

24 5 34

	PLE	PLC	PLRE	Q
L	2.4	3.1	4.2	4.7
E	2.1	1.1	0.6	0.6
D	0.0			

$b \times D = 2.0 \times 1.75$

A	4.7	2.5	3.9
M	4-D16	2-D16	2-D16

24

	PLE	PLC	PLRE	Q
L	5.4	1.7	2.8	3.9
E	7.1	7.0	1.6	1.6
D	12.5	4.0	4.4	7.1

$b \times D = 2.0 \times 1.75$

A	6.0	2.5	2.4
M	4-D19	2-D19	2-D19

26

	PLE	PLC	PLRE	Q
L	0.9	1.6	2.5	3.4
E	11.9	4.7	2.5	2.7
D	17.0	6.3	5.0	4.2

$b \times D = 2.0 \times 1.75$

A	9.7	2.4	2.0
M	4-D27	2-D27	2-D27

(2) COLUMN

LOAD	X	P	Y	X	M	Y	X	Q	Y
L		5.2		0.2	1.2		0.1	0.7	
E	0.5	0.8		0.7	2.2		0.4	0.8	
S	0.7	6.0		1.1	3.8		0.9	2.3	
	4.7	4.4							

$w/b = 2.2/2.0$   
 $= 1.1 < 1.5$   
 $4 \times 0.8 = 3.2$   
 $4 \times 2.3 = 9.2$

$b \times D = 2.8 \times 1.75$        $\alpha_x = 2.8 \times 0.8 / 1.75 = 1.28$

	X	P/bD	Y	X	M/bD <sup>2</sup>	Y	X	P <sub>t</sub>	Y	X	Q <sub>t</sub>	Y	X	M <sub>t</sub>	Y
L		2.5		0.4	1.0		-	-							
E	2.7	2.9		0.7	2.4		0.0	0.0		2.1	2.1		2.019		3-D19
	2.2	2.1													

LOAD

	X	P	Y	X	M	Y	X	Q	Y
L		15.1		0.2	1.2		0.2	0.7	
E	2.1	2.6		2.1	3.8		1.1	1.8	
				2.1	3.1				
S	17.2	17.7		2.4	5.0		2.4	4.3	
	17.0	12.5							

$b \times D = 2.8 \times 1.75$        $\alpha_0 = 1.6$        $\alpha M = 6.019$

	X	P/bD	Y	X	M/bD <sup>2</sup>	Y	X	P <sub>t</sub>	Y	X	Q <sub>t</sub>	Y	X	M <sub>t</sub>	Y
L		7.2		0.6	0.9		-	-							
E	0.2	0.4		0.1	0.2		0.1	0.0		2.7	1.7		2.019		3-D19
	0.2	0.4													

LOAD

	X	P	Y	X	M	Y	X	Q	Y
L		26.9		0.1	0.7		0	0.2	
				0	0.4				
E	4.7	6.0		2.6	4.2		1.2	4.2	
				3.1	4.2				
D	21.6	22.9		2.1	14.2		2.2	4.6	
	22.2	20.9							

$w/b = 0.175 / 2.0$   
 $= 0.0875$   
 $\beta = 1.10$

$b \times D = 2.8 \times 1.75$

	X	P/bD	Y	X	M/bD <sup>2</sup>	Y	X	P <sub>t</sub>	Y	X	Q <sub>t</sub>	Y	X	M <sub>t</sub>	Y
L		14.1		0.2	0.5		-	-							
E	1.6	1.7		0.2	0.4		0.1	0.2		2.3	4.8		2.019		3-D19
	1.6	1.7													
S	11.6	10.9		2.2	9.9		2.1	2.3		2.3	4.8		2.019		3-D19

Case	X	P	Y	X	Π	Y	X	Q	Y
L		86		0	11	0.4	0	0.5	
E	0.1	1.7		1.1	4.3	2.6	0.5	1.8	
D	0.7	10.3		1.1	5.4		1.0	4.1	
	0.5	6.9							

$b \times D = 2.8 \times 0.75$

X	$\frac{P}{bD}$	Y	X	$\frac{\Pi}{bD^2}$	Y	X	$P_A$	Y	X	$Q_A$	Y	X	$M$	Y
L		4.1		-	0.7		-	-						
B	4.1	4.9		2.3	3.4		0.10	0.1		2.1	2.1		2-D19	2-D19
	4.0	3.3												

Case	X	P	Y	X	Π	Y	X	Q	Y
L		19.2		0	11	1.7	0	0.7	
E	0.1	5.2		2.5	6.1	7.2	1.3	4.2	
D	0.7	24.4		2.5	9.9		2.6	9.1	
	1.0	14.0							

$b \times D = 2.8 \times 0.75$

X	$\frac{P}{bD}$	Y	X	$\frac{\Pi}{bD^2}$	Y	X	$P_A$	Y	X	$Q_A$	Y	X	$M$	Y
L		9.1		-	1.1		-	-						
B	9.1	11.6		4.3	6.3		0.04	0.14		1.9	2.9		2-D19	2-D19
	8.9	6.1												

Case	X	P	Y	X	Π	Y	X	Q	Y
L		22.1		0	12	0.6	0	0.4	
E	1.2	12.9		2.8	13.0	16.5	1.3	6.2	
D	2.3	45.0		3.4	14.2	17.1	2.6	12.8	
	2.9	19.2							

$b \times D = 2.8 \times 0.75$

X	$\frac{P}{bD}$	Y	X	$\frac{\Pi}{bD^2}$	Y	X	$P_A$	Y	X	$Q_A$	Y	X	$M$	Y
L		16.8		-	0.9		-	-						
B	17.5	23.5		8.0	10.0		0.07	0.25		1.5	5.3		2-D19	2-D19
	16.2	10.0			12.0						6.9		2-D19	2-D19

	$\times P Y$	$\times M Y$	$\times Q Y$
L	5.9	$\frac{0.5}{0.5}$ $\frac{0.5}{0.5}$	0.3 0.3
B	1.3 1.4	$\frac{3.2}{1.0}$ $\frac{3.7}{1.0}$	1.1 1.1
S	$\frac{1.2}{4.6}$ $\frac{1.3}{4.5}$	3.7 3.8	2.5 2.6

$b \times D = 75 \times 75$

$A = 2 \times 10$

$0.3 \times 0.3 = 27.3$

	$\times P_{HD} Y$	$\times P_{HD^2} Y$	$\times P_A Y$	$\times Q_A Y$	$\times M Y$
L	1.7	0.3 0.3	- -		
B	$\frac{2.1}{1.3}$ 2.1	2.4 2.4	0.1 0.1	3.4 3.4	2.09 2.09

	$\times P Y$	$\times M Y$	$\times Q Y$
L	13.5	$\frac{0.4}{0.4}$ $\frac{0.4}{0.5}$	0.2 0.2
B	4.7 4.1	$\frac{5.0}{4.7}$ $\frac{5.3}{4.3}$	2.7 2.5
S	$\frac{17.6}{9.2}$ 17.6	6.1 5.7	5.6 5.2

$b \times D = 75 \times 75$

	$\times P_{HD} Y$	$\times P_{HD^2} Y$	$\times P_A Y$	$\times Q_A Y$	$\times M Y$
L	4.0	0.3 0.3	- -		
B	$\frac{4.2}{2.0}$ 4.2	3.9 3.6	0.12 0.1	4.1 3.9	2.019 2.019

	$\times P Y$	$\times M Y$	$\times Q Y$
L	25.0	$\frac{0.2}{0.1}$ $\frac{0.2}{0.1}$	0.1 0.1
B	9.7 9.3	$\frac{4.9}{22.4}$ $\frac{7.0}{22.2}$	6.4 6.3
S	$\frac{3.7}{15.7}$ 3.7	$\frac{8.1}{22.5}$ $\frac{7.0}{22.3}$	12.9 12.7

$b \times D = 75 \times 75$

	$\times P_{HD} Y$	$\times P_{HD^2} Y$	$\times P_A Y$	$\times Q_A Y$	$\times M Y$
L	7.4	0.1 0.1	- -		
B	$\frac{10.2}{4.5}$ 10.1	$\frac{5.2}{14.3}$ $\frac{5.1}{14.2}$	0.13 0.12	4.4 4.1	T 2.019 2.019
S	$\frac{1.7}{4.6}$ 1.7	$\frac{1.7}{14.2}$ $\frac{1.7}{14.2}$	0.52 0.51	17.7 17.4	B 5.022 5.022

	x P Y	x M Y	x Q Y
L	0.0	5.8 3.6	0 2.5
E	0.9 0.8	1.0 9 3.4 1.9	0.5 1.4
S	10.5 2.9	10.5 2.0	1.1 9.3 1.0 5.3

$b \times D = 2.9 \times 1.5$

	x P/b <sup>2</sup> Y	x M/b <sup>2</sup> Y	x Pa Y	x Qa Y	x M Y
L	0	3.7	-	0.11	
S	5.1 4.2	5.0 4.3	2.3 5.9	0.1 0.17	2.1 3.6 2-D19 2-D19

	x P Y	x M Y	x Q Y
L	2.1 0	0.1 3.3 6.3	0 2.4
E	2.1 2.4	2.5 6.5 2.5 5.3	1.3 3.1
S	24.5 19.1	24.6 19.0	2.6 10.6 2.6 3.6

$b \times D = 2.1 \times 1.5$

	x P/b <sup>2</sup> Y	x M/b <sup>2</sup> Y	x Pa Y	x Qa Y	x M Y
L	0.2	3.9	-	-	
S	11.6 9.1	11.7 9.0	5.5 6.8	0.04 0.12	1.7 2.5 2-D19 2-D19

	x P Y	x M Y	x Q Y
L	3.9	0.2 3.6 0.1 1.8	0 1.1
E	6.3 6.4	2.0 11.6 0.4 15.4	1.3 5.3
S	42.2 29.6	42.7 29.1	3.5 17.2 2.7 11.7

$b \times D = 2.8 \times 1.5$

	x P/b <sup>2</sup> Y	x M/b <sup>2</sup> Y	x Pa Y	x Qa Y	x M Y
L	0.4	2.5	-	-	
S	4.2 15.5	12.1 15.2	0.1 0.26	2.1 5.5	2-D19 2-D19

	x P Y		x P <sup>2</sup> Y		x Q Y	
L	0.77		0.0	0.7	0	0.3
P	0	0.3	1.1	0.9	0.5	1.6
S	0.77	0.2	1.1	0.4	1.0	3.6

$b \times D = 2.8 \times 7.5$

	x P/bD Y	x P <sup>2</sup> /bD <sup>2</sup> Y	x P <sup>3</sup> Y	x Q <sup>2</sup> Y	x M Y
L	0.7	0	0.4	-	-
P	0.7	0.6	2.7	0.1	0.1
S	0.7	0.5	2.7	0.1	0.1

	x P Y		x P <sup>2</sup> Y		x Q Y	
L	2.15		0.1	0.7	0	0.2
P	0	1.2	2.5	2.8	1.3	3.7
S	2.15	2.7	2.6	0.1	2.6	0.6

$b \times D = 2.8 \times 7.5$

	x P/bD Y	x P <sup>2</sup> /bD <sup>2</sup> Y	x P <sup>3</sup> Y	x Q <sup>2</sup> Y	x M Y
L	10.2		0	0.7	-
P	10.2	10.4	4.7	4.2	0.06
S	10.2	0.6	4.7	4.2	0.07

	x P Y		x P <sup>2</sup> Y		x Q Y	
L	3.4		0.1	0.2	0	0.1
P	0.2	2.4	2.8	11.2	1.3	15.8
S	3.4	36.0	3.4	16.4	2.6	11.7

$b \times D = 2.8 \times 7.5$

	x P/bD Y	x P <sup>2</sup> /bD <sup>2</sup> Y	x P <sup>3</sup> Y	x Q <sup>2</sup> Y	x M Y
L	13.0		0.2	0.1	-
P	13.1	19.3	13.0	11.5	0.05
S	13.1	16.7	13.0	11.5	0.22

~~2.2.2~~ x P y x R y x Q y

L		11.7	0	2.1	0	1.0
E	a	1.2	1.1 0.9	5.4 3.4	0.5	2.4
D	11.7	12.5 10.1	1.1	7.5	1.0	5.3

$b < D = 2.4 < 7.5$

x P/D y x  $\frac{P}{bD^2}$  y x P+ y x a+ y x M y

L		5.4	0	1.3	-	-
B	5.14	6.0 4.8	2.3	4.5	0.1	0.12
					2.1	2.5
					2-D19	2-D19

~~2.2.3~~ x P y x R y x Q y

L		23.9	0	2.2	0	1.4
E	a	4.0	2.5 2.4	11.2 9.5	1.3	5.4
D	23.9	20.9 19.9	2.5	13.4	2.6	12.2

$b \times D = 2.4 < 7.5$

x P/D y x  $\frac{P}{bD^2}$  y x P+ y x a+ y x M y

L		11.4	0	2.0	-	-
S	11.4	13.3 9.5	5.3	2.6	0.04	0.2
					0.9	4.2
					2-D19	2-D19

~~2.2.4~~ x P y x R y x Q y

L		38.0	0	2.1	0	0.7
E	a	8.6	2.0 2.1	15.3 16.5	1.4	7.1
D	38.0	46.6 24.4	2.0	17.2 19.6	2.4	14.4

$b \times D = 2.4 < 7.5$

x P/D y x  $\frac{P}{bD^2}$  y x P+ y x a+ y x M y

L		19.9	0	1.5	-	-
S	19.9	24.4 15.4	0.1	12.2 13.1	0.05	0.25
					0.35	5.7
					1.1	7.4
						2-D19
						2-D19

	x P y	x π y	x Q y
L	9.1	2.6 2.0	1.2 0
E	11.3 1.0	4.2 2.3	1.1 0.4
S	12.4 10.1 9.0 8.1	6.8 1.1	4.6 1.0

$b \times D = 2.3 \times 17.5$

	x P/bD y	x π/bD² y	x Pπ y	x Qπ y	x π y
L	4.3	1.7 0	- -		
S	11.0 4.6 3.7 3.8	4.3 2.3	0.12 0.1	2.5 2.1	Z-D19 Z-D19

	x P y	x π y	x Q y
L	20.2	2.0 2.0	1.2 0
E	4.6 2.6	2.2 2.3	4.2 1.2
S	25.0 22.8 15.4 17.6	10.8 2.3	9.6 2.4

$b \times D = 2.3 \times 17.5$

	x P/bD y	x π/bD² y	x Pπ y	x Qπ y	x π y
L	9.6	1.7 0	- -		
S	11.9 10.9 7.7 8.4	6.9 4.9	0.16 0.1	3.4 1.5	Z-D19 Z-D19

	x P y	x π y	x Q y
L	27.6	1.2 1.0	0 0
E	10.7 6.0	12.0 2.3 16.5 3.4	6.0 1.3
S	44.7 29.6 22.9 27.6	13.9 3.4 17.5 3.4	12.6 2.6

$b \times D = 2.3 \times 17.5$

	x P/bD y	x π/bD² y	x Pπ y	x Qπ y	x π y
L	17.6	1.3 0	- -		
S	22.2 20.6 11.9 14.4	9.7 9.0 12.3 9.0	0.21 0.1 0.32 0.1	4.4 2.1	Z-D19 Z-D19



	x P y	x π y	x Q y
L	11.5	0.7 0.6	0 0
E	0.6 0.7	5.3 2.5	1.1 0.4
D	12.3 12.2 10.7 10.4	6.0	1.1

b x D = 2.0 x 7.5

	x P/bD y	x π/bD² y	x Pπ y	x Qπ y	x M y
L	4.5	0.5	0	-	-
E	4.4 4.6 4.1 5.1	3.6 2.3	0.1 0.1	2.1 2.1	2-D19 2-D19

	x P y	x π y	x Q y
L	27.3	1.1 1.2	0 0
E	5.7 2.3	12.0 9.0	2.3 2.3
D	20.0 29.6 24.6 25.0	13.1	2.3

b x D = 2.0 x 7.5

	x P/bD y	x π/bD² y	x Pπ y	x Qπ y	x M y
L	13.0	0.4	0	-	-
E	14.3 14.1 11.7 11.9	8.4 4.9	0.15 -	2.2	2-D19 2-D19

	x P y	x π y	x Q y
L	45.2	0.9 0.6	0 0
E	6.1 5.3	15.3 18.6	2.4 2.4
D	21.3 50.5 29.1 29.9	14.0 19.0	3.4

b x D = 2.0 x 7.5

	x P/bD y	x π/bD² y	x Pπ y	x Qπ y	x M y
L	23.0	0.6	0	-	-
E	22.9 26.4 20.5 20.9	11.2 8.0	0.14 0.31	4.0 -	T 2-D19 B 3-D19 2-D19

Cell	x	P	Y	x	M	Y	x	Q	Y
L		5.3		0.5	0		0.3	0	
E	1.2	0		2.7	1.1	0.9	1.0	0.5	
S	6.5	5.3		3.2	1.1		2.3	1.0	

$b \times D = 2.3 \times 1.5$

	x	P/bD	Y	x	$\pi/bD^2$	Y	x	PA	Y	x	QA	Y	x	M	Y
L		2.5		0.3	0		-	-							
S	1.1	2.5		2.0	2.3		0.1	0.1		2.1	2.1		2-D19	2-D19	

Cell	x	P	Y	x	M	Y	x	Q	Y
L		13.2		0.4	0		0.2	0	
E	4.2	0.1		5.5	2.3		2.5	1.2	
S	11.4	13.3		5.9	2.3		5.2	2.4	

$b \times D = 2.3 \times 1.5$

	x	P/bD	Y	x	$\pi/bD^2$	Y	x	PA	Y	x	QA	Y	x	M	Y
L	4.3	6.3		0.3	0		-	-							
S	4.7	6.3		3.8	4.4		0.0	0.1		1.7	2.1		2-D19	2-D19	

Cell	x	P	Y	x	M	Y	x	Q	Y
L		29.4		0.2	0		0.1	0	
E	4.3	0.3		7.4	2.8		4.7	1.3	
S	22.7	24.7		7.6	3.4		4.5	2.6	

$b \times D = 2.3 \times 1.5$

	x	P/bD	Y	x	$\pi/bD^2$	Y	x	PA	Y	x	QA	Y	x	M	Y
L		12.6		0.1	0		-	-							
S	12.6	12.4		5.3	3.0		0.3	0.12		6.5	2.5		2-D19	2-D19	

	X	P	Y	X	M	Y	X	Q	Y
L		10.2		0	0	0.1	0	0	
E	0		0.1	1.1	0.9	4.2	0.5	1.7	
S	10.2	10.2	10.1	1.1	4.2		1.0	3.4	

$b \times D = 2.8 \times 7.5$

	X	P/100	Y	X	M/100	Y	X	PA	Y	X	DA	Y	X	M	Y
L		4.9		0		0.1		-		-					
E	4.9	4.9	4.9	2.3	2.3		0.1	0.1		0.1	2-D19		2-D19		

	X	P	Y	X	M	Y	X	Q	Y
L		24.7		0	0	0.1	0	0.1	
E	0		0.5	2.5	2.5	0.9	1.3	4.0	
S	24.7	24.7	24.2	2.5	0.5		2.6	0.1	

$b \times D = 2.8 \times 7.5$

	X	P/100	Y	X	M/100	Y	X	PA	Y	X	DA	Y	X	M	Y
L		11.9		0		0.1		-		-					
E	11.9	11.9	12.0	5.7	5.7		0.5	0.5		0.6	1.1	2-D19	2-D19		

	X	P	Y	X	M	Y	X	Q	Y
L		29.3		0	0	0	0	0	
E	0		1.1	2.8	2.8	12.0	1.3	6.0	
S	29.3	29.3	40.4	2.8	1.1	16.6	2.6	12.0	

$b \times D = 2.8 \times 7.5$

	X	P/100	Y	X	M/100	Y	X	PA	Y	X	DA	Y	X	M	Y
L		20.6		0		0.1		-		-					
E	20.6	20.6	21.2	8.0	8.0	11.6		0.04		0.8	2-D19	2-D19	2-D19		
S	20.6	20.6	20.0	8.0	1.6			0.74		7.4	2-D19	2-D19	2-D19		

	$x$	$P$	$Y$	$x$	$P$	$Y$	$x$	$P$	$Y$
L	9.3			0	5.3		0	2.5	
E	0	0.1		11	2.2	1.9	0.5	1.4	
D	9.3	12.0	2.7	11	2.2	1.0	4.4		

$b \times D = 2.7 \times 17.5$

	$x$	$P$	$Y$	$x$	$P$	$Y$	$x$	$P$	$Y$	$x$	$P$	$Y$	$x$	$P$	$Y$
L	4.4			0	2.4		-	0.10							
D	4.4	4.8	4.1	2.7	4.6	0.1	0.15	2.1	3.2	2-D19	2-D19				

	$x$	$P$	$Y$	$x$	$P$	$Y$	$x$	$P$	$Y$
L	7.0			0	4.7		0	2.7	
E	0	2.4		2.5	0.5	5.7	1.3	3.1	
D	7.0	7.0	7.0	2.5	1.2		2.6	2.9	

$b \times D = 2.7 \times 17.5$

	$x$	$P$	$Y$	$x$	$P$	$Y$	$x$	$P$	$Y$	$x$	$P$	$Y$	$x$	$P$	$Y$
L	14.5			0	2.5		-	-							
D	14.5	15.6	17.3	0.4	7.1		0.08	1.7	2-D19	2-D19					

	$x$	$P$	$Y$	$x$	$P$	$Y$	$x$	$P$	$Y$
L	5.2			0	2.6		0	1.1	
E	0	5.5		3.0	1.6	17.4	1.4	5.5	
D	5.2	5.4	4.7	3.7	17.2		2.8	11.7	

$b \times D = 2.7 \times 17.5$

	$x$	$P$	$Y$	$x$	$P$	$Y$	$x$	$P$	$Y$	$x$	$P$	$Y$	$x$	$P$	$Y$
L	27.1			0	2.4		-	-							
D	27.1	30.6	29.8	0.7	10.6		0.11	4.4	2-D19	2-D19					

$\begin{matrix} \text{P} \\ \text{Y} \end{matrix} \times \begin{matrix} \text{P} \\ \text{Y} \end{matrix} \quad \times \begin{matrix} \text{P} \\ \text{Y} \end{matrix} \quad \times \begin{matrix} \text{P} \\ \text{Y} \end{matrix}$

L	2.4		1.1	0	0.5	0
B	0.9	0	2.3	1.1	1.2	0.5
S	4.7	3.2	2.4	1.1	2.4	1.0
	2.5					

$b \times d = 2.4 \times 1.1$

$\times \begin{matrix} \text{P} \\ \text{Y} \end{matrix} \quad \times \begin{matrix} \text{P} \\ \text{Y} \end{matrix} \quad \times \begin{matrix} \text{P} \\ \text{Y} \end{matrix} \quad \times \begin{matrix} \text{P} \\ \text{Y} \end{matrix} \quad \times \begin{matrix} \text{P} \\ \text{Y} \end{matrix}$

L	1.6		0.7	0	-	-
B	2.0	1.6	2.5	2.3	0.1	0.1
S	11.2	1.6	2.1	2.1	2-D19	2-D19

$\begin{matrix} \text{P} \\ \text{Y} \end{matrix} \times \begin{matrix} \text{P} \\ \text{Y} \end{matrix} \quad \times \begin{matrix} \text{P} \\ \text{Y} \end{matrix} \quad \times \begin{matrix} \text{P} \\ \text{Y} \end{matrix}$

L	8.7		0.2	0	0.1	0
B	2.5	0	7.4	2.3	2.0	1.2
S	12.2	0.7	7.6	2.3	4.1	2.4
	9.2					

$b \times d = 2.4 \times 1.1$

$\times \begin{matrix} \text{P} \\ \text{Y} \end{matrix} \quad \times \begin{matrix} \text{P} \\ \text{Y} \end{matrix} \quad \times \begin{matrix} \text{P} \\ \text{Y} \end{matrix} \quad \times \begin{matrix} \text{P} \\ \text{Y} \end{matrix} \quad \times \begin{matrix} \text{P} \\ \text{Y} \end{matrix}$

L	4.1		0.1	0	-	-
B	4.6	4.1	4.4	4.4	0.6	0.3
S	21.4	4.1	2.4	2.7	2-D19	2-D19

$\begin{matrix} \text{P} \\ \text{Y} \end{matrix} \times \begin{matrix} \text{P} \\ \text{Y} \end{matrix} \quad \times \begin{matrix} \text{P} \\ \text{Y} \end{matrix} \quad \times \begin{matrix} \text{P} \\ \text{Y} \end{matrix}$

L	14.3		0.1	0	0.1	0
B	2.5	0	9.7	2.4	2.0	1.3
S	17.0	14.3	9.3	3.4	4.1	2.6
	10.4					

$b \times d = 2.4 \times 1.1$

$\times \begin{matrix} \text{P} \\ \text{Y} \end{matrix} \quad \times \begin{matrix} \text{P} \\ \text{Y} \end{matrix} \quad \times \begin{matrix} \text{P} \\ \text{Y} \end{matrix} \quad \times \begin{matrix} \text{P} \\ \text{Y} \end{matrix} \quad \times \begin{matrix} \text{P} \\ \text{Y} \end{matrix}$

L	7.5		0.1	0	-	-
B	9.3	7.4	6.9	8.0	0.20	0.21
S	4.6	7.4	4.2	4.4	2-D19	2-D19

	$x P y$	$x M y$	$x Q y$
L	17.4	1.1 0 0.5 0	0.4 0
B	0.1 0.0 0.7 0.0	5.0 1.1 2.1 2.9	2.1 0.5
D	0.1 0.0 0.7 0.0	6.1 1.1	4.6 1.0

$b \times D = 2.8 \times 17.5$

	$x P_{bD} y$	$x M_{bD} y$	$x P^* y$	$x Q^* y$	$x M y$
L	2.5	0.7 0	-	-	
B	0.1 0.0 0.2 0.0	3.9 2.3	0.12 0.1	2.5 2.1	2-D19 2-D19

	$x P y$	$x M y$	$x Q y$
L	16.8	0.2 0 0.1 0	0.1 0
B	0.1 2.1	10.5 2.3 7.0 2.3	4.6 1.2
D	0.1 1.0 0.7 1.0	10.7 2.3	9.0 2.4

$b \times D = 2.8 \times 17.5$

	$x P_{bD} y$	$x M_{bD} y$	$x P^* y$	$x Q^* y$	$x M y$
L	0.0	0.1 0	-	-	
B	0.1 0.0 0.6 0.0	6.0 4.4	0.17 0.08	3.6 1.7	2-D19 2-D19

	$x P y$	$x M y$	$x Q y$
L	27.1	0.1 0 0 0	0 0
B	0.1 0.0	11.3 2.0 16.2 2.4	5.0 1.3
D	0.1 0.0 0.7 0.0	11.4 2.4 16.2 2.4	11.6 2.6

$b \times D = 2.8 \times 17.5$

	$x P_{bD} y$	$x M_{bD} y$	$x P^* y$	$x Q^* y$	$x M y$
L	14.2	0.1 0	-	-	
B	0.1 0.0 0.6 0.0	8.0 0.0 11.4 0.0	0.22 0.13 0.36 0.13	4.6 2.7	T 2-D19 B 3-D19 2-D19

~~CPA~~ x P Y      x  $\pi$  Y      x Q Y

L	9.4		0.1	0	0	0
E	12	0	0.4	0.4	0.2	0.2
S	10.6	4.4	0.5	0.4	0.4	0.4

$b \times D = 2B \times 2B$        $0.4 \times 0.4 = 0.16$

x P/BD Y      x  $\pi/bD^2$  Y      x P<sub>A</sub> Y      x Q<sub>A</sub> Y      x  $\mu$  Y

L	12.1		0.6	0	-	-
E	12.6	12.1	2.1	2.8	-	-
S	10.4					

2-B19 2-B19

~~CPA~~ x P Y      x  $\pi$  Y      x Q Y

L	19.4		0	0	0	0
E	42	0.3	1.0	1.0	0.5	0.5
S	24.6	19.1	1.0	1.0	1.0	1.0

$b \times D = 2B \times 2B$

x P/BD Y      x  $\pi/bD^2$  Y      x P<sub>A</sub> Y      x Q<sub>A</sub> Y      x  $\mu$  Y

L	24.9		0	0	-	-
E	24.6	24.3	6.2	6.2	-	-
S	16.9	24.5				

2-B19 2-B19

~~CPA~~ x P Y      x  $\pi$  Y      x Q Y

L	29.8		0	0	0	0
E	11.2	0.4	1.1	1.3	0.5	0.5
S	17.0	20.6	1.3	1.3	1.0	1.0

$b \times D = 2B \times 2B$

x P/BD Y      x  $\pi/bD^2$  Y      x P<sub>A</sub> Y      x Q<sub>A</sub> Y      x  $\mu$  Y

L	42.1		0	0	-	-
E	42.2	42.2	8.1	8.1	0.07	-
S	12.6	40.9			0.6	-

2-B19 2-B19

CPB x P Y x M Y x Q Y

L	0.9	1.6 0.2	0 0	0.5 0
E	0.5 0.6	4.0 2.6	1.1 2.9	1.4 0.5
S	9.4 9.5 8.4 0.3	6.3	1.1	4.3 1.0

$b \times D = 2.9 \times 17.5$

x P/100 Y x P/100<sup>2</sup> Y x P<sub>A</sub> Y x Q<sub>A</sub> Y x M Y

L	4.2	1.0	0	-	-	-	-
E	4.5 4.5 4.0 3.9	4.0	3.3	0.10 0.1	2.1 2.1	2.019 2.019	

CPB x P Y x M Y x Q Y

L	14.6	0.1 0.6	0 0	0.2 0
E	1.9 2.1	9.1 3.4	3.3 2.2	3.4 1.2
S	16.4 16.7 12.0 12.5	4.2	2.3	7.0 2.4

$b \times D = 2.0 \times 7.5$

x P/100 Y x P/100<sup>2</sup> Y x P<sub>A</sub> Y x Q<sub>A</sub> Y x M Y

L	7.0	0.4	0	-	-	-	-
E	7.4 8.0 4.0 5.4	1.4	4.9	0.14 0.10	3.0 2.1	2.019 2.019	

CPB x P Y x M Y x Q Y

L	21.7	0.5 0.3	0 0	0.2 0
E	4.6 4.6	6.4 15.0	2.8 3.4	4.5 1.3
S	27.7 26.5 16.1 16.9	8.9 15.3	3.4	9.2 2.6

$b \times D = 2.0 \times 17.5$

x P/100 Y x P/100<sup>2</sup> Y x P<sub>A</sub> Y x Q<sub>A</sub> Y x M Y

L	11.4	0.4	0	-	-	-	-
E	14.7 13.9 6.4 8.9	4.4 10.7	0	0.55 0.30	1.1 1.6	1.1 1.6	1.1 1.6



	$x$	$P$	$Y$	$x$	$P$	$Y$	$x$	$P$	$Y$
L		6.0		0	0		0	0	
B	0.5	0		0.4	0.4		0.2	0.2	
S	7.3	6.7		0.4	0.4		0.4	0.4	

$b \times b = z \times z$

	$x$	$P$	$Y$	$x$	$P$	$Y$	$x$	$P$	$Y$	$x$	$P$	$Y$
L		8.7		0	0		-	-		-	-	
S	9.4	8.7		0.7	0.7		-	-		z-b19	z-b19	

	$x$	$P$	$Y$	$x$	$P$	$Y$	$x$	$P$	$Y$
L		17.9		0	0		0.1	0	
B	1.5	0		1.0	1.0		0.5	0.5	
S	19.4	17.9		1.2	1.0		1.1	1.0	

$b \times D = z \times z$

	$x$	$P$	$Y$	$x$	$P$	$Y$	$x$	$P$	$Y$	$x$	$P$	$Y$
L		27.0		1.1	0		-	-		-	-	
S	29.4	27.0		6.3	4.1		-	-		z-b19	z-b19	

	$x$	$P$	$Y$	$x$	$P$	$Y$	$x$	$P$	$Y$
L		29.4		0	0		0	0	
B	1.3	0		1.3	1.3		0.5	0.5	
S	30.7	29.4		1.3	1.3		1.0	1.0	

$b \times D = z \times z$

	$x$	$P$	$Y$	$x$	$P$	$Y$	$x$	$P$	$Y$	$x$	$P$	$Y$
L		41.5		0	0		-	-		-	-	
S	44.1	41.5		8.1	8.1		-	-		z-b19	z-b19	

Case	x	P	y	x	P	y	x	P	y
L		0.0		0.1	0		0.1	0	
B	0.1	0		0.1	0.9		0.1	0.5	
S	0.1	0.5		0.2	1.1		0.1	1.0	

$b \times D = 40 \Phi$

$0.5 \times 0.1 = 0.05$   
 $x = \frac{40 \times 0.05}{0.1} = 100$

x	P/b <sup>2</sup>	y	x	P/b <sup>2</sup>	y	x	P	y	x	P	y	n
L		0.5		0	0		-	-				
B	0.1	0.5	0	1.4		0.2	-	0.4				12-D13

Case	x	P	y	x	P	y	x	P	y
L		17.8		0.1	0		0.1	0	
B	0.1	0		0.1	0.3		0.1	1.2	
S	0.1	0.5	17.8	0.2	0.3		0.2	2.4	

$b \times D = 40 \Phi$

x	P/b <sup>2</sup>	y	x	P/b <sup>2</sup>	y	x	P	y	x	P	y	n
L		11.1		0.2	0		-	-				
B	0.1	0.5	11.1	0.3	0.3	0.1	-	0.4				12-D13

Case	x	P	y	x	P	y	x	P	y
L		27.5		0.1	0		0	0	
B	0.1	0		0.2	0.4		0.1	1.2	
S	0.1	0.5	27.5	0.2	0.2		0.2	2.4	

$b \times D = 40 \Phi$

x	P/b <sup>2</sup>	y	x	P/b <sup>2</sup>	y	x	P	y	x	P	y	n
L		17.2		0.0	0		-	-				
B	0.1	0.5	17.2	0.3	0.4	0.1	0.1	1.9	1.3			12-D13

LINE	x P Y	x M Y	x Q Y
L	9.4	0.2 0.2	0 0
E	0.9 0	0.4 0.3	0.4 0.3
S	10.3 9.4 8.5	0.6 0.4	0.6 0.4

$b \times D = 28 \times 28$

	x P/100 Y	x M/100 <sup>2</sup> Y	x P+ Y	x A+ Y	x M Y
L	100	1.1 0	-	-	
S	10.2 12.0 10.9	3.4 2.3	-	-	2-D19 2-D19

LINE	x P Y	x M Y	x Q Y
L	20.7	0.4 0.4	0 0
E	2.7 0.3	1.0 1.0	1.0 1.0
S	2.0 21.0 11.4 20.4	1.4 1.0	1.2 1.0

$b \times D = 28 \times 28$

	x P/100 Y	x M/100 <sup>2</sup> Y	x P+ Y	x A+ Y	x M Y
L	26.4	2.3 0	-	-	
S	10.4 27.0 22.3 26.1	2.4 5.7	-	-	2-D19 2-D19

LINE	x P Y	x M Y	x Q Y
L	22.4	0.2 0.1	0 0
E	1.0 0.6	1.3 1.6	1.1 1.3
S	41.4 23.0 22.4 31.8	1.7 1.3	1.3 1.0

$b \times D = 28 \times 28$

	x P/100 Y	x M/100 <sup>2</sup> Y	x P+ Y	x A+ Y	x M Y
L	44.7	1.3 0	-	-	
S	14.6 46.4 22.0 44.9	10.6 3.1	0.4	-	2-D19 2-D19



(2) SLAB

$w_r = 0.56$

$w_n = 0.66$

$l_x = 2.8 \text{ m} \quad \gamma = 1.0$

$m_{x1} = 0.044 \times W \times 2.8^2 = 0.341W \quad 0.19 \quad 0.22$

$m_{x2} = 0.028 \times \dots = 0.22W \quad 0.12 \quad 0.15$

$D = 10 \quad d = 17 \quad j = 6.1$

$a_{x1} = 1.8 \quad D10 \quad 20 \text{ @}$

$a_{x2} = 1.2 \quad D10 \quad 30 \text{ @}$

$l_y = 1.8 \text{ m} \quad w = 0.66 + 2.40 = 3.06 \text{ m}^2/\text{m}$

$m_0 = 0.90 \times 1.8^2 / 1.8 = 0.76$

$D = 26 \quad d = 21 \quad j = 14.3$

$a = 76 / 14.3 \times 1.8 = 0.94 \quad D13 \quad 30 \text{ @}$

$l = 3.49 \quad w' = 0.90 \times 1.8 / 2 + 0.51 = 1.32$

$m_0 = 1.32 \times 3.49^2 / 1.8 = 11.9$

$a = 11.9 \times 3.49 / 2 = 5.6$

$b \times D = 2.8 \times 17.5 \quad j = 6.2$

$T_3 = 5600 / 2.8 \times 17.5 = 37.3 \leq 6.0$

$a_3 = 5600 / 2.8 \times 12 = 17.6$

$a = 11.9 / 0.90 \times 1.8 = 7.5 \quad \leftarrow D19$

(A) FOOTING

$f_p \text{ FDF} = 35^T$

$w = 1.2 \times 1.2 \times 0.75 \times 2.4 = 26T \quad \left. \vphantom{w} \right\} 35 - 26 = 9^T$

	P	WALL	TIE BARS	IP	Ø x n	l x l'
53	26.9	0.4A x 1.2B 2.16 x 1.91	0.03 4.13	2.42	34.5	40Ø x 2 120 x 240
54	22.1	0.4A x 2.5B	1.25	2.6A	37.2	"
55	25.0	0.4A x 2.5B	1.25	2.15	28.4	"
56	25.4	0.4A x 2.5B	1.25	5.3A	42.5	"
57	24.4	0.4A x 1.2B 2.16 x 1.91 1.04 x 1.2A	2.63 4.13 2.35	4.96	45.6	40Ø x 3 120 x 360
58	22.0			7.11	45.1	"
59	22.6	0.4A x 2.5B	1.25	4.30	39.2	40Ø x 2 120 x 240
60	44.2	1.04 x 2.5B	4.6A	7.53	57.4	40Ø x 4 240 x 240
61	24.4	0.4A x 2.5B	1.25	2.23	28.4	40Ø x 2 120 x 240
62	29.3	0.4A x 1.2B 1.04 x 1.2B	2.63 2.35	4.30	46.6	40Ø x 3 120 x 360
63	52.9	1.04 x 2.5B	4.6A	5.3B	63.0	40Ø x 4 240 x 240
64	14.3			4.20	18.6	40Ø x 1 120 x 120
65	27.1	0.4A x 2.5B	1.25	5.44	33.8	40Ø x 2 120 x 240
66	29.8	1.04 x 2.5B	4.6A	5.3B	39.9	"
67	21.7	0.4A x 2.5B	1.25	6.63	29.8	"
68	29.4	2.16 x 2.5B 1.04 x 1.2A	5.61 2.35	5.44	42.7	"
69	27.5			6.82	34.3	"
70	22.4	1.04 x 2.2B	4.16	5.3A	41.9	"

$$F_1 \quad 40 \text{ lb} \times 1 \quad 120 \times 20 \quad D = 75 \quad d' = 29.5$$

$$u = 15 - 0.16$$

$$F_2 \quad 40 \text{ lb} \times 2 \quad 120 \times 24.0$$

$$\Gamma_p = 42.0 / 2 = 21.0^T = \text{Q}$$

$$T_b = 21.4 \times 10^3 / 120 \times 59.5 = 3.0 < 5$$

$$B = 21.4 \times 10^3 / 59.5 \times 15 = 24.0$$

$$A = 21.4 \times 60 / 59.5 \times 2.0 = 10.3 \quad \left. \vphantom{A} \right\} \text{6-016}$$

$$F_3 \quad 40 \text{ lb} \times 3 \quad 120 \times 36.0$$

$$\sigma_p = 46.6 / 3 = 15.5$$

$$S = 15.5 \times 10^3 / 59.5 \times 15 = 17.4$$

$$A = 15.5 \times 120 / 59.5 \times 2.0 = 15.6 \quad \left. \vphantom{A} \right\} \text{6-019}$$

$$F_4 \quad 40 \text{ lb} \times 4 \quad 240 \times 24.0$$

$$\sigma_p = 67.0 / 4 = 15.0$$

$$T_b = 15.0 \times 2 \times 10^3 / 150 \times 59.5 = 3.5$$

$$B = \quad \quad \quad / 59.5 \times 15 = 35.4$$

$$A = 15.0 \times 2 \times 60 / 59.5 \times 2.0 = 15.4 \quad \left. \vphantom{A} \right\} \text{6-019}$$

(B) THE BEAM

$b \times d = 25 \times 90$

$w = 0.76$

FIG 12

$\phi = 72.6$

$M_{OE} = 22.4 + 0.1 = 22.5$

$M_{IE} = 1.9 - 0 = 1.9$

$w' = 0.76 + 0.49 = 1.25 \text{ T/m}$

$C = 1.25 \times 2.0^3 / 12 = 0.833$

$M_0 = \quad \quad \quad / \phi = 1.25$

$M_{IE} = 1.25 C = 1.0$

$\Sigma M_{IE} = 1.9 + 1.0 = 2.9$

$a_{OE} = 22.5 / 0.76 \times 2.0 = 14.7 \quad 4 \rightarrow 19$

$a_{IE} = 2.9 / \quad \quad \quad = 1.7 \quad 2 \rightarrow 19$

FIG 13

$M_{OE} = 3.1 - 0 = 3.1$

$\Sigma M_{IE} = 1.7 + 0 + 1.0 = 2.7$

$a = 3.1 / 0.76 \times 2.0 = 2.0 \quad 2 \rightarrow 19$

FIG 14

$M_{OE} = 16.5 + 1.0 = 17.5$

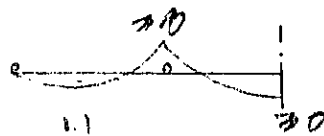
$M_{IE} = 11.1 + 0.2 = 11.3$

$w' = 0.76 \quad l = 566 \quad l = 989$

$C = 0.76 \times 5.66^3 / 12 = 2.0 \quad 0.76 \times 9.89^3 / 12 = 4.6$

$M_0 = \quad \quad \quad / \phi = 2.0 \quad \quad \quad / \phi = 6.6$

$$\begin{array}{r} 0.76 \quad 0.67 \\ 0.76 \quad 0.47 \\ + 2.0 \quad - 4.6 \\ + 0.8 \quad + 0.8 \end{array}$$



$\Sigma M_{IE} = 11.3 + 3.8 = 15.1$



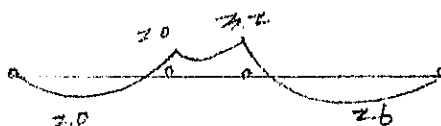
$$\begin{aligned}
 a_{OE} &= 17.5 / 0.726 \times 3.0 = 7.2 & 4-D19 \\
 a_{IE} &= 15.1 / \dots = 6.9 & 4-D19 \\
 a_{CE} &= 3.0 / 2.76 \times 3.0 = 3.1 & 2-D19
 \end{aligned}$$

FGFW

$$\begin{aligned}
 R_{OE} &= 9.7 + 0.1 = 9.8 \\
 R_{IE} &= 12.2 + 0 = 12.2
 \end{aligned}$$

$$\begin{aligned}
 w' &= 0.76 & l &= 1.96 & d &= 56.3 \\
 C &= 0.76 \times 1.46^2 / 12 = 0.2 & 0.76 \times 6.67^2 / 12 &= 2.8 \\
 R_{CO} &= \dots / 1.6 = 0.3 & \dots & / 1.6 &= 4.2
 \end{aligned}$$

1.0	0.406	0.165	0
0.70	0.80	0.47	0.17
+3.0	-0.2	+0.2	-4.2
-4.6	-2.2	+3.3	+0.7
	+1.6	-1.1	
-0.3	-1.3	+0.4	+2.2
	+0.4	-0.6	
-0.1	-0.3	+0.5	+0.1



$$R_{IE} = 12.2 + 0.2 = 12.4$$

$$\begin{aligned}
 a_{OE} &= 9.8 / 0.726 \times 3.0 = 4.5 & 2-D19 \\
 a_{IE} &= 15.4 / \dots = 7.1 & 4-D19
 \end{aligned}$$

FGFN

$$\begin{aligned}
 R_{OE} &= \dots \\
 R_{IE} &= \dots
 \end{aligned}$$

FGZOE

$$\begin{aligned}
 R_{IE} &= 15.4 + 1.8 = 17.2 \\
 R_{CO} &= 0.76 \times 8.49^2 / 12 = 6.8 \\
 a_{IE} &= 17.2 / 1.726 \times 3.0 = 7.9 & 4-D19 \\
 a_{CE} &= 6.8 / 0.726 \times 3.0 = 4.7 & 3-D19
 \end{aligned}$$

FFFFAE

$$r_{DE} = 16.5 + 0.2 = 16.7$$

$$r_{IE} = 13.1 + 0.2 = 13.3$$

$$W = 0.76 \quad l = 3.57$$

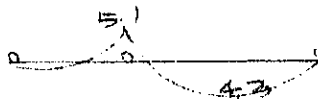
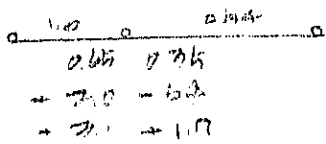
$$l = 3.69$$

$$C = 0.76 \times 1.57^2 / 12 = 1.3$$

$$0.76 \times 3.40^2 / 12 = 4.6$$

$$M_0 = 2.0$$

$$M_1 = 6.8$$



$$M_{IE} = 13.3 - 6.1 = 17.9$$

$$r_C = 4.4 + 4.3 = 8.7$$

$$a_{DE} = 16.7 / 0.726 \times 3.0 = 7.7$$

4-D19

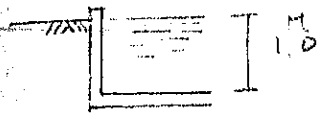
$$a_{IE} = 17.9 / \dots = 8.2$$

4-D19

$$a_C = 8.7 / \dots = 4.0$$

3-D19

67 FOND



$$W = 1.0 \text{ T/m}^2$$

$$M = 1.0 \times 1.0 / 2 \times 1.0 / 2 = 0.125 \text{ T-m}$$

$$D = 15 \quad \alpha = 10 \quad \beta = 8.5$$

$$a = 17 / 8.5 \times 1.0 = 1.0 \quad D10 \ 20 \text{ @}$$

SLAB  $l_x = 2.83 \quad l_y = 5.66 \quad \lambda = 3.0 \quad w = 1.00 \times 0.42 = 0.42$

$$M_{x1} = 0.057 \times 1.42 \times 2.83^2 = 0.89$$

$$M_{x2} = 0.052 \times \quad \quad \quad = 0.59$$

$$M_{y1} = 0.042 \times \quad \quad \quad = 0.48$$

$$M_{y2} = 0.038 \times \quad \quad \quad = 0.32$$

$$D = 15 \quad \alpha = 10$$

$$a_{x1} = 5.1 \quad D10 \ 10 \text{ @}$$

$$a_{x2} = 3.4 \quad D10 \ 20 \text{ @}$$

$$a_{y1} = 2.8 \quad D10 \ 20 \text{ @}$$

$$a_{y2} = 1.9$$

67) PORCH ROOF

STEEL FOLDED PLATE BEAM  $\left. \begin{matrix} 15 \\ 25 \end{matrix} \right\} 150 \text{ kg/m}^2$

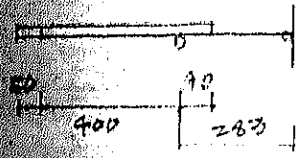
WIND  $H = 400$

$S = 60\sqrt{400} = 120 \text{ kg/m}^2$

$C = 2.0$

$W = -120 \times 2.0 = -240 \text{ kg/m}^2$

$S(W + G) = -240 + 150 = -90$



B1  $l = 283$

$W = 90 \times 2.90 = 261 \text{ kg/m}$

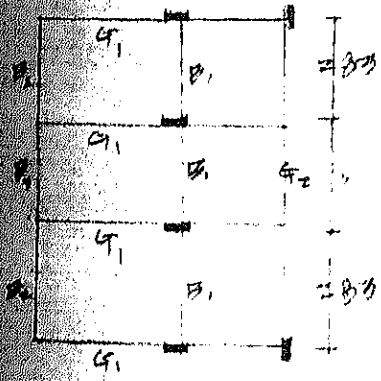
$\sigma_0 = 0.55 \times 283^2 / 4 = 0.55 \text{ T-m}$

$Q = 0.65 \times 283 / 2 = 0.78 \text{ T}$

$I = 380 \times 100 \times 10.5 \times 16$

$f_b = 900 / 283 \times 283 / 16 \times 10 = 1.34$

$\sigma_b = 261 / 762 = 0.072 < 1.34 \times 1.1 = 2.01$



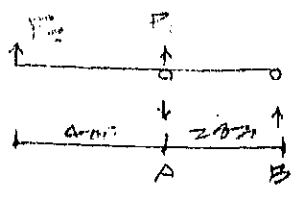
B2  $l = 283$   $W = 120 \times 2.0 = 240 \text{ kg/m}$

$\sigma_0 = 0.475 \times 283^2 / 4 = 0.475 \text{ T-m}$

$Q = 0.475 \times 283 / 2 = 0.67 \text{ T}$

$I = 380 \times 150 \times 10.5 \times 16$  OK

G1



$P_1 = 0.55 \times 40 = 22$

$P_2 = 0.475 \times 40 = 19$

$R_B = 0.95 \times 40 / 2.83 = 134 \text{ T}$

$$F_A = 295 + 1.12 + 1.34 = 3.39$$

$$F_A = 0.95 \times 400 = 3.80 \text{ T-M}$$

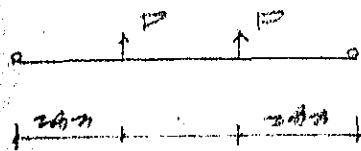
$$E = 300 \times 100 \times 10.5 \times 16 \quad Z_x = 762$$

$$f_b = 900 / 600 < 70 / 1.0 \times 10 = 0.947$$

$$\sigma_b = 300 / 762 = 0.499 < 0.947 \times 1.5 = 1.42$$

$$\delta = 950 \times 400^3 / 3 \times 2.1 \times 10^6 \times 14500 = 0.67 \approx 400 / 600$$

Case



$$Q = 849$$

$$P = 1.34 \text{ T}$$

$$F_c = 1.34 \times 2000 = 3.79 \text{ T-M}$$

$$Q = 1.34 \text{ T}$$

$$E = 300 \times 100 \times 10.5 \times 16$$

$$f_b = 1.34$$

$$\sigma_b = 379 / 762 = 0.497 < 1.34 \times 1.5 = 2.01$$

$$\delta = 1.340 \times 849^3 \times 2000 / 6400 \times 2.1 \times 10^6 \times 14500 = 0.956 \approx 849 / 886$$

$$\tau_b = 1.34 / 886 \times 1.05 = 0.0016 < 0.9 \times 1.5 = 1.35$$