2-2. DESIGN OF STAIR CASE

Summary

2 staircases will be constructed on both ends of the Rupsa main bridge. These 4 (2+2) staircases are typical. Therefore analysis and design are carried out for a single staircase. A mathematical model is prepared for the staircase including its sub-structures (pile caps & piles).

The design is carried out following the standard specification for Buildings/Structure,

- Bangladesh National Building Code-1993 (BNBC)
- Building Code Requirements for Reinforced Concrete (ACI 318-89/95)
- American Society for Testing and Materials (ASTM)

Mathematical Modeling of Structure

Super-structure: Columns are considered as vertical member of 3.0m height starting at pile cap. Interior beams at landing levels are considered as two-nodded horizontal member starting from column and extend up to edge of landing. All loads from landing slab are superimposed on landing beams. The exterior landing beams are divided into two consecutive beams with one intermediate node. The flight is considered as a two-nodded member connecting at the intermediate nodes of exterior landing beams. The dead loads and live load are uniformly distributed over the flight beams.

Sub-structure: Sub-structures are started at pile cap level. Pile cap is considered as two nodded horizontal members connected to piles. Piles are considered as consecutive discrete two nodded vertical members of 1.0m length. Supports are provided through the substructure nodes with horizontal spring constants. The spring constant values are derived from the values of spring constants of the piles of the adjacent pier.

Loads

The following loads and forces are considered in the design:

Dead load: Dead load is consists of the weight of the structure. The following weights are considered in computing the dead loads.

Concrete	24 kN/cubic meter
Steel	7849 kN/cubic meter

Live load: The live load is considered as per BNBC/93 (5 kN/sq. meter)

Wind load: The calculation of wind loads conforms to sub-clause 2.4, chapter 2, part 6 of BNBC.

Seismic load: Seismic load is not considered since the proposed site falls within the lowest seismic risk zone of Bangladesh (fig 6.2.10 BNBC, 1993)

Load Combinations

R.C structural members is designed to have strength not less that that required to resist the most unfavorable effect of the combinations of the factored loads shown below.

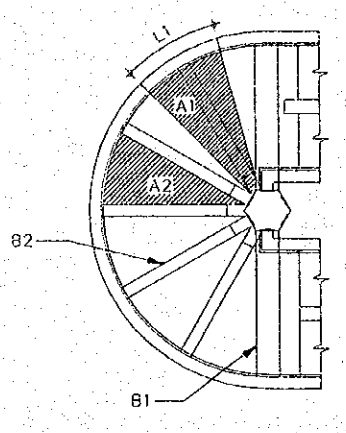
1. 1.4D + 1.7L
2. 0.75(1.4D+1.7L+1.7W)

(Ref. BNBC, Part 6, Sec. 2.7.5)

However for geotechnical design of foundation (eg. Number and length of ples) following load combination shall be considered.

1. D+L
2. D+L+W

Calculation of Superimposed Loads



Length of beam	=	3.80 m
Area of landing supported by each interior beam (A1)	=	3.26 m^2
Area of slab supported by each interior beam (A2)	=	2.39 m^2
Unit weight of concrete	=	24.00 kN/m^3
Live load	=	5.00 kN/m^2
Thickness of slab	=	0.30 m

Dead Load over Beams from Slab

Dead load of slab = 2.39 X 0.3 X 24	=	17.21 kN
Uniform dead load over the beam = 17.208/3.8	=	4.53 kN/m
Triangular distribution of load over beam (B2)	=	9.06 KN▶0 kN
Triangular distribution of load over beam (B1)	=	4.53 KN▶0 kN

7

Dead Load over Beams from Edge Wall

Length of edge beam segment (L1)	=	1.92 M
Width of edge beam	=	0.25 M
Depth of edge beam	=	0.45 M
Dead load from edge beam segment = 0.25X0.45X1.92X24	=	5.184 kN
Concreted load over beam (B2)	=	5.18 kN
Concreted load over beam (B1)	=	2.59 kN

Live Load over Beams from Slab

Load from landing = 3.26 X 5	=	16.30 kN
Uniform live load over the beam = 16.3/3.8	=	4.29 kN/m
Triangular distribution of load over beam (B2)	=	8.58 KN▶0 kN
Triangular distribution of load over beam (B1)	=	4.29 KN▶0 kN

Calculation of Basic Wind Speed

As per Bangladesh Natioanl Building Code (BNBC), 1993

Sustained wind pressure q_z

$= C_c C_I C_z V_b^2$

Where C_c = 47.2×10^{-6} , a constant

C_I = structure importance co-efficient

= 0.8, low risk structure (Table 6.2.9, BNBC)

C_z = height and exposure coefficient (Table 6.2.9, BNBC)

= 1.0, for 10m average height & open country (B)

V_b = 238 km/h, base wind velocity

q_z = 2.14 kN/m^2

Design Wind Pressure p_z

$= C_G C_p C_z q_z$

Where C_G = Gust co-efficient

= 1.4 (Sec. 2.4.6.6)

C_p = 1.3 (Sec2.4.6.7)

p_z = 1.4 X 1.3 X 2.14

= 3.8948 kN/m^2

= 4.00 kN/m^2 (say)

Wind Load on Structure

Wind Load along X axis

Exposed height of flight	=	0.6 m
Exposed height of railing (10% of actual height)	=	0.09 m
Total exposed height of flight & railing	=	0.6 + 0.09
	=	0.69 m

Considering average column diameter of 1.2 m

Length of flight = 8-0.6X2 = 6.8 m

(actual length was not considered since some area is common to two consecutive flight)

Wind load from flight = **18.8** kN

Length of landing	=	(3.8-0.6) m
	=	3.2 m
Depth of landing = (10%0.9+0.45+(0.6+0.9)/2)	=	1.29 m
Wind load from landing	=	**16.6** kN

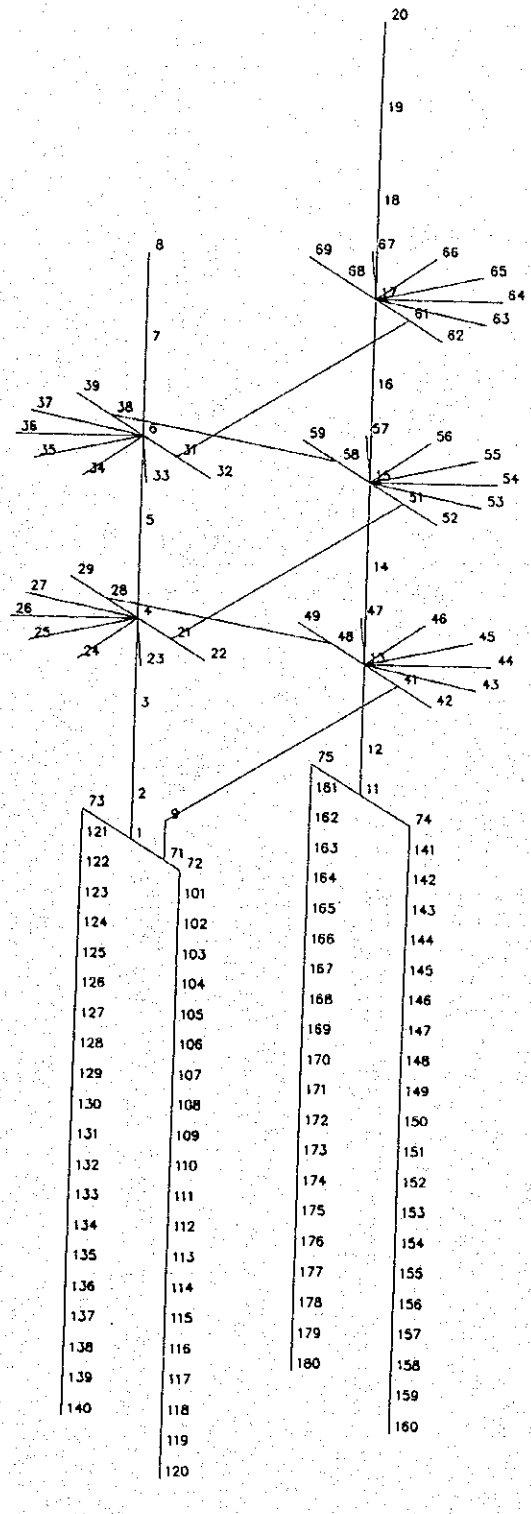
Load at start of first flight	=	9.4 kN
Load at junctions of intermediate flights	=	35.4 kN
Load at end of last flight	=	26.0 kN

The typical analysis and design output of the staircase is presented wherewith.

MEMBER	LOAD	JT	AXIAL	SHEAR-Y	SHEAR-Z	TORSION	MOM-Y	MOM-Z
		19	-14.57	.00	9.18	.00	-13.85	-.02
	10	18	35.56	-21.42	.00	.00	.29	-59.59
		19	-14.57	9.18	.00	.00	-.08	13.75
101	7	72	1646.30	-35.97	46.76	.00	-164.20	-204.32
		101	-1661.29	35.97	-46.76	.00	117.63	168.75
	8	72	2387.79	-52.70	67.88	.00	-238.18	-298.99
		101	-2408.78	52.70	-67.88	.00	170.56	246.84
	9	72	2285.98	-127.73	170.27	.00	-383.96	-428.82
		101	-2301.72	127.73	-170.27	.00	213.69	301.50
	10	72	2072.11	-281.84	64.17	.00	-205.98	-412.45
		101	-2087.85	281.84	-64.17	.00	141.99	130.56
121	7	73	1350.28	1.06	-38.16	.00	167.16	-123.65
		121	-1365.27	-1.06	38.16	.00	-129.23	125.05
	8	73	1954.37	1.52	-55.32	.00	242.56	-180.81
		121	-1975.35	-1.52	55.32	.00	-187.57	182.82
	9	73	739.25	70.97	91.72	.00	-75.99	-21.93
		121	-754.99	-70.97	-91.72	.00	-15.81	93.15
	10	73	1499.61	-65.68	-36.28	.00	186.04	22.80
		121	-1515.35	65.68	36.28	.00	-150.00	-88.47
141	7	74	1769.14	23.64	48.77	.00	-195.89	-82.99
		141	-1784.13	-23.64	-48.77	.00	147.41	107.12
	8	74	2564.48	34.69	70.73	.00	-284.12	-120.63
		141	-2585.46	-34.69	-70.73	.00	213.82	156.03
	9	74	2301.97	41.68	149.90	.00	-378.88	-94.97
		141	-2317.71	-41.68	-149.90	.00	229.16	137.24
	10	74	1549.92	6.61	30.08	.00	-135.23	174.95
		141	-1565.66	-6.61	-30.08	.00	105.46	-167.44
161	7	75	1716.86	11.27	-57.37	.00	218.22	-107.91
		161	-1731.85	-11.27	57.37	.00	-161.14	119.65
	8	75	2487.21	16.49	-83.29	.00	316.81	-157.30
		161	-2508.19	-16.49	83.29	.00	-233.93	174.45
	9	75	1166.31	15.08	44.81	.00	32.29	-148.76
		161	-1182.05	-15.08	-44.81	.00	-77.28	164.25
	10	75	1371.87	-130.07	-57.98	.00	208.16	-99.70
		161	-1387.61	130.07	57.98	.00	-150.50	-29.54

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

MN/ELEM

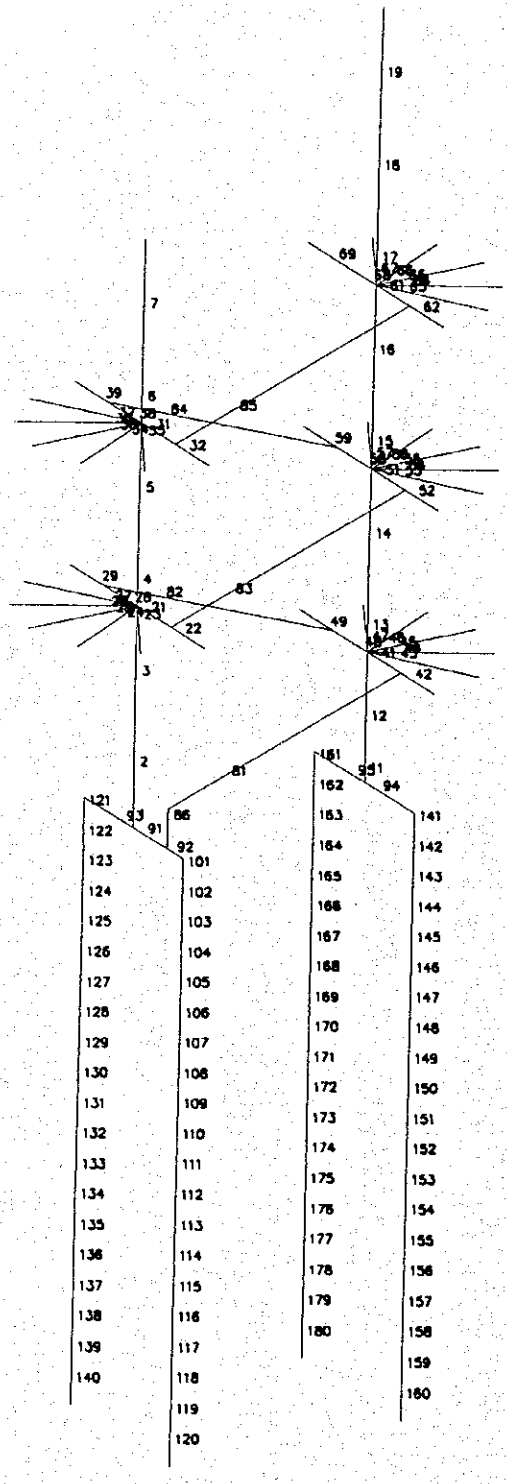


STAIRCASE (Node Number)

J=149,M=152

UNIT MET KNS

MN/ELEM



STAIRCASE (Member Number)

J=149,M=152

UNIT MET KNS

```
 ************************************************
 *                                              *
 *           S T A A D - III                    *
 *           Revision 22.3a                     *
 *           Proprietary Program of             *
 *           Research Engineers, Inc.           *
 *           Date=    FEB 29, 2000              *
 *           Time=    15:52: 5                  *
 *                                              *
 *      USER ID: Development Design Consultants L *
 ************************************************

  1. STAAD SPACE RUPSA BRIDGE (ANALYSIS OF STAIRCASE)
  2. UNIT KNS METER
  3. PAGE EJE
  4. JOINT COORDINATES
  5.  1 0 0 0;  2 0 1.3 0  8 0 19.3 0; 9 0 1.3 1.9
  6. 11 8 0 0; 12 8 1.3 0 20 8 25.3 0
  7. *
  8. 21 0 7.3 1.9; 22 0 7.3 3.8; 23 -1.9 7.3 3.291; 24 -3.291 7.3 1.9
  9. 25 -3.8 7.3 0; 26 -3.291 7.3 -1.9; 27 -1.9 7.3 -3.291; 28 0 7.3 -1.9
 10. 29 0 7.3 -3.8
 11. 31 0 13.3 1.9; 32 0 13.3 3.8; 33 -1.9 13.3 3.291; 34 -3.291 13.3 1.9
 12. 35 -3.8 13.3 0; 36 -3.291 13.3 -1.9; 37 -1.9 13.3 -3.291; 38 0 13.3 -1.9
 13. 39 0 13.3 -3.8
 14. 41 8 4.3 1.9; 42 8 4.3 3.8; 43 9.9 4.3 3.291; 44 11.291 4.3 1.9
 15. 45 11.8 4.3 0; 46 11.291 4.3 -1.9; 47 9.9 4.3 -3.291; 48 8 4.3 -1.9
 16. 49 8 4.3 -3.8
 17. 51 8 10.3 1.9; 52 8 10.3 3.8; 53 9.9 10.3 3.291; 54 11.291 10.3 1.9
 18. 55 11.8 10.3 0; 56 11.291 10.3 -1.9; 57 9.9 10.3 -3.291; 58 8 10.3 -1.9
 19. 59 8 10.3 -3.8
 20. 61 8 16.3 1.9; 62 8 16.3 3.8; 63 9.9 16.3 3.291; 64 11.291 16.3 1.9
 21. 65 11.8 16.3 0; 66 11.291 16.3 -1.9; 67 9.9 16.3 -3.291; 68 8 16.3 -1.9
 22. 69 8 16.3 -3.8
 24. *PILECAP
 25. 71 0 0 1.9; 72 0 0 2.8; 73 0 0 -2.8; 74 8 0 2.8; 75 8 0 -2.8
 27. *PILE
 28. 101  0 -1  2.8  120  0 -20.0  2.8
 29. 121  0 -1 -2.8  140  0 -20.0 -2.8
 30. 141  8 -1  2.8  160  8 -20.0  2.8
 31. 161  8 -1 -2.8  180  8 -20.0 -2.8
 33. MEMBER INCIDENCE
 34. *COLUMN 1 TO 7; 11 TO 19
 35. 1 1 2 7; 11 11 12 19
 37. *BEAM 21 TO 29; 31 TO 39; 41 TO 49; 51 TO 59; 61 TO 69
 38. 21 4 21; 22 21 22; 23 4 23; 24 4 24; 25 4 25; 26 4 26
 39. 27 4 27; 28 4 28; 29 28 29
 40. 31 6 31; 32 31 32; 33 6 33; 34 6 34; 35 6 35; 36 6 36
 41. 37 6 37; 38 6 38; 39 38 39
 42. 41 13 41; 42 41 42; 43 13 43; 44 13 44; 45 13 45; 46 13 46
 43. 47 13 47; 48 13 48; 49 48 49
 44. 51 15 51; 52 51 52; 53 15 53; 54 15 54; 55 15 55; 56 15 56
 45. 57 15 57; 58 15 58; 59 58 59
 46. 61 17 61; 62 61 62; 63 17 63; 64 17 64; 65 17 65; 66 17 66
 47. 67 17 67; 68 17 68; 69 68 69
 49. *FLIGHT 81 TO 86
 50. 81 9 41; 82 28 48; 83 21 51; 84 38 58; 85 31 61
 51. 86 9 71
 53. *PILECAP 91 TO 95
 54. 91 1 71; 92 71 72; 93 1 73; 94 11 74; 95 11 75
 56. *PILE
 57. 101   72 101; 102 101 102 120
 58. 121   73 121; 122 121 122 140
 59. 141   74 141; 142 141 142 160
 60. 161   75 161; 162 161 162 180
 62. MEMBER OFFSET
 63. 1 11        START 0.70
 64. 21 23 TO 28 START 0.35
 65. 31 33 TO 38 START 0.30
 66. 41 43 TO 48 START 0.45
```

```
67. 51 53 TO 58 START 0.35
68. 61 63 TO 68 START 0.30
69. 86          END   0.70
71. MEMBER PROPERETY
72. *COLUMN
73. 1 2 3 11 12 13  PRI YD 1.2
74. 4 5 14 15       PRI YD 1.0
75. 6   16 17       PRI YD 0.8
76.       18        PRI YD 0.6
77.       19        PRI YD 0.5
78. 7               PRI YD 0.3
80. *BEAM
81. 21 28 31 38 41 48 51 58 61 68  PRI YD 1.20 ZD 0.55
82. 22 29 32 39 42 49 52 59 62 69  PRI YD 0.95 ZD 0.55
83. 23 TO 27 33 TO 37 43 TO 47     PRI YD 1.20 ZD 0.25
84. 53 TO 57 63 TO 67              PRI YD 1.20 ZD 0.25
86. *FLIGHT
87. 81 TO 85        PRI YD 0.300 ZD 3.2
88. 86              PRI YD 0.500 ZD 3.2
90. *PILECAP
91. 91 TO 95      PRI YD 1.40  ZD 2.2
93. *PILE
94. 101 TO 180    PRI YD 0.9
96. CONSTANTS
97. E CONCRETE ALL
98. DEN CON ALL
100. SUPPORT
101. *72 TO 75 FIXED
102. 101 TO 161 BY 20 FIXED BUT FY MX MY MZ  KFX 15961  KFZ 11971
103. 102 TO 162 BY 20 FIXED BUT FY MX MY MZ  KFX 17474  KFZ 13105
104. 103 TO 163 BY 20 FIXED BUT FY MX MY MZ  KFX 18755  KFZ 14066
105. 104 TO 164 BY 20 FIXED BUT FY MX MY MZ  KFX 19896  KFZ 14922
106. 105 TO 165 BY 20 FIXED BUT FY MX MY MZ  KFX 20939  KFZ 15704
107. 106 TO 166 BY 20 FIXED BUT FY MX MY MZ  KFX 21908  KFZ 16431
108. 107 TO 167 BY 20 FIXED BUT FY MX MY MZ  KFX 61700  KFZ 46275
109. 108 TO 168 BY 20 FIXED BUT FY MX MY MZ  KFX 62563  KFZ 46922
110. 109 TO 169 BY 20 FIXED BUT FY MX MY MZ  KFX 63387  KFZ 47540
111. 110 TO 170 BY 20 FIXED BUT FY MX MY MZ  KFX 64177  KFZ 48133
112. 111 TO 171 BY 20 FIXED BUT FY MX MY MZ  KFX 64937  KFZ 48703
113. 112 TO 172 BY 20 FIXED BUT FY MX MY MZ  KFX 65672  KFZ 49254
114. 113 TO 173 BY 20 FIXED BUT FY MX MY MZ  KFX 66383  KFZ 49787
115. 114 TO 174 BY 20 FIXED BUT FY MX MY MZ  KFX 67073  KFZ 50305
116. 115 TO 175 BY 20 FIXED BUT FY MX MY MZ  KFX 67744  KFZ 50808
117. 116 TO 176 BY 20 FIXED BUT FY MX MY MZ  KFX 68399  KFZ 51299
118. 117 TO 177 BY 20 FIXED BUT FY MX MY MZ  KFX 69037  KFZ 51778
119. 118 TO 178 BY 20 FIXED BUT FY MX MY MZ  KFX 69662  KFZ 52247
120. 119 TO 179 BY 20 FIXED BUT FY MX MY MZ  KFX 70273  KFZ 52705
121. 120 TO 180 BY 20 PINNED
123. LOAD 1 : SELFWEIGHT
124. SELF
126. LOAD 2 : DEAD LOAD OVER FLIGHTS AND BEAMS
127. MEM LOAD
128. *OVER FLIGHTS FROM STEP+SIDEWALL+RAILING (4.47+3.6+10)
129. 81 TO 85   UNI GY -18.07
131. *DEDUCTION OF BEAM SELFWEIGHT
132. 22 29 32 39 42 49 52 59 62 69   TRA GY 0.0  1.98
133. 23 TO 27 33 TO 37 43 TO 47      TRA GY 0.0  1.80
134. 53 TO 57 63 TO 67               TRA GY 0.0  1.80
136. *OVER BEAMS FROM SLAB
137. 21 28 31 38 41 48 51 58 61 68   TRA GY -0.0   -2.275
138. 22 29 32 39 42 49 52 59 62 69   TRA GY -2.275 -4.550
139. 23 TO 27 33 TO 37 43 TO 47      TRA GY -0.0   -9.100
140. 53 TO 57 63 TO 67               TRA GY -0.0   -9.100
142. *OVER BEAMS FROM SIDE WALL
143. 22 29 32 39 42 49 52 59 62 69   CON GY -2.6
144. 23 TO 27 33 TO 37 43 TO 47      CON GY -5.2
145. 53 TO 57 63 TO 67               CON GY -5.2
147. *OVER BEAMS FROM RAILING
148. 22 29 32 39 42 49 52 59 62 69   CON GY -4.81
149. 23 TO 27 33 TO 37 43 TO 47      CON GY -9.62
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150. 53 TO 57 63 TO 67                CON GY -9.62
152. LOAD 3 : FULL LIVE LOAD (5.0 KN/M^2)
153. MEM LOAD
154. *OVER FLIGHT
155. 81 TO 85   UNI GY -13.5
156. *OVER BEAMS
157. 21 28 31 38 41 48 51 58 61 68   TRA GY -0.0  -2.15
158. 22 29 32 39 42 49 52 59 62 69   TRA GY -2.15 -4.30
159. 23 TO 27 33 TO 37 43 TO 47      TRA GY -0.0  -8.60
160. 53 TO 57 63 TO 67               TRA GY -0.0  -8.60
162. LOAD 4 : PARTIAL LIVE LOAD
163. MEM LOAD
164. *OVER FLIGHT
165. 81 83 85   UNI GY -13.5
166. *OVER BEAMS
167. 21 31 41 51 61                  TRA GY -0.0  -2.15
168. 22 32 42 52 62                  TRA GY -2.15 -4.30
169. 23 TO 25 33 TO 35 43 TO 45      TRA GY -0.0  -8.60
170. 53 TO 55 63 TO 65               TRA GY -0.0  -8.60
172. LOAD 5 : WIND LOAD IN Z DIRECTION (WIND PRESSURE=4.0 KN/M^2)
173. *EXP. HEIGHT = 0.6+10%0.9=0.69M
174. *LOAD FROM FLIGHT=18.8, FROM LANDING=16.6
175. JOINT LOAD
176. 2          FZ 9.4
177. 4 6 13 15  FZ 35.4
178. 17         FZ 26.0
179. MEM LOAD
180. 2 3 12 13  UNI GZ 5.6
181. 4 5 14 15  UNI GZ 4.8
182. 6   16 17  UNI GZ 4.0
183.        18  UNI GZ 3.2
184.        19  UNI GZ 2.4
185. 7          UNI GZ 1.2
187. LOAD 6 : WIND LOAD IN X DIRECTION (WIND PRESSURE=4.0 KN/M^2)
188. JOINT LOAD
189. 12         FX -24.2
190. 13 TO 17   FX -48.4
191. MEM LOAD
192. 12 13   UNI GX -5.6
193. 14 15   UNI GX -4.8
194. 16 17   UNI GX -4.0
195. 18      UNI GX -3.2
196. 19      UNI GX -2.4
198. LOAD COMB 7 : DL+LL
199. 1 1.0 2 1.0 3 1.0
201. LOAD COMB 8 : 1.4DL+1.7LL
202. 1 1.4 2 1.4 3 1.7
204. LOAD COMB 9 : 0.75(1.4DL+1.7LL+1.7WL(Z))
205. 1 1.05 2 1.05 4 1.275 5 1.275
207. LOAD COMB 10 : 0.75(1.4DL+1.7LL+1.7WL(X))
208. 1 1.05 2 1.05 4 1.275 6 1.275
210. 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 =   149/  152/   80
  ORIGINAL/FINAL BAND-WIDTH =    66/   18
  TOTAL PRIMARY LOAD CASES  =     6, TOTAL DEGREES OF FREEDOM =   882
  SIZE OF STIFFNESS MATRIX =  100548 DOUBLE PREC. WORDS
  REQRD/AVAIL. DISK SPACE =  12.84/  231.8 MB,  EXMEM = 1965.6 MB

++ Processing Element Stiffness Matrix.              15:52: 6
++ Processing Global Stiffness Matrix.               15:52: 6
++ Processing Triangular Factorization.              15:52: 6
++ Calculating Joint Displacements.                  15:52: 6
++ Adjusting Displacements                           15:52: 6
++ Calculating Member  Forces.                       15:52: 7
```

```
211. LOAD LIST 7 TO 10
212. PRINT SUPPORT REACTION
```

SUPPORT REACTIONS -UNIT KNS METE STRUCTURE TYPE = SPACE

JOINT	LOAD	FORCE-X	FORCE-Y	FORCE-Z	MOM-X	MOM-Y	MOM Z
101	7	-4.47	.00	-6.06	.00	.00	.00
	8	-6.50	.00	-8.81	.00	.00	.00
	9	17.47	.00	-43.24	.00	.00	.00
	10	98.28	.00	-10.23	.00	.00	.00
121	7	-14.43	.00	1.66	.00	.00	.00
	8	-21.08	.00	2.38	.00	.00	.00
	9	-38.80	.00	-36.06	.00	.00	.00
	10	36.16	.00	-1.10	.00	.00	.00
141	7	-21.50	.00	-3.87	.00	.00	.00
	8	-31.42	.00	-5.61	.00	.00	.00
	9	-32.10	.00	-34.00	.00	.00	.00
	10	15.87	.00	-.96	.00	.00	.00
161	7	-17.94	.00	5.77	.00	.00	.00
	8	-26.17	.00	8.38	.00	.00	.00
	9	-24.42	.00	-24.43	.00	.00	.00
	10	55.16	.00	7.04	.00	.00	.00
102	7	1.55	.00	-7.79	.00	.00	.00
	8	2.30	.00	-11.32	.00	.00	.00
	9	22.92	.00	-40.29	.00	.00	.00
	10	81.77	.00	-11.77	.00	.00	.00
122	7	-7.65	.00	4.51	.00	.00	.00
	8	-11.17	.00	6.52	.00	.00	.00
	9	-27.92	.00	-28.85	.00	.00	.00
	10	25.97	.00	2.78	.00	.00	.00
142	7	-13.79	.00	-6.75	.00	.00	.00
	8	-20.16	.00	-9.79	.00	.00	.00
	9	-21.27	.00	-33.18	.00	.00	.00
	10	7.55	.00	-3.36	.00	.00	.00
162	7	-10.59	.00	8.62	.00	.00	.00
	8	-15.45	.00	12.52	.00	.00	.00
	9	-14.38	.00	-17.92	.00	.00	.00
	10	42.82	.00	9.40	.00	.00	.00
103	7	5.14	.00	-8.05	.00	.00	.00
	8	7.53	.00	-11.69	.00	.00	.00
	9	23.51	.00	-33.89	.00	.00	.00
	10	61.32	.00	-11.46	.00	.00	.00
123	7	-2.46	.00	5.86	.00	.00	.00
	8	-3.59	.00	8.49	.00	.00	.00
	9	-17.65	.00	-20.97	.00	.00	.00
	10	16.38	.00	4.99	.00	.00	.00
143	7	-7.25	.00	-7.87	.00	.00	.00
	8	-10.62	.00	-11.41	.00	.00	.00
	9	-11.86	.00	-28.95	.00	.00	.00
	10	1.42	.00	-4.55	.00	.00	.00
163	7	-4.67	.00	9.52	.00	.00	.00
	8	-6.83	.00	13.82	.00	.00	.00
	9	-6.32	.00	-11.70	.00	.00	.00
	10	29.81	.00	9.88	.00	.00	.00
104	7	6.56	.00	-7.26	.00	.00	.00
	8	9.61	.00	-10.54	.00	.00	.00
	9	20.78	.00	-25.99	.00	.00	.00
	10	41.30	.00	-9.92	.00	.00	.00
124	7	.91	.00	5.99	.00	.00	.00
	8	1.34	.00	8.68	.00	.00	.00
	9	-9.32	.00	-13.70	.00	.00	.00
	10	8.62	.00	5.75	.00	.00	.00
144	7	-2.46	.00	-7.62	.00	.00	.00
	8	-3.62	.00	-11.05	.00	.00	.00
	9	-4.78	.00	-22.96	.00	.00	.00
	10	-2.36	.00	-4.73	.00	.00	.00
164	7	-.59	.00	8.94	.00	.00	.00
	8	-.87	.00	12.98	.00	.00	.00
	9	-.76	.00	-6.54	.00	.00	.00
	10	18.29	.00	9.01	.00	.00	.00

JOINT	LOAD	FORCE-X	FORCE-Y	FORCE-Z	MOM-X	MOM-Y	MOM Z
105	7	6.39	.00	-5.85	.00	.00	.00
	8	9.36	.00	-8.49	.00	.00	.00
	9	16.24	.00	-18.03	.00	.00	.00
	10	24.26	.00	-7.73	.00	.00	.00
125	7	2.63	.00	5.28	.00	.00	.00
	8	3.85	.00	7.65	.00	.00	.00
	9	-3.38	.00	-7.73	.00	.00	.00
	10	3.09	.00	5.43	.00	.00	.00
145	7	.53	.00	-6.48	.00	.00	.00
	8	.75	.00	-9.39	.00	.00	.00
	9	-.19	.00	-16.50	.00	.00	.00
	10	-4.09	.00	-4.22	.00	.00	.00
165	7	1.74	.00	7.43	.00	.00	.00
	8	2.54	.00	10.79	.00	.00	.00
	9	2.41	.00	-2.72	.00	.00	.00
	10	9.28	.00	7.32	.00	.00	.00
106	7	5.23	.00	-4.20	.00	.00	.00
	8	7.66	.00	-6.09	.00	.00	.00
	9	11.17	.00	-10.99	.00	.00	.00
	10	11.36	.00	-5.38	.00	.00	.00
126	7	3.08	.00	4.09	.00	.00	.00
	8	4.51	.00	5.94	.00	.00	.00
	9	.27	.00	-3.32	.00	.00	.00
	10	-.30	.00	4.44	.00	.00	.00
146	7	2.00	.00	-4.88	.00	.00	.00
	8	2.90	.00	-7.08	.00	.00	.00
	9	2.23	.00	-10.50	.00	.00	.00
	10	-4.30	.00	-3.30	.00	.00	.00
166	7	2.66	.00	5.49	.00	.00	.00
	8	3.88	.00	7.97	.00	.00	.00
	9	3.65	.00	-.23	.00	.00	.00
	10	3.06	.00	5.30	.00	.00	.00
107	7	9.90	.00	-7.10	.00	.00	.00
	8	14.48	.00	-10.30	.00	.00	.00
	9	17.62	.00	-14.69	.00	.00	.00
	10	7.46	.00	-8.73	.00	.00	.00
127	7	7.36	.00	7.53	.00	.00	.00
	8	10.77	.00	10.92	.00	.00	.00
	9	5.51	.00	-1.18	.00	.00	.00
	10	-5.22	.00	8.56	.00	.00	.00
147	7	6.35	.00	-8.70	.00	.00	.00
	8	9.25	.00	-12.61	.00	.00	.00
	9	8.14	.00	-15.07	.00	.00	.00
	10	-9.70	.00	-6.12	.00	.00	.00
167	7	7.07	.00	9.59	.00	.00	.00
	8	10.31	.00	13.92	.00	.00	.00
	9	9.68	.00	3.01	.00	.00	.00
	10	-1.69	.00	9.05	.00	.00	.00
108	7	5.75	.00	-3.58	.00	.00	.00
	8	8.41	.00	-5.18	.00	.00	.00
	9	7.81	.00	-4.22	.00	.00	.00
	10	-5.34	.00	-4.11	.00	.00	.00
128	7	5.34	.00	4.28	.00	.00	.00
	8	7.80	.00	6.22	.00	.00	.00
	9	6.65	.00	3.01	.00	.00	.00
	10	-6.25	.00	5.18	.00	.00	.00
148	7	5.47	.00	-4.75	.00	.00	.00
	8	7.97	.00	-6.89	.00	.00	.00
	9	7.44	.00	-5.41	.00	.00	.00
	10	-6.72	.00	-3.52	.00	.00	.00
168	7	5.51	.00	5.08	.00	.00	.00
	8	8.04	.00	7.37	.00	.00	.00
	9	7.53	.00	4.29	.00	.00	.00
	10	-6.14	.00	4.63	.00	.00	.00
109	7	2.65	.00	-1.19	.00	.00	.00
	8	3.88	.00	-1.73	.00	.00	.00
	9	1.65	.00	1.71	.00	.00	.00
	10	-10.27	.00	-1.09	.00	.00	.00

JOINT	LOAD	FORCE-X	FORCE-Y	FORCE-Z	MOM-X	MOM-Y	MOM Z
129	7	3.32	.00	1.92	.00	.00	.00
	8	4.85	.00	2.79	.00	.00	.00
	9	5.85	.00	4.54	.00	.00	.00
	10	-5.48	.00	2.59	.00	.00	.00
149	7	3.96	.00	-1.95	.00	.00	.00
	8	5.78	.00	-2.82	.00	.00	.00
	9	5.62	.00	.34	.00	.00	.00
	10	-3.98	.00	-1.61	.00	.00	.00
169	7	3.68	.00	1.94	.00	.00	.00
	8	5.37	.00	2.82	.00	.00	.00
	9	5.02	.00	4.16	.00	.00	.00
	10	-7.00	.00	1.61	.00	.00	.00
110	7	.67	.00	.19	.00	.00	.00
	8	.98	.00	.29	.00	.00	.00
	9	-1.56	.00	4.33	.00	.00	.00
	10	-10.50	.00	.59	.00	.00	.00
130	7	1.70	.00	.41	.00	.00	.00
	8	2.49	.00	.59	.00	.00	.00
	9	4.30	.00	4.48	.00	.00	.00
	10	-4.01	.00	.84	.00	.00	.00
150	7	2.45	.00	-.22	.00	.00	.00
	8	3.58	.00	-.31	.00	.00	.00
	9	3.64	.00	3.11	.00	.00	.00
	10	-1.90	.00	-.37	.00	.00	.00
170	7	2.08	.00	.05	.00	.00	.00
	8	3.04	.00	.07	.00	.00	.00
	9	2.83	.00	3.34	.00	.00	.00
	10	-5.98	.00	-.16	.00	.00	.00
111	7	-.39	.00	.84	.00	.00	.00
	8	-.57	.00	1.22	.00	.00	.00
	9	-2.73	.00	4.83	.00	.00	.00
	10	-8.47	.00	1.31	.00	.00	.00
131	7	.61	.00	-.41	.00	.00	.00
	8	.89	.00	-.59	.00	.00	.00
	9	2.70	.00	3.64	.00	.00	.00
	10	-2.52	.00	-.17	.00	.00	.00
151	7	1.26	.00	.67	.00	.00	.00
	8	1.84	.00	.98	.00	.00	.00
	9	1.98	.00	3.91	.00	.00	.00
	10	-.55	.00	.30	.00	.00	.00
171	7	.91	.00	-.89	.00	.00	.00
	8	1.33	.00	-1.30	.00	.00	.00
	9	1.24	.00	2.34	.00	.00	.00
	10	-4.30	.00	-1.01	.00	.00	.00
112	7	-.80	.00	1.01	.00	.00	.00
	8	-1.17	.00	1.46	.00	.00	.00
	9	-2.72	.00	4.20	.00	.00	.00
	10	-5.80	.00	1.43	.00	.00	.00
132	7	-.02	.00	-.74	.00	.00	.00
	8	-.04	.00	-1.07	.00	.00	.00
	9	1.41	.00	2.57	.00	.00	.00
	10	-1.31	.00	-.63	.00	.00	.00
152	7	.44	.00	.99	.00	.00	.00
	8	.65	.00	1.43	.00	.00	.00
	9	.80	.00	3.60	.00	.00	.00
	10	.19	.00	.58	.00	.00	.00
172	7	.19	.00	-1.19	.00	.00	.00
	8	.27	.00	-1.73	.00	.00	.00
	9	.25	.00	1.42	.00	.00	.00
	10	-2.64	.00	-1.24	.00	.00	.00
113	7	-.82	.00	.91	.00	.00	.00
	8	-1.21	.00	1.31	.00	.00	.00
	9	-2.16	.00	3.13	.00	.00	.00
	10	-3.38	.00	1.23	.00	.00	.00
133	7	-.31	.00	-.76	.00	.00	.00
	8	-.46	.00	-1.11	.00	.00	.00
	9	.52	.00	1.57	.00	.00	.00
	10	-.48	.00	-.75	.00	.00	.00

JOINT	LOAD	FORCE-X	FORCE-Y	FORCE-Z	MOM-X	MOM-Y	MOM Z
153	7	-.02	.00	.96	.00	.00	.00
	8	-.03	.00	1.40	.00	.00	.00
	9	.09	.00	2.79	.00	.00	.00
	10	.49	.00	.61	.00	.00	.00
173	7	-.19	.00	-1.12	.00	.00	.00
	8	-.27	.00	-1.63	.00	.00	.00
	9	-.26	.00	.71	.00	.00	.00
	10	-1.33	.00	-1.13	.00	.00	.00
114	7	-.67	.00	.69	.00	.00	.00
	8	-.98	.00	1.00	.00	.00	.00
	9	-1.45	.00	2.04	.00	.00	.00
	10	-1.56	.00	.91	.00	.00	.00
134	7	-.38	.00	-.64	.00	.00	.00
	8	-.56	.00	-.93	.00	.00	.00
	9	.00	.00	.80	.00	.00	.00
	10	.00	.00	-.67	.00	.00	.00
154	7	-.24	.00	.78	.00	.00	.00
	8	-.34	.00	1.13	.00	.00	.00
	9	-.26	.00	1.89	.00	.00	.00
	10	.53	.00	.51	.00	.00	.00
174	7	-.33	.00	-.89	.00	.00	.00
	8	-.47	.00	-1.29	.00	.00	.00
	9	-.45	.00	.23	.00	.00	.00
	10	-.45	.00	-.87	.00	.00	.00
115	7	-.46	.00	.47	.00	.00	.00
	8	-.68	.00	.67	.00	.00	.00
	9	-.84	.00	1.14	.00	.00	.00
	10	-.40	.00	.59	.00	.00	.00
135	7	-.34	.00	-.47	.00	.00	.00
	8	-.50	.00	-.67	.00	.00	.00
	9	-.24	.00	.28	.00	.00	.00
	10	.23	.00	-.51	.00	.00	.00
155	7	-.29	.00	.55	.00	.00	.00
	8	-.42	.00	.80	.00	.00	.00
	9	-.37	.00	1.11	.00	.00	.00
	10	.44	.00	.38	.00	.00	.00
175	7	-.32	.00	-.61	.00	.00	.00
	8	-.47	.00	-.89	.00	.00	.00
	9	-.44	.00	-.04	.00	.00	.00
	10	.05	.00	-.59	.00	.00	.00
116	7	-.28	.00	.28	.00	.00	.00
	8	-.40	.00	.40	.00	.00	.00
	9	-.39	.00	.51	.00	.00	.00
	10	.21	.00	.33	.00	.00	.00
136	7	-.25	.00	-.30	.00	.00	.00
	8	-.37	.00	-.44	.00	.00	.00
	9	-.30	.00	-.02	.00	.00	.00
	10	.28	.00	-.35	.00	.00	.00
156	7	-.26	.00	.34	.00	.00	.00
	8	-.37	.00	.50	.00	.00	.00
	9	-.35	.00	.55	.00	.00	.00
	10	.32	.00	.25	.00	.00	.00
176	7	-.26	.00	-.38	.00	.00	.00
	8	-.38	.00	-.55	.00	.00	.00
	9	-.35	.00	-.16	.00	.00	.00
	10	.27	.00	-.35	.00	.00	.00
117	7	-.14	.00	.14	.00	.00	.00
	8	-.21	.00	.21	.00	.00	.00
	9	-.12	.00	.15	.00	.00	.00
	10	.43	.00	.16	.00	.00	.00
137	7	-.16	.00	-.17	.00	.00	.00
	8	-.24	.00	-.25	.00	.00	.00
	9	-.27	.00	-.14	.00	.00	.00
	10	.25	.00	-.21	.00	.00	.00
157	7	-.19	.00	.19	.00	.00	.00
	8	-.28	.00	.28	.00	.00	.00
	9	-.27	.00	.20	.00	.00	.00
	10	.20	.00	.14	.00	.00	.00

JOINT	LOAD	FORCE-X	FORCE-Y	FORCE-Z	MOM-X	MOM-Y	MOM Z
177	7	-.18	.00	-.20	.00	.00	.00
	8	-.26	.00	-.29	.00	.00	.00
	9	-.24	.00	-.19	.00	.00	.00
	10	.31	.00	-.18	.00	.00	.00
118	7	-.06	.00	.06	.00	.00	.00
	8	-.09	.00	.09	.00	.00	.00
	9	.00	.00	-.02	.00	.00	.00
	10	.39	.00	.06	.00	.00	.00
138	7	-.09	.00	-.09	.00	.00	.00
	8	-.14	.00	-.13	.00	.00	.00
	9	-.19	.00	-.15	.00	.00	.00
	10	.18	.00	-.11	.00	.00	.00
158	7	-.12	.00	.09	.00	.00	.00
	8	-.17	.00	.13	.00	.00	.00
	9	-.17	.00	.03	.00	.00	.00
	10	.11	.00	.07	.00	.00	.00
178	7	-.11	.00	-.09	.00	.00	.00
	8	-.16	.00	-.14	.00	.00	.00
	9	-.15	.00	-.15	.00	.00	.00
	10	.24	.00	-.08	.00	.00	.00
119	7	-.02	.00	.02	.00	.00	.00
	8	-.03	.00	.03	.00	.00	.00
	9	.03	.00	-.04	.00	.00	.00
	10	.23	.00	.02	.00	.00	.00
139	7	-.04	.00	-.03	.00	.00	.00
	8	-.06	.00	-.05	.00	.00	.00
	9	-.10	.00	-.09	.00	.00	.00
	10	.09	.00	-.05	.00	.00	.00
159	7	-.06	.00	.03	.00	.00	.00
	8	-.08	.00	.05	.00	.00	.00
	9	-.08	.00	-.02	.00	.00	.00
	10	.05	.00	.03	.00	.00	.00
179	7	-.05	.00	-.03	.00	.00	.00
	8	-.07	.00	-.05	.00	.00	.00
	9	-.07	.00	-.08	.00	.00	.00
	10	.13	.00	-.03	.00	.00	.00
120	7	.22	1946.08	-.29	.00	.00	.00
	8	.33	2807.49	-.42	.00	.00	.00
	9	.49	2600.75	-.92	.00	.00	.00
	10	.55	2386.88	-.38	.00	.00	.00
140	7	.12	1650.06	.25	.00	.00	.00
	8	.18	2374.07	.37	.00	.00	.00
	9	-.01	1054.03	-.41	.00	.00	.00
	10	.01	1814.39	.26	.00	.00	.00
160	7	.07	2068.92	-.31	.00	.00	.00
	8	.11	2984.17	-.45	.00	.00	.00
	9	.08	2616.73	-.83	.00	.00	.00
	10	-.17	1864.69	-.20	.00	.00	.00
180	7	.10	2016.65	.36	.00	.00	.00
	8	.15	2906.90	.52	.00	.00	.00
	9	.14	1481.09	-.16	.00	.00	.00
	10	.17	1686.65	.36	.00	.00	.00

MEMBER END FORCES STRUCTURE TYPE = SPACE

ALL UNITS ARE -- KNS METE

MEMBER	LOAD	JT	AXIAL	SHEAR-Y	SHEAR-Z	TORSION	MOM-Y	MOM-Z
1	7	1	2012.87	1073.91	-6.16	34.59	-169.23	1528.20
		2	-1978.23	-1055.26	6.16	-34.59	178.18	43.47
	8	1	2931.16	1563.57	-8.97	52.13	-249.70	2226.86
		2	-2882.66	-1537.46	8.97	-52.13	262.73	62.20
	9	1	1974.07	1035.70	196.04	1089.02	-2488.52	1432.56
		2	-1937.70	-1016.12	-196.04	-1089.02	2198.87	81.99
	10	1	2342.37	1218.67	-11.48	345.55	-458.97	1486.41
		2	-2306.00	-1199.08	11.48	-345.55	475.73	298.85
2	7	2	2242.06	8.75	6.16	-54.02	173.28	43.47
		3	-2162.12	-8.75	-6.16	54.02	-190.99	-16.51
	8	2	3267.00	12.98	8.97	-78.66	256.04	62.20
		3	-3155.08	-12.98	-8.97	78.66	-281.84	-22.25
	9	2	2187.83	24.01	-184.05	-83.63	2452.35	81.99
		3	-2103.89	-24.01	162.63	83.63	-1931.17	-9.23
	10	2	2598.86	37.53	11.48	78.70	582.69	298.85
		3	-2514.92	-37.53	-11.48	-78.70	-615.97	-186.96
3	7	3	2162.12	8.75	6.16	-54.02	190.99	16.51
		4	-2082.18	-8.75	-6.16	54.02	-208.15	10.51
	8	3	3155.08	12.98	8.97	-78.66	281.84	22.25
		4	-3043.17	-12.98	-8.97	78.66	-306.86	17.77
	9	3	2103.89	24.01	-162.62	-83.63	1931.16	9.23
		4	-2019.95	-24.01	141.20	83.63	-1473.32	63.59
	10	3	2514.91	37.53	11.48	78.70	615.97	186.96
		4	-2430.97	-37.53	-11.48	-78.70	-648.36	-74.78
4	7	4	1091.69	-.54	-6.05	-5.71	184.25	-5.43
		5	-1036.17	.54	6.05	5.71	-165.00	4.16
	8	4	1590.52	.38	-8.93	-8.22	271.28	-5.23
		5	-1512.80	-.38	8.93	8.22	-242.88	6.89
	9	4	1069.89	-17.27	-119.10	20.93	1155.24	-82.77
		5	-1011.60	17.27	100.74	-20.93	-823.76	31.34
	10	4	1208.86	-34.01	-7.01	-58.95	419.73	-79.43
		5	-1150.57	34.01	7.01	58.95	-396.99	-22.60
5	7	5	1036.18	-.54	-6.05	-5.71	165.00	-4.16
		6	-980.66	.54	6.05	5.71	-145.29	2.89
	8	5	1512.81	.38	-8.93	-8.22	242.88	-6.89
		6	-1435.09	-.38	8.93	8.22	-213.82	8.53
	9	5	1011.61	-17.27	-100.74	20.93	823.77	-31.34
		6	-953.32	17.27	82.38	-20.93	-546.71	-20.10
	10	5	1150.58	-34.01	-7.01	-58.95	396.99	22.61
		6	-1092.29	34.01	7.01	58.95	-373.59	-124.63
6	7	6	40.53	.00	.00	.00	.09	.03
		7	-5.00	.00	.00	.00	-.01	.00
	8	6	56.74	.00	.00	.00	.13	.04
		7	-7.00	.00	.00	.00	-.01	.00
	9	6	42.55	.00	-19.89	.00	43.70	.03
		7	-5.25	.00	4.59	.00	-6.90	.00
	10	6	42.55	.00	.00	.00	.10	.03
		7	-5.25	.00	.00	.00	-.01	.00
7	7	7	5.00	.00	.00	.00	.01	.00
		8	.00	.00	.00	.00	.00	.00
	8	7	7.00	.00	.00	.00	.01	.00
		8	.00	.00	.00	.00	.00	.00
	9	7	5.25	.00	-4.59	.00	6.90	.00
		8	.00	.00	.00	.00	.00	.00
	10	7	5.25	.00	.00	.00	.01	.00
		8	.00	.00	.00	.00	.00	.00

MEMBER	LOAD	JT	AXIAL	SHEAR-Y	SHEAR-Z	TORSION	MOM-Y	MOM-Z
11	7	11	2728.05	1429.30	-8.60	54.74	-162.12	1964.81
		12	-2693.41	-1410.65	8.60	-54.74	174.71	131.67
	8	11	3971.18	2080.20	-12.56	80.88	-239.28	2859.95
		12	-3922.68	-2054.09	12.56	-80.88	257.68	192.01
	9	11	2704.92	1392.03	194.71	1157.57	-2594.55	1885.34
		12	-2668.55	-1372.44	-194.71	-1157.57	2306.87	155.39
	10	11	2138.29	1291.63	-27.90	-48.92	-675.36	1821.59
		12	-2101.92	-1272.04	27.90	48.92	716.36	69.97
12	7	12	3040.27	34.91	8.60	-34.64	179.78	131.67
		13	-2960.33	-34.91	-8.60	34.64	-204.74	-26.16
	8	12	4427.66	51.18	12.56	-50.95	265.23	192.01
		13	-4315.74	-51.18	-12.56	50.95	-301.72	-37.35
	9	12	3000.26	56.76	-194.71	-74.48	2579.94	155.39
		13	-2916.32	-56.76	173.29	74.48	-2026.45	15.77
	10	12	2453.78	-92.60	27.90	-382.70	607.54	69.97
		13	-2369.84	71.18	-27.90	382.70	-689.44	-312.41
13	7	13	2029.31	-9.88	-.92	20.68	257.91	-58.27
		14	-1949.36	9.88	.92	-20.68	-253.94	29.18
	8	13	2951.77	-14.73	-1.27	30.04	379.68	-86.82
		14	-2839.85	14.73	1.27	-30.04	-374.11	43.41
	9	13	2044.14	-39.99	-183.29	62.96	1994.53	-205.69
		14	-1960.20	39.99	161.87	-62.96	-1474.54	86.32
	10	13	1780.34	-75.76	-3.88	-4.17	566.86	-37.28
		14	-1696.41	54.34	3.88	4.17	-552.94	-156.32
14	7	14	1949.36	-9.88	-.92	20.68	253.94	-29.18
		15	-1893.84	9.88	.92	-20.68	-248.94	-.04
	8	14	2839.85	-14.73	-1.27	30.04	374.11	-43.41
		15	-2762.13	14.73	1.27	-30.04	-367.05	-.17
	9	14	1960.20	-39.99	-161.87	62.96	1474.54	-86.32
		15	-1901.91	39.99	143.51	-62.96	-1012.67	-33.19
	10	14	1696.40	7.37	-3.88	-4.17	552.94	156.33
		15	-1638.11	-25.73	3.88	4.17	-537.46	-105.48
15	7	15	912.39	-63.73	8.50	4.53	304.15	-76.43
		16	-856.87	63.73	-8.50	-4.53	-327.80	-114.59
	8	15	1324.61	-94.20	12.51	6.98	448.40	-113.29
		16	-1246.89	94.20	-12.51	-6.98	-483.29	-169.07
	9	15	933.34	-70.43	-84.63	17.03	945.20	-110.98
		16	-875.05	70.43	66.27	-17.03	-716.13	-100.12
	10	15	864.38	-105.14	5.22	8.08	415.97	-137.94
		16	-806.09	86.78	-5.22	-8.08	-428.78	-149.56
16	7	16	856.87	-63.73	8.50	4.53	327.80	114.59
		17	-821.34	63.73	-8.50	-4.53	-350.11	-305.02
	8	16	1246.89	-94.20	12.51	6.98	483.29	169.07
		17	-1197.14	94.20	-12.51	-6.98	-516.25	-450.59
	9	16	875.05	-70.43	-66.28	17.03	716.13	100.12
		17	-837.74	70.43	50.98	-17.03	-536.02	-310.67
	10	16	806.09	-25.07	5.22	8.08	428.78	149.56
		17	-768.78	9.77	-5.22	-8.08	-440.05	-200.90
17	7	17	69.39	.00	.00	.00	.67	.20
		18	-33.86	.00	.00	.00	-.27	-.08
	8	17	97.15	.00	.00	.00	.94	.27
		18	-47.41	.00	.00	.00	-.38	-.11
	9	17	72.86	.00	-36.72	.00	147.58	.21
		18	-35.56	.00	21.42	.00	-59.96	-.08
	10	17	72.86	-36.72	.00	.00	.70	-146.67
		18	-35.56	21.42	.00	.00	-.29	59.59
18	7	18	33.87	.00	.00	.00	.27	.08
		19	-13.88	.00	.00	.00	-.08	-.02
	8	18	47.41	.00	.00	.00	.38	.11
		19	-19.43	.00	.00	.00	-.11	-.03
	9	18	35.56	.00	-21.42	.00	59.95	.08

```
214. PLOT BEN FILE
215. PLOT FORCE FILE
216. PLOT DISP FILE
217. START CON DESIGN
218. FC 30000
219. TRACK 1
220. CLEAR 0.05
221. DESIGN COLUMN 1 TO 7 11 TO 18

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

FY - 413.7  FC -  30.0 MPA,  CIRC SIZE 1200.0 MMS DIAMETER  TIED

        AREA OF STEEL REQUIRED = 16851.4  SQ. MM

BAR CONFIGURATION       REINF PCT.   LOAD   LOCATION   PHI
-------------------------------------------------------------

 21 - 32 MM               1.494        9      STA      .700
(EQUALLY SPACED)

    COLUMN INTERACTION: MOMENT ABOUT Z/Y -AXIS (KN-MET)
 ----------------------------------------------------------
   P0        Pn max    P-bal.    M-bal.     e-bal. (MM)
35397.58  28318.07  13656.43   5549.58     406.4
   M0       P-tens.   Des.Pn    Des.Mn     e/h
 3255.17  -6988.57   2820.11   4102.00     .985
 ----------------------------------------------------------

     C O L U M N   N O.    2   D E S I G N   R E S U L T S

FY - 413.7  FC -  30.0 MPA,  CIRC SIZE 1200.0 MMS DIAMETER  TIED

        AREA OF STEEL REQUIRED = 12101.4  SQ. MM

BAR CONFIGURATION       REINF PCT.   LOAD   LOCATION   PHI
-------------------------------------------------------------

 39 - 20 MM               1.083        9      STA      .700
(EQUALLY SPACED)

    COLUMN INTERACTION: MOMENT ABOUT Z/Y -AXIS (KN-MET)
 ----------------------------------------------------------
   P0        Pn max    P-bal.    M-bal.     e-bal. (MM)
33595.46  26876.37  13642.51   5048.20     370.0
   M0       P-tens.   Des.Pn    Des.Mn     e/h
 2459.53  -5068.06   3125.47   3505.31     .374
 ----------------------------------------------------------

==============================================================================

     C O L U M N   N O.    3   D E S I G N   R E S U L T S

FY - 413.7  FC -  30.0 MPA,  CIRC SIZE 1200.0 MMS DIAMETER  TIED

        AREA OF STEEL REQUIRED = 11309.7  SQ. MM

BAR CONFIGURATION       REINF PCT.   LOAD   LOCATION   PHI
-------------------------------------------------------------

  9 - 40 MM               1.000        7      STA      .700
(EQUALLY SPACED)

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

P0	Pn max	P-bal.	M-bal.	e-bal. (MM)
33230.09	26584.07	13443.64	4921.88	366.1
MO	P-tens.	Des.Pn	Des.Mn	e/h
2255.03	-4678.69	3088.75	273.86	.030

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

FY - 413.7 FC - 30.0 MPA, CIRC SIZE 1000.0 MMS DIAMETER TIED

AREA OF STEEL REQUIRED = 7853.9 SQ. MM

BAR CONFIGURATION	REINF PCT.	LOAD	LOCATION	PHI
40 - 16 MM (EQUALLY SPACED)	1.024	7	STA	.700

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

P0	Pn max	P-bal.	M-bal.	e-bal. (MM)
23150.34	18520.27	9341.11	2858.84	306.0
MO	P-tens.	Des.Pn	Des.Mn	e/h
1340.07	-3327.84	1559.55	263.33	.056

C O L U M N N O. 5 D E S I G N R E S U L T S

FY - 413.7 FC - 30.0 MPA, CIRC SIZE 1000.0 MMS DIAMETER TIED

AREA OF STEEL REQUIRED = 7853.9 SQ. MM

BAR CONFIGURATION	REINF PCT.	LOAD	LOCATION	PHI
40 - 16 MM (EQUALLY SPACED)	1.024	7	STA	.700

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

P0	Pn max	P-bal.	M-bal.	e-bal. (MM)
23150.34	18520.27	9341.11	2858.84	306.0
MO	P-tens.	Des.Pn	Des.Mn	e/h
1340.07	-3327.84	1480.25	235.79	.053

C O L U M N N O. 6 D E S I G N R E S U L T S

FY - 413.7 FC - 30.0 MPA, CIRC SIZE 800.0 MMS DIAMETER TIED

AREA OF STEEL REQUIRED = 5026.5 SQ. MM

BAR CONFIGURATION	REINF PCT.	LOAD	LOCATION	PHI
4 - 40 MM (EQUALLY SPACED)	1.000	7	STA	.700

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

```
 ---------------------------------------------------------
   P0        Pn max    P-bal.    M-bal.     e-bal. (MM)
14768.93  11815.14   5664.81   1403.19     247.7
   M0        P-tens.   Des.Pn    Des.Mn     e/h
 684.64  -2079.42     57.89       .14      .001
 ---------------------------------------------------------

=====================================================================

    C O L U M N   N O.   7   D E S I G N   R E S U L T S

FY - 413.7  FC -  30.0 MPA,  CIRC SIZE  300.0 MMS DIAMETER  TIED

        AREA OF STEEL REQUIRED =   706.9  SQ. MM

BAR CONFIGURATION        REINF PCT.   LOAD   LOCATION   PHI
---------------------------------------------------------

  7 - 12 MM                1.120        7      STA      .700
(EQUALLY SPACED)

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

 ---------------------------------------------------------
   P0        Pn max    P-bal.    M-bal.     e-bal. (MM)
 2109.75   1687.80    647.60     67.90     104.8
   M0        P-tens.   Des.Pn    Des.Mn     e/h
  34.26   -327.45      7.14       .02      .001
 ---------------------------------------------------------

=====================================================================

    C O L U M N   N O.   11   D E S I G N   R E S U L T S

FY - 413.7  FC -  30.0 MPA,  CIRC SIZE 1200.0 MMS DIAMETER  TIED

        AREA OF STEEL REQUIRED = 18434.8  SQ. MM

BAR CONFIGURATION        REINF PCT.   LOAD   LOCATION   PHI
---------------------------------------------------------

 23 - 32 MM                1.636        9      STA      .700
(EQUALLY SPACED)

   COLUMN INTERACTION: MOMENT ABOUT Z/Y -AXIS (KN-MET)
 ---------------------------------------------------------
   P0        Pn max    P-bal.    M-bal.     e-bal. (MM)
36022.13  28817.71  13731.45   5733.12     417.5
   M0        P-tens.   Des.Pn    Des.Mn     e/h
 3528.24  -7654.15   3864.17   4581.71     .803
 ---------------------------------------------------------

=====================================================================

    C O L U M N   N O.   12   D E S I G N   R E S U L T S

FY - 413.7  FC -  30.0 MPA,  CIRC SIZE 1200.0 MMS DIAMETER  TIED

        AREA OF STEEL REQUIRED = 11309.7  SQ. MM

BAR CONFIGURATION        REINF PCT.   LOAD   LOCATION   PHI
---------------------------------------------------------

  9 - 40 MM                1.000        7      STA      .700
(EQUALLY SPACED)
```


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

P0	Pn max	P-bal.	M-bal.	e-bal. (MM)
33230.09	26584.07	13443.64	4921.88	366.1
M0	P-tens.	Des.Pn	Des.Mn	e/h
2255.03	-4678.69	4343.24	318.34	.024

C O L U M N N O. 13 D E S I G N R E S U L T S

FY - 413.7 FC - 30.0 MPA, CIRC SIZE 1200.0 MMS DIAMETER TIED

AREA OF STEEL REQUIRED = 11309.7 SQ. MM

BAR CONFIGURATION	REINF PCT.	LOAD	LOCATION	PHI
9 - 40 MM (EQUALLY SPACED)	1.000	7	STA	.700

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

P0	Pn max	P-bal.	M-bal.	e-bal. (MM)
33230.09	26584.07	13443.64	4921.88	366.1
M0	P-tens.	Des.Pn	Des.Mn	e/h
2255.03	-4678.69	2899.01	377.73	.043

C O L U M N N O. 14 D E S I G N R E S U L T S

FY - 413.7 FC - 30.0 MPA, CIRC SIZE 1000.0 MMS DIAMETER TIED

AREA OF STEEL REQUIRED = 7853.9 SQ. MM

BAR CONFIGURATION	REINF PCT.	LOAD	LOCATION	PHI
40 - 16 MM (EQUALLY SPACED)	1.024	7	STA	.700

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

P0	Pn max	P-bal.	M-bal.	e-bal. (MM)
23150.34	18520.27	9341.11	2858.84	306.0
M0	P-tens.	Des.Pn	Des.Mn	e/h
1340.07	-3327.84	2784.80	365.16	.044

C O L U M N N O. 15 D E S I G N R E S U L T S

FY - 413.7 FC - 30.0 MPA, CIRC SIZE 1000.0 MMS DIAMETER TIED

AREA OF STEEL REQUIRED = 7853.9 SQ. MM

BAR CONFIGURATION	REINF PCT.	LOAD	LOCATION	PHI

40 - 16 MM 1.024 7 STA .700
(EQUALLY SPACED)

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

P0	Pn max	P-bal.	M-bal.	e-bal. (MM)
23150.34	18520.27	9341.11	2858.84	306.0
MO	P-tens.	Des.Pn	Des.Mn	e/h
1340.07	-3327.84	1303.41	448.01	.115

C O L U M N N O. 16 D E S I G N R E S U L T S

FY - 413.7 FC - 30.0 MPA, CIRC SIZE 800.0 MMS DIAMETER TIED

AREA OF STEEL REQUIRED = 6082.1 SQ. MM

BAR CONFIGURATION	REINF PCT.	LOAD	LOCATION	PHI
31 - 16 MM (EQUALLY SPACED)	1.240	9	STA	.700

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

P0	Pn max	P-bal.	M-bal.	e-bal. (MM)
15237.78	12190.23	5863.69	1524.02	259.9
MO	P-tens.	Des.Pn	Des.Mn	e/h
800.13	-2579.07	1250.07	1032.99	.275

C O L U M N N O. 17 D E S I G N R E S U L T S

FY - 413.7 FC - 30.0 MPA, CIRC SIZE 800.0 MMS DIAMETER TIED

AREA OF STEEL REQUIRED = 5026.5 SQ. MM

BAR CONFIGURATION	REINF PCT.	LOAD	LOCATION	PHI
4 - 40 MM (EQUALLY SPACED)	1.000	7	STA	.700

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

P0	Pn max	P-bal.	M-bal.	e-bal. (MM)
14768.93	11815.14	5664.81	1403.19	247.7
MO	P-tens.	Des.Pn	Des.Mn	e/h
684.64	-2079.42	99.13	1.00	.003

C O L U M N N O. 18 D E S I G N R E S U L T S

FY - 413.7 FC - 30.0 MPA, CIRC SIZE 600.0 MMS DIAMETER TIED

AREA OF STEEL REQUIRED = 2827.4 SQ. MM

BAR CONFIGURATION	REINF PCT.	LOAD	LOCATION	PHI

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-----------------------------------------------------------

 26 - 12 MM                1.040        7       STA       .700
(EQUALLY SPACED)

   COLUMN INTERACTION: MOMENT ABOUT Z/Y -AXIS (KN-MET)
 ---------------------------------------------------------
   P0        Pn max    P-bal.    M-bal.     e-bal. (MM)
 8351.22   6680.97   3166.67    600.70     189.7
   M0        P-tens.   Des.Pn    Des.Mn     e/h
  282.17  -1216.24     48.38       .40      .003
 ---------------------------------------------------------


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


222. DESIGN BEAM 21 TO 29 31 TO 39 41 TO 49 51 TO 59


=================================================================

      B E A M  N O.  21  D E S I G N  R E S U L T S -  FLEXURE

LEN -  1932. MM  FY -  414.  FC -  30.  MPA, SIZE -  550. X 1200. MMS

LEVEL    HEIGHT     BAR INFO        FROM          TO          ANCHOR
          (MM)                      (MM)         (MM)         STA  END
_________________________________________________________________

  1        73.     7 - 20MM        937.         1932.        NO   YES
|-----------------------------------------------------------------|
|   CRITICAL POS MOMENT=    143.95 KN-MET  AT  1932.MM, LOAD  10 |
|   REQD STEEL=  2067.MM2, ROW= .0033, ROWMX= .0228 ROWMN= .0033 |
|   MAX/MIN/ACTUAL BAR SPACING=   428./   45./   71. MMS         |
|   BASIC/REQD. DEVELOPMENT LENGTH =   450./   592. MMS          |
|-----------------------------------------------------------------|

  2       1127.     7 - 20MM          0.         1932.        YES  YES
|-----------------------------------------------------------------|
|   CRITICAL NEG MOMENT=    825.53 KN-MET  AT     0.MM, LOAD   8 |
|   REQD STEEL=  2067.MM2, ROW= .0033, ROWMX= .0228 ROWMN= .0033 |
|   MAX/MIN/ACTUAL BAR SPACING=   428./   45./   71. MMS         |
|   BASIC/REQD. DEVELOPMENT LENGTH =   450./   819. MMS          |
|-----------------------------------------------------------------|

      B E A M  N O.  21  D E S I G N  R E S U L T S - SHEAR

 AT START SUPPORT - Vu=  432.29 KNS  Vc=  147.89 KNS  Vs=  360.69 KNS
                    Tu=  372.48 KN-MET  Ts=  310.8 KN-MET
                    Tc=  127.4 KN-MET
                    PROVIDE 12 MM BARS AT  81. MM  C/C FOR 1932. MM
 AT END   SUPPORT - Vu=  438.69 KNS  Vc=  149.93 KNS  Vs=  366.19 KNS
                    Tu=  372.48 KN-MET  Ts=  310.9 KN-MET
                    Tc=  127.3 KN-MET
                    PROVIDE 12 MM BARS AT  81. MM  C/C FOR 1932. MM
|    RUPSA BRIDGE (ANALYSIS OF STAIRCASE)                    -- PAGE NO.   24

___   4J_____________________  1931X 549X 1199_____________________  21J____
||=================================================================||
| 7No20 H1127.   0.TO 1932          |   |   |   |   |   |   |   |   |   | |
|                                   |   |   |   |   |   |   |   |   |   | |
| 25*12c/c 81                       |   |   |   |   |   |  25*12c/c 81  | |
|                                   |   |   |   |   |   |   |   |   |   | |
|                                 7No20|H  73. 937.TO 1932 |   |   |   | |
|                                 ==================================||
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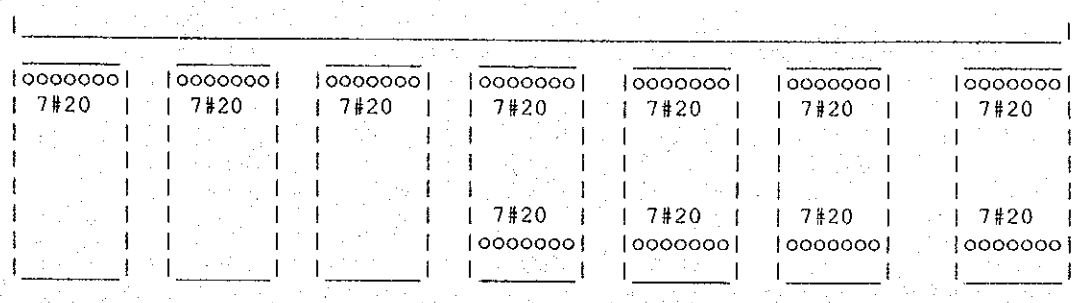
11-395



B E A M N O. 22 D E S I G N R E S U L T S - FLEXURE

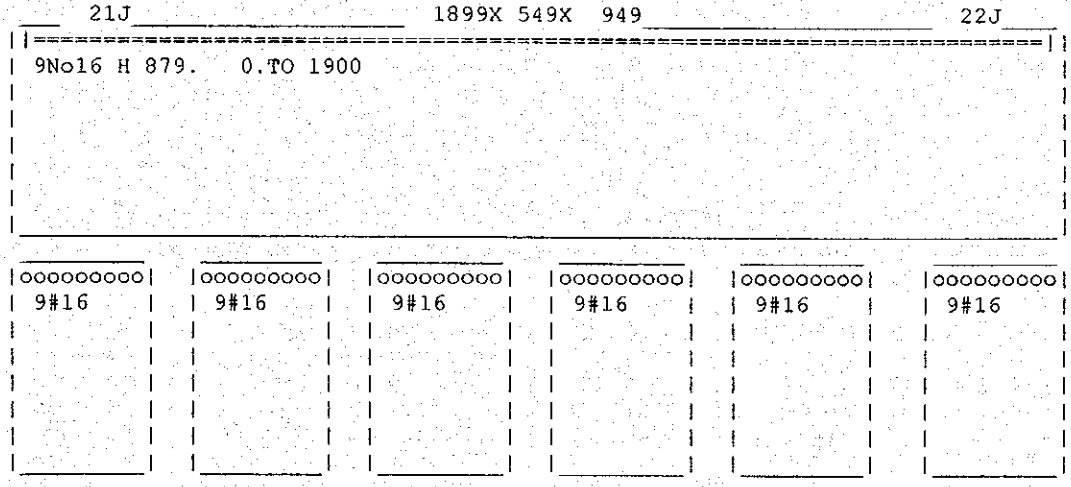
LEN - 1900. MM FY - 414. FC - 30. MPA, SIZE - 550. X 950. MMS

LEVEL	HEIGHT (MM)	BAR INFO	FROM (MM)	TO (MM)	ANCHOR STA	ANCHOR END
1	879.	9 - 16MM	0.	1900.	YES	YES

CRITICAL NEG MOMENT= 58.21 KN-MET AT 0.MM, LOAD 8
REQD STEEL= 1612.MM2, ROW= .0033, ROWMX= .0228 ROWMN= .0033
MAX/MIN/ACTUAL BAR SPACING= 432./ 41./ 54. MMS
BASIC/REQD. DEVELOPMENT LENGTH = 288./ 568. MMS

B E A M N O. 22 D E S I G N R E S U L T S - SHEAR

AT START SUPPORT - Vu= 38.03 KNS Vc= 437.54 KNS Vs= .00 KNS
STIRRUPS ARE NOT REQUIRED.
AT END SUPPORT - Vu= 24.95 KNS Vc= 437.54 KNS Vs= .00 KNS
STIRRUPS ARE NOT REQUIRED.



B E A M N O. 23 D E S I G N R E S U L T S - FLEXURE

LEN - 3987. MM FY - 414. FC - 30. MPA, SIZE - 250. X 1200. MMS

LEVEL	HEIGHT (MM)	BAR INFO	FROM (MM)	TO (MM)	ANCHOR STA	ANCHOR END

```
 1       1127.     3 - 20MM          0.          3987.        YES  YES
|-----------------------------------------------------------------|
|   CRITICAL NEG MOMENT=    251.61 KN-MET  AT     0.MM, LOAD   8 |
|   REQD STEEL=   939.MM2, ROW= .0033, ROWMX= .0228 ROWMN= .0033 |
|   MAX/MIN/ACTUAL BAR SPACING=   128./   45./   64. MMS         |
|   BASIC/REQD. DEVELOPMENT LENGTH =   450./   819. MMS          |
|-----------------------------------------------------------------|
```

B E A M N O. 23 D E S I G N R E S U L T S - SHEAR

```
AT START SUPPORT - Vu=   92.69 KNS  Vc=  255.73 KNS  Vs=     .00 KNS
                   STIRRUPS ARE NOT REQUIRED.
AT END   SUPPORT - Vu=   27.50 KNS  Vc=  255.73 KNS  Vs=     .00 KNS
                   STIRRUPS ARE NOT REQUIRED.
```

```
___   4J_____________________  3986X 249X 1199_____________________  23J____
|||=================================================================|||
| 3No20 H1127.   0.TO 3987                                          |
|                                                                   |
|                                                                   |
|                                                                   |
|                                                                   |
|                                                                   |
|___________________________________________________________________|
 ___        ___        ___        ___        ___        ___
|ooo|      |ooo|      |ooo|      |ooo|      |ooo|      |ooo|
| 3#20     | 3#20     | 3#20     | 3#20     | 3#20     | 3#2
0|   |      |   |      |   |      |   |      |   |      |   |
|   |      |   |      |   |      |   |      |   |      |   |
|   |      |   |      |   |      |   |      |   |      |   |
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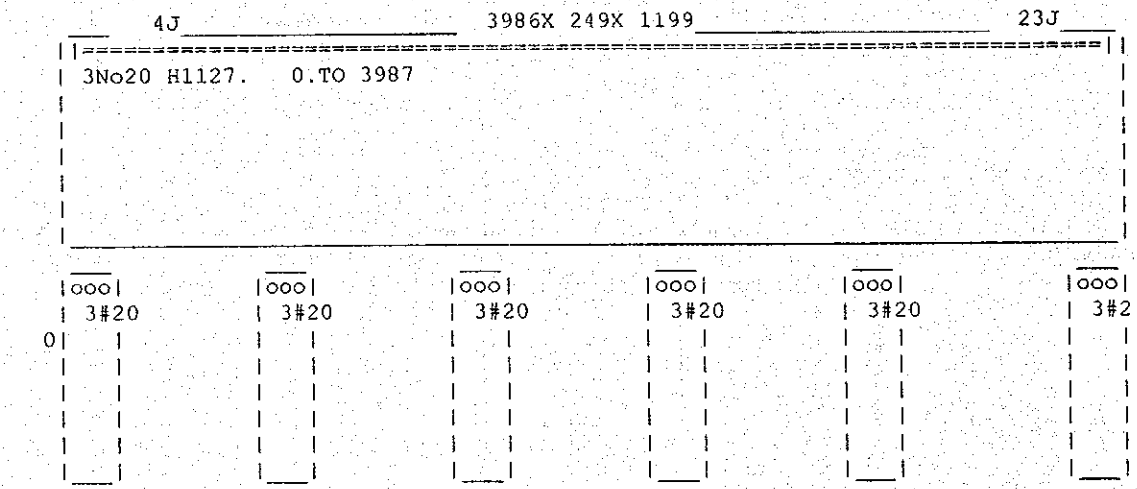
|___|      |___|      |___|      |___|      |___|      |___|
```



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B E A M N O. 24 D E S I G N R E S U L T S - FLEXURE

LEN - 4107. MM FY - 414. FC - 30. MPA, SIZE - 250. X 1200. MMS

LEVEL	HEIGHT (MM)	BAR INFO	FROM (MM)	TO (MM)	ANCHOR STA	ANCHOR END

```
 1       1127.     3 - 20MM          0.          4107.        YES  YES
|-----------------------------------------------------------------|
|   CRITICAL NEG MOMENT=    265.74 KN-MET  AT     0.MM, LOAD   8 |
|   REQD STEEL=   939.MM2, ROW= .0033, ROWMX= .0228 ROWMN= .0033 |
|   MAX/MIN/ACTUAL BAR SPACING=   128./   45./   64. MMS         |
|   BASIC/REQD. DEVELOPMENT LENGTH =   450./   819. MMS          |
|-----------------------------------------------------------------|
```

B E A M N O. 24 D E S I G N R E S U L T S - SHEAR

```
AT START SUPPORT - Vu=   95.38 KNS  Vc=  255.73 KNS  Vs=     .00 KNS
                   STIRRUPS ARE NOT REQUIRED.
AT END   SUPPORT - Vu=   27.50 KNS  Vc=  255.73 KNS  Vs=     .00 KNS
                   STIRRUPS ARE NOT REQUIRED.
|    RUPSA BRIDGE (ANALYSIS OF STAIRCASE)                    -- PAGE NO.   27
```

```
___   4J_____________________  4106X 249X 1199_____________________  24J____
```


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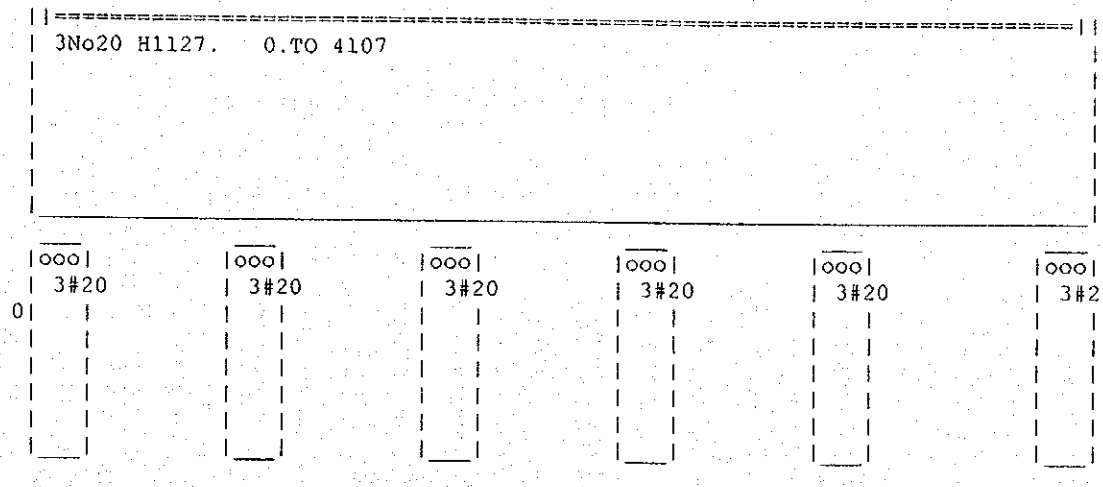


B E A M N O. 25 D E S I G N R E S U L T S - FLEXURE

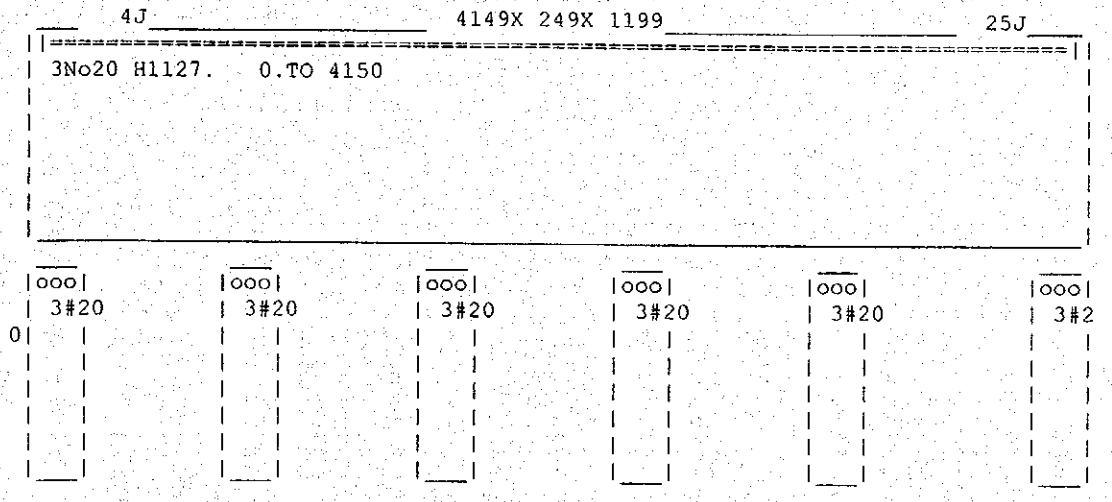
LEN - 4150. MM FY - 414. FC - 30. MPA, SIZE - 250. X 1200. MMS

LEVEL	HEIGHT (MM)	BAR INFO	FROM (MM)	TO (MM)	ANCHOR STA	ANCHOR END
1	1127.	3 - 20MM	0.	4150.	YES	YES

CRITICAL NEG MOMENT= 270.90 KN-MET AT 0.MM, LOAD 8
REQD STEEL= 939.MM2, ROW= .0033, ROWMX= .0228 ROWMN= .0033
MAX/MIN/ACTUAL BAR SPACING= 128./ 45./ 64. MMS
BASIC/REQD. DEVELOPMENT LENGTH = 450./ 819. MMS

B E A M N O. 25 D E S I G N R E S U L T S - SHEAR

AT START SUPPORT - Vu= 96.34 KNS Vc= 255.73 KNS Vs= .00 KNS
STIRRUPS ARE NOT REQUIRED.
AT END SUPPORT - Vu= 36.66 KNS Vc= 255.73 KNS Vs= .00 KNS
STIRRUPS ARE NOT REQUIRED.



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B E A M N O. 26 D E S I G N R E S U L T S - FLEXURE

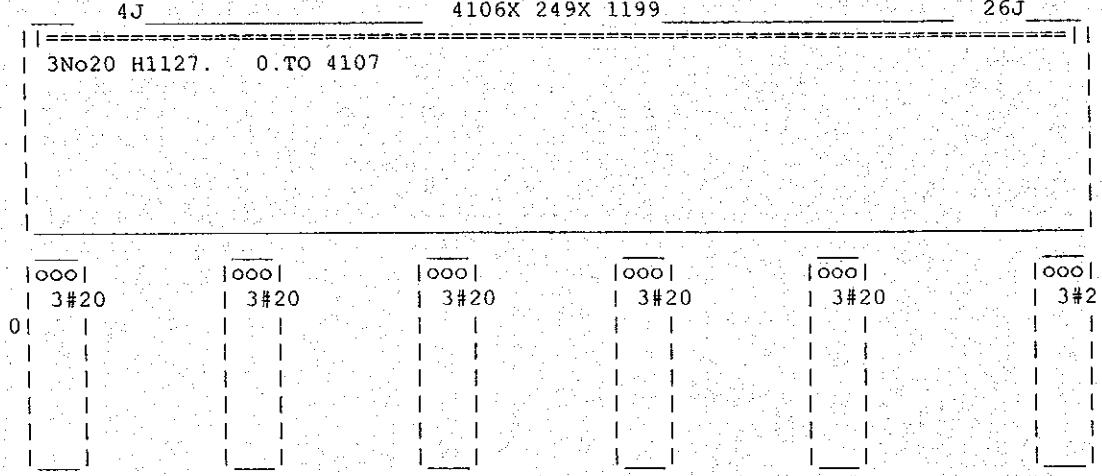
LEN - 4107. MM FY - 414. FC - 30. MPA, SIZE - 250. X 1200. MMS

LEVEL	HEIGHT (MM)	BAR INFO	FROM (MM)	TO (MM)	ANCHOR STA	ANCHOR END
1	1127.	3 - 20MM	0.	4107.	YES	YES

CRITICAL NEG MOMENT= 265.74 KN-MET AT 0.MM, LOAD 8
REQD STEEL= 939.MM2, ROW= .0033, ROWMX= .0228 ROWMN= .0033
MAX/MIN/ACTUAL BAR SPACING= 128./ 45./ 64. MMS
BASIC/REQD. DEVELOPMENT LENGTH = 450./ 819. MMS

B E A M N O. 26 D E S I G N R E S U L T S - SHEAR

AT START SUPPORT - Vu= 95.38 KNS Vc= 255.73 KNS Vs= .00 KNS
STIRRUPS ARE NOT REQUIRED.
AT END SUPPORT - Vu= 16.23 KNS Vc= 255.73 KNS Vs= .00 KNS
STIRRUPS ARE NOT REQUIRED.



B E A M N O. 27 D E S I G N R E S U L T S - FLEXURE

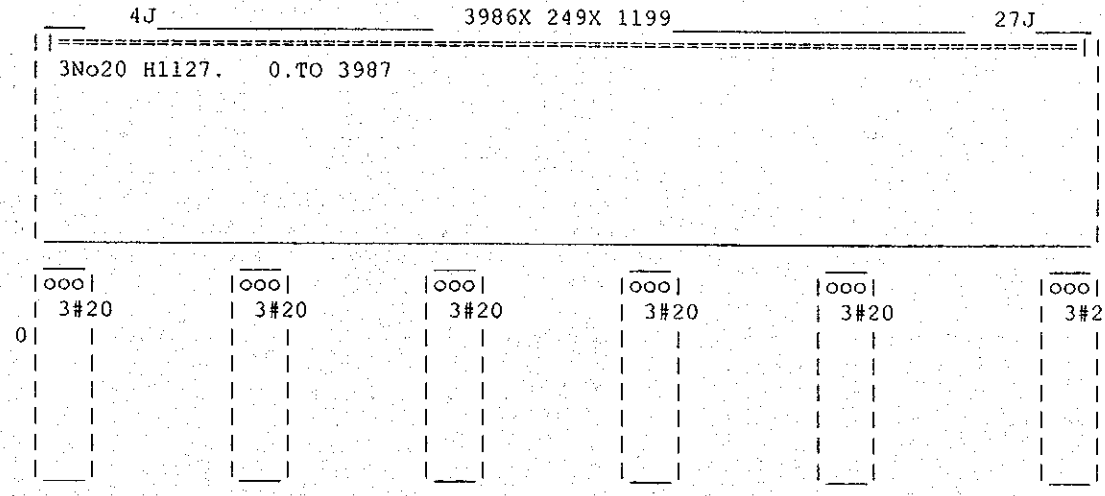
LEN - 3987. MM FY - 414. FC - 30. MPA, SIZE - 250. X 1200. MMS

LEVEL	HEIGHT (MM)	BAR INFO	FROM (MM)	TO (MM)	ANCHOR STA	ANCHOR END
1	1127.	3 - 20MM	0.	3987.	YES	YES

CRITICAL NEG MOMENT= 251.62 KN-MET AT 0.MM, LOAD 8
REQD STEEL= 939.MM2, ROW= .0033, ROWMX= .0228 ROWMN= .0033
MAX/MIN/ACTUAL BAR SPACING= 128./ 45./ 64. MMS
BASIC/REQD. DEVELOPMENT LENGTH = 450./ 819. MMS

B E A M N O. 27 D E S I G N R E S U L T S - SHEAR

AT START SUPPORT - Vu= 92.69 KNS Vc= 255.73 KNS Vs= .00 KNS
STIRRUPS ARE NOT REQUIRED.
AT END SUPPORT - Vu= 16.23 KNS Vc= 255.73 KNS Vs= .00 KNS
STIRRUPS ARE NOT REQUIRED.



B E A M N O. 28 D E S I G N R E S U L T S - FLEXURE

LEN - 1932. MM FY - 414. FC - 30. MPA, SIZE - 550. X 1200. MMS

LEVEL	HEIGHT (MM)	BAR INFO	FROM (MM)	TO (MM)	ANCHOR STA	ANCHOR END
1	73.	7 - 20MM	937.	1932.	NO	YES
	CRITICAL POS MOMENT= 172.45 KN-MET AT 1932.MM, LOAD 10					
	REQD STEEL= 2067.MM2, ROW= .0033, ROWMX= .0228 ROWMN= .0033					
	MAX/MIN/ACTUAL BAR SPACING= 428./ 45./ 71. MMS					
	BASIC/REQD. DEVELOPMENT LENGTH = 450./ 592. MMS					
2	1127.	7 - 20MM	0.	1932.	YES	YES
	CRITICAL NEG MOMENT= 794.27 KN-MET AT 0.MM, LOAD 8					
	REQD STEEL= 2067.MM2, ROW= .0033, ROWMX= .0228 ROWMN= .0033					
	MAX/MIN/ACTUAL BAR SPACING= 428./ 45./ 71. MMS					
	BASIC/REQD. DEVELOPMENT LENGTH = 450./ 819. MMS					

B E A M N O. 28 D E S I G N R E S U L T S - SHEAR

AT START SUPPORT - Vu= 419.88 KNS Vc= 136.98 KNS Vs= 357.00 KNS
Tu= 392.67 KN-MET Ts= 333.9 KN-MET
Tc= 128.1 KN-MET
PROVIDE 12 MM BARS AT 77. MM C/C FOR 1932. MM

AT END SUPPORT - Vu= 428.42 KNS Vc= 139.59 KNS Vs= 364.43 KNS
Tu= 392.67 KN-MET Ts= 334.0 KN-MET
Tc= 127.9 KN-MET
PROVIDE 12 MM BARS AT 77. MM C/C FOR 1932. MM

4J 1931X 549X 1199 28J

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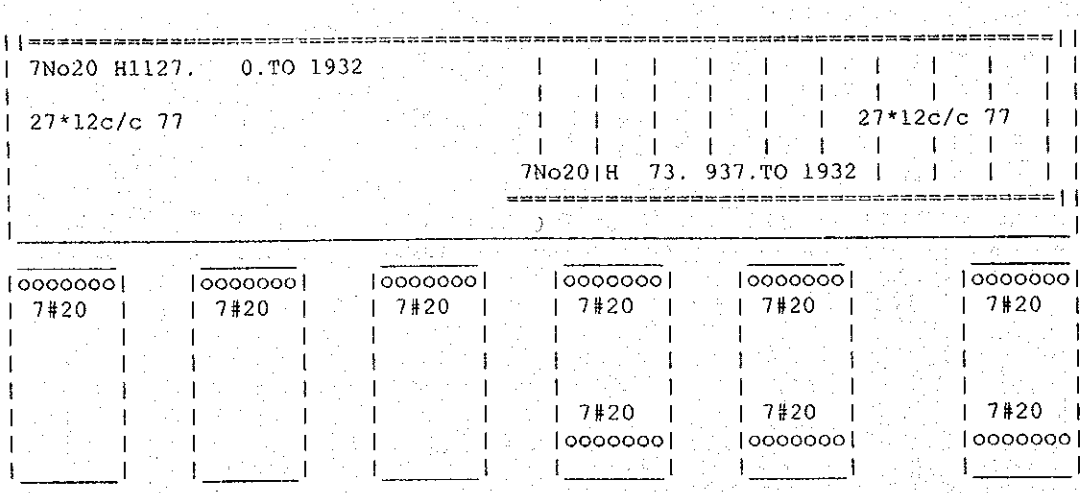


B E A M N O. 29 D E S I G N R E S U L T S - FLEXURE

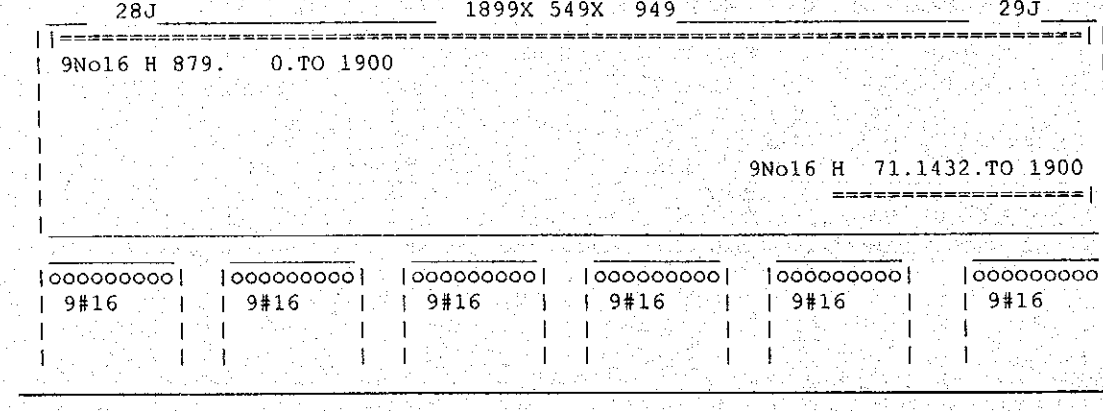
LEN - 1900. MM FY - 414. FC - 30. MPA, SIZE - 550. X 950. MMS

LEVEL	HEIGHT (MM)	BAR INFO	FROM (MM)	TO (MM)	ANCHOR STA	ANCHOR END
1	71.	9 - 16MM	1432.	1900.	NO	YES
	CRITICAL POS MOMENT= .00 KN-MET AT 1900.MM, LOAD 9					
	REQD STEEL= 1612.MM2, ROW= .0033, ROWMX= .0228 ROWMN= .0033					
	MAX/MIN/ACTUAL BAR SPACING= 432./ 41./ 54. MMS					
	BASIC/REQD. DEVELOPMENT LENGTH = 288./ 389. MMS					
2	879.	9 - 16MM	0.	1900.	YES	YES
	CRITICAL NEG MOMENT= 58.21 KN-MET AT 0.MM, LOAD 8					
	REQD STEEL= 1612.MM2, ROW= .0033, ROWMX= .0228 ROWMN= .0033					
	MAX/MIN/ACTUAL BAR SPACING= 432./ 41./ 54. MMS					
	BASIC/REQD. DEVELOPMENT LENGTH = 288./ 568. MMS					

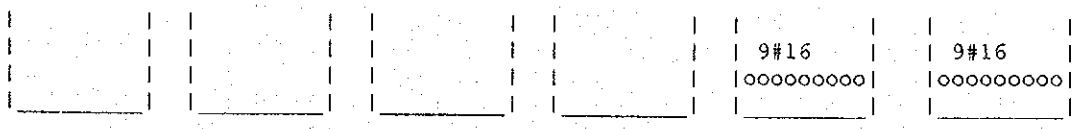
B E A M N O. 29 D E S I G N R E S U L T S - SHEAR

AT START SUPPORT - Vu= 38.03 KNS Vc= 437.54 KNS Vs= .00 KNS
STIRRUPS ARE NOT REQUIRED.

AT END SUPPORT - Vu= 20.76 KNS Vc= 437.54 KNS Vs= .00 KNS
STIRRUPS ARE NOT REQUIRED.



11-401



B E A M N O. 31 D E S I G N R E S U L T S - FLEXURE

LEN - 1924. MM FY - 414. FC - 30. MPA, SIZE - 550. X 1200. MMS

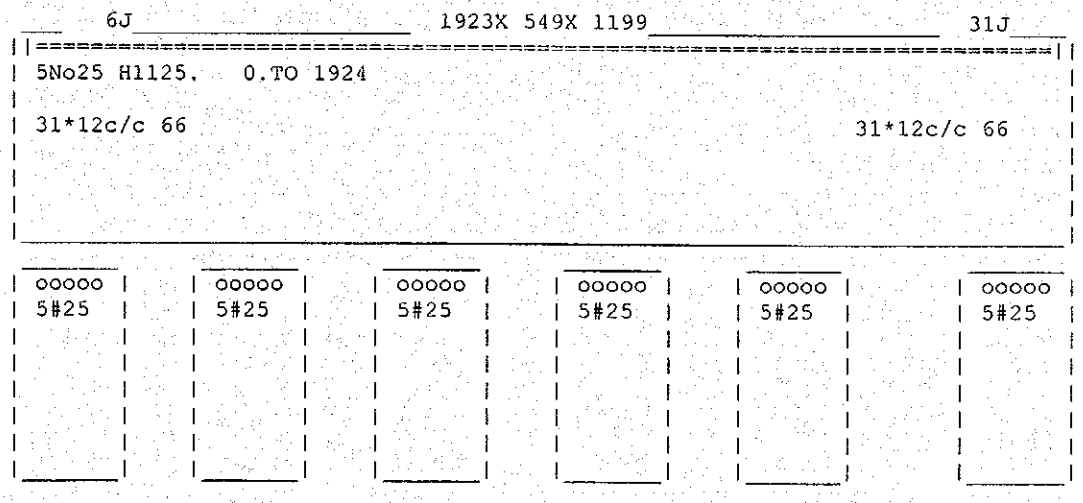
LEVEL	HEIGHT (MM)	BAR INFO	FROM (MM)	TO (MM)	ANCHOR STA	ANCHOR END
1	1125.	5 - 25MM	0.	1924.	YES	YES

CRITICAL NEG MOMENT= 979.94 KN-MET AT 0.MM, LOAD 8
REQD STEEL= 2417.MM2, ROW= .0039, ROWMX= .0228 ROWMN= .0033
MAX/MIN/ACTUAL BAR SPACING= 423./ 50./ 106. MMS
BASIC/REQD. DEVELOPMENT LENGTH = 703./ 914. MMS

B E A M N O. 31 D E S I G N R E S U L T S - SHEAR

AT START SUPPORT - Vu= 384.69 KNS Vc= 108.17 KNS Vs= 344.40 KNS
Tu= 460.92 KN-MET Ts= 412.6 KN-MET
Tc= 129.6 KN-MET
PROVIDE 12 MM BARS AT 66. MM C/C FOR 1924. MM

AT END SUPPORT - Vu= 392.41 KNS Vc= 110.26 KNS Vs= 351.40 KNS
Tu= 460.92 KN-MET Ts= 412.7 KN-MET
Tc= 129.5 KN-MET
PROVIDE 12 MM BARS AT 66. MM C/C FOR 1924. MM



B E A M N O. 32 D E S I G N R E S U L T S - FLEXURE

LEN - 1900. MM FY - 414. FC - 30. MPA, SIZE - 550. X 950. MMS

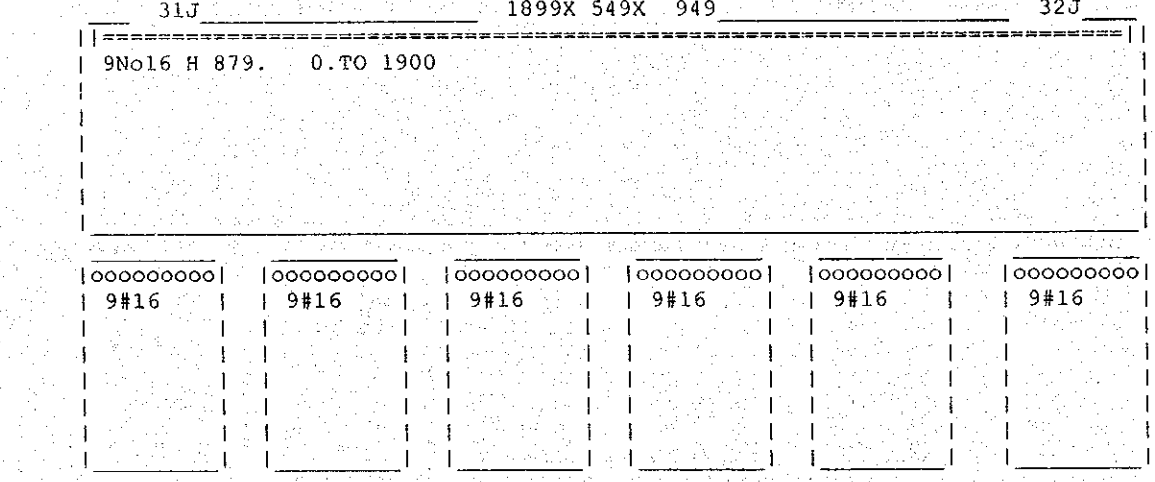
LEVEL	HEIGHT (MM)	BAR INFO	FROM (MM)	TO (MM)	ANCHOR STA	ANCHOR END

11-402

```
  1        879.     9 - 16MM          0.          1900.         YES  YES
 |-------------------------------------------------------------------|
 |   CRITICAL NEG MOMENT=     58.21 KN-MET  AT      0.MM, LOAD   8 |
 |   REQD STEEL=  1612.MM2, ROW= .0033, ROWMX= .0228 ROWMN= .0033 |
 |   MAX/MIN/ACTUAL BAR SPACING=   432./   41./   54. MMS         |
 |   BASIC/REQD. DEVELOPMENT LENGTH =   288./   568. MMS          |
 |-------------------------------------------------------------------|
```

B E A M N O. 32 D E S I G N R E S U L T S - SHEAR

AT START SUPPORT - Vu= 38.04 KNS Vc= 437.54 KNS Vs= .00 KNS
STIRRUPS ARE NOT REQUIRED.
AT END SUPPORT - Vu= 24.95 KNS Vc= 437.54 KNS Vs= .00 KNS
STIRRUPS ARE NOT REQUIRED.



B E A M N O. 33 D E S I G N R E S U L T S - FLEXURE

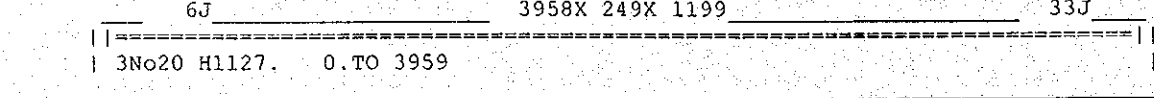
LEN - 3959. MM FY - 414. FC - 30. MPA, SIZE - 250. X 1200. MMS

LEVEL	HEIGHT (MM)	BAR INFO	FROM (MM)	TO (MM)	ANCHOR STA	ANCHOR END
1	1127.	3 - 20MM	0.	3959.	YES	YES

```
 |-------------------------------------------------------------------|
 |   CRITICAL NEG MOMENT=    248.38 KN-MET  AT      0.MM, LOAD   8 |
 |   REQD STEEL=   939.MM2, ROW= .0033, ROWMX= .0228 ROWMN= .0033 |
 |   MAX/MIN/ACTUAL BAR SPACING=   128./   45./   64. MMS         |
 |   BASIC/REQD. DEVELOPMENT LENGTH =   450./   819. MMS          |
 |-------------------------------------------------------------------|
```

B E A M N O. 33 D E S I G N R E S U L T S - SHEAR

AT START SUPPORT - Vu= 92.07 KNS Vc= 255.73 KNS Vs= .00 KNS
STIRRUPS ARE NOT REQUIRED.
AT END SUPPORT - Vu= 36.66 KNS Vc= 255.73 KNS Vs= .00 KNS
STIRRUPS ARE NOT REQUIRED.



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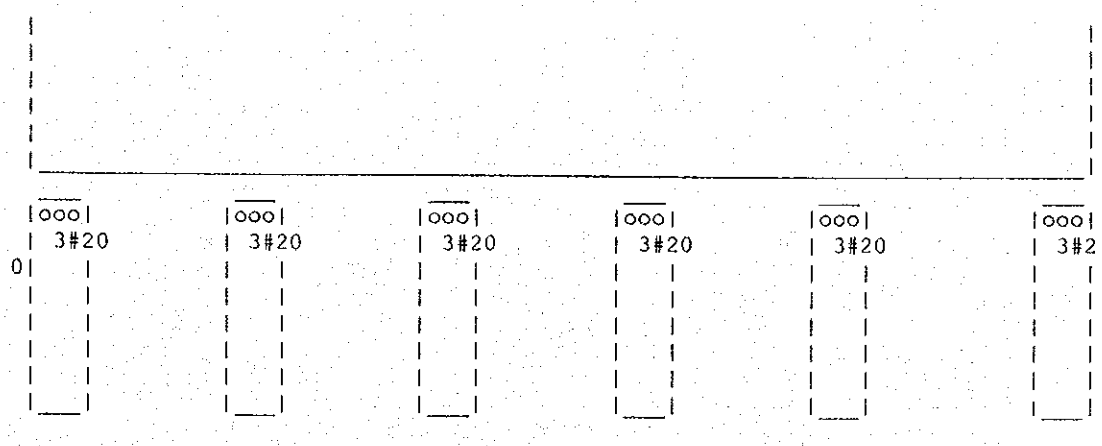


B E A M N O. 34 D E S I G N R E S U L T S - FLEXURE

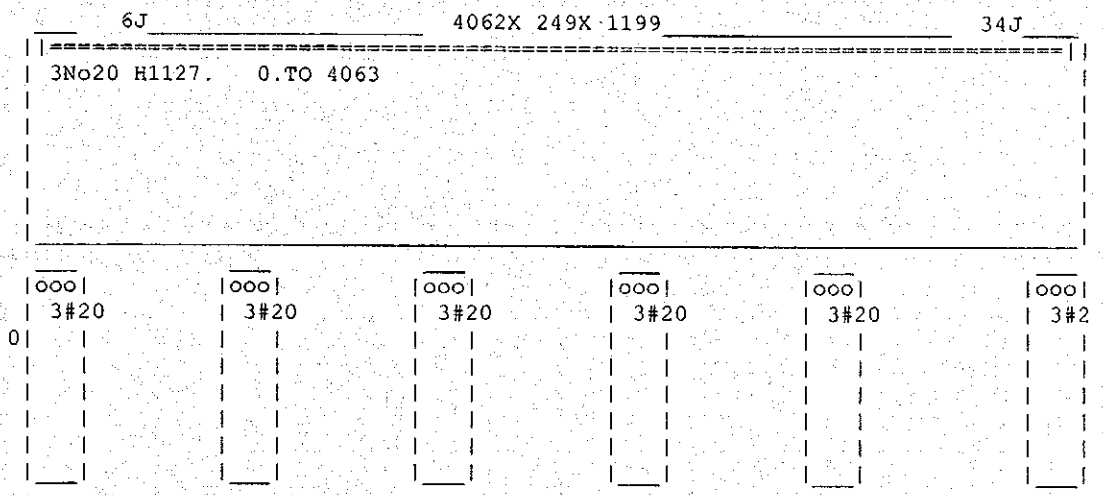
LEN - 4063. MM FY - 414. FC - 30. MPA, SIZE - 250. X 1200. MMS

LEVEL	HEIGHT (MM)	BAR INFO	FROM (MM)	TO (MM)	ANCHOR STA	ANCHOR END
1	1127.	3 - 20MM	0.	4063.	YES	YES

CRITICAL NEG MOMENT= 260.50 KN-MET AT 0.MM, LOAD 8
REQD STEEL= 939.MM2, ROW= .0033, ROWMX= .0228 ROWMN= .0033
MAX/MIN/ACTUAL BAR SPACING= 128./ 45./ 64. MMS
BASIC/REQD. DEVELOPMENT LENGTH = 450./ 819. MMS

B E A M N O. 34 D E S I G N R E S U L T S - SHEAR

AT START SUPPORT - Vu= 94.39 KNS Vc= 255.73 KNS Vs= .00 KNS
STIRRUPS ARE NOT REQUIRED.
AT END SUPPORT - Vu= 27.50 KNS Vc= 255.73 KNS Vs= .00 KNS
STIRRUPS ARE NOT REQUIRED.



B E A M N O. 35 D E S I G N R E S U L T S - FLEXURE

11-404

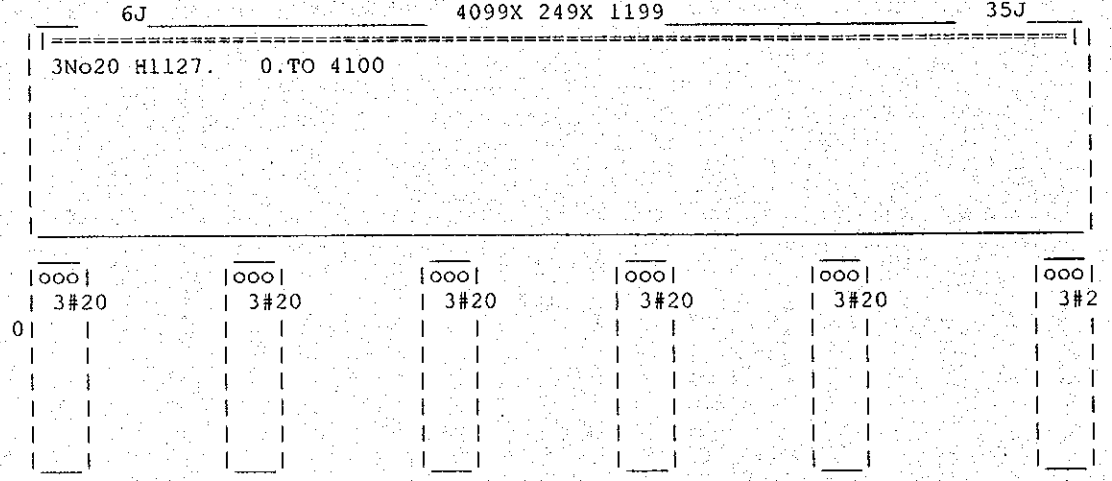
LEN - 4100. MM FY - 414. FC - 30. MPA, SIZE - 250. X 1200. MMS

LEVEL	HEIGHT (MM)	BAR INFO	FROM (MM)	TO (MM)	ANCHOR STA	ANCHOR END
1	1127.	3 - 20MM	0.	4100.	YES	YES

CRITICAL NEG MOMENT=	264.92 KN-MET AT 0.MM, LOAD 8
REQD STEEL=	939.MM2, ROW= .0033, ROWMX= .0228 ROWMN= .0033
MAX/MIN/ACTUAL BAR SPACING=	128./ 45./ 64. MMS
BASIC/REQD. DEVELOPMENT LENGTH =	450./ 819. MMS

B E A M N O. 35 D E S I G N R E S U L T S - SHEAR

AT START SUPPORT - Vu= 95.22 KNS Vc= 255.73 KNS Vs= .00 KNS
STIRRUPS ARE NOT REQUIRED.
AT END SUPPORT - Vu= 27.50 KNS Vc= 255.73 KNS Vs= .00 KNS
STIRRUPS ARE NOT REQUIRED.



B E A M N O. 36 D E S I G N R E S U L T S - FLEXURE

LEN - 4063. MM FY - 414. FC - 30. MPA, SIZE - 250. X 1200. MMS

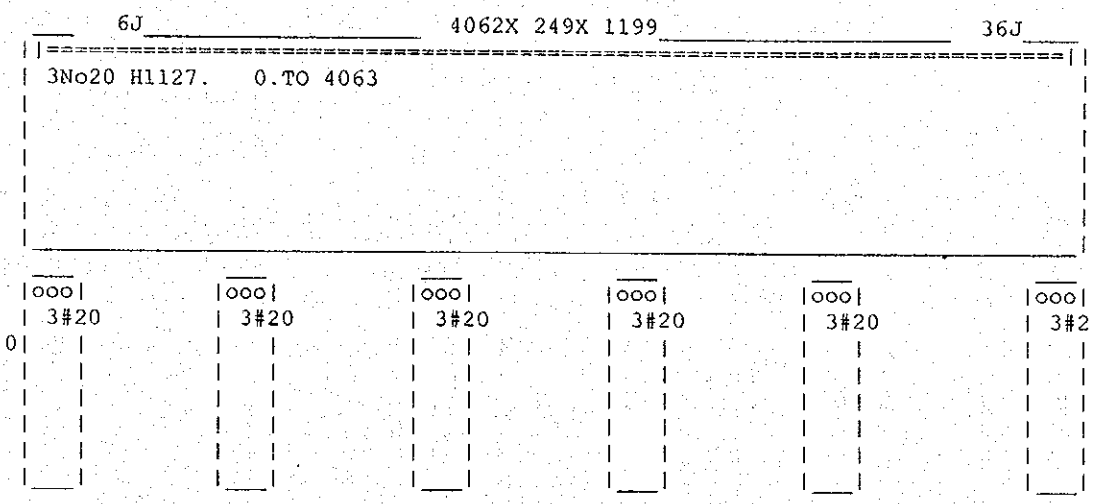
LEVEL	HEIGHT (MM)	BAR INFO	FROM (MM)	TO (MM)	ANCHOR STA	ANCHOR END
1	1127.	3 - 20MM	0.	4063.	YES	YES

CRITICAL NEG MOMENT=	260.50 KN-MET AT 0.MM, LOAD 8
REQD STEEL=	939.MM2, ROW= .0033, ROWMX= .0228 ROWMN= .0033
MAX/MIN/ACTUAL BAR SPACING=	128./ 45./ 64. MMS
BASIC/REQD. DEVELOPMENT LENGTH =	450./ 819. MMS

B E A M N O. 36 D E S I G N R E S U L T S - SHEAR

11-405

AT START SUPPORT - Vu= 94.39 KNS Vc= 255.73 KNS Vs= .00 KNS
STIRRUPS ARE NOT REQUIRED.
AT END SUPPORT - Vu= 16.23 KNS Vc= 255.73 KNS Vs= .00 KNS
STIRRUPS ARE NOT REQUIRED.



B E A M N O. 37 D E S I G N R E S U L T S - FLEXURE

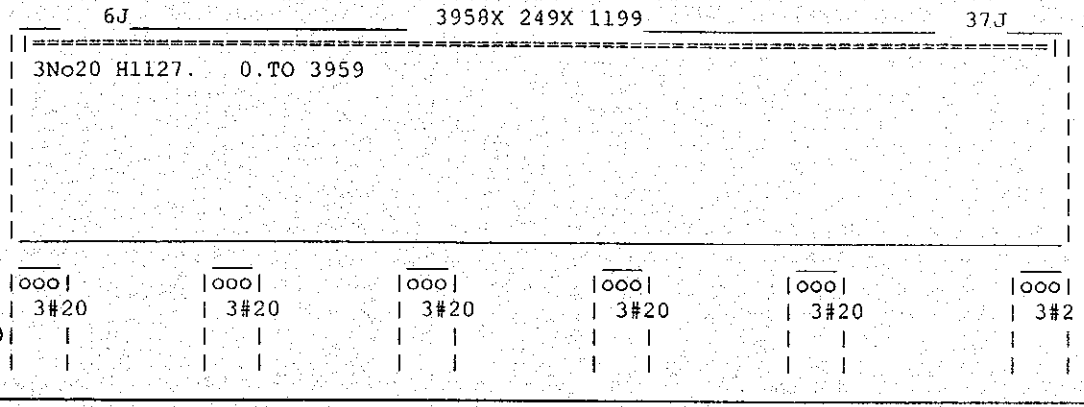
LEN - 3959. MM FY - 414. FC - 30. MPA, SIZE - 250. X 1200. MMS

LEVEL	HEIGHT (MM)	BAR INFO	FROM (MM)	TO (MM)	ANCHOR STA	ANCHOR END
1	1127.	3 - 20MM	0.	3959.	YES	YES

CRITICAL NEG MOMENT= 248.38 KN-MET AT 0.MM, LOAD 8
REQD STEEL= 939.MM2, ROW= .0033, ROWMX= .0228 ROWMN= .0033
MAX/MIN/ACTUAL BAR SPACING= 128./ 45./ 64. MMS
BASIC/REQD. DEVELOPMENT LENGTH = 450./ 819. MMS

B E A M N O. 37 D E S I G N R E S U L T S - SHEAR

AT START SUPPORT - Vu= 92.07 KNS Vc= 255.73 KNS Vs= .00 KNS
STIRRUPS ARE NOT REQUIRED.
AT END SUPPORT - Vu= 16.23 KNS Vc= 255.73 KNS Vs= .00 KNS
STIRRUPS ARE NOT REQUIRED.



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|   |       |   |       |   |       |   |       |   |       |   |
|   |       |   |       |   |       |   |       |   |       |   |
|___|       |___|       |___|       |___|       |___|       |___|
```

B E A M N O. 38 D E S I G N R E S U L T S - FLEXURE

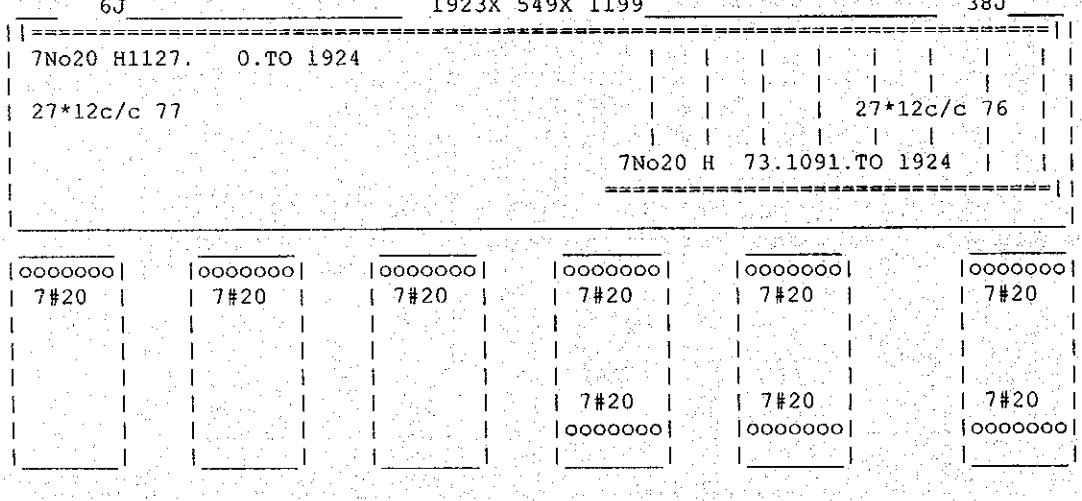
LEN - 1924. MM FY - 414. FC - 30. MPA, SIZE - 550. X 1200. MMS

LEVEL	HEIGHT (MM)	BAR INFO	FROM (MM)	TO (MM)	ANCHOR STA	ANCHOR END
1	73.	7 - 20MM	1091.	1924.	NO	YES
	CRITICAL POS MOMENT= 53.84 KN-MET AT 1924.MM, LOAD 10					
	REQD STEEL= 2067.MM2, ROW= .0033, ROWMX= .0228 ROWMN= .0033					
	MAX/MIN/ACTUAL BAR SPACING= 428./ 45./ 71. MMS					
	BASIC/REQD. DEVELOPMENT LENGTH = 450./ 592. MMS					
2	1127.	7 - 20MM	0.	1924.	YES	YES
	CRITICAL NEG MOMENT= 772.84 KN-MET AT 0.MM, LOAD 8					
	REQD STEEL= 2067.MM2, ROW= .0033, ROWMX= .0228 ROWMN= .0033					
	MAX/MIN/ACTUAL BAR SPACING= 428./ 45./ 71. MMS					
	BASIC/REQD. DEVELOPMENT LENGTH = 450./ 819. MMS					

B E A M N O. 38 D E S I G N R E S U L T S - SHEAR

AT START SUPPORT - Vu= 386.95 KNS Vc= 123.87 KNS Vs= 331.36 KNS
Tu= 402.45 KN-MET Ts= 344.6 KN-MET
Tc= 128.8 KN-MET
PROVIDE 12 MM BARS AT 77. MM C/C FOR 1924. MM

AT END SUPPORT - Vu= 394.67 KNS Vc= 126.22 KNS Vs= 338.10 KNS
Tu= 402.45 KN-MET Ts= 344.8 KN-MET
Tc= 128.7 KN-MET
PROVIDE 12 MM BARS AT 76. MM C/C FOR 1924. MM



B E A M N O. 39 D E S I G N R E S U L T S - FLEXURE

11.407

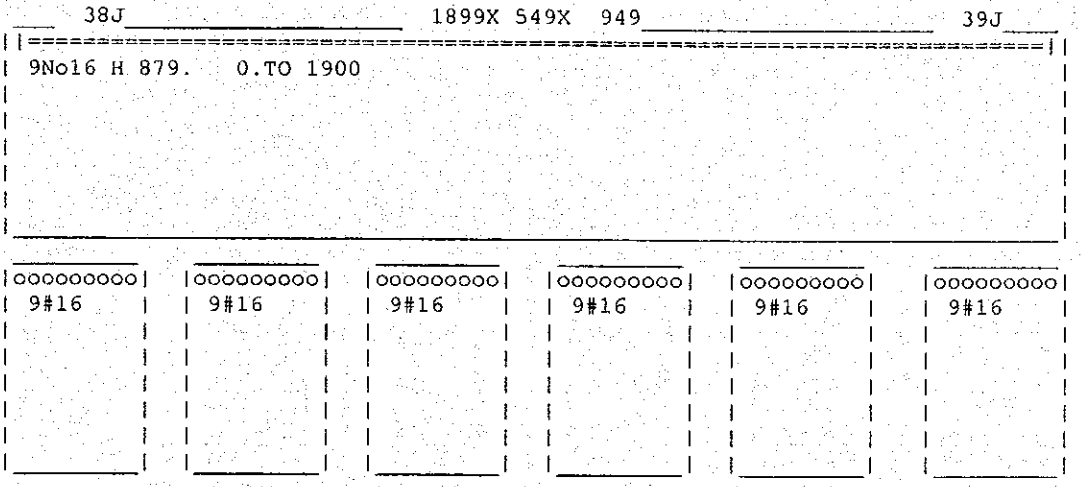
LEN - 1900. MM FY - 414. FC - 30. MPA, SIZE - 550. X 950. MMS

LEVEL	HEIGHT (MM)	BAR INFO	FROM (MM)	TO (MM)	ANCHOR STA	ANCHOR END
1	879.	9 - 16MM	0.	1900.	YES	YES

CRITICAL NEG MOMENT= 58.21 KN-MET AT 0.MM, LOAD 8
REQD STEEL= 1612.MM2, ROW= .0033, ROWMX= .0228 ROWMN= .0033
MAX/MIN/ACTUAL BAR SPACING= 432./ 41./ 54. MMS
BASIC/REQD. DEVELOPMENT LENGTH = 288./ 568. MMS

B E A M N O. 39 D E S I G N R E S U L T S - SHEAR

AT START SUPPORT - Vu= 38.04 KNS Vc= 437.54 KNS Vs= .00 KNS
STIRRUPS ARE NOT REQUIRED.
AT END SUPPORT - Vu= 20.76 KNS Vc= 437.54 KNS Vs= .00 KNS
STIRRUPS ARE NOT REQUIRED.



B E A M N O. 41 D E S I G N R E S U L T S - FLEXURE

LEN - 1953. MM FY - 414. FC - 30. MPA, SIZE - 550. X 1200. MMS

LEVEL	HEIGHT (MM)	BAR INFO	FROM (MM)	TO (MM)	ANCHOR STA	ANCHOR END
1	73.	7 - 20MM	954.	1953.	NO	YES

CRITICAL POS MOMENT= 82.23 KN-MET AT 1953.MM, LOAD 9
REQD STEEL= 2067.MM2, ROW= .0033, ROWMX= .0228 ROWMN= .0033
MAX/MIN/ACTUAL BAR SPACING= 428./ 45./ 71. MMS
BASIC/REQD. DEVELOPMENT LENGTH = 450./ 592. MMS

2	1127.	7 - 20MM	0.	1953.	YES	YES

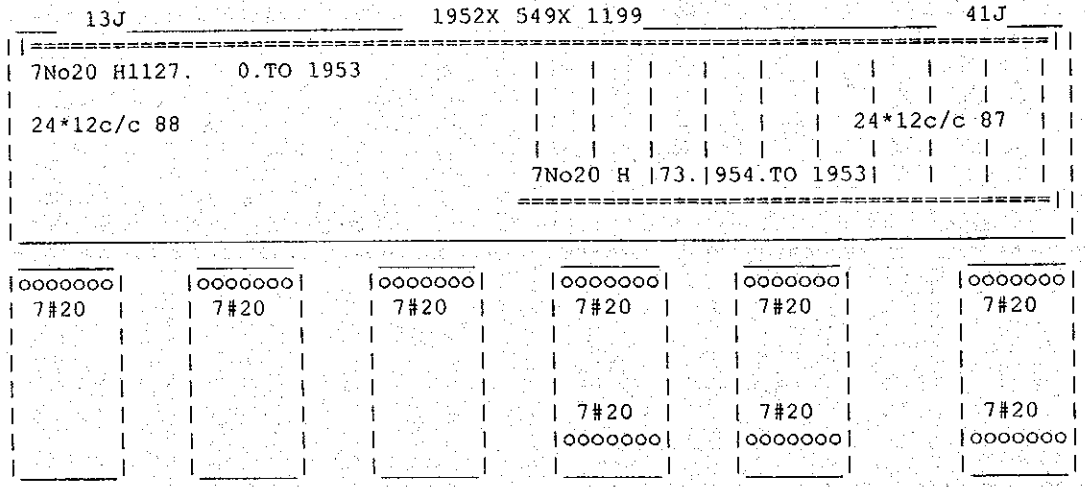
CRITICAL NEG MOMENT= 891.83 KN-MET AT 0.MM, LOAD 8
REQD STEEL= 2187.MM2, ROW= .0035, ROWMX= .0228 ROWMN= .0033
MAX/MIN/ACTUAL BAR SPACING= 428./ 45./ 71. MMS

```
|   BASIC/REQD. DEVELOPMENT LENGTH =   450./   819. MMS          |
|----------------------------------------------------------------|
```

B E A M N O. 41 D E S I G N R E S U L T S - SHEAR

AT START SUPPORT - Vu= 391.69 KNS Vc= 140.33 KNS Vs= 320.48 KNS
Tu= 356.99 KN-MET Ts= 292.1 KN-MET
Tc= 127.9 KN-MET
PROVIDE 12 MM BARS AT 88. MM C/C FOR 1953. MM

AT END SUPPORT - Vu= 399.71 KNS Vc= 143.02 KNS Vs= 327.23 KNS
Tu= 356.99 KN-MET Ts= 292.3 KN-MET
Tc= 127.7 KN-MET
PROVIDE 12 MM BARS AT 87. MM C/C FOR 1953. MM



B E A M N O. 42 D E S I G N R E S U L T S - FLEXURE

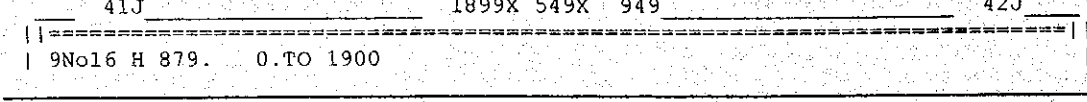
LEN - 1900. MM FY - 414. FC - 30. MPA, SIZE - 550. X 950. MMS

LEVEL	HEIGHT (MM)	BAR INFO	FROM (MM)	TO (MM)	ANCHOR STA	ANCHOR END
1	879.	9 - 16MM	0.	1900.	YES	YES

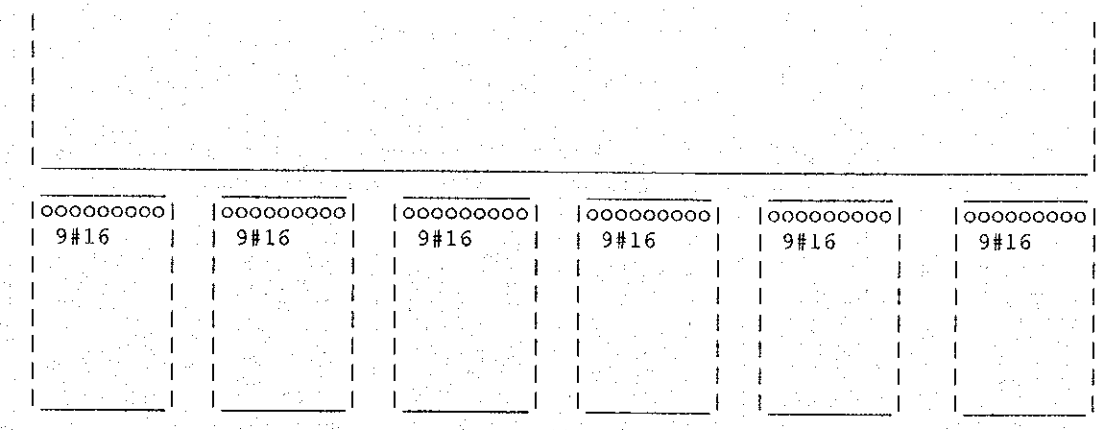
```
|   CRITICAL NEG MOMENT=     58.21 KN-MET  AT     0.MM, LOAD   8 |
|   REQD STEEL= 1612.MM2, ROW= .0033, ROWMX= .0228 ROWMN= .0033 |
|   MAX/MIN/ACTUAL BAR SPACING=  432./   41./   54. MMS         |
|   BASIC/REQD. DEVELOPMENT LENGTH =   288./   568. MMS         |
|---------------------------------------------------------------|
```

B E A M N O. 42 D E S I G N R E S U L T S - SHEAR

AT START SUPPORT - Vu= 38.04 KNS Vc= 437.54 KNS Vs= .00 KNS
STIRRUPS ARE NOT REQUIRED.
AT END SUPPORT - Vu= 24.96 KNS Vc= 437.54 KNS Vs= .00 KNS
STIRRUPS ARE NOT REQUIRED.



11.409



B E A M N O. 43 D E S I G N R E S U L T S - FLEXURE

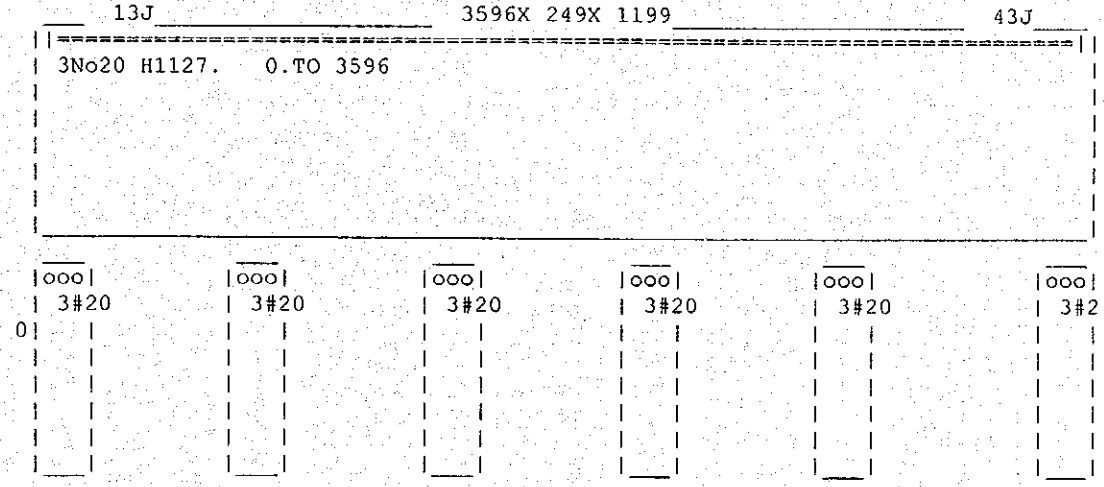
LEN - 3596. MM FY - 414. FC - 30. MPA, SIZE - 250. X 1200. MMS

LEVEL	HEIGHT (MM)	BAR INFO	FROM (MM)	TO (MM)	ANCHOR STA	ANCHOR END
1	1127.	3 - 20MM	0.	3596.	YES	YES

CRITICAL NEG MOMENT= 208.41 KN-MET AT 0.MM, LOAD 8
REQD STEEL= 939.MM2, ROW= .0033, ROWMX= .0228 ROWMN= .0033
MAX/MIN/ACTUAL BAR SPACING= 128./ 45./ 64. MMS
BASIC/REQD. DEVELOPMENT LENGTH = 450./ 819. MMS

B E A M N O. 43 D E S I G N R E S U L T S - SHEAR

AT START SUPPORT - Vu= 83.98 KNS Vc= 255.73 KNS Vs= .00 KNS
STIRRUPS ARE NOT REQUIRED.
AT END SUPPORT - Vu= 27.50 KNS Vc= 255.73 KNS Vs= .00 KNS
STIRRUPS ARE NOT REQUIRED.



B E A M N O. 44 D E S I G N R E S U L T S - FLEXURE

11-410

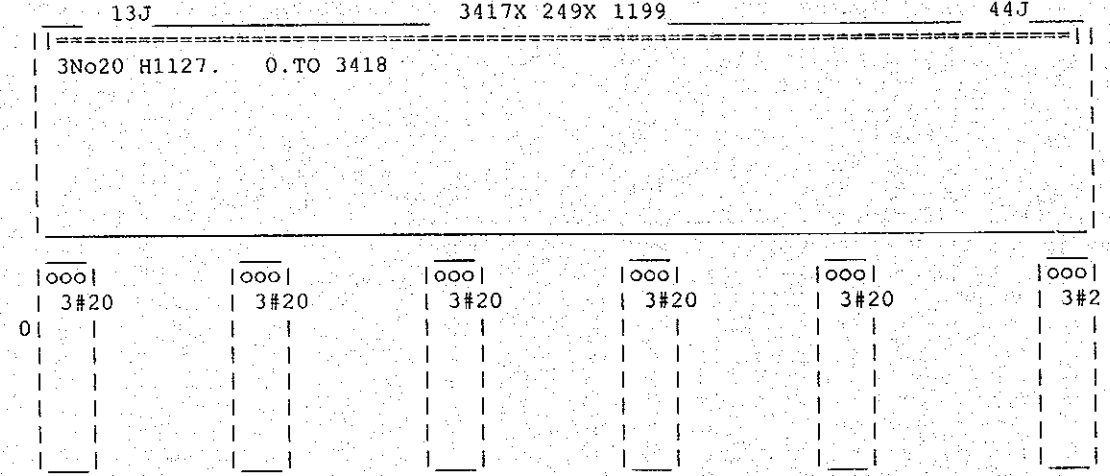
LEN - 3418. MM FY - 414. FC - 30. MPA, SIZE - 250. X 1200. MMS

LEVEL	HEIGHT (MM)	BAR INFO	FROM (MM)	TO (MM)	ANCHOR STA	ANCHOR END
1	1127.	3 - 20MM	0.	3418.	YES	YES

CRITICAL NEG MOMENT= 189.99 KN-MET AT 0.MM, LOAD 8
REQD STEEL= 939.MM2, ROW= .0033, ROWMX= .0228 ROWMN= .0033
MAX/MIN/ACTUAL BAR SPACING= 128./ 45./ 64. MMS
BASIC/REQD. DEVELOPMENT LENGTH = 450./ 819. MMS

B E A M N O. 44 D E S I G N R E S U L T S - SHEAR

AT START SUPPORT - Vu= 80.00 KNS Vc= 255.73 KNS Vs= .00 KNS
STIRRUPS ARE NOT REQUIRED.
AT END SUPPORT - Vu= 36.66 KNS Vc= 255.73 KNS Vs= .00 KNS
STIRRUPS ARE NOT REQUIRED.



B E A M N O. 45 D E S I G N R E S U L T S - FLEXURE

LEN - 3350. MM FY - 414. FC - 30. MPA, SIZE - 250. X 1200. MMS

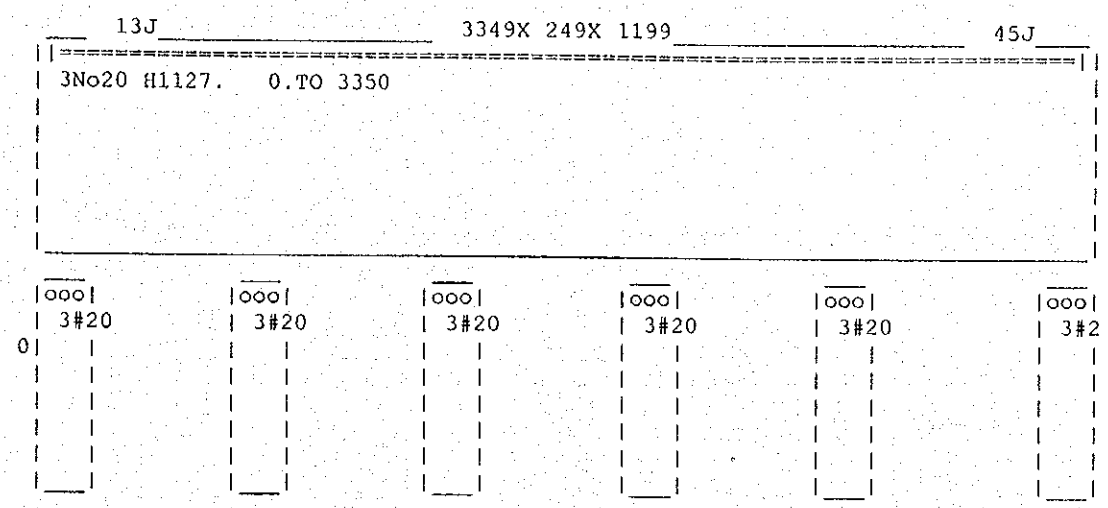
LEVEL	HEIGHT (MM)	BAR INFO	FROM (MM)	TO (MM)	ANCHOR STA	ANCHOR END
1	1127.	3 - 20MM	0.	3350.	YES	YES

CRITICAL NEG MOMENT= 183.22 KN-MET AT 0.MM, LOAD 8
REQD STEEL= 939.MM2, ROW= .0033, ROWMX= .0228 ROWMN= .0033
MAX/MIN/ACTUAL BAR SPACING= 128./ 45./ 64. MMS
BASIC/REQD. DEVELOPMENT LENGTH = 450./ 819. MMS

B E A M N O. 45 D E S I G N R E S U L T S - SHEAR

AT START SUPPORT - Vu= 79.66 KNS Vc= 255.73 KNS Vs= .00 KNS

STIRRUPS ARE NOT REQUIRED.
AT END SUPPORT - Vu= 31.56 KNS Vc= 255.73 KNS Vs= .00 KNS
STIRRUPS ARE NOT REQUIRED.



B E A M N O. 46 D E S I G N R E S U L T S - FLEXURE

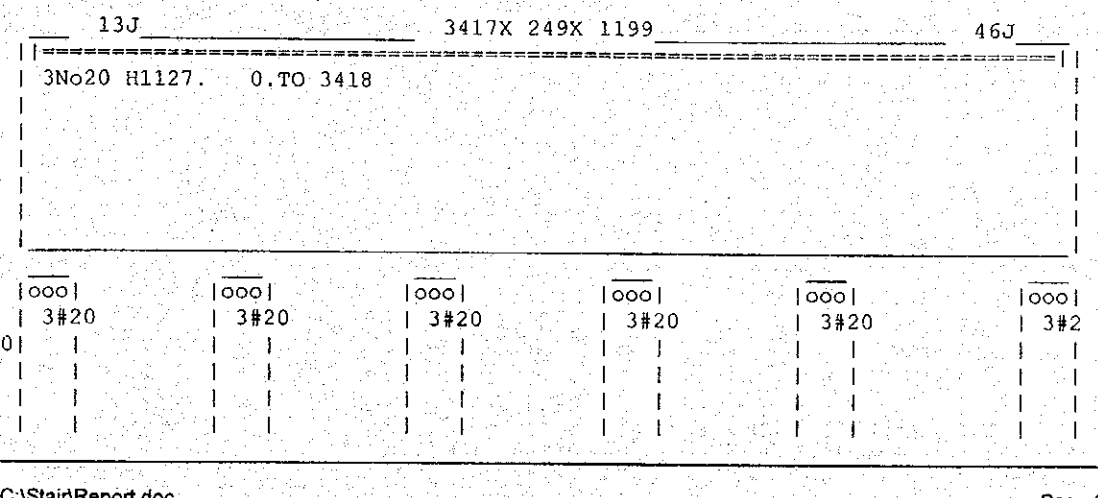
LEN - 3418. MM FY - 414. FC - 30. MPA, SIZE - 250. X 1200. MMS

LEVEL	HEIGHT (MM)	BAR INFO	FROM (MM)	TO (MM)	ANCHOR STA	ANCHOR END
1	1127.	3 - 20MM	0.	3418.	YES	YES

CRITICAL NEG MOMENT= 189.99 KN-MET AT 0.MM, LOAD 8
REQD STEEL= 939.MM2, ROW= .0033, ROWMX= .0228 ROWMN= .0033
MAX/MIN/ACTUAL BAR SPACING= 128./ 45./ 64. MMS
BASIC/REQD. DEVELOPMENT LENGTH = 450./ 819. MMS

B E A M N O. 46 D E S I G N R E S U L T S - SHEAR

AT START SUPPORT - Vu= 80.00 KNS Vc= 255.73 KNS Vs= .00 KNS
STIRRUPS ARE NOT REQUIRED.
AT END SUPPORT - Vu= 16.23 KNS Vc= 255.73 KNS Vs= .00 KNS
STIRRUPS ARE NOT REQUIRED.



11-412

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      B E A M   N O.  47   D E S I G N   R E S U L T S -  FLEXURE

LEN -  3596. MM  FY -  414.  FC -  30.  MPA, SIZE -  250. X 1200. MMS

LEVEL    HEIGHT     BAR INFO        FROM          TO          ANCHOR
          (MM)                      (MM)          (MM)        STA  END
_____________________________________________________________________

  1       1127.     3 - 20MM         0.          3596.        YES  YES
|-------------------------------------------------------------------|
|   CRITICAL NEG MOMENT=     208.41 KN-MET  AT      0.MM, LOAD   8 |
|   REQD STEEL=   939.MM2, ROW= .0033, ROWMX= .0228 ROWMN= .0033 |
|   MAX/MIN/ACTUAL BAR SPACING=   128./   45./   64. MMS          |
|   BASIC/REQD. DEVELOPMENT LENGTH =   450./   819. MMS           |
|-------------------------------------------------------------------|

      B E A M   N O.  47   D E S I G N   R E S U L T S - SHEAR

 AT START SUPPORT - Vu=   83.98 KNS  Vc=  255.73 KNS  Vs=      .00 KNS
                    STIRRUPS ARE NOT REQUIRED.
 AT END   SUPPORT - Vu=   16.23 KNS  Vc=  255.73 KNS  Vs=      .00 KNS
                    STIRRUPS ARE NOT REQUIRED.

___  13J_____________________  3596X 249X 1199_____________________  47J____
||=================================================================||
| 3No20 H1127.   0.TO 3596                                          |
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 |ooo|      |ooo|      |ooo|      |ooo|      |ooo|      |ooo|
 | 3#20     | 3#20     | 3#20     | 3#20     | 3#20     | 3#2
0|   |      |   |      |   |      |   |      |   |      |   |
 |   |      |   |      |   |      |   |      |   |      |   |
 |   |      |   |      |   |      |   |      |   |      |   |
 |   |      |   |      |   |      |   |      |   |      |   |
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 |___|      |___|      |___|      |___|      |___|      |___|

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      B E A M   N O.  48   D E S I G N   R E S U L T S -  FLEXURE

LEN -  1953. MM  FY -  414.  FC -  30.  MPA, SIZE -  550. X 1200. MMS

LEVEL    HEIGHT     BAR INFO        FROM          TO          ANCHOR
          (MM)                      (MM)          (MM)        STA  END
_____________________________________________________________________

  1         73.      7 - 20MM       1279.         1953.        NO   YES
|-------------------------------------------------------------------|
|   CRITICAL POS MOMENT=       4.99 KN-MET  AT  1953.MM, LOAD   9 |
|   REQD STEEL=  2067.MM2, ROW= .0033, ROWMX= .0228 ROWMN= .0033 |
|   MAX/MIN/ACTUAL BAR SPACING=   428./   45./   71. MMS          |
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11.413

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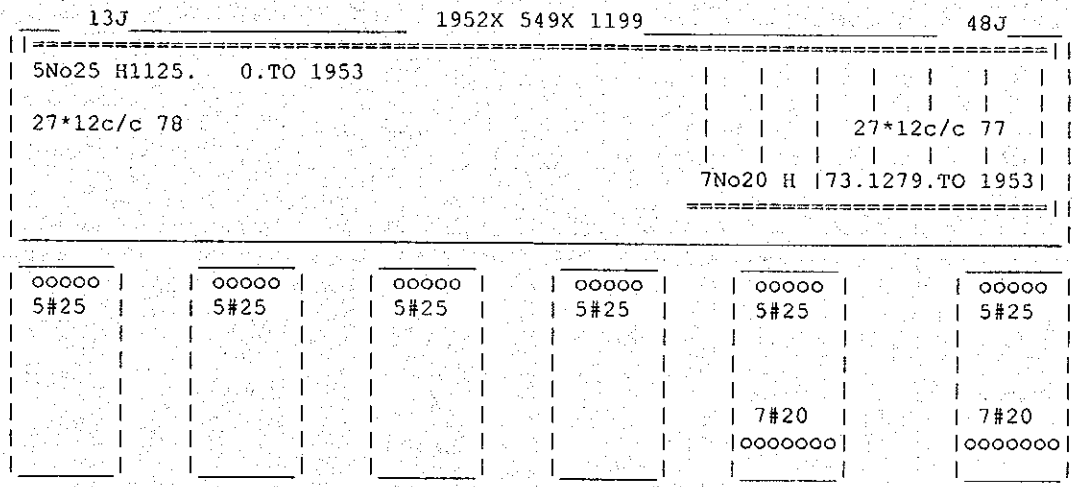
|   BASIC/REQD. DEVELOPMENT LENGTH =    450./    592. MMS          |
|-----------------------------------------------------------------|

  2       1125.     5 - 25MM          0.          1953.        YES  YES
|-----------------------------------------------------------------|
|   CRITICAL NEG MOMENT=     979.42 KN-MET  AT      0.MM, LOAD   8 |
|   REQD STEEL=  2415.MM2, ROW= .0039, ROWMX= .0228 ROWMN= .0033 |
|   MAX/MIN/ACTUAL BAR SPACING=   423./   50./  106. MMS         |
|   BASIC/REQD. DEVELOPMENT LENGTH =   703./   914. MMS          |
|-----------------------------------------------------------------|
```

B E A M N O. 48 D E S I G N R E S U L T S - SHEAR

AT START SUPPORT - Vu= 426.61 KNS Vc= 140.41 KNS Vs= 361.48 KNS
Tu= 388.57 KN-MET Ts= 329.2 KN-MET
Tc= 127.9 KN-MET
PROVIDE 12 MM BARS AT 78. MM C/C FOR 1953. MM

AT END SUPPORT - Vu= 434.63 KNS Vc= 142.89 KNS Vs= 368.45 KNS
Tu= 388.57 KN-MET Ts= 329.4 KN-MET
Tc= 127.7 KN-MET
PROVIDE 12 MM BARS AT 77. MM C/C FOR 1953. MM



B E A M N O. 49 D E S I G N R E S U L T S - FLEXURE

LEN - 1900. MM FY - 414. FC - 30. MPA, SIZE - 550. X 950. MMS

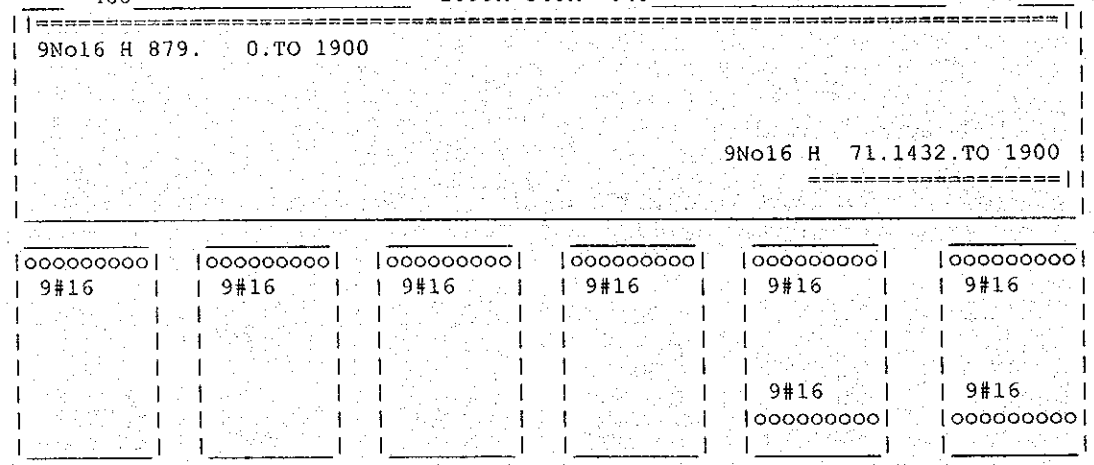
LEVEL	HEIGHT (MM)	BAR INFO	FROM (MM)	TO (MM)	ANCHOR STA	ANCHOR END
1	71.	9 - 16MM	1432.	1900.	NO	YES
	CRITICAL POS MOMENT= .00 KN-MET AT 1900.MM, LOAD 9					
	REQD STEEL= 1612.MM2, ROW= .0033, ROWMX= .0228 ROWMN= .0033					
	MAX/MIN/ACTUAL BAR SPACING= 432./ 41./ 54. MMS					
	BASIC/REQD. DEVELOPMENT LENGTH = 288./ 389. MMS					
2	879.	9 - 16MM	0.	1900.	YES	YES
	CRITICAL NEG MOMENT= 58.21 KN-MET AT 0.MM, LOAD 8					
	REQD STEEL= 1612.MM2, ROW= .0033, ROWMX= .0228 ROWMN= .0033					
	MAX/MIN/ACTUAL BAR SPACING= 432./ 41./ 54. MMS					

```
|   BASIC/REQD. DEVELOPMENT LENGTH =   288./   568. MMS          |
|---------------------------------------------------------------|
```

B E A M N O. 49 D E S I G N R E S U L T S - SHEAR

AT START SUPPORT - Vu= 38.04 KNS Vc= 437.54 KNS Vs=   .00 KNS
STIRRUPS ARE NOT REQUIRED.

AT END SUPPORT - Vu= 20.76 KNS Vc= 437.54 KNS Vs=   .00 KNS
STIRRUPS ARE NOT REQUIRED.



B E A M N O. 51 D E S I G N R E S U L T S - FLEXURE

LEN - 1932. MM FY - 414. FC - 30. MPA, SIZE - 550. X 1200. MMS

LEVEL	HEIGHT (MM)	BAR INFO	FROM (MM)	TO (MM)	ANCHOR STA	ANCHOR END
1	73.	7 - 20MM	1098.	1932.	NO	YES

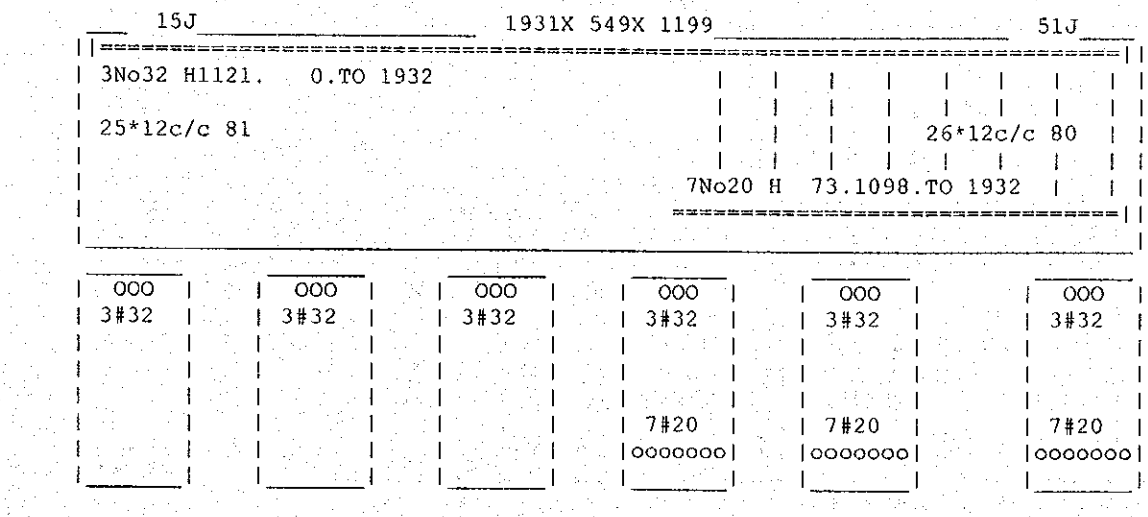
```
|   CRITICAL POS MOMENT=     88.04 KN-MET  AT  1932.MM, LOAD   9 |
|   REQD STEEL=  2067.MM2, ROW= .0033, ROWMX= .0228 ROWMN= .0033 |
|   MAX/MIN/ACTUAL BAR SPACING=   428./   45./   71. MMS         |
|   BASIC/REQD. DEVELOPMENT LENGTH =   450./   592. MMS          |
|---------------------------------------------------------------|
```

LEVEL	HEIGHT (MM)	BAR INFO	FROM (MM)	TO (MM)	ANCHOR STA	ANCHOR END
2	1121.	3 - 32MM	0.	1932.	YES	YES

```
|   CRITICAL NEG MOMENT=    903.01 KN-MET  AT     0.MM, LOAD   8 |
|   REQD STEEL=  2228.MM2, ROW= .0036, ROWMX= .0228 ROWMN= .0033 |
|   MAX/MIN/ACTUAL BAR SPACING=   416./   64./  208. MMS         |
|   BASIC/REQD. DEVELOPMENT LENGTH =  1152./  1498. MMS          |
|---------------------------------------------------------------|
```

B E A M N O. 51 D E S I G N R E S U L T S - SHEAR

AT START SUPPORT - Vu= 424.91 KNS Vc= 144.10 KNS Vs= 355.78 KNS
Tu= 376.44 KN-MET Ts= 315.2 KN-MET
Tc= 127.7 KN-MET
PROVIDE 12 MM BARS AT 81. MM C/C FOR 1932. MM



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AT END   SUPPORT - Vu=  433.45 KNS  Vc=  146.80 KNS  Vs=  363.13 KNS
                   Tu=  376.44 KN-MET  Ts=  315.4 KN-MET
                   Tc=  127.5 KN-MET
                   PROVIDE 12 MM BARS AT  80. MM  C/C FOR 1932. MM

___ 15J_____________________ 1931X 549X 1199_____________________ 51J____
|||=========================================================================||
| 3No32 H1121.   0.TO 1932                    |   |   |   |   |   |   |   | |
|                                             |   |   |   |   |   |   |   | |
| 25*12c/c 81                                 |   |   |   |  26*12c/c 80  | |
|                                             |   |   |   |   |   |   |   | |
|                                          7No20 H  73.1098.TO 1932   |   | |
|                                          ===============================||
|_________________________________________________________________________|

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| OOO |  | OOO |  | OOO |  | OOO |  | OOO |  | OOO |
| 3#32 |  | 3#32 |  | 3#32 |  | 3#32 |  | 3#32 |  | 3#32 |
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|      |  |      |  |      |  |      |  |      |  |      |
|      |  |      |  |      |  | 7#20 |  | 7#20 |  | 7#20 |
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      B E A M   N O.  52  D E S I G N   R E S U L T S -  FLEXURE

LEN -  1900. MM  FY -  414.  FC -  30.  MPA, SIZE -  550. X  950. MMS

LEVEL    HEIGHT     BAR INFO       FROM          TO          ANCHOR
          (MM)                     (MM)          (MM)        STA  END
_____________________________________________________________________

  1       879.     9 - 16MM        0.          1900.        YES  YES
|-------------------------------------------------------------------|
|   CRITICAL NEG MOMENT=     58.21 KN-MET  AT     0.MM, LOAD   8 |
|   REQD STEEL=  1612.MM2, ROW= .0033, ROWMX= .0228 ROWMN= .0033 |
|   MAX/MIN/ACTUAL BAR SPACING=   432./   41./   54. MMS         |
|   BASIC/REQD. DEVELOPMENT LENGTH =   288./   568. MMS          |
|-------------------------------------------------------------------|

      B E A M   N O.  52  D E S I G N   R E S U L T S - SHEAR

AT START SUPPORT - Vu=   38.03 KNS  Vc=  437.54 KNS  Vs=     .00 KNS
                   STIRRUPS ARE NOT REQUIRED.
AT END   SUPPORT - Vu=   24.95 KNS  Vc=  437.54 KNS  Vs=     .00 KNS
                   STIRRUPS ARE NOT REQUIRED.

___ 51J_____________________ 1899X 549X  949_____________________ 52J____
|||=========================================================================||
| 9No16 H 879.   0.TO 1900                                                |
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| 9#16   | | 9#16   | | 9#16   | | 9#16   | | 9#16   | | 9#16   |
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|        | |        | |        | |        | |        | |        |
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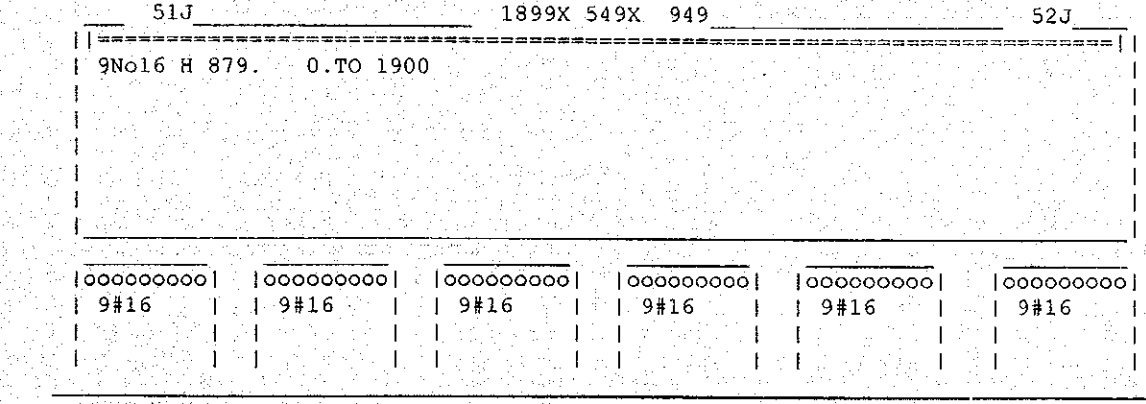

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      B E A M   N O.  53   D E S I G N   R E S U L T S -  FLEXURE

LEN -  3638. MM  FY -  414.  FC -  30.  MPA, SIZE -  250. X 1200. MMS

LEVEL    HEIGHT      BAR INFO        FROM          TO          ANCHOR
          (MM)                       (MM)          (MM)        STA  END
_____________________________________________________________________

  1       1127.      3 - 20MM         0.          3638.        YES  YES
|-------------------------------------------------------------------|
|   CRITICAL NEG MOMENT=     212.80 KN-MET  AT      0.MM, LOAD   8 |
|   REQD STEEL=   939.MM2, ROW= .0033, ROWMX= .0228 ROWMN= .0033 |
|   MAX/MIN/ACTUAL BAR SPACING=   128./   45./   64. MMS          |
|   BASIC/REQD. DEVELOPMENT LENGTH =   450./   819. MMS           |
|-------------------------------------------------------------------|


      B E A M   N O.  53   D E S I G N   R E S U L T S - SHEAR

 AT START SUPPORT - Vu=   84.91 KNS  Vc=  255.73 KNS  Vs=      .00 KNS
                    STIRRUPS ARE NOT REQUIRED.
 AT END   SUPPORT - Vu=   36.66 KNS  Vc=  255.73 KNS  Vs=      .00 KNS
                    STIRRUPS ARE NOT REQUIRED.

___  15J_____________________  3637X 249X 1199_____________________  53J____
||=================================================================||
| 3No20 H1127.   0.TO 3638                                          |
|                                                                   |
|                                                                   |
|                                                                   |
|                                                                   |
|                                                                   |
|___________________________________________________________________|
 ___        ___        ___        ___        ___        ___
 |ooo|      |ooo|      |ooo|      |ooo|      |ooo|      |ooo|
 | 3#20     | 3#20     | 3#20     | 3#20     | 3#20     | 3#2
0|   |      |   |      |   |      |   |      |   |      |   |
 |   |      |   |      |   |      |   |      |   |      |   |
 |   |      |   |      |   |      |   |      |   |      |   |
 |   |      |   |      |   |      |   |      |   |      |   |
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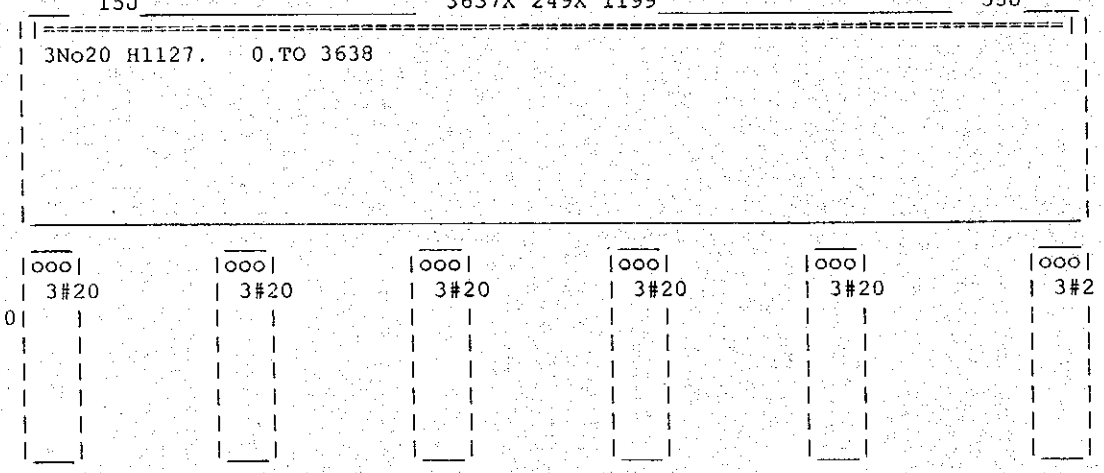

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=====================================================================

      B E A M   N O.  54   D E S I G N   R E S U L T S -  FLEXURE

LEN -  3501. MM  FY -  414.  FC -  30.  MPA, SIZE -  250. X 1200. MMS

LEVEL    HEIGHT      BAR INFO        FROM          TO          ANCHOR
          (MM)                       (MM)          (MM)        STA  END
_____________________________________________________________________

  1       1127.      3 - 20MM         0.          3501.        YES  YES
|-------------------------------------------------------------------|
|   CRITICAL NEG MOMENT=     198.51 KN-MET  AT      0.MM, LOAD   8 |
```


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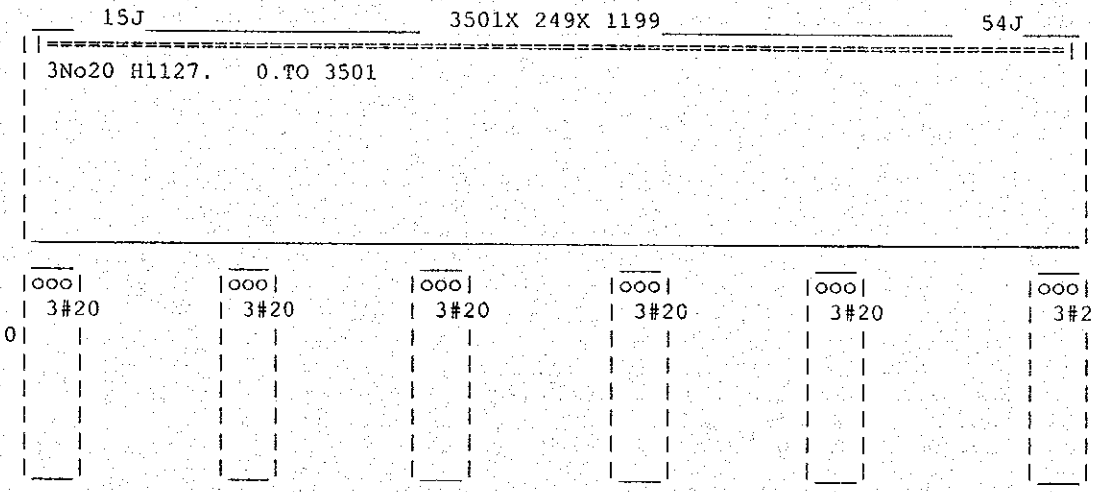
```
|   REQD STEEL=   939.MM2, ROW= .0033, ROWMX= .0228 ROWMN= .0033 |
|   MAX/MIN/ACTUAL BAR SPACING=   128./   45./   64. MMS         |
|   BASIC/REQD. DEVELOPMENT LENGTH =   450./   819. MMS          |
|----------------------------------------------------------------|
```

B E A M N O. 54 D E S I G N R E S U L T S - SHEAR

```
 AT START SUPPORT - Vu=   81.86 KNS  Vc=  255.73 KNS  Vs=     .00 KNS
                    STIRRUPS ARE NOT REQUIRED.
 AT END   SUPPORT - Vu=   27.50 KNS  Vc=  255.73 KNS  Vs=     .00 KNS
                    STIRRUPS ARE NOT REQUIRED.
```



B E A M N O. 55 D E S I G N R E S U L T S - FLEXURE

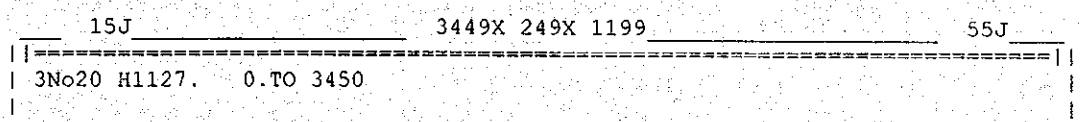
LEN - 3450. MM FY - 414. FC - 30. MPA, SIZE - 250. X 1200. MMS

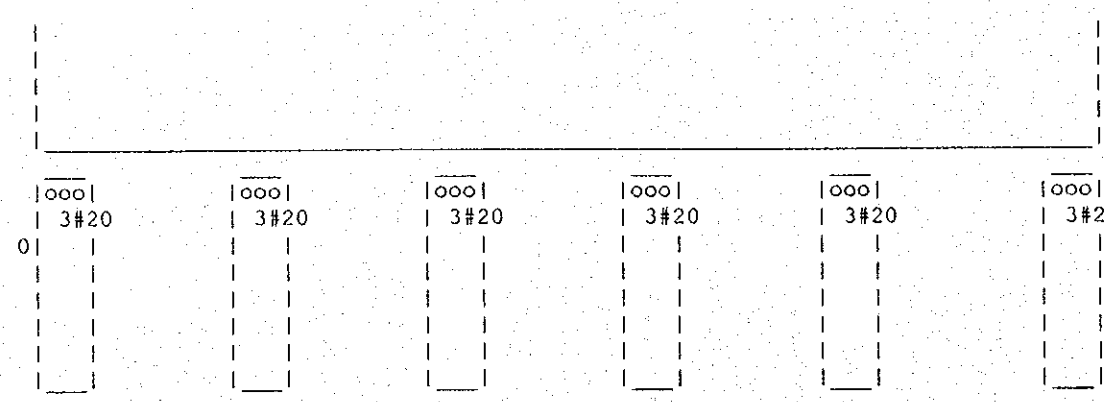
LEVEL	HEIGHT (MM)	BAR INFO	FROM (MM)	TO (MM)	ANCHOR STA	ANCHOR END
1	1127.	3 - 20MM	0.	3450.	YES	YES

```
|   CRITICAL NEG MOMENT=    193.25 KN-MET  AT     0.MM, LOAD   8 |
|   REQD STEEL=   939.MM2, ROW= .0033, ROWMX= .0228 ROWMN= .0033 |
|   MAX/MIN/ACTUAL BAR SPACING=   128./   45./   64. MMS         |
|   BASIC/REQD. DEVELOPMENT LENGTH =   450./   819. MMS          |
|----------------------------------------------------------------|
```

B E A M N O. 55 D E S I G N R E S U L T S - SHEAR

```
 AT START SUPPORT - Vu=   80.72 KNS  Vc=  255.73 KNS  Vs=     .00 KNS
                    STIRRUPS ARE NOT REQUIRED.
 AT END   SUPPORT - Vu=   27.50 KNS  Vc=  255.73 KNS  Vs=     .00 KNS
                    STIRRUPS ARE NOT REQUIRED.
```





B E A M N O. 56 D E S I G N R E S U L T S - FLEXURE

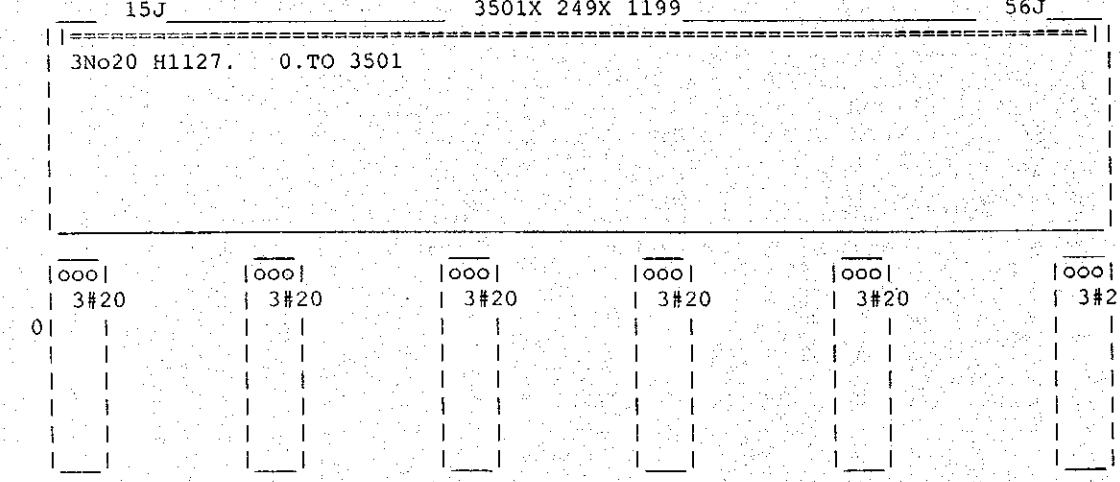
LEN - 3501. MM FY - 414. FC - 30. MPA, SIZE - 250. X 1200. MMS

LEVEL	HEIGHT (MM)	BAR INFO	FROM (MM)	TO (MM)	ANCHOR STA	ANCHOR END
1	1127.	3 - 20MM	0.	3501.	YES	YES

CRITICAL NEG MOMENT= 198.51 KN-MET AT 0.MM, LOAD 8
REQD STEEL= 939.MM2, ROW= .0033, ROWMX= .0228 ROWMN= .0033
MAX/MIN/ACTUAL BAR SPACING= 128./ 45./ 64. MMS
BASIC/REQD. DEVELOPMENT LENGTH = 450./ 819. MMS

B E A M N O. 56 D E S I G N R E S U L T S - SHEAR

AT START SUPPORT - Vu= 81.86 KNS Vc= 255.73 KNS Vs= .00 KNS
STIRRUPS ARE NOT REQUIRED.
AT END SUPPORT - Vu= 36.66 KNS Vc= 255.73 KNS Vs= .00 KNS
STIRRUPS ARE NOT REQUIRED.



B E A M N O. 57 D E S I G N R E S U L T S - FLEXURE

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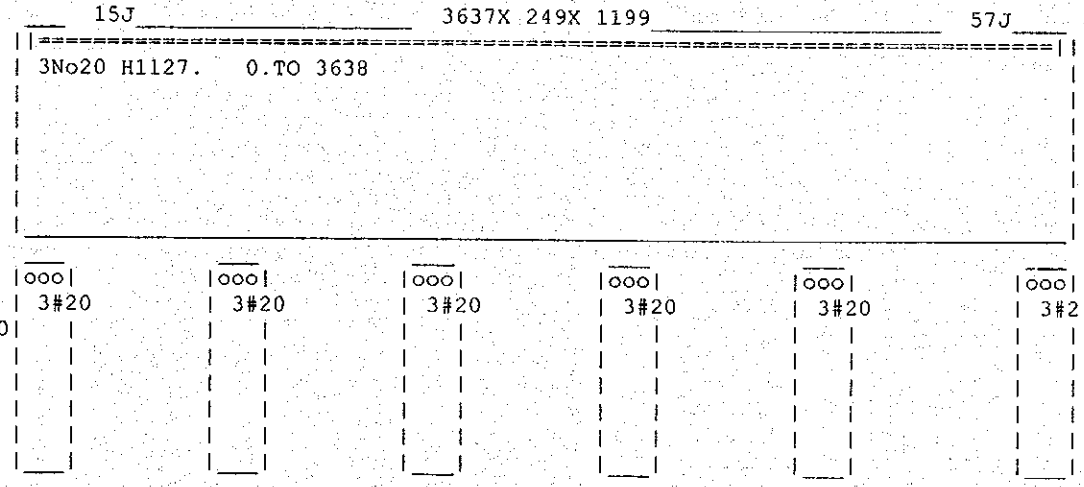
LEN - 3638. MM FY - 414. FC - 30. MPA, SIZE - 250. X 1200. MMS

LEVEL	HEIGHT (MM)	BAR INFO	FROM (MM)	TO (MM)	ANCHOR STA	ANCHOR END
1	1127.	3 - 20MM	0.	3638.	YES	YES

CRITICAL NEG MOMENT= 212.81 KN-MET AT 0.MM, LOAD 8
REQD STEEL= 939.MM2, ROW= .0033, ROWMX= .0228 ROWMN= .0033
MAX/MIN/ACTUAL BAR SPACING= 128./ 45./ 64. MMS
BASIC/REQD. DEVELOPMENT LENGTH = 450./ 819. MMS

B E A M N O. 57 D E S I G N R E S U L T S - SHEAR

AT START SUPPORT - Vu= 84.91 KNS Vc= 255.73 KNS Vs= .00 KNS
STIRRUPS ARE NOT REQUIRED.
AT END SUPPORT - Vu= 16.23 KNS Vc= 255.73 KNS Vs= .00 KNS
STIRRUPS ARE NOT REQUIRED.



B E A M N O. 58 D E S I G N R E S U L T S - FLEXURE

LEN - 1932. MM FY - 414. FC - 30. MPA, SIZE - 550. X 1200. MMS

LEVEL	HEIGHT (MM)	BAR INFO	FROM (MM)	TO (MM)	ANCHOR STA	ANCHOR END
1	1125.	5 - 25MM	0.	1932.	YES	YES

CRITICAL NEG MOMENT= 988.47 KN-MET AT 0.MM, LOAD 8
REQD STEEL= 2438.MM2, ROW= .0039, ROWMX= .0228 ROWMN= .0033
MAX/MIN/ACTUAL BAR SPACING= 423./ 50./ 106. MMS
BASIC/REQD. DEVELOPMENT LENGTH = 703./ 914. MMS

B E A M N O. 58 D E S I G N R E S U L T S - SHEAR

AT START SUPPORT - Vu= 459.13 KNS Vc= 149.39 KNS Vs= 390.77 KNS
Tu= 391.34 KN-MET Ts= 333.1 KN-MET

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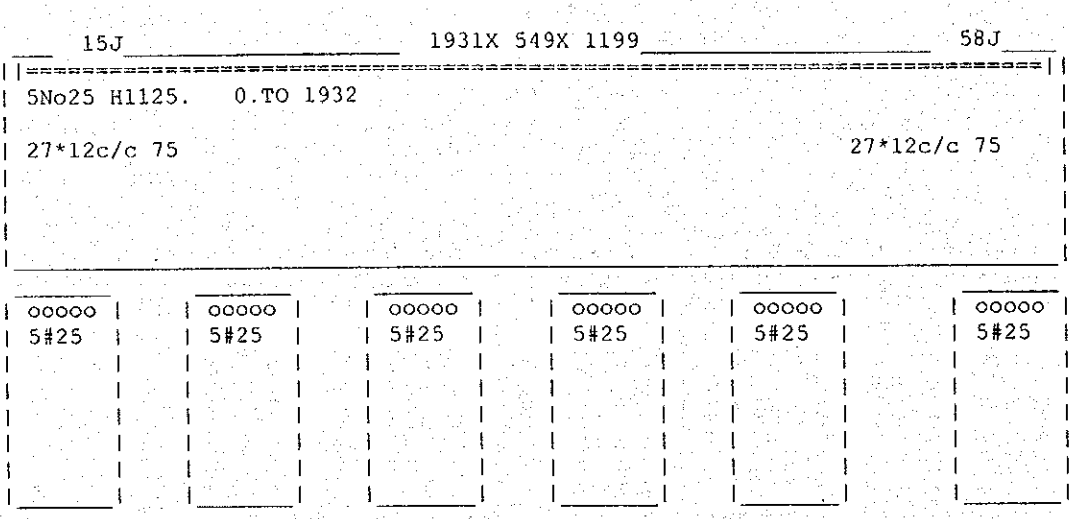


```
                    Tc=  127.3 KN-MET
                    PROVIDE 12 MM BARS AT  75. MM  C/C FOR 1932. MM
AT END   SUPPORT - Vu=  467.68 KNS  Vc=  151.97 KNS  Vs=  398.24 KNS
                    Tu=  391.34 KN-MET  Ts=  333.2 KN-MET
                    Tc=  127.2 KN-MET
                    PROVIDE 12 MM BARS AT  75. MM  C/C FOR 1932. MM

___ 15J_____________________ 1931X 549X 1199_____________________ 58J____
||=========================================================================||
| 5No25 H1125.   0.TO 1932                                                |
|                                                                         |
| 27*12c/c 75                                                 27*12c/c 75 |
|                                                                         |
|                                                                         |
|                                                                         |
|_________________________________________________________________________|
 _______    _______    _______    _______    _______    _______
| ooooo |  | ooooo |  | ooooo |  | ooooo |  | ooooo |  | ooooo |
| 5#25  |  | 5#25  |  | 5#25  |  | 5#25  |  | 5#25  |  | 5#25  |
|       |  |       |  |       |  |       |  |       |  |       |
|       |  |       |  |       |  |       |  |       |  |       |
|       |  |       |  |       |  |       |  |       |  |       |
|       |  |       |  |       |  |       |  |       |  |       |
|       |  |       |  |       |  |       |  |       |  |       |
|_______|  |_______|  |_______|  |_______|  |_______|  |_______|

=====================================================================

      B E A M  N O.  59  D E S I G N  R E S U L T S -  FLEXURE

LEN -  1900. MM  FY -  414.  FC -  30.  MPA, SIZE -  550. X  950. MMS

LEVEL    HEIGHT     BAR INFO        FROM          TO          ANCHOR
          (MM)                      (MM)          (MM)        STA  END
_____________________________________________________________________

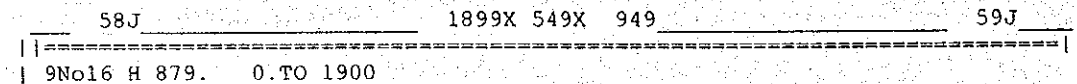
  1        71.      9 - 16MM      1432.         1900.        NO   YES
|-----------------------------------------------------------------|
|   CRITICAL POS MOMENT=        .00 KN-MET  AT  1900.MM, LOAD   9 |
|   REQD STEEL=  1612.MM2, ROW= .0033, ROWMX= .0228 ROWMN= .0033 |
|   MAX/MIN/ACTUAL BAR SPACING=   432./   41./   54. MMS         |
|   BASIC/REQD. DEVELOPMENT LENGTH =   288./   389. MMS          |
|-----------------------------------------------------------------|

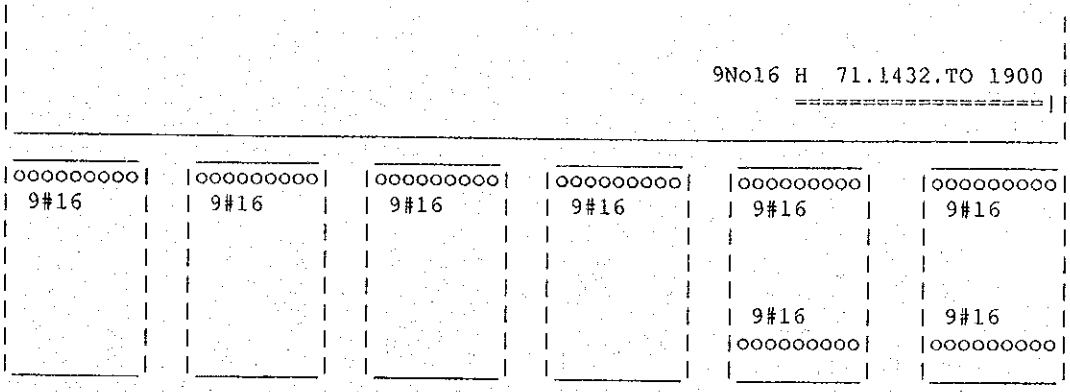
  2       879.      9 - 16MM         0.         1900.        YES  YES
|-----------------------------------------------------------------|
|   CRITICAL NEG MOMENT=      58.21 KN-MET  AT     0.MM, LOAD   8 |
|   REQD STEEL=  1612.MM2, ROW= .0033, ROWMX= .0228 ROWMN= .0033 |
|   MAX/MIN/ACTUAL BAR SPACING=   432./   41./   54. MMS         |
|   BASIC/REQD. DEVELOPMENT LENGTH =   288./   568. MMS          |
|-----------------------------------------------------------------|


      B E A M  N O.  59  D E S I G N  R E S U L T S - SHEAR

AT START SUPPORT - Vu=   38.04 KNS  Vc=  437.54 KNS  Vs=     .00 KNS
                   STIRRUPS ARE NOT REQUIRED.
AT END   SUPPORT - Vu=   20.76 KNS  Vc=  437.54 KNS  Vs=     .00 KNS
                   STIRRUPS ARE NOT REQUIRED.

___ 58J_____________________ 1899X 549X  949_____________________ 59J____
||=========================================================================||
| 9No16 H 879.   0.TO 1900                                                |
|                                                                         |
```





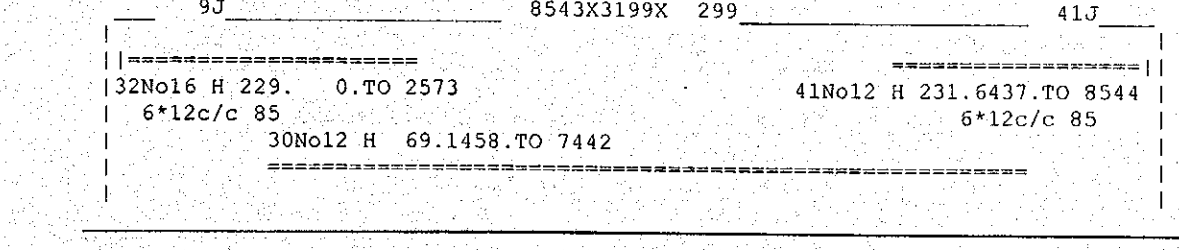
B E A M N O. 81 D E S I G N R E S U L T S - FLEXURE

LEN - 8544. MM FY - 414. FC - 30. MPA, SIZE - 3200. X 300. MMS

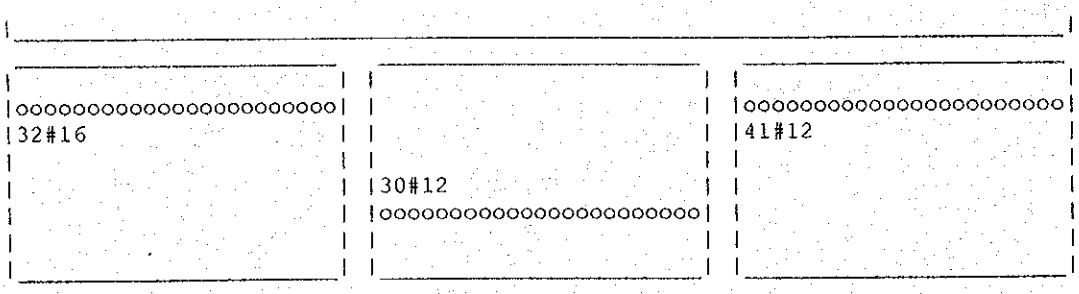
LEVEL	HEIGHT (MM)	BAR INFO	FROM (MM)	TO (MM)	ANCHOR STA	ANCHOR END
1	69.	30 - 12MM	1458.	7442.	NO	NO
	CRITICAL POS MOMENT= 276.50 KN-MET AT 4272.MM, LOAD 8					
	REQD STEEL= 3333.MM2, ROW= .0045, ROWMX= .0228 ROWMN= .0033					
	MAX/MIN/ACTUAL BAR SPACING= 3086./ 37./ 106. MMS					
	BASIC/REQD. DEVELOPMENT LENGTH = 162./ 322. MMS					
2	229.	32 - 16MM	0.	2573.	YES	NO
	CRITICAL NEG MOMENT= 507.89 KN-MET AT 0.MM, LOAD 10					
	REQD STEEL= 6402.MM2, ROW= .0087, ROWMX= .0228 ROWMN= .0033					
	MAX/MIN/ACTUAL BAR SPACING= 3082./ 41./ 99. MMS					
	BASIC/REQD. DEVELOPMENT LENGTH = 288./ 437. MMS					
3	231.	41 - 12MM	6437.	8544.	NO	YES
	CRITICAL NEG MOMENT= 375.04 KN-MET AT 8544.MM, LOAD 8					
	REQD STEEL= 4630.MM2, ROW= .0063, ROWMX= .0228 ROWMN= .0033					
	MAX/MIN/ACTUAL BAR SPACING= 3086./ 37./ 77. MMS					
	BASIC/REQD. DEVELOPMENT LENGTH = 162./ 327. MMS					

B E A M N O. 81 D E S I G N R E S U L T S - SHEAR

AT START SUPPORT - Vu= 310.11 KNS Vc= 653.75 KNS Vs= .00 KNS
PROVIDE 12 MM BARS AT 85. MM C/C FOR 356. MM
AT END SUPPORT - Vu= 295.59 KNS Vc= 653.75 KNS Vs= .00 KNS
PROVIDE 12 MM BARS AT 85. MM C/C FOR 356. MM



11.422



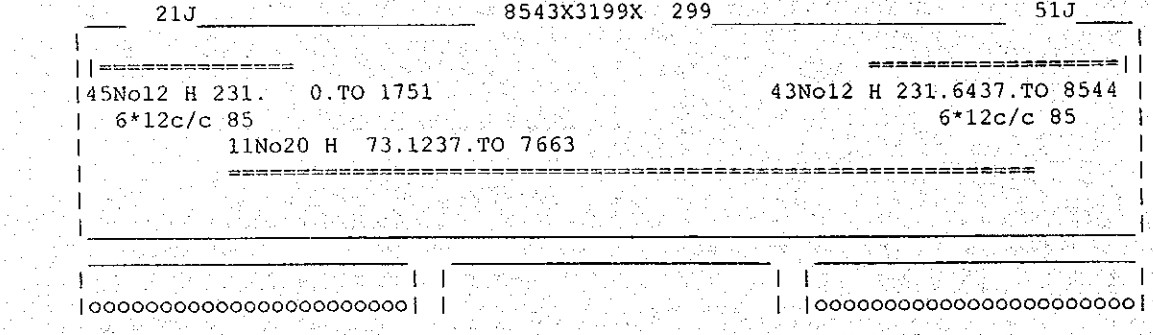
B E A M N O. 83 D E S I G N R E S U L T S - FLEXURE

LEN - 8544. MM FY - 414. FC - 30. MPA, SIZE - 3200. X 300. MMS

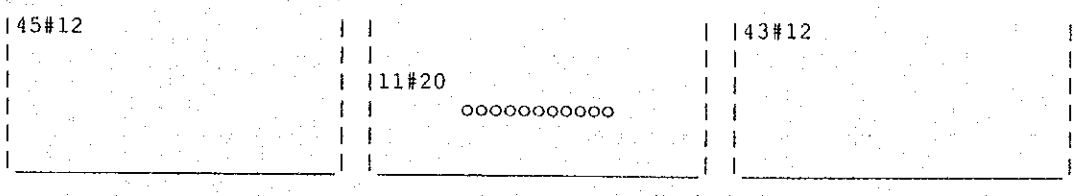
LEVEL	HEIGHT (MM)	BAR INFO	FROM (MM)	TO (MM)	ANCHOR STA	ANCHOR END
1	73.	11 - 20MM	1237.	7663.	NO	NO
	CRITICAL POS MOMENT= 285.08 KN-MET AT 4272.MM, LOAD 8					
	REQD STEEL= 3440.MM2, ROW= .0046, ROWMX= .0228 ROWMN= .0033					
	MAX/MIN/ACTUAL BAR SPACING= 3078./ 45./ 308. MMS					
	BASIC/REQD. DEVELOPMENT LENGTH = 450./ 543. MMS					
2	231.	45 - 12MM	0.	1751.	YES	NO
	CRITICAL NEG MOMENT= 411.57 KN-MET AT 0.MM, LOAD 8					
	REQD STEEL= 5060.MM2, ROW= .0068, ROWMX= .0228 ROWMN= .0033					
	MAX/MIN/ACTUAL BAR SPACING= 3086./ 37./ 70. MMS					
	BASIC/REQD. DEVELOPMENT LENGTH = 162./ 327. MMS					
3	231.	43 - 12MM	6437.	8544.	NO	YES
	CRITICAL NEG MOMENT= 383.75 KN-MET AT 8544.MM, LOAD 8					
	REQD STEEL= 4850.MM2, ROW= .0067, ROWMX= .0228 ROWMN= .0033					
	MAX/MIN/ACTUAL BAR SPACING= 3086./ 37./ 73. MMS					
	BASIC/REQD. DEVELOPMENT LENGTH = 162./ 327. MMS					

B E A M N O. 83 D E S I G N R E S U L T S - SHEAR

AT START SUPPORT - Vu= 306.10 KNS Vc= 653.75 KNS Vs= .00 KNS
PROVIDE 12 MM BARS AT 85. MM C/C FOR 356. MM
AT END SUPPORT - Vu= 299.61 KNS Vc= 653.75 KNS Vs= .00 KNS
PROVIDE 12 MM BARS AT 85. MM C/C FOR 356. MM



11-423



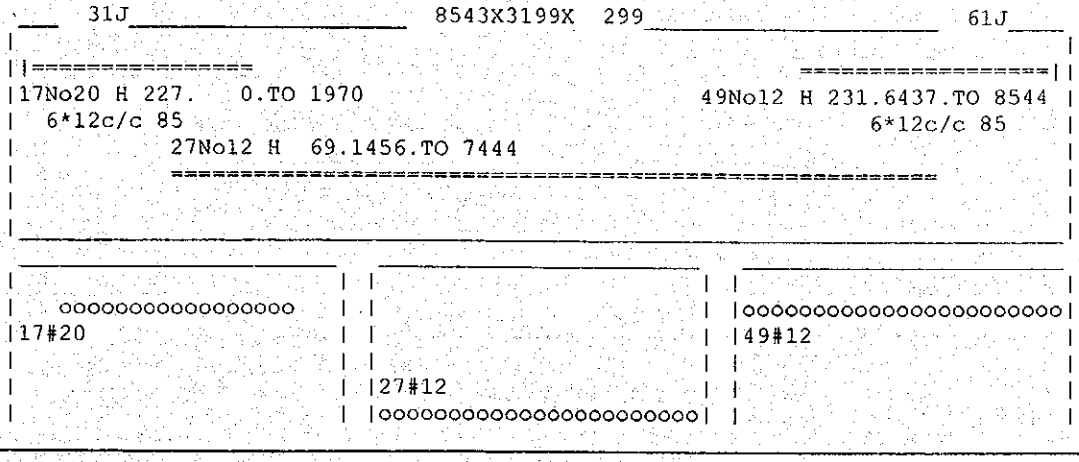
B E A M N O. 85 D E S I G N R E S U L T S - FLEXURE

LEN - 8544. MM FY - 414. FC - 30. MPA, SIZE - 3200. X 300. MMS

LEVEL	HEIGHT (MM)	BAR INFO	FROM (MM)	TO (MM)	ANCHOR STA	ANCHOR END
1	69.	27 - 12MM	1456.	7444.	NO	NO
	CRITICAL POS MOMENT= 251.53 KN-MET AT 8544.MM, LOAD 8					
	REQD STEEL= 3021.MM2, ROW= .0041, ROWMX= .0228 ROWMN= .0033					
	MAX/MIN/ACTUAL BAR SPACING= 3086./ 37./ 119. MMS					
	BASIC/REQD. DEVELOPMENT LENGTH = 162./ 324. MMS					
2	227.	17 - 20MM	0.	1970.	YES	NO
	CRITICAL NEG MOMENT= 418.93 KN-MET AT 0.MM, LOAD 8					
	REQD STEEL= 5325.MM2, ROW= .0074, ROWMX= .0228 ROWMN= .0033					
	MAX/MIN/ACTUAL BAR SPACING= 3078./ 45./ 192. MMS					
	BASIC/REQD. DEVELOPMENT LENGTH = 450./ 546. MMS					
3	231.	49 - 12MM	6437.	8544.	NO	YES
	CRITICAL NEG MOMENT= 443.52 KN-MET AT 8544.MM, LOAD 8					
	REQD STEEL= 5479.MM2, ROW= .0074, ROWMX= .0228 ROWMN= .0033					
	MAX/MIN/ACTUAL BAR SPACING= 3086./ 37./ 64. MMS					
	BASIC/REQD. DEVELOPMENT LENGTH = 162./ 327. MMS					

B E A M N O. 85 D E S I G N R E S U L T S - SHEAR

AT START SUPPORT - Vu= 299.97 KNS Vc= 653.75 KNS Vs= .00 KNS
PROVIDE 12 MM BARS AT 85. MM C/C FOR 356. MM
AT END SUPPORT - Vu= 305.74 KNS Vc= 653.75 KNS Vs= .00 KNS
PROVIDE 12 MM BARS AT 85. MM C/C FOR 356. MM



11-424

B E A M N O. 91 D E S I G N R E S U L T S - FLEXURE

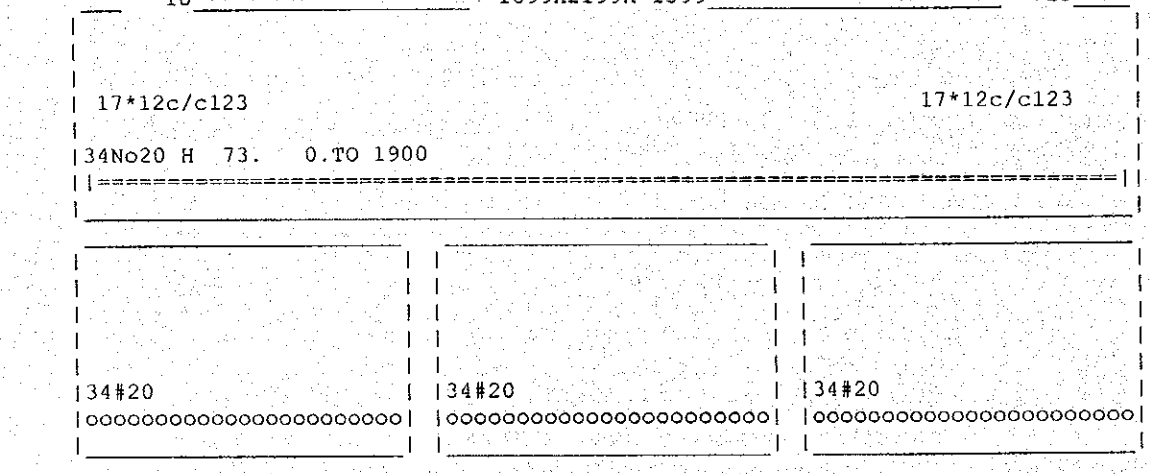
LEN - 1900. MM FY - 414. FC - 30. MPA, SIZE - 2200. X 1400. MMS

LEVEL	HEIGHT (MM)	BAR INFO	FROM (MM)	TO (MM)	ANCHOR STA	ANCHOR END
1	73.	34 - 20MM	0.	1900.	YES	YES

CRITICAL POS MOMENT= 5075.99 KN-MET AT 0.MM, LOAD 8
REQD STEEL= 10583.MM2, ROW= .0036, ROWMX= .0228 ROWMN= .0033
MAX/MIN/ACTUAL BAR SPACING= 2078./ 45./ 63. MMS
BASIC/REQD. DEVELOPMENT LENGTH = 450./ 624. MMS

B E A M N O. 91 D E S I G N R E S U L T S - SHEAR

AT START SUPPORT - Vu= 1804.17 KNS Vc= 2650.68 KNS Vs= .00 KNS
PROVIDE 12 MM BARS AT 123. MM C/C FOR 1900. MM
AT END SUPPORT - Vu= 1747.08 KNS Vc= 2650.68 KNS Vs= .00 KNS
PROVIDE 12 MM BARS AT 123. MM C/C FOR 1900. MM



B E A M N O. 92 D E S I G N R E S U L T S - FLEXURE

LEN - 900. MM FY - 414. FC - 30. MPA, SIZE - 2200. X 1400. MMS

LEVEL	HEIGHT (MM)	BAR INFO	FROM (MM)	TO (MM)	ANCHOR STA	ANCHOR END
1	73.	31 - 20MM	0.	900.	YES	YES

CRITICAL POS MOMENT= 1869.70 KN-MET AT 0.MM, LOAD 8
REQD STEEL= 9733.MM2, ROW= .0033, ROWMX= .0228 ROWMN= .0033
MAX/MIN/ACTUAL BAR SPACING= 2078./ 45./ 69. MMS

11-425

```
|   BASIC/REQD. DEVELOPMENT LENGTH =   450./   630. MMS          |
|----------------------------------------------------------------|

  2       1327.    31 - 20MM         0.          900.        YES  YES
|----------------------------------------------------------------|
|   CRITICAL NEG MOMENT=    383.97 KN-MET  AT   900.MM, LOAD   9 |
|   REQD STEEL=  9733.MM2, ROW= .0033, ROWMX= .0228 ROWMN= .0033 |
|   MAX/MIN/ACTUAL BAR SPACING=  2078./   45./   69. MMS         |
|   BASIC/REQD. DEVELOPMENT LENGTH =   450./   819. MMS          |
|----------------------------------------------------------------|
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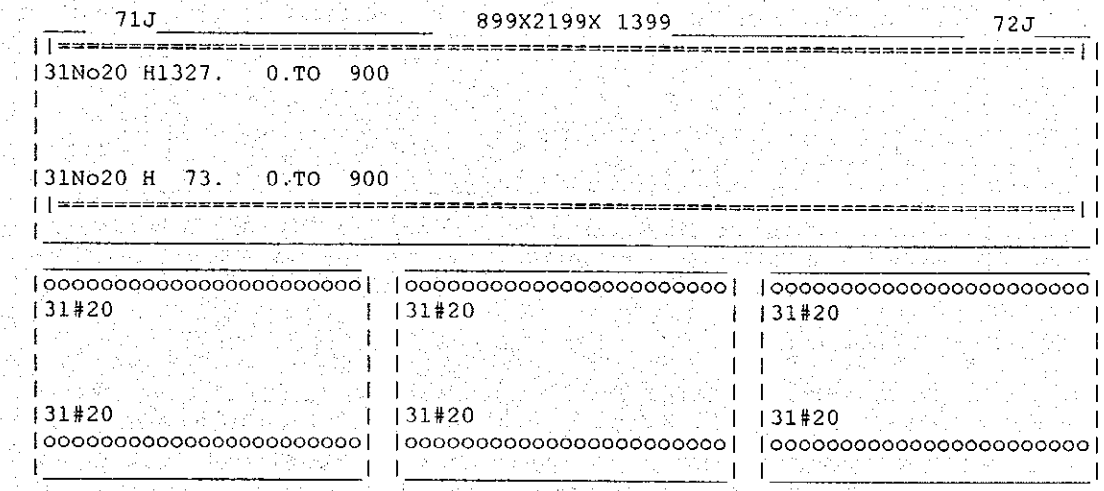
B E A M N O. 92 D E S I G N R E S U L T S - SHEAR

AT START SUPPORT - Vu=   .04 KNS Vc= 2650.68 KNS Vs=   .00 KNS
STIRRUPS ARE NOT REQUIRED.
AT END   SUPPORT - Vu=   .04 KNS Vc= 2650.68 KNS Vs=   .00 KNS
STIRRUPS ARE NOT REQUIRED.



B E A M N O. 93 D E S I G N R E S U L T S - FLEXURE

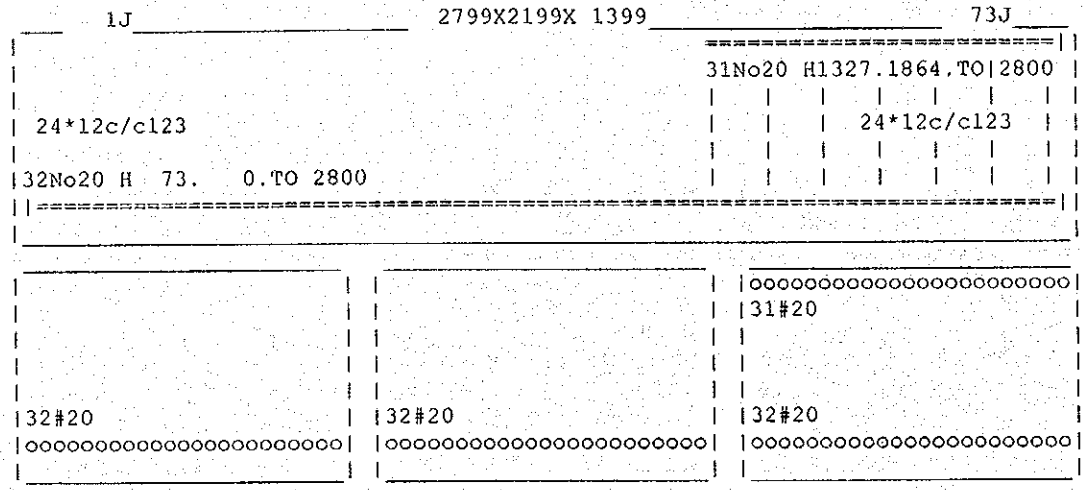
LEN - 2800. MM FY - 414. FC - 30. MPA, SIZE - 2200. X 1400. MMS

LEVEL	HEIGHT (MM)	BAR INFO	FROM (MM)	TO (MM)	ANCHOR STA	ANCHOR END
1	73.	32 - 20MM	0.	2800.	YES	YES
	CRITICAL POS MOMENT= 4831.42 KN-MET AT 0.MM, LOAD 8					
	REQD STEEL= 10042.MM2, ROW= .0034, ROWMX= .0228 ROWMN= .0033					
	MAX/MIN/ACTUAL BAR SPACING= 2078./ 45./ 67. MMS					
	BASIC/REQD. DEVELOPMENT LENGTH = 450./ 629. MMS					
2	1327.	31 - 20MM	1864.	2800.	NO	YES
	CRITICAL NEG MOMENT= 242.56 KN-MET AT 2800.MM, LOAD 8					
	REQD STEEL= 9733.MM2, ROW= .0033, ROWMX= .0228 ROWMN= .0033					
	MAX/MIN/ACTUAL BAR SPACING= 2078./ 45./ 69. MMS					
	BASIC/REQD. DEVELOPMENT LENGTH = 450./ 819. MMS					

B E A M N O. 93 D E S I G N R E S U L T S - SHEAR

AT START SUPPORT - Vu= 1804.47 KNS Vc= 2650.68 KNS Vs= .00 KNS
PROVIDE 12 MM BARS AT 123. MM C/C FOR 2800. MM

AT END SUPPORT - Vu= 1819.79 KNS Vc= 2650.68 KNS Vs= .00 KNS
PROVIDE 12 MM BARS AT 123. MM C/C FOR 2800. MM



B E A M N O. 94 D E S I G N R E S U L T S - FLEXURE

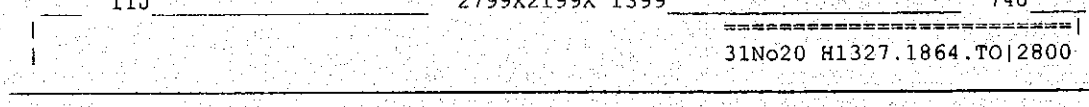
LEN - 2800. MM FY - 414. FC - 30. MPA, SIZE - 2200. X 1400. MMS

LEVEL	HEIGHT (MM)	BAR INFO	FROM (MM)	TO (MM)	ANCHOR STA	ANCHOR END
1	75.	28 - 25MM	0.	2800.	YES	YES
	CRITICAL POS MOMENT= 6498.16 KN-MET AT 0.MM, LOAD 8					
	REQD STEEL= 13696.MM2, ROW= .0047, ROWMX= .0228 ROWMN= .0033					
	MAX/MIN/ACTUAL BAR SPACING= 2073./ 50./ 77. MMS					
	BASIC/REQD. DEVELOPMENT LENGTH = 703./ 981. MMS					
2	1327.	31 - 20MM	1864.	2800.	NO	YES
	CRITICAL NEG MOMENT= 378.88 KN-MET AT 2800.MM, LOAD 9					
	REQD STEEL= 9733.MM2, ROW= .0033, ROWMX= .0228 ROWMN= .0033					
	MAX/MIN/ACTUAL BAR SPACING= 2078./ 45./ 69. MMS					
	BASIC/REQD. DEVELOPMENT LENGTH = 450./ 819. MMS					

B E A M N O. 94 D E S I G N R E S U L T S - SHEAR

AT START SUPPORT - Vu= 2414.58 KNS Vc= 2650.68 KNS Vs= 190.00 KNS
PROVIDE 12 MM BARS AT 123. MM C/C FOR 2800. MM

AT END SUPPORT - Vu= 2429.90 KNS Vc= 2650.68 KNS Vs= 208.03 KNS
PROVIDE 12 MM BARS AT 123. MM C/C FOR 2800. MM



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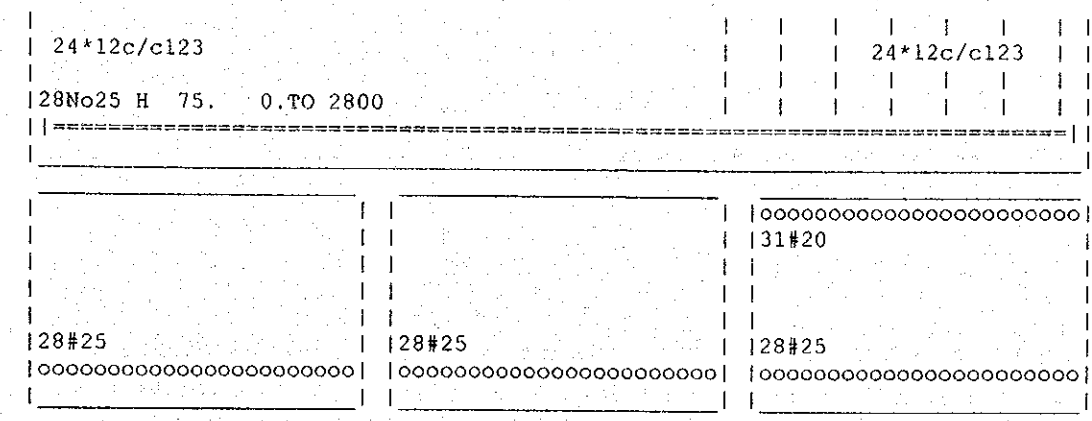


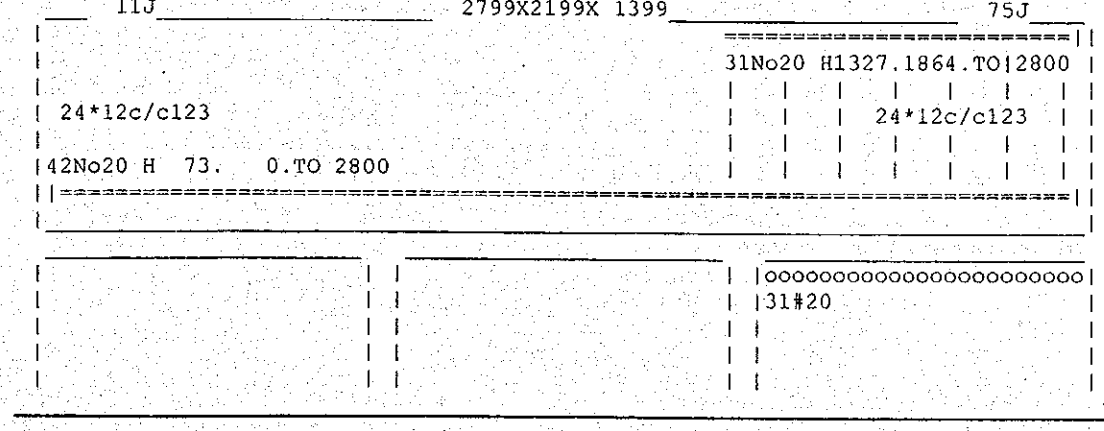
B E A M N O. 95 D E S I G N R E S U L T S - FLEXURE

LEN - 2800. MM FY - 414. FC - 30. MPA, SIZE - 2200. X 1400. MMS

LEVEL	HEIGHT (MM)	BAR INFO	FROM (MM)	TO (MM)	ANCHOR STA	ANCHOR END
1	73.	42 - 20MM	0.	2800.	YES	YES
	CRITICAL POS MOMENT= 6249.14 KN-MET AT 0.MM, LOAD 8					
	REQD STEEL= 13124.MM2, ROW= .0045, ROWMX= .0228 ROWMN= .0033					
	MAX/MIN/ACTUAL BAR SPACING= 2078./ 45./ 51. MMS					
	BASIC/REQD. DEVELOPMENT LENGTH = 450./ 895. MMS					
2	1327.	31 - 20MM	1864.	2800.	NO	YES
	CRITICAL NEG MOMENT= 316.81 KN-MET AT 2800.MM, LOAD 8					
	REQD STEEL= 9733.MM2, ROW= .0033, ROWMX= .0228 ROWMN= .0033					
	MAX/MIN/ACTUAL BAR SPACING= 2078./ 45./ 69. MMS					
	BASIC/REQD. DEVELOPMENT LENGTH = 450./ 819. MMS					

B E A M N O. 95 D E S I G N R E S U L T S - SHEAR

AT START SUPPORT - Vu= 2337.31 KNS Vc= 2650.68 KNS Vs= 99.10 KNS
PROVIDE 12 MM BARS AT 123. MM C/C FOR 2800. MM
AT END SUPPORT - Vu= 2352.63 KNS Vc= 2650.68 KNS Vs= 117.13 KNS
PROVIDE 12 MM BARS AT 123. MM C/C FOR 2800. MM



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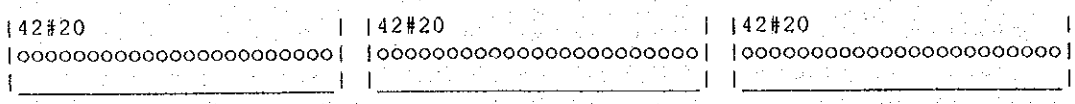

**********END OF BEAM DESIGN**********

224. CLEAR 0.15
225. DESIGN COLUMN 101 TO 108 141 TO 148 161 TO 168

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C O L U M N N O. 101 D E S I G N R E S U L T S

FY - 413.7 FC - 30.0 MPA, CIRC SIZE 900.0 MMS DIAMETER TIED

AREA OF STEEL REQUIRED = 6361.7 SQ. MM

BAR CONFIGURATION	REINF PCT.	LOAD	LOCATION	PHI
13 - 25 MM (EQUALLY SPACED)	1.003	7	STA	.700

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

P0	Pn max	P-bal.	M-bal.	e-bal. (MM)
18699.51	14959.61	5951.46	1811.19	304.3
MO	P-tens.	Des.Pn	Des.Mn	e/h
865.04	-2639.85	2373.27	374.47	.158

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C O L U M N N O. 102 D E S I G N R E S U L T S

FY - 413.7 FC - 30.0 MPA, CIRC SIZE 900.0 MMS DIAMETER TIED

AREA OF STEEL REQUIRED = 6361.7 SQ. MM

BAR CONFIGURATION	REINF PCT.	LOAD	LOCATION	PHI
13 - 25 MM (EQUALLY SPACED)	1.003	7	STA	.700

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

P0	Pn max	P-bal.	M-bal.	e-bal. (MM)
18699.51	14959.61	5951.46	1811.19	304.3
MO	P-tens.	Des.Pn	Des.Mn	e/h
865.04	-2639.85	2394.68	293.86	.123

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C O L U M N N O. 103 D E S I G N R E S U L T S

FY - 413.7 FC - 30.0 MPA, CIRC SIZE 900.0 MMS DIAMETER TIED

AREA OF STEEL REQUIRED = 6361.7 SQ. MM

BAR CONFIGURATION	REINF PCT.	LOAD	LOCATION	PHI
13 - 25 MM (EQUALLY SPACED)	1.003	7	STA	.700

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

P0	Pn max	P-bal.	M-bal.	e-bal. (MM)
18699.51	14959.61	5951.46	1811.19	304.3
M0	P-tens.	Des.Pn	Des.Mn	e/h
865.04	-2639.85	2416.10	214.06	.089

C O L U M N N O. 104 D E S I G N R E S U L T S

FY - 413.7 FC - 30.0 MPA, CIRC SIZE 900.0 MMS DIAMETER TIED

AREA OF STEEL REQUIRED = 6361.7 SQ. MM

BAR CONFIGURATION	REINF PCT.	LOAD	LOCATION	PHI
13 - 25 MM (EQUALLY SPACED)	1.003	7	STA	.700

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

P0	Pn max	P-bal.	M-bal.	e-bal. (MM)
18699.51	14959.61	5951.46	1811.19	304.3
M0	P-tens.	Des.Pn	Des.Mn	e/h
865.04	-2639.85	2437.51	142.88	.059

C O L U M N N O. 105 D E S I G N R E S U L T S

FY - 413.7 FC - 30.0 MPA, CIRC SIZE 900.0 MMS DIAMETER TIED

AREA OF STEEL REQUIRED = 6361.7 SQ. MM

BAR CONFIGURATION	REINF PCT.	LOAD	LOCATION	PHI
13 - 25 MM (EQUALLY SPACED)	1.003	7	STA	.700

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

P0	Pn max	P-bal.	M-bal.	e-bal. (MM)
18699.51	14959.61	5951.46	1811.19	304.3
M0	P-tens.	Des.Pn	Des.Mn	e/h
865.04	-2639.85	2458.92	84.64	.034

C O L U M N N O. 106 D E S I G N R E S U L T S

FY - 413.7 FC - 30.0 MPA, CIRC SIZE 900.0 MMS DIAMETER TIED

AREA OF STEEL REQUIRED = 6361.7 SQ. MM

BAR CONFIGURATION	REINF PCT.	LOAD	LOCATION	PHI
13 - 25 MM (EQUALLY SPACED)	1.003	7	STA	.700

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

P0	Pn max	P-bal.	M-bal.	e-bal. (MM)
18699.51	14959.61	5951.46	1811.19	304.3
M0	P-tens.	Des.Pn	Des.Mn	e/h
865.04	-2639.85	2480.34	41.29	.017

C O L U M N N O. 107 D E S I G N R E S U L T S

FY - 413.7 FC - 30.0 MPA, CIRC SIZE 900.0 MMS DIAMETER TIED

AREA OF STEEL REQUIRED = 6361.7 SQ. MM

BAR CONFIGURATION	REINF PCT.	LOAD	LOCATION	PHI
13 - 25 MM (EQUALLY SPACED)	1.003	7	STA	.700

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

P0	Pn max	P-bal.	M-bal.	e-bal. (MM)
18699.51	14959.61	5951.46	1811.19	304.3
M0	P-tens.	Des.Pn	Des.Mn	e/h
865.04	-2639.85	2501.75	18.73	.007

C O L U M N N O. 108 D E S I G N R E S U L T S

FY - 413.7 FC - 30.0 MPA, CIRC SIZE 900.0 MMS DIAMETER TIED

AREA OF STEEL REQUIRED = 6361.7 SQ. MM

BAR CONFIGURATION	REINF PCT.	LOAD	LOCATION	PHI
13 - 25 MM (EQUALLY SPACED)	1.003	7	STA	.700

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

P0	Pn max	P-bal.	M-bal.	e-bal. (MM)
18699.51	14959.61	5951.46	1811.19	304.3
M0	P-tens.	Des.Pn	Des.Mn	e/h
865.04	-2639.85	2523.16	27.90	.011

C O L U M N N O. 141 D E S I G N R E S U L T S

FY - 413.7 FC - 30.0 MPA, CIRC SIZE 900.0 MMS DIAMETER TIED

AREA OF STEEL REQUIRED = 6361.7 SQ. MM

BAR CONFIGURATION	REINF PCT.	LOAD	LOCATION	PHI
13 - 25 MM (EQUALLY SPACED)	1.003	7	STA	.700

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

P0	Pn max	P-bal.	M-bal.	e-bal. (MM)
18699.51	14959.61	5951.46	1811.19	304.3
M0	P-tens.	Des.Pn	Des.Mn	e/h
865.04	-2639.85	2548.76	303.91	.119

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C O L U M N N O. 142 D E S I G N R E S U L T S

FY - 413.7 FC - 30.0 MPA, CIRC SIZE 900.0 MMS DIAMETER TIED

AREA OF STEEL REQUIRED = 6361.7 SQ. MM

BAR CONFIGURATION	REINF PCT.	LOAD	LOCATION	PHI
13 - 25 MM (EQUALLY SPACED)	1.003	7	STA	.700

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

P0	Pn max	P-bal.	M-bal.	e-bal. (MM)
18699.51	14959.61	5951.46	1811.19	304.3
M0	P-tens.	Des.Pn	Des.Mn	e/h
865.04	-2639.85	2570.16	260.32	.101

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C O L U M N N O. 143 D E S I G N R E S U L T S

FY - 413.7 FC - 30.0 MPA, CIRC SIZE 900.0 MMS DIAMETER TIED

AREA OF STEEL REQUIRED = 6361.7 SQ. MM

BAR CONFIGURATION	REINF PCT.	LOAD	LOCATION	PHI
13 - 25 MM (EQUALLY SPACED)	1.003	7	STA	.700

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

P0	Pn max	P-bal.	M-bal.	e-bal. (MM)
18699.51	14959.61	5951.46	1811.19	304.3
M0	P-tens.	Des.Pn	Des.Mn	e/h
865.04	-2639.85	2591.58	214.59	.083

C O L U M N N O. 144 D E S I G N R E S U L T S

FY - 413.7 FC - 30.0 MPA, CIRC SIZE 900.0 MMS DIAMETER TIED

AREA OF STEEL REQUIRED = 6361.7 SQ. MM

BAR CONFIGURATION	REINF PCT.	LOAD	LOCATION	PHI
13 - 25 MM (EQUALLY SPACED)	1.003	7	STA	.700

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

P0	Pn max	P-bal.	M-bal.	e-bal. (MM)
18699.51	14959.61	5951.46	1811.19	304.3
M0	P-tens.	Des.Pn	Des.Mn	e/h
865.04	-2639.85	2612.98	167.99	.064

C O L U M N N O. 145 D E S I G N R E S U L T S

FY - 413.7 FC - 30.0 MPA, CIRC SIZE 900.0 MMS DIAMETER TIED

AREA OF STEEL REQUIRED = 6361.7 SQ. MM

BAR CONFIGURATION	REINF PCT.	LOAD	LOCATION	PHI
13 - 25 MM (EQUALLY SPACED)	1.003	7	STA	.700

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

P0	Pn max	P-bal.	M-bal.	e-bal. (MM)
18699.51	14959.61	5951.46	1811.19	304.3
M0	P-tens.	Des.Pn	Des.Mn	e/h
865.04	-2639.85	2634.40	123.77	.047

C O L U M N N O. 146 D E S I G N R E S U L T S

FY - 413.7 FC - 30.0 MPA, CIRC SIZE 900.0 MMS DIAMETER TIED

AREA OF STEEL REQUIRED = 6361.7 SQ. MM

BAR CONFIGURATION	REINF PCT.	LOAD	LOCATION	PHI
13 - 25 MM (EQUALLY SPACED)	1.003	7	STA	.700

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

P0	Pn max	P-bal.	M-bal.	e-bal. (MM)
18699.51	14959.61	5951.46	1811.19	304.3
M0	P-tens.	Des.Pn	Des.Mn	e/h

865.04 -2639.85 2655.81 84.94 .032

C O L U M N N O. 147 D E S I G N R E S U L T S

FY - 413.7 FC - 30.0 MPA, CIRC SIZE 900.0 MMS DIAMETER TIED

AREA OF STEEL REQUIRED = 6361.7 SQ. MM

BAR CONFIGURATION	REINF PCT.	LOAD	LOCATION	PHI
13 - 25 MM (EQUALLY SPACED)	1.003	7	STA	.700

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

P0	Pn max	P-bal.	M-bal.	e-bal. (MM)
18699.51	14959.61	5951.46	1811.19	304.3
M0	P-tens.	Des.Pn	Des.Mn	e/h
865.04	-2639.85	2677.22	54.09	.020

C O L U M N N O. 148 D E S I G N R E S U L T S

FY - 413.7 FC - 30.0 MPA, CIRC SIZE 900.0 MMS DIAMETER TIED

AREA OF STEEL REQUIRED = 6361.7 SQ. MM

BAR CONFIGURATION	REINF PCT.	LOAD	LOCATION	PHI
13 - 25 MM (EQUALLY SPACED)	1.003	7	STA	.700

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

P0	Pn max	P-bal.	M-bal.	e-bal. (MM)
18699.51	14959.61	5951.46	1811.19	304.3
M0	P-tens.	Des.Pn	Des.Mn	e/h
865.04	-2639.85	2698.64	35.35	.013

C O L U M N N O. 161 D E S I G N R E S U L T S

FY - 413.7 FC - 30.0 MPA, CIRC SIZE 900.0 MMS DIAMETER TIED

AREA OF STEEL REQUIRED = 6361.7 SQ. MM

BAR CONFIGURATION	REINF PCT.	LOAD	LOCATION	PHI
13 - 25 MM (EQUALLY SPACED)	1.003	7	STA	.700

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

P0	Pn max	P-bal.	M-bal.	e-bal. (MM)
18699.51	14959.61	5951.46	1811.19	304.3
M0	P-tens.	Des.Pn	Des.Mn	e/h
865.04	-2639.85	2474.07	347.77	.141

C O L U M N N O. 162 D E S I G N R E S U L T S

FY - 413.7 FC - 30.0 MPA, CIRC SIZE 900.0 MMS DIAMETER TIED

AREA OF STEEL REQUIRED = 6361.7 SQ. MM

BAR CONFIGURATION	REINF PCT.	LOAD	LOCATION	PHI
13 - 25 MM (EQUALLY SPACED)	1.003	7	STA	.700

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

P0	Pn max	P-bal.	M-bal.	e-bal. (MM)
18699.51	14959.61	5951.46	1811.19	304.3
M0	P-tens.	Des.Pn	Des.Mn	e/h
865.04	-2639.85	2495.48	286.72	.115

C O L U M N N O. 163 D E S I G N R E S U L T S

FY - 413.7 FC - 30.0 MPA, CIRC SIZE 900.0 MMS DIAMETER TIED

AREA OF STEEL REQUIRED = 6361.7 SQ. MM

BAR CONFIGURATION	REINF PCT.	LOAD	LOCATION	PHI
13 - 25 MM (EQUALLY SPACED)	1.003	7	STA	.700

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

P0	Pn max	P-bal.	M-bal.	e-bal. (MM)
18699.51	14959.61	5951.46	1811.19	304.3
M0	P-tens.	Des.Pn	Des.Mn	e/h
865.04	-2639.85	2516.90	225.30	.090

C O L U M N N O. 164 D E S I G N R E S U L T S

FY - 413.7 FC - 30.0 MPA, CIRC SIZE 900.0 MMS DIAMETER TIED

AREA OF STEEL REQUIRED = 6361.7 SQ. MM

BAR CONFIGURATION	REINF PCT.	LOAD	LOCATION	PHI
13 - 25 MM (EQUALLY SPACED)	1.003	7	STA	.700

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

P0	Pn max	P-bal.	M-bal.	e-bal. (MM)
18699.51	14959.61	5951.46	1811.19	304.3
M0	P-tens.	Des.Pn	Des.Mn	e/h
865.04	-2639.85	2538.31	167.39	.066

C O L U M N N O. 165 D E S I G N R E S U L T S

FY - 413.7 FC - 30.0 MPA, CIRC SIZE 900.0 MMS DIAMETER TIED

AREA OF STEEL REQUIRED = 6361.7 SQ. MM

BAR CONFIGURATION	REINF PCT.	LOAD	LOCATION	PHI
13 - 25 MM (EQUALLY SPACED)	1.003	7	STA	.700

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

P0	Pn max	P-bal.	M-bal.	e-bal. (MM)
18699.51	14959.61	5951.46	1811.19	304.3
M0	P-tens.	Des.Pn	Des.Mn	e/h
865.04	-2639.85	2559.73	116.59	.046

C O L U M N N O. 166 D E S I G N R E S U L T S

FY - 413.7 FC - 30.0 MPA, CIRC SIZE 900.0 MMS DIAMETER TIED

AREA OF STEEL REQUIRED = 6361.7 SQ. MM

BAR CONFIGURATION	REINF PCT.	LOAD	LOCATION	PHI
13 - 25 MM (EQUALLY SPACED)	1.003	7	STA	.700

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

P0	Pn max	P-bal.	M-bal.	e-bal. (MM)
18699.51	14959.61	5951.46	1811.19	304.3
M0	P-tens.	Des.Pn	Des.Mn	e/h
865.04	-2639.85	2581.14	75.46	.029

C O L U M N N O. 167 D E S I G N R E S U L T S

FY - 413.7 FC - 30.0 MPA, CIRC SIZE 900.0 MMS DIAMETER TIED

AREA OF STEEL REQUIRED = 6361.7 SQ. MM

BAR CONFIGURATION	REINF PCT.	LOAD	LOCATION	PHI

```
 13 - 25 MM                1.003        7       STA       .700
(EQUALLY SPACED)

    COLUMN INTERACTION: MOMENT ABOUT Z/Y -AXIS (KN-MET)
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   P0         Pn max     P-bal.     M-bal.      e-bal. (MM)
18699.51   14959.61    5951.46    1811.19      304.3
   M0         P-tens.    Des.Pn     Des.Mn      e/h
  865.04   -2639.85    2602.55      46.48       .018
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     C O L U M N   N O.  168   D E S I G N   R E S U L T S

FY - 413.7  FC -  30.0 MPA,  CIRC SIZE  900.0 MMS DIAMETER  TIED

        AREA OF STEEL REQUIRED =  6361.7  SQ. MM

BAR CONFIGURATION         REINF PCT.    LOAD    LOCATION    PHI
 ----------------------------------------------------------

 13 - 25 MM                1.003        7       STA       .700
(EQUALLY SPACED)

    COLUMN INTERACTION: MOMENT ABOUT Z/Y -AXIS (KN-MET)
 ----------------------------------------------------------
   P0         Pn max     P-bal.     M-bal.      e-bal. (MM)
18699.51   14959.61    5951.46    1811.19      304.3
   M0         P-tens.    Des.Pn     Des.Mn      e/h
  865.04   -2639.85    2623.96      34.64       .013
 ----------------------------------------------------------

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

226. END CON DESIGN
227. FINISH

          *************** END OF STAAD-III ***************

           **** DATE= FEB 29,2000   TIME= 15:52:10 ****

      ************************************************************
      *        For questions on  STAAD-III,   contact:           *
      *              Research Engineers, Inc at                  *
      *  West Coast: Ph- (714) 974-2500  Fax- (714) 921-2543     *
      *  East Coast: Ph- (508) 688-3626  Fax- (508) 685-7230     *
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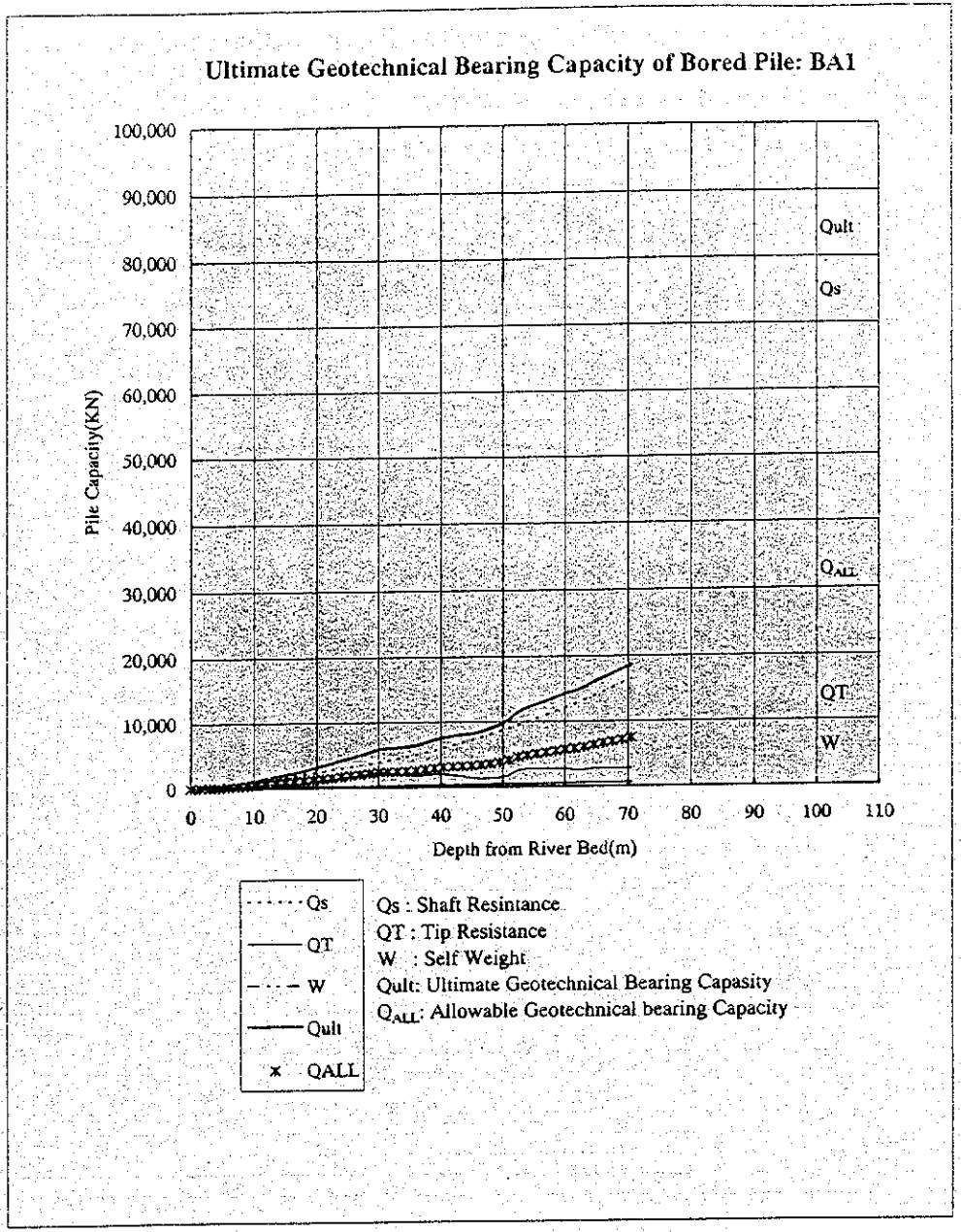
Bearing Capacity of a Pile: Bored into the soil layers as indicated by BH1BA1

Diameter of pile = 0.90 m
Scour depth = 0.00 m
Safety Factor = 2.50

Depth	N	γ_s	γ_i'	soil type	α_i	s_{ui}	consistenc	z_i	β_i	σ_{vi}'	f_{si}	Q_{si}	Q_s	N_c	s_{ui}	q_T	a	b	F_r	q_{TR}	Q_T	W	Q_{ULT}	Q_{ALL}
m		kN/m^3	kN/m^3			kPa		m		kPa	kPa	kPa	kN		kPa	kPa				kPa	kN	kN	kN	kN
0.0		14.9	5.1	clayey silt	0.00	0.0	-	0.0	1.20	3.8	0.0	0.0	0.0	0.0	0.0	0.0	-	-	-	0.0	0.0	0.0	0.0	0.0
1.5	5	14.9	5.1	clayey silt	0.00	0.0	-	1.5	1.20	11.5	13.8	58.4	58.4	8.0	0.0	143.6	-	-	-	143.6	91.4	13.4	136.4	54.6
3.0	5	14.9	5.1	clayey silt	0.00	0.0	-	3.0	1.08	19.1	20.6	87.3	145.7	9.0	0.0	71.8	-	-	-	71.8	45.7	26.7	164.7	65.9
4.5	0	14.9	5.1	clayey silt	0.00	0.0	-	4.5	0.98	26.8	26.3	111.4	257.1	9.0	0.0	86.2	-	-	-	86.2	54.8	40.1	271.9	108.8
6.0	0	14.9	5.1	clayey silt	0.00	0.0	-	6.0	0.90	34.4	31.0	131.6	388.7	9.0	0.0	244.2	-	-	-	244.2	155.3	53.4	490.6	196.2
7.5	0	14.9	5.1	clayey silt	0.00	0.0	-	7.5	0.83	42.1	34.9	148.2	536.9	9.0	0.0	387.8	-	-	-	387.8	246.7	66.8	716.8	286.7
9.0	6	14.9	5.1	clayey silt	0.00	0.0	-	9.0	0.77	49.7	38.1	161.6	698.5	9.0	0.0	588.9	-	-	-	588.9	374.7	80.2	993.0	397.2
10.5	11	18.1	8.3	silty sand	0.00	0.0	-	10.5	0.71	62.2	44.0	186.6	885.1	9.0	0.0	746.9	-	-	-	746.9	475.2	93.5	1266.8	506.7
12.0	10	18.1	8.3	silty sand	0.00	0.0	-	12.0	0.65	74.6	48.7	206.7	1091.8	9.0	0.0	818.7	-	-	-	818.7	520.9	106.9	1505.7	602.3
13.5	14	18.1	8.3	silty sand	0.00	0.0	-	13.5	0.60	87.1	52.4	222.2	1313.9	9.0	0.0	976.8	-	-	-	976.8	621.4	120.2	1815.1	726.0
15.0	17	18.1	8.3	silty sand	0.00	0.0	-	15.0	0.55	99.5	55.0	233.4	1547.3	9.0	0.0	1062.9	-	-	-	1062.9	676.2	133.6	2089.9	836.0
16.5	16	18.1	8.3	silty sand	0.00	0.0	-	16.5	0.51	112.0	56.7	240.6	1788.0	9.0	0.0	1120.4	-	-	-	1120.4	712.8	147.0	2353.8	941.5
18.0	21	18.1	8.3	silty sand	0.00	0.0	-	18.0	0.46	124.4	57.6	244.1	2032.1	9.0	0.0	1177.8	-	-	-	1177.8	749.3	160.3	2621.1	1048.4
19.5	20	18.1	8.3	silty sand	0.00	0.0	-	19.5	0.42	136.9	57.5	243.9	2276.0	9.0	0.0	1450.8	-	-	-	1450.8	922.9	173.7	3025.3	1210.1
21.0	21	18.1	8.3	silty sand	0.00	0.0	-	21.0	0.38	149.3	56.7	240.3	2516.3	9.0	0.0	1738.0	-	-	-	1738.0	1105.7	187.0	3435.0	1374.0
22.5	20	18.1	8.3	silty sand	0.00	0.0	-	22.5	0.34	161.8	55.0	233.4	2749.7	9.0	0.0	1953.5	-	-	-	1953.5	1242.8	200.4	3792.0	1516.8
24.0	40	19.6	9.8	silty sand	0.00	0.0	-	24.0	0.30	176.5	53.3	226.1	2975.8	9.0	0.0	2312.6	-	-	-	2312.6	1471.2	213.8	4233.2	1693.3
25.5	40	19.6	9.8	silty sand	0.00	0.0	-	25.5	0.27	191.2	50.7	215.0	3190.8	9.0	0.0	2614.2	-	-	-	2614.2	1663.1	227.1	4626.8	1850.7
27.0	36	19.6	9.8	silty sand	0.00	0.0	-	27.0	0.25	205.9	51.5	218.3	3409.1	9.0	0.0	2887.2	-	-	-	2887.2	1836.7	240.5	5005.3	2002.1
28.5	45	19.6	9.8	silty sand	0.00	0.0	-	28.5	0.25	220.6	55.1	233.9	3642.9	9.0	0.0	3246.3	-	-	-	3246.3	2065.2	253.8	5454.3	2181.7
30.0	61	19.6	9.8	silty sand	0.00	0.0	-	30.0	0.25	235.3	58.8	249.5	3892.4	9.0	0.0	3662.8	-	-	-	3662.8	2330.2	267.2	5955.4	2382.2
31.5	59	19.6	9.8	silty sand	0.00	0.0	-	31.5	0.25	250.0	62.5	265.0	4157.4	9.0	0.0	3375.5	-	-	-	3375.5	2147.4	280.6	6024.3	2409.7
33.0	61	19.6	9.8	silty sand	0.00	0.0	-	33.0	0.25	264.7	66.2	280.6	4438.1	9.0	0.0	3102.6	-	-	-	3102.6	1973.8	293.9	6118.0	2447.2
34.5	74	19.6	9.8	silty sand	0.00	0.0	-	34.5	0.25	279.4	69.8	296.2	4734.3	9.0	0.0	2987.7	-	-	-	2987.7	1900.7	307.3	6327.7	2531.1
36.0	41	19.6	9.8	silty sand	0.00	0.0	-	36.0	0.25	294.1	73.5	311.8	5046.1	9.0	0.0	2714.8	-	-	-	2714.8	1727.1	320.6	6452.5	2581.0
37.5	40	19.6	9.8	silty sand	0.00	0.0	-	37.5	0.25	308.8	77.2	327.4	5373.5	9.0	0.0	2887.2	-	-	-	2887.2	1836.7	334.0	6876.2	2750.5
39.0	53	19.6	9.8	silty sand	0.00	0.0	-	39.0	0.25	323.5	80.9	343.0	5716.5	9.0	0.0	3088.3	-	-	-	3088.3	1964.7	347.4	7333.8	2933.5
40.5	55	19.6	9.8	silty sand	0.00	0.0	-	40.5	0.25	338.2	84.5	358.6	6075.0	9.0	0.0	3073.9	-	-	-	3073.9	1955.5	360.7	7669.8	3067.9
42.0	53	19.6	9.8	silty sand	0.00	0.0	-	42.0	0.25	352.9	88.2	374.1	6449.2	9.0	0.0	2829.7	-	-	-	2829.7	1800.2	374.1	7875.3	3150.1
43.5	54	19.6	9.8	silty sand	0.00	0.0	-	43.5	0.25	367.6	91.9	389.7	6838.9	9.0	0.0	2599.9	-	-	-	2599.9	1654.0	387.4	8105.5	3242.2
45.0	52	19.6	9.8	silty sand	0.00	0.0	-	45.0	0.25	382.3	95.6	405.3	7244.2	9.0	0.0	2140.2	-	-	-	2140.2	1361.6	400.8	8205.0	3282.0
46.5	38	19.6	9.8	silty sand	0.00	0.0	-	46.5	0.25	397.0	99.2	420.9	7665.1	9.0	0.0	2025.3	-	-	-	2025.3	1288.5	414.1	8539.4	3415.8
48.0	37	19.6	9.8	silty sand	0.00	0.0	-	48.0	0.25	411.7	102.9	436.5	8101.6	9.0	0.0	2082.8	-	-	-	2082.8	1325.0	427.5	8999.1	3599.7
49.5	22	19.6	9.8	silty sand	0.00	0.0	-	49.5	0.25	426.4	106.6	452.1	8553.7	9.0	0.0	2212.1	-	-	-	2212.1	1407.2	440.9	9520.1	3808.0
51.0	44	19.6	9.8	silty sand	0.00	0.0	-	51.0	0.25	441.1	110.3	467.7	9021.4	9.0	0.0	2757.9	-	-	-	2757.9	1754.5	454.2	10321.6	4128.7
52.5	42	19.6	9.8	silty sand	0.00	0.0	-	52.5	0.25	455.8	113.9	483.3	9504.6	9.0	0.0	3921.4	-	-	-	3921.4	2494.7	467.6	11531.7	4612.7
54.0	46	19.6	9.8	silty sand	0.00	0.0	-	54.0	0.25	470.5	117.6	498.8	10003.5	9.0	0.0	4280.5	-	-	-	4280.5	2723.1	480.9	12245.6	4898.3
55.5	60	20.4	10.6	silty sand	0.00	0.0	-	55.5	0.25	486.4	121.6	515.7	10519.2	9.0	0.0	4309.2	-	-	-	4309.2	2741.4	494.3	12766.3	5106.5
57.0	125	20.4	10.6	silty sand	0.00	0.0	-	57.0	0.25	502.3	125.6	532.6	11051.7	9.0	0.0	4309.2	-	-	-	4309.2	2741.4	507.7	13285.5	5314.2
58.5	67	20.4	10.6	fine sand	0.00	0.0	-	58.5	0.25	518.2	129.5	549.4	11601.1	9.0	0.0	4309.2	-	-	-	4309.2	2741.4	521.0	13821.5	5528.6
60.0	87	20.4	10.6	fine sand	0.00	0.0	-	60.0	0.25	534.1	133.5	566.3	12167.4	9.0	0.0	4309.2	-	-	-	4309.2	2741.4	534.4	14374.4	5749.8
61.5	77	20.4	10.6	fine sand	0.00	0.0	-	61.5	0.25	550.0	137.5	583.1	12750.5	9.0	0.0	3993.2	-	-	-	3993.2	2540.4	547.7	14743.2	5897.3
63.0	74	20.4	10.6	fine sand	0.00	0.0	-	63.0	0.25	565.9	141.5	600.0	13350.5	9.0	0.0	3978.8	-	-	-	3978.8	2531.2	561.1	15320.7	6128.3
64.5	64	20.4	10.6	fine sand	0.00	0.0	-	64.5	0.25	581.8	145.4	616.8	13967.4	9.0	0.0	4309.2	-	-	-	4309.2	2741.4	574.5	16134.3	6453.7
66.0	63	20.4	10.6	fine sand	0.00	0.0	-	66.0	0.25	597.7	149.4	633.7	14601.1	9.0	0.0	4309.2	-	-	-	4309.2	2741.4	587.8	16754.7	6701.9
67.5	76	20.4	10.6	fine sand	0.00	0.0	-	67.5	0.25	613.6	153.4	650.6	15251.7	9.0	0.0	4309.2	-	-	-	4309.2	2741.4	601.2	17391.9	6956.7
69.0	134	20.4	10.6	fine sand	0.00	0.0	-	69.0	0.25	629.5	157.4	667.4	15919.1	9.0	0.0	4309.2	-	-	-	4309.2	2741.4	614.5	18045.9	7218.4
70.5	132	20.4	10.6	fine sand	0.00	0.0	-	70.5	0.25	645.4	161.3	684.3	16603.4	9.0	0.0	4309.2	-	-	-	4309.2	2741.4	627.9	18716.9	7486.7

Geotechnical Ultimate Bearing Capacity of Bored Pile

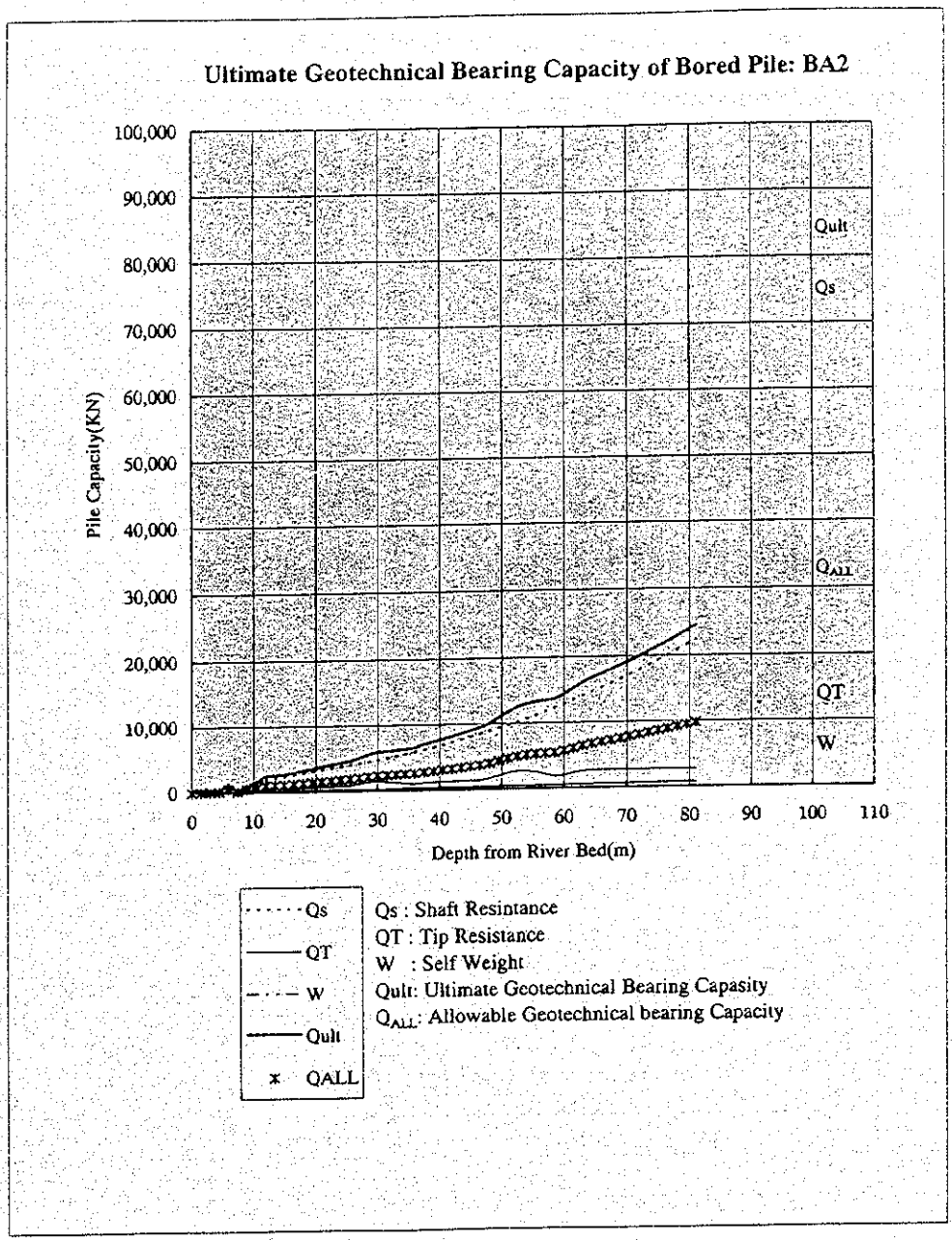
Shaft Diameter D=0.9m					
Depth	Qs	QT	W	Qult	Q_{ALL}
0.0	0.0	0.0	0.0	0.0	0.0
1.5	58.4	91.4	13.4	136.4	54.6
3.0	145.7	45.7	26.7	164.7	65.9
4.5	257.1	54.8	40.1	271.9	108.8
6.0	388.7	155.3	53.4	490.6	196.2
7.5	536.9	246.7	66.8	716.8	286.7
9.0	698.5	374.7	80.2	993.0	397.2
10.5	885.1	475.2	93.5	1,266.8	506.7
12.0	1091.8	520.9	106.9	1,505.7	602.3
13.5	1313.9	621.4	120.2	1,815.1	726.0
15.0	1547.3	676.2	133.6	2,089.9	836.0
16.5	1788.0	712.8	147.0	2,353.8	941.5
18.0	2032.1	749.3	160.3	2,621.1	1,048.4
19.5	2276.0	922.9	173.7	3,025.3	1,210.1
21.0	2516.3	1,105.7	187.0	3,435.0	1,374.0
22.5	2749.7	1,242.8	200.4	3,792.0	1,516.8
24.0	2975.8	1,471.2	213.8	4,233.2	1,693.3
25.5	3190.8	1,663.1	227.1	4,626.8	1,850.7
27.0	3409.1	1,836.7	240.5	5,005.3	2,002.1
28.5	3642.9	2,065.2	253.8	5,454.3	2,181.7
30.0	3892.4	2,330.2	267.2	5,955.4	2,382.2
31.5	4157.4	2,147.4	280.6	6,024.3	2,409.7
33.0	4438.1	1,973.8	293.9	6,118.0	2,447.2
34.5	4734.3	1,900.7	307.3	6,327.7	2,531.1
36.0	5046.1	1,727.1	320.6	6,452.5	2,581.0
37.5	5373.5	1,836.7	334.0	6,876.2	2,750.5
39.0	5716.5	1,964.7	347.4	7,333.8	2,933.5
40.5	6075.0	1,955.5	360.7	7,669.8	3,067.9
42.0	6449.2	1,800.2	374.1	7,875.3	3,150.1
43.5	6838.9	1,654.0	387.4	8,105.5	3,242.2
45.0	7244.2	1,361.6	400.8	8,205.0	3,282.0
46.5	7665.1	1,288.5	414.1	8,539.4	3,415.8
48.0	8101.6	1,325.0	427.5	8,999.1	3,599.7
49.5	8553.7	1,407.2	440.9	9,520.1	3,808.0
51.0	9021.4	1,754.5	454.2	10,321.6	4,128.7
52.5	9504.6	2,494.7	467.6	11,531.7	4,612.7
54.0	10003.5	2,723.1	480.9	12,245.6	4,898.3
55.5	10519.2	2,741.4	494.3	12,766.3	5,106.5
57.0	11051.7	2,741.4	507.7	13,285.5	5,314.2
58.5	11601.1	2,741.4	521.0	13,821.5	5,528.6
60.0	12167.4	2,741.4	534.4	14,374.4	5,749.8
61.5	12750.5	2,540.4	547.7	14,743.2	5,897.3
63.0	13350.5	2,531.2	561.1	15,320.7	6,128.3
64.5	13967.4	2,741.4	574.5	16,134.3	6,453.7
66.0	14601.1	2,741.4	587.8	16,754.7	6,701.9
67.5	15251.7	2,741.4	601.2	17,391.9	6,956.7
69.0	15919.1	2,741.4	614.5	18,045.9	7,218.4
70.5	16603.4	2,741.4	627.9	18,716.9	7,486.7



Bearing Capacity of a Pile: Bored into the soil layers as indicated by BH1BA2

Diameter of pile = 0.90 m
Scour depth = 0.00 m
Safety Factor = 2.50

Depth	N	γ_s	γ_i	soil type	α_i	s_{ui}	consistenc	z_i	β_i	σ_{vi}	f_{si}	Q_{si}	Q_s	N_c	s_{ui}	q_T	a	b	F_r	q_{TR}	Q_T	W	Q_{ULT}	Q_{ALL}
m		kN/m^3	kN/m^3			kPa		m		kPa	kPa	kPa	kN		kPa	kPa				kPa	kN	kN	kN	kN
0.0		14.9	5.1	clayey silt	0.00	0.0	-	0.0	1.20	3.8	0.0	0.0	0.0	0.0	0.0	0.0	-	-	-	0.0	0.0	0.0	0.0	0.0
1.5	2	14.9	5.1	clayey silt	0.00	0.0	-	1.5	1.20	11.5	13.8	58.4	58.4	8.0	0.0	201.1	-	-	-	201.1	127.9	13.4	173.0	69.2
3.0	5	14.9	5.1	clayey silt	0.00	0.0	-	3.0	1.08	19.1	20.6	87.3	145.7	9.0	0.0	186.7	-	-	-	186.7	118.8	26.7	237.8	95.1
4.5	3	15.7	5.9	clayey silt	0.00	0.0	-	4.5	0.98	28.0	27.5	116.4	262.1	9.0	0.0	158.0	-	-	-	158.0	100.5	40.1	322.6	129.0
6.0	4	15.7	5.9	cohesive	0.55	35.0	soft	6.0	-	36.8	19.3	81.6	343.8	9.0	192.5	1653.8	0.015	1.500	0.139	1653.8	1052.1	53.4	1342.4	537.0
7.5	1	14.9	5.1	cohesive	0.55	10.0	very soft	7.5	-	44.5	5.5	23.3	367.1	9.0	183.8	0.0	0.015	1.500	0.139	0.0	0.0	66.8	300.3	120.1
9.0	3	15.7	5.9	clayey silt	0.00	0.0	-	9.0	0.77	53.3	40.9	173.3	540.4	9.0	0.0	1034.2	-	-	-	1034.2	657.9	80.2	1118.2	447.3
10.5	24	18.1	8.3	cohesive	0.55	725.0	very stiff	10.5	-	65.8	265.0	1123.9	1664.3	9.0	181.3	0.0	0.015	1.500	0.139	0.0	0.0	93.5	1570.8	628.3
12.0	23	18.1	8.3	silty sand	0.00	0.0	-	12.0	0.65	78.2	51.1	216.6	1881.0	9.0	0.0	1091.7	-	-	-	1091.7	694.5	106.9	2468.6	987.4
13.5	22	18.1	8.3	silty sand	0.00	0.0	-	13.5	0.60	90.7	54.5	231.3	2112.3	9.0	0.0	962.4	-	-	-	962.4	612.2	120.2	2604.3	1041.7
15.0	19	18.1	8.3	silty sand	0.00	0.0	-	15.0	0.55	103.1	57.0	241.8	2354.2	9.0	0.0	847.5	-	-	-	847.5	539.1	133.6	2759.7	1103.9
16.5	12	18.1	8.3	silty sand	0.00	0.0	-	16.5	0.51	115.6	58.6	248.4	2602.5	9.0	0.0	833.1	-	-	-	833.1	530.0	147.0	2985.6	1194.2
18.0	14	18.1	8.3	silty sand	0.00	0.0	-	18.0	0.46	128.0	59.2	251.2	2853.7	9.0	0.0	933.7	-	-	-	933.7	594.0	160.3	3287.4	1314.9
19.5	14	18.1	8.3	silty sand	0.00	0.0	-	19.5	0.42	140.5	59.0	250.3	3104.1	9.0	0.0	1019.8	-	-	-	1019.8	648.8	173.7	3579.2	1431.7
21.0	18	18.1	8.3	silty sand	0.00	0.0	-	21.0	0.38	152.9	58.0	246.1	3350.2	9.0	0.0	1106.0	-	-	-	1106.0	703.6	187.0	3866.7	1546.7
22.5	19	18.1	8.3	silty sand	0.00	0.0	-	22.5	0.34	165.4	56.2	238.5	3588.7	9.0	0.0	1177.8	-	-	-	1177.8	749.3	200.4	4137.6	1655.0
24.0	20	18.1	8.3	silty sand	0.00	0.0	-	24.0	0.30	177.8	53.7	227.8	3816.5	9.0	0.0	1249.7	-	-	-	1249.7	795.0	213.8	4397.8	1759.1
25.5	20	18.1	8.3	silty sand	0.00	0.0	-	25.5	0.27	190.3	50.5	214.0	4030.5	9.0	0.0	1335.9	-	-	-	1335.9	849.8	227.1	4653.3	1861.3
27.0	23	18.1	8.3	silty sand	0.00	0.0	-	27.0	0.25	202.7	50.7	214.9	4245.5	9.0	0.0	1709.3	-	-	-	1709.3	1087.4	240.5	5092.4	2037.0
28.5	24	18.1	8.3	silty sand	0.00	0.0	-	28.5	0.25	215.2	53.8	228.1	4473.6	9.0	0.0	2125.9	-	-	-	2125.9	1352.4	253.8	5572.2	2228.9
30.0	26	18.1	8.3	silty sand	0.00	0.0	-	30.0	0.25	227.6	56.9	241.3	4715.0	9.0	0.0	2384.4	-	-	-	2384.4	1516.9	267.2	5964.7	2385.9
31.5	46	19.6	9.8	silty sand	0.00	0.0	-	31.5	0.25	242.3	60.6	256.9	4971.9	9.0	0.0	2140.2	-	-	-	2140.2	1361.6	280.6	6052.9	2421.2
33.0	52	19.6	9.8	silty sand	0.00	0.0	-	33.0	0.25	257.0	64.3	272.5	5244.4	9.0	0.0	1924.8	-	-	-	1924.8	1224.5	293.9	6175.0	2470.0
34.5	42	19.6	9.8	silty sand	0.00	0.0	-	34.5	0.25	271.7	67.9	288.1	5532.5	9.0	0.0	1723.7	-	-	-	1723.7	1096.6	307.3	6321.8	2528.7
36.0	9	19.6	9.8	silty sand	0.00	0.0	-	36.0	0.25	286.4	71.6	303.7	5836.2	9.0	0.0	1565.7	-	-	-	1565.7	996.0	320.6	6511.6	2604.7
37.5	31	19.6	9.8	silty sand	0.00	0.0	-	37.5	0.25	301.1	75.3	319.3	6155.5	9.0	0.0	1867.3	-	-	-	1867.3	1187.9	334.0	7009.5	2803.8
39.0	38	19.6	9.8	silty sand	0.00	0.0	-	39.0	0.25	315.8	79.0	334.9	6490.4	9.0	0.0	1939.1	-	-	-	1939.1	1233.6	347.4	7376.7	2950.7
40.5	31	19.6	9.8	silty sand	0.00	0.0	-	40.5	0.25	330.5	82.6	350.5	6840.8	9.0	0.0	1996.6	-	-	-	1996.6	1270.2	360.7	7750.3	3100.1
42.0	30	19.6	9.8	silty sand	0.00	0.0	-	42.0	0.25	345.2	86.3	366.0	7206.9	9.0	0.0	2025.3	-	-	-	2025.3	1288.5	374.1	8121.3	3248.5
43.5	36	19.6	9.8	silty sand	0.00	0.0	-	43.5	0.25	359.9	90.0	381.6	7588.5	9.0	0.0	2097.1	-	-	-	2097.1	1334.1	387.4	8535.2	3414.1
45.0	42	19.6	9.8	silty sand	0.00	0.0	-	45.0	0.25	374.6	93.7	397.2	7985.7	9.0	0.0	2169.0	-	-	-	2169.0	1379.8	400.8	8964.8	3585.9
46.5	33	19.6	9.8	silty sand	0.00	0.0	-	46.5	0.25	389.3	97.3	412.8	8398.5	9.0	0.0	2183.3	-	-	-	2183.3	1389.0	414.1	9373.3	3749.3
48.0	35	19.6	9.8	silty sand	0.00	0.0	-	48.0	0.25	404.0	101.0	428.4	8826.9	9.0	0.0	2556.8	-	-	-	2556.8	1626.6	427.5	10025.9	4010.4
49.5	41	19.6	9.8	silty sand	0.00	0.0	-	49.5	0.25	418.7	104.7	444.0	9270.9	9.0	0.0	3231.9	-	-	-	3231.9	2056.0	440.9	10886.0	4354.4
51.0	43	19.6	9.8	silty sand	0.00	0.0	-	51.0	0.25	433.4	108.4	459.6	9730.4	9.0	0.0	3863.9	-	-	-	3863.9	2458.1	454.2	11734.3	4693.7
52.5	59	19.6	9.8	silty sand	0.00	0.0	-	52.5	0.25	448.1	112.0	475.1	10205.5	9.0	0.0	4309.2	-	-	-	4309.2	2741.4	467.6	12479.4	4991.7
54.0	82	19.6	9.8	silty sand	0.00	0.0	-	54.0	0.25	462.8	115.7	490.7	10696.3	9.0	0.0	4309.2	-	-	-	4309.2	2741.4	480.9	12956.7	5182.7
55.5	85	20.4	10.6	silty sand	0.00	0.0	-	55.5	0.25	478.7	119.7	507.6	11203.9	9.0	0.0	4021.9	-	-	-	4021.9	2558.6	494.3	13268.2	5307.3
57.0	88	20.4	10.6	silty sand	0.00	0.0	-	57.0	0.25	494.6	123.7	524.4	11728.3	9.0	0.0	3433.0	-	-	-	3433.0	2184.0	507.7	13404.6	5361.8
58.5	68	20.4	10.6	silty sand	0.00	0.0	-	58.5	0.25	510.5	127.6	541.3	12269.6	9.0	0.0	2915.9	-	-	-	2915.9	1855.0	521.0	13603.6	5441.4
60.0	39	20.4	10.6	silty sand	0.00	0.0	-	60.0	0.25	526.4	131.6	558.2	12827.8	9.0	0.0	3102.6	-	-	-	3102.6	1973.8	534.4	14267.2	5706.9
61.5	44	20.4	10.6	silty sand	0.00	0.0	-	61.5	0.25	542.3	135.6	575.0	13402.8	9.0	0.0	3705.9	-	-	-	3705.9	2357.6	547.7	15212.6	6085.1
63.0	52	20.4	10.6	silty sand	0.00	0.0	-	63.0	0.25	558.2	139.6	591.9	13994.7	9.0	0.0	4108.1	-	-	-	4108.1	2613.5	561.1	16047.0	6418.8
64.5	81	20.4	10.6	silty sand	0.00	0.0	-	64.5	0.25	574.1	143.5	608.7	14603.4	9.0	0.0	4309.2	-	-	-	4309.2	2741.4	574.5	16770.3	6708.1
66.0	81	20.4	10.6	silty sand	0.00	0.0	-	66.0	0.25	590.0	147.5	625.6	15229.0	9.0	0.0	4309.2	-	-	-	4309.2	2741.4	587.8	17382.6	6953.0
67.5	72	20.4	10.6	silty sand	0.00	0.0	-	67.5	0.25	605.9	151.5	642.5	15871.5	9.0	0.0	4309.2	-	-	-	4309.2	2741.4	601.2	18011.7	7204.7
69.0	132	20.4	10.6	fine sand	0.00	0.0	-	69.0	0.25	621.8	155.5	659.3	16530.8	9.0	0.0	4309.2	-	-	-	4309.2	2741.4	614.5	18657.6	7463.1
70.5	84	20.4	10.6	fine sand	0.00	0.0	-	70.5	0.25	637.7	159.4	676.2	17206.9	9.0	0.0	4309.2	-	-	-	4309.2	2741.4	627.9	19320.4	7728.2
72.0	93	20.4	10.6	fine sand	0.00	0.0	-	72.0	0.25	653.6	163.4	693.0	17900.0	9.0	0.0	4309.2	-	-	-	4309.2	2741.4	641.3	20000.1	8000.0
73.5	112	20.4	10.6	fine sand	0.00	0.0	-	73.5	0.25	669.5	167.4	709.9	18609.9	9.0	0.0	4309.2	-	-	-	4309.2	2741.4	654.6	20696.6	8278.7
75.0	105	20.4	10.6	fine sand	0.00	0.0	-	75.0	0.25	685.4	171.4	726.7	19336.6	9.0	0.0	4309.2	-	-	-	4309.2	2741.4	668.0	21410.0	8564.0
76.5	112	20.4	10.6	fine sand	0.00	0.0	-	76.5	0.25	701.3	175.3	743.6	20080.2	9.0	0.0	4309.2	-	-	-	4309.2	2741.4	681.3	22140.3	8856.1
78.0	115	20.4	10.6	fine sand	0.00	0.0	-	78.0	0.25	717.2	179.3	760.5	20840.7	9.0	0.0	4309.2	-	-	-	4309.2	2741.4	694.7	22887.4	9155.0
79.5	120	20.4	10.6	fine sand	0.00	0.0	-	79.5	0.25	733.1	183.3	777.3	21618.0	9.0	0.0	4309.2	-	-	-	4309.2	2741.4	708.1	23651.3	9460.5
81.0	125	20.4	10.6	fine sand	0.00	0.0	-	81.0	0.25	749.0	187.3	794.2	22412.2	9.0	0.0	4309.2	-	-	-	4309.2	2741.4	721.4	24432.2	9772.9

Geotechnical Ultimate Bearing Capacity of Bored Pile

Shaft Diameter D=0.9m					
Depth	Qs	QT	W	Qult	Q_{ALL}
0.0	0.0	0.0	0.0	0.0	0.0
1.5	58.4	127.9	13.4	173.0	69.2
3.0	145.7	118.8	26.7	237.8	95.1
4.5	262.1	100.5	40.1	322.6	129.0
6.0	343.8	1,052.1	53.4	1,342.4	537.0
7.5	367.1	0.0	66.8	300.3	120.1
9.0	540.4	657.9	80.2	1,118.2	447.3
10.5	1664.3	0.0	93.5	1,570.8	628.3
12.0	1881.0	694.5	106.9	2,468.6	987.4
13.5	2112.3	612.2	120.2	2,604.3	1,041.7
15.0	2354.2	539.1	133.6	2,759.7	1,103.9
16.5	2602.5	530.0	147.0	2,985.6	1,194.2
18.0	2853.7	594.0	160.3	3,287.4	1,314.9
19.5	3104.1	648.8	173.7	3,579.2	1,431.7
21.0	3350.2	703.6	187.0	3,866.7	1,546.7
22.5	3588.7	749.3	200.4	4,137.6	1,655.0
24.0	3816.5	795.0	213.8	4,397.8	1,759.1
25.5	4030.5	849.8	227.1	4,653.3	1,861.3
27.0	4245.5	1,087.4	240.5	5,092.4	2,037.0
28.5	4473.6	1,352.4	253.8	5,572.2	2,228.9
30.0	4715.0	1,516.9	267.2	5,964.7	2,385.9
31.5	4971.9	1,361.6	280.6	6,052.9	2,421.2
33.0	5244.4	1,224.5	293.9	6,175.0	2,470.0
34.5	5532.5	1,096.6	307.3	6,321.8	2,528.7
36.0	5836.2	996.0	320.6	6,511.6	2,604.7
37.5	6155.5	1,187.9	334.0	7,009.5	2,803.8
39.0	6490.4	1,233.6	347.4	7,376.7	2,950.7
40.5	6840.8	1,270.2	360.7	7,750.3	3,100.1
42.0	7206.9	1,288.5	374.1	8,121.3	3,248.5
43.5	7588.5	1,334.1	387.4	8,535.2	3,414.1
45.0	7985.7	1,379.8	400.8	8,964.8	3,585.9
46.5	8398.5	1,389.0	414.1	9,373.3	3,749.3
48.0	8826.9	1,626.6	427.5	10,025.9	4,010.4
49.5	9270.9	2,056.0	440.9	10,886.0	4,354.4
51.0	9730.4	2,458.1	454.2	11,734.3	4,693.7
52.5	10205.5	2,741.4	467.6	12,479.4	4,991.7
54.0	10696.3	2,741.4	480.9	12,956.7	5,182.7
55.5	11203.9	2,558.6	494.3	13,268.2	5,307.3
57.0	11728.3	2,184.0	507.7	13,404.6	5,361.8
58.5	12269.6	1,855.0	521.0	13,603.6	5,441.4
60.0	12827.8	1,973.8	534.4	14,267.2	5,706.9
61.5	13402.8	2,357.6	547.7	15,212.6	6,085.1
63.0	13994.7	2,613.5	561.1	16,047.0	6,418.8
64.5	14603.4	2,741.4	574.5	16,770.3	6,708.1
66.0	15229.0	2,741.4	587.8	17,382.6	6,953.0
67.5	15871.5	2,741.4	601.2	18,011.7	7,204.7
69.0	16530.8	2,741.4	614.5	18,657.6	7,463.1
70.5	17206.9	2,741.4	627.9	19,320.4	7,728.2
72.0	17900.0	2,741.4	641.3	20,000.1	8,000.0
73.5	18609.9	2,741.4	654.6	20,696.6	8,278.7
75.0	19336.6	2,741.4	668.0	21,410.0	8,564.0
76.5	20080.2	2,741.4	681.3	22,140.3	8,856.1
78.0	20840.7	2,741.4	694.7	22,887.4	9,155.0
79.5	21618.0	2,741.4	708.1	23,651.3	9,460.5
81.0	22412.2	2,741.4	721.4	24,432.2	9,772.9