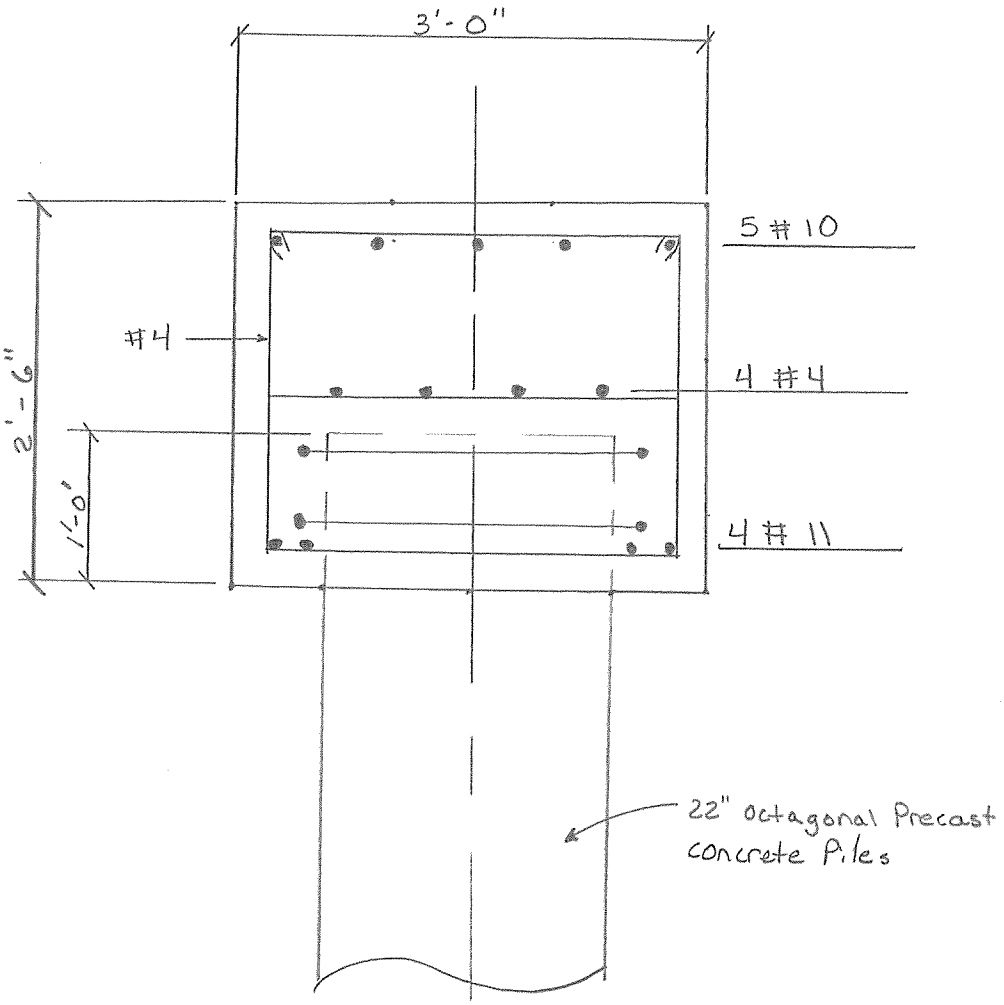
TYPE 1



Notes:
Piles to be driven to a minimum bearing capacity of 50 tons Each

Concrete Pile

Octagonal Area = 2.7855 ft²

Circle dia = $\sqrt{\frac{A_4}{\pi}}$ = 1.88324'

22" Octagonal Piles Existing

22.6" Round column Used in Model

2.0" Square Column

weight = 2.7855 ft² x 0.150 k/ft³ = 0.4178 k/ft

KO & ASSOCIATES, P.C.
Consulting Engineers

PROJECT NUMBER _____ SHEET NUMBER 1 OF 1
PROJECT _____
SUBJECT Simple Span Live Load Moment Summary
CALC. BY AKO 5/26/2006 CHECK BY MJM 6/06

SIMPLE SPAN LIVE LOAD MOMENTS
For all bridges except those carrying interstate traffic
Updated for truck loads dated 10/25/2005

MUNICIPALITY: _____
BRIDGE NUMBER: _____

SPAN LENGTH Bearing to Bearing Length = **61.500'**

LANE LOAD

		Truck Weight (tons)	Maximum Moment (k-ft)	Maximum Shear End (k)	Maximum Shear Intermed. (k)
SV	NSH	13.50	380.9	25.9	25.9
SV	NGARB-S2	20.00	504.9	36.2	36.2
SV	NS3A	27.03	734.8	50.1	50.9
SV	NCOTT-S3	25.50	701.6	47.9	48.3
SV	NAGGR-S4	34.93	902.5	62.1	64.2
SV	NS5A	35.55	921.6	61.2	65.5
SV	NS6A	39.95	998.9	67.0	72.4
SV	NS7B	42.00	1047.3	68.0	76.1
TTST	NT4A	33.08	815.5	57.9	59.5
TTST	NAGRI-T4	38.00	640.5	52.8	55.0
TTST	NT5B	37.20	917.1	60.3	67.0
TTST	NAGRI-T5A	45.00	780.8	57.7	69.2
TTST	NAGRI-T5B	45.00	705.7	60.4	66.3
TTST	NT6A	41.60	987.4	63.6	73.7
TTST	NT7A	42.00	981.4	65.2	73.8
TTST	NT7B	42.00	951.9	69.8	72.5

AASHTO TRUCKS

	Truck Weight
H-15	15.0 tons
H-20	20.0 tons
HS-15	27.0 tons
HS-20	36.0 tons

	Maximum Moment	Maximum Shear End	Maximum Shear Intermed.
H-15	434.5	34.3	49.0
H-20	579.3	45.7	65.4
HS-15	625.0	45.8	49.0
HS-20	833.4	61.1	65.4

VERIFY

	Maximum Moment	Maximum Shear End	Maximum Shear Intermed.
H-15	434.8	34.3	49.0
H-20	579.8	45.7	65.4
HS-15	625.0	45.8	49.0
HS-20	833.4	61.1	65.4

VERIFY BY INTERPOLATION

		Truck Weight (tons)	Maximum Moment (k-ft)	Maximum Shear End (k)	Maximum Shear Intermed. (k)
SV	NSH	13.50	380.9	25.9	25.9
SV	NGARB-S2	20.00	504.9	36.2	36.2
SV	NS3A	27.03	734.8	50.1	50.9
SV	NCOTT-S3	25.50	701.6	47.9	48.3
SV	NAGGR-S4	34.93	902.5	62.1	64.2
SV	NS5A	35.55	921.6	61.2	65.5
SV	NS6A	39.95	998.9	67.0	72.4
SV	NS7B	42.00	1047.3	68.0	76.0
TTST	NT4A	33.08	815.5	57.9	59.5
TTST	NAGRI-T4	38.00	640.5	52.7	55.0
TTST	NT5B	37.20	917.1	60.3	67.0
TTST	NAGRI-T5A	45.00	780.8	57.6	69.1
TTST	NAGRI-T5B	45.00	705.8	60.4	66.3
TTST	NT6A	41.60	987.4	63.5	73.7
TTST	NT7A	42.00	981.5	65.2	73.8
TTST	NT7B	42.00	951.9	69.7	72.5

KO & ASSOCIATES, P.C.
Consulting Engineers

PROJECT NUMBER _____ SHEET NUMBER 1 OF 1
PROJECT _____
SUBJECT Simple Span Live Load Moment Summary
CALC. BY AKO 5/26/2006 CHECK BY MJM 6/06

SIMPLE SPAN LIVE LOAD MOMENTS
For all bridges except those carrying interstate traffic
Updated for truck loads dated 10/25/2005

MUNICIPALITY: _____
BRIDGE NUMBER: _____

SPAN LENGTH Bearing to Bearing Length = **46.100'**

LANE LOAD.

		Truck Weight (tons)	Maximum Moment (k-ft)	Maximum Shear End (k)	Maximum Shear Intermed. (k)
SV	NSH	13.50	277.2	25.5	25.5
SV	NGARB-S2	20.00	352.7	35.0	35.0
SV	NS3A	27.03	526.8	48.8	49.9
SV	NCOTT-S3	25.50	505.3	46.8	47.4
SV	NAGGR-S4	34.93	634.3	59.6	62.3
SV	NS5A	35.55	647.9	57.9	63.7
SV	NS6A	39.95	691.7	62.6	69.9
SV	NS7B	42.00	723.9	62.6	73.4
TTST	NT4A	33.08	562.1	55.2	57.3
TTST	NAGRI-T4	38.00	443.0	45.7	48.0
TTST	NT5B	37.20	630.9	55.6	64.5
TTST	NAGRI-T5A	45.00	535.7	53.1	62.2
TTST	NAGRI-T5B	45.00	466.2	51.2	58.4
TTST	NT6A	41.60	667.3	57.0	70.5
TTST	NT7A	42.00	659.1	61.6	70.4
TTST	NT7B	42.00	640.4	65.0	68.7

AASHTO TRUCKS

	Truck Weight
H-15	15.0 tons
H-20	20.0 tons
HS-15	27.0 tons
HS-20	36.0 tons

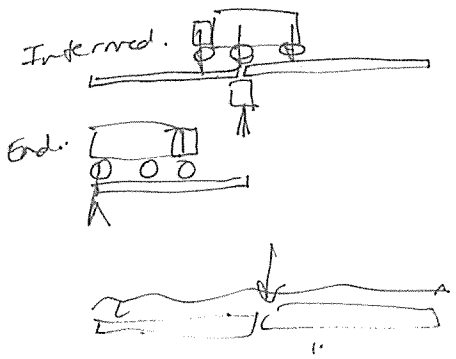
	Maximum Moment	Maximum Shear End	Maximum Shear Intermed.
H-15	305.0	30.6	41.6
H-20	406.7	40.8	55.5
HS-15	418.7	43.1	44.9
HS-20	558.3	57.4	59.9

VERIFY

	Maximum Moment	Maximum Shear End	Maximum Shear Intermed.
H-15	305.0	30.6	41.6
H-20	406.7	40.8	55.5
HS-15	418.7	43.1	44.9
HS-20	558.3	57.4	59.9

VERIFY BY INTERPOLATION

		Truck Weight (tons)	Maximum Moment (k-ft)	Maximum Shear End (k)	Maximum Shear Intermed. (k)
SV	NSH	13.50	277.2	25.5	25.5
SV	NGARB-S2	20.00	352.7	35.0	35.0
SV	NS3A	27.03	526.8	48.8	49.9
SV	NCOTT-S3	25.50	505.2	46.8	47.4
SV	NAGGR-S4	34.93	634.3	59.6	62.3
SV	NS5A	35.55	647.9	57.9	63.7
SV	NS6A	39.95	691.7	62.6	69.9
SV	NS7B	42.00	723.9	62.6	73.4
TTST	NT4A	33.08	562.1	55.2	57.3
TTST	NAGRI-T4	38.00	443.0	45.7	48.0
TTST	NT5B	37.20	630.9	55.6	64.5
TTST	NAGRI-T5A	45.00	535.7	53.1	62.2
TTST	NAGRI-T5B	45.00	466.2	51.2	58.4
TTST	NT6A	41.60	667.3	57.0	70.5
TTST	NT7A	42.00	659.1	61.6	70.4
TTST	NT7B	42.00	640.4	65.0	68.7



TYPE III PRESTRESSED PRECAST BEAM RATING

Note: Dimensions and prestressing data obtained from previous analysis and original structure plans. Condition based on field observations.

Structure Data:

Beam Length: BEAM := 59.667ft

Span Length: SPAN := 61.5ft

Girder Spacing: S := 8.0ft

Slab Overhang: SO := 2.875ft

Slab Thickness: SLABT := 7.25in

Clear Roadway Width: CLRROAD := 28ft

Bridge Width: BRIDGEW := 33.25ft out to out

Total Sidewalk Area: SIDEA := 265.6in^2 *Assume sidewalk was poured integrally with the deck and is therefore a non-composite load applied to the ext. girder only.*

Total Parapet Area: PARAPETA := 188.5in^2

Single Rail Width: RAILW := 1.0ft

Prestressed Concrete Girder Data:

Channel Unit Properties:

Number of Beams: NU := 4

Unit Depth: h := 45.0in

Unit Width: Top: bt := 16in

Bottom: bb := 22in

Flange Thickness: tft := 7in bft := 7in

Web Thickness: wt := 7in

Beam Area: $A := (bt \cdot tft + bb \cdot bft) + (h - tft - bft) \cdot wt + \left(\frac{bt - wt}{2}\right)^2 + \left(\frac{bb - wt}{2}\right)^2$ $A = 560\,in^2$

Dead Load Data:

Concrete Unit Weight: $CONCWT := 150 \cdot \frac{lbf}{ft^3}$

Rail Weight (All Rails): $RAILWT := 2 \cdot 210 \cdot \frac{lbf}{ft}$

Distribution of Rail Load: $RAILDIST := if(BRIDGEW < 44ft, NU, if(NU < 6, NU, 6))$

$RAILDIST = 4$ beams *(Ref. 3 Article 14.5.3.2-3)*

Additional Load on Beam: (distributed to one beam) $ALG := (1.5in \cdot bt) \cdot CONCWT$ $ALG = 25 \frac{lbf}{ft}$ buildup weight + ~~section loss weight~~

Diaphragm Unit Weight: $Pdiaphint := \left(12.6ft^3\right) \cdot CONCWT$ $Pdiaphint = 1.89\,k$

$Pdiaphend := \left(8.33ft^3\right) \cdot CONCWT$ $Pdiaphend = 1.25\,k$

Interior Beam Dead Load Data:

Uniform Distributed Loads:

Prestressed Girder Unit Weight: $BEAMWT := A \cdot CONCWT$ $BEAMWT = 582.8 \frac{lbf}{ft}$

Slab Weight: $SLABWTI := S \cdot SLABT \cdot CONCWT$ $SLABWTI = 725.0 \frac{lbf}{ft}$

Rail Weight: $RAILWT := \frac{RAILWT}{NU}$ $RAILWT = 105.0 \frac{lbf}{ft}$

Additional Girder Loads: $ALG = 25 \frac{lbf}{ft}$

Total Dead Load:

$$INTDL := [(SLABWTI + RAILWT) \cdot SPAN] + [(ALG + BEAMWT) \cdot BEAM] + (Pdiaphint + Pdiaphend) \cdot 2$$

$INTDL = ~~93.6~~\,k$ 91.7 say Ok

Exterior Beam Dead Load Data:

Slab Weight: $SLABWTE := \left(\frac{S}{2} + SO\right) \cdot SLABT \cdot CONCWT$ $SLABWTE = 623.0 \frac{lbf}{ft}$

Sidewalk Weight: $SIDEWT := SIDEA \cdot CONCWT$ $SIDEWT = 276.667 \frac{lbf}{ft}$

Total Dead Load:

$$EXTDL := [(SLABWTE + RAILWT + SIDEWT) \cdot SPAN] + [(ALG + BEAMWT) \cdot BEAM] + \left(\frac{Pdiaphint + Pdiaphend}{2}\right)$$

$EXTDL = ~~101.2~~\,k$ 100.2 k Say Ok

	Offsets Selfweight				Brace Cap Load		
	Length (ft)	Width (ft)	Depth (ft)	Load (k)	Area (ft^2)	Length (ft)	Load (k)
Bent Model Type 1	1.6667	3	2.5	1.875	-----	-----	-----
Bent Model Type 2	1.6667	3	2.5	1.875	9.25	3	4.2
Bent Model Type 3	1.6667	3	2.5	1.875	-----	-----	-----
Bent Model Type 4	1.6667	3	2.5	1.875	9.25	3	4.2
Bent Model Type 5	3.0000	4.333	3	5.850	-----	-----	-----
Bent Model Type 6	3.0000	3	2.5	3.375	9.25	3	4.2
Bent Model Type 7	3.5000	3	2.5	3.938	9.25	3	4.2
Bent Model Type 8	2.9167	3	2.5	3.281	-----	-----	-----
Bent Model Type 9	4.0000	3	2.5	4.500	-----	-----	-----
Bent Model Type 10	3.7500	3	2.5	4.219	9.25	3	4.2

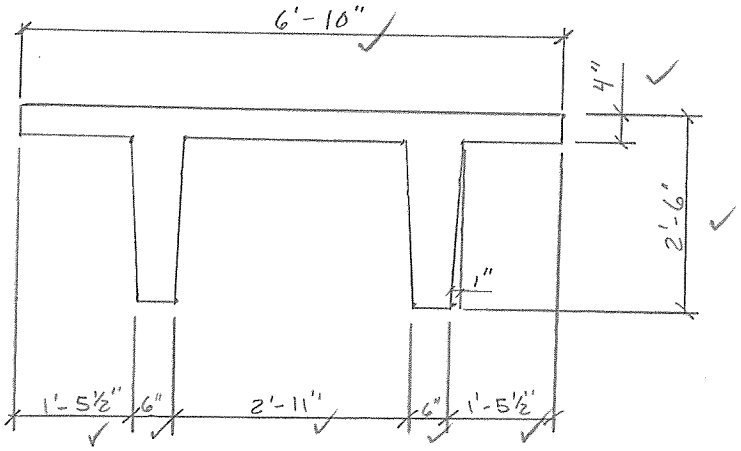
Bent Cap Step 1	Elev. 1 (ft)	Elev. 2 (ft)	Width (ft)	Load (k/ft)
Bent Model Type 1 (Bent 1)	11.05	10.92	3	0.0585
Bent Model Type 2 (Bent 8)	16.65	16.52	3	0.0585
Bent Model Type 3 (Bent 41)	17.15	16.97	3	0.081
Bent Model Type 4 (Bent 40)	17.09	16.96	3	0.0585
Bent Model Type 5 (Bent A)	24.92	24.75	4.333	0.0565
Bent Model Type 6 (Bent 167)	19.59	19.41	3	0.0810
Bent Model Type 7 (Bent 175)	17.22	16.98	3	0.1080
Bent Model Type 8 (Bent 173)	17.22	16.98	3	0.1080
Bent Model Type 9 (Bent 184)	17.22	16.98	3	0.1080
Bent Model Type 10 (Bent 187)	17.22	16.98	3	0.1080

Bent Cap Step 2	Elev. 1 (ft)	Elev. 2 (ft)	Width (ft)	Load (k/ft)
Bent Model Type 3 (Bent 41)	17.34	16.97	3	0.1665
Bent Model Type 4 (Bent 40)	17.21	16.96	3	0.1125
Bent Model Type 6 (Bent 167)	19.77	19.41	3	0.162
Bent Model Type 7 (Bent 175)	17.46	16.98	3	0.216
Bent Model Type 8 (Bent 173)	17.46	16.98	3	0.216
Bent Model Type 9 (Bent 184)	17.46	16.98	3	0.216
Bent Model Type 10 (Bent 187)	17.46	16.98	3	0.216

Bent Cap Step 3	Elev. 1 (ft)	Elev. 2 (ft)	Width (ft)	Load (k/ft)
Bent Model Type 3 (Bent 41)	17.52	16.97	3	0.2475
Bent Model Type 4 (Bent 40)	17.34	16.96	3	0.171
Bent Model Type 6 (Bent 167)	19.96	19.41	3	0.2475
Bent Model Type 7 (Bent 175)	17.70	16.98	3	0.324
Bent Model Type 8 (Bent 173)	17.70	16.98	3	0.324
Bent Model Type 9 (Bent 184)	17.70	16.98	3	0.324
Bent Model Type 10 (Bent 187)	17.70	16.98	3	0.324

Crutch Bents Dead Loads	Length (ft)	Width (ft)	Depth (ft)	Load (k)
Bent Model Type 6 (Bent 167)	0.9167	3	5	2.063
Bent Model Type 6 (Bent 167)	2.1042	6.5	4.5	9.232
Bent Model Type 7 (Bent 175)	2.5	3.5	5.25	6.891
Bent Model Type 8 (Bent 173)	2.5	2.9167	4.5	4.922
Bent Model Type 9 (Bent 184)	2.50	4	4	6.000
Bent Model Type 10 (Bent 187)	0.92	3.75	5	2.578
Bent Model Type 10 (Bent 187)	2.1042	6.5	4.5	9.232

Walkway Dead Load



Area = 6.8333' x 0.3333' x 2[0.5' x 2.1667' + 0.0833' x 2.1667']

Area = 2.28 ft² + 2.53 ft² = 4.81 ft² ✓

WT = 4.81 ft² x 61.5' x 0.150 k/CF = 44.3 kips ✓

Four Brgs = 11.08 k/Brg ✓

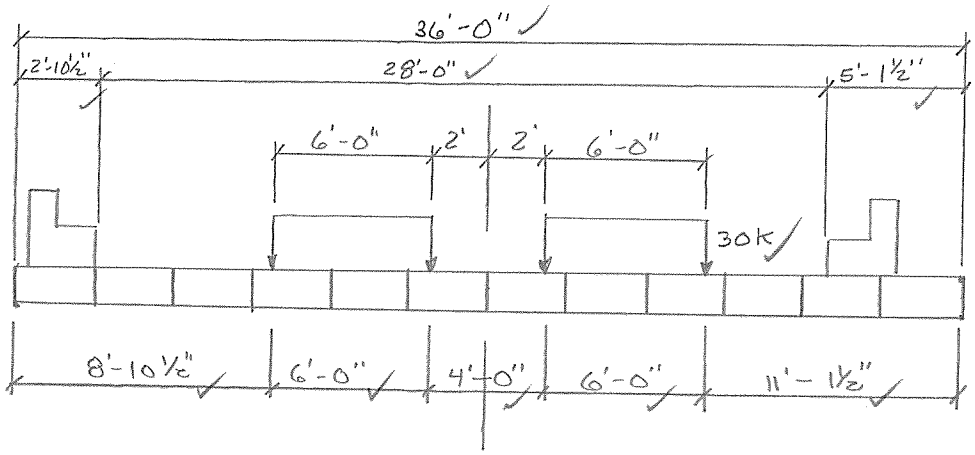
Rail = 20 lbs/ft x $\frac{61.5'}{4\ Brg}$ = 0.31 k/Brg

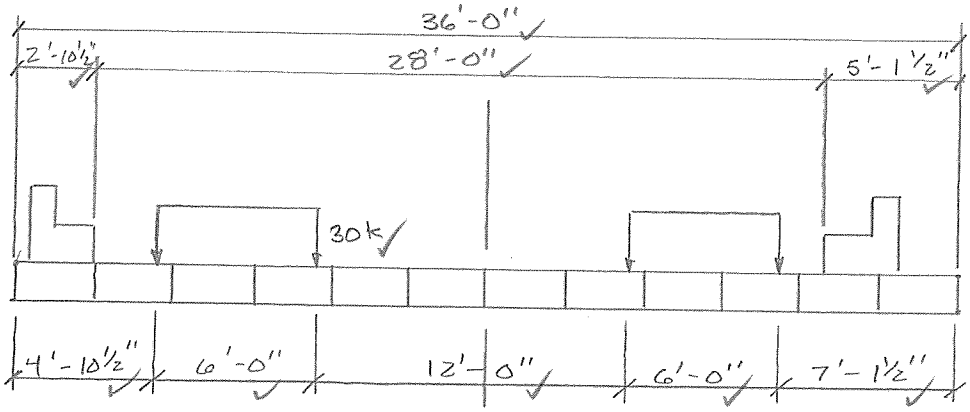
Total Dead Load = 11.4 k/Brg ✓

Walkway Live Load AASHTO 3.14.1.1

Total Live Load = $\frac{85\ psf \times 61.5' \times 6.8333'}{4 \times 1,000\ lbf/k}$ = 8.9 k/Brg ✓

Live Load Distribution Cored Slab Span





Live Load Distribution for Concrete Spans

Load testing of the bridge determined the distribution factor to be S/8.5 to S/11. The Live Load can be distributed equally to all beams

R. = 65.4 K/Lane x 2 Lanes / 4 Beamings

R = 32.7 kips

Impact

$$I = \frac{50}{L+125} \qquad I_{BS} = \frac{50}{61.5+125} + 1 = 1.268$$

$$I_{CS} = \frac{50}{46.1+125} + 1 = 1.292$$

Lane Load Reaction

61.5' spans

$$26k + 61.5'(0.640\ k/ft) = 65.4\ k/Lane$$

46.1' spans

$$26k + 46.1'(0.640\ k/ft) = 55.0\ k/Lane$$

Longitudinal Force Apply to Brace Bents

61.5' spans

$$0.05 \times 65.4\ k/Lane = 3.3\ k/Lane$$

46.1 spans

$$0.05 \times 55\ k/Lane = 2.8\ k/Lane$$

Centrifugal Force Apply at 6' above Roadsurface

1° curve, $R = 5729.58'$ Spans 42-115, 167-193
S = design speed = 55 mph

$$C = \frac{6.68(55)^2}{5729.58} = 3.53\%$$

61.5' Spans

$$CF = 0.0353 \times 2\ Lanes \times 65.4\ k/Lane = 4.62\ k$$

46.1' Spans

$$CF = 0.0353 \times 2\ Lanes \times 59.9\ k/Lane = 4.23\ k$$

Wind on Superstructure AASHTO 3.15.2.1.3

50 psf transverse
12 psf longitudinal

Concrete Beam Spans

$H = 1.333' + 1.625' + 3.15' + 0.4167' + 0.03(24')$

$H = 7.845'$

Cored Slab Spans

$H = 2.375 + 1.75 + 04167 = 4.5417'$

Concrete Beam Spans

$W_T = 61.5' \times 7.845' \times 50\,psf = 24.123\,k$ All Bents

$W_L = 61.5' \times 7.845' \times 12\,psf = 5.790\,k$ Brace Bents

Cored Slab Spans

$W_T = 46.125' \times 4.5417' \times 50\,psf = 10.47\,k$ All Bents

$W_L = 46.125' \times 4.5417' \times 12\,psf = 2.51\,k$ All Bents

Wind on Live Load AASHTO 3.15.2.1.3 At 6' above Top of Deck

Concrete Girder Spans

$WL_T = 100\,plf \times 61.5' = 6.15\,k$ All Bents

$WL_L = 40\,plf \times 61.5' = 2.46\,k$ Brace Bents

Cored Slab Span

$WL_T = 100\,plf \times 46.125' = 4.61\,k$ All Bents

$WL_L = 40\,plf \times 46.125' = 1.85\,k$ All Bents

	Wind On Live Load Transverse			
	Load	Height to	Height to	Adjusted
		Design Load	Bearing	Load
	(k)	(ft)	(ft)	(k)
Approach Bent Model Type 1	1.54	70	77.845	1.71
Approach Bent Model Type 2	1.54	70	77.845	1.71
Approach Bent Model Type 3	1.54	55	62.845	1.76
Approach Bent Model Type 4	1.54	55	62.845	1.76
Approach Bent Model Type 5	4.61	95	99.5417	4.83
Approach Bent Model Type 6	1.54	113.4	121.245	1.64
Approach Bent Model Type 7	1.54	87.9583	95.8033	1.67
Approach Bent Model Type 8	1.54	87.5833	95.4283	1.68
Approach Bent Model Type 9	1.54	87.3333	95.1783	1.68
Approach Bent Model Type 10	1.54	113.4	121.245	1.64

	Wind On Live Load Longitudinal			
	Load	Height to	Height to	Adjusted
		Design Load	Bearing	Load
	(k)	(ft)	(ft)	(k)
Approach Bent Model Type 1	----	----	----	----
Approach Bent Model Type 2	2.46	70	77.845	2.74
Approach Bent Model Type 3	----	----	----	----
Approach Bent Model Type 4	2.46	55	62.845	2.81
Approach Bent Model Type 5	1.85	95	99.5417	1.94
Approach Bent Model Type 6	0.62	113.4	121.245	0.66
Approach Bent Model Type 7	0.62	87.9583	95.8033	0.67
Approach Bent Model Type 8	0.62	87.5833	95.4283	0.67
Approach Bent Model Type 9	0.62	87.3333	95.1783	0.67
Approach Bent Model Type 10	0.62	113.4	121.245	0.66

	Centrifugal Force				Longitudinal Force			
	Load	Height to	Height to	Adjusted	Load	Height to	Height to	Adjusted
		Design Load	Bearing	Load		Design Load	Bearing	Load
	(k)	(ft)	(ft)	(k)	(k)	(ft)	(ft)	(k)
Approach Bent Model Type 1	----	----	----	----	----	----	----	----
Approach Bent Model Type 2	----	----	----	----	6.60	70	77.845	7.34
Approach Bent Model Type 3	1.16	55	62.845	1.32	----	----	----	----
Approach Bent Model Type 4	1.16	55	62.845	1.32	6.60	55	62.845	7.54
Approach Bent Model Type 5	----	----	----	----	5.60	95	99.5417	5.87
Approach Bent Model Type 6	1.16	113.4	121.245	1.23	1.65	113.4	121.245	1.76
Approach Bent Model Type 7	1.16	87.9583	95.8033	1.26	1.65	87.9583	95.8033	1.80
Approach Bent Model Type 8	1.16	87.5833	95.4283	1.26	1.65	87.5833	95.4283	1.80
Approach Bent Model Type 9	1.16	87.3333	95.1783	1.26	1.65	87.3333	95.1783	1.80
Approach Bent Model Type 10	1.16	113.4	121.245	1.23	1.65	113.4	121.245	1.76

Substructure Wind Loads ANSI/ASCE 7-95

ASCE STANDARD → "MINIMUM DESIGN LOADS FOR BUILDINGS AND OTHER STRUCTURES

Section 6.5 Velocity Pressure (Beam Section Bents)

$$q_z = 0.00256\, K_z\, K_{zt}\, V^2\, I$$

$V = 130$ mph
$I = 1.15$ (Table 6-2, category IV)
$K_z = 1.12$ (Table 6-3, H = 25', Exp. D)
K_{zt} → Section 6.5.5

$$K_{zt} = (1 + K_1 K_2 K_3)^2$$

→ $H_{h,11} < 16'$ Exp. D

$$K_{zt} = 1.0$$

$$q_z = 0.00256\,(1.12)(1.0)(130)^2(1.15)$$

$$q_z = 56 \text{ psf}$$

LOADS BEAM SECTION SPANS

$P_{cap} = 3' \times 2.5' \times 56\text{psf} = 420 \text{ lbs}$

$P_{column} = \frac{22''}{12''/1'} \times 56\text{psf} = 103 \text{ lbs/ft}$

LOADS CORED SLAB SECTION SPANS

$P_{cap} = 3' \times 4.333' \times 56\text{psf} = 728 \text{ lbs}$

$P_{column} = 2' \times 56\text{psf} = 112 \text{ plf}$

WIND LOADS ON COLUMNS

	w_1 kip/ft	d_1 ft	d_2 ft
Bent model Type 1	0.103	0	10'
Bent model Type 2	0.103	0	10'
Bent Model Type 3	0.103	0	10'
Bent Model Type 4	0.103	0	10'
Bent Model Type 5	0.112	0	28'
Bent Model Type 7	0.094	0	10'
Bent Model Type 8	0.094	0	10'
Bent Model Type 9	0.094	0	10'

WIND LOADS ON CRUTCH BENTS

Bent Model Type 6

Subcap = 17'-6" x 4'-6" x 56 psf = 4.41 kips

AASHTO Beam Ends

wind on Beams = [2 [560 in²] + 16" x 14" + 24" x 23"
+ 6" x 17" + 2 x 9" x 9" x ½ + 2 x 6" x 6" x ½] / 144 in²/ft² x 56 psf

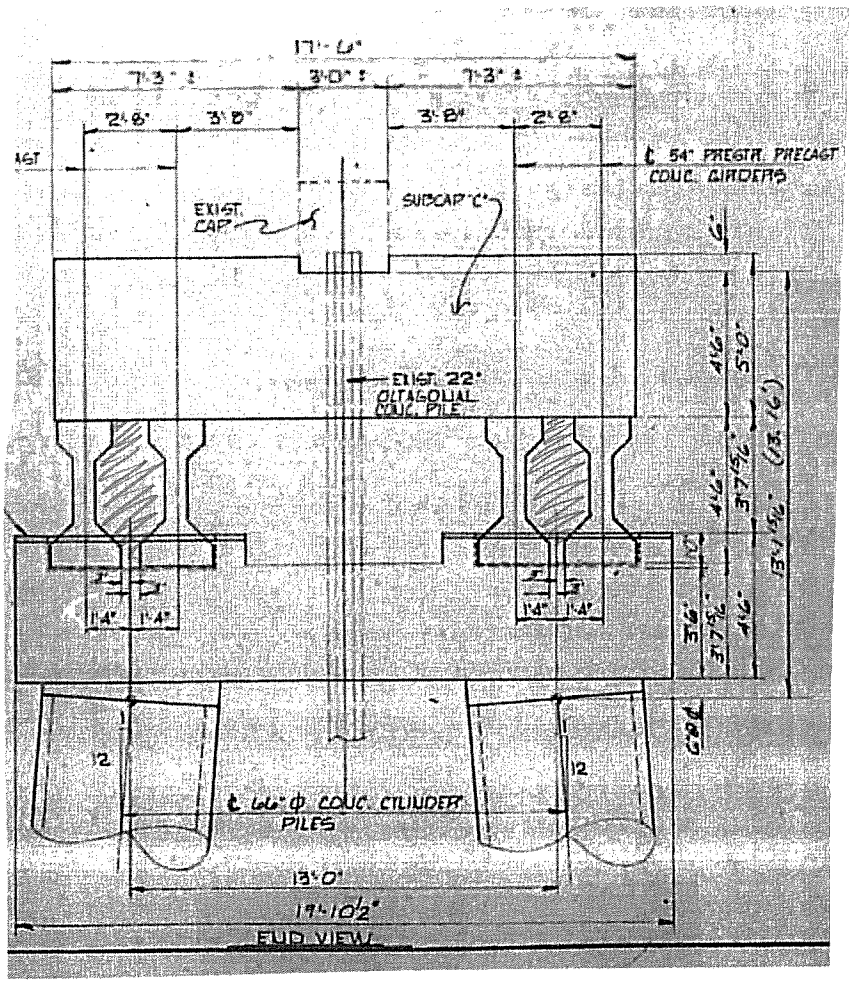
[1120 + 224 + 552 + 102 + 81 + 36] / 144 [56 psf)

14.688 ft² x 56 psf = 0.823 kips

TRANSVERSE WIND LOAD – TYPE 6.

AKO
8/14/06

MJM
8/28/06



Total Transverse Wind on substr.

4.90
+ 2 (1.0)
+ 3.90
+ 0.34
11.14 k.

(Wind on superstr.
= 24.1 k.)

(Wind on LL
= 5.8 k.)

Sub Cap : 17.5′ × 5.0′ × 56 psf = 4.90 k. ✓

P/S Girders : Area = 5.4792 ft² + 2.667′ × 4.5′ = 17.5 ft²

Wind Load = 17.5 ft² × 56 psf = 1.0 k ✓

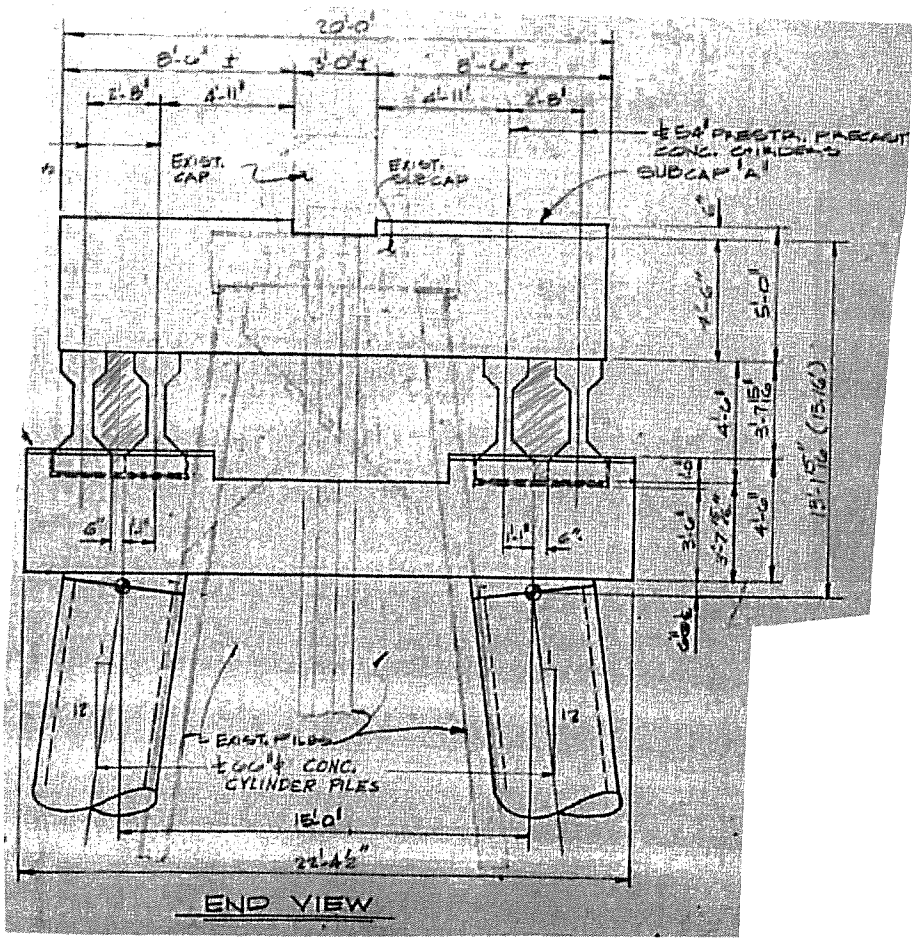
Pile Cap : 19.875′ × 3.5′ × 56 psf = 3.90 k ✓

Original Cap. ~~2.0~~ 1.6k′ × 3.0′ × 56 psf = ~~0.9~~ ok k.

Piles : Height = 17.5′ − 2.5′ − 13′ = 2.0′ ✓ ignore wind.

TRANSVERSE WIND LOAD - TYPE 10

AKO 8/19/06
MJM 8/28/06



Total Transverse Wind in Substr.

5.60
+ 2 (1.0)
+ 4.39
+ 0.34
12.33 k

Sub Cap : 20.0' × 5.0' × 56 psf = 5.60 k. ✓

P/S Girders: Area = 5.4792 ft² + 2.667' × 4.5' = 17.5 ft²

Wind Load = 17.5 ft² × 56 psf = 1.0 k ✓

Pile Cap : 22.375' × 3.5' × 56 psf = 4.39 k. ✓

Original Cap : ~~40~~ 20.0' × 3.0' × 56 psf = 0.~~34~~ 34 k ✓ ok

Ignore wind on 66" ϕ piles ✓

WIND LOADS ON CRUTCH BENTS

Bent Model Type 7

Subcap = 25' x 5.25' x 56 psf = 7.35 k ✓

Bent Model Type 8

Subcap = 15' x 4.5' x 56 psf = 3.78 k ✓

Bent Model Type 9

Subcap = 15' x 4.0' x 56 psf = 3.36 k ✓

Bent Model Type 10

Subcap = 20' x 4.5' x 56 psf = 5.04 k

Wind on Beams = 0.823 kips Total Per beam pair
or 0.412 per beam end

LOAD COMBINATIONS

Bent Load combinations

Service Load Groups

Group I, II, III

Group I

$1.0[1.0DL + 1.0LL + 1.0CF + 1.0SF]$

Group II

$1.0[1.0DL + 1.0W_S + 1.0SF]$

Group III

$1.0[1.0DL + 1.0LL + 1.0CF + 0.3W_S + 1.0W_{L_T} + 1.0LF + 1.0SF]$

Factored Load Groups

Group I, II, III

Group I

$1.3[1.0DL + 2.12LL + 1.0CF + 1.0SF]$

Group III

$1.3[1.0DL + 1.268LL + 1.0CF + 0.3W_S + 1.0W_{L_T} + 1.0L.F + 1.0SF]$

Group II

$1.3[1.0DL + 1.0W_S + 1.0SF]$

Walk way Live loads are Added to Models 1, 2, 9 & 10. Service = $1.0W_{Walkway\ LL}$
Factored Group I = 2.17 Walkway LL
Factored Group III = 1.3 walkway LL

Approach Bent Summary Sheet

STAAD Model	Bents represented by STAAD Model
Model 1	1, 2, 3, 5, 6, 7, 9, 10, 11, 13, 14, 15, 17, 18, 19, 201, 202 and 203
Model 2	4, 8, 12, 16 and 20
Model 3	21, 22, 23, 25, 26, 27, 29, 30, 31, 33, 34, 35, 37, 38, 39, 41, 42, 43, 45, 46, 47, 49, 50, 51, 53, 54, 55, 57, 58, 59, 61, 62, 63, 65, 66, 67, 69, 70, 71, 73, 74, 75, 77, 78, 79, 81, 82, 83, 85, 86, 87, 89, 90, 91, 93, 94, 95, 97, 98, 99, 101, 102, 103, 105, 106, 107, 109, 110, 111, 113, 114, 115, 117, 118, 119, 121, 122 and 123
Model 4	24, 28, 32, 36, 40, 44, 48, 52, 56, 60, 64, 68, 72, 76, 80, 84, 88, 92, 96, 100, 104, 108, 112, 116 and 120
Model 5	A, B, C, D, E, F and G
Model 6	167, 168, 169, 170, 171 and 172
Model 7	175, 179 and 183
Model 8	173, 174, 176, 177, 178, 180, 181 and 182
Model 9	184, 185 and 186
Model 10	187, 188, 189, 190, 191, 192, 193, 194, 195, 196, 197, 198, 199 and 200

	Bent Cap Flexural Analysis					
	Positive Moment			Negative Moment		
	+ Mu	+ ϕMn	Ratio	- Mu	- ϕMn	Ratio
STAAD Model	kip-ft	kip-ft	%	kip-ft	kip-ft	%
Model 1	**430**	**490**	88%	**251**	**499**	50%
Model 2	**418**	**471**	89%	**400**	**499**	80%
Model 3	**178**	**473**	38%	**302**	**500**	60%
Model 4	**169**	**473**	36%	**432**	**500**	86%
Model 5	**391**	**563**	69%	**347**	**710**	49%
Model 6	**302**	**473**	64%	**323**	**500**	65%
Model 7	**128**	**473**	27%	**236**	**500**	47%
Model 8	**175**	**473**	37%	**241**	**500**	48%
Model 9	**302**	**492**	61%	**97**	**500**	19%
Model 10	**460**	**473**	97%	**137**	**500**	27%

	Bent Cap Shear Analysis		
	Shear Vu	Shear ϕVn	Ratio
STAAD Model	kips	kips	%
Model 1	**136**	**228**	60%
Model 2	**207**	**263**	79%
Model 3	**122**	**244**	50%
Model 4	**174**	**280**	62%
Model 5	**115**	**322**	36%
Model 6	**225**	**228**	99%
Model 7	**225**	**228**	99%
Model 8	**225**	**228**	99%
Model 9	**128**	**150**	85%
Model 10	**307**	**210**	146%

	54" Prestressed Concrete Girder					
	Mu	ϕMn	Ratio	Shear Vu	Shear ϕVn	Ratio
STAAD Model	kip-ft	kip-ft	%	kips	kips	%
Model 6	**1602**	**3639**	44%	**195**	**234**	83%
Model 10	**1701**	**3637**	47%	**247**	**257**	96%

	Concrete Pile Cap					
	Mu	ϕMn	Ratio	Shear Vu	Shear ϕVn	Ratio
STAAD Model	kip-ft	kip-ft	%	kips	kips	%
Model 6	193	1354	14%	43	459	9%
Model 10	215	1354	16%	45	459	10%

	Concrete Subcap I (Longitudinal)					
	Mu	ϕMn	Ratio	Shear Vu	Shear ϕVn	Ratio
STAAD Model	kip-ft	kip-ft	%	kips	kips	%
Model 6	1231	1767	70%	221	371	60%
Model 7	1766	2584	68%	200	315	63%
Model 8	794	1505	53%	174	243	72%
Model 9	965	1309	74%	211	265	80%
Model 10	1856	2472	75%	337	390	86%

	Concrete Subcap II (Transverse)					
	Mu	ϕMn	Ratio	Shear Vu	Shear ϕVn	Ratio
STAAD Model	kip-ft	kip-ft	%	kips	kips	%
Model 9	810	1165	70%	140	311	45%

	Concrete Strut					
	Mu	ϕMn	Ratio	Shear Vu	Shear ϕVn	Ratio
STAAD Model	kip-ft	kip-ft	%	kips	kips	%
Model 7	239	358	67%	42	104	40%
Model 8	193	358	54%	36	104	35%
Model 9	116	358	32%	30	104	29%

		End Bearing Capacity			
		Load	Capacity	Capacity	Ratio
STAAD Model	**Pile Type**	Kips	Tons	Kips	%
Model 1	22" Octagonal Pile	110	50	100	110%
Model 2	22" Octagonal Pile	141	50	100	141%
Model 3	22" Octagonal Pile	102	50	100	102%
Model 4	22" Octagonal Pile	135	50	100	135%
Model 5	24" Square Pile	96	50	100	96%
Model 6	66" Cylinder Pile	248	250	500	50%
Model 7	20" Square Pile	141	80	160	88%
Model 8	20" Square Pile	118	70	140	85%
Model 9	20" Square Pile	132	70	140	94%
Model 10	66" Cylinder Pile	288	250	500	58%

Model 1 End Bearing Reactions							
Service Load Group	Pile 1	Pile 2	Pile 3	Pile 4	Pile 5	Pile 6	Pile 7
Service Group I	72	96	101	100	101	96	72
Service Group II	87	4	53	61	69	110	-7
Service Group III	84	47	76	80	85	107	31

Model 2 End Bearing Reactions								
Service Load Group	Pile 1	Pile 2A	Pile 2B	Pile 3	Pile 4	Pile 5A	Pile 5B	Pile 6
Service Group I	65	78	78	101	101	78	78	65
Service Group II	85	-15	45	62	61	49	108	-12
Service Group III	79	-16	106	81	81	19	141	26

Model 3 Adjusted End Bearing Reactions						
Service Load Group	Pile 1	Pile 2	Pile 3	Pile 4	Pile 5	Pile 6
Service Group I	97	45	46	52	71	76
Service Group II	91	-19	13	35	79	5
Service Group III	102	8	30	48	84	36

Model 4 Adjusted End Bearing Reactions							
Service Load Group	Pile 1	Pile 2A	Pile 2B	Pile 3	Pile 4A	Pile 4B	Pile 5
Service Group I	123	60	60	61	75	75	102
Service Group II	113	-18	38	37	43	100	26
Service Group III	123	-28	90	49	18	135	58

Model 5 Adjusted End Bearing Reactions						
Service Load Group	Pile 1	Pile 2	Pile 3	Pile 4	Pile 5	Pile 6
Service Group I, Live Load I	76	44	91	77	30	71
Service Group I, Live Load 2	66	43	96	87	34	63
Service Group II	89	-34	10	80	69	1
Service Group III, Live Load I	87	0	67	66	59	32
Service Group III, Live Load 2	78	0	72	74	62	26

Model 6 Adjusted End Bearing Reactions				
Service Load Group	Pile 1	Pile 2	Pile 3	Pile 4
Service Group I	248	241	248	241
Service Group II	180	145	194	159
Service Group III	193	171	221	198

Model 7 Adjusted End Bearing Reactions						
Service Load Group	Pile 1	Pile 2	Pile 3	Pile 4	Pile 5	Pile 6
Service Group I	141	123	130	141	123	130
Service Group II	120	80	56	125	85	61
Service Group III	124	94	83	134	103	93

Model 8 Adjusted End Bearing Reactions						
Service Load Group	Pile 1	Pile 2	Pile 3	Pile 4	Pile 5	Pile 6
Service Group I	118	105	108	118	105	108
Service Group II	97	64	41	104	71	49
Service Group III	102	77	64	117	91	79

Model 9 Adjusted End Bearing Reactions								
Service Load Group	Pile 1	Pile 2	Pile 3	Pile 4	Pile 5	Pile 6	Pile 7	Pile 8
Service Group I	85	132	132	80	85	132	132	80
Service Group II	64	84	81	37	69	89	86	43
Service Group III	70	100	99	52	81	112	110	62

Model 10 Adjusted End Bearing Reactions				
Service Load Group	Pile 1	Pile 2	Pile 3	Pile 4
Service Group I	288	284	288	284
Service Group II	205	174	217	187
Service Group III	226	207	251	232

	Pile weight		
	Pile Area	Pile Length	Weight of Concrete
	ft^2	ft	kips
Model 1	2.7855	70	29
Model 2	2.7855	70	29
Model 3	2.7855	55	23
Model 4	2.7855	55	23
Model 5	4	95	57
Model 6	7.86	100	118
Model 7	2.7777	85	35
Model 8	2.7777	85	35
Model 9	2.7777	85	35
Model 10	7.86	100	118

Service Load Group	%
Service Group I	100%
Service Group II	125%
Service Group III	125%

Model 1 Raw End Bearing Reactions from STAAD							
Service Load Group	Pile 1	Pile 2	Pile 3	Pile 4	Pile 5	Pile 6	Pile 7
Service Group I	101	126	130	129	130	126	101
Service Group II	138	35	96	105	116	167	20
Service Group III	134	88	125	129	136	163	68

Model 1 Adjusted End Bearing Reactions							
Service Load Group	Pile 1	Pile 2	Pile 3	Pile 4	Pile 5	Pile 6	Pile 7
Service Group I	72	96	101	100	101	96	72
Service Group II	87	4	53	61	69	110	-7
Service Group III	84	47	76	80	85	107	31

Model 2 Raw End Bearing Reactions from STAAD								
Service Load Group	Pile 1	Pile 2A	Pile 2B	Pile 3	Pile 4	Pile 5A	Pile 5B	Pile 6
Service Group I	95	107	107	131	131	107	107	95
Service Group II	135	11	85	107	106	90	165	14
Service Group III	128	10	161	131	130	53	205	62

Model 2 Adjusted End Bearing Reactions								
Service Load Group	Pile 1	Pile 2A	Pile 2B	Pile 3	Pile 4	Pile 5A	Pile 5B	Pile 6
Service Group I	65	78	78	101	101	78	78	65
Service Group II	85	-15	45	62	61	49	108	-12
Service Group III	79	-16	106	81	81	19	141	26

Model 3 Raw End Bearing Reactions from STAAD						
Service Load Group	Pile 1	Pile 2	Pile 3	Pile 4	Pile 5	Pile 6
Service Group I	120	68	69	75	94	99
Service Group II	136	0	39	67	121	30
Service Group III	151	33	61	83	129	68

Model 3 Adjusted End Bearing Reactions						
Service Load Group	Pile 1	Pile 2	Pile 3	Pile 4	Pile 5	Pile 6
Service Group I	97	45	46	52	71	76
Service Group II	91	-19	13	35	79	5
Service Group III	102	8	30	48	84	36

Model 4 Raw End Bearing Reactions from STAAD							
Service Load Group	Pile 1	Pile 2A	Pile 2B	Pile 3	Pile 4A	Pile 4B	Pile 5
Service Group I	146	83	83	84	98	98	125
Service Group II	164	1	71	69	77	148	56
Service Group III	176	-12	135	84	45	192	95

Model 4 Adjusted End Bearing Reactions							
Service Load Group	Pile 1	Pile 2A	Pile 2B	Pile 3	Pile 4A	Pile 4B	Pile 5
Service Group I	123	60	60	61	75	75	102
Service Group II	113	-18	38	37	43	100	26
Service Group III	123	-28	90	49	18	135	58

Model 5 Raw End Bearing Reactions from STAAD						
Service Load Group	Pile 1	Pile 2	Pile 3	Pile 4	Pile 5	Pile 6
Service Group I, Live Load I	133	101	148	134	87	128
Service Group I, Live Load 2	123	100	153	144	91	120
Service Group II	168	15	70	157	143	58
Service Group III, Live Load I	165	58	141	140	130	97
Service Group III, Live Load 2	155	57	147	150	134	90

Model 5 Adjusted End Bearing Reactions						
Service Load Group	Pile 1	Pile 2	Pile 3	Pile 4	Pile 5	Pile 6
Service Group I, Live Load I	76	44	91	77	30	71
Service Group I, Live Load 2	66	43	96	87	34	63
Service Group II	89	-34	10	80	69	1
Service Group III, Live Load I	87	0	67	66	59	32
Service Group III, Live Load 2	78	0	72	74	62	26

Model 6 Raw End Bearing Reactions from STAAD				
Service Load Group	Pile 1	Pile 2	Pile 3	Pile 4
Service Group I	366	359	366	359
Service Group II	343	299	360	316
Service Group III	359	331	394	366

Model 6 Adjusted End Bearing Reactions				
Service Load Group	Pile 1	Pile 2	Pile 3	Pile 4
Service Group I	248	241	248	241
Service Group II	180	145	194	159
Service Group III	193	171	221	198

Model 7 Raw End Bearing Reactions from STAAD						
Service Load Group	Pile 1	Pile 2	Pile 3	Pile 4	Pile 5	Pile 6
Service Group I	176	159	165	176	159	165
Service Group II	185	135	106	191	142	112
Service Group III	191	152	139	203	165	151

Model 7 Adjusted End Bearing Reactions						
Service Load Group	Pile 1	Pile 2	Pile 3	Pile 4	Pile 5	Pile 6
Service Group I	141	123	130	141	123	130
Service Group II	120	80	56	125	85	61
Service Group III	124	94	83	134	103	93

Model 8 Raw End Bearing Reactions from STAAD						
Service Load Group	Pile 1	Pile 2	Pile 3	Pile 4	Pile 5	Pile 6
Service Group I	154	140	143	154	140	143
Service Group II	156	115	87	165	124	96
Service Group III	163	131	116	182	149	134

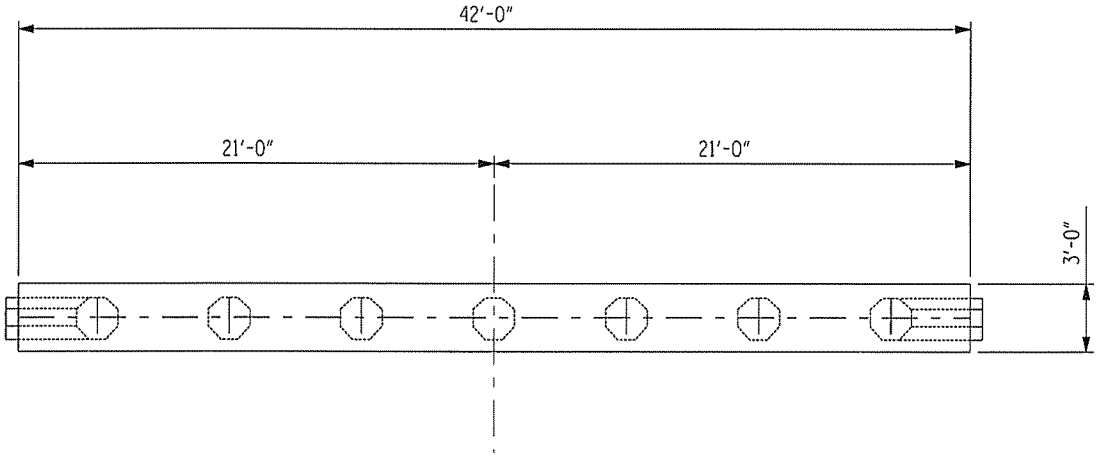
Model 8 Adjusted End Bearing Reactions						
Service Load Group	Pile 1	Pile 2	Pile 3	Pile 4	Pile 5	Pile 6
Service Group I	118	105	108	118	105	108
Service Group II	97	64	41	104	71	49
Service Group III	102	77	64	117	91	79

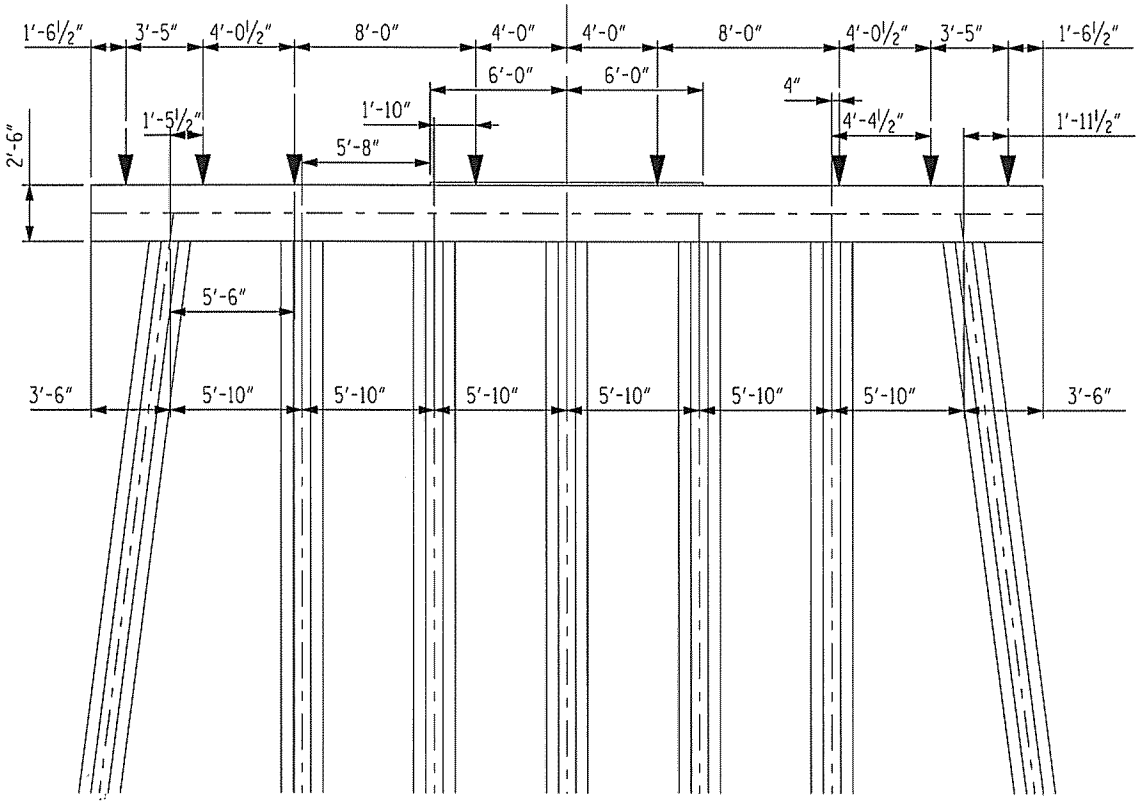
Model 9 Raw End Bearing Reactions from STAAD								
Service Load Group	Pile 1	Pile 2	Pile 3	Pile 4	Pile 5	Pile 6	Pile 7	Pile 8
Service Group I	120	167	167	116	120	167	167	116
Service Group II	115	140	137	82	122	147	143	89
Service Group III	123	161	159	100	136	175	173	113

Model 9 Adjusted End Bearing Reactions								
Service Load Group	Pile 1	Pile 2	Pile 3	Pile 4	Pile 5	Pile 6	Pile 7	Pile 8
Service Group I	85	132	132	80	85	132	132	80
Service Group II	64	84	81	37	69	89	86	43
Service Group III	70	100	99	52	81	112	110	62

Model 10 Raw End Bearing Reactions from STAAD				
Service Load Group	Pile 1	Pile 2	Pile 3	Pile 4
Service Group I	406	402	406	402
Service Group II	374	336	389	351
Service Group III	401	377	431	408

Model 10 Adjusted End Bearing Reactions				
Service Load Group	Pile 1	Pile 2	Pile 3	Pile 4
Service Group I	288	284	288	284
Service Group II	205	174	217	187
Service Group III	226	207	251	232



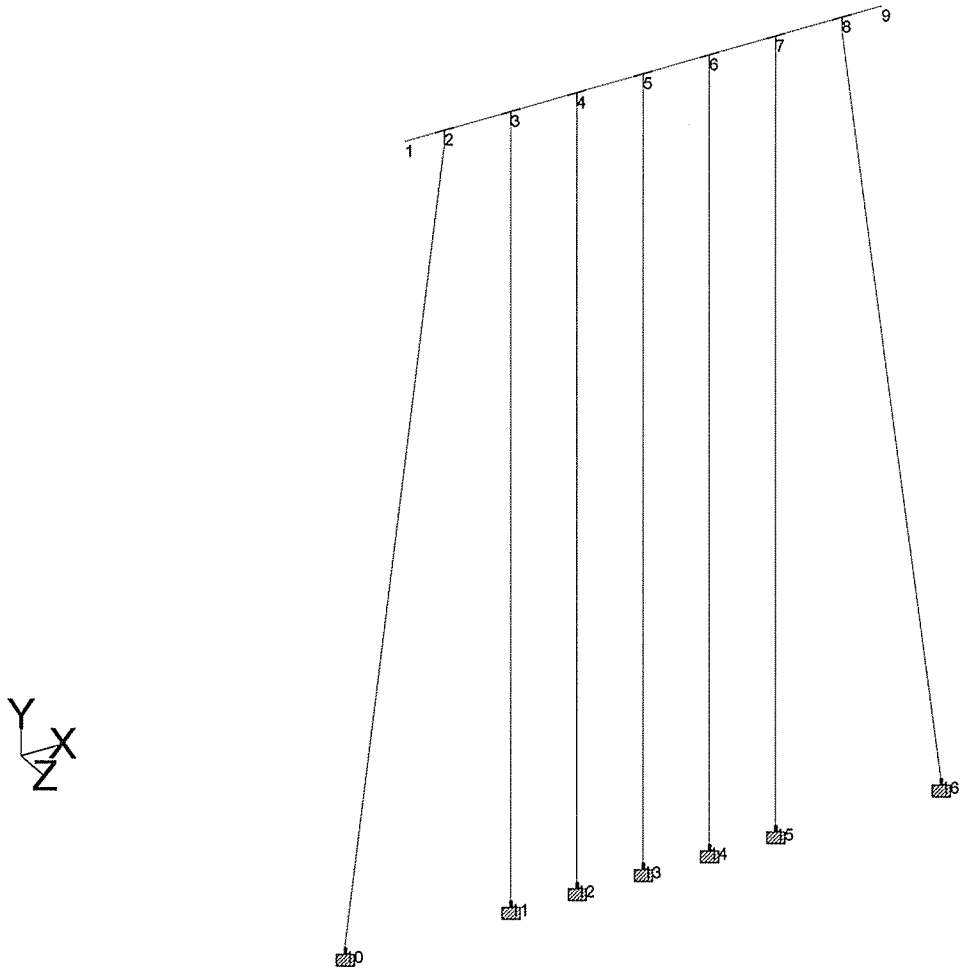


ELEVATION TYPE 1

BENTS 1, 2, 3, 5, 6, 7, 9, 10, 11, 13, 14, 15, 17, 18, 19, 201, 202, 203

NBIS REPORT BENT TYPE B

✓ AKO 8/22



Load 1

MJM 8/22

✓ AKo 8/22

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*          STAAD.Pro                             *
*          Version  2005    Bld 1003.US          *
*          Proprietary Program of                *
*          Research Engineers,  Intl.            *
*          Date=    AUG 28, 2006                 *
*          Time=     9:37:45                     *
*                                                *
*      USER ID: Ko and Associates                *
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    2. START JOB INFORMATION
    3. ENGINEER DATE 24-MAY-06
    4. END JOB INFORMATION
    5. INPUT WIDTH 79
    6. UNIT FEET KIP
    7. JOINT COORDINATES
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    9. 7 32.6667 0 0; 8 38.5 0 0; 9 42 0 0; 10 -5.25 -70 0; 11 9.333 -70 0
   10. 12 15.1667 -70 0; 13 21 -70 0; 14 26.8333 -70 0; 15 32.6667 -70 0
   11. 16 47.25 -70 0
   12. MEMBER INCIDENCES
   13. 1 1 2; 2 2 3; 3 3 4; 4 4 5; 5 5 6; 6 6 7; 7 7 8; 8 8 9; 9 2 10; 10 3 11
   14. 11 4 12; 12 5 13; 13 6 14; 14 7 15; 15 8 16
   15. UNIT INCHES KIP
   16. MEMBER PROPERTY AMERICAN
   17. 1 TO 8 PRIS YD 30 ZD 36
   18. UNIT FEET KIP
   19. MEMBER PROPERTY AMERICAN
   20. 9 TO 15 PRIS AX 2.626 IX 1.235 IY 0.6967 IZ 0.6966
   21. UNIT INCHES KIP
   22. DEFINE MATERIAL START
   23. ISOTROPIC CONCRETE
   24. E 3150
   25. POISSON 0.17
   26. DENSITY 8.68E-005
   27. ALPHA 5.5E-006
   28. DAMP 0.05
   29. END DEFINE MATERIAL
   30. CONSTANTS
   31. MATERIAL CONCRETE MEMB 1 TO 15
   32. UNIT FEET KIP
   33. SUPPORTS
   34. 10 TO 16 FIXED
   35. UNIT INCHES KIP
   36. LOAD 1 LOADTYPE NONE  TITLE LIVE LOAD
   37. MEMBER LOAD
   38. 2 CON GY -32.7 66
   39. 4 CON GY -32.7 21.9996
   40. 5 CON GY -32.7 48
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41. 7 CON GY -32.7 3.99996
42. LOAD 2 LOADTYPE NONE  TITLE DEAD LOAD
43. MEMBER LOAD
44. 1 CON GY -11.4 18.5
45. 2 CON GY -11.4 17.4996
46. 2 CON GY -101.2 66
47. 4 CON GY -93.6 21.9996
48. 5 CON GY -93.6 48
49. 7 CON GY -101.2 3.9996
50. 7 CON GY -11.4 52.5
51. 8 CON GY -11.4 23.4996
52. SELFWEIGHT Y -1
53. UNIT FEET KIP
54. MEMBER LOAD
55. 3 UNI GY -0.0585 5.6667 5.8333
56. 4 5 UNI GY -0.0585 0 5.8333
57. 6 UNI GY -0.0585 0 0.1667
58. UNIT INCHES KIP
59. LOAD 5 LOADTYPE NONE  TITLE WIND ON STRUCTURE
60. MEMBER LOAD
61. 2 CON GX -6.03 66
62. 4 CON GX -6.03 21.9996
63. 5 CON GX -6.03 48
64. 7 CON GX -6.03 3.99996
65. UNIT FEET KIP
66. JOINT LOAD
67. 9 FX -0.42
68. MEMBER LOAD
69. 15 UNI GX -0.103 0 10
70. UNIT INCHES KIP
71. LOAD 6 LOADTYPE NONE  TITLE WIND ON LIVE LOAD
72. MEMBER LOAD
73. 2 CON GX -1.71 66
74. 4 CON GX -1.71 21.9996
75. 5 CON GX -1.71 48
76. 7 CON GX -1.71 3.9996
77. LOAD 8 LOADTYPE NONE  TITLE WALKWAY LIVE LOAD
78. MEMBER LOAD
79. 1 CON GY -8.9 18.5
80. 2 CON GY -8.9 17.4996
81. 7 CON GY -8.9 52.5
82. UNIT FEET KIP
83. 8 CON GY -8.9 1.9583
84. UNIT INCHES KIP
85. LOAD COMB 9 SERVICE GROUP I
86. 1 1.0 8 1.0 2 1.0
87. LOAD COMB 11 SERVICE GROUP II
88. 2 1.0 5 1.0
89. LOAD COMB 13 SERVICE GROUP III
90. 2 1.0 5 0.3 1 1.0 6 1.0 8 1.0
91. LOAD COMB 14 FACTORED GROUP I
92. 2 1.3 1 2.75 8 2.17
93. LOAD COMB 16 FACTORED GROUP II
```

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94. 2 1.3 5 1.3
95. LOAD COMB 17 FACTORED GROUP III
96. 2 1.3 1 1.65 8 1.3 5 0.39 6 1.3
97. UNIT FEET KIP
98. PERFORM ANALYSIS PRINT STATICS LOAD


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

 NUMBER OF JOINTS/MEMBER+ELEMENTS/SUPPORTS =    16/    15/     7
 ORIGINAL/FINAL BAND-WIDTH=     8/     2/     12 DOF
 TOTAL PRIMARY LOAD CASES =    5, TOTAL DEGREES OF FREEDOM =     54
 SIZE OF STIFFNESS MATRIX =        1 DOUBLE  KILO-WORDS
 REQRD/AVAIL. DISK SPACE  =     12.0/  24803.7 MB
```

FOR LOADING - 1
APPLIED JOINT EQUIVALENT LOADS

JOINT	FORCE-X	FORCE-Y	FORCE-Z	MOM-X	MOM-Y	MOM-Z
2	0.00000E+00	-3.08066E-01	0.00000E+00	0.00000E+00	0.00000E+00	-7.04584E+00
3	0.00000E+00	-3.23919E+01	0.00000E+00	0.00000E+00	0.00000E+00	1.16268E+02
4	0.00000E+00	-2.50406E+01	0.00000E+00	0.00000E+00	0.00000E+00	-3.38263E+02
5	0.00000E+00	-1.53189E+01	0.00000E+00	0.00000E+00	0.00000E+00	-4.57764E-05
6	0.00000E+00	-2.50405E+01	0.00000E+00	0.00000E+00	0.00000E+00	3.38263E+02
7	0.00000E+00	-3.23919E+01	0.00000E+00	0.00000E+00	0.00000E+00	-1.16277E+02
8	0.00000E+00	-3.08121E-01	0.00000E+00	0.00000E+00	0.00000E+00	7.04708E+00

STATIC LOAD/REACTION/EQUILIBRIUM SUMMARY FOR CASE NO. 1
LOADTYPE NONE TITLE LIVE LOAD

***TOTAL APPLIED LOAD (KIP INCH) SUMMARY (LOADING 1)
SUMMATION FORCE-X = 0.00
SUMMATION FORCE-Y = -130.80
SUMMATION FORCE-Z = 0.00

SUMMATION OF MOMENTS AROUND THE ORIGIN-
MX= 0.00 MY= 0.00 MZ= -32961.61

***TOTAL REACTION LOAD(KIP INCH) SUMMARY (LOADING 1)
SUMMATION FORCE-X = 0.00
SUMMATION FORCE-Y = 130.80
SUMMATION FORCE-Z = 0.00

SUMMATION OF MOMENTS AROUND THE ORIGIN-
MX= 0.00 MY= 0.00 MZ= 32961.61

MAXIMUM DISPLACEMENTS (INCH /RADIANS) (LOADING 1)

	MAXIMUMS	AT NODE
X =	6.59949E-05	1
Y =	-1.80279E-02	5
Z =	0.00000E+00	0
RX=	0.00000E+00	0
RY=	0.00000E+00	0
RZ=	1.42215E-04	8

EXTERNAL AND INTERNAL JOINT LOAD SUMMARY (KIP INCH)-

JT	EXT FX/ INT FX	EXT FY/ INT FY	EXT FZ/ INT FZ	EXT MX/ INT MX	EXT MY/ INT MY	EXT MZ/ INT MZ	
							SUPPORT=1
10	0.00	0.00	0.00	0.00	0.00	0.00	
	-0.97	-7.36	0.00	0.00	0.00	15.01	111111
11	0.00	0.00	0.00	0.00	0.00	0.00	
	-0.03	-20.31	0.00	0.00	0.00	8.75	111111
12	0.00	0.00	0.00	0.00	0.00	0.00	
	-0.01	-24.95	0.00	0.00	0.00	4.00	111111

13	0.00	0.00	0.00	0.00	0.00	0.00	
	0.00	-25.56	0.00	0.00	0.00	0.00	111111
14	0.00	0.00	0.00	0.00	0.00	0.00	
	0.01	-24.95	0.00	0.00	0.00	-4.00	111111
15	0.00	0.00	0.00	0.00	0.00	0.00	
	0.03	-20.31	0.00	0.00	0.00	-8.75	111111
16	0.00	0.00	0.00	0.00	0.00	0.00	
	0.97	-7.36	0.00	0.00	0.00	-15.01	111111

FOR LOADING - 2
APPLIED JOINT EQUIVALENT LOADS

JOINT	FORCE-X	FORCE-Y	FORCE-Z	MOM-X	MOM-Y	MOM-Z
1	0.00000E+00	-8.68167E+00	0.00000E+00	0.00000E+00	0.00000E+00	-7.98062E+01
2	0.00000E+00	-3.44017E+01	0.00000E+00	0.00000E+00	0.00000E+00	1.36583E+02
3	-1.09193E-12	-1.22376E+02	0.00000E+00	0.00000E+00	0.00000E+00	3.97238E+02
4	0.00000E+00	-9.22038E+01	0.00000E+00	0.00000E+00	0.00000E+00	-9.70218E+02
5	0.00000E+00	-6.45375E+01	0.00000E+00	0.00000E+00	0.00000E+00	-1.22070E-04
6	0.00000E+00	-9.22038E+01	0.00000E+00	0.00000E+00	0.00000E+00	9.70218E+02
7	0.00000E+00	-1.22376E+02	0.00000E+00	0.00000E+00	0.00000E+00	-3.97231E+02
8	0.00000E+00	-3.44019E+01	0.00000E+00	0.00000E+00	0.00000E+00	-1.36584E+02
9	0.00000E+00	-8.68151E+00	0.00000E+00	0.00000E+00	0.00000E+00	7.98054E+01
10	0.00000E+00	-1.38929E+01	0.00000E+00	0.00000E+00	0.00000E+00	-2.43126E+02
11	-1.09193E-12	-1.37856E+01	0.00000E+00	0.00000E+00	0.00000E+00	-8.25631E-03
12	0.00000E+00	-1.37856E+01	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
13	0.00000E+00	-1.37856E+01	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
14	0.00000E+00	-1.37856E+01	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
15	0.00000E+00	-1.37856E+01	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
16	0.00000E+00	-1.38929E+01	0.00000E+00	0.00000E+00	0.00000E+00	2.43126E+02

STATIC LOAD/REACTION/EQUILIBRIUM SUMMARY FOR CASE NO. 2
LOADTYPE NONE TITLE DEAD LOAD

***TOTAL APPLIED LOAD (KIP INCH) SUMMARY (LOADING 2)
SUMMATION FORCE-X = 0.00
SUMMATION FORCE-Y = -676.58
SUMMATION FORCE-Z = 0.00

SUMMATION OF MOMENTS AROUND THE ORIGIN-
MX= 0.00 MY= 0.00 MZ= -170497.27

***TOTAL REACTION LOAD(KIP INCH) SUMMARY (LOADING 2)
SUMMATION FORCE-X = 0.00
SUMMATION FORCE-Y = 676.58
SUMMATION FORCE-Z = 0.00

SUMMATION OF MOMENTS AROUND THE ORIGIN-
MX= 0.00 MY= 0.00 MZ= 170497.27

MAXIMUM DISPLACEMENTS (INCH /RADIANS) (LOADING 2)

	MAXIMUMS	AT NODE
X =	5.29494E-04	1
Y =	-6.49035E-02	4
Z =	0.00000E+00	0
RX=	0.00000E+00	0
RY=	0.00000E+00	0
RZ=	1.93890E-04	8

EXTERNAL AND INTERNAL JOINT LOAD SUMMARY (KIP INCH)-

JT	EXT FX/ INT FX	EXT FY/ INT FY	EXT FZ/ INT FZ	EXT MX/ INT MX	EXT MY/ INT MY	EXT MZ/ INT MZ	
							SUPPORT=1
10	0.00	-13.89	0.00	0.00	0.00	-243.13	
	-8.20	-65.08	0.00	0.00	0.00	18.42	111111
11	0.00	-13.79	0.00	0.00	0.00	-0.01	
	-0.04	-87.01	0.00	0.00	0.00	11.67	111111
12	0.00	-13.79	0.00	0.00	0.00	0.00	
	-0.02	-92.04	0.00	0.00	0.00	6.07	111111
13	0.00	-13.79	0.00	0.00	0.00	0.00	
	0.00	-91.61	0.00	0.00	0.00	-0.01	111111
14	0.00	-13.79	0.00	0.00	0.00	0.00	
	0.02	-92.04	0.00	0.00	0.00	-6.09	111111
15	0.00	-13.79	0.00	0.00	0.00	0.00	
	0.04	-87.01	0.00	0.00	0.00	-11.69	111111
16	0.00	-13.89	0.00	0.00	0.00	243.13	
	8.20	-65.08	0.00	0.00	0.00	-18.44	111111

FOR LOADING - 5
APPLIED JOINT EQUIVALENT LOADS

JOINT	FORCE-X	FORCE-Y	FORCE-Z	MOM-X	MOM-Y	MOM-Z
2	-3.44539E-01	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
3	-5.68546E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
4	-4.13488E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
5	-3.79024E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
6	-4.13488E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
7	-5.68543E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
8	-1.35451E+00	-6.61826E-03	0.00000E+00	0.00000E+00	0.00000E+00	-5.03486E+01
9	-4.20000E-01	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
16	-2.00573E-02	6.61825E-03	0.00000E+00	0.00000E+00	0.00000E+00	5.17905E+00

STATIC LOAD/REACTION/EQUILIBRIUM SUMMARY FOR CASE NO. 5
LOADTYPE NONE TITLE WIND ON STRUCTURE

***TOTAL APPLIED LOAD (KIP INCH) SUMMARY (LOADING 5)
SUMMATION FORCE-X = -25.57
SUMMATION FORCE-Y = 0.00
SUMMATION FORCE-Z = 0.00

SUMMATION OF MOMENTS AROUND THE ORIGIN-
MX= 0.00 MY= 0.00 MZ= -61.32

***TOTAL REACTION LOAD(KIP INCH) SUMMARY (LOADING 5)
SUMMATION FORCE-X = 25.57
SUMMATION FORCE-Y = 0.00
SUMMATION FORCE-Z = 0.00

SUMMATION OF MOMENTS AROUND THE ORIGIN-
MX= 0.00 MY= 0.00 MZ= 61.32

MAXIMUM DISPLACEMENTS (INCH /RADIANS) (LOADING 5)

	MAXIMUMS	AT NODE
X =	-1.39791E+00	5
Y =	-1.85243E-01	9
Z =	0.00000E+00	0
RX=	0.00000E+00	0
RY=	0.00000E+00	0
RZ=	-1.26086E-03	8

EXTERNAL AND INTERNAL JOINT LOAD SUMMARY (KIP INCH)-

JT	EXT FX/ INT FX	EXT FY/ INT FY	EXT FZ/ INT FZ	EXT MX/ INT MX	EXT MY/ INT MY	EXT MZ/ INT MZ	
							SUPPORT=1
10	0.00	0.00	0.00	0.00	0.00	0.00	
	-9.12	-58.97	0.00	0.00	0.00	668.85	111111
11	0.00	0.00	0.00	0.00	0.00	0.00	
	-1.64	66.20	0.00	0.00	0.00	638.69	111111
12	0.00	0.00	0.00	0.00	0.00	0.00	
	-1.39	10.05	0.00	0.00	0.00	569.32	111111
13	0.00	0.00	0.00	0.00	0.00	0.00	
	-1.30	0.07	0.00	0.00	0.00	543.19	111111
14	0.00	0.00	0.00	0.00	0.00	0.00	
	-1.39	-9.87	0.00	0.00	0.00	569.29	111111
15	0.00	0.00	0.00	0.00	0.00	0.00	
	-1.64	-66.05	0.00	0.00	0.00	638.96	111111
16	-0.02	0.01	0.00	0.00	0.00	5.18	
	-9.08	58.56	0.00	0.00	0.00	670.14	111111

FOR LOADING - 6
APPLIED JOINT EQUIVALENT LOADS

JOINT	FORCE-X	FORCE-Y	FORCE-Z	MOM-X	MOM-Y	MOM-Z
2	-9.77050E-02	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
3	-1.61230E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
4	-1.17258E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
5	-1.07484E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
6	-1.17258E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
7	-1.61230E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
8	-9.77050E-02	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00

STATIC LOAD/REACTION/EQUILIBRIUM SUMMARY FOR CASE NO. 6
LOADTYPE NONE TITLE WIND ON LIVE LOAD

***TOTAL APPLIED LOAD (KIP INCH) SUMMARY (LOADING 6)
SUMMATION FORCE-X = -6.84
SUMMATION FORCE-Y = 0.00
SUMMATION FORCE-Z = 0.00

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

***TOTAL REACTION LOAD(KIP INCH) SUMMARY (LOADING 6)
SUMMATION FORCE-X = 6.84
SUMMATION FORCE-Y = 0.00
SUMMATION FORCE-Z = 0.00

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

MAXIMUM DISPLACEMENTS (INCH /RADIANS) (LOADING 6)

	MAXIMUMS	AT NODE
X =	-3.73573E-01	5
Y =	4.92945E-02	1
Z =	0.00000E+00	0
RX=	0.00000E+00	0
RY=	0.00000E+00	0
RZ=	-3.33873E-04	8

EXTERNAL AND INTERNAL JOINT LOAD SUMMARY (KIP INCH)-

JT	EXT FX/ INT FX	EXT FY/ INT FY	EXT FZ/ INT FZ	EXT MX/ INT MX	EXT MY/ INT MY	EXT MZ/ INT MZ	
							SUPPORT=1
10	0.00	0.00	0.00	0.00	0.00	0.00	
	-2.44	-15.76	0.00	0.00	0.00	178.74	111111
11	0.00	0.00	0.00	0.00	0.00	0.00	
	-0.44	17.69	0.00	0.00	0.00	170.69	111111
12	0.00	0.00	0.00	0.00	0.00	0.00	
	-0.37	2.68	0.00	0.00	0.00	152.16	111111
13	0.00	0.00	0.00	0.00	0.00	0.00	
	-0.35	0.00	0.00	0.00	0.00	145.19	111111
14	0.00	0.00	0.00	0.00	0.00	0.00	
	-0.37	-2.68	0.00	0.00	0.00	152.16	111111
15	0.00	0.00	0.00	0.00	0.00	0.00	
	-0.44	-17.69	0.00	0.00	0.00	170.69	111111
16	0.00	0.00	0.00	0.00	0.00	0.00	
	-2.44	15.76	0.00	0.00	0.00	178.74	111111

FOR LOADING - 8
APPLIED JOINT EQUIVALENT LOADS

JOINT	FORCE-X	FORCE-Y	FORCE-Z	MOM-X	MOM-Y	MOM-Z
1	0.00000E+00	-5.24089E+00	0.00000E+00	0.00000E+00	0.00000E+00	-5.15465E+01
2	0.00000E+00	-1.11685E+01	0.00000E+00	0.00000E+00	0.00000E+00	-4.70292E+01
3	0.00000E+00	-1.39058E+00	0.00000E+00	0.00000E+00	0.00000E+00	2.92021E+01

APPLIED JOINT EQUIVALENT LOADS

JOINT	FORCE-X	FORCE-Y	FORCE-Z	MOM-X	MOM-Y	MOM-Z
8	0.00000E+00	-1.11687E+01	0.00000E+00	0.00000E+00	0.00000E+00	4.70283E+01
9	0.00000E+00	-5.24076E+00	0.00000E+00	0.00000E+00	0.00000E+00	5.15458E+01

STATIC LOAD/REACTION/EQUILIBRIUM SUMMARY FOR CASE NO. 8
LOADTYPE NONE TITLE WALKWAY LIVE LOAD

***TOTAL APPLIED LOAD (KIP INCH) SUMMARY (LOADING 8)
SUMMATION FORCE-X = 0.00
SUMMATION FORCE-Y = -35.60
SUMMATION FORCE-Z = 0.00

SUMMATION OF MOMENTS AROUND THE ORIGIN-
MX= 0.00 MY= 0.00 MZ= -8971.20

***TOTAL REACTION LOAD(KIP INCH) SUMMARY (LOADING 8)
SUMMATION FORCE-X = 0.00
SUMMATION FORCE-Y = 35.60
SUMMATION FORCE-Z = 0.00

SUMMATION OF MOMENTS AROUND THE ORIGIN-
MX= 0.00 MY= 0.00 MZ= 8971.20

MAXIMUM DISPLACEMENTS (INCH /RADIANS) (LOADING 8)

	MAXIMUMS	AT NODE
X =	1.09499E-04	2
Y =	-1.62072E-02	1
Z =	0.00000E+00	0
RX=	0.00000E+00	0
RY=	0.00000E+00	0
RZ=	1.32115E-04	1

EXTERNAL AND INTERNAL JOINT LOAD SUMMARY (KIP INCH)-

JT	EXT FX/ INT FX	EXT FY/ INT FY	EXT FZ/ INT FZ	EXT MX/ INT MX	EXT MY/ INT MY	EXT MZ/ INT MZ	
							SUPPORT=1
10	0.00	0.00	0.00	0.00	0.00	0.00	
	-1.78	-14.61	0.00	0.00	0.00	-13.71	111111
11	0.00	0.00	0.00	0.00	0.00	0.00	
	0.03	-4.53	0.00	0.00	0.00	-8.61	111111
12	0.00	0.00	0.00	0.00	0.00	0.00	
	0.01	0.49	0.00	0.00	0.00	-3.08	111111
13	0.00	0.00	0.00	0.00	0.00	0.00	
	0.00	1.69	0.00	0.00	0.00	0.00	111111
14	0.00	0.00	0.00	0.00	0.00	0.00	
	-0.01	0.49	0.00	0.00	0.00	3.08	111111
15	0.00	0.00	0.00	0.00	0.00	0.00	
	-0.03	-4.53	0.00	0.00	0.00	8.61	111111

16	0.00	0.00	0.00	0.00	0.00	0.00	
	1.78	-14.61	0.00	0.00	0.00	13.71	111111

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

99. PRINT MEMBER INFORMATION LIST 1 TO 15

MEMBER INFORMATION

MEMBER	START JOINT	END JOINT	LENGTH (FEET)	BETA (DEG)	RELEASES
1	1	2	3.500	0.00	
2	2	3	5.833	0.00	
3	3	4	5.833	0.00	
4	4	5	5.833	0.00	
5	5	6	5.833	0.00	
6	6	7	5.833	0.00	
7	7	8	5.833	0.00	
8	8	9	3.500	0.00	
9	2	10	70.545	0.00	
10	3	11	70.000	0.00	
11	4	12	70.000	0.00	
12	5	13	70.000	0.00	
13	6	14	70.000	0.00	
14	7	15	70.000	0.00	
15	8	16	70.545	0.00	

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

100. PRINT MEMBER PROPERTIES LIST 1 TO 15

MEMBER PROPERTIES. UNIT - INCH

MEMB	PROFILE	AX/ AY	IZ/ AZ	IY/ SZ	IX/ SY
1	PRISMATIC	1080.00	81000.00	116640.00	160735.94
		918.00	918.00	5400.00	6480.00
2	PRISMATIC	1080.00	81000.00	116640.00	160735.94
		918.00	918.00	5400.00	6480.00
3	PRISMATIC	1080.00	81000.00	116640.00	160735.94
		918.00	918.00	5400.00	6480.00
4	PRISMATIC	1080.00	81000.00	116640.00	160735.94
		918.00	918.00	5400.00	6480.00
5	PRISMATIC	1080.00	81000.00	116640.00	160735.94
		918.00	918.00	5400.00	6480.00
6	PRISMATIC	1080.00	81000.00	116640.00	160735.94
		918.00	918.00	5400.00	6480.00
7	PRISMATIC	1080.00	81000.00	116640.00	160735.94
		918.00	918.00	5400.00	6480.00
8	PRISMATIC	1080.00	81000.00	116640.00	160735.94
		918.00	918.00	5400.00	6480.00
9	PRISMATIC	378.14	14444.70	14446.77	25608.96
		0.00	0.00	2891.83	2892.25
10	PRISMATIC	378.14	14444.70	14446.77	25608.96
		0.00	0.00	2891.83	2892.25
11	PRISMATIC	378.14	14444.70	14446.77	25608.96
		0.00	0.00	2891.83	2892.25
12	PRISMATIC	378.14	14444.70	14446.77	25608.96
		0.00	0.00	2891.83	2892.25
13	PRISMATIC	378.14	14444.70	14446.77	25608.96
		0.00	0.00	2891.83	2892.25
14	PRISMATIC	378.14	14444.70	14446.77	25608.96
		0.00	0.00	2891.83	2892.25
15	PRISMATIC	378.14	14444.70	14446.77	25608.96
		0.00	0.00	2891.83	2892.25

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

101. PRINT MATERIAL PROPERTIES LIST 1 TO 15

MATERIAL PROPERTIES.

ALL UNITS ARE - KIP FEET

MEMBER	E	G	DEN	ALPHA
1	453600.0	193846.1	0.14999039	0.00000550
2	453600.0	193846.1	0.14999039	0.00000550
3	453600.0	193846.1	0.14999039	0.00000550
4	453600.0	193846.1	0.14999039	0.00000550
5	453600.0	193846.1	0.14999039	0.00000550
6	453600.0	193846.1	0.14999039	0.00000550
7	453600.0	193846.1	0.14999039	0.00000550
8	453600.0	193846.1	0.14999039	0.00000550
9	453600.0	193846.1	0.14999039	0.00000550
10	453600.0	193846.1	0.14999039	0.00000550
11	453600.0	193846.1	0.14999039	0.00000550
12	453600.0	193846.1	0.14999039	0.00000550
13	453600.0	193846.1	0.14999039	0.00000550
14	453600.0	193846.1	0.14999039	0.00000550
15	453600.0	193846.1	0.14999039	0.00000550

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

102. PRINT SUPPORT INFORMATION

SUPPORT INFORMATION (1=FIXED, 0=RELEASED)

UNITS FOR SPRING CONSTANTS ARE KIP FEET DEGREES

JOINT	FORCE-X/ KFX	FORCE-Y/ KFY	FORCE-Z/ KFZ	MOM-X/ KMX	MOM-Y/ KMY	MOM-Z/ KMZ
10	1	1	1	1	1	1
	0.0000E+00	0.0000E+00	0.0000E+00	0.000E+00	0.000E+00	0.000E+00
11	1	1	1	1	1	1
	0.0000E+00	0.0000E+00	0.0000E+00	0.000E+00	0.000E+00	0.000E+00
12	1	1	1	1	1	1
	0.0000E+00	0.0000E+00	0.0000E+00	0.000E+00	0.000E+00	0.000E+00
13	1	1	1	1	1	1
	0.0000E+00	0.0000E+00	0.0000E+00	0.000E+00	0.000E+00	0.000E+00
14	1	1	1	1	1	1
	0.0000E+00	0.0000E+00	0.0000E+00	0.000E+00	0.000E+00	0.000E+00
15	1	1	1	1	1	1
	0.0000E+00	0.0000E+00	0.0000E+00	0.000E+00	0.000E+00	0.000E+00

```
 16       1          1          1          1          1          1
     0.0000E+00 0.0000E+00 0.0000E+00 0.000E+00 0.000E+00 0.000E+00


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


103. LOAD LIST 9 11 13
104. PRINT SUPPORT REACTION LIST 10 TO 16
```

SUPPORT REACTIONS -UNIT KIP FEET STRUCTURE TYPE = SPACE

JOINT	LOAD	FORCE-X	FORCE-Y	FORCE-Z	MOM-X	MOM-Y	MOM Z
10	9	10.96	100.94	0.00	0.00	0.00	18.62
	11	17.33	137.94	0.00	0.00	0.00	-37.01
	13	16.13	134.39	0.00	0.00	0.00	-13.00
11	9	0.04	125.63	0.00	0.00	0.00	-0.98
	11	1.68	34.60	0.00	0.00	0.00	-54.20
	13	0.97	88.08	0.00	0.00	0.00	-31.17
12	9	0.03	130.28	0.00	0.00	0.00	-0.58
	11	1.41	95.77	0.00	0.00	0.00	-47.95
	13	0.81	124.59	0.00	0.00	0.00	-27.50
13	9	0.00	129.27	0.00	0.00	0.00	0.00
	11	1.30	105.33	0.00	0.00	0.00	-45.27
	13	0.74	129.25	0.00	0.00	0.00	-25.68
14	9	-0.03	130.28	0.00	0.00	0.00	0.58
	11	1.37	115.69	0.00	0.00	0.00	-46.93
	13	0.76	135.93	0.00	0.00	0.00	-26.33
15	9	-0.04	125.62	0.00	0.00	0.00	0.99
	11	1.60	166.84	0.00	0.00	0.00	-52.27
	13	0.89	163.13	0.00	0.00	0.00	-29.21
16	9	-10.96	100.94	0.00	0.00	0.00	-18.62
	11	0.89	20.41	0.00	0.00	0.00	-75.00
	13	-5.79	67.62	0.00	0.00	0.00	-50.39

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

105. LOAD LIST 14 16 17
106. SECTION 0 0.143 0.5 0.857 1 MEMB 1 TO 8
107. PRINT MEMBER SECTION FORCES LIST 1 TO 8

MEMBER FORCES AT INTERMEDIATE SECTIONS

ALL UNITS ARE -- KIP FEET

MEMB	LOAD	SEC	SHEAR-Y	SHEAR-Z	MOM-Y	MOM-Z
1	14	0.14	-0.73	0.00	0.00	0.18
		0.50	-36.69	0.00	0.00	9.35
		0.86	-38.52	0.00	0.00	56.34
	16	0.14	-0.73	0.00	0.00	0.18
		0.50	-17.38	0.00	0.00	5.33
		0.86	-19.21	0.00	0.00	28.18
	17	0.14	-0.73	0.00	0.00	0.18
		0.50	-28.95	0.00	0.00	7.74
		0.86	-30.78	0.00	0.00	45.05
2	14	0.14	78.01	0.00	0.00	42.89
		0.50	40.83	0.00	0.00	-66.61
		0.86	37.79	0.00	0.00	-148.48
	16	0.14	122.05	0.00	0.00	53.26
		0.50	104.18	0.00	0.00	-176.11
		0.86	101.14	0.00	0.00	-389.90
	17	0.14	108.43	0.00	0.00	50.88
		0.50	79.00	0.00	0.00	-133.27
		0.86	75.95	0.00	0.00	-294.61
3	14	0.14	-25.28	0.00	0.00	-81.64
		0.50	-28.33	0.00	0.00	-25.82
		0.86	-31.37	0.00	0.00	36.34
	16	0.14	-23.73	0.00	0.00	-328.27
		0.50	-26.78	0.00	0.00	-275.68
		0.86	-29.82	0.00	0.00	-216.75
	17	0.14	-26.24	0.00	0.00	-225.89
		0.50	-29.29	0.00	0.00	-168.07
		0.86	-32.33	0.00	0.00	-103.91
4	14	0.14	135.39	0.00	0.00	-48.41
		0.50	-79.41	0.00	0.00	-97.79
		0.86	-82.62	0.00	0.00	70.93
	16	0.14	56.32	0.00	0.00	-172.79
		0.50	-68.56	0.00	0.00	-154.92
		0.86	-71.77	0.00	0.00	-8.81
	17	0.14	100.01	0.00	0.00	-121.89
		0.50	-78.83	0.00	0.00	-136.54
		0.86	-82.04	0.00	0.00	30.96
5	14	0.14	82.62	0.00	0.00	70.93
		0.50	79.42	0.00	0.00	-97.79
		0.86	-135.39	0.00	0.00	-48.41
	16	0.14	26.75	0.00	0.00	87.84
		0.50	23.54	0.00	0.00	35.48
		0.86	-101.34	0.00	0.00	111.36
	17	0.14	56.52	0.00	0.00	85.77

MEMBER FORCES AT INTERMEDIATE SECTIONS

ALL UNITS ARE -- KIP FEET

MEMB	LOAD	SEC	SHEAR-Y	SHEAR-Z	MOM-Y	MOM-Z
		0.50	53.32	0.00	0.00	-28.60
		0.86	-125.52	0.00	0.00	39.18
6	14	0.14	31.37	0.00	0.00	36.33
		0.50	28.33	0.00	0.00	-25.83
		0.86	25.28	0.00	0.00	-81.65
	16	0.14	10.69	0.00	0.00	250.42
		0.50	7.65	0.00	0.00	231.32
		0.86	4.60	0.00	0.00	218.57
	17	0.14	21.56	0.00	0.00	160.90
		0.50	18.51	0.00	0.00	119.17
		0.86	15.47	0.00	0.00	83.78
7	14	0.14	-37.79	0.00	0.00	-148.49
		0.50	-40.84	0.00	0.00	-66.62
		0.86	-78.01	0.00	0.00	42.89
	16	0.14	51.66	0.00	0.00	205.09
		0.50	48.61	0.00	0.00	100.69
		0.86	30.74	0.00	0.00	11.88
	17	0.14	10.85	0.00	0.00	42.18
		0.50	7.81	0.00	0.00	22.75
		0.86	-21.63	0.00	0.00	26.14
8	14	0.14	38.52	0.00	0.00	56.34
		0.50	36.69	0.00	0.00	9.35
		0.86	0.73	0.00	0.00	0.18
	16	0.14	19.21	0.00	0.00	28.18
		0.50	17.38	0.00	0.00	5.33
		0.86	0.73	0.00	0.00	0.18
	17	0.14	30.78	0.00	0.00	45.05
		0.50	28.95	0.00	0.00	7.74
		0.86	0.73	0.00	0.00	0.18

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

108. PRINT MAXFORCE ENVELOPE NSECTION 10 LIST 1 TO 8

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
1	MAX	0.00	0.00	14	75.80	3.50	14			
		0.00	0.00	14	0.00	0.00	14	0.00	0.00	14
	MIN	-39.25	3.50	14	0.00	0.00	14			
		0.00	3.50	17	0.00	3.50	17	0.00	3.50	17
2	MAX	123.27	0.00	16	155.58	0.00	16			
		0.00	0.00	14	0.00	0.00	14	22.53 C	0.00	16
	MIN	-184.92	5.83	14	-429.90	5.83	16			
		0.00	5.83	17	0.00	5.83	17	14.69 C	5.83	16
3	MAX	-22.51	0.00	16	63.02	5.83	14			
		0.00	0.00	14	0.00	0.00	14	18.01 C	0.00	17
	MIN	-33.56	5.83	17	-347.56	0.00	16			
		0.00	5.83	17	0.00	5.83	17	16.87 C	5.83	16
4	MAX	136.68	0.00	14	140.38	5.83	14			
		0.00	0.00	14	0.00	0.00	14	19.07 C	0.00	17
	MIN	-83.90	5.83	14	-223.73	1.75	16			
		0.00	5.83	17	0.00	5.83	17	10.86 C	5.83	16
5	MAX	83.90	0.00	14	196.43	5.83	16			
		0.00	0.00	14	0.00	0.00	14	17.32 C	0.00	14
	MIN	-136.68	5.83	14	-171.77	4.08	14			
		0.00	5.83	17	0.00	5.83	17	4.71 C	5.83	16
6	MAX	32.61	0.00	14	259.85	0.00	16			
		0.00	0.00	14	0.00	0.00	14	17.27 C	0.00	14
	MIN	3.38	5.83	16	-102.23	5.83	14			
		0.00	5.83	17	0.00	5.83	17	6.49 C	5.83	16
7	MAX	197.59	0.00	17	292.54	0.00	16			
		0.00	0.00	14	0.00	0.00	14	17.20 C	0.00	14
	MIN	-79.23	5.83	14	-157.93	0.58	14			
		0.00	5.83	17	0.00	5.83	17	0.72 C	5.83	16
8	MAX	39.25	0.00	14	75.80	0.00	14			
		0.00	0.00	14	0.00	0.00	14	0.55 C	0.00	16
	MIN	0.00	3.50	16	0.00	3.50	16			
		0.00	3.50	17	0.00	3.50	17	0.00 T	3.50	14

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

109. FINISH

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

**** DATE= AUG 28,2006 TIME= 9:37:46 ****

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************************************************************
*         For questions on STAAD.Pro, please contact       *
*   Research Engineers Offices at the following locations  *
*                                                          *
*              Telephone              Email                *
*  USA:      +1 (714)974-2500       support@reiusa.com      *
*  CANADA    +1 (905)632-4771       detech@odandetech.com   *
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*  THAILAND  +66(0)2645-1018/19    support@thai.reiusa.com  *
*                                                          *
*  North America                  support@reiusa.com       *
*  Europe                         support@reel.co.uk       *
*  Asia                           support@reiasia.net      *
************************************************************
```

Information about the key files in the current distribution

Modfication Date	CRC	Size (Bytes)	File Name
02/27/2006	0x8140	12701696	SProStaad.exe
12/16/2004	0xca81	04558848	SProStaadStl.exe
09/19/2003	0x2fc0	00081970	CMesh.dll
02/06/2006	0x5601	02486272	dbsectioninterface.dll
01/23/2001	0x9b40	00073728	LoadGen.dll
09/25/2003	0x6340	00704512	MeshEngine.dll
09/22/2003	0xce00	00069632	QuadPlateEngine.dll
12/22/2005	0x4181	00094208	SurfMesh.dll
09/30/2005	0x2dc1	00475136	aiscsections.mdb
01/05/2005	0x79c1	00319488	aiscsections_all_editions.mdb
01/05/2005	0x4b81	01810432	aiscsteeljoists.mdb
01/05/2005	0xcac1	03651584	aitctimbersections.mdb
01/27/2005	0xeb01	00552960	aluminumsections.mdb
01/05/2005	0xcd01	00163840	australiansections.mdb
01/05/2005	0x6a41	00229376	britishsections.mdb
07/08/2005	0x9d41	00434176	bscoldformedsections.mdb
06/28/2005	0x8201	00327680	butlercoldformedsections.mdb
01/05/2005	0xabc0	00262144	canadiansections.mdb
05/31/2005	0x9e81	00450560	canadiantimbersections.mdb
05/05/2005	0x7f80	00409600	chinesesections.mdb
01/05/2005	0xd6c0	00600064	dutchsections.mdb
01/05/2005	0x1a00	00354304	europeansections.mdb
01/05/2005	0xd301	00202752	frenchsections.mdb
01/05/2005	0x11c1	00233472	germansections.mdb
01/05/2005	0x3c40	00264192	indiansections.mdb
01/05/2005	0xd540	00180224	iscoldformedsections.mdb
01/24/2006	0x2501	00221184	japanesesections.mdb
11/08/2005	0x9081	00376832	Kingspancoldformedsections.mdb
01/05/2005	0xb740	00174080	koreansections.mdb
02/03/2005	0xda00	00096256	lysaghtcoldformedsections.mdb
02/07/2005	0x9a00	00243712	mexicansteeltables.mdb
01/04/2006	0x8980	00413696	RCecoColdFormedSections.mdb
02/03/2005	0x9b40	00307200	russiansections.mdb
01/05/2005	0x9081	00206848	southafricansections.mdb
01/06/2005	0x9341	00194560	spanishsections.mdb
01/04/2006	0x8680	00223232	uscoldformedsections.mdb
01/05/2005	0xbac0	00149504	usersectionstemplate.mdb
01/05/2005	0x9d41	00141312	venezuelansections.mdb

REINFORCED BEAM CAP

Reinforing Yield Strength	$Fy := 40000psi$
Concrete Compresion Strength	$Fc := 4990psi$
Width of Beam	$b := 3ft$
Depth of Reinforcemnt	$d := 2.25ft$ Top Reinforcement
Positive Reinforcement Area	$Asp := 6.24in^2$
Negative Reinforcement Area	$Asn := 6.35in^2$
Factored Shear at Section	$Vu := 135.39k$
Factored Moment at Section	$Mu := 48.41k \cdot ft$

$\rho w := \frac{Asp}{b \cdot d}$ Reinforcement Ratio

Positive Moment Capacity: Compression Steel neglected $\phi_f := 0.9$

Tension in Reinforcemnt $Tp := Asp \cdot Fy$

Depth of Compression Block $ap := \frac{Tp}{0.85 \cdot Fc \cdot b}$

$\phi Mnp := \phi_f Tp \cdot \left(d - \frac{ap}{2}\right)$ $\phi Mnp = 490\ ft\,k$

Negative Moment Capacity: Compression Steel neglected

Tension in Reinforcemnt $Tn := Asn \cdot Fy$

Depth of Compression Block $an := \frac{Tn}{0.85 \cdot Fc \cdot b}$

$\phi Mnn := \phi_f Tn \cdot \left(d - \frac{an}{2}\right)$ $\phi Mnn = 499\ ft\,k$

Shear Capacity Stirrup Spacing $S := 11in$ Stirrup Area $Av := 0.4in^2$

$Vc1 := 2 \cdot psi \sqrt{\frac{Fc}{psi}} \cdot b \cdot d$ $Vc1 = 137\,k$

$Vc2 := \left(1.9 \cdot \sqrt{\frac{Fc}{psi}} + 2500 \cdot \rho w \frac{Vu \cdot d}{Mu}\right) \cdot b \cdot d \cdot psi$ $Vc2 = 229\,k$

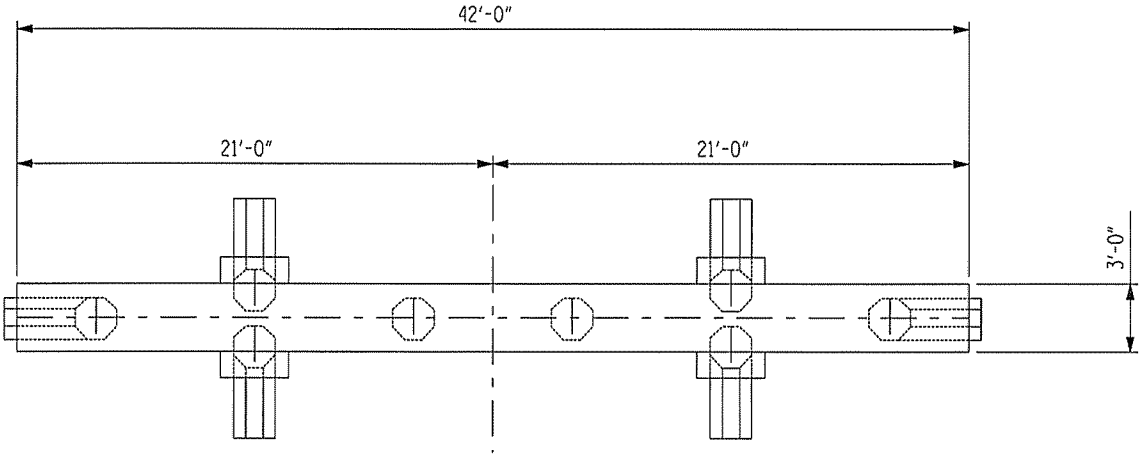
$Vc3 := 3.5 \cdot psi \sqrt{\frac{Fc}{psi}} \cdot b \cdot d$ $Vc3 = 240\,k$

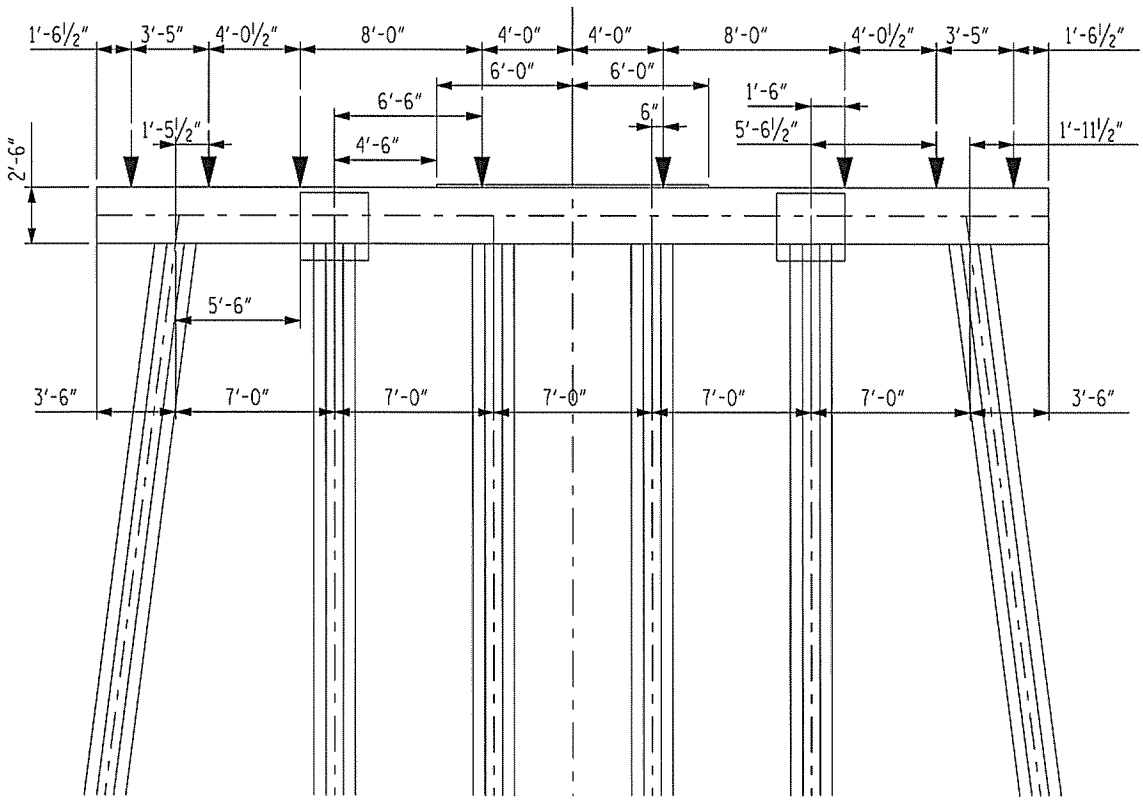
$Vc4 := if(Vc1 < Vc2, Vc2, Vc\ Vc := if(Vc4 < Vc3, Vc4, Vc3)$ $Vc = 229\,k$

$Vs := \frac{Av \cdot Fy \cdot d}{S}$ $\phi_s := 0.85$ $Vs = 39\,k$

$\phi Vn := \phi_s \cdot (Vc + Vs)$ $\phi Vn = 228\,k$

Q:\inspect\BonnerBridge\CrutchBents\Type 1 SectionCapacity.xmcd



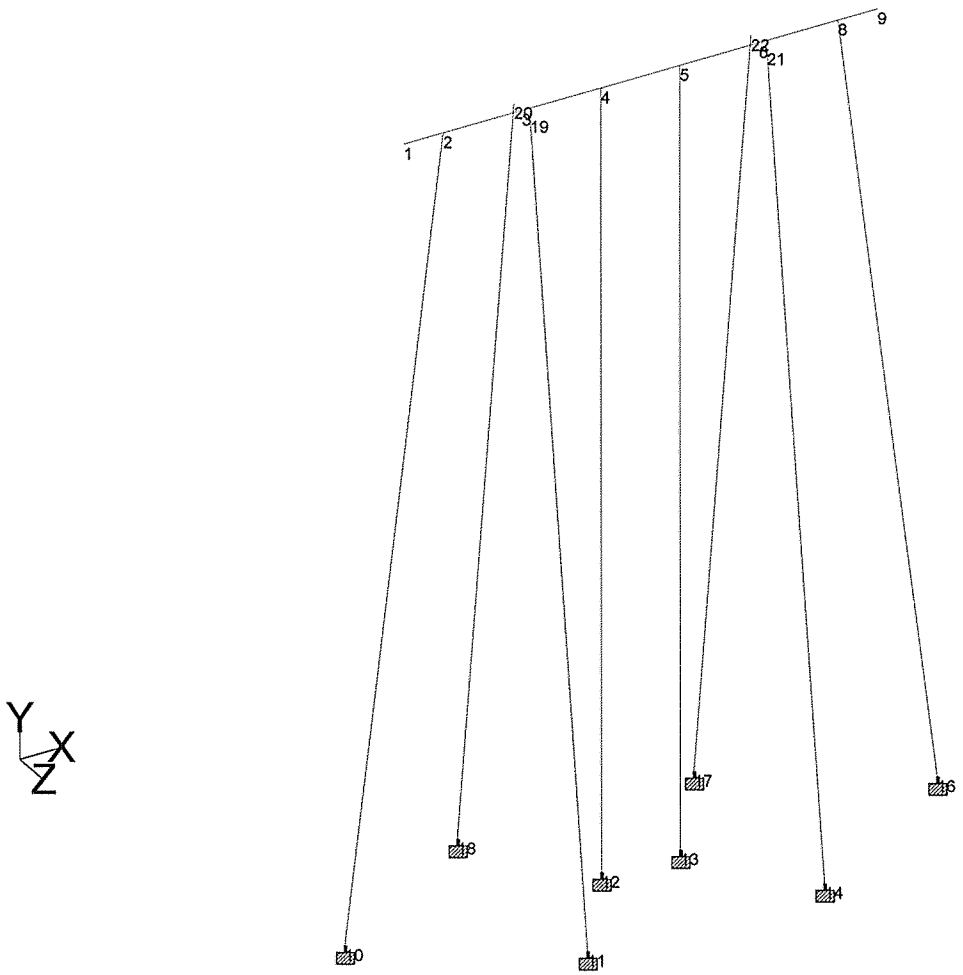


ELEVATION TYPE 2

BENTS 4, 8, 12, 16, 20

NBIS REPORT BENT TYPE D

ATCO 8/29



Load 1

MJM 8/22
✓ AKo 8/29

```
*****************************************************
*                                                   *
*           STAAD.Pro                               *
*           Version  2005    Bld 1003.US            *
*           Proprietary Program of                  *
*           Research Engineers,  Intl.              *
*           Date=    AUG 29, 2006                   *
*           Time=     9: 2:26                       *
*                                                   *
*      USER ID: Ko and Associates                   *
*****************************************************
```

```
     1. STAAD SPACE
INPUT FILE: Type 2.STD
     2. START JOB INFORMATION
     3. ENGINEER DATE 24-MAY-06
     4. END JOB INFORMATION
     5. INPUT WIDTH 79
     6. UNIT FEET KIP
     7. JOINT COORDINATES
     8. 1 0 0 0; 2 3.5 0 0; 3 10.5 0 0; 4 17.5 0 0; 5 24.5 0 0; 6 31.5 0 0; 8 38.5 0 0
     9. 9 42 0 0; 10 -5.25 -70 0; 11 10.5 -70 10; 12 17.5 -70 0; 13 24.5 -70 0
    10. 14 31.5 -70 10; 16 47.25 -70 0; 17 31.5 -70 -10; 18 10.5 -70 -10
    11. 19 10.5 0 1.25; 20 10.5 0 -1.25; 21 31.5 0 1.25; 22 31.5 0 -1.25
    12. MEMBER INCIDENCES
    13. 1 1 2; 2 2 3; 3 3 4; 4 4 5; 5 5 6; 6 6 8; 8 8 9; 9 2 10; 10 19 11; 11 4 12
    14. 12 5 13; 13 21 14; 15 8 16; 16 22 17; 17 20 18
    15. UNIT INCHES KIP
    16. MEMBER PROPERTY AMERICAN
    17. 1 TO 6 8 PRIS YD 30 ZD 36
    18. UNIT FEET KIP
    19. MEMBER PROPERTY AMERICAN
    20. 9 TO 13 15 TO 17 PRIS AX 2.626 IX 1.235 IY 0.6966 IZ 0.6966
    21. DEFINE MATERIAL START
    22. ISOTROPIC CONCRETE
    23. E 453600
    24. POISSON 0.17
    25. DENSITY 0.14999
    26. ALPHA 5.5E-006
    27. DAMP 0.05
    28. END DEFINE MATERIAL
    29. CONSTANTS
    30. MATERIAL CONCRETE MEMB 1 TO 6 8 TO 13 15 TO 17
    31. SUPPORTS
    32. 10 TO 14 16 TO 18 FIXED
    33. SLAVE RIGID MASTER 3 JOINT 19 20
    34. SLAVE RIGID MASTER 6 JOINT 21 22
    35. UNIT INCHES KIP
    36. LOAD 1 LOADTYPE NONE  TITLE LIVE LOAD
    37. MEMBER LOAD
    38. 2 CON GY -32.7 66
    39. 3 CON GY -32.7 78
    40. 5 CON GY -32.7 6
```

```
41. 6 CON GY -32.7 18
42. LOAD 2 LOADTYPE NONE  TITLE DEAD LOAD
43. MEMBER LOAD
44. 1 CON GY -11.4 18.5
45. 2 CON GY -11.4 17.4996
46. 2 CON GY -101.2 66
47. 3 CON GY -93.6 78
48. 5 CON GY -93.6 6
49. 6 CON GY -101.2 18
50. 6 CON GY -11.4 66.5004
51. 8 CON GY -11.4 23.4996
52. UNIT FEET KIP
53. SELFWEIGHT Y -1
54. MEMBER LOAD
55. 3 UNI GY -0.0585 4.5 7
56. JOINT LOAD
57. 3 6 FY -4.2
58. MEMBER LOAD
59. 4 UNI GY -0.0585 0 7
60. 5 UNI GY -0.0585 0 2.5
61. LOAD 3 LOADTYPE NONE  TITLE LIVE LOAD WALKWAY
62. MEMBER LOAD
63. 1 CON GY -8.9 1.5417
64. 2 CON GY -8.9 1.4583
65. 6 CON GY -8.9 5.5417
66. 8 CON GY -8.9 1.9583
67. LOAD 5 LOADTYPE NONE  TITLE LONGITUDINAL FORCE
68. MEMBER LOAD
69. 2 CON GZ -7.34 5.5
70. 3 CON GZ -7.34 6.5
71. 5 CON GZ -7.34 0.5
72. 6 CON GZ -7.34 1.5
73. LOAD 6 LOADTYPE NONE  TITLE WIND ON STRUCTURE
74. MEMBER LOAD
75. 2 CON GX -6.03 5.5
76. 3 CON GX -6.03 6.5
77. 5 CON GX -6.03 0.5
78. 6 CON GX -6.03 1.5
79. 2 CON GZ -5.79 5.5
80. 3 CON GZ -5.79 6.5
81. 5 CON GZ -5.79 0.5
82. 6 CON GZ -5.79 1.5
83. JOINT LOAD
84. 9 FX -0.42
85. MEMBER LOAD
86. 13 15 16 UNI GX -0.103 0 10
87. LOAD 7 LOADTYPE NONE  TITLE WIND ON LIVE LOAD
88. MEMBER LOAD
89. 2 CON GX -1.71 5.5
90. 3 CON GX -1.71 6.5
91. 5 CON GX -1.71 0.5
92. 6 CON GX -1.71 1.5
93. 2 CON GZ -2.74 5.5
94. 3 CON GZ -2.74 6.5
95. 5 CON GZ -2.74 0.5
96. 6 CON GZ -2.74 1.5
```

```
 97. LOAD COMB 8 SERVICE GROUP I
 98. 1 1.0 2 1.0 3 1.0
 99. LOAD COMB 10 SERVICE GROUP II
100. 2 1.0 6 1.0
101. LOAD COMB 11 SERVICE GROUP III
102. 1 1.0 2 1.0 3 1.0 6 0.3 5 1.0 7 1.0
103. LOAD COMB 13 FACTORED GROUP I
104. 2 1.3 1 2.75 3 2.17
105. LOAD COMB 15 FACTORED GROUP II
106. 2 1.3 6 1.3
107. LOAD COMB 16 FACTORED GROUP III
108. 2 1.3 1 1.65 3 1.3 6 0.39 5 1.3 7 1.3
109. PERFORM ANALYSIS PRINT STATICS CHECK


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

  NUMBER OF JOINTS/MEMBER+ELEMENTS/SUPPORTS =    20/    15/     8
  ORIGINAL/FINAL BAND-WIDTH=     7/     2/     12 DOF
  TOTAL PRIMARY LOAD CASES =     6, TOTAL DEGREES OF FREEDOM =     48
  SIZE OF STIFFNESS MATRIX =        1 DOUBLE  KILO-WORDS
  REQRD/AVAIL. DISK SPACE  =     12.0/  24803.6 MB
```

STATIC LOAD/REACTION/EQUILIBRIUM SUMMARY FOR CASE NO. 1
LOADTYPE NONE TITLE LIVE LOAD

***TOTAL APPLIED LOAD (KIP FEET) SUMMARY (LOADING 1)
SUMMATION FORCE-X = 0.00
SUMMATION FORCE-Y = -130.80
SUMMATION FORCE-Z = 0.00

SUMMATION OF MOMENTS AROUND THE ORIGIN-
MX= 0.00 MY= 0.00 MZ= -2746.80

***TOTAL REACTION LOAD(KIP FEET) SUMMARY (LOADING 1)
SUMMATION FORCE-X = 0.00
SUMMATION FORCE-Y = 130.80
SUMMATION FORCE-Z = 0.00

SUMMATION OF MOMENTS AROUND THE ORIGIN-
MX= 0.00 MY= 0.00 MZ= 2746.80

MAXIMUM DISPLACEMENTS (INCH /RADIANS) (LOADING 1)

	MAXIMUMS	AT NODE
X =	4.78646E-05	1
Y =	-1.82097E-02	4
Z =	0.00000E+00	0
RX=	0.00000E+00	0
RY=	0.00000E+00	0
RZ=	1.16751E-04	9

STATIC LOAD/REACTION/EQUILIBRIUM SUMMARY FOR CASE NO. 2
LOADTYPE NONE TITLE DEAD LOAD

***TOTAL APPLIED LOAD (KIP FEET) SUMMARY (LOADING 2)
SUMMATION FORCE-X = 0.00
SUMMATION FORCE-Y = -713.41
SUMMATION FORCE-Z = 0.00

SUMMATION OF MOMENTS AROUND THE ORIGIN-
MX= 0.00 MY= 0.00 MZ= -14981.52

***TOTAL REACTION LOAD(KIP FEET) SUMMARY (LOADING 2)
SUMMATION FORCE-X = 0.00
SUMMATION FORCE-Y = 713.41
SUMMATION FORCE-Z = 0.00

SUMMATION OF MOMENTS AROUND THE ORIGIN-
MX= 0.00 MY= 0.00 MZ= 14981.52

MAXIMUM DISPLACEMENTS (INCH /RADIANS) (LOADING 2)

	MAXIMUMS	AT NODE
X =	4.71249E-04	1
Y =	-6.55494E-02	5
Z =	0.00000E+00	0
RX=	0.00000E+00	0
RY=	0.00000E+00	0
RZ=	1.14105E-04	8

STATIC LOAD/REACTION/EQUILIBRIUM SUMMARY FOR CASE NO. 3
LOADTYPE NONE TITLE LIVE LOAD WALKWAY

***TOTAL APPLIED LOAD (KIP FEET) SUMMARY (LOADING 3)
SUMMATION FORCE-X = 0.00
SUMMATION FORCE-Y = -35.60
SUMMATION FORCE-Z = 0.00

SUMMATION OF MOMENTS AROUND THE ORIGIN-
MX= 0.00 MY= 0.00 MZ= -747.60

***TOTAL REACTION LOAD(KIP FEET) SUMMARY (LOADING 3)
SUMMATION FORCE-X = 0.00
SUMMATION FORCE-Y = 35.60
SUMMATION FORCE-Z = 0.00

SUMMATION OF MOMENTS AROUND THE ORIGIN-
MX= 0.00 MY= 0.00 MZ= 747.60

MAXIMUM DISPLACEMENTS (INCH /RADIANS) (LOADING 3)

	MAXIMUMS	AT NODE
X =	1.08653E-04	2
Y =	-1.65053E-02	1
Z =	0.00000E+00	0
RX=	0.00000E+00	0
RY=	0.00000E+00	0
RZ=	1.36825E-04	1

STATIC LOAD/REACTION/EQUILIBRIUM SUMMARY FOR CASE NO. 5
LOADTYPE NONE TITLE LONGITUDINAL FORCE

***TOTAL APPLIED LOAD (KIP FEET) SUMMARY (LOADING 5)
SUMMATION FORCE-X = 0.00
SUMMATION FORCE-Y = 0.00
SUMMATION FORCE-Z = -29.36

SUMMATION OF MOMENTS AROUND THE ORIGIN-
MX= 0.00 MY= 616.56 MZ= 0.00

```
***TOTAL REACTION LOAD( KIP  FEET ) SUMMARY (LOADING     5 )
    SUMMATION FORCE-X =        0.00
    SUMMATION FORCE-Y =        0.00
    SUMMATION FORCE-Z =       29.36

   SUMMATION OF MOMENTS AROUND THE ORIGIN-
   MX=           0.00  MY=        -616.56  MZ=           0.00


MAXIMUM DISPLACEMENTS ( INCH /RADIANS) (LOADING      5)
         MAXIMUMS    AT NODE
   X =  1.55578E-03      22
   Y =  1.52414E-02      22
   Z = -4.02798E-01       5
   RX=  1.01610E-03       3
   RY=  1.14369E-04       1
   RZ=  0.00000E+00       0


       STATIC LOAD/REACTION/EQUILIBRIUM SUMMARY FOR CASE NO.     6
       LOADTYPE NONE  TITLE WIND ON STRUCTURE


***TOTAL APPLIED LOAD ( KIP  FEET ) SUMMARY (LOADING    6 )
    SUMMATION FORCE-X =      -27.63
    SUMMATION FORCE-Y =        0.00
    SUMMATION FORCE-Z =      -23.16

   SUMMATION OF MOMENTS AROUND THE ORIGIN-
   MX=           0.00  MY=         486.36  MZ=         -15.33


***TOTAL REACTION LOAD( KIP  FEET ) SUMMARY (LOADING     6 )
    SUMMATION FORCE-X =       27.63
    SUMMATION FORCE-Y =        0.00
    SUMMATION FORCE-Z =       23.16

   SUMMATION OF MOMENTS AROUND THE ORIGIN-
   MX=           0.00  MY=        -486.36  MZ=          15.33


MAXIMUM DISPLACEMENTS ( INCH /RADIANS) (LOADING      6)
         MAXIMUMS    AT NODE
   X = -1.41048E+00      21
   Y = -1.88855E-01       9
   Z = -3.17738E-01       5
   RX=  8.01525E-04       3
   RY=  9.02176E-05       1
   RZ= -1.33814E-03       9


       STATIC LOAD/REACTION/EQUILIBRIUM SUMMARY FOR CASE NO.     7
       LOADTYPE NONE  TITLE WIND ON LIVE LOAD
```

```
***TOTAL APPLIED LOAD ( KIP  FEET ) SUMMARY (LOADING    7 )
    SUMMATION FORCE-X =       -6.84
    SUMMATION FORCE-Y =        0.00
    SUMMATION FORCE-Z =      -10.96

   SUMMATION OF MOMENTS AROUND THE ORIGIN-
   MX=           0.00  MY=         230.16  MZ=           0.00


***TOTAL REACTION LOAD( KIP  FEET ) SUMMARY (LOADING     7 )
    SUMMATION FORCE-X =        6.84
    SUMMATION FORCE-Y =        0.00
    SUMMATION FORCE-Z =       10.96

   SUMMATION OF MOMENTS AROUND THE ORIGIN-
   MX=           0.00  MY=        -230.16  MZ=           0.00


MAXIMUM DISPLACEMENTS ( INCH /RADIANS) (LOADING      7)
         MAXIMUMS    AT NODE
   X = -3.48893E-01      20
   Y =  4.63672E-02       1
   Z = -1.50363E-01       5
   RX=  3.79305E-04      22
   RY=  4.26937E-05       1
   RZ= -3.27373E-04       9



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


110. PRINT MEMBER INFORMATION LIST 1 TO 6 8 TO 13 15 TO 17
```

MEMBER INFORMATION

MEMBER	START JOINT	END JOINT	LENGTH (FEET)	BETA (DEG)	RELEASES
1	1	2	3.500	0.00	
2	2	3	7.000	0.00	
3	3	4	7.000	0.00	
4	4	5	7.000	0.00	
5	5	6	7.000	0.00	
6	6	8	7.000	0.00	
8	8	9	3.500	0.00	
9	2	10	70.545	0.00	
10	19	11	70.545	0.00	
11	4	12	70.000	0.00	
12	5	13	70.000	0.00	
13	21	14	70.545	0.00	
15	8	16	70.545	0.00	
16	22	17	70.545	0.00	
17	20	18	70.545	0.00	

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

111. PRINT MEMBER PROPERTIES LIST 1 TO 6 8 TO 13 15 TO 17

MEMBER PROPERTIES. UNIT - INCH

MEMB	PROFILE	AX/ AY	IZ/ AZ	IY/ SZ	IX/ SY
1	PRISMATIC	1080.00	81000.00	116640.00	160735.94
		918.00	918.00	5400.00	6480.00
2	PRISMATIC	1080.00	81000.00	116640.00	160735.94
		918.00	918.00	5400.00	6480.00
3	PRISMATIC	1080.00	81000.00	116640.00	160735.94
		918.00	918.00	5400.00	6480.00
4	PRISMATIC	1080.00	81000.00	116640.00	160735.94
		918.00	918.00	5400.00	6480.00
5	PRISMATIC	1080.00	81000.00	116640.00	160735.94
		918.00	918.00	5400.00	6480.00
6	PRISMATIC	1080.00	81000.00	116640.00	160735.94
		918.00	918.00	5400.00	6480.00
8	PRISMATIC	1080.00	81000.00	116640.00	160735.94
		918.00	918.00	5400.00	6480.00
9	PRISMATIC	378.14	14444.70	14444.70	25608.96
		0.00	0.00	2891.83	2891.83
10	PRISMATIC	378.14	14444.70	14444.70	25608.96
		0.00	0.00	2891.83	2891.83
11	PRISMATIC	378.14	14444.70	14444.70	25608.96
		0.00	0.00	2891.83	2891.83
12	PRISMATIC	378.14	14444.70	14444.70	25608.96
		0.00	0.00	2891.83	2891.83
13	PRISMATIC	378.14	14444.70	14444.70	25608.96
		0.00	0.00	2891.83	2891.83
15	PRISMATIC	378.14	14444.70	14444.70	25608.96
		0.00	0.00	2891.83	2891.83
16	PRISMATIC	378.14	14444.70	14444.70	25608.96
		0.00	0.00	2891.83	2891.83
17	PRISMATIC	378.14	14444.70	14444.70	25608.96
		0.00	0.00	2891.83	2891.83

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

112. PRINT MATERIAL PROPERTIES LIST 1 TO 6 8 TO 13 15 TO 17

MATERIAL PROPERTIES.

ALL UNITS ARE - KIP FEET

MEMBER	E	G	DEN	ALPHA
1	453600.0	193846.1	0.14999001	0.00000550
2	453600.0	193846.1	0.14999001	0.00000550
3	453600.0	193846.1	0.14999001	0.00000550
4	453600.0	193846.1	0.14999001	0.00000550
5	453600.0	193846.1	0.14999001	0.00000550
6	453600.0	193846.1	0.14999001	0.00000550
8	453600.0	193846.1	0.14999001	0.00000550
9	453600.0	193846.1	0.14999001	0.00000550
10	453600.0	193846.1	0.14999001	0.00000550
11	453600.0	193846.1	0.14999001	0.00000550
12	453600.0	193846.1	0.14999001	0.00000550
13	453600.0	193846.1	0.14999001	0.00000550
15	453600.0	193846.1	0.14999001	0.00000550
16	453600.0	193846.1	0.14999001	0.00000550
17	453600.0	193846.1	0.14999001	0.00000550

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

113. PRINT SUPPORT INFORMATION

SUPPORT INFORMATION (1=FIXED, 0=RELEASED)

UNITS FOR SPRING CONSTANTS ARE KIP FEET DEGREES

JOINT	FORCE-X/ KFX	FORCE-Y/ KFY	FORCE-Z/ KFZ	MOM-X/ KMX	MOM-Y/ KMY	MOM-Z/ KMZ
10	1	1	1	1	1	1
	0.0000E+00	0.0000E+00	0.0000E+00	0.000E+00	0.000E+00	0.000E+00
11	1	1	1	1	1	1
	0.0000E+00	0.0000E+00	0.0000E+00	0.000E+00	0.000E+00	0.000E+00
12	1	1	1	1	1	1
	0.0000E+00	0.0000E+00	0.0000E+00	0.000E+00	0.000E+00	0.000E+00
13	1	1	1	1	1	1
	0.0000E+00	0.0000E+00	0.0000E+00	0.000E+00	0.000E+00	0.000E+00
14	1	1	1	1	1	1
	0.0000E+00	0.0000E+00	0.0000E+00	0.000E+00	0.000E+00	0.000E+00
16	1	1	1	1	1	1
	0.0000E+00	0.0000E+00	0.0000E+00	0.000E+00	0.000E+00	0.000E+00

```
 17       1          1          1          1          1          1
     0.0000E+00 0.0000E+00 0.0000E+00 0.000E+00 0.000E+00 0.000E+00
 18       1          1          1          1          1          1
     0.0000E+00 0.0000E+00 0.0000E+00 0.000E+00 0.000E+00 0.000E+00


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


114. LOAD LIST 8 10 11
115. PRINT SUPPORT REACTION LIST 10 TO 14 16 TO 18
```

SUPPORT REACTIONS -UNIT KIP FEET STRUCTURE TYPE = SPACE

JOINT	LOAD	FORCE-X	FORCE-Y	FORCE-Z	MOM-X	MOM-Y	MOM Z
10	8	10.12	94.61	0.00	0.00	0.00	19.58
	10	17.00	135.28	0.53	15.59	-2.55	-37.34
	11	15.27	127.98	1.09	31.81	-5.21	-11.48
11	8	0.03	107.31	-11.67	20.53	-0.12	-0.71
	10	1.58	10.74	0.99	37.40	-7.08	-51.56
	11	0.87	9.53	1.75	55.24	-4.31	-28.28
12	8	0.03	130.67	0.00	0.00	0.00	-0.81
	10	1.35	106.79	0.56	16.52	-0.14	-46.55
	11	0.76	130.75	1.15	33.72	-0.29	-25.93
13	8	-0.03	130.67	0.00	0.00	0.00	0.81
	10	1.29	106.02	0.56	16.52	0.14	-45.27
	11	0.69	130.39	1.15	33.72	0.29	-24.31
14	8	-0.03	107.31	-11.67	20.53	0.12	0.71
	10	1.55	90.35	-8.96	37.62	-6.38	-50.94
	11	0.84	53.12	-3.69	55.37	-3.03	-27.68
16	8	-10.12	94.61	0.00	0.00	0.00	-19.58
	10	1.73	14.25	0.53	15.59	2.55	-76.75
	11	-5.00	61.53	1.09	31.81	5.21	-50.81
17	8	-0.03	107.31	11.67	-20.53	-0.12	0.71
	10	1.54	164.79	19.44	-3.54	6.89	-50.62
	11	0.82	205.05	25.09	14.19	4.08	-27.01
18	8	0.03	107.31	11.67	-20.53	0.12	-0.71
	10	1.59	85.18	9.50	-3.32	6.56	-51.88
	11	0.89	161.46	19.64	14.32	3.26	-28.94

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

```
116. LOAD LIST 13 15 16
117. SECTION 0 0.119 0.5 0.881 1 MEMB 1 TO 6 8
118. PRINT MEMBER SECTION FORCES LIST 1 TO 6 8
```

MEMBER FORCES AT INTERMEDIATE SECTIONS

ALL UNITS ARE -- KIP FEET

MEMB	LOAD	SEC	SHEAR-Y	SHEAR-Z	MOM-Y	MOM-Z
1	13	0.12	-0.61	0.00	0.00	0.13
		0.50	-36.69	0.00	0.00	9.35
		0.88	-38.64	0.00	0.00	59.58
	15	0.12	-0.61	0.00	0.00	0.13
		0.50	-17.38	0.00	0.00	5.33
		0.88	-19.33	0.00	0.00	29.80
	16	0.12	-0.61	0.00	0.00	0.13
		0.50	-28.95	0.00	0.00	7.74
		0.88	-30.90	0.00	0.00	47.64
2	13	0.12	67.33	0.00	0.00	48.63
		0.50	29.29	0.00	0.00	-56.04
		0.88	-196.09	0.00	0.00	18.77
	15	0.12	118.58	0.69	3.34	56.66
		0.50	99.86	0.69	5.19	-224.14
		0.88	-35.60	-6.83	2.02	-397.53
	16	0.12	99.48	1.42	6.81	55.24
		0.50	69.19	1.42	10.59	-150.98
		0.88	-120.23	-13.94	4.13	-206.56
3	13	0.12	56.38	0.00	0.00	140.24
		0.50	52.48	0.00	0.00	-4.91
		0.88	48.45	0.00	0.00	-139.56
	15	0.12	8.96	6.80	1.19	-221.44
		0.50	5.06	6.80	19.32	-240.14
		0.88	1.04	6.80	37.45	-248.34
	16	0.12	33.81	13.87	2.44	-47.87
		0.50	29.91	13.87	39.43	-132.85
		0.88	25.89	13.87	76.43	-207.32
4	13	0.12	4.10	0.00	0.00	-74.79
		0.50	0.00	0.00	0.00	-80.26
		0.88	-4.10	0.00	0.00	-74.79
	15	0.12	-20.22	0.00	39.16	-109.57
		0.50	-24.32	0.00	39.16	-50.17
		0.88	-28.43	0.00	39.16	20.17
	16	0.12	-9.15	0.00	79.93	-98.13
		0.50	-13.25	0.00	79.93	-68.26
		0.88	-17.35	0.00	79.93	-27.45
5	13	0.12	-48.45	0.00	0.00	-139.56
		0.50	-52.48	0.00	0.00	-4.91
		0.88	-56.38	0.00	0.00	140.24
	15	0.12	-50.69	-6.80	37.45	83.85
		0.50	-54.72	-6.80	19.32	224.47
		0.88	-58.62	-6.80	1.19	375.60
	16	0.12	-52.85	-13.87	76.43	-26.11

MEMBER FORCES AT INTERMEDIATE SECTIONS

ALL UNITS ARE -- KIP FEET

MEMB	LOAD	SEC	SHEAR-Y	SHEAR-Z	MOM-Y	MOM-Z
		0.50	-56.88	-13.87	39.43	120.27
		0.88	-60.78	-13.87	2.44	277.15
6	13	0.12	196.09	0.00	0.00	18.77
		0.50	-29.29	0.00	0.00	-56.04
		0.88	-67.33	0.00	0.00	48.62
	15	0.12	192.93	6.83	2.02	399.46
		0.50	57.47	-0.69	5.19	153.22
		0.88	38.75	-0.69	3.34	14.41
	16	0.12	206.61	13.94	4.13	230.03
		0.50	17.19	-1.42	10.59	55.24
		0.88	-13.10	-1.42	6.81	31.09
8	13	0.12	38.64	0.00	0.00	59.58
		0.50	36.69	0.00	0.00	9.35
		0.88	0.61	0.00	0.00	0.13
	15	0.12	19.33	0.00	0.00	29.80
		0.50	17.38	0.00	0.00	5.33
		0.88	0.61	0.00	0.00	0.13
	16	0.12	30.90	0.00	0.00	47.64
		0.50	28.95	0.00	0.00	7.74
		0.88	0.61	0.00	0.00	0.13

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

119. PRINT MAXFORCE ENVELOPE NSECTION 5 LIST 1 TO 6 8

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
1	MAX	0.00	0.00	16	75.80	3.50	13			
		0.00	0.00	15	0.00	3.50	16	0.00	0.00	13
	MIN	-39.25	3.50	13	0.00	0.00	13			
		0.00	3.50	13	0.00	0.00	16	0.00	3.50	16
2	MAX	119.80	0.00	15	182.62	7.00	13			
		1.42	0.00	16	12.03	5.60	16	22.10 C	0.00	15
	MIN	-197.31	7.00	13	-417.47	5.60	15			
		-13.94	7.00	16	-7.49	7.00	16	14.26 C	7.00	15
3	MAX	57.59	0.00	13	187.71	0.00	13			
		13.87	0.00	16	80.30	7.00	16	18.38 C	0.00	15
	MIN	-164.44	7.00	13	-247.51	5.60	15			
		-1.49	7.00	16	-9.12	0.00	16	10.55 C	7.00	15
4	MAX	5.38	0.00	13	44.39	7.00	15			
		0.00	0.00	13	79.93	0.00	16	15.96 C	0.00	13
	MIN	-29.71	7.00	15	-125.87	0.00	15			
		0.00	7.00	16	0.00	7.00	13	12.30 C	7.00	15
5	MAX	164.44	0.00	13	424.94	7.00	15			
		1.49	0.00	16	80.30	0.00	16	15.90 C	0.00	13
	MIN	-61.99	7.00	16	-111.84	1.40	13			
		-13.87	7.00	16	-9.12	7.00	16	6.13 C	7.00	15
6	MAX	207.83	0.00	16	560.68	0.00	15			
		13.94	0.00	16	12.03	1.40	16	15.80 C	0.00	13
	MIN	-68.54	7.00	13	-92.18	1.40	13			
		-1.42	7.00	16	-7.49	0.00	16	0.37 T	7.00	15
8	MAX	39.25	0.00	13	75.80	0.00	13			
		0.00	0.00	16	0.00	0.00	13	0.55 C	0.00	15
	MIN	0.00	3.50	13	0.00	3.50	13			
		0.00	3.50	15	0.00	0.00	16	0.00 C	3.50	13

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

120. FINISH

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

**** DATE= AUG 29,2006 TIME= 9: 2:27 ****

Information about the key files in the current distribution

Modfication Date	CRC	Size (Bytes)	File Name
02/27/2006	0x8140	12701696	SProStaad.exe
12/16/2004	0xca81	04558848	SProStaadStl.exe
09/19/2003	0x2fc0	00081970	CMesh.dll
02/06/2006	0x5601	02486272	dbsectioninterface.dll
01/23/2001	0x9b40	00073728	LoadGen.dll
09/25/2003	0x6340	00704512	MeshEngine.dll
09/22/2003	0xce00	00069632	QuadPlateEngine.dll
12/22/2005	0x4181	00094208	SurfMesh.dll
09/30/2005	0x2dc1	00475136	aiscsections.mdb
01/05/2005	0x79c1	00319488	aiscsections_all_editions.mdb
01/05/2005	0x4b81	01810432	aiscsteeljoists.mdb
01/05/2005	0xcac1	03651584	aitctimbersections.mdb
01/27/2005	0xeb01	00552960	aluminumsections.mdb
01/05/2005	0xcd01	00163840	australiansections.mdb
01/05/2005	0x6a41	00229376	britishsections.mdb
07/08/2005	0x9d41	00434176	bscoldformedsections.mdb
06/28/2005	0x8201	00327680	butlercoldformedsections.mdb
01/05/2005	0xabc0	00262144	canadiansections.mdb
05/31/2005	0x9e81	00450560	canadiantimbersections.mdb
05/05/2005	0x7f80	00409600	chinesesections.mdb
01/05/2005	0xd6c0	00600064	dutchsections.mdb
01/05/2005	0x1a00	00354304	europeansections.mdb
01/05/2005	0xd301	00202752	frenchsections.mdb
01/05/2005	0x11c1	00233472	germansections.mdb
01/05/2005	0x3c40	00264192	indiansections.mdb
01/05/2005	0xd540	00180224	iscoldformedsections.mdb
01/24/2006	0x2501	00221184	japanesesections.mdb
11/08/2005	0x9081	00376832	Kingspancoldformedsections.mdb
01/05/2005	0xb740	00174080	koreansections.mdb
02/03/2005	0xda00	00096256	lysaghtcoldformedsections.mdb
02/07/2005	0x9a00	00243712	mexicansteeltables.mdb
01/04/2006	0x8980	00413696	RCecoColdFormedSections.mdb
02/03/2005	0x9b40	00307200	russiansections.mdb
01/05/2005	0x9081	00206848	southafricansections.mdb
01/06/2005	0x9341	00194560	spanishsections.mdb
01/04/2006	0x8680	00223232	uscoldformedsections.mdb
01/05/2005	0xbac0	00149504	usersectionstemplate.mdb
01/05/2005	0x9d41	00141312	venezuelansections.mdb

REINFORCED BEAM CAP

Reinforing Yield Strength	$Fy := 40000psi$
Concrete Compresion Strength	$Fc := 4990psi$
Width of Beam	$bf := 3ft$
Depth of Reinforcemnt	$dt := 2.25ft$ Top Reinforcement $db := 2.1667ft$ Bottom Reinforcement
Positive Reinforcement Area	$Asp := 6.24in^2$ $\rho w := \frac{Asp}{bf \cdot db}$ Reinforcement Ratio
Negative Reinforcement Area	$Asn := 6.35in^2$
Factored Shear at Section	$Vu := 206.61k$
Factored Moment at Section	$Mu := 230.03k \cdot ft$

Positive Moment Capacity: Compression Steel neglected $\phi f := 0.9$

Tension in Reinforcemnt $Tp := Asp \cdot Fy$

Depth of Compression Block $ap := \frac{Tp}{0.85 \cdot Fc \cdot bf}$

$\phi Mnp := \phi f Tp \cdot \left(db - \frac{ap}{2} \right)$ $\phi Mnp = 471\ ft\,k$

Negative Moment Capacity: Compression Steel neglected

Tension in Reinforcemnt $Tn := Asn \cdot Fy$

Depth of Compression Block $an := \frac{Tn}{0.85 \cdot Fc \cdot bf}$

$\phi Mnn := \phi f Tn \cdot \left(dt - \frac{an}{2} \right)$ $\phi Mnn = 499\ ft\,k$

Shear Capacity Stirrup Spacing $S := 13in$ Stirrup Area $Av := 0.4in^2$ $bw := 5.3333ft$

$Vc1 := 2 \cdot psi \sqrt{\frac{Fc}{psi}} \cdot bw \cdot db$ $Vc1 = 235\,k$

$Vc2 := \left(1.9 \cdot \sqrt{\frac{Fc}{psi}} + 2500 \cdot \rho w \frac{Vu \cdot db}{Mu} \right) \cdot bw \cdot db \cdot psi$ $Vc2 = 277\,k$

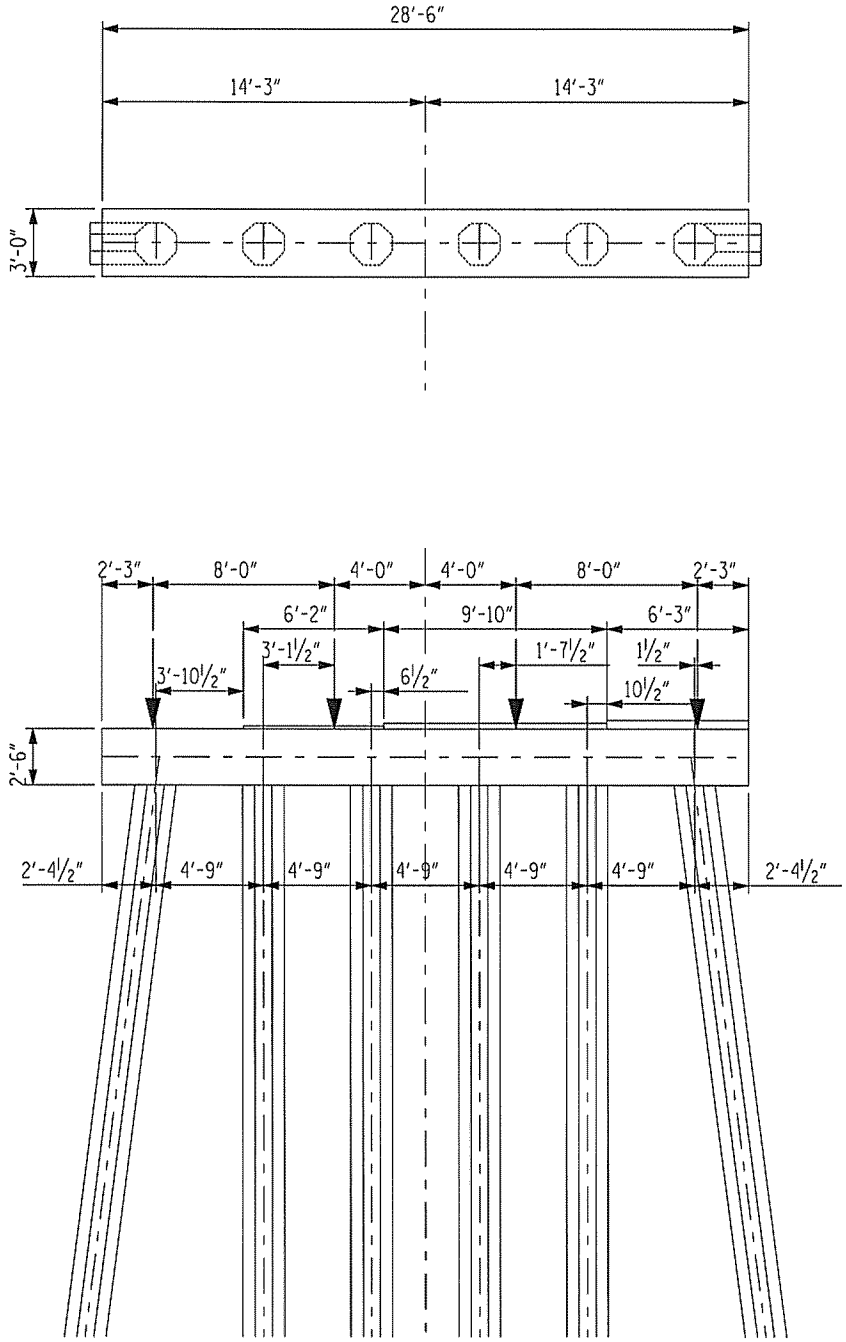
$Vc3 := 3.5 \cdot psi \sqrt{\frac{Fc}{psi}} \cdot bw \cdot db$ $Vc3 = 411\,k$

$Vc4 := if(Vc1 < Vc2, Vc2, Vc$ $Vc := if(Vc4 < Vc3, Vc4, Vc3)$ $Vc = 277\,k$

$Vs := \frac{Av \cdot Fy \cdot db}{S}$ $\phi s := 0.85$ $Vs = 32\,k$

$\phi Vn := \phi s \cdot (Vc + Vs)$ $\phi Vn = 263\,k$

Q:\inspect\BonnerBridge\CrutchBents\Type 2 SectionCapacity.xmcd



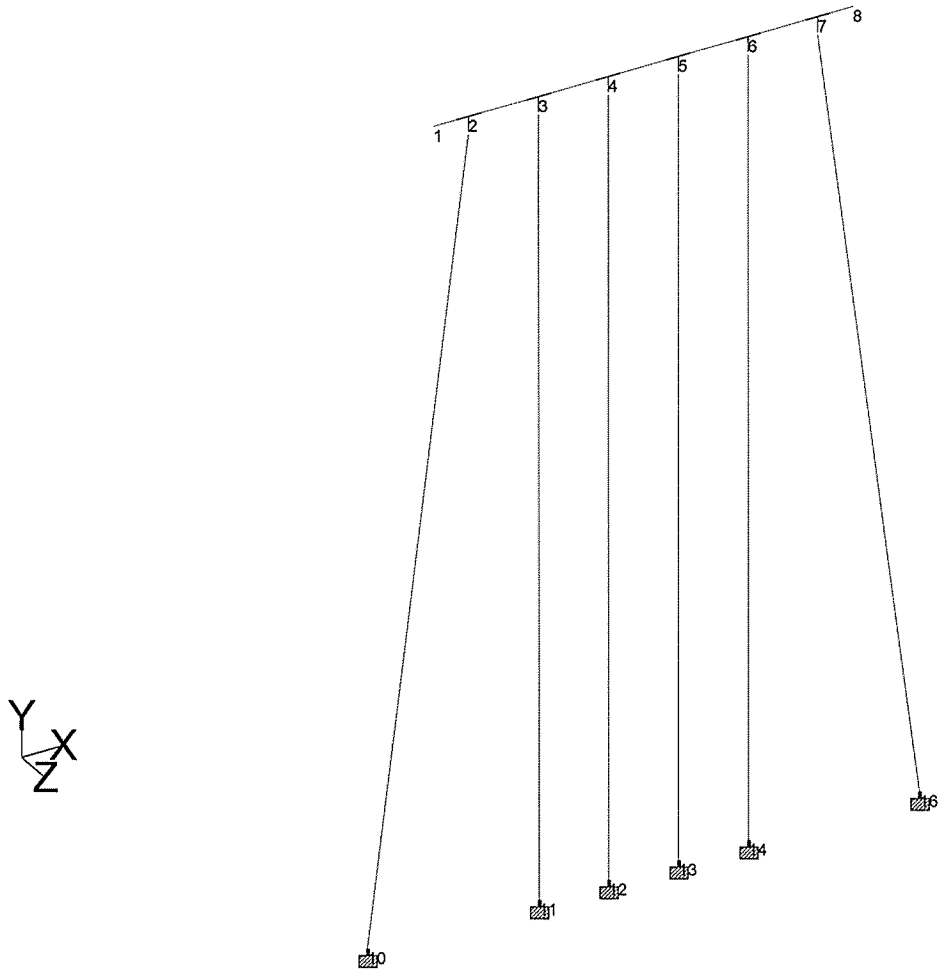
ELEVATION TYPE 3

BENTS 21, 22, 23, 25, 26, 27, 29, 30, 31, 33, 34, 35, 37, 38, 39, 41, 42, 43, 45, 46, 47, 49, 50, 51, 53, 54, 55, 57, 58, 59, 61, 62, 63, 65, 66, 67, 69, 70, 71, 73, 74, 75, 77, 78, 79, 81, 82, 83, 85, 86, 87, 89, 90, 91, 93, 94, 95, 97, 98, 99, 101, 102, 109, 110, 111, 113, 114, 115, 117, 118, 119, 121, 122, 123

NBIS REPORT BENT TYPE A

Software licensed to Ko and Associates	Job No	Sheet No 1	Rev
	Part		
Job Title	Ref		
	By MJM	Date 24-May-06	Chd
Client	File Type 3.std	Date/Time 27-Jul-2006 14:02	

√ AKO 8/22



Load 1

```
*****************************************************
*                                                   *
*           STAAD.Pro                               *
*           Version  2005    Bld 1003.US            *
*           Proprietary Program of                  *
*           Research Engineers,  Intl.              *
*           Date=    AUG 28, 2006                   *
*           Time=     9:44:28                       *
*                                                   *
*      USER ID: Ko and Associates                   *
*****************************************************
```

MJM 8/22

✓ AKO 8/29

```
    1. STAAD SPACE
INPUT FILE: Type 3.STD
    2. START JOB INFORMATION
    3. ENGINEER DATE 24-MAY-06
    4. END JOB INFORMATION
    5. INPUT WIDTH 79
    6. UNIT FEET KIP
    7. JOINT COORDINATES
    8. 1 0 0 0; 2 2.375 0 0; 3 7.125 0 0; 4 11.875 0 0; 5 16.625 0 0; 6 21.375 0 0
    9. 7 26.125 0 0; 8 28.5 0 0; 10 -4.5 -55 0; 11 7.125 -55 0; 12 11.875 -55 0
   10. 13 16.625 -55 0; 14 21.375 -55 0; 16 33 -55 0
   11. MEMBER INCIDENCES
   12. 1 1 2; 2 2 3; 3 3 4; 4 4 5; 5 5 6; 6 6 7; 7 7 8; 9 2 10; 10 3 11; 11 4 12
   13. 12 5 13; 13 6 14; 15 7 16
   14. UNIT INCHES KIP
   15. MEMBER PROPERTY AMERICAN
   16. 1 TO 7 PRIS YD 30 ZD 36
   17. UNIT FEET KIP
   18. MEMBER PROPERTY AMERICAN
   19. 9 TO 13 15 PRIS AX 2.626 IX 1.235 IY 0.6966 IZ 0.6966
   20. DEFINE MATERIAL START
   21. ISOTROPIC CONCRETE
   22. E 453600
   23. POISSON 0.17
   24. DENSITY 0.14999
   25. ALPHA 5.5E-006
   26. DAMP 0.05
   27. END DEFINE MATERIAL
   28. CONSTANTS
   29. MATERIAL CONCRETE MEMB 1 TO 7 9 TO 13 15
   30. SUPPORTS
   31. 10 TO 14 16 FIXED
   32. UNIT INCHES KIP
   33. LOAD 1 LOADTYPE NONE  TITLE LIVE LOAD
   34. MEMBER LOAD
   35. UNIT FEET KIP
   36. 1 CON GY -32.7 2.25
   37. 3 CON GY -32.7 3.125
   38. 5 CON GY -32.7 1.625
   39. 7 CON GY -32.7 0.125
   40. UNIT INCHES KIP
```

```
41. LOAD 2 LOADTYPE NONE  TITLE DEAD LOAD
42. MEMBER LOAD
43. UNIT FEET KIP
44. 1 CON GY -101.2 2.25
45. 3 CON GY -93.6 3.125
46. 5 CON GY -93.6 1.625
47. 7 CON GY -101.2 0.125
48. MEMBER LOAD
49. 2 UNI GY -0.081 3.875 4.75
50. 4 UNI GY -0.1665 0.5417 4.75
51. 6 UNI GY -0.2475 0.875 4.75
52. 7 UNI GY -0.2475 0 2.375
53. 5 UNI GY -0.1665 0 4.75
54. 6 UNI GY -0.1665 0 0.875
55. 3 UNI GY -0.081 0 4.75
56. 4 UNI GY -0.081 0 0.5417
57. LOAD 4 LOADTYPE NONE  TITLE CENTRIFUGAL FORCE
58. MEMBER LOAD
59. 1 CON GX -1.32 2.25
60. 3 CON GX -1.32 3.125
61. 5 CON GX -1.32 1.625
62. 7 CON GX -1.32 0.125
63. LOAD 5 LOADTYPE NONE  TITLE WIND ON STRUCTURE
64. MEMBER LOAD
65. 1 CON GX -6.03 2.25
66. 3 CON GX -6.03 3.125
67. 5 CON GX -6.03 1.625
68. 7 CON GX -6.03 0.125
69. JOINT LOAD
70. 8 FX -0.42
71. MEMBER LOAD
72. 15 UNI GX -0.103 0 10
73. LOAD 6 LOADTYPE NONE  TITLE WIND ON LIVE LOAD
74. MEMBER LOAD
75. 1 CON GX -1.76 2.25
76. 3 CON GX -1.76 3.125
77. 5 CON GX -1.76 1.625
78. 7 CON GX -1.76 0.125
79. LOAD COMB 8 SERVICE GROUP I
80. 2 1.0 1 1.0 4 1.0
81. LOAD COMB 10 SERVICE GROUP II
82. 2 1.0 5 1.0
83. LOAD COMB 11 SERVICE GROUP III
84. 2 1.0 1 1.0 4 1.0 5 0.3 6 1.0
85. LOAD COMB 13 FACTORED GROUP I
86. 2 1.3 1 2.75 4 1.3
87. LOAD COMB 15 FACTORED GROUP II
88. 2 1.3 5 1.3
89. LOAD COMB 16 FACTORED GROUP III
90. 2 1.3 1 1.65 4 1.3 5 0.39 6 1.3
91. PERFORM ANALYSIS PRINT STATICS CHECK
```

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

NUMBER OF JOINTS/MEMBER+ELEMENTS/SUPPORTS = 14/ 13/ 6
ORIGINAL/FINAL BAND-WIDTH= 7/ 2/ 12 DOF
TOTAL PRIMARY LOAD CASES = 5, TOTAL DEGREES OF FREEDOM = 48
SIZE OF STIFFNESS MATRIX = 1 DOUBLE KILO-WORDS
REQRD/AVAIL. DISK SPACE = 12.0/ 24801.5 MB

STATIC LOAD/REACTION/EQUILIBRIUM SUMMARY FOR CASE NO. 1
LOADTYPE NONE TITLE LIVE LOAD

***TOTAL APPLIED LOAD (KIP FEET) SUMMARY (LOADING 1)
SUMMATION FORCE-X = 0.00
SUMMATION FORCE-Y = -130.80
SUMMATION FORCE-Z = 0.00

SUMMATION OF MOMENTS AROUND THE ORIGIN-
MX= 0.00 MY= 0.00 MZ= -1863.90

***TOTAL REACTION LOAD(KIP FEET) SUMMARY (LOADING 1)
SUMMATION FORCE-X = 0.00
SUMMATION FORCE-Y = 130.80
SUMMATION FORCE-Z = 0.00

SUMMATION OF MOMENTS AROUND THE ORIGIN-
MX= 0.00 MY= 0.00 MZ= 1863.90

MAXIMUM DISPLACEMENTS (INCH /RADIANS) (LOADING 1)

	MAXIMUMS	AT NODE
X =	1.36668E-04	1
Y =	-1.73948E-02	8
Z =	0.00000E+00	0
RX=	0.00000E+00	0
RY=	0.00000E+00	0
RZ=	-7.93118E-05	8

STATIC LOAD/REACTION/EQUILIBRIUM SUMMARY FOR CASE NO. 2
LOADTYPE NONE TITLE DEAD LOAD

***TOTAL APPLIED LOAD (KIP FEET) SUMMARY (LOADING 2)
SUMMATION FORCE-X = 0.00
SUMMATION FORCE-Y = -393.28
SUMMATION FORCE-Z = 0.00

SUMMATION OF MOMENTS AROUND THE ORIGIN-
MX= 0.00 MY= 0.00 MZ= -5624.09

***TOTAL REACTION LOAD(KIP FEET) SUMMARY (LOADING 2)
SUMMATION FORCE-X = 0.00
SUMMATION FORCE-Y = 393.28
SUMMATION FORCE-Z = 0.00

SUMMATION OF MOMENTS AROUND THE ORIGIN-
MX= 0.00 MY= 0.00 MZ= 5624.09

MAXIMUM DISPLACEMENTS (INCH /RADIANS) (LOADING 2)

	MAXIMUMS	AT NODE
X =	-5.16797E-03	8
Y =	-5.55717E-02	8
Z =	0.00000E+00	0
RX=	0.00000E+00	0
RY=	0.00000E+00	0
RZ=	-2.75745E-04	8

STATIC LOAD/REACTION/EQUILIBRIUM SUMMARY FOR CASE NO. 4
LOADTYPE NONE TITLE CENTRIFUGAL FORCE

***TOTAL APPLIED LOAD (KIP FEET) SUMMARY (LOADING 4)
SUMMATION FORCE-X = -5.28
SUMMATION FORCE-Y = 0.00
SUMMATION FORCE-Z = 0.00

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

***TOTAL REACTION LOAD(KIP FEET) SUMMARY (LOADING 4)
SUMMATION FORCE-X = 5.28
SUMMATION FORCE-Y = 0.00
SUMMATION FORCE-Z = 0.00

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

MAXIMUM DISPLACEMENTS (INCH /RADIANS) (LOADING 4)

	MAXIMUMS	AT NODE
X =	-1.81633E-01	5
Y =	2.10320E-02	1
Z =	0.00000E+00	0
RX=	0.00000E+00	0
RY=	0.00000E+00	0
RZ=	-1.63419E-04	1

STATIC LOAD/REACTION/EQUILIBRIUM SUMMARY FOR CASE NO. 5
LOADTYPE NONE TITLE WIND ON STRUCTURE

***TOTAL APPLIED LOAD (KIP FEET) SUMMARY (LOADING 5)
SUMMATION FORCE-X = -25.57
SUMMATION FORCE-Y = 0.00
SUMMATION FORCE-Z = 0.00

SUMMATION OF MOMENTS AROUND THE ORIGIN-
MX= 0.00 MY= 0.00 MZ= -5.11

```
***TOTAL REACTION LOAD( KIP  FEET ) SUMMARY (LOADING     5 )
    SUMMATION FORCE-X =       25.57
    SUMMATION FORCE-Y =        0.00
    SUMMATION FORCE-Z =        0.00

   SUMMATION OF MOMENTS AROUND THE ORIGIN-
   MX=           0.00  MY=           0.00  MZ=           5.11


MAXIMUM DISPLACEMENTS ( INCH /RADIANS) (LOADING      5)
          MAXIMUMS    AT NODE
   X = -8.80026E-01       5
   Y = -1.02423E-01       8
   Z =  0.00000E+00       0
   RX=  0.00000E+00       0
   RY=  0.00000E+00       0
   RZ= -8.01669E-04       8


       STATIC LOAD/REACTION/EQUILIBRIUM SUMMARY FOR CASE NO.     6
       LOADTYPE NONE  TITLE WIND ON LIVE LOAD


***TOTAL APPLIED LOAD ( KIP  FEET ) SUMMARY (LOADING    6 )
    SUMMATION FORCE-X =       -7.04
    SUMMATION FORCE-Y =        0.00
    SUMMATION FORCE-Z =        0.00

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


***TOTAL REACTION LOAD( KIP  FEET ) SUMMARY (LOADING     6 )
    SUMMATION FORCE-X =        7.04
    SUMMATION FORCE-Y =        0.00
    SUMMATION FORCE-Z =        0.00

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


MAXIMUM DISPLACEMENTS ( INCH /RADIANS) (LOADING      6)
          MAXIMUMS    AT NODE
   X = -2.42177E-01       4
   Y = -2.80426E-02       8
   Z =  0.00000E+00       0
   RX=  0.00000E+00       0
   RY=  0.00000E+00       0
   RZ= -2.17892E-04       1



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


 92. PRINT MEMBER INFORMATION LIST 1 TO 7 9 TO 13 15
```

MEMBER INFORMATION

MEMBER	START JOINT	END JOINT	LENGTH (FEET)	BETA (DEG)	RELEASES
1	1	2	2.375	0.00	
2	2	3	4.750	0.00	
3	3	4	4.750	0.00	
4	4	5	4.750	0.00	
5	5	6	4.750	0.00	
6	6	7	4.750	0.00	
7	7	8	2.375	0.00	
9	2	10	55.428	0.00	
10	3	11	55.000	0.00	
11	4	12	55.000	0.00	
12	5	13	55.000	0.00	
13	6	14	55.000	0.00	
15	7	16	55.428	0.00	

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

93. PRINT MEMBER PROPERTIES LIST 1 TO 7 9 TO 13 15

MEMBER PROPERTIES. UNIT - INCH

MEMB	PROFILE	AX/ AY	IZ/ AZ	IY/ SZ	IX/ SY
1	PRISMATIC	1080.00	81000.00	116640.00	160735.94
		918.00	918.00	5400.00	6480.00
2	PRISMATIC	1080.00	81000.00	116640.00	160735.94
		918.00	918.00	5400.00	6480.00
3	PRISMATIC	1080.00	81000.00	116640.00	160735.94
		918.00	918.00	5400.00	6480.00
4	PRISMATIC	1080.00	81000.00	116640.00	160735.94
		918.00	918.00	5400.00	6480.00
5	PRISMATIC	1080.00	81000.00	116640.00	160735.94
		918.00	918.00	5400.00	6480.00
6	PRISMATIC	1080.00	81000.00	116640.00	160735.94
		918.00	918.00	5400.00	6480.00
7	PRISMATIC	1080.00	81000.00	116640.00	160735.94
		918.00	918.00	5400.00	6480.00
9	PRISMATIC	378.14	14444.70	14444.70	25608.96
		0.00	0.00	2891.83	2891.83
10	PRISMATIC	378.14	14444.70	14444.70	25608.96
		0.00	0.00	2891.83	2891.83
11	PRISMATIC	378.14	14444.70	14444.70	25608.96
		0.00	0.00	2891.83	2891.83
12	PRISMATIC	378.14	14444.70	14444.70	25608.96
		0.00	0.00	2891.83	2891.83
13	PRISMATIC	378.14	14444.70	14444.70	25608.96
		0.00	0.00	2891.83	2891.83
15	PRISMATIC	378.14	14444.70	14444.70	25608.96
		0.00	0.00	2891.83	2891.83

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

94. PRINT MATERIAL PROPERTIES LIST 1 TO 7 9 TO 13 15

MATERIAL PROPERTIES.

ALL UNITS ARE - KIP FEET

MEMBER	E	G	DEN	ALPHA
1	453600.0	193846.1	0.14999001	0.00000550
2	453600.0	193846.1	0.14999001	0.00000550
3	453600.0	193846.1	0.14999001	0.00000550
4	453600.0	193846.1	0.14999001	0.00000550
5	453600.0	193846.1	0.14999001	0.00000550
6	453600.0	193846.1	0.14999001	0.00000550
7	453600.0	193846.1	0.14999001	0.00000550
9	453600.0	193846.1	0.14999001	0.00000550
10	453600.0	193846.1	0.14999001	0.00000550
11	453600.0	193846.1	0.14999001	0.00000550
12	453600.0	193846.1	0.14999001	0.00000550
13	453600.0	193846.1	0.14999001	0.00000550
15	453600.0	193846.1	0.14999001	0.00000550

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

95. PRINT SUPPORT INFORMATION

SUPPORT INFORMATION (1=FIXED, 0=RELEASED)

UNITS FOR SPRING CONSTANTS ARE KIP FEET DEGREES

JOINT	FORCE-X/ KFX	FORCE-Y/ KFY	FORCE-Z/ KFZ	MOM-X/ KMX	MOM-Y/ KMY	MOM-Z/ KMZ
10	1	1	1	1	1	1
	0.0000E+00	0.0000E+00	0.0000E+00	0.000E+00	0.000E+00	0.000E+00
11	1	1	1	1	1	1
	0.0000E+00	0.0000E+00	0.0000E+00	0.000E+00	0.000E+00	0.000E+00
12	1	1	1	1	1	1
	0.0000E+00	0.0000E+00	0.0000E+00	0.000E+00	0.000E+00	0.000E+00
13	1	1	1	1	1	1
	0.0000E+00	0.0000E+00	0.0000E+00	0.000E+00	0.000E+00	0.000E+00
14	1	1	1	1	1	1
	0.0000E+00	0.0000E+00	0.0000E+00	0.000E+00	0.000E+00	0.000E+00
16	1	1	1	1	1	1
	0.0000E+00	0.0000E+00	0.0000E+00	0.000E+00	0.000E+00	0.000E+00

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

96. LOAD LIST 8 10 11
97. PRINT SUPPORT REACTION LIST 10 TO 14 16

SUPPORT REACTIONS -UNIT KIP FEET STRUCTURE TYPE = SPACE

JOINT	LOAD	FORCE-X	FORCE-Y	FORCE-Z	MOM-X	MOM-Y	MOM Z
10	8	15.24	120.13	0.00	0.00	0.00	-7.18
	10	19.00	136.19	0.00	0.00	0.00	-51.37
	11	20.34	151.08	0.00	0.00	0.00	-38.48
11	8	0.33	67.73	0.00	0.00	0.00	-9.36
	10	1.99	-0.38	0.00	0.00	0.00	-51.88
	11	1.52	33.07	0.00	0.00	0.00	-39.89
12	8	0.34	68.83	0.00	0.00	0.00	-9.49
	10	1.83	39.28	0.00	0.00	0.00	-48.99
	11	1.41	60.84	0.00	0.00	0.00	-37.95
13	8	0.45	74.92	0.00	0.00	0.00	-11.52
	10	1.92	67.25	0.00	0.00	0.00	-50.56
	11	1.52	82.82	0.00	0.00	0.00	-39.99
14	8	0.54	93.95	0.00	0.00	0.00	-13.17
	10	2.16	121.36	0.00	0.00	0.00	-54.92
	11	1.73	128.56	0.00	0.00	0.00	-43.71
16	8	-11.63	98.53	0.00	0.00	0.00	-15.94
	10	-1.33	29.59	0.00	0.00	0.00	-58.79
	11	-6.53	67.71	0.00	0.00	0.00	-47.45

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

```
 98. LOAD LIST 13 15 16
 99. SECTION 0 0.175 0.5 0.825 1 MEMB 1 TO 7
100. PRINT MEMBER SECTION FORCES LIST 1 TO 7
```

MEMBER FORCES AT INTERMEDIATE SECTIONS

ALL UNITS ARE -- KIP FEET

MEMB	LOAD	SEC	SHEAR-Y	SHEAR-Z	MOM-Y	MOM-Z
1	13	0.17	0.00	0.00	0.00	0.00
		0.50	0.00	0.00	0.00	0.00
		0.82	0.00	0.00	0.00	0.00
	15	0.17	0.00	0.00	0.00	0.00
		0.50	0.00	0.00	0.00	0.00
		0.82	0.00	0.00	0.00	0.00
	16	0.17	0.00	0.00	0.00	0.00
		0.50	0.00	0.00	0.00	0.00
		0.82	0.00	0.00	0.00	0.00
2	13	0.17	-26.67	0.00	0.00	53.79
		0.50	-26.67	0.00	0.00	94.95
		0.82	-26.67	0.00	0.00	136.11
	15	0.17	45.49	0.00	0.00	53.28
		0.50	45.49	0.00	0.00	-16.94
		0.82	45.48	0.00	0.00	-87.17
	16	0.17	20.22	0.00	0.00	59.87
		0.50	20.22	0.00	0.00	28.65
		0.82	20.21	0.00	0.00	-2.56
3	13	0.17	90.61	0.00	0.00	93.51
		0.50	90.45	0.00	0.00	-46.24
		0.82	-121.32	0.00	0.00	-17.78
	15	0.17	44.81	0.00	0.00	-87.38
		0.50	44.65	0.00	0.00	-156.43
		0.82	-77.19	0.00	0.00	-128.65
	16	0.17	70.13	0.00	0.00	-21.22
		0.50	69.96	0.00	0.00	-129.35
		0.82	-105.83	0.00	0.00	-97.83
4	13	0.17	-5.27	0.00	0.00	98.78
		0.50	-5.60	0.00	0.00	107.17
		0.82	-5.94	0.00	0.00	116.08
	15	0.17	-26.34	0.00	0.00	24.70
		0.50	-26.67	0.00	0.00	65.62
		0.82	-27.01	0.00	0.00	107.06
	16	0.17	-20.48	0.00	0.00	58.65
		0.50	-20.82	0.00	0.00	90.53
		0.82	-21.15	0.00	0.00	122.92
5	13	0.17	117.88	0.00	0.00	41.01
		0.50	-94.06	0.00	0.00	17.99
		0.82	-94.39	0.00	0.00	163.46
	15	0.17	60.06	0.00	0.00	150.96
		0.50	-61.96	0.00	0.00	149.76
		0.82	-62.29	0.00	0.00	245.67
	16	0.17	92.62	0.00	0.00	120.62

MEMBER FORCES AT INTERMEDIATE SECTIONS

ALL UNITS ARE -- KIP FEET

MEMB	LOAD	SEC	SHEAR-Y	SHEAR-Z	MOM-Y	MOM-Z
		0.50	-83.34	0.00	0.00	109.61
		0.82	-83.68	0.00	0.00	238.53
6	13	0.17	56.78	0.00	0.00	217.47
		0.50	56.29	0.00	0.00	130.20
		0.82	55.79	0.00	0.00	43.69
	15	0.17	95.11	0.00	0.00	301.09
		0.50	94.62	0.00	0.00	154.64
		0.82	94.12	0.00	0.00	8.95
	16	0.17	90.19	0.00	0.00	300.01
		0.50	89.70	0.00	0.00	161.16
		0.82	89.20	0.00	0.00	23.07
7	13	0.17	0.63	0.00	0.00	0.62
		0.50	0.38	0.00	0.00	0.23
		0.82	0.13	0.00	0.00	0.03
	15	0.17	0.63	0.00	0.00	0.62
		0.50	0.38	0.00	0.00	0.23
		0.82	0.13	0.00	0.00	0.03
	16	0.17	0.63	0.00	0.00	0.62
		0.50	0.38	0.00	0.00	0.23
		0.82	0.13	0.00	0.00	0.03

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

101. PRINT MAXFORCE ENVELOPE NSECTION 10 LIST 1 TO 7

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
1	MAX	0.00	0.00	13	27.69	2.38	13			
		0.00	0.00	13	0.00	0.00	13	0.00	0.00	15
	MIN	-221.49	2.38	13	0.00	0.00	15			
		0.00	2.38	16	0.00	2.38	16	7.84 T	2.38	15
2	MAX	45.49	0.00	15	158.32	4.75	13			
		0.00	0.00	13	0.00	0.00	13	22.85 C	0.00	13
	MIN	-26.76	4.75	13	-124.94	4.75	15			
		0.00	4.75	16	0.00	4.75	16	16.86 C	4.75	15
3	MAX	90.70	0.00	13	168.87	0.00	13			
		0.00	0.00	13	0.00	0.00	13	23.25 C	0.00	13
	MIN	-121.41	4.75	13	-177.63	2.85	15			
		0.00	4.75	16	0.00	4.75	16	11.61 C	4.75	15
4	MAX	-5.15	0.00	13	140.58	4.75	16			
		0.00	0.00	13	0.00	0.00	13	21.96 C	0.00	13
	MIN	-27.19	4.75	15	2.86	0.00	15			
		0.00	4.75	16	0.00	4.75	16	13.99 C	4.75	15
5	MAX	118.06	0.00	13	308.17	4.75	16			
		0.00	0.00	13	0.00	0.00	13	22.57 C	0.00	13
	MIN	-94.57	4.75	13	-28.95	1.42	13			
		0.00	4.75	16	0.00	4.75	16	8.65 C	4.75	15
6	MAX	95.29	0.00	15	380.23	0.00	15			
		0.00	0.00	13	0.00	0.00	13	21.59 C	0.00	13
	MIN	55.52	4.75	13	-69.18	4.75	15			
		0.00	4.75	16	0.00	4.75	16	11.45 C	4.75	15
7	MAX	222.25	0.00	13	28.59	0.00	13			
		0.00	0.00	13	0.00	0.00	13	8.39 C	0.00	15
	MIN	0.00	2.38	16	0.00	2.38	13			
		0.00	2.38	16	0.00	2.38	16	0.00	2.38	13

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

102. FINISH

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

**** DATE= AUG 28,2006 TIME= 9:44:29 ****


```
************************************************************
*         For questions on STAAD.Pro, please contact       *
*   Research Engineers Offices at the following locations  *
*                                                          *
*              Telephone              Email                *
*  USA:      +1 (714)974-2500       support@reiusa.com      *
*  CANADA    +1 (905)632-4771       detech@odandetech.com   *
*  CANADA    +1 (604)629 6087       staad@dowco.com         *
*  UK        +44(1454)207-000       support@reel.co.uk      *
*  FRANCE    +33(0)1 64551084       support@reel.co.uk      *
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*                                                          *
*  North America                   support@reiusa.com       *
*  Europe                          support@reel.co.uk       *
*  Asia                            support@reiasia.net      *
************************************************************
```

Information about the key files in the current distribution

Modfication Date	CRC	Size (Bytes)	File Name
02/27/2006	0x8140	12701696	SProStaad.exe
12/16/2004	0xca81	04558848	SProStaadStl.exe
09/19/2003	0x2fc0	00081970	CMesh.dll
02/06/2006	0x5601	02486272	dbsectioninterface.dll
01/23/2001	0x9b40	00073728	LoadGen.dll
09/25/2003	0x6340	00704512	MeshEngine.dll
09/22/2003	0xce00	00069632	QuadPlateEngine.dll
12/22/2005	0x4181	00094208	SurfMesh.dll
09/30/2005	0x2dc1	00475136	aiscsections.mdb
01/05/2005	0x79c1	00319488	aiscsections_all_editions.mdb
01/05/2005	0x4b81	01810432	aiscsteeljoists.mdb
01/05/2005	0xcac1	03651584	aitctimbersections.mdb
01/27/2005	0xeb01	00552960	aluminumsections.mdb
01/05/2005	0xcd01	00163840	australiansections.mdb
01/05/2005	0x6a41	00229376	britishsections.mdb
07/08/2005	0x9d41	00434176	bscoldformedsections.mdb
06/28/2005	0x8201	00327680	butlercoldformedsections.mdb
01/05/2005	0xabc0	00262144	canadiansections.mdb
05/31/2005	0x9e81	00450560	canadiantimbersections.mdb
05/05/2005	0x7f80	00409600	chinesesections.mdb
01/05/2005	0xd6c0	00600064	dutchsections.mdb
01/05/2005	0x1a00	00354304	europeansections.mdb
01/05/2005	0xd301	00202752	frenchsections.mdb
01/05/2005	0x11c1	00233472	germansections.mdb
01/05/2005	0x3c40	00264192	indiansections.mdb
01/05/2005	0xd540	00180224	iscoldformedsections.mdb
01/24/2006	0x2501	00221184	japanesesections.mdb
11/08/2005	0x9081	00376832	Kingspancoldformedsections.mdb
01/05/2005	0xb740	00174080	koreansections.mdb
02/03/2005	0xda00	00096256	lysaghtcoldformedsections.mdb
02/07/2005	0x9a00	00243712	mexicansteeltables.mdb
01/04/2006	0x8980	00413696	RCecoColdFormedSections.mdb
02/03/2005	0x9b40	00307200	russiansections.mdb
01/05/2005	0x9081	00206848	southafricansections.mdb
01/06/2005	0x9341	00194560	spanishsections.mdb
01/04/2006	0x8680	00223232	uscoldformedsections.mdb
01/05/2005	0xbac0	00149504	usersectionstemplate.mdb
01/05/2005	0x9d41	00141312	venezuelansections.mdb

REINFORCED BEAM CAP

Reinforing Yield Strength $Fy := 40000psi$

Concrete Compresion Strength $Fc := 5600psi$

Width of Beam $b := 3ft$

Depth of Reinforcemnt $dt := 2.25ft$ Top Reinforcement $db := 2.1667ft$ Bottom Reinforcement

Positive Reinforcement Area $Asp := 6.24in^2$

Negative Reinforcement Area $Asn := 6.35in^2$

$\rho w := \frac{Asp}{b \cdot db}$ Reinforcement Ratio

Factored Shear at Section $Vu := 121.32k$

Factored Moment at Section $Mu := 17.78k \cdot ft$

Positive Moment Capacity: Compression Steel neglected $\phi_f := 0.9$

Tension in Reinforcemnt $Tp := Asp \cdot Fy$

Depth of Compression Block $ap := \frac{Tp}{0.85 \cdot Fc \cdot b}$

$\phi Mnp := \phi_f Tp \cdot \left(db - \frac{ap}{2} \right)$ $\phi Mnp = 473\ ft\,k$

Negative Moment Capacity: Compression Steel neglected

Tension in Reinforcemnt $Tn := Asn \cdot Fy$

Depth of Compression Block $an := \frac{Tn}{0.85 \cdot Fc \cdot b}$

$\phi Mnn := \phi_f Tn \cdot \left(dt - \frac{an}{2} \right)$ $\phi Mnn = 500\ ft\,k$

Shear Capacity Stirrup Spacing $S := 10in$ Stirrup Area $Av := 0.4in^2$

$Vc1 := 2 \cdot psi \sqrt{\frac{Fc}{psi}} \cdot b \cdot db$ $Vc1 = 140\,k$

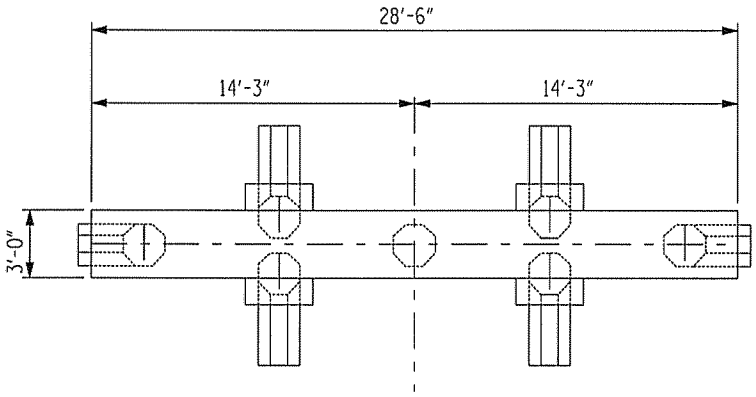
$Vc2 := \left(1.9 \cdot \sqrt{\frac{Fc}{psi}} + 2500 \cdot \rho w \frac{Vu \cdot db}{Mu} \right) \cdot b \cdot db \cdot psi$ $Vc2 = 364\,k$

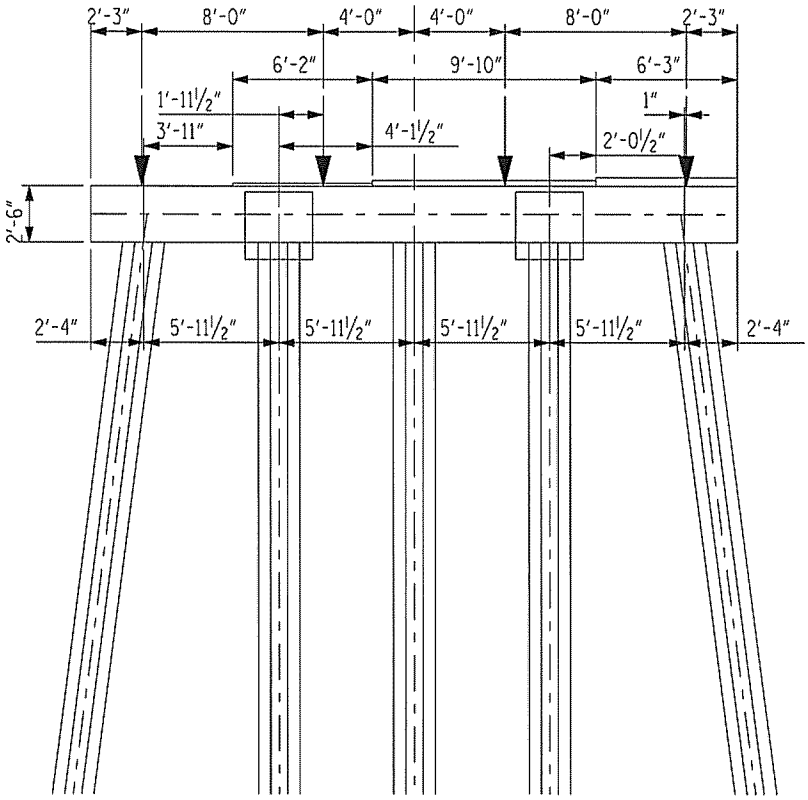
$Vc3 := 3.5 \cdot psi \sqrt{\frac{Fc}{psi}} \cdot b \cdot db$ $Vc3 = 245\,k$

$Vc4 := if(Vc1 < Vc2, Vc2, Vc\ Vc := if(Vc4 < Vc3, Vc4, Vc3)$ $Vc = 245\,k$

$Vs := \frac{Av \cdot Fy \cdot db}{S}$ $\phi_s := 0.85$ $Vs = 42\,k$

$\phi Vn := \phi_s \cdot (Vc + Vs)$ $\phi Vn = 244\,k$





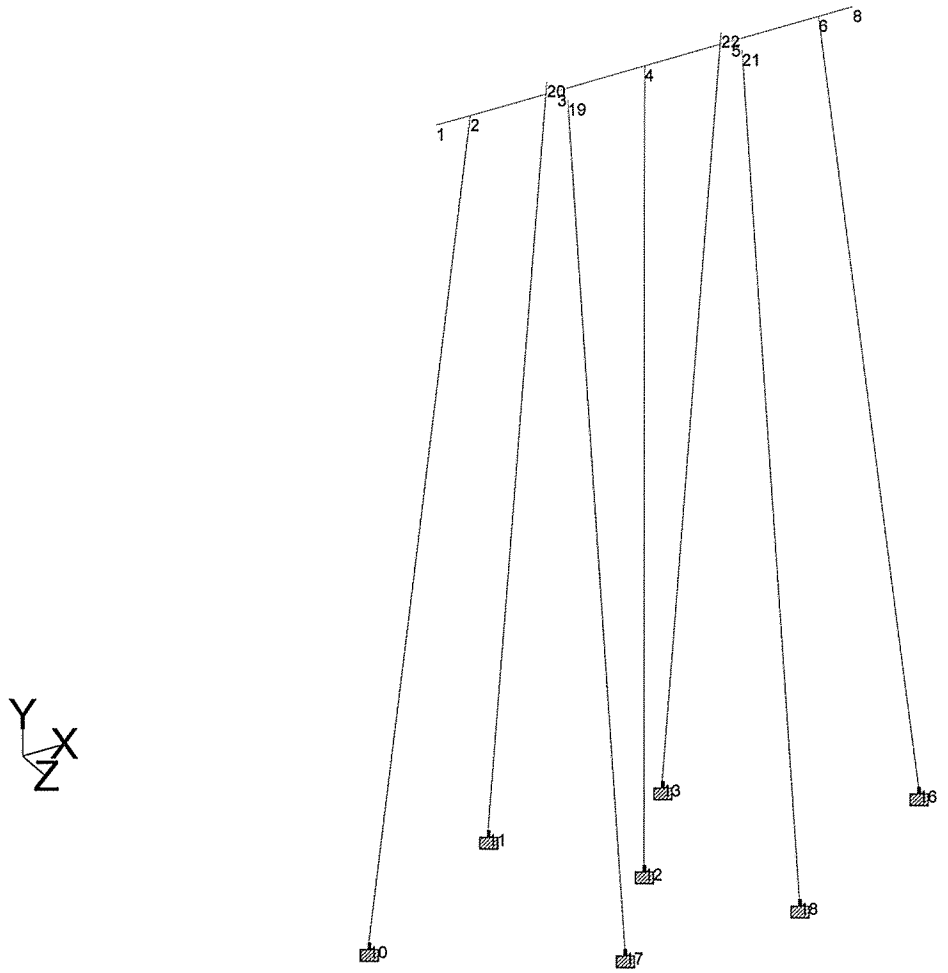
ELEVATION TYPE 4

BENTS 24, 28, 32, 36, 40, 44, 48, 52, 56, 60, 64, 68, 72, 76, 80, 84, 88, 92, 96, 100, 104, 108, 112, 116, 120

NBIS REPORT BENT TYPE C

Software licensed to Ko and Associates	Job No	Sheet No 1	Rev
	Part		
Job Title	Ref		
	By MJM	Date 24-May-06	Chd
Client	File Type 4.std	Date/Time 25-Aug-2006 10:51	

√ APLO 8/22



Load 1

```
*****************************************************
*                                                   *
*           STAAD.Pro                               *
*           Version  2005    Bld 1003.US            *
*           Proprietary Program of                  *
*           Research Engineers,  Intl.              *
*           Date=    AUG 28, 2006                   *
*           Time=     9:49:35                       *
*                                                   *
*      USER ID: Ko and Associates                   *
*****************************************************
```

MJM
✓ AKo
8/29

```
    1. STAAD SPACE
INPUT FILE: Type 4.STD
    2. START JOB INFORMATION
    3. ENGINEER DATE 24-MAY-06
    4. END JOB INFORMATION
    5. INPUT WIDTH 79
    6. UNIT FEET KIP
    7. JOINT COORDINATES
    8. 1 0 0 0; 2 2.3333 0 0; 3 8.292 0 0; 4 14.25 0 0; 5 20.2083 0 0; 6 26.1667 0 0
    9. 8 28.5 0 0; 10 -4.5417 -55 0; 11 8.292 -55 -8.125; 12 14.25 -55 0
   10. 13 20.208 -55 -8.125; 16 33.0417 -55 0; 17 8.292 -55 8.125
   11. 18 20.208 -55 8.125; 19 8.292 0 1.25; 20 8.292 0 -1.25; 21 20.208 0 1.25
   12. 22 20.208 0 -1.25
   13. MEMBER INCIDENCES
   14. 1 1 2; 2 2 3; 3 3 4; 4 4 5; 5 5 6; 6 6 8; 9 2 10; 10 20 11; 11 4 12; 12 22 13
   15. 13 6 16; 14 19 17; 15 21 18
   16. UNIT INCHES KIP
   17. MEMBER PROPERTY AMERICAN
   18. 1 TO 6 PRIS YD 30 ZD 36
   19. UNIT FEET KIP
   20. MEMBER PROPERTY AMERICAN
   21. 9 TO 15 PRIS AX 2.626 IX 1.235 IY 0.6966 IZ 0.6966
   22. DEFINE MATERIAL START
   23. ISOTROPIC CONCRETE
   24. E 453600
   25. POISSON 0.17
   26. DENSITY 0.14999
   27. ALPHA 5.5E-006
   28. DAMP 0.05
   29. END DEFINE MATERIAL
   30. CONSTANTS
   31. MATERIAL CONCRETE MEMB 1 TO 6 9 TO 15
   32. SUPPORTS
   33. 10 TO 13 16 TO 18 FIXED
   34. SLAVE RIGID MASTER 3 JOINT 19 20
   35. SLAVE RIGID MASTER 5 JOINT 21 22
   36. UNIT INCHES KIP
   37. LOAD 1 LOADTYPE NONE  TITLE LIVE LOAD
   38. MEMBER LOAD
   39. UNIT FEET KIP
   40. 1 CON GY -32.7 2.25
```

```
41. 3 CON GY -32.7 1.9583
42. 4 CON GY -32.7 4
43. 6 CON GY -32.7 0.08333
44. UNIT INCHES KIP
45. LOAD 2 LOADTYPE NONE  TITLE DEAD LOAD
46. MEMBER LOAD
47. UNIT FEET KIP
48. 1 CON GY -101.2 2.25
49. 3 CON GY -93.6 1.9583
50. 4 CON GY -93.6 4
51. 6 CON GY -101.2 0.08333
52. SELFWEIGHT Y -1
53. MEMBER LOAD
54. 2 UNI GY -0.0585 3.9167 5.9583
55. 3 UNI GY -0.1125 4.125 5.9583
56. 5 UNI GY -0.171 2.0417 5.9583
57. 6 UNI GY -0.171 0 2.3333
58. 3 UNI GY -0.0585 0 4.125
59. 4 UNI GY -0.1125 0 5.9583
60. 5 UNI GY -0.1125 0 2.0417
61. JOINT LOAD
62. 3 5 FY -4.2
63. LOAD 4 LOADTYPE NONE  TITLE CENTRIFUGAL FORCE
64. MEMBER LOAD
65. 1 CON GX -1.32 2.25
66. 3 CON GX -1.32 1.9583
67. 4 CON GX -1.32 4
68. 6 CON GX -1.32 0.08333
69. LOAD 5 LOADTYPE NONE  TITLE WIND ON STRUCTURE
70. MEMBER LOAD
71. 1 CON GX -6.03 2.25
72. 3 CON GX -6.03 1.9583
73. 4 CON GX -6.03 4
74. 6 CON GX -6.03 0.08333
75. 1 CON GZ -5.8 2.25
76. 3 CON GZ -5.8 1.9583
77. 4 CON GZ -5.8 4
78. 6 CON GZ -5.8 0.0833
79. JOINT LOAD
80. 8 FX -0.42
81. MEMBER LOAD
82. 12 13 15 UNI GX -0.103 0 10
83. LOAD 6 LOADTYPE NONE  TITLE WIND ON LIVE LOAD
84. MEMBER LOAD
85. 1 CON GX -1.76 2.25
86. 3 CON GX -1.76 1.9583
87. 4 CON GX -1.76 4
88. 6 CON GX -1.76 0.0833
89. 1 CON GZ -2.81 2.25
90. 3 CON GZ -2.81 1.9583
91. 4 CON GZ -2.81 4
92. 6 CON GZ -2.81 0.0833
93. LOAD 7 LOADTYPE NONE  TITLE LONGITUDINAL FORCE
94. MEMBER LOAD
95. 1 CON GZ -7.54 2.25
96. 3 CON GZ -7.54 1.9583
```

```
 97. 4 CON GZ -7.54 4
 98. 6 CON GZ -7.54 0.0833
 99. LOAD COMB 9 SERVICE GROUP I
100. 2 1.0 1 1.0 4 1.0
101. LOAD COMB 11 SERVICE GROUP II
102. 2 1.0 5 1.0
103. LOAD COMB 12 SERVICE GROUP III
104. 2 1.0 1 1.0 4 1.0 5 0.3 6 1.0 7 1.0
105. LOAD COMB 14 FACTORED GROUP I
106. 2 1.3 1 2.75 4 1.3
107. LOAD COMB 16 FACTORED GROUP II
108. 2 1.3 5 1.3
109. LOAD COMB 17 FACTORED GROUP III
110. 2 1.3 1 1.65 4 1.3 5 0.39 6 1.3 7 1.3
111. PERFORM ANALYSIS PRINT STATICS CHECK


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

  NUMBER OF JOINTS/MEMBER+ELEMENTS/SUPPORTS =    18/    13/     7
  ORIGINAL/FINAL BAND-WIDTH=     7/     2/     12 DOF
  TOTAL PRIMARY LOAD CASES =     6, TOTAL DEGREES OF FREEDOM =     42
  SIZE OF STIFFNESS MATRIX =        1 DOUBLE  KILO-WORDS
  REQRD/AVAIL. DISK SPACE  =     12.0/  24801.5 MB
```

STATIC LOAD/REACTION/EQUILIBRIUM SUMMARY FOR CASE NO. 1
LOADTYPE NONE TITLE LIVE LOAD

***TOTAL APPLIED LOAD (KIP FEET) SUMMARY (LOADING 1)
SUMMATION FORCE-X = 0.00
SUMMATION FORCE-Y = -130.80
SUMMATION FORCE-Z = 0.00

SUMMATION OF MOMENTS AROUND THE ORIGIN-
MX= 0.00 MY= 0.00 MZ= -1863.91

***TOTAL REACTION LOAD(KIP FEET) SUMMARY (LOADING 1)
SUMMATION FORCE-X = 0.00
SUMMATION FORCE-Y = 130.80
SUMMATION FORCE-Z = 0.00

SUMMATION OF MOMENTS AROUND THE ORIGIN-
MX= 0.00 MY= 0.00 MZ= 1863.91

MAXIMUM DISPLACEMENTS (INCH /RADIANS) (LOADING 1)

	MAXIMUMS	AT NODE
X =	-1.34283E-04	6
Y =	-1.74305E-02	8
Z =	2.89762E-21	8
RX=	-1.97588E-24	8
RY=	-6.81474E-23	8
RZ=	-9.67418E-05	8

STATIC LOAD/REACTION/EQUILIBRIUM SUMMARY FOR CASE NO. 2
LOADTYPE NONE TITLE DEAD LOAD

***TOTAL APPLIED LOAD (KIP FEET) SUMMARY (LOADING 2)
SUMMATION FORCE-X = 0.00
SUMMATION FORCE-Y = -585.25
SUMMATION FORCE-Z = 0.00

SUMMATION OF MOMENTS AROUND THE ORIGIN-
MX= 0.00 MY= 0.00 MZ= -8353.36

***TOTAL REACTION LOAD(KIP FEET) SUMMARY (LOADING 2)
SUMMATION FORCE-X = 0.00
SUMMATION FORCE-Y = 585.25
SUMMATION FORCE-Z = 0.00

SUMMATION OF MOMENTS AROUND THE ORIGIN-
MX= 0.00 MY= 0.00 MZ= 8353.36

MAXIMUM DISPLACEMENTS (INCH /RADIANS) (LOADING 2)

	MAXIMUMS	AT NODE
X =	-3.44048E-03	8
Y =	-6.65368E-02	8
Z =	1.19174E-20	8
RX=	-1.26543E-23	5
RY=	-2.83966E-22	8
RZ=	-3.58587E-04	8

STATIC LOAD/REACTION/EQUILIBRIUM SUMMARY FOR CASE NO. 4
LOADTYPE NONE TITLE CENTRIFUGAL FORCE

***TOTAL APPLIED LOAD (KIP FEET) SUMMARY (LOADING 4)
SUMMATION FORCE-X = -5.28
SUMMATION FORCE-Y = 0.00
SUMMATION FORCE-Z = 0.00

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

***TOTAL REACTION LOAD(KIP FEET) SUMMARY (LOADING 4)
SUMMATION FORCE-X = 5.28
SUMMATION FORCE-Y = 0.00
SUMMATION FORCE-Z = 0.00

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

MAXIMUM DISPLACEMENTS (INCH /RADIANS) (LOADING 4)

	MAXIMUMS	AT NODE
X =	-1.68415E-01	4
Y =	1.95312E-02	1
Z =	2.17274E-20	8
RX=	-2.63373E-23	5
RY=	-7.70045E-22	8
RZ=	-1.59189E-04	2

STATIC LOAD/REACTION/EQUILIBRIUM SUMMARY FOR CASE NO. 5
LOADTYPE NONE TITLE WIND ON STRUCTURE

***TOTAL APPLIED LOAD (KIP FEET) SUMMARY (LOADING 5)
SUMMATION FORCE-X = -27.63
SUMMATION FORCE-Y = 0.00
SUMMATION FORCE-Z = -23.20

SUMMATION OF MOMENTS AROUND THE ORIGIN-
MX= 0.00 MY= 330.60 MZ= -15.33

```
***TOTAL REACTION LOAD( KIP  FEET ) SUMMARY (LOADING     5 )
    SUMMATION FORCE-X =       27.63
    SUMMATION FORCE-Y =        0.00
    SUMMATION FORCE-Z =       23.20

   SUMMATION OF MOMENTS AROUND THE ORIGIN-
   MX=           0.00  MY=        -330.60  MZ=          15.33


MAXIMUM DISPLACEMENTS ( INCH /RADIANS) (LOADING      5)
          MAXIMUMS    AT NODE
   X = -8.82204E-01      22
   Y = -1.03140E-01       8
   Z = -2.40415E-01       8
   RX=  6.09178E-04       5
   RY=  7.28900E-05       8
   RZ= -8.45747E-04       6


       STATIC LOAD/REACTION/EQUILIBRIUM SUMMARY FOR CASE NO.     6
       LOADTYPE NONE  TITLE WIND ON LIVE LOAD


***TOTAL APPLIED LOAD ( KIP  FEET ) SUMMARY (LOADING    6 )
    SUMMATION FORCE-X =       -7.04
    SUMMATION FORCE-Y =        0.00
    SUMMATION FORCE-Z =      -11.24

   SUMMATION OF MOMENTS AROUND THE ORIGIN-
   MX=           0.00  MY=         160.17  MZ=           0.00


***TOTAL REACTION LOAD( KIP  FEET ) SUMMARY (LOADING     6 )
    SUMMATION FORCE-X =        7.04
    SUMMATION FORCE-Y =        0.00
    SUMMATION FORCE-Z =       11.24

   SUMMATION OF MOMENTS AROUND THE ORIGIN-
   MX=           0.00  MY=        -160.17  MZ=           0.00


MAXIMUM DISPLACEMENTS ( INCH /RADIANS) (LOADING      6)
          MAXIMUMS    AT NODE
   X = -2.24864E-01      22
   Y =  2.60416E-02       1
   Z = -1.16477E-01       8
   RX=  2.95136E-04       5
   RY=  3.53139E-05       8
   RZ= -2.12252E-04       2


       STATIC LOAD/REACTION/EQUILIBRIUM SUMMARY FOR CASE NO.     7
       LOADTYPE NONE  TITLE LONGITUDINAL FORCE
```

```
***TOTAL APPLIED LOAD ( KIP  FEET ) SUMMARY (LOADING    7 )
    SUMMATION FORCE-X =        0.00
    SUMMATION FORCE-Y =        0.00
    SUMMATION FORCE-Z =      -30.16

   SUMMATION OF MOMENTS AROUND THE ORIGIN-
   MX=           0.00  MY=         429.78  MZ=           0.00


***TOTAL REACTION LOAD( KIP  FEET ) SUMMARY (LOADING     7 )
    SUMMATION FORCE-X =        0.00
    SUMMATION FORCE-Y =        0.00
    SUMMATION FORCE-Z =       30.16

   SUMMATION OF MOMENTS AROUND THE ORIGIN-
   MX=           0.00  MY=        -429.78  MZ=           0.00


MAXIMUM DISPLACEMENTS ( INCH /RADIANS) (LOADING      7)
          MAXIMUMS    AT NODE
   X =  8.53633E-04      21
   Y =  1.18790E-02      22
   Z = -3.12540E-01       8
   RX=  7.91931E-04      22
   RY=  9.47570E-05       8
   RZ=  1.46568E-23       3


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


112. PRINT MEMBER INFORMATION LIST 1 TO 6 9 TO 15
```

MEMBER INFORMATION

MEMBER	START JOINT	END JOINT	LENGTH (FEET)	BETA (DEG)	RELEASES
1	1	2	2.333	0.00	
2	2	3	5.959	0.00	
3	3	4	5.958	0.00	
4	4	5	5.958	0.00	
5	5	6	5.958	0.00	
6	6	8	2.333	0.00	
9	2	10	55.428	0.00	
10	20	11	55.428	0.00	
11	4	12	55.000	0.00	
12	22	13	55.428	0.00	
13	6	16	55.428	0.00	
14	19	17	55.428	0.00	
15	21	18	55.428	0.00	

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

113. PRINT MATERIAL PROPERTIES LIST 1 TO 6 9 TO 15

MATERIAL PROPERTIES.

ALL UNITS ARE - KIP FEET

MEMBER	E	G	DEN	ALPHA
1	453600.0	193846.1	0.14999001	0.00000550
2	453600.0	193846.1	0.14999001	0.00000550
3	453600.0	193846.1	0.14999001	0.00000550
4	453600.0	193846.1	0.14999001	0.00000550
5	453600.0	193846.1	0.14999001	0.00000550
6	453600.0	193846.1	0.14999001	0.00000550
9	453600.0	193846.1	0.14999001	0.00000550
10	453600.0	193846.1	0.14999001	0.00000550
11	453600.0	193846.1	0.14999001	0.00000550
12	453600.0	193846.1	0.14999001	0.00000550
13	453600.0	193846.1	0.14999001	0.00000550
14	453600.0	193846.1	0.14999001	0.00000550
15	453600.0	193846.1	0.14999001	0.00000550

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

114. PRINT MATERIAL PROPERTIES LIST 1 TO 6 9 TO 15

MATERIAL PROPERTIES.

ALL UNITS ARE - KIP FEET

MEMBER	E	G	DEN	ALPHA
1	453600.0	193846.1	0.14999001	0.00000550
2	453600.0	193846.1	0.14999001	0.00000550
3	453600.0	193846.1	0.14999001	0.00000550
4	453600.0	193846.1	0.14999001	0.00000550
5	453600.0	193846.1	0.14999001	0.00000550
6	453600.0	193846.1	0.14999001	0.00000550
9	453600.0	193846.1	0.14999001	0.00000550
10	453600.0	193846.1	0.14999001	0.00000550
11	453600.0	193846.1	0.14999001	0.00000550
12	453600.0	193846.1	0.14999001	0.00000550
13	453600.0	193846.1	0.14999001	0.00000550
14	453600.0	193846.1	0.14999001	0.00000550
15	453600.0	193846.1	0.14999001	0.00000550

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

115. PRINT SUPPORT INFORMATION

SUPPORT INFORMATION (1=FIXED, 0=RELEASED)

UNITS FOR SPRING CONSTANTS ARE KIP FEET DEGREES

JOINT	FORCE-X/ KFX	FORCE-Y/ KFY	FORCE-Z/ KFZ	MOM-X/ KMX	MOM-Y/ KMY	MOM-Z/ KMZ
10	1	1	1	1	1	1
	0.0000E+00	0.0000E+00	0.0000E+00	0.000E+00	0.000E+00	0.000E+00
11	1	1	1	1	1	1
	0.0000E+00	0.0000E+00	0.0000E+00	0.000E+00	0.000E+00	0.000E+00
12	1	1	1	1	1	1
	0.0000E+00	0.0000E+00	0.0000E+00	0.000E+00	0.000E+00	0.000E+00
13	1	1	1	1	1	1
	0.0000E+00	0.0000E+00	0.0000E+00	0.000E+00	0.000E+00	0.000E+00
16	1	1	1	1	1	1
	0.0000E+00	0.0000E+00	0.0000E+00	0.000E+00	0.000E+00	0.000E+00
17	1	1	1	1	1	1
	0.0000E+00	0.0000E+00	0.0000E+00	0.000E+00	0.000E+00	0.000E+00
18	1	1	1	1	1	1
	0.0000E+00	0.0000E+00	0.0000E+00	0.000E+00	0.000E+00	0.000E+00

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

116. LOAD LIST 9 11 12
117. PRINT SUPPORT REACTION LIST 10 TO 13 16 TO 18

SUPPORT REACTIONS -UNIT KIP FEET STRUCTURE TYPE = SPACE

JOINT	LOAD	FORCE-X	FORCE-Y	FORCE-Z	MOM-X	MOM-Y	MOM Z
10	9	16.98	145.74	0.00	0.00	0.00	7.40
	11	21.12	164.26	0.76	18.04	-2.22	-38.26
	12	21.99	176.21	1.59	37.61	-4.62	-23.10
11	9	0.29	82.65	8.96	-12.77	1.01	-8.28
	11	1.87	71.07	8.33	6.32	6.57	-49.35
	12	1.36	135.06	17.21	26.74	5.03	-36.07
12	9	0.35	84.37	0.00	0.00	0.00	-9.42
	11	1.81	69.03	0.79	18.55	0.00	-48.56
	12	1.35	84.23	1.65	38.67	0.00	-36.26
13	9	0.46	97.72	10.84	-12.82	1.55	-11.41
	11	2.06	147.50	17.87	6.04	6.74	-52.77
	12	1.56	192.19	24.34	26.54	4.87	-39.90
16	9	-13.56	125.20	0.00	0.00	0.00	-28.82
	11	-3.16	55.83	0.76	18.04	2.22	-72.77
	12	-8.58	95.04	1.59	37.61	4.62	-59.52
17	9	0.29	82.65	-8.96	12.77	-1.01	-8.28
	11	1.88	0.56	2.11	31.52	-6.22	-49.58
	12	1.38	-11.91	4.56	52.13	-4.30	-36.57
18	9	0.46	97.72	-10.84	12.82	-1.55	-11.41
	11	2.05	77.00	-7.43	31.79	-7.09	-52.53
	12	1.54	45.23	-2.58	52.33	-5.60	-39.41

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

```
118. LOAD LIST 14 16 17
119. SECTION 0 0.14 0.5 0.86 1 MEMB 1 TO 6
120. PRINT MEMBER SECTION FORCES LIST 1 TO 6
```

MEMBER FORCES AT INTERMEDIATE SECTIONS

ALL UNITS ARE -- KIP FEET

MEMB	LOAD	SEC	SHEAR-Y	SHEAR-Z	MOM-Y	MOM-Z
1	14	0.14	-0.48	0.00	0.00	0.08
		0.50	-1.71	0.00	0.00	1.00
		0.86	-2.93	0.00	0.00	2.94
	16	0.14	-0.48	0.00	0.00	0.08
		0.50	-1.71	0.00	0.00	1.00
		0.86	-2.93	0.00	0.00	2.94
	17	0.14	-0.48	0.00	0.00	0.08
		0.50	-1.71	0.00	0.00	1.00
		0.86	-2.93	0.00	0.00	2.94
2	14	0.14	-27.43	0.00	0.00	60.14
		0.50	-30.57	0.00	0.00	122.36
		0.86	-33.80	0.00	0.00	191.36
	16	0.14	48.97	-6.55	-2.16	63.02
		0.50	45.83	-6.55	-16.20	-38.67
		0.86	42.60	-6.55	-30.25	-133.57
	17	0.14	19.62	-13.65	-4.50	66.92
		0.50	16.48	-13.65	-33.78	28.21
		0.86	13.25	-13.65	-63.06	-3.72
3	14	0.14	162.75	0.00	0.00	102.35
		0.50	-52.16	0.00	0.00	-27.21
		0.86	-55.53	0.00	0.00	88.23
	16	0.14	70.93	7.03	-29.30	-88.15
		0.50	-54.05	-0.51	-21.93	-112.56
		0.86	-57.42	-0.51	-23.04	6.94
	17	0.14	119.77	14.64	-61.09	-13.68
		0.50	-59.17	-1.07	-45.72	-87.76
		0.86	-62.54	-1.07	-48.02	42.73
4	14	0.14	44.89	0.00	0.00	109.96
		0.50	41.44	0.00	0.00	17.36
		0.86	-173.61	0.00	0.00	170.04
	16	0.14	1.48	0.51	-23.04	119.80
		0.50	-1.98	0.51	-21.93	120.34
		0.86	-127.11	-7.03	-29.31	265.06
	17	0.14	21.33	1.07	-48.02	126.55
		0.50	17.88	1.07	-45.72	84.50
		0.86	-161.21	-14.64	-61.09	247.29
5	14	0.14	61.98	0.00	0.00	301.58
		0.50	58.46	0.00	0.00	172.36
		0.86	54.85	0.00	0.00	50.84
	16	0.14	99.84	6.55	-30.25	431.38
		0.50	96.32	6.55	-16.20	220.95
		0.86	92.70	6.55	-2.16	18.23
	17	0.14	93.74	13.65	-63.05	418.81

MEMBER FORCES AT INTERMEDIATE SECTIONS

ALL UNITS ARE -- KIP FEET

MEMB	LOAD	SEC	SHEAR-Y	SHEAR-Z	MOM-Y	MOM-Z
		0.50	90.22	13.65	-33.77	221.46
		0.86	86.61	13.65	-4.50	31.80
6	14	0.14	3.38	0.00	0.00	3.39
		0.50	1.97	0.00	0.00	1.15
		0.86	0.55	0.00	0.00	0.09
	16	0.14	3.38	0.00	0.00	3.39
		0.50	1.97	0.00	0.00	1.15
		0.86	0.55	0.00	0.00	0.09
	17	0.14	3.38	0.00	0.00	3.39
		0.50	1.97	0.00	0.00	1.15
		0.86	0.55	0.00	0.00	0.09

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

121. PRINT MAXFORCE ENVELOPE NSECTION 10 LIST 1 TO 6

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
1	MAX	0.00	0.00	16	22.43	2.33	14			
		0.00	0.00	14	0.00	0.00	17	0.00	0.00	14
	MIN	-224.90	2.33	14	0.00	0.00	16			
		-15.72	2.33	17	-1.31	2.33	17	7.84 T	2.33	16
2	MAX	50.19	0.00	16	220.09	5.96	14			
		0.00	0.00	14	6.89	0.00	17	24.97 C	0.00	14
	MIN	-35.08	5.96	14	-168.57	5.96	16			
		-13.65	5.96	17	-74.45	5.96	17	19.61 C	5.96	16
3	MAX	164.03	0.00	14	238.63	0.00	14			
		14.64	0.00	17	0.00	5.96	14	26.90 C	0.00	17
	MIN	-63.88	5.96	17	-155.07	1.79	16			
		-1.07	5.96	17	-73.30	0.00	17	16.66 C	5.96	16
4	MAX	46.24	0.00	14	382.32	5.96	17			
		1.07	0.00	17	0.00	5.96	14	24.42 C	0.00	14
	MIN	-174.95	5.96	14	-7.05	3.57	14			
		-14.64	5.96	17	-73.30	5.96	17	11.17 C	5.96	16
5	MAX	101.18	0.00	16	515.22	0.00	16			
		13.65	0.00	17	6.89	5.96	17	23.96 C	0.00	14
	MIN	53.44	5.96	14	-58.52	5.96	16			
		0.00	5.96	14	-74.44	0.00	17	13.83 C	5.96	16
6	MAX	225.42	0.00	14	23.04	0.00	14			
		15.72	0.00	17	0.00	1.40	17	8.39 C	0.00	16
	MIN	0.00	2.33	17	0.00	2.33	16			
		0.00	2.33	16	-1.31	0.00	17	0.00	2.33	14

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

122. FINISH

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

**** DATE= AUG 28,2006 TIME= 9:49:35 ****

```
************************************************************
*         For questions on STAAD.Pro, please contact       *
*   Research Engineers Offices at the following locations  *
*                                                          *
*               Telephone               Email              *
*  USA:       +1 (714)974-2500       support@reiusa.com     *
*  CANADA     +1 (905)632-4771       detech@odandetech.com  *
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*  THAILAND   +66(0)2645-1018/19    support@thai.reiusa.com *
*                                                          *
*  North America                    support@reiusa.com     *
*  Europe                           support@reel.co.uk     *
*  Asia                             support@reiasia.net    *
************************************************************
```

Information about the key files in the current distribution

Modification Date	CRC	Size (Bytes)	File Name
02/27/2006	0x8140	12701696	SProStaad.exe
12/16/2004	0xca81	04558848	SProStaadStl.exe
09/19/2003	0x2fc0	00081970	CMesh.dll
02/06/2006	0x5601	02486272	dbsectioninterface.dll
01/23/2001	0x9b40	00073728	LoadGen.dll
09/25/2003	0x6340	00704512	MeshEngine.dll
09/22/2003	0xce00	00069632	QuadPlateEngine.dll
12/22/2005	0x4181	00094208	SurfMesh.dll
09/30/2005	0x2dc1	00475136	aiscsections.mdb
01/05/2005	0x79c1	00319488	aiscsections_all_editions.mdb
01/05/2005	0x4b81	01810432	aiscsteeljoists.mdb
01/05/2005	0xcac1	03651584	aitctimbersections.mdb
01/27/2005	0xeb01	00552960	aluminumsections.mdb
01/05/2005	0xcd01	00163840	australiansections.mdb
01/05/2005	0x6a41	00229376	britishsections.mdb
07/08/2005	0x9d41	00434176	bscoldformedsections.mdb
06/28/2005	0x8201	00327680	butlercoldformedsections.mdb
01/05/2005	0xabc0	00262144	canadiansections.mdb
05/31/2005	0x9e81	00450560	canadiantimbersections.mdb
05/05/2005	0x7f80	00409600	chinesesections.mdb
01/05/2005	0xd6c0	00600064	dutchsections.mdb
01/05/2005	0x1a00	00354304	europeansections.mdb
01/05/2005	0xd301	00202752	frenchsections.mdb
01/05/2005	0x11c1	00233472	germansections.mdb
01/05/2005	0x3c40	00264192	indiansections.mdb
01/05/2005	0xd540	00180224	iscoldformedsections.mdb
01/24/2006	0x2501	00221184	japanesesections.mdb
11/08/2005	0x9081	00376832	Kingspancoldformedsections.mdb
01/05/2005	0xb740	00174080	koreansections.mdb
02/03/2005	0xda00	00096256	lysaghtcoldformedsections.mdb
02/07/2005	0x9a00	00243712	mexicansteeltables.mdb
01/04/2006	0x8980	00413696	RCecoColdFormedSections.mdb
02/03/2005	0x9b40	00307200	russiansections.mdb
01/05/2005	0x9081	00206848	southafricansections.mdb
01/06/2005	0x9341	00194560	spanishsections.mdb
01/04/2006	0x8680	00223232	uscoldformedsections.mdb
01/05/2005	0xbac0	00149504	usersectionstemplate.mdb
01/05/2005	0x9d41	00141312	venezuelansections.mdb

REINFORCED BEAM CAP

Reinforing Yield Strength $Fy := 40000psi$

Concrete Compresion Strength $Fc := 5600psi$

Width of Beam $bf := 3ft$

Depth of Reinforcemnt $dt := 2.25ft$ Top Reinforcement $db := 2.1667ft$ Bottom Reinforcement

Positive Reinforcement Area $Asp := 6.24in^2$

Negative Reinforcement Area $Asn := 6.35in^2$

$\rho w := \frac{Asp}{bf \cdot db}$ Reinforcement Ratio

Factored Shear at Section $Vu := 173.61k$

Factored Moment at Section $Mu := 170.04k \cdot ft$

Positive Moment Capacity: Compression Steel neglected $\phi f := 0.9$

Tension in Reinforcemnt $Tp := Asp \cdot Fy$

Depth of Compression Block $ap := \frac{Tp}{0.85 \cdot Fc \cdot bf}$

$\phi Mnp := \phi f \cdot Tp \cdot \left(db - \frac{ap}{2} \right)$ $\phi Mnp = 473\ ft\,k$

Negative Moment Capacity: Compression Steel neglected

Tension in Reinforcemnt $Tn := Asn \cdot Fy$

Depth of Compression Block $an := \frac{Tn}{0.85 \cdot Fc \cdot bf}$

$\phi Mnn := \phi f \cdot Tn \cdot \left(dt - \frac{an}{2} \right)$ $\phi Mnn = 500\ ft\,k$

Shear Capacity Stirrup Spacing $S := 13in$ Stirrup Area $Av := 0.4in^2$ $bw := 5.3333ft$

$Vc1 := 2 \cdot psi \sqrt{\frac{Fc}{psi}} \cdot bw \cdot db$ $Vc1 = 249\,k$

$Vc2 := \left(1.9 \cdot \sqrt{\frac{Fc}{psi}} + 2500 \cdot \rho w \frac{Vu \cdot db}{Mu} \right) \cdot bw \cdot db \cdot psi$ $Vc2 = 298\,k$

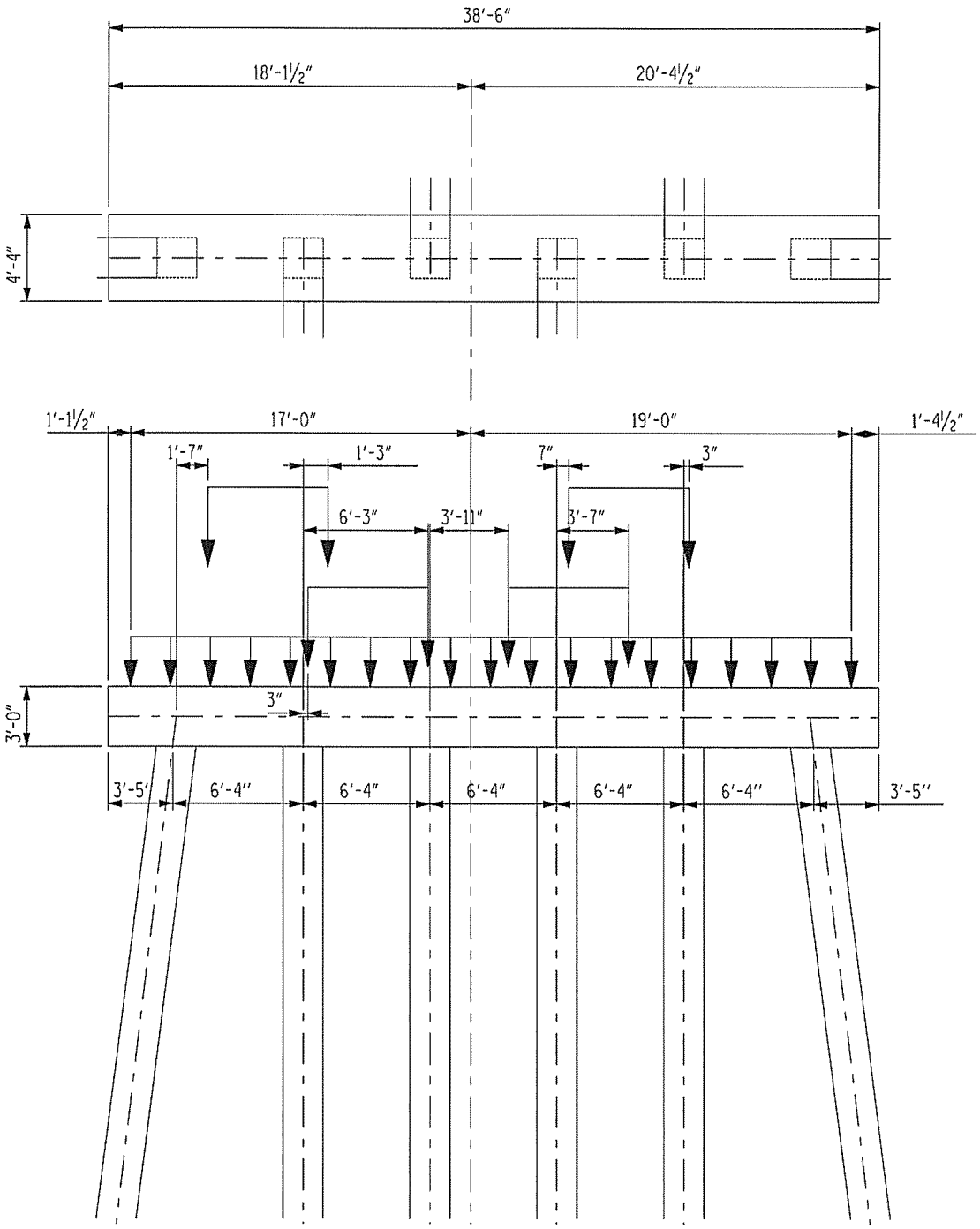
$Vc3 := 3.5 \cdot psi \sqrt{\frac{Fc}{psi}} \cdot bw \cdot db$ $Vc3 = 436\,k$

$Vc4 := if(Vc1 < Vc2, Vc2, Vc\ Vc := if(Vc4 < Vc3, Vc4, Vc3)$ $Vc = 298\,k$

$Vs := \frac{Av \cdot Fy \cdot db}{S}$ $\phi s := 0.85$ $Vs = 32\,k$

$\phi Vn := \phi s \cdot (Vc + Vs)$ $\phi Vn = 280\,k$

Q:\inspect\BonnerBridge\CrutchBents\Type 4 SectionCapacity.xmcd



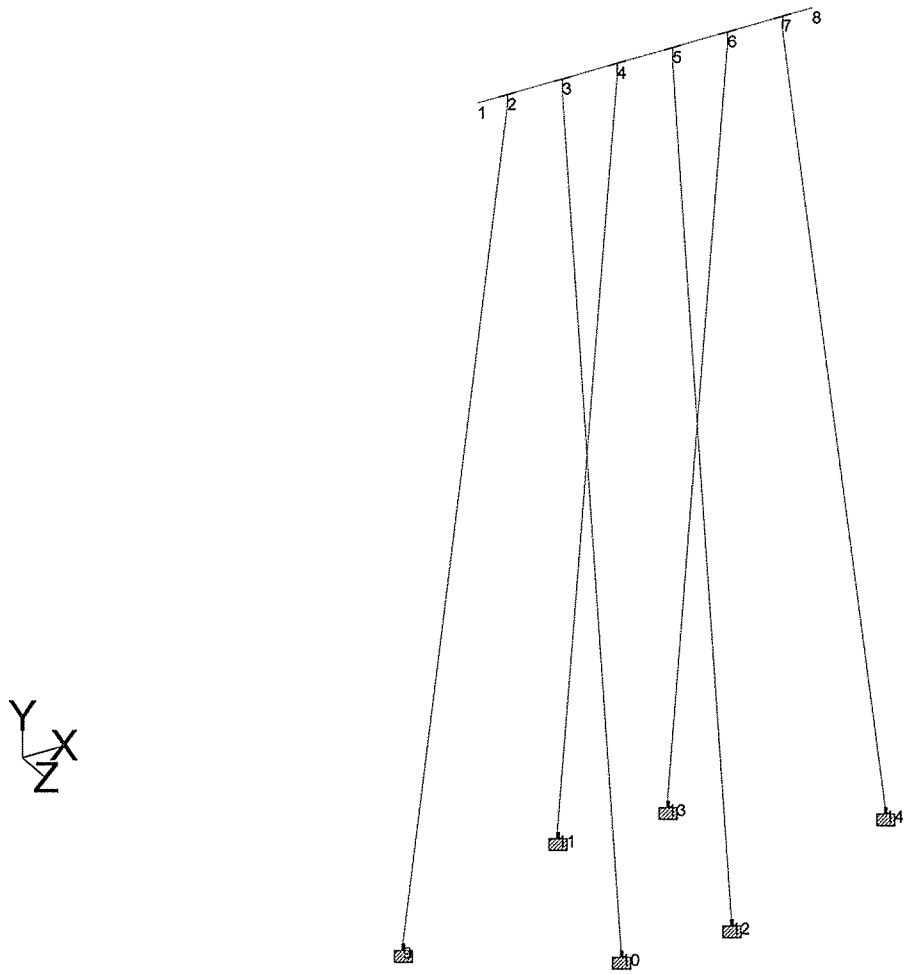
ELEVATION TYPE 5

REPLACEMENT BENTS A, B, C, D, E, F, G

NBIS REPORT BENT TYPE 5

Software licensed to Ko and Associates	Job No	Sheet No 1	Rev
	Part		
Job Title	Ref		
	By MSM	Date 05-Jun-06	Chd
Client	File Type 5.std	Date/Time 26-Jul-2006 14:55	

/ AKS 8/22



```
**************************************************
*                                                *
*           STAAD.Pro                            *
*           Version  2005    Bld 1003.US         *
*           Proprietary Program of               *
*           Research Engineers,  Intl.           *
*           Date=    AUG 28, 2006                *
*           Time=     9:59:12                    *
*                                                *
*      USER ID: Ko and Associates                *
**************************************************
```

MJM
AKO 8/29

```
     1. STAAD SPACE
INPUT FILE: Type 5.STD
     2. START JOB INFORMATION
     3. ENGINEER DATE 05-JUN-06
     4. END JOB INFORMATION
     5. INPUT WIDTH 79
     6. UNIT FEET KIP
     7. JOINT COORDINATES
     8. 1 0 0 0; 2 3.4167 0 0; 3 9.75 0 0; 4 16.0833 0 0; 5 22.4167 0 0; 6 28.75 0 0
     9. 7 35.0833 0 0; 8 38.5 0 0; 9 -8.458 -95 0; 10 9.75 -95 11.875
    10. 11 16.0833 -95 -11.875; 12 22.417 -95 11.875; 13 28.75 -95 -11.875
    11. 14 46.958 -95 0
    12. MEMBER INCIDENCES
    13. 1 1 2; 2 2 3; 3 3 4; 4 4 5; 5 5 6; 6 6 7; 7 7 8; 8 2 9; 9 3 10; 10 4 11
    14. 11 5 12; 12 6 13; 13 7 14
    15. DEFINE MATERIAL START
    16. ISOTROPIC CONCRETE
    17. E 453600
    18. POISSON 0.17
    19. DENSITY 0.14999
    20. ALPHA 5.5E-006
    21. DAMP 0.05
    22. END DEFINE MATERIAL
    23. MEMBER PROPERTY AMERICAN
    24. 1 TO 7 PRIS YD 4.3333 ZD 3
    25. 8 TO 13 PRIS YD 2 ZD 2
    26. CONSTANTS
    27. MATERIAL CONCRETE MEMB 1 TO 13
    28. SUPPORTS
    29. 9 TO 14 FIXED
    30. LOAD 1 LOADTYPE NONE  TITLE LIVE LOAD CASE 1
    31. MEMBER LOAD
    32. 2 CON GY -30 1.5833
    33. 3 CON GY -30 1.25
    34. 5 CON GY -30 0.5833
    35. 6 CON GY -30 0.25
    36. LOAD 2 LOADTYPE NONE  TITLE DEAD LOAD
    37. MEMBER LOAD
    38. 1 UNI GY -5.262 1.125 3.4167
    39. SELFWEIGHT Y -1
    40. MEMBER LOAD
```

```
41. 2 TO 6 UNI GY -5.262 0 6.3333
42. 7 UNI GY -5.262 0 2.0417
43. 1 7 UNI GY -0.0565 0 3.4167
44. 2 TO 6 UNI GY -0.0565 0 6.3333
45. LOAD 3 LOADTYPE NONE  TITLE LIVE LOAD CASE 2
46. MEMBER LOAD
47. 3 CON GY -30 0.25
48. 3 CON GY -30 6.25
49. 4 CON GY -30 3.9167
50. 5 CON GY -30 3.5833
51. LOAD 4 LOADTYPE NONE  TITLE WIND ON STRUCTURE
52. JOINT LOAD
53. 2 7 FX -5.23
54. 3 TO 6 FZ -1.26
55. 8 FX -0.728
56. MEMBER LOAD
57. 11 TO 13 UNI GX -0.112 0 28
58. LOAD 5 LOADTYPE NONE  TITLE WIND ON LIVE LOAD
59. JOINT LOAD
60. 2 7 FX -2.42
61. 3 TO 6 FZ -0.485
62. LOAD 6 LOADTYPE NONE  TITLE LONGITUDINAL FORCE
63. JOINT LOAD
64. 3 TO 6 FZ -1.47
65. LOAD COMB 8 SERVICE GROUP I LL1
66. 2 1.0 1 1.0
67. LOAD COMB 9 SERVICE GROUP I LL2
68. 2 1.0 3 1.0
69. LOAD COMB 10 SERVICE GROUP II
70. 2 1.0 4 1.0
71. LOAD COMB 11 SERVICE GROUP III LL1
72. 2 1.0 1 1.0 4 0.3 5 1.0 6 1.0
73. LOAD COMB 12 SERVICE GROUP III LL2
74. 2 1.0 3 1.0 4 0.3 5 1.0 6 1.0
75. LOAD COMB 13 FACTORED GROUP I LL1
76. 2 1.3 1 2.82
77. LOAD COMB 14 FACTORED GROUP I LL2
78. 2 1.3 3 2.82
79. LOAD COMB 15 FACTORED GROUP II
80. 2 1.3 4 1.3
81. LOAD COMB 16 FACTORED GROUP III LL1
82. 2 1.3 1 1.69 4 0.39 5 1.3 6 1.3
83. LOAD COMB 17 FACTORED GROUP III LL2
84. 2 1.3 3 1.69 4 0.39 5 1.3 6 1.3
85. PERFORM ANALYSIS PRINT STATICS CHECK
```

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

NUMBER OF JOINTS/MEMBER+ELEMENTS/SUPPORTS = 14/ 13/ 6
ORIGINAL/FINAL BAND-WIDTH= 7/ 2/ 12 DOF
TOTAL PRIMARY LOAD CASES = 6, TOTAL DEGREES OF FREEDOM = 48
SIZE OF STIFFNESS MATRIX = 1 DOUBLE KILO-WORDS
REQRD/AVAIL. DISK SPACE = 12.0/ 24801.5 MB

STATIC LOAD/REACTION/EQUILIBRIUM SUMMARY FOR CASE NO. 1
LOADTYPE NONE TITLE LIVE LOAD CASE 1

***TOTAL APPLIED LOAD (KIP FEET) SUMMARY (LOADING 1)
SUMMATION FORCE-X = 0.00
SUMMATION FORCE-Y = -120.00
SUMMATION FORCE-Z = 0.00

SUMMATION OF MOMENTS AROUND THE ORIGIN-
MX= 0.00 MY= 0.00 MZ= -2040.00

***TOTAL REACTION LOAD(KIP FEET) SUMMARY (LOADING 1)
SUMMATION FORCE-X = 0.00
SUMMATION FORCE-Y = 120.00
SUMMATION FORCE-Z = 0.00

SUMMATION OF MOMENTS AROUND THE ORIGIN-
MX= 0.00 MY= 0.00 MZ= 2040.00

MAXIMUM DISPLACEMENTS (INCH /RADIANS) (LOADING 1)

	MAXIMUMS	AT NODE
X =	1.00471E-01	2
Y =	-2.87438E-02	1
Z =	-1.11481E-01	1
RX=	-4.26170E-05	1
RY=	-3.94977E-04	3
RZ=	1.29620E-04	7

STATIC LOAD/REACTION/EQUILIBRIUM SUMMARY FOR CASE NO. 2
LOADTYPE NONE TITLE DEAD LOAD

***TOTAL APPLIED LOAD (KIP FEET) SUMMARY (LOADING 2)
SUMMATION FORCE-X = 0.00
SUMMATION FORCE-Y = -611.31
SUMMATION FORCE-Z = 0.00

SUMMATION OF MOMENTS AROUND THE ORIGIN-
MX= 0.00 MY= 0.00 MZ= -11744.14

***TOTAL REACTION LOAD(KIP FEET) SUMMARY (LOADING 2)
SUMMATION FORCE-X = 0.00
SUMMATION FORCE-Y = 611.31
SUMMATION FORCE-Z = 0.00

SUMMATION OF MOMENTS AROUND THE ORIGIN-
MX= 0.00 MY= 0.00 MZ= 11744.14

MAXIMUM DISPLACEMENTS (INCH /RADIANS) (LOADING 2)

	MAXIMUMS	AT NODE
X =	8.79451E-03	1
Y =	-5.64561E-02	1
Z =	-3.10206E-01	1
RX=	-4.40069E-05	6
RY=	-1.34010E-03	3
RZ=	4.80547E-05	1

STATIC LOAD/REACTION/EQUILIBRIUM SUMMARY FOR CASE NO. 3
LOADTYPE NONE TITLE LIVE LOAD CASE 2

***TOTAL APPLIED LOAD (KIP FEET) SUMMARY (LOADING 3)
SUMMATION FORCE-X = 0.00
SUMMATION FORCE-Y = -120.00
SUMMATION FORCE-Z = 0.00

SUMMATION OF MOMENTS AROUND THE ORIGIN-
MX= 0.00 MY= 0.00 MZ= -2160.00

***TOTAL REACTION LOAD(KIP FEET) SUMMARY (LOADING 3)
SUMMATION FORCE-X = 0.00
SUMMATION FORCE-Y = 120.00
SUMMATION FORCE-Z = 0.00

SUMMATION OF MOMENTS AROUND THE ORIGIN-
MX= 0.00 MY= 0.00 MZ= 2160.00

MAXIMUM DISPLACEMENTS (INCH /RADIANS) (LOADING 3)

	MAXIMUMS	AT NODE
X =	4.52649E-02	2
Y =	-2.13438E-02	4
Z =	-8.47647E-02	1
RX=	-2.57550E-05	2
RY=	-3.25211E-04	3
RZ=	1.43361E-04	8

STATIC LOAD/REACTION/EQUILIBRIUM SUMMARY FOR CASE NO. 4
LOADTYPE NONE TITLE WIND ON STRUCTURE

***TOTAL APPLIED LOAD (KIP FEET) SUMMARY (LOADING 4)
SUMMATION FORCE-X = -20.60
SUMMATION FORCE-Y = 0.00
SUMMATION FORCE-Z = -5.04

SUMMATION OF MOMENTS AROUND THE ORIGIN-
MX= 0.00 MY= 97.02 MZ= -130.69

```
***TOTAL REACTION LOAD( KIP  FEET ) SUMMARY (LOADING     4 )
    SUMMATION FORCE-X =       20.60
    SUMMATION FORCE-Y =        0.00
    SUMMATION FORCE-Z =        5.04

   SUMMATION OF MOMENTS AROUND THE ORIGIN-
   MX=           0.00  MY=         -97.02  MZ=         130.69


MAXIMUM DISPLACEMENTS ( INCH /RADIANS) (LOADING      4)
         MAXIMUMS    AT NODE
   X = -1.15272E+00       8
   Y = -1.39522E-01       8
   Z =  1.17387E-01       8
   RX=  1.46034E-04       7
   RY= -7.18104E-05       6
   RZ= -7.24734E-04       8


       STATIC LOAD/REACTION/EQUILIBRIUM SUMMARY FOR CASE NO.     5
       LOADTYPE NONE  TITLE WIND ON LIVE LOAD


***TOTAL APPLIED LOAD ( KIP  FEET ) SUMMARY (LOADING    5 )
    SUMMATION FORCE-X =       -4.84
    SUMMATION FORCE-Y =        0.00
    SUMMATION FORCE-Z =       -1.94

   SUMMATION OF MOMENTS AROUND THE ORIGIN-
   MX=           0.00  MY=          37.35  MZ=           0.00


***TOTAL REACTION LOAD( KIP  FEET ) SUMMARY (LOADING     5 )
    SUMMATION FORCE-X =        4.84
    SUMMATION FORCE-Y =        0.00
    SUMMATION FORCE-Z =        1.94

   SUMMATION OF MOMENTS AROUND THE ORIGIN-
   MX=           0.00  MY=         -37.35  MZ=           0.00


MAXIMUM DISPLACEMENTS ( INCH /RADIANS) (LOADING      5)
         MAXIMUMS    AT NODE
   X = -2.67025E-01       8
   Y =  3.10735E-02       1
   Z =  1.78692E-02       8
   RX=  2.20542E-05       8
   RY= -1.56027E-05       6
   RZ= -1.58847E-04       2


       STATIC LOAD/REACTION/EQUILIBRIUM SUMMARY FOR CASE NO.     6
       LOADTYPE NONE  TITLE LONGITUDINAL FORCE
```

```
***TOTAL APPLIED LOAD ( KIP  FEET ) SUMMARY (LOADING    6 )
    SUMMATION FORCE-X =        0.00
    SUMMATION FORCE-Y =        0.00
    SUMMATION FORCE-Z =       -5.88

   SUMMATION OF MOMENTS AROUND THE ORIGIN-
   MX=           0.00  MY=         113.19  MZ=           0.00


***TOTAL REACTION LOAD( KIP  FEET ) SUMMARY (LOADING     6 )
    SUMMATION FORCE-X =        0.00
    SUMMATION FORCE-Y =        0.00
    SUMMATION FORCE-Z =        5.88

   SUMMATION OF MOMENTS AROUND THE ORIGIN-
   MX=           0.00  MY=        -113.19  MZ=           0.00


MAXIMUM DISPLACEMENTS ( INCH /RADIANS) (LOADING      6)
          MAXIMUMS    AT NODE
   X =  4.77861E-02       8
   Y = -8.08534E-03       1
   Z = -7.26990E-02       8
   RX= -9.42849E-05       8
   RY=  4.31102E-06       6
   RZ=  3.81378E-05       3



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


 86. PRINT MEMBER INFORMATION LIST 1 TO 13
```

MEMBER INFORMATION

MEMBER	START JOINT	END JOINT	LENGTH (FEET)	BETA (DEG)	RELEASES
1	1	2	3.417	0.00	
2	2	3	6.333	0.00	
3	3	4	6.333	0.00	
4	4	5	6.333	0.00	
5	5	6	6.333	0.00	
6	6	7	6.333	0.00	
7	7	8	3.417	0.00	
8	2	9	95.739	0.00	
9	3	10	95.739	0.00	
10	4	11	95.739	0.00	
11	5	12	95.739	0.00	
12	6	13	95.739	0.00	
13	7	14	95.739	0.00	

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

87. PRINT MEMBER PROPERTIES LIST 1 TO 13

MEMBER PROPERTIES. UNIT - INCH

MEMB	PROFILE	AX/ AY	IZ/ AZ	IY/ SZ	IX/ SY
1	PRISMATIC	1871.99	421814.34	202174.45	462730.88
		1591.19	1591.19	16223.75	11231.91
2	PRISMATIC	1871.99	421814.34	202174.45	462730.88
		1591.19	1591.19	16223.75	11231.91
3	PRISMATIC	1871.99	421814.34	202174.45	462730.88
		1591.19	1591.19	16223.75	11231.91
4	PRISMATIC	1871.99	421814.34	202174.45	462730.88
		1591.19	1591.19	16223.75	11231.91
5	PRISMATIC	1871.99	421814.34	202174.45	462730.88
		1591.19	1591.19	16223.75	11231.91
6	PRISMATIC	1871.99	421814.34	202174.45	462730.88
		1591.19	1591.19	16223.75	11231.91
7	PRISMATIC	1871.99	421814.34	202174.45	462730.88
		1591.19	1591.19	16223.75	11231.91
8	PRISMATIC	576.00	27648.00	27648.00	46725.12
		489.60	489.60	2304.00	2304.00
9	PRISMATIC	576.00	27648.00	27648.00	46725.12
		489.60	489.60	2304.00	2304.00
10	PRISMATIC	576.00	27648.00	27648.00	46725.12
		489.60	489.60	2304.00	2304.00
11	PRISMATIC	576.00	27648.00	27648.00	46725.12
		489.60	489.60	2304.00	2304.00
12	PRISMATIC	576.00	27648.00	27648.00	46725.12
		489.60	489.60	2304.00	2304.00
13	PRISMATIC	576.00	27648.00	27648.00	46725.12
		489.60	489.60	2304.00	2304.00

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

88. PRINT MATERIAL PROPERTIES LIST 1 TO 13

MATERIAL PROPERTIES.

ALL UNITS ARE - KIP FEET

MEMBER	E	G	DEN	ALPHA
1	453600.0	193846.1	0.14999001	0.00000550
2	453600.0	193846.1	0.14999001	0.00000550
3	453600.0	193846.1	0.14999001	0.00000550
4	453600.0	193846.1	0.14999001	0.00000550
5	453600.0	193846.1	0.14999001	0.00000550
6	453600.0	193846.1	0.14999001	0.00000550
7	453600.0	193846.1	0.14999001	0.00000550
8	453600.0	193846.1	0.14999001	0.00000550
9	453600.0	193846.1	0.14999001	0.00000550
10	453600.0	193846.1	0.14999001	0.00000550
11	453600.0	193846.1	0.14999001	0.00000550
12	453600.0	193846.1	0.14999001	0.00000550
13	453600.0	193846.1	0.14999001	0.00000550

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

89. PRINT SUPPORT INFORMATION

SUPPORT INFORMATION (1=FIXED, 0=RELEASED)

UNITS FOR SPRING CONSTANTS ARE KIP FEET DEGREES

JOINT	FORCE-X/ KFX	FORCE-Y/ KFY	FORCE-Z/ KFZ	MOM-X/ KMX	MOM-Y/ KMY	MOM-Z/ KMZ
9	1	1	1	1	1	1
	0.0000E+00	0.0000E+00	0.0000E+00	0.000E+00	0.000E+00	0.000E+00
10	1	1	1	1	1	1
	0.0000E+00	0.0000E+00	0.0000E+00	0.000E+00	0.000E+00	0.000E+00
11	1	1	1	1	1	1
	0.0000E+00	0.0000E+00	0.0000E+00	0.000E+00	0.000E+00	0.000E+00
12	1	1	1	1	1	1
	0.0000E+00	0.0000E+00	0.0000E+00	0.000E+00	0.000E+00	0.000E+00
13	1	1	1	1	1	1
	0.0000E+00	0.0000E+00	0.0000E+00	0.000E+00	0.000E+00	0.000E+00
14	1	1	1	1	1	1
	0.0000E+00	0.0000E+00	0.0000E+00	0.000E+00	0.000E+00	0.000E+00

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

90. LOAD LIST 8 TO 12
91. PRINT SUPPORT REACTION LIST 9 TO 14

SUPPORT REACTIONS -UNIT KIP FEET STRUCTURE TYPE = SPACE

JOINT	LOAD	FORCE-X	FORCE-Y	FORCE-Z	MOM-X	MOM-Y	MOM Z
9	8	12.96	133.38	0.32	14.86	6.00	61.98
	9	11.74	122.83	0.30	14.14	5.77	58.42
	10	18.49	168.28	0.23	9.44	4.51	11.19
	11	17.46	165.20	0.32	15.15	5.85	39.15
	12	16.24	154.65	0.31	14.43	5.61	35.58
10	8	-0.03	101.02	-8.88	64.35	8.11	1.13
	9	0.05	100.18	-8.78	63.93	7.33	-2.07
	10	1.07	14.67	1.86	60.70	-0.37	-47.07
	11	0.47	57.50	-3.44	64.67	5.09	-20.72
	12	0.55	56.66	-3.34	64.25	4.30	-23.92
11	8	-0.19	147.85	14.93	-54.85	6.80	8.16
	9	-0.13	153.13	15.58	-55.12	6.85	5.49
	10	0.89	70.09	5.18	-57.04	11.21	-39.84
	11	0.28	141.26	14.11	-54.34	9.49	-12.83
	12	0.34	146.54	14.77	-54.61	9.54	-15.50
12	8	-0.01	133.93	-13.18	55.54	7.90	0.38
	9	0.02	143.96	-14.43	55.48	7.43	-1.03
	10	1.27	157.25	-16.10	54.08	-0.60	-52.74
	11	0.53	139.69	-13.89	56.05	4.98	-22.67
	12	0.56	149.72	-15.15	55.98	4.51	-24.08
13	8	-0.19	86.91	7.12	-63.55	6.78	8.14
	9	-0.16	90.91	7.63	-63.51	6.67	6.57
	10	1.20	143.06	14.15	-64.49	12.94	-49.07
	11	0.38	130.21	12.54	-63.25	10.08	-15.82
	12	0.41	134.21	13.04	-63.20	9.97	-17.39
14	8	-12.55	128.22	-0.31	-14.02	5.99	-52.23
	9	-11.53	120.30	-0.30	-13.69	5.75	-53.86
	10	-2.32	57.96	-0.27	-13.46	4.76	-111.06
	11	-8.10	97.46	-0.31	-13.76	6.16	-77.22
	12	-7.08	89.54	-0.30	-13.42	5.92	-78.85

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

```
 92. LOAD LIST 13 TO 17
 93. SECTION 0 0.158 0.5 0.842 1 MEMB 1 TO 7
 94. PRINT MEMBER SECTION FORCES LIST 1 TO 7
```

MEMBER FORCES AT INTERMEDIATE SECTIONS

ALL UNITS ARE -- KIP FEET

MEMB	LOAD	SEC	SHEAR-Y	SHEAR-Z	MOM-Y	MOM-Z
1	13	0.16	-1.41	0.00	0.00	0.38
		0.50	-8.45	0.00	0.00	4.97
		0.84	-19.49	0.00	0.00	21.29
	14	0.16	-1.41	0.00	0.00	0.38
		0.50	-8.45	0.00	0.00	4.97
		0.84	-19.49	0.00	0.00	21.29
	15	0.16	-1.41	0.00	0.00	0.38
		0.50	-8.45	0.00	0.00	4.97
		0.84	-19.49	0.00	0.00	21.29
	16	0.16	-1.41	0.00	0.00	0.38
		0.50	-8.45	0.00	0.00	4.97
		0.84	-19.49	0.00	0.00	21.29
	17	0.16	-1.41	0.00	0.00	0.38
		0.50	-8.45	0.00	0.00	4.97
		0.84	-19.49	0.00	0.00	21.29
2	13	0.16	97.85	0.52	16.56	-11.04
		0.50	-7.22	0.52	17.68	-66.87
		0.84	-27.68	0.52	18.79	-29.08
	14	0.16	68.10	0.48	15.41	33.59
		0.50	47.63	0.48	16.45	-91.74
		0.84	27.16	0.48	17.49	-172.74
	15	0.16	110.05	0.29	9.66	62.02
		0.50	89.58	0.29	10.29	-154.18
		0.84	69.12	0.29	10.93	-326.05
	16	0.16	114.55	0.44	13.84	12.68
		0.50	43.39	0.44	14.80	-133.01
		0.84	22.92	0.44	15.76	-204.82
	17	0.16	96.72	0.42	13.15	39.43
		0.50	76.26	0.42	14.06	-147.91
		0.84	55.79	0.42	14.98	-290.92
3	13	0.16	42.30	-15.01	16.44	-51.83
		0.50	-62.77	-15.01	-16.06	40.87
		0.84	-83.23	-15.01	-48.57	198.99
	14	0.16	10.16	-14.77	15.91	-226.00
		0.50	-10.30	-14.77	-16.07	-225.84
		0.84	-30.77	-14.77	-48.05	-181.36
	15	0.16	-5.39	1.08	28.37	-318.70
		0.50	-25.85	1.08	30.70	-284.86
		0.84	-46.32	1.08	33.03	-206.70
	16	0.16	12.36	-8.08	22.48	-210.84
		0.50	-58.80	-8.08	4.98	-118.28
		0.84	-79.27	-8.08	-12.52	31.26
	17	0.16	-6.90	-7.93	22.16	-315.22
		0.50	-27.36	-7.93	4.98	-278.11
		0.84	-47.83	-7.93	-12.21	-196.68

MEMBER FORCES AT INTERMEDIATE SECTIONS

ALL UNITS ARE -- KIP FEET

MEMB	LOAD	SEC	SHEAR-Y	SHEAR-Z	MOM-Y	MOM-Z
4	13	0.16	64.37	10.54	-37.54	196.41
		0.50	43.91	10.54	-14.72	79.14
		0.84	23.44	10.54	8.10	6.20
	14	0.16	47.13	12.63	-36.70	-202.49
		0.50	26.66	12.63	-9.34	-282.40
		0.84	-78.41	12.63	18.01	-198.18
	15	0.16	-48.79	6.18	41.14	-53.58
		0.50	-69.25	6.18	54.53	74.26
		0.84	-89.72	6.18	67.91	246.43
	16	0.16	23.35	8.81	-2.81	102.77
		0.50	2.89	8.81	16.27	74.35
		0.84	-17.58	8.81	35.34	90.26
	17	0.16	13.02	10.06	-2.30	-136.29
		0.50	-7.45	10.06	19.49	-142.32
		0.84	-78.62	10.06	41.28	-32.22
5	13	0.16	48.92	-10.30	20.55	-121.01
		0.50	28.46	-10.30	-1.75	-204.81
		0.84	7.99	-10.30	-24.06	-244.28
	14	0.16	59.97	-11.74	30.68	-182.05
		0.50	39.50	-11.74	5.24	-289.78
		0.84	-65.56	-11.74	-20.19	-205.18
	15	0.16	21.12	-16.39	69.41	346.49
		0.50	0.66	-16.39	33.90	322.91
		0.84	-19.81	-16.39	-1.61	343.65
	16	0.16	27.32	-13.24	44.02	69.13
		0.50	6.85	-13.24	15.35	32.13
		0.84	-13.62	-13.24	-13.32	39.46
	17	0.16	33.94	-14.10	50.09	32.55
		0.50	13.47	-14.10	19.54	-18.79
		0.84	-57.70	-14.10	-11.00	62.89
6	13	0.16	-44.69	0.49	-18.33	-251.66
		0.50	-65.15	0.49	-17.27	-132.70
		0.84	-85.62	0.49	-16.20	30.59
	14	0.16	-22.36	0.47	-17.23	-136.70
		0.50	-42.82	0.47	-16.22	-66.11
		0.84	-63.29	0.47	-15.21	48.81
	15	0.16	72.59	0.36	-12.32	318.85
		0.50	52.12	0.36	-11.55	183.78
		0.84	31.66	0.36	-10.78	93.05
	16	0.16	14.58	0.42	-15.80	32.57
		0.50	-5.88	0.42	-14.89	23.15
		0.84	-26.35	0.42	-13.97	58.06
	17	0.16	27.96	0.41	-15.14	101.46
		0.50	7.50	0.41	-14.26	63.05
		0.84	-12.97	0.41	-13.38	68.98

MEMBER FORCES AT INTERMEDIATE SECTIONS

ALL UNITS ARE -- KIP FEET

MEMB	LOAD	SEC	SHEAR-Y	SHEAR-Z	MOM-Y	MOM-Z
7	13	0.16	17.78	0.00	0.00	18.51
		0.50	6.74	0.00	0.00	4.19
		0.84	1.41	0.00	0.00	0.38
	14	0.16	17.78	0.00	0.00	18.51
		0.50	6.74	0.00	0.00	4.19
		0.84	1.41	0.00	0.00	0.38
	15	0.16	17.78	0.00	0.00	18.51
		0.50	6.74	0.00	0.00	4.19
		0.84	1.41	0.00	0.00	0.38
	16	0.16	17.78	0.00	0.00	18.51
		0.50	6.74	0.00	0.00	4.19
		0.84	1.41	0.00	0.00	0.38
	17	0.16	17.78	0.00	0.00	18.51
		0.50	6.74	0.00	0.00	4.19
		0.84	1.41	0.00	0.00	0.38

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

95. PRINT MAXFORCE ENVELOPE NSECTION 10 LIST 1 TO 7

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
1	MAX	0.00	0.00	15	33.19	3.42	13			
		0.00	0.00	13	0.00	3.42	13	0.00	0.00	13
	MIN	-24.59	3.42	17	0.00	0.00	15			
		0.00	3.42	14	0.00	3.08	14	0.00	3.42	17
2	MAX	124.01	0.00	16	176.88	0.00	15			
		0.52	0.00	13	19.31	6.33	13	20.85 C	0.00	13
	MIN	-37.14	6.33	13	-390.48	6.33	15			
		0.29	6.33	15	9.36	0.00	15	16.47 C	6.33	17
3	MAX	104.22	0.00	14	287.01	6.33	13			
		1.08	0.00	15	34.11	6.33	15	20.70 C	0.00	13
	MIN	-124.83	6.33	14	-320.04	0.63	15			
		-15.01	6.33	13	-63.59	6.33	13	17.19 C	6.33	17
4	MAX	73.83	0.00	13	340.94	6.33	15			
		12.63	0.00	14	74.09	6.33	15	20.29 C	0.00	13
	MIN	-99.17	6.33	15	-297.39	3.80	14			
		6.18	6.33	15	-49.34	0.00	14	17.25 C	6.33	14
5	MAX	142.98	0.00	13	372.36	0.00	15			
		-10.30	0.00	13	85.81	0.00	15	20.18 C	0.00	13
	MIN	-75.02	6.33	14	-294.57	3.80	14			
		-16.39	6.33	15	-34.37	6.33	13	17.11 C	6.33	17
6	MAX	82.04	0.00	15	396.21	0.00	15			
		0.49	0.00	13	-10.42	6.33	15	19.74 C	0.00	13
	MIN	-95.08	6.33	13	-270.49	0.00	13			
		0.36	6.33	15	-18.82	0.00	13	14.84 C	6.33	15
7	MAX	22.88	0.00	13	29.48	0.00	13			
		0.00	0.00	16	0.00	0.00	13	0.95 C	0.00	15
	MIN	0.00	3.42	16	0.00	3.42	15			
		0.00	3.42	14	0.00	3.08	14	0.00 T	3.42	13

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

96. FINISH

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

**** DATE= AUG 28,2006 TIME= 9:59:13 ****

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************************************************************
*         For questions on STAAD.Pro, please contact       *
*   Research Engineers Offices at the following locations  *
*                                                          *
*              Telephone               Email               *
*  USA:      +1 (714)974-2500       support@reiusa.com      *
*  CANADA    +1 (905)632-4771       detech@odandetech.com   *
*  CANADA    +1 (604)629 6087       staad@dowco.com         *
*  UK        +44(1454)207-000       support@reel.co.uk      *
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*                                                          *
*  North America                   support@reiusa.com       *
*  Europe                          support@reel.co.uk       *
*  Asia                            support@reiasia.net      *
************************************************************
```

Information about the key files in the current distribution

Modfication Date	CRC	Size (Bytes)	File Name
02/27/2006	0x8140	12701696	SProStaad.exe
12/16/2004	0xca81	04558848	SProStaadStl.exe
09/19/2003	0x2fc0	00081970	CMesh.dll
02/06/2006	0x5601	02486272	dbsectioninterface.dll
01/23/2001	0x9b40	00073728	LoadGen.dll
09/25/2003	0x6340	00704512	MeshEngine.dll
09/22/2003	0xce00	00069632	QuadPlateEngine.dll
12/22/2005	0x4181	00094208	SurfMesh.dll
09/30/2005	0x2dc1	00475136	aiscsections.mdb
01/05/2005	0x79c1	00319488	aiscsections_all_editions.mdb
01/05/2005	0x4b81	01810432	aiscsteeljoists.mdb
01/05/2005	0xcac1	03651584	aitctimbersections.mdb
01/27/2005	0xeb01	00552960	aluminumsections.mdb
01/05/2005	0xcd01	00163840	australiansections.mdb
01/05/2005	0x6a41	00229376	britishsections.mdb
07/08/2005	0x9d41	00434176	bscoldformedsections.mdb
06/28/2005	0x8201	00327680	butlercoldformedsections.mdb
01/05/2005	0xabc0	00262144	canadiansections.mdb
05/31/2005	0x9e81	00450560	canadiantimbersections.mdb
05/05/2005	0x7f80	00409600	chinesesections.mdb
01/05/2005	0xd6c0	00600064	dutchsections.mdb
01/05/2005	0x1a00	00354304	europeansections.mdb
01/05/2005	0xd301	00202752	frenchsections.mdb
01/05/2005	0x11c1	00233472	germansections.mdb
01/05/2005	0x3c40	00264192	indiansections.mdb
01/05/2005	0xd540	00180224	iscoldformedsections.mdb
01/24/2006	0x2501	00221184	japanesesections.mdb
11/08/2005	0x9081	00376832	Kingspancoldformedsections.mdb
01/05/2005	0xb740	00174080	koreansections.mdb
02/03/2005	0xda00	00096256	lysaghtcoldformedsections.mdb
02/07/2005	0x9a00	00243712	mexicansteeltables.mdb
01/04/2006	0x8980	00413696	RCecoColdFormedSections.mdb
02/03/2005	0x9b40	00307200	russiansections.mdb
01/05/2005	0x9081	00206848	southafricansections.mdb
01/06/2005	0x9341	00194560	spanishsections.mdb
01/04/2006	0x8680	00223232	uscoldformedsections.mdb
01/05/2005	0xbac0	00149504	usersectionstemplate.mdb
01/05/2005	0x9d41	00141312	venezuelansections.mdb

REINFORCED BEAM CAP

Reinforing Yield Strength $Fy := 40000psi$

Concrete Compresion Strength $Fc := 3000psi$

Width of Beam $b := 4.3333ft$

Depth of Reinforcemnt $dt := 2.625ft$ Top Reinforcement $db := 2.5833ft$ Bottom Reinforcement

Positive Reinforcement Area $Asp := 6.24in^2$

Negative Reinforcement Area $Asn := 7.8in^2$

$\rho w := \frac{Asp}{b \cdot db}$ Reinforcement Ratio

Factored Shear at Section $Vu := 114.55k$

Factored Moment at Section $Mu := 12.68k \cdot ft$

Positive Moment Capacity: Compression Steel neglected $\phi f := 0.9$

Tension in Reinforcemnt $Tp := Asp \cdot Fy$

Depth of Compression Block $ap := \frac{Tp}{0.85 \cdot Fc \cdot b}$

$\phi Mnp := \phi f Tp \cdot \left(db - \frac{ap}{2} \right)$ $\phi Mnp = 563\ ft\,k$

Negative Moment Capacity: Compression Steel neglected

Tension in Reinforcemnt $Tn := Asn \cdot Fy$

Depth of Compression Block $an := \frac{Tn}{0.85 \cdot Fc \cdot b}$

$\phi Mnn := \phi f Tn \cdot \left(dt - \frac{an}{2} \right)$ $\phi Mnn = 710\ ft\,k$

Shear Capacity Stirrup Spacing $S := 11in$ Stirrup Area $Av := 0.62in^2$

$Vc1 := 2 \cdot psi \sqrt{\frac{Fc}{psi}} \cdot b \cdot db$ $Vc1 = 177\,k$

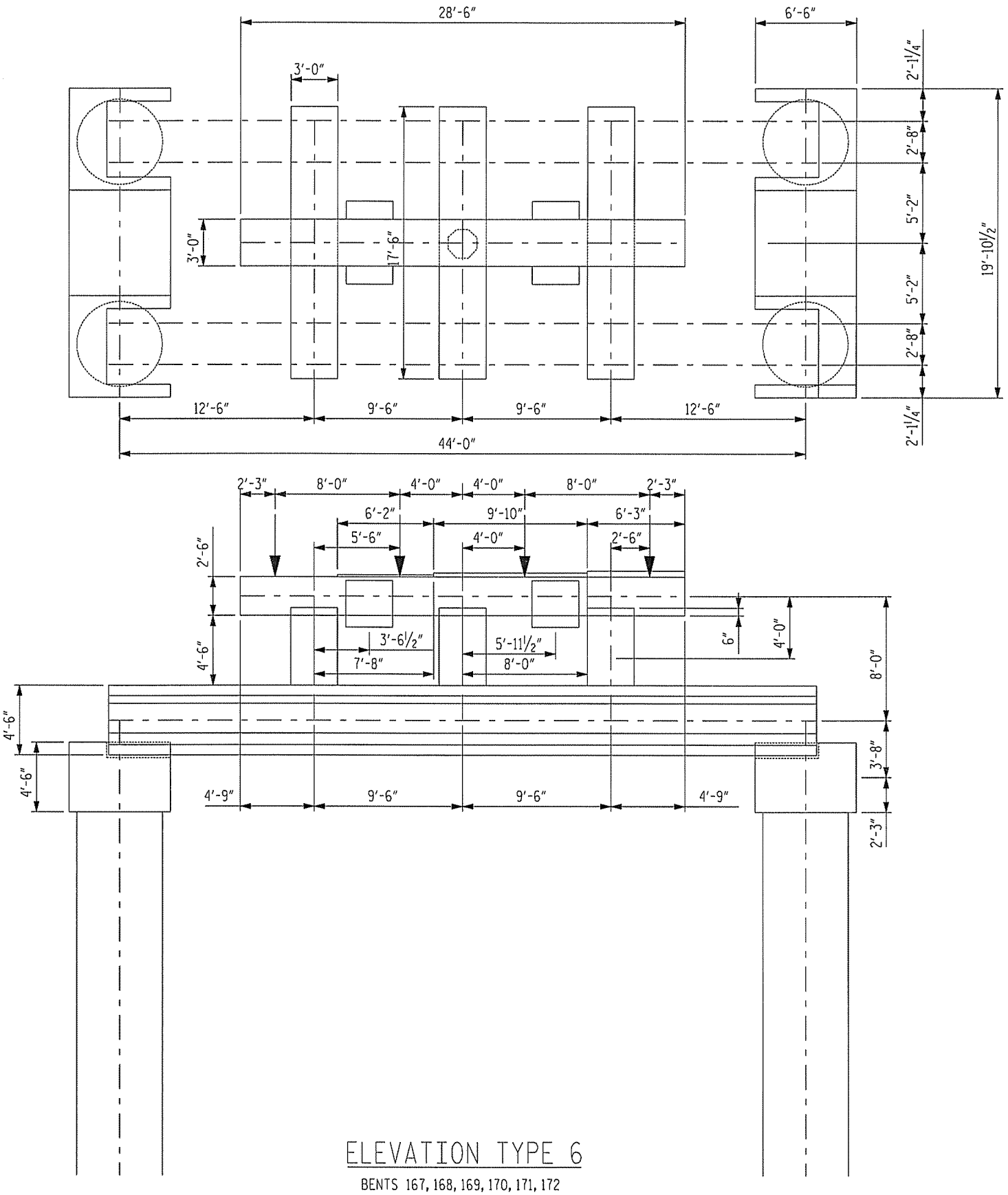
$Vc2 := \left(1.9 \cdot \sqrt{\frac{Fc}{psi}} + 2500 \cdot \rho w \frac{Vu \cdot db}{Mu} \right) \cdot b \cdot db \cdot psi$ $Vc2 = 532\,k$

$Vc3 := 3.5 \cdot psi \sqrt{\frac{Fc}{psi}} \cdot b \cdot db$ $Vc3 = 309\,k$

$Vc4 := if(Vc1 < Vc2, Vc2, Vc\ Vc := if(Vc4 < Vc3, Vc4, Vc3)$ $Vc = 309\,k$

$Vs := \frac{Av \cdot Fy \cdot db}{S}$ $\phi s := 0.85$ $Vs = 70\,k$

$\phi Vn := \phi s \cdot (Vc + Vs)$ $\phi Vn = 322\,k$



ELEVATION TYPE 6

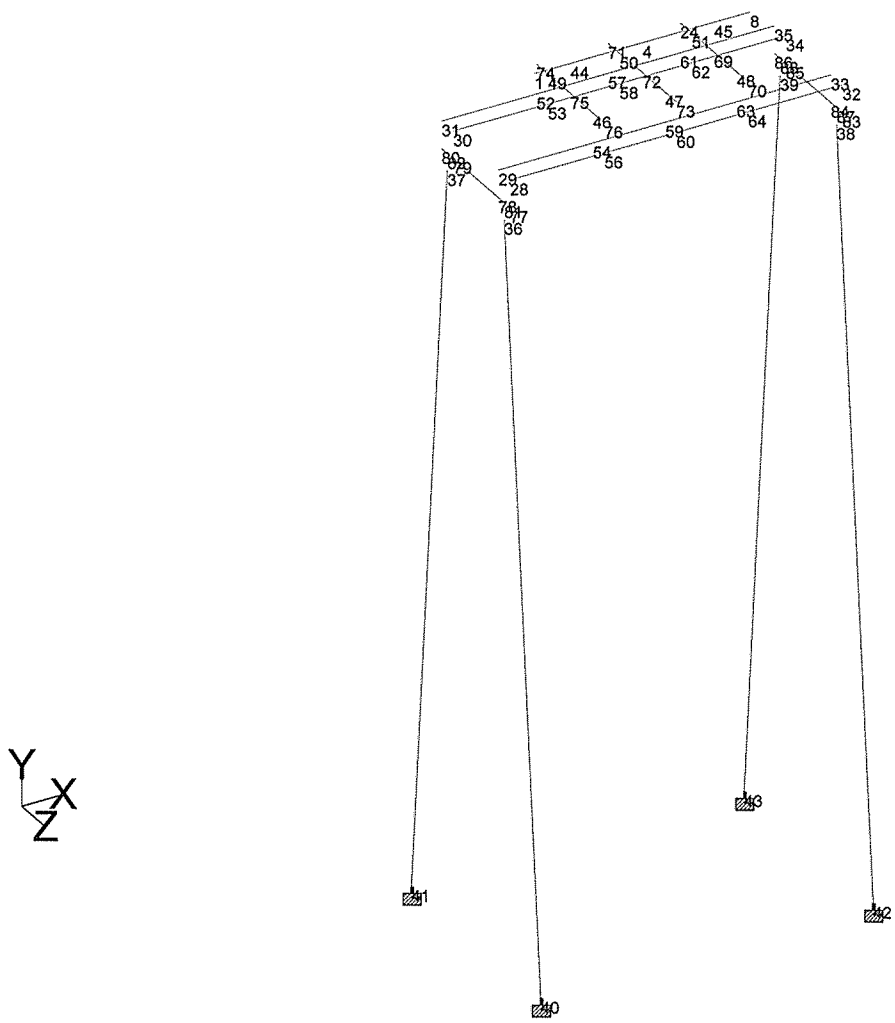
BENTS 167, 168, 169, 170, 171, 172

NBIS REPORT BENT TYPE A CRUTCH BENT 3

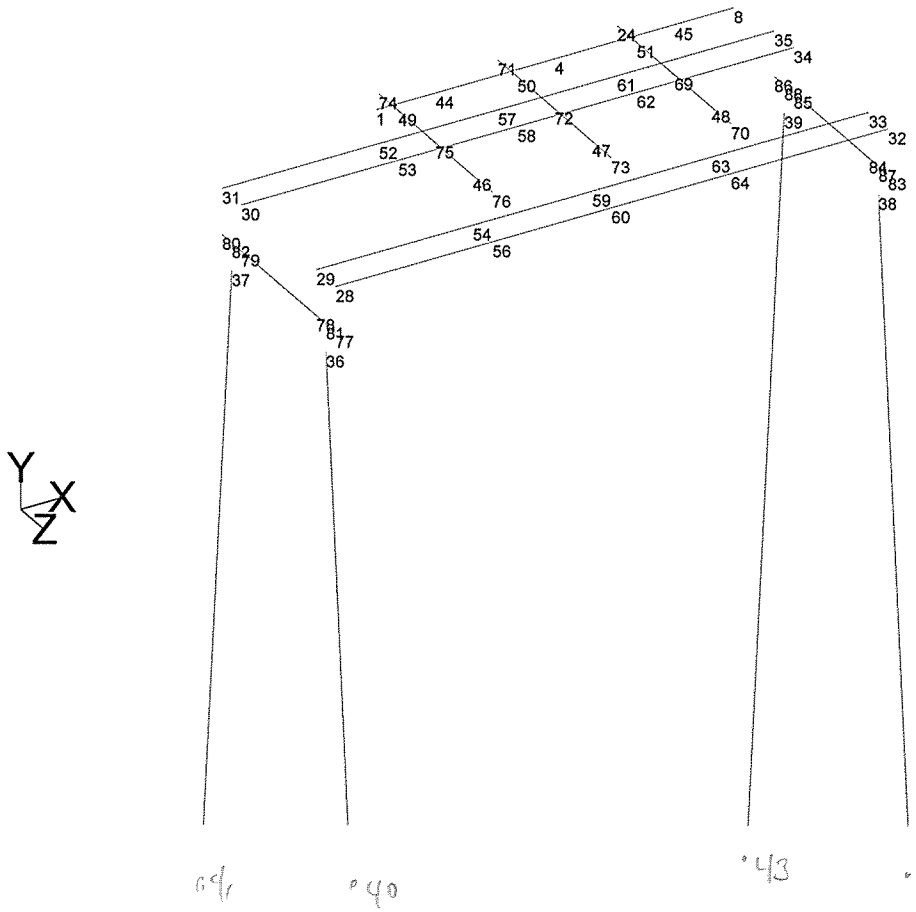
NBIS REPORT BENT TYPE C CRUTCH BENT 3

Software licensed to Ko and Associates	Job No	Sheet No 1	Rev
	Part		
Job Title	Ref		
	By MJM	Date 24-May-06	Chd
Client	File Type 6.std	Date/Time 21-Aug-2006 09:15	

AKO 8/22



MJM
✓ AMO
8/22



Load 2

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*****************************************************
*                                                   *
*           STAAD.Pro                               *
*           Version  2005    Bld 1003.US            *
*           Proprietary Program of                  *
*           Research Engineers,  Intl.              *
*           Date=    AUG 28, 2006                   *
*           Time=     9: 9: 0                       *
*                                                   *
*      USER ID: Ko and Associates                   *
*****************************************************
```

MJM
JMK
8/29

```
    1. STAAD SPACE
INPUT FILE: Type 6.STD
    2. START JOB INFORMATION
    3. ENGINEER DATE 24-MAY-06
    4. END JOB INFORMATION
    5. INPUT WIDTH 79
    6. UNIT FEET KIP
    7. JOINT COORDINATES
    8. 1 0 0 0; 4 14.25 0 0; 8 28.5 0 0; 24 23.75 -4 -7.833; 28 -7.75 -8 7.833
    9. 29 -7.75 -8 5.1667; 30 -7.75 -8 -5.1667; 31 -7.75 -8 -7.833; 32 36.25 -8 7.833
   10. 33 36.25 -8 5.1667; 34 36.25 -8 -5.167; 35 36.25 -8 -7.833
   11. 36 -7.75 -13.9167 6.5; 37 -7.75 -13.917 -6.5; 38 36.25 -13.917 6.5
   12. 39 36.25 -13.917 -6.5; 40 -7.75 -113.4 14.8333; 41 -7.75 -113.4 -14.8333
   13. 42 36.25 -113.4 14.8333; 43 36.25 -113.4 -14.8333; 44 4.75 0 0; 45 23.75 0 0
   14. 46 4.75 -4 5.1667; 47 14.25 -4 5.1667; 48 23.75 -4 5.1667; 49 4.75 -4 -5.1667
   15. 50 14.25 -4 -5.1667; 51 23.75 -4 -5.1667; 52 4.75 -8 -7.833
   16. 53 4.75 -8 -5.16679; 54 4.75 -8 5.1667; 56 4.75 -8 7.833; 57 14.25 -8 -7.833
   17. 58 14.25 -8 -5.16687; 59 14.25 -8 5.1667; 60 14.25 -8 7.833
   18. 61 23.75 -8 -7.833; 62 23.75 -8 -5.16694; 63 23.75 -8 5.1667
   19. 64 23.75 -8 7.833; 69 23.75 -4 0; 70 23.75 -4 7.833; 71 14.25 -4 -7.833
   20. 72 14.25 -4 0; 73 14.25 -4 7.833; 74 4.75 -4 -7.833; 75 4.75 -4 0
   21. 76 4.75 -4 7.833; 77 -7.75 -11.667 7.833; 78 -7.75 -11.6667 5.167
   22. 79 -7.75 -11.6667 -5.167; 80 -7.75 -11.667 -7.833; 81 -7.75 -11.6667 6.5
   23. 82 -7.75 -11.667 -6.5; 83 36.25 -11.6667 7.833; 84 36.25 -11.6667 5.167
   24. 85 36.25 -11.667 -5.167; 86 36.25 -11.67 -7.833; 87 36.25 -11.667 6.5
   25. 88 36.25 -11.6667 -6.5
   26. MEMBER INCIDENCES
   27. 22 80 82; 23 79 78; 24 78 81; 25 88 86; 26 84 85; 27 87 84; 28 28 56; 29 29 54
   28. 30 30 53; 31 31 52; 32 36 40; 33 37 41; 34 39 43; 35 38 42; 40 52 57; 42 53 58
   29. 44 54 59; 47 56 60; 49 57 61; 51 58 62; 53 59 63; 55 60 64; 57 61 35; 59 62 34
   30. 61 63 33; 63 64 32; 65 83 87; 67 85 88; 69 81 77; 71 82 79; 72 1 44; 73 44 4
   31. 74 4 45; 75 45 8; 76 24 51; 77 51 69; 78 69 48; 79 48 70; 80 71 50; 81 50 72
   32. 82 72 47; 83 47 73; 84 74 49; 85 49 75; 86 75 46; 87 46 76
   33. MEMBER PROPERTY AMERICAN
   34. 76 TO 87 PRIS YD 5 ZD 3
   35. 22 TO 27 65 67 69 71 PRIS YD 3.75 ZD 6.5
   36. 28 TO 31 40 42 44 47 49 51 53 55 57 59 61 -
   37. 63 PRIS AX 5.4792 AY 100 AZ 100 IX 1 IY 1.113 IZ 12.57
   38. MEMBER PROPERTY AMERICAN
   39. 32 TO 35 PRIS AX 7.864 IX 65.335 IY 29.07 IZ 29.07
   40. MEMBER PROPERTY AMERICAN
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41. 72 TO 75 PRIS YD 2.5 ZD 3
42. DEFINE MATERIAL START
43. ISOTROPIC CONCRETE
44. E 453600
45. POISSON 0.17
46. DENSITY 0.14999
47. ALPHA 5.5E-006
48. DAMP 0.05
49. END DEFINE MATERIAL
50. CONSTANTS
51. MATERIAL CONCRETE MEMB 22 TO 35 40 42 44 47 49 51 53 55 57 59 61 63 65 67 -
52. 69 71 TO 87
53. SUPPORTS
54. 40 TO 43 FIXED
55. SLAVE RIGID MASTER 49 JOINT 53
56. SLAVE RIGID MASTER 46 JOINT 54
57. SLAVE RIGID MASTER 50 JOINT 58
58. SLAVE RIGID MASTER 47 JOINT 59
59. SLAVE RIGID MASTER 24 JOINT 61
60. SLAVE RIGID MASTER 51 JOINT 62
61. SLAVE RIGID MASTER 48 JOINT 63
62. SLAVE RIGID MASTER 44 JOINT 75
63. SLAVE RIGID MASTER 4 JOINT 72
64. SLAVE RIGID MASTER 45 JOINT 69
65. SLAVE RIGID MASTER 70 JOINT 64
66. SLAVE RIGID MASTER 71 JOINT 57
67. SLAVE RIGID MASTER 73 JOINT 60
68. SLAVE RIGID MASTER 74 JOINT 52
69. SLAVE RIGID MASTER 76 JOINT 56
70. SLAVE RIGID MASTER 81 JOINT 36
71. SLAVE RIGID MASTER 82 JOINT 37
72. SLAVE RIGID MASTER 28 JOINT 77
73. SLAVE RIGID MASTER 29 JOINT 78
74. SLAVE RIGID MASTER 30 JOINT 79
75. SLAVE RIGID MASTER 31 JOINT 80
76. SLAVE RIGID MASTER 32 JOINT 83
77. SLAVE RIGID MASTER 33 JOINT 84
78. SLAVE RIGID MASTER 34 JOINT 85
79. SLAVE RIGID MASTER 35 JOINT 86
80. SLAVE RIGID MASTER 87 JOINT 38
81. SLAVE RIGID MASTER 88 JOINT 39
82. UNIT INCHES KIP
83. LOAD 1 LOADTYPE NONE  TITLE LIVE LOAD
84. UNIT FEET KIP
85. MEMBER LOAD
86. 72 CON GY -32.7 2.25
87. 73 CON GY -32.7 5.5
88. 74 CON GY -32.7 4
89. 75 CON GY -32.7 2.5
90. UNIT INCHES KIP
91. LOAD 2 LOADTYPE NONE  TITLE DEAD LOAD
92. UNIT FEET KIP
```

```
 93. SELFWEIGHT Y -1
 94. MEMBER LOAD
 95. 72 CON GY -101.2 2.25
 96. 73 CON GY -93.6 5.5
 97. 74 CON GY -93.6 4
 98. 75 CON GY -101.2 2.5
 99. JOINT LOAD
100. 24 70 71 73 74 76 FY -2.063
101. 81 82 87 88 FY -9.232
102. MEMBER LOAD
103. 73 CON GY -4.2 3.5417
104. 74 CON GY -4.2 5.9583
105. 73 UNI GY -0.081 1.5 7.6667
106. 74 UNI GY -0.162 0 8
107. 75 UNI GY -0.2475 0 4.75
108. 73 UNI GY -0.162 7.6667 9.5
109. 74 UNI GY -0.2475 8 9.5
110. LOAD 4 LOADTYPE NONE  TITLE CENTRIFUGAL FORCE
111. MEMBER LOAD
112. 72 CON GX -1.23 2.25
113. 73 CON GX -1.23 5.5
114. 74 CON GX -1.23 4
115. 75 CON GX -1.23 2.5
116. LOAD 5 LOADTYPE NONE  TITLE WIND ON STRUCTURE
117. JOINT LOAD
118. 8 FX -0.42
119. MEMBER LOAD
120. 72 CON GX -6.03 2.25
121. 73 CON GX -6.03 5.5
122. 74 CON GX -6.03 4
123. 75 CON GX -6.03 2.5
124. 72 CON GZ -1.45 2.25
125. 73 CON GZ -1.45 5.5
126. 74 CON GZ -1.45 4
127. 75 CON GZ -1.45 2.5
128. JOINT LOAD
129. 69 FX -4.41
130. 32 TO 35 FX -0.4115
131. 87 88 FX -1.95
132. LOAD 6 LOADTYPE NONE  TITLE WIND ON LIVE LOAD
133. MEMBER LOAD
134. 72 CON GX -1.64 2.25
135. 73 CON GX -1.64 5.5
136. 74 CON GX -1.64 4
137. 75 CON GX -1.64 2.5
138. 72 CON GZ -0.66 2.25
139. 73 CON GZ -0.66 5.5
140. 74 CON GZ -0.66 4
141. 75 CON GZ -0.66 2.5
142. LOAD 7 LOADTYPE NONE  TITLE LONGITUDINAL FORCE
143. MEMBER LOAD
144. 72 CON GZ -1.76 2.25
145. 73 CON GZ -1.76 5.5
```

```
146. 74 CON GZ -1.76 4
147. 75 CON GZ -1.76 2.5
148. LOAD COMB 9 SERVICE GROUP I
149. 2 1.0 1 1.0 4 1.0
150. LOAD COMB 11 SERVICE GROUP II
151. 2 1.0 5 1.0
152. LOAD COMB 12 SERVICE GROUP III
153. 2 1.0 1 1.0 4 1.0 5 0.3 6 1.0 7 1.0
154. LOAD COMB 14 FACTORED GROUP I
155. 2 1.3 1 2.75 4 1.3
156. LOAD COMB 16 FACTORED GROUP II
157. 2 1.3 5 1.3
158. LOAD COMB 17 FACTORED GROUP III
159. 2 1.3 1 1.65 4 1.3 5 0.39 6 1.3 7 1.3
160. PERFORM ANALYSIS PRINT STATICS CHECK
```

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

```
NUMBER OF JOINTS/MEMBER+ELEMENTS/SUPPORTS =    60/    46/     4
ORIGINAL/FINAL BAND-WIDTH=    31/     2/    137 DOF
TOTAL PRIMARY LOAD CASES =    6, TOTAL DEGREES OF FREEDOM =    174
SIZE OF STIFFNESS MATRIX =       24 DOUBLE  KILO-WORDS
REQRD/AVAIL. DISK SPACE  =     12.3/  24810.7 MB
```

STATIC LOAD/REACTION/EQUILIBRIUM SUMMARY FOR CASE NO. 1
LOADTYPE NONE TITLE LIVE LOAD

***TOTAL APPLIED LOAD (KIP FEET) SUMMARY (LOADING 1)
SUMMATION FORCE-X = 0.00
SUMMATION FORCE-Y = -130.80
SUMMATION FORCE-Z = 0.00

SUMMATION OF MOMENTS AROUND THE ORIGIN-
MX= 0.00 MY= 0.00 MZ= -1863.90

***TOTAL REACTION LOAD(KIP FEET) SUMMARY (LOADING 1)
SUMMATION FORCE-X = 0.00
SUMMATION FORCE-Y = 130.80
SUMMATION FORCE-Z = 0.00

SUMMATION OF MOMENTS AROUND THE ORIGIN-
MX= 0.00 MY= 0.00 MZ= 1863.90

MAXIMUM DISPLACEMENTS (INCH /RADIANS) (LOADING 1)

	MAXIMUMS	AT NODE
X =	-1.43092E-02	37
Y =	-4.70649E-02	4
Z =	1.68211E-03	64
RX=	3.52809E-05	61
RY=	4.18714E-05	62
RZ=	-1.98075E-04	78

STATIC LOAD/REACTION/EQUILIBRIUM SUMMARY FOR CASE NO. 2
LOADTYPE NONE TITLE DEAD LOAD

***TOTAL APPLIED LOAD (KIP FEET) SUMMARY (LOADING 2)
SUMMATION FORCE-X = 0.00
SUMMATION FORCE-Y = -1318.95
SUMMATION FORCE-Z = 0.00

SUMMATION OF MOMENTS AROUND THE ORIGIN-
MX= 0.00 MY= 0.00 MZ= -18814.68

***TOTAL REACTION LOAD(KIP FEET) SUMMARY (LOADING 2)
SUMMATION FORCE-X = 0.00
SUMMATION FORCE-Y = 1318.95
SUMMATION FORCE-Z = 0.00

SUMMATION OF MOMENTS AROUND THE ORIGIN-
MX= 0.00 MY= 0.00 MZ= 18814.68

MAXIMUM DISPLACEMENTS (INCH /RADIANS) (LOADING 2)

	MAXIMUMS	AT NODE
X =	-7.34199E-02	37
Y =	-2.70932E-01	72
Z =	6.48762E-03	64
RX=	1.35982E-04	24
RY=	2.21064E-04	62
RZ=	1.00879E-03	84

STATIC LOAD/REACTION/EQUILIBRIUM SUMMARY FOR CASE NO. 4
LOADTYPE NONE TITLE CENTRIFUGAL FORCE

***TOTAL APPLIED LOAD (KIP FEET) SUMMARY (LOADING 4)
SUMMATION FORCE-X = -4.92
SUMMATION FORCE-Y = 0.00
SUMMATION FORCE-Z = 0.00

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

***TOTAL REACTION LOAD(KIP FEET) SUMMARY (LOADING 4)
SUMMATION FORCE-X = 4.92
SUMMATION FORCE-Y = 0.00
SUMMATION FORCE-Z = 0.00

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

MAXIMUM DISPLACEMENTS (INCH /RADIANS) (LOADING 4)

	MAXIMUMS	AT NODE
X =	-1.22462E-01	59
Y =	-1.34970E-03	8
Z =	-4.38703E-05	52
RX=	8.75883E-07	74
RY=	-3.76874E-06	50
RZ=	4.43795E-05	87

STATIC LOAD/REACTION/EQUILIBRIUM SUMMARY FOR CASE NO. 5
LOADTYPE NONE TITLE WIND ON STRUCTURE

***TOTAL APPLIED LOAD (KIP FEET) SUMMARY (LOADING 5)
SUMMATION FORCE-X = -34.50
SUMMATION FORCE-Y = 0.00
SUMMATION FORCE-Z = -5.80

SUMMATION OF MOMENTS AROUND THE ORIGIN-
MX= 0.00 MY= 82.65 MZ= -76.31

```
***TOTAL REACTION LOAD( KIP  FEET ) SUMMARY (LOADING     5 )
    SUMMATION FORCE-X =       34.50
    SUMMATION FORCE-Y =        0.00
    SUMMATION FORCE-Z =        5.80

   SUMMATION OF MOMENTS AROUND THE ORIGIN-
   MX=           0.00  MY=         -82.65  MZ=          76.31


MAXIMUM DISPLACEMENTS ( INCH /RADIANS) (LOADING      5)
          MAXIMUMS    AT NODE
   X = -8.58438E-01      58
   Y =  1.03566E-02       1
   Z = -5.31272E-02      52
   RX=  1.18681E-05      85
   RY= -2.42846E-05      58
   RZ=  3.17914E-04      81


       STATIC LOAD/REACTION/EQUILIBRIUM SUMMARY FOR CASE NO.     6
       LOADTYPE NONE  TITLE WIND ON LIVE LOAD


***TOTAL APPLIED LOAD ( KIP  FEET ) SUMMARY (LOADING    6 )
    SUMMATION FORCE-X =       -6.56
    SUMMATION FORCE-Y =        0.00
    SUMMATION FORCE-Z =       -2.64

   SUMMATION OF MOMENTS AROUND THE ORIGIN-
   MX=           0.00  MY=          37.62  MZ=           0.00


***TOTAL REACTION LOAD( KIP  FEET ) SUMMARY (LOADING     6 )
    SUMMATION FORCE-X =        6.56
    SUMMATION FORCE-Y =        0.00
    SUMMATION FORCE-Z =        2.64

   SUMMATION OF MOMENTS AROUND THE ORIGIN-
   MX=           0.00  MY=         -37.62  MZ=           0.00


MAXIMUM DISPLACEMENTS ( INCH /RADIANS) (LOADING      6)
          MAXIMUMS    AT NODE
   X = -1.63282E-01      59
   Y =  2.10691E-03      35
   Z = -2.41252E-02      60
   RX=  5.04468E-06      34
   RY= -5.02509E-06      50
   RZ=  6.11692E-05      39


       STATIC LOAD/REACTION/EQUILIBRIUM SUMMARY FOR CASE NO.     7
       LOADTYPE NONE  TITLE LONGITUDINAL FORCE
```

```
***TOTAL APPLIED LOAD ( KIP  FEET ) SUMMARY (LOADING    7 )
    SUMMATION FORCE-X =        0.00
    SUMMATION FORCE-Y =        0.00
    SUMMATION FORCE-Z =       -7.04

   SUMMATION OF MOMENTS AROUND THE ORIGIN-
   MX=           0.00  MY=         100.32  MZ=           0.00


***TOTAL REACTION LOAD( KIP  FEET ) SUMMARY (LOADING     7 )
    SUMMATION FORCE-X =        0.00
    SUMMATION FORCE-Y =        0.00
    SUMMATION FORCE-Z =        7.04

   SUMMATION OF MOMENTS AROUND THE ORIGIN-
   MX=           0.00  MY=        -100.32  MZ=           0.00


MAXIMUM DISPLACEMENTS ( INCH /RADIANS) (LOADING      7)
          MAXIMUMS    AT NODE
   X = -4.96515E-04      38
   Y =  1.60876E-03      80
   Z = -6.43336E-02      60
   RX=  1.27626E-05      78
   RY= -5.33308E-06      32
   RZ= -6.19931E-06      32



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


161. PRINT MEMBER INFORMATION LIST 22 TO 35 40 42 44 47 49 51 53 55 57 59 61 63 -
162. 65 67 69 71 TO 87
```

MEMBER INFORMATION

MEMBER	START JOINT	END JOINT	LENGTH (FEET)	BETA (DEG)	RELEASES
22	80	82	1.333	0.00	
23	79	78	10.334	0.00	
24	78	81	1.333	0.00	
25	88	86	1.333	0.00	
26	84	85	10.334	0.00	
27	87	84	1.333	0.00	
28	28	56	12.500	0.00	
29	29	54	12.500	0.00	
30	30	53	12.500	0.00	
31	31	52	12.500	0.00	
32	36	40	99.832	0.00	
33	37	41	99.831	0.00	
34	39	43	99.831	0.00	
35	38	42	99.831	0.00	
40	52	57	9.500	0.00	
42	53	58	9.500	0.00	
44	54	59	9.500	0.00	
47	56	60	9.500	0.00	
49	57	61	9.500	0.00	
51	58	62	9.500	0.00	
53	59	63	9.500	0.00	
55	60	64	9.500	0.00	
57	61	35	12.500	0.00	
59	62	34	12.500	0.00	
61	63	33	12.500	0.00	
63	64	32	12.500	0.00	
65	83	87	1.333	0.00	
67	85	88	1.333	0.00	
69	81	77	1.333	0.00	
71	82	79	1.333	0.00	
72	1	44	4.750	0.00	
73	44	4	9.500	0.00	
74	4	45	9.500	0.00	
75	45	8	4.750	0.00	
76	24	51	2.666	0.00	
77	51	69	5.167	0.00	
78	69	48	5.167	0.00	
79	48	70	2.666	0.00	
80	71	50	2.666	0.00	
81	50	72	5.167	0.00	
82	72	47	5.167	0.00	
83	47	73	2.666	0.00	
84	74	49	2.666	0.00	
85	49	75	5.167	0.00	
86	75	46	5.167	0.00	
87	46	76	2.666	0.00	

MEMBER INFORMATION

MEMBER	START JOINT	END JOINT	LENGTH (FEET)	BETA (DEG)	RELEASES

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

```
163. PRINT MEMBER PROPERTIES LIST 22 TO 35 40 42 44 47 49 51 53 55 57 59 61 63 -
164. 65 67 69 71 TO 87
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MEMBER PROPERTIES. UNIT - INCH

MEMB	PROFILE	AX/ AY	IZ/ AZ	IY/ SZ	IX/ SY
22	PRISMATIC	3510.00	592312.50	1779570.00	1516068.62
		2983.50	2983.50	26325.00	45630.00
23	PRISMATIC	3510.00	592312.50	1779570.00	1516068.62
		2983.50	2983.50	26325.00	45630.00
24	PRISMATIC	3510.00	592312.50	1779570.00	1516068.62
		2983.50	2983.50	26325.00	45630.00
25	PRISMATIC	3510.00	592312.50	1779570.00	1516068.62
		2983.50	2983.50	26325.00	45630.00
26	PRISMATIC	3510.00	592312.50	1779570.00	1516068.62
		2983.50	2983.50	26325.00	45630.00
27	PRISMATIC	3510.00	592312.50	1779570.00	1516068.62
		2983.50	2983.50	26325.00	45630.00
28	PRISMATIC	789.00	260651.52	23079.17	20736.00
		14400.00	14400.00	52182.49	4620.45
29	PRISMATIC	789.00	260651.52	23079.17	20736.00
		14400.00	14400.00	52182.49	4620.45
30	PRISMATIC	789.00	260651.52	23079.17	20736.00
		14400.00	14400.00	52182.49	4620.45
31	PRISMATIC	789.00	260651.52	23079.17	20736.00
		14400.00	14400.00	52182.49	4620.45
32	PRISMATIC	1132.42	602795.50	602795.50	1354786.50
		0.00	0.00	120679.78	120679.78
33	PRISMATIC	1132.42	602795.50	602795.50	1354786.50
		0.00	0.00	120679.78	120679.78
34	PRISMATIC	1132.42	602795.50	602795.50	1354786.50
		0.00	0.00	120679.78	120679.78
35	PRISMATIC	1132.42	602795.50	602795.50	1354786.50
		0.00	0.00	120679.78	120679.78
40	PRISMATIC	789.00	260651.52	23079.17	20736.00
		14400.00	14400.00	52182.49	4620.45
42	PRISMATIC	789.00	260651.52	23079.17	20736.00
		14400.00	14400.00	52182.49	4620.45
44	PRISMATIC	789.00	260651.52	23079.17	20736.00
		14400.00	14400.00	52182.49	4620.45
47	PRISMATIC	789.00	260651.52	23079.17	20736.00
		14400.00	14400.00	52182.49	4620.45
49	PRISMATIC	789.00	260651.52	23079.17	20736.00
		14400.00	14400.00	52182.49	4620.45
51	PRISMATIC	789.00	260651.52	23079.17	20736.00
		14400.00	14400.00	52182.49	4620.45
53	PRISMATIC	789.00	260651.52	23079.17	20736.00
		14400.00	14400.00	52182.49	4620.45
55	PRISMATIC	789.00	260651.52	23079.17	20736.00
		14400.00	14400.00	52182.49	4620.45
57	PRISMATIC	789.00	260651.52	23079.17	20736.00
		14400.00	14400.00	52182.49	4620.45
59	PRISMATIC	789.00	260651.52	23079.17	20736.00
		14400.00	14400.00	52182.49	4620.45

MEMBER PROPERTIES. UNIT - INCH

MEMB	PROFILE	AX/ AY	IZ/ AZ	IY/ SZ	IX/ SY
61	PRISMATIC	789.00	260651.52	23079.17	20736.00
		14400.00	14400.00	52182.49	4620.45
63	PRISMATIC	789.00	260651.52	23079.17	20736.00
		14400.00	14400.00	52182.49	4620.45
65	PRISMATIC	3510.00	592312.50	1779570.00	1516068.62
		2983.50	2983.50	26325.00	45630.00
67	PRISMATIC	3510.00	592312.50	1779570.00	1516068.62
		2983.50	2983.50	26325.00	45630.00
69	PRISMATIC	3510.00	592312.50	1779570.00	1516068.62
		2983.50	2983.50	26325.00	45630.00
71	PRISMATIC	3510.00	592312.50	1779570.00	1516068.62
		2983.50	2983.50	26325.00	45630.00
72	PRISMATIC	1080.00	81000.00	116640.00	160735.94
		918.00	918.00	5400.00	6480.00
73	PRISMATIC	1080.00	81000.00	116640.00	160735.94
		918.00	918.00	5400.00	6480.00
74	PRISMATIC	1080.00	81000.00	116640.00	160735.94
		918.00	918.00	5400.00	6480.00
75	PRISMATIC	1080.00	81000.00	116640.00	160735.94
		918.00	918.00	5400.00	6480.00
76	PRISMATIC	2160.00	648000.00	233280.00	584210.00
		1836.00	1836.00	21600.00	12960.00
77	PRISMATIC	2160.00	648000.00	233280.00	584210.00
		1836.00	1836.00	21600.00	12960.00
78	PRISMATIC	2160.00	648000.00	233280.00	584210.00
		1836.00	1836.00	21600.00	12960.00
79	PRISMATIC	2160.00	648000.00	233280.00	584210.00
		1836.00	1836.00	21600.00	12960.00
80	PRISMATIC	2160.00	648000.00	233280.00	584210.00
		1836.00	1836.00	21600.00	12960.00
81	PRISMATIC	2160.00	648000.00	233280.00	584210.00
		1836.00	1836.00	21600.00	12960.00
82	PRISMATIC	2160.00	648000.00	233280.00	584210.00
		1836.00	1836.00	21600.00	12960.00
83	PRISMATIC	2160.00	648000.00	233280.00	584210.00
		1836.00	1836.00	21600.00	12960.00
84	PRISMATIC	2160.00	648000.00	233280.00	584210.00
		1836.00	1836.00	21600.00	12960.00
85	PRISMATIC	2160.00	648000.00	233280.00	584210.00
		1836.00	1836.00	21600.00	12960.00
86	PRISMATIC	2160.00	648000.00	233280.00	584210.00
		1836.00	1836.00	21600.00	12960.00
87	PRISMATIC	2160.00	648000.00	233280.00	584210.00
		1836.00	1836.00	21600.00	12960.00

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

165. PRINT MATERIAL PROPERTIES LIST 22 TO 35 40 42 44 47 49 51 53 55 57 59 61 63 -
166. 65 67 69 71 TO 87

MATERIAL PROPERTIES.

ALL UNITS ARE - KIP FEET

MEMBER	E	G	DEN	ALPHA
22	453600.0	193846.1	0.14999001	0.00000550
23	453600.0	193846.1	0.14999001	0.00000550
24	453600.0	193846.1	0.14999001	0.00000550
25	453600.0	193846.1	0.14999001	0.00000550
26	453600.0	193846.1	0.14999001	0.00000550
27	453600.0	193846.1	0.14999001	0.00000550
28	453600.0	193846.1	0.14999001	0.00000550
29	453600.0	193846.1	0.14999001	0.00000550
30	453600.0	193846.1	0.14999001	0.00000550
31	453600.0	193846.1	0.14999001	0.00000550
32	453600.0	193846.1	0.14999001	0.00000550
33	453600.0	193846.1	0.14999001	0.00000550
34	453600.0	193846.1	0.14999001	0.00000550
35	453600.0	193846.1	0.14999001	0.00000550
40	453600.0	193846.1	0.14999001	0.00000550
42	453600.0	193846.1	0.14999001	0.00000550
44	453600.0	193846.1	0.14999001	0.00000550
47	453600.0	193846.1	0.14999001	0.00000550
49	453600.0	193846.1	0.14999001	0.00000550
51	453600.0	193846.1	0.14999001	0.00000550
53	453600.0	193846.1	0.14999001	0.00000550
55	453600.0	193846.1	0.14999001	0.00000550
57	453600.0	193846.1	0.14999001	0.00000550
59	453600.0	193846.1	0.14999001	0.00000550
61	453600.0	193846.1	0.14999001	0.00000550
63	453600.0	193846.1	0.14999001	0.00000550
65	453600.0	193846.1	0.14999001	0.00000550
67	453600.0	193846.1	0.14999001	0.00000550
69	453600.0	193846.1	0.14999001	0.00000550
71	453600.0	193846.1	0.14999001	0.00000550
72	453600.0	193846.1	0.14999001	0.00000550
73	453600.0	193846.1	0.14999001	0.00000550
74	453600.0	193846.1	0.14999001	0.00000550
75	453600.0	193846.1	0.14999001	0.00000550
76	453600.0	193846.1	0.14999001	0.00000550
77	453600.0	193846.1	0.14999001	0.00000550
78	453600.0	193846.1	0.14999001	0.00000550
79	453600.0	193846.1	0.14999001	0.00000550
80	453600.0	193846.1	0.14999001	0.00000550
81	453600.0	193846.1	0.14999001	0.00000550
82	453600.0	193846.1	0.14999001	0.00000550
83	453600.0	193846.1	0.14999001	0.00000550
84	453600.0	193846.1	0.14999001	0.00000550
85	453600.0	193846.1	0.14999001	0.00000550
86	453600.0	193846.1	0.14999001	0.00000550
87	453600.0	193846.1	0.14999001	0.00000550

MATERIAL PROPERTIES.

ALL UNITS ARE - KIP FEET

MEMBER	E	G	DEN	ALPHA

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

167. PRINT SUPPORT INFORMATION

SUPPORT INFORMATION (1=FIXED, 0=RELEASED)

UNITS FOR SPRING CONSTANTS ARE KIP FEET DEGREES

JOINT	FORCE-X/ KFX	FORCE-Y/ KFY	FORCE-Z/ KFZ	MOM-X/ KMX	MOM-Y/ KMY	MOM-Z/ KMZ
40	1	1	1	1	1	1
	0.0000E+00	0.0000E+00	0.0000E+00	0.000E+00	0.000E+00	0.000E+00
41	1	1	1	1	1	1
	0.0000E+00	0.0000E+00	0.0000E+00	0.000E+00	0.000E+00	0.000E+00
42	1	1	1	1	1	1
	0.0000E+00	0.0000E+00	0.0000E+00	0.000E+00	0.000E+00	0.000E+00
43	1	1	1	1	1	1
	0.0000E+00	0.0000E+00	0.0000E+00	0.000E+00	0.000E+00	0.000E+00

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

168. LOAD LIST 9 11 12
169. PRINT SUPPORT REACTION LIST 40 TO 43

SUPPORT REACTIONS -UNIT KIP FEET STRUCTURE TYPE = SPACE

JOINT	LOAD	FORCE-X	FORCE-Y	FORCE-Z	MOM-X	MOM-Y	MOM Z
40	9	11.64	365.50	-25.30	96.67	-48.92	-430.43
	11	17.26	342.99	-22.70	131.31	-73.57	-771.41
	12	15.78	359.36	-23.36	165.86	-67.63	-657.52
41	9	11.64	365.50	25.30	-96.67	48.92	-430.44
	11	17.35	360.46	25.60	-61.59	72.84	-774.53
	12	15.94	393.76	29.07	-28.57	66.20	-663.65
42	9	-9.18	359.37	-24.79	96.36	38.42	296.14
	11	-0.01	299.01	-19.07	129.13	0.01	-168.87
	12	-4.86	331.12	-21.03	164.46	21.08	62.42
43	9	-9.18	359.37	24.79	-96.36	-38.42	296.14
	11	-0.10	316.48	21.97	-59.41	0.72	-165.76
	12	-5.03	365.52	26.74	-27.17	-19.64	68.55

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

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170. LOAD LIST 14 16 17
171. SECTION 0 0.158 0.5 0.842 1 MEMB 73 74
172. SECTION 0 0.5 0.684 1 MEMB 72 75
173. PRINT MEMBER SECTION FORCES LIST 72 TO 75
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MEMBER FORCES AT INTERMEDIATE SECTIONS

ALL UNITS ARE -- KIP FEET

MEMB	LOAD	SEC	SHEAR-Y	SHEAR-Z	MOM-Y	MOM-Z
72	14	0.50	-224.96	0.00	0.00	31.81
		0.68	-226.24	0.00	0.00	228.98
	16	0.50	-135.03	-1.88	-0.24	20.57
		0.68	-136.31	-1.88	-1.88	139.15
	17	0.50	-188.99	-3.71	-0.46	27.31
		0.68	-190.27	-3.71	-3.71	193.05
73	14	0.16	164.81	0.00	0.00	322.68
		0.50	154.25	0.00	0.00	-197.90
		0.84	-62.48	0.00	0.00	-161.99
	16	0.16	112.58	1.76	-4.76	230.48
		0.50	102.03	1.76	0.96	-120.41
		0.84	-24.78	-0.12	1.98	-139.54
	17	0.16	144.96	3.47	-9.37	289.28
		0.50	134.40	3.47	1.90	-166.82
		0.84	-46.36	-0.24	3.89	-156.31
74	14	0.16	64.71	0.00	0.00	-155.63
		0.50	-152.33	0.00	0.00	-198.36
		0.84	-163.22	0.00	0.00	316.52
	16	0.16	36.26	0.12	1.98	-102.88
		0.50	-90.85	-1.76	0.96	-120.60
		0.84	-101.75	-1.76	-4.76	194.56
	17	0.16	54.40	0.24	3.89	-131.23
		0.50	-126.67	-3.47	1.90	-167.42
		0.84	-137.57	-3.47	-9.37	264.11
75	14	0.50	225.72	0.00	0.00	32.72
		0.68	2.68	0.00	0.00	2.01
	16	0.50	135.80	1.88	-0.24	21.48
		0.68	2.68	0.00	0.00	2.01
	17	0.50	189.75	3.71	-0.46	28.22
		0.68	2.68	0.00	0.00	2.01

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

174. PRINT MAXFORCE ENVELOPE NSECTION 10 LIST 23 26 28 TO 31 40 42 44 47 49 51 -

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
175. 53 55 57 59 61 63 72 TO 75 77 78 81 82 85 86										
23	MAX	42.46	0.00	17	192.51	0.00	17			
		0.00	0.00	14	-57.58	0.00	14	16.78 C	0.00	16
	MIN	-24.56	10.33	14	3.19	9.30	17			
		-2.98	10.33	17	-90.98	10.33	16	15.99 C	10.33	14
26	MAX	24.55	0.00	14	186.95	10.33	17			
		2.98	0.00	17	13.15	10.33	16	15.44 C	10.33	14
	MIN	-42.46	10.33	17	-2.38	1.03	17			
		0.00	10.33	14	-44.70	0.00	14	12.83 C	0.00	16
28	MAX	126.21	0.00	14	560.38	0.00	16			
		-6.08	0.00	16	47.92	0.00	14	10.70 T	0.00	16
	MIN	89.49	12.50	16	-1056.78	12.50	14			
		-9.95	12.50	14	-76.47	12.50	14	22.97 T	12.50	14
29	MAX	194.05	0.00	14	813.86	0.00	17			
		-6.65	0.00	16	52.01	0.00	14	40.58 C	0.00	14
	MIN	136.47	12.50	16	-1569.48	12.50	14			
		-10.87	12.50	14	-83.92	12.50	14	34.65 C	12.50	16
30	MAX	194.05	0.00	14	837.62	0.00	17			
		11.60	0.00	17	86.84	12.50	17	40.58 C	0.00	14
	MIN	138.62	12.50	16	-1569.47	12.50	14			
		8.65	12.50	16	-58.10	0.00	17	33.74 C	12.50	16
31	MAX	126.21	0.00	14	572.97	0.00	16			
		10.55	0.00	17	78.65	12.50	17	12.70 T	0.00	16
	MIN	91.87	12.50	16	-1056.77	12.50	14			
		7.85	12.50	16	-53.20	0.00	17	22.97 T	12.50	14
40	MAX	30.73	0.00	16	-286.01	0.00	16			
		6.02	0.00	14	11.83	9.50	16	40.96 T	0.00	16
	MIN	15.15	9.50	14	-726.80	9.50	14			
		5.03	9.50	16	-47.63	0.00	14	58.86 T	9.50	14
42	MAX	46.99	0.00	17	-147.58	0.00	16			
		7.89	0.00	14	18.34	9.50	17	96.48 T	0.00	16
	MIN	34.79	9.50	14	-710.17	9.50	14			
		6.51	9.50	16	-58.61	0.00	14	143.64 T	9.50	14

44	MAX	47.49	0.00	17	-142.03	0.00	16			
		-6.40	0.00	16	58.61	0.00	14	94.66 T	0.00	16
	MIN	34.79	9.50	14	-710.17	9.50	14			
		-7.89	9.50	14	-17.06	9.50	17	143.64 T	9.50	14
47	MAX	30.49	0.00	16	-282.23	0.00	16			
		-5.02	0.00	16	47.63	0.00	14	36.12 T	0.00	16
	MIN	15.15	9.50	14	-726.80	9.50	14			
		-6.02	9.50	14	-11.44	9.50	16	58.86 T	9.50	14
49	MAX	4.85	0.00	16	-488.34	9.50	16			
		-3.41	0.00	16	7.73	0.00	14	45.04 T	0.00	16
	MIN	-21.45	9.50	14	-720.83	0.00	14			
		-5.73	9.50	14	-46.72	9.50	14	59.50 T	9.50	14
51	MAX	-7.77	0.00	16	-339.68	9.50	16			
		-4.63	0.00	16	14.27	0.00	14	109.13 T	0.00	16
	MIN	-40.61	9.50	14	-699.05	0.00	14			
		-7.56	9.50	14	-57.54	9.50	14	145.74 T	9.50	14
53	MAX	-8.03	0.00	16	-334.13	9.50	16			
		7.56	0.00	14	57.53	9.50	14	107.32 T	0.00	16
	MIN	-40.61	9.50	14	-699.05	0.00	14			
		4.52	9.50	16	-14.27	0.00	14	145.74 T	9.50	14
55	MAX	5.09	0.00	16	-484.38	0.00	16			
		5.73	0.00	14	46.72	9.50	14	40.20 T	0.00	16
	MIN	-21.45	9.50	14	-720.83	0.00	14			
		3.39	9.50	16	-7.73	0.00	14	59.51 T	9.50	14
57	MAX	-63.17	0.00	16	356.12	12.50	14			
		-7.46	0.00	16	77.24	0.00	17	21.00 T	0.00	16
	MIN	-122.17	12.50	14	-1087.48	0.00	14			
		-10.28	12.50	17	-51.25	12.50	17	25.46 T	12.50	17
59	MAX	-110.14	0.00	16	691.41	12.50	14			
		-8.27	0.00	16	85.36	0.00	17	38.74 C	0.00	14
	MIN	-190.12	12.50	14	-1601.63	0.00	14			
		-11.33	12.50	17	-56.24	12.50	17	23.22 C	12.50	16
61	MAX	-108.00	0.00	16	691.45	12.50	14			
		10.83	0.00	14	51.66	12.50	14	38.76 C	0.00	14
	MIN	-190.13	12.50	14	-1601.67	0.00	14			
		6.27	12.50	16	-83.66	0.00	14	24.13 C	12.50	16
63	MAX	-60.79	0.00	16	356.12	12.50	14			
		9.90	0.00	14	47.55	12.50	14	19.00 T	0.00	16
	MIN	-122.17	12.50	14	-1087.49	0.00	14			
		5.69	12.50	16	-76.23	0.00	14	24.34 T	12.50	14
72	MAX	0.00	0.00	16	570.21	4.75	14			
		0.00	0.00	17	0.00	1.90	17	0.00	0.00	14
	MIN	-228.43	4.75	14	0.00	0.00	14			
		-3.71	4.75	17	-9.28	4.75	17	7.84 T	4.75	16

73	MAX	167.00	0.00	14	571.71	0.00	14			
		3.47	0.00	17	4.45	5.70	17	438.62 C	0.00	14
	MIN	-64.99	9.50	14	-301.41	5.70	14			
		-0.24	8.55	17	-14.58	0.00	17	297.53 C	9.50	16
74	MAX	67.23	0.00	14	563.53	9.50	14			
		0.24	0.00	17	4.45	3.80	17	442.51 C	0.00	14
	MIN	-165.90	9.50	14	-299.99	3.80	14			
		-3.47	9.50	17	-14.58	9.50	17	323.15 C	9.50	16
75	MAX	229.96	0.00	14	573.84	0.00	14			
		3.71	0.00	17	0.00	3.80	17	8.39 C	0.00	16
	MIN	0.00	4.75	16	0.00	4.75	14			
		0.00	4.75	16	-9.28	0.00	17	0.00 C	4.75	14
77	MAX	213.04	0.00	14	-94.28	0.00	16			
		219.65	0.00	14	964.54	5.17	14	10.63 C	0.00	17
	MIN	124.50	5.17	16	-1229.41	5.17	14			
		156.39	5.17	16	-170.32	0.00	14	7.44 C	5.17	14
78	MAX	-119.96	0.00	16	-102.89	5.17	16			
		-152.65	0.00	16	964.54	0.00	14	7.44 C	0.00	14
	MIN	-213.04	5.17	14	-1229.42	0.00	14			
		-219.66	5.17	14	-170.38	5.17	14	3.45 C	5.17	17
81	MAX	81.22	0.00	14	41.75	0.00	16			
		-2.74	0.00	14	11.95	0.00	16	27.20 C	0.00	14
	MIN	33.02	5.17	16	-341.81	5.17	14			
		-16.73	5.17	16	-74.49	5.17	16	19.58 C	5.17	16
82	MAX	-33.04	0.00	16	42.36	5.17	16			
		16.73	0.00	16	11.95	5.17	16	27.20 C	0.00	14
	MIN	-81.22	5.17	14	-341.81	0.00	14			
		2.74	5.17	14	-74.49	0.00	16	19.33 C	5.17	16
85	MAX	212.83	0.00	14	-112.88	0.00	16			
		-158.48	0.00	16	170.93	0.00	14	8.76 C	0.00	17
	MIN	128.91	5.17	16	-1230.80	5.17	14			
		-220.11	5.17	14	-966.30	5.17	14	4.96 C	5.17	16
86	MAX	-124.37	0.00	16	-121.50	5.17	16			
		220.11	0.00	14	170.95	5.17	14	6.92 C	0.00	14
	MIN	-212.83	5.17	14	-1230.81	0.00	14			
		154.73	5.17	16	-966.30	0.00	14	1.32 C	5.17	16

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

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176. LOAD LIST 2
177. SECTION 0 0.26 0.5 0.74 1 MEMB 28 TO 31 57 59 61 63
178. PRINT MEMBER SECTION FORCES LIST 28 TO 31 57 59 61 63
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MEMBER FORCES AT INTERMEDIATE SECTIONS

ALL UNITS ARE -- KIP FEET

MEMB	LOAD	SEC	SHEAR-Y	SHEAR-Z	MOM-Y	MOM-Z
28	2	0.26	66.21	-5.22	7.80	-1.59
		0.50	63.75	-5.22	-7.85	-196.53
		0.74	61.28	-5.22	-23.50	-384.07
29	2	0.26	102.33	-5.75	8.50	58.54
		0.50	99.87	-5.75	-8.75	-244.76
		0.74	97.40	-5.75	-26.01	-540.67
30	2	0.26	102.33	5.75	-8.50	58.54
		0.50	99.87	5.75	8.75	-244.76
		0.74	97.40	5.75	26.01	-540.66
31	2	0.26	66.21	5.22	-7.80	-1.59
		0.50	63.75	5.22	7.85	-196.53
		0.74	61.28	5.22	23.50	-384.07
57	2	0.26	-61.44	-5.23	23.56	-385.77
		0.50	-63.90	-5.23	7.86	-197.77
		0.74	-66.37	-5.23	-7.85	-2.37
59	2	0.26	-97.70	-5.77	26.07	-542.96
		0.50	-100.17	-5.77	8.77	-246.16
		0.74	-102.63	-5.77	-8.54	58.04
61	2	0.26	-97.70	5.77	-26.07	-542.98
		0.50	-100.17	5.77	-8.77	-246.16
		0.74	-102.64	5.77	8.54	58.05
63	2	0.26	-61.44	5.23	-23.56	-385.78
		0.50	-63.90	5.23	-7.86	-197.77
		0.74	-66.37	5.23	7.84	-2.37

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

179. LOAD LIST 14 16 17
180. SECTION 0 0.26 0.5 0.74 1 MEMB 28 TO 31 57 59 61 63
181. PRINT MEMBER SECTION FORCES LIST 28 TO 31 57 59 61 63

MEMBER FORCES AT INTERMEDIATE SECTIONS

ALL UNITS ARE -- KIP FEET

MEMB	LOAD	SEC	SHEAR-Y	SHEAR-Z	MOM-Y	MOM-Z
28	14	0.26	122.74	-9.95	15.58	32.83
		0.50	119.53	-9.95	-14.28	-330.57
		0.74	116.33	-9.95	-44.13	-684.36
	16	0.26	99.37	-6.08	8.42	231.78
		0.50	96.17	-6.08	-9.81	-61.53
		0.74	92.96	-6.08	-28.04	-345.23
	17	0.26	113.75	-7.05	8.85	143.12
		0.50	110.55	-7.05	-12.31	-193.32
		0.74	107.34	-7.05	-33.47	-520.15
29	14	0.26	190.58	-10.87	16.67	147.66
		0.50	187.37	-10.87	-15.95	-419.26
		0.74	184.17	-10.87	-48.58	-976.58
	16	0.26	146.36	-6.65	8.99	311.87
		0.50	143.15	-6.65	-10.97	-122.39
		0.74	139.95	-6.65	-30.93	-547.04
	17	0.26	173.51	-7.67	9.31	244.33
		0.50	170.30	-7.67	-13.69	-271.39
		0.74	167.10	-7.67	-36.69	-777.48
30	14	0.26	190.58	10.88	-16.67	147.66
		0.50	187.37	10.88	15.95	-419.26
		0.74	184.17	10.88	48.58	-976.57
	16	0.26	148.50	8.65	-14.63	316.96
		0.50	145.30	8.65	11.32	-123.75
		0.74	142.09	8.65	37.27	-554.84
	17	0.26	177.74	11.60	-20.42	254.34
		0.50	174.53	11.60	14.37	-274.06
		0.74	171.33	11.60	49.15	-792.84
31	14	0.26	122.74	9.95	-15.58	32.82
		0.50	119.53	9.95	14.28	-330.57
		0.74	116.32	9.95	44.13	-684.36
	16	0.26	101.75	7.85	-13.53	236.62
		0.50	98.55	7.85	10.02	-63.83
		0.74	95.34	7.85	33.57	-354.67
	17	0.26	118.44	10.55	-18.92	152.66
		0.50	115.23	10.55	12.72	-197.85
		0.74	112.03	10.55	44.37	-538.75
57	14	0.26	-112.28	-9.90	44.04	-728.20
		0.50	-115.49	-9.90	14.34	-386.55
		0.74	-118.69	-9.90	-15.37	-35.28
	16	0.26	-66.64	-7.46	32.91	-653.37
		0.50	-69.85	-7.46	10.52	-448.64
		0.74	-73.05	-7.46	-11.87	-234.30
	17	0.26	-93.66	-10.28	43.83	-727.04

MEMBER FORCES AT INTERMEDIATE SECTIONS

ALL UNITS ARE -- KIP FEET

MEMB	LOAD	SEC	SHEAR-Y	SHEAR-Z	MOM-Y	MOM-Z
		0.50	-96.86	-10.28	13.00	-441.26
		0.74	-100.07	-10.28	-17.84	-145.86
59	14	0.26	-180.24	-10.82	48.47	-1021.50
		0.50	-183.44	-10.82	16.00	-475.98
		0.74	-186.65	-10.82	-16.48	79.16
	16	0.26	-113.62	-8.27	36.50	-858.88
		0.50	-116.82	-8.27	11.70	-513.22
		0.74	-120.03	-8.27	-13.11	-157.94
	17	0.26	-152.98	-11.33	48.54	-984.01
		0.50	-156.19	-11.33	14.56	-520.26
		0.74	-159.39	-11.33	-19.43	-46.90
61	14	0.26	-180.24	10.83	-48.48	-1021.52
		0.50	-183.45	10.83	-16.00	-475.98
		0.74	-186.65	10.83	16.48	79.18
	16	0.26	-111.47	6.27	-30.17	-851.09
		0.50	-114.68	6.27	-11.35	-511.86
		0.74	-117.88	6.27	7.47	-163.02
	17	0.26	-148.75	7.40	-36.08	-968.66
		0.50	-151.96	7.40	-13.88	-517.59
		0.74	-155.17	7.40	8.32	-56.90
63	14	0.26	-112.28	9.90	-44.04	-728.21
		0.50	-115.49	9.90	-14.34	-386.55
		0.74	-118.69	9.90	15.37	-35.27
	16	0.26	-64.26	5.69	-27.38	-643.93
		0.50	-67.46	5.69	-10.31	-446.34
		0.74	-70.67	5.69	6.75	-239.14
	17	0.26	-88.97	6.78	-32.94	-708.45
		0.50	-92.17	6.78	-12.59	-436.73
		0.74	-95.38	6.78	7.77	-155.40

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

182. FINISH

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

**** DATE= AUG 28,2006 TIME= 9: 9: 1 ****


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************************************************************
*         For questions on STAAD.Pro, please contact       *
*   Research Engineers Offices at the following locations  *
*                                                          *
*              Telephone               Email               *
*  USA:      +1 (714)974-2500       support@reiusa.com      *
*  CANADA    +1 (905)632-4771       detech@odandetech.com   *
*  CANADA    +1 (604)629 6087       staad@dowco.com         *
*  UK        +44(1454)207-000       support@reel.co.uk      *
*  FRANCE    +33(0)1 64551084       support@reel.co.uk      *
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*                                                          *
*  North America                  support@reiusa.com       *
*  Europe                         support@reel.co.uk       *
*  Asia                           support@reiasia.net      *
************************************************************
```

Information about the key files in the current distribution

Modfication Date	CRC	Size (Bytes)	File Name
02/27/2006	0x8140	12701696	SProStaad.exe
12/16/2004	0xca81	04558848	SProStaadStl.exe
09/19/2003	0x2fc0	00081970	CMesh.dll
02/06/2006	0x5601	02486272	dbsectioninterface.dll
01/23/2001	0x9b40	00073728	LoadGen.dll
09/25/2003	0x6340	00704512	MeshEngine.dll
09/22/2003	0xce00	00069632	QuadPlateEngine.dll
12/22/2005	0x4181	00094208	SurfMesh.dll
09/30/2005	0x2dc1	00475136	aiscsections.mdb
01/05/2005	0x79c1	00319488	aiscsections_all_editions.mdb
01/05/2005	0x4b81	01810432	aiscsteeljoists.mdb
01/05/2005	0xcac1	03651584	aitctimbersections.mdb
01/27/2005	0xeb01	00552960	aluminumsections.mdb
01/05/2005	0xcd01	00163840	australiansections.mdb
01/05/2005	0x6a41	00229376	britishsections.mdb
07/08/2005	0x9d41	00434176	bscoldformedsections.mdb
06/28/2005	0x8201	00327680	butlercoldformedsections.mdb
01/05/2005	0xabc0	00262144	canadiansections.mdb
05/31/2005	0x9e81	00450560	canadiantimbersections.mdb
05/05/2005	0x7f80	00409600	chinesesections.mdb
01/05/2005	0xd6c0	00600064	dutchsections.mdb
01/05/2005	0x1a00	00354304	europeansections.mdb
01/05/2005	0xd301	00202752	frenchsections.mdb
01/05/2005	0x11c1	00233472	germansections.mdb
01/05/2005	0x3c40	00264192	indiansections.mdb
01/05/2005	0xd540	00180224	iscoldformedsections.mdb
01/24/2006	0x2501	00221184	japanesesections.mdb
11/08/2005	0x9081	00376832	Kingspancoldformedsections.mdb
01/05/2005	0xb740	00174080	koreansections.mdb
02/03/2005	0xda00	00096256	lysaghtcoldformedsections.mdb
02/07/2005	0x9a00	00243712	mexicansteeltables.mdb
01/04/2006	0x8980	00413696	RCecoColdFormedSections.mdb
02/03/2005	0x9b40	00307200	russiansections.mdb
01/05/2005	0x9081	00206848	southafricansections.mdb
01/06/2005	0x9341	00194560	spanishsections.mdb
01/04/2006	0x8680	00223232	uscoldformedsections.mdb
01/05/2005	0xbac0	00149504	usersectionstemplate.mdb
01/05/2005	0x9d41	00141312	venezuelansections.mdb

REINFORCED BEAM CAP

Reinforing Yield Strength	$Fy := 40000psi$
Concrete Compresion Strength	$Fc := 5600psi$
Width of Beam	$b := 3ft$
Depth of Top Reinforcemnt	$dt := 2.25ft$
Depth of Botttom Reinforcemnt	$db := 2.1667ft$
Positive Reinforcement Area	$Asp := 6.24in^2$
Negative Reinforcement Area	$Asn := 6.35in^2$
Reinforcement Ratio	$\rho w := \frac{Asp}{b \cdot dt}$ $\rho w = 0.006$

Positive Moment Capacity: Compression Steel neglected

$\phi f := 0.9$

Tension in Reinforcemnt $Tp := Asp \cdot Fy$

Depth of Compression Block $ap := \frac{Tp}{0.85 \cdot Fc \cdot b}$

$\phi Mnp := \phi f Tp \cdot \left(db - \frac{ap}{2} \right)$

$\phi Mnp = 473\ ft\,k$

Negative Moment Capacity: Compression Steel neglected

Tension in Reinforcemnt $Tn := Asn \cdot Fy$

Depth of Compression Block $an := \frac{Tn}{0.85 \cdot Fc \cdot b}$

$\phi Mnn := \phi f Tn \cdot \left(dt - \frac{an}{2} \right)$

$\phi Mnn = 500\ ft\,k$

Shear Capacity at 26'-3" East end of the Bent Cap

Factored Shear at Section	$Vu := 225.72k$	
Factored Moment at Section	$Mu := 32.72k \cdot ft$	
Stirrup Spacing	$S := 32in$	
Stirrup Area	$Av := 0.4in^2$	
Depth of Reinforcemnt	$ds := 2.8ft$	
	$Vc1 := 2 \cdot psi \sqrt{\frac{Fc}{psi}} \cdot b \cdot ds$	$Vc1 = 181\,k$
	$Vc2 := \left(1.9 \cdot \sqrt{\frac{Fc}{psi}} + 2500 \cdot \rho w \frac{Vu \cdot ds}{Mu}\right) \cdot b \cdot ds \cdot psi$	$Vc2 = 547\,k$
	$Vc3 := 3.5 \cdot psi \sqrt{\frac{Fc}{psi}} \cdot b \cdot ds$	$Vc3 = 317\,k$
	$Vc4 := if(Vc1 < Vc2, Vc2, Vc \; Vc := if(Vc4 < Vc3, Vc4, Vc3)$	$Vc = 317\,k$
	$Vs := \frac{Av \cdot Fy \cdot ds}{S} \qquad \phi_s := 0.85$	$Vs = 17\,k$
	$\phi Vn := \phi_s \cdot (Vc + Vs)$	$\phi Vn = 284\,k$

Shear Capacity at 6'-3" from the East end of the Bent Cap

Factored Shear at Section	$Vu := 164.81k$	
Factored Moment at Section	$Mu := 322.68k \cdot ft$	
Stirrup Spacing	$S := 11in$	
Stirrup Area	$Av := 0.4in^2$	
Depth of Reinforcemnt	$ds := 2.43ft$	
	$Vc1 := 2 \cdot psi \sqrt{\frac{Fc}{psi}} \cdot b \cdot ds$	$Vc1 = 157\,k$
	$Vc2 := \left(1.9 \cdot \sqrt{\frac{Fc}{psi}} + 2500 \cdot \rho w \frac{Vu \cdot ds}{Mu}\right) \cdot b \cdot ds \cdot psi$	$Vc2 = 170\,k$
	$Vc3 := 3.5 \cdot psi \sqrt{\frac{Fc}{psi}} \cdot b \cdot ds$	$Vc3 = 275\,k$
	$Vc4 := if(Vc1 < Vc2, Vc2, Vc \; Vc := if(Vc4 < Vc3, Vc4, Vc3)$	$Vc = 170\,k$
	$Vs := \frac{Av \cdot Fy \cdot ds}{S} \qquad \phi_s := 0.85$	$Vs = 42\,k$
	$\phi Vn := \phi_s \cdot (Vc + Vs)$	$\phi Vn = 181\,k$

Q:\inspect\BonnerBridge\CrutchBents\Type 6 SectionCapacity.xmcd

Shear Capacity at 2'-3" from the East end of the Bent Cap

Factored Shear at Section $Vu := 224.96k$

Factored Moment at Section $Mu := 31.81k \cdot ft$

Stirrup Spacing $S := 32in$

Stirrup Area $Av := 0.4in^2$

$$Vc1 := 2 \cdot psi \sqrt{\frac{Fc}{psi}} \cdot b \cdot dt \qquad Vc1 = 145\,k$$

$$Vc2 := \left(1.9 \cdot \sqrt{\frac{Fc}{psi}} + 2500 \cdot \rho w \frac{Vu \cdot dt}{Mu}\right) \cdot b \cdot dt \cdot psi \qquad Vc2 = 386\,k$$

$$Vc3 := 3.5 \cdot psi \sqrt{\frac{Fc}{psi}} \cdot b \cdot dt \qquad Vc3 = 255\,k$$

$Vc4 := if(Vc1 < Vc2, Vc2, Vc$ $Vc := if(Vc4 < Vc3, Vc4, Vc3)$ $Vc = 255\,k$

$$Vs := \frac{Av \cdot Fy \cdot dt}{S} \qquad \phi s := 0.85 \qquad Vs = 14\,k$$

$\phi Vn := \phi s \cdot (Vc + Vs)$ $\phi Vn = 228\,k$

REINFORCED SUBCAP

Reinforing Yield Strength	$Fy := 40ksi$
Concrete Compresion Strength	$Fc := 4.5ksi$
Width of Beam	$b := 3.0ft$
Depth of Reinforcemnt	$d := 4.0833ft$
Positive Reinforcement Area	$As := 12.48in^2$

Positive Moment Capacity: Compression Steel neglected

Tension in Reinforcemnt $T := As \cdot Fy$

Depth of Compression Block $a := \frac{T}{0.85 \cdot Fc \cdot b}$

$\phi_f := 0.90$

$\phi Mn := \phi_f T \cdot \left(d - \frac{a}{2} \right)$

$\phi Mn = 1767\ ft\,k$

Shear Capacity

Stirrup Spacing $S := 8in$ $ds := 4.5833ft$

Stirrup Area $Av := 0.62in^2$

$Vc := 2 \cdot psi \sqrt{\frac{Fc}{psi}} \cdot b \cdot ds$

$Vc = 266\ k$

$Vs := \frac{Av \cdot Fy \cdot ds}{S}$

$Vs = 170\ k$

$\phi_s := 0.85$

$\phi Vn := \phi_s \cdot (Vc + Vs)$

$\phi Vn = 371\ k$

REINFORCED PILE CAP

Reinforing Yield Strength	$Fy := 40ksi$
Concrete Compresion Strength	$Fc := 4.5ksi$
Width of Beam	$b := 6.5ft$
Depth of Reinforcemnt	$d := 3.0833ft$
Positive Reinforcement Area	$As := 12.48in^2$

Positive Moment Capacity: Compression Steel neglected

Tension in Reinforcemnt $T := As \cdot Fy$

Depth of Compression Block $a := \frac{T}{0.85 \cdot Fc \cdot b}$

$$\phi Mn := \phi_f T \cdot \left(d - \frac{a}{2} \right)$$

$\phi Mn = 1354\ ft\,k$

Shear Capacity

Stirrup Spacing $S := 6in$

Stirrup Area $Av := 0.62in^2$

$$Vc := 2 \cdot psi \sqrt{\frac{Fc}{psi}} \cdot b \cdot d$$

$Vc = 387\,k$

$$Vs := \frac{Av \cdot Fy \cdot d}{S}$$

$Vs = 153\,k$

$\phi_s = 0.85$

$\phi Vn := \phi_s \cdot (Vc + Vs)$

$\phi Vn = 459\,k$

PRESTRESSED BEAM **TYPE 6 CRUTCH BENT SECTION CAPACITY**

Material Properties:

Reinforing Yield Strength $f_y := 40ksi$

Strand Ultimate Strength $f_{su} := 270ksi$

28th DayConcrete Compresion Strength $f_c := 6ksi$

Beam Properties:

Total Height of Beam $h := 54in$

Top Flange: $b_t := 20in$ $t_t := 8in$

Bottom Flange: $b_b := 26in$ $t_b := 8in$

Web: $b_w := 8in$

Area: $A_c := 789in^2$

Moment of Inertia: $I_c := 260741in^4$

Centroid Location: $y_t := 29.27in$ $y_b := 24.73in$

$S_t := \frac{I_c}{y_t}$ $S_t = 8908\,in^3$ $S_b := \frac{I_c}{y_b}$ $S_b = 10544\,in^3$

Strand Properties:

Area of Single Strand $Aps := 0.153in^2$ $\gamma := 0.4$ for stress-relieved strands

Strand Layout at Midspan: $i := 1..5$

$n_1 := 11$ $y_1 := 3in$

$n_2 := 11$ $y_2 := 5in$

$n_3 := 9$ $y_3 := 7in$

$n_4 := 3$ $y_4 := 9in$

$n_5 := 2$ $y_5 := 52in$

$n_{total} := \sum_i n_i$ $n_{total} = 36$

$d_{total} := h - \frac{\sum_i (n_i \cdot y_i)}{n_{total}}$ $d_{total} = 46.167\,in$

Eccentricity: $e_{total} := d_{total} - y_t$ $e_{total} = 16.897\,in$

Prestressing force per cable: $F_{ult} := 41.3k$ $F_i := 28.9k$ initial prestressing force

MOMENT CAPACITY: $\phi_m := 1.0$ *as per AASHTO 9.14*

$\beta 1 := if\left[f_c < 4000psi, 0.85, 0.85 - \frac{0.05\cdot(f_c - 4000psi)}{1000psi}\right]$ $\beta 1 = 0.75$ Minimum is 0.65

$0.36\beta 1 = 0.27$

$\rho := \frac{n_{total}\cdot Aps}{b_t\cdot d_{total}}$ $\rho = 0.006$ $ri := \rho\cdot\frac{f_{su}}{f_c}$ $ri = 0.268$ $f_{final} := f_{su}\cdot\left[1 - \left(\frac{\gamma}{\beta 1}\right)\cdot\left(\frac{\rho\cdot f_{su}}{f_c}\right)\right]$

$f_{final} = 231.345\,ksi$

$a_{cp} := \frac{n_{total}\cdot Aps\cdot f_{final}}{0.85\cdot f_c\cdot b_t}$ $a_{cp} = 12.493\,in$

Check1 = "COMPRESSION BLOCK EXCEEDS TOP FLANGE THICKNESS" Use AASTHO Section 9.7.3.

AASHTO 9.7.2 - Rectangular Section:

$\phi Mn_{1a} := \phi_m\cdot n_{total}\cdot Aps\cdot f_{final}\cdot d_{total}\cdot(1 - 0.6ri)$ $\phi Mn_{1a} = 4113\,ft\,k$

$\phi Mn_{1b} := \phi_m\cdot\left(0.36\cdot\beta 1 - 0.08\cdot\beta 1^2\right)\cdot f_c\cdot b_t\cdot d_{total}^2$ $\phi Mn_{1b} = 4796\,ft\,k$ *AASHTO 9.18.1*

$\phi Mn_1 := if\left(ri \le 0.36\beta 1, \phi Mn_{1a}, \phi Mn_{1b}\right)$ $\phi Mn_1 = 4113\,ft\,k$

AASHTO 9.7.3 - Flanged Section:

$ri_{flanged} := \frac{n_{total}\cdot Aps\cdot f_{final}}{b_w\cdot f_c\cdot d_{total}}$ $ri_{flanged} = 0.575$ $\rho_{flanged} := \frac{n_{total}\cdot Aps}{b_w\cdot d_{total}}$ $\rho_{flanged} = 0.015$

$f_{final\_flanged} := f_{su}\cdot\left[1 - \left(\frac{\gamma}{\beta 1}\right)\cdot\left(\frac{\rho_{flanged}\cdot f_{su}}{f_c}\right)\right]$ $f_{final\_flanged} = 173.361\,ksi$

$\phi Mn_{2a} := \phi_m\cdot\left[n_{total}\cdot Aps\cdot f_{final\_flanged}\cdot d_{total}\cdot\left(1 - 0.6ri_{flanged}\right) + 0.85\cdot f_c\cdot\left(b_t - b_w\right)\cdot t_t\cdot\left(d_{total} - 0.5\cdot t_t\right)\right]$

$\phi Mn_{2a} = 4127\,k\cdot ft$

$\phi Mn_{2b} := \phi_m\cdot\left[\left(0.36\cdot\beta 1 - 0.08\cdot\beta 1^2\right)\cdot f_c\cdot b_w\cdot d_{total}^2 + 0.85\cdot f_c\cdot\left(b_t - b_w\right)\cdot t_t\cdot\left(d_{total} - 0.5\cdot t_t\right)\right]$ *AASHTO 9.18.1*

$\phi Mn_{2b} = 3639\,k\cdot ft$

$\phi Mn_2 := if\left(ri_{flanged} \le 0.36\beta 1, \phi Mn_{2a}, \phi Mn_{2b}\right)$ $\phi Mn_2 = 3639\,ft\,k$

Final Moment Capacity:

$\phi Mn := if\left(a_{cp} > t_t, \phi Mn_2, \phi Mn_1\right)$ $\phi Mn = 3639\,k\cdot ft$

****

SHEAR CAPACITY: Section at 3.25 ft from Support $x := 3.25ft$ $\phi_s := 0.85$

Shear Reinforcing: Stirrup Spacing $S := 18in$

Stirrup Area $Av := 0.4in^2$

Prestressing Strands: $i := 1..8$

$n_1 := 8$ $y_1 := 3in$ $delta\_y := 25in$

$n_2 := 8$ $y_2 := 5in$ $delta\_x := 17.708ft$

$n_3 := 6$ $y_3 := 7in$ $\theta := \operatorname{atan}\left(\frac{delta\_y}{delta\_x}\right)$ $\theta = 0.117$ rad

$n_4 := 0$ $y_4 := 0in$

$n_5 := 3$ $y_5 := 5in + \frac{delta\_x - x}{delta\_x} \cdot delta\_y$ $y_5 = 25.412\,in$

$n_6 := 3$ $y_6 := 7in + \frac{delta\_x - x}{delta\_x} \cdot delta\_y$ $y_6 = 27.412\,in$

$n_7 := 3$ $y_7 := 9in + \frac{delta\_x - x}{delta\_x} \cdot delta\_y$ $y_7 = 29.412\,in$

$n_8 := 2$ $y_8 := 52in$

$n_{total} := \sum_i n_i$ $n_{total} = 33$

$d_{total} := h - \frac{\sum_i \left(n_i \cdot y_i\right)}{n_{total}}$ $d_{total} = 40.16\,in$

for shear calculations, use $d := if\left(d_{total} < 0.8 \cdot h, 0.8 \cdot h, d_{total}\right)$ $d = 43.2\,in$

Eccentricity: $e_{total} := d_{total} - y_t$ $e_{total} = 10.89\,in$

Prestressing force per cable: $F_{ult} := 41.3k$ $F_i := 28.9k$ initial prestressing force

Estimated Losses: $f_{su} = 270\,ksi$ $f_{final\_flanged} = 173.361\,ksi$

$F_{final} := f_{final\_flanged} \cdot Aps$ $F_{final} = 26.52k$

Applied Moment and Shear:

$V_d := 102.33k$ Shear due to dead load only

$M_d := 58.54k \cdot ft$ Moment due to dead load only

$M_{max} := 316.96k \cdot ft$ Maximum factored moment due to applied loads

$V_i := 148.50k$ Shear concurrent with M max

SHEAR CAPACITY, cont'd.

Compute Cracking Moment at the Section (AASHTO 9.20.2.2)

$f_d := \frac{M_d}{S_b}$ $\quad f_d = 66.627\ psi$ — stress, due to unfactored dead load, in the extreme fiber where tensile stress is caused by externally applied loads

$f_{pe} := \frac{n_{total} \cdot F_{final}}{A_c} + -\frac{n_{total} \cdot F_{final} \cdot e_{total}}{S_b}$ $\quad f_{pe} = 205.277\ psi$ — stress, due to prestressing only, in the extreme fiber where tensile stress is caused by externally applied loads

$M_{cr} := \frac{I_c}{y_b} \cdot \left(6psi \cdot \sqrt{\frac{f_c}{psi}} + f_{pe} - f_d\right)$ $\quad M_{cr} = 530.17\,k \cdot ft$

Shear Strength in the Concrete (AASHTO 9.20.2):

AASHTO 9.20.2.2 - Vci

$V_{ci\_min} := 1.7psi \cdot \sqrt{\frac{f_c}{psi}} \cdot b_w \cdot d$ $\quad V_{ci\_min} = 45.509\,k$

$V_{ci\_1} := 0.6psi \cdot \sqrt{\frac{f_c}{psi}} \cdot b_w \cdot d + V_d + \frac{V_i \cdot M_{cr}}{M_{max}}$ $\quad V_{ci\_1} = 366.784\,k$

$V_{ci} := if\left(V_{ci\_1} > V_{ci\_min}, V_{ci\_1}, V_{ci\_min}\right)$ $\quad V_{ci} = 366.784\,k$

AASHTO 9.20.2.3 - V cw

$V_p := F_{final} \cdot \left(n_5 + n_6 + n_7\right) \cdot \sin(\theta)$ $\quad V_p = 27.893\,k$ — vertical component of the prestressing force in the draped strands

$f_{pc} := \frac{n_{total} \cdot F_{final}}{A_c}$ $\quad f_{pc} = 1.109\,ksi$ — compressive stress in the concrete at the centroid of the section due to prestressing and applied moments

$V_{cw} := \left(3.5psi \cdot \sqrt{\frac{f_c}{psi}} + 0.3 \cdot f_{pc}\right) \cdot b_w \cdot d + V_p$ $\quad V_{cw} = 236.609\,k$

Shear strength in the concrete:

$V_c := if\left(V_{ci} > V_{cw}, V_{cw}, V_{ci}\right)$ $\quad V_c = 236.6\,k$

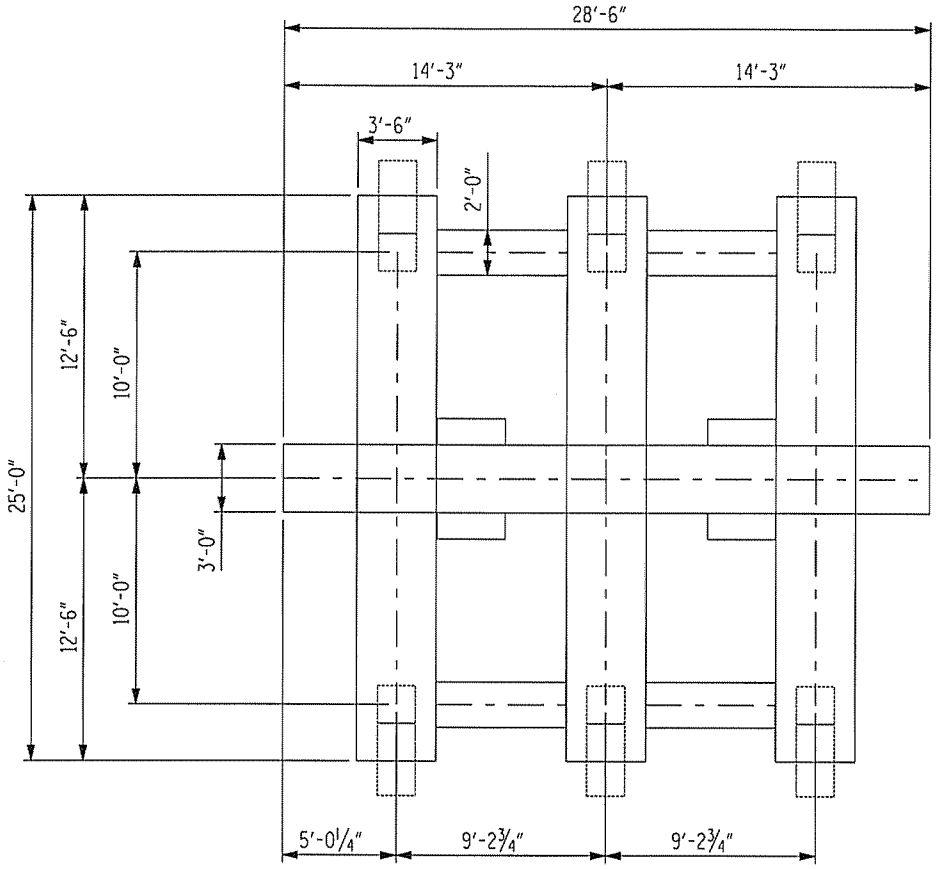
Shear Strength in the Stirrups:

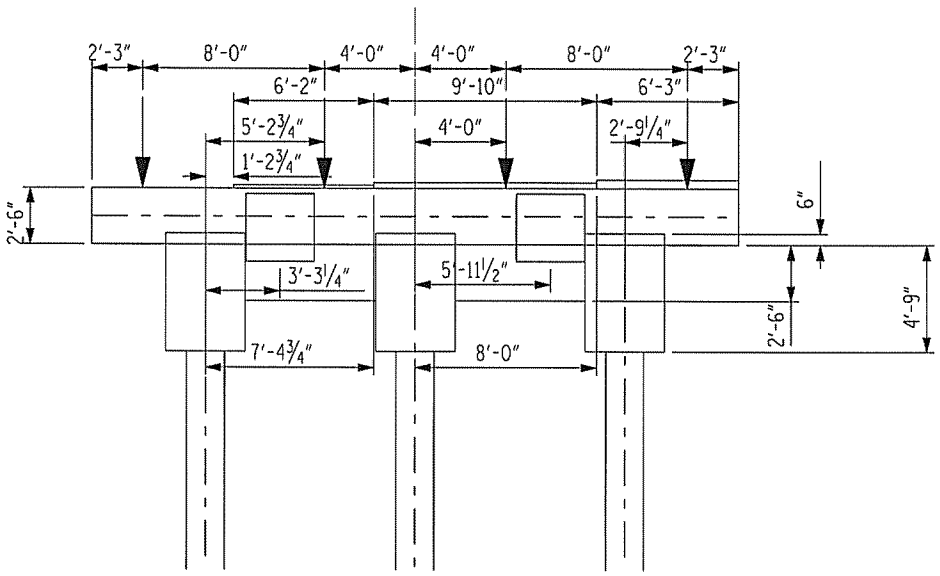
$V_s := \frac{Av \cdot f_y \cdot d}{S}$ $\quad V_s = 38.4\,k$

Total Nominal Shear Strength:

$\phi Vn := \phi_s \cdot \left(V_c + V_s\right)$ $\quad \phi Vn = 233.8\,k$

****



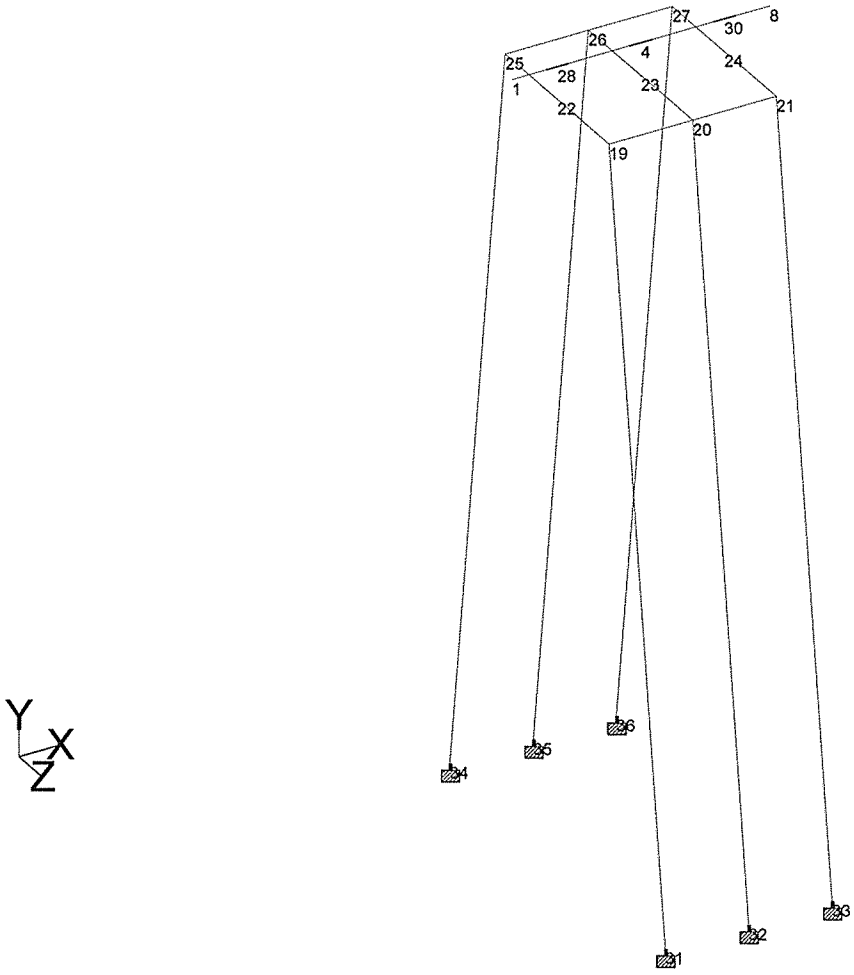


ELEVATION TYPE 7

BENTS 175, 179, 183

NBIS REPORT BENT TYPE C CRUTCH BENT 2

J AMC 8/22



Load 1

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*           STAAD.Pro                               *
*           Version  2005    Bld 1003.US            *
*           Proprietary Program of                  *
*           Research Engineers,  Intl.              *
*           Date=    AUG 28, 2006                   *
*           Time=    10:41:59                       *
*                                                   *
*      USER ID: Ko and Associates                   *
*****************************************************
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MJM
AKO
8/29

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INPUT FILE: Type 7.STD
    2. START JOB INFORMATION
    3. ENGINEER DATE 24-MAY-06
    4. END JOB INFORMATION
    5. INPUT WIDTH 79
    6. UNIT FEET KIP
    7. JOINT COORDINATES
    8. 1 0 0 0; 4 14.25 0 0; 8 28.5 0 0; 19 5.0208 -3.625 10; 20 14.25 -3.625 10
    9. 21 23.4792 -3.625 10; 22 5.021 -3.625 0; 23 14.25 -3.625 0; 24 23.479 -3.625 0
   10. 25 5.021 -3.625 -10; 26 14.25 -3.625 -10; 27 23.479 -3.625 -10; 28 5.021 0 0
   11. 30 23.479 0 0; 31 5.0208 -87.9583 20.625; 32 14.25 -87.9583 20.625
   12. 33 23.4792 -87.9583 20.625; 34 5.0208 -87.9583 -20.625
   13. 35 14.25 -87.9583 -20.625; 36 23.4792 -87.9583 -20.625
   14. MEMBER INCIDENCES
   15. 16 25 22; 17 22 19; 18 26 23; 19 23 20; 20 27 24; 21 24 21; 22 19 31; 23 20 32
   16. 24 21 33; 25 25 34; 26 26 35; 27 27 36; 28 25 26; 29 26 27; 30 19 20; 31 20 21
   17. 32 1 28; 33 28 4; 34 4 30; 35 30 8
   18. MEMBER PROPERTY AMERICAN
   19. 22 TO 27 PRIS AX 2.626 IX 1.235 IY 0.6966 IZ 0.6966
   20. 16 TO 21 PRIS YD 5.25 ZD 3.5
   21. MEMBER PROPERTY AMERICAN
   22. 28 TO 31 PRIS YD 2.5 ZD 2
   23. MEMBER PROPERTY AMERICAN
   24. 32 TO 35 PRIS YD 2.5 ZD 3
   25. DEFINE MATERIAL START
   26. ISOTROPIC CONCRETE
   27. E 453600
   28. POISSON 0.17
   29. DENSITY 0.14999
   30. ALPHA 5.5E-006
   31. DAMP 0.05
   32. END DEFINE MATERIAL
   33. CONSTANTS
   34. MATERIAL CONCRETE MEMB 16 TO 35
   35. SUPPORTS
   36. 31 TO 36 FIXED
   37. SLAVE RIGID MASTER 28 JOINT 22
   38. SLAVE RIGID MASTER 4 JOINT 23
   39. SLAVE RIGID MASTER 30 JOINT 24
   40. UNIT INCHES KIP
```

```
41. LOAD 1 LOADTYPE NONE  TITLE LIVE LOAD
42. UNIT FEET KIP
43. MEMBER LOAD
44. 32 CON GY -32.7 2.25
45. 33 CON GY -32.7 5.2292
46. 34 CON GY -32.7 4
47. 35 CON GY -32.7 2.7708
48. UNIT INCHES KIP
49. LOAD 2 LOADTYPE NONE  TITLE DEAD LOAD
50. UNIT FEET KIP
51. SELFWEIGHT Y -1
52. MEMBER LOAD
53. 32 CON GY -101.2 2.25
54. 33 CON GY -93.6 5.2292
55. 34 CON GY -93.6 4
56. 35 CON GY -101.2 2.7708
57. JOINT LOAD
58. 19 TO 21 25 TO 27 FY -6.891
59. MEMBER LOAD
60. 33 CON GY -4.2 3.271
61. 34 CON GY -4.2 5.958
62. 33 UNI GY -0.108 1.2292 7.3959
63. 35 UNI GY -0.324 0 5.0208
64. 33 UNI GY -0.216 7.3958 9.2292
65. 34 UNI GY -0.216 0 8
66. 34 UNI GY -0.324 8 9.2292
67. LOAD 4 LOADTYPE NONE  TITLE CENTRIFUGAL FORCE
68. MEMBER LOAD
69. 32 CON GX -1.26 2.25
70. 33 CON GX -1.26 5.2292
71. 34 CON GX -1.26 4
72. 35 CON GX -1.26 2.7708
73. LOAD 5 LOADTYPE NONE  TITLE WIND ON STRUCTURE
74. JOINT LOAD
75. 8 FX -0.42
76. MEMBER LOAD
77. 32 CON GX -6.03 2.25
78. 33 CON GX -6.03 5.2292
79. 34 CON GX -6.03 4
80. 35 CON GX -6.03 2.7708
81. 32 CON GZ -1.45 2.25
82. 33 CON GZ -1.45 5.2292
83. 34 CON GZ -1.45 4
84. 35 CON GZ -1.45 2.7708
85. 24 27 UNI GX -0.094 0 10
86. JOINT LOAD
87. 24 FX -7.35
88. LOAD 6 LOADTYPE NONE  TITLE WIND ON LIVE LOAD
89. MEMBER LOAD
90. 32 CON GX -1.67 2.25
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 91. 33 CON GX -1.67 5.2292
 92. 34 CON GX -1.67 4
 93. 35 CON GX -1.67 2.7708
 94. 32 CON GZ -0.67 2.25
 95. 33 CON GZ -0.67 5.2292
 96. 34 CON GZ -0.67 4
 97. 35 CON GZ -0.67 2.7708
 98. LOAD 7 LOADTYPE NONE  TITLE LONGITUDINAL FORCE
 99. MEMBER LOAD
100. 32 CON GZ -1.8 2.25
101. 33 CON GZ -1.8 5.2292
102. 34 CON GZ -1.8 4
103. 35 CON GZ -1.8 2.7708
104. LOAD COMB 9 SERVICE GROUP I
105. 2 1.0 1 1.0 4 1.0
106. LOAD COMB 11 SERVICE GROUP II
107. 2 1.0 5 1.0
108. LOAD COMB 12 SERVICE GROUP III
109. 2 1.0 1 1.0 4 1.0 5 0.3 6 1.0 7 1.0
110. LOAD COMB 14 FACTORED GROUP I
111. 2 1.3 1 2.75 4 1.3
112. LOAD COMB 16 FACTORED GROUP II
113. 2 1.3 5 1.3
114. LOAD COMB 17 FACTORED GROUP III
115. 2 1.3 1 1.65 4 1.3 5 0.39 6 1.3 7 1.3
116. PERFORM ANALYSIS PRINT STATICS CHECK


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

  NUMBER OF JOINTS/MEMBER+ELEMENTS/SUPPORTS =    20/    20/     6
  ORIGINAL/FINAL BAND-WIDTH=    12/     5/     53 DOF
  TOTAL PRIMARY LOAD CASES =    6, TOTAL DEGREES OF FREEDOM =     66
  SIZE OF STIFFNESS MATRIX =        4 DOUBLE  KILO-WORDS
  REQRD/AVAIL. DISK SPACE  =     12.1/  24801.5 MB
```

STATIC LOAD/REACTION/EQUILIBRIUM SUMMARY FOR CASE NO. 1
LOADTYPE NONE TITLE LIVE LOAD

***TOTAL APPLIED LOAD (KIP FEET) SUMMARY (LOADING 1)
SUMMATION FORCE-X = 0.00
SUMMATION FORCE-Y = -130.80
SUMMATION FORCE-Z = 0.00

SUMMATION OF MOMENTS AROUND THE ORIGIN-
MX= 0.00 MY= 0.00 MZ= -1863.90

***TOTAL REACTION LOAD(KIP FEET) SUMMARY (LOADING 1)
SUMMATION FORCE-X = 0.00
SUMMATION FORCE-Y = 130.80
SUMMATION FORCE-Z = 0.00

SUMMATION OF MOMENTS AROUND THE ORIGIN-
MX= 0.00 MY= 0.00 MZ= 1863.90

MAXIMUM DISPLACEMENTS (INCH /RADIANS) (LOADING 1)

	MAXIMUMS	AT NODE
X =	-2.20673E-03	24
Y =	-3.33648E-02	1
Z =	-5.52001E-05	21
RX=	-5.87703E-05	21
RY=	2.06222E-05	25
RZ=	1.28614E-04	1

STATIC LOAD/REACTION/EQUILIBRIUM SUMMARY FOR CASE NO. 2
LOADTYPE NONE TITLE DEAD LOAD

***TOTAL APPLIED LOAD (KIP FEET) SUMMARY (LOADING 2)
SUMMATION FORCE-X = 0.00
SUMMATION FORCE-Y = -870.15
SUMMATION FORCE-Z = 0.00

SUMMATION OF MOMENTS AROUND THE ORIGIN-
MX= 0.00 MY= 0.00 MZ= -12425.38

***TOTAL REACTION LOAD(KIP FEET) SUMMARY (LOADING 2)
SUMMATION FORCE-X = 0.00
SUMMATION FORCE-Y = 870.15
SUMMATION FORCE-Z = 0.00

SUMMATION OF MOMENTS AROUND THE ORIGIN-
MX= 0.00 MY= 0.00 MZ= 12425.38

MAXIMUM DISPLACEMENTS (INCH /RADIANS) (LOADING 2)

	MAXIMUMS	AT NODE
X =	1.00333E-02	22
Y =	-1.62934E-01	8
Z =	-2.87544E-04	21
RX=	2.30880E-04	27
RY=	6.43486E-05	21
RZ=	-4.23595E-04	8

STATIC LOAD/REACTION/EQUILIBRIUM SUMMARY FOR CASE NO. 4
LOADTYPE NONE TITLE CENTRIFUGAL FORCE

***TOTAL APPLIED LOAD (KIP FEET) SUMMARY (LOADING 4)
SUMMATION FORCE-X = -5.04
SUMMATION FORCE-Y = 0.00
SUMMATION FORCE-Z = 0.00

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

***TOTAL REACTION LOAD(KIP FEET) SUMMARY (LOADING 4)
SUMMATION FORCE-X = 5.04
SUMMATION FORCE-Y = 0.00
SUMMATION FORCE-Z = 0.00

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

MAXIMUM DISPLACEMENTS (INCH /RADIANS) (LOADING 4)

	MAXIMUMS	AT NODE
X =	-1.67974E+00	8
Y =	-1.08416E-02	1
Z =	-1.13095E-05	8
RX=	-4.74786E-06	27
RY=	1.13490E-05	20
RZ=	9.57283E-05	19

STATIC LOAD/REACTION/EQUILIBRIUM SUMMARY FOR CASE NO. 5
LOADTYPE NONE TITLE WIND ON STRUCTURE

***TOTAL APPLIED LOAD (KIP FEET) SUMMARY (LOADING 5)
SUMMATION FORCE-X = -33.77
SUMMATION FORCE-Y = 0.00
SUMMATION FORCE-Z = -5.80

SUMMATION OF MOMENTS AROUND THE ORIGIN-
MX= 0.00 MY= 82.65 MZ= -42.79

```
***TOTAL REACTION LOAD( KIP  FEET ) SUMMARY (LOADING     5 )
    SUMMATION FORCE-X =       33.77
    SUMMATION FORCE-Y =        0.00
    SUMMATION FORCE-Z =        5.80

   SUMMATION OF MOMENTS AROUND THE ORIGIN-
   MX=           0.00  MY=         -82.65  MZ=          42.78


MAXIMUM DISPLACEMENTS ( INCH /RADIANS) (LOADING      5)
          MAXIMUMS    AT NODE
   X = -1.12384E+01       8
   Y = -1.25063E-01      19
   Z = -7.33996E-01      24
   RX=  7.72901E-04      25
   RY=  7.15620E-05      20
   RZ=  6.34367E-04      25


       STATIC LOAD/REACTION/EQUILIBRIUM SUMMARY FOR CASE NO.     6
       LOADTYPE NONE  TITLE WIND ON LIVE LOAD


***TOTAL APPLIED LOAD ( KIP  FEET ) SUMMARY (LOADING    6 )
    SUMMATION FORCE-X =       -6.68
    SUMMATION FORCE-Y =        0.00
    SUMMATION FORCE-Z =       -2.68

   SUMMATION OF MOMENTS AROUND THE ORIGIN-
   MX=           0.00  MY=          38.19  MZ=           0.00


***TOTAL REACTION LOAD( KIP  FEET ) SUMMARY (LOADING     6 )
    SUMMATION FORCE-X =        6.68
    SUMMATION FORCE-Y =        0.00
    SUMMATION FORCE-Z =        2.68

   SUMMATION OF MOMENTS AROUND THE ORIGIN-
   MX=           0.00  MY=         -38.19  MZ=           0.00


MAXIMUM DISPLACEMENTS ( INCH /RADIANS) (LOADING      6)
          MAXIMUMS    AT NODE
   X = -2.22633E+00       1
   Y = -4.86083E-02      19
   Z = -3.39143E-01      24
   RX=  3.49287E-04      25
   RY=  1.50419E-05      20
   RZ=  1.26892E-04      21


       STATIC LOAD/REACTION/EQUILIBRIUM SUMMARY FOR CASE NO.     7
       LOADTYPE NONE  TITLE LONGITUDINAL FORCE
```

```
***TOTAL APPLIED LOAD ( KIP  FEET ) SUMMARY (LOADING    7 )
    SUMMATION FORCE-X =        0.00
    SUMMATION FORCE-Y =        0.00
    SUMMATION FORCE-Z =       -7.20

   SUMMATION OF MOMENTS AROUND THE ORIGIN-
   MX=           0.00  MY=         102.60  MZ=           0.00


***TOTAL REACTION LOAD( KIP  FEET ) SUMMARY (LOADING     7 )
    SUMMATION FORCE-X =        0.00
    SUMMATION FORCE-Y =        0.00
    SUMMATION FORCE-Z =        7.20

   SUMMATION OF MOMENTS AROUND THE ORIGIN-
   MX=           0.00  MY=        -102.60  MZ=           0.00


MAXIMUM DISPLACEMENTS ( INCH /RADIANS) (LOADING      7)
          MAXIMUMS    AT NODE
   X = -8.79407E-06      19
   Y =  1.11396E-01      26
   Z = -9.11105E-01      22
   RX=  9.29286E-04       4
   RY= -3.42419E-06       1
   RZ= -3.94886E-08      27



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


117. PRINT MEMBER INFORMATION LIST 16 TO 35
```

MEMBER INFORMATION

MEMBER	START JOINT	END JOINT	LENGTH (FEET)	BETA (DEG)	RELEASES
16	25	22	10.000	0.00	
17	22	19	10.000	0.00	
18	26	23	10.000	0.00	
19	23	20	10.000	0.00	
20	27	24	10.000	0.00	
21	24	21	10.000	0.00	
22	19	31	85.000	0.00	
23	20	32	85.000	0.00	
24	21	33	85.000	0.00	
25	25	34	85.000	0.00	
26	26	35	85.000	0.00	
27	27	36	85.000	0.00	
28	25	26	9.229	0.00	
29	26	27	9.229	0.00	
30	19	20	9.229	0.00	
31	20	21	9.229	0.00	
32	1	28	5.021	0.00	
33	28	4	9.229	0.00	
34	4	30	9.229	0.00	
35	30	8	5.021	0.00	

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

118. PRINT MEMBER PROPERTIES LIST 16 TO 35

MEMBER PROPERTIES. UNIT - INCH

MEMB	PROFILE	AX/ AY	IZ/ AZ	IY/ SZ	IX/ SY
16	PRISMATIC	2646.00	875164.50	388962.00	913148.31
		2249.10	2249.10	27783.00	18522.00
17	PRISMATIC	2646.00	875164.50	388962.00	913148.31
		2249.10	2249.10	27783.00	18522.00
18	PRISMATIC	2646.00	875164.50	388962.00	913148.31
		2249.10	2249.10	27783.00	18522.00
19	PRISMATIC	2646.00	875164.50	388962.00	913148.31
		2249.10	2249.10	27783.00	18522.00
20	PRISMATIC	2646.00	875164.50	388962.00	913148.31
		2249.10	2249.10	27783.00	18522.00
21	PRISMATIC	2646.00	875164.50	388962.00	913148.31
		2249.10	2249.10	27783.00	18522.00
22	PRISMATIC	378.14	14444.70	14444.70	25608.96
		0.00	0.00	2891.83	2891.83
23	PRISMATIC	378.14	14444.70	14444.70	25608.96
		0.00	0.00	2891.83	2891.83
24	PRISMATIC	378.14	14444.70	14444.70	25608.96
		0.00	0.00	2891.83	2891.83
25	PRISMATIC	378.14	14444.70	14444.70	25608.96
		0.00	0.00	2891.83	2891.83
26	PRISMATIC	378.14	14444.70	14444.70	25608.96
		0.00	0.00	2891.83	2891.83
27	PRISMATIC	378.14	14444.70	14444.70	25608.96
		0.00	0.00	2891.83	2891.83
28	PRISMATIC	720.00	54000.00	34560.00	70945.21
		612.00	612.00	3600.00	2880.00
29	PRISMATIC	720.00	54000.00	34560.00	70945.21
		612.00	612.00	3600.00	2880.00
30	PRISMATIC	720.00	54000.00	34560.00	70945.21
		612.00	612.00	3600.00	2880.00
31	PRISMATIC	720.00	54000.00	34560.00	70945.21
		612.00	612.00	3600.00	2880.00
32	PRISMATIC	1080.00	81000.00	116640.00	160735.94
		918.00	918.00	5400.00	6480.00
33	PRISMATIC	1080.00	81000.00	116640.00	160735.94
		918.00	918.00	5400.00	6480.00
34	PRISMATIC	1080.00	81000.00	116640.00	160735.94
		918.00	918.00	5400.00	6480.00
35	PRISMATIC	1080.00	81000.00	116640.00	160735.94
		918.00	918.00	5400.00	6480.00

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

119. PRINT MEMBER PROPERTIES LIST 16 TO 35

MEMBER PROPERTIES. UNIT - INCH

MEMB	PROFILE	AX/ AY	IZ/ AZ	IY/ SZ	IX/ SY
16	PRISMATIC	2646.00	875164.50	388962.00	913148.31
		2249.10	2249.10	27783.00	18522.00
17	PRISMATIC	2646.00	875164.50	388962.00	913148.31
		2249.10	2249.10	27783.00	18522.00
18	PRISMATIC	2646.00	875164.50	388962.00	913148.31
		2249.10	2249.10	27783.00	18522.00
19	PRISMATIC	2646.00	875164.50	388962.00	913148.31
		2249.10	2249.10	27783.00	18522.00
20	PRISMATIC	2646.00	875164.50	388962.00	913148.31
		2249.10	2249.10	27783.00	18522.00
21	PRISMATIC	2646.00	875164.50	388962.00	913148.31
		2249.10	2249.10	27783.00	18522.00
22	PRISMATIC	378.14	14444.70	14444.70	25608.96
		0.00	0.00	2891.83	2891.83
23	PRISMATIC	378.14	14444.70	14444.70	25608.96
		0.00	0.00	2891.83	2891.83
24	PRISMATIC	378.14	14444.70	14444.70	25608.96
		0.00	0.00	2891.83	2891.83
25	PRISMATIC	378.14	14444.70	14444.70	25608.96
		0.00	0.00	2891.83	2891.83
26	PRISMATIC	378.14	14444.70	14444.70	25608.96
		0.00	0.00	2891.83	2891.83
27	PRISMATIC	378.14	14444.70	14444.70	25608.96
		0.00	0.00	2891.83	2891.83
28	PRISMATIC	720.00	54000.00	34560.00	70945.21
		612.00	612.00	3600.00	2880.00
29	PRISMATIC	720.00	54000.00	34560.00	70945.21
		612.00	612.00	3600.00	2880.00
30	PRISMATIC	720.00	54000.00	34560.00	70945.21
		612.00	612.00	3600.00	2880.00
31	PRISMATIC	720.00	54000.00	34560.00	70945.21
		612.00	612.00	3600.00	2880.00
32	PRISMATIC	1080.00	81000.00	116640.00	160735.94
		918.00	918.00	5400.00	6480.00
33	PRISMATIC	1080.00	81000.00	116640.00	160735.94
		918.00	918.00	5400.00	6480.00
34	PRISMATIC	1080.00	81000.00	116640.00	160735.94
		918.00	918.00	5400.00	6480.00
35	PRISMATIC	1080.00	81000.00	116640.00	160735.94
		918.00	918.00	5400.00	6480.00

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

120. PRINT SUPPORT INFORMATION

SUPPORT INFORMATION (1=FIXED, 0=RELEASED)

UNITS FOR SPRING CONSTANTS ARE KIP FEET DEGREES

JOINT	FORCE-X/ KFX	FORCE-Y/ KFY	FORCE-Z/ KFZ	MOM-X/ KMX	MOM-Y/ KMY	MOM-Z/ KMZ
31	1	1	1	1	1	1
	0.0000E+00	0.0000E+00	0.0000E+00	0.000E+00	0.000E+00	0.000E+00
32	1	1	1	1	1	1
	0.0000E+00	0.0000E+00	0.0000E+00	0.000E+00	0.000E+00	0.000E+00
33	1	1	1	1	1	1
	0.0000E+00	0.0000E+00	0.0000E+00	0.000E+00	0.000E+00	0.000E+00
34	1	1	1	1	1	1
	0.0000E+00	0.0000E+00	0.0000E+00	0.000E+00	0.000E+00	0.000E+00
35	1	1	1	1	1	1
	0.0000E+00	0.0000E+00	0.0000E+00	0.000E+00	0.000E+00	0.000E+00
36	1	1	1	1	1	1
	0.0000E+00	0.0000E+00	0.0000E+00	0.000E+00	0.000E+00	0.000E+00

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

121. LOAD LIST 9 11 12
122. PRINT SUPPORT REACTION LIST 31 TO 36

SUPPORT REACTIONS -UNIT KIP FEET STRUCTURE TYPE = SPACE

JOINT	LOAD	FORCE-X	FORCE-Y	FORCE-Z	MOM-X	MOM-Y	MOM Z
31	9	0.79	176.39	-20.18	27.86	-3.99	-34.30
	11	5.57	184.91	-20.67	49.82	-29.52	-237.63
	12	3.58	190.63	-20.82	71.25	-18.87	-153.16
32	9	0.85	158.70	-17.94	28.10	-4.53	-35.86
	11	5.66	135.45	-14.42	50.12	-30.31	-240.12
	12	3.66	152.44	-15.99	71.54	-19.62	-155.46
33	9	0.89	165.38	-18.79	27.89	-4.94	-36.98
	11	5.66	105.50	-10.65	50.06	-30.34	-240.15
	12	3.68	138.95	-14.30	71.40	-19.86	-156.00
34	9	0.79	176.39	20.18	-27.86	3.99	-34.30
	11	5.57	191.07	22.60	-6.45	29.52	-237.63
	12	3.58	202.96	24.69	15.65	18.87	-153.16
35	9	0.85	158.70	17.94	-28.09	4.53	-35.86
	11	5.66	141.57	16.35	-6.75	30.30	-240.12
	12	3.66	164.71	19.86	15.35	19.62	-155.46
36	9	0.89	165.38	18.79	-27.89	4.94	-36.99
	11	5.66	111.64	12.58	-6.69	30.34	-240.15
	12	3.68	151.27	18.17	15.50	19.86	-156.00

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

```
123. LOAD LIST 14 16 17
124. SECTION 0 0.19 0.5 0.81 1 MEMB 33 34
125. SECTION 0 0.47 0.651 1 MEMB 32
126. SECTION 0 0.349 0.47 0.99 1 MEMB 35
127. PRINT MEMBER SECTION FORCES LIST 32 TO 35
```

MEMBER FORCES AT INTERMEDIATE SECTIONS

ALL UNITS ARE -- KIP FEET

MEMB	LOAD	SEC	SHEAR-Y	SHEAR-Z	MOM-Y	MOM-Z
32	14	0.47	-224.94	0.00	0.00	28.41
		0.65	-226.27	0.00	0.00	233.43
	16	0.47	-135.01	-1.88	-0.21	18.53
		0.65	-136.34	-1.88	-1.92	141.83
	17	0.47	-188.97	-3.78	-0.41	24.45
		0.65	-190.30	-3.78	-3.85	196.79
33	14	0.19	95.70	0.00	0.00	148.66
		0.50	85.66	0.00	0.00	-111.25
		0.81	-130.55	0.00	0.00	125.58
	16	0.19	87.28	0.72	-0.64	205.39
		0.50	77.23	0.72	1.43	-30.42
		0.81	-49.04	-1.16	-0.75	28.51
	17	0.19	97.66	1.44	-1.27	192.78
		0.50	87.61	1.44	2.86	-72.72
		0.81	-92.62	-2.34	-1.50	77.71
34	14	0.19	140.77	0.00	0.00	142.52
		0.50	-75.82	0.00	0.00	-123.05
		0.81	-86.27	0.00	0.00	109.30
	16	0.19	112.54	1.17	-0.75	137.56
		0.50	-14.12	-0.72	1.43	-102.52
		0.81	-24.57	-0.72	-0.63	-46.70
	17	0.19	134.85	2.34	-1.51	149.05
		0.50	-45.78	-1.44	2.86	-121.68
		0.81	-56.22	-1.44	-1.26	24.70
35	14	0.35	227.64	0.00	0.00	235.64
		0.47	226.50	0.00	0.00	97.68
		0.99	0.09	0.00	0.00	0.00
	16	0.35	137.72	1.88	-1.92	144.05
		0.47	136.57	1.88	-0.77	60.73
		0.99	0.09	0.00	0.00	0.00
	17	0.35	191.67	3.78	-3.85	199.00
		0.47	190.53	3.78	-1.55	82.90
		0.99	0.09	0.00	0.00	0.00

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

128. PRINT MAXFORCE ENVELOPE NSECTION 10 LIST 16 TO 21 28 TO 35

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
16	MAX	199.41	0.00	14	120.15	0.00	17			
		31.95	0.00	14	276.08	10.00	14	35.93 C	0.00	14
	MIN	118.42	10.00	16	-1765.94	10.00	14			
		20.66	10.00	16	-47.31	0.00	17	28.06 C	10.00	16
17	MAX	-110.40	0.00	16	49.04	10.00	14			
		-20.29	0.00	16	276.08	0.00	14	35.93 C	0.00	14
	MIN	-199.41	10.00	14	-1765.94	0.00	14			
		-31.95	10.00	14	-46.44	10.00	17	25.46 C	10.00	16
18	MAX	174.54	0.00	14	107.39	0.00	17			
		-3.21	0.00	14	22.91	0.00	16	15.69 C	0.00	17
	MIN	87.81	10.00	16	-1530.00	10.00	14			
		-20.27	10.00	16	-179.79	10.00	16	12.98 C	10.00	16
19	MAX	-79.89	0.00	16	36.28	10.00	14			
		20.27	0.00	16	22.92	10.00	16	14.27 C	0.00	14
	MIN	-174.54	10.00	14	-1530.00	0.00	14			
		3.21	10.00	14	-179.77	0.00	16	10.65 C	10.00	16
20	MAX	196.05	0.00	14	116.10	0.00	17			
		-21.12	0.00	16	37.92	0.00	14	35.81 C	0.00	14
	MIN	88.42	10.00	16	-1733.01	10.00	14			
		-32.02	10.00	14	-282.33	10.00	14	25.96 C	10.00	16
21	MAX	-80.40	0.00	16	48.34	10.00	14			
		32.02	0.00	14	37.92	10.00	14	35.81 C	0.00	14
	MIN	-196.05	10.00	14	-1733.02	0.00	14			
		20.74	10.00	16	-282.33	0.00	14	23.35 C	10.00	16
28	MAX	41.66	0.00	16	238.32	0.00	16			
		1.32	0.00	16	37.77	0.00	14	32.96 C	0.00	14
	MIN	1.51	9.23	14	-104.67	9.23	16			
		-5.50	9.23	14	-13.01	9.23	14	27.90 C	9.23	16
29	MAX	40.59	0.00	16	166.77	0.00	16			
		9.60	0.00	16	48.00	9.23	17	30.86 C	0.00	14
	MIN	0.44	9.23	14	-166.28	9.23	16			
		7.19	9.23	14	-42.51	0.00	16	14.99 C	9.23	16
30	MAX	41.67	0.00	16	238.36	0.00	16			
		5.50	0.00	14	13.01	9.23	14	32.96 C	0.00	14

	MIN	1.51	9.23	14	-104.73	9.23	16			
		-1.41	9.23	16	-37.77	0.00	14	27.52 C	9.23	16
31	MAX	40.56	0.00	16	166.65	0.00	16			
		-7.19	0.00	14	42.12	0.00	16	30.85 C	0.00	14
	MIN	0.44	9.23	14	-166.17	9.23	16			
		-9.51	9.23	16	-47.15	9.23	17	14.61 C	9.23	16
32	MAX	0.00	0.00	14	632.17	5.02	14			
		0.00	0.00	17	0.00	4.52	14	0.00	0.00	16
	MIN	-228.83	5.02	14	0.00	0.00	16			
		-3.78	5.02	17	-10.46	5.02	17	7.84 T	5.02	16
33	MAX	100.30	0.00	17	366.39	0.00	17			
		1.44	0.00	17	3.02	5.54	17	48.79 T	0.00	16
	MIN	-133.60	9.23	14	-124.40	5.54	14			
		-2.34	9.23	17	-5.60	9.23	17	67.18 T	9.23	14
34	MAX	143.83	0.00	14	392.04	0.00	14			
		2.34	0.00	17	3.02	3.69	17	16.09 T	0.00	16
	MIN	-89.50	9.23	14	-127.03	3.69	14			
		-1.44	9.23	17	-5.61	0.00	17	62.41 T	9.23	14
35	MAX	230.94	0.00	14	637.43	0.00	14			
		3.78	0.00	17	0.00	3.01	16	8.39 C	0.00	16
	MIN	0.00	5.02	16	0.00	5.02	17			
		0.00	5.02	16	-10.46	0.00	17	0.00 C	5.02	14

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

129. FINISH

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

**** DATE= AUG 28,2006 TIME= 10:41:59 ****

```
*************************************************************
*         For questions on STAAD.Pro, please contact        *
*   Research Engineers Offices at the following locations   *
*                                                           *
*              Telephone               Email                *
*  USA:      +1 (714)974-2500       support@reiusa.com       *
*  CANADA    +1 (905)632-4771       detech@odandetech.com    *
*  CANADA    +1 (604)629 6087       staad@dowco.com          *
*  UK        +44(1454)207-000       support@reel.co.uk       *
*  FRANCE    +33(0)1 64551084       support@reel.co.uk       *
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*                                                           *
*  North America                   support@reiusa.com       *
*  Europe                          support@reel.co.uk       *
*  Asia                            support@reiasia.net      *
*************************************************************
```

Information about the key files in the current distribution

Modfication Date	CRC	Size (Bytes)	File Name
02/27/2006	0x8140	12701696	SProStaad.exe
12/16/2004	0xca81	04558848	SProStaadStl.exe
09/19/2003	0x2fc0	00081970	CMesh.dll
02/06/2006	0x5601	02486272	dbsectioninterface.dll
01/23/2001	0x9b40	00073728	LoadGen.dll
09/25/2003	0x6340	00704512	MeshEngine.dll
09/22/2003	0xce00	00069632	QuadPlateEngine.dll
12/22/2005	0x4181	00094208	SurfMesh.dll
09/30/2005	0x2dc1	00475136	aiscsections.mdb
01/05/2005	0x79c1	00319488	aiscsections_all_editions.mdb
01/05/2005	0x4b81	01810432	aiscsteeljoists.mdb
01/05/2005	0xcac1	03651584	aitctimbersections.mdb
01/27/2005	0xeb01	00552960	aluminumsections.mdb
01/05/2005	0xcd01	00163840	australiansections.mdb
01/05/2005	0x6a41	00229376	britishsections.mdb
07/08/2005	0x9d41	00434176	bscoldformedsections.mdb
06/28/2005	0x8201	00327680	butlercoldformedsections.mdb
01/05/2005	0xabc0	00262144	canadiansections.mdb
05/31/2005	0x9e81	00450560	canadiantimbersections.mdb
05/05/2005	0x7f80	00409600	chinesesections.mdb
01/05/2005	0xd6c0	00600064	dutchsections.mdb
01/05/2005	0x1a00	00354304	europeansections.mdb
01/05/2005	0xd301	00202752	frenchsections.mdb
01/05/2005	0x11c1	00233472	germansections.mdb
01/05/2005	0x3c40	00264192	indiansections.mdb
01/05/2005	0xd540	00180224	iscoldformedsections.mdb
01/24/2006	0x2501	00221184	japanesesections.mdb
11/08/2005	0x9081	00376832	Kingspancoldformedsections.mdb
01/05/2005	0xb740	00174080	koreansections.mdb
02/03/2005	0xda00	00096256	lysaghtcoldformedsections.mdb
02/07/2005	0x9a00	00243712	mexicansteeltables.mdb
01/04/2006	0x8980	00413696	RCecoColdFormedSections.mdb
02/03/2005	0x9b40	00307200	russiansections.mdb
01/05/2005	0x9081	00206848	southafricansections.mdb
01/06/2005	0x9341	00194560	spanishsections.mdb
01/04/2006	0x8680	00223232	uscoldformedsections.mdb
01/05/2005	0xbac0	00149504	usersectionstemplate.mdb
01/05/2005	0x9d41	00141312	venezuelansections.mdb

REINFORCED BEAM CAP

Reinforing Yield Strength	$Fy := 40000psi$
Concrete Compresion Strength	$Fc := 5600psi$
Width of Beam	$b := 3ft$
Depth of Top Reinforcemnt	$dt := 2.25ft$
Depth of Bottom Reinforcement	$db := 2.1667ft$
Positive Reinforcement Area	$Asp := 6.24in^2$
Negative Reinforcement Area	$Asn := 6.35in^2$
Reinforcement Ratio	$\rho w := \frac{Asp}{b \cdot db}$

Positive Moment Capacity: Compression Steel neglected

$$\phi_f := 0.9$$

Tension in Reinforcemnt $\quad Tp := Asp \cdot Fy$

Depth of Compression Block $\quad ap := \frac{Tp}{0.85 \cdot Fc \cdot b}$

$$\phi Mnp := \phi_f Tp \cdot \left(db - \frac{ap}{2} \right)$$

$$\phi Mnp = 473 \text{ ft k}$$

Negative Moment Capacity: Compression Steel neglected

Tension in Reinforcemnt $\quad Tn := Asn \cdot Fy$

Depth of Compression Block $\quad an := \frac{Tn}{0.85 \cdot Fc \cdot b}$

$$\phi Mnn := \phi_f Tn \cdot \left(dt - \frac{an}{2} \right)$$

$$\phi Mnn = 500 \text{ ft k}$$

Shear Capacity at 26'-3" East end of the Bent Cap

Factored Shear at Section	$Vu := 226.50k$	
Factored Moment at Section	$Mu := 97.68k \cdot ft$	
Stirrup Spacing	$S := 32in$	
Stirrup Area	$Av := 0.4in^2$	
Depth of Reinforcemnt	$ds := 2.97ft$	
	$Vc1 := 2 \cdot psi \sqrt{\frac{Fc}{psi}} \cdot b \cdot ds$	$Vc1 = 192\,k$
	$Vc2 := \left(1.9 \cdot \sqrt{\frac{Fc}{psi}} + 2500 \cdot \rho w \frac{Vu \cdot ds}{Mu}\right) \cdot b \cdot ds \cdot psi$	$Vc2 = 330\,k$
	$Vc3 := 3.5 \cdot psi \sqrt{\frac{Fc}{psi}} \cdot b \cdot ds$	$Vc3 = 336\,k$
	$Vc4 := if(Vc1 < Vc2, Vc2, Vc\ Vc := if(Vc4 < Vc3, Vc4, Vc3)$	$Vc = 330\,k$
	$Vs := \frac{Av \cdot Fy \cdot ds}{S}$ $\phi_S := 0.85$	$Vs = 18\,k$
	$\phi Vn := \phi_S \cdot (Vc + Vs)$	$\phi Vn = 295\,k$

Shear Capacity at 16'-0" from the East end of the Bent Cap

Factored Shear at Section	$Vu := 140.77k$	
Factored Moment at Section	$Mu := 142.52k \cdot ft$	
Stirrup Spacing	$S := 11in$	
Stirrup Area	$Av := 0.4in^2$	
Depth of Reinforcemnt	$ds := 2.73ft$	
	$Vc1 := 2 \cdot psi \sqrt{\frac{Fc}{psi}} \cdot b \cdot ds$	$Vc1 = 177\,k$
	$Vc2 := \left(1.9 \cdot \sqrt{\frac{Fc}{psi}} + 2500 \cdot \rho w \frac{Vu \cdot ds}{Mu}\right) \cdot b \cdot ds \cdot psi$	$Vc2 = 221\,k$
	$Vc3 := 3.5 \cdot psi \sqrt{\frac{Fc}{psi}} \cdot b \cdot ds$	$Vc3 = 309\,k$
	$Vc4 := if(Vc1 < Vc2, Vc2, Vc\ Vc := if(Vc4 < Vc3, Vc4, Vc3)$	$Vc = 221\,k$
	$Vs := \frac{Av \cdot Fy \cdot ds}{S}$ $\phi_S := 0.85$	$Vs = 48\,k$
	$\phi Vn := \phi_S \cdot (Vc + Vs)$	$\phi Vn = 228\,k$

Shear Capacity at 2'-3" from the East end of the Bent Cap

Factored Shear at Section $Vu := 224.94k$

Factored Moment at Section $Mu := 28.41k \cdot ft$

Stirrup Spacing $S := 32in$

Stirrup Area $Av := 0.4in^2$

$Vc1 := 2 \cdot psi \sqrt{\frac{Fc}{psi}} \cdot b \cdot dt$ $Vc1 = 145\,k$

$Vc2 := \left(1.9 \cdot \sqrt{\frac{Fc}{psi}} + 2500 \cdot \rho w \frac{Vu \cdot dt}{Mu}\right) \cdot b \cdot dt \cdot psi$ $Vc2 = 427\,k$

$Vc3 := 3.5 \cdot psi \sqrt{\frac{Fc}{psi}} \cdot b \cdot dt$ $Vc3 = 255\,k$

$Vc4 := if(Vc1 < Vc2, Vc2, Vc\ Vc := if(Vc4 < Vc3, Vc4, Vc3)$ $Vc = 255\,k$

$Vs := \frac{Av \cdot Fy \cdot dt}{S}$ $\phi_S := 0.85$ $Vs = 14\,k$

$\phi Vn := \phi_S \cdot (Vc + Vs)$ $\phi Vn = 228\,k$

REINFORCED SUBCAP

Reinforing Yield Strength	$Fy := 40ksi$
Concrete Compresion Strength	$Fc := 3ksi$
Width of Beam	$b := 3.5ft$
Depth of Reinforcemnt	$df := 4.125ft$
Positive Reinforcement Area	$As := 18.72in^2$

Positive Moment Capacity: Compression Steel neglected

Tension in Reinforcemnt $T := As \cdot Fy$

Depth of Compression Block $a := \frac{T}{0.85 \cdot Fc \cdot b}$

$\phi f := 0.90$

$\phi Mn := \phi f \cdot T \cdot \left(df - \frac{a}{2} \right)$

$\phi Mn = 2584\ ft\,k$

Shear Capacity

Stirrup Spacing $S := 12in$

Stirrup Area $Av := 0.62in^2$

$ds := 4.625ft$

$Vc := 2 \cdot psi \sqrt{\frac{Fc}{psi}} \cdot b \cdot ds$

$Vc = 255\ k$

$Vs := \frac{Av \cdot Fy \cdot ds}{S}$

$Vs = 115\ k$

$\phi s := 0.85$

$\phi Vn := \phi s \cdot (Vc + Vs)$

$\phi Vn = 315\ k$

REINFORCED STRUT

Reinforing Yield Strength	$Fy := 40ksi$
Concrete Compresion Strength	$Fc := 3ksi$
Width of Beam	$b := 2.0ft$
Depth of Reinforcemnt	$d := 2.25ft$
Positive Reinforcement Area	$As := 4.68in^2$

Positive Moment Capacity: Compression Steel neglected

Tension in Reinforcemnt $T := As \cdot Fy$

Depth of Compression Block $a := \frac{T}{0.85 \cdot Fc \cdot b}$

$\phi_f := 0.90$

$\phi Mn := \phi_f T \cdot \left(d - \frac{a}{2} \right)$

$\phi Mn = 358\ ft\,k$

Shear Capacity

Stirrup Spacing $S := 13in$

Stirrup Area $Av := 0.62in^2$

$Vc := 2 \cdot psi \sqrt{\frac{Fc}{psi}} \cdot b \cdot d$

$Vc = 71\,k$

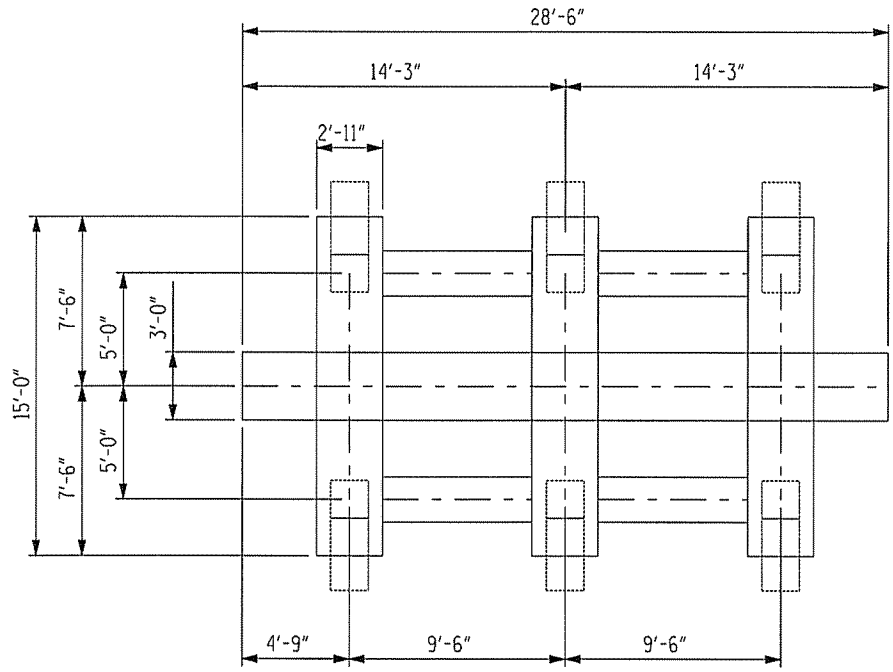
$Vs := \frac{Av \cdot Fy \cdot d}{S}$

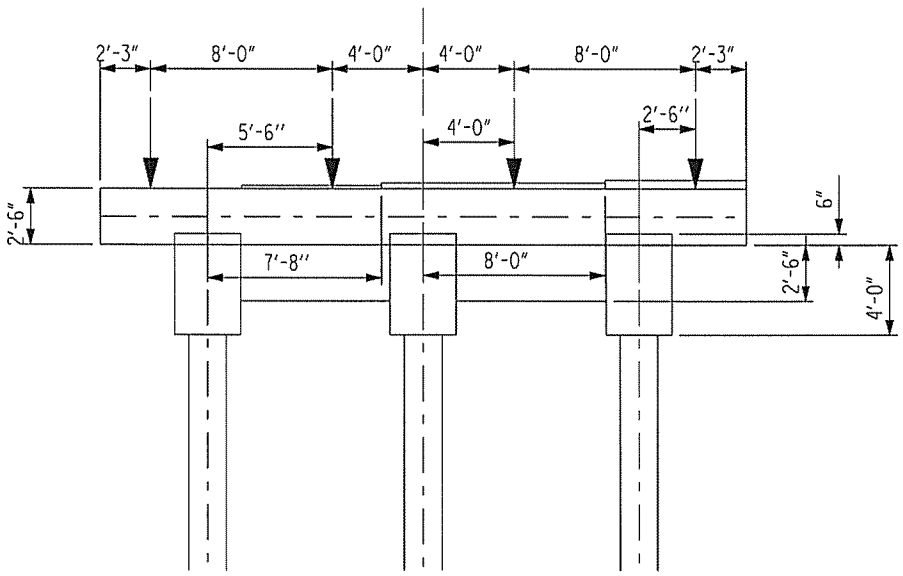
$Vs = 52\,k$

$\phi_s := 0.85$

$\phi Vn := \phi_s \cdot (Vc + Vs)$

$\phi Vn = 104\,k$





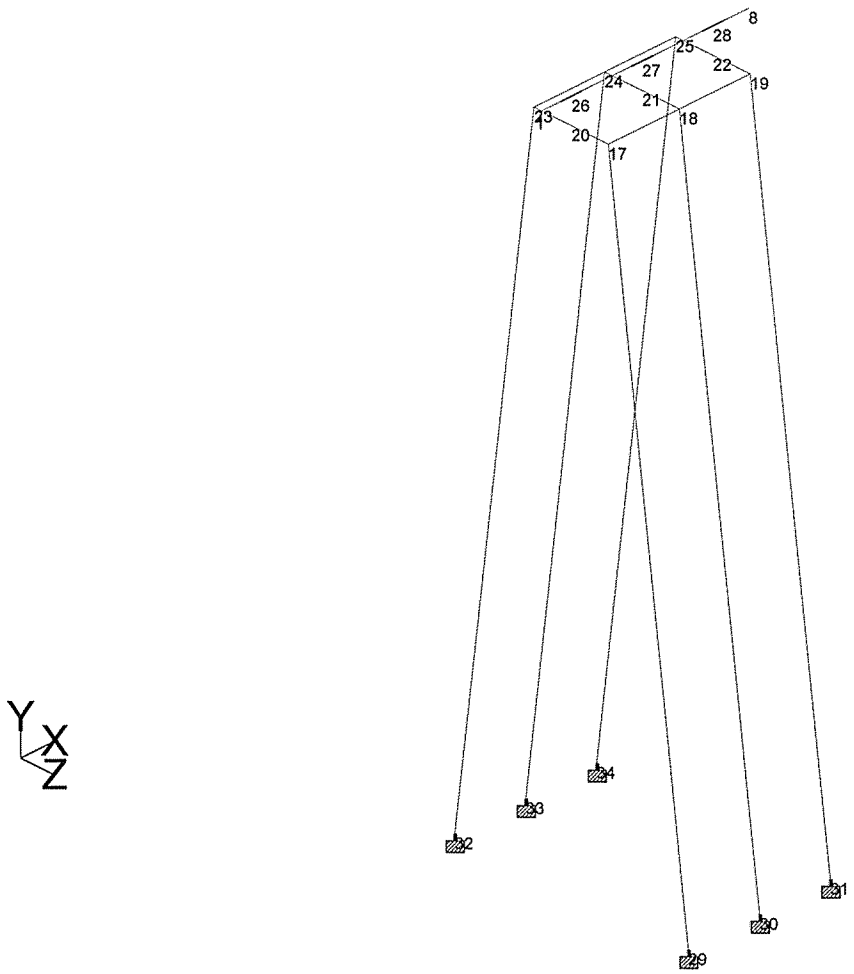
ELEVATION TYPE 8

BENTS 173, 174, 176, 177, 178, 180, 181, 182

NBIS REPORT BENT TYPE A CRUTCH BENT 2

Software licensed to Ko and Associates	Job No	Sheet No 1	Rev
	Part		
Job Title	Ref		
	By MJM	Date 24-May-06	Chd
Client	File Type 8.std	Date/Time 26-Jul-2006 16:04	

JAKD 8/22



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*****************************************************
*                                                   *
*           STAAD.Pro                               *
*           Version  2005    Bld 1003.US            *
*           Proprietary Program of                  *
*           Research Engineers,  Intl.              *
*           Date=    AUG 28, 2006                   *
*           Time=    11: 2:27                       *
*                                                   *
*      USER ID: Ko and Associates                   *
*****************************************************
```

MJM
✓ AKO
8/29

```
    1. STAAD SPACE
INPUT FILE: Type 8.STD
    2. START JOB INFORMATION
    3. ENGINEER DATE 24-MAY-06
    4. END JOB INFORMATION
    5. INPUT WIDTH 79
    6. UNIT FEET KIP
    7. JOINT COORDINATES
    8. 1 0 0 0; 8 28.5 0 0; 17 4.75 -3.25 5; 18 14.25 -3.25 5; 19 23.75 -3.25 5
    9. 20 4.75 -3.25 0; 21 14.25 -3.25 0; 22 23.75 -3.25 0; 23 4.75 -3.25 -5
   10. 24 14.25 -3.25 -5; 25 23.75 -3.25 -5; 26 4.75 0 0; 27 14.25 0 0; 28 23.75 0 0
   11. 29 4.75 -87.5833 15.625; 30 14.25 -87.5833 15.625; 31 23.75 -87.5833 15.625
   12. 32 4.75 -87.5833 -15.625; 33 14.25 -87.5833 -15.625; 34 23.75 -87.5833 -15.625
   13. MEMBER INCIDENCES
   14. 16 23 20; 17 20 17; 18 24 21; 19 21 18; 20 25 22; 21 22 19; 22 17 29; 23 18 30
   15. 24 19 31; 25 23 32; 26 24 33; 27 25 34; 28 23 24; 29 24 25; 30 17 18; 31 18 19
   16. 32 1 26; 33 26 27; 34 27 28; 35 28 8
   17. MEMBER PROPERTY AMERICAN
   18. 22 TO 27 PRIS AX 2.626 IX 1.235 IY 0.6966 IZ 0.6966
   19. 16 TO 21 PRIS YD 4.5 ZD 2.9167
   20. MEMBER PROPERTY AMERICAN
   21. 28 TO 31 PRIS YD 2.5 ZD 2
   22. MEMBER PROPERTY AMERICAN
   23. 32 TO 35 PRIS YD 2.5 ZD 3
   24. DEFINE MATERIAL START
   25. ISOTROPIC CONCRETE
   26. E 453600
   27. POISSON 0.17
   28. DENSITY 0.14999
   29. ALPHA 5.5E-006
   30. DAMP 0.05
   31. END DEFINE MATERIAL
   32. CONSTANTS
   33. MATERIAL CONCRETE MEMB 16 TO 35
   34. SUPPORTS
   35. 29 TO 34 FIXED
   36. SLAVE RIGID MASTER 26 JOINT 20
   37. SLAVE RIGID MASTER 27 JOINT 21
   38. SLAVE RIGID MASTER 28 JOINT 22
   39. UNIT INCHES KIP
   40. LOAD 1 LOADTYPE NONE  TITLE LIVE LOAD
```

```
41. UNIT FEET KIP
42. MEMBER LOAD
43. 32 CON GY -32.7 2.25
44. 33 CON GY -32.7 5.5
45. 34 CON GY -32.7 4
46. 35 CON GY -32.7 2.5
47. UNIT INCHES KIP
48. LOAD 2 LOADTYPE NONE  TITLE DEAD LOAD
49. UNIT FEET KIP
50. SELFWEIGHT Y -1
51. MEMBER LOAD
52. 32 CON GY -101.2 2.25
53. 33 CON GY -93.6 5.5
54. 34 CON GY -93.6 4
55. 35 CON GY -101.2 2.5
56. JOINT LOAD
57. 17 TO 19 23 TO 25 FY -4.922
58. MEMBER LOAD
59. 33 UNI GY -0.108 1.5 7.6667
60. 33 UNI GY -0.216 7.6667 9.5
61. 35 UNI GY -0.324 0 4.75
62. 34 UNI GY -0.216 0 8
63. 34 UNI GY -0.324 8 9.5
64. LOAD 4 LOADTYPE NONE  TITLE CENTRIFUGAL FORCE
65. MEMBER LOAD
66. 32 CON GX -1.26 2.25
67. 33 CON GX -1.26 5.5
68. 34 CON GX -1.26 4
69. 35 CON GX -1.26 2.5
70. LOAD 5 LOADTYPE NONE  TITLE WIND ON STRUCTURE
71. JOINT LOAD
72. 8 FX -0.42
73. MEMBER LOAD
74. 32 CON GX -6.03 2.25
75. 33 CON GX -6.03 5.5
76. 34 CON GX -6.03 4
77. 35 CON GX -6.03 2.5
78. 32 CON GZ -1.45 2.25
79. 33 CON GZ -1.45 5.5
80. 34 CON GZ -1.45 4
81. 35 CON GZ -1.45 2.5
82. 24 27 UNI GX -0.094 0 10
83. JOINT LOAD
84. 22 FX -3.78
85. LOAD 6 LOADTYPE NONE  TITLE WIND ON LIVE LOAD
86. MEMBER LOAD
87. 32 CON GX -1.68 2.25
88. 33 CON GX -1.68 5.5
89. 34 CON GX -1.68 4
90. 35 CON GX -1.68 2.5
```

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 91. 32 CON GZ -0.67 2.25
 92. 33 CON GZ -0.67 5.5
 93. 34 CON GZ -0.67 4
 94. 35 CON GZ -0.67 2.5
 95. LOAD 18 LOADTYPE NONE  TITLE LONGITUDINAL FORCE
 96. MEMBER LOAD
 97. 32 CON GZ -1.8 2.25
 98. 33 CON GZ -1.8 5.5
 99. 34 CON GZ -1.8 4
100. 35 CON GZ -1.8 2.5
101. LOAD COMB 8 SERVICE GROUP I
102. 2 1.0 1 1.0 4 1.0
103. LOAD COMB 10 SERVICE GROUP II
104. 2 1.0 5 1.0
105. LOAD COMB 11 SERVICE GROUP III
106. 2 1.0 1 1.0 4 1.0 5 0.3 6 1.0 18 1.0
107. LOAD COMB 13 FACTORED GROUP I
108. 2 1.3 1 2.75 4 1.3
109. LOAD COMB 15 FACTORED GROUP II
110. 2 1.3 5 1.3
111. LOAD COMB 16 FACTORED GROUP III
112. 2 1.3 1 1.65 4 1.3 5 0.39 6 1.3 18 1.3
113. PERFORM ANALYSIS PRINT STATICS CHECK


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

  NUMBER OF JOINTS/MEMBER+ELEMENTS/SUPPORTS =    20/    20/     6
  ORIGINAL/FINAL BAND-WIDTH=    12/     5/     53 DOF
  TOTAL PRIMARY LOAD CASES =    6, TOTAL DEGREES OF FREEDOM =     66
  SIZE OF STIFFNESS MATRIX =        4 DOUBLE  KILO-WORDS
  REQRD/AVAIL. DISK SPACE  =     12.1/  24801.5 MB
```

STATIC LOAD/REACTION/EQUILIBRIUM SUMMARY FOR CASE NO. 1
LOADTYPE NONE TITLE LIVE LOAD

***TOTAL APPLIED LOAD (KIP FEET) SUMMARY (LOADING 1)
SUMMATION FORCE-X = 0.00
SUMMATION FORCE-Y = -130.80
SUMMATION FORCE-Z = 0.00

SUMMATION OF MOMENTS AROUND THE ORIGIN-
MX= 0.00 MY= 0.00 MZ= -1863.90

***TOTAL REACTION LOAD(KIP FEET) SUMMARY (LOADING 1)
SUMMATION FORCE-X = 0.00
SUMMATION FORCE-Y = 130.80
SUMMATION FORCE-Z = 0.00

SUMMATION OF MOMENTS AROUND THE ORIGIN-
MX= 0.00 MY= 0.00 MZ= 1863.90

MAXIMUM DISPLACEMENTS (INCH /RADIANS) (LOADING 1)

	MAXIMUMS	AT NODE
X =	9.68449E-04	20
Y =	-2.67970E-02	1
Z =	3.40285E-05	25
RX=	2.78353E-05	25
RY=	-1.23184E-05	25
RZ=	9.20726E-05	1

STATIC LOAD/REACTION/EQUILIBRIUM SUMMARY FOR CASE NO. 2
LOADTYPE NONE TITLE DEAD LOAD

***TOTAL APPLIED LOAD (KIP FEET) SUMMARY (LOADING 2)
SUMMATION FORCE-X = 0.00
SUMMATION FORCE-Y = -744.44
SUMMATION FORCE-Z = 0.00

SUMMATION OF MOMENTS AROUND THE ORIGIN-
MX= 0.00 MY= 0.00 MZ= -10634.08

***TOTAL REACTION LOAD(KIP FEET) SUMMARY (LOADING 2)
SUMMATION FORCE-X = 0.00
SUMMATION FORCE-Y = 744.44
SUMMATION FORCE-Z = 0.00

SUMMATION OF MOMENTS AROUND THE ORIGIN-
MX= 0.00 MY= 0.00 MZ= 10634.08

MAXIMUM DISPLACEMENTS (INCH /RADIANS) (LOADING 2)

	MAXIMUMS	AT NODE
X =	5.87417E-03	20
Y =	-1.19752E-01	8
Z =	-1.56841E-04	19
RX=	-8.61041E-05	19
RY=	3.87192E-05	19
RZ=	-3.07115E-04	8

STATIC LOAD/REACTION/EQUILIBRIUM SUMMARY FOR CASE NO. 4
LOADTYPE NONE TITLE CENTRIFUGAL FORCE

***TOTAL APPLIED LOAD (KIP FEET) SUMMARY (LOADING 4)
SUMMATION FORCE-X = -5.04
SUMMATION FORCE-Y = 0.00
SUMMATION FORCE-Z = 0.00

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

***TOTAL REACTION LOAD(KIP FEET) SUMMARY (LOADING 4)
SUMMATION FORCE-X = 5.04
SUMMATION FORCE-Y = 0.00
SUMMATION FORCE-Z = 0.00

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

MAXIMUM DISPLACEMENTS (INCH /RADIANS) (LOADING 4)

	MAXIMUMS	AT NODE
X =	-1.67653E+00	1
Y =	-9.60958E-03	1
Z =	2.71508E-06	23
RX=	-2.33803E-06	17
RY=	9.14856E-06	18
RZ=	8.93599E-05	17

STATIC LOAD/REACTION/EQUILIBRIUM SUMMARY FOR CASE NO. 5
LOADTYPE NONE TITLE WIND ON STRUCTURE

***TOTAL APPLIED LOAD (KIP FEET) SUMMARY (LOADING 5)
SUMMATION FORCE-X = -30.20
SUMMATION FORCE-Y = 0.00
SUMMATION FORCE-Z = -5.80

SUMMATION OF MOMENTS AROUND THE ORIGIN-
MX= 0.00 MY= 82.65 MZ= -27.72

***TOTAL REACTION LOAD(KIP FEET) SUMMARY (LOADING 5)
SUMMATION FORCE-X = 30.20
SUMMATION FORCE-Y = 0.00
SUMMATION FORCE-Z = 5.80

SUMMATION OF MOMENTS AROUND THE ORIGIN-
MX= 0.00 MY= -82.65 MZ= 27.72

MAXIMUM DISPLACEMENTS (INCH /RADIANS) (LOADING 5)

	MAXIMUMS	AT NODE
X =	-1.00328E+01	8
Y =	-7.52434E-02	17
Z =	-3.85813E-01	17
RX=	7.52263E-04	23
RY=	-5.25755E-05	24
RZ=	5.29909E-04	23

STATIC LOAD/REACTION/EQUILIBRIUM SUMMARY FOR CASE NO. 6
LOADTYPE NONE TITLE WIND ON LIVE LOAD

***TOTAL APPLIED LOAD (KIP FEET) SUMMARY (LOADING 6)
SUMMATION FORCE-X = -6.72
SUMMATION FORCE-Y = 0.00
SUMMATION FORCE-Z = -2.68

SUMMATION OF MOMENTS AROUND THE ORIGIN-
MX= 0.00 MY= 38.19 MZ= 0.00

***TOTAL REACTION LOAD(KIP FEET) SUMMARY (LOADING 6)
SUMMATION FORCE-X = 6.72
SUMMATION FORCE-Y = 0.00
SUMMATION FORCE-Z = 2.68

SUMMATION OF MOMENTS AROUND THE ORIGIN-
MX= 0.00 MY= -38.19 MZ= 0.00

MAXIMUM DISPLACEMENTS (INCH /RADIANS) (LOADING 6)

	MAXIMUMS	AT NODE
X =	-2.23537E+00	1
Y =	-2.75516E-02	17
Z =	-1.78269E-01	22
RX=	3.44431E-04	19
RY=	-1.21981E-05	24
RZ=	1.19162E-04	19

STATIC LOAD/REACTION/EQUILIBRIUM SUMMARY FOR CASE NO. 18
LOADTYPE NONE TITLE LONGITUDINAL FORCE

```
***TOTAL APPLIED LOAD ( KIP  FEET ) SUMMARY (LOADING   18 )
    SUMMATION FORCE-X =        0.00
    SUMMATION FORCE-Y =        0.00
    SUMMATION FORCE-Z =       -7.20

   SUMMATION OF MOMENTS AROUND THE ORIGIN-
   MX=           0.00  MY=         102.60  MZ=           0.00


***TOTAL REACTION LOAD( KIP  FEET ) SUMMARY (LOADING    18 )
    SUMMATION FORCE-X =        0.00
    SUMMATION FORCE-Y =        0.00
    SUMMATION FORCE-Z =        7.20

   SUMMATION OF MOMENTS AROUND THE ORIGIN-
   MX=           0.00  MY=        -102.60  MZ=           0.00


MAXIMUM DISPLACEMENTS ( INCH /RADIANS) (LOADING     18)
          MAXIMUMS    AT NODE
   X = -1.45593E-05      17
   Y = -5.54046E-02      18
   Z = -4.78931E-01      22
   RX=  9.22216E-04      21
   RY=  3.07298E-06       8
   RZ= -4.10687E-08      17



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


114. PRINT MEMBER INFORMATION LIST 16 TO 35
```

MEMBER INFORMATION

MEMBER	START JOINT	END JOINT	LENGTH (FEET)	BETA (DEG)	RELEASES
16	23	20	5.000	0.00	
17	20	17	5.000	0.00	
18	24	21	5.000	0.00	
19	21	18	5.000	0.00	
20	25	22	5.000	0.00	
21	22	19	5.000	0.00	
22	17	29	85.000	0.00	
23	18	30	85.000	0.00	
24	19	31	85.000	0.00	
25	23	32	85.000	0.00	
26	24	33	85.000	0.00	
27	25	34	85.000	0.00	
28	23	24	9.500	0.00	
29	24	25	9.500	0.00	
30	17	18	9.500	0.00	
31	18	19	9.500	0.00	
32	1	26	4.750	0.00	
33	26	27	9.500	0.00	
34	27	28	9.500	0.00	
35	28	8	4.750	0.00	

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

115. PRINT MEMBER PROPERTIES LIST 16 TO 35

MEMBER PROPERTIES. UNIT - INCH

MEMB	PROFILE	AX/ AY	IZ/ AZ	IY/ SZ	IX/ SY
16	PRISMATIC	1890.02	459275.22	192944.06	461265.69
		1606.52	1606.52	17010.19	11025.25
17	PRISMATIC	1890.02	459275.22	192944.06	461265.69
		1606.52	1606.52	17010.19	11025.25
18	PRISMATIC	1890.02	459275.22	192944.06	461265.69
		1606.52	1606.52	17010.19	11025.25
19	PRISMATIC	1890.02	459275.22	192944.06	461265.69
		1606.52	1606.52	17010.19	11025.25
20	PRISMATIC	1890.02	459275.22	192944.06	461265.69
		1606.52	1606.52	17010.19	11025.25
21	PRISMATIC	1890.02	459275.22	192944.06	461265.69
		1606.52	1606.52	17010.19	11025.25
22	PRISMATIC	378.14	14444.70	14444.70	25608.96
		0.00	0.00	2891.83	2891.83
23	PRISMATIC	378.14	14444.70	14444.70	25608.96
		0.00	0.00	2891.83	2891.83
24	PRISMATIC	378.14	14444.70	14444.70	25608.96
		0.00	0.00	2891.83	2891.83
25	PRISMATIC	378.14	14444.70	14444.70	25608.96
		0.00	0.00	2891.83	2891.83
26	PRISMATIC	378.14	14444.70	14444.70	25608.96
		0.00	0.00	2891.83	2891.83
27	PRISMATIC	378.14	14444.70	14444.70	25608.96
		0.00	0.00	2891.83	2891.83
28	PRISMATIC	720.00	54000.00	34560.00	70945.21
		612.00	612.00	3600.00	2880.00
29	PRISMATIC	720.00	54000.00	34560.00	70945.21
		612.00	612.00	3600.00	2880.00
30	PRISMATIC	720.00	54000.00	34560.00	70945.21
		612.00	612.00	3600.00	2880.00
31	PRISMATIC	720.00	54000.00	34560.00	70945.21
		612.00	612.00	3600.00	2880.00
32	PRISMATIC	1080.00	81000.00	116640.00	160735.94
		918.00	918.00	5400.00	6480.00
33	PRISMATIC	1080.00	81000.00	116640.00	160735.94
		918.00	918.00	5400.00	6480.00
34	PRISMATIC	1080.00	81000.00	116640.00	160735.94
		918.00	918.00	5400.00	6480.00
35	PRISMATIC	1080.00	81000.00	116640.00	160735.94
		918.00	918.00	5400.00	6480.00

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

116. PRINT MATERIAL PROPERTIES LIST 16 TO 35

MATERIAL PROPERTIES.

ALL UNITS ARE - KIP FEET

MEMBER	E	G	DEN	ALPHA
16	453600.0	193846.1	0.14999001	0.00000550
17	453600.0	193846.1	0.14999001	0.00000550
18	453600.0	193846.1	0.14999001	0.00000550
19	453600.0	193846.1	0.14999001	0.00000550
20	453600.0	193846.1	0.14999001	0.00000550
21	453600.0	193846.1	0.14999001	0.00000550
22	453600.0	193846.1	0.14999001	0.00000550
23	453600.0	193846.1	0.14999001	0.00000550
24	453600.0	193846.1	0.14999001	0.00000550
25	453600.0	193846.1	0.14999001	0.00000550
26	453600.0	193846.1	0.14999001	0.00000550
27	453600.0	193846.1	0.14999001	0.00000550
28	453600.0	193846.1	0.14999001	0.00000550
29	453600.0	193846.1	0.14999001	0.00000550
30	453600.0	193846.1	0.14999001	0.00000550
31	453600.0	193846.1	0.14999001	0.00000550
32	453600.0	193846.1	0.14999001	0.00000550
33	453600.0	193846.1	0.14999001	0.00000550
34	453600.0	193846.1	0.14999001	0.00000550
35	453600.0	193846.1	0.14999001	0.00000550

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

117. PRINT SUPPORT INFORMATION

SUPPORT INFORMATION (1=FIXED, 0=RELEASED)

UNITS FOR SPRING CONSTANTS ARE KIP FEET DEGREES

JOINT	FORCE-X/ KFX	FORCE-Y/ KFY	FORCE-Z/ KFZ	MOM-X/ KMX	MOM-Y/ KMY	MOM-Z/ KMZ
29	1	1	1	1	1	1
	0.0000E+00	0.0000E+00	0.0000E+00	0.000E+00	0.000E+00	0.000E+00
30	1	1	1	1	1	1
	0.0000E+00	0.0000E+00	0.0000E+00	0.000E+00	0.000E+00	0.000E+00
31	1	1	1	1	1	1
	0.0000E+00	0.0000E+00	0.0000E+00	0.000E+00	0.000E+00	0.000E+00
32	1	1	1	1	1	1
	0.0000E+00	0.0000E+00	0.0000E+00	0.000E+00	0.000E+00	0.000E+00

```
 33       1          1          1          1          1          1
      0.0000E+00 0.0000E+00 0.0000E+00 0.000E+00 0.000E+00 0.000E+00
 34       1          1          1          1          1          1
      0.0000E+00 0.0000E+00 0.0000E+00 0.000E+00 0.000E+00 0.000E+00


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


118. LOAD LIST 8 10 11
119. PRINT SUPPORT REACTION LIST 29 TO 34
```

SUPPORT REACTIONS -UNIT KIP FEET STRUCTURE TYPE = SPACE

JOINT	LOAD	FORCE-X	FORCE-Y	FORCE-Z	MOM-X	MOM-Y	MOM Z
29	8	0.81	153.91	-17.30	29.12	-4.18	-34.81
	10	4.99	156.11	-17.18	43.24	-26.51	-212.79
	11	3.43	163.36	-17.70	57.13	-18.15	-146.38
30	8	0.84	140.41	-15.60	29.21	-4.52	-35.82
	10	5.05	115.27	-12.03	43.33	-27.04	-214.51
	11	3.49	131.30	-13.66	57.22	-18.66	-147.97
31	8	0.87	143.31	-15.97	29.12	-4.75	-36.46
	10	5.05	87.27	-8.50	43.27	-27.01	-214.44
	11	3.49	115.77	-11.70	57.14	-18.75	-148.16
32	8	0.81	153.91	17.30	-29.12	4.18	-34.81
	10	4.99	165.17	19.11	-15.28	26.51	-212.79
	11	3.43	181.51	21.58	-1.10	18.15	-146.38
33	8	0.84	140.41	15.60	-29.21	4.52	-35.82
	10	5.05	124.30	13.96	-15.36	27.04	-214.51
	11	3.49	149.39	17.53	-1.19	18.66	-147.97
34	8	0.87	143.31	15.97	-29.12	4.75	-36.46
	10	5.05	96.32	10.44	-15.30	27.01	-214.44
	11	3.49	133.91	15.58	-1.11	18.75	-148.16

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

```
120. LOAD LIST 13 15 16
121. SECTION 0 0.154 0.5 0.846 1 MEMB 33 34
122. SECTION 0 0.475 0.693 1 MEMB 32
123. SECTION 0 0.307 0.47 0.99 1 MEMB 35
124. PRINT MEMBER SECTION FORCES LIST 32 TO 35
```

MEMBER FORCES AT INTERMEDIATE SECTIONS

ALL UNITS ARE -- KIP FEET

MEMB	LOAD	SEC	SHEAR-Y	SHEAR-Z	MOM-Y	MOM-Z
32	13	0.47	-224.78	0.00	0.00	5.11
		0.69	-226.30	0.00	0.00	238.66
	15	0.47	-134.86	-1.88	-0.01	4.54
		0.69	-136.37	-1.88	-1.96	144.98
	16	0.47	-188.81	-3.78	-0.02	4.88
		0.69	-190.33	-3.78	-3.93	201.18
33	13	0.15	91.17	0.00	0.00	154.43
		0.50	85.91	0.00	0.00	-136.62
		0.85	-131.02	0.00	0.00	126.51
	15	0.15	81.31	0.70	-0.94	199.68
		0.50	76.04	0.70	1.34	-58.94
		0.85	-50.96	-1.19	-1.15	8.48
	16	0.15	93.07	1.39	-1.89	196.22
		0.50	87.81	1.39	2.69	-101.08
		0.85	-93.14	-2.38	-2.31	64.55
34	13	0.15	141.41	0.00	0.00	151.92
		0.50	-75.92	0.00	0.00	-144.78
		0.85	-81.66	0.00	0.00	114.19
	15	0.15	110.18	1.19	-1.15	157.58
		0.50	-17.23	-0.70	1.34	-103.91
		0.85	-22.96	-0.70	-0.94	-37.86
	16	0.15	134.78	2.38	-2.31	168.72
		0.50	-46.59	-1.39	2.69	-133.14
		0.85	-52.32	-1.39	-1.89	29.42
35	13	0.31	227.69	0.00	0.00	240.94
		0.47	226.23	0.00	0.00	65.22
		0.99	0.09	0.00	0.00	0.00
	15	0.31	137.76	1.88	-1.96	147.26
		0.47	136.30	1.88	-0.50	41.16
		0.99	0.09	0.00	0.00	0.00
	16	0.31	191.72	3.78	-3.93	203.47
		0.47	190.26	3.78	-1.01	55.59
		0.99	0.09	0.00	0.00	0.00

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

125. PRINT MAXFORCE ENVELOPE NSECTION 10 LIST 16 TO 21 28 TO 35

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
16	MAX	173.67	0.00	13	93.42	0.00	16			
		38.68	0.00	13	165.78	5.00	13	29.66 C	0.00	16
	MIN	116.87	5.00	15	-793.77	5.00	13			
		28.39	5.00	15	-36.81	0.00	15	23.53 C	5.00	15
17	MAX	-105.08	0.00	15	42.58	5.00	13			
		-27.78	0.00	15	165.78	0.00	13	29.65 C	0.00	13
	MIN	-173.67	5.00	13	-793.77	0.00	13			
		-38.68	5.00	13	-36.53	5.00	15	20.95 C	5.00	15
18	MAX	151.56	0.00	13	88.16	0.00	16			
		-4.61	0.00	13	8.82	0.00	15	17.34 C	0.00	16
	MIN	88.97	5.00	15	-688.47	5.00	13			
		-26.54	5.00	15	-123.88	5.00	15	13.48 C	5.00	15
19	MAX	-77.27	0.00	15	37.34	5.00	13			
		26.54	0.00	15	8.82	5.00	15	16.69 C	0.00	13
	MIN	-151.56	5.00	13	-688.47	0.00	13			
		4.61	5.00	13	-123.88	0.00	15	11.10 C	5.00	15
20	MAX	170.22	0.00	13	91.64	0.00	16			
		-20.26	0.00	15	20.50	0.00	13	29.17 C	0.00	13
	MIN	89.01	5.00	15	-776.84	5.00	13			
		-37.34	5.00	13	-166.19	5.00	13	19.56 C	5.00	15
21	MAX	-77.22	0.00	15	42.27	5.00	13			
		37.34	0.00	13	20.50	5.00	13	29.17 C	0.00	13
	MIN	-170.22	5.00	13	-776.84	0.00	13			
		19.65	5.00	15	-166.19	0.00	13	16.98 C	5.00	15
28	MAX	35.13	0.00	15	192.02	0.00	15			
		1.32	0.00	15	21.88	0.00	13	40.21 C	0.00	16
	MIN	-0.16	9.50	13	-97.69	9.50	15			
		-3.04	9.50	13	-6.99	9.50	13	34.88 C	9.50	15
29	MAX	35.77	0.00	15	146.01	0.00	15			
		5.99	0.00	15	29.78	9.50	16	36.20 C	0.00	13
	MIN	1.23	9.50	13	-149.79	9.50	15			
		4.29	9.50	13	-28.65	0.00	15	14.91 C	9.50	15
30	MAX	35.14	0.00	15	192.10	0.00	15			
		3.04	0.00	13	6.99	9.50	13	39.71 C	0.00	13

	MIN	-0.16	9.50	13	-97.79	9.50	15			
		-1.38	9.50	15	-21.88	0.00	13	34.27 C	9.50	15
31	MAX	35.75	0.00	15	145.91	0.00	15			
		-4.29	0.00	13	28.31	0.00	15	36.20 C	0.00	13
	MIN	1.23	9.50	13	-149.72	9.50	15			
		-5.93	9.50	15	-29.21	9.50	16	14.30 C	9.50	15
32	MAX	0.00	0.00	15	570.21	4.75	13			
		0.00	0.00	16	0.00	0.00	13	0.00	0.00	13
	MIN	-228.43	4.75	13	0.00	0.00	13			
		-3.78	4.75	16	-9.44	4.75	16	7.84 T	4.75	15
33	MAX	95.21	0.00	16	333.95	0.00	16			
		1.39	0.00	16	3.26	5.70	16	64.01 T	0.00	15
	MIN	-133.57	9.50	13	-175.19	5.70	13			
		-2.38	9.50	16	-5.79	9.50	16	82.63 T	9.50	16
34	MAX	143.96	0.00	13	367.77	0.00	16			
		2.38	0.00	16	3.26	3.80	16	18.77 T	0.00	15
	MIN	-84.41	9.50	13	-173.80	3.80	13			
		-1.39	9.50	16	-5.79	0.00	16	73.04 T	9.50	13
35	MAX	230.43	0.00	13	574.96	0.00	13			
		3.78	0.00	16	0.00	3.80	16	8.39 C	0.00	15
	MIN	0.00	4.75	15	0.00	4.75	13			
		0.00	4.75	15	-9.44	0.00	16	0.00 C	4.75	13

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

126. FINISH

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

**** DATE= AUG 28,2006 TIME= 11: 2:28 ****

```
*************************************************************
*         For questions on STAAD.Pro, please contact        *
*   Research Engineers Offices at the following locations   *
*                                                           *
*               Telephone                Email              *
*  USA:       +1 (714)974-2500       support@reiusa.com      *
*  CANADA     +1 (905)632-4771       detech@odandetech.com   *
*  CANADA     +1 (604)629 6087       staad@dowco.com         *
*  UK         +44(1454)207-000       support@reel.co.uk      *
*  FRANCE     +33(0)1 64551084       support@reel.co.uk      *
*  GERMANY    +49/931/40468-71       info@reig.de            *
*  NORWAY     +47 67 57 21 30        staad@edr.no            *
*  SINGAPORE +65 6225-6015/16        support@reiasia.net     *
*  INDIA      +91(033)2357-3575 support@calcutta.reiusa.com *
*  JAPAN      +81(03)5952-6500       eng-eye@crc.co.jp       *
*  CHINA      +86(411)363-1983       support@reiasia.net     *
*  THAILAND   +66(0)2645-1018/19    support@thai.reiusa.com  *
*                                                           *
*  North America                    support@reiusa.com       *
*  Europe                           support@reel.co.uk       *
*  Asia                             support@reiasia.net      *
*************************************************************
```

Information about the key files in the current distribution

Modfication Date	CRC	Size (Bytes)	File Name
02/27/2006	0x8140	12701696	SProStaad.exe
12/16/2004	0xca81	04558848	SProStaadStl.exe
09/19/2003	0x2fc0	00081970	CMesh.dll
02/06/2006	0x5601	02486272	dbsectioninterface.dll
01/23/2001	0x9b40	00073728	LoadGen.dll
09/25/2003	0x6340	00704512	MeshEngine.dll
09/22/2003	0xce00	00069632	QuadPlateEngine.dll
12/22/2005	0x4181	00094208	SurfMesh.dll
09/30/2005	0x2dc1	00475136	aiscsections.mdb
01/05/2005	0x79c1	00319488	aiscsections_all_editions.mdb
01/05/2005	0x4b81	01810432	aiscsteeljoists.mdb
01/05/2005	0xcac1	03651584	aitctimbersections.mdb
01/27/2005	0xeb01	00552960	aluminumsections.mdb
01/05/2005	0xcd01	00163840	australiansections.mdb
01/05/2005	0x6a41	00229376	britishsections.mdb
07/08/2005	0x9d41	00434176	bscoldformedsections.mdb
06/28/2005	0x8201	00327680	butlercoldformedsections.mdb
01/05/2005	0xabc0	00262144	canadiansections.mdb
05/31/2005	0x9e81	00450560	canadiantimbersections.mdb
05/05/2005	0x7f80	00409600	chinesesections.mdb
01/05/2005	0xd6c0	00600064	dutchsections.mdb
01/05/2005	0x1a00	00354304	europeansections.mdb
01/05/2005	0xd301	00202752	frenchsections.mdb
01/05/2005	0x11c1	00233472	germansections.mdb
01/05/2005	0x3c40	00264192	indiansections.mdb
01/05/2005	0xd540	00180224	iscoldformedsections.mdb
01/24/2006	0x2501	00221184	japanesesections.mdb
11/08/2005	0x9081	00376832	Kingspancoldformedsections.mdb
01/05/2005	0xb740	00174080	koreansections.mdb
02/03/2005	0xda00	00096256	lysaghtcoldformedsections.mdb
02/07/2005	0x9a00	00243712	mexicansteeltables.mdb
01/04/2006	0x8980	00413696	RCecoColdFormedSections.mdb
02/03/2005	0x9b40	00307200	russiansections.mdb
01/05/2005	0x9081	00206848	southafricansections.mdb
01/06/2005	0x9341	00194560	spanishsections.mdb
01/04/2006	0x8680	00223232	uscoldformedsections.mdb
01/05/2005	0xbac0	00149504	usersectionstemplate.mdb
01/05/2005	0x9d41	00141312	venezuelansections.mdb

REINFORCED BEAM CAP

Reinforing Yield Strength	$Fy := 40000psi$
Concrete Compresion Strength	$Fc := 5600psi$
Width of Beam	$b := 3ft$
Depth of Top Reinforcemnt	$dt := 2.25ft$
Depth of Bottom Reinforcemnt	$db := 2.1667ft$
Positive Reinforcement Area	$Asp := 6.24in^2$
Negative Reinforcement Area	$Asn := 6.35in^2$
Reinforcement Ratio	$\rho w := \frac{Asp}{b \cdot db}$

Positive Moment Capacity: Compression Steel neglected

$$\phi_f := 0.9$$

Tension in Reinforcemnt $\quad Tp := Asp \cdot Fy$

Depth of Compression Block $\quad ap := \frac{Tp}{0.85 \cdot Fc \cdot b}$

$$\phi Mnp := \phi_f Tp \cdot \left(db - \frac{ap}{2} \right)$$

$$\phi Mnp = 473 \ ft\,k$$

Negative Moment Capacity: Compression Steel neglected

Tension in Reinforcemnt $\quad Tn := Asn \cdot Fy$

Depth of Compression Block $\quad an := \frac{Tn}{0.85 \cdot Fc \cdot b}$

$$\phi Mnn := \phi_f Tn \cdot \left(dt - \frac{an}{2} \right)$$

$$\phi Mnn = 500 \ ft\,k$$

Shear Capacity at 26'-3" East end of the Bent Cap

Factored Shear at Section	$Vu := 226.23k$
Factored Moment at Section	$Mu := 65.22k \cdot ft$
Stirrup Spacing	$S := 32in$
Stirrup Area	$Av := 0.4in^2$
Depth of Reinforcemnt	$ds := 2.97ft$

$$Vc1 := 2 \cdot psi \sqrt{\frac{Fc}{psi}} \cdot b \cdot ds \qquad Vc1 = 192\,k$$

$$Vc2 := \left(1.9 \cdot \sqrt{\frac{Fc}{psi}} + 2500 \cdot \rho w \frac{Vu \cdot ds}{Mu}\right) \cdot b \cdot ds \cdot psi \qquad Vc2 = 403\,k$$

$$Vc3 := 3.5 \cdot psi \sqrt{\frac{Fc}{psi}} \cdot b \cdot ds \qquad Vc3 = 336\,k$$

$Vc4 := if(Vc1 < Vc2, Vc2, Vc$ $Vc := if(Vc4 < Vc3, Vc4, Vc3)$ $Vc = 336\,k$

$$Vs := \frac{Av \cdot Fy \cdot ds}{S} \qquad \phi_S := 0.85 \qquad Vs = 18\,k$$

$$\phi Vn := \phi_S \cdot (Vc + Vs) \qquad \phi Vn = 301\,k$$

Shear Capacity at 15'-8 1/2" from the East end of the Bent Cap

Factored Shear at Section	$Vu := 141.41k$
Factored Moment at Section	$Mu := 151.92k \cdot ft$
Stirrup Spacing	$S := 11in$
Stirrup Area	$Av := 0.4in^2$
Depth of Reinforcemnt	$ds := 2.73ft$

$$Vc1 := 2 \cdot psi \sqrt{\frac{Fc}{psi}} \cdot b \cdot ds \qquad Vc1 = 177\,k$$

$$Vc2 := \left(1.9 \cdot \sqrt{\frac{Fc}{psi}} + 2500 \cdot \rho w \frac{Vu \cdot ds}{Mu}\right) \cdot b \cdot ds \cdot psi \qquad Vc2 = 218\,k$$

$$Vc3 := 3.5 \cdot psi \sqrt{\frac{Fc}{psi}} \cdot b \cdot ds \qquad Vc3 = 309\,k$$

$Vc4 := if(Vc1 < Vc2, Vc2, Vc$ $Vc := if(Vc4 < Vc3, Vc4, Vc3)$ $Vc = 218\,k$

$$Vs := \frac{Av \cdot Fy \cdot ds}{S} \qquad \phi_S := 0.85 \qquad Vs = 48\,k$$

$$\phi Vn := \phi_S \cdot (Vc + Vs) \qquad \phi Vn = 225\,k$$

Shear Capacity at 2'-3" from the East end of the Bent Cap

Factored Shear at Section $Vu := 224.78k$

Factored Moment at Section $Mu := 5.11k \cdot ft$

Stirrup Spacing $S := 32in$

Stirrup Area $Av := 0.4in^2$

$$Vc1 := 2 \cdot psi \sqrt{\frac{Fc}{psi}} \cdot b \cdot dt \qquad Vc1 = 145\,k$$

$$Vc2 := \left(1.9 \cdot \sqrt{\frac{Fc}{psi}} + 2500 \cdot \rho w \frac{Vu \cdot dt}{Mu}\right) \cdot b \cdot dt \cdot psi \qquad Vc2 = 1742\,k$$

$$Vc3 := 3.5 \cdot psi \sqrt{\frac{Fc}{psi}} \cdot b \cdot dt \qquad Vc3 = 255\,k$$

$Vc4 := if(Vc1 < Vc2, Vc2, Vc\ Vc := if(Vc4 < Vc3, Vc4, Vc3))$ $Vc = 255\,k$

$$Vs := \frac{Av \cdot Fy \cdot dt}{S} \qquad \phi_S := 0.85 \qquad Vs = 14\,k$$

$\phi Vn := \phi_S \cdot (Vc + Vs)$ $\phi Vn = 228\,k$

REINFORCED SUBCAP

Reinforing Yield Strength	$Fy := 40ksi$
Concrete Compresion Strength	$Fc := 3ksi$
Width of Beam	$b := 2.9167ft$
Depth of Reinforcemnt	$d := 3.5833ft$
Positive Reinforcement Area	$As := 12.48in^2$

Positive Moment Capacity: Compression Steel neglected

Tension in Reinforcemnt $T := As \cdot Fy$

Depth of Compression Block $a := \frac{T}{0.85 \cdot Fc \cdot b}$

$\phi_f := 0.90$

$\phi Mn := \phi_f T \cdot \left(d - \frac{a}{2} \right)$

$\phi Mn = 1505\ ft\,k$

Shear Capacity

Stirrup Spacing $S := 12in$

Stirrup Area $Av := 0.62in^2$

$ds := 4.0417ft$

$Vc := 2 \cdot psi \sqrt{\frac{Fc}{psi}} \cdot b \cdot ds$

$Vc = 186\ k$

$Vs := \frac{Av \cdot Fy \cdot ds}{S}$

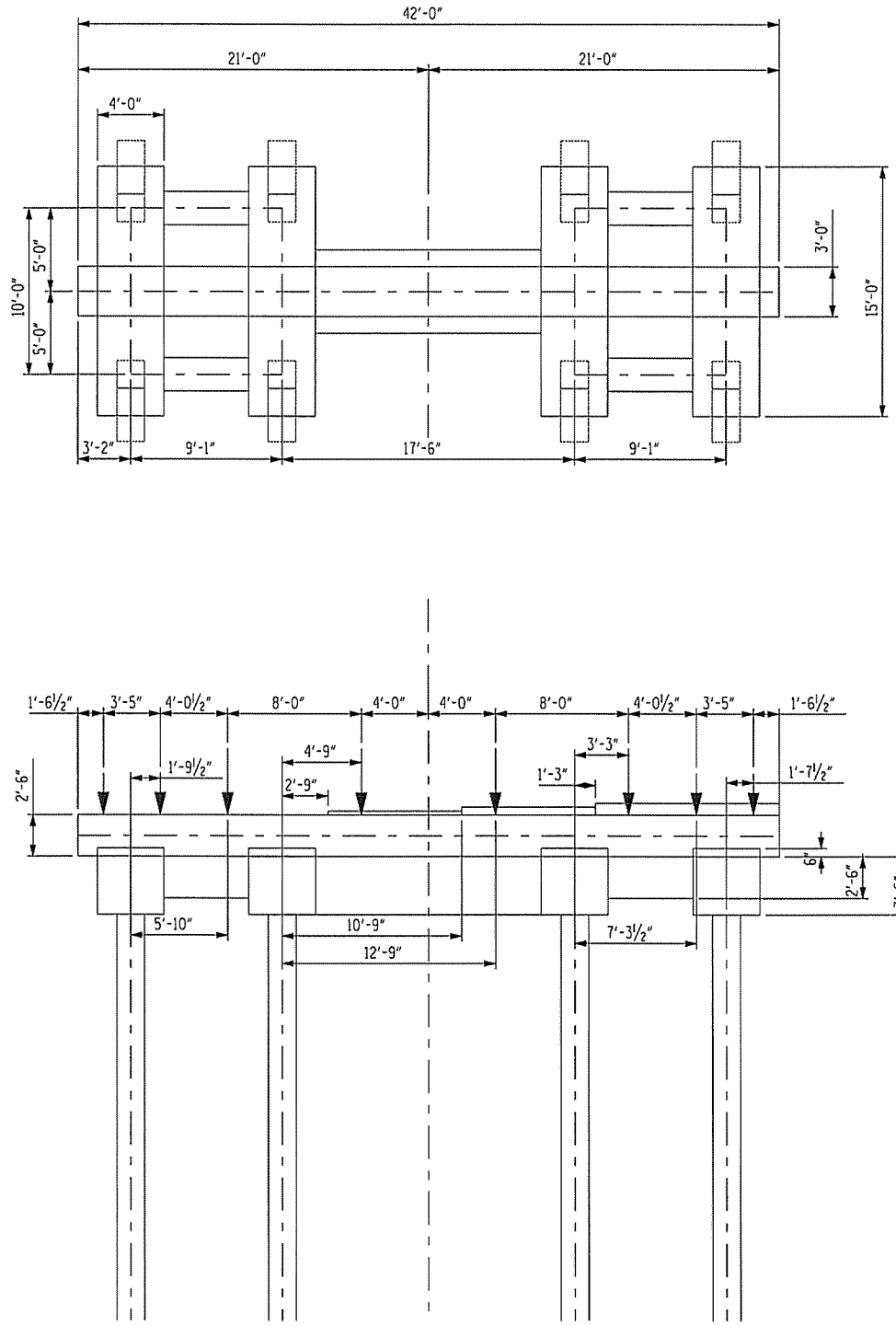
$Vs = 100\ k$

$\phi_s := 0.85$

$\phi Vn := \phi_s \cdot (Vc + Vs)$

$\phi Vn = 243\ k$

For Reinforced Strut Section Capacity see Type 7 Section Capacity Mathcad Sheet

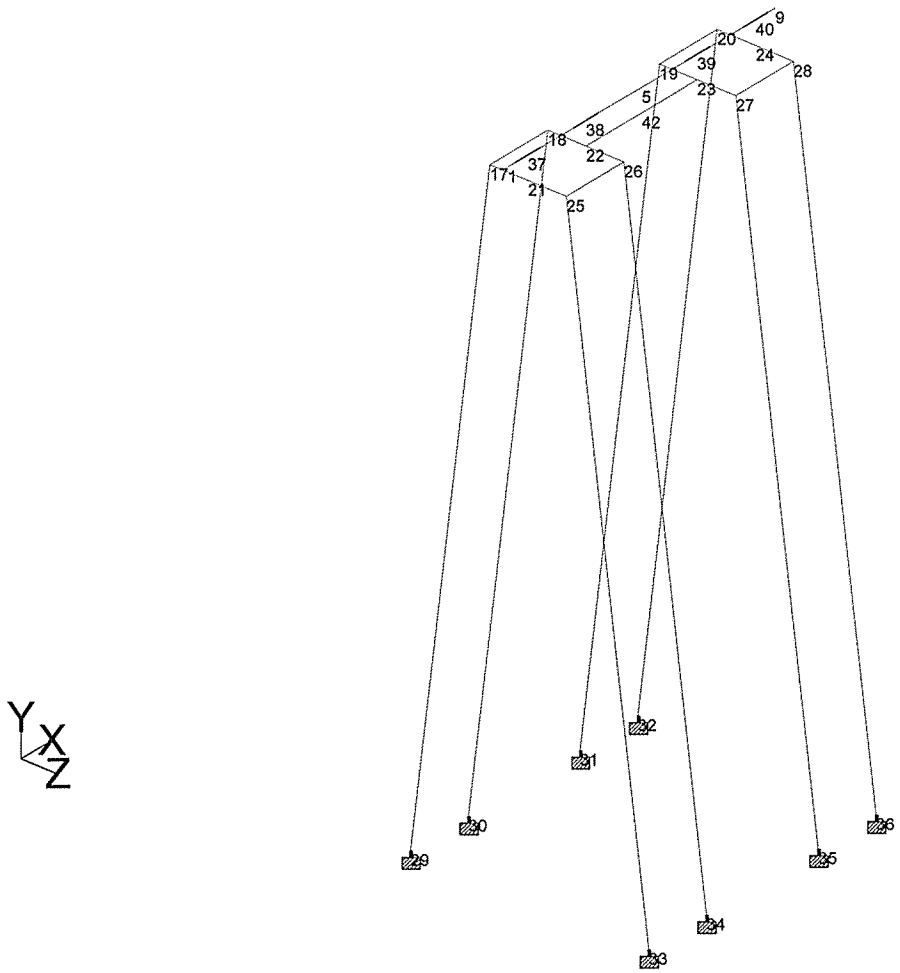


ELEVATION TYPE 9

BENTS 184, 185, 186

NBIS REPORT BENT TYPE B CRUTCH BENT 1

JAKO
8/22


Y
X
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171
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23
Load 1

```
*****************************************************
*                                                   *
*           STAAD.Pro                               *
*           Version  2005    Bld 1003.US            *
*           Proprietary Program of                  *
*           Research Engineers,  Intl.              *
*           Date=    AUG 28, 2006                   *
*           Time=    11:31:37                       *
*                                                   *
*      USER ID: Ko and Associates                   *
*****************************************************
```

MJM
AKO
8/29

```
     1. STAAD SPACE
INPUT FILE: Type 9.STD
     2. START JOB INFORMATION
     3. ENGINEER DATE 24-MAY-06
     4. END JOB INFORMATION
     5. INPUT WIDTH 79
     6. UNIT FEET KIP
     7. JOINT COORDINATES
     8. 1 0 0 0; 5 21 0 0; 9 42 0 0; 17 3.1667 -3 -5; 18 12.25 -3 -5; 19 29.75 -3 -5
     9. 20 38.8333 -3 -5; 21 3.1667 -3 0; 22 12.25 -3 0; 23 29.75 -3 0
    10. 24 38.8333 -3 0; 25 3.1667 -3 5; 26 12.25 -3 5; 27 29.75 -3 5; 28 38.8333 -3 5
    11. 29 3.1667 -87.333 -15.625; 30 12.25 -87.333 -15.625; 31 29.75 -87.333 -15.625
    12. 32 38.8333 -87.333 -15.625; 33 3.1667 -87.333 15.625; 34 12.25 -87.333 15.625
    13. 35 29.75 -87.333 15.625; 36 38.8333 -87.333 15.625; 37 3.1667 0 0
    14. 38 12.25 0 0; 39 29.75 0 0; 40 38.8333 0 0; 42 21 -3 0
    15. MEMBER INCIDENCES
    16. 16 17 21; 17 21 25; 18 18 22; 19 22 26; 20 19 23; 21 23 27; 22 20 24; 23 24 28
    17. 24 25 33; 25 26 34; 26 27 35; 27 28 36; 28 17 29; 29 18 30; 30 19 31; 31 20 32
    18. 32 22 42; 33 17 18; 34 19 20; 35 27 28; 36 25 26; 37 1 37; 38 37 38; 39 38 5
    19. 40 5 39; 41 39 40; 42 40 9; 43 42 23
    20. MEMBER PROPERTY AMERICAN
    21. 16 TO 23 PRIS YD 4 ZD 4
    22. 24 TO 31 PRIS AX 2.626 IX 1.235 IY 0.6966 IZ 0.6966
    23. 32 43 PRIS YD 3.5 ZD 5
    24. MEMBER PROPERTY AMERICAN
    25. 33 TO 36 PRIS YD 2.5 ZD 2
    26. MEMBER PROPERTY AMERICAN
    27. 37 TO 42 PRIS YD 2.5 ZD 3
    28. UNIT INCHES KIP
    29. DEFINE MATERIAL START
    30. ISOTROPIC CONCRETE
    31. E 3150
    32. POISSON 0.17
    33. DENSITY 8.68E-005
    34. ALPHA 5.5E-006
    35. DAMP 0.05
    36. END DEFINE MATERIAL
    37. CONSTANTS
    38. MATERIAL CONCRETE MEMB 16 TO 43
    39. SUPPORTS
    40. 29 TO 36 FIXED
```

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41. UNIT FEET KIP
42. SLAVE RIGID MASTER 37 JOINT 21
43. SLAVE RIGID MASTER 38 JOINT 22
44. SLAVE RIGID MASTER 39 JOINT 23
45. SLAVE RIGID MASTER 40 JOINT 24
46. SLAVE RIGID MASTER 5 JOINT 42
47. UNIT INCHES KIP
48. LOAD 1 LOADTYPE NONE  TITLE LIVE LOAD
49. UNIT FEET KIP
50. MEMBER LOAD
51. 38 CON GY -32.7 5.8333
52. 39 CON GY -32.7 4.75
53. 40 CON GY -32.7 4
54. 41 CON GY -32.7 3.25
55. UNIT INCHES KIP
56. LOAD 2 LOADTYPE NONE  TITLE DEAD LOAD
57. SELFWEIGHT Y -1
58. UNIT FEET KIP
59. MEMBER LOAD
60. 37 CON GY -11.4 1.5417
61. 38 CON GY -11.4 1.7917
62. 38 CON GY -101.2 5.8333
63. 39 CON GY -93.6 4.75
64. 40 CON GY -93.6 4
65. 41 CON GY -101.2 3.25
66. 41 CON GY -11.4 7.2917
67. 42 CON GY -11.4 1.625
68. JOINT LOAD
69. 17 TO 20 25 TO 28 FY -6
70. MEMBER LOAD
71. 39 UNI GY -0.108 2.75 8.75
72. 40 UNI GY -0.216 2 8.75
73. 41 UNI GY -0.324 1.25 9.083
74. 41 UNI GY -0.216 0 1.25
75. 42 UNI GY -0.324 0 3.1667
76. 40 UNI GY -0.108 0 2
77. UNIT INCHES KIP
78. LOAD 5 LOADTYPE NONE  TITLE WIND ON STRUCTURE
79. UNIT FEET KIP
80. MEMBER LOAD
81. 38 CON GX -6.03 5.8333
82. 39 CON GX -6.03 4.75
83. 40 CON GX -6.03 4
84. 41 CON GX -6.03 3.25
85. 38 CON GZ -1.45 5.8333
86. 39 CON GZ -1.45 4.75
87. 40 CON GZ -1.45 4
```

```
 88. 41 CON GZ -1.45 3.25
 89. JOINT LOAD
 90. 9 FX -0.42
 91. MEMBER LOAD
 92. 27 31 UNI GX -0.094 0 10
 93. JOINT LOAD
 94. 24 FX -2.94
 95. UNIT INCHES KIP
 96. LOAD 6 LOADTYPE NONE  TITLE WIND ON LIVE LOAD
 97. UNIT FEET KIP
 98. MEMBER LOAD
 99. 38 CON GX -1.68 5.8333
100. 39 CON GX -1.68 4.75
101. 40 CON GX -1.68 4
102. 41 CON GX -1.68 3.25
103. 38 CON GZ -0.67 5.8333
104. 39 CON GZ -0.67 4.75
105. 40 CON GZ -0.67 4
106. 41 CON GZ -0.67 3.25
107. UNIT INCHES KIP
108. LOAD 7 LOADTYPE NONE  TITLE LONGITUDINAL FORCE
109. UNIT FEET KIP
110. MEMBER LOAD
111. 38 CON GZ -1.8 5.8333
112. 39 CON GZ -1.8 4.75
113. 40 CON GZ -1.8 4
114. 41 CON GZ -1.8 3.25
115. LOAD 4 LOADTYPE NONE  TITLE WALKWAY LIVE LOAD
116. MEMBER LOAD
117. 37 CON GY -8.9 1.5417
118. 38 CON GY -8.9 1.7917
119. 41 CON GY -8.9 7.2917
120. 42 CON GY -8.9 1.625
121. LOAD 19 LOADTYPE NONE  TITLE CENTRIFUGAL FORCE
122. MEMBER LOAD
123. 38 CON GX -1.26 5.8333
124. 39 CON GX -1.26 4.75
125. 40 CON GX -1.26 4
126. 41 CON GX -1.26 3.25
127. UNIT INCHES KIP
128. LOAD COMB 9 SERVICE GROUP I
129. 1 1.0 2 1.0 4 1.0 19 1.0
130. LOAD COMB 11 SERVICE GROUP II
131. 2 1.0 5 1.0
132. LOAD COMB 13 SERVICE GROUP III
133. 2 1.0 5 0.3 1 1.0 6 1.0 7 1.0 4 1.0 19 1.0
134. LOAD COMB 14 FACTORED GROUP I
135. 2 1.3 1 2.75 4 2.17 19 1.3
136. LOAD COMB 16 FACTORED GROUP II
137. 2 1.3 5 1.3
```

```
138. LOAD COMB 17 FACTORED GROUP III
139. 2 1.3 1 1.65 5 0.39 7 1.3 6 1.3 4 1.3 19 1.3
140. UNIT FEET KIP
141. PERFORM ANALYSIS PRINT STATICS LOAD


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

  NUMBER OF JOINTS/MEMBER+ELEMENTS/SUPPORTS =    28/    28/     8
  ORIGINAL/FINAL BAND-WIDTH=    24/     4/     65 DOF
  TOTAL PRIMARY LOAD CASES =    7, TOTAL DEGREES OF FREEDOM =     90
  SIZE OF STIFFNESS MATRIX =        6 DOUBLE  KILO-WORDS
  REQRD/AVAIL. DISK SPACE  =     12.1/  24801.5 MB
```

FOR LOADING - 1
APPLIED JOINT EQUIVALENT LOADS

JOINT	FORCE-X	FORCE-Y	FORCE-Z	MOM-X	MOM-Y	MOM-Z
5	0.00000E+00	-3.68940E+01	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
37	0.00000E+00	-9.56312E+00	0.00000E+00	0.00000E+00	0.00000E+00	-2.93037E+02
38	0.00000E+00	-3.73899E+01	0.00000E+00	0.00000E+00	0.00000E+00	1.36444E+02
39	0.00000E+00	-3.73899E+01	0.00000E+00	0.00000E+00	0.00000E+00	-1.36444E+02
40	0.00000E+00	-9.56311E+00	0.00000E+00	0.00000E+00	0.00000E+00	2.93037E+02

STATIC LOAD/REACTION/EQUILIBRIUM SUMMARY FOR CASE NO. 1
LOADTYPE NONE TITLE LIVE LOAD

***TOTAL APPLIED LOAD (KIP INCH) SUMMARY (LOADING 1)
SUMMATION FORCE-X = 0.00
SUMMATION FORCE-Y = -130.80
SUMMATION FORCE-Z = 0.00

SUMMATION OF MOMENTS AROUND THE ORIGIN-
MX= 0.00 MY= 0.00 MZ= -32961.60

***TOTAL REACTION LOAD(KIP INCH) SUMMARY (LOADING 1)
SUMMATION FORCE-X = 0.00
SUMMATION FORCE-Y = 130.80
SUMMATION FORCE-Z = 0.00

SUMMATION OF MOMENTS AROUND THE ORIGIN-
MX= 0.00 MY= 0.00 MZ= 32961.60

MAXIMUM DISPLACEMENTS (INCH /RADIANS) (LOADING 1)

	MAXIMUMS	AT NODE
X =	2.04574E-03	24
Y =	-2.59217E-02	5
Z =	-2.35641E-05	27
RX=	3.08523E-05	19
RY=	9.37402E-06	20
RZ=	1.08234E-04	28

EXTERNAL AND INTERNAL JOINT LOAD SUMMARY (KIP INCH)-

JT	EXT FX/ INT FX	EXT FY/ INT FY	EXT FZ/ INT FZ	EXT MX/ INT MX	EXT MY/ INT MY	EXT MZ/ INT MZ	
							SUPPORT=1
5	0.00	-36.89	0.00	0.00	0.00	0.00	
	0.00	7.55	0.00	0.00	0.00	0.00	000000
21	0.00	0.00	0.00	0.00	0.00	0.00	
	15.63	16.15	0.00	0.00	0.00	-39.71	000000
22	0.00	0.00	0.00	0.00	0.00	0.00	
	26.72	34.57	0.00	0.00	0.00	-537.83	000000
23	0.00	0.00	0.00	0.00	0.00	0.00	
	-26.72	34.57	0.00	0.00	0.00	537.83	000000

24	0.00	0.00	0.00	0.00	0.00	0.00	
	-15.63	16.15	0.00	0.00	0.00	39.71	000000
29	0.00	0.00	0.00	0.00	0.00	0.00	
	-0.03	-10.12	-1.28	-0.70	-2.00	9.69	111111
30	0.00	0.00	0.00	0.00	0.00	0.00	
	-0.02	-22.58	-2.85	-2.10	-0.69	5.85	111111
31	0.00	0.00	0.00	0.00	0.00	0.00	
	0.02	-22.58	-2.85	-2.10	0.69	-5.85	111111
32	0.00	0.00	0.00	0.00	0.00	0.00	
	0.03	-10.12	-1.28	-0.70	2.00	-9.69	111111
33	0.00	0.00	0.00	0.00	0.00	0.00	
	-0.03	-10.12	1.28	0.70	2.00	9.69	111111
34	0.00	0.00	0.00	0.00	0.00	0.00	
	-0.02	-22.58	2.85	2.10	0.69	5.85	111111
35	0.00	0.00	0.00	0.00	0.00	0.00	
	0.02	-22.58	2.85	2.10	-0.69	-5.85	111111
36	0.00	0.00	0.00	0.00	0.00	0.00	
	0.03	-10.12	1.28	0.70	-2.00	-9.69	111111
37	0.00	-9.56	0.00	0.00	0.00	-293.04	
	-15.63	-6.59	0.00	0.00	0.00	-230.00	000000
38	0.00	-37.39	0.00	0.00	0.00	136.44	
	-26.72	2.82	0.00	0.00	0.00	-560.62	000000
39	0.00	-37.39	0.00	0.00	0.00	-136.44	
	26.72	2.82	0.00	0.00	0.00	560.62	000000
40	0.00	-9.56	0.00	0.00	0.00	293.04	
	15.63	-6.59	0.00	0.00	0.00	230.00	000000
42	0.00	0.00	0.00	0.00	0.00	0.00	
	0.00	29.35	0.00	0.00	0.00	0.00	000000

FOR LOADING - 2
APPLIED JOINT EQUIVALENT LOADS

JOINT	FORCE-X	FORCE-Y	FORCE-Z	MOM-X	MOM-Y	MOM-Z
1	0.00000E+00	-7.70601E+00	0.00000E+00	0.00000E+00	0.00000E+00	-6.68173E+01
5	0.00000E+00	-1.39602E+02	0.00000E+00	0.00000E+00	0.00000E+00	-7.18372E+00
9	0.00000E+00	-8.21902E+00	0.00000E+00	0.00000E+00	0.00000E+00	7.00663E+01
17	0.00000E+00	-3.21452E+01	-2.99706E-07	-2.95721E+02	0.00000E+00	-6.18758E+01
18	0.00000E+00	-3.21452E+01	-2.99706E-07	-2.95721E+02	0.00000E+00	6.18758E+01
19	0.00000E+00	-3.21453E+01	-2.99706E-07	-2.95721E+02	0.00000E+00	-6.18758E+01
20	0.00000E+00	-3.21453E+01	-2.99706E-07	-2.95721E+02	0.00000E+00	6.18758E+01
25	0.00000E+00	-3.21452E+01	2.99706E-07	2.95721E+02	0.00000E+00	-6.18758E+01
26	0.00000E+00	-3.21452E+01	2.99706E-07	2.95721E+02	0.00000E+00	6.18758E+01
27	0.00000E+00	-3.21453E+01	2.99706E-07	2.95721E+02	0.00000E+00	-6.18758E+01
28	0.00000E+00	-3.21453E+01	2.99706E-07	2.95721E+02	0.00000E+00	6.18758E+01
29	0.00000E+00	-1.67396E+01	-2.99706E-07	3.55717E+02	0.00000E+00	0.00000E+00
30	0.00000E+00	-1.67396E+01	-2.99706E-07	3.55717E+02	0.00000E+00	0.00000E+00
31	0.00000E+00	-1.67396E+01	-2.99706E-07	3.55717E+02	0.00000E+00	0.00000E+00
32	0.00000E+00	-1.67396E+01	-2.99706E-07	3.55717E+02	0.00000E+00	0.00000E+00
33	0.00000E+00	-1.67396E+01	2.99706E-07	-3.55717E+02	0.00000E+00	0.00000E+00
34	0.00000E+00	-1.67396E+01	2.99706E-07	-3.55717E+02	0.00000E+00	0.00000E+00
35	0.00000E+00	-1.67396E+01	2.99706E-07	-3.55717E+02	0.00000E+00	0.00000E+00

STATIC LOAD/REACTION/EQUILIBRIUM SUMMARY FOR CASE NO. 2
LOADTYPE NONE TITLE DEAD LOAD

***TOTAL APPLIED LOAD (KIP INCH) SUMMARY (LOADING 2)
SUMMATION FORCE-X = 0.00
SUMMATION FORCE-Y = -973.61
SUMMATION FORCE-Z = 0.00

SUMMATION OF MOMENTS AROUND THE ORIGIN-
MX= 0.00 MY= 0.00 MZ= -246117.12

***TOTAL REACTION LOAD(KIP INCH) SUMMARY (LOADING 2)
SUMMATION FORCE-X = 0.00
SUMMATION FORCE-Y = 973.61
SUMMATION FORCE-Z = 0.00

SUMMATION OF MOMENTS AROUND THE ORIGIN-
MX= 0.00 MY= 0.00 MZ= 246117.13

MAXIMUM DISPLACEMENTS (INCH /RADIANS) (LOADING 2)

	MAXIMUMS	AT NODE
X =	7.95344E-03	24
Y =	-1.31467E-01	42
Z =	1.30795E-04	19
RX=	1.12667E-04	19
RY=	2.94228E-05	20
RZ=	-3.55237E-04	17

EXTERNAL AND INTERNAL JOINT LOAD SUMMARY (KIP INCH)-

JT	EXT FX/ INT FX	EXT FY/ INT FY	EXT FZ/ INT FZ	EXT MX/ INT MX	EXT MY/ INT MY	EXT MZ/ INT MZ	
							SUPPORT=1
5	0.00	-139.60	0.00	0.00	0.00	-7.18	
	-0.33	28.56	0.00	0.00	0.00	-1.11	000000
21	0.00	0.00	0.00	0.00	0.00	0.00	
	48.59	91.93	0.00	0.00	0.00	-192.10	000000
22	0.00	0.00	0.00	0.00	0.00	0.00	
	93.85	141.55	0.00	0.00	0.00	-1911.09	000000
23	0.00	0.00	0.00	0.00	0.00	0.00	
	-93.73	143.45	0.00	0.00	0.00	1913.16	000000
24	0.00	0.00	0.00	0.00	0.00	0.00	
	-49.05	94.56	0.00	0.00	0.00	197.85	000000
29	0.00	-16.74	0.00	355.72	0.00	0.00	
	-0.09	-84.18	-10.61	-1.92	-6.46	31.44	111111
30	0.00	-16.74	0.00	355.72	0.00	0.00	
	-0.06	-124.65	-15.73	-6.36	-2.30	18.96	111111
31	0.00	-16.74	0.00	355.72	0.00	0.00	
	0.06	-125.44	-15.83	-6.44	2.29	-19.15	111111

32	0.00	-16.74	0.00	355.72	0.00	0.00	
	0.09	-85.58	-10.79	-2.03	6.49	-31.74	111111
33	0.00	-16.74	0.00	-355.72	0.00	0.00	
	-0.09	-84.18	10.61	1.92	6.46	31.44	111111
34	0.00	-16.74	0.00	-355.72	0.00	0.00	
	-0.06	-124.65	15.73	6.36	2.30	18.96	111111
35	0.00	-16.74	0.00	-355.72	0.00	0.00	
	0.06	-125.44	15.83	6.44	-2.29	-19.15	111111
36	0.00	-16.74	0.00	-355.72	0.00	0.00	
	0.09	-85.58	10.79	2.03	-6.49	-31.74	111111
37	0.00	-64.20	0.00	0.00	0.00	-1093.68	
	-48.59	-27.73	0.00	0.00	0.00	-463.44	000000
38	0.00	-147.27	0.00	0.00	0.00	352.15	
	-93.85	5.72	0.00	0.00	0.00	-1819.82	000000
39	0.00	-149.34	0.00	0.00	0.00	-367.01	
	93.73	5.90	0.00	0.00	0.00	1828.00	000000
40	0.00	-66.19	0.00	0.00	0.00	1117.08	
	49.05	-28.38	0.00	0.00	0.00	450.84	000000
42	0.00	0.00	0.00	0.00	0.00	0.00	
	0.33	111.04	0.00	0.00	0.00	-3.63	000000

FOR LOADING - 5
APPLIED JOINT EQUIVALENT LOADS

JOINT	FORCE-X	FORCE-Y	FORCE-Z	MOM-X	MOM-Y	MOM-Z
5	-6.54686E+00	0.00000E+00	-1.63597E+00	0.00000E+00	0.00000E+00	0.00000E+00
9	-4.20000E-01	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
20	-9.27755E-01	0.00000E+00	0.00000E+00	0.00000E+00	5.99293E+00	-4.75672E+01
28	-9.27755E-01	0.00000E+00	0.00000E+00	0.00000E+00	-5.99293E+00	-4.75672E+01
32	-1.22451E-02	0.00000E+00	0.00000E+00	0.00000E+00	-5.04156E-01	4.00160E+00
36	-1.22451E-02	0.00000E+00	0.00000E+00	0.00000E+00	5.04156E-01	4.00160E+00
37	-2.15753E+00	0.00000E+00	-4.24053E-01	0.00000E+00	1.29940E+01	0.00000E+00
38	-6.62904E+00	0.00000E+00	-1.65796E+00	0.00000E+00	-6.05027E+00	0.00000E+00
39	-6.62904E+00	0.00000E+00	-1.65796E+00	0.00000E+00	6.05028E+00	0.00000E+00
40	-5.09753E+00	0.00000E+00	-4.24052E-01	0.00000E+00	-1.29940E+01	-1.05840E+02

STATIC LOAD/REACTION/EQUILIBRIUM SUMMARY FOR CASE NO. 5
LOADTYPE NONE TITLE WIND ON STRUCTURE

***TOTAL APPLIED LOAD (KIP INCH) SUMMARY (LOADING 5)
SUMMATION FORCE-X = -29.36
SUMMATION FORCE-Y = 0.00
SUMMATION FORCE-Z = -5.80

SUMMATION OF MOMENTS AROUND THE ORIGIN-
MX= 0.00 MY= 1461.60 MZ= -285.44

***TOTAL REACTION LOAD(KIP INCH) SUMMARY (LOADING 5)
SUMMATION FORCE-X = 29.36
SUMMATION FORCE-Y = 0.00
SUMMATION FORCE-Z = 5.80

SUMMATION OF MOMENTS AROUND THE ORIGIN-

MAXIMUM DISPLACEMENTS (INCH /RADIANS) (LOADING 5)

	MAXIMUMS	AT NODE
X =	-7.24257E+00	9
Y =	-4.87926E-02	25
Z =	-2.91972E-01	42
RX=	5.77340E-04	27
RY=	4.21363E-05	26
RZ=	2.73347E-04	25

EXTERNAL AND INTERNAL JOINT LOAD SUMMARY (KIP INCH)-

JT	EXT FX/ INT FX	EXT FY/ INT FY	EXT FZ/ INT FZ	EXT MX/ INT MX	EXT MY/ INT MY	EXT MZ/ INT MZ	
							SUPPORT=1
5	-6.55	0.00	-1.64	0.00	0.00	0.00	
	-71.65	0.00	0.55	6.25	0.00	-606.56	000000
21	0.00	0.00	0.00	0.00	0.00	0.00	
	-31.33	7.70	1.09	40.29	-43.64	1857.49	000000
22	0.00	0.00	0.00	0.00	0.00	0.00	
	4.52	0.16	1.27	47.76	-29.29	471.61	000000
23	0.00	0.00	0.00	0.00	0.00	0.00	
	4.56	-0.36	1.27	47.76	29.29	479.41	000000
24	0.00	0.00	0.00	0.00	0.00	0.00	
	-28.47	-7.51	1.09	40.29	43.64	1825.83	000000
29	0.00	0.00	0.00	0.00	0.00	0.00	
	-3.65	-20.63	-2.90	-126.57	-232.59	1860.30	111111
30	0.00	0.00	0.00	0.00	0.00	0.00	
	-3.68	-5.35	-0.98	-128.47	-235.79	1869.48	111111
31	0.00	0.00	0.00	0.00	0.00	0.00	
	-3.68	-1.24	-0.45	-125.15	-236.15	1869.28	111111
32	-0.01	0.00	0.00	0.00	-0.50	4.00	
	-3.65	13.70	1.43	-126.59	-233.28	1860.98	111111
33	0.00	0.00	0.00	0.00	0.00	0.00	
	-3.65	-14.03	1.47	-126.59	233.04	1859.84	111111
34	0.00	0.00	0.00	0.00	0.00	0.00	
	-3.68	1.57	-0.49	-125.16	236.21	1869.05	111111
35	0.00	0.00	0.00	0.00	0.00	0.00	
	-3.68	5.68	-1.02	-128.47	235.73	1869.72	111111
36	-0.01	0.00	0.00	0.00	0.50	4.00	
	-3.66	20.29	-2.86	-126.57	232.84	1861.45	111111
37	-2.16	0.00	-0.42	0.00	12.99	0.00	
	33.49	-7.70	-0.67	-1.04	30.64	-729.49	000000
38	-6.63	0.00	-1.66	0.00	-6.05	0.00	
	2.11	-0.16	0.39	-2.08	35.34	-634.35	000000

APPLIED JOINT EQUIVALENT LOADS

JOINT	FORCE-X	FORCE-Y	FORCE-Z	MOM-X	MOM-Y	MOM-Z
5	-1.82400E+00	0.00000E+00	-7.55932E-01	0.00000E+00	0.00000E+00	0.00000E+00
37	-6.01103E-01	0.00000E+00	-1.95942E-01	0.00000E+00	6.00413E+00	0.00000E+00
38	-1.84690E+00	0.00000E+00	-7.66093E-01	0.00000E+00	-2.79564E+00	0.00000E+00
39	-1.84690E+00	0.00000E+00	-7.66093E-01	0.00000E+00	2.79565E+00	0.00000E+00
40	-6.01103E-01	0.00000E+00	-1.95941E-01	0.00000E+00	-6.00413E+00	0.00000E+00

STATIC LOAD/REACTION/EQUILIBRIUM SUMMARY FOR CASE NO. 6
LOADTYPE NONE TITLE WIND ON LIVE LOAD

***TOTAL APPLIED LOAD (KIP INCH) SUMMARY (LOADING 6)
SUMMATION FORCE-X = -6.72
SUMMATION FORCE-Y = 0.00
SUMMATION FORCE-Z = -2.68

SUMMATION OF MOMENTS AROUND THE ORIGIN-
MX= 0.00 MY= 675.36 MZ= 0.00

***TOTAL REACTION LOAD(KIP INCH) SUMMARY (LOADING 6)
SUMMATION FORCE-X = 6.72
SUMMATION FORCE-Y = 0.00
SUMMATION FORCE-Z = 2.68

SUMMATION OF MOMENTS AROUND THE ORIGIN-
MX= 0.00 MY= -675.36 MZ= 0.00

MAXIMUM DISPLACEMENTS (INCH /RADIANS) (LOADING 6)

	MAXIMUMS	AT NODE
X =	-1.65951E+00	40
Y =	-1.90593E-02	25
Z =	-1.34911E-01	42
RX=	2.62317E-04	27
RY=	-1.12679E-05	19
RZ=	6.25589E-05	25

EXTERNAL AND INTERNAL JOINT LOAD SUMMARY (KIP INCH)-

JT	EXT FX/ INT FX	EXT FY/ INT FY	EXT FZ/ INT FZ	EXT MX/ INT MX	EXT MY/ INT MY	EXT MZ/ INT MZ	
							SUPPORT=1
5	-1.82	0.00	-0.76	0.00	0.00	0.00	
	-16.46	0.00	0.26	2.89	0.00	-141.71	000000
21	0.00	0.00	0.00	0.00	0.00	0.00	
	-7.11	1.80	0.50	18.62	-20.16	424.63	000000
22	0.00	0.00	0.00	0.00	0.00	0.00	
	1.33	0.03	0.59	22.07	-13.54	100.99	000000
23	0.00	0.00	0.00	0.00	0.00	0.00	
	1.33	-0.03	0.59	22.07	13.54	100.99	000000
24	0.00	0.00	0.00	0.00	0.00	0.00	
	-7.11	-1.80	0.50	18.62	20.16	424.63	000000

29	0.00	0.00	0.00	0.00	0.00	0.00	
	-0.84	-5.52	-0.83	-58.49	-53.25	426.32	111111
30	0.00	0.00	0.00	0.00	0.00	0.00	
	-0.84	-2.07	-0.40	-58.98	-53.98	428.41	111111
31	0.00	0.00	0.00	0.00	0.00	0.00	
	-0.84	-1.12	-0.28	-58.21	-54.17	428.21	111111
32	0.00	0.00	0.00	0.00	0.00	0.00	
	-0.84	2.48	0.17	-58.49	-53.45	426.11	111111
33	0.00	0.00	0.00	0.00	0.00	0.00	
	-0.84	-2.48	0.17	-58.49	53.45	426.11	111111
34	0.00	0.00	0.00	0.00	0.00	0.00	
	-0.84	1.12	-0.28	-58.21	54.17	428.21	111111
35	0.00	0.00	0.00	0.00	0.00	0.00	
	-0.84	2.07	-0.40	-58.98	53.98	428.41	111111
36	0.00	0.00	0.00	0.00	0.00	0.00	
	-0.84	5.52	-0.83	-58.49	53.25	426.32	111111
37	-0.60	0.00	-0.20	0.00	6.00	0.00	
	7.71	-1.80	-0.31	-0.48	14.16	-168.63	000000
38	-1.85	0.00	-0.77	0.00	-2.80	0.00	
	0.52	-0.03	0.18	-0.96	16.33	-148.91	000000
39	-1.85	0.00	-0.77	0.00	2.80	0.00	
	0.52	0.03	0.18	-0.96	-16.33	-148.91	000000
40	-0.60	0.00	-0.20	0.00	-6.00	0.00	
	7.71	1.80	-0.31	-0.48	-14.16	-168.63	000000
42	0.00	0.00	0.00	0.00	0.00	0.00	
	18.28	0.00	0.50	15.12	0.00	-516.37	000000

FOR LOADING - 7
APPLIED JOINT EQUIVALENT LOADS

JOINT	FORCE-X	FORCE-Y	FORCE-Z	MOM-X	MOM-Y	MOM-Z
5	0.00000E+00	0.00000E+00	-2.03086E+00	0.00000E+00	0.00000E+00	0.00000E+00
37	0.00000E+00	0.00000E+00	-5.26410E-01	0.00000E+00	1.61305E+01	0.00000E+00
38	0.00000E+00	0.00000E+00	-2.05816E+00	0.00000E+00	-7.51068E+00	0.00000E+00
39	0.00000E+00	0.00000E+00	-2.05816E+00	0.00000E+00	7.51069E+00	0.00000E+00
40	0.00000E+00	0.00000E+00	-5.26410E-01	0.00000E+00	-1.61305E+01	0.00000E+00

STATIC LOAD/REACTION/EQUILIBRIUM SUMMARY FOR CASE NO. 7
LOADTYPE NONE TITLE LONGITUDINAL FORCE

***TOTAL APPLIED LOAD (KIP INCH) SUMMARY (LOADING 7)
SUMMATION FORCE-X = 0.00
SUMMATION FORCE-Y = 0.00
SUMMATION FORCE-Z = -7.20

SUMMATION OF MOMENTS AROUND THE ORIGIN-
MX= 0.00 MY= 1814.40 MZ= 0.00

***TOTAL REACTION LOAD(KIP INCH) SUMMARY (LOADING 7)
SUMMATION FORCE-X = 0.00

SUMMATION OF MOMENTS AROUND THE ORIGIN-
MX= 0.00 MY= -1814.40 MZ= 0.00

MAXIMUM DISPLACEMENTS (INCH /RADIANS) (LOADING 7)

	MAXIMUMS	AT NODE
X =	-5.42134E-04	28
Y =	4.18542E-02	17
Z =	-3.62448E-01	42
RX=	6.97240E-04	37
RY=	-9.58642E-06	9
RZ=	4.81188E-08	26

EXTERNAL AND INTERNAL JOINT LOAD SUMMARY (KIP INCH)-

JT	EXT FX/ INT FX	EXT FY/ INT FY	EXT FZ/ INT FZ	EXT MX/ INT MX	EXT MY/ INT MY	EXT MZ/ INT MZ	
							SUPPORT=1
5	0.00	0.00	-2.03	0.00	0.00	0.00	
	0.00	0.00	0.69	7.76	0.00	0.00	000000
21	0.00	0.00	0.00	0.00	0.00	0.00	
	0.00	0.00	1.35	50.01	-54.17	0.00	000000
22	0.00	0.00	0.00	0.00	0.00	0.00	
	0.00	0.00	1.57	59.28	-36.36	0.00	000000
23	0.00	0.00	0.00	0.00	0.00	0.00	
	0.00	0.00	1.57	59.28	36.36	0.00	000000
24	0.00	0.00	0.00	0.00	0.00	0.00	
	0.00	0.00	1.35	50.01	54.17	0.00	000000
29	0.00	0.00	0.00	0.00	0.00	0.00	
	0.00	-4.09	-0.89	-157.13	0.28	0.29	111111
30	0.00	0.00	0.00	0.00	0.00	0.00	
	0.00	-4.29	-0.91	-157.42	0.26	0.27	111111
31	0.00	0.00	0.00	0.00	0.00	0.00	
	0.00	-4.29	-0.91	-157.42	-0.26	-0.27	111111
32	0.00	0.00	0.00	0.00	0.00	0.00	
	0.00	-4.09	-0.89	-157.13	-0.28	-0.29	111111
33	0.00	0.00	0.00	0.00	0.00	0.00	
	0.00	4.09	-0.89	-157.13	0.28	-0.29	111111
34	0.00	0.00	0.00	0.00	0.00	0.00	
	0.00	4.29	-0.91	-157.42	0.26	-0.27	111111
35	0.00	0.00	0.00	0.00	0.00	0.00	
	0.00	4.29	-0.91	-157.42	-0.26	0.27	111111
36	0.00	0.00	0.00	0.00	0.00	0.00	
	0.00	4.09	-0.89	-157.13	-0.28	0.29	111111
37	0.00	0.00	-0.53	0.00	16.13	0.00	
	0.00	0.00	-0.83	-1.30	38.04	0.00	000000

FOR LOADING - 4
\PPLIED JOINT EQUIVALENT LOADS

JOINT	FORCE-X	FORCE-Y	FORCE-Z	MOM-X	MOM-Y	MOM-Z
1	0.00000E+00	-4.62554E+00	0.00000E+00	0.00000E+00	0.00000E+00	-4.33575E+01
9	0.00000E+00	-4.62555E+00	0.00000E+00	0.00000E+00	0.00000E+00	4.33575E+01
37	0.00000E+00	-1.22722E+01	0.00000E+00	0.00000E+00	0.00000E+00	-8.21741E+01
38	0.00000E+00	-9.02243E-01	0.00000E+00	0.00000E+00	0.00000E+00	3.02996E+01
39	0.00000E+00	-9.02153E-01	0.00000E+00	0.00000E+00	0.00000E+00	-3.02967E+01
40	0.00000E+00	-1.22723E+01	0.00000E+00	0.00000E+00	0.00000E+00	8.21708E+01

STATIC LOAD/REACTION/EQUILIBRIUM SUMMARY FOR CASE NO. 4
LOADTYPE NONE TITLE WALKWAY LIVE LOAD

***TOTAL APPLIED LOAD (KIP INCH) SUMMARY (LOADING 4)
SUMMATION FORCE-X = 0.00
SUMMATION FORCE-Y = -35.60
SUMMATION FORCE-Z = 0.00

SUMMATION OF MOMENTS AROUND THE ORIGIN-
MX= 0.00 MY= 0.00 MZ= -8971.21

***TOTAL REACTION LOAD(KIP INCH) SUMMARY (LOADING 4)
SUMMATION FORCE-X = 0.00
SUMMATION FORCE-Y = 35.60
SUMMATION FORCE-Z = 0.00

SUMMATION OF MOMENTS AROUND THE ORIGIN-
MX= 0.00 MY= 0.00 MZ= 8971.21

MAXIMUM DISPLACEMENTS (INCH /RADIANS) (LOADING 4)

	MAXIMUMS	AT NODE
X =	6.16115E-04	21
Y =	-7.51906E-03	9
Z =	-6.58808E-06	28
RX=	-8.94949E-06	28
RY=	-3.04374E-06	20
RZ=	-3.68878E-05	9

EXTERNAL AND INTERNAL JOINT LOAD SUMMARY (KIP INCH)-

JT	EXT FX/ INT FX	EXT FY/ INT FY	EXT FZ/ INT FZ	EXT MX/ INT MX	EXT MY/ INT MY	EXT MZ/ INT MZ	
							SUPPORT=1
21	0.00	0.00	0.00	0.00	0.00	0.00	
	-5.08	14.33	0.00	0.00	0.00	34.68	000000
22	0.00	0.00	0.00	0.00	0.00	0.00	
	-4.98	3.47	0.00	0.00	0.00	-3.29	000000
23	0.00	0.00	0.00	0.00	0.00	0.00	
	4.98	3.47	0.00	0.00	0.00	3.29	000000
24	0.00	0.00	0.00	0.00	0.00	0.00	
	5.08	14.33	0.00	0.00	0.00	-34.68	000000

29	0.00	0.00	0.00	0.00	0.00	0.00	
	0.01	-6.31	-0.80	-0.62	0.59	-2.80	111111
30	0.00	0.00	0.00	0.00	0.00	0.00	
	0.00	-2.59	-0.33	-0.15	0.16	-1.55	111111
31	0.00	0.00	0.00	0.00	0.00	0.00	
	0.00	-2.59	-0.33	-0.15	-0.16	1.55	111111
32	0.00	0.00	0.00	0.00	0.00	0.00	
	-0.01	-6.31	-0.80	-0.62	-0.59	2.80	111111
33	0.00	0.00	0.00	0.00	0.00	0.00	
	0.01	-6.31	0.80	0.62	-0.59	-2.80	111111
34	0.00	0.00	0.00	0.00	0.00	0.00	
	0.00	-2.59	0.33	0.15	-0.16	-1.55	111111
35	0.00	0.00	0.00	0.00	0.00	0.00	
	0.00	-2.59	0.33	0.15	0.16	1.55	111111
36	0.00	0.00	0.00	0.00	0.00	0.00	
	-0.01	-6.31	0.80	0.62	0.59	2.80	111111
37	0.00	-12.27	0.00	0.00	0.00	-82.17	
	5.08	-2.06	0.00	0.00	0.00	230.39	000000
38	0.00	-0.90	0.00	0.00	0.00	30.30	
	4.98	-2.57	0.00	0.00	0.00	152.10	000000
39	0.00	-0.90	0.00	0.00	0.00	-30.30	
	-4.98	-2.57	0.00	0.00	0.00	-152.10	000000
40	0.00	-12.27	0.00	0.00	0.00	82.17	
	-5.08	-2.06	0.00	0.00	0.00	-230.39	000000

FOR LOADING - 19
APPLIED JOINT EQUIVALENT LOADS

JOINT	FORCE-X	FORCE-Y	FORCE-Z	MOM-X	MOM-Y	MOM-Z
5	-1.36800E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
37	-4.50827E-01	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
38	-1.38517E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
39	-1.38517E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
40	-4.50827E-01	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00

STATIC LOAD/REACTION/EQUILIBRIUM SUMMARY FOR CASE NO. 19
LOADTYPE NONE TITLE CENTRIFUGAL FORCE

***TOTAL APPLIED LOAD (KIP INCH) SUMMARY (LOADING 19)
SUMMATION FORCE-X = -5.04
SUMMATION FORCE-Y = 0.00
SUMMATION FORCE-Z = 0.00

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

***TOTAL REACTION LOAD(KIP INCH) SUMMARY (LOADING 19)
SUMMATION FORCE-X = 5.04
SUMMATION FORCE-Y = 0.00
SUMMATION FORCE-Z = 0.00

MAXIMUM DISPLACEMENTS (INCH /RADIANS) (LOADING 19)

	MAXIMUMS	AT NODE
X =	-1.24464E+00	40
Y =	-4.08468E-03	1
Z =	-2.03385E-06	26
RX=	-3.35025E-06	26
RY=	-5.99075E-06	18
RZ=	4.69059E-05	17

EXTERNAL AND INTERNAL JOINT LOAD SUMMARY (KIP INCH)-

JT	EXT FX/ INT FX	EXT FY/ INT FY	EXT FZ/ INT FZ	EXT MX/ INT MX	EXT MY/ INT MY	EXT MZ/ INT MZ	
							SUPPORT=1
5	-1.37	0.00	0.00	0.00	0.00	0.00	
	-12.34	0.00	0.00	0.00	0.00	-106.29	000000
21	0.00	0.00	0.00	0.00	0.00	0.00	
	-5.33	1.35	0.00	0.00	0.00	318.48	000000
22	0.00	0.00	0.00	0.00	0.00	0.00	
	1.00	0.02	0.00	0.00	0.00	75.74	000000
23	0.00	0.00	0.00	0.00	0.00	0.00	
	1.00	-0.02	0.00	0.00	0.00	75.74	000000
24	0.00	0.00	0.00	0.00	0.00	0.00	
	-5.33	-1.35	0.00	0.00	0.00	318.48	000000
29	0.00	0.00	0.00	0.00	0.00	0.00	
	-0.63	-3.00	-0.38	0.00	-40.01	319.66	111111
30	0.00	0.00	0.00	0.00	0.00	0.00	
	-0.63	-0.36	-0.05	-0.29	-40.55	321.23	111111
31	0.00	0.00	0.00	0.00	0.00	0.00	
	-0.63	0.36	0.05	0.29	-40.55	321.23	111111
32	0.00	0.00	0.00	0.00	0.00	0.00	
	-0.63	3.00	0.38	0.00	-40.01	319.66	111111
33	0.00	0.00	0.00	0.00	0.00	0.00	
	-0.63	-3.00	0.38	0.00	40.01	319.66	111111
34	0.00	0.00	0.00	0.00	0.00	0.00	
	-0.63	-0.36	0.05	0.29	40.55	321.23	111111
35	0.00	0.00	0.00	0.00	0.00	0.00	
	-0.63	0.36	-0.05	-0.29	40.55	321.23	111111
36	0.00	0.00	0.00	0.00	0.00	0.00	
	-0.63	3.00	-0.38	0.00	40.01	319.66	111111
37	-0.45	0.00	0.00	0.00	0.00	0.00	
	5.78	-1.35	0.00	0.00	0.00	-126.47	000000
38	-1.39	0.00	0.00	0.00	0.00	0.00	
	0.39	-0.02	0.00	0.00	0.00	-111.68	000000

142. PRINT MEMBER INFORMATION LIST 16 TO 42

MEMBER INFORMATION

MEMBER	START JOINT	END JOINT	LENGTH (FEET)	BETA (DEG)	RELEASES
16	17	21	5.000	0.00	
17	21	25	5.000	0.00	
18	18	22	5.000	0.00	
19	22	26	5.000	0.00	
20	19	23	5.000	0.00	
21	23	27	5.000	0.00	
22	20	24	5.000	0.00	
23	24	28	5.000	0.00	
24	25	33	85.000	0.00	
25	26	34	85.000	0.00	
26	27	35	85.000	0.00	
27	28	36	85.000	0.00	
28	17	29	85.000	0.00	
29	18	30	85.000	0.00	
30	19	31	85.000	0.00	
31	20	32	85.000	0.00	
32	22	42	8.750	0.00	
33	17	18	9.083	0.00	
34	19	20	9.083	0.00	
35	27	28	9.083	0.00	
36	25	26	9.083	0.00	
37	1	37	3.167	0.00	
38	37	38	9.083	0.00	
39	38	5	8.750	0.00	
40	5	39	8.750	0.00	
41	39	40	9.083	0.00	
42	40	9	3.167	0.00	

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

143. PRINT MEMBER PROPERTIES LIST 16 TO 42

MEMBER PROPERTIES. UNIT - INCH

MEMB	PROFILE	AX/ AY	IZ/ AZ	IY/ SZ	IX/ SY
16	PRISMATIC	2304.00	442368.00	442368.00	747601.94
		1958.40	1958.40	18432.00	18432.00
17	PRISMATIC	2304.00	442368.00	442368.00	747601.94
		1958.40	1958.40	18432.00	18432.00
18	PRISMATIC	2304.00	442368.00	442368.00	747601.94
		1958.40	1958.40	18432.00	18432.00
19	PRISMATIC	2304.00	442368.00	442368.00	747601.94
		1958.40	1958.40	18432.00	18432.00
20	PRISMATIC	2304.00	442368.00	442368.00	747601.94
		1958.40	1958.40	18432.00	18432.00
21	PRISMATIC	2304.00	442368.00	442368.00	747601.94
		1958.40	1958.40	18432.00	18432.00
22	PRISMATIC	2304.00	442368.00	442368.00	747601.94
		1958.40	1958.40	18432.00	18432.00
23	PRISMATIC	2304.00	442368.00	442368.00	747601.94
		1958.40	1958.40	18432.00	18432.00
24	PRISMATIC	378.14	14444.70	14444.70	25608.96
		0.00	0.00	2891.83	2891.83
25	PRISMATIC	378.14	14444.70	14444.70	25608.96
		0.00	0.00	2891.83	2891.83
26	PRISMATIC	378.14	14444.70	14444.70	25608.96
		0.00	0.00	2891.83	2891.83
27	PRISMATIC	378.14	14444.70	14444.70	25608.96
		0.00	0.00	2891.83	2891.83
28	PRISMATIC	378.14	14444.70	14444.70	25608.96
		0.00	0.00	2891.83	2891.83
29	PRISMATIC	378.14	14444.70	14444.70	25608.96
		0.00	0.00	2891.83	2891.83
30	PRISMATIC	378.14	14444.70	14444.70	25608.96
		0.00	0.00	2891.83	2891.83
31	PRISMATIC	378.14	14444.70	14444.70	25608.96
		0.00	0.00	2891.83	2891.83
32	PRISMATIC	2520.00	370440.00	756000.00	841378.44
		2142.00	2142.00	17640.00	25200.00
33	PRISMATIC	720.00	54000.00	34560.00	70945.21
		612.00	612.00	3600.00	2880.00
34	PRISMATIC	720.00	54000.00	34560.00	70945.21
		612.00	612.00	3600.00	2880.00
35	PRISMATIC	720.00	54000.00	34560.00	70945.21
		612.00	612.00	3600.00	2880.00
36	PRISMATIC	720.00	54000.00	34560.00	70945.21
		612.00	612.00	3600.00	2880.00
37	PRISMATIC	1080.00	81000.00	116640.00	160735.94
		918.00	918.00	5400.00	6480.00
38	PRISMATIC	1080.00	81000.00	116640.00	160735.94
		918.00	918.00	5400.00	6480.00
39	PRISMATIC	1080.00	81000.00	116640.00	160735.94
		918.00	918.00	5400.00	6480.00

MEMBER PROPERTIES. UNIT - INCH

MEMB	PROFILE	AX/ AY	IZ/ AZ	IY/ SZ	IX/ SY
40	PRISMATIC	1080.00	81000.00	116640.00	160735.94
		918.00	918.00	5400.00	6480.00
41	PRISMATIC	1080.00	81000.00	116640.00	160735.94
		918.00	918.00	5400.00	6480.00
42	PRISMATIC	1080.00	81000.00	116640.00	160735.94
		918.00	918.00	5400.00	6480.00

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

144. PRINT MATERIAL PROPERTIES LIST 16 TO 43

MATERIAL PROPERTIES.

ALL UNITS ARE - KIP FEET

MEMBER	E	G	DEN	ALPHA
16	453600.0	193846.1	0.14999039	0.00000550
17	453600.0	193846.1	0.14999039	0.00000550
18	453600.0	193846.1	0.14999039	0.00000550
19	453600.0	193846.1	0.14999039	0.00000550
20	453600.0	193846.1	0.14999039	0.00000550
21	453600.0	193846.1	0.14999039	0.00000550
22	453600.0	193846.1	0.14999039	0.00000550
23	453600.0	193846.1	0.14999039	0.00000550
24	453600.0	193846.1	0.14999039	0.00000550
25	453600.0	193846.1	0.14999039	0.00000550
26	453600.0	193846.1	0.14999039	0.00000550
27	453600.0	193846.1	0.14999039	0.00000550
28	453600.0	193846.1	0.14999039	0.00000550
29	453600.0	193846.1	0.14999039	0.00000550
30	453600.0	193846.1	0.14999039	0.00000550
31	453600.0	193846.1	0.14999039	0.00000550
32	453600.0	193846.1	0.14999039	0.00000550
33	453600.0	193846.1	0.14999039	0.00000550
34	453600.0	193846.1	0.14999039	0.00000550
35	453600.0	193846.1	0.14999039	0.00000550
36	453600.0	193846.1	0.14999039	0.00000550
37	453600.0	193846.1	0.14999039	0.00000550
38	453600.0	193846.1	0.14999039	0.00000550
39	453600.0	193846.1	0.14999039	0.00000550
40	453600.0	193846.1	0.14999039	0.00000550
41	453600.0	193846.1	0.14999039	0.00000550
42	453600.0	193846.1	0.14999039	0.00000550
43	453600.0	193846.1	0.14999039	0.00000550

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

145. PRINT SUPPORT INFORMATION

SUPPORT INFORMATION (1=FIXED, 0=RELEASED)

UNITS FOR SPRING CONSTANTS ARE KIP FEET DEGREES

JOINT	FORCE-X/ KFX	FORCE-Y/ KFY	FORCE-Z/ KFZ	MOM-X/ KMX	MOM-Y/ KMY	MOM-Z/ KMZ

29	1	1	1	1	1	1
	0.0000E+00	0.0000E+00	0.0000E+00	0.000E+00	0.000E+00	0.000E+00
30	1	1	1	1	1	1
	0.0000E+00	0.0000E+00	0.0000E+00	0.000E+00	0.000E+00	0.000E+00
31	1	1	1	1	1	1
	0.0000E+00	0.0000E+00	0.0000E+00	0.000E+00	0.000E+00	0.000E+00
32	1	1	1	1	1	1
	0.0000E+00	0.0000E+00	0.0000E+00	0.000E+00	0.000E+00	0.000E+00
33	1	1	1	1	1	1
	0.0000E+00	0.0000E+00	0.0000E+00	0.000E+00	0.000E+00	0.000E+00
34	1	1	1	1	1	1
	0.0000E+00	0.0000E+00	0.0000E+00	0.000E+00	0.000E+00	0.000E+00
35	1	1	1	1	1	1
	0.0000E+00	0.0000E+00	0.0000E+00	0.000E+00	0.000E+00	0.000E+00
36	1	1	1	1	1	1
	0.0000E+00	0.0000E+00	0.0000E+00	0.000E+00	0.000E+00	0.000E+00

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

146. LOAD LIST 9 11 13
147. PRINT SUPPORT REACTION LIST 29 TO 36

SUPPORT REACTIONS -UNIT KIP FEET STRUCTURE TYPE = SPACE

JOINT	LOAD	FORCE-X	FORCE-Y	FORCE-Z	MOM-X	MOM-Y	MOM Z
29	9	0.74	120.35	13.07	-29.37	3.99	-29.83
	11	3.75	121.54	13.51	-18.94	19.92	-157.65
	13	2.67	136.15	15.66	-8.24	14.22	-111.89
30	9	0.70	166.92	18.95	-28.90	3.62	-28.71
	11	3.74	146.74	16.71	-18.41	19.84	-157.37
	13	2.65	174.89	20.56	-7.66	13.99	-111.17
31	9	0.56	166.99	18.96	-28.94	3.14	-24.82
	11	3.62	143.41	16.28	-18.68	19.49	-154.18
	13	2.51	172.77	20.29	-7.85	13.58	-107.21
32	9	0.51	115.75	12.49	-29.36	2.68	-23.42
	11	3.57	88.62	9.36	-18.92	18.94	-152.77
	13	2.45	113.26	12.77	-8.23	13.00	-105.53
33	9	0.74	120.35	-13.07	29.37	-3.99	-29.83
	11	3.74	114.95	-12.08	40.03	-19.96	-157.61
	13	2.67	122.94	-12.79	50.51	-14.29	-111.81
34	9	0.70	166.92	-18.95	28.90	-3.62	-28.71
	11	3.73	139.83	-15.23	39.54	-19.88	-157.33
	13	2.65	161.04	-17.61	50.00	-14.06	-111.09
35	9	0.56	166.99	-18.96	28.94	-3.14	-24.82
	11	3.63	136.50	-14.81	39.81	-19.45	-154.21
	13	2.51	158.92	-17.34	50.19	-13.51	-107.28
36	9	0.51	115.75	-12.49	29.36	-2.68	-23.42
	11	3.57	82.03	-7.93	40.02	-18.90	-152.81
	13	2.45	100.05	-9.91	50.50	-12.92	-105.61

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

148. LOAD LIST 14 16 17
149. SECTION 0 0.368 0.5 0.631 1 MEMB 37 42
150. SECTION 0 0.22 0.5 0.78 1 MEMB 38 41
151. SECTION 0 0.25 0.5 0.75 1 MEMB 39 40
152. PRINT MEMBER SECTION FORCES LIST 37 TO 42

MEMBER FORCES AT INTERMEDIATE SECTIONS

ALL UNITS ARE -- KIP FEET

MEMB	LOAD	SEC	SHEAR-Y	SHEAR-Z	MOM-Y	MOM-Z
37	14	0.37	-1.70	0.00	0.00	0.99
		0.50	-36.45	0.00	0.00	3.25
		0.63	-37.06	0.00	0.00	18.50
	16	0.37	-1.70	0.00	0.00	0.99
		0.50	-17.14	0.00	0.00	2.45
		0.63	-17.74	0.00	0.00	9.68
	17	0.37	-1.70	0.00	0.00	0.99
		0.50	-28.71	0.00	0.00	2.93
		0.63	-29.31	0.00	0.00	14.97
38	14	0.22	105.37	0.00	0.00	63.62
		0.50	101.65	0.00	0.00	-199.63
		0.78	-123.56	0.00	0.00	-176.20
	16	0.22	76.73	1.42	-1.90	96.32
		0.50	73.02	1.42	1.71	-94.12
		0.78	-62.26	-0.47	2.95	-110.42
	17	0.22	95.96	2.84	-3.80	88.48
		0.50	92.24	2.84	3.42	-150.84
		0.78	-96.99	-0.94	5.92	-148.50
39	14	0.25	126.44	0.00	0.00	7.08
		0.50	123.02	0.00	0.00	-265.83
		0.75	-92.09	0.00	0.00	-147.56
	16	0.25	85.31	1.18	1.43	32.77
		0.50	81.88	1.18	4.01	-150.16
		0.75	-43.31	-0.70	3.18	-104.89
	17	0.25	112.06	2.37	2.87	24.25
		0.50	108.64	2.37	8.04	-217.21
		0.75	-70.51	-1.41	6.38	-132.67
40	14	0.25	96.07	0.00	0.00	-143.90
		0.50	-119.35	0.00	0.00	-270.53
		0.75	-123.16	0.00	0.00	-5.28
	16	0.25	64.15	0.70	3.18	-83.94
		0.50	-61.34	-1.18	4.01	-174.48
		0.75	-65.15	-1.18	1.43	-36.13
	17	0.25	85.38	1.41	6.38	-117.78
		0.50	-94.07	-2.37	8.04	-234.51
		0.75	-97.88	-2.37	2.87	-24.56
41	14	0.22	127.96	0.00	0.00	-179.68
		0.50	-98.31	0.00	0.00	-212.96
		0.78	-103.10	0.00	0.00	43.18
	16	0.22	82.93	0.47	2.95	-125.60
		0.50	-53.42	-1.42	1.71	-160.50
		0.78	-58.21	-1.42	-1.90	-18.56
	17	0.22	112.01	0.94	5.92	-159.66

MEMBER FORCES AT INTERMEDIATE SECTIONS

ALL UNITS ARE -- KIP FEET

MEMB	LOAD	SEC	SHEAR-Y	SHEAR-Z	MOM-Y	MOM-Z
		0.50	-78.30	-2.84	3.42	-198.82
		0.78	-83.09	-2.84	-3.80	6.40
42	14	0.37	37.90	0.00	0.00	19.46
		0.50	37.12	0.00	0.00	3.78
		0.63	2.20	0.00	0.00	1.29
	16	0.37	18.59	0.00	0.00	10.58
		0.50	17.80	0.00	0.00	2.98
		0.63	2.20	0.00	0.00	1.29
	17	0.37	30.16	0.00	0.00	15.90
		0.50	29.37	0.00	0.00	3.46
		0.63	2.20	0.00	0.00	1.29

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

153. PRINT MAXFORCE ENVELOPE NSECTION 5 LIST 16 TO 23 32 TO 43

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
16	MAX	106.19	0.00	14	69.33	0.00	17			
		-11.88	0.00	16	4.46	0.00	14	19.31 C	0.00	17
	MIN	61.23	5.00	16	-461.22	5.00	14			
		-44.10	5.00	14	-216.03	5.00	14	15.84 C	5.00	16
17	MAX	-52.70	0.00	16	30.74	5.00	14			
		44.10	0.00	14	4.46	5.00	14	19.28 C	0.00	14
	MIN	-106.19	5.00	14	-461.22	0.00	14			
		10.56	5.00	16	-216.03	0.00	14	14.42 C	5.00	16
18	MAX	210.91	0.00	14	88.19	0.00	17			
		42.17	0.00	14	198.31	5.00	14	29.31 C	0.00	14
	MIN	144.84	5.00	16	-964.89	5.00	14			
		2.15	5.00	16	-19.19	0.00	16	23.44 C	5.00	16
19	MAX	-135.81	0.00	16	50.67	5.00	14			
		-0.83	0.00	16	198.31	0.00	14	29.31 C	0.00	14
	MIN	-210.91	5.00	14	-964.89	0.00	14			
		-42.17	5.00	14	-21.20	5.00	16	21.09 C	5.00	16
20	MAX	205.07	0.00	14	85.80	0.00	17			
		-52.68	0.00	14	7.97	0.00	14	28.80 C	0.00	14
	MIN	105.89	5.00	16	-936.29	5.00	14			
		-62.50	5.00	17	-315.29	5.00	17	19.93 C	5.00	16
21	MAX	-96.86	0.00	16	50.06	5.00	14			
		59.87	0.00	17	7.97	5.00	14	28.80 C	0.00	14
	MIN	-205.07	5.00	14	-936.29	0.00	14			
		52.68	5.00	14	-298.06	0.00	17	17.58 C	5.00	16
22	MAX	106.15	0.00	14	71.18	0.00	17			
		56.44	0.00	17	256.82	5.00	17	19.05 C	0.00	14
	MIN	53.05	5.00	16	-460.49	5.00	14			
		51.04	5.00	16	-29.18	0.00	16	13.40 C	5.00	16
23	MAX	-44.52	0.00	16	31.26	5.00	14			
		-49.73	0.00	16	247.35	0.00	17	19.05 C	0.00	14
	MIN	-106.15	5.00	14	-460.49	0.00	14			
		-53.79	5.00	17	-27.31	5.00	16	11.98 C	5.00	16
32	MAX	139.55	0.00	17	357.08	0.00	16			
		1.41	0.00	17	35.92	8.75	17	130.87 T	0.00	16

	MIN	97.10	8.75	16	-809.17	8.75	14		
		0.00	8.75	14	0.00	8.75	14	270.34 T	8.75 14
33	MAX	29.86	0.00	16	115.59	0.00	16		
		1.73	0.00	16	6.62	9.08	16	7.01 T	0.00 16
	MIN	10.25	9.08	14	-115.38	9.08	16		
		0.25	9.08	14	-11.37	0.00	17	43.10 T	9.08 14
34	MAX	13.62	0.00	16	6.07	0.00	16		
		1.23	0.00	16	-5.20	9.08	16	51.96 T	0.00 14
	MIN	-13.17	9.08	14	-77.45	9.08	16		
		0.27	9.08	14	-16.35	0.00	16	59.25 T	9.08 17
35	MAX	13.67	0.00	16	6.26	0.00	16		
		-0.27	0.00	14	18.42	0.00	16	51.96 T	0.00 14
	MIN	-13.17	9.08	14	-77.65	9.08	16		
		-1.67	9.08	16	3.27	9.08	16	56.61 T	9.08 17
36	MAX	29.81	0.00	16	115.39	0.00	16		
		-0.25	0.00	14	9.68	0.00	14	5.69 T	0.00 16
	MIN	10.25	9.08	14	-115.19	9.08	16		
		-1.29	9.08	16	-4.55	9.08	16	43.10 T	9.08 14
37	MAX	0.00	0.00	16	62.80	3.17	14		
		0.00	0.00	16	0.00	3.17	16	0.00	0.00 14
	MIN	-38.76	3.17	14	0.00	0.00	14		
		0.00	3.17	14	0.00	0.00	16	0.00	3.17 17
38	MAX	142.42	0.00	14	338.25	0.00	14		
		2.84	0.00	17	6.00	5.45	17	88.20 C	0.00 14
	MIN	-126.48	9.08	14	-291.36	5.45	14		
		-0.94	9.08	17	-9.47	0.00	17	14.59 C	9.08 16
39	MAX	129.64	0.00	14	287.18	0.00	14		
		2.37	0.00	17	8.23	5.25	17	272.56 C	0.00 14
	MIN	-95.60	8.75	14	-267.05	5.25	14		
		-1.41	8.75	17	-2.31	0.00	17	134.64 C	8.75 16
40	MAX	99.60	0.00	14	268.30	8.75	14		
		1.41	0.00	17	8.23	3.50	17	289.17 C	0.00 14
	MIN	-126.97	8.75	14	-268.49	3.50	14		
		-2.37	8.75	17	-2.31	8.75	17	228.89 C	8.75 16
41	MAX	131.55	0.00	14	314.13	9.08	14		
		0.94	0.00	17	6.00	3.63	17	117.72 C	0.00 17
	MIN	-141.00	9.08	14	-301.48	3.63	14		
		-2.84	9.08	17	-9.47	9.08	17	102.66 C	9.08 14
42	MAX	40.10	0.00	14	64.91	0.00	14		
		0.00	0.00	17	0.00	3.17	17	0.55 C	0.00 16
	MIN	0.00	3.17	14	0.00	3.17	17		
		0.00	3.17	14	0.00	0.00	17	0.00 C	3.17 14
43	MAX	-17.40	0.00	16	156.18	8.75	14		
		0.00	0.00	14	35.92	0.00	17	232.96 T	0.00 16

```
    MIN   -120.41   8.75   14    -766.82   0.00   14
            -1.41   8.75   17       0.00   8.75   14    288.59 T   8.75   14

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

154. FINISH

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

            **** DATE= AUG 28,2006   TIME= 11:31:37 ****

      ************************************************************
      *         For questions on STAAD.Pro, please contact       *
      *   Research Engineers Offices at the following locations  *
      *                                                          *
      *               Telephone               Email              *
      *  USA:       +1 (714)974-2500       support@reiusa.com     *
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      *  Asia                            support@reiasia.net     *
      ************************************************************
```

Information about the key files in the current distribution

Modfication Date	CRC	Size (Bytes)	File Name
02/27/2006	0x8140	12701696	SProStaad.exe
12/16/2004	0xca81	04558848	SProStaadStl.exe
09/19/2003	0x2fc0	00081970	CMesh.dll
02/06/2006	0x5601	02486272	dbsectioninterface.dll
01/23/2001	0x9b40	00073728	LoadGen.dll
09/25/2003	0x6340	00704512	MeshEngine.dll
09/22/2003	0xce00	00069632	QuadPlateEngine.dll
12/22/2005	0x4181	00094208	SurfMesh.dll
09/30/2005	0x2dc1	00475136	aiscsections.mdb
01/05/2005	0x79c1	00319488	aiscsections_all_editions.mdb
01/05/2005	0x4b81	01810432	aiscsteeljoists.mdb
01/05/2005	0xcac1	03651584	aitctimbersections.mdb
01/27/2005	0xeb01	00552960	aluminumsections.mdb
01/05/2005	0xcd01	00163840	australiansections.mdb
01/05/2005	0x6a41	00229376	britishsections.mdb
07/08/2005	0x9d41	00434176	bscoldformedsections.mdb
06/28/2005	0x8201	00327680	butlercoldformedsections.mdb
01/05/2005	0xabc0	00262144	canadiansections.mdb
05/31/2005	0x9e81	00450560	canadiantimbersections.mdb
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01/05/2005	0x11c1	00233472	germansections.mdb
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01/05/2005	0xd540	00180224	iscoldformedsections.mdb
01/24/2006	0x2501	00221184	japanesesections.mdb
11/08/2005	0x9081	00376832	Kingspancoldformedsections.mdb
01/05/2005	0xb740	00174080	koreansections.mdb
02/03/2005	0xda00	00096256	lysaghtcoldformedsections.mdb
02/07/2005	0x9a00	00243712	mexicansteeltables.mdb
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01/06/2005	0x9341	00194560	spanishsections.mdb
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01/05/2005	0xbac0	00149504	usersectionstemplate.mdb
01/05/2005	0x9d41	00141312	venezuelansections.mdb

REINFORCED BEAM CAP

Reinforing Yield Strength	$Fy := 40000psi$
Concrete Compresion Strength	$Fc := 5600psi$
Width of Beam	$b := 3ft$
Depth of Reinforcemnt	$d := 2.25ft$
Positive Reinforcement Area	$Asp := 6.24in^2$
Negative Reinforcement Area	$Asn := 6.35in^2$
Reinforcement Ratio	$\rho w := \frac{Asp}{b \cdot d}$

Positive Moment Capacity: Compression Steel neglected

$$\phi_f := 0.9$$

Tension in Reinforcemnt $\quad Tp := Asp \cdot Fy$

Depth of Compression Block $\quad ap := \frac{Tp}{0.85 \cdot Fc \cdot b}$

$$\phi Mnp := \phi_f Tp \cdot \left(d - \frac{ap}{2} \right)$$

$$\phi Mnp = 492 \text{ ft k}$$

Negative Moment Capacity: Compression Steel neglected

Tension in Reinforcemnt $\quad Tn := Asn \cdot Fy$

Depth of Compression Block $\quad an := \frac{Tn}{0.85 \cdot Fc \cdot b}$

$$\phi Mnn := \phi_f Tn \cdot \left(d - \frac{an}{2} \right)$$

$$\phi Mnn = 500 \text{ ft k}$$

Shear Capacity of the Bent Cap

Factored Shear at Section $Vu := 127.96k$

Factored Moment at Section $Mu := 179.68k \cdot ft$

Stirrup Spacing $S := 32in$

Stirrup Area $Av := 0.4in^2$

$$Vc1 := 2 \cdot psi \sqrt{\frac{Fc}{psi}} \cdot b \cdot d \qquad Vc1 = 145\,k$$

$$Vc2 := \left(1.9 \cdot \sqrt{\frac{Fc}{psi}} + 2500 \cdot \rho w \frac{Vu \cdot d}{Mu}\right) \cdot b \cdot d \cdot psi \qquad Vc2 = 163\,k$$

$$Vc3 := 3.5 \cdot psi \sqrt{\frac{Fc}{psi}} \cdot b \cdot d \qquad Vc3 = 255\,k$$

$Vc4 := if(Vc1 < Vc2, Vc2, Vc$ $Vc := if(Vc4 < Vc3, Vc4, Vc3)$ $Vc = 163\,k$

$$Vs := \frac{Av \cdot Fy \cdot d}{S} \qquad \phi_s := 0.85 \qquad Vs = 14\,k$$

$\phi Vn := \phi_s \cdot (Vc + Vs)$ $\phi Vn = 150\,k$

REINFORCED SUBCAP I (LONGITUDINAL)

Reinforing Yield Strength	$Fy := 40ksi$
Concrete Compresion Strength	$Fc := 3ksi$
Width of Beam	$b := 4ft$
Depth of Reinforcemnt	$d := 3.0833ft$
Positive Reinforcement Area	$As := 12.48in^2$

Positive Moment Capacity: Compression Steel neglected

Tension in Reinforcemnt $T := As \cdot Fy$

Depth of Compression Block $a := \frac{T}{0.85 \cdot Fc \cdot b}$

$\phi f := 0.90$

$\phi Mn := \phi f \cdot T \cdot \left(d - \frac{a}{2} \right)$

$\phi Mn = 1309\ ft\,k$

Shear Capacity

Stirrup Spacing $S := 12in$

Stirrup Area $Av := 0.62in^2$

$ds := 3.5417ft$

$Vc := 2 \cdot psi \sqrt{\frac{Fc}{psi}} \cdot b \cdot ds$

$Vc = 223\ k$

$Vs := \frac{Av \cdot Fy \cdot ds}{S}$

$Vs = 88\ k$

$\phi s := 0.85$

$\phi Vn := \phi s \cdot (Vc + Vs)$

$\phi Vn = 265\ k$

REINFORCED SUBCAP II (TRANSVERSE UNDER ORIGINAL CAP)

Reinforing Yield Strength	$Fy := 40ksi$
Concrete Compresion Strength	$Fc := 3ksi$
Width of Beam	$b := 5ft$
Depth of Reinforcemnt	$d := 3.0833ft$
Positive Reinforcement Area	$As := 6.24in^2$

Positive Moment Capacity: Compression Steel neglected

Tension in Reinforcemnt $T := As \cdot Fy$

Depth of Compression Block $a := \frac{T}{0.85 \cdot Fc \cdot b}$

$\phi f := 0.90$

$\phi Mn := \phi f \cdot T \cdot \left(d - \frac{a}{2}\right)$

$\phi Mn = 677\ ft\,k$

Shear Capacity

Stirrup Spacing $S := 7.5in$

Stirrup Area $Av := 0.62in^2$

$Vc := 2 \cdot psi \sqrt{\frac{Fc}{psi}} \cdot b \cdot d$

$Vc = 243\ k$

$Vs := \frac{Av \cdot Fy \cdot d}{S}$

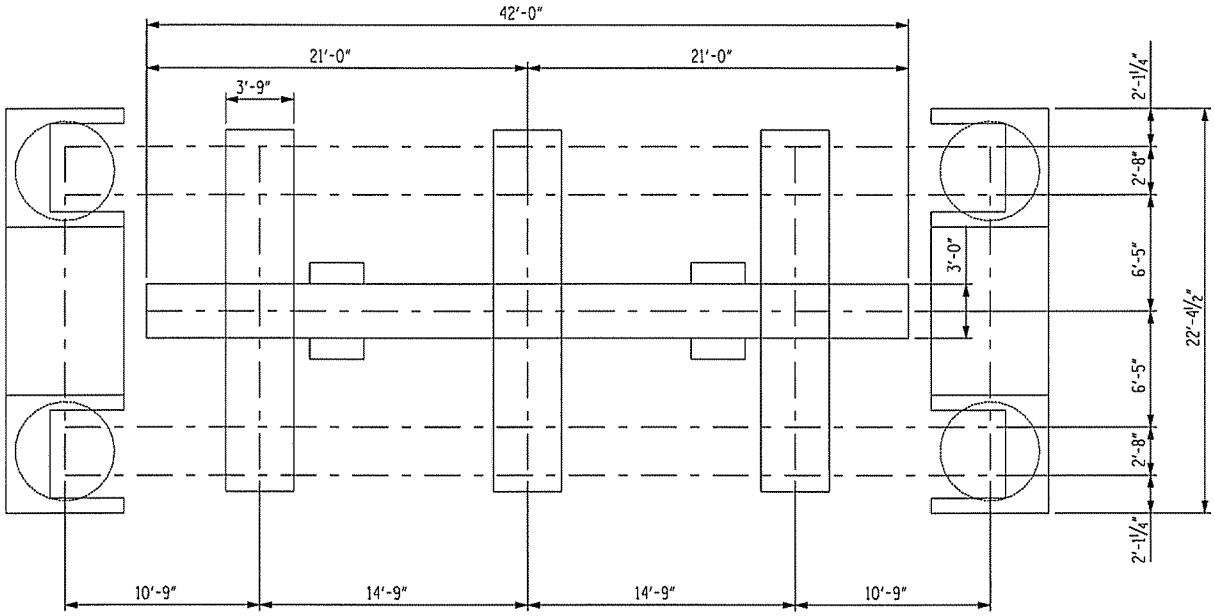
$Vs = 122\ k$

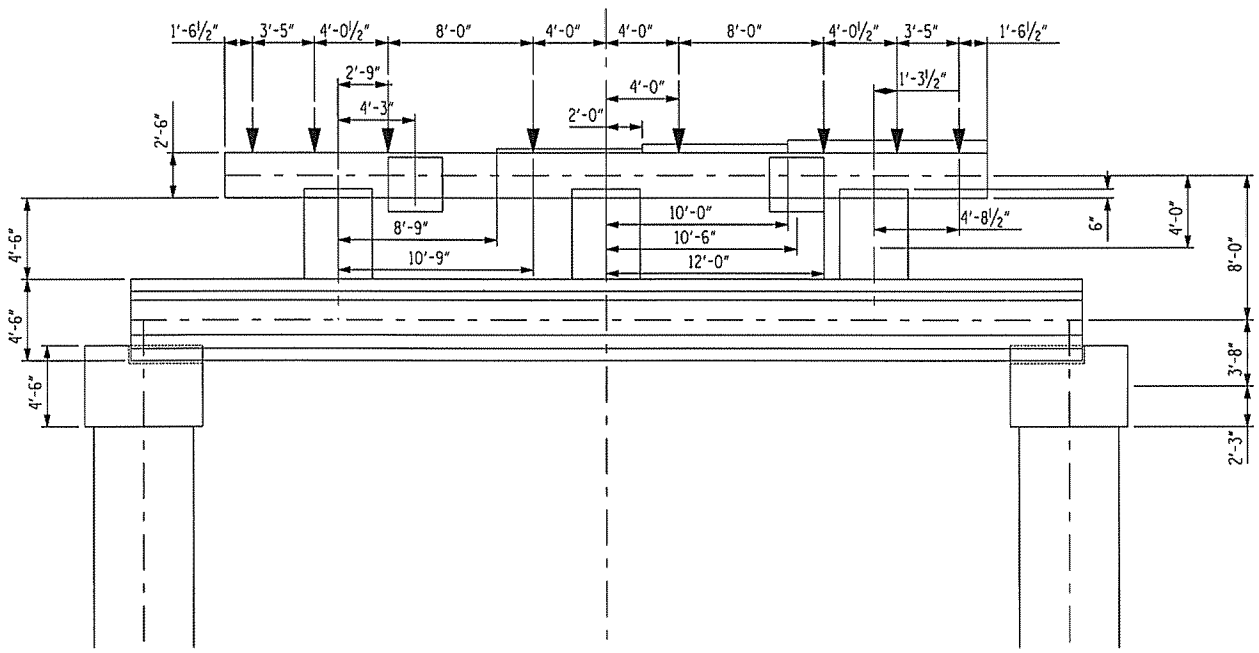
$\phi s := 0.85$

$\phi Vn := \phi s \cdot (Vc + Vs)$

$\phi Vn = 311\ k$

For Reinforced Strut Section Capacity see Type 7 Section Capacity Mathcad Sheet



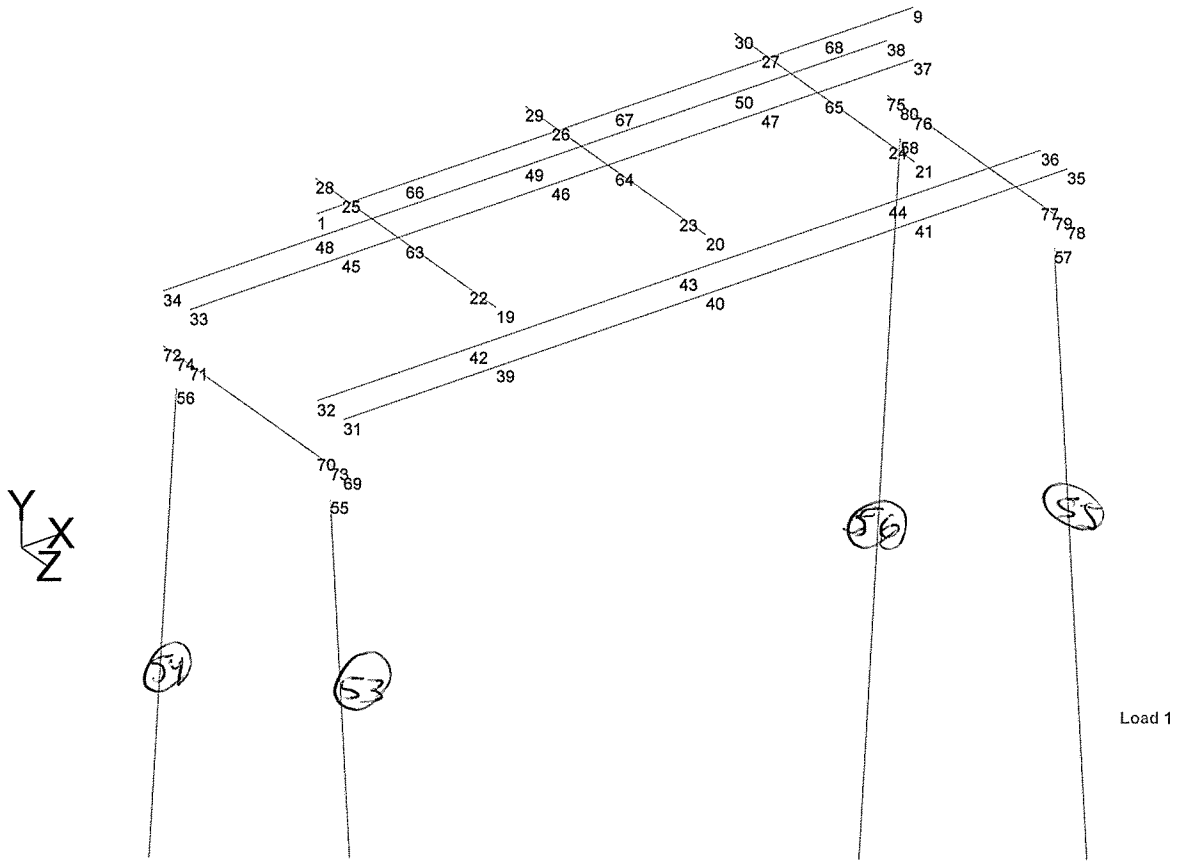


ELEVATION TYPE 10

BENTS 187, 188, 189, 190, 191, 192, 193, 194, 195, 196, 197, 198, 199, 200

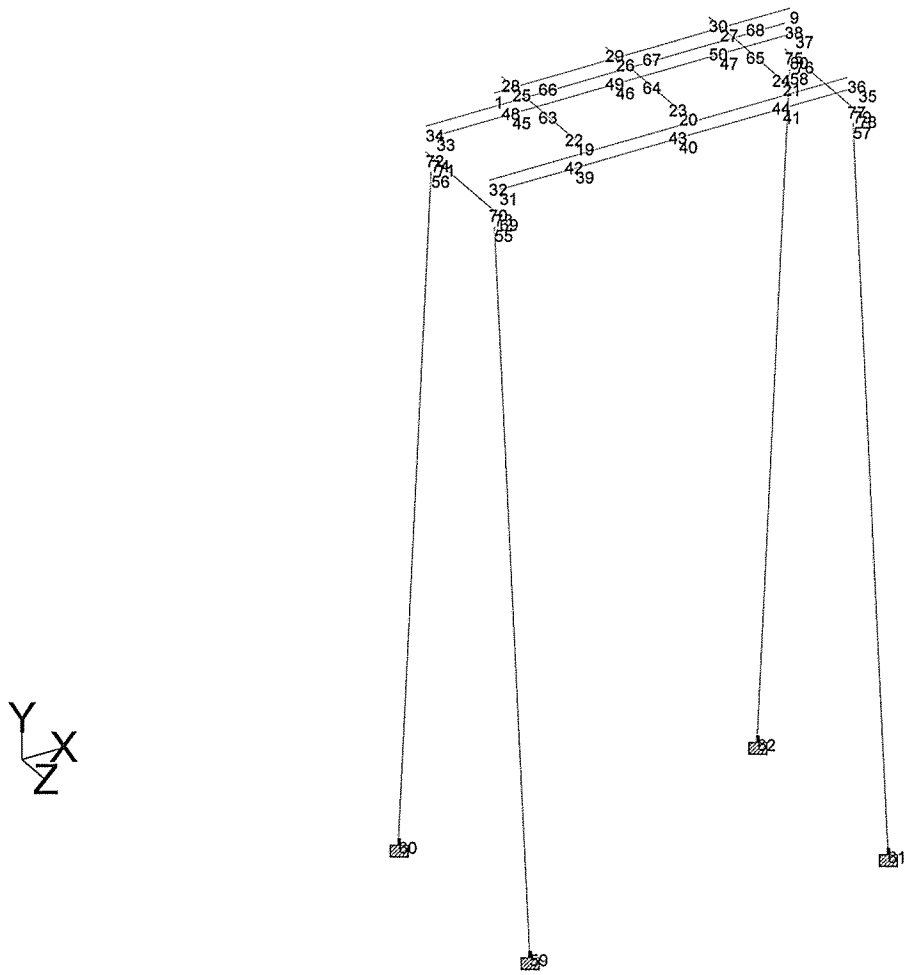
NBIS REPORT BENT TYPE A CRUTCH BENT 3

JAKO
8/22



Software licensed to Ko and Associates	Job No	Sheet No 1	Rev
	Part		
Job Title	Ref		
	By MSM	Date 24-May-06	Chd
Client	File Type 10.std	Date/Time 25-Aug-2006 15:46	

✓ MKO 8/22



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*           STAAD.Pro                               *
*           Version  2005    Bld 1003.US            *
*           Proprietary Program of                  *
*           Research Engineers,  Intl.              *
*           Date=    AUG 28, 2006                   *
*           Time=    14:46:28                       *
*                                                   *
*      USER ID: Ko and Associates                   *
*****************************************************
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MJM
✓ AKO 8/29

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     1. STAAD SPACE
INPUT FILE: Type 10.STD
     2. START JOB INFORMATION
     3. ENGINEER DATE 24-MAY-06
     4. END JOB INFORMATION
     5. INPUT WIDTH 79
     6. UNIT FEET KIP
     7. JOINT COORDINATES
     8. 1 0 0 0; 9 42 0 0; 19 6.25 -4 9.083; 20 21 -4 9.0834; 21 35.75 -4 9.0834
     9. 22 6.25 -4 6.4167; 23 21 -4 6.417; 24 35.75 -4 6.417; 25 6.25 -4 -6.417
    10. 26 21 -4 -6.417; 27 35.75 -4 -6.417; 28 6.25 -4 -9.0834; 29 21 -4 -9.083
    11. 30 35.75 -4 -9.083; 31 -4.5 -8 9.083; 32 -4.5 -8 6.417; 33 -4.5 -8 -6.417
    12. 34 -4.5 -8 -9.083; 35 46.5 -8 9.083; 36 46.5 -8 6.417; 37 46.5 -8 -6.417
    13. 38 46.5 -8 -9.083; 39 6.25 -8 9.083; 40 21 -8 9.0834; 41 35.75 -8 9.0834
    14. 42 6.25 -8 6.4167; 43 21 -8 6.417; 44 35.75 -8 6.417; 45 6.25 -8 -6.417
    15. 46 21 -8 -6.417; 47 35.75 -8 -6.417; 48 6.25 -8 -9.0834; 49 21 -8 -9.083
    16. 50 35.75 -8 -9.083; 55 -4.5 -13.917 7.75; 56 -4.5 -13.917 -7.75
    17. 57 46.5 -13.917 7.75; 58 46.5 -13.917 -7.75; 59 -4.5 -113.4 16.083
    18. 60 -4.5 -113.4 -16.083; 61 46.5 -113.4 16.083; 62 46.5 -113.4 -16.083
    19. 63 6.25 -4 0; 64 21 -4 0; 65 35.75 -4 0; 66 6.25 0 0; 67 21 0 0; 68 35.75 0 0
    20. 69 -4.5 -11.6667 9.083; 70 -4.5 -11.667 6.417; 71 -4.5 -11.667 -6.417
    21. 72 -4.5 -11.667 -9.083; 73 -4.5 -11.667 7.75; 74 -4.5 -11.667 -7.75
    22. 75 46.5 -11.6667 -9.083; 76 46.5 -11.6667 -6.417; 77 46.5 -11.667 6.417
    23. 78 46.5 -11.667 9.083; 79 46.5 -11.667 7.75; 80 46.5 -11.667 -7.75
    24. MEMBER INCIDENCES
    25. 18 28 25; 19 25 63; 20 22 19; 21 29 26; 22 26 64; 23 23 20; 24 30 27; 25 27 65
    26. 26 24 21; 27 31 39; 28 39 40; 29 40 41; 30 41 35; 31 32 42; 32 42 43; 33 43 44
    27. 34 44 36; 35 33 45; 36 45 46; 37 46 47; 38 47 37; 39 34 48; 40 48 49; 41 49 50
    28. 42 50 38; 43 72 74; 44 74 71; 45 71 70; 46 70 73; 47 73 69; 48 80 75; 49 76 80
    29. 50 77 76; 51 79 77; 52 78 79; 53 55 59; 54 56 60; 55 57 61; 56 58 62; 57 1 66
    30. 58 66 67; 59 67 68; 60 68 9; 61 63 22; 62 64 23; 63 65 24
    31. MEMBER PROPERTY AMERICAN
    32. 18 TO 26 61 TO 63 PRIS YD 4.5 ZD 3.75
    33. 43 TO 52 PRIS YD 3.5 ZD 6.5
    34. 53 TO 56 PRIS AX 7.864 IX 65.335 IY 29.07 IZ 29.07
    35. 27 TO 42 PRIS AX 5.4792 IX 1 IY 1.113 IZ 12.574
    36. MEMBER PROPERTY AMERICAN
    37. 57 TO 60 PRIS YD 2.5 ZD 3
    38. DEFINE MATERIAL START
    39. ISOTROPIC CONCRETE
    40. E 453600
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41. POISSON 0.17
42. DENSITY 0.14999
43. ALPHA 5.5E-006
44. DAMP 0.05
45. END DEFINE MATERIAL
46. CONSTANTS
47. MATERIAL CONCRETE MEMB 18 TO 63
48. SUPPORTS
49. 59 TO 62 FIXED
50. SLAVE RIGID MASTER 66 JOINT 63
51. SLAVE RIGID MASTER 67 JOINT 64
52. SLAVE RIGID MASTER 68 JOINT 65
53. SLAVE RIGID MASTER 19 JOINT 39
54. SLAVE RIGID MASTER 20 JOINT 40
55. SLAVE RIGID MASTER 21 JOINT 41
56. SLAVE RIGID MASTER 22 JOINT 42
57. SLAVE RIGID MASTER 23 JOINT 43
58. SLAVE RIGID MASTER 24 JOINT 44
59. SLAVE RIGID MASTER 25 JOINT 45
60. SLAVE RIGID MASTER 26 JOINT 46
61. SLAVE RIGID MASTER 27 JOINT 47
62. SLAVE RIGID MASTER 28 JOINT 48
63. SLAVE RIGID MASTER 29 JOINT 49
64. SLAVE RIGID MASTER 30 JOINT 50
65. SLAVE RIGID MASTER 31 JOINT 69
66. SLAVE RIGID MASTER 32 JOINT 70
67. SLAVE RIGID MASTER 33 JOINT 71
68. SLAVE RIGID MASTER 34 JOINT 72
69. SLAVE RIGID MASTER 73 JOINT 55
70. SLAVE RIGID MASTER 74 JOINT 56
71. SLAVE RIGID MASTER 35 JOINT 78
72. SLAVE RIGID MASTER 36 JOINT 77
73. SLAVE RIGID MASTER 37 JOINT 76
74. SLAVE RIGID MASTER 38 JOINT 75
75. SLAVE RIGID MASTER 80 JOINT 58
76. SLAVE RIGID MASTER 79 JOINT 57
77. UNIT INCHES KIP
78. LOAD 1 LOADTYPE NONE  TITLE LIVE LOAD
79. UNIT FEET KIP
80. MEMBER LOAD
81. 58 CON GY -32.7 2.75
82. 58 CON GY -32.7 10.75
83. 59 CON GY -32.7 4
84. 59 CON GY -32.7 12
85. UNIT INCHES KIP
86. LOAD 2 LOADTYPE NONE  TITLE DEAD LOAD
87. UNIT FEET KIP
88. SELFWEIGHT Y -1
89. MEMBER LOAD
90. 57 CON GY -11.4 1.5417
```

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 91. 57 CON GY -11.4 4.9584
 92. 58 CON GY -101.2 2.75
 93. 58 CON GY -93.6 10.75
 94. 59 CON GY -93.6 4
 95. 59 CON GY -101.2 12
 96. 60 CON GY -11.4 1.2917
 97. 60 CON GY -11.4 4.7084
 98. JOINT LOAD
 99. 19 TO 21 28 TO 30 FY -2.578
100. 31 34 35 38 FY -9.232
101. MEMBER LOAD
102. 58 CON GY -4.2 4.25
103. 59 CON GY -4.2 10.5
104. 58 UNI GY -0.108 8.75 14.75
105. 59 UNI GY -0.216 2 10
106. 60 UNI GY -0.324 0 6.25
107. 59 UNI GY -0.108 0 2
108. 59 UNI GY -0.324 10 14.75
109. LOAD 5 LOADTYPE NONE  TITLE LONGITUDINAL FORCE
110. MEMBER LOAD
111. 58 CON GZ -1.76 2.75
112. 58 CON GZ -1.76 10.75
113. 59 CON GZ -1.76 4
114. 59 CON GZ -1.76 12
115. LOAD 6 LOADTYPE NONE  TITLE WIND ON STRUCTURE
116. JOINT LOAD
117. 9 FX -0.42
118. MEMBER LOAD
119. 58 CON GX -6.03 2.75
120. 58 CON GX -6.03 10.75
121. 59 CON GX -6.03 4
122. 59 CON GX -6.03 12
123. 58 CON GZ -1.45 2.75
124. 58 CON GZ -1.45 10.75
125. 59 CON GZ -1.45 4
126. 59 CON GZ -1.45 12
127. JOINT LOAD
128. 35 TO 38 FX -0.4115
129. 65 FX -5.04
130. 79 80 FX -2.2
131. LOAD 7 LOADTYPE NONE  TITLE WIND ON LIVE LOAD
132. MEMBER LOAD
133. 58 CON GX -1.64 2.75
134. 58 CON GX -1.64 10.75
135. 59 CON GX -1.64 4
136. 59 CON GX -1.64 12
137. 58 CON GZ -0.66 2.75
138. 58 CON GZ -0.66 10.75
139. 59 CON GZ -0.66 4
140. 59 CON GZ -0.66 12
141. LOAD 18 LOADTYPE NONE  TITLE WALKWAY LIVE LOAD
142. MEMBER LOAD
143. 57 CON GY -8.9 1.5417
144. 57 CON GY -8.9 4.9584
145. 60 CON GY -8.9 1.2917
146. 60 CON GY -8.9 4.7084
```

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147. LOAD 19 LOADTYPE NONE  TITLE CENTRIFUGAL FORCES
148. MEMBER LOAD
149. 58 CON GX -1.23 2.75
150. 58 CON GX -1.23 10.75
151. 59 CON GX -1.23 4
152. 59 CON GX -1.23 12
153. LOAD COMB 8 SERVICE GROUP I
154. 1 1.0 2 1.0 18 1.0 19 1.0
155. LOAD COMB 10 SERVICE GROUP II
156. 2 1.0 6 1.0
157. LOAD COMB 11 SERVICE GROUP III
158. 1 1.0 2 1.0 6 0.3 5 1.0 7 1.0 18 1.0 19 1.0
159. LOAD COMB 13 FACTORED GROUP I
160. 2 1.3 1 2.75 18 2.17 19 1.3
161. LOAD COMB 15 FACTORED GROUP II
162. 2 1.3 6 1.3
163. LOAD COMB 16 FACTORED GROUP III
164. 2 1.3 1 1.65 6 0.39 5 1.3 7 1.3 18 1.3 19 1.3
165. PERFORM ANALYSIS PRINT STATICS CHECK


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

 NUMBER OF JOINTS/MEMBER+ELEMENTS/SUPPORTS =    60/    46/     4
 ORIGINAL/FINAL BAND-WIDTH=    46/     1/    101 DOF
 TOTAL PRIMARY LOAD CASES =     7, TOTAL DEGREES OF FREEDOM =    174
 SIZE OF STIFFNESS MATRIX =       18 DOUBLE  KILO-WORDS
 REQRD/AVAIL. DISK SPACE  =     12.3/  24802.0 MB
```

STATIC LOAD/REACTION/EQUILIBRIUM SUMMARY FOR CASE NO. 1
LOADTYPE NONE TITLE LIVE LOAD

***TOTAL APPLIED LOAD (KIP FEET) SUMMARY (LOADING 1)
SUMMATION FORCE-X = 0.00
SUMMATION FORCE-Y = -130.80
SUMMATION FORCE-Z = 0.00

SUMMATION OF MOMENTS AROUND THE ORIGIN-
MX= 0.00 MY= 0.00 MZ= -2746.80

***TOTAL REACTION LOAD(KIP FEET) SUMMARY (LOADING 1)
SUMMATION FORCE-X = 0.00
SUMMATION FORCE-Y = 130.80
SUMMATION FORCE-Z = 0.00

SUMMATION OF MOMENTS AROUND THE ORIGIN-
MX= 0.00 MY= 0.00 MZ= 2746.80

MAXIMUM DISPLACEMENTS (INCH /RADIANS) (LOADING 1)

	MAXIMUMS	AT NODE
X =	-1.46622E-02	55
Y =	-5.53891E-02	64
Z =	-2.13485E-03	49
RX=	4.52652E-05	29
RY=	-5.49252E-05	44
RZ=	1.93338E-04	78

STATIC LOAD/REACTION/EQUILIBRIUM SUMMARY FOR CASE NO. 2
LOADTYPE NONE TITLE DEAD LOAD

***TOTAL APPLIED LOAD (KIP FEET) SUMMARY (LOADING 2)
SUMMATION FORCE-X = 0.00
SUMMATION FORCE-Y = -1449.98
SUMMATION FORCE-Z = 0.00

SUMMATION OF MOMENTS AROUND THE ORIGIN-
MX= 0.01 MY= 0.00 MZ= -30513.48

***TOTAL REACTION LOAD(KIP FEET) SUMMARY (LOADING 2)
SUMMATION FORCE-X = 0.00
SUMMATION FORCE-Y = 1449.98
SUMMATION FORCE-Z = 0.00

SUMMATION OF MOMENTS AROUND THE ORIGIN-
MX= -0.01 MY= 0.00 MZ= 30513.48

MAXIMUM DISPLACEMENTS (INCH /RADIANS) (LOADING 2)

	MAXIMUMS	AT NODE
X =	-8.71466E-02	55
Y =	-3.46162E-01	67
Z =	-8.13388E-03	50
RX=	1.72791E-04	50
RY=	-3.00792E-04	24
RZ=	1.14265E-03	78

STATIC LOAD/REACTION/EQUILIBRIUM SUMMARY FOR CASE NO. 5
LOADTYPE NONE TITLE LONGITUDINAL FORCE

***TOTAL APPLIED LOAD (KIP FEET) SUMMARY (LOADING 5)
SUMMATION FORCE-X = 0.00
SUMMATION FORCE-Y = 0.00
SUMMATION FORCE-Z = -7.04

SUMMATION OF MOMENTS AROUND THE ORIGIN-
MX= 0.00 MY= 147.84 MZ= 0.00

***TOTAL REACTION LOAD(KIP FEET) SUMMARY (LOADING 5)
SUMMATION FORCE-X = 0.00
SUMMATION FORCE-Y = 0.00
SUMMATION FORCE-Z = 7.04

SUMMATION OF MOMENTS AROUND THE ORIGIN-
MX= 0.00 MY= -147.84 MZ= 0.00

MAXIMUM DISPLACEMENTS (INCH /RADIANS) (LOADING 5)

	MAXIMUMS	AT NODE
X =	-4.86633E-04	56
Y =	-2.50666E-03	31
Z =	-6.98771E-02	46
RX=	1.63003E-05	22
RY=	-4.56564E-06	38
RZ=	5.38046E-06	31

STATIC LOAD/REACTION/EQUILIBRIUM SUMMARY FOR CASE NO. 6
LOADTYPE NONE TITLE WIND ON STRUCTURE

***TOTAL APPLIED LOAD (KIP FEET) SUMMARY (LOADING 6)
SUMMATION FORCE-X = -35.63
SUMMATION FORCE-Y = 0.00
SUMMATION FORCE-Z = -5.80

SUMMATION OF MOMENTS AROUND THE ORIGIN-
MX= 0.00 MY= 121.80 MZ= -84.66

```
***TOTAL REACTION LOAD( KIP  FEET ) SUMMARY (LOADING     6 )
    SUMMATION FORCE-X =       35.63
    SUMMATION FORCE-Y =        0.00
    SUMMATION FORCE-Z =        5.80

   SUMMATION OF MOMENTS AROUND THE ORIGIN-
   MX=           0.00  MY=        -121.80  MZ=          84.66


MAXIMUM DISPLACEMENTS ( INCH /RADIANS) (LOADING      6)
         MAXIMUMS    AT NODE
   X = -9.03921E-01      43
   Y =  1.40959E-02      48
   Z = -5.75741E-02      46
   RX=  1.94416E-05      28
   RY= -3.84093E-05      26
   RZ=  3.53682E-04      73


       STATIC LOAD/REACTION/EQUILIBRIUM SUMMARY FOR CASE NO.     7
       LOADTYPE NONE  TITLE WIND ON LIVE LOAD


***TOTAL APPLIED LOAD ( KIP  FEET ) SUMMARY (LOADING    7 )
    SUMMATION FORCE-X =       -6.56
    SUMMATION FORCE-Y =        0.00
    SUMMATION FORCE-Z =       -2.64

   SUMMATION OF MOMENTS AROUND THE ORIGIN-
   MX=           0.00  MY=          55.44  MZ=           0.00


***TOTAL REACTION LOAD( KIP  FEET ) SUMMARY (LOADING     7 )
    SUMMATION FORCE-X =        6.56
    SUMMATION FORCE-Y =        0.00
    SUMMATION FORCE-Z =        2.64

   SUMMATION OF MOMENTS AROUND THE ORIGIN-
   MX=           0.00  MY=         -55.44  MZ=           0.00


MAXIMUM DISPLACEMENTS ( INCH /RADIANS) (LOADING      7)
         MAXIMUMS    AT NODE
   X = -1.66615E-01      43
   Y =  2.93247E-03      28
   Z = -2.62040E-02      46
   RX=  7.24222E-06      25
   RY= -7.59690E-06      26
   RZ=  6.59156E-05      58


       STATIC LOAD/REACTION/EQUILIBRIUM SUMMARY FOR CASE NO.    18
       LOADTYPE NONE  TITLE WALKWAY LIVE LOAD
```

```
***TOTAL APPLIED LOAD ( KIP  FEET ) SUMMARY (LOADING   18 )
    SUMMATION FORCE-X =        0.00
    SUMMATION FORCE-Y =      -35.60
    SUMMATION FORCE-Z =        0.00

   SUMMATION OF MOMENTS AROUND THE ORIGIN-
   MX=           0.00  MY=           0.00  MZ=        -747.60


***TOTAL REACTION LOAD( KIP  FEET ) SUMMARY (LOADING    18 )
    SUMMATION FORCE-X =        0.00
    SUMMATION FORCE-Y =       35.60
    SUMMATION FORCE-Z =        0.00

   SUMMATION OF MOMENTS AROUND THE ORIGIN-
   MX=           0.00  MY=           0.00  MZ=         747.60


MAXIMUM DISPLACEMENTS ( INCH /RADIANS) (LOADING     18)
          MAXIMUMS    AT NODE
   X = -3.19195E-03      55
   Y = -1.42612E-02       9
   Z = -7.70340E-04      50
   RX=  1.62915E-05      50
   RY=  5.16331E-06      27
   RZ= -6.69159E-05       9


       STATIC LOAD/REACTION/EQUILIBRIUM SUMMARY FOR CASE NO.    19
       LOADTYPE NONE  TITLE CENTRIFUGAL FORCES


***TOTAL APPLIED LOAD ( KIP  FEET ) SUMMARY (LOADING   19 )
    SUMMATION FORCE-X =       -4.92
    SUMMATION FORCE-Y =        0.00
    SUMMATION FORCE-Z =        0.00

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


***TOTAL REACTION LOAD( KIP  FEET ) SUMMARY (LOADING    19 )
    SUMMATION FORCE-X =        4.92
    SUMMATION FORCE-Y =        0.00
    SUMMATION FORCE-Z =        0.00

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

MAXIMUM DISPLACEMENTS (INCH /RADIANS) (LOADING 19)

	MAXIMUMS	AT NODE
X =	-1.24961E-01	43
Y =	1.77334E-03	1
Z =	-4.57933E-05	48
RX=	9.31433E-07	48
RY=	-5.69766E-06	26
RZ=	4.80790E-05	74

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

166. PRINT MEMBER INFORMATION LIST 18 TO 60

MEMBER INFORMATION

MEMBER	START JOINT	END JOINT	LENGTH (FEET)	BETA (DEG)	RELEASES
18	28	25	2.666	0.00	
19	25	63	6.417	0.00	
20	22	19	2.666	0.00	
21	29	26	2.666	0.00	
22	26	64	6.417	0.00	
23	23	20	2.666	0.00	
24	30	27	2.666	0.00	
25	27	65	6.417	0.00	
26	24	21	2.666	0.00	
27	31	39	10.750	0.00	
28	39	40	14.750	0.00	
29	40	41	14.750	0.00	
30	41	35	10.750	0.00	
31	32	42	10.750	0.00	
32	42	43	14.750	0.00	
33	43	44	14.750	0.00	
34	44	36	10.750	0.00	
35	33	45	10.750	0.00	
36	45	46	14.750	0.00	
37	46	47	14.750	0.00	
38	47	37	10.750	0.00	
39	34	48	10.750	0.00	
40	48	49	14.750	0.00	
41	49	50	14.750	0.00	
42	50	38	10.750	0.00	
43	72	74	1.333	0.00	
44	74	71	1.333	0.00	
45	71	70	12.834	0.00	
46	70	73	1.333	0.00	
47	73	69	1.333	0.00	
48	80	75	1.333	0.00	
49	76	80	1.333	0.00	
50	77	76	12.834	0.00	
51	79	77	1.333	0.00	
52	78	79	1.333	0.00	
53	55	59	99.831	0.00	
54	56	60	99.831	0.00	
55	57	61	99.831	0.00	
56	58	62	99.831	0.00	
57	1	66	6.250	0.00	
58	66	67	14.750	0.00	
59	67	68	14.750	0.00	
60	68	9	6.250	0.00	

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

167. PRINT MEMBER PROPERTIES LIST 18 TO 63

MEMBER PROPERTIES. UNIT - INCH

MEMB	PROFILE	AX/ AY	IZ/ AZ	IY/ SZ	IX/ SY
18	PRISMATIC	2430.00	590490.00	410062.50	813725.69
		2065.50	2065.50	21870.00	18225.00
19	PRISMATIC	2430.00	590490.00	410062.50	813725.69
		2065.50	2065.50	21870.00	18225.00
20	PRISMATIC	2430.00	590490.00	410062.50	813725.69
		2065.50	2065.50	21870.00	18225.00
21	PRISMATIC	2430.00	590490.00	410062.50	813725.69
		2065.50	2065.50	21870.00	18225.00
22	PRISMATIC	2430.00	590490.00	410062.50	813725.69
		2065.50	2065.50	21870.00	18225.00
23	PRISMATIC	2430.00	590490.00	410062.50	813725.69
		2065.50	2065.50	21870.00	18225.00
24	PRISMATIC	2430.00	590490.00	410062.50	813725.69
		2065.50	2065.50	21870.00	18225.00
25	PRISMATIC	2430.00	590490.00	410062.50	813725.69
		2065.50	2065.50	21870.00	18225.00
26	PRISMATIC	2430.00	590490.00	410062.50	813725.69
		2065.50	2065.50	21870.00	18225.00
27	PRISMATIC	789.00	260734.47	23079.17	20736.00
		0.00	0.00	52199.09	4620.45
28	PRISMATIC	789.00	260734.47	23079.17	20736.00
		0.00	0.00	52199.09	4620.45
29	PRISMATIC	789.00	260734.47	23079.17	20736.00
		0.00	0.00	52199.09	4620.45
30	PRISMATIC	789.00	260734.47	23079.17	20736.00
		0.00	0.00	52199.09	4620.45
31	PRISMATIC	789.00	260734.47	23079.17	20736.00
		0.00	0.00	52199.09	4620.45
32	PRISMATIC	789.00	260734.47	23079.17	20736.00
		0.00	0.00	52199.09	4620.45
33	PRISMATIC	789.00	260734.47	23079.17	20736.00
		0.00	0.00	52199.09	4620.45
34	PRISMATIC	789.00	260734.47	23079.17	20736.00
		0.00	0.00	52199.09	4620.45
35	PRISMATIC	789.00	260734.47	23079.17	20736.00
		0.00	0.00	52199.09	4620.45
36	PRISMATIC	789.00	260734.47	23079.17	20736.00
		0.00	0.00	52199.09	4620.45
37	PRISMATIC	789.00	260734.47	23079.17	20736.00
		0.00	0.00	52199.09	4620.45
38	PRISMATIC	789.00	260734.47	23079.17	20736.00
		0.00	0.00	52199.09	4620.45
39	PRISMATIC	789.00	260734.47	23079.17	20736.00
		0.00	0.00	52199.09	4620.45
40	PRISMATIC	789.00	260734.47	23079.17	20736.00
		0.00	0.00	52199.09	4620.45
41	PRISMATIC	789.00	260734.47	23079.17	20736.00
		0.00	0.00	52199.09	4620.45

MEMBER PROPERTIES. UNIT - INCH

MEMB	PROFILE	AX/ AY	IZ/ AZ	IY/ SZ	IX/ SY
42	PRISMATIC	789.00	260734.47	23079.17	20736.00
		0.00	0.00	52199.09	4620.45
43	PRISMATIC	3276.00	481572.00	1660932.00	1277409.62
		2784.60	2784.60	22932.00	42588.00
44	PRISMATIC	3276.00	481572.00	1660932.00	1277409.62
		2784.60	2784.60	22932.00	42588.00
45	PRISMATIC	3276.00	481572.00	1660932.00	1277409.62
		2784.60	2784.60	22932.00	42588.00
46	PRISMATIC	3276.00	481572.00	1660932.00	1277409.62
		2784.60	2784.60	22932.00	42588.00
47	PRISMATIC	3276.00	481572.00	1660932.00	1277409.62
		2784.60	2784.60	22932.00	42588.00
48	PRISMATIC	3276.00	481572.00	1660932.00	1277409.62
		2784.60	2784.60	22932.00	42588.00
49	PRISMATIC	3276.00	481572.00	1660932.00	1277409.62
		2784.60	2784.60	22932.00	42588.00
50	PRISMATIC	3276.00	481572.00	1660932.00	1277409.62
		2784.60	2784.60	22932.00	42588.00
51	PRISMATIC	3276.00	481572.00	1660932.00	1277409.62
		2784.60	2784.60	22932.00	42588.00
52	PRISMATIC	3276.00	481572.00	1660932.00	1277409.62
		2784.60	2784.60	22932.00	42588.00
53	PRISMATIC	1132.42	602795.50	602795.50	1354786.50
		0.00	0.00	120679.78	120679.78
54	PRISMATIC	1132.42	602795.50	602795.50	1354786.50
		0.00	0.00	120679.78	120679.78
55	PRISMATIC	1132.42	602795.50	602795.50	1354786.50
		0.00	0.00	120679.78	120679.78
56	PRISMATIC	1132.42	602795.50	602795.50	1354786.50
		0.00	0.00	120679.78	120679.78
57	PRISMATIC	1080.00	81000.00	116640.00	160735.94
		918.00	918.00	5400.00	6480.00
58	PRISMATIC	1080.00	81000.00	116640.00	160735.94
		918.00	918.00	5400.00	6480.00
59	PRISMATIC	1080.00	81000.00	116640.00	160735.94
		918.00	918.00	5400.00	6480.00
60	PRISMATIC	1080.00	81000.00	116640.00	160735.94
		918.00	918.00	5400.00	6480.00
61	PRISMATIC	2430.00	590490.00	410062.50	813725.69
		2065.50	2065.50	21870.00	18225.00
62	PRISMATIC	2430.00	590490.00	410062.50	813725.69
		2065.50	2065.50	21870.00	18225.00
63	PRISMATIC	2430.00	590490.00	410062.50	813725.69
		2065.50	2065.50	21870.00	18225.00

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

168. PRINT MATERIAL PROPERTIES

MATERIAL PROPERTIES.

ALL UNITS ARE - KIP FEET

MEMBER	E	G	DEN	ALPHA
18	453600.0	193846.1	0.14999001	0.00000550
19	453600.0	193846.1	0.14999001	0.00000550
20	453600.0	193846.1	0.14999001	0.00000550
21	453600.0	193846.1	0.14999001	0.00000550
22	453600.0	193846.1	0.14999001	0.00000550
23	453600.0	193846.1	0.14999001	0.00000550
24	453600.0	193846.1	0.14999001	0.00000550
25	453600.0	193846.1	0.14999001	0.00000550
26	453600.0	193846.1	0.14999001	0.00000550
27	453600.0	193846.1	0.14999001	0.00000550
28	453600.0	193846.1	0.14999001	0.00000550
29	453600.0	193846.1	0.14999001	0.00000550
30	453600.0	193846.1	0.14999001	0.00000550
31	453600.0	193846.1	0.14999001	0.00000550
32	453600.0	193846.1	0.14999001	0.00000550
33	453600.0	193846.1	0.14999001	0.00000550
34	453600.0	193846.1	0.14999001	0.00000550
35	453600.0	193846.1	0.14999001	0.00000550
36	453600.0	193846.1	0.14999001	0.00000550
37	453600.0	193846.1	0.14999001	0.00000550
38	453600.0	193846.1	0.14999001	0.00000550
39	453600.0	193846.1	0.14999001	0.00000550
40	453600.0	193846.1	0.14999001	0.00000550
41	453600.0	193846.1	0.14999001	0.00000550
42	453600.0	193846.1	0.14999001	0.00000550
43	453600.0	193846.1	0.14999001	0.00000550
44	453600.0	193846.1	0.14999001	0.00000550
45	453600.0	193846.1	0.14999001	0.00000550
46	453600.0	193846.1	0.14999001	0.00000550
47	453600.0	193846.1	0.14999001	0.00000550
48	453600.0	193846.1	0.14999001	0.00000550
49	453600.0	193846.1	0.14999001	0.00000550
50	453600.0	193846.1	0.14999001	0.00000550
51	453600.0	193846.1	0.14999001	0.00000550
52	453600.0	193846.1	0.14999001	0.00000550
53	453600.0	193846.1	0.14999001	0.00000550
54	453600.0	193846.1	0.14999001	0.00000550
55	453600.0	193846.1	0.14999001	0.00000550
56	453600.0	193846.1	0.14999001	0.00000550
57	453600.0	193846.1	0.14999001	0.00000550
58	453600.0	193846.1	0.14999001	0.00000550
59	453600.0	193846.1	0.14999001	0.00000550
60	453600.0	193846.1	0.14999001	0.00000550
61	453600.0	193846.1	0.14999001	0.00000550
62	453600.0	193846.1	0.14999001	0.00000550
63	453600.0	193846.1	0.14999001	0.00000550

MATERIAL PROPERTIES.

ALL UNITS ARE - KIP FEET

MEMBER	E	G	DEN	ALPHA

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

169. PRINT SUPPORT INFORMATION

SUPPORT INFORMATION (1=FIXED, 0=RELEASED)

UNITS FOR SPRING CONSTANTS ARE KIP FEET DEGREES

JOINT	FORCE-X/ KFX	FORCE-Y/ KFY	FORCE-Z/ KFZ	MOM-X/ KMX	MOM-Y/ KMY	MOM-Z/ KMZ
59	1	1	1	1	1	1
	0.0000E+00	0.0000E+00	0.0000E+00	0.000E+00	0.000E+00	0.000E+00
60	1	1	1	1	1	1
	0.0000E+00	0.0000E+00	0.0000E+00	0.000E+00	0.000E+00	0.000E+00
61	1	1	1	1	1	1
	0.0000E+00	0.0000E+00	0.0000E+00	0.000E+00	0.000E+00	0.000E+00
62	1	1	1	1	1	1
	0.0000E+00	0.0000E+00	0.0000E+00	0.000E+00	0.000E+00	0.000E+00

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

170. LOAD LIST 8 10 11
171. PRINT SUPPORT REACTION LIST 59 TO 62

SUPPORT REACTIONS -UNIT KIP FEET STRUCTURE TYPE = SPACE

JOINT	LOAD	FORCE-X	FORCE-Y	FORCE-Z	MOM-X	MOM-Y	MOM Z
59	8	13.14	406.28	-28.60	100.61	-56.14	-484.26
	10	18.70	373.63	-25.09	138.46	-80.51	-831.41
	11	17.37	400.50	-26.54	176.97	-75.17	-717.87
60	8	13.14	406.28	28.60	-100.62	56.14	-484.26
	10	18.78	389.30	27.99	-61.51	79.90	-834.25
	11	17.52	431.34	32.25	-25.45	73.98	-723.47
61	8	-10.68	401.91	-28.25	100.29	45.58	348.60
	10	-0.89	335.70	-21.98	136.03	4.16	-146.86
	11	-6.28	376.85	-24.60	175.45	27.66	108.82
62	8	-10.68	401.91	28.25	-100.28	-45.58	348.60
	10	-0.96	351.36	24.88	-59.06	-3.56	-144.01
	11	-6.44	407.69	30.31	-23.90	-26.47	114.43

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

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172. LOAD LIST 13 15 16
173. SECTION 0 0.18 0.5 0.82 1 MEMB 58 59
174. SECTION 0 0.3 0.5 0.7 MEMB 57 60
175. PRINT MEMBER SECTION FORCES LIST 57 TO 60
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MEMBER FORCES AT INTERMEDIATE SECTIONS

ALL UNITS ARE -- KIP FEET

MEMB	LOAD	SEC	SHEAR-Y	SHEAR-Z	MOM-Y	MOM-Z
57	13	0.30	-36.88	0.00	0.00	13.95
		0.50	-38.70	0.00	0.00	61.18
		0.70	-40.53	0.00	0.00	110.70
	15	0.30	-17.56	0.00	0.00	7.51
		0.50	-19.39	0.00	0.00	30.61
		0.70	-21.22	0.00	0.00	55.99
	16	0.30	-29.13	0.00	0.00	11.37
		0.50	-30.96	0.00	0.00	48.92
		0.70	-32.79	0.00	0.00	88.77
58	13	0.18	306.40	0.00	-0.02	136.36
		0.50	72.56	0.00	0.00	-252.14
		0.82	-146.42	0.00	0.02	-292.92
	15	0.18	195.78	3.12	-4.39	122.67
		0.50	51.85	1.23	1.60	-159.58
		0.82	-77.20	-0.65	4.87	-223.60
	16	0.18	262.91	6.13	-8.63	134.73
		0.50	65.04	2.42	3.15	-214.86
		0.82	-117.97	-1.29	9.59	-268.53
59	13	0.18	149.00	0.00	0.00	-285.47
		0.50	-70.84	0.00	0.00	-255.15
		0.82	-306.30	0.00	0.00	128.66
	15	0.18	87.38	0.66	4.86	-182.69
		0.50	-42.53	-1.23	1.60	-165.04
		0.82	-188.07	-3.11	-4.37	76.62
	16	0.18	125.13	1.29	9.57	-241.01
		0.50	-58.74	-2.42	3.15	-219.43
		0.82	-258.23	-6.13	-8.62	103.86
60	13	0.30	42.37	0.00	0.00	114.74
		0.50	40.02	0.00	0.00	63.24
		0.70	37.66	0.00	0.00	14.69
	15	0.30	23.06	0.00	0.00	60.02
		0.50	20.71	0.00	0.00	32.66
		0.70	18.35	0.00	0.00	8.25
	16	0.30	34.63	0.00	0.00	92.80
		0.50	32.28	0.00	0.00	50.98
		0.70	29.92	0.00	0.00	12.11

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

176. PRINT MAXFORCE ENVELOPE NSECTION 10 LIST 19 22 25 27 TO 42 45 50 57 TO 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
19	MAX	214.96	0.00	13	-20.10	0.00	15			
		-233.56	0.00	15	305.90	0.00	13	26.32 C	0.00	13
	MIN	121.06	6.42	15	-1351.98	6.42	13			
		-335.83	6.42	13	-1849.09	6.42	13	18.18 C	6.42	15
22	MAX	173.12	0.00	13	-15.99	0.00	15			
		-4.32	0.00	13	11.15	0.00	15	27.71 C	0.00	13
	MIN	87.15	6.42	15	-1093.74	6.42	13			
		-25.59	6.42	15	-153.06	6.42	15	19.96 C	6.42	15
25	MAX	216.78	0.00	13	-5.63	0.00	15			
		336.94	0.00	13	1855.22	6.42	13	26.82 C	0.00	13
	MIN	119.08	6.42	15	-1362.19	6.42	13			
		239.93	6.42	15	-306.94	0.00	13	19.99 C	6.42	15
27	MAX	131.04	0.00	13	563.43	0.00	15			
		-12.19	0.00	15	80.71	0.00	13	35.96 T	0.00	15
	MIN	94.22	10.75	15	-926.91	10.75	13			
		-19.28	10.75	13	-126.53	10.75	13	61.19 T	10.75	13
28	MAX	51.13	0.00	16	-54.89	0.00	15			
		-5.02	0.00	15	66.85	0.00	13	62.91 T	0.00	15
	MIN	32.28	14.75	15	-891.17	14.75	13			
		-6.74	14.75	13	-32.54	14.75	13	98.23 T	14.75	13
29	MAX	-9.47	0.00	15	-296.01	14.75	13			
		6.53	0.00	13	65.90	14.75	13	67.90 T	0.00	15
	MIN	-47.53	14.75	13	-880.81	0.00	13			
		3.91	14.75	15	-30.39	0.00	13	99.00 T	14.75	13
30	MAX	-68.34	0.00	15	338.10	10.75	13			
		19.31	0.00	13	80.69	10.75	13	45.60 T	0.00	15
	MIN	-127.75	10.75	13	-973.46	0.00	13			
		11.94	10.75	15	-126.91	0.00	13	62.81 T	10.75	13
31	MAX	246.91	0.00	13	961.76	0.00	16			
		-13.34	0.00	15	88.38	0.00	13	81.04 C	0.00	13
	MIN	171.22	10.75	15	-1647.44	10.75	13			
		-21.11	10.75	13	-138.54	10.75	13	61.29 C	10.75	15
32	MAX	76.85	0.00	13	124.08	0.00	15			
		-5.44	0.00	15	72.68	0.00	13	140.42 T	0.00	15

	MIN	51.03	14.75	15	-1011.38	14.75	13			
		-7.33	14.75	13	-35.45	14.75	13	217.76 T	14.75	13
33	MAX	-26.50	0.00	15	-35.95	14.75	13			
		7.11	0.00	13	71.70	14.75	13	161.02 T	0.00	15
	MIN	-72.87	14.75	13	-994.50	0.00	13			
		4.28	14.75	15	-33.22	0.00	13	221.30 T	14.75	13
34	MAX	-147.78	0.00	15	866.33	10.75	13			
		21.15	0.00	13	88.40	10.75	13	79.45 C	0.00	13
	MIN	-244.53	10.75	13	-1700.58	0.00	13			
		13.12	10.75	15	-138.95	0.00	13	51.70 C	10.75	15
35	MAX	246.91	0.00	13	990.06	0.00	16			
		21.11	0.00	13	138.54	10.75	13	81.03 C	0.00	13
	MIN	174.26	10.75	15	-1647.44	10.75	13			
		15.41	10.75	15	-88.38	0.00	13	61.25 C	10.75	15
36	MAX	76.85	0.00	13	122.61	0.00	15			
		7.33	0.00	13	36.89	14.75	16	142.99 T	0.00	15
	MIN	51.16	14.75	15	-1011.37	14.75	13			
		5.78	14.75	15	-72.70	0.00	13	217.76 T	14.75	13
37	MAX	-26.62	0.00	15	-35.96	14.75	13			
		-4.62	0.00	15	33.22	0.00	13	163.59 T	0.00	15
	MIN	-72.86	14.75	13	-994.47	0.00	13			
		-7.11	14.75	13	-71.69	14.75	13	221.30 T	14.75	13
38	MAX	-150.82	0.00	15	866.30	10.75	13			
		-15.19	0.00	15	138.96	0.00	13	79.44 C	0.00	13
	MIN	-244.52	10.75	13	-1700.54	0.00	13			
		-21.15	10.75	13	-88.40	10.75	13	51.66 C	10.75	15
39	MAX	131.04	0.00	13	567.09	0.00	15			
		19.28	0.00	13	126.53	10.75	13	37.85 T	0.00	15
	MIN	95.42	10.75	15	-926.91	10.75	13			
		13.89	10.75	15	-80.71	0.00	13	61.19 T	10.75	13
40	MAX	51.99	0.00	16	-54.13	0.00	15			
		6.74	0.00	13	34.08	14.75	16	67.18 T	0.00	15
	MIN	32.71	14.75	15	-891.15	14.75	13			
		5.34	14.75	15	-66.87	0.00	13	98.23 T	14.75	13
41	MAX	-9.90	0.00	15	-295.98	14.75	13			
		-4.22	0.00	15	30.39	0.00	13	72.17 T	0.00	15
	MIN	-47.53	14.75	13	-880.78	0.00	13			
		-6.53	14.75	13	-65.90	14.75	13	99.01 T	14.75	13
42	MAX	-69.54	0.00	15	338.10	10.75	13			
		-13.64	0.00	15	126.92	0.00	13	47.49 T	0.00	15
	MIN	-127.75	10.75	13	-973.47	0.00	13			
		-19.31	10.75	13	-80.69	10.75	13	62.80 T	10.75	13
45	MAX	44.33	0.00	16	214.95	0.00	16			
		0.00	0.00	13	-100.00	0.00	16	7.09 C	0.00	15

	MIN	-28.46	12.83	13	-6.41	10.27	16			
		-1.99	12.83	16	-125.59	12.83	16	1.36 C	12.83	13
50	MAX	28.46	0.00	13	209.76	12.83	16			
		2.00	0.00	16	-19.84	12.83	15	3.51 C	0.00	15
	MIN	-44.33	12.83	16	-11.59	2.57	16			
		0.00	12.83	13	-88.24	0.00	13	0.82 C	12.83	13
57	MAX	0.00	0.00	15	233.36	6.25	13			
		0.00	0.00	13	0.00	0.00	15	0.00	0.00	13
	MIN	-77.41	6.25	13	0.00	0.00	15			
		0.00	6.25	15	0.00	5.62	16	0.00	6.25	16
58	MAX	310.29	0.00	13	955.01	0.00	13			
		6.13	0.00	16	10.29	10.33	16	671.66 C	0.00	13
	MIN	-150.68	14.75	13	-459.64	10.33	13			
		-1.29	13.28	16	-24.91	0.00	16	446.54 C	14.75	15
59	MAX	153.35	0.00	13	948.53	14.75	13			
		1.29	0.00	16	10.28	4.43	16	677.08 C	0.00	13
	MIN	-311.30	14.75	13	-456.53	4.43	13			
		-6.13	14.75	16	-24.89	14.75	16	482.04 C	14.75	15
60	MAX	80.04	0.00	13	241.59	0.00	13			
		0.00	0.00	15	0.00	6.25	15	0.55 C	0.00	15
	MIN	0.00	6.25	15	0.00	6.25	13			
		0.00	6.25	13	0.00	0.00	16	0.00 T	6.25	13
61	MAX	-117.38	0.00	15	-31.01	6.42	15			
		335.83	0.00	13	305.86	6.42	13	26.31 C	0.00	13
	MIN	-214.96	6.42	13	-1351.97	0.00	13			
		228.65	6.42	15	-1849.07	0.00	13	15.07 C	6.42	15
62	MAX	-86.03	0.00	15	-18.57	6.42	15			
		25.59	0.00	15	11.14	6.42	15	27.72 C	0.00	13
	MIN	-173.13	6.42	13	-1093.75	0.00	13			
		4.31	6.42	13	-153.05	0.00	15	18.65 C	6.42	15
63	MAX	-115.40	0.00	15	-16.47	6.42	15			
		-235.01	0.00	15	1855.22	0.00	13	26.82 C	0.00	13
	MIN	-216.79	6.42	13	-1362.19	0.00	13			
		-336.94	6.42	13	-306.95	6.42	13	16.88 C	6.42	15

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

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177. LOAD LIST 2
178. SECTION 0 0.3 0.5 0.7 1 MEMB 27 30 31 34 35 38 39 42
179. PRINT MEMBER SECTION FORCES LIST 27 30 31 34 35 38 39 42
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MEMBER FORCES AT INTERMEDIATE SECTIONS

ALL UNITS ARE -- KIP FEET

MEMB	LOAD	SEC	SHEAR-Y	SHEAR-Z	MOM-Y	MOM-Z
27	2	0.30	68.96	-9.93	8.84	-15.97
		0.50	67.19	-9.93	-12.50	-162.33
		0.70	65.43	-9.93	-33.84	-304.90
30	2	0.30	-65.77	10.00	-34.03	-308.58
		0.50	-67.54	10.00	-12.53	-165.27
		0.70	-69.31	10.00	8.97	-18.16
31	2	0.30	129.62	-10.97	9.93	61.09
		0.50	127.85	-10.97	-13.64	-215.69
		0.70	126.08	-10.97	-37.22	-488.67
34	2	0.30	-127.02	11.04	-37.42	-494.00
		0.50	-128.78	11.04	-13.67	-219.01
		0.70	-130.55	11.04	10.07	59.77
35	2	0.30	129.62	10.97	-9.93	61.09
		0.50	127.85	10.97	13.64	-215.69
		0.70	126.08	10.97	37.22	-488.67
38	2	0.30	-127.01	-11.04	37.42	-493.99
		0.50	-128.78	-11.04	13.67	-219.01
		0.70	-130.55	-11.04	-10.07	59.76
39	2	0.30	68.96	9.93	-8.84	-15.97
		0.50	67.19	9.93	12.50	-162.34
		0.70	65.43	9.93	33.84	-304.90
42	2	0.30	-65.77	-10.00	34.03	-308.58
		0.50	-67.54	-10.00	12.53	-165.27
		0.70	-69.31	-10.00	-8.97	-18.16

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

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180. LOAD LIST 13 15 16
181. SECTION 0 0.3 0.5 0.7 1 MEMB 27 30 31 34 35 38 39 42
182. PRINT MEMBER SECTION FORCES LIST 27 30 31 34 35 38 39 42
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MEMBER FORCES AT INTERMEDIATE SECTIONS

ALL UNITS ARE -- KIP FEET

MEMB	LOAD	SEC	SHEAR-Y	SHEAR-Z	MOM-Y	MOM-Z
27	13	0.30	127.59	-19.28	18.54	2.98
		0.50	125.30	-19.28	-22.91	-268.88
		0.70	123.00	-19.28	-64.36	-535.79
	15	0.30	102.26	-12.19	10.79	228.07
		0.50	99.97	-12.19	-15.41	10.67
		0.70	97.67	-12.19	-41.61	-201.79
	16	0.30	118.43	-15.14	12.87	127.63
		0.50	116.14	-15.14	-19.69	-124.54
		0.70	113.84	-15.14	-52.25	-371.76
30	13	0.30	-119.71	19.31	-64.63	-592.96
		0.50	-122.01	19.31	-23.11	-333.11
		0.70	-124.30	19.31	18.41	-68.33
	15	0.30	-71.78	11.94	-42.48	-587.78
		0.50	-74.08	11.94	-16.81	-430.98
		0.70	-76.38	11.94	8.85	-269.24
	16	0.30	-97.66	14.99	-52.75	-613.12
		0.50	-99.96	14.99	-20.53	-400.67
		0.70	-102.26	14.99	11.70	-183.29
31	13	0.30	243.47	-21.11	20.30	154.39
		0.50	241.17	-21.11	-25.08	-366.59
		0.70	238.87	-21.11	-70.47	-882.63
	15	0.30	179.25	-13.34	11.80	328.70
		0.50	176.96	-13.34	-16.89	-54.23
		0.70	174.66	-13.34	-45.58	-432.22
	16	0.30	217.27	-16.42	13.79	255.51
		0.50	214.97	-16.42	-21.52	-209.15
		0.70	212.68	-16.42	-56.84	-668.87
34	13	0.30	-236.49	21.15	-70.75	-943.47
		0.50	-238.78	21.15	-25.28	-432.56
		0.70	-241.08	21.15	20.19	83.30
	15	0.30	-151.23	13.12	-46.40	-833.60
		0.50	-153.52	13.12	-18.19	-505.99
		0.70	-155.82	13.12	10.02	-173.44
	16	0.30	-198.10	16.28	-57.31	-919.91
		0.50	-200.40	16.28	-22.29	-491.53
		0.70	-202.69	16.28	12.72	-58.21
35	13	0.30	243.46	21.11	-20.30	154.38
		0.50	241.17	21.11	25.08	-366.59
		0.70	238.87	21.11	70.47	-882.63
	15	0.30	182.30	15.41	-15.96	333.24
		0.50	180.00	15.41	17.17	-56.24
		0.70	177.71	15.41	50.30	-440.78
	16	0.30	223.27	20.49	-21.97	264.47

MEMBER FORCES AT INTERMEDIATE SECTIONS

ALL UNITS ARE -- KIP FEET

MEMB	LOAD	SEC	SHEAR-Y	SHEAR-Z	MOM-Y	MOM-Z
		0.50	220.97	20.49	22.08	-213.09
		0.70	218.67	20.49	66.13	-685.71
38	13	0.30	-236.48	-21.15	70.75	-943.45
		0.50	-238.78	-21.15	25.28	-432.55
		0.70	-241.07	-21.15	-20.20	83.28
	15	0.30	-154.27	-15.19	51.13	-842.13
		0.50	-156.57	-15.19	18.48	-507.99
		0.70	-158.86	-15.19	-14.18	-168.90
	16	0.30	-204.09	-20.35	66.61	-936.74
		0.50	-206.39	-20.35	22.85	-495.47
		0.70	-208.69	-20.35	-20.90	-49.26
39	13	0.30	127.59	19.28	-18.54	2.97
		0.50	125.29	19.28	22.91	-268.89
		0.70	123.00	19.28	64.36	-535.80
	15	0.30	103.46	13.89	-14.27	227.87
		0.50	101.16	13.89	15.59	7.89
		0.70	98.87	13.89	45.46	-207.14
	16	0.30	120.79	18.50	-19.72	127.23
		0.50	118.50	18.50	20.06	-130.01
		0.70	116.20	18.50	59.84	-382.30
42	13	0.30	-119.71	-19.31	64.64	-592.96
		0.50	-122.01	-19.31	23.11	-333.12
		0.70	-124.30	-19.31	-18.41	-68.33
	15	0.30	-72.98	-13.64	46.34	-593.14
		0.50	-75.28	-13.64	17.00	-433.76
		0.70	-77.58	-13.64	-12.33	-269.43
	16	0.30	-100.03	-18.35	60.35	-623.66
		0.50	-102.32	-18.35	20.90	-406.14
		0.70	-104.62	-18.35	-18.55	-183.67

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

183. FINISH

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

**** DATE= AUG 28,2006 TIME= 14:46:29 ****

```
************************************************************
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************************************************************
```

Information about the key files in the current distribution

Modfication Date	CRC	Size (Bytes)	File Name
02/27/2006	0x8140	12701696	SProStaad.exe
12/16/2004	0xca81	04558848	SProStaadStl.exe
09/19/2003	0x2fc0	00081970	CMesh.dll
02/06/2006	0x5601	02486272	dbsectioninterface.dll
01/23/2001	0x9b40	00073728	LoadGen.dll
09/25/2003	0x6340	00704512	MeshEngine.dll
09/22/2003	0xce00	00069632	QuadPlateEngine.dll
12/22/2005	0x4181	00094208	SurfMesh.dll
09/30/2005	0x2dc1	00475136	aiscsections.mdb
01/05/2005	0x79c1	00319488	aiscsections_all_editions.mdb
01/05/2005	0x4b81	01810432	aiscsteeljoists.mdb
01/05/2005	0xcac1	03651584	aitctimbersections.mdb
01/27/2005	0xeb01	00552960	aluminumsections.mdb
01/05/2005	0xcd01	00163840	australiansections.mdb
01/05/2005	0x6a41	00229376	britishsections.mdb
07/08/2005	0x9d41	00434176	bscoldformedsections.mdb
06/28/2005	0x8201	00327680	butlercoldformedsections.mdb
01/05/2005	0xabc0	00262144	canadiansections.mdb
05/31/2005	0x9e81	00450560	canadiantimbersections.mdb
05/05/2005	0x7f80	00409600	chinesesections.mdb
01/05/2005	0xd6c0	00600064	dutchsections.mdb
01/05/2005	0x1a00	00354304	europeansections.mdb
01/05/2005	0xd301	00202752	frenchsections.mdb
01/05/2005	0x11c1	00233472	germansections.mdb
01/05/2005	0x3c40	00264192	indiansections.mdb
01/05/2005	0xd540	00180224	iscoldformedsections.mdb
01/24/2006	0x2501	00221184	japanesesections.mdb
11/08/2005	0x9081	00376832	Kingspancoldformedsections.mdb
01/05/2005	0xb740	00174080	koreansections.mdb
02/03/2005	0xda00	00096256	lysaghtcoldformedsections.mdb
02/07/2005	0x9a00	00243712	mexicansteeltables.mdb
01/04/2006	0x8980	00413696	RCecoColdFormedSections.mdb
02/03/2005	0x9b40	00307200	russiansections.mdb
01/05/2005	0x9081	00206848	southafricansections.mdb
01/06/2005	0x9341	00194560	spanishsections.mdb
01/04/2006	0x8680	00223232	uscoldformedsections.mdb
01/05/2005	0xbac0	00149504	usersectionstemplate.mdb
01/05/2005	0x9d41	00141312	venezuelansections.mdb

REINFORCED BEAM CAP

Reinforing Yield Strength $Fy := 40000psi$

Concrete Compresion Strength $Fc := 5600psi$

Width of Beam $b := 3ft$

Depth of Reinforcemnt $dt := 2.25ft$ Top Reinforcement $db := 2.1667ft$ Bottom Reinforcement

Positive Reinforcement Area $Asp := 6.24in^2$ $\rho w := \frac{Asp}{b \cdot db}$ Reinforcement Ratio

Negative Reinforcement Area $Asn := 6.35in^2$

Factored Shear at Section $Vu := 306.4k$

Factored Moment at Section $Mu := 136.36k \cdot ft$

Positive Moment Capacity: Compression Steel neglected $\phi f := 0.9$

Tension in Reinforcemnt $Tp := Asp \cdot Fy$

Depth of Compression Block $ap := \frac{Tp}{0.85 \cdot Fc \cdot b}$

$\phi Mnp := \phi f Tp \cdot \left(db - \frac{ap}{2} \right)$ $\phi Mnp = 473\ ft\,k$

Negative Moment Capacity: Compression Steel neglected

Tension in Reinforcemnt $Tn := Asn \cdot Fy$

Depth of Compression Block $an := \frac{Tn}{0.85 \cdot Fc \cdot b}$

$\phi Mnn := \phi f Tn \cdot \left(dt - \frac{an}{2} \right)$ $\phi Mnn = 500\ ft\,k$

Shear Capacity Stirrup Spacing $S := 11in$ Stirrup Area $Av := 0.4in^2$

$Vc1 := 2 \cdot psi \sqrt{\frac{Fc}{psi}} \cdot b \cdot db$ $Vc1 = 140\,k$

$Vc2 := \left(1.9 \cdot \sqrt{\frac{Fc}{psi}} + 2500 \cdot \rho w \frac{Vu \cdot db}{Mu} \right) \cdot b \cdot db \cdot psi$ $Vc2 = 209\,k$

$Vc3 := 3.5 \cdot psi \sqrt{\frac{Fc}{psi}} \cdot b \cdot db$ $Vc3 = 245\,k$

$Vc4 := if(Vc1 < Vc2, Vc2, Vc\ Vc := if(Vc4 < Vc3, Vc4, Vc3))$ $Vc = 209\,k$

$Vs := \frac{Av \cdot Fy \cdot db}{S}$ $\phi s := 0.85$ $Vs = 38\,k$

$\phi Vn := \phi s \cdot (Vc + Vs)$ $\phi Vn = 210\,k$

Q:\inspect\BonnerBridge\CrutchBents\Type 10 SectionCapacity.xmcd

REINFORCED SUBCAP

Reinforing Yield Strength	$Fy := 40ksi$
Concrete Compresion Strength	$Fc := 4.5ksi$
Width of Beam	$b := 3.75ft$
Depth of Reinforcemnt	$d := 3.85ft$
Positive Reinforcement Area	$As := 18.72in^2$

Positive Moment Capacity: Compression Steel neglected

Tension in Reinforcemnt $T := As \cdot Fy$

Depth of Compression Block $a := \frac{T}{0.85 \cdot Fc \cdot b}$

$\phi f := 0.90$

$\phi Mn := \phi f \cdot T \cdot \left(d - \frac{a}{2} \right)$

$\phi Mn = 2472\ ft\,k$

Shear Capacity

Stirrup Spacing $S := 9in$

Stirrup Area $Av := 0.62in^2$

$ds := 4.35ft$

$Vc := 2 \cdot psi \sqrt{\frac{Fc}{psi}} \cdot b \cdot ds$

$Vc = 315\ k$

$Vs := \frac{Av \cdot Fy \cdot ds}{S}$

$Vs = 144\ k$

$\phi s := 0.85$

$\phi Vn := \phi s \cdot (Vc + Vs)$

$\phi Vn = 390\ k$

REINFORCED PILE CAP

Reinforing Yield Strength	$Fy := 40ksi$
Concrete Compresion Strength	$Fc := 4.5ksi$
Width of Beam	$b := 6.5ft$
Depth of Reinforcemnt	$d := 3.0833ft$
Positive Reinforcement Area	$As := 12.48in^2$

Positive Moment Capacity: Compression Steel neglected

Tension in Reinforcemnt $T := As \cdot Fy$

Depth of Compression Block $a := \frac{T}{0.85 \cdot Fc \cdot b}$

$$\phi Mn := \phi_f T \cdot \left(d - \frac{a}{2} \right)$$

$\phi Mn = 1354\ ft\,k$

Shear Capacity

Stirrup Spacing $S := 6in$

Stirrup Area $Av := 0.62in^2$

$$Vc := 2 \cdot psi \sqrt{\frac{Fc}{psi}} \cdot b \cdot d$$

$Vc = 387\ k$

$$Vs := \frac{Av \cdot Fy \cdot d}{S}$$

$Vs = 153\ k$

$\phi_s = 0.85$

$\phi Vn := \phi_s \cdot (Vc + Vs)$

$\phi Vn = 459\ k$

PRESTRESSED BEAM **TYPE 10 CRUTCH BENT SECTION CAPACITY**

Material Properties:

Reinforing Yield Strength $f_y := 40ksi$

Strand Ultimate Strength $f_{su} := 270ksi$

28th DayConcrete Compresion Strength $f_c := 6ksi$

Beam Properties:

Total Height of Beam $h := 54in$

Top Flange: $b_t := 20in$ $t_t := 8in$

Bottom Flange: $b_b := 26in$ $t_b := 8in$

Web: $b_w := 8in$

Area: $A_c := 789in^2$

Moment of Inertia: $I_c := 260741in^4$

Centroid Location: $y_t := 29.27in$ $y_b := 24.73in$

$S_t := \frac{I_c}{y_t}$ $S_t = 8908\,in^3$ $S_b := \frac{I_c}{y_b}$ $S_b = 10544\,in^3$

Strand Properties:

Area of Single Strand $Aps := 0.153in^2$ $\gamma := 0.4$ for stress-relieved strands

Strand Layout at Midspan: $i := 1..5$

$n_1 := 11$ $y_1 := 3in$

$n_2 := 11$ $y_2 := 5in$

$n_3 := 11$ $y_3 := 7in$

$n_4 := 5$ $y_4 := 9in$

$n_5 := 2$ $y_5 := 52in$

$n_{total} := \sum_i n_i$

$n_{total} = 40$

$d_{total} := h - \frac{\sum_i (n_i \cdot y_i)}{n_{total}}$ $d_{total} = 46.15\,in$

Eccentricity: $e_{total} := d_{total} - y_t$ $e_{total} = 16.88\,in$

Prestressing force per cable: $F_{ult} := 41.3k$ $F_i := 28.9k$ initial prestressing force

MOMENT CAPACITY: $\phi_m := 1.0$ *as per AASHTO 9.14*

$$\beta 1 := \text{if}\left[f_c < 4000\text{psi}, 0.85, 0.85 - \frac{0.05\cdot(f_c - 4000\text{psi})}{1000\text{psi}}\right] \qquad \beta 1 = 0.75 \quad \text{Minimum is } 0.65$$

$$0.36\beta 1 = 0.27$$

$$\rho := \frac{n_{total}\cdot Aps}{b_t\cdot d_{total}} \qquad \rho = 0.007 \qquad ri := \rho\cdot\frac{f_{su}}{f_c} \qquad ri = 0.298 \qquad f_{final} := f_{su}\cdot\left[1 - \left(\frac{\gamma}{\beta 1}\right)\cdot\left(\frac{\rho\cdot f_{su}}{f_c}\right)\right]$$

$$f_{final} = 227.034\ \text{ksi}$$

$$a_{cp} := \frac{n_{total}\cdot Aps\cdot f_{final}}{0.85\cdot f_c\cdot b_t} \qquad a_{cp} = 13.622\ \text{in}$$

Check1 = "COMPRESSION BLOCK EXCEEDS TOP FLANGE THICKNESS" Use AASTHO Section 9.7.3.

AASHTO 9.7.2 - Rectangular Section:

$$\phi Mn_{1a} := \phi_m\cdot n_{total}\cdot Aps\cdot f_{final}\cdot d_{total}\cdot(1 - 0.6ri) \qquad \phi Mn_{1a} = 4387\ \text{ft k}$$

$$\phi Mn_{1b} := \phi_m\cdot\left(0.36\cdot\beta 1 - 0.08\cdot\beta 1^2\right)\cdot f_c\cdot b_t\cdot d_{total}^2 \qquad \phi Mn_{1b} = 4792\ \text{ft k} \qquad \textit{AASHTO 9.18.1}$$

$$\phi Mn_1 := \text{if}\left(ri \le 0.36\beta 1, \phi Mn_{1a}, \phi Mn_{1b}\right) \qquad \phi Mn_1 = 4792\ \text{ft k}$$

AASHTO 9.7.3 - Flanged Section:

$$ri_{flanged} := \frac{n_{total}\cdot Aps\cdot f_{final}}{b_w\cdot f_c\cdot d_{total}} \qquad ri_{flanged} = 0.627 \qquad \rho_{flanged} := \frac{n_{total}\cdot Aps}{b_w\cdot d_{total}} \qquad \rho_{flanged} = 0.017$$

$$f_{final\_flanged} := f_{su}\cdot\left[1 - \left(\frac{\gamma}{\beta 1}\right)\cdot\left(\frac{\rho_{flanged}\cdot f_{su}}{f_c}\right)\right] \qquad f_{final\_flanged} = 162.585\ \text{ksi}$$

$$\phi Mn_{2a} := \phi_m\cdot\left[n_{total}\cdot Aps\cdot f_{final\_flanged}\cdot d_{total}\cdot\left(1 - 0.6ri_{flanged}\right) + 0.85\cdot f_c\cdot\left(b_t - b_w\right)\cdot t_t\cdot\left(d_{total} - 0.5\cdot t_t\right)\right]$$

$$\phi Mn_{2a} = 4106\ \text{k}\cdot\text{ft}$$

$$\phi Mn_{2b} := \phi_m\cdot\left[\left(0.36\cdot\beta 1 - 0.08\cdot\beta 1^2\right)\cdot f_c\cdot b_w\cdot d_{total}^2 + 0.85\cdot f_c\cdot\left(b_t - b_w\right)\cdot t_t\cdot\left(d_{total} - 0.5\cdot t_t\right)\right] \qquad \textit{AASHTO 9.18.1}$$

$$\phi Mn_{2b} = 3637\ \text{k}\cdot\text{ft}$$

$$\phi Mn_2 := \text{if}\left(ri_{flanged} \le 0.36\beta 1, \phi Mn_{2a}, \phi Mn_{2b}\right) \qquad \phi Mn_2 = 3637\ \text{ft k}$$

Final Moment Capacity:

$$\phi Mn := \text{if}\left(a_{cp} > t_t, \phi Mn_2, \phi Mn_1\right) \qquad \phi Mn = 3637\ \text{k}\cdot\text{ft}$$

****

SHEAR CAPACITY: Section at 3.25 ft from Support $x := 3.25ft$ $\phi_s := 0.85$

Shear Reinforcing: Stirrup Spacing $S := 21in$

Stirrup Area $Av := 0.4in^2$

Prestressing Strands: $i := 1..8$

$n_1 := 8$ $y_1 := 3in$ $delta\_y := 27in$ $delta\_x := 21.208ft$

$n_2 := 8$ $y_2 := 5in$ $\theta := \operatorname{atan}\left(\frac{delta\_y}{delta\_x}\right)$ $\theta = 0.106$ rad

$n_3 := 8$ $y_3 := 7in$

$n_4 := 8$ $y_4 := 7in$

$n_5 := 3$ $y_5 := 3in + \frac{delta\_x - x}{delta\_x} \cdot delta\_y$ $y_5 = 25.862\,in$

$n_6 := 3$ $y_6 := 5in + \frac{delta\_x - x}{delta\_x} \cdot delta\_y$ $y_6 = 27.862\,in$

$n_7 := 3$ $y_7 := 7in + \frac{delta\_x - x}{delta\_x} \cdot delta\_y$ $y_7 = 29.862\,in$

$n_8 := 3$ $y_8 := 9in + \frac{delta\_x - x}{delta\_x} \cdot delta\_y$ $y_8 = 31.862\,in$

$n_9 := 2$ $y_9 := 52in$

$n_{total} := \sum_i n_i$ $n_{total} = 44$

$d_{total} := h - \frac{\sum_i \left(n_i \cdot y_i\right)}{n_{total}}$ $d_{total} = 42.128\,in$

for shear calculations, use $d := if\left(d_{total} < 0.8 \cdot h, 0.8 \cdot h, d_{total}\right)$ $d = 43.2\,in$

Eccentricity: $e_{total} := d_{total} - y_t$ $e_{total} = 12.858\,in$

Prestressing force per cable: $F_{ult} := 41.3k$ $F_i := 28.9k$ initial prestressing force

Estimated Losses: $f_{su} = 270\,ksi$ $f_{final\_flanged} = 162.585\,ksi$

$F_{final} := f_{final\_flanged} \cdot Aps$ $F_{final} = 24.88k$

Applied Moment and Shear:

$V_d := 130.55k$ Shear due to dead load only

$M_d := 59.77k \cdot ft$ Moment due to dead load only

$M_{max} := 333.24k \cdot ft$ Maximum factored moment due to applied loads

$V_i := 182.30k$ Shear concurrent with M max

SHEAR CAPACITY, cont'd.

Compute Cracking Moment at the Section (AASHTO 9.20.2.2)

$f_d := \frac{M_d}{S_b}$ $\quad f_d = 68.027\ psi$ — stress, due to unfactored dead load, in the extreme fiber where tensile stress is caused by externally applied loads

$f_{pe} := \frac{n_{total} \cdot F_{final}}{A_c} + -\frac{n_{total} \cdot F_{final} \cdot e_{total}}{S_b}$ $\quad f_{pe} = 52.393\ psi$ — stress, due to prestressing only, in the extreme fiber where tensile stress is caused by externally applied loads

$M_{cr} := \frac{I_c}{y_b} \cdot \left(6psi \cdot \sqrt{\frac{f_c}{psi}} + f_{pe} - f_d \right)$ $\quad M_{cr} = 394.612\ k \cdot ft$

Shear Strength in the Concrete (AASHTO 9.20.2):

AASHTO 9.20.2.2 - Vci

$V_{ci\_min} := 1.7psi \cdot \sqrt{\frac{f_c}{psi}} \cdot b_w \cdot d$ $\quad V_{ci\_min} = 45.509\ k$

$V_{ci\_1} := 0.6psi \cdot \sqrt{\frac{f_c}{psi}} \cdot b_w \cdot d + V_d + \frac{V_i \cdot M_{cr}}{M_{max}}$ $\quad V_{ci\_1} = 362.486\ k$

$V_{ci} := if\left(V_{ci\_1} > V_{ci\_min}, V_{ci\_1}, V_{ci\_min}\right)$ $\quad V_{ci} = 362.486\ k$

AASHTO 9.20.2.3 - V cw

$V_p := F_{final} \cdot \left(n_5 + n_6 + n_7 + n_8\right) \cdot \sin(\theta)$ $\quad V_p = 31.492\ k$ — vertical component of the prestressing force in the draped strands

$f_{pc} := \frac{n_{total} \cdot F_{final}}{A_c}$ $\quad f_{pc} = 1.387\ ksi$ — compressive stress in the concrete at the centroid of the section due to prestressing and applied moments

$V_{cw} := \left(3.5psi \cdot \sqrt{\frac{f_c}{psi}} + 0.3 \cdot f_{pc} \right) \cdot b_w \cdot d + V_p$ $\quad V_{cw} = 269.015\ k$

Shear strength in the concrete:

$V_c := if\left(V_{ci} > V_{cw}, V_{cw}, V_{ci}\right)$ $\quad V_c = 269\ k$

Shear Strength in the Stirrups:

$V_s := \frac{Av \cdot f_y \cdot d}{S}$ $\quad V_s = 32.9\ k$

Total Nominal Shear Strength:

$\phi Vn := \phi_s \cdot \left(V_c + V_s\right)$ $\quad \phi Vn = 256.6\ k$

****