ARE -- KIP FEET (LOCAL)

MEMBER	LOAD	JT	AXIAL	SHEAR-Y	SHEAR-Z	TORSION	MOM-Y	MOM-Z
	13	7	144.87	2.31	-3.03	8.78	-1.45	56.35
		8	-144.87	-2.31	3.03	-8.78	19.87	-42.26
	14	7	14.68	-0.83	-1.45	-1.14	-0.47	-112.50
		8	-14.68	0.83	1.45	1.14	9.27	107.45
	15	7	33.39	3.50	-1.18	1.39	2.45	-136.19
		8	-33.39	-3.50	1.18	-1.39	4.76	157.47
	16	7	56.92	9.86	-0.50	5.08	2.55	-127.89
		8	-56.92	-9.86	0.50	-5.08	0.52	187.92
	17	7	81.66	15.79	0.25	7.37	-0.43	-85.35
		8	-81.66	-15.79	-0.25	-7.37	-1.06	181.43
	18	7	103.40	18.34	0.73	5.61	-4.99	-21.50
		8	-103.40	-18.34	-0.73	-5.61	0.53	133.12
	19	7	118.89	16.30	0.56	-0.69	-8.56	43.59
		8	-118.89	-16.30	-0.56	0.69	5.18	55.65
	20	7	130.14	12.04	-0.03	-8.93	-11.43	96.78
		8	-130.14	-12.04	0.03	8.93	11.60	-23.48
	21	7	139.19	8.34	-0.73	-14.18	-12.07	127.26
		8	-139.19	-8.34	0.73	14.18	16.49	-76.51
	22	7	146.20	5.56	-1.47	-15.93	-11.17	139.03
		8	-146.20	-5.56	1.47	15.93	20.09	-105.22
	23	7	150.24	3.11	-2.10	-14.17	-8.81	141.46
		8	-150.24	-3.11	2.10	14.17	21.61	-122.50
	24	7	150.87	0.80	-2.63	-9.50	-5.52	138.92
		8	-150.87	-0.80	2.63	9.50	21.52	-134.05
	25	7	148.30	-1.25	-3.00	-3.59	-1.95	131.98
		8	-148.30	1.25	3.00	3.59	20.21	-139.62
	26	7	142.72	-2.94	-3.19	2.27	1.49	121.40
		8	-142.72	2.94	3.19	-2.27	17.94	-139.29
	27	7	134.26	-4.21	-3.24	7.57	4.56	108.08
		8	-134.26	4.21	3.24	-7.57	15.14	-133.74
	28	7	123.57	-5.07	-3.13	11.09	6.99	93.54
		8	-123.57	5.07	3.13	-11.09	12.07	-124.41
	29	7	110.60	-5.49	-2.91	13.43	8.78	78.17
		8	-110.60	5.49	2.91	-13.43	8.95	-111.59
	30	7	96.22	-5.52	-2.61	14.24	9.79	63.20
		8	-96.22	5.52	2.61	-14.24	6.08	-96.78
	31	7	80.51	-5.16	-2.24	13.95	10.07	48.93
		8	-80.51	5.16	2.24	-13.95	3.56	-80.33
	32	7	64.37	-4.51	-1.84	12.67	9.68	36.08
		8	-64.37	4.51	1.84	-12.67	1.53	-63.53
	33	7	48.32	-3.63	-1.43	10.65	8.77	24.96
		8	-48.32	3.63	1.43	-10.65	-0.05	-47.06
	34	7	-1.09	-2.62	-1.00	-1.81	-3.63	-49.49
		8	1.09	2.62	1.00	1.81	9.69	33.56
	35	7	5.31	-3.40	-1.37	-3.10	1.62	-92.02
		8	-5.31	3.40	1.37	3.10	6.69	71.33
	36	7	18.57	0.22	-1.17	-0.85	4.21	-112.45
		8	-18.57	-0.22	1.17	0.85	2.94	113.76

MEMBER END FORCES STRUCTURE TYPE = SPACE

ALL UNITS ARE -- KIP FEET (LOCAL)

MEMBER	LOAD	JT	AXIAL	SHEAR-Y	SHEAR-Z	TORSION	MOM-Y	MOM-Z
	37	7	39.55	8.53	-0.20	5.76	2.75	-102.67
		8	-39.55	-8.53	0.20	-5.76	-1.52	154.57
	38	7	59.52	14.78	0.64	9.68	-0.19	-67.34
		8	-59.52	-14.78	-0.64	-9.68	-3.73	157.32
	39	7	72.05	14.22	0.77	5.70	-3.69	-10.54
		8	-72.05	-14.22	-0.77	-5.70	-0.97	97.07
	40	7	80.10	10.28	0.48	-1.60	-6.84	46.02
		8	-80.10	-10.28	-0.48	1.60	3.91	16.54
	41	7	87.52	7.25	0.01	-7.66	-8.48	78.15
		8	-87.52	-7.25	-0.01	7.66	8.41	-34.01
	42	7	94.36	5.36	-0.53	-11.85	-9.08	90.39
		8	-94.36	-5.36	0.53	11.85	12.29	-57.80
	43	7	99.24	3.67	-1.02	-12.55	-8.08	95.26
		8	-99.24	-3.67	1.02	12.55	14.31	-72.91
	44	7	101.85	1.94	-1.49	-10.43	-6.12	96.81
		8	-101.85	-1.94	1.49	10.43	15.22	-84.99
	45	7	102.22	0.33	-1.84	-6.85	-3.70	94.91
		8	-102.22	-0.33	1.84	6.85	14.91	-92.88
	46	7	100.24	-1.05	-2.09	-2.00	-1.10	89.48
		8	-100.24	1.05	2.09	2.00	13.81	-95.89
	47	7	96.39	-2.19	-2.21	2.35	1.30	81.81
		8	-96.39	2.19	2.21	-2.35	12.18	-95.15
	48	7	90.58	-3.04	-2.22	5.78	3.39	72.49
		8	-90.58	3.04	2.22	-5.78	10.15	-91.01
	49	7	83.11	-3.60	-2.14	8.27	5.06	62.21
		8	-83.11	3.60	2.14	-8.27	7.95	-84.14
	50	7	74.34	-3.87	-1.98	9.58	6.24	51.72
		8	-74.34	3.87	1.98	-9.58	5.78	-75.27
	51	7	64.41	-3.85	-1.76	10.06	6.94	41.36
		8	-64.41	3.85	1.76	-10.06	3.77	-64.81
	52	7	53.76	-3.59	-1.50	9.75	7.05	31.71
		8	-53.76	3.59	1.50	-9.75	2.10	-53.54
	53	7	42.54	-3.10	-1.22	8.81	6.69	22.93
		8	-42.54	3.10	1.22	-8.81	0.76	-41.78
	54	7	0.24	-1.62	-0.65	-1.20	-1.65	-35.24
		8	-0.24	1.62	0.65	1.20	5.61	25.39
	55	7	5.27	-1.40	-0.79	-1.42	1.05	-58.10
		8	-5.27	1.40	0.79	1.42	3.77	49.60
	56	7	14.29	1.25	-0.59	0.39	2.28	-67.61
		8	-14.29	-1.25	0.59	-0.39	1.29	75.19
	57	7	26.67	5.75	-0.06	3.71	1.37	-58.94
		8	-26.67	-5.75	0.06	-3.71	-0.98	93.95
	58	7	38.17	8.79	0.38	5.16	-0.57	-34.62
		8	-38.17	-8.79	-0.38	-5.16	-1.74	88.09
	59	7	45.76	8.36	0.43	2.70	-2.59	-0.91
		8	-45.76	-8.36	-0.43	-2.70	-0.03	51.80
	60	7	50.91	6.19	0.24	-1.60	-4.40	30.71
		8	-50.91	-6.19	-0.24	1.60	2.94	6.97

MEMBER END FORCES STRUCTURE TYPE = SPACE

ALL UNITS ARE -- KIP FEET (LOCAL)

MEMBER	LOAD	JT	AXIAL	SHEAR-Y	SHEAR-Z	TORSION	MOM-Y	MOM-Z
	61	7	55.40	4.37	-0.05	-5.12	-5.30	49.35
		8	-55.40	-4.37	0.05	5.12	5.63	-22.78
	62	7	59.39	3.16	-0.38	-7.26	-5.47	56.84
		8	-59.39	-3.16	0.38	7.26	7.79	-37.63
	63	7	62.19	2.10	-0.69	-7.48	-4.79	59.52
		8	-62.19	-2.10	0.69	7.48	8.99	-46.73
	64	7	63.57	1.04	-0.96	-6.06	-3.54	60.10
		8	-63.57	-1.04	0.96	6.06	9.40	-53.74
	65	7	63.54	0.07	-1.17	-3.68	-2.02	58.53
		8	-63.54	-0.07	1.17	3.68	9.16	-58.12
	66	7	62.13	-0.77	-1.31	-0.85	-0.44	54.98
		8	-62.13	0.77	1.31	0.85	8.42	-59.68
	67	7	59.47	-1.45	-1.38	1.83	1.03	49.99
		8	-59.47	1.45	1.38	-1.83	7.37	-58.80
	68	7	55.71	-1.95	-1.37	3.82	2.27	44.14
		8	-55.71	1.95	1.37	-3.82	6.09	-56.00
	69	7	50.89	-2.26	-1.31	5.26	3.27	37.70
		8	-50.89	2.26	1.31	-5.26	4.73	-51.48
	70	7	45.31	-2.40	-1.21	6.00	3.95	31.20
		8	-45.31	2.40	1.21	-6.00	3.40	-45.81
	71	7	39.03	-2.36	-1.07	6.21	4.32	24.82
		8	-39.03	2.36	1.07	-6.21	2.19	-39.21
	72	7	32.33	-2.18	-0.91	5.96	4.34	18.90
		8	-32.33	2.18	0.91	-5.96	1.18	-32.14
	73	7	25.35	-1.86	-0.73	5.30	4.08	13.57
		8	-25.35	1.86	0.73	-5.30	0.38	-24.87
	74	7	2.18	-2.41	-1.05	-1.93	-1.59	-62.37
		8	-2.18	2.41	1.05	1.93	7.99	47.73
	75	7	11.40	-1.17	-1.13	-1.47	2.09	-92.89
		8	-11.40	1.17	1.13	1.47	4.80	85.78
	76	7	26.30	3.47	-0.73	1.72	3.23	-100.94
		8	-26.30	-3.47	0.73	-1.72	1.19	122.07
	77	7	45.03	9.88	0.06	6.15	1.40	-81.59
		8	-45.03	-9.88	-0.06	-6.15	-1.75	141.72
	78	7	61.45	13.45	0.61	7.16	-1.59	-41.15
		8	-61.45	-13.45	-0.61	-7.16	-2.14	123.01
	79	7	72.17	12.12	0.60	2.69	-4.60	9.88
		8	-72.17	-12.12	-0.60	-2.69	0.97	63.91
	80	7	79.70	8.79	0.26	-3.79	-7.11	54.45
		8	-79.70	-8.79	-0.26	3.79	5.52	-0.97
	81	7	86.40	6.23	-0.20	-8.63	-8.18	78.81
		8	-86.40	-6.23	0.20	8.63	9.39	-40.91
	82	7	92.13	4.45	-0.70	-11.29	-8.18	88.20
		8	-92.13	-4.45	0.70	11.29	12.46	-61.12
	83	7	95.90	2.84	-1.16	-11.01	-6.90	91.54
		8	-95.90	-2.84	1.16	11.01	13.94	-74.27
	84	7	97.48	1.24	-1.56	-8.40	-4.87	91.60
		8	-97.48	-1.24	1.56	8.40	14.36	-84.04

MEMBER END FORCES STRUCTURE TYPE = SPACE

ALL UNITS ARE -- KIP FEET (LOCAL)

MEMBER	LOAD	JT	AXIAL	SHEAR-Y	SHEAR-Z	TORSION	MOM-Y	MOM-Z
	85	7	96.95	-0.21	-1.85	-4.64	-2.52	88.50
		8	-96.95	0.21	1.85	4.64	13.79	-89.77
	86	7	94.31	-1.43	-2.04	-0.30	-0.13	82.50
		8	-94.31	1.43	2.04	0.30	12.53	-91.22
	87	7	89.85	-2.41	-2.12	3.54	2.04	74.54
		8	-89.85	2.41	2.12	-3.54	10.83	-89.20
	88	7	83.68	-3.11	-2.09	6.39	3.86	65.34
		8	-83.68	3.11	2.09	-6.39	8.85	-84.25
	89	7	76.00	-3.53	-1.98	8.36	5.27	55.42
		8	-76.00	3.53	1.98	-8.36	6.77	-76.89
	90	7	67.19	-3.67	-1.80	9.28	6.20	45.50
		8	-67.19	3.67	1.80	-9.28	4.77	-67.86
	91	7	57.39	-3.56	-1.58	9.45	6.64	35.87
		8	-57.39	3.56	1.58	-9.45	2.98	-57.53
	92	7	47.03	-3.22	-1.33	8.90	6.57	27.01
		8	-47.03	3.22	1.33	-8.90	1.51	-46.63
	93	7	36.32	-2.70	-1.06	7.77	6.08	19.12
		8	-36.32	2.70	1.06	-7.77	0.36	-35.53
	94	7	5.54	-2.33	-1.25	-2.04	-0.83	-82.19
		8	-5.54	2.33	1.25	2.04	8.43	67.98
	95	7	18.06	0.09	-1.19	-0.69	2.79	-111.41
		8	-18.06	-0.09	1.19	0.69	4.48	111.99
	96	7	36.54	5.95	-0.63	3.27	3.28	-112.46
		8	-36.54	-5.95	0.63	-3.27	0.55	148.69
	97	7	57.88	12.63	0.24	7.45	0.67	-82.93
		8	-57.88	-12.63	-0.24	-7.45	-2.12	159.78
	98	7	75.47	15.40	0.72	7.08	-2.77	-32.76
		8	-75.47	-15.40	-0.72	-7.08	-1.59	126.51
	99	7	87.10	13.24	0.60	1.13	-6.20	25.02
		8	-87.10	-13.24	-0.60	-1.13	2.57	55.58
	100	7	95.63	9.52	0.17	-5.94	-8.67	71.45
		8	-95.63	-9.52	-0.17	5.94	7.67	-13.50
	101	7	103.18	6.75	-0.39	-10.91	-9.59	95.54
		8	-103.18	-6.75	0.39	10.91	11.96	-54.47
	102	7	109.31	4.72	-0.97	-13.16	-9.21	104.56
		8	-109.31	-4.72	0.97	13.16	15.09	-75.81
	103	7	113.06	2.84	-1.48	-12.12	-7.48	107.45
		8	-113.06	-2.84	1.48	12.12	16.47	-90.17
	104	7	114.26	1.01	-1.92	-8.68	-4.99	106.55
		8	-114.26	-1.01	1.92	8.68	16.68	-100.41
	105	7	113.00	-0.62	-2.23	-4.16	-2.23	102.06
		8	-113.00	0.62	2.23	4.16	15.79	-105.85
	106	7	109.30	-1.98	-2.42	0.86	0.52	94.35
		8	-109.30	1.98	2.42	-0.86	14.18	-106.42
	107	7	103.57	-3.04	-2.47	5.01	2.95	84.67
		8	-103.57	3.04	2.47	-5.01	12.11	-103.19
	108	7	95.83	-3.78	-2.42	8.11	4.97	73.61
		8	-95.83	3.78	2.42	-8.11	9.74	-96.59

MEMBER END FORCES STRUCTURE TYPE = SPACE

ALL UNITS ARE -- KIP FEET (LOCAL)

MEMBER	LOAD	JT	AXIAL	SHEAR-Y	SHEAR-Z	TORSION	MOM-Y	MOM-Z
	109	7	86.49	-4.18	-2.27	10.09	6.47	61.99
		8	-86.49	4.18	2.27	-10.09	7.33	-87.46
	110	7	75.83	-4.27	-2.05	10.95	7.41	50.43
		8	-75.83	4.27	2.05	-10.95	5.05	-76.45
	111	7	64.16	-4.07	-1.78	10.92	7.77	39.37
		8	-64.16	4.07	1.78	-10.92	3.04	-64.16
	112	7	51.89	-3.62	-1.48	10.09	7.56	29.27
		8	-51.89	3.62	1.48	-10.09	1.42	-51.30
	113	7	39.43	-2.97	-1.16	8.63	6.90	20.40
		8	-39.43	2.97	1.16	-8.63	0.15	-38.45
	114	7	68.83	10.91	-0.09	2.95	-6.26	-40.17
		8	-68.83	-10.91	0.09	-2.95	6.78	106.57
	115	7	81.59	7.36	-0.61	-4.24	-5.34	-22.83
		8	-81.59	-7.36	0.61	4.24	9.06	67.65
	116	7	97.72	7.00	-0.90	-7.90	-4.90	-6.44
		8	-97.72	-7.00	0.90	7.90	10.39	49.03
	117	7	118.60	10.92	-0.71	-6.49	-6.25	13.52
		8	-118.60	-10.92	0.71	6.49	10.58	52.96
	118	7	137.09	13.74	-0.58	-4.33	-7.42	42.98
		8	-137.09	-13.74	0.58	4.33	10.94	40.65
	119	7	148.11	11.74	-0.91	-5.09	-8.04	84.13
		8	-148.11	-11.74	0.91	5.09	13.57	-12.68
	120	7	153.85	7.45	-1.44	-6.80	-8.00	121.97
		8	-153.85	-7.45	1.44	6.80	16.75	-76.60
	121	7	157.03	4.03	-1.98	-6.96	-6.79	139.52
		8	-157.03	-4.03	1.98	6.96	18.83	-115.02
	122	7	157.86	1.64	-2.47	-5.83	-4.96	140.68
		8	-157.86	-1.64	2.47	5.83	20.00	-130.69
	123	7	155.66	-0.33	-2.82	-3.28	-2.36	135.31
		8	-155.66	0.33	2.82	3.28	19.52	-137.29
	124	7	150.17	-2.04	-3.07	0.48	0.57	126.61
		8	-150.17	2.04	3.07	-0.48	18.10	-139.04
	125	7	141.96	-3.40	-3.15	4.19	3.33	115.38
		8	-141.96	3.40	3.15	-4.19	15.87	-136.09
	126	7	130.98	-4.34	-3.12	8.00	5.75	101.80
		8	-130.98	4.34	3.12	-8.00	13.23	-128.20
	127	7	118.06	-4.87	-2.96	10.72	7.52	87.30
		8	-118.06	4.87	2.96	-10.72	10.52	-116.94
	128	7	103.33	-4.99	-2.70	12.16	8.62	72.56
		8	-103.33	4.99	2.70	-12.16	7.84	-102.95
	129	7	87.61	-4.78	-2.38	12.49	9.11	58.30
		8	-87.61	4.78	2.38	-12.49	5.35	-87.41
	130	7	71.80	-4.31	-2.01	11.73	9.10	45.30
		8	-71.80	4.31	2.01	-11.73	3.13	-71.51
	131	7	56.56	-3.66	-1.64	10.44	8.77	33.73
		8	-56.56	3.66	1.64	-10.44	1.20	-56.00
	132	7	43.36	-3.00	-1.28	8.79	7.56	24.35
		8	-43.36	3.00	1.28	-8.79	0.22	-42.63

MEMBER END FORCES STRUCTURE TYPE = SPACE

ALL UNITS ARE -- KIP FEET (LOCAL)

MEMBER	LOAD	JT	AXIAL	SHEAR-Y	SHEAR-Z	TORSION	MOM-Y	MOM-Z
	133	7	31.28	-2.29	-0.97	7.28	6.89	16.29
		8	-31.28	2.29	0.97	-7.28	-0.99	-30.26
9	3	9	116.11	-7.26	-1.07	13.48	-47.23	-19.66
		10	-116.11	7.26	1.07	-13.48	52.81	-18.10
	4	9	122.29	-9.11	-1.30	14.07	-49.61	-63.74
		10	-122.29	9.11	1.30	-14.07	56.40	16.33
	5	9	132.33	-11.72	-1.79	13.56	-36.88	-137.81
		10	-132.33	11.72	1.79	-13.56	46.21	76.84
	6	9	151.24	-4.72	-0.21	19.63	-51.67	-43.81
		10	-151.24	4.72	0.21	-19.63	52.77	19.27
	7	9	159.42	-7.45	-0.65	13.77	-55.70	-4.48
		10	-159.42	7.45	0.65	-13.77	59.09	-34.31
	8	9	163.75	-8.99	-1.49	11.53	-53.96	12.04
		10	-163.75	8.99	1.49	-11.53	61.71	-58.85
	9	9	162.85	-9.72	-2.03	13.40	-50.45	18.38
		10	-162.85	9.72	2.03	-13.40	61.00	-68.99
	10	9	156.94	-9.86	-2.19	14.92	-46.26	16.54
		10	-156.94	9.86	2.19	-14.92	57.66	-67.85
	11	9	147.28	-9.43	-2.09	14.97	-42.24	9.23
		10	-147.28	9.43	2.09	-14.97	53.10	-58.30
	12	9	135.40	-8.60	-1.81	14.08	-39.26	-0.99
		10	-135.40	8.60	1.81	-14.08	48.67	-43.76
	13	9	124.12	-7.67	-1.47	12.79	-37.60	-10.82
		10	-124.12	7.67	1.47	-12.79	45.24	-29.08
	14	9	9.78	-4.43	-0.47	4.24	-21.06	-97.49
		10	-9.78	4.43	0.47	-4.24	23.49	74.44
	15	9	19.73	-7.30	-0.93	3.82	-12.42	-170.16
		10	-19.73	7.30	0.93	-3.82	17.26	132.16
	16	9	32.82	-9.23	-1.13	4.15	-1.24	-235.18
		10	-32.82	9.23	1.13	-4.15	7.10	187.16
	17	9	49.56	-8.51	-0.68	6.42	4.73	-260.06
		10	-49.56	8.51	0.68	-6.42	-1.19	215.79
	18	9	69.58	-4.90	0.54	10.28	0.84	-225.86
		10	-69.58	4.90	-0.54	-10.28	-3.64	200.38
	19	9	89.70	0.04	1.99	13.48	-13.58	-138.28
		10	-89.70	-0.04	-1.99	-13.48	3.24	138.50
	20	9	107.06	2.94	3.05	13.16	-30.85	-42.47
		10	-107.06	-2.94	-3.05	-13.16	14.98	57.76
	21	9	118.82	1.83	2.92	8.26	-40.42	19.69
		10	-118.82	-1.83	-2.92	-8.26	25.21	-10.17
	22	9	125.92	-1.67	1.92	1.25	-43.70	50.54
		10	-125.92	1.67	-1.92	-1.25	33.71	-59.26
	23	9	130.43	-4.62	0.73	-3.11	-43.25	68.88
		10	-130.43	4.62	-0.73	3.11	39.46	-92.90
	24	9	132.83	-6.10	-0.38	-3.68	-41.00	83.15
		10	-132.83	6.10	0.38	3.68	42.99	-114.91

MEMBER END FORCES STRUCTURE TYPE = SPACE

ALL UNITS ARE -- KIP FEET (LOCAL)

MEMBER	LOAD	JT	AXIAL	SHEAR-Y	SHEAR-Z	TORSION	MOM-Y	MOM-Z
	25	9	132.46	-6.93	-1.30	-1.81	-37.62	92.56
		10	-132.46	6.93	1.30	1.81	44.39	-128.61
	26	9	128.98	-7.55	-1.96	1.32	-33.46	96.76
		10	-128.98	7.55	1.96	-1.32	43.66	-136.06
	27	9	122.53	-7.88	-2.40	4.71	-28.80	96.45
		10	-122.53	7.88	2.40	-4.71	41.31	-137.44
	28	9	113.77	-7.87	-2.61	7.05	-23.89	92.42
		10	-113.77	7.87	2.61	-7.05	37.48	-133.40
	29	9	102.61	-7.51	-2.64	8.68	-18.91	85.19
		10	-102.61	7.51	2.64	-8.68	32.67	-124.30
	30	9	89.88	-6.90	-2.53	9.17	-14.19	75.61
		10	-89.88	6.90	2.53	-9.17	27.34	-111.50
	31	9	75.64	-6.03	-2.29	8.93	-9.92	64.10
		10	-75.64	6.03	2.29	-8.93	21.82	-95.47
	32	9	60.79	-5.00	-1.96	8.04	-6.31	51.65
		10	-60.79	5.00	1.96	-8.04	16.51	-77.66
	33	9	45.83	-3.86	-1.57	6.73	-3.43	38.91
		10	-45.83	3.86	1.57	-6.73	11.61	-59.01
	34	9	0.69	-0.81	0.07	3.42	-19.11	-16.32
		10	-0.69	0.81	-0.07	-3.42	18.73	12.12
	35	9	5.87	-2.17	-0.18	3.36	-19.52	-47.60
		10	-5.87	2.17	0.18	-3.36	20.44	36.32
	36	9	11.78	-5.05	-0.68	2.38	-11.81	-110.22
		10	-11.78	5.05	0.68	-2.38	15.37	83.91
	37	9	19.23	-8.94	-1.37	0.63	5.88	-198.77
		10	-19.23	8.94	1.37	-0.63	1.26	152.24
	38	9	30.51	-9.09	-1.28	1.69	15.62	-233.93
		10	-30.51	9.09	1.28	-1.69	-8.96	186.64
	39	9	47.25	-2.78	0.40	8.30	4.06	-166.43
		10	-47.25	2.78	-0.40	-8.30	-6.14	151.97
	40	9	64.21	3.95	2.26	14.10	-14.39	-64.67
		10	-64.21	-3.95	-2.26	-14.10	2.61	85.21
	41	9	74.81	4.43	2.69	11.47	-25.04	-3.76
		10	-74.81	-4.43	-2.69	-11.47	11.05	26.84
	42	9	80.37	0.67	2.12	3.93	-29.44	20.72
		10	-80.37	-0.67	-2.12	-3.93	18.41	-17.25
	43	9	84.65	-2.29	1.28	-1.42	-30.24	35.45
		10	-84.65	2.29	-1.28	1.42	23.60	-47.37
	44	9	88.36	-3.48	0.37	-3.89	-29.52	48.66
		10	-88.36	3.48	-0.37	3.89	27.61	-66.78
	45	9	90.29	-4.13	-0.38	-3.74	-27.76	58.47
		10	-90.29	4.13	0.38	3.74	29.76	-79.97
	46	9	89.75	-4.75	-1.00	-1.39	-25.32	64.28
		10	-89.75	4.75	1.00	1.39	30.54	-88.98
	47	9	87.27	-5.23	-1.44	1.25	-22.48	66.63
		10	-87.27	5.23	1.44	-1.25	29.99	-93.87
	48	9	82.83	-5.44	-1.71	3.59	-19.26	66.02
		10	-82.83	5.44	1.71	-3.59	28.14	-94.34

MEMBER END FORCES   STRUCTURE TYPE = SPACE

ALL UNITS ARE -- KIP FEET   (LOCAL)

MEMBER	LOAD	JT	AXIAL	SHEAR-Y	SHEAR-Z	TORSION	MOM-Y	MOM-Z
	49	9	76.68	-5.39	-1.83	5.36	-15.84	62.98
		10	-76.68	5.39	1.83	-5.36	25.35	-91.05
	50	9	69.12	-5.14	-1.83	6.23	-12.38	57.85
		10	-69.12	5.14	1.83	-6.23	21.90	-84.61
	51	9	60.30	-4.69	-1.74	6.50	-9.09	51.03
		10	-60.30	4.69	1.74	-6.50	18.13	-75.46
	52	9	50.62	-4.09	-1.56	6.21	-6.20	43.06
		10	-50.62	4.09	1.56	-6.21	14.34	-64.36
	53	9	40.26	-3.36	-1.33	5.55	-3.77	34.27
		10	-40.26	3.36	1.33	-5.55	10.69	-51.73
	54	9	1.06	-0.70	0.01	2.08	-11.70	-14.53
		10	-1.06	0.70	-0.01	-2.08	11.66	10.88
	55	9	4.35	-1.78	-0.18	1.94	-10.81	-38.99
		10	-4.35	1.78	0.18	-1.94	11.77	29.70
	56	9	8.31	-3.60	-0.51	1.27	-4.95	-79.34
		10	-8.31	3.60	0.51	-1.27	7.58	60.62
	57	9	13.52	-5.28	-0.78	0.75	3.84	-123.29
		10	-13.52	5.28	0.78	-0.75	0.23	95.78
	58	9	21.25	-4.64	-0.52	2.11	7.30	-133.15
		10	-21.25	4.64	0.52	-2.11	-4.60	109.03
	59	9	31.27	-1.13	0.42	5.60	0.50	-92.62
		10	-31.27	1.13	-0.42	-5.60	-2.71	86.77
	60	9	40.88	2.09	1.37	7.95	-9.66	-36.80
		10	-40.88	-2.09	-1.37	-7.95	2.53	47.66
	61	9	47.17	2.22	1.58	6.21	-15.85	-1.11
		10	-47.17	-2.22	-1.58	-6.21	7.64	12.66
	62	9	50.70	0.22	1.23	2.09	-18.34	14.51
		10	-50.70	-0.22	-1.23	-2.09	11.96	-13.36
	63	9	53.27	-1.49	0.70	-1.02	-18.75	23.51
		10	-53.27	1.49	-0.70	1.02	15.13	-31.26
	64	9	55.31	-2.24	0.16	-2.27	-18.20	31.27
		10	-55.31	2.24	-0.16	2.27	17.37	-42.94
	65	9	56.24	-2.65	-0.30	-1.98	-17.05	36.98
		10	-56.24	2.65	0.30	1.98	18.63	-50.75
	66	9	55.73	-3.01	-0.66	-0.61	-15.49	40.26
		10	-55.73	3.01	0.66	0.61	18.94	-55.93
	67	9	53.93	-3.27	-0.92	1.04	-13.67	41.42
		10	-53.93	3.27	0.92	-1.04	18.48	-58.47
	68	9	51.01	-3.38	-1.07	2.39	-11.65	40.80
		10	-51.01	3.38	1.07	-2.39	17.23	-58.41
	69	9	47.00	-3.33	-1.14	3.41	-9.51	38.68
		10	-47.00	3.33	1.14	-3.41	15.43	-56.01
	70	9	42.16	-3.15	-1.13	3.89	-7.39	35.32
		10	-42.16	3.15	1.13	-3.89	13.26	-51.73
	71	9	36.56	-2.86	-1.06	4.01	-5.39	30.95
		10	-36.56	2.86	1.06	-4.01	10.91	-45.82
	72	9	30.46	-2.47	-0.95	3.79	-3.63	25.90
		10	-30.46	2.47	0.95	-3.79	8.57	-38.76

MEMBER END FORCES STRUCTURE TYPE = SPACE

ALL UNITS ARE -- KIP FEET (LOCAL)

MEMBER	LOAD	JT	AXIAL	SHEAR-Y	SHEAR-Z	TORSION	MOM-Y	MOM-Z
	73	9	24.01	-2.01	-0.80	3.34	-2.18	20.42
		10	-24.01	2.01	0.80	-3.34	6.33	-30.86
	74	9	2.82	-1.46	-0.06	3.16	-17.71	-31.13
		10	-2.82	1.46	0.06	-3.16	18.00	23.51
	75	9	8.11	-3.43	-0.41	2.69	-14.24	-74.95
		10	-8.11	3.43	0.41	-2.69	16.37	57.12
	76	9	14.64	-6.10	-0.87	1.79	-4.62	-137.11
		10	-14.64	6.10	0.87	-1.79	9.15	105.35
	77	9	23.60	-7.83	-1.09	1.72	6.98	-192.21
		10	-23.60	7.83	1.09	-1.72	-1.32	151.48
	78	9	36.14	-5.95	-0.48	4.39	9.12	-191.28
		10	-36.14	5.95	0.48	-4.39	-6.60	160.30
	79	9	51.38	-0.65	0.97	9.35	-2.62	-122.98
		10	-51.38	0.65	-0.97	-9.35	-2.41	119.62
	80	9	65.12	3.38	2.21	11.73	-17.30	-42.29
		10	-65.12	-3.38	-2.21	-11.73	5.80	59.90
	81	9	73.73	2.77	2.31	8.17	-25.30	4.76
		10	-73.73	-2.77	-2.31	-8.17	13.26	9.68
	82	9	78.70	-0.32	1.68	1.96	-28.35	25.62
		10	-78.70	0.32	-1.68	-1.96	19.60	-27.29
	83	9	82.44	-2.59	0.88	-2.06	-28.57	38.91
		10	-82.44	2.59	-0.88	2.06	24.01	-52.39
	84	9	85.17	-3.59	0.07	-3.39	-27.51	50.10
		10	-85.17	3.59	-0.07	3.39	27.16	-68.81
	85	9	86.09	-4.19	-0.60	-2.58	-25.58	57.96
		10	-86.09	4.19	0.60	2.58	28.69	-79.79
	86	9	84.81	-4.71	-1.12	-0.32	-23.09	62.20
		10	-84.81	4.71	1.12	0.32	28.90	-86.74
	87	9	81.65	-5.07	-1.47	2.09	-20.22	63.33
		10	-81.65	5.07	1.47	-2.09	27.89	-89.70
	88	9	76.77	-5.17	-1.67	4.03	-17.08	61.82
		10	-76.77	5.17	1.67	-4.03	25.77	-88.75
	89	9	70.31	-5.04	-1.74	5.42	-13.81	58.10
		10	-70.31	5.04	1.74	-5.42	22.87	-84.36
	90	9	62.62	-4.73	-1.71	6.01	-10.59	52.58
		10	-62.62	4.73	1.71	-6.01	19.48	-77.21
	91	9	53.83	-4.24	-1.59	6.07	-7.61	45.61
		10	-53.83	4.24	1.59	-6.07	15.87	-67.68
	92	9	44.36	-3.62	-1.40	5.65	-5.03	37.72
		10	-44.36	3.62	1.40	-5.65	12.32	-56.56
	93	9	34.42	-2.89	-1.16	4.89	-2.92	29.27
		10	-34.42	2.89	1.16	-4.89	8.95	-44.31
	94	9	4.93	-2.37	-0.18	3.55	-19.62	-50.94
		10	-4.93	2.37	0.18	-3.55	20.55	38.62
	95	9	11.56	-4.86	-0.63	2.86	-13.59	-107.45
		10	-11.56	4.86	0.63	-2.86	16.85	82.16
	96	9	19.99	-7.60	-1.08	2.13	-2.18	-176.48
		10	-19.99	7.60	1.08	-2.13	7.78	136.91

MEMBER END FORCES   STRUCTURE TYPE = SPACE

ALL UNITS ARE -- KIP FEET   (LOCAL)

MEMBER	LOAD	JT	AXIAL	SHEAR-Y	SHEAR-Z	TORSION	MOM-Y	MOM-Z
	97	9	31.70	-8.53	-1.06	2.95	8.61	-224.31
		10	-31.70	8.53	1.06	-2.95	-3.10	179.93
	98	9	47.08	-5.41	-0.14	6.61	7.25	-203.99
		10	-47.08	5.41	0.14	-6.61	-6.52	175.86
	99	9	64.46	0.36	1.50	11.55	-7.53	-120.33
		10	-64.46	-0.36	-1.50	-11.55	-0.28	122.21
	100	9	79.11	3.79	2.63	12.70	-22.78	-35.08
		10	-79.11	-3.79	-2.63	-12.70	9.10	54.81
	101	9	88.14	2.37	2.52	7.76	-30.66	12.33
		10	-88.14	-2.37	-2.52	-7.76	17.53	0.01
	102	9	93.53	-1.08	1.72	1.06	-33.35	34.18
		10	-93.53	1.08	-1.72	-1.06	24.38	-39.79
	103	9	97.59	-3.37	0.78	-2.81	-33.20	49.09
		10	-97.59	3.37	-0.78	2.81	29.13	-66.62
	104	9	100.25	-4.40	-0.13	-3.72	-31.69	61.24
		10	-100.25	4.40	0.13	3.72	32.36	-84.16
	105	9	100.67	-5.08	-0.86	-2.37	-29.26	69.35
		10	-100.67	5.08	0.86	2.37	33.73	-95.80
	106	9	98.55	-5.64	-1.42	0.39	-26.21	73.36
		10	-98.55	5.64	1.42	-0.39	33.61	-102.70
	107	9	94.35	-5.98	-1.79	3.03	-22.77	73.87
		10	-94.35	5.98	1.79	-3.03	32.08	-105.01
	108	9	88.10	-6.03	-1.98	5.17	-19.04	71.40
		10	-88.10	6.03	1.98	-5.17	29.35	-102.79
	109	9	80.15	-5.82	-2.03	6.55	-15.21	66.49
		10	-80.15	5.82	2.03	-6.55	25.80	-96.81
	110	9	70.77	-5.40	-1.97	7.08	-11.51	59.56
		10	-70.77	5.40	1.97	-7.08	21.75	-87.66
	111	9	60.25	-4.79	-1.81	7.00	-8.13	51.09
		10	-60.25	4.79	1.81	-7.00	17.53	-76.00
	112	9	48.99	-4.02	-1.57	6.40	-5.26	41.66
		10	-48.99	4.02	1.57	-6.40	13.42	-62.60
	113	9	37.40	-3.15	-1.28	5.44	-2.93	31.78
		10	-37.40	3.15	1.28	-5.44	9.57	-48.20
	114	9	47.44	-3.03	0.52	9.99	-11.97	-157.53
		10	-47.44	3.03	-0.52	-9.99	9.26	141.74
	115	9	65.55	0.68	1.74	13.39	-27.10	-98.80
		10	-65.55	-0.68	-1.74	-13.39	18.03	102.32
	116	9	80.03	-0.35	1.85	11.23	-31.76	-84.03
		10	-80.03	0.35	-1.85	-11.23	22.12	82.21
	117	9	91.16	-5.66	0.90	4.24	-23.54	-119.61
		10	-91.16	5.66	-0.90	-4.24	18.85	90.15
	118	9	103.01	-8.50	0.19	0.12	-17.51	-130.35
		10	-103.01	8.50	-0.19	-0.12	16.53	86.13
	119	9	117.86	-5.35	0.57	2.83	-24.93	-70.80
		10	-117.86	5.35	-0.57	-2.83	21.97	42.93
	120	9	131.34	-1.24	1.18	7.12	-36.31	10.14
		10	-131.34	1.24	-1.18	-7.12	30.19	-16.58

MEMBER END FORCES STRUCTURE TYPE = SPACE

ALL UNITS ARE -- KIP FEET (LOCAL)

MEMBER	LOAD	JT	AXIAL	SHEAR-Y	SHEAR-Z	TORSION	MOM-Y	MOM-Z
	121	9	138.18	-1.43	0.93	7.12	-41.50	58.47
		10	-138.18	1.43	-0.93	-7.12	36.67	-65.91
	122	9	139.42	-4.50	0.12	4.26	-41.83	77.75
		10	-139.42	4.50	-0.12	-4.26	41.22	-101.17
	123	9	138.07	-6.78	-0.72	2.47	-39.35	87.37
		10	-138.07	6.78	0.72	-2.47	43.07	-122.64
	124	9	134.60	-7.55	-1.46	2.33	-35.59	93.57
		10	-134.60	7.55	1.46	-2.33	43.21	-132.84
	125	9	128.64	-7.74	-1.99	3.21	-31.12	95.50
		10	-128.64	7.74	1.99	-3.21	41.48	-135.81
	126	9	119.73	-7.73	-2.33	5.09	-26.33	93.00
		10	-119.73	7.73	2.33	-5.09	38.46	-133.25
	127	9	108.70	-7.49	-2.47	6.66	-21.63	87.03
		10	-108.70	7.49	2.47	-6.66	34.50	-126.04
	128	9	95.74	-6.94	-2.43	7.64	-17.12	78.29
		10	-95.74	6.94	2.43	-7.64	29.77	-114.40
	129	9	81.63	-6.15	-2.26	7.97	-12.94	67.78
		10	-81.63	6.15	2.26	-7.97	24.68	-99.79
	130	9	67.22	-5.23	-1.99	7.53	-9.21	56.38
		10	-67.22	5.23	1.99	-7.53	19.54	-83.59
	131	9	53.16	-4.25	-1.67	6.73	-5.92	44.81
		10	-53.16	4.25	1.67	-6.73	14.61	-66.91
	132	9	40.92	-3.35	-1.35	5.61	-3.68	34.59
		10	-40.92	3.35	1.35	-5.61	10.68	-52.02
	133	9	29.61	-2.48	-1.05	4.62	-1.47	24.87
		10	-29.61	2.48	1.05	-4.62	6.91	-37.76
13	3	13	102.94	-6.53	0.47	14.66	-59.77	-31.39
		14	-102.94	6.53	-0.47	-14.66	57.58	1.06
	4	13	109.04	-7.48	0.43	16.16	-66.60	-44.63
		14	-109.04	7.48	-0.43	-16.16	64.59	9.92
	5	13	118.29	-9.35	-0.19	16.90	-65.34	-75.29
		14	-118.29	9.35	0.19	-16.90	66.22	31.92
	6	13	126.53	-12.06	-1.03	16.59	-43.15	-141.26
		14	-126.53	12.06	1.03	-16.59	47.92	85.30
	7	13	140.01	-4.18	1.88	19.79	-62.02	-54.34
		14	-140.01	4.18	-1.88	-19.79	53.31	34.95
	8	13	144.67	-7.19	1.33	14.35	-75.21	-24.06
		14	-144.67	7.19	-1.33	-14.35	69.03	-9.32
	9	13	144.98	-8.49	0.54	15.03	-81.13	-11.94
		14	-144.98	8.49	-0.54	-15.03	78.64	-27.44
	10	13	140.39	-8.89	0.20	17.25	-80.55	-8.44
		14	-140.39	8.89	-0.20	-17.25	79.61	-32.81
	11	13	131.83	-8.69	0.11	17.69	-75.21	-11.77
		14	-131.83	8.69	-0.11	-17.69	74.69	-28.55
	12	13	120.85	-8.01	0.13	16.62	-67.38	-19.44
		14	-120.85	8.01	-0.13	-16.62	66.79	-17.73

MEMBER END FORCES STRUCTURE TYPE = SPACE

ALL UNITS ARE -- KIP FEET (LOCAL)

MEMBER	LOAD	JT	AXIAL	SHEAR-Y	SHEAR-Z	TORSION	MOM-Y	MOM-Z
	13	13	110.22	-7.16	0.21	14.91	-59.48	-27.98
		14	-110.22	7.16	-0.21	-14.91	58.53	-5.25
	14	13	10.82	-1.77	0.14	6.29	-27.47	-19.36
		14	-10.82	1.77	-0.14	-6.29	26.83	11.12
	15	13	20.41	-3.45	-0.38	7.38	-29.45	-44.09
		14	-20.41	3.45	0.38	-7.38	31.21	28.07
	16	13	31.40	-5.84	-1.27	7.84	-23.11	-83.16
		14	-31.40	5.84	1.27	-7.84	29.00	56.07
	17	13	42.88	-8.77	-2.33	7.86	-7.38	-138.92
		14	-42.88	8.77	2.33	-7.86	18.18	98.23
	18	13	55.11	-11.08	-3.07	7.75	15.63	-197.35
		14	-55.11	11.08	3.07	-7.75	-1.40	145.94
	19	13	67.49	-10.81	-2.69	8.41	32.62	-227.86
		14	-67.49	10.81	2.69	-8.41	-20.15	177.68
	20	13	81.57	-7.21	-0.82	9.60	36.34	-208.15
		14	-81.57	7.21	0.82	-9.60	-32.52	174.68
	21	13	95.46	-1.60	1.75	10.31	20.67	-136.89
		14	-95.46	1.60	-1.75	-10.31	-28.81	129.45
	22	13	107.56	2.45	4.01	8.64	-6.41	-50.50
		14	-107.56	-2.45	-4.01	-8.64	-12.19	61.86
	23	13	115.34	2.32	4.55	4.57	-30.08	9.06
		14	-115.34	-2.32	-4.55	-4.57	8.96	1.71
	24	13	118.45	-1.05	3.56	-0.06	-47.08	35.58
		14	-118.45	1.05	-3.56	0.06	30.56	-40.45
	25	13	118.59	-4.31	2.22	-2.00	-58.90	48.28
		14	-118.59	4.31	-2.22	2.00	48.62	-68.27
	26	13	116.63	-5.74	1.19	-0.19	-66.16	58.52
		14	-116.63	5.74	-1.19	0.19	60.65	-85.17
	27	13	112.03	-6.19	0.42	3.35	-69.69	65.50
		14	-112.03	6.19	-0.42	-3.35	67.72	-94.24
	28	13	104.95	-6.46	-0.03	6.50	-69.13	67.74
		14	-104.95	6.46	0.03	-6.50	69.27	-97.71
	29	13	95.28	-6.43	-0.31	9.15	-65.51	66.01
		14	-95.28	6.43	0.31	-9.15	66.94	-95.85
	30	13	83.93	-6.11	-0.45	10.29	-59.31	61.13
		14	-83.93	6.11	0.45	-10.29	61.40	-89.49
	31	13	70.96	-5.46	-0.51	10.41	-51.24	53.68
		14	-70.96	5.46	0.51	-10.41	53.58	-79.02
	32	13	57.26	-4.61	-0.50	9.55	-42.04	44.51
		14	-57.26	4.61	0.50	-9.55	44.34	-65.90
	33	13	43.30	-3.62	-0.44	8.07	-32.29	34.33
		14	-43.30	3.62	0.44	-8.07	34.34	-51.11
	34	13	1.14	-0.34	0.31	3.32	-14.61	-1.63
		14	-1.14	0.34	-0.31	-3.32	13.15	0.04
	35	13	6.16	-1.08	0.26	4.40	-20.32	-11.24
		14	-6.16	1.08	-0.26	-4.40	19.12	6.24
	36	13	12.89	-1.86	0.00	5.32	-24.36	-21.22
		14	-12.89	1.86	0.00	-5.32	24.35	12.60

MEMBER END FORCES STRUCTURE TYPE = SPACE

ALL UNITS ARE -- KIP FEET (LOCAL)

MEMBER	LOAD	JT	AXIAL	SHEAR-Y	SHEAR-Z	TORSION	MOM-Y	MOM-Z
	37	13	21.40	-3.03	-0.61	5.74	-23.33	-37.78
		14	-21.40	3.03	0.61	-5.74	26.19	23.75
	38	13	29.40	-5.62	-1.61	5.47	-11.82	-81.44
		14	-29.40	5.62	1.61	-5.47	19.28	55.37
	39	13	35.96	-9.85	-2.96	4.30	16.09	-159.86
		14	-35.96	9.85	2.96	-4.30	-2.36	114.15
	40	13	43.28	-11.28	-3.34	4.02	40.15	-209.17
		14	-43.28	11.28	3.34	-4.02	-24.67	156.84
	41	13	54.16	-5.40	-0.94	7.02	34.63	-163.65
		14	-54.16	5.40	0.94	-7.02	-30.28	138.62
	42	13	66.78	2.89	2.61	10.27	11.49	-69.08
		14	-66.78	-2.89	-2.61	-10.27	-23.61	82.48
	43	13	75.04	5.11	3.97	7.92	-8.54	-6.48
		14	-75.04	-5.11	-3.97	-7.92	-9.86	30.21
	44	13	78.39	1.43	3.30	1.08	-23.33	15.05
		14	-78.39	-1.43	-3.30	-1.08	8.01	-8.43
	45	13	79.83	-2.23	2.24	-2.96	-33.62	23.99
		14	-79.83	2.23	-2.24	2.96	23.24	-34.33
	46	13	80.24	-3.51	1.29	-2.57	-41.48	33.87
		14	-80.24	3.51	-1.29	2.57	35.50	-50.15
	47	13	79.19	-3.88	0.60	-0.41	-46.40	41.83
		14	-79.19	3.88	-0.60	0.41	43.63	-59.85
	48	13	75.98	-4.24	0.17	2.51	-48.25	45.95
		14	-75.98	4.24	-0.17	-2.51	47.49	-65.64
	49	13	70.87	-4.49	-0.11	5.16	-47.60	46.95
		14	-70.87	4.49	0.11	-5.16	48.11	-67.76
	50	13	64.30	-4.47	-0.26	6.71	-44.73	45.43
		14	-64.30	4.47	0.26	-6.71	45.94	-66.19
	51	13	56.41	-4.19	-0.34	7.47	-40.24	41.85
		14	-56.41	4.19	0.34	-7.47	41.81	-61.31
	52	13	47.59	-3.74	-0.36	7.34	-34.57	36.54
		14	-47.59	3.74	0.36	-7.34	36.27	-53.89
	53	13	37.99	-3.12	-0.35	6.66	-28.08	29.89
		14	-37.99	3.12	0.35	-6.66	29.72	-44.37
	54	13	1.35	-0.30	0.18	2.18	-9.73	-2.05
		14	-1.35	0.30	-0.18	-2.18	8.88	0.67
	55	13	4.70	-0.76	0.12	2.85	-13.03	-8.17
		14	-4.70	0.76	-0.12	-2.85	12.48	4.63
	56	13	9.09	-1.33	-0.09	3.33	-14.73	-15.71
		14	-9.09	1.33	0.09	-3.33	15.15	9.56
	57	13	14.17	-2.28	-0.51	3.52	-12.67	-30.40
		14	-14.17	2.28	0.51	-3.52	15.04	19.83
	58	13	19.06	-4.06	-1.18	3.23	-3.22	-61.36
		14	-19.06	4.06	1.18	-3.23	8.68	42.53
	59	13	23.37	-6.04	-1.80	2.76	11.85	-102.08
		14	-23.37	6.04	1.80	-2.76	-3.51	74.04
	60	13	28.55	-5.93	-1.63	3.07	22.57	-119.68
		14	-28.55	5.93	1.63	-3.07	-15.02	92.14

MEMBER END FORCES   STRUCTURE TYPE = SPACE

ALL UNITS ARE -- KIP FEET   (LOCAL)

MEMBER	LOAD	JT	AXIAL	SHEAR-Y	SHEAR-Z	TORSION	MOM-Y	MOM-Z
	61	13	35.23	-2.49	-0.20	4.65	18.55	-90.72
		14	-35.23	2.49	0.20	-4.65	-17.64	79.17
	62	13	42.30	1.56	1.61	5.72	5.43	-39.40
		14	-42.30	-1.56	-1.61	-5.72	-12.88	46.63
	63	13	47.05	2.56	2.33	4.07	-6.73	-3.42
		14	-47.05	-2.56	-2.33	-4.07	-4.06	15.31
	64	13	49.11	0.61	1.95	0.54	-15.48	10.27
		14	-49.11	-0.61	-1.95	-0.54	6.41	-7.44
	65	13	49.87	-1.42	1.30	-1.61	-21.78	16.14
		14	-49.87	1.42	-1.30	1.61	15.76	-22.73
	66	13	49.95	-2.22	0.75	-1.33	-26.27	21.86
		14	-49.95	2.22	-0.75	1.33	22.80	-32.16
	67	13	49.00	-2.46	0.33	0.12	-29.07	26.40
		14	-49.00	2.46	-0.33	-0.12	27.51	-37.84
	68	13	46.83	-2.67	0.08	1.81	-29.95	28.67
		14	-46.83	2.67	-0.08	-1.81	29.57	-41.06
	69	13	43.47	-2.78	-0.08	3.35	-29.32	29.04
		14	-43.47	2.78	0.08	-3.35	29.69	-41.96
	70	13	39.25	-2.75	-0.17	4.23	-27.38	27.89
		14	-39.25	2.75	0.17	-4.23	28.16	-40.66
	71	13	34.22	-2.56	-0.21	4.61	-24.46	25.47
		14	-34.22	2.56	0.21	-4.61	25.44	-37.36
	72	13	28.64	-2.26	-0.22	4.49	-20.85	22.04
		14	-28.64	2.26	0.22	-4.49	21.89	-32.52
	73	13	22.66	-1.87	-0.21	4.01	-16.77	17.85
		14	-22.66	1.87	0.21	-4.01	17.76	-26.51
	74	13	3.28	-0.63	0.26	3.60	-16.14	-5.42
		14	-3.28	0.63	-0.26	-3.60	14.94	2.51
	75	13	8.83	-1.37	0.11	4.54	-20.63	-15.12
		14	-8.83	1.37	-0.11	-4.54	20.14	8.78
	76	13	15.76	-2.38	-0.29	5.19	-21.92	-29.44
		14	-15.76	2.38	0.29	-5.19	23.24	18.41
	77	13	23.50	-4.18	-1.04	5.28	-15.77	-58.41
		14	-23.50	4.18	1.04	-5.28	20.60	39.01
	78	13	30.84	-6.90	-2.02	4.81	0.17	-108.15
		14	-30.84	6.90	2.02	-4.81	9.19	76.12
	79	13	37.75	-9.17	-2.68	4.39	21.73	-162.20
		14	-37.75	9.17	2.68	-4.39	-9.29	119.64
	80	13	46.17	-7.99	-2.03	5.22	33.77	-174.83
		14	-46.17	7.99	2.03	-5.22	-24.37	137.77
	81	13	56.53	-2.44	0.30	7.48	24.15	-121.71
		14	-56.53	2.44	-0.30	-7.48	-25.55	110.39
	82	13	66.69	2.87	2.78	8.24	3.60	-46.35
		14	-66.69	-2.87	-2.78	-8.24	-16.52	59.68
	83	13	72.99	3.32	3.47	5.05	-13.56	0.48
		14	-72.99	-3.32	-3.47	-5.05	-2.53	14.94
	84	13	75.59	0.20	2.75	-0.03	-26.20	18.14
		14	-75.59	-0.20	-2.75	0.03	13.44	-17.23

MEMBER END FORCES STRUCTURE TYPE = SPACE

ALL UNITS ARE -- KIP FEET (LOCAL)

MEMBER	LOAD	JT	AXIAL	SHEAR-Y	SHEAR-Z	TORSION	MOM-Y	MOM-Z
	85	13	76.52	-2.51	1.79	-2.44	-35.06	26.81
		14	-76.52	2.51	-1.79	2.44	26.77	-38.47
	86	13	76.24	-3.51	0.99	-1.51	-41.36	35.20
		14	-76.24	3.51	-0.99	1.51	36.76	-51.50
	87	13	74.38	-3.85	0.42	0.79	-44.93	41.38
		14	-74.38	3.85	-0.42	-0.79	42.99	-59.26
	88	13	70.61	-4.14	0.06	3.33	-45.72	44.15
		14	-70.61	4.14	-0.06	-3.33	45.43	-63.34
	89	13	65.13	-4.26	-0.16	5.48	-44.28	44.15
		14	-65.13	4.26	0.16	-5.48	45.01	-63.92
	90	13	58.36	-4.16	-0.28	6.63	-40.93	41.91
		14	-58.36	4.16	0.28	-6.63	42.21	-61.20
	91	13	50.43	-3.82	-0.33	7.04	-36.20	37.82
		14	-50.43	3.82	0.33	-7.04	37.73	-55.53
	92	13	41.74	-3.32	-0.34	6.71	-30.49	32.28
		14	-41.74	3.32	0.34	-6.71	32.07	-47.70
	93	13	32.51	-2.70	-0.32	5.88	-24.14	25.70
		14	-32.51	2.70	0.32	-5.88	25.61	-38.21
	94	13	5.58	-0.96	0.26	4.52	-20.36	-9.30
		14	-5.58	0.96	-0.26	-4.52	19.17	4.84
	95	13	12.53	-1.92	0.00	5.52	-24.56	-22.23
		14	-12.53	1.92	0.00	-5.52	24.57	13.31
	96	13	20.84	-3.37	-0.56	6.13	-23.85	-43.96
		14	-20.84	3.37	0.56	-6.13	26.47	28.32
	97	13	29.87	-5.79	-1.54	6.01	-13.12	-84.67
		14	-29.87	5.79	1.54	-6.01	20.28	57.78
	98	13	38.34	-8.74	-2.56	5.54	6.56	-142.81
		14	-38.34	8.74	2.56	-5.54	5.32	102.24
	99	13	47.06	-10.26	-2.88	5.50	28.75	-192.72
		14	-47.06	10.26	2.88	-5.50	-15.41	145.13
	100	13	57.39	-7.69	-1.67	6.80	36.73	-189.04
		14	-57.39	7.69	1.67	-6.80	-28.97	153.34
	101	13	69.39	-1.40	1.06	8.85	22.20	-120.86
		14	-69.39	1.40	-1.06	-8.85	-27.13	114.36
	102	13	80.23	3.51	3.48	8.69	-1.09	-39.96
		14	-80.23	-3.51	-3.48	-8.69	-15.05	56.23
	103	13	86.53	3.03	3.87	4.51	-19.79	6.38
		14	-86.53	-3.03	-3.87	-4.51	1.84	7.67
	104	13	89.02	-0.60	2.93	-0.78	-33.52	24.01
		14	-89.02	0.60	-2.93	0.78	19.93	-26.78
	105	13	89.74	-3.28	1.86	-2.62	-43.06	33.99
		14	-89.74	3.28	-1.86	2.62	34.42	-49.22
	106	13	88.89	-4.23	0.98	-1.04	-49.67	43.22
		14	-88.89	4.23	-0.98	1.04	45.10	-62.84
	107	13	86.15	-4.61	0.38	1.68	-52.97	49.42
		14	-86.15	4.61	-0.38	-1.68	51.20	-70.82
	108	13	81.17	-4.89	0.01	4.59	-53.22	51.81
		14	-81.17	4.89	-0.01	-4.59	53.19	-74.50

MEMBER END FORCES STRUCTURE TYPE = SPACE

ALL UNITS ARE -- KIP FEET (LOCAL)

MEMBER	LOAD	JT	AXIAL	SHEAR-Y	SHEAR-Z	TORSION	MOM-Y	MOM-Z
	109	13	74.36	-4.97	-0.22	6.78	-50.94	51.12
		14	-74.36	4.97	0.22	-6.78	51.96	-74.19
	110	13	66.04	-4.77	-0.34	7.91	-46.58	47.92
		14	-66.04	4.77	0.34	-7.91	48.15	-70.06
	111	13	56.50	-4.33	-0.39	8.16	-40.72	42.68
		14	-56.50	4.33	0.39	-8.16	42.53	-62.76
	112	13	46.14	-3.71	-0.39	7.61	-33.82	35.85
		14	-46.14	3.71	0.39	-7.61	35.64	-53.05
	113	13	35.34	-2.95	-0.36	6.54	-26.34	28.03
		14	-35.34	2.95	0.36	-6.54	27.99	-41.73
	114	13	36.84	-8.53	-2.19	6.99	4.01	-144.90
		14	-36.84	8.53	2.19	-6.99	6.14	105.32
	115	13	48.42	-9.06	-1.99	8.13	16.00	-179.16
		14	-48.42	9.06	1.99	-8.13	-6.77	137.12
	116	13	62.63	-5.68	-0.50	10.36	10.77	-155.45
		14	-62.63	5.68	0.50	-10.36	-8.46	129.11
	117	13	78.97	-0.93	1.60	11.92	-6.93	-95.57
		14	-78.97	0.93	-1.60	-11.92	-0.52	91.26
	118	13	92.33	-0.47	2.25	10.11	-17.59	-67.93
		14	-92.33	0.47	-2.25	-10.11	7.15	65.73
	119	13	100.52	-5.69	0.91	4.65	-11.55	-98.39
		14	-100.52	5.69	-0.91	-4.65	7.33	71.98
	120	13	106.92	-9.84	-0.32	0.89	-4.39	-123.60
		14	-106.92	9.84	0.32	-0.89	5.89	77.95
	121	13	114.66	-7.16	0.55	3.10	-15.13	-83.11
		14	-114.66	7.16	-0.55	-3.10	12.59	49.90
	122	13	122.16	-1.72	2.41	7.44	-35.92	-9.15
		14	-122.16	1.72	-2.41	-7.44	24.74	1.15
	123	13	124.82	-0.44	2.96	8.19	-51.58	38.88
		14	-124.82	0.44	-2.96	-8.19	37.83	-40.90
	124	13	122.10	-3.21	2.24	5.71	-61.23	54.85
		14	-122.10	3.21	-2.24	-5.71	50.86	-69.75
	125	13	116.73	-5.77	1.34	4.23	-65.67	59.53
		14	-116.73	5.77	-1.34	-4.23	59.46	-86.30
	126	13	109.36	-6.39	0.60	5.13	-66.85	62.92
		14	-109.36	6.39	-0.60	-5.13	64.09	-92.58
	127	13	100.16	-6.21	0.08	6.52	-64.89	63.42
		14	-100.16	6.21	-0.08	-6.52	64.50	-92.22
	128	13	88.78	-5.87	-0.21	7.89	-60.02	60.02
		14	-88.78	5.87	0.21	-7.89	60.97	-87.25
	129	13	76.04	-5.37	-0.36	8.68	-53.13	53.91
		14	-76.04	5.37	0.36	-8.68	54.79	-78.84
	130	13	62.86	-4.68	-0.40	8.50	-44.89	46.20
		14	-62.86	4.68	0.40	-8.50	46.76	-67.92
	131	13	49.88	-3.86	-0.39	7.77	-36.20	37.70
		14	-49.88	3.86	0.39	-7.77	38.01	-55.61
	132	13	38.51	-3.08	-0.35	6.57	-28.23	29.76
		14	-38.51	3.08	0.35	-6.57	29.83	-44.08

MEMBER END FORCES STRUCTURE TYPE = SPACE

ALL UNITS ARE -- KIP FEET (LOCAL)

MEMBER	LOAD	JT	AXIAL	SHEAR-Y	SHEAR-Z	TORSION	MOM-Y	MOM-Z
	133	13	27.94	-2.32	-0.30	5.34	-20.67	21.81
		14	-27.94	2.32	0.30	-5.34	22.05	-32.56
17	3	17	93.48	-7.68	1.14	9.95	-41.46	-28.81
		18	-93.48	7.68	-1.14	-9.95	36.56	-4.22
	4	17	99.45	-8.69	1.27	11.57	-48.01	-33.07
		18	-99.45	8.69	-1.27	-11.57	42.57	-4.30
	5	17	108.52	-10.07	1.32	14.78	-58.26	-40.93
		18	-108.52	10.07	-1.32	-14.78	52.59	-2.38
	6	17	116.32	-11.81	0.58	17.62	-53.64	-63.99
		18	-116.32	11.81	-0.58	-17.62	51.13	13.22
	7	17	120.72	-14.40	-0.88	17.36	-18.43	-126.20
		18	-120.72	14.40	0.88	-17.36	22.22	64.27
	8	17	128.92	-5.51	3.14	9.79	-40.93	-42.82
		18	-128.92	5.51	-3.14	-9.79	27.42	19.13
	9	17	131.14	-8.67	2.18	5.66	-58.33	-17.67
		18	-131.14	8.67	-2.18	-5.66	48.97	-19.60
	10	17	128.57	-9.75	1.55	8.70	-63.25	-9.20
		18	-128.57	9.75	-1.55	-8.70	56.56	-32.72
	11	17	121.37	-9.77	1.42	11.40	-60.57	-9.20
		18	-121.37	9.77	-1.42	-11.40	54.48	-32.82
	12	17	111.07	-9.23	1.31	11.98	-53.92	-15.67
		18	-111.07	9.23	-1.31	-11.98	48.30	-24.01
	13	17	100.60	-8.38	1.17	11.16	-46.05	-24.32
		18	-100.60	8.38	-1.17	-11.16	41.03	-11.71
	14	17	11.01	-1.79	0.55	5.42	-20.87	-3.23
		18	-11.01	1.79	-0.55	-5.42	18.49	-4.46
	15	17	20.40	-3.22	0.66	8.66	-32.03	-9.62
		18	-20.40	3.22	-0.66	-8.66	29.20	-4.23
	16	17	31.25	-4.83	0.59	12.64	-42.63	-18.36
		18	-31.25	4.83	-0.59	-12.64	40.09	-2.42
	17	17	42.54	-6.71	0.17	16.99	-48.01	-33.30
		18	-42.54	6.71	-0.17	-16.99	47.28	4.44
	18	17	53.54	-9.11	-0.87	21.13	-41.13	-61.06
		18	-53.54	9.11	0.87	-21.13	44.88	21.90
	19	17	62.41	-11.84	-2.33	23.82	-19.47	-105.03
		18	-62.41	11.84	2.33	-23.82	29.49	54.14
	20	17	70.41	-14.20	-3.82	24.16	16.86	-158.70
		18	-70.41	14.20	3.82	-24.16	-0.44	97.64
	21	17	76.97	-14.20	-4.07	21.22	48.61	-194.34
		18	-76.97	14.20	4.07	-21.22	-31.10	133.29
	22	17	84.72	-10.56	-2.32	14.00	64.18	-186.61
		18	-84.72	10.56	2.32	-14.00	-54.20	141.22
	23	17	92.56	-4.31	0.84	4.45	52.50	-128.47
		18	-92.56	4.31	-0.84	-4.45	-56.12	109.94
	24	17	99.92	1.06	3.97	-5.88	20.20	-47.47
		18	-99.92	-1.06	-3.97	5.88	-37.27	52.04

MEMBER END FORCES STRUCTURE TYPE = SPACE

ALL UNITS ARE -- KIP FEET (LOCAL)

MEMBER	LOAD	JT	AXIAL	SHEAR-Y	SHEAR-Z	TORSION	MOM-Y	MOM-Z
	25	17	104.82	2.27	5.19	-13.56	-12.64	14.13
		18	-104.82	-2.27	-5.19	13.56	-9.69	-4.36
	26	17	105.70	-0.76	4.18	-16.40	-35.08	40.06
		18	-105.70	0.76	-4.18	16.40	17.13	-43.33
	27	17	103.03	-4.29	2.58	-15.16	-49.83	49.48
		18	-103.03	4.29	-2.58	15.16	38.73	-67.91
	28	17	98.27	-5.84	1.68	-11.00	-56.66	55.64
		18	-98.27	5.84	-1.68	11.00	49.45	-80.76
	29	17	90.69	-5.95	1.19	-5.40	-58.43	59.27
		18	-90.69	5.95	-1.19	5.40	53.31	-84.86
	30	17	81.06	-5.77	0.96	-1.12	-55.94	58.41
		18	-81.06	5.77	-0.96	1.12	51.80	-83.20
	31	17	69.28	-5.34	0.84	2.17	-50.47	53.42
		18	-69.28	5.34	-0.84	-2.17	46.86	-76.40
	32	17	56.42	-4.68	0.72	3.90	-42.93	45.65
		18	-56.42	4.68	-0.72	-3.90	39.82	-65.78
	33	17	42.98	-3.75	0.60	4.51	-34.09	36.16
		18	-42.98	3.75	-0.60	-4.51	31.53	-52.30
	34	17	1.50	-0.28	0.26	1.71	-6.59	1.65
		18	-1.50	0.28	-0.26	-1.71	5.47	-2.87
	35	17	6.39	-1.08	0.38	3.13	-12.62	-1.32
		18	-6.39	1.08	-0.38	-3.13	10.98	-3.30
	36	17	12.77	-2.08	0.50	5.26	-20.85	-5.74
		18	-12.77	2.08	-0.50	-5.26	18.68	-3.20
	37	17	20.89	-3.29	0.58	8.37	-31.33	-11.61
		18	-20.89	3.29	-0.58	-8.37	28.83	-2.55
	38	17	29.22	-4.37	0.46	11.69	-39.22	-17.19
		18	-29.22	4.37	-0.46	-11.69	37.24	-1.60
	39	17	36.91	-5.30	-0.11	14.74	-38.83	-24.47
		18	-36.91	5.30	0.11	-14.74	39.29	1.69
	40	17	43.06	-7.28	-1.31	17.12	-24.32	-53.11
		18	-43.06	7.28	1.31	-17.12	29.95	21.83
	41	17	47.09	-11.39	-3.42	18.13	13.74	-121.89
		18	-47.09	11.39	3.42	-18.13	0.96	72.93
	42	17	50.51	-13.91	-4.95	16.81	56.58	-182.93
		18	-50.51	13.91	4.95	-16.81	-35.30	123.13
	43	17	55.16	-8.84	-2.74	11.19	62.07	-158.50
		18	-55.16	8.84	2.74	-11.19	-50.30	120.51
	44	17	63.01	0.74	2.20	1.80	35.77	-70.51
		18	-63.01	-0.74	-2.20	-1.80	-45.25	73.71
	45	17	69.47	5.16	4.76	-6.11	7.94	-2.39
		18	-69.47	-5.16	-4.76	6.11	-28.39	24.59
	46	17	71.58	2.15	3.89	-11.76	-13.60	21.30
		18	-71.58	-2.15	-3.89	11.76	-3.13	-12.06
	47	17	71.53	-2.22	2.34	-13.78	-28.09	27.28
		18	-71.53	2.22	-2.34	13.78	18.03	-36.82
	48	17	70.00	-3.89	1.42	-11.14	-36.38	33.81
		18	-70.00	3.89	-1.42	11.14	30.29	-50.54

MEMBER END FORCES STRUCTURE TYPE = SPACE

ALL UNITS ARE -- KIP FEET (LOCAL)

MEMBER	LOAD	JT	AXIAL	SHEAR-Y	SHEAR-Z	TORSION	MOM-Y	MOM-Z
	49	17	66.69	-4.01	0.92	-6.86	-40.38	39.82
		18	-66.69	4.01	-0.92	6.86	36.44	-57.08
	50	17	61.57	-4.03	0.71	-3.03	-40.71	42.00
		18	-61.57	4.03	-0.71	3.03	37.66	-59.33
	51	17	54.69	-3.99	0.63	0.20	-38.53	40.66
		18	-54.69	3.99	-0.63	-0.20	35.83	-57.83
	52	17	46.66	-3.74	0.56	2.12	-34.50	36.79
		18	-46.66	3.74	-0.56	-2.12	32.07	-52.88
	53	17	37.60	-3.21	0.50	3.21	-29.09	31.04
		18	-37.60	3.21	-0.50	-3.21	26.96	-44.86
	54	17	1.55	-0.27	0.18	1.25	-4.88	0.69
		18	-1.55	0.27	-0.18	-1.25	4.12	-1.85
	55	17	4.79	-0.80	0.25	2.24	-8.94	-1.44
		18	-4.79	0.80	-0.25	-2.24	7.86	-2.00
	56	17	8.98	-1.44	0.32	3.69	-14.29	-4.29
		18	-8.98	1.44	-0.32	-3.69	12.92	-1.91
	57	17	13.94	-2.16	0.34	5.59	-20.19	-7.83
		18	-13.94	2.16	-0.34	-5.59	18.75	-1.46
	58	17	19.10	-2.83	0.19	7.64	-23.92	-11.76
		18	-19.10	2.83	-0.19	-7.64	23.09	-0.43
	59	17	23.63	-3.62	-0.24	9.42	-21.76	-20.15
		18	-23.63	3.62	0.24	-9.42	22.78	4.59
	60	17	27.28	-5.15	-1.12	10.73	-9.25	-43.42
		18	-27.28	5.15	1.12	-10.73	14.08	21.29
	61	17	29.79	-7.18	-2.22	11.03	12.76	-80.92
		18	-29.79	7.18	2.22	-11.03	-3.24	50.03
	62	17	32.23	-7.59	-2.57	9.58	33.15	-105.45
		18	-32.23	7.59	2.57	-9.58	-22.10	72.81
	63	17	35.48	-4.38	-1.10	5.83	34.69	-87.28
		18	-35.48	4.38	1.10	-5.83	-29.97	68.45
	64	17	39.91	0.47	1.42	0.44	19.76	-39.30
		18	-39.91	-0.47	-1.42	-0.44	-25.87	41.31
	65	17	43.42	2.56	2.73	-4.34	2.84	-0.90
		18	-43.42	-2.56	-2.73	4.34	-14.59	11.93
	66	17	44.68	0.92	2.28	-7.32	-9.63	13.55
		18	-44.68	-0.92	-2.28	7.32	-0.18	-9.61
	67	17	44.42	-1.41	1.39	-8.07	-18.23	17.92
		18	-44.42	1.41	-1.39	8.07	12.27	-23.98
	68	17	43.30	-2.40	0.85	-6.48	-22.94	21.68
		18	-43.30	2.40	-0.85	6.48	19.28	-32.00
	69	17	40.99	-2.51	0.56	-3.86	-25.10	24.89
		18	-40.99	2.51	-0.56	3.86	22.68	-35.70
	70	17	37.63	-2.51	0.44	-1.59	-25.07	25.93
		18	-37.63	2.51	-0.44	1.59	23.19	-36.72
	71	17	33.23	-2.45	0.39	0.27	-23.54	24.86
		18	-33.23	2.45	-0.39	-0.27	21.88	-35.39
	72	17	28.11	-2.27	0.34	1.40	-20.89	22.26
		18	-28.11	2.27	-0.34	-1.40	19.41	-32.01

MEMBER END FORCES STRUCTURE TYPE = SPACE

ALL UNITS ARE -- KIP FEET (LOCAL)

MEMBER	LOAD	JT	AXIAL	SHEAR-Y	SHEAR-Z	TORSION	MOM-Y	MOM-Z
	73	17	22.43	-1.93	0.30	1.98	-17.43	18.58
		18	-22.43	1.93	-0.30	-1.98	16.15	-26.85
	74	17	3.55	-0.61	0.30	2.28	-8.95	0.26
		18	-3.55	0.61	-0.30	-2.28	7.66	-2.88
	75	17	8.89	-1.46	0.41	3.98	-15.71	-3.23
		18	-8.89	1.46	-0.41	-3.98	13.94	-3.05
	76	17	15.55	-2.47	0.50	6.33	-24.02	-7.86
		18	-15.55	2.47	-0.50	-6.33	21.89	-2.77
	77	17	23.28	-3.55	0.46	9.32	-32.37	-13.25
		18	-23.28	3.55	-0.46	-9.32	30.38	-2.02
	78	17	30.95	-4.64	0.15	12.37	-36.00	-21.18
		18	-30.95	4.64	-0.15	-12.37	35.38	1.22
	79	17	37.55	-6.13	-0.69	14.94	-28.86	-39.70
		18	-37.55	6.13	0.69	-14.94	31.81	13.33
	80	17	42.80	-8.59	-2.11	16.58	-6.52	-79.48
		18	-42.80	8.59	2.11	-16.58	15.57	42.55
	81	17	46.51	-11.12	-3.51	16.43	26.49	-132.31
		18	-46.51	11.12	3.51	-16.43	-11.38	84.51
	82	17	50.70	-10.59	-3.44	13.33	52.19	-156.63
		18	-50.70	10.59	3.44	-13.33	-37.38	111.10
	83	17	55.96	-5.04	-0.83	7.08	48.39	-117.56
		18	-55.96	5.04	0.83	-7.08	-44.82	95.87
	84	17	62.45	1.54	2.70	-1.19	23.87	-45.81
		18	-62.45	-1.54	-2.70	1.19	-35.47	52.41
	85	17	67.13	3.45	4.08	-7.76	-0.27	4.64
		18	-67.13	-3.45	-4.08	7.76	-17.28	10.21
	86	17	68.43	0.62	3.18	-11.51	-18.07	22.83
		18	-68.43	-0.62	-3.18	11.51	4.37	-20.16
	87	17	67.73	-2.58	1.92	-11.88	-29.76	28.80
		18	-67.73	2.58	-1.92	11.88	21.50	-39.89
	88	17	65.57	-3.76	1.19	-9.02	-36.03	34.39
		18	-65.57	3.76	-1.19	9.02	30.89	-50.56
	89	17	61.65	-3.85	0.81	-5.08	-38.53	38.62
		18	-61.65	3.85	-0.81	5.08	35.04	-55.17
	90	17	56.13	-3.83	0.65	-1.77	-37.92	39.42
		18	-56.13	3.83	-0.65	1.77	35.13	-55.88
	91	17	49.07	-3.69	0.58	0.87	-35.15	37.19
		18	-49.07	3.69	-0.58	-0.87	32.67	-53.07
	92	17	41.04	-3.36	0.51	2.36	-30.79	32.82
		18	-41.04	3.36	-0.51	-2.36	28.59	-47.25
	93	17	32.23	-2.79	0.44	3.09	-25.26	26.90
		18	-32.23	2.79	-0.44	-3.09	23.38	-38.89
	94	17	5.83	-0.98	0.39	3.21	-12.63	-0.82
		18	-5.83	0.98	-0.39	-3.21	10.97	-3.41
	95	17	12.52	-2.03	0.51	5.41	-21.05	-5.23
		18	-12.52	2.03	-0.51	-5.41	18.86	-3.50
	96	17	20.61	-3.23	0.57	8.34	-30.72	-10.85
		18	-20.61	3.23	-0.57	-8.34	28.26	-3.02

MEMBER END FORCES STRUCTURE TYPE = SPACE

ALL UNITS ARE -- KIP FEET (LOCAL)

MEMBER	LOAD	JT	AXIAL	SHEAR-Y	SHEAR-Z	TORSION	MOM-Y	MOM-Z
	97	17	29.73	-4.50	0.44	11.90	-39.07	-17.91
		18	-29.73	4.50	-0.44	-11.90	37.18	-1.44
	98	17	38.34	-5.92	-0.08	15.30	-40.07	-30.86
		18	-38.34	5.92	0.08	-15.30	40.43	5.39
	99	17	45.72	-8.04	-1.29	18.05	-26.17	-60.04
		18	-45.72	8.04	1.29	-18.05	31.72	25.47
	100	17	51.38	-10.82	-2.89	19.40	2.36	-109.15
		18	-51.38	10.82	2.89	-19.40	10.07	62.62
	101	17	56.00	-12.69	-4.00	18.21	38.12	-160.81
		18	-56.00	12.69	4.00	-18.21	-20.94	106.23
	102	17	61.17	-10.73	-3.24	13.70	60.09	-171.82
		18	-61.17	10.73	3.24	-13.70	-46.16	125.68
	103	17	67.62	-4.09	0.01	5.84	49.68	-117.28
		18	-67.62	4.09	-0.01	-5.84	-49.71	99.69
	104	17	74.72	2.37	3.59	-3.45	20.50	-38.27
		18	-74.72	-2.37	-3.59	3.45	-35.93	48.47
	105	17	79.27	3.25	4.56	-10.22	-5.68	11.32
		18	-79.27	-3.25	-4.56	10.22	-13.91	2.67
	106	17	80.08	-0.23	3.34	-13.59	-24.87	28.75
		18	-80.08	0.23	-3.34	13.59	10.49	-29.73
	107	17	78.85	-3.41	2.03	-13.12	-36.84	35.49
		18	-78.85	3.41	-2.03	13.12	28.10	-50.15
	108	17	75.72	-4.45	1.28	-9.34	-43.07	41.64
		18	-75.72	4.45	-1.28	9.34	37.55	-60.76
	109	17	70.66	-4.51	0.90	-4.95	-45.04	45.57
		18	-70.66	4.51	-0.90	4.95	41.16	-64.97
	110	17	63.69	-4.45	0.74	-1.26	-43.65	45.58
		18	-63.69	4.45	-0.74	1.26	40.47	-64.70
	111	17	55.11	-4.23	0.66	1.48	-39.90	42.30
		18	-55.11	4.23	-0.66	-1.48	37.08	-60.48
	112	17	45.45	-3.76	0.58	2.99	-34.42	36.68
		18	-45.45	3.76	-0.58	-2.99	31.94	-52.87
	113	17	35.09	-3.07	0.48	3.62	-27.75	29.50
		18	-35.09	3.07	-0.48	-3.62	25.67	-42.68
	114	17	36.79	-6.01	-0.28	15.43	-35.20	-34.78
		18	-36.79	6.01	0.28	-15.43	36.42	8.94
	115	17	46.02	-8.69	-1.47	18.36	-21.06	-69.71
		18	-46.02	8.69	1.47	-18.36	27.38	32.36
	116	17	54.62	-11.62	-2.64	20.14	0.82	-118.36
		18	-54.62	11.62	2.64	-20.14	10.54	68.40
	117	17	64.57	-12.93	-2.95	19.99	22.13	-156.60
		18	-64.57	12.93	2.95	-19.99	-9.42	101.01
	118	17	75.16	-10.06	-1.43	17.23	23.34	-144.34
		18	-75.16	10.06	1.43	-17.23	-17.21	101.06
	119	17	86.63	-4.34	1.49	11.62	4.01	-85.46
		18	-86.63	4.34	-1.49	-11.62	-10.40	66.81
	120	17	96.44	-1.96	2.92	6.04	-11.33	-45.04
		18	-96.44	1.96	-2.92	-6.04	-1.21	36.63

MEMBER END FORCES STRUCTURE TYPE = SPACE

ALL UNITS ARE -- KIP FEET (LOCAL)

MEMBER	LOAD	JT	AXIAL	SHEAR-Y	SHEAR-Z	TORSION	MOM-Y	MOM-Z
	121	17	101.59	-6.37	1.13	2.41	-3.56	-66.85
		18	-101.59	6.37	-1.13	-2.41	-1.31	39.45
	122	17	103.66	-11.56	-1.26	0.04	13.20	-102.04
		18	-103.66	11.56	1.26	-0.04	-7.79	52.32
	123	17	105.25	-9.82	-0.56	-2.06	9.56	-79.58
		18	-105.25	9.82	0.56	2.06	-7.15	37.36
	124	17	107.29	-3.33	2.46	-4.83	-12.62	-12.48
		18	-107.29	3.33	-2.46	4.83	2.03	-1.83
	125	17	106.85	-0.17	4.05	-7.02	-32.52	37.60
		18	-106.85	0.17	-4.05	7.02	15.09	-38.33
	126	17	101.65	-2.20	3.35	-8.14	-45.55	52.93
		18	-101.65	2.20	-3.35	8.14	31.15	-62.38
	127	17	93.86	-5.02	2.18	-7.78	-51.86	53.34
		18	-93.86	5.02	-2.18	7.78	42.48	-74.94
	128	17	84.16	-5.70	1.46	-4.99	-52.51	52.44
		18	-84.16	5.70	-1.46	4.99	46.23	-76.95
	129	17	72.98	-5.14	1.02	-1.75	-49.38	50.22
		18	-72.98	5.14	-1.02	1.75	45.00	-72.32
	130	17	60.94	-4.46	0.77	0.60	-43.46	45.07
		18	-60.94	4.46	-0.77	-0.60	40.14	-64.24
	131	17	48.69	-3.77	0.62	2.22	-36.22	37.91
		18	-48.69	3.77	-0.62	-2.22	33.56	-54.13
	132	17	37.86	-3.12	0.49	2.74	-28.99	30.61
		18	-37.86	3.12	-0.49	-2.74	26.88	-44.00
	133	17	27.65	-2.39	0.38	2.90	-22.01	23.03
		18	-27.65	2.39	-0.38	-2.90	20.36	-33.32
21	3	21	88.73	-7.70	-0.01	-1.82	-16.79	-35.21
		22	-88.73	7.70	0.01	1.82	16.85	3.02
	4	21	95.56	-8.60	0.01	-1.80	-20.32	-33.90
		22	-95.56	8.60	-0.01	1.80	20.30	-2.03
	5	21	105.57	-9.98	0.17	-0.22	-28.11	-34.97
		22	-105.57	9.98	-0.17	0.22	27.40	-6.74
	6	21	114.31	-11.40	0.28	3.01	-35.06	-42.85
		22	-114.31	11.40	-0.28	-3.01	33.89	-4.80
	7	21	118.82	-12.89	-0.35	7.39	-26.35	-66.35
		22	-118.82	12.89	0.35	-7.39	27.79	12.47
	8	21	117.73	-15.35	-2.08	8.19	16.42	-131.34
		22	-117.73	15.35	2.08	-8.19	-7.74	67.21
	9	21	118.61	-5.26	2.08	-8.24	-16.91	-46.92
		22	-118.61	5.26	-2.08	8.24	8.23	24.94
	10	21	119.26	-7.87	0.35	-12.33	-30.41	-24.27
		22	-119.26	7.87	-0.35	12.33	28.96	-8.60
	11	21	114.55	-8.55	-0.28	-8.62	-29.36	-19.01
		22	-114.55	8.55	0.28	8.62	30.53	-16.73
	12	21	105.70	-8.44	-0.17	-4.40	-24.90	-22.07
		22	-105.70	8.44	0.17	4.40	25.61	-13.20

MEMBER END FORCES STRUCTURE TYPE = SPACE

ALL UNITS ARE -- KIP FEET (LOCAL)

MEMBER	LOAD	JT	AXIAL	SHEAR-Y	SHEAR-Z	TORSION	MOM-Y	MOM-Z
	13	21	95.60	-8.07	-0.01	-1.73	-20.22	-29.49
		22	-95.60	8.07	0.01	1.73	20.24	-4.24
	14	21	12.97	-1.62	0.13	0.55	-8.74	4.73
		22	-12.97	1.62	-0.13	-0.55	8.20	-11.50
	15	21	23.32	-2.97	0.28	1.91	-16.47	5.47
		22	-23.32	2.97	-0.28	-1.91	15.30	-17.89
	16	21	35.06	-4.53	0.50	4.33	-26.31	4.75
		22	-35.06	4.53	-0.50	-4.33	24.22	-23.67
	17	21	47.44	-6.27	0.74	7.87	-37.03	1.29
		22	-47.44	6.27	-0.74	-7.87	33.95	-27.48
	18	21	59.56	-8.05	0.90	12.81	-46.58	-5.38
		22	-59.56	8.05	-0.90	-12.81	42.84	-28.24
	19	21	69.62	-9.85	0.74	18.39	-49.59	-18.82
		22	-69.62	9.85	-0.74	-18.39	46.48	-22.35
	20	21	77.77	-11.96	0.00	25.08	-40.13	-44.12
		22	-77.77	11.96	0.00	-25.08	40.13	-5.88
	21	21	82.51	-14.42	-1.29	30.67	-15.60	-86.04
		22	-82.51	14.42	1.29	-30.67	21.01	25.76
	22	21	84.92	-16.77	-2.94	33.91	25.49	-141.68
		22	-84.92	16.77	2.94	-33.91	-13.20	71.61
	23	21	84.53	-17.10	-3.71	31.27	63.61	-186.64
		22	-84.53	17.10	3.71	-31.27	-48.12	115.19
	24	21	83.64	-13.50	-2.58	20.25	81.72	-191.08
		22	-83.64	13.50	2.58	-20.25	-70.94	134.66
	25	21	83.39	-6.63	0.15	2.96	68.96	-144.39
		22	-83.39	6.63	-0.15	-2.96	-69.59	116.70
	26	21	84.62	0.49	3.11	-16.02	30.70	-65.13
		22	-84.62	-0.49	-3.11	16.02	-43.68	67.18
	27	21	85.88	3.96	4.29	-30.84	-8.47	3.43
		22	-85.88	-3.96	-4.29	30.84	-9.47	13.13
	28	21	85.88	2.21	2.86	-35.87	-28.02	32.23
		22	-85.88	-2.21	-2.86	35.87	16.06	-22.99
	29	21	81.59	-0.97	0.59	-34.41	-35.60	40.23
		22	-81.59	0.97	-0.59	34.41	33.12	-44.27
	30	21	75.11	-2.58	-0.61	-29.62	-35.67	42.79
		22	-75.11	2.58	0.61	29.62	38.22	-53.56
	31	21	65.65	-2.56	-0.97	-22.80	-31.69	43.45
		22	-65.65	2.56	0.97	22.80	35.73	-54.16
	32	21	54.58	-2.21	-0.90	-16.39	-26.22	40.35
		22	-54.58	2.21	0.90	16.39	29.98	-49.58
	33	21	42.16	-1.84	-0.66	-10.61	-20.11	33.81
		22	-42.16	1.84	0.66	10.61	22.86	-41.49
	34	21	2.27	-0.29	0.00	-0.23	-1.33	2.03
		22	-2.27	0.29	0.00	0.23	1.31	-3.23
	35	21	7.74	-0.97	0.04	-0.08	-4.54	3.39
		22	-7.74	0.97	-0.04	0.08	4.37	-7.45
	36	21	14.67	-1.83	0.14	0.64	-9.57	4.62
		22	-14.67	1.83	-0.14	-0.64	9.00	-12.26

MEMBER END FORCES STRUCTURE TYPE = SPACE

ALL UNITS ARE -- KIP FEET (LOCAL)

MEMBER	LOAD	JT	AXIAL	SHEAR-Y	SHEAR-Z	TORSION	MOM-Y	MOM-Z
	37	21	23.42	-2.95	0.32	2.34	-17.20	4.98
		22	-23.42	2.95	-0.32	-2.34	15.85	-17.31
	38	21	32.45	-4.23	0.53	4.75	-25.61	2.69
		22	-32.45	4.23	-0.53	-4.75	23.38	-20.37
	39	21	40.78	-5.54	0.73	8.04	-33.74	-2.77
		22	-40.78	5.54	-0.73	-8.04	30.70	-20.40
	40	21	47.87	-6.63	0.79	12.02	-39.28	-9.13
		22	-47.87	6.63	-0.79	-12.02	35.97	-18.57
	41	21	53.35	-7.33	0.52	16.66	-38.15	-15.35
		22	-53.35	7.33	-0.52	-16.66	35.97	-15.27
	42	21	56.98	-8.73	-0.38	21.77	-23.75	-37.57
		22	-56.98	8.73	0.38	-21.77	25.34	1.10
	43	21	57.87	-12.43	-2.41	25.94	15.98	-100.60
		22	-57.87	12.43	2.41	-25.94	-5.89	48.67
	44	21	56.95	-15.85	-4.66	27.20	69.73	-173.52
		22	-56.95	15.85	4.66	-27.20	-50.28	107.27
	45	21	53.95	-12.24	-3.53	18.90	83.26	-172.71
		22	-53.95	12.24	3.53	-18.90	-68.49	121.55
	46	21	53.86	-1.71	1.42	-0.38	47.23	-89.92
		22	-53.86	1.71	-1.42	0.38	-53.17	82.78
	47	21	57.41	5.53	4.76	-17.01	7.76	-11.35
		22	-57.41	-5.53	-4.76	17.01	-27.64	34.43
	48	21	59.35	4.26	3.64	-24.74	-13.86	18.29
		22	-59.35	-4.26	-3.64	24.74	-1.34	-0.47
	49	21	58.55	0.01	1.16	-26.74	-24.09	23.56
		22	-58.55	-0.01	-1.16	26.74	19.26	-23.49
	50	21	55.88	-1.92	-0.20	-24.35	-26.47	27.07
		22	-55.88	1.92	0.20	24.35	27.32	-35.08
	51	21	51.03	-1.88	-0.72	-19.68	-24.81	30.93
		22	-51.03	1.88	0.72	19.68	27.84	-38.81
	52	21	44.70	-1.66	-0.79	-14.97	-21.61	31.35
		22	-44.70	1.66	0.79	14.97	24.89	-38.30
	53	21	36.71	-1.53	-0.63	-10.24	-17.51	28.25
		22	-36.71	1.53	0.63	10.24	20.13	-34.62
	54	21	2.07	-0.26	0.01	-0.11	-1.26	1.46
		22	-2.07	0.26	-0.01	0.11	1.22	-2.53
	55	21	5.70	-0.72	0.04	0.07	-3.51	2.23
		22	-5.70	0.72	-0.04	-0.07	3.35	-5.22
	56	21	10.23	-1.28	0.11	0.65	-6.97	2.87
		22	-10.23	1.28	-0.11	-0.65	6.51	-8.22
	57	21	15.61	-1.99	0.22	1.75	-11.66	2.66
		22	-15.61	1.99	-0.22	-1.75	10.72	-10.99
	58	21	21.18	-2.79	0.36	3.40	-16.92	0.93
		22	-21.18	2.79	-0.36	-3.40	15.44	-12.59
	59	21	26.18	-3.57	0.45	5.49	-21.48	-2.44
		22	-26.18	3.57	-0.45	-5.49	19.59	-12.46
	60	21	30.46	-4.20	0.44	8.10	-24.01	-6.34
		22	-30.46	4.20	-0.44	-8.10	22.16	-11.20

MEMBER END FORCES STRUCTURE TYPE = SPACE

ALL UNITS ARE -- KIP FEET (LOCAL)

MEMBER	LOAD	JT	AXIAL	SHEAR-Y	SHEAR-Z	TORSION	MOM-Y	MOM-Z
	61	21	33.61	-4.81	0.18	10.97	-21.34	-13.46
		22	-33.61	4.81	-0.18	-10.97	20.57	-6.63
	62	21	35.57	-6.03	-0.55	14.02	-8.58	-33.35
		22	-35.57	6.03	0.55	-14.02	10.87	8.13
	63	21	35.96	-8.02	-1.71	16.10	15.88	-70.07
		22	-35.96	8.02	1.71	-16.10	-8.72	36.57
	64	21	35.14	-8.96	-2.51	15.38	41.64	-102.44
		22	-35.14	8.96	2.51	-15.38	-31.13	64.98
	65	21	33.97	-6.24	-1.51	9.21	45.95	-95.43
		22	-33.97	6.24	1.51	-9.21	-39.63	69.36
	66	21	34.26	-0.68	1.04	-1.58	26.02	-49.67
		22	-34.26	0.68	-1.04	1.58	-30.36	46.83
	67	21	35.84	2.88	2.63	-11.10	3.21	-6.25
		22	-35.84	-2.88	-2.63	11.10	-14.18	18.29
	68	21	36.91	2.16	2.00	-15.41	-9.22	11.20
		22	-36.91	-2.16	-2.00	15.41	0.87	-2.18
	69	21	36.15	-0.02	0.64	-16.21	-14.97	15.29
		22	-36.15	0.02	-0.64	16.21	12.29	-15.37
	70	21	34.29	-1.13	-0.15	-14.63	-16.20	17.28
		22	-34.29	1.13	0.15	14.63	16.81	-21.99
	71	21	31.10	-1.17	-0.44	-11.78	-15.09	19.13
		22	-31.10	1.17	0.44	11.78	16.93	-24.01
	72	21	26.97	-1.03	-0.46	-8.84	-13.01	19.08
		22	-26.97	1.03	0.46	8.84	14.96	-23.36
	73	21	21.93	-0.92	-0.37	-6.04	-10.46	16.97
		22	-21.93	0.92	0.37	6.04	12.01	-20.82
	74	21	4.50	-0.56	0.02	-0.11	-2.73	2.50
		22	-4.50	0.56	-0.02	0.11	2.63	-4.85
	75	21	10.41	-1.30	0.09	0.32	-6.68	3.68
		22	-10.41	1.30	-0.09	-0.32	6.31	-9.13
	76	21	17.63	-2.22	0.21	1.38	-12.36	4.32
		22	-17.63	2.22	-0.21	-1.38	11.48	-13.61
	77	21	25.98	-3.35	0.39	3.29	-19.83	3.46
		22	-25.98	3.35	-0.39	-3.29	18.19	-17.45
	78	21	34.31	-4.56	0.58	5.96	-27.60	0.24
		22	-34.31	4.56	-0.58	-5.96	25.18	-19.31
	79	21	41.72	-5.69	0.69	9.34	-33.91	-5.03
		22	-41.72	5.69	-0.69	-9.34	31.02	-18.75
	80	21	47.90	-6.67	0.59	13.47	-35.92	-12.41
		22	-47.90	6.67	-0.59	-13.47	33.46	-15.47
	81	21	52.23	-7.83	0.03	17.90	-28.33	-27.98
		22	-52.23	7.83	-0.03	-17.90	28.21	-4.73
	82	21	54.78	-9.96	-1.27	22.34	-4.17	-64.13
		22	-54.78	9.96	1.27	-22.34	9.49	22.51
	83	21	54.78	-12.62	-2.91	24.47	33.31	-118.81
		22	-54.78	12.62	2.91	-24.47	-21.15	66.08
	84	21	53.64	-12.78	-3.49	21.28	65.81	-155.15
		22	-53.64	12.78	3.49	-21.28	-51.25	101.74

MEMBER END FORCES STRUCTURE TYPE = SPACE

ALL UNITS ARE -- KIP FEET (LOCAL)

MEMBER	LOAD	JT	AXIAL	SHEAR-Y	SHEAR-Z	TORSION	MOM-Y	MOM-Z
	85	21	52.14	-7.66	-1.46	10.39	64.04	-131.01
		22	-52.14	7.66	1.46	-10.39	-57.94	99.01
	86	21	52.95	0.22	2.15	-5.94	31.66	-60.63
		22	-52.95	-0.22	-2.15	5.94	-40.64	61.56
	87	21	55.43	4.31	3.88	-18.72	0.12	-2.34
		22	-55.43	-4.31	-3.88	18.72	-16.32	20.34
	88	21	56.38	2.62	2.62	-24.00	-16.41	19.27
		22	-56.38	-2.62	-2.62	24.00	5.46	-8.33
	89	21	54.77	-0.49	0.67	-24.35	-23.52	24.12
		22	-54.77	0.49	-0.67	24.35	20.73	-26.18
	90	21	51.47	-1.79	-0.35	-21.47	-24.52	27.13
		22	-51.47	1.79	0.35	21.47	25.97	-34.61
	91	21	46.17	-1.73	-0.69	-16.95	-22.38	29.39
		22	-46.17	1.73	0.69	16.95	25.26	-36.62
	92	21	39.55	-1.54	-0.68	-12.55	-19.05	28.53
		22	-39.55	1.54	0.68	12.55	21.90	-34.95
	93	21	31.58	-1.36	-0.52	-8.34	-15.04	24.81
		22	-31.58	1.36	0.52	8.34	17.21	-30.47
	94	21	7.14	-0.90	0.05	0.01	-4.45	3.28
		22	-7.14	0.90	-0.05	-0.01	4.24	-7.02
	95	21	14.48	-1.82	0.14	0.72	-9.63	4.52
		22	-14.48	1.82	-0.14	-0.72	9.04	-12.11
	96	21	23.25	-2.96	0.30	2.19	-16.77	4.74
		22	-23.25	2.96	-0.30	-2.19	15.50	-17.10
	97	21	33.10	-4.31	0.52	4.72	-25.74	3.06
		22	-33.10	4.31	-0.52	-4.72	23.56	-21.06
	98	21	42.55	-5.70	0.71	8.03	-34.31	-1.36
		22	-42.55	5.70	-0.71	-8.03	31.33	-22.47
	99	21	50.91	-6.97	0.78	12.29	-40.43	-7.95
		22	-50.91	6.97	-0.78	-12.29	37.18	-21.17
	100	21	57.55	-8.20	0.52	17.17	-39.74	-19.61
		22	-57.55	8.20	-0.52	-17.17	37.59	-14.67
	101	21	62.11	-9.94	-0.42	22.43	-24.93	-45.31
		22	-62.11	9.94	0.42	-22.43	26.67	3.76
	102	21	64.31	-12.49	-1.99	26.85	6.63	-91.94
		22	-64.31	12.49	1.99	-26.85	1.69	39.76
	103	21	63.88	-14.66	-3.49	27.52	47.82	-148.55
		22	-63.88	14.66	3.49	-27.52	-33.23	87.28
	104	21	62.58	-13.40	-3.45	21.53	76.55	-174.41
		22	-62.58	13.40	3.45	-21.53	-62.15	118.42
	105	21	61.56	-6.74	-0.70	7.45	66.00	-133.49
		22	-61.56	6.74	0.70	-7.45	-63.07	105.32
	106	21	62.79	1.47	3.03	-10.95	27.32	-53.33
		22	-62.79	-1.47	-3.03	10.95	-39.98	59.47
	107	21	65.41	4.58	4.20	-23.61	-4.93	4.07
		22	-65.41	-4.58	-4.20	23.61	-12.64	15.07
	108	21	65.63	2.17	2.48	-28.23	-21.46	24.33
		22	-65.63	-2.17	-2.48	28.23	11.10	-15.25

MEMBER END FORCES STRUCTURE TYPE = SPACE

ALL UNITS ARE -- KIP FEET (LOCAL)

MEMBER	LOAD	JT	AXIAL	SHEAR-Y	SHEAR-Z	TORSION	MOM-Y	MOM-Z
	109	21	63.28	-0.99	0.47	-27.71	-27.93	29.22
		22	-63.28	0.99	-0.47	27.71	25.96	-33.34
	110	21	58.75	-2.10	-0.51	-23.80	-28.12	32.48
		22	-58.75	2.10	0.51	23.80	30.27	-41.26
	111	21	52.14	-1.97	-0.81	-18.54	-25.24	34.22
		22	-52.14	1.97	0.81	18.54	28.61	-42.46
	112	21	43.95	-1.74	-0.75	-13.45	-21.12	32.34
		22	-43.95	1.74	0.75	13.45	24.27	-39.62
	113	21	34.47	-1.51	-0.55	-8.74	-16.40	27.48
		22	-34.47	1.51	0.55	8.74	18.70	-33.79
	114	21	41.32	-5.58	0.66	8.24	-33.00	-2.07
		22	-41.32	5.58	-0.66	-8.24	30.25	-21.25
	115	21	51.79	-7.11	0.64	12.37	-38.48	-8.17
		22	-51.79	7.11	-0.64	-12.37	35.82	-21.55
	116	21	61.42	-8.90	0.26	17.09	-36.82	-21.76
		22	-61.42	8.90	-0.26	-17.09	35.71	-15.42
	117	21	70.75	-11.52	-0.72	22.81	-22.18	-51.56
		22	-70.75	11.52	0.72	-22.81	25.20	3.42
	118	21	77.78	-14.63	-1.97	27.08	3.14	-98.83
		22	-77.78	14.63	1.97	-27.08	5.07	37.70
	119	21	82.92	-16.41	-2.67	27.51	31.15	-144.38
		22	-82.92	16.41	2.67	-27.51	-20.01	75.80
	120	21	86.67	-14.09	-1.62	22.20	38.60	-147.34
		22	-86.67	14.09	1.62	-22.20	-31.84	88.46
	121	21	90.38	-7.55	1.29	10.89	15.48	-94.41
		22	-90.38	7.55	-1.29	-10.89	-20.86	62.84
	122	21	94.87	-2.81	3.23	-0.10	-8.69	-43.73
		22	-94.87	2.81	-3.23	0.10	-4.82	31.98
	123	21	97.28	-5.38	1.44	-4.37	-0.97	-56.11
		22	-97.28	5.38	-1.44	4.37	-5.05	33.64
	124	21	95.49	-10.80	-2.10	-5.07	27.49	-99.44
		22	-95.49	10.80	2.10	5.07	-18.73	54.32
	125	21	90.63	-10.24	-2.61	-9.02	34.53	-96.22
		22	-90.63	10.24	2.61	9.02	-23.61	53.44
	126	21	85.71	-3.01	0.39	-18.44	10.44	-34.99
		22	-85.71	3.01	-0.39	18.44	-12.07	22.41
	127	21	82.00	2.34	2.67	-25.79	-14.46	20.81
		22	-82.00	-2.34	-2.67	25.79	3.29	-11.05
	128	21	75.75	1.62	2.01	-26.99	-25.94	38.82
		22	-75.75	-1.62	-2.01	26.99	17.54	-32.03
	129	21	66.91	-1.16	0.44	-24.78	-29.13	37.65
		22	-66.91	1.16	-0.44	24.78	27.30	-42.50
	130	21	56.81	-2.21	-0.35	-20.35	-26.94	34.47
		22	-56.81	2.21	0.35	20.35	28.41	-43.69
	131	21	45.98	-1.83	-0.59	-15.14	-22.33	31.62
		22	-45.98	1.83	0.59	15.14	24.80	-39.25
	132	21	36.34	-1.41	-0.58	-10.94	-17.62	27.40
		22	-36.34	1.41	0.58	10.94	20.03	-33.27

MEMBER END FORCES STRUCTURE TYPE = SPACE

ALL UNITS ARE -- KIP FEET (LOCAL)

MEMBER	LOAD	JT	AXIAL	SHEAR-Y	SHEAR-Z	TORSION	MOM-Y	MOM-Z
	133	21	26.90	-1.13	-0.45	-7.19	-12.98	21.77
		22	-26.90	1.13	0.45	7.19	14.85	-26.50
38	3	38	137.21	-2.97	2.82	-7.37	-19.42	34.71
		39	-137.21	2.97	-2.82	7.37	2.26	-52.80
	4	38	144.87	-2.31	3.03	-8.78	-19.87	42.26
		39	-144.87	2.31	-3.03	8.78	1.45	-56.35
	5	38	156.79	-1.47	3.35	-10.77	-20.65	54.30
		39	-156.79	1.47	-3.35	10.77	0.28	-63.23
	6	38	169.67	-0.92	3.68	-11.89	-22.25	67.93
		39	-169.67	0.92	-3.68	11.89	-0.16	-73.56
	7	38	180.65	-1.02	3.94	-11.52	-24.69	79.45
		39	-180.65	1.02	-3.94	11.52	0.71	-85.64
	8	38	188.11	-1.88	4.04	-9.03	-27.39	85.54
		39	-188.11	1.88	-4.04	9.03	2.81	-96.96
	9	38	190.66	-3.46	3.89	-4.89	-29.39	82.52
		39	-190.66	3.46	-3.89	4.89	5.75	-103.57
	10	38	187.49	-5.50	3.49	-2.97	-29.56	67.53
		39	-187.49	5.50	-3.49	2.97	8.34	-101.03
	11	38	179.37	-7.98	2.99	-6.69	-26.82	31.83
		39	-179.37	7.98	-2.99	6.69	8.59	-80.37
	12	38	167.61	-10.53	2.79	-11.94	-23.38	-46.61
		39	-167.61	10.53	-2.79	11.94	6.37	-17.47
	13	38	144.91	-2.39	3.54	-6.37	-26.16	-17.53
		39	-144.91	2.39	-3.54	6.37	4.64	2.97
	14	38	14.65	1.22	0.55	-4.66	2.45	13.41
		39	-14.65	-1.22	-0.55	4.66	-5.77	-5.99
	15	38	26.42	2.13	0.86	-6.90	1.68	25.06
		39	-26.42	-2.13	-0.86	6.90	-6.90	-12.10
	16	38	40.14	3.09	1.22	-9.30	0.66	38.79
		39	-40.14	-3.09	-1.22	9.30	-8.08	-19.98
	17	38	55.67	4.03	1.62	-11.57	-0.69	54.58
		39	-55.67	-4.03	-1.62	11.57	-9.17	-30.04
	18	38	72.10	4.84	2.03	-13.34	-2.47	71.50
		39	-72.10	-4.84	-2.03	13.34	-9.89	-42.06
	19	38	88.09	5.35	2.42	-14.20	-4.71	88.16
		39	-88.09	-5.35	-2.42	14.20	-10.01	-55.57
	20	38	103.33	5.54	2.76	-13.90	-7.40	104.04
		39	-103.33	-5.54	-2.76	13.90	-9.38	-70.30
	21	38	116.99	5.33	3.02	-12.47	-10.37	117.85
		39	-116.99	-5.33	-3.02	12.47	-8.03	-85.41
	22	38	128.98	4.71	3.19	-9.49	-13.50	129.18
		39	-128.98	-4.71	-3.19	9.49	-5.90	-100.53
	23	38	138.61	3.65	3.23	-5.30	-16.47	136.71
		39	-138.61	-3.65	-3.23	5.30	-3.18	-114.49
	24	38	145.71	2.17	3.11	0.22	-19.03	139.81
		39	-145.71	-2.17	-3.11	-0.22	0.07	-126.57

MEMBER END FORCES STRUCTURE TYPE = SPACE

ALL UNITS ARE -- KIP FEET (LOCAL)

MEMBER	LOAD	JT	AXIAL	SHEAR-Y	SHEAR-Z	TORSION	MOM-Y	MOM-Z
	25	38	149.91	0.32	2.84	6.18	-20.86	137.56
		39	-149.91	-0.32	-2.84	-6.18	3.58	-135.62
	26	38	150.90	-1.86	2.41	11.47	-21.65	129.27
		39	-150.90	1.86	-2.41	-11.47	7.01	-140.58
	27	38	148.75	-4.29	1.81	15.14	-20.92	114.23
		39	-148.75	4.29	-1.81	-15.14	9.89	-140.37
	28	38	143.39	-7.01	1.15	15.51	-18.72	89.54
		39	-143.39	7.01	-1.15	-15.51	11.74	-132.21
	29	38	135.23	-10.16	0.41	12.22	-14.33	50.06
		39	-135.23	10.16	-0.41	-12.22	11.85	-111.91
	30	38	124.56	-13.55	-0.21	6.28	-9.23	-7.65
		39	-124.56	13.55	0.21	-6.28	10.52	-74.81
	31	38	110.90	-16.51	-0.60	-1.33	-3.44	-81.74
		39	-110.90	16.51	0.60	1.33	7.10	-18.73
	32	38	93.56	-17.31	-0.60	-6.60	0.33	-151.42
		39	-93.56	17.31	0.60	6.60	3.29	46.04
	33	38	71.58	-14.40	-0.07	-7.77	1.03	-192.30
		39	-71.58	14.40	0.07	7.77	-0.60	104.64
	34	38	2.78	0.24	0.18	-1.70	2.08	2.06
		39	-2.78	-0.24	-0.18	1.70	-3.15	-0.59
	35	38	8.73	0.76	0.34	-2.91	1.70	7.87
		39	-8.73	-0.76	-0.34	2.91	-3.74	-3.25
	36	38	16.31	1.37	0.54	-4.45	1.23	15.34
		39	-16.31	-1.37	-0.54	4.45	-4.52	-6.98
	37	38	26.24	2.11	0.80	-6.38	0.62	25.19
		39	-26.24	-2.11	-0.80	6.38	-5.50	-12.37
	38	38	37.29	2.81	1.09	-8.16	-0.25	36.37
		39	-37.29	-2.81	-1.09	8.16	-6.39	-19.25
	39	38	48.55	3.38	1.37	-9.38	-1.43	48.07
		39	-48.55	-3.38	-1.37	9.38	-6.94	-27.48
	40	38	59.53	3.76	1.64	-10.00	-2.95	59.64
		39	-59.53	-3.76	-1.64	10.00	-7.06	-36.76
	41	38	69.81	3.89	1.88	-9.91	-4.81	70.52
		39	-69.81	-3.89	-1.88	9.91	-6.64	-46.83
	42	38	79.20	3.77	2.07	-8.99	-6.93	80.26
		39	-79.20	-3.77	-2.07	8.99	-5.67	-57.34
	43	38	87.25	3.34	2.19	-7.10	-9.13	88.06
		39	-87.25	-3.34	-2.19	7.10	-4.23	-67.74
	44	38	93.94	2.63	2.23	-4.01	-11.27	93.65
		39	-93.94	-2.63	-2.23	4.01	-2.31	-77.67
	45	38	98.65	1.62	2.16	-0.20	-13.11	95.95
		39	-98.65	-1.62	-2.16	0.20	-0.06	-86.10
	46	38	101.56	0.34	1.97	4.68	-14.46	94.84
		39	-101.56	-0.34	-1.97	-4.68	2.49	-92.75
	47	38	102.31	-1.17	1.67	8.93	-15.21	89.28
		39	-102.31	1.17	-1.67	-8.93	5.03	-96.38
	48	38	100.73	-2.86	1.25	11.81	-14.87	78.99
		39	-100.73	2.86	-1.25	-11.81	7.25	-96.40

MEMBER END FORCES STRUCTURE TYPE = SPACE

ALL UNITS ARE -- KIP FEET (LOCAL)

MEMBER	LOAD	JT	AXIAL	SHEAR-Y	SHEAR-Z	TORSION	MOM-Y	MOM-Z
	49	38	96.93	-4.58	0.76	12.63	-13.43	65.22
		39	-96.93	4.58	-0.76	-12.63	8.79	-93.10
	50	38	90.88	-6.29	0.24	9.96	-10.40	47.21
		39	-90.88	6.29	-0.24	-9.96	8.94	-85.49
	51	38	83.54	-8.66	-0.28	4.60	-6.04	11.69
		39	-83.54	8.66	0.28	-4.60	7.73	-64.38
	52	38	76.08	-12.46	-0.66	-2.28	-1.31	-58.01
		39	-76.08	12.46	0.66	2.28	5.35	-17.85
	53	38	66.22	-15.29	-0.77	-8.69	2.98	-135.86
		39	-66.22	15.29	0.77	8.69	1.72	42.81
	54	38	2.42	0.21	0.13	-1.21	1.26	1.96
		39	-2.42	-0.21	-0.13	1.21	-2.04	-0.68
	55	38	6.42	0.55	0.24	-2.02	1.01	5.88
		39	-6.42	-0.55	-0.24	2.02	-2.44	-2.53
	56	38	11.42	0.95	0.37	-3.01	0.69	10.81
		39	-11.42	-0.95	-0.37	3.01	-2.94	-5.05
	57	38	17.66	1.39	0.53	-4.16	0.27	17.03
		39	-17.66	-1.39	-0.53	4.16	-3.53	-8.58
	58	38	24.57	1.81	0.71	-5.20	-0.30	24.06
		39	-24.57	-1.81	-0.71	5.20	-4.03	-13.02
	59	38	31.54	2.14	0.89	-5.90	-1.08	31.30
		39	-31.54	-2.14	-0.89	5.90	-4.32	-18.26
	60	38	38.32	2.35	1.05	-6.20	-2.07	38.45
		39	-38.32	-2.35	-1.05	6.20	-4.33	-24.14
	61	38	44.61	2.40	1.19	-6.05	-3.25	45.08
		39	-44.61	-2.40	-1.19	6.05	-4.01	-30.45
	62	38	50.32	2.29	1.30	-5.35	-4.58	50.92
		39	-50.32	-2.29	-1.30	5.35	-3.36	-36.98
	63	38	55.19	1.99	1.37	-4.04	-5.94	55.52
		39	-55.19	-1.99	-1.37	4.04	-2.41	-43.40
	64	38	59.11	1.51	1.38	-2.05	-7.22	58.58
		39	-59.11	-1.51	-1.38	2.05	-1.18	-49.38
	65	38	61.89	0.86	1.32	0.47	-8.31	59.65
		39	-61.89	-0.86	-1.32	-0.47	0.26	-54.45
	66	38	63.42	0.03	1.19	3.31	-9.09	58.38
		39	-63.42	-0.03	-1.19	-3.31	1.83	-58.17
	67	38	63.65	-0.93	0.99	5.84	-9.39	54.42
		39	-63.65	0.93	-0.99	-5.84	3.37	-60.05
	68	38	62.41	-1.98	0.73	7.33	-9.08	47.66
		39	-62.41	1.98	-0.73	-7.33	4.66	-59.70
	69	38	59.78	-3.05	0.41	7.37	-7.93	38.49
		39	-59.78	3.05	-0.41	-7.37	5.41	-57.08
	70	38	55.94	-4.25	0.10	5.52	-5.98	24.23
		39	-55.94	4.25	-0.10	-5.52	5.39	-50.09
	71	38	51.40	-5.94	-0.21	2.00	-3.21	-2.74
		39	-51.40	5.94	0.21	-2.00	4.48	-33.39
	72	38	46.24	-7.96	-0.41	-2.00	-0.43	-44.27
		39	-46.24	7.96	0.41	2.00	2.91	-4.16

MEMBER END FORCES STRUCTURE TYPE = SPACE

ALL UNITS ARE -- KIP FEET (LOCAL)

MEMBER	LOAD	JT	AXIAL	SHEAR-Y	SHEAR-Z	TORSION	MOM-Y	MOM-Z
	73	38	39.07	-8.77	-0.38	-4.90	1.56	-83.98
		39	-39.07	8.77	0.38	4.90	0.78	30.59
	74	38	5.19	0.45	0.24	-2.15	1.83	4.45
		39	-5.19	-0.45	-0.24	2.15	-3.27	-1.73
	75	38	11.68	0.99	0.41	-3.46	1.43	10.82
		39	-11.68	-0.99	-0.41	3.46	-3.93	-4.80
	76	38	19.76	1.61	0.63	-5.04	0.91	18.82
		39	-19.76	-1.61	-0.63	5.04	-4.72	-9.02
	77	38	29.60	2.29	0.88	-6.76	0.21	28.68
		39	-29.60	-2.29	-0.88	6.76	-5.59	-14.76
	78	38	40.23	2.90	1.16	-8.24	-0.75	39.54
		39	-40.23	-2.90	-1.16	8.24	-6.30	-21.87
	79	38	50.84	3.36	1.42	-9.17	-2.01	50.62
		39	-50.84	-3.36	-1.42	9.17	-6.64	-30.14
	80	38	61.08	3.63	1.67	-9.46	-3.60	61.41
		39	-61.08	-3.63	-1.67	9.46	-6.53	-39.32
	81	38	70.50	3.65	1.87	-9.04	-5.47	71.26
		39	-70.50	-3.65	-1.87	9.04	-5.92	-49.07
	82	38	78.98	3.41	2.02	-7.71	-7.52	79.81
		39	-78.98	-3.41	-2.02	7.71	-4.80	-59.08
	83	38	86.07	2.88	2.11	-5.50	-9.57	86.27
		39	-86.07	-2.88	-2.11	5.50	-3.25	-68.73
	84	38	91.71	2.08	2.10	-2.18	-11.48	90.30
		39	-91.71	-2.08	-2.10	2.18	-1.28	-77.63
	85	38	95.48	1.01	1.98	1.73	-13.04	91.04
		39	-95.48	-1.01	-1.98	-1.73	0.97	-84.87
	86	38	97.37	-0.30	1.75	6.03	-14.05	88.12
		39	-97.37	0.30	-1.75	-6.03	3.37	-89.93
	87	38	97.17	-1.80	1.42	9.52	-14.31	81.03
		39	-97.17	1.80	-1.42	-9.52	5.64	-92.00
	88	38	94.75	-3.42	1.00	11.27	-13.52	69.89
		39	-94.75	3.42	-1.00	-11.27	7.42	-90.70
	89	38	90.29	-5.12	0.52	10.69	-11.47	53.77
		39	-90.29	5.12	-0.52	-10.69	8.31	-84.97
	90	38	84.16	-7.14	0.04	7.25	-8.21	27.25
		39	-84.16	7.14	-0.04	-7.25	7.98	-70.72
	91	38	76.91	-9.82	-0.40	1.58	-3.86	-18.91
		39	-76.91	9.82	0.40	-1.58	6.28	-40.87
	92	38	68.29	-12.49	-0.62	-4.10	0.06	-81.96
		39	-68.29	12.49	0.62	4.10	3.74	5.94
	93	38	56.05	-12.68	-0.46	-7.38	2.36	-134.10
		39	-56.05	12.68	0.46	7.38	0.43	56.94
	94	38	8.14	0.70	0.33	-2.93	2.03	7.24
		39	-8.14	-0.70	-0.33	2.93	-4.05	-3.00
	95	38	16.23	1.35	0.55	-4.55	1.51	15.19
		39	-16.23	-1.35	-0.55	4.55	-4.86	-6.95
	96	38	26.23	2.10	0.81	-6.44	0.85	25.14
		39	-26.23	-2.10	-0.81	6.44	-5.81	-12.37

MEMBER END FORCES STRUCTURE TYPE = SPACE

ALL UNITS ARE -- KIP FEET (LOCAL)

MEMBER	LOAD	JT	AXIAL	SHEAR-Y	SHEAR-Z	TORSION	MOM-Y	MOM-Z
	97	38	38.05	2.88	1.12	-8.40	-0.05	37.05
		39	-38.05	-2.88	-1.12	8.40	-6.78	-19.54
	98	38	50.50	3.55	1.44	-9.96	-1.27	49.84
		39	-50.50	-3.55	-1.44	9.96	-7.50	-28.23
	99	38	62.86	4.03	1.74	-10.84	-2.86	62.77
		39	-62.86	-4.03	-1.74	10.84	-7.76	-38.24
	100	38	74.61	4.26	2.02	-10.97	-4.81	75.13
		39	-74.61	-4.26	-2.02	10.97	-7.48	-49.18
	101	38	85.39	4.20	2.24	-10.18	-7.05	86.30
		39	-85.39	-4.20	-2.24	10.18	-6.60	-60.71
	102	38	94.91	3.83	2.40	-8.36	-9.46	95.68
		39	-94.91	-3.83	-2.40	8.36	-5.15	-72.34
	103	38	102.77	3.13	2.47	-5.43	-11.83	102.49
		39	-102.77	-3.13	-2.47	5.43	-3.20	-83.42
	104	38	108.83	2.11	2.42	-1.33	-13.96	106.23
		39	-108.83	-2.11	-2.42	1.33	-0.80	-93.37
	105	38	112.64	0.78	2.26	3.31	-15.63	105.91
		39	-112.64	-0.78	-2.26	-3.31	1.88	-101.15
	106	38	114.23	-0.82	1.95	8.17	-16.55	101.23
		39	-114.23	0.82	-1.95	-8.17	4.66	-106.20
	107	38	113.31	-2.61	1.54	11.70	-16.58	91.66
		39	-113.31	2.61	-1.54	-11.70	7.18	-107.58
	108	38	109.83	-4.54	1.02	12.99	-15.18	77.14
		39	-109.83	4.54	-1.02	-12.99	8.96	-104.76
	109	38	104.10	-6.65	0.46	11.50	-12.47	54.73
		39	-104.10	6.65	-0.46	-11.50	9.67	-95.20
	110	38	96.59	-9.28	-0.09	6.68	-8.24	16.76
		39	-96.59	9.28	0.09	-6.68	8.80	-73.22
	111	38	87.58	-12.33	-0.53	0.12	-3.33	-41.50
		39	-87.58	12.33	0.53	-0.12	6.58	-33.53
	112	38	76.20	-14.57	-0.67	-5.65	0.67	-111.00
		39	-76.20	14.57	0.67	5.65	3.37	22.35
	113	38	60.55	-13.55	-0.36	-8.09	2.44	-159.88
		39	-60.55	13.55	0.36	8.09	-0.28	77.39
	114	38	49.97	3.41	1.48	-10.13	-0.20	49.11
		39	-49.97	-3.41	-1.48	10.13	-8.78	-28.34
	115	38	64.56	4.10	1.84	-11.44	-1.98	64.14
		39	-64.56	-4.10	-1.84	11.44	-9.21	-39.19
	116	38	79.55	4.61	2.20	-12.31	-4.09	79.49
		39	-79.55	-4.61	-2.20	12.31	-9.30	-51.40
	117	38	95.34	4.96	2.55	-12.56	-6.54	95.41
		39	-95.34	-4.96	-2.55	12.56	-9.00	-65.19
	118	38	110.61	5.01	2.86	-11.89	-9.20	110.31
		39	-110.61	-5.01	-2.86	11.89	-8.19	-79.79
	119	38	124.61	4.69	3.07	-9.71	-11.98	123.28
		39	-124.61	-4.69	-3.07	9.71	-6.72	-94.72
	120	38	136.68	3.96	3.18	-6.40	-14.72	133.11
		39	-136.68	-3.96	-3.18	6.40	-4.63	-108.99

MEMBER END FORCES STRUCTURE TYPE = SPACE

ALL UNITS ARE -- KIP FEET (LOCAL)

MEMBER	LOAD	JT	AXIAL	SHEAR-Y	SHEAR-Z	TORSION	MOM-Y	MOM-Z
	121	38	146.30	2.81	3.15	-2.22	-17.18	138.80
		39	-146.30	-2.81	-3.15	2.22	-1.98	-121.71
	122	38	153.35	1.27	2.98	2.24	-19.14	139.83
		39	-153.35	-1.27	-2.98	-2.24	1.02	-132.11
	123	38	157.21	-0.62	2.67	5.71	-20.22	135.31
		39	-157.21	0.62	-2.67	-5.71	3.94	-139.06
	124	38	158.04	-2.83	2.22	7.98	-19.94	124.17
		39	-158.04	2.83	-2.22	-7.98	6.41	-141.37
	125	38	155.74	-5.51	1.70	8.15	-18.45	101.42
		39	-155.74	5.51	-1.70	-8.15	8.08	-134.93
	126	38	150.77	-8.87	1.11	6.38	-15.23	60.25
		39	-150.77	8.87	-1.11	-6.38	8.45	-114.26
	127	38	142.85	-12.39	0.63	3.97	-11.89	0.69
		39	-142.85	12.39	-0.63	-3.97	8.06	-76.12
	128	38	130.49	-14.49	0.40	2.07	-8.91	-62.42
		39	-130.49	14.49	-0.40	-2.07	6.47	-25.79
	129	38	112.64	-13.09	0.48	2.57	-7.73	-96.10
		39	-112.64	13.09	-0.48	-2.57	4.84	16.44
	130	38	90.35	-8.35	0.81	4.77	-8.64	-88.54
		39	-90.35	8.35	-0.81	-4.77	3.68	37.70
	131	38	69.57	-4.80	0.95	4.91	-9.41	-73.73
		39	-69.57	4.80	-0.95	-4.91	3.61	44.51
	132	38	56.46	-6.37	0.46	0.52	-6.17	-86.04
		39	-56.46	6.37	-0.46	-0.52	3.34	47.29
	133	38	45.53	-9.22	0.09	-5.14	-4.99	-114.98
		39	-45.53	9.22	-0.09	5.14	4.45	58.84
40	3	40	137.04	7.45	2.82	-7.83	14.32	39.23
		41	-137.04	-7.45	-2.82	7.83	-31.47	6.12
	4	40	144.63	8.69	3.03	-9.35	16.28	37.02
		41	-144.63	-8.69	-3.03	9.35	-34.70	15.87
	5	40	156.45	10.44	3.35	-11.49	19.25	35.99
		41	-156.45	-10.44	-3.35	11.49	-39.61	27.55
	6	40	169.25	11.96	3.68	-12.72	21.64	40.04
		41	-169.25	-11.96	-3.68	12.72	-44.05	32.74
	7	40	180.20	12.70	3.94	-12.35	22.38	50.16
		41	-180.20	-12.70	-3.94	12.35	-46.37	27.13
	8	40	187.71	12.41	4.04	-9.72	21.06	64.98
		41	-187.71	-12.41	-4.04	9.72	-45.64	10.55
	9	40	190.37	11.03	3.89	-5.34	17.52	80.62
		41	-190.37	-11.03	-3.89	5.34	-41.17	-13.51
	10	40	187.37	8.75	3.49	-3.14	12.66	91.25
		41	-187.37	-8.75	-3.49	3.14	-33.88	-38.02
	11	40	179.46	5.67	2.99	-6.71	9.13	87.49
		41	-179.46	-5.67	-2.99	6.71	-27.36	-53.01
	12	40	167.93	2.23	2.79	-12.07	9.73	42.83
		41	-167.93	-2.23	-2.79	12.07	-26.74	-29.28

MEMBER END FORCES STRUCTURE TYPE = SPACE

ALL UNITS ARE -- KIP FEET (LOCAL)

MEMBER	LOAD	JT	AXIAL	SHEAR-Y	SHEAR-Z	TORSION	MOM-Y	MOM-Z
	13	40	144.68	8.62	3.54	-6.81	16.38	-21.85
		41	-144.68	-8.62	-3.54	6.81	-37.90	74.29
	14	40	14.51	2.33	0.55	-5.21	8.72	-4.80
		41	-14.51	-2.33	-0.55	5.21	-12.03	18.96
	15	40	26.18	4.13	0.86	-7.60	11.57	-6.93
		41	-26.18	-4.13	-0.86	7.60	-16.79	32.06
	16	40	39.78	6.13	1.22	-10.16	14.76	-8.08
		41	-39.78	-6.13	-1.22	10.16	-22.18	45.38
	17	40	55.21	8.25	1.62	-12.61	18.11	-7.32
		41	-55.21	-8.25	-1.62	12.61	-27.97	57.52
	18	40	71.53	10.30	2.03	-14.52	21.21	-3.99
		41	-71.53	-10.30	-2.03	14.52	-33.57	66.66
	19	40	87.43	12.03	2.42	-15.48	23.60	2.70
		41	-87.43	-12.03	-2.42	15.48	-38.32	70.50
	20	40	102.61	13.37	2.76	-15.21	25.06	12.75
		41	-102.61	-13.37	-2.76	15.21	-41.84	68.64
	21	40	116.25	14.20	3.02	-13.75	25.44	26.02
		41	-116.25	-14.20	-3.02	13.75	-43.84	60.38
	22	40	128.25	14.49	3.19	-10.64	24.54	42.16
		41	-128.25	-14.49	-3.19	10.64	-43.94	46.00
	23	40	137.93	14.16	3.23	-6.27	22.40	60.32
		41	-137.93	-14.16	-3.23	6.27	-42.05	25.87
	24	40	145.13	13.23	3.11	-0.49	18.89	79.74
		41	-145.13	-13.23	-3.11	0.49	-37.84	0.78
	25	40	149.46	11.70	2.84	5.77	14.16	99.10
		41	-149.46	-11.70	-2.84	-5.77	-31.44	-27.90
	26	40	150.61	9.60	2.41	11.42	8.51	117.07
		41	-150.61	-9.60	-2.41	-11.42	-23.15	-58.62
	27	40	148.65	7.01	1.81	15.42	2.30	132.17
		41	-148.65	-7.01	-1.81	-15.42	-13.33	-89.50
	28	40	143.50	3.89	1.15	16.10	-3.56	141.77
		41	-143.50	-3.89	-1.15	-16.10	-3.42	-118.07
	29	40	135.61	0.13	0.41	12.99	-8.42	142.50
		41	-135.61	-0.13	-0.41	-12.99	5.94	-141.68
	30	40	125.23	-4.05	-0.21	7.11	-11.30	128.44
		41	-125.23	4.05	0.21	-7.11	12.58	-153.10
	31	40	111.84	-8.04	-0.60	-0.65	-10.83	93.51
		41	-111.84	8.04	0.60	0.65	14.48	-142.43
	32	40	94.60	-10.16	-0.60	-6.20	-7.41	37.65
		41	-94.60	10.16	0.60	6.20	11.03	-99.49
	33	40	72.47	-8.93	-0.07	-7.77	-0.42	-33.59
		41	-72.47	8.93	0.07	7.77	0.85	-20.74
	34	40	2.75	0.45	0.18	-1.98	4.08	-1.52
		41	-2.75	-0.45	-0.18	1.98	-5.15	4.27
	35	40	8.64	1.42	0.34	-3.27	5.55	-3.37
		41	-8.64	-1.42	-0.34	3.27	-7.60	12.01
	36	40	16.16	2.61	0.54	-4.91	7.46	-5.13
		41	-16.16	-2.61	-0.54	4.91	-10.75	21.01

MEMBER END FORCES STRUCTURE TYPE = SPACE

ALL UNITS ARE -- KIP FEET (LOCAL)

MEMBER	LOAD	JT	AXIAL	SHEAR-Y	SHEAR-Z	TORSION	MOM-Y	MOM-Z
	37	40	26.00	4.09	0.80	-6.96	9.88	-6.49
		41	-26.00	-4.09	-0.80	6.96	-14.77	31.39
	38	40	36.97	5.64	1.09	-8.88	12.37	-6.45
		41	-36.97	-5.64	-1.09	8.88	-19.01	40.74
	39	40	48.16	7.06	1.37	-10.20	14.56	-4.28
		41	-48.16	-7.06	-1.37	10.20	-22.93	47.24
	40	40	59.08	8.27	1.64	-10.89	16.28	0.17
		41	-59.08	-8.27	-1.64	10.89	-26.28	50.15
	41	40	69.31	9.18	1.88	-10.82	17.30	7.06
		41	-69.31	-9.18	-1.88	10.82	-28.74	48.82
	42	40	78.68	9.77	2.07	-9.88	17.56	16.18
		41	-78.68	-9.77	-2.07	9.88	-30.16	43.26
	43	40	86.75	9.95	2.19	-7.91	17.02	27.31
		41	-86.75	-9.95	-2.19	7.91	-30.38	33.27
	44	40	93.47	9.75	2.23	-4.69	15.56	40.04
		41	-93.47	-9.75	-2.23	4.69	-29.14	19.30
	45	40	98.24	9.10	2.16	-0.70	13.20	53.51
		41	-98.24	-9.10	-2.16	0.70	-26.37	1.89
	46	40	101.25	8.05	1.97	4.40	9.83	67.24
		41	-101.25	-8.05	-1.97	-4.40	-21.80	-18.23
	47	40	102.11	6.60	1.67	8.90	5.83	79.87
		41	-102.11	-6.60	-1.67	-8.90	-16.02	-39.67
	48	40	100.66	4.80	1.25	12.03	1.28	90.55
		41	-100.66	-4.80	-1.25	-12.03	-8.89	-61.37
	49	40	97.00	2.79	0.76	13.09	-3.18	98.59
		41	-97.00	-2.79	-0.76	-13.09	-1.46	-81.60
	50	40	91.09	0.63	0.24	10.56	-6.69	102.76
		41	-91.09	-0.63	-0.24	-10.56	5.22	-98.93
	51	40	83.96	-2.29	-0.28	5.24	-9.06	97.75
		41	-83.96	2.29	0.28	-5.24	10.75	-111.69
	52	40	76.80	-6.65	-0.66	-1.71	-9.55	76.08
		41	-76.80	6.65	0.66	1.71	13.59	-116.57
	53	40	67.19	-10.21	-0.77	-8.35	-7.07	34.86
		41	-67.19	10.21	0.77	8.35	11.77	-97.03
	54	40	2.40	0.39	0.13	-1.39	2.72	-1.16
		41	-2.40	-0.39	-0.13	1.39	-3.50	3.56
	55	40	6.36	1.04	0.24	-2.25	3.72	-2.29
		41	-6.36	-1.04	-0.24	2.25	-5.15	8.60
	56	40	11.31	1.81	0.37	-3.31	4.95	-3.33
		41	-11.31	-1.81	-0.37	3.31	-7.20	14.34
	57	40	17.50	2.73	0.53	-4.54	6.45	-3.95
		41	-17.50	-2.73	-0.53	4.54	-9.70	20.54
	58	40	24.36	3.67	0.71	-5.66	7.96	-3.67
		41	-24.36	-3.67	-0.71	5.66	-12.29	26.03
	59	40	31.28	4.53	0.89	-6.42	9.26	-2.05
		41	-31.28	-4.53	-0.89	6.42	-14.67	29.63
	60	40	38.03	5.25	1.05	-6.75	10.24	1.01
		41	-38.03	-5.25	-1.05	6.75	-16.64	30.96

MEMBER END FORCES STRUCTURE TYPE = SPACE

ALL UNITS ARE -- KIP FEET (LOCAL)

MEMBER	LOAD	JT	AXIAL	SHEAR-Y	SHEAR-Z	TORSION	MOM-Y	MOM-Z
	61	40	44.30	5.78	1.19	-6.61	10.80	5.54
		41	-44.30	-5.78	-1.19	6.61	-18.06	29.66
	62	40	50.00	6.10	1.30	-5.89	10.87	11.46
		41	-50.00	-6.10	-1.30	5.89	-18.80	25.68
	63	40	54.88	6.18	1.37	-4.53	10.43	18.56
		41	-54.88	-6.18	-1.37	4.53	-18.77	19.03
	64	40	58.83	6.00	1.38	-2.45	9.41	26.55
		41	-58.83	-6.00	-1.38	2.45	-17.82	9.95
	65	40	61.64	5.55	1.32	0.18	7.82	34.97
		41	-61.64	-5.55	-1.32	-0.18	-15.87	-1.18
	66	40	63.24	4.85	1.19	3.16	5.68	43.33
		41	-63.24	-4.85	-1.19	-3.16	-12.94	-13.82
	67	40	63.54	3.91	0.99	5.85	3.10	51.00
		41	-63.54	-3.91	-0.99	-5.85	-9.12	-27.21
	68	40	62.38	2.77	0.73	7.50	0.33	57.32
		41	-62.38	-2.77	-0.73	-7.50	-4.76	-40.48
	69	40	59.84	1.49	0.41	7.67	-2.32	61.86
		41	-59.84	-1.49	-0.41	-7.67	-0.20	-52.76
	70	40	56.10	0.01	0.10	5.89	-4.38	63.01
		41	-56.10	-0.01	-0.10	-5.89	3.79	-62.94
	71	40	51.70	-2.02	-0.21	2.38	-5.58	57.62
		41	-51.70	2.02	0.21	-2.38	6.85	-69.90
	72	40	46.71	-4.42	-0.41	-1.68	-5.52	41.88
		41	-46.71	4.42	0.41	1.68	8.00	-68.81
	73	40	39.62	-5.78	-0.38	-4.73	-3.49	13.73
		41	-39.62	5.78	0.38	4.73	5.83	-48.90
	74	40	5.14	0.84	0.24	-2.44	4.54	-2.19
		41	-5.14	-0.84	-0.24	2.44	-5.98	7.30
	75	40	11.57	1.87	0.41	-3.84	6.15	-3.91
		41	-11.57	-1.87	-0.41	3.84	-8.65	15.30
	76	40	19.58	3.11	0.63	-5.52	8.14	-5.33
		41	-19.58	-3.11	-0.63	5.52	-11.95	24.23
	77	40	29.34	4.53	0.88	-7.37	10.44	-5.97
		41	-29.34	-4.53	-0.88	7.37	-15.82	33.52
	78	40	39.89	5.95	1.16	-8.97	12.69	-5.06
		41	-39.89	-5.95	-1.16	8.97	-19.73	41.27
	79	40	50.44	7.21	1.42	-9.97	14.57	-2.05
		41	-50.44	-7.21	-1.42	9.97	-23.22	45.96
	80	40	60.63	8.25	1.67	-10.31	15.92	3.17
		41	-60.63	-8.25	-1.67	10.31	-26.06	47.07
	81	40	70.02	8.99	1.87	-9.90	16.60	10.64
		41	-70.02	-8.99	-1.87	9.90	-27.99	44.06
	82	40	78.49	9.39	2.02	-8.53	16.51	20.16
		41	-78.49	-9.39	-2.02	8.53	-28.83	37.01
	83	40	85.61	9.41	2.11	-6.22	15.63	31.35
		41	-85.61	-9.41	-2.11	6.22	-28.46	25.90
	84	40	91.29	9.04	2.10	-2.75	13.85	43.81
		41	-91.29	-9.04	-2.10	2.75	-26.61	11.20

MEMBER END FORCES STRUCTURE TYPE = SPACE

ALL UNITS ARE -- KIP FEET (LOCAL)

MEMBER	LOAD	JT	AXIAL	SHEAR-Y	SHEAR-Z	TORSION	MOM-Y	MOM-Z
	85	40	95.12	8.26	1.98	1.34	11.23	56.68
		41	-95.12	-8.26	-1.98	-1.34	-23.30	-6.41
	86	40	97.11	7.09	1.75	5.86	7.76	69.28
		41	-97.11	-7.09	-1.75	-5.86	-18.43	-26.10
	87	40	97.03	5.58	1.42	9.59	3.75	80.54
		41	-97.03	-5.58	-1.42	-9.59	-12.42	-46.58
	88	40	94.74	3.78	1.00	11.56	-0.46	89.63
		41	-94.74	-3.78	-1.00	-11.56	-5.64	-66.60
	89	40	90.42	1.74	0.52	11.17	-4.33	95.30
		41	-90.42	-1.74	-0.52	-11.17	1.17	-84.68
	90	40	84.46	-0.73	0.04	7.83	-7.19	94.73
		41	-84.46	0.73	-0.04	-7.83	6.96	-99.19
	91	40	77.43	-3.95	-0.40	2.14	-8.55	82.84
		41	-77.43	3.95	0.40	-2.14	10.96	-106.90
	92	40	69.04	-7.27	-0.62	-3.66	-7.83	54.25
		41	-69.04	7.27	0.62	3.66	11.62	-98.49
	93	40	56.85	-8.39	-0.46	-7.22	-3.78	7.21
		41	-56.85	8.39	0.46	7.22	6.58	-58.25
	94	40	8.06	1.31	0.33	-3.31	5.84	-3.10
		41	-8.06	-1.31	-0.33	3.31	-7.86	11.08
	95	40	16.08	2.58	0.55	-5.04	7.84	-5.03
		41	-16.08	-2.58	-0.55	5.04	-11.18	20.75
	96	40	25.99	4.08	0.81	-7.05	10.26	-6.43
		41	-25.99	-4.08	-0.81	7.05	-15.22	31.28
	97	40	37.72	5.76	1.12	-9.15	12.95	-6.71
		41	-37.72	-5.76	-1.12	9.15	-19.78	41.74
	98	40	50.09	7.37	1.44	-10.84	15.47	-4.99
		41	-50.09	-7.37	-1.44	10.84	-24.24	49.87
	99	40	62.37	8.79	1.74	-11.80	17.52	-0.77
		41	-62.37	-8.79	-1.74	11.80	-28.13	54.28
	100	40	74.07	9.92	2.02	-11.97	18.90	6.05
		41	-74.07	-9.92	-2.02	11.97	-31.18	54.30
	101	40	84.82	10.67	2.24	-11.17	19.45	15.45
		41	-84.82	-10.67	-2.24	11.17	-33.10	49.51
	102	40	94.34	11.03	2.40	-9.29	19.10	27.14
		41	-94.34	-11.03	-2.40	9.29	-33.72	39.98
	103	40	102.23	10.93	2.47	-6.23	17.80	40.67
		41	-102.23	-10.93	-2.47	6.23	-32.82	25.83
	104	40	108.35	10.37	2.42	-1.94	15.44	55.42
		41	-108.35	-10.37	-2.42	1.94	-30.19	7.68
	105	40	112.26	9.33	2.26	2.92	12.12	70.41
		41	-112.26	-9.33	-2.26	-2.92	-25.86	-13.62
	106	40	113.97	7.86	1.95	8.05	7.85	84.82
		41	-113.97	-7.86	-1.95	-8.05	-19.74	-37.00
	107	40	113.18	6.00	1.54	11.85	3.12	97.34
		41	-113.18	-6.00	-1.54	-11.85	-12.51	-60.85
	108	40	109.85	3.81	1.02	13.40	-1.73	107.01
		41	-109.85	-3.81	-1.02	-13.40	-4.49	-83.80

MEMBER END FORCES STRUCTURE TYPE = SPACE

ALL UNITS ARE -- KIP FEET (LOCAL)

MEMBER	LOAD	JT	AXIAL	SHEAR-Y	SHEAR-Z	TORSION	MOM-Y	MOM-Z
	109	40	104.30	1.27	0.46	12.10	-5.97	111.61
		41	-104.30	-1.27	-0.46	-12.10	3.17	-103.86
	110	40	97.02	-1.92	-0.09	7.35	-8.83	107.34
		41	-97.02	1.92	0.09	-7.35	9.39	-119.00
	111	40	88.26	-5.64	-0.53	0.74	-9.79	88.28
		41	-88.26	5.64	0.53	-0.74	13.04	-122.63
	112	40	77.09	-8.74	-0.67	-5.22	-7.84	48.64
		41	-77.09	8.74	0.67	5.22	11.89	-101.82
	113	40	61.40	-8.92	-0.36	-8.00	-2.50	-8.95
		41	-61.40	8.92	0.36	8.00	4.67	-45.32
	114	40	49.57	7.20	1.48	-11.11	16.96	-3.93
		41	-49.57	-7.20	-1.48	11.11	-25.93	47.72
	115	40	64.07	8.99	1.84	-12.53	19.49	-0.61
		41	-64.07	-8.99	-1.84	12.53	-30.68	55.31
	116	40	78.97	10.64	2.20	-13.49	21.71	5.00
		41	-78.97	-10.64	-2.20	13.49	-35.09	59.76
	117	40	94.69	12.19	2.55	-13.80	23.53	13.03
		41	-94.69	-12.19	-2.55	13.80	-39.06	61.14
	118	40	109.91	13.40	2.86	-13.14	24.63	23.79
		41	-109.91	-13.40	-2.86	13.14	-42.02	57.75
	119	40	123.90	14.14	3.07	-10.90	24.64	37.46
		41	-123.90	-14.14	-3.07	10.90	-43.34	48.59
	120	40	135.98	14.33	3.18	-7.47	23.46	53.37
		41	-135.98	-14.33	-3.18	7.47	-42.80	33.83
	121	40	145.67	13.91	3.15	-3.10	20.95	70.89
		41	-145.67	-13.91	-3.15	3.10	-40.11	13.75
	122	40	152.81	12.91	2.98	1.63	17.25	89.03
		41	-152.81	-12.91	-2.98	-1.63	-35.36	-10.49
	123	40	156.80	11.32	2.67	5.38	12.77	106.55
		41	-156.80	-11.32	-2.67	-5.38	-29.05	-37.66
	124	40	157.79	9.18	2.22	7.93	7.73	122.10
		41	-157.79	-9.18	-2.22	-7.93	-21.25	-66.23
	125	40	155.71	6.33	1.70	8.35	2.92	132.48
		41	-155.71	-6.33	-1.70	-8.35	-13.28	-93.93
	126	40	151.01	2.60	1.11	6.74	-1.17	133.43
		41	-151.01	-2.60	-1.11	-6.74	-5.61	-117.61
	127	40	143.38	-1.51	0.63	4.42	-3.90	118.52
		41	-143.38	1.51	-0.63	-4.42	0.06	-127.72
	128	40	131.21	-4.54	0.40	2.46	-3.87	83.80
		41	-131.21	4.54	-0.40	-2.46	1.44	-111.46
	129	40	113.31	-4.50	0.48	2.82	-1.73	37.15
		41	-113.31	4.50	-0.48	-2.82	-1.16	-64.53
	130	40	90.72	-1.47	0.81	4.84	1.64	-7.76
		41	-90.72	1.47	-0.81	-4.84	-6.60	-1.18
	131	40	69.73	0.50	0.95	4.95	2.56	-31.38
		41	-69.73	-0.50	-0.95	-4.95	-8.36	34.40
	132	40	56.78	-2.06	0.46	0.67	-0.47	-21.60
		41	-56.78	2.06	-0.46	-0.67	-2.36	9.05

MEMBER END FORCES STRUCTURE TYPE = SPACE

ALL UNITS ARE -- KIP FEET (LOCAL)

MEMBER	LOAD	JT	AXIAL	SHEAR-Y	SHEAR-Z	TORSION	MOM-Y	MOM-Z
	133	40	46.10	-5.74	0.09	-4.81	-4.30	-13.27
		41	-46.10	5.74	-0.09	4.81	3.77	-21.66
42	3	42	156.43	1.75	3.75	-4.65	57.10	10.43
		43	-156.43	-1.75	-3.75	4.65	-75.91	-1.65
	4	42	160.99	5.56	3.80	-7.91	58.36	-16.18
		43	-160.99	-5.56	-3.80	7.91	-77.43	44.03
	5	42	168.87	10.76	3.92	-12.49	60.74	-50.43
		43	-168.87	-10.76	-3.92	12.49	-80.38	104.35
	6	42	179.05	14.84	4.13	-15.35	64.28	-72.31
		43	-179.05	-14.84	-4.13	15.35	-84.99	146.69
	7	42	190.08	16.13	4.42	-15.10	68.08	-70.16
		43	-190.08	-16.13	-4.42	15.10	-90.24	151.01
	8	42	200.82	14.00	4.72	-10.80	71.33	-41.62
		43	-200.82	-14.00	-4.72	10.80	-95.00	111.79
	9	42	209.60	8.51	4.95	-2.74	73.09	8.74
		43	-209.60	-8.51	-4.95	2.74	-97.93	33.93
	10	42	214.66	0.50	5.07	4.84	73.42	69.39
		43	-214.66	-0.50	-5.07	-4.84	-98.85	-66.86
	11	42	214.62	-8.38	5.09	6.87	73.83	122.91
		43	-214.62	8.38	-5.09	-6.87	-99.35	-164.93
	12	42	208.89	-16.42	5.03	3.24	74.76	134.04
		43	-208.89	16.42	-5.03	-3.24	-99.98	-216.34
	13	42	195.55	-19.25	4.90	-0.38	74.39	46.38
		43	-195.55	19.25	-4.90	0.38	-98.98	-142.90
	14	42	8.73	7.24	0.23	-9.60	7.95	-51.24
		43	-8.73	-7.24	-0.23	9.60	-9.09	87.54
	15	42	16.15	12.70	0.31	-14.69	9.66	-88.26
		43	-16.15	-12.70	-0.31	14.69	-11.22	151.91
	16	42	25.24	18.65	0.43	-20.17	11.90	-127.41
		43	-25.24	-18.65	-0.43	20.17	-14.06	220.88
	17	42	36.21	24.77	0.60	-25.52	14.85	-165.71
		43	-36.21	-24.77	-0.60	25.52	-17.84	289.88
	18	42	48.66	30.46	0.81	-29.96	18.40	-198.57
		43	-48.66	-30.46	-0.81	29.96	-22.48	351.28
	19	42	61.94	34.92	1.08	-32.62	22.46	-220.15
		43	-61.94	-34.92	-1.08	32.62	-27.89	395.20
	20	42	75.93	37.95	1.39	-33.15	26.73	-229.17
		43	-75.93	-37.95	-1.39	33.15	-33.69	419.41
	21	42	90.07	39.18	1.72	-31.48	30.94	-223.53
		43	-90.07	-39.18	-1.72	31.48	-39.56	419.94
	22	42	104.30	38.58	2.05	-27.06	34.75	-203.30
		43	-104.30	-38.58	-2.05	27.06	-45.03	396.70
	23	42	117.97	36.01	2.36	-20.26	37.95	-168.69
		43	-117.97	-36.01	-2.36	20.26	-49.79	349.22
	24	42	130.87	31.51	2.63	-10.82	40.22	-120.66
		43	-130.87	-31.51	-2.63	10.82	-53.39	278.61

MEMBER END FORCES   STRUCTURE TYPE = SPACE

ALL UNITS ARE -- KIP FEET   (LOCAL)

MEMBER	LOAD	JT	AXIAL	SHEAR-Y	SHEAR-Z	TORSION	MOM-Y	MOM-Z
	25	42	142.45	25.19	2.83	0.30	41.50	-61.39
		43	-142.45	-25.19	-2.83	-0.30	-55.68	187.65
	26	42	152.19	17.21	2.96	11.90	41.84	6.59
		43	-152.19	-17.21	-2.96	-11.90	-56.67	79.68
	27	42	159.87	7.85	3.01	22.94	41.43	80.23
		43	-159.87	-7.85	-3.01	-22.94	-56.50	-40.90
	28	42	164.80	-2.49	3.00	31.03	40.93	154.87
		43	-164.80	2.49	-3.00	-31.03	-56.00	-167.35
	29	42	166.89	-13.51	2.92	35.54	40.56	226.87
		43	-166.89	13.51	-2.92	-35.54	-55.20	-294.61
	30	42	165.87	-24.64	2.83	35.87	40.92	286.58
		43	-165.87	24.64	-2.83	-35.87	-55.12	-410.08
	31	42	161.64	-35.65	2.70	31.53	42.17	323.75
		43	-161.64	35.65	-2.70	-31.53	-55.69	-502.45
	32	42	153.90	-45.48	2.57	25.21	43.69	324.33
		43	-153.90	45.48	-2.57	-25.21	-56.59	-552.32
	33	42	141.65	-52.88	2.49	17.59	45.79	279.53
		43	-141.65	52.88	-2.49	-17.59	-58.28	-544.59
	34	42	1.54	1.47	0.11	-3.24	4.35	-10.98
		43	-1.54	-1.47	-0.11	3.24	-4.87	18.33
	35	42	5.05	4.46	0.14	-5.98	5.09	-31.98
		43	-5.05	-4.46	-0.14	5.98	-5.78	54.31
	36	42	9.70	8.09	0.19	-9.43	6.14	-56.96
		43	-9.70	-8.09	-0.19	9.43	-7.09	97.49
	37	42	16.11	12.55	0.26	-13.76	7.61	-86.82
		43	-16.11	-12.55	-0.26	13.76	-8.93	149.72
	38	42	23.75	17.06	0.37	-17.88	9.58	-115.54
		43	-23.75	-17.06	-0.37	17.88	-11.44	201.04
	39	42	32.21	21.02	0.52	-20.95	12.10	-138.58
		43	-32.21	-21.02	-0.52	20.95	-14.71	243.95
	40	42	41.26	24.15	0.71	-22.82	14.98	-154.00
		43	-41.26	-24.15	-0.71	22.82	-18.52	275.08
	41	42	50.69	26.21	0.92	-23.29	17.96	-160.02
		43	-50.69	-26.21	-0.92	23.29	-22.57	291.39
	42	42	60.35	27.10	1.15	-22.22	20.87	-156.40
		43	-60.35	-27.10	-1.15	22.22	-26.64	292.27
	43	42	69.94	26.67	1.39	-19.42	23.60	-142.31
		43	-69.94	-26.67	-1.39	19.42	-30.56	276.00
	44	42	79.39	24.93	1.61	-14.56	25.86	-118.39
		43	-79.39	-24.93	-1.61	14.56	-33.91	243.38
	45	42	88.06	21.84	1.79	-8.18	27.41	-85.28
		43	-88.06	-21.84	-1.79	8.18	-36.38	194.76
	46	42	96.07	17.47	1.92	0.28	28.16	-43.94
		43	-96.07	-17.47	-1.92	-0.28	-37.81	131.53
	47	42	102.78	12.02	2.02	8.82	28.29	3.02
		43	-102.78	-12.02	-2.02	-8.82	-38.39	57.24
	48	42	107.95	5.56	2.04	16.83	27.66	54.13
		43	-107.95	-5.56	-2.04	-16.83	-37.88	-26.24

MEMBER END FORCES STRUCTURE TYPE = SPACE

ALL UNITS ARE -- KIP FEET (LOCAL)

MEMBER	LOAD	JT	AXIAL	SHEAR-Y	SHEAR-Z	TORSION	MOM-Y	MOM-Z
	49	42	111.45	-1.59	2.02	23.21	26.94	106.30
		43	-111.45	1.59	-2.02	-23.21	-37.07	-114.25
	50	42	112.89	-9.14	1.97	26.10	26.67	156.66
		43	-112.89	9.14	-1.97	-26.10	-36.55	-202.47
	51	42	112.16	-16.79	1.88	25.90	26.79	202.33
		43	-112.16	16.79	-1.88	-25.90	-36.22	-286.50
	52	42	109.13	-24.17	1.81	22.64	27.77	238.53
		43	-109.13	24.17	-1.81	-22.64	-36.82	-359.67
	53	42	104.04	-31.27	1.71	16.53	29.38	249.68
		43	-104.04	31.27	-1.71	-16.53	-37.93	-406.43
	54	42	1.37	1.26	0.07	-2.35	2.81	-9.27
		43	-1.37	-1.26	-0.07	2.35	-3.16	15.59
	55	42	3.76	3.24	0.09	-4.18	3.32	-23.06
		43	-3.76	-3.24	-0.09	4.18	-3.79	39.29
	56	42	6.87	5.59	0.13	-6.42	4.02	-39.14
		43	-6.87	-5.59	-0.13	6.42	-4.67	67.15
	57	42	10.97	8.33	0.18	-9.02	5.01	-57.24
		43	-10.97	-8.33	-0.18	9.02	-5.90	98.97
	58	42	15.83	11.07	0.25	-11.46	6.30	-74.45
		43	-15.83	-11.07	-0.25	11.46	-7.55	129.94
	59	42	21.16	13.43	0.35	-13.23	7.90	-87.85
		43	-21.16	-13.43	-0.35	13.23	-9.64	155.18
	60	42	26.86	15.26	0.47	-14.23	9.69	-96.40
		43	-26.86	-15.26	-0.47	14.23	-12.03	172.92
	61	42	32.76	16.41	0.60	-14.35	11.54	-99.06
		43	-32.76	-16.41	-0.60	14.35	-14.56	181.32
	62	42	38.78	16.82	0.75	-13.47	13.33	-95.60
		43	-38.78	-16.82	-0.75	13.47	-17.07	179.89
	63	42	44.75	16.40	0.89	-11.49	14.97	-85.76
		43	-44.75	-16.40	-0.89	11.49	-19.43	167.98
	64	42	50.53	15.16	1.02	-8.31	16.29	-69.81
		43	-50.53	-15.16	-1.02	8.31	-21.41	145.82
	65	42	55.89	13.10	1.13	-4.06	17.17	-48.29
		43	-55.89	-13.10	-1.13	4.06	-22.84	113.94
	66	42	60.70	10.26	1.21	1.06	17.59	-22.00
		43	-60.70	-10.26	-1.21	-1.06	-23.66	73.42
	67	42	64.74	6.74	1.26	6.40	17.56	7.80
		43	-64.74	-6.74	-1.26	-6.40	-23.86	25.99
	68	42	67.76	2.65	1.27	11.09	17.23	39.59
		43	-67.76	-2.65	-1.27	-11.09	-23.60	-26.29
	69	42	69.70	-1.85	1.25	14.62	16.82	71.94
		43	-69.70	1.85	-1.25	-14.62	-23.11	-81.23
	70	42	70.36	-6.56	1.22	16.14	16.71	102.63
		43	-70.36	6.56	-1.22	-16.14	-22.83	-135.51
	71	42	69.63	-11.30	1.17	15.61	16.92	129.93
		43	-69.63	11.30	-1.17	-15.61	-22.77	-186.56
	72	42	67.54	-15.88	1.12	13.37	17.55	148.44
		43	-67.54	15.88	-1.12	-13.37	-23.14	-228.02

MEMBER END FORCES STRUCTURE TYPE = SPACE

ALL UNITS ARE -- KIP FEET (LOCAL)

MEMBER	LOAD	JT	AXIAL	SHEAR-Y	SHEAR-Z	TORSION	MOM-Y	MOM-Z
	73	42	64.25	-20.28	1.06	9.70	18.46	147.92
		43	-64.25	20.28	-1.06	-9.70	-23.75	-249.59
	74	42	2.98	2.66	0.12	-4.27	4.49	-19.28
		43	-2.98	-2.66	-0.12	4.27	-5.07	32.61
	75	42	6.90	5.83	0.16	-7.23	5.34	-41.29
		43	-6.90	-5.83	-0.16	7.23	-6.12	70.50
	76	42	12.01	9.56	0.21	-10.78	6.53	-66.56
		43	-12.01	-9.56	-0.21	10.78	-7.60	114.47
	77	42	18.59	13.77	0.30	-14.72	8.14	-94.09
		43	-18.59	-13.77	-0.30	14.72	-9.65	163.12
	78	42	26.22	17.85	0.42	-18.23	10.23	-119.16
		43	-26.22	-17.85	-0.42	18.23	-12.34	208.63
	79	42	34.53	21.28	0.58	-20.67	12.76	-137.92
		43	-34.53	-21.28	-0.58	20.67	-15.66	244.58
	80	42	43.35	23.85	0.76	-21.88	15.54	-148.94
		43	-43.35	-23.85	-0.76	21.88	-19.37	268.48
	81	42	52.43	25.32	0.98	-21.72	18.36	-150.73
		43	-52.43	-25.32	-0.98	21.72	-23.25	277.68
	82	42	61.67	25.66	1.20	-19.93	21.05	-143.14
		43	-61.67	-25.66	-1.20	19.93	-27.04	271.76
	83	42	70.72	24.71	1.41	-16.51	23.45	-125.79
		43	-70.72	-24.71	-1.41	16.51	-30.53	249.67
	84	42	79.48	22.51	1.61	-11.14	25.31	-99.25
		43	-79.48	-22.51	-1.61	11.14	-33.36	212.10
	85	42	87.47	19.06	1.76	-4.40	26.50	-64.52
		43	-87.47	-19.06	-1.76	4.40	-35.34	160.06
	86	42	94.58	14.45	1.87	3.62	26.95	-22.83
		43	-94.58	-14.45	-1.87	-3.62	-36.34	95.26
	87	42	100.39	8.85	1.93	11.53	26.82	23.55
		43	-100.39	-8.85	-1.93	-11.53	-36.52	20.81
	88	42	104.63	2.42	1.94	18.30	26.28	72.57
		43	-104.63	-2.42	-1.94	-18.30	-36.02	-60.41
	89	42	107.14	-4.56	1.91	23.03	25.74	121.60
		43	-107.14	4.56	-1.91	-23.03	-35.33	-144.48
	90	42	107.64	-11.79	1.86	24.64	25.69	167.49
		43	-107.64	11.79	-1.86	-24.64	-34.99	-226.58
	91	42	106.03	-19.01	1.77	23.13	26.17	206.19
		43	-106.03	19.01	-1.77	-23.13	-35.04	-301.51
	92	42	102.39	-25.96	1.69	19.27	27.19	227.69
		43	-102.39	25.96	-1.69	-19.27	-35.66	-357.83
	93	42	96.85	-32.52	1.60	13.41	28.67	216.74
		43	-96.85	32.52	-1.60	-13.41	-36.69	-379.76
	94	42	4.74	4.12	0.15	-5.95	5.54	-29.55
		43	-4.74	-4.12	-0.15	5.95	-6.29	50.20
	95	42	9.70	8.00	0.20	-9.59	6.64	-56.34
		43	-9.70	-8.00	-0.20	9.59	-7.65	96.46
	96	42	16.14	12.51	0.28	-13.86	8.17	-86.56
		43	-16.14	-12.51	-0.28	13.86	-9.57	149.28

MEMBER END FORCES   STRUCTURE TYPE = SPACE

ALL UNITS ARE -- KIP FEET   (LOCAL)

MEMBER	LOAD	JT	AXIAL	SHEAR-Y	SHEAR-Z	TORSION	MOM-Y	MOM-Z
	97	42	24.20	17.43	0.39	-18.37	10.21	-118.22
		43	-24.20	-17.43	-0.39	18.37	-12.17	205.59
	98	42	33.35	22.00	0.54	-22.16	12.80	-145.63
		43	-33.35	-22.00	-0.54	22.16	-15.52	255.93
	99	42	43.28	25.77	0.74	-24.63	15.84	-165.30
		43	-43.28	-25.77	-0.74	24.63	-19.53	294.48
	100	42	53.70	28.44	0.96	-25.63	19.12	-175.35
		43	-53.70	-28.44	-0.96	25.63	-23.94	317.93
	101	42	64.41	29.82	1.21	-24.92	22.39	-174.53
		43	-64.41	-29.82	-1.21	24.92	-28.47	324.03
	102	42	75.20	29.82	1.47	-22.33	25.45	-162.61
		43	-75.20	-29.82	-1.47	22.33	-32.82	312.10
	103	42	85.72	28.32	1.72	-17.72	28.10	-139.38
		43	-85.72	-28.32	-1.72	17.72	-36.71	281.33
	104	42	95.78	25.35	1.94	-10.96	30.07	-105.70
		43	-95.78	-25.35	-1.94	10.96	-39.77	232.79
	105	42	104.85	20.94	2.11	-2.75	31.25	-62.84
		43	-104.85	-20.94	-2.11	2.75	-41.81	167.82
	106	42	112.83	15.22	2.22	6.74	31.58	-12.36
		43	-112.83	-15.22	-2.22	-6.74	-42.69	88.65
	107	42	119.15	8.40	2.28	15.60	31.34	42.78
		43	-119.15	-8.40	-2.28	-15.60	-42.75	-0.67
	108	42	123.59	0.67	2.27	22.91	30.67	100.43
		43	-123.59	-0.67	-2.27	-22.91	-42.05	-97.05
	109	42	125.92	-7.59	2.23	27.54	30.20	156.91
		43	-125.92	7.59	-2.23	-27.54	-41.37	-194.97
	110	42	125.84	-16.08	2.15	28.38	30.34	208.77
		43	-125.84	16.08	-2.15	-28.38	-41.12	-289.35
	111	42	123.33	-24.47	2.05	25.95	31.03	248.47
		43	-123.33	24.47	-2.05	-25.95	-41.32	-371.14
	112	42	118.52	-32.55	1.96	20.82	32.37	262.80
		43	-118.52	32.55	-1.96	-20.82	-42.17	-425.97
	113	42	111.14	-39.67	1.85	14.13	34.01	238.61
		43	-111.14	39.67	-1.85	-14.13	-43.31	-437.46
	114	42	33.41	21.40	0.61	-22.33	15.16	-140.67
		43	-33.41	-21.40	-0.61	22.33	-18.22	247.93
	115	42	44.60	26.33	0.81	-25.80	18.39	-168.75
		43	-44.60	-26.33	-0.81	25.80	-22.47	300.74
	116	42	56.88	30.66	1.05	-28.46	21.97	-190.64
		43	-56.88	-30.66	-1.05	28.46	-27.25	344.34
	117	42	70.65	34.46	1.32	-30.14	25.72	-206.72
		43	-70.65	-34.46	-1.32	30.14	-32.36	379.48
	118	42	85.13	37.05	1.62	-30.11	29.59	-212.33
		43	-85.13	-37.05	-1.62	30.11	-37.71	398.07
	119	42	99.98	37.99	1.92	-27.40	33.38	-204.50
		43	-99.98	-37.99	-1.92	27.40	-43.03	394.93
	120	42	114.60	37.10	2.22	-22.36	36.80	-182.91
		43	-114.60	-37.10	-2.22	22.36	-47.95	368.88

MEMBER END FORCES STRUCTURE TYPE = SPACE

ALL UNITS ARE -- KIP FEET (LOCAL)

MEMBER	LOAD	JT	AXIAL	SHEAR-Y	SHEAR-Z	TORSION	MOM-Y	MOM-Z
	121	42	128.57	34.24	2.50	-15.11	39.56	-147.34
		43	-128.57	-34.24	-2.50	15.11	-52.08	318.99
	122	42	141.63	29.54	2.73	-6.27	41.65	-99.55
		43	-141.63	-29.54	-2.73	6.27	-55.35	247.63
	123	42	153.04	23.04	2.93	2.65	43.20	-41.39
		43	-153.04	-23.04	-2.93	-2.65	-57.88	156.87
	124	42	162.72	14.95	3.05	11.46	44.18	24.77
		43	-162.72	-14.95	-3.05	-11.46	-59.50	50.17
	125	42	169.90	5.61	3.14	18.50	45.12	94.78
		43	-169.90	-5.61	-3.14	-18.50	-60.88	-66.64
	126	42	174.52	-4.73	3.15	23.67	46.02	164.70
		43	-174.52	4.73	-3.15	-23.67	-61.83	-188.40
	127	42	176.20	-15.61	3.14	26.68	46.89	223.13
		43	-176.20	15.61	-3.14	-26.68	-62.62	-301.39
	128	42	174.81	-26.85	3.07	26.94	47.88	257.17
		43	-174.81	26.85	-3.07	-26.94	-63.26	-391.78
	129	42	169.63	-37.07	2.98	26.09	48.57	257.02
		43	-169.63	37.07	-2.98	-26.09	-63.51	-442.83
	130	42	158.67	-44.07	2.95	24.54	49.49	226.27
		43	-158.67	44.07	-2.95	-24.54	-64.28	-447.21
	131	42	139.54	-45.03	3.00	23.70	50.37	194.18
		43	-139.54	45.03	-3.00	-23.70	-65.41	-419.91
	132	42	113.22	-38.69	2.60	20.63	43.17	185.92
		43	-113.22	38.69	-2.60	-20.63	-56.18	-379.89
	133	42	87.14	-31.67	2.79	20.49	44.45	177.88
		43	-87.14	31.67	-2.79	-20.49	-58.44	-336.62
44	3	44	156.01	11.56	3.75	-9.99	94.27	-31.78
		45	-156.01	-11.56	-3.75	9.99	-113.07	89.72
	4	44	160.33	15.64	3.80	-13.34	95.85	-97.25
		45	-160.33	-15.64	-3.80	13.34	-114.92	175.66
	5	44	167.86	21.32	3.92	-18.12	99.08	-184.87
		45	-167.86	-21.32	-3.92	18.12	-118.73	291.77
	6	44	177.76	26.04	4.13	-21.30	104.57	-249.29
		45	-177.76	-26.04	-4.13	21.30	-125.29	379.81
	7	44	188.69	28.02	4.42	-21.43	111.27	-261.81
		45	-188.69	-28.02	-4.42	21.43	-133.43	402.25
	8	44	199.54	26.57	4.72	-17.48	117.80	-213.61
		45	-199.54	-26.57	-4.72	17.48	-141.47	346.78
	9	44	208.65	21.64	4.95	-9.65	122.39	-109.63
		45	-208.65	-21.64	-4.95	9.65	-147.22	218.11
	10	44	214.20	13.96	5.07	-2.16	124.38	30.50
		45	-214.20	-13.96	-5.07	2.16	-149.81	39.51
	11	44	214.72	5.09	5.09	-0.18	125.09	173.12
		45	-214.72	-5.09	-5.09	0.18	-150.60	-147.60
	12	44	209.51	-3.29	5.03	-3.83	125.20	265.70
		45	-209.51	3.29	-5.03	3.83	-150.42	-282.17

MEMBER END FORCES STRUCTURE TYPE = SPACE

ALL UNITS ARE -- KIP FEET (LOCAL)

MEMBER	LOAD	JT	AXIAL	SHEAR-Y	SHEAR-Z	TORSION	MOM-Y	MOM-Z
	13	44	196.37	-6.95	4.90	-7.35	123.33	208.57
		45	-196.37	6.95	-4.90	7.35	-147.92	-243.42
	14	44	8.26	7.77	0.23	-10.19	9.61	-125.21
		45	-8.26	-7.77	-0.23	10.19	-10.74	164.18
	15	44	15.33	13.68	0.31	-15.41	11.83	-218.08
		45	-15.33	-13.68	-0.31	15.41	-13.39	286.68
	16	44	24.02	20.19	0.43	-21.08	14.93	-318.31
		45	-24.02	-20.19	-0.43	21.08	-17.08	419.53
	17	44	34.58	26.99	0.60	-26.69	19.20	-419.74
		45	-34.58	-26.99	-0.60	26.69	-22.20	555.05
	18	44	46.65	33.45	0.81	-31.44	24.64	-511.62
		45	-46.65	-33.45	-0.81	31.44	-28.72	679.32
	19	44	59.63	38.74	1.08	-34.48	31.21	-579.98
		45	-59.63	-38.74	-1.08	34.48	-36.64	774.15
	20	44	73.40	42.64	1.39	-35.42	38.51	-621.59
		45	-73.40	-42.64	-1.39	35.42	-45.47	835.32
	21	44	87.44	44.75	1.72	-34.17	46.13	-630.52
		45	-87.44	-44.75	-1.72	34.17	-54.75	854.87
	22	44	101.68	45.04	2.05	-30.15	53.53	-606.50
		45	-101.68	-45.04	-2.05	30.15	-63.81	832.31
	23	44	115.48	43.34	2.36	-23.72	60.26	-548.31
		45	-115.48	-43.34	-2.36	23.72	-72.10	765.57
	24	44	128.64	39.65	2.63	-14.56	65.77	-457.16
		45	-128.64	-39.65	-2.63	14.56	-78.93	655.94
	25	44	140.59	34.07	2.83	-3.63	69.76	-336.34
		45	-140.59	-34.07	-2.83	3.63	-83.93	507.13
	26	44	150.81	26.72	2.96	7.86	72.13	-189.93
		45	-150.81	-26.72	-2.96	-7.86	-86.97	323.87
	27	44	159.06	17.86	3.01	18.88	72.89	-23.63
		45	-159.06	-17.86	-3.01	-18.88	-87.95	113.15
	28	44	164.63	7.85	3.00	26.98	72.89	153.84
		45	-164.63	-7.85	-3.00	-26.98	-87.95	-114.48
	29	44	167.41	-3.02	2.92	31.55	71.96	336.02
		45	-167.41	3.02	-2.92	-31.55	-86.61	-351.16
	30	44	167.09	-14.19	2.83	31.90	71.45	507.42
		45	-167.09	14.19	-2.83	-31.90	-85.65	-578.53
	31	44	163.56	-25.44	2.70	27.55	71.06	655.65
		45	-163.56	25.44	-2.70	-27.55	-84.58	-783.20
	32	44	156.44	-35.74	2.57	21.20	70.96	756.00
		45	-156.44	35.74	-2.57	-21.20	-83.86	-935.15
	33	44	144.69	-43.89	2.49	13.51	71.75	787.27
		45	-144.69	43.89	-2.49	-13.51	-84.23	-1007.28
	34	44	1.45	1.56	0.11	-3.56	5.19	-25.92
		45	-1.45	-1.56	-0.11	3.56	-5.72	33.75
	35	44	4.76	4.76	0.14	-6.35	6.09	-77.44
		45	-4.76	-4.76	-0.14	6.35	-6.79	101.32
	36	44	9.18	8.68	0.19	-9.89	7.44	-139.55
		45	-9.18	-8.68	-0.19	9.89	-8.39	183.05

MEMBER END FORCES   STRUCTURE TYPE = SPACE

ALL UNITS ARE -- KIP FEET   (LOCAL)

MEMBER	LOAD	JT	AXIAL	SHEAR-Y	SHEAR-Z	TORSION	MOM-Y	MOM-Z
	37	44	15.30	13.53	0.26	-14.34	9.37	-215.15
		45	-15.30	-13.53	-0.26	14.34	-10.69	282.99
	38	44	22.63	18.51	0.37	-18.62	12.16	-290.27
		45	-22.63	-18.51	-0.37	18.62	-14.03	383.07
	39	44	30.83	23.00	0.52	-21.91	15.98	-354.37
		45	-30.83	-23.00	-0.52	21.91	-18.60	469.65
	40	44	39.67	26.69	0.71	-24.04	20.59	-402.64
		45	-39.67	-26.69	-0.71	24.04	-24.14	536.45
	41	44	48.94	29.33	0.92	-24.80	25.68	-430.73
		45	-48.94	-29.33	-0.92	24.80	-30.30	577.77
	42	44	58.53	30.83	1.15	-24.03	30.97	-437.63
		45	-58.53	-30.83	-1.15	24.03	-36.74	592.20
	43	44	68.13	31.00	1.39	-21.51	36.23	-420.68
		45	-68.13	-31.00	-1.39	21.51	-43.19	576.09
	44	44	77.67	29.86	1.61	-16.91	40.98	-380.86
		45	-77.67	-29.86	-1.61	16.91	-49.03	530.56
	45	44	86.51	27.32	1.79	-10.72	44.77	-318.10
		45	-86.51	-27.32	-1.79	10.72	-53.75	455.04
	46	44	94.79	23.46	1.92	-2.40	47.39	-234.25
		45	-94.79	-23.46	-1.92	2.40	-57.04	351.88
	47	44	101.83	18.44	2.02	6.08	48.97	-133.69
		45	-101.83	-18.44	-2.02	-6.08	-59.08	226.14
	48	44	107.39	12.32	2.04	14.10	49.07	-18.66
		45	-107.39	-12.32	-2.04	-14.10	-59.29	80.43
	49	44	111.33	5.41	2.02	20.52	48.59	104.63
		45	-111.33	-5.41	-2.02	-20.52	-58.73	-77.53
	50	44	113.24	-2.04	1.97	23.45	48.00	230.48
		45	-113.24	2.04	-1.97	-23.45	-57.88	-240.71
	51	44	112.99	-9.72	1.88	23.28	47.21	352.98
		45	-112.99	9.72	-1.88	-23.28	-56.64	-401.72
	52	44	110.43	-17.27	1.81	20.00	47.22	463.58
		45	-110.43	17.27	-1.81	-20.00	-56.27	-550.17
	53	44	105.79	-24.68	1.71	13.85	47.45	546.75
		45	-105.79	24.68	-1.71	-13.85	-56.01	-670.49
	54	44	1.29	1.34	0.07	-2.55	3.35	-22.12
		45	-1.29	-1.34	-0.07	2.55	-3.70	28.86
	55	44	3.55	3.47	0.09	-4.42	3.99	-56.11
		45	-3.55	-3.47	-0.09	4.42	-4.46	73.49
	56	44	6.51	6.01	0.13	-6.72	4.90	-96.24
		45	-6.51	-6.01	-0.13	6.72	-5.54	126.36
	57	44	10.43	9.00	0.18	-9.40	6.22	-142.43
		45	-10.43	-9.00	-0.18	9.40	-7.12	187.53
	58	44	15.10	12.04	0.25	-11.95	8.08	-187.91
		45	-15.10	-12.04	-0.25	11.95	-9.34	248.26
	59	44	20.28	14.73	0.35	-13.86	10.54	-225.83
		45	-20.28	-14.73	-0.35	13.86	-12.29	299.68
	60	44	25.85	16.92	0.47	-15.03	13.46	-253.66
		45	-25.85	-16.92	-0.47	15.03	-15.80	338.48

MEMBER END FORCES STRUCTURE TYPE = SPACE

ALL UNITS ARE -- KIP FEET (LOCAL)

MEMBER	LOAD	JT	AXIAL	SHEAR-Y	SHEAR-Z	TORSION	MOM-Y	MOM-Z
	61	44	31.66	18.43	0.60	-15.33	16.65	-268.74
		45	-31.66	-18.43	-0.60	15.33	-19.66	361.14
	62	44	37.65	19.21	0.75	-14.63	19.93	-270.28
		45	-37.65	-19.21	-0.75	14.63	-23.67	366.60
	63	44	43.63	19.18	0.89	-12.83	23.14	-257.24
		45	-43.63	-19.18	-0.89	12.83	-27.60	353.37
	64	44	49.47	18.30	1.02	-9.80	25.97	-229.77
		45	-49.47	-18.30	-1.02	9.80	-31.10	321.51
	65	44	54.96	16.58	1.13	-5.66	28.21	-188.40
		45	-54.96	-16.58	-1.13	5.66	-33.88	271.50
	66	44	59.93	14.04	1.21	-0.62	29.75	-134.41
		45	-59.93	-14.04	-1.21	0.62	-35.82	204.81
	67	44	64.19	10.79	1.26	4.70	30.52	-69.97
		45	-64.19	-10.79	-1.26	-4.70	-36.82	124.04
	68	44	67.46	6.90	1.27	9.39	30.63	2.31
		45	-67.46	-6.90	-1.27	-9.39	-37.00	32.27
	69	44	69.68	2.52	1.25	12.94	30.26	79.53
		45	-69.68	-2.52	-1.25	-12.94	-36.55	-66.90
	70	44	70.63	-2.13	1.22	14.48	29.92	157.28
		45	-70.63	2.13	-1.22	-14.48	-36.05	-167.98
	71	44	70.20	-6.91	1.17	13.97	29.56	232.20
		45	-70.20	6.91	-1.17	-13.97	-35.42	-266.82
	72	44	68.40	-11.61	1.12	11.71	29.53	296.95
		45	-68.40	11.61	-1.12	-11.71	-35.12	-355.15
	73	44	65.39	-16.21	1.06	8.03	29.61	341.13
		45	-65.39	16.21	-1.06	-8.03	-34.90	-422.40
	74	44	2.81	2.84	0.12	-4.60	5.38	-46.41
		45	-2.81	-2.84	-0.12	4.60	-5.96	60.65
	75	44	6.52	6.25	0.16	-7.62	6.44	-100.80
		45	-6.52	-6.25	-0.16	7.62	-7.22	132.12
	76	44	11.39	10.29	0.21	-11.27	7.99	-164.27
		45	-11.39	-10.29	-0.21	11.27	-9.06	215.87
	77	44	17.69	14.91	0.30	-15.35	10.21	-235.07
		45	-17.69	-14.91	-0.30	15.35	-11.72	309.82
	78	44	25.05	19.46	0.42	-19.04	13.28	-302.21
		45	-25.05	-19.46	-0.42	19.04	-15.39	399.74
	79	44	33.13	23.40	0.58	-21.70	17.22	-356.65
		45	-33.13	-23.40	-0.58	21.70	-20.12	473.95
	80	44	41.77	26.52	0.76	-23.17	21.80	-394.82
		45	-41.77	-26.52	-0.76	23.17	-25.63	527.75
	81	44	50.73	28.56	0.98	-23.29	26.73	-412.87
		45	-50.73	-28.56	-0.98	23.29	-31.62	556.05
	82	44	59.94	29.47	1.20	-21.78	31.74	-410.07
		45	-59.94	-29.47	-1.20	21.78	-37.73	557.82
	83	44	69.03	29.10	1.41	-18.62	36.53	-384.67
		45	-69.03	-29.10	-1.41	18.62	-43.61	530.54
	84	44	77.91	27.45	1.61	-13.47	40.66	-337.45
		45	-77.91	-27.45	-1.61	13.47	-48.71	475.06

MEMBER END FORCES STRUCTURE TYPE = SPACE

ALL UNITS ARE -- KIP FEET (LOCAL)

MEMBER	LOAD	JT	AXIAL	SHEAR-Y	SHEAR-Z	TORSION	MOM-Y	MOM-Z
	85	44	86.10	24.51	1.76	-6.88	43.84	-269.37
		45	-86.10	-24.51	-1.76	6.88	-52.69	392.23
	86	44	93.49	20.35	1.87	1.04	45.88	-182.58
		45	-93.49	-20.35	-1.87	-1.04	-55.27	284.60
	87	44	99.64	15.13	1.93	8.91	46.87	-80.99
		45	-99.64	-15.13	-1.93	-8.91	-56.57	156.83
	88	44	104.27	8.98	1.94	15.69	46.85	31.77
		45	-104.27	-8.98	-1.94	-15.69	-56.60	13.25
	89	44	107.22	2.16	1.91	20.47	46.28	150.46
		45	-107.22	-2.16	-1.91	-20.47	-55.86	-139.61
	90	44	108.17	-5.01	1.86	22.10	45.77	268.68
		45	-108.17	5.01	-1.86	-22.10	-55.08	-293.81
	91	44	107.01	-12.33	1.77	20.60	45.30	380.09
		45	-107.01	12.33	-1.77	-20.60	-54.17	-441.88
	92	44	103.82	-19.49	1.69	16.73	45.27	471.80
		45	-103.82	19.49	-1.69	-16.73	-53.74	-569.49
	93	44	98.70	-26.38	1.60	10.84	45.47	527.48
		45	-98.70	26.38	-1.60	-10.84	-53.48	-659.73
	94	44	4.48	4.41	0.15	-6.35	6.65	-71.59
		45	-4.48	-4.41	-0.15	6.35	-7.40	93.69
	95	44	9.18	8.60	0.20	-10.09	8.04	-138.10
		45	-9.18	-8.60	-0.20	10.09	-9.05	181.19
	96	44	15.32	13.50	0.28	-14.47	10.08	-214.54
		45	-15.32	-13.50	-0.28	14.47	-11.48	282.21
	97	44	23.06	18.91	0.39	-19.15	12.95	-296.76
		45	-23.06	-18.91	-0.39	19.15	-14.90	391.57
	98	44	31.91	24.05	0.54	-23.17	16.81	-371.48
		45	-31.91	-24.05	-0.54	23.17	-19.53	492.05
	99	44	41.58	28.43	0.74	-25.92	21.63	-430.46
		45	-41.58	-28.43	-0.74	25.92	-25.32	572.99
	100	44	51.81	31.75	0.96	-27.23	27.12	-468.95
		45	-51.81	-31.75	-0.96	27.23	-31.95	628.13
	101	44	62.42	33.80	1.21	-26.84	32.93	-483.66
		45	-62.42	-33.80	-1.21	26.84	-39.02	653.12
	102	44	73.18	34.48	1.47	-24.57	38.74	-473.41
		45	-73.18	-34.48	-1.47	24.57	-46.11	646.23
	103	44	83.78	33.64	1.72	-20.26	44.15	-436.77
		45	-83.78	-33.64	-1.72	20.26	-52.77	605.39
	104	44	94.01	31.31	1.94	-13.74	48.71	-374.94
		45	-94.01	-31.31	-1.94	13.74	-58.41	531.88
	105	44	103.33	27.48	2.11	-5.70	52.11	-289.32
		45	-103.33	-27.48	-2.11	5.70	-62.67	427.06
	106	44	111.66	22.26	2.22	3.70	54.14	-182.70
		45	-111.66	-22.26	-2.22	-3.70	-65.24	294.31
	107	44	118.39	15.86	2.28	12.53	55.06	-60.22
		45	-118.39	-15.86	-2.28	-12.53	-66.47	139.71
	108	44	123.31	8.42	2.27	19.87	54.78	74.20
		45	-123.31	-8.42	-2.27	-19.87	-66.16	-31.98

MEMBER END FORCES STRUCTURE TYPE = SPACE

ALL UNITS ARE -- KIP FEET (LOCAL)

MEMBER	LOAD	JT	AXIAL	SHEAR-Y	SHEAR-Z	TORSION	MOM-Y	MOM-Z
	109	44	126.15	0.32	2.23	24.54	54.18	213.17
		45	-126.15	-0.32	-2.23	-24.54	-65.34	-211.57
	110	44	126.60	-8.15	2.15	25.40	53.61	350.09
		45	-126.60	8.15	-2.15	-25.40	-64.39	-390.95
	111	44	124.62	-16.69	2.05	22.98	53.16	474.35
		45	-124.62	16.69	-2.05	-22.98	-63.45	-558.01
	112	44	120.33	-25.05	1.96	17.82	53.19	570.43
		45	-120.33	25.05	-1.96	-17.82	-62.99	-696.01
	113	44	113.41	-32.62	1.85	11.10	53.41	618.76
		45	-113.41	32.62	-1.85	-11.10	-62.71	-782.28
	114	44	32.00	23.45	0.61	-23.52	19.84	-360.44
		45	-32.00	-23.45	-0.61	23.52	-22.90	477.99
	115	44	42.86	29.08	0.81	-27.28	24.88	-439.74
		45	-42.86	-29.08	-0.81	27.28	-28.96	585.49
	116	44	54.85	34.17	1.05	-30.28	30.69	-506.97
		45	-54.85	-34.17	-1.05	30.28	-35.97	678.24
	117	44	68.35	38.83	1.32	-32.31	37.04	-563.35
		45	-68.35	-38.83	-1.32	32.31	-43.67	757.99
	118	44	82.64	42.32	1.62	-32.67	43.86	-597.20
		45	-82.64	-42.32	-1.62	32.67	-51.97	809.35
	119	44	97.40	44.18	1.92	-30.35	50.88	-601.08
		45	-97.40	-44.18	-1.92	30.35	-60.52	822.57
	120	44	112.05	44.21	2.22	-25.67	57.60	-572.88
		45	-112.05	-44.21	-2.22	25.67	-68.75	794.51
	121	44	126.17	42.24	2.50	-18.74	63.54	-510.89
		45	-126.17	-42.24	-2.50	18.74	-76.06	722.62
	122	44	139.50	38.36	2.73	-10.16	68.54	-418.00
		45	-139.50	-38.36	-2.73	10.16	-82.24	610.30
	123	44	151.30	32.59	2.93	-1.45	72.61	-296.46
		45	-151.30	-32.59	-2.93	1.45	-87.29	459.82
	124	44	161.46	25.12	3.05	7.23	75.41	-150.74
		45	-161.46	-25.12	-3.05	-7.23	-90.72	276.68
	125	44	169.21	16.26	3.14	14.15	77.68	11.72
		45	-169.21	-16.26	-3.14	-14.15	-93.43	69.78
	126	44	174.47	6.23	3.15	19.25	79.01	184.58
		45	-174.47	-6.23	-3.15	-19.25	-94.82	-153.37
	127	44	176.84	-4.53	3.14	22.21	79.90	351.86
		45	-176.84	4.53	-3.14	-22.21	-95.63	-374.58
	128	44	176.15	-15.84	3.07	22.44	80.20	498.80
		45	-176.15	15.84	-3.07	-22.44	-95.58	-578.19
	129	44	171.62	-26.36	2.98	21.59	79.96	601.87
		45	-171.62	26.36	-2.98	-21.59	-94.91	-733.98
	130	44	161.12	-34.04	2.95	20.00	80.47	643.10
		45	-161.12	34.04	-2.95	-20.00	-95.26	-813.72
	131	44	142.09	-36.19	3.00	19.08	81.81	623.61
		45	-142.09	36.19	-3.00	-19.08	-96.85	-805.02
	132	44	115.42	-31.52	2.60	16.66	70.37	555.99
		45	-115.42	31.52	-2.60	-16.66	-83.38	-713.99

MEMBER END FORCES STRUCTURE TYPE = SPACE

ALL UNITS ARE -- KIP FEET (LOCAL)

MEMBER	LOAD	JT	AXIAL	SHEAR-Y	SHEAR-Z	TORSION	MOM-Y	MOM-Z
	133	44	88.96	-26.14	2.79	16.35	73.59	481.59
		45	-88.96	26.14	-2.79	-16.35	-87.57	-612.62

************** END OF LATEST ANALYSIS RESULT **************

1230. * COLUMNS
1231. PRINT MEMBER FORCES LIST 45 49 53 57 61 63

MEMBER END FORCES STRUCTURE TYPE = SPACE

ALL UNITS ARE -- KIP FEET (LOCAL)

MEMBER	LOAD	JT	AXIAL	SHEAR-Y	SHEAR-Z	TORSION	MOM-Y	MOM-Z
45	3	46	65.69	0.00	-2.44	-0.14	57.56	0.10
		47	-65.69	0.00	2.44	0.14	-19.41	-0.10
	4	46	26.02	-0.26	-2.26	-0.16	54.13	-4.33
		47	-26.02	0.26	2.26	0.16	-18.76	0.20
	5	46	12.93	-0.07	-1.77	-0.26	44.62	2.19
		47	-12.93	0.07	1.77	0.26	-16.99	-3.30
	6	46	7.39	0.07	-1.33	-0.25	35.09	6.23
		47	-7.39	-0.07	1.33	0.25	-14.32	-5.20
	7	46	5.83	0.12	-1.01	-0.16	26.99	6.47
		47	-5.83	-0.12	1.01	0.16	-11.18	-4.67
	8	46	6.94	0.06	-0.82	-0.03	21.08	2.77
		47	-6.94	-0.06	0.82	0.03	-8.30	-1.90
	9	46	9.15	-0.08	-0.73	0.12	17.50	-3.22
		47	-9.15	0.08	0.73	-0.12	-6.16	2.01
	10	46	11.28	-0.21	-0.71	0.25	16.21	-8.72
		47	-11.28	0.21	0.71	-0.25	-5.09	5.38
	11	46	12.56	-0.29	-0.74	0.32	16.50	-11.44
		47	-12.56	0.29	0.74	-0.32	-4.90	6.89
	12	46	12.74	-0.28	-0.80	0.30	18.06	-10.25
		47	-12.74	0.28	0.80	-0.30	-5.53	5.94
	13	46	12.11	-0.19	-0.88	0.19	20.61	-6.19
		47	-12.11	0.19	0.88	-0.19	-6.90	3.24
	14	46	85.27	-0.35	-3.15	-0.65	77.70	-4.58
		47	-85.27	0.35	3.15	0.65	-28.42	-0.86
	15	46	47.43	-0.47	-3.10	-0.73	77.66	-5.02
		47	-47.43	0.47	3.10	0.73	-29.26	-2.27
	16	46	21.11	-0.19	-2.90	-0.84	74.69	3.80
		47	-21.11	0.19	2.90	0.84	-29.40	-6.72
	17	46	6.41	0.06	-2.44	-0.94	66.12	11.71
		47	-6.41	-0.06	2.44	0.94	-27.93	-10.72
	18	46	-1.69	0.25	-1.93	-0.99	55.67	17.69
		47	1.69	-0.25	1.93	0.99	-25.48	-13.72
	19	46	-7.47	0.40	-1.43	-0.97	44.40	21.83
		47	7.47	-0.40	1.43	0.97	-22.13	-15.51
	20	46	-11.52	0.51	-0.96	-0.88	33.02	23.98
		47	11.52	-0.51	0.96	0.88	-18.02	-15.99
	21	46	-13.60	0.56	-0.56	-0.73	22.38	23.95
		47	13.60	-0.56	0.56	0.73	-13.70	-15.15
	22	46	-13.95	0.55	-0.20	-0.54	12.19	21.50
		47	13.95	-0.55	0.20	0.54	-9.05	-12.91
	23	46	-13.00	0.48	0.08	-0.33	3.41	17.23
		47	13.00	-0.48	-0.08	0.33	-4.71	-9.66
	24	46	-11.16	0.37	0.31	-0.10	-4.23	11.22
		47	11.16	-0.37	-0.31	0.10	-0.63	-5.49

MEMBER END FORCES STRUCTURE TYPE = SPACE

ALL UNITS ARE -- KIP FEET (LOCAL)

MEMBER	LOAD	JT	AXIAL	SHEAR-Y	SHEAR-Z	TORSION	MOM-Y	MOM-Z
	25	46	-8.78	0.22	0.48	0.14	-10.47	4.25
		47	8.78	-0.22	-0.48	-0.14	2.96	-0.87
	26	46	-6.18	0.05	0.59	0.37	-15.13	-2.97
		47	6.18	-0.05	-0.59	-0.37	5.86	3.75
	27	46	-3.60	-0.13	0.67	0.59	-18.64	-10.19
		47	3.60	0.13	-0.67	-0.59	8.23	8.24
	28	46	-1.29	-0.27	0.69	0.77	-20.54	-16.11
		47	1.29	0.27	-0.69	-0.77	9.74	11.82
	29	46	0.63	-0.40	0.69	0.92	-21.44	-20.86
		47	-0.63	0.40	-0.69	-0.92	10.71	14.58
	30	46	2.03	-0.48	0.65	1.01	-21.14	-23.55
		47	-2.03	0.48	-0.65	-1.01	10.97	16.03
	31	46	2.85	-0.51	0.59	1.04	-19.81	-24.18
		47	-2.85	0.51	-0.59	-1.04	10.59	16.16
	32	46	3.13	-0.49	0.51	1.00	-17.50	-22.73
		47	-3.13	0.49	-0.51	-1.00	9.57	15.00
	33	46	2.91	-0.43	0.41	0.90	-14.32	-19.45
		47	-2.91	0.43	-0.41	-0.90	7.98	12.71
	34	46	85.59	-0.32	-2.01	-0.39	49.12	-6.62
		47	-85.59	0.32	2.01	0.39	-17.74	1.58
	35	46	49.01	-0.53	-2.23	-0.40	54.32	-10.09
		47	-49.01	0.53	2.23	0.40	-19.45	1.80
	36	46	22.40	-0.28	-2.24	-0.46	55.40	-2.75
		47	-22.40	0.28	2.24	0.46	-20.33	-1.67
	37	46	9.43	-0.08	-1.98	-0.57	51.15	3.70
		47	-9.43	0.08	1.98	0.57	-20.14	-5.01
	38	46	3.12	0.06	-1.63	-0.67	44.61	8.64
		47	-3.12	-0.06	1.63	0.67	-19.17	-7.72
	39	46	-2.02	0.19	-1.26	-0.70	37.02	12.69
		47	2.02	-0.19	1.26	0.70	-17.34	-9.77
	40	46	-6.16	0.30	-0.92	-0.68	29.37	15.72
		47	6.16	-0.30	0.92	0.68	-14.99	-11.07
	41	46	-8.74	0.37	-0.61	-0.61	21.67	17.22
		47	8.74	-0.37	0.61	0.61	-12.16	-11.39
	42	46	-9.88	0.41	-0.33	-0.50	14.15	17.08
		47	9.88	-0.41	0.33	0.50	-9.00	-10.72
	43	46	-9.87	0.40	-0.10	-0.37	7.49	15.33
		47	9.87	-0.40	0.10	0.37	-5.93	-9.14
	44	46	-9.02	0.34	0.09	-0.22	1.36	12.04
		47	9.02	-0.34	-0.09	0.22	-2.81	-6.69
	45	46	-7.63	0.26	0.24	-0.07	-3.52	7.98
		47	7.63	-0.26	-0.24	0.07	-0.15	-3.87
	46	46	-5.88	0.15	0.35	0.10	-7.81	2.76
		47	5.88	-0.15	-0.35	-0.10	2.37	-0.47
	47	46	-4.02	0.03	0.42	0.26	-10.93	-2.39
		47	4.02	-0.03	-0.42	-0.26	4.34	2.82
	48	46	-2.22	-0.09	0.46	0.41	-13.01	-7.32
		47	2.22	0.09	-0.46	-0.41	5.80	5.87

MEMBER END FORCES STRUCTURE TYPE = SPACE

ALL UNITS ARE -- KIP FEET (LOCAL)

MEMBER	LOAD	JT	AXIAL	SHEAR-Y	SHEAR-Z	TORSION	MOM-Y	MOM-Z
	49	46	-0.59	-0.21	0.48	0.54	-14.33	-11.73
		47	0.59	0.21	-0.48	-0.54	6.87	8.53
	50	46	0.73	-0.29	0.47	0.64	-14.79	-14.94
		47	-0.73	0.29	-0.47	-0.64	7.45	10.39
	51	46	1.67	-0.35	0.45	0.71	-14.59	-16.88
		47	-1.67	0.35	-0.45	-0.71	7.64	11.42
	52	46	2.20	-0.37	0.40	0.73	-13.71	-17.22
		47	-2.20	0.37	-0.40	-0.73	7.39	11.45
	53	46	2.32	-0.35	0.35	0.70	-12.13	-16.05
		47	-2.32	0.35	-0.35	-0.70	6.70	10.54
	54	46	49.56	-0.17	-1.29	-0.24	31.49	-3.18
		47	-49.56	0.17	1.29	0.24	-11.34	0.57
	55	46	28.46	-0.30	-1.37	-0.26	33.58	-5.29
		47	-28.46	0.30	1.37	0.26	-12.14	0.66
	56	46	13.23	-0.16	-1.37	-0.30	34.00	-1.11
		47	-13.23	0.16	1.37	0.30	-12.66	-1.39
	57	46	5.40	-0.04	-1.20	-0.37	31.13	2.79
		47	-5.40	0.04	1.20	0.37	-12.43	-3.39
	58	46	1.41	0.05	-0.98	-0.42	27.02	5.81
		47	-1.41	-0.05	0.98	0.42	-11.74	-5.02
	59	46	-1.65	0.13	-0.75	-0.43	22.29	8.20
		47	1.65	-0.13	0.75	0.43	-10.55	-6.20
	60	46	-4.04	0.19	-0.54	-0.41	17.48	9.90
		47	4.04	-0.19	0.54	0.41	-9.02	-6.89
	61	46	-5.51	0.23	-0.35	-0.37	12.74	10.66
		47	5.51	-0.23	0.35	0.37	-7.24	-6.99
	62	46	-6.12	0.25	-0.18	-0.30	8.15	10.38
		47	6.12	-0.25	0.18	0.30	-5.29	-6.47
	63	46	-6.03	0.24	-0.04	-0.21	4.04	9.14
		47	6.03	-0.24	0.04	0.21	-3.36	-5.40
	64	46	-5.46	0.20	0.07	-0.12	0.39	7.04
		47	5.46	-0.20	-0.07	0.12	-1.50	-3.86
	65	46	-4.56	0.15	0.16	-0.02	-2.66	4.34
		47	4.56	-0.15	-0.16	0.02	0.18	-2.01
	66	46	-3.47	0.08	0.22	0.08	-5.13	1.20
		47	3.47	-0.08	-0.22	-0.08	1.65	0.04
	67	46	-2.32	0.00	0.27	0.18	-7.04	-2.06
		47	2.32	0.00	-0.27	-0.18	2.86	2.11
	68	46	-1.22	-0.07	0.29	0.27	-8.23	-5.01
		47	1.22	0.07	-0.29	-0.27	3.71	3.93
	69	46	-0.24	-0.14	0.30	0.35	-8.97	-7.63
		47	0.24	0.14	-0.30	-0.35	4.33	5.49
	70	46	0.54	-0.19	0.29	0.41	-9.18	-9.47
		47	-0.54	0.19	-0.29	-0.41	4.65	6.56
	71	46	1.08	-0.22	0.27	0.44	-8.99	-10.49
		47	-1.08	0.22	-0.27	-0.44	4.72	7.08
	72	46	1.37	-0.23	0.25	0.45	-8.35	-10.55
		47	-1.37	0.23	-0.25	-0.45	4.52	7.01

MEMBER END FORCES STRUCTURE TYPE = SPACE

ALL UNITS ARE -- KIP FEET (LOCAL)

MEMBER	LOAD	JT	AXIAL	SHEAR-Y	SHEAR-Z	TORSION	MOM-Y	MOM-Z
	73	46	1.41	-0.21	0.21	0.43	-7.27	-9.67
		47	-1.41	0.21	-0.21	-0.43	4.02	6.34
	74	46	68.29	-0.32	-2.00	-0.38	48.87	-6.14
		47	-68.29	0.32	2.00	0.38	-17.63	1.07
	75	46	37.97	-0.41	-2.11	-0.42	51.79	-6.80
		47	-37.97	0.41	2.11	0.42	-18.85	0.34
	76	46	17.19	-0.20	-2.03	-0.49	51.12	-0.24
		47	-17.19	0.20	2.03	0.49	-19.33	-2.87
	77	46	6.66	-0.03	-1.76	-0.58	46.26	5.42
		47	-6.66	0.03	1.76	0.58	-18.81	-5.81
	78	46	1.03	0.11	-1.42	-0.65	39.70	9.80
		47	-1.03	-0.11	1.42	0.65	-17.57	-8.14
	79	46	-3.42	0.22	-1.07	-0.66	32.42	13.21
		47	3.42	-0.22	1.07	0.66	-15.63	-9.77
	80	46	-6.77	0.31	-0.76	-0.62	25.06	15.48
		47	6.77	-0.31	0.76	0.62	-13.18	-10.62
	81	46	-8.70	0.37	-0.48	-0.54	17.87	16.28
		47	8.70	-0.37	0.48	0.54	-10.41	-10.55
	82	46	-9.37	0.38	-0.23	-0.42	10.94	15.48
		47	9.37	-0.38	0.23	0.42	-7.38	-9.53
	83	46	-9.05	0.36	-0.02	-0.30	4.87	13.29
		47	9.05	-0.36	0.02	0.30	-4.49	-7.74
	84	46	-8.04	0.29	0.14	-0.15	-0.59	9.77
		47	8.04	-0.29	-0.14	0.15	-1.64	-5.21
	85	46	-6.59	0.20	0.27	0.00	-4.98	5.54
		47	6.59	-0.20	-0.27	0.00	0.81	-2.35
	86	46	-4.89	0.09	0.36	0.16	-8.60	0.62
		47	4.89	-0.09	-0.36	-0.16	2.99	0.83
	87	46	-3.15	-0.02	0.42	0.31	-11.23	-4.23
		47	3.15	0.02	-0.42	-0.31	4.70	3.89
	88	46	-1.51	-0.13	0.45	0.44	-12.89	-8.64
		47	1.51	0.13	-0.45	-0.44	5.93	6.60
	89	46	-0.08	-0.23	0.45	0.55	-13.84	-12.39
		47	0.08	0.23	-0.45	-0.55	6.77	8.83
	90	46	1.03	-0.30	0.44	0.64	-14.02	-14.91
		47	-1.03	0.30	-0.44	-0.64	7.16	10.26
	91	46	1.77	-0.34	0.41	0.68	-13.56	-16.14
		47	-1.77	0.34	-0.41	-0.68	7.17	10.85
	92	46	2.12	-0.34	0.36	0.68	-12.42	-15.88
		47	-2.12	0.34	-0.36	-0.68	6.75	10.51
	93	46	2.10	-0.31	0.30	0.63	-10.59	-14.22
		47	-2.10	0.31	-0.30	-0.63	5.87	9.31
	94	46	71.02	-0.42	-2.37	-0.46	57.99	-7.61
		47	-71.02	0.42	2.37	0.46	-21.01	1.09
	95	46	38.19	-0.42	-2.45	-0.51	60.65	-5.99
		47	-38.19	0.42	2.45	0.51	-22.30	-0.59
	96	46	16.86	-0.18	-2.30	-0.60	58.48	1.47
		47	-16.86	0.18	2.30	0.60	-22.52	-4.27

MEMBER END FORCES   STRUCTURE TYPE = SPACE

ALL UNITS ARE -- KIP FEET   (LOCAL)

MEMBER	LOAD	JT	AXIAL	SHEAR-Y	SHEAR-Z	TORSION	MOM-Y	MOM-Z
	97	46	6.05	0.01	-1.96	-0.70	52.29	7.73
		47	-6.05	-0.01	1.96	0.70	-21.70	-7.54
	98	46	-0.16	0.16	-1.56	-0.77	44.36	12.55
		47	0.16	-0.16	1.56	0.77	-20.03	-10.05
	99	46	-5.04	0.29	-1.16	-0.76	35.76	16.20
		47	5.04	-0.29	1.16	0.76	-17.57	-11.73
	100	46	-8.54	0.38	-0.81	-0.70	27.20	18.41
		47	8.54	-0.38	0.81	0.70	-14.62	-12.44
	101	46	-10.41	0.43	-0.48	-0.60	18.83	18.84
		47	10.41	-0.43	0.48	0.60	-11.28	-12.06
	102	46	-10.90	0.44	-0.20	-0.46	10.96	17.48
		47	10.90	-0.44	0.20	0.46	-7.76	-10.63
	103	46	-10.31	0.40	0.02	-0.30	4.05	14.52
		47	10.31	-0.40	-0.02	0.30	-4.40	-8.31
	104	46	-8.99	0.31	0.21	-0.12	-2.06	10.13
		47	8.99	-0.31	-0.21	0.12	-1.16	-5.22
	105	46	-7.22	0.21	0.34	0.05	-6.92	5.03
		47	7.22	-0.21	-0.34	-0.05	1.60	-1.80
	106	46	-5.20	0.07	0.44	0.24	-10.93	-0.80
		47	5.20	-0.07	-0.44	-0.24	4.05	1.94
	107	46	-3.19	-0.06	0.50	0.40	-13.69	-6.31
		47	3.19	0.06	-0.50	-0.40	5.89	5.40
	108	46	-1.33	-0.18	0.53	0.55	-15.43	-11.31
		47	1.33	0.18	-0.53	-0.55	7.22	8.44
	109	46	0.25	-0.29	0.53	0.68	-16.30	-15.32
		47	-0.25	0.29	-0.53	-0.68	8.07	10.80
	110	46	1.43	-0.36	0.51	0.76	-16.31	-17.88
		47	-1.43	0.36	-0.51	-0.76	8.41	12.22
	111	46	2.18	-0.40	0.47	0.80	-15.56	-18.86
		47	-2.18	0.40	-0.47	-0.80	8.29	12.63
	112	46	2.48	-0.39	0.41	0.79	-14.00	-18.11
		47	-2.48	0.39	-0.41	-0.79	7.64	11.96
	113	46	2.38	-0.35	0.33	0.71	-11.68	-15.83
		47	-2.38	0.35	-0.33	-0.71	6.50	10.35
	114	46	58.41	-0.04	-2.59	-0.93	69.15	7.60
		47	-58.41	0.04	2.59	0.93	-28.73	-8.21
	115	46	28.83	-0.09	-2.42	-0.91	65.46	7.73
		47	-28.83	0.09	2.42	0.91	-27.59	-9.12
	116	46	7.65	0.15	-2.14	-0.89	59.06	14.14
		47	-7.65	-0.15	2.14	0.89	-25.58	-11.77
	117	46	-2.54	0.32	-1.70	-0.86	48.98	18.31
		47	2.54	-0.32	1.70	0.86	-22.44	-13.35
	118	46	-6.94	0.40	-1.23	-0.81	38.08	20.03
		47	6.94	-0.40	1.23	0.81	-18.84	-13.70
	119	46	-9.76	0.44	-0.79	-0.68	27.08	19.70
		47	9.76	-0.44	0.79	0.68	-14.68	-12.81
	120	46	-11.35	0.44	-0.42	-0.52	16.94	17.79
		47	11.35	-0.44	0.42	0.52	-10.43	-10.94

MEMBER END FORCES   STRUCTURE TYPE = SPACE

ALL UNITS ARE -- KIP FEET   (LOCAL)

MEMBER	LOAD	JT	AXIAL	SHEAR-Y	SHEAR-Z	TORSION	MOM-Y	MOM-Z
	121	46	-11.55	0.39	-0.10	-0.31	7.74	14.19
		47	11.55	-0.39	0.10	0.31	-6.23	-8.11
	122	46	-10.61	0.30	0.17	-0.08	-0.56	9.11
		47	10.61	-0.30	-0.17	0.08	-2.10	-4.49
	123	46	-8.94	0.18	0.37	0.14	-7.14	3.43
		47	8.94	-0.18	-0.37	-0.14	1.39	-0.62
	124	46	-6.85	0.04	0.52	0.37	-12.65	-2.89
		47	6.85	-0.04	-0.52	-0.37	4.57	3.50
	125	46	-4.66	-0.09	0.61	0.57	-16.47	-8.59
		47	4.66	0.09	-0.61	-0.57	6.95	7.13
	126	46	-2.59	-0.22	0.66	0.75	-19.22	-13.86
		47	2.59	0.22	-0.66	-0.75	8.85	10.36
	127	46	-0.82	-0.32	0.67	0.87	-20.47	-17.66
		47	0.82	0.32	-0.67	-0.87	9.94	12.61
	128	46	0.54	-0.39	0.64	0.94	-20.29	-19.85
		47	-0.54	0.39	-0.64	-0.94	10.21	13.80
	129	46	1.48	-0.42	0.59	0.95	-19.01	-20.55
		47	-1.48	0.42	-0.59	-0.95	9.84	14.01
	130	46	1.98	-0.41	0.51	0.91	-16.80	-19.65
		47	-1.98	0.41	-0.51	-0.91	8.88	13.22
	131	46	2.12	-0.38	0.42	0.86	-14.35	-17.71
		47	-2.12	0.38	-0.42	-0.86	7.73	11.78
	132	46	2.04	-0.33	0.34	0.75	-11.91	-15.26
		47	-2.04	0.33	-0.34	-0.75	6.52	10.06
	133	46	1.74	-0.27	0.28	0.69	-9.77	-12.38
		47	-1.74	0.27	-0.28	-0.69	5.45	8.09
49	3	5	33.15	0.01	-1.90	-0.41	23.11	0.32
		51	-33.15	-0.01	1.90	0.41	-0.41	-0.15
	4	5	63.85	-0.23	-1.37	-0.49	15.79	-6.33
		51	-63.85	0.23	1.37	0.49	0.59	3.53
	5	5	51.01	-0.39	-2.24	-0.47	29.65	-10.14
		51	-51.01	0.39	2.24	0.47	-2.88	5.45
	6	5	44.26	-0.23	-2.09	-0.42	26.89	-5.67
		51	-44.26	0.23	2.09	0.42	-1.81	2.97
	7	5	34.96	-0.01	-1.59	-0.41	18.13	0.29
		51	-34.96	0.01	1.59	0.41	0.85	-0.37
	8	5	25.32	0.17	-1.07	-0.46	9.69	5.04
		51	-25.32	-0.17	1.07	0.46	3.10	-3.04
	9	5	17.92	0.26	-0.68	-0.50	3.81	7.59
		51	-17.92	-0.26	0.68	0.50	4.39	-4.48
	10	5	13.93	0.27	-0.48	-0.49	0.97	7.97
		51	-13.93	-0.27	0.48	0.49	4.77	-4.71
	11	5	13.70	0.23	-0.45	-0.44	0.91	6.70
		51	-13.70	-0.23	0.45	0.44	4.49	-4.00
	12	5	16.74	0.15	-0.57	-0.39	3.19	4.53
		51	-16.74	-0.15	0.57	0.39	3.67	-2.76

MEMBER END FORCES STRUCTURE TYPE = SPACE

ALL UNITS ARE -- KIP FEET (LOCAL)

MEMBER	LOAD	JT	AXIAL	SHEAR-Y	SHEAR-Z	TORSION	MOM-Y	MOM-Z
	13	5	21.39	0.07	-0.78	-0.36	6.81	2.30
		51	-21.39	-0.07	0.78	0.36	2.50	-1.47
	14	5	75.85	-0.45	-1.39	-0.36	22.03	-13.49
		51	-75.85	0.45	1.39	0.36	-5.42	8.14
	15	5	93.68	-0.75	-1.39	-0.40	23.61	-21.01
		51	-93.68	0.75	1.39	0.40	-6.98	12.09
	16	5	94.17	-0.97	-1.92	-0.39	33.00	-26.49
		51	-94.17	0.97	1.92	0.39	-10.00	14.83
	17	5	81.30	-1.08	-2.74	-0.33	45.99	-28.60
		51	-81.30	1.08	2.74	0.33	-13.18	15.66
	18	5	65.31	-0.97	-3.36	-0.23	55.08	-25.74
		51	-65.31	0.97	3.36	0.23	-14.86	14.18
	19	5	53.85	-0.74	-3.31	-0.15	53.23	-19.89
		51	-53.85	0.74	3.31	0.15	-13.59	10.99
	20	5	44.47	-0.48	-2.85	-0.07	44.47	-12.57
		51	-44.47	0.48	2.85	0.07	-10.31	6.87
	21	5	33.72	-0.21	-2.23	-0.05	33.20	-5.16
		51	-33.72	0.21	2.23	0.05	-6.54	2.71
	22	5	21.43	0.05	-1.55	-0.06	21.05	1.70
		51	-21.43	-0.05	1.55	0.06	-2.55	-1.14
	23	5	9.33	0.27	-0.88	-0.11	9.65	7.70
		51	-9.33	-0.27	0.88	0.11	0.94	-4.50
	24	5	-1.72	0.44	-0.27	-0.18	-0.62	12.50
		51	1.72	-0.44	0.27	0.18	3.90	-7.20
	25	5	-11.36	0.57	0.26	-0.24	-9.30	16.08
		51	11.36	-0.57	-0.26	0.24	6.24	-9.22
	26	5	-19.28	0.66	0.68	-0.28	-16.05	18.41
		51	19.28	-0.66	-0.68	0.28	7.87	-10.54
	27	5	-25.31	0.69	1.01	-0.30	-21.11	19.42
		51	25.31	-0.69	-1.01	0.30	8.98	-11.13
	28	5	-29.25	0.69	1.23	-0.28	-24.23	19.46
		51	29.25	-0.69	-1.23	0.28	9.48	-11.16
	29	5	-31.07	0.65	1.35	-0.25	-25.71	18.41
		51	31.07	-0.65	-1.35	0.25	9.56	-10.58
	30	5	-30.88	0.59	1.37	-0.19	-25.55	16.71
		51	30.88	-0.59	-1.37	0.19	9.19	-9.62
	31	5	-28.74	0.51	1.29	-0.14	-23.88	14.37
		51	28.74	-0.51	-1.29	0.14	8.42	-8.29
	32	5	-25.07	0.41	1.14	-0.08	-20.94	11.71
		51	25.07	-0.41	-1.14	0.08	7.31	-6.77
	33	5	-20.18	0.31	0.92	-0.04	-16.96	8.88
		51	20.18	-0.31	-0.92	0.04	5.90	-5.15
	34	5	33.06	-0.06	-1.18	-0.19	17.35	-3.18
		51	-33.06	0.06	1.18	0.19	-3.21	2.42
	35	5	64.01	-0.24	-0.41	-0.27	6.95	-8.40
		51	-64.01	0.24	0.41	0.27	-2.01	5.54
	36	5	76.40	-0.59	-0.38	-0.31	7.70	-15.98
		51	-76.40	0.59	0.38	0.31	-3.13	8.95

MEMBER END FORCES STRUCTURE TYPE = SPACE

ALL UNITS ARE -- KIP FEET (LOCAL)

MEMBER	LOAD	JT	AXIAL	SHEAR-Y	SHEAR-Z	TORSION	MOM-Y	MOM-Z
	37	5	65.40	-0.80	-1.37	-0.28	23.76	-20.93
		51	-65.40	0.80	1.37	0.28	-7.39	11.34
	38	5	49.11	-0.80	-2.30	-0.23	38.49	-21.28
		51	-49.11	0.80	2.30	0.23	-10.95	11.75
	39	5	41.10	-0.68	-2.53	-0.15	41.49	-18.25
		51	-41.10	0.68	2.53	0.15	-11.24	10.14
	40	5	37.09	-0.50	-2.33	-0.07	37.43	-13.42
		51	-37.09	0.50	2.33	0.07	-9.57	7.41
	41	5	30.90	-0.31	-1.94	-0.03	30.27	-8.16
		51	-30.90	0.31	1.94	0.03	-7.04	4.44
	42	5	22.45	-0.12	-1.48	-0.01	21.83	-2.96
		51	-22.45	0.12	1.48	0.01	-4.11	1.53
	43	5	13.72	0.05	-1.01	-0.03	13.52	1.75
		51	-13.72	-0.05	1.01	0.03	-1.45	-1.10
	44	5	5.44	0.20	-0.54	-0.07	5.45	5.79
		51	-5.44	-0.20	0.54	0.07	1.04	-3.37
	45	5	-2.02	0.32	-0.13	-0.12	-1.39	9.09
		51	2.02	-0.32	0.13	0.12	2.96	-5.22
	46	5	-8.59	0.41	0.23	-0.17	-7.23	11.38
		51	8.59	-0.41	-0.23	0.17	4.50	-6.52
	47	5	-13.98	0.46	0.52	-0.21	-11.76	12.89
		51	13.98	-0.46	-0.52	0.21	5.58	-7.38
	48	5	-17.99	0.48	0.73	-0.21	-14.97	13.53
		51	17.99	-0.48	-0.73	0.21	6.23	-7.75
	49	5	-20.61	0.48	0.88	-0.20	-17.04	13.38
		51	20.61	-0.48	-0.88	0.20	6.56	-7.67
	50	5	-21.75	0.45	0.95	-0.17	-17.93	12.63
		51	21.75	-0.45	-0.95	0.17	6.57	-7.26
	51	5	-21.49	0.40	0.96	-0.13	-17.75	11.34
		51	21.49	-0.40	-0.96	0.13	6.31	-6.53
	52	5	-19.94	0.34	0.90	-0.09	-16.57	9.72
		51	19.94	-0.34	-0.90	0.09	5.79	-5.61
	53	5	-17.20	0.27	0.79	-0.05	-14.44	7.81
		51	17.20	-0.27	-0.79	0.05	5.02	-4.52
	54	5	23.74	-0.07	-0.66	-0.13	9.77	-2.67
		51	-23.74	0.07	0.66	0.13	-1.91	1.88
	55	5	39.97	-0.20	-0.32	-0.17	5.34	-6.26
		51	-39.97	0.20	0.32	0.17	-1.56	3.86
	56	5	45.42	-0.37	-0.39	-0.19	7.29	-10.24
		51	-45.42	0.37	0.39	0.19	-2.58	5.76
	57	5	39.20	-0.49	-0.93	-0.17	15.99	-12.89
		51	-39.20	0.49	0.93	0.17	-4.87	7.01
	58	5	30.32	-0.48	-1.43	-0.13	23.80	-12.80
		51	-30.32	0.48	1.43	0.13	-6.70	7.06
	59	5	25.32	-0.40	-1.54	-0.09	25.18	-10.80
		51	-25.32	0.40	1.54	0.09	-6.76	5.99
	60	5	22.29	-0.29	-1.40	-0.04	22.47	-7.79
		51	-22.29	0.29	1.40	0.04	-5.66	4.30

MEMBER END FORCES STRUCTURE TYPE = SPACE

ALL UNITS ARE -- KIP FEET (LOCAL)

MEMBER	LOAD	JT	AXIAL	SHEAR-Y	SHEAR-Z	TORSION	MOM-Y	MOM-Z
	61	5	18.29	-0.17	-1.16	-0.02	17.95	-4.53
		51	-18.29	0.17	1.16	0.02	-4.07	2.46
	62	5	13.08	-0.06	-0.87	-0.01	12.74	-1.36
		51	-13.08	0.06	0.87	0.01	-2.29	0.69
	63	5	7.69	0.05	-0.58	-0.02	7.58	1.50
		51	-7.69	-0.05	0.58	0.02	-0.64	-0.92
	64	5	2.62	0.14	-0.30	-0.05	2.73	3.94
		51	-2.62	-0.14	0.30	0.05	0.82	-2.29
	65	5	-1.94	0.21	-0.04	-0.08	-1.47	5.88
		51	1.94	-0.21	0.04	0.08	2.01	-3.38
	66	5	-5.89	0.26	0.17	-0.11	-4.93	7.25
		51	5.89	-0.26	-0.17	0.11	2.90	-4.15
	67	5	-9.11	0.29	0.34	-0.13	-7.65	8.07
		51	9.11	-0.29	-0.34	0.13	3.54	-4.62
	68	5	-11.46	0.30	0.47	-0.13	-9.52	8.41
		51	11.46	-0.30	-0.47	0.13	3.91	-4.82
	69	5	-12.92	0.29	0.55	-0.12	-10.69	8.24
		51	12.92	-0.29	-0.55	0.12	4.08	-4.73
	70	5	-13.49	0.27	0.59	-0.10	-11.13	7.73
		51	13.49	-0.27	-0.59	0.10	4.06	-4.44
	71	5	-13.19	0.24	0.59	-0.08	-10.90	6.89
		51	13.19	-0.24	-0.59	0.08	3.87	-3.97
	72	5	-12.10	0.21	0.55	-0.05	-10.07	5.85
		51	12.10	-0.21	-0.55	0.05	3.52	-3.38
	73	5	-10.31	0.16	0.47	-0.03	-8.65	4.66
		51	10.31	-0.16	-0.47	0.03	3.01	-2.70
	74	5	42.35	-0.15	-0.89	-0.21	13.42	-5.44
		51	-42.35	0.15	0.89	0.21	-2.80	3.61
	75	5	63.38	-0.36	-0.51	-0.27	8.95	-10.89
		51	-63.38	0.36	0.51	0.27	-2.78	6.59
	76	5	67.77	-0.62	-0.78	-0.28	14.07	-16.76
		51	-67.77	0.62	0.78	0.28	-4.73	9.32
	77	5	57.11	-0.75	-1.60	-0.25	27.27	-19.79
		51	-57.11	0.75	1.60	0.25	-8.12	10.79
	78	5	44.47	-0.71	-2.24	-0.19	37.20	-18.94
		51	-44.47	0.71	2.24	0.19	-10.36	10.47
	79	5	37.58	-0.58	-2.32	-0.12	37.75	-15.50
		51	-37.58	0.58	2.32	0.12	-10.00	8.59
	80	5	32.77	-0.40	-2.07	-0.05	32.83	-10.75
		51	-32.77	0.40	2.07	0.05	-8.10	5.92
	81	5	26.18	-0.22	-1.67	-0.02	25.66	-5.79
		51	-26.18	0.22	1.67	0.02	-5.61	3.12
	82	5	18.06	-0.05	-1.23	-0.02	17.60	-1.03
		51	-18.06	0.05	1.23	0.02	-2.88	0.46
	83	5	9.92	0.11	-0.79	-0.04	9.86	3.22
		51	-9.92	-0.11	0.79	0.04	-0.46	-1.92
	84	5	2.32	0.24	-0.36	-0.09	2.60	6.75
		51	-2.32	-0.24	0.36	0.09	1.72	-3.91

MEMBER END FORCES STRUCTURE TYPE = SPACE

ALL UNITS ARE -- KIP FEET (LOCAL)

MEMBER	LOAD	JT	AXIAL	SHEAR-Y	SHEAR-Z	TORSION	MOM-Y	MOM-Z
	85	5	-4.44	0.34	0.01	-0.14	-3.54	9.54
		51	4.44	-0.34	-0.01	0.14	3.41	-5.47
	86	5	-10.23	0.41	0.33	-0.18	-8.59	11.42
		51	10.23	-0.41	-0.33	0.18	4.69	-6.54
	87	5	-14.85	0.45	0.57	-0.20	-12.43	12.51
		51	14.85	-0.45	-0.57	0.20	5.57	-7.16
	88	5	-18.13	0.46	0.75	-0.20	-15.04	12.85
		51	18.13	-0.46	-0.75	0.20	6.06	-7.36
	89	5	-20.05	0.44	0.86	-0.18	-16.57	12.46
		51	20.05	-0.44	-0.86	0.18	6.26	-7.15
	90	5	-20.60	0.41	0.91	-0.15	-17.00	11.55
		51	20.60	-0.41	-0.91	0.15	6.16	-6.64
	91	5	-19.83	0.36	0.89	-0.11	-16.43	10.18
		51	19.83	-0.36	-0.89	0.11	5.81	-5.87
	92	5	-17.91	0.30	0.81	-0.07	-14.93	8.54
		51	17.91	-0.30	-0.81	0.07	5.21	-4.93
	93	5	-14.97	0.23	0.69	-0.04	-12.58	6.68
		51	14.97	-0.23	-0.69	0.04	4.37	-3.87
	94	5	55.80	-0.25	-0.95	-0.27	14.68	-8.20
		51	-55.80	0.25	0.95	0.27	-3.34	5.19
	95	5	75.63	-0.50	-0.69	-0.32	12.20	-14.49
		51	-75.63	0.50	0.69	0.32	-3.90	8.55
	96	5	76.49	-0.77	-1.15	-0.32	20.29	-20.59
		51	-76.49	0.77	1.15	0.32	-6.52	11.38
	97	5	63.24	-0.87	-2.08	-0.27	35.05	-22.95
		51	-63.24	0.87	2.08	0.27	-10.20	12.55
	98	5	50.03	-0.79	-2.66	-0.20	43.85	-21.18
		51	-50.03	0.79	2.66	0.20	-12.06	11.71
	99	5	42.55	-0.62	-2.64	-0.12	42.79	-16.73
		51	-42.55	0.62	2.64	0.12	-11.14	9.26
	100	5	36.43	-0.42	-2.30	-0.05	36.32	-11.09
		51	-36.43	0.42	2.30	0.05	-8.74	6.08
	101	5	28.23	-0.21	-1.83	-0.03	27.62	-5.33
		51	-28.23	0.21	1.83	0.03	-5.74	2.84
	102	5	18.68	-0.01	-1.31	-0.03	18.26	0.11
		51	-18.68	0.01	1.31	0.03	-2.63	-0.20
	103	5	9.30	0.17	-0.79	-0.07	9.35	4.87
		51	-9.30	-0.17	0.79	0.07	0.13	-2.87
	104	5	0.63	0.31	-0.31	-0.12	1.14	8.78
		51	-0.63	-0.31	0.31	0.12	2.55	-5.07
	105	5	-7.00	0.42	0.11	-0.17	-5.69	11.79
		51	7.00	-0.42	-0.11	0.17	4.39	-6.76
	106	5	-13.44	0.49	0.46	-0.21	-11.28	13.73
		51	13.44	-0.49	-0.46	0.21	5.79	-7.86
	107	5	-18.44	0.53	0.73	-0.23	-15.39	14.80
		51	18.44	-0.53	-0.73	0.23	6.69	-8.47
	108	5	-21.86	0.53	0.91	-0.23	-18.13	14.95
		51	21.86	-0.53	-0.91	0.23	7.18	-8.57

MEMBER END FORCES STRUCTURE TYPE = SPACE

ALL UNITS ARE -- KIP FEET (LOCAL)

MEMBER	LOAD	JT	AXIAL	SHEAR-Y	SHEAR-Z	TORSION	MOM-Y	MOM-Z
	109	5	-23.70	0.51	1.02	-0.20	-19.58	14.34
		51	23.70	-0.51	-1.02	0.20	7.32	-8.24
	110	5	-23.93	0.47	1.06	-0.16	-19.77	13.13
		51	23.93	-0.47	-1.06	0.16	7.12	-7.56
	111	5	-22.68	0.40	1.02	-0.11	-18.82	11.44
		51	22.68	-0.40	-1.02	0.11	6.64	-6.60
	112	5	-20.11	0.33	0.91	-0.07	-16.79	9.45
		51	20.11	-0.33	-0.91	0.07	5.85	-5.46
	113	5	-16.47	0.26	0.76	-0.04	-13.85	7.26
		51	16.47	-0.26	-0.76	0.04	4.81	-4.21
	114	5	62.41	-0.66	-3.15	-0.28	50.20	-18.76
		51	-62.41	0.66	3.15	0.28	-12.47	10.86
	115	5	79.23	-0.62	-2.43	-0.26	39.18	-18.00
		51	-79.23	0.62	2.43	0.26	-10.04	10.57
	116	5	82.15	-0.69	-2.05	-0.25	33.10	-18.43
		51	-82.15	0.69	2.05	0.25	-8.53	10.21
	117	5	66.60	-0.66	-2.32	-0.22	36.58	-17.12
		51	-66.60	0.66	2.32	0.22	-8.84	9.20
	118	5	46.87	-0.50	-2.53	-0.20	39.19	-12.97
		51	-46.87	0.50	2.53	0.20	-8.85	7.02
	119	5	33.45	-0.28	-2.26	-0.18	33.92	-7.11
		51	-33.45	0.28	2.26	0.18	-6.82	3.81
	120	5	23.61	-0.04	-1.73	-0.18	24.56	-0.70
		51	-23.61	0.04	1.73	0.18	-3.80	0.19
	121	5	13.19	0.17	-1.13	-0.19	14.21	5.16
		51	-13.19	-0.17	1.13	0.19	-0.64	-3.12
	122	5	2.26	0.35	-0.54	-0.20	4.02	10.12
		51	-2.26	-0.35	0.54	0.20	2.45	-5.91
	123	5	-7.55	0.49	-0.01	-0.22	-4.78	14.02
		51	7.55	-0.49	0.01	0.22	4.91	-8.10
	124	5	-15.70	0.59	0.45	-0.23	-12.32	16.66
		51	15.70	-0.59	-0.45	0.23	6.95	-9.59
	125	5	-21.90	0.65	0.80	-0.24	-17.88	18.25
		51	21.90	-0.65	-0.80	0.24	8.29	-10.49
	126	5	-26.13	0.66	1.05	-0.24	-21.71	18.61
		51	26.13	-0.66	-1.05	0.24	9.10	-10.69
	127	5	-28.35	0.64	1.20	-0.23	-23.67	18.12
		51	28.35	-0.64	-1.20	0.23	9.33	-10.41
	128	5	-28.51	0.59	1.24	-0.20	-23.81	16.76
		51	28.51	-0.59	-1.24	0.20	9.00	-9.64
	129	5	-26.99	0.52	1.19	-0.16	-22.52	14.79
		51	26.99	-0.52	-1.19	0.16	8.27	-8.52
	130	5	-24.12	0.44	1.07	-0.12	-20.07	12.48
		51	24.12	-0.44	-1.07	0.12	7.22	-7.20
	131	5	-20.43	0.35	0.92	-0.07	-17.04	10.01
		51	20.43	-0.35	-0.92	0.07	6.06	-5.78
	132	5	-16.73	0.27	0.76	-0.04	-14.03	7.81
		51	16.73	-0.27	-0.76	0.04	4.95	-4.52

MEMBER END FORCES STRUCTURE TYPE = SPACE

ALL UNITS ARE -- KIP FEET (LOCAL)

MEMBER	LOAD	JT	AXIAL	SHEAR-Y	SHEAR-Z	TORSION	MOM-Y	MOM-Z
	133	5	-12.81	0.20	0.59	0.00	-10.99	5.66
		51	12.81	-0.20	-0.59	0.00	3.93	-3.28
53	3	9	28.83	-0.13	-2.05	-0.65	3.51	-2.10
		55	-28.83	0.13	2.05	0.65	11.93	1.11
	4	9	33.05	-0.41	-2.23	-0.77	4.96	-6.88
		55	-33.05	0.41	2.23	0.77	11.80	3.80
	5	9	50.46	-1.07	-1.00	-0.90	-2.49	-17.44
		55	-50.46	1.07	1.00	0.90	10.03	9.42
	6	9	39.50	-1.27	-2.78	-0.64	12.09	-20.59
		55	-39.50	1.27	2.78	0.64	8.83	11.03
	7	9	40.36	-0.70	-2.84	-0.53	8.82	-11.34
		55	-40.36	0.70	2.84	0.53	12.50	6.07
	8	9	39.57	-0.08	-2.40	-0.67	3.10	-1.27
		55	-39.57	0.08	2.40	0.67	14.90	0.64
	9	9	37.78	0.35	-2.01	-0.87	0.16	5.72
		55	-37.78	-0.35	2.01	0.87	14.95	-3.13
	10	9	35.77	0.53	-1.75	-0.95	-0.81	8.69
		55	-35.77	-0.53	1.75	0.95	13.96	-4.72
	11	9	33.79	0.48	-1.59	-0.91	-0.80	7.97
		55	-33.79	-0.48	1.59	0.91	12.78	-4.33
	12	9	32.02	0.28	-1.54	-0.81	-0.08	4.67
		55	-32.02	-0.28	1.54	0.81	11.63	-2.55
	13	9	30.67	0.03	-1.56	-0.70	1.13	0.48
		55	-30.67	-0.03	1.56	0.70	10.58	-0.28
	14	9	6.96	-0.51	-0.98	-0.44	5.00	-8.81
		55	-6.96	0.51	0.98	0.44	2.36	4.95
	15	9	19.11	-1.03	-0.25	-0.60	1.65	-17.46
		55	-19.11	1.03	0.25	0.60	0.26	9.75
	16	9	33.38	-1.65	0.62	-0.70	-2.06	-27.88
		55	-33.38	1.65	-0.62	0.70	-2.61	15.45
	17	9	43.82	-2.39	0.93	-0.65	-1.54	-39.16
		55	-43.82	2.39	-0.93	0.65	-5.42	21.20
	18	9	45.44	-2.84	0.20	-0.42	6.03	-46.35
		55	-45.44	2.84	-0.20	0.42	-7.51	24.99
	19	9	38.30	-3.01	-1.43	-0.08	18.17	-48.20
		55	-38.30	3.01	1.43	0.08	-7.42	25.59
	20	9	29.93	-2.60	-3.08	0.28	27.83	-41.94
		55	-29.93	2.60	3.08	-0.28	-4.70	22.41
	21	9	27.03	-1.90	-3.65	0.47	27.55	-30.93
		55	-27.03	1.90	3.65	-0.47	-0.14	16.64
	22	9	28.17	-1.11	-3.39	0.49	19.92	-18.01
		55	-28.17	1.11	3.39	-0.49	5.52	9.66
	23	9	28.67	-0.33	-2.83	0.35	11.32	-5.28
		55	-28.67	0.33	2.83	-0.35	9.97	2.76
	24	9	27.08	0.35	-2.25	0.10	4.06	5.92
		55	-27.08	-0.35	2.25	-0.10	12.82	-3.27

MEMBER END FORCES STRUCTURE TYPE = SPACE

ALL UNITS ARE -- KIP FEET (LOCAL)

MEMBER	LOAD	JT	AXIAL	SHEAR-Y	SHEAR-Z	TORSION	MOM-Y	MOM-Z
	25	9	24.67	0.93	-1.70	-0.19	-1.45	15.26
		55	-24.67	-0.93	1.70	0.19	14.21	-8.30
	26	9	22.23	1.37	-1.23	-0.44	-5.04	22.47
		55	-22.23	-1.37	1.23	0.44	14.29	-12.18
	27	9	19.71	1.66	-0.83	-0.64	-7.37	27.24
		55	-19.71	-1.66	0.83	0.64	13.62	-14.75
	28	9	17.14	1.83	-0.52	-0.75	-8.58	30.00
		55	-17.14	-1.83	0.52	0.75	12.48	-16.23
	29	9	14.52	1.86	-0.27	-0.78	-9.06	30.41
		55	-14.52	-1.86	0.27	0.78	11.08	-16.45
	30	9	12.00	1.78	-0.08	-0.75	-8.99	29.16
		55	-12.00	-1.78	0.08	0.75	9.60	-15.77
	31	9	9.57	1.60	0.05	-0.67	-8.41	26.22
		55	-9.57	-1.60	-0.05	0.67	8.06	-14.18
	32	9	7.32	1.36	0.12	-0.56	-7.41	22.21
		55	-7.32	-1.36	-0.12	0.56	6.52	-12.01
	33	9	5.28	1.06	0.14	-0.44	-6.03	17.41
		55	-5.28	-1.06	-0.14	0.44	4.98	-9.41
	34	9	-2.44	-0.07	-1.07	-0.16	5.17	-1.04
		55	2.44	0.07	1.07	0.16	2.86	0.53
	35	9	-0.73	-0.27	-1.19	-0.29	6.89	-4.45
		55	0.73	0.27	1.19	0.29	2.04	2.43
	36	9	9.66	-0.55	-0.49	-0.43	3.05	-9.78
		55	-9.66	0.55	0.49	0.43	0.64	5.63
	37	9	28.60	-1.02	1.17	-0.58	-7.10	-18.21
		55	-28.60	1.02	-1.17	0.58	-1.69	10.51
	38	9	40.07	-1.79	1.92	-0.59	-10.25	-29.18
		55	-40.07	1.79	-1.92	0.59	-4.20	15.76
	39	9	32.99	-2.30	0.37	-0.33	3.59	-36.30
		55	-32.99	2.30	-0.37	0.33	-6.35	19.02
	40	9	19.89	-2.22	-1.78	0.03	20.39	-35.71
		55	-19.89	2.22	1.78	-0.03	-6.98	19.06
	41	9	15.84	-1.81	-2.68	0.28	24.34	-29.63
		55	-15.84	1.81	2.68	-0.28	-4.24	16.00
	42	9	18.67	-1.27	-2.65	0.42	19.37	-20.60
		55	-18.67	1.27	2.65	-0.42	0.52	11.10
	43	9	20.46	-0.70	-2.30	0.40	12.78	-11.27
		55	-20.46	0.70	2.30	-0.40	4.49	6.01
	44	9	19.62	-0.17	-1.86	0.26	6.34	-2.56
		55	-19.62	0.17	1.86	-0.26	7.65	1.32
	45	9	18.00	0.31	-1.46	0.07	1.59	5.20
		55	-18.00	-0.31	1.46	-0.07	9.36	-2.86
	46	9	16.43	0.69	-1.08	-0.15	-1.82	11.37
		55	-16.43	-0.69	1.08	0.15	9.97	-6.18
	47	9	14.86	0.99	-0.77	-0.34	-4.07	16.23
		55	-14.86	-0.99	0.77	0.34	9.86	-8.79
	48	9	13.15	1.19	-0.52	-0.47	-5.35	19.42
		55	-13.15	-1.19	0.52	0.47	9.24	-10.51

MEMBER END FORCES STRUCTURE TYPE = SPACE

ALL UNITS ARE -- KIP FEET (LOCAL)

MEMBER	LOAD	JT	AXIAL	SHEAR-Y	SHEAR-Z	TORSION	MOM-Y	MOM-Z
	49	9	11.36	1.28	-0.31	-0.54	-6.03	20.99
		55	-11.36	-1.28	0.31	0.54	8.36	-11.36
	50	9	9.61	1.30	-0.15	-0.55	-6.30	21.20
		55	-9.61	-1.30	0.15	0.55	7.39	-11.46
	51	9	7.89	1.23	-0.02	-0.52	-6.21	20.10
		55	-7.89	-1.23	0.02	0.52	6.39	-10.87
	52	9	6.27	1.10	0.06	-0.46	-5.83	18.02
		55	-6.27	-1.10	-0.06	0.46	5.37	-9.75
	53	9	4.73	0.92	0.11	-0.38	-5.12	15.06
		55	-4.73	-0.92	-0.11	0.38	4.33	-8.14
	54	9	-1.11	-0.07	-0.66	-0.11	3.29	-1.07
		55	1.11	0.07	0.66	0.11	1.65	0.57
	55	9	1.33	-0.21	-0.61	-0.20	3.47	-3.51
		55	-1.33	0.21	0.61	0.20	1.09	1.97
	56	9	8.45	-0.41	-0.08	-0.29	0.53	-7.23
		55	-8.45	0.41	0.08	0.29	0.08	4.14
	57	9	18.36	-0.75	0.72	-0.35	-4.08	-12.76
		55	-18.36	0.75	-0.72	0.35	-1.31	7.15
	58	9	23.21	-1.13	0.90	-0.32	-3.89	-18.55
		55	-23.21	1.13	-0.90	0.32	-2.86	10.04
	59	9	19.18	-1.40	0.01	-0.16	3.87	-22.23
		55	-19.18	1.40	-0.01	0.16	-3.91	11.71
	60	9	12.68	-1.33	-1.13	0.04	12.33	-21.38
		55	-12.68	1.33	1.13	-0.04	-3.83	11.40
	61	9	10.43	-1.07	-1.63	0.18	14.33	-17.41
		55	-10.43	1.07	1.63	-0.18	-2.07	9.39
	62	9	11.67	-0.73	-1.61	0.25	11.39	-11.87
		55	-11.67	0.73	1.61	-0.25	0.69	6.39
	63	9	12.58	-0.38	-1.39	0.23	7.30	-6.11
		55	-12.58	0.38	1.39	-0.23	3.11	3.26
	64	9	12.08	-0.05	-1.12	0.14	3.56	-0.80
		55	-12.08	0.05	1.12	-0.14	4.88	0.39
	65	9	11.08	0.23	-0.87	0.02	0.67	3.84
		55	-11.08	-0.23	0.87	-0.02	5.88	-2.10
	66	9	10.10	0.46	-0.65	-0.11	-1.32	7.59
		55	-10.10	-0.46	0.65	0.11	6.18	-4.12
	67	9	9.09	0.63	-0.46	-0.23	-2.65	10.38
		55	-9.09	-0.63	0.46	0.23	6.07	-5.62
	68	9	8.02	0.75	-0.30	-0.30	-3.39	12.24
		55	-8.02	-0.75	0.30	0.30	5.67	-6.62
	69	9	6.91	0.80	-0.18	-0.34	-3.78	13.06
		55	-6.91	-0.80	0.18	0.34	5.11	-7.06
	70	9	5.82	0.80	-0.08	-0.34	-3.91	13.06
		55	-5.82	-0.80	0.08	0.34	4.51	-7.06
	71	9	4.76	0.75	-0.01	-0.32	-3.82	12.27
		55	-4.76	-0.75	0.01	0.32	3.88	-6.64
	72	9	3.75	0.67	0.04	-0.28	-3.55	10.89
		55	-3.75	-0.67	-0.04	0.28	3.24	-5.89

MEMBER END FORCES STRUCTURE TYPE = SPACE

ALL UNITS ARE -- KIP FEET (LOCAL)

MEMBER	LOAD	JT	AXIAL	SHEAR-Y	SHEAR-Z	TORSION	MOM-Y	MOM-Z
	73	9	2.81	0.55	0.06	-0.23	-3.07	9.00
		55	-2.81	-0.55	-0.06	0.23	2.59	-4.87
	74	9	-0.83	-0.15	-1.00	-0.21	5.13	-2.54
		55	0.83	0.15	1.00	0.21	2.35	1.39
	75	9	4.69	-0.39	-0.72	-0.34	4.15	-6.74
		55	-4.69	0.39	0.72	0.34	1.28	3.82
	76	9	16.41	-0.75	0.14	-0.46	-0.72	-13.08
		55	-16.41	0.75	-0.14	0.46	-0.37	7.43
	77	9	29.79	-1.28	1.15	-0.53	-6.02	-21.59
		55	-29.79	1.28	-1.15	0.53	-2.59	12.00
	78	9	34.48	-1.84	1.10	-0.44	-3.48	-29.91
		55	-34.48	1.84	-1.10	0.44	-4.76	16.05
	79	9	27.31	-2.13	-0.37	-0.18	8.74	-33.89
		55	-27.31	2.13	0.37	0.18	-5.97	17.88
	80	9	18.39	-1.94	-1.95	0.12	19.94	-31.40
		55	-18.39	1.94	1.95	-0.12	-5.29	16.80
	81	9	16.29	-1.52	-2.51	0.31	21.11	-24.72
		55	-16.29	1.52	2.51	-0.31	-2.24	13.33
	82	9	18.28	-0.99	-2.38	0.38	15.91	-16.08
		55	-18.28	0.99	2.38	-0.38	2.01	8.64
	83	9	19.16	-0.46	-2.03	0.33	9.84	-7.40
		55	-19.16	0.46	2.03	-0.33	5.41	3.93
	84	9	18.16	0.02	-1.63	0.17	4.33	0.47
		55	-18.16	-0.02	1.63	-0.17	7.88	-0.31
	85	9	16.63	0.44	-1.25	-0.02	0.28	7.30
		55	-16.63	-0.44	1.25	0.02	9.13	-3.98
	86	9	15.11	0.77	-0.92	-0.22	-2.53	12.67
		55	-15.11	-0.77	0.92	0.22	9.45	-6.87
	87	9	13.55	1.01	-0.64	-0.37	-4.34	16.63
		55	-13.55	-1.01	0.64	0.37	9.17	-9.01
	88	9	11.89	1.17	-0.42	-0.47	-5.35	19.09
		55	-11.89	-1.17	0.42	0.47	8.49	-10.33
	89	9	10.19	1.22	-0.24	-0.52	-5.85	20.04
		55	-10.19	-1.22	0.24	0.52	7.62	-10.84
	90	9	8.53	1.21	-0.10	-0.51	-5.97	19.77
		55	-8.53	-1.21	0.10	0.51	6.68	-10.69
	91	9	6.92	1.12	0.01	-0.47	-5.77	18.32
		55	-6.92	-1.12	-0.01	0.47	5.71	-9.91
	92	9	5.41	0.98	0.07	-0.41	-5.27	16.03
		55	-5.41	-0.98	-0.07	0.41	4.73	-8.67
	93	9	4.00	0.79	0.10	-0.33	-4.47	13.00
		55	-4.00	-0.79	-0.10	0.33	3.72	-7.03
	94	9	0.95	-0.25	-1.07	-0.28	5.60	-4.31
		55	-0.95	0.25	1.07	0.28	2.44	2.41
	95	9	9.20	-0.57	-0.57	-0.43	3.29	-9.90
		55	-9.20	0.57	0.57	0.43	0.98	5.61
	96	9	23.14	-1.06	0.45	-0.56	-2.27	-18.15
		55	-23.14	1.06	-0.45	0.56	-1.09	10.15

MEMBER END FORCES   STRUCTURE TYPE = SPACE

ALL UNITS ARE -- KIP FEET   (LOCAL)

MEMBER	LOAD	JT	AXIAL	SHEAR-Y	SHEAR-Z	TORSION	MOM-Y	MOM-Z
	97	9	36.19	-1.65	1.30	-0.59	-6.03	-27.70
		55	-36.19	1.65	-1.30	0.59	-3.74	15.29
	98	9	38.37	-2.25	0.86	-0.44	-0.48	-36.32
		55	-38.37	2.25	-0.86	0.44	-5.95	19.39
	99	9	29.53	-2.44	-0.90	-0.12	13.52	-38.99
		55	-29.53	2.44	0.90	0.12	-6.73	20.63
	100	9	20.92	-2.15	-2.46	0.20	23.78	-34.79
		55	-20.92	2.15	2.46	-0.20	-5.28	18.64
	101	9	19.62	-1.62	-2.91	0.38	23.21	-26.37
		55	-19.62	1.62	2.91	-0.38	-1.34	14.21
	102	9	21.72	-1.00	-2.69	0.43	16.80	-16.19
		55	-21.72	1.00	2.69	-0.43	3.41	8.69
	103	9	22.20	-0.39	-2.26	0.33	9.90	-6.25
		55	-22.20	0.39	2.26	-0.33	7.09	3.30
	104	9	20.85	0.15	-1.79	0.14	3.82	2.65
		55	-20.85	-0.15	1.79	-0.14	9.65	-1.49
	105	9	19.05	0.62	-1.37	-0.08	-0.52	10.26
		55	-19.05	-0.62	1.37	0.08	10.82	-5.58
	106	9	17.24	0.98	-0.99	-0.30	-3.53	16.07
		55	-17.24	-0.98	0.99	0.30	11.00	-8.71
	107	9	15.39	1.24	-0.68	-0.47	-5.41	20.30
		55	-15.39	-1.24	0.68	0.47	10.55	-10.99
	108	9	13.43	1.39	-0.43	-0.57	-6.43	22.69
		55	-13.43	-1.39	0.43	0.57	9.69	-12.28
	109	9	11.45	1.43	-0.23	-0.61	-6.90	23.44
		55	-11.45	-1.43	0.23	0.61	8.65	-12.68
	110	9	9.52	1.39	-0.08	-0.59	-6.94	22.75
		55	-9.52	-1.39	0.08	0.59	7.54	-12.30
	111	9	7.66	1.27	0.03	-0.53	-6.61	20.79
		55	-7.66	-1.27	-0.03	0.53	6.40	-11.24
	112	9	5.91	1.09	0.09	-0.45	-5.94	17.88
		55	-5.91	-1.09	-0.09	0.45	5.24	-9.67
	113	9	4.31	0.87	0.12	-0.36	-4.93	14.23
		55	-4.31	-0.87	-0.12	0.36	4.05	-7.69
	114	9	28.45	-2.12	-0.61	-0.38	8.09	-33.73
		55	-28.45	2.12	0.61	0.38	-3.53	17.79
	115	9	20.54	-2.20	-2.35	-0.16	21.69	-35.36
		55	-20.54	2.20	2.35	0.16	-4.00	18.85
	116	9	23.22	-2.03	-2.75	-0.05	23.47	-33.57
		55	-23.22	2.03	2.75	0.05	-2.78	18.33
	117	9	37.73	-1.86	-1.61	-0.05	12.48	-31.35
		55	-37.73	1.86	1.61	0.05	-0.36	17.39
	118	9	47.41	-1.87	-0.77	-0.07	4.22	-30.36
		55	-47.41	1.87	0.77	0.07	1.55	16.33
	119	9	41.88	-1.74	-1.48	-0.02	8.38	-27.34
		55	-41.88	1.74	1.48	0.02	2.72	14.29
	120	9	31.12	-1.24	-2.61	0.05	15.73	-19.80
		55	-31.12	1.24	2.61	-0.05	3.91	10.49

MEMBER END FORCES   STRUCTURE TYPE = SPACE

ALL UNITS ARE -- KIP FEET   (LOCAL)

MEMBER	LOAD	JT	AXIAL	SHEAR-Y	SHEAR-Z	TORSION	MOM-Y	MOM-Z
	121	9	26.72	-0.60	-2.91	0.04	15.46	-9.71
		55	-26.72	0.60	2.91	-0.04	6.38	5.21
	122	9	27.18	0.05	-2.59	-0.03	9.82	0.97
		55	-27.18	-0.05	2.59	0.03	9.62	-0.57
	123	9	26.83	0.63	-2.10	-0.16	3.95	10.51
		55	-26.83	-0.63	2.10	0.16	11.87	-5.75
	124	9	24.54	1.09	-1.60	-0.32	-1.23	17.98
		55	-24.54	-1.09	1.60	0.32	13.27	-9.77
	125	9	21.73	1.44	-1.16	-0.46	-4.82	23.56
		55	-21.73	-1.44	1.16	0.46	13.57	-12.77
	126	9	18.99	1.63	-0.79	-0.59	-7.11	26.77
		55	-18.99	-1.63	0.79	0.59	13.03	-14.49
	127	9	16.34	1.72	-0.49	-0.67	-8.29	28.15
		55	-16.34	-1.72	0.49	0.67	11.97	-15.23
	128	9	13.68	1.68	-0.27	-0.68	-8.47	27.57
		55	-13.68	-1.68	0.27	0.68	10.53	-14.92
	129	9	11.13	1.55	-0.12	-0.65	-8.00	25.43
		55	-11.13	-1.55	0.12	0.65	8.91	-13.76
	130	9	8.79	1.36	-0.02	-0.57	-7.10	22.25
		55	-8.79	-1.36	0.02	0.57	7.28	-12.03
	131	9	6.69	1.13	0.03	-0.47	-6.02	18.41
		55	-6.69	-1.13	-0.03	0.47	5.77	-9.96
	132	9	4.96	0.90	0.07	-0.37	-4.97	14.77
		55	-4.96	-0.90	-0.07	0.37	4.47	-7.99
	133	9	3.47	0.67	0.08	-0.27	-3.95	11.03
		55	-3.47	-0.67	-0.08	0.27	3.37	-5.97
57	3	13	24.01	-0.60	-1.54	-0.69	-11.59	-5.76
		59	-24.01	0.60	1.54	0.69	18.49	3.06
	4	13	24.38	-0.76	-1.74	-0.82	-11.73	-7.11
		59	-24.38	0.76	1.74	0.82	19.50	3.74
	5	13	25.91	-1.15	-1.60	-1.08	-9.09	-10.97
		59	-25.91	1.15	1.60	1.08	16.25	5.85
	6	13	41.73	-2.48	0.82	-1.02	-15.13	-23.57
		59	-41.73	2.48	-0.82	1.02	11.47	12.50
	7	13	31.40	-2.76	-2.53	-0.49	-6.51	-26.21
		59	-31.40	2.76	2.53	0.49	17.81	13.87
	8	13	33.31	-1.50	-2.82	-0.51	-12.16	-14.31
		59	-33.31	1.50	2.82	0.51	24.76	7.59
	9	13	33.14	-0.38	-2.56	-0.82	-14.40	-3.61
		59	-33.14	0.38	2.56	0.82	25.85	1.93
	10	13	31.84	0.25	-2.40	-1.02	-13.25	2.38
		59	-31.84	-0.25	2.40	1.02	23.95	-1.24
	11	13	30.01	0.37	-2.20	-1.03	-11.68	3.47
		59	-30.01	-0.37	2.20	1.03	21.50	-1.82
	12	13	27.83	0.10	-1.94	-0.93	-10.47	0.89
		59	-27.83	-0.10	1.94	0.93	19.12	-0.45

MEMBER END FORCES STRUCTURE TYPE = SPACE

ALL UNITS ARE -- KIP FEET (LOCAL)

MEMBER	LOAD	JT	AXIAL	SHEAR-Y	SHEAR-Z	TORSION	MOM-Y	MOM-Z
	13	13	25.81	-0.36	-1.67	-0.79	-9.62	-3.40
		59	-25.81	0.36	1.67	0.79	17.10	1.81
	14	13	-0.90	-0.06	-0.61	-0.43	-3.48	-0.41
		59	0.90	0.06	0.61	0.43	6.19	0.15
	15	13	0.03	-0.35	-0.55	-0.70	-1.34	-3.18
		59	-0.03	0.35	0.55	0.70	3.80	1.63
	16	13	3.63	-0.85	0.14	-0.98	0.48	-8.11
		59	-3.63	0.85	-0.14	0.98	-1.12	4.33
	17	13	11.84	-1.69	1.65	-1.16	0.26	-16.42
		59	-11.84	1.69	-1.65	1.16	-7.63	8.85
	18	13	23.47	-2.82	3.60	-1.12	-1.74	-27.63
		59	-23.47	2.82	-3.60	1.12	-14.35	15.01
	19	13	33.86	-4.33	4.67	-0.81	-3.55	-41.10
		59	-33.86	4.33	-4.67	0.81	-17.33	21.77
	20	13	37.17	-5.26	3.87	-0.21	-2.19	-50.15
		59	-37.17	5.26	-3.87	0.21	-15.12	26.64
	21	13	32.16	-5.71	1.17	0.40	2.19	-53.30
		59	-32.16	5.71	-1.17	-0.40	-7.41	27.79
	22	13	24.54	-4.94	-2.09	0.89	5.11	-46.43
		59	-24.54	4.94	2.09	-0.89	4.21	24.35
	23	13	21.45	-3.48	-3.82	1.04	2.31	-33.17
		59	-21.45	3.48	3.82	-1.04	14.76	17.62
	24	13	23.23	-1.89	-3.94	0.84	-5.04	-18.07
		59	-23.23	1.89	3.94	-0.84	22.65	9.63
	25	13	25.11	-0.39	-3.52	0.46	-11.42	-3.69
		59	-25.11	0.39	3.52	-0.46	27.14	1.96
	26	13	24.61	0.87	-3.15	0.03	-14.02	8.25
		59	-24.61	-0.87	3.15	-0.03	28.09	-4.37
	27	13	22.87	1.80	-2.83	-0.37	-14.24	17.04
		59	-22.87	-1.80	2.83	0.37	26.88	-9.00
	28	13	20.95	2.47	-2.58	-0.64	-12.94	23.42
		59	-20.95	-2.47	2.58	0.64	24.47	-12.37
	29	13	18.80	2.80	-2.34	-0.80	-10.88	26.56
		59	-18.80	-2.80	2.34	0.80	21.32	-14.04
	30	13	16.40	2.90	-2.07	-0.85	-8.84	27.47
		59	-16.40	-2.90	2.07	0.85	18.11	-14.52
	31	13	13.74	2.74	-1.78	-0.82	-6.86	25.97
		59	-13.74	-2.74	1.78	0.82	14.82	-13.73
	32	13	11.00	2.41	-1.46	-0.73	-5.14	22.86
		59	-11.00	-2.41	1.46	0.73	11.68	-12.08
	33	13	8.28	1.94	-1.13	-0.59	-3.64	18.40
		59	-8.28	-1.94	1.13	0.59	8.69	-9.73
	34	13	-0.44	0.11	-0.24	-0.11	-3.93	1.03
		59	0.44	-0.11	0.24	0.11	5.01	-0.55
	35	13	0.01	0.00	-0.43	-0.25	-3.45	0.11
		59	-0.01	0.00	0.43	0.25	5.39	-0.09
	36	13	-1.04	-0.15	-0.69	-0.45	-1.14	-1.19
		59	1.04	0.15	0.69	0.45	4.21	0.52

MEMBER END FORCES STRUCTURE TYPE = SPACE

ALL UNITS ARE -- KIP FEET (LOCAL)

MEMBER	LOAD	JT	AXIAL	SHEAR-Y	SHEAR-Z	TORSION	MOM-Y	MOM-Z
	37	13	-2.40	-0.39	-0.76	-0.72	3.02	-3.38
		59	2.40	0.39	0.76	0.72	0.36	1.63
	38	13	3.05	-0.83	0.33	-0.92	3.68	-8.16
		59	-3.05	0.83	-0.33	0.92	-5.14	4.45
	39	13	19.10	-1.66	3.36	-0.93	-3.07	-17.29
		59	-19.10	1.66	-3.36	0.93	-11.92	9.88
	40	13	32.80	-3.13	5.60	-0.70	-8.67	-30.28
		59	-32.80	3.13	-5.60	0.70	-16.35	16.30
	41	13	29.52	-4.41	3.63	-0.16	-2.99	-40.35
		59	-29.52	4.41	-3.63	0.16	-13.21	20.65
	42	13	16.78	-4.31	-0.49	0.50	7.25	-40.32
		59	-16.78	4.31	0.49	-0.50	-5.04	21.04
	43	13	11.24	-3.45	-2.69	0.82	8.36	-33.03
		59	-11.24	3.45	2.69	-0.82	3.66	17.60
	44	13	14.26	-2.30	-2.93	0.83	0.96	-22.01
		59	-14.26	2.30	2.93	-0.83	12.14	11.74
	45	13	17.46	-1.11	-2.62	0.63	-5.66	-10.48
		59	-17.46	1.11	2.62	-0.63	17.37	5.54
	46	13	17.55	-0.11	-2.29	0.29	-9.25	-1.00
		59	-17.55	0.11	2.29	-0.29	19.49	0.52
	47	13	16.42	0.75	-2.04	-0.04	-10.54	7.06
		59	-16.42	-0.75	2.04	0.04	19.66	-3.73
	48	13	15.29	1.38	-1.87	-0.31	-10.01	13.09
		59	-15.29	-1.38	1.87	0.31	18.37	-6.91
	49	13	14.10	1.79	-1.72	-0.50	-8.69	16.96
		59	-14.10	-1.79	1.72	0.50	16.38	-8.96
	50	13	12.66	2.01	-1.57	-0.59	-7.21	19.04
		59	-12.66	-2.01	1.57	0.59	14.22	-10.06
	51	13	10.98	2.04	-1.40	-0.61	-5.72	19.29
		59	-10.98	-2.04	1.40	0.61	11.97	-10.20
	52	13	9.18	1.92	-1.20	-0.57	-4.44	18.18
		59	-9.18	-1.92	1.20	0.57	9.80	-9.61
	53	13	7.28	1.66	-0.98	-0.50	-3.30	15.74
		59	-7.28	-1.66	0.98	0.50	7.66	-8.32
	54	13	-0.26	0.05	-0.18	-0.09	-2.33	0.53
		59	0.26	-0.05	0.18	0.09	3.12	-0.29
	55	13	-0.22	-0.02	-0.30	-0.18	-1.78	-0.10
		59	0.22	0.02	0.30	0.18	3.14	0.02
	56	13	-0.74	-0.13	-0.42	-0.31	-0.18	-1.05
		59	0.74	0.13	0.42	0.31	2.04	0.49
	57	13	-0.36	-0.31	-0.27	-0.46	1.64	-2.82
		59	0.36	0.31	0.27	0.46	-0.43	1.45
	58	13	4.25	-0.64	0.66	-0.57	1.13	-6.39
		59	-4.25	0.64	-0.66	0.57	-4.08	3.53
	59	13	12.98	-1.24	2.22	-0.54	-2.24	-12.44
		59	-12.98	1.24	-2.22	0.54	-7.69	6.89
	60	13	18.98	-2.03	3.00	-0.36	-4.01	-19.57
		59	-18.98	2.03	-3.00	0.36	-9.38	10.48

MEMBER END FORCES STRUCTURE TYPE = SPACE

ALL UNITS ARE -- KIP FEET (LOCAL)

MEMBER	LOAD	JT	AXIAL	SHEAR-Y	SHEAR-Z	TORSION	MOM-Y	MOM-Z
	61	13	16.84	-2.67	1.78	-0.03	-0.76	-24.67
		59	-16.84	2.67	-1.78	0.03	-7.18	12.73
	62	13	10.58	-2.57	-0.38	0.32	3.90	-24.06
		59	-10.58	2.57	0.38	-0.32	-2.20	12.56
	63	13	7.69	-2.02	-1.63	0.50	4.10	-19.27
		59	-7.69	2.02	1.63	-0.50	3.18	10.25
	64	13	9.11	-1.31	-1.79	0.49	0.09	-12.51
		59	-9.11	1.31	1.79	-0.49	7.92	6.67
	65	13	10.77	-0.59	-1.60	0.35	-3.81	-5.63
		59	-10.77	0.59	1.60	-0.35	10.96	2.98
	66	13	10.82	0.02	-1.41	0.15	-5.80	0.23
		59	-10.82	-0.02	1.41	-0.15	12.11	-0.13
	67	13	10.14	0.52	-1.26	-0.05	-6.44	4.92
		59	-10.14	-0.52	1.26	0.05	12.07	-2.60
	68	13	9.42	0.90	-1.15	-0.21	-6.09	8.52
		59	-9.42	-0.90	1.15	0.21	11.24	-4.50
	69	13	8.64	1.13	-1.06	-0.32	-5.26	10.71
		59	-8.64	-1.13	1.06	0.32	9.98	-5.66
	70	13	7.72	1.25	-0.96	-0.36	-4.35	11.84
		59	-7.72	-1.25	0.96	0.36	8.64	-6.26
	71	13	6.66	1.25	-0.85	-0.37	-3.45	11.86
		59	-6.66	-1.25	0.85	0.37	7.24	-6.27
	72	13	5.52	1.16	-0.72	-0.35	-2.66	11.03
		59	-5.52	-1.16	0.72	0.35	5.89	-5.83
	73	13	4.34	0.99	-0.58	-0.30	-1.96	9.43
		59	-4.34	-0.99	0.58	0.30	4.56	-4.99
	74	13	-0.38	0.06	-0.32	-0.17	-3.40	0.58
		59	0.38	-0.06	0.32	0.17	4.81	-0.33
	75	13	-0.57	-0.07	-0.51	-0.33	-2.09	-0.48
		59	0.57	0.07	0.51	0.33	4.39	0.19
	76	13	-0.97	-0.26	-0.59	-0.53	0.33	-2.26
		59	0.97	0.26	0.59	0.53	2.28	1.10
	77	13	1.23	-0.59	-0.05	-0.75	2.23	-5.63
		59	-1.23	0.59	0.05	0.75	-2.02	2.99
	78	13	9.48	-1.19	1.53	-0.86	0.67	-11.94
		59	-9.48	1.19	-1.53	0.86	-7.52	6.60
	79	13	21.92	-2.21	3.65	-0.77	-3.93	-21.74
		59	-21.92	2.21	-3.65	0.77	-12.36	11.87
	80	13	28.67	-3.35	4.24	-0.43	-5.20	-31.88
		59	-28.67	3.35	-4.24	0.43	-13.73	16.92
	81	13	23.80	-4.09	2.01	0.07	0.35	-37.77
		59	-23.80	4.09	-2.01	-0.07	-9.34	19.50
	82	13	15.00	-3.75	-1.10	0.57	6.23	-35.24
		59	-15.00	3.75	1.10	-0.57	-1.31	18.48
	83	13	12.15	-2.84	-2.59	0.77	5.01	-27.11
		59	-12.15	2.84	2.59	-0.77	6.58	14.44
	84	13	14.57	-1.75	-2.68	0.70	-1.37	-16.72
		59	-14.57	1.75	2.68	-0.70	13.35	8.91

MEMBER END FORCES STRUCTURE TYPE = SPACE

ALL UNITS ARE -- KIP FEET (LOCAL)

MEMBER	LOAD	JT	AXIAL	SHEAR-Y	SHEAR-Z	TORSION	MOM-Y	MOM-Z
	85	13	16.59	-0.68	-2.39	0.47	-6.60	-6.43
		59	-16.59	0.68	2.39	-0.47	17.26	3.40
	86	13	16.37	0.22	-2.11	0.15	-9.16	2.06
		59	-16.37	-0.22	2.11	-0.15	18.57	-1.10
	87	13	15.28	0.94	-1.89	-0.14	-9.78	8.91
		59	-15.28	-0.94	1.89	0.14	18.23	-4.71
	88	13	14.15	1.47	-1.73	-0.36	-9.05	13.91
		59	-14.15	-1.47	1.73	0.36	16.79	-7.35
	89	13	12.91	1.78	-1.59	-0.50	-7.73	16.87
		59	-12.91	-1.78	1.59	0.50	14.81	-8.91
	90	13	11.45	1.92	-1.43	-0.56	-6.34	18.20
		59	-11.45	-1.92	1.43	0.56	12.74	-9.62
	91	13	9.79	1.89	-1.26	-0.56	-4.99	17.88
		59	-9.79	-1.89	1.26	0.56	10.60	-9.45
	92	13	8.03	1.73	-1.06	-0.52	-3.82	16.35
		59	-8.03	-1.73	1.06	0.52	8.55	-8.64
	93	13	6.22	1.44	-0.84	-0.44	-2.77	13.69
		59	-6.22	-1.44	0.84	0.44	6.53	-7.24
	94	13	-0.56	0.03	-0.44	-0.25	-3.56	0.35
		59	0.56	-0.03	0.44	0.25	5.51	-0.23
	95	13	-0.80	-0.14	-0.62	-0.45	-1.67	-1.12
		59	0.80	0.14	0.62	0.45	4.46	0.51
	96	13	-0.32	-0.41	-0.51	-0.69	0.89	-3.72
		59	0.32	0.41	0.51	0.69	1.40	1.90
	97	13	4.16	-0.88	0.48	-0.91	2.01	-8.62
		59	-4.16	0.88	-0.48	0.91	-4.17	4.67
	98	13	14.84	-1.74	2.42	-0.98	-0.54	-17.17
		59	-14.84	1.74	-2.42	0.98	-10.27	9.38
	99	13	27.46	-2.90	4.38	-0.79	-4.74	-28.39
		59	-27.46	2.90	-4.38	0.79	-14.81	15.44
	100	13	32.20	-4.15	4.30	-0.35	-4.44	-39.19
		59	-32.20	4.15	-4.30	0.35	-14.77	20.64
	101	13	25.52	-4.70	1.46	0.23	1.95	-43.54
		59	-25.52	4.70	-1.46	-0.23	-8.47	22.55
	102	13	16.73	-4.12	-1.75	0.73	6.94	-38.85
		59	-16.73	4.12	1.75	-0.73	0.90	20.44
	103	13	14.88	-2.99	-3.09	0.88	4.06	-28.64
		59	-14.88	2.99	3.09	-0.88	9.73	15.26
	104	13	17.71	-1.72	-3.06	0.75	-3.24	-16.46
		59	-17.71	1.72	3.06	-0.75	16.89	8.76
	105	13	19.43	-0.51	-2.72	0.46	-8.52	-4.87
		59	-19.43	0.51	2.72	-0.46	20.67	2.57
	106	13	18.88	0.47	-2.40	0.09	-10.94	4.49
		59	-18.88	-0.47	2.40	-0.09	21.68	-2.38
	107	13	17.59	1.27	-2.17	-0.23	-11.26	12.03
		59	-17.59	-1.27	2.17	0.23	20.96	-6.35
	108	13	16.22	1.82	-1.99	-0.47	-10.21	17.21
		59	-16.22	-1.82	1.99	0.47	19.09	-9.09

MEMBER END FORCES STRUCTURE TYPE = SPACE

ALL UNITS ARE -- KIP FEET (LOCAL)

MEMBER	LOAD	JT	AXIAL	SHEAR-Y	SHEAR-Z	TORSION	MOM-Y	MOM-Z
	109	13	14.70	2.13	-1.81	-0.61	-8.65	20.21
		59	-14.70	-2.13	1.81	0.61	16.75	-10.68
	110	13	12.93	2.24	-1.63	-0.66	-7.03	21.25
		59	-12.93	-2.24	1.63	0.66	14.29	-11.23
	111	13	10.95	2.16	-1.41	-0.65	-5.49	20.51
		59	-10.95	-2.16	1.41	0.65	11.81	-10.84
	112	13	8.87	1.94	-1.18	-0.58	-4.16	18.37
		59	-8.87	-1.94	1.18	0.58	9.41	-9.71
	113	13	6.75	1.59	-0.92	-0.48	-2.97	15.05
		59	-6.75	-1.59	0.92	0.48	7.08	-7.96
	114	13	17.45	-1.87	2.71	-0.87	-4.88	-18.33
		59	-17.45	1.87	-2.71	0.87	-7.23	9.96
	115	13	26.69	-2.94	3.73	-0.69	-7.18	-28.52
		59	-26.69	2.94	-3.73	0.69	-9.50	15.38
	116	13	25.28	-4.02	2.35	-0.40	-2.67	-37.15
		59	-25.28	4.02	-2.35	0.40	-7.83	19.20
	117	13	16.17	-4.16	-0.70	-0.08	6.42	-38.54
		59	-16.17	4.16	0.70	0.08	-3.27	19.96
	118	13	14.63	-3.68	-2.06	0.07	8.43	-35.22
		59	-14.63	3.68	2.06	-0.07	0.78	18.77
	119	13	27.08	-3.22	-0.34	0.06	-1.50	-31.88
		59	-27.08	3.22	0.34	-0.06	3.02	17.47
	120	13	39.35	-3.18	1.50	0.04	-11.47	-30.62
		59	-39.35	3.18	-1.50	-0.04	4.77	16.41
	121	13	37.44	-3.14	0.38	0.13	-10.62	-28.70
		59	-37.44	3.14	-0.38	-0.13	8.91	14.68
	122	13	27.46	-2.31	-2.29	0.29	-4.54	-21.51
		59	-27.46	2.31	2.29	-0.29	14.78	11.18
	123	13	22.41	-1.11	-3.68	0.28	-3.38	-10.73
		59	-22.41	1.11	3.68	-0.28	19.82	5.78
	124	13	23.33	0.07	-3.70	0.12	-7.41	0.48
		59	-23.33	-0.07	3.70	-0.12	23.94	-0.17
	125	13	24.21	1.10	-3.33	-0.10	-10.74	10.47
		59	-24.21	-1.10	3.33	0.10	25.60	-5.54
	126	13	22.66	1.82	-2.93	-0.36	-11.90	17.26
		59	-22.66	-1.82	2.93	0.36	24.97	-9.14
	127	13	20.13	2.30	-2.56	-0.56	-11.59	21.79
		59	-20.13	-2.30	2.56	0.56	23.02	-11.51
	128	13	17.53	2.50	-2.22	-0.68	-10.13	23.68
		59	-17.53	-2.50	2.22	0.68	20.07	-12.51
	129	13	14.92	2.46	-1.90	-0.72	-8.27	23.32
		59	-14.92	-2.46	1.90	0.72	16.75	-12.33
	130	13	12.26	2.25	-1.58	-0.68	-6.44	21.37
		59	-12.26	-2.25	1.58	0.68	13.51	-11.30
	131	13	9.67	1.93	-1.28	-0.59	-4.77	18.27
		59	-9.67	-1.93	1.28	0.59	10.49	-9.66
	132	13	7.42	1.59	-1.00	-0.49	-3.49	15.10
		59	-7.42	-1.59	1.00	0.49	7.95	-7.98

MEMBER END FORCES STRUCTURE TYPE = SPACE

ALL UNITS ARE -- KIP FEET (LOCAL)

MEMBER	LOAD	JT	AXIAL	SHEAR-Y	SHEAR-Z	TORSION	MOM-Y	MOM-Z
	133	13	5.37	1.22	-0.75	-0.38	-2.44	11.58
		59	-5.37	-1.22	0.75	0.38	5.78	-6.12
61	3	17	23.35	-1.32	-0.67	-0.43	-16.08	-6.25
		63	-23.35	1.32	0.67	0.43	19.24	-0.02
	4	17	24.64	-1.09	-0.83	-0.53	-17.50	-5.12
		63	-24.64	1.09	0.83	0.53	21.44	-0.04
	5	17	26.07	-0.99	-1.51	-0.76	-16.32	-4.59
		63	-26.07	0.99	1.51	0.76	23.46	-0.12
	6	17	27.01	-1.54	-1.61	-0.92	-10.62	-7.27
		63	-27.01	1.54	1.61	0.92	18.25	-0.02
	7	17	41.63	-4.26	2.76	-0.63	-10.43	-20.25
		63	-41.63	4.26	-2.76	0.63	-2.63	0.11
	8	17	30.32	-4.88	-1.81	-0.12	-16.81	-23.25
		63	-30.32	4.88	1.81	0.12	25.38	0.15
	9	17	31.64	-2.68	-1.64	-0.28	-25.26	-12.70
		63	-31.64	2.68	1.64	0.28	33.02	0.03
	10	17	30.83	-1.00	-1.35	-0.53	-25.17	-4.64
		63	-30.83	1.00	1.35	0.53	31.56	-0.07
	11	17	29.04	-0.30	-1.30	-0.62	-21.94	-1.33
		63	-29.04	0.30	1.30	0.62	28.11	-0.10
	12	17	26.90	-0.40	-1.18	-0.60	-18.53	-1.79
		63	-26.90	0.40	1.18	0.60	24.11	-0.09
	13	17	24.84	-0.97	-0.96	-0.52	-15.74	-4.53
		63	-24.84	0.97	0.96	0.52	20.29	-0.05
	14	17	2.06	0.75	-0.41	-0.27	-6.26	3.61
		63	-2.06	-0.75	0.41	0.27	8.22	-0.05
	15	17	3.78	0.97	-1.04	-0.50	-5.82	4.70
		63	-3.78	-0.97	1.04	0.50	10.73	-0.11
	16	17	5.28	1.06	-1.86	-0.78	-3.20	5.21
		63	-5.28	-1.06	1.86	0.78	12.00	-0.19
	17	17	6.67	0.95	-2.50	-1.08	1.78	4.72
		63	-6.67	-0.95	2.50	1.08	10.04	-0.23
	18	17	9.56	0.40	-2.19	-1.31	9.07	1.98
		63	-9.56	-0.40	2.19	1.31	1.31	-0.09
	19	17	15.74	-0.90	-0.36	-1.35	15.77	-4.40
		63	-15.74	0.90	0.36	1.35	-14.08	0.13
	20	17	25.60	-2.95	3.00	-1.11	20.64	-14.70
		63	-25.60	2.95	-3.00	1.11	-34.81	0.75
	21	17	35.32	-5.95	5.83	-0.62	20.44	-28.41
		63	-35.32	5.95	-5.83	0.62	-48.02	0.27
	22	17	38.96	-8.20	6.33	0.08	15.04	-39.37
		63	-38.96	8.20	-6.33	-0.08	-44.99	0.55
	23	17	34.33	-9.57	3.71	0.71	5.85	-44.99
		63	-34.33	9.57	-3.71	-0.71	-23.40	-0.32
	24	17	25.53	-8.69	-0.41	1.11	-6.30	-40.90
		63	-25.53	8.69	0.41	-1.11	8.24	-0.23

MEMBER END FORCES STRUCTURE TYPE = SPACE

ALL UNITS ARE -- KIP FEET (LOCAL)

MEMBER	LOAD	JT	AXIAL	SHEAR-Y	SHEAR-Z	TORSION	MOM-Y	MOM-Z
	25	17	20.07	-6.19	-2.98	1.16	-18.37	-29.68
		63	-20.07	6.19	2.98	-1.16	32.46	0.39
	26	17	20.44	-3.41	-2.99	0.89	-27.55	-16.43
		63	-20.44	3.41	2.99	-0.89	41.69	0.31
	27	17	21.93	-1.05	-2.16	0.48	-32.79	-4.96
		63	-21.93	1.05	2.16	-0.48	43.00	-0.01
	28	17	21.15	0.93	-1.71	0.14	-32.84	4.58
		63	-21.15	-0.93	1.71	-0.14	40.92	-0.17
	29	17	18.85	2.16	-1.50	-0.15	-29.74	10.45
		63	-18.85	-2.16	1.50	0.15	36.84	-0.21
	30	17	16.34	2.96	-1.41	-0.31	-25.53	14.25
		63	-16.34	-2.96	1.41	0.31	32.23	-0.22
	31	17	13.77	3.21	-1.34	-0.39	-20.67	15.42
		63	-13.77	-3.21	1.34	0.39	27.03	-0.23
	32	17	11.12	3.10	-1.22	-0.40	-16.01	14.88
		63	-11.12	-3.10	1.22	0.40	21.79	-0.22
	33	17	8.40	2.64	-1.04	-0.36	-11.62	12.67
		63	-8.40	-2.64	1.04	0.36	16.53	-0.18
	34	17	0.06	0.35	0.05	-0.05	-3.88	1.69
		63	-0.06	-0.35	-0.05	0.05	3.62	-0.02
	35	17	1.13	0.53	-0.12	-0.14	-4.88	2.55
		63	-1.13	-0.53	0.12	0.14	5.46	-0.04
	36	17	2.74	0.68	-0.50	-0.29	-5.14	3.28
		63	-2.74	-0.68	0.50	0.29	7.51	-0.04
	37	17	4.55	0.81	-1.20	-0.52	-3.78	3.90
		63	-4.55	-0.81	1.20	0.52	9.43	-0.06
	38	17	4.68	0.82	-2.07	-0.77	-0.28	4.12
		63	-4.68	-0.82	2.07	0.77	10.06	-0.22
	39	17	2.73	0.61	-2.85	-0.99	6.38	3.38
		63	-2.73	-0.61	2.85	0.99	7.10	-0.47
	40	17	5.07	0.02	-2.03	-1.09	13.19	0.23
		63	-5.07	-0.02	2.03	1.09	-3.60	-0.13
	41	17	18.22	-1.31	2.48	-0.91	16.35	-7.47
		63	-18.22	1.31	-2.48	0.91	-28.09	1.25
	42	17	33.01	-4.04	7.56	-0.49	16.22	-20.37
		63	-33.01	4.04	-7.56	0.49	-52.01	1.26
	43	17	32.78	-7.29	6.70	0.08	12.26	-33.41
		63	-32.78	7.29	-6.70	-0.08	-43.98	-1.08
	44	17	19.69	-7.65	1.10	0.73	4.81	-35.69
		63	-19.69	7.65	-1.10	-0.73	-10.00	-0.54
	45	17	10.99	-6.02	-2.52	1.01	-4.22	-29.00
		63	-10.99	6.02	2.52	-1.01	16.14	0.52
	46	17	12.27	-4.05	-2.60	0.87	-14.76	-19.63
		63	-12.27	4.05	2.60	-0.87	27.07	0.47
	47	17	15.58	-1.98	-1.74	0.59	-22.06	-9.45
		63	-15.58	1.98	1.74	-0.59	30.30	0.06
	48	17	15.73	-0.30	-1.25	0.29	-23.93	-1.32
		63	-15.73	0.30	1.25	-0.29	29.85	-0.11

MEMBER END FORCES STRUCTURE TYPE = SPACE

ALL UNITS ARE -- KIP FEET (LOCAL)

MEMBER	LOAD	JT	AXIAL	SHEAR-Y	SHEAR-Z	TORSION	MOM-Y	MOM-Z
	49	17	14.14	0.90	-1.03	0.02	-22.82	4.37
		63	-14.14	-0.90	1.03	-0.02	27.68	-0.12
	50	17	12.51	1.74	-0.97	-0.15	-20.24	8.39
		63	-12.51	-1.74	0.97	0.15	24.83	-0.13
	51	17	10.95	2.19	-0.97	-0.25	-16.92	10.52
		63	-10.95	-2.19	0.97	0.25	21.49	-0.16
	52	17	9.26	2.36	-0.93	-0.29	-13.66	11.32
		63	-9.26	-2.36	0.93	0.29	18.06	-0.17
	53	17	7.38	2.21	-0.85	-0.29	-10.40	10.61
		63	-7.38	-2.21	0.85	0.29	14.42	-0.15
	54	17	0.18	0.24	0.01	-0.04	-2.51	1.13
		63	-0.18	-0.24	-0.01	0.04	2.48	-0.01
	55	17	0.92	0.35	-0.13	-0.11	-3.03	1.67
		63	-0.92	-0.35	0.13	0.11	3.65	-0.02
	56	17	1.91	0.44	-0.41	-0.21	-2.95	2.11
		63	-1.91	-0.44	0.41	0.21	4.89	-0.03
	57	17	2.72	0.50	-0.85	-0.35	-1.86	2.43
		63	-2.72	-0.50	0.85	0.35	5.87	-0.07
	58	17	2.62	0.48	-1.37	-0.50	0.79	2.42
		63	-2.62	-0.48	1.37	0.50	5.70	-0.17
	59	17	2.36	0.29	-1.56	-0.62	4.64	1.60
		63	-2.36	-0.29	1.56	0.62	2.74	-0.21
	60	17	5.34	-0.19	-0.51	-0.64	8.39	-1.02
		63	-5.34	0.19	0.51	0.64	-6.00	0.13
	61	17	12.79	-1.21	2.02	-0.51	10.02	-6.37
		63	-12.79	1.21	-2.02	0.51	-19.57	0.63
	62	17	19.44	-2.85	4.17	-0.23	9.46	-13.97
		63	-19.44	2.85	-4.17	0.23	-29.22	0.47
	63	17	18.61	-4.42	3.42	0.12	6.68	-20.48
		63	-18.61	4.42	-3.42	-0.12	-22.88	-0.44
	64	17	11.95	-4.52	0.53	0.46	1.94	-21.15
		63	-11.95	4.52	-0.53	-0.46	-4.47	-0.27
	65	17	7.46	-3.54	-1.43	0.60	-3.87	-17.03
		63	-7.46	3.54	1.43	-0.60	10.66	0.26
	66	17	7.97	-2.29	-1.53	0.51	-9.72	-11.08
		63	-7.97	2.29	1.53	-0.51	16.97	0.24
	67	17	9.57	-1.10	-1.05	0.33	-13.74	-5.22
		63	-9.57	1.10	1.05	-0.33	18.72	0.03
	68	17	9.60	-0.07	-0.77	0.15	-14.71	-0.28
		63	-9.60	0.07	0.77	-0.15	18.36	-0.06
	69	17	8.67	0.63	-0.64	0.00	-13.90	3.05
		63	-8.67	-0.63	0.64	0.00	16.94	-0.08
	70	17	7.64	1.12	-0.61	-0.10	-12.26	5.39
		63	-7.64	-1.12	0.61	0.10	15.13	-0.09
	71	17	6.64	1.37	-0.60	-0.16	-10.22	6.59
		63	-6.64	-1.37	0.60	0.16	13.04	-0.10
	72	17	5.57	1.44	-0.57	-0.18	-8.18	6.92
		63	-5.57	-1.44	0.57	0.18	10.87	-0.10

MEMBER END FORCES STRUCTURE TYPE = SPACE

ALL UNITS ARE -- KIP FEET (LOCAL)

MEMBER	LOAD	JT	AXIAL	SHEAR-Y	SHEAR-Z	TORSION	MOM-Y	MOM-Z
	73	17	4.40	1.33	-0.51	-0.17	-6.19	6.39
		63	-4.40	-1.33	0.51	0.17	8.61	-0.09
	74	17	0.54	0.40	-0.04	-0.09	-4.05	1.94
		63	-0.54	-0.40	0.04	0.09	4.23	-0.03
	75	17	1.79	0.57	-0.31	-0.20	-4.61	2.73
		63	-1.79	-0.57	0.31	0.20	6.06	-0.04
	76	17	3.21	0.70	-0.78	-0.37	-4.15	3.35
		63	-3.21	-0.70	0.78	0.37	7.85	-0.06
	77	17	4.09	0.76	-1.50	-0.59	-1.86	3.74
		63	-4.09	-0.76	1.50	0.59	8.98	-0.14
	78	17	3.99	0.67	-2.16	-0.81	2.54	3.42
		63	-3.99	-0.67	2.16	0.81	7.69	-0.27
	79	17	4.79	0.28	-1.99	-0.96	8.42	1.52
		63	-4.79	-0.28	1.99	0.96	1.01	-0.17
	80	17	10.69	-0.66	0.08	-0.94	13.55	-3.46
		63	-10.69	0.66	-0.08	0.94	-13.93	0.36
	81	17	21.90	-2.52	3.82	-0.69	15.21	-12.68
		63	-21.90	2.52	-3.82	0.69	-33.27	0.76
	82	17	29.74	-4.85	6.23	-0.22	13.52	-23.56
		63	-29.74	4.85	-6.23	0.22	-43.00	0.62
	83	17	26.36	-6.86	4.30	0.31	8.60	-31.79
		63	-26.36	6.86	-4.30	-0.31	-28.94	-0.69
	84	17	16.65	-6.63	0.05	0.76	0.75	-31.17
		63	-16.65	6.63	-0.05	-0.76	-1.01	-0.23
	85	17	11.46	-4.97	-2.29	0.89	-8.02	-23.93
		63	-11.46	4.97	2.29	-0.89	18.87	0.42
	86	17	12.72	-3.09	-2.19	0.72	-16.41	-14.92
		63	-12.72	3.09	2.19	-0.72	26.79	0.31
	87	17	14.75	-1.29	-1.50	0.44	-21.51	-6.12
		63	-14.75	1.29	1.50	-0.44	28.62	0.01
	88	17	14.43	0.16	-1.13	0.18	-22.32	0.85
		63	-14.43	-0.16	1.13	-0.18	27.67	-0.11
	89	17	12.91	1.15	-0.97	-0.04	-20.73	5.56
		63	-12.91	-1.15	0.97	0.04	25.31	-0.12
	90	17	11.35	1.82	-0.92	-0.18	-18.08	8.76
		63	-11.35	-1.82	0.92	0.18	22.46	-0.14
	91	17	9.79	2.13	-0.91	-0.25	-14.90	10.22
		63	-9.79	-2.13	0.91	0.25	19.19	-0.15
	92	17	8.11	2.18	-0.85	-0.27	-11.82	10.45
		63	-8.11	-2.18	0.85	0.27	15.85	-0.16
	93	17	6.31	1.95	-0.75	-0.26	-8.80	9.36
		63	-6.31	-1.95	0.75	0.26	12.36	-0.14
	94	17	1.04	0.53	-0.13	-0.14	-4.93	2.53
		63	-1.04	-0.53	0.13	0.14	5.54	-0.03
	95	17	2.54	0.71	-0.51	-0.29	-5.25	3.39
		63	-2.54	-0.71	0.51	0.29	7.67	-0.05
	96	17	4.00	0.84	-1.14	-0.50	-4.19	4.05
		63	-4.00	-0.84	1.14	0.50	9.57	-0.10

MEMBER END FORCES STRUCTURE TYPE = SPACE

ALL UNITS ARE -- KIP FEET (LOCAL)

MEMBER	LOAD	JT	AXIAL	SHEAR-Y	SHEAR-Z	TORSION	MOM-Y	MOM-Z
	97	17	4.72	0.86	-1.98	-0.76	-0.72	4.29
		63	-4.72	-0.86	1.98	0.76	10.11	-0.21
	98	17	5.01	0.66	-2.48	-1.00	4.74	3.42
		63	-5.01	-0.66	2.48	1.00	6.98	-0.27
	99	17	7.72	0.03	-1.58	-1.11	11.46	0.16
		63	-7.72	-0.03	1.58	1.11	-3.97	0.00
	100	17	15.94	-1.37	1.22	-1.02	16.41	-6.98
		63	-15.94	1.37	-1.22	1.02	-22.18	0.50
	101	17	27.71	-3.64	5.06	-0.66	17.28	-18.11
		63	-27.71	3.64	-5.06	0.66	-41.22	0.90
	102	17	33.87	-6.28	6.72	-0.10	14.34	-30.10
		63	-33.87	6.28	-6.72	0.10	-46.13	0.37
	103	17	28.26	-7.99	3.86	0.49	7.68	-37.09
		63	-28.26	7.99	-3.86	-0.49	-25.95	-0.72
	104	17	17.98	-7.28	-0.66	0.93	-1.87	-34.39
		63	-17.98	7.28	0.66	-0.93	4.99	-0.07
	105	17	13.73	-5.23	-2.70	0.99	-11.88	-25.23
		63	-13.73	5.23	2.70	-0.99	24.64	0.47
	106	17	15.53	-3.09	-2.36	0.75	-20.83	-14.88
		63	-15.53	3.09	2.36	-0.75	32.00	0.28
	107	17	17.23	-1.06	-1.65	0.44	-25.52	-4.99
		63	-17.23	1.06	1.65	-0.44	33.33	-0.02
	108	17	16.47	0.48	-1.28	0.14	-25.69	2.41
		63	-16.47	-0.48	1.28	-0.14	31.73	-0.13
	109	17	14.67	1.56	-1.12	-0.09	-23.52	7.52
		63	-14.67	-1.56	1.12	0.09	28.83	-0.15
	110	17	12.84	2.23	-1.08	-0.23	-20.24	10.72
		63	-12.84	-2.23	1.08	0.23	25.34	-0.17
	111	17	10.97	2.51	-1.05	-0.30	-16.54	12.06
		63	-10.97	-2.51	1.05	0.30	21.49	-0.18
	112	17	8.96	2.48	-0.97	-0.32	-12.94	11.93
		63	-8.96	-2.48	0.97	0.32	17.53	-0.18
	113	17	6.85	2.16	-0.84	-0.29	-9.49	10.39
		63	-6.85	-2.16	0.84	0.29	13.46	-0.15
	114	17	5.02	0.63	-1.90	-0.95	3.84	3.15
		63	-5.02	-0.63	1.90	0.95	5.18	-0.17
	115	17	9.96	-0.05	-0.52	-1.04	8.74	-0.43
		63	-9.96	0.05	0.52	1.04	-6.29	0.17
	116	17	20.03	-1.57	2.14	-0.97	11.17	-7.87
		63	-20.03	1.57	-2.14	0.97	-21.31	0.43
	117	17	30.40	-3.49	4.56	-0.71	11.28	-17.38
		63	-30.40	3.49	-4.56	0.71	-32.86	0.83
	118	17	31.39	-5.70	3.68	-0.39	9.82	-26.55
		63	-31.39	5.70	-3.68	0.39	-27.21	-0.43
	119	17	21.89	-6.36	-0.58	-0.08	7.39	-29.26
		63	-21.89	6.36	0.58	0.08	-4.66	-0.86
	120	17	16.12	-5.44	-3.24	0.10	3.72	-25.94
		63	-16.12	5.44	3.24	-0.10	11.62	0.18

MEMBER END FORCES STRUCTURE TYPE = SPACE

ALL UNITS ARE -- KIP FEET (LOCAL)

MEMBER	LOAD	JT	AXIAL	SHEAR-Y	SHEAR-Z	TORSION	MOM-Y	MOM-Z
	121	17	24.86	-4.51	-0.59	0.13	-2.35	-22.63
		63	-24.86	4.51	0.59	-0.13	5.13	1.27
	122	17	37.57	-4.66	3.67	0.17	-8.79	-23.02
		63	-37.57	4.66	-3.67	-0.17	-8.56	0.99
	123	17	37.86	-5.36	3.52	0.32	-13.56	-24.53
		63	-37.86	5.36	-3.52	-0.32	-3.13	-0.85
	124	17	27.29	-4.54	-0.23	0.53	-17.78	-21.00
		63	-27.29	4.54	0.23	-0.53	18.86	-0.50
	125	17	19.54	-2.61	-2.72	0.57	-21.83	-12.57
		63	-19.54	2.61	2.72	-0.57	34.68	0.24
	126	17	18.89	-0.82	-2.75	0.38	-26.20	-4.07
		63	-18.89	0.82	2.75	-0.38	39.23	0.18
	127	17	19.60	0.76	-2.10	0.15	-28.27	3.73
		63	-19.60	-0.76	2.10	-0.15	38.20	-0.11
	128	17	17.93	1.80	-1.67	-0.06	-26.55	8.73
		63	-17.93	-1.80	1.67	0.06	34.43	-0.22
	129	17	15.02	2.30	-1.38	-0.21	-22.97	11.08
		63	-15.02	-2.30	1.38	0.21	29.48	-0.20
	130	17	12.21	2.43	-1.18	-0.28	-18.72	11.67
		63	-12.21	-2.43	1.18	0.28	24.28	-0.18
	131	17	9.68	2.25	-1.01	-0.30	-14.40	10.82
		63	-9.68	-2.25	1.01	0.30	19.17	-0.16
	132	17	7.49	2.00	-0.84	-0.27	-10.81	9.62
		63	-7.49	-2.00	0.84	0.27	14.77	-0.14
	133	17	5.43	1.63	-0.68	-0.23	-7.66	7.82
		63	-5.43	-1.63	0.68	0.23	10.88	-0.11
63	3	21	22.53	-1.98	1.15	-0.22	-18.47	-5.61
		65	-22.53	1.98	-1.15	0.22	12.09	-5.34
	4	21	23.78	-1.08	1.26	-0.28	-21.25	-3.09
		65	-23.78	1.08	-1.26	0.28	14.29	-2.87
	5	21	25.88	-0.02	1.15	-0.49	-25.11	-0.15
		65	-25.88	0.02	-1.15	0.49	18.77	0.05
	6	21	27.38	0.86	0.30	-0.81	-25.45	2.35
		65	-27.38	-0.86	-0.30	0.81	23.77	2.41
	7	21	27.42	0.49	-0.54	-1.01	-16.21	1.25
		65	-27.42	-0.49	0.54	1.01	19.17	1.47
	8	21	41.00	-5.31	5.22	-0.29	-3.03	-14.93
		65	-41.00	5.31	-5.22	0.29	-25.83	-14.43
	9	21	28.60	-8.43	0.10	0.42	-22.01	-23.65
		65	-28.60	8.43	-0.10	-0.42	21.45	-22.95
	10	21	29.29	-5.46	1.21	0.15	-31.86	-15.39
		65	-29.29	5.46	-1.21	-0.15	25.18	-14.81
	11	21	28.06	-3.27	1.70	-0.15	-30.51	-9.24
		65	-28.06	3.27	-1.70	0.15	21.14	-8.86
	12	21	25.94	-2.16	1.48	-0.28	-25.56	-6.14
		65	-25.94	2.16	-1.48	0.28	17.39	-5.82

MEMBER END FORCES STRUCTURE TYPE = SPACE

ALL UNITS ARE -- KIP FEET (LOCAL)

MEMBER	LOAD	JT	AXIAL	SHEAR-Y	SHEAR-Z	TORSION	MOM-Y	MOM-Z
	13	21	23.92	-2.06	1.17	-0.30	-20.57	-5.84
		65	-23.92	2.06	-1.17	0.30	14.08	-5.56
	14	21	2.31	2.05	0.43	-0.16	-8.28	5.72
		65	-2.31	-2.05	-0.43	0.16	5.93	5.62
	15	21	4.39	3.13	0.38	-0.36	-12.46	8.71
		65	-4.39	-3.13	-0.38	0.36	10.37	8.57
	16	21	6.86	4.17	0.09	-0.65	-16.63	11.60
		65	-6.86	-4.17	-0.09	0.65	16.13	11.43
	17	21	9.35	5.35	-0.57	-1.03	-19.69	14.91
		65	-9.35	-5.35	0.57	1.03	22.83	14.66
	18	21	11.31	6.40	-1.77	-1.49	-19.85	17.89
		65	-11.31	-6.40	1.77	1.49	29.62	17.47
	19	21	12.48	7.29	-3.07	-1.91	-15.49	20.43
		65	-12.48	-7.29	3.07	1.91	32.48	19.86
	20	21	14.19	7.25	-3.82	-2.23	-4.33	20.19
		65	-14.19	-7.25	3.82	2.23	25.44	19.92
	21	21	18.32	5.98	-2.78	-2.23	11.02	16.38
		65	-18.32	-5.98	2.78	2.23	4.34	16.68
	22	21	26.37	2.40	0.62	-1.75	29.50	5.65
		65	-26.37	-2.40	-0.62	1.75	-32.95	7.60
	23	21	35.16	-3.39	4.55	-0.85	41.54	-10.07
		65	-35.16	3.39	-4.55	0.85	-66.70	-8.69
	24	21	39.09	-9.85	6.55	0.35	41.00	-27.74
		65	-39.09	9.85	-6.55	-0.35	-77.22	-26.74
	25	21	34.98	-14.95	5.04	1.41	26.58	-40.99
		65	-34.98	14.95	-5.04	-1.41	-54.45	-41.69
	26	21	25.19	-16.15	1.07	2.01	2.44	-43.84
		65	-25.19	16.15	-1.07	-2.01	-8.35	-45.45
	27	21	17.43	-13.79	-1.71	2.13	-21.20	-38.64
		65	-17.43	13.79	1.71	-2.13	30.67	-37.62
	28	21	16.18	-9.64	-1.18	1.79	-34.26	-27.41
		65	-16.18	9.64	1.18	-1.79	40.81	-25.87
	29	21	17.19	-6.47	0.60	1.24	-39.96	-18.28
		65	-17.19	6.47	-0.60	-1.24	36.66	-17.52
	30	21	16.46	-3.61	1.57	0.80	-39.35	-10.09
		65	-16.46	3.61	-1.57	-0.80	30.65	-9.86
	31	21	13.91	-1.74	1.81	0.43	-34.77	-4.88
		65	-13.91	1.74	-1.81	-0.43	24.78	-4.72
	32	21	11.04	-0.40	1.62	0.19	-28.55	-1.17
		65	-11.04	0.40	-1.62	-0.19	19.57	-1.02
	33	21	8.34	0.23	1.25	0.03	-21.60	0.59
		65	-8.34	-0.23	-1.25	-0.03	14.67	0.69
	34	21	0.30	0.77	0.26	0.00	-2.80	2.16
		65	-0.30	-0.77	-0.26	0.00	1.38	2.12
	35	21	1.32	1.39	0.34	-0.07	-5.16	3.87
		65	-1.32	-1.39	-0.34	0.07	3.27	3.80
	36	21	2.66	2.00	0.37	-0.19	-8.16	5.60
		65	-2.66	-2.00	-0.37	0.19	6.12	5.48

MEMBER END FORCES   STRUCTURE TYPE = SPACE

ALL UNITS ARE -- KIP FEET   (LOCAL)

MEMBER	LOAD	JT	AXIAL	SHEAR-Y	SHEAR-Z	TORSION	MOM-Y	MOM-Z
	37	21	4.45	2.75	0.26	-0.39	-11.79	7.67
		65	-4.45	-2.75	-0.26	0.39	10.37	7.52
	38	21	6.58	3.61	-0.08	-0.66	-14.80	10.03
		65	-6.58	-3.61	0.08	0.66	15.21	9.92
	39	21	8.75	4.43	-0.84	-0.98	-15.86	12.27
		65	-8.75	-4.43	0.84	0.98	20.48	12.24
	40	21	9.30	5.13	-2.10	-1.33	-13.84	14.36
		65	-9.30	-5.13	2.10	1.33	25.46	14.02
	41	21	6.91	5.52	-3.94	-1.67	-6.57	15.91
		65	-6.91	-5.52	3.94	1.67	28.36	14.63
	42	21	6.69	5.22	-4.57	-1.85	6.06	14.92
		65	-6.69	-5.22	4.57	1.85	19.21	13.93
	43	21	16.59	3.64	-0.32	-1.47	22.70	8.57
		65	-16.59	-3.64	0.32	1.47	-20.91	11.58
	44	21	31.67	-1.36	6.86	-0.58	39.57	-6.31
		65	-31.67	1.36	-6.86	0.58	-77.50	-1.21
	45	21	34.58	-9.38	8.29	0.36	38.97	-24.44
		65	-34.58	9.38	-8.29	-0.36	-84.81	-27.40
	46	21	21.91	-13.34	2.47	1.26	17.90	-35.23
		65	-21.91	13.34	-2.47	-1.26	-31.56	-38.55
	47	21	10.25	-11.79	-2.42	1.74	-4.17	-33.11
		65	-10.25	11.79	2.42	-1.74	17.55	-32.06
	48	21	9.26	-8.82	-2.22	1.57	-18.83	-25.31
		65	-9.26	8.82	2.22	-1.57	31.10	-23.47
	49	21	12.39	-6.15	-0.24	1.16	-27.27	-17.36
		65	-12.39	6.15	0.24	-1.16	28.60	-16.65
	50	21	12.89	-3.79	0.91	0.78	-29.25	-10.54
		65	-12.89	3.79	-0.91	-0.78	24.21	-10.42
	51	21	11.13	-2.11	1.35	0.45	-27.43	-5.89
		65	-11.13	2.11	-1.35	-0.45	19.96	-5.76
	52	21	9.13	-0.74	1.35	0.23	-23.79	-2.13
		65	-9.13	0.74	-1.35	-0.23	16.33	-1.96
	53	21	7.29	0.05	1.13	0.08	-19.02	0.08
		65	-7.29	-0.05	-1.13	-0.08	12.80	0.18
	54	21	0.31	0.53	0.17	-0.01	-2.04	1.49
		65	-0.31	-0.53	-0.17	0.01	1.11	1.46
	55	21	0.99	0.95	0.21	-0.06	-3.60	2.64
		65	-0.99	-0.95	-0.21	0.06	2.42	2.59
	56	21	1.89	1.34	0.21	-0.14	-5.53	3.74
		65	-1.89	-1.34	-0.21	0.14	4.38	3.67
	57	21	3.03	1.82	0.11	-0.28	-7.64	5.08
		65	-3.03	-1.82	-0.11	0.28	7.02	5.00
	58	21	4.35	2.34	-0.16	-0.45	-9.24	6.49
		65	-4.35	-2.34	0.16	0.45	10.14	6.43
	59	21	5.40	2.84	-0.69	-0.65	-9.50	7.90
		65	-5.40	-2.84	0.69	0.65	13.30	7.82
	60	21	5.37	3.22	-1.57	-0.87	-7.47	9.08
		65	-5.37	-3.22	1.57	0.87	16.13	8.72

MEMBER END FORCES STRUCTURE TYPE = SPACE

ALL UNITS ARE -- KIP FEET (LOCAL)

MEMBER	LOAD	JT	AXIAL	SHEAR-Y	SHEAR-Z	TORSION	MOM-Y	MOM-Z
	61	21	4.57	3.38	-2.40	-1.05	-2.46	9.67
		65	-4.57	-3.38	2.40	1.05	15.73	9.02
	62	21	6.02	2.99	-2.02	-1.07	5.93	8.21
		65	-6.02	-2.99	2.02	1.07	5.25	8.31
	63	21	12.04	1.50	0.62	-0.80	15.81	3.27
		65	-12.04	-1.50	-0.62	0.80	-19.21	5.05
	64	21	19.06	-1.88	3.93	-0.27	23.28	-6.01
		65	-19.06	1.88	-3.93	0.27	-45.03	-4.41
	65	21	19.56	-5.94	4.24	0.32	21.14	-15.87
		65	-19.56	5.94	-4.24	-0.32	-44.61	-16.99
	66	21	12.84	-7.86	1.24	0.81	9.16	-20.94
		65	-12.84	7.86	-1.24	-0.81	-16.02	-22.54
	67	21	6.86	-7.09	-1.24	1.04	-3.95	-19.85
		65	-6.86	7.09	1.24	-1.04	10.81	-19.34
	68	21	6.19	-5.21	-1.15	0.93	-12.32	-14.89
		65	-6.19	5.21	1.15	-0.93	18.66	-13.91
	69	21	7.58	-3.63	-0.08	0.68	-16.95	-10.26
		65	-7.58	3.63	0.08	-0.68	17.38	-9.83
	70	21	7.78	-2.21	0.59	0.46	-17.92	-6.15
		65	-7.78	2.21	-0.59	-0.46	14.68	-6.06
	71	21	6.75	-1.19	0.82	0.26	-16.65	-3.32
		65	-6.75	1.19	-0.82	-0.26	12.10	-3.24
	72	21	5.51	-0.40	0.81	0.13	-14.29	-1.16
		65	-5.51	0.40	-0.81	-0.13	9.82	-1.07
	73	21	4.35	0.05	0.67	0.04	-11.35	0.12
		65	-4.35	-0.05	-0.67	-0.04	7.65	0.18
	74	21	0.73	0.98	0.27	-0.03	-3.69	2.73
		65	-0.73	-0.98	-0.27	0.03	2.17	2.68
	75	21	1.85	1.59	0.32	-0.12	-6.23	4.44
		65	-1.85	-1.59	-0.32	0.12	4.44	4.36
	76	21	3.31	2.23	0.29	-0.27	-9.23	6.22
		65	-3.31	-2.23	-0.29	0.27	7.65	6.11
	77	21	5.15	2.98	0.07	-0.49	-12.31	8.29
		65	-5.15	-2.98	-0.07	0.49	11.92	8.18
	78	21	7.05	3.77	-0.43	-0.76	-14.29	10.47
		65	-7.05	-3.77	0.43	0.76	16.70	10.37
	79	21	8.23	4.51	-1.38	-1.08	-13.87	12.58
		65	-8.23	-4.51	1.38	1.08	21.49	12.34
	80	21	8.01	5.00	-2.69	-1.40	-9.69	14.13
		65	-8.01	-5.00	2.69	1.40	24.59	13.50
	81	21	7.58	5.09	-3.54	-1.62	-0.89	14.41
		65	-7.58	-5.09	3.54	1.62	20.48	13.72
	82	21	11.32	4.01	-2.17	-1.55	12.85	10.74
		65	-11.32	-4.01	2.17	1.55	-0.84	11.45
	83	21	20.90	1.03	2.08	-1.04	26.91	1.68
		65	-20.90	-1.03	-2.08	1.04	-38.41	4.00
	84	21	29.47	-4.14	6.18	-0.18	35.03	-12.65
		65	-29.47	4.14	-6.18	0.18	-69.20	-10.26

MEMBER END FORCES STRUCTURE TYPE = SPACE

ALL UNITS ARE -- KIP FEET (LOCAL)

MEMBER	LOAD	JT	AXIAL	SHEAR-Y	SHEAR-Z	TORSION	MOM-Y	MOM-Z
	85	21	27.81	-9.91	5.54	0.67	28.40	-26.30
		65	-27.81	9.91	-5.54	-0.67	-59.03	-28.48
	86	21	17.62	-11.93	1.03	1.32	9.23	-32.05
		65	-17.62	11.93	-1.03	-1.32	-14.95	-33.88
	87	21	10.08	-10.16	-1.96	1.56	-9.21	-28.62
		65	-10.08	10.16	1.96	-1.56	20.03	-27.57
	88	21	9.87	-7.40	-1.43	1.35	-20.65	-21.12
		65	-9.87	7.40	1.43	-1.35	28.53	-19.77
	89	21	11.77	-5.04	0.15	0.96	-26.45	-14.20
		65	-11.77	5.04	-0.15	-0.96	25.65	-13.68
	90	21	11.61	-2.98	1.00	0.63	-27.09	-8.31
		65	-11.61	2.98	-1.00	-0.63	21.59	-8.18
	91	21	9.88	-1.54	1.27	0.35	-24.68	-4.33
		65	-9.88	1.54	-1.27	-0.35	17.68	-4.20
	92	21	8.02	-0.43	1.19	0.17	-20.87	-1.26
		65	-8.02	0.43	-1.19	-0.17	14.27	-1.13
	93	21	6.25	0.15	0.96	0.04	-16.24	0.37
		65	-6.25	-0.15	-0.96	-0.04	10.96	0.44
	94	21	1.20	1.35	0.34	-0.07	-5.13	3.76
		65	-1.20	-1.35	-0.34	0.07	3.26	3.70
	95	21	2.63	2.06	0.37	-0.19	-8.25	5.76
		65	-2.63	-2.06	-0.37	0.19	6.23	5.65
	96	21	4.45	2.86	0.27	-0.38	-11.77	7.96
		65	-4.45	-2.86	-0.27	0.38	10.28	7.83
	97	21	6.64	3.73	-0.08	-0.66	-15.05	10.39
		65	-6.64	-3.73	0.08	0.66	15.51	10.26
	98	21	8.61	4.66	-0.80	-0.99	-16.65	12.97
		65	-8.61	-4.66	0.80	0.99	21.05	12.80
	99	21	9.50	5.43	-2.07	-1.37	-14.87	15.23
		65	-9.50	-5.43	2.07	1.37	26.31	14.79
	100	21	9.32	5.89	-3.41	-1.71	-8.65	16.66
		65	-9.32	-5.89	3.41	1.71	27.49	15.92
	101	21	10.36	5.62	-3.58	-1.87	3.41	15.64
		65	-10.36	-5.62	3.58	1.87	16.39	15.42
	102	21	16.22	3.75	-1.25	-1.66	19.40	9.74
		65	-16.22	-3.75	1.25	1.66	-12.51	11.02
	103	21	26.77	-0.47	3.50	-0.96	33.62	-2.49
		65	-26.77	0.47	-3.50	0.96	-52.97	-0.10
	104	21	34.02	-6.54	7.03	0.05	38.98	-18.96
		65	-34.02	6.54	-7.03	-0.05	-77.87	-17.23
	105	21	29.76	-12.16	5.26	0.98	27.80	-32.32
		65	-29.76	12.16	-5.26	-0.98	-56.87	-34.93
	106	21	18.43	-13.54	0.31	1.62	5.05	-36.77
		65	-18.43	13.54	-0.31	-1.62	-6.79	-38.08
	107	21	11.70	-11.04	-2.17	1.78	-14.28	-31.20
		65	-11.70	11.04	2.17	-1.78	26.29	-29.86
	108	21	12.10	-7.99	-1.20	1.46	-26.02	-22.76
		65	-12.10	7.99	1.20	-1.46	32.63	-21.40

MEMBER END FORCES STRUCTURE TYPE = SPACE

ALL UNITS ARE -- KIP FEET (LOCAL)

MEMBER	LOAD	JT	AXIAL	SHEAR-Y	SHEAR-Z	TORSION	MOM-Y	MOM-Z
	109	21	13.77	-5.28	0.43	1.03	-31.25	-14.84
		65	-13.77	5.28	-0.43	-1.03	28.86	-14.34
	110	21	13.11	-3.06	1.25	0.65	-31.05	-8.54
		65	-13.11	3.06	-1.25	-0.65	24.12	-8.40
	111	21	11.02	-1.47	1.46	0.36	-27.79	-4.14
		65	-11.02	1.47	-1.46	-0.36	19.70	-3.99
	112	21	8.86	-0.33	1.33	0.16	-23.07	-0.98
		65	-8.86	0.33	-1.33	-0.16	15.73	-0.85
	113	21	6.81	0.24	1.03	0.03	-17.64	0.62
		65	-6.81	-0.24	-1.03	-0.03	11.92	0.69
	114	21	8.02	4.87	-0.94	-0.99	-15.92	13.59
		65	-8.02	-4.87	0.94	0.99	21.12	13.33
	115	21	9.05	5.82	-2.11	-1.37	-14.34	16.38
		65	-9.05	-5.82	2.11	1.37	25.99	15.82
	116	21	9.96	6.49	-2.91	-1.68	-9.18	18.25
		65	-9.96	-6.49	2.91	1.68	25.25	17.63
	117	21	13.70	6.17	-2.23	-1.84	0.94	16.92
		65	-13.70	-6.17	2.23	1.84	11.39	17.19
	118	21	22.28	4.32	0.54	-1.67	12.11	11.29
		65	-22.28	-4.32	-0.54	1.67	-15.09	12.57
	119	21	32.70	0.55	4.15	-1.12	20.92	0.24
		65	-32.70	-0.55	-4.15	1.12	-43.88	2.81
	120	21	35.45	-4.45	4.53	-0.50	21.10	-12.10
		65	-35.45	4.45	-4.53	0.50	-46.18	-12.48
	121	21	26.07	-7.61	-0.15	-0.06	10.62	-19.28
		65	-26.07	7.61	0.15	0.06	-9.77	-22.81
	122	21	16.70	-7.17	-4.49	0.21	-0.20	-19.58
		65	-16.70	7.17	4.49	-0.21	25.03	-20.06
	123	21	21.21	-5.50	-2.00	0.39	-1.51	-16.98
		65	-21.21	5.50	2.00	-0.39	12.58	-13.41
	124	21	33.57	-6.68	4.56	0.65	2.97	-20.67
		65	-33.57	6.68	-4.56	-0.65	-28.19	-16.25
	125	21	36.28	-10.13	6.67	0.97	0.52	-27.06
		65	-36.28	10.13	-6.67	-0.97	-37.38	-28.97
	126	21	25.93	-11.38	2.96	1.32	-12.70	-30.35
		65	-25.93	11.38	-2.96	-1.32	-3.66	-32.58
	127	21	15.76	-9.07	-0.49	1.45	-24.88	-25.51
		65	-15.76	9.07	0.49	-1.45	27.60	-24.63
	128	21	13.27	-6.25	-0.55	1.19	-30.83	-17.98
		65	-13.27	6.25	0.55	-1.19	33.86	-16.58
	129	21	13.78	-4.04	0.58	0.81	-32.19	-11.44
		65	-13.78	4.04	-0.58	-0.81	28.98	-10.90
	130	21	12.50	-2.38	1.12	0.50	-29.28	-6.64
		65	-12.50	2.38	-1.12	-0.50	23.06	-6.54
	131	21	9.80	-1.38	1.21	0.26	-24.34	-3.87
		65	-9.80	1.38	-1.21	-0.26	17.65	-3.77
	132	21	7.38	-0.55	1.07	0.12	-19.25	-1.59
		65	-7.38	0.55	-1.07	-0.12	13.34	-1.47

MEMBER END FORCES STRUCTURE TYPE = SPACE

ALL UNITS ARE -- KIP FEET (LOCAL)

MEMBER	LOAD	JT	AXIAL	SHEAR-Y	SHEAR-Z	TORSION	MOM-Y	MOM-Z
	133	21	5.35	-0.06	0.83	0.02	-14.27	-0.22
		65	-5.35	0.06	-0.83	-0.02	9.68	-0.14

************** END OF LATEST ANALYSIS RESULT **************

1232. FINISH

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

**** DATE= FEB 14,2013 TIME= 16:10:40 ****

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*  EUROPE    +31 23 5560560                              *
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Hatch Mott MacDonald

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Checked by		Date	

(Input values are shown underlined and in italics.)

Brookpark Road Bridge - Original Bridge's Material Properties References

Tabulate the Material Properties for the Load Rating

Year Built: ***1933***

Reference

ODOT, *Bridge Design Manual* , 2004, Figs. 906 & 907.

Reinforced Concrete

Unknown 1931 to 1950

Plan Sheet Reference: ***NA***

f'_c	f_b^{INV}	f_b^{OPR}	f_v^{INV}	f_v^{OPR}
3.0 ksi	1.0 ksi	1.5 ksi	1.0 ksi	1.5 ksi

Reference

AASHTO, *Manual for Condition Evaluation of Bridges* , 1994, 6.6.2.1, 6.6.2.3, & 6.6.2.4.

Reinforcing Steel

Billet

Plan Sheet Reference: ***25/50***

f_y	f_b^{INV}	f_b^{OPR}
40.0 ksi	20.0 ksi	28.0 ksi

MRussell

Hatch Mott MacDonald

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Checked by [signature] Date 2-27-13

(Input values are shown underlined and in italics.)

Controlling Forces in the Arch and Spandrel Columns

References

Tabulate the Controlling Forces from the Model

Dead and Sidewalk Loads

Note:

The fascia spandrel beams were not placed until after the centering and shoring were removed.

So, any moment or shears in the model for these column members are ficticious as it models a fully shored frame.

Member	1.3 DC				2.17 PL			
	V	P	Mz	My	V	P	Mz	My
	kip	kip	kip-ft	kip-ft	kip	kip	kip-ft	kip-ft
Arch								
1	107.3	2,814.5	-429.5	1,861.8	6.0	87.6	-46.3	-223.6
3	30.8	2,762.6	388.9	1,203.7	0.5	87.8	0.0	-144.9
5	83.2	2,398.7	-153.8	433.7	4.5	75.9	-9.5	-52.0
7	51.5	2,349.1	581.2	-157.0	1.3	76.0	27.5	18.1
9	87.6	2,025.8	-336.0	-726.1	4.0	65.0	-7.7	83.3
13	81.4	1,785.8	-501.2	-1,063.0	3.5	57.7	-14.8	131.9
17	102.6	1,619.3	-388.4	-865.9	4.0	52.2	-16.0	111.7
21	99.6	1,536.8	-437.5	-421.0	4.3	49.1	-23.1	54.7
Spandrel Columns								
45	0.0	321.6	0.0	0.0	0.1	4.7	-1.9	0.0
49	0.0	402.0	0.0	0.0	0.0	15.3	0.6	0.0
53	0.0	407.7	0.0	0.0	0.1	16.3	-0.7	0.0
57	0.0	327.6	0.0	0.0	0.4	13.3	-3.4	0.0
61	0.0	324.6	0.0	0.0	0.9	13.1	-4.4	0.0
63	0.0	314.2	0.0	0.0	1.5	12.9	-4.2	0.0

HS20 Truck

Member	HS20 Truck									
	V	Case	P	Mz	My	Case	P	Mz	My	Case
	kip		kip	kip-ft	kip-ft		kip	kip-ft	kip-ft	
Arch										
1	47.8	16	80.6	-851.0	50.4	29	167.7	474.3	86.1	20
3	56.3	16	83.2	-422.8	36.9	29	166.8	359.8	55.1	20
5	10.4	18	14.6	-132.8	92.3	14	150.5	44.1	85.6	24
7	18.3	18	56.9	-127.9	2.6	16	150.9	138.9	-5.5	24
9	9.2	16	49.6	-260.1	83.7	17	132.8	83.2	85.6	24
13	11.1	18	67.5	-227.9	85.0	19	118.6	48.3	81.9	25
17	14.2	20	77.0	-194.3	87.0	21	105.7	40.1	75.9	26
21	17.1	23	83.6	-191.1	85.6	24	85.9	3.4	68.4	27
Spandrel										
45	0.5	31	2.9	-24.2	32.8	31	85.3	-4.6	92.3	14
49	1.1	17	81.3	-28.6	83.7	17	94.2	-26.5	83.7	16
53	3.0	19	38.3	-48.2	85.0	19	45.4	-46.4	84.1	18
57	5.7	21	32.2	-53.3	87.0	21	37.2	-50.2	86.1	20
61	9.6	23	34.3	-45.0	87.5	23	39.0	-39.4	87.9	22
63	16.2	26	25.2	-43.8	75.9	26	39.1	-27.7	85.6	24

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Checked by	[illegible]	Date	2-27-13

(Input values are shown underlined and in italics.)

References

Controlling Forces in the Arch and Spandrel Columns

Military Loading

Member	Military Loading									
	V kip	Case	P kip	Mz kip-ft	My kip-ft	Case	P kip	Mz kip-ft	My kip-ft	Case
Arch										
1	36.9	36	63.0	-588.5	39.8	49	113.4	316.9	57.2	41
3	42.1	36	55.2	-293.9	24.5	50	112.8	242.7	36.3	41
5	10.2	38	5.0	-137.0	60.0	35	102.0	28.2	58.2	45
7	14.8	38	59.5	-67.3	-0.2	38	102.2	94.9	-3.7	45
9	9.1	38	30.5	-233.9	55.7	38	90.3	58.5	58.2	45
13	11.3	40	43.3	-209.2	56.4	40	80.2	33.9	55.5	46
17	13.9	42	50.5	-182.9	58.5	42	71.6	21.3	55.5	46
21	15.9	44	57.0	-173.5	59.4	44	59.4	18.3	46.0	48
Spandrel										
45	0.5	35	2.2	-17.2	21.1	52	85.6	-6.6	66.9	34
49	0.8	37	49.1	-21.3	55.7	38	76.4	-16.0	55.9	36
53	2.3	39	33.0	-36.3	56.2	39	40.1	-29.2	55.7	38
57	4.4	41	29.5	-40.4	57.2	41	32.8	-30.3	56.4	40
61	7.7	44	19.7	-35.7	59.4	44	33.0	-20.4	58.5	42
63	13.3	46	21.9	-35.2	55.5	46	34.6	-24.4	58.2	45

Lane Loading

Member	Lane Loading									
	V kip	Case	P kip	Mz kip-ft	My kip-ft	Case	P kip	Mz kip-ft	My kip-ft	Case
Arch										
1	28.0	10	188.7	-402.3	133.4	10	214.7	147.6	150.6	6
3	16.1	10	208.9	216.3	100.0	5	214.7	66.9	98.9	7
5	12.7	10	144.7	-74.3	147.9	4	190.4	13.5	147.2	8
7	0.9	11	188.1	97.0	-2.8	9	190.7	103.6	-5.8	8
9	11.7	5	132.3	-137.8	150.4	5	163.8	12.0	147.2	8
13	12.1	6	126.5	-141.3	150.6	6	145.0	-11.9	141.5	9
17	14.4	7	120.7	-126.2	149.8	7	131.1	-17.7	141.5	9
21	15.4	8	117.7	-131.3	147.2	8	119.3	-24.3	133.4	10
Spandrel										
45	0.3	11	12.6	-11.4	125.3	11	65.7	0.1	148.1	3
49	0.4	5	51.0	-10.1	150.4	5	63.9	-6.3	147.9	4
53	1.3	6	39.5	-20.6	150.6	6	50.5	-17.4	150.4	5
57	2.8	7	31.4	-26.2	149.8	7	41.7	-23.6	150.6	6
61	4.9	8	30.3	-23.3	147.2	8	41.6	-20.3	149.8	7
63	8.4	9	28.6	-23.7	141.5	9	41.0	-14.9	147.2	8

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Controlling Forces in the Arch and Spandrel Columns

References

2F1

Member	2F1 V (kip)	Case	P (kip)	Mz (kip-ft)	My (kip-ft)	Case	P (kip)	Mz (kip-ft)	My (kip-ft)	Case
Arch										
1	22.4	56	38.3	-366.0	24.1	69	70.7	179.7	35.9	61
3	25.6	56	33.4	-181.8	14.8	70	70.4	141.7	22.8	61
5	6.2	68	5.2	-78.7	37.4	55	63.5	28.8	36.9	64
7	8.8	58	26.7	-58.9	1.4	57	63.6	60.1	-3.5	64
9	5.3	57	21.3	-133.2	34.8	58	56.2	37.0	36.0	65
13	6.0	59	28.6	-119.7	35.4	60	50.0	21.9	34.1	66
17	7.6	62	32.2	-105.5	36.6	62	44.7	13.6	34.1	66
21	9.0	64	35.1	-102.4	36.9	64	36.9	11.2	28.0	68
Spandrel										
45	0.3	55	1.4	-10.6	12.7	72	49.6	-3.2	40.8	54
49	0.5	57	39.2	-12.9	34.7	57	45.4	-10.2	34.9	56
53	1.4	59	19.2	-22.2	35.1	59	23.2	-18.6	34.8	58
57	2.7	61	16.8	-24.7	35.9	61	19.0	-19.6	35.4	60
61	4.5	64	12.0	-21.2	36.9	64	19.4	-14.0	36.6	62
63	7.9	66	12.8	-20.9	34.1	66	19.6	-15.9	36.0	65

3F1

Member	3F1 V (kip)	Case	P (kip)	Mz (kip-ft)	My (kip-ft)	Case	P (kip)	Mz (kip-ft)	My (kip-ft)	Case
Arch										
1	33.9	76	56.5	-560.5	35.5	89	108.1	238.5	55.2	81
3	39.1	76	49.1	-276.2	21.8	90	107.7	197.5	35.0	81
5	9.5	88	11.3	-115.0	56.3	75	97.3	39.2	56.3	84
7	13.5	78	45.0	-81.6	1.4	77	97.5	91.6	-4.9	84
9	7.8	77	23.6	-192.2	53.2	77	86.1	58.0	54.5	85
13	9.2	79	46.2	-174.8	54.5	80	76.5	26.8	54.5	85
17	11.1	81	50.7	-156.6	56.3	82	68.4	22.8	51.4	86
21	12.8	84	53.6	-155.2	56.3	84	56.4	19.3	41.6	88
Spandrel										
45	0.4	75	1.8	-16.1	23.6	91	68.3	-6.1	61.5	74
49	0.8	77	57.1	-19.8	53.2	77	67.8	-16.8	53.4	76
53	2.1	79	27.3	-33.9	54.0	79	34.5	-29.9	53.5	78
57	4.1	81	23.8	-37.8	55.2	81	28.7	-31.9	54.5	80
61	6.9	83	26.4	-31.8	56.5	83	29.7	-23.6	56.3	82
63	11.9	86	17.6	-32.1	51.4	86	29.5	-12.7	56.3	84

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Controlling Forces in the Arch and Spandrel Columns

References

4F1

Member	4F1									
	V kip	Case	P kip	Mz kip-ft	My kip-ft	Case	P kip	Mz kip-ft	My kip-ft	Case
Arch										
1	38.8	96	63.6	-654.3	39.8	109	126.5	410.7	64.2	100
3	45.1	96	65.6	-323.8	29.0	109	126.0	205.9	41.3	101
5	11.0	108	18.0	-122.8	65.1	95	114.0	39.7	65.5	104
7	15.4	98	57.9	-82.9	0.7	97	114.3	106.6	-5.0	104
9	8.5	97	31.7	-224.3	62.5	97	100.7	69.4	63.0	105
13	10.3	99	47.1	-192.7	63.6	99	89.7	34.0	63.0	105
17	12.7	101	61.2	-171.8	66.1	102	80.1	28.8	58.9	106
21	14.7	103	62.6	-174.4	65.5	104	65.6	24.3	46.9	108
Spandrel										
45	0.4	102	2.2	-18.9	26.0	111	71.0	-7.6	70.9	94
49	0.9	97	63.2	-23.0	62.5	97	76.5	-20.6	62.7	96
53	2.4	99	29.5	-39.0	63.6	99	38.4	-36.3	63.0	98
57	4.7	101	25.5	-43.5	65.2	101	32.2	-39.2	64.2	100
61	8.0	103	28.3	-37.1	66.2	103	33.9	-30.1	66.1	102
63	13.5	106	18.4	-36.8	58.9	106	34.0	-19.0	65.5	104

5C1

Member	5C1									
	V kip	Case	P kip	Mz kip-ft	My kip-ft	Case	P kip	Mz kip-ft	My kip-ft	Case
Arch										
1	44.3	126	90.3	-819.8	56.1	127	176.8	475.0	95.9	118
3	41.9	115	92.9	-398.6	40.3	127	175.8	343.8	63.1	118
5	14.3	126	87.0	-60.5	39.6	129	157.5	51.3	89.6	122
7	13.7	118	68.8	-40.2	-6.3	114	157.9	140.7	-5.0	122
9	8.5	118	47.4	-157.5	101.3	114	139.4	77.8	89.6	122
13	3.5	102	48.4	-179.2	96.9	115	124.8	38.9	84.8	123
17	12.9	117	64.6	-156.6	95.2	117	107.3	-12.5	79.3	124
21	16.4	119	86.7	-147.3	95.0	120	97.3	-56.1	84.8	123
Spandrel										
45	0.4	119	1.5	-20.6	39.6	129	58.4	7.6	101.3	114
49	0.7	116	62.4	-18.8	101.3	114	82.2	-18.4	94.5	116
53	2.2	115	20.5	-35.4	96.9	115	47.4	-30.4	95.9	118
57	4.2	117	16.2	-38.5	95.2	117	39.4	-30.6	95.0	120
61	6.4	119	21.9	-29.3	96.1	119	37.9	-24.5	84.8	123
63	11.4	126	25.9	-30.4	64.4	126	36.3	-27.1	72.2	125

(Input values are shown underlined and in italics.)

Controlling Forces in the Arch and Spandrel Columns

References

Determine the Live Load with Impact for Rating

Live Load Impact

S *173* ft Span length. (AASHTO, *Std. Specs.* , 3.8.2.1)

I = 50 / (L+125) ≤ 0.3

0.17 Live load impact factor.

HS20 Truck

Member	HS20 Truck									
	V *kip*	Case	P *kip*	Mz *kip-ft*	My *kip-ft*	Case	P *kip*	Mz *kip-ft*	My *kip-ft*	Case
Arch										
1	55.8	16	94.1	-993.8	58.9	29	195.8	553.9	100.6	20
3	65.8	16	97.2	-493.8	43.0	29	194.8	420.2	64.3	20
5	12.2	18	17.0	-155.0	107.8	14	175.8	51.5	100.0	24
7	21.4	18	66.5	-149.3	3.0	16	176.2	162.2	-6.4	24
9	10.8	16	57.9	-303.7	97.7	17	155.1	97.1	100.0	24
13	12.9	18	78.8	-266.1	99.3	19	138.5	56.4	95.6	25
17	16.6	20	89.9	-226.9	101.5	21	123.4	46.8	88.6	26
21	20.0	23	97.7	-223.1	100.0	24	100.3	4.0	79.9	27
Spandrel Columns										
45	0.6	31	3.3	-28.2	38.3	31	99.6	-5.3	107.8	14
49	1.3	17	94.9	-33.4	97.7	17	110.0	-30.9	97.8	16
53	3.5	19	44.7	-56.3	99.3	19	53.1	-54.1	98.2	18
57	6.7	21	37.6	-62.2	101.5	21	43.4	-58.6	100.6	20
61	11.2	23	40.1	-52.5	102.2	23	45.5	-46.0	102.7	22
63	18.9	26	29.4	-51.2	88.6	26	45.6	-32.4	100.0	24

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Controlling Forces in the Arch and Spandrel Columns

References

Military Loading

Member	Military Loading									
	V *kip*	**Case**	**P** *kip*	**Mz** *kip-ft*	**My** *kip-ft*	**Case**	**P** *kip*	**Mz** *kip-ft*	**My** *kip-ft*	**Case**
Arch										
1	43.1	36	73.6	-687.2	46.5	49	132.4	370.1	66.8	41
3	49.1	36	64.5	-343.2	28.6	50	131.8	283.4	42.4	41
5	11.9	38	5.9	-160.0	70.0	35	119.1	32.9	67.9	45
7	17.3	38	69.5	-78.6	-0.2	38	119.4	110.8	-4.3	45
9	10.6	38	35.6	-273.2	65.0	38	105.4	68.3	67.9	45
13	13.2	40	50.5	-244.3	65.8	40	93.7	39.6	64.8	46
17	16.2	42	59.0	-213.6	68.3	42	83.6	24.9	64.8	46
21	18.5	44	66.5	-202.6	69.4	44	69.3	21.4	53.7	48
Spandrel Columns										
45	0.6	35	2.6	-20.1	24.6	52	100.0	-7.7	78.1	34
49	0.9	37	57.3	-24.9	65.0	38	89.2	-18.7	65.3	36
53	2.7	39	38.5	-42.4	65.6	39	46.8	-34.1	65.0	38
57	5.1	41	34.5	-47.1	66.8	41	38.3	-35.4	65.8	40
61	8.9	44	23.0	-41.7	69.4	44	38.5	-23.8	68.3	42
63	15.6	46	25.6	-41.1	64.8	46	40.4	-28.5	67.9	45

Lane Loading

Member	Lane Loading									
	V *kip*	**Case**	**P** *kip*	**Mz** *kip-ft*	**My** *kip-ft*	**Case**	**P** *kip*	**Mz** *kip-ft*	**My** *kip-ft*	**Case**
Arch										
1	32.7	10	220.3	-469.7	155.8	10	250.7	172.4	175.9	6
3	18.8	10	243.9	252.6	116.8	5	250.7	78.1	115.4	7
5	14.8	10	169.0	-86.8	172.7	4	222.3	15.8	171.9	8
7	1.1	11	219.7	113.2	-3.3	9	222.6	120.9	-6.7	8
9	13.7	5	154.5	-160.9	175.7	5	191.2	14.1	171.9	8
13	14.1	6	147.8	-165.0	175.9	6	169.3	-13.9	165.2	9
17	16.8	7	141.0	-147.4	174.9	7	153.1	-20.6	165.2	9
21	17.9	8	137.5	-153.4	171.9	8	139.3	-28.3	155.8	10
Spandrel Columns										
45	0.3	11	14.7	-13.4	146.3	11	76.7	0.1	172.9	3
49	0.5	5	59.6	-11.8	175.7	5	74.6	-7.4	172.7	4
53	1.5	6	46.1	-24.0	175.9	6	58.9	-20.4	175.7	5
57	3.2	7	36.7	-30.6	174.9	7	48.7	-27.5	175.9	6
61	5.7	8	35.4	-27.2	171.9	8	48.6	-23.6	174.9	7
63	9.8	9	33.4	-27.6	165.2	9	47.9	-17.4	171.9	8

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Project Name 287366 - ODOT D12 GES - 2012 Bridge Load Ratings
Project # CUY-17-0283 Page of
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Calculated by MAR Date 22-Feb-13
Checked by [signature] Date 2-27-13

(Input values are shown underlined and in italics.)

Controlling Forces in the Arch and Spandrel Columns

References

2F1

Member	V kip	Case	P kip	Mz kip-ft	My kip-ft	Case	P kip	Mz kip-ft	My kip-ft	Case
	2F1									
Arch										
1	26.1	56	44.7	-427.4	28.2	69	82.5	209.8	41.9	61
3	29.9	56	39.1	-212.3	17.3	70	82.2	165.5	26.6	61
5	7.2	68	6.0	-91.9	43.7	55	74.1	33.6	43.0	64
7	10.3	58	31.1	-68.8	1.6	57	74.2	70.2	-4.1	64
9	6.2	57	24.8	-155.5	40.6	58	65.7	43.2	42.0	65
13	7.1	59	33.3	-139.8	41.3	60	58.3	25.5	39.8	66
17	8.9	62	37.6	-123.1	42.7	62	52.2	15.8	39.8	66
21	10.5	64	41.0	-119.6	43.0	64	43.1	13.1	32.7	68
Spandrel Columns										
45	0.4	55	1.6	-12.3	14.8	72	57.9	-3.7	47.6	54
49	0.6	57	45.8	-15.1	40.5	57	53.0	-12.0	40.8	56
53	1.6	59	22.4	-26.0	41.0	59	27.1	-21.7	40.6	58
57	3.1	61	19.7	-28.8	41.9	61	22.2	-22.9	41.3	60
61	5.3	64	14.0	-24.7	43.0	64	22.7	-16.3	42.7	62
63	9.2	66	15.0	-24.5	39.8	66	22.8	-18.5	42.0	65

3F1

Member	V kip	Case	P kip	Mz kip-ft	My kip-ft	Case	P kip	Mz kip-ft	My kip-ft	Case
	3F1									
Arch										
1	39.6	76	66.0	-654.5	41.5	89	126.2	278.5	64.5	81
3	45.7	76	57.3	-322.6	25.5	90	125.8	230.7	40.9	81
5	11.0	88	13.2	-134.3	65.8	75	113.6	45.7	65.7	84
7	15.7	78	52.6	-95.3	1.6	77	113.8	107.0	-5.7	84
9	9.1	77	27.6	-224.5	62.1	77	100.5	67.7	63.7	85
13	10.7	79	53.9	-204.2	63.6	80	89.4	31.3	63.7	85
17	13.0	81	59.2	-182.9	65.7	82	79.9	26.7	60.0	86
21	14.9	84	62.6	-181.2	65.7	84	65.8	22.5	48.5	88
Spandrel Columns										
45	0.5	75	2.1	-18.8	27.5	91	79.7	-7.2	71.8	74
49	0.9	77	66.7	-23.1	62.1	77	79.1	-19.6	62.4	76
53	2.5	79	31.9	-39.6	63.0	79	40.3	-34.9	62.5	78
57	4.8	81	27.8	-44.1	64.5	81	33.5	-37.2	63.6	80
61	8.0	83	30.8	-37.1	66.0	83	34.7	-27.5	65.7	82
63	13.9	86	20.6	-37.4	60.0	86	34.4	-14.8	65.7	84

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Controlling Forces in the Arch and Spandrel Columns

References

4F1

Member	V	Case	P	Mz	My	Case	P	Mz	My	Case
					4F1					
	kip		kip	kip-ft	kip-ft		kip	kip-ft	kip-ft	
Arch										
1	45.3	96	74.2	-764.1	46.5	109	147.8	479.6	74.9	100
3	52.7	96	76.6	-378.2	33.8	109	147.2	240.5	48.2	101
5	12.9	108	21.0	-143.4	76.1	95	133.1	46.3	76.5	104
7	18.0	98	67.6	-96.8	0.8	97	133.4	124.4	-5.8	104
9	10.0	97	37.0	-261.9	72.9	97	117.6	81.0	73.6	105
13	12.0	99	55.0	-225.1	74.2	99	104.8	39.7	73.6	105
17	14.8	101	71.4	-200.6	77.2	102	93.5	33.6	68.8	106
21	17.1	103	73.1	-203.7	76.5	104	76.6	28.4	54.8	108
Spandrel Columns										
45	0.5	102	2.5	-22.0	30.4	111	82.9	-8.9	82.8	94
49	1.0	97	73.9	-26.8	72.9	97	89.3	-24.0	73.2	96
53	2.8	99	34.5	-45.5	74.2	99	44.8	-42.4	73.5	98
57	5.5	101	29.8	-50.8	76.1	101	37.6	-45.8	74.9	100
61	9.3	103	33.0	-43.3	77.3	103	39.6	-35.2	77.2	102
63	15.8	106	21.5	-42.9	68.8	106	39.7	-22.1	76.5	104

5C1

Member	V	Case	P	Mz	My	Case	P	Mz	My	Case
					5C1					
	kip		kip	kip-ft	kip-ft		kip	kip-ft	kip-ft	
Arch										
1	51.8	126	105.5	-957.3	65.5	127	206.5	554.7	111.9	118
3	48.9	115	108.5	-465.4	47.1	127	205.3	401.5	73.6	118
5	16.7	126	101.6	-70.6	46.3	129	184.0	59.9	104.6	122
7	16.0	118	80.4	-46.9	-7.3	114	184.3	164.3	-5.8	122
9	9.9	118	55.4	-184.0	118.3	114	162.8	90.8	104.6	122
13	4.1	102	56.5	-209.2	113.1	115	145.8	45.4	99.1	123
17	15.1	117	75.4	-182.9	111.1	117	125.3	-14.6	92.5	124
21	19.2	119	101.2	-172.1	110.9	120	113.6	-65.5	99.1	123
Spandrel Columns										
45	0.5	119	1.7	-24.0	46.3	129	68.2	8.9	118.3	114
49	0.8	116	72.9	-21.9	118.3	114	95.9	-21.5	110.4	116
53	2.6	115	24.0	-41.3	113.1	115	55.4	-35.5	111.9	118
57	4.9	117	18.9	-45.0	111.1	117	46.0	-35.8	110.9	120
61	7.4	119	25.6	-34.2	112.2	119	44.2	-28.6	99.1	123
63	13.3	126	30.3	-35.4	75.2	126	42.4	-31.6	84.3	125

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Arch and Spandrel Column Rating Summary

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References

Summary of Ratings

Loading	Arch								
	1	3	5	7	9	13	17	21	Min
HS20 INV	3.44	3.17	12.53	7.68	5.70	4.68	4.75	4.52	3.17
	3.44	3.17	5.96	4.83	5.85	5.90	5.86	4.72	3.17
MIL INV	4.45	4.25	13.78	9.53	6.87	5.65	5.72	5.09	4.25
	4.45	4.25	8.80	7.11	8.59	8.72	5.99	5.09	4.25
Lane INV	4.24	4.32	6.11	4.17	5.07	4.29	4.41	4.35	4.17
	4.86	4.31	4.76	4.11	4.85	4.75	5.03	5.26	4.11
HS20 OPR	5.74	5.29	20.92	12.83	9.52	7.81	7.92	7.55	5.29
	5.74	5.29	9.95	8.06	9.76	9.85	9.79	7.88	5.29
MIL OPR	7.43	7.09	23.01	15.92	11.47	9.42	9.54	8.49	7.09
	7.43	7.09	14.70	11.87	14.34	14.55	9.99	8.49	7.09
Lane OPR	7.08	7.21	10.20	6.96	8.46	7.16	7.35	7.25	6.96
	8.12	7.20	7.95	6.86	8.10	7.92	8.40	8.78	6.86
2F1	12.27	11.63	38.35	26.76	19.52	15.94	16.06	15.03	11.63
	12.27	11.63	23.48	19.01	22.95	23.35	18.31	15.03	11.63
3F1	8.10	7.62	25.04	17.49	13.78	10.64	10.63	10.15	7.62
	8.10	7.62	15.34	12.42	14.93	15.33	12.50	10.54	7.62
4F1	7.08	6.61	21.43	15.28	11.65	9.74	9.39	8.91	6.61
	7.08	6.61	13.11	10.61	12.71	13.05	10.94	9.19	6.61
5C1	5.86	7.12	16.58	17.12	12.82	9.56	9.31	8.21	5.86
	6.19	6.81	9.50	7.76	9.33	9.42	10.75	8.21	6.19

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Summary of Ratings

References

Loading	Spandrel Columns							Total	
	45	49	53	57	61	63	Min		
HS20 INV	16.02	10.42	7.53	5.14	3.11	2.15	2.15	**2.15**	**2.15**
	16.71	9.44	7.83	5.91	3.60	2.15	2.15	**2.15**	
MIL INV	22.81	15.69	10.02	7.31	3.73	2.60	2.60	**2.60**	
	16.60	11.87	11.83	9.99	4.55	2.60	2.60	**2.60**	
Lane INV	68.40	17.83	15.24	11.47	6.07	4.11	4.11	**4.11**	
	21.81	14.65	14.85	11.82	6.55	4.11	4.11	**4.11**	
HS20 OPR	26.75	17.40	12.57	8.58	5.18	3.58	3.58	**3.58**	**3.58**
	27.89	15.77	13.06	9.86	6.00	3.58	3.58	**3.58**	
MIL OPR	38.07	26.19	16.72	12.20	6.23	4.34	4.34	**4.34**	
	27.71	19.82	19.75	16.68	7.60	4.34	4.34	**4.34**	
Lane OPR	114.17	29.77	25.44	19.14	10.14	6.86	6.86	**6.86**	
	36.40	24.45	24.79	19.73	10.93	6.86	6.86	**6.86**	
2F1	62.32	37.05	27.31	19.42	10.57	7.36	7.36	**7.36**	**7.36**
	47.92	33.19	31.64	25.83	12.85	7.36	7.36	**7.36**	
3F1	39.63	24.92	17.89	12.30	7.39	4.85	4.85	**4.85**	**4.85**
	34.68	22.11	19.91	15.81	8.49	4.85	4.85	**4.85**	
4F1	34.19	22.07	15.50	10.39	6.29	4.27	4.27	**4.27**	**4.27**
	33.29	19.47	16.58	12.79	7.29	4.27	4.27	**4.27**	
5C1	29.60	23.67	16.24	10.50	7.95	5.08	5.08	**5.08**	**5.08**
	40.38	18.35	18.41	16.25	9.15	5.08	5.08	**5.08**	

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Arch Member 1 - Mz — References

Determine the Axial Load/Moment Interaction Diagram & Shear Capacity of a Rectangular Reinforced Concrete Section

> **RC Beam-Column Rating**
>
> The challenge is to determine the capacity for a given set of dead and live loads, as moment capacity is a function the applied axial load.
>
> The approach taken here is to develop an axial-moment interaction curve for the section, and then determine where the projection of the live load axial-moment function will intersect that curve.
>
> Those coordinates are the axial and moment capacities for the rating equation. - MR

Criteria

Designed by AASHTO, *Standard Specifications for Highway Bridges* , 17th ed. 2002.
Strength design.
Capacity based on strain compatibility.
Dimensions are in pounds, feet and seconds, U.N.O.

Assumptions

Section is rectangular and uniform.
Reinforcement is evenly spaced along the tensile sides.

Material Properties & Section Details

Material Strengths and Properties

Steel

f_y	*40*	ksi	Reinforcement yield.	
E_s	29,000	ksi	Steel modulus of elasticity.	(8.7.2)
ε_{sy}	-0.0014		Yield strain in steel.	

Concrete

f'_c	*3.0*	ksi	Concrete strength.	
β_1	$= 0.85 - 0.05\,(f'_c - 4.0) \le 0.85\ \&\ \ge 0.65$			(8.16.2.7)
	0.850			
ε_c	+0.0030		Limiting strain in concrete.	(8.16.2.3)

Resistance Factors

Φ	0.75	Compression controlled section. (i.e. $\lvert\varepsilon_{st}\rvert < \lvert\varepsilon_{sy}\rvert$)	(8.16.1.2.2)
Φ	0.90	Tension controlled section. (i.e. $\lvert\varepsilon_{st}\rvert \ge 0.005$)	(After AASHTO, *LRFD* , 5.5.4.2.1)
Φ	0.85	Shear.	(8.16.6.2)

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Arch Member 1 - Mz

References

Section Details

Section is a: *Beam-Column*

b	*84*	in	Section width.	7' - 0"	
h	*60*	in	Section depth.	5' - 0"	
d_{cc}	*2*	in	Depth of clear cover.		(ACI 318-02, 7.5.2.1)
A_g	5,040.0	in^2	Area of gross section.		

Tensile Reinforcement

(Reinforcement in the side faces is, conservatively, ignored.)

d_{bt}	*1 1/4*	in	Bar diameter.
A_{st}	*18.750*	in^2	Tensile reinforcement area.
d_{st}	57 3/8	in	Depth to reinforcement.

Compression Reinforcement

d_{bc}	*1 1/4*	in	Bar diameter.
A_{sc}	*18.750*	in^2	Compression reinforcement area.
d_{sc}	2 5/8	in	Depth to reinforcement.

Transverse Reinforcement

d_{bv}	*9/16*	in	Bar diameter.
n	*4*		Number of legs / stirrup.
A_v	1.000	in^2	Stirrup reinforcement area.
s_v	*24*	in	Stirrup spacing.

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Arch Member 1 - Mz

References

Shear Strength & Rating

Shear Strength

Concrete

V_c $= 2f'_c{}^{1/2}bd$ (8-49)

527.9 kip

Reinforcement (8.16.6.3.2 & 8.16.6.3.9)

V_s $= A_v\, f_y\, d / s \leq 4\, f'_c{}^{1/2}\, b\, d$ (8-53)

95.6 kip

Shear Capacity

ΦV_n $= \Phi\,(V_c + V_s)$ Shear capacity of beam-column section.

530.0 kip

Shear Capacity & Load Rating

Loading	A_1V_{DU} *kip*	A_2V_{LU} *kip*	V_U *kip*	ΦV_n *kip*	RF V
HS20 INV	113.3	121.1	234.4	**530.0**	3.44
MIL INV	113.3	93.6	206.9	**530.0**	4.45
Lane INV	113.3	71.0	184.3	**530.0**	5.87
HS20 OPR	113.3	72.6	185.8	**530.0**	5.74
MIL OPR	113.3	56.1	169.3	**530.0**	7.43
Lane OPR	113.3	42.5	155.8	**530.0**	9.80
2F1	113.3	34.0	147.2	**530.0**	12.27
3F1	113.3	51.5	164.7	**530.0**	8.10
4F1	113.3	58.9	172.2	**530.0**	7.08
5C1	113.3	67.3	180.6	**530.0**	6.19

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Arch Member 1 - Mz

Moment/Axial Interaction Diagram

Axial Capacity

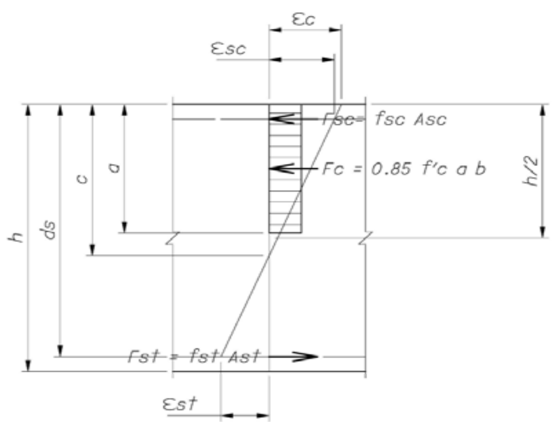
ψ 0.80 Ties.

$\Phi P_n = \Phi\,\psi\,[\,0.85\,f'_c\,(A_g - A_s) + f_y\,A_s\,]$ (8-29 and 8-30)

8,553.8 kip

General Expressions

c	$= d_s / [\,1 - \varepsilon_s / \varepsilon_c\,]$	Depth of the compression zone.
a	$= \beta_1\,c$	Depth of the stress block.
f_{st}	$= E_s\,\varepsilon_{st}$	Stress in the steel.
F_{st}	$= f_{st}\,A_{st}$	Force in the steel.
M_{st}	$= F_{st}\,(\,h/2 - d_{st}\,)$	Moment due to the steel.
F_c	$= 0.85\,f'_c\,a\,b$	Compressive force in concrete.
M_c	$= F_c\,(\,h/2 - a/2\,)$	Compressive moment in concrete.
f_{sc}	$= E_s\,\varepsilon_{sc}$	Stress in the steel.
F_{sc}	$= f_{sc}\,A_{sc}$	Force in the steel.
M_{sc}	$= F_{sc}\,(\,h/2 - d_{sc}\,)$	Moment due to the steel.



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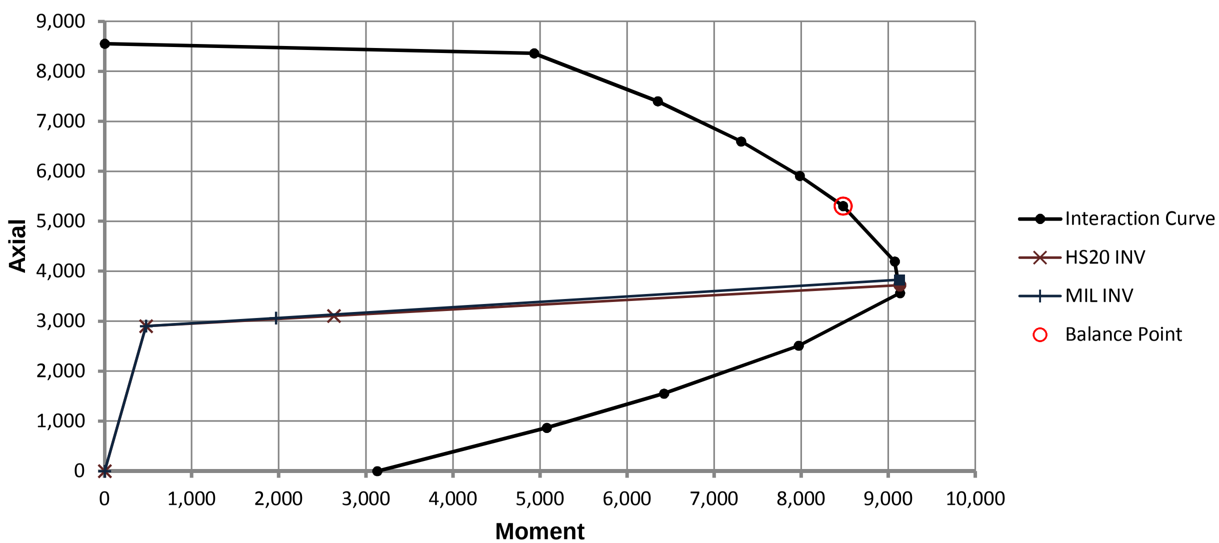
Arch Member 1 - Mz

Axial/Moment Interaction Diagram

ε_{st} / ε_y	Tensile Reinforcement				Concrete				Compressive Reinforcement				Capacity			
	ε_{st}	f_{st} ksi	P_{st} *kip*	M_{st} *kip-ft*	c *in*	a *in*	P_c *kip*	M_c *kip-ft*	ε_{sc}	f_{sc} ksi	P_{sc} *kip*	M_{sc} *kip-ft*	Φ	ΦP_n *kip*	ΦM_n *kip-ft*	e *ft*
N.A.													0.75	**8,553.8**	**0.0**	0.000
0%	0.0000	0.00	0.0	0.0	57.38	48.77	10,398.5	4,866.2	0.0029	40.00	750.0	1,710.9	0.75	8,361.3	4,932.8	0.590
25%	-0.0004	-10.00	-187.5	427.7	51.38	43.67	9,307.1	6,331.3	0.0028	40.00	750.0	1,710.9	0.75	7,402.2	6,352.5	0.858
50%	-0.0007	-20.00	-375.0	855.5	46.52	39.54	8,422.1	7,179.1	0.0028	40.00	750.0	1,710.9	0.75	6,597.8	7,309.1	1.108
75%	-0.0011	-30.00	-562.5	1,283.2	42.50	36.13	7,690.2	7,650.1	0.0028	40.00	750.0	1,710.9	0.75	5,908.2	7,983.2	1.351
100%	-0.0014	-40.00	-750.0	1,710.9	39.12	33.25	7,074.6	7,884.9	0.0028	40.00	750.0	1,710.9	0.75	5,306.0	8,480.1	1.598
219%	-0.0031	-40.00	-750.0	1,710.9	28.40	24.14	5,122.6	7,654.4	0.0027	40.00	750.0	1,710.9	0.82	4,196.5	9,073.9	2.162
337%	-0.0047	-40.00	-750.0	1,710.9	22.29	18.95	4,010.4	6,860.1	0.0026	40.00	750.0	1,710.9	0.89	3,563.0	9,134.8	2.564
575%	-0.0080	-40.00	-750.0	1,710.9	15.58	13.25	2,789.7	5,434.4	0.0025	40.00	750.0	1,710.9	0.90	2,510.7	7,970.6	3.175
1049%	-0.0147	-40.00	-750.0	1,710.9	9.73	8.27	1,723.8	3,715.5	0.0022	40.00	750.0	1,710.9	0.90	1,551.4	6,423.6	4.14
1998%	-0.0280	-40.00	-750.0	1,710.9	5.56	4.72	963.8	2,219.9	0.0016	40.00	750.0	1,710.9	0.90	867.4	5,077.6	5.854
3778%	-0.0529	-40.00	-750.0	1,710.9	3.08	2.62	512.9	1,226.2	0.0004	12.65	237.1	541.0	0.90	**0.0**	**3,130.3**	∞



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Hatch Mott MacDonald

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(Input values are shown underlined and in italics.)

References

Arch Member 1 - Mz

Axial Capacity & Load Rating

Loading	A_1P_{DU}	A_1M_{DU}	A_2P_{LU}	A_2M_{LU}	e_L	P_U	M_U	ΦP_n	ΦM_n	RF	
	kip	*kip-ft*	*kip*	*kip-ft*	*ft*	*kip*	*kip-ft*	*kip*	*kip-ft*	F	M
HS20 INV	2,902.1	475.8	204.3	2,156.6	10.557	3,106.4	2,632.4	3,722.2	9,134.0	4.01	4.01
	2,902.1	475.8	424.8	1,201.9	2.829	3,326.9	1,677.7	5,637.9	8,215.6	6.44	6.44
MIL INV	2,902.1	475.8	159.6	1,491.2	9.340	3,061.7	1,967.0	3,828.5	9,128.6	5.80	5.80
	2,902.1	475.8	287.4	803.1	2.795	3,189.5	1,278.9	5,663.8	8,194.0	9.61	9.61
Lane INV	2,902.1	475.8	478.2	1,019.3	2.132	3,380.2	1,495.1	6,266.4	7,647.9	7.04	7.04
	2,902.1	475.8	544.1	374.0	0.687	3,446.2	849.8	8,388.1	4,246.9	10.08	10.08
HS20 OPR	2,902.1	475.8	122.4	1,292.0	10.557	3,024.5	1,767.7	3,722.2	9,134.0	6.70	6.70
	2,902.1	475.8	254.5	720.0	2.829	3,156.6	1,195.8	5,637.9	8,215.6	10.75	10.75
MIL OPR	2,902.1	475.8	95.6	893.3	9.340	2,997.7	1,369.1	3,828.5	9,128.6	9.69	9.69
	2,902.1	475.8	172.2	481.1	2.795	3,074.2	956.9	5,663.8	8,194.0	16.04	16.04
Lane OPR	2,902.1	475.8	286.5	610.7	2.132	3,188.5	1,086.4	6,266.4	7,647.9	11.74	11.74
	2,902.1	475.8	326.0	224.1	0.687	3,228.1	699.8	8,388.1	4,246.9	16.83	16.83
2F1	2,902.1	475.8	58.2	555.6	9.553	2,960.2	1,031.4	3,808.0	9,130.1	15.58	15.58
	2,902.1	475.8	107.3	272.8	2.543	3,009.3	748.5	5,867.9	8,018.5	27.65	27.65
3F1	2,902.1	475.8	85.8	850.9	9.913	2,987.9	1,326.6	3,775.3	9,131.8	10.17	10.17
	2,902.1	475.8	164.1	362.1	2.207	3,066.2	837.8	6,187.3	7,724.9	20.02	20.02
4F1	2,902.1	475.8	96.5	993.4	10.295	2,998.6	1,469.1	3,743.1	9,133.4	8.72	8.72
	2,902.1	475.8	192.1	623.4	3.246	3,094.2	1,099.2	5,356.3	8,441.1	12.78	12.78
5C1	2,902.1	475.8	137.1	1,244.5	9.074	3,039.2	1,720.3	3,855.4	9,126.5	6.95	6.95
	2,902.1	475.8	268.5	721.2	2.686	3,170.6	1,196.9	5,748.6	8,122.1	10.60	10.60

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(*Input values are shown underlined and in italics.*)

References

Arch Member 1 - Mz

Summary of Ratings

Loading	RF			
	V	F	M	Total
HS20 INV	3.44	4.01	4.01	**3.44**
		6.44	6.44	**3.44**
MIL INV	4.45	5.80	5.80	**4.45**
		9.61	9.61	**4.45**
Lane INV	5.87	7.04	7.04	**5.87**
		10.08	10.08	**5.87**
HS20 OPR	5.74	6.70	6.70	**5.74**
		10.75	10.75	**5.74**
MIL OPR	7.43	9.69	9.69	**7.43**
		16.04	16.04	**7.43**
Lane OPR	9.80	11.74	11.74	**9.80**
		16.83	16.83	**9.80**
2F1	12.27	15.58	15.58	**12.27**
		27.65	27.65	**12.27**
3F1	8.10	10.17	10.17	**8.10**
		20.02	20.02	**8.10**
4F1	7.08	8.72	8.72	**7.08**
		12.78	12.78	**7.08**
5C1	6.19	6.95	6.95	**6.19**
		10.60	10.60	**6.19**

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(Input values are shown underlined and in italics.)

Arch Member 1 - My

References

Determine the Axial Load/Moment Interaction Diagram & Shear Capacity of a Rectangular Reinforced Concrete Section

Criteria

Designed by AASHTO, *Standard Specifications for Highway Bridges* , 17^{th} ed. 2002.
Strength design.
Capacity based on strain compatibility.
Dimensions are in pounds, feet and seconds, U.N.O.

Assumptions

Section is rectangular and uniform.
Reinforcement is evenly spaced along the tensile sides.

Material Properties & Section Details

Material Strengths and Properties

Steel

f_y	*40*	ksi	Reinforcement yield.	
E_s	29,000	ksi	Steel modulus of elasticity.	(8.7.2)
ε_{sy}	-0.0014		Yield strain in steel.	

Concrete

f'_c	*3.0*	ksi	Concrete strength.	
β_1	$= 0.85 - 0.05 (f'_c - 4.0) \leq 0.85$ & ≥ 0.65			(8.16.2.7)
	0.850			
ε_c	+0.0030		Limiting strain in concrete.	(8.16.2.3)

Resistance Factors

Φ	0.75	Compression controlled section. (i.e. $\lvert\varepsilon_{st}\rvert < \lvert\varepsilon_{sy}\rvert$)	(8.16.1.2.2)
Φ	0.90	Tension controlled section. (i.e. $\lvert\varepsilon_{st}\rvert \geq 0.005$)	(After AASHTO, *LRFD* , 5.5.4.2.1)
Φ	0.85	Shear.	(8.16.6.2)

(Input values are shown underlined and in italics.)

References

Arch Member 1 - My

Section Details

Section is a: *Beam-Column*

b	*60*	in	Section width.	5' - 0"	
h	*84*	in	Section depth.	7' - 0"	
d_{cc}	*2*	in	Depth of clear cover.		(ACI 318-02, 7.5.2.1)
A_g	5,040.0	in^2	Area of gross section.		

Tensile Reinforcement

(Reinforcement in the side faces is, conservatively, ignored.)

d_{bt}	*1 1/4*	in	Bar diameter.
A_{st}	*3.125*	in^2	Tensile reinforcement area.
d_{st}	81 3/8	in	Depth to reinforcement.

Compression Reinforcement

d_{bc}	*1 1/4*	in	Bar diameter.
A_{sc}	*3.125*	in^2	Compression reinforcement area.
d_{sc}	2 5/8	in	Depth to reinforcement.

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(Input values are shown underlined and in italics.)

References

Arch Member 1 - My

Moment/Axial Interaction Diagram

Axial Capacity

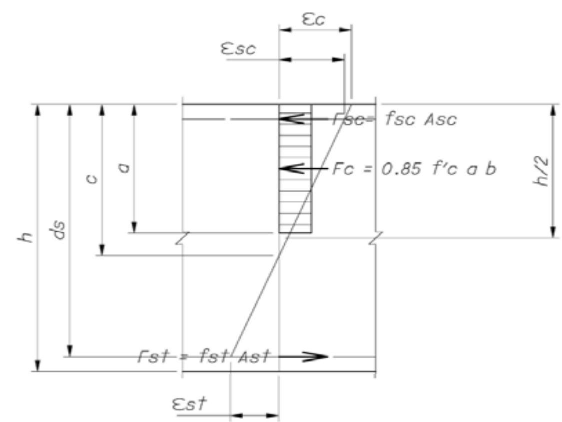
ψ 0.80 Ties.

$\Phi P_n = \Phi\ \psi\ [\ 0.85\ f'_c\ (A_g - A_s) + f_y\ A_s\ ]$ (8-29 and 8-30)

7,851.6 kip

General Expressions

c	$= d_s / [\ 1 - \varepsilon_s / \varepsilon_c\ ]$	Depth of the compression zone.
a	$= \beta_1\ c$	Depth of the stress block.
f_{st}	$= E_s\ \varepsilon_{st}$	Stress in the steel.
F_{st}	$= f_{st}\ A_{st}$	Force in the steel.
M_{st}	$= F_{st}\ (\ h/2 - d_{st}\ )$	Moment due to the steel.
F_c	$= 0.85\ f'_c\ a\ b$	Compressive force in concrete.
M_c	$= F_c\ (\ h/2 - a/2\ )$	Compressive moment in concrete.
f_{sc}	$= E_s\ \varepsilon_{sc}$	Stress in the steel.
F_{sc}	$= f_{sc}\ A_{sc}$	Force in the steel.
M_{sc}	$= F_{sc}\ (\ h/2 - d_{sc}\ )$	Moment due to the steel.



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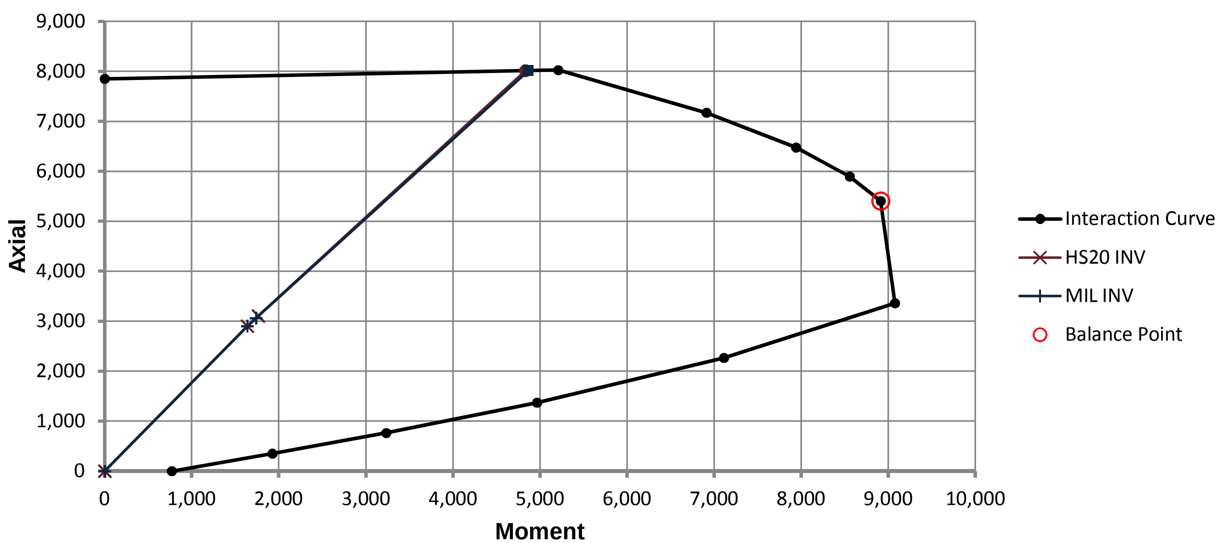
References

Arch Member 1 - My

Axial/Moment Interaction Diagram

$\varepsilon_{st} / \varepsilon_y$	Tensile Reinforcement				Concrete				Compressive Reinforcement				Capacity			
	ε_{st}	f_{st} ksi	P_{st} *kip*	M_{st} *kip-ft*	c *in*	a *in*	P_c *kip*	M_c *kip-ft*	ε_{sc}	f_{sc} ksi	P_{sc} *kip*	M_{sc} *kip-ft*	Φ	ΦP_n *kip*	ΦM_n *kip-ft*	e *ft*
N.A.													0.75	**7,851.6**	**0.0**	0.000
0%	0.0000	0.00	0.0	0.0	81.38	69.17	10,574.9	6,534.9	0.0029	40.00	125.0	410.2	0.75	8,024.9	5,208.8	0.649
25%	-0.0004	-10.00	-31.3	102.5	72.87	61.94	9,469.2	8,702.9	0.0029	40.00	125.0	410.2	0.75	7,172.2	6,911.7	0.964
50%	-0.0007	-20.00	-62.5	205.1	65.98	56.08	8,572.7	9,971.9	0.0029	40.00	125.0	410.2	0.75	6,476.4	7,940.4	1.226
75%	-0.0011	-30.00	-93.8	307.6	60.28	51.24	7,831.2	10,690.8	0.0029	40.00	125.0	410.2	0.75	5,896.8	8,556.4	1.451
100%	-0.0014	-40.00	-125.0	410.2	55.48	47.16	7,207.6	11,063.5	0.0029	40.00	125.0	410.2	0.75	5,405.7	8,912.9	1.649
392%	-0.0055	-40.00	-125.0	410.2	28.78	24.46	3,734.4	9,264.5	0.0027	40.00	125.0	410.2	0.90	3,361.0	9,076.3	2.7
683%	-0.0096	-40.00	-125.0	410.2	19.43	16.51	2,518.4	7,081.7	0.0026	40.00	125.0	410.2	0.90	2,266.5	7,111.8	3.138
1267%	-0.0177	-40.00	-125.0	410.2	11.77	10.01	1,523.3	4,696.2	0.0023	40.00	125.0	410.2	0.90	1,370.9	4,964.9	3.622
2433%	-0.0341	-40.00	-125.0	410.2	6.59	5.60	848.5	2,771.9	0.0018	40.00	125.0	410.2	0.90	763.7	3,233.0	4.233
4767%	-0.0667	-40.00	-125.0	410.2	3.50	2.98	447.3	1,510.1	0.0008	21.44	67.0	219.9	0.90	350.4	1,926.1	5.497
9142%	-0.1280	-40.00	-125.0	410.2	1.86	1.58	234.4	805.0	-0.0012	-35.01	-109.4	-359.0	0.90	**0.0**	**770.5**	∞



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Arch Member 1 - My

References

Axial Capacity & Load Rating

Loading	A_1P_{DU}	A_1M_{DU}	A_2P_{LU}	A_2M_{LU}	e_L	P_U	M_U	ΦP_n	ΦM_n	RF	
	kip	*kip-ft*	*kip*	*kip-ft*	*ft*	*kip*	*kip-ft*	*kip*	*kip-ft*	F	M
HS20 INV	2,902.1	1,638.2	204.3	127.7	0.625	3,106.4	1,765.9	**8,012.4**	**4,833.3**	25.02	25.02
	2,902.1	1,638.2	424.8	218.3	0.514	3,326.9	1,856.5	**7,993.1**	**4,253.7**	11.98	11.98
MIL INV	2,902.1	1,638.2	159.6	100.8	0.631	3,061.7	1,739.0	**8,013.5**	**4,865.7**	32.02	32.02
	2,902.1	1,638.2	287.4	145.1	0.505	3,189.5	1,783.3	**7,991.6**	**4,207.2**	17.71	17.71
Lane INV	2,902.1	1,638.2	478.2	338.1	0.707	3,380.2	1,976.3	**8,007.2**	**5,248.2**	10.68	10.68
	2,902.1	1,638.2	544.1	381.6	0.701	3,446.2	2,019.8	**8,017.2**	**5,225.8**	9.40	9.40
HS20 OPR	2,902.1	1,638.2	122.4	76.5	0.625	3,024.5	1,714.7	**8,012.4**	**4,833.3**	41.76	41.76
	2,902.1	1,638.2	254.5	130.8	0.514	3,156.6	1,769.0	**7,993.1**	**4,253.7**	20.00	20.00
MIL OPR	2,902.1	1,638.2	95.6	60.4	0.631	2,997.7	1,698.6	**8,013.5**	**4,865.7**	53.44	53.44
	2,902.1	1,638.2	172.2	86.9	0.505	3,074.2	1,725.1	**7,991.6**	**4,207.2**	29.56	29.56
Lane OPR	2,902.1	1,638.2	286.5	202.6	0.707	3,188.5	1,840.8	**8,007.2**	**5,248.2**	17.82	17.82
	2,902.1	1,638.2	326.0	228.6	0.701	3,228.1	1,866.8	**8,017.2**	**5,225.8**	15.69	15.69
2F1	2,902.1	1,638.2	58.2	36.6	0.630	2,960.2	1,674.8	**8,013.2**	**4,858.9**	87.88	87.88
	2,902.1	1,638.2	107.3	54.5	0.508	3,009.3	1,692.7	**7,992.2**	**4,224.7**	47.46	47.46
3F1	2,902.1	1,638.2	85.8	54.0	0.629	2,987.9	1,692.2	**8,013.0**	**4,850.8**	59.54	59.54
	2,902.1	1,638.2	164.1	83.9	0.511	3,066.2	1,722.1	**7,992.7**	**4,240.0**	31.03	31.03
4F1	2,902.1	1,638.2	96.5	60.5	0.626	2,998.6	1,698.7	**8,012.6**	**4,839.9**	52.96	52.96
	2,902.1	1,638.2	192.1	97.4	0.507	3,094.2	1,735.6	**7,992.0**	**4,218.7**	26.50	26.50
5C1	2,902.1	1,638.2	137.1	85.2	0.621	3,039.2	1,723.4	**8,011.7**	**4,811.8**	37.26	37.26
	2,902.1	1,638.2	268.5	145.5	0.542	3,170.6	1,783.7	**7,998.0**	**4,400.6**	18.98	18.98

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References

Arch Member 1 - My

Summary of Ratings

Loading	RF			
	V	F	M	Total
HS20 INV		25.02	25.02	**25.02**
		11.98	11.98	**11.98**
MIL INV		32.02	32.02	**32.02**
		17.71	17.71	**17.71**
Lane INV		10.68	10.68	**10.68**
		9.40	9.40	**9.40**
HS20 OPR		41.76	41.76	**41.76**
		20.00	20.00	**20.00**
MIL OPR		53.44	53.44	**53.44**
		29.56	29.56	**29.56**
Lane OPR		17.82	17.82	**17.82**
		15.69	15.69	**15.69**
2F1		87.88	87.88	**87.88**
		47.46	47.46	**47.46**
3F1		59.54	59.54	**59.54**
		31.03	31.03	**31.03**
4F1		52.96	52.96	**52.96**
		26.50	26.50	**26.50**
5C1		37.26	37.26	**37.26**
		18.98	18.98	**18.98**

Summary of Ratings - Combined Effects

$1/RF = \Sigma\ 1/RFi$

Loading	RF			
	V	F	M	Total
HS20 INV	3.44	3.46	3.46	**3.44**
		4.19	4.19	**3.44**
MIL INV	4.45	4.91	4.91	**4.45**
		6.23	6.23	**4.45**
Lane INV	5.87	4.24	4.24	**4.24**
		4.86	4.86	**4.86**
HS20 OPR	5.74	5.77	5.77	**5.74**
		6.99	6.99	**5.74**
MIL OPR	7.43	8.20	8.20	**7.43**
		10.40	10.40	**7.43**
Lane OPR	9.80	7.08	7.08	**7.08**
		8.12	8.12	**8.12**
2F1	12.27	13.23	13.23	**12.27**
		17.47	17.47	**12.27**
3F1	8.10	8.69	8.69	**8.10**
		12.17	12.17	**8.10**
4F1	7.08	7.48	7.48	**7.08**
		8.62	8.62	**7.08**
5C1	6.19	5.86	5.86	**5.86**
		6.80	6.80	**6.19**

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(Input values are shown underlined and in italics.)

Arch Member 3 - Mz — References

Determine the Axial Load/Moment Interaction Diagram & Shear Capacity of a Rectangular Reinforced Concrete Section

Criteria

Designed by AASHTO, *Standard Specifications for Highway Bridges*, 17th ed. 2002.
Strength design.
Capacity based on strain compatibility.
Dimensions are in pounds, feet and seconds, U.N.O.

Assumptions

Section is rectangular and uniform.
Reinforcement is evenly spaced along the tensile sides.

Material Properties & Section Details

Material Strengths and Properties

Steel

f_y	*40*	ksi	Reinforcement yield.	
E_s	29,000	ksi	Steel modulus of elasticity.	(8.7.2)
ε_{sy}	-0.0014		Yield strain in steel.	

Concrete

f'_c	*3.0*	ksi	Concrete strength.	
β_1	$= 0.85 - 0.05\,(f'_c - 4.0) \le 0.85\ \&\ \ge 0.65$			(8.16.2.7)
	0.850			
ε_c	+0.0030		Limiting strain in concrete.	(8.16.2.3)

Resistance Factors

Φ	0.75	Compression controlled section. (i.e. $\lvert\varepsilon_{st}\rvert < \lvert\varepsilon_{sy}\rvert$)	(8.16.1.2.2)
Φ	0.90	Tension controlled section. (i.e. $\lvert\varepsilon_{st}\rvert \ge 0.005$)	(After AASHTO, *LRFD*, 5.5.4.2.1)
Φ	0.85	Shear.	(8.16.6.2)

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Hatch Mott MacDonald

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(Input values are shown underlined and in italics.)

References

Arch Member 3 - Mz

Section Details

Section is a: *Beam-Column*

b	*84*	in	Section width.	7' - 0"	
h	*55*	in	Section depth.	4' - 7"	
d_{cc}	*2*	in	Depth of clear cover.		(ACI 318-02, 7.5.2.1)
A_g	4,620.0	in^2	Area of gross section.		

Tensile Reinforcement

(Reinforcement in the side faces is, conservatively, ignored.)

d_{bt}	*1 1/4*	in	Bar diameter.
A_{st}	*18.750*	in^2	Tensile reinforcement area.
d_{st}	52 3/8	in	Depth to reinforcement.

Compression Reinforcement

d_{bc}	*1 1/4*	in	Bar diameter.
A_{sc}	*18.750*	in^2	Compression reinforcement area.
d_{sc}	2 5/8	in	Depth to reinforcement.

Transverse Reinforcement

d_{bv}	*9/16*	in	Bar diameter.
n	*4*		Number of legs / stirrup.
A_v	1.000	in^2	Stirrup reinforcement area.
s_v	*24*	in	Stirrup spacing.

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References

Arch Member 3 - Mz

Shear Strength & Rating

Shear Strength

Concrete

$V_c = 2f'_c{}^{1/2}bd$ (8-49)

481.9 kip

Reinforcement (8.16.6.3.2 & 8.16.6.3.9)

$V_s = A_v f_y d / s \leq 4 f'_c{}^{1/2} b d$ (8-53)

87.3 kip

Shear Capacity

$\Phi V_n = \Phi (V_c + V_s)$ Shear capacity of beam-column section.

483.8 kip

Shear Capacity & Load Rating

Loading	A_1V_{DU} *kip*	A_2V_{LU} *kip*	V_U *kip*	ΦV_n *kip*	RF V
HS20 INV	31.3	142.8	174.1	**483.8**	3.17
MIL INV	31.3	106.6	137.9	**483.8**	4.25
Lane INV	31.3	40.9	72.2	**483.8**	11.07
HS20 OPR	31.3	85.5	116.8	**483.8**	5.29
MIL OPR	31.3	63.9	95.1	**483.8**	7.09
Lane OPR	31.3	24.5	55.8	**483.8**	18.48
2F1	31.3	38.9	70.2	**483.8**	11.63
3F1	31.3	59.4	90.6	**483.8**	7.62
4F1	31.3	68.5	99.8	**483.8**	6.61
5C1	31.3	63.6	94.8	**483.8**	7.12

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References

Arch Member 3 - Mz

Moment/Axial Interaction Diagram

Axial Capacity

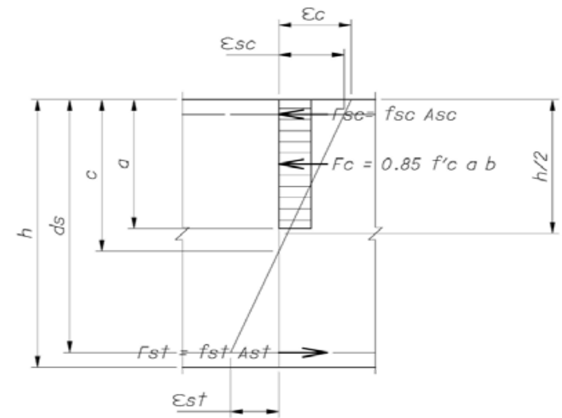
ψ 0.80 Ties.

$\Phi P_n = \Phi\,\psi\,[\,0.85\,f'_c\,(A_g - A_s) + f_y\,A_s\,]$ (8-29 and 8-30)

7,911.2 kip

General Expressions

c	$= d_s / [\,1 - \varepsilon_s / \varepsilon_c\,]$	Depth of the compression zone.
a	$= \beta_1\,c$	Depth of the stress block.
f_{st}	$= E_s\,\varepsilon_{st}$	Stress in the steel.
F_{st}	$= f_{st}\,A_{st}$	Force in the steel.
M_{st}	$= F_{st}\,(\,h/2 - d_{st}\,)$	Moment due to the steel.
F_c	$= 0.85\,f'_c\,a\,b$	Compressive force in concrete.
M_c	$= F_c\,(\,h/2 - a/2\,)$	Compressive moment in concrete.
f_{sc}	$= E_s\,\varepsilon_{sc}$	Stress in the steel.
F_{sc}	$= f_{sc}\,A_{sc}$	Force in the steel.
M_{sc}	$= F_{sc}\,(\,h/2 - d_{sc}\,)$	Moment due to the steel.



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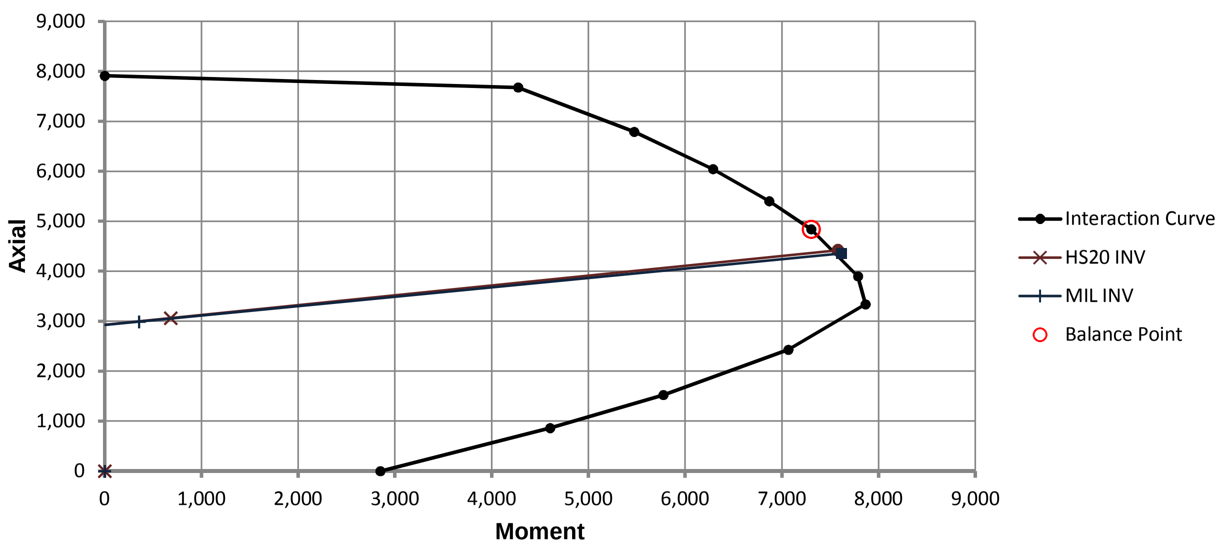
References

Arch Member 3 - Mz

Axial/Moment Interaction Diagram

ε_{st} / ε_y	Tensile Reinforcement				Concrete				Compressive Reinforcement				Capacity			
	ε_{st}	f_{st} ksi	P_{st} *kip*	M_{st} *kip-ft*	c *in*	a *in*	P_c *kip*	M_c *kip-ft*	ε_{sc}	f_{sc} ksi	P_{sc} *kip*	M_{sc} *kip-ft*	Φ	ΦP_n *kip*	ΦM_n *kip-ft*	e *ft*
N.A.													0.75	**7,911.2**	**0.0**	0.000
0%	0.0000	0.00	0.0	0.0	52.38	44.52	9,488.1	4,143.6	0.0028	40.00	750.0	1,554.7	0.75	7,678.6	4,273.7	0.557
25%	-0.0004	-10.00	-187.5	388.7	46.90	39.87	8,491.8	5,354.3	0.0028	40.00	750.0	1,554.7	0.75	6,790.7	5,473.2	0.806
50%	-0.0007	-20.00	-375.0	777.3	42.47	36.10	7,684.0	6,052.3	0.0028	40.00	750.0	1,554.7	0.75	6,044.3	6,288.3	1.040
75%	-0.0011	-30.00	-562.5	1,166.0	38.80	32.98	7,015.8	6,437.9	0.0028	40.00	750.0	1,554.7	0.75	5,402.5	6,869.0	1.271
100%	-0.0014	-40.00	-750.0	1,554.7	35.71	30.35	6,453.9	6,627.7	0.0028	40.00	750.0	1,554.7	0.75	4,840.5	7,302.8	1.509
207%	-0.0029	-40.00	-750.0	1,554.7	26.61	22.62	4,797.7	6,472.6	0.0027	40.00	750.0	1,554.7	0.81	3,898.9	7,787.0	1.997
315%	-0.0044	-40.00	-750.0	1,554.7	21.21	18.03	3,813.9	5,875.2	0.0026	40.00	750.0	1,554.7	0.88	3,338.4	7,864.5	2.356
530%	-0.0074	-40.00	-750.0	1,554.7	15.08	12.82	2,698.7	4,742.7	0.0025	40.00	750.0	1,554.7	0.90	2,428.8	7,066.9	2.91
959%	-0.0134	-40.00	-750.0	1,554.7	9.56	8.13	1,693.1	3,306.7	0.0022	40.00	750.0	1,554.7	0.90	1,523.8	5,774.5	3.789
1819%	-0.0255	-40.00	-750.0	1,554.7	5.52	4.69	957.2	2,006.5	0.0016	40.00	750.0	1,554.7	0.90	861.5	4,604.3	5.344
3430%	-0.0480	-40.00	-750.0	1,554.7	3.08	2.62	512.9	1,119.4	0.0004	12.65	237.1	491.6	0.90	**0.0**	**2,849.1**	∞



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References

Arch Member 3 - Mz

Axial Capacity & Load Rating

Loading	A_1P_{DU}	A_1M_{DU}	A_2P_{LU}	A_2M_{LU}	e_L	P_U	M_U	ΦP_n	ΦM_n	RF	
	kip	*kip-ft*	*kip*	*kip-ft*	*ft*	*kip*	*kip-ft*	*kip*	*kip-ft*	F	M
HS20 INV	2,850.4	-388.9	210.9	1,071.5	5.081	3,061.3	682.6	4,418.8	7,580.9	7.44	7.44
	2,850.4	388.9	422.6	911.7	2.157	3,273.0	1,300.6	5,724.6	6,589.6	6.80	6.80
MIL INV	2,850.4	-388.9	139.9	744.7	5.325	2,990.3	355.8	4,353.6	7,614.8	10.75	10.75
	2,850.4	388.9	285.9	615.0	2.151	3,136.3	1,003.9	5,730.8	6,584.1	10.07	10.07
Lane INV	2,850.4	-388.9	529.3	548.2	1.036	3,379.7	159.3	7,543.8	4,471.9	8.87	8.87
	2,850.4	388.9	544.0	169.4	0.311	3,394.4	558.3	7,806.0	1,932.4	9.11	9.11
HS20 OPR	2,850.4	-388.9	126.3	641.9	5.081	2,976.7	253.0	4,418.8	7,580.9	12.42	12.42
	2,850.4	388.9	253.2	546.2	2.157	3,103.6	935.1	5,724.6	6,589.6	11.35	11.35
MIL OPR	2,850.4	-388.9	83.8	446.1	5.325	2,934.2	57.2	4,353.6	7,614.8	17.94	17.94
	2,850.4	388.9	171.3	368.4	2.151	3,021.7	757.3	5,730.8	6,584.1	16.82	16.82
Lane OPR	2,850.4	-388.9	317.1	328.4	1.036	3,167.5	-60.4	7,543.8	4,471.9	14.80	14.80
	2,850.4	388.9	325.9	101.5	0.311	3,176.3	490.4	7,806.0	1,932.4	15.21	15.21
2F1	2,850.4	-388.9	50.8	275.9	5.435	2,901.2	-112.9	4,325.4	7,628.6	29.06	29.06
	2,850.4	388.9	106.8	215.1	2.014	2,957.2	604.0	5,864.8	6,460.5	28.22	28.22
3F1	2,850.4	-388.9	74.5	419.4	5.626	2,924.9	30.5	4,279.3	7,650.4	19.17	19.17
	2,850.4	388.9	163.5	299.9	1.834	3,013.9	688.8	6,059.1	6,273.4	19.62	19.62
4F1	2,850.4	-388.9	99.5	491.6	4.939	2,949.9	102.7	4,459.6	7,558.5	16.17	16.17
	2,850.4	388.9	191.3	312.6	1.634	3,041.7	701.5	6,300.8	6,026.0	18.03	18.03
5C1	2,850.4	-388.9	141.0	605.0	4.291	2,991.4	216.2	4,671.9	7,426.3	12.92	12.92
	2,850.4	388.9	266.9	521.9	1.955	3,117.3	910.8	5,926.1	6,402.6	11.52	11.52

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References

Arch Member 3 - Mz

Summary of Ratings

Loading	RF			
	V	F	M	Total
HS20 INV	3.17	7.44	7.44	**3.17**
		6.80	6.80	**3.17**
MIL INV	4.25	10.75	10.75	**4.25**
		10.07	10.07	**4.25**
Lane INV	11.07	8.87	8.87	**8.87**
		9.11	9.11	**9.11**
HS20 OPR	5.29	12.42	12.42	**5.29**
		11.35	11.35	**5.29**
MIL OPR	7.09	17.94	17.94	**7.09**
		16.82	16.82	**7.09**
Lane OPR	18.48	14.80	14.80	**14.80**
		15.21	15.21	**15.21**
2F1	11.63	29.06	29.06	**11.63**
		28.22	28.22	**11.63**
3F1	7.62	19.17	19.17	**7.62**
		19.62	19.62	**7.62**
4F1	6.61	16.17	16.17	**6.61**
		18.03	18.03	**6.61**
5C1	7.12	12.92	12.92	**7.12**
		11.52	11.52	**7.12**

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Arch Member 3 - My

References

Determine the Axial Load/Moment Interaction Diagram & Shear Capacity of a Rectangular Reinforced Concrete Section

Criteria

Designed by AASHTO, *Standard Specifications for Highway Bridges*, 17th ed. 2002.
Strength design.
Capacity based on strain compatibility.
Dimensions are in pounds, feet and seconds, U.N.O.

Assumptions

Section is rectangular and uniform.
Reinforcement is evenly spaced along the tensile sides.

Material Properties & Section Details

Material Strengths and Properties

Steel

f_y	*40* ksi	Reinforcement yield.	
E_s	29,000 ksi	Steel modulus of elasticity.	(8.7.2)
ε_{sy}	-0.0014	Yield strain in steel.	

Concrete

f'_c	*3.0* ksi	Concrete strength.	
β_1	$= 0.85 - 0.05\,(f'_c - 4.0) \leq 0.85\ \&\ \geq 0.65$		(8.16.2.7)
	0.850		
ε_c	+0.0030	Limiting strain in concrete.	(8.16.2.3)

Resistance Factors

Φ	0.75	Compression controlled section. (i.e. $\lvert\varepsilon_{st}\rvert < \lvert\varepsilon_{sy}\rvert$)	(8.16.1.2.2)
Φ	0.90	Tension controlled section. (i.e. $\lvert\varepsilon_{st}\rvert \geq 0.005$)	(After AASHTO, *LRFD*, 5.5.4.2.1)
Φ	0.85	Shear.	(8.16.6.2)

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(Input values are shown underlined and in italics.)

Arch Member 3 - My

References

Section Details

Section is a: *Beam-Column*

b	*55*	in	Section width.	4' - 7"	
h	*84*	in	Section depth.	7' - 0"	
d_{cc}	*2*	in	Depth of clear cover.		(ACI 318-02, 7.5.2.1)
A_g	4,620.0	in^2	Area of gross section.		

Tensile Reinforcement

(Reinforcement in the side faces is, conservatively, ignored.)

d_{bt}	*1 1/4*	in	Bar diameter.
A_{st}	*3.125*	in^2	Tensile reinforcement area.
d_{st}	81 3/8	in	Depth to reinforcement.

Compression Reinforcement

d_{bc}	*1 1/4*	in	Bar diameter.
A_{sc}	*3.125*	in^2	Compression reinforcement area.
d_{sc}	2 5/8	in	Depth to reinforcement.

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Arch Member 3 - My

References

Moment/Axial Interaction Diagram

Axial Capacity

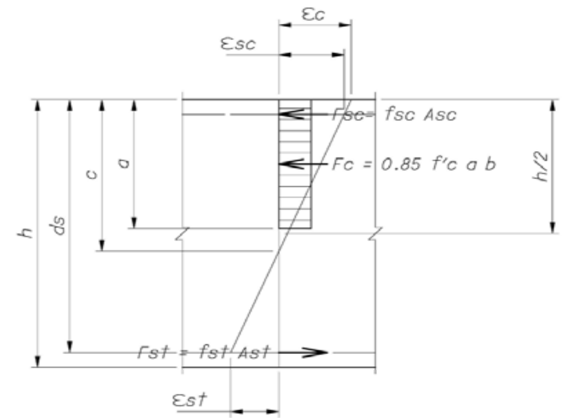
ψ 0.80 Ties.

ΦP_n $= \Phi\ \psi\ [\ 0.85\ f'_c\ (A_g - A_s) + f_y\ A_s\ ]$ (8-29 and 8-30)

7,209.0 kip

General Expressions

c	$= d_s / [\ 1 - \varepsilon_s / \varepsilon_c\ ]$	Depth of the compression zone.
a	$= \beta_1\ c$	Depth of the stress block.
f_{st}	$= E_s\ \varepsilon_{st}$	Stress in the steel.
F_{st}	$= f_{st}\ A_{st}$	Force in the steel.
M_{st}	$= F_{st}\ (\ h/2 - d_{st}\ )$	Moment due to the steel.
F_c	$= 0.85\ f'_c\ a\ b$	Compressive force in concrete.
M_c	$= F_c\ (\ h/2 - a/2\ )$	Compressive moment in concrete.
f_{sc}	$= E_s\ \varepsilon_{sc}$	Stress in the steel.
F_{sc}	$= f_{sc}\ A_{sc}$	Force in the steel.
M_{sc}	$= F_{sc}\ (\ h/2 - d_{sc}\ )$	Moment due to the steel.



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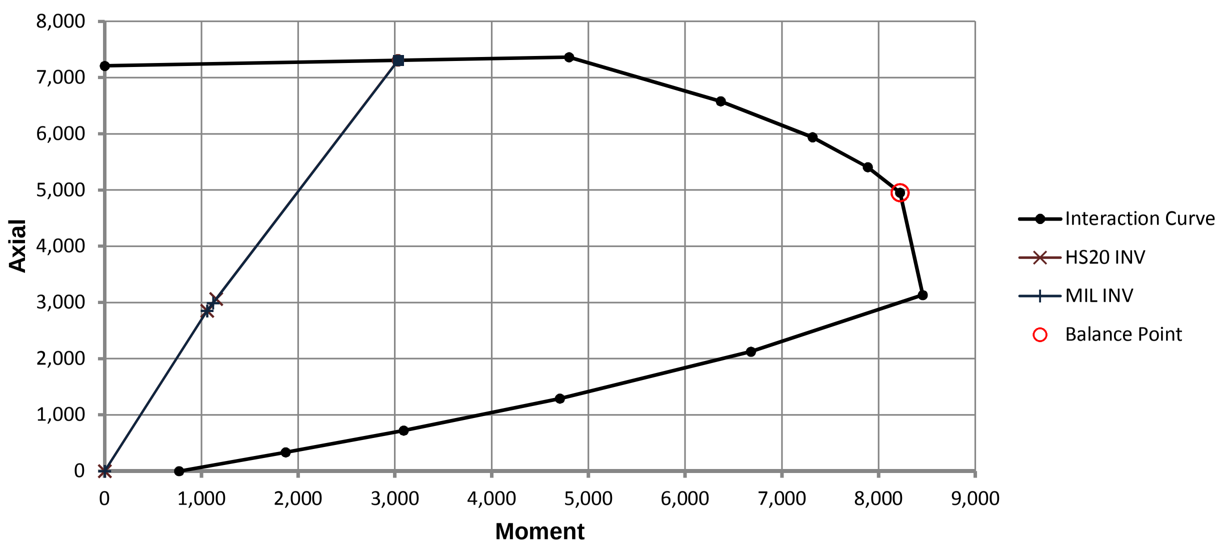
References

Arch Member 3 - My

Axial/Moment Interaction Diagram

$\varepsilon_{st} / \varepsilon_y$	Tensile Reinforcement				Concrete				Compressive Reinforcement				Capacity			
	ε_{st}	f_{st} ksi	P_{st} *kip*	M_{st} *kip-ft*	c *in*	a *in*	P_c *kip*	M_c *kip-ft*	ε_{sc}	f_{sc} ksi	P_{sc} *kip*	M_{sc} *kip-ft*	Φ	ΦP_n *kip*	ΦM_n *kip-ft*	e *ft*
N.A.													0.75	**7,209.0**	**0.0**	0.000
0%	0.0000	0.00	0.0	0.0	81.38	69.17	9,692.9	5,989.9	0.0029	40.00	125.0	410.2	0.75	7,363.5	4,800.1	0.652
25%	-0.0004	-10.00	-31.3	102.5	72.87	61.94	8,679.4	7,977.1	0.0029	40.00	125.0	410.2	0.75	6,579.9	6,367.3	0.968
50%	-0.0007	-20.00	-62.5	205.1	65.98	56.08	7,857.6	9,140.1	0.0029	40.00	125.0	410.2	0.75	5,940.1	7,316.5	1.232
75%	-0.0011	-30.00	-93.8	307.6	60.28	51.24	7,177.9	9,799.0	0.0029	40.00	125.0	410.2	0.75	5,406.9	7,887.6	1.459
100%	-0.0014	-40.00	-125.0	410.2	55.48	47.16	6,606.3	10,140.5	0.0029	40.00	125.0	410.2	0.75	4,954.7	8,220.6	1.659
382%	-0.0053	-40.00	-125.0	410.2	29.26	24.87	3,480.4	8,574.4	0.0027	40.00	125.0	410.2	0.90	3,132.3	8,455.3	2.699
663%	-0.0093	-40.00	-125.0	410.2	19.87	16.89	2,360.9	6,601.5	0.0026	40.00	125.0	410.2	0.90	2,124.8	6,679.7	3.144
1227%	-0.0172	-40.00	-125.0	410.2	12.10	10.29	1,434.8	4,406.8	0.0023	40.00	125.0	410.2	0.90	1,291.3	4,704.4	3.643
2353%	-0.0329	-40.00	-125.0	410.2	6.79	5.77	801.7	2,613.2	0.0018	40.00	125.0	410.2	0.90	721.6	3,090.1	4.283
4606%	-0.0645	-40.00	-125.0	410.2	3.62	3.07	423.3	1,427.2	0.0008	23.52	73.5	241.1	0.90	334.6	1,870.7	5.591
8831%	-0.1236	-40.00	-125.0	410.2	1.93	1.64	221.9	761.4	-0.0011	-30.99	-96.9	-317.8	0.90	**0.0**	**768.3**	∞



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References

Arch Member 3 - My

Axial Capacity & Load Rating

Loading	A_1P_{DU} kip	A_1M_{DU} kip-ft	A_2P_{LU} kip	A_2M_{LU} kip-ft	e_L ft	P_U kip	M_U kip-ft	ΦP_n kip	ΦM_n kip-ft	RF F	RF M
HS20 INV	2,850.4	1,058.8	210.9	93.4	0.443	3,061.3	1,152.2	**7,306.6**	**3,032.3**	21.13	21.13
	2,850.4	1,058.8	422.6	139.6	0.330	3,273.0	1,198.4	**7,290.3**	**2,525.2**	10.51	10.51
MIL INV	2,850.4	1,058.8	139.9	62.0	0.444	2,990.3	1,120.9	**7,306.7**	**3,035.4**	31.86	31.86
	2,850.4	1,058.8	285.9	92.1	0.322	3,136.3	1,150.9	**7,289.1**	**2,488.0**	15.52	15.52
Lane INV	2,850.4	1,058.8	529.3	253.4	0.479	3,379.7	1,312.2	**7,311.8**	**3,194.2**	8.43	8.43
	2,850.4	1,058.8	544.0	250.5	0.460	3,394.4	1,309.3	**7,309.2**	**3,112.1**	8.20	8.20
HS20 OPR	2,850.4	1,058.8	126.3	55.9	0.443	2,976.7	1,114.8	**7,306.6**	**3,032.3**	35.28	35.28
	2,850.4	1,058.8	253.2	83.6	0.330	3,103.6	1,142.4	**7,290.3**	**2,525.2**	17.54	17.54
MIL OPR	2,850.4	1,058.8	83.8	37.2	0.444	2,934.2	1,096.0	**7,306.7**	**3,035.4**	53.19	53.19
	2,850.4	1,058.8	171.3	55.2	0.322	3,021.7	1,114.0	**7,289.1**	**2,488.0**	25.91	25.91
Lane OPR	2,850.4	1,058.8	317.1	151.8	0.479	3,167.5	1,210.6	**7,311.8**	**3,194.2**	14.07	14.07
	2,850.4	1,058.8	325.9	150.1	0.460	3,176.3	1,208.9	**7,309.2**	**3,112.1**	13.68	13.68
2F1	2,850.4	1,058.8	50.8	22.5	0.444	2,901.2	1,081.3	**7,306.7**	**3,036.4**	87.78	87.78
	2,850.4	1,058.8	106.8	34.6	0.324	2,957.2	1,093.4	**7,289.3**	**2,496.2**	41.56	41.56
3F1	2,850.4	1,058.8	74.5	33.1	0.445	2,924.9	1,092.0	**7,306.8**	**3,040.2**	59.79	59.79
	2,850.4	1,058.8	163.5	53.1	0.325	3,013.9	1,112.0	**7,289.5**	**2,501.7**	27.15	27.15
4F1	2,850.4	1,058.8	99.5	44.0	0.442	2,949.9	1,102.8	**7,306.4**	**3,027.6**	44.76	44.76
	2,850.4	1,058.8	191.3	62.7	0.328	3,041.7	1,121.5	**7,289.9**	**2,513.5**	23.20	23.20
5C1	2,850.4	1,058.8	141.0	61.2	0.434	2,991.4	1,120.0	**7,305.3**	**2,991.1**	31.59	31.59
	2,850.4	1,058.8	266.9	95.7	0.359	3,117.3	1,154.5	**7,294.4**	**2,652.3**	16.65	16.65

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(Input values are shown underlined and in italics.)

References

Arch Member 3 - My

Summary of Ratings

Loading	RF			
	V	F	M	Total
HS20 INV		21.13	21.13	21.13
		10.51	10.51	10.51
MIL INV		31.86	31.86	31.86
		15.52	15.52	15.52
Lane INV		8.43	8.43	8.43
		8.20	8.20	8.20
HS20 OPR		35.28	35.28	35.28
		17.54	17.54	17.54
MIL OPR		53.19	53.19	53.19
		25.91	25.91	25.91
Lane OPR		14.07	14.07	14.07
		13.68	13.68	13.68
2F1		87.78	87.78	87.78
		41.56	41.56	41.56
3F1		59.79	59.79	59.79
		27.15	27.15	27.15
4F1		44.76	44.76	44.76
		23.20	23.20	23.20
5C1		31.59	31.59	31.59
		16.65	16.65	16.65

Summary of Ratings - Combined Effects

1/RF = Σ 1/RFi

Loading	RF			
	V	F	M	Total
HS20 INV	3.17	5.50	5.50	3.17
		4.13	4.13	3.17
MIL INV	4.25	8.04	8.04	4.25
		6.11	6.11	4.25
Lane INV	11.07	4.32	4.32	4.32
		4.31	4.31	4.31
HS20 OPR	5.29	9.18	9.18	5.29
		6.89	6.89	5.29
MIL OPR	7.09	13.42	13.42	7.09
		10.20	10.20	7.09
Lane OPR	18.48	7.21	7.21	7.21
		7.20	7.20	7.20
2F1	11.63	21.83	21.83	11.63
		16.81	16.81	11.63
3F1	7.62	14.52	14.52	7.62
		11.39	11.39	7.62
4F1	6.61	11.88	11.88	6.61
		10.15	10.15	6.61
5C1	7.12	9.17	9.17	7.12
		6.81	6.81	6.81

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(Input values are shown underlined and in italics.)

Arch Member 5 - Mz References

Determine the Axial Load/Moment Interaction Diagram & Shear Capacity of a Rectangular Reinforced Concrete Section

Criteria

Designed by AASHTO, *Standard Specifications for Highway Bridges* , 17th ed. 2002.
Strength design.
Capacity based on strain compatibility.
Dimensions are in pounds, feet and seconds, U.N.O.

Assumptions

Section is rectangular and uniform.
Reinforcement is evenly spaced along the tensile sides.

Material Properties & Section Details

Material Strengths and Properties

Steel

f_y	*40*	ksi	Reinforcement yield.	
E_s	29,000	ksi	Steel modulus of elasticity.	(8.7.2)
ε_{sy}	-0.0014		Yield strain in steel.	

Concrete

f'_c	*3.0*	ksi	Concrete strength.	
β_1	$= 0.85 - 0.05\,(f'_c - 4.0) \le 0.85\ \&\ \ge 0.65$			(8.16.2.7)
	0.850			
ε_c	+0.0030		Limiting strain in concrete.	(8.16.2.3)

Resistance Factors

Φ	0.75	Compression controlled section. (i.e. $\lvert\varepsilon_{st}\rvert < \lvert\varepsilon_{sy}\rvert$)	(8.16.1.2.2)
Φ	0.90	Tension controlled section. (i.e. $\lvert\varepsilon_{st}\rvert \ge 0.005$)	(After AASHTO, *LRFD* , 5.5.4.2.1)
Φ	0.85	Shear.	(8.16.6.2)

MRussell

Hatch Mott MacDonald

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(Input values are shown underlined and in italics.)

References

Arch Member 5 - Mz

Section Details

Section is a: *Beam-Column*

b	*84*	in	Section width.	7' - 0"	
h	*51*	in	Section depth.	4' - 3"	
d_{cc}	*2*	in	Depth of clear cover.		(ACI 318-02, 7.5.2.1)
A_g	4,284.0	in^2	Area of gross section.		

Tensile Reinforcement *(Reinforcement in the side faces is, conservatively, ignored.)*

d_{bt}	*1 1/4*	in	Bar diameter.
A_{st}	*18.750*	in^2	Tensile reinforcement area.
d_{st}	48 3/8	in	Depth to reinforcement.

Compression Reinforcement

d_{bc}	*1 1/4*	in	Bar diameter.
A_{sc}	*18.750*	in^2	Compression reinforcement area.
d_{sc}	2 5/8	in	Depth to reinforcement.

Transverse Reinforcement

d_{bv}	*9/16*	in	Bar diameter.
n	*4*		Number of legs / stirrup.
A_v	1.000	in^2	Stirrup reinforcement area.
s_v	*24*	in	Stirrup spacing.

Hatch Mott MacDonald

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Arch Member 5 - Mz — References

Shear Strength & Rating

Shear Strength

Concrete

$V_c = 2f'_c{}^{1/2}bd$ (8-49)

445.1 kip

Reinforcement (8.16.6.3.2 & 8.16.6.3.9)

$V_s = A_v f_y d / s \le 4 f'_c{}^{1/2} b d$ (8-53)

80.6 kip

Shear Capacity

$\Phi V_n = \Phi (V_c + V_s)$ Shear capacity of beam-column section.

446.9 kip

Shear Capacity & Load Rating

Loading	A_1V_{DU} *kip*	A_2V_{LU} *kip*	V_U *kip*	ΦV_n *kip*	RF V
HS20 INV	87.7	26.5	114.2	**446.9**	13.58
MIL INV	87.7	25.9	113.6	**446.9**	13.87
Lane INV	87.7	32.2	119.9	**446.9**	11.16
HS20 OPR	87.7	15.8	103.6	**446.9**	22.66
MIL OPR	87.7	15.5	103.2	**446.9**	23.15
Lane OPR	87.7	19.3	107.0	**446.9**	18.63
2F1	87.7	9.4	97.1	**446.9**	38.35
3F1	87.7	14.3	102.1	**446.9**	25.04
4F1	87.7	16.8	104.5	**446.9**	21.43
5C1	87.7	21.7	109.4	**446.9**	16.58

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References

Arch Member 5 - Mz

Moment/Axial Interaction Diagram

Axial Capacity

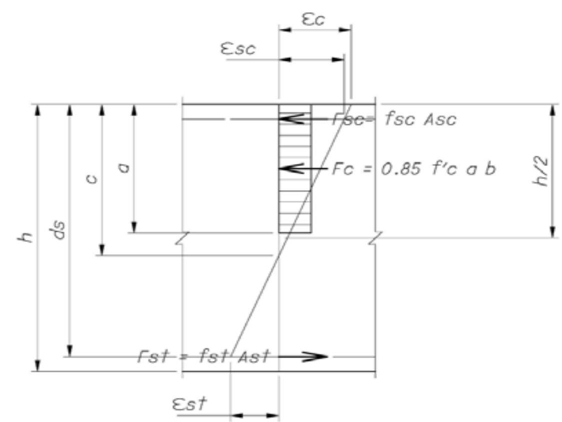
ψ 0.80 Ties.

ΦP_n $= \Phi\ \psi\ [\ 0.85\ f'_c\ (A_g - A_s) + f_y\ A_s\ ]$ (8-29 and 8-30)

7,397.1 kip

General Expressions

c	$= d_s / [\ 1 - \varepsilon_s / \varepsilon_c\ ]$	Depth of the compression zone.
a	$= \beta_1\ c$	Depth of the stress block.
f_{st}	$= E_s\ \varepsilon_{st}$	Stress in the steel.
F_{st}	$= f_{st}\ A_{st}$	Force in the steel.
M_{st}	$= F_{st}\ (\ h/2 - d_{st}\ )$	Moment due to the steel.
F_c	$= 0.85\ f'_c\ a\ b$	Compressive force in concrete.
M_c	$= F_c\ (\ h/2 - a/2\ )$	Compressive moment in concrete.
f_{sc}	$= E_s\ \varepsilon_{sc}$	Stress in the steel.
F_{sc}	$= f_{sc}\ A_{sc}$	Force in the steel.
M_{sc}	$= F_{sc}\ (\ h/2 - d_{sc}\ )$	Moment due to the steel.



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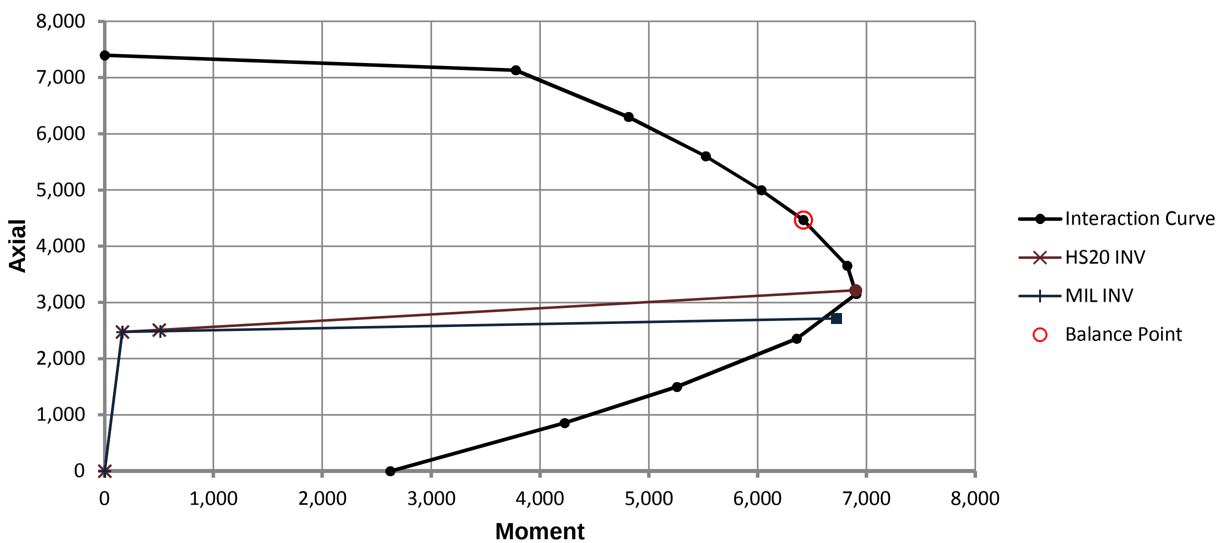
Arch Member 5 - Mz

References

Axial/Moment Interaction Diagram

$\varepsilon_{st} / \varepsilon_y$	Tensile Reinforcement				Concrete				Compressive Reinforcement				Capacity			
	ε_{st}	f_{st} ksi	P_{st} kip	M_{st} kip-ft	c in	a in	P_c kip	M_c kip-ft	ε_{sc}	f_{sc} ksi	P_{sc} kip	M_{sc} kip-ft	Φ	ΦP_n kip	ΦM_n kip-ft	e ft
N.A.													0.75	**7,397.1**	**0.0**	0.000
0%	0.0000	0.00	0.0	0.0	48.38	41.12	8,759.8	3,606.6	0.0028	40.00	750.0	1,429.7	0.75	7,132.4	3,777.2	0.530
25%	-0.0004	-10.00	-187.5	357.4	43.32	36.82	7,839.6	4,631.0	0.0028	40.00	750.0	1,429.7	0.75	6,301.6	4,813.6	0.764
50%	-0.0007	-20.00	-375.0	714.8	39.22	33.34	7,093.5	5,219.8	0.0028	40.00	750.0	1,429.7	0.75	5,601.4	5,523.2	0.986
75%	-0.0011	-30.00	-562.5	1,072.3	35.83	30.46	6,476.4	5,543.1	0.0028	40.00	750.0	1,429.7	0.75	4,997.9	6,033.8	1.207
100%	-0.0014	-40.00	-750.0	1,429.7	32.98	28.04	5,957.4	5,700.4	0.0028	40.00	750.0	1,429.7	0.75	4,468.0	6,419.8	1.437
198%	-0.0028	-40.00	-750.0	1,429.7	25.12	21.35	4,525.0	5,590.6	0.0027	40.00	750.0	1,429.7	0.81	3,653.6	6,822.7	1.867
297%	-0.0042	-40.00	-750.0	1,429.7	20.28	17.24	3,644.3	5,126.8	0.0026	40.00	750.0	1,429.7	0.86	3,151.8	6,906.9	2.191
494%	-0.0069	-40.00	-750.0	1,429.7	14.64	12.44	2,617.6	4,205.2	0.0025	40.00	750.0	1,429.7	0.90	2,355.8	6,358.1	2.699
888%	-0.0124	-40.00	-750.0	1,429.7	9.41	8.00	1,665.0	2,983.4	0.0022	40.00	750.0	1,429.7	0.90	1,498.5	5,258.5	3.509
1675%	-0.0235	-40.00	-750.0	1,429.7	5.49	4.66	951.0	1,836.2	0.0016	40.00	750.0	1,429.7	0.90	855.9	4,226.0	4.937
3152%	-0.0441	-40.00	-750.0	1,429.7	3.08	2.62	512.9	1,033.9	0.0004	12.65	237.1	452.1	0.90	**0.0**	**2,624.1**	∞



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References

Arch Member 5 - Mz

Axial Capacity & Load Rating

Loading	A_1P_{DU} *kip*	A_1M_{DU} *kip-ft*	A_2P_{LU} *kip*	A_2M_{LU} *kip-ft*	e_L *ft*	P_U *kip*	M_U *kip-ft*	ΦP_n *kip*	ΦM_n *kip-ft*	RF F	RF M
HS20 INV	2,474.6	163.3	36.9	336.4	9.106	2,511.6	499.7	**3,214.6**	**6,901.6**	20.03	20.03
	2,474.6	163.3	381.4	111.8	0.293	2,856.0	275.1	**7,286.8**	**1,574.3**	12.62	12.62
MIL INV	2,474.6	163.3	12.8	347.1	27.181	2,487.4	510.4	**2,716.0**	**6,725.3**	18.90	18.90
	2,474.6	163.3	258.4	71.3	0.276	2,733.0	234.6	**7,292.4**	**1,493.6**	18.65	18.65
Lane INV	2,474.6	163.3	366.6	188.3	0.513	2,841.3	351.6	**7,215.1**	**2,597.4**	12.93	12.93
	2,474.6	163.3	482.4	34.2	0.071	2,957.0	197.5	**7,361.4**	**510.1**	10.13	10.13
HS20 OPR	2,474.6	163.3	22.1	201.5	9.106	2,496.8	364.8	**3,214.6**	**6,901.6**	33.43	33.43
	2,474.6	163.3	228.5	67.0	0.293	2,703.1	230.3	**7,286.8**	**1,574.3**	21.06	21.06
MIL OPR	2,474.6	163.3	7.7	208.0	27.181	2,482.3	371.3	**2,716.0**	**6,725.3**	31.55	31.55
	2,474.6	163.3	154.8	42.7	0.276	2,629.4	206.0	**7,292.4**	**1,493.6**	31.13	31.13
Lane OPR	2,474.6	163.3	219.6	112.8	0.513	2,694.3	276.1	**7,215.1**	**2,597.4**	21.58	21.58
	2,474.6	163.3	289.0	20.5	0.071	2,763.6	183.8	**7,361.4**	**510.1**	16.91	16.91
2F1	2,474.6	163.3	7.8	119.5	15.285	2,482.4	282.8	**2,915.5**	**6,902.0**	56.39	56.39
	2,474.6	163.3	96.4	43.7	0.453	2,571.0	207.0	**7,234.5**	**2,320.1**	49.40	49.40
3F1	2,474.6	163.3	17.1	174.6	10.194	2,491.7	337.9	**3,136.2**	**6,907.9**	38.64	38.64
	2,474.6	163.3	147.7	59.4	0.402	2,622.3	222.7	**7,251.0**	**2,085.1**	32.34	32.34
4F1	2,474.6	163.3	27.3	186.4	6.817	2,502.0	349.7	**3,458.1**	**6,867.9**	35.97	35.97
	2,474.6	163.3	173.1	60.2	0.348	2,647.7	223.5	**7,268.8**	**1,831.2**	27.70	27.70
5C1	2,474.6	163.3	132.1	91.8	0.695	2,606.7	255.1	**7,157.5**	**3,418.6**	35.46	35.46
	2,474.6	163.3	239.1	77.8	0.326	2,713.8	241.1	**7,276.1**	**1,726.3**	20.08	20.08

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References

Arch Member 5 - Mz

Summary of Ratings

Loading	RF			
	V	F	M	Total
HS20 INV	13.58	20.03	20.03	**13.58**
		12.62	12.62	**12.62**
MIL INV	13.87	18.90	18.90	**13.87**
		18.65	18.65	**13.87**
Lane INV	11.16	12.93	12.93	**11.16**
		10.13	10.13	**10.13**
HS20 OPR	22.66	33.43	33.43	**22.66**
		21.06	21.06	**21.06**
MIL OPR	23.15	31.55	31.55	**23.15**
		31.13	31.13	**23.15**
Lane OPR	18.63	21.58	21.58	**18.63**
		16.91	16.91	**16.91**
2F1	38.35	56.39	56.39	**38.35**
		49.40	49.40	**38.35**
3F1	25.04	38.64	38.64	**25.04**
		32.34	32.34	**25.04**
4F1	21.43	35.97	35.97	**21.43**
		27.70	27.70	**21.43**
5C1	16.58	35.46	35.46	**16.58**
		20.08	20.08	**16.58**

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(Input values are shown underlined and in italics.)

Arch Member 5 - My — References

Determine the Axial Load/Moment Interaction Diagram & Shear Capacity of a Rectangular Reinforced Concrete Section

Criteria

Designed by AASHTO, *Standard Specifications for Highway Bridges* , 17th ed. 2002.
Strength design.
Capacity based on strain compatibility.
Dimensions are in pounds, feet and seconds, U.N.O.

Assumptions

Section is rectangular and uniform.
Reinforcement is evenly spaced along the tensile sides.

Material Properties & Section Details

Material Strengths and Properties

Steel

f_y	*40*	ksi	Reinforcement yield.	
E_s	29,000	ksi	Steel modulus of elasticity.	(8.7.2)
ε_{sy}	-0.0014		Yield strain in steel.	

Concrete

f'_c	*3.0*	ksi	Concrete strength.	
β_1	$= 0.85 - 0.05\ (f'_c - 4.0) \le 0.85\ \&\ \ge 0.65$			(8.16.2.7)
	0.850			
ε_c	+0.0030		Limiting strain in concrete.	(8.16.2.3)

Resistance Factors

Φ	0.75	Compression controlled section. (i.e. $\lvert\varepsilon_{st}\rvert < \lvert\varepsilon_{sy}\rvert$)	(8.16.1.2.2)
Φ	0.90	Tension controlled section. (i.e. $\lvert\varepsilon_{st}\rvert \ge 0.005$)	(After AASHTO, *LRFD* , 5.5.4.2.1)
Φ	0.85	Shear.	(8.16.6.2)

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Arch Member 5 - My References

Section Details

Section is a: *Beam-Column*

b	*51*	in	Section width.	4' - 3"	
h	*84*	in	Section depth.	7' - 0"	
d_{cc}	*2*	in	Depth of clear cover.		(ACI 318-02, 7.5.2.1)
A_g	4,284.0	in^2	Area of gross section.		

Tensile Reinforcement *(Reinforcement in the side faces is, conservatively, ignored.)*

d_{bt}	*1 1/4*	in	Bar diameter.
A_{st}	*3.125*	in^2	Tensile reinforcement area.
d_{st}	81 3/8	in	Depth to reinforcement.

Compression Reinforcement

d_{bc}	*1 1/4*	in	Bar diameter.
A_{sc}	*3.125*	in^2	Compression reinforcement area.
d_{sc}	2 5/8	in	Depth to reinforcement.

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(Input values are shown underlined and in italics.)

References

Arch Member 5 - My

Moment/Axial Interaction Diagram

Axial Capacity

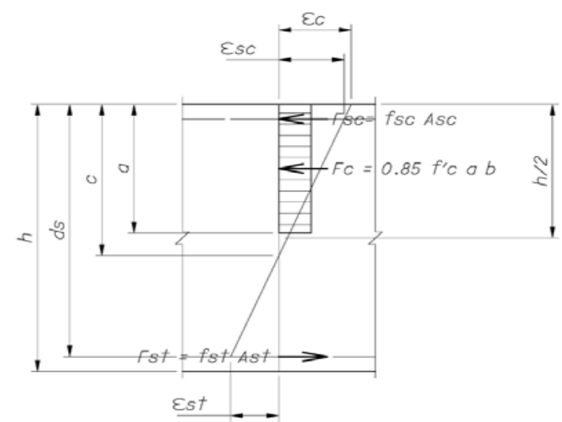
ψ 0.80 Ties.

ΦP_n $= \Phi\ \psi\ [\ 0.85\ f'_c\ (A_g - A_s) + f_y\ A_s\ ]$ (8-29 and 8-30)

6,695.0 kip

General Expressions

c	$= d_s\ /\ [\ 1 - \varepsilon_s\ /\ \varepsilon_c\ ]$	Depth of the compression zone.
a	$= \beta_1\ c$	Depth of the stress block.
f_{st}	$= E_s\ \varepsilon_{st}$	Stress in the steel.
F_{st}	$= f_{st}\ A_{st}$	Force in the steel.
M_{st}	$= F_{st}\ (\ h/2 - d_{st}\ )$	Moment due to the steel.
F_c	$= 0.85\ f'_c\ a\ b$	Compressive force in concrete.
M_c	$= F_c\ (\ h/2 - a/2\ )$	Compressive moment in concrete.
f_{sc}	$= E_s\ \varepsilon_{sc}$	Stress in the steel.
F_{sc}	$= f_{sc}\ A_{sc}$	Force in the steel.
M_{sc}	$= F_{sc}\ (\ h/2 - d_{sc}\ )$	Moment due to the steel.



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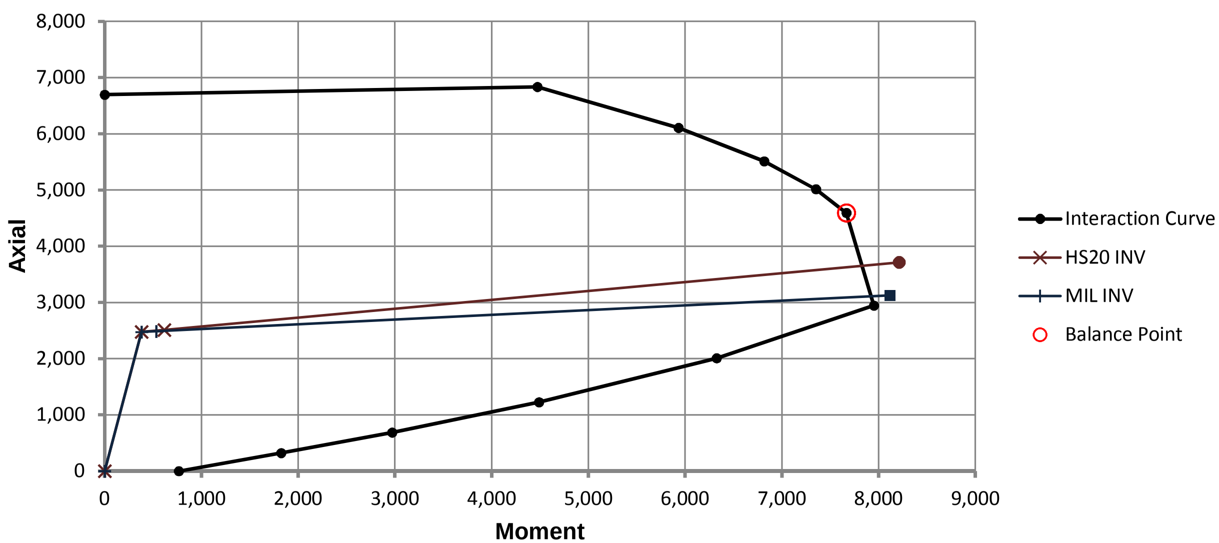
References

Arch Member 5 - My

Axial/Moment Interaction Diagram

$\varepsilon_{st} / \varepsilon_y$	Tensile Reinforcement				Concrete				Compressive Reinforcement				Capacity			
	ε_{st}	f_{st} ksi	P_{st} *kip*	M_{st} *kip-ft*	c *in*	a *in*	P_c *kip*	M_c *kip-ft*	ε_{sc}	f_{sc} ksi	P_{sc} *kip*	M_{sc} *kip-ft*	Φ	ΦP_n *kip*	ΦM_n *kip-ft*	e *ft*
N.A.													0.75	**6,695.0**	**0.0**	0.000
0%	0.0000	0.00	0.0	0.0	81.38	69.17	8,987.4	5,553.9	0.0029	40.00	125.0	410.2	0.75	6,834.3	4,473.1	0.655
25%	-0.0004	-10.00	-31.3	102.5	72.87	61.94	8,047.6	7,396.4	0.0029	40.00	125.0	410.2	0.75	6,106.0	5,931.8	0.971
50%	-0.0007	-20.00	-62.5	205.1	65.98	56.08	7,285.6	8,474.7	0.0029	40.00	125.0	410.2	0.75	5,511.1	6,817.5	1.237
75%	-0.0011	-30.00	-93.8	307.6	60.28	51.24	6,655.3	9,085.5	0.0029	40.00	125.0	410.2	0.75	5,014.9	7,352.5	1.466
100%	-0.0014	-40.00	-125.0	410.2	55.48	47.16	6,125.3	9,402.1	0.0029	40.00	125.0	410.2	0.75	4,593.9	7,666.8	1.669
373%	-0.0052	-40.00	-125.0	410.2	29.68	25.23	3,272.6	8,014.4	0.0027	40.00	125.0	410.2	0.90	2,945.4	7,951.3	2.7
647%	-0.0091	-40.00	-125.0	410.2	20.26	17.22	2,231.2	6,208.5	0.0026	40.00	125.0	410.2	0.90	2,008.1	6,325.9	3.15
1193%	-0.0167	-40.00	-125.0	410.2	12.39	10.53	1,361.6	4,168.2	0.0024	40.00	125.0	410.2	0.90	1,225.5	4,489.6	3.664
2286%	-0.0320	-40.00	-125.0	410.2	6.97	5.93	762.9	2,481.7	0.0019	40.00	125.0	410.2	0.90	686.6	2,971.8	4.328
4473%	-0.0626	-40.00	-125.0	410.2	3.72	3.16	403.3	1,358.4	0.0009	25.24	78.9	258.8	0.90	321.5	1,824.6	5.676
8572%	-0.1200	-40.00	-125.0	410.2	1.98	1.69	211.4	725.1	-0.0010	-27.65	-86.4	-283.6	0.90	**0.0**	**766.5**	∞



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References

Arch Member 5 - My

Axial Capacity & Load Rating

Loading	A_1P_{DU} kip	A_1M_{DU} kip-ft	A_2P_{LU} kip	A_2M_{LU} kip-ft	e_L ft	P_U kip	M_U kip-ft	ΦP_n kip	ΦM_n kip-ft	RF F	RF M
HS20 INV	2,474.6	381.7	36.9	233.9	6.332	2,511.6	615.6	**3,711.5**	**8,213.8**	33.48	33.48
	2,474.6	381.7	381.4	217.0	0.569	2,856.0	598.6	**6,783.2**	**2,832.8**	11.30	11.30
MIL INV	2,474.6	381.7	12.8	151.9	11.897	2,487.4	533.6	**3,124.7**	**8,115.2**	50.90	50.90
	2,474.6	381.7	258.4	147.4	0.570	2,733.0	529.1	**6,783.4**	**2,839.7**	16.68	16.68
Lane INV	2,474.6	381.7	366.6	374.8	1.022	2,841.3	756.5	**6,721.7**	**4,723.9**	11.58	11.58
	2,474.6	381.7	482.4	373.1	0.773	2,957.0	754.7	**6,811.3**	**3,735.4**	8.99	8.99
HS20 OPR	2,474.6	381.7	22.1	140.2	6.332	2,496.8	521.8	**3,711.5**	**8,213.8**	55.88	55.88
	2,474.6	381.7	228.5	130.0	0.569	2,703.1	511.7	**6,783.2**	**2,832.8**	18.86	18.86
MIL OPR	2,474.6	381.7	7.7	91.0	11.897	2,482.3	472.7	**3,124.7**	**8,115.2**	84.96	84.96
	2,474.6	381.7	154.8	88.3	0.570	2,629.4	470.0	**6,783.4**	**2,839.7**	27.84	27.84
Lane OPR	2,474.6	381.7	219.6	224.6	1.022	2,694.3	606.2	**6,721.7**	**4,723.9**	19.34	19.34
	2,474.6	381.7	289.0	223.5	0.773	2,763.6	605.2	**6,811.3**	**3,735.4**	15.01	15.01
2F1	2,474.6	381.7	7.8	56.8	7.270	2,482.4	438.5	**3,553.2**	**8,222.5**	137.95	137.95
	2,474.6	381.7	96.4	56.0	0.581	2,571.0	437.6	**6,784.8**	**2,884.8**	44.73	44.73
3F1	2,474.6	381.7	17.1	85.5	4.993	2,491.7	467.2	**4,023.9**	**8,117.0**	90.47	90.47
	2,474.6	381.7	147.7	85.4	0.578	2,622.3	467.1	**6,784.5**	**2,874.1**	29.18	29.18
4F1	2,474.6	381.7	27.3	98.9	3.617	2,502.0	480.6	**4,512.6**	**7,752.7**	74.54	74.54
	2,474.6	381.7	173.1	99.5	0.575	2,647.7	481.1	**6,784.0**	**2,858.1**	24.90	24.90
5C1	2,474.6	381.7	132.1	60.2	0.456	2,606.7	441.8	**6,767.8**	**2,337.5**	32.51	32.51
	2,474.6	381.7	239.1	136.0	0.569	2,713.8	517.7	**6,783.2**	**2,832.0**	18.02	18.02

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References

Arch Member 5 - My

Summary of Ratings

Loading	RF			
	V	F	M	Total
HS20 INV		33.48	33.48	**33.48**
		11.30	11.30	**11.30**
MIL INV		50.90	50.90	**50.90**
		16.68	16.68	**16.68**
Lane INV		11.58	11.58	**11.58**
		8.99	8.99	**8.99**
HS20 OPR		55.88	55.88	**55.88**
		18.86	18.86	**18.86**
MIL OPR		84.96	84.96	**84.96**
		27.84	27.84	**27.84**
Lane OPR		19.34	19.34	**19.34**
		15.01	15.01	**15.01**
2F1		137.95	137.95	**137.95**
		44.73	44.73	**44.73**
3F1		90.47	90.47	**90.47**
		29.18	29.18	**29.18**
4F1		74.54	74.54	**74.54**
		24.90	24.90	**24.90**
5C1		32.51	32.51	**32.51**
		18.02	18.02	**18.02**

Summary of Ratings - Combined Effects

1/RF = Σ 1/RFi

Loading	RF			
	V	F	M	Total
HS20 INV	13.58	12.53	12.53	**12.53**
		5.96	5.96	**5.96**
MIL INV	13.87	13.78	13.78	**13.78**
		8.80	8.80	**8.80**
Lane INV	11.16	6.11	6.11	**6.11**
		4.76	4.76	**4.76**
HS20 OPR	22.66	20.92	20.92	**20.92**
		9.95	9.95	**9.95**
MIL OPR	23.15	23.01	23.01	**23.01**
		14.70	14.70	**14.70**
Lane OPR	18.63	10.20	10.20	**10.20**
		7.95	7.95	**7.95**
2F1	38.35	40.03	40.03	**38.35**
		23.48	23.48	**23.48**
3F1	25.04	27.07	27.07	**25.04**
		15.34	15.34	**15.34**
4F1	21.43	24.26	24.26	**21.43**
		13.11	13.11	**13.11**
5C1	16.58	16.96	16.96	**16.58**
		9.50	9.50	**9.50**

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Arch Member 7 - Mz References

Determine the Axial Load/Moment Interaction Diagram & Shear Capacity of a Rectangular Reinforced Concrete Section

Criteria

Designed by AASHTO, *Standard Specifications for Highway Bridges* , 17th ed. 2002.
Strength design.
Capacity based on strain compatibility.
Dimensions are in pounds, feet and seconds, U.N.O.

Assumptions

Section is rectangular and uniform.
Reinforcement is evenly spaced along the tensile sides.

Material Properties & Section Details

Material Strengths and Properties

Steel

f_y	*40*	ksi	Reinforcement yield.	
E_s	29,000	ksi	Steel modulus of elasticity.	(8.7.2)
ε_{sy}	-0.0014		Yield strain in steel.	

Concrete

f'_c	*3.0*	ksi	Concrete strength.	
β_1	= 0.85 - 0.05 (f'_c - 4.0) ≤ 0.85 & ≥ 0.65			(8.16.2.7)
	0.850			
ε_c	+0.0030		Limiting strain in concrete.	(8.16.2.3)

Resistance Factors

Φ	0.75	Compression controlled section. (i.e. $\lvert\varepsilon_{st}\rvert < \lvert\varepsilon_{sy}\rvert$)	(8.16.1.2.2)
Φ	0.90	Tension controlled section. (i.e. $\lvert\varepsilon_{st}\rvert \geq 0.005$)	(After AASHTO, *LRFD* , 5.5.4.2.1)
Φ	0.85	Shear.	(8.16.6.2)

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Arch Member 7 - Mz

References

Section Details

Section is a: *Beam-Column*

b	*84*	in	Section width.	7' - 0"	
h	*47*	in	Section depth.	3' - 11"	
d_{cc}	*2*	in	Depth of clear cover.		(ACI 318-02, 7.5.2.1)
A_g	3,948.0	in^2	Area of gross section.		

Tensile Reinforcement

(Reinforcement in the side faces is, conservatively, ignored.)

d_{bt}	*1 1/4*	in	Bar diameter.
A_{st}	*18.750*	in^2	Tensile reinforcement area.
d_{st}	44 3/8	in	Depth to reinforcement.

Compression Reinforcement

d_{bc}	*1 1/4*	in	Bar diameter.
A_{sc}	*18.750*	in^2	Compression reinforcement area.
d_{sc}	2 5/8	in	Depth to reinforcement.

Transverse Reinforcement

d_{bv}	*9/16*	in	Bar diameter.
n	*4*		Number of legs / stirrup.
A_v	1.000	in^2	Stirrup reinforcement area.
s_v	*24*	in	Stirrup spacing.

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References

Arch Member 7 - Mz

Shear Strength & Rating

Shear Strength

Concrete

$V_c = 2f'_c{}^{1/2}bd$ (8-49)

408.3 kip

Reinforcement (8.16.6.3.2 & 8.16.6.3.9)

$V_s = A_v f_y d / s \le 4 f'_c{}^{1/2} b d$ (8-53)

74.0 kip

Shear Capacity

$\Phi V_n = \Phi (V_c + V_s)$ Shear capacity of beam-column section.

409.9 kip

Shear Capacity & Load Rating

Loading	**A_1V_{DU}** *kip*	**A_2V_{LU}** *kip*	**V_U** *kip*	**ΦV_n** *kip*	**RF** **V**
HS20 INV	52.8	46.5	99.3	**409.9**	7.68
MIL INV	52.8	37.5	90.3	**409.9**	9.53
Lane INV	52.8	2.3	55.2	**409.9**	153.18
HS20 OPR	52.8	27.8	80.7	**409.9**	12.83
MIL OPR	52.8	22.4	75.3	**409.9**	15.92
Lane OPR	52.8	1.4	54.2	**409.9**	255.70
2F1	52.8	13.3	66.2	**409.9**	26.76
3F1	52.8	20.4	73.2	**409.9**	17.49
4F1	52.8	23.4	76.2	**409.9**	15.28
5C1	52.8	20.9	73.7	**409.9**	17.12

(Input values are shown underlined and in italics.)

References

Arch Member 7 - Mz

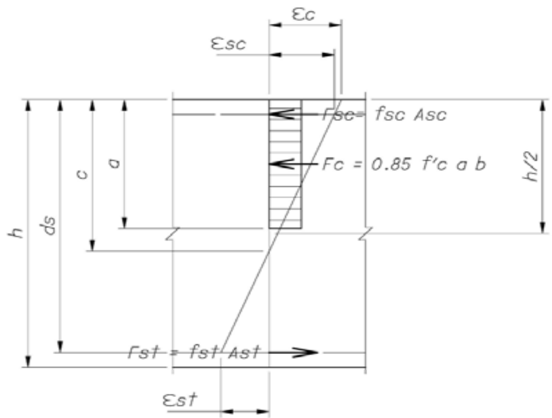
Moment/Axial Interaction Diagram

Axial Capacity

ψ 0.80 Ties.

$\Phi P_n = \Phi\, \psi\, [\, 0.85\, f'_c\, (A_g - A_s) + f_y\, A_s\,]$ (8-29 and 8-30)

6,883.1 kip



General Expressions

c	$= d_s / [\, 1 - \varepsilon_s / \varepsilon_c\,]$	Depth of the compression zone.
a	$= \beta_1\, c$	Depth of the stress block.
f_{st}	$= E_s\, \varepsilon_{st}$	Stress in the steel.
F_{st}	$= f_{st}\, A_{st}$	Force in the steel.
M_{st}	$= F_{st}\, (\, h/2 - d_{st}\,)$	Moment due to the steel.
F_c	$= 0.85\, f'_c\, a\, b$	Compressive force in concrete.
M_c	$= F_c\, (\, h/2 - a/2\,)$	Compressive moment in concrete.
f_{sc}	$= E_s\, \varepsilon_{sc}$	Stress in the steel.
F_{sc}	$= f_{sc}\, A_{sc}$	Force in the steel.
M_{sc}	$= F_{sc}\, (\, h/2 - d_{sc}\,)$	Moment due to the steel.

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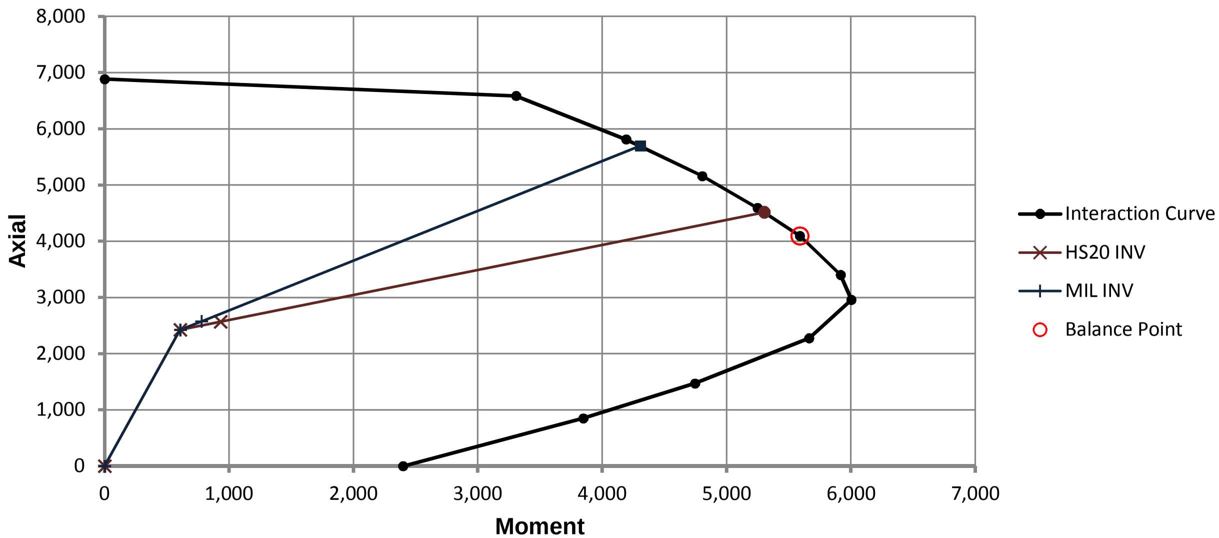
References

Arch Member 7 - Mz

Axial/Moment Interaction Diagram

ε_{st} / ε_y	Tensile Reinforcement				Concrete				Compressive Reinforcement				Capacity			
	ε_{st}	f_{st} ksi	P_{st} kip	M_{st} kip-ft	c in	a in	P_c kip	M_c kip-ft	ε_{sc}	f_{sc} ksi	P_{sc} kip	M_{sc} kip-ft	Φ	ΦP_n kip	ΦM_n kip-ft	e ft
N.A.													0.75	**6,883.1**	**0.0**	0.000
0%	0.0000	0.00	0.0	0.0	44.38	37.72	8,031.5	3,105.9	0.0028	40.00	750.0	1,304.7	0.75	6,586.2	3,308.0	0.502
25%	-0.0004	-10.00	-187.5	326.2	39.74	33.78	7,187.4	3,959.7	0.0028	40.00	750.0	1,304.7	0.75	5,812.4	4,192.9	0.721
50%	-0.0007	-20.00	-375.0	652.3	35.98	30.58	6,503.0	4,448.4	0.0028	40.00	750.0	1,304.7	0.75	5,158.5	4,804.1	0.931
75%	-0.0011	-30.00	-562.5	978.5	32.87	27.94	5,936.9	4,714.9	0.0028	40.00	750.0	1,304.7	0.75	4,593.3	5,248.6	1.143
100%	-0.0014	-40.00	-750.0	1,304.7	30.26	25.72	5,460.8	4,842.6	0.0027	40.00	750.0	1,304.7	0.75	4,095.6	5,588.9	1.365
189%	-0.0027	-40.00	-750.0	1,304.7	23.55	20.02	4,240.1	4,766.9	0.0027	40.00	750.0	1,304.7	0.80	3,401.4	5,917.2	1.74
279%	-0.0039	-40.00	-750.0	1,304.7	19.28	16.39	3,462.3	4,416.3	0.0026	40.00	750.0	1,304.7	0.85	2,958.1	6,002.6	2.029
458%	-0.0064	-40.00	-750.0	1,304.7	14.15	12.02	2,527.8	3,683.9	0.0024	40.00	750.0	1,304.7	0.90	2,275.1	5,663.9	2.49
816%	-0.0114	-40.00	-750.0	1,304.7	9.23	7.85	1,632.9	2,664.0	0.0021	40.00	750.0	1,304.7	0.90	1,469.7	4,746.0	3.229
1532%	-0.0214	-40.00	-750.0	1,304.7	5.45	4.63	943.9	1,666.3	0.0016	40.00	750.0	1,304.7	0.90	849.5	3,848.1	4.53
2874%	-0.0402	-40.00	-750.0	1,304.7	3.08	2.62	512.9	948.4	0.0004	12.65	237.1	412.5	0.90	**0.0**	**2,399.1**	∞



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References

Arch Member 7 - Mz

Axial Capacity & Load Rating

Loading	A_1P_{DU}	A_1M_{DU}	A_2P_{LU}	A_2M_{LU}	e_L	P_U	M_U	ΦP_n	ΦM_n	RF	
	kip	*kip-ft*	*kip*	*kip-ft*	*ft*	*kip*	*kip-ft*	*kip*	*kip-ft*	F	M
HS20 INV	2,425.2	608.7	144.2	324.1	2.247	2,569.4	932.7	4,515.2	5,304.6	14.49	14.49
	2,425.2	608.7	382.3	352.0	0.921	2,807.5	960.7	6,047.0	3,943.6	9.47	9.47
MIL INV	2,425.2	608.7	150.8	170.6	1.131	2,576.0	779.3	5,696.3	4,309.6	21.69	21.69
	2,425.2	608.7	259.0	240.5	0.928	2,684.2	849.2	6,033.2	3,958.7	13.93	13.93
Lane INV	2,425.2	608.7	476.7	245.7	0.515	2,901.9	854.4	6,633.7	2,777.9	8.83	8.83
	2,425.2	608.7	483.2	262.5	0.543	2,908.3	871.1	6,623.7	2,889.4	8.69	8.69
HS20 OPR	2,425.2	608.7	86.4	194.2	2.247	2,511.6	802.8	4,515.2	5,304.6	24.19	24.19
	2,425.2	608.7	229.0	210.9	0.921	2,654.2	819.6	6,047.0	3,943.6	15.81	15.81
MIL OPR	2,425.2	608.7	90.4	102.2	1.131	2,515.5	710.9	5,696.3	4,309.6	36.20	36.20
	2,425.2	608.7	155.2	144.1	0.928	2,580.4	752.7	6,033.2	3,958.7	23.25	23.25
Lane OPR	2,425.2	608.7	285.6	147.2	0.515	2,710.8	755.9	6,633.7	2,777.9	14.74	14.74
	2,425.2	608.7	289.4	157.2	0.543	2,714.6	765.9	6,623.7	2,889.4	14.51	14.51
2F1	2,425.2	608.7	40.5	89.5	2.210	2,465.7	698.1	4,541.5	5,285.8	52.27	52.27
	2,425.2	608.7	96.5	91.2	0.945	2,521.7	699.9	6,003.2	3,991.4	37.08	37.08
3F1	2,425.2	608.7	68.4	123.9	1.812	2,493.5	732.5	4,870.3	5,039.0	35.77	35.77
	2,425.2	608.7	148.0	139.1	0.940	2,573.2	747.7	6,013.3	3,980.4	24.25	24.25
4F1	2,425.2	608.7	87.9	125.9	1.433	2,513.0	734.6	5,280.0	4,699.0	32.49	32.49
	2,425.2	608.7	173.5	161.8	0.933	2,598.6	770.4	6,026.0	3,966.5	20.76	20.76
5C1	2,425.2	608.7	104.5	61.0	0.584	2,529.7	669.6	6,609.3	3,050.5	40.04	40.04
	2,425.2	608.7	239.7	213.6	0.891	2,664.8	822.2	6,101.2	3,884.6	15.34	15.34

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Hatch Mott MacDonald

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References

Arch Member 7 - Mz

Summary of Ratings

Loading	RF			
	V	F	M	Total
HS20 INV	7.68	14.49	14.49	**7.68**
		9.47	9.47	**7.68**
MIL INV	9.53	21.69	21.69	**9.53**
		13.93	13.93	**9.53**
Lane INV	153.18	8.83	8.83	**8.83**
		8.69	8.69	**8.69**
HS20 OPR	12.83	24.19	24.19	**12.83**
		15.81	15.81	**12.83**
MIL OPR	15.92	36.20	36.20	**15.92**
		23.25	23.25	**15.92**
Lane OPR	255.70	14.74	14.74	**14.74**
		14.51	14.51	**14.51**
2F1	26.76	52.27	52.27	**26.76**
		37.08	37.08	**26.76**
3F1	17.49	35.77	35.77	**17.49**
		24.25	24.25	**17.49**
4F1	15.28	32.49	32.49	**15.28**
		20.76	20.76	**15.28**
5C1	17.12	40.04	40.04	**17.12**
		15.34	15.34	**15.34**

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(Input values are shown underlined and in italics.)

Arch Member 7 - My References

Determine the Axial Load/Moment Interaction Diagram & Shear Capacity of a Rectangular Reinforced Concrete Section

Criteria

Designed by AASHTO, *Standard Specifications for Highway Bridges* , 17^{th} ed. 2002.
Strength design.
Capacity based on strain compatibility.
Dimensions are in pounds, feet and seconds, U.N.O.

Assumptions

Section is rectangular and uniform.
Reinforcement is evenly spaced along the tensile sides.

Material Properties & Section Details

Material Strengths and Properties

Steel

f_y	*40*	ksi	Reinforcement yield.	
E_s	29,000	ksi	Steel modulus of elasticity.	(8.7.2)
ε_{sy}	-0.0014		Yield strain in steel.	

Concrete

f'_c	*3.0*	ksi	Concrete strength.	
β_1	$= 0.85 - 0.05 (f'_c - 4.0) \leq 0.85 \ \& \geq 0.65$			(8.16.2.7)
	0.850			
ε_c	+0.0030		Limiting strain in concrete.	(8.16.2.3)

Resistance Factors

Φ	0.75	Compression controlled section. (i.e. $\lvert\varepsilon_{st}\rvert < \lvert\varepsilon_{sy}\rvert$)	(8.16.1.2.2)
Φ	0.90	Tension controlled section. (i.e. $\lvert\varepsilon_{st}\rvert \geq 0.005$)	(After AASHTO, *LRFD* , 5.5.4.2.1)
Φ	0.85	Shear.	(8.16.6.2)

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(Input values are shown underlined and in italics.)

References

Arch Member 7 - My

Section Details

Section is a: *Beam-Column*

b	*47*	in	Section width.	3' - 11"	
h	*84*	in	Section depth.	7' - 0"	
d_{cc}	*2*	in	Depth of clear cover.		(ACI 318-02, 7.5.2.1)
A_g	3,948.0	in^2	Area of gross section.		

Tensile Reinforcement

(Reinforcement in the side faces is, conservatively, ignored.)

d_{bt}	*1 1/4*	in	Bar diameter.
A_{st}	*3.125*	in^2	Tensile reinforcement area.
d_{st}	81 3/8	in	Depth to reinforcement.

Compression Reinforcement

d_{bc}	*1 1/4*	in	Bar diameter.
A_{sc}	*3.125*	in^2	Compression reinforcement area.
d_{sc}	2 5/8	in	Depth to reinforcement.

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References

Arch Member 7 - My

Moment/Axial Interaction Diagram

Axial Capacity

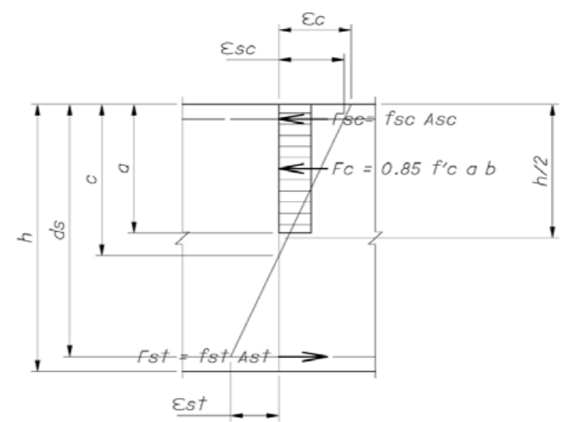
ψ 0.80 Ties.

$\Phi P_n = \Phi\, \psi\, [\, 0.85\, f'_c\, (A_g - A_s) + f_y\, A_s\,]$ (8-29 and 8-30)

6,180.9 kip

General Expressions

c	$= d_s / [\, 1 - \varepsilon_s / \varepsilon_c\,]$	Depth of the compression zone.
a	$= \beta_1\, c$	Depth of the stress block.
f_{st}	$= E_s\, \varepsilon_{st}$	Stress in the steel.
F_{st}	$= f_{st}\, A_{st}$	Force in the steel.
M_{st}	$= F_{st}\, (\, h/2 - d_{st}\,)$	Moment due to the steel.
F_c	$= 0.85\, f'_c\, a\, b$	Compressive force in concrete.
M_c	$= F_c\, (\, h/2 - a/2\,)$	Compressive moment in concrete.
f_{sc}	$= E_s\, \varepsilon_{sc}$	Stress in the steel.
F_{sc}	$= f_{sc}\, A_{sc}$	Force in the steel.
M_{sc}	$= F_{sc}\, (\, h/2 - d_{sc}\,)$	Moment due to the steel.



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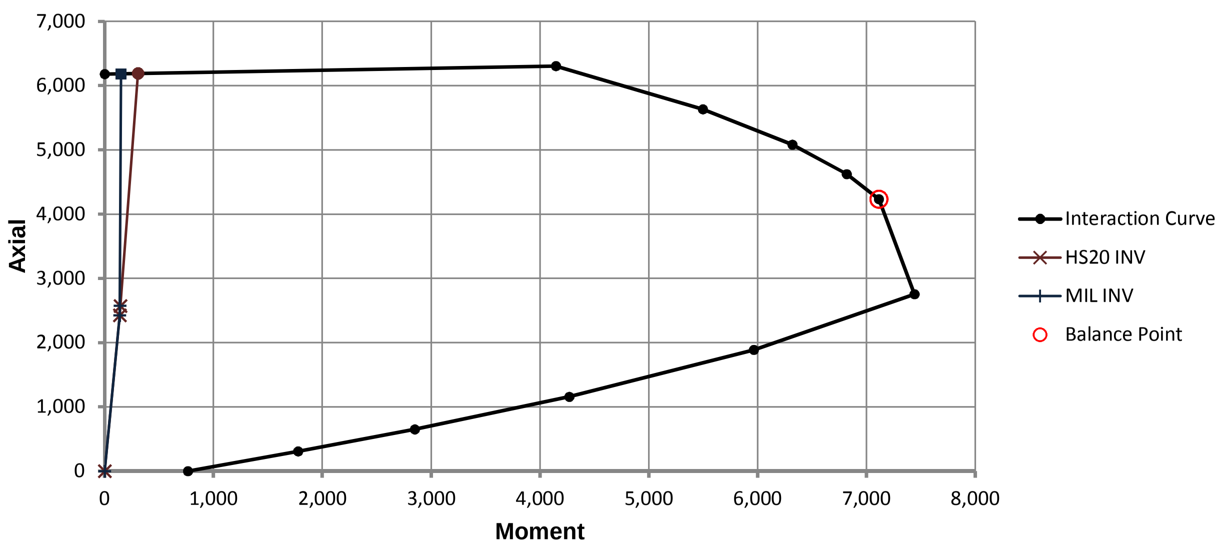
References

Arch Member 7 - My

Axial/Moment Interaction Diagram

ε_{st} / ε_y	Tensile Reinforcement				Concrete				Compressive Reinforcement				Capacity			
	ε_{st}	f_{st} ksi	P_{st} kip	M_{st} kip-ft	c in	a in	P_c kip	M_c kip-ft	ε_{sc}	f_{sc} ksi	P_{sc} kip	M_{sc} kip-ft	Φ	ΦP_n kip	ΦM_n kip-ft	e ft
N.A.													0.75	**6,180.9**	**0.0**	0.000
0%	0.0000	0.00	0.0	0.0	81.38	69.17	8,281.9	5,118.0	0.0029	40.00	125.0	410.2	0.75	6,305.2	4,146.1	0.658
25%	-0.0004	-10.00	-31.3	102.5	72.87	61.94	7,415.8	6,815.7	0.0029	40.00	125.0	410.2	0.75	5,632.2	5,496.3	0.976
50%	-0.0007	-20.00	-62.5	205.1	65.98	56.08	6,713.6	7,809.3	0.0029	40.00	125.0	410.2	0.75	5,082.0	6,318.4	1.243
75%	-0.0011	-30.00	-93.8	307.6	60.28	51.24	6,132.7	8,372.1	0.0029	40.00	125.0	410.2	0.75	4,622.9	6,817.4	1.475
100%	-0.0014	-40.00	-125.0	410.2	55.48	47.16	5,644.2	8,663.8	0.0029	40.00	125.0	410.2	0.75	4,233.2	7,113.1	1.680
365%	-0.0051	-40.00	-125.0	410.2	30.12	25.60	3,060.6	7,447.0	0.0027	40.00	125.0	410.2	0.90	2,754.5	7,440.6	2.701
629%	-0.0088	-40.00	-125.0	410.2	20.67	17.57	2,098.0	5,806.9	0.0026	40.00	125.0	410.2	0.90	1,888.2	5,964.4	3.159
1158%	-0.0162	-40.00	-125.0	410.2	12.70	10.80	1,286.1	3,922.6	0.0024	40.00	125.0	410.2	0.90	1,157.5	4,268.7	3.688
2217%	-0.0310	-40.00	-125.0	410.2	7.17	6.10	722.7	2,345.8	0.0019	40.00	125.0	410.2	0.90	650.4	2,849.5	4.381
4334%	-0.0607	-40.00	-125.0	410.2	3.83	3.26	382.6	1,287.2	0.0009	27.03	84.5	277.1	0.90	307.9	1,777.0	5.772
8303%	-0.1162	-40.00	-125.0	410.2	2.05	1.74	200.6	687.5	-0.0008	-24.19	-75.6	-248.0	0.90	**0.0**	**764.7**	∞



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References

Arch Member 7 - My

Axial Capacity & Load Rating

Loading	A_1P_{DU}	A_1M_{DU}	A_2P_{LU}	A_2M_{LU}	e_L	P_U	M_U	ΦP_n	ΦM_n	RF	
	kip	kip-ft	kip	kip-ft	ft	kip	kip-ft	kip	kip-ft	F	M
HS20 INV	2,425.2	139.0	144.2	6.5	0.045	2,569.4	145.4	6,190.1	307.6	26.10	26.10
	2,425.2	139.0	382.3	14.0	0.037	2,807.5	152.9	6,189.2	276.7	9.85	9.85
MIL INV	2,425.2	139.0	150.8	0.5	0.003	2,576.0	139.4	6,185.4	151.0	24.93	24.93
	2,425.2	139.0	259.0	9.4	0.036	2,684.2	148.3	6,189.1	275.2	14.53	14.53
Lane INV	2,425.2	139.0	476.7	7.1	0.015	2,901.9	146.1	6,186.7	195.1	7.89	7.89
	2,425.2	139.0	483.2	14.6	0.030	2,908.3	153.5	6,188.4	252.4	7.79	7.79
HS20 OPR	2,425.2	139.0	86.4	3.9	0.045	2,511.6	142.8	6,190.1	307.6	43.57	43.57
	2,425.2	139.0	229.0	8.4	0.037	2,654.2	147.3	6,189.2	276.7	16.43	16.43
MIL OPR	2,425.2	139.0	90.4	0.3	0.003	2,515.5	139.2	6,185.4	151.0	41.61	41.61
	2,425.2	139.0	155.2	5.6	0.036	2,580.4	144.6	6,189.1	275.2	24.26	24.26
Lane OPR	2,425.2	139.0	285.6	4.3	0.015	2,710.8	143.2	6,186.7	195.1	13.17	13.17
	2,425.2	139.0	289.4	8.7	0.030	2,714.6	147.7	6,188.4	252.4	13.00	13.00
2F1	2,425.2	139.0	40.5	2.1	0.051	2,465.7	141.0	6,190.8	332.4	93.01	93.01
	2,425.2	139.0	96.5	5.4	0.056	2,521.7	144.3	6,191.3	348.7	39.02	39.02
3F1	2,425.2	139.0	68.4	2.1	0.031	2,493.5	141.1	6,188.6	256.0	55.05	55.05
	2,425.2	139.0	148.0	7.4	0.050	2,573.2	146.3	6,190.7	327.1	25.44	25.44
4F1	2,425.2	139.0	87.9	1.0	0.012	2,513.0	140.0	6,186.3	182.5	42.80	42.80
	2,425.2	139.0	173.5	7.6	0.044	2,598.6	146.5	6,190.0	303.4	21.70	21.70
5C1	2,425.2	139.0	104.5	9.5	0.091	2,529.7	148.5	6,195.3	481.8	36.08	36.08
	2,425.2	139.0	239.7	7.5	0.031	2,664.8	146.5	6,188.6	257.2	15.70	15.70

MRussell

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References

Arch Member 7 - My

Summary of Ratings

Loading	RF V	RF F	RF M	RF Total
HS20 INV		26.10	26.10	26.10
		9.85	9.85	9.85
MIL INV		24.93	24.93	24.93
		14.53	14.53	14.53
Lane INV		7.89	7.89	7.89
		7.79	7.79	7.79
HS20 OPR		43.57	43.57	43.57
		16.43	16.43	16.43
MIL OPR		41.61	41.61	41.61
		24.26	24.26	24.26
Lane OPR		13.17	13.17	13.17
		13.00	13.00	13.00
2F1		93.01	93.01	93.01
		39.02	39.02	39.02
3F1		55.05	55.05	55.05
		25.44	25.44	25.44
4F1		42.80	42.80	42.80
		21.70	21.70	21.70
5C1		36.08	36.08	36.08
		15.70	15.70	15.70

Summary of Ratings - Combined Effects

$1/RF = \Sigma\ 1/RFi$

Loading	RF V	RF F	RF M	RF Total
HS20 INV	7.68	9.32	9.32	7.68
		4.83	4.83	4.83
MIL INV	9.53	11.60	11.60	9.53
		7.11	7.11	7.11
Lane INV	153.18	4.17	4.17	4.17
		4.11	4.11	4.11
HS20 OPR	12.83	15.55	15.55	12.83
		8.06	8.06	8.06
MIL OPR	15.92	19.36	19.36	15.92
		11.87	11.87	11.87
Lane OPR	255.70	6.96	6.96	6.96
		6.86	6.86	6.86
2F1	26.76	33.46	33.46	26.76
		19.01	19.01	19.01
3F1	17.49	21.68	21.68	17.49
		12.42	12.42	12.42
4F1	15.28	18.47	18.47	15.28
		10.61	10.61	10.61
5C1	17.12	18.98	18.98	17.12
		7.76	7.76	7.76

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Arch Member 9 - Mz — References

Determine the Axial Load/Moment Interaction Diagram & Shear Capacity of a Rectangular Reinforced Concrete Section

Criteria

Designed by AASHTO, *Standard Specifications for Highway Bridges* , 17th ed. 2002.
Strength design.
Capacity based on strain compatibility.
Dimensions are in pounds, feet and seconds, U.N.O.

Assumptions

Section is rectangular and uniform.
Reinforcement is evenly spaced along the tensile sides.

Material Properties & Section Details

Material Strengths and Properties

Steel

f_y	*40* ksi	Reinforcement yield.	
E_s	29,000 ksi	Steel modulus of elasticity.	(8.7.2)
ε_{sy}	-0.0014	Yield strain in steel.	

Concrete

f'_c	*3.0* ksi	Concrete strength.	
β_1	$= 0.85 - 0.05\,(f'_c - 4.0) \le 0.85\ \&\ \ge 0.65$		(8.16.2.7)
	0.850		
ε_c	+0.0030	Limiting strain in concrete.	(8.16.2.3)

Resistance Factors

Φ	0.75	Compression controlled section. (i.e. $\lvert\varepsilon_{st}\rvert < \lvert\varepsilon_{sy}\rvert$)	(8.16.1.2.2)
Φ	0.90	Tension controlled section. (i.e. $\lvert\varepsilon_{st}\rvert \ge 0.005$)	(After AASHTO, *LRFD* , 5.5.4.2.1)
Φ	0.85	Shear.	(8.16.6.2)

MRussell

Hatch Mott MacDonald

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(Input values are shown underlined and in italics.)

Arch Member 9 - Mz

References

Section Details

Section is a: *Beam-Column*

b	*84*	in	Section width.	7' - 0"	
h	*44*	in	Section depth.	3' - 8"	
d_{cc}	*2*	in	Depth of clear cover.		(ACI 318-02, 7.5.2.1)
A_g	3,696.0	in^2	Area of gross section.		

Tensile Reinforcement

(Reinforcement in the side faces is, conservatively, ignored.)

d_{bt}	*1 1/4*	in	Bar diameter.
A_{st}	*18.750*	in^2	Tensile reinforcement area.
d_{st}	41 3/8	in	Depth to reinforcement.

Compression Reinforcement

d_{bc}	*1 1/4*	in	Bar diameter.
A_{sc}	*18.750*	in^2	Compression reinforcement area.
d_{sc}	2 5/8	in	Depth to reinforcement.

Transverse Reinforcement

d_{bv}	*9/16*	in	Bar diameter.
n	*4*		Number of legs / stirrup.
A_v	1.000	in^2	Stirrup reinforcement area.
s_v	*24*	in	Stirrup spacing.

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Arch Member 9 - Mz

References

Shear Strength & Rating

Shear Strength

Concrete

V_c $= 2f'_c{}^{1/2}bd$ (8-49)

380.7 kip

Reinforcement (8.16.6.3.2 & 8.16.6.3.9)

V_s $= A_v f_y d / s \leq 4 f'_c{}^{1/2} b d$ (8-53)

69.0 kip

Shear Capacity

ΦV_n $= \Phi (V_c + V_s)$ Shear capacity of beam-column section.

382.2 kip

Shear Capacity & Load Rating

Loading	A_1V_{DU} *kip*	A_2V_{LU} *kip*	V_U *kip*	ΦV_n *kip*	RF V
HS20 INV	91.6	23.4	115.0	**382.2**	12.42
MIL INV	91.6	23.0	114.7	**382.2**	12.62
Lane INV	91.6	29.7	121.3	**382.2**	9.78
HS20 OPR	91.6	14.0	105.6	**382.2**	20.74
MIL OPR	91.6	13.8	105.4	**382.2**	21.06
Lane OPR	91.6	17.8	109.4	**382.2**	16.33
2F1	91.6	8.0	99.7	**382.2**	36.19
3F1	91.6	11.9	103.5	**382.2**	24.45
4F1	91.6	12.9	104.6	**382.2**	22.44
5C1	91.6	12.9	104.5	**382.2**	22.52

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References

Arch Member 9 - Mz

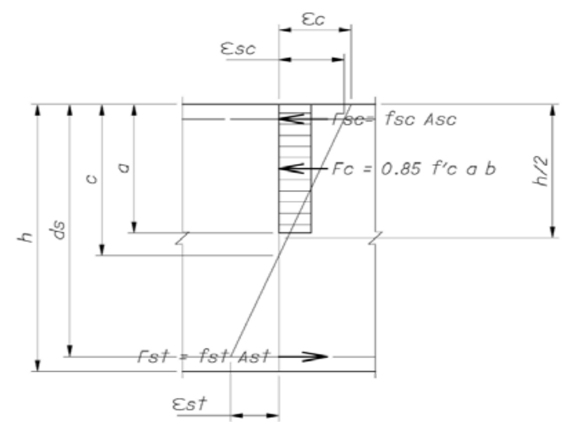
Moment/Axial Interaction Diagram

Axial Capacity

ψ	0.80	Ties.	
ΦP_n	$= \Phi\, \psi\, [\, 0.85\, f'_c\, (A_g - A_s) + f_y\, A_s\,]$		(8-29 and 8-30)
	6,497.5 kip		

General Expressions

c	$= d_s / [\, 1 - \varepsilon_s / \varepsilon_c\,]$	Depth of the compression zone.
a	$= \beta_1\, c$	Depth of the stress block.
f_{st}	$= E_s\, \varepsilon_{st}$	Stress in the steel.
F_{st}	$= f_{st}\, A_{st}$	Force in the steel.
M_{st}	$= F_{st}\, (\, h/2 - d_{st}\,)$	Moment due to the steel.
F_c	$= 0.85\, f'_c\, a\, b$	Compressive force in concrete.
M_c	$= F_c\, (\, h/2 - a/2\,)$	Compressive moment in concrete.
f_{sc}	$= E_s\, \varepsilon_{sc}$	Stress in the steel.
F_{sc}	$= f_{sc}\, A_{sc}$	Force in the steel.
M_{sc}	$= F_{sc}\, (\, h/2 - d_{sc}\,)$	Moment due to the steel.



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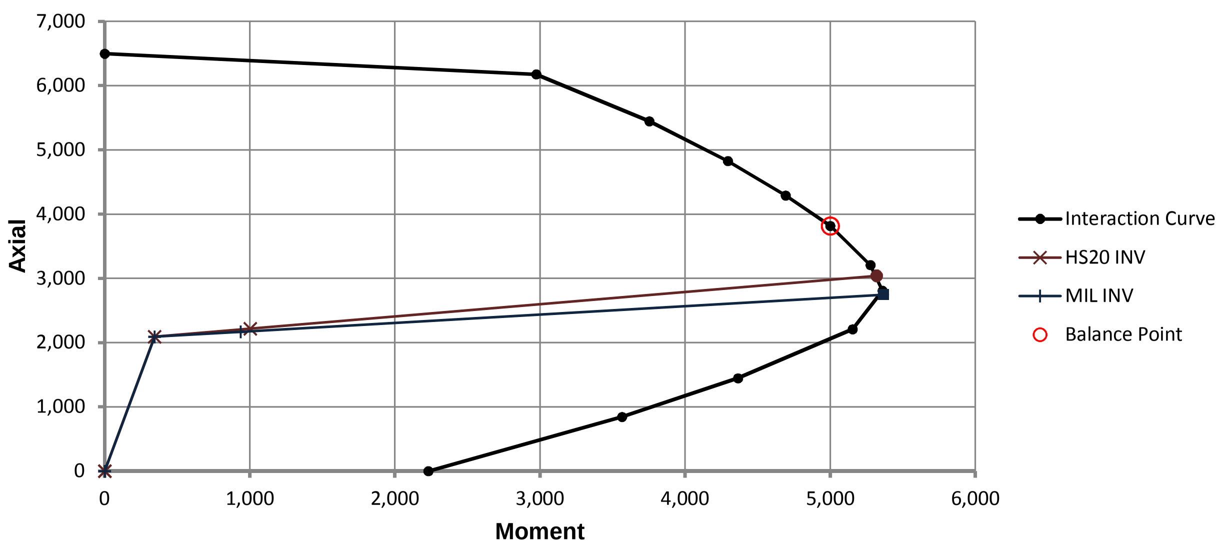
References

Arch Member 9 - Mz

Axial/Moment Interaction Diagram

ε_{st} / ε_y	Tensile Reinforcement				Concrete				Compressive Reinforcement				Capacity			
	ε_{st}	f_{st} ksi	P_{st} kip	M_{st} kip-ft	c in	a in	P_c kip	M_c kip-ft	ε_{sc}	f_{sc} ksi	P_{sc} kip	M_{sc} kip-ft	Φ	ΦP_n kip	ΦM_n kip-ft	e ft
N.A.													0.75	6,497.5	0.0	0.000
0%	0.0000	0.00	0.0	0.0	41.38	35.17	7,485.3	2,754.4	0.0028	40.00	750.0	1,210.9	0.75	6,176.5	2,974.0	0.481
25%	-0.0004	-10.00	-187.5	302.7	37.05	31.49	6,698.3	3,490.3	0.0028	40.00	750.0	1,210.9	0.75	5,445.6	3,752.9	0.689
50%	-0.0007	-20.00	-375.0	605.5	33.55	28.52	6,060.1	3,910.0	0.0028	40.00	750.0	1,210.9	0.75	4,826.4	4,294.8	0.890
75%	-0.0011	-30.00	-562.5	908.2	30.65	26.05	5,532.3	4,137.5	0.0027	40.00	750.0	1,210.9	0.75	4,289.8	4,692.5	1.094
100%	-0.0014	-40.00	-750.0	1,210.9	28.21	23.98	5,088.4	4,244.9	0.0027	40.00	750.0	1,210.9	0.75	3,816.3	5,000.1	1.310
183%	-0.0026	-40.00	-750.0	1,210.9	22.33	18.98	4,018.1	4,188.5	0.0026	40.00	750.0	1,210.9	0.80	3,207.5	5,276.9	1.645
265%	-0.0037	-40.00	-750.0	1,210.9	18.48	15.71	3,316.9	3,910.0	0.0026	40.00	750.0	1,210.9	0.85	2,807.8	5,360.1	1.909
431%	-0.0060	-40.00	-750.0	1,210.9	13.74	11.68	2,454.0	3,304.7	0.0024	40.00	750.0	1,210.9	0.90	2,208.6	5,153.9	2.334
762%	-0.0107	-40.00	-750.0	1,210.9	9.08	7.72	1,605.8	2,427.4	0.0021	40.00	750.0	1,210.9	0.90	1,445.2	4,364.4	3.02
1424%	-0.0199	-40.00	-750.0	1,210.9	5.41	4.60	937.6	1,539.3	0.0015	40.00	750.0	1,210.9	0.90	843.9	3,565.0	4.225
2665%	-0.0373	-40.00	-750.0	1,210.9	3.08	2.62	512.9	884.3	0.0004	12.65	237.1	382.9	0.90	**0.0**	**2,230.3**	∞



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Arch Member 9 - Mz

References

Axial Capacity & Load Rating

Loading	A_1P_{DU}	A_1M_{DU}	A_2P_{LU}	A_2M_{LU}	e_L	P_U	M_U	ΦP_n	ΦM_n	RF	
	kip	*kip-ft*	*kip*	*kip-ft*	*ft*	*kip*	*kip-ft*	*kip*	*kip-ft*	F	M
HS20 INV	2,090.8	343.7	125.6	659.0	5.246	2,216.4	1,002.7	**3,039.3**	**5,320.0**	7.55	7.55
	2,090.8	343.7	336.6	210.7	0.626	2,427.4	554.4	**6,183.9**	**2,905.9**	12.16	12.16
MIL INV	2,090.8	343.7	77.3	592.8	7.667	2,168.1	936.5	**2,746.0**	**5,367.5**	8.47	8.47
	2,090.8	343.7	228.8	148.2	0.648	2,319.6	491.8	**6,167.9**	**2,983.9**	17.82	17.82
Lane INV	2,090.8	343.7	335.3	349.2	1.041	2,426.1	692.9	**5,402.9**	**3,793.0**	9.88	9.88
	2,090.8	343.7	415.0	30.5	0.074	2,505.7	374.2	**6,426.0**	**662.4**	10.45	10.45
HS20 OPR	2,090.8	343.7	75.3	394.8	5.246	2,166.0	738.5	**3,039.3**	**5,320.0**	12.60	12.60
	2,090.8	343.7	201.7	126.2	0.626	2,292.4	469.9	**6,183.9**	**2,905.9**	20.30	20.30
MIL OPR	2,090.8	343.7	46.3	355.1	7.667	2,137.1	698.8	**2,746.0**	**5,367.5**	14.15	14.15
	2,090.8	343.7	137.1	88.8	0.648	2,227.9	432.4	**6,167.9**	**2,983.9**	29.74	29.74
Lane OPR	2,090.8	343.7	200.9	209.2	1.041	2,291.7	552.9	**5,402.9**	**3,793.0**	16.49	16.49
	2,090.8	343.7	248.6	18.3	0.074	2,339.4	361.9	**6,426.0**	**662.4**	17.44	17.44
2F1	2,090.8	343.7	32.3	202.1	6.266	2,123.0	545.8	**2,889.5**	**5,348.2**	24.76	24.76
	2,090.8	343.7	85.4	56.1	0.658	2,176.2	399.8	**6,145.5**	**3,009.8**	47.49	47.49
3F1	2,090.8	343.7	35.8	291.8	8.144	2,126.6	635.5	**2,708.1**	**5,371.6**	17.23	17.23
	2,090.8	343.7	130.7	88.0	0.673	2,221.5	431.7	**6,110.4**	**3,050.3**	30.76	30.76
4F1	2,090.8	343.7	48.1	340.5	7.076	2,138.9	684.2	**2,799.8**	**5,361.1**	14.73	14.73
	2,090.8	343.7	152.8	105.3	0.689	2,243.6	449.0	**6,076.6**	**3,089.4**	26.08	26.08
5C1	2,090.8	343.7	72.0	239.1	3.321	2,162.8	582.8	**3,538.5**	**5,151.1**	20.10	20.10
	2,090.8	343.7	211.7	118.0	0.558	2,302.4	461.7	**6,212.3**	**2,642.1**	19.47	19.47

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References

Arch Member 9 - Mz

Summary of Ratings

Loading	RF			
	V	F	M	Total
HS20 INV	12.42	7.55	7.55	**7.55**
		12.16	12.16	**12.16**
MIL INV	12.62	8.47	8.47	**8.47**
		17.82	17.82	**12.62**
Lane INV	9.78	9.88	9.88	**9.78**
		10.45	10.45	**9.78**
HS20 OPR	20.74	12.60	12.60	**12.60**
		20.30	20.30	**20.30**
MIL OPR	21.06	14.15	14.15	**14.15**
		29.74	29.74	**21.06**
Lane OPR	16.33	16.49	16.49	**16.33**
		17.44	17.44	**16.33**
2F1	36.19	24.76	24.76	**24.76**
		47.49	47.49	**36.19**
3F1	24.45	17.23	17.23	**17.23**
		30.76	30.76	**24.45**
4F1	22.44	14.73	14.73	**14.73**
		26.08	26.08	**22.44**
5C1	22.52	20.10	20.10	**20.10**
		19.47	19.47	**19.47**

(Input values are shown underlined and in italics.)

Arch Member 9 - My — References

Determine the Axial Load/Moment Interaction Diagram & Shear Capacity of a Rectangular Reinforced Concrete Section

Criteria

Designed by AASHTO, *Standard Specifications for Highway Bridges*, 17^{th} ed. 2002.
Strength design.
Capacity based on strain compatibility.
Dimensions are in pounds, feet and seconds, U.N.O.

Assumptions

Section is rectangular and uniform.
Reinforcement is evenly spaced along the tensile sides.

Material Properties & Section Details

Material Strengths and Properties

Steel

f_y	*40*	ksi	Reinforcement yield.	
E_s	29,000	ksi	Steel modulus of elasticity.	(8.7.2)
ε_{sy}	-0.0014		Yield strain in steel.	

Concrete

f'_c	*3.0*	ksi	Concrete strength.	
β_1	$= 0.85 - 0.05 (f'_c - 4.0) \le 0.85 \ \& \ \ge 0.65$			(8.16.2.7)
	0.850			
ε_c	+0.0030		Limiting strain in concrete.	(8.16.2.3)

Resistance Factors

Φ	0.75	Compression controlled section. (i.e. $\lvert\varepsilon_{st}\rvert < \lvert\varepsilon_{sy}\rvert$)	(8.16.1.2.2)
Φ	0.90	Tension controlled section. (i.e. $\lvert\varepsilon_{st}\rvert \ge 0.005$)	(After AASHTO, *LRFD*, 5.5.4.2.1)
Φ	0.85	Shear.	(8.16.6.2)

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Arch Member 9 - My

References

Section Details

Section is a: *Beam-Column*

b	*44*	in	Section width.	3' - 8"	
h	*84*	in	Section depth.	7' - 0"	
d_{cc}	*2*	in	Depth of clear cover.		(ACI 318-02, 7.5.2.1)
A_g	3,696.0	in^2	Area of gross section.		

Tensile Reinforcement

(Reinforcement in the side faces is, conservatively, ignored.)

d_{bt}	*1 1/4*	in	Bar diameter.
A_{st}	*3.125*	in^2	Tensile reinforcement area.
d_{st}	81 3/8	in	Depth to reinforcement.

Compression Reinforcement

d_{bc}	*1 1/4*	in	Bar diameter.
A_{sc}	*3.125*	in^2	Compression reinforcement area.
d_{sc}	2 5/8	in	Depth to reinforcement.

MRussell

(Input values are shown underlined and in italics.)

References

Arch Member 9 - My

Moment/Axial Interaction Diagram

Axial Capacity

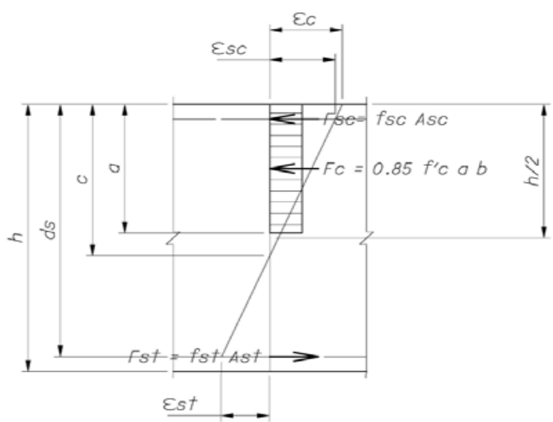
ψ 0.80 Ties.

$\Phi P_n = \Phi\,\psi\,[\,0.85\,f'_c\,(A_g - A_s) + f_y\,A_s\,]$ (8-29 and 8-30)

5,795.3 kip

General Expressions

c	$= d_s / [\,1 - \varepsilon_s / \varepsilon_c\,]$	Depth of the compression zone.
a	$= \beta_1\,c$	Depth of the stress block.
f_{st}	$= E_s\,\varepsilon_{st}$	Stress in the steel.
F_{st}	$= f_{st}\,A_{st}$	Force in the steel.
M_{st}	$= F_{st}\,(\,h/2 - d_{st}\,)$	Moment due to the steel.
F_c	$= 0.85\,f'_c\,a\,b$	Compressive force in concrete.
M_c	$= F_c\,(\,h/2 - a/2\,)$	Compressive moment in concrete.
f_{sc}	$= E_s\,\varepsilon_{sc}$	Stress in the steel.
F_{sc}	$= f_{sc}\,A_{sc}$	Force in the steel.
M_{sc}	$= F_{sc}\,(\,h/2 - d_{sc}\,)$	Moment due to the steel.



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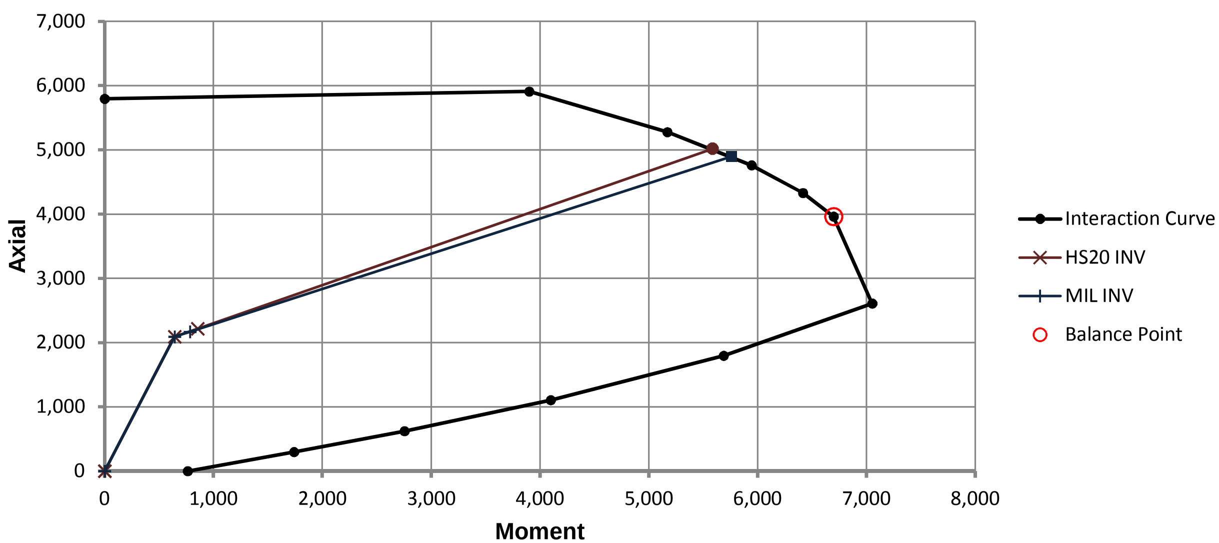
References

Arch Member 9 - My

Axial/Moment Interaction Diagram

$\varepsilon_{st} / \varepsilon_y$	Tensile Reinforcement				Concrete				Compressive Reinforcement				Capacity			
	ε_{st}	f_{st} ksi	P_{st} *kip*	M_{st} *kip-ft*	c *in*	a *in*	P_c *kip*	M_c *kip-ft*	ε_{sc}	f_{sc} ksi	P_{sc} *kip*	M_{sc} *kip-ft*	Φ	ΦP_n *kip*	ΦM_n *kip-ft*	e *ft*
N.A.													0.75	**5,795.3**	**0.0**	0.000
0%	0.0000	0.00	0.0	0.0	81.38	69.17	7,752.8	4,791.0	0.0029	40.00	125.0	410.2	0.75	5,908.3	3,900.8	0.660
25%	-0.0004	-10.00	-31.3	102.5	72.87	61.94	6,941.9	6,380.2	0.0029	40.00	125.0	410.2	0.75	5,276.8	5,169.7	0.980
50%	-0.0007	-20.00	-62.5	205.1	65.98	56.08	6,284.5	7,310.3	0.0029	40.00	125.0	410.2	0.75	4,760.3	5,944.1	1.249
75%	-0.0011	-30.00	-93.8	307.6	60.28	51.24	5,740.7	7,837.0	0.0029	40.00	125.0	410.2	0.75	4,329.0	6,416.1	1.482
100%	-0.0014	-40.00	-125.0	410.2	55.48	47.16	5,283.4	8,110.0	0.0029	40.00	125.0	410.2	0.75	3,962.6	6,697.7	1.690
358%	-0.0050	-40.00	-125.0	410.2	30.48	25.90	2,898.5	7,016.3	0.0027	40.00	125.0	410.2	0.90	2,608.7	7,052.9	2.704
616%	-0.0086	-40.00	-125.0	410.2	21.01	17.86	1,995.5	5,499.6	0.0026	40.00	125.0	410.2	0.90	1,795.9	5,687.9	3.167
1132%	-0.0158	-40.00	-125.0	410.2	12.96	11.01	1,227.7	3,733.6	0.0024	40.00	125.0	410.2	0.90	1,104.9	4,098.5	3.709
2163%	-0.0303	-40.00	-125.0	410.2	7.33	6.23	691.5	2,240.7	0.0019	40.00	125.0	410.2	0.90	622.4	2,754.9	4.426
4226%	-0.0592	-40.00	-125.0	410.2	3.93	3.34	366.5	1,231.9	0.0010	28.42	88.8	291.4	0.90	297.3	1,740.1	5.853
8095%	-0.1133	-40.00	-125.0	410.2	2.10	1.78	192.2	658.3	-0.0008	-21.50	-67.2	-220.4	0.90	**0.0**	**763.3**	∞



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Arch Member 9 - My

References

Axial Capacity & Load Rating

Loading	A_1P_{DU}	A_1M_{DU}	A_2P_{LU}	A_2M_{LU}	e_L	P_U	M_U	ΦP_n	ΦM_n	RF	
	kip	*kip-ft*	*kip*	*kip-ft*	*ft*	*kip*	*kip-ft*	*kip*	*kip-ft*	F	M
HS20 INV	2,090.8	642.8	125.6	212.1	1.689	2,216.4	854.9	5,018.0	5,585.6	23.30	23.30
	2,090.8	642.8	336.6	217.0	0.645	2,427.4	859.8	5,884.8	3,088.4	11.27	11.27
MIL INV	2,090.8	642.8	77.3	141.0	1.824	2,168.1	783.9	4,896.5	5,761.3	36.29	36.29
	2,090.8	642.8	228.8	147.4	0.644	2,319.6	790.2	5,884.7	3,086.7	16.58	16.58
Lane INV	2,090.8	642.8	335.3	381.2	1.137	2,426.1	1,024.0	5,578.2	4,607.0	10.40	10.40
	2,090.8	642.8	415.0	373.1	0.899	2,505.7	1,015.9	5,852.7	4,025.0	9.07	9.07
HS20 OPR	2,090.8	642.8	75.3	127.1	1.689	2,166.0	769.9	5,018.0	5,585.6	38.90	38.90
	2,090.8	642.8	201.7	130.0	0.645	2,292.4	772.8	5,884.8	3,088.4	18.81	18.81
MIL OPR	2,090.8	642.8	46.3	84.5	1.824	2,137.1	727.3	4,896.5	5,761.3	60.58	60.58
	2,090.8	642.8	137.1	88.3	0.644	2,227.9	731.1	5,884.7	3,086.7	27.68	27.68
Lane OPR	2,090.8	642.8	200.9	228.4	1.137	2,291.7	871.2	5,578.2	4,607.0	17.36	17.36
	2,090.8	642.8	248.6	223.5	0.899	2,339.4	866.3	5,852.7	4,025.0	15.13	15.13
2F1	2,090.8	642.8	32.3	52.8	1.638	2,123.0	695.7	5,065.5	5,514.3	92.21	92.21
	2,090.8	642.8	85.4	54.6	0.640	2,176.2	697.5	5,884.3	3,070.4	44.43	44.43
3F1	2,090.8	642.8	35.8	80.7	2.253	2,126.6	723.5	4,553.2	6,189.5	68.73	68.73
	2,090.8	642.8	130.7	82.8	0.633	2,221.5	725.6	5,883.5	3,044.3	29.02	29.02
4F1	2,090.8	642.8	48.1	94.8	1.970	2,138.9	737.7	4,772.9	5,927.5	55.73	55.73
	2,090.8	642.8	152.8	95.6	0.626	2,243.6	738.5	5,882.7	3,015.8	24.81	24.81
5C1	2,090.8	642.8	72.0	153.8	2.135	2,162.8	796.6	4,641.5	6,088.9	35.42	35.42
	2,090.8	642.8	211.7	136.0	0.643	2,302.4	778.8	5,884.6	3,080.7	17.92	17.92

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References

Arch Member 9 - My

Summary of Ratings

Loading	RF			
	V	F	M	Total
HS20 INV		23.30	23.30	**23.30**
		11.27	11.27	**11.27**
MIL INV		36.29	36.29	**36.29**
		16.58	16.58	**16.58**
Lane INV		10.40	10.40	**10.40**
		9.07	9.07	**9.07**
HS20 OPR		38.90	38.90	**38.90**
		18.81	18.81	**18.81**
MIL OPR		60.58	60.58	**60.58**
		27.68	27.68	**27.68**
Lane OPR		17.36	17.36	**17.36**
		15.13	15.13	**15.13**
2F1		92.21	92.21	**92.21**
		44.43	44.43	**44.43**
3F1		68.73	68.73	**68.73**
		29.02	29.02	**29.02**
4F1		55.73	55.73	**55.73**
		24.81	24.81	**24.81**
5C1		35.42	35.42	**35.42**
		17.92	17.92	**17.92**

Summary of Ratings - Combined Effects

1/RF = Σ 1/RFi

Loading	RF			
	V	F	M	Total
HS20 INV	12.42	5.70	5.70	**5.70**
		5.85	5.85	**5.85**
MIL INV	12.62	6.87	6.87	**6.87**
		8.59	8.59	**8.59**
Lane INV	9.78	5.07	5.07	**5.07**
		4.85	4.85	**4.85**
HS20 OPR	20.74	9.52	9.52	**9.52**
		9.76	9.76	**9.76**
MIL OPR	21.06	11.47	11.47	**11.47**
		14.34	14.34	**14.34**
Lane OPR	16.33	8.46	8.46	**8.46**
		8.10	8.10	**8.10**
2F1	36.19	19.52	19.52	**19.52**
		22.95	22.95	**22.95**
3F1	24.45	13.78	13.78	**13.78**
		14.93	14.93	**14.93**
4F1	22.44	11.65	11.65	**11.65**
		12.71	12.71	**12.71**
5C1	22.52	12.82	12.82	**12.82**
		9.33	9.33	**9.33**

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Arch Member 13 - Mz

References

Determine the Axial Load/Moment Interaction Diagram & Shear Capacity of a Rectangular Reinforced Concrete Section

Criteria

Designed by AASHTO, *Standard Specifications for Highway Bridges* , 17th ed. 2002.
Strength design.
Capacity based on strain compatibility.
Dimensions are in pounds, feet and seconds, U.N.O.

Assumptions

Section is rectangular and uniform.
Reinforcement is evenly spaced along the tensile sides.

Material Properties & Section Details

Material Strengths and Properties

Steel

f_y	*40* ksi	Reinforcement yield.	
E_s	29,000 ksi	Steel modulus of elasticity.	(8.7.2)
ε_{sy}	-0.0014	Yield strain in steel.	

Concrete

f'_c	*3.0* ksi	Concrete strength.	
β_1	$= 0.85 - 0.05\ (f'_c - 4.0) \leq 0.85\ \&\ \geq 0.65$		(8.16.2.7)
	0.850		
ε_c	+0.0030	Limiting strain in concrete.	(8.16.2.3)

Resistance Factors

Φ	0.75	Compression controlled section. (i.e. $\lvert\varepsilon_{st}\rvert < \lvert\varepsilon_{sy}\rvert$)	(8.16.1.2.2)
Φ	0.90	Tension controlled section. (i.e. $\lvert\varepsilon_{st}\rvert \geq 0.005$)	(After AASHTO, *LRFD* , 5.5.4.2.1)
Φ	0.85	Shear.	(8.16.6.2)

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Arch Member 13 - Mz

References

Section Details

Section is a: *Beam-Column*

b	*84*	in	Section width.	7' - 0"	
h	*39*	in	Section depth.	3' - 3"	
d_{cc}	*2*	in	Depth of clear cover.		(ACI 318-02, 7.5.2.1)
A_g	3,276.0	in^2	Area of gross section.		

Tensile Reinforcement

(Reinforcement in the side faces is, conservatively, ignored.)

d_{bt}	*1 1/4*	in	Bar diameter.
A_{st}	*18.750*	in^2	Tensile reinforcement area.
d_{st}	36 3/8	in	Depth to reinforcement.

Compression Reinforcement

d_{bc}	*1 1/4*	in	Bar diameter.
A_{sc}	*18.750*	in^2	Compression reinforcement area.
d_{sc}	2 5/8	in	Depth to reinforcement.

Transverse Reinforcement

d_{bv}	*9/16*	in	Bar diameter.
n	*4*		Number of legs / stirrup.
A_v	1.000	in^2	Stirrup reinforcement area.
s_v	*24*	in	Stirrup spacing.

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References

Arch Member 13 - Mz

Shear Strength & Rating

Shear Strength

Concrete

$V_c = 2f'_c{}^{1/2}bd$ (8-49)

334.7 kip

Reinforcement (8.16.6.3.2 & 8.16.6.3.9)

$V_s = A_v f_y d / s \leq 4 f'_c{}^{1/2} b d$ (8-53)

60.6 kip

Shear Capacity

$\Phi V_n = \Phi (V_c + V_s)$ Shear capacity of beam-column section.

336.0 kip

Shear Capacity & Load Rating

Loading	**A_1V_{DU}** *kip*	**A_2V_{LU}** *kip*	**V_U** *kip*	**ΦV_n** *kip*	**RF** **V**
HS20 INV	84.8	28.1	112.9	**336.0**	8.95
MIL INV	84.8	28.6	113.4	**336.0**	8.79
Lane INV	84.8	30.6	115.4	**336.0**	8.22
HS20 OPR	84.8	16.8	101.7	**336.0**	14.93
MIL OPR	84.8	17.1	102.0	**336.0**	14.67
Lane OPR	84.8	18.3	103.1	**336.0**	13.72
2F1	84.8	9.2	94.0	**336.0**	27.40
3F1	84.8	13.9	98.8	**336.0**	18.04
4F1	84.8	15.6	100.4	**336.0**	16.13
5C1	84.8	5.3	90.2	**336.0**	47.14

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References

Arch Member 13 - Mz

Moment/Axial Interaction Diagram

Axial Capacity

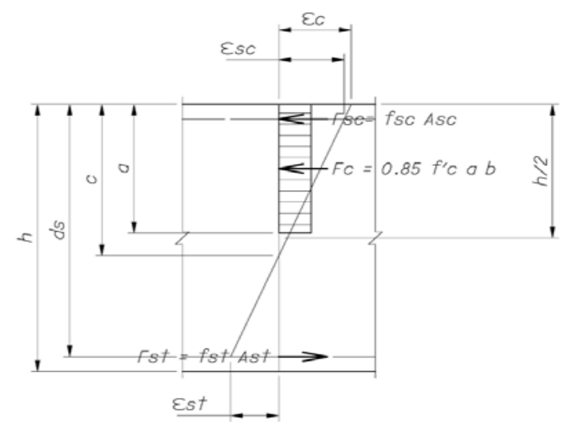
ψ 0.80 Ties.

ΦP_n $= \Phi\,\psi\,[\,0.85\,f'_c\,(A_g - A_s) + f_y\,A_s\,]$ (8-29 and 8-30)

5,854.9 kip

General Expressions

c	$= d_s / [\,1 - \varepsilon_s / \varepsilon_c\,]$	Depth of the compression zone.
a	$= \beta_1\,c$	Depth of the stress block.
f_{st}	$= E_s\,\varepsilon_{st}$	Stress in the steel.
F_{st}	$= f_{st}\,A_{st}$	Force in the steel.
M_{st}	$= F_{st}\,(\,h/2 - d_{st}\,)$	Moment due to the steel.
F_c	$= 0.85\,f'_c\,a\,b$	Compressive force in concrete.
M_c	$= F_c\,(\,h/2 - a/2\,)$	Compressive moment in concrete.
f_{sc}	$= E_s\,\varepsilon_{sc}$	Stress in the steel.
F_{sc}	$= f_{sc}\,A_{sc}$	Force in the steel.
M_{sc}	$= F_{sc}\,(\,h/2 - d_{sc}\,)$	Moment due to the steel.



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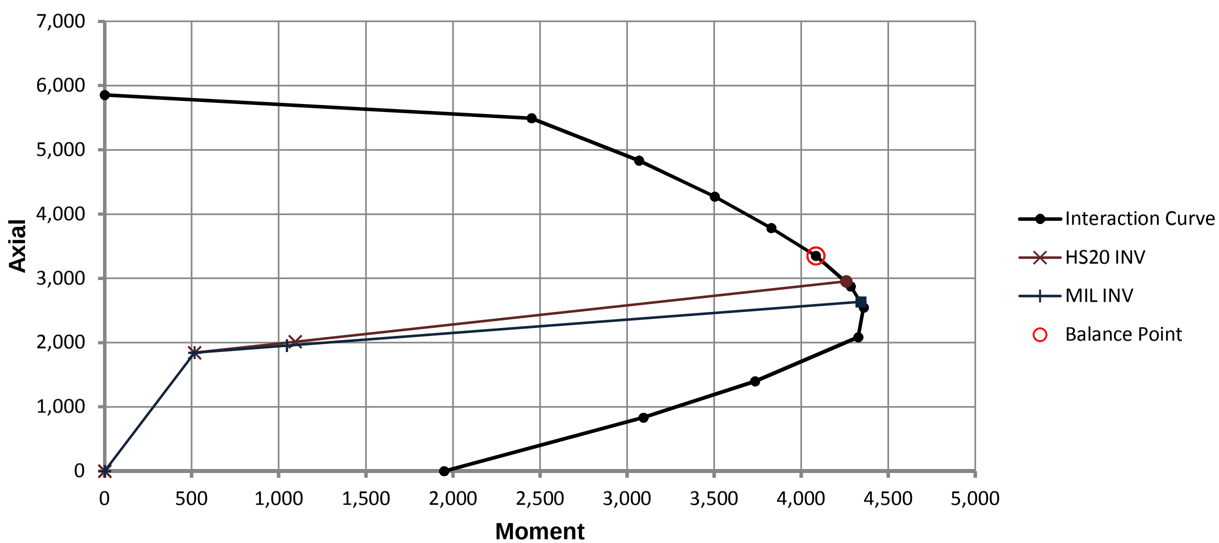
References

Arch Member 13 - Mz

Axial/Moment Interaction Diagram

$\varepsilon_{st} / \varepsilon_y$	Tensile Reinforcement				Concrete				Compressive Reinforcement				Capacity			
	ε_{st}	f_{st} ksi	P_{st} kip	M_{st} kip-ft	c in	a in	P_c kip	M_c kip-ft	ε_{sc}	f_{sc} ksi	P_{sc} kip	M_{sc} kip-ft	Φ	$ΦP_n$ kip	$ΦM_n$ kip-ft	e ft
N.A.													0.75	5,854.9	0.0	0.000
0%	0.0000	0.00	0.0	0.0	36.38	30.92	6,575.0	2,213.9	0.0028	40.00	750.0	1,054.7	0.75	5,493.7	2,451.5	0.446
25%	-0.0004	-10.00	-187.5	263.7	32.57	27.69	5,883.0	2,772.8	0.0028	40.00	750.0	1,054.7	0.75	4,834.2	3,068.3	0.635
50%	-0.0007	-20.00	-375.0	527.3	29.49	25.07	5,322.0	3,089.2	0.0027	40.00	750.0	1,054.7	0.75	4,272.8	3,503.4	0.820
75%	-0.0011	-30.00	-562.5	791.0	26.94	22.90	4,858.0	3,258.3	0.0027	40.00	750.0	1,054.7	0.75	3,784.1	3,828.0	1.012
100%	-0.0014	-40.00	-750.0	1,054.7	24.80	21.08	4,467.7	3,335.7	0.0027	40.00	750.0	1,054.7	0.75	3,350.8	4,083.8	1.219
172%	-0.0024	-40.00	-750.0	1,054.7	20.20	17.17	3,630.7	3,301.9	0.0026	40.00	750.0	1,054.7	0.79	2,874.5	4,284.2	1.49
243%	-0.0034	-40.00	-750.0	1,054.7	17.04	14.49	3,055.5	3,120.7	0.0025	40.00	750.0	1,054.7	0.83	2,546.5	4,358.9	1.712
386%	-0.0054	-40.00	-750.0	1,054.7	12.98	11.04	2,316.1	2,698.7	0.0024	40.00	750.0	1,054.7	0.90	2,084.5	4,327.2	2.076
672%	-0.0094	-40.00	-750.0	1,054.7	8.79	7.47	1,553.2	2,040.3	0.0021	40.00	750.0	1,054.7	0.90	1,397.9	3,734.7	2.672
1244%	-0.0174	-40.00	-750.0	1,054.7	5.34	4.54	925.2	1,328.3	0.0015	40.00	750.0	1,054.7	0.90	832.7	3,094.0	3.716
2317%	-0.0324	-40.00	-750.0	1,054.7	3.08	2.62	512.9	777.5	0.0004	12.65	237.1	333.5	0.90	**0.0**	**1,949.1**	∞



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Arch Member 13 - Mz

References

Axial Capacity & Load Rating

Loading	A_1P_{DU}	A_1M_{DU}	A_2P_{LU}	A_2M_{LU}	e_L	P_U	M_U	ΦP_n	ΦM_n	RF	
	kip	*kip-ft*	*kip*	*kip-ft*	*ft*	*kip*	*kip-ft*	*kip*	*kip-ft*	F	M
HS20 INV	1,843.5	515.9	171.0	577.4	3.376	2,014.5	1,093.3	2,952.3	4,259.5	6.48	6.48
	1,843.5	515.9	300.5	122.3	0.407	2,144.0	638.3	5,556.2	2,027.3	12.35	12.35
MIL INV	1,843.5	515.9	109.7	530.1	4.833	1,953.2	1,046.0	2,635.3	4,342.9	7.22	7.22
	1,843.5	515.9	203.3	85.8	0.422	2,046.8	601.7	5,548.5	2,079.8	18.22	18.22
Lane INV	1,843.5	515.9	320.6	358.0	1.116	2,164.1	873.9	4,422.0	3,394.6	8.04	8.04
	1,843.5	515.9	367.4	30.3	0.082	2,210.9	546.2	5,731.7	836.1	10.58	10.58
HS20 OPR	1,843.5	515.9	102.5	345.9	3.376	1,945.9	861.8	2,952.3	4,259.5	10.82	10.82
	1,843.5	515.9	180.0	73.3	0.407	2,023.5	589.2	5,556.2	2,027.3	20.62	20.62
MIL OPR	1,843.5	515.9	65.7	317.5	4.833	1,909.2	833.5	2,635.3	4,342.9	12.05	12.05
	1,843.5	515.9	121.8	51.4	0.422	1,965.3	567.3	5,548.5	2,079.8	30.42	30.42
Lane OPR	1,843.5	515.9	192.1	214.4	1.116	2,035.6	730.4	4,422.0	3,394.6	13.42	13.42
	1,843.5	515.9	220.1	18.1	0.082	2,063.6	534.0	5,731.7	836.1	17.67	17.67
2F1	1,843.5	515.9	43.3	181.7	4.192	1,886.8	697.6	2,750.4	4,317.7	20.92	20.92
	1,843.5	515.9	75.8	33.2	0.438	1,919.3	549.1	5,540.5	2,133.9	48.75	48.75
3F1	1,843.5	515.9	70.1	265.4	3.787	1,913.6	781.3	2,841.2	4,293.8	14.23	14.23
	1,843.5	515.9	116.2	40.7	0.350	1,959.7	556.6	5,585.7	1,827.1	32.21	32.21
4F1	1,843.5	515.9	71.4	292.6	4.095	1,914.9	808.5	2,770.6	4,312.7	12.98	12.98
	1,843.5	515.9	136.2	51.6	0.379	1,979.7	567.5	5,570.8	1,928.1	27.36	27.36
5C1	1,843.5	515.9	73.5	272.0	3.700	1,917.0	787.9	2,862.8	4,287.6	13.87	13.87
	1,843.5	515.9	189.5	59.0	0.311	2,033.0	574.9	5,606.2	1,688.0	19.86	19.86

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References

Arch Member 13 - Mz

Summary of Ratings

Loading	RF			
	V	F	M	Total
HS20 INV	8.95	6.48	6.48	**6.48**
		12.35	12.35	**8.95**
MIL INV	8.79	7.22	7.22	**7.22**
		18.22	18.22	**8.79**
Lane INV	8.22	8.04	8.04	**8.04**
		10.58	10.58	**8.22**
HS20 OPR	14.93	10.82	10.82	**10.82**
		20.62	20.62	**14.93**
MIL OPR	14.67	12.05	12.05	**12.05**
		30.42	30.42	**14.67**
Lane OPR	13.72	13.42	13.42	**13.42**
		17.67	17.67	**13.72**
2F1	27.40	20.92	20.92	**20.92**
		48.75	48.75	**27.40**
3F1	18.04	14.23	14.23	**14.23**
		32.21	32.21	**18.04**
4F1	16.13	12.98	12.98	**12.98**
		27.36	27.36	**16.13**
5C1	47.14	13.87	13.87	**13.87**
		19.86	19.86	**19.86**

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Arch Member 13 - My References

Determine the Axial Load/Moment Interaction Diagram & Shear Capacity of a Rectangular Reinforced Concrete Section

Criteria

Designed by AASHTO, *Standard Specifications for Highway Bridges* , 17^{th} ed. 2002.
Strength design.
Capacity based on strain compatibility.
Dimensions are in pounds, feet and seconds, U.N.O.

Assumptions

Section is rectangular and uniform.
Reinforcement is evenly spaced along the tensile sides.

Material Properties & Section Details

Material Strengths and Properties

Steel

f_y	*40* ksi	Reinforcement yield.	
E_s	29,000 ksi	Steel modulus of elasticity.	(8.7.2)
ε_{sy}	-0.0014	Yield strain in steel.	

Concrete

f'_c	*3.0* ksi	Concrete strength.	
β_1	$= 0.85 - 0.05 (f'_c - 4.0) \le 0.85 \ \& \ \ge 0.65$		(8.16.2.7)
	0.850		
ε_c	+0.0030	Limiting strain in concrete.	(8.16.2.3)

Resistance Factors

Φ	0.75	Compression controlled section. (i.e. $\lvert\varepsilon_{st}\rvert < \lvert\varepsilon_{sy}\rvert$)	(8.16.1.2.2)
Φ	0.90	Tension controlled section. (i.e. $\lvert\varepsilon_{st}\rvert \ge 0.005$)	(After AASHTO, *LRFD* , 5.5.4.2.1)
Φ	0.85	Shear.	(8.16.6.2)

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References

Arch Member 13 - My

Section Details

Section is a: *Beam-Column*

b	*39*	in	Section width.	3' - 3"	
h	*84*	in	Section depth.	7' - 0"	
d_{cc}	*2*	in	Depth of clear cover.		(ACI 318-02, 7.5.2.1)
A_g	3,276.0	in^2	Area of gross section.		

Tensile Reinforcement

(Reinforcement in the side faces is, conservatively, ignored.)

d_{bt}	*1 1/4*	in	Bar diameter.
A_{st}	*3.125*	in^2	Tensile reinforcement area.
d_{st}	81 3/8	in	Depth to reinforcement.

Compression Reinforcement

d_{bc}	*1 1/4*	in	Bar diameter.
A_{sc}	*3.125*	in^2	Compression reinforcement area.
d_{sc}	2 5/8	in	Depth to reinforcement.

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Arch Member 13 - My

References

Moment/Axial Interaction Diagram

Axial Capacity

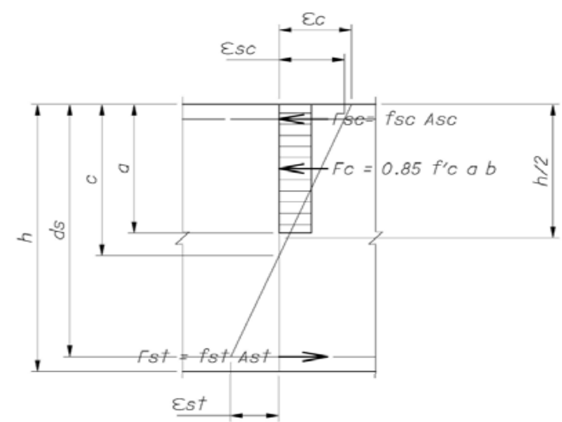
ψ 0.80 Ties.

$\Phi P_n = \Phi\, \psi\, [\, 0.85\, f'_c\, (A_g - A_s) + f_y\, A_s\,]$ (8-29 and 8-30)

5,152.7 kip

General Expressions

c	$= d_s / [\, 1 - \varepsilon_s / \varepsilon_c\,]$	Depth of the compression zone.
a	$= \beta_1\, c$	Depth of the stress block.
f_{st}	$= E_s\, \varepsilon_{st}$	Stress in the steel.
F_{st}	$= f_{st}\, A_{st}$	Force in the steel.
M_{st}	$= F_{st}\, (\, h/2 - d_{st}\,)$	Moment due to the steel.
F_c	$= 0.85\, f'_c\, a\, b$	Compressive force in concrete.
M_c	$= F_c\, (\, h/2 - a/2\,)$	Compressive moment in concrete.
f_{sc}	$= E_s\, \varepsilon_{sc}$	Stress in the steel.
F_{sc}	$= f_{sc}\, A_{sc}$	Force in the steel.
M_{sc}	$= F_{sc}\, (\, h/2 - d_{sc}\,)$	Moment due to the steel.



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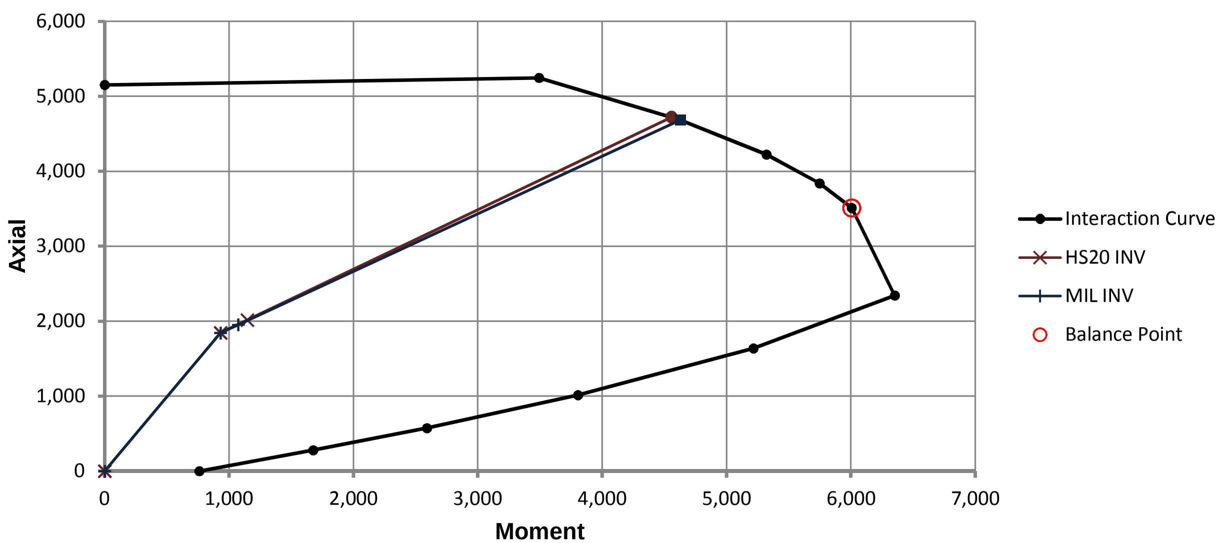
References

Arch Member 13 - My

Axial/Moment Interaction Diagram

ε_{st} / ε_y	Tensile Reinforcement				Concrete				Compressive Reinforcement				Capacity			
	ε_{st}	f_{st} ksi	P_{st} kip	M_{st} kip-ft	c in	a in	P_c kip	M_c kip-ft	ε_{sc}	f_{sc} ksi	P_{sc} kip	M_{sc} kip-ft	Φ	ΦP_n kip	ΦM_n kip-ft	e ft
N.A.													0.75	**5,152.7**	**0.0**	0.000
0%	0.0000	0.00	0.0	0.0	81.38	69.17	6,870.9	4,246.0	0.0029	40.00	125.0	410.2	0.75	5,246.9	3,492.1	0.666
25%	-0.0004	-10.00	-31.3	102.5	72.87	61.94	6,152.2	5,654.3	0.0029	40.00	125.0	410.2	0.75	4,684.4	4,625.3	0.987
50%	-0.0007	-20.00	-62.5	205.1	65.98	56.08	5,569.5	6,478.5	0.0029	40.00	125.0	410.2	0.75	4,224.0	5,320.3	1.260
75%	-0.0011	-30.00	-93.8	307.6	60.28	51.24	5,087.5	6,945.2	0.0029	40.00	125.0	410.2	0.75	3,839.0	5,747.2	1.497
100%	-0.0014	-40.00	-125.0	410.2	55.48	47.16	4,682.1	7,187.0	0.0029	40.00	125.0	410.2	0.75	3,511.6	6,005.5	1.710
346%	-0.0048	-40.00	-125.0	410.2	31.11	26.45	2,622.0	6,287.9	0.0027	40.00	125.0	410.2	0.89	2,343.1	6,352.0	2.711
592%	-0.0083	-40.00	-125.0	410.2	21.62	18.37	1,819.4	4,974.9	0.0026	40.00	125.0	410.2	0.90	1,637.5	5,215.7	3.185
1085%	-0.0152	-40.00	-125.0	410.2	13.42	11.41	1,126.8	3,408.0	0.0024	40.00	125.0	410.2	0.90	1,014.1	3,805.5	3.753
2069%	-0.0290	-40.00	-125.0	410.2	7.64	6.49	637.5	2,058.8	0.0020	40.00	125.0	410.2	0.90	573.7	2,591.2	4.516
4039%	-0.0565	-40.00	-125.0	410.2	4.10	3.48	338.6	1,135.9	0.0011	30.83	96.4	316.2	0.90	279.0	1,676.1	6.008
7732%	-0.1082	-40.00	-125.0	410.2	2.19	1.87	177.5	607.6	-0.0006	-16.81	-52.5	-172.4	0.90	**0.0**	**760.8**	∞



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References

Arch Member 13 - My

Axial Capacity & Load Rating

Loading	A_1P_{DU}	A_1M_{DU}	A_2P_{LU}	A_2M_{LU}	e_L	P_U	M_U	ΦP_n	ΦM_n	RF	
	kip	*kip-ft*	*kip*	*kip-ft*	*ft*	*kip*	*kip-ft*	*kip*	*kip-ft*	**F**	**M**
HS20 INV	1,843.5	931.1	171.0	215.5	1.260	2,014.5	1,146.6	**4,722.0**	**4,558.2**	16.83	16.83
	1,843.5	931.1	300.5	207.4	0.690	2,144.0	1,138.6	**5,241.1**	**3,276.2**	11.30	11.30
MIL INV	1,843.5	931.1	109.7	142.8	1.302	1,953.2	1,074.0	**4,682.4**	**4,628.7**	25.88	25.88
	1,843.5	931.1	203.3	140.5	0.691	2,046.8	1,071.7	**5,241.2**	**3,279.1**	16.71	16.71
Lane INV	1,843.5	931.1	320.6	381.6	1.190	2,164.1	1,312.8	**4,789.5**	**4,437.6**	9.19	9.19
	1,843.5	931.1	367.4	358.5	0.976	2,210.9	1,289.6	**5,005.7**	**4,016.8**	8.61	8.61
HS20 OPR	1,843.5	931.1	102.5	129.1	1.260	1,945.9	1,060.2	**4,722.0**	**4,558.2**	28.09	28.09
	1,843.5	931.1	180.0	124.3	0.690	2,023.5	1,055.4	**5,241.1**	**3,276.2**	18.87	18.87
MIL OPR	1,843.5	931.1	65.7	85.6	1.302	1,909.2	1,016.7	**4,682.4**	**4,628.7**	43.21	43.21
	1,843.5	931.1	121.8	84.2	0.691	1,965.3	1,015.3	**5,241.2**	**3,279.1**	27.89	27.89
Lane OPR	1,843.5	931.1	192.1	228.6	1.190	2,035.6	1,159.8	**4,789.5**	**4,437.6**	15.34	15.34
	1,843.5	931.1	220.1	214.8	0.976	2,063.6	1,145.9	**5,005.7**	**4,016.8**	14.37	14.37
2F1	1,843.5	931.1	43.3	53.7	1.240	1,886.8	984.9	**4,741.2**	**4,524.0**	66.86	66.86
	1,843.5	931.1	75.8	51.8	0.683	1,919.3	982.9	**5,240.4**	**3,251.5**	44.80	44.80
3F1	1,843.5	931.1	70.1	82.7	1.179	1,913.6	1,013.8	**4,800.0**	**4,417.8**	42.18	42.18
	1,843.5	931.1	116.2	82.8	0.712	1,959.7	1,013.9	**5,243.1**	**3,352.9**	29.27	29.27
4F1	1,843.5	931.1	71.4	96.5	1.351	1,914.9	1,027.6	**4,637.4**	**4,704.6**	39.11	39.11
	1,843.5	931.1	136.2	95.6	0.702	1,979.7	1,026.8	**5,242.2**	**3,317.1**	24.95	24.95
5C1	1,843.5	931.1	73.5	147.0	2.000	1,917.0	1,078.2	**4,108.6**	**5,461.9**	30.82	30.82
	1,843.5	931.1	189.5	128.8	0.680	2,033.0	1,059.9	**5,240.1**	**3,239.3**	17.92	17.92

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References

Arch Member 13 - My

Summary of Ratings

Loading	RF			
	V	F	M	Total
HS20 INV		16.83	16.83	**16.83**
		11.30	11.30	**11.30**
MIL INV		25.88	25.88	**25.88**
		16.71	16.71	**16.71**
Lane INV		9.19	9.19	**9.19**
		8.61	8.61	**8.61**
HS20 OPR		28.09	28.09	**28.09**
		18.87	18.87	**18.87**
MIL OPR		43.21	43.21	**43.21**
		27.89	27.89	**27.89**
Lane OPR		15.34	15.34	**15.34**
		14.37	14.37	**14.37**
2F1		66.86	66.86	**66.86**
		44.80	44.80	**44.80**
3F1		42.18	42.18	**42.18**
		29.27	29.27	**29.27**
4F1		39.11	39.11	**39.11**
		24.95	24.95	**24.95**
5C1		30.82	30.82	**30.82**
		17.92	17.92	**17.92**

Summary of Ratings - Combined Effects

1/RF = Σ 1/RFi

Loading	RF			
	V	F	M	Total
HS20 INV	8.95	4.68	4.68	**4.68**
		5.90	5.90	**5.90**
MIL INV	8.79	5.65	5.65	**5.65**
		8.72	8.72	**8.72**
Lane INV	8.22	4.29	4.29	**4.29**
		4.75	4.75	**4.75**
HS20 OPR	14.93	7.81	7.81	**7.81**
		9.85	9.85	**9.85**
MIL OPR	14.67	9.42	9.42	**9.42**
		14.55	14.55	**14.55**
Lane OPR	13.72	7.16	7.16	**7.16**
		7.92	7.92	**7.92**
2F1	27.40	15.94	15.94	**15.94**
		23.35	23.35	**23.35**
3F1	18.04	10.64	10.64	**10.64**
		15.33	15.33	**15.33**
4F1	16.13	9.74	9.74	**9.74**
		13.05	13.05	**13.05**
5C1	47.14	9.56	9.56	**9.56**
		9.42	9.42	**9.42**

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Arch Member 17 - Mz

References

Determine the Axial Load/Moment Interaction Diagram & Shear Capacity of a Rectangular Reinforced Concrete Section

Criteria

Designed by AASHTO, *Standard Specifications for Highway Bridges* , 17th ed. 2002.
Strength design.
Capacity based on strain compatibility.
Dimensions are in pounds, feet and seconds, U.N.O.

Assumptions

Section is rectangular and uniform.
Reinforcement is evenly spaced along the tensile sides.

Material Properties & Section Details

Material Strengths and Properties

Steel

f_y	*40*	ksi	Reinforcement yield.	
E_s	29,000	ksi	Steel modulus of elasticity.	(8.7.2)
ε_{sy}	-0.0014		Yield strain in steel.	

Concrete

f'_c	*3.0*	ksi	Concrete strength.	
β_1	$= 0.85 - 0.05\,(f'_c - 4.0) \le 0.85\ \&\ \ge 0.65$			(8.16.2.7)
	0.850			
ε_c	+0.0030		Limiting strain in concrete.	(8.16.2.3)

Resistance Factors

Φ	0.75	Compression controlled section. (i.e. $\lvert\varepsilon_{st}\rvert < \lvert\varepsilon_{sy}\rvert$)	(8.16.1.2.2)
Φ	0.90	Tension controlled section. (i.e. $\lvert\varepsilon_{st}\rvert \ge 0.005$)	(After AASHTO, *LRFD* , 5.5.4.2.1)
Φ	0.85	Shear.	(8.16.6.2)

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References

Section Details

Section is a: *Beam-Column*

b	*84*	in	Section width.	7' - 0"	
h	*37*	in	Section depth.	3' - 1"	
d_{cc}	*2*	in	Depth of clear cover.		(ACI 318-02, 7.5.2.1)
A_g	3,108.0	in^2	Area of gross section.		

Tensile Reinforcement

(Reinforcement in the side faces is, conservatively, ignored.)

d_{bt}	*1 1/4*	in	Bar diameter.
A_{st}	*18.750*	in^2	Tensile reinforcement area.
d_{st}	34 3/8	in	Depth to reinforcement.

Compression Reinforcement

d_{bc}	*1 1/4*	in	Bar diameter.
A_{sc}	*18.750*	in^2	Compression reinforcement area.
d_{sc}	2 5/8	in	Depth to reinforcement.

Transverse Reinforcement

d_{bv}	*9/16*	in	Bar diameter.
n	*4*		Number of legs / stirrup.
A_v	1.000	in^2	Stirrup reinforcement area.
s_v	*24*	in	Stirrup spacing.

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Shear Strength & Rating

Shear Strength

Concrete

$V_c = 2f'_c{}^{1/2}bd$ (8-49)

316.3 kip

Reinforcement (8.16.6.3.2 & 8.16.6.3.9)

$V_s = A_v f_y d / s \leq 4 f'_c{}^{1/2} b d$ (8-53)

57.3 kip

Shear Capacity

$\Phi V_n = \Phi (V_c + V_s)$ Shear capacity of beam-column section.

317.6 kip

Shear Capacity & Load Rating

Loading	A_1V_{DU} kip	A_2V_{LU} kip	V_U kip	ΦV_n kip	RF V
HS20 INV	106.6	36.0	142.6	**317.6**	5.86
MIL INV	106.6	35.2	141.8	**317.6**	5.99
Lane INV	106.6	36.5	143.1	**317.6**	5.78
HS20 OPR	106.6	21.6	128.1	**317.6**	9.79
MIL OPR	106.6	21.1	127.7	**317.6**	9.99
Lane OPR	106.6	21.9	128.4	**317.6**	9.65
2F1	106.6	11.5	118.1	**317.6**	18.31
3F1	106.6	16.9	123.5	**317.6**	12.50
4F1	106.6	19.3	125.9	**317.6**	10.94
5C1	106.6	19.6	126.2	**317.6**	10.75

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Arch Member 17 - Mz

References

Moment/Axial Interaction Diagram

Axial Capacity

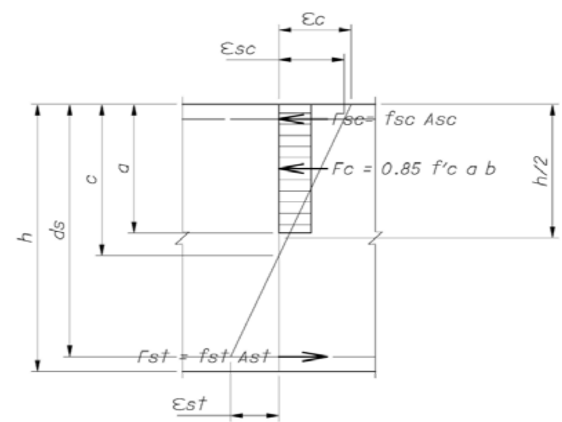
ψ 0.80 Ties.

$\Phi P_n = \Phi\,\psi\,[\,0.85\,f'_c\,(A_g - A_s) + f_y\,A_s\,]$ (8-29 and 8-30)

5,597.9 kip

General Expressions

c	$= d_s / [\,1 - \varepsilon_s / \varepsilon_c\,]$	Depth of the compression zone.
a	$= \beta_1\,c$	Depth of the stress block.
f_{st}	$= E_s\,\varepsilon_{st}$	Stress in the steel.
F_{st}	$= f_{st}\,A_{st}$	Force in the steel.
M_{st}	$= F_{st}\,(\,h/2 - d_{st}\,)$	Moment due to the steel.
F_c	$= 0.85\,f'_c\,a\,b$	Compressive force in concrete.
M_c	$= F_c\,(\,h/2 - a/2\,)$	Compressive moment in concrete.
f_{sc}	$= E_s\,\varepsilon_{sc}$	Stress in the steel.
F_{sc}	$= f_{sc}\,A_{sc}$	Force in the steel.
M_{sc}	$= F_{sc}\,(\,h/2 - d_{sc}\,)$	Moment due to the steel.



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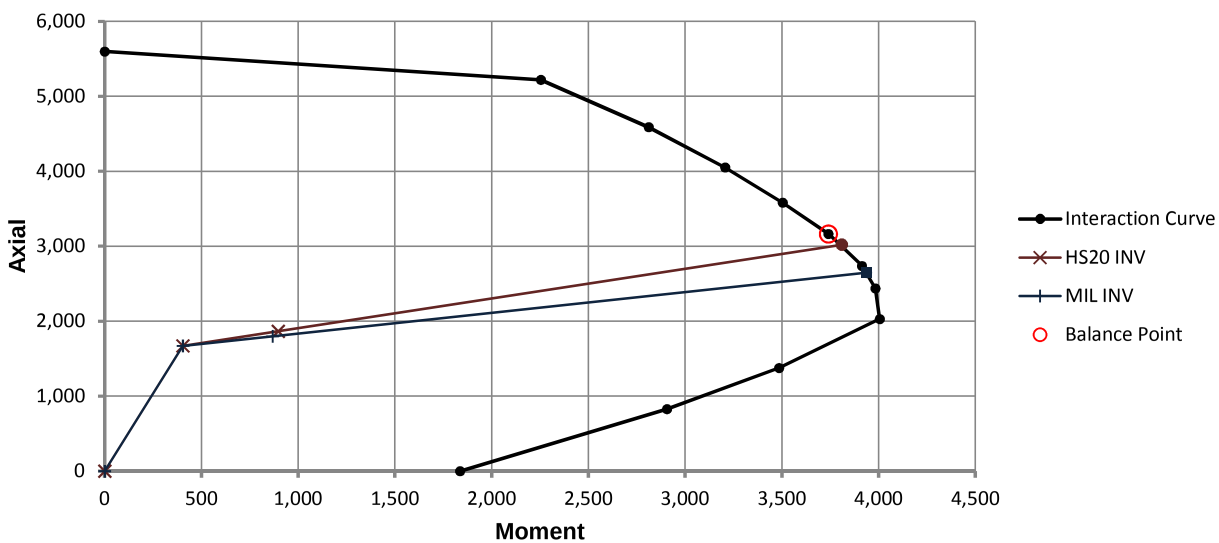
Axial/Moment Interaction Diagram

ε_{st} / ε_y	Tensile Reinforcement				Concrete				Compressive Reinforcement				Capacity			
	ε_{st}	f_{st} ksi	P_{st} *kip*	M_{st} *kip-ft*	c *in*	a *in*	P_c *kip*	M_c *kip-ft*	ε_{sc}	f_{sc} ksi	P_{sc} *kip*	M_{sc} *kip-ft*	Φ	ΦP_n *kip*	ΦM_n *kip-ft*	e *ft*
N.A.													0.75	**5,597.9**	**0.0**	0.000
0%	0.0000	0.00	0.0	0.0	34.38	29.22	6,210.8	2,013.7	0.0028	40.00	750.0	992.2	0.75	5,220.6	2,254.4	0.432
25%	-0.0004	-10.00	-187.5	248.0	30.78	26.17	5,557.0	2,508.5	0.0027	40.00	750.0	992.2	0.75	4,589.6	2,811.5	0.613
50%	-0.0007	-20.00	-375.0	496.1	27.87	23.69	5,026.8	2,787.6	0.0027	40.00	750.0	992.2	0.75	4,051.3	3,206.9	0.792
75%	-0.0011	-30.00	-562.5	744.1	25.46	21.64	4,588.2	2,935.8	0.0027	40.00	750.0	992.2	0.75	3,581.8	3,504.1	0.978
100%	-0.0014	-40.00	-750.0	992.2	23.44	19.92	4,219.5	3,002.5	0.0027	40.00	750.0	992.2	0.75	3,164.6	3,740.2	1.182
167%	-0.0023	-40.00	-750.0	992.2	19.32	16.42	3,469.4	2,975.0	0.0026	40.00	750.0	992.2	0.79	2,737.7	3,913.4	1.429
234%	-0.0033	-40.00	-750.0	992.2	16.43	13.97	2,943.6	2,825.2	0.0025	40.00	750.0	992.2	0.83	2,437.8	3,983.2	1.634
368%	-0.0052	-40.00	-750.0	992.2	12.65	10.75	2,255.0	2,466.4	0.0024	40.00	750.0	992.2	0.90	2,029.5	4,005.7	1.974
636%	-0.0089	-40.00	-750.0	992.2	8.66	7.36	1,529.1	1,888.3	0.0021	40.00	750.0	992.2	0.90	1,376.2	3,485.4	2.533
1172%	-0.0164	-40.00	-750.0	992.2	5.31	4.52	919.3	1,244.4	0.0015	40.00	750.0	992.2	0.90	827.4	2,905.9	3.512
2178%	-0.0305	-40.00	-750.0	992.2	3.08	2.62	512.9	734.7	0.0004	12.65	237.1	313.7	0.90	**0.0**	**1,836.6**	∞



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References

Arch Member 17 - Mz

Axial Capacity & Load Rating

Loading	A_1P_{DU}	A_1M_{DU}	A_2P_{LU}	A_2M_{LU}	e_L	P_U	M_U	ΦP_n	ΦM_n	RF	
	kip	*kip-ft*	*kip*	*kip-ft*	*ft*	*kip*	*kip-ft*	*kip*	*kip-ft*	F	M
HS20 INV	1,671.5	404.4	195.0	492.5	2.525	1,866.5	896.9	**3,020.1**	**3,809.5**	6.91	6.91
	1,671.5	404.4	267.9	101.5	0.379	1,939.4	505.9	**5,300.1**	**1,779.6**	13.55	13.55
MIL INV	1,671.5	404.4	128.0	463.6	3.622	1,799.5	868.0	**2,647.3**	**3,938.4**	7.62	7.62
	1,671.5	404.4	181.4	54.0	0.298	1,852.9	458.4	**5,347.2**	**1,498.2**	20.26	20.26
Lane INV	1,671.5	404.4	305.9	319.8	1.045	1,977.4	724.2	**4,232.0**	**3,081.2**	8.37	8.37
	1,671.5	404.4	332.3	44.8	0.135	2,003.8	449.2	**5,445.1**	**912.9**	11.36	11.36
HS20 OPR	1,671.5	404.4	116.8	295.0	2.525	1,788.3	699.5	**3,020.1**	**3,809.5**	11.54	11.54
	1,671.5	404.4	160.5	60.8	0.379	1,832.0	465.2	**5,300.1**	**1,779.6**	22.61	22.61
MIL OPR	1,671.5	404.4	76.7	277.7	3.622	1,748.2	682.1	**2,647.3**	**3,938.4**	12.73	12.73
	1,671.5	404.4	108.7	32.3	0.298	1,780.2	436.8	**5,347.2**	**1,498.2**	33.83	33.83
Lane OPR	1,671.5	404.4	183.3	191.6	1.045	1,854.8	596.0	**4,232.0**	**3,081.2**	13.97	13.97
	1,671.5	404.4	199.1	26.8	0.135	1,870.6	431.3	**5,445.1**	**912.9**	18.95	18.95
2F1	1,671.5	404.4	48.9	160.1	3.272	1,720.4	564.5	**2,743.5**	**3,911.7**	21.91	21.91
	1,671.5	404.4	67.8	20.6	0.303	1,739.3	425.0	**5,343.8**	**1,518.1**	54.14	54.14
3F1	1,671.5	404.4	77.0	237.8	3.089	1,748.5	642.2	**2,800.9**	**3,893.5**	14.67	14.67
	1,671.5	404.4	103.9	34.7	0.334	1,775.4	439.1	**5,326.2**	**1,623.7**	35.18	35.18
4F1	1,671.5	404.4	92.9	260.8	2.809	1,764.4	665.3	**2,901.1**	**3,858.2**	13.24	13.24
	1,671.5	404.4	121.6	43.6	0.359	1,793.1	448.1	**5,311.5**	**1,711.3**	29.94	29.94
5C1	1,671.5	404.4	98.0	237.7	2.425	1,769.5	642.2	**3,066.8**	**3,788.3**	14.23	14.23
	1,671.5	404.4	162.9	18.9	0.116	1,834.4	423.4	**5,456.5**	**844.7**	23.24	23.24

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References

Arch Member 17 - Mz

Summary of Ratings

Loading	RF			
	V	F	M	Total
HS20 INV	5.86	6.91	6.91	**5.86**
		13.55	13.55	**5.86**
MIL INV	5.99	7.62	7.62	**5.99**
		20.26	20.26	**5.99**
Lane INV	5.78	8.37	8.37	**5.78**
		11.36	11.36	**5.78**
HS20 OPR	9.79	11.54	11.54	**9.79**
		22.61	22.61	**9.79**
MIL OPR	9.99	12.73	12.73	**9.99**
		33.83	33.83	**9.99**
Lane OPR	9.65	13.97	13.97	**9.65**
		18.95	18.95	**9.65**
2F1	18.31	21.91	21.91	**18.31**
		54.14	54.14	**18.31**
3F1	12.50	14.67	14.67	**12.50**
		35.18	35.18	**12.50**
4F1	10.94	13.24	13.24	**10.94**
		29.94	29.94	**10.94**
5C1	10.75	14.23	14.23	**10.75**
		23.24	23.24	**10.75**

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(Input values are shown underlined and in italics.)

Arch Member 17 - My

References

Determine the Axial Load/Moment Interaction Diagram & Shear Capacity of a Rectangular Reinforced Concrete Section

Criteria

Designed by AASHTO, *Standard Specifications for Highway Bridges* , 17th ed. 2002.
Strength design.
Capacity based on strain compatibility.
Dimensions are in pounds, feet and seconds, U.N.O.

Assumptions

Section is rectangular and uniform.
Reinforcement is evenly spaced along the tensile sides.

Material Properties & Section Details

Material Strengths and Properties

Steel

f_y	*40* ksi	Reinforcement yield.	
E_s	29,000 ksi	Steel modulus of elasticity.	(8.7.2)
ε_{sy}	-0.0014	Yield strain in steel.	

Concrete

f'_c	*3.0* ksi	Concrete strength.	
β_1	$= 0.85 - 0.05\ (f'_c - 4.0) \le 0.85\ \&\ \ge 0.65$		(8.16.2.7)
	0.850		
ε_c	+0.0030	Limiting strain in concrete.	(8.16.2.3)

Resistance Factors

Φ	0.75	Compression controlled section. (i.e. $\lvert\varepsilon_{st}\rvert < \lvert\varepsilon_{sy}\rvert$)	(8.16.1.2.2)
Φ	0.90	Tension controlled section. (i.e. $\lvert\varepsilon_{st}\rvert \ge 0.005$)	(After AASHTO, *LRFD* , 5.5.4.2.1)
Φ	0.85	Shear.	(8.16.6.2)

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(Input values are shown underlined and in italics.)

Arch Member 17 - My

References

Section Details

Section is a: *Beam-Column*

b	*37*	in	Section width.	3' - 1"	
h	*84*	in	Section depth.	7' - 0"	
d_{cc}	*2*	in	Depth of clear cover.		(ACI 318-02, 7.5.2.1)
A_g	3,108.0	in^2	Area of gross section.		

Tensile Reinforcement

(Reinforcement in the side faces is, conservatively, ignored.)

d_{bt}	*1 1/4*	in	Bar diameter.
A_{st}	*3.125*	in^2	Tensile reinforcement area.
d_{st}	81 3/8	in	Depth to reinforcement.

Compression Reinforcement

d_{bc}	*1 1/4*	in	Bar diameter.
A_{sc}	*3.125*	in^2	Compression reinforcement area.
d_{sc}	2 5/8	in	Depth to reinforcement.

MRussell

(Input values are shown underlined and in italics.)

References

Arch Member 17 - My

Moment/Axial Interaction Diagram

Axial Capacity

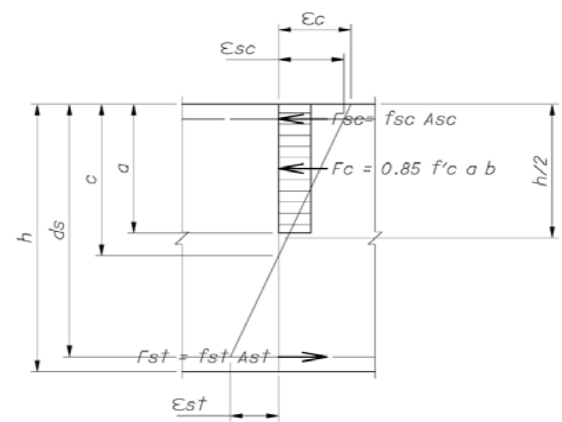
ψ 0.80 Ties.

$\Phi P_n = \Phi\ \psi\ [\ 0.85\ f'_c\ (A_g - A_s) + f_y\ A_s\ ]$ (8-29 and 8-30)

4,895.7 kip

General Expressions

c	$= d_s / [\ 1 - \varepsilon_s / \varepsilon_c\ ]$	Depth of the compression zone.
a	$= \beta_1\ c$	Depth of the stress block.
f_{st}	$= E_s\ \varepsilon_{st}$	Stress in the steel.
F_{st}	$= f_{st}\ A_{st}$	Force in the steel.
M_{st}	$= F_{st}\ (\ h/2 - d_{st}\ )$	Moment due to the steel.
F_c	$= 0.85\ f'_c\ a\ b$	Compressive force in concrete.
M_c	$= F_c\ (\ h/2 - a/2\ )$	Compressive moment in concrete.
f_{sc}	$= E_s\ \varepsilon_{sc}$	Stress in the steel.
F_{sc}	$= f_{sc}\ A_{sc}$	Force in the steel.
M_{sc}	$= F_{sc}\ (\ h/2 - d_{sc}\ )$	Moment due to the steel.



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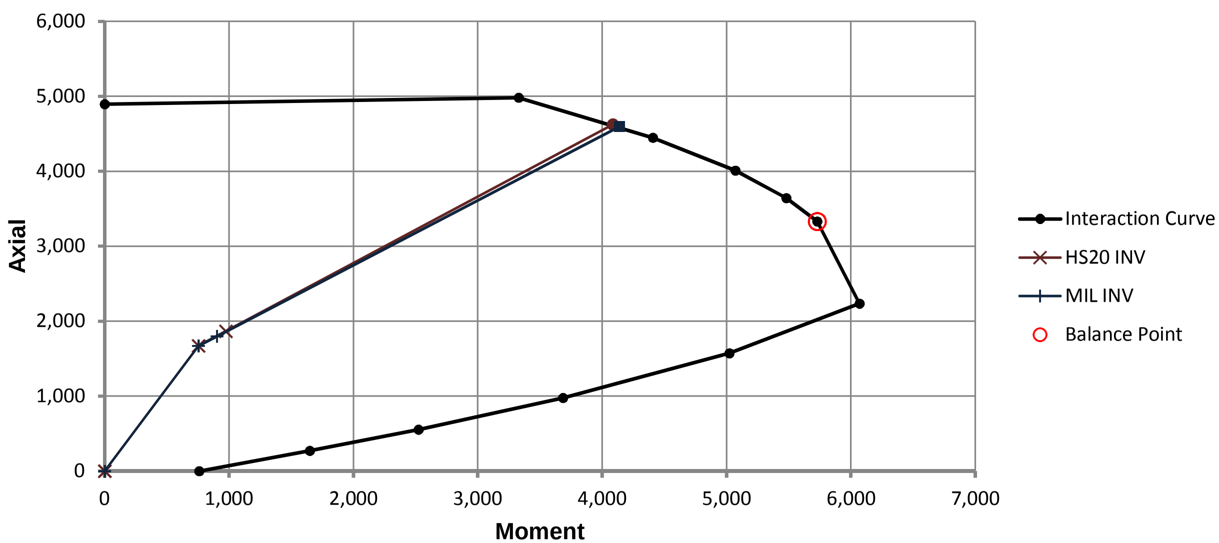
References

Arch Member 17 - My

Axial/Moment Interaction Diagram

$\varepsilon_{st} / \varepsilon_y$	Tensile Reinforcement				Concrete				Compressive Reinforcement				Capacity			
	ε_{st}	f_{st} ksi	P_{st} *kip*	M_{st} *kip-ft*	c *in*	a *in*	P_c *kip*	M_c *kip-ft*	ε_{sc}	f_{sc} ksi	P_{sc} *kip*	M_{sc} *kip-ft*	Φ	ΦP_n *kip*	ΦM_n *kip-ft*	e *ft*
N.A.													0.75	**4,895.7**	**0.0**	0.000
0%	0.0000	0.00	0.0	0.0	81.38	69.17	6,518.1	4,028.0	0.0029	40.00	125.0	410.2	0.75	4,982.3	3,328.6	0.668
25%	-0.0004	-10.00	-31.3	102.5	72.87	61.94	5,836.3	5,364.0	0.0029	40.00	125.0	410.2	0.75	4,447.5	4,407.5	0.991
50%	-0.0007	-20.00	-62.5	205.1	65.98	56.08	5,283.4	6,145.8	0.0029	40.00	125.0	410.2	0.75	4,009.5	5,070.8	1.265
75%	-0.0011	-30.00	-93.8	307.6	60.28	51.24	4,826.2	6,588.5	0.0029	40.00	125.0	410.2	0.75	3,643.1	5,479.7	1.504
100%	-0.0014	-40.00	-125.0	410.2	55.48	47.16	4,441.6	6,817.8	0.0029	40.00	125.0	410.2	0.75	3,331.2	5,728.6	1.720
341%	-0.0048	-40.00	-125.0	410.2	31.39	26.68	2,509.1	5,992.8	0.0027	40.00	125.0	410.2	0.89	2,235.0	6,068.8	2.715
583%	-0.0082	-40.00	-125.0	410.2	21.88	18.60	1,746.9	4,760.4	0.0026	40.00	125.0	410.2	0.90	1,572.2	5,022.6	3.195
1065%	-0.0149	-40.00	-125.0	410.2	13.63	11.58	1,085.0	3,273.8	0.0024	40.00	125.0	410.2	0.90	976.5	3,684.7	3.773
2030%	-0.0284	-40.00	-125.0	410.2	7.77	6.60	615.0	1,983.4	0.0020	40.00	125.0	410.2	0.90	553.5	2,523.3	4.559
3961%	-0.0555	-40.00	-125.0	410.2	4.18	3.55	327.0	1,096.1	0.0011	31.84	99.5	326.5	0.90	271.3	1,649.4	6.079
7580%	-0.1061	-40.00	-125.0	410.2	2.24	1.90	171.4	586.5	-0.0005	-14.86	-46.4	-152.4	0.90	**0.0**	**759.8**	∞



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Arch Member 17 - My

References

Axial Capacity & Load Rating

Loading	A_1P_{DU} kip	A_1M_{DU} kip-ft	A_2P_{LU} kip	A_2M_{LU} kip-ft	e_L ft	P_U kip	M_U kip-ft	ΦP_n kip	ΦM_n kip-ft	RF F	RF M
HS20 INV	1,671.5	754.2	195.0	220.3	1.130	1,866.5	974.5	4,622.1	4,087.4	15.13	15.13
	1,671.5	754.2	267.9	192.4	0.718	1,939.4	946.6	4,977.1	3,128.2	12.34	12.34
MIL INV	1,671.5	754.2	128.0	148.1	1.157	1,799.5	902.3	4,595.3	4,138.1	22.84	22.84
	1,671.5	754.2	181.4	140.5	0.775	1,852.9	894.7	4,982.1	3,318.8	18.25	18.25
Lane INV	1,671.5	754.2	305.9	379.6	1.241	1,977.4	1,133.8	4,516.3	4,284.5	9.30	9.30
	1,671.5	754.2	332.3	358.5	1.079	2,003.8	1,112.7	4,671.7	3,990.8	9.03	9.03
HS20 OPR	1,671.5	754.2	116.8	132.0	1.130	1,788.3	886.2	4,622.1	4,087.4	25.25	25.25
	1,671.5	754.2	160.5	115.2	0.718	1,832.0	869.4	4,977.1	3,128.2	20.60	20.60
MIL OPR	1,671.5	754.2	76.7	88.7	1.157	1,748.2	842.9	4,595.3	4,138.1	38.13	38.13
	1,671.5	754.2	108.7	84.2	0.775	1,780.2	838.4	4,982.1	3,318.8	30.47	30.47
Lane OPR	1,671.5	754.2	183.3	227.4	1.241	1,854.8	981.6	4,516.3	4,284.5	15.52	15.52
	1,671.5	754.2	199.1	214.8	1.079	1,870.6	969.0	4,671.7	3,990.8	15.07	15.07
2F1	1,671.5	754.2	48.9	55.5	1.135	1,720.4	809.7	4,617.2	4,096.6	60.20	60.20
	1,671.5	754.2	67.8	51.8	0.764	1,739.3	806.0	4,981.1	3,281.6	48.79	48.79
3F1	1,671.5	754.2	77.0	85.4	1.110	1,748.5	839.6	4,641.7	4,050.2	38.59	38.59
	1,671.5	754.2	103.9	78.0	0.751	1,775.4	832.2	4,980.0	3,237.8	31.85	31.85
4F1	1,671.5	754.2	92.9	100.4	1.081	1,764.4	854.6	4,669.5	3,995.3	32.28	32.28
	1,671.5	754.2	121.6	89.5	0.736	1,793.1	843.7	4,978.7	3,188.3	27.20	27.20
5C1	1,671.5	754.2	98.0	144.4	1.474	1,769.5	898.6	4,307.8	4,639.1	26.89	26.89
	1,671.5	754.2	162.9	120.3	0.739	1,834.4	874.5	4,978.9	3,197.2	20.31	20.31

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Arch Member 17 - My

References

Summary of Ratings

Loading	RF V	RF F	RF M	RF Total
HS20 INV		15.13	15.13	**15.13**
		12.34	12.34	**12.34**
MIL INV		22.84	22.84	**22.84**
		18.25	18.25	**18.25**
Lane INV		9.30	9.30	**9.30**
		9.03	9.03	**9.03**
HS20 OPR		25.25	25.25	**25.25**
		20.60	20.60	**20.60**
MIL OPR		38.13	38.13	**38.13**
		30.47	30.47	**30.47**
Lane OPR		15.52	15.52	**15.52**
		15.07	15.07	**15.07**
2F1		60.20	60.20	**60.20**
		48.79	48.79	**48.79**
3F1		38.59	38.59	**38.59**
		31.85	31.85	**31.85**
4F1		32.28	32.28	**32.28**
		27.20	27.20	**27.20**
5C1		26.89	26.89	**26.89**
		20.31	20.31	**20.31**

Summary of Ratings - Combined Effects

1/RF = Σ 1/RFi

Loading	RF V	RF F	RF M	RF Total
HS20 INV	5.86	4.75	4.75	**4.75**
		6.46	6.46	**5.86**
MIL INV	5.99	5.72	5.72	**5.72**
		9.60	9.60	**5.99**
Lane INV	5.78	4.41	4.41	**4.41**
		5.03	5.03	**5.03**
HS20 OPR	9.79	7.92	7.92	**7.92**
		10.78	10.78	**9.79**
MIL OPR	9.99	9.54	9.54	**9.54**
		16.03	16.03	**9.99**
Lane OPR	9.65	7.35	7.35	**7.35**
		8.40	8.40	**8.40**
2F1	18.31	16.06	16.06	**16.06**
		25.66	25.66	**18.31**
3F1	12.50	10.63	10.63	**10.63**
		16.72	16.72	**12.50**
4F1	10.94	9.39	9.39	**9.39**
		14.25	14.25	**10.94**
5C1	10.75	9.31	9.31	**9.31**
		10.84	10.84	**10.75**

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Arch Member 21 - Mz

References

Determine the Axial Load/Moment Interaction Diagram & Shear Capacity of a Rectangular Reinforced Concrete Section

Criteria

Designed by AASHTO, *Standard Specifications for Highway Bridges* , 17th ed. 2002.
Strength design.
Capacity based on strain compatibility.
Dimensions are in pounds, feet and seconds, U.N.O.

Assumptions

Section is rectangular and uniform.
Reinforcement is evenly spaced along the tensile sides.

Material Properties & Section Details

Material Strengths and Properties

Steel

f_y	*40* ksi	Reinforcement yield.	
E_s	29,000 ksi	Steel modulus of elasticity.	(8.7.2)
ε_{sy}	-0.0014	Yield strain in steel.	

Concrete

f'_c	*3.0* ksi	Concrete strength.	
β_1	$= 0.85 - 0.05\ (f'_c - 4.0) \le 0.85\ \&\ \ge 0.65$		(8.16.2.7)
	0.850		
ε_c	+0.0030	Limiting strain in concrete.	(8.16.2.3)

Resistance Factors

Φ	0.75	Compression controlled section. (i.e. $\lvert\varepsilon_{st}\rvert < \lvert\varepsilon_{sy}\rvert$)	(8.16.1.2.2)
Φ	0.90	Tension controlled section. (i.e. $\lvert\varepsilon_{st}\rvert \ge 0.005$)	(After AASHTO, *LRFD* , 5.5.4.2.1)
Φ	0.85	Shear.	(8.16.6.2)

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Arch Member 21 - Mz

References

Section Details

Section is a: *Beam-Column*

b	*84*	in	Section width.	7' - 0"	
h	*36*	in	Section depth.	3' - 0"	
d_{cc}	*2*	in	Depth of clear cover.		(ACI 318-02, 7.5.2.1)
A_g	3,024.0	in^2	Area of gross section.		

Tensile Reinforcement

(Reinforcement in the side faces is, conservatively, ignored.)

d_{bt}	*1 1/4*	in	Bar diameter.
A_{st}	*18.750*	in^2	Tensile reinforcement area.
d_{st}	33 3/8	in	Depth to reinforcement.

Compression Reinforcement

d_{bc}	*1 1/4*	in	Bar diameter.
A_{sc}	*18.750*	in^2	Compression reinforcement area.
d_{sc}	2 5/8	in	Depth to reinforcement.

Transverse Reinforcement

d_{bv}	*9/16*	in	Bar diameter.
n	*4*		Number of legs / stirrup.
A_v	1.000	in^2	Stirrup reinforcement area.
s_v	*24*	in	Stirrup spacing.

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Arch Member 21 - Mz

References

Shear Strength & Rating

Shear Strength

Concrete

$V_c = 2f'_c{}^{1/2}bd$ (8-49)

307.1 kip

Reinforcement (8.16.6.3.2 & 8.16.6.3.9)

$V_s = A_v\, f_y\, d / s \le 4\, f'_c{}^{1/2}\, b\, d$ (8-53)

55.6 kip

Shear Capacity

$\Phi V_n = \Phi\,(V_c + V_s)$ Shear capacity of beam-column section.

308.3 kip

Shear Capacity & Load Rating

Loading	A_1V_{DU} *kip*	A_2V_{LU} *kip*	V_U *kip*	ΦV_n *kip*	RF V
HS20 INV	103.8	43.3	147.2	**308.3**	4.72
MIL INV	103.8	40.2	144.0	**308.3**	5.09
Lane INV	103.8	38.9	142.7	**308.3**	5.26
HS20 OPR	103.8	26.0	129.8	**308.3**	7.88
MIL OPR	103.8	24.1	127.9	**308.3**	8.49
Lane OPR	103.8	23.3	127.1	**308.3**	8.78
2F1	103.8	13.6	117.4	**308.3**	15.03
3F1	103.8	19.4	123.2	**308.3**	10.54
4F1	103.8	22.3	126.1	**308.3**	9.19
5C1	103.8	24.9	128.7	**308.3**	8.21

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References

Arch Member 21 - Mz

Moment/Axial Interaction Diagram

Axial Capacity

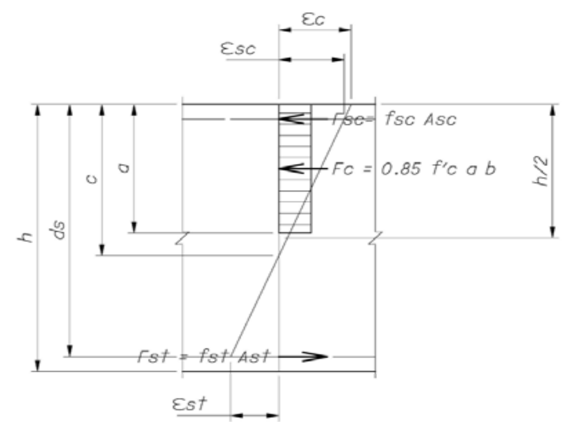
ψ 0.80 Ties.

$\Phi P_n = \Phi\ \psi\ [\ 0.85\ f'_c\ (A_g - A_s) + f_y\ A_s\ ]$ (8-29 and 8-30)

5,469.3 kip

General Expressions

c	$= d_s / [\ 1 - \varepsilon_s / \varepsilon_c\ ]$	Depth of the compression zone.
a	$= \beta_1\ c$	Depth of the stress block.
f_{st}	$= E_s\ \varepsilon_{st}$	Stress in the steel.
F_{st}	$= f_{st}\ A_{st}$	Force in the steel.
M_{st}	$= F_{st}\ (\ h/2 - d_{st}\ )$	Moment due to the steel.
F_c	$= 0.85\ f'_c\ a\ b$	Compressive force in concrete.
M_c	$= F_c\ (\ h/2 - a/2\ )$	Compressive moment in concrete.
f_{sc}	$= E_s\ \varepsilon_{sc}$	Stress in the steel.
F_{sc}	$= f_{sc}\ A_{sc}$	Force in the steel.
M_{sc}	$= F_{sc}\ (\ h/2 - d_{sc}\ )$	Moment due to the steel.



MRussell

Hatch Mott MacDonald

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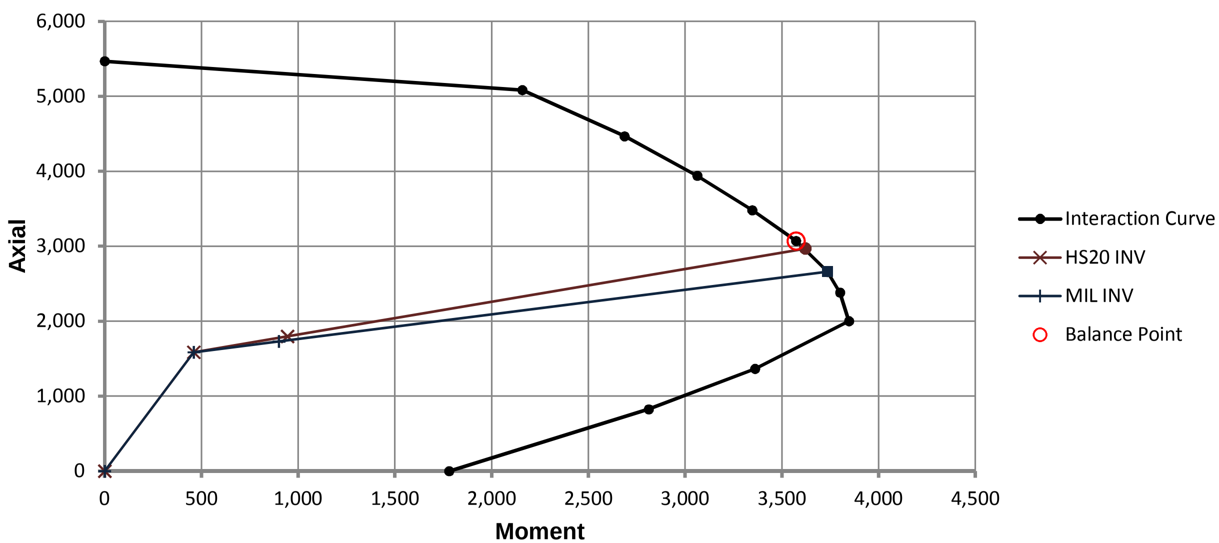
Arch Member 21 - Mz

References

Axial/Moment Interaction Diagram

$\varepsilon_{st} / \varepsilon_y$	Tensile Reinforcement				Concrete				Compressive Reinforcement				Capacity			
	ε_{st}	f_{st} ksi	P_{st} kip	M_{st} kip-ft	c in	a in	P_c kip	M_c kip-ft	ε_{sc}	f_{sc} ksi	P_{sc} kip	M_{sc} kip-ft	Φ	ΦP_n kip	ΦM_n kip-ft	e ft
N.A.													0.75	**5,469.3**	**0.0**	0.000
0%	0.0000	0.00	0.0	0.0	33.38	28.37	6,028.8	1,917.0	0.0028	40.00	750.0	960.9	0.75	5,084.1	2,158.4	0.425
25%	-0.0004	-10.00	-187.5	240.2	29.89	25.40	5,393.9	2,381.2	0.0027	40.00	750.0	960.9	0.75	4,467.3	2,686.8	0.601
50%	-0.0007	-20.00	-375.0	480.5	27.06	23.00	4,879.1	2,642.5	0.0027	40.00	750.0	960.9	0.75	3,940.6	3,063.0	0.777
75%	-0.0011	-30.00	-562.5	720.7	24.72	21.01	4,453.4	2,780.8	0.0027	40.00	750.0	960.9	0.75	3,480.6	3,346.8	0.962
100%	-0.0014	-40.00	-750.0	960.9	22.76	19.34	4,095.3	2,842.4	0.0027	40.00	750.0	960.9	0.75	3,071.5	3,573.2	1.163
165%	-0.0023	-40.00	-750.0	960.9	18.87	16.04	3,387.3	2,817.5	0.0026	40.00	750.0	960.9	0.79	2,668.5	3,733.7	1.399
230%	-0.0032	-40.00	-750.0	960.9	16.11	13.70	2,885.9	2,682.0	0.0025	40.00	750.0	960.9	0.83	2,382.5	3,800.8	1.595
359%	-0.0050	-40.00	-750.0	960.9	12.47	10.60	2,223.0	2,352.6	0.0024	40.00	750.0	960.9	0.90	2,000.7	3,847.0	1.923
618%	-0.0087	-40.00	-750.0	960.9	8.59	7.30	1,516.3	1,813.1	0.0021	40.00	750.0	960.9	0.90	1,364.6	3,361.4	2.463
1136%	-0.0159	-40.00	-750.0	960.9	5.29	4.50	916.2	1,202.5	0.0015	40.00	750.0	960.9	0.90	824.6	2,811.9	3.41
2108%	-0.0295	-40.00	-750.0	960.9	3.08	2.62	512.9	713.3	0.0004	12.65	237.1	303.8	0.90	**0.0**	**1,780.3**	∞



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References

Arch Member 21 - Mz

Axial Capacity & Load Rating

Loading	A_1P_{DU}	A_1M_{DU}	A_2P_{LU}	A_2M_{LU}	e_L	P_U	M_U	ΦP_n	ΦM_n	RF	
	kip	*kip-ft*	*kip*	*kip-ft*	*ft*	*kip*	*kip-ft*	*kip*	*kip-ft*	F	M
HS20 INV	1,585.9	460.6	212.0	484.2	2.285	1,797.9	944.8	2,969.6	3,621.8	6.53	6.53
	1,585.9	460.6	217.6	8.7	0.040	1,803.5	469.3	5,360.2	611.3	17.34	17.34
MIL INV	1,585.9	460.6	144.3	439.7	3.047	1,730.2	900.3	2,660.9	3,735.9	7.45	7.45
	1,585.9	460.6	150.4	46.3	0.308	1,736.3	506.9	5,188.9	1,570.9	23.96	23.96
Lane INV	1,585.9	460.6	298.3	332.8	1.116	1,884.2	793.4	3,926.7	3,072.0	7.85	7.85
	1,585.9	460.6	302.2	61.5	0.204	1,888.1	522.1	5,253.9	1,207.0	12.14	12.14
HS20 OPR	1,585.9	460.6	127.0	290.1	2.285	1,712.9	750.7	2,969.6	3,621.8	10.90	10.90
	1,585.9	460.6	130.4	5.2	0.040	1,716.3	465.8	5,360.2	611.3	28.95	28.95
MIL OPR	1,585.9	460.6	86.5	263.4	3.047	1,672.4	724.0	2,660.9	3,735.9	12.43	12.43
	1,585.9	460.6	90.1	27.8	0.308	1,676.0	488.3	5,188.9	1,570.9	39.99	39.99
Lane OPR	1,585.9	460.6	178.7	199.4	1.116	1,764.6	660.0	3,926.7	3,072.0	13.10	13.10
	1,585.9	460.6	181.1	36.8	0.204	1,767.0	497.4	5,253.9	1,207.0	20.26	20.26
2F1	1,585.9	460.6	53.3	155.5	2.915	1,639.2	616.1	2,704.9	3,722.5	20.98	20.98
	1,585.9	460.6	56.0	17.0	0.303	1,641.9	477.6	5,191.8	1,554.8	64.35	64.35
3F1	1,585.9	460.6	81.4	235.5	2.892	1,667.3	696.1	2,712.8	3,720.0	13.84	13.84
	1,585.9	460.6	85.6	29.3	0.342	1,671.5	489.8	5,168.6	1,685.1	41.86	41.86
4F1	1,585.9	460.6	95.0	264.8	2.787	1,680.9	725.4	2,750.9	3,707.5	12.26	12.26
	1,585.9	460.6	99.6	36.9	0.371	1,685.5	497.5	5,151.2	1,782.3	35.78	35.78
5C1	1,585.9	460.6	131.6	223.7	1.700	1,717.5	684.3	3,333.1	3,430.8	13.28	13.28
	1,585.9	460.6	147.7	85.2	0.577	1,733.6	545.8	4,868.9	2,354.2	22.23	22.23

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Arch Member 21 - Mz

References

Summary of Ratings

Loading	RF			
	V	F	M	Total
HS20 INV	4.72	6.53	6.53	4.72
		17.34	17.34	4.72
MIL INV	5.09	7.45	7.45	5.09
		23.96	23.96	5.09
Lane INV	5.26	7.85	7.85	5.26
		12.14	12.14	5.26
HS20 OPR	7.88	10.90	10.90	7.88
		28.95	28.95	7.88
MIL OPR	8.49	12.43	12.43	8.49
		39.99	39.99	8.49
Lane OPR	8.78	13.10	13.10	8.78
		20.26	20.26	8.78
2F1	15.03	20.98	20.98	15.03
		64.35	64.35	15.03
3F1	10.54	13.84	13.84	10.54
		41.86	41.86	10.54
4F1	9.19	12.26	12.26	9.19
		35.78	35.78	9.19
5C1	8.21	13.28	13.28	8.21
		22.23	22.23	8.21

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Arch Member 21 - My

References

Determine the Axial Load/Moment Interaction Diagram & Shear Capacity of a Rectangular Reinforced Concrete Section

Criteria

Designed by AASHTO, *Standard Specifications for Highway Bridges* , 17^{th} ed. 2002.
Strength design.
Capacity based on strain compatibility.
Dimensions are in pounds, feet and seconds, U.N.O.

Assumptions

Section is rectangular and uniform.
Reinforcement is evenly spaced along the tensile sides.

Material Properties & Section Details

Material Strengths and Properties

Steel

f_y	*40*	ksi	Reinforcement yield.	
E_s	29,000	ksi	Steel modulus of elasticity.	(8.7.2)
ε_{sy}	-0.0014		Yield strain in steel.	

Concrete

f'_c	*3.0*	ksi	Concrete strength.	
β_1	$= 0.85 - 0.05\,(f'_c - 4.0) \le 0.85\ \&\ \ge 0.65$			(8.16.2.7)
	0.850			
ε_c	+0.0030		Limiting strain in concrete.	(8.16.2.3)

Resistance Factors

Φ	0.75	Compression controlled section. (i.e. $\lvert\varepsilon_{st}\rvert < \lvert\varepsilon_{sy}\rvert$)	(8.16.1.2.2)
Φ	0.90	Tension controlled section. (i.e. $\lvert\varepsilon_{st}\rvert \ge 0.005$)	(After AASHTO, *LRFD* , 5.5.4.2.1)
Φ	0.85	Shear.	(8.16.6.2)

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Arch Member 21 - My References

Section Details

Section is a: *Beam-Column*

b	*36*	in	Section width.	3' - 0"	
h	*84*	in	Section depth.	7' - 0"	
d_{cc}	*2*	in	Depth of clear cover.		(ACI 318-02, 7.5.2.1)
A_g	3,024.0	in^2	Area of gross section.		

Tensile Reinforcement *(Reinforcement in the side faces is, conservatively, ignored.)*

d_{bt}	*1 1/4*	in	Bar diameter.
A_{st}	*3.125*	in^2	Tensile reinforcement area.
d_{st}	81 3/8	in	Depth to reinforcement.

Compression Reinforcement

d_{bc}	*1 1/4*	in	Bar diameter.
A_{sc}	*3.125*	in^2	Compression reinforcement area.
d_{sc}	2 5/8	in	Depth to reinforcement.

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References

Arch Member 21 - My

Moment/Axial Interaction Diagram

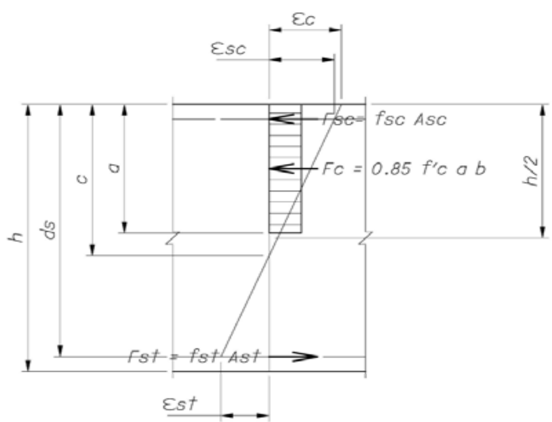
Axial Capacity

ψ 0.80 Ties.

$\Phi P_n = \Phi\ \psi\ [\ 0.85\ f'_c\ (A_g - A_s) + f_y\ A_s\ ]$ (8-29 and 8-30)

4,767.2 kip

General Expressions



c	$= d_s / [\ 1 - \varepsilon_s / \varepsilon_c\ ]$	Depth of the compression zone.
a	$= \beta_1\ c$	Depth of the stress block.
f_{st}	$= E_s\ \varepsilon_{st}$	Stress in the steel.
F_{st}	$= f_{st}\ A_{st}$	Force in the steel.
M_{st}	$= F_{st}\ (\ h/2 - d_{st}\ )$	Moment due to the steel.
F_c	$= 0.85\ f'_c\ a\ b$	Compressive force in concrete.
M_c	$= F_c\ (\ h/2 - a/2\ )$	Compressive moment in concrete.
f_{sc}	$= E_s\ \varepsilon_{sc}$	Stress in the steel.
F_{sc}	$= f_{sc}\ A_{sc}$	Force in the steel.
M_{sc}	$= F_{sc}\ (\ h/2 - d_{sc}\ )$	Moment due to the steel.

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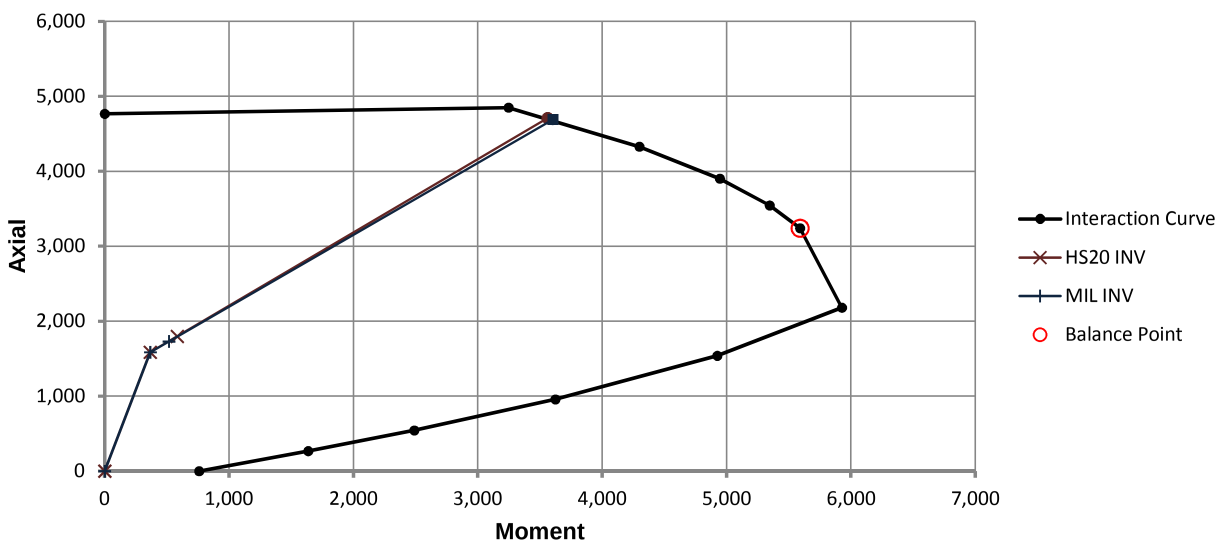
References

Arch Member 21 - My

Axial/Moment Interaction Diagram

ε_{st} / ε_y	Tensile Reinforcement				Concrete				Compressive Reinforcement				Capacity			
	ε_{st}	f_{st} ksi	P_{st} *kip*	M_{st} *kip-ft*	c *in*	a *in*	P_c *kip*	M_c *kip-ft*	ε_{sc}	f_{sc} ksi	P_{sc} *kip*	M_{sc} *kip-ft*	Φ	ΦP_n *kip*	ΦM_n *kip-ft*	e *ft*
N.A.													0.75	**4,767.2**	**0.0**	0.000
0%	0.0000	0.00	0.0	0.0	81.38	69.17	6,341.7	3,919.0	0.0029	40.00	125.0	410.2	0.75	4,850.0	3,246.9	0.669
25%	-0.0004	-10.00	-31.3	102.5	72.87	61.94	5,678.3	5,218.8	0.0029	40.00	125.0	410.2	0.75	4,329.1	4,298.6	0.993
50%	-0.0007	-20.00	-62.5	205.1	65.98	56.08	5,140.4	5,979.4	0.0029	40.00	125.0	410.2	0.75	3,902.2	4,946.0	1.267
75%	-0.0011	-30.00	-93.8	307.6	60.28	51.24	4,695.5	6,410.1	0.0029	40.00	125.0	410.2	0.75	3,545.1	5,345.9	1.508
100%	-0.0014	-40.00	-125.0	410.2	55.48	47.16	4,321.4	6,633.2	0.0029	40.00	125.0	410.2	0.75	3,241.0	5,590.1	1.725
339%	-0.0047	-40.00	-125.0	410.2	31.53	26.80	2,452.1	5,844.3	0.0028	40.00	125.0	410.2	0.89	2,180.6	5,926.9	2.718
578%	-0.0081	-40.00	-125.0	410.2	22.02	18.72	1,710.2	4,652.0	0.0026	40.00	125.0	410.2	0.90	1,539.2	4,925.1	3.2
1055%	-0.0148	-40.00	-125.0	410.2	13.74	11.67	1,063.8	3,205.8	0.0024	40.00	125.0	410.2	0.90	957.4	3,623.5	3.785
2011%	-0.0281	-40.00	-125.0	410.2	7.84	6.66	603.6	1,945.1	0.0020	40.00	125.0	410.2	0.90	543.2	2,488.9	4.581
3921%	-0.0549	-40.00	-125.0	410.2	4.22	3.58	321.1	1,075.8	0.0011	32.35	101.1	331.8	0.90	267.5	1,635.9	6.117
7503%	-0.1050	-40.00	-125.0	410.2	2.26	1.92	168.3	575.7	-0.0005	-13.87	-43.3	-142.2	0.90	**0.0**	**759.3**	∞



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References

Arch Member 21 - My

Axial Capacity & Load Rating

Loading	A_1P_{DU}	A_1M_{DU}	A_2P_{LU}	A_2M_{LU}	e_L	P_U	M_U	ΦP_n	ΦM_n	RF	
	kip	*kip-ft*	*kip*	*kip-ft*	*ft*	*kip*	*kip-ft*	*kip*	*kip-ft*	**F**	**M**
HS20 INV	1,585.9	366.3	212.0	217.0	1.024	1,797.9	583.2	**4,707.8**	**3,562.0**	14.73	14.73
	1,585.9	366.3	217.6	173.4	0.797	1,803.5	539.7	**4,842.7**	**2,961.0**	14.97	14.97
MIL INV	1,585.9	366.3	144.3	150.6	1.043	1,730.2	516.8	**4,688.3**	**3,603.2**	21.50	21.50
	1,585.9	366.3	150.4	116.6	0.775	1,736.3	482.9	**4,840.9**	**2,890.2**	21.64	21.64
Lane INV	1,585.9	366.3	298.3	373.1	1.250	1,884.2	739.3	**4,491.9**	**4,000.2**	9.74	9.74
	1,585.9	366.3	302.2	338.1	1.119	1,888.1	704.4	**4,615.6**	**3,755.9**	10.02	10.02
HS20 OPR	1,585.9	366.3	127.0	130.0	1.024	1,712.9	496.3	**4,707.8**	**3,562.0**	24.59	24.59
	1,585.9	366.3	130.4	103.9	0.797	1,716.3	470.1	**4,842.7**	**2,961.0**	24.98	24.98
MIL OPR	1,585.9	366.3	86.5	90.2	1.043	1,672.4	456.5	**4,688.3**	**3,603.2**	35.88	35.88
	1,585.9	366.3	90.1	69.9	0.775	1,676.0	436.1	**4,840.9**	**2,890.2**	36.13	36.13
Lane OPR	1,585.9	366.3	178.7	223.5	1.250	1,764.6	589.8	**4,491.9**	**4,000.2**	16.26	16.26
	1,585.9	366.3	181.1	202.6	1.119	1,767.0	568.8	**4,615.6**	**3,755.9**	16.73	16.73
2F1	1,585.9	366.3	53.3	56.0	1.049	1,639.2	422.2	**4,682.8**	**3,614.8**	58.05	58.05
	1,585.9	366.3	56.0	42.6	0.759	1,641.9	408.8	**4,839.6**	**2,837.2**	58.07	58.07
3F1	1,585.9	366.3	81.4	85.4	1.049	1,667.3	451.7	**4,682.8**	**3,615.0**	38.03	38.03
	1,585.9	366.3	85.6	63.1	0.737	1,671.5	429.4	**4,837.7**	**2,763.9**	37.99	37.99
4F1	1,585.9	366.3	95.0	99.5	1.047	1,680.9	465.7	**4,684.9**	**3,610.4**	32.62	32.62
	1,585.9	366.3	99.6	71.3	0.715	1,685.5	437.5	**4,835.8**	**2,690.7**	32.62	32.62
5C1	1,585.9	366.3	131.6	144.2	1.096	1,717.5	510.4	**4,637.8**	**3,710.1**	23.20	23.20
	1,585.9	366.3	147.7	128.8	0.872	1,733.6	495.0	**4,849.1**	**3,211.5**	22.10	22.10

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References

Arch Member 21 - My

Summary of Ratings

Loading	RF V	RF F	RF M	RF Total
HS20 INV		14.73	14.73	**14.73**
		14.97	14.97	**14.97**
MIL INV		21.50	21.50	**21.50**
		21.64	21.64	**21.64**
Lane INV		9.74	9.74	**9.74**
		10.02	10.02	**10.02**
HS20 OPR		24.59	24.59	**24.59**
		24.98	24.98	**24.98**
MIL OPR		35.88	35.88	**35.88**
		36.13	36.13	**36.13**
Lane OPR		16.26	16.26	**16.26**
		16.73	16.73	**16.73**
2F1		58.05	58.05	**58.05**
		58.07	58.07	**58.07**
3F1		38.03	38.03	**38.03**
		37.99	37.99	**37.99**
4F1		32.62	32.62	**32.62**
		32.62	32.62	**32.62**
5C1		23.20	23.20	**23.20**
		22.10	22.10	**22.10**

Summary of Ratings - Combined Effects

1/RF = Σ 1/RFi

Loading	RF V	RF F	RF M	RF Total
HS20 INV	4.72	4.52	4.52	**4.52**
		8.03	8.03	**4.72**
MIL INV	5.09	5.53	5.53	**5.09**
		11.37	11.37	**5.09**
Lane INV	5.26	4.35	4.35	**4.35**
		5.49	5.49	**5.26**
HS20 OPR	7.88	7.55	7.55	**7.55**
		13.41	13.41	**7.88**
MIL OPR	8.49	9.23	9.23	**8.49**
		18.98	18.98	**8.49**
Lane OPR	8.78	7.25	7.25	**7.25**
		9.16	9.16	**8.78**
2F1	15.03	15.41	15.41	**15.03**
		30.52	30.52	**15.03**
3F1	10.54	10.15	10.15	**10.15**
		19.92	19.92	**10.54**
4F1	9.19	8.91	8.91	**8.91**
		17.06	17.06	**9.19**
5C1	8.21	8.44	8.44	**8.21**
		11.08	11.08	**8.21**

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Column Member 45 — References

Determine the Design Loads Considering Slenderness Effects

Criteria

Designed by AASHTO *Standard Specifications for Highway Bridges* , 17th ed. 2002.
Strength design.
Slenderness is considered. (8.16.5.2)
Dimensions are in pounds, feet and seconds, U.N.O.

Assumptions

Column is *not* braced against sidesway.
Only one column is considered in the system, i.e. the column is *not* part of a bent.

Material Properties & Section Details

Material Strength

f'_c	*3.0*	ksi	Concrete strength.		
E_c	$= 57\, f'_c{}^{1/2}$				
	3,100	ksi	Concrete modulus of elasticity.		(18.7.1)

Member Geometry

k_X	1.0				(8.16.5.2.3)
ℓ_{uX}	*61.00*	ft	Unbraced length for moments about the strong axis.		
	732.00	in			

Section Details

b	*72*	in	Section width.	6' - 0"	
D	*34*	in	Section depth.	2' - 10"	
A_g	2,448.0	in^2	Area of gross section.		
I_{gX}	235,824	in^4	Moment of inertia of gross section about the horizontal axis.		
r_X	9.815	in	Radius of gyration about the horizontal axis.		

Ties

Φ	0.75		Compression.		(8.16.1.2.2)

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Column Member 45 References

Investigate and Determine Slenderness Effects (8.16.5.2)

Investigate Slenderness Effects (8.16.5.2.5 & 8.16.5.2.6)

$k_X \ell_{uX} / r_X =$ 74.6 **>** 22 **Consider slenderness effects in this axis.**

Determine Slenderness Effects (8.16.5.2.7)

Moment Magnification Expression

$M_c \quad = \delta_b M_{2b} + \delta_s M_{2s}$ (8-40)

where

M_{2b} = the larger end moment due to gravity loads that result in *no* appreciable sidesway. (8.1.2)

M_{2s} = the larger end moment due to lateral and gravity loads that *do* result in appreciable sidesway. (8.1.2)

$\therefore$

$M_U \quad = M_{2b} + M_{2s}$

$\delta_b \quad = C_m / (1 - P_u / \Phi P_c) \geq 1.0$ (8-41)

$= 1.0 / (1 - P_u / \Phi P_c) \geq 1.0$ as $C_m = 1.0$, because the column is *not* braced against sidesway.

$\delta_s \quad = 1.0 / (1 - \Sigma P_u / \Phi \Sigma P_c) \geq 1.0$ (8-41A)

Taken here as:

$= 1.0 / (1 - P_u / \Phi P_c) \geq 1.0$ as $P_u / \Phi P_c \geq \Sigma P_u / \Phi \Sigma P_c$, because the column is *not* part of a bent.

$\therefore$

$\delta_b = \delta_s = \delta = 1.0 / (1 - P_u / \Phi P_c)$

$M_c \quad = \delta M_U$

$\mathbf{M_c \quad = [1.0 / (1 - P_u / \Phi P_c)] M_u \geq M_u}$

Critical Axial Load Expression

$P_c \quad = \pi^2 EI / (k \ell_u)^2$ (8-42)

Where:

$EI = (E_c I_g / 2.5) / (1 + \beta_d)$ (8-44)

$\beta_d = M_{DL} / M_S \geq 0.0$

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References

Column Member 45

Determine Magnified Total and Live Load Moments

Consider slenderness effects in this axis.

Methodology: Determine magnified moment (M_c) by the method above.

Determine the applicable live load moment (M'_{LU}) by subtracting the dead load moment (M_{DU}) from the magnified moment (M_c).

Loading	A_1P_{DU} kip	A_1M_{DU} kip-ft	A_2P_{LU} kip	A_2M_{LU} kip-ft	P_U kip	M_U kip-ft	β_d	EI_X (kip - in^2)	ΦP_c (kip)	δ	M_c (kip-in)	P_{LU} kip	M'_{LU} kip-ft
HS20 INV	326.3	1.9	7.2	61.3	333.5	63.2	0.030	283.97E+6	3,923	1.093	69.0	**7.2**	**67.1**
	326.3	1.9	216.1	11.6	542.4	13.5	0.139	256.64E+6	3,545	1.181	15.9	**216.1**	**14.0**
MIL INV	326.3	1.9	5.6	43.6	331.8	45.5	0.041	280.82E+6	3,879	1.094	49.8	**5.6**	**47.9**
	326.3	1.9	216.9	16.8	543.2	18.7	0.101	265.65E+6	3,670	1.174	21.9	**216.9**	**20.0**
Lane INV	326.3	1.9	31.9	29.0	358.1	30.9	0.061	275.64E+6	3,808	1.104	34.1	**31.9**	**32.2**
	326.3	1.9	166.5	0.3	492.7	2.1	0.881	155.44E+6	2,147	1.298	2.8	**166.5**	**0.9**
HS20 OPR	326.3	1.9	4.3	36.7	330.6	38.6	0.049	278.84E+6	3,852	1.094	42.2	**4.3**	**40.3**
	326.3	1.9	129.5	7.0	455.7	8.8	0.213	241.11E+6	3,331	1.159	10.2	**129.5**	**8.4**
MIL OPR	326.3	1.9	3.3	26.1	329.6	28.0	0.067	274.04E+6	3,786	1.095	30.7	**3.3**	**28.8**
	326.3	1.9	129.9	10.0	456.2	11.9	0.158	252.61E+6	3,490	1.150	13.7	**129.9**	**11.8**
Lane OPR	326.3	1.9	19.1	17.4	345.4	19.2	0.098	266.40E+6	3,680	1.104	21.2	**19.1**	**19.4**
	326.3	1.9	99.7	0.2	426.0	2.0	0.925	151.89E+6	2,098	1.255	2.5	**99.7**	**0.7**
2F1	326.3	1.9	2.1	16.0	328.3	17.9	0.105	264.62E+6	3,656	1.099	19.7	**2.1**	**17.8**
	326.3	1.9	75.2	4.8	401.5	6.7	0.280	228.40E+6	3,155	1.146	7.7	**75.2**	**5.8**
3F1	326.3	1.9	2.7	24.5	329.0	26.4	0.071	272.97E+6	3,771	1.096	28.9	**2.7**	**27.0**
	326.3	1.9	103.7	9.3	429.9	11.2	0.168	250.40E+6	3,459	1.142	12.8	**103.7**	**10.9**
4F1	326.3	1.9	3.3	28.6	329.6	30.5	0.062	275.45E+6	3,805	1.095	33.4	**3.3**	**31.5**
	326.3	1.9	107.8	11.6	434.1	13.4	0.140	256.52E+6	3,544	1.140	15.3	**107.8**	**13.4**
5C1	326.3	1.9	2.2	31.2	328.5	33.1	0.057	276.70E+6	3,822	1.094	36.2	**2.2**	**34.3**
	326.3	-1.9	88.7	11.5	414.9	9.7	0.000	292.42E+6	4,040	1.114	10.8	**88.7**	**12.6**

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Column Member 45

References

Determine the Axial Load/Moment Interaction Diagram & Shear Capacity of a Rectangular Reinforced Concrete Section

Criteria

Designed by AASHTO, *Standard Specifications for Highway Bridges* , 17^{th} ed. 2002.
Strength design.
Capacity based on strain compatibility.
Dimensions are in pounds, feet and seconds, U.N.O.

Assumptions

Section is rectangular and uniform.
Reinforcement is evenly spaced along the tensile sides.

Material Properties & Section Details

Material Strengths and Properties

Steel

f_y	*40*	ksi	Reinforcement yield.	
E_s	29,000	ksi	Steel modulus of elasticity.	(8.7.2)
ε_{sy}	-0.0014		Yield strain in steel.	

Concrete

f'_c	*3.0*	ksi	Concrete strength.	
β_1	$= 0.85 - 0.05\ (f'_c - 4.0) \le 0.85\ \&\ \ge 0.65$			(8.16.2.7)
	0.850			
ε_c	+0.0030		Limiting strain in concrete.	(8.16.2.3)

Resistance Factors

Φ	0.75	Compression controlled section. (i.e. $\lvert\varepsilon_{st}\rvert < \lvert\varepsilon_{sy}\rvert$)	(8.16.1.2.2)
Φ	0.90	Tension controlled section. (i.e. $\lvert\varepsilon_{st}\rvert \ge 0.005$)	(After AASHTO, *LRFD* , 5.5.4.2.1)
Φ	0.85	Shear.	(8.16.6.2)

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Column Member 45

References

Section Details

Section is a: *Beam-Column*

b	*72*	in	Section width.	6' - 0"	
h	*34*	in	Section depth.	2' - 10"	
d_{cc}	*2*	in	Depth of clear cover.		(ACI 318-02, 7.5.2.1)
A_g	2,448.0	in^2	Area of gross section.		

Tensile Reinforcement

(Reinforcement in the side faces is, conservatively, ignored.)

d_{bt}	*1*	in	Bar diameter.
A_{st}	*4.712*	in^2	Tensile reinforcement area.
d_{st}	31 1/2	in	Depth to reinforcement.

Compression Reinforcement

d_{bc}	*1*	in	Bar diameter.
A_{sc}	*4.712*	in^2	Compression reinforcement area.
d_{sc}	2 1/2	in	Depth to reinforcement.

Transverse Reinforcement

d_{bv}	*9/16*	in	Bar diameter.
n	*4*		Number of legs / stirrup.
A_v	1.000	in^2	Stirrup reinforcement area.
s_v	*24*	in	Stirrup spacing.

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Column Member 45

Shear Strength & Rating

Shear Strength

Concrete

$V_c = 2f'_c{}^{1/2}bd$ (8-49)

248.4 kip

Reinforcement (8.16.6.3.2 & 8.16.6.3.9)

$V_s = A_v f_y d / s \le 4 f'_c{}^{1/2} b d$ (8-53)

52.5 kip

Shear Capacity

$\Phi V_n = \Phi (V_c + V_s)$ Shear capacity of beam-column section.

255.8 kip

Shear Capacity & Load Rating

Loading	A_1V_{DU} *kip*	A_2V_{LU} *kip*	V_U *kip*	ΦV_n *kip*	RF V
HS20 INV	0.1	1.3	1.4	**255.8**	197.87
MIL INV	0.1	1.3	1.4	**255.8**	190.40
Lane INV	0.1	0.7	0.8	**255.8**	347.98
HS20 OPR	0.1	0.8	0.9	**255.8**	330.29
MIL OPR	0.1	0.8	0.9	**255.8**	317.83
Lane OPR	0.1	0.4	0.5	**255.8**	580.86
2F1	0.1	0.5	0.5	**255.8**	561.49
3F1	0.1	0.6	0.7	**255.8**	410.85
4F1	0.1	0.7	0.7	**255.8**	382.84
5C1	0.1	0.7	0.7	**255.8**	382.84

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Column Member 45

Moment/Axial Interaction Diagram

Axial Capacity

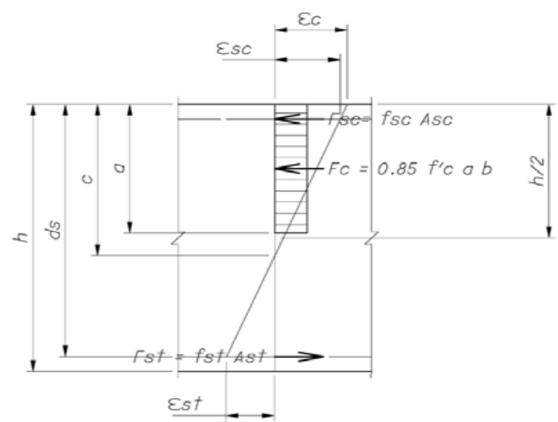
ψ 0.80 Ties.

$\Phi P_n = \Phi\,\psi\,[\,0.85\,f'_c\,(A_g - A_s) + f_y\,A_s\,]$ (8-29 and 8-30)

3,957.2 kip

General Expressions

c	$= d_s / [\,1 - \varepsilon_s / \varepsilon_c\,]$	Depth of the compression zone.
a	$= \beta_1\,c$	Depth of the stress block.
f_{st}	$= E_s\,\varepsilon_{st}$	Stress in the steel.
F_{st}	$= f_{st}\,A_{st}$	Force in the steel.
M_{st}	$= F_{st}\,(\,h/2 - d_{st}\,)$	Moment due to the steel.
F_c	$= 0.85\,f'_c\,a\,b$	Compressive force in concrete.
M_c	$= F_c\,(\,h/2 - a/2\,)$	Compressive moment in concrete.
f_{sc}	$= E_s\,\varepsilon_{sc}$	Stress in the steel.
F_{sc}	$= f_{sc}\,A_{sc}$	Force in the steel.
M_{sc}	$= F_{sc}\,(\,h/2 - d_{sc}\,)$	Moment due to the steel.



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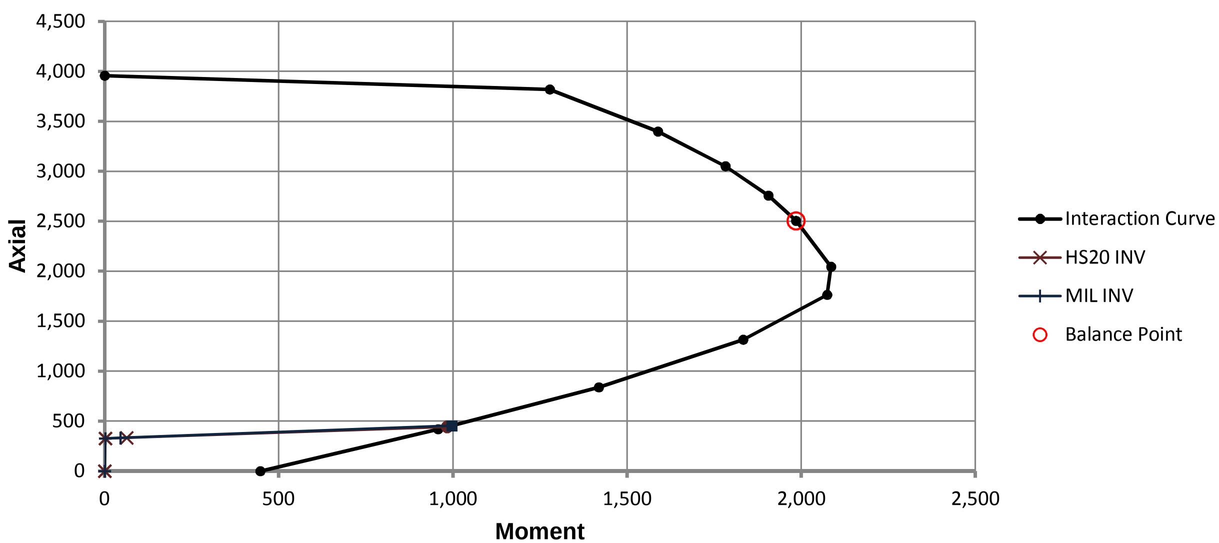
Column Member 45

Axial/Moment Interaction Diagram

ε_{st} / ε_y	Tensile Reinforcement				Concrete				Compressive Reinforcement				Capacity			
	ε_{st}	f_{st} ksi	P_{st} *kip*	M_{st} *kip-ft*	c *in*	a *in*	P_c *kip*	M_c *kip-ft*	ε_{sc}	f_{sc} ksi	P_{sc} *kip*	M_{sc} *kip-ft*	Φ	ΦP_n *kip*	ΦM_n *kip-ft*	e *ft*
N.A.													0.75	**3,957.2**	**0.0**	0.000
0%	0.0000	0.00	0.0	0.0	31.50	26.78	4,903.9	1,476.3	0.0028	40.00	188.5	227.8	0.75	3,819.3	1,278.0	0.335
25%	-0.0004	-10.00	-47.1	56.9	28.21	23.98	4,390.3	1,833.4	0.0027	40.00	188.5	227.8	0.75	3,398.7	1,588.6	0.467
50%	-0.0007	-20.00	-94.2	113.9	25.54	21.71	3,973.8	2,035.0	0.0027	40.00	188.5	227.8	0.75	3,051.1	1,782.5	0.584
75%	-0.0011	-30.00	-141.4	170.8	23.33	19.83	3,629.4	2,142.3	0.0027	40.00	188.5	227.8	0.75	2,757.4	1,905.7	0.691
100%	-0.0014	-40.00	-188.5	227.8	21.48	18.26	3,339.7	2,190.9	0.0027	40.00	188.5	227.8	0.75	2,504.8	1,984.8	0.792
200%	-0.0028	-40.00	-188.5	227.8	16.29	13.84	2,529.7	2,124.6	0.0025	40.00	188.5	227.8	0.81	2,045.1	2,085.8	1.02
300%	-0.0042	-40.00	-188.5	227.8	13.12	11.15	2,035.0	1,937.6	0.0024	40.00	188.5	227.8	0.87	1,764.1	2,074.4	1.176
501%	-0.0070	-40.00	-188.5	227.8	9.44	8.03	1,461.5	1,581.7	0.0022	40.00	188.5	227.8	0.90	1,315.3	1,833.5	1.394
901%	-0.0126	-40.00	-188.5	227.8	6.05	5.14	932.3	1,121.0	0.0018	40.00	188.5	227.8	0.90	839.1	1,418.8	1.691
1702%	-0.0238	-40.00	-188.5	227.8	3.52	2.99	537.6	694.5	0.0009	24.86	117.2	141.6	0.90	419.6	957.5	2.282
3205%	-0.0449	-40.00	-188.5	227.8	1.97	1.68	296.1	398.7	-0.0008	-22.83	-107.6	-130.0	0.90	**0.0**	**446.9**	∞



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Column Member 45 References

Axial Capacity & Load Rating

Loading	A_1P_{DU}	A_1M_{DU}	A_2P_{LU}	A_2M_{LU}	e_L	P_U	M_U	ΦP_n	ΦM_n	RF	
	kip	*kip-ft*	*kip*	*kip-ft*	*ft*	*kip*	*kip-ft*	*kip*	*kip-ft*	**F**	**M**
HS20 INV	326.3	1.9	7.2	61.3	8.484	333.5	63.2	**442.0**	**983.7**	16.02	16.02
	326.3	1.9	216.1	11.6	0.054	542.4	13.5	**3,936.1**	**195.8**	16.71	16.71
MIL INV	326.3	1.9	5.6	43.6	7.827	331.8	45.5	**453.4**	**997.1**	22.81	22.81
	326.3	1.9	216.9	16.8	0.077	543.2	18.7	**3,927.0**	**280.4**	16.60	16.60
Lane INV	326.3	1.9	31.9	29.0	0.910	358.1	30.9	**2,505.0**	**1,984.8**	68.40	68.40
	326.3	1.9	166.5	0.3	0.002	492.7	2.1	**3,956.4**	**7.4**	21.81	21.81
HS20 OPR	326.3	1.9	4.3	36.7	8.484	330.6	38.6	**442.0**	**983.7**	26.75	26.75
	326.3	1.9	129.5	7.0	0.054	455.7	8.8	**3,936.1**	**195.8**	27.89	27.89
MIL OPR	326.3	1.9	3.3	26.1	7.827	329.6	28.0	**453.4**	**997.1**	38.07	38.07
	326.3	1.9	129.9	10.0	0.077	456.2	11.9	**3,927.0**	**280.4**	27.71	27.71
Lane OPR	326.3	1.9	19.1	17.4	0.910	345.4	19.2	**2,505.0**	**1,984.8**	114.17	114.17
	326.3	1.9	99.7	0.2	0.002	426.0	2.0	**3,956.4**	**7.4**	36.40	36.40
2F1	326.3	1.9	2.1	16.0	7.701	328.3	17.9	**455.9**	**1,000.0**	62.32	62.32
	326.3	1.9	75.2	4.8	0.064	401.5	6.7	**3,932.0**	**233.2**	47.92	47.92
3F1	326.3	1.9	2.7	24.5	9.119	329.0	26.4	**432.8**	**972.9**	39.63	39.63
	326.3	1.9	103.7	9.3	0.090	429.9	11.2	**3,922.1**	**325.2**	34.68	34.68
4F1	326.3	1.9	3.3	28.6	8.651	329.6	30.5	**439.4**	**980.7**	34.19	34.19
	326.3	1.9	107.8	11.6	0.107	434.1	13.4	**3,915.5**	**386.5**	33.29	33.29
5C1	326.3	1.9	2.2	31.2	13.885	328.5	33.1	**392.8**	**925.5**	29.60	29.60
	326.3	1.9	88.7	11.5	0.130	414.9	13.4	**3,906.7**	**467.8**	40.38	40.38

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References

Column Member 45

Summary of Ratings

Loading	RF			
	V	F	M	Total
HS20 INV	197.87	16.02	16.02	**16.02**
		16.71	16.71	**16.71**
MIL INV	190.40	22.81	22.81	**22.81**
		16.60	16.60	**16.60**
Lane INV	347.98	68.40	68.40	**68.40**
		21.81	21.81	**21.81**
HS20 OPR	330.29	26.75	26.75	**26.75**
		27.89	27.89	**27.89**
MIL OPR	317.83	38.07	38.07	**38.07**
		27.71	27.71	**27.71**
Lane OPR	580.86	114.17	114.17	**114.17**
		36.40	36.40	**36.40**
2F1	561.49	62.32	62.32	**62.32**
		47.92	47.92	**47.92**
3F1	410.85	39.63	39.63	**39.63**
		34.68	34.68	**34.68**
4F1	382.84	34.19	34.19	**34.19**
		33.29	33.29	**33.29**
5C1	382.84	29.60	29.60	**29.60**
		40.38	40.38	**40.38**

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Column Member 49

References

Determine the Design Loads Considering Slenderness Effects

Criteria

Designed by AASHTO *Standard Specifications for Highway Bridges* , 17th ed. 2002.
Strength design.
Slenderness is considered. (8.16.5.2)
Dimensions are in pounds, feet and seconds, U.N.O.

Assumptions

Column is *not* braced against sidesway.
Only one column is considered in the system, i.e. the column is *not* part of a bent.

Material Properties & Section Details

Material Strength

f'_c	*3.0*	ksi	Concrete strength.		
E_c	$= 57 f'_c{}^{1/2}$				
	3,100	ksi	Concrete modulus of elasticity.		(18.7.1)

Member Geometry

k_X	1.0				(8.16.5.2.3)
ℓ_{uX}	*45.37*	ft	Unbraced length for moments about the strong axis.		
	544.44	in			

Section Details

b	*72*	in	Section width.	6' - 0"	
D	*24*	in	Section depth.	2' - 0"	
A_g	1,728.0	in^2	Area of gross section.		
I_{gX}	82,944	in^4	Moment of inertia of gross section about the horizontal axis.		
r_X	6.928	in	Radius of gyration about the horizontal axis.		

Ties

Φ	0.75		Compression.		(8.16.1.2.2)

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Column Member 49

Investigate and Determine Slenderness Effects (8.16.5.2)

Investigate Slenderness Effects (8.16.5.2.5 & 8.16.5.2.6)

$k_X \ell_{uX} / r_X =$ 78.6 **>** 22 **Consider slenderness effects in this axis.**

Determine Slenderness Effects (8.16.5.2.7)

Moment Magnification Expression

$M_c = \delta_b M_{2b} + \delta_s M_{2s}$ (8-40)

where

M_{2b} = the larger end moment due to gravity loads that result in *no* appreciable sidesway. (8.1.2)

M_{2s} = the larger end moment due to lateral and gravity loads that *do* result in appreciable sidesway. (8.1.2)

$\therefore$

$M_U = M_{2b} + M_{2s}$

$\delta_b = C_m / (1 - P_u / \Phi P_c) \geq 1.0$ (8-41)

$= 1.0 / (1 - P_u / \Phi P_c) \geq 1.0$ as $C_m = 1.0$, because the column is *not* braced against sidesway.

$\delta_s = 1.0 / (1 - \Sigma P_u / \Phi \Sigma P_c) \geq 1.0$ (8-41A)

Taken here as:

$= 1.0 / (1 - P_u / \Phi P_c) \geq 1.0$ as $P_u / \Phi P_c \geq \Sigma P_u / \Phi \Sigma P_c$, because the column is *not* part of a bent.

$\therefore$

$\delta_b = \delta_s = \delta = 1.0 / (1 - P_u / \Phi P_c)$

$M_c = \delta M_U$

$\mathbf{M_c = [\,1.0 / (1 - P_u / \Phi P_c)\,]\, M_u \geq M_u}$

Critical Axial Load Expression

$P_c = \pi^2 EI / (k \ell_u)^2$ (8-42)

Where:

$EI = (E_c I_g / 2.5) / (1 + \beta_d)$ (8-44)

$\beta_d = M_{DL} / M_S \geq 0.0$

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References

Column Member 49

Determine Magnified Total and Live Load Moments

Consider slenderness effects in this axis.

Methodology: Determine magnified moment (M_c) by the method above.

Determine the applicable live load moment (M'_{LU}) by subtracting the dead load moment (M_{DU}) from the magnified moment (M_c).

Loading	A_1P_{DU} kip	A_1M_{DU} kip-ft	A_2P_{LU} kip	A_2M_{LU} kip-ft	P_U kip	M_U kip-ft	β_d	EI_X (kip - in^2)	ΦP_c (kip)	δ	M_c (kip-in)	P_{LU} kip	M'_{LU} kip-ft
HS20 INV	417.3	-0.6	206.0	72.5	623.3	71.9	0.000	102.85E+6	2,568	1.320	94.9	**206.0**	**95.5**
	417.3	-0.6	238.6	67.1	655.9	66.5	0.000	102.85E+6	2,568	1.343	89.3	**238.6**	**89.9**
MIL INV	417.3	-0.6	124.4	53.9	541.7	53.3	0.000	102.85E+6	2,568	1.267	67.6	**124.4**	**68.2**
	417.3	-0.6	193.6	40.5	610.9	39.9	0.000	102.85E+6	2,568	1.312	52.3	**193.6**	**52.9**
Lane INV	417.3	-0.6	129.3	25.7	546.5	25.1	0.000	102.85E+6	2,568	1.270	31.9	**129.3**	**32.5**
	417.3	-0.6	161.8	16.0	579.1	15.4	0.000	102.85E+6	2,568	1.291	19.9	**161.8**	**20.5**
HS20 OPR	417.3	-0.6	123.4	43.4	540.7	42.8	0.000	102.85E+6	2,568	1.267	54.2	**123.4**	**54.8**
	417.3	-0.6	143.0	40.2	560.2	39.6	0.000	102.85E+6	2,568	1.279	50.6	**143.0**	**51.3**
MIL OPR	417.3	-0.6	74.6	32.3	491.8	31.7	0.000	102.85E+6	2,568	1.237	39.2	**74.6**	**39.8**
	417.3	-0.6	116.0	24.3	533.3	23.6	0.000	102.85E+6	2,568	1.262	29.8	**116.0**	**30.5**
Lane OPR	417.3	-0.6	77.4	15.4	494.7	14.8	0.000	102.85E+6	2,568	1.239	18.3	**77.4**	**18.9**
	417.3	-0.6	96.9	9.6	514.2	9.0	0.000	102.85E+6	2,568	1.250	11.2	**96.9**	**11.9**
2F1	417.3	-0.6	59.5	19.6	476.8	18.9	0.000	102.85E+6	2,568	1.228	23.3	**59.5**	**23.9**
	417.3	-0.6	69.0	15.5	486.2	14.9	0.000	102.85E+6	2,568	1.234	18.4	**69.0**	**19.0**
3F1	417.3	-0.6	86.7	30.0	504.0	29.4	0.000	102.85E+6	2,568	1.244	36.6	**86.7**	**37.2**
	417.3	-0.6	102.9	25.4	520.2	24.8	0.000	102.85E+6	2,568	1.254	31.1	**102.9**	**31.7**
4F1	417.3	-0.6	96.0	34.9	513.3	34.2	0.000	102.85E+6	2,568	1.250	42.8	**96.0**	**43.4**
	417.3	-0.6	116.1	31.3	533.4	30.6	0.000	102.85E+6	2,568	1.262	38.7	**116.1**	**39.3**
5C1	417.3	-0.6	94.7	28.5	512.0	27.9	0.000	102.85E+6	2,568	1.249	34.8	**94.7**	**35.4**
	417.3	-0.6	124.7	28.0	542.0	27.4	0.000	102.85E+6	2,568	1.267	34.7	**124.7**	**35.3**

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Column Member 49 References

Determine the Axial Load/Moment Interaction Diagram & Shear Capacity of a Rectangular Reinforced Concrete Section

Criteria

Designed by AASHTO, *Standard Specifications for Highway Bridges* , 17^{th} ed. 2002.
Strength design.
Capacity based on strain compatibility.
Dimensions are in pounds, feet and seconds, U.N.O.

Assumptions

Section is rectangular and uniform.
Reinforcement is evenly spaced along the tensile sides.

Material Properties & Section Details

Material Strengths and Properties

Steel

f_y	*40* ksi	Reinforcement yield.	
E_s	29,000 ksi	Steel modulus of elasticity.	(8.7.2)
ε_{sy}	-0.0014	Yield strain in steel.	

Concrete

f'_c	*3.0* ksi	Concrete strength.	
β_1	$= 0.85 - 0.05\ (f'_c - 4.0) \le 0.85\ \&\ \ge 0.65$		(8.16.2.7)
	0.850		
ε_c	+0.0030	Limiting strain in concrete.	(8.16.2.3)

Resistance Factors

Φ	0.75	Compression controlled section. (i.e. $\lvert\varepsilon_{st}\rvert < \lvert\varepsilon_{sy}\rvert$)	(8.16.1.2.2)
Φ	0.90	Tension controlled section. (i.e. $\lvert\varepsilon_{st}\rvert \ge 0.005$)	(After AASHTO, *LRFD* , 5.5.4.2.1)
Φ	0.85	Shear.	(8.16.6.2)

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Column Member 49 — References

Section Details

Section is a: *Beam-Column*

b	*72*	in	Section width.	6' - 0"	
h	*24*	in	Section depth.	2' - 0"	
d_{cc}	*2*	in	Depth of clear cover.		(ACI 318-02, 7.5.2.1)
A_g	1,728.0	in^2	Area of gross section.		

Tensile Reinforcement — *(Reinforcement in the side faces is, conservatively, ignored.)*

d_{bt}	*1*	in	Bar diameter.
A_{st}	*4.712*	in^2	Tensile reinforcement area.
d_{st}	21 1/2	in	Depth to reinforcement.

Compression Reinforcement

d_{bc}	*1*	in	Bar diameter.
A_{sc}	*4.712*	in^2	Compression reinforcement area.
d_{sc}	2 1/2	in	Depth to reinforcement.

Transverse Reinforcement

d_{bv}	*9/16*	in	Bar diameter.
n	*4*		Number of legs / stirrup.
A_v	1.000	in^2	Stirrup reinforcement area.
s_v	*24*	in	Stirrup spacing.

(Input values are shown underlined and in italics.)

References

Column Member 49

Shear Strength & Rating

Shear Strength

Concrete

$V_c = 2f'_c{}^{1/2}bd$ (8-49)

169.6 kip

Reinforcement (8.16.6.3.2 & 8.16.6.3.9)

$V_s = A_v f_y d / s \le 4 f'_c{}^{1/2} b d$ (8-53)

35.8 kip

Shear Capacity

$\Phi V_n = \Phi (V_c + V_s)$ Shear capacity of beam-column section.

174.6 kip

Shear Capacity & Load Rating

Loading	A_1V_{DU} *kip*	A_2V_{LU} *kip*	V_U *kip*	ΦV_n *kip*	RF V
HS20 INV	0.0	2.7	2.8	**174.6**	63.79
MIL INV	0.0	2.0	2.0	**174.6**	86.11
Lane INV	0.0	1.0	1.0	**174.6**	176.64
HS20 OPR	0.0	1.6	1.7	**174.6**	106.48
MIL OPR	0.0	1.2	1.2	**174.6**	143.74
Lane OPR	0.0	0.6	0.6	**174.6**	294.86
2F1	0.0	0.7	0.8	**174.6**	234.68
3F1	0.0	1.1	1.2	**174.6**	153.33
4F1	0.0	1.3	1.3	**174.6**	132.18
5C1	0.0	1.0	1.1	**174.6**	166.66

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Column Member 49

Moment/Axial Interaction Diagram

Axial Capacity

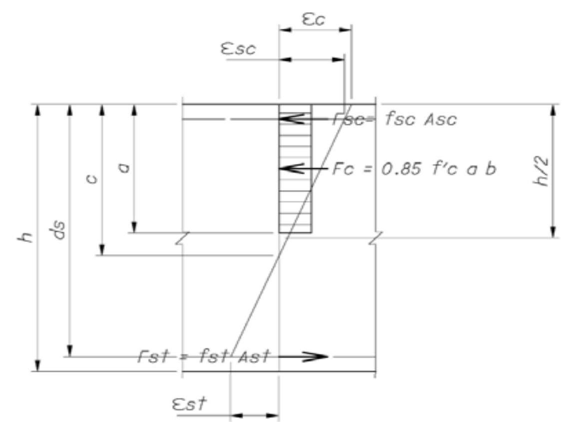
ψ 0.80 Ties.

$\Phi P_n = \Phi\, \psi\, [\, 0.85\, f'_c\, (A_g - A_s) + f_y\, A_s\,]$ (8-29 and 8-30)

2,855.6 kip

General Expressions

c	$= d_s / [\, 1 - \varepsilon_s / \varepsilon_c\,]$	Depth of the compression zone.
a	$= \beta_1\, c$	Depth of the stress block.
f_{st}	$= E_s\, \varepsilon_{st}$	Stress in the steel.
F_{st}	$= f_{st}\, A_{st}$	Force in the steel.
M_{st}	$= F_{st}\, (\, h/2 - d_{st}\,)$	Moment due to the steel.
F_c	$= 0.85\, f'_c\, a\, b$	Compressive force in concrete.
M_c	$= F_c\, (\, h/2 - a/2\,)$	Compressive moment in concrete.
f_{sc}	$= E_s\, \varepsilon_{sc}$	Stress in the steel.
F_{sc}	$= f_{sc}\, A_{sc}$	Force in the steel.
M_{sc}	$= F_{sc}\, (\, h/2 - d_{sc}\,)$	Moment due to the steel.



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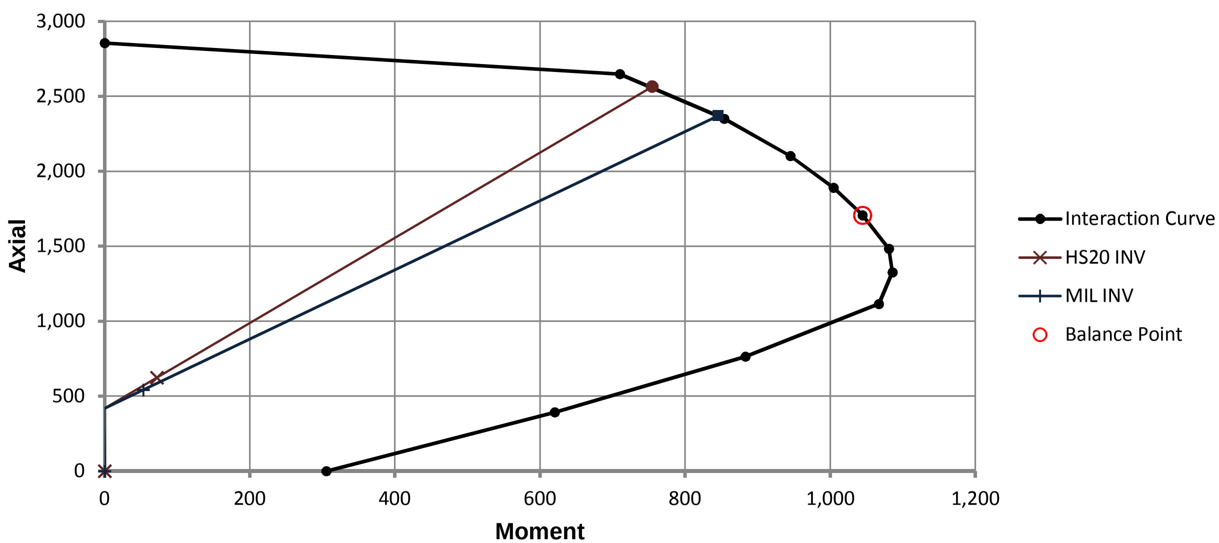
Column Member 49

Axial/Moment Interaction Diagram

ε_{st} / ε_y	Tensile Reinforcement				Concrete				Compressive Reinforcement				Capacity			
	ε_{st}	f_{st} ksi	P_{st} kip	M_{st} kip-ft	c in	a in	P_c kip	M_c kip-ft	ε_{sc}	f_{sc} ksi	P_{sc} kip	M_{sc} kip-ft	Φ	ΦP_n kip	ΦM_n kip-ft	e ft
N.A.													0.75	**2,855.6**	**0.0**	0.000
0%	0.0000	0.00	0.0	0.0	21.50	18.28	3,343.3	797.5	0.0027	40.00	188.5	149.2	0.75	2,648.8	710.1	0.268
25%	-0.0004	-10.00	-47.1	37.3	19.25	16.37	2,992.7	952.0	0.0026	40.00	188.5	149.2	0.75	2,350.6	853.9	0.363
50%	-0.0007	-20.00	-94.2	74.6	17.43	14.82	2,708.5	1,036.3	0.0026	40.00	188.5	149.2	0.75	2,102.1	945.1	0.450
75%	-0.0011	-30.00	-141.4	111.9	15.93	13.54	2,473.4	1,078.3	0.0025	40.00	188.5	149.2	0.75	1,890.4	1,004.6	0.531
100%	-0.0014	-40.00	-188.5	149.2	14.66	12.46	2,275.7	1,094.2	0.0025	40.00	188.5	149.2	0.75	1,706.8	1,044.5	0.612
165%	-0.0023	-40.00	-188.5	149.2	12.14	10.32	1,882.9	1,073.2	0.0024	40.00	188.5	149.2	0.79	1,483.7	1,080.8	0.728
230%	-0.0032	-40.00	-188.5	149.2	10.36	8.81	1,605.3	1,016.1	0.0023	40.00	188.5	149.2	0.83	1,325.9	1,085.8	0.819
361%	-0.0050	-40.00	-188.5	149.2	8.01	6.81	1,238.7	887.1	0.0021	40.00	188.5	149.2	0.90	1,114.8	1,067.0	0.957
621%	-0.0087	-40.00	-188.5	149.2	5.51	4.69	848.6	682.9	0.0016	40.00	188.5	149.2	0.90	763.8	883.2	1.156
1142%	-0.0160	-40.00	-188.5	149.2	3.40	2.89	518.0	455.7	0.0008	22.62	106.6	84.4	0.90	392.5	620.4	1.581
2119%	-0.0297	-40.00	-188.5	149.2	1.97	1.68	296.1	275.4	-0.0008	-22.83	-107.6	-85.2	0.90	**0.0**	**305.5**	∞



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Column Member 49

Axial Capacity & Load Rating

Loading	A_1P_{DU}	A_1M_{DU}	A_2P_{LU}	A_2M_{LU}	e_L	P_U	M_U	ΦP_n	ΦM_n	RF	
	kip	*kip-ft*	*kip*	*kip-ft*	*ft*	*kip*	*kip-ft*	*kip*	*kip-ft*	F	M
HS20 INV	417.3	-0.6	206.0	72.5	0.352	623.3	71.9	2,564.3	754.7	10.42	10.42
	417.3	-0.6	238.6	67.1	0.281	655.9	66.5	2,671.2	633.4	9.44	9.44
MIL INV	417.3	-0.6	124.4	53.9	0.433	541.7	53.3	2,370.0	845.5	15.69	15.69
	417.3	-0.6	193.6	40.5	0.209	610.9	39.9	2,715.8	480.1	11.87	11.87
Lane INV	417.3	-0.6	129.3	25.7	0.199	546.5	25.1	2,722.4	457.6	17.83	17.83
	417.3	-0.6	161.8	16.0	0.099	579.1	15.4	2,787.4	234.3	14.65	14.65
HS20 OPR	417.3	-0.6	123.4	43.4	0.352	540.7	42.8	2,564.3	754.7	17.40	17.40
	417.3	-0.6	143.0	40.2	0.281	560.2	39.6	2,671.2	633.4	15.77	15.77
MIL OPR	417.3	-0.6	74.6	32.3	0.433	491.8	31.7	2,370.0	845.5	26.19	26.19
	417.3	-0.6	116.0	24.3	0.209	533.3	23.6	2,715.8	480.1	19.82	19.82
Lane OPR	417.3	-0.6	77.4	15.4	0.199	494.7	14.8	2,722.4	457.6	29.77	29.77
	417.3	-0.6	96.9	9.6	0.099	514.2	9.0	2,787.4	234.3	24.45	24.45
2F1	417.3	-0.6	59.5	19.6	0.329	476.8	18.9	2,622.0	724.4	37.05	37.05
	417.3	-0.6	69.0	15.5	0.225	486.2	14.9	2,705.6	515.3	33.19	33.19
3F1	417.3	-0.6	86.7	30.0	0.347	504.0	29.4	2,577.5	748.0	24.92	24.92
	417.3	-0.6	102.9	25.4	0.247	520.2	24.8	2,692.0	561.9	22.11	22.11
4F1	417.3	-0.6	96.0	34.9	0.363	513.3	34.2	2,536.4	768.8	22.07	22.07
	417.3	-0.6	116.1	31.3	0.269	533.4	30.6	2,678.5	608.1	19.47	19.47
5C1	417.3	-0.6	94.7	28.5	0.301	512.0	27.9	2,659.5	673.4	23.67	23.67
	417.3	-0.6	124.7	28.0	0.224	542.0	27.4	2,706.2	512.9	18.35	18.35

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References

Column Member 49

Summary of Ratings

Loading	RF			
	V	F	M	Total
HS20 INV	63.79	10.42	10.42	**10.42**
		9.44	9.44	**9.44**
MIL INV	86.11	15.69	15.69	**15.69**
		11.87	11.87	**11.87**
Lane INV	176.64	17.83	17.83	**17.83**
		14.65	14.65	**14.65**
HS20 OPR	106.48	17.40	17.40	**17.40**
		15.77	15.77	**15.77**
MIL OPR	143.74	26.19	26.19	**26.19**
		19.82	19.82	**19.82**
Lane OPR	294.86	29.77	29.77	**29.77**
		24.45	24.45	**24.45**
2F1	234.68	37.05	37.05	**37.05**
		33.19	33.19	**33.19**
3F1	153.33	24.92	24.92	**24.92**
		22.11	22.11	**22.11**
4F1	132.18	22.07	22.07	**22.07**
		19.47	19.47	**19.47**
5C1	166.66	23.67	23.67	**23.67**
		18.35	18.35	**18.35**

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References

Column Member 53

Determine the Design Loads Considering Slenderness Effects

Criteria

Designed by AASHTO *Standard Specifications for Highway Bridges* , 17th ed. 2002.
Strength design.
Slenderness is considered. (8.16.5.2)
Dimensions are in pounds, feet and seconds, U.N.O.

Assumptions

Column is *not* braced against sidesway.
Only one column is considered in the system, i.e. the column is *not* part of a bent.

Material Properties & Section Details

Material Strength

f'_c	*3.0* ksi	Concrete strength.		
E_c	$= 57\, f'_c{}^{1/2}$			
	3,100 ksi	Concrete modulus of elasticity.		(18.7.1)

Member Geometry

k_X	1.0			(8.16.5.2.3)
ℓ_{uX}	*27.66* ft	Unbraced length for moments about the strong axis.		
	331.92 in			

Section Details

b	*72* in	Section width.	6' - 0"	
D	*22* in	Section depth.	1' - 10"	
A_g	1,584.0 in^2	Area of gross section.		
I_{gX}	63,888 in^4	Moment of inertia of gross section about the horizontal axis.		
r_X	6.351 in	Radius of gyration about the horizontal axis.		

Ties

Φ	0.75	Compression.		(8.16.1.2.2)

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References

Column Member 53

Investigate and Determine Slenderness Effects (8.16.5.2)

Investigate Slenderness Effects (8.16.5.2.5 & 8.16.5.2.6)

$k_X \ell_{uX} / r_X =$ 52.3 **>** 22 **Consider slenderness effects in this axis.**

Determine Slenderness Effects (8.16.5.2.7)

Moment Magnification Expression

$M_c = \delta_b M_{2b} + \delta_s M_{2s}$ (8-40)

where

M_{2b} = the larger end moment due to gravity loads that result in *no* appreciable sidesway. (8.1.2)

M_{2s} = the larger end moment due to lateral and gravity loads that *do* result in appreciable sidesway. (8.1.2)

$\therefore$

$M_U = M_{2b} + M_{2s}$

$\delta_b = C_m / (1 - P_u / \Phi P_c) \geq 1.0$ (8-41)

$= 1.0 / (1 - P_u / \Phi P_c) \geq 1.0$ as $C_m = 1.0$, because the column is *not* braced against sidesway.

$\delta_s = 1.0 / (1 - \Sigma P_u / \Phi \Sigma P_c) \geq 1.0$ (8-41A)

Taken here as:

$= 1.0 / (1 - P_u / \Phi P_c) \geq 1.0$ as $P_u / \Phi P_c \geq \Sigma P_u / \Phi \Sigma P_c$, because the column is *not* part of a bent.

$\therefore$

$\delta_b = \delta_s = \delta = 1.0 / (1 - P_u / \Phi P_c)$

$M_c = \delta M_U$

$\mathbf{M_c = [1.0 / (1 - P_u / \Phi P_c)] M_u \geq M_u}$

Critical Axial Load Expression

$P_c = \pi^2 EI / (k \ell_u)^2$ (8-42)

Where:

$EI = (E_c I_g / 2.5) / (1 + \beta_d)$ (8-44)

$\beta_d = M_{DL} / M_S \geq 0.0$

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Column Member 53

Determine Magnified Total and Live Load Moments

Consider slenderness effects in this axis.

Methodology: Determine magnified moment (M_c) by the method above.

Determine the applicable live load moment (M'_{LU}) by subtracting the dead load moment (M_{DU}) from the magnified moment (M_c).

Loading	A_1P_{DU} *kip*	A_1M_{DU} *kip-ft*	A_2P_{LU} *kip*	A_2M_{LU} *kip-ft*	P_U *kip*	M_U *kip-ft*	β_d	EI_X (kip - in^2)	ΦP_c (kip)	δ	M_c (kip-in)	P_{LU} *kip*	M'_{LU} *kip-ft*
	424.0	0.7	97.1	122.1	521.1	122.9	0.006	78.75E+6	5,291	1.109	136.3	**97.1**	**135.6**
	424.0	0.7	115.1	117.5	539.1	118.2	0.006	78.73E+6	5,290	1.113	131.6	**115.1**	**130.9**
MIL INV	424.0	0.7	83.6	92.0	507.6	92.7	0.008	78.60E+6	5,281	1.106	102.6	**83.6**	**101.8**
	424.0	0.7	101.5	73.9	525.5	74.7	0.010	78.45E+6	5,271	1.111	82.9	**101.5**	**82.2**
Lane INV	424.0	0.7	100.1	52.2	524.1	52.9	0.014	78.14E+6	5,250	1.111	58.8	**100.1**	**58.0**
	424.0	0.7	127.9	44.2	551.9	44.9	0.016	77.95E+6	5,238	1.118	50.2	**127.9**	**49.5**
HS20 OPR	424.0	0.7	58.1	73.2	482.1	73.9	0.010	78.45E+6	5,271	1.101	81.3	**58.1**	**80.6**
	424.0	0.7	69.0	70.4	493.0	71.1	0.010	78.42E+6	5,269	1.103	78.4	**69.0**	**77.7**
MIL OPR	424.0	0.7	50.1	55.1	474.1	55.8	0.013	78.20E+6	5,254	1.099	61.4	**50.1**	**60.6**
	424.0	0.7	60.8	44.3	484.8	45.0	0.016	77.96E+6	5,238	1.102	49.6	**60.8**	**48.9**
Lane OPR	424.0	0.7	60.0	31.3	484.0	32.0	0.023	77.45E+6	5,204	1.103	35.3	**60.0**	**34.5**
	424.0	0.7	76.6	26.5	500.6	27.2	0.027	77.15E+6	5,184	1.107	30.1	**76.6**	**29.4**
2F1	424.0	0.7	29.1	33.7	453.1	34.5	0.021	77.58E+6	5,212	1.095	37.8	**29.1**	**37.0**
	424.0	0.7	35.2	28.2	459.2	28.9	0.025	77.27E+6	5,192	1.097	31.7	**35.2**	**31.0**
3F1	424.0	0.7	41.5	51.4	465.5	52.2	0.014	78.13E+6	5,249	1.097	57.3	**41.5**	**56.5**
	424.0	0.7	52.3	45.4	476.3	46.1	0.016	77.99E+6	5,240	1.100	50.8	**52.3**	**50.0**
4F1	424.0	0.7	44.8	59.2	468.8	59.9	0.012	78.27E+6	5,259	1.098	65.8	**44.8**	**65.1**
	424.0	0.7	58.3	55.1	482.3	55.9	0.013	78.20E+6	5,254	1.101	61.5	**58.3**	**60.8**
5C1	424.0	0.7	31.2	53.7	455.2	54.4	0.013	78.17E+6	5,252	1.095	59.6	**31.2**	**58.8**
	424.0	0.7	72.0	46.1	496.0	46.8	0.016	78.00E+6	5,241	1.105	51.7	**72.0**	**51.0**

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Column Member 53 — References

Determine the Axial Load/Moment Interaction Diagram & Shear Capacity of a Rectangular Reinforced Concrete Section

Criteria

Designed by AASHTO, *Standard Specifications for Highway Bridges* , 17^{th} ed. 2002.
Strength design.
Capacity based on strain compatibility.
Dimensions are in pounds, feet and seconds, U.N.O.

Assumptions

Section is rectangular and uniform.
Reinforcement is evenly spaced along the tensile sides.

Material Properties & Section Details

Material Strengths and Properties

Steel

f_y	*40*	ksi	Reinforcement yield.	
E_s	29,000	ksi	Steel modulus of elasticity.	(8.7.2)
ε_{sy}	-0.0014		Yield strain in steel.	

Concrete

f'_c	*3.0*	ksi	Concrete strength.	
β_1	$= 0.85 - 0.05 (f'_c - 4.0) \le 0.85$ & ≥ 0.65			(8.16.2.7)
	0.850			
ε_c	+0.0030		Limiting strain in concrete.	(8.16.2.3)

Resistance Factors

Φ	0.75	Compression controlled section. (i.e. $\lvert\varepsilon_{st}\rvert < \lvert\varepsilon_{sy}\rvert$)	(8.16.1.2.2)
Φ	0.90	Tension controlled section. (i.e. $\lvert\varepsilon_{st}\rvert \ge 0.005$)	(After AASHTO, *LRFD* , 5.5.4.2.1)
Φ	0.85	Shear.	(8.16.6.2)

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References

Column Member 53

Section Details

Section is a: *Beam-Column*

b	*72*	in	Section width.	6' - 0"	
h	*22*	in	Section depth.	1' - 10"	
d_{cc}	*2*	in	Depth of clear cover.		(ACI 318-02, 7.5.2.1)
A_g	1,584.0	in^2	Area of gross section.		

Tensile Reinforcement

(Reinforcement in the side faces is, conservatively, ignored.)

d_{bt}	*1*	in	Bar diameter.
A_{st}	*4.712*	in^2	Tensile reinforcement area.
d_{st}	19 1/2	in	Depth to reinforcement.

Compression Reinforcement

d_{bc}	*1*	in	Bar diameter.
A_{sc}	*4.712*	in^2	Compression reinforcement area.
d_{sc}	2 1/2	in	Depth to reinforcement.

Transverse Reinforcement

d_{bv}	*9/16*	in	Bar diameter.
n	*4*		Number of legs / stirrup.
A_v	1.000	in^2	Stirrup reinforcement area.
s_v	*24*	in	Stirrup spacing.

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Column Member 53

Shear Strength & Rating

Shear Strength

Concrete

$V_c = 2f'_c{}^{1/2}bd$ (8-49)

153.8 kip

Reinforcement (8.16.6.3.2 & 8.16.6.3.9)

$V_s = A_v f_y d / s \le 4 f'_c{}^{1/2} b d$ (8-53)

32.5 kip

Shear Capacity

$\Phi V_n = \Phi (V_c + V_s)$ Shear capacity of beam-column section.

158.4 kip

Shear Capacity & Load Rating

Loading	A_1V_{DU} *kip*	A_2V_{LU} *kip*	V_U *kip*	ΦV_n *kip*	RF V
HS20 INV	0.1	7.6	7.7	**158.4**	20.75
MIL INV	0.1	5.8	5.9	**158.4**	27.16
Lane INV	0.1	3.2	3.3	**158.4**	49.19
HS20 OPR	0.1	4.6	4.6	**158.4**	34.64
MIL OPR	0.1	3.5	3.5	**158.4**	45.34
Lane OPR	0.1	1.9	2.0	**158.4**	82.11
2F1	0.1	2.1	2.2	**158.4**	74.48
3F1	0.1	3.2	3.3	**158.4**	48.96
4F1	0.1	3.7	3.8	**158.4**	42.74
5C1	0.1	3.3	3.4	**158.4**	47.40

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Column Member 53

Moment/Axial Interaction Diagram

Axial Capacity

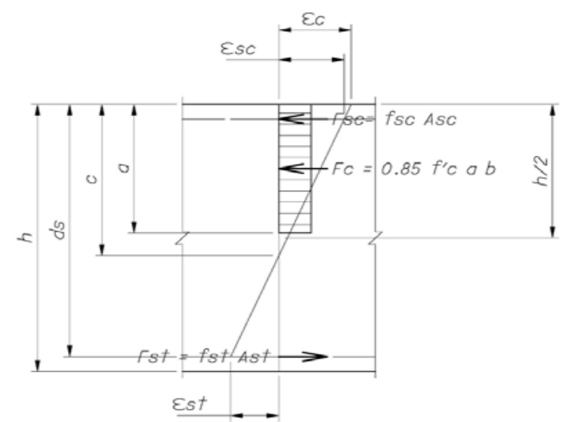
ψ 0.80 Ties.

ΦP_n $= \Phi\ \psi\ [\ 0.85\ f'_c\ (A_g - A_s) + f_y\ A_s\ ]$ (8-29 and 8-30)

2,635.3 kip

General Expressions

c	$= d_s / [\ 1 - \varepsilon_s / \varepsilon_c\ ]$	Depth of the compression zone.
a	$= \beta_1\ c$	Depth of the stress block.
f_{st}	$= E_s\ \varepsilon_{st}$	Stress in the steel.
F_{st}	$= f_{st}\ A_{st}$	Force in the steel.
M_{st}	$= F_{st}\ (\ h/2 - d_{st}\ )$	Moment due to the steel.
F_c	$= 0.85\ f'_c\ a\ b$	Compressive force in concrete.
M_c	$= F_c\ (\ h/2 - a/2\ )$	Compressive moment in concrete.
f_{sc}	$= E_s\ \varepsilon_{sc}$	Stress in the steel.
F_{sc}	$= f_{sc}\ A_{sc}$	Force in the steel.
M_{sc}	$= F_{sc}\ (\ h/2 - d_{sc}\ )$	Moment due to the steel.



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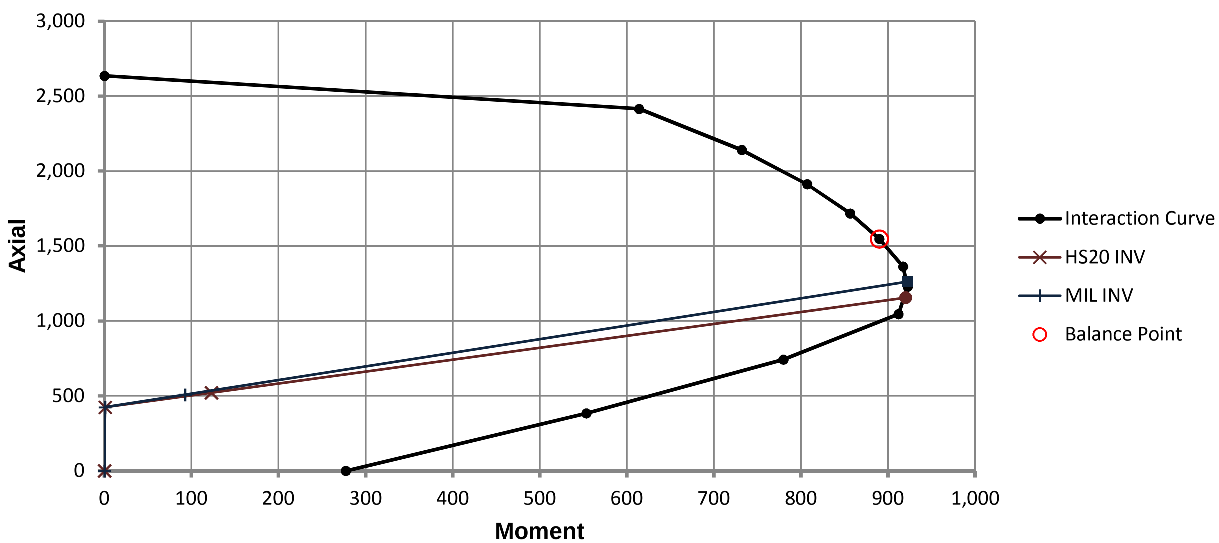
Column Member 53

Axial/Moment Interaction Diagram

$\varepsilon_{st} / \varepsilon_y$	Tensile Reinforcement				Concrete				Compressive Reinforcement				Capacity			
	ε_{st}	f_{st} ksi	P_{st} kip	M_{st} kip-ft	c in	a in	P_c kip	M_c kip-ft	ε_{sc}	f_{sc} ksi	P_{sc} kip	M_{sc} kip-ft	Φ	ΦP_n kip	ΦM_n kip-ft	e ft
N.A.													0.75	**2,635.3**	**0.0**	0.000
0%	0.0000	0.00	0.0	0.0	19.50	16.58	3,031.2	685.2	0.0026	40.00	188.5	133.5	0.75	2,414.7	614.0	0.254
25%	-0.0004	-10.00	-47.1	33.4	17.46	14.84	2,713.2	809.1	0.0026	40.00	188.5	133.5	0.75	2,140.9	732.0	0.342
50%	-0.0007	-20.00	-94.2	66.8	15.81	13.44	2,455.4	875.8	0.0025	40.00	188.5	133.5	0.75	1,912.2	807.1	0.422
75%	-0.0011	-30.00	-141.4	100.1	14.44	12.28	2,242.2	908.3	0.0025	40.00	188.5	133.5	0.75	1,717.0	856.5	0.499
100%	-0.0014	-40.00	-188.5	133.5	13.30	11.30	2,062.9	919.6	0.0024	40.00	188.5	133.5	0.75	1,547.2	890.0	0.575
158%	-0.0022	-40.00	-188.5	133.5	11.22	9.54	1,739.0	903.0	0.0023	40.00	188.5	133.5	0.78	1,363.2	917.2	0.673
216%	-0.0030	-40.00	-188.5	133.5	9.70	8.25	1,502.5	860.9	0.0022	40.00	188.5	133.5	0.82	1,228.8	922.4	0.751
333%	-0.0047	-40.00	-188.5	133.5	7.64	6.50	1,180.5	762.6	0.0020	40.00	188.5	133.5	0.89	1,045.5	911.9	0.872
565%	-0.0079	-40.00	-188.5	133.5	5.36	4.56	824.7	599.4	0.0016	40.00	188.5	133.5	0.90	742.2	779.8	1.051
1030%	-0.0144	-40.00	-188.5	133.5	3.36	2.85	512.0	408.4	0.0008	21.89	103.2	73.1	0.90	384.0	553.5	1.442
1902%	-0.0266	-40.00	-188.5	133.5	1.97	1.68	296.1	250.7	-0.0008	-22.83	-107.6	-76.2	0.90	**0.0**	**277.2**	∞



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Column Member 53

Axial Capacity & Load Rating

Loading	A_1P_{DU}	A_1M_{DU}	A_2P_{LU}	A_2M_{LU}	e_L	P_U	M_U	ΦP_n	ΦM_n	RF	
	kip	*kip-ft*	*kip*	*kip-ft*	*ft*	*kip*	*kip-ft*	*kip*	*kip-ft*	**F**	**M**
HS20 INV	424.0	0.7	97.1	122.1	1.258	521.1	122.9	**1,154.8**	**920.4**	7.53	7.53
	424.0	0.7	115.1	117.5	1.020	539.1	118.2	**1,325.1**	**919.9**	7.83	7.83
MIL INV	424.0	0.7	83.6	92.0	1.100	507.6	92.7	**1,261.5**	**922.2**	10.02	10.02
	424.0	0.7	101.5	73.9	0.728	525.5	74.7	**1,625.3**	**875.5**	11.83	11.83
Lane INV	424.0	0.7	100.1	52.2	0.521	524.1	52.9	**1,949.8**	**796.1**	15.24	15.24
	424.0	0.7	127.9	44.2	0.346	551.9	44.9	**2,322.9**	**657.0**	14.85	14.85
HS20 OPR	424.0	0.7	58.1	73.2	1.258	482.1	73.9	**1,154.8**	**920.4**	12.57	12.57
	424.0	0.7	69.0	70.4	1.020	493.0	71.1	**1,325.1**	**919.9**	13.06	13.06
MIL OPR	424.0	0.7	50.1	55.1	1.100	474.1	55.8	**1,261.5**	**922.2**	16.72	16.72
	424.0	0.7	60.8	44.3	0.728	484.8	45.0	**1,625.3**	**875.5**	19.75	19.75
Lane OPR	424.0	0.7	60.0	31.3	0.521	484.0	32.0	**1,949.8**	**796.1**	25.44	25.44
	424.0	0.7	76.6	26.5	0.346	500.6	27.2	**2,322.9**	**657.0**	24.79	24.79
2F1	424.0	0.7	29.1	33.7	1.159	453.1	34.5	**1,219.2**	**922.3**	27.31	27.31
	424.0	0.7	35.2	28.2	0.799	459.2	28.9	**1,538.8**	**891.7**	31.64	31.64
3F1	424.0	0.7	41.5	51.4	1.241	465.5	52.2	**1,165.5**	**920.9**	17.89	17.89
	424.0	0.7	52.3	45.4	0.867	476.3	46.1	**1,466.3**	**904.9**	19.91	19.91
4F1	424.0	0.7	44.8	59.2	1.320	468.8	59.9	**1,118.9**	**918.3**	15.50	15.50
	424.0	0.7	58.3	55.1	0.947	482.3	55.9	**1,389.6**	**914.8**	16.58	16.58
5C1	424.0	0.7	31.2	53.7	1.722	455.2	54.4	**930.3**	**872.3**	16.24	16.24
	424.0	0.7	72.0	46.1	0.640	496.0	46.8	**1,749.0**	**849.2**	18.41	18.41

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References

Column Member 53

Summary of Ratings

Loading	RF			
	V	F	M	Total
HS20 INV	20.75	7.53	7.53	7.53
		7.83	7.83	7.83
MIL INV	27.16	10.02	10.02	10.02
		11.83	11.83	11.83
Lane INV	49.19	15.24	15.24	15.24
		14.85	14.85	14.85
HS20 OPR	34.64	12.57	12.57	12.57
		13.06	13.06	13.06
MIL OPR	45.34	16.72	16.72	16.72
		19.75	19.75	19.75
Lane OPR	82.11	25.44	25.44	25.44
		24.79	24.79	24.79
2F1	74.48	27.31	27.31	27.31
		31.64	31.64	31.64
3F1	48.96	17.89	17.89	17.89
		19.91	19.91	19.91
4F1	42.74	15.50	15.50	15.50
		16.58	16.58	16.58
5C1	47.40	16.24	16.24	16.24
		18.41	18.41	18.41

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Column Member 57

References

Determine the Design Loads Considering Slenderness Effects

Criteria

Designed by AASHTO *Standard Specifications for Highway Bridges*, 17th ed. 2002.
Strength design.
Slenderness is considered. (8.16.5.2)
Dimensions are in pounds, feet and seconds, U.N.O.

Assumptions

Column is *not* braced against sidesway.
Only one column is considered in the system, i.e. the column is *not* part of a bent.

Material Properties & Section Details

Material Strength

f'_c	*3.0*	ksi	Concrete strength.		
E_c	$= 57\ f'_c{}^{1/2}$				
	3,100	ksi	Concrete modulus of elasticity.		(18.7.1)

Member Geometry

k_X	1.0				(8.16.5.2.3)
ℓ_{uX}	*15.22*	ft	Unbraced length for moments about the strong axis.		
	182.64	in			

Section Details

b	*72*	in	Section width.	6' - 0"	
D	*20*	in	Section depth.	1' - 8"	
A_g	1,440.0	in^2	Area of gross section.		
I_{gX}	48,000	in^4	Moment of inertia of gross section about the horizontal axis.		
r_X	5.774	in	Radius of gyration about the horizontal axis.		

Ties

Φ	0.75		Compression.		(8.16.1.2.2)

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Column Member 57 — References

Investigate and Determine Slenderness Effects (8.16.5.2)

Investigate Slenderness Effects (8.16.5.2.5 & 8.16.5.2.6)

$k_X \ell_{uX} / r_X =$ 31.6 **>** 22 **Consider slenderness effects in this axis.**

Determine Slenderness Effects (8.16.5.2.7)

Moment Magnification Expression

$M_c = \delta_b M_{2b} + \delta_s M_{2s}$ (8-40)

where

M_{2b} = the larger end moment due to gravity loads that result in *no* appreciable sidesway. (8.1.2)

M_{2s} = the larger end moment due to lateral and gravity loads that *do* result in appreciable sidesway. (8.1.2)

$\therefore$

$M_U = M_{2b} + M_{2s}$

$\delta_b = C_m / (1 - P_u / \Phi P_c) \geq 1.0$ (8-41)

$= 1.0 / (1 - P_u / \Phi P_c) \geq 1.0$ as $C_m = 1.0$, because the column is *not* braced against sidesway.

$\delta_s = 1.0 / (1 - \Sigma P_u / \Phi \Sigma P_c) \geq 1.0$ (8-41A)

Taken here as:

$= 1.0 / (1 - P_u / \Phi P_c) \geq 1.0$ as $P_u / \Phi P_c \geq \Sigma P_u / \Phi \Sigma P_c$, because the column is *not* part of a bent.

$\therefore$

$\delta_b = \delta_s = \delta = 1.0 / (1 - P_u / \Phi P_c)$

$M_c = \delta M_U$

$\mathbf{M_c = [1.0 / (1 - P_u / \Phi P_c)] M_u \geq M_u}$

Critical Axial Load Expression

$P_c = \pi^2 EI / (k \ell_u)^2$ (8-42)

Where:

$EI = (E_c I_g / 2.5) / (1 + \beta_d)$ (8-44)

$\beta_d = M_{DL} / M_S \geq 0.0$

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References

Column Member 57

Determine Magnified Total and Live Load Moments

Consider slenderness effects in this axis.

Methodology: Determine magnified moment (M_c) by the method above.

Determine the applicable live load moment (M'_{LU}) by subtracting the dead load moment (M_{DU}) from the magnified moment (M_c).

Loading	A_1P_{DU} *kip*	A_1M_{DU} *kip-ft*	A_2P_{LU} *kip*	A_2M_{LU} *kip-ft*	P_U *kip*	M_U *kip-ft*	β_d	EI_X (kip - in^2)	ΦP_c (kip)	δ	M_c (kip-in)	P_{LU} *kip*	M'_{LU} *kip-ft*
	340.8	3.4	81.5	135.1	422.3	138.5	0.025	58.09E+6	12,891	1.034	143.2	**81.5**	**139.8**
	340.8	3.4	94.2	127.1	435.0	130.5	0.026	58.01E+6	12,872	1.035	135.0	**94.2**	**131.6**
MIL INV	340.8	3.4	74.8	102.3	415.6	105.7	0.032	57.66E+6	12,796	1.034	109.2	**74.8**	**105.8**
	340.8	3.4	83.1	76.7	423.9	80.1	0.042	57.10E+6	12,670	1.035	82.9	**83.1**	**79.5**
Lane INV	340.8	3.4	79.6	66.4	420.4	69.8	0.049	56.76E+6	12,595	1.035	72.2	**79.6**	**68.8**
	340.8	3.4	105.7	59.7	446.6	63.1	0.054	56.48E+6	12,533	1.037	65.5	**105.7**	**62.1**
HS20 OPR	340.8	3.4	48.8	80.9	389.6	84.3	0.040	57.21E+6	12,696	1.032	87.0	**48.8**	**83.6**
	340.8	3.4	56.4	76.1	397.2	79.5	0.043	57.08E+6	12,666	1.032	82.1	**56.4**	**78.7**
MIL OPR	340.8	3.4	44.8	61.3	385.6	64.7	0.053	56.55E+6	12,548	1.032	66.7	**44.8**	**63.3**
	340.8	3.4	49.8	46.0	390.6	49.4	0.069	55.68E+6	12,357	1.033	51.0	**49.8**	**47.6**
Lane OPR	340.8	3.4	47.7	39.8	388.5	43.2	0.079	55.18E+6	12,244	1.033	44.6	**47.7**	**41.2**
	340.8	3.4	63.4	35.8	404.2	39.2	0.087	54.77E+6	12,153	1.034	40.5	**63.4**	**37.1**
2F1	340.8	3.4	25.6	37.5	366.4	40.9	0.083	54.95E+6	12,193	1.031	42.1	**25.6**	**38.7**
	340.8	3.4	28.8	29.7	369.6	33.1	0.103	53.98E+6	11,978	1.032	34.2	**28.8**	**30.8**
3F1	340.8	3.4	36.1	57.3	377.0	60.7	0.056	56.36E+6	12,508	1.031	62.6	**36.1**	**59.2**
	340.8	3.4	43.5	48.4	384.3	51.8	0.066	55.85E+6	12,394	1.032	53.5	**43.5**	**50.1**
4F1	340.8	3.4	38.7	66.1	379.6	69.5	0.049	56.74E+6	12,592	1.031	71.7	**38.7**	**68.3**
	340.8	3.4	48.9	59.5	389.7	62.9	0.054	56.47E+6	12,530	1.032	64.9	**48.9**	**61.5**
5C1	340.8	3.4	24.5	58.5	365.4	61.9	0.055	56.42E+6	12,520	1.030	63.8	**24.5**	**60.4**
	340.8	3.4	59.7	46.5	400.6	49.9	0.068	55.72E+6	12,365	1.033	51.6	**59.7**	**48.2**

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Column Member 57 — References

Determine the Axial Load/Moment Interaction Diagram & Shear Capacity of a Rectangular Reinforced Concrete Section

Criteria

Designed by AASHTO, *Standard Specifications for Highway Bridges* , 17th ed. 2002.
Strength design.
Capacity based on strain compatibility.
Dimensions are in pounds, feet and seconds, U.N.O.

Assumptions

Section is rectangular and uniform.
Reinforcement is evenly spaced along the tensile sides.

Material Properties & Section Details

Material Strengths and Properties

Steel

f_y	*40*	ksi	Reinforcement yield.	
E_s	29,000	ksi	Steel modulus of elasticity.	(8.7.2)
ε_{sy}	-0.0014		Yield strain in steel.	

Concrete

f'_c	*3.0*	ksi	Concrete strength.	
β_1	$= 0.85 - 0.05\ (f'_c - 4.0) \le 0.85\ \&\ \ge 0.65$			(8.16.2.7)
	0.850			
ε_c	+0.0030		Limiting strain in concrete.	(8.16.2.3)

Resistance Factors

Φ	0.75	Compression controlled section. (i.e. $\lvert\varepsilon_{st}\rvert < \lvert\varepsilon_{sy}\rvert$)	(8.16.1.2.2)
Φ	0.90	Tension controlled section. (i.e. $\lvert\varepsilon_{st}\rvert \ge 0.005$)	(After AASHTO, *LRFD* , 5.5.4.2.1)
Φ	0.85	Shear.	(8.16.6.2)

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Column Member 57

References

Section Details

Section is a: *Beam-Column*

b	*72*	in	Section width.	6' - 0"	
h	*20*	in	Section depth.	1' - 8"	
d_{cc}	*2*	in	Depth of clear cover.		(ACI 318-02, 7.5.2.1)
A_g	1,440.0	in^2	Area of gross section.		

Tensile Reinforcement

(Reinforcement in the side faces is, conservatively, ignored.)

d_{bt}	*1*	in	Bar diameter.
A_{st}	*4.712*	in^2	Tensile reinforcement area.
d_{st}	17 1/2	in	Depth to reinforcement.

Compression Reinforcement

d_{bc}	*1*	in	Bar diameter.
A_{sc}	*4.712*	in^2	Compression reinforcement area.
d_{sc}	2 1/2	in	Depth to reinforcement.

Transverse Reinforcement

d_{bv}	*9/16*	in	Bar diameter.
n	*4*		Number of legs / stirrup.
A_v	1.000	in^2	Stirrup reinforcement area.
s_v	*24*	in	Stirrup spacing.

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Column Member 57

Shear Strength & Rating

Shear Strength

Concrete

V_c $= 2f'_c{}^{1/2}bd$ (8-49)

138.0 kip

Reinforcement (8.16.6.3.2 & 8.16.6.3.9)

V_s $= A_v f_y d / s \leq 4 f'_c{}^{1/2} b d$ (8-53)

29.2 kip

Shear Capacity

ΦV_n $= \Phi (V_c + V_s)$ Shear capacity of beam-column section.

142.1 kip

Shear Capacity & Load Rating

Loading	A_1V_{DU} *kip*	A_2V_{LU} *kip*	V_U *kip*	ΦV_n *kip*	RF V
HS20 INV	0.4	14.5	14.8	**142.1**	9.80
MIL INV	0.4	11.2	11.5	**142.1**	12.68
Lane INV	0.4	7.0	7.4	**142.1**	20.27
HS20 OPR	0.4	8.7	9.0	**142.1**	16.35
MIL OPR	0.4	6.7	7.1	**142.1**	21.17
Lane OPR	0.4	4.2	4.6	**142.1**	33.83
2F1	0.4	4.1	4.4	**142.1**	34.97
3F1	0.4	6.2	6.6	**142.1**	22.83
4F1	0.4	7.1	7.5	**142.1**	19.87
5C1	0.4	6.3	6.7	**142.1**	22.45

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Column Member 57

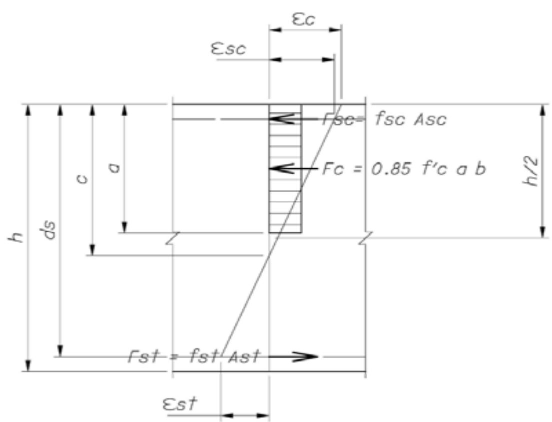
Moment/Axial Interaction Diagram

Axial Capacity

ψ 0.80 Ties.

$\Phi P_n = \Phi\, \psi\, [\, 0.85\, f'_c\, (A_g - A_s) + f_y\, A_s\,]$ (8-29 and 8-30)

2,415.0 kip



General Expressions

c	$= d_s / [\, 1 - \varepsilon_s / \varepsilon_c\,]$	Depth of the compression zone.
a	$= \beta_1\, c$	Depth of the stress block.
f_{st}	$= E_s\, \varepsilon_{st}$	Stress in the steel.
F_{st}	$= f_{st}\, A_{st}$	Force in the steel.
M_{st}	$= F_{st}\, (\, h/2 - d_{st}\,)$	Moment due to the steel.
F_c	$= 0.85\, f'_c\, a\, b$	Compressive force in concrete.
M_c	$= F_c\, (\, h/2 - a/2\,)$	Compressive moment in concrete.
f_{sc}	$= E_s\, \varepsilon_{sc}$	Stress in the steel.
F_{sc}	$= f_{sc}\, A_{sc}$	Force in the steel.
M_{sc}	$= F_{sc}\, (\, h/2 - d_{sc}\,)$	Moment due to the steel.

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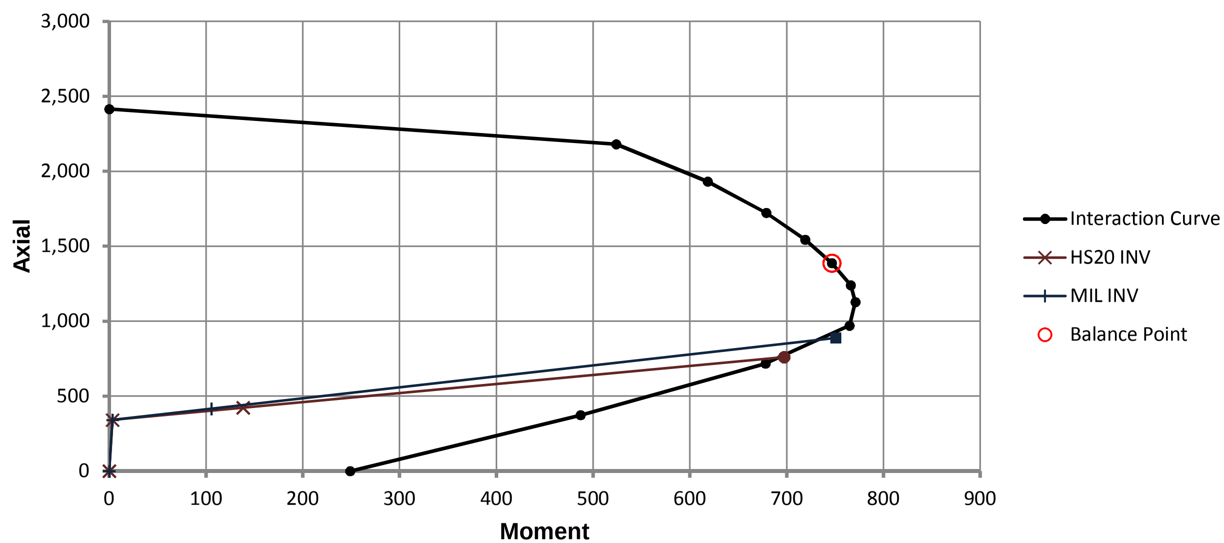
Column Member 57

Axial/Moment Interaction Diagram

ε_{st} / ε_y	Tensile Reinforcement				Concrete				Compressive Reinforcement				Capacity			
	ε_{st}	f_{st} ksi	P_{st} *kip*	M_{st} *kip-ft*	c *in*	a *in*	P_c *kip*	M_c *kip-ft*	ε_{sc}	f_{sc} ksi	P_{sc} *kip*	M_{sc} *kip-ft*	Φ	ΦP_n *kip*	ΦM_n *kip-ft*	e *ft*
N.A.													0.75	**2,415.0**	**0.0**	0.000
0%	0.0000	0.00	0.0	0.0	17.50	14.88	2,719.0	580.6	0.0026	40.00	188.5	117.8	0.75	2,180.6	523.8	0.240
25%	-0.0004	-10.00	-47.1	29.5	15.67	13.32	2,433.7	677.3	0.0025	40.00	188.5	117.8	0.75	1,931.3	618.4	0.320
50%	-0.0007	-20.00	-94.2	58.9	14.19	12.06	2,202.3	728.5	0.0025	40.00	188.5	117.8	0.75	1,722.4	678.9	0.394
75%	-0.0011	-30.00	-141.4	88.4	12.96	11.02	2,011.0	752.6	0.0024	40.00	188.5	117.8	0.75	1,543.6	719.1	0.466
100%	-0.0014	-40.00	-188.5	117.8	11.93	10.14	1,850.1	759.9	0.0024	40.00	188.5	117.8	0.75	1,387.5	746.6	0.538
151%	-0.0021	-40.00	-188.5	117.8	10.26	8.72	1,589.5	746.9	0.0023	40.00	188.5	117.8	0.78	1,239.5	766.2	0.618
202%	-0.0028	-40.00	-188.5	117.8	9.00	7.65	1,392.9	716.6	0.0022	40.00	188.5	117.8	0.81	1,127.8	771.0	0.684
305%	-0.0043	-40.00	-188.5	117.8	7.23	6.14	1,116.0	644.3	0.0020	40.00	188.5	117.8	0.87	970.1	764.9	0.788
509%	-0.0071	-40.00	-188.5	117.8	5.18	4.41	797.0	517.8	0.0016	40.00	188.5	117.8	0.90	717.3	678.1	0.945
918%	-0.0129	-40.00	-188.5	117.8	3.31	2.81	504.8	361.4	0.0007	21.00	99.0	61.9	0.90	373.7	487.0	1.303
1685%	-0.0236	-40.00	-188.5	117.8	1.97	1.68	296.1	226.0	-0.0008	-22.83	-107.6	-67.2	0.90	**0.0**	**248.9**	∞



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Column Member 57

Axial Capacity & Load Rating

Loading	A_1P_{DU}	A_1M_{DU}	A_2P_{LU}	A_2M_{LU}	e_L	P_U	M_U	ΦP_n	ΦM_n	RF	
	kip	*kip-ft*	*kip*	*kip-ft*	*ft*	*kip*	*kip-ft*	*kip*	*kip-ft*	F	M
HS20 INV	340.8	3.4	81.5	135.1	1.657	422.3	138.5	759.6	697.4	5.14	5.14
	340.8	3.4	94.2	127.1	1.349	435.0	130.5	897.4	754.3	5.91	5.91
MIL INV	340.8	3.4	74.8	102.3	1.367	415.6	105.7	887.4	750.5	7.31	7.31
	340.8	3.4	83.1	76.7	0.923	423.9	80.1	1,171.3	770.1	9.99	9.99
Lane INV	340.8	3.4	79.6	66.4	0.835	420.4	69.8	1,253.2	765.0	11.47	11.47
	340.8	3.4	105.7	59.7	0.565	446.6	63.1	1,590.7	709.4	11.82	11.82
HS20 OPR	340.8	3.4	48.8	80.9	1.657	389.6	84.3	759.6	697.4	8.58	8.58
	340.8	3.4	56.4	76.1	1.349	397.2	79.5	897.4	754.3	9.86	9.86
MIL OPR	340.8	3.4	44.8	61.3	1.367	385.6	64.7	887.4	750.5	12.20	12.20
	340.8	3.4	49.8	46.0	0.923	390.6	49.4	1,171.3	770.1	16.68	16.68
Lane OPR	340.8	3.4	47.7	39.8	0.835	388.5	43.2	1,253.2	765.0	19.14	19.14
	340.8	3.4	63.4	35.8	0.565	404.2	39.2	1,590.7	709.4	19.73	19.73
2F1	340.8	3.4	25.6	37.5	1.465	366.4	40.9	837.3	730.7	19.42	19.42
	340.8	3.4	28.8	29.7	1.031	369.6	33.1	1,085.0	770.7	25.83	25.83
3F1	340.8	3.4	36.1	57.3	1.587	377.0	60.7	785.3	708.8	12.30	12.30
	340.8	3.4	43.5	48.4	1.112	384.3	51.8	1,029.1	768.8	15.81	15.81
4F1	340.8	3.4	38.7	66.1	1.706	379.6	69.5	743.3	690.1	10.39	10.39
	340.8	3.4	48.9	59.5	1.217	389.7	62.9	966.3	764.6	12.79	12.79
5C1	340.8	3.4	24.5	58.5	2.383	365.4	61.9	598.5	617.7	10.50	10.50
	340.8	3.4	59.7	46.5	0.778	400.6	49.9	1,311.3	758.6	16.25	16.25

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References

Column Member 57

Summary of Ratings

Loading	RF			
	V	F	M	Total
HS20 INV	9.80	5.14	5.14	**5.14**
		5.91	5.91	**5.91**
MIL INV	12.68	7.31	7.31	**7.31**
		9.99	9.99	**9.99**
Lane INV	20.27	11.47	11.47	**11.47**
		11.82	11.82	**11.82**
HS20 OPR	16.35	8.58	8.58	**8.58**
		9.86	9.86	**9.86**
MIL OPR	21.17	12.20	12.20	**12.20**
		16.68	16.68	**16.68**
Lane OPR	33.83	19.14	19.14	**19.14**
		19.73	19.73	**19.73**
2F1	34.97	19.42	19.42	**19.42**
		25.83	25.83	**25.83**
3F1	22.83	12.30	12.30	**12.30**
		15.81	15.81	**15.81**
4F1	19.87	10.39	10.39	**10.39**
		12.79	12.79	**12.79**
5C1	22.45	10.50	10.50	**10.50**
		16.25	16.25	**16.25**

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Column Member 61 — References

Determine the Design Loads Considering Slenderness Effects

Criteria

Designed by AASHTO *Standard Specifications for Highway Bridges*, 17th ed. 2002.
Strength design.
Slenderness is considered. (8.16.5.2)
Dimensions are in pounds, feet and seconds, U.N.O.

Assumptions

Column is *not* braced against sidesway.
Only one column is considered in the system, i.e. the column is *not* part of a bent.

Material Properties & Section Details

Material Strength

f'_c	*3.0*	ksi	Concrete strength.		
E_c	$= 57\, f'^{1/2}_c$				
	3,100	ksi	Concrete modulus of elasticity.		(18.7.1)

Member Geometry

k_X	1.0				(8.16.5.2.3)
ℓ_{uX}	*7.11*	ft	Unbraced length for moments about the strong axis.		
	85.32	in			

Section Details

b	*72*	in	Section width.	6' - 0"	
D	*13 1/2*	in	Section depth.	1' - 1 1/2"	
A_g	972.0	in^2	Area of gross section.		
I_{gX}	14,762	in^4	Moment of inertia of gross section about the horizontal axis.		
r_X	3.897	in	Radius of gyration about the horizontal axis.		

Ties

Φ	0.75		Compression.		(8.16.1.2.2)

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References

Column Member 61

Investigate and Determine Slenderness Effects (8.16.5.2)

Investigate Slenderness Effects (8.16.5.2.5 & 8.16.5.2.6)

$k_X \ell_{uX} / r_X =$ 21.9 **<** 22 **Neglect slenderness effects in this axis.**

.

Determine Slenderness Effects (8.16.5.2.7)

Moment Magnification Expression

$M_c = \delta_b M_{2b} + \delta_s M_{2s}$ (8-40)

where

M_{2b} = the larger end moment due to gravity loads that result in *no* appreciable sidesway. (8.1.2)

M_{2s} = the larger end moment due to lateral and gravity loads that *do* result in appreciable sidesway. (8.1.2)

$\therefore$

$M_U = M_{2b} + M_{2s}$

$\delta_b = C_m / (1 - P_u / \Phi P_c) \geq 1.0$ (8-41)

$= 1.0 / (1 - P_u / \Phi P_c) \geq 1.0$ as $C_m = 1.0$, because the column is *not* braced against sidesway.

$\delta_s = 1.0 / (1 - \Sigma P_u / \Phi \Sigma P_c) \geq 1.0$ (8-41A)

Taken here as:

$= 1.0 / (1 - P_u / \Phi P_c) \geq 1.0$ as $P_u / \Phi P_c \geq \Sigma P_u / \Phi \Sigma P_c$, because the column is *not* part of a bent.

$\therefore$

$\delta_b = \delta_s = \delta = 1.0 / (1 - P_u / \Phi P_c)$

$M_c = \delta M_U$

$\mathbf{M_c = [1.0 / (1 - P_u / \Phi P_c)] M_u \geq M_u}$

Critical Axial Load Expression

$P_c = \pi^2 EI / (k \ell_u)^2$ (8-42)

Where:

$EI = (E_c I_g / 2.5) / (1 + \beta_d)$ (8-44)

$\beta_d = M_{DL} / M_S \geq 0.0$

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References

Column Member 61

Determine Magnified Total and Live Load Moments *Neglect slenderness effects in this axis.*

Methodology: Determine magnified moment (M_c) by the method above.

Determine the applicable live load moment (M'_{LU}) by subtracting the dead load moment (M_{DU}) from the magnified moment (M_c).

Loading	A_1P_{DU} *kip*	A_1M_{DU} *kip-ft*	A_2P_{LU} *kip*	A_2M_{LU} *kip-ft*	P_U *kip*	M_U *kip-ft*	β_d	EI_X (kip - in^2)	ΦP_c (kip)	δ	M_c (kip-in)	P_{LU} *kip*	M'_{LU} *kip-ft*
HS20 INV	337.7	4.4	87.0	114.0	424.7	118.4	0.037	17.64E+6	17,941	1.000	118.4	**87.0**	**114.0**
	337.7	4.4	98.7	99.8	436.4	104.2	0.043	17.56E+6	17,853	1.000	104.2	**98.7**	**99.8**
MIL INV	337.7	4.4	49.9	90.4	387.6	94.9	0.047	17.49E+6	17,782	1.000	94.9	**49.9**	**90.4**
	337.7	4.4	83.7	51.6	421.3	56.1	0.079	16.96E+6	17,248	1.000	56.1	**83.7**	**51.6**
Lane INV	337.7	4.4	76.8	58.9	414.5	63.4	0.070	17.11E+6	17,395	1.000	63.4	**76.8**	**58.9**
	337.7	4.4	105.5	51.3	443.2	55.8	0.080	16.96E+6	17,241	1.000	55.8	**105.5**	**51.3**
HS20 OPR	337.7	4.4	52.1	68.3	389.8	72.7	0.061	17.25E+6	17,543	1.000	72.7	**52.1**	**68.3**
	337.7	4.4	59.1	59.8	396.8	64.2	0.069	17.12E+6	17,410	1.000	64.2	**59.1**	**59.8**
MIL OPR	337.7	4.4	29.9	54.2	367.6	58.6	0.076	17.02E+6	17,303	1.000	58.6	**29.9**	**54.2**
	337.7	4.4	50.1	30.9	387.8	35.4	0.125	16.26E+6	16,538	1.000	35.4	**50.1**	**30.9**
Lane OPR	337.7	4.4	46.0	35.3	383.7	39.7	0.112	16.47E+6	16,743	1.000	39.7	**46.0**	**35.3**
	337.7	4.4	63.2	30.7	400.9	35.2	0.126	16.25E+6	16,528	1.000	35.2	**63.2**	**30.7**
2F1	337.7	4.4	18.1	32.1	355.8	36.5	0.121	16.32E+6	16,597	1.000	36.5	**18.1**	**32.1**
	337.7	4.4	29.5	21.2	367.2	25.6	0.173	15.60E+6	15,867	1.000	25.6	**29.5**	**21.2**
3F1	337.7	4.4	40.0	48.3	377.7	52.7	0.084	16.88E+6	17,167	1.000	52.7	**40.0**	**48.3**
	337.7	4.4	45.1	35.8	382.8	40.2	0.110	16.48E+6	16,763	1.000	40.2	**45.1**	**35.8**
4F1	337.7	4.4	42.9	56.3	380.6	60.7	0.073	17.06E+6	17,346	1.000	60.7	**42.9**	**56.3**
	337.7	4.4	51.4	45.7	389.1	50.1	0.089	16.82E+6	17,099	1.000	50.1	**51.4**	**45.7**
5C1	337.7	4.4	33.2	44.4	370.9	48.9	0.091	16.78E+6	17,063	1.000	48.9	**33.2**	**44.4**
	337.7	4.4	57.5	37.2	395.1	41.7	0.107	16.54E+6	16,822	1.000	41.7	**57.5**	**37.2**

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Column Member 61 References

Determine the Axial Load/Moment Interaction Diagram & Shear Capacity of a Rectangular Reinforced Concrete Section

Criteria

Designed by AASHTO, *Standard Specifications for Highway Bridges* , 17^{th} ed. 2002.
Strength design.
Capacity based on strain compatibility.
Dimensions are in pounds, feet and seconds, U.N.O.

Assumptions

Section is rectangular and uniform.
Reinforcement is evenly spaced along the tensile sides.

Material Properties & Section Details

Material Strengths and Properties

Steel

f_y	*40*	ksi	Reinforcement yield.	
E_s	29,000	ksi	Steel modulus of elasticity.	(8.7.2)
ε_{sy}	-0.0014		Yield strain in steel.	

Concrete

f'_c	*3.0*	ksi	Concrete strength.	
β_1	$= 0.85 - 0.05 (f'_c - 4.0) \le 0.85 \ \& \ \ge 0.65$			(8.16.2.7)
	0.850			
ε_c	+0.0030		Limiting strain in concrete.	(8.16.2.3)

Resistance Factors

Φ	0.75	Compression controlled section. (i.e. $\lvert\varepsilon_{st}\rvert < \lvert\varepsilon_{sy}\rvert$)	(8.16.1.2.2)
Φ	0.90	Tension controlled section. (i.e. $\lvert\varepsilon_{st}\rvert \ge 0.005$)	(After AASHTO, *LRFD* , 5.5.4.2.1)
Φ	0.85	Shear.	(8.16.6.2)

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References

Column Member 61

Section Details

Section is a: *Beam-Column*

b	*72*	in	Section width.	6' - 0"	
h	*13 1/2*	in	Section depth.	1' - 1 1/2"	
d_{cc}	*2*	in	Depth of clear cover.		(ACI 318-02, 7.5.2.1)
A_g	972.0	in^2	Area of gross section.		

Tensile Reinforcement

(Reinforcement in the side faces is, conservatively, ignored.)

d_{bt}	*1*	in	Bar diameter.
A_{st}	*4.712*	in^2	Tensile reinforcement area.
d_{st}	11	in	Depth to reinforcement.

Compression Reinforcement

d_{bc}	*1*	in	Bar diameter.
A_{sc}	*4.712*	in^2	Compression reinforcement area.
d_{sc}	2 1/2	in	Depth to reinforcement.

Transverse Reinforcement

d_{bv}	*9/16*	in	Bar diameter.
n	*4*		Number of legs / stirrup.
A_v	1.000	in^2	Stirrup reinforcement area.
s_v	*24*	in	Stirrup spacing.

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Column Member 61

Shear Strength & Rating

Shear Strength

Concrete

$V_c = 2f'_c{}^{1/2}bd$ (8-49)

86.8 kip

Reinforcement (8.16.6.3.2 & 8.16.6.3.9)

$V_s = A_v f_y d / s \leq 4 f'_c{}^{1/2} b d$ (8-53)

18.3 kip

Shear Capacity

$\Phi V_n = \Phi (V_c + V_s)$ Shear capacity of beam-column section.

89.3 kip

Shear Capacity & Load Rating

Loading	A_1V_{DU} *kip*	A_2V_{LU} *kip*	V_U *kip*	ΦV_n *kip*	RF V
HS20 INV	0.9	24.3	25.2	**89.3**	3.64
MIL INV	0.9	19.4	20.4	**89.3**	4.55
Lane INV	0.9	12.4	13.3	**89.3**	7.15
HS20 OPR	0.9	14.5	15.5	**89.3**	6.08
MIL OPR	0.9	11.6	12.6	**89.3**	7.60
Lane OPR	0.9	7.4	8.3	**89.3**	11.93
2F1	0.9	6.9	7.8	**89.3**	12.85
3F1	0.9	10.4	11.4	**89.3**	8.49
4F1	0.9	12.1	13.1	**89.3**	7.29
5C1	0.9	9.7	10.6	**89.3**	9.15

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Column Member 61

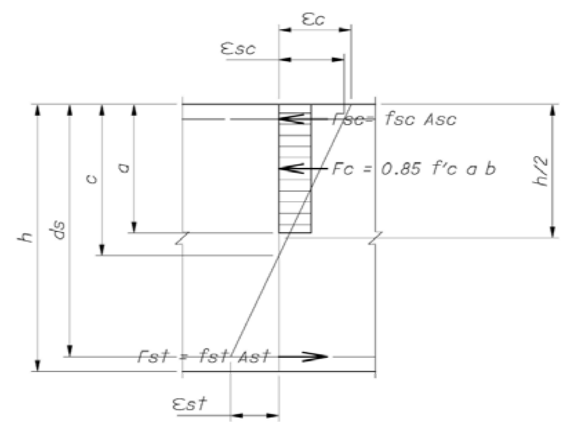
Moment/Axial Interaction Diagram

Axial Capacity

ψ 0.80 Ties.

$\Phi P_n = \Phi\ \psi\ [\ 0.85\ f'_c\ (A_g - A_s) + f_y\ A_s\ ]$ (8-29 and 8-30)

1,698.9 kip



General Expressions

c	$= d_s / [\ 1 - \varepsilon_s / \varepsilon_c\ ]$	Depth of the compression zone.
a	$= \beta_1\ c$	Depth of the stress block.
f_{st}	$= E_s\ \varepsilon_{st}$	Stress in the steel.
F_{st}	$= f_{st}\ A_{st}$	Force in the steel.
M_{st}	$= F_{st}\ (\ h/2 - d_{st}\ )$	Moment due to the steel.
F_c	$= 0.85\ f'_c\ a\ b$	Compressive force in concrete.
M_c	$= F_c\ (\ h/2 - a/2\ )$	Compressive moment in concrete.
f_{sc}	$= E_s\ \varepsilon_{sc}$	Stress in the steel.
F_{sc}	$= f_{sc}\ A_{sc}$	Force in the steel.
M_{sc}	$= F_{sc}\ (\ h/2 - d_{sc}\ )$	Moment due to the steel.

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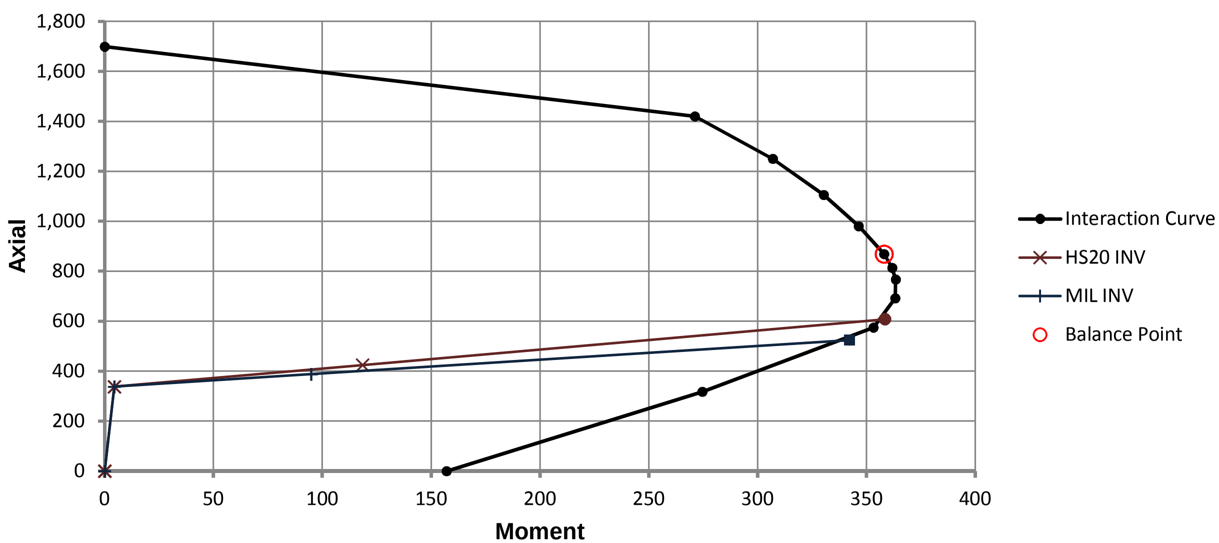
Column Member 61

Axial/Moment Interaction Diagram

$\varepsilon_{st} / \varepsilon_y$	Tensile Reinforcement				Concrete				Compressive Reinforcement				Capacity			
	ε_{st}	f_{st} ksi	P_{st} kip	M_{st} kip-ft	c in	a in	P_c kip	M_c kip-ft	ε_{sc}	f_{sc} ksi	P_{sc} kip	M_{sc} kip-ft	Φ	$ΦP_n$ kip	$ΦM_n$ kip-ft	e ft
N.A.													0.75	**1,698.9**	**0.0**	0.000
0%	0.0000	0.00	0.0	0.0	11.00	9.35	1,704.6	294.8	0.0023	40.00	188.5	66.8	0.75	1,419.9	271.1	0.191
25%	-0.0004	-10.00	-47.1	16.7	9.85	8.37	1,525.3	325.8	0.0022	40.00	188.5	66.8	0.75	1,250.0	307.0	0.246
50%	-0.0007	-20.00	-94.2	33.4	8.92	7.58	1,379.9	340.3	0.0022	40.00	188.5	66.8	0.75	1,105.6	330.3	0.299
75%	-0.0011	-30.00	-141.4	50.1	8.15	6.93	1,259.6	345.0	0.0021	40.00	188.5	66.8	0.75	980.0	346.4	0.353
100%	-0.0014	-40.00	-188.5	66.8	7.50	6.38	1,158.4	343.9	0.0020	40.00	188.5	66.8	0.75	868.8	358.1	0.412
128%	-0.0018	-40.00	-188.5	66.8	6.88	5.85	1,061.5	338.5	0.0019	40.00	188.5	66.8	0.77	813.7	361.8	0.445
157%	-0.0022	-40.00	-188.5	66.8	6.35	5.40	979.4	330.6	0.0018	40.00	188.5	66.8	0.78	767.0	363.4	0.474
214%	-0.0030	-40.00	-188.5	66.8	5.51	4.68	847.9	311.5	0.0016	40.00	188.5	66.8	0.82	692.0	363.2	0.525
327%	-0.0046	-40.00	-188.5	66.8	4.35	3.70	667.6	272.5	0.0013	36.50	172.0	60.9	0.88	574.5	353.2	0.615
554%	-0.0078	-40.00	-188.5	66.8	3.07	2.61	466.8	211.8	0.0006	15.87	74.8	26.5	0.90	317.7	274.6	0.864
980%	-0.0137	-40.00	-188.5	66.8	1.97	1.68	296.1	145.8	-0.0008	-22.83	-107.6	-38.1	0.90	**0.0**	**157.0**	∞



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References

Axial Capacity & Load Rating

Loading	A_1P_{DU}	A_1M_{DU}	A_2P_{LU}	A_2M_{LU}	e_L	P_U	M_U	ΦP_n	ΦM_n	RF	
	kip	*kip-ft*	*kip*	*kip-ft*	*ft*	*kip*	*kip-ft*	*kip*	*kip-ft*	F	M
HS20 INV	337.7	4.4	87.0	114.0	1.311	424.7	118.4	607.8	358.5	3.11	3.11
	337.7	4.4	98.7	99.8	1.011	436.4	104.2	692.7	363.2	3.60	3.60
MIL INV	337.7	4.4	49.9	90.4	1.813	387.6	94.9	524.0	342.1	3.73	3.73
	337.7	4.4	83.7	51.6	0.617	421.3	56.1	904.7	354.5	6.78	6.78
Lane INV	337.7	4.4	76.8	58.9	0.767	414.5	63.4	804.3	362.2	6.07	6.07
	337.7	4.4	105.5	51.3	0.486	443.2	55.8	1,028.7	340.6	6.55	6.55
HS20 OPR	337.7	4.4	52.1	68.3	1.311	389.8	72.7	607.8	358.5	5.18	5.18
	337.7	4.4	59.1	59.8	1.011	396.8	64.2	692.7	363.2	6.00	6.00
MIL OPR	337.7	4.4	29.9	54.2	1.813	367.6	58.6	524.0	342.1	6.23	6.23
	337.7	4.4	50.1	30.9	0.617	387.8	35.4	904.7	354.5	11.31	11.31
Lane OPR	337.7	4.4	46.0	35.3	0.767	383.7	39.7	804.3	362.2	10.14	10.14
	337.7	4.4	63.2	30.7	0.486	400.9	35.2	1,028.7	340.6	10.93	10.93
2F1	337.7	4.4	18.1	32.1	1.770	355.8	36.5	529.4	343.8	10.57	10.57
	337.7	4.4	29.5	21.2	0.719	367.2	25.6	833.4	360.7	16.80	16.80
3F1	337.7	4.4	40.0	48.3	1.206	377.7	52.7	633.3	361.0	7.39	7.39
	337.7	4.4	45.1	35.8	0.792	382.8	40.2	790.0	362.8	10.02	10.02
4F1	337.7	4.4	42.9	56.3	1.312	380.6	60.7	607.4	358.4	6.29	6.29
	337.7	4.4	51.4	45.7	0.889	389.1	50.1	741.9	363.7	7.86	7.86
5C1	337.7	4.4	33.2	44.4	1.337	370.9	48.9	601.9	357.6	7.95	7.95
	337.7	4.4	57.5	37.2	0.648	395.1	41.7	881.5	356.8	9.46	9.46

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Column Member 61

Summary of Ratings

Loading	RF			
	V	F	M	Total
HS20 INV	3.64	3.11	3.11	3.11
		3.60	3.60	3.60
MIL INV	4.55	3.73	3.73	3.73
		6.78	6.78	4.55
Lane INV	7.15	6.07	6.07	6.07
		6.55	6.55	6.55
HS20 OPR	6.08	5.18	5.18	5.18
		6.00	6.00	6.00
MIL OPR	7.60	6.23	6.23	6.23
		11.31	11.31	7.60
Lane OPR	11.93	10.14	10.14	10.14
		10.93	10.93	10.93
2F1	12.85	10.57	10.57	10.57
		16.80	16.80	12.85
3F1	8.49	7.39	7.39	7.39
		10.02	10.02	8.49
4F1	7.29	6.29	6.29	6.29
		7.86	7.86	7.29
5C1	9.15	7.95	7.95	7.95
		9.46	9.46	9.15

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Checked by	[illegible signature]	Date	2-27-13

(Input values are shown underlined and in italics.)

Column Member 63 — References

Determine the Axial Load/Moment Interaction Diagram & Shear Capacity of a Rectangular Reinforced Concrete Section

Criteria

Designed by AASHTO, *Standard Specifications for Highway Bridges* , 17th ed. 2002.
Strength design.
Capacity based on strain compatibility.
Dimensions are in pounds, feet and seconds, U.N.O.

Assumptions

Section is rectangular and uniform.
Reinforcement is evenly spaced along the tensile sides.

Material Properties & Section Details

Material Strengths and Properties

Steel

f_y	*40*	ksi	Reinforcement yield.	
E_s	29,000	ksi	Steel modulus of elasticity.	(8.7.2)
ε_{sy}	-0.0014		Yield strain in steel.	

Concrete

f'_c	*3.0*	ksi	Concrete strength.	
β_1	$= 0.85 - 0.05\,(f'_c - 4.0) \le 0.85\ \&\ \ge 0.65$			(8.16.2.7)
	0.850			
ε_c	+0.0030		Limiting strain in concrete.	(8.16.2.3)

Resistance Factors

Φ	0.75	Compression controlled section. (i.e. $\lvert\varepsilon_{st}\rvert < \lvert\varepsilon_{sy}\rvert$)	(8.16.1.2.2)
Φ	0.90	Tension controlled section. (i.e. $\lvert\varepsilon_{st}\rvert \ge 0.005$)	(After AASHTO, *LRFD* , 5.5.4.2.1)
Φ	0.85	Shear.	(8.16.6.2)

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(Input values are shown underlined and in italics.)

References

Column Member 63

Section Details

Section is a: *Beam-Column*

b	*72*	in	Section width.	6' - 0"	
h	*13 1/2*	in	Section depth.	1' - 1 1/2"	
d_{cc}	*2*	in	Depth of clear cover.		(ACI 318-02, 7.5.2.1)
A_g	972.0	in^2	Area of gross section.		

Tensile Reinforcement *(Reinforcement in the side faces is, conservatively, ignored.)*

d_{bt}	*1*	in	Bar diameter.
A_{st}	*4.712*	in^2	Tensile reinforcement area.
d_{st}	11	in	Depth to reinforcement.

Compression Reinforcement

d_{bc}	*1*	in	Bar diameter.
A_{sc}	*4.712*	in^2	Compression reinforcement area.
d_{sc}	2 1/2	in	Depth to reinforcement.

Transverse Reinforcement

d_{bv}	*9/16*	in	Bar diameter.
n	*4*		Number of legs / stirrup.
A_v	1.000	in^2	Stirrup reinforcement area.
s_v	*24*	in	Stirrup spacing.

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References

Column Member 63

Shear Strength & Rating

Shear Strength

Concrete

$V_c = 2f'_c{}^{1/2}bd$ (8-49)

86.8 kip

Reinforcement (8.16.6.3.2 & 8.16.6.3.9)

$V_s = A_v f_y d / s \leq 4 f'_c{}^{1/2} b d$ (8-53)

18.3 kip

Shear Capacity

$\Phi V_n = \Phi (V_c + V_s)$ Shear capacity of beam-column section.

89.3 kip

Shear Capacity & Load Rating

Loading	A_1V_{DU} *kip*	A_2V_{LU} *kip*	V_U *kip*	ΦV_n *kip*	RF V
HS20 INV	1.5	40.9	42.4	**89.3**	2.15
MIL INV	1.5	33.8	35.3	**89.3**	2.60
Lane INV	1.5	21.4	22.8	**89.3**	4.11
HS20 OPR	1.5	24.5	26.0	**89.3**	3.58
MIL OPR	1.5	20.3	21.7	**89.3**	4.34
Lane OPR	1.5	12.8	14.3	**89.3**	6.86
2F1	1.5	11.9	13.4	**89.3**	7.36
3F1	1.5	18.1	19.6	**89.3**	4.85
4F1	1.5	20.6	22.0	**89.3**	4.27
5C1	1.5	17.3	18.8	**89.3**	5.08

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References

Column Member 63

Moment/Axial Interaction Diagram

Axial Capacity

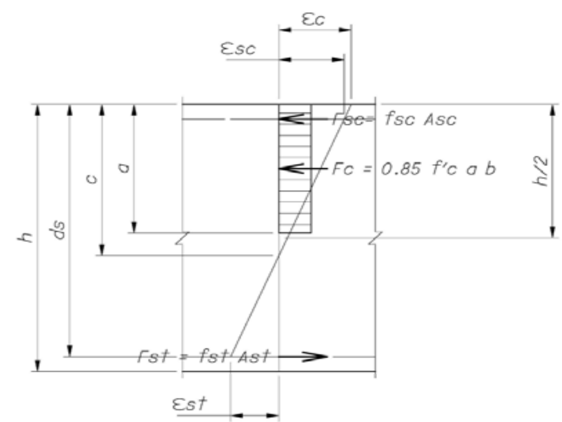
ψ 0.80 Ties.

ΦP_n $= \Phi\,\psi\,[\,0.85\,f'_c\,(A_g - A_s) + f_y\,A_s\,]$ (8-29 and 8-30)

1,698.9 kip

General Expressions

c	$= d_s / [\,1 - \varepsilon_s / \varepsilon_c\,]$	Depth of the compression zone.
a	$= \beta_1\,c$	Depth of the stress block.
f_{st}	$= E_s\,\varepsilon_{st}$	Stress in the steel.
F_{st}	$= f_{st}\,A_{st}$	Force in the steel.
M_{st}	$= F_{st}\,(\,h/2 - d_{st}\,)$	Moment due to the steel.
F_c	$= 0.85\,f'_c\,a\,b$	Compressive force in concrete.
M_c	$= F_c\,(\,h/2 - a/2\,)$	Compressive moment in concrete.
f_{sc}	$= E_s\,\varepsilon_{sc}$	Stress in the steel.
F_{sc}	$= f_{sc}\,A_{sc}$	Force in the steel.
M_{sc}	$= F_{sc}\,(\,h/2 - d_{sc}\,)$	Moment due to the steel.



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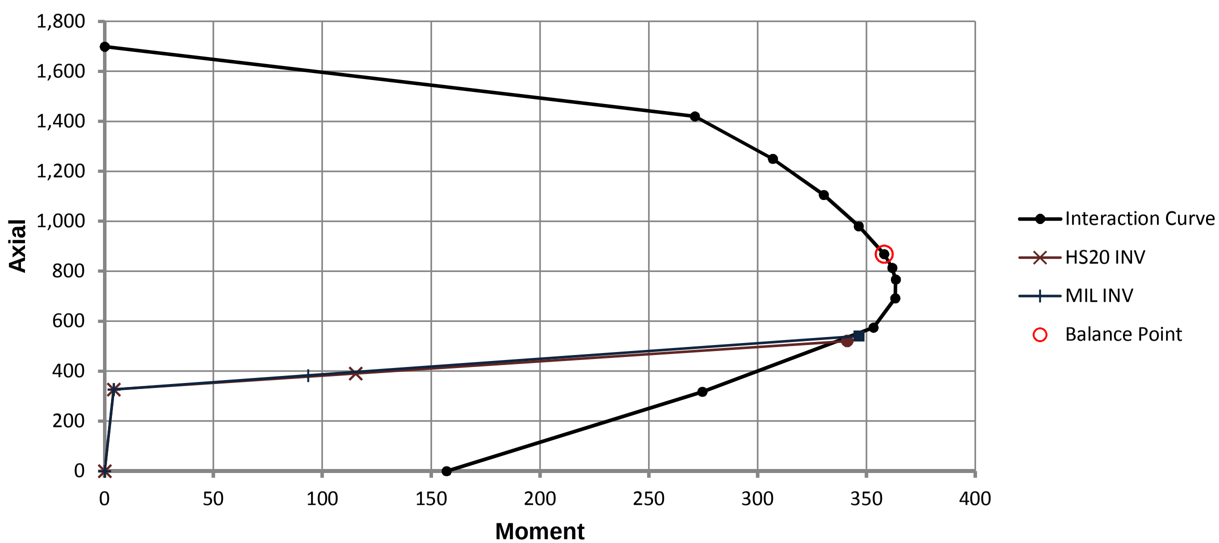
References

Column Member 63

Axial/Moment Interaction Diagram

$\varepsilon_{st} / \varepsilon_y$	Tensile Reinforcement				Concrete				Compressive Reinforcement				Capacity			
	ε_{st}	f_{st} ksi	P_{st} *kip*	M_{st} *kip-ft*	c *in*	a *in*	P_c *kip*	M_c *kip-ft*	ε_{sc}	f_{sc} ksi	P_{sc} *kip*	M_{sc} *kip-ft*	Φ	ΦP_n *kip*	ΦM_n *kip-ft*	e *ft*
N.A.													0.75	**1,698.9**	**0.0**	0.000
0%	0.0000	0.00	0.0	0.0	11.00	9.35	1,704.6	294.8	0.0023	40.00	188.5	66.8	0.75	1,419.9	271.1	0.191
25%	-0.0004	-10.00	-47.1	16.7	9.85	8.37	1,525.3	325.8	0.0022	40.00	188.5	66.8	0.75	1,250.0	307.0	0.246
50%	-0.0007	-20.00	-94.2	33.4	8.92	7.58	1,379.9	340.3	0.0022	40.00	188.5	66.8	0.75	1,105.6	330.3	0.299
75%	-0.0011	-30.00	-141.4	50.1	8.15	6.93	1,259.6	345.0	0.0021	40.00	188.5	66.8	0.75	980.0	346.4	0.353
100%	-0.0014	-40.00	-188.5	66.8	7.50	6.38	1,158.4	343.9	0.0020	40.00	188.5	66.8	0.75	868.8	358.1	0.412
128%	-0.0018	-40.00	-188.5	66.8	6.88	5.85	1,061.5	338.5	0.0019	40.00	188.5	66.8	0.77	813.7	361.8	0.445
157%	-0.0022	-40.00	-188.5	66.8	6.35	5.40	979.4	330.6	0.0018	40.00	188.5	66.8	0.78	767.0	363.4	0.474
214%	-0.0030	-40.00	-188.5	66.8	5.51	4.68	847.9	311.5	0.0016	40.00	188.5	66.8	0.82	692.0	363.2	0.525
327%	-0.0046	-40.00	-188.5	66.8	4.35	3.70	667.6	272.5	0.0013	36.50	172.0	60.9	0.88	574.5	353.2	0.615
554%	-0.0078	-40.00	-188.5	66.8	3.07	2.61	466.8	211.8	0.0006	15.87	74.8	26.5	0.90	317.7	274.6	0.864
980%	-0.0137	-40.00	-188.5	66.8	1.97	1.68	296.1	145.8	-0.0008	-22.83	-107.6	-38.1	0.90	**0.0**	**157.0**	∞



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References

Column Member 63

Axial Capacity & Load Rating

Loading	A_1P_{DU}	A_1M_{DU}	A_2P_{LU}	A_2M_{LU}	e_L	P_U	M_U	ΦP_n	ΦM_n	RF	
	kip	kip-ft	kip	kip-ft	ft	kip	kip-ft	kip	kip-ft	F	M
HS20 INV	327.1	4.2	63.8	111.1	1.740	390.9	115.3	**520.7**	**341.1**	3.03	3.03
	327.1	4.2	99.1	70.3	0.710	426.1	74.5	**829.8**	**360.9**	5.08	5.08
MIL INV	327.1	4.2	55.5	89.3	1.607	382.6	93.4	**540.1**	**346.5**	3.83	3.83
	327.1	4.2	87.6	61.9	0.707	414.7	66.1	**831.7**	**360.8**	5.76	5.76
Lane INV	327.1	4.2	72.5	59.9	0.827	399.5	64.1	**761.6**	**363.5**	6.00	6.00
	327.1	4.2	103.9	37.8	0.364	431.0	42.0	**1,188.1**	**317.7**	8.29	8.29
HS20 OPR	327.1	4.2	38.2	66.6	1.740	365.3	70.7	**520.7**	**341.1**	5.06	5.06
	327.1	4.2	59.3	42.1	0.710	386.4	46.3	**829.8**	**360.9**	8.47	8.47
MIL OPR	327.1	4.2	33.3	53.5	1.607	360.3	57.7	**540.1**	**346.5**	6.40	6.40
	327.1	4.2	52.5	37.1	0.707	379.6	41.3	**831.7**	**360.8**	9.61	9.61
Lane OPR	327.1	4.2	43.4	35.9	0.827	370.5	40.1	**761.6**	**363.5**	10.01	10.01
	327.1	4.2	62.2	22.7	0.364	389.3	26.8	**1,188.1**	**317.7**	13.83	13.83
2F1	327.1	4.2	19.5	31.8	1.631	346.6	36.0	**536.4**	**345.6**	10.74	10.74
	327.1	4.2	29.7	24.1	0.811	356.8	28.3	**769.8**	**363.4**	14.91	14.91
3F1	327.1	4.2	26.7	48.7	1.819	353.8	52.8	**510.6**	**338.1**	6.86	6.86
	327.1	4.2	44.7	19.2	0.429	371.8	23.4	**1,091.5**	**332.3**	17.09	17.09
4F1	327.1	4.2	28.0	55.8	1.995	355.0	60.0	**491.5**	**332.2**	5.88	5.88
	327.1	4.2	51.6	28.8	0.557	378.7	33.0	**947.6**	**350.0**	12.01	12.01
5C1	327.1	4.2	39.4	46.1	1.170	366.4	50.2	**631.8**	**360.9**	7.74	7.74
	327.1	4.2	55.1	41.1	0.746	382.1	45.3	**807.0**	**362.1**	8.71	8.71

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References

Column Member 63

Summary of Ratings

Loading	RF			
	V	F	M	Total
HS20 INV	2.15	3.03	3.03	**2.15**
		5.08	5.08	**2.15**
MIL INV	2.60	3.83	3.83	**2.60**
		5.76	5.76	**2.60**
Lane INV	4.11	6.00	6.00	**4.11**
		8.29	8.29	**4.11**
HS20 OPR	3.58	5.06	5.06	**3.58**
		8.47	8.47	**3.58**
MIL OPR	4.34	6.40	6.40	**4.34**
		9.61	9.61	**4.34**
Lane OPR	6.86	10.01	10.01	**6.86**
		13.83	13.83	**6.86**
2F1	7.36	10.74	10.74	**7.36**
		14.91	14.91	**7.36**
3F1	4.85	6.86	6.86	**4.85**
		17.09	17.09	**4.85**
4F1	4.27	5.88	5.88	**4.27**
		12.01	12.01	**4.27**
5C1	5.08	7.74	7.74	**5.08**
		8.71	8.71	**5.08**

Arch Slab & Floorbeams, and Approach Stringers Rating

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Project Name 287366 - D12 Load Ratings
Project # C4V-17-0283
Subject Lane Distribution Factors
Calculated by MRussell
Checked by [illegible]

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Date 24 Oct 12
Date 2-27-13

Determine the Lane Load Distribution Factors

Deck Slab

$E = (4 + 0.06S) \leq 7.0'/\text{wheel}$ (AASHTO, STD Spec., 3.24.3.2)

$= (4 + 0.06 \times 16'\text{-}8'') = 5.0'/\text{wheel}$

Say 7.0' for the lane

$b = 84.0''$

$DF = 1.0$

Approaches

$DF = S/5.5/\text{wheel}$

$= S/11.0/\text{lane}$

$= 5'\text{-}6''\text{o.c}/11 = 0.50/\text{lane}$

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LOAD ANALYSIS AND RATING INPUT v5.00.06.08

```
***************************************
* Form Type 01 - Batch Specifications *
***************************************
```

LARS Model for the arch slab deck & floorbeams, and the approach T-beams. - MR

Date: 10/02/12

Rating Analyst:MAR

```
                               Inv.    Oper    Post
Rating Type Exceptions:

Inventory Load Name:  HS20

Operating Load Name:  HS20         Allowable Stress Ratio / Inv.:

Posting Load Name:    2F1          Allowable Stress Ratio / Inv.:
Posting Load Name:    3F1
Posting Load Name:    4F1

Special                            Allowable Stress Ratio / Inv.:
```

"POST" always: POST

```
***************************************************
* Form Type 02 - Structure Header and Description *
***************************************************
```

Structure I.D.: CUY-17

Rating Analyst:MAR

Engineer's Attention:

```
                               Inv.    Oper    Post
Rating Type Exceptions:
```

Floor beam single lane:

Curb distance: 6 inches

Structure Type: RC

Year of Construction: 1933

Structure Length: 1919.000 feet

Roadway Width: 52.00 feet

Number of Spans: 6

Negate Special Load Analysis:

Inventory Load Name:

Operating Load Name:

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```
**********************************************************
* Form Type 03 - Non-Standard Live Load Truck Description *
**********************************************************
```

Load Name: 2F1

Number of Axle Loads: 2

Seq.	Axle 1		Axle 2		Axle 3		Axle 4	
	Load	Spacing	Load	Spacing	Load	Spacing	Load	Spacing
1	10.0	10.000	20.0	0.000		0.000		0.000

Load Name: 3F1

Number of Axle Loads: 3

Seq.	Axle 1		Axle 2		Axle 3		Axle 4	
	Load	Spacing	Load	Spacing	Load	Spacing	Load	Spacing
1	12.0	10.000	17.0	4.000	17.0	0.000		0.000

Load Name: 4F1

Number of Axle Loads: 4

Seq.	Axle 1		Axle 2		Axle 3		Axle 4	
	Load	Spacing	Load	Spacing	Load	Spacing	Load	Spacing
1	12.0	10.000	14.0	4.000	14.0	4.000	14.0	0.000

Load Name: 5C1

Number of Axle Loads: 5

Seq.	Axle 1		Axle 2		Axle 3		Axle 4	
	Load	Spacing	Load	Spacing	Load	Spacing	Load	Spacing
1	12.0	12.000	17.0	4.000	17.0	31.000	17.0	4.000

Seq.	Axle 5		Axle 6		Axle 7		Axle 8	
	Load	Spacing	Load	Spacing	Load	Spacing	Load	Spacing
2	17.0	0.000		0.000		0.000		0.000

Load Name: HS20

Number of Axle Loads: 3

Seq.	Axle 1		Axle 2		Axle 3		Axle 4	
	Load	Spacing	Load	Spacing	Load	Spacing	Load	Spacing
1	8.00	14.000	32.0	14.000	32.0	0.000		0.000

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```
*************************************************************************
* Form Type 04 - LRFD System Factors                                    *
*************************************************************************
```

Structure I.D.: CUY-17

System Factor: 0.000

ADTT: 0

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```
**************************************************************************
* Form Type 05 - Structure Location and Permanent Identification Factors *
**************************************************************************


Structure I.D.: CUY-17

Bridge Number: CUY-17-0

District: 1

County: CUY

Construction  Route:
              Section:
              Station:     +  .

Microfilm Reel Number  Design Plans:
                       Computations:
                       Correspondence:

Key Route I.D.:

Marked Route: SR-17

***************************
* Form Type 06 - Comments *
***************************


Structure I.D.: CUY-17

1 -  Mainspan roadway slab & floorbeams; and approach spans' roadway stri
2 -  ngers and floorbeams.


NBI ID                   1802046

Facility Carried         SR-17

Feature Intersected      Rocky River



******************************************
* Form Type 07 - Material Strength Input *
******************************************


Structure I.D.: CUY-17

Fy:             f'c:

                           Inv.  Oper   Post   Spec
Maximum Impact Factor:     30%    30%    30%    30%

                           Inv.  Oper   Post   Spec
Minimum Impact Factor:     10%    10%    10%    10%
```

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```
*************************************
* Form Type 44 - LRFD Member Factors *
*************************************
```

System Factor: 1.000

Condition Factor: 1.000

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```
*****************************************************
* Form Type 08 - Member Description Specifications *
*****************************************************
```

Main Arch Floorbeam - MR

Structure I.D.: CUY-17

Member I.D.: B01

Number of Spans: 3 Symmetry:

	Span 1	Span 2	Span 3	Span 4	Span 5	Span 6
Span Lengths:	5.50	35.50	5.50	0.00	0.00	0.00

Material Type: RC

Fy: 40000 f'c: 3000

Floor Beam Spacing: 16.67

End Floor Beam:

Through Beam (RC only):

	Inv.	Oper	Post	Spec
Maximum Impact Factor:	30%	30%	30%	30%

Stiffener Code:

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```
****************************************************
* Form Type 48 - LRFD Live Load Distribution Factor *
****************************************************
```

Structure I.D.: CUY-17

Member I.D.: S01

	Span 1			Span 2			Span 3		
	R1	R2	R3	R1	R2	R3	R1	R2	R3
1-lane DF	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
1-lane ft	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

	Span 4			Span 5			Span 6		
1-lane DF	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
1-lane ft	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

	Span 1			Span 2			Span 3		
	R1	R2	R3	R1	R2	R3	R1	R2	R3
2-lane DF	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
2-lane ft	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

	Span 4			Span 5			Span 6		
2-lane DF	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
2-lane ft	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

LRFD LLDF Shear

	Span 1			Span 2			Span 3		
	R1	R2	R3	R1	R2	R3	R1	R2	R3
1-lane DF	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
1-lane ft	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

	Span 4			Span 5			Span 6		
1-lane DF	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
1-lane ft	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

	Span 1			Span 2			Span 3		
	R1	R2	R3	R1	R2	R3	R1	R2	R3
2-lane DF	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

MRussell

```
2-lane ft |    0.000    0.000    0.000|   0.000    0.000    0.000|   0.000    0.000    0.0
00|

          |           Span  4          |           Span  5         |           Span  6
  |
2-lane DF |    0.000    0.000    0.000|   0.000    0.000    0.000|   0.000    0.000    0.0
00|
2-lane ft |    0.000    0.000    0.000|   0.000    0.000    0.000|   0.000    0.000    0.0
00|
```

MRussell

```
****************************************************
* Form Type 40 - Factors *
****************************************************
```

Structure I.D.:

Member I.D.:
LRFD Impact Factor: 0.000
AASHTO Multiplier - ASD/LFD Impact: 0.000

```
*****************************************
* Form Type 10 - Superimposed Dead Loads *
*****************************************
```

Structure I.D.: CUY-17

Member I.D.: B01

Symmetry:

Span No.	Load Type	Dist. from Left Supp.	Distributed Load (lbs/ft) Left	Right	Length	Concentrated Load (kips)
1	W	0.000	2580.	2580.	5.500	
2	W	0.000	2580.	2580.	35.500	
3	W	0.000	2580.	2580.	5.500	

```
**********************************************
* Form Type 11 - Section Range Specifications *
**********************************************
```

Structure I.D.: CUY-17

Member I.D.: B01

Symmetry:

Range Length -- Non-Composite:

Span No.	Range No.	Range Length	Sect. Left	Sect. Right	Sect. Var.	Hinge Location No. 1	No. 2	Hybrid Yield Base Fy	Exception Fy
1	1	5.500	1			0.0	0.0		
2	1	35.500	2			0.0	0.0		
3	1	5.500	1			0.0	0.0		

```
************************************************
* Form Type 13 - Reinforced Concrete Properties *
************************************************
```

Structure I.D.: CUY-17

Member I.D.: B01

MRussell

Sect. No.	Same/ Exc. Code	Bott Flg	Height	a	b	b'	t	i		Area	Dy	Comp Code
1			72.00	69.00		16.50		1	B	209	69.00	
1								2	B	309	6.00	
1								3	B	409	3.00	
2			72.00	69.00		16.50		1	B	411	69.00	
2								2	B	410	66.00	
2								3	B	309	6.00	
2								4	B	409	3.00	

****
* Form Type 17 - Shear Reinforcement Specifications *
****

Structure I.D.: CUY-17

Member I.D.: B01

Symmetry:

Span No.	Range No.	S B	Range Length	Group Code	Angle of reinf.	Shear i	Reinforcement Code	As	No. of Spaces	Equally Spaced Spaces in Range
1	1	S	5.500			01		4.650	5	0.000
2	1	S	5.167			01		8.600	10	0.000
2	2	S	25.163			01	B	004	1	25.163
2	3	S	5.167			01		8.600	10	0.000
3	1	S	5.500			01		4.650	5	0.000

MRussell

```
**************************************
* Form Type 44 - LRFD Member Factors *
**************************************
```

System Factor: 1.000

Condition Factor: 1.000

MRussell

```
***************************************************
* Form Type 08 - Member Description Specifications *
***************************************************
```

Main Arch Deck Slab - MR

Structure I.D.: CUY-17

Member I.D.: S01

Number of Spans: 11 Symmetry:

	Span 1	Span 2	Span 3	Span 4	Span 5	Span 6
Span Lengths:	16.67	16.67	16.67	16.67	16.67	16.67

Material Type: RC

Fy: 40000 f'c: 3000

Live Load Distribution Factor: 1.0

2nd Live Load Dist. Factor: 1.0

Through Beam (RC only):

	Inv.	Oper	Post	Spec
Maximum Impact Factor:	30%	30%	30%	30%

Stiffener Code:

MRussell

****
* Form Type 48 - LRFD Live Load Distribution Factor *
****

Structure I.D.: CUY-17

Member I.D.: S02

	Span 1			Span 2			Span 3		
	R1	R2	R3	R1	R2	R3	R1	R2	R3
1-lane DF	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
1-lane ft	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

	Span 4			Span 5			Span 6		
1-lane DF	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
1-lane ft	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

	Span 1			Span 2			Span 3		
	R1	R2	R3	R1	R2	R3	R1	R2	R3
2-lane DF	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
2-lane ft	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

	Span 4			Span 5			Span 6		
2-lane DF	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
2-lane ft	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

LRFD LLDF Shear

	Span 1			Span 2			Span 3		
	R1	R2	R3	R1	R2	R3	R1	R2	R3
1-lane DF	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
1-lane ft	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

	Span 4			Span 5			Span 6		
1-lane DF	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
1-lane ft	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

	Span 1			Span 2			Span 3		
	R1	R2	R3	R1	R2	R3	R1	R2	R3
2-lane DF	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

MRussell

```
2-lane ft |    0.000    0.000    0.000|   0.000    0.000    0.000|   0.000    0.000    0.0
00|

          |          Span  4         |          Span  5         |          Span  6
  |
2-lane DF |    0.000    0.000    0.000|   0.000    0.000    0.000|   0.000    0.000    0.0
00|
2-lane ft |    0.000    0.000    0.000|   0.000    0.000    0.000|   0.000    0.000    0.0
00|
```

MRussell

****
* Form Type 40 - Factors *
****

Structure I.D.:

Member I.D.:
LRFD Impact Factor: 0.000
AASHTO Multiplier - ASD/LFD Impact: 0.000

****
* Form Type 11 - Section Range Specifications *
****

Structure I.D.: CUY-17

Member I.D.: S01

Symmetry:

Range Length -- Non-Composite:

Span No.	Range No.	Range Length	Sect. Left	Sect. Right	Sect. Var.	Hinge Location No. 1	Hinge Location No. 2	Hybrid Yield Base Fy	Hybrid Yield Exception Fy
1	1	16.667	1			0.0	0.0		
2	1	16.667	1			0.0	0.0		
3	1	16.667	1			0.0	0.0		
4	1	16.667	1			0.0	0.0		
5	1	16.667	1			0.0	0.0		
6	1	16.667	1			0.0	0.0		
7	1	16.667	1			0.0	0.0		
8	1	16.667	1			0.0	0.0		
9	1	16.667	1			0.0	0.0		
10	1	16.667	1			0.0	0.0		
11	1	16.667	1			0.0	0.0		

****
* Form Type 13 - Reinforced Concrete Properties *
****

Structure I.D.: CUY-17

Member I.D.: S01

Sect. No.	Same/ Exc.	Code	Bott Flg	Height	a	b	b'	t	i	Area	Dy	Comp Code
1				12.00	9.500		84.00		1	14.00	9.50	
1									2	14.00	2.50	

MRussell

****
* Form Type 44 - LRFD Member Factors *
****

System Factor: 1.000

Condition Factor: 1.000

MRussell

```
*****************************************************
* Form Type 08 - Member Description Specifications *
*****************************************************
```

East Approach Interior Stringer (Original) - MR

Structure I.D.: CUY-17

Member I.D.: S02

Number of Spans: 3 Symmetry:

	Span 1	Span 2	Span 3	Span 4	Span 5	Span 6
Span Lengths:	32.50	50.00	32.50	0.00	0.00	0.00

Material Type: RC

Fy: 40000 f'c: 3000

Live Load Distribution Factor: 0.5

Through Beam (RC only):

	Inv.	Oper	Post	Spec
Maximum Impact Factor:	30%	30%	30%	30%

Stiffener Code:

MRussell

```
****************************************************
* Form Type 48 - LRFD Live Load Distribution Factor *
****************************************************


Structure I.D.: CUY-17

Member I.D.: S03

          |           Span  1          |           Span  2          |           Span  3
  |
          |     R1       R2       R3  |    R1       R2       R3  |    R1       R2       R3
  |
1-lane DF |    0.000    0.000    0.000|   0.000    0.000    0.000|   0.000    0.000    0.0
00|
1-lane ft |    0.000    0.000    0.000|   0.000    0.000    0.000|   0.000    0.000    0.0
00|

          |           Span  4          |           Span  5          |           Span  6
  |
1-lane DF |    0.000    0.000    0.000|   0.000    0.000    0.000|   0.000    0.000    0.0
00|
1-lane ft |    0.000    0.000    0.000|   0.000    0.000    0.000|   0.000    0.000    0.0
00|

          |           Span  1          |           Span  2          |           Span  3
  |
          |     R1       R2       R3  |    R1       R2       R3  |    R1       R2       R3
  |
2-lane DF |    0.000    0.000    0.000|   0.000    0.000    0.000|   0.000    0.000    0.0
00|
2-lane ft |    0.000    0.000    0.000|   0.000    0.000    0.000|   0.000    0.000    0.0
00|

          |           Span  4          |           Span  5          |           Span  6
  |
2-lane DF |    0.000    0.000    0.000|   0.000    0.000    0.000|   0.000    0.000    0.0
00|
2-lane ft |    0.000    0.000    0.000|   0.000    0.000    0.000|   0.000    0.000    0.0
00|

LRFD LLDF Shear

          |           Span  1          |           Span  2          |           Span  3
  |
          |     R1       R2       R3  |    R1       R2       R3  |    R1       R2       R3
  |
1-lane DF |    0.000    0.000    0.000|   0.000    0.000    0.000|   0.000    0.000    0.0
00|
1-lane ft |    0.000    0.000    0.000|   0.000    0.000    0.000|   0.000    0.000    0.0
00|

          |           Span  4          |           Span  5          |           Span  6
  |
1-lane DF |    0.000    0.000    0.000|   0.000    0.000    0.000|   0.000    0.000    0.0
00|
1-lane ft |    0.000    0.000    0.000|   0.000    0.000    0.000|   0.000    0.000    0.0
00|

          |           Span  1          |           Span  2          |           Span  3
  |
          |     R1       R2       R3  |    R1       R2       R3  |    R1       R2       R3
  |
2-lane DF |    0.000    0.000    0.000|   0.000    0.000    0.000|   0.000    0.000    0.0
00|
```

MRussell

```
2-lane ft |    0.000    0.000    0.000|   0.000    0.000    0.000|   0.000    0.000    0.0
00|

          |          Span  4         |          Span  5         |          Span  6
  |
2-lane DF |    0.000    0.000    0.000|   0.000    0.000    0.000|   0.000    0.000    0.0
00|
2-lane ft |    0.000    0.000    0.000|   0.000    0.000    0.000|   0.000    0.000    0.0
00|
```

MRussell

****
* Form Type 40 - Factors *
****

Structure I.D.:

Member I.D.:
LRFD Impact Factor: 0.000
AASHTO Multiplier - ASD/LFD Impact: 0.000

****
* Form Type 10 - Superimposed Dead Loads *
****

Structure I.D.: CUY-17

Member I.D.: S02

Symmetry:

Span No.	Load Type	Dist. from Left Supp.	Distributed Load (lbs/ft) Left	Right	Length	Concentrated Load (kips)
1	W	0.000	357.0	357.0	32.500	
2	W	0.000	357.0	357.0	50.000	
3	W	0.000	357.0	357.0	32.500	

****
* Form Type 11 - Section Range Specifications *
****

Structure I.D.: CUY-17

Member I.D.: S02

Symmetry:

Range Length -- Non-Composite:

Span No.	Range No.	Range Length	Sect. Left	Sect. Right	Sect. Var.	Hinge Location No. 1	No. 2	Hybrid Yield Base Fy	Exception Fy
1	1	3.250	1	2	PB	0.0	0.0		
1	2	3.250	3	4	PB	0.0	0.0		
1	3	19.500	4			0.0	0.0		
1	4	3.250	5	6	PB	0.0	0.0		
1	5	3.250	7	8	PB	0.0	0.0		
2	1	6.500	9	10	PB	0.0	0.0		
2	2	37.000	11			0.0	0.0		
2	3	6.500	10	9	PB	0.0	0.0		
3	1	6.500	8	12	PB	0.0	0.0		
3	2	19.500	4			0.0	0.0		
3	3	6.500	4	13	PB	0.0	0.0		

****

MRussell

* Form Type 13 - Reinforced Concrete Properties *
****

Structure I.D.: CUY-17

Member I.D.: S02

Sect. No.	Same/ Exc. Code	Bott Flg	Height	a	b	b'	t	i		Area	Dy	Comp Code
1			66.00	62.99		16.00		1	B	210	63.00	
1								2	B	210	60.00	
1								3	B	211	3.00	
2			43.50	40.49		16.00		1	B	210	40.50	
2								2	B	210	37.50	
2								3	B	211	3.00	
3			43.50	40.49		16.00		1	B	210	40.50	
3								2	B	210	40.50	
3								3	B	210	37.50	
3								4	B	211	3.00	
4			36.00	32.99		16.00		1	B	210	33.00	
4								2	B	210	33.00	
4								3	B	210	30.00	
4								4	B	211	3.00	
5			36.00	32.99		16.00		1	B	210	33.00	
5								2	B	210	33.00	
5								3	B	211	6.00	
5								4	B	211	3.00	
5								5	B	211	3.00	
6			43.50	40.49		16.00		1	B	210	40.50	
6								2	B	210	40.50	
6								3	B	211	6.00	
6								4	B	211	3.00	
6								5	B	211	3.00	
7			43.50	40.49		16.00		1	B	210	40.50	
7								2	B	211	6.00	
7								3	B	211	3.00	
7								4	B	211	3.00	
8			66.00	62.99		16.00		1	B	210	63.00	
8								2	B	211	6.00	
8								3	B	211	3.00	
8								4	B	211	3.00	
9			66.00	62.99		16.00		1	B	211	63.00	
9								2	B	211	6.00	
9								3	B	211	3.00	
9								4	B	211	3.00	
10			36.00	32.99		16.00		1	B	211	33.00	
10								2	B	211	6.00	
10								3	B	211	3.00	
10								4	B	211	3.00	
11			36.00	33.00		16.00		1	B	211	33.00	
11								2	B	211	33.00	
11								3	B	211	30.00	
11								4	B	211	3.00	
12			36.00	32.99		16.00		1	B	210	33.00	
12								2	B	211	6.00	
12								3	B	211	3.00	
12								4	B	211	3.00	
13			66.00	63.00		16.00		1	B	210	63.00	
13								2	B	210	63.00	
13								3	B	210	60.00	
13								4	B	211	3.00	

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****
* Form Type 17 - Shear Reinforcement Specifications *
****

Structure I.D.: CUY-17

Member I.D.: S02

Symmetry:

Span No.	Range No.	S B	Range Length	Group Code	Angle of reinf.	Shear i	Reinforcement Code	As	No. of Spaces	Equally Spaced Spaces in Range
1	1	S	6.500			01		6.000	13	0.000
1	2	S	19.500			01	B	004	1	19.500
1	3	S	6.500			01		12.00	26	0.000
2	1	S	6.500			01		12.00	26	0.000
2	2	S	37.000			01	B	004	1	37.000
2	3	S	6.500			01		12.00	26	0.000
3	1	S	6.500			01		12.00	26	0.000
3	2	S	19.500			01	B	004	1	19.500
3	3	S	6.500			01		6.000	13	0.000

MRussell

```
**************************************
* Form Type 44 - LRFD Member Factors *
**************************************
```

System Factor: 1.000

Condition Factor: 1.000

MRussell

```
****************************************************
* Form Type 08 - Member Description Specifications *
****************************************************
```

East Approach Interior Stringer (Rehab) - MR

Structure I.D.: CUY-17

Member I.D.: S03

Number of Spans: 3 Symmetry:

	Span 1	Span 2	Span 3	Span 4	Span 5	Span 6
Span Lengths:	32.50	50.00	32.50	0.00	0.00	0.00

Material Type: RC

Fy: 60000 f'c: 4500

Live Load Distribution Factor: 0.5

Through Beam (RC only):

	Inv.	Oper	Post	Spec
Maximum Impact Factor:	30%	30%	30%	30%

Stiffener Code:

MRussell

```
****************************************************
* Form Type 48 - LRFD Live Load Distribution Factor *
****************************************************
```

Structure I.D.: CUY-17

Member I.D.: S04

	Span 1			Span 2			Span 3		
	R1	R2	R3	R1	R2	R3	R1	R2	R3
1-lane DF	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
1-lane ft	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

	Span 4			Span 5			Span 6		
1-lane DF	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
1-lane ft	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

	Span 1			Span 2			Span 3		
	R1	R2	R3	R1	R2	R3	R1	R2	R3
2-lane DF	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
2-lane ft	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

	Span 4			Span 5			Span 6		
2-lane DF	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
2-lane ft	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

LRFD LLDF Shear

	Span 1			Span 2			Span 3		
	R1	R2	R3	R1	R2	R3	R1	R2	R3
1-lane DF	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
1-lane ft	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

	Span 4			Span 5			Span 6		
1-lane DF	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
1-lane ft	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

	Span 1			Span 2			Span 3		
	R1	R2	R3	R1	R2	R3	R1	R2	R3
2-lane DF	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

MRussell

2-lane ft	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

	Span 4			Span 5			Span 6		
2-lane DF	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
2-lane ft	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

MRussell

****
* Form Type 40 - Factors *
****

Structure I.D.:

Member I.D.:
LRFD Impact Factor: 0.000
AASHTO Multiplier - ASD/LFD Impact: 0.000

****
* Form Type 10 - Superimposed Dead Loads *
****

Structure I.D.: CUY-17

Member I.D.: S03

Symmetry:

Span No.	Load Type	Dist. from Left Supp.	Distributed Load (lbs/ft) Left	Right	Length	Concentrated Load (kips)
1	W	0.000	370.0	370.0	32.500	
2	W	0.000	370.0	370.0	50.000	
3	W	0.000	370.0	370.0	32.500	

****
* Form Type 11 - Section Range Specifications *
****

Structure I.D.: CUY-17

Member I.D.: S03

Symmetry:

Range Length -- Non-Composite:

Span No.	Range No.	Range Length	Sect. Left	Sect. Right	Sect. Var.	Hinge Location No. 1	Hinge Location No. 2	Hybrid Yield Base Fy	Hybrid Yield Exception Fy
1	1	16.250	1	2	PB	0.0	0.0		
1	2	8.125	3	4	PB	0.0	0.0		
1	3	8.125	5	6	PB	0.0	0.0		
2	1	8.125	7	8	PB	0.0	0.0		
2	2	8.125	9	10	PB	0.0	0.0		
2	3	8.750	11	12	PB	0.0	0.0		
2	4	8.750	12	11	PB	0.0	0.0		
2	5	8.130	10	9	PB	0.0	0.0		
2	6	8.120	8	7	PB	0.0	0.0		
3	1	8.130	6	5	PB	0.0	0.0		
3	2	8.120	4	3	PB	0.0	0.0		
3	3	16.250	2	1	PB	0.0	0.0		

MRussell

****
* Form Type 13 - Reinforced Concrete Properties *
****

Structure I.D.: CUY-17

Member I.D.: S03

Sect. No.	Same/ Exc.	Code	Bott Flg	Height	a	b	b'	t	i		Area	Dy	Comp Code
1				57.00	53.99		16.00		1	B	411	54.00	
1									2	B	411	3.00	
2				39.00	35.99		16.00		1	B	411	36.00	
2									2	B	411	3.00	
3				39.00	35.99		16.00		1	B	411	36.00	
3									2	B	411	6.00	
3									3	B	411	3.00	
4				43.50	40.49		16.00		1	B	411	40.50	
4									2	B	411	6.00	
4									3	B	411	3.00	
5				43.50	40.49		16.00		1	B	411	40.50	
5									2	B	211	9.00	
5									3	B	411	6.00	
5									4	B	411	3.00	
6				57.00	53.99		16.00		1	B	411	54.00	
6									2	B	211	9.00	
6									3	B	411	6.00	
6									4	B	411	3.00	
7				57.00	53.99		16.00		1	B	411	54.00	
7									2	B	211	51.00	
7									3	B	211	9.00	
7									4	B	411	6.00	
7									5	B	411	3.00	
8				47.20	44.20		16.00		1	B	411	44.20	
8									2	B	211	41.20	
8									3	B	211	9.00	
8									4	B	411	6.00	
8									5	B	411	3.00	
9				47.20	44.20		16.00		1	B	411	44.20	
9									2	B	211	41.20	
9									3	B	411	6.00	
9									4	B	411	3.00	
10				41.20	38.20		16.00		1	B	411	38.20	
10									2	B	211	35.20	
10									3	B	411	6.00	
10									4	B	411	3.00	
11				41.20	38.20		16.00		1	B	411	38.20	
11									2	B	211	35.20	
11									3	B	411	3.00	
12				39.00	35.99		16.00		1	B	411	36.00	
12									2	B	211	33.00	
12									3	B	411	3.00	

****
* Form Type 17 - Shear Reinforcement Specifications *
****

Structure I.D.: CUY-17

MRussell

Member I.D.: S03

Symmetry:

Span No.	Range No.	S B	Range Length	Group Code	Angle of reinf.	Shear i	Reinforcement Code	As	No. of Spaces	Equally Spaced Spaces in Range
1	1	S	13.000			01	B	205	13	1.000
1	2	S	9.450			01	B	004	1	9.450
1	3	S	10.050			01	B	205	30	0.670
2	1	S	10.050			01	B	205	30	0.670
2	2	S	29.900			01	B	004	1	29.900
2	3	S	10.050			01	B	205	30	0.670
3	1	S	10.050			01	B	205	30	0.670
3	2	S	9.450			01	B	004	1	9.450
3	3	S	13.000			01	B	205	13	1.000

MRussell

```
***************************************
* Form Type 44 - LRFD Member Factors *
***************************************
```

System Factor: 1.000

Condition Factor: 1.000

MRussell

```
*****************************************************
* Form Type 08 - Member Description Specifications *
*****************************************************
```

West Approach Interior Stringer (Original) - MR

Structure I.D.: CUY-17

Member I.D.: S04

Number of Spans: 6 Symmetry:

	Span 1	Span 2	Span 3	Span 4	Span 5	Span 6
Span Lengths:	33.33	33.33	33.33	33.33	33.33	33.33

Material Type: RC

Fy: 40000 f'c: 3000

Live Load Distribution Factor: 0.5

2nd Live Load Dist. Factor: 0.5

Through Beam (RC only):

	Inv.	Oper	Post	Spec
Maximum Impact Factor:	30%	30%	30%	30%

Stiffener Code:

MRussell

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*****************************************************
* Form Type 48 - LRFD Live Load Distribution Factor *
*****************************************************
```

Structure I.D.: CUY-17

Member I.D.: S05

	Span 1			Span 2			Span 3		
	R1	R2	R3	R1	R2	R3	R1	R2	R3
1-lane DF	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
1-lane ft	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

	Span 4			Span 5			Span 6		
1-lane DF	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
1-lane ft	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

	Span 1			Span 2			Span 3		
	R1	R2	R3	R1	R2	R3	R1	R2	R3
2-lane DF	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
2-lane ft	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

	Span 4			Span 5			Span 6		
2-lane DF	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
2-lane ft	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

LRFD LLDF Shear

	Span 1			Span 2			Span 3		
	R1	R2	R3	R1	R2	R3	R1	R2	R3
1-lane DF	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
1-lane ft	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

	Span 4			Span 5			Span 6		
1-lane DF	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
1-lane ft	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

	Span 1			Span 2			Span 3		
	R1	R2	R3	R1	R2	R3	R1	R2	R3
2-lane DF	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

MRussell

```
2-lane ft |    0.000    0.000    0.000|   0.000    0.000    0.000|   0.000    0.000    0.0
00|

          |           Span  4         |           Span  5        |           Span  6
  |
2-lane DF |    0.000    0.000    0.000|   0.000    0.000    0.000|   0.000    0.000    0.0
00|
2-lane ft |    0.000    0.000    0.000|   0.000    0.000    0.000|   0.000    0.000    0.0
00|
```

MRussell

****
* Form Type 40 - Factors *
****

Structure I.D.:

Member I.D.:
LRFD Impact Factor: 0.000
AASHTO Multiplier - ASD/LFD Impact: 0.000

****
* Form Type 10 - Superimposed Dead Loads *
****

Structure I.D.: CUY-17

Member I.D.: S04

Symmetry:

Span No.	Load Type	Dist. from Left Supp.	Distributed Load (lbs/ft) Left	Right	Length	Concentrated Load (kips)
1	W	0.000	357.0	357.0	33.330	
2	W	0.000	357.0	357.0	33.330	
3	W	0.000	357.0	357.0	33.330	
4	W	0.000	357.0	357.0	33.330	
5	W	0.000	357.0	357.0	33.330	
6	W	0.000	357.0	357.0	33.330	

****
* Form Type 11 - Section Range Specifications *
****

Structure I.D.: CUY-17

Member I.D.: S04

Symmetry:

Range Length -- Non-Composite:

Span No.	Range No.	Range Length	Sect. Left	Sect. Right	Sect. Var.	Hinge Location No. 1	No. 2	Hybrid Yield Base Fy	Exception Fy
1	1	6.500	1	2	PB	0.0	0.0		
1	2	20.330	3			0.0	0.0		
1	3	6.500	4	5	PB	0.0	0.0		
2	1	6.500	5	4	PB	0.0	0.0		
2	2	20.330	3			0.0	0.0		
2	3	6.500	4	5	PB	0.0	0.0		
3	1	6.500	5	4	PB	0.0	0.0		
3	2	20.330	3			0.0	0.0		
3	3	6.500	4	5	PB	0.0	0.0		
4	1	6.500	5	4	PB	0.0	0.0		
4	2	20.330	3			0.0	0.0		

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4	3	6.500	4	5	PB	0.0	0.0
5	1	6.500	5	4	PB	0.0	0.0
5	2	20.330	3			0.0	0.0
5	3	6.500	4	5	PB	0.0	0.0
6	1	6.500	5	4	PB	0.0	0.0
6	2	20.330	3			0.0	0.0
6	3	6.500	2	1	PB	0.0	0.0

****
* Form Type 13 - Reinforced Concrete Properties *
****

Structure I.D.: CUY-17

Member I.D.: S04

Sect. No.	Same/ Exc.	Code	Bott Flg	Height	a	b	b'	t	i		Area	Dy	Comp Code
1				66.00	62.99		16.00		1	B	211	63.00	
1									2	B	211	3.00	
2				36.00	32.99		16.00		1	B	211	33.00	
2									2	B	211	3.00	
3				36.00	33.00		16.00		1	B	211	33.00	
3									2	B	211	33.00	
3									3	B	211	30.00	
3									4	B	211	3.00	
4				36.00	32.99		16.00		1	B	211	33.00	
4									2	B	211	6.00	
4									3	B	211	3.00	
4									4	B	211	3.00	
5				66.00	62.99		16.00		1	B	211	63.00	
5									2	B	211	6.00	
5									3	B	211	3.00	
5									4	B	211	3.00	

****
* Form Type 17 - Shear Reinforcement Specifications *
****

Structure I.D.: CUY-17

Member I.D.: S04

Symmetry:

Span No.	Range No.	S B	Range Length	Group Code	Angle of reinf.	Shear i	Reinforcement Code	As	No. of Spaces	Equally Spaced Spaces in Range
1	1	S	9.000			01		6.500	6	0.000
1	2	S	15.330			01	B	004	1	15.330
1	3	S	9.000			01		13.00	12	0.000
2	1	S	9.000			01		13.00	12	0.000
2	2	S	15.330			01	B	004	1	15.330
2	3	S	9.000			01		13.00	12	0.000
3	1	S	9.000			01		13.00	12	0.000
3	2	S	15.330			01	B	004	1	15.330
3	3	S	9.000			01		13.00	12	0.000

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4	1	S	9.000	01		13.00	12	0.000
4	2	S	15.330	01	B	004	1	15.330
4	3	S	9.000	01		13.00	12	0.000
5	1	S	9.000	01		13.00	12	0.000
5	2	S	15.330	01	B	004	1	15.330
5	3	S	9.000	01		13.00	12	0.000
6	1	S	9.000	01		13.00	12	0.000
6	2	S	15.330	01	B	004	1	15.330
6	3	S	9.000	01		6.500	6	0.000

MRussell

```
**************************************
* Form Type 44 - LRFD Member Factors *
**************************************
```

System Factor: 1.000

Condition Factor: 1.000

MRussell

```
***************************************************
* Form Type 08 - Member Description Specifications *
***************************************************
```

West Approach Interior Stringer (Rehab) - MR

Structure I.D.: CUY-17

Member I.D.: S05

Number of Spans: 6 Symmetry:

	Span 1	Span 2	Span 3	Span 4	Span 5	Span 6
Span Lengths:	33.33	33.33	33.33	33.33	33.33	33.33

Material Type: RC

Fy: 60000 f'c: 4500

Live Load Distribution Factor: 0.5

2nd Live Load Dist. Factor: 0.5

Through Beam (RC only):

	Inv.	Oper	Post	Spec
Maximum Impact Factor:	30%	30%	30%	30%

Stiffener Code:

MRussell

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****************************************************
* Form Type 48 - LRFD Live Load Distribution Factor *
****************************************************


Structure I.D.: CUY-17

Member I.D.: S05

          |           Span  1          |           Span  2          |           Span  3
  |
          |     R1       R2       R3  |    R1       R2       R3  |    R1       R2       R3
  |
1-lane DF |    0.000    0.000    0.000|   0.000    0.000    0.000|   0.000    0.000    0.0
00|
1-lane ft |    0.000    0.000    0.000|   0.000    0.000    0.000|   0.000    0.000    0.0
00|

          |           Span  4          |           Span  5          |           Span  6
  |
1-lane DF |    0.000    0.000    0.000|   0.000    0.000    0.000|   0.000    0.000    0.0
00|
1-lane ft |    0.000    0.000    0.000|   0.000    0.000    0.000|   0.000    0.000    0.0
00|

          |           Span  1          |           Span  2          |           Span  3
  |
          |     R1       R2       R3  |    R1       R2       R3  |    R1       R2       R3
  |
2-lane DF |    0.000    0.000    0.000|   0.000    0.000    0.000|   0.000    0.000    0.0
00|
2-lane ft |    0.000    0.000    0.000|   0.000    0.000    0.000|   0.000    0.000    0.0
00|

          |           Span  4          |           Span  5          |           Span  6
  |
2-lane DF |    0.000    0.000    0.000|   0.000    0.000    0.000|   0.000    0.000    0.0
00|
2-lane ft |    0.000    0.000    0.000|   0.000    0.000    0.000|   0.000    0.000    0.0
00|

LRFD LLDF Shear

          |           Span  1          |           Span  2          |           Span  3
  |
          |     R1       R2       R3  |    R1       R2       R3  |    R1       R2       R3
  |
1-lane DF |    0.000    0.000    0.000|   0.000    0.000    0.000|   0.000    0.000    0.0
00|
1-lane ft |    0.000    0.000    0.000|   0.000    0.000    0.000|   0.000    0.000    0.0
00|

          |           Span  4          |           Span  5          |           Span  6
  |
1-lane DF |    0.000    0.000    0.000|   0.000    0.000    0.000|   0.000    0.000    0.0
00|
1-lane ft |    0.000    0.000    0.000|   0.000    0.000    0.000|   0.000    0.000    0.0
00|

          |           Span  1          |           Span  2          |           Span  3
  |
          |     R1       R2       R3  |    R1       R2       R3  |    R1       R2       R3
  |
2-lane DF |    0.000    0.000    0.000|   0.000    0.000    0.000|   0.000    0.000    0.0
00|
```

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```
2-lane ft |    0.000    0.000    0.000|   0.000    0.000    0.000|   0.000    0.000    0.0
00|

          |          Span  4         |          Span  5         |          Span  6
  |
2-lane DF |    0.000    0.000    0.000|   0.000    0.000    0.000|   0.000    0.000    0.0
00|
2-lane ft |    0.000    0.000    0.000|   0.000    0.000    0.000|   0.000    0.000    0.0
00|
```

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****
* Form Type 40 - Factors *
****

Structure I.D.:

Member I.D.:
LRFD Impact Factor: 0.000
AASHTO Multiplier - ASD/LFD Impact: 0.000

****
* Form Type 10 - Superimposed Dead Loads *
****

Structure I.D.: CUY-17

Member I.D.: S05

Symmetry:

Span No.	Load Type	Dist. from Left Supp.	Distributed Load (lbs/ft) Left	Right	Length	Concentrated Load (kips)
1	W	0.000	370.0	370.0	33.330	
2	W	0.000	370.0	370.0	33.330	
3	W	0.000	370.0	370.0	33.330	
4	W	0.000	370.0	370.0	33.330	
5	W	0.000	370.0	370.0	33.330	
6	W	0.000	370.0	370.0	33.330	

****
* Form Type 11 - Section Range Specifications *
****

Structure I.D.: CUY-17

Member I.D.: S05

Symmetry:

Range Length -- Non-Composite:

Span No.	Range No.	Range Length	Sect. Left	Sect. Right	Sect. Var.	Hinge Location No. 1	No. 2	Hybrid Yield Base Fy	Exception Fy
1	1	6.500	1	2	PB	0.0	0.0		
1	2	20.330	3			0.0	0.0		
1	3	6.500	4	5	PB	0.0	0.0		
2	1	6.500	5	4	PB	0.0	0.0		
2	2	20.330	2			0.0	0.0		
2	3	6.500	4	5	PB	0.0	0.0		
3	1	6.500	5	4	PB	0.0	0.0		
3	2	20.330	2			0.0	0.0		
3	3	6.500	4	5	PB	0.0	0.0		
4	1	6.500	5	4	PB	0.0	0.0		
4	2	20.330	2			0.0	0.0		

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4	3	6.500	4	5	PB	0.0	0.0
5	1	6.500	5	4	PB	0.0	0.0
5	2	20.330	2			0.0	0.0
5	3	6.500	4	5	PB	0.0	0.0
6	1	6.500	5	4	PB	0.0	0.0
6	2	20.330	3			0.0	0.0
6	3	6.500	2	1	PB	0.0	0.0

****
* Form Type 13 - Reinforced Concrete Properties *
****

Structure I.D.: CUY-17

Member I.D.: S05

Sect. No.	Same/ Exc. Code	Bott Flg	Height	a	b	b'	t	i		Area	Dy	Comp Code
1			66.00	62.99		16.00		1	B	411	63.00	
1								2	B	211	3.00	
2			36.00	32.99		16.00		1	B	411	33.00	
2								2	B	211	3.00	
3			36.00	32.99		16.00		1	B	411	33.00	
3								2	B	211	30.00	
3								3	B	211	3.00	
4			36.00	32.99		16.00		1	B	411	33.00	
4								2	B	211	6.00	
4								3	B	211	3.00	
4								4	B	211	3.00	
5			66.00	62.99		16.00		1	B	411	63.00	
5								2	B	211	6.00	
5								3	B	211	3.00	
5								4	B	211	3.00	

****
* Form Type 17 - Shear Reinforcement Specifications *
****

Structure I.D.: CUY-17

Member I.D.: S05

Symmetry:

Span No.	Range No.	S B	Range Length	Group Code	Angle of reinf.	Shear i	Reinforcement Code	As	No. of Spaces	Equally Spaced Spaces in Range
1	1	S	12.000			01	B	205	12	0.000
1	2	S	12.330			01	B	004	1	12.330
1	3	S	9.000			01	B	205	24	0.000
2	1	S	9.000			01	B	205	24	0.000
2	2	S	15.330			01	B	004	1	15.330
2	3	S	9.000			01	B	205	24	0.000
3	1	S	9.000			01	B	205	24	0.000
3	2	S	15.330			01	B	004	1	15.330
3	3	S	9.000			01	B	205	24	0.000
4	1	S	9.000			01	B	205	24	0.000

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4	2	S	15.330	01	B	004	1	15.330
4	3	S	9.000	01	B	205	24	0.000
5	1	S	9.000	01	B	205	24	0.000
5	2	S	15.330	01	B	004	1	15.330
5	3	S	9.000	01	B	205	24	0.000
6	1	S	9.000	01	B	205	24	0.000
6	2	S	12.330	01	B	004	1	12.330
6	3	S	12.000	01	B	205	12	0.000

MRussell

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LOAD ANALYSIS AND RATING SYSTEM -- LFD v5.00.06.08

BRIDGE / MEMBER DATA

SUMMARY REPORT

Load Rating Summaries - MR

Bridge ID	CUY-17
NBI ID	1802046
Facility Carried	SR-17
Feature Intersected	Rocky River

Material of Construction	RC
Year of Construction	1933
Roadway Width	52.000
Number of Spans	3
Floor Beam Spacing	16.67

Comments:

1Mainspan roadway slab & floorbeams; and approach spans' roadway stri
2ngers and floorbeams.

Member ID B01 Main Arch Floorbeam

Symmetry:

Span Length:	Span 1	Span 2	Span 3	Span 4	Span 5
	5.500	35.500	5.500	0.000	0.000

Moment

C.P.			Rating Factor	Rating Value	Load Capacity (tons)
2.577	INV.	Truck:	HS20		
			0.80	HS 16.01	28.8
2.577	OPER.	Truck:	HS20		
			1.33	HS 26.68	48.0
2.577	POST.	Truck:	2F1		
			2.13	0.00	32.0
2.577	POST.	Truck:	3F1		
			1.48	0.00	33.9
2.577	POST.	Truck:	4F1		
			1.38	0.00	37.2
2.577	SPEC.	Truck:	5C1		
			1.54	0.00	61.6

Shear

C.P.	Rating Factor	Rating Value	Load Capacity

MRussell

			(-)	(+)		
2.577	INV.	Truck: HS20	1.08	3.15	HS 21.62	38.90
2.577	OPER.	Truck: HS20	1.80	5.25	HS 36.03	64.80
2.577	POST.	Truck: 2F1	2.88	8.40	0.00	43.20
2.577	POST.	Truck: 3F1	1.99	5.80	0.00	45.80
2.577	POST.	Truck: 4F1	1.86	5.42	0.00	50.20
2.577	SPEC.	Truck: 5C1	2.08	6.05	0.00	83.10

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LOAD ANALYSIS AND RATING SYSTEM -- LFD v5.00.06.08

BRIDGE / MEMBER DATA

SUMMARY REPORT

Bridge ID	CUY-17
NBI ID	1802046
Facility Carried	SR-17
Feature Intersected	Rocky River

Material of Construction	RC
Year of Construction	1933
Roadway Width	52.000
Number of Spans	11

Live Load Distribution Factor 1.0

Second Live Load Dist. Factor 1.0

Comments:

1Mainspan roadway slab & floorbeams; and approach spans' roadway stri
2ngers and floorbeams.

Member ID S01 Main Arch Deck Slab

Symmetry:

Span Length:

Span 1	Span 2	Span 3	Span 4	Span 5
16.667	16.667	16.667	16.667	16.667
Span 6	Span 7	Span 8	Span 9	Span 10
16.667	16.667	16.667	16.667	16.667
Span 11	Span 12	Span 13	Span 14	Span 15
16.667	0.000	0.000	0.000	0.000

Moment

C.P.				Rating Factor	Rating Value	Load Capacity (tons)
1.400	INV.	Truck:	HS20	2.05	HS 41.07	73.9
1.400	OPER.	Truck:	HS20	3.42	HS 68.45	123.2
1.400	POST.	Truck:	2F1	5.48	0.00	82.1
1.400	POST.	Truck:	3F1	4.27	0.00	98.1
1.400	POST.	Truck:	4F1	4.12	0.00	111.2

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1.400	SPEC.	Truck:	5C1			
			4.10		0.00	164.1

Shear

C.P.			Rating Factor (-)	(+)	Rating Value	Load Capacity
1.000	INV.	Truck:	HS20			
			999.00	999.00	HS 0.00	0.00
1.000	OPER.	Truck:	HS20			
			999.00	999.00	HS 0.00	0.00
1.000	POST.	Truck:	2F1			
			999.00	999.00	0.00	0.00
1.000	POST.	Truck:	3F1			
			999.00	999.00	0.00	0.00
1.000	POST.	Truck:	4F1			
			999.00	999.00	0.00	0.00
1.000	SPEC.	Truck:	5C1			
			999.00	999.00	0.00	0.00

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BRIDGE / MEMBER DATA

SUMMARY REPORT

Bridge ID	CUY-17
NBI ID	1802046
Facility Carried	SR-17
Feature Intersected	Rocky River

Material of Construction	RC
Year of Construction	1933
Roadway Width	52.000
Number of Spans	3

Live Load Distribution Factor 0.5

Comments:

1Mainspan roadway slab & floorbeams; and approach spans' roadway stri
2ngers and floorbeams.

Member ID S02 E Appr Int Str (Orig)

Symmetry:

Span Length:	Span 1	Span 2	Span 3	Span 4	Span 5
	32.500	50.000	32.500	0.000	0.000

Moment

C.P.			Rating Factor	Rating Value	Load Capacity (tons)
1.800	INV.	Truck:	HS20		
			1.01	HS 20.16	36.3
1.800	OPER.	Truck:	HS20		
			1.68	HS 33.60	60.5
3.200	POST.	Truck:	2F1		
			3.49	0.00	52.3
1.800	POST.	Truck:	3F1		
			2.33	0.00	53.5
3.200	POST.	Truck:	4F1		
			2.04	0.00	55.0
3.200	SPEC.	Truck:	5C1		
			2.49	0.00	99.7

Shear

C.P.	Rating Factor	Rating Value	Load Capacity

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				(-)	(+)		
1.800	INV.	Truck:	HS20	0.99	24.84	HS 19.81	35.70
1.800	OPER.	Truck:	HS20	1.66	41.46	HS 33.13	59.60
1.800	POST.	Truck:	2F1	3.11	85.49	0.00	46.60
1.800	POST.	Truck:	3F1	2.16	103.55	0.00	49.80
1.800	POST.	Truck:	4F1	2.00	102.81	0.00	54.10
1.800	SPEC.	Truck:	5C1	1.98	57.60	0.00	79.00

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LOAD ANALYSIS AND RATING SYSTEM -- LFD v5.00.06.08

BRIDGE / MEMBER DATA

SUMMARY REPORT

Bridge ID CUY-17

NBI ID 1802046

Facility Carried SR-17

Feature Intersected Rocky River

Material of Construction	RC
Year of Construction	1933
Roadway Width	52.000
Number of Spans	3

Live Load Distribution Factor 0.5

Comments:

1Mainspan roadway slab & floorbeams; and approach spans' roadway stri
2ngers and floorbeams.

Member ID S03 E Appr Int Str (Rehab)

Symmetry:

Span Length:	Span 1	Span 2	Span 3	Span 4	Span 5
	32.500	50.000	32.500	0.000	0.000

Moment

C.P.			Rating Factor	Rating Value	Load Capacity (tons)
1.400	INV.	Truck:	HS20		
			5.00	HS100.04	180.1
1.400	OPER.	Truck:	HS20		
			8.34	HS166.73	300.1
1.400	POST.	Truck:	2F1		
			13.48	0.00	202.1
1.400	POST.	Truck:	3F1		
			9.68	0.00	222.7
1.400	POST.	Truck:	4F1		
			8.88	0.00	239.7
1.400	SPEC.	Truck:	5C1		
			10.02	0.00	401.0

Shear

C.P.	Rating Factor	Rating Value	Load Capacity

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			(-)	(+)		
2.700	INV.	Truck: HS20				
			2.40	13.97	HS 47.92	86.30
2.700	OPER.	Truck: HS20				
			4.01	23.35	HS 80.23	144.40
2.700	POST.	Truck: 2F1				
			7.54	36.31	0.00	113.10
2.700	POST.	Truck: 3F1				
			5.25	28.14	0.00	120.80
2.700	POST.	Truck: 4F1				
			4.83	29.76	0.00	130.50
2.700	SPEC.	Truck: 5C1				
			4.89	28.37	0.00	195.80

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BRIDGE / MEMBER DATA

SUMMARY REPORT

Bridge ID CUY-17

NBI ID 1802046

Facility Carried SR-17

Feature Intersected Rocky River

Material of Construction	RC
Year of Construction	1933
Roadway Width	52.000
Number of Spans	6

Live Load Distribution Factor 0.5

Second Live Load Dist. Factor 0.5

Comments:

1Mainspan roadway slab & floorbeams; and approach spans' roadway stri
2ngers and floorbeams.

Member ID S04 W Appr Int Str (Orig)

Symmetry:

Span Length:

Span 1	Span 2	Span 3	Span 4	Span 5
33.330	33.330	33.330	33.330	33.330

Span 6	Span 7	Span 8	Span 9	Span 10
33.330	0.000	0.000	0.000	0.000

Moment

C.P.			Rating Factor	Rating Value	Load Capacity (tons)
2.200	INV.	Truck:	HS20		
			2.12	HS 42.36	76.2
2.200	OPER.	Truck:	HS20		
			3.53	HS 70.59	127.1
2.200	POST.	Truck:	2F1		
			6.61	0.00	99.2
2.200	POST.	Truck:	3F1		
			4.43	0.00	101.8
2.200	POST.	Truck:	4F1		
			3.97	0.00	107.2
2.200	SPEC.	Truck:	5C1		
			4.53	0.00	181.1

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Shear

C.P.				Rating Factor (-)	Rating Factor (+)	Rating Value	Load Capacity
1.700	INV.	Truck:	HS20	1.76	18.87	HS 35.26	63.50
1.700	OPER.	Truck:	HS20	3.03	32.10	HS 60.66	109.20
1.700	POST.	Truck:	2F1	5.53	51.06	0.00	83.00
1.700	POST.	Truck:	3F1	3.88	44.76	0.00	89.20
1.700	POST.	Truck:	4F1	3.64	55.35	0.00	98.30
1.700	SPEC.	Truck:	5C1	3.86	39.86	0.00	154.20

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LOAD ANALYSIS AND RATING SYSTEM -- LFD v5.00.06.08

BRIDGE / MEMBER DATA

SUMMARY REPORT

Bridge ID CUY-17

NBI ID 1802046

Facility Carried SR-17

Feature Intersected Rocky River

Material of Construction	RC
Year of Construction	1933
Roadway Width	52.000
Number of Spans	6

Live Load Distribution Factor 0.5

Second Live Load Dist. Factor 0.5

Comments:

1Mainspan roadway slab & floorbeams; and approach spans' roadway stri
2ngers and floorbeams.

Member ID S05 W Appr Int Str (Rehab)

Symmetry:

Span Length:

Span 1	Span 2	Span 3	Span 4	Span 5
33.330	33.330	33.330	33.330	33.330
Span 6	**Span 7**	**Span 8**	**Span 9**	**Span 10**
33.330	0.000	0.000	0.000	0.000

Moment

C.P.			Rating Factor	Rating Value	Load Capacity (tons)
2.200	INV.	Truck:	HS20		
			3.40	HS 67.96	122.3
2.200	OPER.	Truck:	HS20		
			5.66	HS113.26	203.9
2.200	POST.	Truck:	2F1		
			10.61	0.00	159.2
2.200	POST.	Truck:	3F1		
			7.10	0.00	163.4
2.200	POST.	Truck:	4F1		
			6.37	0.00	172.0
2.200	SPEC.	Truck:	5C1		
			7.26	0.00	290.5

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Shear

C.P.			Rating Factor (-)	(+)	Rating Value	Load Capacity
6.200	INV.	Truck:	HS20			
			38.27	1.75	HS 35.07	63.10
6.200	OPER.	Truck:	HS20			
			63.78	2.92	HS 58.44	105.20
6.200	POST.	Truck:	2F1			
			128.15	5.43	0.00	81.50
6.200	POST.	Truck:	3F1			
			142.37	3.78	0.00	87.00
6.200	POST.	Truck:	4F1			
			159.64	3.50	0.00	94.50
6.200	SPEC.	Truck:	5C1			
			89.11	3.74	0.00	149.70

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LOAD ANALYSIS AND RATING SYSTEM -- v5.00.06.08

BRIDGE SUMMARY REPORT

STRUCTURE ID: CUY-17

Rating Summary for the
Floor System
- MR

C.P.		Critical Member				Rating Factor	Rating Value	Load Cap./Res. (tons)
2.577	INV.	Truck: HS20						
			B01	LFD	M	0.80	HS 16.01	28.8
2.577	OPER.	Truck: HS20						
			B01	LFD	M	1.33	HS 26.68	48.0
2.577	POST.	Truck: 2F1						
			B01	LFD	M	2.13	0.00	32.0
2.577	POST.	Truck: 3F1						
			B01	LFD	M	1.48	0.00	33.9
2.577	POST.	Truck: 4F1						
			B01	LFD	M	1.38	0.00	37.2
2.577	SPEC.	Truck: 5C1						
			B01	LFD	M	1.54	0.00	61.6

Hatch Mott MacDonald