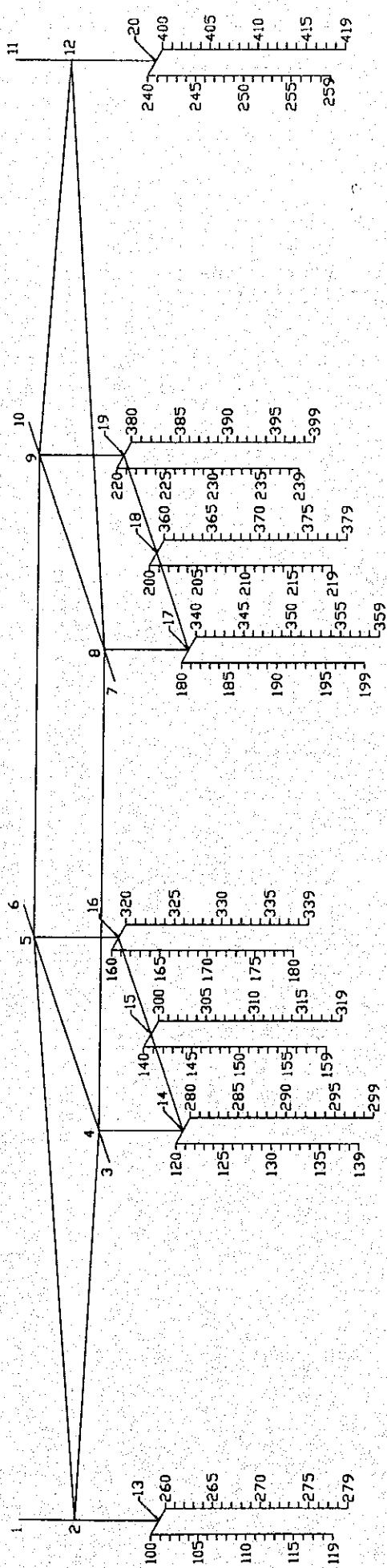
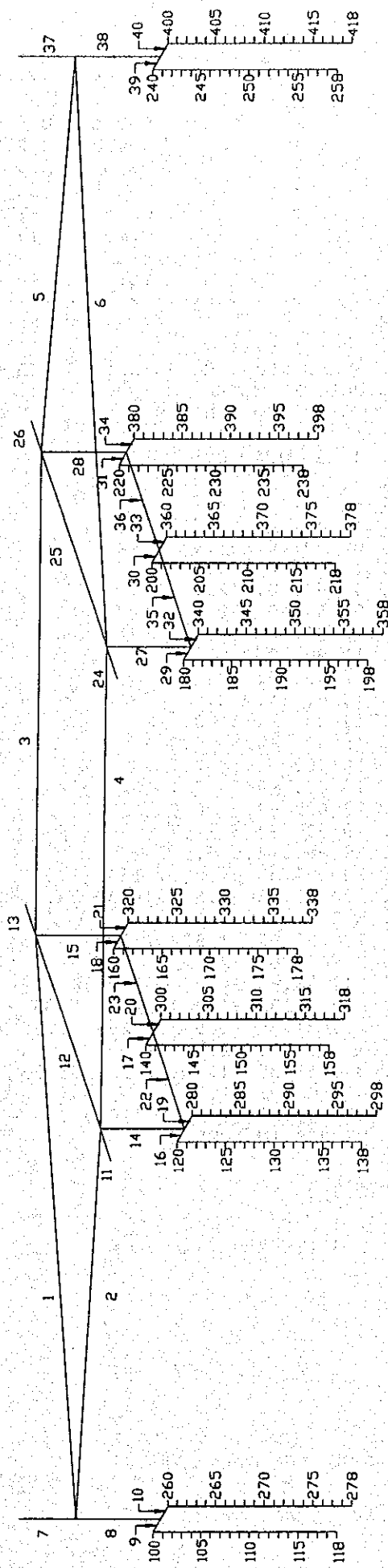


# APPENDIX 'A'



MODEL OF HATIA BRIDGE SHOWING THE JOINT NUMBERS



MODEL OF HATIA BRIDGE SHOWING THE MEMBER NUMBERS

```
*****  
*  
*          S T A A D - III          *  
*          Revision 22.3            *  
*          Proprietary Program of   *  
*          Research Engineers, Inc.  *  
*          Date=   FEB 13, 2000     *  
*          Time=   17:40:45         *  
*  
*          USER ID: Pacific Consulta *  
*****
```

1. STAAD SPACE RUPSA BRIDGE VIADUCT (THERMAL CONTRACTION)
2. UNIT KN METER
3. JOINT COORDINATES
4. 1 0. 2.0 0.
5. 2 0. 0.0 0.
6. 3 30. 0. 4.5
7. 4 30. 0. 2.7
8. 5 30. 0. -2.7
9. 6 30. 0. -4.5
10. 7 60. 0. 4.5
11. 8 60. 0. 2.7
12. 9 60. 0. -2.7
13. 10 60. 0. -4.5
14. 11 90. 2.0 0.
15. 12 90. 0.0 0.
16. 13 0. -4.0 0.
17. 14 30. -4.5 2.7
18. 15 30. -4.5 0.0
19. 16 30. -4.5 -2.7
20. 17 60. -4.5 2.7
21. 18 60. -4.5 0.0
22. 19 60. -4.5 -2.7
23. 20 90. -4.0 0.
25. 100 -1.35 -4.0 0. 119 -1.35 -32.5 0.
26. 120 28.65 -4.5 2.7 139 28.65 -33.0 2.7
27. R 2 0. 0. -2.7
28. 180 58.65 -4.5 2.7 199 58.65 -33.0 2.7
29. R 2 0. 0. -2.7
30. 240 88.65 -4.0 0. 259 88.65 -32.5 0.
31. 260 1.35 -4.0 0. 279 1.35 -32.5 0.
32. 280 31.35 -4.5 2.7 299 31.35 -33.0 2.7
33. R 2 0. 0. -2.7
34. 340 61.35 -4.5 2.7 359 61.35 -33.0 2.7
35. R 2 0. 0. -2.7
36. 400 91.35 -4.0 0. 419 91.35 -32.5 0.
38. MEMBER INCIDENCE
39. 1 2 5
40. 2 2 4
41. 3 5 9
42. 4 4 8
43. 5 9 12

44. 6 8 12  
45. 7 1 2  
46. 8 2 13  
47. 9 100 13  
48. 10 13 260  
49. 11 3 4 13  
50. 14 4 14  
51. 15 5 16  
52. 16 120 14  
53. 17 140 15  
54. 18 160 16  
55. 19 14 280  
56. 20 15 300  
57. 21 16 320  
58. 22 14 15 23  
59. 24 7 8 26  
60. 27 8 17  
61. 28 9 19  
62. 29 180 17  
63. 30 200 18  
64. 31 220 19  
65. 32 17 340  
66. 33 18 360  
67. 34 19 380  
68. 35 17 18 36  
69. 37 11 12  
70. 38 12 20  
71. 39 240 20  
72. 40 20 400  
74. 100 100 101 118  
75. R 15 20 20  
78. MEMBER PROPERETY  
80. 1 TO 6 PRI YD 2.017 ZD 2.017  
81. 7 37 PRI YD 0.45 ZD 9.65  
82. 8 38 PRI YD 1.35 ZD 9.65  
83. 9 10 39 40 PRI YD 1.00 ZD 10.5  
84. 11 TO 13 24 TO 26 PRI YD 0.9 ZD 1.65  
85. 14 15 27 28 PRI YD 1.20 ZD 1.20  
86. 16 TO 21 29 TO 34 PRI YD 1.2 ZD 2.70  
87. 22 23 35 36 PRI YD 1.2 ZD 4.2  
89. 100 TO 118 260 TO 278 PRI YD 1.8  
90. 120 TO 138 280 TO 298 PRI YD 0.9  
91. 140 TO 158 300 TO 318 PRI YD 0.9  
92. 160 TO 178 320 TO 338 PRI YD 0.9  
93. 180 TO 198 340 TO 358 PRI YD 0.9  
94. 200 TO 218 360 TO 378 PRI YD 0.9  
95. 220 TO 238 380 TO 398 PRI YD 0.9  
96. 240 TO 258 400 TO 418 PRI YD 1.8  
98. \*  
99. MEMBER RELEASES  
100. 1 TO 6 START MX MY MZ  
101. 1 TO 6 END MX MY MZ  
103. CONSTANTS  
104. E 27.98E6 LIST 1 TO 6  
105. E 25.91E6 LIST 7 TO 40 400 TO 418  
106. E 25.91E6 LIST 100 TO 118 120 TO 138 140 TO 158 160 TO 178 180 TO 198

107. E 25.91E6 LIST 200 TO 218 220 TO 238 240 TO 258 260 TO 278 280 TO 298  
 108. E 25.91E6 LIST 300 TO 318 320 TO 338 340 TO 358 360 TO 378 380 TO 398  
 109. ALPHA 1.08E-5 1 TO 6  
 110. DEN CON LIST 7 TO 40  
 111. \*  
 112. SUPPORT  
 113. \*ABUTMENT  
 114. 101 241 261 401 FIXED BUT FY MX MY MZ KFX 42222 KFZ 42222  
 115. 102 242 262 402 FIXED BUT FY MX MY MZ KFX 48405 KFZ 48405  
 116. 103 243 263 403 FIXED BUT FY MX MY MZ KFX 53000 KFZ 53000  
 117. 104 244 264 404 FIXED BUT FY MX MY MZ KFX 56893 KFZ 56893  
 118. 105 245 265 405 FIXED BUT FY MX MY MZ KFX 60360 KFZ 60360  
 119. 106 246 266 406 FIXED BUT FY MX MY MZ KFX 63528 KFZ 63528  
 120. 107 247 267 407 FIXED BUT FY MX MY MZ KFX 66473 KFZ 66473  
 121. 108 248 268 408 FIXED BUT FY MX MY MZ KFX 69242 KFZ 69242  
 122. 109 249 269 409 FIXED BUT FY MX MY MZ KFX 71866 KFZ 71866  
 123. 110 250 270 410 FIXED BUT FY MX MY MZ KFX 74369 KFZ 74369  
 124. 111 251 271 411 FIXED BUT FY MX MY MZ KFX 76769 KFZ 76769  
 125. 112 252 272 412 FIXED BUT FY MX MY MZ KFX 194683 KFZ 194683  
 126. 113 253 273 413 FIXED BUT FY MX MY MZ KFX 196914 KFZ 196914  
 127. 114 254 274 414 FIXED BUT FY MX MY MZ KFX 199075 KFZ 199075  
 128. 115 255 275 415 FIXED BUT FY MX MY MZ KFX 201172 KFZ 201172  
 129. 116 256 276 416 FIXED BUT FY MX MY MZ KFX 203212 KFZ 203212  
 130. 117 257 277 417 FIXED BUT FY MX MY MZ KFX 205200 KFZ 205200  
 131. 118 258 278 418 FIXED BUT FY MX MY MZ KFX 207141 KFZ 207141  
 132. \*PIER 1  
 133. 124 144 164 284 304 324 FIXED BUT FY MX MY MZ KFX 10555 KFZ 10555  
 134. 125 145 165 285 305 325 FIXED BUT FY MX MY MZ KFX 12101 KFZ 12101  
 135. 126 146 166 286 306 326 FIXED BUT FY MX MY MZ KFX 13250 KFZ 13250  
 136. 127 147 167 287 307 327 FIXED BUT FY MX MY MZ KFX 14223 KFZ 14223  
 137. 128 148 168 288 308 328 FIXED BUT FY MX MY MZ KFX 15090 KFZ 15090  
 138. 129 149 169 289 309 329 FIXED BUT FY MX MY MZ KFX 15882 KFZ 15882  
 139. 130 150 170 290 310 330 FIXED BUT FY MX MY MZ KFX 16618 KFZ 16618  
 140. 131 151 171 291 311 331 FIXED BUT FY MX MY MZ KFX 46212 KFZ 46212  
 141. 132 152 172 292 312 332 FIXED BUT FY MX MY MZ KFX 46868 KFZ 46868  
 142. 133 153 173 293 313 333 FIXED BUT FY MX MY MZ KFX 47493 KFZ 47493  
 143. 134 154 174 294 314 334 FIXED BUT FY MX MY MZ KFX 48093 KFZ 48093  
 144. 135 155 175 295 315 335 FIXED BUT FY MX MY MZ KFX 48671 KFZ 48671  
 145. 136 156 176 296 316 336 FIXED BUT FY MX MY MZ KFX 49229 KFZ 49229  
 146. 137 157 177 297 317 337 FIXED BUT FY MX MY MZ KFX 49769 KFZ 49769  
 147. 138 158 178 298 318 338 FIXED BUT FY MX MY MZ KFX 50293 KFZ 50293  
 148. \*PIER 2  
 149. 184 204 224 344 364 384 FIXED BUT FY MX MY MZ KFX 10555 KFZ 10555  
 150. 185 205 225 345 365 385 FIXED BUT FY MX MY MZ KFX 12101 KFZ 12101  
 151. 186 206 226 346 366 386 FIXED BUT FY MX MY MZ KFX 13250 KFZ 13250  
 152. 187 207 227 347 367 387 FIXED BUT FY MX MY MZ KFX 14223 KFZ 14223  
 153. 188 208 228 348 368 388 FIXED BUT FY MX MY MZ KFX 15090 KFZ 15090  
 154. 189 209 229 349 369 389 FIXED BUT FY MX MY MZ KFX 15882 KFZ 15882  
 155. 190 210 230 350 370 390 FIXED BUT FY MX MY MZ KFX 16618 KFZ 16618  
 156. 191 211 231 351 371 391 FIXED BUT FY MX MY MZ KFX 46212 KFZ 46212  
 157. 192 212 232 352 372 392 FIXED BUT FY MX MY MZ KFX 46868 KFZ 46868  
 158. 193 213 233 353 373 393 FIXED BUT FY MX MY MZ KFX 47493 KFZ 47493  
 159. 194 214 234 354 374 394 FIXED BUT FY MX MY MZ KFX 48093 KFZ 48093  
 160. 195 215 235 355 375 395 FIXED BUT FY MX MY MZ KFX 48671 KFZ 48671  
 161. 196 216 236 356 376 396 FIXED BUT FY MX MY MZ KFX 49229 KFZ 49229  
 162. 197 217 237 357 377 397 FIXED BUT FY MX MY MZ KFX 49769 KFZ 49769

163. 198 218 238 358 378 398 FIXED BUT FY MX MY MZ KFX 50293 KFZ 50293  
 165. 119 TO 419 BY 20 PINNED  
 166. \*  
 167. LOAD 1 : DEAD LOAD  
 168. SELFWEIGHT Y -1.0  
 169. MEM LOAD  
 170. 11 24 CON GY -1255.0 0.85  
 171. 12 25 CON GY -1255.0 1.45  
 172. 12 25 CON GY -1255.0 3.95  
 173. 13 26 CON GY -1255.0 1.04  
 174. 9 40 UNI GY -1023.0  
 175. JOINT LOAD  
 176. 2 FY -2691.0 MZ -609.0  
 177. 12 FY -2691.0 MZ 609.0  
 179. LOAD 2 : LIVE LOAD FROM SUPERSTRUCTURE  
 180. MEM LOAD  
 181. 11 24 CON GY -300.0 0.85  
 182. 12 25 CON GY -300.0 1.45  
 183. 12 25 CON GY -300.0 3.95  
 184. 13 26 CON GY -300.0 1.04  
 185. JOINT LOAD  
 186. 2 FY -600.0 MZ -165.0  
 187. 12 FY -600.0 MZ 165.0  
 189. LOAD 3 : WIND LOAD ON STRUCTURE  
 190. JOI LOAD  
 191. 3 7 FZ -422.0  
 192. 4 5 8 9 FX 50.5  
 193. LOAD 4 : WIND LOAD ON LIVE LOAD  
 194. JOI LOAD  
 195. 3 7 FZ -91.0  
 196. 4 5 8 9 FX 18.0  
 198. LOAD 5 : LONGITUDINAL FORCES  
 199. JOI LOAD  
 200. 4 5 8 9 FX 20.0  
 202. LOAD 6 : TEMPARATURE LOAD  
 203. TEMP LOAD  
 204. 1 TO 6 TEMP -19.0  
 205. 1 TO 6 STRAIN -9.39E-3  
 206. \* BACK FILL PRESSURE  
 207. MEMBER LOAD  
 208. 7 TRAP GX 0. 107.4  
 209. 8 TRAP GX 107.4 322.3  
 210. 37 TRAP GX 0. -107.4  
 211. 38 TRAP GX -107.4 -322.3  
 213. \*  
 214. LOAD COMB 7 : AASHTO LOAD COMB. I 1.3[(DL+1.67(LL+I))  
 215. 1 1.3 2 2.17  
 216. LOAD COMB 8 : AASHTO LOAD COMB. II 1.3(0.75DL+W)  
 217. 1 0.975 3 1.3  
 218. LOAD COMB 9 : AASHTO LOAD COMB. III 1.3(0.75DL+(LL+I)+0.3W+WL+LF)  
 219. 1 0.975 2 1.3 3 0.39 4 1.3 5 1.3  
 221. LOAD COMB 10 : AASHTO LOAD COMB. IV 1.3[(0.75DL+(LL+I)+(R+S+T))  
 222. 1 0.975 2 1.3 6 1.3  
 223. LOAD COMB 11 : AASHTO LOAD COMB. V 1.25[(0.75DL+W+(R+S+T))  
 224. 1 0.9375 3 1.25 6 1.25  
 225. LOAD COMB 12 : AASHTO LOAD COMB. VI 1.25[(0.75DL+(LL+I)+0.3W+WL+LF+(R+S+T))

226. 1 0.9375 2 1.25 3 0.375 4 1.25 5 1.25 6 1.25  
227. \*  
228. LOAD COM 13 : DEAD LOAD + LIVE LOAD (SERVICE LOAD)  
229. 1 1.0 2 1.0  
230. LOAD COMB 14 : DEAD LOAD + WIND LOAD + (R+S+T) (SERVICE LOAD)  
231. 1 1.0 3 1.0 6 1.0  
232. \*  
233. PDELTA ANALYSIS

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

NUMBER OF JOINTS/MEMBER+ELEMENTS/SUPPORTS = 340/ 344/ 268  
ORIGINAL/FINAL BAND-WIDTH = 301/ 15  
TOTAL PRIMARY LOAD CASES = 6, TOTAL DEGREES OF FREEDOM = 1992  
SIZE OF STIFFNESS MATRIX = 191232 DOUBLE PREC. WORDS  
REQD/AVAIL. DISK SPACE = 13.70/ 1443.8 MB, EXMEM = 1961.7 MB

++ Processing Element Stiffness Matrix.	17:40:46
++ Processing Global Stiffness Matrix.	17:40:46
++ Processing Triangular Factorization.	17:40:46
++ Calculating Joint Displacements.	17:40:47
++ Adjusting Displacements	17:40:47
++ Calculating Member Forces.	17:40:47

234. LOAD LIST 14  
235. PRINT JOINT DISPLACEMENT LIST 1 TO 20

JOINT DISPLACEMENT (CM    RADIANS)    STRUCTURE TYPE = SPACE

JOINT	LOAD	X-TRANS	Y-TRANS	Z-TRANS	X-ROTAN	Y-ROTAN	Z-ROTAN
1	14	2.8299	-.1485	-.3848	-.0004	.0000	-.0023
2	14	2.3664	-.1483	-.3138	-.0004	.0000	-.0023
3	14	.8515	-.1921	-.7254	-.0001	.0000	-.0006
4	14	.8434	-.2103	-.7234	-.0003	.0000	-.0006
5	14	.8192	-.2957	-.7199	-.0002	.0000	-.0006
6	14	.8112	-.3779	-.7199	-.0005	.0000	-.0006
7	14	-.7140	-.1921	-.7254	-.0001	.0000	.0005
8	14	-.7060	-.2103	-.7234	-.0003	.0000	.0005
9	14	-.6817	-.2957	-.7200	-.0002	.0000	.0005
10	14	-.6737	-.3779	-.7200	-.0005	.0000	.0005
11	14	-2.6673	-.1485	-.3847	-.0004	.0000	.0022
12	14	-2.2311	-.1483	-.3138	-.0004	.0000	.0022
13	14	1.4994	-.1442	-.1716	-.0004	.0000	-.0019
14	14	.6136	-.1784	-.5944	-.0001	.0000	-.0003
15	14	.6022	-.1937	-.5942	-.0001	.0000	-.0003
16	14	.5914	-.2614	-.5942	-.0003	.0000	-.0003
17	14	-.5140	-.1784	-.5945	-.0001	.0000	.0003
18	14	-.5026	-.1937	-.5943	-.0001	.0000	.0003
19	14	-.4918	-.2614	-.5943	-.0003	.0000	.0003
20	14	-1.4158	-.1442	-.1716	-.0004	.0000	.0018

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

- 236. LOAD LIST 13 14
- 237. PRINT MEMBER FORCES LIST 100 TO 400 BY 20



MEMBER END FORCES      STRUCTURE TYPE = SPACE

-----  
 ALL UNITS ARE -- KN    METE

MEMBER	LOAD	JT	AXIAL	SHEAR-Y	SHEAR-Z	TORSION	MOM-Y	MOM-Z
100	13	100	3440.04	-67.75	-.91	.00	-3.67	-398.13
		101	-3440.04	67.75	.91	.00	5.05	296.75
	14	100	-2359.61	1485.71	-82.99	.00	-332.12	1945.19
		101	2359.61	-1485.71	82.99	.00	456.53	268.55
120	13	120	1397.95	-5.05	-5.35	.00	36.94	-34.91
		121	-1397.95	5.05	5.35	.00	-29.05	27.47
	14	120	721.13	35.35	-46.21	.00	219.27	139.83
		121	-721.13	-35.35	46.21	.00	-150.21	-86.83
140	13	140	1231.91	-4.44	.28	.00	-1.95	-30.71
		141	-1231.91	4.44	-.28	.00	1.54	24.16
	14	140	816.91	34.75	-43.47	.00	201.25	137.68
		141	-816.91	-34.75	43.47	.00	-136.05	-85.60
160	13	160	1420.03	-5.15	6.00	.00	-41.51	-35.56
		161	-1420.03	5.15	-6.00	.00	32.67	27.98
	14	160	1173.98	31.87	-36.96	.00	157.00	119.68
		161	-1173.98	-31.87	36.96	.00	-101.30	-71.86
180	13	180	1397.99	-5.07	-5.36	.00	36.99	-35.02
		181	-1397.99	5.07	5.36	.00	-29.09	27.55
	14	180	1181.67	-35.79	-47.17	.00	223.98	-161.52
		181	-1181.67	35.79	47.17	.00	-153.49	107.81
200	13	200	1231.93	-4.44	.27	.00	-1.90	-30.73
		201	-1231.93	4.44	-.27	.00	1.51	24.17
	14	200	1253.57	-35.73	-44.42	.00	205.88	-162.98
		201	-1253.57	35.73	44.42	.00	-139.26	109.35
220	13	220	1420.03	-5.13	5.99	.00	-41.46	-35.48
		221	-1420.03	5.13	-5.99	.00	32.63	27.93
	14	220	1630.55	-35.70	-37.88	.00	161.54	-164.56
		221	-1630.55	35.70	37.88	.00	-104.46	111.02
240	13	240	3332.39	-61.65	-.91	.00	-3.67	-435.25
		241	-3332.39	61.65	.91	.00	5.05	343.15
	14	240	8209.32	-1506.56	-82.98	.00	-332.07	-2610.74
		241	-8209.32	1506.56	82.98	.00	456.47	336.22
260	13	260	3332.39	61.65	-.91	.00	-3.67	435.25
		261	-3332.39	-61.65	.91	.00	5.05	-343.15
	14	260	8532.07	1588.70	-82.98	.00	-331.81	2717.88
		261	-8532.07	-1588.70	82.98	.00	456.38	-320.13

MEMBER END FORCES      STRUCTURE TYPE = SPACE

-----  
 ALL UNITS ARE -- KN      METE

MEMBER	LOAD	JT	AXIAL	SHEAR-Y	SHEAR-Z	TORSION	MOM-Y	MOM-Z
280	13	280	1397.99	5.07	-5.36	.00	36.99	35.02
		281	-1397.99	-5.07	5.36	.00	-29.09	-27.55
	14	280	1223.00	42.06	-47.15	.00	223.97	187.90
		281	-1223.00	-42.06	47.15	.00	-153.48	-124.82
300	13	300	1231.94	4.44	.27	.00	-1.90	30.73
		301	-1231.94	-4.44	-.27	.00	1.51	-24.17
	14	300	1292.96	42.08	-44.39	.00	205.87	190.08
		301	-1292.96	-42.08	44.39	.00	-139.26	-126.92
320	13	320	1420.04	5.13	5.99	.00	-41.46	35.48
		321	-1420.04	-5.13	-5.99	.00	32.63	-27.93
	14	320	1671.86	41.93	-37.85	.00	161.53	190.96
		321	-1671.86	-41.93	37.85	.00	-104.47	-128.05
340	13	340	1397.94	5.05	-5.35	.00	36.94	34.91
		341	-1397.94	-5.05	5.35	.00	-29.05	-27.47
	14	340	762.44	-29.08	-46.20	.00	219.30	-113.45
		341	-762.44	29.08	46.20	.00	-150.25	69.83
360	13	360	1231.92	4.44	.28	.00	-1.95	30.71
		361	-1231.92	-4.44	-.28	.00	1.54	-24.16
	14	360	856.25	-28.39	-43.45	.00	201.27	-110.58
		361	-856.25	28.39	43.45	.00	-136.07	68.02
380	13	380	1420.04	5.15	6.00	.00	-41.51	35.56
		381	-1420.04	-5.15	-6.00	.00	32.67	-27.98
	14	380	1215.35	-25.64	-36.93	.00	157.00	-93.28
		381	-1215.35	25.64	36.93	.00	-101.31	54.83
400	13	400	3440.05	67.75	-.91	.00	-3.67	398.13
		401	-3440.05	-67.75	.91	.00	5.05	-296.76
	14	400	-2036.81	-1403.54	-82.97	.00	-331.77	-1838.04
		401	2036.81	1403.54	82.97	.00	456.32	-252.45

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

238. LOAD LIST 7 TO 12  
 239. PRINT MAXF ENV LIST 11 12 13 24 25 26

MEMBER FORCE ENVELOPE  
 -----

ALL UNITS ARE KN METE

MAX AND MIN FORCE VALUES AMONGST ALL SECTION LOCATIONS

MEMB		FY/ FZ	DIST DIST	LD LD	MZ/ MY	DIST DIST	LD LD	FX	DIST	LD
11	MAX	.00	.00	8	2242.06	1.80	7			
		.00	.00	9	.04	1.80	8	548.63 C	.00	8
	MIN	-2364.37	1.80	7	.00	.00	7			
		.00	1.80	10	-.01	1.65	10	.00 C	1.80	10
12	MAX	2378.22	.00	7	2499.18	5.40	7			
		1.17	.00	8	3.63	5.40	11	327.78 C	.00	11
	MIN	-2432.40	5.40	7	-1056.96	2.25	7			
		.01	5.40	10	-3.14	.00	8	102.01 T	5.40	7
13	MAX	2364.37	.00	7	2447.49	.00	7			
		.00	.00	11	.01	1.65	11	.00 T	.00	10
	MIN	.00	1.80	8	.00	1.80	12			
		.00	1.80	7	.00	.00	8	.01 T	1.80	8
24	MAX	.00	.00	11	2242.06	1.80	7			
		.01	.00	12	.00	1.80	10	548.59 C	.00	8
	MIN	-2364.38	1.80	7	.00	.00	7			
		.00	1.80	7	-.04	1.80	8	.00 C	1.80	7
25	MAX	2378.22	.00	7	2499.18	5.40	7			
		-.01	.00	10	3.23	.00	8	318.66 C	.00	11
	MIN	-2432.40	5.40	7	-1056.96	2.25	7			
		-1.18	5.40	8	-3.55	5.40	11	102.01 T	5.40	7
26	MAX	2364.37	.00	7	2447.49	.00	7			
		.01	.00	11	.01	1.80	11	.03 C	.00	8
	MIN	.00	1.80	8	.00	1.80	10			
		.00	1.80	7	-.01	.00	12	.00 T	1.80	7

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

240. PRINT MEMBER FORCES LIST 14 15 27 28

MEMBER END FORCES      STRUCTURE TYPE = SPACE

ALL UNITS ARE -- KN    METE

MEMBER	LOAD	JT	AXIAL	SHEAR-Y	SHEAR-Z	TORSION	MOM-Y	MOM-Z
14	7	4	4742.60	.04	-99.67	-.04	-110.85	.04
		14	-4941.08	-.04	99.67	.04	559.60	.16
	8	4	2470.88	14.28	-222.08	-3.18	249.77	3.32
		14	-2619.74	-14.28	222.08	3.18	749.61	60.91
	9	4	3302.14	13.97	-158.06	-1.63	83.06	1.73
		14	-3451.00	-13.97	158.06	1.63	628.32	61.11
	10	4	3361.61	136.01	-71.43	.49	-77.81	.03
		14	-3510.47	-136.01	71.43	-.49	399.38	612.00
	11	4	2375.84	144.48	-214.83	-2.56	241.88	3.20
		14	-2518.98	-144.48	214.83	2.56	724.88	646.94
	12	4	3175.14	144.18	-153.27	-1.08	81.58	1.67
		14	-3318.27	-144.18	153.27	1.08	608.25	647.13
15	7	5	4796.77	.00	102.35	-.04	51.69	-.04
		16	-4995.25	.00	-102.35	.04	-512.03	.02
	8	5	2730.61	10.22	-111.23	-3.27	340.93	-3.32
		16	-2879.48	-10.22	111.23	3.27	159.92	49.35
	9	5	3459.37	11.85	-12.66	-1.73	196.07	-1.73
		16	-3608.23	-11.85	12.66	1.73	-138.87	55.08
	10	5	3399.91	135.97	73.32	-.54	36.00	-.03
		16	-3548.77	-135.97	-73.32	.54	-365.75	611.90
	11	5	2625.59	140.58	-105.66	-3.63	326.10	-3.20
		16	-2768.73	-140.58	105.66	3.63	149.66	635.82
	12	5	3326.32	142.15	-10.88	-2.15	186.81	-1.66
		16	-3469.45	-142.15	10.88	2.15	-137.63	641.34
27	7	8	4742.60	-.04	-99.67	.04	-110.85	-.04
		17	-4941.08	.04	99.67	-.04	559.59	-.16
	8	8	2470.87	10.24	-221.99	3.28	249.66	-3.33
		17	-2619.73	-10.24	221.99	-3.28	749.30	49.38
	9	8	3302.14	11.83	-157.95	1.73	82.92	-1.73
		17	-3451.00	-11.83	157.95	-1.73	627.96	54.98
	10	8	3361.61	-136.01	-71.42	-.49	-77.81	-.03
		17	-3510.47	136.01	71.42	.49	399.38	-612.00
	11	8	2375.84	-120.90	-214.75	2.66	241.77	-3.20
		17	-2518.97	120.90	214.75	-2.66	724.59	-540.89
	12	8	3175.13	-119.37	-153.17	1.17	81.45	-1.67
		17	-3318.27	119.37	153.17	-1.17	607.92	-535.51
28	7	9	4796.77	.00	102.35	.04	51.69	.04
		19	-4995.25	.00	-102.35	-.04	-512.03	-.02
	8	9	2730.62	14.28	-111.35	3.18	341.10	3.33
		19	-2879.49	-14.28	111.35	-3.18	160.30	60.96
	9	9	3459.37	13.94	-12.78	1.63	196.23	1.73
		19	-3608.24	-13.94	12.78	-1.63	-138.49	61.01

MEMBER END FORCES      STRUCTURE TYPE = SPACE

-----  
ALL UNITS ARE -- KN    METE

MEMBER	LOAD	JT	AXIAL	SHEAR-Y	SHEAR-Z	TORSION	MOM-Y	MOM-Z
10		9	3399.91	-135.97	73.32	.54	36.00	.03
		19	-3548.77	135.97	-73.32	-.54	-365.75	-611.90
11		9	2625.60	-117.02	-105.78	3.55	326.27	3.20
		19	-2768.74	117.02	105.78	-3.55	150.04	-529.75
12		9	3326.32	-117.34	-11.00	2.06	186.97	1.67
		19	-3469.46	117.34	11.00	-2.06	-137.26	-529.71

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

241. PRINT MAXF ENV LIST 16 TO 21 29 TO 34

MEMBER FORCE ENVELOPE

-----

ALL UNITS ARE KN      METE

MAX AND MIN FORCE VALUES AMONGST ALL SECTION LOCATIONS

MEMB		FY/ FZ	DIST DIST	LD LD	MZ/ MY	DIST DIST	LD LD		FX	DIST	LD
16	MAX	1999.13	.00	7	50.02	.00	7				
		58.74	.00	8	79.28	1.35	8	7.23 C	.00	7	
	MIN	433.22	1.35	11	-2558.37	1.35	7				
		5.52	1.35	10	-.05	.00	11	45.58 T	1.35	11	
17	MAX	1756.09	.00	7	43.89	.00	7				
		56.56	.00	8	76.38	1.35	8	6.34 C	.00	7	
	MIN	595.09	1.35	11	-2236.40	1.35	7				
		-.41	1.35	7	-.55	1.35	7	44.55 T	1.35	11	
18	MAX	2031.55	.00	7	51.00	.00	7				
		49.56	.00	8	66.92	1.35	8	7.38 C	.00	7	
	MIN	993.73	1.35	11	-2601.17	1.35	7				
		-8.81	1.35	7	-11.89	1.35	7	41.42 T	1.35	12	
19	MAX	-805.08	.00	8	234.07	1.35	12				
		-5.55	.00	10	80.88	.00	8	52.38 C	.00	12	
	MIN	-1999.25	1.35	7	-2558.34	.00	7				
		-59.91	1.35	8	-.01	1.35	9	7.27 C	1.35	7	
20	MAX	-953.61	.00	8	236.07	1.35	12				
		.39	.00	7	77.98	.00	8	52.43 C	.00	12	
	MIN	-1756.17	1.35	7	-2236.46	.00	7				
		-57.76	1.35	8	-.53	.00	7	6.36 C	1.35	7	
21	MAX	-1382.80	.00	8	236.26	1.35	12				
		8.79	.00	7	68.52	.00	8	52.31 C	.00	12	
	MIN	-2031.60	1.35	7	-2601.33	.00	7				
		-50.73	1.35	8	-11.87	.00	7	7.36 C	1.35	7	
29	MAX	1999.27	.00	7	226.29	.00	10				
		59.95	.00	8	80.93	1.35	8	49.99 C	.00	10	
	MIN	751.35	1.35	8	-2558.34	1.35	7				
		5.55	1.35	10	-.02	.00	9	.21 C	1.35	8	
30	MAX	1756.17	.00	7	226.96	.00	10				
		57.85	.00	8	78.07	1.35	8	50.18 C	.00	10	
	MIN	902.41	1.35	8	-2236.44	1.35	7				
		-.39	1.35	7	-.53	1.35	7	.43 T	1.35	8	
31	MAX	2031.60	.00	7	226.77	.00	10				
		50.84	.00	8	68.59	1.35	8	50.16 C	.00	10	

	MIN	1329.10	1.35	8	-2601.32	1.35	7				
		-8.79	1.35	7	-11.87	1.35	7	.07	C	1.35	8
32	MAX	-484.89	.00	11	50.04	1.35	7				
		-5.52	.00	10	79.23	.00	8	8.31	C	.00	9
	MIN	-1999.16	1.35	7	-2558.38	.00	7				
		-58.68	1.35	8	-.01	1.35	12	39.91	T	1.35	10
33	MAX	-644.26	.00	11	49.97	1.35	9				
		.41	.00	7	76.39	.00	8	8.88	C	.00	9
	MIN	-1756.08	1.35	7	-2236.39	.00	7				
		-56.61	1.35	8	-.55	.00	7	41.41	T	1.35	10
34	MAX	-1045.43	.00	11	61.07	1.35	9				
		8.81	.00	7	66.92	.00	8	10.68	C	.00	9
	MIN	-2031.54	1.35	7	-2601.16	.00	7				
		-49.58	1.35	8	-11.89	.00	7	39.96	T	1.35	10

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

242. PRINT MAXF ENV LIST 22 23 35 36

MEMBER FORCE ENVELOPE  
 -----

ALL UNITS ARE KN METE

MAX AND MIN FORCE VALUES AMONGST ALL SECTION LOCATIONS

MEMB		FY/ FZ	DIST DIST	LD LD	MZ/ MY	DIST DIST	LD LD	FX	DIST	LD
22	MAX	-849.82	.00	10	3163.28	2.70	7			
		48.11	.00	12	130.08	2.70	12	103.50 C	.00	8
	MIN	-1627.44	2.70	7	-1306.78	.00	8			
		.00	2.70	7	-.57	.00	10	60.36 C	2.70	10
23	MAX	1616.84	.00	7	3168.94	.00	7			
		-.01	.00	7	129.26	.00	12	84.75 C	.00	7
	MIN	158.89	2.70	11	-633.84	2.70	7			
		-48.39	2.70	12	-2.12	2.70	11	10.87 T	2.70	8
35	MAX	-849.83	.00	10	3163.29	2.70	7			
		4.48	.00	9	11.24	2.70	9	103.27 C	.00	8
	MIN	-1627.44	2.70	7	-1306.54	.00	8			
		-45.77	2.70	10	-123.08	2.70	10	60.36 C	2.70	10
36	MAX	1616.83	.00	7	3168.93	.00	7			
		45.82	.00	10	12.11	.00	9	84.75 C	.00	7
	MIN	158.83	2.70	11	-633.84	2.70	7			
		-4.20	2.70	9	-123.16	.00	10	11.07 T	2.70	8

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

243. PRINT MAXF ENV LIST 7 8 37 38



MEMBER FORCE ENVELOPE

ALL UNITS ARE KN METE

MAX AND MIN FORCE VALUES AMONGST ALL SECTION LOCATIONS

MEMB		FY/ FZ	DIST DIST	LD LD	MZ/ MY	DIST DIST	LD LD	FX	DIST	LD
7	MAX	139.62	2.00	10	.00	1.83	9			
		.00	.00	7	.00	.00	10	266.04 C	2.00	7
	MIN	.00	.17	12	-93.04	2.00	10			
		-.01	2.00	8	-.04	1.83	8	.01 C	.00	9
8	MAX	3865.71	4.00	10	-593.77	.00	8			
		-1.89	.00	10	.03	.00	9	6662.42 C	4.00	7
	MIN	-22.09	4.00	7	-13757.10	4.00	10			
		-215.29	4.00	8	-861.19	4.00	8	2714.68 C	.00	11
37	MAX	.02	.00	10	93.03	2.00	10			
		.01	.00	8	.11	2.00	8	266.02 C	2.00	7
	MIN	-139.60	2.00	10	.00	.00	9			
		.00	2.00	9	.00	.00	7	.00 T	.00	7
38	MAX	123.73	.00	9	13757.13	4.00	10			
		-1.90	.00	10	.00	.00	10	6662.43 C	4.00	7
	MIN	-3865.72	4.00	10	205.65	4.00	8			
		-215.25	4.00	8	-861.18	4.00	8	2714.68 C	.00	11

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

244. PRINT MAXF ENV LIST 9 10 39 40

MEMBER FORCE ENVELOPE

ALL UNITS ARE KN METE

MAX AND MIN FORCE VALUES AMONGST ALL SECTION LOCATIONS

MEMB		FY/ FZ	DIST DIST	LD LD	MZ/ MY	DIST DIST	LD LD	FX	DIST	LD
9	MAX	4723.12	.00	7	3868.70	1.35	11			
		107.66	.00	8	145.33	1.35	8	100.70 C	.00	7
	MIN	-5542.19	1.35	11	-4287.93	1.35	7			
		.95	1.35	10	-.02	.00	8	1876.77 T	1.35	10
10	MAX	-2829.22	.00	8	3332.95	1.35	10			
		-.95	.00	10	145.33	.00	8	1989.26 C	.00	10
	MIN	-10305.33	1.35	10	-10355.00	.00	10			
		-107.65	1.35	8	-.01	1.35	8	78.61 C	1.35	7
39	MAX	10305.33	.00	10	3332.90	.00	10			
		107.53	.00	8	145.23	1.35	8	1988.62 C	.00	10
	MIN	2409.64	1.35	8	-10355.00	1.35	10			
		.95	1.35	10	.00	.00	10	3.28 C	1.35	9
40	MAX	5179.36	.00	10	3457.98	.00	11			
		-.95	.00	10	145.23	.00	8	127.02 C	.00	9
	MIN	-4723.10	1.35	7	-4287.93	.00	7			
		-107.54	1.35	8	.00	1.35	10	1876.70 T	1.35	10

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

245. PRINT MEMBER FORCES LIST 100 TO 400 BY 20

MEMBER END FORCES      STRUCTURE TYPE = SPACE

-----  
 ALL UNITS ARE -- KN    METE

MEMBER	LOAD	JT	AXIAL	SHEAR-Y	SHEAR-Z	TORSION	MOM-Y	MOM-Z
100	7	100	4723.11	-100.70	-1.34	.00	-5.39	-583.34
		101	-4723.11	100.70	1.34	.00	7.41	432.62
	8	100	2863.30	1.40	-107.64	.00	-430.79	-244.96
		101	-2863.30	-1.40	107.64	.00	592.16	247.28
	9	100	3227.24	-14.62	-56.08	.00	-224.41	-339.53
		101	-3227.24	14.62	56.08	.00	308.51	317.82
	10	100	-3507.19	1876.55	-.95	.00	-3.81	2465.79
		101	3507.19	-1876.55	.95	.00	5.24	329.72
	11	100	-3934.34	1873.77	-103.50	.00	-414.22	2532.28
		101	3934.34	-1873.77	103.50	.00	569.39	259.77
	12	100	-3584.40	1858.36	-53.92	.00	-215.78	2441.35
		101	3584.40	-1858.36	53.92	.00	296.64	327.60
120	7	120	1999.14	-7.23	-7.85	.00	54.23	-50.03
		121	-1999.14	7.23	7.85	.00	-42.64	39.37
	8	120	849.27	2.10	-58.71	.00	275.59	1.10
		121	-849.27	-2.10	58.71	.00	-187.82	2.17
	9	120	1256.66	.24	-33.62	.00	165.46	-11.13
		121	-1256.66	-.24	33.62	.00	-115.22	11.63
	10	120	1132.70	40.07	-5.52	.00	38.11	154.51
		121	-1132.70	-40.07	5.52	.00	-29.97	-94.46
	11	120	529.86	45.52	-56.42	.00	264.77	184.03
		121	-529.86	-45.52	56.42	.00	-180.44	-115.82
	12	120	921.58	43.73	-32.30	.00	158.88	172.26
		121	-921.58	-43.73	32.30	.00	-110.62	-106.72
140	7	140	1756.08	-6.34	.41	.00	-2.87	-43.89
		141	-1756.08	6.34	-.41	.00	2.27	34.51
	8	140	1002.94	.44	-56.59	.00	262.14	-7.91
		141	-1002.94	-.44	56.59	.00	-177.27	8.66
	9	140	1232.29	-.20	-29.00	.00	133.94	-12.89
		141	-1232.29	.20	29.00	.00	-90.43	12.70
	10	140	975.29	41.42	.29	.00	-2.03	163.98
		141	-975.29	-41.42	-.29	.00	1.60	-101.91
	11	140	691.70	44.61	-54.41	.00	252.06	180.28
		141	-691.70	-44.61	54.41	.00	-170.45	-113.43
	12	140	912.22	44.01	-27.89	.00	128.79	175.49
		141	-912.22	-44.01	27.89	.00	-86.96	-109.55
160	7	160	2031.55	-7.38	8.81	.00	-60.95	-51.00
		161	-2031.55	7.38	-8.81	.00	47.95	40.12
	8	160	1432.19	-2.39	-49.58	.00	214.76	-24.92
		161	-1432.19	2.39	49.58	.00	-140.10	21.50
	9	160	1571.18	-2.13	-21.80	.00	84.50	-24.97
		161	-1571.18	2.13	21.80	.00	-51.59	21.92

MEMBER END FORCES      STRUCTURE TYPE = SPACE

-----  
 ALL UNITS ARE -- KN    METE

MEMBER	LOAD	JT	AXIAL	SHEAR-Y	SHEAR-Z	TORSION	MOM-Y	MOM-Z
	10	160	1155.61	39.96	6.19	.00	-42.86	153.83
	161		-1155.61	-39.96	-6.19	.00	33.73	-93.94
	11	160	1090.35	41.20	-47.71	.00	206.71	159.00
	161		-1090.35	-41.20	47.71	.00	-134.87	-97.23
	12	160	1224.00	41.45	-21.00	.00	81.46	158.96
	161		-1224.00	-41.45	21.00	.00	-49.77	-96.82
180	7	180	1999.26	-7.27	-7.87	.00	54.31	-50.22
	181		-1999.26	7.27	7.87	.00	-42.69	39.50
	8	180	851.82	-.20	-59.93	.00	281.61	-9.96
	181		-851.82	.20	59.93	.00	-192.01	9.78
	9	180	1258.07	-.97	-34.26	.00	168.60	-16.94
	181		-1258.07	.97	34.26	.00	-117.40	15.62
	10	180	1728.92	-50.13	-5.55	.00	38.26	-226.28
	181		-1728.92	50.13	5.55	.00	-30.08	151.04
	11	180	1105.54	-43.40	-57.61	.00	270.65	-192.64
	181		-1105.54	43.40	57.61	.00	-184.53	127.48
	12	180	1496.16	-44.13	-32.93	.00	161.99	-199.35
	181		-1496.16	44.13	32.93	.00	-112.79	133.10
200	7	200	1756.16	-6.36	.39	.00	-2.79	-43.94
	201		-1756.16	6.36	-.39	.00	2.21	34.55
	8	200	1002.88	.44	-57.81	.00	268.15	-7.88
	201		-1002.88	-.44	57.81	.00	-181.44	8.64
	9	200	1232.30	-.20	-29.64	.00	137.06	-12.92
	201		-1232.30	.20	29.64	.00	-92.60	12.72
	10	200	1543.05	-50.22	.28	.00	-1.97	-226.96
	201		-1543.05	50.22	-.28	.00	1.57	151.56
	11	200	1237.53	-43.48	-55.59	.00	257.83	-195.56
	201		-1237.53	43.48	55.59	.00	-174.46	130.26
	12	200	1458.12	-44.11	-28.50	.00	131.79	-200.41
	201		-1458.12	44.11	28.50	.00	-89.04	134.18
220	7	220	2031.61	-7.36	8.79	.00	-60.87	-50.91
	221		-2031.61	7.36	-8.79	.00	47.90	40.06
	8	220	1429.58	-.08	-50.80	.00	220.75	-13.80
	221		-1429.58	.08	50.80	.00	-144.26	13.84
	9	220	1569.89	-.94	-22.43	.00	87.61	-19.22
	221		-1569.89	.94	22.43	.00	-53.75	17.96
	10	220	1751.79	-50.19	6.20	.00	-42.90	-226.77
	221		-1751.79	50.19	-6.20	.00	33.76	151.44
	11	220	1661.08	-43.27	-48.86	.00	212.38	-196.33
	221		-1661.08	43.27	48.86	.00	-138.81	131.39
	12	220	1795.99	-44.10	-21.59	.00	84.36	-201.54
	221		-1795.99	44.10	21.59	.00	-51.78	135.35
240	7	240	4603.04	-78.61	-1.34	.00	-5.39	-571.54
	241		-4603.04	78.61	1.34	.00	7.41	454.12

MEMBER END FORCES      STRUCTURE TYPE = SPACE

-----  
 ALL UNITS ARE -- KN    METE

MEMBER	LOAD	JT	AXIAL	SHEAR-Y	SHEAR-Z	TORSION	MOM-Y	MOM-Z
	8	240	2735.26	-8.33	-107.63	.00	-430.73	-348.21
		241	-2735.26	8.33	107.63	.00	592.08	336.07
	9	240	3129.29	-3.28	-56.08	.00	-224.39	-353.15
		241	-3129.29	3.28	56.08	.00	308.48	348.58
	10	240	10305.33	-1989.13	-.95	.00	-3.81	-3332.93
		241	-10305.33	1989.13	.95	.00	5.24	330.06
	11	240	9317.60	-1863.39	-103.49	.00	-414.16	-3129.46
		241	-9317.60	1863.39	103.49	.00	569.31	315.92
	12	240	9696.47	-1858.53	-53.92	.00	-215.76	-3134.20
		241	-9696.47	1858.53	53.92	.00	296.62	327.96
260	7	260	4603.05	78.61	-1.34	.00	-5.39	571.54
		261	-4603.05	-78.61	1.34	.00	7.41	-454.12
	8	260	3154.85	115.12	-107.64	.00	-430.39	487.50
		261	-3154.85	-115.12	107.64	.00	591.97	-315.17
	9	260	3570.89	115.68	-56.08	.00	-224.27	499.74
		261	-3570.89	-115.68	56.08	.00	308.44	-326.59
	10	260	10305.32	1989.11	-.95	.00	-3.81	3332.92
		261	-10305.32	-1989.11	.95	.00	5.24	-330.04
	11	260	9721.04	1966.05	-103.50	.00	-413.84	3263.38
		261	-9721.04	-1966.05	103.50	.00	569.20	-295.81
	12	260	10121.08	1966.59	-53.92	.00	-215.64	3275.15
		261	-10121.08	-1966.59	53.92	.00	296.57	-306.79
280	7	280	1999.25	7.27	-7.87	.00	54.31	50.22
		281	-1999.25	-7.27	7.87	.00	-42.69	-39.50
	8	280	905.56	8.36	-59.90	.00	281.59	44.26
		281	-905.56	-8.36	59.90	.00	-192.00	-31.88
	9	280	1314.61	9.53	-34.25	.00	168.59	53.05
		281	-1314.61	-9.53	34.25	.00	-117.40	-38.90
	10	280	1728.91	50.12	-5.55	.00	38.26	226.28
		281	-1728.91	-50.12	5.55	.00	-30.08	-151.04
	11	280	1157.21	51.23	-57.58	.00	270.63	225.62
		281	-1157.21	-51.23	57.58	.00	-184.52	-148.74
	12	280	1550.53	52.36	-32.92	.00	161.98	234.07
		281	-1550.53	-52.36	32.92	.00	-112.78	-155.48
300	7	300	1756.17	6.36	.39	.00	-2.79	43.94
		301	-1756.17	-6.36	-.39	.00	2.21	-34.55
	8	300	1054.09	7.81	-57.78	.00	268.12	43.11
		301	-1054.09	-7.81	57.78	.00	-181.44	-31.49
	9	300	1286.19	8.90	-29.63	.00	137.05	50.00
		301	-1286.19	-8.90	29.63	.00	-92.60	-36.76
	10	300	1543.06	50.22	.28	.00	-1.97	226.96
		301	-1543.06	-50.22	-.28	.00	1.57	-151.56
	11	300	1286.76	51.42	-55.56	.00	257.81	229.44
		301	-1286.76	-51.42	55.56	.00	-174.46	-152.23

MEMBER END FORCES      STRUCTURE TYPE = SPACE

-----  
 ALL UNITS ARE -- KN    METE

MEMBER	LOAD	JT	AXIAL	SHEAR-Y	SHEAR-Z	TORSION	MOM-Y	MOM-Z
	12	300	1509.94	52.46	-28.49	.00	131.78	236.06
		301	-1509.94	-52.46	28.49	.00	-89.04	-157.30
320	7	320	2031.62	7.36	8.79	.00	-60.87	50.91
		321	-2031.62	-7.36	-8.79	.00	47.90	-40.06
	8	320	1483.29	8.18	-50.76	.00	220.73	48.12
		321	-1483.29	-8.18	50.76	.00	-144.27	-35.98
	9	320	1626.42	9.48	-22.42	.00	87.60	55.33
		321	-1626.42	-9.48	22.42	.00	-53.76	-41.25
	10	320	1751.80	50.19	6.20	.00	-42.90	226.77
		321	-1751.80	-50.19	-6.20	.00	33.76	-151.44
	11	320	1712.72	51.06	-48.83	.00	212.36	229.33
		321	-1712.72	-51.06	48.83	.00	-138.82	-152.68
	12	320	1850.35	52.31	-21.57	.00	84.36	236.26
		321	-1850.35	-52.31	21.57	.00	-51.79	-157.74
340	7	340	1999.14	7.23	-7.85	.00	54.23	50.03
		341	-1999.14	-7.23	7.85	.00	-42.64	-39.37
	8	340	902.98	6.05	-58.69	.00	275.63	33.20
		341	-902.98	-6.05	58.69	.00	-187.87	-24.27
	9	340	1313.21	8.32	-33.62	.00	165.49	47.24
		341	-1313.21	-8.32	33.62	.00	-115.25	-34.90
	10	340	1132.69	-40.07	-5.52	.00	38.11	-154.52
		341	-1132.69	40.07	5.52	.00	-29.97	94.46
	11	340	581.50	-37.68	-56.40	.00	264.82	-151.05
		341	-581.50	37.68	56.40	.00	-180.48	94.56
	12	340	975.95	-35.50	-32.29	.00	158.91	-137.55
		341	-975.95	35.50	32.29	.00	-110.65	84.34
360	7	360	1756.08	6.34	.41	.00	-2.87	43.88
		361	-1756.08	-6.34	-.41	.00	2.27	-34.51
	8	360	1054.09	7.82	-56.56	.00	262.16	43.14
		361	-1054.09	-7.82	56.56	.00	-177.30	-31.51
	9	360	1286.12	8.89	-28.99	.00	133.94	49.97
		361	-1286.12	-8.89	28.99	.00	-90.44	-36.74
	10	360	975.29	-41.42	.29	.00	-2.03	-163.98
		361	-975.29	41.42	-.29	.00	1.60	101.91
	11	360	740.87	-36.67	-54.39	.00	252.08	-146.40
		361	-740.87	36.67	54.39	.00	-170.48	91.46
	12	360	963.98	-35.65	-27.88	.00	128.79	-139.83
		361	-963.98	35.65	27.88	.00	-86.97	86.43
380	7	380	2031.56	7.38	8.81	.00	-60.95	51.00
		381	-2031.56	-7.38	-8.81	.00	47.95	-40.12
	8	380	1485.96	10.48	-49.56	.00	214.76	59.24
		381	-1485.96	-10.48	49.56	.00	-140.11	-43.64
	9	380	1627.76	10.67	-21.79	.00	84.48	61.08
		381	-1627.76	-10.67	21.79	.00	-51.58	-45.21

MEMBER END FORCES      STRUCTURE TYPE = SPACE

-----  
 ALL UNITS ARE -- KN      METE

MEMBER	LOAD	JT	AXIAL	SHEAR-Y	SHEAR-Z	TORSION	MOM-Y	MOM-Z
	10	380	1155.62	-39.96	6.19	.00	-42.86	-153.83
		381	-1155.62	39.96	-6.19	.00	33.73	93.93
	11	380	1142.06	-33.42	-47.68	.00	206.71	-126.00
		381	-1142.06	33.42	47.68	.00	-134.88	75.94
	12	380	1278.40	-33.24	-20.98	.00	81.45	-124.23
		381	-1278.40	33.24	20.98	.00	-49.76	74.43
400	7	400	4723.12	100.70	-1.34	.00	-5.39	583.35
		401	-4723.12	-100.70	1.34	.00	7.41	-432.62
	8	400	3282.89	105.39	-107.62	.00	-430.33	384.25
		401	-3282.89	-105.39	107.62	.00	591.89	-226.38
	9	400	3668.84	127.01	-56.07	.00	-224.24	486.12
		401	-3668.84	-127.01	56.07	.00	308.41	-295.83
	10	400	-3507.15	-1876.52	-.95	.00	-3.81	-2465.77
		401	3507.15	1876.52	.95	.00	5.24	-329.69
	11	400	-3530.85	-1771.06	-103.49	.00	-413.78	-2398.34
		401	3530.85	1771.06	103.49	.00	569.12	-239.65
	12	400	-3159.75	-1750.26	-53.92	.00	-215.62	-2300.38
		401	3159.75	1750.26	53.92	.00	296.55	-306.43

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

- 246. PLOT BEN FILE
- 247. PLOT DISP FILE
- 248. START CON DESIGN
- 249. FC 30000
- 250. FY 410000
- 251. MAXMAIN 25
- 252. CLEAR 0.065
- 253. TRACK 2
- 254. DESIGN COL 14

C O L U M N N O . 1 4 D E S I G N R E S U L T S

FY - 410.0 FC - 30.0 MPA, SQRE SIZE -1200.0 X1200.0 MMS, TIED

AREA OF STEEL REQUIRED = 14399.9 SQ. MM

BAR CONFIGURATION	REINF PCT.	LOAD	LOCATION	PHI
72 - 16 MM (PROVIDE EQUAL NUMBER OF BARS ON EACH FACE)	1.006	7	STA	.700

COLUMN INTERACTION: MOMENT ABOUT Z -AXIS (KN-MET)

P0	Pn max	P-bal.	M-bal.	e-bal. (MM)
42287.53	33830.03	17261.40	7445.54	431.3
M0	P-tens.	Des.Pn	Des.Mn	e/h
3173.81	-5936.77	7058.68	.06	.000

COLUMN INTERACTION: MOMENT ABOUT Y -AXIS (KN-MET)

P0	Pn max	P-bal.	M-bal.	e-bal. (MM)
42287.53	33830.03	17261.40	7445.54	431.3
M0	P-tens.	Des.Pn	Des.Mn	e/h
3173.81	-5936.77	7058.68	158.35	.005

	Pn	Mn	Pn	Mn	(@ Z )
P0	31227.71	4700.17	15613.86	7415.38	
P0 *	28625.41	5513.51	13011.55	7207.14	
Pn,max	26023.10	6168.63	10409.24	6801.56	
Pn,max *	23420.79	6681.57	7806.93	6195.52	
Pn	20818.48	7075.31	5204.62	5393.13	
Pn *	18216.17	7360.57	2602.31	4380.78	
NOMINAL	Pn	Mn	Pn	Mn	(@ Y )
AXIAL	31227.71	4700.17	15613.86	7415.38	
AXIAL *	28625.41	5513.51	13011.55	7207.14	
COMPRESSION	26023.10	6168.63	10409.24	6801.56	
Pb	23420.79	6681.57	7806.93	6195.52	
Pb *	20818.48	7075.31	5204.62	5393.13	
* MO Mn	18216.17	7360.57	2602.31	4380.78	
* BENDING					
* MOMENT					
P-tens					

\*\*\*\*\*END OF COLUMN DESIGN RESULTS\*\*\*\*\*

255. CLEAR 0.100  
 256. DESIGN COL 320



## **APPENDIX 'B'**

0000000 00000 00000 00000 00000 00  
00 00 00 00 00 00 00 00 00 00 00  
00 00 00 00 00 00 00 00 00 00 00  
00 00 00 00 00 00 00 00 00 00 00  
00 00 00 0000000 00 00 00 00  
0000000 00 00 00 00 00 00 00 00 00  
00 00 00 00 00 00 00 00 00 00  
00 00000 00 00 00000 00000 00000 (TM)

=====  
Computer program for the Strength Design of Reinforced Concrete Sections  
=====

Licensee stated above acknowledges that Portland Cement Association (PCA) is not and cannot be responsible for either the accuracy or adequacy of the material supplied as input for processing by the PCACOL(tm) computer program. Furthermore, PCA neither makes any warranty expressed nor implied with respect to the correctness of the output prepared by the PCACOL(tm) program. Although PCA has endeavored to produce PCACOL(tm) error free, the program is not and can't be certified infallible. The final and only responsibility for analysis, design and engineering documents is the licensees. Accordingly, PCA disclaims all responsibility in contract, negligence or other tort for any analysis, design or engineering documents prepared in connection with the use of the PCACOL(tm) program.

General Information:

=====

File Name: C:\AZMAISH\PCACOL\RUPSA1.COL  
 Project: Rupsa Bridge Project Code: ACI 318-89  
 Column: Hatia bridge Units: SI Metric  
 Engineer: Date: 16/2/2000 Time: 14:34:05

Run Option: Design Short (nonslender) column  
 Run Axis: Biaxial Column Type: Structural

Material Properties:

=====

f'c = 30 MPa fy = 410 MPa  
 Ec = 27691.5 MPa Es = 199955 MPa  
 fc = 25.5 MPa erup = 0 mm/mm  
 eu = 0.003 mm/mm  
 Stress Profile: Block Beta1 = 0.832451

Geometry:

=====

Circular: Diameter = 900 mm

Gross section area, Ag = 636173 mm<sup>2</sup>

Ix = 3.22062e+010 mm<sup>4</sup>

Xo = 0 mm

Iy = 3.22062e+010 mm<sup>4</sup>

Yo = 0 mm

Reinforcement:

=====

Rebar Database: ASTM

Size	Diam	Area	Size	Diam	Area	Size	Diam	Area
10	11	100	15	16	200	20	20	300
25	25	500	30	30	700	35	36	1000
45	44	1500	55	56	2500			

Confinement: Tied; phi(c) = 0.7, phi(b) = 0.9, a = 0.8

N-10 ties with N-30 bars, N-10 with larger bars.

Layout: Circular

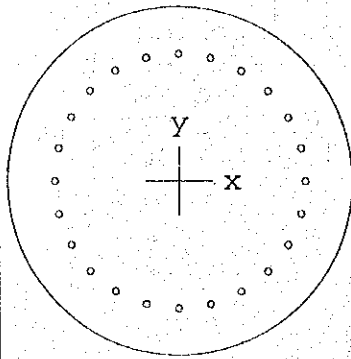
Pattern: All Sides Equal [Cover to transverse reinforcement (ties)]

Total steel area, As = 7200 mm<sup>2</sup> at 1.13%

24N-20 Cover = 100 mm

Pt.	Applied Loads			Computed Strength			Computed/ Applied Ray length
	P (kN)	Mx (kN-m)	My (kN-m)	P (kN)	Mx (kN-m)	My (kN-m)	
1	2576	4	833	4100	7	1369	1.597
2	-896	54	610	-903	55	617	1.009

Program completed as requested!



900 mm diam.

$f'c = 30$  MPa

$f_y = 410$  MPa

Confinement: Tied  
 clr cover = 111 mm  
 spacing = 66 mm  
 24 N-20 at 1.13%

$A_s = 7200$  mm<sup>2</sup>

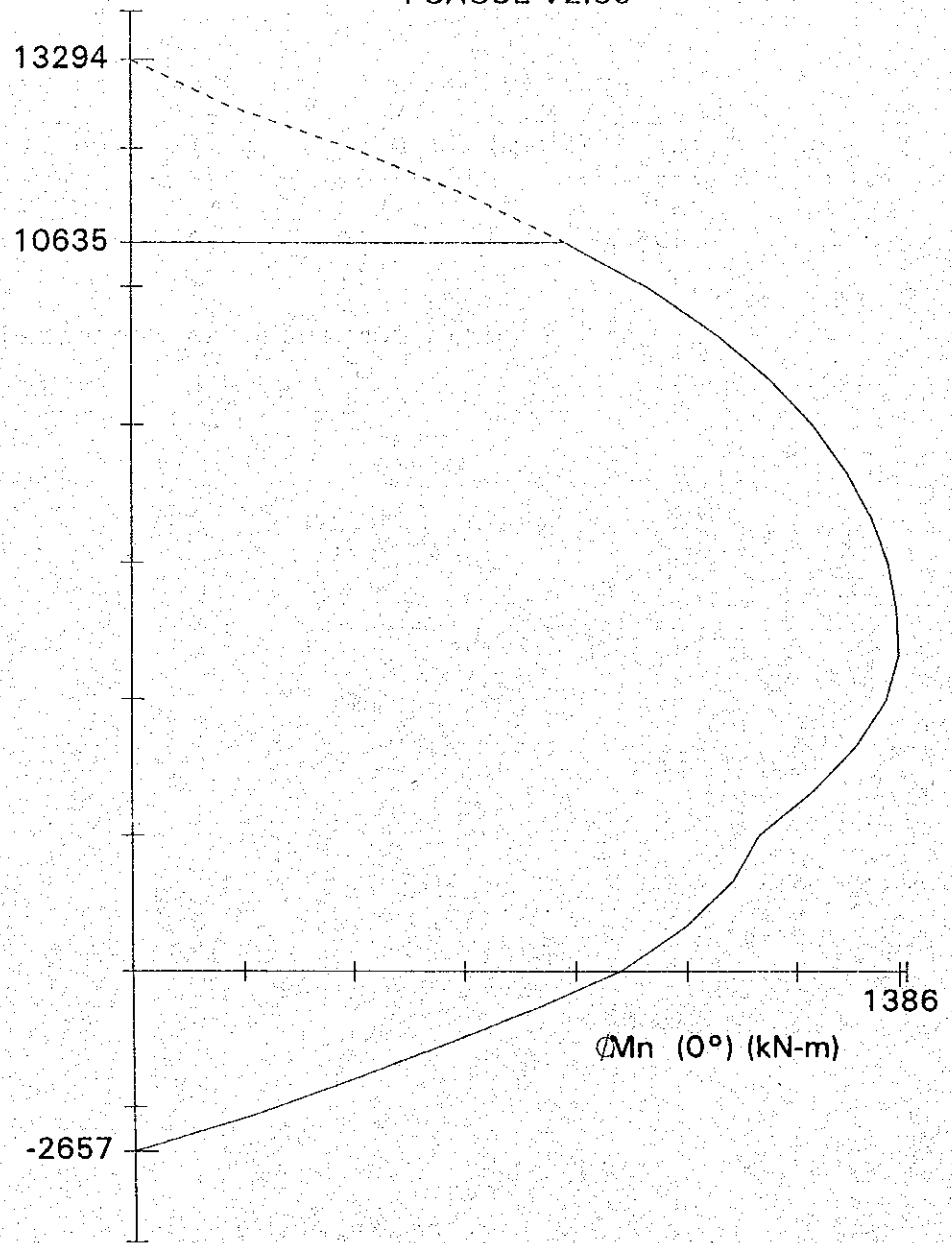
$I_x = 3.221e+010$  mm<sup>4</sup>

$I_y = 3.221e+010$  mm<sup>4</sup>

$X_o = 0$  mm

$Y_o = 0$  mm

Ø  
P  
n  
K  
N



© 1993 PCA

Licensed To: Licensee name not yet specified.

File name: C:\AZMAISH\PCACOL\RUPSA1.COL

Project: Rupsa Bridge Project

Material Properties:

Column Id: Hatia bridge

$E_c = 27692$  MPa

$e_u = 0.003$  mm/mm

Engineer:

$f_c = 25.50$  MPa

$E_s = 199955$  MPa

Date: 16/2/2000

Time: 14:34:05

$\beta_{t1} = 0.83$

Code: ACI 318-89

Stress Profile: Block

Units: Metric

$\phi(c) = 0.70$ ,  $\phi(b) = 0.90$

X-axis slenderness is not considered.

Y-axis slenderness is not considered.

# APPENDIX 'C'



**DESIGN OF  
MOLONGHATA BRIDGE**



THE UNIVERSITY OF  
MICHIGAN LIBRARY

## MOLONGHATA BRIDGE

The abutment of Hatia bridge is adopted for this bridge. Hence, structural design is not shown separately.

### Geotechnical :

	Abutment
Reference bore hole :	BH1 EB7
Pile reaction for load 13 (kn) :	833
Pile reaction for load 14 (kn) :	2133
Uplift for load 14 (kn) :	590
Ultimate capacity of pile (kn) :	6681
Depth of pile tip from G.L. (m) :	39.00
Top of bore hole R.L.. (MPWD) :	3.35
Pile tip R. L.. (MPWD) :	-35.65
Length of pile (m) :	35.23
Weight of pile (kn) :	528.38
Net uplift deducting pile weight :	61.63
FS against load 13 :	8.02
FS against load 14 :	3.13

Minimum bearing capacity : Abutment = 2133 kn



JICA