REPUBLIC OF KENYA

MINISTRY OF PUBLIC WORKS

DETAILED DESIGN STUDY
ON
THE NAIROBI BYPASS PROJECT

STRUCTURAL CALCULATIONS
COMPUTOR OUTPUT

VOL—2

SEPTEMBER 1992

JAPAN INTERNATIONAL COOPERATION AGENCY

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Japan International
Cooperation Agency

The Permanent Secretary
Ministry of Public Works
P.O.Box 30260
NAIROBI

The Chief Engineer (Roads)
Ministry of Public Works
P.O.Box 30260
NAIROBI

CALCULATION OF

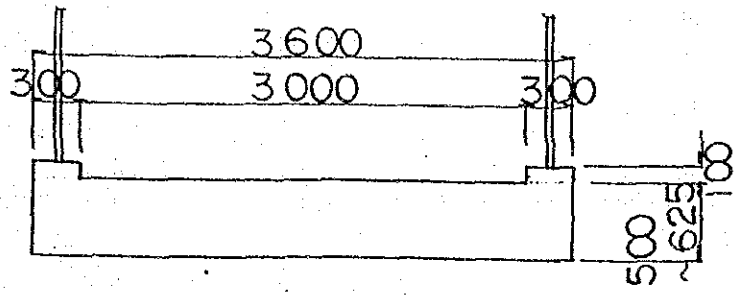
OVER BRIDGE

PEDESTRIAN OVER BRIDGE(1)

No.① PEDESTRIAN BRIDGE OF MAIN

1) Shape and factors for calculation of stress

(1) Superstructure

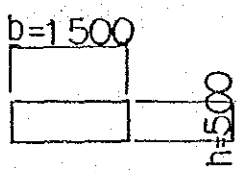


$$\begin{cases} A_1 = 3.60\times0.50 = 1.800\ m^2 \\ I_1 = \frac{1}{12}\times3.60\times0.50^3 = 0.03750\ m^4 \end{cases}$$

$$\begin{cases} A_2 = 3.60\times0.625 = 2.250\ m^2 \\ I_2 = \frac{1}{12}\times3.60\times0.625^3 = 0.07324\ m^4 \end{cases}$$

$Ec_1 = 27\ KN/mm^2 = 2.7\times10^7\ KN/m^2$ ($\because$ fcu=30 N/mm^2)

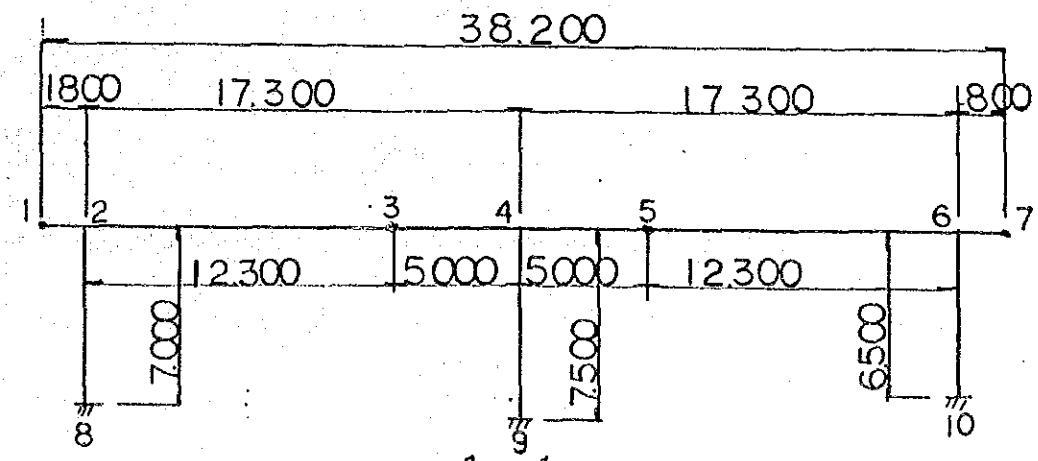
(2) Substructure



$$\begin{cases} A = 1.50\times0.50 = 0.750\ m^3 \\ I = \frac{1.50\times0.50^3}{12} = 0.01562\ m^4 \end{cases}$$

$Ec_2 = 25\ KN/mm^2 = 2.5\times10^7\ KN/m^2$ (fcu=25 N/mm^2)

(3) Frame



2) Load

(1) Dead load

Parapet = 23.6 (2×0.30×0.10) +0.294 ×2 = 2.004 KN/m

Slab (1) = 23.6×1.800 = 42.480 KN/m

ωd_1 = = 44.484 KN/m

Parapet = = 2.004 KN/m

Slab (2) = 23.6×2.250 = 53.100 KN/m

ωd_2 = = 55.104 KN/m

pillar ωd_3 = 23.6 ×0.750 = 17.700 KN/m

(2) Dead load form staircase

ω_R = 98.116/3.60 = 27.255 KN/m

(3) Live load : width = 3.0 m

a) Intensity of load

small than 2.0m width : $\omega \ell_1$ = 5.0 KN/m²×2.0 ×1.00 = 10.000 KN/m²

large than 2.0m width : $\omega \ell_2$ = 5.0 KN/m²×1.0 ×0.85 = 4.250 KN/m²

$\omega \ell_o$ = = 14.250 KN/m²

b) For first span

loaded length … ℓ = 17.30m < 30.0 m ∴ K = 1.0

∴ $\omega \ell = \omega \ell_o \cdot K$ = 14.250 ×1.00 = 14.250 KN/m

c) For middle fulcrum

loaded length … ℓ = 2×17.30 = 34.60 m

reduced factor : K

$$K = 151 \cdot \left(\frac{1}{\ell}\right)^{0.475} / 30.0 = 151 \left(\frac{1}{34.60}\right)^{0.475} / 30.0 = 0.935$$

$\omega \ell = \omega \ell_o \cdot K$ = 14.250 ×0.935 = 13.324 KN/m

(4) Others load

a) Temperature

Point, ② to ⑥ $T = +12.5$ ℃

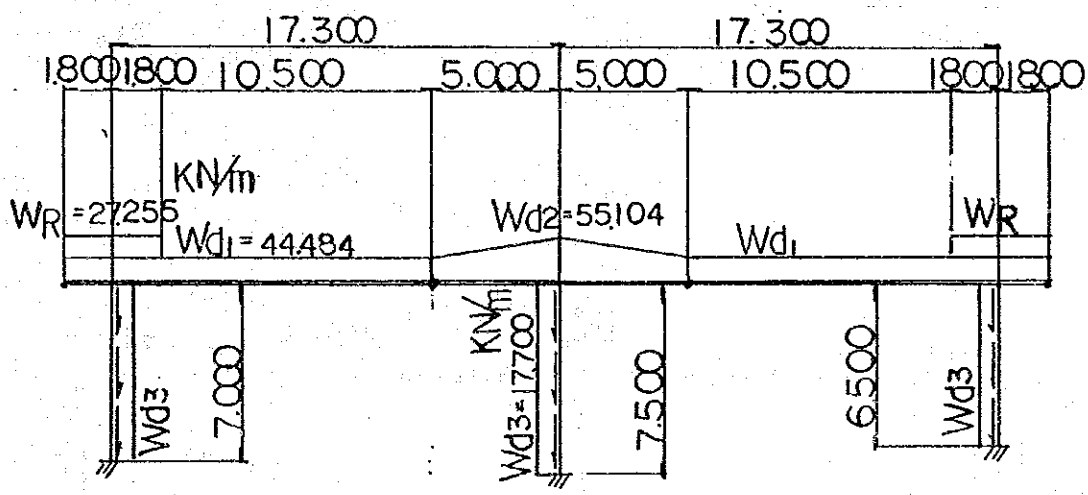
Coefficient of thermal expansion : $\alpha = 12 \times 10^{-6} / ℃$

b) Seismic

Coefficient of seismic $k_H = 0.10$

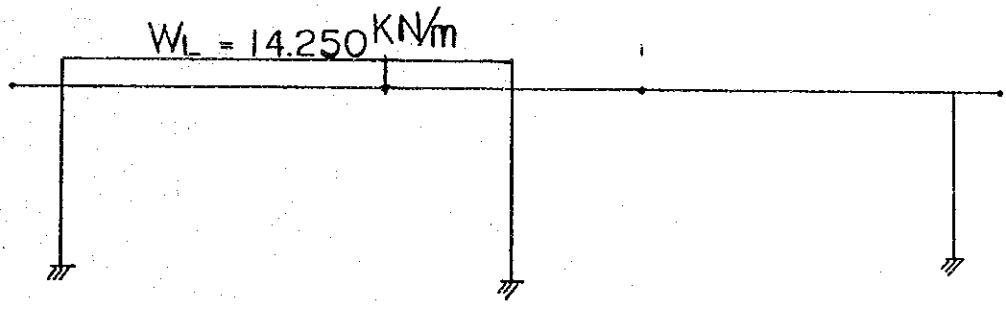
13) Loaded figure

(1) Dead load ··· case－1

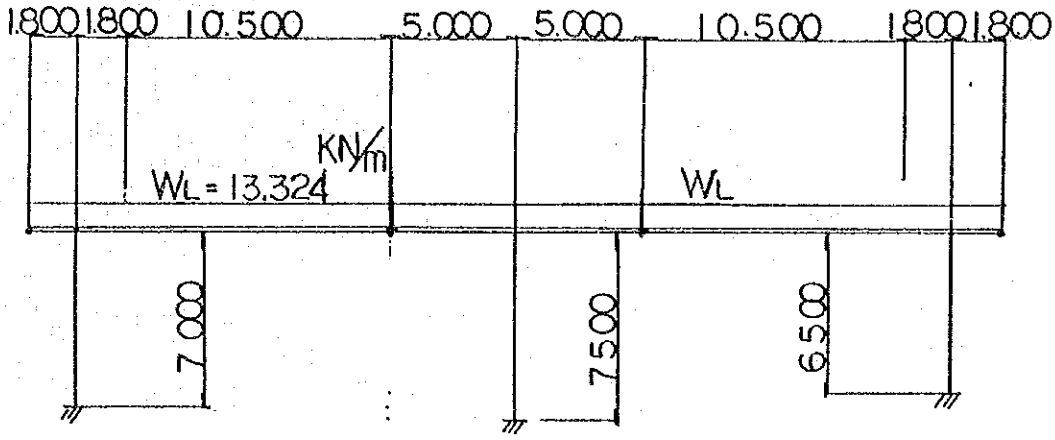


(2) Live load

a) for first span ··· case－2



b) for middle fulcrum … case－3



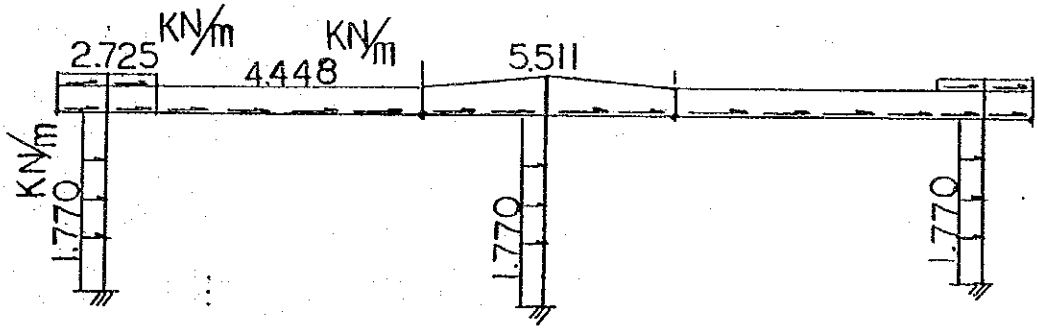
(3) Others load

a) Temperature … case－4

$T = +12.5℃$

$\alpha = 12 \times 10^{-6}/℃$

b) Seismic ($k_H = 0.10$) … case－5



PEDE Br NO-1 SUPERSTRUCTURE (MAIN BRIDGE)

NOTE: THE DIMENSION(t) BE EXCHANG TO
DIMENSION(KN) INTO THIS CALCULATION

	(m)	(m)
1	0.0000	7.5000
2	1.8000	7.5000
3	14.1000	7.5000
4	19.1000	7.5000
5	24.1000	7.5000
6	36.4000	7.5000
7	38.2000	7.5000
8	1.8000	0.5000
9	19.1000	0.0000
10	36.4000	1.0000

No	I	J	A (m2)	I (m4)	I - J	L (m)	E (t/m2)	EPS
1	1	2	1.80000	0.037500	Fix - Fix	1.800	2.70E+07	1.20E-05
2	2	3	1.80000	0.037500	Fix - Fix	12.300	2.70E+07	1.20E-05
3	3	4	2.02500	0.055370	Fix - Fix	5.000	2.70E+07	1.20E-05
4	4	5	2.02500	0.055370	Fix - Fix	5.000	2.70E+07	1.20E-05
5	5	6	1.80000	0.037500	Fix - Fix	12.300	2.70E+07	1.20E-05
6	6	7	1.80000	0.037500	Fix - Fix	1.800	2.70E+07	1.20E-05
7	2	8	0.75000	0.015620	Fix - Fix	7.000	2.50E+07	1.20E-05
8	4	9	0.75000	0.015620	Fix - Fix	7.500	2.50E+07	1.20E-05
9	6	10	0.75000	0.015620	Fix - Fix	6.500	2.50E+07	1.20E-05

No	X (t/m)	Y (t/m)	M(tm/Rad)
8	Fix	Fix	Fix
9	Fix	Fix	Fix
10	Fix	Fix	Fix

		L-No 1 / 11	L-No 2 / 12	L-No 3 / 13	L-No 4 / 14	L-No 5 / 15	L-No 6 / 16	L-No 7 / 17	L-No 8 / 18	L-No 9 / 19	L-No 10 / 20
1	0										
2	9	1.230	2.460	3.690	4.920	6.150	7.380	8.610	9.840	11.070	
3	4	1.000	2.000	3.000	4.000						
4	4	1.000	2.000	3.000	4.000						
5	9	1.230	2.460	3.690	4.920	6.150	7.380	8.610	9.840	11.070	
6	0										
7	4	1.400	2.800	4.200	5.600						
8	4	1.500	3.000	4.500	6.000						
9	4	1.300	2.600	3.900	5.200						

: DEAD LOAD
No. : 1
No. : 1

No	i	-j		Li (m)	Lo (m)	Pi (t/m)	Pj (t/m)
1	1-	2	-Y	0.000	1.800	-27.255	-27.255
2	2-	3	-Y	0.000	1.800	-27.255	-27.255
1	1-	2	-Y	0.000	1.800	-44.484	-44.484
2	2-	3	-Y	0.000	12.300	-44.484	-44.484
3	3-	4	-Y	0.000	5.000	-44.484	-55.104
4	4-	5	-Y	0.000	5.000	-55.104	-44.484
5	5-	6	-Y	0.000	12.300	-44.484	-44.484
6	6-	7	-Y	0.000	1.800	-44.484	-44.484
5	5-	6	-Y	10.500	1.800	-27.255	-27.255
6	6-	7	-Y	0.000	1.800	-27.255	-27.255
7	2-	8	-Y	0.000	7.000	-17.700	-17.700
8	4-	9	-Y	0.000	7.500	-17.700	-17.700
9	6-	10	-Y	0.000	6.500	-17.700	-17.700

ΣV = -2320.325 (t)
ΣH = 0.000 (t)

: LIVE LOAD
No. : 2
No. : 1

			Li (m)	Lo (m)	Pi (t/m)	Pj (t/m)
2	2-	3	0.000	12.300	-14.250	-14.250
3	3-	4	0.000	5.000	-14.250	-14.250

ΣV = -246.525 (t)
ΣH = 0.000 (t)

: LIVE LOAD
No. : 3
No. : 1

No	i	-j	Li (m)	Lo (m)	Pi (t/m)	Pj (t/m)
2	2-	3	0.000	12.300	-13.324	-13.324
3	3-	4	0.000	5.000	-13.324	-13.324
4	4-	5	0.000	5.000	-13.324	-13.324
5	5-	6	0.000	12.300	-13.324	-13.324

ΣV = -461.010 (t)
ΣH = 0.000 (t)

: TEMPERATURE
No. : 4
No. : 1

No	TO	No	T (°C)
2	—	5	12.50

ΣV = 0.000 (t)
ΣH = 0.000 (t)

PEDE Br NO-1

: SEISMIC
: 5
: 1

No	i	-j		Li (m)	Lo (m)	Pi (t/m)	Pj (t/m)
1	1-	2	-X	0.000	1.800	2.725	2.725
2	2-	3	-X	0.000	1.800	2.725	2.725
1	1-	2	-X	0.000	1.800	4.448	4.448
2	2-	3	-X	0.000	12.300	4.448	4.448
3	3-	4	-X	0.000	5.000	4.448	5.511
4	4-	5	-X	0.000	5.000	5.511	4.448
5	5-	6	-X	0.000	12.300	4.448	4.448
6	6-	7	-X	0.000	1.800	4.448	4.448
5	5-	6	-X	10.500	1.800	2.725	2.725
6	6-	7	-X	0.000	1.800	2.725	2.725
7	2-	8	-X	0.000	7.000	1.770	1.770
8	4-	9	-X	0.000	7.500	1.770	1.770
9	6-	10	-X	0.000	6.500	1.770	1.770

ΣV = 0.000 (t)
ΣH = 232.019 (t)

PEDE Br NO-1

	C-No 1 No 6 1.0000	C-No 2 No 7 1.0000	C-No 3 No 8 1.0000	C-No 4 No 9 1.0000	C-No 5 No10 1.0000	C-No 6 No11 1.0000	C-No 7 No12 1.0000	C-No 8 No13 1.0000
No 1	1.3800	1.3800	1.3800	1.3800	1.0000	1.0000	1.0000	1.0000
No 2	1.6500	0.0000	0.0000	0.0000	1.0000	0.0000	0.0000	0.0000
No 3	0.0000	1.6500	1.3800	0.0000	0.0000	1.0000	1.0000	0.0000
No 4	0.0000	0.0000	-1.4300	0.0000	0.0000	0.0000	-1.0000	0.0000
No 5	0.0000	0.0000	0.0000	1.3200	0.0000	0.0000	0.0000	0.8000

No 1 : 6 7 8 9

No 2 : 10 11 12 13

PEDE Br NO-1

No.	Case. 1 RX (t)	RY (t)	RM (tm)	Case. 2 RX (t)	RY (t)	RM (tm)	Case. 3 RX (t)	RY (t)	RM (tm)
8.	102.810	629.510	245.562	36.379	114.146	70.738	33.156	96.967	79.190
9.	3.497	1071.170	14.175	-38.047	143.186	-107.266	1.128	267.404	4.569
10.	-106.308	619.643	-222.425	1.668	-10.807	-12.571	-34.285	96.039	-71.738

No.	Case. 4 RX (t)	RY (t)	RM (tm)	Case. 5 RX (t)	RY (t)	RM (tm)	Case. 6 RX (t)	RY (t)	RM (tm)
8.	24.281	6.480	100.550	-69.386	-17.428	-265.601	201.904	1057.060	455.593
9.	1.503	-12.522	6.080	-80.050	-1.965	-288.468	-57.951	1714.470	-157.427
10.	-25.783	6.041	-100.576	-82.583	19.393	-301.259	-143.953	837.277	-327.089

No.	Case. 7 RX (t)	RY (t)	RM (tm)	Case. 8 RX (t)	RY (t)	RM (tm)	Case. 9 RX (t)	RY (t)	RM (tm)
8.	196.587	1028.720	469.539	152.913	993.272	304.372	50.289	845.719	-11.718
9.	5.688	1919.430	27.101	4.235	1865.140	17.173	-100.840	1475.620	-361.216
10.	-203.275	1014.560	-425.314	-157.148	979.830	-202.121	-255.714	880.706	-704.009

No.	Case. 10 RX (t)	RY (t)	RM (tm)	Case. 11 RX (t)	RY (t)	RM (tm)	Case. 12 RX (t)	RY (t)	RM (tm)
8.	139.189	743.656	316.300	135.967	726.477	324.752	111.686	719.997	224.202
9.	-34.549	1214.300	-93.091	4.626	1338.580	18.745	3.123	1331.100	12.664
10.	-104.640	608.836	-234.996	-140.593	716.282	-294.163	-114.809	710.240	-193.587

No.	Case. 13 RX (t)	RY (t)	RM (tm)
8.	47.302	615.565	33.081
9.	-60.543	1069.600	-216.599
10.	-172.374	635.157	-463.433

PEDE Br NO-1

*

No.	Case. 1 X-DIS.(mm)	Y-DIS.(mm)	ROTA.(mmRad)	Case. 2 X-DIS.(mm)	Y-DIS.(mm)	ROTA.(mmRad)	Case. 3 X-DIS.(mm)	Y-DIS.(mm)	ROTA.(mmRad)
1.	-0.35579	3.38236	-1.97959	0.88753	1.78328	-1.01438	-0.11449	1.15306	-0.6607
2.	-0.35579	-0.21189	-2.04846	0.88753	-0.04261	-1.01438	-0.11449	-0.03620	-0.6607
3.	-0.38181	-8.12968	2.12618	0.87832	-4.71760	0.91439	-0.12289	-2.43403	0.6450
4.	-0.39121	-0.40192	0.02036	0.87499	-0.05727	0.68008	-0.12592	-0.10096	0.0065
5.	-0.40093	-8.01273	-2.11728	0.87515	2.12632	0.22347	-0.12905	-2.39710	-0.6423
6.	-0.42784	-0.19487	2.04863	0.87557	0.00375	-0.29948	-0.13773	-0.03350	0.0006
7.	-0.42784	3.39970	1.97976	0.87557	-0.53532	-0.29948	-0.13773	1.15503	0.6606
8.	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.0000
9.	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.0000
10.	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.0000

No.	Case. 4 X-DIS.(mm)	Y-DIS.(mm)	ROTA.(mmRad)	Case. 5 X-DIS.(mm)	Y-DIS.(mm)	ROTA.(mmRad)	Case. 6 X-DIS.(mm)	Y-DIS.(mm)	ROTA.(mmRad)
1.	-2.75397	-0.50473	0.27906	6.95994	1.20703	-0.66696	0.97343	7.61006	-4.4056
2.	-2.75397	-0.00242	0.27906	6.95970	0.00651	-0.66696	0.97343	-0.36272	-4.5006
3.	-0.91511	0.22895	-0.08006	6.96278	-0.33155	0.17797	0.92233	-19.00300	4.4429
4.	-0.16733	0.00501	0.00854	6.96026	0.00079	-0.09360	0.90387	-0.64915	1.1502
5.	0.58031	0.27709	0.08345	6.96149	0.41100	0.20364	0.89070	-7.54913	-2.5531
6.	2.41878	-0.00209	-0.27930	6.95485	-0.00672	-0.75451	0.85427	-0.26274	2.3330
7.	2.41878	-0.50484	-0.27930	6.95508	-1.36485	-0.75451	0.85427	3.80830	2.2379
8.	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.0000
9.	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.0000
10.	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.0000

No.	Case. 7 X-DIS.(mm)	Y-DIS.(mm)	ROTA.(mmRad)	Case. 8 X-DIS.(mm)	Y-DIS.(mm)	ROTA.(mmRad)	Case. 9 X-DIS.(mm)	Y-DIS.(mm)	ROTA.(mmRad)
1.	-0.67991	6.57020	-3.82199	3.28918	6.98064	-4.04265	8.69613	6.26094	-3.6122
2.	-0.67991	-0.35214	-3.91703	3.28918	-0.33890	-4.13769	8.69581	-0.28382	-3.7073
3.	-0.72966	-15.23507	3.99836	0.61213	-14.90529	3.93870	8.66397	-11.65661	3.1691
4.	-0.74764	-0.73113	0.03880	-0.47435	-0.70942	0.02483	8.64768	-0.55361	-0.0955
5.	-0.76623	-15.01277	-3.98162	-1.56122	-14.76180	-3.92754	8.63588	-10.51505	-2.6531
6.	-0.81767	-0.32419	3.91713	-4.23935	-0.31215	4.13817	8.58998	-0.27779	1.8312
7.	-0.81767	6.59834	3.82209	-4.23935	7.00825	4.04313	8.59030	2.88998	1.7361
8.	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.0000
9.	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.0000
10.	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.0000

No.	Case. 10 X-DIS.(mm)	Y-DIS.(mm)	ROTA.(mmRad)	Case. 11 X-DIS.(mm)	Y-DIS.(mm)	ROTA.(mmRad)	Case. 12 X-DIS.(mm)	Y-DIS.(mm)	ROTA.(mmRad)
1.	0.53174	5.16564	-2.99397	-0.47028	4.53542	-2.64029	2.28368	5.04015	-2.9194
2.	0.53174	-0.25450	-3.06284	-0.47028	-0.24809	-2.70916	2.28368	-0.24567	-2.9882
3.	0.49651	-12.84728	3.04057	-0.50470	-10.56369	2.77117	0.41042	-10.79264	2.8512
4.	0.48378	-0.45919	0.70044	-0.51713	-0.50888	0.02685	-0.34980	-0.51389	0.0183
5.	0.47421	-5.88640	-1.89381	-0.52999	-10.40982	-2.75957	-1.11030	-10.68692	-2.8430
6.	0.44773	-0.19112	1.74915	-0.56557	-0.22837	2.70925	-2.98435	-0.22627	2.9886
7.	0.44773	2.86438	1.68028	-0.56557	4.55531	2.64038	-2.98435	5.06015	2.9197
8.	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.0000
9.	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.0000
10.	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.0000

No.	Case. 13 X-DIS.(mm)	Y-DIS.(mm)	ROTA.(mmRad)
1.	5.21216	4.34798	-2.51315
2.	5.21197	-0.20668	-2.58202
3.	5.18842	-8.39492	2.26855
4.	5.17700	-0.40129	-0.05453
5.	5.16826	-7.68393	-1.95437
6.	5.13604	-0.20025	1.44502
7.	5.13623	2.30782	1.37015
8.	0.00000	0.00000	0.00000
9.	0.00000	0.00000	0.00000
10.	0.00000	0.00000	0.00000

PEDE Br NO-1

	No	L(m)	Case 1 DEAD LOAD M (tm)	S (t)	N (t)	Case 2 LIVE LOAD M (tm)	S (t)	N (t)
1-	2	0.000	0.000	0.000	0.000	0.000	0.000	0.000
2-	1	1.800	-116.217	-129.130	0.000	0.000	0.000	0.000
2-	3	0.000	-590.328	376.480	-102.810	-183.914	114.146	-36.379
*	1	1.230	-181.525	288.241	-102.810	-54.294	96.619	-36.379
*	2	2.460	124.680	217.990	-102.810	53.768	79.091	-36.379
*	3	3.690	359.158	163.275	-102.810	140.270	61.564	-36.379
*	4	4.920	526.336	108.559	-102.810	205.214	44.036	-36.379
*	5	6.150	626.214	53.844	-102.810	248.599	26.509	-36.379
*	6	7.380	658.792	-0.871	-102.810	270.425	8.981	-36.379
*	7	8.610	624.071	-55.587	-102.810	270.693	-8.546	-36.379
*	8	9.840	522.049	-110.302	-102.810	249.401	-26.074	-36.379
*	9	11.070	352.728	-165.017	-102.810	206.551	-43.601	-36.379
3-	2	12.300	116.107	-219.733	-102.810	142.142	-61.129	-36.379
3-	4	0.000	116.107	-219.733	-102.810	142.142	-61.129	-36.379
*	1	1.000	-126.221	-265.279	-102.810	73.888	-75.379	-36.379
*	2	2.000	-415.158	-312.949	-102.810	-8.616	-89.629	-36.379
*	3	3.000	-752.826	-362.743	-102.810	-105.370	-103.879	-36.379
*	4	4.000	-1141.351	-414.661	-102.810	-216.374	-118.129	-36.379
4-	3	5.000	-1582.855	-468.703	-102.810	-341.628	-132.379	-36.379
4-	5	0.000	-1594.911	469.719	-106.308	-163.542	10.807	1.668
*	1	1.000	-1152.390	415.677	-106.308	-152.736	10.807	1.668
*	2	2.000	-762.848	363.759	-106.308	-141.929	10.807	1.668
*	3	3.000	-424.163	313.965	-106.308	-131.122	10.807	1.668
*	4	4.000	-134.210	266.295	-106.308	-120.316	10.807	1.668
5-	4	5.000	109.136	220.749	-106.308	-109.509	10.807	1.668
5-	6	0.000	109.136	220.749	-106.308	-109.509	10.807	1.668
*	1	1.230	347.007	166.034	-106.308	-96.217	10.807	1.668
*	2	2.460	517.579	111.319	-106.308	-82.925	10.807	1.668
*	3	3.690	620.851	56.603	-106.308	-69.633	10.807	1.668
*	4	4.920	656.823	1.888	-106.308	-56.340	10.807	1.668
*	5	6.150	625.496	-52.827	-106.308	-43.048	10.807	1.668
*	6	7.380	526.868	-107.543	-106.308	-29.756	10.807	1.668
*	7	8.610	360.941	-162.258	-106.308	-16.464	10.807	1.668
*	8	9.840	127.714	-216.973	-106.308	-3.172	10.807	1.668
*	9	11.070	-177.241	-287.224	-106.308	10.121	10.807	1.668
6-	5	12.300	-584.793	-375.463	-106.308	23.413	10.807	1.668
6-	7	0.000	-116.217	129.130	0.000	0.000	0.000	0.000
7-	6	1.800	0.000	0.000	0.000	0.000	0.000	0.000
2-	8	0.000	474.111	-102.810	-505.610	183.914	-36.379	-114.146
*	1	1.400	330.177	-102.810	-530.390	132.984	-36.379	-114.146
*	2	2.800	186.242	-102.810	-555.170	82.053	-36.379	-114.146
*	3	4.200	42.307	-102.810	-579.950	31.123	-36.379	-114.146
*	4	5.600	-101.627	-102.810	-604.730	-19.808	-36.379	-114.146
8-	2	7.000	-245.562	-102.810	-629.510	-70.738	-36.379	-114.146
4-	9	0.000	12.055	-3.497	-938.422	-178.085	38.047	-143.186
*	1	1.500	6.809	-3.497	-964.972	-121.015	38.047	-143.186
*	2	3.000	1.563	-3.497	-991.522	-63.945	38.047	-143.186
*	3	4.500	-3.683	-3.497	-1018.072	-6.875	38.047	-143.186
*	1	6.000	-8.929	-3.497	-1044.622	50.196	38.047	-143.186
9-	4	7.500	-14.175	-3.497	-1071.172	107.266	38.047	-143.186
6-	10	0.000	-468.576	106.308	-504.593	23.413	-1.668	10.807
*	1	1.300	-330.376	106.308	-527.603	21.244	-1.668	10.807
*	2	2.600	-192.176	106.308	-550.613	19.076	-1.668	10.807
*	3	3.900	-53.975	106.308	-573.623	16.908	-1.668	10.807
*	4	5.200	84.225	106.308	-596.633	14.739	-1.668	10.807
10-	6	6.500	222.425	106.308	-619.643	12.571	-1.668	10.807

PEDE Dr NO-1

	No	L(m)	Case 3 LIVE LOAD M (tm)	S (t)	N (t)	Case 4 TEMPERATURE M (tm)	S (t)	N (t)
1-	2	0.000	0.000	0.000	0.000	0.000	0.000	0.000
2-	1	1.800	0.000	0.000	0.000	0.000	0.000	0.000
2-	3	0.000	-152.905	96.967	-33.156	-69.414	6.480	-24.281
*	1	1.230	-43.714	80.579	-33.156	-61.444	6.480	-24.281
*	2	2.460	45.319	64.190	-33.156	-53.473	6.480	-24.281
*	3	3.690	114.194	47.802	-33.156	-45.503	6.480	-24.281
*	4	4.920	162.912	31.413	-33.156	-37.532	6.480	-24.281
*	5	6.150	191.472	15.025	-33.156	-29.562	6.480	-24.281
*	6	7.380	199.873	-1.364	-33.156	-21.591	6.480	-24.281
*	7	8.610	188.117	-17.752	-33.156	-13.620	6.480	-24.281
*	8	9.840	156.203	-34.141	-33.156	-5.650	6.480	-24.281
*	9	11.070	104.131	-50.529	-33.156	2.321	6.480	-24.281
3-	2	12.300	31.901	-66.918	-33.156	10.291	6.480	-24.281
3-	4	0.000	31.901	-66.918	-33.156	10.291	6.480	-24.281
*	1	1.000	-41.679	-80.242	-33.156	16.772	6.480	-24.281
*	2	2.000	-128.582	-93.566	-33.156	23.252	6.480	-24.281
*	3	3.000	-228.810	-106.890	-33.156	29.732	6.480	-24.281
*	4	4.000	-342.362	-120.214	-33.156	36.212	6.480	-24.281
4-	3	5.000	-469.237	-133.538	-33.156	42.692	6.480	-24.281
4-	5	0.000	-473.131	133.866	-34.285	37.501	-6.041	-25.783
*	1	1.000	-345.927	120.542	-34.285	31.460	-6.041	-25.783
*	2	2.000	-232.046	107.218	-34.285	25.418	-6.041	-25.783
*	3	3.000	-131.490	93.894	-34.285	19.377	-6.041	-25.783
*	4	4.000	-44.258	80.570	-34.285	13.336	-6.041	-25.783
5-	4	5.000	29.651	67.246	-34.285	7.294	-6.041	-25.783
6-	6	0.000	29.651	67.246	-34.285	7.294	-6.041	-25.783
*	1	1.230	102.285	50.858	-34.285	-0.137	-6.041	-25.783
*	2	2.460	154.761	34.469	-34.285	-7.568	-6.041	-25.783
*	3	3.690	187.079	18.081	-34.285	-14.999	-6.041	-25.783
*	4	4.920	199.240	1.692	-34.285	-22.430	-6.041	-25.783
*	5	6.150	191.242	-14.696	-34.285	-29.861	-6.041	-25.783
*	6	7.380	163.087	-31.085	-34.285	-37.292	-6.041	-25.783
*	7	8.610	114.774	-47.473	-34.285	-44.723	-6.041	-25.783
*	8	9.840	46.302	-63.862	-34.285	-52.154	-6.041	-25.783
*	9	11.070	-42.327	-80.250	-34.285	-59.585	-6.041	-25.783
6-	5	12.300	-151.113	-96.639	-34.285	-67.016	-6.041	-25.783
6-	7	0.000	0.000	0.000	0.000	0.000	0.000	0.000
7-	6	1.800	0.000	0.000	0.000	0.000	0.000	0.000
2-	8	0.000	152.905	-33.156	-96.967	69.414	-24.281	-6.480
*	1	1.400	106.486	-33.156	-96.967	35.422	-24.281	-6.480
*	2	2.800	60.067	-33.156	-96.967	1.429	-24.281	-6.480
*	3	4.200	13.648	-33.156	-96.967	-32.564	-24.281	-6.480
*	4	5.600	-32.771	-33.156	-96.967	-66.557	-24.281	-6.480
8-	2	7.000	-79.190	-33.156	-96.967	-100.550	-24.281	-6.480
4-	9	0.000	3.894	-1.128	-267.404	5.191	-1.503	12.522
*	1	1.500	2.201	-1.128	-267.404	2.936	-1.503	12.522
*	2	3.000	0.508	-1.128	-267.404	0.682	-1.503	12.522
*	3	4.500	-1.184	-1.128	-267.404	-1.572	-1.503	12.522
*	4	6.000	-2.877	-1.128	-267.404	-3.826	-1.503	12.522
9-	4	7.500	-4.569	-1.128	-267.404	-6.080	-1.503	12.522
6-	10	0.000	-151.113	34.285	-96.639	-67.016	25.783	-6.041
*	1	1.300	-106.543	34.285	-96.639	-33.498	25.783	-6.041
*	2	2.600	-61.973	34.285	-96.639	0.021	25.783	-6.041
*	3	3.900	-17.403	34.285	-96.639	33.539	25.783	-6.041
*	4	5.200	27.168	34.285	-96.639	67.057	25.783	-6.041
10-	6	6.500	71.738	34.285	-96.639	100.576	25.783	-6.041

PEDE Br NO-1

	No	L(m)	Case 5 SEISMIC M (tm)	S (t)	N (t)	Case 6 M (tm)	S (t)	N (t)
1-	2	0.000	0.000	0.000	0.000	0.000	0.000	0.000
2-	1	1.800	0.000	0.000	-12.911	-160.380	-178.200	0.000
2-	3	0.000	176.733	-17.428	44.084	-1118.112	707.883	-201.904
*	1	1.230	155.297	-17.428	35.261	-340.090	557.193	-201.904
*	2	2.460	133.861	-17.428	28.237	260.775	431.327	-201.904
*	3	3.690	112.424	-17.428	22.766	727.084	326.899	-201.904
*	4	4.920	90.988	-17.428	17.295	1064.946	222.472	-201.904
*	5	6.150	69.552	-17.428	11.824	1274.364	118.044	-201.904
*	6	7.380	48.115	-17.428	6.353	1355.335	13.617	-201.904
*	7	8.610	26.679	-17.428	0.882	1307.860	-90.811	-201.904
*	8	9.840	5.243	-17.428	-4.589	1131.940	-195.238	-201.904
*	9	11.070	-16.194	-17.428	-10.060	827.574	-299.666	-201.904
3-	2	12.300	-37.630	-17.428	-15.531	394.762	-404.094	-201.904
3-	4	0.000	-37.630	-17.428	-15.531	394.762	-404.094	-201.904
*	1	1.000	-55.058	-17.428	-20.085	-52.271	-490.459	-201.904
*	2	2.000	-72.486	-17.428	-24.852	-587.135	-579.757	-201.904
*	3	3.000	-89.914	-17.428	-29.832	-1212.761	-671.985	-201.904
*	4	4.000	-107.341	-17.428	-35.024	-1932.081	-767.144	-201.904
4-	3	5.000	-124.769	-17.428	-40.429	-2748.026	-865.235	-201.904
4-	5	0.000	137.357	-19.393	26.346	-2470.822	666.044	-143.953
*	1	1.000	117.964	-19.393	20.942	-1842.312	591.466	-143.953
*	2	2.000	98.572	-19.393	15.750	-1286.914	519.819	-143.953
*	3	3.000	79.179	-19.393	10.770	-801.697	451.103	-143.953
*	4	4.000	59.786	-19.393	6.003	-383.730	385.318	-143.953
5-	4	5.000	40.393	-19.393	1.449	-30.083	322.465	-143.953
5-	6	0.000	40.393	-19.393	1.449	-30.083	322.465	-143.953
*	1	1.230	16.540	-19.393	-4.022	320.112	246.958	-143.953
*	2	2.460	-7.313	-19.393	-9.493	577.433	171.451	-143.953
*	3	3.690	-31.166	-19.393	-14.964	741.881	95.944	-143.953
*	4	4.920	-55.019	-19.393	-20.435	813.455	20.436	-143.953
*	5	6.150	-78.872	-19.393	-25.906	792.155	-55.071	-143.953
*	6	7.380	-102.725	-19.393	-31.377	677.981	-130.578	-143.953
*	7	8.610	-126.579	-19.393	-36.848	470.933	-206.085	-143.953
*	8	9.840	-150.432	-19.393	-42.319	171.012	-281.592	-143.953
*	9	11.070	-174.285	-19.393	-49.344	-227.894	-378.538	-143.953
6-	5	12.300	-198.138	-19.393	-58.166	-768.384	-500.308	-143.953
6-	7	0.000	0.000	0.000	12.911	-160.380	178.200	0.000
7-	6	1.800	0.000	0.000	0.000	0.000	0.000	0.000
2-	8	0.000	-176.733	56.996	17.428	957.732	-201.904	-886.083
*	1	1.400	-95.205	59.474	17.428	675.067	-201.904	-920.279
*	2	2.800	-10.207	61.952	17.428	392.402	-201.904	-954.476
*	3	4.200	78.260	64.430	17.428	109.737	-201.904	-988.672
*	4	5.600	170.196	66.908	17.428	-172.928	-201.904	-1022.868
8-	2	7.000	265.601	69.386	17.428	-455.593	-201.904	-1057.065
4-	9	0.000	-262.127	66.775	1.965	-277.204	57.951	-1531.278
*	1	1.500	-159.973	69.430	1.965	-190.278	57.951	-1567.917
*	2	3.000	-53.836	72.085	1.965	-103.352	57.951	-1604.556
*	3	4.500	56.282	74.740	1.965	-16.426	57.951	-1641.195
*	4	6.000	170.384	77.395	1.965	70.500	57.951	-1677.834
9-	4	7.500	288.468	80.050	1.965	157.427	57.951	-1714.473
6-	10	0.000	-198.138	71.078	-19.393	-608.004	143.953	-678.508
*	1	1.300	-104.241	73.379	-19.393	-420.865	143.953	-710.261
*	2	2.600	-7.353	75.680	-19.393	-233.727	143.953	-742.015
*	3	3.900	92.527	77.981	-19.393	-46.588	143.953	-773.769
*	4	5.200	195.397	80.282	-19.393	140.550	143.953	-805.523
10-	6	6.500	301.259	82.583	-19.393	327.689	143.953	-837.277

PEDE Br NO-1

	No	L(m)	Case 7 M (tm)	S (t)	N (t)	Case 8 M (tm)	S (t)	N (t)
1-	2	0.000	0.000	0.000	0.000	0.000	0.000	0.000
2-	1	1.800	-160.380	-178.200	0.000	-160.380	-178.200	0.000
2-	3	0.000	-1066.947	679.538	-196.587	-926.400	644.091	-152.913
*	1	1.230	-322.633	530.728	-196.587	-222.966	499.705	-152.913
*	2	2.460	246.835	406.741	-196.587	311.065	380.142	-152.913
*	3	3.690	684.059	304.192	-196.587	718.295	282.019	-152.913
*	4	4.920	995.148	201.644	-196.587	1004.833	183.896	-152.913
*	5	6.150	1180.103	99.096	-196.587	1170.679	85.773	-152.913
*	6	7.380	1238.924	-3.452	-196.587	1215.833	-12.351	-152.913
*	7	8.610	1171.611	-106.000	-196.587	1140.296	-110.474	-152.913
*	8	9.840	978.163	-208.549	-196.587	944.067	-208.597	-152.913
*	9	11.070	658.581	-311.097	-196.587	627.147	-306.721	-152.913
3-	2	12.300	212.865	-413.645	-196.587	189.535	-404.844	-152.913
3-	4	0.000	212.865	-413.645	-196.587	189.535	-404.844	-152.913
*	1	1.000	-242.955	-498.483	-196.587	-255.685	-486.085	-152.913
*	2	2.000	-785.079	-586.252	-196.587	-783.612	-570.256	-152.913
*	3	3.000	-1416.437	-676.953	-196.587	-1397.175	-657.359	-152.913
*	4	4.000	-2139.961	-770.584	-196.587	-2099.307	-747.393	-152.913
4-	3	5.000	-2958.582	-867.147	-196.587	-2892.938	-840.358	-152.913
4-	5	0.000	-2981.643	869.092	-203.275	-2907.525	841.587	-157.148
*	1	1.000	-2161.076	772.530	-203.275	-2112.664	748.622	-157.148
*	2	2.000	-1435.607	678.898	-203.275	-1409.303	658.588	-157.148
*	3	3.000	-802.303	588.198	-203.275	-794.510	571.486	-157.148
*	4	4.000	-258.234	500.429	-203.275	-265.355	487.314	-157.148
5-	4	5.000	199.531	415.590	-203.275	181.095	406.073	-157.148
5-	6	0.000	199.531	415.590	-203.275	181.095	406.073	-157.148
*	1	1.230	647.640	313.042	-203.275	620.219	307.950	-157.148
*	2	2.460	969.615	210.494	-203.275	938.652	209.827	-157.148
*	3	3.690	1165.455	107.946	-203.275	1136.393	111.703	-157.148
*	4	4.920	1235.162	5.398	-203.275	1213.442	13.580	-157.148
*	5	6.150	1178.734	-97.151	-203.275	1169.800	-84.543	-157.148
*	6	7.380	996.171	-199.699	-203.275	1005.466	-182.667	-157.148
*	7	8.610	687.475	-302.247	-203.275	720.440	-280.790	-157.148
*	8	9.840	252.644	-404.795	-203.275	314.723	-378.913	-157.148
*	9	11.070	-314.431	-528.782	-203.275	-217.796	-498.475	-157.148
6-	5	12.300	-1056.352	-677.593	-203.275	-919.718	-642.861	-157.148
6-	7	0.000	-160.380	178.200	0.000	-160.380	178.200	0.000
7-	6	1.800	0.000	0.000	0.000	0.000	0.000	0.000
2-	8	0.000	906.567	-196.587	-857.738	766.020	-152.913	-822.290
*	1	1.400	631.346	-196.587	-891.934	551.942	-152.913	-856.487
*	2	2.800	356.125	-196.587	-926.131	337.863	-152.913	-890.683
*	3	4.200	80.904	-196.587	-960.327	123.785	-152.913	-924.879
*	4	5.600	-194.318	-196.587	-994.524	-90.293	-152.913	-959.076
8-	2	7.000	-469.539	-196.587	-1028.720	-304.372	-152.913	-993.272
4-	9	0.000	23.061	-6.688	-1736.239	14.587	-4.235	-1681.946
*	1	1.500	13.028	-6.688	-1772.878	8.235	-4.235	-1718.585
*	2	3.000	2.996	-6.688	-1809.517	1.883	-4.235	-1755.224
*	3	4.500	-7.036	-6.688	-1846.156	-4.469	-4.235	-1791.863
*	4	6.000	-17.069	-6.688	-1882.795	-10.821	-4.235	-1828.502
9-	4	7.500	-27.101	-6.688	-1919.434	-17.173	-4.235	-1865.141
6-	10	0.000	-895.972	203.275	-855.793	-759.338	157.148	-821.061
*	1	1.300	-631.715	203.275	-887.546	-555.046	157.148	-852.815
*	2	2.600	-367.458	203.275	-919.300	-350.754	157.148	-884.568
*	3	3.900	-103.201	203.275	-951.054	-146.463	157.148	-916.322
*	4	5.200	161.057	203.275	-982.808	57.829	157.148	-948.076
10-	6	6.500	425.314	203.275	-1014.562	262.121	157.148	-979.830

PEDE Dr NO-1

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	No	L(m)	Case 9 M (tm)	S (t)	N (t)	Case 10 M (tm)	S (t)	N (t)
1-	2	0.000	0.000	0.000	0.000	0.000	0.000	0.000
2-	1	1.800	-160.380	-178.200	-17.043	-116.217	-129.130	0.000
2-	3	0.000	-581.366	496.537	-83.687	-774.243	490.626	-139.189
*	1	1.230	-45.513	374.767	-95.333	-235.819	384.859	-139.189
*	2	2.460	348.754	277.821	-104.605	178.447	297.081	-139.189
*	3	3.690	644.038	202.314	-111.827	499.428	224.838	-139.189
*	4	4.920	846.447	126.807	-119.049	731.550	152.596	-139.189
*	5	6.150	955.983	51.300	-126.271	874.813	80.353	-139.189
*	6	7.380	972.645	-24.207	-133.492	929.217	8.110	-139.189
*	7	8.610	896.434	-99.714	-140.714	894.763	-64.133	-139.189
*	8	9.840	727.348	-175.221	-147.936	771.450	-136.376	-139.189
*	9	11.070	465.389	-250.729	-155.158	559.279	-208.619	-139.189
3-	2	12.300	110.556	-326.236	-162.380	258.249	-280.861	-139.189
3-	4	0.000	110.556	-326.236	-162.380	258.249	-280.861	-139.189
*	1	1.000	-246.862	-389.089	-168.391	-52.334	-340.657	-139.189
*	2	2.000	-608.599	-454.874	-174.684	-423.774	-402.577	-139.189
*	3	3.000	-1157.586	-523.589	-181.256	-858.196	-466.621	-139.189
*	4	4.000	-1716.755	-595.236	-188.110	-1357.725	-532.789	-139.189
4-	3	5.000	-2349.036	-669.814	-195.244	-1924.483	-601.081	-139.189
4-	5	0.000	-2019.665	622.614	-111.928	-1758.453	480.526	-104.640
*	1	1.000	-1434.584	548.036	-119.062	-1305.125	426.484	-104.640
*	2	2.000	-922.616	476.389	-125.915	-904.777	374.566	-104.640
*	3	3.000	-480.829	407.674	-132.488	-555.285	324.772	-104.640
*	4	4.000	-106.292	341.889	-138.781	-254.525	277.102	-104.640
5-	4	5.000	203.926	279.036	-144.792	-0.374	231.556	-104.640
5-	6	0.000	203.926	279.036	-144.792	-0.374	231.556	-104.640
*	1	1.230	500.703	203.528	-152.014	250.790	176.841	-104.640
*	2	2.460	704.606	128.021	-159.236	434.654	122.125	-104.640
*	3	3.690	815.635	52.514	-166.458	551.219	67.410	-104.640
*	4	4.920	833.791	-22.993	-173.679	600.483	12.695	-104.640
*	5	6.150	759.073	-98.500	-180.901	582.448	-42.021	-104.640
*	6	7.380	591.481	-174.007	-188.123	497.112	-96.736	-104.640
*	7	8.610	331.015	-249.514	-195.345	344.477	-151.451	-104.640
*	8	9.840	-22.325	-325.022	-202.566	124.542	-206.167	-104.640
*	9	11.070	-474.649	-421.968	-211.839	-167.120	-276.417	-104.640
6-	5	12.300	-1068.557	-543.737	-223.485	-561.381	-364.656	-104.640
6-	7	0.000	-160.380	178.200	17.043	-116.217	129.130	0.000
7-	6	1.800	0.000	0.000	0.000	0.000	0.000	0.000
2-	8	0.000	420.986	-66.644	-674.737	658.026	-139.189	-619.756
*	1	1.400	329.974	-63.373	-708.933	463.160	-139.189	-644.536
*	2	2.800	243.541	-60.102	-743.130	268.295	-139.189	-669.316
*	3	4.200	161.687	-56.831	-777.326	73.430	-139.189	-694.096
*	4	5.600	84.413	-53.560	-811.522	-121.435	-139.189	-718.876
8-	2	7.000	11.718	-50.289	-845.719	-316.300	-139.189	-743.656
4-	9	0.000	-329.371	83.317	-1292.428	-166.030	34.549	-1081.607
*	1	1.500	-201.767	86.821	-1329.067	-114.206	34.549	-1108.157
*	2	3.000	-68.907	90.326	-1365.706	-62.382	34.549	-1134.707
*	3	4.500	69.210	93.830	-1402.345	-10.558	34.549	-1161.257
*	4	6.000	212.584	97.335	-1438.984	41.266	34.549	-1187.807
9-	4	7.500	361.215	100.840	-1475.623	93.091	34.549	-1214.357
6-	10	0.000	-908.177	240.528	-721.937	-445.163	104.640	-493.786
*	1	1.300	-593.517	243.565	-753.691	-309.131	104.640	-516.796
*	2	2.600	-274.908	246.602	-785.445	-173.100	104.640	-539.806
*	3	3.900	47.649	249.640	-817.198	-37.068	104.640	-562.816
*	4	5.200	374.155	252.677	-848.952	98.964	104.640	-585.826
10-	6	6.500	704.609	255.714	-880.706	234.996	104.640	-608.836

PEDE Br NO-1

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	No	L(m)	Case 11 M (tm)	S (t)	N (t)	Case 12 M (tm)	S (t)	N (t)
1-	2	0.000	0.000	0.000	0.000	0.000	0.000	0.000
2-	1	1.800	-116.217	-129.130	0.000	-116.217	-129.130	0.000
2-	3	0.000	-743.234	473.447	-135.967	-673.819	466.967	-111.686
*	1	1.230	-225.239	368.820	-135.967	-163.796	362.340	-111.686
*	2	2.460	169.999	282.181	-135.967	223.472	275.700	-111.686
*	3	3.690	473.352	211.077	-135.967	518.855	204.597	-111.686
*	4	4.920	689.248	139.973	-135.967	726.780	133.493	-111.686
*	5	6.150	817.685	68.869	-135.967	847.247	62.389	-111.686
*	6	7.380	858.665	-2.235	-135.967	880.256	-8.715	-111.686
*	7	8.610	812.188	-73.339	-135.967	825.808	-79.819	-111.686
*	8	9.840	678.252	-144.443	-135.967	683.902	-150.923	-111.686
*	9	11.070	456.859	-215.546	-135.967	454.538	-222.027	-111.686
3-	2	12.300	148.008	-286.650	-135.967	137.717	-293.130	-111.686
3-	4	0.000	148.008	-286.650	-135.967	137.717	-293.130	-111.686
*	1	1.000	-167.900	-345.520	-135.967	-184.672	-352.000	-111.686
*	2	2.000	-543.740	-406.514	-135.967	-566.992	-412.994	-111.686
*	3	3.000	-981.636	-469.632	-135.967	-1011.368	-476.112	-111.686
*	4	4.000	-1483.713	-534.874	-135.967	-1519.925	-541.354	-111.686
4-	3	5.000	-2052.093	-602.240	-135.967	-2094.785	-608.720	-111.686
4-	5	0.000	-2068.042	603.586	-140.593	-2105.543	609.627	-114.809
*	1	1.000	-1498.316	536.220	-140.593	-1529.776	542.261	-114.809
*	2	2.000	-994.895	470.978	-140.593	-1020.313	477.019	-114.809
*	3	3.000	-555.653	407.860	-140.593	-575.030	413.901	-114.809
*	4	4.000	-178.467	346.866	-140.593	-191.803	352.907	-114.809
5-	4	5.000	138.786	287.996	-140.593	131.492	294.037	-114.809
5-	6	0.000	138.786	287.996	-140.593	131.492	294.037	-114.809
*	1	1.230	449.292	216.892	-140.593	449.429	222.933	-114.809
*	2	2.460	672.340	145.788	-140.593	679.908	151.829	-114.809
*	3	3.690	807.930	74.684	-140.593	822.929	80.726	-114.809
*	4	4.920	856.063	3.580	-140.593	878.493	9.622	-114.809
*	5	6.150	816.738	-67.524	-140.593	846.599	-61.482	-114.809
*	6	7.380	689.955	-138.627	-140.593	727.247	-132.586	-114.809
*	7	8.610	475.714	-209.731	-140.593	520.438	-203.690	-114.809
*	8	9.840	174.016	-280.835	-140.593	226.170	-274.794	-114.809
*	9	11.070	-219.567	-367.474	-140.593	-159.982	-361.433	-114.809
6-	5	12.300	-735.907	-472.102	-140.593	-668.891	-466.060	-114.809
6-	7	0.000	-116.217	129.130	0.000	-116.217	129.130	0.000
7-	6	1.800	0.000	0.000	0.000	0.000	0.000	0.000
2-	8	0.000	627.016	-135.967	-602.577	557.602	-111.686	-596.097
*	1	1.400	436.663	-135.967	-627.357	401.241	-111.686	-620.877
*	2	2.800	246.309	-135.967	-652.137	244.880	-111.686	-645.657
*	3	4.200	55.955	-135.967	-676.917	88.519	-111.686	-670.437
*	4	5.600	-134.398	-135.967	-701.697	-67.841	-111.686	-695.217
8-	2	7.000	-324.752	-135.967	-726.477	-224.202	-111.686	-719.997
4-	9	0.000	15.949	-4.626	-1205.826	10.758	-3.123	-1218.347
*	1	1.500	9.010	-4.626	-1232.376	6.074	-3.123	-1244.897
*	2	3.000	2.072	-4.626	-1258.926	1.389	-3.123	-1271.447
*	3	4.500	-4.867	-4.626	-1285.476	-3.295	-3.123	-1297.997
*	4	6.000	-11.806	-4.626	-1312.026	-7.980	-3.123	-1324.547
9-	4	7.500	-18.745	-4.626	-1338.576	-12.664	-3.123	-1351.097
6-	10	0.000	-619.690	140.593	-601.232	-552.673	114.809	-595.190
*	1	1.300	-436.919	140.593	-624.242	-403.421	114.809	-618.200
*	2	2.600	-254.149	140.593	-647.252	-254.169	114.809	-641.210
*	3	3.900	-71.378	140.593	-670.262	-104.917	114.809	-664.220
*	4	5.200	111.392	140.593	-693.272	44.335	114.809	-687.230
10-	6	6.500	294.163	140.593	-716.282	193.587	114.809	-710.240

Case 13

	No	L(m)	M (tm)	S (t)	N (t)
1-	2	0.000	0.000	0.000	0.000
2-	1	1.800	-116.217	-129.130	-10.329
2-	3	0.000	-448.942	362.537	-67.543
*	1	1.230	-57.288	274.298	-74.601
*	2	2.460	231.768	204.048	-80.221
*	3	3.690	449.097	149.332	-84.598
*	4	4.920	599.126	94.617	-88.974
*	5	6.150	681.855	39.902	-93.351
*	6	7.380	697.284	-14.814	-97.728
*	7	8.610	645.414	-69.529	-102.105
*	8	9.840	526.243	-124.244	-106.482
*	9	11.070	339.773	-178.959	-110.859
3-	2	12.300	86.003	-233.675	-115.235
3-	4	0.000	86.003	-233.675	-115.235
*	1	1.000	-170.268	-279.221	-118.879
*	2	2.000	-473.146	-326.891	-122.692
*	3	3.000	-824.757	-376.685	-126.676
*	4	4.000	-1227.224	-428.603	-130.830
4-	3	5.000	-1682.671	-482.645	-135.153
4-	5	0.000	-1485.025	454.205	-85.231
*	1	1.000	-1058.018	400.163	-89.555
*	2	2.000	-683.991	348.245	-93.708
*	3	3.000	-360.820	298.451	-97.692
*	4	4.000	-86.381	250.781	-101.505
5-	4	5.000	141.450	205.235	-105.149
5-	6	0.000	141.450	205.235	-105.149
*	1	1.230	360.239	150.520	-109.526
*	2	2.460	511.729	95.804	-113.902
*	3	3.690	595.918	41.089	-118.279
*	4	4.920	612.808	-13.626	-122.656
*	5	6.150	562.398	-68.342	-127.033
*	6	7.380	444.688	-123.057	-131.410
*	7	8.610	259.678	-177.772	-135.787
*	8	9.840	7.368	-232.487	-140.163
*	9	11.070	-316.669	-302.738	-145.783
6-	5	12.300	-743.304	-390.977	-152.841
6-	7	0.000	-116.217	129.130	10.329
7-	6	1.800	0.000	0.000	0.000
2-	8	0.000	332.725	-57.214	-491.668
*	1	1.400	254.013	-55.232	-516.448
*	2	2.800	178.076	-53.249	-541.228
*	3	4.200	104.915	-51.267	-566.008
*	4	5.600	34.530	-49.284	-590.788
8-	2	7.000	-33.081	-47.302	-615.568
4-	9	0.000	-197.646	49.923	-936.850
*	1	1.500	-121.169	52.047	-963.400
*	2	3.000	-41.506	54.171	-989.950
*	3	4.500	41.343	56.295	-1016.500
*	4	6.000	127.378	58.419	-1043.050
9-	4	7.500	216.599	60.543	-1069.600
6-	10	0.000	-627.087	163.170	-520.107
*	1	1.300	-413.769	165.011	-543.117
*	2	2.600	-198.058	166.852	-566.127
*	3	3.900	20.046	168.693	-589.137
*	4	5.200	240.543	170.533	-612.147
10-	6	6.500	463.433	172.374	-635.157

PICK-UP NO 1 (ULS)

No.	L (m)	M. MAXIMUM Case	M (tm)	S (t)	N (t)	M. MINIMUM Case	M (tm)	S (t)	N (t)
1 - 2	0.000	C- 6	0.000	0.000	0.000	C- 8	0.000	0.000	0.000
2 - 1	1.800	C- 8	-160.380	-178.200	0.000	C- 9	-160.380	-178.200	-17.043
2 - 3	0.000	C- 9	-581.366	496.537	-83.687	C- 6	-1118.112	707.883	-201.904
* 1	1.230	C- 9	-45.513	374.767	-95.333	C- 6	-340.090	557.193	-201.904
* 2	2.460	C- 9	348.754	277.821	-104.605	C- 7	246.835	406.741	-196.587
* 3	3.690	C- 6	727.084	326.899	-201.904	C- 9	644.036	202.314	-111.827
* 4	4.920	C- 6	1064.946	222.472	-201.904	C- 9	846.447	126.807	-119.049
* 5	6.150	C- 6	1274.364	118.044	-201.904	C- 9	955.983	51.300	-126.271
* 6	7.380	C- 6	1355.335	13.617	-201.904	C- 9	972.645	-24.207	-133.492
* 7	8.610	C- 6	1307.860	-90.811	-201.904	C- 9	896.434	-99.714	-140.714
* 8	9.840	C- 6	1131.940	-195.238	-201.904	C- 9	727.348	-175.221	-147.936
* 9	11.070	C- 6	827.574	-299.666	-201.904	C- 9	465.389	-250.729	-155.158
3 - 2	12.300	C- 6	394.762	-404.094	-201.904	C- 9	110.556	-326.236	-162.380
3 - 4	0.000	C- 6	394.762	-404.094	-201.904	C- 9	110.556	-326.236	-162.380
* 1	1.000	C- 6	-52.271	-490.459	-201.904	C- 8	-255.685	-486.085	-152.913
* 2	2.000	C- 6	-587.135	-579.757	-201.904	C- 7	-785.079	-580.252	-196.587
* 3	3.000	C- 9	-1157.586	-523.589	-181.256	C- 7	-1416.437	-676.933	-196.587
* 4	4.000	C- 9	-1716.755	-595.236	-188.110	C- 7	-2139.961	-770.584	-196.587
4 - 3	5.000	C- 9	-2349.036	-669.814	-195.244	C- 7	-2958.582	-867.147	-196.587
4 - 5	0.000	C- 9	-2019.665	622.614	-111.928	C- 7	-2981.643	869.092	-203.275
* 1	1.000	C- 9	-1434.584	548.036	-119.062	C- 7	-2161.076	772.530	-203.275
* 2	2.000	C- 9	-922.616	476.389	-125.915	C- 7	-1435.607	678.898	-203.275
* 3	3.000	C- 9	-480.829	407.674	-132.488	C- 7	-802.303	588.198	-203.275
* 4	4.000	C- 9	-106.292	341.889	-138.781	C- 6	-383.730	385.318	-143.953
5 - 4	5.000	C- 9	203.926	279.036	-144.792	C- 6	-30.083	322.465	-143.953
5 - 6	0.000	C- 9	203.926	279.036	-144.792	C- 6	-30.083	322.465	-143.953
* 1	1.230	C- 7	647.640	313.042	-203.275	C- 6	320.112	246.958	-143.953
* 2	2.460	C- 7	969.615	210.494	-203.275	C- 6	577.433	171.451	-143.953
* 3	3.690	C- 7	1165.455	107.946	-203.275	C- 6	741.881	95.944	-143.953
* 4	4.920	C- 7	1235.162	5.398	-203.275	C- 6	813.455	20.436	-143.953
* 5	6.150	C- 7	1178.734	-97.151	-203.275	C- 9	759.073	-98.500	-180.901
* 6	7.380	C- 8	1005.466	-182.667	-157.148	C- 9	591.481	-174.007	-188.123
* 7	8.610	C- 8	720.440	-280.790	-157.148	C- 9	331.015	-249.514	-195.345
* 8	9.840	C- 8	314.723	-378.913	-157.148	C- 9	-22.325	-325.022	-202.566
* 9	11.070	C- 8	-217.796	-498.475	-157.148	C- 9	-474.649	-421.968	-211.839
6 - 5	12.300	C- 6	-768.384	-500.308	-143.953	C- 9	-1068.557	-543.737	-223.485
6 - 7	0.000	C- 8	-160.380	178.200	0.000	C- 6	-160.380	178.200	0.000
7 - 6	1.800	C- 6	0.000	0.000	0.000	C- 9	0.000	0.000	0.000
2 - 8	0.000	C- 6	957.732	-201.904	-886.083	C- 9	420.986	-66.644	-674.737
* 1	1.400	C- 6	675.067	-201.904	-920.279	C- 9	329.974	-63.373	-708.933
* 2	2.800	C- 6	392.402	-201.904	-954.476	C- 9	243.541	-60.102	-743.130
* 3	4.200	C- 9	161.687	-56.831	-777.326	C- 7	80.904	-196.587	-960.327
* 4	5.600	C- 9	84.413	-53.560	-811.522	C- 7	-194.318	-196.587	-994.524
8 - 2	7.000	C- 9	11.718	-50.289	-845.719	C- 7	-469.539	-196.587	-1028.720
4 - 9	0.000	C- 7	23.061	-6.688	-1730.239	C- 9	-329.371	83.317	-1292.428
* 1	1.500	C- 7	13.028	-6.688	-1772.878	C- 9	-201.707	80.821	-1329.067
* 2	3.000	C- 7	2.996	-6.688	-1809.517	C- 6	-103.352	57.951	-1604.556
* 3	4.500	C- 9	69.210	93.830	-1402.345	C- 6	-16.420	57.951	-1641.195
* 4	6.000	C- 9	212.584	97.335	-1438.984	C- 7	-17.069	-6.688	-1882.795
9 - 4	7.500	C- 9	361.215	100.840	-1475.623	C- 7	-27.101	-6.688	-1919.434
6 - 10	0.000	C- 6	-608.004	143.953	-678.308	C- 9	-908.177	240.528	-721.937
* 1	1.300	C- 6	-420.865	143.953	-710.261	C- 7	-631.715	203.275	-887.546
* 2	2.600	C- 6	-233.727	143.953	-742.015	C- 7	-367.458	203.275	-919.300
* 3	3.900	C- 9	47.649	249.640	-817.198	C- 8	-146.463	157.148	-916.322
* 4	5.200	C- 9	374.155	252.677	-848.952	C- 6	57.829	157.148	-948.076
10 - 6	6.500	C- 9	704.609	255.714	-880.706	C- 8	262.121	157.148	-979.830

PICK-UP NO.1

		S. MAXIMUM				S. MINIMUM			
No.	L (m)	Case	M (tm)	S (t)	N (t)	Case	M (tm)	S (t)	N (t)
1 - 2	0.000	C- 8	0.000	0.000	0.000	C- 6	0.000	0.000	0.000
2 - 1	1.800	C- 8	-160.380	-178.200	0.000	C- 6	-160.380	-178.200	0.000
2 - 3	0.000	C- 6	-1118.112	707.883	-201.904	C- 9	-581.366	496.537	-83.687
* 1	1.230	C- 6	-340.090	557.193	-201.904	C- 9	-45.513	374.707	-95.333
* 2	2.460	C- 6	260.775	431.327	-201.904	C- 9	348.754	277.821	-104.605
* 3	3.690	C- 6	727.084	326.899	-201.904	C- 9	644.038	202.314	-111.827
* 4	4.920	C- 6	1064.946	222.472	-201.904	C- 9	846.447	126.807	-119.049
* 5	6.150	C- 6	1274.364	118.044	-201.904	C- 9	955.983	51.300	-126.271
* 6	7.380	C- 6	1355.335	13.617	-201.904	C- 9	972.645	-24.207	-133.492
* 7	8.610	C- 6	1307.860	-90.811	-201.904	C- 8	1140.296	-110.474	-152.913
* 8	9.840	C- 9	727.348	-175.221	-147.936	C- 8	944.067	-208.597	-152.913
* 9	11.070	C- 9	465.389	-250.729	-155.158	C- 7	658.581	-311.097	-196.587
3 - 2	12.300	C- 9	110.556	-326.236	-162.380	C- 7	212.865	-413.645	-196.587
3 - 4	0.000	C- 9	110.556	-326.236	-162.380	C- 7	212.865	-413.645	-196.587
* 1	1.000	C- 9	-246.862	-389.089	-168.391	C- 7	-242.955	-498.483	-196.587
* 2	2.000	C- 9	-658.599	-454.874	-174.684	C- 7	-785.079	-586.252	-196.587
* 3	3.000	C- 9	-1157.586	-523.589	-181.256	C- 7	-1416.437	-676.953	-196.587
* 4	4.000	C- 9	-1716.755	-595.236	-188.110	C- 7	-2139.961	-770.584	-196.587
4 - 3	5.000	C- 9	-2349.036	-669.814	-195.244	C- 7	-2958.582	-867.147	-196.587
4 - 5	0.000	C- 7	-2981.643	869.092	-203.275	C- 9	-2019.665	622.614	-111.928
* 1	1.000	C- 7	-2161.076	772.530	-203.275	C- 9	-1434.584	548.036	-119.062
* 2	2.000	C- 7	-1435.607	678.898	-203.275	C- 9	-922.616	476.389	-125.915
* 3	3.000	C- 7	-802.303	588.198	-203.275	C- 9	-480.829	407.674	-132.488
* 4	4.000	C- 7	-258.234	500.429	-203.275	C- 9	-106.292	341.889	-138.781
5 - 4	5.000	C- 7	199.531	415.590	-203.275	C- 9	203.926	279.036	-144.792
5 - 6	0.000	C- 7	199.531	415.590	-203.275	C- 9	203.926	279.036	-144.792
* 1	1.230	C- 7	647.640	313.042	-203.275	C- 9	500.703	203.528	-152.014
* 2	2.460	C- 7	969.615	210.494	-203.275	C- 9	704.606	128.021	-159.236
* 3	3.690	C- 8	1136.393	111.703	-157.148	C- 9	815.635	52.514	-166.458
* 4	4.920	C- 6	813.455	20.436	-143.953	C- 9	833.791	-22.993	-173.679
* 5	6.150	C- 6	792.155	-55.071	-143.953	C- 9	759.073	-98.500	-180.901
* 6	7.380	C- 6	677.981	-130.578	-143.953	C- 7	996.171	-199.699	-203.275
* 7	8.610	C- 6	470.933	-206.085	-143.953	C- 7	687.473	-302.247	-203.275
* 8	9.840	C- 6	171.012	-281.592	-143.953	C- 7	252.644	-404.795	-203.275
* 9	11.070	C- 6	-227.894	-378.538	-143.953	C- 7	-314.431	-528.782	-203.275
6 - 5	12.300	C- 6	-768.384	-500.308	-143.953	C- 7	-1056.352	-677.593	-203.275
6 - 7	0.000	C- 6	-160.380	178.200	0.000	C- 8	-160.380	178.200	0.000
7 - 6	1.800	C- 6	0.000	0.000	0.000	C- 8	0.000	0.000	0.000
2 - 8	0.000	C- 9	420.986	-66.644	-674.737	C- 6	957.732	-201.904	-886.083
* 1	1.400	C- 9	329.974	-63.373	-708.933	C- 6	675.067	-201.904	-920.279
* 2	2.800	C- 9	243.541	-60.102	-743.130	C- 6	392.402	-201.904	-954.476
* 3	4.200	C- 9	161.687	-56.831	-777.326	C- 6	109.737	-201.904	-988.672
* 4	5.600	C- 9	84.413	-53.560	-811.522	C- 6	-172.928	-201.904	-1022.868
8 - 2	7.000	C- 9	11.718	-50.289	-845.719	C- 6	-455.593	-201.904	-1057.065
4 - 9	0.000	C- 9	-329.371	83.317	-1292.428	C- 7	23.061	-6.688	-1736.239
* 1	1.500	C- 9	-201.767	86.821	-1329.067	C- 7	13.028	-6.688	-1772.878
* 2	3.000	C- 9	-68.907	90.326	-1365.706	C- 7	2.996	-6.688	-1809.517
* 3	4.500	C- 9	69.210	93.830	-1402.345	C- 7	-7.036	-6.688	-1846.156
* 4	6.000	C- 9	212.584	97.335	-1438.984	C- 7	-17.069	-6.688	-1882.795
9 - 4	7.500	C- 9	361.215	100.840	-1475.623	C- 7	-27.101	-6.688	-1919.434
6 - 10	0.000	C- 9	-908.177	240.528	-721.937	C- 6	-608.004	143.953	-678.506
* 1	1.300	C- 9	-593.517	243.565	-753.691	C- 6	-420.865	143.953	-710.261
* 2	2.600	C- 9	-274.908	246.602	-785.445	C- 6	-233.727	143.953	-742.015
* 3	3.900	C- 9	47.649	249.640	-817.198	C- 6	-46.588	143.953	-773.769
* 4	5.200	C- 9	374.155	252.677	-848.952	C- 6	140.550	143.953	-805.523
10 - 6	6.500	C- 9	704.609	255.714	-880.706	C- 6	327.689	143.953	-837.277

No.	L (m)	N. MAXIMUM Case	M (tm)	S (t)	N (t)	N. MINIMUM Case	M (tm)	S (t)	N (t)
1 - 2	0.000	C- 9	0.000	0.000	0.000	C- 6	0.000	0.000	0.000
2 - 1	1.800	C- 6	-160.380	-178.200	0.000	C- 9	-160.380	-178.200	-17.043
2 - 3	0.000	C- 9	-581.366	496.537	-83.687	C- 6	-1118.112	707.883	-201.904
* 1	1.230	C- 9	-45.513	374.767	-95.333	C- 6	-340.090	557.193	-201.904
* 2	2.460	C- 9	348.754	277.821	-104.605	C- 6	260.775	431.327	-201.904
* 3	3.690	C- 9	644.038	202.314	-111.827	C- 6	727.084	326.899	-201.904
* 4	4.920	C- 9	846.447	126.807	-119.049	C- 6	1064.946	222.472	-201.904
* 5	6.150	C- 9	955.983	51.300	-126.271	C- 6	1274.364	118.044	-201.904
* 6	7.380	C- 9	972.645	-24.207	-133.492	C- 6	1355.335	13.617	-201.904
* 7	8.610	C- 9	896.434	-99.714	-140.714	C- 6	1307.860	-90.811	-201.904
* 8	9.840	C- 9	727.348	-175.221	-147.936	C- 6	1131.940	-195.238	-201.904
* 9	11.070	C- 8	627.147	-306.721	-152.913	C- 6	827.574	-299.666	-201.904
3 - 2	12.300	C- 8	189.535	-404.844	-152.913	C- 6	394.762	-404.094	-201.904
3 - 4	0.000	C- 8	189.535	-404.844	-152.913	C- 6	394.762	-404.094	-201.904
* 1	1.000	C- 8	-255.685	-486.085	-152.913	C- 6	-52.271	-490.459	-201.904
* 2	2.000	C- 8	-783.612	-570.256	-152.913	C- 6	-587.135	-579.757	-201.904
* 3	3.000	C- 8	-1397.175	-657.359	-152.913	C- 6	-1212.761	-671.985	-201.904
* 4	4.000	C- 8	-2099.307	-747.393	-152.913	C- 6	-1932.081	-767.144	-201.904
4 - 3	5.000	C- 8	-2892.938	-840.358	-152.913	C- 6	-2748.026	-865.235	-201.904
4 - 5	0.000	C- 9	-2019.665	622.614	-111.928	C- 7	-2981.643	809.092	-203.275
* 1	1.000	C- 9	-1434.584	548.036	-119.062	C- 7	-2161.076	772.530	-203.275
* 2	2.000	C- 9	-922.616	476.389	-125.916	C- 7	-1435.607	678.898	-203.275
* 3	3.000	C- 9	-480.829	407.674	-132.488	C- 7	-802.303	588.198	-203.275
* 4	4.000	C- 9	-106.292	341.889	-138.781	C- 7	-258.234	500.429	-203.275
5 - 4	5.000	C- 6	-30.083	322.465	-143.953	C- 7	199.531	415.590	-203.275
5 - 6	0.000	C- 6	-30.083	322.465	-143.953	C- 7	199.531	415.590	-203.275
* 1	1.230	C- 6	320.112	246.958	-143.953	C- 7	647.640	313.042	-203.275
* 2	2.460	C- 6	577.433	171.451	-143.953	C- 7	969.615	210.494	-203.275
* 3	3.690	C- 6	741.881	95.944	-143.953	C- 7	1165.455	107.946	-203.275
* 4	4.920	C- 6	813.455	20.436	-143.953	C- 7	1235.162	5.398	-203.275
* 5	6.150	C- 6	792.155	-55.071	-143.953	C- 7	1178.734	-97.151	-203.275
* 6	7.380	C- 6	677.981	-130.578	-143.953	C- 7	996.171	-199.699	-203.275
* 7	8.610	C- 6	470.933	-206.085	-143.953	C- 7	687.475	-302.247	-203.275
* 8	9.840	C- 6	171.012	-281.592	-143.953	C- 7	252.644	-404.795	-203.275
* 9	11.070	C- 6	-227.894	-378.538	-143.953	C- 9	-474.649	-421.958	-211.839
6 - 5	12.300	C- 6	-768.384	-500.308	-143.953	C- 9	-1068.557	-543.737	-220.485
6 - 7	0.000	C- 9	-160.380	178.200	17.043	C- 6	-160.380	178.200	0.000
7 - 6	1.800	C- 6	0.000	0.000	0.000	C- 9	0.000	0.000	0.000
2 - 8	0.000	C- 9	420.986	-66.644	-674.737	C- 6	957.732	-201.904	-886.083
* 1	1.400	C- 9	329.974	-63.373	-708.933	C- 6	675.067	-201.904	-920.279
* 2	2.800	C- 9	243.541	-60.102	-743.130	C- 6	392.402	-201.904	-954.476
* 3	4.200	C- 9	161.687	-56.831	-777.326	C- 6	109.737	-201.904	-988.672
* 4	5.600	C- 9	84.413	-53.560	-811.522	C- 6	-172.928	-201.904	-1022.868
8 - 2	7.000	C- 9	11.718	-50.289	-845.719	C- 6	-455.593	-201.904	-1057.065
4 - 9	0.000	C- 9	-329.371	83.317	-1292.428	C- 7	23.061	-6.688	-1736.239
* 1	1.500	C- 9	-201.767	86.821	-1329.067	C- 7	13.028	-6.688	-1772.878
* 2	3.000	C- 9	-68.907	90.326	-1365.706	C- 7	2.996	-6.688	-1809.517
* 3	4.500	C- 9	69.210	93.830	-1402.345	C- 7	-7.036	-6.688	-1846.156
* 4	6.000	C- 9	212.584	97.335	-1438.984	C- 7	-17.069	-6.688	-1882.795
9 - 4	7.500	C- 9	361.215	100.840	-1475.623	C- 7	-27.101	-6.688	-1919.434
6 - 10	0.000	C- 6	-608.004	143.953	-678.508	C- 7	-895.977	203.275	-855.793
* 1	1.300	C- 6	-420.865	143.953	-710.261	C- 7	-631.715	203.275	-887.546
* 2	2.600	C- 6	-233.727	143.953	-742.013	C- 7	-367.458	203.275	-919.300
* 3	3.900	C- 6	-46.588	143.953	-773.769	C- 7	-103.201	203.275	-951.054
* 4	5.200	C- 6	140.550	143.953	-805.523	C- 7	161.057	203.275	-982.808
10 - 6	6.500	C- 6	327.689	143.953	-837.277	C- 7	425.314	203.275	-1014.562

No.	L (m)	M. MAXIMUM Case	M (tm)	S (t)	X (t)	M. MINIMUM Case	M (tm)	S (t)	X (t)
1 - 2	0.000	C-10	0.000	0.000	0.000	C-12	0.000	0.000	0.000
2 - 1	1.800	C-12	-116.217	-129.130	0.000	C-13	-116.217	-129.130	-10.329
2 - 3	0.000	C-13	-448.942	362.537	-67.543	C-10	-774.243	490.626	-139.189
* 1	1.230	C-13	-57.288	274.298	-74.601	C-10	-235.819	384.859	-139.189
* 2	2.460	C-13	231.768	204.048	-80.223	C-11	169.999	282.181	-135.967
* 3	3.690	C-12	518.855	204.597	-111.686	C-13	449.097	149.332	-84.598
* 4	4.920	C-10	731.550	152.596	-139.189	C-13	599.126	94.617	-68.574
* 5	6.150	C-10	874.813	80.353	-139.189	C-13	681.855	39.902	-93.351
* 6	7.380	C-10	929.217	8.110	-139.189	C-13	697.284	-14.814	-97.728
* 7	8.610	C-10	894.763	-64.133	-139.189	C-13	645.414	-69.529	-102.105
* 8	9.840	C-10	771.450	-136.376	-139.189	C-13	526.243	-124.244	-106.482
* 9	11.070	C-10	559.279	-208.619	-139.189	C-13	339.773	-178.959	-110.859
3 - 2	12.300	C-10	258.249	-280.861	-139.189	C-13	86.003	-233.675	-115.235
3 - 4	0.000	C-10	258.249	-280.861	-139.189	C-13	86.003	-233.675	-115.235
* 1	1.000	C-10	-52.334	-340.657	-139.189	C-12	-184.672	-352.000	-111.686
* 2	2.000	C-10	-423.774	-402.577	-139.189	C-12	-506.992	-412.994	-111.686
* 3	3.000	C-13	-824.757	-370.685	-126.676	C-12	-1011.368	-470.112	-111.686
* 4	4.000	C-13	-1227.224	-428.603	-130.830	C-12	-1519.925	-541.554	-111.686
4 - 3	5.000	C-13	-1682.671	-482.645	-135.153	C-12	-2094.765	-606.720	-111.686
4 - 5	0.000	C-13	-1485.025	454.205	-85.231	C-12	-2105.543	609.627	-114.809
* 1	1.000	C-13	-1058.018	400.163	-89.555	C-12	-1529.776	542.261	-114.809
* 2	2.000	C-13	-683.991	348.245	-93.708	C-12	-1020.313	477.019	-114.809
* 3	3.000	C-13	-360.820	298.451	-97.692	C-12	-575.030	413.901	-114.809
* 4	4.000	C-13	-86.381	250.781	-101.505	C-10	-254.525	277.102	-104.640
5 - 4	5.000	C-13	141.450	205.235	-105.149	C-10	-0.374	231.556	-104.640
5 - 6	0.000	C-13	141.450	205.235	-105.149	C-10	-0.374	231.556	-104.640
* 1	1.230	C-12	449.429	222.933	-114.809	C-10	250.790	176.841	-104.640
* 2	2.460	C-12	679.908	151.829	-114.809	C-10	434.654	122.125	-104.640
* 3	3.690	C-12	822.629	80.726	-114.809	C-10	551.219	67.410	-104.640
* 4	4.920	C-12	878.493	9.622	-114.809	C-10	600.483	12.695	-104.640
* 5	6.150	C-12	846.599	-61.482	-114.809	C-13	582.398	-68.342	-127.033
* 6	7.380	C-12	727.247	-132.586	-114.809	C-13	444.688	-123.057	-131.410
* 7	8.610	C-12	520.438	-203.690	-114.809	C-13	259.678	-177.772	-135.787
* 8	9.840	C-12	226.170	-274.794	-114.809	C-13	7.368	-232.487	-140.163
* 9	11.070	C-12	-159.982	-361.433	-114.809	C-13	-316.669	-302.738	-145.783
6 - 5	12.300	C-10	-561.381	-364.656	-104.640	C-13	-743.304	-390.977	-152.841
6 - 7	0.000	C-12	-116.217	129.130	0.000	C-10	-116.217	129.130	0.000
7 - 6	1.800	C-10	0.000	0.000	0.000	C-13	0.000	0.000	0.000
2 - 8	0.000	C-10	658.020	-139.189	-619.756	C-13	332.725	-57.214	-491.668
* 1	1.400	C-10	463.160	-139.189	-644.536	C-13	254.013	-55.232	-510.448
* 2	2.800	C-10	268.295	-139.189	-669.316	C-13	178.076	-53.249	-541.228
* 3	4.200	C-13	104.915	-51.267	-566.008	C-11	55.955	-135.967	-676.917
* 4	5.600	C-13	34.530	-49.284	-590.788	C-11	-134.398	-135.967	-701.697
8 - 2	7.000	C-13	-33.081	-47.302	-615.568	C-11	-324.752	-135.967	-726.477
4 - 9	0.000	C-11	15.949	-4.626	-1205.826	C-13	-197.046	49.923	-936.850
* 1	1.500	C-11	9.010	-4.626	-1232.376	C-13	-121.169	52.047	-963.400
* 2	3.000	C-11	2.072	-4.626	-1258.926	C-10	-62.382	34.549	-1134.707
* 3	4.500	C-13	41.343	56.295	-1016.500	C-10	-10.558	34.549	-1161.257
* 4	6.000	C-13	127.378	58.419	-1043.050	C-11	-11.806	-4.626	-1312.026
9 - 4	7.500	C-13	216.599	60.543	-1069.600	C-11	-18.748	-4.626	-1338.576
6 - 10	0.000	C-10	-445.163	104.640	-493.786	C-13	-627.087	163.170	-520.107
* 1	1.300	C-10	-309.131	104.640	-516.796	C-11	-436.919	140.593	-624.242
* 2	2.600	C-10	-173.100	104.640	-539.806	C-12	-254.169	114.809	-641.230
* 3	3.900	C-13	20.046	168.693	-569.137	C-12	-104.917	114.809	-664.220
* 4	5.200	C-13	240.543	170.533	-612.147	C-12	44.335	114.809	-687.230
10 - 6	6.500	C-13	463.433	172.374	-635.157	C-12	193.587	114.809	-710.240

PICK-UP NO 2

No.	L (m)	S.MAXIMUM Case	M (tm)	S (t)	N (t)	S.MINIMUM Case	M (tm)	S (t)	N (t)
1 - 2	0.000	C-12	0.000	0.000	0.000	C-10	0.000	0.000	0.000
2 - 1	1.800	C-12	-116.217	-129.130	0.000	C-10	-116.217	-129.130	0.000
2 - 3	0.000	C-10	-774.243	490.626	-139.189	C-13	-448.842	362.337	-67.543
* 1	1.230	C-10	-235.819	384.859	-139.189	C-13	-57.288	274.298	-74.601
* 2	2.460	C-10	178.447	297.081	-139.189	C-13	231.768	204.048	-80.221
* 3	3.690	C-10	499.428	224.838	-139.189	C-13	449.097	149.332	-84.598
* 4	4.920	C-10	731.550	152.596	-139.189	C-13	599.126	94.617	-88.974
* 5	6.150	C-10	874.813	80.353	-139.189	C-13	681.855	39.902	-93.351
* 6	7.380	C-10	929.217	8.110	-139.189	C-13	697.284	-14.814	-97.728
* 7	8.610	C-10	894.763	-64.133	-139.189	C-12	825.808	-79.819	-111.686
* 8	9.840	C-13	526.243	-124.244	-106.482	C-12	683.902	-150.923	-111.686
* 9	11.070	C-13	339.773	-178.959	-110.859	C-12	454.538	-222.027	-111.686
3 - 2	12.300	C-13	86.003	-233.675	-115.235	C-12	137.717	-293.130	-111.686
3 - 4	0.000	C-13	86.003	-233.675	-115.235	C-12	137.717	-293.130	-111.686
* 1	1.000	C-13	-170.268	-279.221	-118.879	C-12	-184.672	-352.000	-111.686
* 2	2.000	C-13	-473.146	-326.891	-122.692	C-12	-500.992	-412.994	-111.686
* 3	3.000	C-13	-824.757	-376.686	-126.076	C-12	-1011.368	-476.112	-111.686
* 4	4.000	C-13	-1227.224	-428.603	-130.830	C-12	-1519.925	-541.354	-111.686
4 - 3	5.000	C-13	-1682.671	-482.648	-135.153	C-12	-2094.782	-608.720	-111.686
4 - 5	0.000	C-12	-2105.543	609.627	-114.809	C-13	-1485.025	454.205	-85.231
* 1	1.000	C-12	-1529.776	542.201	-114.809	C-13	-1058.018	400.163	-89.555
* 2	2.000	C-12	-1020.313	477.019	-114.809	C-13	-683.991	348.245	-93.708
* 3	3.000	C-12	-575.030	413.901	-114.809	C-13	-360.820	298.457	-97.692
* 4	4.000	C-12	-191.803	352.907	-114.809	C-13	-80.381	250.781	-101.505
5 - 4	5.000	C-12	131.492	294.037	-114.809	C-13	141.450	205.235	-105.149
5 - 6	0.000	C-12	131.492	294.037	-114.809	C-13	141.450	205.235	-105.149
* 1	1.230	C-12	449.429	222.933	-114.809	C-13	360.239	150.520	-109.320
* 2	2.460	C-12	679.908	151.829	-114.809	C-13	511.729	95.804	-113.902
* 3	3.690	C-12	822.929	80.726	-114.809	C-13	595.918	41.089	-118.279
* 4	4.920	C-10	600.483	12.695	-104.640	C-13	612.808	-13.626	-122.656
* 5	6.150	C-10	582.448	-42.021	-104.640	C-13	562.398	-68.342	-127.033
* 6	7.380	C-10	497.112	-96.736	-104.640	C-11	689.955	-138.027	-140.593
* 7	8.610	C-10	344.477	-151.451	-104.640	C-11	475.714	-209.731	-140.593
* 8	9.840	C-10	124.542	-206.167	-104.640	C-11	174.016	-280.835	-140.593
* 9	11.070	C-10	-167.120	-276.417	-104.640	C-11	-219.567	-367.474	-140.593
6 - 5	12.300	C-10	-561.381	-364.656	-104.640	C-11	-735.907	-472.102	-140.593
6 - 7	0.000	C-10	-116.217	129.130	0.000	C-12	-116.217	129.130	0.000
7 - 6	1.800	C-10	0.000	0.000	0.000	C-12	0.000	0.000	0.000
2 - 8	0.000	C-13	332.725	-57.214	-491.668	C-10	658.026	-139.189	-619.730
* 1	1.400	C-13	254.013	-55.232	-516.448	C-10	468.160	-139.189	-644.530
* 2	2.800	C-13	178.076	-33.249	-541.228	C-10	268.293	-139.189	-669.310
* 3	4.200	C-13	104.915	-51.267	-566.008	C-10	73.430	-139.189	-694.090
* 4	5.600	C-13	34.530	-49.284	-590.788	C-10	-121.435	-139.189	-718.870
8 - 2	7.000	C-13	-33.081	-47.302	-615.568	C-10	-316.300	-139.189	-743.650
4 - 9	0.000	C-13	-197.646	49.923	-936.850	C-11	15.949	-4.626	-1205.826
* 1	1.500	C-13	-121.169	52.047	-963.400	C-11	9.010	-4.626	-1232.376
* 2	3.000	C-13	-41.506	54.171	-989.950	C-11	2.072	-4.626	-1258.926
* 3	4.500	C-13	41.343	56.295	-1016.500	C-11	-4.867	-4.626	-1285.476
* 4	6.000	C-13	127.378	58.419	-1043.050	C-11	-11.806	-4.626	-1312.026
9 - 4	7.500	C-13	216.599	60.543	-1069.600	C-11	-18.745	-4.626	-1338.576
6 - 10	0.000	C-13	-627.087	163.170	-520.107	C-10	-445.163	104.640	-493.780
* 1	1.300	C-13	-413.769	165.011	-543.117	C-10	-309.131	104.640	-516.790
* 2	2.600	C-13	-198.058	166.852	-566.127	C-10	-173.100	104.640	-539.805
* 3	3.900	C-13	20.046	168.693	-589.137	C-10	-37.068	104.640	-562.819
* 4	5.200	C-13	240.543	170.533	-612.147	C-10	98.964	104.640	-585.829
10 - 6	6.500	C-13	463.463	172.374	-635.157	C-10	234.996	104.640	-608.839

No.	L (m)	N. MAXIMUM Case	M (tm)	S (t)	N (t)	N. MINIMUM Case	M (tm)	S (t)	N (t)
1 - 2	0.000	C-13	0.000	0.000	0.000	C-10	0.000	0.000	0.000
2 - 1	1.800	C-10	-116.217	-129.130	0.000	C-13	-116.217	-129.130	-10.329
2 - 3	0.000	C-13	-448.942	362.537	-67.543	C-10	-774.243	490.626	-139.189
* 1	1.230	C-13	-57.288	274.298	-74.601	C-10	-235.819	384.859	-139.189
* 2	2.460	C-13	231.768	204.048	-80.221	C-10	178.447	297.081	-139.189
* 3	3.690	C-13	449.097	149.332	-84.598	C-10	499.428	224.858	-139.189
* 4	4.920	C-13	599.126	94.617	-88.974	C-10	731.550	152.596	-139.189
* 5	6.150	C-13	681.855	39.902	-93.351	C-10	874.813	80.353	-139.189
* 6	7.380	C-13	697.284	-14.814	-97.728	C-10	929.217	8.110	-139.189
* 7	8.610	C-13	645.414	-69.529	-102.105	C-10	894.763	-64.133	-139.189
* 8	9.840	C-13	526.243	-124.244	-106.482	C-10	771.450	-136.376	-139.189
* 9	11.070	C-13	339.773	-178.959	-110.859	C-10	559.279	-208.619	-139.189
3 - 2	12.300	C-12	137.717	-293.130	-111.686	C-10	258.249	-280.861	-139.189
3 - 4	0.000	C-12	137.717	-293.130	-111.686	C-10	258.249	-280.861	-139.189
* 1	1.000	C-12	-184.672	-352.000	-111.686	C-10	-52.334	-340.037	-139.189
* 2	2.000	C-12	-566.992	-412.994	-111.686	C-10	-423.774	-402.577	-139.189
* 3	3.000	C-12	-1011.368	-476.112	-111.686	C-10	-858.196	-466.621	-139.189
* 4	4.000	C-12	-1519.925	-541.354	-111.686	C-10	-1357.725	-532.789	-139.189
4 - 3	5.000	C-12	-2094.785	-608.720	-111.686	C-10	-1924.483	-601.081	-139.189
4 - 5	0.000	C-13	-1485.025	454.205	-85.231	C-11	-2068.042	603.586	-140.593
* 1	1.000	C-13	-1058.018	400.163	-89.553	C-11	-1498.316	536.220	-140.593
* 2	2.000	C-13	-683.991	348.245	-93.708	C-11	-994.895	470.978	-140.593
* 3	3.000	C-13	-360.820	298.451	-97.692	C-11	-555.653	407.860	-140.593
* 4	4.000	C-13	-86.381	250.781	-101.505	C-11	-178.467	346.866	-140.593
5 - 4	5.000	C-10	-0.374	231.556	-104.640	C-11	138.786	287.996	-140.593
5 - 6	0.000	C-10	-0.374	231.556	-104.640	C-11	138.786	287.996	-140.593
* 1	1.230	C-10	250.790	176.841	-104.640	C-11	449.292	216.892	-140.593
* 2	2.460	C-10	434.654	122.125	-104.640	C-11	672.540	145.788	-140.593
* 3	3.690	C-10	551.219	67.410	-104.640	C-11	807.930	74.684	-140.593
* 4	4.920	C-10	600.483	12.695	-104.640	C-11	856.063	3.580	-140.593
* 5	6.150	C-10	582.448	-42.021	-104.640	C-11	816.738	-67.524	-140.593
* 6	7.380	C-10	497.112	-96.736	-104.640	C-11	689.955	-138.627	-140.593
* 7	8.610	C-10	344.477	-151.451	-104.640	C-11	475.714	-209.731	-140.593
* 8	9.840	C-10	124.542	-206.167	-104.640	C-11	174.016	-280.835	-140.593
* 9	11.070	C-10	-167.120	-276.417	-104.640	C-13	-316.669	-302.738	-145.783
6 - 5	12.300	C-10	-561.381	-364.656	-104.640	C-13	-743.304	-390.977	-152.841
6 - 7	0.000	C-13	-116.217	129.130	10.329	C-10	-116.217	129.130	0.000
7 - 6	1.800	C-10	0.000	0.000	0.000	C-13	0.000	0.000	0.000
2 - 8	0.000	C-13	332.725	-57.214	-491.668	C-10	658.026	-139.189	-619.736
* 1	1.400	C-13	254.013	-55.232	-516.448	C-10	463.160	-139.189	-644.536
* 2	2.800	C-13	178.076	-53.249	-541.228	C-10	268.293	-139.189	-669.316
* 3	4.200	C-13	104.915	-51.267	-566.008	C-10	73.430	-139.189	-694.096
* 4	5.600	C-13	34.530	-49.284	-590.788	C-10	-121.435	-139.189	-718.876
8 - 2	7.000	C-13	-33.081	-47.302	-615.568	C-10	-316.300	-139.189	-743.656
4 - 9	0.000	C-13	-197.646	49.923	-936.850	C-12	10.738	-3.123	-1218.347
* 1	1.500	C-13	-121.169	52.047	-963.400	C-12	6.074	-3.123	-1244.897
* 2	3.000	C-13	-41.506	54.171	-989.950	C-12	1.389	-3.123	-1271.447
* 3	4.500	C-13	41.343	56.295	-1016.500	C-12	-3.295	-3.123	-1297.997
* 4	6.000	C-13	127.378	58.419	-1043.050	C-12	-7.980	-3.123	-1324.547
9 - 4	7.500	C-13	216.599	60.543	-1069.600	C-12	-12.664	-3.123	-1351.097
6 - 10	0.000	C-10	-445.163	104.640	-493.786	C-11	-619.090	140.593	-601.232
* 1	1.300	C-10	-309.131	104.640	-516.796	C-11	-436.919	140.593	-624.242
* 2	2.600	C-10	-173.100	104.640	-539.806	C-11	-254.149	140.593	-647.252
* 3	3.900	C-10	-37.068	104.640	-562.816	C-11	-71.378	140.593	-670.262
* 4	5.200	C-10	98.964	104.640	-585.826	C-11	111.392	140.593	-693.272
10 - 6	6.500	C-10	234.996	104.640	-608.836	C-11	294.163	140.593	-716.282

No.① PEDESTRIAN BRIDGE －Superstructure

1. Calculation of bending moment for U.L.S.

1) For middle point of first span … Mu.max = 1355.4^{KNm}

section　　b =360^{cm}　h =50　d =43.0　　d´=7.0

As = $Y_{25}-29^{NO}$ = 4.909×29 =142.361 cm^2

$$\chi = \frac{0.87\times 41000 \times 142.361}{0.40\times 3000\times 360} = 11.8^{cm}$$

$$Z = 43.0-\frac{11.8}{2} = 37.1^{cm} < 0.95\times 43.0 = 40.8^{cm} \quad OK$$

$M_{RS}=0.87\times 41000 \times 142.361 \times 37.1\times 10^{-5}=1884.0^{KNm} > 1355.4^{KNm}$

$M_{RC}=0.40\times 3000\times 360 \times 11.8\times 37.1\times 10^{-5}=1891.2^{KNm} > 1355.4^{KNm}$ OK

2) For middle fulcrum　　… Mu.min =－2981.7^{KNm}

section　　b =360^{cm}　h =62.5　d=56.0　　d´=6.5

As = $Y_{32}-29^{NO}$ = 8.042×29 =233.218 cm^2

$$\chi = \frac{0.87\times 41000 \times 233.218}{0.40\times 3000\times 360} = 19.4^{cm}$$

$$Z = 56.0-\frac{19.4}{2} = 46.3^{cm} < 0.95\times 56.0 = 53.2^{cm} \quad OK$$

$M_{RS}=0.87\times 41000 \times 233.218 \times 46.3\times 10^{-5}=3851.6^{KNm} > M=2981.7^{KNm}$

$M_{RC}=0.40\times 3000\times 360 \times 19.4\times 46.3\times 10^{-5}=3880.3^{KNm} > M=2981.7^{KNm}$ OK

2. Calculation of bending moment for S.L.S.

1) For middle point of first span ··· Ms.max = 929.3 KNm

section b = 360cm h = 50 d = 43.0 d´ = 7.0

$As = Y_{25} - 29^{NO} = 4.909 \times 29 = 142.361\ cm^2$

$$\chi = \frac{2 \times 0.80 \times 41000 \times 142.361}{0.50 \times 3000 \times 360} = 17.4^{cm}$$

$$Z = 43.0 - \frac{17.4}{3} = 37.2^{cm}$$

$M_{RS} = 0.80 \times 41000 \times 142.361 \times 37.2 \times 10^{-5} = 1737.0^{KNm} > M = 929.3\ ^{KNm}$

$$M_{RC} = \frac{1}{2} \times 0.50 \times 3000 \times 360 \times 17.4 \times 37.2 \times 10^{-5}$$

$= 1738.3^{KNm} > M = 929.3\ ^{KNm}$ OK

2) For middle fulcrum ··· Ms.min = −2105.6 KNm

section b = 360cm h = 62.5 d = 56.0 d´ = 6.5

$As = Y_{32} - 29^{NO} = 8.042 \times 29 = 233.218\ cm^2$

$$\chi = \frac{2 \times 0.80 \times 41000 \times 233.218}{0.50 \times 3000 \times 360} = 28.5^{cm}$$

$$Z = 56.0 - \frac{28.5}{3} = 46.5^{cm}$$

$M_{RS} = 0.80 \times 41000 \times 233.218 \times 46.5 \times 10^{-5} = 3557.0^{KNm} > M = 2105.6^{KNm}$

$$M_{RC} = \frac{1}{2} \times 0.50 \times 3000 \times 360 \times 28.5 \times 46.5 \times 10^{-5}$$

$= 3578.2^{KNm} > M = 2105.6^{KNm}$ OK

Note : U.L.S is critical state than S.L.S.

3. Calculation of shearing force for U.L.S.

1) For first fulcrum　　Su.max = 707.9 KNm

section　　b = 360 cm　　h = 50　　d = 43.0　　d′ = 7.0

$As = Y_{25} - 29^{NO} = 4.909 \times 29 = 142.361\ cm^2$

$$P = \frac{142.361}{360 \times 43.0} \times 100 = 0.920\ \%$$

$$Vc = \frac{707.9 \times 10^3}{360 \times 43.0} = 45.8\ N/cm^2$$

$$< Vca = 55.0 + 15.0 \left(\frac{0.920 - 0.500}{0.500} \right) = 67.6\ N/cm^2$$

2) For second fulcrum　　Su.max = 869.1 KN

section　　b = 360 cm　　h = 62.5　　d = 56.0　　d′ = 6.5

$As = Y_{32} - 29^{NO} = 8.042 \times 29 = 233.218\ cm^2$

$$P = \frac{233.218}{360 \times 56.0} \times 100 = 1.157\ \%$$

$$Vc = \frac{869.1 \times 10^3}{360 \times 56.0} = 43.1\ N/cm^2$$

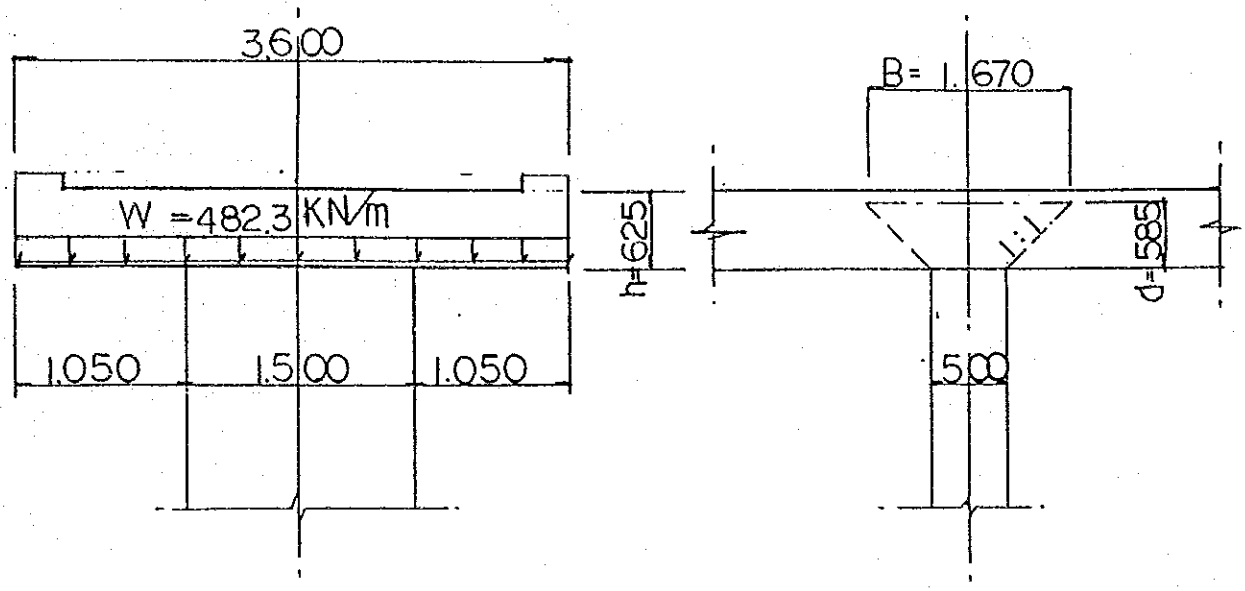
$$< Vca = 70.0 + 20.0 \left(\frac{1.157 - 1.00}{1.00} \right) = 73.1\ N/cm^2$$

1. Calculation of pedestal for U.S.L.

1) For middle fulcrum

a) Reaction of middle fulcrum　　Rmax= 1736.3^{KN}

b) load …　$\omega = \frac{R}{b} = \frac{1736.3}{3.60} = 482.3$ $^{KN/m}$



c) bending moment and shearing force.

$M = \frac{1}{2} \times 482.3 \times 1.050^2 = 265.9$ ^{KNm}

$S = 482.3 \times 1.050 = 506.5$ ^{KN}

d) For bending moment

$A_S = Y_{20} - 150^{ctc}(11^{NO}) = 3.1416 \times 11 = 34.558$ cm^2

$b = 167.0^{cm}$　$h = 62.5$　$d = 58.5$　$d' = 4.0$

$$X = \frac{0.87 \times 41000 \times 34.558}{0.40 \times 3000 \times 167.0} = 6.2^{cm}$$

$$Z = 58.5 - \frac{6.2}{2} = 55.4^{cm} < 0.95 \times 58.5 = 55.6^{cm}$$　OK

$M_{RS} = 0.87 \times 41000 \times 34.558 \times 55.4 \times 10^{-5} = 682.9^{KNm} > M = 265.9^{KNm}$

$M_{RC} = 0.40 \times 3000 \times 167.0 \times 6.2 \times 55.4 \times 10^{-5} = 688.3^{KNm} > M = 265.9^{KNm}$

e) For shearing force

$$Vc = \frac{506.5 \times 10^3}{2 \times 167.0 \times 58.5} = 30.0 \quad N/cm^2$$

$$P = \frac{34.558}{167.0 \times 58.5} \times 100 = 0.353 \ \%$$

$$< Vca = 35.0 + 20.0 \left(\frac{0.353 - 0.25}{0.25} \right) = 43.2 \quad N/cm^2 \qquad OK$$

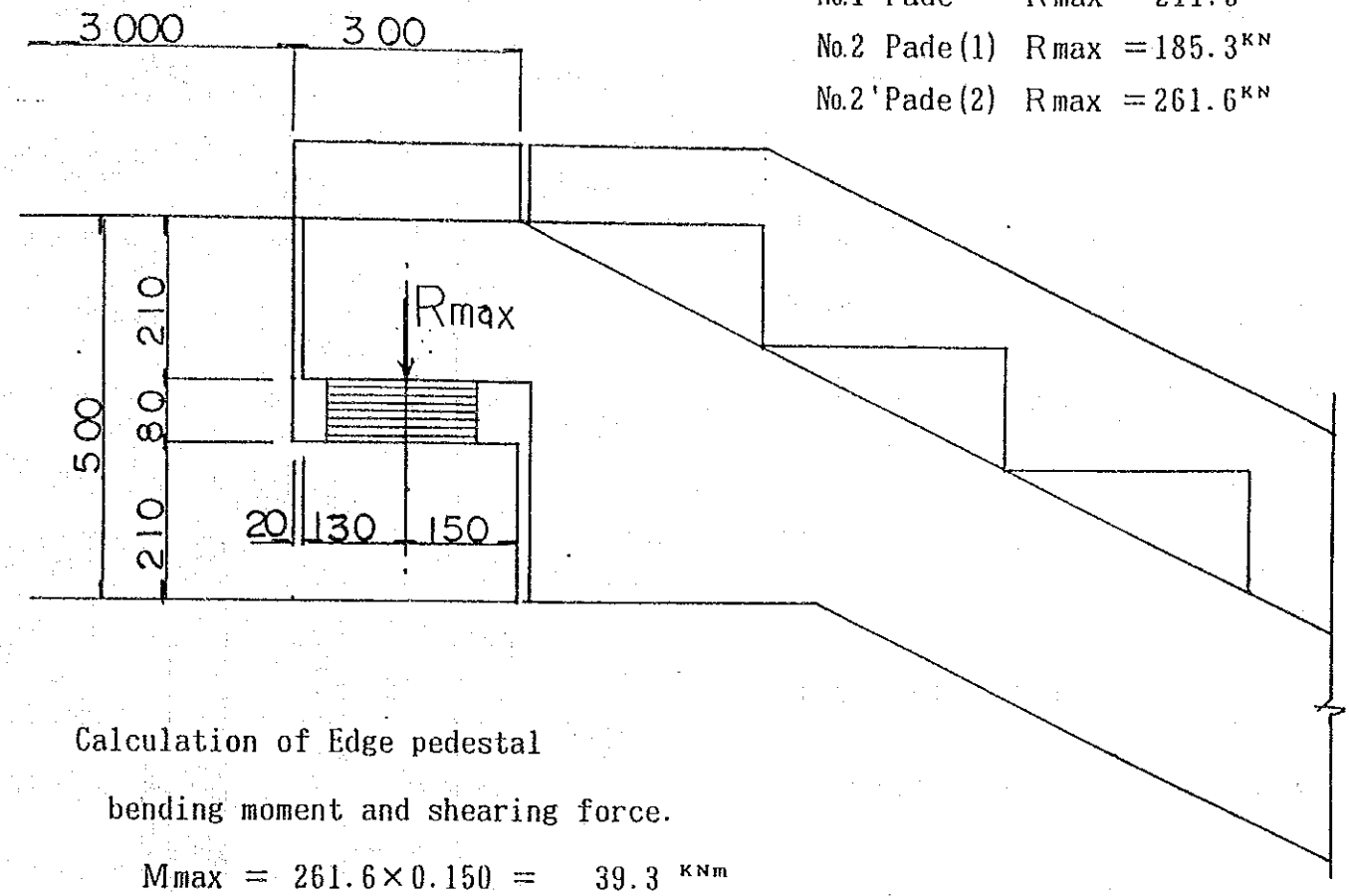
1. Calculation of pedestal of joint for U.L.S.

1.Reaction

No.1 Pade Rmax ＝211.3^{KN}

No.2 Pade(1) Rmax ＝185.3^{KN}

No.2'Pade(2) Rmax ＝261.6^{KN}



Calculation of Edge pedestal

bending moment and shearing force.

Mmax ＝ 261.6×0.150 ＝ 39.3 ^{KNm}

Smax ≒ Rmax ＝ 261.6 ^{KN}

section b＝300^{cm} h ＝21.0 d＝15.0 d′＝6.0

As ＝ Y_{16}－150^{ctc}(21NO)＝ 2.011×21＝ 42.23 cm^2

$$P = \frac{42.23}{300\times 15.0}\times 100 = 0.938\ \%$$

$$Vca = 55.0 + 15.0\left(\frac{0.938 - 0.50}{0.50}\right) = 68.1\ N/cm^2$$

$$Vc = \frac{261.6\times 10^3}{300\times 15.0} = 58.2\ N/cm^2 < 68.1\ N/cm^2 \quad OK$$

$$X = \frac{0.87\times 41000\times 42.23}{0.40\times 3000\times 300.0} = 4.4^{cm}$$

$$Z = 15.0 - \frac{4.4}{2} = 12.8^{cm} < 0.95\times 15.0 = 14.3^{cm} \quad OK$$

M_{RS}＝0.87×41000 ×42.23 ×12.8×10^{-5}＝192.8^{KNm}> M＝39.3^{KNm}

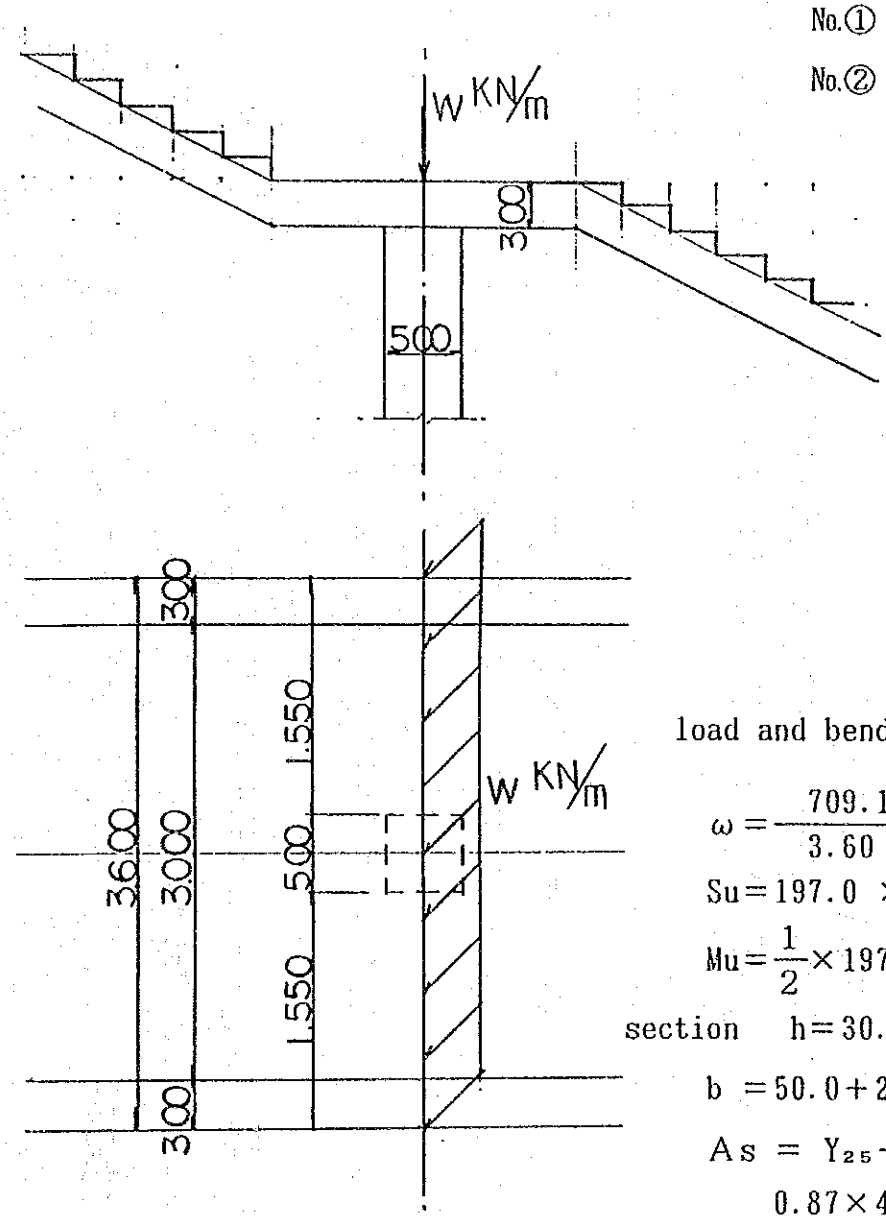
M_{RC}＝0.40×3000×300 ×4.4 ×12.8×10^{-5}＝202.7^{KNm}> M＝39.3^{KNm}

Calculation of middle pedestal

Reaction

No.① Pedestrian-Rmax=709.1^{KN}

No.② Pedestrian-Rmax=677.1^{KN}



load and bending moment

$$\omega = \frac{709.1}{3.60} = 197.0 \ ^{KN/m}$$

$$Su = 197.0 \times 1.55 = 305.4^{KN}$$

$$Mu = \frac{1}{2} \times 197.0 \times 1.55^2 = 236.7 \ ^{KNm}$$

section h=30.0 d=24.5 d´=5.5

$$b = 50.0 + 2 \times 24.5 = 99.0 \ ^{cm}$$

$$As = Y_{25} - 8(150^{c\,t\,c}) = 39.27 \ cm^2$$

$$\chi = \frac{0.87 \times 41000 \times 39.27}{0.40 \times 3000 \times 99.0} = 12.0^{cm}$$

$$Z = 24.5 - \frac{12.0}{2} = 18.5^{cm} < 0.95 \times 24.5 = 23.3^{cm}$$

$$M_{RS} = 0.87 \times 41000 \times 39.27 \times 18.5 \times 10^{-5} = 259.1^{KNm} > Mu = 236.7^{KNm}$$

$$M_{RC} = 0.40 \times 3000 \times 99 \times 12.0 \times 18.5 \times 10^{-5} = 263.7^{KNm} > Mu = 236.7^{KNm}$$

$$P = \frac{39.27}{99.0 \times 24.5} \times 100 = 1.619 \ \%$$

$$Vc = \frac{305.4 \times 10^3}{99.0 \times 24.5} = 126.0 \ N/cm^2$$

$$< Vca = 70.0 + 20.0 \left(\frac{1.619 - 1.0}{1.0} \right) \times 2 = 164.8 \ N/cm^2 \ OK$$

Calculation of Shoe

1) quantity of expantion between
Girder-edge and Parapet face of abutment

quantity of expantion or shrinkage (maximum)

for temperature : $dt = a \times T \times L = (1.0 \times 10^{-5} \times 15.0 \times L)^{m} = (0.150 \times L)^{mm}$

for shrinkage : $ds = a \times T \times L \times b = (1.0 \times 10^{-5} \times 20.0 \times L \times 0.8) = (0.160 \times L)$ "

for creep : $dc = \frac{P}{E \times A} \times \phi \times L \times b = \frac{750}{2.7 \times 10^{6}} \times 1.9 \times L \times 0.8 = (0.430 \times L)$ "

for other : $do = -5.0$ "

total : $dL = (0.80L + 5.0)^{mm}$

where a = coefficient of thermal expantion or shrinkage
T = quantity of temperature variance
L = girder length
b = coefficient of decrease
E = young's modulus
P/A = $0.5 fcu / 2 = 0.5 \times 300 / 2 = 750^{N/cm^2}$
ϕ = creep factor
fcu = strength of concrete ($30^{N/mm^2}$)

Pedestrian bridge

calculation of shoe

No① Pedestrian, bridge

Rmax = 144.0 KN

d_L = (0.80L + 5) mm

= (0.80 × 17.30 + 5)

= 19 mm

$$R = \frac{144.0}{2}$$

= 72.0 KN／shoe

No② Pedestrian, bridge

stair(1)

Rmax = 126.0 KN

d_L = (0.80L + 5) mm

= (0.80 × 22.80 + 5)

= 24 mm

$$R = \frac{126.0}{2} = 63.0 \text{ KN}^{\text{shoe}}$$

= 63.0 KN／shoe

No② Pedestrian, bridge

stair(2)

Rmax = 206.4 KN (Rd=156.1KN + Rd=50.3KN)

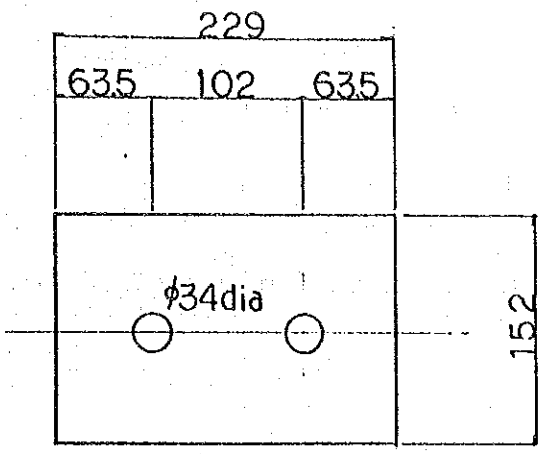
d_L = (0.80L + 5) mm

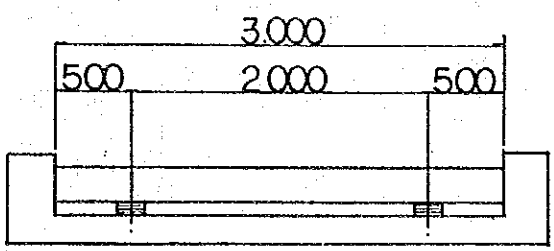
= (0.80 × 23.80 + 5)

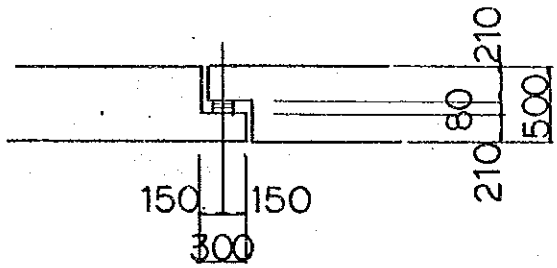
= 24 mm

$$R = \frac{206.4}{2} \fallingdotseq 104 \text{ KN／shoe}$$

edge shoe (MOV) :229×152×56 (edge pedestal)







this case is calculate for stair (2)

Dowel bar

Hd = 156.1×0.15 = 23.5 KN／shoe ----- temperature

anchor bar ----- As = φ 20mm×2NO×400mm = $\frac{\pi}{4}$ ×2.0²×2 = 6.283 cm²

shearing stress

$$\tau s = \frac{1.43Hd}{As} = \frac{1.43\times 23.5\times 10^3}{6.283} = 54.00\ N/cm^2 < 9000\ N/cm^2 \quad OK$$

anchor cap φ(20+30+30)×160mm×2 = φ80×160mm×2NO／shoe

vertical pressure:

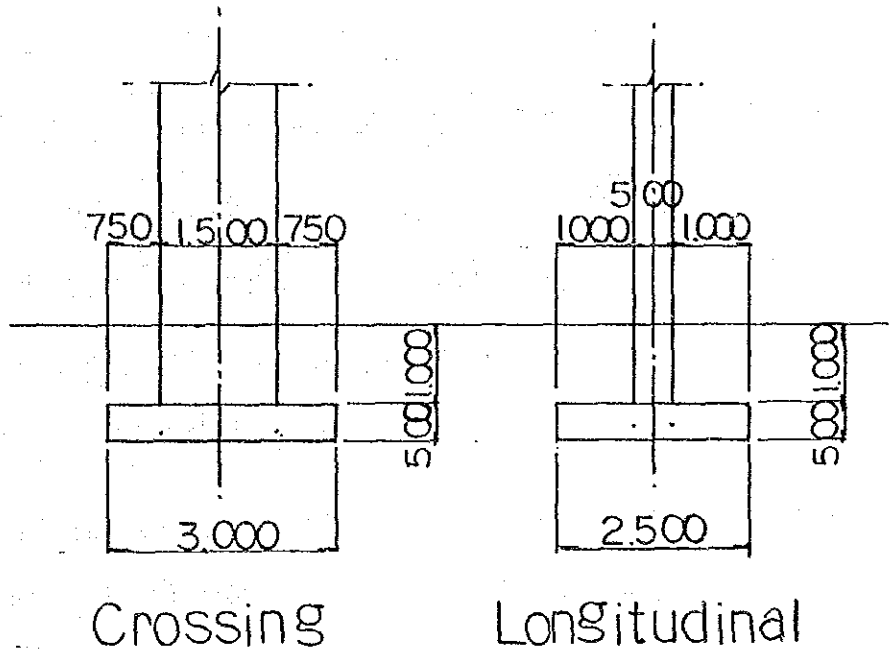
$$As = 22.9\times 15.2 - \frac{\pi}{4}\times 3.4^2\times 2 = 330\ cm^2$$

$$\therefore VC = \frac{Rmax}{As} = \frac{104\times 10^3}{330} = 320\ N/cm^2 < Vca = 800\ N/cm^2$$

Calculation of stability for Longitudinal direction.

1. Footing and surcharge

1) Shape and size of foundation



2) load of foundation

Footing = 23.6 ×3.00×2.50×0.50 = 88.5 KN

Surcharge =18.6×3.00×2.50×1.00 = 139.5 KN

Total = 228.0 KN

2. Calculation of stability of foundation for S.L.S.

1) action force for bottom slab from case-13

a) For pillar⑩～⑥ (pillar ⑧～②)

N＝ 635.2＋ 228.0 ＝ 863.2^{KN}

H＝ 172.4 ＝ 172.4^{KN}

M＝ 463.5＋172.4 ＋0.50＝ 549.7^{KNm}

b) For pillar⑨～④

N＝ 1069.6 ＋228.0 ＝1297.6^{KN}

H＝ 60.6 ＝ 60.6 ^{KN}

M＝ 216.6＋60.6＋0.50 ＝ 246.9^{KNm}

2) stability for foundation

a) For pillar⑩～⑥

$$e=\frac{M}{N}=\frac{549.7}{863.2}=0.637^{cm}$$

$$\chi=\frac{B}{2}-e=\frac{2.50}{2}-0.637=0.613\ ^{m}$$

$$q_{max}=\frac{2\cdot N}{3\cdot\chi\cdot L}=\frac{2\times 863.2}{3\times 0.613\times 3.00}=313.0\ KN/m^2 < qa=350.0\ KN/m^2 \quad OK$$

$$Fs=\frac{863.2\times 0.50}{172.4}=2.5 > 1.5 \quad OK$$

b) For pillar⑨～④

$$e=\frac{M}{N}=\frac{246.9}{1297.6}=0.191^{cm}$$

$$q=\frac{N}{B\cdot L}\left(1\pm\frac{6e}{B}\right)=\frac{1297.6}{2.50\times 3.00}\left(1\pm\frac{6\times 0.191}{2.50}\right)$$

$$=\begin{cases}252.3\ KN/m^2\\93.7\ KN/m^2\end{cases} < qa=350.0\ KN/m^2 \quad OK$$

$$Fs=\frac{N\cdot\mu}{H}=\frac{1297.6\times 0.50}{60.6}=10.7 > 1.5 \quad OK$$

3. Calculation of stability of foundation for U.L.S.

1) action force for bottom slab from case-9

a) For pillar⑩~⑥ (pillar ⑧~②)

$N = 880.7 + 228.0 \times 1.380 = 1195.4^{KN}$

$H = 255.8 = 255.8^{KN}$

$M = 704.6 + 255.8 + 0.50 = 832.5^{KNm}$

b) For pillar⑨~④

$N = 1475.7 + 228.0 \times 1.380 = 1790.4^{KN}$

$H = 100.9 = 100.9^{KN}$

$M = 361.3 + 100.9 + 0.50 = 411.8^{KNm}$

2) stability for foundation

a) For pillar⑩~⑥

$$e = \frac{M}{N} = \frac{832.5}{1195.4} = 0.697^{cm}$$

$$\chi = \frac{B}{2} - e = \frac{2.50}{2} - 0.697 = 0.553\ ^{m}$$

$$q_{max} = \frac{2N}{3 \cdot \chi \cdot L} = \frac{2 \times 1195.4}{3 \times 0.553 \times 3.00} = 480.4\ KN/m^2 < qa = 525.0\ KN/m^2 \quad OK$$

$$Fs = \frac{N \cdot \mu}{H} = \frac{1195.4 \times 0.50}{255.8} = 2.3 > 1.1$$

b) For pillar⑨~④

$$e = \frac{M}{N} = \frac{411.8}{1790.4} = 0.231^{cm}$$

$$q = \frac{N}{B\,L}\left(1 \pm \frac{6e}{B}\right) = \frac{1790.4}{2.50 \times 3.00}\left(1 \pm \frac{6 \times 0.231}{2.50}\right)$$

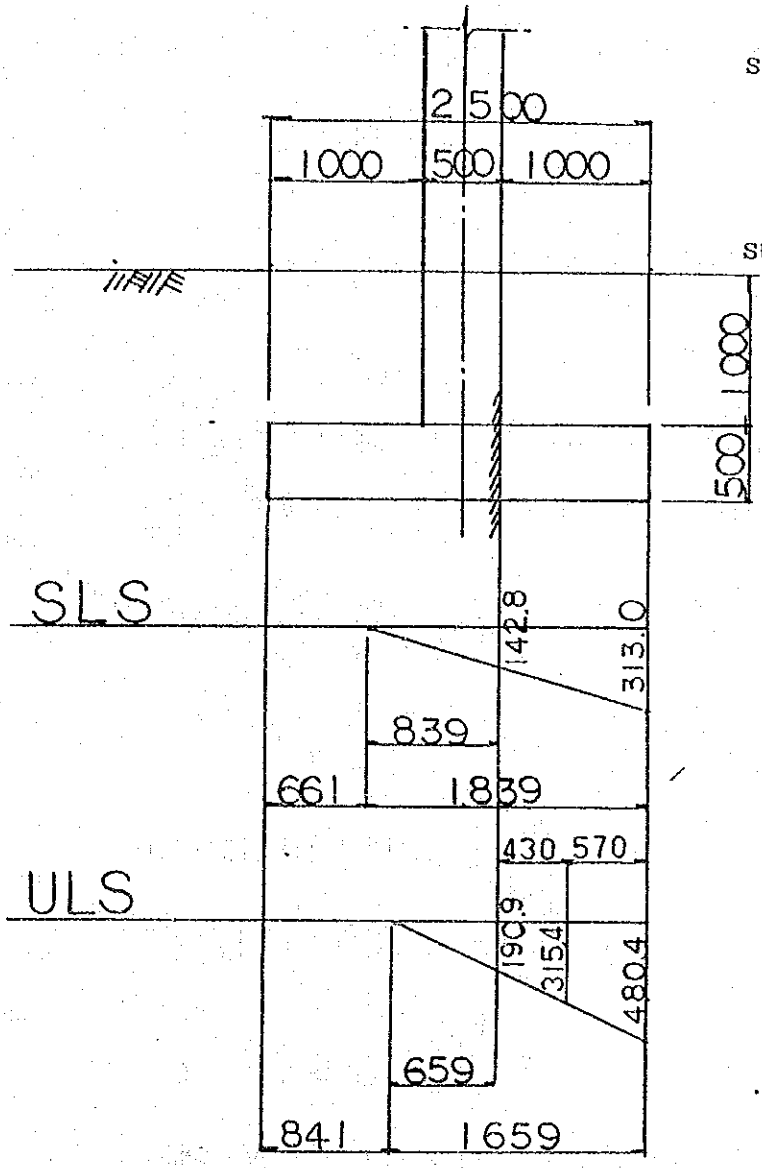
$$= \begin{cases} 371.1\ KN/m^2 \\ 106.4\ KN/m^2 \end{cases} \leq qa = 525.0\ KN/m^2 \quad OK$$

$$Fs = \frac{N \cdot \mu}{H} = \frac{1790.4 \times 0.50}{100.9} = 8.8 > 1.1 \quad OK$$

Calculation of stress for Longitudinal direction

1. For pillar ⑩～⑥ (pillar⑧～②)

(1) load



surcharge for S.L.S.

$\omega = (23.6 \times 0.50 + 18.6 \times 1.00) = 30.4$ KN/m

surcharge for U.L.S.

$\omega = (23.6 \times 0.50 + 18.6 \times 1.00) \times 1.38$

$= 41.9$ KN/m

(2) bending moment and shearing force.

a) for S.L.S.

$$M = \left\{\frac{1.00^2}{6}(2 \times 313.0 + 142.8) - \frac{1.00^2}{2} \times 30.4\right\} \times 3.00 = 338.8 \text{ KNm}$$

$$S = \left\{\frac{1.00}{2}(313.0 + 142.8) - 1.00 \times 30.4\right\} \times 3.00 = 592.5 \text{ KN}$$

a) for U.L.S.

$$M = \left\{\frac{1.00^2}{6}(2 \times 480.4 + 190.9) - \frac{1.00^2}{2} \times 41.9\right\} \times 3.00 = 513.0 \text{ KNm}$$

$$S = \left\{\frac{1.00}{2}(480.4 + 190.9) - 1.00 \times 41.9\right\} \times 3.00 = 881.3 \text{ KN}$$

(3) Calculation of stress for U.L.S.

section $b = 15.00 + 2 \times 43.0 = 236.0^{cm}$ $d = 43.0$ $d' = 7.0$

$As = Y_{20} - 160^{c\,t\,c}\,(15^{No}) = 3.142 \times 15 = 47.13\ cm^2$

$P = \dfrac{47.13}{236.0 \times 43.0} \times 100 = 0.464\ \% > 0.15\ cm^2$

$X = \dfrac{0.87 \times 41000 \times 47.13}{0.40 \times 2500 \times 236.0} = 7.2\ cm$

$Z = 43.0 - \dfrac{7.2}{2} = 39.4\ cm < 0.95 \times 43.0 = 40.8^{cm}$

$M_{RS} = 0.87 \times 41000 \times 47.13 \times 39.4 \times 10^{-5} = 662.4^{KNm} > M = 513.0^{KNm}$

$M_{RC} = 0.40 \times 2500 \times 236.0 \times 7.2 \times 39.4 \times 10^{-5} = 669.5\ " > "$ OK

$V_C = \dfrac{881.3 \times 10^3}{236.0 \times 43.0} = 86.9^{N/cm^2}$

$< V_{Ca} = \left[35.0 + 15.0\left(\dfrac{0.464 - 0.25}{0.25}\right)\right] \times 2 = 95.6^{N/cm^2}$

Check of Critical Section

$S = \left[\dfrac{0.57}{2}(480.4 + 315.4) - 0.57 \times 41.9\right] \times 3.00 = 608.8^{KN}$

$V_C = \dfrac{608.8 \times 10^3}{236.0 \times 43.0} = 60.0^{N/cm^2}$

$< V_{Ca} = \left[35.0 + 15.0\left(\dfrac{0.464 - 0.25}{0.25}\right)\right] \dfrac{2 \times 43.0}{50.0} = 82.3^{N/cm^2}$ OK

No.① PEDESTRIAN BRIDGE －Substructure

Calculation for pillar for Longitudinal direction.

$M = 957.8^{KNm}$
$H = 201.9^{KN}$
$N = 886.1^{KN}$
} for pillar ②～⑧ from case-6 (U.L.S)

section $b = 150^{cm}$ $h = 50$ $d = 44.5$ $d' = 5.5$

$$Ma = M + N\left(d - \frac{h}{2}\right) = 957.8 + 886.1\left(0.445 - \frac{0.50}{2}\right) = 1130.6^{KNM}$$

$$As = As' = Y_{32} - 10^{NO} = 8.042 \times 10 = 80.42\ cm^2$$

$$\chi = \frac{(0.87 - 0.72) \times 41000 \times 80.42}{0.40 \times 2500 \times 150} \fallingdotseq 4.4^{cm}$$

$$Z = 44.5 - \frac{4.4}{2} = 42.3^{cm} \fallingdotseq 0.95 \times 44.5 = 42.3^{cm} \quad OK$$

$$M_{RS} = 0.87 \times 41000 \times 80.42 \times 42.3 \times 10^{-5} = 1213.4^{KNm} > Ma = 1130.6^{KNm}$$

$$M_{RC} = (0.72 \times 41000 \times 80.42 \times 39.0 + 0.40 \times 2500 \times 150 \times 4.4 \times 42.3) \times 10^{-5} = 1205.0^{KNm} > Ma = 1130.6^{KNm}$$

$$Asn = A'sn = As - \frac{N}{0.87fy} = 80.42 - \frac{886.1 \times 10^3}{0.87 \times 41000} \fallingdotseq 54.0\ cm^2$$

$$\leqq Asu = A'su = Y_{25} - 11^{NO} = 54.0\ cm^2 \quad OK$$

$$P = \frac{54.0}{150 \times 44.5} \times 100 = 0.809\ \%$$

$$Vc = \frac{201.9 \times 10^3}{150 \times 44.5} = 30.3\ N/cm^2$$

$$< Vca = 50.0 + 15.0\left(\frac{0.809 - 0.50}{0.50}\right) = 59.3\ N/cm^2 \quad OK$$

Note : U.L.S is critical stress than S.L.S.

$M = 658.1^{KNm}$
$H = 139.2^{KN}$
$N = 619.8^{KN}$
} for pillar ②～⑧ from case-10 (S.L.S)

section $b = 150^{cm}$ $h = 50$ $d = 44.5$ $d' = 5.5$

$$Ma = M + N\left(d - \frac{h}{2}\right) = 658.1 + 619.8\left(0.445 - \frac{0.50}{2}\right) = 779.0^{KNM}$$

$$As = As' = Y_{32} - 8^{NO} = 8.042 \times 8 = 64.336\ cm^2$$

$$\chi = \frac{(0.80 - 0.72) \times 41000 \times 64.336}{\frac{1}{2} \times 0.50 \times 2500 \times 150} = 4.4^{cm}$$

$$Z = 44.5 - \frac{4.4}{2} = 42.3^{cm} \fallingdotseq 0.95 \times 44.5 = 42.3\ cm^2 \quad OK$$

$$M_{RS} = 0.80 \times 41000 \times 64.336 \times 42.3 \times 10^{-5} = 892.6^{KNm} > Ma = 779.0^{KNm}$$

$$M_{RC} = (0.72 \times 41000 \times 64.336 \times 39.0 + \frac{1}{2} \times 0.50 \times 2500 \times 150 \times 4.4 \times 42.3) \times 10^{-5} = 915.2^{KNm} > Ma = 779.0^{KNm} \quad OK$$

$$Asn = A'sn = 64.336 - \frac{619.8 \times 10^3}{0.80 \times 41000} = 45.5\ cm^2$$

$$\leqq \quad Asu = A'su = Y_{25} - 11^{NO} = 54.0\ cm^2 \quad OK$$

Calculation for bottom of pillar for Crossing direction. (U.L.S)

action force and stress.

$M = (67.6 \times 7.75 + 10.7 \times 3.75) \times 1.650 = 930.7^{KNm}$

$H = (67.6 + 10.7) \times 1.650 = 129.2^{KN}$

$N = (938.5 + 132.8) \times 1.380 = 1478.4^{KN}$

section $b = 50^{cm}$ $h = 150$ $d = 143.0$ $d' = 7.0$

$$Ma = 930.7 + 1478.4\left(1.430 - \frac{1.50}{2}\right) = 1936.0^{KNm}$$

$As = As' = Y_{32} - 6^{NO} = 8.042 \times 6 = 48.252\ cm^2$

$$\chi = \frac{(0.87 - 0.72) \times 41000 \times 48.252}{0.40 \times 2500 \times 50.0} \fallingdotseq 14.4^{cm}$$

$$Z = 143.0 - \frac{14.4}{2} = 135.8^{cm} \fallingdotseq 0.95 \times 143.0 = 135.8^{cm} \quad OK$$

$M_{RS} = 0.87 \times 41000 \times 48.252 \times 135.8 \times 10^{-5} = 2337.3^{KNm} > Ma = 1936.0^{KNm}$

$M_{Rc} = (0.40 \times 2500 \times 50.0 \times 15.0 \times 135.8 + 0.72 \times 41000 \times 48.252 \times 136.0) \times 10^{-5} = 2955.6^{KNm} > Ma = 1936.0^{KNm}$

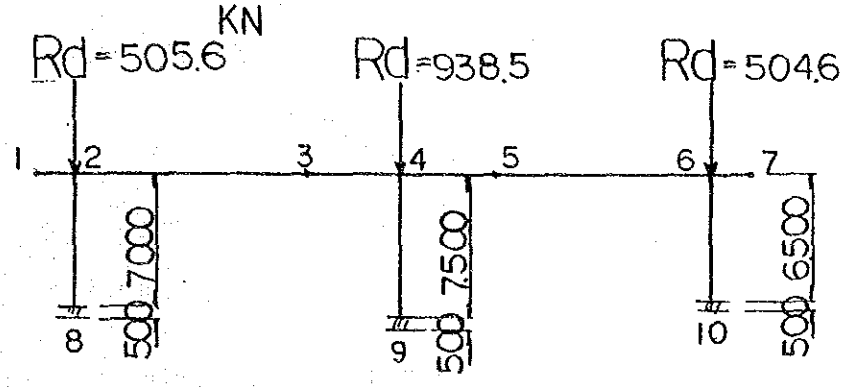
$$Asn = A'sn = 48.252 - \frac{1478.4 \times 10^3}{0.87 \times 41000} = 6.9\ cm^2$$

$< Asu = A'su = Y_{25} - 4^{NO} = 19.636\ cm^2$ OK

No.① PEDESTRIAN BRIDGE －Substructure

1. Calculation of stability of Crossing direction

1) Shape and Reaction



2) Action force and stability

a) For bottom slab for S.L.S.

action force for pillar⑨～④ (seismic state)

	N KN	H KN	y m	M＝H・y KNm
Reaction from superstructure	938.5	67.6	8.250	557.7
Pillar	17.70 ×7.50 ＝132.8	10.7	4.250	45.5
Footing	228.0	－	－	－
Total	1299.3	78.3	－	603.2

Stability

$$e = \frac{M}{N} = \frac{603.2}{1299.3} = 0.465^{m} < \frac{B}{6} = \frac{3.00}{6} = 0.500^{m}$$

$$q = \frac{N}{BL}\left(1 \pm \frac{6e}{B}\right) = \frac{1299.3}{3.00 \times 2.50}\left(1 \pm \frac{6 \times 0.465}{3.00}\right)$$

$$= \begin{cases} 334.4\ KN/m^2 \\ 12.2\ KN/m^2 \end{cases} < qa = 350\ KN/m^2$$

$$Fs = \frac{N \cdot \mu}{H} = \frac{1299.3 \times 0.50}{78.3} = 8.3 > 1.5$$

b) For bottom slab for U.L.S.

action force for pillar⑨～④ (seismic state)

$N = 1299.3 \times 1.38 = 1793.1^{KN}$

$H = 78.3 \times 1.65 = 129.2^{KN}$

$M = 603.2 \times 1.65 = 995.3^{KNm}$

Stability

$$e = \frac{M}{N} = \frac{995.3}{1793.1} = 0.555^{m}$$

$$\chi = \frac{B}{2} - e = \frac{3.00}{2} - 0.555 = 0.945\ ^{m}$$

$$q_{max} = \frac{2 \cdot N}{3 \cdot \chi \cdot L} = \frac{2 \times 1793.1}{3 \times 0.945 \times 2.50} = 506.0\ KN/m^2 < qa = 525\ KN/m^2$$

$$Fs = \frac{N \cdot \mu}{H} = \frac{1793.1 \times 0.50}{129.2} = 6.9 > 1.1$$

Calculation of stress for Crossing direction.

1. For pillar ⑨～④

(1) load

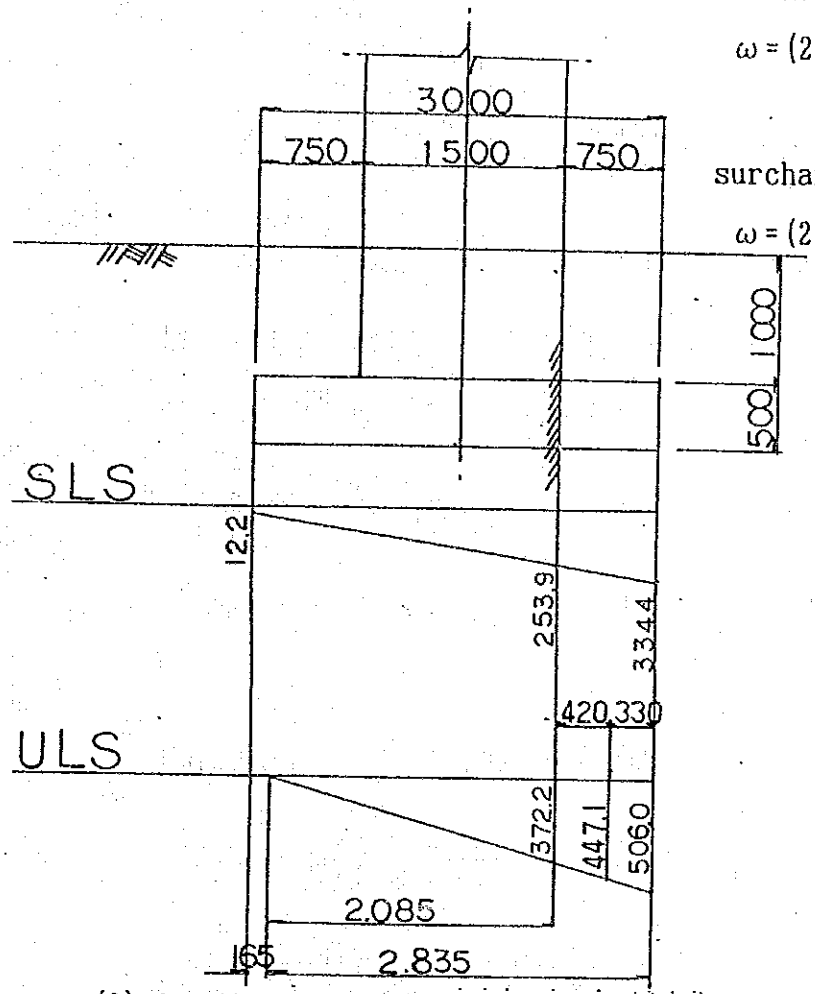
surcharge for S.L.S.

$\omega = (23.6 \times 0.50 + 18.6 \times 1.00) = 30.4$ KN/m

surcharge for U.L.S.

$\omega = (23.6 \times 0.50 + 18.6 \times 1.00) \times 1.38$

$= 41.9$ KN/m



(2) bending moment and shearing force.

a) for S.L.S.

$$M = \left\{\frac{0.75^2}{6}(2 \times 334.4 + 253.9) - \frac{0.75^2}{2} \times 30.4\right\} \times 2.50 = 194.9 \text{ KNm}$$

$$S = \left\{\frac{0.75}{2}(334.4 + 253.9) - 0.75 \times 30.4\right\} \times 2.50 = 494.6 \text{ KN}$$

a) for U.L.S.

$$M = \left\{\frac{0.75^2}{6}(2 \times 506.0 + 372.2) - \frac{0.75^2}{2} \times 41.9\right\} \times 2.50 = 295.0 \text{ KNm}$$

$$S = \left\{\frac{0.75}{2}(506.0 + 372.2) - 0.75 \times 41.9\right\} \times 2.50 = 744.8 \text{ KN}$$

$$Sc = \left\{\frac{0.33}{2}(506.0 + 447.1) - 0.33 \times 41.9\right\} \times 2.50 = 358.6 \text{ KN}$$

(3) Calculation of stress for U.L.S.

section $b = 50.0 + 2 \times 42.0 = 134.0^{cm}$ $h = 50$ $d = 42.0$ $d' = 8.0$

$As = Y_{20} - 130^{c\,t\,c}\,(11^{NO}) = 3.142 \times 11 = 34.562\ cm^2$

$$P = \frac{34.562}{134.0 \times 42.0} \times 100 = 0.614\ \% > 0.15\ \%$$

$$X = \frac{0.87 \times 41000 \times 34.562}{0.40 \times 2500 \times 134.0} = 9.2^{cm}$$

$$Z = 42.0 - \frac{9.2}{2} = 37.4^{cm} < 0.95 \times 42.0 = 39.9^{cm}$$

$M_{RS} = 0.87 \times 41000 \times 34.562 \times 37.4 \times 10^{-5} = 461.0^{KNm} > M = 295.0^{KNm}$

$M_{RC} = 0.40 \times 2500 \times 134.0 \times 9.2 \times 37.4 \times 10^{-5} = 461.1$ " > " OK

$$Vc = \frac{744.8 \times 10^3}{134.0 \times 42.0} = 132.4\ N/cm^2$$

$$< Vca = \left[50.0 + 15.0\left(\frac{0.614 - 0.50}{0.50}\right)\right] \times \frac{250.0}{134.0} \times 2 = 199.3^{N/cm^2}$$

Check of Critical Section

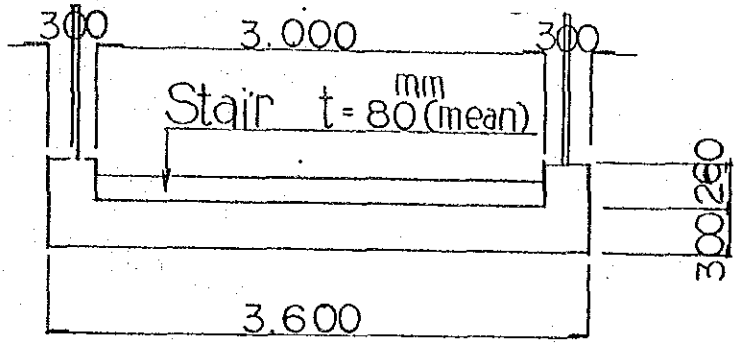
$$Vc = \frac{358.6 \times 10^3}{134.0 \times 42.0} = 63.7^{N/cm^2}$$

$$< Vca = \left[50.0 + 15.0\left(\frac{0.614 - 0.50}{0.50}\right)\right] \times \frac{2 \times 42.0}{37.5} = 119.6^{N/cm^2}\ OK$$

No.① PEDESTRIAN BRIDGE OF STAIRCASE

1) Shape and factor for Calculation of stress.

(1) Superstructure



$A = 3.60 \times 0.30 = 1.080\ m^2$

$I = \frac{3.60 \times 0.30^3}{12} = 0.00810\ m^4$

$Ec_1 = 2.7\ KN/mm^2 = 2.7 \times 10^7\ KN/m^3\ (fcu=30\ N/mm^2)$

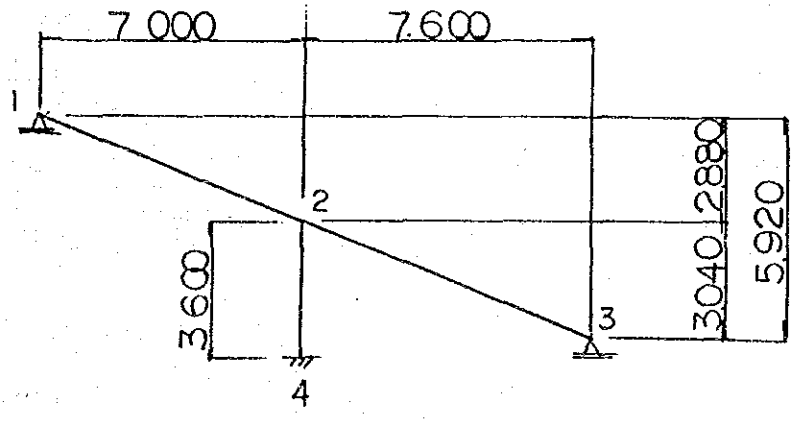
(2) Substructure

$A = 0.50 \times 0.50 = 0.250\ m^2$

$I = \frac{0.50^4}{12} = 0.00521\ m^4$

$Ec_1 = 2.5\ KN/mm^2 = 2.5 \times 10^7\ KN/m^3\ (fcu=25\ N/mm^2)$

(3) Frame



2) Load

(1) Dead load

parapet = $(23.6\times0.30\times0.26+0.294)\times2$ = 4.270 KN/m

slab = 23.6×1.080 = 25.488 KN/m

stair = $22.6\times3.00\times0.08$ = 5.424 KN/m

ωd_1 = = 35.182 KN/m

pillar ω_2 = 23.6×0.250 = 5.900 KN/m

(2) Live load

loaded length < 30.0m

$\omega \ell$ = $5.0(2.00+1.00\times0.85)$ = 14.250 KN/m

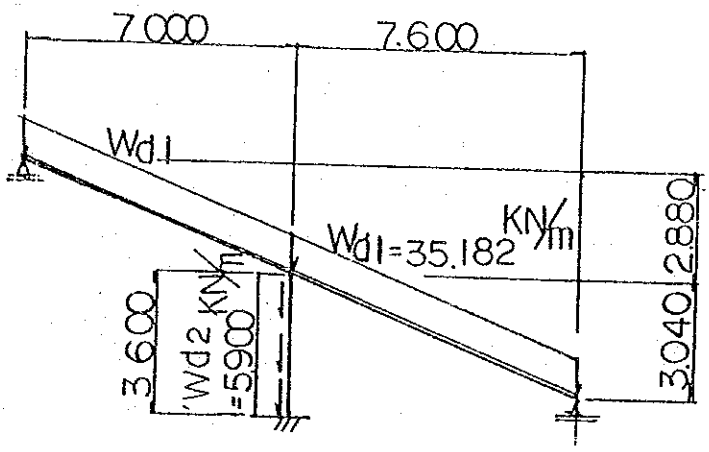
(3) Other load

seismic

Coefficient of seismic ··· $k_H=0.100$

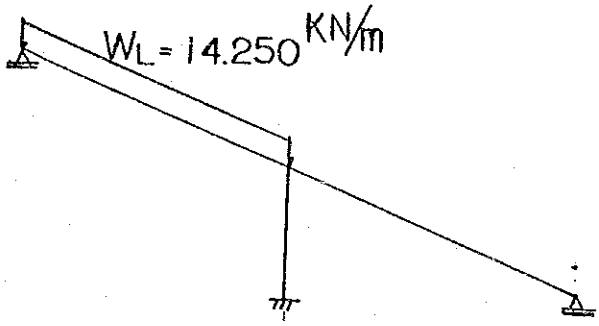
3) Loaded figure

(1) Dead load ··· case-1

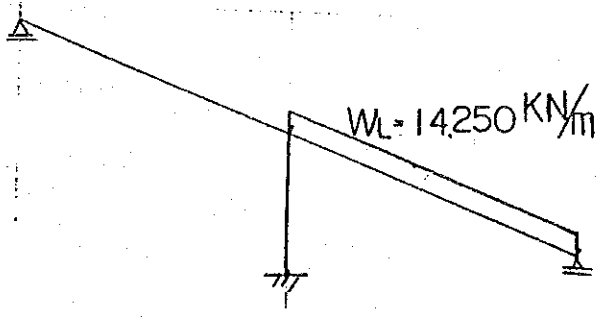


(2) Live load

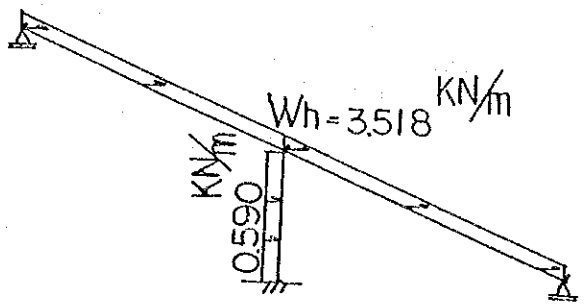
a) for first span ··· case-2



b) for second span ··· case-3



3) seismic ··· case-4



PEDE NOI STAIR

NOTE: THE DIMENSION(t) BE EXCHANG TO DIMENSION(KN) INTO THIS CALCULATION

No	X (m)	Y (m)
1	0.0000	10.0000
2	7.0000	7.1200
3	14.6000	4.0800
4	7.0000	3.5200

PEDE NOI STAIR

No	I	J	A (m2)	I (m4)	I - J	L (m)	E (t/m2)	EPS
1	1	2	1.08000	0.008100	Fix - Fix	7.569	2.70E+07	1.20E-05
2	2	3	1.08000	0.008100	Fix - Fix	8.185	2.70E+07	1.20E-05
3	2	4	0.25000	0.005210	Fix - Fix	3.600	2.50E+07	1.20E-05

PEDE NOI STAIR

No. 1

No	X (t/m)	Y (t/m)	M(tm/Rad)
1	Free	Fix	Free
3	Free	Fix	Free
4	Fix	Fix	Fix

PEDE NOI STAIR

No		L-No 1	L-No 2	L-No 3	L-No 4	L-No 5	L-No 6	L-No 7	L-No 8	L-No 9	L-No 10
		11	12	13	14	15	16	17	18	19	20
1	9	0.757	1.514	2.271	3.028	3.785	4.542	5.299	6.055	6.812	
2	9	0.819	1.637	2.456	3.274	4.093	4.911	5.730	6.548	7.367	
3	4	0.720	1.440	2.160	2.880						

PEDE NOI STAIR

: Dead load
No. : 1
No. : 1

No	i	-j		Li (m)	Lo (m)	Pi (t/m)	Pj (t/m)
1	1-	2	-Y	0.000	7.569	-35.182	-35.182
2	2-	3	-Y	0.000	8.185	-35.182	-35.182
3	2-	4	-Y	0.000	3.600	-5.900	-5.900

ΣV = -575.497 (t)
ΣH = 0.000 (t)

PEDE NOI STAIR

: Live load
No. : 2
No. : 1

No	i	-j		Li (m)	Lo (m)	Pi (t/m)	Pj (t/m)
1	1-	2	-Y	0.000	7.569	-14.250	-14.250

ΣV = -107.858 (t)
ΣH = 0.000 (t)

PEDE NOI STAIR

: Live load
No. : 3
No. : 1

No	i	-j		Li (m)	Lo (m)	Pi (t/m)	Pj (t/m)
2	2-	3	-Y	0.000	8.185	-14.250	-14.250

ΣV = -116.636 (t)
ΣH = 0.000 (t)

PEDE NOI STAIR

: SEISMIC
No. : 4
No. : 1

No	i -j		Li (m)	Lo (m)	Pi (t/m)	Pj (t/m)
1	1- 2	-X	0.000	7.569	3.518	3.518
2	2- 3	-X	0.000	8.185	3.518	3.518
3	2- 4	-X	0.000	3.600	0.590	0.590

ΣV = 0.000 (t)
ΣH = 57.547 (t)

PEDE NOI STAIR

		C-No 1 No 5	C-No 2 No 6	C-No 3 No 7	C-No 4 No 8	C-No 5 No 9	C-No 6 No10	C-No 7 No11	C-No 8 No12
	α	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
No	1	1.3800	1.3800	1.3800	1.3800	1.0000	1.0000	1.0000	1.0000
No	2	1.6500	0.0000	1.6500	0.0000	1.0000	0.0000	1.0000	0.0000
No	3	0.0000	1.6500	1.6500	0.0000	0.0000	1.0000	1.0000	0.0000
No	4	0.0000	0.0000	0.0000	1.3200	0.0000	0.0000	0.0000	0.8000

PEDE NOI STAIR

No 1 : 5 6 7 8

No 2 : 9 10 11 12

PEDE NOI STAIR

No.	Case. 1 RX (t)	RY (t)	RM (tm)	Case. 2 RX (t)	RY (t)	RM (tm)	Case. 3 RX (t)	RY (t)	RM (tm)
1.	0.000	97.732	0.000	0.000	46.269	0.000	0.000	-6.688	0.000
3.	0.000	110.391	0.000	0.000	-4.846	0.000	0.000	49.555	0.000
4.	0.000	367.374	-7.297	0.000	66.435	16.807	0.000	73.770	-19.762

No.	Case. 4 RX (t)	RY (t)	RM (tm)	Case. 5 RX (t)	RY (t)	RM (tm)	Case. 6 RX (t)	RY (t)	RM (tm)
1.	0.000	-10.177	0.000	0.000	211.214	0.000	0.000	123.835	0.000
3.	0.000	0.870	0.000	0.000	144.344	0.000	0.000	234.105	0.000
4.	-57.547	9.307	-120.077	0.000	616.594	17.662	0.000	628.696	-42.678

No.	Case. 7 RX (t)	RY (t)	RM (tm)	Case. 8 RX (t)	RY (t)	RM (tm)	Case. 9 RX (t)	RY (t)	RM (tm)
1.	0.000	200.179	0.000	0.000	121.437	0.000	0.000	144.001	0.000
3.	0.000	226.109	0.000	0.000	153.487	0.000	0.000	105.545	0.000
4.	0.000	738.314	-14.946	-75.961	519.262	-168.571	0.000	433.809	9.510

No.	Case. 10 RX (t)	RY (t)	RM (tm)	Case. 11 RX (t)	RY (t)	RM (tm)	Case. 12 RX (t)	RY (t)	RM (tm)
1.	0.000	91.044	0.000	0.000	137.313	0.000	0.000	89.591	0.000
3.	0.000	159.946	0.000	0.000	155.100	0.000	0.000	111.087	0.000
4.	0.000	441.144	-27.059	0.000	507.579	-10.252	-46.037	374.820	-103.359

PEDE NOI STAIR

No.	Case. 1 X-DIS.(mm)	Y-DIS.(mm)	ROTA.(mmRad)	Case. 2 X-DIS.(mm)	Y-DIS.(mm)	ROTA.(mmRad)	Case. 3 X-DIS.(mm)	Y-DIS.(mm)	ROTA.(mmRad)
1.	0.45137	0.00000	-1.28760	-0.81961	0.00000	-0.78495	1.00137	0.00000	0.2640
2.	0.36304	-0.20549	-0.20169	-0.83617	-0.03827	0.46454	0.98318	-0.04249	-0.5462
3.	0.44901	0.00000	1.84825	-0.82032	0.00000	-0.22468	1.00116	0.00000	0.9728
4.	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.0000

No.	Case. 4 X-DIS.(mm)	Y-DIS.(mm)	ROTA.(mmRad)	Case. 5 X-DIS.(mm)	Y-DIS.(mm)	ROTA.(mmRad)	Case. 6 X-DIS.(mm)	Y-DIS.(mm)	ROTA.(mmRad)
1.	2.57676	0.00000	0.29934	-0.72946	0.00000	-3.07206	2.27516	0.00000	-1.3414
2.	2.57001	-0.00536	-0.49107	-0.87868	-0.34672	0.48816	2.12324	-0.35369	-1.1796
3.	2.57609	0.00000	0.17860	-0.73389	0.00000	2.17986	2.27154	0.00000	4.1557
4.	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.0000

No.	Case. 7 X-DIS.(mm)	Y-DIS.(mm)	ROTA.(mmRad)	Case. 8 X-DIS.(mm)	Y-DIS.(mm)	ROTA.(mmRad)	Case. 9 X-DIS.(mm)	Y-DIS.(mm)	ROTA.(mmRad)
1.	0.92280	0.00000	-2.63655	4.02421	0.00000	-1.38176	-0.36824	0.00000	-2.0726
2.	0.74356	-0.41683	-0.41309	3.89341	-0.29065	-0.92655	-0.47313	-0.24376	0.2629
3.	0.91802	0.00000	3.78497	4.02008	0.00000	2.78634	-0.37131	0.00000	1.6236
4.	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.0000

No.	Case. 10 X-DIS.(mm)	Y-DIS.(mm)	ROTA.(mmRad)	Case. 11 X-DIS.(mm)	Y-DIS.(mm)	ROTA.(mmRad)	Case. 12 X-DIS.(mm)	Y-DIS.(mm)	ROTA.(mmRad)
1.	1.45274	0.00000	-1.02366	0.63314	0.00000	-1.80861	2.51278	0.00000	-1.0481
2.	1.34622	-0.24798	-0.74790	0.51005	-0.28625	-0.28336	2.41905	-0.20978	-0.5946
3.	1.45017	0.00000	2.82104	0.62985	0.00000	2.59636	2.50989	0.00000	1.9911
4.	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.0000

PEDE NO1 STAIR

	No	L(m)	Case 1 Dead load M (tm)	S (t)	N (t)	Case 2 Live load M (tm)	S (t)	N (t)	Case 3 Live load M (tm)	S (t)	N (t)
1-	2	0.000	0.000	90.381	37.186	0.000	42.789	17.605	0.000	-6.185	-2.545
*	1	0.757	59.096	65.752	27.052	28.615	32.813	13.500	-4.682	-6.185	-2.545
*	2	1.514	99.548	41.122	16.919	49.679	22.837	9.396	-9.364	-6.185	-2.545
*	3	2.271	121.355	16.492	6.785	63.191	12.861	5.291	-14.046	-6.185	-2.545
*	4	3.028	124.518	-8.137	-3.348	69.151	2.885	1.187	-18.728	-6.185	-2.545
*	5	3.785	109.036	-32.767	-13.481	67.559	-7.091	-2.917	-23.410	-6.185	-2.545
*	6	4.542	74.909	-57.396	-23.615	58.416	-17.067	-7.022	-28.092	-6.185	-2.545
*	7	5.299	22.137	-82.026	-33.748	41.720	-27.042	-11.126	-32.774	-6.185	-2.545
*	8	6.055	-49.172	-106.623	-43.868	17.510	-37.005	-15.225	-37.450	-6.185	-2.545
*	9	6.812	-139.208	-131.253	-54.001	-14.279	-46.981	-19.329	-42.132	-6.185	-2.545
2-	1	7.569	-247.937	-155.883	-64.135	-53.637	-56.957	-23.434	-46.816	-6.185	-2.545
2-	3	0.000	-255.234	164.873	65.949	-36.829	4.499	1.800	-66.578	62.284	24.913
*	1	0.819	-131.159	138.120	55.248	-33.144	4.499	1.800	-20.005	51.448	20.579
*	2	1.637	-29.105	111.399	44.560	-29.464	4.499	1.800	17.653	40.625	16.250
*	3	2.456	51.175	84.646	33.858	-25.779	4.499	1.800	46.487	29.789	11.916
*	4	3.274	109.487	57.926	23.170	-22.098	4.499	1.800	66.428	18.966	7.586
*	5	4.093	145.973	31.172	12.469	-18.413	4.499	1.800	77.524	8.130	3.252
*	6	4.911	160.543	4.452	1.781	-14.733	4.499	1.800	79.748	-2.693	-1.077
*	7	5.730	153.234	-22.301	-8.920	-11.048	4.499	1.800	73.105	-13.529	-5.412
*	8	6.548	124.063	-49.022	-19.609	-7.367	4.499	1.800	57.612	-24.352	-9.741
*	9	7.367	72.959	-75.775	-30.310	-3.683	4.499	1.800	33.231	-35.188	-14.075
3-	2	8.185	0.000	-102.495	-40.998	0.000	4.499	1.800	0.000	-46.010	-18.404
2-	4	0.000	7.297	0.000	-346.134	-16.807	0.000	-66.435	19.762	0.000	-73.770
*	1	0.720	7.297	0.000	-350.382	-16.807	0.000	-66.435	19.762	0.000	-73.770
*	2	1.440	7.297	0.000	-354.630	-16.807	0.000	-66.435	19.762	0.000	-73.770
*	3	2.160	7.297	0.000	-358.878	-16.807	0.000	-66.435	19.762	0.000	-73.770
*	4	2.880	7.297	0.000	-363.126	-16.807	0.000	-66.435	19.762	0.000	-73.770
4-	2	3.600	7.297	0.000	-367.374	-16.807	0.000	-66.435	19.762	0.000	-73.770

PEDE NOI STAIR

	No	L(m)	Case 4 SEISMIC M (tm)	S (t)	N (t)	Case 5 M (tm)	S (t)	N (t)	Case 6 M (tm)	S (t)	N (t)
1-	2	0.000	0.000	-9.411	-3.872	0.000	195.328	80.364	0.000	114.521	47.117
*	1	0.757	-6.741	-8.398	-6.335	128.768	144.879	59.607	73.828	80.532	33.133
*	2	1.514	-12.715	-7.385	-8.798	219.347	94.430	38.851	121.926	46.543	19.149
*	3	2.271	-17.922	-6.372	-11.261	271.735	43.981	18.095	144.295	12.554	5.165
*	4	3.028	-22.362	-5.358	-13.723	285.933	-6.469	-2.661	140.933	-21.434	-8.819
*	5	3.785	-26.034	-4.345	-16.186	261.942	-56.918	-23.418	111.843	-55.423	-22.803
*	6	4.542	-28.940	-3.332	-18.649	199.760	-107.367	-44.174	57.023	-89.412	-36.787
*	7	5.299	-31.079	-2.319	-21.112	99.388	-157.816	-64.930	-23.527	-123.401	-50.771
*	8	6.055	-32.449	-1.307	-23.572	-38.966	-208.199	-85.659	-129.650	-157.345	-64.736
*	9	6.812	-33.055	-0.293	-26.034	-215.667	-258.648	-106.415	-261.625	-191.334	-78.720
2-	1	7.569	-32.893	0.720	-28.497	-430.653	-309.097	-127.171	-419.399	-225.323	-92.704
2-	3	0.000	50.375	-11.502	26.412	-412.991	234.949	93.979	-462.076	330.293	132.117
*	1	0.819	41.393	-10.431	23.737	-235.687	198.029	79.212	-214.007	275.494	110.198
*	2	1.637	33.298	-9.363	21.065	-88.780	161.155	64.462	-11.038	220.762	88.305
*	3	2.456	26.068	-8.293	18.390	28.087	124.236	49.694	147.326	165.963	66.385
*	4	3.274	19.721	-7.224	15.718	114.630	87.361	34.945	260.699	111.231	44.493
*	5	4.093	14.243	-6.154	13.043	171.061	50.442	20.177	329.357	56.433	22.573
*	6	4.911	9.646	-5.085	10.371	197.241	13.568	5.427	353.134	1.701	0.680
*	7	5.730	5.920	-4.015	7.696	193.234	-23.352	-9.341	332.086	-53.098	-21.239
*	8	6.548	3.073	-2.946	5.024	159.051	-60.226	-24.090	266.267	-107.830	-43.132
*	9	7.367	1.098	-1.876	2.349	94.607	-97.145	-38.858	155.514	-162.629	-65.052
3-	2	8.185	0.000	-0.807	-0.323	0.000	-134.020	-53.608	0.000	-217.361	-86.944
2-	4	0.000	-83.268	55.423	-9.307	-17.662	0.000	-587.283	42.678	0.000	-599.385
*	1	0.720	-43.211	55.847	-9.307	-17.662	0.000	-593.146	42.678	0.000	-605.247
*	2	1.440	-2.848	56.272	-9.307	-17.662	0.000	-599.008	42.678	0.000	-611.109
*	3	2.160	37.821	56.697	-9.307	-17.662	0.000	-604.870	42.678	0.000	-616.972
*	4	2.880	78.796	57.122	-9.307	-17.662	0.000	-610.732	42.678	0.000	-622.834
4-	2	3.600	120.077	57.547	-9.307	-17.662	0.000	-616.594	42.678	0.000	-628.696

PEDE NOI STAIR

	No	L(m)	Case 7 M (tm)	S (t)	N (t)	Case 8 M (tm)	S (t)	N (t)	Case 9 M (tm)	S (t)	N (t)
1-	2	0.000	0.000	185.123	76.165	0.000	112.303	46.205	0.000	133.170	54.790
*	1	0.757	121.043	134.674	55.409	72.655	79.652	28.970	87.712	98.565	40.552
*	2	1.514	203.896	84.225	34.652	120.593	47.000	11.735	149.227	63.959	26.315
*	3	2.271	248.559	33.775	13.896	143.814	14.349	-5.500	184.546	29.354	12.077
*	4	3.028	255.032	-16.674	-6.860	142.317	-18.302	-22.735	193.669	-5.252	-2.161
*	5	3.785	223.315	-67.123	-27.616	116.104	-50.954	-39.970	176.595	-39.857	-16.399
*	6	4.542	153.408	-117.572	-48.373	65.173	-83.605	-57.205	133.324	-74.463	-30.636
*	7	5.299	45.311	-168.021	-69.129	-10.474	-116.257	-74.440	63.858	-109.069	-44.874
*	8	6.055	-100.758	-218.404	-89.858	-110.690	-148.865	-91.652	-31.662	-143.628	-59.093
*	9	6.812	-285.184	-268.853	-110.614	-235.739	-181.516	-108.887	-153.487	-178.234	-73.331
2-	1	7.569	-507.899	-319.302	-131.370	-385.571	-214.168	-126.122	-301.573	-212.840	-87.568
2-	3	0.000	-522.845	337.717	135.087	-285.728	212.343	125.874	-292.063	169.372	67.749
*	1	0.819	-268.695	282.918	113.167	-126.360	176.836	107.575	-164.303	142.619	57.048
*	2	1.637	-59.653	228.186	91.274	3.788	141.372	89.299	-58.569	115.899	46.359
*	3	2.456	104.791	173.387	69.355	105.031	105.865	71.000	25.397	89.146	35.658
*	4	3.274	224.236	118.655	47.462	177.125	70.402	52.723	87.389	62.425	24.970
*	5	4.093	298.975	63.856	25.543	220.244	34.895	34.424	127.560	35.672	14.269
*	6	4.911	328.824	9.125	3.650	234.283	-0.569	16.147	145.810	8.951	3.581
*	7	5.730	313.857	-45.674	-18.270	219.277	-30.070	-2.152	142.186	-17.802	-7.121
*	8	6.548	254.110	-100.406	-40.162	175.263	-71.539	-20.428	116.696	-44.522	-17.809
*	9	7.367	149.438	-155.205	-62.082	102.132	-107.046	-38.727	69.276	-71.276	-28.510
3-	2	8.185	0.000	-209.937	-83.975	0.000	-142.510	-57.004	0.000	-97.996	-39.198
2-	4	0.000	14.946	0.000	-709.003	-99.843	73.158	-489.951	-9.510	0.000	-412.569
*	1	0.720	14.946	0.000	-714.865	-46.968	73.719	-495.813	-9.510	0.000	-416.817
*	2	1.440	14.946	0.000	-720.727	6.311	74.279	-501.675	-9.510	0.000	-421.065
*	3	2.160	14.946	0.000	-726.590	59.994	74.840	-507.537	-9.510	0.000	-425.313
*	4	2.880	14.946	0.000	-732.452	114.081	75.401	-513.400	-9.510	0.000	-429.561
4-	2	3.600	14.946	0.000	-738.314	168.571	75.961	-519.262	-9.510	0.000	-433.809

PEDE NOI STAIR

	No	L(m)	Case 10 M (tm)	S (t)	N (t)	Case 11 M (tm)	S (t)	N (t)	Case 12 M (tm)	S (t)	N (t)
1-	2	0.000	0.000	84.197	34.641	0.000	126.985	52.245	0.000	82.852	34.088
*	1	0.757	54.414	59.567	24.508	83.030	92.380	38.008	53.704	59.033	21.984
*	2	1.514	90.184	34.937	14.374	139.863	57.774	23.770	89.376	35.214	9.881
*	3	2.271	107.309	10.308	4.241	170.500	23.169	9.532	107.018	11.395	-2.223
*	4	3.028	105.790	-14.322	-5.893	174.941	-11.437	-4.705	106.629	-12.424	-14.327
*	5	3.785	85.626	-38.952	-16.026	153.185	-46.042	-18.943	88.208	-36.243	-26.430
*	6	4.542	46.817	-63.581	-26.159	105.232	-80.648	-33.181	51.757	-60.062	-38.534
*	7	5.299	-10.637	-88.211	-36.293	31.084	-115.254	-47.419	-2.726	-83.881	-50.637
*	8	6.055	-86.622	-112.808	-46.413	-69.112	-149.813	-61.638	-75.131	-107.669	-62.725
*	9	6.812	-181.340	-137.438	-56.546	-195.619	-184.419	-75.875	-165.652	-131.488	-74.829
2-	1	7.569	-294.752	-162.068	-66.679	-348.389	-219.025	-90.113	-274.251	-155.307	-86.932
2-	3	0.000	-321.812	227.157	90.863	-358.641	231.656	92.662	-214.934	155.672	87.079
*	1	0.819	-151.163	189.568	75.827	-184.308	194.067	77.627	-98.044	129.775	74.238
*	2	1.637	-11.452	152.024	60.810	-40.916	156.524	62.609	-2.467	103.909	61.412
*	3	2.456	97.663	114.435	45.774	71.884	118.934	47.574	72.030	78.012	48.571
*	4	3.274	175.915	76.892	30.757	153.817	81.391	32.556	125.264	52.147	35.745
*	5	4.093	223.497	39.302	15.721	205.083	43.802	17.521	157.368	26.249	22.903
*	6	4.911	240.291	1.759	0.704	225.558	6.259	2.503	168.261	0.384	10.078
*	7	5.730	226.339	-35.830	-14.332	215.291	-31.331	-12.532	157.970	-25.513	-2.764
*	8	6.548	181.675	-73.373	-29.349	174.307	-68.874	-27.550	126.521	-51.379	-15.589
*	9	7.367	106.189	-110.963	-44.385	102.507	-106.463	-42.585	73.837	-77.276	-28.431
3-	2	8.185	0.000	-148.506	-59.402	0.000	-144.006	-57.603	0.000	-103.141	-41.257
2-	4	0.000	27.059	0.000	-419.904	10.252	0.000	-486.339	-59.317	44.338	-353.580
*	1	0.720	27.059	0.000	-424.152	10.252	0.000	-490.587	-27.271	44.678	-357.828
*	2	1.440	27.059	0.000	-428.400	10.252	0.000	-494.835	5.019	45.018	-362.076
*	3	2.160	27.059	0.000	-432.648	10.252	0.000	-499.083	37.554	45.358	-366.324
*	4	2.880	27.059	0.000	-436.896	10.252	0.000	-503.331	70.334	45.697	-370.572
4-	2	3.600	27.059	0.000	-441.144	10.252	0.000	-507.579	103.359	46.037	-374.820

PEDE NOI STAIR

PICK-UP No. 1 * ULS

No.	L (m)	M. MAXIMUM Case	M (tm)	S (t)	N (t)	M. MINIMUM Case	M (tm)	S (t)	N (t)
1 - 2	0.000	C- 8	0.000	112.303	46.205	C- 7	0.000	185.123	76.165
* 1	0.757	C- 5	128.768	144.879	59.607	C- 8	72.655	79.652	28.970
* 2	1.514	C- 5	219.347	94.430	38.851	C- 8	120.593	47.000	11.735
* 3	2.271	C- 5	271.735	43.981	18.095	C- 8	143.814	14.349	-5.500
* 4	3.028	C- 5	285.933	-6.469	-2.661	C- 6	140.933	-21.434	-8.819
* 5	3.785	C- 5	261.942	-56.918	-23.418	C- 6	111.843	-55.423	-22.803
* 6	4.542	C- 5	199.760	-107.367	-44.174	C- 6	57.023	-89.412	-36.787
* 7	5.299	C- 5	99.388	-157.816	-64.930	C- 6	-23.527	-123.401	-50.771
* 8	6.055	C- 5	-38.966	-208.199	-85.659	C- 6	-129.650	-157.345	-64.736
* 9	6.812	C- 5	-215.667	-258.648	-106.415	C- 7	-285.184	-268.853	-110.614
2 - 1	7.569	C- 8	-385.571	-214.168	-126.122	C- 7	-507.899	-319.302	-131.370
2 - 3	0.000	C- 8	-285.728	212.343	125.874	C- 7	-522.845	337.717	135.087
* 1	0.819	C- 8	-126.360	176.836	107.575	C- 7	-268.695	282.918	113.167
* 2	1.637	C- 8	3.788	141.372	89.299	C- 5	-88.780	161.155	64.462
* 3	2.456	C- 6	147.326	165.963	66.385	C- 5	28.087	124.230	49.694
* 4	3.274	C- 6	260.699	111.231	44.493	C- 5	114.630	87.361	34.945
* 5	4.093	C- 6	329.357	56.433	22.573	C- 5	171.061	50.442	20.177
* 6	4.911	C- 6	353.134	1.701	0.680	C- 5	197.241	13.568	5.427
* 7	5.730	C- 6	332.086	-53.098	-21.239	C- 5	193.234	-23.352	-9.341
* 8	6.548	C- 6	266.267	-107.830	-43.132	C- 5	159.051	-60.226	-24.090
* 9	7.367	C- 6	155.514	-162.629	-65.052	C- 5	94.607	-97.145	-38.858
3 - 2	8.185	C- 6	0.000	-217.361	-86.944	C- 5	0.000	-134.020	-53.608
2 - 4	0.000	C- 6	42.678	0.000	-599.385	C- 8	-99.843	73.158	-489.951
* 1	0.720	C- 6	42.678	0.000	-605.247	C- 8	-46.968	73.719	-495.813
* 2	1.440	C- 6	42.678	0.000	-611.109	C- 5	-17.662	0.000	-599.008
* 3	2.160	C- 8	59.994	74.840	-507.537	C- 5	-17.662	0.000	-604.870
* 4	2.880	C- 8	114.081	75.401	-513.400	C- 5	-17.662	0.000	-610.732
4 - 2	3.600	C- 8	168.571	75.961	-519.262	C- 5	-17.662	0.000	-616.594

PEDE NOI STAIR

PICK-UP No. 1 * ULS

No.	L (m)	S. MAXIMUM Case	M (tm)	S (t)	N (t)	S. MINIMUM Case	M (tm)	S (t)	N (t)
1 - 2	0.000	C- 5	0.000	195.328	80.364	C- 8	0.000	112.303	46.205
* 1	0.757	C- 5	128.768	144.879	59.607	C- 8	72.655	79.652	28.970
* 2	1.514	C- 5	219.347	94.430	38.851	C- 6	121.926	46.543	19.149
* 3	2.271	C- 5	271.735	43.981	18.095	C- 6	144.295	12.554	5.165
* 4	3.028	C- 5	285.933	-6.469	-2.661	C- 6	140.933	-21.434	-8.819
* 5	3.785	C- 8	116.104	-50.954	-39.970	C- 7	223.315	-67.123	-27.616
* 6	4.542	C- 8	65.173	-83.605	-57.205	C- 7	153.408	-117.572	-48.373
* 7	5.299	C- 8	-10.474	-116.257	-74.440	C- 7	45.311	-168.021	-69.129
* 8	6.055	C- 8	-110.690	-148.865	-91.652	C- 7	-100.758	-218.404	-89.858
* 9	6.812	C- 8	-235.739	-181.516	-108.887	C- 7	-285.184	-268.853	-110.614
2 - 1	7.569	C- 8	-385.571	-214.168	-126.122	C- 7	-507.899	-319.302	-131.370
2 - 3	0.000	C- 7	-522.845	337.717	135.087	C- 8	-285.728	212.343	125.874
* 1	0.819	C- 7	-268.695	282.918	113.167	C- 8	-126.360	176.836	107.575
* 2	1.637	C- 7	-59.653	228.186	91.274	C- 8	3.788	141.372	89.299
* 3	2.456	C- 7	104.791	173.387	69.355	C- 8	105.031	105.865	71.000
* 4	3.274	C- 7	224.236	118.655	47.462	C- 8	177.125	70.402	52.723
* 5	4.093	C- 7	298.975	63.856	25.543	C- 8	220.244	34.895	34.424
* 6	4.911	C- 5	197.241	13.568	5.427	C- 8	234.283	-0.569	16.147
* 7	5.730	C- 5	193.234	-23.352	-9.341	C- 6	332.086	-53.098	-21.239
* 8	6.548	C- 5	159.051	-60.226	-24.090	C- 6	266.267	-107.830	-43.132
* 9	7.367	C- 5	94.607	-97.145	-38.858	C- 6	155.514	-162.629	-65.052
3 - 2	8.185	C- 5	0.000	-134.020	-53.608	C- 6	0.000	-217.361	-86.944
2 - 4	0.000	C- 8	-99.843	73.158	-489.951	C- 5	-17.662	0.000	-587.283
* 1	0.720	C- 8	-46.968	73.719	-495.813	C- 5	-17.662	0.000	-593.146
* 2	1.440	C- 8	6.311	74.279	-501.675	C- 5	-17.662	0.000	-599.008
* 3	2.160	C- 8	59.994	74.840	-507.537	C- 5	-17.662	0.000	-604.870
* 4	2.880	C- 8	114.081	75.401	-513.400	C- 5	-17.662	0.000	-610.732
4 - 2	3.600	C- 8	168.571	75.961	-519.262	C- 5	-17.662	0.000	-616.594

PEDE NOI STAIR

PICK-UP No. 1 * ULS

No.	L (m)	N. MAXIMUM Case	M (tm)	S (t)	N (t)	N. MINIMUM Case	M (tm)	S (t)	N (t)
1 - 2	0.000	C- 5	0.000	195.328	80.364	C- 8	0.000	112.303	46.205
* 1	0.757	C- 5	128.768	144.879	59.607	C- 8	72.655	79.652	28.970
* 2	1.514	C- 5	219.347	94.430	38.851	C- 8	120.593	47.000	11.735
* 3	2.271	C- 5	271.735	43.981	18.095	C- 8	143.814	14.349	-5.500
* 4	3.028	C- 5	285.933	-6.469	-2.661	C- 8	142.317	-18.302	-22.735
* 5	3.785	C- 6	111.843	-55.423	-22.803	C- 8	116.104	-50.954	-39.970
* 6	4.542	C- 6	57.023	-89.412	-36.787	C- 8	65.173	-83.605	-57.205
* 7	5.299	C- 6	-23.527	-123.401	-50.771	C- 8	-10.474	-116.257	-74.440
* 8	6.055	C- 6	-129.650	-157.345	-64.736	C- 8	-110.690	-148.865	-91.652
* 9	6.812	C- 6	-261.625	-191.334	-78.720	C- 7	-285.184	-268.853	-110.614
2 - 1	7.569	C- 6	-419.399	-225.323	-92.704	C- 7	-507.899	-319.302	-131.370
2 - 3	0.000	C- 7	-522.845	337.717	135.087	C- 5	-412.991	234.949	93.979
* 1	0.819	C- 7	-268.695	282.918	113.167	C- 5	-235.687	198.029	79.212
* 2	1.637	C- 7	-59.653	228.186	91.274	C- 5	-88.780	161.155	64.462
* 3	2.456	C- 8	105.031	105.865	71.000	C- 5	28.087	124.236	49.694
* 4	3.274	C- 8	177.125	70.402	52.723	C- 5	114.630	87.361	34.945
* 5	4.093	C- 8	220.244	34.895	34.424	C- 5	171.061	50.442	20.177
* 6	4.911	C- 8	234.283	-0.569	16.147	C- 6	353.134	1.701	0.680
* 7	5.730	C- 8	219.277	-36.076	-2.152	C- 6	332.086	-53.098	-21.239
* 8	6.548	C- 8	175.263	-71.539	-20.428	C- 6	266.267	-107.830	-43.132
* 9	7.367	C- 8	102.132	-107.046	-38.727	C- 6	155.514	-162.629	-65.052
3 - 2	8.185	C- 5	0.000	-134.020	-53.608	C- 6	0.000	-217.361	-86.944
2 - 4	0.000	C- 8	-99.843	73.158	-489.951	C- 7	14.946	0.000	-709.003
* 1	0.720	C- 8	-46.968	73.719	-495.813	C- 7	14.946	0.000	-714.865
* 2	1.440	C- 8	6.311	74.279	-501.675	C- 7	14.946	0.000	-720.727
* 3	2.160	C- 8	59.994	74.840	-507.537	C- 7	14.946	0.000	-726.590
* 4	2.880	C- 8	114.081	75.401	-513.400	C- 7	14.946	0.000	-732.452
4 - 2	3.600	C- 8	168.571	75.961	-519.262	C- 7	14.946	0.000	-738.314

PEDE NOI STAIR

PICK-UP No. 2 * SLS

No.	L (m)	M. MAXIMUM Case	M (tm)	S (t)	N (t)	M. MINIMUM Case	M (tm)	S (t)	N (t)
1 - 2	0.000	C-12	0.000	82.852	34.088	C-11	0.000	126.985	52.245
* 1	0.757	C- 9	87.712	98.565	40.552	C-12	53.704	59.033	21.984
* 2	1.514	C- 9	149.227	63.959	26.315	C-12	89.376	35.214	9.881
* 3	2.271	C- 9	184.546	29.354	12.077	C-12	107.018	11.395	-2.223
* 4	3.028	C- 9	193.669	-5.252	-2.161	C-10	105.790	-14.322	-5.893
* 5	3.785	C- 9	176.595	-39.857	-16.399	C-10	85.626	-38.952	-16.026
* 6	4.542	C- 9	133.324	-74.463	-30.636	C-10	46.817	-63.581	-26.159
* 7	5.299	C- 9	63.858	-109.069	-44.874	C-10	-10.637	-88.211	-36.293
* 8	6.055	C- 9	-31.662	-143.628	-59.093	C-10	-86.622	-112.808	-46.413
* 9	6.812	C- 9	-153.487	-178.234	-73.331	C-11	-195.619	-184.419	-75.875
2 - 1	7.569	C-12	-274.251	-155.307	-86.932	C-11	-348.389	-219.025	-90.113
2 - 3	0.000	C-12	-214.934	155.672	87.079	C-11	-358.641	231.656	92.662
* 1	0.819	C-12	-98.044	129.775	74.238	C-11	-184.308	194.067	77.627
* 2	1.637	C-12	-2.467	103.909	61.412	C- 9	-58.569	115.899	46.359
* 3	2.456	C-10	97.663	114.435	45.774	C- 9	25.397	89.146	35.658
* 4	3.274	C-10	175.915	76.892	30.757	C- 9	87.389	62.425	24.970
* 5	4.093	C-10	223.497	39.302	15.721	C- 9	127.560	35.672	14.269
* 6	4.911	C-10	240.291	1.759	0.704	C- 9	145.810	8.951	3.581
* 7	5.730	C-10	226.339	-35.830	-14.332	C- 9	142.186	-17.802	-7.121
* 8	6.548	C-10	181.675	-73.373	-29.349	C- 9	116.696	-44.522	-17.809
* 9	7.367	C-10	106.189	-110.963	-44.385	C- 9	69.276	-71.276	-28.510
3 - 2	8.185	C-10	0.000	-148.506	-59.402	C- 9	0.000	-97.996	-39.198
2 - 4	0.000	C-10	27.059	0.000	-419.904	C-12	-59.317	44.338	-353.580
* 1	0.720	C-10	27.059	0.000	-424.152	C-12	-27.271	44.678	-357.828
* 2	1.440	C-10	27.059	0.000	-428.400	C- 9	-9.510	0.000	-421.065
* 3	2.160	C-12	37.554	45.358	-366.324	C- 9	-9.510	0.000	-425.313
* 4	2.880	C-12	70.334	45.697	-370.572	C- 9	-9.510	0.000	-429.561
4 - 2	3.600	C-12	103.359	46.037	-374.820	C- 9	-9.510	0.000	-433.809

PEDE NO1 STAIR

PICK-UP No. 2 * SLS

No.	L (m)	S. MAXIMUM Case	M (tm)	S (t)	N (t)	S. MINIMUM Case	M (tm)	S (t)	N (t)
1 - 2	0.000	C- 9	0.000	133.170	54.790	C-12	0.000	82.852	34.088
* 1	0.757	C- 9	87.712	98.565	40.552	C-12	53.704	59.033	21.984
* 2	1.514	C- 9	149.227	63.959	26.315	C-10	90.184	34.937	14.374
* 3	2.271	C- 9	184.546	29.354	12.077	C-10	107.309	10.308	4.241
* 4	3.028	C- 9	193.669	-5.252	-2.161	C-10	105.790	-14.322	-5.893
* 5	3.785	C-12	88.208	-36.243	-26.430	C-11	153.185	-46.042	-18.943
* 6	4.542	C-12	51.757	-60.062	-38.534	C-11	105.232	-80.648	-33.181
* 7	5.299	C-12	-2.726	-83.881	-50.637	C-11	31.084	-115.254	-47.419
* 8	6.055	C-12	-75.131	-107.669	-62.725	C-11	-69.112	-149.813	-61.638
* 9	6.812	C-12	-165.652	-131.488	-74.829	C-11	-195.619	-184.419	-75.875
2 - 1	7.569	C-12	-274.251	-155.307	-86.932	C-11	-348.389	-219.025	-90.113
2 - 3	0.000	C-11	-358.641	231.656	92.662	C-12	-214.934	155.672	87.079
* 1	0.819	C-11	-184.308	194.067	77.627	C-12	-98.044	129.775	74.238
* 2	1.637	C-11	-40.916	156.524	62.609	C-12	-2.467	103.909	61.412
* 3	2.456	C-11	71.884	118.934	47.574	C-12	72.030	78.012	48.571
* 4	3.274	C-11	153.817	81.391	32.556	C-12	125.264	52.147	35.745
* 5	4.093	C-11	205.083	43.802	17.521	C-12	157.368	26.249	22.903
* 6	4.911	C- 9	145.810	8.951	3.581	C-12	168.261	0.384	10.078
* 7	5.730	C- 9	142.186	-17.802	-7.121	C-10	226.339	-35.830	-14.332
* 8	6.548	C- 9	116.696	-44.522	-17.809	C-10	181.675	-73.373	-29.349
* 9	7.367	C- 9	69.276	-71.270	-28.510	C-10	106.189	-110.963	-44.385
3 - 2	8.185	C- 9	0.000	-97.996	-39.198	C-10	0.000	-148.506	-59.402
2 - 4	0.000	C-12	-59.317	44.338	-353.580	C- 9	-9.510	0.000	-412.569
* 1	0.720	C-12	-27.271	44.678	-357.828	C- 9	-9.510	0.000	-416.817
* 2	1.440	C-12	5.019	45.018	-362.076	C- 9	-9.510	0.000	-421.065
* 3	2.160	C-12	37.554	45.358	-366.324	C- 9	-9.510	0.000	-425.313
* 4	2.880	C-12	70.334	45.697	-370.572	C- 9	-9.510	0.000	-429.561
4 - 2	3.600	C-12	103.359	46.037	-374.820	C- 9	-9.510	0.000	-433.809

PEDE NOI STAIR

PICK-UP No. 2 * SLS

No.	L (m)	N. MAXIMUM Case	M (tm)	S (t)	N (t)	N. MINIMUM Case	M (tm)	S (t)	N (t)
1 - 2	0.000	C- 9	0.000	133.170	54.790	C-12	0.000	82.852	34.088
* 1	0.757	C- 9	87.712	98.565	40.552	C-12	53.704	59.033	21.984
* 2	1.514	C- 9	149.227	63.959	26.315	C-12	89.376	35.214	9.881
* 3	2.271	C- 9	184.546	29.354	12.077	C-12	107.018	11.395	-2.223
* 4	3.028	C- 9	193.669	-5.252	-2.161	C-12	106.629	-12.424	-14.327
* 5	3.785	C-10	85.626	-38.952	-16.026	C-12	88.208	-36.243	-26.430
* 6	4.542	C-10	46.817	-63.581	-26.159	C-12	51.757	-60.062	-38.534
* 7	5.299	C-10	-10.637	-88.211	-36.293	C-12	-2.726	-83.881	-50.637
* 8	6.055	C-10	-86.622	-112.808	-46.413	C-12	-75.131	-107.669	-62.725
* 9	6.812	C-10	-181.340	-137.438	-56.546	C-11	-195.619	-184.419	-75.875
2 - 1	7.569	C-10	-294.752	-162.068	-66.679	C-11	-348.389	-219.025	-90.113
2 - 3	0.000	C-11	-358.641	231.656	92.662	C- 9	-292.063	169.372	67.749
* 1	0.819	C-11	-184.308	194.067	77.627	C- 9	-164.303	142.619	57.048
* 2	1.637	C-11	-40.916	156.524	62.609	C- 9	-58.569	115.899	46.359
* 3	2.456	C-12	72.030	78.012	48.571	C- 9	25.397	89.146	35.658
* 4	3.274	C-12	125.264	52.147	35.745	C- 9	87.389	62.425	24.970
* 5	4.093	C-12	157.368	26.249	22.903	C- 9	127.560	35.672	14.269
* 6	4.911	C-12	168.261	0.384	10.078	C-10	240.291	1.759	0.704
* 7	5.730	C-12	157.970	-25.513	-2.764	C-10	226.339	-35.830	-14.332
* 8	6.548	C-12	126.521	-51.379	-15.589	C-10	181.675	-73.373	-29.349
* 9	7.367	C-12	73.837	-77.276	-28.431	C-10	106.189	-110.963	-44.385
3 - 2	8.185	C- 9	0.000	-97.996	-39.198	C-10	0.000	-148.506	-59.402
2 - 4	0.000	C-12	-59.317	44.338	-353.580	C-11	10.252	0.000	-486.339
* 1	0.720	C-12	-27.271	44.678	-357.828	C-11	10.252	0.000	-490.587
* 2	1.440	C-12	5.019	45.018	-362.076	C-11	10.252	0.000	-494.835
* 3	2.160	C-12	37.554	45.358	-366.324	C-11	10.252	0.000	-499.083
* 4	2.880	C-12	70.334	45.697	-370.572	C-11	10.252	0.000	-503.331
4 - 2	3.600	C-12	103.359	46.037	-374.820	C-11	10.252	0.000	-507.579

No.① PEDESTRIAN BRIDGE－Staircase －Superstructure

1. Calculation of bending moment for U.L.S.

1) For middle point of second span … $Mu.max = 353.2^{KNm}$

(For middle point of first span … $Mu.max = 286.0^{KNm}$)

section $b = 360^{cm}$ $h = 30$ $d = 23.5$ $d' = 6.5$

$As = Y_{16} - 25^{NO} = 2.011 \times 25 = 50.275\ cm^2$

$$\chi = \frac{0.87 \times 41000 \times 50.275}{0.40 \times 3000 \times 360} = 4.2^{cm}$$

$$Z = 23.5 - \frac{4.2}{2} = 21.4^{cm} < 0.95 \times 23.5 = 22.4^{cm} \quad OK$$

$M_{RS} = 0.87 \times 41000 \times 50.275 \times 21.4 \times 10^{-5} = 383.8^{KNm} > Mu = 353.2^{KNm}$

$M_{RC} = 0.40 \times 3000 \times 360 \times 4.2 \times 21.4 \times 10^{-5} = 388.3^{KNm} > Mu = 353.2^{KNm}$ OK

2) For middle fulcrum … $Mu.min = -522.9^{KNm}$

section $b = 360^{cm}$ $h = 30$ $d = 24.0$ $d' = 6.0$

$As = Y_{20} - 25^{NO} = 3.1416 \times 25 = 78.54\ cm^2$

$$\chi = \frac{0.87 \times 41000 \times 78.54}{0.40 \times 3000 \times 360} = 6.6^{cm}$$

$$Z = 24.0 - \frac{6.6}{2} = 20.7^{cm} < 0.95 \times 24.0 = 22.8^{cm}$$

$M_{RS} = 0.87 \times 41000 \times 78.54 \times 20.7 \times 10^{-5} = 580.0^{KNm} > Mu = 522.9^{KNm}$

$M_{RC} = 0.40 \times 3000 \times 360 \times 6.6 \times 20.7 \times 10^{-5} = 590.2^{KNm} > Mu = 522.9^{KNm}$

2. Calculation of bending moment for S.L.S.

1) For middle point of second span … $Ms.max = 240.3^{KNm}$

(For middle point of first span … $Ms.max = 193.7^{KNm}$)

section $b = 360^{cm}$ $h = 30$ $d = 23.5$ $d' = 6.5$

$As = Y_{16} - 25^{NO} = 50.275\ cm^2$

$$\chi = \frac{0.80 \times 41000 \times 50.275}{\frac{1}{2} \times 0.50 \times 3000 \times 360} = 6.3^{cm}$$

$$Z = 23.5 - \frac{6.3}{3} = 21.4^{cm}$$

$M_{RS} = 0.80 \times 41000 \times 50.275 \times 21.4 \times 10^{-5} = 352.9^{KNm} > M = 240.3^{KNm}$

$M_{RC} = \frac{1}{2} \times 0.50 \times 3000 \times 360 \times 6.3 \times 21.4 \times 10^{-5} = 364.0^{KNm}$

$> M = 240.3^{KNm}$ OK

2) For middle fulcrum … $Ms.min = -358.7^{KNm}$

section $b = 360^{cm}$ $h = 30$ $d = 24.0$ $d' = 6.0$

$As = Y_{20} - 25^{NO} = 78.54\ cm^2$

$$\chi = \frac{0.80 \times 41000 \times 78.54}{\frac{1}{2} \times 0.50 \times 3000 \times 360} = 9.6^{cm}$$

$$Z = 24.0 - \frac{9.6}{3} = 20.8^{cm}$$

$M_{RS} = 0.80 \times 41000 \times 78.54 \times 20.8 \times 10^{-5} = 535.8^{KNm} > M = 358.7^{KNm}$

$M_{RC} = \frac{1}{2} \times 0.50 \times 3000 \times 360 \times 9.6 \times 20.8 \times 10^{-5} = 539.1^{KNm}$

$> M = 358.7^{KNm}$ OK

Note : U.L.S is critical state than S.L.S.

3. Calculation of shearing stress for U.L.S.

1) For middle fulcrum　　Su.max＝337.8^{KNm}

section　　b ＝360^{cm}　h ＝30　d ＝24.0　d′＝6.0

$As = Y_{20} - 25^{NO} = 3.1416 \times 25 = 78.54\ cm^2$

$$P = \frac{78.54}{360 \times 24.0} \times 100 = 0.909\ \%$$

$$Vc = \frac{337.8 \times 10^3}{360 \times 24.0} = 39.1\ N/cm^2$$

$$< Vca = 55.0 + 15.0 \left(\frac{0.909 - 0.50}{0.50} \right) = 67.3\ N/cm^2$$　OK

No.① PEDESTRIAN BRIDGE－Staircase － Substructure

Calculation for bottom of pillar for Longitudinal direction.

$M = 168.6^{KNm}$
$H = 76.0^{KN}$
$N = 519.3^{KN}$
} for pillar ④～② from case-8 (U.L.S)

section $b = 50^{cm}$ $h = 50$ $d = 43.5$ $d' = 6.5$

$As = As' = Y_{32} - 3^{N} = 8.042 \times 3 = 24.126\ cm^2$

$$Ma = 168.6 + 519.3 \left(0.435 - \frac{0.500}{2}\right) = 264.7^{KNm}$$

$$\chi = \frac{(0.87 - 0.72) \times 41000 \times 24.126}{0.40 \times 2500 \times 50.0} \fallingdotseq 4.4^{cm}$$

$$Z = 43.5 - \frac{4.4}{2} = 41.3^{cm} \fallingdotseq 0.95 \times 43.5 = 41.3^{cm}$$

$M_{Rs} = 0.87 \times 41000 \times 24.126 \times 41.3 \times 10^{-5} = 355.4^{KNm} > Ma = 264.7^{KNm}$

$M_{Rc} = (0.72 \times 41000 \times 24.126 \times 37.0 + 0.40 \times 2500 \times 50 \times 4.4 \times 41.3) \times 10^{-5} = 354.4^{KNm} > Ma = 264.7^{KNm}$ OK

$$Asn = A'sn = 24.126 - \frac{519.3 \times 10^3}{0.87 \times 41000} = 9.6\ cm^2$$

$< Asu = A'su = Y_{25} - 4^{N} = 4.909 \times 4 = 19.636 cm^2$

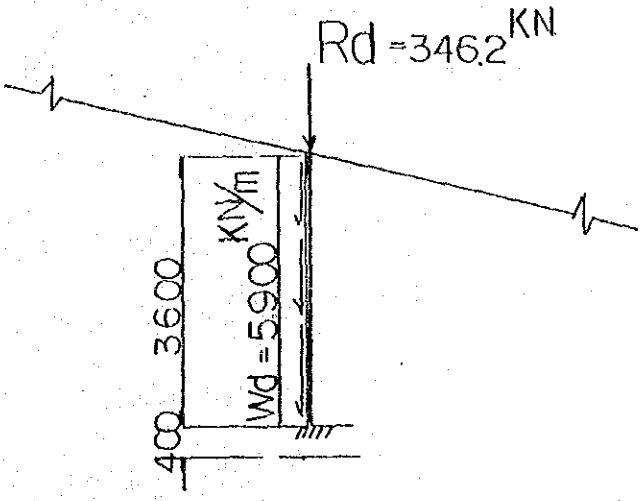
$$P = \frac{19.636}{50 \times 43.5} \times 100 = 0.903\ \%$$

$$Vc = \frac{76.0 \times 10^3}{50 \times 43.5} = 35.0\ N/cm^2$$

$$< Vca = 50.0 + 15.0 \left(\frac{0.903 - 0.50}{0.50}\right) = 62.1\ N/cm^2$$

No.① PEDESTRIAN BRIDGE－Staircase － Substructure

Calculation for bottom of pillar for crossing direction.



action force for seismic state (S.L.S)

$N = 346.2 + 5.90 \times 3.60 = 367.4^{KN}$

$H = 27.7 + 0.472 \times 3.60 = 29.4^{KN}$

$M = 27.7 \times 3.80 + \frac{1}{2} \times 0.472 \times 3.60^2 = 108.3^{KNm}$

action force for seismic state for U.L.S

$N = 367.4 + 1.38 = 507.0^{KN}$

$H = 29.4 + 1.65 = 48.5^{KN}$

$M = 108.3 \times 1.65 = 178.7^{KNm}$

section　b $=50^{cm}$　h=50　d=43.5　d′=6.5

$As = As' = Y_{32} - 3^{N} = 8.042 \times 3 = 24.126\ cm^2$

$Ma = 178.7 + 507.0 \left(0.435 - \frac{0.50}{2} \right) = 272.5^{KNm}$

$$x = \frac{(0.87 - 0.72) \times 41000 \times 24.126}{0.40 \times 2500 \times 50} = 4.4^{cm}$$

$$Z = 43.5 - \frac{4.4}{2} = 41.3^{cm} < 0.95 \times 43.5 = 41.3^{cm}$$

$M_{RS} = 0.87 \times 41000 \times 24.126 \times 41.3 \times 10^{-5} = 355.4^{KNm} > Ma = 272.5^{KNm}$

$M_{RC} = (0.72 \times 41000 \times 24.126 \times 37.0 + 0.40 \times 2500 \times 50 \times 4.4 \times 41.3) \times 10^{-5} = 354.4^{KNm} > Ma = 272.5^{KNm}$

$$A'sn = 24.126 - \frac{507.0 \times 10^3}{0.87 \times 41000} = 10.0\ cm^2$$

$< Asu = A'su = Y_{25} - 4^{NO} = 4.909 \times 4 = 19.636\ cm^2$　OK

Calculation of stability of foundation

Notice : this case is abridge and the bar arrengement is apply substructure of №② pedestrian bridge.