APPENDIX 3 Chapter 6 Design Standards

A6-2-1 + Yearly Max. Water Level of Red River in Hanoi
+ The Return Period of Max. Water Level in Hanoi
+ Water Level, Max. Discharge and Max. Velocity of Red River in Hanoi
+ Criteria to Class Vietnam

OBSERVATORY FOR HYDROMETEOROLOGY AND ENVIRONMENTAL CONTROL OF THE RED RIVER DELTA

YEARLY MAX WATER LEVEL OF RED RIVER (meter)

Red River Measuring Station: Ha Noi

Year	Max water level	Year	Max water level	Year	Max water level
1945	12.52	1963	9.51	1981	10.90
1946	9.89	1964	11.42	1982	11.06
1947	12.08	1965	9.47	1983	11.91
1948	10.57	1966	11.62	1984	10.32
1949	10.72	1967	10.64	1985	11.80
1950	10.83	1968	11.07	1986	12.19
1951	10.12	1969	13.06	1987	10.02
1952	9.69	1970	11.89	1988	9.99
1953	10.44	1971	13.97	1989	10.07
1954	11.26	1972	9.81	1990	11.78
1955	9.89	1973	11.00	1991	11.33
1956	10.52	1974	9.76	1992	11.32
1957	10.04	1975	10.06	1993	9.46
1958	10.26	1976	10.73	1994	10.57
1959	10.22	1977	11.07	1995	11.73
1960	10.21	1978	11.26	1996	12.43
1961	10.81	1979	11.53		
1962	9.81	1980	11.65		

Note: All of the water level before 1995 were revised according to the National Bech mark

HYDROMETEOROLOGY FORECASTING AND SERVICE DIVISION

OBSERVATORY FOR HYDROMETEOROLOGY AND
ENVIREMENTAL CONTOL OF THE RED RIVER DETA

THE RETURN PERIODS OF MAX. WATER LEVELS AT HANOI

(Predicting value)

Year numbers	5	10	20	30	40	50
Max Water levels	11.51	12.03	12.5	12.8	13.02	13.18
(m)	m	m	m	m	m	m

Year numbers	55	60	70	80	90	100
Max Water levels	13.25	13.51	13.4	13.5	13.59	13.97
(m)	m	m	m	m	m	m

HYDROMETEOROLRGY FORECAST AND SERVICE DIVISION

OBSEVATORY FOR HYDROMETEOROLOGY AND ENVIREMENTAL CONTOL OF THE RED RIVER DETA
HYDROMETEOROLRGY FORECAST AND SERVICE DIVISION
TEL : 8343584 FAX : 8357773

MAX. WATER LEVELS (m/s) , MAX. DISCHARGE (m3/ s) and MAX. VELOCITY (m/s)
Measuring station: Hanoi

Year	MAX. WATER LEVEL		MAX. DISCHARGE		MAX. VELOCITY	
	Water level (m)	Time occurence	Discharge (m3/s)	Time occurence	V (m/s)	Time occurence
1945	12.53	Aug , 20	x		x	
1969	13.06	Aug , 18	17800	Aug ,18	2.62	Aug , 14
1971	13.97	Aug ,22	22200	Aug ,20	2.81	Aug ,21
1986	12.19	Jul ,29	14600	Jul, 28	2.28	Jul, 26
1996	12.43	Aug , 21	14800	Aug, 21	2.23	Jul, 26

Note : * x : No measured data
* Water levels before 1996 were revised according to National bech mark .

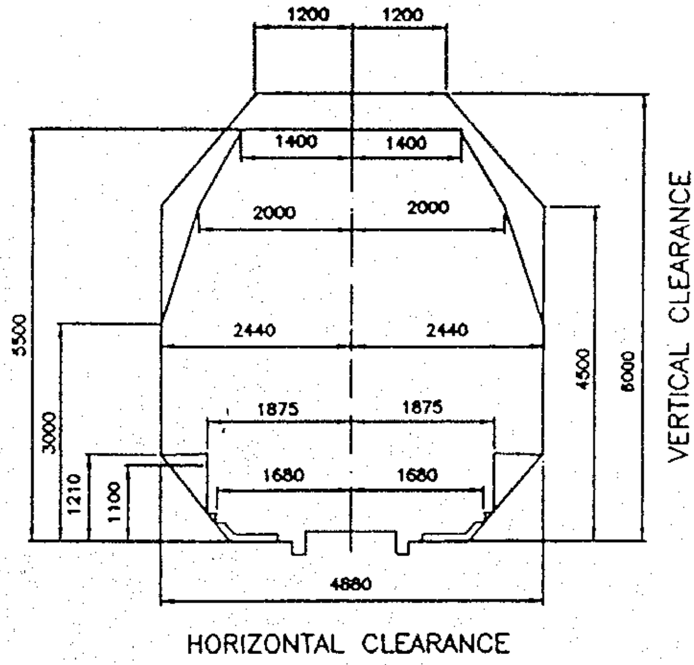
CRITERIA TO CLASS VIETNAMESE RIVERS

LEVEL	NATURAL RIVER		BRIDGE			SHIPS	THE MAXIMUM DIMENSION Length x width x water- depth (m)
	Depth of water (m)	Width of river-bed (m)	Waterway width (m)		Height of clearance (m)		
			River	Channel			
I	> 2.80	90	80	50	10	- Big ship 2 000 tons - Cargo ship 2 000 - 3 000 tons - Passenger ship 2 - 3 floors	180 x 14 x 2.8
II	2 - 2.80	70 - 90	60	40	9	- Big ship 1 000 tons - Cargo ship 1 000 - 2 000 tons - Passenger ship 2 floors	160 x 14 x 2.4
III	1.5 - 2.0	50 - 70	50	30	7	- Self-moving ship 600 tons - Cargo ship 720 - 1 500 tons - Passenger ship 1 floor	110 x 13 x 1.5
IV	1.20 - 1.5	30 - 50	40	25	6	- Self-moving ship 300 tons - Cargo ship 400 - 2 000 tons - Passenger ship 1 floor	100 x 13 x 1.2
V	1 - 1.2	20 - 30	25	20	3.5	- Self-moving ship 100 tons - Cargo ship 100 - 400 tons - Passenger ship 1 floors	65 x 7 x 1.0
VI	< 1.0	10 - 20	15	10	2.5	- Self-moving ship 40 tons - Cargo ship 100 tons - Passenger Canoe	40 x 5 x 0.6

A6-2-2 Clearance of Railway

A) FROM APPENDIX 1 OF VIET NAM BRIDGE DESIGN CODE

22TCN018-79



- OFF LINE IS LIMIT OF BRIDGE
- IN LINE IS LIMIT OF INTERIOR STRUCTURE
- DIAMENSION IN MM

6.2.1.1

FIGURE CLEARANCE DIAGRAM FOR BRIDGE OF RAILWAY GAUGE 1435 MM

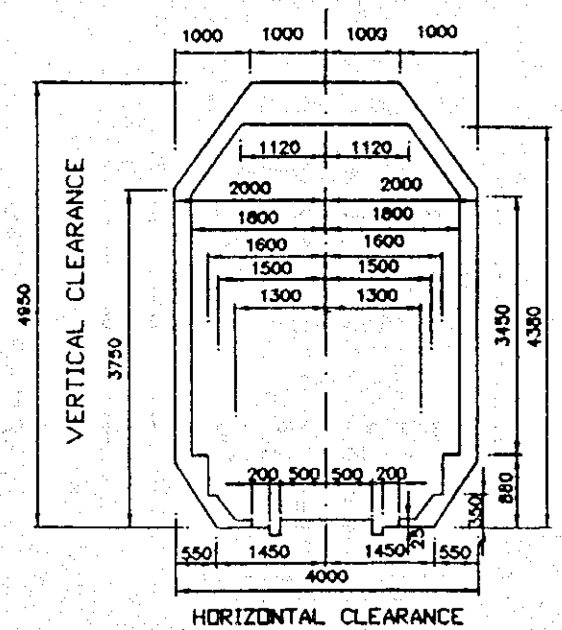
NOTES : FROM DECISION OF THE RAILWAY AUTHORY No 228/CDKT

FOR RAILWAY GAUGE 1435 :+ VERTICAL CLEARANCE IS 6200 MM

+HORIZONTAL CLEARANCE IS 6200 MM

THIS CLEARANCE IS SATISSFY SAFETY REQUIREMENT OF RAILWAY FILD

AND IT ALLOW TRAIN IMPACT IS NOT CONSIDERATION



- OFF LINE IS LIMIT OF BRIDGE
- IN LINE IS LIMIT OF INTERIOR STRUCTURE
- DIAMENSION IN MM

6.2.1.2.

FIGURE CLEARANCE DIAGRAM FOR BRIDGE OF RAILWAY GAUGE 1000 MM b, FROM DECISION OF THE RAILWAY AUTHORITY No228/CDKT

(6th APRIL 1992 FOR FUTURE DUAL RAILWAY GAUGE 1435mm)

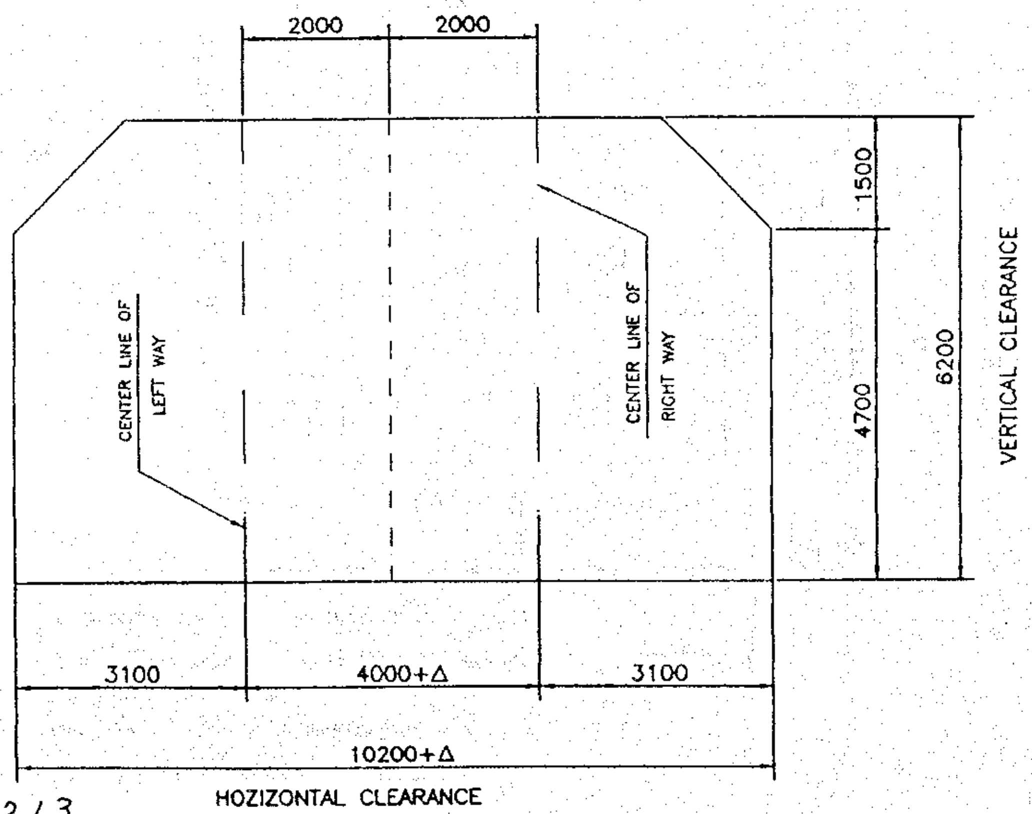


FIGURE 6.2.1.3 CLEARANCE DIAGRAM FOR BRIDGES OF FUTURE DUAL RAILWAY. GAUGE 1435mm, DIMENSION IN mm

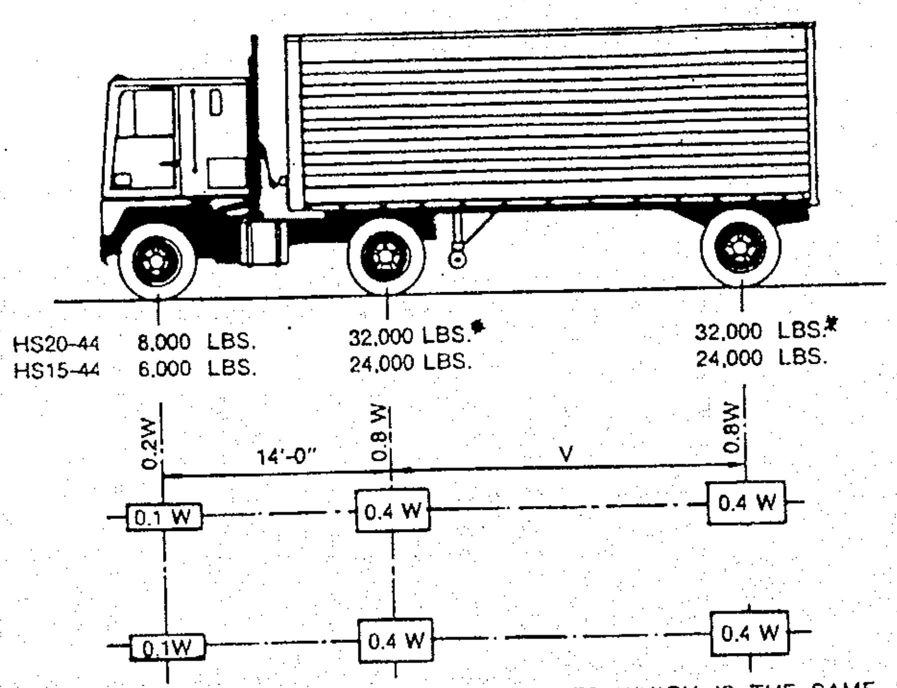
NOTES : Δ IS WIDENING ON THE CURVE

- THIS CLEARANCE IS TO SATISFY SAFETY REQUIREMENT OF RAILWAY FIELD AND IT ALLOWS TRAIN IMPACT IS NOT CONSIDERATION
- REQUIREMENT OF RAILWAY AUTHORITY IS FOLLOWING:

  ALL NEW BRIDGE CONSTRUCTIONS OVER PASS THE NATIONAL RAILWAY MUST BE DESIGNED WITH THE CLEARANCE FOR DUAL RAILWAY GAUGE 1435mm

  (THIS REQUIREMENT WILL BE APPLIED FLY OVER PASS THE NATIONAL RAILWAY OVER PASS BRIDGE AT GIE)

A6-2-3 The Standard Lane and Truck Loads



W = COMBINED WEIGHT ON THE FIRST TWO AXLES WHICH IS THE SAME AS FOR THE CORRESPONDING H TRUCK.

V = VARIABLE SPACING — 14 FEET TO 30 FEET INCLUSIVE. SPACING TO BE USED IS THAT WHICH PRODUCES MAXIMUM STRESSES.

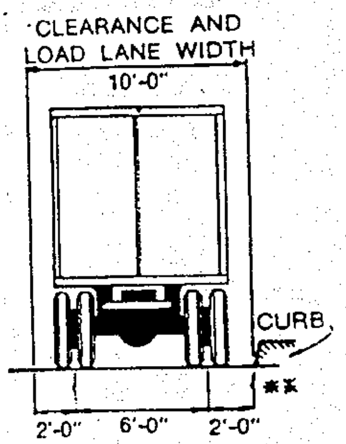
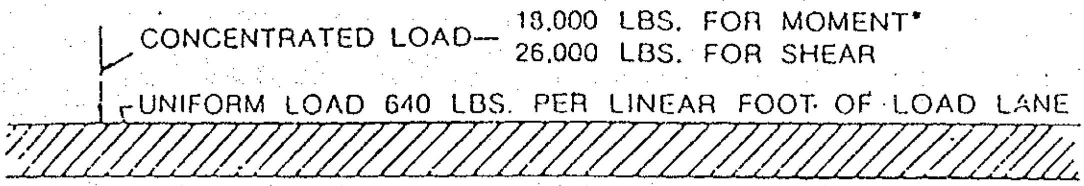


FIGURE 2.8



H20-44 LOADING
HS20-44 LOADING

FIGURE 2.9

A6-2-4 Monthly Maximum Winds in Hanoi

MONTHLY MAXIMUM WINDS (km/h)

Measuring station: Lang - Hanoi

Year	January		February		March		April		May		June	
	Direction	Speed	Direction	Speed	Direction	Speed	Direction	Speed	Direction	Speed	Direction	Speed
1956	ENE	43	NE	36	NNE	43	SSE	29	NNE	32	SSE,NNW	25
1957	SSE	32	NNE,ENE,SE	25	NE	43	SE	29	ESE	32	NNE	43
1958	NE	43	NE	32	NE	32	SE	29	NE	29	NE,SE	29
1959	NE,ESE	29	ESE,SE	25	N	29	NE,ESE	25	NW	29	WNW	25
1960	NE	43	NE	29	SE	43	NE	43	N	43	NE,NNW	36
1961	NE	47	NE	36	NNE	32	NE	43	NNE	72	NE-SE	43
1962	NE	47	NE	54	N-ENE	47	W	72	NNE	65	NW	65
1963	N-NE-SE	36	SSE	50	SSE	54	NE	68	W	76	NE	65
1964	NE	54	SE,NE,NNE	36	NE	50	SW	54	NE	58	SSW	54
1965	ESE	40	NE	40	NE	32	WNW-NE	36	S	79	E	43
1966	SE-NE	32	NE	50	ENE-NE	50	SW	54	SW	47	NE	61
1967	NNE-SSE	36	NNE-NE	36	NE	43	NE-ESE	40	SE-NNW	43	SSW	50
1968	SE	36	NE-ENE	36	SE	43	SE	32	S	43	SW	43
1969	NE	50	SE-ESE	36	SE	36	NE	65	SW	108	NE	50
1970	NE	32	ESE-NE	36	NE	29	NNE	43	SSE	47	NW	32
1971	SE	32	NE	40	NE	40	NNE	36	NNE	43	S	50
1972	NNE-NE	29	NE	36	SSE	50	NE-NNW	43	S-W	58	SE	43
1973	NNE-NE	36	NE	36	E-S	36	E	58	NE-S	43	SW-NE	36
1974	NE	36	NE	43	NE	50	NE-SE	43	N-SE	36	NNE	72
1975	NE	29	S-SE-NE	29	NE	36	W	54	N	72	S	43
1976	NE	36	SE-ESE	29	N-NNE	29	NE	50	NE-SSE-N	29	NE	36
1977	NE	36	ENE	29	NE	36	SE	32	ENE-SE	29	W-NW	65
1978	NE	36	N-NE-E	36	SE-NE	43	SE	43	ESE-E	43	SE	29
1979	NNE	50	SSE	36	NE	32	SE	36	NW	50	NW	43
1980	NE	43	NE	36	NNE	29	NE	40	NE	43	NE-SW	43
1981	NNE	29	NE,SSE	29	SE,ESE	36	SE,NE	32	NW	65	NW,SE	29
1982	NE, SSE	36	SE,NE	36	NE	43	NE	43	NE	40	NNE,SE	29
1983	NE	54	NE	32	NE,SE	25	SE	36	E	36	W	50
1984	SE	50	NE	29	NE,ESE	25	SSE,NE	29	E	36	NNE	50
1985	NE	36	NE	43	NE	50	NE	61	SE	29	NE	36
1986	NE, SE	29	NE,SE	29	NE,NNE	36	W	43	NNW	29	S,NE	29
1987	NE	43	NE	50	NE	50	NE	50	NE,S	43	NE,SW	36
1988	NE	36	NE	36	NE	36	NE	36	E	36	SE,N	29
1989	NE	50	SSE	43	NE	50	SE,NE	29	SSE	43	W,NW	101
1990	NE	43	NE	43	SE	36	NE	36	NE	50	SE	50
1994	NE	32	NE	32	NE	43	NE	32	NE	50	E	50
1995	NE,SE	36	NW	25	N	43	SE	36	NE	58	NE	36
1996	NE,SE	29	NE	47	NE	36	SE	36	NE	43	E	32

MONTHLY MAXIMUM WINDS (km/h)

Measuring station: Lang - Hanoi

Year	July		August		September		October		November		December	
	Direction	Speed	Direction	Speed	Direction	Speed	Direction	Speed	Direction	Speed	Direction	Speed
1956	N	122	ESE	29	NNE	29	NE	32	N	29	SE,ENE,SSE	25
1957	S	43	ENE	32	NE	32	NE	58	NE	29	N,NNE,SE	32
1958	SE	32	SSE	32	WNW,NW	29	NNE	32	NNE	25	NSE	29
1959	WNW	32	ENE	29	NE	32	SSE	29	SE,NE	32	NE	54
1960	SE	43	SE	72	NE	65	NNE	36	SE,NNE	32	NE	32
1961	SW	68	NW-NNE	50	SSE	47	SE-NE-E	43	NNE	61	NE	50
1962	N	68	W	58	N,ENE	72	NE	68	NE	50	NE	50
1963	ESE	83	W	65	WNW	65	NE	50	NE	79	NE	65
1964	WSW	54	E	40	NE	50	N	32	N-NNW	32	NE	36
1965	NE	65	E	43	E	32	NNE	29	N,NE,NNE	32	N-NE-NNE	50
1966	S	43	NNE-NE	47	N-NW	32	NE	54	NE	54	NNE	36
1967	N-SSW	43	NE	47	NNE	43	NNE	36	NE	54	NE	36
1968	S	83	N	72	ENE	101	W	36	NE-SE	29	NE-NNE	50
1969	E	36	SW	40	NNW	36	NE	40	NE	36	NE	29
1970	WSW	61	NE	43	NE	29	NE	43	NE	54	SE-NE	29
1971	E	58	WSW-S	43	W	36	N	47	NE	36	NNE	43
1972	WNW	43	WSW	72	ENE	50	NNE-NE	43	N-NNE	29	NE	43
1973	W	43	NE	65	E	54	NNE	36	NE-N	29	NE-NNE	29
1974	W-SW	43	N	50	SW	36	E-NE-N	36	NE	25	NE	29
1975	SW	36	E	58	SE	65	NE	32	NE	43	NE	43
1976	E	36	SE	43	SW	36	NNE	50	N-NNE	36	NE	36
1977	NW	101	N	36	W	32	SE	36	NE	36	SE-NE	29
1978	W	72	E	68	N	58	WNW	50	NE	36	E	36
1979	SW	43	NE	43	SE-E-NE	36	NE	50	NNE	43	SE	36
1980	N	86	NE	43	SSE	43	SE	36	SE	32		
1981	NNE	65	E,NE	112	NE	29	ENE,NNW	43	NE	50	NE	47
1982	S	36	W,SE	22	W	36	ENE	36	ENE	43	NE	61
1983	NW	72	NE	43	NE	36	N	58	NE	29	SSE,NE	36
1984	SSE,W	47	SW	43	NE	32	NE	50	W	43	NNE,NE	36
1985	SW	43	E	58	NE	29	NE	50	NE	54	NE	54
1986	NW,SE	29	NE	58	N	79	NE	43	NE	36	NE,SE	36
1987	NE	43	E	65	N	43	NE	43	N,NE	36	NE	32
1988	SE	43	N	43	NW	36	N	36	SE,NE	36	NE	43
1989	SE,NE	36	SE	36	SE,NE	29	NE	61	NE	36	NE	32
1990	E,SE	29	NE	43	SE	36	NE	36	NE	43	SE	36
1994	NW	36	NW	36			NE	50	E,NE	22	NE	32
1995	W	43	NW	29	SE	50	NE	40	NE	36	NE	29
1996	N	58	N	61	NE,NW	29	N	36	NE	32	NE	29

A6-2- 5 Yearly Max. and Min. Temperature

OBSERVATORY FOR HYDROMETEOROLOGY AND ENVIRONMENTAL CONTROL OF THE RED RIVER DELTA

YEARLY MIN. TEMPERATURE (° C and tenth)

Measuring Station: Lang Ha Noi

Year	Min. temperature	Year	Min. temperature	Year	Min. temperature
1945	6.4	1963	6.3	1981	8.7
1946	9.4	1964	8.1	1982	7.0
1947	7.6	1965	11.0	1983	7.0
1948	7.2	1966	9.0	1984	8.4
1949	5.9	1967	6.2	1985	9.4
1950	9.4	1968	5.0	1986	7.0
1951	8.2	1969	9.3	1987	8.9
1952	8.9	1970	10.2	1988	7.1
1953	10.4	1971	7.0	1989	8.7
1954	9.3	1972	8.5	1990	9.3
1955	2.7	1973	6.5	1991	8.4
1956	8.5	1974	6.1	1992	10.4
1957	7.2	1975	5.1	1993	8.0
1958	7.2	1976	8.0	1994	10.4
1959	9.0	1977	5.4	1995	9.7
1960	7.9	1978	9.6	1996	6.0
1961	6.4	1979	9.2		
1962	8.5	1980	8.2		

YEARLY MAX. TEMPERATURE (°C and tenth)

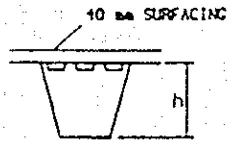
Measuring Station: Lang Ha Noi

Year	Max. temperature	Year	Max. temperature	Year	Max. temperature
1945	37.1	1963	36.1	1981	37.7
1946	37.5	1964	36.7	1982	38.8
1947	37.1	1965	36.1	1983	40.1
1948	36.5	1966	39.2	1984	37.6
1949	40.4	1967	38.7	1985	37.4
1950	36.7	1968	37.3	1986	38.2
1951	37.0	1969	38.0	1987	39.3
1952	38.6	1970	37.6	1988	38.8
1953	38.0	1971	37.8	1989	36.7
1954	39.3	1972	37.1	1990	38.0
1955	36.1	1973	37.5	1991	37.5
1956	37.3	1974	36.4	1992	37.8
1957	39.3	1975	36.7	1993	38.9
1958	38.3	1976	37.5	1994	39.8
1959	37.8	1977	38.7	1995	38.5
1960	39.3	1978	37.8	1996	38.3
1961	37.7	1979	37.8		
1962	37.5	1980	36.2		

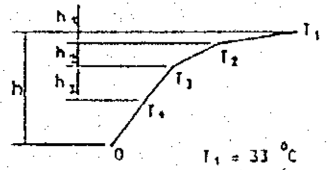
A6-2-6 Temperature Difference T for Different Types of Construction

GROUP	TYPE OF CONSTRUCTION	TEMPERATURE DIFFERENCE C

GROUP 1 — STEEL DECK ON STEEL BOX GIRDERS



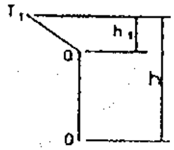
POSITIVE TEMPERATURE DIFFERENCE



$h_1 = 0.1$ m, $h_2 = 0.2$ m, $h_3 = 0.3$ m

$T_1 = 33$ °C, $T_2 = 19$ °C, $T_3 = 11$ °C, $T_4 = 6$ °C

REVERSE TEMPERATURE DIFFERENCE

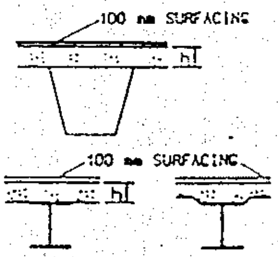


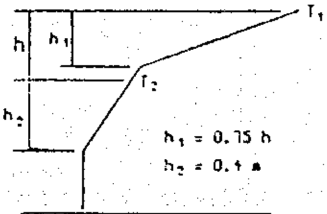
$T_1 = 3$ °C $\quad h_1 = 0.5$ m

GROUP 2 — STEEL DECK ON STEEL TRUSS OR PLATE GIRDERS

USE DIFFERENCES AS FOR GROUP 1

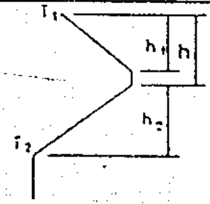
GROUP 3 — CONCRETE DECK ON STEEL BOX, TRUSS OR PLATE GIRDERS





$h_1 = 0.75$ h, $h_2 = 0.4$ m

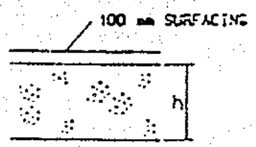
h	T_1	T_2
m	°C	°C
0.2	19	11
0.3	19	5

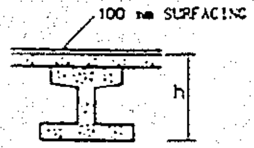


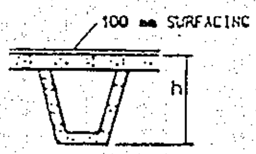
$h_1 = 0.6$ h, $h_2 = 0.4$ m

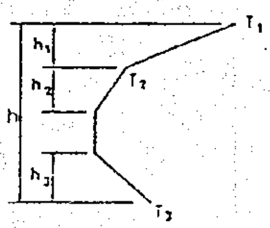
h	T_1	T_2
m	°C	°C
0.2	1.0	9.0
0.3	4.0	9.0

GROUP 4 — CONCRETE SLAB OR CONCRETE DECK ON CONCRETE BEAMS OR BOX GIRDERS









$h_1 = 0.1h < 0.15$m

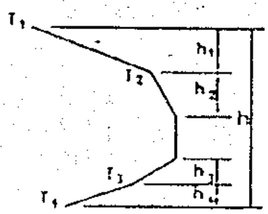
$h_2 = 0.1h > 0.08$m < 0.25m

$h_3 = 0.1h$ + SURFACING

DEPTH IN METRES

(FOR THIN SLABS, h_3 IS LIMITED BY $h-h_1-h_2$)

h	T_1	T_2	T_3
m	°C	°C	°C
<0.2	12.3	5.0	0.0
0.3	15.5	5.5	0.0
0.4	16.9	5.5	0.0
0.7	17.7	6.7	0.0
1.0	17.9	6.7	0.2
>3.0	18.7	7.0	0.9



$h_1 = h_4 = 0.2h < 0.25$m

$h_2 = 0.25h < 0.1$m

$h_3 = 0.15h < 0.1$m

h	T_1	T_2	T_3	T_4
m	°C	°C	°C	°C
<0.2	1.8	0.8	0.3	0.9
0.3	2.9	1.2	0.4	1.6
0.4	3.7	1.3	0.7	2.3
0.7	6.8	2.3	1.5	4.6
1.0	9.1	2.9	2.2	6.7
>3.0	11.3	4.1	3.5	8.9

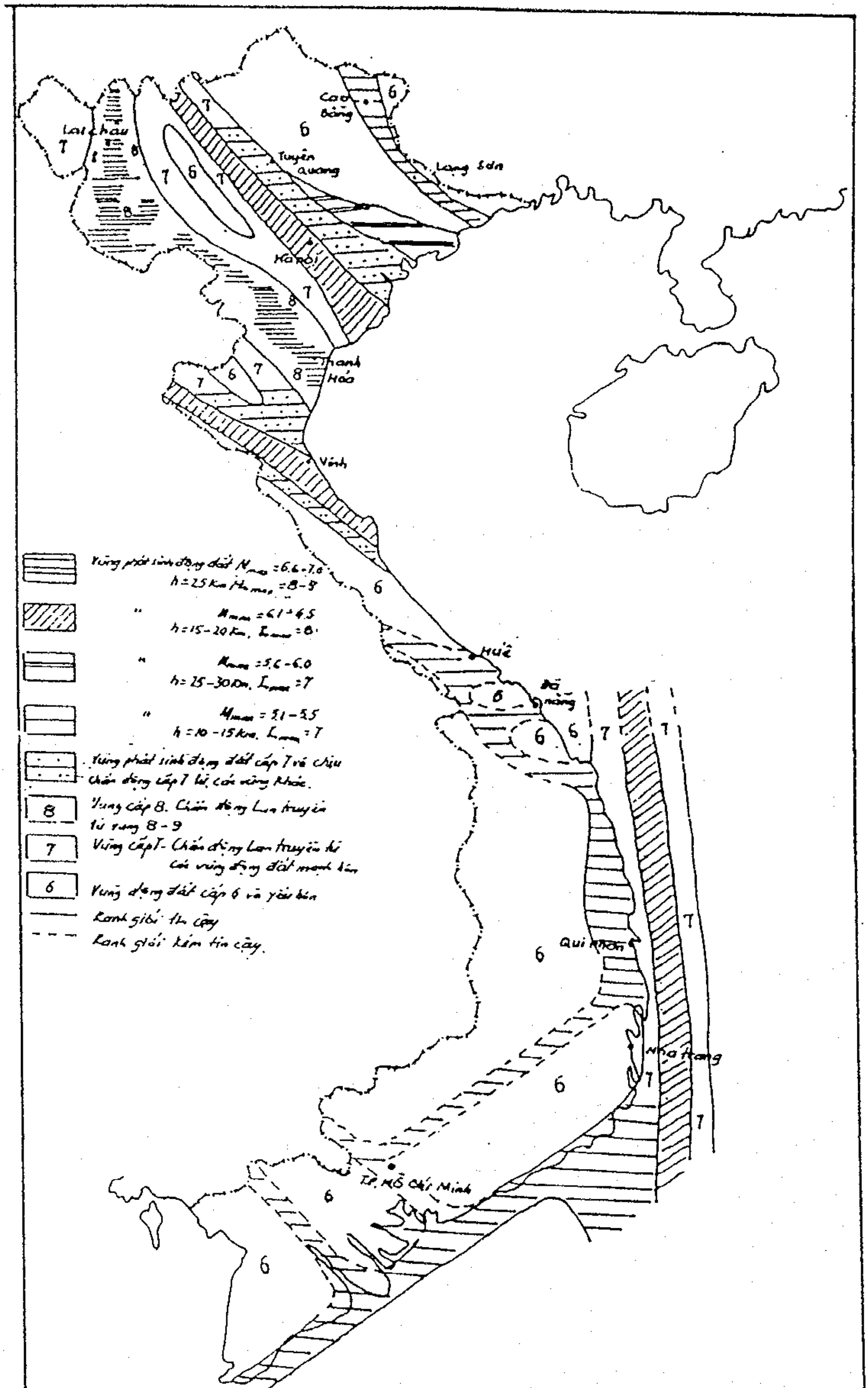
Temperature Difference T for Different Types of Construction

Values of T for Group 4

Depth of slab (h)	Surfacing thickness	Positive temperature difference			Reverse temperature difference			
		T_1	T_2	T_3	T_1	T_2	T_3	T_4
m	mm	°C	°C	°C	°C	°C	°C	°C
≤0.2	U.P.**	13.3	6.6		5.5	2.1	0.1	1.0
	U.T.**	19.3	7.4		5.5	2.1	0.1	1.0
	waterproofed	21.7	8.9		5.5	2.1	0.1	1.0
	50	16.2	5.0		3.1	1.6	0.2	0.7
	100	12.3	5.0		1.8	0.8	0.3	0.9
	150	9.5	4.0		1.0	0.3	0.3	0.8
	200	7.4	3.3		1.0	0.3	0.3	0.8
0.3	U.P.	16.1	5.3		6.7	3.1	0.2	1.3
	U.T.	23.6	7.8		6.7	3.1	0.2	1.3
	waterproofed	26.6	9.0		6.7	3.1	0.2	1.3
	50	20.2	7.1		4.4	2.0	0.3	1.3
	100	15.5	5.5		2.9	1.2	0.4	1.6
	150	12.0	4.2		1.8	0.6	0.7	1.9
	200	9.3	3.5		1.0	0.2	0.8	1.9
0.4	U.P.	17.2	5.2		7.6	3.5	0.3	1.8
	U.T.	25.2	8.1		7.6	3.5	0.3	1.8
	waterproofed	28.4	9.2		7.6	3.5	0.3	1.8
	50	21.8	7.3		5.3	2.2	0.5	2.1
	100	16.9	5.5		3.7	1.3	0.7	2.3
	150	13.1	4.5		2.5	0.8	0.9	2.5
	200	10.1	3.6		1.7	0.4	1.2	2.8
0.7	U.P.	17.7	6.2		10.6	4.3	0.9	3.7
	U.T.	25.9	9.1		10.6	4.3	0.9	3.7
	waterproofed	28.4	10.4		10.6	4.3	0.9	3.7
	50	21.8	8.2		8.6	3.2	1.2	4.1
	100	16.9	6.7		6.8	2.3	1.5	4.6
	150	13.1	5.3		5.3	1.7	1.7	5.0
	200	10.1	4.1		4.1	1.2	2.1	5.3
1.0	U.P.	18.0	6.3		13.5	4.7	1.7	6.0
	U.T.	26.2	9.5		13.5	4.7	1.7	6.0
	waterproofed	29.5	10.3		13.5	4.7	1.7	6.0
	50	23.1	8.3		11.1	3.7	1.9	6.3
	100	17.9	6.7	0.2	9.1	2.9	2.2	6.7
	150	13.8	5.1	0.2	7.4	2.2	2.4	6.9
	200	10.7	4.1	0.2	5.8	1.7	2.6	7.2
≥3.0	U.P.	19.1	6.7	0.8	16.5	6.2	3.5	8.9
	U.T.	27.5	9.8	0.6	16.5	6.2	3.5	8.9
	waterproofed	30.9	11.1	0.5	16.5	6.2	3.5	8.9
	50	24.1	8.6	0.9	13.7	5.0	3.5	8.9
	100	18.7	7.0	0.9	11.3	4.1	3.5	8.9
	150	14.4	5.5	0.9	9.3	3.3	3.5	8.9
	200	11.2	4.4	0.8	7.6	2.6	3.5	8.9

A6-2-7 Seismic Intensity in Vietnam

SO DO PHAN VUNG DONG DAT LANH THO VIET NAM TY LE 1 : 5000000



APPENDIX 4 Chapter 9 Bridge Alternative Study and Selection of the Recommended Bridge Type

A9-4-1 Technical Data for PC Cable Stayed Bridge

THE GOVERNMENT OF THE SOCIALIST REPUBLIC OF VIETNAM THANG LONG PROJECTS MANAGEMENT UNIT, MINISTRY OF TRANSPORT			
PROJECT	FEASIBILITY STUDY FOR THANH TRI BRIDGE AND SOUTHERN SECTION OF RING ROAD No.3 IN HA NOI		
CONSULTANT	PACIFIC CONSULTANTS INTERNATIONAL		
	DESIGNED BY	CHECKED BY	APPROVED BY
NAME			
SIGNATURE			
DATE			

THANH TRI BRIDGE – CABLE STAY OPTION
TOWER DETAILS

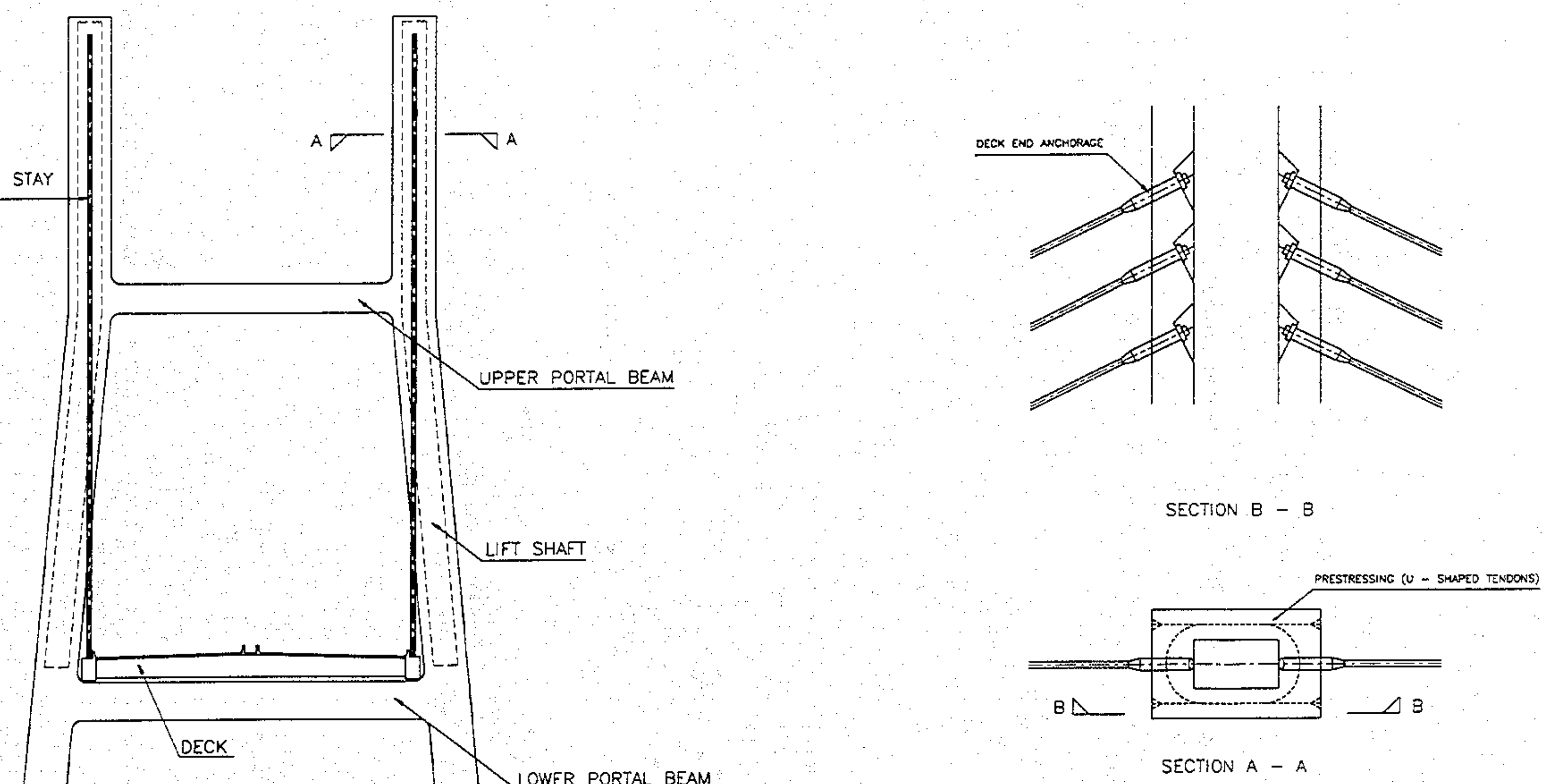
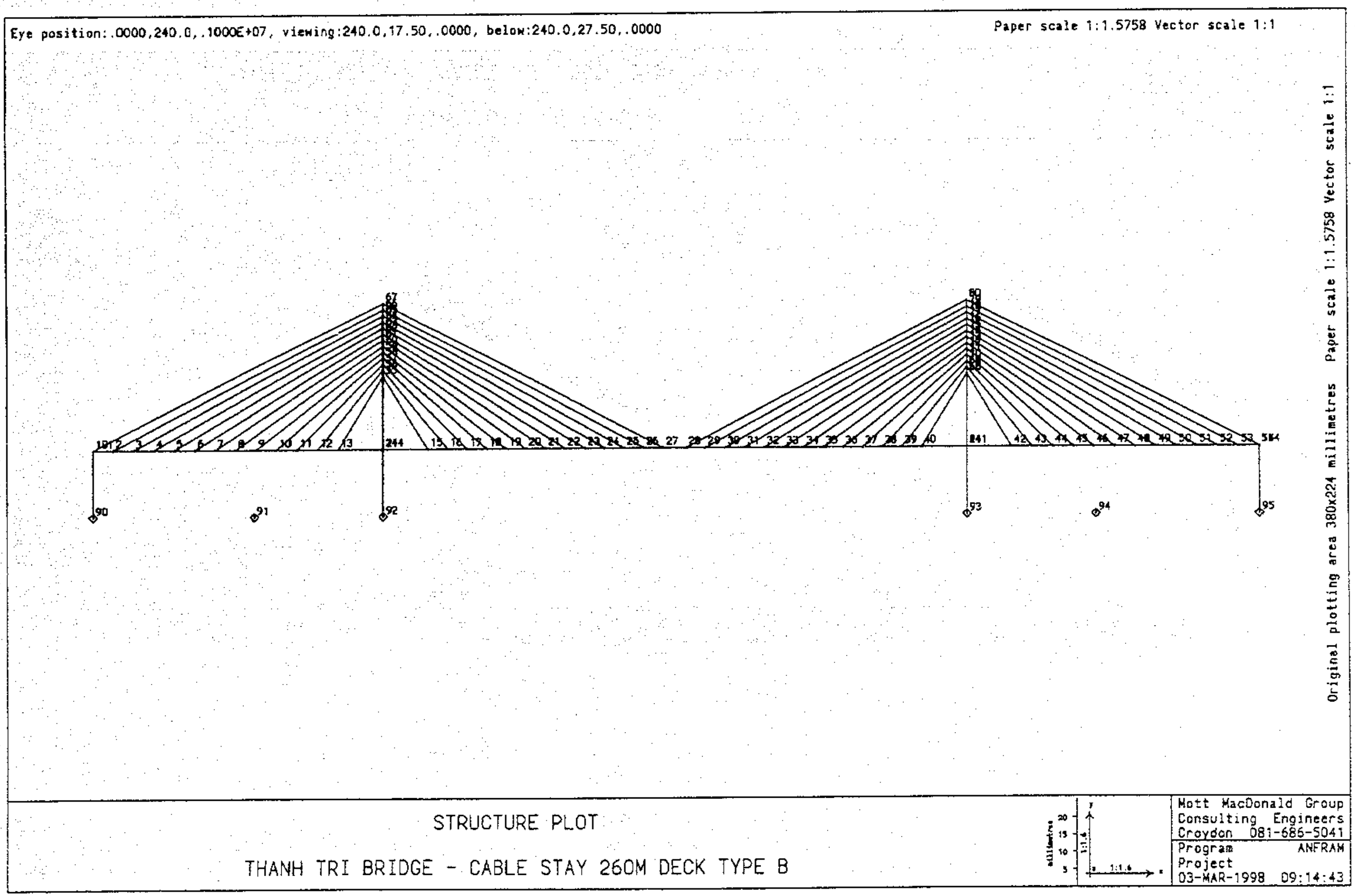


FIGURE 5.5

Drawn by Mr. T.H.N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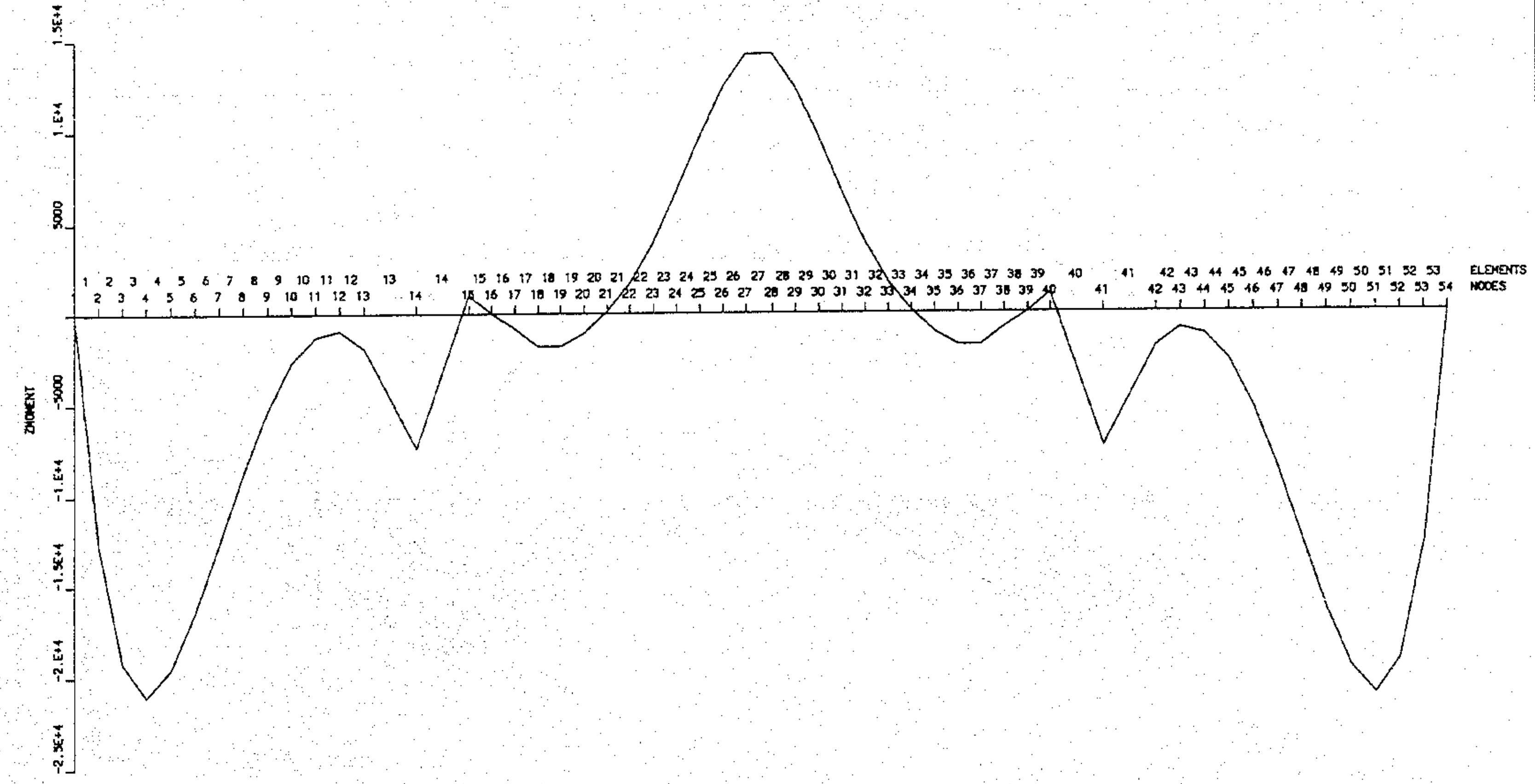
Paper scale 1:1.5758 Vector scale 1:1
Original plotting area 380x224 millimetres Paper scale 1:1.5758 Vector scale 1:1
STRUCTURE PLOT
THANH TRI BRIDGE - CABLE STAY 260M DECK TYPE B
Mott MacDonald Group
Consulting Engineers
Croydon 081-686-5041
Program ANFRAM
Project
03-MAR-1998 09:14:43

Figure 5.6



LIVE MAIN - DECK MOMENTS

THANH TRI BRIDGE - CABLE STAY 260M DECK TYPE B

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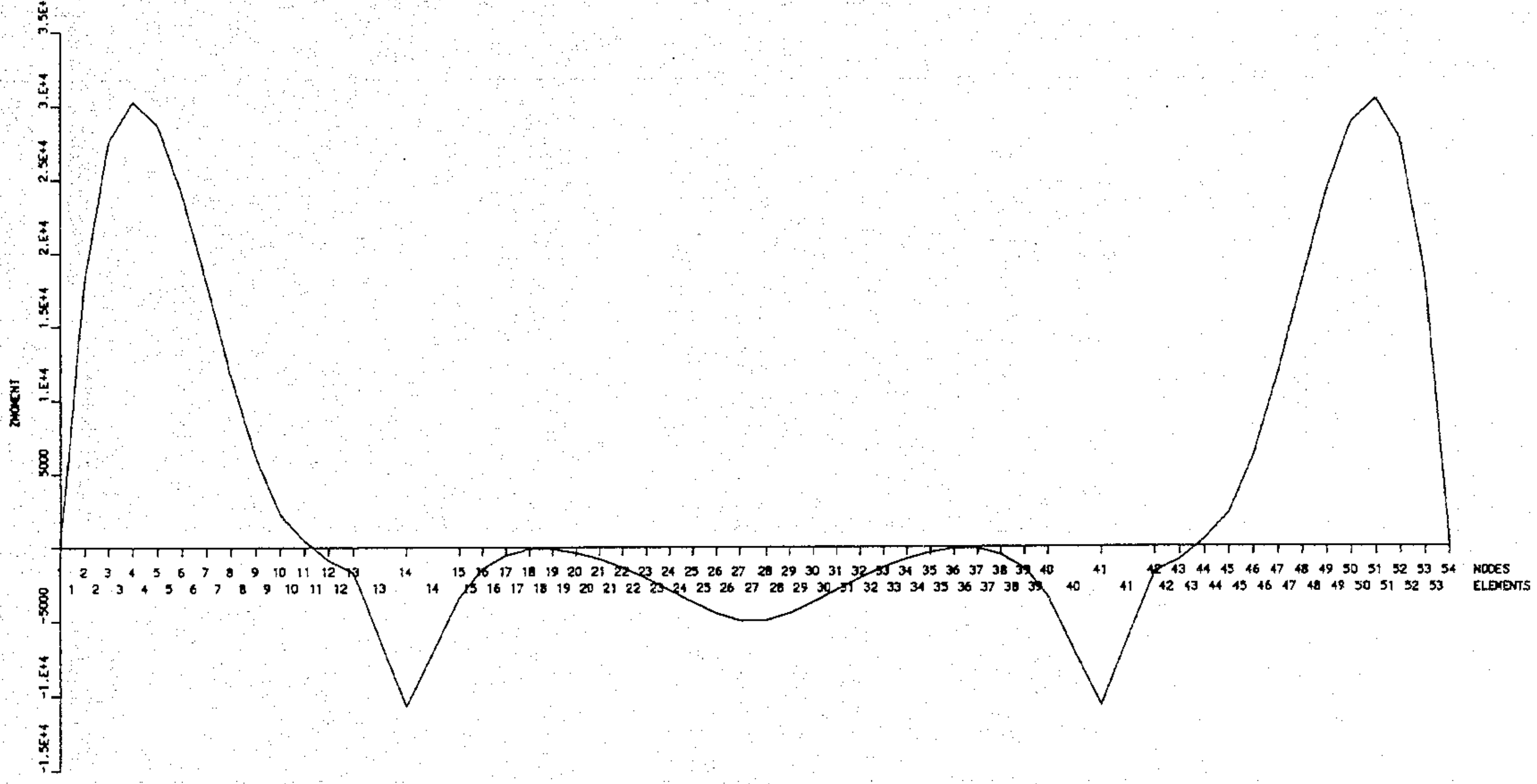

LIVE SIDE - DECK MOMENTS

THANH TRI BRIDGE - CABLE STAY 260M DECK TYPE B

Mott MacDonald Group
Consulting Engineers
Croydon 081-686-5041
Program ANFRAM
Project
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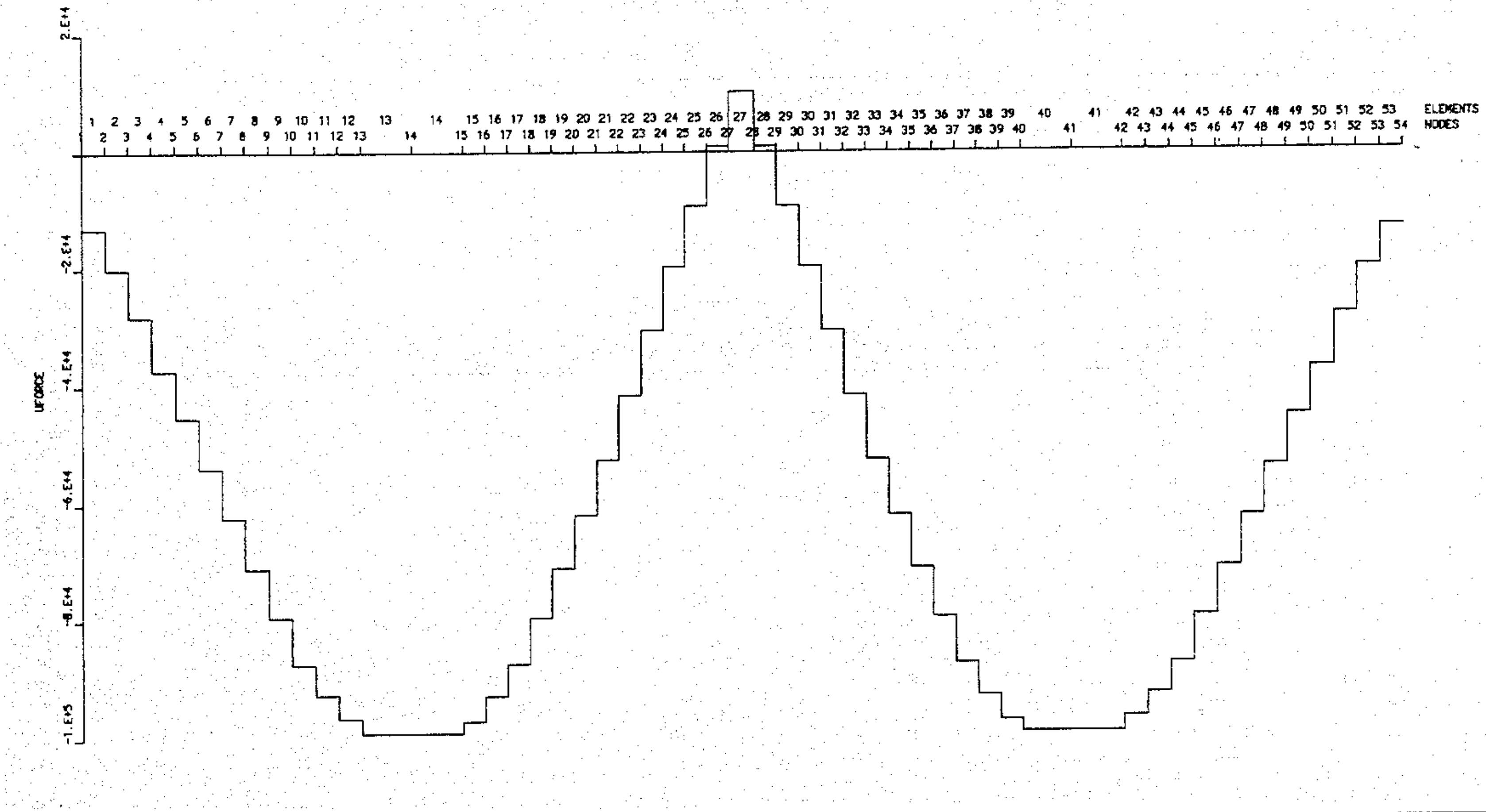

DEAD + LIVE MAIN - AXIAL DECK

THANH TRI BRIDGE - CABLE STAY 260M DECK TYPE B

Mott MacDonald Group
Consulting Engineers
Croydon 081-686-5041
Program ANFRAM
Project
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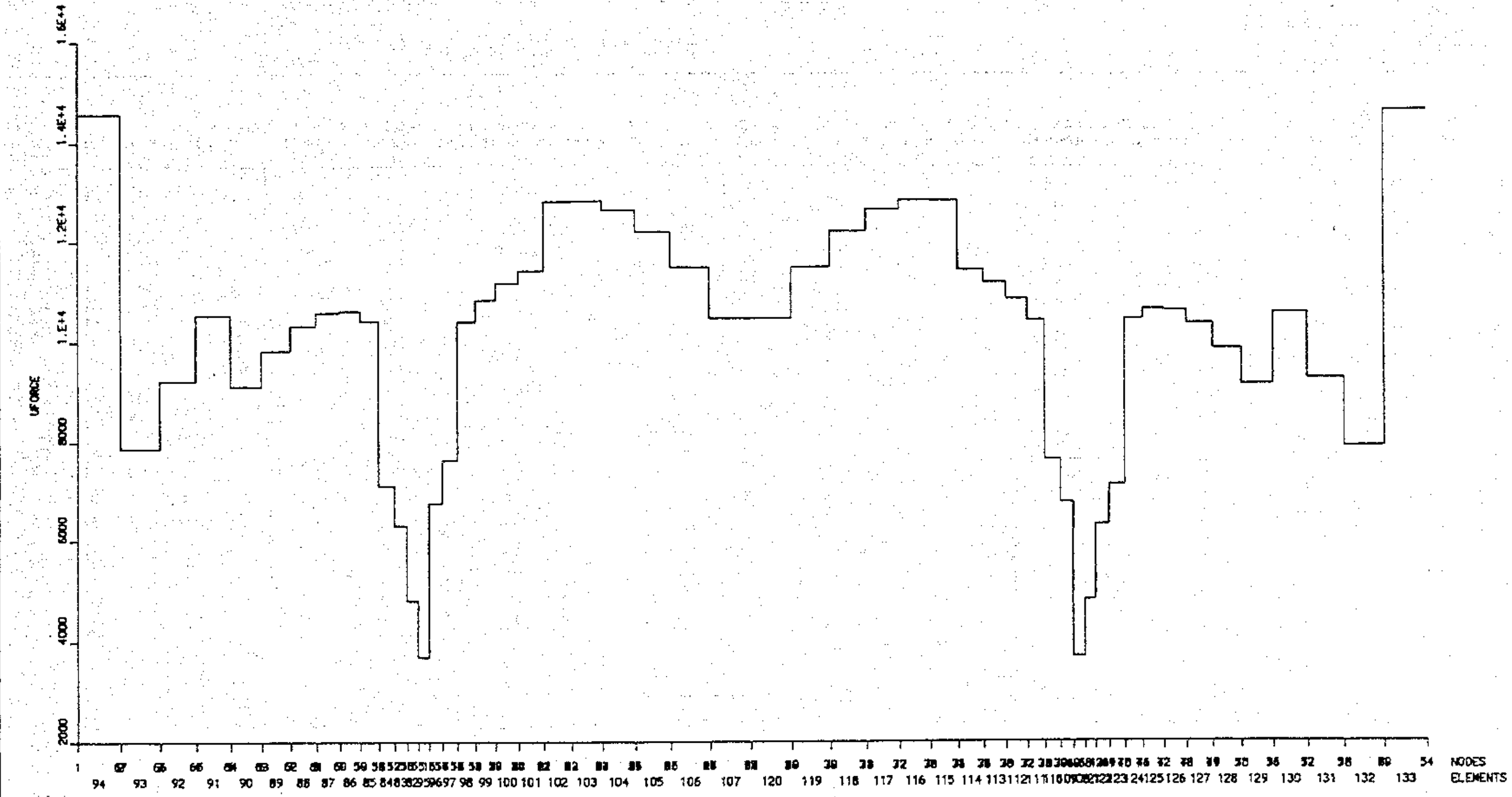

DEAD + LIVE MAIN - STAY FORCES

THANH TRI BRIDGE - CABLE STAY 260M DECK TYPE B

Mott MacDonald Group
Consulting Engineers
Croydon 081-686-5041
Program ANFRAM
Project
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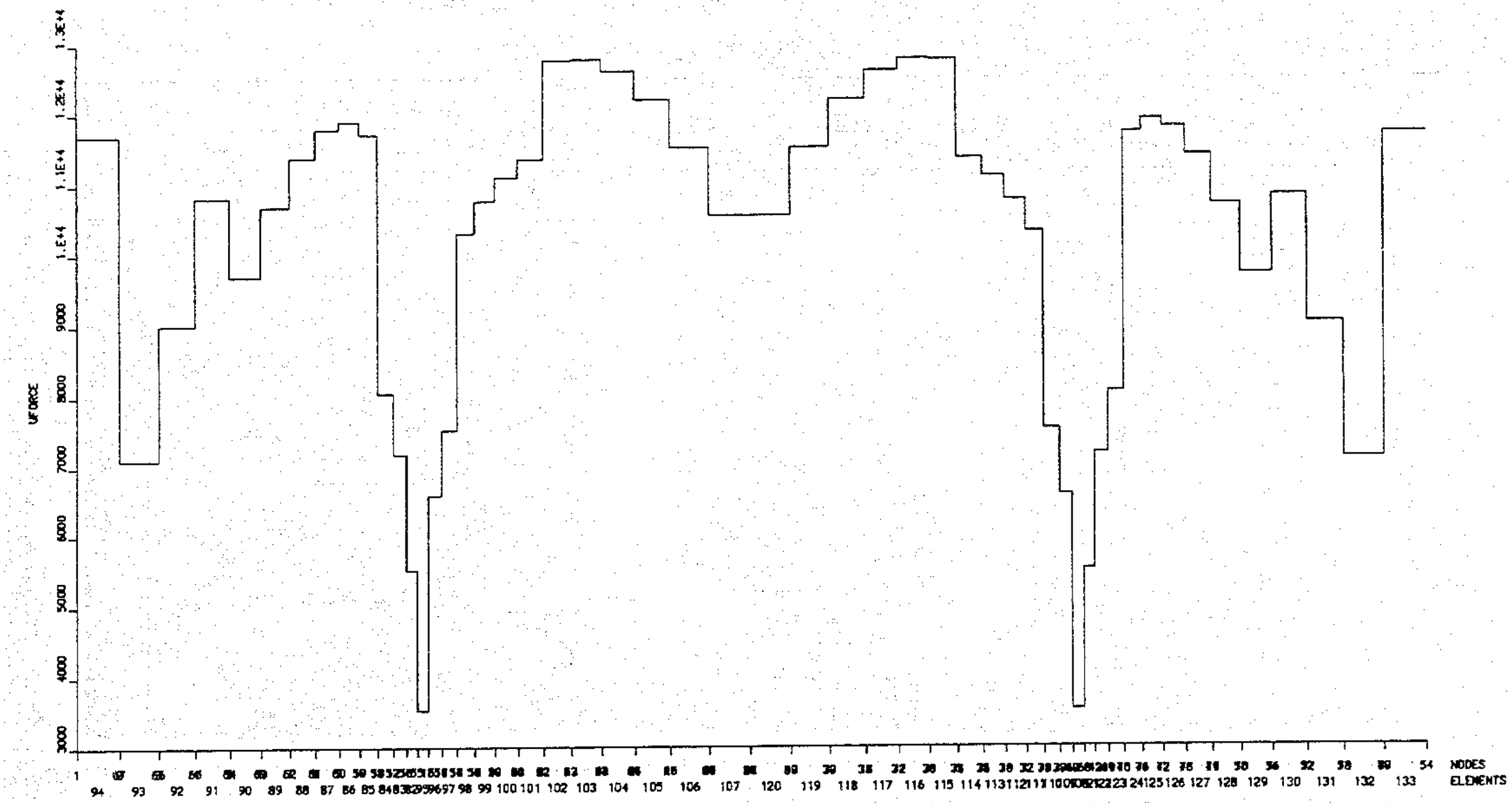

DEAD + LIVE ALL - STAY FORCES

THANH TRI BRIDGE - CABLE STAY 260M DECK TYPE B

Mott MacDonald Group
Consulting Engineers
Croydon 081-686-5041
Program AMFRAM
Project
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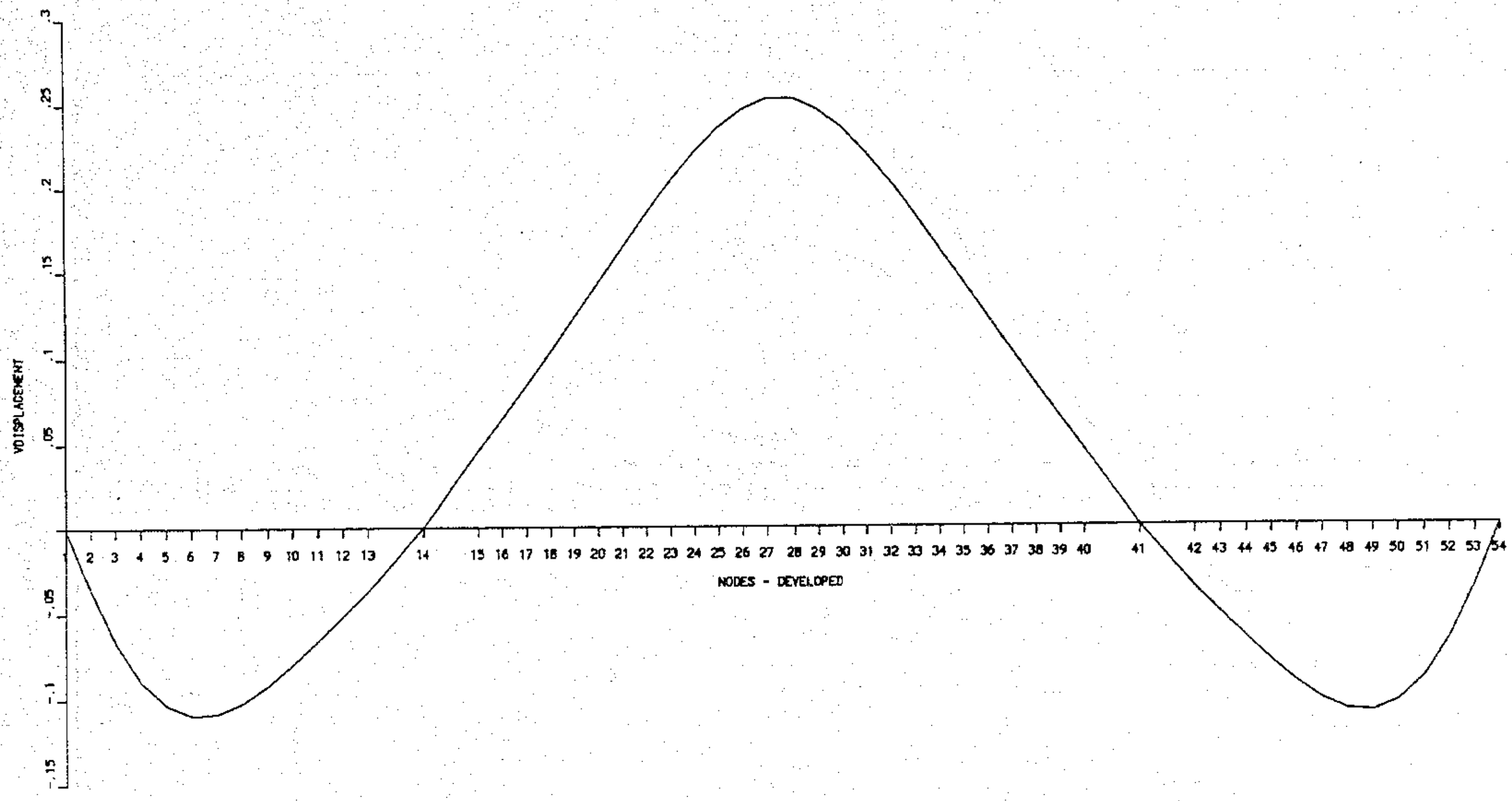

LIVE MAIN - DECK DISPLACEMENTS

THANH TRI BRIDGE - CABLE STAY 260M DECK TYPE B

Mott MacDonald Group
Consulting Engineers
Croydon 081-686-5041
Program ANFRAM
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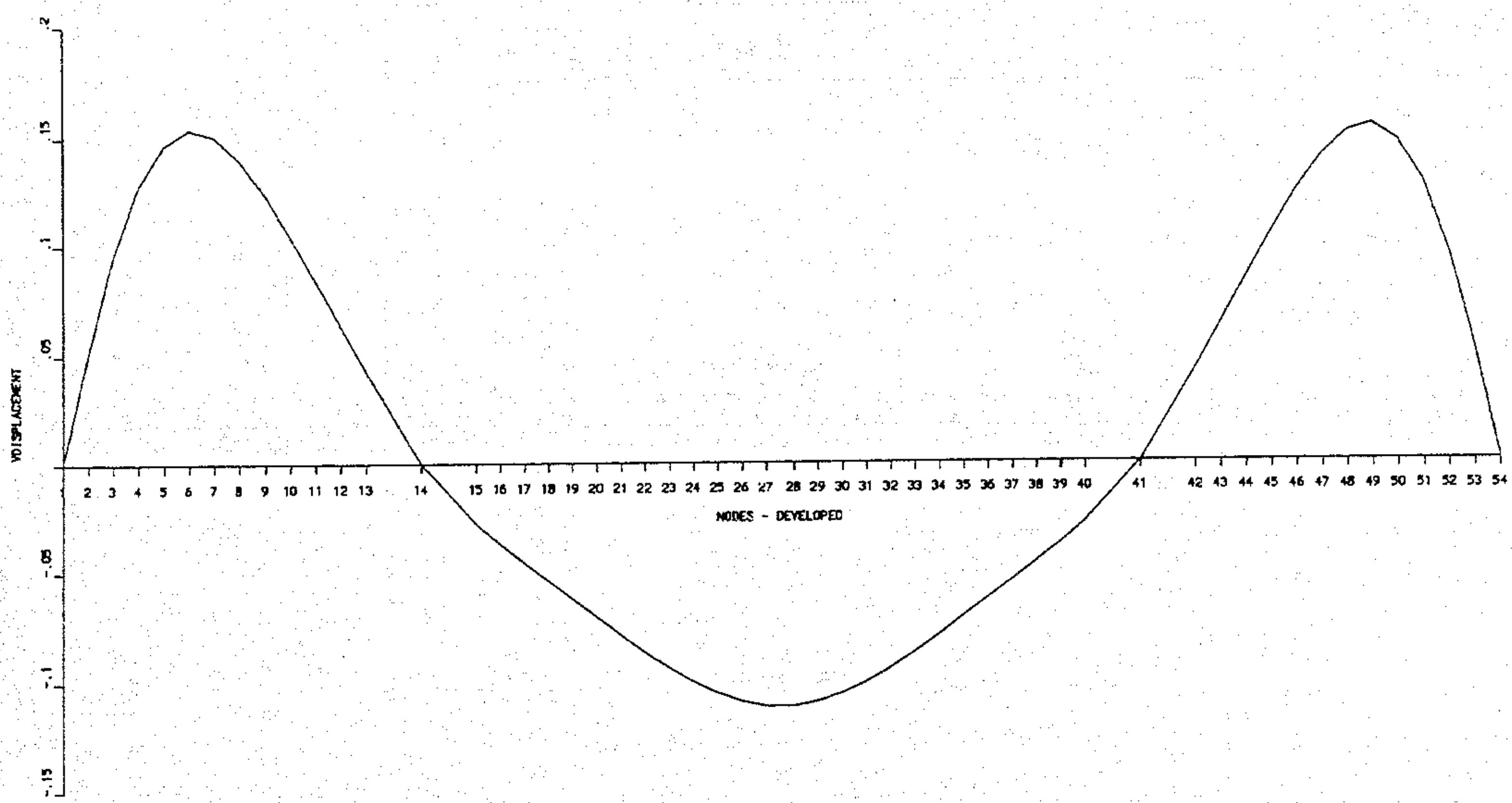

LIVE SIDE - DECK DISPLACEMENTS

THANH TRI BRIDGE - CABLE STAY 260M DECK TYPE B

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Project	
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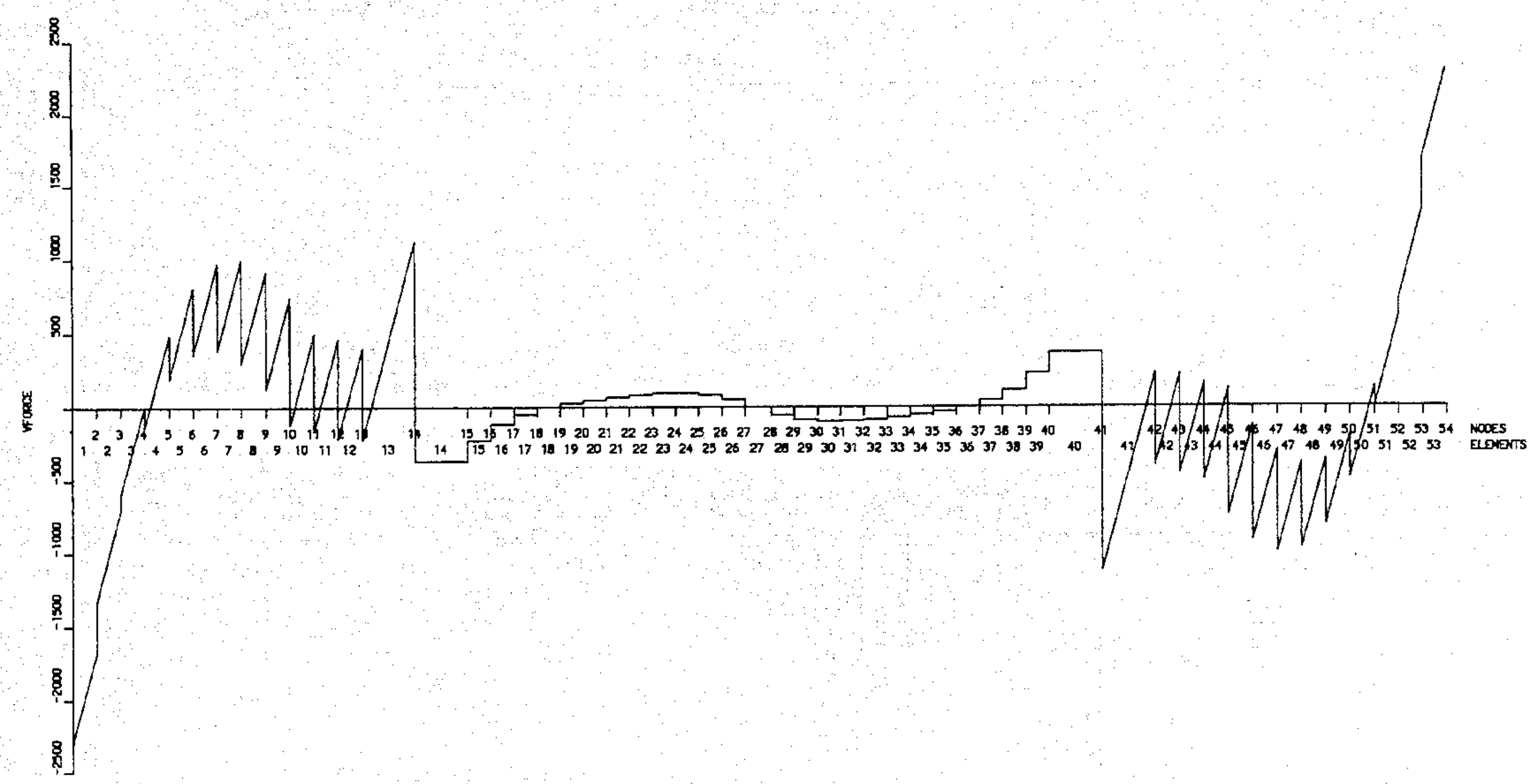

LIVE SIDE - DECK SHEARS

THANH TRI BRIDGE - CABLE STAY 260M DECK TYPE B

Mott MacDonald Group Consulting Engineers Croydon 081-686-5041	
Program	ANFRAM
Project	
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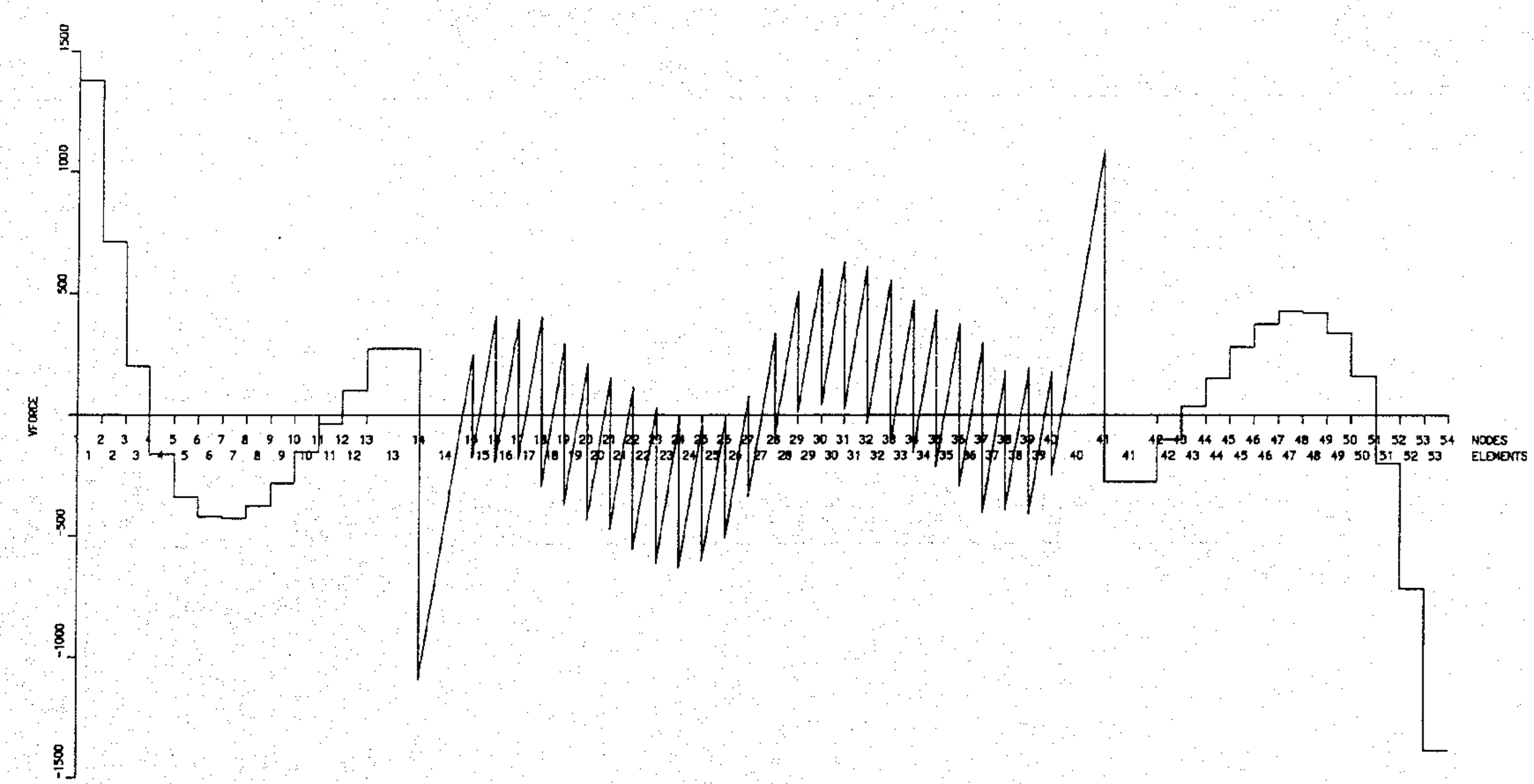

LIVE MAIN - DECK SHEARS

THANH TRI BRIDGE - CABLE STAY 260M DECK TYPE B

Mott MacDonald Group
Consulting Engineers
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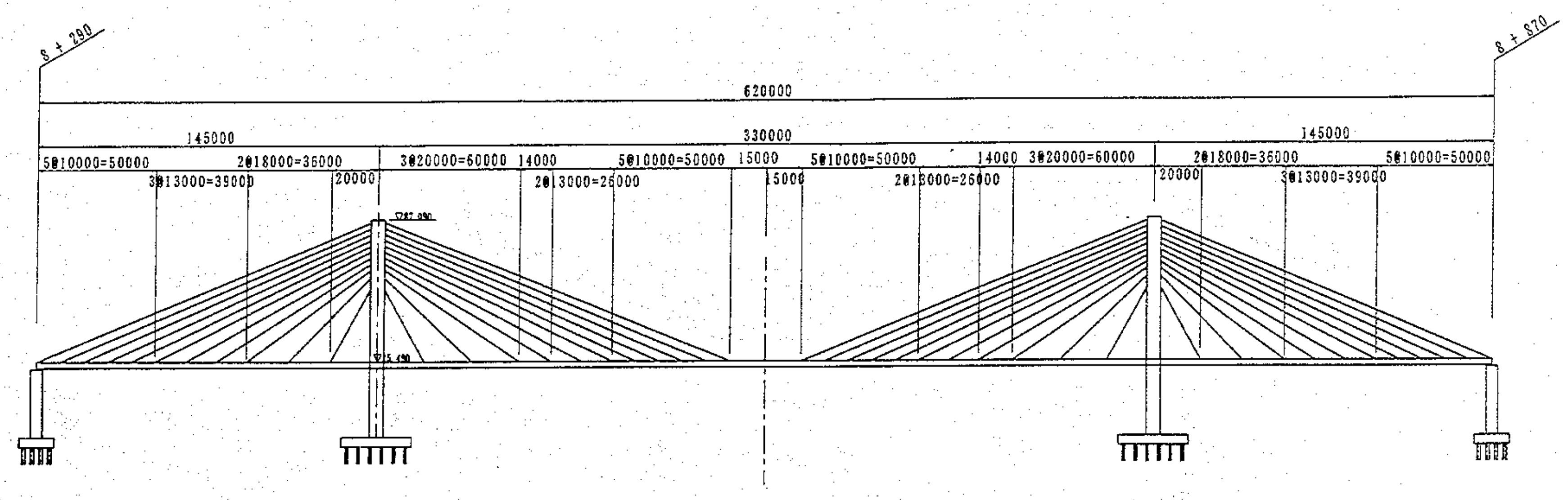
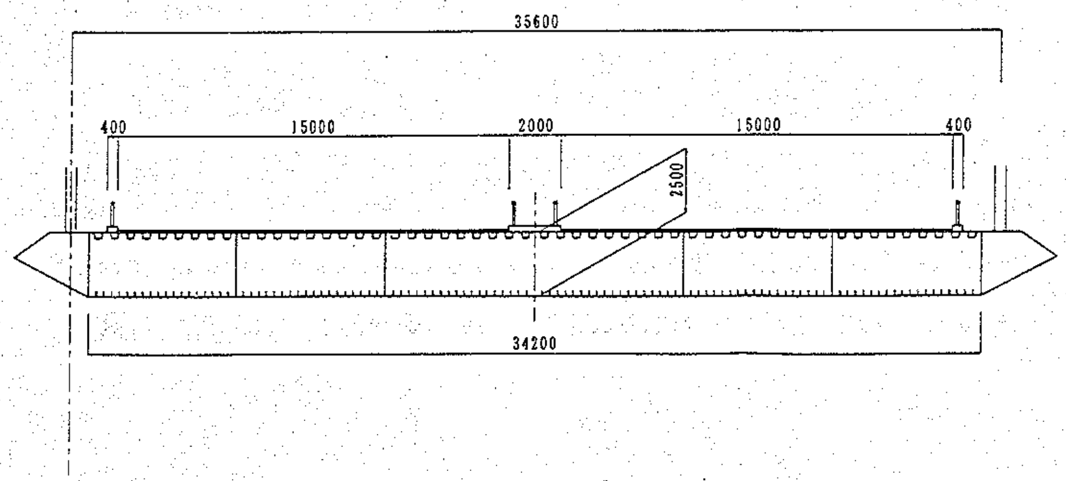
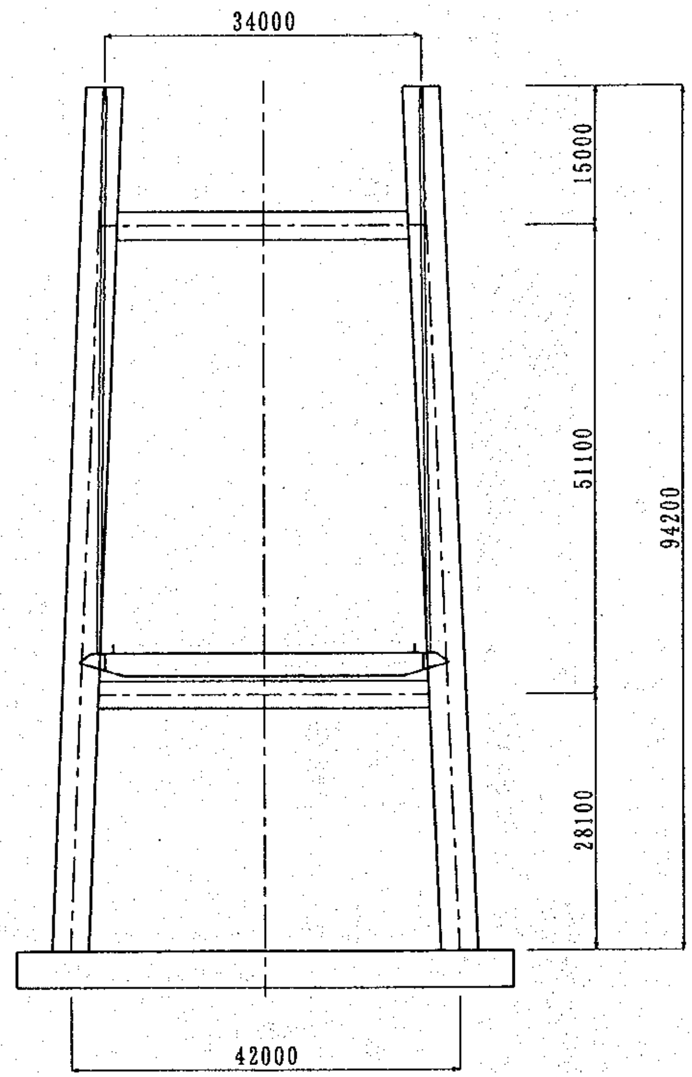
A9-5-1 Technical data for Steel Box Girder Cable Stayed Bridge

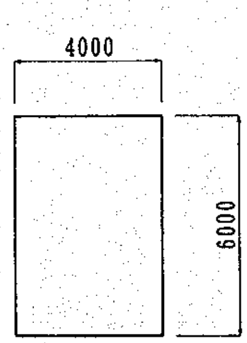
General View



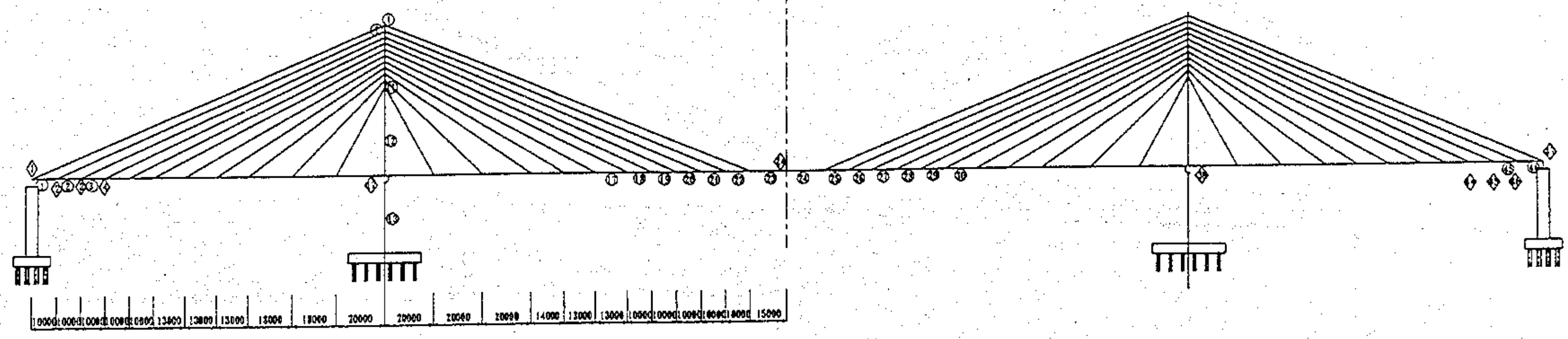


Tower





Structural Frame



A9-6-1 Cost Comparison on Alternatives

<u>Comparison on Costs of Alternatives</u>

Unit; US$ (million $)

		ALTERNATIVE 1	ALTERNATIVE 2	ALTERNATIVE 3	ALTERNATIVE 4
		PC Continuous Box Girder	PC Extradosed Bridge	PC Cable Stayed Bridge	Cable Stayed Bridge with Steel Girder
1	Main Bridge	60.0	87.7	93.4	108.7
2	Approach Bridge (1)	75.7	75.2	83.9	78.5
3	Dyke Bridge	32.4	32.4	32.3	32.3
4	Approach Bridge (2)	18.7	18.7	18.7	18.7
5	Total	(1.00) 186.8	(1.15) 214.0	(1.22) 228.3	(1.28) 238.2