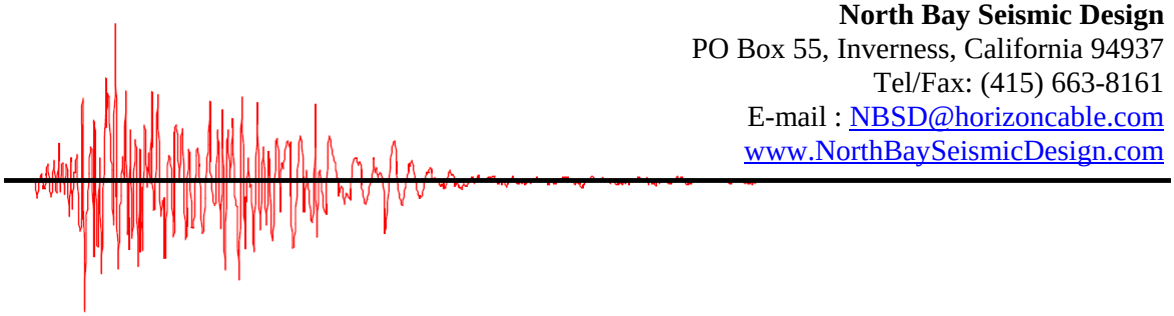
North Bay Seismic Design
PO Box 55, Inverness, California 94937
Tel/Fax: (415) 663-8161
E-mail : NBSD@horizoncable.com
www.NorthBaySeismicDesign.com



NORTH BAY SEISMIC DESIGN
SOFTWARE LIBRARY – BRIDGE ANALYSIS

RC BOX GIRDER BRIDGE
LINEAR ELASTIC
RESPONSE SPECTRUM ANALYSIS
- EARTHQUAKE MODELS

MODEL 1 – ALAMEDA CREEK BRIDGE BOH
(As Built)

MODEL 2 – FORT BRAGG HSR STATION
(As Designed in S.F. Bay Area)

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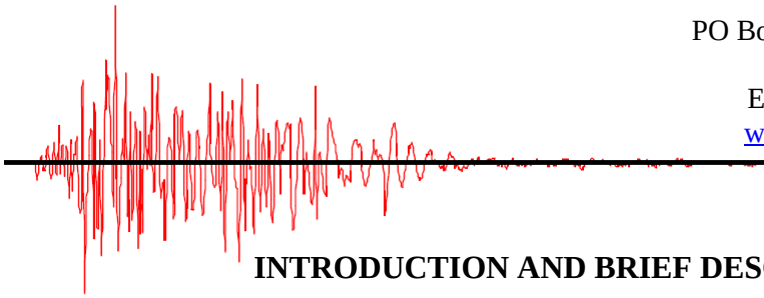


INTRODUCTION AND BRIEF DESCRIPTION

The NBSD Reinforced Concrete (RC) Box Girder Bridge software Model, created early 2014, is an Excel spreadsheet used as a Pre-Processor (Input Data leading to creation of input file) for SAP2000 analysis, as well as a Post-Processor (using output data) for displaying results (displacements, reactions, forces) obtained from the analysis.

The following are salient features of the RC Box Girder Bridge Model:

- Flexible, efficient, and transparent modeling, visualized first graphically in Excel Pre-processor, reproduced exactly on SAP2000 screen, and included in separate Excel results Post processor (input data and results) for complete documentation. The entire process is automated by means of Excel Macros at each stage.

- Permits analysis of wide range of bridge structures (vehicular, rail, High Speed Rail, etc), as well as transitions between dissimilar interconnecting Box Girder (BG) shapes in the superstructure.

- Transparent Horizontal and Vertical curve data modeling for superstructure nodes.

- One or Two user defined RC Box Girder decks, modeled as spine frame elements w/ inteconnecting elements at C.G. discontinuities. Platform Deck (at Stations) modeled as spine distributed mass, and point loads on betcaps at Platform Box Girder web locations.

- Up to 5 user defined Box Girder section definitions, assigned at each superstructure node defined. Input parameters define entire Box Girder cross section (Max 6 cells), used to determine Box Girder and Bentcap section properties.

- Up to 10 hinges can specified for the superstructure, with either restraint or foundation spring values at boundaries, and constraint or spring values at hinge locations.

- Up to 15 Bentcaps can be specified with 5 columns max per bent. Bentcaps use Box Girder webs on either side along their alignments in order to define effective Bentcap section properties per Caltrans criteria.

- Flexible Column data input for material, location, geometry, height and number of nodes.

- Concrete cracking parameter (fraction of E) specified separately for Bentcap, Pier, and column plastic hinge locations.

- Use of Foundation restraints and/or Soil Springs. (expandable to discretized nodal p-y, q-u, t-z springs for pilecaps and piles in soft soil conditions)

- Acceleration Response Spectrum (ARS) curve Data for Dynamic loads.

'- SAP2000 Vehicular Live Loads as specified in various codes (AASHTO HL loads, etc); output from program is used in RC Superstructure Design software tools (under Design Task).

RC Box Girder Bridge LE RSA - EQ Models

Table of Contents

Table of Contents - Cont

BRIDGE DATA - MODEL 1
ALAMEDA CREEK BRIDGE BOH (AS - BUILT)

- 990' long curved 2-lane bridge, built in 1947;.
- RC Box Girder varies from shallow 3 cell Box Girder to deep single spine girder with large overhangs;
- 14 spans are supported on single or double columns bents with varying height and geometry;
- Bridge spans over a railroad track as well as a environmentally sensitive creek.

This Bridge was retrofitted by SOHA Engineers in 2000, as shown on the structural drawings provided. The information shown is used to create the As-Built model for this bridge in this example.

DIST	COUNTY	ROUTE	KILOMETER POST TOTAL PROJECT	SHEET NO.	TOTAL SHEETS
4	ALA	84			

Caltrans Metric

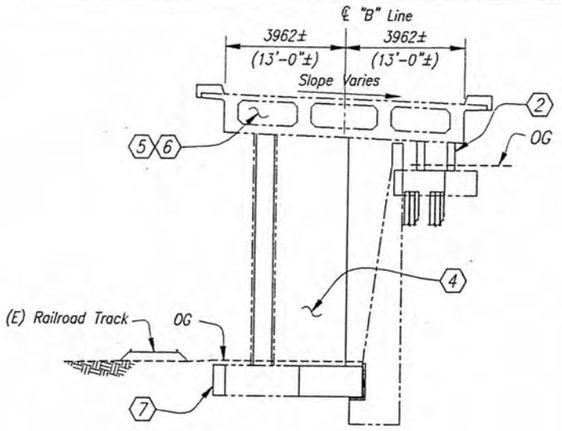
REGISTERED CIVIL ENGINEER

FRANKIE LEE
No. 21054
Exp. 9/30/05
CIVIL
REGISTERED PROFESSIONAL ENGINEER
STATE OF CALIFORNIA

PLANS APPROVAL DATE

SOHA ENGINEERS
Structural Engineers
550 Kearny Street Suite 200
San Francisco, Ca 94108

The State of California or its officers or agents shall not be responsible for accuracy or completeness of electronic copies of this plan sheet.



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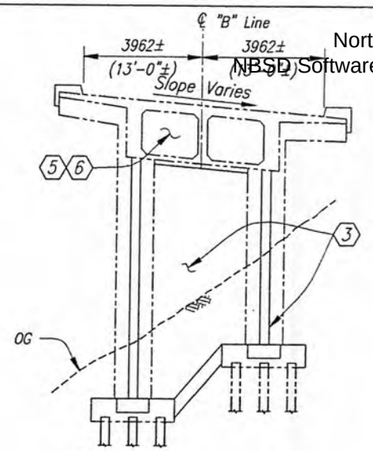

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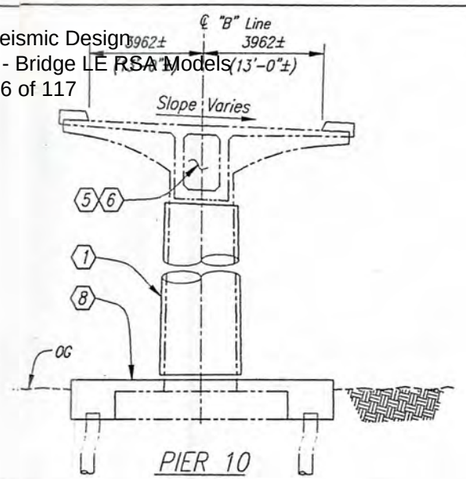

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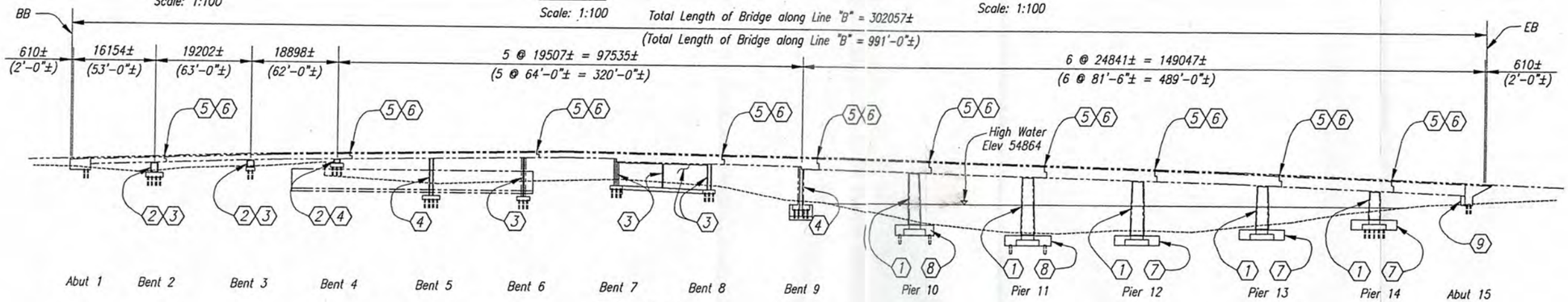
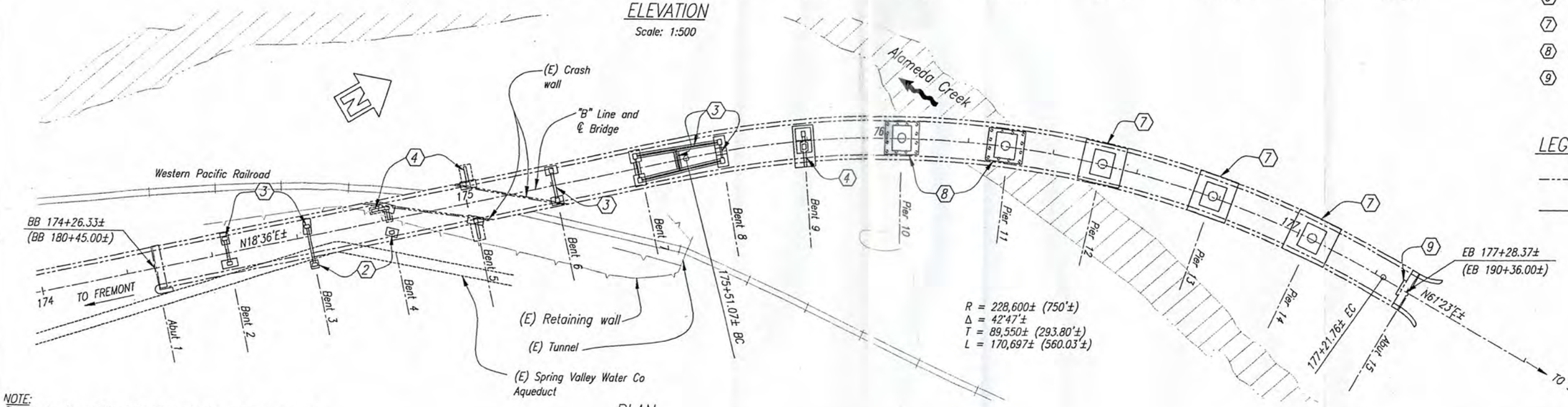


ELEVATION
Scale: 1:500



PLAN
Scale: 1:500

NOTES:

1. All dimensions are shown in millimeters, except as noted.
2. For general notes, list of abbreviations, type of concrete to be used, or index to plans, see sheet "Index To Plans".

RETROFIT LEGEND

1. Class P Steel Column Casing
2. Concrete Column Casing
3. Infill Wall
4. Buttress Wall
5. Diaphragm Bolster
6. Pipe Seat Restrainer
7. Spread Footing Retrofit
8. Piled Footing Retrofit
9. Catcher / Shear Block

LEGEND:

- Existing Structure
- New Structure

NOTE:
The contractor shall verify all controlling field dimensions before ordering or fabricating any material.

JAMES J. ACCINELLI, DESIGN OVERSIGHT	DESIGN	BY A. LIZARANZU	CHECKED S. SINGH	PREPARED FOR THE STATE OF CALIFORNIA DEPARTMENT OF TRANSPORTATION
SIGNOFF DATE	DETAILS	BY D. LEUNG	CHECKED A. DELL	
	QUANTITIES	BY A. LIZARANZU	CHECKED S. SINGH	

ORIGINAL SCALE IS IN MILLIMETERS FOR REDUCED PLANS
0 20 40 60 80

FRANKIE LEE, PROJECT ENGINEER

CU
EA 04-146701

BRIDGE NO. 33-0039
km POST 23.05

DISREGARD PRINTS BEARING EARLIER REVISION DATES

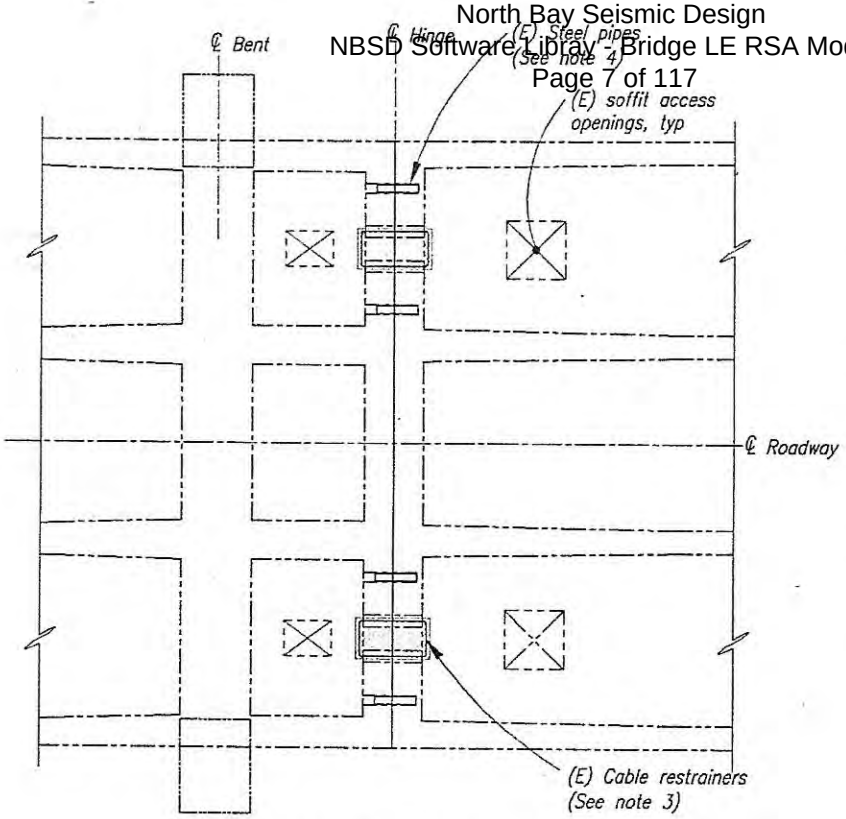
EARTHQUAKE RETROFIT PROJECT NO. 701

ALAMEDA CREEK BRIDGE OH

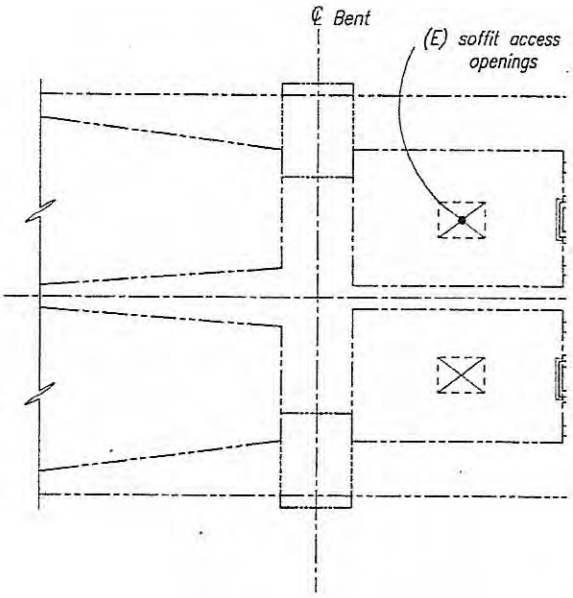
GENERAL PLAN

SHEET OF

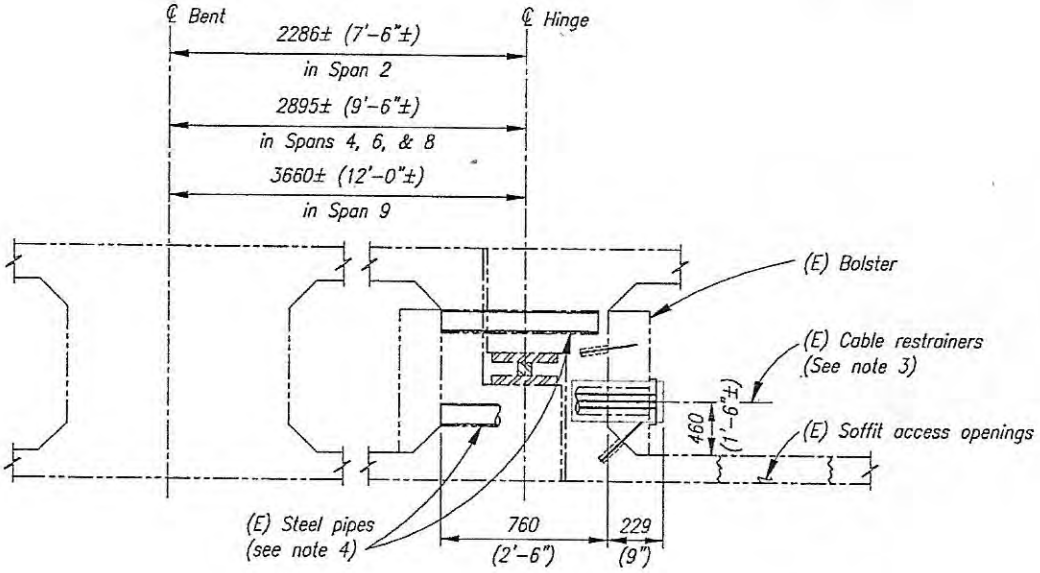
PLOT SCALE : 1:2

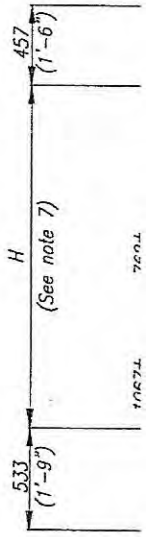


HINGE PLAN AT SPANS 2, 4 AND 6
No Scale



HINGE PLAN AT SPAN
No Scale





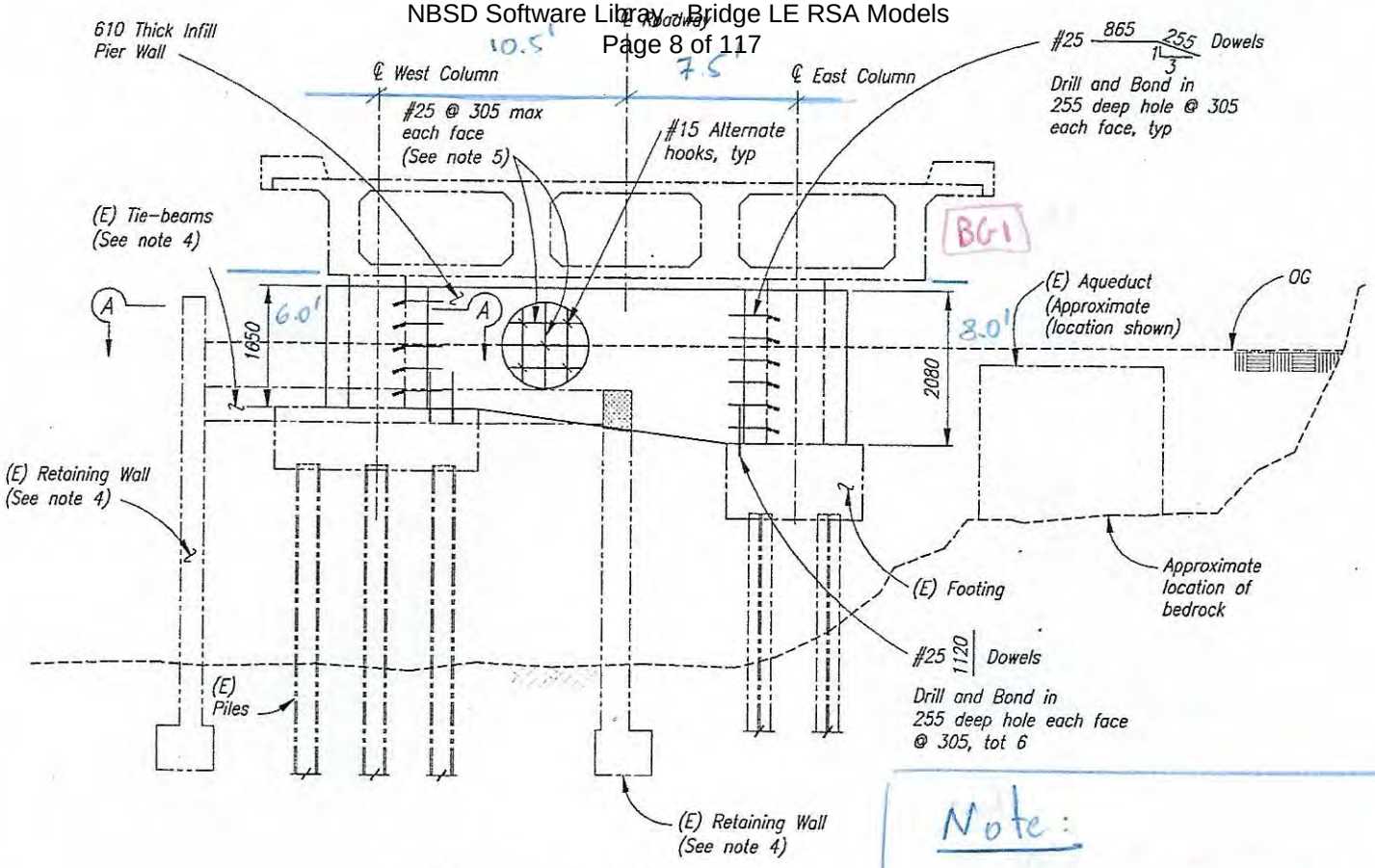
HINGE ELEVATION AT SPANS 2, 4, 6, 8 AND 9
No Scale

NOTE:
The contractor shall verify all controlling field dimensions before ordering or fabricating any material.

JAMES J. ACCINELLI DESIGN OVERSIGHT SIGNOFF DATE		DESIGN	BY A. LIZARANZU	CHECKED	S. SINGH
		DETAILS	BY D. LEUNG	CHECKED	A. DELL
		QUANTITIES	BY A. LIZARANZU	CHECKED	S. SINGH

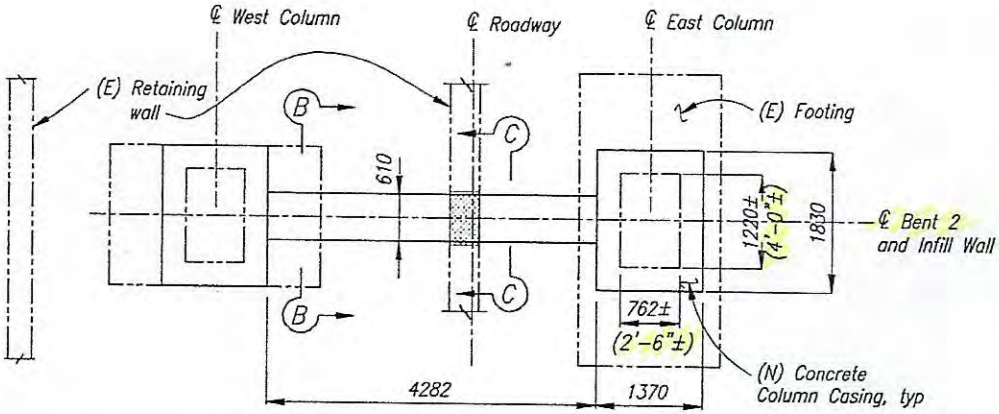
PLOT SCALE = 1'=1"

ORIGINAL SCALE IS IN M
FOR REDUCED PLANS



BENT 2 ELEVATION
Scale 1:50

Note:
1/8" = 1'-0" works.



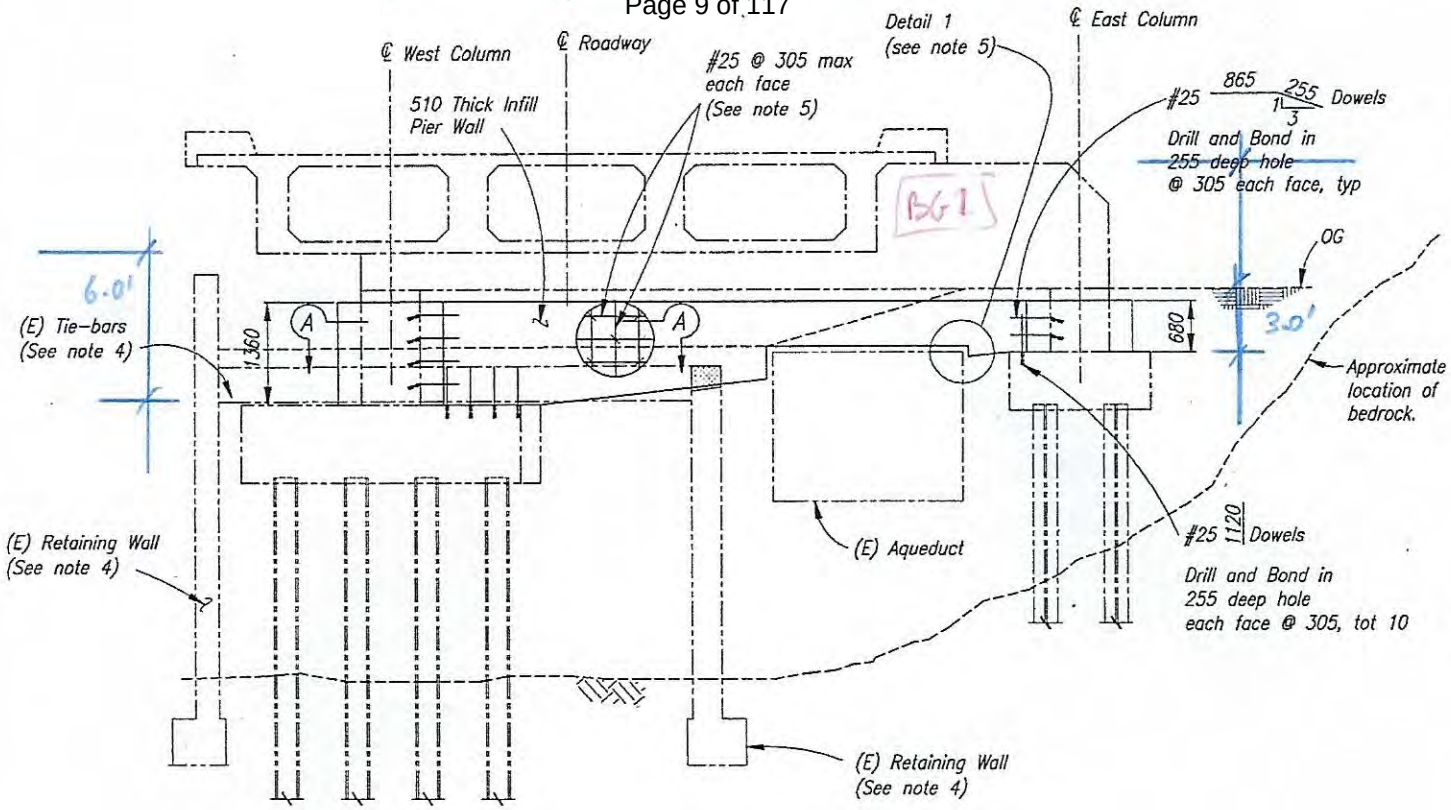
BENT 2 PLAN
Scale 1:50

NOTE:
The contractor shall verify all controlling field dimensions before ordering or fabricating any material.

JAMES J. ACCINELLI DESIGN OVERSIGHT SIGNATURE DATE		DESIGN	BY A. LIZARANZU	CHECKED S. SINGH	
		DETAILS	BY D. LEUNG	CHECKED A. DELL	
		QUANTITIES	BY A. LIZARANZU	CHECKED S. SINGH	

PLOT SCALE

ORIGINAL SCALE IS IN MILLIMETERS
FOR REDUCED PLANS



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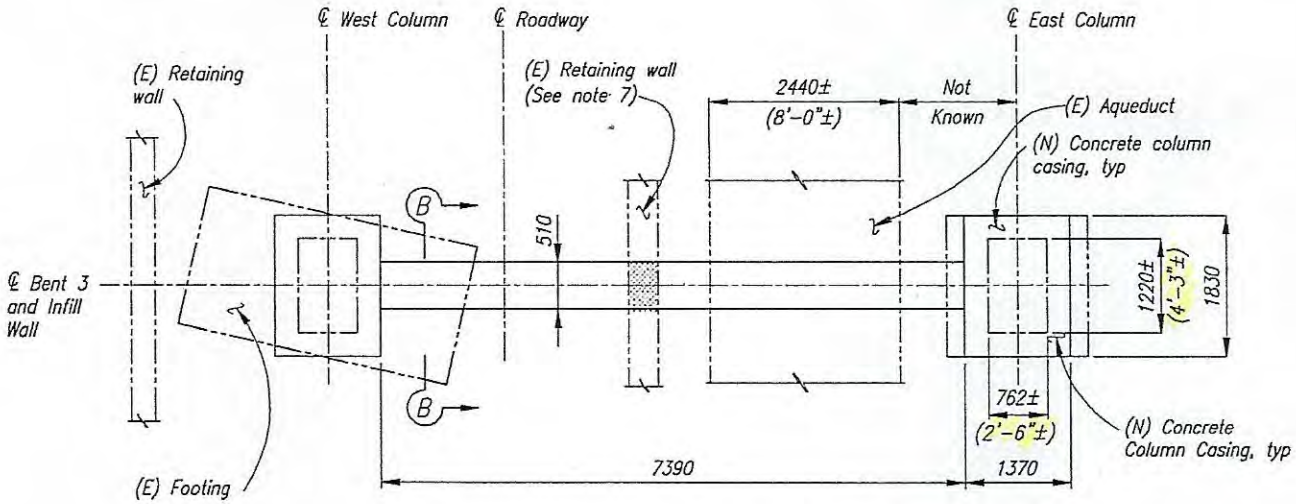


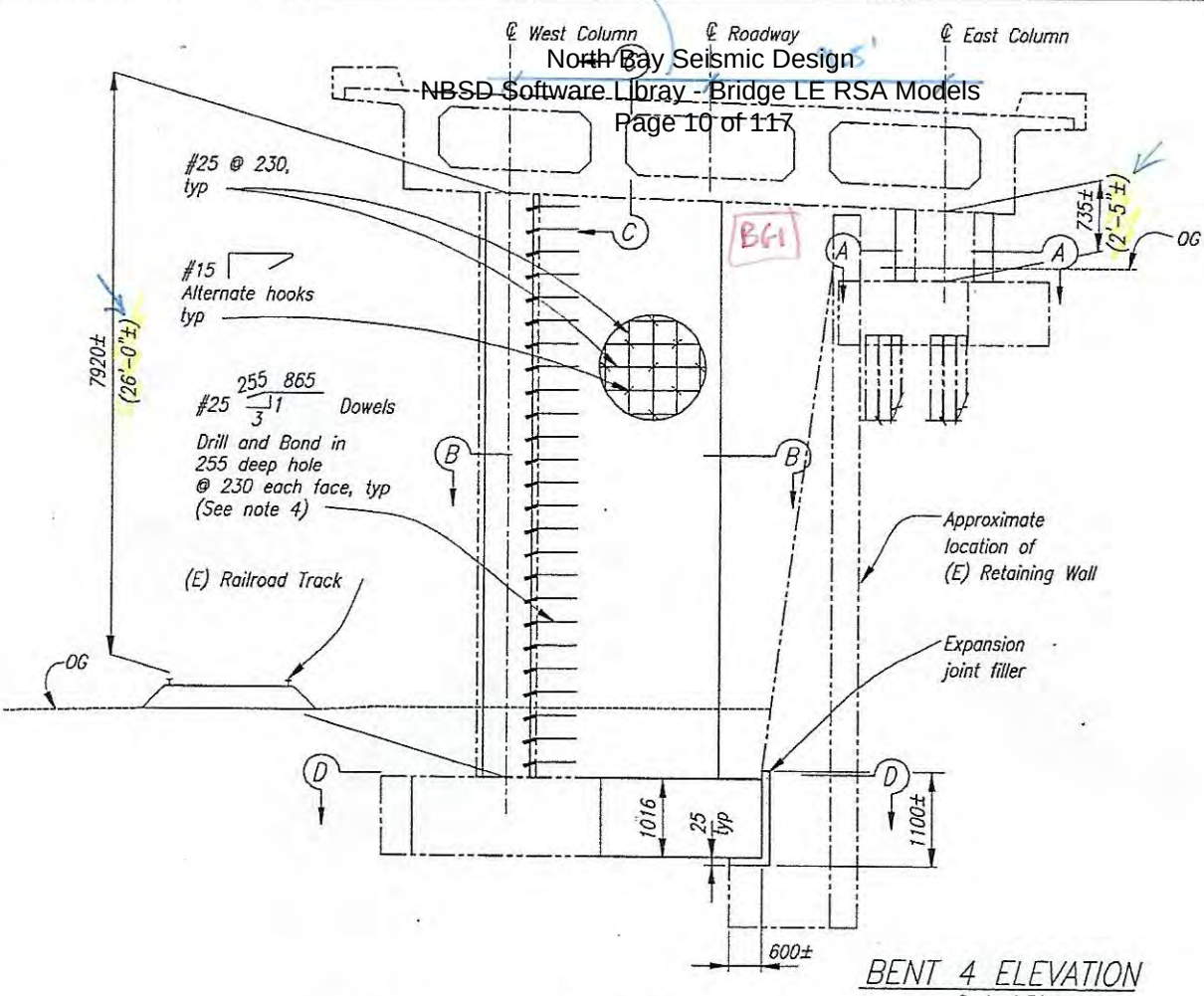
BENT 3 PLAN
Scale 1:50

NOTE:
The contractor shall verify all controlling field dimensions before ordering or fabricating any material.

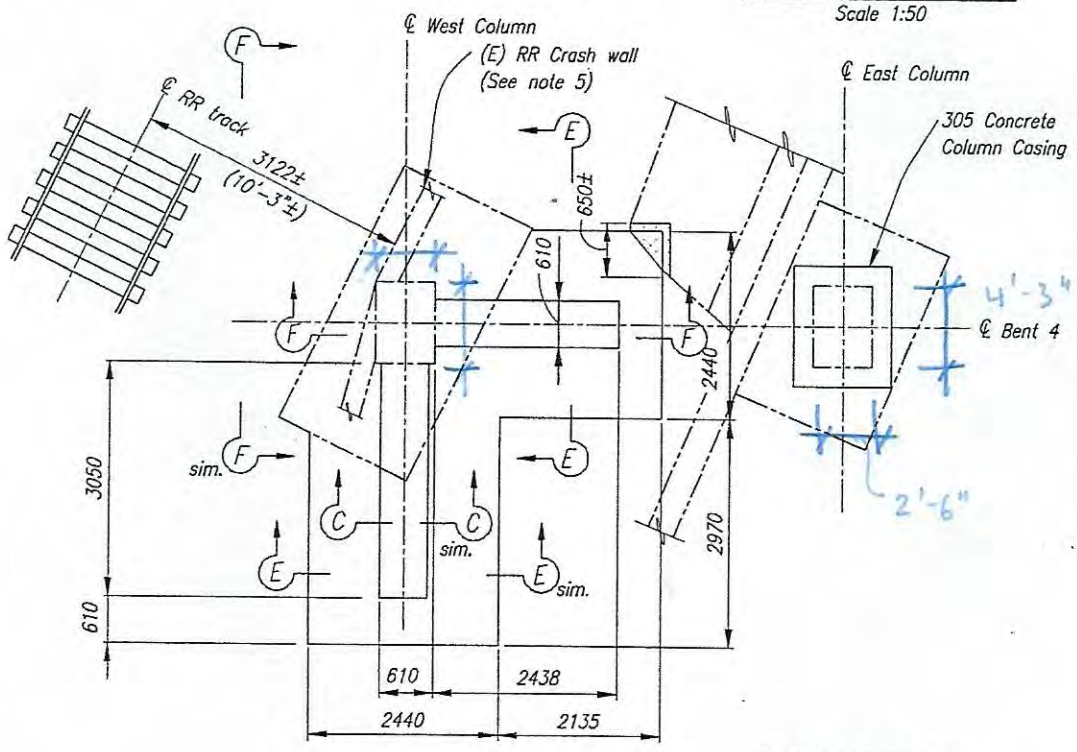
JAMES J. ACCINELLI DESIGN OVERSIGHT SIGNOFF DATE		DESIGN	BY A. LIZARANZU	CHECKED S. SINGH	
		DETAILS	BY D. LEUNG	CHECKED A. DELL	
		QUANTITIES	BY A. LIZARANZU	CHECKED S. SINGH	

PLOT SCALE : 1:2

ORIGINAL SCALE IS IN MILLIMETERS
FOR REDUCED PLANS



BENT 4 ELEVATION
Scale 1:50



BENT 4 PLAN
Scale 1:50

(E) RR Crash
(See Note 5)

(E) Column

#25 Drill and Bond Dowels, typ

NOTE:
The contractor shall verify all controlling field dimensions before ordering or fabricating any material.

JAMES J. ACCINELLI DESIGN OVERSIGHT SIGNOFF DATE		DESIGN	BY A. LIZARANZU	CHECKED S. SINGH
		DETAILS	BY D. LEUNG	CHECKED A. DELL
		QUANTITIES	BY A. LIZARANZU	CHECKED S. SINGH

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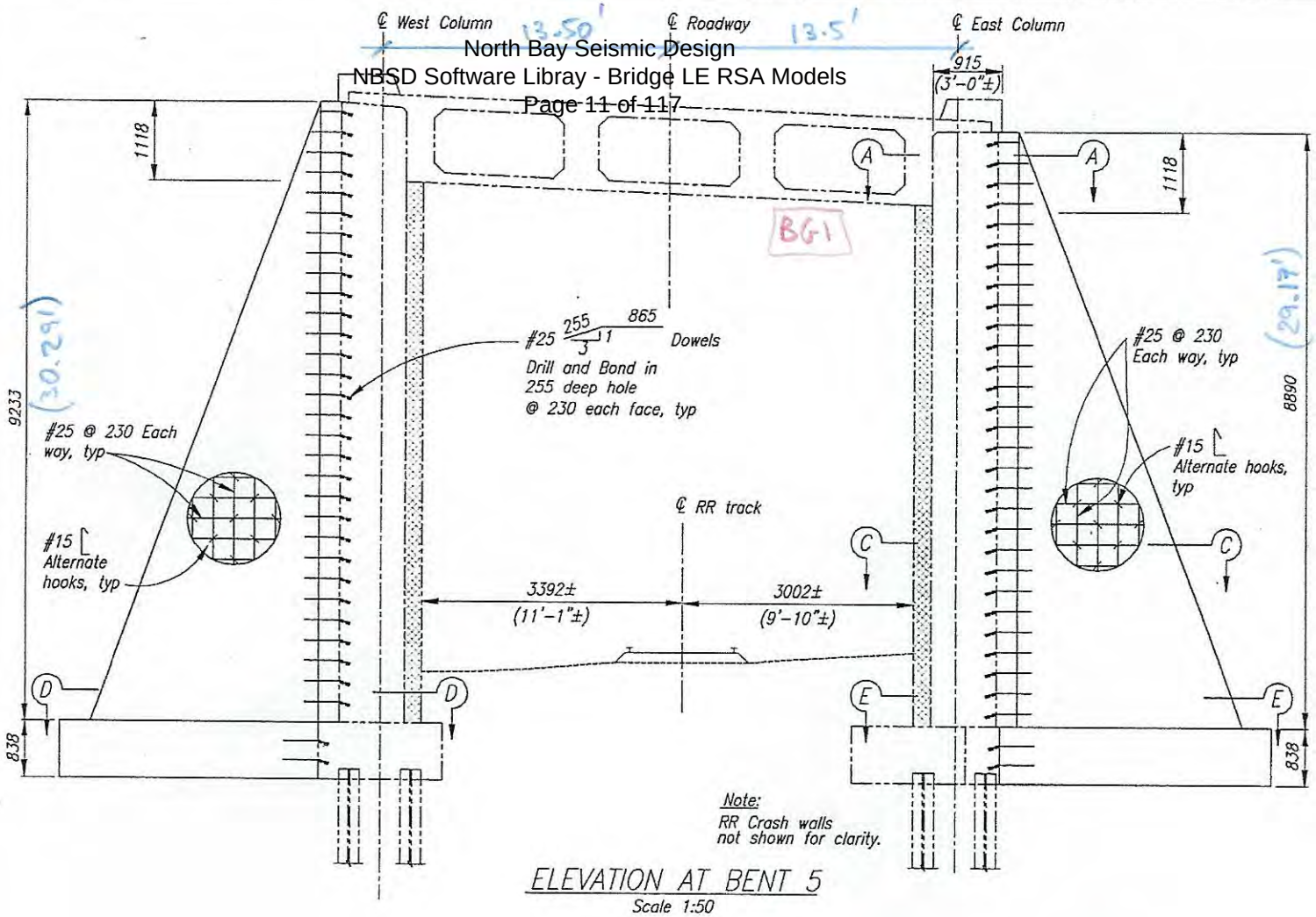
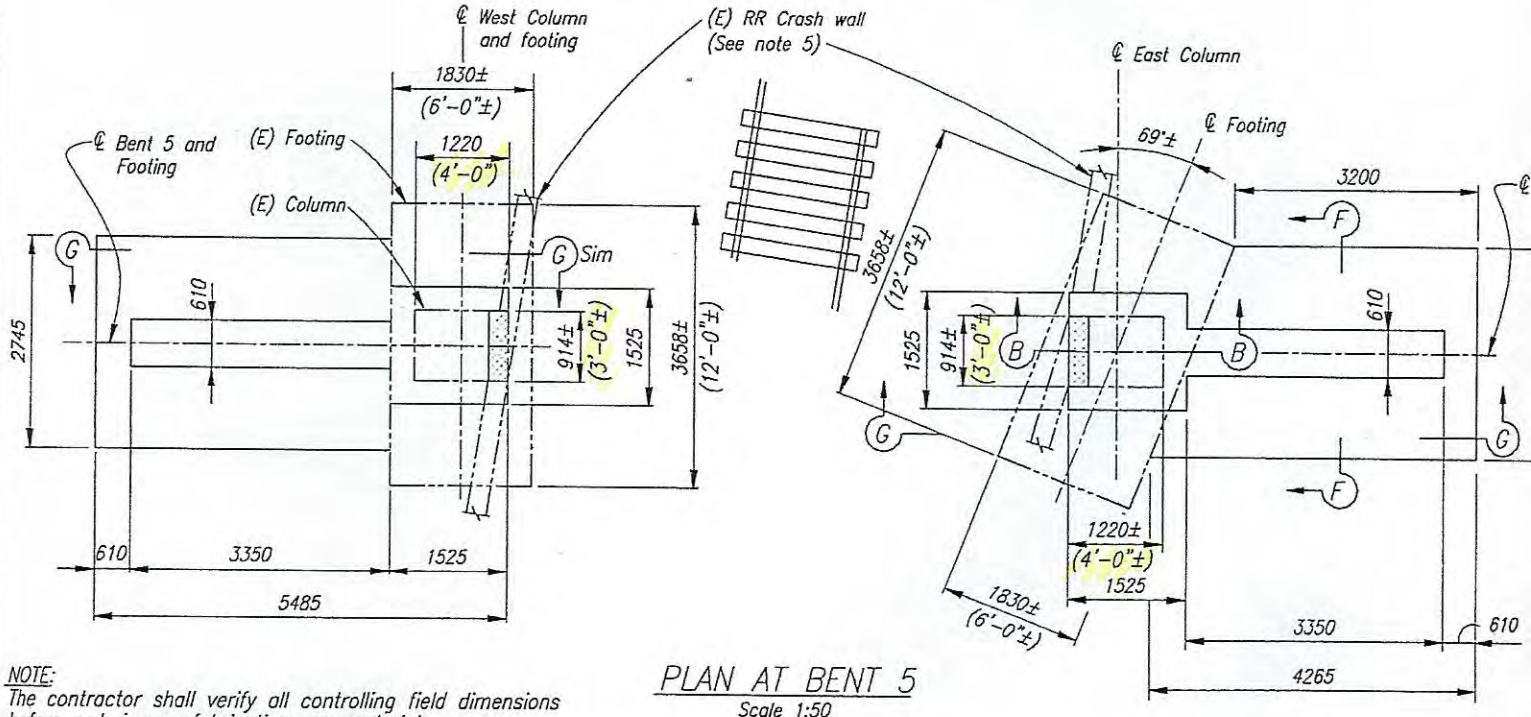
FOR REDUCED PLANS



ELEVATION AT BENT 5

Scale 1:50



NOTE:
The contractor shall verify all controlling field dimensions before ordering or fabricating any material.

PLAN AT BENT 5

Scale 1:50

JAMES J. ACCINELLI DESIGN OVERSIGHT SIGNOFF DATE		DESIGN	BY A. LIZARANZU	CHECKED	S. SINGH
		DETAILS	BY D. LEUNG	CHECKED	A. DELL
		QUANTITIES	BY A. LIZARANZU	CHECKED	S. SINGH

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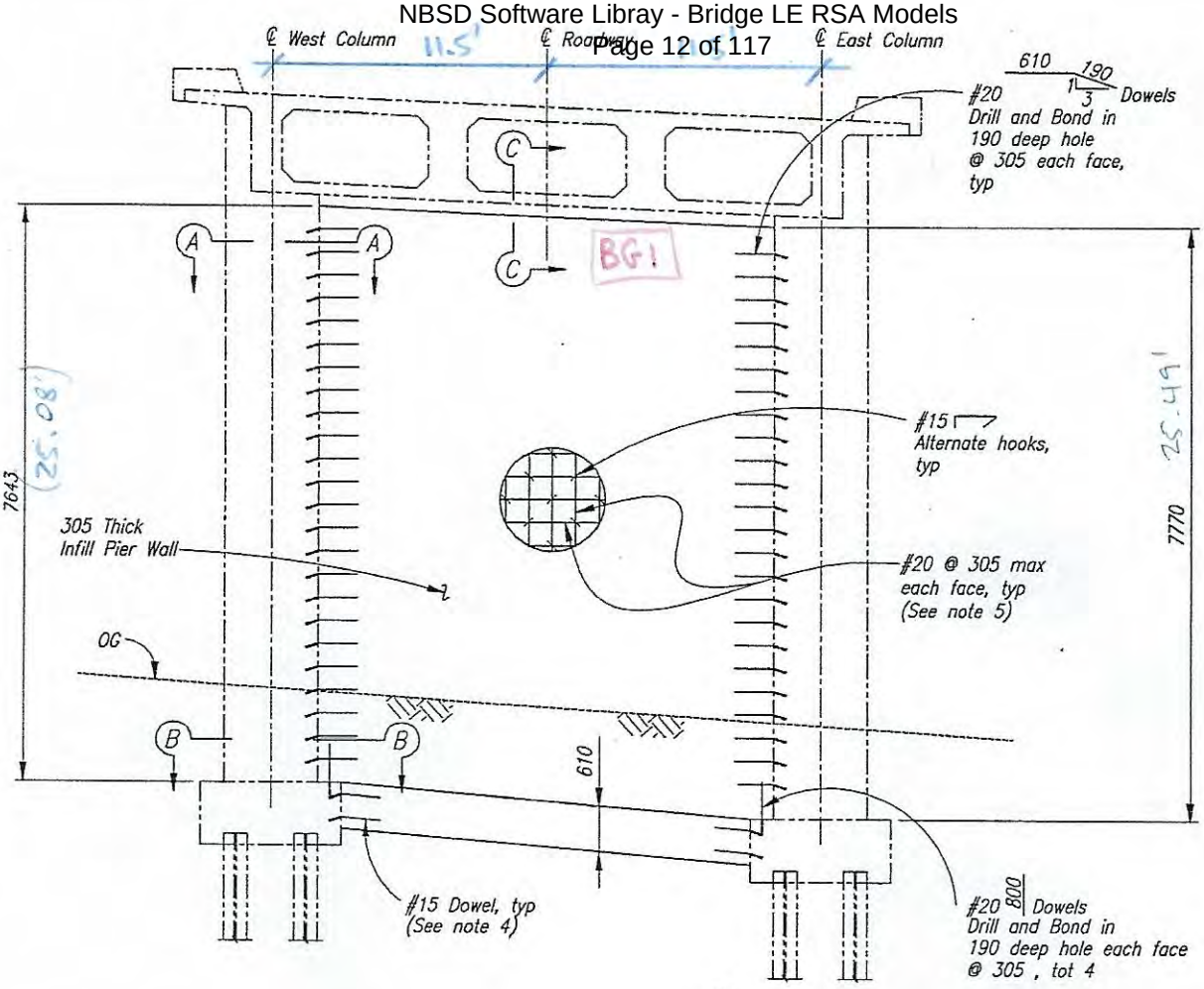
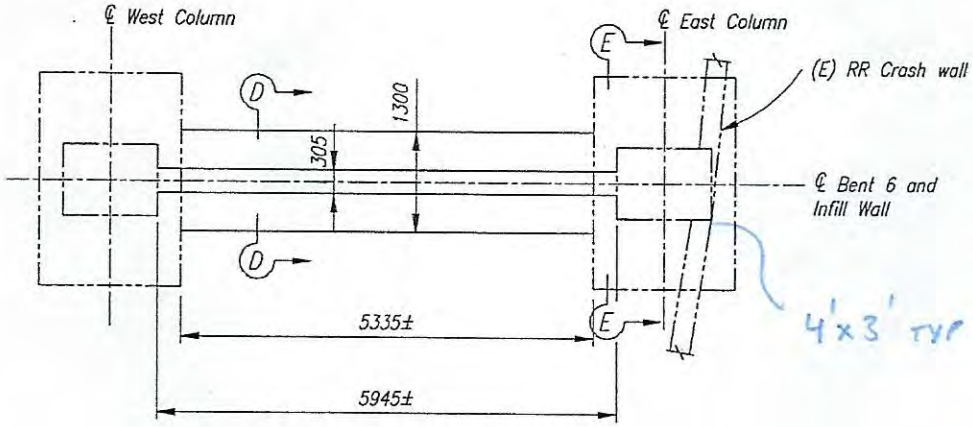
FOR REDUCED PLANS



Note:
(E) RR Crash walls
not shown for clarity.

BENT 6 ELEVATION
Scale 1:50



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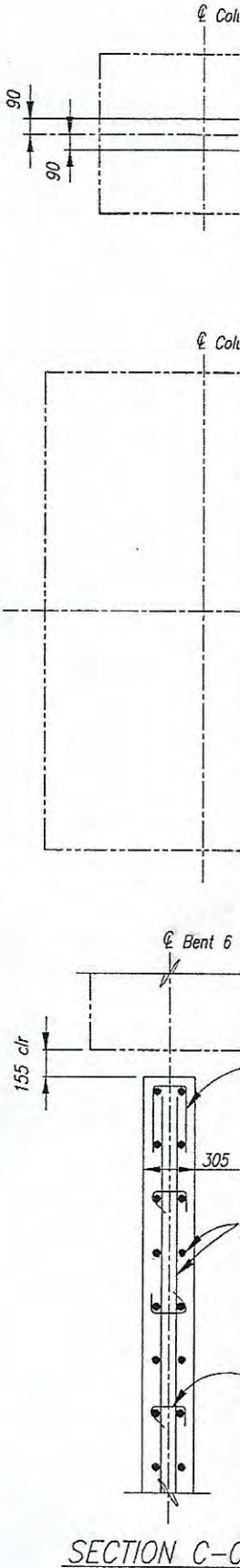

SECTION C–C
Scale 1:20

NOTE:
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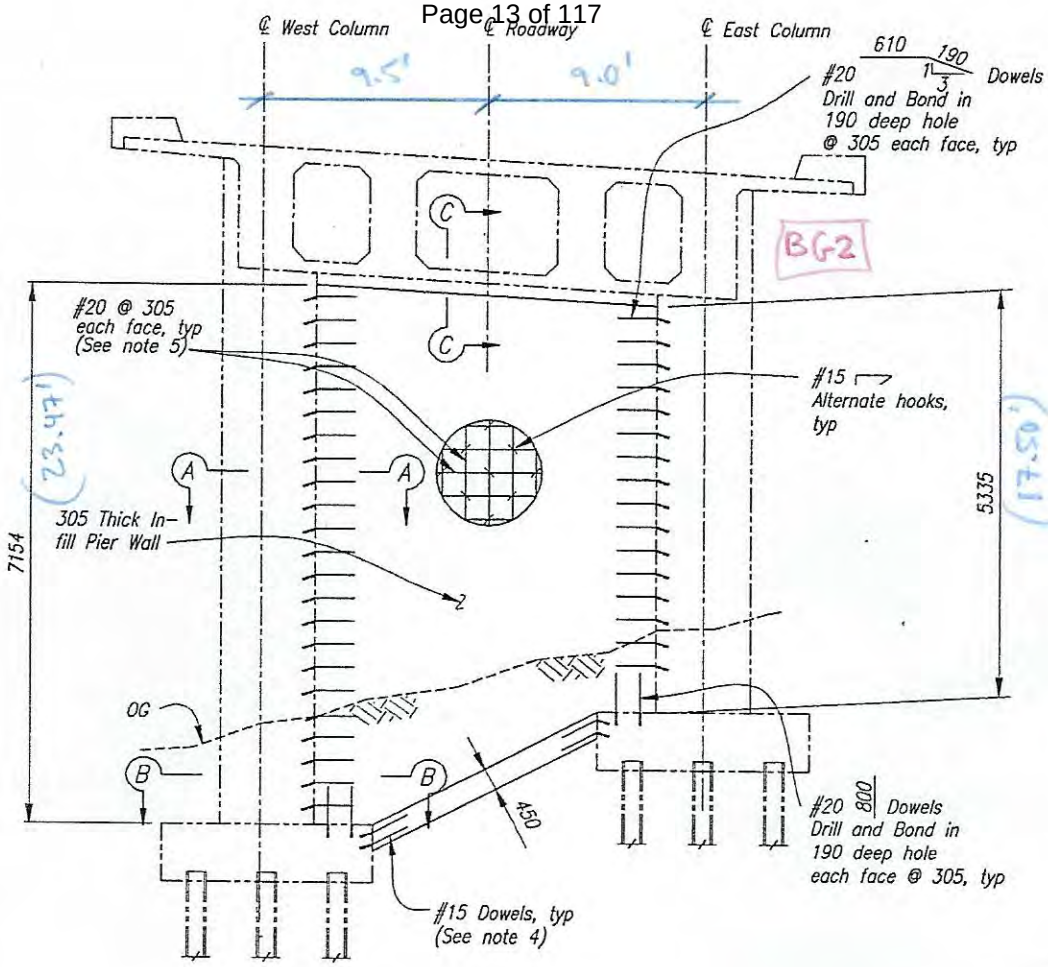
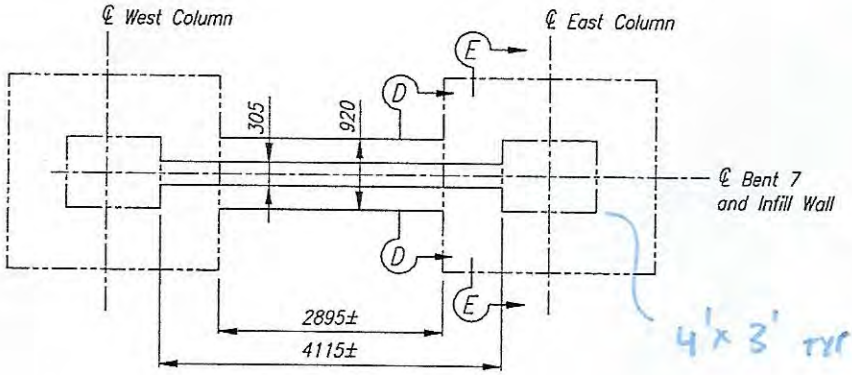
JAMES J. ACCINELLI DESIGN OVERSIGHT SIGNOFF DATE		DESIGN	BY A. LIZARANZU	CHECKED S. SINGH	
		DETAILS	BY D. LEUNG	CHECKED A. DELL	
		QUANTITIES	BY A. LIZARANZU	CHECKED S. SINGH	

PLOT SCALE = 1:2

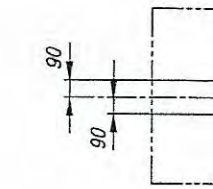
ORIGINAL SCALE IS IN MILLIMETERS
FOR REDUCED PLANS

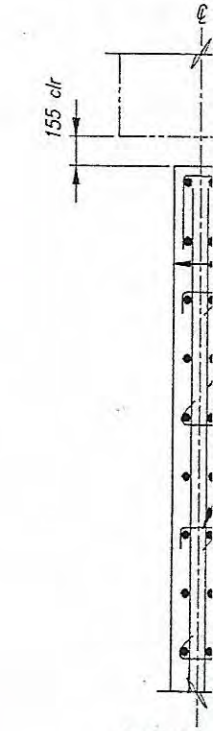


BENT 7 ELEVATION
Scale 1:50



BENT 7 PLAN
Scale 1:50



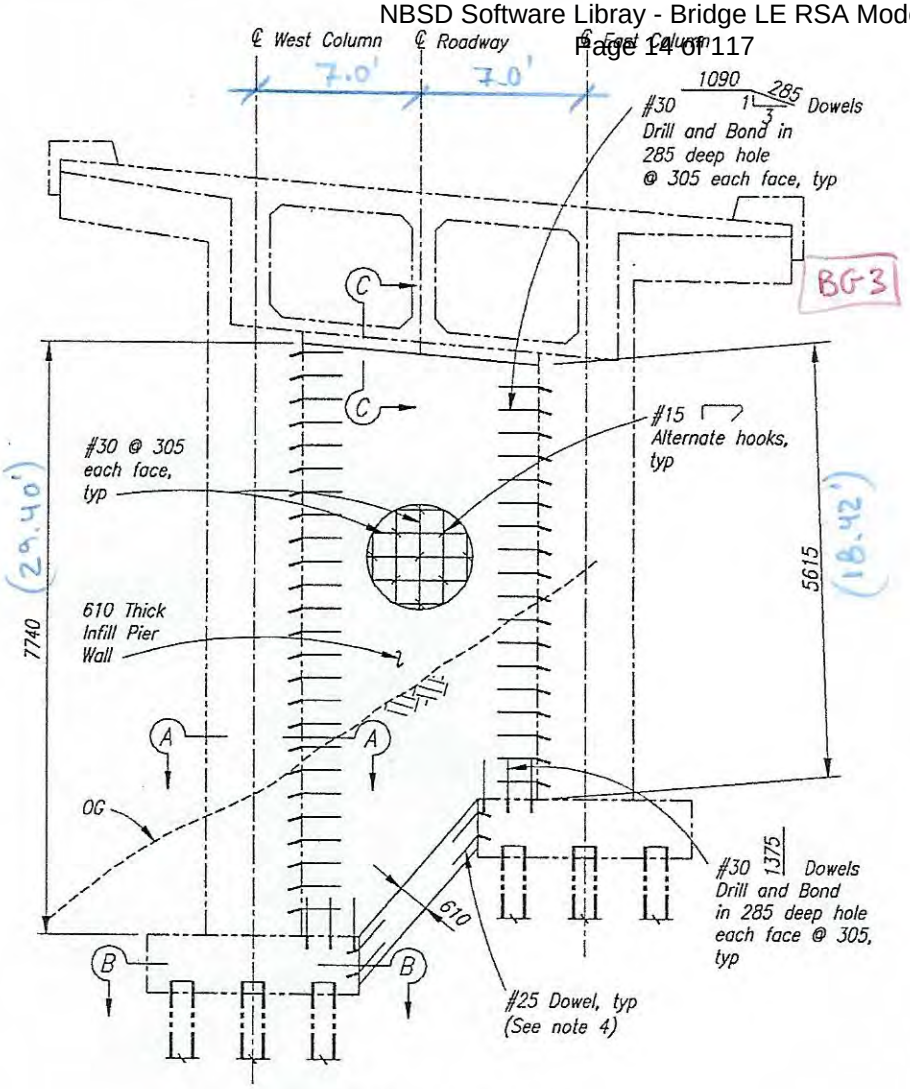


SECTION
Scale

NOTE:
The contractor shall verify all controlling field dimensions before ordering or fabricating any material.

JAMES J. ACCINELLI DESIGN OVERSIGHT SIGNOFF DATE		DESIGN	BY A. LIZARANZU	CHECKED S. SINGH
		DETAILS	BY D. LEUNG	CHECKED A. DELL
		QUANTITIES	BY A. LIZARANZU	CHECKED S. SINGH

ORIGINAL SCALE IS IN MILLIMETER
FOR REDUCED PLANS



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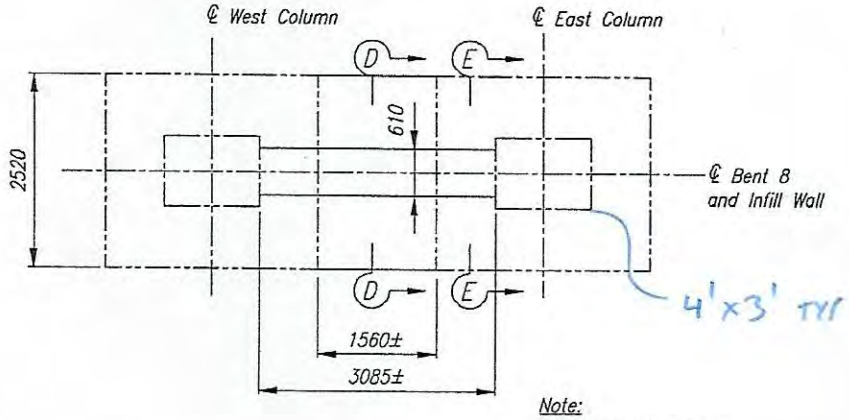
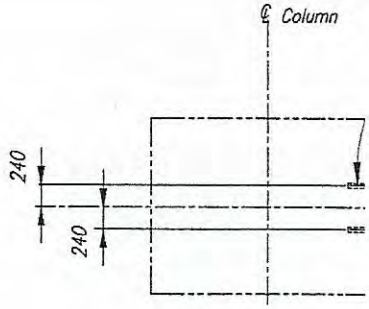
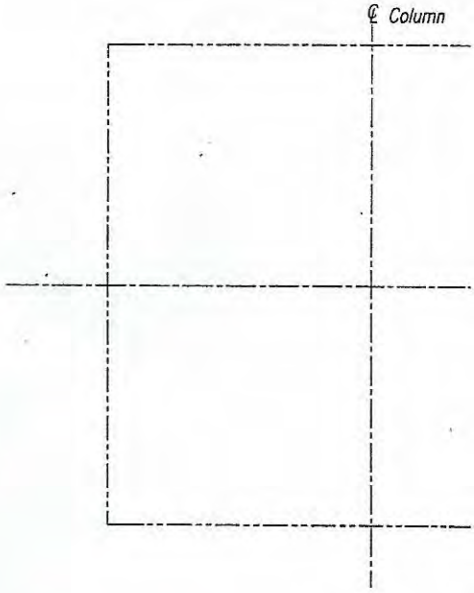
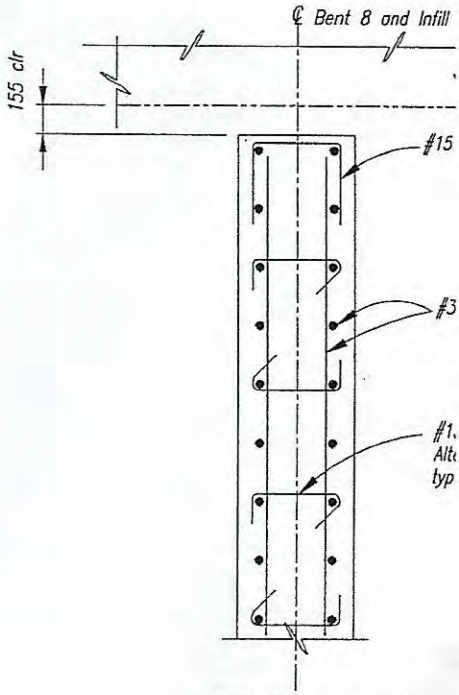


Note:
(E) Piles not shown
for clarity.

BENT 8 PLAN
Scale 1:50







SECTION C–C
Scale 1:20

NOTE:
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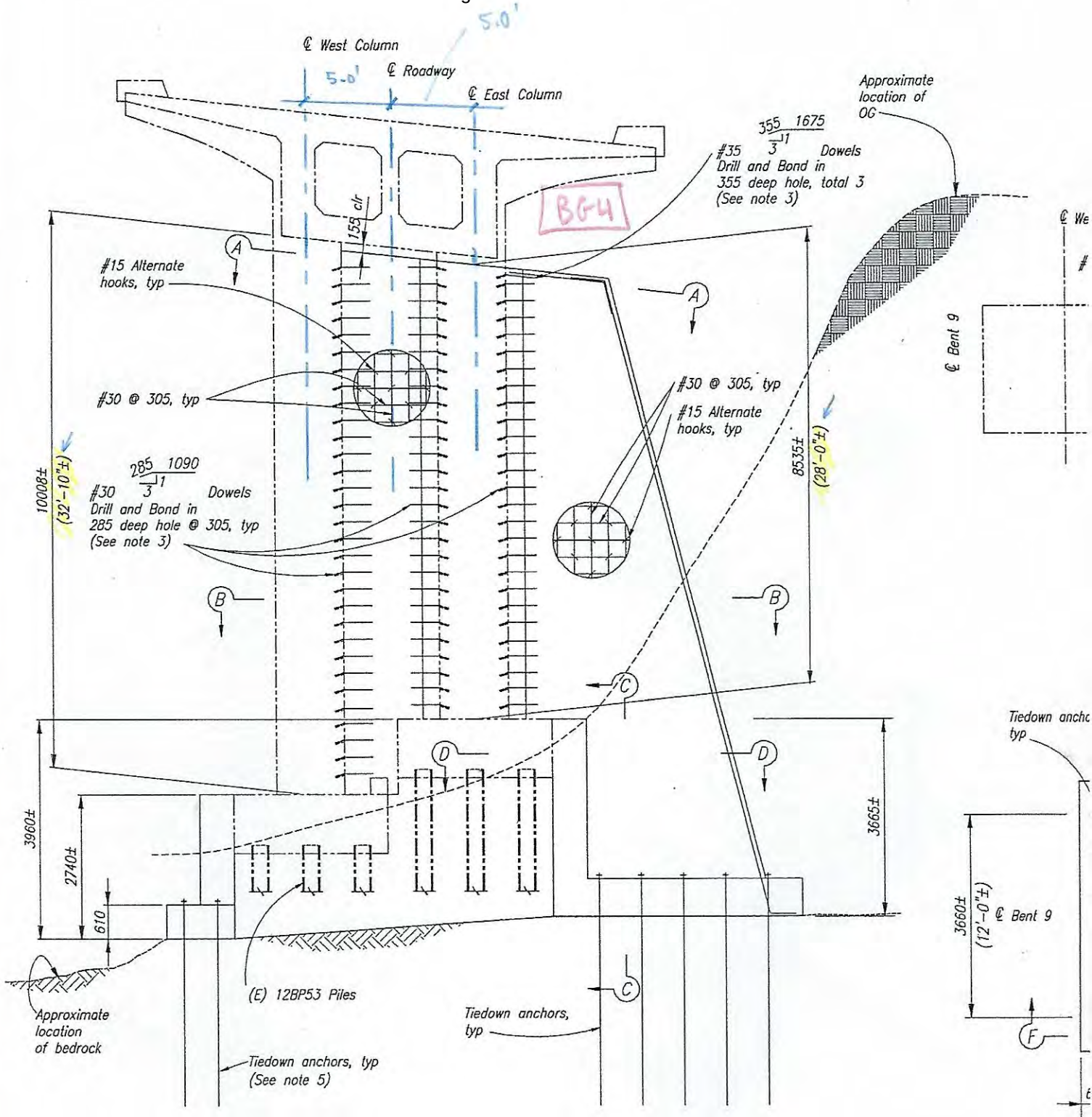
JAMES J. ACCINELLI DESIGN OVERSIGHT SIGNOFF DATE		DESIGN	BY A. LIZARANZU	CHECKED S. SINGH	
		DETAILS	BY D. LEUNG	CHECKED A. DELL	
		QUANTITIES	BY A. LIZARANZU	CHECKED S. SINGH	

ORIGINAL SCALE IS IN MILLIMETERS
FOR REDUCED PLANS



BENT 9 ELEVATION

Scale 1:50

NOTE:
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JAMES J. ACCINELLI DESIGN OVERSIGHT SIGNOFF DATE		DESIGN	BY A. LIZARANZU	CHECKED S. SINGH	
		DETAILS	BY D. LEUNG	CHECKED A. DELL	
		QUANTITIES	BY A. LIZARANZU	CHECKED S. SINGH	

PLOT SCALE : 1:2

ORIGINAL SCALE IS IN MILLIME
FOR REDUCED PLANS

Caltrans Metric

DIST	COUNTY	ROUTE	KILOMETER POST TOTAL PROJECT	SHEET NO.	TOTAL SHEETS
4	ALA	84			

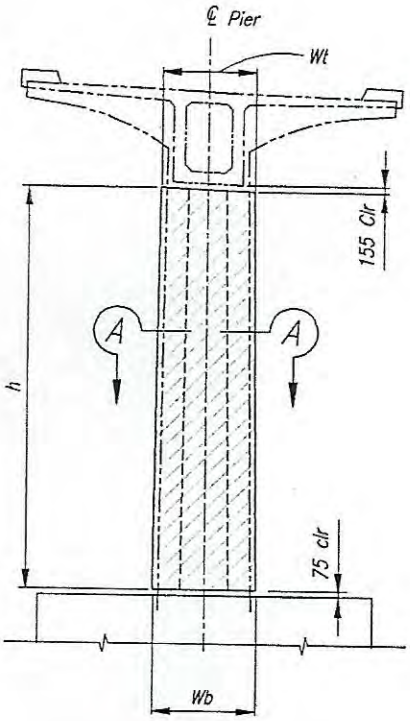
REGISTERED CIVIL ENGINEER

PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER
FRANKIE LEE
No. 21054
Exp. 9/30/05
CIVIL
STATE OF CALIFORNIA

SOHA ENGINEERS
Structural Engineers
550 Kearny Street Suite 200
San Francisco, Ca 94108

BG 5

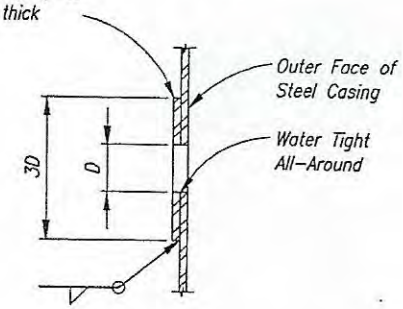


ELEVATION
NO SCALE

NOTES:

1. Appropriate injection nozzles to be provided on casing, but removed and ground flush following completion of grouting operation.
2. For general notes, list of abbreviations, type of concrete to be used, or index to plans, see sheet "Index To Plans".
3. All voids between steel casing and (E) column to be filled with grout. Hollow area inside column is to be filled with grout for the full full height of the column.
4. Location and number of vertical and horizontal welds to be determined by the contractor, and subject to the approval of the engineer. The location of casing welds are for illustration. No skip welds allowed.
5. Flame sprayed plastic is to be applied to outside of casing after completion of installation.

...reinforcement shall be the same thickness as the steel casing up to max 13 thick



SECTION

D Bot
8'-8"
8'-8"
8'-4"
8'-4"
7'-11"

COLUMN CASING SCHEDULE				
PIER	THICKNESS	Wt	Wb	h
10	12.7	2469	2959	11615
11	12.7	2469	3004	12700
12	12.7	2469	2959	11620
13	12.7	2469	2871	9505
14	12.7	2469	2745	6460

38.11'
41.67'
38.12'
31.18
21.19'

...t required for
...ings larger than 50mm.

...ENING DETAIL
...CALE

PREPARED FOR THE
STATE OF CALIFORNIA
DEPARTMENT OF TRANSPORTATION

0 20 40 60 80

FRANKIE LEE
PROJECT ENGINEER

CU
FA 04-146701

BRIDGE NO. 33-0039
km POST 23.05

DISREGARD PRINTS BEARING EARLIER REVISION DATES

EARTHQUAKE RETROFIT PROJECT NO. 701
ALAMEDA CREEK BRIDGE OH
COLUMN CASING DETAILS

SHEET OF

PRE-PROCESSOR - MODEL 1

North Bay Seismic Design
Structural Analysis and Design
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Tel/Fax (415) 669-9678
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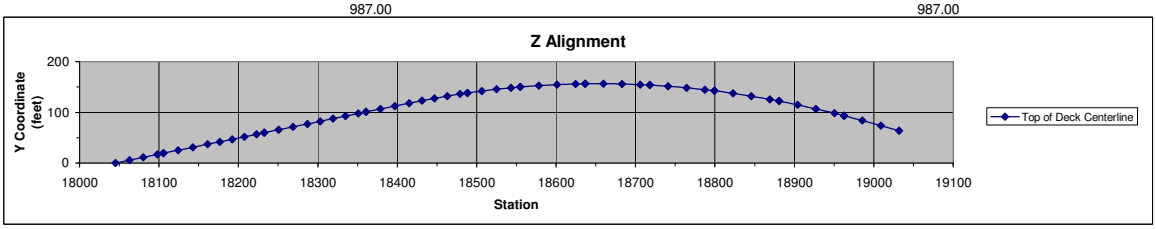
TRACKWAY AND SEGMENT ALIGNMENT DATA
SAP2000 BRIDGE ANALYSIS INPUT FILE DATA
ALAMEDA CREEK BRIDGE - AS-BUILT

1. Trackway Alignment - Horizontal Curve Data

Origin: x_i = 18,045.00
y_i = 0.00

Initial Heading = 18.60 degrees (from Horizontal)

Section	Node	Node ID	Segment Length (feet)	Curve Segment: Radius (feet)	Curve Segment: Length (feet)	Curve Segment: Central Angle (Degrees)	Curve Segment: Heading (degrees)	Curve Segment: Heading Increment (degrees)	Straight Segment: Length (feet)	Straight Segment: Length Along Centerline (feet)	Z Alignment Top of Deck Centerline: Station (feet)	Z Alignment Top of Deck Centerline: X (feet)	Z Alignment Top of Deck Centerline: Y (feet)
Abutment 1 - BC1	1	0100					18.60			18,045.00	18045.00	0.00	0.00
	2	0101	17.67				18.60		17.67	18,062.67	18062.67	17.67	5.63
Bent 2	3	0200	17.67				18.60		35.33	18,080.33	18080.33	35.33	11.27
Hinge	4	0201	17.67				18.60		53.00	18,098.00	18098.00	53.00	16.90
"	5	0202	7.50				18.60		60.50	18,105.50	18105.50	60.50	19.30
	6	0203	0.00				18.60		60.50	18,105.50	18105.50	60.50	19.30
	7	0204	18.50				18.60		79.00	18,124.00	18124.00	79.00	25.20
	8	0205	18.50				18.60		97.50	18,142.50	18142.50	97.50	31.10
Bent 3	9	0300	18.50				18.60		116.00	18,161.00	18161.00	116.00	37.00
	10	0301	15.50				18.60		131.50	18,176.50	18176.50	131.50	41.94
	11	0302	15.50				18.60		147.00	18,192.00	18192.00	147.00	46.89
	12	0303	15.50				18.60		162.50	18,207.50	18207.50	162.50	51.83
Bent 4	13	0400	15.50				18.60		178.00	18,223.00	18223.00	178.00	56.77
Hinge	14	0401	9.50				18.60		187.50	18,232.50	18232.50	187.50	59.80
"	15	0402	0.00				18.60		187.50	18,232.50	18232.50	187.50	59.80
	16	0403	18.17				18.60		205.67	18,250.67	18250.67	205.67	65.60
	17	0404	18.17				18.60		223.83	18,268.83	18268.83	223.83	71.39
Bent 5	18	0500	18.17				18.60		242.00	18,287.00	18287.00	242.00	77.19
	19	0501	16.00				18.60		258.00	18,303.00	18303.00	258.00	82.29
	20	0502	16.00				18.60		274.00	18,319.00	18319.00	274.00	87.39
	21	0503	16.00				18.60		290.00	18,335.00	18335.00	290.00	92.50
Bent 6	22	0600	16.00				18.60		306.00	18,351.00	18351.00	306.00	97.60
Hinge	23	0601	9.50				18.60		315.50	18,360.50	18360.50	315.50	100.63
"	24	0602	0.00				18.60		315.50	18,360.50	18360.50	315.50	100.63
	25	0603	18.17				18.60		333.67	18,378.67	18378.67	333.67	106.43
	26	0604	18.17				18.60		351.83	18,396.83	18396.83	351.83	112.22
Bent 7	27	0700	18.17				18.60		370.00	18,415.00	18415.00	370.00	118.01
	28	0701	16.00				18.60		386.00	18,431.00	18431.00	386.00	123.12
BC	29	0702	16.00	-750	16.00	-1.22	17.38	-1.22		18,447.00	18447.00	402.00	127.73
	30	0703	16.00	-750	32.00	-1.22	16.16	-1.22		18,463.00	18463.00	418.00	132.02
Bent 8	31	0800	16.00	-750	48.00	-1.22	14.93	-1.22		18,479.00	18479.00	434.00	135.98
Hinge	32	0801	9.50	-750	57.50	-0.73	14.21	-0.73		18,488.50	18488.50	443.50	138.25
"	33	0802	0.00	-750	57.50	0.00	14.21			18,488.50	18488.50	443.50	138.25
	34	0803	18.17	-750	75.67	-1.39	12.82	-1.39		18,506.67	18506.67	461.67	142.07
	35	0804	18.17	-750	93.83	-1.39	11.43	-1.39		18,524.83	18524.83	479.83	145.45
Bent 9	36	0900	18.17	-750	112.00	-1.39	10.04	-1.39		18,543.00	18543.00	498.00	148.40
Hinge	37	0901	12.00	-750	124.00	-0.92	9.13	-0.92		18,555.00	18555.00	510.00	150.21
"	38	0902	0.00	-750	124.00	0.00	9.13			18,555.00	18555.00	510.00	150.21
	39	0903	23.17	-750	147.17	-1.77	7.36	-1.77		18,578.17	18578.17	533.17	152.82
	40	0904	23.17	-750	170.33	-1.77	5.59	-1.77		18,601.33	18601.33	556.33	154.72
Bent 10	41	1000	23.17	-750	193.50	-1.77	3.82	-1.77		18,624.50	18624.50	579.50	155.91
Hinge	42	1001	12.00	-750	205.50	-0.92	2.90	-0.92		18,636.50	18636.50	591.50	156.42
"	43	1002	0.00	-750	205.50	0.00	2.90			18,636.50	18636.50	591.50	156.42
	44	1003	23.17	-750	228.67	-1.77	1.13	-1.77		18,659.67	18659.67	614.67	156.52
	45	1004	23.17	-750	251.83	-1.77	-0.64	-1.77		18,682.83	18682.83	637.83	155.90
Bent 11	46	1100	23.17	-750	275.00	-1.77	-2.41	-1.77		18,706.00	18706.00	661.00	154.57
Hinge	47	1101	12.00	-750	287.00	-0.92	-3.33	-0.92		18,718.00	18718.00	673.00	153.78
"	48	1102	0.00	-750	287.00	0.00	-3.33			18,718.00	18718.00	673.00	153.78
	49	1103	23.17	-750	310.17	-1.77	-5.09	-1.77		18,741.17	18741.17	696.17	151.37
	50	1104	23.17	-750	333.33	-1.77	-6.86	-1.77		18,764.33	18764.33	719.33	148.24
Bent 12	51	1200	23.17	-750	356.50	-1.77	-8.63	-1.77		18,787.50	18787.50	742.50	144.41
Hinge	52	1201	12.00	-750	368.50	-0.92	-9.55	-0.92		18,799.50	18799.50	754.50	142.33
"	53	1202	0.00	-750	368.50	0.00	-9.55			18,799.50	18799.50	754.50	142.33
	54	1203	23.17	-750	391.67	-1.77	-11.32	-1.77		18,822.67	18822.67	777.67	137.43
	55	1204	23.17	-750	414.83	-1.77	-13.09	-1.77		18,845.83	18845.83	800.83	131.83
Bent 13	56	1300	23.17	-750	438.00	-1.77	-14.86	-1.77		18,869.00	18869.00	824.00	125.55
Hinge	57	1301	12.00	-750	450.00	-0.92	-15.78	-0.92		18,881.00	18881.00	836.00	122.19
"	58	1302	0.00	-750	450.00	0.00	-15.78			18,881.00	18881.00	836.00	122.19
	59	1303	23.17	-750	473.17	-1.77	-17.55	-1.77		18,904.17	18904.17	859.17	114.87
	60	1304	23.17	-750	496.33	-1.77	-19.32	-1.77		18,927.33	18927.33	882.33	106.87
Bent 14	61	1400	23.17	-750	519.50	-1.77	-21.09	-1.77		18,950.50	18950.50	905.50	98.20
Hinge	62	1401	12.00	-750	531.50	-0.92	-22.00	-0.92		18,962.50	18962.50	917.50	93.62
	63	1402	0.00	-750	531.50	0.00	-22.00			18,962.50	18962.50	917.50	93.62
	64	1403	23.17	-750	554.67	-1.77	-23.77	-1.77		18,985.67	18985.67	940.67	83.95
EC	65	1404	23.17	-750	577.83	-1.77	-25.54	-1.77		19,008.83	19008.83	963.83	73.64
Abutment 15	66	1500	23.17				-25.54		23.17	19,032.00	19032.00	987.00	63.65
											19032.00	987.00	63.65



2. Trackway Alignment - Vertical Curve Data

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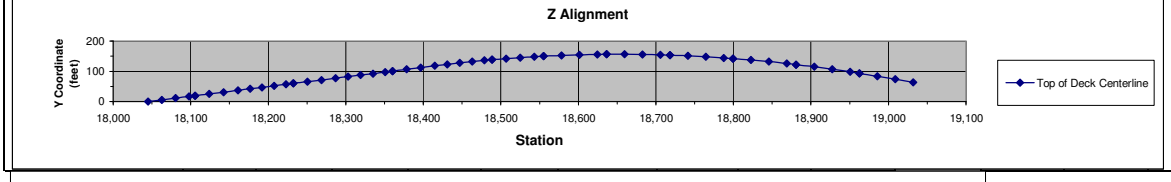
ALAMEDA CREEK BRIDGE - AS-BUILT

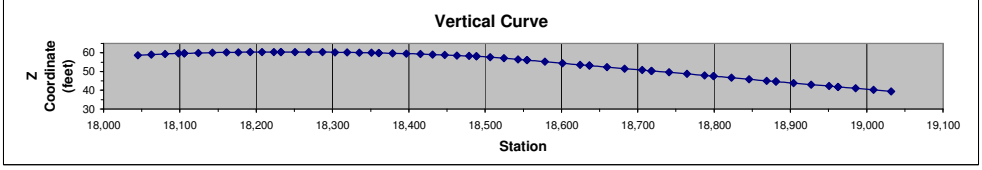
Crest Data :
LC = 400.00 feet (Length of Curve)
g_1 = 1.00 percent (Grade 1)
g_2 = -2.00 percent (Grade 2)
BVC = 18,105.50 feet (Beginning of Vertical Curve)

Datum Elevation = 160.00 Feet

Vertex :
L_V = 18,305.50 feet (Location of Vertex) => h_{BVC} = 219.78 feet (Height at BVC)
h_V = 221.78 feet (Height at Vertex) h_{EVC} = 217.78 feet (Height at EVC)

			Z Alignment Vertical Curve Elevations Options							Trackway Alignment			
			Interpolated			Calculated							
Section	Node	Station (feet)	Deck Elevation (feet)	Increment (feet)	Z (feet)	Grade g_1 (feet)	Transition (feet)	Grade g_2 (feet)	Z (feet)	Station (feet)	X (feet)	Y (feet)	Z (feet)
Abutment 1 - BC1	1	18,045.00	219.87	-0.29	219.87	218.72			218.72	18,045.00	0.00	0.00	58.72
	2	18,062.67		-0.29	220.16	219.03			219.03	18,062.67	17.67	5.63	59.03
Bent 2	3	18,080.33		-0.29	220.46	219.34			219.34	18,080.33	35.33	11.27	59.34
Hinge	4	18,098.00		-0.29	220.75	219.65			219.65	18,098.00	53.00	16.90	59.65
"	5	18,105.50	221.34	-0.06	221.34	219.78			219.78	18,105.50	60.50	19.30	59.78
	6	18,105.50		-0.06	221.41	219.78			219.78	18,105.50	60.50	19.30	59.78
	7	18,124.00		-0.06	221.47		219.95		219.95	18,124.00	79.00	25.20	59.95
	8	18,142.50		-0.06	221.54		220.10		220.10	18,142.50	97.50	31.10	60.10
Bent 3	9	18,161.00		-0.06	221.60		220.22		220.22	18,161.00	116.00	37.00	60.22
	10	18,176.50	221.73	0.22	221.73		220.30		220.30	18,176.50	131.50	41.94	60.30
	11	18,192.00		0.22	221.51		220.36		220.36	18,192.00	147.00	46.89	60.36
	12	18,207.50		0.22	221.30		220.41		220.41	18,207.50	162.50	51.83	60.41
Bent 4	13	18,223.00		0.22	221.08		220.44		220.44	18,223.00	178.00	56.77	60.44
Hinge	14	18,232.50	220.65	0.43	220.65		220.45		220.45	18,232.50	187.50	59.80	60.45
"	15	18,232.50		0.43	220.22		220.45		220.45	18,232.50	187.50	59.80	60.45
	16	18,250.67		0.43	219.79		220.44		220.44	18,250.67	205.67	65.60	60.44
	17	18,268.83		0.43	219.37		220.41		220.41	18,268.83	223.83	71.39	60.41
Bent 5	18	18,287.00		0.43	218.94		220.36		220.36	18,287.00	242.00	77.19	60.36
	19	18,303.00	218.08	0.88	218.08		220.29		220.29	18,303.00	258.00	82.29	60.29
	20	18,319.00		0.88	217.20		220.21		220.21	18,319.00	274.00	87.39	60.21
	21	18,335.00		0.88	216.32		220.10		220.10	18,335.00	290.00	92.50	60.10
Bent 6	22	18,351.00		0.88	215.44		219.97		219.97	18,351.00	306.00	97.60	59.97
Hinge	23	18,360.50	213.68	1.04	213.68		219.89		219.89	18,360.50	315.50	100.63	59.89
"	24	18,360.50		1.04	212.64		219.89		219.89	18,360.50	315.50	100.63	59.89
	25	18,378.67		1.04	211.60		219.71		219.71	18,378.67	333.67	106.43	59.71
	26	18,396.83		1.04	210.55		219.51		219.51	18,396.83	351.83	112.22	59.51
Bent 7	27	18,415.00	208.47	23.16	208.47		219.28		219.28	18,415.00	370.00	118.01	59.28
	28	18,431.00		23.16	185.31		219.06		219.06	18,431.00	386.00	123.12	59.06
BC	29	18,447.00		23.16	162.14		218.82		218.82	18,447.00	402.00	127.73	58.82
	30	18,463.00		23.16	138.98		218.56		218.56	18,463.00	418.00	132.02	58.56
Bent 8	31	18,479.00		23.16	115.82		218.28		218.28	18,479.00	434.00	135.98	58.28
Hinge	32	18,488.50		23.16	92.65		218.11		218.11	18,488.50	443.50	138.25	58.11
"	33	18,488.50		23.16	69.49		218.11		218.11	18,488.50	443.50	138.25	58.11
	34	18,506.67		23.16	46.33			217.74	217.74	18,506.67	461.67	142.07	57.74
	35	18,524.83		23.16	23.16			217.10	217.10	18,524.83	479.83	145.45	57.10
Bent 9	36	18,543.00		23.16	0.00			216.47	216.47	18,543.00	498.00	148.40	56.47
Hinge	37	18,555.00		23.16	-23.16			216.05	216.05	18,555.00	510.00	150.21	56.05
"	38	18,555.00		23.16	-46.33			216.05	216.05	18,555.00	510.00	150.21	56.05
	39	18,578.17		23.16	-69.49			215.24	215.24	18,578.17	533.17	152.82	55.24
	40	18,601.33		23.16	-92.65			214.43	214.43	18,601.33	556.33	154.72	54.43
Bent 10	41	18,624.50		23.16	-115.82			213.62	213.62	18,624.50	579.50	155.91	53.62
Hinge	42	18,636.50		23.16	-138.98			213.21	213.21	18,636.50	591.50	156.42	53.21
"	43	18,636.50		23.16	-162.14			213.21	213.21	18,636.50	591.50	156.42	53.21
	44	18,659.67		23.16	-185.31			212.40	212.40	18,659.67	614.67	156.52	52.40
	45	18,682.83		23.16	-208.47			211.59	211.59	18,682.83	637.83	155.90	51.59
Bent 11	46	18,706.00		23.16	-231.63			210.78	210.78	18,706.00	661.00	154.57	50.78
Hinge	47	18,718.00		23.16	-254.80			210.36	210.36	18,718.00	673.00	153.78	50.36
"	48	18,718.00		23.16	-277.96			210.36	210.36	18,718.00	673.00	153.78	50.36
	49	18,741.17		23.16	-301.12			209.55	209.55	18,741.17	696.17	151.37	49.55
	50	18,764.33		23.16	-324.29			208.74	208.74	18,764.33	719.33	148.24	48.74
Bent 12	51	18,787.50		23.16	-347.45			207.93	207.93	18,787.50	742.50	144.41	47.93
Hinge	52	18,799.50		23.16	-370.61			207.51	207.51	18,799.50	754.50	142.33	47.51
"	53	18,799.50		23.16	-393.78			207.51	207.51	18,799.50	754.50	142.33	47.51
	54	18,822.67		23.16	-416.94			206.70	206.70	18,822.67	777.67	137.43	46.70
	55	18,845.83		23.16	-440.10			205.90	205.90	18,845.83	800.83	131.83	45.90
Bent 13	56	18,869.00		23.16	-463.27			205.09	205.09	18,869.00	824.00	125.55	45.09
Hinge	57	18,881.00		23.16	-486.43			204.67	204.67	18,881.00	836.00	122.19	44.67
"	58	18,881.00		23.16	-509.59			204.67	204.67	18,881.00	836.00	122.19	44.67
												114.87	43.86
												106.87	43.05
												98.20	42.24
												93.62	41.82
												93.62	41.82
												83.95	41.01
												73.64	40.20
												63.65	39.39
												63.65	39.39





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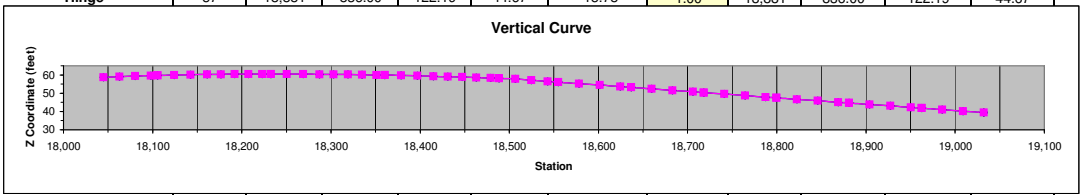
3. Trackway Alignment - Segment Alignment Data 0 1 2 3 4 5 6 7 8 9

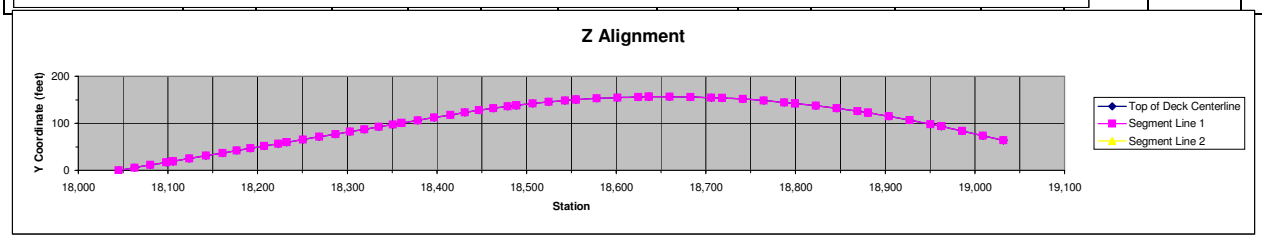
L_1 = feet (Centerline distance between Trackway Alignment and Segment 1)

L_2 = feet (Centerline distance between Trackway Alignment and Segment 2)

Origin: x_i = 18,045.00
y_i = 0.00

		Trackway Alignment					Vertical	Segment Line 1				Segment Line 2			
Section	Node	Station (feet)	X (feet)	Y (feet)	Z (feet)	Heading (degrees)	Skew (degrees)	Station (feet)	X (feet)	Y (feet)	Z (feet)	Station (feet)	X (feet)	Y (feet)	Z (feet)
Abutment 1 - BC1	1	18,045	0.00	0.00	58.72	18.60	0.00	18,045	0.00	0.00	58.72				
	2	18,063	17.67	5.63	59.03	18.60	0.00	18,063	17.67	5.63	59.03				
Bent 2	3	18,080	35.33	11.27	59.34	18.60	0.00	18,080	35.33	11.27	59.34				
Hinge	4	18,098	53.00	16.90	59.65	18.60	0.00	18,098	53.00	16.90	59.65				
"	5	18,106	60.50	19.30	59.78	18.60	0.00	18,106	60.50	19.30	59.78				
	6	18,106	60.50	19.30	59.78	18.60	0.00	18,106	60.50	19.30	59.78				
	7	18,124	79.00	25.20	59.95	18.60	0.00	18,124	79.00	25.20	59.95				
	8	18,143	97.50	31.10	60.10	18.60	0.00	18,143	97.50	31.10	60.10				
Bent 3	9	18,161	116.00	37.00	60.22	18.60	0.00	18,161	116.00	37.00	60.22				
	10	18,177	131.50	41.94	60.30	18.60	0.13	18,177	131.50	41.94	60.30				
	11	18,192	147.00	46.89	60.36	18.60	0.25	18,192	147.00	46.89	60.36				
	12	18,208	162.50	51.83	60.41	18.60	0.38	18,208	162.50	51.83	60.41				
Bent 4	13	18,223	178.00	56.77	60.44	18.60	0.50	18,223	178.00	56.77	60.44				
Hinge	14	18,233	187.50	59.80	60.45	18.60	0.63	18,233	187.50	59.80	60.45				
"	15	18,233	187.50	59.80	60.45	18.60	0.75	18,233	187.50	59.80	60.45				
	16	18,251	205.67	65.60	60.44	18.60	0.88	18,251	205.67	65.60	60.44				
	17	18,269	223.83	71.39	60.41	18.60	1.00	18,269	223.83	71.39	60.41				
Bent 5	18	18,287	242.00	77.19	60.36	18.60	1.13	18,287	242.00	77.19	60.36				
	19	18,303	258.00	82.29	60.29	18.60	1.25	18,303	258.00	82.29	60.29				
	20	18,319	274.00	87.39	60.21	18.60	1.38	18,319	274.00	87.39	60.21				
	21	18,335	290.00	92.50	60.10	18.60	1.50	18,335	290.00	92.50	60.10				
Bent 6	22	18,351	306.00	97.60	59.97	18.60	1.63	18,351	306.00	97.60	59.97				
Hinge	23	18,361	315.50	100.63	59.89	18.60	1.75	18,361	315.50	100.63	59.89				
"	24	18,361	315.50	100.63	59.89	18.60	1.88	18,361	315.50	100.63	59.89				
	25	18,379	333.67	106.43	59.71	18.60	2.00	18,379	333.67	106.43	59.71				
	26	18,397	351.83	112.22	59.51	18.60	2.13	18,397	351.83	112.22	59.51				
Bent 7	27	18,415	370.00	118.01	59.28	18.60	2.25	18,415	370.00	118.01	59.28				
	28	18,431	386.00	123.12	59.06	18.60	2.38	18,431	386.00	123.12	59.06				
BC	29	18,447	402.00	127.73	58.82	17.38	2.50	18,447	402.00	127.73	58.82				
	30	18,463	418.00	132.02	58.56	16.16	2.63	18,463	418.00	132.02	58.56				
Bent 8	31	18,479	434.00	135.98	58.28	14.93	2.75	18,479	434.00	135.98	58.28				
Hinge	32	18,489	443.50	138.25	58.11	14.21	2.88	18,489	443.50	138.25	58.11				
"	33	18,489	443.50	138.25	58.11	14.21	3.00	18,489	443.50	138.25	58.11				
	34	18,507	461.67	142.07	57.74	12.82	3.13	18,507	461.67	142.07	57.74				
	35	18,525	479.83	145.45	57.10	11.43	3.25	18,525	479.83	145.45	57.10				
Bent 9	36	18,543	498.00	148.40	56.47	10.04	3.38	18,543	498.00	148.40	56.47				
Hinge	37	18,555	510.00	150.21	56.05	9.13	3.50	18,555	510.00	150.21	56.05				
"	38	18,555	510.00	150.21	56.05	9.13	3.38	18,555	510.00	150.21	56.05				
	39	18,578	533.17	152.82	55.24	7.36	3.25	18,578	533.17	152.82	55.24				
	40	18,601	556.33	154.72	54.43	5.59	3.13	18,601	556.33	154.72	54.43				
Bent 10	41	18,625	579.50	155.91	53.62	3.82	3.00	18,625	579.50	155.91	53.62				
Hinge	42	18,637	591.50	156.42	53.21	2.90	2.88	18,637	591.50	156.42	53.21				
"	43	18,637	591.50	156.42	53.21	2.90	2.75	18,637	591.50	156.42	53.21				
	44	18,660	614.67	156.52	52.40	1.13	2.63	18,660	614.67	156.52	52.40				
	45	18,683	637.83	155.90	51.59	-0.64	2.50	18,683	637.83	155.90	51.59				
Bent 11	46	18,706	661.00	154.57	50.78	-2.41	2.38	18,706	661.00	154.57	50.78				
Hinge	47	18,718	673.00	153.78	50.36	-3.33	2.25	18,718	673.00	153.78	50.36				
"	48	18,718	673.00	153.78	50.36	-3.33	2.13	18,718	673.00	153.78	50.36				
	49	18,741	696.17	151.37	49.55	-5.09	2.00	18,741	696.17	151.37	49.55				
	50	18,764	719.33	148.24	48.74	-6.86	1.88	18,764	719.33	148.24	48.74				
Bent 12	51	18,788	742.50	144.41	47.93	-8.63	1.75	18,788	742.50	144.41	47.93				
Hinge	52	18,800	754.50	142.33	47.51	-9.55	1.63	18,800	754.50	142.33	47.51				
"	53	18,800	754.50	142.33	47.51	-9.55	1.50	18,800	754.50	142.33	47.51				
	54	18,823	777.67	137.43	46.70	-11.32	1.38	18,823	777.67	137.43	46.70				
	55	18,846	800.83	131.83	45.90	-13.09	1.25	18,846	800.83	131.83	45.90				
Bent 13	56	18,869	824.00	125.55	45.09	-14.86	1.13	18,869	824.00	125.55	45.09				
Hinge	57	18,881	836.00	122.19	44.67	-15.78	1.00	18,881	836.00	122.19	44.67				





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SUPERSTRUCTURE SECTIONS
SAP2000 BRIDGE ANALYSIS INPUT FILE DATA
ALAMEDA CREEK BRIDGE - AS-BUILT

1. Superstructure Section 1

Section ID : **BG1**

a) Material Properties

Concrete : ρ_c = 0.145 kip/ft^3 => NWC (Normal vs Light Weight Concrete, ACI 2.2; threshold is 0.115 kcf)

f'_c = 4.00 Ksi => E = 4,743 Ksi

b) Section Dimensions and Cross-section

L = 70.00 feet (Span Length)

H_{bg} = 4.50 feet (Height of T-girder)

T_{ts} = 8.00 inches (Top slab thickness)

T_{bs} = 8.00 inches (Bottom slab thickness)

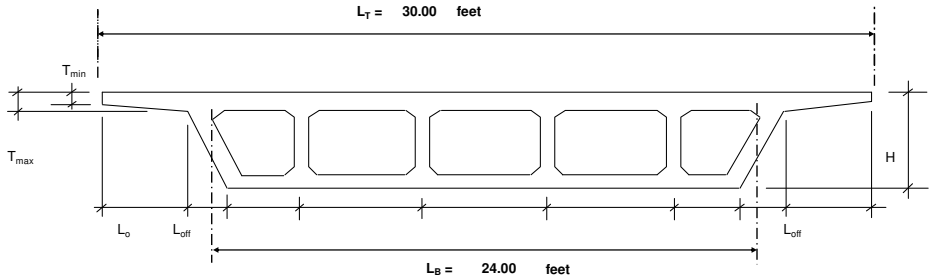
From analysis output:

I_g = 2.11 ft^4

Y_t = 2.39 ft

Flares = 4.00 inches

Span Type	Location	T_{min} (inches)	T_{max} (inches)	Lo (inches)	Offset Length (feet)	Girder Thickness (inches)	Span Length (feet)
Cantilever	Left	8.00	8.00	36.00			
	Right	8.00	8.00	36.00			
Exterior	Left				0.00	16.00	8.00
	Right				0.00	16.00	8.00
Interior	1					18.00	8.00
	2					18.00	
	3						
	4						



c) Resulting Section properties - About Horizontal Axis

Element	b (inches)	d (inches)	A (in^2)	y (inches)	I_o (in^4)	A*y (in^3)	$A*d^2$ (in^4)	I_{yy} (in^4)
Left Overhang	36.00	8.00	288	50.00	1,536	14,400	130,596	132,132
	36.00	0.00	0	46.00	0	0	0	0
Right Overhang	8.00	36.00	288	50.00	31,104	14,400	130,596	161,700
	36.00	0	0	46.00	0	0	0	0
Top Slab	288	8.00	2,304	50.00	12,288	115,200	1,044,766	1,057,054
Bottom Slab	288	8.00	2,304	4.00	12,288	9,216	1,406,269	1,418,557
Girders	68.00	38	2,584	27.00	310,941	69,768	7,516	318,457

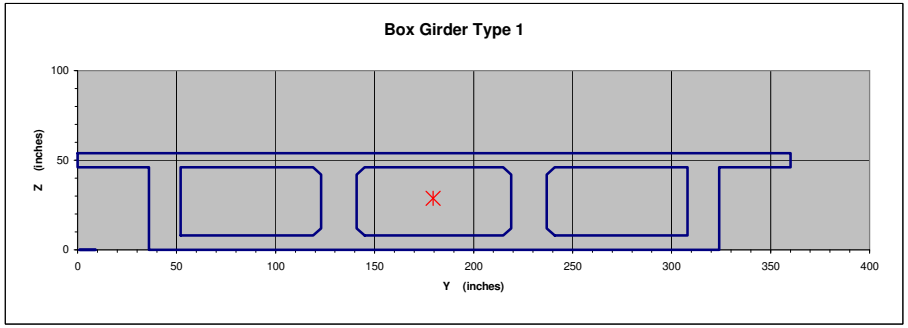
Z_t = 28.71 inches (from Soffitt)
= 2.39 feet
= 25.29 inches (from Deck)
= 2.11 feet
I_{YY} = 3,087,899 in^4
= 148.91 ft^4
A_3 = 2,584 in^2
= 17.94 ft^2

Y_t = 179.48 inches (from Left Edge)
= 14.96 feet
= 180.52 inches (from Right Edge)
= 15.04 feet
I_{ZZ} = 324,300,061 in^4
= 15,639.47 ft^4
A_2 = 5,184 in^2
= 36.00 ft^2

A_G = 53.94 ft^2
J = 15,788 ft^4

d) Resulting Section properties - About Vertical Axis

Element	b (inches)	d (inches)	A (in^2)	y (inches)	I_o (in^4)	A*y (in^3)	$A*d^2$ (in^4)	I_{zz} (in^4)
Left Overhang	8.00	36.00	288	4.00	31,104	1,152	4,608	35,712
	0.00	36.00	0	24.00	0	0	0	0
Right Overhang	36.00	8.00	288	342.00	1,536	98,496	33,685,632	33,687,168
	0.00	36.00	0	336.00	0	0	0	0
Top Slab	8.00	288.00	2,304	180.00	15,925,248	414,720	74,649,600	90,574,848
Bottom Slab	8.00	288.00	2,304	180.00	15,925,248	414,720	74,649,600	90,574,848
Girders	38.00	16.00	608	44.00	12,971	26,752	1,177,088	1,190,059
	38.00	16.00	608	316.00	12,971	192,128	60,712,448	60,725,419
	38.00	18.00	684	132.00	18,468	90,288	11,918,016	11,936,484
	38.00	18.00	684	228.00	18,468	155,952	35,557,056	35,575,524
	38.00	0.00	0	228.00	0	0	0	0
	38.00	0.00	0	228.00	0	0	0	0



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SUPERSTRUCTURE SECTIONS
SAP2000 BRIDGE ANALYSIS INPUT FILE DATA
ALAMEDA CREEK BRIDGE - AS-BUILT

2. Superstructure Section 2

Section ID : **BG2**

a) Material Properties

Concrete : ρ_c = 0.145 kip/ft^3 => NWC (Normal vs Light Weight Concrete, ACI 2.2; threshold is 0.115 kcf)

f'_c = 4.00 Ksi => E = 4,743 Ksi

b) Section Dimensions and Cross-section

L = 70.00 feet (Span Length)

H_{bg} = 5.00 feet (Height of T-girder)

T_{ts} = 8.00 inches (Top slab thickness)

T_{bs} = 8.00 inches (Bottom slab thickness)

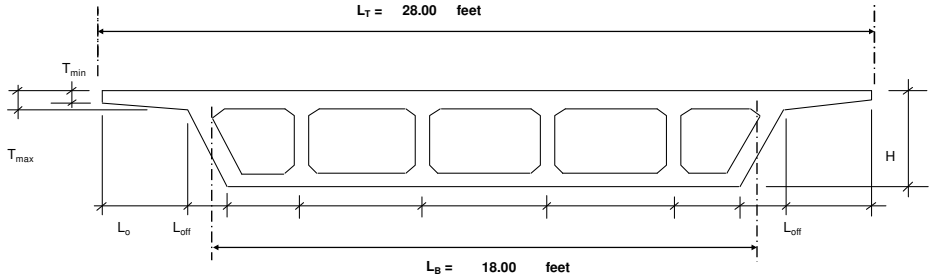
From analysis output:

I_g = 186.33 ft^4

Y_t = 2.78 ft

Flares = 4.00 inches

Span Type	Location	T_{min} (inches)	T_{max} (inches)	Lo (inches)	Offset Length (feet)	Girder Thickness (inches)	Span Length (feet)
Cantilever	Left	8.00	12.00	60.00			
	Right	8.00	12.00	60.00			
Exterior	Left				0.00	26.00	5.00
	Right				0.00	26.00	5.00
Interior	1					24.00	8.00
	2					24.00	
	3						
	4						



c) Resulting Section properties - About Horizontal Axis

Element	b (inches)	d (inches)	A (in^2)	y (inches)	I_o (in^4)	A*y (in^3)	$A*d^2$ (in^4)	I_{yy} (in^4)
Left Overhang	60.00	8.00	480	56.00	2,560	26,880	247,255	249,815
	60.00	2.00	120	50.67	40	6,080	36,176	36,216
Right Overhang	8.00	60.00	480	56.00	144,000	26,880	247,255	391,255
	60.00	2	120	50.67	40	6,080	36,176	36,216
Top Slab	216	8.00	1,728	56.00	9,216	96,768	890,116	899,332
Bottom Slab	216	8.00	1,728	4.00	9,216	6,912	1,483,864	1,493,080
Girders	100.00	44	4,400	30.00	709,867	132,000	48,029	757,896

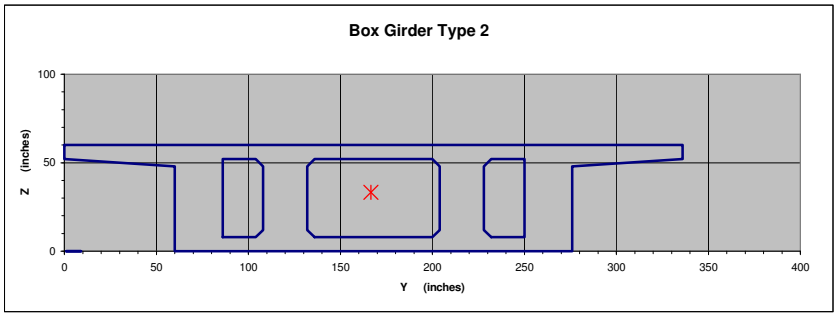
Z_t = 33.30 inches (from Soffitt)
= 2.78 feet
= 26.70 inches (from Deck)
= 2.22 feet
I_{YY} = 3,863,809 in^4
= 186.33 ft^4
A_3 = 4,400 in^2
= 30.56 ft^2

Y_t = 166.62 inches (from Left Edge)
= 13.89 feet
= 169.38 inches (from Right Edge)
= 14.11 feet
I_{ZZ} = 316,787,627 in^4
= 15,277.18 ft^4
A_2 = 4,416 in^2
= 30.67 ft^2

A_G = 62.89 ft^2
J = 15,464 ft^4

d) Resulting Section properties - About Vertical Axis

Element	b (inches)	d (inches)	A (in^2)	y (inches)	I_o (in^4)	A*y (in^3)	$A*d^2$ (in^4)	I_{zz} (in^4)
Left Overhang	8.00	60.00	480	4.00	144,000	1,920	7,680	151,680
	2.00	60.00	120	40.00	36,000	4,800	192,000	228,000
Right Overhang	60.00	8.00	480	306.00	2,560	146,880	44,945,280	44,947,840
	2.00	60.00	120	296.00	36,000	35,520	10,513,920	10,549,920
Top Slab	8.00	216.00	1,728	168.00	6,718,464	290,304	48,771,072	55,489,536
Bottom Slab	8.00	216.00	1,728	168.00	6,718,464	290,304	48,771,072	55,489,536
Girders	44.00	26.00	1,144	73.00	64,445	83,512	6,096,376	6,160,821
	44.00	26.00	1,144	263.00	64,445	300,872	79,129,336	79,193,781
	44.00	24.00	1,056	120.00	50,688	126,720	15,206,400	15,257,088
	44.00	24.00	1,056	216.00	50,688	228,096	49,268,736	49,319,424
	44.00	0.00	0	216.00	0	0	0	0
	44.00	0.00	0	216.00	0	0	0	0



3. Superstructure Section 3

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SUPERSTRUCTURE SECTIONS
SAP2000 BRIDGE ANALYSIS INPUT FILE DATA
ALAMEDA CREEK BRIDGE - AS-BUILT

Section ID : **BG3**

a) Material Properties

Concrete : ρ_c = 0.145 kip/ft^3 => NWC (Normal vs Light Weight Concrete, ACI 2.2; threshold is 0.115 kcf)

f'_c = 4.00 Ksi => E = 4,743 Ksi

b) Section Dimensions and Cross-section

L = 70.00 feet (Span Length)

H_{bg} = 6.00 feet (Height of T-girder)

T_{ts} = 8.00 inches (Top slab thickness)

T_{bs} = 8.00 inches (Bottom slab thickness)

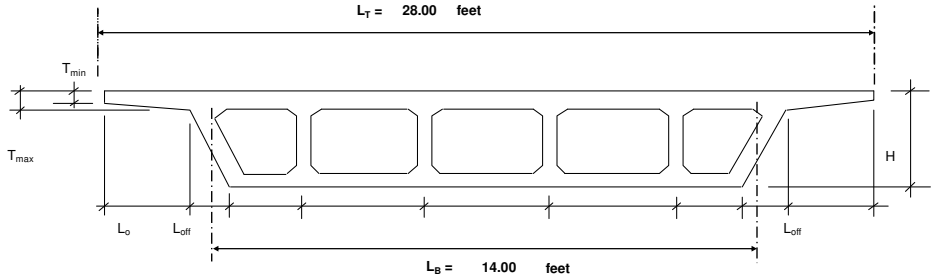
From analysis output:

I_g = 2.41 ft^4

Y_t = 3.59 ft

Flares = 4.00 inches

Span Type	Location	T_{min} (inches)	T_{max} (inches)	Lo (inches)	Offset Length (feet)	Girder Thickness (inches)	Span Length (feet)
Cantilever	Left	8.00	12.00	84.00			
	Right	8.00	12.00	84.00			
Exterior	Left				0.00	18.00	7.00
	Right				0.00	18.00	7.00
Interior	1					16.00	
	2						
	3						
	4						



c) Resulting Section properties - About Horizontal Axis

Element	b (inches)	d (inches)	A (in^2)	y (inches)	I_o (in^4)	A*y (in^3)	$A*d^2$ (in^4)	I_{yy} (in^4)
Left Overhang	84.00	8.00	672	68.00	3,584	45,696	415,361	418,945
	84.00	2.00	168	62.67	56	10,528	64,067	64,123
Right Overhang	8.00	84.00	672	68.00	395,136	45,696	415,361	810,497
	84.00	2	168	62.67	56	10,528	64,067	64,123
Top Slab	168	8.00	1,344	68.00	7,168	91,392	830,721	837,889
Bottom Slab	168	8.00	1,344	4.00	7,168	5,376	2,058,765	2,065,933
Girders	52.00	56	2,912	36.00	761,003	104,832	148,389	909,391

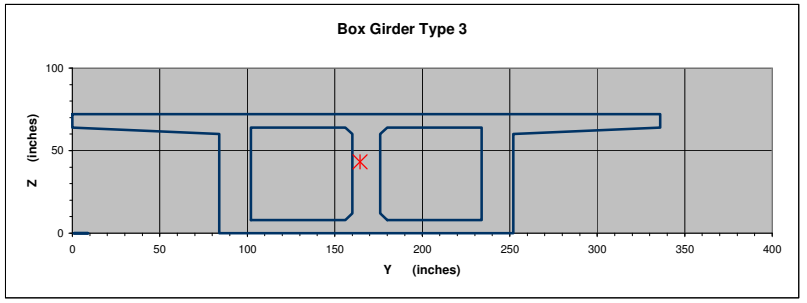
Z_t = 43.14 inches (from Soffitt)
= 3.59 feet
= 28.86 inches (from Deck)
= 2.41 feet
I_{YY} = 5,170,900 in^4
= 249.37 ft^4
A_3 = 2,912 in^2
= 20.22 ft^2

Y_t = 164.49 inches (from Left Edge)
= 13.71 feet
= 171.51 inches (from Right Edge)
= 14.29 feet
I_{ZZ} = 248,180,203 in^4
= 11,968.57 ft^4
A_2 = 4,032 in^2
= 28.00 ft^2

A_G = 50.56 ft^2
J = 12,218 ft^4

d) Resulting Section properties - About Vertical Axis

Element	b (inches)	d (inches)	A (in^2)	y (inches)	I_o (in^4)	A*y (in^3)	$A*d^2$ (in^4)	I_{zz} (in^4)
Left Overhang	8.00	84.00	672	4.00	395,136	2,688	10,752	405,888
	2.00	84.00	168	56.00	98,784	9,408	526,848	625,632
Right Overhang	84.00	8.00	672	294.00	3,584	197,568	58,084,992	58,088,576
	2.00	84.00	168	280.00	98,784	47,040	13,171,200	13,269,984
Top Slab	8.00	168.00	1,344	168.00	3,161,088	225,792	37,933,056	41,094,144
Bottom Slab	8.00	168.00	1,344	168.00	3,161,088	225,792	37,933,056	41,094,144
Girders	56.00	18.00	1,008	93.00	27,216	93,744	8,718,192	8,745,408
	56.00	18.00	1,008	243.00	27,216	244,944	59,521,392	59,548,608
	56.00	16.00	896	168.00	19,115	150,528	25,288,704	25,307,819
	56.00	0.00	0	168.00	0	0	0	0
	56.00	0.00	0	168.00	0	0	0	0
	56.00	0.00	0	168.00	0	0	0	0



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ALAMEDA CREEK BRIDGE - AS-BUILT

4. Superstructure Section 4

Section ID : **BG4**

a) Material Properties

Concrete : ρ_c = 0.145 kip/ft^3 => NWC (Normal vs Light Weight Concrete, ACI 2.2; threshold is 0.115 kcf)

f'_c = 4.00 Ksi => E = 4,743 Ksi

b) Section Dimensions and Cross-section

L = 70.00 feet (Span Length)

H_{bg} = 8.00 feet (Height of T-girder)

T_{ts} = 12.00 inches (Top slab thickness)

T_{bs} = 12.00 inches (Bottom slab thickness)

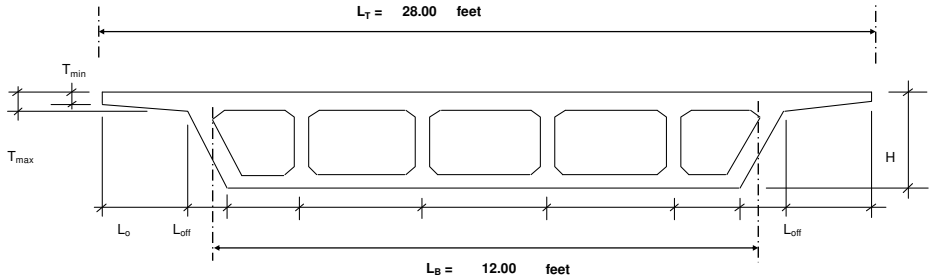
From analysis output:

I_g = 3.25 ft^4

Y_t = 4.75 ft

Flares = 4.00 inches

Span Type	Location	T_{min} (inches)	T_{max} (inches)	Lo (inches)	Offset Length (feet)	Girder Thickness (inches)	Span Length (feet)
Cantilever	Left	8.00	12.00	96.00			
	Right	8.00	12.00	96.00			
Exterior	Left				0.00	18.00	6.00
	Right				0.00	18.00	6.00
Interior	1					16.00	
	2						
	3						
	4						



c) Resulting Section properties - About Horizontal Axis

Element	b (inches)	d (inches)	A (in^2)	y (inches)	I_o (in^4)	A*y (in^3)	A*d^2 (in^4)	I_{yy} (in^4)
Left Overhang	96.00	8.00	768	92.00	4,096	70,656	938,726	942,822
	96.00	2.00	192	86.67	64	16,640	168,542	168,606
Right Overhang	8.00	96.00	768	92.00	589,824	70,656	938,726	1,528,550
	96.00	2	192	86.67	64	16,640	168,542	168,606
Top Slab	144	12.00	1,728	90.00	20,736	155,520	1,877,393	1,898,129
Bottom Slab	144	12.00	1,728	6.00	20,736	10,368	4,501,333	4,522,069
Girders	52.00	72	3,744	48.00	1,617,408	179,712	305,871	1,923,279

Z_t = 57.04 inches (from Soffitt)
= 4.75 feet
= 38.96 inches (from Deck)
= 3.25 feet

I_{YY} = 11,152,061 in^4
= 537.81 ft^4

A_3 = 3,744 in^2
= 26.00 ft^2

Y_t = 164.29 inches (from Left Edge)
= 13.69 feet
= 171.71 inches (from Right Edge)
= 14.31 feet

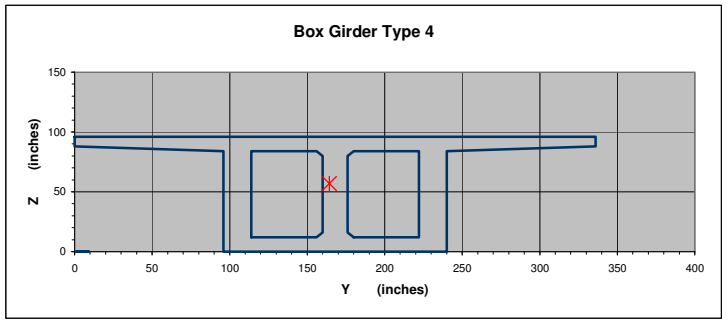
I_{ZZ} = 299,160,448 in^4
= 14,427.10 ft^4

A_2 = 4,992 in^2
= 34.67 ft^2

A_G = 63.33 ft^2
J = 14,965 ft^4

d) Resulting Section properties - About Vertical Axis

Element	b (inches)	d (inches)	A (in^2)	y (inches)	I_o (in^4)	A*y (in^3)	A*d^2 (in^4)	I_{zz} (in^4)
Left Overhang	8.00	96.00	768	4.00	589,824	3,072	12,288	602,112
	2.00	96.00	192	64.00	147,456	12,288	786,432	933,888
Right Overhang	96.00	8.00	768	288.00	4,096	221,184	63,700,992	63,705,088
	2.00	96.00	192	272.00	147,456	52,224	14,204,928	14,352,384
Top Slab	12.00	144.00	1,728	168.00	2,985,984	290,304	48,771,072	51,757,056
Bottom Slab	12.00	144.00	1,728	168.00	2,985,984	290,304	48,771,072	51,757,056
Girders	72.00	18.00	1,296	105.00	34,992	136,080	14,288,400	14,323,392
	72.00	18.00	1,296	231.00	34,992	299,376	69,155,856	69,190,848
	72.00	16.00	1,152	168.00	24,576	193,536	32,514,048	32,538,624
	72.00	0.00	0	168.00	0	0	0	0
	72.00	0.00	0	168.00	0	0	0	0
	72.00	0.00	0	168.00	0	0	0	0



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SUPERSTRUCTURE SECTIONS
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ALAMEDA CREEK BRIDGE - AS-BUILT

5. Superstructure Section 5

Section ID : **BG5**

a) Material Properties

Concrete : ρ_c = 0.145 kip/ft^3 => NWC (Normal vs Light Weight Concrete, ACI 2.2; threshold is 0.115 kcf)

f'_c = 4.00 Ksi => E = 4,743 Ksi

b) Section Dimensions and Cross-section

L = 70.00 feet (Span Length)

H_{bg} = 9.00 feet (Height of T-girder)

T_{ts} = 16.00 inches (Top slab thickness)

T_{bs} = 16.00 inches (Bottom slab thickness)

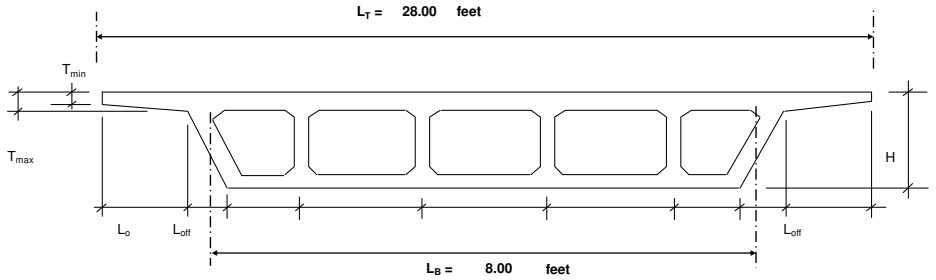
From analysis output:

I_g = 3.31 ft^4

Y_t = 5.69 ft

Flares = 0.00 inches

Span Type	Location	T_{min} (inches)	T_{max} (inches)	Lo (inches)	Offset Length (feet)	Girder Thickness (inches)	Span Length (feet)
Cantilever	Left	8.00	12.00	120.00			
	Right	8.00	12.00	120.00			
Exterior	Left				0.00	18.00	4.00
	Right				0.00	18.00	4.00
Interior	1					0.00	
	2						
	3						
	4						



c) Resulting Section properties - About Horizontal Axis

Element	b (inches)	d (inches)	A (in^2)	y (inches)	I_o (in^4)	A*y (in^3)	$A*d^2$ (in^4)	I_{yy} (in^4)
Left Overhang	120.00	8.00	960	104.00	5,120	99,840	1,222,963	1,228,083
	120.00	2.00	240	98.67	80	23,680	221,196	221,276
Right Overhang	8.00	120.00	960	104.00	1,152,000	99,840	1,222,963	2,374,963
	120.00	2	240	98.67	80	23,680	221,196	221,276
Top Slab	96	16.00	1,536	100.00	32,768	153,600	1,542,733	1,575,501
Bottom Slab	96	16.00	1,536	8.00	32,768	12,288	5,586,515	5,619,283
Girders	36.00	76	2,736	54.00	1,316,928	147,744	560,110	1,877,038

Z_t = 68.31 inches (from Soffitt)
= 5.69 feet
= 39.69 inches (from Deck)
= 3.31 feet

I_{YY} = 13,117,419 in^4
= 632.59 ft^4

A_3 = 2,736 in^2
= 19.00 ft^2

Y_t = 161.45 inches (from Left Edge)
= 13.45 feet
= 174.55 inches (from Right Edge)
= 14.55 feet

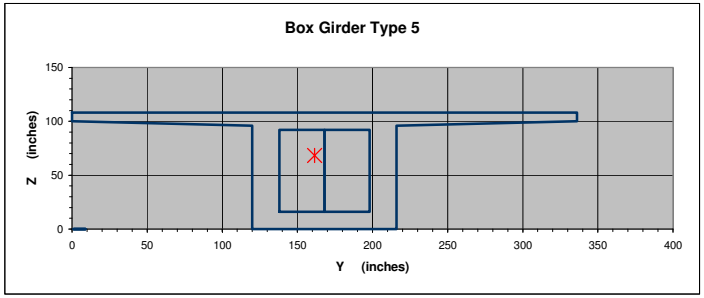
I_{ZZ} = 262,661,696 in^4
= 12,666.94 ft^4

A_2 = 4,992 in^2
= 34.67 ft^2

A_G = 57.00 ft^2
J = 13,300 ft^4

d) Resulting Section properties - About Vertical Axis

Element	b (inches)	d (inches)	A (in^2)	y (inches)	I_o (in^4)	A*y (in^3)	$A*d^2$ (in^4)	I_{zz} (in^4)
Left Overhang	8.00	120.00	960	4.00	1,152,000	3,840	15,360	1,167,360
	2.00	120.00	240	80.00	288,000	19,200	1,536,000	1,824,000
Right Overhang	120.00	8.00	960	276.00	5,120	264,960	73,128,960	73,134,080
	2.00	120.00	240	256.00	288,000	61,440	15,728,640	16,016,640
Top Slab	16.00	96.00	1,536	168.00	1,179,648	258,048	43,352,064	44,531,712
Bottom Slab	16.00	96.00	1,536	168.00	1,179,648	258,048	43,352,064	44,531,712
Girders	76.00	18.00	1,368	129.00	36,936	176,472	22,764,888	22,801,824
	76.00	18.00	1,368	207.00	36,936	283,176	58,617,432	58,654,368
	76.00	0.00	0	168.00	0	0	0	0
	76.00	0.00	0	168.00	0	0	0	0
	76.00	0.00	0	168.00	0	0	0	0
	76.00	0.00	0	168.00	0	0	0	0



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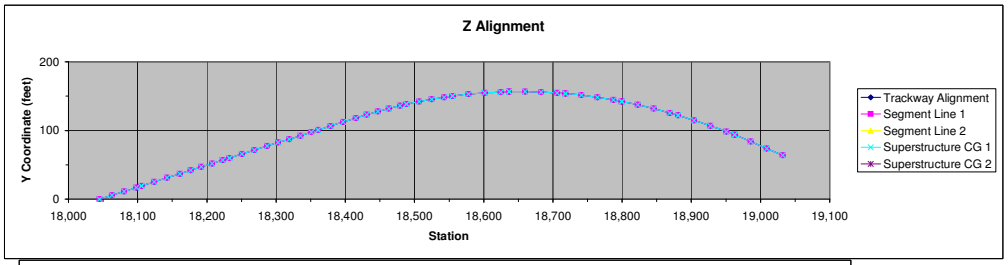
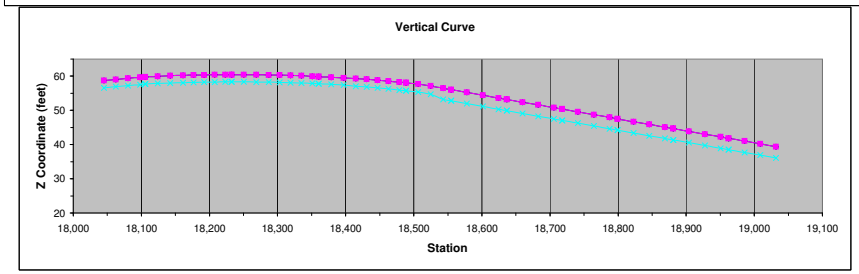
1. Segment Alignment Data (from 1a. Trackway Alignment" worksheet)

L_1 = 0.00 feet (Centerline distance between Trackway Alignment and Segment 1)

L_2 = 0.00 feet (Centerline distance between Trackway Alignment and Segment 2)

Origin: x_i = 18,045.00
y_i = 0.00





2. Superstructure Separation from Segment Centerlines and Section Summary

Section	y' from Segment CL [1] (inches)	Girder Height (inches)	Section C.G. Y [2] (feet)	Section C.G. Z [3] (feet)	Top Slab Length (feet)	Top Slab t_s (inches)	Bottom Slab Length (feet)	Bottom Slab t_s (inches)	T&B Slab Horiz. Offset (feet)	Superstructure Section Properties - Summary: Area (ft^2)	J (ft^4)	I_{33} (ft^4)	I_{22} (ft^4)	A_{22} (ft^2)	A_{33} (ft^2)
BG1	0.00	54.00	14.96	2.11	30.00	8.00	24.00	8.00	3.00	53.94	15,788	148.91	15,639.47	36.00	*17.94*
BG2	0.00	60.00	13.89	2.22	28.00	8.00	18.00	8.00	5.00	62.89	15,464	186.33	15,277.18	30.67	*30.56*
BG3	0.00	72.00	13.71	2.41	28.00	8.00	14.00	8.00	7.00	50.56	12,218	249.37	11,968.57	28.00	*20.22*
BG4	0.00	96.00	13.69	3.25	28.00	12.00	12.00	12.00	8.00	63.33	14,965	537.81	14,427.10	34.67	*26.00*
BG5	0.00	108.00	13.45	3.31	28.00	16.00	8.00	16.00	3.00	57.00	13,300	632.59	12,666.94	34.67	*19.00*

Notes:
1. Separation distance y' between Deck Section C.G. to Segment Centerline (Boxcar, tracks); + distance outwards, - distance inwards from Segment Centerline.
2. Tranverse location of C.G. as measured from Left Edge of Top Slab.
3. Vertical location of C.G. as measured from Top Edge of Top Slab.

3. Platform Placement and Section

Platform Station Begin : feet
Platform Station End : feet

Platform Section : => L_P = feet (Platform Length)
W_P = feet (Platform Width)

Centroid : Z_1 = feet (from Deck)
Y_1 = feet (from Left Edge)

Distance from Platform C.G. to Trackway Centerline :

L_{P1} = 0.00 feet
L_{P2} = 2.39 feet

4. Trackway, Segment, (from 1a. Trackway Alignment" worksheet) and Box Girder Alignment Data

Non Prismatic Deck Sections Property Distribution (between nodes, Max 7) :
1. Linear Distribution
2. Parabolic Distribution
3. Cubic Distribution

Non Prismatic Deck Sections Property Distribution (between nodes, Max 7) :
1. Linear Distribution
2. Parabolic Distribution
3. Cubic Distribution

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36
			Trackway Alignment							Non Prismatic		Segment Line 1				Superstructure CG 1				Platform CG						Non Prismatic		Segment Line 2				Superstructure CG 2			
Section	Node		Station (feet)	X (feet)	Y (feet)	Z (feet)	Heading (degrees)		Section ID	EI_{33}	EI_{22}	Station (feet)	X (feet)	Y (feet)	Z (feet)	Station (feet)	X (feet)	Y (feet)	Z (feet)	Platform Section ID	X (feet)	Y (feet)	Z (feet)		Section ID	EI_{33}	EI_{22}	Station (feet)	X (feet)	Y (feet)	Z (feet)	Station (feet)	X (feet)	Y (feet)	Z (feet)
Abutment 1 - BC1	1		18,045	0.00	0.00	58.72	18.60	0100	**BG1**			18,045	0.00	0.00	58.72	**18,045**	**0.00**	**0.00**	**56.62**																
	2		18,063	17.67	5.63	59.03	18.60	0101	**BG1**			18,063	17.67	5.63	59.03	**18,063**	**17.67**	**5.63**	**56.92**																
Bent 2	3		18,080	35.33	11.27	59.34	18.60	0200	**BG1**			18,080	35.33	11.27	59.34	**18,080**	**35.33**	**11.27**	**57.23**																
Hinge	4		18,098	53.00	16.90	59.65	18.60	0201	**BG1**			18,098	53.00	16.90	59.65	**18,098**	**53.00**	**16.90**	**57.54**																
"	5		18,106	60.50	19.30	59.78	18.60	0202	**BG1**			18,106	60.50	19.30	59.78	**18,106**	**60.50**	**19.30**	**57.67**																
	6		18,106	60.50	19.30	59.78	18.60	0203	**BG1**			18,106	60.50	19.30	59.78	**18,106**	**60.50**	**19.30**	**57.67**																
	7		18,124	79.00	25.20	59.95	18.60	0204	**BG1**			18,124	79.00	25.20	59.95	**18,124**	**79.00**	**25.20**	**57.84**																
	8		18,143	97.50	31.10	60.10	18.60	0205	**BG1**			18,143	97.50	31.10	60.10	**18,143**	**97.50**	**31.10**	**57.99**																
Bent 3	9		18,161	116.00	37.00	60.22	18.60	0300	**BG1**			18,161	116.00	37.00	60.22	**18,161**	**116.00**	**37.00**	**58.11**																
	10		18,177	131.50	41.94	60.30	18.60	0301	**BG1**			18,177	131.50	41.94	60.30	**18,177**	**131.50**	**41.94**	**58.19**																
	11		18,192	147.00	46.89	60.36	18.60	0302	**BG1**			18,192	147.00	46.89	60.36	**18,192**	**147.00**	**46.89**	**58.26**																
	12		18,208	162.50	51.83	60.41	18.60	0303	**BG1**			18,208	162.50	51.83	60.41	**18,208**	**162.50**	**51.83**	**58.30**																
Bent 4	13		18,223	178.00	56.77	60.44	18.60	0400	**BG1**			18,223	178.00	56.77	60.44	**18,223**	**178.00**	**56.77**	**58.33**																
Hinge	14		18,233	187.50	59.80	60.45	18.60	0401	**BG1**			18,233	187.50	59.80	60.45	**18,233**	**187.50**	**59.80**	**58.34**																
"	15		18,233	187.50	59.80	60.45	18.60	0402	**BG1**			18,233	187.50	59.80	60.45	**18,233**	**187.50**	**59.80**	**58.34**																
	16		18,251	205.67	65.60	60.44	18.60	0403	**BG1**			18,251	205.67	65.60	60.44	**18,251**	**205.67**	**65.60**	**58.33**																
	17		18,269	223.83	71.39	60.41	18.60	0404	**BG1**			18,269	223.83	71.39	60.41	**18,269**	**223.83**	**71.39**	**58.31**																
Bent 5	18		18,287	242.00	77.19	60.36	18.60	0500	**BG1**			18,287	242.00	77.19	60.36	**18,287**	**242.00**	**77.19**	**58.25**																
	19		18,303	258.00	82.29	60.29	18.60	0501	**BG1**			18,303	258.00	82.29	60.29	**18,303**	**258.00**	**82.29**	**58.18**																
	20		18,319	274.00	87.39	60.21	18.60	0502	**BG1**			18,319	274.00	87.39	60.21	**18,319**	**274.00**	**87.39**	**58.10**																
	21		18,335	290.00	92.50	60.10	18.60	0503	**BG1**			18,335	290.00	92.50	60.10	**18,335**	**290.00**	**92.50**	**57.99**																
Bent 6	22		18,351	306.00	97.60	59.97	18.60	0600	**BG1**			18,351	306.00	97.60	59.97	**18,351**	**306.00**	**97.60**	**57.87**																
Hinge	23		18,361	315.50	100.63	59.89	18.60	0601	**BG1**			18,361	315.50	100.63	59.89	**18,361**	**315.50**	**100.63**	**57.78**																
"	24		18,361	315.50	100.63	59.89	18.60	0602	**BG1**			18,361	315.50	100.63	59.89	**18,361**	**315.50**	**100.63**	**57.78**																
	25		18,379	333.67	106.43	59.71	18.60	0603	**BG1**			18,379	333.67	106.43	59.71	**18,379**	**333.67**	**106.43**	**57.61**																
	26		18,397	351.83	112.22	59.51	18.60	0604	**BG1**			18,397	351.83	112.22	59.51	**18,397**	**351.83**	**112.22**	**57.40**																
Bent 7	27		18,415	370.00	118.01	59.28	18.60	0700	**BG2**	1	2	18,415	370.00	118.01	59.28	**18,415**	**370.00**	**118.01**	**57.06**																
	28		18,431	386.00	123.12	59.06	18.60	0701	**BG2**	1	2	18,431	386.00	123.12	59.06	**18,431**	**386.00**	**123.12**	**56.84**																
BC	29		18,447	402.00	127.73	58.82	17.38	0702	**BG2**	1	2	18,447	402.00	127.73	58.82	**18,447**	**402.00**	**127.73**	**56.60**																
	30		18,463	418.00	132.02	58.56	16.16	0703	**BG2**	1	2	18,463	418.00	132.02	58.56	**18,463**	**418.00**	**132.02**	**56.34**																
Bent 8	31		18,479	434.00	135.98	58.28	14.93	0800	**BG3**	1	2	18,479	434.00	135.98	58.28	**18,479**	**434.00**	**135.98**	**55.88**																
Hinge	32		18,489	443.50	138.25	58.11	14.21	0801	**BG3**	1	2	18,489	443.50	138.25	58.11	**18,489**	**443.50**	**138.25**	**55.70**																
"	33		18,489	443.50	138.25	58.11	14.21	0802	**BG3**	1	2	18,489	443.50	138.25	58.11	**18,489**	**443.50**	**138.25**	**55.70**																
	34		18,507	461.67	142.07	57.74	12.82	0803	**BG3**	1	2	18,507	461.67	142.07	57.74	**18,507**	**461.67**	**142.07**	**55.33**																
	35		18,525	479.83	145.45	57.10	11.43	0804	**BG3**	1	2	18,525	479.83	145.45	57.10	**18,525**	**479.83**	**145.45**	**54.70**																
Bent 9	36		18,543	498.00	148.40	56.47	10.04	0900	**BG4**	1	2	18,543	498.00	148.40	56.47	**18,543**	**498.00**	**148.40**	**53.22**																
Hinge	37		18,555	510.00	150.21	56.05	9.13	0901	**BG4**	1	2	18,555	510.00	150.21	56.05	**18,555**	**510.00**	**150.21**	**52.80**																
"	38		18,555	510.00	150.21	56.05	9.13	0902	**BG4**	1	2	18,555	510.00	150.21	56.05	**18,555**	**510.00**	**150.21**	**52.80**																
	39		18,578	533.17	152.82	55.24	7.36	0903	**BG4**	1	2	18,578	533.17	152.82	55.24	**18,578**	**533.17**	**152.82**	**52.00**																

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	40	18,601	556.33	154.72	54.43	5.59	0904	BG4	1	2	18,601	556.33	154.72	54.43	**18,601**	**556.33**	**154.72**	**51.19**
Bent 10	41	18,625	579.50	155.91	53.62	3.82	1000	BG5			18,625	579.50	155.91	53.62	**18,625**	**579.50**	**155.91**	**50.32**
Hinge	42	18,637	591.50	156.42	53.21	2.90	1001	BG5			18,637	591.50	156.42	53.21	**18,637**	**591.50**	**156.42**	**49.90**
"	43	18,637	591.50	156.42	53.21	2.90	1002	BG5			18,637	591.50	156.42	53.21	**18,637**	**591.50**	**156.42**	**49.90**
	44	18,660	614.67	156.52	52.40	1.13	1003	BG5			18,660	614.67	156.52	52.40	**18,660**	**614.67**	**156.52**	**49.09**
	45	18,683	637.83	155.90	51.59	-0.64	1004	BG5			18,683	637.83	155.90	51.59	**18,683**	**637.83**	**155.90**	**48.28**
Bent 11	46	18,706	661.00	154.57	50.78	-2.41	1100	BG5			18,706	661.00	154.57	50.78	**18,706**	**661.00**	**154.57**	**47.47**
Hinge	47	18,718	673.00	153.78	50.36	-3.33	1101	BG5			18,718	673.00	153.78	50.36	**18,718**	**673.00**	**153.78**	**47.05**
"	48	18,718	673.00	153.78	50.36	-3.33	1102	BG5			18,718	673.00	153.78	50.36	**18,718**	**673.00**	**153.78**	**47.05**
	49	18,741	696.17	151.37	49.55	-5.09	1103	BG5			18,741	696.17	151.37	49.55	**18,741**	**696.17**	**151.37**	**46.24**
	50	18,764	719.33	148.24	48.74	-6.86	1104	BG5			18,764	719.33	148.24	48.74	**18,764**	**719.33**	**148.24**	**45.43**
Bent 12	51	18,788	742.50	144.41	47.93	-8.63	1200	BG5			18,788	742.50	144.41	47.93	**18,788**	**742.50**	**144.41**	**44.62**
Hinge	52	18,800	754.50	142.33	47.51	-9.55	1201	BG5			18,800	754.50	142.33	47.51	**18,800**	**754.50**	**142.33**	**44.21**
"	53	18,800	754.50	142.33	47.51	-9.55	1202	BG5			18,800	754.50	142.33	47.51	**18,800**	**754.50**	**142.33**	**44.21**
	54	18,823	777.67	137.43	46.70	-11.32	1203	BG5			18,823	777.67	137.43	46.70	**18,823**	**777.67**	**137.43**	**43.40**
	55	18,846	800.83	131.83	45.90	-13.09	1204	BG5			18,846	800.83	131.83	45.90	**18,846**	**800.83**	**131.83**	**42.59**
Bent 13	56	18,869	824.00	125.55	45.09	-14.86	1300	BG5			18,869	824.00	125.55	45.09	**18,869**	**824.00**	**125.55**	**41.78**
Hinge	57	18,881	836.00	122.19	44.67	-15.78	1301	BG5			18,881	836.00	122.19	44.67	**18,881**	**836.00**	**122.19**	**41.36**
"	58	18,881	836.00	122.19	44.67	-15.78	1302	BG5			18,881	836.00	122.19	44.67	**18,881**	**836.00**	**122.19**	**41.36**
	59	18,904	859.17	114.87	43.86	-17.55	1303	BG5			18,904	859.17	114.87	43.86	**18,904**	**859.17**	**114.87**	**40.55**
	60	18,927	882.33	106.87	43.05	-19.32	1304	BG5			18,927	882.33	106.87	43.05	**18,927**	**882.33**	**106.87**	**39.74**
Bent 14	61	18,951	905.50	98.20	42.24	-21.09	1400	BG5			18,951	905.50	98.20	42.24	**18,951**	**905.50**	**98.20**	**38.93**
Hinge	62	18,963	917.50	93.62	41.82	-22.00	1401	BG5			18,963	917.50	93.62	41.82	**18,963**	**917.50**	**93.62**	**38.51**
	63	18,963	917.50	93.62	41.82	-22.00	1402	BG5			18,963	917.50	93.62	41.82	**18,963**	**917.50**	**93.62**	**38.51**
	64	18,986	940.67	83.95	41.01	-23.77	1403	BG5			18,986	940.67	83.95	41.01	**18,986**	**940.67**	**83.95**	**37.70**
EC	65	19,009	963.83	73.64	40.20	-25.54	1404	BG5			19,009	963.83	73.64	40.20	**19,009**	**963.83**	**73.64**	**36.90**
Abutment 15	66	19,032	987.00	63.65	39.39	-25.54	1500	BG5			19,032	987.00	63.65	39.39	**19,032**	**987.00**	**63.65**	**36.09**

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SUPERSTRUCTURE SECTIONS
SAP2000 BRIDGE ANALYSIS INPUT FILE DATA
ALAMEDA CREEK BRIDGE - AS-BUILT

5. Non Prismatic Section - Assigments and Properties

		Segment Line 1															
		Section ID		Non Prismatic						Transition Fraction		**Section Properties - Non Prismatic**					
Section	Node	Begin Node	End Node	EI_{33}	EI_{22}	Count	**Section ID**	Section Length (feet)	Transition Length (feet)	Begin Node	End Node	Area (ft^2)	J (ft^4)	I_{33} (ft^4)	I_{22} (ft^4)	A_{22} (ft^2)	A_{33} (ft^2)
Abutment 1 - BC1	1	BG1															
	2	BG1															
Bent 2	3	BG1															
Hinge	4	BG1															
"	5	BG1															
	6	BG1															
	7	BG1															
	8	BG1															
Bent 3	9	BG1															
	10	BG1															
	11	BG1															
	12	BG1															
Bent 4	13	BG1															
Hinge	14	BG1															
"	15	BG1															
	16	BG1															
	17	BG1															
Bent 5	18	BG1															
	19	BG1															
	20	BG1															
	21	BG1															
Bent 6	22	BG1															
Hinge	23	BG1															
"	24	BG1															
	25	BG1															
	26	BG1															
Bent 7	27	BG2	BG3	1	2	1	BG2-1	18.17	0.00	1.00	0.00	63	15,464	186	15,277	31	31
	28	BG2	BG3	1	2	2	BG2-2	16.00	16.00	0.75	0.25	60	14,652	202	14,450	30	28
BC	29	BG2	BG3	1	2	3	BG2-3	16.00	32.00	0.50	0.50	57	13,841	218	13,623	29	25
	30	BG2	BG3	1	2	4	BG2-4	16.00	48.00	0.25	0.75	54	13,029	234	12,796	29	23
Bent 8	31	BG3	BG4	1	2	1	BG3-1	16.00	64.00	1.00	1.00	51	12,218	249	11,969	28	20
Hinge	32	BG3	BG4	1	2	2	BG3-2	9.50	9.50	0.85	0.15	52	12,626	292	12,334	29	21
"	33	BG3	BG4	1	2	3	BG3-3	0.00	9.50	0.85	0.15	52	12,626	292	12,334	29	21
	34	BG3	BG4	1	2	4	BG3-4	18.17	27.67	0.57	0.43	56	13,405	374	13,031	31	23
	35	BG3	BG4	1	2	5	BG3-5	18.17	45.83	0.28	0.72	60	14,185	456	13,729	33	24
Bent 9	36	BG4	BG5	1	2	1	BG4-1	18.17	64.00	1.00	1.00	63	14,965	538	14,427	35	26
Hinge	37	BG4	BG5	1	2	2	BG4-2	12.00	12.00	0.85	0.15	62	14,720	552	14,168	35	25
"	38	BG4	BG5	1	2	3	BG4-3	0.00	12.00	0.85	0.15	62	14,720	552	14,168	35	25
	39	BG4	BG5	1	2	4	BG4-4	23.17	35.17	0.57	0.43	61	14,246	579	13,668	35	23
	40	BG4	BG5	1	2	5	BG4-5	23.17	58.33	0.28	0.72	59	13,773	606	13,167	35	21
Bent 10	41	BG5						23.17	81.50	0.00	1.00						
Hinge	42	BG5															
"	43	BG5															
	44	BG5															
	45	BG5															
Bent 11	46	BG5															
Hinge	47	BG5															
"	48	BG5															
	49	BG5															
	50	BG5															
Bent 12	51	BG5															
Hinge	52	BG5															
"	53	BG5															
	54	BG5															
	55	BG5															
Bent 13	56	BG5															
Hinge	57	BG5															
"	58	BG5															
	59	BG5															
	60	BG5															
Bent 14	61	BG5															
Hinge	62	BG5															
	63	BG5															
	64	BG5															
EC	65	BG5															
Abutment 15	66	BG5															

Segment Line 2															
Section ID		Non Prismatic						Transition Fraction		**Section Properties - Non Prismatic**					
Begin Node	End Node	EI_{33}	EI_{22}	Count	Section ID	Section Length (feet)	Transition Length (feet)	Begin Node	End Node	Area (ft^2)	J (ft^4)	I_{33} (ft^4)	I_{22} (ft^4)	A_{22} (ft^2)	A_{33} (ft^2)

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BENT INPUT DATA
SAP2000 BRIDGE ANALYSIS INPUT FILE DATA
ALAMEDA CREEK BRIDGE - AS-BUILT

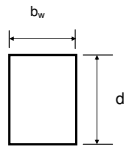
1. Bentcap Sections and Geometry

a) Material Properties

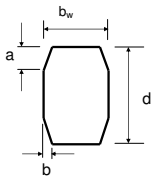
Notes:
1. Concrete material properties are specified for columns for each Bent; bentcaps are assumed to have the same concrete properties as columns.
2. Columns can be specified as either Steel (S) or Concrete (C, or default).
3. Steel column material properties as as follows: E_S = 29,000 Ksi
   W_S = 0.490 Kips/ft^3

b) Column Sections

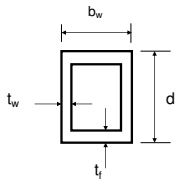
Note: **SH = O** (User Input Shape - Other than those shown)



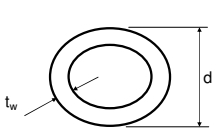
SH = R



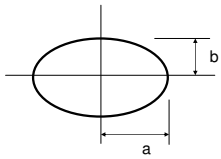
SH = F



SH = B

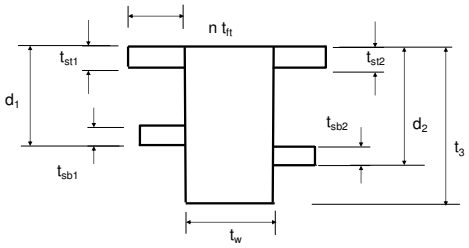


SH = P



SH = E

c) Bentcap Sections



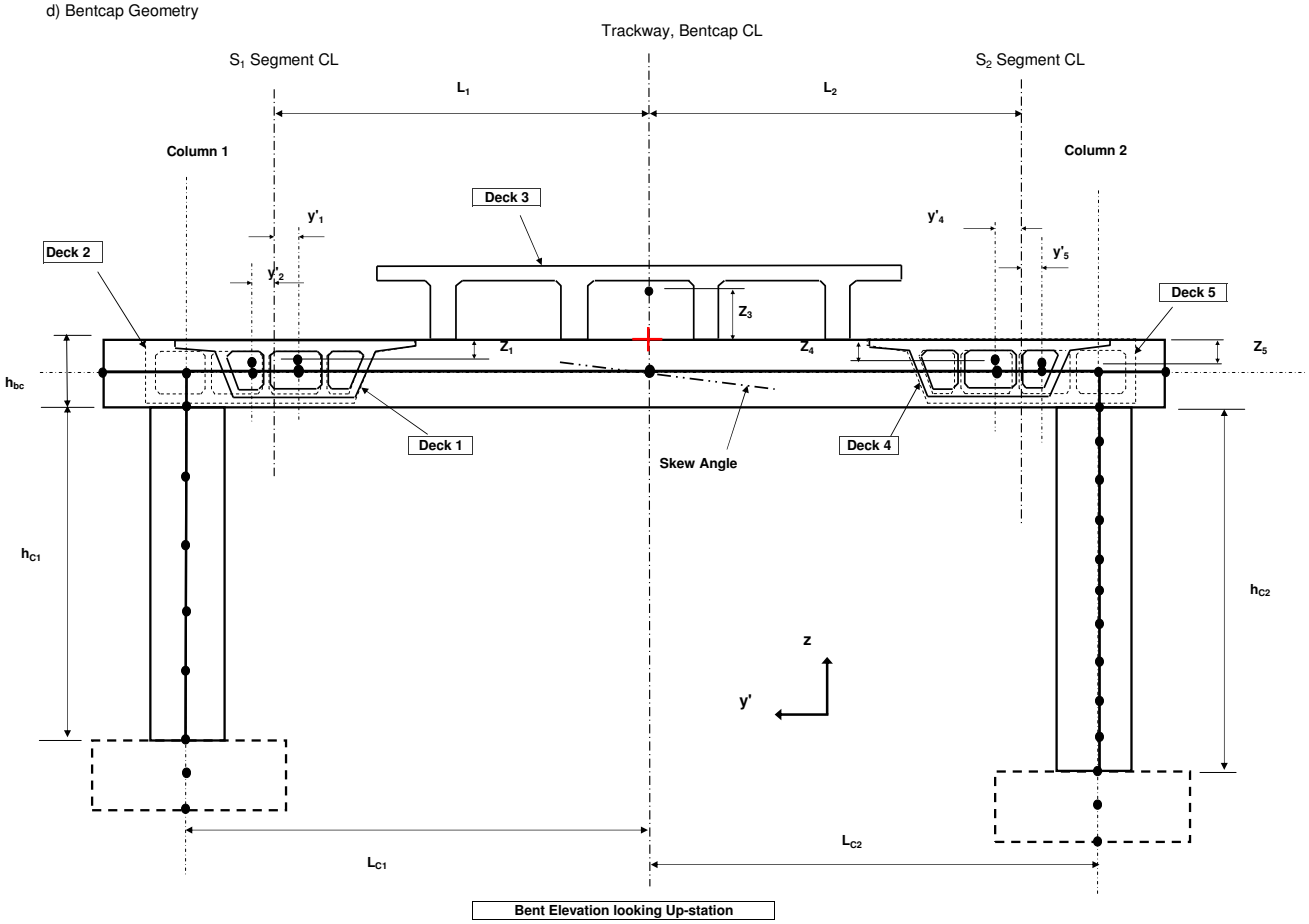
SH = T

Superstructure Section Summary (from "1c. Deck Assigments")

Section	y' from Segment CL [1] (inches)	Girder Height (inches)	C.G. from Top of Deck Y [2] (feet)	C.G. from Top of Deck Z [3] (feet)	Top Slab Length (feet)	Top Slab t_s (inches)	Bottom Slab Length (feet)	Bottom Slab t_s (inches)	Horiz. Offsett Between (feet)
BG1	0.00	54.00	14.96	2.11	30.00	8.00	24.00	8.00	3.00
BG2	0.00	60.00	13.89	2.22	28.00	8.00	18.00	8.00	5.00
BG3	0.00	72.00	13.71	2.41	28.00	8.00	14.00	8.00	7.00
BG4	0.00	96.00	13.69	3.25	28.00	12.00	12.00	12.00	8.00
BG5	0.00	108.00	13.45	3.31	28.00	16.00	8.00	16.00	3.00

Notes:
1. Separation distance y' between Deck Section Center of Gravity to Segment Centerline (Boxcar and tracks).
2. Tranverse location of C.G. as measured from Left Edge of Top Slab.
3. Vertical location of C.G. as measured from Top Edge of Top Slab.

d) Bentcap Geometry



Bent Elevation looking Up-station

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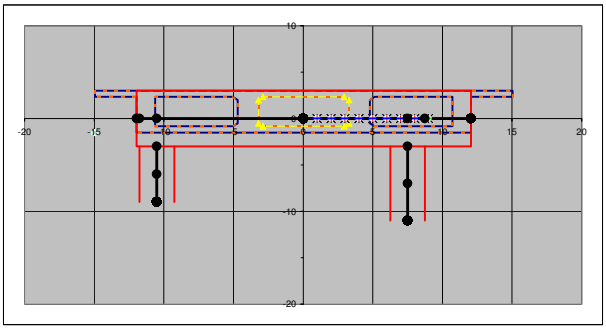
BENT INPUT DATA
SAP2000 BRIDGE ANALYSIS INPUT FILE DATA
ALAMEDA CREEK BRIDGE - AS-BUILT

2. Bent Input Data - Bent 2

Label : **Bent 2**



a) Alignment Data

L_1 = 0.00 feet (Centerline distance between Trackway Alignment and Segment 1)
L_2 = 0.00 feet (Centerline distance between Trackway Alignment and Segment 2)

		Line Segment 1		Line Segment 2	
	Trackway Alignment	Top of Deck	Deck C.G.	Top of Deck	Deck C.G.
Station (feet)	18,080	18,080	18,080		
X (feet)	35.33	35.33	35.33		
Y (feet)	11.27	11.27	11.27		
Z (feet)	59.34	59.34	57.23		

Heading = 18.60 Degrees
Skew Angle = 0.00 Degrees

b) Pier Node Assignment and Section Properties

Concrete : ρ_c = 0.145 kip/ft^3 => NWC (Normal vs Light Weight Concrete, ACI 2.2; threshold is 0.115 kcf)
f'_c = 4.00 Ksi => E = 4,743 Ksi

	Pier Definition						Section Dimensions						Section Properties					
Pier Number	L_C (feet)	Height h_C (feet)	Number of Nodes	Nodal Spacing (feet)	Shape	Material	b_w (inches)	d (inches)	a (inches)	b (inches)	t_w (inches)	t_f (inches)	Area (ft^2)	J (ft^4)	I_{33} (ft^4)	I_{22} (ft^4)	A_{22} (ft^2)	A_{33} (ft^2)
1	10.50	6.00	3	3.00	R	C	30.00	48.00					10.00	18.54	13.33	5.21	8.33	8.33
2	-7.50	8.00	3	4.00	R	C	30.00	48.00					10.00	18.54	13.33	5.21	8.33	8.33
3																		
4																		
5																		

Note : Maximum number of pier nodes is 40.

c) Bentcap Nodes and Section Properties

b_w = 7.00 feet => n = 6 (Bentcap Flange extent Factor for Top Slabs)
d = 6.00 feet
L_e = 0.00 feet (Bentcap Extension beyond Edge of Columns => L_{BC} = 24.00 feet (Length of Bentcap)

	Bent 2 Nodes																			
Node No.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Y (feet)	-11.96	-11.75	-10.50	0.00	7.50	8.75	12.04													
Z (feet)	0.00	0.00	0.00	0.00	0.00	0.00	0.00													
b_w (feet)	7.00	7.00	7.00	7.00	7.00	7.00	7.00													
d (feet)	6.00	6.00	6.00	6.00	6.00	6.00	6.00													
Approaching Section t_{Top} (feet)	0.67	0.67	0.67	0.67	0.67	0.67	0.67													
Approaching Section d_1 (feet)	4.50	4.50	4.50	4.50	4.50	4.50	4.50													
Approaching Section t_{Bott} (feet)	0.67	0.67	0.67	0.67	0.67	0.67	0.67													
Departing Section t_{Top} (feet)	0.67	0.67	0.67	0.67	0.67	0.67	0.67													
Departing Section d_1 (feet)	4.50	4.50	4.50	4.50	4.50	4.50	4.50													
Departing Section t_{Bott} (feet)	0.67	0.67	0.67	0.67	0.67	0.67	0.67													
Bentcap Section Properties y_i (feet)	3.15	3.15	3.15	3.15	3.15	3.15	3.15													
Bentcap Section Properties Area (ft^2)	52.67	52.67	52.67	52.67	52.67	52.67	52.67													
Bentcap Section Properties A_2 (ft^2)	35.00	35.00	35.00	35.00	35.00	35.00	35.00													
Bentcap Section Properties A_3 (ft^2)	45.67	45.67	45.67	45.67	45.67	45.67	45.67													
Bentcap Section Properties J (ft^4)	721.07	721.07	721.07	721.07	721.07	721.07	721.07													
Bentcap Section Properties I_{33} (ft^4)	212.68	212.68	212.68	212.68	212.68	212.68	212.68													
Bentcap Section Properties I_{22} (ft^4)	508.39	508.39	508.39	508.39	508.39	508.39	508.39													

d) Superstructure Data

Line Segment 1

Approaching Section : **BG1**
y'_1 = 0.00 feet = 0.00 inches
Z'_1 = -2.11 feet = -25.29 inches
$d_1 = H_{bg}$ = 4.50 feet (Box Girder Height) = 54.00 inches

	Slab Distance to Segment CL		Slab Distance to Trackway CL					
Box Girder Slab	Left Edge (feet)	Right Edge (feet)	Left Edge (feet)	Center of Gravity (feet)	Right Edge (feet)	Length (feet)	Thickness (inches)
Top	14.96	-15.04	14.96	0.00	-15.04	30.00	8.00
Bottom	11.96	-12.04	11.96		-12.04	24.00	8.00

Departing Section : **BG1**
y'_2 = 0.00 feet = 0.00 inches
Z'_2 = -2.11 feet = -25.29 inches
$d_2 = H_{bg}$ = 4.50 feet (Box Girder Height) = 54.00 inches

	Slab Distance to Segment CL		Slab Distance to Trackway CL					
Box Girder Slab	Left Edge (feet)	Right Edge (feet)	Left Edge (feet)	Center of Gravity (feet)	Right Edge (feet)	Length (feet)	Thickness (inches)
Top	14.96	-15.04	14.96	0.00	-15.04	30.00	8.00
Bottom	11.96	-12.04	11.96		-12.04	24.00	8.00

Line Segment 2

Approaching Section : **0**
y'_4 = 0.00 feet = 0.00 inches
Z'_4 = 0.00 feet = 0.00 inches
$d_4 = H_{bg}$ = 0.00 feet (Box Girder Height) = 0.00 inches

	Slab Distance to Segment CL		Slab Distance to Trackway CL					
Box Girder Slab	Left Edge (feet)	Right Edge (feet)	Left Edge (feet)	Center of Gravity (feet)	Right Edge (feet)	Length (feet)	Thickness (inches)
Top	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Bottom	0.00	0.00	0.00		0.00	0.00	0.00

Departing Section : **0**
y'_5 = 0.00 feet = 0.00 inches
Z'_5 = 0.00 feet = 0.00 inches
$d_5 = H_{bg}$ = 0.00 feet (Box Girder Height) = 0.00 inches

	Slab Distance to Segment CL		Slab Distance to Trackway CL					
Box Girder Slab	Left Edge (feet)	Right Edge (feet)	Left Edge (feet)	Center of Gravity (feet)	Right Edge (feet)	Length (feet)	Thickness (inches)
Top	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Bottom	0.00	0.00	0.00		0.00	0.00	0.00

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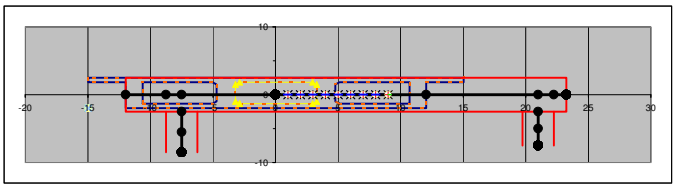
BENT INPUT DATA
SAP2000 BRIDGE ANALYSIS INPUT FILE DATA
ALAMEDA CREEK BRIDGE - AS-BUILT

2. Bent Input Data - Bent 3

Label : **Bent 3**



a) Alignment Data

L_1 = 0.00 feet (Centerline distance between Trackway Alignment and Segment 1)
L_2 = 0.00 feet (Centerline distance between Trackway Alignment and Segment 2)

	Trackway Alignment	Line Segment 1 Top of Deck	Line Segment 1 Deck C.G.	Line Segment 2 Top of Deck	Line Segment 2 Deck C.G.
Station (feet)	18,161	18,161	18,161		
X (feet)	116.00	116.00	116.00		
Y (feet)	37.00	37.00	37.00		
Z (feet)	60.22	60.22	58.11		

Heading = 18.60 Degrees
Skew Angle = 0.00 Degrees

b) Pier Node Assignment and Section Properties

Concrete : ρ_c = 0.145 kip/ft^3 => NWC (Normal vs Light Weight Concrete, ACI 2.2; threshold is 0.115 kcf)
f'_c = 4.00 Ksi => E = 4,743 Ksi

Pier Definition							Section Dimensions						Section Properties					
Pier Number	L_C (feet)	Height h_C (feet)	Number of Nodes	Nodal Spacing (feet)	Shape	Material	b_w (inches)	d (inches)	a (inches)	b (inches)	t_w (inches)	t_f (inches)	Area (ft^2)	J (ft^4)	I_{33} (ft^4)	I_{22} (ft^4)	A_{22} (ft^2)	A_{33} (ft^2)
1	7.50	6.00	3	3.00	R	C	30.00	51.00					10.63	21.53	15.99	5.53	8.85	8.85
2	-21.00	5.00	3	2.50	R	C	30.00	51.00					10.63	21.53	15.99	5.53	8.85	8.85
3																		
4																		
5																		

Note : Maximum number of pier nodes is 40.

c) Bentcap Nodes and Section Properties

b_w = 4.00 feet => n = 6 (Bentcap Flange extent Factor for Top Slabs)
d = 5.00 feet
L_e = 1.00 feet (Bentcap Extension beyond Edge of Columns => L_{BC} = 35.21 feet (Length of Bentcap)

	Bent 3 Nodes																			
Node No.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Y (feet)	-11.96	-8.75	-7.50	0.00	12.04	21.00	22.25	23.25												
Z (feet)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00												
b_w (feet)	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00												
d (feet)	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00												
Approaching Section t_{Top} (feet)	0.67	0.67	0.67	0.67	0.67															
Approaching Section d_1 (feet)	4.50	4.50	4.50	4.50	4.50															
Approaching Section t_{Bott} (feet)	0.67	0.67	0.67	0.67	0.67															
Departing Section t_{Top} (feet)	0.67	0.67	0.67	0.67	0.67															
Departing Section d_1 (feet)	4.50	4.50	4.50	4.50	4.50															
Departing Section t_{Bott} (feet)	0.67	0.67	0.67	0.67	0.67															
Bentcap Section Properties y_i (feet)	2.59	2.59	2.59	2.59	2.59	2.50	2.50	2.50												
Bentcap Section Properties Area (ft^2)	30.67	30.67	30.67	30.67	30.67	20.00	20.00	20.00												
Bentcap Section Properties A_2 (ft^2)	16.67	16.67	16.67	16.67	16.67	16.67	16.67	16.67												
Bentcap Section Properties A_3 (ft^2)	27.33	27.33	27.33	27.33	27.33	16.67	16.67	16.67												
Bentcap Section Properties J (ft^4)	311.39	311.39	311.39	311.39	311.39	68.33	68.33	68.33												
Bentcap Section Properties I_{33} (ft^4)	99.83	99.83	99.83	99.83	99.83	41.67	41.67	41.67												
Bentcap Section Properties I_{22} (ft^4)	211.56	211.56	211.56	211.56	211.56	26.67	26.67	26.67												

d) Superstructure Data

Line Segment 1

Approaching Section : **BG1**
y'_1 = 0.00 feet = 0.00 inches
Z'_1 = -2.11 feet = -25.29 inches
$d_1 = H_{bg}$ = 4.50 feet (Box Girder Height) = 54.00 inches

Box Girder Slab	Slab Distance to Left Edge (feet)	Slab Distance to Right Edge (feet)	Slab Distance to Trackway CL Left Edge (feet)	Slab Distance to Trackway CL Center of Gravity (feet)	Slab Distance to Trackway CL Right Edge (feet)	Length (feet)	Thickness (inches)
Top	14.96	-15.04	14.96	0.00	-15.04	30.00	8.00
Bottom	11.96	-12.04	11.96		-12.04	24.00	8.00

Departing Section : **BG1**
y'_2 = 0.00 feet = 0.00 inches
Z'_2 = -2.11 feet = -25.29 inches
$d_2 = H_{bg}$ = 4.50 feet (Box Girder Height) = 54.00 inches

Box Girder Slab	Slab Distance to Left Edge (feet)	Slab Distance to Right Edge (feet)	Slab Distance to Trackway CL Left Edge (feet)	Slab Distance to Trackway CL Center of Gravity (feet)	Slab Distance to Trackway CL Right Edge (feet)	Length (feet)	Thickness (inches)
Top	14.96	-15.04	14.96	0.00	-15.04	30.00	8.00
Bottom	11.96	-12.04	11.96		-12.04	24.00	8.00

Line Segment 2

Approaching Section : **0**
y'_4 = 0.00 feet = 0.00 inches
Z'_4 = 0.00 feet = 0.00 inches
$d_4 = H_{bg}$ = 0.00 feet (Box Girder Height) = 0.00 inches

Box Girder Slab	Slab Distance to Left Edge (feet)	Slab Distance to Right Edge (feet)	Slab Distance to Trackway CL Left Edge (feet)	Slab Distance to Trackway CL Center of Gravity (feet)	Slab Distance to Trackway CL Right Edge (feet)	Length (feet)	Thickness (inches)
Top	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Bottom	0.00	0.00	0.00		0.00	0.00	0.00

Departing Section : **0**
y'_5 = 0.00 feet = 0.00 inches
Z'_5 = 0.00 feet = 0.00 inches
$d_5 = H_{bg}$ = 0.00 feet (Box Girder Height) = 0.00 inches

Box Girder Slab	Slab Distance to Left Edge (feet)	Slab Distance to Right Edge (feet)	Slab Distance to Trackway CL Left Edge (feet)	Slab Distance to Trackway CL Center of Gravity (feet)	Slab Distance to Trackway CL Right Edge (feet)	Length (feet)	Thickness (inches)
Top	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Bottom	0.00	0.00	0.00		0.00	0.00	0.00

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BENT INPUT DATA
SAP2000 BRIDGE ANALYSIS INPUT FILE DATA
ALAMEDA CREEK BRIDGE - AS-BUILT

2. Bent Input Data - Bent 4

Label : **Bent 4**

a) Alignment Data

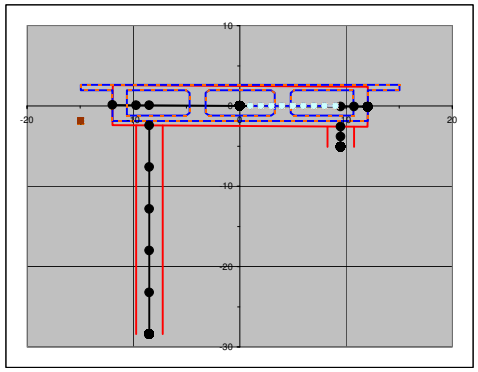
L_1 = 0.00 feet (Centerline distance between Trackway Alignment and Segment 1)

L_2 = 0.00 feet (Centerline distance between Trackway Alignment and Segment 2)

		Line Segment 1		Line Segment 2	
	Trackway Alignment	Top of Deck	Deck C.G.	Top of Deck	Deck C.G.
Station (feet)	18,223	18,223	18,223		
X (feet)	178.00	178.00	178.00		
Y (feet)	56.77	56.77	56.77		
Z (feet)	60.44	60.44	58.33		

Heading = 18.60 Degrees

Skew Angle = 0.50 Degrees



b) Pier Node Assignment and Section Properties

Concrete : ρ_c = 0.145 kip/ft^3 => NWC (Normal vs Light Weight Concrete, ACI 2.2; threshold is 0.115 kcf)

f'_c = 4.00 Ksi => E = 4,743 Ksi

	Pier Definition						Section Dimensions					
Pier Number	L_C (feet)	Height h_C (feet)	Number of Nodes	Nodal Spacing (feet)	Shape	Material	b_w (inches)	d (inches)	a (inches)	b (inches)	t_w (inches)	t_f (inches)
1	8.50	26.00	6	5.20	**R**	C	30.00	51.00				
2	-9.50	2.50	3	1.25	**R**	C	30.00	51.00				
3												
4												
5												

Section Properties					
Area (ft^2)	J (ft^4)	I_{33} (ft^4)	I_{22} (ft^4)	A_{22} (ft^2)	A_{33} (ft^2)
10.63	21.53	15.99	5.53	8.85	8.85
10.63	21.53	15.99	5.53	8.85	8.85

Note : Maximum number of pier nodes is 40.

c) Bentcap Nodes and Section Properties

b_w = 4.00 feet => n = 6 (Bentcap Flange extent Factor for Top Slabs)

d = 5.00 feet

L_e = 0.00 feet (Bentcap Extension beyond Edge of Columns => L_{BC} = 24.00 feet (Length of Bentcap)

	Bent 4 Nodes																		
Node No.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Y (feet)	-11.96	-9.75	-8.50	0.00	9.50	10.75	12.04													
Z (feet)	0.10	0.09	0.07	0.00	-0.08	-0.09	-0.11													
b_w (feet)	4.00	4.00	4.00	4.00	4.00	4.00	4.00													
d (feet)	5.00	5.00	5.00	5.00	5.00	5.00	5.00													
Approaching Section t_{Top} (feet)	0.67	0.67	0.67	0.67	0.67	0.67	0.67													
Approaching Section d_1 (feet)	4.50	4.50	4.50	4.50	4.50	4.50	4.50													
Approaching Section t_{Bott} (feet)	0.67	0.67	0.67	0.67	0.67	0.67	0.67													
Departing Section t_{Top} (feet)	0.67	0.67	0.67	0.67	0.67	0.67	0.67													
Departing Section d_1 (feet)	4.50	4.50	4.50	4.50	4.50	4.50	4.50													
Departing Section t_{Bott} (feet)	0.67	0.67	0.67	0.67	0.67	0.67	0.67													
Bentcap Section Properties y_i (feet)	2.59	2.59	2.59	2.59	2.59	2.59	2.59													
Bentcap Section Properties Area (ft^2)	30.67	30.67	30.67	30.67	30.67	30.67	30.67													
Bentcap Section Properties A_2 (ft^2)	16.67	16.67	16.67	16.67	16.67	16.67	16.67													
Bentcap Section Properties A_3 (ft^2)	27.33	27.33	27.33	27.33	27.33	27.33	27.33													
Bentcap Section Properties J (ft^4)	311.39	311.39	311.39	311.39	311.39	311.39	311.39													
Bentcap Section Properties I_{33} (ft^4)	99.83	99.83	99.83	99.83	99.83	99.83	99.83													
Bentcap Section Properties I_{22} (ft^4)	211.56	211.56	211.56	211.56	211.56	211.56	211.56													

d) Superstructure Data

Line Segment 1

Approaching Section : **BG1**

y'_1 = 0.00 feet = 0.00 inches

Z'_1 = -2.11 feet = -25.29 inches

$d_1 = H_{bg}$ = 4.50 feet (Box Girder Height) = 54.00 inches

	Slab Distance to		Slab Distance to Trackway CL				
Box Girder Slab	Left Edge (feet)	Right Edge (feet)	Left Edge (feet)	Center of Gravity (feet)	Right Edge (feet)	Length (feet)	Thickness (inches)
Top	14.96	-15.04	14.96	0.00	-15.04	30.00	8.00
Bottom	11.96	-12.04	11.96		-12.04	24.00	8.00

Departing Section : **BG1**

y'_2 = 0.00 feet = 0.00 inches

Z'_2 = -2.11 feet = -25.29 inches

$d_2 = H_{bg}$ = 4.50 feet (Box Girder Height) = 54.00 inches

	Slab Distance to		Slab Distance to Trackway CL				
Box Girder Slab	Left Edge (feet)	Right Edge (feet)	Left Edge (feet)	Center of Gravity (feet)	Right Edge (feet)	Length (feet)	Thickness (inches)
Top	14.96	-15.04	14.96	0.00	-15.04	30.00	8.00
Bottom	11.96	-12.04	11.96		-12.04	24.00	8.00

Line Segment 2

Approaching Section : **0**

y'_4 = 0.00 feet = 0.00 inches

Z'_4 = 0.00 feet = 0.00 inches

$d_4 = H_{bg}$ = 0.00 feet (Box Girder Height) = 0.00 inches

	Slab Distance to		Slab Distance to Trackway CL				
Box Girder Slab	Left Edge (feet)	Right Edge (feet)	Left Edge (feet)	Center of Gravity (feet)	Right Edge (feet)	Length (feet)	Thickness (inches)
Top	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Bottom	0.00	0.00	0.00		0.00	0.00	0.00

Departing Section : **0**

y'_5 = 0.00 feet = 0.00 inches

Z'_5 = 0.00 feet = 0.00 inches

$d_5 = H_{bg}$ = 0.00 feet (Box Girder Height) = 0.00 inches

	Slab Distance to		Slab Distance to Trackway CL				
Box Girder Slab	Left Edge (feet)	Right Edge (feet)	Left Edge (feet)	Center of Gravity (feet)	Right Edge (feet)	Length (feet)	Thickness (inches)
Top	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Bottom	0.00	0.00	0.00		0.00	0.00	0.00

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BENT INPUT DATA
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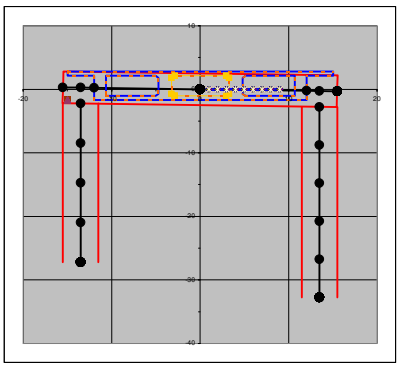
ALAMEDA CREEK BRIDGE - AS-BUILT

2. Bent Input Data - Bent 5

Label : **Bent 5**



a) Alignment Data

L_1 = 0.00 feet (Centerline distance between Trackway Alignment and Segment 1)

L_2 = 0.00 feet (Centerline distance between Trackway Alignment and Segment 2)

		Line Segment 1		Line Segment 2	
	Trackway Alignment	Top of Deck	Deck C.G.	Top of Deck	Deck C.G.
Station (feet)	18,287	18,287	18,287		
X (feet)	242.00	242.00	242.00		
Y (feet)	77.19	77.19	77.19		
Z (feet)	60.36	60.36	58.25		

Heading = 18.60 Degrees

Skew Angle = 1.13 Degrees

b) Pier Node Assignment and Section Properties

Concrete : ρ_c = 0.145 kip/ft^3 => NWC (Normal vs Light Weight Concrete, ACI 2.2; threshold is 0.115 kcf)

f'_c = 4.00 Ksi => E = 4,743 Ksi

	Pier Definition						Section Dimensions					
Pier Number	L_C (feet)	Height h_C (feet)	Number of Nodes	Nodal Spacing (feet)	Shape	Material	b_w (inches)	d (inches)	a (inches)	b (inches)	t_w (inches)	t_f (inches)
1	13.50	25.00	5	6.25	R	C	48.00	36.00				
2	-13.50	30.00	6	6.00	R	C	48.00	36.00				
3												
4												
5												

Section Properties					
Area (ft^2)	J (ft^4)	I_{33} (ft^4)	I_{22} (ft^4)	A_{22} (ft^2)	A_{33} (ft^2)
12.00	25.00	9.00	16.00	10.00	10.00
12.00	25.00	9.00	16.00	10.00	10.00

Note : Maximum number of pier nodes is 40.

c) Bentcap Nodes and Section Properties

b_w = 4.00 feet => n = 6 (Bentcap Flange extent Factor for Top Slabs)

d = 5.00 feet

L_e = 0.00 feet (Bentcap Extension beyond Edge of Columns => L_{BC} = 31.00 feet (Length of Bentcap)

	Bent 5 Nodes																		
Node No.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Y (feet)	-15.50	-13.50	-11.96	0.00	12.04	13.50	15.50													
Z (feet)	0.30	0.27	0.23	0.00	-0.24	-0.27	-0.30													
b_w (feet)	4.00	4.00	4.00	4.00	4.00	4.00	4.00													
d (feet)	5.00	5.00	5.00	5.00	5.00	5.00	5.00													
Approaching Section t_{Top} (feet)		0.67	0.67	0.67	0.67	0.67														
Approaching Section d_1 (feet)			4.50	4.50	4.50															
Approaching Section t_{Bott} (feet)			0.67	0.67	0.67															
Departing Section t_{Top} (feet)		0.67	0.67	0.67	0.67	0.67														
Departing Section d_1 (feet)			4.50	4.50	4.50															
Departing Section t_{Bott} (feet)			0.67	0.67	0.67															
Bentcap Section Properties y_i (feet)	2.50	2.96	2.59	2.59	2.59	2.96	2.50													
Bentcap Section Properties Area (ft^2)	20.00	25.33	30.67	30.67	30.67	25.33	20.00													
Bentcap Section Properties A_2 (ft^2)	16.67	16.67	16.67	16.67	16.67	16.67	16.67													
Bentcap Section Properties A_3 (ft^2)	16.67	22.00	27.33	27.33	27.33	22.00	16.67													
Bentcap Section Properties J (ft^4)	68.33	180.74	311.39	311.39	311.39	180.74	68.33													
Bentcap Section Properties I_{33} (ft^4)	41.67	61.63	99.83	99.83	99.83	61.63	41.67													
Bentcap Section Properties I_{22} (ft^4)	26.67	119.11	211.56	211.56	211.56	119.11	26.67													

d) Superstructure Data

Line Segment 1

Approaching Section : **BG1**

y'_1 = 0.00 feet = 0.00 inches

Z'_1 = -2.11 feet = -25.29 inches

$d_1 = H_{bg}$ = 4.50 feet (Box Girder Height) = 54.00 inches

	Slab Distance to		Slab Distance to Trackway CL				
Box Girder Slab	Left Edge (feet)	Right Edge (feet)	Left Edge (feet)	Center of Gravity (feet)	Right Edge (feet)	Length (feet)	Thickness (inches)
Top	14.96	-15.04	14.96	0.00	-15.04	30.00	8.00
Bottom	11.96	-12.04	11.96		-12.04	24.00	8.00

Departing Section : **BG1**

y'_2 = 0.00 feet = 0.00 inches

Z'_2 = -2.11 feet = -25.29 inches

$d_2 = H_{bg}$ = 4.50 feet (Box Girder Height) = 54.00 inches

	Slab Distance to		Slab Distance to Trackway CL				
Box Girder Slab	Left Edge (feet)	Right Edge (feet)	Left Edge (feet)	Center of Gravity (feet)	Right Edge (feet)	Length (feet)	Thickness (inches)
Top	14.96	-15.04	14.96	0.00	-15.04	30.00	8.00
Bottom	11.96	-12.04	11.96		-12.04	24.00	8.00

Line Segment 2

Approaching Section : **0**

y'_4 = 0.00 feet = 0.00 inches

Z'_4 = 0.00 feet = 0.00 inches

$d_4 = H_{bg}$ = 0.00 feet (Box Girder Height) = 0.00 inches

	Slab Distance to		Slab Distance to Trackway CL				
Box Girder Slab	Left Edge (feet)	Right Edge (feet)	Left Edge (feet)	Center of Gravity (feet)	Right Edge (feet)	Length (feet)	Thickness (inches)
Top	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Bottom	0.00	0.00	0.00		0.00	0.00	0.00

Departing Section : **0**

y'_5 = 0.00 feet = 0.00 inches

Z'_5 = 0.00 feet = 0.00 inches

$d_5 = H_{bg}$ = 0.00 feet (Box Girder Height) = 0.00 inches

	Slab Distance to		Slab Distance to Trackway CL				
Box Girder Slab	Left Edge (feet)	Right Edge (feet)	Left Edge (feet)	Center of Gravity (feet)	Right Edge (feet)	Length (feet)	Thickness (inches)
Top	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Bottom	0.00	0.00	0.00		0.00	0.00	0.00

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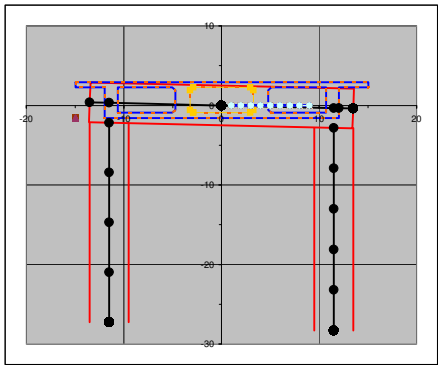
2. Bent Input Data - Bent 6

Label : **Bent 6**



a) Alignment Data

L_1 = 0.00 feet (Centerline distance between Trackway Alignment and Segment 1)

L_2 = 0.00 feet (Centerline distance between Trackway Alignment and Segment 2)

		Line Segment 1		Line Segment 2	
	Trackway Alignment	Top of Deck	Deck C.G.	Top of Deck	Deck C.G.
Station (feet)	18,351	18,351	18,351		
X (feet)	306.00	306.00	306.00		
Y (feet)	97.60	97.60	97.60		
Z (feet)	59.97	59.97	57.87		

Heading = 18.60 Degrees

Skew Angle = 1.63 Degrees

b) Pier Node Assignment and Section Properties

Concrete : ρ_c = 0.145 kip/ft^3 => NWC (Normal vs Light Weight Concrete, ACI 2.2; threshold is 0.115 kcf)

f'_c = 4.00 Ksi => E = 4,743 Ksi

	Pier Definition						Section Dimensions					
Pier Number	L_C (feet)	Height h_C (feet)	Number of Nodes	Nodal Spacing (feet)	Shape	Material	b_w (inches)	d (inches)	a (inches)	b (inches)	t_w (inches)	t_f (inches)
1	11.50	25.08	5	6.27	**R**	C	48.00	36.00				
2	-11.50	25.49	6	5.10	**R**	C	48.00	36.00				
3												
4												
5												

Section Properties					
Area (ft^2)	J (ft^4)	I_{33} (ft^4)	I_{22} (ft^4)	A_{22} (ft^2)	A_{33} (ft^2)
12.00	25.00	9.00	16.00	10.00	10.00
12.00	25.00	9.00	16.00	10.00	10.00

Note : Maximum number of pier nodes is 40.

c) Bentcap Nodes and Section Properties

b_w = 4.00 feet => n = 6 (Bentcap Flange extent Factor for Top Slabs)

d = 5.00 feet

L_e = 0.00 feet (Bentcap Extension beyond Edge of Columns => L_{BC} = 27.00 feet (Length of Bentcap)

	Bent 6 Nodes																		
Node No.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Y (feet)	-13.50	-11.50	0.00	11.50	12.04	13.50														
Z (feet)	0.38	0.33	0.00	-0.33	-0.34	-0.38														
b_w (feet)	4.00	4.00	4.00	4.00	4.00	4.00														
d (feet)	5.00	5.00	5.00	5.00	5.00	5.00														
Approaching Section t_{Top} (feet)	0.67	0.67	0.67	0.67	0.67	0.67														
Approaching Section d_1 (feet)		4.50	4.50	4.50	4.50															
Approaching Section t_{Bott} (feet)		0.67	0.67	0.67	0.67															
Departing Section t_{Top} (feet)	0.67	0.67	0.67	0.67	0.67	0.67														
Departing Section d_1 (feet)		4.50	4.50	4.50	4.50															
Departing Section t_{Bott} (feet)		0.67	0.67	0.67	0.67															
Bentcap Section Properties y_i (feet)	2.96	2.59	2.59	2.59	2.59	2.96														
Bentcap Section Properties Area (ft^2)	25.33	30.67	30.67	30.67	30.67	25.33														
Bentcap Section Properties A_2 (ft^2)	16.67	16.67	16.67	16.67	16.67	16.67														
Bentcap Section Properties A_3 (ft^2)	22.00	27.33	27.33	27.33	27.33	22.00														
Bentcap Section Properties J (ft^4)	180.74	311.39	311.39	311.39	311.39	180.74														
Bentcap Section Properties I_{33} (ft^4)	61.63	99.83	99.83	99.83	99.83	61.63														
Bentcap Section Properties I_{22} (ft^4)	119.11	211.56	211.56	211.56	211.56	119.11														

d) Superstructure Data

Line Segment 1

Approaching Section : **BG1**

y'_1 = 0.00 feet = 0.00 inches

Z'_1 = -2.11 feet = -25.29 inches

$d_1 = H_{bg}$ = 4.50 feet (Box Girder Height) = 54.00 inches

	Slab Distance to		Slab Distance to Trackway CL				
Box Girder Slab	Left Edge (feet)	Right Edge (feet)	Left Edge (feet)	Center of Gravity (feet)	Right Edge (feet)	Length (feet)	Thickness (inches)
Top	14.96	-15.04	14.96	0.00	-15.04	30.00	8.00
Bottom	11.96	-12.04	11.96		-12.04	24.00	8.00

Departing Section : **BG1**

y'_2 = 0.00 feet = 0.00 inches

Z'_2 = -2.11 feet = -25.29 inches

$d_2 = H_{bg}$ = 4.50 feet (Box Girder Height) = 54.00 inches

	Slab Distance to		Slab Distance to Trackway CL				
Box Girder Slab	Left Edge (feet)	Right Edge (feet)	Left Edge (feet)	Center of Gravity (feet)	Right Edge (feet)	Length (feet)	Thickness (inches)
Top	14.96	-15.04	14.96	0.00	-15.04	30.00	8.00
Bottom	11.96	-12.04	11.96		-12.04	24.00	8.00

Line Segment 2

Approaching Section : **0**

y'_4 = 0.00 feet = 0.00 inches

Z'_4 = 0.00 feet = 0.00 inches

$d_4 = H_{bg}$ = 0.00 feet (Box Girder Height) = 0.00 inches

	Slab Distance to		Slab Distance to Trackway CL				
Box Girder Slab	Left Edge (feet)	Right Edge (feet)	Left Edge (feet)	Center of Gravity (feet)	Right Edge (feet)	Length (feet)	Thickness (inches)
Top	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Bottom	0.00	0.00	0.00		0.00	0.00	0.00

Departing Section : **0**

y'_5 = 0.00 feet = 0.00 inches

Z'_5 = 0.00 feet = 0.00 inches

$d_5 = H_{bg}$ = 0.00 feet (Box Girder Height) = 0.00 inches

	Slab Distance to		Slab Distance to Trackway CL				
Box Girder Slab	Left Edge (feet)	Right Edge (feet)	Left Edge (feet)	Center of Gravity (feet)	Right Edge (feet)	Length (feet)	Thickness (inches)
Top	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Bottom	0.00	0.00	0.00		0.00	0.00	0.00

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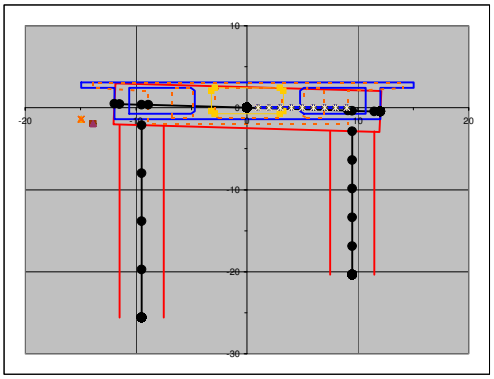
BENT INPUT DATA
SAP2000 BRIDGE ANALYSIS INPUT FILE DATA
ALAMEDA CREEK BRIDGE - AS-BUILT

2. Bent Input Data - Bent 7

Label : **Bent 7**



a) Alignment Data

L_1 = 0.00 feet (Centerline distance between Trackway Alignment and Segment 1)

L_2 = 0.00 feet (Centerline distance between Trackway Alignment and Segment 2)

		Line Segment 1		Line Segment 2	
	Trackway Alignment	Top of Deck	Deck C.G.	Top of Deck	Deck C.G.
Station (feet)	18,415	18,415	18,415		
X (feet)	370.00	370.00	370.00		
Y (feet)	118.01	118.01	118.01		
Z (feet)	59.28	59.28	57.06		

Heading = 18.60 Degrees

Skew Angle = 2.25 Degrees

b) Pier Node Assignment and Section Properties

Concrete : ρ_c = 0.145 kip/ft^3 => NWC (Normal vs Light Weight Concrete, ACI 2.2; threshold is 0.115 kcf)

f'_c = 4.00 Ksi => E = 4,743 Ksi

	Pier Definition						Section Dimensions					
Pier Number	L_C (feet)	Height h_C (feet)	Number of Nodes	Nodal Spacing (feet)	Shape	Material	b_w (inches)	d (inches)	a (inches)	b (inches)	t_w (inches)	t_f (inches)
1	9.50	23.47	5	5.87	**R**	C	48.00	36.00				
2	-9.50	17.50	6	3.50	**R**	C	48.00	36.00				
3												
4												
5												

Section Properties					
Area (ft^2)	J (ft^4)	I_{33} (ft^4)	I_{22} (ft^4)	A_{22} (ft^2)	A_{33} (ft^2)
12.00	25.00	9.00	16.00	10.00	10.00
12.00	25.00	9.00	16.00	10.00	10.00

Note : Maximum number of pier nodes is 40.

c) Bentcap Nodes and Section Properties

b_w = 4.00 feet => n = 6 (Bentcap Flange extent Factor for Top Slabs)

d = 5.00 feet

L_e = 0.00 feet (Bentcap Extension beyond Edge of Columns => L_{BC} = 24.00 feet (Length of Bentcap)

	Bent 7 Nodes																		
Node No.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Y (feet)	-11.96	-11.50	-9.50	-8.89	0.00	9.11	9.50	11.50	12.04											
Z (feet)	0.47	0.45	0.37	0.35	0.00	-0.36	-0.37	-0.45	-0.47											
b_w (feet)	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00											
d (feet)	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00											
Approaching Section t_{Top} (feet)	0.67	0.67	0.67	0.67	0.67	0.67	0.67	0.67	0.67											
Approaching Section d_1 (feet)	4.50	4.50	4.50	4.50	4.50	4.50	4.50	4.50	4.50											
Approaching Section t_{Bott} (feet)	0.67	0.67	0.67	0.67	0.67	0.67	0.67	0.67	0.67											
Departing Section t_{Top} (feet)	0.67	0.67	0.67	0.67	0.67	0.67	0.67	0.67	0.67											
Departing Section d_1 (feet)				5.00	5.00	5.00														
Departing Section t_{Bott} (feet)				0.67	0.67	0.67														
Bentcap Section Properties y_i (feet)	2.75	2.75	2.75	2.54	2.54	2.54	2.75	2.75	2.75											
Bentcap Section Properties Area (ft^2)	28.00	28.00	28.00	30.67	30.67	30.67	28.00	28.00	28.00											
Bentcap Section Properties A_2 (ft^2)	16.67	16.67	16.67	16.67	16.67	16.67	16.67	16.67	16.67											
Bentcap Section Properties A_3 (ft^2)	24.67	24.67	24.67	27.33	27.33	27.33	24.67	24.67	24.67											
Bentcap Section Properties J (ft^4)	247.72	247.72	247.72	310.53	310.53	310.53	247.72	247.72	247.72											
Bentcap Section Properties I_{33} (ft^4)	82.38	82.38	82.38	98.97	98.97	98.97	82.38	82.38	82.38											
Bentcap Section Properties I_{22} (ft^4)	165.33	165.33	165.33	211.56	211.56	211.56	165.33	165.33	165.33											

d) Superstructure Data

Line Segment 1

Approaching Section : **BG1**

y'_1 = 0.00 feet = 0.00 inches

Z'_1 = -2.11 feet = -25.29 inches

$d_1 = H_{bg}$ = 4.50 feet (Box Girder Height) = 54.00 inches

	Slab Distance to		Slab Distance to Trackway CL				
Box Girder Slab	Left Edge (feet)	Right Edge (feet)	Left Edge (feet)	Center of Gravity (feet)	Right Edge (feet)	Length (feet)	Thickness (inches)
Top	14.96	-15.04	14.96	0.00	-15.04	30.00	8.00
Bottom	11.96	-12.04	11.96		-12.04	24.00	8.00

Departing Section : **BG2**

y'_2 = 0.00 feet = 0.00 inches

Z'_2 = -2.22 feet = -26.70 inches

$d_2 = H_{bg}$ = 5.00 feet (Box Girder Height) = 60.00 inches

	Slab Distance to		Slab Distance to Trackway CL				
Box Girder Slab	Left Edge (feet)	Right Edge (feet)	Left Edge (feet)	Center of Gravity (feet)	Right Edge (feet)	Length (feet)	Thickness (inches)
Top	13.89	-14.11	13.89	0.00	-14.11	28.00	8.00
Bottom	8.89	-9.11	8.89		-9.11	18.00	8.00

Line Segment 2

Approaching Section : **0**

y'_4 = 0.00 feet = 0.00 inches

Z'_4 = 0.00 feet = 0.00 inches

$d_4 = H_{bg}$ = 0.00 feet (Box Girder Height) = 0.00 inches

	Slab Distance to		Slab Distance to Trackway CL				
Box Girder Slab	Left Edge (feet)	Right Edge (feet)	Left Edge (feet)	Center of Gravity (feet)	Right Edge (feet)	Length (feet)	Thickness (inches)
Top	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Bottom	0.00	0.00	0.00		0.00	0.00	0.00

Departing Section : **0**

y'_5 = 0.00 feet = 0.00 inches

Z'_5 = 0.00 feet = 0.00 inches

$d_5 = H_{bg}$ = 0.00 feet (Box Girder Height) = 0.00 inches

	Slab Distance to		Slab Distance to Trackway CL				
Box Girder Slab	Left Edge (feet)	Right Edge (feet)	Left Edge (feet)	Center of Gravity (feet)	Right Edge (feet)	Length (feet)	Thickness (inches)
Top	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Bottom	0.00	0.00	0.00		0.00	0.00	0.00

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BENT INPUT DATA
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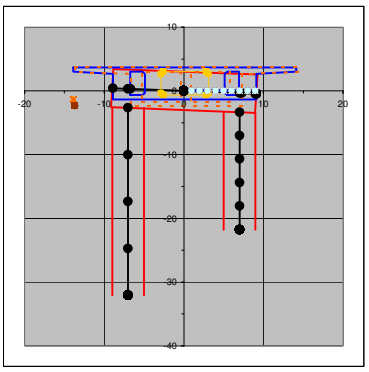
ALAMEDA CREEK BRIDGE - AS-BUILT

2. Bent Input Data - Bent 8

Label : **Bent 8**



a) Alignment Data

L_1 = 0.00 feet (Centerline distance between Trackway Alignment and Segment 1)
L_2 = 0.00 feet (Centerline distance between Trackway Alignment and Segment 2)

	Trackway Alignment	Line Segment 1 Top of Deck	Line Segment 1 Deck C.G.	Line Segment 2 Top of Deck	Line Segment 2 Deck C.G.
Station (feet)	18,479	18,479	18,479		
X (feet)	434.00	434.00	434.00		
Y (feet)	135.98	135.98	135.98		
Z (feet)	58.28	58.28	55.88		

Heading = 14.93 Degrees
Skew Angle = 2.75 Degrees

b) Pier Node Assignment and Section Properties

Concrete : ρ_c = 0.145 kip/ft^3 => NWC (Normal vs Light Weight Concrete, ACI 2.2; threshold is 0.115 kcf)
f'_c = 4.00 Ksi => E = 4,743 Ksi

Pier Definition							Section Dimensions					
Pier Number	L_C (feet)	Height h_C (feet)	Number of Nodes	Nodal Spacing (feet)	Shape	Material	b_w (inches)	d (inches)	a (inches)	b (inches)	t_w (inches)	t_f (inches)
1	7.00	29.40	5	7.35	**R**	C	48.00	36.00				
2	-7.00	18.42	6	3.68	**R**	C	48.00	36.00				
3												
4												
5												

Section Properties					
Area (ft^2)	J (ft^4)	I_{33} (ft^4)	I_{22} (ft^4)	A_{22} (ft^2)	A_{33} (ft^2)
12.00	25.00	9.00	16.00	10.00	10.00
12.00	25.00	9.00	16.00	10.00	10.00

Note : Maximum number of pier nodes is 40.

c) Bentcap Nodes and Section Properties

b_w = 4.00 feet => n = 6 (Bentcap Flange extent Factor for Top Slabs)
d = 6.00 feet
L_e = 0.00 feet (Bentcap Extension beyond Edge of Columns => L_{BC} = 18.11 feet (Length of Bentcap)

	Bent 8 Nodes																		
Node No.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Y (feet)	-8.89	-7.00	-6.71	0.00	7.00	7.29	9.00													
Z (feet)	0.43	0.34	0.32	0.00	-0.34	-0.35	-0.43													
b_w (feet)	4.00	4.00	4.00	4.00	4.00	4.00	4.00													
d (feet)	6.00	6.00	6.00	6.00	6.00	6.00	6.00													
Approaching Section t_{Top} (feet)	0.67	0.67	0.67	0.67	0.67	0.67	0.67													
Approaching Section d_1 (feet)	5.00	5.00	5.00	5.00	5.00	5.00	5.00													
Approaching Section t_{Bott} (feet)	0.67	0.67	0.67	0.67	0.67	0.67	0.67													
Departing Section t_{Top} (feet)	0.67	0.67	0.67	0.67	0.67	0.67	0.67													
Departing Section d_1 (feet)			6.00	6.00	6.00	6.00														
Departing Section t_{Bott} (feet)			0.67	0.67	0.67	0.67														
Bentcap Section Properties y_i (feet)	3.31	3.31	3.08	3.08	3.08	3.08	3.31													
Bentcap Section Properties Area (ft^2)	32.00	32.00	34.67	34.67	34.67	34.67	32.00													
Bentcap Section Properties A_2 (ft^2)	20.00	20.00	20.00	20.00	20.00	20.00	20.00													
Bentcap Section Properties A_3 (ft^2)	28.00	28.00	30.67	30.67	30.67	30.67	28.00													
Bentcap Section Properties J (ft^4)	302.62	302.62	371.68	371.68	371.68	371.68	302.62													
Bentcap Section Properties I_{33} (ft^4)	131.96	131.96	154.79	154.79	154.79	154.79	131.96													
Bentcap Section Properties I_{22} (ft^4)	170.67	170.67	216.89	216.89	216.89	216.89	170.67													

d) Superstructure Data

Line Segment 1

Approaching Section : **BG2**
y'_1 = 0.00 feet = 0.00 inches
Z'_1 = -2.22 feet = -26.70 inches
$d_1 = H_{bg}$ = 5.00 feet (Box Girder Height) = 60.00 inches

Box Girder Slab	Slab Distance to Left Edge (feet)	Slab Distance to Right Edge (feet)	Slab Distance to Trackway CL Left Edge (feet)	Slab Distance to Trackway CL Center of Gravity (feet)	Slab Distance to Trackway CL Right Edge (feet)	Length (feet)	Thickness (inches)
Top	13.89	-14.11	13.89	0.00	-14.11	28.00	8.00
Bottom	8.89	-9.11	8.89		-9.11	18.00	8.00

Departing Section : **BG3**
y'_2 = 0.00 feet = 0.00 inches
Z'_2 = -2.41 feet = -28.86 inches
$d_2 = H_{bg}$ = 6.00 feet (Box Girder Height) = 72.00 inches

Box Girder Slab	Slab Distance to Left Edge (feet)	Slab Distance to Right Edge (feet)	Slab Distance to Trackway CL Left Edge (feet)	Slab Distance to Trackway CL Center of Gravity (feet)	Slab Distance to Trackway CL Right Edge (feet)	Length (feet)	Thickness (inches)
Top	13.71	-14.29	13.71	0.00	-14.29	28.00	8.00
Bottom	6.71	-7.29	6.71		-7.29	14.00	8.00

Line Segment 2

Approaching Section : **0**
y'_4 = 0.00 feet = 0.00 inches
Z'_4 = 0.00 feet = 0.00 inches
$d_4 = H_{bg}$ = 0.00 feet (Box Girder Height) = 0.00 inches

Box Girder Slab	Slab Distance to Left Edge (feet)	Slab Distance to Right Edge (feet)	Slab Distance to Trackway CL Left Edge (feet)	Slab Distance to Trackway CL Center of Gravity (feet)	Slab Distance to Trackway CL Right Edge (feet)	Length (feet)	Thickness (inches)
Top	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Bottom	0.00	0.00	0.00		0.00	0.00	0.00

Departing Section : **0**
y'_5 = 0.00 feet = 0.00 inches
Z'_5 = 0.00 feet = 0.00 inches
$d_5 = H_{bg}$ = 0.00 feet (Box Girder Height) = 0.00 inches

Box Girder Slab	Slab Distance to Left Edge (feet)	Slab Distance to Right Edge (feet)	Slab Distance to Trackway CL Left Edge (feet)	Slab Distance to Trackway CL Center of Gravity (feet)	Slab Distance to Trackway CL Right Edge (feet)	Length (feet)	Thickness (inches)
Top	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Bottom	0.00	0.00	0.00		0.00	0.00	0.00

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BENT INPUT DATA
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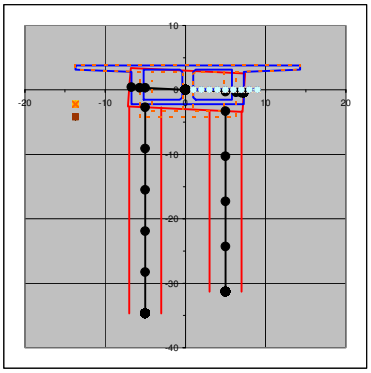
ALAMEDA CREEK BRIDGE - AS-BUILT

2. Bent Input Data - Bent 9

Label : **Bent 9**



a) Alignment Data

L_1 = 0.00 feet (Centerline distance between Trackway Alignment and Segment 1)
L_2 = 0.00 feet (Centerline distance between Trackway Alignment and Segment 2)

	Trackway Alignment	Line Segment 1 Top of Deck	Line Segment 1 Deck C.G.	Line Segment 2 Top of Deck	Line Segment 2 Deck C.G.
Station (feet)	18,543	18,543	18,543		
X (feet)	498.00	498.00	498.00		
Y (feet)	148.40	148.40	148.40		
Z (feet)	56.47	56.47	53.22		

Heading = 10.04 Degrees
Skew Angle = 3.38 Degrees

b) Pier Node Assignment and Section Properties

Concrete : ρ_c = 0.145 kip/ft^3 => NWC (Normal vs Light Weight Concrete, ACI 2.2; threshold is 0.115 kcf)
f'_c = 4.00 Ksi => E = 4,743 Ksi

Pier Number	Pier Definition L_C (feet)	Height h_C (feet)	Number of Nodes	Nodal Spacing (feet)	Shape	Material	Section Dimensions b_w (inches)	d (inches)	a (inches)	b (inches)	t_w (inches)	t_f (inches)
1	5.00	32.00	6	6.40	R	C	48.00	36.00				
2	-5.00	28.00	5	7.00	R	C	48.00	36.00				
3												
4												
5												

Section Properties Area (ft^2)	J (ft^4)	I_{33} (ft^4)	I_{22} (ft^4)	A_{22} (ft^2)	A_{33} (ft^2)
12.00	25.00	9.00	16.00	10.00	10.00
12.00	25.00	9.00	16.00	10.00	10.00

Note : Maximum number of pier nodes is 40.

c) Bentcap Nodes and Section Properties

b_w = 4.00 feet => n = 6 (Bentcap Flange extent Factor for Top Slabs)
d = 6.00 feet
L_e = 0.00 feet (Bentcap Extension beyond Edge of Columns => L_{BC} = 14.29 feet (Length of Bentcap)

	Bent 9 Nodes																		
Node No.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Y (feet)	-6.71	-5.69	-5.00	0.00	5.00	6.31	7.00													
Z (feet)	0.39	0.34	0.29	0.00	-0.29	-0.37	-0.41													
b_w (feet)	4.00	4.00	4.00	4.00	4.00	4.00	4.00													
d (feet)	6.00	6.00	6.00	6.00	6.00	6.00	6.00													
Approaching Section t_{Top} (feet)	0.67	0.67	0.67	0.67	0.67	0.67	0.67													
Approaching Section d_1 (feet)	6.00	6.00	6.00	6.00	6.00	6.00	6.00													
Approaching Section t_{Bott} (feet)	0.67	0.67	0.67	0.67	0.67	0.67	0.67													
Departing Section t_{Top} (feet)	1.00	1.00	1.00	1.00	1.00	1.00	1.00													
Departing Section d_1 (feet)		8.00	8.00	8.00	8.00	8.00														
Departing Section t_{Bott} (feet)		1.00	1.00	1.00	1.00	1.00														
Bentcap Section Properties y_i (feet)	3.42	2.71	2.71	2.71	2.71	2.71	3.42													
Bentcap Section Properties Area (ft^2)	35.33	41.33	41.33	41.33	41.33	41.33	35.33													
Bentcap Section Properties A_2 (ft^2)	20.00	20.00	20.00	20.00	20.00	20.00	20.00													
Bentcap Section Properties A_3 (ft^2)	31.33	37.33	37.33	37.33	37.33	37.33	31.33													
Bentcap Section Properties J (ft^4)	437.02	661.74	661.74	661.74	661.74	661.74	437.02													
Bentcap Section Properties I_{33} (ft^4)	144.58	201.30	201.30	201.30	201.30	201.30	144.58													
Bentcap Section Properties I_{22} (ft^4)	292.44	460.44	460.44	460.44	460.44	460.44	292.44													

d) Superstructure Data

Line Segment 1

Approaching Section : **BG3**
y'_1 = 0.00 feet = 0.00 inches
Z'_1 = -2.41 feet = -28.86 inches
$d_1 = H_{bg}$ = 6.00 feet (Box Girder Height) = 72.00 inches

Box Girder Slab	Slab Distance to Left Edge (feet)	Slab Distance to Right Edge (feet)	Slab Distance to Trackway CL Left Edge (feet)	Slab Distance to Trackway CL Center of Gravity (feet)	Slab Distance to Trackway CL Right Edge (feet)	Length (feet)	Thickness (inches)
Top	13.71	-14.29	13.71	0.00	-14.29	28.00	8.00
Bottom	6.71	-7.29	6.71		-7.29	14.00	8.00

Departing Section : **BG4**
y'_2 = 0.00 feet = 0.00 inches
Z'_2 = -3.25 feet = -38.96 inches
$d_2 = H_{bg}$ = 8.00 feet (Box Girder Height) = 96.00 inches

Box Girder Slab	Slab Distance to Left Edge (feet)	Slab Distance to Right Edge (feet)	Slab Distance to Trackway CL Left Edge (feet)	Slab Distance to Trackway CL Center of Gravity (feet)	Slab Distance to Trackway CL Right Edge (feet)	Length (feet)	Thickness (inches)
Top	13.69	-14.31	13.69	0.00	-14.31	28.00	12.00
Bottom	5.69	-6.31	5.69		-6.31	12.00	12.00

Line Segment 2

Approaching Section : **0**
y'_4 = 0.00 feet = 0.00 inches
Z'_4 = 0.00 feet = 0.00 inches
$d_4 = H_{bg}$ = 0.00 feet (Box Girder Height) = 0.00 inches

Box Girder Slab	Slab Distance to Left Edge (feet)	Slab Distance to Right Edge (feet)	Slab Distance to Trackway CL Left Edge (feet)	Slab Distance to Trackway CL Center of Gravity (feet)	Slab Distance to Trackway CL Right Edge (feet)	Length (feet)	Thickness (inches)
Top	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Bottom	0.00	0.00	0.00		0.00	0.00	0.00

Departing Section : **0**
y'_5 = 0.00 feet = 0.00 inches
Z'_5 = 0.00 feet = 0.00 inches
$d_5 = H_{bg}$ = 0.00 feet (Box Girder Height) = 0.00 inches

Box Girder Slab	Slab Distance to Left Edge (feet)	Slab Distance to Right Edge (feet)	Slab Distance to Trackway CL Left Edge (feet)	Slab Distance to Trackway CL Center of Gravity (feet)	Slab Distance to Trackway CL Right Edge (feet)	Length (feet)	Thickness (inches)
Top	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Bottom	0.00	0.00	0.00		0.00	0.00	0.00

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BENT INPUT DATA
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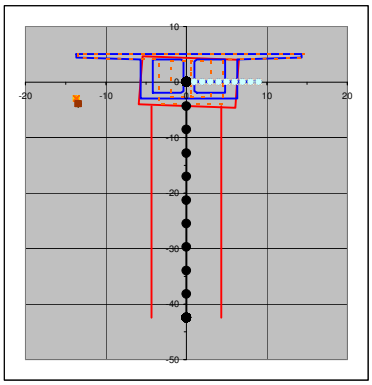
ALAMEDA CREEK BRIDGE - AS-BUILT

2. Bent Input Data - Bent 10

Label : **Bent 10**



a) Alignment Data

L_1 = 0.00 feet (Centerline distance between Trackway Alignment and Segment 1)

L_2 = 0.00 feet (Centerline distance between Trackway Alignment and Segment 2)

		Line Segment 1		Line Segment 2	
	Trackway Alignment	Top of Deck	Deck C.G.	Top of Deck	Deck C.G.
Station (feet)	18,625	18,625	18,625		
X (feet)	579.50	579.50	579.50		
Y (feet)	155.91	155.91	155.91		
Z (feet)	53.62	53.62	50.32		

Heading = 3.82 Degrees

Skew Angle = 3.00 Degrees

b) Pier Node Assignment and Section Properties

Concrete : ρ_c = 0.145 kip/ft^3 => NWC (Normal vs Light Weight Concrete, ACI 2.2; threshold is 0.115 kcf)

f'_c = 4.00 Ksi => E = 4,743 Ksi

	Pier Definition						Section Dimensions					
Pier Number	L_C (feet)	Height h_C (feet)	Number of Nodes	Nodal Spacing (feet)	Shape	Material	b_w (inches)	d (inches)	a (inches)	b (inches)	t_w (inches)	t_f (inches)
1	0.00	38.11	10	4.23	**P**	C		104.00			24.00	
2												
3												
4												
5												

Section Properties					
Area (ft^2)	J (ft^4)	I_{33} (ft^4)	I_{22} (ft^4)	A_{22} (ft^2)	A_{33} (ft^2)
41.89	507.31	253.65	253.65	27.23	27.23

Note : Maximum number of pier nodes is 40.

c) Bentcap Nodes and Section Properties

b_w = 8.00 feet => n = 6 (Bentcap Flange extent Factor for Top Slabs)

d = 8.67 feet

L_e = 0.00 feet (Bentcap Extension beyond Edge of Columns => L_{BC} = 12.00 feet (Length of Bentcap)

		Bent 10 Nodes																		
	Node No.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
	Y (feet)	0.00																			
	Z (feet)	0.00																			
	b_w (feet)	8.00																			
	d (feet)	8.67																			
Approaching Section	t_{Top} (feet)	1.00																			
	d_1 (feet)	8.00																			
	t_{Bott} (feet)	1.00																			
Departing Section	t_{Top} (feet)	1.33																			
	d_1 (feet)	0.00																			
	t_{Bott} (feet)	0.00																			
Bentcap Section Properties	y_i (feet)	4.80																			
	Area (ft^2)	92.00																			
	A_2 (ft^2)	57.78																			
	A_3 (ft^2)	80.44																			
	J (ft^4)	2491.05																			
	I_{33} (ft^4)	757.72																			
	I_{22} (ft^4)	1733.33																			

d) Superstructure Data

Line Segment 1

Approaching Section : **BG4**

y'_1 = 0.00 feet = 0.00 inches

Z'_1 = -3.25 feet = -38.96 inches

$d_1 = H_{bg}$ = 8.00 feet (Box Girder Height) = 96.00 inches

	Slab Distance to		Slab Distance to Trackway CL				
Box Girder Slab	Left Edge (feet)	Right Edge (feet)	Left Edge (feet)	Center of Gravity (feet)	Right Edge (feet)	Length (feet)	Thickness (inches)
Top	13.69	-14.31	13.69	0.00	-14.31	28.00	12.00
Bottom	5.69	-6.31	5.69		-6.31	12.00	12.00

Departing Section : **BG5**

y'_2 = 0.00 feet = 0.00 inches

Z'_2 = -3.31 feet = -39.69 inches

$d_2 = H_{bg}$ = 9.00 feet (Box Girder Height) = 108.00 inches

	Slab Distance to		Slab Distance to Trackway CL				
Box Girder Slab	Left Edge (feet)	Right Edge (feet)	Left Edge (feet)	Center of Gravity (feet)	Right Edge (feet)	Length (feet)	Thickness (inches)
Top	13.45	-14.55	13.45	0.00	-14.55	28.00	16.00
Bottom	10.45	2.45	10.45		2.45	8.00	16.00

Line Segment 2

Approaching Section : **0**

y'_4 = 0.00 feet = 0.00 inches

Z'_4 = 0.00 feet = 0.00 inches

$d_4 = H_{bg}$ = 0.00 feet (Box Girder Height) = 0.00 inches

	Slab Distance to		Slab Distance to Trackway CL				
Box Girder Slab	Left Edge (feet)	Right Edge (feet)	Left Edge (feet)	Center of Gravity (feet)	Right Edge (feet)	Length (feet)	Thickness (inches)
Top	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Bottom	0.00	0.00	0.00		0.00	0.00	0.00

Departing Section : **0**

y'_5 = 0.00 feet = 0.00 inches

Z'_5 = 0.00 feet = 0.00 inches

$d_5 = H_{bg}$ = 0.00 feet (Box Girder Height) = 0.00 inches

	Slab Distance to		Slab Distance to Trackway CL				
Box Girder Slab	Left Edge (feet)	Right Edge (feet)	Left Edge (feet)	Center of Gravity (feet)	Right Edge (feet)	Length (feet)	Thickness (inches)
Top	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Bottom	0.00	0.00	0.00		0.00	0.00	0.00

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BENT INPUT DATA
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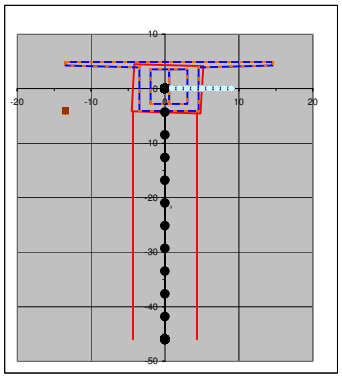
ALAMEDA CREEK BRIDGE - AS-BUILT

2. Bent Input Data - Bent 11

Label : **Bent 11**



a) Alignment Data

L_1 = 0.00 feet (Centerline distance between Trackway Alignment and Segment 1)
L_2 = 0.00 feet (Centerline distance between Trackway Alignment and Segment 2)

		Line Segment 1		Line Segment 2	
	Trackway Alignment	Top of Deck	Deck C.G.	Top of Deck	Deck C.G.
Station (feet)	18,706	18,706	18,706		
X (feet)	661.00	661.00	661.00		
Y (feet)	154.57	154.57	154.57		
Z (feet)	50.78	50.78	47.47		

Heading = -2.41 Degrees
Skew Angle = 2.38 Degrees

b) Pier Node Assignment and Section Properties

Concrete : ρ_c = 0.145 kip/ft^3 => NWC (Normal vs Light Weight Concrete, ACI 2.2; threshold is 0.115 kcf)
f'_c = 4.00 Ksi => E = 4,743 Ksi

	Pier Definition						Section Dimensions					
Pier Number	L_C (feet)	Height h_C (feet)	Number of Nodes	Nodal Spacing (feet)	Shape	Material	b_w (inches)	d (inches)	a (inches)	b (inches)	t_w (inches)	t_f (inches)
1	0.00	41.67	11	4.17	**P**	C		104.00			24.00	
2												
3												
4												
5												

Section Properties					
Area (ft^2)	J (ft^4)	I_{33} (ft^4)	I_{22} (ft^4)	A_{22} (ft^2)	A_{33} (ft^2)
41.89	507.31	253.65	253.65	27.23	27.23

Note : Maximum number of pier nodes is 40.

c) Bentcap Nodes and Section Properties

b_w = 8.67 feet => n = 6 (Bentcap Flange extent Factor for Top Slabs)
d = 8.67 feet
L_e = 0.00 feet (Bentcap Extension beyond Edge of Columns => L_{BC} = 9.33 feet (Length of Bentcap)

		Bent 11 Nodes																		
	Node No.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
	Y (feet)	0.00																			
	Z (feet)	0.00																			
	b_w (feet)	8.67																			
	d (feet)	8.67																			
Approaching Section	t_{Top} (feet)	1.33																			
	d_1 (feet)	0.00																			
	t_{Bott} (feet)	0.00																			
Departing Section	t_{Top} (feet)	1.33																			
	d_1 (feet)	0.00																			
	t_{Bott} (feet)	0.00																			
Bentcap Section Properties	y_i (feet)	5.14																			
	Area (ft^2)	96.44																			
	A_2 (ft^2)	62.59																			
	A_3 (ft^2)	83.93																			
	J (ft^4)	2762.07																			
	I_{33} (ft^4)	696.67																			
	I_{22} (ft^4)	2065.40																			

d) Superstructure Data

Line Segment 1

Approaching Section : **BG5**
y'_1 = 0.00 feet = 0.00 inches
Z'_1 = -3.31 feet = -39.69 inches
$d_1 = H_{bg}$ = 9.00 feet (Box Girder Height) = 108.00 inches

	Slab Distance to		Slab Distance to Trackway CL				
Box Girder Slab	Left Edge (feet)	Right Edge (feet)	Left Edge (feet)	Center of Gravity (feet)	Right Edge (feet)	Length (feet)	Thickness (inches)
Top	13.45	-14.55	13.45	0.00	-14.55	28.00	16.00
Bottom	10.45	2.45	10.45		2.45	8.00	16.00

Departing Section : **BG5**
y'_2 = 0.00 feet = 0.00 inches
Z'_2 = -3.31 feet = -39.69 inches
$d_2 = H_{bg}$ = 9.00 feet (Box Girder Height) = 108.00 inches

	Slab Distance to		Slab Distance to Trackway CL				
Box Girder Slab	Left Edge (feet)	Right Edge (feet)	Left Edge (feet)	Center of Gravity (feet)	Right Edge (feet)	Length (feet)	Thickness (inches)
Top	13.45	-14.55	13.45	0.00	-14.55	28.00	16.00
Bottom	10.45	2.45	10.45		2.45	8.00	16.00

Line Segment 2

Approaching Section : **0**
y'_4 = 0.00 feet = 0.00 inches
Z'_4 = 0.00 feet = 0.00 inches
$d_4 = H_{bg}$ = 0.00 feet (Box Girder Height) = 0.00 inches

	Slab Distance to		Slab Distance to Trackway CL				
Box Girder Slab	Left Edge (feet)	Right Edge (feet)	Left Edge (feet)	Center of Gravity (feet)	Right Edge (feet)	Length (feet)	Thickness (inches)
Top	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Bottom	0.00	0.00	0.00		0.00	0.00	0.00

Departing Section : **0**
y'_5 = 0.00 feet = 0.00 inches
Z'_5 = 0.00 feet = 0.00 inches
$d_5 = H_{bg}$ = 0.00 feet (Box Girder Height) = 0.00 inches

	Slab Distance to		Slab Distance to Trackway CL				
Box Girder Slab	Left Edge (feet)	Right Edge (feet)	Left Edge (feet)	Center of Gravity (feet)	Right Edge (feet)	Length (feet)	Thickness (inches)
Top	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Bottom	0.00	0.00	0.00		0.00	0.00	0.00

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BENT INPUT DATA
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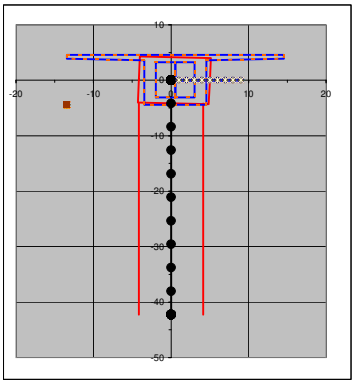
2. Bent Input Data - Bent 12

Label : **Bent 12**



a) Alignment Data

L_1 = 0.00 feet (Centerline distance between Trackway Alignment and Segment 1)

L_2 = 0.00 feet (Centerline distance between Trackway Alignment and Segment 2)

		Line Segment 1		Line Segment 2	
	Trackway Alignment	Top of Deck	Deck C.G.	Top of Deck	Deck C.G.
Station (feet)	18,788	18,788	18,788		
X (feet)	742.50	742.50	742.50		
Y (feet)	144.41	144.41	144.41		
Z (feet)	47.93	47.93	44.62		

Heading = -8.63 Degrees

Skew Angle = 1.75 Degrees

b) Pier Node Assignment and Section Properties

Concrete : ρ_c = 0.145 kip/ft^3 => NWC (Normal vs Light Weight Concrete, ACI 2.2; threshold is 0.115 kcf)

f'_c = 4.00 Ksi => E = 4,743 Ksi

	Pier Definition						Section Dimensions					
Pier Number	L_C (feet)	Height h_C (feet)	Number of Nodes	Nodal Spacing (feet)	Shape	Material	b_w (inches)	d (inches)	a (inches)	b (inches)	t_w (inches)	t_f (inches)
1	0.00	38.12	10	4.24	**P**	C		100.00			24.00	
2												
3												
4												
5												

Section Properties					
Area (ft^2)	J (ft^4)	I_{33} (ft^4)	I_{22} (ft^4)	A_{22} (ft^2)	A_{33} (ft^2)
39.79	438.83	219.42	219.42	26.18	26.18

Note : Maximum number of pier nodes is 40.

c) Bentcap Nodes and Section Properties

b_w = 8.00 feet => n = 6 (Bentcap Flange extent Factor for Top Slabs)

d = 8.33 feet

L_e = 0.00 feet (Bentcap Extension beyond Edge of Columns => L_{BC} = 9.17 feet (Length of Bentcap)

		Bent 12 Nodes																		
	Node No.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
	Y (feet)	0.00																			
	Z (feet)	0.00																			
	b_w (feet)	8.00																			
	d (feet)	8.33																			
Approaching Section	t_{Top} (feet)	1.33																			
	d_1 (feet)	0.00																			
	t_{Bott} (feet)	0.00																			
Departing Section	t_{Top} (feet)	1.33																			
	d_1 (feet)	0.00																			
	t_{Bott} (feet)	0.00																			
Bentcap Section Properties	y_i (feet)	5.02																			
	Area (ft^2)	88.00																			
	A_2 (ft^2)	55.56																			
	A_3 (ft^2)	76.89																			
	J (ft^4)	2421.61																			
	I_{33} (ft^4)	586.94																			
	I_{22} (ft^4)	1834.67																			

d) Superstructure Data

Line Segment 1

Approaching Section : **BG5**

y'_1 = 0.00 feet = 0.00 inches

Z'_1 = -3.31 feet = -39.69 inches

$d_1 = H_{bg}$ = 9.00 feet (Box Girder Height) = 108.00 inches

	Slab Distance to		Slab Distance to Trackway CL				
Box Girder Slab	Left Edge (feet)	Right Edge (feet)	Left Edge (feet)	Center of Gravity (feet)	Right Edge (feet)	Length (feet)	Thickness (inches)
Top	13.45	-14.55	13.45	0.00	-14.55	28.00	16.00
Bottom	10.45	2.45	10.45		2.45	8.00	16.00

Departing Section : **BG5**

y'_2 = 0.00 feet = 0.00 inches

Z'_2 = -3.31 feet = -39.69 inches

$d_2 = H_{bg}$ = 9.00 feet (Box Girder Height) = 108.00 inches

	Slab Distance to		Slab Distance to Trackway CL				
Box Girder Slab	Left Edge (feet)	Right Edge (feet)	Left Edge (feet)	Center of Gravity (feet)	Right Edge (feet)	Length (feet)	Thickness (inches)
Top	13.45	-14.55	13.45	0.00	-14.55	28.00	16.00
Bottom	10.45	2.45	10.45		2.45	8.00	16.00

Line Segment 2

Approaching Section : **0**

y'_4 = 0.00 feet = 0.00 inches

Z'_4 = 0.00 feet = 0.00 inches

$d_4 = H_{bg}$ = 0.00 feet (Box Girder Height) = 0.00 inches

	Slab Distance to		Slab Distance to Trackway CL				
Box Girder Slab	Left Edge (feet)	Right Edge (feet)	Left Edge (feet)	Center of Gravity (feet)	Right Edge (feet)	Length (feet)	Thickness (inches)
Top	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Bottom	0.00	0.00	0.00		0.00	0.00	0.00

Departing Section : **0**

y'_5 = 0.00 feet = 0.00 inches

Z'_5 = 0.00 feet = 0.00 inches

$d_5 = H_{bg}$ = 0.00 feet (Box Girder Height) = 0.00 inches

	Slab Distance to		Slab Distance to Trackway CL				
Box Girder Slab	Left Edge (feet)	Right Edge (feet)	Left Edge (feet)	Center of Gravity (feet)	Right Edge (feet)	Length (feet)	Thickness (inches)
Top	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Bottom	0.00	0.00	0.00		0.00	0.00	0.00

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BENT INPUT DATA
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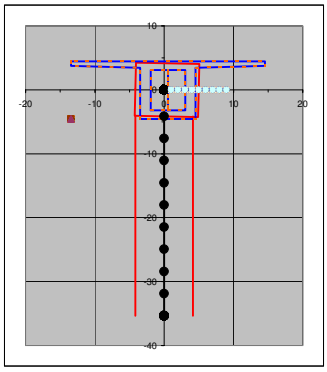
2. Bent Input Data - Bent 13

Label : **Bent 13**



a) Alignment Data

L_1 = 0.00 feet (Centerline distance between Trackway Alignment and Segment 1)
L_2 = 0.00 feet (Centerline distance between Trackway Alignment and Segment 2)

		Line Segment 1		Line Segment 2	
	Trackway Alignment	Top of Deck	Deck C.G.	Top of Deck	Deck C.G.
Station (feet)	18,869	18,869	18,869		
X (feet)	824.00	824.00	824.00		
Y (feet)	125.55	125.55	125.55		
Z (feet)	45.09	45.09	41.78		

Heading = -14.86 Degrees
Skew Angle = 1.13 Degrees

b) Pier Node Assignment and Section Properties

Concrete : ρ_c = 0.145 kip/ft^3 => NWC (Normal vs Light Weight Concrete, ACI 2.2; threshold is 0.115 kcf)
f'_c = 4.00 Ksi => E = 4,743 Ksi

	Pier Definition						Section Dimensions					
Pier Number	L_C (feet)	Height h_C (feet)	Number of Nodes	Nodal Spacing (feet)	Shape	Material	b_w (inches)	d (inches)	a (inches)	b (inches)	t_w (inches)	t_f (inches)
1	0.00	31.18	10	3.46	**P**	C		100.00			24.00	
2												
3												
4												
5												

Section Properties					
Area (ft^2)	J (ft^4)	I_{33} (ft^4)	I_{22} (ft^4)	A_{22} (ft^2)	A_{33} (ft^2)
39.79	438.83	219.42	219.42	26.18	26.18

Note : Maximum number of pier nodes is 40.

c) Bentcap Nodes and Section Properties

b_w = 8.33 feet => n = 6 (Bentcap Flange extent Factor for Top Slabs)
d = 8.33 feet
L_e = 0.00 feet (Bentcap Extension beyond Edge of Columns => L_{BC} = 9.17 feet (Length of Bentcap)

	Bent 13 Nodes																			
Node No.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Y (feet)	0.00																			
Z (feet)	0.00																			
b_w (feet)	8.33																			
d (feet)	8.33																			
Approaching Section t_{Top} (feet)	1.33																			
Approaching Section d_1 (feet)	0.00																			
Approaching Section t_{Bott} (feet)	0.00																			
Departing Section t_{Top} (feet)	1.33																			
Departing Section d_1 (feet)	0.00																			
Departing Section t_{Bott} (feet)	0.00																			
Bentcap Section Properties y_i (feet)	4.99																			
Bentcap Section Properties Area (ft^2)	90.78																			
Bentcap Section Properties A_2 (ft^2)	57.87																			
Bentcap Section Properties A_3 (ft^2)	79.20																			
Bentcap Section Properties J (ft^4)	2543.43																			
Bentcap Section Properties I_{33} (ft^4)	604.96																			
Bentcap Section Properties I_{22} (ft^4)	1938.47																			

d) Superstructure Data

Line Segment 1

Approaching Section : **BG5**
y'_1 = 0.00 feet = 0.00 inches
Z'_1 = -3.31 feet = -39.69 inches
$d_1 = H_{bg}$ = 9.00 feet (Box Girder Height) = 108.00 inches

	Slab Distance to		Slab Distance to Trackway CL				
Box Girder Slab	Left Edge (feet)	Right Edge (feet)	Left Edge (feet)	Center of Gravity (feet)	Right Edge (feet)	Length (feet)	Thickness (inches)
Top	13.45	-14.55	13.45	0.00	-14.55	28.00	16.00
Bottom	10.45	2.45	10.45		2.45	8.00	16.00

Departing Section : **BG5**
y'_2 = 0.00 feet = 0.00 inches
Z'_2 = -3.31 feet = -39.69 inches
$d_2 = H_{bg}$ = 9.00 feet (Box Girder Height) = 108.00 inches

	Slab Distance to		Slab Distance to Trackway CL				
Box Girder Slab	Left Edge (feet)	Right Edge (feet)	Left Edge (feet)	Center of Gravity (feet)	Right Edge (feet)	Length (feet)	Thickness (inches)
Top	13.45	-14.55	13.45	0.00	-14.55	28.00	16.00
Bottom	10.45	2.45	10.45		2.45	8.00	16.00

Line Segment 2

Approaching Section : **0**
y'_4 = 0.00 feet = 0.00 inches
Z'_4 = 0.00 feet = 0.00 inches
$d_4 = H_{bg}$ = 0.00 feet (Box Girder Height) = 0.00 inches

	Slab Distance to		Slab Distance to Trackway CL				
Box Girder Slab	Left Edge (feet)	Right Edge (feet)	Left Edge (feet)	Center of Gravity (feet)	Right Edge (feet)	Length (feet)	Thickness (inches)
Top	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Bottom	0.00	0.00	0.00		0.00	0.00	0.00

Departing Section : **0**
y'_5 = 0.00 feet = 0.00 inches
Z'_5 = 0.00 feet = 0.00 inches
$d_5 = H_{bg}$ = 0.00 feet (Box Girder Height) = 0.00 inches

	Slab Distance to		Slab Distance to Trackway CL				
Box Girder Slab	Left Edge (feet)	Right Edge (feet)	Left Edge (feet)	Center of Gravity (feet)	Right Edge (feet)	Length (feet)	Thickness (inches)
Top	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Bottom	0.00	0.00	0.00		0.00	0.00	0.00

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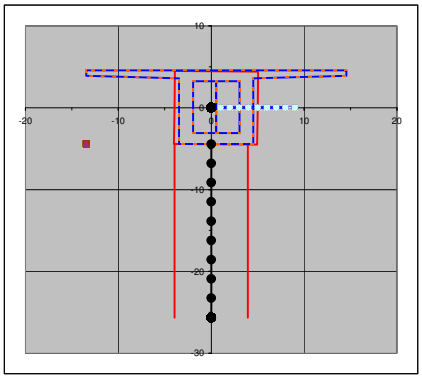
BENT INPUT DATA
SAP2000 BRIDGE ANALYSIS INPUT FILE DATA
ALAMEDA CREEK BRIDGE - AS-BUILT

2. Bent Input Data - Bent 14

Label : **Bent 14**



a) Alignment Data

L_1 = 0.00 feet (Centerline distance between Trackway Alignment and Segment 1)

L_2 = 0.00 feet (Centerline distance between Trackway Alignment and Segment 2)

	Trackway Alignment	Line Segment 1 Top of Deck	Line Segment 1 Deck C.G.	Line Segment 2 Top of Deck	Line Segment 2 Deck C.G.
Station (feet)	18,951	18,951	18,951		
X (feet)	905.50	905.50	905.50		
Y (feet)	98.20	98.20	98.20		
Z (feet)	42.24	42.24	38.93		

Heading = -21.09 Degrees

Skew Angle = 0.50 Degrees

b) Pier Node Assignment and Section Properties

Concrete : ρ_c = 0.145 kip/ft^3 => NWC (Normal vs Light Weight Concrete, ACI 2.2; threshold is 0.115 kcf)

f'_c = 4.00 Ksi => E = 4,743 Ksi

	Pier Definition						Section Dimensions					
Pier Number	L_C (feet)	Height h_C (feet)	Number of Nodes	Nodal Spacing (feet)	Shape	Material	b_w (inches)	d (inches)	a (inches)	b (inches)	t_w (inches)	t_f (inches)
1	0.00	21.19	10	2.35	**P**	C		95.00			24.00	
2												
3												
4												
5												

Section Properties					
Area (ft^2)	J (ft^4)	I_{33} (ft^4)	I_{22} (ft^4)	A_{22} (ft^2)	A_{33} (ft^2)
37.18	362.53	181.26	181.26	24.87	24.87

Note : Maximum number of pier nodes is 40.

c) Bentcap Nodes and Section Properties

b_w = 7.92 feet => n = 6 (Bentcap Flange extent Factor for Top Slabs)

d = 8.92 feet

L_e = 0.00 feet (Bentcap Extension beyond Edge of Columns => L_{BC} = 8.96 feet (Length of Bentcap)

	Bent 14 Nodes																		
Node No.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Y (feet)	0.00																			
Z (feet)	0.00																			
b_w (feet)	7.92																			
d (feet)	8.92																			
Approaching Section t_{Top} (feet)	1.33																			
Approaching Section d_1 (feet)	0.00																			
Approaching Section t_{Bott} (feet)	0.00																			
Departing Section t_{Top} (feet)	1.33																			
Departing Section d_1 (feet)	0.00																			
Departing Section t_{Bott} (feet)	0.00																			
Bentcap Section Properties y_i (feet)	5.34																			
Bentcap Section Properties Area (ft^2)	91.92																			
Bentcap Section Properties A_2 (ft^2)	58.83																			
Bentcap Section Properties A_3 (ft^2)	80.16																			
Bentcap Section Properties J (ft^4)	2539.99																			
Bentcap Section Properties I_{33} (ft^4)	706.39																			
Bentcap Section Properties I_{22} (ft^4)	1833.60																			

d) Superstructure Data

Line Segment 1

Approaching Section : **BG5**

y'_1 = 0.00 feet = 0.00 inches

Z'_1 = -3.31 feet = -39.69 inches

$d_1 = H_{bg}$ = 9.00 feet (Box Girder Height) = 108.00 inches

	Slab Distance to		Slab Distance to Trackway CL				
Box Girder Slab	Left Edge (feet)	Right Edge (feet)	Left Edge (feet)	Center of Gravity (feet)	Right Edge (feet)	Length (feet)	Thickness (inches)
Top	13.45	-14.55	13.45	0.00	-14.55	28.00	16.00
Bottom	10.45	2.45	10.45		2.45	8.00	16.00

Departing Section : **BG5**

y'_2 = 0.00 feet = 0.00 inches

Z'_2 = -3.31 feet = -39.69 inches

$d_2 = H_{bg}$ = 9.00 feet (Box Girder Height) = 108.00 inches

	Slab Distance to		Slab Distance to Trackway CL				
Box Girder Slab	Left Edge (feet)	Right Edge (feet)	Left Edge (feet)	Center of Gravity (feet)	Right Edge (feet)	Length (feet)	Thickness (inches)
Top	13.45	-14.55	13.45	0.00	-14.55	28.00	16.00
Bottom	10.45	2.45	10.45		2.45	8.00	16.00

Line Segment 2

Approaching Section : **0**

y'_4 = 0.00 feet = 0.00 inches

Z'_4 = 0.00 feet = 0.00 inches

$d_4 = H_{bg}$ = 0.00 feet (Box Girder Height) = 0.00 inches

	Slab Distance to		Slab Distance to Trackway CL				
Box Girder Slab	Left Edge (feet)	Right Edge (feet)	Left Edge (feet)	Center of Gravity (feet)	Right Edge (feet)	Length (feet)	Thickness (inches)
Top	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Bottom	0.00	0.00	0.00		0.00	0.00	0.00

Departing Section : **0**

y'_5 = 0.00 feet = 0.00 inches

Z'_5 = 0.00 feet = 0.00 inches

$d_5 = H_{bg}$ = 0.00 feet (Box Girder Height) = 0.00 inches

	Slab Distance to		Slab Distance to Trackway CL				
Box Girder Slab	Left Edge (feet)	Right Edge (feet)	Left Edge (feet)	Center of Gravity (feet)	Right Edge (feet)	Length (feet)	Thickness (inches)
Top	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Bottom	0.00	0.00	0.00		0.00	0.00	0.00

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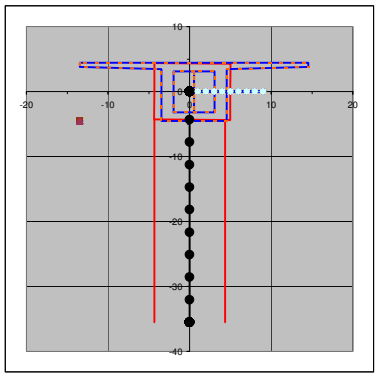
BENT INPUT DATA
SAP2000 BRIDGE ANALYSIS INPUT FILE DATA
ALAMEDA CREEK BRIDGE - AS-BUILT

2. Bent Input Data - Bent 14

Label : **Bent 14** (Not used !)



a) Alignment Data

L_1 = 0.00 feet (Centerline distance between Trackway Alignment and Segment 1)

L_2 = 0.00 feet (Centerline distance between Trackway Alignment and Segment 2)

		Line Segment 1		Line Segment 2	
	Trackway Alignment	Top of Deck	Deck C.G.	Top of Deck	Deck C.G.
Station (feet)	18,951	18,951	18,951		
X (feet)	905.50	905.50	905.50		
Y (feet)	98.20	98.20	98.20		
Z (feet)	42.24	42.24	38.93		

Heading = -21.09 Degrees

Skew Angle = 0.50 Degrees

b) Pier Node Assignment and Section Properties

Concrete : ρ_c = 0.145 kip/ft^3 => NWC (Normal vs Light Weight Concrete, ACI 2.2; threshold is 0.115 kcf)

f'_c = 4.00 Ksi => E = 4,743 Ksi

	Pier Definition						Section Dimensions					
Pier Number	L_c (feet)	Height h_c (feet)	Number of Nodes	Nodal Spacing (feet)	Shape	Material	b_w (inches)	d (inches)	a (inches)	b (inches)	t_w (inches)	t_f (inches)
1	0.00	31.18	10	3.46	P	C		104.00			24.00	
2												
3												
4												
5												

Section Properties					
Area (ft^2)	J (ft^4)	I_{33} (ft^4)	I_{22} (ft^4)	A_{22} (ft^2)	A_{33} (ft^2)
41.89	507.31	253.65	253.65	27.23	27.23

Note : Maximum number of pier nodes is 40.

c) Bentcap Nodes and Section Properties

b_w = 8.67 feet => n = 6 (Bentcap Flange extent Factor for Top Slabs)

d = 8.67 feet

L_e = 0.00 feet (Bentcap Extension beyond Edge of Columns => L_{BC} = 9.33 feet (Length of Bentcap)

		Bent 14 Nodes																			
	Node No.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
	Y (feet)	0.00																			
	Z (feet)	0.00																			
	b_w (feet)	8.67																			
	d (feet)	8.67																			
Approaching Section	t_{Top} (feet)	1.33																			
	d_1 (feet)	0.00																			
	t_{Bott} (feet)	0.00																			
Departing Section	t_{Top} (feet)	1.33																			
	d_1 (feet)	0.00																			
	t_{Bott} (feet)	0.00																			
Bentcap Section Properties	y_i (feet)	5.14																			
	Area (ft^2)	96.44																			
	A_2 (ft^2)	62.59																			
	A_3 (ft^2)	83.93																			
	J (ft^4)	2762.07																			
	I_{33} (ft^4)	696.67																			
	I_{22} (ft^4)	2065.40																			

d) Superstructure Data

Line Segment 1

Approaching Section : **BG5**

y'_1 = 0.00 feet = 0.00 inches

Z'_1 = -3.31 feet = -39.69 inches

$d_1 = H_{bg}$ = 9.00 feet (Box Girder Height) = 108.00 inches

	Slab Distance to		Slab Distance to Trackway CL				
Box Girder Slab	Left Edge (feet)	Right Edge (feet)	Left Edge (feet)	Center of Gravity (feet)	Right Edge (feet)	Length (feet)	Thickness (inches)
Top	13.45	-14.55	13.45	0.00	-14.55	28.00	16.00
Bottom	10.45	2.45	10.45		2.45	8.00	16.00

Departing Section : **BG5**

y'_2 = 0.00 feet = 0.00 inches

Z'_2 = -3.31 feet = -39.69 inches

$d_2 = H_{bg}$ = 9.00 feet (Box Girder Height) = 108.00 inches

	Slab Distance to		Slab Distance to Trackway CL				
Box Girder Slab	Left Edge (feet)	Right Edge (feet)	Left Edge (feet)	Center of Gravity (feet)	Right Edge (feet)	Length (feet)	Thickness (inches)
Top	13.45	-14.55	13.45	0.00	-14.55	28.00	16.00
Bottom	10.45	2.45	10.45		2.45	8.00	16.00

Line Segment 2

Approaching Section : **0**

y'_4 = 0.00 feet = 0.00 inches

Z'_4 = 0.00 feet = 0.00 inches

$d_4 = H_{bg}$ = 0.00 feet (Box Girder Height) = 0.00 inches

	Slab Distance to		Slab Distance to Trackway CL				
Box Girder Slab	Left Edge (feet)	Right Edge (feet)	Left Edge (feet)	Center of Gravity (feet)	Right Edge (feet)	Length (feet)	Thickness (inches)
Top	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Bottom	0.00	0.00	0.00		0.00	0.00	0.00

Departing Section : **0**

y'_5 = 0.00 feet = 0.00 inches

Z'_5 = 0.00 feet = 0.00 inches

$d_5 = H_{bg}$ = 0.00 feet (Box Girder Height) = 0.00 inches

	Slab Distance to		Slab Distance to Trackway CL				
Box Girder Slab	Left Edge (feet)	Right Edge (feet)	Left Edge (feet)	Center of Gravity (feet)	Right Edge (feet)	Length (feet)	Thickness (inches)
Top	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Bottom	0.00	0.00	0.00		0.00	0.00	0.00

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BRIDGE CONNECTIVITY
SAP2000 BRIDGE ANALYSIS INPUT FILE DATA - Tension EQ MODEL
ALAMEDA CREEK BRIDGE - AS-BUILT

Model : Tension EQ

1. ABUTMENT CONNECTIVITY - RESTRAINT OR SPRING VALUES

$F_X = 1/8\ H_W^2\ W_W\ F_p$ Where F_p = 7.70 Ksf (Passive Pressure)

Abutment or Hinge Node	Line Segment	Node ID	Wall Dimension Height (ft)	Wall Dimension Width (ft)	Passive Pressure (Ksf)	Passive Force (Kips)	DX / D1 (feet)	K_X / K_1 (inches)	RESTRAINT OR SPRING VALUES (KIP/FT) UX / U1	UY / U2	UZ / U3	RX / R1	RY / R2	RZ / R3
1	1	1000100	5.00	20.00	0.00	0.00	0.36	0	0	x	x	x		
	2		5.50	18.00	0.00	0.00	0.27	0	0					
15	1	1001500	5.25	19.00	0.00	0.00	0.32	0	0	x	x	x		x
	2		5.50	18.00	0.00	0.00	0.35	0	0					

2. HINGE CONNECTIVITY - CONSTRAINTS

Hinge Number	Hinge Node Data Depart	Hinge Node Data Arrive	Segment Line 1 UX / U1	UY / U2	UZ / U3	RX / R1	RY / R2	RZ / R3	Segment Line 2 UX / U1	UY / U2	UZ / U3	RX / R1	RY / R2	RZ / R3
1	0202	0203	x	x	x	x								
2	0401	0402	x	x	x	x								
3	0601	0602	x	x	x	x								
4	0801	0802	x	x	x	x								
5	0901	0902	x	x	x	x								
6	1001	1002	x	x	x	x								
7	1101	1102	x	x	x	x								
8	1201	1202	x	x	x	x								
9	1301	1302	x	x	x	x								
10	1401	1402	x	x	x	x								

3. PLATFORM TO BENTCAP CONNECTIVITY - CONSTRAINTS

Platform Station Begin : 0 feet

Platform Station End : 0 feet

Platform Section : => L_P = feet (Platform Length)
W_P = feet (Platform Width)

Centroid : Z_1 = feet (from Deck)
Y_1 = feet (from Left Edge)

Distance from Platform C.G. to Trackway Centerline : L_{Py} = 0.00 feet

L_{Pz} = 2.39 feet

Bent Number	Constraint Nodes Bentcap	Constraint Nodes Platform	Platform to Bentcap Constraints UX / U1	UY / U2	UZ / U3	RX / R1	RY / R2	RZ / R3
Bent 2								
Bent 3								
Bent 4								
Bent 5								
Bent 6								
Bent 7								
Bent 8								
Bent 9								
Bent 10								
Bent 11								
Bent 12								
Bent 13								
Bent 14								
Bent 14								

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BRIDGE CONNECTIVITY
SAP2000 BRIDGE ANALYSIS INPUT FILE DATA - Tension EQ MODEL
ALAMEDA CREEK BRIDGE - AS-BUILT

Model : Tension EQ

4. BENT CONNECTIVITY - RESTRAINTS, SPRING, OR DOF RELEASES

Cracked Member Stiffness Parameters :

E_{cB} = 0.90 E (Bentcap Cracked Modulus)

E_{cC} = 0.75 E (Column Cracked Modulus) Note: Not implemented yet!

E_{PH} = 0.50 E (Column Cracked Modulus - at Plastic Hinges)

Note: Plastic hinge elements are taken as the first and last pier elements, if fixed there.

		Pier Definition				PIER CONNECTIVITY - AT **FOUNDATIONS** RESTRAINT OR SPRING VALUES (KIP/FT)						PIER CONNECTIVITY - AT **BENTCAPS** DOF **RELEASES** AT RIGID LINKS					
Bent Number	Pier Number	L_c (feet)	Height h_c (feet)	Shape	Material	UX / U1	UY / U2	UZ / U3	RX / R1	RY / R2	RZ / R3	UX / U1	UY / U2	UZ / U3	RX / R1	RY / R2	RZ / R3
2	1	10.50	6.00	R	C	x	x	x	x	x	x						
	2	-7.50	8.00	R	C	x	x	x	x	x	x						
	3																
	4																
	5																
3	1	7.50	6.00	R	C	x	x	x	x	x	x						
	2	-21.00	5.00	R	C	x	x	x	x	x	x						
	3																
	4																
	5																
4	1	8.50	26.00	R	C	x	x	x	x								
	2	-9.50	2.50	R	C	x	x	x	x	x	x						
	3																
	4																
	5																
5	1	13.50	25.00	R	C	x	x	x	x	x	x						
	2	-13.50	30.00	R	C	x	x	x	x	x	x						
	3																
	4																
	5																
6	1	11.50	25.08	R	C	x	x	x	x	x	x						
	2	-11.50	25.49	R	C	x	x	x	x	x	x						
	3																
	4																
	5																
7	1	9.50	23.47	R	C	x	x	x	x	x	x						
	2	-9.50	17.50	R	C	x	x	x	x	x	x						
	3																
	4																
	5																
8	1	7.00	29.40	R	C	x	x	x	x	x	x						
	2	-7.00	18.42	R	C	x	x	x	x	x	x						
	3																
	4																
	5																
9	1	5.00	32.00	R	C	x	x	x	x	x	x						
	2	-5.00	28.00	R	C	x	x	x	x	x	x						
	3																
	4																
	5																
10	1	0.00	38.11	P	C	x	x	x	x	x	x						
	2																
	3																
	4																
	5																
11	1	0.00	41.67	P	C	x	x	x	x	x	x						
	2																
	3																
	4																
	5																
12	1	0.00	38.12	P	C	x	x	x	x	x	x						
	2																
	3																
	4																
	5																
13	1	0.00	31.18	P	C	x	x	x	x	x	x						
	2																
	3																
	4																
	5																
14	1	0.00	21.19	P	C	x	x	x	x	x	x						
	2																
	3																
	4																
	5																
	1																
	2																
	3																
	4																
	5																

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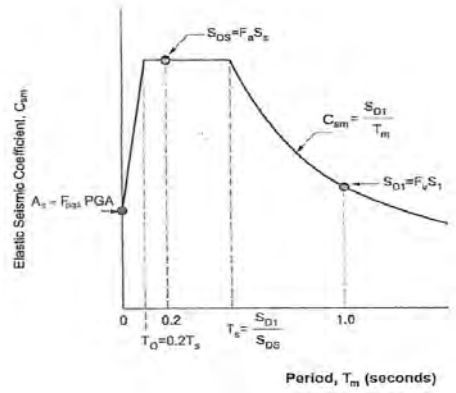
ACCELERATION RESPONSE SPECTRUM VALUES
SAP2000 BRIDGE ANALYSIS INPUT FILE DATA
ALAMEDA CREEK BRIDGE - AS-BUILT



1. Seismic Design Parameters (AASHTO LFRD BDS 3.10.4)

A_S = 0.785 g's (Site Design Coefficient - PGA)

S_{DS} = 2.056 g's (Site Design Coefficient - Short Period)

S_{D1} = 1.205 g's (Site Design Coefficient - at 1-Second Period)

2. AASHTO LRFD BDS Acceleration Design Response Spectrum Curve

a) Period Parameters (X Axis)

$T_o = 0.2\ S_{D1} / S_{DS}$

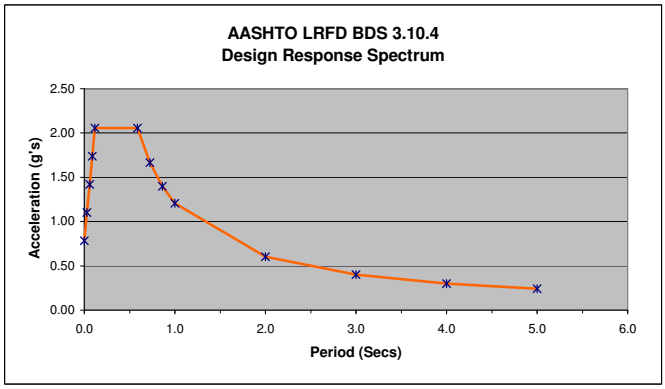
Where S_{DS} = 2.056 g's (Site Design Coefficient - Short Period)

S_{D1} = 1.205 g's (Site Design Coefficient - at 1.0 Second Period)

$T_a = S_{D1} / S_{DS}$

T_o = 0.117 seconds

T_a = 0.586 seconds



b) Acceleration Parameters (Y Axis)

S_{DS} = 2.056 g's (Site Design Coefficient - Short Period)

S_{D1} = 1.205 g's (Site Design Coefficient - at 1-Second Period)

c) ARS Curve Data

i) For Periods $T_{ARS} \le T_o$

$S_a = A_S + (S_{DS} - A_S)\ (T / T_o)$

Where A_S = 0.785 g's

S_{DS} = 2.056 g's (Site Design Coefficient - Short Period)

T_o = 0.12 seconds

ii) For Periods $T_S \le T_{ARS} \le T_o$

$S_a = S_{DS}$

Where S_{DS} = 2.056 g's (Site Design Coefficient - Short Period)

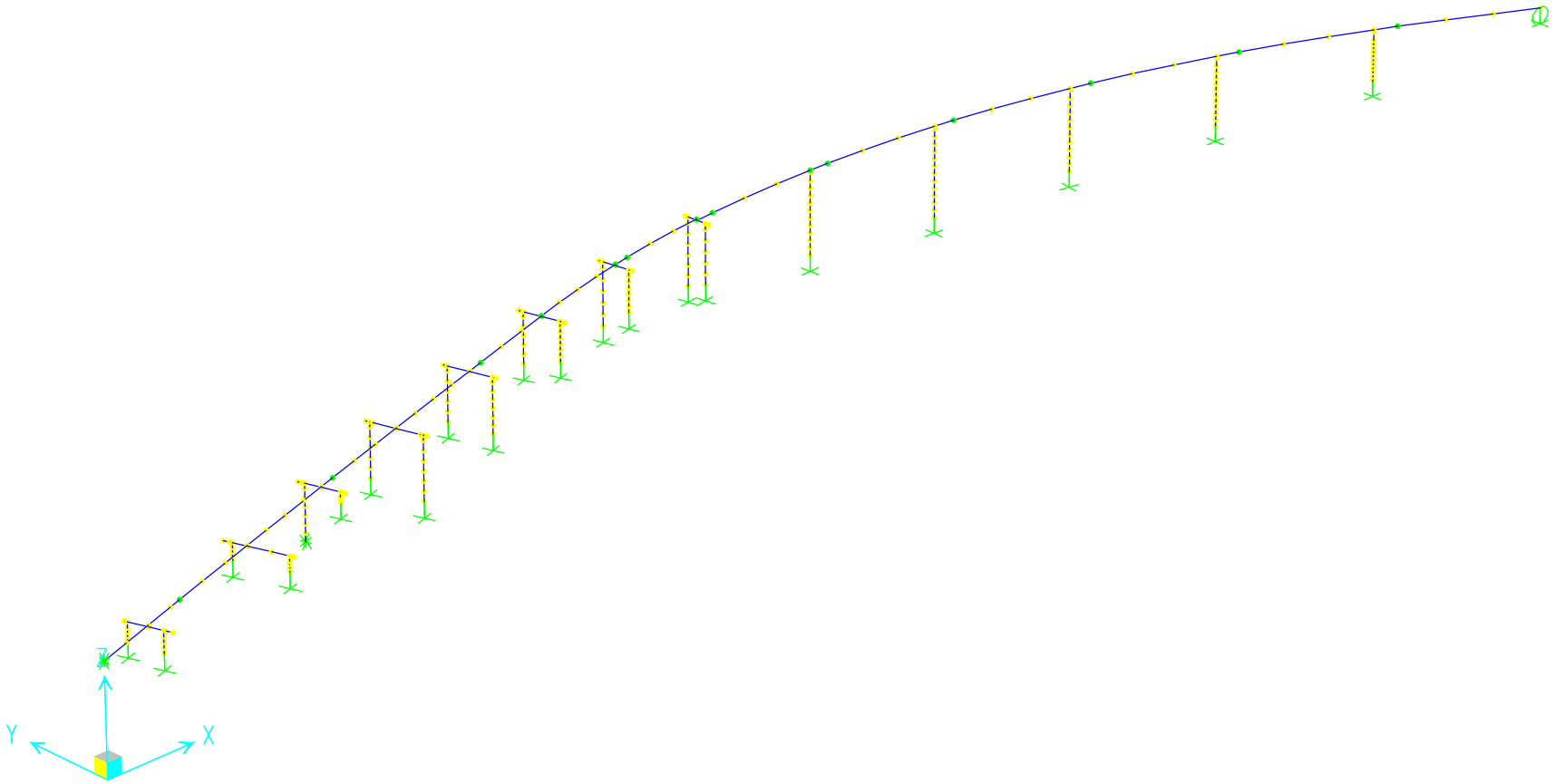
iii) For Periods $T_S \le T_{ARS}$

$S_a = S_{D1} / T$

Where S_{D1} = 1.205 g's (Site Design Coefficient - at 1-Second Period)

Period Ranges		T (Secs)	S_a (g's)
$T_{ARS} \le T_o$		0.00	0.785
		0.03	1.103
		0.06	1.421
		0.09	1.738
$T_S \le T_{ARS} \le T_o$	T_o =	0.12	2.056
	T_S =	0.59	2.056
$T_S \le T_{ARS}$		0.72	1.664
		0.86	1.398
		1.00	1.205
		2.00	0.603
		3.00	0.402
		4.00	0.301
		5.00	0.241

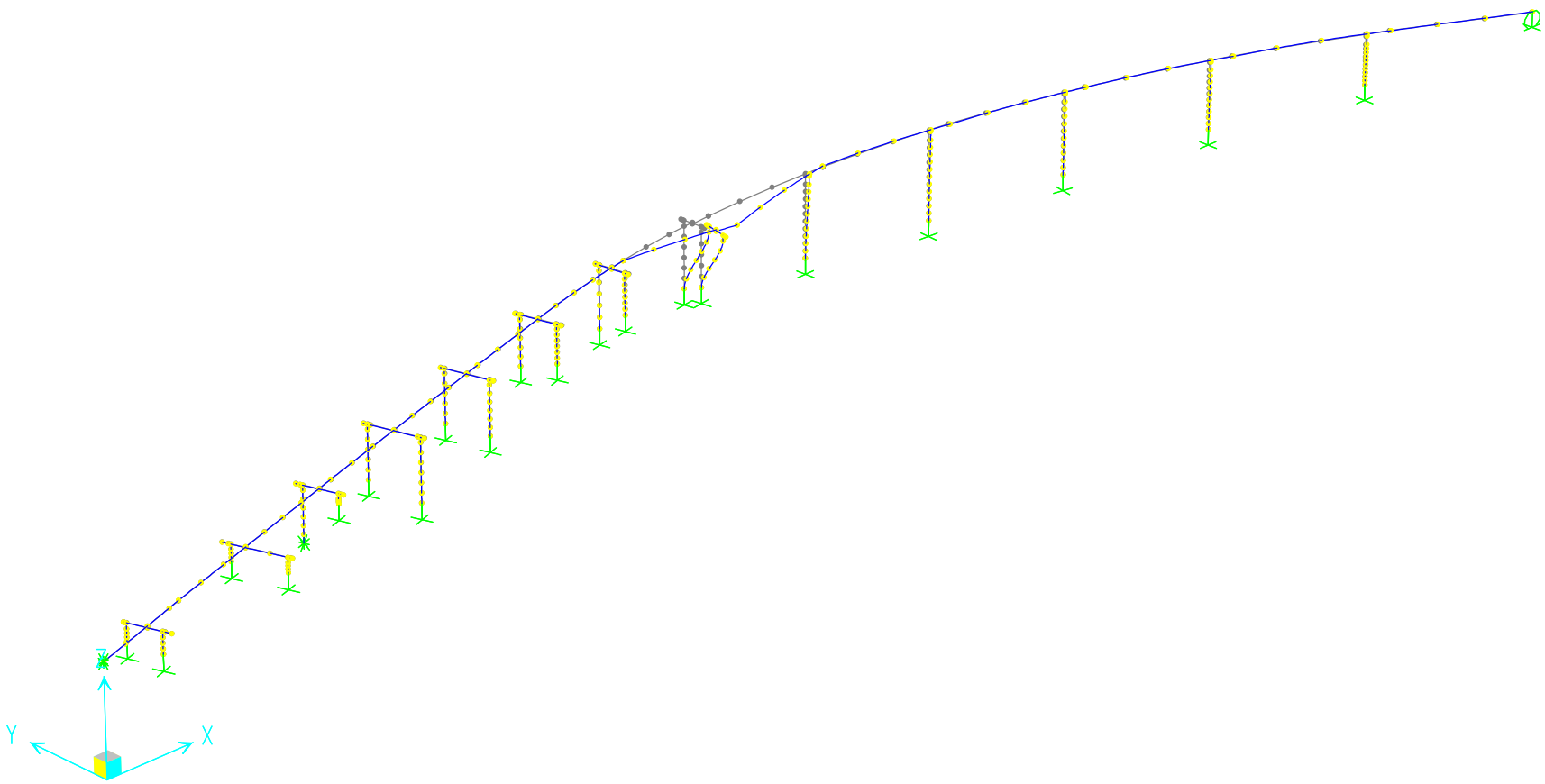
SAP2000 LINEAR ELASTIC RESPONSE SPECTRUM ANALYSIS - MODEL 1


Z
Y
X

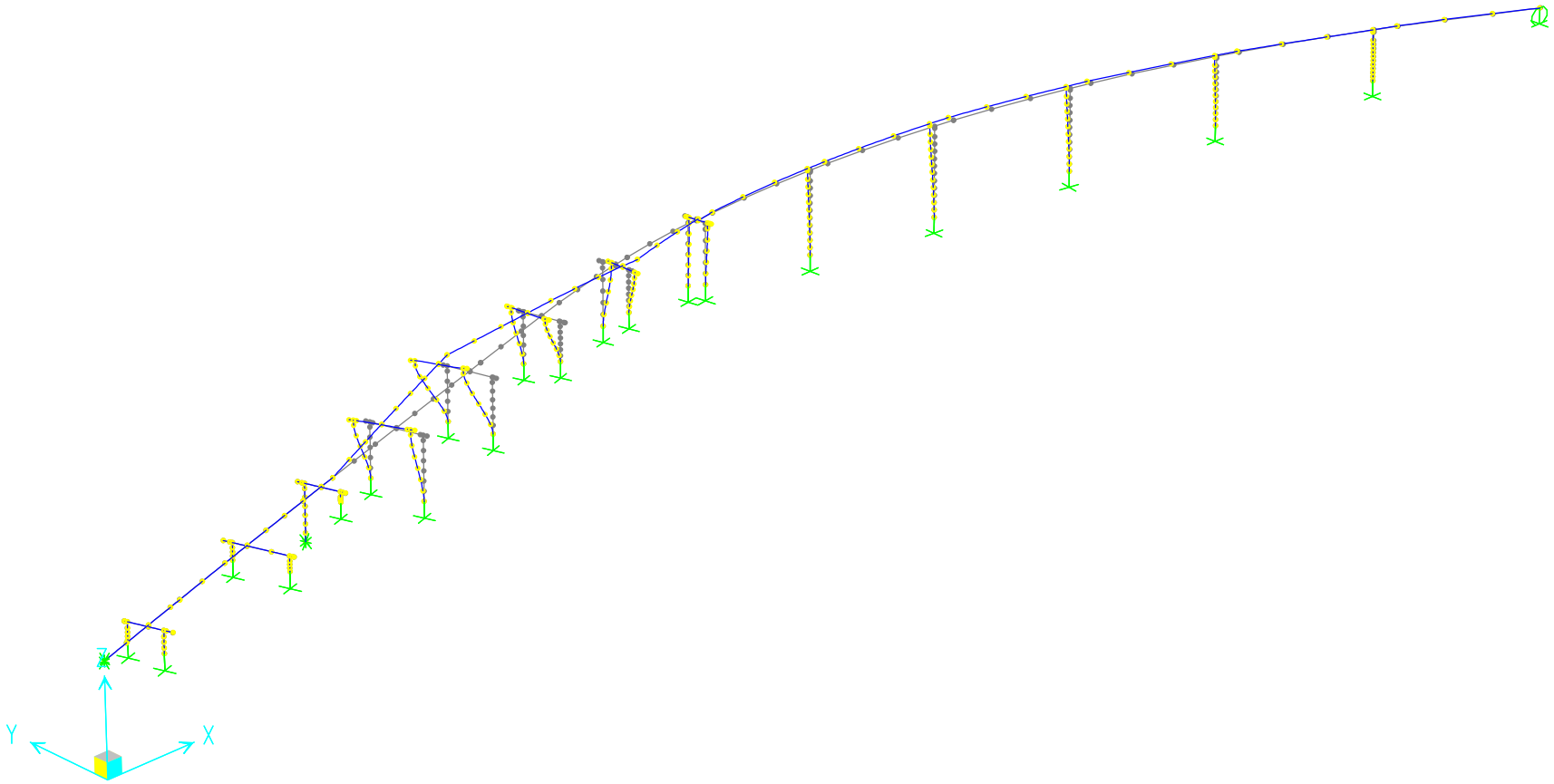
PARAMETRIC BRIDGE SAP2000 MODEL

M O D A L P A R T I C I P A T I N G M A S S R A T I O S

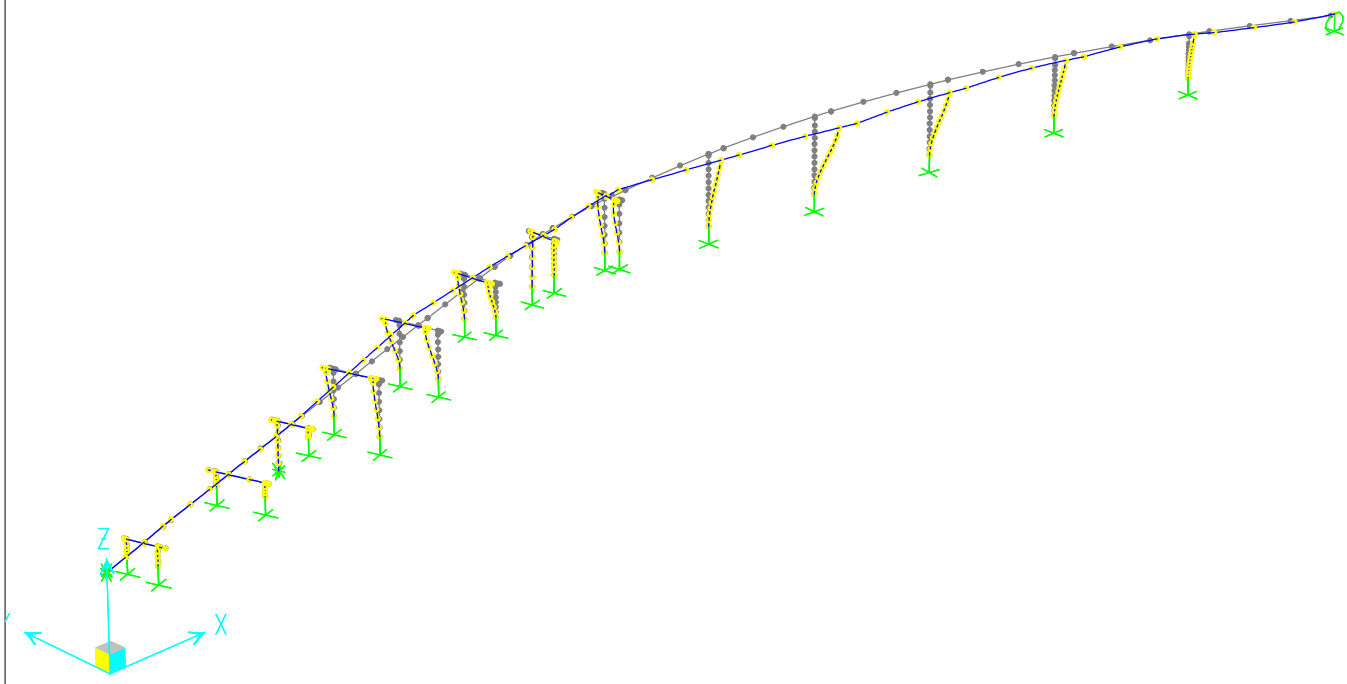
MODE	PERIOD	INDIVIDUAL MODE (PERCENT) UX	UY	UZ	CUMULATIVE SUM (PERCENT) UX	UY	UZ
1	0.398149	0.8046	11.2880	0.0013	0.8046	11.2880	0.0013
2	0.304805	0.6043	23.8598	0.0001	1.4089	35.1478	0.0014
3	0.301374	0.6023	15.5292	0.0001	2.0112	50.6769	0.0015
4	0.251180	8.2741	8.8777	0.0087	10.2853	59.5547	0.0102
5	0.234874	1.5227	0.6864	0.0025	11.8080	60.2411	0.0127
6	0.212632	3.4967	0.7049	0.0005	15.3047	60.9460	0.0132
7	0.206712	65.1792	3.5111	0.0192	80.4838	64.4570	0.0324
8	0.187710	0.4200	2.2381	0.0126	80.9038	66.6951	0.0449
9	0.170298	0.9705	0.0961	3.4389	81.8743	66.7912	3.4838
10	0.132347	0.0248	0.0007	0.5569	81.8991	66.7919	4.0408
11	0.116211	0.9308	0.2338	0.0000	82.8299	67.0258	4.0408
12	0.112708	2.2283	1.6882	0.0028	85.0583	68.7140	4.0435
13	0.108270	0.0001	0.5245	0.3030	85.0583	69.2385	4.3466
14	0.103164	3.3122	5.9957	0.0199	88.3705	75.2343	4.3665
15	0.099668	0.1833	0.0005	2.9434	88.5539	75.2347	7.3099
16	0.098461	0.0115	0.0172	2.3102	88.5654	75.2520	9.6200
17	0.095869	0.0052	0.3672	7.2585	88.5706	75.6192	16.8785
18	0.093181	0.0010	0.0013	3.2381	88.5716	75.6205	20.1166
19	0.091258	0.0886	0.0175	4.8458	88.6601	75.6380	24.9624
20	0.084742	0.0234	0.0144	0.5582	88.6835	75.6525	25.5206
21	0.081411	1.4374	0.1077	2.4317	90.1210	75.7601	27.9523
22	0.078519	0.8281	8.0852	0.1722	90.9491	83.8453	28.1245
23	0.077974	0.0249	0.9907	0.0509	90.9740	84.8360	28.1754
24	0.073938	0.0019	0.0152	0.0050	90.9759	84.8511	28.1804
25	0.072959	1.1168	3.5078	1.8531	92.0927	88.3589	30.0335
26	0.072258	0.1777	0.0010	33.0823	92.2704	88.3599	63.1158
27	0.069695	1.6050	1.3351	0.9219	93.8754	89.6950	64.0377
28	0.060192	0.0138	0.0021	0.2962	93.8892	89.6971	64.3339
29	0.056711	0.3725	0.0344	0.0794	94.2618	89.7315	64.4133
30	0.055914	0.2539	0.0005	0.6335	94.5157	89.7320	65.0467
31	0.052505	0.0481	0.8723	0.0849	94.5638	90.6043	65.1317
32	0.050881	0.0815	0.0002	1.4731	94.6454	90.6046	66.6047
33	0.046730	0.0550	0.2522	0.9788	94.7004	90.8567	67.5835
34	0.045222	0.1147	0.0082	0.8248	94.8150	90.8649	68.4083
35	0.043735	0.3907	0.0115	5.1896	95.2058	90.8764	73.5979
36	0.042659	0.0142	0.0070	0.0228	95.2199	90.8834	73.6207
37	0.042643	0.0253	0.0460	0.1509	95.2452	90.9294	73.7716
38	0.042591	0.0127	0.0540	0.4672	95.2579	90.9834	74.2388
39	0.041187	0.1177	0.0000	1.2212	95.3757	90.9834	75.4600
40	0.040797	0.0033	0.0001	0.1373	95.3790	90.9834	75.5973
41	0.040397	0.1060	0.1214	0.6299	95.4850	91.1048	76.2272
42	0.039885	0.0055	0.0006	0.1731	95.4905	91.1054	76.4003
43	0.038491	0.0056	0.0082	0.2866	95.4961	91.1135	76.6869
44	0.038139	0.1304	0.0102	2.5297	95.6265	91.1237	79.2166
45	0.037651	0.0579	0.0074	0.0064	95.6844	91.1311	79.2230
46	0.037088	0.0148	0.0008	0.0034	95.6991	91.1319	79.2264
47	0.035393	0.0105	0.0291	0.2352	95.7096	91.1610	79.4616
48	0.033893	0.0049	0.2476	0.1970	95.7145	91.4086	79.6586
49	0.033481	0.0028	0.0539	0.8268	95.7173	91.4626	80.4854
50	0.032974	0.0640	0.0001	0.1238	95.7813	91.4626	80.6092



SAP2000 v7.40 - File:Alameda Model - Mode 1 Period 0.3981 seconds - Kip-ft Units



SAP2000 v7.40 - File:Alameda Model - Mode 2 Period 0.3048 seconds - Kip-ft Units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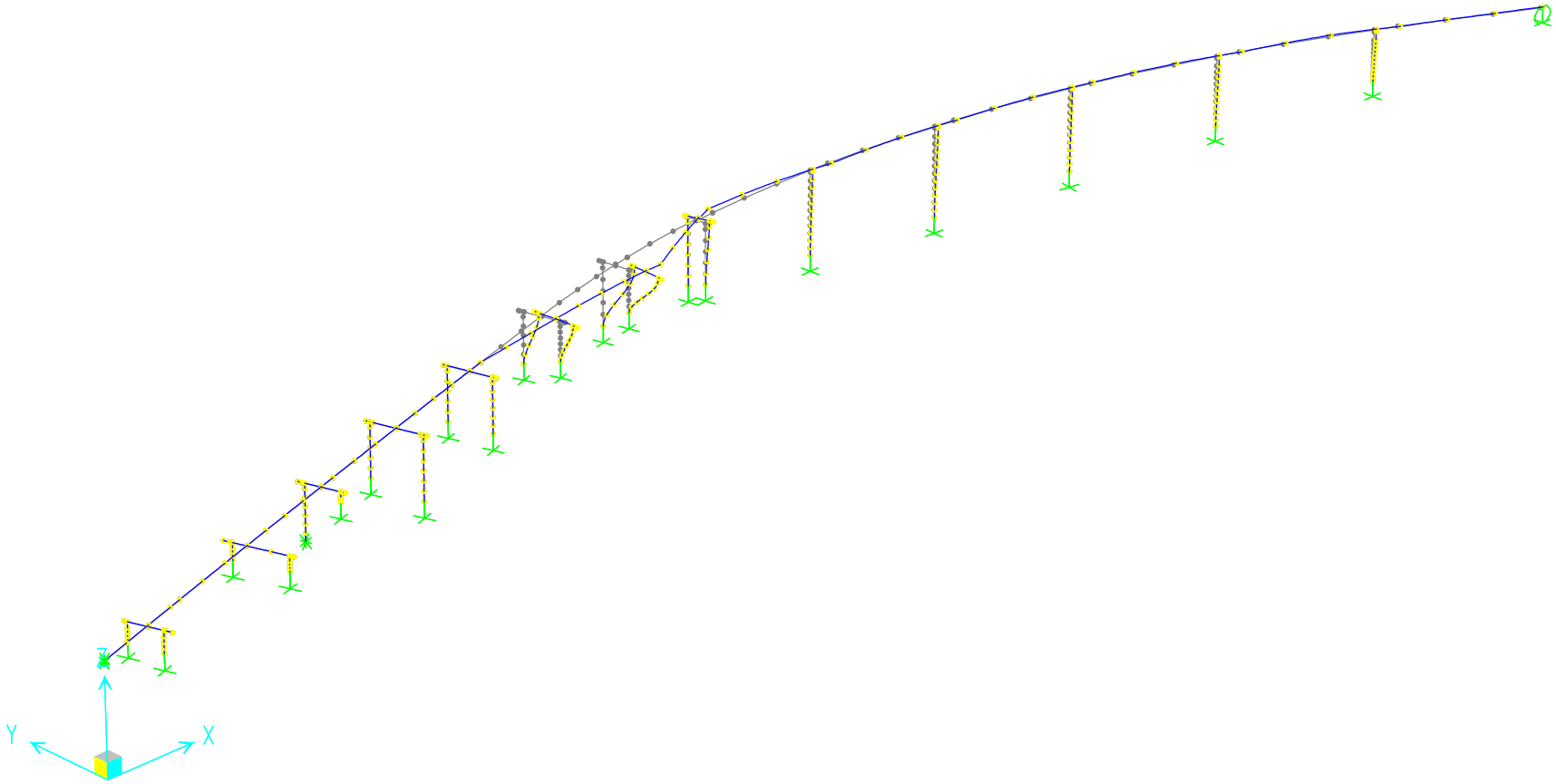
Y
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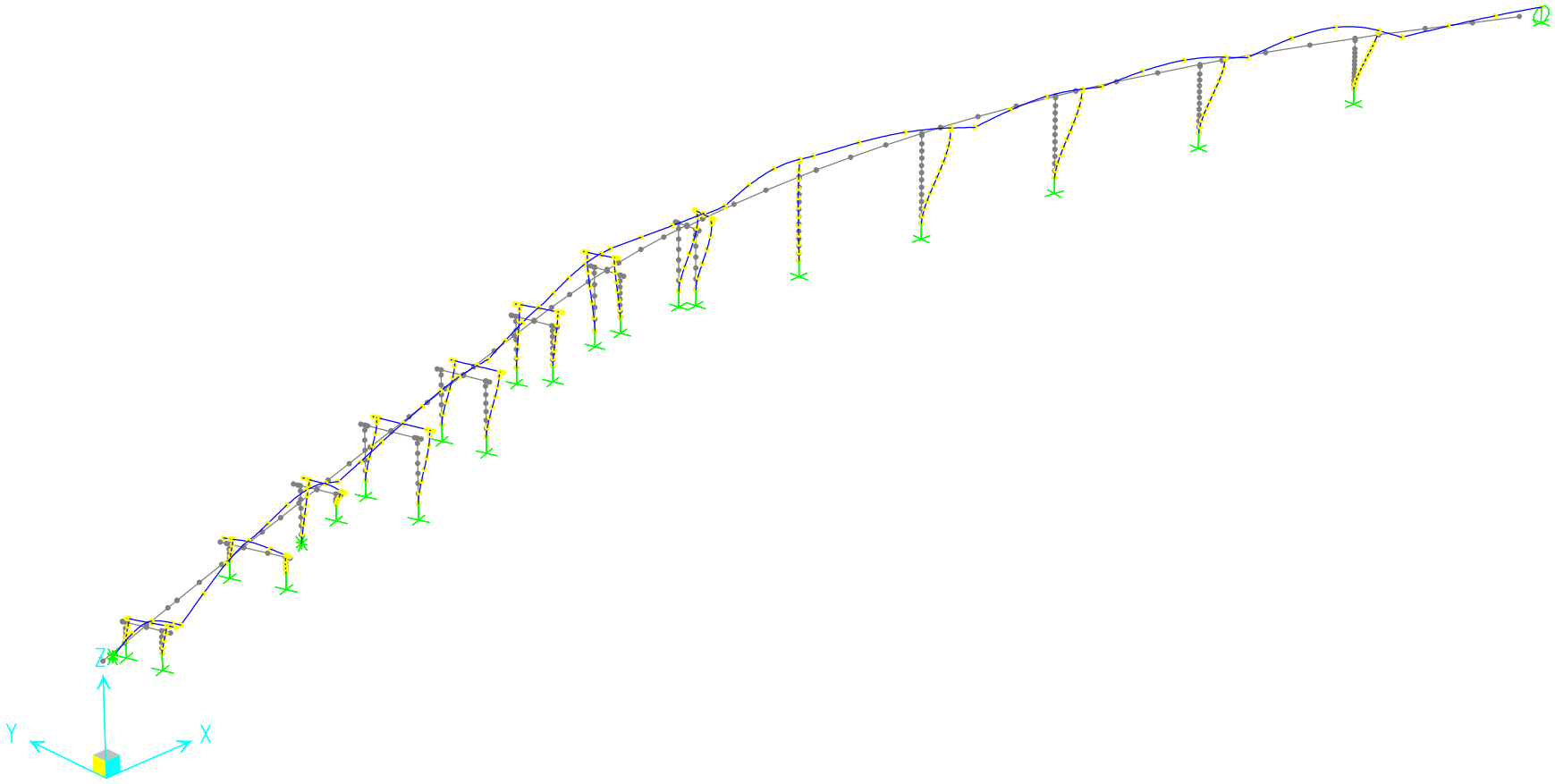
Z
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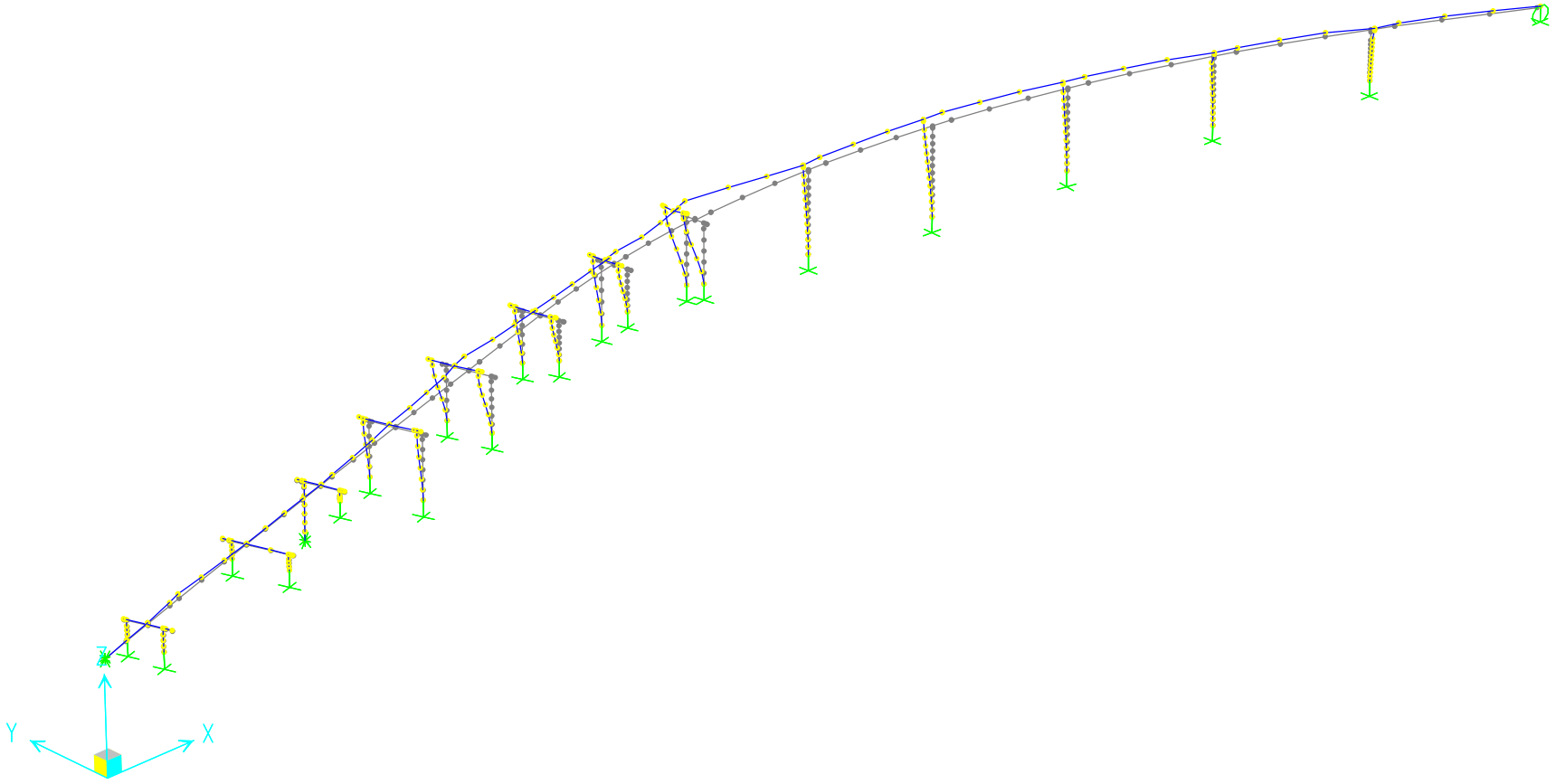
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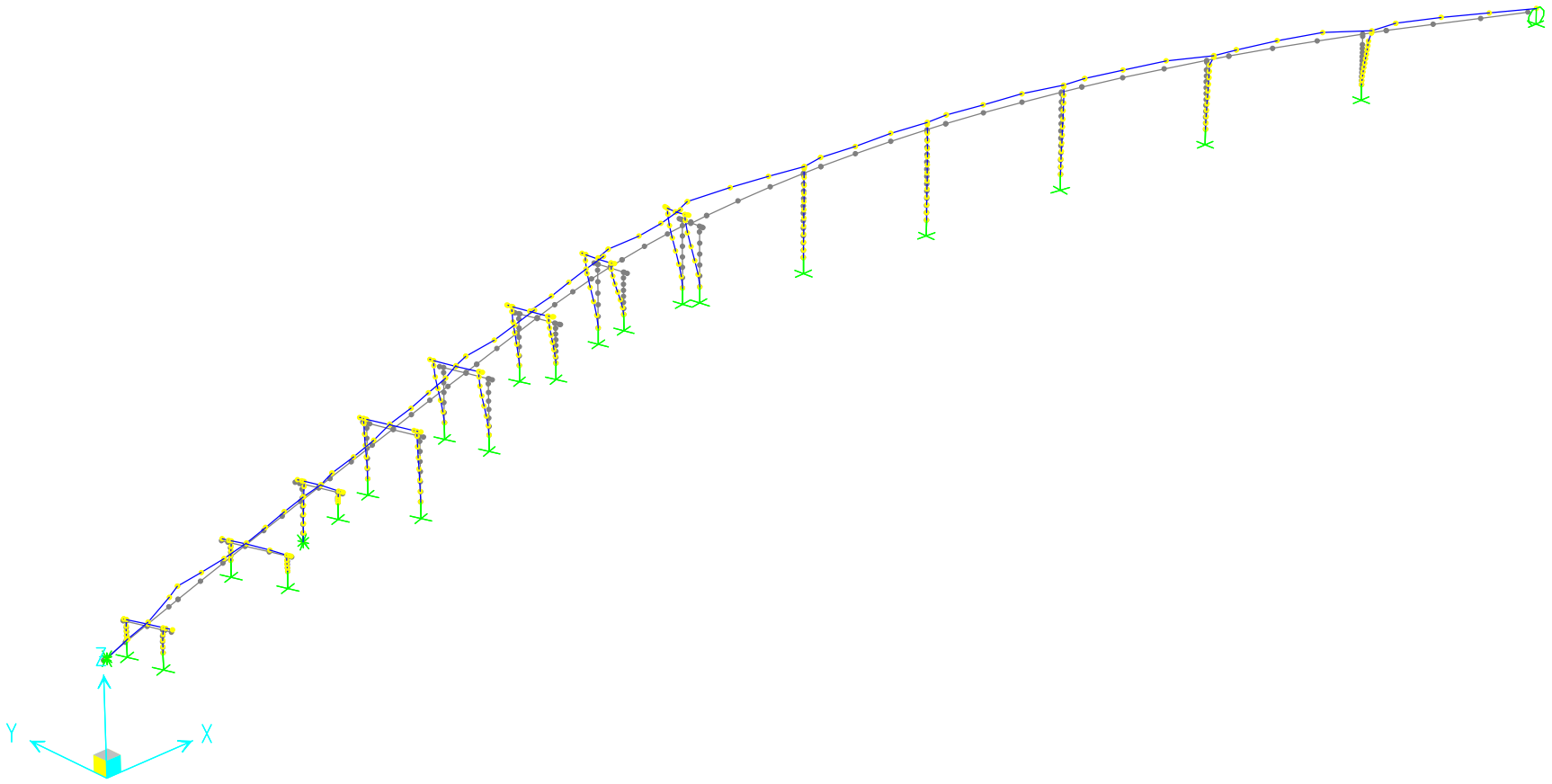
Z
Y
X

POST-PROCESSOR - MODEL 1

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ANALYSIS RESULTS - NODAL DISPLACEMENTS
SAP2000 BRIDGE ANALYSIS INPUT FILE DATA - Tension EQ MODEL
ALAMEDA CREEK BRIDGE - AS-BUILT

Model : Tension EQ

1. ABUTMENT MOVEMENT

Abutment	Line Segment	Node ID	Gravity Loads (DL) UX / U1 (inches)	UY / U2 (inches)	UZ / U3 (inches)	RX / R1 (radians)	RY / R2 (radians)	RZ / R3 (radians)	Fault Parallel (FP) UX / U1 (inches)	UY / U2 (inches)	UZ / U3 (inches)	RX / R1 (radians)	RY / R2 (radians)	RZ / R3 (radians)	Fault Normal (FN) UX / U1 (inches)	UY / U2 (inches)	UZ / U3 (inches)	RX / R1 (radians)	RY / R2 (radians)	RZ / R3 (radians)
1	1	1000100	0.01	0.00	0.00	0.000	0.000	0.000	0.19	0.00	0.00	0.000	0.005	0.005	0.34	0.00	0.00	0.000	0.008	0.005
	2																			
15	1	1001500	-0.01	0.00	0.00	0.000	-0.004	0.000	0.79	0.00	0.00	0.000	0.015	0.000	1.10	0.00	0.00	0.000	0.007	0.000
	2																			

2. HINGE MOVEMENT

	Hinge Number	Hinge Node Data: Location	Hinge Node Data: Node Number	Gravity Loads (DL) UX / U1 (inches)	UY / U2 (inches)	UZ / U3 (inches)	RX / R1 (radians)	RY / R2 (radians)	RZ / R3 (radians)	Fault Parallel (FP) UX / U1 (inches)	UY / U2 (inches)	UZ / U3 (inches)	RX / R1 (radians)	RY / R2 (radians)	RZ / R3 (radians)	Fault Normal (FN) UX / U1 (inches)	UY / U2 (inches)	UZ / U3 (inches)	RX / R1 (radians)	RY / R2 (radians)	RZ / R3 (radians)
Line Segment 1	1	Depart	1000202	0.01	-0.01	-0.32	0.000	0.014	0.000	0.20	0.29	0.45	0.001	0.019	0.005	0.35	0.23	0.88	0.002	0.036	0.005
		Arrive	1000203	0.01	-0.01	-0.32	0.000	-0.002	0.000	0.20	0.29	0.45	0.001	0.011	0.003	0.35	0.23	0.88	0.002	0.020	0.002
	2	Depart	1000401	0.00	0.01	-0.04	0.000	0.001	0.000	0.26	0.10	0.15	0.003	0.013	0.003	0.45	0.08	0.23	0.002	0.022	0.003
		Arrive	1000402	0.00	0.01	-0.04	0.000	0.005	0.000	0.26	0.10	0.15	0.003	0.006	0.020	0.45	0.08	0.23	0.002	0.005	0.010
	3	Depart	1000601	0.00	0.00	-0.04	0.000	-0.001	0.000	0.42	2.57	0.05	0.007	0.005	0.019	0.72	1.36	0.08	0.004	0.008	0.010
		Arrive	1000602	0.00	0.00	-0.04	0.000	0.004	0.000	0.42	2.57	0.05	0.007	0.002	0.028	0.72	1.36	0.08	0.004	0.004	0.019
	4	Depart	1000801	0.00	0.02	-0.02	0.000	-0.001	0.000	0.54	1.99	0.07	0.015	0.005	0.027	0.89	1.90	0.11	0.009	0.009	0.019
		Arrive	1000802	0.00	0.02	-0.02	0.000	0.002	0.000	0.54	1.99	0.07	0.015	0.001	0.084	0.89	1.90	0.11	0.009	0.001	0.054
	5	Depart	1000901	-0.01	0.02	-0.05	0.000	0.001	0.000	0.58	5.13	0.05	0.024	0.004	0.085	0.95	2.75	0.10	0.011	0.007	0.054
		Arrive	1000902	-0.01	0.02	-0.05	0.000	0.002	0.000	0.58	5.13	0.05	0.024	0.004	0.069	0.95	2.75	0.10	0.011	0.006	0.038

	Hinge Number	Hinge Node Data: Location	Hinge Node Data: Node Number	Gravity Loads (DL) UX / U1 (inches)	UY / U2 (inches)	UZ / U3 (inches)	RX / R1 (radians)	RY / R2 (radians)	RZ / R3 (radians)	Fault Parallel (FP) UX / U1 (inches)	UY / U2 (inches)	UZ / U3 (inches)	RX / R1 (radians)	RY / R2 (radians)	RZ / R3 (radians)	Fault Normal (FN) UX / U1 (inches)	UY / U2 (inches)	UZ / U3 (inches)	RX / R1 (radians)	RY / R2 (radians)	RZ / R3 (radians)
	1	Depart																			
		Arrive																			
	2	Depart																			
		Arrive																			
	3	Depart																			
		Arrive																			
	4	Depart																			
		Arrive																			
	5	Depart																			
		Arrive																			

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ANALYSIS RESULTS - NODAL DISPLACEMENTS
SAP2000 BRIDGE ANALYSIS INPUT FILE DATA - Tension EQ MODEL
ALAMEDA CREEK BRIDGE - AS-BUILT

Model : Tension EQ

5. PIER DISPLACEMENT DEMANDS

Cracked Member Stiffness Parameters :

E_{cB} = 0.90 E (Bentcap Cracked Modulus)

E_{cC} = 0.75 E (Column Cracked Modulus)

E_{PH} = 0.50 E (Column Cracked Modulus - at Plastic Hinges)

Note: Plastic hinge elements are taken as the first and last pier elements, if fixed there.

		Pier Data				Gravity Loads (DL)						Fault Parallel (FP)						Fault Normal (FN)					
Bent Number	Pier Number	L_C (feet)	Height h_C (feet)	Number of Nodes	Node Number	UX / U1 (inches)	UY / U2 (inches)	UZ / U3 (inches)	RX / R1 (radians)	RY / R2 (radians)	RZ / R3 (radians)	UX / U1 (inches)	UY / U2 (inches)	UZ / U3 (inches)	RX / R1 (radians)	RY / R2 (radians)	RZ / R3 (radians)	UX / U1 (inches)	UY / U2 (inches)	UZ / U3 (inches)	RX / R1 (radians)	RY / R2 (radians)	RZ / R3 (radians)
2	1	10.50	6.00	3	020103	0.00	0.00	-0.01	0.001	0.004	0.000	0.10	0.15	0.01	0.003	0.014	0.005	0.17	0.11	0.01	0.002	0.026	0.006
	2	-7.50	8.00	3	020203	-0.01	-0.01	-0.01	-0.001	0.004	0.000	0.15	0.15	0.01	0.002	0.014	0.005	0.25	0.11	0.01	0.003	0.025	0.004
	3																						
	4																						
	5																						
3	1	7.50	6.00	3	030103	0.01	0.01	-0.01	0.003	-0.001	0.000	0.15	0.12	0.01	0.004	0.010	0.004	0.26	0.10	0.01	0.004	0.016	0.005
	2	-21.00	5.00	3	030203	0.00	0.00	0.00	-0.002	-0.001	-0.001	0.05	0.11	0.00	0.005	0.007	0.008	0.08	0.09	0.00	0.004	0.012	0.015
	3																						
	4																						
	5																						
4	1	8.50	26.00	6	040106	0.00	0.01	-0.02	0.001	0.000	0.000	0.23	0.08	0.02	0.002	0.012	0.003	0.39	0.06	0.01	0.001	0.021	0.003
	2	-9.50	2.50	3	040203	0.00	0.00	0.00	-0.003	0.000	0.000	0.08	0.05	0.00	0.008	0.019	0.010	0.14	0.04	0.00	0.005	0.034	0.017
	3																						
	4																						
	5																						
5	1	13.50	25.00	5	050105	0.00	0.02	-0.02	0.004	0.000	0.000	0.34	1.10	0.03	0.009	0.003	0.019	0.58	0.59	0.01	0.005	0.003	0.010
	2	-13.50	30.00	6	050206	0.00	-0.01	-0.02	-0.004	0.000	0.000	0.53	1.11	0.03	0.005	0.002	0.019	0.63	0.59	0.02	0.003	0.002	0.010
	3																						
	4																						
	5																						
6	1	11.50	25.08	5	060105	0.00	0.01	-0.02	0.003	-0.002	0.000	0.36	2.34	0.06	0.016	0.005	0.018	0.67	1.24	0.03	0.008	0.010	0.010
	2	-11.50	25.49	6	060206	0.00	-0.01	-0.02	-0.003	-0.002	0.000	0.55	2.34	0.06	0.016	0.007	0.018	0.72	1.23	0.03	0.008	0.010	0.010
	3																						
	4																						
	5																						
7	1	9.50	23.47	5	070105	0.00	0.01	-0.02	0.002	0.000	0.000	0.63	1.46	0.07	0.011	0.004	0.027	0.82	1.07	0.05	0.008	0.007	0.019
	2	-9.50	17.50	6	070206	0.00	0.00	-0.01	-0.002	0.000	0.000	0.45	1.43	0.05	0.022	0.006	0.027	0.80	1.04	0.04	0.015	0.010	0.018
	3																						
	4																						
	5																						
8	1	7.00	29.40	5	080105	0.00	0.02	-0.02	0.000	-0.002	0.000	0.62	1.77	0.09	0.012	0.005	0.027	0.88	1.71	0.07	0.009	0.009	0.019
	2	-7.00	18.42	6	080206	0.00	0.01	-0.01	-0.001	-0.002	0.000	0.44	1.74	0.05	0.018	0.006	0.027	0.84	1.67	0.04	0.017	0.012	0.018
	3																						
	4																						
	5																						
9	1	5.00	32.00	6	090106	-0.01	0.02	-0.03	0.000	0.000	0.000	0.66	4.14	0.10	0.023	0.003	0.084	1.00	2.20	0.05	0.012	0.005	0.054
	2	-5.00	28.00	5	090205	-0.01	0.02	-0.03	-0.001	0.000	0.000	0.81	4.12	0.09	0.025	0.003	0.084	1.03	2.19	0.05	0.012	0.005	0.054
	3																						
	4																						
	5																						
10	1	0.00	38.11	10	100110	0.00	0.01	-0.02	0.000	-0.001	0.000	0.59	1.43	0.00	0.033	0.009	0.068	0.91	0.78	0.00	0.014	0.015	0.038
	2																						
	3																						

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ANALYSIS RESULTS - NODAL DISPLACEMENTS
SAP2000 BRIDGE ANALYSIS INPUT FILE DATA - Tension EQ MODEL
ALAMEDA CREEK BRIDGE - AS-BUILT

Model : Tension EQ

	4																						
	5																						
11	1	0.00	41.67	11	110111	-0.01	0.00	-0.02	0.000	-0.001	0.000	0.54	2.38	0.00	0.041	0.006	0.019	0.93	0.99	0.00	0.016	0.010	0.012
	2																						
	3																						
	4																						
	5																						
12	1	0.00	38.12	10	120110	-0.01	0.00	-0.02	0.000	-0.001	0.000	0.62	1.90	0.00	0.039	0.008	0.014	0.96	0.96	0.01	0.016	0.011	0.011
	2																						
	3																						
	4																						
	5																						
13	1	0.00	31.18	10	130110	-0.01	-0.01	-0.02	0.000	-0.001	0.000	0.56	0.99	0.01	0.030	0.008	0.016	0.91	0.51	0.01	0.013	0.014	0.010
	2																						
	3																						
	4																						
	5																						

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ANALYSIS RESULTS - NODAL REACTIONS
SAP2000 BRIDGE ANALYSIS INPUT FILE DATA - Tension EQ MODEL
ALAMEDA CREEK BRIDGE - AS-BUILT

Model : Tension EQ

		Pier Data				Gravity Loads (DL)						Fault Parallel (FP)						Fault Normal (FN)					
Bent Number	Pier Number	L_c (feet)	Height h_c (feet)	Number of Nodes	Node Number	F1 (Kips)	F2 (Kips)	F3 (Kips)	M1 (Kip-ft)	M2 (Kip-ft)	M3 (Kip-ft)	F1 (Kips)	F2 (Kips)	F3 (Kips)	M1 (Kip-ft)	M2 (Kip-ft)	M3 (Kip-ft)	F1 (Kips)	F2 (Kips)	F3 (Kips)	M1 (Kip-ft)	M2 (Kip-ft)	M3 (Kip-ft)
2	1	10.50	6.00	3.00	020100	-1	-28	382	44	-474	-15	523	767	367	2,389	1,920	312	736	465	305	1,445	2,700	356
	2	-7.50	8.00	3.00	020200	1	28	490	-91	-354	-11	540	410	415	1,666	2,365	242	603	251	270	1,016	2,771	281
	3																						
	4																						
	5																						
3	1	7.50	6.00	3.00	030100	-32	-79	620	161	88	-10	504	838	473	2,641	2,010	138	626	394	572	1,187	2,570	107
	2	-21.00	5.00	3.00	030200	-14	84	144	-141	144	6	183	1,082	354	2,948	751	136	281	430	172	1,186	1,421	212
	3																						
	4																						
	5																						
4	1	8.50	26.00	6.00	040100	0	-3	268	34	0	0	14	17	243	127	0	0	14	10	199	82	0	0
	2	-9.50	2.50	3.00	040200	46	-2	356	184	162	-35	517	681	261	1,121	1,433	430	1,055	377	210	653	2,969	492
	3																						
	4																						
	5																						
5	1	13.50	25.00	5.00	050100	4	-20	392	142	49	-2	627	1,231	1,084	16,029	8,145	918	861	840	888	10,888	11,205	678
	2	-13.50	30.00	6.00	050200	2	19	386	-202	29	-2	294	792	1,124	12,107	4,532	802	558	528	689	8,100	8,601	530
	3																						
	4																						
	5																						
6	1	11.50	25.08	5.00	060100	-3	-15	355	123	-6	-3	571	619	768	7,941	7,607	909	795	380	589	4,847	10,671	654
	2	-11.50	25.49	6.00	060200	-4	16	348	-133	-20	-2	423	605	754	7,896	5,795	927	800	361	469	4,740	10,906	609
	3																						
	4																						
	5																						
7	1	9.50	23.47	5.00	070100	2	-17	374	151	28	1	381	630	1,138	7,594	4,631	501	491	555	949	6,668	5,992	415
	2	-9.50	17.50	6.00	070200	6	17	382	-63	51	0	658	1,363	1,175	12,628	6,096	716	1,084	1,186	819	10,997	10,012	566
	3																						
	4																						
	5																						
8	1	7.00	29.40	5.00	080100	-3	-4	301	46	-18	0	192	267	1,159	3,940	2,879	394	255	157	633	2,299	3,855	322
	2	-7.00	18.42	6.00	080200	-6	3	349	4	-21	1	590	953	1,198	9,178	5,704	654	950	558	775	5,328	9,191	524
	3																						
	4																						
	5																						
9	1	5.00	32.00	6.00	090100	0	-2	420	19	-5	0	452	439	1,160	7,014	7,274	4,997	670	184	756	2,943	10,836	2,015
	2	-5.00	28.00	5.00	090200	0	2	436	-10	-7	0	530	617	1,149	8,706	7,494	5,552	926	259	746	3,654	13,150	2,239
	3																						
	4																						
	5																						
10	1	0.00	38.11	10.00	100100	0	0	921	0	371	0	659	1,011	130	25,700	14,766	35,608	1,822	480	240	11,822	40,622	13,234
	2																						
	3																						
	4																						
	5																						
11	1	0.00	41.67	11.00	110100	0	0	929	-48	165	0	540	1,330	148	34,518	12,428	34,250	1,566	722	219	17,935	35,722	12,180
	2																						
	3																						
	4																						
	5																						
12	1	0.00	38.12	10.00	120100	0	0	906	-98	185	0	700	1,153	412	28,580	15,153	36,153	1,602	599	728	14,441	34,467	15,395
	2																						
	3																						
	4																						
	5																						
13	1	0.00	31.18	10.00	130100	0	0	873	-132	292	0	1,061	985	349	22,443	18,716	35,261	1,800	690	386	14,180	32,514	18,317
	2																						
	3																						
	4																						
	5																						

Sum= 9,634 Kips

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ANALYSIS RESULTS - FORCE RESULTS
SAP2000 BRIDGE ANALYSIS INPUT FILE DATA - Tension EQ MODEL
ALAMEDA CREEK BRIDGE - AS-BUILT

Model : Tension EQ

1. DECK FORCES

	Section	Element ID	Node ID	Gravity Loads (DL)						Fault Parallel (FP)						Fault Normal (FN)					
				F1 (Kips)	F2 (Kips)	F3 (Kips)	M1 (Kip-ft)	M2 (Kip-ft)	M3 (Kip-ft)	F1 (Kips)	F2 (Kips)	F3 (Kips)	M1 (Kip-ft)	M2 (Kip-ft)	M3 (Kip-ft)	F1 (Kips)	F2 (Kips)	F3 (Kips)	M1 (Kip-ft)	M2 (Kip-ft)	M3 (Kip-ft)
Line Segment 1	Abutment 1 - BC1	1000100	i	0	24	0	1,540	25	491	72	103	124	2,342	38	746	98	196	125	3,172	51	1,011
			j	3	170	0	1,540	25	-1,308	72	103	124	2,342	2,314	1,829	98	196	125	3,172	2,316	2,836
		1000101	i	3	170	0	1,541	26	-1,307	217	72	341	2,341	2,314	1,829	298	156	277	3,173	2,316	2,835
			j	5	315	0	1,541	26	-5,794	217	72	341	2,341	8,564	2,891	298	156	277	3,173	7,399	5,594
	Bent 2	1000200	i	-6	-354	0	1,185	20	-6,626	135	144	330	2,758	6,768	3,546	186	235	257	2,025	5,299	5,655
			j	-3	-209	0	1,185	20	-1,404	135	144	330	2,758	641	947	186	235	257	2,025	525	1,460
	Hinge	1000201	i	-3	-209	0	1,187	20	-1,402	32	120	83	2,758	641	948	44	185	68	2,026	525	1,459
			j	-2	-147	0	1,187	20	1	32	120	83	2,758	46	3	44	185	68	2,026	33	2
	"		i																		
			j																		
		1000203	i	-1	-147	0	1,187	10	0	62	134	254	2,758	24	0	119	226	123	2,027	18	0
			j	0	4	0	1,187	10	1,388	62	134	254	2,758	4,938	2,595	119	226	123	2,027	2,392	4,392
		1000204	i	0	4	0	1,187	9	1,388	188	40	650	2,758	4,939	2,595	358	61	312	2,026	2,392	4,392
			j	1	156	0	1,187	9	-172	188	40	650	2,758	17,562	2,450	358	61	312	2,026	8,454	4,123
		1000205	i	1	156	0	1,187	7	-172	310	189	941	2,757	17,562	2,450	592	335	448	2,025	8,454	4,123
			j	2	308	0	1,187	7	-4,682	310	189	941	2,757	35,801	1,988	592	335	448	2,025	17,141	3,367
	Bent 3	1000300	i	44	-286	5	-1,320	-58	-4,062	140	112	603	3,869	30,947	2,412	217	182	237	2,302	15,008	4,431
			j	45	-159	5	-1,320	-145	-447	140	112	603	3,869	21,989	1,588	217	182	237	2,302	12,647	2,444
		1000301	i	45	-159	5	-1,320	-144	-447	187	83	491	3,867	21,989	1,589	372	150	206	2,303	12,647	2,444
			j	45	-31	5	-1,320	-232	1,097	187	83	491	3,867	14,910	1,269	372	150	206	2,303	11,164	1,814
		1000302	i	45	-31	5	-1,320	-229	1,098	260	89	443	3,865	14,911	1,269	544	128	205	2,308	11,163	1,814
			j	46	96	5	-1,320	-316	571	260	89	443	3,865	8,641	1,313	544	128	205	2,308	10,105	2,227
		1000303	i	45	96	5	-1,320	-316	571	343	114	470	3,865	8,641	1,313	718	147	238	2,310	10,104	2,227
			j	46	223	5	-1,320	-403	-2,026	343	114	470	3,865	4,929	2,305	718	147	238	2,310	10,033	3,258
	Bent 4	1000400	i	0	-250	0	-26	0	-2,105	29	201	45	5,989	449	2,001	54	198	27	3,069	271	1,976
			j	0	-172	0	-26	0	0	29	201	45	5,989	6	1	54	198	27	3,069	3	1
	Hinge		i																		
			j																		
	"	1000402	i	0	-172	0	-26	0	0	100	111	248	5,989	3	0	161	161	164	3,069	2	0
			j	0	-23	0	-26	0	1,861	100	111	248	5,989	4,736	2,113	161	161	164	3,069	3,130	3,068
		1000403	i	0	-23	0	-25	0	1,861	299	88	648	5,989	4,736	2,113	484	110	430	3,069	3,130	3,068
			j	0	126	0	-25	0	877	299	88	648	5,989	17,083	3,064	484	110	430	3,069	11,313	4,489
		1000404	i	0	126	0	-26	0	877	498	135	959	5,993	17,082	3,064	806	194	637	3,073	11,312	4,489
			j	-1	275	0	-26	0	-2,951	498	135	959	5,993	35,325	3,898	806	194	637	3,073	23,426	5,818
	Bent 5	1000500	i	-5	-275	-1	-286	-30	-3,054	52	353	579	9,424	30,258	9,394	96	579	410	4,654	22,403	15,482
			j	-6	-144	-1	-286	-18	465	52	353	579	9,424	22,408	3,619	96	579	410	4,654	16,420	5,829
		1000501	i	-5	-144	-1	-286	-18	465	212	352	397	9,421	22,410	3,619	371	573	298	4,650	16,421	5,829
			j	-6	-12	-1	-286	-6	1,777	212	352	397	9,421	17,007	2,365	371	573	298	4,650	12,035	3,858
		1000502	i	-6	-13	-1	-287	-5	1,777	385	337	339	9,411	17,012	2,365	654	555	257	4,641	12,038	3,858
			j	-7	119	-1	-287	6	884	385	337	339	9,411	11,392	7,983	654	555	257	4,641	7,791	13,132
		1000503	i	-7	119	-1	-286	7	884	560	326	498	9,408	11,394	7,983	937	535	332	4,640	7,792	13,132
			j	-8	250	-1	-286	19	-2,215	560	326	498	9,408	4,413	13,281	937	535	332	4,640	2,907	22,046
	Bent 6	1000600	i	2	-246	0	-410	4	-2,066	52	81	108	14,421	1,067	805	84	125	63	6,714	624	1,246
			j	2	-168	0	-410	4	0	52	81	108	14,421	130	3	84	125	63	6,714	61	2
	Hinge		i																		
			j																		
	"	1000602	i	1	-168	0	-410	4	0	101	74	240	14,421	129	0	156	120	215	6,714	60	0
			j	0	-19	0	-410	4	1,786	101	74	240	14,421	4,555	1,417	156	120	215	6,714	4,079	2,283
		1000603	i	0	-19	0	-410	5	1,786	302	64	619	14,423	4,552	1,416	466	101	564	6,719	4,074	2,284
			j	-1	130	0	-410	5	728	302	64	619	14,423	16,335	2,595	466	101	564	6,719	14,818	4,127
		1000604	i	-2	130	0	-410	5	728	503	58	910	14,427	16,332	2,595	775	89	836	6,728	14,815	4,128
			j	-3	279	0	-410	5	-3,174	503	58	910	14,427	33,603	3,568	775	89	836	6,728	30,736	5,587
	Bent 7	1000700	i	-4	-301	0	-233	35	-3,273	136	298	682	21,471	32,038	8,985	198	465	533	9,917	27,178	13,562
			j	-6	-152	0	-233	37	522	136	298	682	21,471	22,873	4,096	198	465	533	9,917	19,065	5,928
		1000701	i	-6	-152	0	-218	37	529	80	300	493	21,470	22,882	4,044	120	463	393	9,918	19,071	5,905
			j	-8	-11	0	-218	35	1,877	80	300	493	21,470	16,489	1,370	120	463	393	9,918	13,371	2,588
	BC	1000702	i	-8	-11	0	-183	34	1,881	261	295	442	21,459	16,502	1,444	399	450	345	9,914	13,377	2,602
			j	-10	121	0	-183	30	959	261	295	442	21,459	9,938	5,963	399	450	345	9,914	8,621	9,564
			i																		
			j																		
			i																		
			j																		

	Section	Element ID	Node ID	Gravity Loads (DL)						Fault Parallel (FP)						Fault Normal (FN)					
				F1 (Kips)	F2 (Kips)	F3 (Kips)	M1 (Kip-ft)	M2 (Kip-ft)	M3 (Kip-ft)	F1 (Kips)	F2 (Kips)	F3 (Kips)	M1 (Kip-ft)	M2 (Kip-ft)	M3 (Kip-ft)	F1 (Kips)	F2 (Kips)	F3 (Kips)	M1 (Kip-ft)	M2 (Kip-ft)	M3 (Kip-ft)

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ANALYSIS RESULTS - FORCE RESULTS
SAP2000 BRIDGE ANALYSIS INPUT FILE DATA - Tension EQ MODEL
ALAMEDA CREEK BRIDGE - AS-BUILT

Model : Tension EQ

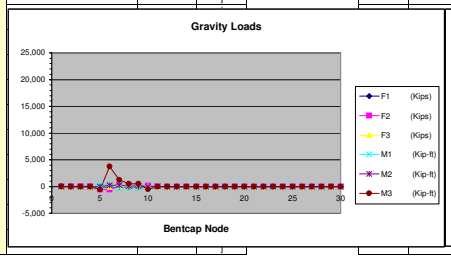
2. BENTCAP FORCES

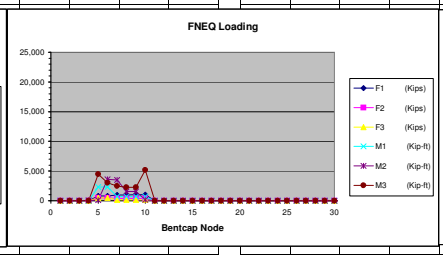
Bent Number	Node No.	Element ID	Node ID
3	1	0301	i
			j
	2	0302	i
			j
	3	0303	i
			j
	4	0304	i
			j
	5	0305	i
			j
	6	0306	i
			j
	7	0307	i
			j
	8		i
			j
	9		i
			j
	10		i
			j
	11		i
			j
	12		i
			j
	13		i
			j
	14		i
			j
	15		i
			j
	16		i
			j
	17		i
			j
	18		i
			j
	19		i
			j
	20		i
			j

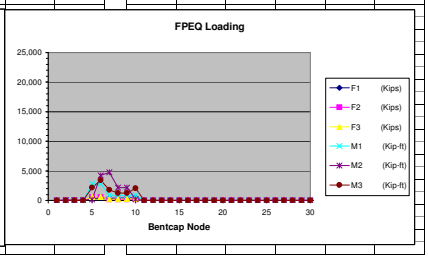
Gravity Loads (DL)					
F1 (Kips)	F2 (Kips)	F3 (Kips)	M1 (Kip-ft)	M2 (Kip-ft)	M3 (Kip-ft)
0	0	0	0	0	0
0	14	0	0	0	-23
0	14	0	0	0	-23
0	20	0	0	0	-44
-79	-591	-32	357	-10	-555
-79	-557	-32	357	228	3,750
-84	36	14	-246	279	1,246
-84	90	14	-246	116	485
-84	90	14	-246	116	485
-84	130	14	-246	-6	-499
0	-7	0	0	0	-7
0	-3	0	0	0	-1
0	-3	0	0	0	-1
0	0	0	0	0	0

Fault Parallel (FP)					
F1 (Kips)	F2 (Kips)	F3 (Kips)	M1 (Kip-ft)	M2 (Kip-ft)	M3 (Kip-ft)
10	2	6	0	0	0
10	2	6	0	20	5
23	3	14	0	20	5
23	3	14	0	38	9
785	468	472	2,297	132	4,471
785	468	472	2,297	3,595	3,020
985	352	159	725	3,480	2,474
985	352	159	725	1,566	2,275
1,045	352	175	725	1,566	2,275
1,045	352	175	725	137	5,155
6	1	2	0	2	1
6	1	2	0	0	0
2	0	0	0	0	0
2	0	0	0	0	0

Fault Normal (FN)					
F1 (Kips)	F2 (Kips)	F3 (Kips)	M1 (Kip-ft)	M2 (Kip-ft)	M3 (Kip-ft)
5	1	9	0	0	0
5	1	9	0	28	3
11	2	21	0	28	3
11	2	21	0	55	4
369	567	576	2,806	147	2,155
369	567	576	2,806	4,233	3,428
387	160	213	840	4,740	1,812
387	160	213	840	2,180	1,245
413	172	263	840	2,180	1,245
413	172	263	840	216	2,044
3	0	3	0	4	1
3	0	3	0	1	0
1	0	1	0	1	0
1	0	1	0	0	0





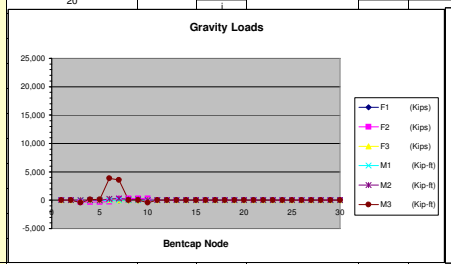


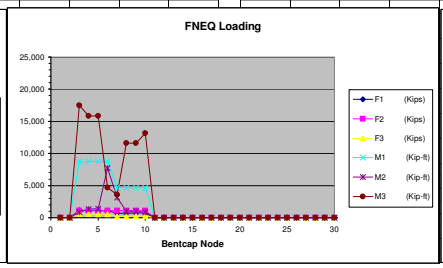
Section	Node No.	Element ID	Node ID
5	1	0501	i
			j
	2	0502	i
			j
	3	0503	i
			j
	4	0504	i
			j
	5	0505	i
			j
	6	0506	i
			j
	7		i
			j
	8		i
			j
	9		i
			j
	10		i
			j
	11		i
			j
	12		i
			j
	13		i
			j
	14		i
			j
	15		i
			j
	16		i
			j
	17		i
			j
	18		i
			j
	19		i
			j
	20		i
			j

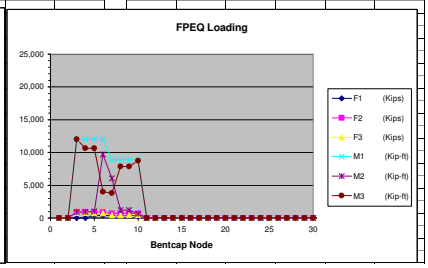
Gravity Loads (DL)					
F1 (Kips)	F2 (Kips)	F3 (Kips)	M1 (Kip-ft)	M2 (Kip-ft)	M3 (Kip-ft)
0	0	0	0	0	0
0	6	0	0	0	-6
-11	-343	4	-63	0	-409
-11	-337	4	-63	-7	115
-13	-337	4	-63	-7	115
-14	-284	4	-63	-56	3,832
-24	266	-2	38	-27	3,573
-26	320	-2	38	-2	44
-26	320	-2	38	-2	44
-26	326	-2	38	1	-427
0	-7	0	0	0	-7
0	0	0	0	0	0

Fault Parallel (FP)					
F1 (Kips)	F2 (Kips)	F3 (Kips)	M1 (Kip-ft)	M2 (Kip-ft)	M3 (Kip-ft)
5	0	5	0	0	0
5	0	5	0	10	1
1,155	1,112	581	8,785	861	17,491
1,155	1,112	581	8,785	1,334	15,824
1,113	1,102	536	8,777	1,387	15,824
1,113	1,102	536	8,777	7,699	4,700
704	1,106	215	4,674	3,159	3,595
704	1,106	215	4,674	1,006	11,592
754	1,107	251	4,673	1,007	11,592
754	1,107	251	4,673	829	13,155
6	1	5	0	9	1
6	1	5	0	0	0

Fault Normal (FN)					
F1 (Kips)	F2 (Kips)	F3 (Kips)	M1 (Kip-ft)	M2 (Kip-ft)	M3 (Kip-ft)
3	0	6	0	0	0
3	0	6	0	12	1
786	906	798	12,023	860	11,987
786	906	798	12,023	935	10,663
760	899	736	12,018	1,004	10,663
760	899	736	12,018	9,698	4,010
468	676	415	8,907	6,078	3,807
468	676	415	8,907	1,232	7,853
501	678	480	8,907	1,237	7,853
501	678	480	8,907	639	8,732
4	1	8	0	16	1
4	1	8	0	0	0







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Model : Tension EQ

3. PIER FORCES

Pier Data						Gravity Loads (DL)						Fault Parallel (FP)						Fault Normal (FN)					
Bent Number	Pier Number	L_C (feet)	Height h_C (feet)	Element ID	Node ID	F1 (Kips)	F2 (Kips)	F3 (Kips)	M1 (Kip-ft)	M2 (Kip-ft)	M3 (Kip-ft)	F1 (Kips)	F2 (Kips)	F3 (Kips)	M1 (Kip-ft)	M2 (Kip-ft)	M3 (Kip-ft)	F1 (Kips)	F2 (Kips)	F3 (Kips)	M1 (Kip-ft)	M2 (Kip-ft)	M3 (Kip-ft)
2	1	10.50	6.00	020100	i	-382	1	28	15	44	474	367	523	767	312	2,389	1,920	305	736	465	356	1,445	2,700
					j	-379	1	28	15	-11	471	367	523	767	312	856	897	305	736	465	356	516	1,290
				020102	i	-377	1	28	15	-67	468	367	521	762	312	675	312	305	734	462	356	413	599
					j	-374	1	28	15	-123	465	367	521	762	312	2,199	1,260	305	734	462	356	1,336	1,841
	2	-7.50	8.00	020200	i	-490	-1	-28	11	-91	354	415	540	410	242	1,666	2,365	270	603	251	281	1,016	2,771
					j	-486	-1	-28	11	-17	358	415	540	410	242	572	943	270	603	251	281	346	1,199
				020202	i	-482	-1	-28	11	57	362	415	537	404	242	517	579	269	600	247	281	322	614
					j	-478	-1	-28	11	132	365	415	537	404	242	1,592	1,969	269	600	247	281	981	2,105
	3				i																		
					j																		
					i																		
	4				j																		
					i																		
	5				j																		
					i																		
					j																		
3	1	7.50	6.00	030100	i	-620	32	79	10	161	-88	473	504	838	138	2,641	2,010	572	626	394	107	1,187	2,570
					j	-617	32	79	10	3	-151	473	504	838	138	966	1,019	572	626	394	107	405	1,351
				030102	i	-614	32	79	10	-155	-214	472	502	835	138	713	258	571	623	392	107	394	429
					j	-611	32	79	10	-314	-278	472	502	835	138	2,381	1,062	571	623	392	107	1,175	1,293
	2	-21.00	5.00	030200	i	-144	14	-84	-6	-141	-144	354	183	1,082	136	2,948	751	172	281	430	212	1,186	1,421
					j	-141	14	-84	-6	0	-167	354	183	1,082	136	1,148	489	172	281	430	212	480	985
				030202	i	-139	14	-84	-6	141	-189	354	183	1,079	136	670	336	172	280	429	212	287	609
					j	-136	14	-84	-6	281	-212	354	183	1,079	136	2,461	380	172	280	429	212	979	428
	3				i																		
					j																		
					i																		
	4				j																		
					i																		
	5				j																		
					i																		
					j																		
4	1	8.50	26.00	040100	i	-268	0	3	0	34	0	243	14	17	0	127	0	199	14	10	0	82	0
					j	-261	0	3	0	20	-1	243	14	17	0	57	63	199	14	10	0	37	60
				040105	i	-235	0	3	0	-39	-6	239	12	14	0	64	187	196	21	8	0	45	192
					j	-228	0	3	0	-53	-8	239	12	14	0	61	194	196	21	8	0	40	237
	2	-9.50	2.50	040200	i	-356	-46	2	35	184	-162	261	517	681	430	1,121	1,433	210	1,055	377	492	653	2,969
					j	-355	-46	2	35	182	-124	261	517	681	430	561	1,047	210	1,055	377	492	349	2,119
				040202	i	-354	-46	2	35	181	-86	261	517	681	430	131	707	210	1,054	377	492	121	1,304
					j	-352	-46	2	35	179	-48	261	517	681	430	606	488	210	1,054	377	492	331	648
	3				i																		
					j																		
					i																		
	4				j																		
					i																		
	5				j																		
					i																		
					j																		
5	1	13.50	25.00	050100	i	-392	-4	20	2	142	-49	1,084	627	1,231	918	16,029	8,145	888	861	840	678	10,888	11,205
					j	-383	-4	20	2	43	-29	1,084	627	1,231	918	9,873	5,011	888	861	840	678	6,689	6,902
				050104	i	-357	-4	20	2	-254	32	1,083	601	1,204	918	8,480	4,283	887	826	822	678	5,835	5,860
					j	-348	-4	20	2	-353	52	1,083	601	1,204	918	14,499	7,288	887	826	822	678	9,944	9,988
	2	-13.50	30.00	050200	i	-386	-2	-19	2	-202	-29	1,124	294	792	802	12,107	4,532	689	558	528	530	8,100	8,601
					j	-378	-2	-19	2	-106	-19	1,124	294	792	802	8,146	3,063	689	558	528	530	5,462	5,811
				050205	i	-343	-2	-19	2	276	23	1,123	269	757	802	7,496	2,671	688	513	505	530	4,959	5,090
					j	-334	-2	-19	2	372	33	1,123	269	757	802	11,281	4,014	688	513	505	530	7,482	7,653
	3				i																		
					j																		
					i																		
	4				j																		
					i																		
	5				j																		
					i																		
					j																		
6	1	11.50	25.08	060100	i	-355	3	15	3	123	6	768	571	619	909	7,941	7,607	589	795	380	654	4,847	10,671
					j	-346	3	15	3	47	-7	768	571	619	909	4,835	4,743	589	795	380	654	2,943	6,684
				060104	i	-320	3	15	3	-180	-45	766	547	579	909	4,310	3,748	588	761	357	654	2,673	5,134
					j	-311	3	15	3	-256	-58	766	547	579	909	7,214	6,489	588	761	357	654	4,462	8,951
	2	-11.50	25.49	060200	i	-348	4	-16	2	-133	20	754	423	605	927	7,896	5,795	469	800	361	609	4,740	10,906
					j	-341	4	-16	2	-66	4	754	423	605	927	5,326	3,997	469	800	361	609	3,206	7,508
				060205	i	-311	4	-16	2	202	-57	752	403	562	927	4,744	3,102	468	763	337	609	2,818	5,908
					j	-304	4	-16	2	270	-72	752	403	562	927	7,132	4,813	468	763	337	609	4,249	9,151
	3				i																		
					j																		
					i																		
	4				j																		
					i																		
	5				j																		
					i																		
					j																		
7	1	9.50	23.47	070100	i	-374	-2	17	-1	151	-28	1,138	381	630	501	7,594	4,631	949	491	555	415	6,668	5,992
					j	-366	-2	17	-1	71	-17	1,138	381	630	501	4,638	2,845	949	491	555	415	4,062	3,688
				070104	i	-341	-2	17	-1	-169	16	1,137	358	605	501	4,134	2,424	948	459	533	415	3,671	3,099
					j	-333	-2	17	-1	-248	27	1,137	358	605	501	6,974	4,103	948	459	533	415	6,175	5,255
	2	-9.50	17.50	070200	i	-382	-6	-17	0	-63	-51	1,175	658	1,363	716	12,628	6,096	819	1,084	1,186	566	10,997	10,012
					j	-377	-6	-17	0	-14	-35	1,175	658	1,363	716	8,652	4,176	819	1,084	1,186	566	7,538	6,851
				070205	i	-357	-6	-17	0	184	31	1,174	644	1,345	716	7,192	3,457	819	1,060	1,170	566	6,248	5,713
					j	-352	-6	-17	0	233	48	1,174	644	1,345	716	11,115	5,336	819	1,060	1,170	566	9,660	8,804
	3				i																		
					j																		
					i																		
	4				j																		
					i																		
	5				j																		
					i																		
					j																		
	1	7.00	29.40	080100	i	-301	3	4	0	46	18	1,159	192	267	394	3,940	2,879	633	255	157	322	2,299	3,855
					j	-291	3	4	0	24	4	1,159	192	267	394	2,374	1,753	633	255	157	322	1,375	2,358
				080104	i	-260	3	4	0	-41	-41	1,157	164	219	394	2,096	1,490	632	216	133	322	1,277	1,945
					j	-250	3	4	0	-63	-55	1,157	164	219	394	3,383	2,453	632	216	133	322	2,058	3,212
				080200	i	-349	6	-3	-1	4	21	1,198	590	953	654	9,178	5,704	775	950	558	524	5,328	9,191

North Bay Seismic Design
Structural Analysis and Design
PO Box 55, Inverness, CA 94937
Tel/Fax (415) 669-9678
www.NorthBaySeismicDesign.com

ANALYSIS RESULTS - FORCE RESULTS
SAP2000 BRIDGE ANALYSIS INPUT FILE DATA - Tension EQ MODEL
ALAMEDA CREEK BRIDGE - AS-BUILT

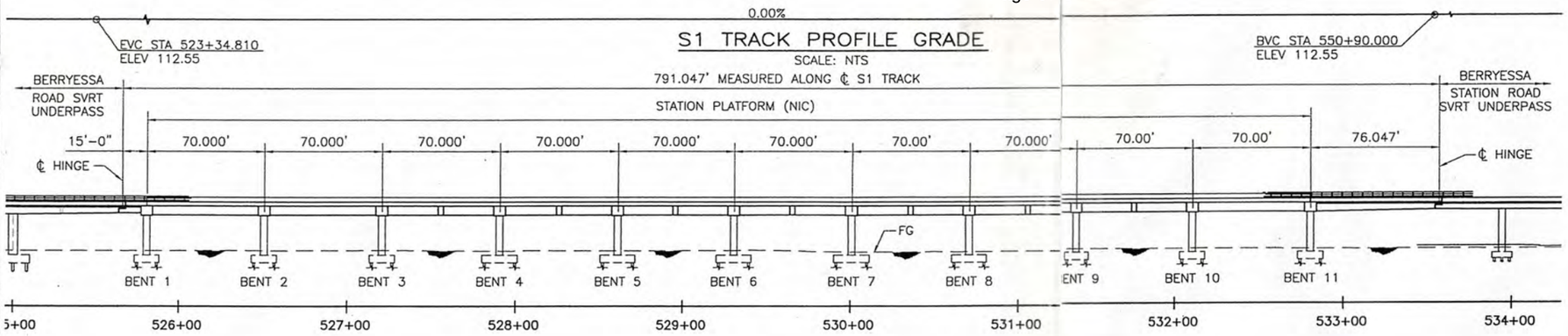
Model : Tension EQ

	2	-7.00	18.42	080200	j	-344	6	-3	-1	13	4	1,198	590	953	654	6,254	3,894	775	950	558	524	3,614	6,276
				080205	i	-322	6	-3	-1	53	-64	1,197	575	923	654	5,350	3,294	775	924	543	524	3,193	5,300
					j	-317	6	-3	-1	63	-80	1,197	575	923	654	8,181	5,058	775	924	543	524	4,860	8,138
8	3				i																		
					j																		
	4				i																		
					j																		
	5				i																		
					j																		
	1	5.00	32.00	090100	i	-420	0	2	0	19	5	1,160	452	439	4,997	7,014	7,274	756	670	184	2,015	2,943	10,836
					j	-411	0	2	0	11	5	1,160	452	439	4,997	4,676	4,866	756	670	184	2,015	1,961	7,264
				090105	i	-374	0	2	0	-21	6	1,158	432	386	4,997	4,374	4,649	754	623	162	2,015	1,839	6,739
					j	-364	0	2	0	-29	6	1,158	432	386	4,997	6,427	6,955	754	623	162	2,015	2,701	10,061
	2	-5.00	28.00	090200	i	-436	0	-2	0	-10	7	1,149	530	617	5,552	8,706	7,494	746	926	259	2,239	3,654	13,150
					j	-427	0	-2	0	-2	7	1,149	530	617	5,552	5,256	4,525	746	926	259	2,239	2,205	7,967
				090204	i	-397	0	-2	0	24	6	1,147	514	572	5,552	4,912	4,306	745	886	240	2,239	2,067	7,396
					j	-388	0	-2	0	32	6	1,147	514	572	5,552	8,112	7,186	745	886	240	2,239	3,411	12,359
9	3				i																		
					j																		
	4				i																		
					j																		
	5				i																		
					j																		
	1	0.00	38.11	100100	i	-921	0	0	0	0	-371	130	659	1,011	35,608	25,700	14,766	240	1,822	480	13,234	11,822	40,622
					j	-898	0	0	0	0	-371	130	659	1,011	35,608	21,864	12,256	240	1,822	480	13,234	10,010	33,683
				100109	i	-713	0	0	0	0	-371	127	589	910	35,608	8,403	7,246	233	1,627	413	13,234	4,370	20,165
					j	-690	0	0	0	0	-371	127	589	910	35,608	11,797	9,487	233	1,627	413	13,234	5,894	26,359
	2				i																		
					j																		
10	3				i																		
					j																		
	4				i																		
					j																		
	5				i																		
					j																		
	1	0.00	41.67	110100	i	-929	0	0	0	-48	-165	148	540	1,330	34,250	34,518	12,428	219	1,566	722	12,180	17,935	35,722
					j	-906	0	0	0	-48	-165	148	540	1,330	34,250	29,502	10,386	219	1,566	722	12,180	15,214	29,791
				110110	i	-699	0	0	0	-48	-165	144	471	1,099	34,250	13,606	7,360	210	1,364	568	12,180	7,977	21,584
					j	-676	0	0	0	-48	-165	144	471	1,099	34,250	17,699	9,136	210	1,364	568	12,180	10,097	26,747
	2				i																		
					j																		
11	3				i																		
					j																		
	4				i																		
					j																		
	5				i																		
					j																		
	1	0.00	38.12	120100	i	-906	0	0	0	-98	-185	412	700	1,153	36,153	28,580	15,153	728	1,602	599	15,395	14,441	34,467
					j	-884	0	0	0	-98	-185	412	700	1,153	36,153	24,202	12,485	728	1,602	599	15,395	12,167	28,364
				120109	i	-708	0	0	0	-98	-185	409	623	1,011	36,153	10,051	8,206	723	1,427	509	15,395	5,457	18,940
					j	-686	0	0	0	-98	-185	409	623	1,011	36,153	13,832	10,577	723	1,427	509	15,395	7,365	24,372
	2				i																		
					j																		
12	3				i																		
					j																		
	4				i																		
					j																		
	5				i																		
					j																		
	1	0.00	31.18	130100	i	-873	0	0	0	-206	-246	349	1,153	870	35,261	20,313	21,071	386	1,863	487	18,317	10,758	33,840
					j	-855	0	0	0	-206	-246	349	1,153	870	35,261	17,657	17,480	386	1,863	487	18,317	9,271	28,037
				130109	i	-711	0	0	0	-206	-246	347	1,052	818	35,261	5,711	10,589	383	1,701	451	18,317	3,563	17,311
					j	-693	0	0	0	-206	-246	347	1,052	818	35,261	7,774	13,862	383	1,701	451	18,317	4,767	22,602
	2				i																		
					j																		
13	3				i																		
					j																		
	4				i																		
					j																		
	5				i																		
					j																		

BRIDGE DATA - MODEL 2
FORT BRAGG HSR STATION
(AS DESIGNED FOR BERRYESSA BART STATION)

- 800' long elevated guideway with 2 HSR lines with a straight aligment;
- Connected to bentcaps supported on two-column Bents;
- 5 Bents at Station on Piled Footings, 3 approach Bents each side on Spread Footings;
- Station Platform is located between HSR lines, and provides access stairways to street level;

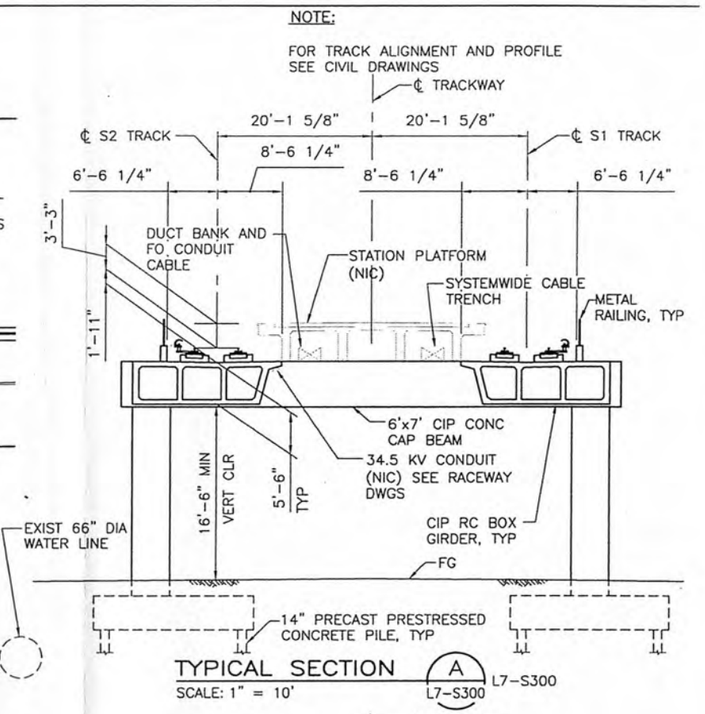
This BART Station was designed by Biggs Cardossa and Associates (BCA) in 2006, as shown on the structural drawings provided. The same alignment and profile is assumed and used for a future High Speed Rail Station in downtown Fort Bragg, California.



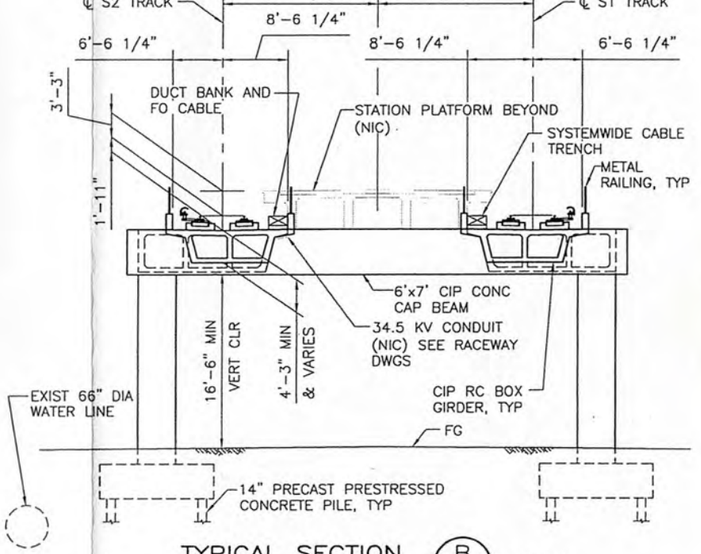
S1 TRACK PROFILE GRADE
SCALE: NTS
791.047' MEASURED ALONG ℄ S1 TRACK

ELEVATION
SCALE: 1"=40'

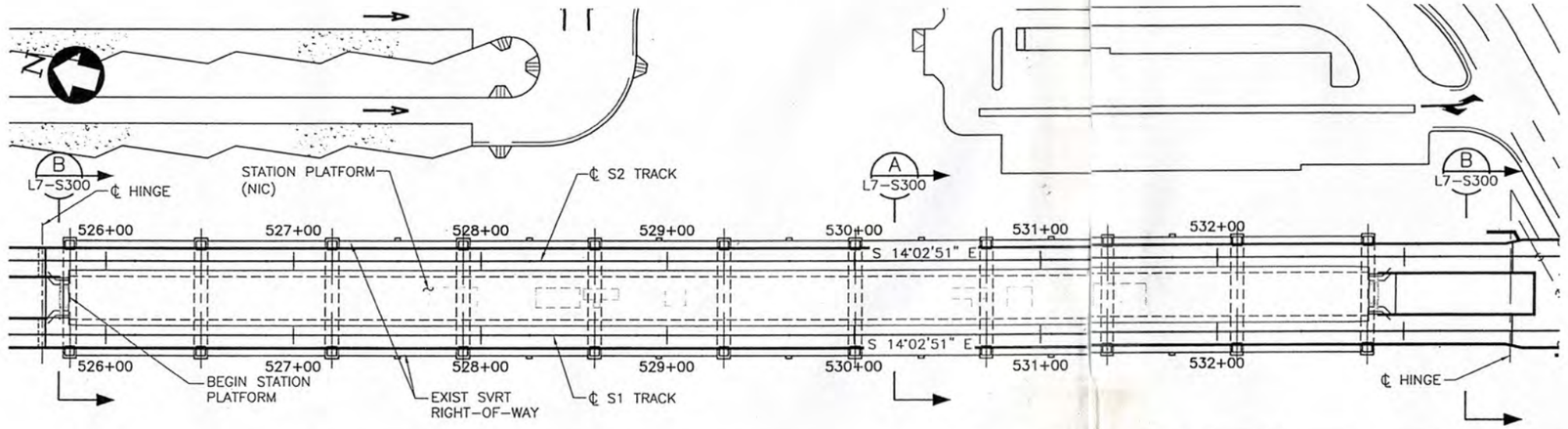
NOTE:
STATION ARCHITECTURAL ELEMENTS NOT SHOWN



TYPICAL SECTION (A) L7-S300
SCALE: 1" = 10'



TYPICAL SECTION (B) L7-S300
SCALE: 1" = 10'



PLAN
SCALE: 1"=40'

4' 0' 4' 12' 20' 28' 40' 0' 40' 80'
GRAPHIC SCALE
GRAPHIC SCALE

REV	DATE	BY	SUB	APP	DESCRIPTION
A	20071018				65% SUBMITTAL-ISSUED FOR REVIEW
--	20070405				REPLACED D200-L7-S300, REV. C

DESIGNED BY M. THOMAS
DRAWN BY S. HICKEY
CHECKED BY M. THOMAS
IN CHARGE S. BIGGS
DATE 20071009

BIGGS CARDOSA ASSOCIATES INC
STRUCTURAL ENGINEERS
1871 The Alameda, Suite 200
San Jose, California 95126
408-296-5515

HNTB Corporation
Engineers Architects Planners
1735 Technology Drive, Suite 650
San Jose, CA 95110-1005
Tel (408) 451-7300
Fax (408) 451-6942

SUBMITTED _____ APPROVED _____

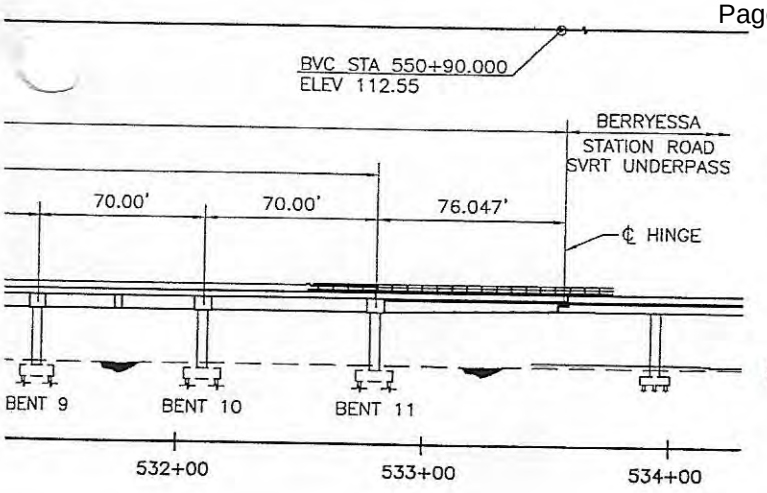
VTA Silicon Valley Rapid Transit Corridor
2000 Measure A Project

CIVIL CONSTRUCTION
SOUTH OF SIERRA/LUNDY
BERRYESSA STATION GUIDEWAY
GENERAL PLAN

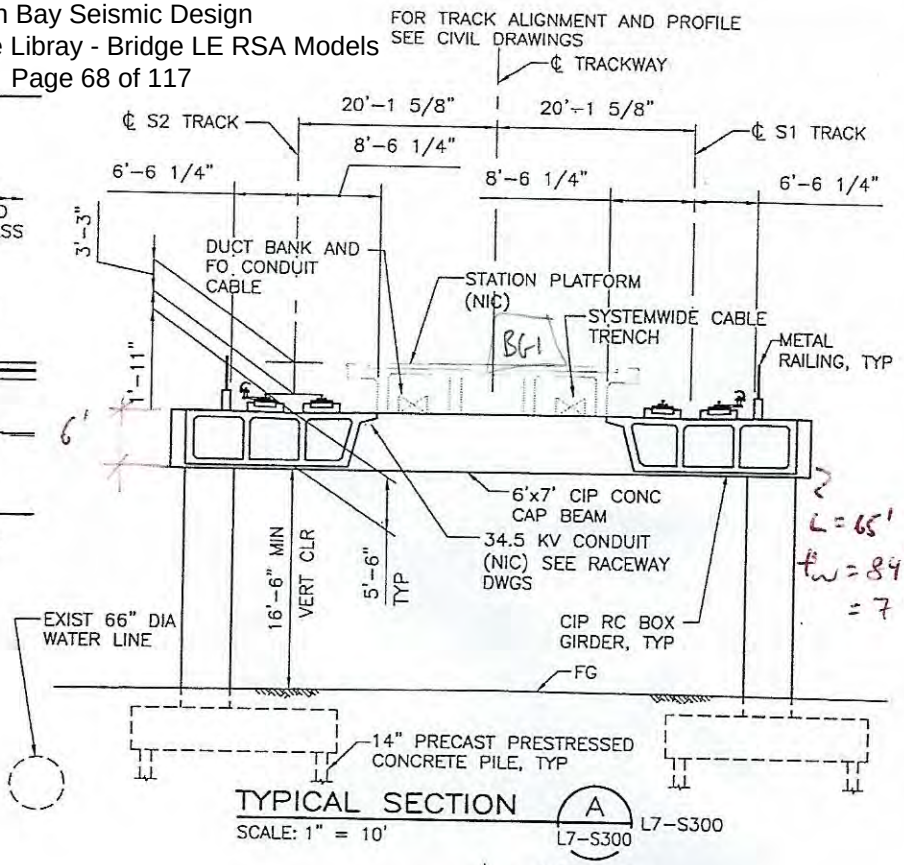
CADD FILENAME C201-S-L7-S300.dwg
SIZE D | SCALE AS NOTED
CONTRACT NO. C201 | REV. A
AREA CODE L7 | SHEET NO. S300 | PAGE NO.

Oct 09, 2007
DM
W:\2004\20040412\STCAD\65%_SE\LINE-SEGMENT\C201\L7\BERRYESSA_STATION_GUIDEWAY\C201-S-L7-S300.dwg

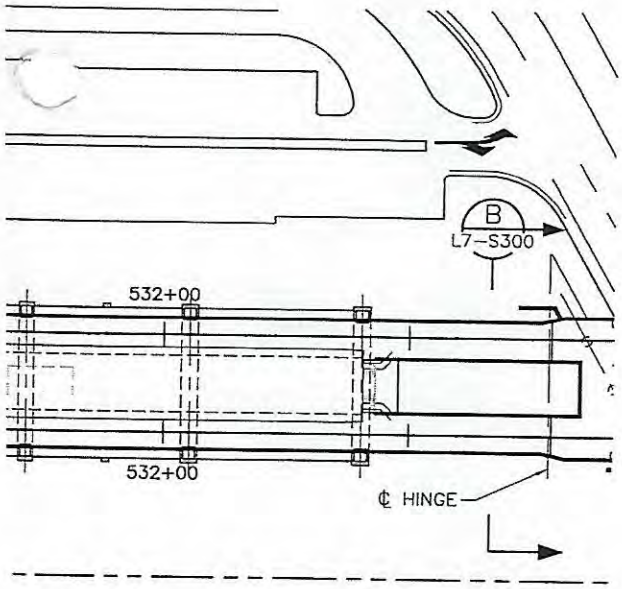
NOTE:
FOR TRACK ALIGNMENT AND PROFILE SEE CIVIL DRAWINGS

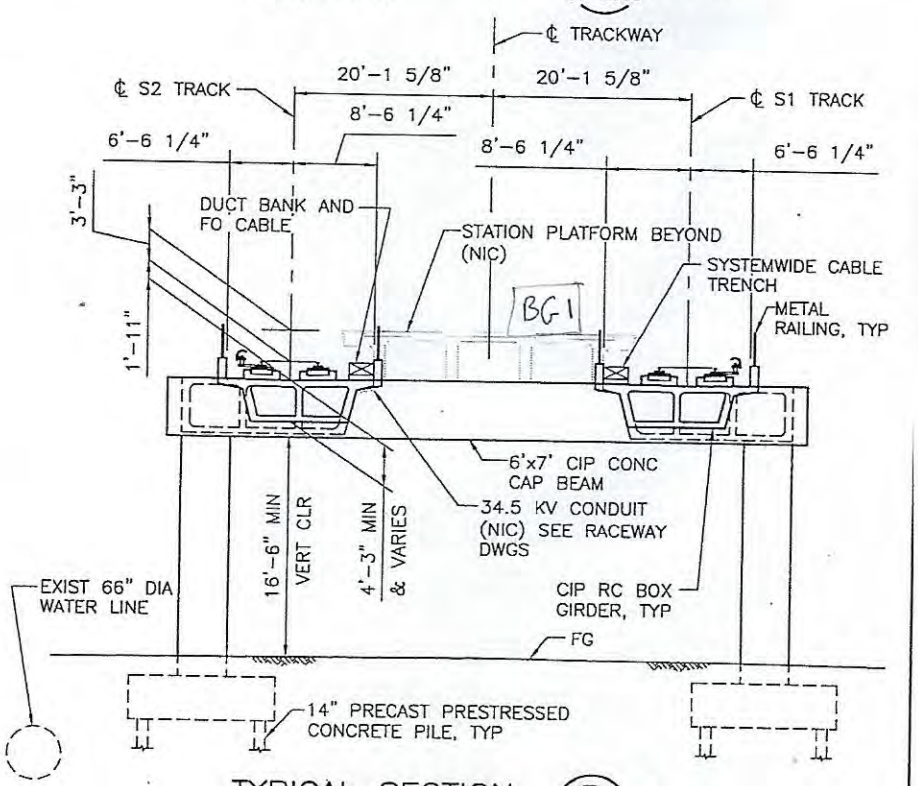


ARCHITECTURAL ELEMENTS
OWN



TYPICAL SECTION A L7-S300
SCALE: 1" = 10'





TYPICAL SECTION B L7-S300
SCALE: 1" = 10'

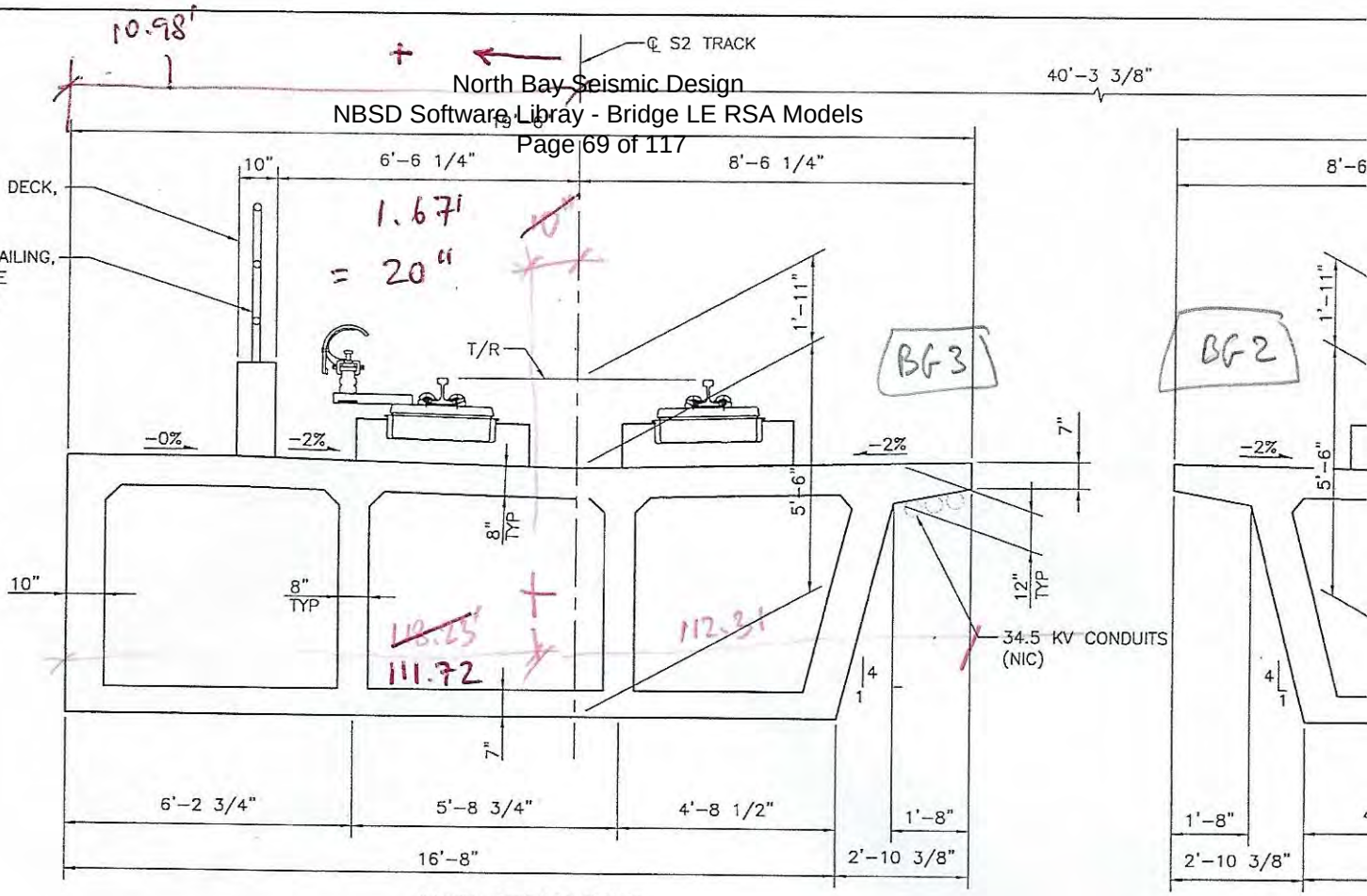
4' 0' 4' 12' 20' 28' GRAPHIC SCALE
40' 0' 40' 80' GRAPHIC SCALE

Corporation
ers Architects Planners
Tel (408) 451-7300
Fax (408) 451-6942

Silicon Valley Rapid Transit Corridor
2000 Measure A Project

CIVIL CONSTRUCTION
SOUTH OF SIERRA/LUNDY
BERRYESSA STATION GUIDEWAY
GENERAL PLAN

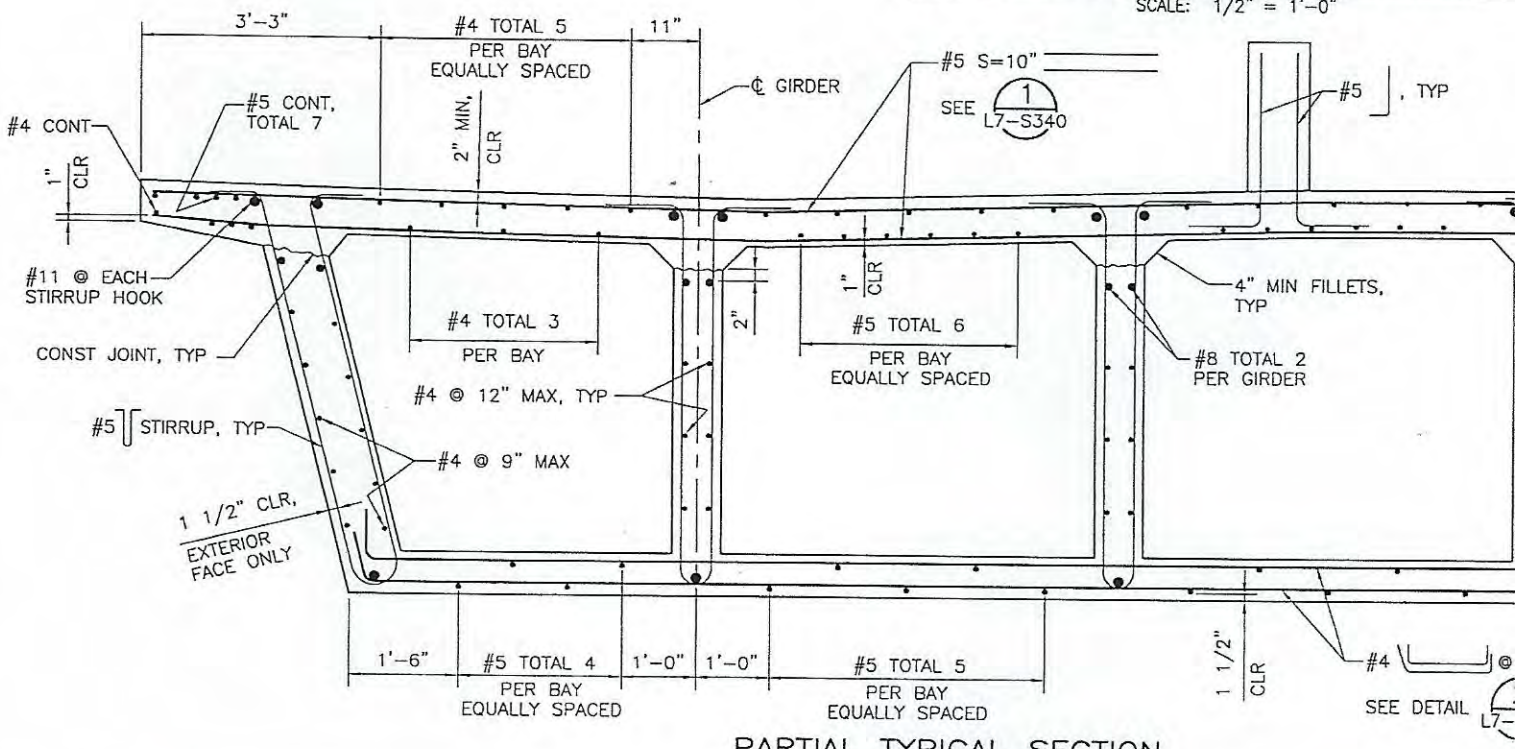
CADD FILENAME	C201-S-L7-S300.dwg
SIZE	D
SCALE	AS NOTED
CONTRACT NO.	C201
REV.	A
AREA CODE	L7
SHEET NO.	S300
PAGE NO.	



LEFT STRUCTURE

TYPICAL SECTION AT INTERIOR SPAN

SCALE: 1/2" = 1'-0"



PARTIAL TYPICAL SECTION

SCALE: 3/4" = 1'-0"

REV	DATE	BY	SUB	APP	DESCRIPTION
A	20071011				65% SUBMITTAL–ISSUED FOR REVIEW

DESIGNED BY M. THOMAS
DRAWN BY S. HICKEY
CHECKED BY M. THOMAS
IN CHARGE S. BIGGS
DATE 20071005

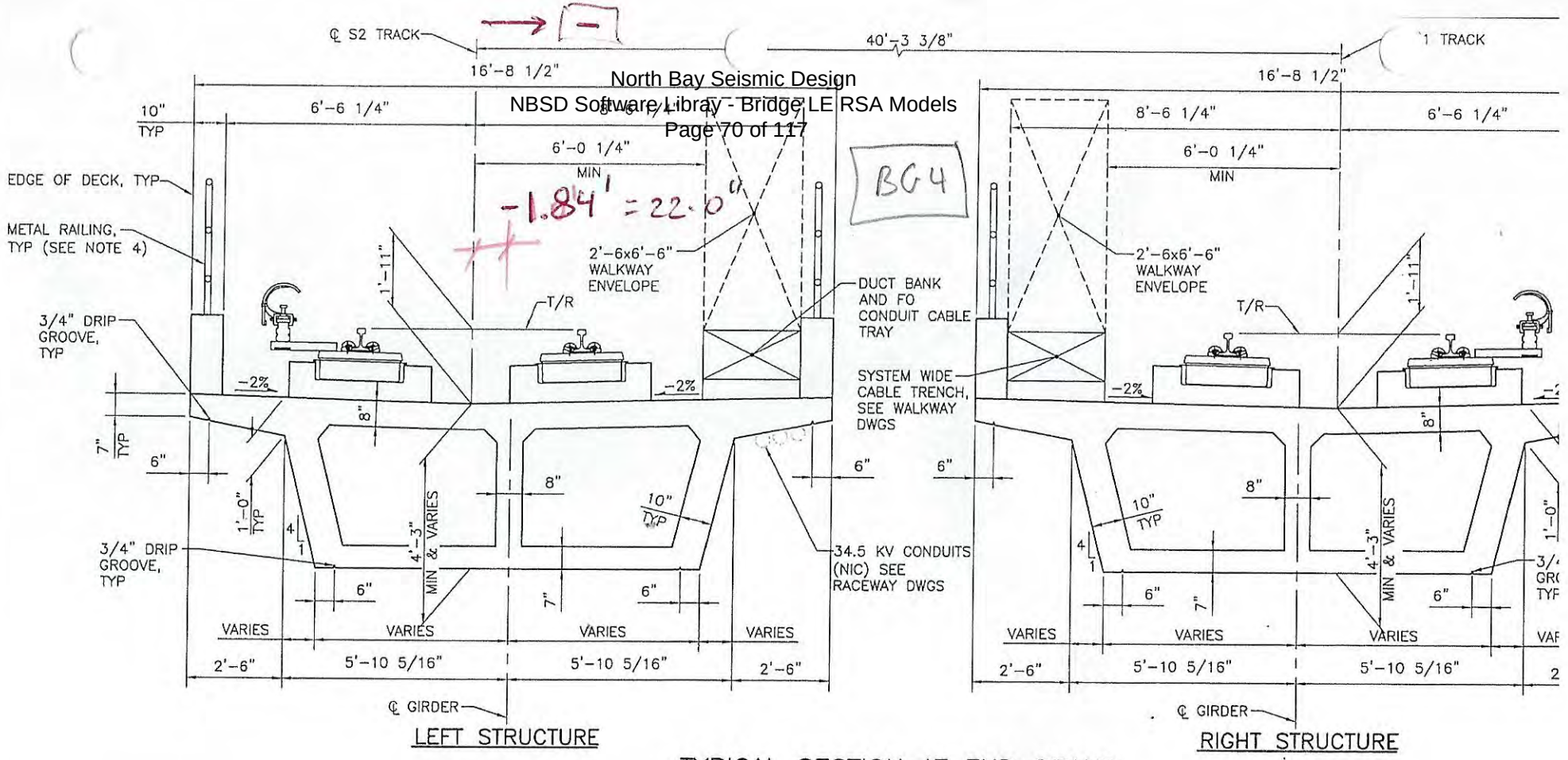
BIGGS CARDOSA ASSOCIATES INC
STRUCTURAL ENGINEERS
1671 The Alameda, Suite 200
San Jose, California 95126
408-296-5515

HNTB
1735 Technology Drive, Suite 650
San Jose, CA 95110-1005

SUBMITTED

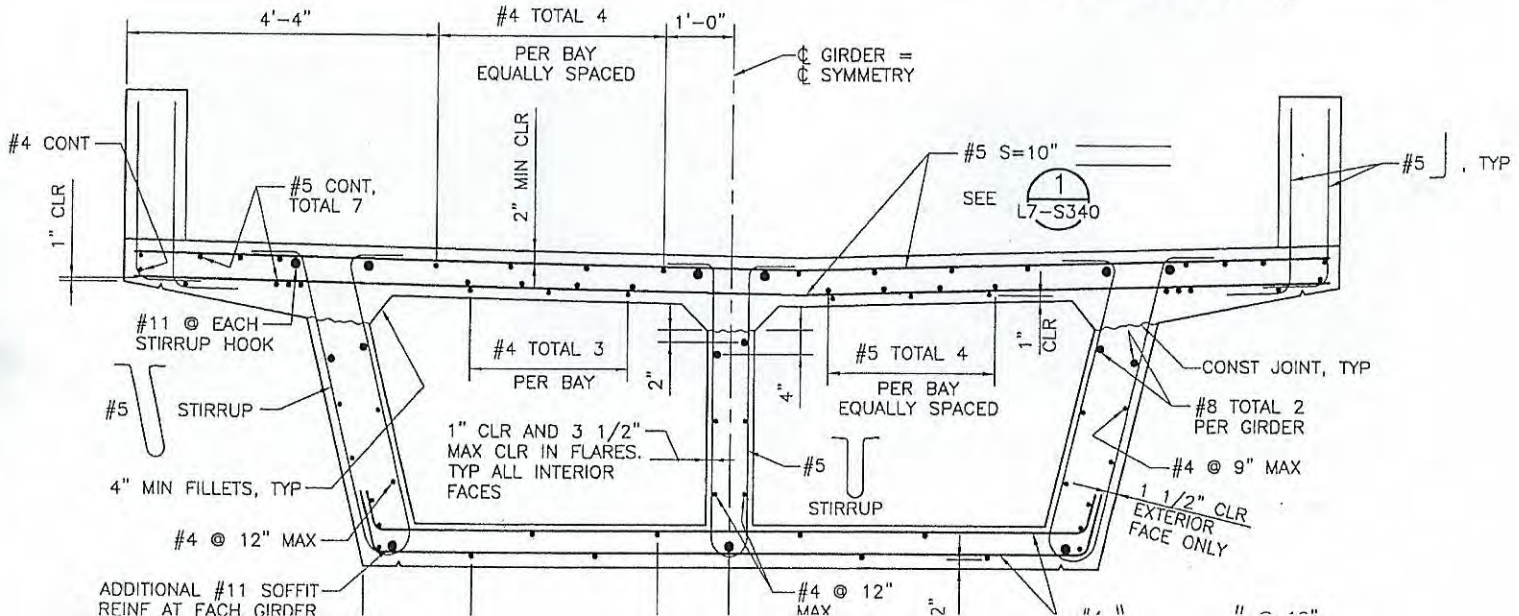
APPROVED

W:\2004\2004012\STCADD\65%_SEISMIC_SEGMENT\C201\L7\BERRYESSA_STATION_GUIDEWAY\C201-S-L7-S341.dwg
DM Oct 05, 2007



TYPICAL SECTION AT END SPANS

SCALE: 1/2" = 1'-0"



PRE-PROCESSOR - MODEL 2

North Bay Seismic Design
Structural Analysis and Design
PO Box 55, Inverness, CA 94937
Tel/Fax (415) 669-9678
www.NorthBaySeismicDesign.com

TRACKWAY AND SEGMENT ALIGNMENT DATA
SAP2000 BRIDGE ANALYSIS INPUT FILE DATA
FORT BRAGG HSR DOWNTOWN STATION

1. Trackway Alignment - Horizontal Curve Data

Origin: x_i = 52,585.00
y_i = 0.00

Initial Heading = 0.00 degrees (from Horizontal)

				Curve Segment					Straight Segment		Z Alignment Top of Deck Centerline		
Section	Node	Node ID	Segment Length (feet)	Radius (feet)	Length (feet)	Central Angle (Degrees)	Heading (degrees)	Heading Increment (degrees)	Length (feet)	Length Along Centerline (feet)	Station (feet)	X (feet)	Y (feet)
Hinge	1	0000					0.00			52,585.00	52585.00	0.00	0.00
	2	0001	7.50				0.00		7.50	52,592.50	52592.50	7.50	0.00
Bent 1	3	0100	7.50				0.00		15.00	52,600.00	52600.00	15.00	0.00
	4	0101	14.00				0.00		29.00	52,614.00	52614.00	29.00	0.00
	5	0102	14.00				0.00		43.00	52,628.00	52628.00	43.00	0.00
	6	0103	14.00				0.00		57.00	52,642.00	52642.00	57.00	0.00
	7	0104	14.00				0.00		71.00	52,656.00	52656.00	71.00	0.00
Bent 2	8	0200	14.00				0.00		85.00	52,670.00	52670.00	85.00	0.00
	9	0201	14.00				0.00		99.00	52,684.00	52684.00	99.00	0.00
	10	0202	14.00				0.00		113.00	52,698.00	52698.00	113.00	0.00
	11	0203	14.00				0.00		127.00	52,712.00	52712.00	127.00	0.00
	12	0204	14.00				0.00		141.00	52,726.00	52726.00	141.00	0.00
Bent 3	13	0300	14.00				0.00		155.00	52,740.00	52740.00	155.00	0.00
	14	0301	14.00				0.00		169.00	52,754.00	52754.00	169.00	0.00
	15	0302	14.00				0.00		183.00	52,768.00	52768.00	183.00	0.00
	16	0303	14.00				0.00		197.00	52,782.00	52782.00	197.00	0.00
	17	0304	14.00				0.00		211.00	52,796.00	52796.00	211.00	0.00
Bent 4	18	0400	14.00				0.00		225.00	52,810.00	52810.00	225.00	0.00
	19	0401	14.00				0.00		239.00	52,824.00	52824.00	239.00	0.00
	20	0402	14.00				0.00		253.00	52,838.00	52838.00	253.00	0.00
	21	0403	14.00				0.00		267.00	52,852.00	52852.00	267.00	0.00
	22	0404	14.00				0.00		281.00	52,866.00	52866.00	281.00	0.00
Bent 5	23	0500	14.00				0.00		295.00	52,880.00	52880.00	295.00	0.00
	24	0501	14.00				0.00		309.00	52,894.00	52894.00	309.00	0.00
	25	0502	14.00				0.00		323.00	52,908.00	52908.00	323.00	0.00
	26	0503	14.00				0.00		337.00	52,922.00	52922.00	337.00	0.00
	27	0504	14.00				0.00		351.00	52,936.00	52936.00	351.00	0.00
Bent 6	28	0600	14.00				0.00		365.00	52,950.00	52950.00	365.00	0.00
	29	0601	14.00				0.00		379.00	52,964.00	52964.00	379.00	0.00
	30	0602	14.00				0.00		393.00	52,978.00	52978.00	393.00	0.00
	31	0603	14.00				0.00		407.00	52,992.00	52992.00	407.00	0.00
	32	0604	14.00				0.00		421.00	53,006.00	53006.00	421.00	0.00
Bent 7	33	0700	14.00				0.00		435.00	53,020.00	53020.00	435.00	0.00
	34	0701	14.00				0.00		449.00	53,034.00	53034.00	449.00	0.00
	35	0702	14.00				0.00		463.00	53,048.00	53048.00	463.00	0.00
	36	0703	14.00				0.00		477.00	53,062.00	53062.00	477.00	0.00
	37	0704	14.00				0.00		491.00	53,076.00	53076.00	491.00	0.00
Bent 8	38	0800	14.00				0.00		505.00	53,090.00	53090.00	505.00	0.00
	39	0801	14.00				0.00		519.00	53,104.00	53104.00	519.00	0.00
	40	0802	14.00				0.00		533.00	53,118.00	53118.00	533.00	0.00
	41	0803	14.00				0.00		547.00	53,132.00	53132.00	547.00	0.00
	42	0804	14.00				0.00		561.00	53,146.00	53146.00	561.00	0.00
Bent 9	43	0900	14.00				0.00		575.00	53,160.00	53160.00	575.00	0.00
	44	0901	14.00				0.00		589.00	53,174.00	53174.00	589.00	0.00
	45	0902	14.00				0.00		603.00	53,188.00	53188.00	603.00	0.00
	46	0903	14.00				0.00		617.00	53,202.00	53202.00	617.00	0.00
	47	0904	14.00				0.00		631.00	53,216.00	53216.00	631.00	0.00
Bent 10	48	1000	14.00				0.00		645.00	53,230.00	53230.00	645.00	0.00
	49	1001	14.00				0.00		659.00	53,244.00	53244.00	659.00	0.00
	50	1002	14.00				0.00		673.00	53,258.00	53258.00	673.00	0.00
	51	1003	14.00				0.00		687.00	53,272.00	53272.00	687.00	0.00
	52	1004	14.00				0.00		701.00	53,286.00	53286.00	701.00	0.00
Bent 11	53	1100	14.00				0.00		715.00	53,300.00	53300.00	715.00	0.00
	54	1101	14.00				0.00		729.00	53,314.00	53314.00	729.00	0.00
	55	1102	14.00				0.00		743.00	53,328.00	53328.00	743.00	0.00
	56	1103	14.00				0.00		757.00	53,342.00	53342.00	757.00	0.00
	57	1104	14.00				0.00		771.00	53,356.00	53356.00	771.00	0.00
	58	1105	14.00				0.00		785.00	53,370.00	53370.00	785.00	0.00
Hinge	59	1106	6.05				0.00		791.05	53,376.05	53376.05	791.05	0.00
											53376.05	791.05	0.00
											53376.05	791.05	0.00
											53376.05	791.05	0.00
											53376.05	791.05	0.00
											53376.05	791.05	0.00
											53376.05	791.05	0.00
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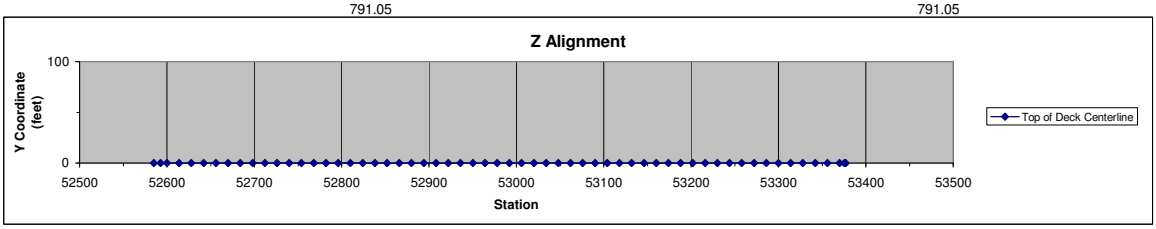
791.05 791.05



2. Trackway Alignment - Vertical Curve Data

North Bay Seismic Design
Structural Analysis and Design
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www.NorthBaySeismicDesign.com

TRACKWAY AND SEGMENT ALIGNMENT DATA
SAP2000 BRIDGE ANALYSIS INPUT FILE DATA
FORT BRAGG HSR DOWNTOWN STATION

Crest Data :
LC = 400.00 feet (Length of Curve)
g_1 = 0.00 percent (Grade 1)
g_2 = 0.00 percent (Grade 2)
BVC = 52,628.00 feet (Beginning of Vertical Curve)

Datum Elevation = 160.00 Feet

Vertex :
L_V = 52,828.00 feet (Location of Vertex) => h_{BVC} = 221.78 feet (Height at BVC)
h_V = 221.78 feet (Height at Vertex) h_{EVC} = 221.78 feet (Height at EVC)

			Z Alignment Vertical Curve Elevations Options							Trackway Alignment			
				Interpolated		Calculated							
Section	Node	Station (feet)	Deck Elevation (feet)	Increment (feet)	Z (feet)	Grade g_1 (feet)	Transition (feet)	Grade g_2 (feet)	Z (feet)	Station (feet)	X (feet)	Y (feet)	Z (feet)
Hinge	1	52,585.00		0.00	0.00	221.78			221.78	52,585.00	0.00	0.00	61.78
	2	52,592.50		0.00	0.00	221.78			221.78	52,592.50	7.50	0.00	61.78
Bent 1	3	52,600.00		0.00	0.00	221.78			221.78	52,600.00	15.00	0.00	61.78
	4	52,614.00		0.00	0.00	221.78			221.78	52,614.00	29.00	0.00	61.78
	5	52,628.00		0.00	0.00	221.78			221.78	52,628.00	43.00	0.00	61.78
	6	52,642.00		0.00	0.00		221.78		221.78	52,642.00	57.00	0.00	61.78
	7	52,656.00		0.00	0.00		221.78		221.78	52,656.00	71.00	0.00	61.78
Bent 2	8	52,670.00		0.00	0.00		221.78		221.78	52,670.00	85.00	0.00	61.78
	9	52,684.00		0.00	0.00		221.78		221.78	52,684.00	99.00	0.00	61.78
	10	52,698.00		0.00	0.00		221.78		221.78	52,698.00	113.00	0.00	61.78
	11	52,712.00		0.00	0.00		221.78		221.78	52,712.00	127.00	0.00	61.78
	12	52,726.00		0.00	0.00		221.78		221.78	52,726.00	141.00	0.00	61.78
Bent 3	13	52,740.00		0.00	0.00		221.78		221.78	52,740.00	155.00	0.00	61.78
	14	52,754.00		0.00	0.00		221.78		221.78	52,754.00	169.00	0.00	61.78
	15	52,768.00		0.00	0.00		221.78		221.78	52,768.00	183.00	0.00	61.78
	16	52,782.00		0.00	0.00		221.78		221.78	52,782.00	197.00	0.00	61.78
	17	52,796.00		0.00	0.00		221.78		221.78	52,796.00	211.00	0.00	61.78
Bent 4	18	52,810.00		0.00	0.00		221.78		221.78	52,810.00	225.00	0.00	61.78
	19	52,824.00		0.00	0.00		221.78		221.78	52,824.00	239.00	0.00	61.78
	20	52,838.00		0.00	0.00		221.78		221.78	52,838.00	253.00	0.00	61.78
	21	52,852.00		0.00	0.00		221.78		221.78	52,852.00	267.00	0.00	61.78
	22	52,866.00		0.00	0.00		221.78		221.78	52,866.00	281.00	0.00	61.78
Bent 5	23	52,880.00		0.00	0.00		221.78		221.78	52,880.00	295.00	0.00	61.78
	24	52,894.00		0.00	0.00		221.78		221.78	52,894.00	309.00	0.00	61.78
	25	52,908.00		0.00	0.00		221.78		221.78	52,908.00	323.00	0.00	61.78
	26	52,922.00		0.00	0.00		221.78		221.78	52,922.00	337.00	0.00	61.78
	27	52,936.00		0.00	0.00		221.78		221.78	52,936.00	351.00	0.00	61.78
Bent 6	28	52,950.00		0.00	0.00		221.78		221.78	52,950.00	365.00	0.00	61.78
	29	52,964.00		0.00	0.00		221.78		221.78	52,964.00	379.00	0.00	61.78
	30	52,978.00		0.00	0.00		221.78		221.78	52,978.00	393.00	0.00	61.78
	31	52,992.00		0.00	0.00		221.78		221.78	52,992.00	407.00	0.00	61.78
	32	53,006.00		0.00	0.00		221.78		221.78	53,006.00	421.00	0.00	61.78
Bent 7	33	53,020.00		0.00	0.00		221.78		221.78	53,020.00	435.00	0.00	61.78
	34	53,034.00		0.00	0.00			221.78	221.78	53,034.00	449.00	0.00	61.78
	35	53,048.00		0.00	0.00			221.78	221.78	53,048.00	463.00	0.00	61.78
	36	53,062.00		0.00	0.00			221.78	221.78	53,062.00	477.00	0.00	61.78
	37	53,076.00		0.00	0.00			221.78	221.78	53,076.00	491.00	0.00	61.78
Bent 8	38	53,090.00		0.00	0.00			221.78	221.78	53,090.00	505.00	0.00	61.78
	39	53,104.00		0.00	0.00			221.78	221.78	53,104.00	519.00	0.00	61.78
	40	53,118.00		0.00	0.00			221.78	221.78	53,118.00	533.00	0.00	61.78
	41	53,132.00		0.00	0.00			221.78	221.78	53,132.00	547.00	0.00	61.78
	42	53,146.00		0.00	0.00			221.78	221.78	53,146.00	561.00	0.00	61.78
Bent 9	43	53,160.00		0.00	0.00			221.78	221.78	53,160.00	575.00	0.00	61.78
	44	53,174.00		0.00	0.00			221.78	221.78	53,174.00	589.00	0.00	61.78
	45	53,188.00		0.00	0.00			221.78	221.78	53,188.00	603.00	0.00	61.78
	46	53,202.00		0.00	0.00			221.78	221.78	53,202.00	617.00	0.00	61.78
	47	53,216.00		0.00	0.00			221.78	221.78	53,216.00	631.00	0.00	61.78
Bent 10	48	53,230.00		0.00	0.00			221.78	221.78	53,230.00	645.00	0.00	61.78
	49	53,244.00		0.00	0.00			221.78	221.78	53,244.00	659.00	0.00	61.78
	50	53,258.00		0.00	0.00			221.78	221.78	53,258.00	673.00	0.00	61.78
	51	53,272.00		0.00	0.00			221.78	221.78	53,272.00	687.00	0.00	61.78
	52	53,286.00		0.00	0.00			221.78	221.78	53,286.00	701.00	0.00	61.78
Bent 11	53	53,300.00		0.00	0.00			221.78	221.78	53,300.00	715.00	0.00	61.78
	54	53,314.00		0.00	0.00			221.78	221.78	53,314.00	729.00	0.00	61.78
	55	53,328.00		0.00	0.00			221.78	221.78	53,328.00	743.00	0.00	61.78
	56	53,342.00		0.00	0.00			221.78	221.78	53,342.00	757.00	0.00	61.78
	57	53,356.00		0.00	0.00			221.78	221.78	53,356.00	771.00	0.00	61.78
	58	53,370.00		0.00	0.00			221.78	221.78	53,370.00	785.00	0.00	61.78
												0.00	61.78
												0.00	61.78
												0.00	61.78
												0.00	61.78
												0.00	61.78
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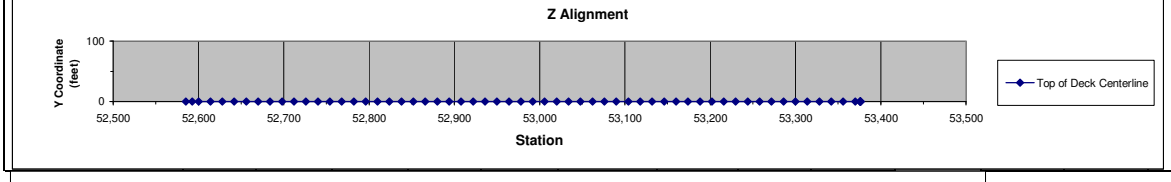

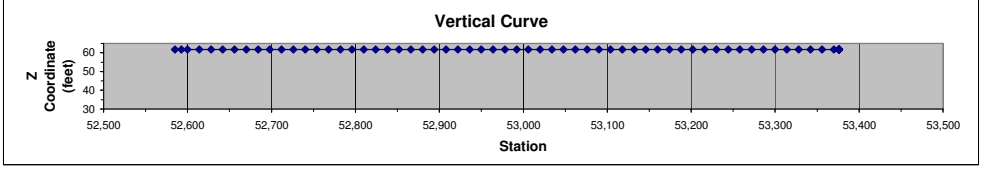

North Bay Seismic Design
Structural Analysis and Design
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TRACKWAY AND SEGMENT ALIGNMENT DATA
SAP2000 BRIDGE ANALYSIS INPUT FILE DATA
FORT BRAGG HSR DOWNTOWN STATION

3. Trackway Alignment - Segment Alignment Data 0 1 2 3 4 5 6 7 8 9

L_1 = 20.14 feet (Centerline distance between Trackway Alignment and Segment 1)

L_2 = 20.14 feet (Centerline distance between Trackway Alignment and Segment 2)

Origin: x_i = 52,585.00
y_i = 0.00

		Trackway Alignment					Vertical	Segment Line 1				Segment Line 2			
Section	Node	Station (feet)	X (feet)	Y (feet)	Z (feet)	Heading (degrees)	Skew (degrees)	Station (feet)	X (feet)	Y (feet)	Z (feet)	Station (feet)	X (feet)	Y (feet)	Z (feet)
Hinge	1	52,585	0.00	0.00	61.78	0.00		52,585	0.00	20.14	61.78	52,585	0.00	-20.14	61.78
	2	52,593	7.50	0.00	61.78	0.00		52,593	7.50	20.14	61.78	52,593	7.50	-20.14	61.78
Bent 1	3	52,600	15.00	0.00	61.78	0.00		52,600	15.00	20.14	61.78	52,600	15.00	-20.14	61.78
	4	52,614	29.00	0.00	61.78	0.00		52,614	29.00	20.14	61.78	52,614	29.00	-20.14	61.78
	5	52,628	43.00	0.00	61.78	0.00		52,628	43.00	20.14	61.78	52,628	43.00	-20.14	61.78
	6	52,642	57.00	0.00	61.78	0.00		52,642	57.00	20.14	61.78	52,642	57.00	-20.14	61.78
	7	52,656	71.00	0.00	61.78	0.00		52,656	71.00	20.14	61.78	52,656	71.00	-20.14	61.78
Bent 2	8	52,670	85.00	0.00	61.78	0.00		52,670	85.00	20.14	61.78	52,670	85.00	-20.14	61.78
	9	52,684	99.00	0.00	61.78	0.00		52,684	99.00	20.14	61.78	52,684	99.00	-20.14	61.78
	10	52,698	113.00	0.00	61.78	0.00		52,698	113.00	20.14	61.78	52,698	113.00	-20.14	61.78
	11	52,712	127.00	0.00	61.78	0.00		52,712	127.00	20.14	61.78	52,712	127.00	-20.14	61.78
	12	52,726	141.00	0.00	61.78	0.00		52,726	141.00	20.14	61.78	52,726	141.00	-20.14	61.78
Bent 3	13	52,740	155.00	0.00	61.78	0.00		52,740	155.00	20.14	61.78	52,740	155.00	-20.14	61.78
	14	52,754	169.00	0.00	61.78	0.00		52,754	169.00	20.14	61.78	52,754	169.00	-20.14	61.78
	15	52,768	183.00	0.00	61.78	0.00		52,768	183.00	20.14	61.78	52,768	183.00	-20.14	61.78
	16	52,782	197.00	0.00	61.78	0.00		52,782	197.00	20.14	61.78	52,782	197.00	-20.14	61.78
	17	52,796	211.00	0.00	61.78	0.00		52,796	211.00	20.14	61.78	52,796	211.00	-20.14	61.78
Bent 4	18	52,810	225.00	0.00	61.78	0.00		52,810	225.00	20.14	61.78	52,810	225.00	-20.14	61.78
	19	52,824	239.00	0.00	61.78	0.00		52,824	239.00	20.14	61.78	52,824	239.00	-20.14	61.78
	20	52,838	253.00	0.00	61.78	0.00		52,838	253.00	20.14	61.78	52,838	253.00	-20.14	61.78
	21	52,852	267.00	0.00	61.78	0.00		52,852	267.00	20.14	61.78	52,852	267.00	-20.14	61.78
	22	52,866	281.00	0.00	61.78	0.00		52,866	281.00	20.14	61.78	52,866	281.00	-20.14	61.78
Bent 5	23	52,880	295.00	0.00	61.78	0.00		52,880	295.00	20.14	61.78	52,880	295.00	-20.14	61.78
	24	52,894	309.00	0.00	61.78	0.00		52,894	309.00	20.14	61.78	52,894	309.00	-20.14	61.78
	25	52,908	323.00	0.00	61.78	0.00		52,908	323.00	20.14	61.78	52,908	323.00	-20.14	61.78
	26	52,922	337.00	0.00	61.78	0.00		52,922	337.00	20.14	61.78	52,922	337.00	-20.14	61.78
	27	52,936	351.00	0.00	61.78	0.00		52,936	351.00	20.14	61.78	52,936	351.00	-20.14	61.78
Bent 6	28	52,950	365.00	0.00	61.78	0.00		52,950	365.00	20.14	61.78	52,950	365.00	-20.14	61.78
	29	52,964	379.00	0.00	61.78	0.00		52,964	379.00	20.14	61.78	52,964	379.00	-20.14	61.78
	30	52,978	393.00	0.00	61.78	0.00		52,978	393.00	20.14	61.78	52,978	393.00	-20.14	61.78
	31	52,992	407.00	0.00	61.78	0.00		52,992	407.00	20.14	61.78	52,992	407.00	-20.14	61.78
	32	53,006	421.00	0.00	61.78	0.00		53,006	421.00	20.14	61.78	53,006	421.00	-20.14	61.78
Bent 7	33	53,020	435.00	0.00	61.78	0.00		53,020	435.00	20.14	61.78	53,020	435.00	-20.14	61.78
	34	53,034	449.00	0.00	61.78	0.00		53,034	449.00	20.14	61.78	53,034	449.00	-20.14	61.78
	35	53,048	463.00	0.00	61.78	0.00		53,048	463.00	20.14	61.78	53,048	463.00	-20.14	61.78
	36	53,062	477.00	0.00	61.78	0.00		53,062	477.00	20.14	61.78	53,062	477.00	-20.14	61.78
	37	53,076	491.00	0.00	61.78	0.00		53,076	491.00	20.14	61.78	53,076	491.00	-20.14	61.78
Bent 8	38	53,090	505.00	0.00	61.78	0.00		53,090	505.00	20.14	61.78	53,090	505.00	-20.14	61.78
	39	53,104	519.00	0.00	61.78	0.00		53,104	519.00	20.14	61.78	53,104	519.00	-20.14	61.78
	40	53,118	533.00	0.00	61.78	0.00		53,118	533.00	20.14	61.78	53,118	533.00	-20.14	61.78
	41	53,132	547.00	0.00	61.78	0.00		53,132	547.00	20.14	61.78	53,132	547.00	-20.14	61.78
	42	53,146	561.00	0.00	61.78	0.00		53,146	561.00	20.14	61.78	53,146	561.00	-20.14	61.78
Bent 9	43	53,160	575.00	0.00	61.78	0.00		53,160	575.00	20.14	61.78	53,160	575.00	-20.14	61.78
	44	53,174	589.00	0.00	61.78	0.00		53,174	589.00	20.14	61.78	53,174	589.00	-20.14	61.78
	45	53,188	603.00	0.00	61.78	0.00		53,188	603.00	20.14	61.78	53,188	603.00	-20.14	61.78
	46	53,202	617.00	0.00	61.78	0.00		53,202	617.00	20.14	61.78	53,202	617.00	-20.14	61.78
	47	53,216	631.00	0.00	61.78	0.00		53,216	631.00	20.14	61.78	53,216	631.00	-20.14	61.78
Bent 10	48	53,230	645.00	0.00	61.78	0.00		53,230	645.00	20.14	61.78	53,230	645.00	-20.14	61.78
	49	53,244	659.00	0.00	61.78	0.00		53,244	659.00	20.14	61.78	53,244	659.00	-20.14	61.78
	50	53,258	673.00	0.00	61.78	0.00		53,258	673.00	20.14	61.78	53,258	673.00	-20.14	61.78
	51	53,272	687.00	0.00	61.78	0.00		53,272	687.00	20.14	61.78	53,272	687.00	-20.14	61.78
	52	53,286	701.00	0.00	61.78	0.00		53,286	701.00	20.14	61.78	53,286	701.00	-20.14	61.78
Bent 11	53	53,300	715.00	0.00	61.78	0.00		53,300	715.00	20.14	61.78	53,300	715.00	-20.14	61.78
	54	53,314	729.00	0.00	61.78	0.00		53,314	729.00	20.14	61.78	53,314	729.00	-20.14	61.78
	55	53,328	743.00	0.00	61.78	0.00		53,328	743.00	20.14	61.78	53,328	743.00	-20.14	61.78
	56	53,342	757.00	0.00	61.78	0.00		53,342	757.00	20.14	61.78	53,342	757.00	-20.14	61.78
														-20.14	61.78
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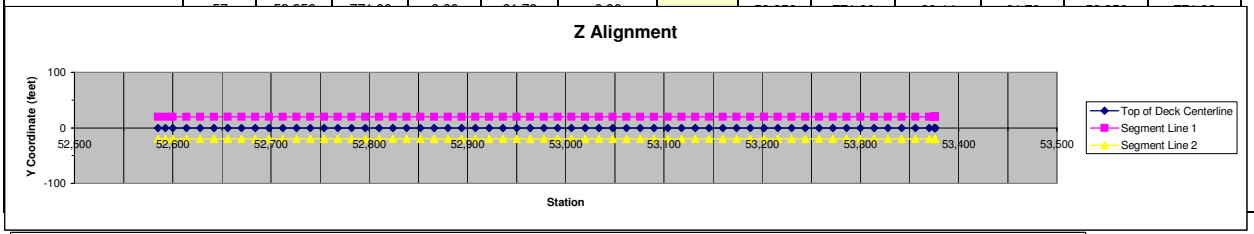

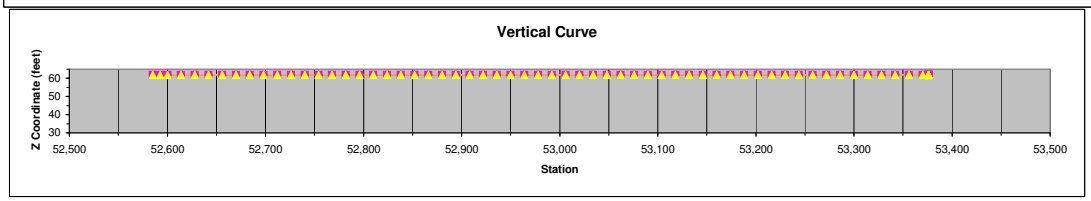

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SUPERSTRUCTURE SECTIONS
SAP2000 BRIDGE ANALYSIS INPUT FILE DATA
FORT BRAGG HSR DOWNTOWN STATION

1. Superstructure Section 1

Section ID : **BG1**

a) Material Properties

Concrete : ρ_c = 0.145 kip/ft^3 => NWC (Normal vs Light Weight Concrete, ACI 2.2; threshold is 0.115 kcf)

f'_c = 4.00 Ksi => E = 4,743 Ksi

b) Section Dimensions and Cross-section

L = 70.00 feet (Span Length)

H_{bg} = 4.50 feet (Height of T-girder)

T_{ts} = 8.00 inches (Top slab thickness)

T_{bs} = 0.00 inches (Bottom slab thickness)

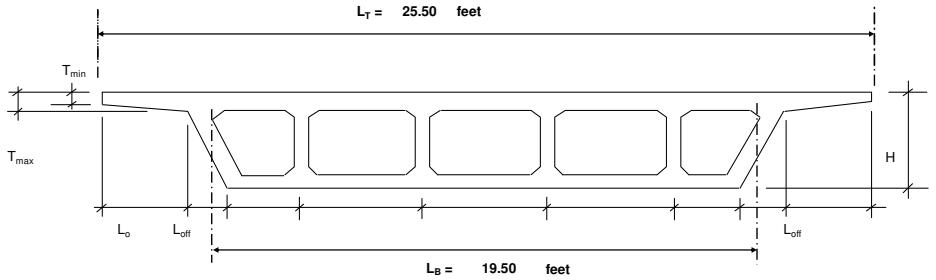
From analysis output:

I_g = 1.63 ft^4

Y_t = 2.87 ft

Flares = 0.00 inches

Span Type	Location	T_{min} (inches)	T_{max} (inches)	Lo (inches)	Offset Length (feet)	Girder Thickness (inches)	Span Length (feet)
Cantilever	Left	8.00	8.00	36.00			
	Right	8.00	8.00	36.00			
Exterior	Left				0.00	18.00	6.50
	Right				0.00	18.00	6.50
Interior	1					18.00	6.50
	2					18.00	
	3						
	4						



c) Resulting Section properties - About Horizontal Axis

Element	b (inches)	d (inches)	A (in^2)	y (inches)	I_o (in^4)	A*y (in^3)	$A*d^2$ (in^4)	I_{yy} (in^4)
Left Overhang	36.00	8.00	288	50.00	1,536	14,400	69,415	70,951
	36.00	0.00	0	46.00	0	0	0	0
Right Overhang	8.00	36.00	288	50.00	31,104	14,400	69,415	100,519
	36.00	0	0	46.00	0	0	0	0
Top Slab	234	8.00	1,872	50.00	9,984	93,600	451,200	461,184
Bottom Slab	234	0.00	0	0.00	0	0	0	0
Girders	72.00	46	3,312	23.00	584,016	76,176	436,110	1,020,126

Z_t = 34.48 inches (from Soffitt)
= 2.87 feet
= 19.53 inches (from Deck)
= 1.63 feet

I_{YY} = 1,652,780 in^4
= 79.71 ft^4

A_3 = 3,312 in^2
= 23.00 ft^2

A_G = 40.00 ft^2
J = 8,555 ft^4

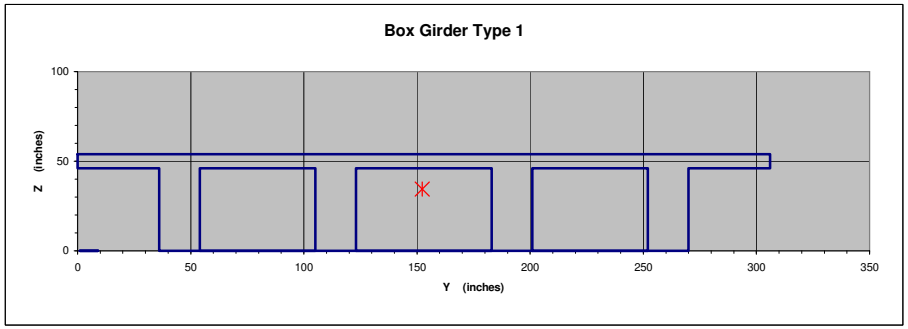
Y_t = 152.30 inches (from Left Edge)
= 12.69 feet
= 153.70 inches (from Right Edge)
= 12.81 feet

I_{ZZ} = 175,743,096 in^4
= 8,475.27 ft^4

A_2 = 2,448 in^2
= 17.00 ft^2

d) Resulting Section properties - About Vertical Axis

Element	b (inches)	d (inches)	A (in^2)	y (inches)	I_o (in^4)	A*y (in^3)	$A*d^2$ (in^4)	I_{zz} (in^4)
Left Overhang	8.00	36.00	288	4.00	31,104	1,152	4,608	35,712
	0.00	36.00	0	24.00	0	0	0	0
Right Overhang	36.00	8.00	288	288.00	1,536	82,944	23,887,872	23,889,408
	0.00	36.00	0	282.00	0	0	0	0
Top Slab	8.00	234.00	1,872	153.00	8,541,936	286,416	43,821,648	52,363,584
Bottom Slab	0.00	234.00	0	153.00	0	0	0	0
Girders	46.00	18.00	828	45.00	22,356	37,260	1,676,700	1,699,056
	46.00	18.00	828	261.00	22,356	216,108	56,404,188	56,426,544
	46.00	18.00	828	114.00	22,356	94,392	10,760,688	10,783,044
	46.00	18.00	828	192.00	22,356	158,976	30,523,392	30,545,748
	46.00	0.00	0	192.00	0	0	0	0
	46.00	0.00	0	192.00	0	0	0	0



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SUPERSTRUCTURE SECTIONS
SAP2000 BRIDGE ANALYSIS INPUT FILE DATA
FORT BRAGG HSR DOWNTOWN STATION

2. Superstructure Section 2

Section ID : **BG2**

a) Material Properties

Concrete : ρ_c = 0.145 kip/ft^3 => NWC (Normal vs Light Weight Concrete, ACI 2.2; threshold is 0.115 kcf)

f'_c = 4.00 Ksi => E = 4,743 Ksi

b) Section Dimensions and Cross-section

L = 70.00 feet (Span Length)

H_{bg} = 5.50 feet (Height of T-girder)

T_{ts} = 8.00 inches (Top slab thickness)

T_{bs} = 7.00 inches (Bottom slab thickness)

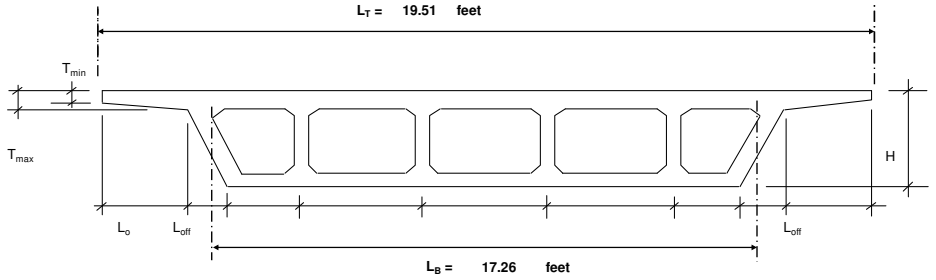
From analysis output:

I_g = 149.72 ft^4

Y_t = 2.98 ft

Flares = 4.00 inches

Span Type	Location	T_{min} (inches)	T_{max} (inches)	Lo (inches)	Offset Length (feet)	Girder Thickness (inches)	Span Length (feet)
Cantilever	Left	8.00	12.00	20.00			
	Right						
Exterior	Left				1.17	10.00	4.71
	Right					10.00	6.23
Interior	1					8.00	5.73
	2						
	3						
	4						



c) Resulting Section properties - About Horizontal Axis

Element	b (inches)	d (inches)	A (in^2)	y (inches)	I_o (in^4)	A*y (in^3)	$A*d^2$ (in^4)	I_{yy} (in^4)
Left Overhang	20.00	8.00	160	62.00	853	9,920	109,908	110,761
	20.00	2.00	40	56.67	13	2,267	17,432	17,445
Right Overhang	0.00	0.00	0	66.00	0	0	0	0
	0.00	0	0	66.00	0	0	0	0
Top Slab	214.08	8.00	1,713	62.00	9,134	106,184	1,176,450	1,185,584
Bottom Slab	200.04	7.00	1,400	3.50	5,718	4,901	1,460,066	1,465,784
Girders	28.00	51	1,428	32.50	309,519	46,410	15,464	324,983

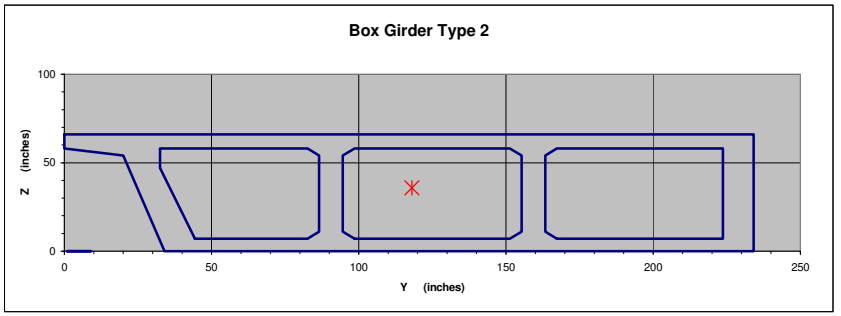
Z_t = 35.79 inches (from Soffitt)
= 2.98 feet
= 30.21 inches (from Deck)
= 2.52 feet
I_{YY} = 3,104,558 in^4
= 149.72 ft^4
A_3 = 1,428 in^2
= 9.92 ft^2

Y_t = 118.00 inches (from Left Edge)
= 9.83 feet
= 116.08 inches (from Right Edge)
= 9.67 feet
I_{ZZ} = 90,496,232 in^4
= 4,364.21 ft^4
A_2 = 3,273 in^2
= 22.73 ft^2

A_G = 32.92 ft^2
J = 4,514 ft^4

d) Resulting Section properties - About Vertical Axis

Element	b (inches)	d (inches)	A (in^2)	y (inches)	I_o (in^4)	A*y (in^3)	$A*d^2$ (in^4)	I_{zz} (in^4)
Left Overhang	8.00	20.00	160	4.00	5,333	640	2,560	7,893
	2.00	20.00	40	13.33	1,333	533	7,111	8,444
Right Overhang	0.00	0.00	0	224.08	0	0	0	0
	0.00	0.00	0	220.75	0	0	0	0
Top Slab	8.00	214.08	1,713	117.04	6,540,893	200,447	23,460,362	30,001,255
Bottom Slab	7.00	200.04	1,400	134.06	4,669,467	187,722	25,165,949	29,835,416
Girders	51.00	10.00	510	32.02	4,250	16,330	522,893	527,143
	51.00	10.00	510	229.08	4,250	116,831	26,763,600	26,767,850
	51.00	8.00	408	90.56	2,176	36,948	3,346,054	3,348,230
	51.00	0.00	0	159.32	0	0	0	0
	51.00	0.00	0	159.32	0	0	0	0
	51.00	0.00	0	159.32	0	0	0	0



3. Superstructure Section 3

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SUPERSTRUCTURE SECTIONS
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FORT BRAGG HSR DOWNTOWN STATION

Section ID : **BG3**

a) Material Properties

Concrete : ρ_c = 0.145 kip/ft^3 => NWC (Normal vs Light Weight Concrete, ACI 2.2; threshold is 0.115 kcf)

f'_c = 4.00 Ksi => E = 4,743 Ksi

b) Section Dimensions and Cross-section

L = 70.00 feet (Span Length)

H_{bg} = 5.50 feet (Height of T-girder)

T_{ts} = 8.00 inches (Top slab thickness)

T_{bs} = 7.00 inches (Bottom slab thickness)

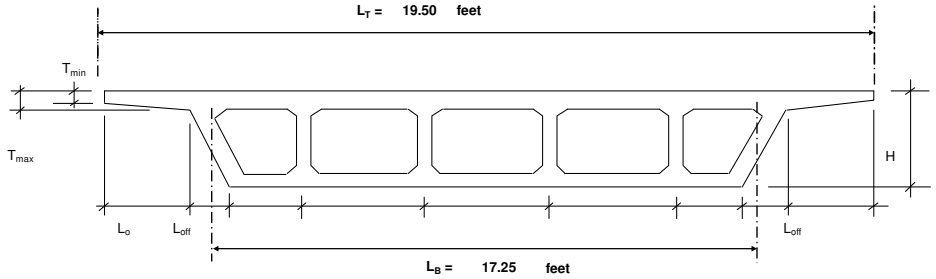
From analysis output:

I_g = 2.52 ft^4

Y_t = 2.98 ft

Flares = 4.00 inches

Span Type	Location	T_{min} (inches)	T_{max} (inches)	Lo (inches)	Offset Length (feet)	Girder Thickness (inches)	Span Length (feet)
Cantilever	Left						
	Right	8.00	12.00	20.00			
Exterior	Left				0.00	10.00	6.23
	Right				1.17	10.00	4.71
Interior	1					8.00	5.73
	2						
	3						
	4						



c) Resulting Section properties - About Horizontal Axis

Element	b (inches)	d (inches)	A (in^2)	y (inches)	I_o (in^4)	A*y (in^3)	$A*d^2$ (in^4)	I_{yy} (in^4)
Left Overhang	0.00	0.00	0	66.00	0	0	0	0
	0.00	0.00	0	66.00	0	0	0	0
Right Overhang	8.00	20.00	160	62.00	5,333	9,920	109,907	115,240
	20.00	2	40	56.67	13	2,267	17,432	17,445
Top Slab	214.05	8.00	1,712	62.00	9,133	106,169	1,176,276	1,185,409
Bottom Slab	200.01	7.00	1,400	3.50	5,717	4,900	1,459,857	1,465,574
Girders	28.00	51	1,428	32.50	309,519	46,410	15,465	324,984

Z_t = 35.79 inches (from Soffitt)
= 2.98 feet
= 30.21 inches (from Deck)
= 2.52 feet

I_{YY} = 3,108,652 in^4
= 149.92 ft^4

A_3 = 1,428 in^2
= 9.92 ft^2

Y_t = 110.39 inches (from Left Edge)
= 9.20 feet
= 123.66 inches (from Right Edge)
= 10.30 feet

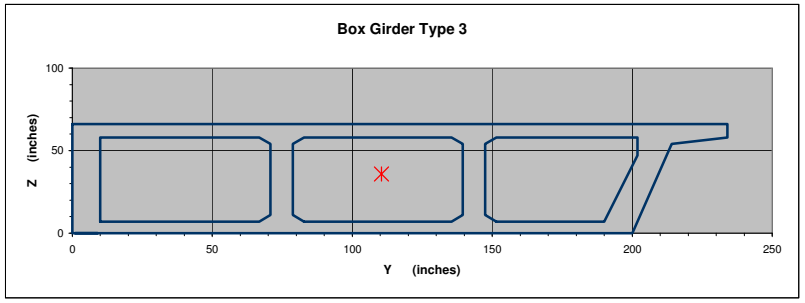
I_{ZZ} = 82,736,113 in^4
= 3,989.97 ft^4

A_2 = 3,272 in^2
= 22.73 ft^2

A_G = 32.92 ft^2
J = 4,140 ft^4

d) Resulting Section properties - About Vertical Axis

Element	b (inches)	d (inches)	A (in^2)	y (inches)	I_o (in^4)	A*y (in^3)	$A*d^2$ (in^4)	I_{zz} (in^4)
Left Overhang	0.00	0.00	0	0.00	0	0	0	0
	0.00	0.00	0	0.00	0	0	0	0
Right Overhang	20.00	8.00	160	234.05	853	37,448	8,764,704	8,765,558
	2.00	20.00	40	234.05	1,333	9,362	2,191,176	2,192,509
Top Slab	8.00	214.05	1,712	117.03	6,538,143	200,394	23,451,062	29,989,206
Bottom Slab	7.00	200.01	1,400	100.01	4,667,367	140,014	14,002,100	18,669,467
Girders	51.00	10.00	510	5.00	4,250	2,550	12,750	17,000
	51.00	10.00	510	202.03	4,250	103,035	20,816,222	20,820,472
	51.00	8.00	408	74.75	2,176	30,498	2,279,726	2,281,902
	51.00	0.00	0	143.51	0	0	0	0
	51.00	0.00	0	143.51	0	0	0	0
	51.00	0.00	0	143.51	0	0	0	0



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4. Superstructure Section 4

Section ID : **BG4**

a) Material Properties

Concrete : ρ_c = 0.145 kip/ft^3 => NWC (Normal vs Light Weight Concrete, ACI 2.2; threshold is 0.115 kcf)

f'_c = 4.00 Ksi => E = 4,743 Ksi

b) Section Dimensions and Cross-section

L = 70.00 feet (Span Length)

H_{bg} = 4.50 feet (Height of T-girder)

T_{ts} = 8.00 inches (Top slab thickness)

T_{bs} = 7.00 inches (Bottom slab thickness)

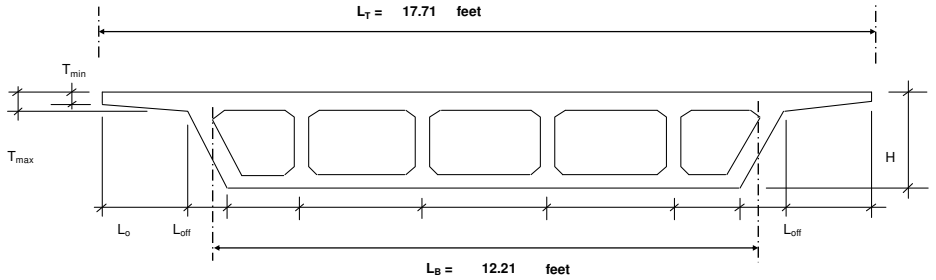
From analysis output:

I_g = 1.88 ft^4

Y_t = 2.62 ft

Flares = 4.00 inches

Span Type	Location	T_{min} (inches)	T_{max} (inches)	Lo (inches)	Offset Length (feet)	Girder Thickness (inches)	Span Length (feet)
Cantilever	Left	7.00	12.00	30.00			
	Right	7.00	12.00	30.00			
Exterior	Left				0.50	10.00	5.85
	Right				0.50	10.00	5.85
Interior	1					8.00	
	2						
	3						
	4						



c) Resulting Section properties - About Horizontal Axis

Element	b (inches)	d (inches)	A (in^2)	y (inches)	I_o (in^4)	A*y (in^3)	A*d^2 (in^4)	I_{yy} (in^4)
Left Overhang	30.00	7.00	210	50.50	858	10,605	76,582	77,439
	30.00	2.50	75	45.33	39	3,400	14,553	14,592
Right Overhang	7.00	30.00	210	50.50	15,750	10,605	76,582	92,332
	30.00	2.5	75	45.33	39	3,400	14,553	14,592
Top Slab	152.5	8.00	1,220	50.00	6,507	61,000	421,912	428,419
Bottom Slab	140.5	7.00	984	3.50	4,016	3,442	765,759	769,775
Girders	28.00	39	1,092	26.50	138,411	28,938	26,256	164,667

Z_t = 31.40 inches (from Soffitt)
= 2.62 feet
= 22.60 inches (from Deck)
= 1.88 feet

I_{YY} = 1,561,816 in^4
= 75.32 ft^4

A_3 = 1,092 in^2
= 7.58 ft^2

Y_t = 105.63 inches (from Left Edge)
= 8.80 feet
= 106.87 inches (from Right Edge)
= 8.91 feet

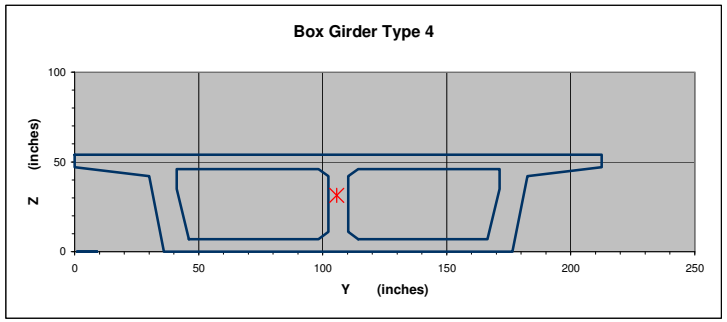
I_{ZZ} = 55,857,783 in^4
= 2,693.76 ft^4

A_2 = 2,624 in^2
= 18.22 ft^2

A_G = 26.84 ft^2
J = 2,769 ft^4

d) Resulting Section properties - About Vertical Axis

Element	b (inches)	d (inches)	A (in^2)	y (inches)	I_o (in^4)	A*y (in^3)	A*d^2 (in^4)	I_{zz} (in^4)
Left Overhang	7.00	30.00	210	3.50	15,750	735	2,573	18,323
	2.50	30.00	75	20.00	5,625	1,500	30,000	35,625
Right Overhang	30.00	7.00	210	197.50	858	41,475	8,191,313	8,192,170
	2.50	30.00	75	192.50	5,625	14,438	2,779,219	2,784,844
Top Slab	8.00	152.50	1,220	106.25	2,364,385	129,625	13,772,656	16,137,042
Bottom Slab	7.00	140.50	984	106.25	1,617,878	104,497	11,102,793	12,720,671
Girders	39.00	10.00	390	38.00	3,250	14,820	563,160	566,410
	39.00	10.00	390	174.50	3,250	68,055	11,875,598	11,878,848
	39.00	8.00	312	106.25	1,664	33,150	3,522,188	3,523,852
	39.00	0.00	0	106.25	0	0	0	0
	39.00	0.00	0	106.25	0	0	0	0
	39.00	0.00	0	106.25	0	0	0	0



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SUPERSTRUCTURE SECTIONS
SAP2000 BRIDGE ANALYSIS INPUT FILE DATA
FORT BRAGG HSR DOWNTOWN STATION

5. Superstructure Section 5

Section ID : **BG5**

a) Material Properties

Concrete : ρ_c = 0.145 kip/ft^3 => NWC (Normal vs Light Weight Concrete, ACI 2.2; threshold is 0.115 kcf)

f'_c = 4.00 Ksi => E = 4,743 Ksi

b) Section Dimensions and Cross-section

L = 70.00 feet (Span Length)

H_{bg} = 4.50 feet (Height of T-girder)

T_{ts} = 8.00 inches (Top slab thickness)

T_{bs} = 6.00 inches (Bottom slab thickness)

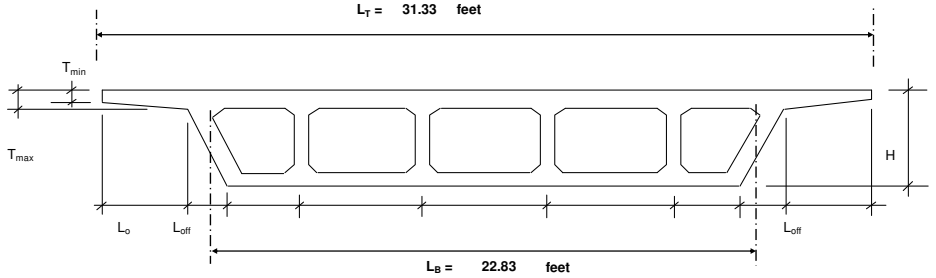
From analysis output:

I_g = 1.79 ft^4

Y_t = 2.71 ft

Flares = 6.00 inches

Span Type	Location	T_{min} (inches)	T_{max} (inches)	Lo (inches)	Offset Length (feet)	Girder Thickness (inches)	Span Length (feet)
Cantilever	Left	6.00	8.00	36.00			
	Right	6.00	8.00	36.00			
Exterior	Left				2.50	10.00	5.17
	Right				2.50	10.00	5.17
Interior	1					12.00	10.00
	2						
	3						
	4						



c) Resulting Section properties - About Horizontal Axis

Element	b (inches)	d (inches)	A (in^2)	y (inches)	I_o (in^4)	A*y (in^3)	A*d^2 (in^4)	I_{yy} (in^4)
Left Overhang	36.00	6.00	216	51.00	648	11,016	73,768	74,416
	36.00	1.00	36	47.33	3	1,704	7,900	7,903
Right Overhang	6.00	36.00	216	51.00	23,328	11,016	73,768	97,096
	36.00	1	36	47.33	3	1,704	7,900	7,903
Top Slab	304	8.00	2,432	50.00	12,971	121,600	743,123	756,093
Bottom Slab	244	6.00	1,464	3.00	4,392	4,392	1,275,750	1,280,142
Girders	32.00	40	1,280	26.00	170,667	33,280	54,409	225,075

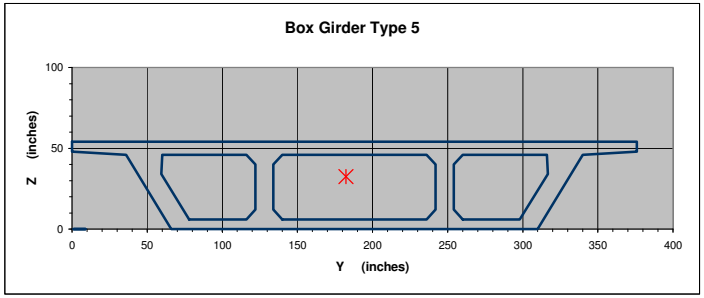
Z_t = 32.52 inches (from Soffitt)
= 2.71 feet
= 21.48 inches (from Deck)
= 1.79 feet
I_{YY} = 2,448,629 in^4
= 118.09 ft^4
A_3 = 1,280 in^2
= 8.89 ft^2

Y_t = 182.36 inches (from Left Edge)
= 15.20 feet
= 193.64 inches (from Right Edge)
= 16.14 feet
I_{ZZ} = 245,982,805 in^4
= 11,862.60 ft^4
A_2 = 4,328 in^2
= 30.06 ft^2

A_G = 39.44 ft^2
J = 11,981 ft^4

d) Resulting Section properties - About Vertical Axis

Element	b (inches)	d (inches)	A (in^2)	y (inches)	I_o (in^4)	A*y (in^3)	A*d^2 (in^4)	I_{zz} (in^4)
Left Overhang	6.00	36.00	216	3.00	23,328	648	1,944	25,272
	1.00	36.00	36	24.00	3,888	864	20,736	24,624
Right Overhang	36.00	6.00	216	358.00	648	77,328	27,683,424	27,684,072
	1.00	36.00	36	352.00	3,888	12,672	4,460,544	4,464,432
Top Slab	8.00	304.00	2,432	188.00	18,729,643	457,216	85,956,608	104,686,251
Bottom Slab	6.00	244.00	1,464	188.00	7,263,392	275,232	51,743,616	59,007,008
Girders	40.00	10.00	400	56.00	3,333	22,400	1,254,400	1,257,733
	40.00	10.00	400	320.00	3,333	128,000	40,960,000	40,963,333
	40.00	12.00	480	128.00	5,760	61,440	7,864,320	7,870,080
	40.00	0.00	0	248.00	0	0	0	0
	40.00	0.00	0	248.00	0	0	0	0
	40.00	0.00	0	248.00	0	0	0	0



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SUPERSTRUCTURE SECTIONS
SAP2000 BRIDGE ANALYSIS INPUT FILE DATA
FORT BRAGG HSR DOWNTOWN STATION

1. Segment Alignment Data (from 1a. Trackway Alignment" worksheet)

L_1 = 20.14 feet (Centerline distance between Trackway Alignment and Segment 1)

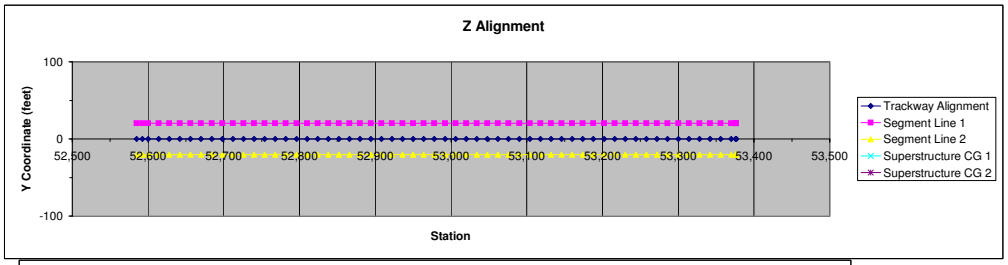
L_2 = 20.14 feet (Centerline distance between Trackway Alignment and Segment 2)

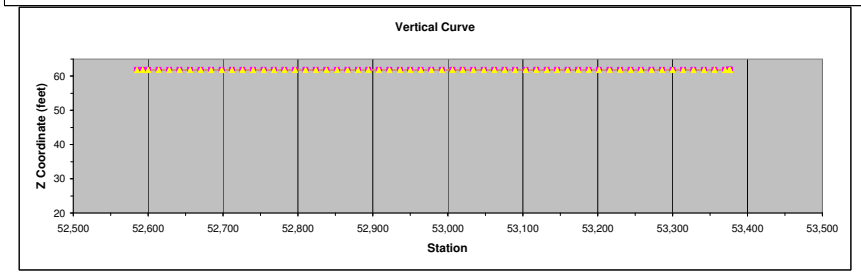
Origin: x_i = 52,585.00
y_i = 0.00

2. Superstructure Separation from Segment Centerlines and Section Summary

Section	y' from Segment CL [1] (inches)	Girder Height (inches)	Section C.G. Y [2] (feet)	Section C.G. Z [3] (feet)	Top Slab Length (feet)	Top Slab t_s (inches)	Bottom Slab Length (feet)	Bottom Slab t_s (inches)	T&B Slab Horiz. Offset (feet)	Superstructure Section Properties - Summary: Area (ft^2)	J (ft^4)	I_{33} (ft^4)	I_{22} (ft^4)	A_{22} (ft^2)	A_{33} (ft^2)
BG1	0.00	54.00	12.69	1.63	25.50	8.00	19.50	0.00	3.00	40.00	8,555	79.71	8,475.27	17.00	*23.00*
BG2	20.00	66.00	9.83	2.52	19.51	8.00	17.26	7.00	2.84	32.92	4,514	149.72	4,364.21	22.73	*9.92*
BG3	20.00	66.00	9.20	2.52	19.50	8.00	17.25	7.00	0.00	32.92	4,140	149.92	3,989.97	22.73	*9.92*
BG4	-22.00	54.00	8.80	1.88	17.71	8.00	12.21	7.00	3.00	26.84	2,769	75.32	2,693.76	18.22	*7.58*
BG5	-25.00	54.00	15.20	1.79	31.33	8.00	22.83	6.00	3.00	39.44	11,981	118.09	11,862.60	30.06	*8.89*

Notes: 1. Separation distance y' between Deck Section C.G. to Segment Centerline (Boxcar, tracks); + distance outwards, - distance inwards from Segment Centerline.
2. Tranverse location of C.G. as measured from Left Edge of Top Slab.
3. Vertical location of C.G. as measured from Top Edge of Top Slab.





3. Platform Placement and Section

Platform Station Begin : 52,600 feet
Platform Station End : 53,300 feet

Platform Section : BG1 = > L_P = 700 feet (Platform Length)
W_P = 25.50 feet (Platform Width)

Centroid : Z_t = 1.63 feet (feet from Deck)
Y_t = 12.69 feet (from Left Edge)

Distance from Platform C.G. to Trackway Centerline :

L_{P1} = 0.00 feet
L_{P2} = 2.87 feet

4. Trackway, Segment, (from 1a. Trackway Alignment" worksheet) and Box Girder Alignment Data

Non Prismatic Deck Sections Property Distribution (between nodes, Max 7) :
1. Linear Distribution
2. Parabolic Distribution
3. Cubic Distribution

Non Prismatic Deck Sections Property Distribution (between nodes, Max 7) :
1. Linear Distribution
2. Parabolic Distribution
3. Cubic Distribution

Section	Node	Trackway Alignment: Station (feet)	X (feet)	Y (feet)	Z (feet)	Heading (degrees)		Section ID	Non Prismatic EI_{33}	Non Prismatic EI_{22}	Segment Line 1: Station (feet)	X (feet)	Y (feet)	Z (feet)	Superstructure CG 1: Station (feet)	X (feet)	Y (feet)	Z (feet)
Hinge	1	52,585	0.00	0.00	61.78	0.00	0000	**BG4**			52,585	0.00	20.14	61.78	**52,585**	**0.00**	**18.30**	**59.90**
	2	52,593	7.50	0.00	61.78	0.00	0001	**BG4**			52,593	7.50	20.14	61.78	**52,593**	**7.50**	**18.30**	**59.90**
Bent 1	3	52,600	15.00	0.00	61.78	0.00	0100	**BG3**			52,600	15.00	20.14	61.78	**52,600**	**15.00**	**21.80**	**59.26**
	4	52,614	29.00	0.00	61.78	0.00	0101	**BG3**			52,614	29.00	20.14	61.78	**52,614**	**29.00**	**21.80**	**59.26**
	5	52,628	43.00	0.00	61.78	0.00	0102	**BG3**			52,628	43.00	20.14	61.78	**52,628**	**43.00**	**21.80**	**59.26**
	6	52,642	57.00	0.00	61.78	0.00	0103	**BG3**			52,642	57.00	20.14	61.78	**52,642**	**57.00**	**21.80**	**59.26**
	7	52,656	71.00	0.00	61.78	0.00	0104	**BG3**			52,656	71.00	20.14	61.78	**52,656**	**71.00**	**21.80**	**59.26**
Bent 2	8	52,670	85.00	0.00	61.78	0.00	0200	**BG3**			52,670	85.00	20.14	61.78	**52,670**	**85.00**	**21.80**	**59.26**
	9	52,684	99.00	0.00	61.78	0.00	0201	**BG3**			52,684	99.00	20.14	61.78	**52,684**	**99.00**	**21.80**	**59.26**
	10	52,698	113.00	0.00	61.78	0.00	0202	**BG3**			52,698	113.00	20.14	61.78	**52,698**	**113.00**	**21.80**	**59.26**
	11	52,712	127.00	0.00	61.78	0.00	0203	**BG3**			52,712	127.00	20.14	61.78	**52,712**	**127.00**	**21.80**	**59.26**
	12	52,726	141.00	0.00	61.78	0.00	0204	**BG3**			52,726	141.00	20.14	61.78	**52,726**	**141.00**	**21.80**	**59.26**
Bent 3	13	52,740	155.00	0.00	61.78	0.00	0300	**BG3**			52,740	155.00	20.14	61.78	**52,740**	**155.00**	**21.80**	**59.26**
	14	52,754	169.00	0.00	61.78	0.00	0301	**BG3**			52,754	169.00	20.14	61.78	**52,754**	**169.00**	**21.80**	**59.26**
	15	52,768	183.00	0.00	61.78	0.00	0302	**BG3**			52,768	183.00	20.14	61.78	**52,768**	**183.00**	**21.80**	**59.26**
	16	52,782	197.00	0.00	61.78	0.00	0303	**BG3**			52,782	197.00	20.14	61.78	**52,782**	**197.00**	**21.80**	**59.26**
	17	52,796	211.00	0.00	61.78	0.00	0304	**BG3**			52,796	211.00	20.14	61.78	**52,796**	**211.00**	**21.80**	**59.26**
Bent 4	18	52,810	225.00	0.00	61.78	0.00	0400	**BG3**			52,810	225.00	20.14	61.78	**52,810**	**225.00**	**21.80**	**59.26**
	19	52,824	239.00	0.00	61.78	0.00	0401	**BG3**			52,824	239.00	20.14	61.78	**52,824**	**239.00**	**21.80**	**59.26**
	20	52,838	253.00	0.00	61.78	0.00	0402	**BG3**			52,838	253.00	20.14	61.78	**52,838**	**253.00**	**21.80**	**59.26**
	21	52,852	267.00	0.00	61.78	0.00	0403	**BG3**			52,852	267.00	20.14	61.78	**52,852**	**267.00**	**21.80**	**59.26**
	22	52,866	281.00	0.00	61.78	0.00	0404	**BG3**			52,866	281.00	20.14	61.78	**52,866**	**281.00**	**21.80**	**59.26**
Bent 5	23	52,880	295.00	0.00	61.78	0.00	0500	**BG3**			52,880	295.00	20.14	61.78	**52,880**	**295.00**	**21.80**	**59.26**
	24	52,894	309.00	0.00	61.78	0.00	0501	**BG3**			52,894	309.00	20.14	61.78	**52,894**	**309.00**	**21.80**	**59.26**
	25	52,908	323.00	0.00	61.78	0.00	0502	**BG3**			52,908	323.00	20.14	61.78	**52,908**	**323.00**	**21.80**	**59.26**
	26	52,922	337.00	0.00	61.78	0.00	0503	**BG3**			52,922	337.00	20.14	61.78	**52,922**	**337.00**	**21.80**	**59.26**
	27	52,936	351.00	0.00	61.78	0.00	0504	**BG3**			52,936	351.00	20.14	61.78	**52,936**	**351.00**	**21.80**	**59.26**
Bent 6	28	52,950	365.00	0.00	61.78	0.00	0600	**BG3**			52,950	365.00	20.14	61.78	**52,950**	**365.00**	**21.80**	**59.26**
	29	52,964	379.00	0.00	61.78	0.00	0601	**BG3**			52,964	379.00	20.14	61.78	**52,964**	**379.00**	**21.80**	**59.26**
	30	52,978	393.00	0.00	61.78	0.00	0602	**BG3**			52,978	393.00	20.14	61.78	**52,978**	**393.00**	**21.80**	**59.26**
	31	52,992	407.00	0.00	61.78	0.00	0603	**BG3**			52,992	407.00	20.14	61.78	**52,992**	**407.00**	**21.80**	**59.26**
	32	53,006	421.00	0.00	61.78	0.00	0604	**BG3**			53,006	421.00	20.14	61.78	**53,006**	**421.00**	**21.80**	**59.26**
Bent 7	33	53,020	435.00	0.00	61.78	0.00	0700	**BG3**			53,020	435.00	20.14	61.78	**53,020**	**435.00**	**21.80**	**59.26**
	34	53,034	449.00	0.00	61.78	0.00	0701	**BG3**			53,034	449.00	20.14	61.78	**53,034**	**449.00**	**21.80**	**59.26**
	35	53,048	463.00	0.00	61.78	0.00	0702	**BG3**			53,048	463.00	20.14	61.78	**53,048**	**463.00**	**21.80**	**59.26**
	36	53,062	477.00	0.00	61.78	0.00	0703	**BG3**			53,062	477.00	20.14	61.78	**53,062**	**477.00**	**21.80**	**59.26**
	37	53,076	491.00	0.00	61.78	0.00	0704	**BG3**			53,076	491.00	20.14	61.78	**53,076**	**491.00**	**21.80**	**59.26**
Bent 8	38	53,090	505.00	0.00	61.78	0.00	0800	**BG3**			53,090	505.00	20.14	61.78	**53,090**	**505.00**	**21.80**	**59.26**
	39	53,104	519.00	0.00	61.78	0.00	0801	**BG3**			53,104	519.00	20.14	61.78	**53,104**	**519.00**	**21.80**	**59.26**

Platform Section ID	Platform CG: X (feet)	Y (feet)	Z (feet)
BG1	**15.00**	**0.00**	**64.65**
BG1	**29.00**	**0.00**	**64.65**
BG1	**43.00**	**0.00**	**64.65**
BG1	**57.00**	**0.00**	**64.65**
BG1	**71.00**	**0.00**	**64.65**
BG1	**85.00**	**0.00**	**64.65**
BG1	**99.00**	**0.00**	**64.65**
BG1	**113.00**	**0.00**	**64.65**
BG1	**127.00**	**0.00**	**64.65**
BG1	**141.00**	**0.00**	**64.65**
BG1	**155.00**	**0.00**	**64.65**
BG1	**169.00**	**0.00**	**64.65**
BG1	**183.00**	**0.00**	**64.65**
BG1	**197.00**	**0.00**	**64.65**
BG1	**211.00**	**0.00**	**64.65**
BG1	**225.00**	**0.00**	**64.65**
BG1	**239.00**	**0.00**	**64.65**
BG1	**253.00**	**0.00**	**64.65**
BG1	**267.00**	**0.00**	**64.65**
BG1	**281.00**	**0.00**	**64.65**
BG1	**295.00**	**0.00**	**64.65**
BG1	**309.00**	**0.00**	**64.65**
BG1	**323.00**	**0.00**	**64.65**
BG1	**337.00**	**0.00**	**64.65**
BG1	**351.00**	**0.00**	**64.65**
BG1	**365.00**	**0.00**	**64.65**
BG1	**379.00**	**0.00**	**64.65**
BG1	**393.00**	**0.00**	**64.65**
BG1	**407.00**	**0.00**	**64.65**
BG1	**421.00**	**0.00**	**64.65**
BG1	**435.00**	**0.00**	**64.65**
BG1	**449.00**	**0.00**	**64.65**
BG1	**463.00**	**0.00**	**64.65**
BG1	**477.00**	**0.00**	**64.65**
BG1	**491.00**	**0.00**	**64.65**
BG1	**505.00**	**0.00**	**64.65**
BG1	**519.00**	**0.00**	**64.65**

Section ID	Non Prismatic EI_{33}	Non Prismatic EI_{22}	Segment Line 2: Station (feet)	X (feet)	Y (feet)	Z (feet)	Superstructure CG 2: Station (feet)	X (feet)	Y (feet)	Z (feet)
BG4			52,585	0.00	-20.14	61.78	**52,585**	**0.00**	**-18.30**	**59.90**
BG4			52,593	7.50	-20.14	61.78	**52,593**	**7.50**	**-18.30**	**59.90**
BG2			52,600	15.00	-20.14	61.78	**52,600**	**15.00**	**-21.80**	**59.26**
BG2			52,614	29.00	-20.14	61.78	**52,614**	**29.00**	**-21.80**	**59.26**
BG2			52,628	43.00	-20.14	61.78	**52,628**	**43.00**	**-21.80**	**59.26**
BG2			52,642	57.00	-20.14	61.78	**52,642**	**57.00**	**-21.80**	**59.26**
BG2			52,656	71.00	-20.14	61.78	**52,656**	**71.00**	**-21.80**	**59.26**
BG2			52,670	85.00	-20.14	61.78	**52,670**	**85.00**	**-21.80**	**59.26**
BG2			52,684	99.00	-20.14	61.78	**52,684**	**99.00**	**-21.80**	**59.26**
BG2			52,698	113.00	-20.14	61.78	**52,698**	**113.00**	**-21.80**	**59.26**
BG2			52,712	127.00	-20.14	61.78	**52,712**	**127.00**	**-21.80**	**59.26**
BG2			52,726	141.00	-20.14	61.78	**52,726**	**141.00**	**-21.80**	**59.26**
BG2			52,740	155.00	-20.14	61.78	**52,740**	**155.00**	**-21.80**	**59.26**
BG2			52,754	169.00	-20.14	61.78	**52,754**	**169.00**	**-21.80**	**59.26**
BG2			52,768	183.00	-20.14	61.78	**52,768**	**183.00**	**-21.80**	**59.26**
BG2			52,782	197.00	-20.14	61.78	**52,782**	**197.00**	**-21.80**	**59.26**
BG2			52,796	211.00	-20.14	61.78	**52,796**	**211.00**	**-21.80**	**59.26**
BG2			52,810	225.00	-20.14	61.78	**52,810**	**225.00**	**-21.80**	**59.26**
BG2			52,824	239.00	-20.14	61.78	**52,824**	**239.00**	**-21.80**	**59.26**
BG2			52,838	253.00	-20.14	61.78	**52,838**	**253.00**	**-21.80**	**59.26**
BG2			52,852	267.00	-20.14	61.78	**52,852**	**267.00**	**-21.80**	**59.26**
BG2			52,866	281.00	-20.14	61.78	**52,866**	**281.00**	**-21.80**	**59.26**
BG2			52,880	295.00	-20.14	61.78	**52,880**	**295.00**	**-21.80**	**59.26**
BG2			52,894	309.00	-20.14	61.78	**52,894**	**309.00**	**-21.80**	**59.26**
BG2			52,908	323.00	-20.14	61.78	**52,908**	**323.00**	**-21.80**	**59.26**
BG2			52,922	337.00	-20.14	61.78	**52,922**	**337.00**	**-21.80**	**59.26**
BG2			52,936	351.00	-20.14	61.78	**52,936**	**351.00**	**-21.80**	**59.26**
BG2			52,950	365.00	-20.14	61.78	**52,950**	**365.00**	**-21.80**	**59.26**
BG2			52,964	379.00	-20.14	61.78	**52,964**	**379.00**	**-21.80**	**59.26**
BG2			52,978	393.00	-20.14	61.78	**52,978**	**393.00**	**-21.80**	**59.26**
BG2			52,992	407.00	-20.14	61.78	**52,992**	**407.00**	**-21.80**	**59.26**
BG2			53,006	421.00	-20.14	61.78	**53,006**	**421.00**	**-21.80**	**59.26**
BG2			53,020	435.00	-20.14	61.78	**53,020**	**435.00**	**-21.80**	**59.26**
BG2			53,034	449.00	-20.14	61.78	**53,034**	**449.00**	**-21.80**	**59.26**
BG2			53,048	463.00	-20.14	61.78	**53,048**	**463.00**	**-21.80**	**59.26**
BG2			53,062	477.00	-20.14	61.78	**53,062**	**477.00**	**-21.80**	**59.26**
BG2			53,076	491.00	-20.14	61.78	**53,076**	**491.00**	**-21.80**	**59.26**
BG2			53,090	505.00	-20.14	61.78	**53,090**	**505.00**	**-21.80**	**59.26**
BG2			53,104	519.00	-20.14	61.78	**53,104**	**519.00**	**-21.80**	**59.26**

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SUPERSTRUCTURE SECTIONS
SAP2000 BRIDGE ANALYSIS INPUT FILE DATA
FORT BRAGG HSR DOWNTOWN STATION

1. Segment Alignment Data (from 1a. Trackway Alignment" worksheet)

L_1 = 20.14 feet (Centerline distance between Trackway Alignment and Segment 1)

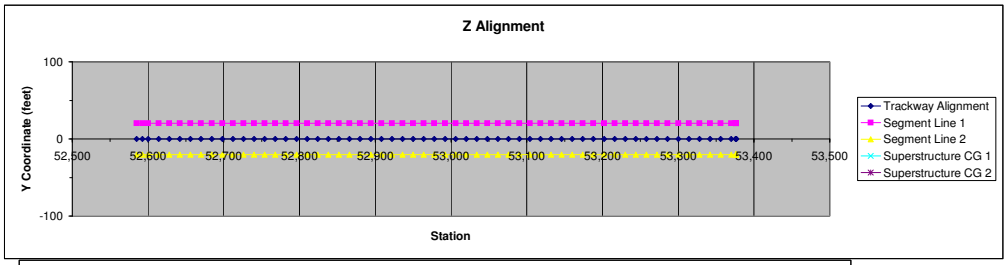
L_2 = 20.14 feet (Centerline distance between Trackway Alignment and Segment 2)

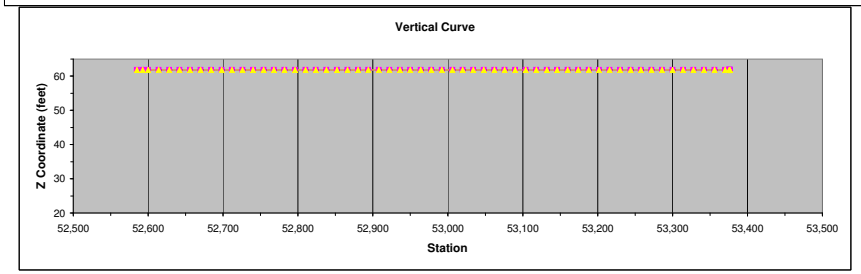
Origin: x_i = 52,585.00
y_i = 0.00

2. Superstructure Separation from Segment Centerlines and Section Summary

Section	y' from Segment CL [1] (inches)	Girder Height (inches)	Section C.G. Y [2] (feet)	Section C.G. Z [3] (feet)	Top Slab Length (feet)	Top Slab t_s (inches)	Bottom Slab Length (feet)	Bottom Slab t_s (inches)	T&B Slab Horiz. Offset (feet)	Superstructure Section Properties - Summary: Area (ft^2)	J (ft^4)	I_{33} (ft^4)	I_{22} (ft^4)	A_{22} (ft^2)	A_{33} (ft^2)
BG1	0.00	54.00	12.69	1.63	25.50	8.00	19.50	0.00	3.00	40.00	8,555	79.71	8,475.27	17.00	*23.00*
BG2	20.00	66.00	9.83	2.52	19.51	8.00	17.26	7.00	2.84	32.92	4,514	149.72	4,364.21	22.73	*9.92*
BG3	20.00	66.00	9.20	2.52	19.50	8.00	17.25	7.00	0.00	32.92	4,140	149.92	3,989.97	22.73	*9.92*
BG4	-22.00	54.00	8.80	1.88	17.71	8.00	12.21	7.00	3.00	26.84	2,769	75.32	2,693.76	18.22	*7.58*
BG5	-25.00	54.00	15.20	1.79	31.33	8.00	22.83	6.00	3.00	39.44	11,981	118.09	11,862.60	30.06	*8.89*

Notes: 1. Separation distance y' between Deck Section C.G. to Segment Centerline (Boxcar, tracks); + distance outwards, - distance inwards from Segment Centerline.
2. Tranverse location of C.G. as measured from Left Edge of Top Slab.
3. Vertical location of C.G. as measured from Top Edge of Top Slab.





3. Platform Placement and Section

Platform Station Begin : 52,600 feet
Platform Station End : 53,300 feet

Platform Section : BG1 = >
L_P = 700 feet (Platform Length)
W_P = 25.50 feet (Platform Width)

Centroid :
Z_t = 1.63 feet (from Deck)
Y_t = 12.69 feet (from Left Edge)

Distance from Platform C.G. to Trackway Centerline :
L_{Py} = 0.00 feet
L_{Pz} = 2.87 feet

4. Trackway, Segment, (from 1a. Trackway Alignment" worksheet) and Box Girder Alignment Data

Non Prismatic Deck Sections Property Distribution (between nodes, Max 7) :
1. Linear Distribution
2. Parabolic Distribution
3. Cubic Distribution

Non Prismatic Deck Sections Property Distribution (between nodes, Max 7) :
1. Linear Distribution
2. Parabolic Distribution
3. Cubic Distribution

Section	Node	Trackway Alignment: Station (feet)	X (feet)	Y (feet)	Z (feet)	Heading (degrees)
	40	53,118	533.00	0.00	61.78	0.00
	41	53,132	547.00	0.00	61.78	0.00
	42	53,146	561.00	0.00	61.78	0.00
Bent 9	43	53,160	575.00	0.00	61.78	0.00
	44	53,174	589.00	0.00	61.78	0.00
	45	53,188	603.00	0.00	61.78	0.00
	46	53,202	617.00	0.00	61.78	0.00
	47	53,216	631.00	0.00	61.78	0.00
Bent 10	48	53,230	645.00	0.00	61.78	0.00
	49	53,244	659.00	0.00	61.78	0.00
	50	53,258	673.00	0.00	61.78	0.00
	51	53,272	687.00	0.00	61.78	0.00
	52	53,286	701.00	0.00	61.78	0.00
Bent 11	53	53,300	715.00	0.00	61.78	0.00
	54	53,314	729.00	0.00	61.78	0.00
	55	53,328	743.00	0.00	61.78	0.00
	56	53,342	757.00	0.00	61.78	0.00
	57	53,356	771.00	0.00	61.78	0.00
	58	53,370	785.00	0.00	61.78	0.00
Hinge	59	53,376	791.05	0.00	61.78	0.00
		53,376	791.05	0.00	61.78	0.00
		53,376	791.05	0.00	61.78	0.00
		53,376	791.05	0.00	61.78	0.00
		53,376	791.05	0.00	61.78	0.00
		53,376	791.05	0.00	61.78	0.00
		53,376	791.05	0.00	61.78	0.00

	Section ID	Non Prismatic EI_{33}	Non Prismatic EI_{22}	Segment Line 1: Station (feet)	X (feet)	Y (feet)	Z (feet)	Superstructure CG 1: Station (feet)	X (feet)	Y (feet)	Z (feet)
0802	**BG3**			53,118	533.00	20.14	61.78	**53,118**	**533.00**	**21.80**	**59.26**
0803	**BG3**			53,132	547.00	20.14	61.78	**53,132**	**547.00**	**21.80**	**59.26**
0804	**BG3**			53,146	561.00	20.14	61.78	**53,146**	**561.00**	**21.80**	**59.26**
0900	**BG3**			53,160	575.00	20.14	61.78	**53,160**	**575.00**	**21.80**	**59.26**
0901	**BG3**			53,174	589.00	20.14	61.78	**53,174**	**589.00**	**21.80**	**59.26**
0902	**BG3**			53,188	603.00	20.14	61.78	**53,188**	**603.00**	**21.80**	**59.26**
0903	**BG3**			53,202	617.00	20.14	61.78	**53,202**	**617.00**	**21.80**	**59.26**
0904	**BG3**			53,216	631.00	20.14	61.78	**53,216**	**631.00**	**21.80**	**59.26**
1000	**BG3**			53,230	645.00	20.14	61.78	**53,230**	**645.00**	**21.80**	**59.26**
1001	**BG3**			53,244	659.00	20.14	61.78	**53,244**	**659.00**	**21.80**	**59.26**
1002	**BG3**			53,258	673.00	20.14	61.78	**53,258**	**673.00**	**21.80**	**59.26**
1003	**BG3**			53,272	687.00	20.14	61.78	**53,272**	**687.00**	**21.80**	**59.26**
1004	**BG3**			53,286	701.00	20.14	61.78	**53,286**	**701.00**	**21.80**	**59.26**
1100	**BG4**			53,300	715.00	20.14	61.78	**53,300**	**715.00**	**18.30**	**59.90**
1101	**BG4**			53,314	729.00	20.14	61.78	**53,314**	**729.00**	**18.30**	**59.90**
1102	**BG4**			53,328	743.00	20.14	61.78	**53,328**	**743.00**	**18.30**	**59.90**
1103	**BG4**			53,342	757.00	20.14	61.78	**53,342**	**757.00**	**18.30**	**59.90**
1104	**BG4**			53,356	771.00	20.14	61.78	**53,356**	**771.00**	**18.30**	**59.90**
1105	**BG4**			53,370	785.00	20.14	61.78	**53,370**	**785.00**	**18.30**	**59.90**
1106	**BG4**			53,376	791.05	20.14	61.78	**53,376**	**791.05**	**18.30**	**59.90**
				53,376	791.05	20.14	61.78				
				53,376	791.05	20.14	61.78				
				53,376	791.05	20.14	61.78				
				53,376	791.05	20.14	61.78				
				53,376	791.05	20.14	61.78				
				53,376	791.05	20.14	61.78				
				53,376	791.05	20.14	61.78				

Platform Section ID	Platform CG X (feet)	Platform CG Y (feet)	Platform CG Z (feet)
BG1	**533.00**	**0.00**	**64.65**
BG1	**547.00**	**0.00**	**64.65**
BG1	**561.00**	**0.00**	**64.65**
BG1	**575.00**	**0.00**	**64.65**
BG1	**589.00**	**0.00**	**64.65**
BG1	**603.00**	**0.00**	**64.65**
BG1	**617.00**	**0.00**	**64.65**
BG1	**631.00**	**0.00**	**64.65**
BG1	**645.00**	**0.00**	**64.65**
BG1	**659.00**	**0.00**	**64.65**
BG1	**673.00**	**0.00**	**64.65**
BG1	**687.00**	**0.00**	**64.65**
BG1	**701.00**	**0.00**	**64.65**
BG1	**715.00**	**0.00**	**64.65**

	Section ID	Non Prismatic EI_{33}	Non Prismatic EI_{22}	Segment Line 2: Station (feet)	X (feet)	Y (feet)	Z (feet)	Superstructure CG 2: Station (feet)	X (feet)	Y (feet)	Z (feet)
	BG2			53,118	533.00	-20.14	61.78	**53,118**	**533.00**	**-21.80**	**59.26**
	BG2			53,132	547.00	-20.14	61.78	**53,132**	**547.00**	**-21.80**	**59.26**
	BG2			53,146	561.00	-20.14	61.78	**53,146**	**561.00**	**-21.80**	**59.26**
	BG2			53,160	575.00	-20.14	61.78	**53,160**	**575.00**	**-21.80**	**59.26**
	BG2			53,174	589.00	-20.14	61.78	**53,174**	**589.00**	**-21.80**	**59.26**
	BG2			53,188	603.00	-20.14	61.78	**53,188**	**603.00**	**-21.80**	**59.26**
	BG2			53,202	617.00	-20.14	61.78	**53,202**	**617.00**	**-21.80**	**59.26**
	BG2			53,216	631.00	-20.14	61.78	**53,216**	**631.00**	**-21.80**	**59.26**
	BG2			53,230	645.00	-20.14	61.78	**53,230**	**645.00**	**-21.80**	**59.26**
	BG2			53,244	659.00	-20.14	61.78	**53,244**	**659.00**	**-21.80**	**59.26**
	BG2			53,258	673.00	-20.14	61.78	**53,258**	**673.00**	**-21.80**	**59.26**
	BG2			53,272	687.00	-20.14	61.78	**53,272**	**687.00**	**-21.80**	**59.26**
	BG2			53,286	701.00	-20.14	61.78	**53,286**	**701.00**	**-21.80**	**59.26**
	BG4			53,300	715.00	-20.14	61.78	**53,300**	**715.00**	**-18.30**	**59.90**
	BG4			53,314	729.00	-20.14	61.78	**53,314**	**729.00**	**-18.30**	**59.90**
	BG4			53,328	743.00	-20.14	61.78	**53,328**	**743.00**	**-18.30**	**59.90**
	BG4			53,342	757.00	-20.14	61.78	**53,342**	**757.00**	**-18.30**	**59.90**
	BG4			53,356	771.00	-20.14	61.78	**53,356**	**771.00**	**-18.30**	**59.90**
	BG4			53,370	785.00	-20.14	61.78	**53,370**	**785.00**	**-18.30**	**59.90**
	BG4			53,376	791.05	-20.14	61.78	**53,376**	**791.05**	**-18.30**	**59.90**
				53,376	791.05	-20.14	61.78				
				53,376	791.05	-20.14	61.78				
				53,376	791.05	-20.14	61.78				
				53,376	791.05	-20.14	61.78				
				53,376	791.05	-20.14	61.78				
				53,376	791.05	-20.14	61.78				
				53,376	791.05	-20.14	61.78				

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BENT INPUT DATA
SAP2000 BRIDGE ANALYSIS INPUT FILE DATA
FORT BRAGG HSR DOWNTOWN STATION

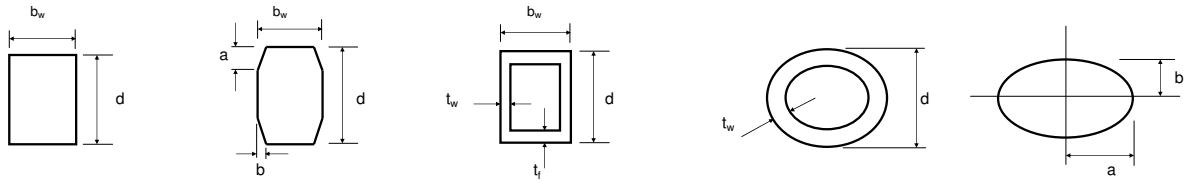
1. Bentcap Sections and Geometry

a) Material Properties

Notes:
1. Concrete material properties are specified for columns for each Bent; bentcaps are assumed to have the same concrete properties as columns.
2. Columns can be specified as either Steel (S) or Concrete (C, or default).
3. Steel column material properties as as follows: E_S = 29,000 Ksi
   W_S = 0.490 Kips/ft^3

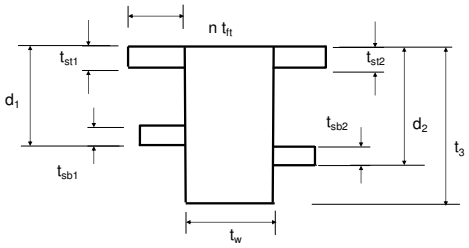
b) Column Sections

Note: **SH = O** (User Input Shape - Other than those shown)



SH = R **SH = F** **SH = B** **SH = P** **SH = E**

c) Bentcap Sections



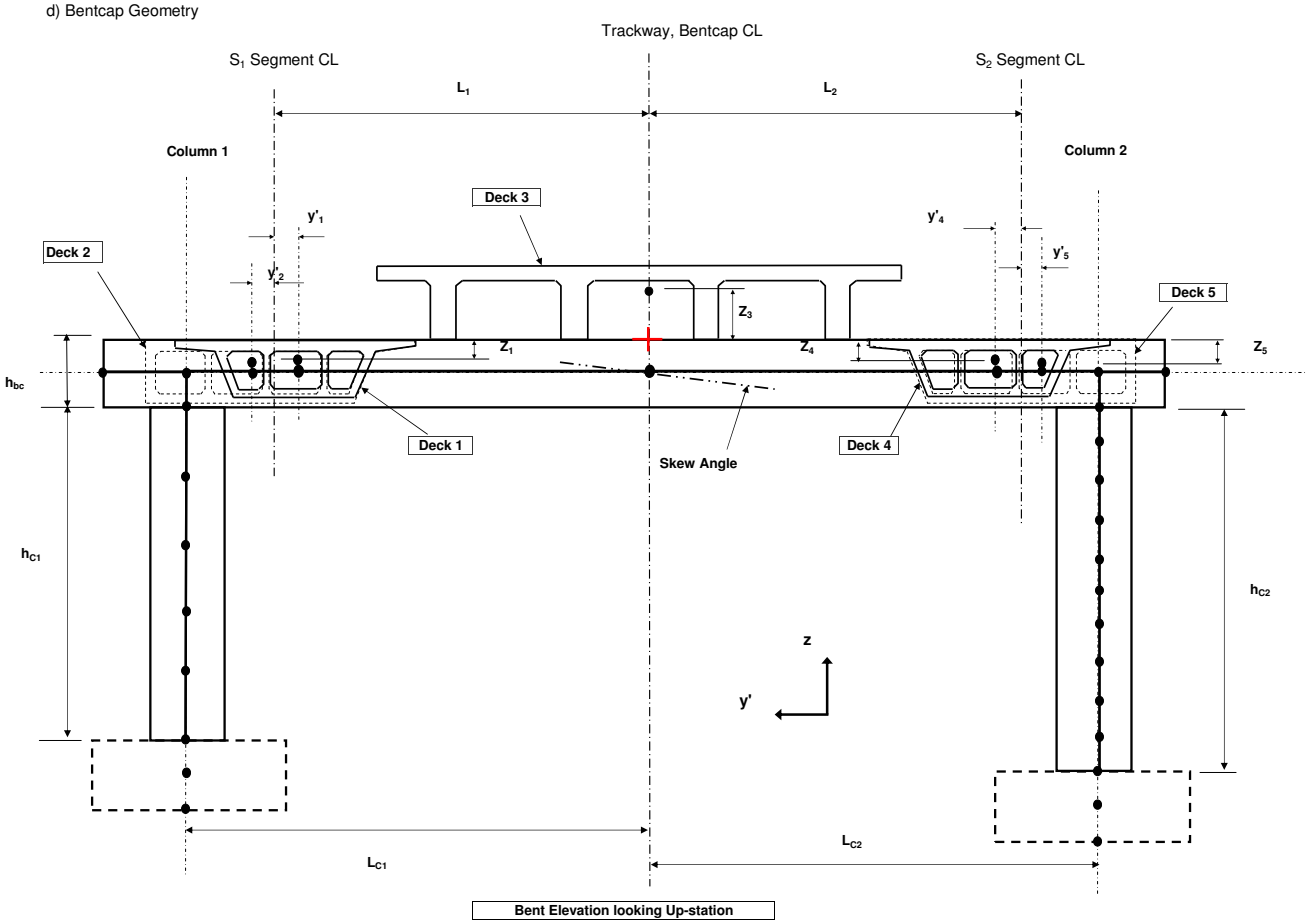
SH = T

Superstructure Section Summary (from "1c. Deck Assigments")

Section	y' from Segment CL [1] (inches)	Girder Height (inches)	C.G. from Top of Deck		Top Slab		Bottom Slab		Horiz. Offsett Between (feet)
			Y [2] (feet)	Z [3] (feet)	Length (feet)	t_s (inches)	Length (feet)	t_s (inches)	
BG1	0.00	54.00	12.69	1.63	25.50	8.00	19.50	0.00	3.00
BG2	20.00	66.00	9.83	2.52	19.51	8.00	17.26	7.00	2.84
BG3	20.00	66.00	9.20	2.52	19.50	8.00	17.25	7.00	0.00
BG4	-22.00	54.00	8.80	1.88	17.71	8.00	12.21	7.00	3.00
BG5	-25.00	54.00	15.20	1.79	31.33	8.00	22.83	6.00	3.00

Notes:
1. Separation distance y' between Deck Section Center of Gravity to Segment Centerline (Boxcar and tracks).
2. Tranverse location of C.G. as measured from Left Edge of Top Slab.
3. Vertical location of C.G. as measured from Top Edge of Top Slab.

d) Bentcap Geometry



Bent Elevation looking Up-station

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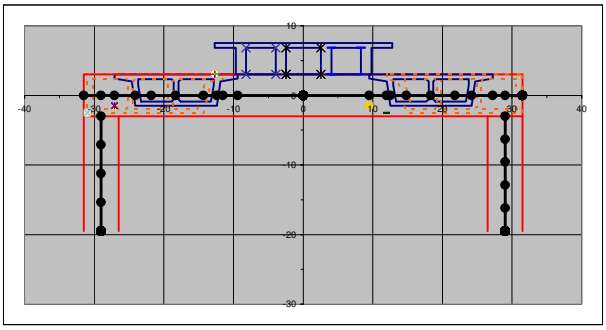
BENT INPUT DATA
SAP2000 BRIDGE ANALYSIS INPUT FILE DATA
FORT BRAGG HSR DOWNTOWN STATION

2. Bent Input Data - Bent 1

Label : **Bent 1**



a) Alignment Data

L_1 = 20.14 feet (Centerline distance between Trackway Alignment and Segment 1)
L_2 = 20.14 feet (Centerline distance between Trackway Alignment and Segment 2)

		Line Segment 1		Line Segment 2	
	Trackway Alignment	Top of Deck	Deck C.G.	Top of Deck	Deck C.G.
Station (feet)	52,600	52,600	52,600	52,600	52,600
X (feet)	15.00	15.00	15.00	15.00	15.00
Y (feet)	0.00	20.14	21.80	-20.14	-21.80
Z (feet)	61.78	61.78	59.26	61.78	59.26

Heading = 0.00 Degrees
Skew Angle = 0.00 Degrees

b) Pier Node Assignment and Section Properties

Concrete : ρ_c = 0.145 kip/ft^3 => NWC (Normal vs Light Weight Concrete, ACI 2.2; threshold is 0.115 kcf)
f'_c = 4.00 Ksi => E = 4,743 Ksi

	Pier Definition						Section Dimensions						Section Properties					
Pier Number	L_C (feet)	Height h_C (feet)	Number of Nodes	Nodal Spacing (feet)	Shape	Material	b_w (inches)	d (inches)	a (inches)	b (inches)	t_w (inches)	t_f (inches)	Area (ft^2)	J (ft^4)	I_{33} (ft^4)	I_{22} (ft^4)	A_{22} (ft^2)	A_{33} (ft^2)
1	29.00	16.50	5	4.13	R	C	60.00	60.00					25.00	104.17	52.08	52.08	20.83	20.83
2	-29.00	16.50	6	3.30	R	C	60.00	60.00					25.00	104.17	52.08	52.08	20.83	20.83
3																		
4																		
5																		

Note : Maximum number of pier nodes is 40.

c) Bentcap Nodes and Section Properties

b_w = 7.00 feet => n = 6 (Bentcap Flange extent Factor for Top Slabs)
d = 6.00 feet
L_e = 0.00 feet (Bentcap Extension beyond Edge of Columns => L_{BC} = 63.00 feet (Length of Bentcap)

	Bent 1 Nodes																			
Node No.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Y (feet)	-31.50	-29.00	-27.10	-24.10	-21.80	-18.30	-14.33	-12.40	-11.50	-9.40	0.00	9.50	11.97	12.50	14.81	18.30	21.80	24.21	27.21	29.00
Z (feet)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
b_w (feet)	7.00	7.00	7.00	7.00	7.00	7.00	7.00	7.00	7.00	7.00	7.00	7.00	7.00	7.00	7.00	7.00	7.00	7.00	7.00	7.00
d (feet)	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00
Approaching Section t_{Top} (feet)			0.67	0.67	0.67	0.67	0.67	0.67	0.67	0.67		0.67	0.67	0.67	0.67	0.67	0.67	0.67	0.67	
Approaching Section d_1 (feet)				4.50	4.50	4.50	4.50	4.50						4.50	4.50	4.50	4.50	4.50		
Approaching Section t_{Bott} (feet)				0.58	0.58	0.58	0.58	0.58						0.58	0.58	0.58	0.58	0.58		
Departing Section t_{Top} (feet)		0.67	0.67	0.67	0.67	0.67	0.67	0.67	0.67				0.67	0.67	0.67	0.67	0.67	0.67	0.67	0.67
Departing Section d_1 (feet)		5.50	5.50	5.50	5.50	5.50	5.50								5.50	5.50	5.50	5.50	5.50	5.50
Departing Section t_{Bott} (feet)		0.58	0.58	0.58	0.58	0.58	0.58								0.58	0.58	0.58	0.58	0.58	0.58
Bentcap Section Properties y_i (feet)	3.00	3.06	3.20	3.14	3.14	3.14	3.14	3.24	3.30	3.16	3.00	3.16	3.30	3.24	3.14	3.14	3.14	3.14	3.20	3.06
Bentcap Section Properties Area (ft^2)	42.00	46.71	49.38	51.42	51.42	51.42	51.42	49.38	47.33	44.67	42.00	44.67	47.33	49.38	51.42	51.42	51.42	51.42	49.38	46.71
Bentcap Section Properties A_2 (ft^2)	35.00	35.00	35.00	35.00	35.00	35.00	35.00	35.00	35.00	35.00	35.00	35.00	35.00	35.00	35.00	35.00	35.00	35.00	35.00	35.00
Bentcap Section Properties A_3 (ft^2)	35.00	39.71	42.38	44.42	44.42	44.42	44.42	42.38	40.33	37.67	35.00	37.67	40.33	42.38	44.42	44.42	44.42	44.42	42.38	39.71
Bentcap Section Properties J (ft^4)	297.50	475.59	577.46	654.98	654.98	654.98	654.98	578.71	499.79	399.65	297.50	399.65	499.79	578.71	654.98	654.98	654.98	654.98	577.46	475.59
Bentcap Section Properties I_{33} (ft^4)	126.00	161.51	179.16	198.32	198.32	198.32	198.32	180.41	159.85	143.93	126.00	143.93	159.85	180.41	198.32	198.32	198.32	198.32	179.16	161.51
Bentcap Section Properties I_{22} (ft^4)	171.50	314.08	398.30	456.66	456.66	456.66	456.66	398.30	339.94	255.72	171.50	255.72	339.94	398.30	456.66	456.66	456.66	456.66	398.30	314.08

d) Superstructure Data

Line Segment 1

Approaching Section : **BG4**

y'_1 = -1.83 feet = -22.00 inches
Z'_1 = -1.88 feet = -22.60 inches
$d_1 = H_{bg}$ = 4.50 feet (Box Girder Height) = 54.00 inches

	Slab Distance to Segment CL		Slab Distance to Trackway CL				
Box Girder Slab	Left Edge (feet)	Right Edge (feet)	Left Edge (feet)	Center of Gravity (feet)	Right Edge (feet)	Length (feet)	Thickness (inches)
Top	6.97	-10.74	27.10	18.30	9.40	17.71	8.00
Bottom	3.97	-8.24	24.10		11.90	12.21	7.00

Departing Section : **BG3**

y'_2 = 1.67 feet = 20.00 inches
Z'_2 = -2.52 feet = -30.21 inches
$d_2 = H_{bg}$ = 5.50 feet (Box Girder Height) = 66.00 inches

	Slab Distance to Segment CL		Slab Distance to Trackway CL				
Box Girder Slab	Left Edge (feet)	Right Edge (feet)	Left Edge (feet)	Center of Gravity (feet)	Right Edge (feet)	Length (feet)	Thickness (inches)
Top	10.87	-8.64	31.00	21.80	11.50	19.50	8.00
Bottom	10.87	-6.39	31.00		13.75	17.25	7.00

Line Segment 2

Approaching Section : **BG4**

y'_4 = -1.83 feet = -22.00 inches
Z'_4 = -1.88 feet = -22.60 inches
$d_4 = H_{bg}$ = 4.50 feet (Box Girder Height) = 54.00 inches

	Slab Distance to Segment CL		Slab Distance to Trackway CL				
Box Girder Slab	Left Edge (feet)	Right Edge (feet)	Left Edge (feet)	Center of Gravity (feet)	Right Edge (feet)	Length (feet)	Thickness (inches)
Top	10.64	28.34	9.50	18.30	27.21	17.71	8.00
Bottom	7.64	19.84	12.50		24.71	12.21	7.00

Departing Section : **BG2**

y'_5 = 1.67 feet = 20.00 inches
Z'_5 = -2.52 feet = -30.21 inches
$d_5 = H_{bg}$ = 5.50 feet (Box Girder Height) = 66.00 inches

	Slab Distance to Segment CL		Slab Distance to Trackway CL				
Box Girder Slab	Left Edge (feet)	Right Edge (feet)	Left Edge (feet)	Center of Gravity (feet)	Right Edge (feet)	Length (feet)	Thickness (inches)
Top	8.17	27.67	11.97	21.80	31.48	19.51	8.00
Bottom	5.33	22.59	14.81		32.06	17.26	7.00

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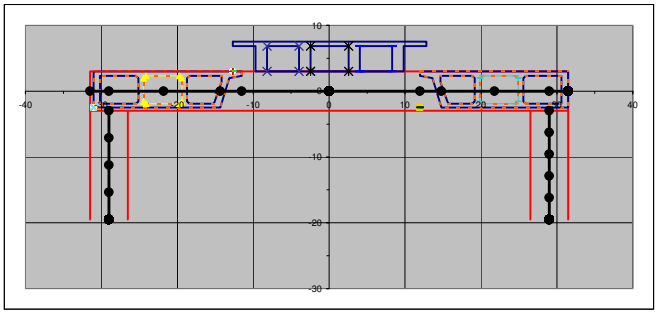
BENT INPUT DATA
SAP2000 BRIDGE ANALYSIS INPUT FILE DATA
FORT BRAGG HSR DOWNTOWN STATION

2. Bent Input Data - Bent 2

Label : **Bent 2**



a) Alignment Data

L_1 = 20.14 feet (Centerline distance between Trackway Alignment and Segment 1)

L_2 = 20.14 feet (Centerline distance between Trackway Alignment and Segment 2)

	Trackway Alignment	Line Segment 1 Top of Deck	Line Segment 1 Deck C.G.	Line Segment 2 Top of Deck	Line Segment 2 Deck C.G.
Station (feet)	52,670	52,670	52,670	52,670	52,670
X (feet)	85.00	85.00	85.00	85.00	85.00
Y (feet)	0.00	20.14	21.80	-20.14	-21.80
Z (feet)	61.78	61.78	59.26	61.78	59.26

Heading = 0.00 Degrees

Skew Angle = 0.00 Degrees

b) Pier Node Assignment and Section Properties

Concrete : ρ_c = 0.145 kip/ft^3 => NWC (Normal vs Light Weight Concrete, ACI 2.2; threshold is 0.115 kcf)

f'_c = 4.00 Ksi => E = 4,743 Ksi

Pier Definition							Section Dimensions						Section Properties					
Pier Number	L_C (feet)	Height h_C (feet)	Number of Nodes	Nodal Spacing (feet)	Shape	Material	b_w (inches)	d (inches)	a (inches)	b (inches)	t_w (inches)	t_f (inches)	Area (ft^2)	J (ft^4)	I_{33} (ft^4)	I_{22} (ft^4)	A_{22} (ft^2)	A_{33} (ft^2)
1	29.00	16.50	5	4.13	R	C	60.00	60.00					25.00	104.17	52.08	52.08	20.83	20.83
2	-29.00	16.50	6	3.30	R	C	60.00	60.00					25.00	104.17	52.08	52.08	20.83	20.83
3																		
4																		
5																		

Note : Maximum number of pier nodes is 40.

c) Bentcap Nodes and Section Properties

b_w = 7.00 feet => n = 6 (Bentcap Flange extent Factor for Top Slabs)

d = 6.00 feet

L_e = 0.00 feet (Bentcap Extension beyond Edge of Columns => L_{BC} = 63.00 feet (Length of Bentcap)

	Bent 2 Nodes																			
Node No.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Y (feet)	-31.50	-29.00	-21.80	-14.33	-11.50	0.00	11.97	14.81	21.80	29.00	31.48	31.50								
Z (feet)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00								
b_w (feet)	7.00	7.00	7.00	7.00	7.00	7.00	7.00	7.00	7.00	7.00	7.00	7.00								
d (feet)	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00								
Approaching Section t_{Top} (feet)		0.67	0.67	0.67	0.67		0.67	0.67	0.67	0.67	0.67									
Approaching Section d_1 (feet)		5.50	5.50	5.50				5.50	5.50	5.50	5.50	5.50								
Approaching Section t_{Bott} (feet)		0.58	0.58	0.58				0.58	0.58	0.58	0.58	0.58								
Departing Section t_{Top} (feet)		0.67	0.67	0.67	0.67		0.67	0.67	0.67	0.67	0.67									
Departing Section d_1 (feet)		5.50	5.50	5.50				5.50	5.50	5.50	5.50	5.50								
Departing Section t_{Bott} (feet)		0.58	0.58	0.58				0.58	0.58	0.58	0.58	0.58								
Bentcap Section Properties y_i (feet)	3.00	3.10	3.10	3.10	3.30	3.00	3.30	3.10	3.10	3.10	3.10	2.80								
Bentcap Section Properties Area (ft^2)	42.00	51.42	51.42	51.42	47.33	42.00	47.33	51.42	51.42	51.42	51.42	46.08								
Bentcap Section Properties A_2 (ft^2)	35.00	35.00	35.00	35.00	35.00	35.00	35.00	35.00	35.00	35.00	35.00	35.00								
Bentcap Section Properties A_3 (ft^2)	35.00	44.42	44.42	44.42	40.33	35.00	40.33	44.42	44.42	44.42	44.42	39.08								
Bentcap Section Properties J (ft^4)	297.50	653.67	653.67	653.67	499.79	297.50	499.79	653.67	653.67	653.67	653.67	444.35								
Bentcap Section Properties I_{33} (ft^4)	126.00	197.01	197.01	197.01	159.85	126.00	159.85	197.01	197.01	197.01	197.01	156.13								
Bentcap Section Properties I_{22} (ft^4)	171.50	456.66	456.66	456.66	339.94	171.50	339.94	456.66	456.66	456.66	456.66	288.22								

d) Superstructure Data

Line Segment 1

Approaching Section : **BG3**

y'_1 = 1.67 feet = 20.00 inches

Z'_1 = -2.52 feet = -30.21 inches

$d_1 = H_{bg}$ = 5.50 feet (Box Girder Height) = 66.00 inches

	Slab Distance to		Slab Distance to Trackway CL				
Box Girder Slab	Left Edge (feet)	Right Edge (feet)	Left Edge (feet)	Center of Gravity (feet)	Right Edge (feet)	Length (feet)	Thickness (inches)
Top	10.87	-8.64	31.00	21.80	11.50	19.50	8.00
Bottom	10.87	-6.39	31.00		13.75	17.25	7.00

Departing Section : **BG3**

y'_2 = 1.67 feet = 20.00 inches

Z'_2 = -2.52 feet = -30.21 inches

$d_2 = H_{bg}$ = 5.50 feet (Box Girder Height) = 66.00 inches

	Slab Distance to		Slab Distance to Trackway CL				
Box Girder Slab	Left Edge (feet)	Right Edge (feet)	Left Edge (feet)	Center of Gravity (feet)	Right Edge (feet)	Length (feet)	Thickness (inches)
Top	10.87	-8.64	31.00	21.80	11.50	19.50	8.00
Bottom	10.87	-6.39	31.00		13.75	17.25	7.00

Line Segment 2

Approaching Section : **BG2**

y'_4 = 1.67 feet = 20.00 inches

Z'_4 = -2.52 feet = -30.21 inches

$d_4 = H_{bg}$ = 5.50 feet (Box Girder Height) = 66.00 inches

	Slab Distance to		Slab Distance to Trackway CL				
Box Girder Slab	Left Edge (feet)	Right Edge (feet)	Left Edge (feet)	Center of Gravity (feet)	Right Edge (feet)	Length (feet)	Thickness (inches)
Top	8.17	27.67	11.97	21.80	31.48	19.51	8.00
Bottom	5.33	22.59	14.81		32.06	17.26	7.00

Departing Section : **BG2**

y'_5 = 1.67 feet = 20.00 inches

Z'_5 = -2.52 feet = -30.21 inches

$d_5 = H_{bg}$ = 5.50 feet (Box Girder Height) = 66.00 inches

	Slab Distance to		Slab Distance to Trackway CL				
Box Girder Slab	Left Edge (feet)	Right Edge (feet)	Left Edge (feet)	Center of Gravity (feet)	Right Edge (feet)	Length (feet)	Thickness (inches)
Top	8.17	27.67	11.97	21.80	31.48	19.51	8.00
Bottom	5.33	22.59	14.81		32.06	17.26	7.00

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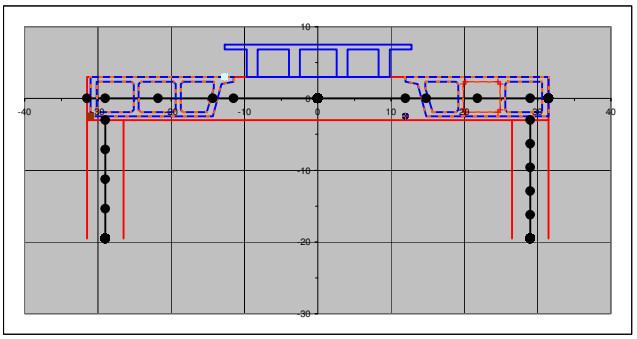
BENT INPUT DATA
SAP2000 BRIDGE ANALYSIS INPUT FILE DATA
FORT BRAGG HSR DOWNTOWN STATION

2. Bent Input Data - Bent 3

Label : **Bent 3**



a) Alignment Data

L_1 = 20.14 feet (Centerline distance between Trackway Alignment and Segment 1)
L_2 = 20.14 feet (Centerline distance between Trackway Alignment and Segment 2)

		Line Segment 1		Line Segment 2	
	Trackway Alignment	Top of Deck	Deck C.G.	Top of Deck	Deck C.G.
Station (feet)	52,740	52,740	52,740	52,740	52,740
X (feet)	155.00	155.00	155.00	155.00	155.00
Y (feet)	0.00	20.14	21.80	-20.14	-21.80
Z (feet)	61.78	61.78	59.26	61.78	59.26

Heading = 0.00 Degrees
Skew Angle = 0.00 Degrees

b) Pier Node Assignment and Section Properties

Concrete : ρ_c = 0.145 kip/ft^3 => NWC (Normal vs Light Weight Concrete, ACI 2.2; threshold is 0.115 kcf)
f'_c = 4.00 Ksi => E = 4,743 Ksi

	Pier Definition						Section Dimensions					
Pier Number	L_C (feet)	Height h_C (feet)	Number of Nodes	Nodal Spacing (feet)	Shape	Material	b_w (inches)	d (inches)	a (inches)	b (inches)	t_w (inches)	t_f (inches)
1	29.00	16.50	5	4.13	R	C	60.00	60.00				
2	-29.00	16.50	6	3.30	R	C	60.00	60.00				
3												
4												
5												

Section Properties					
Area (ft^2)	J (ft^4)	I_{33} (ft^4)	I_{22} (ft^4)	A_{22} (ft^2)	A_{33} (ft^2)
25.00	104.17	52.08	52.08	20.83	20.83
25.00	104.17	52.08	52.08	20.83	20.83

Note : Maximum number of pier nodes is 40.

c) Bentcap Nodes and Section Properties

b_w = 7.00 feet => n = 6 (Bentcap Flange extent Factor for Top Slabs)
d = 6.00 feet
L_e = 0.00 feet (Bentcap Extension beyond Edge of Columns => L_{BC} = 63.00 feet (Length of Bentcap)

	Bent 3 Nodes																			
Node No.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Y (feet)	-31.50	-29.00	-21.80	-14.33	-11.50	0.00	11.97	14.81	21.80	29.00	31.48	31.50								
Z (feet)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00								
b_w (feet)	7.00	7.00	7.00	7.00	7.00	7.00	7.00	7.00	7.00	7.00	7.00	7.00								
d (feet)	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00								
Approaching Section t_{Top} (feet)		0.67	0.67	0.67	0.67		0.67	0.67	0.67	0.67	0.67									
Approaching Section d_1 (feet)		5.50	5.50	5.50				5.50	5.50	5.50	5.50	5.50								
Approaching Section t_{Bott} (feet)		0.58	0.58	0.58				0.58	0.58	0.58	0.58	0.58								
Departing Section t_{Top} (feet)		0.67	0.67	0.67	0.67		0.67	0.67	0.67	0.67	0.67									
Departing Section d_1 (feet)		5.50	5.50	5.50				5.50	5.50	5.50	5.50	5.50								
Departing Section t_{Bott} (feet)		0.58	0.58	0.58				0.58	0.58	0.58	0.58	0.58								
Bentcap Section Properties y_i (feet)	3.00	3.10	3.10	3.10	3.30	3.00	3.30	3.10	3.10	3.10	3.10	2.80								
Bentcap Section Properties Area (ft^2)	42.00	51.42	51.42	51.42	47.33	42.00	47.33	51.42	51.42	51.42	51.42	46.08								
Bentcap Section Properties A_2 (ft^2)	35.00	35.00	35.00	35.00	35.00	35.00	35.00	35.00	35.00	35.00	35.00	35.00								
Bentcap Section Properties A_3 (ft^2)	35.00	44.42	44.42	44.42	40.33	35.00	40.33	44.42	44.42	44.42	44.42	39.08								
Bentcap Section Properties J (ft^4)	297.50	653.67	653.67	653.67	499.79	297.50	499.79	653.67	653.67	653.67	653.67	444.35								
Bentcap Section Properties I_{33} (ft^4)	126.00	197.01	197.01	197.01	159.85	126.00	159.85	197.01	197.01	197.01	197.01	156.13								
Bentcap Section Properties I_{22} (ft^4)	171.50	456.66	456.66	456.66	339.94	171.50	339.94	456.66	456.66	456.66	456.66	288.22								

d) Superstructure Data

Line Segment 1

Approaching Section : **BG3**
y'_1 = 1.67 feet = 20.00 inches
Z'_1 = -2.52 feet = -30.21 inches
$d_1 = H_{bg}$ = 5.50 feet (Box Girder Height) = 66.00 inches

	Slab Distance to		Slab Distance to Trackway CL				
Box Girder Slab	Left Edge (feet)	Right Edge (feet)	Left Edge (feet)	Center of Gravity (feet)	Right Edge (feet)	Length (feet)	Thickness (inches)
Top	10.87	-8.64	31.00	21.80	11.50	19.50	8.00
Bottom	10.87	-6.39	31.00		13.75	17.25	7.00

Departing Section : **BG3**
y'_2 = 1.67 feet = 20.00 inches
Z'_2 = -2.52 feet = -30.21 inches
$d_2 = H_{bg}$ = 5.50 feet (Box Girder Height) = 66.00 inches

	Slab Distance to		Slab Distance to Trackway CL				
Box Girder Slab	Left Edge (feet)	Right Edge (feet)	Left Edge (feet)	Center of Gravity (feet)	Right Edge (feet)	Length (feet)	Thickness (inches)
Top	10.87	-8.64	31.00	21.80	11.50	19.50	8.00
Bottom	10.87	-6.39	31.00		13.75	17.25	7.00

Line Segment 2

Approaching Section : **BG2**
y'_4 = 1.67 feet = 20.00 inches
Z'_4 = -2.52 feet = -30.21 inches
$d_4 = H_{bg}$ = 5.50 feet (Box Girder Height) = 66.00 inches

	Slab Distance to		Slab Distance to Trackway CL				
Box Girder Slab	Left Edge (feet)	Right Edge (feet)	Left Edge (feet)	Center of Gravity (feet)	Right Edge (feet)	Length (feet)	Thickness (inches)
Top	8.17	27.67	11.97	21.80	31.48	19.51	8.00
Bottom	5.33	22.59	14.81		32.06	17.26	7.00

Departing Section : **BG2**
y'_5 = 1.67 feet = 20.00 inches
Z'_5 = -2.52 feet = -30.21 inches
$d_5 = H_{bg}$ = 5.50 feet (Box Girder Height) = 66.00 inches

	Slab Distance to		Slab Distance to Trackway CL				
Box Girder Slab	Left Edge (feet)	Right Edge (feet)	Left Edge (feet)	Center of Gravity (feet)	Right Edge (feet)	Length (feet)	Thickness (inches)
Top	8.17	27.67	11.97	21.80	31.48	19.51	8.00
Bottom	5.33	22.59	14.81		32.06	17.26	7.00

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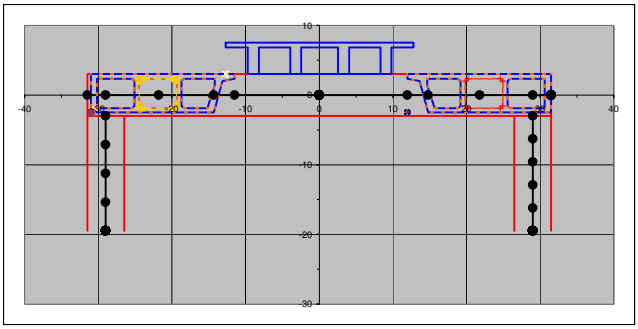
BENT INPUT DATA
SAP2000 BRIDGE ANALYSIS INPUT FILE DATA
FORT BRAGG HSR DOWNTOWN STATION

2. Bent Input Data - Bent 4

Label : **Bent 4**



a) Alignment Data

L_1 = 20.14 feet (Centerline distance between Trackway Alignment and Segment 1)

L_2 = 20.14 feet (Centerline distance between Trackway Alignment and Segment 2)

		Line Segment 1		Line Segment 2	
	Trackway Alignment	Top of Deck	Deck C.G.	Top of Deck	Deck C.G.
Station (feet)	52,810	52,810	52,810	52,810	52,810
X (feet)	225.00	225.00	225.00	225.00	225.00
Y (feet)	0.00	20.14	21.80	-20.14	-21.80
Z (feet)	61.78	61.78	59.26	61.78	59.26

Heading = 0.00 Degrees

Skew Angle = 0.00 Degrees

b) Pier Node Assignment and Section Properties

Concrete : ρ_c = 0.145 kip/ft^3 => NWC (Normal vs Light Weight Concrete, ACI 2.2; threshold is 0.115 kcf)

f'_c = 4.00 Ksi => E = 4,743 Ksi

	Pier Definition						Section Dimensions					
Pier Number	L_C (feet)	Height h_C (feet)	Number of Nodes	Nodal Spacing (feet)	Shape	Material	b_w (inches)	d (inches)	a (inches)	b (inches)	t_w (inches)	t_f (inches)
1	29.00	16.50	5	4.13	R	C	60.00	60.00				
2	-29.00	16.50	6	3.30	R	C	60.00	60.00				
3												
4												
5												

Section Properties					
Area (ft^2)	J (ft^4)	I_{33} (ft^4)	I_{22} (ft^4)	A_{22} (ft^2)	A_{33} (ft^2)
25.00	104.17	52.08	52.08	20.83	20.83
25.00	104.17	52.08	52.08	20.83	20.83

Note : Maximum number of pier nodes is 40.

c) Bentcap Nodes and Section Properties

b_w = 7.00 feet => n = 6 (Bentcap Flange extent Factor for Top Slabs)

d = 6.00 feet

L_e = 0.00 feet (Bentcap Extension beyond Edge of Columns => L_{BC} = 63.00 feet (Length of Bentcap)

		Bent 4 Nodes																			
	Node No.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
	Y (feet)	-31.50	-29.00	-21.80	-14.33	-11.50	0.00	11.97	14.81	21.80	29.00	31.48	31.50								
	Z (feet)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00								
	b_w (feet)	7.00	7.00	7.00	7.00	7.00	7.00	7.00	7.00	7.00	7.00	7.00	7.00								
	d (feet)	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00								
Approaching Section	t_{Top} (feet)		0.67	0.67	0.67	0.67		0.67	0.67	0.67	0.67	0.67									
	d_1 (feet)		5.50	5.50	5.50				5.50	5.50	5.50	5.50	5.50								
	t_{Bott} (feet)		0.58	0.58	0.58				0.58	0.58	0.58	0.58	0.58								
Departing Section	t_{Top} (feet)		0.67	0.67	0.67	0.67		0.67	0.67	0.67	0.67	0.67									
	d_1 (feet)		5.50	5.50	5.50				5.50	5.50	5.50	5.50	5.50								
	t_{Bott} (feet)		0.58	0.58	0.58				0.58	0.58	0.58	0.58	0.58								
Bentcap Section Properties	y_i (feet)	3.00	3.10	3.10	3.10	3.30	3.00	3.30	3.10	3.10	3.10	3.10	2.80								
	Area (ft^2)	42.00	51.42	51.42	51.42	47.33	42.00	47.33	51.42	51.42	51.42	51.42	46.08								
	A_2 (ft^2)	35.00	35.00	35.00	35.00	35.00	35.00	35.00	35.00	35.00	35.00	35.00	35.00								
	A_3 (ft^2)	35.00	44.42	44.42	44.42	40.33	35.00	40.33	44.42	44.42	44.42	44.42	39.08								
	J (ft^4)	297.50	653.67	653.67	653.67	499.79	297.50	499.79	653.67	653.67	653.67	653.67	444.35								
	I_{33} (ft^4)	126.00	197.01	197.01	197.01	159.85	126.00	159.85	197.01	197.01	197.01	197.01	156.13								
	I_{22} (ft^4)	171.50	456.66	456.66	456.66	339.94	171.50	339.94	456.66	456.66	456.66	456.66	288.22								

d) Superstructure Data

Line Segment 1

Approaching Section : **BG3**

y'_1 = 1.67 feet = 20.00 inches

Z'_1 = -2.52 feet = -30.21 inches

$d_1 = H_{bg}$ = 5.50 feet (Box Girder Height) = 66.00 inches

	Slab Distance to		Slab Distance to Trackway CL				
Box Girder Slab	Left Edge (feet)	Right Edge (feet)	Left Edge (feet)	Center of Gravity (feet)	Right Edge (feet)	Length (feet)	Thickness (inches)
Top	10.87	-8.64	31.00	21.80	11.50	19.50	8.00
Bottom	10.87	-6.39	31.00		13.75	17.25	7.00

Departing Section : **BG3**

y'_2 = 1.67 feet = 20.00 inches

Z'_2 = -2.52 feet = -30.21 inches

$d_2 = H_{bg}$ = 5.50 feet (Box Girder Height) = 66.00 inches

	Slab Distance to		Slab Distance to Trackway CL				
Box Girder Slab	Left Edge (feet)	Right Edge (feet)	Left Edge (feet)	Center of Gravity (feet)	Right Edge (feet)	Length (feet)	Thickness (inches)
Top	10.87	-8.64	31.00	21.80	11.50	19.50	8.00
Bottom	10.87	-6.39	31.00		13.75	17.25	7.00

Line Segment 2

Approaching Section : **BG2**

y'_4 = 1.67 feet = 20.00 inches

Z'_4 = -2.52 feet = -30.21 inches

$d_4 = H_{bg}$ = 5.50 feet (Box Girder Height) = 66.00 inches

	Slab Distance to		Slab Distance to Trackway CL				
Box Girder Slab	Left Edge (feet)	Right Edge (feet)	Left Edge (feet)	Center of Gravity (feet)	Right Edge (feet)	Length (feet)	Thickness (inches)
Top	8.17	27.67	11.97	21.80	31.48	19.51	8.00
Bottom	5.33	22.59	14.81		32.06	17.26	7.00

Departing Section : **BG2**

y'_5 = 1.67 feet = 20.00 inches

Z'_5 = -2.52 feet = -30.21 inches

$d_5 = H_{bg}$ = 5.50 feet (Box Girder Height) = 66.00 inches

	Slab Distance to		Slab Distance to Trackway CL				
Box Girder Slab	Left Edge (feet)	Right Edge (feet)	Left Edge (feet)	Center of Gravity (feet)	Right Edge (feet)	Length (feet)	Thickness (inches)
Top	8.17	27.67	11.97	21.80	31.48	19.51	8.00
Bottom	5.33	22.59	14.81		32.06	17.26	7.00

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BENT INPUT DATA
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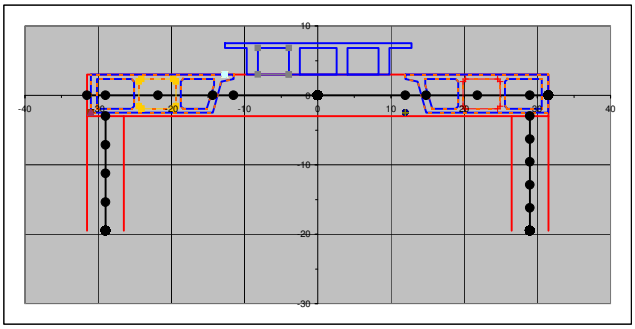
2. Bent Input Data - Bent 5

Label : **Bent 5**



a) Alignment Data

L_1 = 20.14 feet (Centerline distance between Trackway Alignment and Segment 1)

L_2 = 20.14 feet (Centerline distance between Trackway Alignment and Segment 2)

		Line Segment 1		Line Segment 2	
	Trackway Alignment	Top of Deck	Deck C.G.	Top of Deck	Deck C.G.
Station (feet)	52,880	52,880	52,880	52,880	52,880
X (feet)	295.00	295.00	295.00	295.00	295.00
Y (feet)	0.00	20.14	21.80	-20.14	-21.80
Z (feet)	61.78	61.78	59.26	61.78	59.26

Heading = 0.00 Degrees

Skew Angle = 0.00 Degrees

b) Pier Node Assignment and Section Properties

Concrete : ρ_c = 0.145 kip/ft^3 => NWC (Normal vs Light Weight Concrete, ACI 2.2; threshold is 0.115 kcf)

f'_c = 4.00 Ksi => E = 4,743 Ksi

	Pier Definition						Section Dimensions					
Pier Number	L_C (feet)	Height h_C (feet)	Number of Nodes	Nodal Spacing (feet)	Shape	Material	b_w (inches)	d (inches)	a (inches)	b (inches)	t_w (inches)	t_f (inches)
1	29.00	16.50	5	4.13	R	C	60.00	60.00				
2	-29.00	16.50	6	3.30	R	C	60.00	60.00				
3												
4												
5												

Section Properties					
Area (ft^2)	J (ft^4)	I_{33} (ft^4)	I_{22} (ft^4)	A_{22} (ft^2)	A_{33} (ft^2)
25.00	104.17	52.08	52.08	20.83	20.83
25.00	104.17	52.08	52.08	20.83	20.83

Note : Maximum number of pier nodes is 40.

c) Bentcap Nodes and Section Properties

b_w = 7.00 feet => n = 6 (Bentcap Flange extent Factor for Top Slabs)

d = 6.00 feet

L_e = 0.00 feet (Bentcap Extension beyond Edge of Columns => L_{BC} = 63.00 feet (Length of Bentcap)

	Bent 5 Nodes																			
Node No.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Y (feet)	-31.50	-29.00	-21.80	-14.33	-11.50	0.00	11.97	14.81	21.80	29.00	31.48	31.50								
Z (feet)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00								
b_w (feet)	7.00	7.00	7.00	7.00	7.00	7.00	7.00	7.00	7.00	7.00	7.00	7.00								
d (feet)	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00								
Approaching Section t_{Top} (feet)		0.67	0.67	0.67	0.67		0.67	0.67	0.67	0.67	0.67									
Approaching Section d_1 (feet)		5.50	5.50	5.50				5.50	5.50	5.50	5.50	5.50								
Approaching Section t_{Bott} (feet)		0.58	0.58	0.58				0.58	0.58	0.58	0.58	0.58								
Departing Section t_{Top} (feet)		0.67	0.67	0.67	0.67		0.67	0.67	0.67	0.67	0.67									
Departing Section d_1 (feet)		5.50	5.50	5.50				5.50	5.50	5.50	5.50	5.50								
Departing Section t_{Bott} (feet)		0.58	0.58	0.58				0.58	0.58	0.58	0.58	0.58								
Bentcap Section Properties y_i (feet)	3.00	3.10	3.10	3.10	3.30	3.00	3.30	3.10	3.10	3.10	3.10	2.80								
Bentcap Section Properties Area (ft^2)	42.00	51.42	51.42	51.42	47.33	42.00	47.33	51.42	51.42	51.42	51.42	46.08								
Bentcap Section Properties A_2 (ft^2)	35.00	35.00	35.00	35.00	35.00	35.00	35.00	35.00	35.00	35.00	35.00	35.00								
Bentcap Section Properties A_3 (ft^2)	35.00	44.42	44.42	44.42	40.33	35.00	40.33	44.42	44.42	44.42	44.42	39.08								
Bentcap Section Properties J (ft^4)	297.50	653.67	653.67	653.67	499.79	297.50	499.79	653.67	653.67	653.67	653.67	444.35								
Bentcap Section Properties I_{33} (ft^4)	126.00	197.01	197.01	197.01	159.85	126.00	159.85	197.01	197.01	197.01	197.01	156.13								
Bentcap Section Properties I_{22} (ft^4)	171.50	456.66	456.66	456.66	339.94	171.50	339.94	456.66	456.66	456.66	456.66	288.22								

d) Superstructure Data

Line Segment 1

Approaching Section : **BG3**

y'_1 = 1.67 feet = 20.00 inches

Z'_1 = -2.52 feet = -30.21 inches

$d_1 = H_{bg}$ = 5.50 feet (Box Girder Height) = 66.00 inches

	Slab Distance to		Slab Distance to Trackway CL				
Box Girder Slab	Left Edge (feet)	Right Edge (feet)	Left Edge (feet)	Center of Gravity (feet)	Right Edge (feet)	Length (feet)	Thickness (inches)
Top	10.87	-8.64	31.00	21.80	11.50	19.50	8.00
Bottom	10.87	-6.39	31.00		13.75	17.25	7.00

Departing Section : **BG3**

y'_2 = 1.67 feet = 20.00 inches

Z'_2 = -2.52 feet = -30.21 inches

$d_2 = H_{bg}$ = 5.50 feet (Box Girder Height) = 66.00 inches

	Slab Distance to		Slab Distance to Trackway CL				
Box Girder Slab	Left Edge (feet)	Right Edge (feet)	Left Edge (feet)	Center of Gravity (feet)	Right Edge (feet)	Length (feet)	Thickness (inches)
Top	10.87	-8.64	31.00	21.80	11.50	19.50	8.00
Bottom	10.87	-6.39	31.00		13.75	17.25	7.00

Line Segment 2

Approaching Section : **BG2**

y'_4 = 1.67 feet = 20.00 inches

Z'_4 = -2.52 feet = -30.21 inches

$d_4 = H_{bg}$ = 5.50 feet (Box Girder Height) = 66.00 inches

	Slab Distance to		Slab Distance to Trackway CL				
Box Girder Slab	Left Edge (feet)	Right Edge (feet)	Left Edge (feet)	Center of Gravity (feet)	Right Edge (feet)	Length (feet)	Thickness (inches)
Top	8.17	27.67	11.97	21.80	31.48	19.51	8.00
Bottom	5.33	22.59	14.81		32.06	17.26	7.00

Departing Section : **BG2**

y'_5 = 1.67 feet = 20.00 inches

Z'_5 = -2.52 feet = -30.21 inches

$d_5 = H_{bg}$ = 5.50 feet (Box Girder Height) = 66.00 inches

	Slab Distance to		Slab Distance to Trackway CL				
Box Girder Slab	Left Edge (feet)	Right Edge (feet)	Left Edge (feet)	Center of Gravity (feet)	Right Edge (feet)	Length (feet)	Thickness (inches)
Top	8.17	27.67	11.97	21.80	31.48	19.51	8.00
Bottom	5.33	22.59	14.81		32.06	17.26	7.00

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BENT INPUT DATA
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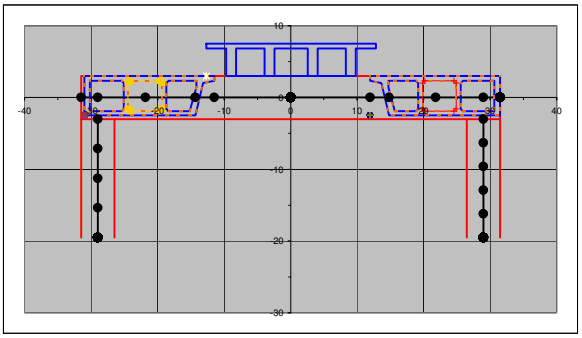
2. Bent Input Data - Bent 6

Label : **Bent 6**



a) Alignment Data

L_1 = 20.14 feet (Centerline distance between Trackway Alignment and Segment 1)

L_2 = 20.14 feet (Centerline distance between Trackway Alignment and Segment 2)

		Line Segment 1		Line Segment 2	
	Trackway Alignment	Top of Deck	Deck C.G.	Top of Deck	Deck C.G.
Station (feet)	52,950	52,950	52,950	52,950	52,950
X (feet)	365.00	365.00	365.00	365.00	365.00
Y (feet)	0.00	20.14	21.80	-20.14	-21.80
Z (feet)	61.78	61.78	59.26	61.78	59.26

Heading = 0.00 Degrees

Skew Angle = 0.00 Degrees

b) Pier Node Assignment and Section Properties

Concrete : ρ_c = 0.145 kip/ft^3 => NWC (Normal vs Light Weight Concrete, ACI 2.2; threshold is 0.115 kcf)

f'_c = 4.00 Ksi => E = 4,743 Ksi

	Pier Definition						Section Dimensions					
Pier Number	L_C (feet)	Height h_C (feet)	Number of Nodes	Nodal Spacing (feet)	Shape	Material	b_w (inches)	d (inches)	a (inches)	b (inches)	t_w (inches)	t_f (inches)
1	29.00	16.50	5	4.13	R	C	60.00	60.00				
2	-29.00	16.50	6	3.30	R	C	60.00	60.00				
3												
4												
5												

Section Properties					
Area (ft^2)	J (ft^4)	I_{33} (ft^4)	I_{22} (ft^4)	A_{22} (ft^2)	A_{33} (ft^2)
25.00	104.17	52.08	52.08	20.83	20.83
25.00	104.17	52.08	52.08	20.83	20.83

Note : Maximum number of pier nodes is 40.

c) Bentcap Nodes and Section Properties

b_w = 7.00 feet => n = 6 (Bentcap Flange extent Factor for Top Slabs)

d = 6.00 feet

L_e = 0.00 feet (Bentcap Extension beyond Edge of Columns => L_{BC} = 63.00 feet (Length of Bentcap)

	Bent 6 Nodes																			
Node No.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Y (feet)	-31.50	-29.00	-21.80	-14.33	-11.50	0.00	11.97	14.81	21.80	29.00	31.48	31.50								
Z (feet)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00								
b_w (feet)	7.00	7.00	7.00	7.00	7.00	7.00	7.00	7.00	7.00	7.00	7.00	7.00								
d (feet)	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00								
Approaching Section t_{Top} (feet)		0.67	0.67	0.67	0.67		0.67	0.67	0.67	0.67	0.67									
Approaching Section d_1 (feet)		5.50	5.50	5.50				5.50	5.50	5.50	5.50	5.50								
Approaching Section t_{Bott} (feet)		0.58	0.58	0.58				0.58	0.58	0.58	0.58	0.58								
Departing Section t_{Top} (feet)		0.67	0.67	0.67	0.67		0.67	0.67	0.67	0.67	0.67									
Departing Section d_1 (feet)		5.50	5.50	5.50				5.50	5.50	5.50	5.50	5.50								
Departing Section t_{Bott} (feet)		0.58	0.58	0.58				0.58	0.58	0.58	0.58	0.58								
Bentcap Section Properties y_i (feet)	3.00	3.10	3.10	3.10	3.30	3.00	3.30	3.10	3.10	3.10	3.10	2.80								
Bentcap Section Properties Area (ft^2)	42.00	51.42	51.42	51.42	47.33	42.00	47.33	51.42	51.42	51.42	51.42	46.08								
Bentcap Section Properties A_2 (ft^2)	35.00	35.00	35.00	35.00	35.00	35.00	35.00	35.00	35.00	35.00	35.00	35.00								
Bentcap Section Properties A_3 (ft^2)	35.00	44.42	44.42	44.42	40.33	35.00	40.33	44.42	44.42	44.42	44.42	39.08								
Bentcap Section Properties J (ft^4)	297.50	653.67	653.67	653.67	499.79	297.50	499.79	653.67	653.67	653.67	653.67	444.35								
Bentcap Section Properties I_{33} (ft^4)	126.00	197.01	197.01	197.01	159.85	126.00	159.85	197.01	197.01	197.01	197.01	156.13								
Bentcap Section Properties I_{22} (ft^4)	171.50	456.66	456.66	456.66	339.94	171.50	339.94	456.66	456.66	456.66	456.66	288.22								

d) Superstructure Data

Line Segment 1

Approaching Section : **BG3**

y'_1 = 1.67 feet = 20.00 inches

Z'_1 = -2.52 feet = -30.21 inches

$d_1 = H_{bg}$ = 5.50 feet (Box Girder Height) = 66.00 inches

	Slab Distance to		Slab Distance to Trackway CL				
Box Girder Slab	Left Edge (feet)	Right Edge (feet)	Left Edge (feet)	Center of Gravity (feet)	Right Edge (feet)	Length (feet)	Thickness (inches)
Top	10.87	-8.64	31.00	21.80	11.50	19.50	8.00
Bottom	10.87	-6.39	31.00		13.75	17.25	7.00

Departing Section : **BG3**

y'_2 = 1.67 feet = 20.00 inches

Z'_2 = -2.52 feet = -30.21 inches

$d_2 = H_{bg}$ = 5.50 feet (Box Girder Height) = 66.00 inches

	Slab Distance to		Slab Distance to Trackway CL				
Box Girder Slab	Left Edge (feet)	Right Edge (feet)	Left Edge (feet)	Center of Gravity (feet)	Right Edge (feet)	Length (feet)	Thickness (inches)
Top	10.87	-8.64	31.00	21.80	11.50	19.50	8.00
Bottom	10.87	-6.39	31.00		13.75	17.25	7.00

Line Segment 2

Approaching Section : **BG2**

y'_4 = 1.67 feet = 20.00 inches

Z'_4 = -2.52 feet = -30.21 inches

$d_4 = H_{bg}$ = 5.50 feet (Box Girder Height) = 66.00 inches

	Slab Distance to		Slab Distance to Trackway CL				
Box Girder Slab	Left Edge (feet)	Right Edge (feet)	Left Edge (feet)	Center of Gravity (feet)	Right Edge (feet)	Length (feet)	Thickness (inches)
Top	8.17	27.67	11.97	21.80	31.48	19.51	8.00
Bottom	5.33	22.59	14.81		32.06	17.26	7.00

Departing Section : **BG2**

y'_5 = 1.67 feet = 20.00 inches

Z'_5 = -2.52 feet = -30.21 inches

$d_5 = H_{bg}$ = 5.50 feet (Box Girder Height) = 66.00 inches

	Slab Distance to		Slab Distance to Trackway CL				
Box Girder Slab	Left Edge (feet)	Right Edge (feet)	Left Edge (feet)	Center of Gravity (feet)	Right Edge (feet)	Length (feet)	Thickness (inches)
Top	8.17	27.67	11.97	21.80	31.48	19.51	8.00
Bottom	5.33	22.59	14.81		32.06	17.26	7.00

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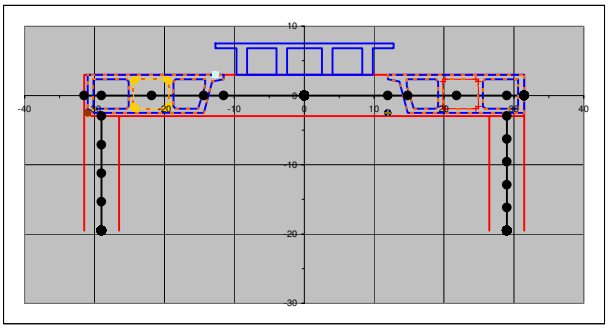
BENT INPUT DATA
SAP2000 BRIDGE ANALYSIS INPUT FILE DATA
FORT BRAGG HSR DOWNTOWN STATION

2. Bent Input Data - Bent 7

Label : **Bent 7**



a) Alignment Data

L_1 = 20.14 feet (Centerline distance between Trackway Alignment and Segment 1)
L_2 = 20.14 feet (Centerline distance between Trackway Alignment and Segment 2)

	Trackway Alignment	Line Segment 1 Top of Deck	Line Segment 1 Deck C.G.	Line Segment 2 Top of Deck	Line Segment 2 Deck C.G.
Station (feet)	53,020	53,020	53,020	53,020	53,020
X (feet)	435.00	435.00	435.00	435.00	435.00
Y (feet)	0.00	20.14	21.80	-20.14	-21.80
Z (feet)	61.78	61.78	59.26	61.78	59.26

Heading = 0.00 Degrees
Skew Angle = 0.00 Degrees

b) Pier Node Assignment and Section Properties

Concrete : ρ_c = 0.145 kip/ft^3 => NWC (Normal vs Light Weight Concrete, ACI 2.2; threshold is 0.115 kcf)
f'_c = 4.00 Ksi => E = 4,743 Ksi

Pier Number	Pier Definition: L_C (feet)	Height h_C (feet)	Number of Nodes	Nodal Spacing (feet)	Shape	Material	Section Dimensions: b_w (inches)	d (inches)	a (inches)	b (inches)	t_w (inches)	t_f (inches)
1	29.00	16.50	5	4.13	**R**	C	60.00	60.00				
2	-29.00	16.50	6	3.30	**R**	C	60.00	60.00				
3												
4												
5												

Section Properties: Area (ft^2)	J (ft^4)	I_{33} (ft^4)	I_{22} (ft^4)	A_{22} (ft^2)	A_{33} (ft^2)
25.00	104.17	52.08	52.08	20.83	20.83
25.00	104.17	52.08	52.08	20.83	20.83

Note : Maximum number of pier nodes is 40.

c) Bentcap Nodes and Section Properties

b_w = 7.00 feet => n = 6 (Bentcap Flange extent Factor for Top Slabs)
d = 6.00 feet
L_e = 0.00 feet (Bentcap Extension beyond Edge of Columns => L_{BC} = 63.00 feet (Length of Bentcap)

	Bent 7 Nodes: Node No.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
	Y (feet)	-31.50	-29.00	-21.80	-14.33	-11.50	0.00	11.97	14.81	21.80	29.00	31.48	31.50								
	Z (feet)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00								
	b_w (feet)	7.00	7.00	7.00	7.00	7.00	7.00	7.00	7.00	7.00	7.00	7.00	7.00								
	d (feet)	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00								
Approaching Section	t_{Top} (feet)		0.67	0.67	0.67	0.67		0.67	0.67	0.67	0.67	0.67									
Approaching Section	d_1 (feet)		5.50	5.50	5.50				5.50	5.50	5.50	5.50	5.50								
Approaching Section	t_{Bott} (feet)		0.58	0.58	0.58				0.58	0.58	0.58	0.58	0.58								
Departing Section	t_{Top} (feet)		0.67	0.67	0.67	0.67		0.67	0.67	0.67	0.67	0.67									
Departing Section	d_1 (feet)		5.50	5.50	5.50				5.50	5.50	5.50	5.50	5.50								
Departing Section	t_{Bott} (feet)		0.58	0.58	0.58				0.58	0.58	0.58	0.58	0.58								
Bentcap Section Properties	y_i (feet)	3.00	3.10	3.10	3.10	3.30	3.00	3.30	3.10	3.10	3.10	3.10	2.80								
Bentcap Section Properties	Area (ft^2)	42.00	51.42	51.42	51.42	47.33	42.00	47.33	51.42	51.42	51.42	51.42	46.08								
Bentcap Section Properties	A_2 (ft^2)	35.00	35.00	35.00	35.00	35.00	35.00	35.00	35.00	35.00	35.00	35.00	35.00								
Bentcap Section Properties	A_3 (ft^2)	35.00	44.42	44.42	44.42	40.33	35.00	40.33	44.42	44.42	44.42	44.42	39.08								
Bentcap Section Properties	J (ft^4)	297.50	653.67	653.67	653.67	499.79	297.50	499.79	653.67	653.67	653.67	653.67	444.35								
Bentcap Section Properties	I_{33} (ft^4)	126.00	197.01	197.01	197.01	159.85	126.00	159.85	197.01	197.01	197.01	197.01	156.13								
Bentcap Section Properties	I_{22} (ft^4)	171.50	456.66	456.66	456.66	339.94	171.50	339.94	456.66	456.66	456.66	456.66	288.22								

d) Superstructure Data

Line Segment 1

Approaching Section : **BG3**
y'_1 = 1.67 feet = 20.00 inches
Z'_1 = -2.52 feet = -30.21 inches
$d_1 = H_{bg}$ = 5.50 feet (Box Girder Height) = 66.00 inches

Box Girder Slab	Slab Distance to Left Edge (feet)	Slab Distance to Right Edge (feet)	Slab Distance to Trackway CL: Left Edge (feet)	Center of Gravity (feet)	Right Edge (feet)	Length (feet)	Thickness (inches)
Top	10.87	-8.64	31.00	21.80	11.50	19.50	8.00
Bottom	10.87	-6.39	31.00		13.75	17.25	7.00

Departing Section : **BG3**
y'_2 = 1.67 feet = 20.00 inches
Z'_2 = -2.52 feet = -30.21 inches
$d_2 = H_{bg}$ = 5.50 feet (Box Girder Height) = 66.00 inches

Box Girder Slab	Slab Distance to Left Edge (feet)	Slab Distance to Right Edge (feet)	Slab Distance to Trackway CL: Left Edge (feet)	Center of Gravity (feet)	Right Edge (feet)	Length (feet)	Thickness (inches)
Top	10.87	-8.64	31.00	21.80	11.50	19.50	8.00
Bottom	10.87	-6.39	31.00		13.75	17.25	7.00

Line Segment 2

Approaching Section : **BG2**
y'_4 = 1.67 feet = 20.00 inches
Z'_4 = -2.52 feet = -30.21 inches
$d_4 = H_{bg}$ = 5.50 feet (Box Girder Height) = 66.00 inches

Box Girder Slab	Slab Distance to Left Edge (feet)	Slab Distance to Right Edge (feet)	Slab Distance to Trackway CL: Left Edge (feet)	Center of Gravity (feet)	Right Edge (feet)	Length (feet)	Thickness (inches)
Top	8.17	27.67	11.97	21.80	31.48	19.51	8.00
Bottom	5.33	22.59	14.81		32.06	17.26	7.00

Departing Section : **BG2**
y'_5 = 1.67 feet = 20.00 inches
Z'_5 = -2.52 feet = -30.21 inches
$d_5 = H_{bg}$ = 5.50 feet (Box Girder Height) = 66.00 inches

Box Girder Slab	Slab Distance to Left Edge (feet)	Slab Distance to Right Edge (feet)	Slab Distance to Trackway CL: Left Edge (feet)	Center of Gravity (feet)	Right Edge (feet)	Length (feet)	Thickness (inches)
Top	8.17	27.67	11.97	21.80	31.48	19.51	8.00
Bottom	5.33	22.59	14.81		32.06	17.26	7.00

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BENT INPUT DATA
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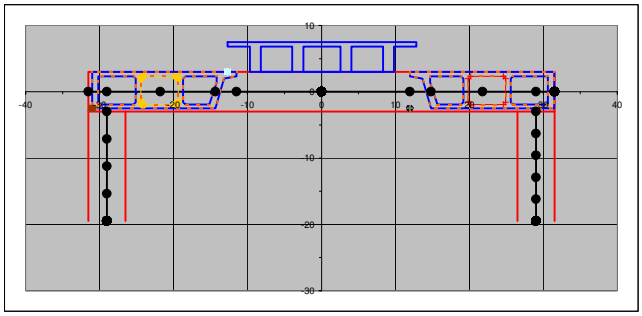
2. Bent Input Data - Bent 8

Label : **Bent 8**



a) Alignment Data

L_1 = 20.14 feet (Centerline distance between Trackway Alignment and Segment 1)
L_2 = 20.14 feet (Centerline distance between Trackway Alignment and Segment 2)

		Line Segment 1		Line Segment 2	
	Trackway Alignment	Top of Deck	Deck C.G.	Top of Deck	Deck C.G.
Station (feet)	53,090	53,090	53,090	53,090	53,090
X (feet)	505.00	505.00	505.00	505.00	505.00
Y (feet)	0.00	20.14	21.80	-20.14	-21.80
Z (feet)	61.78	61.78	59.26	61.78	59.26

Heading = 0.00 Degrees
Skew Angle = 0.00 Degrees

b) Pier Node Assignment and Section Properties

Concrete : ρ_c = 0.145 kip/ft^3 => NWC (Normal vs Light Weight Concrete, ACI 2.2; threshold is 0.115 kcf)
f'_c = 4.00 Ksi => E = 4,743 Ksi

	Pier Definition						Section Dimensions					
Pier Number	L_C (feet)	Height h_C (feet)	Number of Nodes	Nodal Spacing (feet)	Shape	Material	b_w (inches)	d (inches)	a (inches)	b (inches)	t_w (inches)	t_f (inches)
1	29.00	16.50	5	4.13	R	C	60.00	60.00				
2	-29.00	16.50	6	3.30	R	C	60.00	60.00				
3												
4												
5												

Section Properties					
Area (ft^2)	J (ft^4)	I_{33} (ft^4)	I_{22} (ft^4)	A_{22} (ft^2)	A_{33} (ft^2)
25.00	104.17	52.08	52.08	20.83	20.83
25.00	104.17	52.08	52.08	20.83	20.83

Note : Maximum number of pier nodes is 40.

c) Bentcap Nodes and Section Properties

b_w = 7.00 feet
d = 6.00 feet
L_e = 0.00 feet (Bentcap Extension beyond Edge of Columns => n = 6 (Bentcap Flange extent Factor for Top Slabs)
=> L_{BC} = 63.00 feet (Length of Bentcap)

	Bent 8 Nodes																			
Node No.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Y (feet)	-31.50	-29.00	-21.80	-14.33	-11.50	0.00	11.97	14.81	21.80	29.00	31.48	31.50								
Z (feet)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00								
b_w (feet)	7.00	7.00	7.00	7.00	7.00	7.00	7.00	7.00	7.00	7.00	7.00	7.00								
d (feet)	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00								
Approaching Section t_{Top} (feet)		0.67	0.67	0.67	0.67		0.67	0.67	0.67	0.67	0.67									
Approaching Section d_1 (feet)		5.50	5.50	5.50				5.50	5.50	5.50	5.50	5.50								
Approaching Section t_{Bott} (feet)		0.58	0.58	0.58				0.58	0.58	0.58	0.58	0.58								
Departing Section t_{Top} (feet)		0.67	0.67	0.67	0.67		0.67	0.67	0.67	0.67	0.67									
Departing Section d_1 (feet)		5.50	5.50	5.50				5.50	5.50	5.50	5.50	5.50								
Departing Section t_{Bott} (feet)		0.58	0.58	0.58				0.58	0.58	0.58	0.58	0.58								
Bentcap Section Properties y_i (feet)	3.00	3.10	3.10	3.10	3.30	3.00	3.30	3.10	3.10	3.10	3.10	2.80								
Bentcap Section Properties Area (ft^2)	42.00	51.42	51.42	51.42	47.33	42.00	47.33	51.42	51.42	51.42	51.42	46.08								
Bentcap Section Properties A_2 (ft^2)	35.00	35.00	35.00	35.00	35.00	35.00	35.00	35.00	35.00	35.00	35.00	35.00								
Bentcap Section Properties A_3 (ft^2)	35.00	44.42	44.42	44.42	40.33	35.00	40.33	44.42	44.42	44.42	44.42	39.08								
Bentcap Section Properties J (ft^4)	297.50	653.67	653.67	653.67	499.79	297.50	499.79	653.67	653.67	653.67	653.67	444.35								
Bentcap Section Properties I_{33} (ft^4)	126.00	197.01	197.01	197.01	159.85	126.00	159.85	197.01	197.01	197.01	197.01	156.13								
Bentcap Section Properties I_{22} (ft^4)	171.50	456.66	456.66	456.66	339.94	171.50	339.94	456.66	456.66	456.66	456.66	288.22								

d) Superstructure Data

Line Segment 1

Approaching Section : **BG3**
y'_1 = 1.67 feet = 20.00 inches
Z'_1 = -2.52 feet = -30.21 inches
$d_1 = H_{bg}$ = 5.50 feet (Box Girder Height) = 66.00 inches

	Slab Distance to		Slab Distance to Trackway CL				
Box Girder Slab	Left Edge (feet)	Right Edge (feet)	Left Edge (feet)	Center of Gravity (feet)	Right Edge (feet)	Length (feet)	Thickness (inches)
Top	10.87	-8.64	31.00	21.80	11.50	19.50	8.00
Bottom	10.87	-6.39	31.00		13.75	17.25	7.00

Departing Section : **BG3**
y'_2 = 1.67 feet = 20.00 inches
Z'_2 = -2.52 feet = -30.21 inches
$d_2 = H_{bg}$ = 5.50 feet (Box Girder Height) = 66.00 inches

	Slab Distance to		Slab Distance to Trackway CL				
Box Girder Slab	Left Edge (feet)	Right Edge (feet)	Left Edge (feet)	Center of Gravity (feet)	Right Edge (feet)	Length (feet)	Thickness (inches)
Top	10.87	-8.64	31.00	21.80	11.50	19.50	8.00
Bottom	10.87	-6.39	31.00		13.75	17.25	7.00

Line Segment 2

Approaching Section : **BG2**
y'_4 = 1.67 feet = 20.00 inches
Z'_4 = -2.52 feet = -30.21 inches
$d_4 = H_{bg}$ = 5.50 feet (Box Girder Height) = 66.00 inches

	Slab Distance to		Slab Distance to Trackway CL				
Box Girder Slab	Left Edge (feet)	Right Edge (feet)	Left Edge (feet)	Center of Gravity (feet)	Right Edge (feet)	Length (feet)	Thickness (inches)
Top	8.17	27.67	11.97	21.80	31.48	19.51	8.00
Bottom	5.33	22.59	14.81		32.06	17.26	7.00

Departing Section : **BG2**
y'_5 = 1.67 feet = 20.00 inches
Z'_5 = -2.52 feet = -30.21 inches
$d_5 = H_{bg}$ = 5.50 feet (Box Girder Height) = 66.00 inches

	Slab Distance to		Slab Distance to Trackway CL				
Box Girder Slab	Left Edge (feet)	Right Edge (feet)	Left Edge (feet)	Center of Gravity (feet)	Right Edge (feet)	Length (feet)	Thickness (inches)
Top	8.17	27.67	11.97	21.80	31.48	19.51	8.00
Bottom	5.33	22.59	14.81		32.06	17.26	7.00

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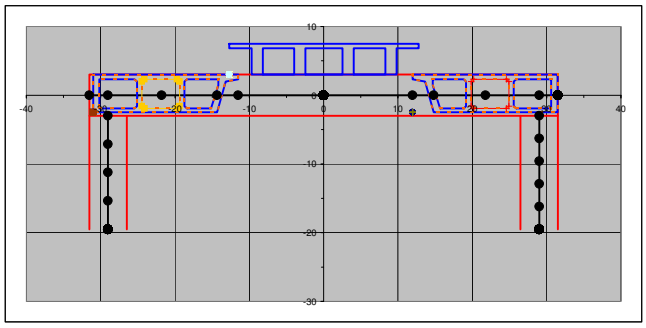
BENT INPUT DATA
SAP2000 BRIDGE ANALYSIS INPUT FILE DATA
FORT BRAGG HSR DOWNTOWN STATION

2. Bent Input Data - Bent 9

Label : **Bent 9**



a) Alignment Data

L_1 = 20.14 feet (Centerline distance between Trackway Alignment and Segment 1)
L_2 = 20.14 feet (Centerline distance between Trackway Alignment and Segment 2)

		Line Segment 1		Line Segment 2	
	Trackway Alignment	Top of Deck	Deck C.G.	Top of Deck	Deck C.G.
Station (feet)	53,160	53,160	53,160	53,160	53,160
X (feet)	575.00	575.00	575.00	575.00	575.00
Y (feet)	0.00	20.14	21.80	-20.14	-21.80
Z (feet)	61.78	61.78	59.26	61.78	59.26

Heading = 0.00 Degrees
Skew Angle = 0.00 Degrees

b) Pier Node Assignment and Section Properties

Concrete : ρ_c = 0.145 kip/ft^3 => NWC (Normal vs Light Weight Concrete, ACI 2.2; threshold is 0.115 kcf)
f'_c = 4.00 Ksi => E = 4,743 Ksi

	Pier Definition						Section Dimensions					
Pier Number	L_C (feet)	Height h_C (feet)	Number of Nodes	Nodal Spacing (feet)	Shape	Material	b_w (inches)	d (inches)	a (inches)	b (inches)	t_w (inches)	t_f (inches)
1	29.00	16.50	5	4.13	**R**	C	60.00	60.00				
2	-29.00	16.50	6	3.30	**R**	C	60.00	60.00				
3												
4												
5												

Section Properties					
Area (ft^2)	J (ft^4)	I_{33} (ft^4)	I_{22} (ft^4)	A_{22} (ft^2)	A_{33} (ft^2)
25.00	104.17	52.08	52.08	20.83	20.83
25.00	104.17	52.08	52.08	20.83	20.83

Note : Maximum number of pier nodes is 40.

c) Bentcap Nodes and Section Properties

b_w = 7.00 feet => n = 6 (Bentcap Flange extent Factor for Top Slabs)
d = 6.00 feet
L_e = 0.00 feet (Bentcap Extension beyond Edge of Columns => L_{BC} = 63.00 feet (Length of Bentcap)

		Bent 9 Nodes																			
	Node No.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
	Y (feet)	-31.50	-29.00	-21.80	-14.33	-11.50	0.00	11.97	14.81	21.80	29.00	31.48	31.50								
	Z (feet)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00								
	b_w (feet)	7.00	7.00	7.00	7.00	7.00	7.00	7.00	7.00	7.00	7.00	7.00	7.00								
	d (feet)	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00								
Approaching Section	t_{Top} (feet)		0.67	0.67	0.67	0.67		0.67	0.67	0.67	0.67	0.67									
	d_1 (feet)		5.50	5.50	5.50				5.50	5.50	5.50	5.50	5.50								
	t_{Bott} (feet)		0.58	0.58	0.58				0.58	0.58	0.58	0.58	0.58								
Departing Section	t_{Top} (feet)		0.67	0.67	0.67	0.67		0.67	0.67	0.67	0.67	0.67									
	d_1 (feet)		5.50	5.50	5.50				5.50	5.50	5.50	5.50	5.50								
	t_{Bott} (feet)		0.58	0.58	0.58				0.58	0.58	0.58	0.58	0.58								
Bentcap Section Properties	y_i (feet)	3.00	3.10	3.10	3.10	3.30	3.00	3.30	3.10	3.10	3.10	3.10	2.80								
	Area (ft^2)	42.00	51.42	51.42	51.42	47.33	42.00	47.33	51.42	51.42	51.42	51.42	46.08								
	A_2 (ft^2)	35.00	35.00	35.00	35.00	35.00	35.00	35.00	35.00	35.00	35.00	35.00	35.00								
	A_3 (ft^2)	35.00	44.42	44.42	44.42	40.33	35.00	40.33	44.42	44.42	44.42	44.42	39.08								
	J (ft^4)	297.50	653.67	653.67	653.67	499.79	297.50	499.79	653.67	653.67	653.67	653.67	444.35								
	I_{33} (ft^4)	126.00	197.01	197.01	197.01	159.85	126.00	159.85	197.01	197.01	197.01	197.01	156.13								
	I_{22} (ft^4)	171.50	456.66	456.66	456.66	339.94	171.50	339.94	456.66	456.66	456.66	456.66	288.22								

d) Superstructure Data

Line Segment 1

Approaching Section : **BG3**
y'_1 = 1.67 feet = 20.00 inches
Z'_1 = -2.52 feet = -30.21 inches
$d_1 = H_{bg}$ = 5.50 feet (Box Girder Height) = 66.00 inches

	Slab Distance to		Slab Distance to Trackway CL				
Box Girder Slab	Left Edge (feet)	Right Edge (feet)	Left Edge (feet)	Center of Gravity (feet)	Right Edge (feet)	Length (feet)	Thickness (inches)
Top	10.87	-8.64	31.00	21.80	11.50	19.50	8.00
Bottom	10.87	-6.39	31.00		13.75	17.25	7.00

Departing Section : **BG3**
y'_2 = 1.67 feet = 20.00 inches
Z'_2 = -2.52 feet = -30.21 inches
$d_2 = H_{bg}$ = 5.50 feet (Box Girder Height) = 66.00 inches

	Slab Distance to		Slab Distance to Trackway CL				
Box Girder Slab	Left Edge (feet)	Right Edge (feet)	Left Edge (feet)	Center of Gravity (feet)	Right Edge (feet)	Length (feet)	Thickness (inches)
Top	10.87	-8.64	31.00	21.80	11.50	19.50	8.00
Bottom	10.87	-6.39	31.00		13.75	17.25	7.00

Line Segment 2

Approaching Section : **BG2**
y'_4 = 1.67 feet = 20.00 inches
Z'_4 = -2.52 feet = -30.21 inches
$d_4 = H_{bg}$ = 5.50 feet (Box Girder Height) = 66.00 inches

	Slab Distance to		Slab Distance to Trackway CL				
Box Girder Slab	Left Edge (feet)	Right Edge (feet)	Left Edge (feet)	Center of Gravity (feet)	Right Edge (feet)	Length (feet)	Thickness (inches)
Top	8.17	27.67	11.97	21.80	31.48	19.51	8.00
Bottom	5.33	22.59	14.81		32.06	17.26	7.00

Departing Section : **BG2**
y'_5 = 1.67 feet = 20.00 inches
Z'_5 = -2.52 feet = -30.21 inches
$d_5 = H_{bg}$ = 5.50 feet (Box Girder Height) = 66.00 inches

	Slab Distance to		Slab Distance to Trackway CL				
Box Girder Slab	Left Edge (feet)	Right Edge (feet)	Left Edge (feet)	Center of Gravity (feet)	Right Edge (feet)	Length (feet)	Thickness (inches)
Top	8.17	27.67	11.97	21.80	31.48	19.51	8.00
Bottom	5.33	22.59	14.81		32.06	17.26	7.00

y

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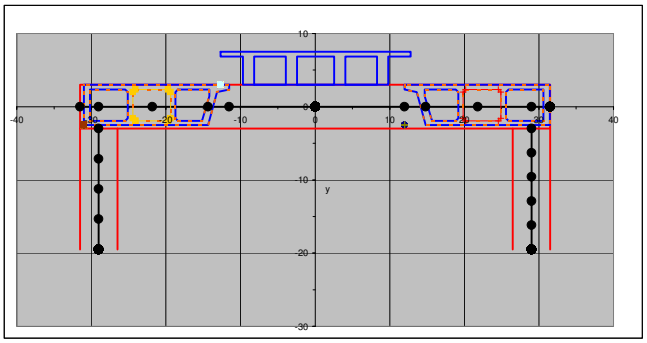
BENT INPUT DATA
SAP2000 BRIDGE ANALYSIS INPUT FILE DATA
FORT BRAGG HSR DOWNTOWN STATION

2. Bent Input Data - Bent 10

Label : **Bent 10**



a) Alignment Data

L_1 = 20.14 feet (Centerline distance between Trackway Alignment and Segment 1)
L_2 = 20.14 feet (Centerline distance between Trackway Alignment and Segment 2)

	Trackway Alignment	Line Segment 1 Top of Deck	Line Segment 1 Deck C.G.	Line Segment 2 Top of Deck	Line Segment 2 Deck C.G.
Station (feet)	53,230	53,230	53,230	53,230	53,230
X (feet)	645.00	645.00	645.00	645.00	645.00
Y (feet)	0.00	20.14	21.80	-20.14	-21.80
Z (feet)	61.78	61.78	59.26	61.78	59.26

Heading = 0.00 Degrees
Skew Angle = 0.00 Degrees

b) Pier Node Assignment and Section Properties

Concrete : ρ_c = 0.145 kip/ft^3 => NWC (Normal vs Light Weight Concrete, ACI 2.2; threshold is 0.115 kcf)
f'_c = 4.00 Ksi => E = 4,743 Ksi

Pier Number	Pier Definition L_C (feet)	Height h_C (feet)	Number of Nodes	Nodal Spacing (feet)	Shape	Material	Section Dimensions b_w (inches)	d (inches)	a (inches)	b (inches)	t_w (inches)	t_f (inches)
1	29.00	16.50	5	4.13	**R**	C	60.00	60.00				
2	-29.00	16.50	6	3.30	**R**	C	60.00	60.00				
3												
4												
5												

Section Properties Area (ft^2)	J (ft^4)	I_{33} (ft^4)	I_{22} (ft^4)	A_{22} (ft^2)	A_{33} (ft^2)
25.00	104.17	52.08	52.08	20.83	20.83
25.00	104.17	52.08	52.08	20.83	20.83

Note : Maximum number of pier nodes is 40.

c) Bentcap Nodes and Section Properties

b_w = 7.00 feet
d = 6.00 feet
L_e = 0.00 feet (Bentcap Extension beyond Edge of Columns
=> n = 6 (Bentcap Flange extent Factor for Top Slabs)
=> L_{BC} = 63.00 feet (Length of Bentcap)

	Bent 10 Nodes																			
Node No.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Y (feet)	-31.50	-29.00	-21.80	-14.33	-11.50	0.00	11.97	14.81	21.80	29.00	31.48	31.50								
Z (feet)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00								
b_w (feet)	7.00	7.00	7.00	7.00	7.00	7.00	7.00	7.00	7.00	7.00	7.00	7.00								
d (feet)	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00								
Approaching Section t_{Top} (feet)		0.67	0.67	0.67	0.67		0.67	0.67	0.67	0.67	0.67									
Approaching Section d_1 (feet)		5.50	5.50	5.50				5.50	5.50	5.50	5.50	5.50								
Approaching Section t_{Bott} (feet)		0.58	0.58	0.58				0.58	0.58	0.58	0.58	0.58								
Departing Section t_{Top} (feet)		0.67	0.67	0.67	0.67		0.67	0.67	0.67	0.67	0.67									
Departing Section d_1 (feet)		5.50	5.50	5.50				5.50	5.50	5.50	5.50	5.50								
Departing Section t_{Bott} (feet)		0.58	0.58	0.58				0.58	0.58	0.58	0.58	0.58								
Bentcap Section Properties y_i (feet)	3.00	3.10	3.10	3.10	3.30	3.00	3.30	3.10	3.10	3.10	3.10	2.80								
Bentcap Section Properties Area (ft^2)	42.00	51.42	51.42	51.42	47.33	42.00	47.33	51.42	51.42	51.42	51.42	46.08								
Bentcap Section Properties A_2 (ft^2)	35.00	35.00	35.00	35.00	35.00	35.00	35.00	35.00	35.00	35.00	35.00	35.00								
Bentcap Section Properties A_3 (ft^2)	35.00	44.42	44.42	44.42	40.33	35.00	40.33	44.42	44.42	44.42	44.42	39.08								
Bentcap Section Properties J (ft^4)	297.50	653.67	653.67	653.67	499.79	297.50	499.79	653.67	653.67	653.67	653.67	444.35								
Bentcap Section Properties I_{33} (ft^4)	126.00	197.01	197.01	197.01	159.85	126.00	159.85	197.01	197.01	197.01	197.01	156.13								
Bentcap Section Properties I_{22} (ft^4)	171.50	456.66	456.66	456.66	339.94	171.50	339.94	456.66	456.66	456.66	456.66	288.22								

d) Superstructure Data

Line Segment 1

Approaching Section : **BG3**
y'_1 = 1.67 feet = 20.00 inches
Z'_1 = -2.52 feet = -30.21 inches
$d_1 = H_{bg}$ = 5.50 feet (Box Girder Height) = 66.00 inches

Box Girder Slab	Slab Distance to Left Edge (feet)	Slab Distance to Right Edge (feet)	Slab Distance to Trackway CL Left Edge (feet)	Slab Distance to Trackway CL Center of Gravity (feet)	Slab Distance to Trackway CL Right Edge (feet)	Length (feet)	Thickness (inches)
Top	10.87	-8.64	31.00	21.80	11.50	19.50	8.00
Bottom	10.87	-6.39	31.00		13.75	17.25	7.00

Departing Section : **BG3**
y'_2 = 1.67 feet = 20.00 inches
Z'_2 = -2.52 feet = -30.21 inches
$d_2 = H_{bg}$ = 5.50 feet (Box Girder Height) = 66.00 inches

Box Girder Slab	Slab Distance to Left Edge (feet)	Slab Distance to Right Edge (feet)	Slab Distance to Trackway CL Left Edge (feet)	Slab Distance to Trackway CL Center of Gravity (feet)	Slab Distance to Trackway CL Right Edge (feet)	Length (feet)	Thickness (inches)
Top	10.87	-8.64	31.00	21.80	11.50	19.50	8.00
Bottom	10.87	-6.39	31.00		13.75	17.25	7.00

Line Segment 2

Approaching Section : **BG2**
y'_4 = 1.67 feet = 20.00 inches
Z'_4 = -2.52 feet = -30.21 inches
$d_4 = H_{bg}$ = 5.50 feet (Box Girder Height) = 66.00 inches

Box Girder Slab	Slab Distance to Left Edge (feet)	Slab Distance to Right Edge (feet)	Slab Distance to Trackway CL Left Edge (feet)	Slab Distance to Trackway CL Center of Gravity (feet)	Slab Distance to Trackway CL Right Edge (feet)	Length (feet)	Thickness (inches)
Top	8.17	27.67	11.97	21.80	31.48	19.51	8.00
Bottom	5.33	22.59	14.81		32.06	17.26	7.00

Departing Section : **BG2**
y'_5 = 1.67 feet = 20.00 inches
Z'_5 = -2.52 feet = -30.21 inches
$d_5 = H_{bg}$ = 5.50 feet (Box Girder Height) = 66.00 inches

Box Girder Slab	Slab Distance to Left Edge (feet)	Slab Distance to Right Edge (feet)	Slab Distance to Trackway CL Left Edge (feet)	Slab Distance to Trackway CL Center of Gravity (feet)	Slab Distance to Trackway CL Right Edge (feet)	Length (feet)	Thickness (inches)
Top	8.17	27.67	11.97	21.80	31.48	19.51	8.00
Bottom	5.33	22.59	14.81		32.06	17.26	7.00

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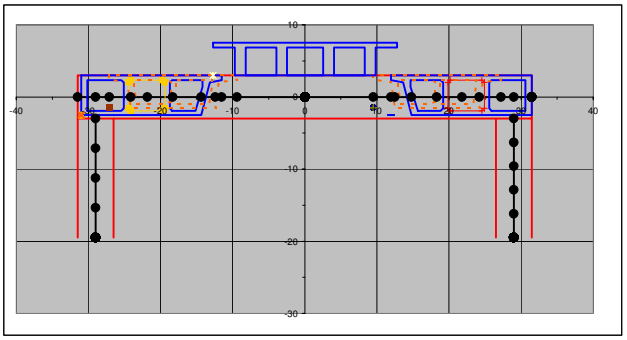
BENT INPUT DATA
SAP2000 BRIDGE ANALYSIS INPUT FILE DATA
FORT BRAGG HSR DOWNTOWN STATION

2. Bent Input Data - Bent 11

Label : **Bent 11**



a) Alignment Data

L_1 = 20.14 feet (Centerline distance between Trackway Alignment and Segment 1)
L_2 = 20.14 feet (Centerline distance between Trackway Alignment and Segment 2)

	Trackway Alignment	Line Segment 1 Top of Deck	Line Segment 1 Deck C.G.	Line Segment 2 Top of Deck	Line Segment 2 Deck C.G.
Station (feet)	53,300	53,300	53,300	53,300	53,300
X (feet)	715.00	715.00	715.00	715.00	715.00
Y (feet)	0.00	20.14	18.30	-20.14	-18.30
Z (feet)	61.78	61.78	59.90	61.78	59.90

Heading = 0.00 Degrees
Skew Angle = 0.00 Degrees

b) Pier Node Assignment and Section Properties

Concrete : ρ_c = 0.145 kip/ft^3 => NWC (Normal vs Light Weight Concrete, ACI 2.2; threshold is 0.115 kcf)
f'_c = 4.00 Ksi => E = 4,743 Ksi

Pier Definition							Section Dimensions					
Pier Number	L_C (feet)	Height h_C (feet)	Number of Nodes	Nodal Spacing (feet)	Shape	Material	b_w (inches)	d (inches)	a (inches)	b (inches)	t_w (inches)	t_f (inches)
1	29.00	16.50	5	4.13	**R**	C	60.00	60.00				
2	-29.00	16.50	6	3.30	**R**	C	60.00	60.00				
3												
4												
5												

Section Properties					
Area (ft^2)	J (ft^4)	I_{33} (ft^4)	I_{22} (ft^4)	A_{22} (ft^2)	A_{33} (ft^2)
25.00	104.17	52.08	52.08	20.83	20.83
25.00	104.17	52.08	52.08	20.83	20.83

Note : Maximum number of pier nodes is 40.

c) Bentcap Nodes and Section Properties

b_w = 7.00 feet
d = 6.00 feet
L_e = 0.00 feet (Bentcap Extension beyond Edge of Columns => n = 6 (Bentcap Flange extent Factor for Top Slabs)
=> L_{BC} = 63.00 feet (Length of Bentcap)

	Bent 11 Nodes																			
Node No.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Y (feet)	-31.50	-29.00	-27.10	-24.10	-21.80	-18.30	-14.33	-12.40	-11.50	-9.40	0.00	9.50	11.97	12.50	14.81	18.30	21.80	24.21	27.21	29.00
Z (feet)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
b_w (feet)	7.00	7.00	7.00	7.00	7.00	7.00	7.00	7.00	7.00	7.00	7.00	7.00	7.00	7.00	7.00	7.00	7.00	7.00	7.00	7.00
d (feet)	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00
Approaching Section t_{Top} (feet)		0.67	0.67	0.67	0.67	0.67	0.67	0.67	0.67				0.67	0.67	0.67	0.67	0.67	0.67	0.67	0.67
Approaching Section d_1 (feet)		5.50	5.50	5.50	5.50	5.50	5.50								5.50	5.50	5.50	5.50	5.50	5.50
Approaching Section t_{Bott} (feet)		0.58	0.58	0.58	0.58	0.58	0.58								0.58	0.58	0.58	0.58	0.58	0.58
Departing Section t_{Top} (feet)			0.67	0.67	0.67	0.67	0.67	0.67	0.67	0.67		0.67	0.67	0.67	0.67	0.67	0.67	0.67	0.67	
Departing Section d_1 (feet)				4.50	4.50	4.50	4.50	4.50						4.50	4.50	4.50	4.50	4.50		
Departing Section t_{Bott} (feet)				0.58	0.58	0.58	0.58	0.58						0.58	0.58	0.58	0.58	0.58		
Bentcap Section Properties y_i (feet)	3.00	3.06	3.20	3.14	3.14	3.14	3.14	3.24	3.30	3.16	3.00	3.16	3.30	3.24	3.14	3.14	3.14	3.14	3.20	3.06
Bentcap Section Properties Area (ft^2)	42.00	46.71	49.38	51.42	51.42	51.42	51.42	49.38	47.33	44.67	42.00	44.67	47.33	49.38	51.42	51.42	51.42	51.42	49.38	46.71
Bentcap Section Properties A_2 (ft^2)	35.00	35.00	35.00	35.00	35.00	35.00	35.00	35.00	35.00	35.00	35.00	35.00	35.00	35.00	35.00	35.00	35.00	35.00	35.00	35.00
Bentcap Section Properties A_3 (ft^2)	35.00	39.71	42.38	44.42	44.42	44.42	44.42	42.38	40.33	37.67	35.00	37.67	40.33	42.38	44.42	44.42	44.42	44.42	42.38	39.71
Bentcap Section Properties J (ft^4)	297.50	475.59	577.46	654.98	654.98	654.98	654.98	578.71	499.79	399.65	297.50	399.65	499.79	578.71	654.98	654.98	654.98	654.98	577.46	475.59
Bentcap Section Properties I_{33} (ft^4)	126.00	161.51	179.16	198.32	198.32	198.32	198.32	180.41	159.85	143.93	126.00	143.93	159.85	180.41	198.32	198.32	198.32	198.32	179.16	161.51
Bentcap Section Properties I_{22} (ft^4)	171.50	314.08	398.30	456.66	456.66	456.66	456.66	398.30	339.94	255.72	171.50	255.72	339.94	398.30	456.66	456.66	456.66	456.66	398.30	314.08

d) Superstructure Data

Line Segment 1

Approaching Section : **BG3**
y'_1 = 1.67 feet = 20.00 inches
Z'_1 = -2.52 feet = -30.21 inches
$d_1 = H_{bg}$ = 5.50 feet (Box Girder Height) = 66.00 inches

Box Girder Slab	Slab Distance to Left Edge (feet)	Slab Distance to Right Edge (feet)	Slab Distance to Trackway CL Left Edge (feet)	Slab Distance to Trackway CL Center of Gravity (feet)	Slab Distance to Trackway CL Right Edge (feet)	Length (feet)	Thickness (inches)
Top	10.87	-8.64	31.00	21.80	11.50	19.50	8.00
Bottom	10.87	-6.39	31.00		13.75	17.25	7.00

Departing Section : **BG4**
y'_2 = -1.83 feet = -22.00 inches
Z'_2 = -1.88 feet = -22.60 inches
$d_2 = H_{bg}$ = 4.50 feet (Box Girder Height) = 54.00 inches

Box Girder Slab	Slab Distance to Left Edge (feet)	Slab Distance to Right Edge (feet)	Slab Distance to Trackway CL Left Edge (feet)	Slab Distance to Trackway CL Center of Gravity (feet)	Slab Distance to Trackway CL Right Edge (feet)	Length (feet)	Thickness (inches)
Top	6.97	-10.74	27.10	18.30	9.40	17.71	8.00
Bottom	3.97	-8.24	24.10		11.90	12.21	7.00

Line Segment 2

Approaching Section : **BG2**
y'_4 = 1.67 feet = 20.00 inches
Z'_4 = -2.52 feet = -30.21 inches
$d_4 = H_{bg}$ = 5.50 feet (Box Girder Height) = 66.00 inches

Box Girder Slab	Slab Distance to Left Edge (feet)	Slab Distance to Right Edge (feet)	Slab Distance to Trackway CL Left Edge (feet)	Slab Distance to Trackway CL Center of Gravity (feet)	Slab Distance to Trackway CL Right Edge (feet)	Length (feet)	Thickness (inches)
Top	8.17	27.67	11.97	21.80	31.48	19.51	8.00
Bottom	5.33	22.59	14.81		32.06	17.26	7.00

Departing Section : **BG4**
y'_5 = -1.83 feet = -22.00 inches
Z'_5 = -1.88 feet = -22.60 inches
$d_5 = H_{bg}$ = 4.50 feet (Box Girder Height) = 54.00 inches

Box Girder Slab	Slab Distance to Left Edge (feet)	Slab Distance to Right Edge (feet)	Slab Distance to Trackway CL Left Edge (feet)	Slab Distance to Trackway CL Center of Gravity (feet)	Slab Distance to Trackway CL Right Edge (feet)	Length (feet)	Thickness (inches)
Top	10.64	28.34	9.50	18.30	27.21	17.71	8.00
Bottom	7.64	19.84	12.50		24.71	12.21	7.00

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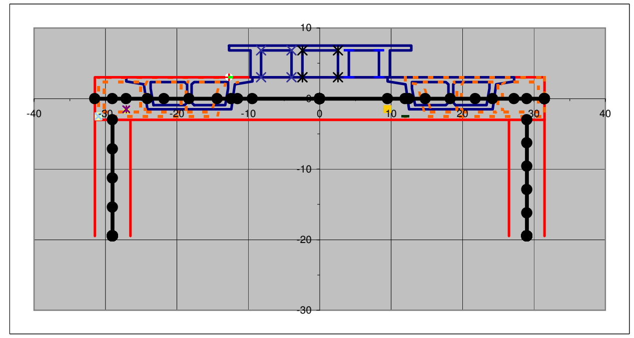
PLATFORM LOADS ON BENTCAPS
SAP2000 BRIDGE ANALYSIS INPUT FILE DATA
FORT BRAGG HSR DOWNTOWN STATION



5. Platform Girder Point Loads on Bentcaps

Platform Station Begin : 52,600 feet

Platform Station End : 53,300 feet

Platform Section : **BG1** = > L_P = 700.00 feet (Platform Length)
W_P = 25.50 feet (Platform Width)

Centroid : Z_t = 1.63 feet (from Deck)
Y_t = 12.69 feet (from Left Edge)

Distance from Platform C.G. to Trackway Centerline : L_{Py} = 0.00 feet

L_{Pz} = 2.87 feet

Material Properties

Concrete : ρ_c = 0.145 kip/ft^3 => NWC (Normal vs Light Weight Concrete, ACI 2.2; threshold is 0.115 kcf)

f'_c = 4.00 Ksi => E = 4,743 Ksi

Tributary Girder Areas:

	Superstructure Section Data		
	d (inches)	A (in^2)	y (inches)
Top Slab	234.00	1872.00	153.00
Bottom Slab	234.00	0.00	153.00
Girders	18.00	828.00	45.00
	18.00	828.00	261.00
	18.00	828.00	114.00
	18.00	828.00	192.00
	0.00	0.00	192.00
	0.00	0.00	192.00

Platform Data									
Girder Number	Location	Girder Area (in^2)	Deck Area (in^2)	Soffit Area (in^2)	Total Area (in^2)	Total Area (ft^2)	Girder Load (Kips/ft)	Distance from Left Slab Edge (feet)	Distance from C.G. (feet)
1	Left Girder	828	636	0	1,464	10.17	1.47	3.75	-9.06
2	Right Girder	828	636	0	1,464	10.17	1.47	21.75	8.94
3	Interior Girder	828	588	0	1,416	9.83	1.43	9.50	-3.31
4	"	828	588	0	1,416	9.83	1.43	16.00	3.19
5	"								
6	"								

Total = 40.00

	Platform C.G.				Platform Tributary Spans on Bentcaps			
Bent No.	Station (feet)	X (feet)	Y (feet)	Z (feet)	Span Length (feet)	Trib Span Segment (feet)	Cantilever Segment (feet)	Total Length (feet)
Bent 1	52,600	15.00	0.00	64.65	66.37	68.19	0.00	68.19
Bent 2	52,670	85.00	0.00	64.65	70.00	70.00	0.00	70.00
Bent 3	52,740	155.00	0.00	64.65	70.00	70.00	0.00	70.00
Bent 4	52,810	225.00	0.00	64.65	70.00	70.00	0.00	70.00
Bent 5	52,880	295.00	0.00	64.65	70.00	70.00	0.00	70.00
Bent 6	52,950	365.00	0.00	64.65	70.00	70.00	0.00	70.00
Bent 7	53,020	435.00	0.00	64.65	70.00	70.00	0.00	70.00
Bent 8	53,090	505.00	0.00	64.65	70.00	70.00	0.00	70.00
Bent 9	53,160	575.00	0.00	64.65	70.00	70.00	0.00	70.00
Bent 10	53,230	645.00	0.00	64.65	70.00	70.00	0.00	70.00
Bent 11	53,300	715.00	0.00	64.65	70.00	35.00	0.00	35.00
Bent 12								
Bent 12								
Bent 12								
				Totals =	766.37	733.19	0.00	733.19

Platform Point Loads																	
Girder 1 (Left)			Girder 2 (Right)			Girder 3 (Interior)			Girder 4 (Interior)			Girder 5 (Interior)			Girder 6 (Interior)		
Point Load (kips)	Bentcap Element Number	d (feet)	Point Load (kips)	Bentcap Element Number	d (feet)	Point Load (kips)	Bentcap Element Number	d (feet)	Point Load (kips)	Bentcap Element Number	d (feet)	Point Load (kips)	Bentcap Element Number	d (feet)	Point Load (kips)	Bentcap Element Number	d (feet)
100.52	10	0.34	100.52	11	8.94	97.22	10	6.09	97.22	11	3.19						
103.19	5	2.44	103.19	6	8.94	99.81	5	8.19	99.81	6	3.19						
103.19	5	2.44	103.19	6	8.94	99.81	5	8.19	99.81	6	3.19						
103.19	5	2.44	103.19	6	8.94	99.81	5	8.19	99.81	6	3.19						
103.19	5	2.44	103.19	6	8.94	99.81	5	8.19	99.81	6	3.19						
103.19	5	2.44	103.19	6	8.94	99.81	5	8.19	99.81	6	3.19						
103.19	5	2.44	103.19	6	8.94	99.81	5	8.19	99.81	6	3.19						
103.19	5	2.44	103.19	6	8.94	99.81	5	8.19	99.81	6	3.19						
103.19	5	2.44	103.19	6	8.94	99.81	5	8.19	99.81	6	3.19						
103.19	5	2.44	103.19	6	8.94	99.81	5	8.19	99.81	6	3.19						
51.60	10	0.34	51.60	11	8.94	49.90	10	6.09	49.90	11	3.19						

Notes:
1. Bentcap Element No. obtained from "2. Bent Input Data".
2. Bentcap Element No. obtained from "2. Bent Input Data".

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BRIDGE CONNECTIVITY
SAP2000 BRIDGE ANALYSIS INPUT FILE DATA - Tension EQ MODEL
FORT BRAGG HSR DOWNTOWN STATION

Model : Tension EQ

1. ABUTMENT CONNECTIVITY - RESTRAINT OR SPRING VALUES

$F_X = 1/8\ H_W^2\ W_W\ F_p$ Where F_p = 7.70 Ksf (Passive Pressure)

Abutment or Hinge Node	Line Segment	Node ID	Wall Dimension Height (ft)	Wall Dimension Width (ft)	Passive Pressure (Ksf)	Passive Force (Kips)	DX / D1 (feet)	K_X / K_1 (inches)	RESTRAINT OR SPRING VALUES (KIP/FT) UX / U1	UY / U2	UZ / U3	RX / R1	RY / R2	RZ / R3
1	1	1000000	5.00	20.00	0.00	0.00	0.36	0	0		x	x		
	2	2000000	5.50	18.00	0.00	0.00	0.27	0	0		x	x		
12	1	1001106	5.25	19.00	0.00	0.00	0.32	0	0		x	x	x	x
	2	2001106	5.50	18.00	0.00	0.00	0.35	0	0		x	x	x	x

2. HINGE CONNECTIVITY - CONSTRAINTS

Hinge Number	Hinge Node Data Depart	Hinge Node Data Arrive	Segment Line 1 UX / U1	UY / U2	UZ / U3	RX / R1	RY / R2	RZ / R3	Segment Line 2 UX / U1	UY / U2	UZ / U3	RX / R1	RY / R2	RZ / R3
1														
2														
3														
4														
5														
6														
7														
8														
9														
10														

3. PLATFORM TO BENTCAP CONNECTIVITY - CONSTRAINTS

Platform Station Begin : 52,600 feet

Platform Station End : 53,300 feet

Platform Section : BG1 = >

L_P = 700.00 feet (Platform Length)
W_P = 25.50 feet (Platform Width)

Centroid :
Z_t = 1.63 feet (from Deck)
Y_t = 12.69 feet (from Left Edge)

Distance from Platform C.G. to Trackway Centerline :
L_{Py} = 0.00 feet

L_{Pz} = 2.87 feet

Bent Number	Constraint Nodes Bentcap	Constraint Nodes Platform	Platform to Bentcap Constraints UX / U1	UY / U2	UZ / U3	RX / R1	RY / R2	RZ / R3
Bent 1	0106	3000100	x	x	x	x		
Bent 2	0206	3000200	x	x	x	x		
Bent 3	0306	3000300	x	x	x	x		
Bent 4	0406	3000400	x	x	x	x		
Bent 5	0506	3000500	x	x	x	x		
Bent 6	0606	3000600	x	x	x	x		
Bent 7	0706	3000700	x	x	x	x		
Bent 8	0806	3000800	x	x	x	x		
Bent 9	0906	3000900	x	x	x	x		
Bent 10	1006	3001000	x	x	x	x		
Bent 11	1106	3001100	x	x	x	x		
Bent 12								
Bent 12								
Bent 12								

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BRIDGE CONNECTIVITY
SAP2000 BRIDGE ANALYSIS INPUT FILE DATA - Tension EQ MODEL
FORT BRAGG HSR DOWNTOWN STATION

Model : Tension EQ

4. BENT CONNECTIVITY - RESTRAINTS, SPRING, OR DOF RELEASES

Cracked Member Stiffness Parameters :

E_{cB} = 0.90 E (Bentcap Cracked Modulus)

E_{cC} = 0.75 E (Column Cracked Modulus) Note: Not implemented yet!

E_{PH} = 0.50 E (Column Cracked Modulus - at Plastic Hinges)

Note: Plastic hinge elements are taken as the first and last pier elements, if fixed there.

		Pier Definition				PIER CONNECTIVITY - AT **FOUNDATIONS** RESTRAINT OR SPRING VALUES (KIP/FT)						PIER CONNECTIVITY - AT **BENTCAPS** DOF **RELEASES** AT RIGID LINKS					
Bent Number	Pier Number	L_C (feet)	Height h_C (feet)	Shape	Material	UX / U1	UY / U2	UZ / U3	RX / R1	RY / R2	RZ / R3	UX / U1	UY / U2	UZ / U3	RX / R1	RY / R2	RZ / R3
1	1	29.00	16.50	R	C	x	x	x	x								
	2	-29.00	16.50	R	C	x	x	x	x								
	3																
	4																
	5																
2	1	29.00	16.50	R	C	x	x	x	x								
	2	-29.00	16.50	R	C	x	x	x	x								
	3																
	4																
	5																
3	1	29.00	16.50	R	C	x	x	x	x								
	2	-29.00	16.50	R	C	x	x	x	x								
	3																
	4																
	5																
4	1	29.00	16.50	R	C	x	x	x	x	x	x						
	2	-29.00	16.50	R	C	x	x	x	x	x	x						
	3																
	4																
	5																
5	1	29.00	16.50	R	C	x	x	x	x	x	x						
	2	-29.00	16.50	R	C	x	x	x	x	x	x						
	3																
	4																
	5																
6	1	29.00	16.50	R	C	x	x	x	x	x	x						
	2	-29.00	16.50	R	C	x	x	x	x	x	x						
	3																
	4																
	5																
7	1	29.00	16.50	R	C	x	x	x	x	x	x						
	2	-29.00	16.50	R	C	x	x	x	x	x	x						
	3																
	4																
	5																
8	1	29.00	16.50	R	C	x	x	x	x	x	x						
	2	-29.00	16.50	R	C	x	x	x	x	x	x						
	3																
	4																
	5																
9	1	29.00	16.50	R	C	x	x	x	x								
	2	-29.00	16.50	R	C	x	x	x	x								
	3																
	4																
	5																
10	1	29.00	16.50	R	C	x	x	x	x								
	2	-29.00	16.50	R	C	x	x	x	x								
	3																
	4																
	5																
11	1	29.00	16.50	R	C	x	x	x	x								
	2	-29.00	16.50	R	C	x	x	x	x								
	3																
	4																
	5																
	1																
	2																
	3																
	4																
	5																
	1																
	2																
	3																
	4																
	5																
	1																
	2																
	3																
	4																
	5																

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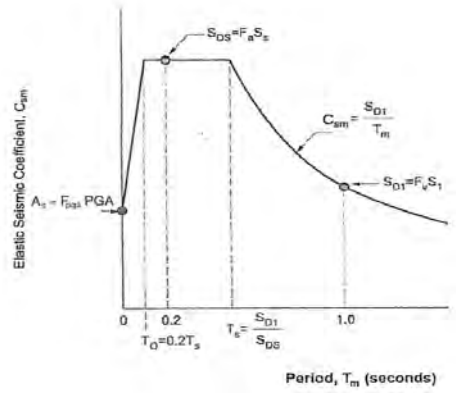
ACCELERATION RESPONSE SPECTRUM VALUES
SAP2000 BRIDGE ANALYSIS INPUT FILE DATA
FORT BRAGG HSR DOWNTOWN STATION



1. Seismic Design Parameters (AASHTO LFRD BDS 3.10.4)

A_S = 0.802 g's (Site Design Coefficient - PGA)

S_{DS} = 1.546 g's (Site Design Coefficient - Short Period)

S_{D1} = 1.172 g's (Site Design Coefficient - at 1-Second Period)

2. AASHTO LRFD BDS Acceleration Design Response Spectrum Curve

a) Period Parameters (X Axis)

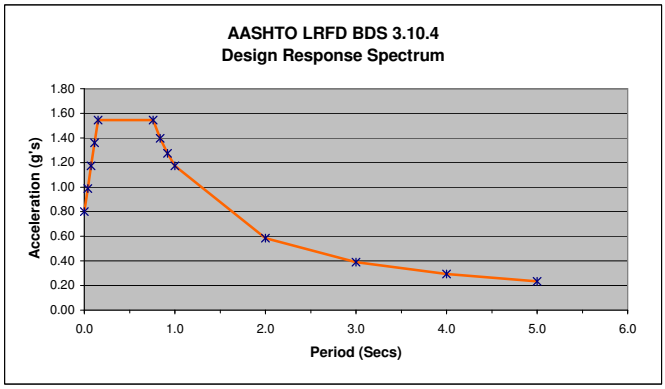
$T_o = 0.2\ S_{D1} / S_{DS}$ Where S_{DS} = 1.546 g's (Site Design Coefficient - Short Period)

S_{D1} = 1.172 g's (Site Design Coefficient - at 1.0 Second Period)

$T_a = S_{D1} / S_{DS}$

T_o = 0.152 seconds

T_a = 0.758 seconds



b) Acceleration Parameters (Y Axis)

S_{DS} = 1.546 g's (Site Design Coefficient - Short Period)

S_{D1} = 1.172 g's (Site Design Coefficient - at 1-Second Period)

c) ARS Curve Data

i) For Periods $T_{ARS} \le T_o$

$S_a = A_S + (S_{DS} - A_S)\ (T / T_o)$ Where A_S = 0.802 g's

S_{DS} = 1.546 g's (Site Design Coefficient - Short Period)

T_o = 0.15 seconds

ii) For Periods $T_S \le T_{ARS} \le T_o$

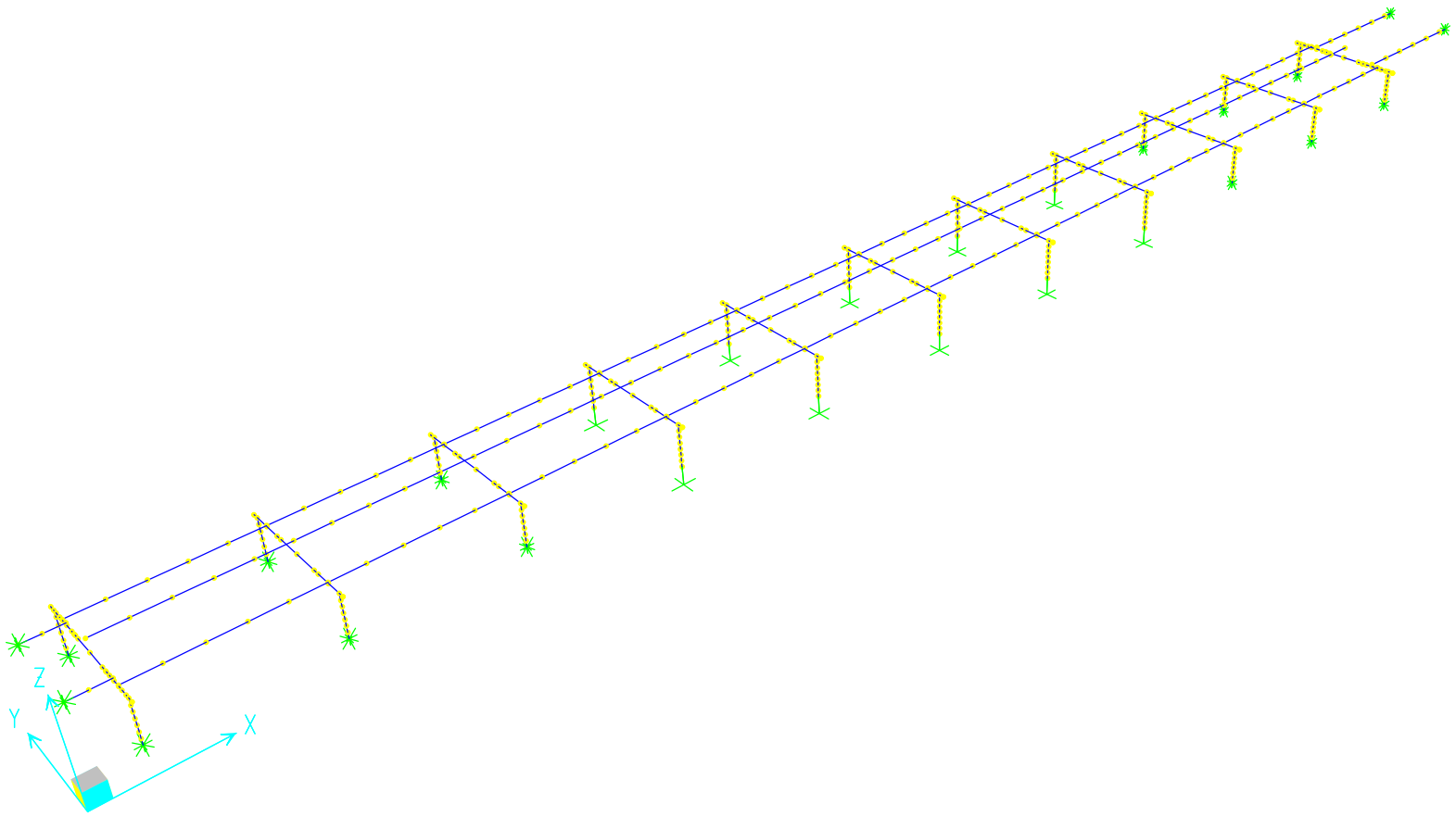
$S_a = S_{DS}$ Where S_{DS} = 1.546 g's (Site Design Coefficient - Short Period)

iii) For Periods $T_S \le T_{ARS}$

$S_a = S_{D1} / T$ Where S_{D1} = 1.172 g's (Site Design Coefficient - at 1-Second Period)

Period Ranges		T (Secs)	S_a (g's)
$T_{ARS} \le T_o$		0.00	0.802
		0.04	0.988
		0.08	1.174
		0.11	1.360
$T_S \le T_{ARS} \le T_o$	T_o =	0.15	1.546
	T_S =	0.76	1.546
$T_S \le T_{ARS}$		0.84	1.397
		0.92	1.275
		1.00	1.172
		2.00	0.586
		3.00	0.391
		4.00	0.293
		5.00	0.234

SAP2000 LINEAR ELASTIC RESPONSE SPECTRUM ANALYSIS - MODEL 2

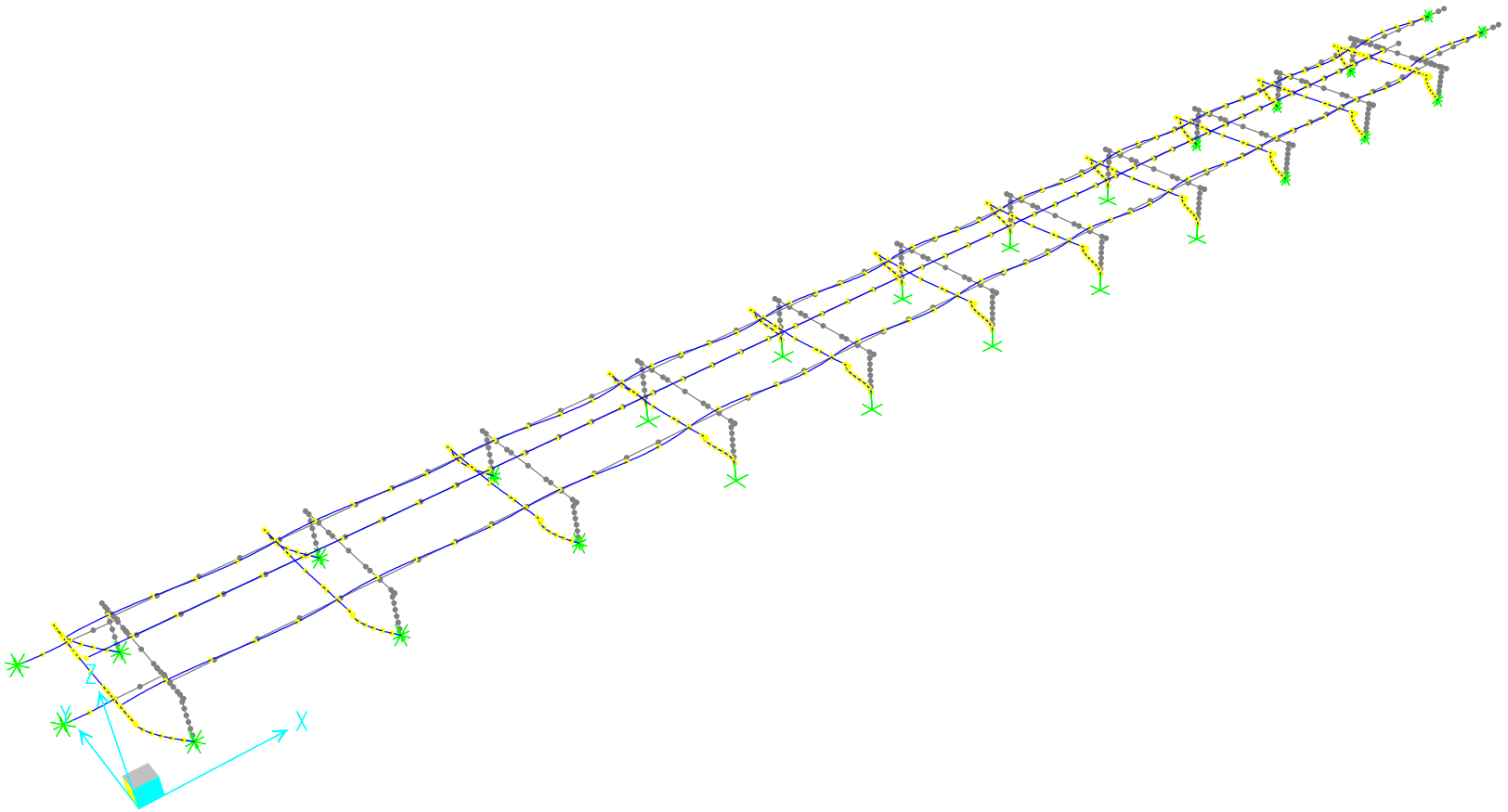

Z
Y
X

 Program SAP2000 Version 7.40 File:inputfile.OUT

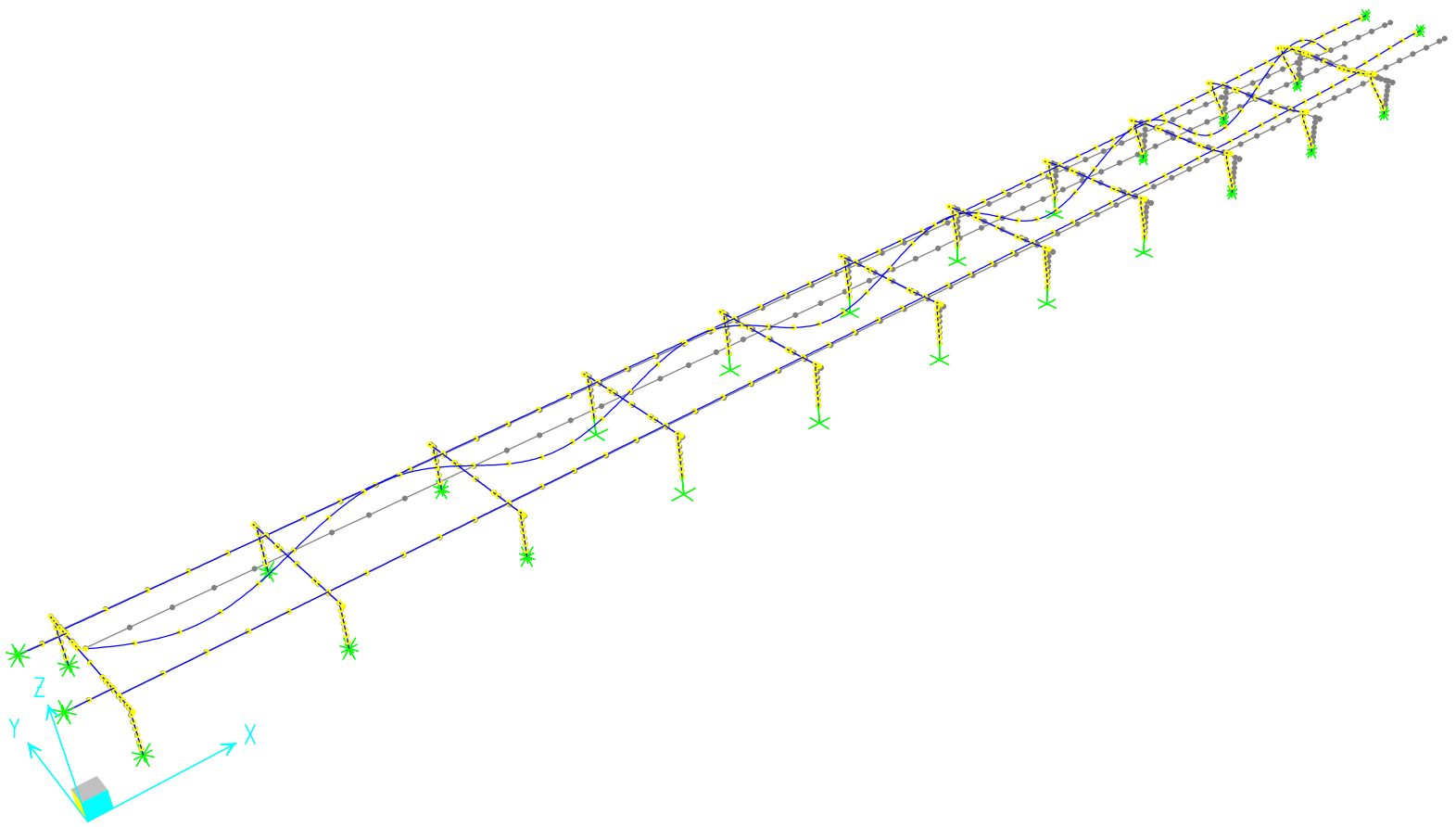
PARAMETRIC BRIDGE SAP2000 MODEL

M O D A L P A R T I C I P A T I N G M A S S R A T I O S

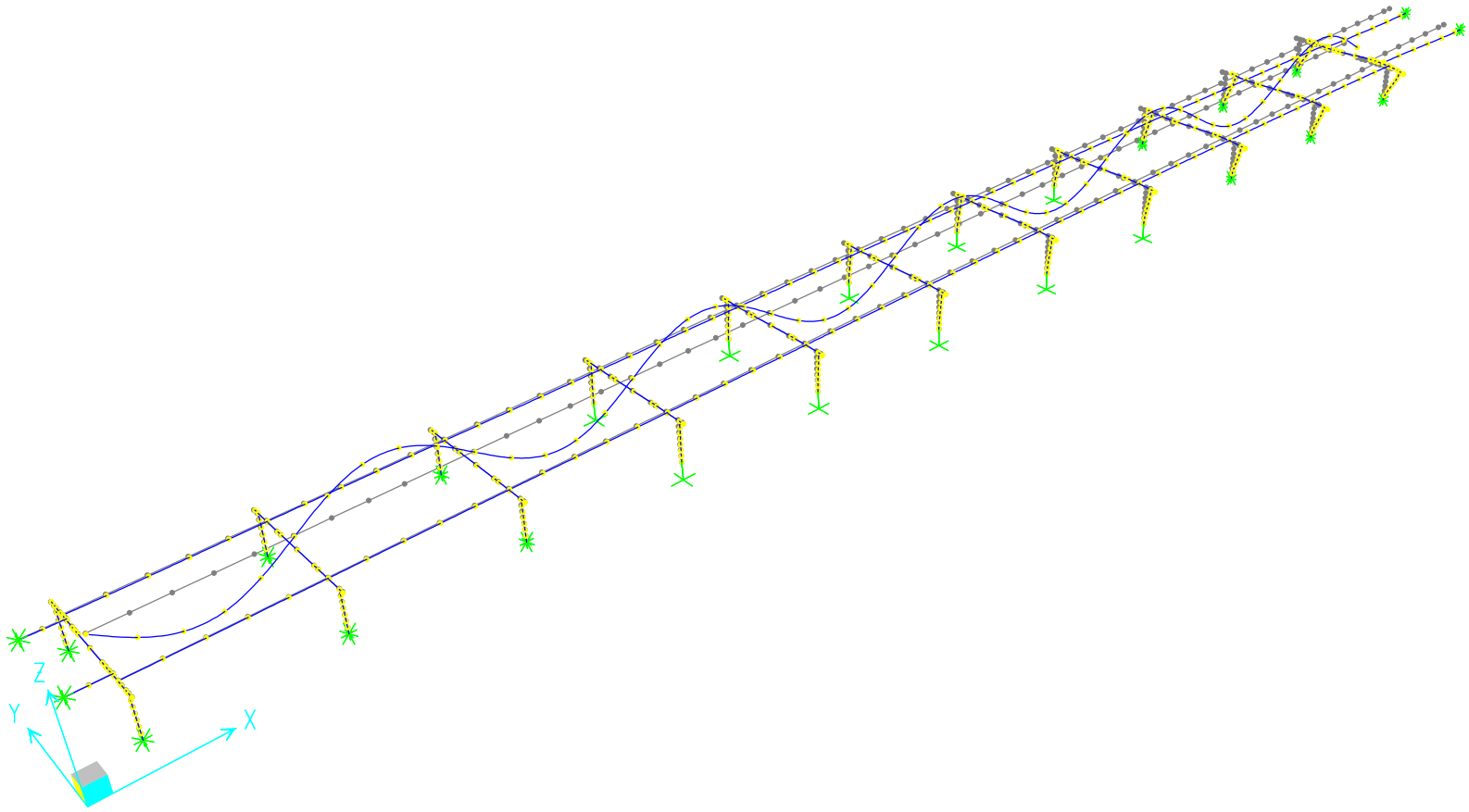
MODE	PERIOD	INDIVIDUAL MODE (PERCENT) UX	UY	UZ	CUMULATIVE SUM (PERCENT) UX	UY	UZ
1	0.241438	97.3403	0.0000	0.0022	97.3403	0.0000	0.0022
2	0.182313	0.0000	28.4969	0.0143	97.3403	28.4969	0.0165
3	0.181758	0.0000	19.3190	0.0246	97.3403	47.8159	0.0411
4	0.178816	0.0000	36.7756	0.2669	97.3404	84.5915	0.3080
5	0.178280	0.0002	4.2397	0.4636	97.3406	88.8312	0.7716
6	0.168574	0.0000	0.0006	0.0025	97.3407	88.8318	0.7741
7	0.167484	0.0000	3.7401	0.0004	97.3407	92.5719	0.7745
8	0.156167	0.0001	0.0005	1.5281	97.3408	92.5724	2.3026
9	0.150618	0.0003	3.6127	0.0952	97.3410	96.1851	2.3978
10	0.147717	0.0000	0.1935	51.1730	97.3410	96.3786	53.5708
11	0.144305	0.0006	0.0091	0.0038	97.3417	96.3877	53.5746
12	0.137261	0.0013	0.0038	0.0002	97.3430	96.3915	53.5748
13	0.135127	0.0000	0.0030	1.2539	97.3430	96.3945	54.8287
14	0.132084	0.0961	0.0009	0.2133	97.4391	96.3955	55.0419
15	0.130370	0.0003	0.0118	2.8246	97.4394	96.4073	57.8665
16	0.129886	0.0003	0.0008	0.0011	97.4397	96.4081	57.8677
17	0.127186	0.0001	0.2647	0.0125	97.4397	96.6729	57.8801
18	0.101493	0.0001	0.1549	0.0000	97.4398	96.8277	57.8801
19	0.099904	0.0449	0.0001	0.2828	97.4847	96.8278	58.1630
20	0.095977	0.0231	0.0000	0.0003	97.5078	96.8278	58.1633
21	0.093646	0.0152	0.0006	0.4509	97.5230	96.8284	58.6142
22	0.091877	0.0001	0.0002	0.0031	97.5231	96.8286	58.6173
23	0.090309	0.0151	0.0002	0.0896	97.5382	96.8288	58.7069
24	0.086611	0.0067	0.0028	1.3939	97.5449	96.8315	60.1008
25	0.085799	0.0000	0.0010	0.0007	97.5449	96.8325	60.1015
26	0.084623	0.0001	0.0010	0.0005	97.5450	96.8335	60.1019
27	0.084180	0.0000	0.0025	0.0019	97.5450	96.8360	60.1038
28	0.083400	0.0052	0.0019	0.2373	97.5502	96.8379	60.3411
29	0.081489	0.0000	0.0001	0.0003	97.5502	96.8380	60.3414
30	0.080635	0.0003	0.0080	2.7930	97.5505	96.8460	63.1344
31	0.079805	0.0007	0.0015	0.0030	97.5512	96.8474	63.1374
32	0.078201	0.0003	0.0079	0.0107	97.5515	96.8554	63.1481
33	0.077820	0.0000	0.0001	0.0222	97.5515	96.8555	63.1703
34	0.075238	0.0007	0.0020	0.0774	97.5522	96.8574	63.2477
35	0.075056	0.0001	0.0039	3.0254	97.5523	96.8614	66.2731
36	0.073029	0.0298	0.0000	0.0265	97.5821	96.8614	66.2996
37	0.072344	0.0037	0.0029	0.0005	97.5858	96.8643	66.3001
38	0.072166	0.0023	0.0060	0.0006	97.5881	96.8703	66.3007
39	0.070472	0.0026	0.0025	14.7758	97.5907	96.8728	81.0764
40	0.070041	0.0793	0.0003	0.2562	97.6700	96.8732	81.3327
41	0.069850	0.0507	0.0000	0.0023	97.7206	96.8732	81.3350
42	0.069249	0.0196	0.0003	0.0634	97.7402	96.8735	81.3984
43	0.068036	0.0001	0.0298	0.0891	97.7403	96.9033	81.4874
44	0.067102	0.0005	0.0002	0.0065	97.7408	96.9035	81.4940
45	0.066911	0.0001	0.4983	0.0378	97.7409	97.4018	81.5318
46	0.065059	0.0000	0.0000	0.0028	97.7409	97.4018	81.5346
47	0.064571	0.0000	0.0000	0.0001	97.7409	97.4018	81.5347
48	0.063696	0.0000	0.0000	0.0281	97.7409	97.4018	81.5628
49	0.062397	0.0008	0.0000	0.0003	97.7416	97.4019	81.5630
50	0.061162	0.0012	0.0230	0.0012	97.7429	97.4248	81.5643

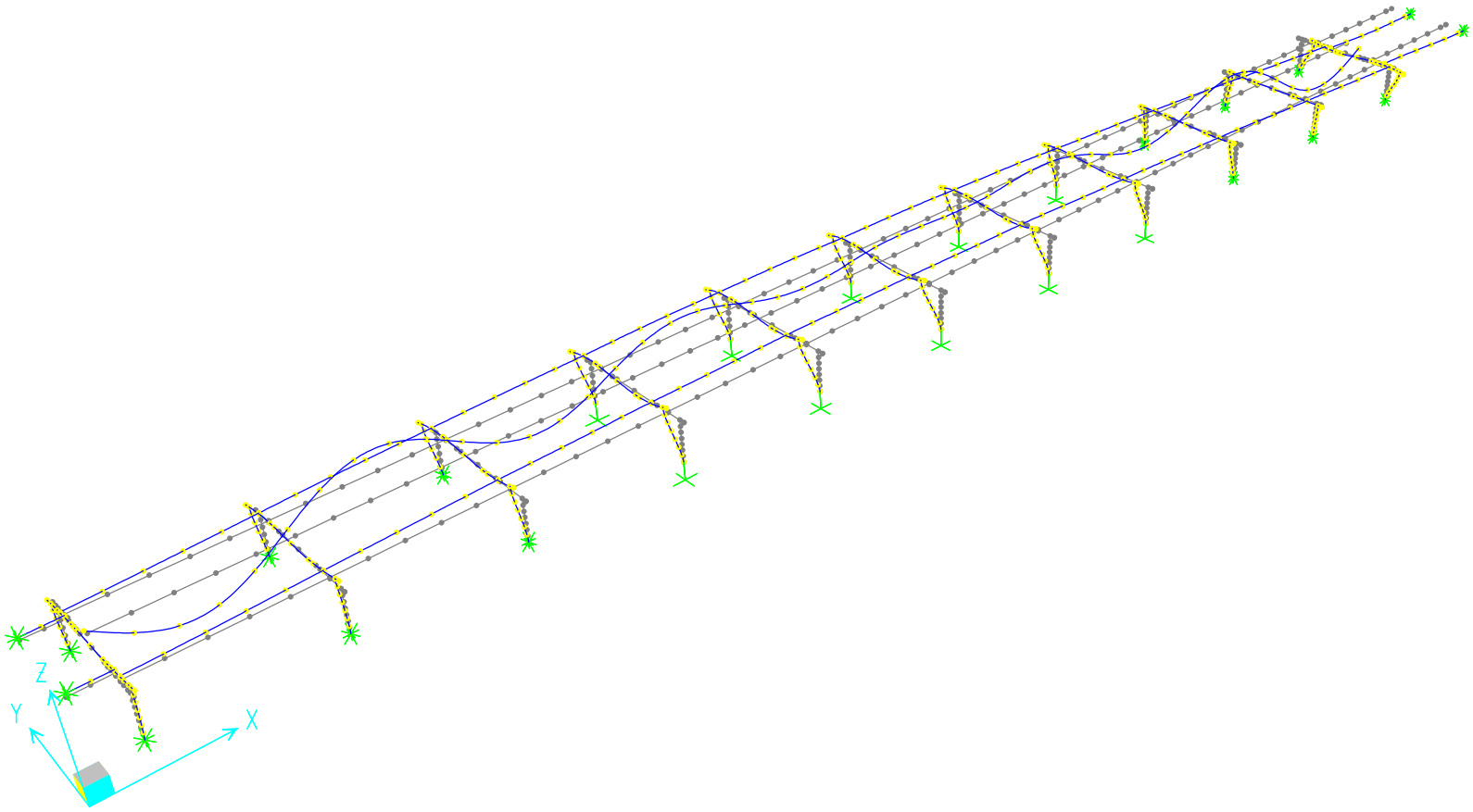


SAP2000 v7.40 - File:FB HSR Model - Mode 1 Period 0.2414 seconds - Kip-ft Units

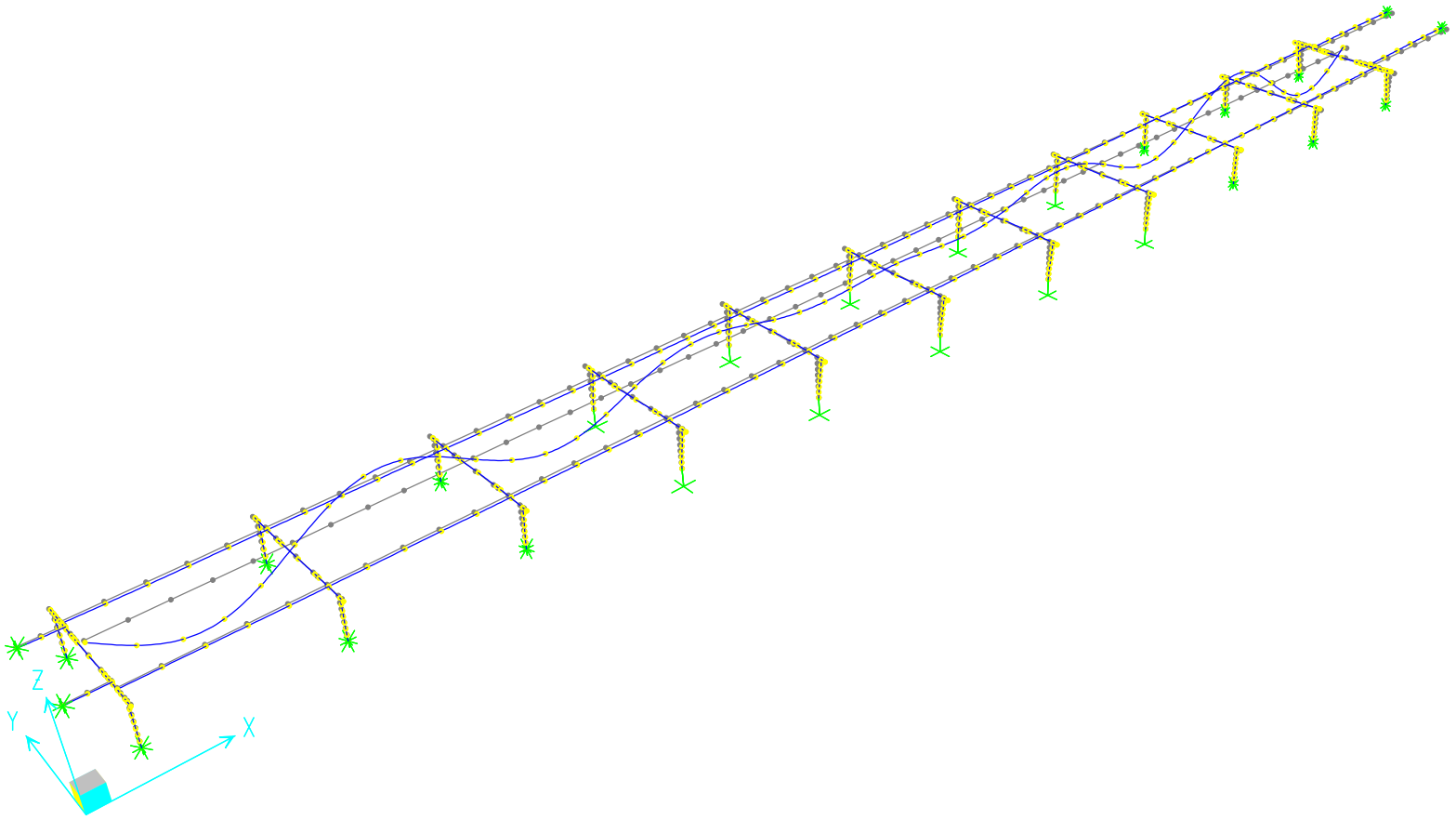


SAP2000 v7.40 - File:FB HSR Model - Mode 2 Period 0.1823 seconds - Kip-ft Units

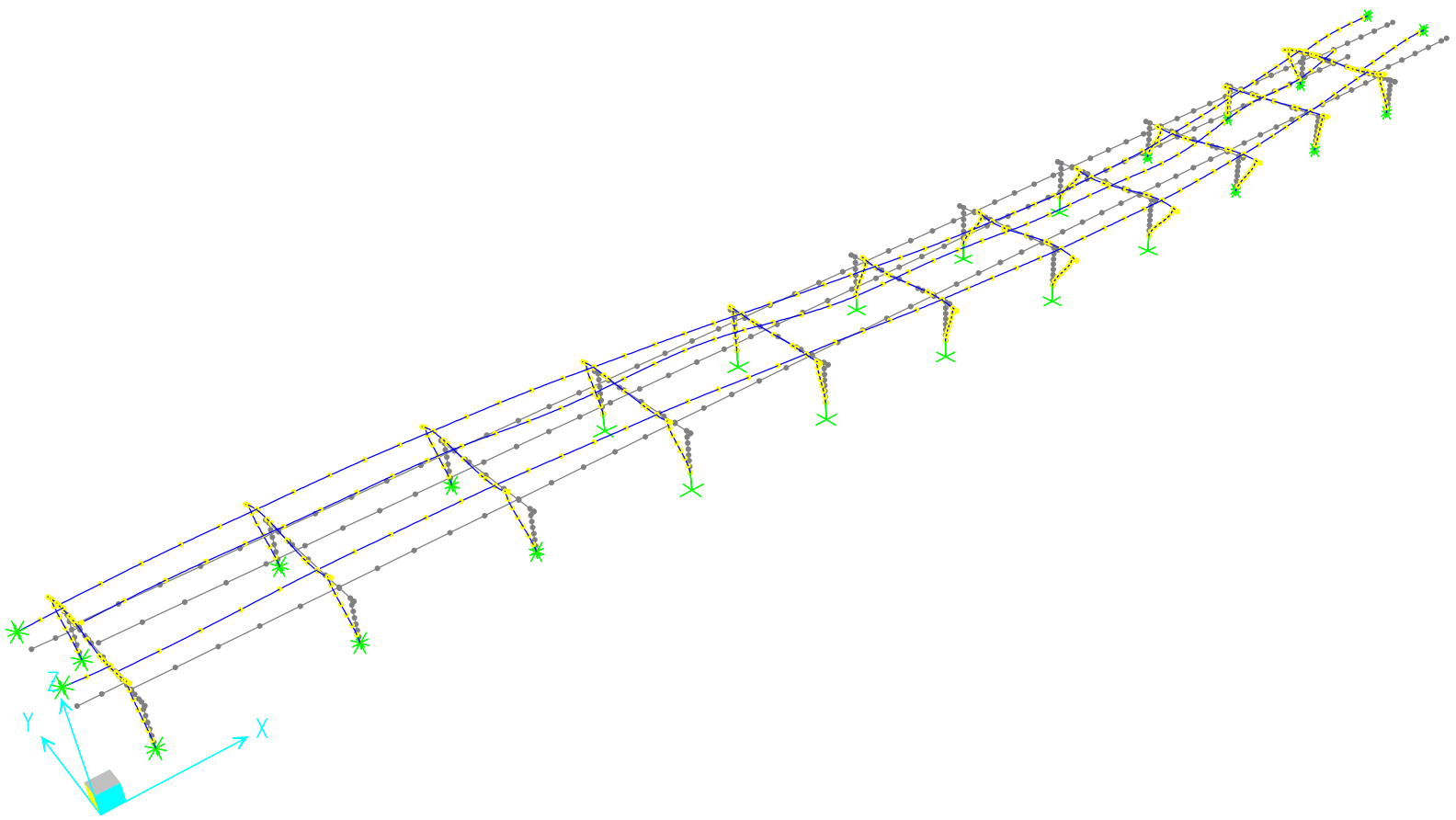

Z
Y
X



SAP2000 v7.40 - File:FB HSR Model - Mode 4 Period 0.1788 seconds - Kip-ft Units



SAP2000 v7.40 - File:FB HSR Model - Mode 5 Period 0.1783 seconds - Kip-ft Units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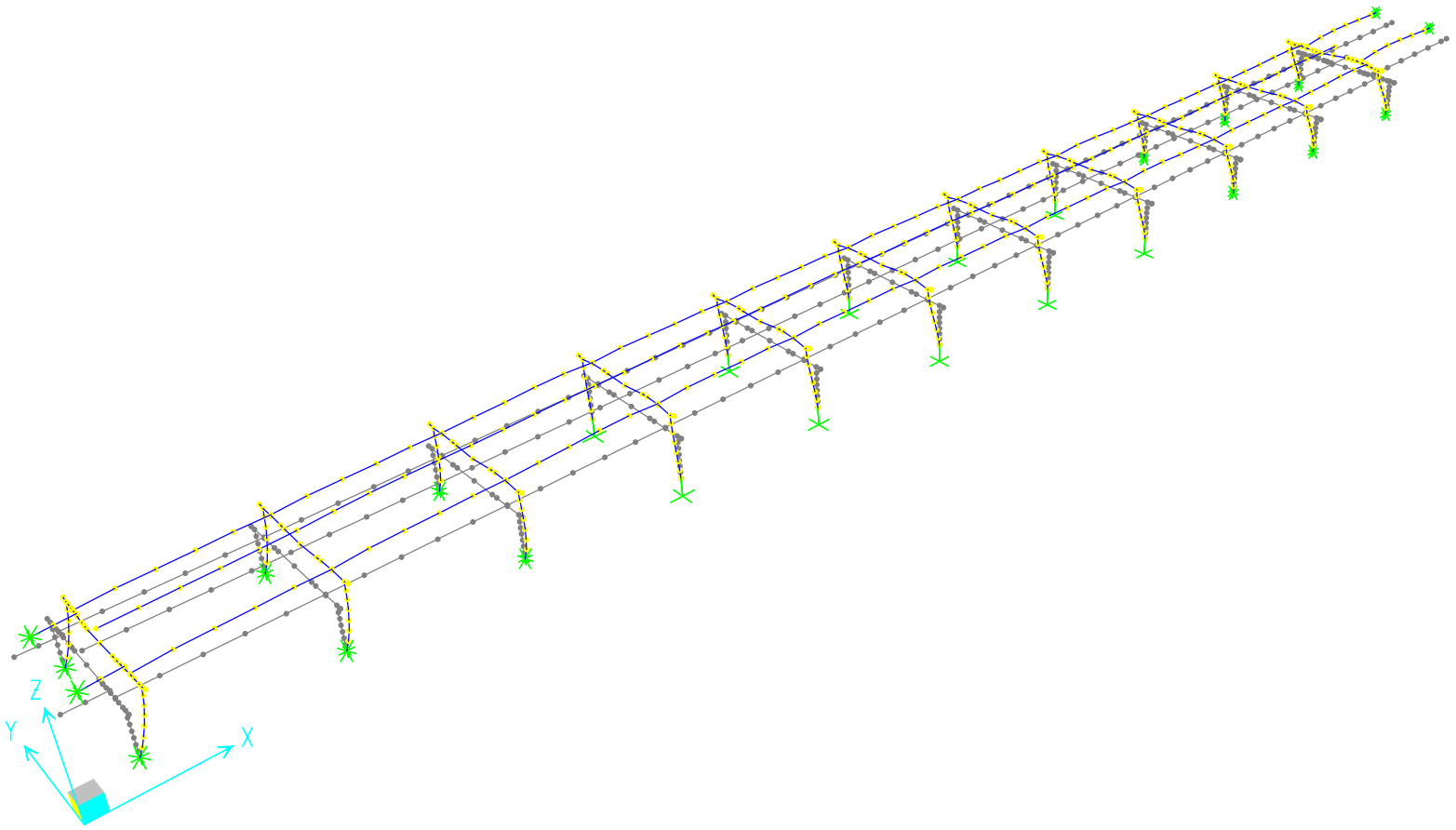
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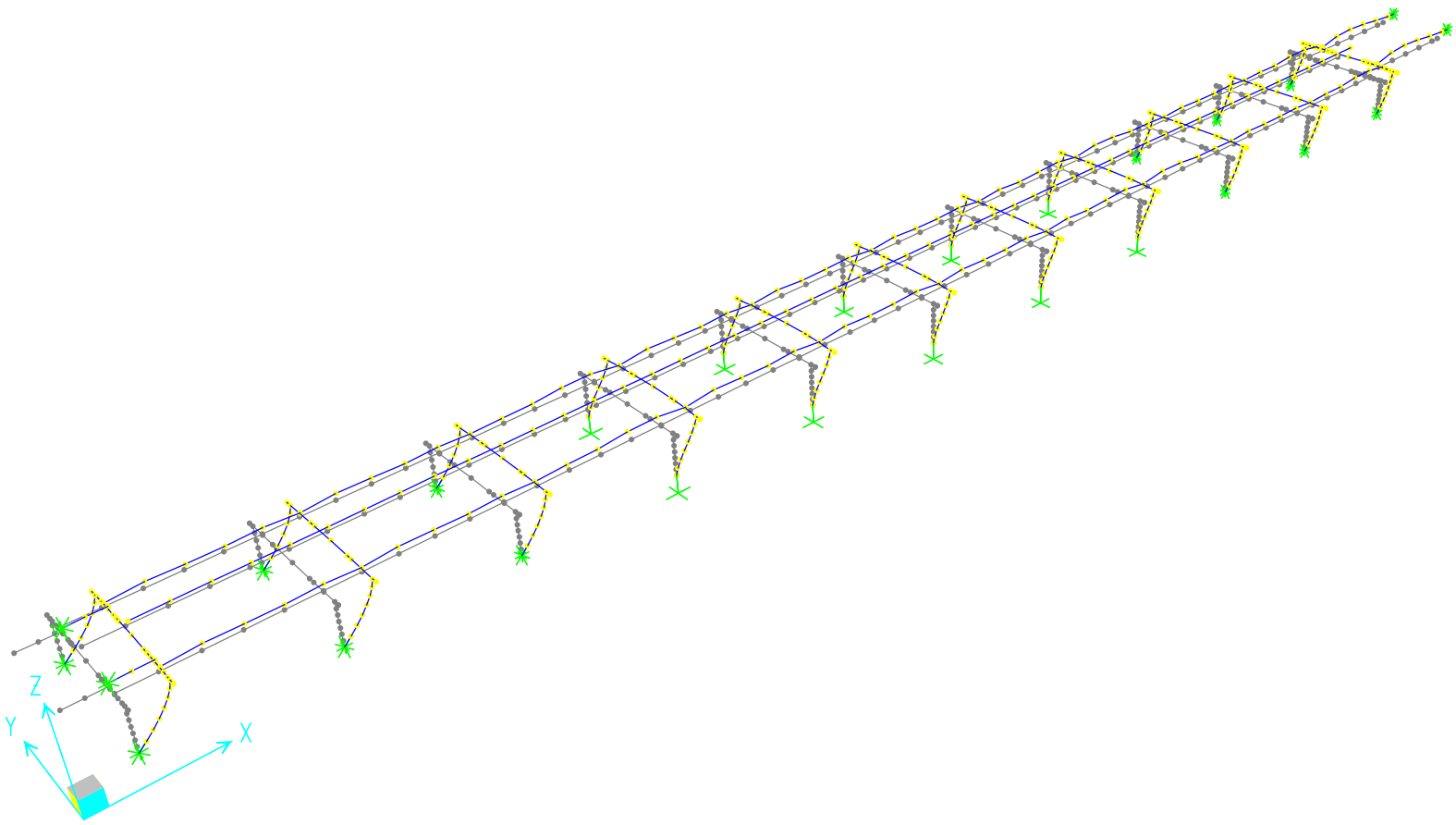
Z
Y
X

POST-PROCESSOR - MODEL 2

Project NBSD Software Development
Job No. 202253.1
By AL
Date 3/1/2022
Sheet _____ of _____

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ANALYSIS RESULTS - NODAL DISPLACEMENTS
SAP2000 BRIDGE ANALYSIS INPUT FILE DATA - Tension EQ MODEL
FORT BRAGG HSR DOWNTOWN STATION

Model : Tension EQ

1. ABUTMENT MOVEMENT

Abutment	Line Segment	Node ID
1	1	1000000
	2	2000000
11	1	1001106
	2	2001106

Gravity Loads (DL)					
UX / U1 (inches)	UY / U2 (inches)	UZ / U3 (inches)	RX / R1 (radians)	RY / R2 (radians)	RZ / R3 (radians)
0.01	0.00	0.00	0.000	0.003	0.000
0.01	0.00	0.00	0.000	0.003	0.000
0.00	0.00	0.00	0.000	0.000	0.000
0.00	0.01	0.00	0.000	0.000	0.000

Fault Parallel (FP)					
UX / U1 (inches)	UY / U2 (inches)	UZ / U3 (inches)	RX / R1 (radians)	RY / R2 (radians)	RZ / R3 (radians)
0.29	0.25	0.00	0.000	0.002	0.002
0.30	0.25	0.00	0.000	0.002	0.002
0.31	0.64	0.00	0.000	0.000	0.000
0.32	0.65	0.00	0.000	0.000	0.000

Fault Normal (FN)					
UX / U1 (inches)	UY / U2 (inches)	UZ / U3 (inches)	RX / R1 (radians)	RY / R2 (radians)	RZ / R3 (radians)
0.93	0.08	0.00	0.000	0.002	0.001
0.91	0.09	0.00	0.000	0.002	0.001
1.01	0.21	0.00	0.000	0.000	0.000
1.01	0.22	0.00	0.000	0.000	0.000

2. HINGE MOVEMENT

	Hinge Number	Hinge Node Data: Location	Hinge Node Data: Node Number
Line Segment 1	1	Depart	
		Arrive	
	2	Depart	
		Arrive	
	3	Depart	
		Arrive	
	4	Depart	
		Arrive	
	5	Depart	
		Arrive	

Gravity Loads (DL)					
UX / U1 (inches)	UY / U2 (inches)	UZ / U3 (inches)	RX / R1 (radians)	RY / R2 (radians)	RZ / R3 (radians)

Fault Parallel (FP)					
UX / U1 (inches)	UY / U2 (inches)	UZ / U3 (inches)	RX / R1 (radians)	RY / R2 (radians)	RZ / R3 (radians)

Fault Normal (FN)					
UX / U1 (inches)	UY / U2 (inches)	UZ / U3 (inches)	RX / R1 (radians)	RY / R2 (radians)	RZ / R3 (radians)

OR('1a. Trackway Alignment'!C201="",

	Hinge Number	Hinge Node Data: Location	Hinge Node Data: Node Number
Line Segment 2	1	Depart	
		Arrive	
	2	Depart	
		Arrive	
	3	Depart	
		Arrive	
	4	Depart	
		Arrive	
	5	Depart	
		Arrive	

Gravity Loads (DL)					
UX / U1 (inches)	UY / U2 (inches)	UZ / U3 (inches)	RX / R1 (radians)	RY / R2 (radians)	RZ / R3 (radians)

Fault Parallel (FP)					
UX / U1 (inches)	UY / U2 (inches)	UZ / U3 (inches)	RX / R1 (radians)	RY / R2 (radians)	RZ / R3 (radians)

Fault Normal (FN)					
UX / U1 (inches)	UY / U2 (inches)	UZ / U3 (inches)	RX / R1 (radians)	RY / R2 (radians)	RZ / R3 (radians)

Project NBSD Software Development
Job No. 202253.1
By AL
Date 3/1/2022
Sheet _____ of _____

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ANALYSIS RESULTS - NODAL DISPLACEMENTS
SAP2000 BRIDGE ANALYSIS INPUT FILE DATA - Tension EQ MODEL
FORT BRAGG HSR DOWNTOWN STATION

Model : Tension EQ

5. PIER DISPLACEMENT DEMANDS

Cracked Member Stiffness Parameters : E_{cB} = 0.90 E (Bentcap Cracked Modulus)

E_{cC} = 0.75 E (Column Cracked Modulus)

E_{PH} = 0.50 E (Column Cracked Modulus - at Plastic Hinges)

Note: Plastic hinge elements are taken as the first and last pier elements, if fixed there.

		Pier Data				Gravity Loads (DL)						Fault Parallel (FP)						Fault Normal (FN)					
Bent Number	Pier Number	L_C (feet)	Height h_C (feet)	Number of Nodes	Node Number	UX / U1 (inches)	UY / U2 (inches)	UZ / U3 (inches)	RX / R1 (radians)	RY / R2 (radians)	RZ / R3 (radians)	UX / U1 (inches)	UY / U2 (inches)	UZ / U3 (inches)	RX / R1 (radians)	RY / R2 (radians)	RZ / R3 (radians)	UX / U1 (inches)	UY / U2 (inches)	UZ / U3 (inches)	RX / R1 (radians)	RY / R2 (radians)	RZ / R3 (radians)
1	1	29.00	16.50	5	010105	0.00	0.01	-0.01	0.003	0.002	0.000	0.29	0.25	0.00	0.006	0.006	0.003	0.86	0.08	0.01	0.002	0.017	0.002
	2	-29.00	16.50	6	010206	0.00	-0.01	-0.01	-0.003	0.002	0.000	0.30	0.25	0.00	0.006	0.006	0.003	0.85	0.08	0.00	0.003	0.017	0.002
	3																						
	4																						
	5																						
2	1	29.00	16.50	5	020105	0.01	0.02	-0.01	0.006	0.000	0.000	0.29	0.35	0.01	0.009	0.006	0.002	0.86	0.11	0.00	0.003	0.016	0.001
	2	-29.00	16.50	6	020206	0.01	-0.01	-0.02	-0.006	0.000	0.000	0.29	0.34	0.00	0.010	0.006	0.002	0.84	0.10	0.00	0.003	0.016	0.001
	3																						
	4																						
	5																						
3	1	29.00	16.50	5	030105	0.00	0.02	-0.01	0.007	0.000	0.000	0.28	0.43	0.01	0.011	0.005	0.002	0.84	0.13	0.00	0.004	0.015	0.001
	2	-29.00	16.50	6	030206	0.00	-0.02	-0.01	-0.008	0.000	0.000	0.28	0.43	0.01	0.013	0.005	0.002	0.82	0.13	0.00	0.004	0.015	0.001
	3																						
	4																						
	5																						
4	1	29.00	16.50	5	040105	0.00	0.02	-0.01	0.008	0.000	0.000	0.24	0.49	0.01	0.013	0.008	0.002	0.74	0.15	0.00	0.004	0.025	0.003
	2	-29.00	16.50	6	040206	0.00	-0.02	-0.01	-0.008	0.000	0.000	0.24	0.48	0.01	0.014	0.008	0.002	0.73	0.14	0.00	0.005	0.025	0.003
	3																						
	4																						
	5																						
5	1	29.00	16.50	5	050105	0.00	0.02	-0.01	0.008	0.000	0.000	0.23	0.50	0.01	0.013	0.007	0.001	0.72	0.15	0.00	0.004	0.023	0.003
	2	-29.00	16.50	6	050206	0.00	-0.02	-0.01	-0.008	0.000	0.000	0.23	0.50	0.01	0.015	0.007	0.001	0.71	0.15	0.00	0.005	0.023	0.003
	3																						
	4																						
	5																						
6	1	29.00	16.50	5	060105	0.00	0.02	-0.01	0.008	0.000	0.000	0.22	0.49	0.01	0.013	0.007	0.001	0.72	0.15	0.00	0.004	0.023	0.003
	2	-29.00	16.50	6	060206	0.00	-0.02	-0.01	-0.009	0.000	0.000	0.22	0.49	0.01	0.015	0.007	0.001	0.71	0.15	0.00	0.005	0.023	0.003
	3																						
	4																						
	5																						
7	1	29.00	16.50	5	070105	0.00	0.02	-0.01	0.008	0.000	0.000	0.23	0.47	0.01	0.012	0.007	0.002	0.73	0.14	0.00	0.004	0.023	0.003
	2	-29.00	16.50	6	070206	0.00	-0.02	-0.01	-0.009	0.000	0.000	0.23	0.47	0.01	0.014	0.007	0.002	0.73	0.14	0.00	0.004	0.023	0.003
	3																						
	4																						
	5																						
8	1	29.00	16.50	5	080105	0.00	0.02	-0.01	0.008	0.000	0.000	0.23	0.45	0.01	0.012	0.008	0.001	0.76	0.14	0.00	0.004	0.025	0.003
	2	-29.00	16.50	6	080206	0.00	-0.02	-0.01	-0.008	0.000	0.000	0.23	0.44	0.01	0.014	0.008	0.001	0.75	0.13	0.00	0.004	0.026	0.003
	3																						
	4																						
	5																						
9	1	29.00	16.50	5	090105	0.00	0.02	-0.01	0.007	0.000	0.000	0.27	0.44	0.01	0.011	0.005	0.001	0.86	0.13	0.00	0.004	0.015	0.001
	2	-29.00	16.50	6	090206	0.00	-0.01	-0.01	-0.008	0.000	0.000	0.27	0.43	0.01	0.013	0.005	0.001	0.86	0.13	0.00	0.004	0.016	0.001
	3																						
	4																						
	5																						
10	1	29.00	16.50	5	100105	0.00	0.02	-0.01	0.006	0.000	0.000	0.29	0.44	0.01	0.011	0.006	0.001	0.90	0.13	0.00	0.004	0.018	0.001
	2	-29.00	16.50	6	100206	0.00	-0.01	-0.02	-0.007	0.000	0.000	0.29	0.43	0.01	0.014	0.006	0.001	0.89	0.13	0.00	0.004	0.018	0.001
	3																						

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Job No. 202253.1
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ANALYSIS RESULTS - NODAL DISPLACEMENTS
SAP2000 BRIDGE ANALYSIS INPUT FILE DATA - Tension EQ MODEL
FORT BRAGG HSR DOWNTOWN STATION

Model : Tension EQ

	4																						
	5																						
11	1	29.00	16.50	5	110105	0.00	0.02	-0.01	0.004	0.000	0.000	0.29	0.49	0.01	0.010	0.007	0.002	0.90	0.15	0.01	0.004	0.023	0.001
	2	-29.00	16.50	6	110206	0.00	-0.01	-0.01	-0.005	0.000	0.000	0.30	0.48	0.01	0.014	0.007	0.002	0.90	0.15	0.00	0.005	0.022	0.001
	3																						
	4																						
	5																						
	1																						
	2																						
	3																						
	4																						
	5																						

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ANALYSIS RESULTS - NODAL REACTIONS
SAP2000 BRIDGE ANALYSIS INPUT FILE DATA - Tension EQ MODEL
FORT BRAGG HSR DOWNTOWN STATION

Model : Tension EQ

		Pier Data				Gravity Loads (DL)						Fault Parallel (FP)						Fault Normal (FN)					
Bent Number	Pier Number	L_C (feet)	Height h_C (feet)	Number of Nodes	Node Number	F1 (Kips)	F2 (Kips)	F3 (Kips)	M1 (Kip-ft)	M2 (Kip-ft)	M3 (Kip-ft)	F1 (Kips)	F2 (Kips)	F3 (Kips)	M1 (Kip-ft)	M2 (Kip-ft)	M3 (Kip-ft)	F1 (Kips)	F2 (Kips)	F3 (Kips)	M1 (Kip-ft)	M2 (Kip-ft)	M3 (Kip-ft)
2	1	29.00	16.50	5.00	020100	-7	-223	804	1,196	0	0	226	957	304	8,802	0	0	665	297	111	2,716	0	0
	2	-29.00	16.50	6.00	020200	-8	228	870	-1,150	0	0	232	939	276	8,807	0	0	667	289	113	2,677	0	0
	3																						
	4																						
	5																						
3	1	29.00	16.50	5.00	030100	0	-275	802	1,473	0	0	227	1,177	404	10,899	0	0	674	364	184	3,340	0	0
	2	-29.00	16.50	6.00	030200	-1	275	828	-1,392	0	0	228	1,154	350	10,911	0	0	677	353	163	3,314	0	0
	3																						
	4																						
	5																						
4	1	29.00	16.50	5.00	040100	-6	-300	812	1,601	-65	0	604	1,319	444	12,234	5,874	158	1,839	408	194	3,753	17,903	237
	2	-29.00	16.50	6.00	040200	-7	299	823	-1,518	-72	1	610	1,288	386	12,221	5,961	163	1,857	394	174	3,706	18,146	244
	3																						
	4																						
	5																						
5	1	29.00	16.50	5.00	050100	-5	-310	815	1,654	-52	0	584	1,366	448	12,688	5,618	121	1,835	413	152	3,830	17,664	221
	2	-29.00	16.50	6.00	050200	-6	310	821	-1,577	-57	1	590	1,330	379	12,659	5,698	125	1,856	402	133	3,826	17,933	226
	3																						
	4																						
	5																						
6	1	29.00	16.50	5.00	060100	-4	-314	815	1,672	-41	-1	568	1,339	441	12,445	5,477	129	1,817	404	136	3,751	17,528	223
	2	-29.00	16.50	6.00	060200	-5	313	821	-1,597	-46	0	575	1,299	365	12,390	5,567	133	1,841	392	113	3,734	17,822	229
	3																						
	4																						
	5																						
7	1	29.00	16.50	5.00	070100	-3	-312	814	1,668	-31	-1	578	1,277	428	11,868	5,564	138	1,858	386	151	3,580	17,889	229
	2	-29.00	16.50	6.00	070200	-4	312	822	-1,584	-38	0	586	1,236	360	11,802	5,665	142	1,884	372	129	3,554	18,205	235
	3																						
	4																						
	5																						
8	1	29.00	16.50	5.00	080100	-3	-305	811	1,640	-24	-2	584	1,224	426	11,354	5,682	121	1,884	379	184	3,479	18,334	232
	2	-29.00	16.50	6.00	080200	-4	303	824	-1,532	-33	0	592	1,183	363	11,277	5,785	125	1,911	367	167	3,455	18,668	238
	3																						
	4																						
	5																						
9	1	29.00	16.50	5.00	090100	-2	-287	803	1,559	0	0	216	1,202	442	11,086	0	0	691	375	210	3,413	0	0
	2	-29.00	16.50	6.00	090200	-2	284	833	-1,422	0	0	219	1,151	362	10,955	0	0	700	361	189	3,378	0	0
	3																						
	4																						
	5																						
10	1	29.00	16.50	5.00	100100	-2	-239	752	1,314	0	0	218	1,197	465	11,092	0	0	681	366	217	3,375	0	0
	2	-29.00	16.50	6.00	100200	-3	248	892	-1,222	0	0	223	1,129	373	10,876	0	0	697	343	181	3,290	0	0
	3																						
	4																						
	5																						
11	1	29.00	16.50	5.00	110100	-9	-167	755	948	0	0	197	1,391	399	12,554	0	0	601	432	289	3,830	0	0
	2	-29.00	16.50	6.00	110200	-10	164	622	-780	0	0	211	1,308	339	12,276	0	0	621	422	268	3,875	0	0
	3																						
	4																						
	5																						
	1																						
	2																						
	3																						
	4																						
	5																						
	1																						
	2																						
	3																						
	4																						
	5																						

Sum= 16,139 Kips

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ANALYSIS RESULTS - FORCE RESULTS
SAP2000 BRIDGE ANALYSIS INPUT FILE DATA - Tension EQ MODEL
FORT BRAGG HSR DOWNTOWN STATION

Model : Tension EQ

1. DECK FORCES

Line Segment 1

Section	Element ID	Node ID	Gravity Loads (DL) F1 (Kips)	F2 (Kips)	F3 (Kips)	M1 (Kip-ft)	M2 (Kip-ft)	M3 (Kip-ft)	Fault Parallel (FP) F1 (Kips)	F2 (Kips)	F3 (Kips)	M1 (Kip-ft)	M2 (Kip-ft)	M3 (Kip-ft)	Fault Normal (FN) F1 (Kips)	F2 (Kips)	F3 (Kips)	M1 (Kip-ft)	M2 (Kip-ft)	M3 (Kip-ft)
Hinge	1000000	i	0	-26	0	8,696	0	0	8	149	15	2,122	0	0	24	411	5	2,194	0	0
		j	0	3	0	8,696	0	84	8	149	15	2,122	115	1,121	24	411	5	2,194	36	3,085
	1000001	i	0	3	0	8,696	0	84	23	148	46	2,122	115	1,121	72	410	14	2,194	36	3,085
		j	0	33	0	8,696	0	-50	23	148	46	2,122	462	2,232	72	410	14	2,194	144	6,163
Bent 1	1000100	i	-37	-148	-3	5,162	-261	-910	191	70	257	3,342	4,809	2,091	153	182	197	1,323	6,370	6,407
		j	-37	-81	-3	5,162	-215	694	191	70	257	3,342	2,012	1,307	153	182	197	1,323	3,858	3,923
	1000101	i	-37	-81	-3	5,162	-215	694	219	65	186	3,342	2,012	1,307	258	187	176	1,323	3,858	3,923
		j	-37	-14	-3	5,162	-169	1,363	219	65	186	3,342	2,684	622	258	187	176	1,323	2,376	1,368
	1000102	i	-37	-14	-3	5,162	-169	1,363	246	62	115	3,342	2,684	622	364	190	156	1,323	2,376	1,368
		j	-37	52	-3	5,162	-122	1,096	246	62	115	3,342	3,080	594	364	190	156	1,323	1,057	1,404
	1000103	i	-37	52	-3	5,162	-122	1,096	273	72	78	3,342	3,080	594	470	190	145	1,323	1,057	1,404
		j	-37	119	-3	5,162	-76	-106	273	72	78	3,342	3,483	1,284	470	190	145	1,323	2,871	3,974
	1000104	i	-37	119	-3	5,162	-76	-106	300	78	143	3,342	3,483	1,284	575	186	165	1,323	2,871	3,974
		j	-37	186	-3	5,162	-29	-2,244	300	78	143	3,342	2,911	2,338	575	186	165	1,323	4,404	6,569
Bent 2	1000200	i	-24	-170	0	2,467	-24	-2,092	246	72	237	1,903	3,100	2,135	499	166	136	875	3,088	6,091
		j	-24	-103	0	2,467	-19	-181	246	72	237	1,903	2,870	1,246	499	166	136	875	2,111	3,804
	1000201	i	-24	-103	0	2,467	-19	-181	280	64	152	1,903	2,870	1,246	606	171	111	875	2,111	3,804
		j	-24	-36	0	2,467	-15	795	280	64	152	1,903	3,822	663	606	171	111	875	1,488	1,512
	1000202	i	-24	-36	0	2,467	-15	795	314	56	80	1,903	3,822	663	712	173	89	875	1,488	1,512
		j	-24	31	0	2,467	-10	834	314	56	80	1,903	4,194	493	712	173	89	875	1,835	1,019
	1000203	i	-24	31	0	2,467	-10	834	348	69	108	1,903	4,194	493	817	175	98	875	1,835	1,019
		j	-24	97	0	2,467	-6	-62	348	69	108	1,903	3,615	1,093	817	175	98	875	2,573	3,359
	1000204	i	-24	97	0	2,467	-6	-62	382	78	198	1,903	3,615	1,093	922	173	124	875	2,573	3,359
		j	-24	164	0	2,467	-1	-1,893	382	78	198	1,903	2,465	2,149	922	173	124	875	3,138	5,768
Bent 3	1000300	i	-24	-166	1	1,172	17	-1,892	449	95	276	1,164	3,230	2,452	960	235	254	408	5,587	7,078
		j	-24	-99	1	1,172	4	-38	449	95	276	1,164	3,482	1,250	960	235	254	408	3,260	3,835
	1000301	i	-24	-99	1	1,172	4	-38	484	84	177	1,164	3,482	1,250	1,063	234	225	408	3,260	3,835
		j	-24	-32	1	1,172	-10	880	484	84	177	1,164	4,200	422	1,063	234	225	408	1,448	672
	1000302	i	-24	-32	1	1,172	-10	880	519	73	110	1,164	4,200	422	1,166	227	204	408	1,448	672
		j	-24	35	1	1,172	-23	863	519	73	110	1,164	5,097	988	1,166	227	204	408	4,109	2,636
	1000303	i	-24	35	1	1,172	-23	863	553	84	177	1,164	5,097	988	1,268	219	223	408	4,109	2,636
		j	-24	101	1	1,172	-36	-90	553	84	177	1,164	4,795	1,794	1,268	219	223	408	6,402	5,596
	1000304	i	-24	101	1	1,172	-36	-90	586	92	281	1,164	4,795	1,794	1,368	210	254	408	6,402	5,596
		j	-24	168	1	1,172	-50	-1,978	586	92	281	1,164	5,014	3,037	1,368	210	254	408	8,843	8,514
Bent 4	1000400	i	-19	-166	1	523	27	-1,919	287	107	307	667	5,060	3,279	418	269	354	355	10,911	9,787
		j	-19	-99	1	523	10	-58	287	107	307	667	4,785	1,949	418	269	354	355	7,155	6,066
	1000401	i	-19	-99	1	523	10	-58	319	98	197	667	4,785	1,949	515	277	322	355	7,155	6,066
		j	-19	-33	1	523	-6	867	319	98	197	667	4,851	940	515	277	322	355	3,498	2,295
	1000402	i	-19	-33	1	523	-6	867	351	89	129	667	4,851	940	612	281	302	355	3,498	2,295
		j	-19	34	1	523	-22	856	351	89	129	667	4,672	746	612	281	302	355	3,039	1,771
	1000403	i	-19	34	1	523	-22	856	383	103	221	667	4,672	746	710	282	329	355	3,039	1,771
		j	-19	101	1	523	-38	-90	383	103	221	667	4,729	1,759	710	282	329	355	6,730	5,589
	1000404	i	-19	101	1	523	-38	-90	414	114	334	667	4,729	1,759	806	277	362	355	6,730	5,589
		j	-19	168	1	523	-54	-1,972	414	114	334	667	6,160	3,322	806	277	362	355	10,827	9,456
Bent 5	1000500	i	-16	-166	1	164	14	-1,922	189	104	293	558	5,738	3,082	196	259	343	219	10,581	9,054
		j	-16	-100	1	164	1	-60	189	104	293	558	4,801	1,713	196	259	343	219	6,735	5,464
	1000501	i	-16	-100	1	164	1	-60	171	94	181	558	4,801	1,713	130	264	309	219	6,735	5,464
		j	-16	-33	1	164	-12	866	171	94	181	558	4,407	797	130	264	309	219	3,049	1,888
	1000502	i	-16	-33	1	164	-12	866	176	82	129	558	4,407	797	144	265	294	219	3,049	1,888
		j	-16	34	1	164	-24	856	176	82	129	558	4,050	801	144	265	294	219	3,058	1,957
	1000503	i	-16	34	1	164	-24	856	201	97	229	558	4,050	801	221	264	323	219	3,058	1,957
		j	-16	101	1	164	-37	-89	201	97	229	558	3,846	1,712	221	264	323	219	6,562	5,525
	1000504	i	-16	101	1	164	-37	-89	229	107	341	558	3,846	1,712	310	258	356	219	6,562	5,525
		j	-16	168	1	164	-50	-1,970	229	107	341	558	6,255	3,177	310	258	356	219	10,843	9,132
Bent 6	1000600	i	-14	-167	1	-101	3	-1,927	266	105	286	636	5,918	3,125	620	260	343	255	10,803	9,165
		j	-14	-100	1	-101	-8	-63	266	105	286	636	4,050	1,721	620	260	343	255	6,648	5,545
	1000601	i	-14	-100	1	-101	-8	-63	238	95	184	636	4,050	1,721	525	266	312	255	6,648	5,545
		j	-14	-33	1	-101	-18	864	238	95	184	636	3,350	798	525	266	312	255	2,839	1,943
		i																		
		j																		
		i																		
		j																		

Line Segment 2

Section	Element ID	Node ID	Gravity Loads (DL) F1 (Kips)	F2 (Kips)	F3 (Kips)	M1 (Kip-ft)	M2 (Kip-ft)	M3 (Kip-ft)	Fault Parallel (FP) F1 (Kips)	F2 (Kips)	F3 (Kips)	M1 (Kip-ft)	M2 (Kip-ft)	M3 (Kip-ft)	Fault Normal (FN) F1 (Kips)	F2 (Kips)	F3 (Kips)	M1 (Kip-ft)	M2 (Kip-ft)	M3 (Kip-ft)
Hinge	2000000	i	0	-30	0	-10,421	0	0	9	160	15	6,478	0	0	24	418	5	3,962	0	0
		j	0	-1	0	-10,421	0	118	9	160	15	6,478	115	1,202	24	418	5	3,962	38	3,132
	2000001	i	0	-1	0	-10,421	0	118	26	158	46	6,478	115	1,202	71	416	15	3,962	38	3,132
		j	0	28	0	-10,421	0	18	26	158	46	6,478	462	2,390	71	416	15	3,962	151	6,256
Bent 1	2000100	i	-45	-148	3	-5,772	300	-922	180	72	268	3,540	5,799	2,216	111	183	229	1,431	8,240	6,489
		j	-45	-82	3	-5,772	259	689	180	72	268	3,540	3,097	1,502	111	183	229	1,431	5,344	4,023
	2000101	i	-45	-82	3	-5,772	259	689	185	66	197	3,540	3,097	1,502	107	188	208	1,431	5,344	4,023
		j	-45	-15	3	-5,772	217	1,365	185	66	197	3,540	3,093	768	107	188	208	1,431	3,261	1,446
	2000102	i	-45	-15	3	-5,772	217	1,365	222	68	125	3,540	3,093	768	209	193	186	1,431	3,261	1,446
		j	-45	52	3	-5,772	175	1,105	222	68	125	3,540	3,115	649	209	193	186	1,431	1,192	1,398
	2000103	i	-45	52	3	-5,772	175	1,105	260	80	85	3,540	3,115	649	316	194	174	1,431	1,192	1,398
		j	-45	119	3	-5,772	134	-91	260	80	85	3,540	3,410	1,346	316	194	174	1,431	2,847	3,988
	2000104	i	-45	119	3	-5,772	134	-91	298	89	149	3,540	3,410	1,346	422	191	193	1,431	2,847	3,988
		j	-45	186	3	-5,772	92	-2,222	298	89	149	3,540	2,906	2,547	422	191	193	1,431	4,769	6,647
Bent 2	2000200	i	-31	-169	1	-2,640	106	-2,067	295	74	216	2,551	2,403	2,150	417	167	150	1,164	3,823	6,083
		j	-31	-102	1	-2,640	95	-165	295	74	216	2,551	3,802	1,274	417	167	150	1,164	3,053	3,802
	2000201	i	-31	-102	1	-2,640	95	-165	332	65	128	2,551	3,802	1,274	522	171	123	1,164	3,053	3,802
		j	-31	-36	1	-2,640	84	803	332	65	128	2,551	4,637	693	522	171	123	1,164	2,114	1,513
	2000202	i	-31	-36	1	-2,640	84	803	368	58	61	2,551	4,637	693	627	173	103	1,164	2,114	1,513
		j	-31	31	1	-2,640	74	834	368	58	61	2,551	4,559	509	627	173	103	1,164	1,838	1,033
	2000203	i	-31	31	1	-2,640	74	834	404	72	130	2,551	4,559	509	731	176	124	1,164	1,838	1,033
		j	-31	98	1	-2,640	63	-70	404	72	130	2,551	3,697	1,113	731	176	124	1,164	2,765	3,374
	2000204	i	-31	98	1	-2,640	63	-70	440	83	227	2,551	3,697	1,113	835	175	153	1,164	2,765	3,374
		j	-31	165	1	-2,640	52	-1,909	440	83	227	2,551	2,350	2,252	835	175	153	1,164	3,546	5,809
Bent 3	2000300	i	-28	-166	1	-1,231	67	-1,891	468	98	276	1,688	3,360	2,472	903	236	271	616	6,267	7,106
		j	-28	-99	1	-1,231	60	-38	468	98	276	1,688	3,966	1,272	903	236	271	616	3,811	3,856
	2000301	i	-28	-99	1	-1,231	60	-38	503	85	177	1,688	3,966	1,272	1,005	235	241	616	3,811	3,856
		j	-28	-32	1	-1,231	53	879	503	85	177	1,688	4,460	472	1,005	235	241	616	1,385	692
	2000302	i	-28	-32	1	-1,231	53	879	537	74	113	1,688	4,460	472	1,106	228	222	616	1,385	692
		j	-28	35	1	-1,231	45	861	537	74	113	1,688	5,352	1,015	1,106	228	222	616	4,254	2,649
	2000303	i	-28	35	1	-1,231	45	861	571	88	186	1,688	5,352	1,015	1,207	221	243	616	4,254	2,649
		j	-28	102	1	-1,231	38	-93	571	88	186	1,688	5,036	1,810	1,207	221	243	616	6,785	5,617
	2000304	i	-28	102	1	-1,231	38	-93	605	99	292	1,688	5,036	1,810	1,306	212	275	616	6,785	5,617
		j	-28	168	1	-1,231	31	-1,983	605	99	292	1,688	5,198	3,162	1,306	212	275	616	9,452	8,578
Bent 4	2000400	i	-21	-166	0	-554	-11	-1,916	292	112	310	1,128	5,322	3,330	383	272	371	484	11,591	9,839
		j	-21	-99	0	-554	-5	-57	292	112	310	1,128	5,246	1,957	383	272	371	484	7,680	6,087
	2000401	i	-21	-99	0	-554	-5	-57	323	100	200	1,128	5,246	1,957	478	279	338	484	7,680	6,087
		j	-21	-33	0	-554	2	867	323	100	200	1,128	5,218	993	478	279	338	484	3,778	2,314
	2000402	i	-21	-33	0	-554	2	867	355	90	135	1,128	5,218	993	574	282	319	484	3,778	2,314
		j	-21	34	0	-554	9	855	355	90	135	1,128	4,972	794	574	282	319	484	3,179	1,799
	2000403	i	-21	34	0	-554	9	855	386	107	229	1,128	4,972	794	670	284	347	484	3,179	1,799
		j	-21	101	0	-554	16	-92	386	107	229	1,128	5,071	1,768	670	284	347	484	7,106	5,619
	2000404	i	-21	101	0	-554	16	-92	417	121	342	1,128	5,071	1,768	766	280	381	484	7,106	5,619
		j	-21	168	0	-554	23	-1,975	417	121	342	1,128	6,397	3,442	766	280	381	484	11,400	9,533
Bent 5	2000500	i	-16	-166	-1	-194	-24	-1,920	204	112	298	684	6,040	3,181	224	262	358	267	11,184	9,133
		j	-16	-100	-1	-194	-16	-60	204	112	298	684	5,160	1,727	224	262	358	267	7,160	5,499
	2000501	i	-16	-100	-1	-194	-16	-60	184	98	186	684	5,160	1,727	150	267	325	267	7,160	5,499
		j	-16	-33	-1	-194	-9	866	184	98	186	684	4,694	858	150	267	325	267	3,255	1,917
	2000502	i	-16	-33	-1	-194	-9	866	181	83	133	684	4,694	858	136	267	309	267	3,255	1,917
		j	-16	34	-1	-194	-1	855	181	83	133	684	4,324	860	136	267	309	267	3,221	1,985
	2000503	i	-16	34	-1	-194	-1	855	201	101	234	684	4,324	860	200	267	339	267	3,221	1,985
		j	-16	101	-1	-194	6	-91	201	101	234	684	4,177	1,725	200	267	339	267	6,945	5,561
	2000504	i	-16	101	-1	-194	6	-91	228	114	346	684	4,177	1,725	286	262	373	267	6,945	5,561
		j	-16	168	-1	-194	14	-1,972	228	114	346	684	6,394	3,297	286	262	373	267	11,375	9,222
Bent 6	2000600	i	-13	-166	-1	54	-35	-1,926	275	112	291	803	6,132	3,241	636	264	357	322	11,323	9,258
		j	-13	-100	-1	54	-26	-63	275	112	291	803	4,262	1,727	636	264	357	322	6,982	5,580
	2000601	i	-13	-100	-1	54	-26	-63	247	99	188	803	4,262	1,727	542	269	327	322	6,982	5,580
		j	-13	-33	-1	54	-17	864	247	99	188	803	3,501	852	542	269	327	322	2,968	1,969
		i																		
		j																		
		i																		
		j																		

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www.NorthBaySeismicDesign.com

ANALYSIS RESULTS - FORCE RESULTS
SAP2000 BRIDGE ANALYSIS INPUT FILE DATA - Tension EQ MODEL
FORT BRAGG HSR DOWNTOWN STATION

Model : Tension EQ

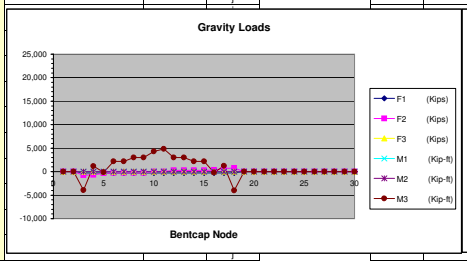
2. BENTCAP FORCES

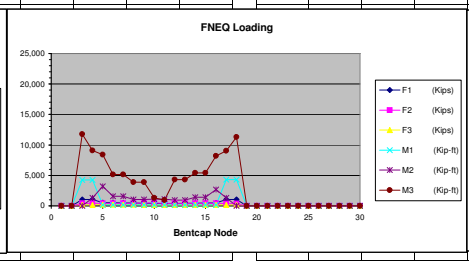
Bent Number	Node No.	Element ID	Node ID
3	1	0301	i
			j
	2	0302	i
			j
	3	0303	i
			j
	4	0304	i
			j
	5	0305	i
			j
	6	0306	i
			j
	7	0307	i
			j
	8	0308	i
			j
	9	0309	i
			j
	10	0310	i
			j
	11	0311	i
			j
	12		i
			j
	13		i
			j
	14		i
			j
	15		i
			j
	16		i
			j
	17		i
			j
	18		i
			j
	19		i
			j
	20		i
			j

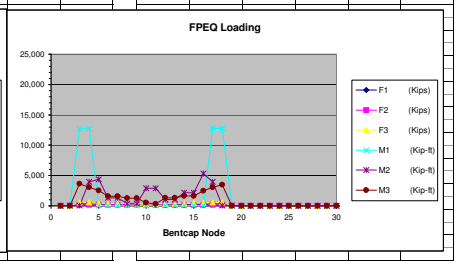
Gravity Loads (DL)					
F1 (Kips)	F2 (Kips)	F3 (Kips)	M1 (Kip-ft)	M2 (Kip-ft)	M3 (Kip-ft)
0	0	0	0	0	0
0	15	0	0	0	-19
-275	-727	0	3	0	-3,906
-275	-674	0	3	1	1,137
-276	-344	0	3	-17	-158
-276	-288	0	3	-18	2,200
-276	288	0	3	-18	2,200
-276	-267	0	3	-18	2,985
-276	-267	0	3	-18	2,985
-276	15	0	3	-20	4,334
-275	18	-2	3	-20	4,876
-275	294	-2	3	2	3,039
-275	294	-2	3	2	3,039
-275	313	-2	3	8	2,177
-275	313	-2	3	8	2,177
-275	365	-2	3	21	-193
-275	696	1	-15	5	1,215
-275	749	1	-15	0	-3,988
0	-19	0	0	0	-23
0	0	0	0	0	0
0	0	0	0	0	0
0	0	0	0	0	0

Fault Parallel (FP)					
F1 (Kips)	F2 (Kips)	F3 (Kips)	M1 (Kip-ft)	M2 (Kip-ft)	M3 (Kip-ft)
12	1	5	0	0	0
12	1	5	0	11	2
1,073	402	183	4,256	11	11,746
1,073	402	183	4,256	1,308	9,083
541	437	221	177	3,217	8,381
541	437	221	177	1,572	5,146
482	442	201	177	1,572	5,146
482	442	201	177	1,025	3,908
405	448	176	177	1,025	3,908
405	448	176	177	1,100	1,332
368	414	143	177	1,100	946
368	414	143	177	940	4,287
439	405	165	177	940	4,287
439	405	165	177	1,401	5,424
494	397	182	177	1,401	5,424
494	397	182	177	2,667	8,181
1,045	348	183	4,292	1,304	9,035
1,045	348	183	4,292	14	11,288
14	1	6	0	14	3
14	1	6	0	0	0
0	0	0	0	0	0
0	0	0	0	0	0

Fault Normal (FN)					
F1 (Kips)	F2 (Kips)	F3 (Kips)	M1 (Kip-ft)	M2 (Kip-ft)	M3 (Kip-ft)
4	0	12	0	0	0
4	0	12	0	30	1
332	183	557	12,698	30	3,661
332	183	557	12,698	3,982	3,040
259	137	415	61	4,391	2,548
259	137	415	61	1,295	1,601
241	138	355	61	1,295	1,601
241	138	355	61	356	1,243
218	140	277	61	356	1,243
218	140	277	61	2,914	529
208	128	323	61	2,914	331
208	128	323	61	1,055	1,306
229	125	395	61	1,055	1,306
229	125	395	61	2,173	1,648
246	123	450	61	2,173	1,648
246	123	450	61	5,315	2,491
320	162	557	12,776	3,975	3,039
320	162	557	12,776	36	3,476
4	0	15	0	36	1
4	0	15	0	0	0
0	0	0	0	0	0
0	0	0	0	0	0





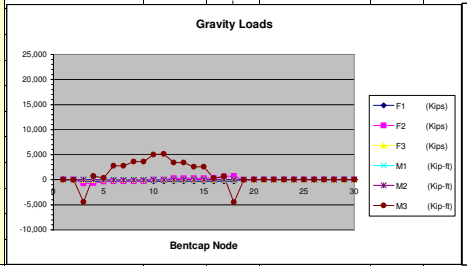


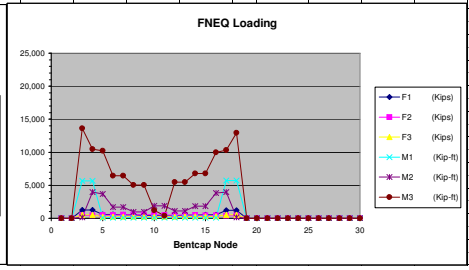
Section	Node No.	Element ID	Node ID
5	1	0501	i
			j
	2	0502	i
			j
	3	0503	i
			j
	4	0504	i
			j
	5	0505	i
			j
	6	0506	i
			j
	7	0507	i
			j
	8	0508	i
			j
	9	0509	i
			j
	10	0510	i
			j
	11	0511	i
			j
	12		i
			j
	13		i
			j
	14		i
			j
	15		i
			j
	16		i
			j
	17		i
			j
	18		i
			j
	19		i
			j
	20		i
			j

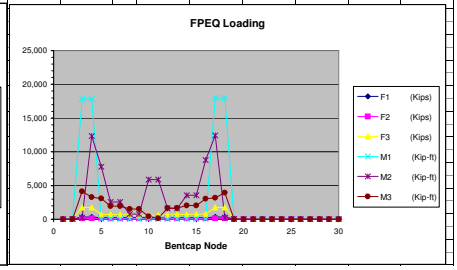
Gravity Loads (DL)					
F1 (Kips)	F2 (Kips)	F3 (Kips)	M1 (Kip-ft)	M2 (Kip-ft)	M3 (Kip-ft)
0	0	0	0	0	0
0	15	0	0	0	-19
-310	-739	-5	48	0	-4,413
-310	-686	-5	48	37	718
-310	-352	-2	0	-32	359
-310	-296	-2	0	-17	2,777
-310	-296	-2	0	-17	2,777
-310	-275	-2	0	-11	3,585
-310	-275	-2	0	-11	3,585
-310	7	-2	0	11	5,026
-310	7	1	0	11	5,152
-310	283	1	0	1	3,440
-310	283	1	0	1	3,440
-310	303	1	0	-1	2,608
-310	303	1	0	-1	2,608
-310	355	1	0	-7	310
-310	689	6	-53	40	670
-310	743	6	-53	-1	-4,485
0	-19	0	0	0	-23
0	0	0	0	0	0
0	0	0	0	0	0
0	0	0	0	0	0

Fault Parallel (FP)					
F1 (Kips)	F2 (Kips)	F3 (Kips)	M1 (Kip-ft)	M2 (Kip-ft)	M3 (Kip-ft)
13	1	4	0	0	0
13	1	4	0	9	3
1,248	445	553	5,678	128	13,593
1,248	445	553	5,678	3,957	10,477
590	507	265	114	3,669	10,229
590	507	265	114	1,691	6,465
523	513	249	114	1,691	6,465
523	513	249	114	988	5,028
436	520	227	114	988	5,028
436	520	227	114	1,889	1,227
407	479	249	114	1,889	391
407	479	249	114	1,096	5,481
487	467	269	114	1,096	5,481
487	467	269	114	1,859	6,802
549	457	284	114	1,859	6,802
549	457	284	114	3,842	9,990
1,208	376	557	5,710	3,990	10,333
1,208	376	557	5,710	133	12,938
16	1	4	0	11	3
16	1	4	0	0	0
0	0	0	0	0	0
0	0	0	0	0	0

Fault Normal (FN)					
F1 (Kips)	F2 (Kips)	F3 (Kips)	M1 (Kip-ft)	M2 (Kip-ft)	M3 (Kip-ft)
4	0	11	0	0	0
4	0	11	0	26	1
377	151	1,742	17,850	247	4,109
377	151	1,742	17,850	12,325	3,268
186	155	700	53	7,803	3,088
186	155	700	53	2,576	1,954
165	156	644	53	2,576	1,954
165	156	644	53	756	1,527
139	158	571	53	756	1,527
139	158	571	53	5,890	407
130	146	625	53	5,890	142
130	146	625	53	1,597	1,658
153	142	692	53	1,597	1,658
153	142	692	53	3,563	2,056
172	140	744	53	3,563	2,056
172	140	744	53	8,762	3,026
366	132	1,759	17,995	12,440	3,201
366	132	1,759	17,995	258	3,919
5	0	13	0	32	1
5	0	13	0	0	0
0	0	0	0	0	0
0	0	0	0	0	0







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ANALYSIS RESULTS - FORCE RESULTS
SAP2000 BRIDGE ANALYSIS INPUT FILE DATA - Tension EQ MODEL
FORT BRAGG HSR DOWNTOWN STATION

Model : Tension EQ

3. PIER FORCES

Pier Data						Gravity Loads (DL)						Fault Parallel (FP)						Fault Normal (FN)					
Bent Number	Pier Number	L_c (feet)	Height h_c (feet)	Element ID	Node ID	F1 (Kips)	F2 (Kips)	F3 (Kips)	M1 (Kip-ft)	M2 (Kip-ft)	M3 (Kip-ft)	F1 (Kips)	F2 (Kips)	F3 (Kips)	M1 (Kip-ft)	M2 (Kip-ft)	M3 (Kip-ft)	F1 (Kips)	F2 (Kips)	F3 (Kips)	M1 (Kip-ft)	M2 (Kip-ft)	M3 (Kip-ft)
1	1	29.00	16.50	010100	i	-675	-44	104	0	570	0	207	223	723	0	6,515	0	284	660	258	0	2,230	0
					j	-663	-44	104	0	226	145	207	223	723	0	4,128	735	284	660	258	0	1,379	2,177
				010104	i	-627	-44	104	0	-804	581	207	207	701	0	2,967	2,883	283	617	251	0	1,157	8,558
					j	-615	-44	104	0	-1,147	726	207	207	701	0	5,280	3,565	283	617	251	0	1,985	10,593
	2	-29.00	16.50	010200	i	-634	-46	-101	0	-504	0	211	231	700	0	6,435	0	271	667	219	0	1,994	0
					j	-624	-46	-101	0	-225	127	211	231	700	0	4,521	635	271	667	219	0	1,428	1,833
				010205	i	-584	-46	-101	0	890	636	210	213	677	0	3,144	3,108	271	623	212	0	1,088	8,995
					j	-574	-46	-101	0	1,169	764	210	213	677	0	5,005	3,695	271	623	212	0	1,668	10,708
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2	1	29.00	16.50	020100	i	-804	7	223	0	1,196	0	304	226	957	0	8,802	0	111	665	297	0	2,716	0
					j	-792	7	223	0	461	-24	304	226	957	0	5,645	747	111	665	297	0	1,735	2,195
				020104	i	-756	7	223	0	-1,743	-96	303	210	930	0	3,750	2,933	111	622	289	0	1,186	8,631
					j	-744	7	223	0	-2,477	-120	303	210	930	0	6,819	3,626	111	622	289	0	2,141	10,685
	2	-29.00	16.50	020200	i	-870	8	-228	0	-1,150	0	276	232	939	0	8,807	0	113	667	289	0	2,677	0
					j	-860	8	-228	0	-525	-21	276	232	939	0	6,225	637	113	667	289	0	1,886	1,835
				020205	i	-820	8	-228	0	1,978	-107	275	215	912	0	4,022	3,119	113	624	280	0	1,271	9,004
					j	-810	8	-228	0	2,604	-129	275	215	912	0	6,528	3,709	113	624	280	0	2,042	10,719
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3	1	29.00	16.50	030100	i	-802	0	275	0	1,473	0	404	227	1,177	0	10,899	0	184	674	364	0	3,340	0
					j	-790	0	275	0	566	-1	404	227	1,177	0	7,015	748	184	674	364	0	2,140	2,223
				030104	i	-754	0	275	0	-2,156	-2	404	211	1,146	0	4,550	2,937	184	632	354	0	1,436	8,745
					j	-743	0	275	0	-3,063	-3	404	211	1,146	0	8,332	3,633	184	632	354	0	2,605	10,829
	2	-29.00	16.50	030200	i	-828	1	-275	0	-1,392	0	350	228	1,154	0	10,911	0	163	677	353	0	3,314	0
					j	-818	1	-275	0	-636	-2	350	228	1,154	0	7,737	628	163	677	353	0	2,344	1,863
				030205	i	-778	1	-275	0	2,385	-10	350	212	1,122	0	4,856	3,079	163	635	343	0	1,509	9,149
					j	-768	1	-275	0	3,141	-13	350	212	1,122	0	7,941	3,663	163	635	343	0	2,452	10,894
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4	1	29.00	16.50	040100	i	-812	6	300	0	1,601	65	444	604	1,319	158	12,234	5,874	194	1,839	408	237	3,753	17,903
					j	-800	6	300	0	612	45	444	604	1,319	158	7,883	3,882	194	1,839	408	237	2,407	11,834
				040104	i	-764	6	300	0	-2,354	-17	443	594	1,284	158	5,074	2,065	194	1,811	398	237	1,605	6,291
					j	-752	6	300	0	-3,343	-38	443	594	1,284	158	9,311	4,024	194	1,811	398	237	2,917	12,267
	2	-29.00	16.50	040200	i	-823	7	-299	-1	-1,518	72	386	610	1,288	163	12,221	5,961	174	1,857	394	244	3,706	18,146
					j	-813	7	-299	-1	-697	53	386	610	1,288	163	8,678	4,284	174	1,857	394	244	2,623	13,040
				040205	i	-774	7	-299	-1	2,588	-24	385	599	1,253	163	5,383	2,391	174	1,828	383	244	1,678	7,294
					j	-764	7	-299	-1	3,409	-43	385	599	1,253	163	8,829	4,039	174	1,828	383	244	2,732	12,321
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5	1	29.00	16.50	050100	i	-815	5	310	0	1,654	52	448	584	1,366	121	12,688	5,618	152	1,835	413	221	3,830	17,664
					j	-803	5	310	0	631	35	448	584	1,366	121	8,181	3,691	152	1,835	413	221	2,469	11,607
				050104	i	-767	5	310	0	-2,440	-16	448	575	1,330	121	5,239	2,065	151	1,808	402	221	1,587	6,484
					j	-755	5	310	0	-3,464	-33	448	575	1,330	121	9,629	3,961	151	1,808	402	221	2,912	12,450
	2	-29.00	16.50	050200	i	-821	6	-310	-1	-1,577	57	379	590	1,330	125	12,659	5,698	133	1,856	402	226	3,826	17,933
					j	-811	6	-310	-1	-726	41	379	590	1,330	125	9,002	4,077	133	1,856	402	226	2,719	12,828
				050205	i	-771	6	-310	-1	2,681	-20	378	580	1,294	125	5,516	2,380	132	1,828	392	226	1,674	7,502
					j	-761	6	-310	-1	3,532	-36	378	580	1,294	125	9,075	3,976	132	1,828	392	226	2,751	12,529
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6	1	29.00	16.50	060100	i	-815	4	314	1	1,672	41	441	568	1,339	129	12,445	5,477	136	1,817	404	223	3,751	17,528
					j	-803	4	314	1	637	27	441	568	1,339	129	8,027	3,604	136	1,817	404	223	2,419	11,532
				060104	i	-767	4	314	1	-2,468	-15	440	559	1,305	129	5,134	1,994	136	1,790	393	223	1,549	6,379
					j	-755	4	314	1	-3,502	-29	440	559	1,305	129	9,439	3,838	136	1,790	393	223	2,847	12,285
	2	-29.00	16.50	060200	i	-821	5	-313	0	-1,597	46	365	575	1,299	133	12,390	5,567	113	1,841	392	229	3,734	17,822
					j	-811	5	-313	0	-735	33	365	575	1,299	133	8,818	3,986	113	1,841	392	229	2,657	12,760
				060205	i	-771	5	-313	0	2,713	-19	365	566	1,264	133	5,362	2,308	113	1,812	381	229	1,617	7,398
					j	-761	5	-313	0	3,575	-32	365	566	1,264	133	8,838	3,863	113	1,812	381	229	2,665	12,383
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FORT BRAGG HSR DOWNTOWN STATION

Model : Tension EQ

7	1	29.00	16.50	070100	i	-814	3	312	1	1,668	31	428	578	1,277	138	11,868	5,564	151	1,858	386	229	3,580	17,889
					j	-802	3	312	1	638	20	428	578	1,277	138	7,655	3,657	151	1,858	386	229	2,308	11,756
				070104	i	-766	3	312	1	-2,454	-14	427	569	1,244	138	4,894	2,040	150	1,831	376	229	1,483	6,564
					j	-754	3	312	1	-3,484	-25	427	569	1,244	138	8,999	3,917	150	1,831	376	229	2,723	12,605
	2	-29.00	16.50	070200	i	-822	4	-312	0	-1,584	38	360	586	1,236	142	11,802	5,665	129	1,884	372	235	3,554	18,205
					j	-812	4	-312	0	-727	27	360	586	1,236	142	8,403	4,054	129	1,884	372	235	2,530	13,023
				070205	i	-772	4	-312	0	2,700	-18	359	577	1,203	142	5,094	2,365	129	1,856	362	235	1,538	7,614
					j	-762	4	-312	0	3,557	-29	359	577	1,203	142	8,402	3,951	129	1,856	362	235	2,534	12,717
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8	1	29.00	16.50	080100	i	-811	3	305	2	1,640	24	426	584	1,224	121	11,354	5,682	184	1,884	379	232	3,479	18,334
					j	-799	3	305	2	632	14	426	584	1,224	121	7,314	3,755	184	1,884	379	232	2,227	12,118
				080104	i	-763	3	305	2	-2,390	-14	425	575	1,193	121	4,720	2,003	184	1,855	370	232	1,501	6,450
					j	-751	3	305	2	-3,398	-24	425	575	1,193	121	8,657	3,901	184	1,855	370	232	2,721	12,572
	2	-29.00	16.50	080200	i	-824	4	-303	0	-1,532	33	363	592	1,183	125	11,277	5,785	167	1,911	367	238	3,455	18,668
					j	-814	4	-303	0	-698	23	363	592	1,183	125	8,024	4,157	167	1,911	367	238	2,446	13,414
				080205	i	-775	4	-303	0	2,636	-18	362	583	1,151	125	4,893	2,327	166	1,881	358	238	1,564	7,512
					j	-765	4	-303	0	3,470	-29	362	583	1,151	125	8,059	3,929	166	1,881	358	238	2,546	12,686
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9	1	29.00	16.50	090100	i	-803	2	287	0	1,559	0	442	216	1,202	0	11,086	0	210	691	375	0	3,413	0
					j	-792	2	287	0	610	-7	442	216	1,202	0	7,119	714	210	691	375	0	2,175	2,279
				090104	i	-756	2	287	0	-2,236	-27	442	202	1,172	0	4,696	2,806	209	648	366	0	1,513	8,968
					j	-744	2	287	0	-3,184	-34	442	202	1,172	0	8,563	3,473	209	648	366	0	2,721	11,106
	2	-29.00	16.50	090200	i	-833	2	-284	0	-1,422	0	362	219	1,151	0	10,955	0	189	700	361	0	3,378	0
					j	-823	2	-284	0	-640	-4	362	219	1,151	0	7,789	604	189	700	361	0	2,386	1,926
				090205	i	-783	2	-284	0	2,489	-22	362	205	1,121	0	4,780	2,962	188	656	352	0	1,556	9,457
					j	-773	2	-284	0	3,272	-26	362	205	1,121	0	7,861	3,526	188	656	352	0	2,522	11,261
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10	1	29.00	16.50	100100	i	-752	2	239	0	1,314	0	465	218	1,197	0	11,092	0	217	681	366	0	3,375	0
					j	-740	2	239	0	527	-7	465	218	1,197	0	7,143	718	217	681	366	0	2,167	2,249
				100104	i	-704	2	239	0	-1,835	-29	465	203	1,167	0	4,622	2,822	217	637	357	0	1,434	8,841
					j	-692	2	239	0	-2,622	-36	465	203	1,167	0	8,473	3,491	217	637	357	0	2,612	10,944
	2	-29.00	16.50	100200	i	-892	3	-248	0	-1,222	0	373	223	1,129	0	10,876	0	181	697	343	0	3,290	0
					j	-882	3	-248	0	-541	-7	373	223	1,129	0	7,771	614	181	697	343	0	2,347	1,917
				100205	i	-842	3	-248	0	2,183	-35	372	208	1,099	0	4,553	3,011	181	652	334	0	1,397	9,411
					j	-832	3	-248	0	2,864	-42	372	208	1,099	0	7,575	3,582	181	652	334	0	2,315	11,203
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11	1	29.00	16.50	110100	i	-755	9	167	0	948	0	399	197	1,391	0	12,554	0	289	601	432	0	3,830	0
					j	-743	9	167	0	396	-28	399	197	1,391	0	7,964	652	289	601	432	0	2,406	1,985
				110104	i	-707	9	167	0	-1,260	-113	399	182	1,358	0	5,714	2,554	288	558	422	0	1,845	7,787
					j	-695	9	167	0	-1,812	-142	399	182	1,358	0	10,195	3,155	288	558	422	0	3,238	9,627
	2	-29.00	16.50	110200	i	-622	10	-164	0	-780	0	339	211	1,308	0	12,276	0	268	621	422	0	3,875	0
					j	-612	10	-164	0	-330	-28	339	211	1,308	0	8,678	580	268	621	422	0	2,714	1,707
				110205	i	-572	10	-164	0	1,471	-142	338	195	1,275	0	5,608	2,838	268	575	412	0	1,897	8,359
					j	-562	10	-164	0	1,921	-170	338	195	1,275	0	9,115	3,373	268	575	412	0	3,030	9,941
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