U is the friction curvature coefficient. If left blank, the default value of 0.20 will be used. A separate value may be input for each span.

K is the friction wobble coefficient per foot of stressing steel. If left blank, a default value of 0.0 will be used. A separate value may be input for each span.

fs is the ultimate strength of the prestressing steel in kips per square inch. If left blank, a default value of 270 ksi will be used. Only one value may be input for each path.

Specifications										P-Jack		f'c		Losses
u X10-2	k X10-4	fs KSI	% Jack	End	Anchor Set LT. 1/8 in.	Anchor Set RT. 1/8 in.	Allow. Tension Spec.	Allow. Tension %	KIPS	Low Relax.	KSI	% Shortening	KSI
46 47	48 49 50	51 52 53	54 55	56	57 58	59 60	61	62 63	64 65 66 67 68	69	70 71	72	73 74

%JACK is the maximum allowable temporary jacking stress expressed as a percent of the ultimate strength of the prestressing steel. If left blank, a default value of 75% is used. Only one value may be input for each path. If both end stressing is requested, the same value for %JACK is used at each end.

END is the input to request jacking location. Enter "L" for left end jacking, enter "R" for right end jacking, enter "B" for both end jacking. If left blank, a default value of "B" is used. Only one value may be entered for each path.

ANCHOR SET, LT, and RT is the length, in eighths of an inch, of the anchor set. If one end jacking was requested, no entry need be made for the anchor set of the non-jacked end. Only one value for anchor set left, and one value for anchor set right may be entered per path. If left blank, a default value of ⅝" is used.

ALLOWABLE TENSION is the given value of the allowable maximum tension stress for which the frame is to be designed. Two methods of input are provided. If a check (√) is placed in the SPEC input field, the allowable tension will be calculated using the specifications in the Bridge Planning and Design Manual, Volume I. The formula is $6\sqrt{f'c}$.

If an entry is made in the % field, the allowable tension is entered % times $6\sqrt{f'c}$. Only one choice is allowed and only one entry is allowed per path. If left blank, the program will design for no tension (if possible).

P-JACK is the input prestress force in kips. If a value for P-JACK is input for all paths in a given trial and frame, then the program only analyzes the structure and reports the effects. If multiple path prestressing is described, all values of P-JACK except one must be given. The path with no value will have its prestress force designed by the program based on full DL + added DL + LL + I. Stresses are then checked for both the DL + PS and DL + added DL + PS cases to assure that tension in these cases does not exceed zero. If tension is detected, P-JACK is redesigned to eliminate the tension and a warning message is printed. When this occurs, the full allowable tension value may not appear in the final stresses.

f'c is the required concrete strength. This value is used as the basis for calculating the allowable tension. If left blank, a default value of 3.5 ksi will be used.

% SHORTENING is the percent of theoretical elastic shortening to be included in the prestressing calculations based on the final prestress force coefficients. Only those frames with columns affected by shortening will be considered. If left blank, a default value of 100% is used. To eliminate shortening, enter a zero. To obtain any other even 10% increment enter its multiple of 10%.

Losses (ksi) are the losses due to creep and shrinkage. If left blank, a default value of 32 ksi is used.

RESULTS

The following items are listed as they appear in the output for each problem. Whether a particular item appears, depends on the nature of the problem.

First, the FRAME DESCRIPTION input is reported as given, except for the deflection and sidesway entries, which do not appear.

SECTION PROPERTIES are reported for each section described with the Section Properties by Parts input option. The input is reported as given, followed by the area, centroid location with respect to the X Y coordinate system chosen, and the moments of inertia about the centroidal X-X and Y-Y axes.

When the above sections supplement a frame member, MEMBER PROPERTIES about the X-X axis are reported. They are the length of the member, minimum moment of inertia about the X-X axis, and the relative stiffness (small k) and carry over factors.

The absence on any message under FRAME DIAGNOSTICS, indicates that no errors have been detected in the data which makes up the frame. The presence of an error message terminates processing of the problem. If the first diagnostic states that 'Errors have been found in either the frame description or cross section data', this indicates that error messages have been printed somewhere in the preceding output of the problem. Although processing is terminated, Load Data input is reported as given, along with error messages pertaining to it.

FRAME PROPERTIES is the result of combining the Frame Description with the Member Properties. Carry Over and Distribution Factors are adjusted for pinned end conditions. At this point, all data pertaining to the frame should be reviewed to determine if it is reasonable and describes the frame as intended.

For each trial, the LOADINGS are reported as given. Errors, if any, in Load Data are reported, and result in processing being terminated for the trial.

FIXED END MOMENTS are the total FEM's for a trial and are adjusted for pinned end conditions.

Distributed MOMENTS and SHEARS are reported at the one-tenth points for each member. In each case, the horizontal members are separated from the vertical members. Beam sign convention is used.

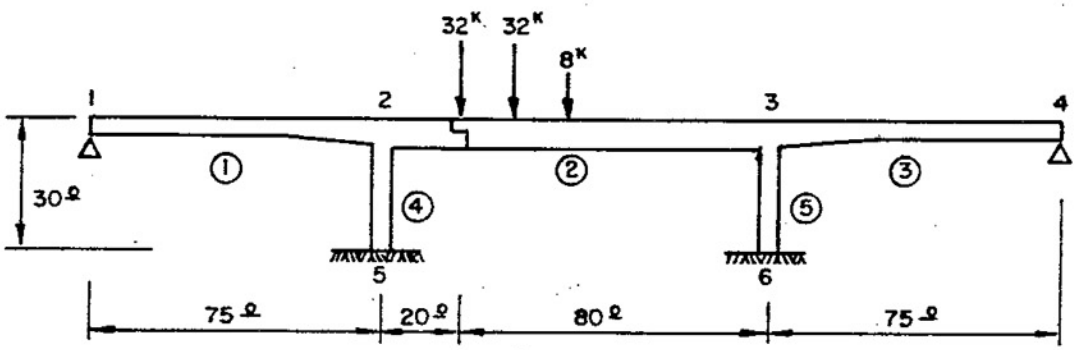
COLUMN REACTIONS are calculated on the assumption that the user followed the rule that the left end of the column was the bottom. Any deviation from this rule will yield incorrect reactions.

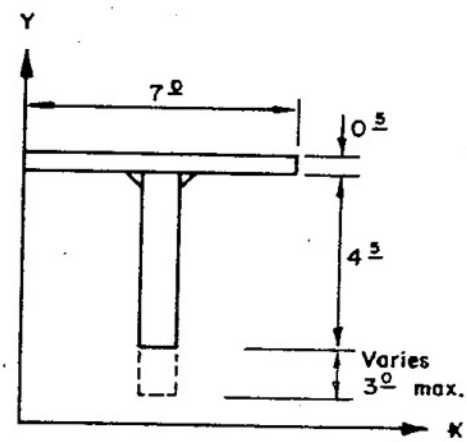
The TANGENTIAL ROTATIONS at the ends of each member are measured from the unloaded position, with clockwise being positive.

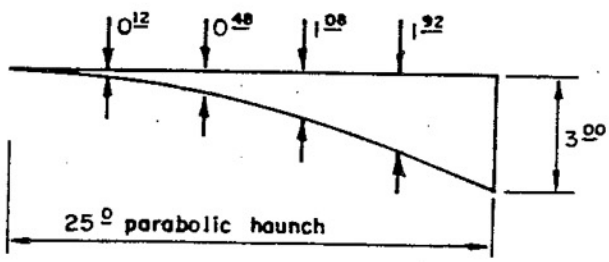
DEFLECTIONS are measured from the unload position. Positive is downward for horizontal members and to the right for vertical members.

EXAMPLE

Following is an example problem intended to illustrate the main features of the program.







FRAME SYSTEM
Frame Description

Page 1 of 3

Name Example 1

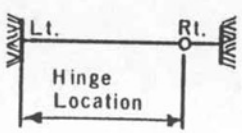
Phone

IDENT. DIST.	GR.	BATCH	PROB.	SOURCE CHARGE DIST. UNIT	DIST. UNIT	EXPENDITURE AUTHORIZATION	SPECIAL DESIGNATION WHEN APPLICABLE	PROGRAM NUMBER
14	T	20	00	14033	14033	910002		B D E ϕ 3 5

S/C 1201, 2488 S/C 1201

Member No.	End Joint No. Lt.	Rt.	End Condition Lt	Rt	Direction	Length ft.	Min. I ft.^{4}	Hinge Location ft.	E ksi	Dead Load Uniform k/ft.	Unit Wt. pcf	Member Properties -K- Stiffness Factor Lt.	Rt.	-C- Carry Over Factor Lt.	Rt.	Recall Member	Reverse R	D.L. Deflections	Sidesway S
1	1	2	P		G	750				180	150								
2	2	3			G	1000		200		180	150								
3	3	4														01	R		
4	5	2				300	1000			600									
5	6	3				300	1000			600									

S/C 2488



END CONDITION:
C = Cantilever
P = Pin
R = Roller

DIRECTION:
G or H = Horizontal

FRAME SYSTEM
Section Properties By Parts

Page 2 of 3

Name Example 1

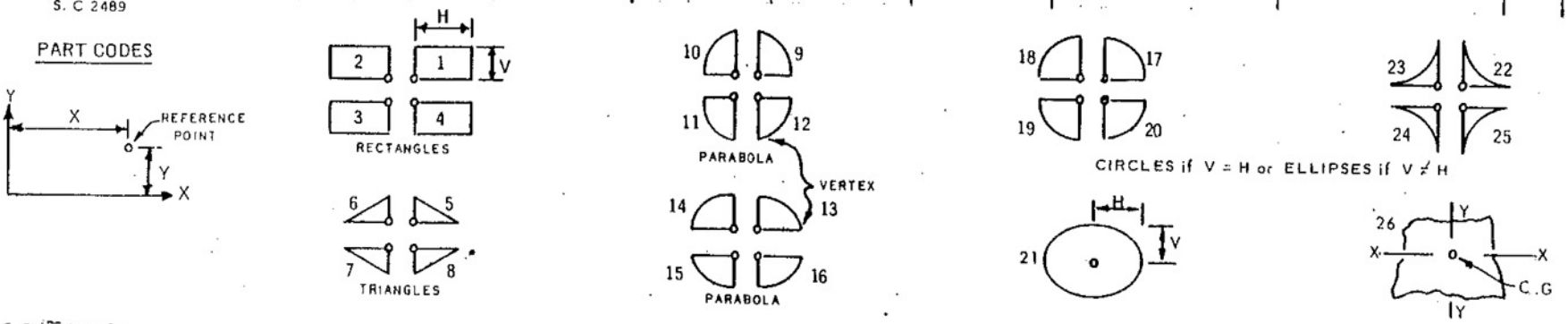
Phone

IDENT. DIST	GROUP	BATCH	PROB	SOURCE DIST.	SOURCE UNIT	CHARGE DIST.	CHARGE UNIT	EXPENDITURE AUTHORIZATION	SPECIAL DESIGNATION WHEN APPLICABLE	PROGRAM NUMBER
14T		2000								BDE/35
S/C 1201, 2489				S/C 1201						

Member No.	Cross Section Location ft.	Recall	Sign + or −	Part Code	Part Dimensions Vertical V ft.	Part Dimensions Horizontal H ft.	Ref. Pt. Coord. X ft.	Ref. Pt. Coord. Y ft.	Any Shape Area ft.²	Any Shape Ixx ft.⁴	Any Shape Iyy ft.⁴	Store
01	00			01	50	700	00	750				
				01	450	100	300	300				
				07	33	33	300	750				
				08	33	33	400	750				01
	500	01										
	600			04	48	100	300	300				
	650				108							
	700				192							
	750				300							02
02	0002											

S. C 2489

PART CODES



FRAME SYSTEM

Load Data

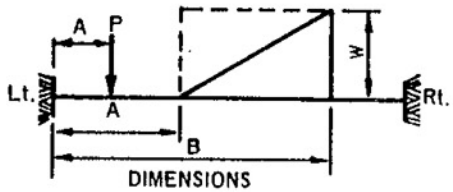
IDENT.

DIST.	GR.	BATCH	PROB.
14T		2000	

S/C 2491

*CODE
L = Max. W on left
R = Max. W on right
U = Uniform Load
P = Point load.

SIGN CONVENTIONS



DIMENSIONS

Page 3 of 3

Name Example 1

Phone

Trial No.	Member No.	Loads: W or P (± k/ft or k)	Code*	A (ft.)	B (ft.)	FEMs*: Left (± ft − k)	FEMs*: Right (± ft − k)	Deflections	Sidesway (S)	Comments
00	02	25200	P	00						CAP WT.
↓	↓	21000	P	200						HINGE WT.
↓	↓	25200	P	1000						CAP WT.
01	02	32000	P	200				1.0		TRUCK LOAD
↓	↓	32000	P	340						1 LANE
↓	↓	8000	P	480						NO IMPACT

S/C 2491

*When FEMs are given, they are not calculated for any load on that member.

FORM H D 95

IDENT 14T 20 00 FRAME SYSTEM JUN. 06, 1969 PAGE 1

FRAME DESCRIPTION

MEM NO	JT LT	JT RT	END COND LT	END COND RT	DIR	SPAN	I	HINGE	E	DEAD LOAD UNIFORM	DEAD LOAD SEC	K LT	K RT	CARRY OVER FACTORS LT	CARRY OVER FACTORS RT	RECALL MEM
1	1	2	P		G	75.0	0.0	0.0	0.	0.180	150.	0.0	0.0	0.0	0.0	
2	2	3			G	100.0	0.0	20.0	0.	0.180	150.	0.0	0.0	0.0	0.0	
3	3	4				0.0	0.0	0.0	0.	0.0	0.	0.0	0.0	0.0	0.0	01R
4	5	2				30.0	10.00	0.0	0.	0.600	0.	0.0	0.0	0.0	0.0	
5	6	3				30.0	10.00	0.0	0.	0.600	0.	0.0	0.0	0.0	0.0	

IDENT 14T 20 00 FRAME SYSTEM JUN. 06, 1969 PAGE 2

SECTION PROPERTIES

MEM	LOC	RECALL	SIGN CODE	V	H	X	Y	AREA	INERTIAS IXX	INERTIAS IYY	STORE
1	0.0		1	4.50	1.00	3.00	3.00	0.0	0.0	0.0	
1	0.0		1	0.50	7.00	0.0	7.50	0.0	0.0	0.0	
1	0.0		6	0.33	0.33	4.00	7.50	0.0	0.0	0.0	01
1	0.0		7	0.33	0.33	3.00	7.50	0.0	0.0	0.0	

AREA	CENTROID LOCATION X	CENTROID LOCATION Y	MOMENT OF INERTIA ABOUT CENTROID X-X	MOMENT OF INERTIA ABOUT CENTROID Y-Y
8.11	3.50	6.36	20.09	14.71

MEM	LOC	RECALL	SIGN CODE	V	H	X	Y	AREA	INERTIAS IXX	INERTIAS IYY	STORE
1	50.0	01	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
	RECALL	1				3.50	6.36	8.11	20.09	14.71	

AREA	CENTROID LOCATION X	CENTROID LOCATION Y	MOMENT OF INERTIA ABOUT CENTROID X-X	MOMENT OF INERTIA ABOUT CENTROID Y-Y
8.11	3.50	6.36	20.09	14.71

MEM	LOC	RECALL	SIGN CODE	V	H	X	Y	AREA	INERTIAS IXX	INERTIAS IYY	STORE
1	60.0	01	4	0.48	1.00	3.00	3.00	0.0	0.0	0.0	
	RECALL	1				3.50	6.36	8.11	20.09	14.71	

AREA	CENTROID LOCATION X	CENTROID LOCATION Y	MOMENT OF INERTIA ABOUT CENTROID X-X	MOMENT OF INERTIA ABOUT CENTROID Y-Y
8.59	3.50	6.16	25.97	14.75

IDENT 14T 20 00 FRAME SYSTEM JUN. 06, 1969 PAGE 3

SECTION PROPERTIES

MEM	LOC	RECALL	SIGN CODE	V	H	X	Y	AREA	INERTIAS IXX	INERTIAS IYY	STORE
1	65.0	01	4	1.08	1.00	3.00	3.00	0.0	0.0	0.0	
	RECALL	1				3.50	6.36	8.11	20.09	14.71	

AREA	CENTROID LOCATION X	CENTROID LOCATION Y	MOMENT OF INERTIA ABOUT CENTROID X-X	MOMENT OF INERTIA ABOUT CENTROID Y-Y
9.19	3.50	5.90	34.67	14.80

MEM	LOC	RECALL	SIGN CODE	V	H	X	Y	AREA	INERTIAS IXX	INERTIAS IYY	STORE
1	70.0	01	4	1.92	1.00	3.00	3.00	0.0	0.0	0.0	
	RECALL	1				3.50	6.36	8.11	20.09	14.71	

AREA	CENTROID LOCATION X	CENTROID LOCATION Y	MOMENT OF INERTIA ABOUT CENTROID X-X	MOMENT OF INERTIA ABOUT CENTROID Y-Y
10.03	3.50	5.53	49.62	14.87

MEM	LOC	RECALL	SIGN CODE	V	H	X	Y	AREA	INERTIAS IXX	INERTIAS IYY	STORE
1	75.0	01	4	3.00	1.00	3.00	3.00	0.0	0.0	0.0	02
	RECALL	1				3.50	6.36	8.11	20.09	14.71	

AREA	CENTROID LOCATION X	CENTROID LOCATION Y	MOMENT OF INERTIA ABOUT CENTROID X-X	MOMENT OF INERTIA ABOUT CENTROID Y-Y
11.11	3.50	5.05	74.02	14.96

MEMBER 1 PROPERTIES

LENGTH	MIN INERTIA	STIFFNESS LT	STIFFNESS RT	CARRY OVER LT	CARRY OVER RT
75.0	20.09	4.367	6.066	0.655	0.471

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SECTION PROPERTIES

MEM	LOC	RECALL	SIGN CODE	V	H	X	Y	AREA	INERTIAS IXX	IYY	STORE
2	0.0	02	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
	RECALL	2				3.50	5.05	11.11	74.02	14.96	

AREA	CENTROID LOCATION X	Y	MOMENT OF INERTIA ABOUT CENTROID X-X	Y-Y
11.11	3.50	5.05	74.02	14.96

MEMBER 2 PROPERTIES

HINGE AT LOCATION 20.0

LENGTH	MIN INERTIA	STIFFNESS LT	RT	CARRY OVER LT	RT
100.0	74.02	0.231	3.692	4.000	0.250

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FRAME DIAGNOSTICS

FRAME PROPERTIES

MEM NO	JT LT	JT RT	END COND LT	END COND RT	DIR	SPAN	I	HINGE	E	CARRY OVER FACTORS LT	CARRY OVER FACTORS RT	DISTRIBUTION FACTORS LT	DISTRIBUTION FACTORS RT
1	1	2	P		G	75.0	20.09	0.0	750.	0.655	0.0	0.0	0.428
2	2	3			G	100.0	74.02	20.0	750.	4.000	0.250	0.065	0.527
3	3	4		P	G	75.0	20.09	0.0	750.	0.0	0.655	0.216	0.0
4	5	2				30.0	10.00	0.0	750.	0.500	0.500	0.0	0.507
5	6	3				30.0	10.00	0.0	750.	0.500	0.500	0.0	0.257

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LOADINGS TRIAL 0

MEM	W OR P	LOAD CODE	A	B	FIXED END MOMENTS LEFT	RIGHT	DEFLT	COMMENTS
2	21.000	P	20.0	0.0	0.	0.		HINGE WT.
2	25.200	P	0.0	0.0	0.	0.		CAP WT.
2	25.200	P	100.0	0.0	0.	0.		CAP WT.

FIXED END MOMENTS TRIAL 0

MEM NO	FIXED END MOMENTS LT	RT	MEM NO	FIXED END MOMENTS LT	RT	MEM NO	FIXED END MOMENTS LT	RT
1	0.	-1250.	2	-1869.	-1588.	3	-1250.	0.
4	0.	0.	5	0.	0.			

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HORIZONTAL MEMBER MOMENTS TRIAL 0

MEM NO	LEFT	.1 PT	.2 PT	.3 PT	.4 PT	.5 PT	.6PT	.7 PT	.8 PT	.9 PT	RIGHT
1	0.	202.	325.	369.	336.	223.	32.	-238.	-587.	-1020.	-1544.
2	-1893.	-854.	0.	459.	734.	824.	730.	451.	-13.	-662.	-1495.
3	-1362.	-856.	-441.	-110.	141.	314.	408.	424.	361.	220.	-0.

VERTICAL MEMBER MOMENTS TRIAL 0

MEM NO	LEFT	.1 PT	.2 PT	.3 PT	.4 PT	.5 PT	.6 PT	.7 PT	.8 PT	.9 PT	RIGHT
4	174.	122.	70.	17.	-35.	-87.	-140.	-192.	-244.	-297.	-349.
5	-66.	-46.	-27.	-7.	13.	33.	53.	73.	93.	113.	133.

HORIZONTAL MEMBER SHEARS TRIAL 0

MEM NO	LEFT	.1 PT	.2 PT	.3 PT	.4 PT	.5 PT	.6 PT	.7 PT	.8 PT	.9 PT	RIGHT
1	32.1	21.7	11.2	0.7	-9.8	-20.2	-30.7	-41.2	-52.0	-63.6	-76.5
2	138.3	94.6	76.2	36.7	18.2	-0.2	-18.7	-37.1	-55.6	-74.1	-117.7
3	74.1	61.1	49.6	38.8	28.3	17.8	7.3	-3.1	-13.6	-24.1	-34.6

VERTICAL MEMBER SHEARS TRIAL 0

MEM NO	LEFT	.1 PT	.2 PT	.3 PT	.4 PT	.5 PT	.6 PT	.7 PT	.8 PT	.9 PT	RIGHT
4	-17.4	-17.4	-17.4	-17.4	-17.4	-17.4	-17.4	-17.4	-17.4	-17.4	-17.4
5	6.6	6.6	6.6	6.6	6.6	6.6	6.6	6.6	6.6	6.6	6.6

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COLUMN REACTIONS TRIAL 0

MEM NO	LT REACTION	RT REACTION	COLUMN WEIGHT
4	232.8	214.8	18.0
5	209.8	191.8	18.0

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TRIAL NO. 0

TANGENTIAL ROTATIONS - RADIANS - CLOCKWISE POSITIVE

SPAN	LT. END	RT. END	SPAN	LT. END	RT. END	SPAN	LT. END	RT. END
1	0.002898	0.002422	2	0.002422	-0.000922	3	-0.000922	-0.003880
4	0.000000	0.002422	5	0.000000	-0.000922			

HORIZONTAL MEMBER DEFLECTIONS IN FEET AT 1/ 4 POINTS FROM LEFT END - DOWNWARD POSITIVE

MEMBER 1	E= 750.	0.0	0.041	0.032	-0.008	0.0
MEMBER 2	E= 750.	0.0	0.086	0.099	0.055	0.0
LONG HINGE	LT	1/4	1/2	3/4	RT	
	0.078	0.100	0.088	0.042	0.0	
MEMBER 3	E= 750.	0.0	0.014	0.059	0.059	0.0

VERTICAL MEMBER DEFLECTIONS IN FEET AT 1/ 4 POINTS FROM LEFT END.

MEMBER 4	E= 750.	0.0	-0.003	-0.009	-0.010	0.0
MEMBER 5	E= 750.	0.0	0.001	0.003	0.004	0.0

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LOADINGS TRIAL 1

MEM	W OR P	LOAD CODE	A	B	FIXED END MOMENTS LEFT	RIGHT	DEFLT	COMMENTS
2	8.000	P	48.0	0.0	0.	0.		NO IMPACT
2	32.000	P	34.0	0.0	0.	0.		1 LANE
2	32.000	P	20.0	0.0	0.	0.	10	TRUCK LOAD

FIXED END MOMENTS TRIAL 1

MEM NO	FIXED END MOMENTS LT	RT	MEM NO	FIXED END MOMENTS LT	RT	MEM NO	FIXED END MOMENTS LT	RT
1	0.	0.	2	-1175.	-389.	3	0.	0.
4	0.	0.	5	0.	0.			

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HORIZONTAL MEMBER MOMENTS TRIAL 1

MEM NO	LEFT	.1 PT	.2 PT	.3 PT	.4 PT	.5 PT	.6PT	.7 PT	.8 PT	.9 PT	RIGHT
1	0.	-54.	-109.	-163.	-217.	-271.	-326.	-380.	-434.	-488.	-543.
2	-1187.	-593.	0.	273.	355.	292.	166.	39.	-87.	-214.	-340.
3	-156.	-140.	-124.	-109.	-93.	-78.	-62.	-47.	-31.	-16.	-0.

VERTICAL MEMBER MOMENTS TRIAL 1

MEM NO	LEFT	.1 PT	.2 PT	.3 PT	.4 PT	.5 PT	.6 PT	.7 PT	.8 PT	.9 PT	RIGHT
4	322.	225.	129.	32.	-64.	-161.	-258.	-354.	-451.	-548.	-644.
5	-92.	-65.	-37.	-9.	18.	46.	74.	102.	129.	157.	185.

HORIZONTAL MEMBER SHEARS TRIAL 1

MEM NO	LEFT	.1 PT	.2 PT	.3 PT	.4 PT	.5 PT	.6 PT	.7 PT	.8 PT	.9 PT	RIGHT
1	-7.2	-7.2	-7.2	-7.2	-7.2	-7.2	-7.2	-7.2	-7.2	-7.2	-7.2
2	59.3	59.3	59.3	27.3	-4.7	-12.7	-12.7	-12.7	-12.7	-12.7	-12.7
3	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1

VERTICAL MEMBER SHEARS TRIAL 1

MEM NO	LEFT	.1 PT	.2 PT	.3 PT	.4 PT	.5 PT	.6 PT	.7 PT	.8 PT	.9 PT	RIGHT
4	-32.2	-32.2	-32.2	-32.2	-32.2	-32.2	-32.2	-32.2	-32.2	-32.2	-32.2
5	9.2	9.2	9.2	9.2	9.2	9.2	9.2	9.2	9.2	9.2	9.2

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COLUMN REACTIONS TRIAL 1

MEM NO	LT REACTION	RT REACTION	COLUMN WEIGHT
4	66.6	66.6	
5	14.7	14.7	

IDENT 14T 20 00 FRAME SYSTEM JUN. 06, 1969 PAGE 13
TRIAL NO. 1

TANGENTIAL ROTATIONS - RADIANS - CLOCKWISE POSITIVE

SPAN	LT. END	RT. END	SPAN	LT. END	RT. END	SPAN	LT. END	RT. END
1	-0.002930	0.004474	2	0.004474	-0.001283	3	-0.001283	0.000840
4	-0.000000	0.004474	5	0.000000	-0.001283			

HORIZONTAL MEMBER DEFLECTIONS IN FEET AT 1/10 POINTS FROM LEFT END - DOWNWARD POSITIVE

MEMBER 1 E= 750.	0.0	-0.022	-0.042	-0.060	-0.073	-0.081
	-0.081	-0.073	-0.057	-0.031	0.0	
MEMBER 2 E= 750.	0.0	0.051	0.109	0.105	0.097	0.084
	0.068	0.051	0.032	0.015	0.0	

LONG HINGE	LT	1/4	1/2	3/4	RT
	0.109	0.097	0.068	0.032	0.0

MEMBER 3 E= 750.	0.0	-0.009	-0.016	-0.021	-0.023	-0.023
	-0.021	-0.017	-0.012	-0.006	0.0	

VERTICAL MEMBER DEFLECTIONS IN FEET AT 1/10 POINTS FROM LEFT END.

MEMBER 4 E= 750.	0.0	-0.001	-0.004	-0.008	-0.013	-0.017
	-0.019	-0.020	-0.017	-0.011	0.0	
MEMBER 5 E= 750.	0.0	0.000	0.001	0.002	0.004	0.005
	0.006	0.006	0.005	0.003	0.0	

LIVE LOAD RESULTS

LIVE LOAD DIAGNOSTICS, if present, will indicate that the live load limitations placed on the frame have been violated or an error was made in the superstructure live load input data.

SUPERSTRUCTURE LIVE LOAD input data is reported as given or assumed.

For each L. L. NO. for which LIVE LOAD DATA was given or assumed, the following results are reported for the tenth points of the horizontal members.

1. NEGATIVE LIVE LOAD MOMENT ENVELOPE
2. DEAD LOAD PLUS NEGATIVE LIVE LOAD MOMENT ENVELOPE
3. POSITIVE LIVE LOAD MOMENT ENVELOPE
4. DEAD LOAD PLUS POSITIVE LIVE LOAD MOMENT ENVELOPE
5. LIVE LOAD SHEAR ENVELOPES (POSITIVE, NEGATIVE and RANGE)
6. DEAD LOAD PLUS LIVE LOAD SHEAR ENVELOPES (POSITIVE and NEGATIVE)

The dead load plus live load envelopes are reported only if the dead load analysis was performed with all horizontal members loaded. The dead load results are obtained from Trial No. 0 of the basic system as described in earlier instructions.

Be careful when using the dead load plus live load shear envelopes. The dead load shears are computed, and only one ordinate is saved at each tenth point. Therefore, when the dead load includes concentrated loads, the abrupt steps are not shown. If the load is exactly at a tenth point, only the most positive value is retained.

LIVE LOAD SUPPORT RESULTS are also reported for each L.L. NO. for which LIVE LOAD DATA was given or assumed. Dead load is not included. Impact is included, unless otherwise specified.

The MAX. POSITIVE AND NEGATIVE (uplift) AXIAL LOAD at each SUPPORT or TOP of VERTICAL MEMBER is reported, as is TOP and BOTTOM vertical member moments created by the same loading.

The MAX POSITIVE and NEGATIVE LONGITUDINAL MOMENT at the TOP of each VERTICAL MEMBER is reported, as is the AXIAL LOAD and BOTTOM vertical member moment created by the same loading.

Beam sign convention is used for all live load results. Units are kips and feet.

INFLUENCE LINE RESULTS

When requested, the following types of INFLUENCE LINES are reported. Ordinates for each are given at the tenth points and at hinges.

The INFLUENCE LINES for GIRDER MOMENT, reported for each tenth point of the horizontal members, are extended two spans on each side of the span with the influence point.

The INFLUENCE LINES for GIRDER SHEAR, reported for the left end of each horizontal member, are extended two spans on each side of the span with the influence point. From this line, the influence line for shear at any point in that member may be constructed.

The INFLUENCE LINES for REACTION at TOP of COLUMN (or support if no column is present) are extended two spans on each side of the column.

The INFLUENCE LINES for MOMENT at TOP of COLUMN are extended two spans on each side of the column.

MODIFICATIONS TO EXISTING SYSTEM

Due to popular demand, the following modifications were made to the existing system. Details of the basis system are described in earlier instructions.

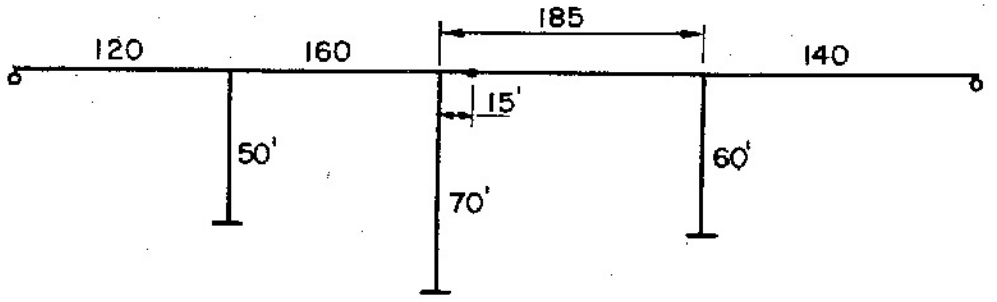
On FRAME DESCRIPTION input, if UNIT WT. is given (accidentally) and the section data (area) was not, the unit wt. is not used and a warning message is printed.

When using SECTION PROPERTIES by PARTS input, if the PART CODE is omitted and data given for AREA and I_{xx}, but not for the PART DIMENSIONS V and H, a message is printed stating that part code 26 (any shape) was assumed.

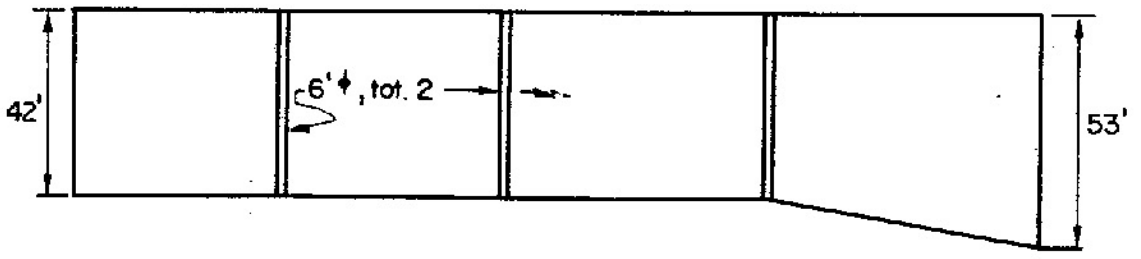
If the LOAD DATA dimensions A or B happen to be greater than the member length, the latter is assumed for these dimensions and a message is printed.

The Dead Load analysis (TRIAL NO. 0) will now be performed even if all horizontal members are not loaded. An appropriate message is printed. The analysis performed with this inconsistency will not be added to Live Load results.

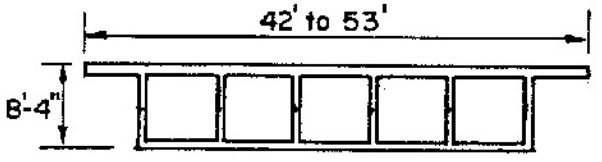
EXAMPLE



ELEVATION



PLAN



FRAME SYSTEM
Frame Description

Page 1 of 4

Name

Phone

Agent			Source		Charge		Expenditure Authorization	Special Designation When Applicable	Program Number
14T	20	00	14	033	14	033	910002	683416	

Member No.	End Joint No.		End Connection	Fixed Pt.	Length	Min. I	Hinge Location	E	Dead Load Uniform (vail)	Dead Load Unit Wt.	Member Properties -K- Stiffness Factor	-C- Carry Over Factor	Recall Member	Recall Reading	D.L. Deflection	D.L. Stiffness
1	1	2	R	H	1200				360	150						5
2	2	3		H	1600											
3	3	4		H	1850		150									
4	4	5	R	H	1400											
5	6	2			500	127.24										
6	7	3			700											
7	8	4			600											

FOR CONDITION:
C = Cantilever
P = Pin
R = Roller

DIRECTION:
G or H = Horizontal

FRAME SYSTEM
Superstructure Sections

Page 2 of 4

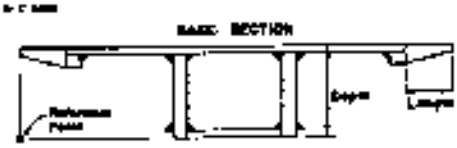
Name

Phone

Agent			Source		Charge		Expenditure Authorization	Special Designation When Applicable	Program Number
14T	20	00							

Member No.	Cross Section Location (FT.)	Recall	Ref. Pt. Coord. H (FT.)	Ref. Pt. Coord. F (FT.)	S.A. Data Width S.A.-S.B. (FT.)	S.A. Data Depth (FT.)	Slab Data Top Thick (IN.)	Slab Data Bottom Thick (IN.)	Int. Girders Inside (Int. Dist.)	Int. Girders Web Thick (IN.)	Exterior Girders Left Type	Exterior Girders Left Web Thick (IN.)	Exterior Girders Left Factor (FT.)	Exterior Girders Right Type	Exterior Girders Right Web Thick (IN.)	Exterior Girders Right Factor (FT.)	Overhangs Left Length (FT.)	Overhangs Left Ext. Thick (IN.)	Overhangs Left Int. Thick (IN.)	Overhangs Right Length (FT.)	Overhangs Right Ext. Thick (IN.)	Overhangs Right Int. Thick (IN.)	Stone
01					420	833	663	550	4	12							40			40			01
02		01																					
03		01																					
04					420	833	750	600	4	12							40			40			
04	1400				530	833	750	600	4	12							40			40			

BASE SECTION



EXTERIOR GIRDERS

TYPE 3 TYPE 4 TYPE 2 TYPE 5

FRAME SYSTEM
Frame Description

Page 1 of 4

Name

Phone

Agent			Source		Charge		Expenditure Authorization	Special Designation When Applicable	Program Number
14T	20	00	14	033	14	033	910002	683416	

Member No.	End Joint No.		End Connection	Fixed Pt.	Length	Min. I	Hinge Location	E	Dead Load Uniform (vail)	Dead Load Unit Wt.	Member Properties -K- Stiffness Factor	-C- Carry Over Factor	Recall Member	Recall Reading	D.L. Deflection	D.L. Stiffness
1	1	2	R	H	1200				360	150						5
2	2	3		H	1600											
3	3	4		H	1850		150									
4	4	5	R	H	1400											
5	6	2			500	127.24										
6	7	3			700											
7	8	4			600											

FOR CONDITION:
C = Cantilever
P = Pin
R = Roller

DIRECTION:
G or H = Horizontal

FRAME SYSTEM
Superstructure Sections

Page 2 of 4

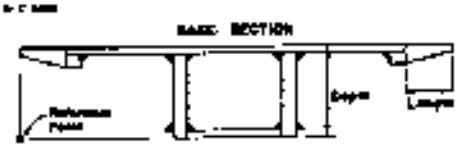
Name

Phone

Agent			Source		Charge		Expenditure Authorization	Special Designation When Applicable	Program Number
14T	20	00							

Member No.	Cross Section Location (FT.)	Recall	Ref. Pt. Coord. H (FT.)	Ref. Pt. Coord. F (FT.)	S.A. Data Width S.A.-S.B. (FT.)	S.A. Data Depth (FT.)	Slab Data Top Thick (IN.)	Slab Data Bottom Thick (IN.)	Int. Girders Inside (Int. Dist.)	Int. Girders Web Thick (IN.)	Exterior Girders Left Type	Exterior Girders Left Web Thick (IN.)	Exterior Girders Left Factor (FT.)	Exterior Girders Right Type	Exterior Girders Right Web Thick (IN.)	Exterior Girders Right Factor (FT.)	Overhangs Left Length (FT.)	Overhangs Left Ext. Thick (IN.)	Overhangs Left Int. Thick (IN.)	Overhangs Right Length (FT.)	Overhangs Right Ext. Thick (IN.)	Overhangs Right Int. Thick (IN.)	Stops
01					420	833	663	550	4	12							40			40			01
02		01																					
03		01																					
04					420	833	750	600	4	12							40			40			
04	1400				530	833	750	600	4	12							40			40			

BASE SECTION



EXTERIOR GIRDERS

TYPE 3 TYPE 4 TYPE 2 TYPE 5

IDENT 14T 20 00 FRAME SYSTEM JUL. 22, 1971 PAGE 1

FRAME DESCRIPTION

MEM NO	JT LT	JT RT	END COND LT	END COND RT	DIR	SPAN	I	HINGE	E	DEAD LOAD UNIFORM	SEC	K LT	K RT	CARRY OVER FACTORS LT	CARRY OVER FACTORS RT	RECALL PEM
1	1	2	R		H	120.0	0.0	0.0	0.	0.360	150.	0.0	0.0	0.0	0.0	
2	2	3			H	160.0	0.0	0.0	0.	0.360	150.	0.0	0.0	0.0	0.0	
3	3	4			H	185.0	0.0	15.0	0.	0.360	150.	0.0	0.0	0.0	0.0	
4	4	5		R	H	140.0	0.0	0.0	0.	0.360	150.	0.0	0.0	0.0	0.0	
5	6	2				50.0	127.24	0.0	0.	0.0	0.	0.0	0.0	0.0	0.0	
6	7	3				70.0	127.24	0.0	0.	0.0	0.	0.0	0.0	0.0	0.0	
7	8	4				60.0	127.24	0.0	0.	0.0	0.	0.0	0.0	0.0	0.0	

IDENT 14T 20 00 FRAME SYSTEM JUL. 22, 1971 PAGE 2

SECTION PROPERTIES

MEM	LOC	RECALL	X	Y	SUPERSTRUCTURE WIDTH	SUPERSTRUCTURE DEPTH	SLAB THICKNESS TOP	SLAB THICKNESS BOTTOM	INT. GIRDER NO.	INT. GIRDER WEB	STORE
1	0.0		0.0	0.0	42.0	8.33	6.63	5.50	4	12.	01

LT. EXT. GIRDER TYPE	LT. EXT. GIRDER WEB	LT. EXT. GIRDER FACTOR	RT. EXT. GIRDER TYPE	RT. EXT. GIRDER WEB	RT. EXT. GIRDER FACTOR	LT. OVERHANG LENGTH	LT. OVERHANG EXT.	LT. OVERHANG INT.	RT. OVERHANG LENGTH	RT. OVERHANG EXT.	RT. OVERHANG INT.
0	12.	0.0	0	12.	0.0	4.0	7.	11.	4.0	7.	11.

*** SOME OF THE ABOVE DATA HAS BEEN ASSUMED. ***

AREA	CENTROID LOCATION X	CENTROID LOCATION Y	MOMENT OF INERTIA ABOUT CENTROID X-X	MOMENT OF INERTIA ABOUT CENTROID Y-Y
85.39	21.00	4.54	810.34	11138.74

MEMBER 1 PROPERTIES

LENGTH	MIN INERTIA	STIFFNESS LT	STIFFNESS RT	CARRY OVER LT	CARRY OVER RT
120.0	810.34	4.000	4.000	0.500	0.500

IDENT 14T 20 00 FRAME SYSTEM JUL. 22, 1971 PAGE 3

SECTION PROPERTIES

MEM	LOC	RECALL	X	Y	SUPERSTRUCTURE WIDTH	SUPERSTRUCTURE DEPTH	SLAB THICKNESS TOP	SLAB THICKNESS BOTTOM	INT. GIRDER NO.	INT. GIRDER WEB	STORE
2	0.0	01	0.0	0.0	0.0	0.0	0.0	0.0	0	0.	

LT. EXT. GIRDER TYPE	LT. EXT. GIRDER WEB	LT. EXT. GIRDER FACTOR	RT. EXT. GIRDER TYPE	RT. EXT. GIRDER WEB	RT. EXT. GIRDER FACTOR	LT. OVERHANG LENGTH	LT. OVERHANG EXT.	LT. OVERHANG INT.	RT. OVERHANG LENGTH	RT. OVERHANG EXT.	RT. OVERHANG INT.
0	0.	0.0	0	0.	0.0	0.0	0.	0.	0.0	0.	0.

MEM	LOC	RECALL	SIGN CODE	V	H	X	Y	INERTIAS OF SECTION PARTS AREA	IXX	IYY	STORE
	RECALL 1					21.00	4.54	85.39	810.34	11138.74	

AREA	CENTROID LOCATION X	CENTROID LOCATION Y	MOMENT OF INERTIA ABOUT CENTROID X-X	MOMENT OF INERTIA ABOUT CENTROID Y-Y
85.39	21.00	4.54	810.34	11138.78

MEMBER 2 PROPERTIES

LENGTH	MIN INERTIA	STIFFNESS LT	STIFFNESS RT	CARRY OVER LT	CARRY OVER RT
160.0	810.34	4.000	4.000	0.500	0.500

```
IDENT  14T 20 00                    FRAME SYSTEM                JUL. 22, 1971                PAGE   4

SECTION PROPERTIES

MEM    LOC  RECALL      X       Y        SUPERSTRUCTURE      SLAB THICKNESS   INT. GIRDER      STORE
                                          WIDTH   DEPTH       TOP    BOTTOM     NO.  WEB
  3     0.0   01        0.0     0.0        0.0     0.0        0.0     0.0        0    0.

                     LT. EXT. GIRDER      RT. EXT. GIRDER      LT. OVERHANG          RT. OVERHANG
                    TYPE  WEB  FACTOR    TYPE  WEB  FACTOR   LENGTH  EXT.  INT.    LENGTH  EXT.  INT.
                     0     0.   0.0       0     0.   0.0       0.0    0.    0.       0.0    0.    0.
                                                                      INERTIAS OF SECTION PARTS
MEM    LOC  RECALL  SIGN CODE     V        H        X       Y      AREA       IXX        IYY      STORE
       RECALL  1                                  21.00    4.54    85.39      810.34   11138.74

            AREA          CENTROID LOCATION          MOMENT OF INERTIA ABOUT CENTROID
                                X        Y                  X-X                  Y-Y
           85.39            21.00     4.54                810.34            11138.78


MEMBER  3 PROPERTIES

                HINGE AT LOCATION  15.0
                     LENGTH          MIN INERTIA          STIFFNESS                CARRY OVER
                                                          LT        RT            LT        RT
                     185.0              810.34            0.025     3.262       11.333     0.088


IDENT  14T 20 00                    FRAME SYSTEM                JUL. 22, 1971                PAGE   5

SECTION PROPERTIES

MEM    LOC  RECALL      X       Y        SUPERSTRUCTURE      SLAB THICKNESS   INT. GIRDER      STORE
                                          WIDTH   DEPTH       TOP    BOTTOM     NO.  WEB
  4     0.0            0.0     0.0        42.0    8.33       7.50    6.00       4   12.

                     LT. EXT. GIRDER      RT. EXT. GIRDER      LT. OVERHANG          RT. OVERHANG
                    TYPE  WEB  FACTOR    TYPE  WEB  FACTOR   LENGTH  EXT.  INT.    LENGTH  EXT.  INT.
                     0    12.   0.0       0    12.   0.0       4.0    7.   11.       4.0    7.   11.
   ***  SOME OF THE ABOVE DATA HAS BEEN ASSUMED. ***

            AREA          CENTROID LOCATION          MOMENT OF INERTIA ABOUT CENTROID
                                X        Y                  X-X                  Y-Y
           88.59            21.00     4.56                849.93            11425.57


MEM    LOC  RECALL      X       Y        SUPERSTRUCTURE      SLAB THICKNESS   INT. GIRDER      STORE
                                          WIDTH   DEPTH       TOP    BOTTOM     NO.  WEB
  4   140.0            0.0     0.0        53.0    8.33       7.50    6.00       4   12.

                     LT. EXT. GIRDER      RT. EXT. GIRDER      LT. OVERHANG          RT. OVERHANG
                    TYPE  WEB  FACTOR    TYPE  WEB  FACTOR   LENGTH  EXT.  INT.    LENGTH  EXT.  INT.
                     0    12.   0.0       0    12.   0.0       4.0    7.   11.       4.0    7.   11.
   ***  SOME OF THE ABOVE DATA HAS BEEN ASSUMED. ***

            AREA          CENTROID LOCATION          MOMENT OF INERTIA ABOUT CENTROID
                                X        Y                  X-X                  Y-Y
          100.96            26.50     4.56               1034.63            22064.25


IDENT  14T 20 00                    FRAME SYSTEM                JUL. 22, 1971                PAGE   6

MEMBER  4 PROPERTIES

                     LENGTH          MIN INERTIA          STIFFNESS                CARRY OVER
                                                          LT        RT            LT        RT
                     140.0              849.93            4.209     4.643       0.525     0.476
```

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FRAME DIAGNOSTICS

FRAME PROPERTIES

MEM NO	JT LT	JT RT	END COND LT	END COND RT	DIR	SPAN	I	HINGE	E	CARRY OVER FACTORS LT	CARRY OVER FACTORS RT	DISTRIBUTION FACTORS LT	DISTRIBUTION FACTORS RT
1	1	2	R		H	120.0	810.34	0.0	750.	0.500	0.0	0.0	0.400
2	2	3			H	160.0	810.34	0.0	750.	0.500	0.500	0.400	0.733
3	3	4			H	185.0	810.34	15.0	750.	11.333	0.088	0.004	0.341
4	4	5		R	H	140.0	849.93	0.0	750.	0.0	0.476	0.457	0.0
5	6	2				50.0	127.24	0.0	750.	0.500	0.500	0.0	0.201
6	7	3				70.0	127.24	0.0	750.	0.500	0.500	0.0	0.263
7	8	4				60.0	127.24	0.0	750.	0.500	0.500	0.0	0.202

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LOAD DATA TRIAL 0

MEM	W OR P	LOAD CODE	A	B	FIXED END MOMENTS LEFT	FIXED END MOMENTS RIGHT	DEFLT	COMMENTS
1	20.500	P	60.0	0.0	0.	0.		DIAPH
1	1.400	U	0.0	0.0	0.	0.		AC SURFACING
		ASSUMED DATA 120.0						
2	1.400	U	0.0	0.0	0.	0.		AC SURFACING
		ASSUMED DATA 160.0						
2	20.500	P	80.0	0.0	0.	0.		DIAPH
3	20.500	P	100.0	0.0	0.	0.		DIAPH
3	1.400	U	0.0	0.0	0.	0.		AC SURFACING
		ASSUMED DATA 185.0						
3	122.600	P	15.0	0.0	0.	0.		HINGE
4	24.600	P	70.0	0.0	0.	0.		DIAPH
4	1.400	U	0.0	0.0	0.	0.		AC SURFACING
		ASSUMED DATA 140.0						
4	0.385	R	0.0	0.0	0.	0.		AC SURFACING
		ASSUMED DATA 140.0						

FIXED END MOMENTS TRIAL 0

MEM NO	FIXED END MOMENTS LT	FIXED END MOMENTS RT	MEM NO	FIXED END MOMENTS LT	FIXED END MOMENTS RT	MEM NO	FIXED END MOMENTS LT	FIXED END MOMENTS RT
1	0.	-26685.	2	-31490.	-31490.	3	-17494.	-53416.
4	-38859.	0.	5	0.	0.	6	0.	0.
7	0.	0.						

IDENT 14T 20 00 JUL. 22, 1971 PAGE 9

SIDESWAY DIAGNOSTICS

RESULTS OF 1 INCH SWAY TO THE RIGHT

VERTICAL MEMBER	SHEAR (KIPS)	MOMENTS (FT-KIPS) LT	MOMENTS (FT-KIPS) RT
5	95.4	-2506.	2264.
6	34.9	-1281.	1160.
7	54.0	-1715.	1522.

IDENT 14T 20 00 FRAME SYSTEM JUL. 22, 1971 PAGE 10

*** SIDESWAY INCLUDED. ***

HORIZONTAL MEMBER MOMENTS TRIAL 0

MEM NO	LEFT	.1 PT	.2 PT	.3 PT	.4 PT	.5 PT	.6 PT	.7 PT	.8 PT	.9 PT	RIGHT
1	0.	6493.	10887.	13184.	13383.	11484.	7241.	901.	-7538.	-18074.	-30709.
2	-33249.	-15171.	-822.	9798.	16688.	19848.	18950.	14324.	5967.	-6119.	-21534.
3	-18047.	3310.	17843.	27389.	31950.	31524.	25887.	15110.	-654.	-21403.	-47139.
4	-46315.	-27514.	-11706.	1064.	10753.	17317.	20367.	20205.	16785.	10065.	-0.

VERTICAL MEMBER MOMENTS TRIAL 0

MEM NO	LEFT	.1 PT	.2 PT	.3 PT	.4 PT	.5 PT	.6 PT	.7 PT	.8 PT	.9 PT	RIGHT
5	1530.	1123.	716.	309.	-98.	-505.	-913.	-1320.	-1727.	-2134.	-2541.
6	-1811.	-1241.	-672.	-102.	468.	1038.	1608.	2178.	2747.	3317.	3887.
7	825.	825.	825.	825.	825.	825.	825.	825.	825.	825.	825.

HORIZONTAL MEMBER SHEARS TRIAL 0

MEM NO	LEFT	.1 PT	.2 PT	.3 PT	.4 PT	.5 PT	.6 PT	.7 PT	.8 PT	.9 PT	RIGHT
1	628.5	453.6	278.8	104.0	-70.8	-245.7	-441.0	-615.8	-790.6	-965.5	-1140.3
						at .5 L -366.2					
2	1246.5	1013.4	780.3	547.2	314.1	81.0	-172.6	-405.7	-638.8	-871.9	-1105.0
						at .5 L 60.5					
3	1312.4	920.3	650.8	381.3	111.7	-157.8	-447.8	-717.3	-986.8	-1256.4	-1525.9
	at .081 L					at .541 L					
4	1448.8	1236.6	1021.2	802.7	581.0	356.2	103.7	-127.4	-361.6	-599.0	-839.4
						at .5 L 331.6					

Shown are the abrupt changes due to concentrated dead loads.

IDENT 14T 20 00 FRAME SYSTEM JUL. 22, 1971 PAGE 11

*** SIDESWAY INCLUDED. ***

VERTICAL MEMBER SHEARS TRIAL 0

MEM NO	LEFT	.1 PT	.2 PT	.3 PT	.4 PT	.5 PT	.6 PT	.7 PT	.8 PT	.9 PT	RIGHT
5	-81.4	-81.4	-81.4	-81.4	-81.4	-81.4	-81.4	-81.4	-81.4	-81.4	-81.4
6	81.4	81.4	81.4	81.4	81.4	81.4	81.4	81.4	81.4	81.4	81.4
7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

VERTICAL MEMBER REACTIONS TRIAL 0

MEM NO	LT REACTION	RT REACTION	MEMBER WEIGHT
5	2386.7	2386.7	0.0
6	2417.5	2417.5	0.0
7	2974.7	2974.7	0.0

IDENT 14T 20 00 FRAME SYSTEM JUL. 22, 1971 PAGE 12
TRIAL 0

TANGENTIAL ROTATIONS - RADIANS - CLOCKWISE POSITIVE

SPAN	LT. END	RT. END	SPAN	LT. END	RT. END	SPAN	LT. END	RT. END
1	0.005179	0.001839	2	0.001839	-0.005287	3	-0.005287	-0.003600
4	-0.003600	-0.007571	5	-0.000000	0.001839	6	0.000000	-0.005287
7	-0.000000	-0.003600						

HORIZONTAL MEMBER DEFLECTIONS IN FEET AT 1/ 4 POINTS FROM LEFT END - DOWNWARD POSITIVE

MEMBER 1	E= 750.	0.0	0.129	0.142	0.090	0.0
MEMBER 2	E= 750.	0.0	0.243	0.432	0.295	0.0
MEMBER 3	E= 750.	0.0	0.499	0.845	0.487	0.0

LONG HINGE	LT	1/4	1/2	3/4	RT
	-0.044	0.650	0.829	0.439	0.0

MEMBER 4	E= 750.	0.0	0.079	0.242	0.220	0.0

VERTICAL MEMBER DEFLECTIONS IN FEET AT 1/ 4 POINTS FROM LEFT END.

MEMBER 5	E= 750.	0.0	-0.007	-0.019	-0.026	-0.016
MEMBER 6	E= 750.	0.0	0.015	0.018	0.039	-0.016
MEMBER 7	E= 750.	0.0	-0.007	-0.027	-0.061	-0.108

IDENT 14T 20 00 FRAME SYSTEM JUL. 22, 1971 PAGE 13

LIVE LOAD DIAGNOSTICS

SUPERSTRUCTURE LIVE LOAD EMPTY CREEK BRIDGE

MEM NO.	NUMBER OF LIVE LOAD LANES SUPERSTRUCTURE LT.END	RT.END	SUBSTRUCTURE LT.END	RT.END	RESISTING MOMENT OF UNIT STEEL POSITIVE	NEGATIVE	PLOT MOMENT ENV.	PLOT SHEAR ENV	INFLUENCE LINES
1	3.000	3.000	2.7	2.7	0.	0.	NO	NO	NO
2	3.000	3.000	2.7	2.7	0.	0.			
3	3.000	3.000	2.7	2.7	0.	0.			
4	3.000	3.786	2.7	3.0	0.	0.			

LIVE LOAD NO.	TRUCK P1	D1	P2	D2	P3	LANE UNIFORM	NOM. RIDER	SHEAR RIDER	IMPACT	NO. LL LNS.	LIVE LOAD SIDESWAY	COMMENTS
1.	8.0	14.0	32.0	14.0	32.0	0.440	38.0	26.0	YES	0.0	NO	HS20-44 AASHO LOADING WITHOUT ALTERNATIVE
2.	70.0	13.0	130.0	28.0	130.0	0.0	0.0	0.0	YES	1.00	NO	CONSTRUCTION LOAD

IDENT 14T 20 00 FRAME SYSTEM JUL. 22, 1971 PAGE 14

LL NO. 1. NEGATIVE LIVE LOAD MOMENT ENVELOPE

MEM NO	LEFT	.1 PT	.2 PT	.3 PT	.4 PT	.5 PT	.6 PT	.7 PT	.8 PT	.9 PT	RIGHT
1	0.	-365.	-730.	-1096.	-1461.	-1826.	-2191.	-2556.	-2978.	-4434.	-6871.
2	-7479.	-3946.	-1811.	-1467.	-1534.	-1681.	-1788.	-1895.	-2002.	-2339.	-4675.
3	-9575.	-57.	-358.	-659.	-961.	-1262.	-1563.	-1866.	-2372.	-5003.	-9454.
4	-9016.	-5694.	-3778.	-3299.	-2877.	-2356.	-1885.	-1414.	-942.	-471.	0.

IDENT 14T 20 00 FRAME SYSTEM JUL. 22, 1971 PAGE 15

LL NO. 1. DEAD LOAD PLUS NEGATIVE LIVE LOAD MOMENT ENVELOPE

MEM NO	LEFT	.1 PT	.2 PT	.3 PT	.4 PT	.5 PT	.6 PT	.7 PT	.8 PT	.9 PT	RIGHT
1	0.	6127.	10157.	12089.	11922.	9658.	5050.	-1656.	-10516.	-22511.	-37579.
2	-40729.	-19117.	-2633.	8331.	15114.	18167.	17162.	12429.	3965.	-8458.	-26610.
3	-21623.	3253.	17485.	26730.	30989.	30262.	24323.	13244.	-3026.	-26406.	-56633.
4	-55330.	-33168.	-15484.	-2234.	7926.	14961.	18482.	18791.	15843.	9594.	-0.

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LL NO. 1. POSITIVE LIVE LOAD MOMENT ENVELOPE

MEM NO	LEFT	.1 PT	.2 PT	.3 PT	.4 PT	.5 PT	.6 PT	.7 PT	.8 PT	.9 PT	RIGHT
1	0.	2416.	4062.	5002.	5370.	5218.	4608.	3549.	2172.	893.	564.
2	847.	989.	2617.	4269.	5494.	6125.	6146.	5488.	4114.	2084.	455.
3	240.	788.	4167.	6346.	7529.	7676.	6829.	5073.	3103.	1000.	242.
4	167.	978.	2940.	4770.	6243.	7176.	7409.	7014.	5752.	3474.	0.

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LL NO. 1. DEAD LOAD PLUS POSITIVE LIVE LOAD MOMENT ENVELOPE

MEM NO	LEFT	.1 PT	.2 PT	.3 PT	.4 PT	.5 PT	.6 PT	.7 PT	.8 PT	.9 PT	RIGHT
1	0.	8909.	14950.	18197.	18753.	16702.	11850.	4450.	-5366.	-17181.	-30145.
2	-32402.	-14181.	1794.	14067.	22181.	25972.	25096.	19811.	10081.	-4035.	-21475.
3	-17807.	4098.	22010.	33736.	39479.	39200.	32715.	20183.	2449.	-20404.	-46858.
4	-46147.	-26536.	-8767.	5834.	16996.	24493.	27777.	27219.	22538.	13539.	-0.

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LL NO. 1. LIVE LOAD SHEAR ENVELOPES

MEMBER 1	LEFT	.1 PT	.2 PT	.3 PT	.4 PT	.5 PT	.6 PT	.7 PT	.8 PT	.9 PT	RIGHT
POS.	234.3	201.4	169.3	138.4	109.2	82.1	57.6	36.1	18.1	9.0	5.3
NEG.	-33.3	-37.7	-54.9	-75.2	-104.7	-134.9	-163.2	-189.2	-212.7	-244.4	-276.2
RANGE	267.6	239.1	224.2	213.6	214.0	217.1	220.9	225.3	230.7	253.3	281.5

LL NO. 1. LIVE LOAD SHEAR ENVELOPES

MEMBER 2	LEFT	.1 PT	.2 PT	.3 PT	.4 PT	.5 PT	.6 PT	.7 PT	.8 PT	.9 PT	RIGHT
POS.	300.3	260.2	220.5	183.6	154.0	126.6	96.5	66.5	38.7	22.5	17.3
NEG.	-23.7	-24.5	-31.2	-45.6	-66.0	-93.2	-122.3	-152.4	-187.3	-227.9	-271.5
RANGE	323.9	284.7	251.7	229.2	222.0	219.8	218.8	218.9	225.9	250.8	288.8

LL NO. 1. LIVE LOAD SHEAR ENVELOPES

MEMBER 3	LEFT	.1 PT	.2 PT	.3 PT	.4 PT	.5 PT	.6 PT	.7 PT	.8 PT	.9 PT	RIGHT
POS.	282.8	239.0	189.4	154.9	122.0	91.6	64.1	40.3	20.7	6.4	1.6
NEG.	-17.7	-17.9	-32.5	-61.1	-95.7	-128.5	-159.0	-192.8	-235.4	-279.5	-324.2
RANGE	300.5	256.9	221.9	216.0	217.7	220.1	223.1	233.1	256.0	285.9	325.8

LL NO. 1. LIVE LOAD SHEAR ENVELOPES

MEMBER 4	LEFT	.1 PT	.2 PT	.3 PT	.4 PT	.5 PT	.6 PT	.7 PT	.8 PT	.9 PT	RIGHT
POS.	316.9	282.7	247.9	213.3	181.7	154.1	123.1	89.3	64.7	43.8	36.7
NEG.	-1.3	-6.9	-21.1	-41.6	-66.6	-95.8	-128.9	-165.6	-205.4	-248.1	-293.2
RANGE	318.2	289.6	269.0	255.0	248.3	250.0	252.0	254.9	270.2	291.9	329.9

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LL NO. 1. DEAD LOAD PLUS LIVE LOAD SHEAR ENVELOPE

MEMBER 1	LEFT	.1 PT	.2 PT	.3 PT	.4 PT	.5 PT	.6 PT	.7 PT	.8 PT	.9 PT	RIGHT
POS.	862.7	655.0	448.1	242.4	38.4	-163.5	-383.4	-579.7	-772.6	-956.5	-1135.0
NEG.	595.1	415.9	223.9	28.8	-175.6	-380.6	-604.2	-805.0	-1003.3	-1209.8	-1416.5

-20.5 = -401.1

LL NO. 1. DEAD LOAD PLUS LIVE LOAD SHEAR ENVELOPE

MEMBER 2	LEFT	.1 PT	.2 PT	.3 PT	.4 PT	.5 PT	.6 PT	.7 PT	.8 PT	.9 PT	RIGHT
POS.	1546.7	1273.6	1000.8	730.7	470.0	267.6	-76.2	-339.3	-600.2	-849.1	-1087.8
NEG.	1222.8	988.8	749.1	501.6	248.0	-12.2	-295.0	-558.2	-826.1	-1099.9	-1376.6

-20.5 = -32.7

LL NO. 1. DEAD LOAD PLUS LIVE LOAD SHEAR ENVELOPE

MEMBER 3	LEFT	.1 PT	.2 PT	.3 PT	.4 PT	.5 PT	.6 PT	.7 PT	.8 PT	.9 PT	RIGHT
POS.	1595.3	1159.3	840.2	536.1	233.8	-66.2	-383.7	-677.1	-966.2	-1250.0	-1524.3
NEG.	1294.8	902.5	618.3	320.1	14.1	-286.3	-606.8	-910.1	-1222.2	-1535.9	-1850.1

at .081 L at .541 L

LL NO. 1. DEAD LOAD PLUS LIVE LOAD SHEAR ENVELOPE

MEMBER 4	LEFT	.1 PT	.2 PT	.3 PT	.4 PT	.5 PT	.6 PT	.7 PT	.8 PT	.9 PT	RIGHT
POS.	1765.7	1519.2	1269.1	1016.0	762.7	510.3	226.8	-38.1	-256.9	-555.2	-802.8
NEG.	1447.5	1229.7	1000.1	761.0	514.4	260.4	-25.3	-293.0	-567.1	-847.1	-1132.7

-24.6 = 236.8

Shown are the abrupt changes due to concentrated dead loads.

IDENT 14T 20 00 FRAME SYSTEM JUL. 22, 1971 PAGE 20

LL NO. 1. LIVE LOAD SUPPORT RESULTS

	MAX. AXIAL LOAD	MAX. AXIAL LOAD MOMENT TOP	MAX. AXIAL LOAD MOMENT BOT.	MAX. LONGITUDINAL MOMENT AXIAL LOAD	MAX. LONGITUDINAL MOMENT MOMENT TOP	MAX. LONGITUDINAL MOMENT MOMENT BOT.
SUPPORT JT. 1						
POSITIVE	210.8	0.	0.	0.0	0.	0.
NEGATIVE	-30.0	0.	0.	0.0	0.	0.
MEMBER 5						
POSITIVE	436.3	-484.	242.	180.0	1291.	-646.
NEGATIVE	-26.0	285.	-142.	244.3	-1651.	825.
MEMBER 6						
POSITIVE	423.4	459.	-230.	169.4	1946.	-973.
NEGATIVE	-26.0	-279.	140.	237.6	-1125.	562.
MEMBER 7						
POSITIVE	486.3	461.	-230.	268.7	1876.	-938.
NEGATIVE	-2.6	-73.	37.	222.9	-1411.	705.
SUPPORT JT. 5						
POSITIVE	233.9	0.	0.	0.0	0.	0.
NEGATIVE	-33.0	0.	0.	0.0	0.	0.

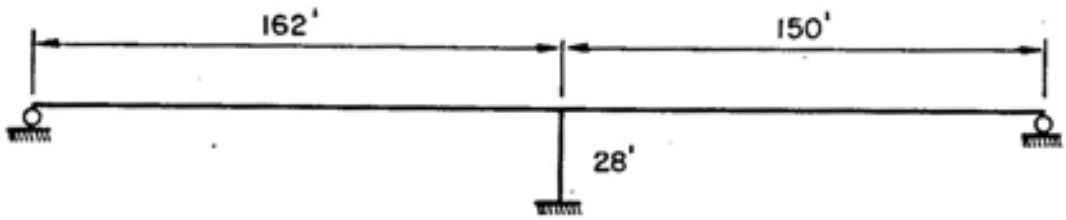
Results for L. L. No. 2 are similar and are not shown in this example.

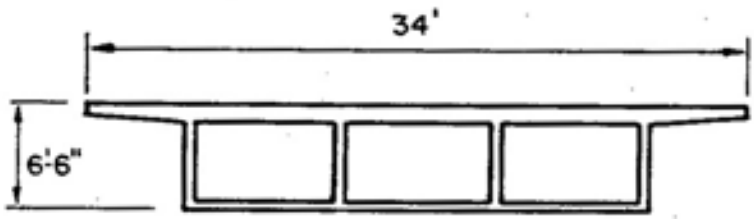
MOMENT AND SHEAR PLOTTED RESULTS

Dead load moments and shears are plotted as dashed lines. Live load moments and shears are plotted as solid lines from enveloped data as presented in the printed output. Plots will be annotated to show if the Dead Load is included or excluded from the Live Load envelopes.

INFLUENCE LINE PLOTTED RESULTS

When influence lines are requested the plotted results will produce separate plot frames for each horizontal member. Each plot frame will contain the influence lines for the .2L, .4L, .5L, .6L, .8L, and 1.0L positions along the particular member. Each influence line is delineated by a separate line code shown on the plot.





FRAME SYSTEM
Frame Description

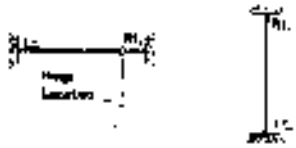
BDEDAX

Page 1 of 4

Name FRED FRANK

Phone

Update		Member No.	End Joint No.		End Condition	Division	Length	Min'l	Hinge Location	C	Dead Load		Moment Properties				Recall	
			LL	RL	L R		ft	ft	ft	kip	kip/ft	kip	K Stiffness Factor LL	K Stiffness Factor RL	C Carry Over Factor LL	C Carry Over Factor RL	Member	Remarks
	1	1	2	R	H		1620					150						
	2	2	3	R	H		1500					150						
	3	4	2				280	8400										



END CONDITION
C-Cantilever
F-Fixed
R-Roller

DIRECTION
V or H-Horizontal

FRAME SYSTEM
Superstructure Sections

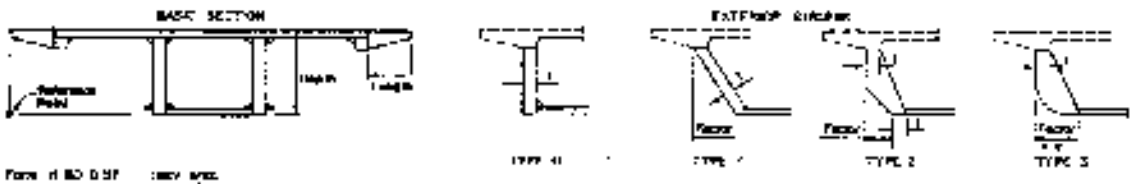
BDEDBX

Page 2 of 4

Name

Phone

Update		Member No.	Cross Section Location		Ref. Coord. X		S.S. Data Width		Slab Data Top Thick	Bottom Thick	Int. Angles	Exterior Girder Left				Exterior Girder Right				Overhangs Left				Overhangs Right			
	1	00			00	00	340	650	675	575	2120	12		012		35	7	1135	7	1	01						
	1	1437	01																								
	1	1620					340	650	675	1200	2120	12		012		35	7	1135	7	1	02						
	2	00	02																								
	2	1830	01																								
	2	1500	01																								



FRAME SYSTEM
Load Data

BDEOAA

Page 3 of 4

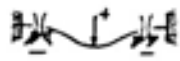
Name

Phone

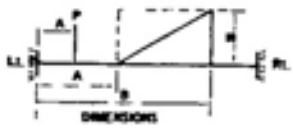
IDENT.			
DIST.	GR.	BATCH	PROG.
14	T	05	01

S/C 7318

*CODE
L=Max. W on left
R=Max. W on right
U=Uniform Load
P=Point Load



SIGN CONVENTIONS



DIMENSIONS

Update CODE	Update Line No.	Trial No.	Member No.	Loads W or P ± k/ft or k	Loads Code*	Loads A ft.	Loads B ft.	FEMs* Left ± ft-k	FEMs* Right ± ft-k	Deflections	Sidesway	Comments
		0	1	14037	P	810						DIAPH
		0	2	14037	P	750						DIAPH

S/C 7316

*When FEMs are given, they are not calculated for any load on that member.

PROG. H-80 (REV. 6/75)

FRAME SYSTEM
Superstructure Live Load

BDEOAA

Page 4 of 4

Name

Phone

IDENT			
DIST.	GR.	BATCH	PROG.
14	T	05	01

S/C 7320, 7321

MEMBER DATA

Update CODE	Update Line No.	Member No.	Number of Live Load Lanes: Superstructure Lt. End	Superstructure Rt. End	Substructure Lt.	Substructure Rt.	Plot Data: Resisting Moment of Unit Steel Positive	Negative	Moment & Shear	✓ Influence Lines	COMMENTS
		1	2430	2430	10	10	4500	5000	1	✓	2 SPAN EXAMPLE
		2	2430	2430	10	10	4500	50[illegible]			

Frame Description data with the horizontal members numbered consecutively starting with 01 must accompany this data.

Member Data – When the Number of L.L. Lanes is given, it must be given for the left end of Superstructure Member 01. (Substructure Member 01 defaults to 1.0 when left blank.) Thereafter, it is assumed to be constant until another entry is made.

Live Load Data – For AASHO HS20-44 loading, leave Truck and Lane data blank for L.L. No. 1. When this data is given, it replaces the HS20-44 loading. An entry for the Number of Live Load Lanes, overrides that given as Member Data. Data entries for L.L. No.'s 2 and 3 produce separate results in addition to L.L. No. 1.

Influence Lines – When checked a plot of the influence lines will be produced along with the printed results.

S/C 7320

LIVE LOAD DATA

Update CODE	Update Line No.	L.L. No.	Truck – (1 Lane) P_1 Kips	D_1 Ft.	P_2 Kips	D_2 Ft.	P_3 Kips	Lane – (1 Lane) Uniform Kips/ft.	Moment Rider Kips	Shear Rider Kips	✓ No Impact	Number of Live Load Lanes	COMMENTS
		1											
		2											
		3											

S/C 7321

```
IDENT  14T 05 01                    FRAME SYSTEM                    DEC. 13, 1972                    PAGE  1

FRAME DESCRIPTION
          JOINT  END                                                                                  CARRY OVER
LINE MEM   NO.   COND                                                  DEAD LOAD          K            FACTORS    RECALL
 NO.  NO  LT RT  LT RT  DIR  SPAN      I      HINGE     E   UNIFORM SEC     LT     RT     LT     RT    MEM

      1   1  2   R      H   162.0     0.0     0.0      0.   0.0   150.   0.0    0.0    0.0    0.0
      2   2  3      R   H   150.0     0.0     0.0      0.   0.0   150.   0.0    0.0    0.0    0.0
      3   4  2               28.0    84.00    0.0      0.   0.0     0.   0.0    0.0    0.0    0.0
```

```
IDENT  14T 05 01                    FRAME SYSTEM                    DEC. 13, 1972                    PAGE  2

SECTION PROPERTIES

LINE MEM    LOC  RECALL      X       Y        SUPERSTRUCTURE      SLAB THICKNESS   INT. GIRDER      STORE
                                              WIDTH   DEPTH       TOP    BOTTOM     NO.  WEB
      1     0.0            0.0     0.0        34.0    6.50       6.75    5.75       2   12.          01

                    LT. EXT. GIRDER      RT. EXT. GIRDER       LT. OVERHANG          RT. OVERHANG
                    TYPE  WEB  FACTOR    TYPE  WEB  FACTOR   LENGTH  EXT.  INT.   LENGTH  EXT.  INT.
                     0    12.   0.0       0    12.   0.0       3.5    7.   11.      3.5    7.   11.

          AREA          CENTROID LOCATION          MOMENT OF INERTIA ABOUT CENTROID
                              X        Y                  X-X                 Y-Y
         55.87          17.00     3.61                 346.69              5008.42


LINE MEM    LOC  RECALL      X       Y        SUPERSTRUCTURE      SLAB THICKNESS   INT. GIRDER      STORE
                                              WIDTH   DEPTH       TOP    BOTTOM     NO.  WEB
      1   143.7   01       0.0     0.0         0.0    0.0        0.0     0.0        0    0.

                    LT. EXT. GIRDER      RT. EXT. GIRDER       LT. OVERHANG          RT. OVERHANG
                    TYPE  WEB  FACTOR    TYPE  WEB  FACTOR   LENGTH  EXT.  INT.   LENGTH  EXT.  INT.
                     0     0.   0.0       0     0.   0.0       0.0    0.    0.      0.0    0.    0.
LINE                  +                                          INERTIAS OF PARTS
 NO. MEM    LOC  RECALL - CODE      V       H        X       Y      AREA        IXX        IYY   STORE
          RECALL  1                                17.00    3.61    55.87      346.69    5008.42

          AREA          CENTROID LOCATION          MOMENT OF INERTIA ABOUT CENTROID
                              X        Y                  X-X                 Y-Y
         55.87          17.00     3.61                 346.69              5008.46
```

```
IDENT  14T 05 01                    FRAME SYSTEM                    DEC. 13, 1972                    PAGE  3

SECTION PROPERTIES

LINE MEM    LOC  RECALL      X       Y        SUPERSTRUCTURE      SLAB THICKNESS   INT. GIRDER      STORE
                                              WIDTH   DEPTH       TOP    BOTTOM     NO.  WEB
      1   162.0            0.0     0.0        34.0    6.50       6.75   12.00       2   12.          02

                    LT. EXT. GIRDER      RT. EXT. GIRDER       LT. OVERHANG          RT. OVERHANG
                    TYPE  WEB  FACTOR    TYPE  WEB  FACTOR   LENGTH  EXT.  INT.   LENGTH  EXT.  INT.
                     0    12.   0.0       0    12.   0.0       3.5    7.   11.      3.5    7.   11.

          AREA          CENTROID LOCATION          MOMENT OF INERTIA ABOUT CENTROID
                              X        Y                  X-X                 Y-Y
         67.85          17.00     3.11                 427.60              5666.94


MEMBER  1 PROPERTIES

                    LENGTH          MIN INERTIA          STIFFNESS                CARRY OVER
                                                          LT        RT           LT        RT
                    162.0              346.69           4.038     4.170        0.515     0.499
```

```
IDENT  14T 05 01                    FRAME SYSTEM                DEC. 13, 1972              PAGE   4

SECTION PROPERTIES

LINE MEM    LOC  RECALL      X      Y        SUPERSTRUCTURE      SLAB THICKNESS   INT. GIRDER      STORE
                                             WIDTH   DEPTH       TOP    BOTTOM     NO.  WEB
      2     0.0   02        0.0    0.0        0.0    0.0        0.0     0.0        0    0.

                     LT. EXT. GIRDER      RT. EXT. GIRDER      LT. OVERHANG         RT. OVERHANG
                    TYPE  WEB  FACTOR    TYPE  WEB  FACTOR   LENGTH  EXT.  INT.   LENGTH  EXT.  INT.
                     0     0.   0.0       0     0.   0.0       0.0    0.    0.      0.0    0.    0.
LINE                    +                                          INERTIAS OF PARTS
 NO. MEM    LOC  RECALL - CODE      V      H       X      Y      AREA        IXX        IYY   STORE
           RECALL  2                            17.00   3.11    67.85      427.60    5666.94

             AREA          CENTROID LOCATION          MOMENT OF INERTIA ABOUT CENTROID
                                X       Y                  X-X                 Y-Y
            67.85           17.00    3.11                427.60              5666.99


LINE MEM    LOC  RECALL      X      Y        SUPERSTRUCTURE      SLAB THICKNESS   INT. GIRDER      STORE
                                             WIDTH   DEPTH       TOP    BOTTOM     NO.  WEB
      2    18.3   01        0.0    0.0        0.0    0.0        0.0     0.0        0    0.

                     LT. EXT. GIRDER      RT. EXT. GIRDER      LT. OVERHANG         RT. OVERHANG
                    TYPE  WEB  FACTOR    TYPE  WEB  FACTOR   LENGTH  EXT.  INT.   LENGTH  EXT.  INT.
                     0     0.   0.0       0     0.   0.0       0.0    0.    0.      0.0    0.    0.
LINE                    +                                          INERTIAS OF PARTS
 NO. MEM    LOC  RECALL - CODE      V      H       X      Y      AREA        IXX        IYY   STORE
           RECALL  1                            17.00   3.61    55.87      346.69    5008.42

             AREA          CENTROID LOCATION          MOMENT OF INERTIA ABOUT CENTROID
                                X       Y                  X-X                 Y-Y
            55.87           17.00    3.61                346.69              5008.46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SECTION PROPERTIES

LINE MEM    LOC  RECALL      X      Y        SUPERSTRUCTURE      SLAB THICKNESS   INT. GIRDER      STORE
                                             WIDTH   DEPTH       TOP    BOTTOM     NO.  WEB
      2   150.0   01        0.0    0.0        0.0    0.0        0.0     0.0        0    0.

                     LT. EXT. GIRDER      RT. EXT. GIRDER      LT. OVERHANG         RT. OVERHANG
                    TYPE  WEB  FACTOR    TYPE  WEB  FACTOR   LENGTH  EXT.  INT.   LENGTH  EXT.  INT.
                     0     0.   0.0       0     0.   0.0       0.0    0.    0.      0.0    0.    0.
LINE                    +                                          INERTIAS OF PARTS
 NO. MEM    LOC  RECALL - CODE      V      H       X      Y      AREA        IXX        IYY   STORE
           RECALL  1                            17.00   3.61    55.87      346.69    5008.42

             AREA          CENTROID LOCATION          MOMENT OF INERTIA ABOUT CENTROID
                                X       Y                  X-X                 Y-Y
            55.87           17.00    3.61                346.69              5008.46


MEMBER  2 PROPERTIES

                     LENGTH          MIN INERTIA          STIFFNESS                CARRY OVER
                                                          LT        RT           LT        RT
                     150.0              346.69           4.180     4.040       0.499     0.516


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FRAME DIAGNOSTICS

     NO ERRORS FOUND

FRAME PROPERTIES
                  END                                                  CARRY OVER        DISTRIBUTION
MEM    JT  JT    COND                                                    FACTORS             FACTORS
 NO    LT  RT    LT RT   DIR    SPAN       I        HINGE       E        LT      RT         LT     RT

  1     1   2    R        H    162.0     346.69     0.0       750.     0.515   0.0       0.0    0.257
  2     2   3       R     H    150.0     346.69     0.0       750.     0.0     0.516     0.278  0.0
  3     4   2                  26.0      84.00     0.0       750.     0.500   0.500     0.0    0.465
```

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LOAD DATA TRIAL 0

LINE	MEM	W OR F	LOAD CODE	A	B	FIXED END MOMENTS LEFT	RIGHT	DEFLT	COMMENTS
	1	14.037	P	61.0	0.0	0.	0.		DIAPH
	2	14.037	P	75.0	0.0	0.	0.		DIAPH

FIXED END MOMENTS TRIAL 0

MEM NO	FIXED END MOMENTS LT	RT	MEM NO	FIXED END MOMENTS LT	RT	MEM NO	FIXED END MOMENTS LT	RT
1	0.	-28798.	2	-24767.	0.	3	0.	0.

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*** SIDESWAY NOT CONSIDERED. ***

HORIZONTAL MEMBER MOMENTS TRIAL 0

MEM NO	LEFT	.1 PT	.2 PT	.3 PT	.4 PT	.5 PT	.6 PT	.7 PT	.8 PT	.9 PT	RIGHT
1	0.	7246.	12292.	15139.	15786.	14234.	10255.	4076.	-4302.	-14880.	-27763.
2	-25886.	-14616.	-5331.	2667.	7579.	11206.	12736.	12380.	10139.	6013.	0.

VERTICAL MEMBER MOMENTS TRIAL 0

MEM NO	LEFT	.1 PT	.2 PT	.3 PT	.4 PT	.5 PT	.6 PT	.7 PT	.8 PT	.9 PT	RIGHT
3	-937.	-656.	-375.	-94.	187.	469.	750.	1031.	1312.	1593.	1874.

HORIZONTAL MEMBER SHEARS TRIAL 0

MEM NO	LEFT	.1 PT	.2 PT	.3 PT	.4 PT	.5 PT	.6 PT	.7 PT	.8 PT	.9 PT	RIGHT
1	515.2	379.4	243.6	107.8	-27.9	-163.7	-313.5	-449.3	-585.1	-721.2	-873.2
2	824.0	682.4	556.1	430.3	304.6	178.9	39.2	-86.6	-212.3	-338.0	-463.7

VERTICAL MEMBER SHEARS TRIAL 0

MEM NO	LEFT	.1 PT	.2 PT	.3 PT	.4 PT	.5 PT	.6 PT	.7 PT	.8 PT	.9 PT	RIGHT
3	100.4	100.4	100.4	100.4	100.4	100.4	100.4	100.4	100.4	100.4	100.4

VERTICAL MEMBER REACTIONS TRIAL 0

MEM NO	LT REACTION	RT REACTION	MEMBER WEIGHT
3	1697.2	1697.2	0.0

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TRIAL 0

TANGENTIAL ROTATIONS - RADIANS - CLOCKWISE POSITIVE

SPAN	LT. END	RT. END	SPAN	LT. END	RT. END	SPAN	LT. END	RT. END
1	0.020362	-0.001446	2	-0.001447	-0.014826	3	0.000000	-0.001446

HORIZONTAL MEMBER DEFLECTIONS IN FEET AT 1/ 4 POINTS FROM LEFT END - DOWNWARD POSITIVE

MEMBER 1	E= 750.	0.0	0.697	0.832	0.398	0.0
MEMBER 2	E= 750.	0.0	0.226	0.536	0.466	0.0

VERTICAL MEMBER DEFLECTIONS IN FEET AT 1/ 4 POINTS FROM LEFT END.

MEMBER 3	E= 750.	0.0	0.002	0.005	0.006	0.0

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LIVE LOAD DIAGNOSTICS

NO ERRORS FOUND

SUPERSTRUCTURE LIVE LOAD 2 SPAN EXAMPLE

LINE NO.	MEM NO.	NUMBER OF LIVE LOAD LANES SUPERSTRULTURE LT.END	SUPERSTRULTURE RT.END	SUBSTRULTURE LT.END	SUBSTRULTURE RT.END	RESISTING MOMENT OF UNIT STEEL POSITIVE	NEGATIVE	PLOT M & S ENV.	PLOT SCALE	INFLUENCE LINES
	1	2.430	2.430	1.0	1.0	4500.	5000.	1	0	YES
	2	2.430	2.430	1.0	1.0	4500.	5000.			

LINE NO.	LIVE LOAD NO.	TRUCK P1	D1	P2	D2	P3	LANE UNIFORM	MOM. RIDER	SHEAR RIDER	IMPACT	NO. LL LNS.	LIVE LOAD SIDESWAY	COMMENTS
	1.	8.0	14.0	32.0	14.0	32.0	0.640	18.0	24.0	YES	0.0	NO	HS20-44 AASHO LOADING WITHOUT ALTERNATIVE

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INFLUENCE LINES FOR GIRDER MOMENT

AT 0.1 L - MEMBER 1

MEM NO	LEFT	.1 PT	.2 PT	.3 PT	.4 PT	.5 PT	.6 PT	.7 PT	.8 PT	.9 PT	RIGHT
1	0.0	13.966	11.770	9.640	7.638	5.777	4.102	2.652	1.462	0.571	0.0
2	0.0	-0.336	-0.570	-0.708	-0.762	-0.745	-0.668	-0.543	-0.362	-0.197	0.0

AT 0.2 L - MEMBER 1

MEM NO	LEFT	.1 PT	.2 PT	.3 PT	.4 PT	.5 PT	.6 PT	.7 PT	.8 PT	.9 PT	RIGHT
1	0.0	11.732	23.539	19.295	15.275	11.553	8.205	5.303	2.925	1.142	0.0
2	0.0	-0.672	-1.140	-1.416	-1.525	-1.490	-1.336	-1.086	-0.764	-0.394	0.0

AT 0.3 L - MEMBER 1

MEM NO	LEFT	.1 PT	.2 PT	.3 PT	.4 PT	.5 PT	.6 PT	.7 PT	.8 PT	.9 PT	RIGHT
1	0.0	9.498	19.109	28.943	22.915	17.330	12.307	7.955	4.387	1.714	0.0
2	0.0	-1.001	-1.710	-2.124	-2.287	-2.235	-2.004	-1.628	-1.145	-0.591	0.0

AT 0.4 L - MEMBER 1

MEM NO	LEFT	.1 PT	.2 PT	.3 PT	.4 PT	.5 PT	.6 PT	.7 PT	.8 PT	.9 PT	RIGHT
1	0.0	7.265	14.676	22.390	30.550	23.107	16.409	10.607	5.849	2.285	0.0
2	0.0	-1.344	-2.279	-2.832	-3.050	-2.960	-2.672	-2.171	-1.527	-0.788	0.0

AT 0.5 L - MEMBER 1

MEM NO	LEFT	.1 PT	.2 PT	.3 PT	.4 PT	.5 PT	.6 PT	.7 PT	.8 PT	.9 PT	RIGHT
1	0.0	5.031	10.246	15.836	21.968	28.683	20.512	13.259	7.311	2.856	0.0
2	0.0	-1.680	-2.849	-3.540	-3.812	-3.725	-3.339	-2.714	-1.909	-0.984	0.0

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INFLUENCE LINES FOR GIRDER MOMENT

AT 0.6 L - MEMBER 1

MEM NO	LEFT	.1 PT	.2 PT	.3 PT	.4 PT	.5 PT	.6 PT	.7 PT	.8 PT	.9 PT	RIGHT
1	0.0	2.797	5.817	9.286	13.425	18.460	24.614	15.910	8.774	3.427	0.0
2	0.0	-2.016	-3.419	-4.248	-4.575	-4.471	-4.007	-3.257	-2.291	-1.181	0.0

AT 0.7 L - MEMBER 1

MEM NO	LEFT	.1 PT	.2 PT	.3 PT	.4 PT	.5 PT	.6 PT	.7 PT	.8 PT	.9 PT	RIGHT
1	0.0	0.563	1.387	2.733	4.663	8.037	12.516	18.562	10.236	3.998	0.0
2	0.0	-2.352	-3.989	-4.956	-5.337	-5.216	-4.675	-3.800	-2.673	-1.378	0.0

AT 0.8 L - MEMBER 1

MEM NO	LEFT	.1 PT	.2 PT	.3 PT	.4 PT	.5 PT	.6 PT	.7 PT	.8 PT	.9 PT	RIGHT
1	0.0	-1.671	-3.643	-3.819	-3.700	-2.386	0.419	5.014	11.698	4.369	0.0
2	0.0	-2.688	-4.559	-5.664	-6.100	-5.961	-5.343	-4.342	-3.054	-1.575	0.0

AT 0.9 L - MEMBER 1

MEM NO	LEFT	.1 PT	.2 PT	.3 PT	.4 PT	.5 PT	.6 PT	.7 PT	.8 PT	.9 PT	RIGHT
1	0.0	-3.905	-7.474	-10.371	-11.262	-12.816	-11.679	-8.534	-3.040	5.141	0.0
2	0.0	-3.024	-5.129	-6.373	-6.862	-6.706	-6.011	-4.885	-3.436	-1.772	0.0

AT 1.0 L - MEMBER 1

MEM NO	LEFT	.1 PT	.2 PT	.3 PT	.4 PT	.5 PT	.6 PT	.7 PT	.8 PT	.9 PT	RIGHT
1	0.0	-6.139	-11.964	-16.924	-20.624	-23.233	-23.777	-22.083	-17.777	-10.688	0.0
2	0.0	-3.359	-5.699	-7.081	-7.623	-7.451	-6.679	-5.426	-3.818	-1.969	0.0

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INFLUENCE LINES FOR GIRDER MOMENT

AT 0.0 L - MEMBER 2

MEM NO	LEFT	.1 PT	.2 PT	.3 PT	.4 PT	.5 PT	.6 PT	.7 PT	.8 PT	.9 PT	RIGHT
1	0.0	-2.297	-4.455	-6.333	-7.793	-8.694	-8.898	-8.264	-6.653	-3.925	0.0
2	0.0	-9.439	-16.011	-19.894	-21.423	-20.934	-18.765	-15.250	-10.727	-5.532	0.0

AT 0.1 L - MEMBER 2

MEM NO	LEFT	.1 PT	.2 PT	.3 PT	.4 PT	.5 PT	.6 PT	.7 PT	.8 PT	.9 PT	RIGHT
1	0.0	-2.067	-4.009	-5.700	-7.014	-7.825	-8.008	-7.437	-5.987	-3.532	0.0
2	0.0	5.005	-2.410	-7.464	-10.280	-11.341	-10.688	-9.225	-6.655	-3.479	0.0

AT 0.2 L - MEMBER 2

MEM NO	LEFT	.1 PT	.2 PT	.3 PT	.4 PT	.5 PT	.6 PT	.7 PT	.8 PT	.9 PT	RIGHT
1	0.0	-1.836	-3.564	-5.067	-6.234	-6.955	-7.118	-6.611	-5.322	-3.140	0.0
2	0.0	4.449	11.191	5.085	0.862	-1.748	-3.012	-3.200	-2.582	-1.425	0.0

AT 0.3 L - MEMBER 2

MEM NO	LEFT	.1 PT	.2 PT	.3 PT	.4 PT	.5 PT	.6 PT	.7 PT	.8 PT	.9 PT	RIGHT
1	0.0	-1.608	-3.118	-4.433	-5.455	-6.086	-6.228	-5.785	-4.657	-2.747	0.0
2	0.0	3.893	9.792	17.574	12.004	7.646	4.865	2.825	1.491	0.628	0.0

AT 0.4 L - MEMBER 2

MEM NO	LEFT	.1 PT	.2 PT	.3 PT	.4 PT	.5 PT	.6 PT	.7 PT	.8 PT	.9 PT	RIGHT
1	0.0	-1.378	-2.673	-3.800	-4.676	-5.217	-5.339	-4.958	-3.992	-2.355	0.0
2	0.0	3.337	8.393	15.064	23.146	17.439	12.741	8.850	5.564	2.681	0.0

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INFLUENCE LINES FOR GIRDER MOMENT

AT 0.5 L - MEMBER 2

MEM NO	LEFT	.1 PT	.2 PT	.3 PT	.4 PT	.5 PT	.6 PT	.7 PT	.8 PT	.9 PT	RIGHT
1	0.0	-1.149	-2.227	-3.167	-3.896	-4.347	-4.449	-4.132	-3.326	-1.962	0.0
2	0.0	2.781	6.994	12.553	19.289	27.633	20.618	14.875	9.636	4.734	0.0

AT 0.6 L - MEMBER 2

MEM NO	LEFT	.1 PT	.2 PT	.3 PT	.4 PT	.5 PT	.6 PT	.7 PT	.8 PT	.9 PT	RIGHT
1	0.0	-0.919	-1.782	-2.535	-3.117	-3.478	-3.559	-3.306	-2.661	-1.570	0.0
2	0.0	2.224	5.595	10.042	15.431	21.626	28.494	20.900	13.709	6.787	0.0

AT 0.7 L - MEMBER 2

MEM NO	LEFT	.1 PT	.2 PT	.3 PT	.4 PT	.5 PT	.6 PT	.7 PT	.8 PT	.9 PT	RIGHT
1	0.0	-0.689	-1.336	-1.900	-2.338	-2.608	-2.669	-2.479	-1.996	-1.177	0.0
2	0.0	1.668	4.197	7.532	11.573	16.220	21.371	26.925	17.762	8.840	0.0

AT 0.8 L - MEMBER 2

MEM NO	LEFT	.1 PT	.2 PT	.3 PT	.4 PT	.5 PT	.6 PT	.7 PT	.8 PT	.9 PT	RIGHT
1	0.0	-0.459	-0.891	-1.267	-1.559	-1.739	-1.780	-1.653	-1.331	-0.785	0.0
2	0.0	1.112	2.798	5.021	7.715	10.813	14.247	17.950	21.855	10.894	0.0

AT 0.9 L - MEMBER 2

MEM NO	LEFT	.1 PT	.2 PT	.3 PT	.4 PT	.5 PT	.6 PT	.7 PT	.8 PT	.9 PT	RIGHT
1	0.0	-0.230	-0.445	-0.633	-0.779	-0.869	-0.890	-0.826	-0.665	-0.392	0.0
2	0.0	0.556	1.399	2.511	3.858	5.407	7.124	8.975	10.927	12.947	0.0

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INFLUENCE LINES FOR GIRDER SHEAR

AT LEFT END - MEMBER 1

MEM NO	LEFT	.1 PT	.2 PT	.3 PT	.4 PT	.5 PT	.6 PT	.7 PT	.8 PT	.9 PT	RIGHT
1	1.000	0.862	0.727	0.596	0.471	0.357	0.253	0.164	0.090	0.035	0.0
2	0.0	-0.021	-0.035	-0.044	-0.047	-0.046	-0.041	-0.034	-0.024	-0.012	0.0

AT LEFT END - MEMBER 2

MEM NO	LEFT	.1 PT	.2 PT	.3 PT	.4 PT	.5 PT	.6 PT	.7 PT	.8 PT	.9 PT	RIGHT
1	0.0	0.015	0.030	0.042	0.052	0.058	0.059	0.055	0.044	0.026	0.0
2	1.000	0.963	0.907	0.833	0.743	0.640	0.525	0.402	0.272	0.137	0.0

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INFLUENCE LINES

REACTION AT LT END MEMBER 1

MEM NO	LEFT	.1 PT	.2 PT	.3 PT	.4 PT	.5 PT	.6 PT	.7 PT	.8 PT	.9 PT	RIGHT
1	1.000	0.862	0.727	0.596	0.471	0.357	0.253	0.164	0.090	0.035	0.0
2	0.0	-0.021	-0.035	-0.044	-0.047	-0.046	-0.041	-0.034	-0.024	-0.012	0.0

REACTION AT TOP OF COLUMN 3

MEM NO	LEFT	.1 PT	.2 PT	.3 PT	.4 PT	.5 PT	.6 PT	.7 PT	.8 PT	.9 PT	RIGHT
1	0.0	0.155	0.303	0.447	0.580	0.701	0.806	0.891	0.954	0.991	1.000
2	1.000	0.984	0.942	0.876	0.790	0.686	0.566	0.435	0.295	0.149	0.0

MOMENT AT TOP OF COLUMN 3

MEM NO	LEFT	.1 PT	.2 PT	.3 PT	.4 PT	.5 PT	.6 PT	.7 PT	.8 PT	.9 PT	RIGHT
1	0.0	3.841	7.449	10.591	13.031	14.539	14.879	13.819	11.125	6.563	0.0
2	0.0	-6.079	-10.313	-12.613	-13.798	-13.463	-12.086	-9.823	-6.909	-3.563	0.0

REACTION AT RT END MEMBER 2

MEM NO	LEFT	.1 PT	.2 PT	.3 PT	.4 PT	.5 PT	.6 PT	.7 PT	.8 PT	.9 PT	RIGHT
1	0.0	-0.015	-0.030	-0.042	-0.052	-0.058	-0.059	-0.055	-0.044	-0.026	0.0
2	0.0	0.037	0.093	0.167	0.257	0.360	0.475	0.598	0.728	0.863	1.000

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LL NO. 1. NEGATIVE LIVE LOAD MOMENT ENVELOPE

MEM NO	LEFT	.1 PT	.2 PT	.3 PT	.4 PT	.5 PT	.6 PT	.7 PT	.8 PT	.9 PT	RIGHT
1	0.	-176.	-352.	-528.	-705.	-881.	-1057.	-1233.	-2046.	-4317.	-7558.
2	-7118.	-4240.	-2233.	-1519.	-1302.	-1085.	-868.	-651.	-434.	-217.	0.

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LL NO. 1. DEAD LOAD PLUS NEGATIVE LIVE LOAD MOMENT ENVELOPE

MEM NO	LEFT	.1 PT	.2 PT	.3 PT	.4 PT	.5 PT	.6 PT	.7 PT	.8 PT	.9 PT	RIGHT
1	0.	7070.	11946.	14610.	15082.	13553.	9198.	2843.	-6347.	-19197.	-35321.
2	-33006.	-18857.	-7564.	548.	6277.	10121.	11866.	11729.	9705.	5796.	0.

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LL NO. 1. POSITIVE LIVE LOAD MOMENT ENVELOPE

MEM NO	LEFT	.1 PT	.2 PT	.3 PT	.4 PT	.5 PT	.6 PT	.7 PT	.8 PT	.9 PT	RIGHT
1	0.	2610.	4336.	5274.	5524.	5219.	4391.	3161.	1720.	471.	0.
2	0.	459.	1639.	2984.	4120.	4871.	5138.	4894.	4020.	2418.	0.

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LL NO. 1. DEAD LOAD PLUS POSITIVE LIVE LOAD MOMENT ENVELOPE

MEM NO	LEFT	.1 PT	.2 PT	.3 PT	.4 PT	.5 PT	.6 PT	.7 PT	.8 PT	.9 PT	RIGHT
1	0.	9856.	16628.	20413.	21310.	19453.	14646.	7237.	-2581.	-14409.	-27763.
2	-25886.	-14178.	-3692.	5051.	11699.	16076.	17674.	17274.	14159.	8431.	0.

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LL NO. 1. LIVE LOAD SHEAR ENVELOPES

MEMBER 1	LEFT	.1 PT	.2 PT	.3 PT	.4 PT	.5 PT	.6 PT	.7 PT	.8 PT	.9 PT	RIGHT
POS.	193.9	161.1	133.8	107.7	83.4	61.2	41.6	25.1	12.2	3.2	0.0
NEG.	-12.0	-20.7	-40.1	-67.6	-93.8	-118.5	-141.1	-163.9	-195.2	-227.1	-258.8
RANGE	205.8	181.8	173.9	175.3	177.2	179.7	182.7	189.0	207.4	230.2	258.8

LL NO. 1. LIVE LOAD SHEAR ENVELOPES

MEMBER 2	LEFT	.1 PT	.2 PT	.3 PT	.4 PT	.5 PT	.6 PT	.7 PT	.8 PT	.9 PT	RIGHT
POS.	249.5	219.7	189.7	160.4	140.1	117.4	92.6	66.2	39.2	23.5	15.8
NEG.	0.0	-3.2	-12.4	-25.4	-41.9	-61.5	-83.6	-108.0	-134.0	-161.2	-189.2
RANGE	249.5	222.9	202.0	185.8	182.0	178.8	176.2	174.2	173.2	184.7	205.0

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LL NO. 1. DEAD LOAD PLUS LIVE LOAD SHEAR ENVELOPE

MEMBER 1	LEFT	.1 PT	.2 PT	.3 PT	.4 PT	.5 PT	.6 PT	.7 PT	.8 PT	.9 PT	RIGHT
POS.	709.0	540.5	377.4	215.0	55.4	-102.6	-271.9	-424.2	-572.8	-718.1	-873.2
NEG.	503.2	358.7	203.5	40.3	-121.6	-282.2	-454.6	-613.2	-780.3	-948.3	-1132.0

LL NO. 1. DEAD LOAD PLUS LIVE LOAD SHEAR ENVELOPE

MEMBER 2	LEFT	.1 PT	.2 PT	.3 PT	.4 PT	.5 PT	.6 PT	.7 PT	.8 PT	.9 PT	RIGHT
POS.	1073.5	902.0	745.7	590.7	444.8	296.3	131.7	-20.3	-173.1	-314.5	-447.9
NEG.	824.0	679.1	543.7	405.0	262.7	117.4	-44.5	-194.5	-346.3	-499.2	-652.9

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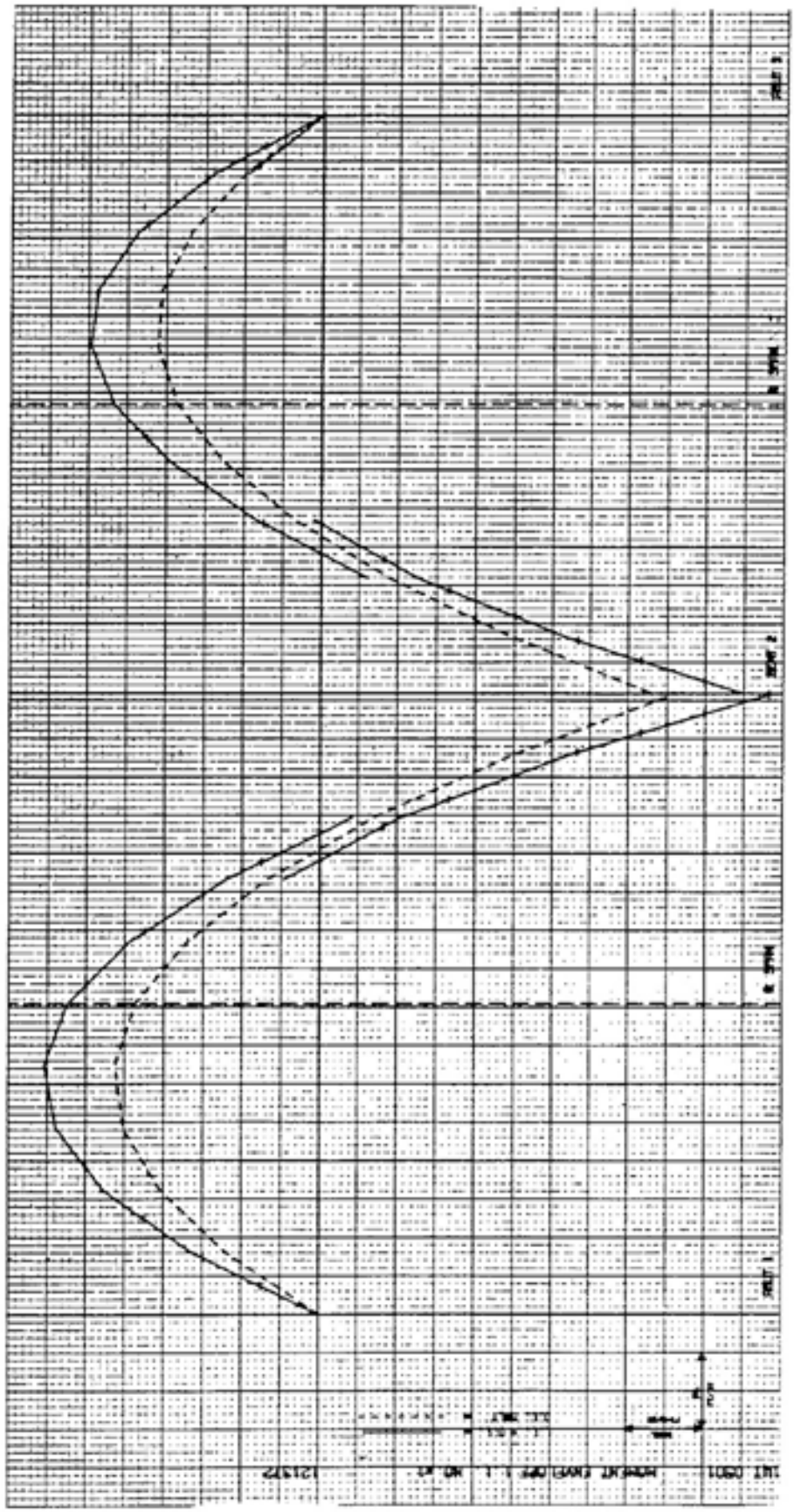
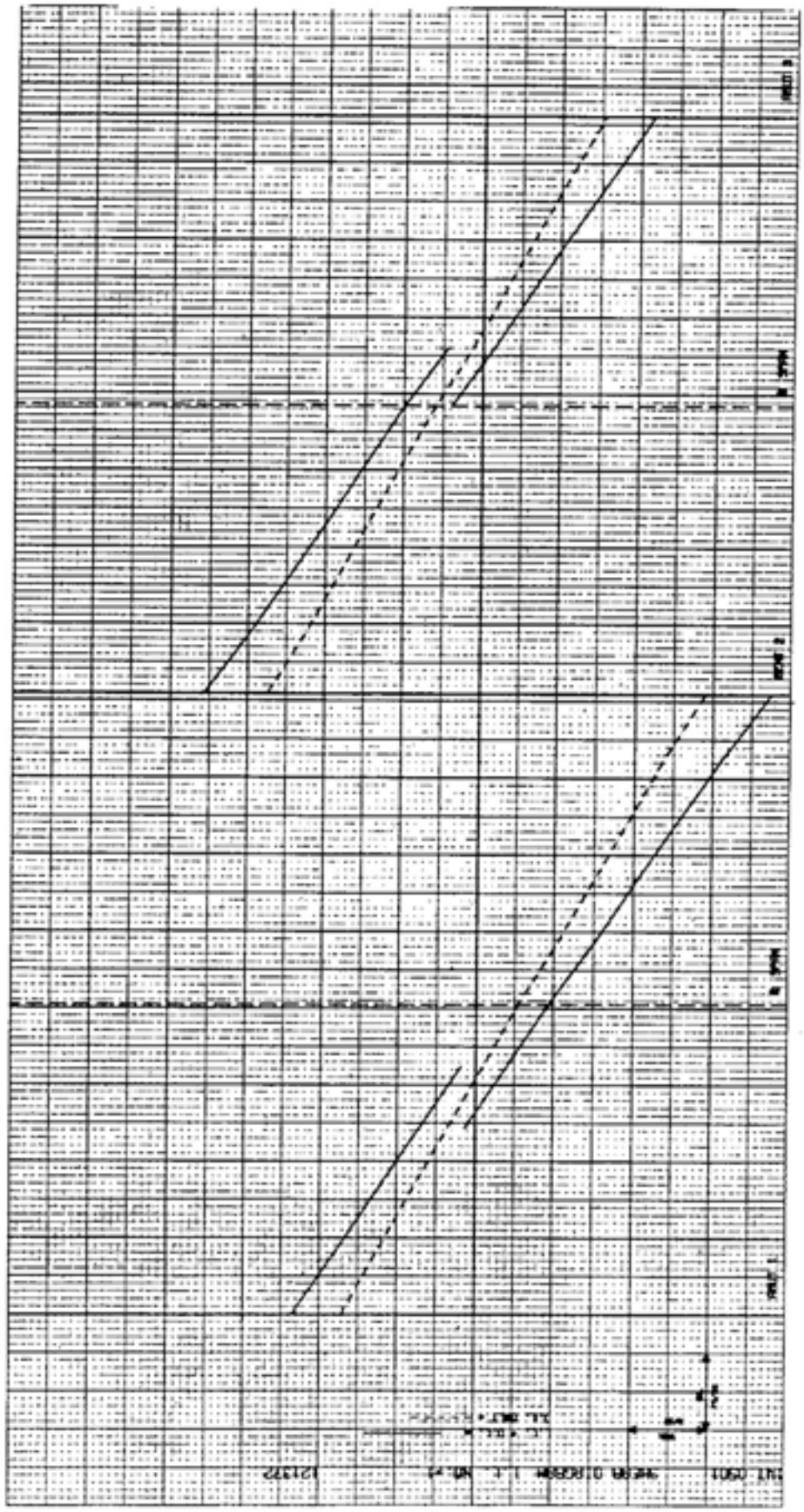
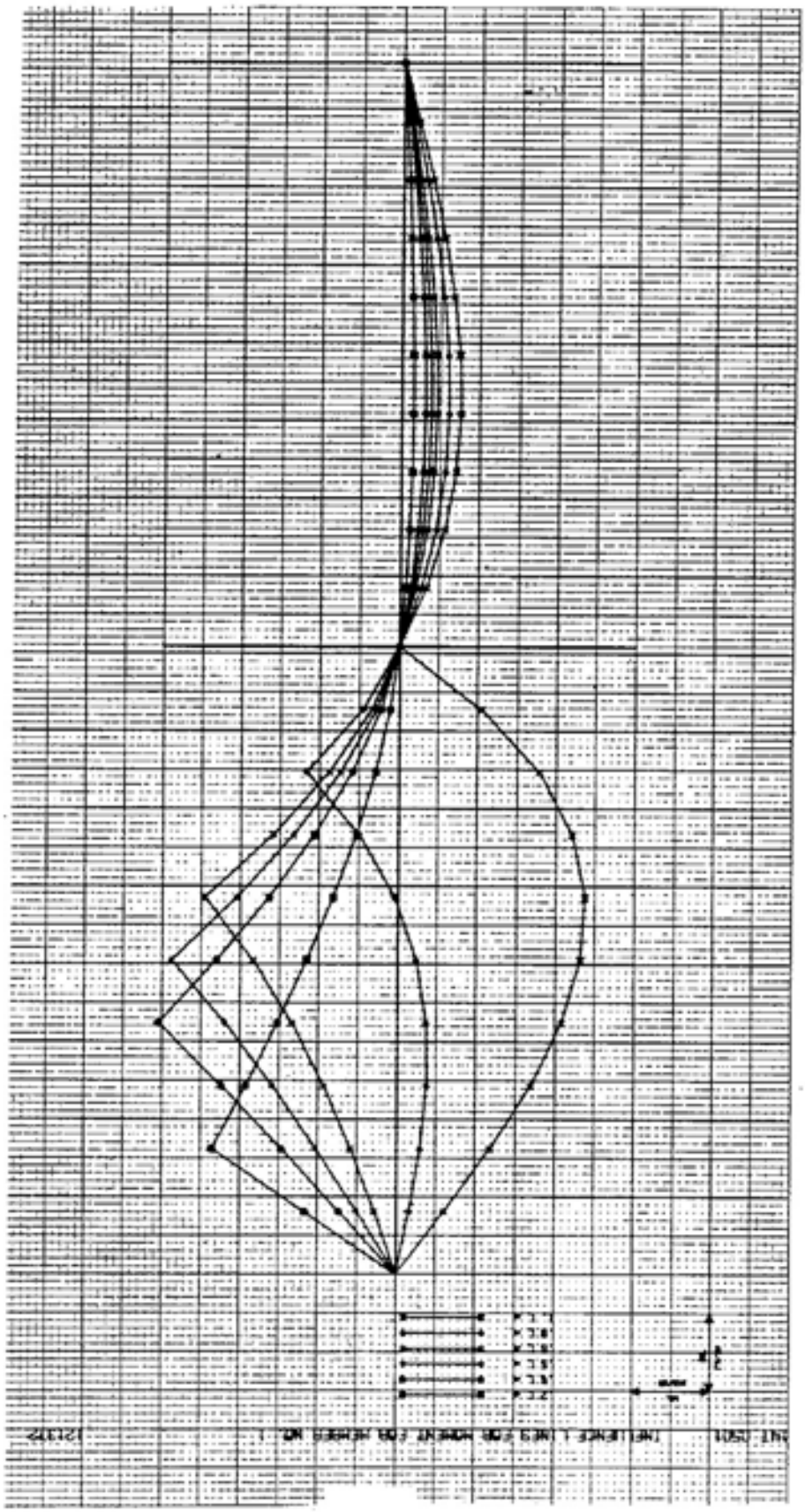
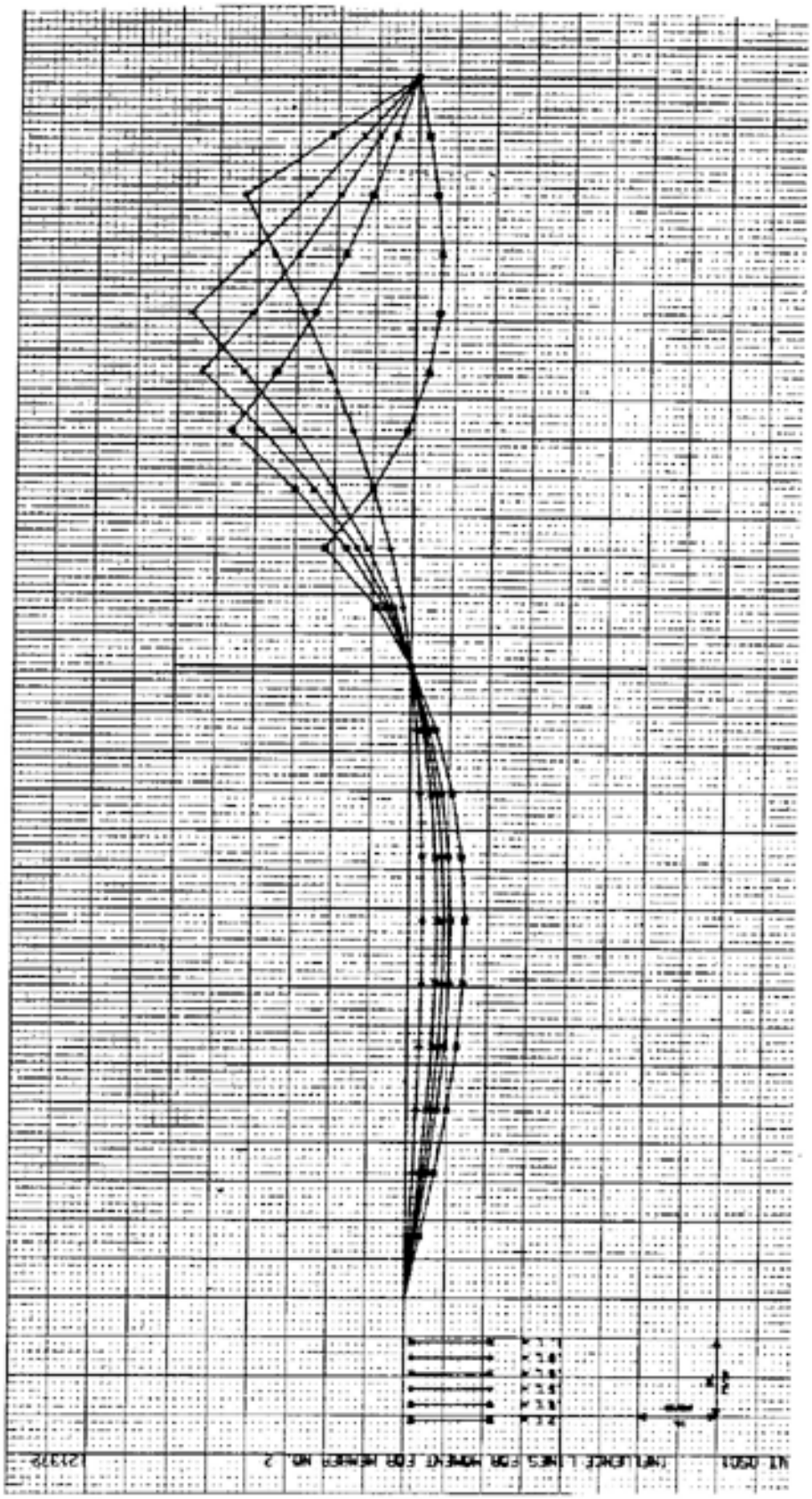
LL NO. 1. LIVE LOAD SUPPORT RESULTS

	MAX. AXIAL LOAD	MAX. AXIAL LOAD MOMENT TOP	MAX. AXIAL LOAD MOMENT BOT.	MAX. LONGITUDINAL MOMENT AXIAL LOAD	MAX. LONGITUDINAL MOMENT TOP	MAX. LONGITUDINAL MOMENT BOT.
SUPPORT JT. 1						
POSITIVE	79.8	0.	0.	0.0	0.	0.
NEGATIVE	-4.9	0.	0.	0.0	0.	0.
MEMBER 3						
POSITIVE	176.7	160.	-80.	94.2	1493.	-746.
NEGATIVE	0.0	0.	0.	67.5	-1312.	656.
SUPPORT JT. 3						
POSITIVE	77.9	0.	0.	0.0	0.	0.
NEGATIVE	-6.5	0.	0.	0.0	0.	0.

THE RATIO OF SUBSTRUCTURE / SUPERSTRUCTURE LOADING IS 0.412

***** BATCH TOTALS 15 FRAME UNITS 2 SUPERSTRUCTURE UNITS 8 PLOT UNITS COST = $ 6.70