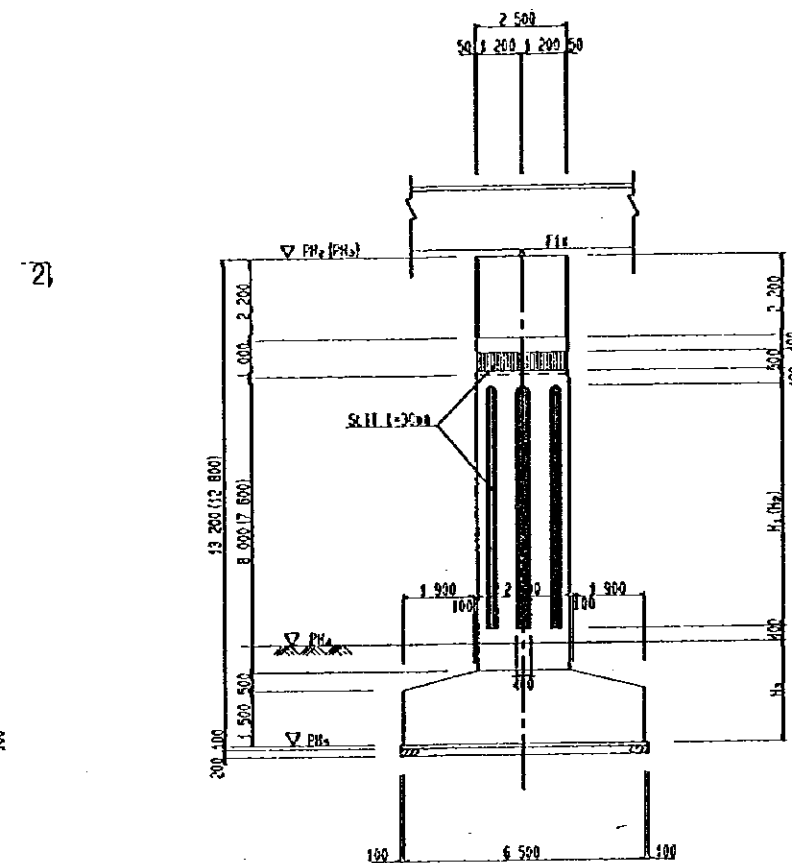
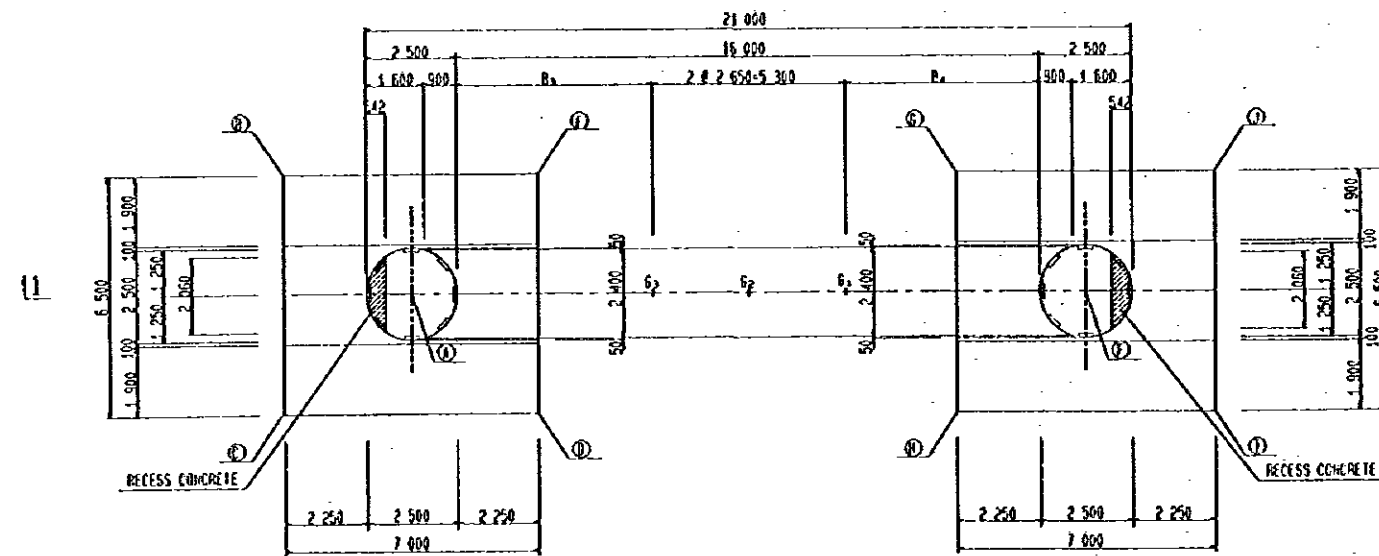


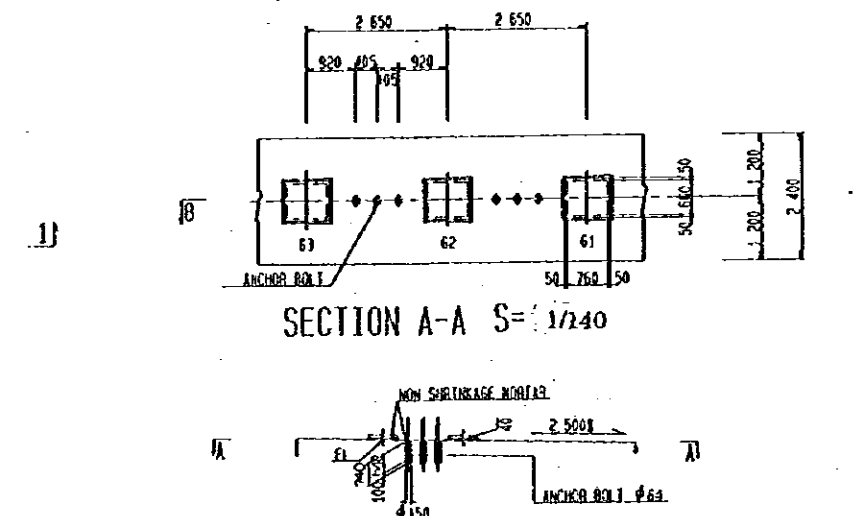
SECTION 1-1 S= 1/200



SECTION 3-3(4-4) S= 1/200



SECTION 2-2 S= 1/200



SECTION B-B S= 1/200  
DETAIL OF SHOE BED

DIMENSION TABLE

	P5	P7
PH1	22.048	22.115
PH2	22.248	22.315
PH3	21.848	21.915
PH4	11.785	11.665
PH5	9.048	9.115
H1	6.563	6.750
H2	6.163	6.350
H3	2.737	2.550
B1	3.015	5.694
B2	2.985	306
B3	5.365	8.044
B4	5.335	2.656

CO-ORDINATES LIST

	A	B	C	D	E
P5	X 2743064.0346	2743069.7255	2743065.2010	2743064.8138	2743062.3641
	Y 4433500.8529	4433501.8269	4433500.8283	4433500.8138	4433500.5792
P7	X 2743065.0090	2743065.0090	2743065.0090	2743065.0090	2743065.0090
	Y 4433518.4970	4433518.4970	4433518.4970	4433518.4970	4433518.4970

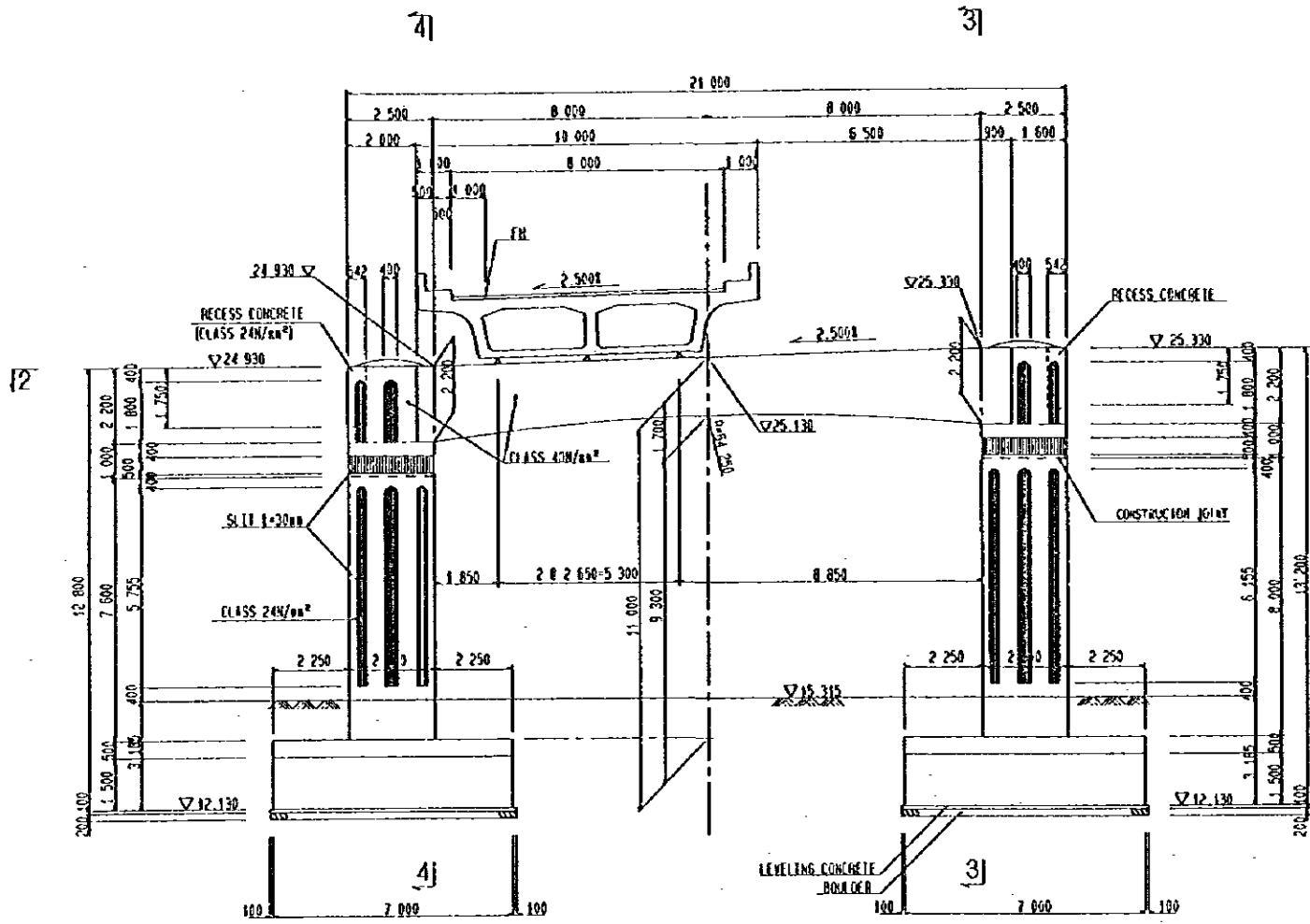
SHOE ELEV.(EL) TABLE

	G1	G2	G3
P5	21.981	22.048	22.115
P7	21.981	22.048	22.115

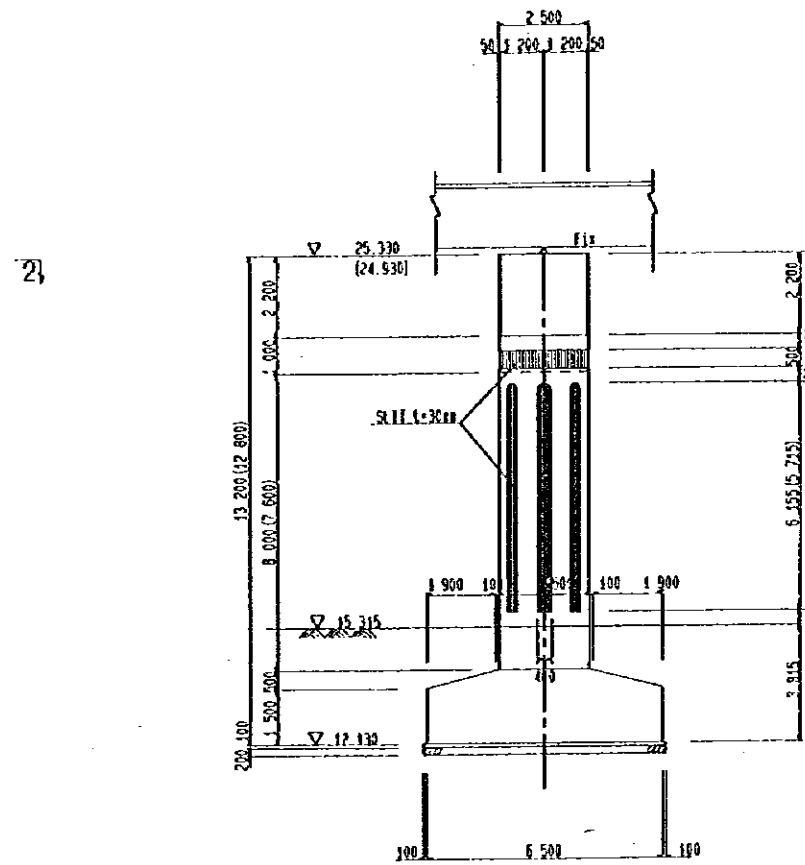
NOTES:

JAPAN INTERNATIONAL COOPERATION AGENCY  
(JICA)  
JICA STUDY TEAM  
PACIFIC CONSULTANTS INTERNATIONAL  
FUKUYAMA CONSULTANTS INTERNATIONAL

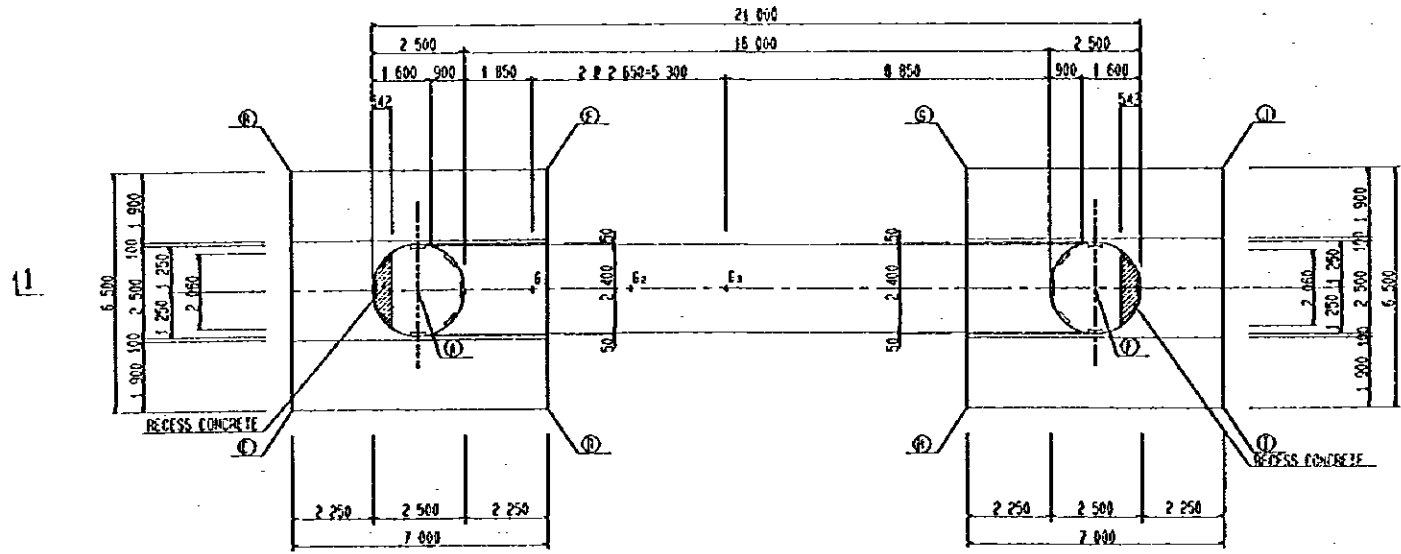
CLIENT: MINISTRY OF COMMUNICATIONS, DIRECTORATE GENERAL OF ROADS  
PROJECT: D/D ON ROAD DEVELOPMENT PROJECT ON BATINAH HIGHWAY  
TITLE: STRUCTURAL DETAIL OF TWO COLUMN PIER(P5,P7) AT A-LINE  
DATE: \_\_\_\_\_  
DWGNO. B-42



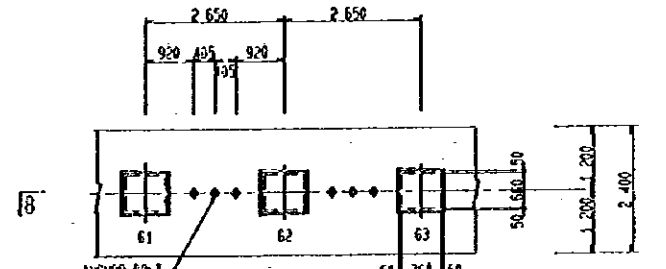
SECTION 1-1 S= 1/200



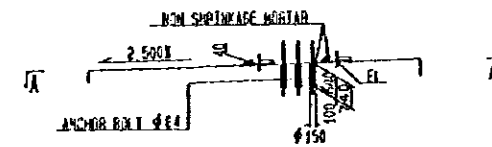
SECTION 3-3(4-4) S= 1/200



SECTION 2-2 S= 1/200



SECTION A-A S= 1/140



SECTION B-B S= 1/200  
DETAIL OF SHOE BED

CO-ORDINATES LIST

	A	B	C	D	E
X	2743348.2668	2743352.1100	2743351.1470	2743345.1095	2743348.9650
Y	442778.3057	442769.3652	442783.7396	442787.1201	442802.8714
	F	G	H	I	J
X	2743335.1502	2743338.8125	2743335.1384	2743334.0310	2743332.9500
Y	442807.5729	442808.6524	442803.0666	442804.5193	442812.1300

SHOE ELEVATION (EL) TABLE

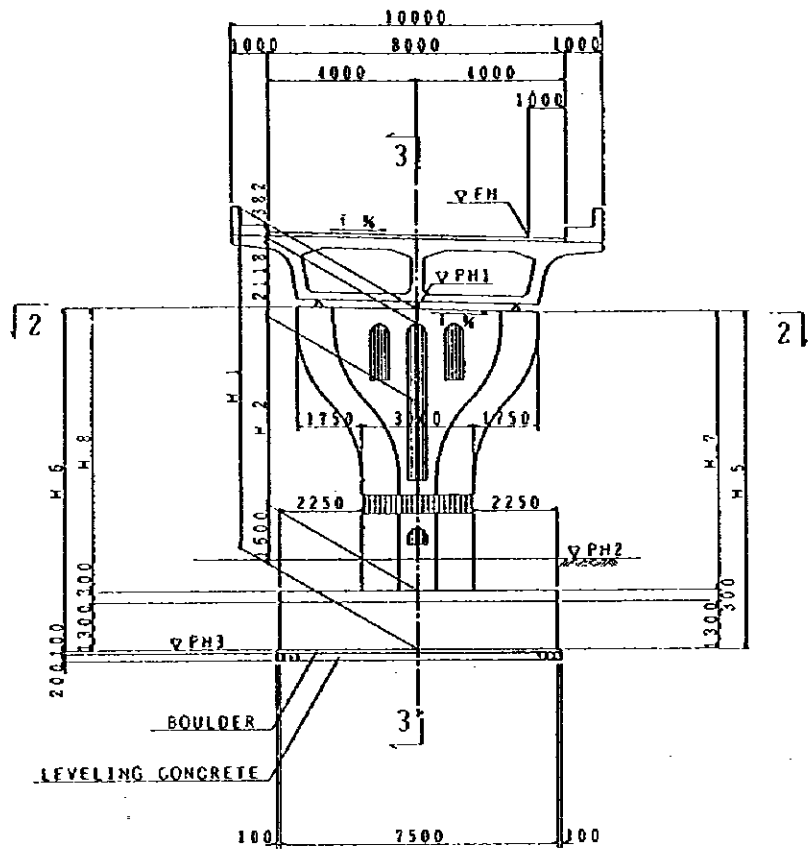
G <sub>1</sub>	G <sub>2</sub>	G <sub>3</sub>
24.978	25.043	25.109

NOTES:

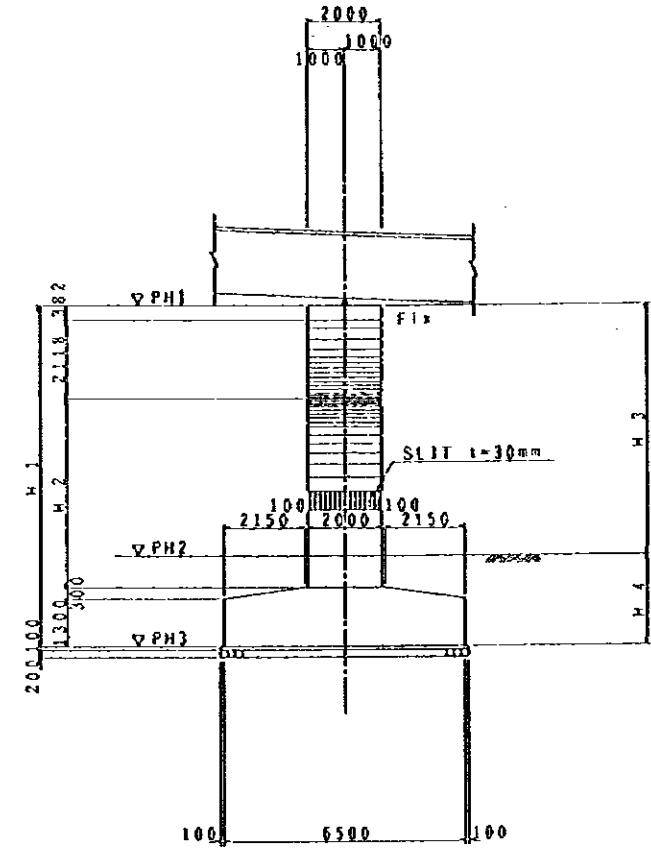
JAPAN INTERNATIONAL COOPERATION AGENCY  
(JICA)  
JICA STUDY TEAM  
PACIFIC CONSULTANTS INTERNATIONAL  
FUKUYAMA CONSULTANTS INTERNATIONAL

CLIENT: MINISTRY OF COMMUNICATIONS, DIRECTORATE GENERAL OF ROADS  
PROJECT: D/D ON ROAD DEVELOPMENT PROJECT ON BATINAH HIGHWAY  
TITLE: STRUCTURAL DETAIL OF TWO-COLUMN PIER(P8) AT B-LINE  
DATE: \_\_\_\_\_ DWGNO. B-43

# RA/18 AQR



SECTION 1-1 S= 1/200

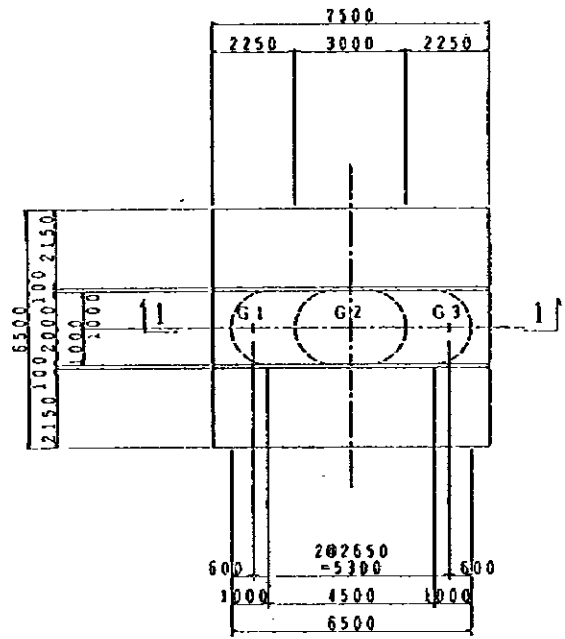


SECTION 3-3 S= 1/200

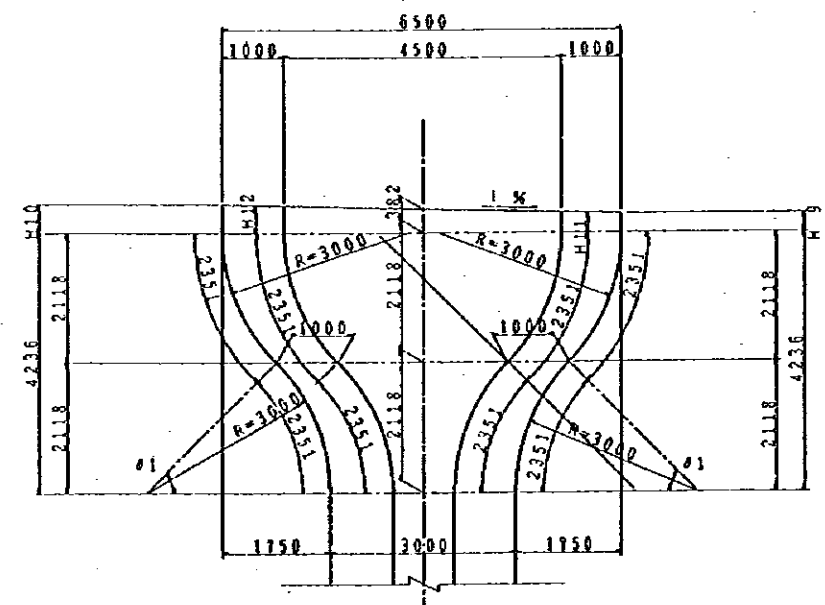
## DEMENSION TABLE

	A-LINE		B-LINE	
	P 1	P11	P 1	P11
PH1	18.775	18.625	23.887	21.430
PH2	12.030	12.375	17.140	14.930
PH3	9.575	9.425	14.687	12.230
H 1	9200	9200	9200	9200
H 2	5100	5100	5100	5100
H 3	6745	6250	6747	7100
H 4	2455	2950	2453	2100
H 5	9119	9281	9281	9204
H 6	9281	9119	9119	9196
H 7	7519	7681	7681	7604
H 8	7681	7519	7519	7596
H 9	301	463	463	386
H10	463	301	301	378
H11	326	438	438	385
H12	438	326	326	379
i %	2.50	-2.50	-2.50	-0.11
ø 1	44°54'04"		44°54'04"	

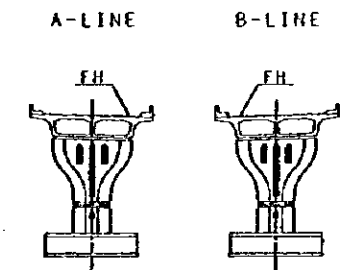
NOTE : THE CROSSFALL VALUES TO THE RIGHT IS PLUS AND THE ONES TO THE LEFT IS MINUS.



SECTION 2-2 S= 1/200



BEAM DETAIL S= 1/120

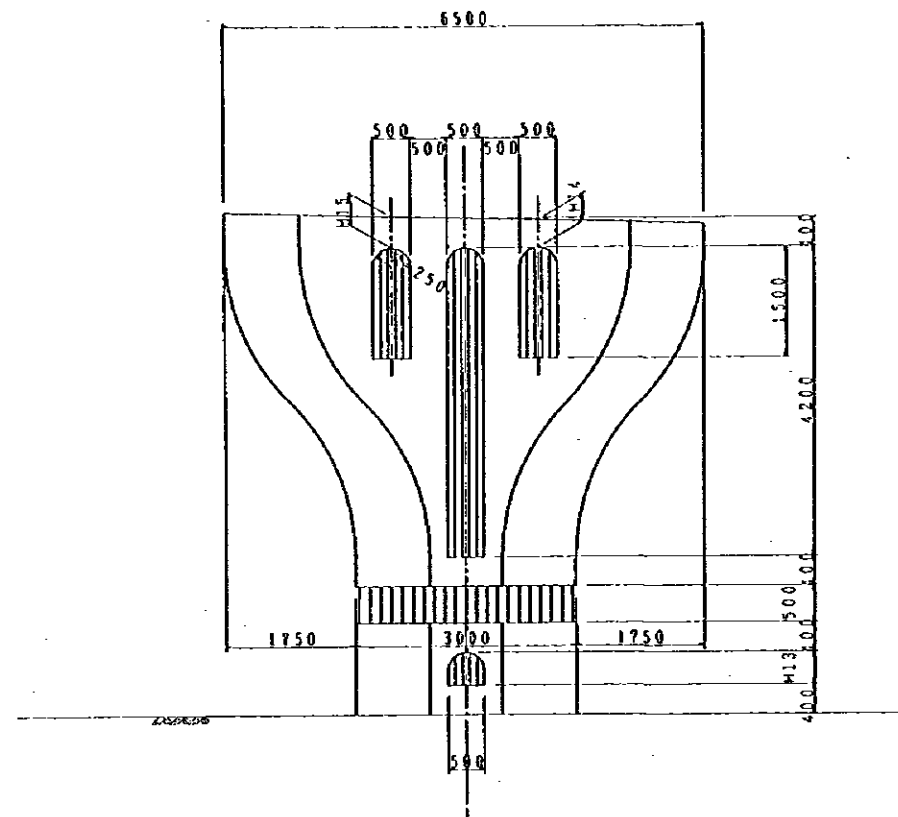


KEY PLAN

## STRUCTURAL DETAIL OF T-WALL PIER FOR P1,P11 AT A·B-LINE(1/2)

NOTES:	JAPAN INTERNATIONAL COOPERATION AGENCY (JICA)	CLIENT: MINISTRY OF COMMUNICATIONS, DIRECTORATE GENERAL OF ROADS
	JICA STUDY TEAM PACIFIC CONSULTANTS INTERNATIONAL FUKUYAMA CONSULTANTS INTERNATIONAL	PROJECT: D/D ON ROAD DEVELOPMENT PROJECT ON BATINAH HIGHWAY
		TITLE: STRUCTURAL DETAIL OF T-WALL PIER FOR P1,P11 AT A,B-LINE(1/2)
	DATE	DWGNO. B-44

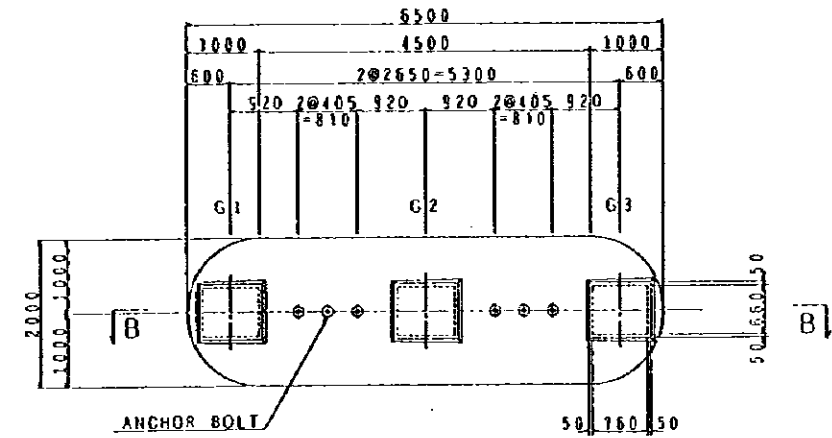
RA/18 AQR



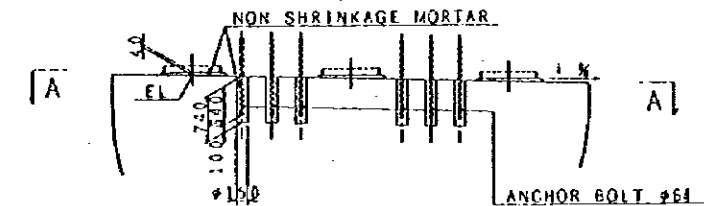
SLIT OF PLAN S= 1/100

DEMENSION TABLE

	A-LINE		B-LINE	
	P I	P11	P I	P11
H13	445	—	447	800
H14	375	425	425	401
H15	425	375	375	399



SECTION A-A S= 1/100



SECTION B-B S= 1/100

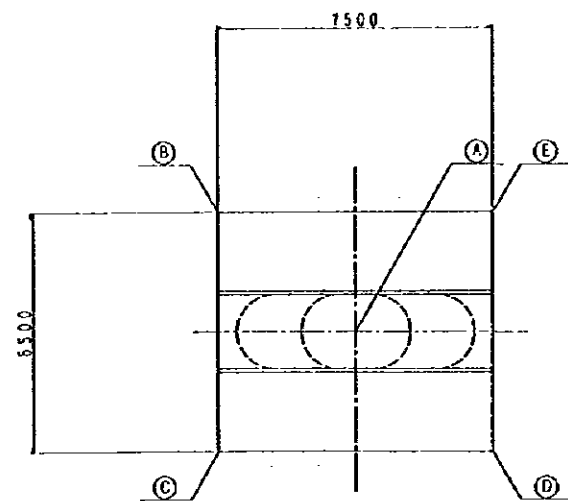
DETAIL OF SHOE BED

SHOE ELEVATION (EL) TABLE

	A-LINE		B-LINE	
	P I	P11	P I	P11
G 2	18.775	18.625	23.887	21.430

CO-ORDINATES LIST

-	PI	X	A		B		C		D		E	
			X	Y	X	Y	X	Y	X	Y	X	Y
A	P11	X	2742551.3572	2742554.3189	2742538.6732	2742552.3989	2742558.0458					
		Y	443457.6099	443452.7407	443455.8836	443462.4789	443458.2498					
		X	2743233.2592	2743235.2590	2743228.0614	2743231.9223	2743231.5199					
B	P11	X	443350.7184	443316.1191	443318.1135	443355.8247	443353.3652					
		Y	2743238.3460	2743261.8745	2743281.0575	2743255.8235	2743255.6905					
		X	442639.8753	442611.0092	442602.7531	442607.3314	442614.1634					
B	P11	X	2743330.8249	2743325.1606	2743391.0851	2743385.8915	2743381.6829					
		Y	442878.7029	442879.1459	442878.8784	442878.2587	442883.5322					
		X										

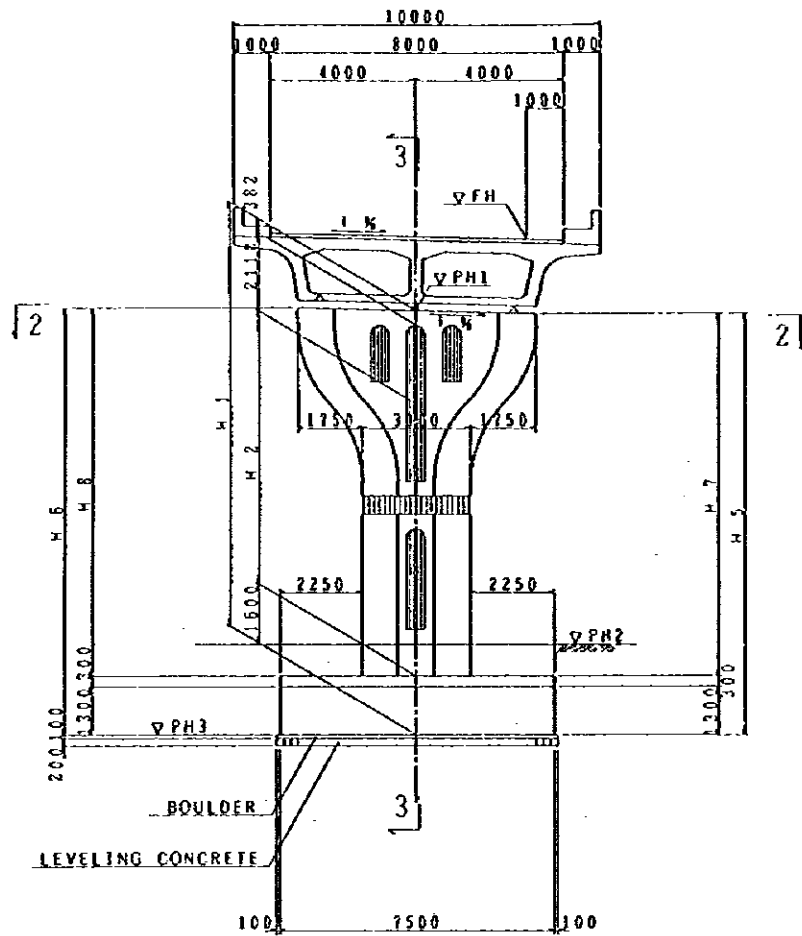


FRAMING PLAN S= 1/200

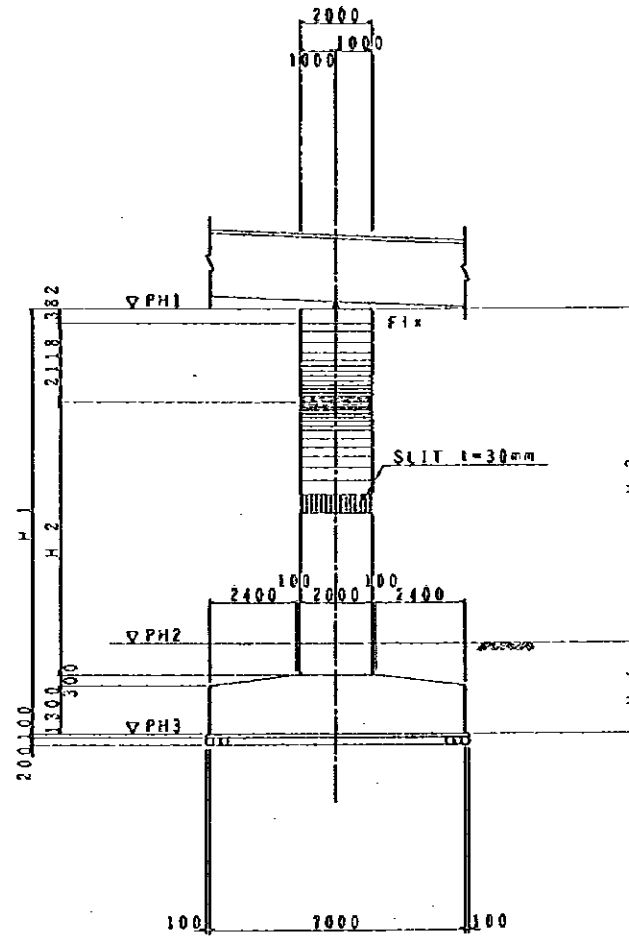
STRUCTURAL DETAIL OF T-WALL PIER FOR P1,P11 AT A-B-LINE (2/2)

NOTES:	JAPAN INTERNATIONAL COOPERATION AGENCY (JICA)	CLIENT: MINISTRY OF COMMUNICATIONS, DIRECTORATE GENERAL OF ROADS
	JICA STUDY TEAM PACIFIC CONSULTANTS INTERNATIONAL FUKUYAMA CONSULTANTS INTERNATIONAL	PROJECT: D/D ON ROAD DEVELOPMENT PROJECT ON BATINAH HIGHWAY
		TITLE: STRUCTURAL DETAIL OF T-WALL PIER FOR P1,P11 AT A,B-LINE (2/2)
		DATE: _____ DWGNO. B-45

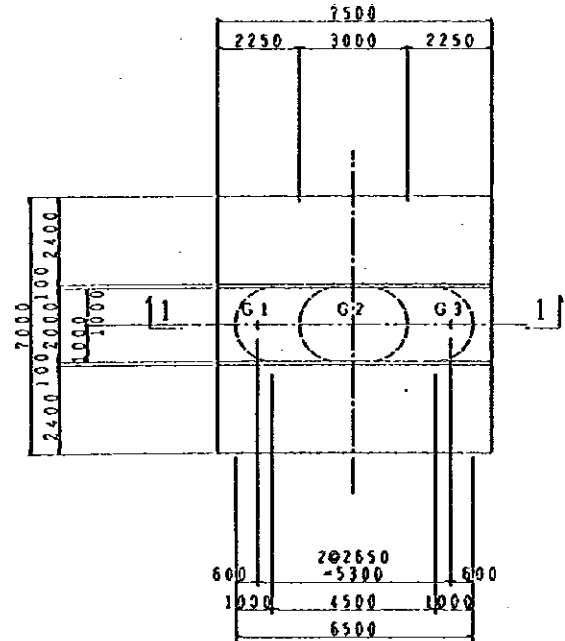
RA/18 AQR



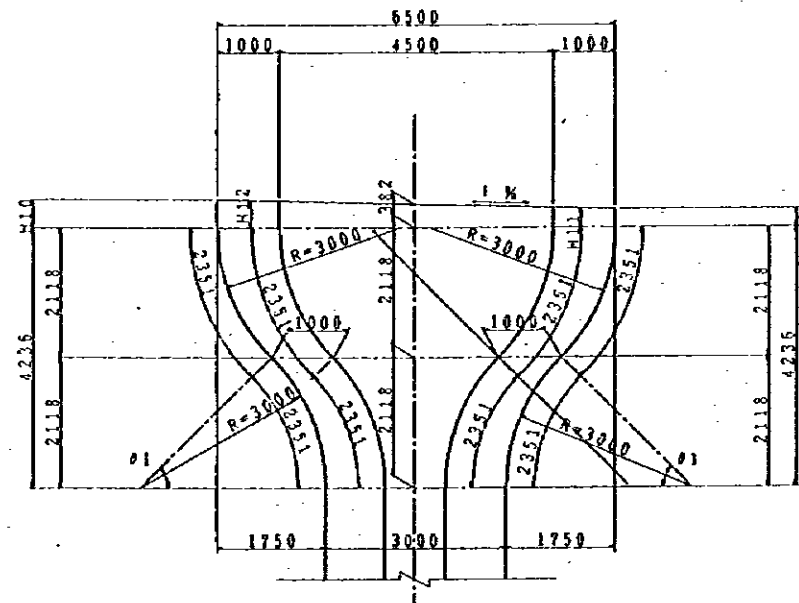
SECTION 1-1 S= 1/200



SECTION 3-3 S= 1/200



SECTION 2-2 S= 1/200

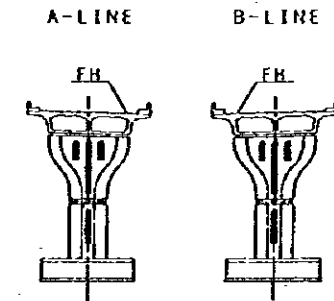


BEAM DETAIL S= 1/120

DEMENSION TABLE

	A-LINE				B-LINE				
	P 2	P 4	P 8	P 10	P 2	P 4	P 5	P 7	P 10
PH1	20.002	21.639	21.635	19.870	24.862	26.002	26.167	25.687	22.935
PH2	11.930	11.770	11.520	11.670	15.500	15.930	15.540	15.200	14.200
PH3	8.502	8.839	8.835	8.370	13.362	13.202	13.367	12.887	11.435
H 1	11500	12800	12800	11500	11500	12800	12800	12800	11500
H 2	7400	8700	8700	7400	7400	8700	8700	8700	7400
H 3	8072	9869	10115	8200	9362	10072	10627	10487	8735
H 4	3428	2931	2685	3300	2138	2728	2173	2313	2765
H 5	11419	12719	12723	11562	11561	12881	12881	12881	11573
H 6	11581	12881	12877	11438	11419	12719	12719	12719	11427
H 7	9819	11119	11123	9962	9981	11281	11281	11281	9973
H 8	9931	11281	11277	9838	9819	11119	11119	11119	9827
H 9	301	301	305	444	463	463	463	463	455
H10	453	463	459	320	301	301	301	301	309
H11	326	326	329	425	438	438	438	438	432
H12	438	438	435	339	326	326	326	326	332
i %	2.50	2.50	2.38	-1.91	-2.50	-2.50	-2.50	-2.50	-2.26
# 1	44°54'04"				44°54'04"				

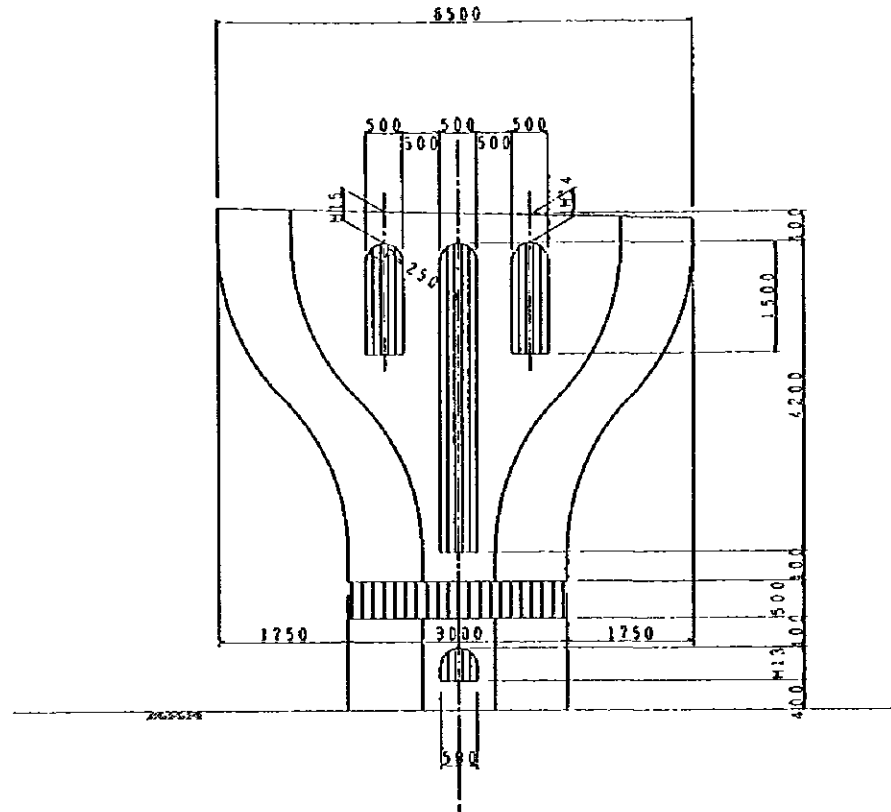
NOTE : THE CROSSFALL VALUES TO THE RIGHT IS PLUS AND THE ONES TO THE LEFT IS MINUS.



KEY PLAN

STRUCTURAL DETAIL OF T-WALL PIER FOR P2,4,8,10 (A-LINE) • P2,4,5,7,10 (B-LINE) (1/2)

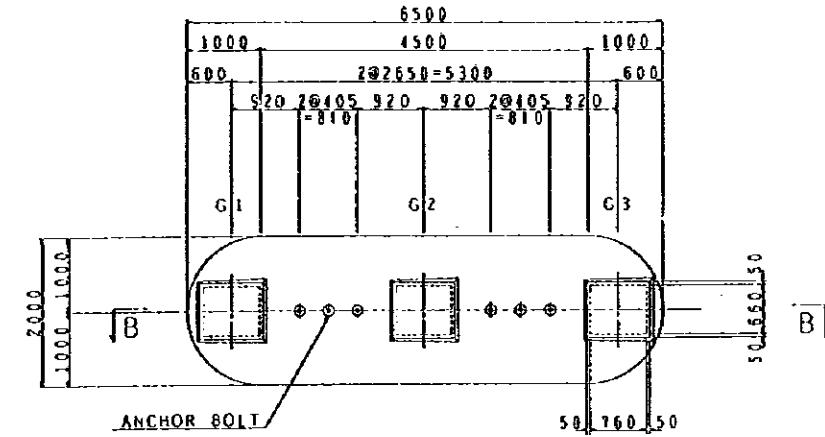
NOTES:	JAPAN INTERNATIONAL COOPERATION AGENCY (JICA)	CLIENT: MINISTRY OF COMMUNICATIONS, DIRECTORATE GENERAL OF ROADS
	JICA STUDY TEAM PACIFIC CONSULTANTS INTERNATIONAL FUKUYAMA CONSULTANTS INTERNATIONAL	PROJECT: D/D ON ROAD DEVELOPMENT PROJECT ON BATINAH HIGHWAY
		TITLE: STRUCTURAL DETAIL OF T-WALL PIER FOR P 2,4,8,10(A-LINE) P2,4,5,7,10(B-LINE) (1/2)
	DATE	DWGNO. B-46



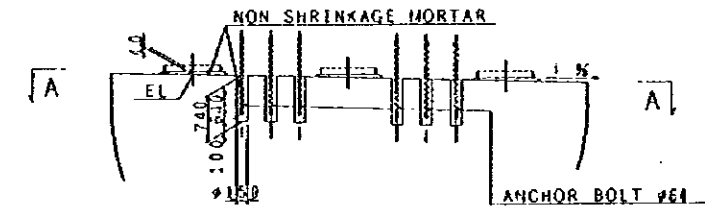
SLIT OF PLAN S= 1/100

DEMENSION TABLE

		H13	H14	H15
A L I N E	P 2	1772	375	425
	P 4	3569	375	425
	P 8	3815	376	424
	P10	1500	419	381
B L I N E	P 2	3062	425	375
	P 4	3772	425	375
	P 5	4327	425	375
	P 7	4187	425	375
	P10	2435	423	377

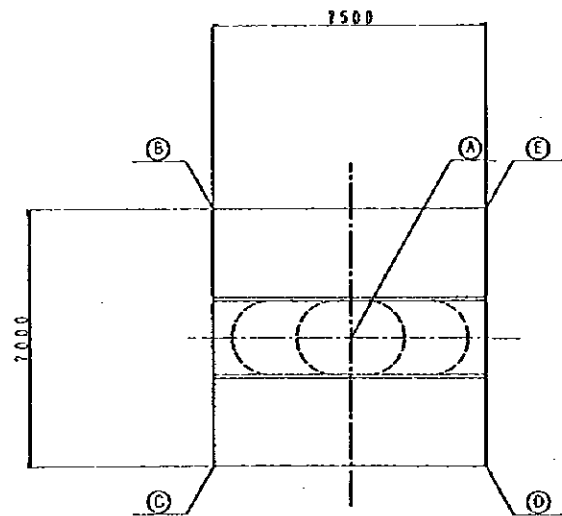


SECTION A-A S= 1/100



SECTION B-B S= 1/100

DETAIL OF SHOE BED



FRAMING PLAN S= 1/200

CO-ORDINATES LIST

		A	B	C	D	E
A L I N E	P2	2742978 7247	2742991 0651	2742974 8714	2742971 3049	2742984 5711
		443449 0518	415408 1434	443411 4185	443443 0261	415414 7751
	P4	2743033 8370	2743025 5043	2743028 1722	2743032 1858	2743038 5817
		443416 7401	443411 8591	443414 7430	443421 5815	443418 7328
B L I N E	P8	2743146 7204	2743149 0178	2743142 3032	2743144 4238	2743151 1376
		443375 1226	443370 5363	443372 5143	443371 1090	443377 7204
	P10	2743204 6112	2743206 8851	2743200 2511	2743202 1925	2743209 8372
		443358 3548	443354 7916	443358 7008	443361 8182	443368 6183
P I E R	P2	2743261 4127	2743272 1442	2743269 8118	2743263 8031	2743265 0361
		442858 8534	442843 7263	442854 1490	442856 5345	442861 1584
	P4	2743308 3635	2743303 3658	2743290 6958	2743283 7628	2743286 4328
		442895 0282	442899 8232	442890 3624	442893 2231	442899 6333
P I E R	P5	2743350 5058	2743325 8558	2743302 4876	2743295 6471	2743298 6320
		442722 6561	442714 9081	442711 9219	442721 0181	442727 8903
	P7	2743327 1199	2743332 8778	2743328 7150	2743332 1622	2743325 4649
		442276 4818	442277 8583	442271 7864	442276 3249	442281 4668
P I E R	P10	2743378 5367	2743378 8861	2743374 7928	2743368 9663	2743372 4887
		442853 8922	442854 8134	442849 6020	442853 1831	442854 8234

SHOE ELEVATION (EL) TABLE

		G 2
A L I N E	P 2	26.002
	P 4	21.639
	P 8	21.635
	P10	19.810
B L I N E	P 2	24.862
	P 4	26.092
	P 5	26.167
	P 7	25.687
	P10	22.935

STRUCTURAL DETAIL OF T-WALL PIER FOR P2,4,8,10 (A-LINE) · P2,4,5,7,10 (B-LINE) (2/2)

NOTES:

JAPAN INTERNATIONAL COOPERATION AGENCY  
(JICA)

JICA STUDY TEAM  
PACIFIC CONSULTANTS INTERNATIONAL  
FUKUYAMA CONSULTANTS INTERNATIONAL

CLIENT: MINISTRY OF COMMUNICATIONS, DIRECTORATE GENERAL OF ROADS

PROJECT: DID ON ROAD DEVELOPMENT PROJECT ON BATINAH HIGHWAY

TITLE: STRUCTURAL DETAIL OF T-WALL PIER FOR P2,4,8,10(A-LINE) P2,4,5,7,10(B-LINE) (2/2)

DATE

DWGNO.

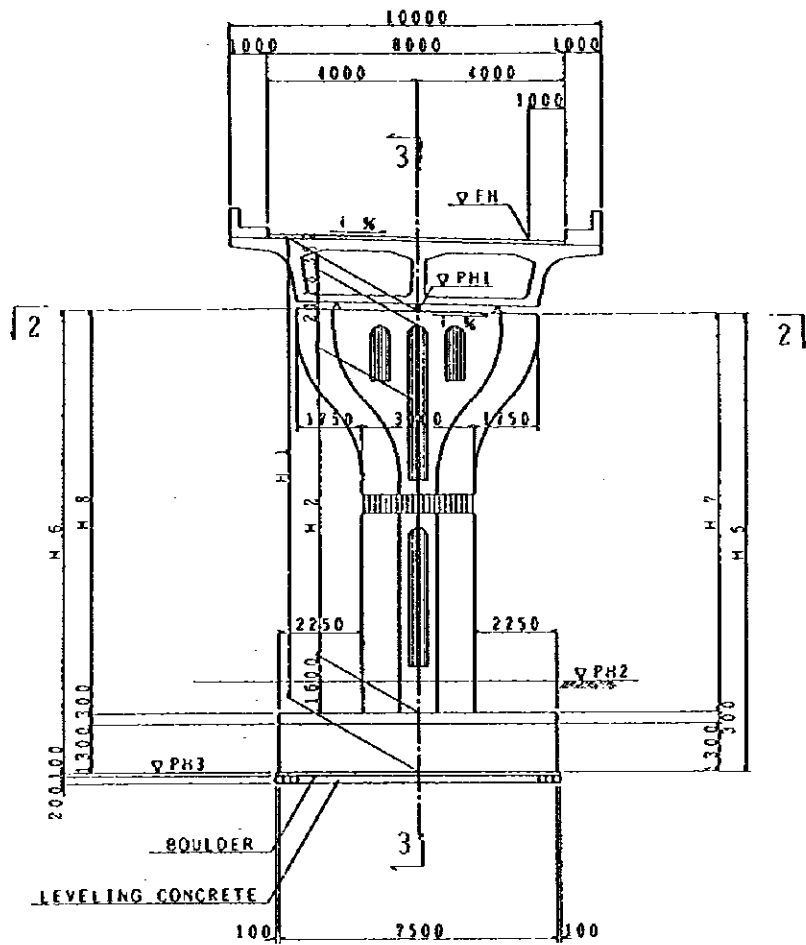
B-47

# RA/18 AQR

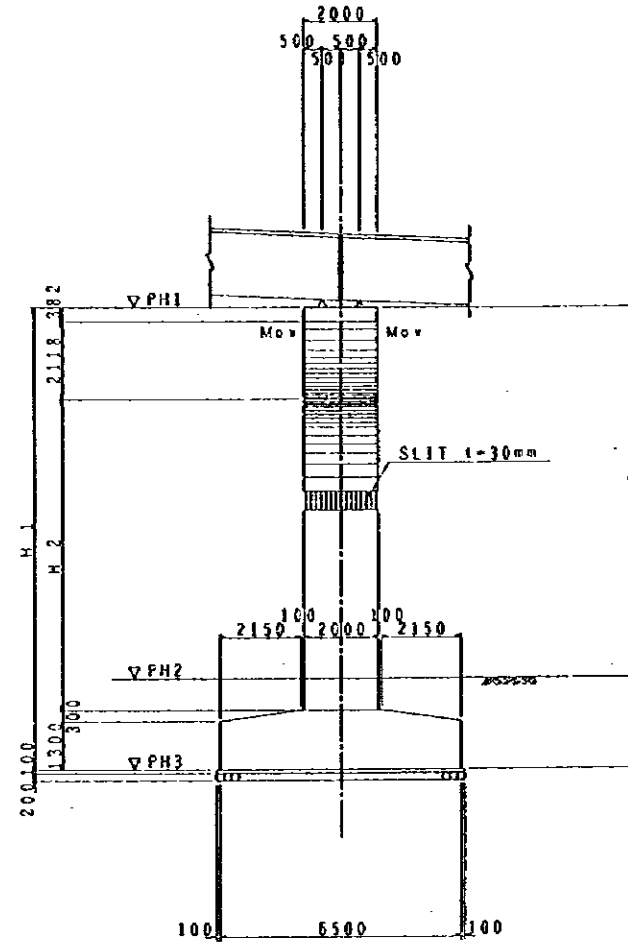
## DEMENSION TABLE

	A-LINE			B-LINE	
	P 3	P 6	P 9	P 3	P 9
PH1	20.952	22.119	20.884	25.562	24.122
PH2	11.785	11.800	11.500	15.350	14.670
PH3	8.452	9.679	8.384	13.062	11.622
H 1	12500	12500	12500	12500	12500
H 2	8400	8400	8400	8400	8400
H 3	9167	10319	9384	10212	9452
H 4	3333	2121	3115	2288	3048
H 5	12419	12419	12492	12581	12581
H 6	12581	12581	12508	12419	12419
H 7	10819	10819	10892	10981	10981
H 8	10981	10981	10908	10819	10819
H 9	301	301	374	463	463
H10	463	463	350	301	301
H11	326	326	376	438	438
H12	438	438	388	326	326
I %	2.50	2.50	0.24	-2.50	-2.50
# 1	44'54'04"			44'54'04"	

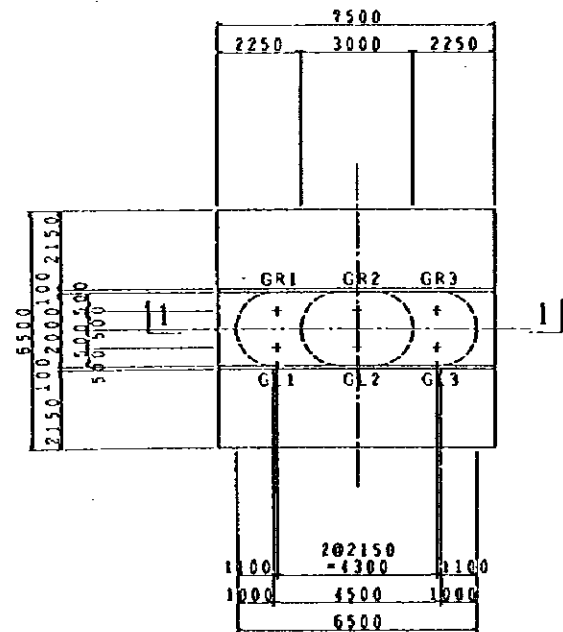
NOTE : THE CROSSFALL VALUES TO THE RIGHT IS PLUS AND THE ONES TO THE LEFT IS MINUS.



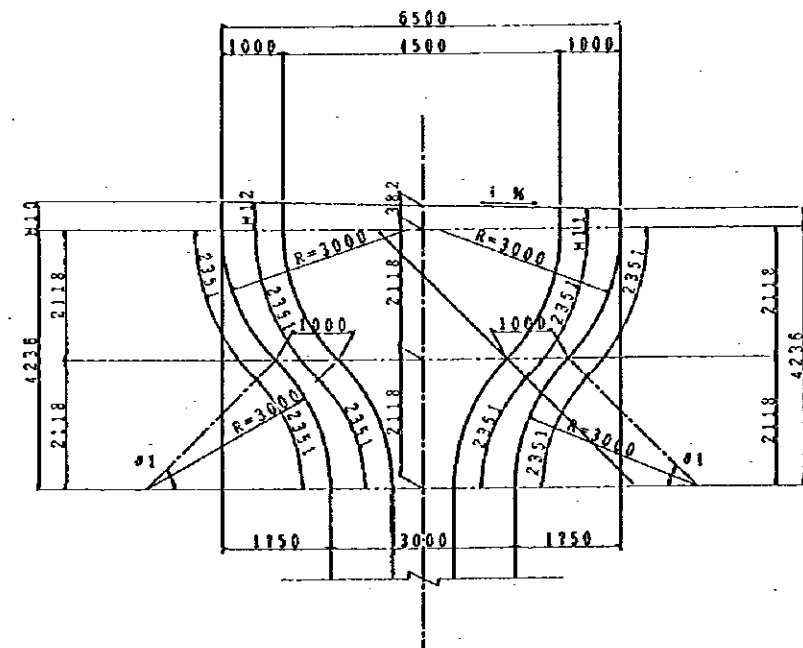
SECTION 1-1 S= 1/200



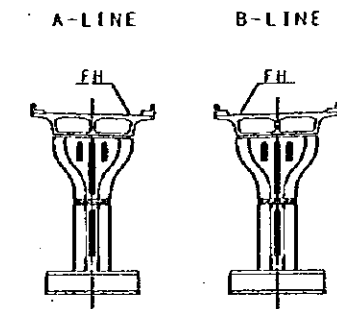
SECTION 3-3 S= 1/200



SECTION 2-2 S= 1/200



BEAM DETAIL S= 1/120



KEY PLAN

### STRUCTURAL DETAIL OF T-WALL PIER FOR P3,6,9 (A-LINE) · P3,9 (B-LINE) (1/2)

JAPAN INTERNATIONAL COOPERATION AGENCY  
(JICA)

JICA STUDY TEAM  
PACIFIC CONSULTANTS INTERNATIONAL  
FUKUYAMA CONSULTANTS INTERNATIONAL

CLIENT: MINISTRY OF COMMUNICATIONS, DIRECTORATE GENERAL OF ROADS

PROJECT: D/D ON ROAD DEVELOPMENT PROJECT ON BATINAH HIGHWAY

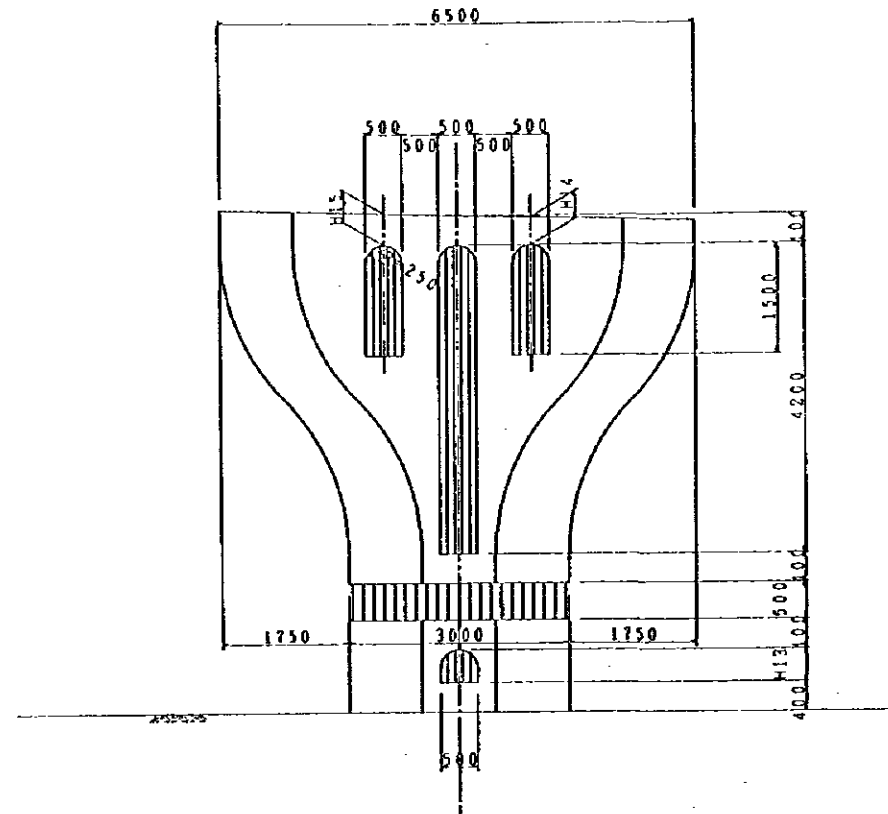
TITLE: STRUCTURAL DETAIL OF T-WALL PIER FOR P3,6,9(A-LINE) P3,9(B-LINE) (1/2)

DATE

DWGNO.

B-48

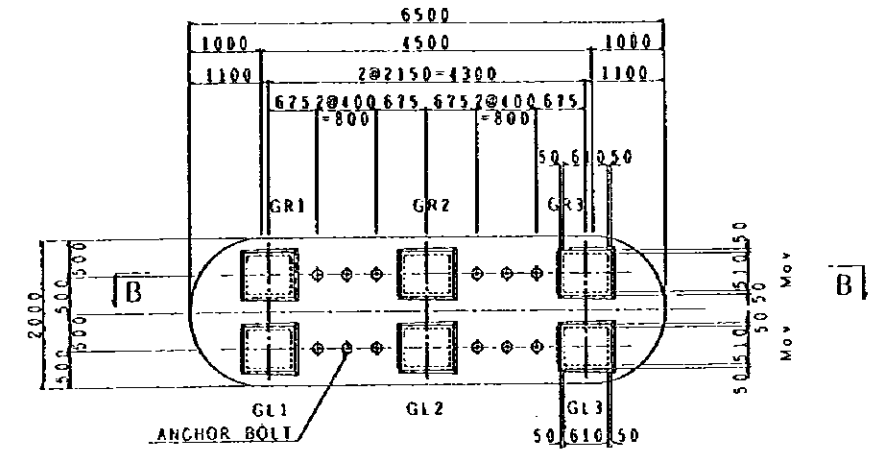
# RA/18 AQR



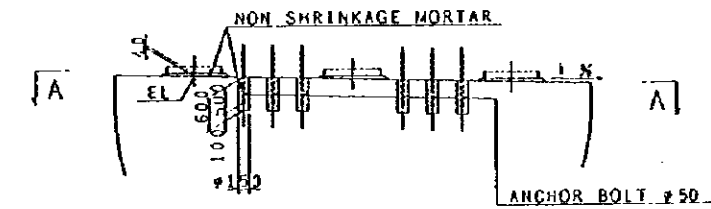
SLIT OF PLAN S= 1/100

## DEMENSION TABLE

	A-LINE			B-LINE	
	P 3	P 6	P 9	P 3	P 9
H13	2867	4079	3084	3912	3152
H14	375	375	398	425	425
H15	425	425	402	375	375



SECTION A-A S= 1/100

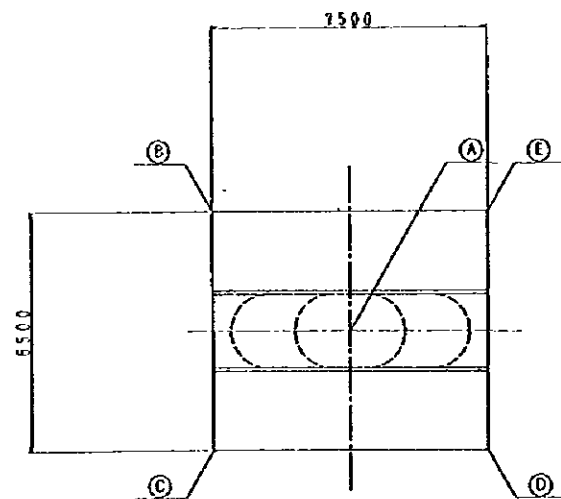


SECTION B-B S= 1/100

## DETAIL OF SHOE BED

## SHOE ELEVATION (EL) TABLE

G 2	A-LINE			B-LINE	
	P 3	P 6	P 9	P 3	P 9
	20.952	22.179	20.884	25.562	24.122



FRAMING PLAN S= 1/200

## CO-ORDINATES LIST

A	B	C	D	E	
X	274300.5612	274300.8411	274301.0973	274305.2813	274301.1251
Y	413428.4606	413424.8722	413427.5183	413434.2611	413437.4150
X	274300.5612	274301.3270	274305.2813	274308.8327	274309.9372
Y	413428.4606	413429.4567	413431.6557	413438.6122	413441.4137
X	274301.7285	274302.9264	274307.4437	274312.5228	274319.8163
Y	413428.4606	413429.4567	413431.6557	413438.6122	413441.4137
X	274302.7285	274303.2502	274307.4437	274312.5228	274319.8163
Y	413428.4606	413429.4567	413431.6557	413438.6122	413441.4137
X	274303.7285	274304.1744	274307.4437	274312.5228	274319.8163
Y	413428.4606	413429.4567	413431.6557	413438.6122	413441.4137

## STRUCTURAL DETAIL OF T-WALL PIER FOR P3,6,9 (A-LINE) · P3,9 (B-LINE) (2/2)

NOTES:

JAPAN INTERNATIONAL COOPERATION AGENCY  
(JICA)

JICA STUDY TEAM  
PACIFIC CONSULTANTS INTERNATIONAL  
FUKUYAMA CONSULTANTS INTERNATIONAL

CLIENT: MINISTRY OF COMMUNICATIONS, DIRECTORATE GENERAL OF ROADS

PROJECT: D/D ON ROAD DEVELOPMENT PROJECT ON BATINAH HIGHWAY

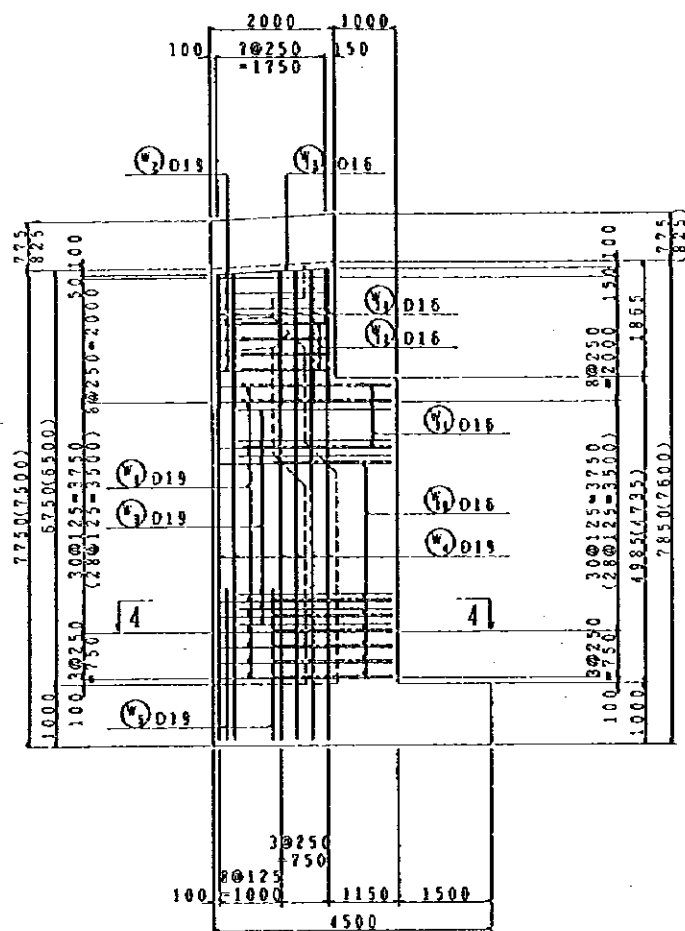
TITLE: STRUCTURAL DETAIL OF T-WALL PIER FOR P3,6,9(A-LINE) P3,9(B-LINE) (2/2)

DATE: \_\_\_\_\_ DWGNO. B-49

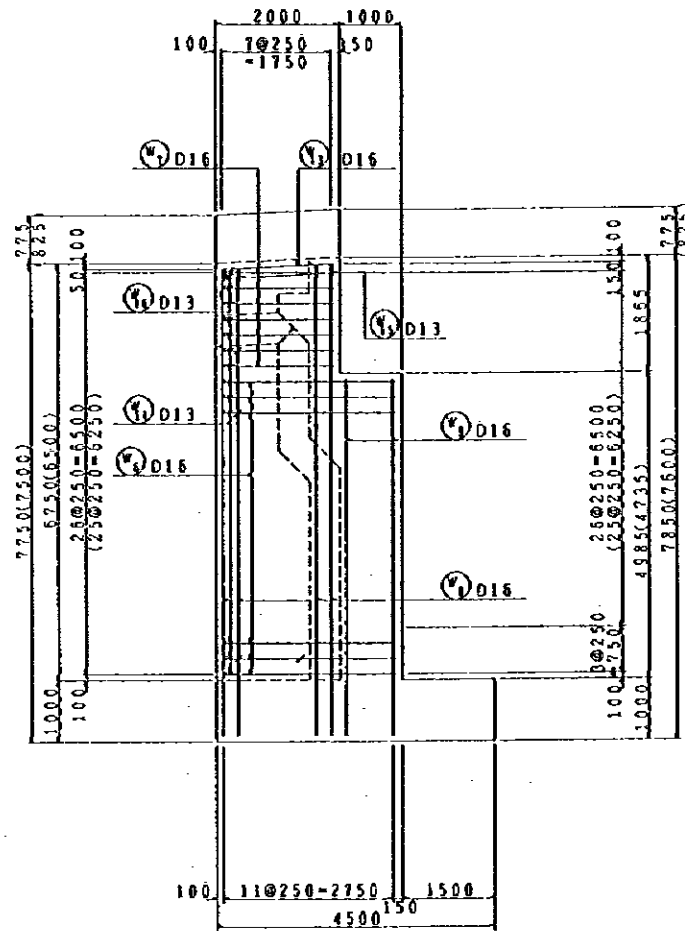




RA/18 AQR

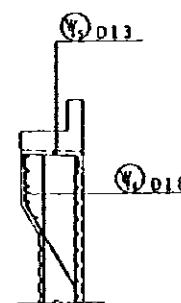


SECTION 1-1 S= 1/120

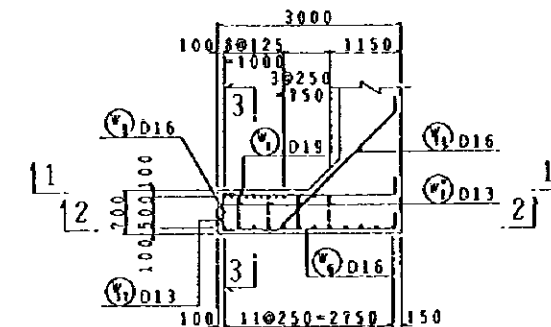


SECTION 2-2 S= 1/120

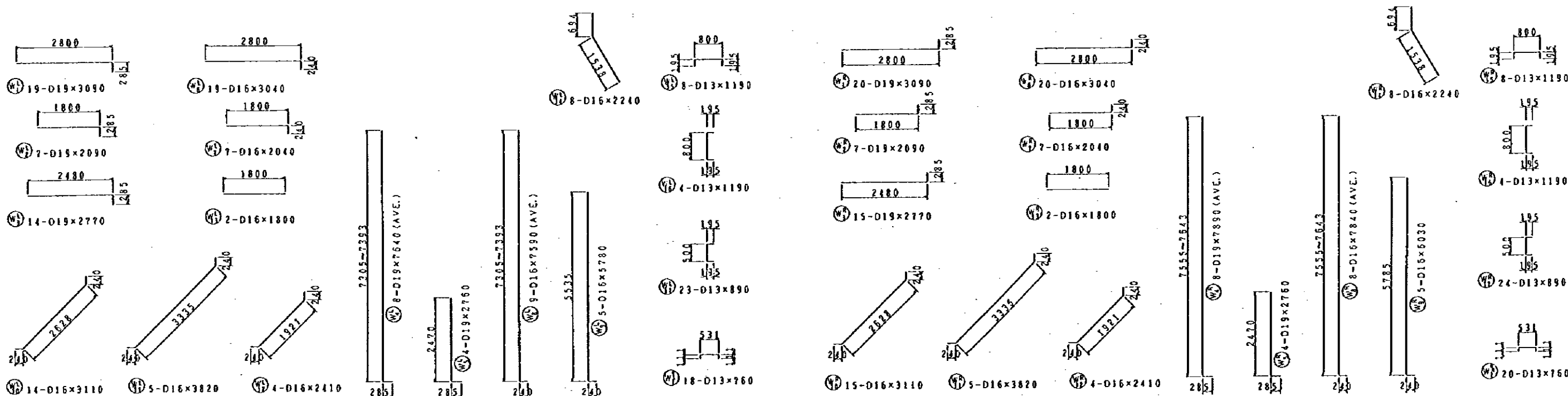
NOTE: ( ) LEFT WING



SECTION 3-3 S= 1/120



SECTION 4-4 S= 1/120



RE-BAR ARRANGEMENT OF A2 ABUTMENT AT A-LINE (2/3)

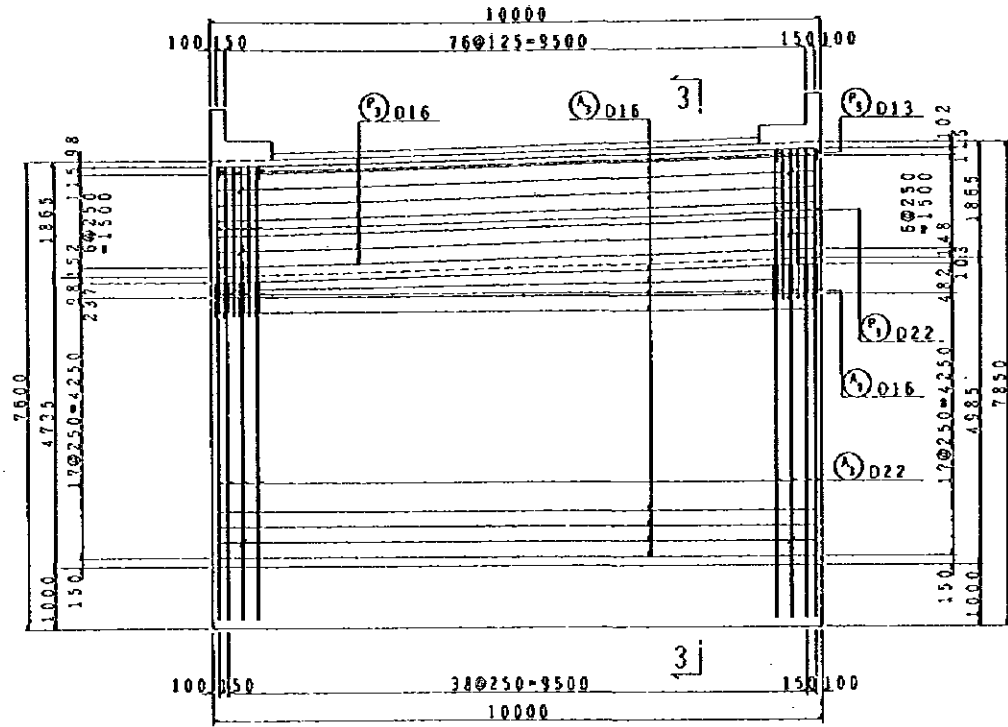
NOTES:

JAPAN INTERNATIONAL COOPERATION AGENCY  
(JICA)  
JICA STUDY TEAM  
PACIFIC CONSULTANTS INTERNATIONAL  
FUKUYAMA CONSULTANTS INTERNATIONAL

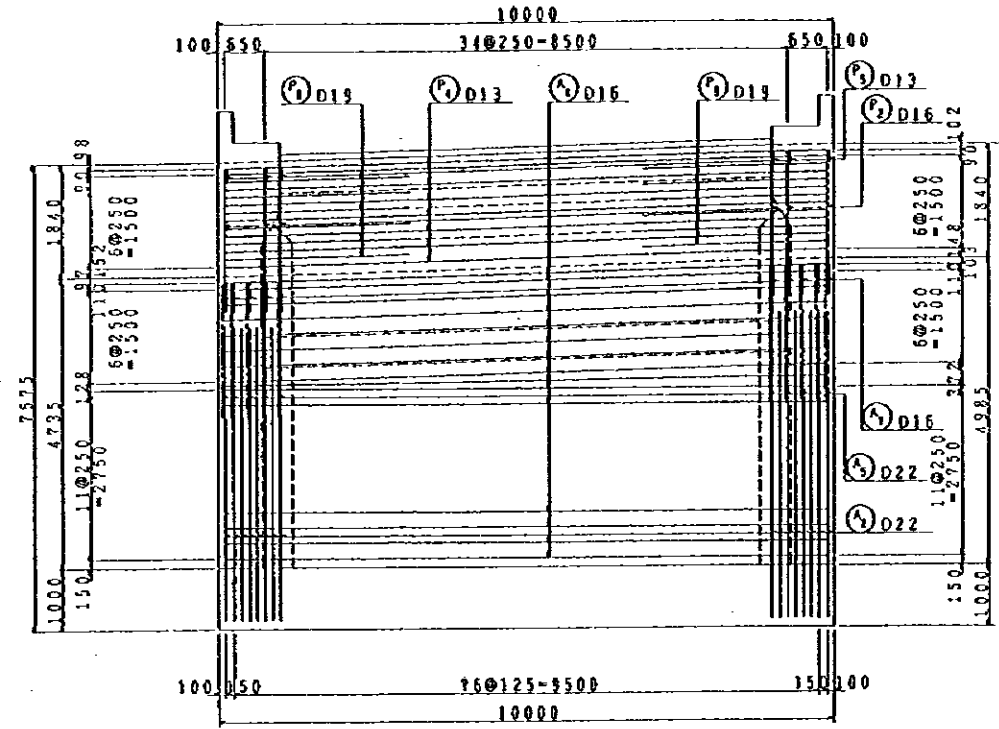
CLIENT: MINISTRY OF COMMUNICATIONS, DIRECTORATE GENERAL OF ROADS  
PROJECT: D/D ON ROAD DEVELOPMENT PROJECT ON BATINAH HIGHWAY  
TITLE: RE-BAR ARRANGEMENT OF A1 ABUTMENT AT A-LINE (2/3)  
DATE: \_\_\_\_\_ DWGNO. B-51



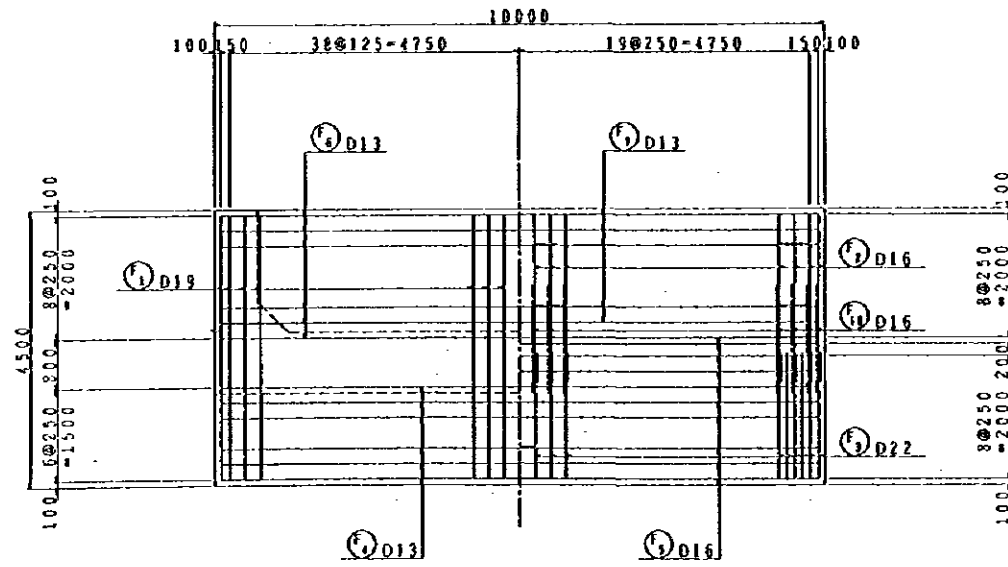
RA/18 AQR



SECTION 1-1 S= 1/120

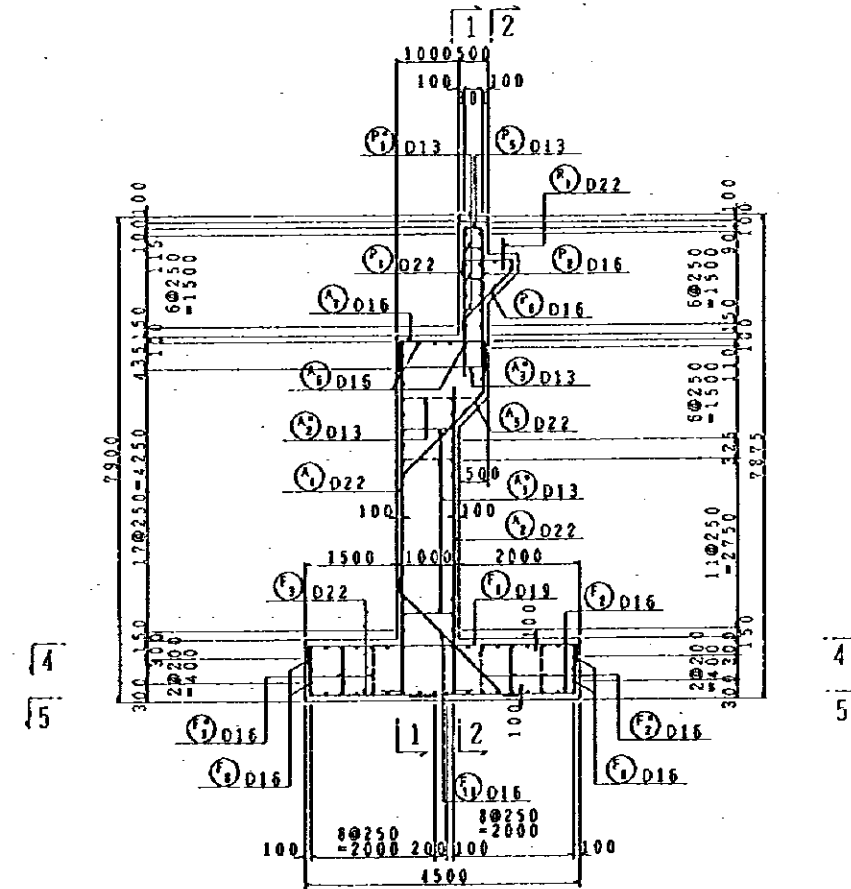


SECTION 2-2 S= 1/120



SECTION 4-4 S= 1/120

SECTION 5-5 S= 1/120



SECTION 3-3 S= 1/120

RE-BAR ARRANGEMENT OF A2 ABUTMENT AT A-LINE (1/3)

NOTES:

JAPAN INTERNATIONAL COOPERATION AGENCY  
(JICA)

JICA STUDY TEAM  
PACIFIC CONSULTANTS INTERNATIONAL  
FUKUYAMA CONSULTANTS INTERNATIONAL

CLIENT: MINISTRY OF COMMUNICATIONS, DIRECTORATE GENERAL OF ROADS

PROJECT: D/D ON ROAD DEVELOPMENT PROJECT ON BATINAH HIGHWAY

TITLE: RE-BAR ARRANGEMENT OF A2 ABUTMENT AT A-LINE (1/3)

DATE

DWGNO.

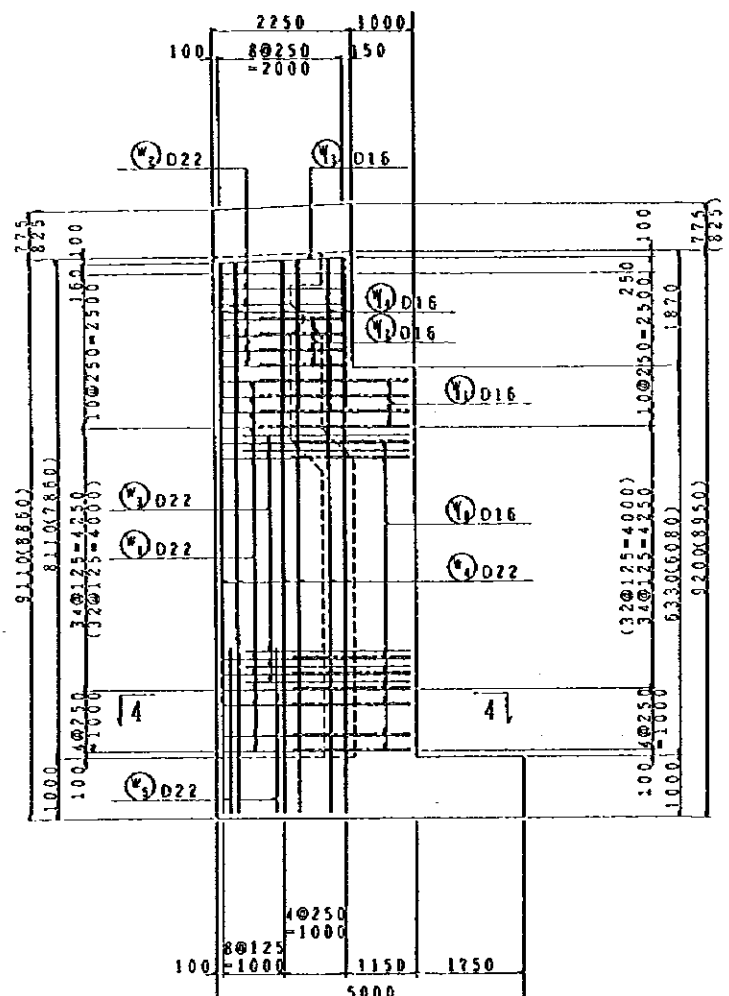
B-53



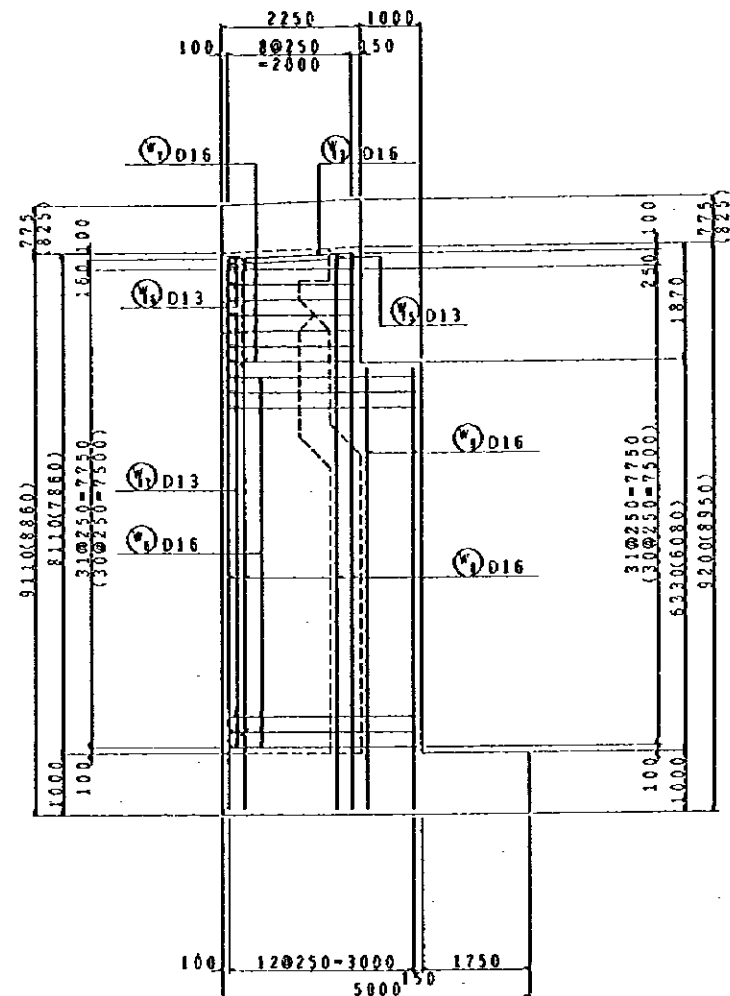




RA/18 AQR

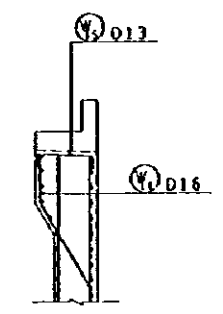


SECTION 1-1 S=1/120

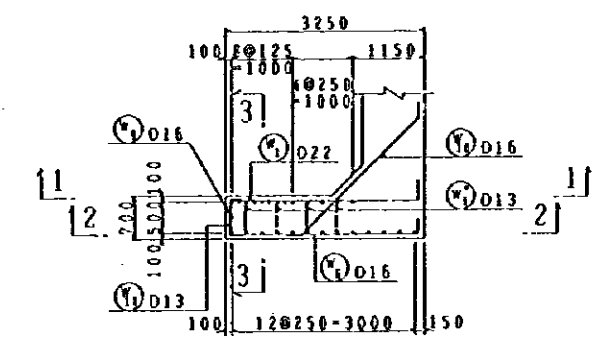


SECTION 2-2 S=1/120

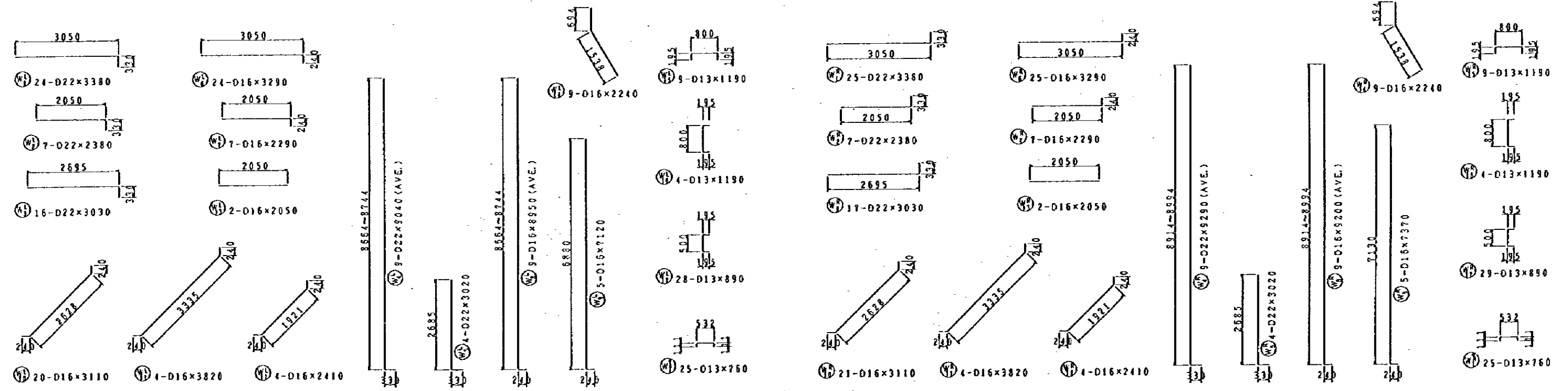
NOTE: ( ) LEFT WING



SECTION 3-3 S=1/120



SECTION 4-4 S=1/120

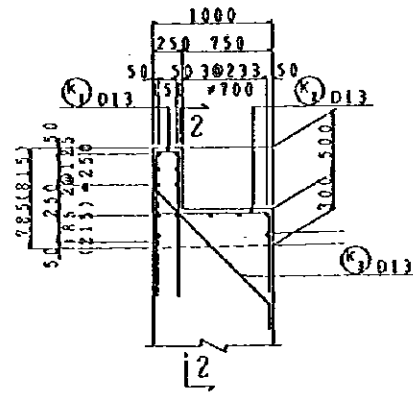


RE-BAR ARRANGEMENT OF A1 ABUTMENT AT B-LINE (2/3)

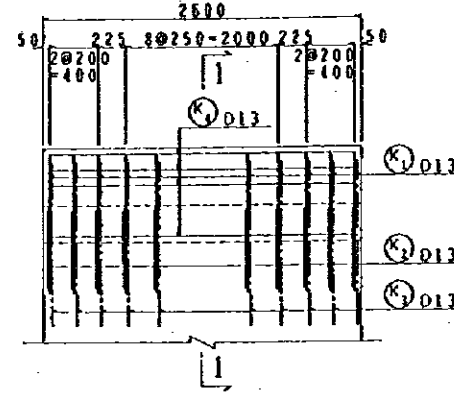
NOTES:	JAPAN INTERNATIONAL COOPERATION AGENCY	CLIENT: MINISTRY OF COMMUNICATIONS, DIRECTORATE GENERAL OF ROADS
	(JICA)	PROJECT: D/D ON ROAD DEVELOPMENT PROJECT ON BATINAH HIGHWAY
	JICA STUDY TEAM PACIFIC CONSULTANTS INTERNATIONAL FUKUYAMA CONSULTANTS INTERNATIONAL	TITLE: RE-BAR ARRANGEMENT OF A1 ABUTMENT AT B-LINE (2/3)
		DATE: _____ DWGNO. B-57



RA/18 AQR

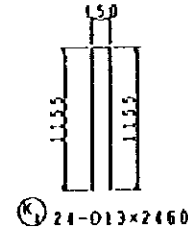


SECTION 1-1

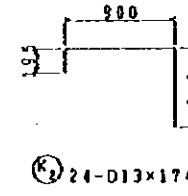


SECTION 2-2

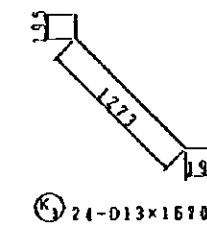
NOTE: ( ) RIGHT RAILING



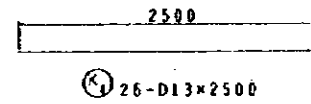
24-D13x2460



24-D13x1740

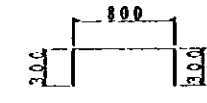
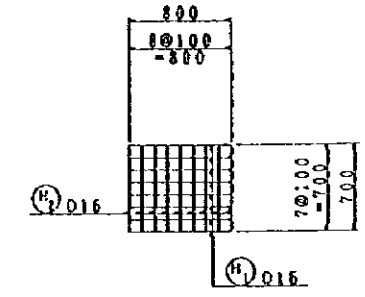


24-D13x1670

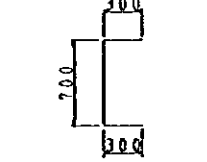


26-D13x2500

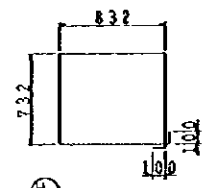
DETAIL OF RAILING S= 1/60



24-D16x1400

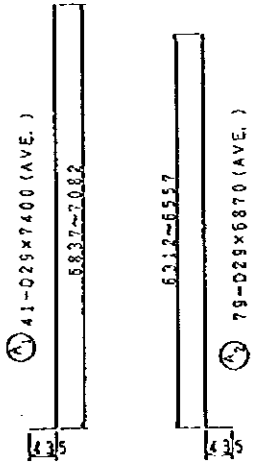


27-D16x1300

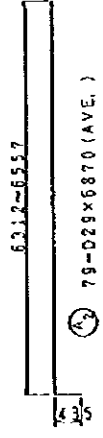


3-D16x3330

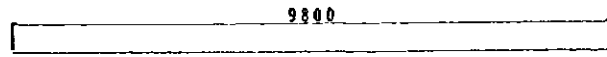
DETAIL OF SHOE BED S= 1/60



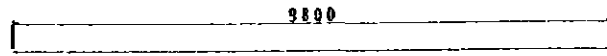
41-D29x7400 (AVE.)



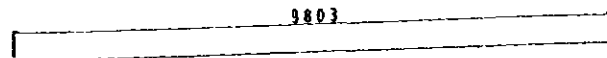
79-D29x6870 (AVE.)



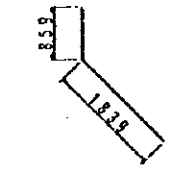
26-D16x9800



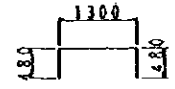
29-D22x9800



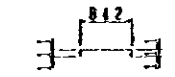
4-D16x9810



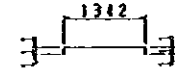
41-D29x2700



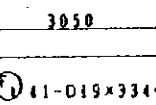
41-D16x2260



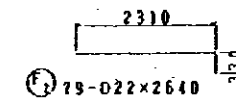
95-D13x1070



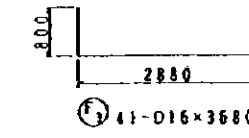
19-D13x1570



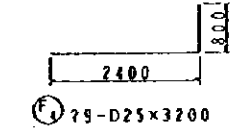
41-D19x3340



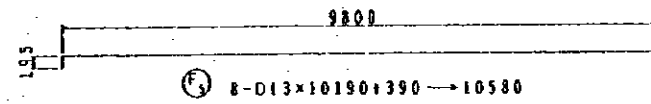
79-D22x2640



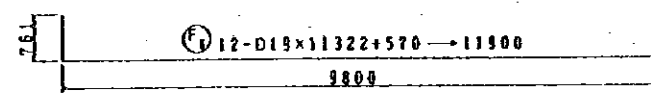
41-D16x3680



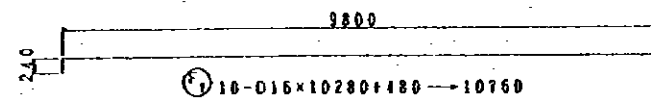
79-D25x3200



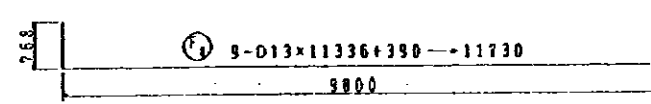
8-D13x10190+390 -> 10580



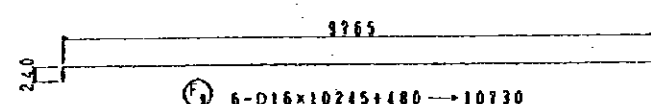
12-D19x11322+570 -> 11900



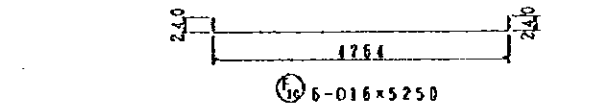
16-D16x10280+480 -> 10760



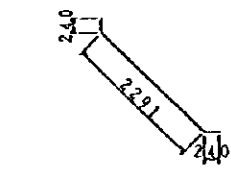
9-D13x11336+390 -> 11730



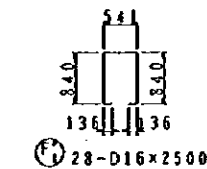
6-D16x10245+480 -> 10730



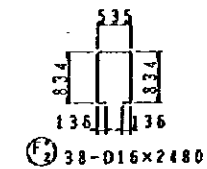
6-D16x5250



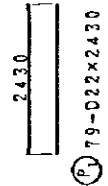
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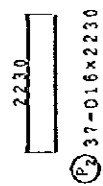
28-D16x2500



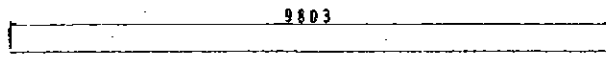
38-D16x2480



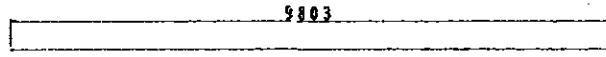
79-D22x2430



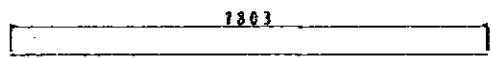
37-D16x2230



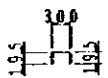
8-D16x9810



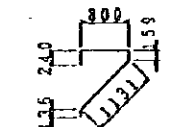
8-D13x9810



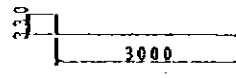
4-D13x7810



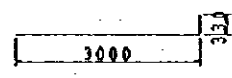
37-D13x690



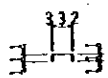
31-D16x2470



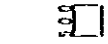
6-D22x3330



6-D22x3330



29-D13x560



16-D22x500

RE-BAR ARRANGEMENT OF A1 ABUTMENT AT B-LINE (3/3)

NOTES:

JAPAN INTERNATIONAL COOPERATION AGENCY (JICA)

JICA STUDY TEAM  
PACIFIC CONSULTANTS INTERNATIONAL  
FUKUYAMA CONSULTANTS INTERNATIONAL

CLIENT: MINISTRY OF COMMUNICATIONS, DIRECTORATE GENERAL OF ROADS

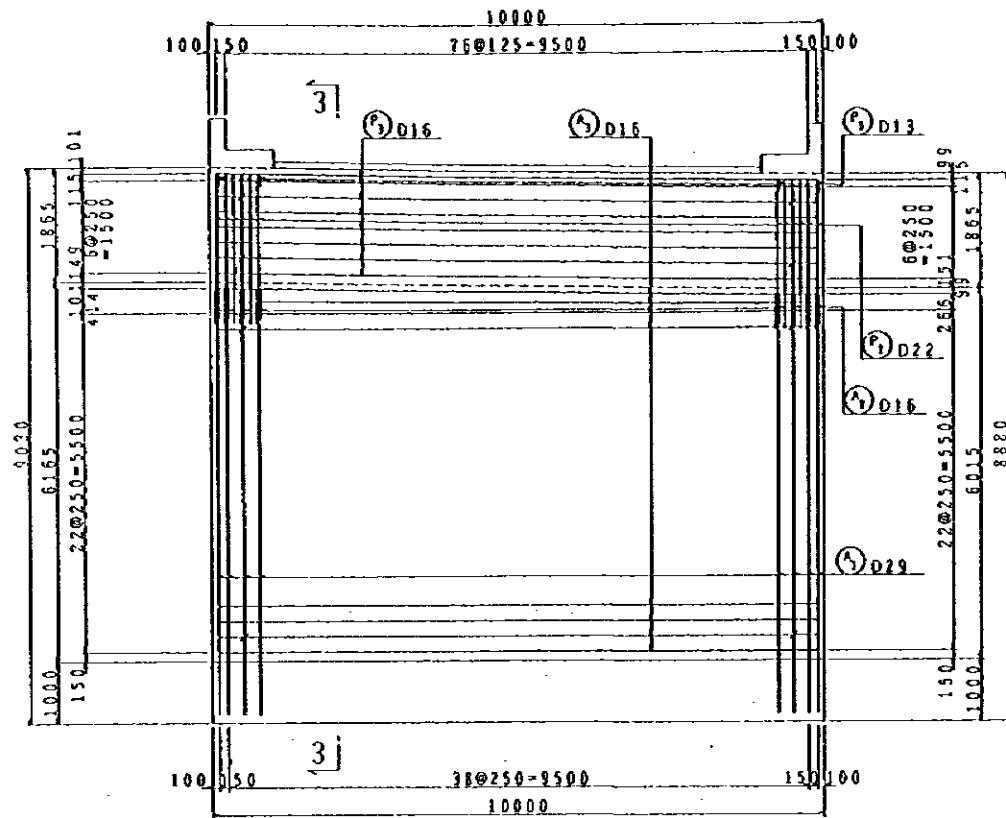
PROJECT: D/D ON ROAD DEVELOPMENT PROJECT ON BATINAH HIGHWAY

TITLE: RE-BAR ARRANGEMENT OF A1 ABUTMENT AT B-LINE (3/3)

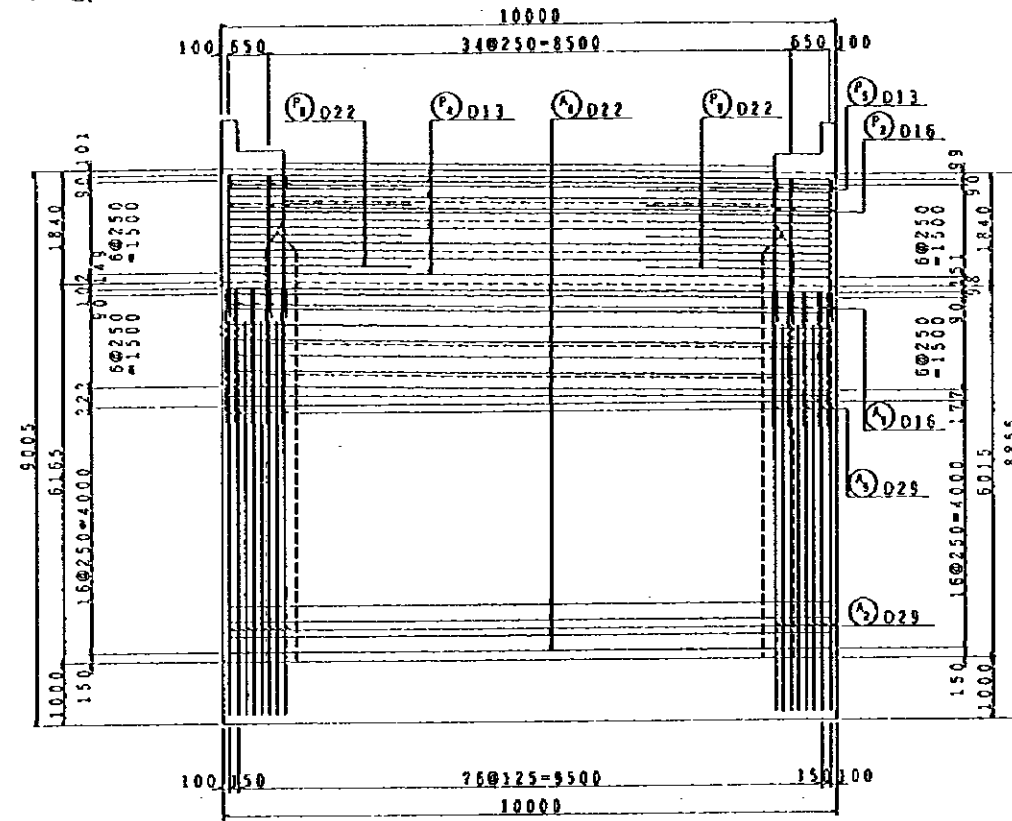
DATE:

DWGNO.

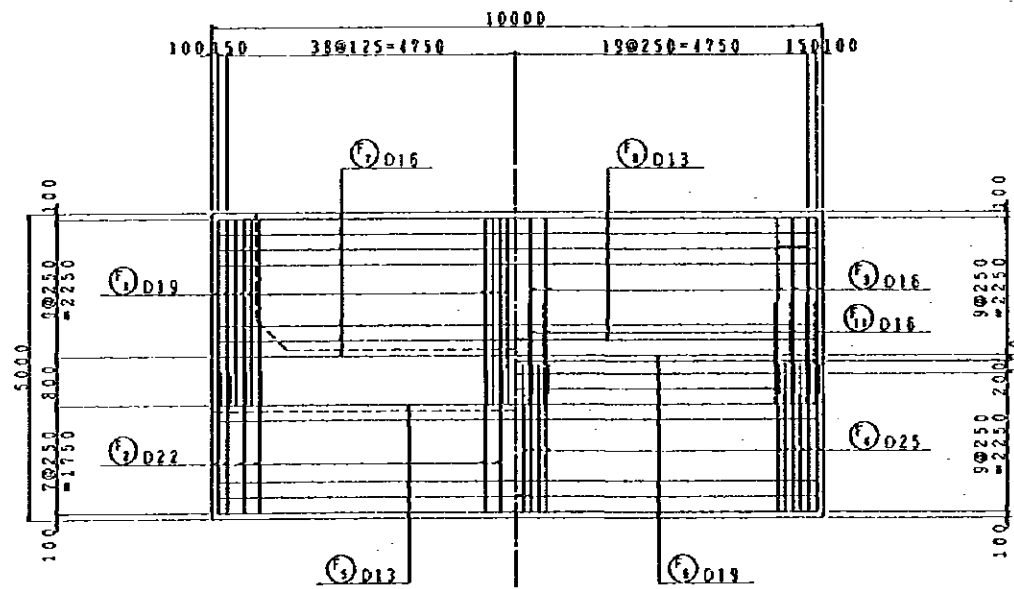
B-58



SECTION 1-1 S= 1/120

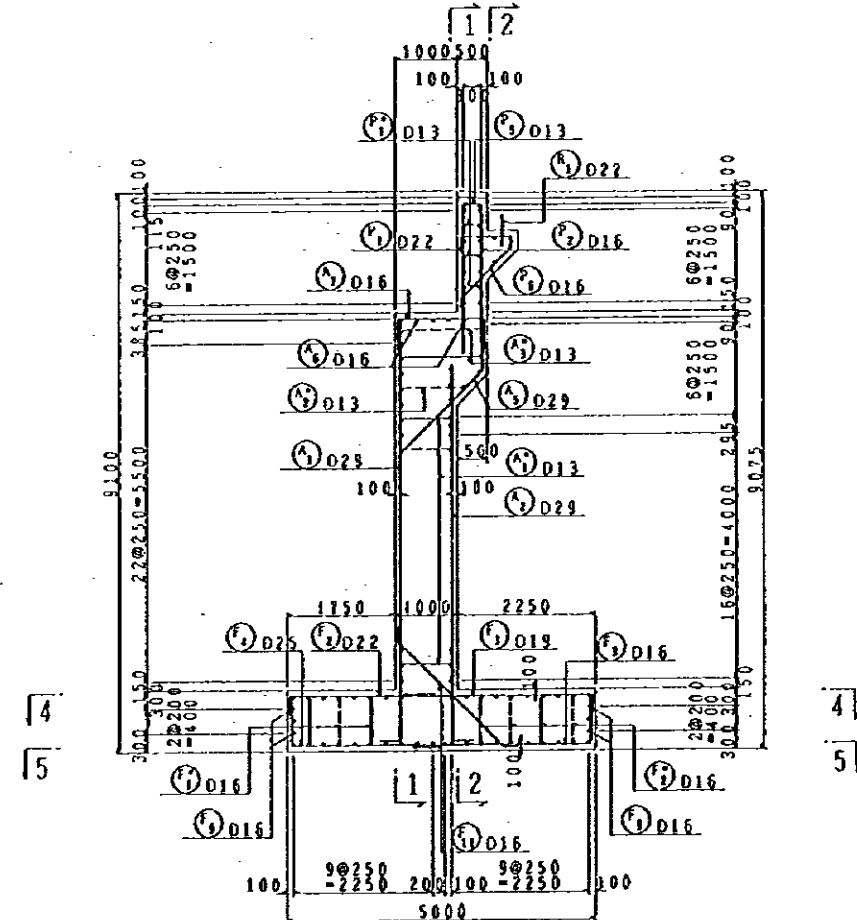


SECTION 2-2 S= 1/120



SECTION 4-4 S= 1/120

SECTION 5-5 S= 1/120



SECTION 3-3 S= 1/120

RE-BAR ARRANGEMENT OF A2 ABUTMENT AT B-LINE (1/3)

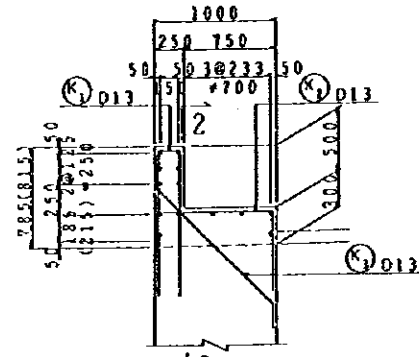
NOTES:

JAPAN INTERNATIONAL COOPERATION AGENCY  
(JICA)  
JICA STUDY TEAM  
PACIFIC CONSULTANTS INTERNATIONAL  
FUKUYAMA CONSULTANTS INTERNATIONAL

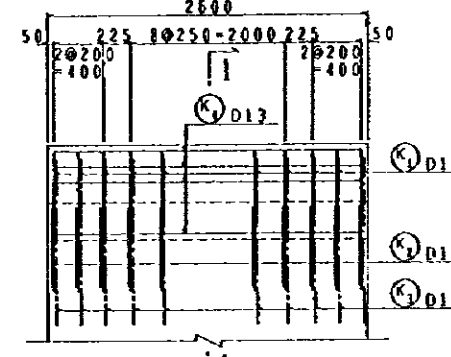
CLIENT: MINISTRY OF COMMUNICATIONS, DIRECTORATE GENERAL OF ROADS  
PROJECT: D/D ON ROAD DEVELOPMENT PROJECT ON BATINAH HIGHWAY  
TITLE: RE-BAR ARRANGEMENT OF A2 ABUTMENT AT B-LINE (1/3)  
DATE: DWONO. B-59



RA/18 AQR

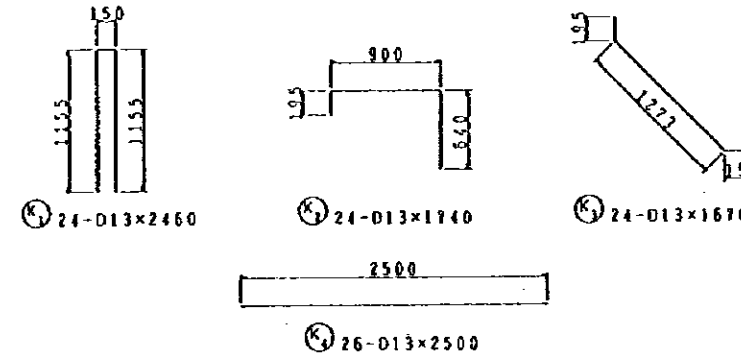


SECTION 1-1

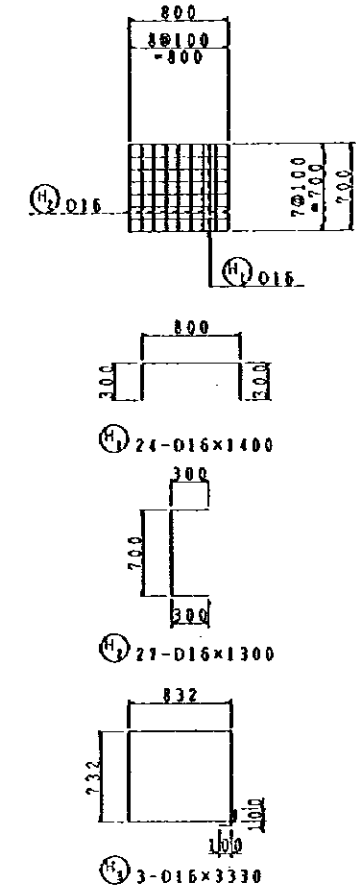


SECTION 2-2

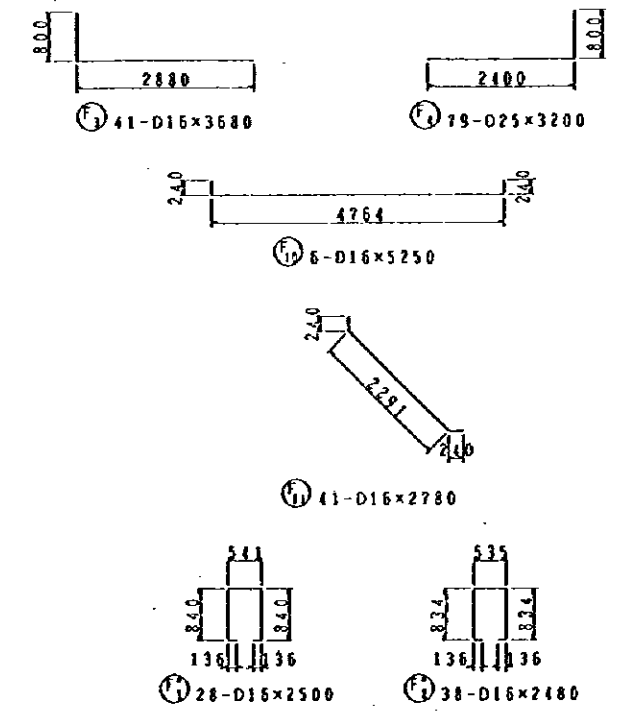
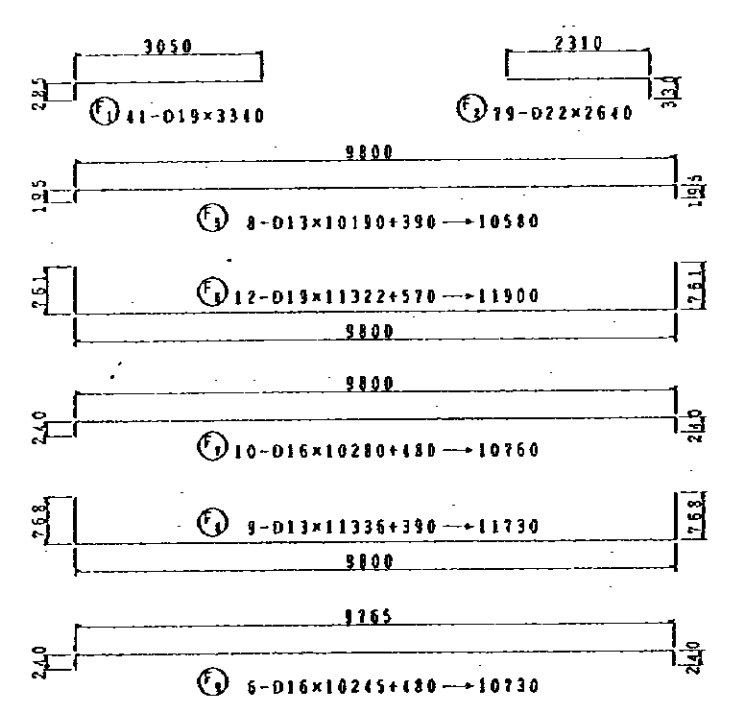
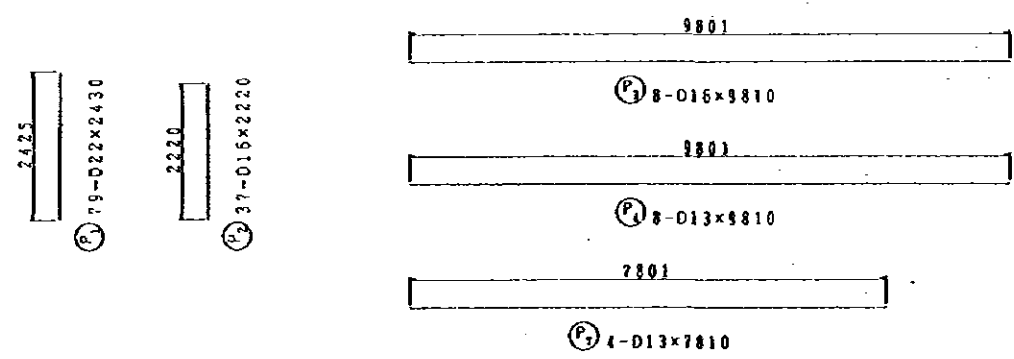
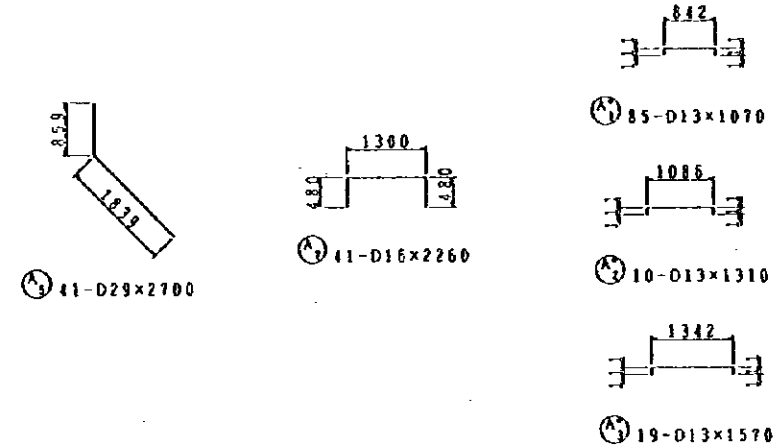
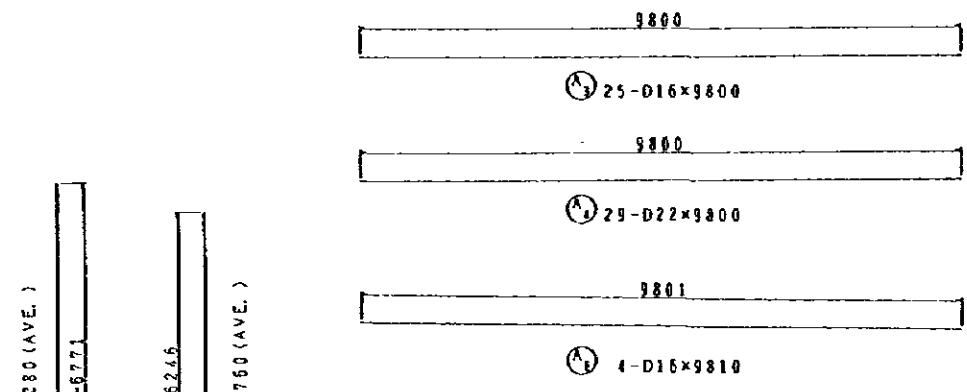
NOTE: ( ) RIGHT RAILING



DETAIL OF RAILING S = 1/60



DETAIL OF SHOE BED S = 1/60



RE-BAR ARRANGEMENT OF A2 ABUTMENT AT B-LINE (3/3)

NOTES:

JAPAN INTERNATIONAL COOPERATION AGENCY (JICA)

JICA STUDY TEAM  
PACIFIC CONSULTANTS INTERNATIONAL  
FUKUYAMA CONSULTANTS INTERNATIONAL

CLIENT: MINISTRY OF COMMUNICATIONS, DIRECTORATE GENERAL OF ROADS

PROJECT: D/D ON ROAD DEVELOPMENT PROJECT ON BATINAH HIGHWAY

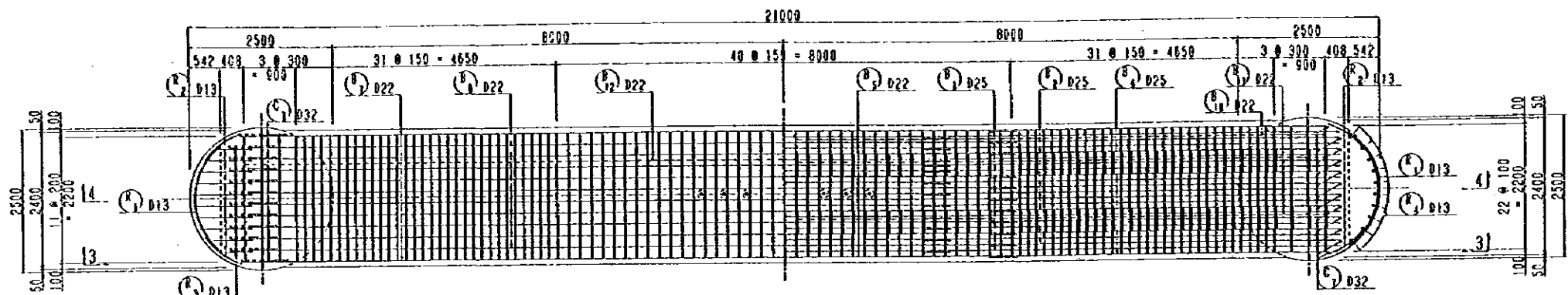
TITLE: RE-BAR ARRANGEMENT OF A2 ABUTMENT AT B-LINE (3/3)

DATE

DWGNO.

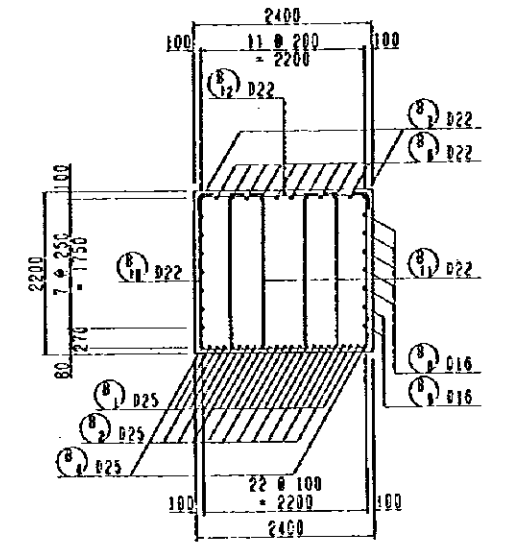
B-61

RA/18 AQR

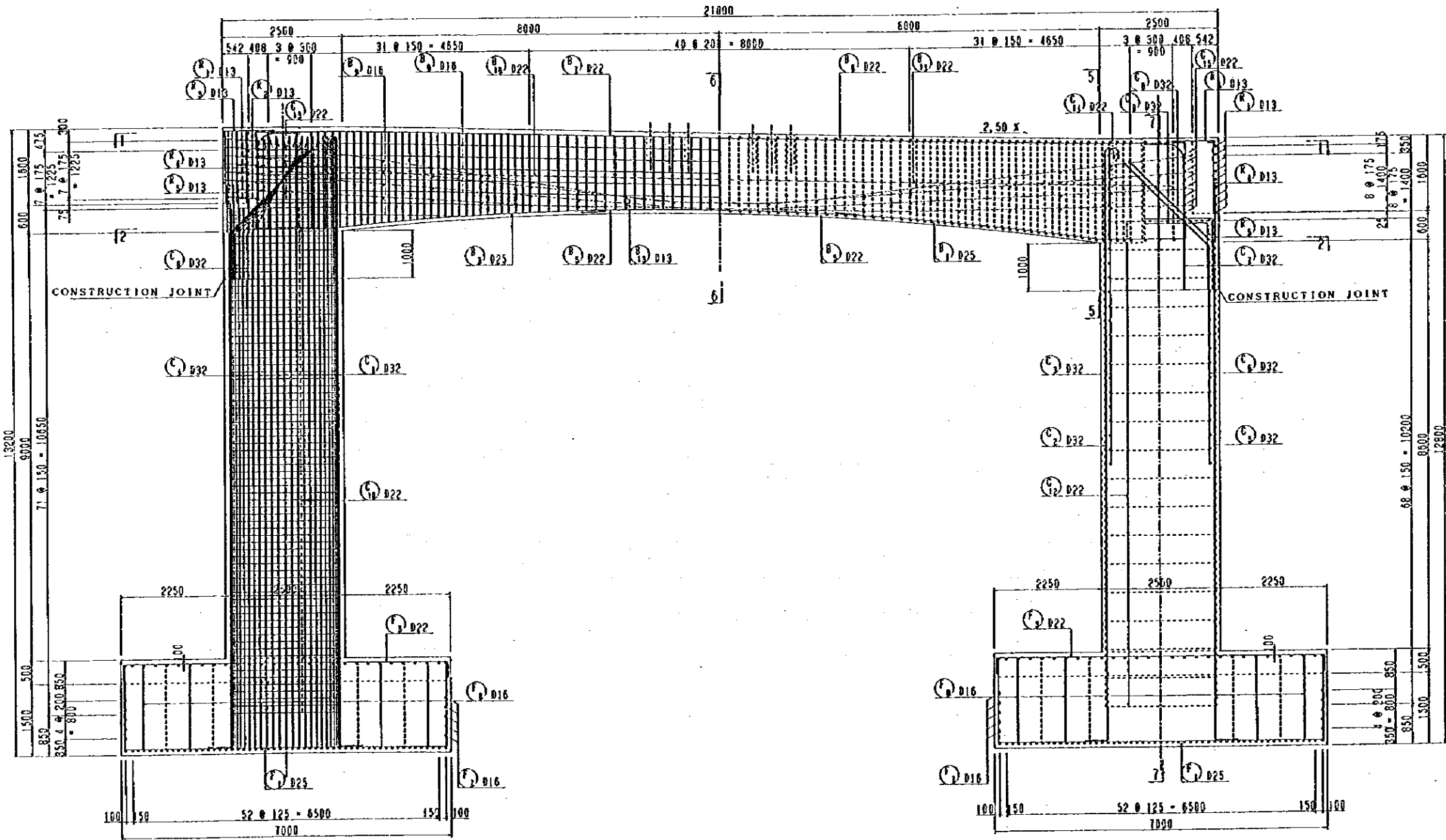


SECTION 1 - 1 S= 1/100

SECTION 2 - 2 S= 1/100

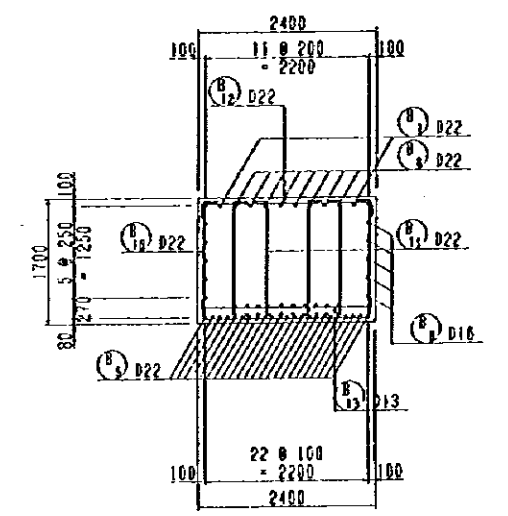


SECTION 5 - 5 S= 1/100



SECTION 3 - 3 S= 1/100

SECTION 4 - 4 S= 1/100

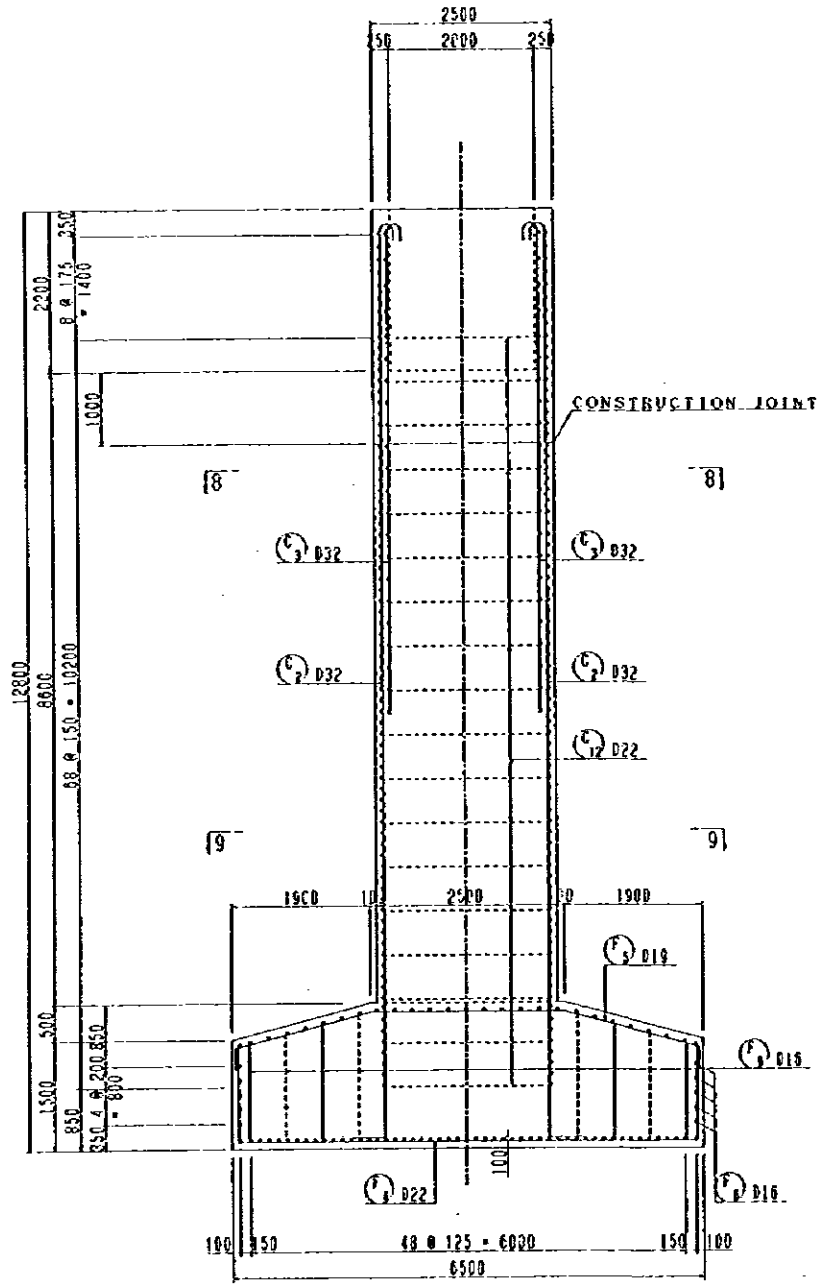


SECTION 6 - 6 S= 1/100

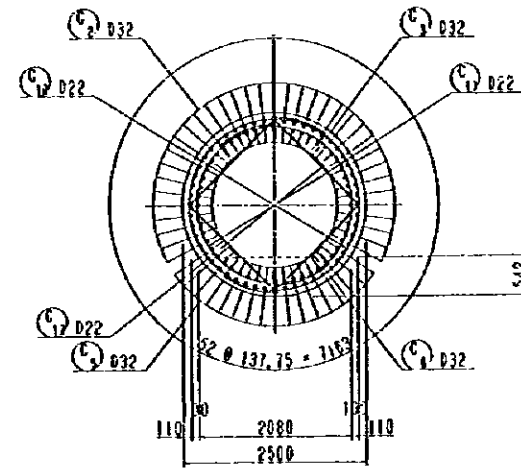
RE-BAR ARRANGEMENT OF TWO-COLUMN PIER FOR P5, 7 (A-LINE) P8 (B-LINE) (1/3)

NOTES:

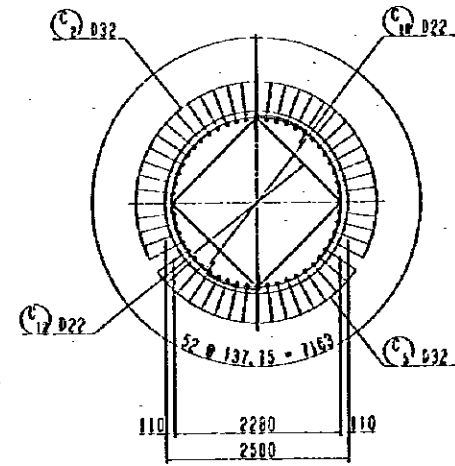
JAPAN INTERNATIONAL COOPERATION AGENCY (JICA)	CLIENT: MINISTRY OF COMMUNICATIONS, DIRECTORATE GENERAL OF ROADS	
	PROJECT: D/D ON ROAD DEVELOPMENT PROJECT ON BATINAH HIGHWAY	
JICA STUDY TEAM PACIFIC CONSULTANTS INTERNATIONAL FUKUYAMA CONSULTANTS INTERNATIONAL	TITLE: RE-BAR ARRANGEMENT OF TWO-COLUMN PIER FOR P5,7(A-LINE)P8(B-LINE) (1/3)	
DATE:	DWGNO.:	B-62



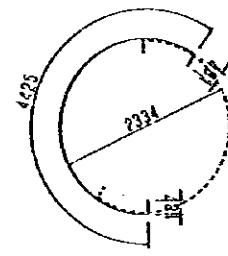
SECTION 7 - 7 S= 1/100



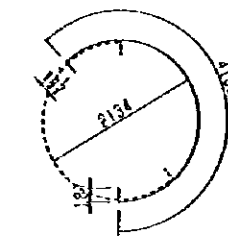
SECTION 8 - 8 S= 1/100



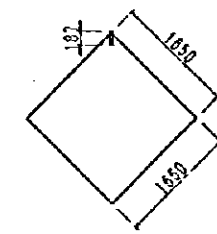
SECTION 9 - 9 S= 1/100



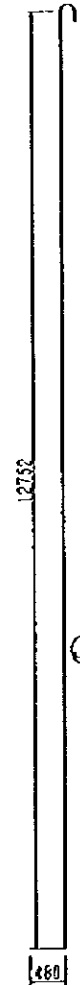
282 - D22 X 5900



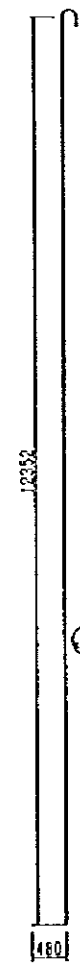
72 - D22 X 4560



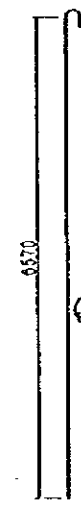
36 - D22 X 6560



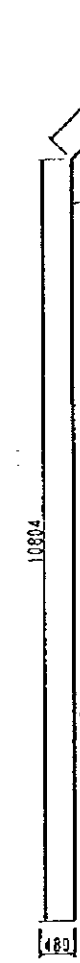
35 - D32 X 13662 + 960 = 14630



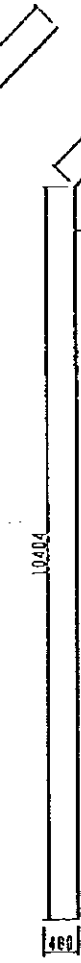
35 - D32 X 13262 + 960 = 14230



74 - D32 X 7000



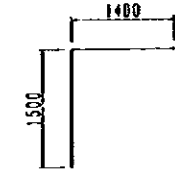
17 - D32 X 13784 + 960 = 14750



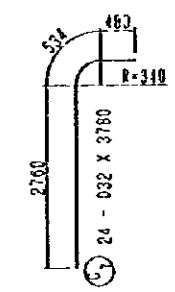
17 - D32 X 13384 + 960 = 14350



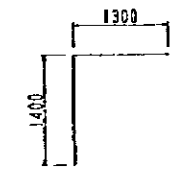
30 - D32 X 7100



34 - D32 X 2960

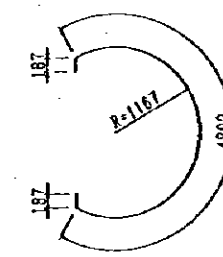


24 - D32 X 3780

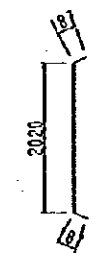
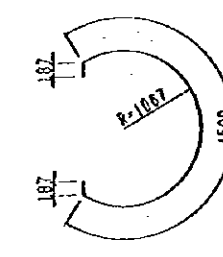


30 - D32 X 2780

7 - D22 X 4970



15 - D22 X 5270



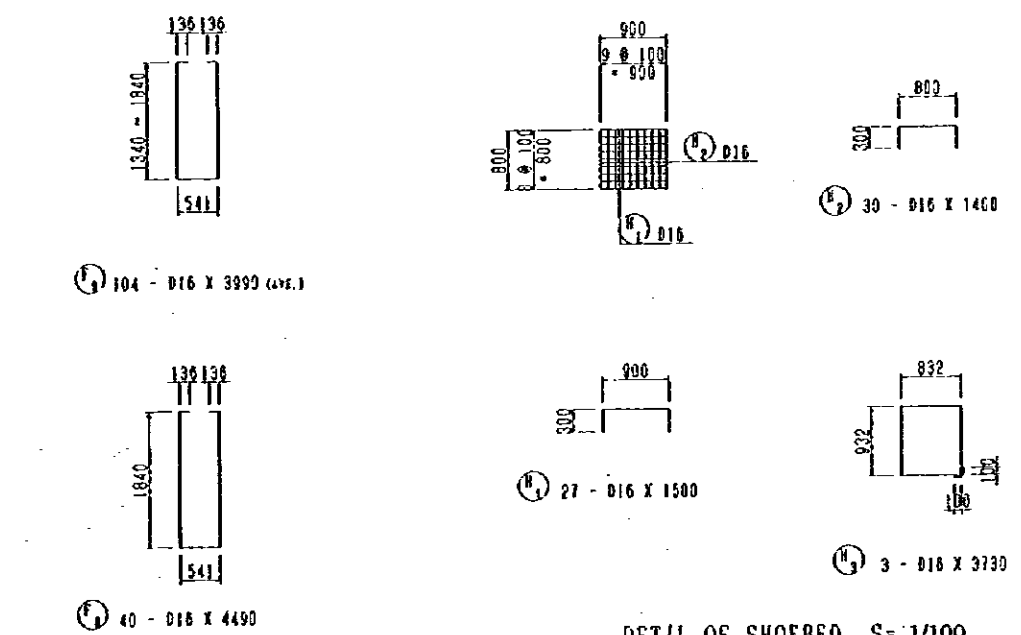
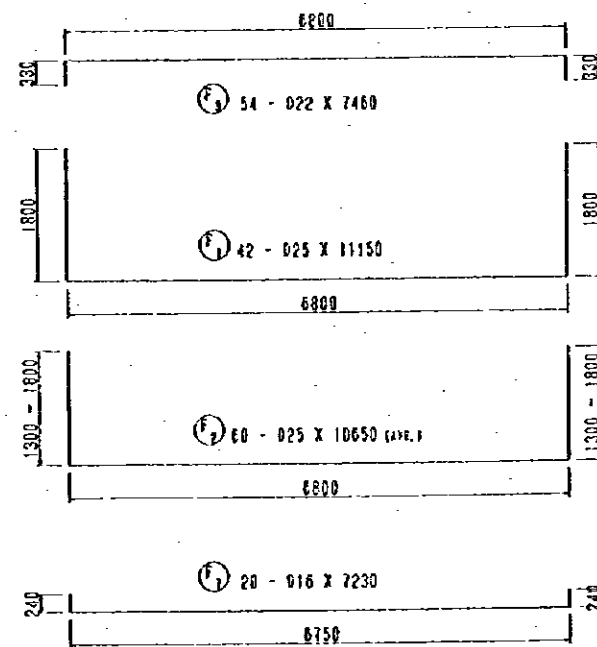
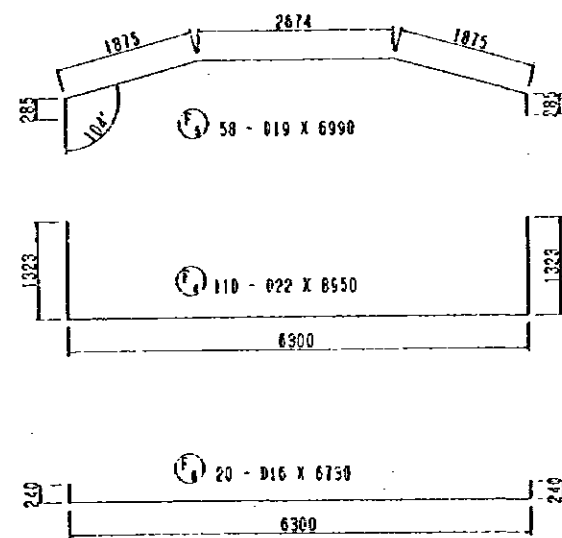
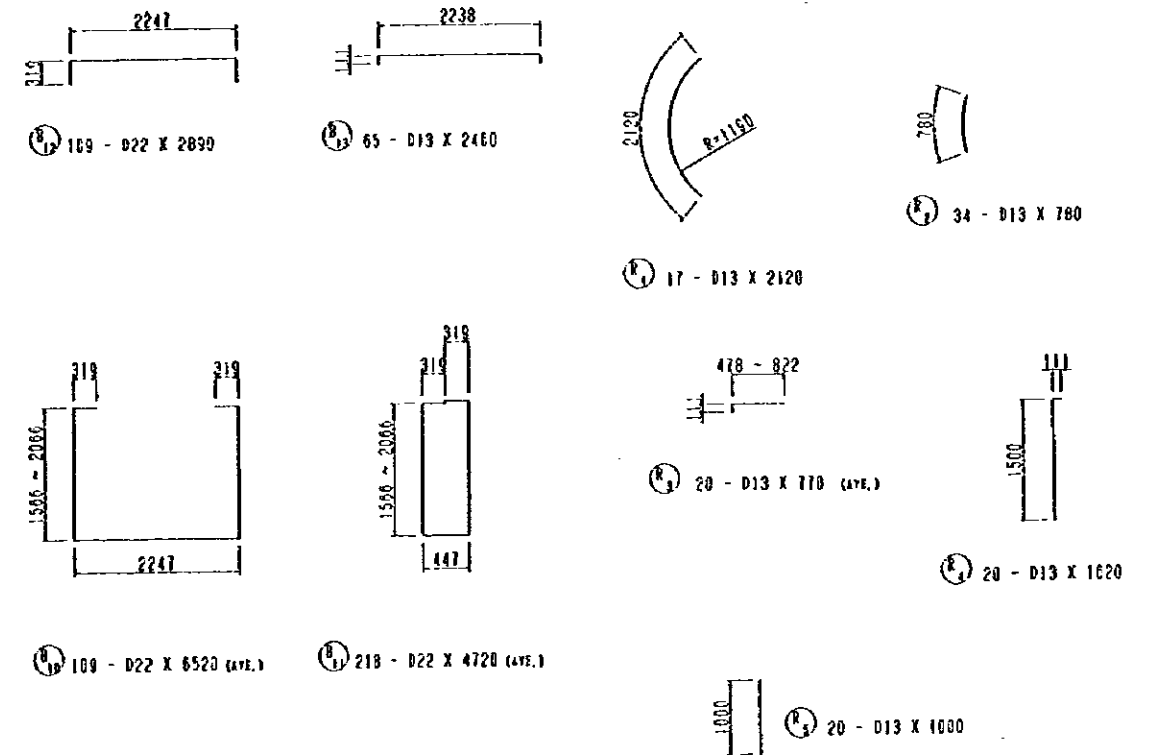
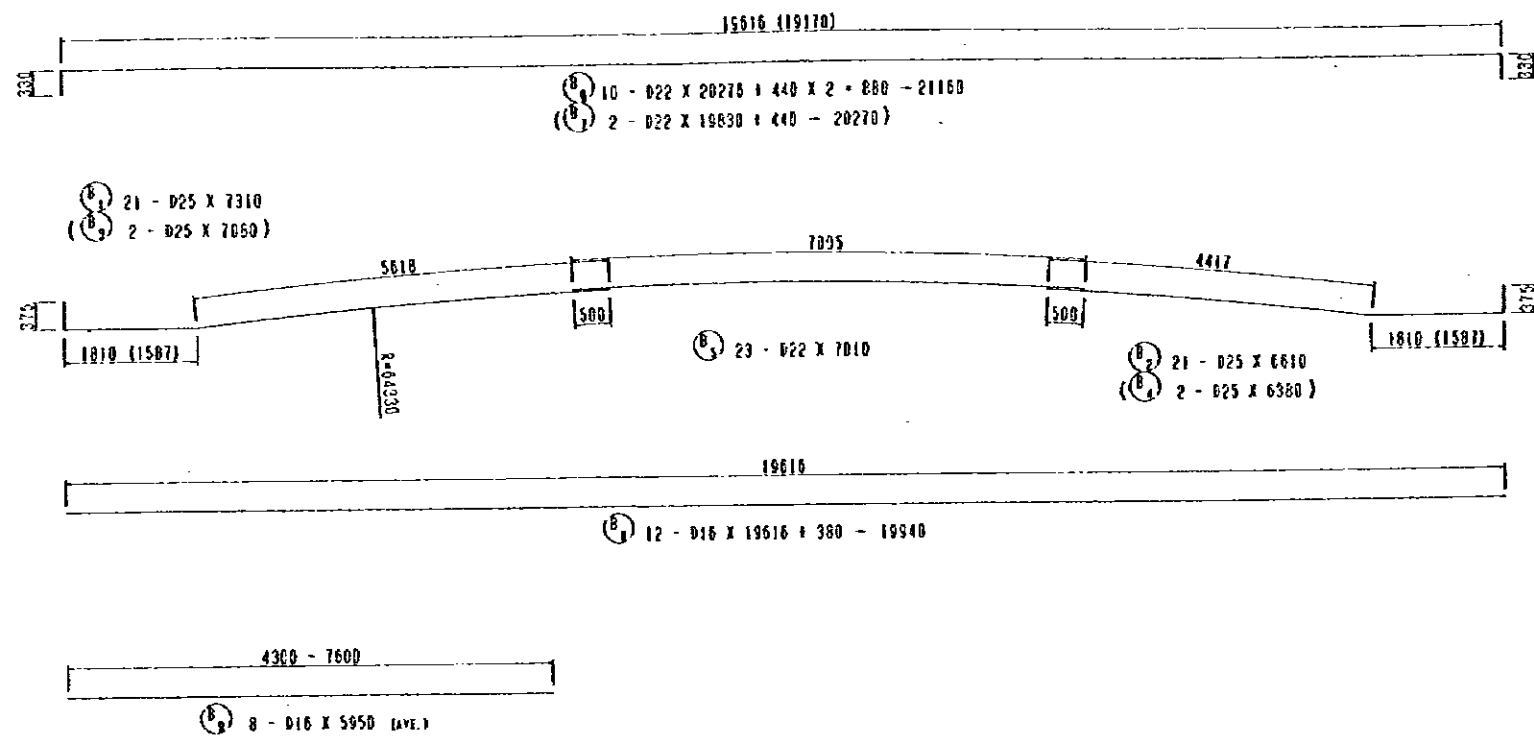
15 - D22 X 2460

RE-BAR ARRANGEMENT OF TWO-COLUMN PIER FOR P5, 7 (A-LINE) P8 (B-LINE) (2/3)

NOTES:

JAPAN INTERNATIONAL COOPERATION AGENCY  
(JICA)  
JICA STUDY TEAM  
PACIFIC CONSULTANTS INTERNATIONAL  
FUKUYAMA CONSULTANTS INTERNATIONAL

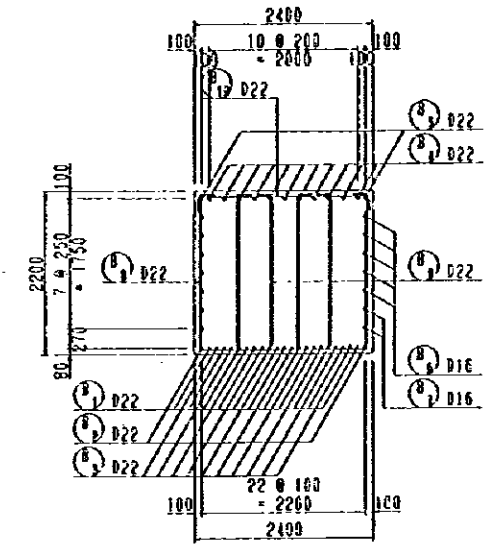
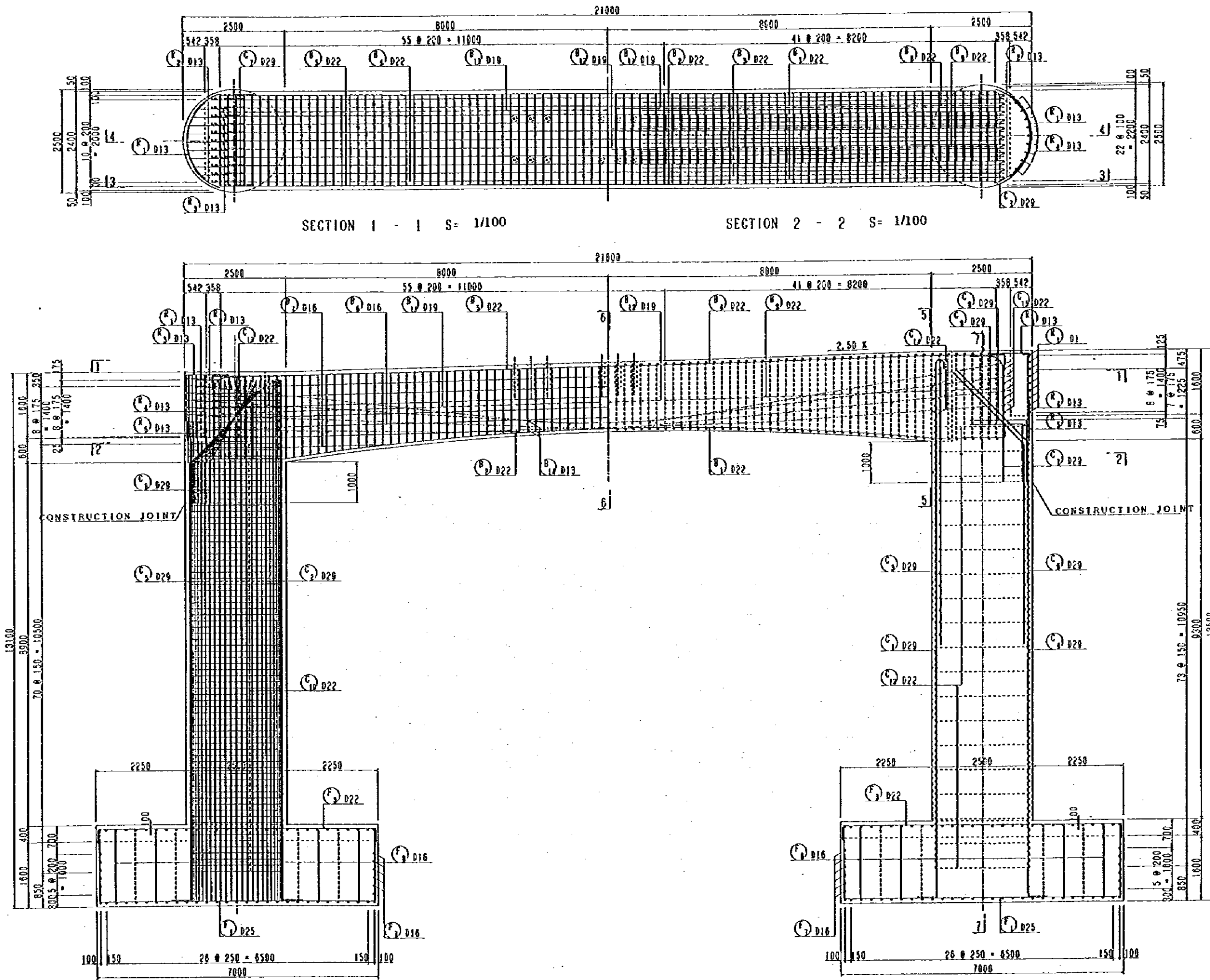
CLIENT: MINISTRY OF COMMUNICATIONS, DIRECTORATE GENERAL OF ROADS  
PROJECT: D/D ON ROAD DEVELOPMENT PROJECT ON BATINAH HIGHWAY  
TITLE: RE-BAR ARRANGEMENT OF TWO-COLUMN PIER FOR P5, 7 (A-LINE) P8 (B-LINE) (2/3)  
DATE: \_\_\_\_\_ DWGNO. B-63



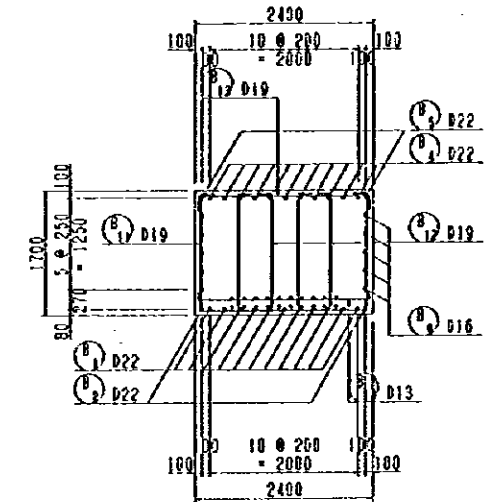
RE-BAR ARRANGEMENT OF TWO-COLUMN PIER FOR P5, 7 (A-LINE) P8 (B-LINE) (3/3)

NOTES:	JAPAN INTERNATIONAL COOPERATION AGENCY (JICA)	CLIENT: MINISTRY OF COMMUNICATIONS, DIRECTORATE GENERAL OF ROADS
	JICA STUDY TEAM PACIFIC CONSULTANTS INTERNATIONAL FUKUYAMA CONSULTANTS INTERNATIONAL	PROJECT: D/D ON ROAD DEVELOPMENT PROJECT ON BATINAH HIGHWAY
		TITLE: RE-BAR ARRANGEMENT OF TWO-COLUMN PIER FOR P5,7(A-LINE)P8(B-LINE) (3/3)
		DATE: _____ DWGNO. B-64

RA/18 AQR



SECTION 5 - 5 S= 1/100



SECTION 6 - 6 S= 1/100

SECTION 3 - 3 S= 1/100

SECTION 4 - 4 S= 1/100

RE-BAR ARRANGEMENT OF TWO-COLUMN PIER FOR P6 AT B-LINE (1/3)

NOTES:

JAPAN INTERNATIONAL COOPERATION AGENCY  
(JICA)

JICA STUDY TEAM  
PACIFIC CONSULTANTS INTERNATIONAL  
FUKUYAMA CONSULTANTS INTERNATIONAL

CLIENT: MINISTRY OF COMMUNICATIONS, DIRECTORATE GENERAL OF ROADS

PROJECT: D/D ON ROAD DEVELOPMENT PROJECT ON BATINAB HIGHWAY

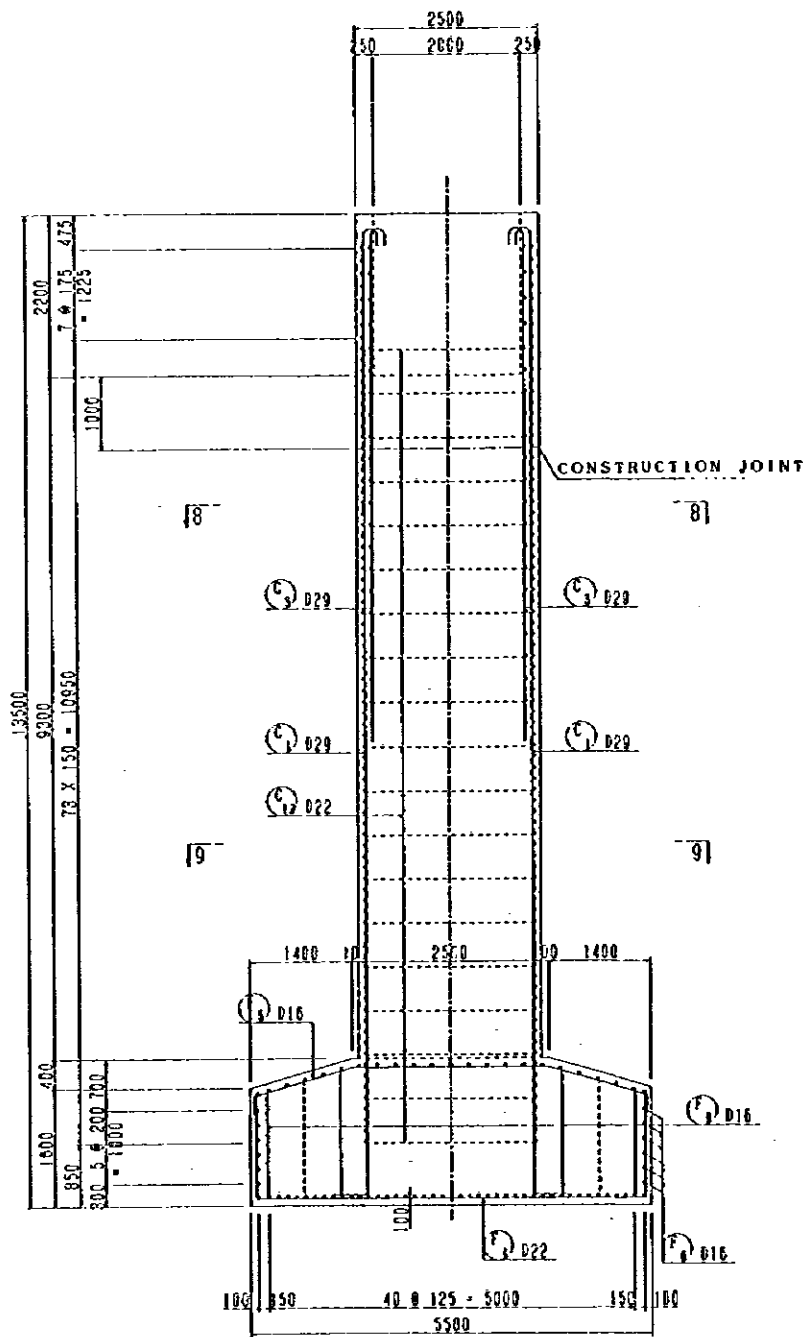
TITLE RE-BAR ARRANGEMENT OF TWO-COLUMN PIER FOR P6 AT B-LINE(1/3)

DATE

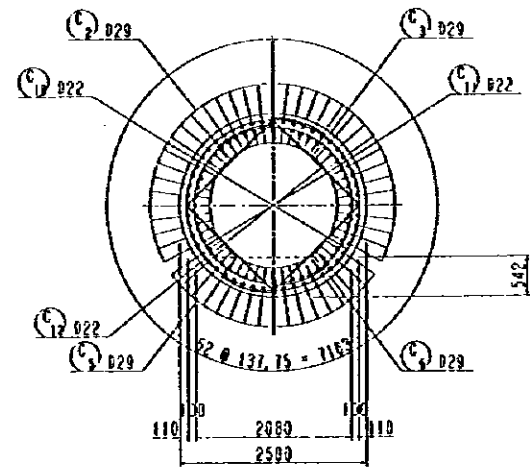
DWGNO.

B-65

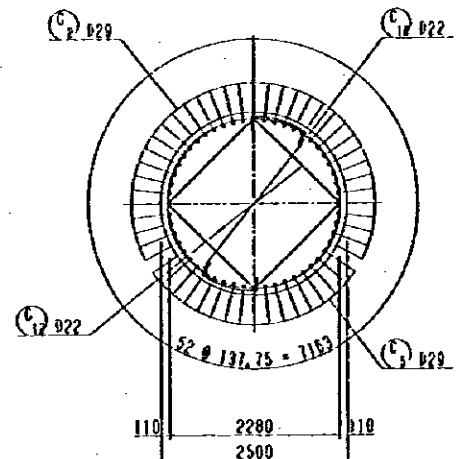




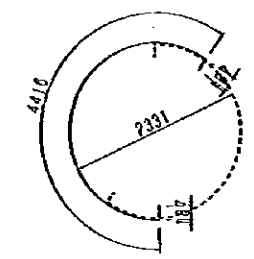
SECTION 7 - 7 S= 1/100



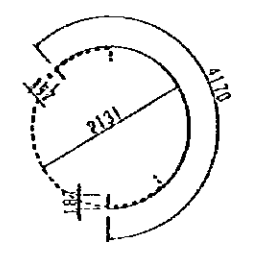
SECTION 8 - 8 S= 1/100



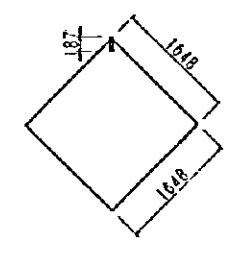
SECTION 9 - 9 S= 1/100



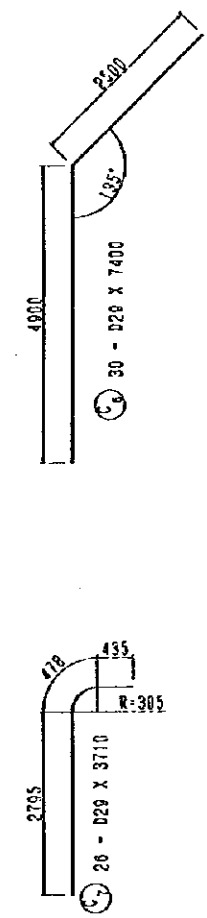
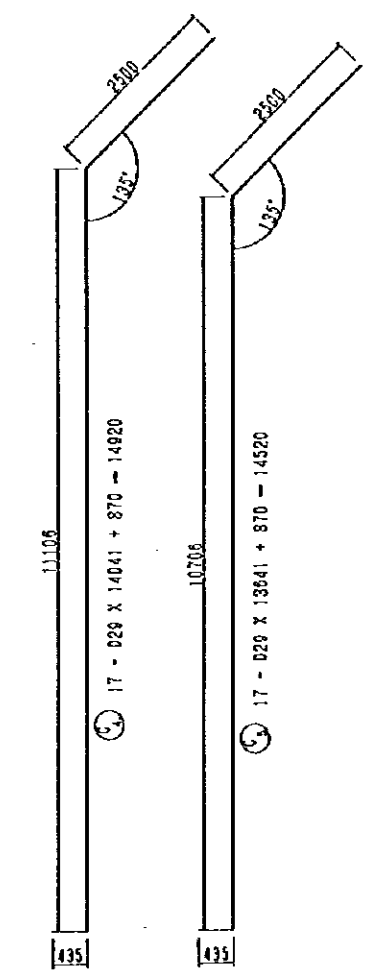
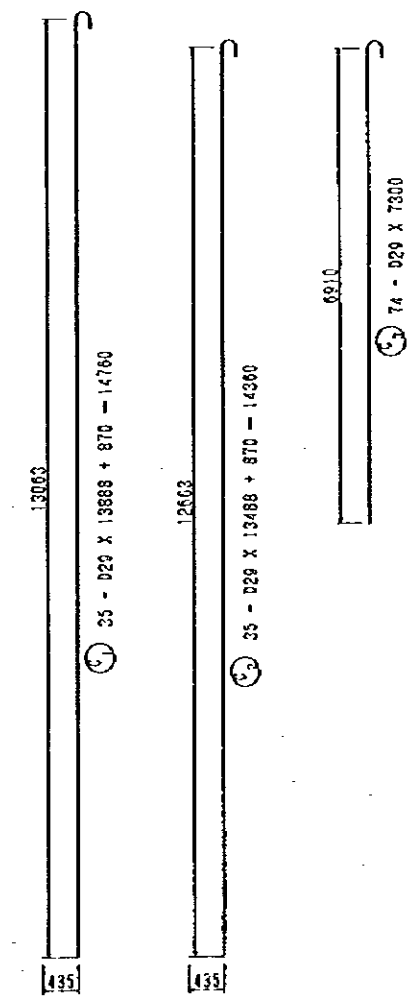
260 - D22 X 4760



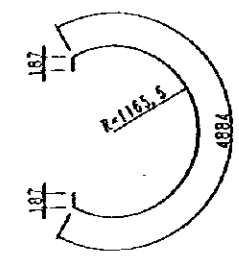
74 - D22 X 4550



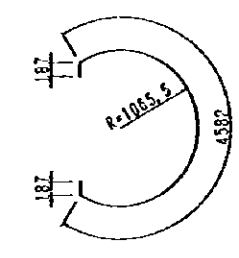
37 - D22 X 6970



8 - D22 X 4960



15 - D22 X 5260



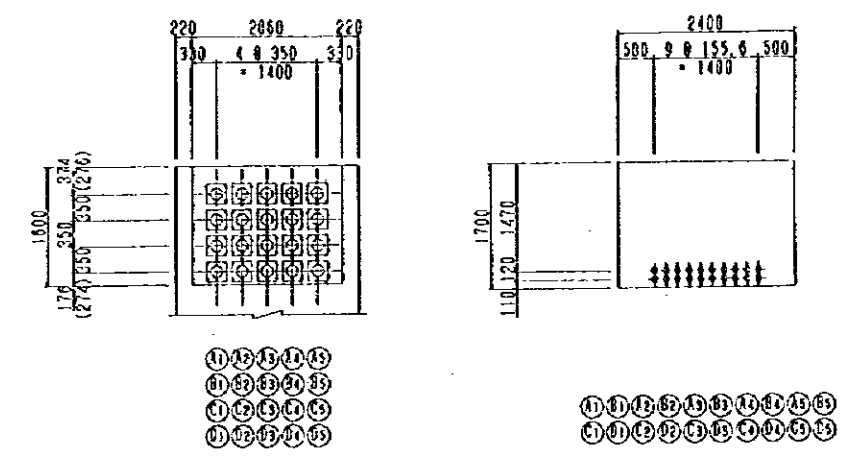
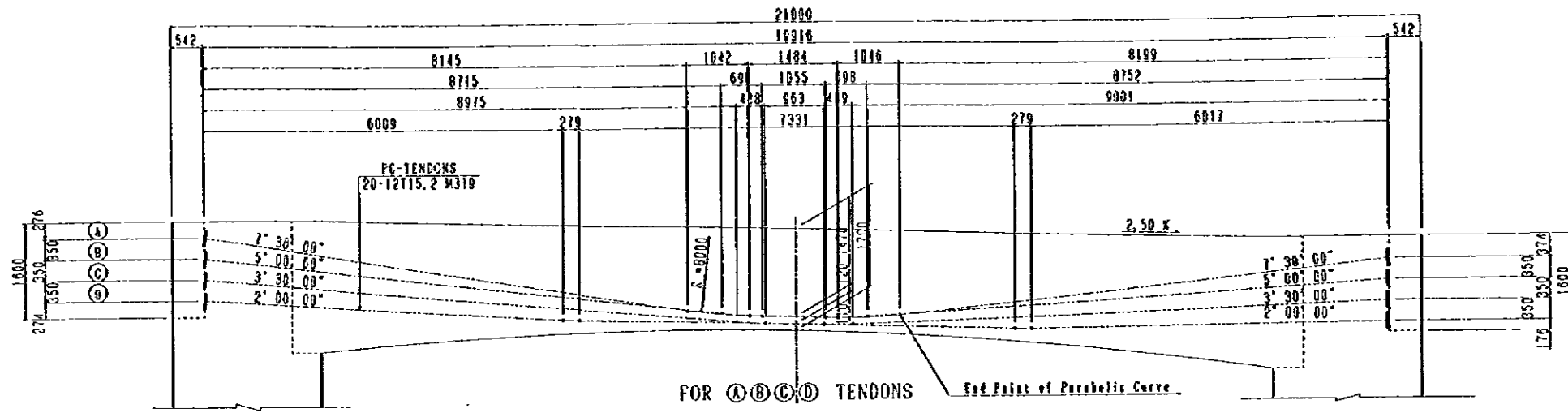
15 - D22 X 2400

RE-BAR ARRANGEMENT OF TWO-COLUMN PIER FOR P6 AT B-LINE (2/3)

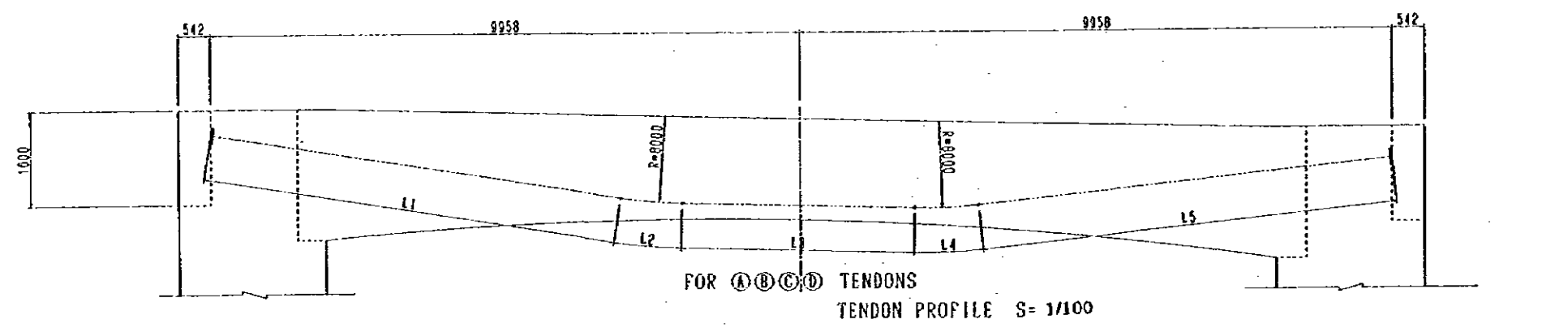
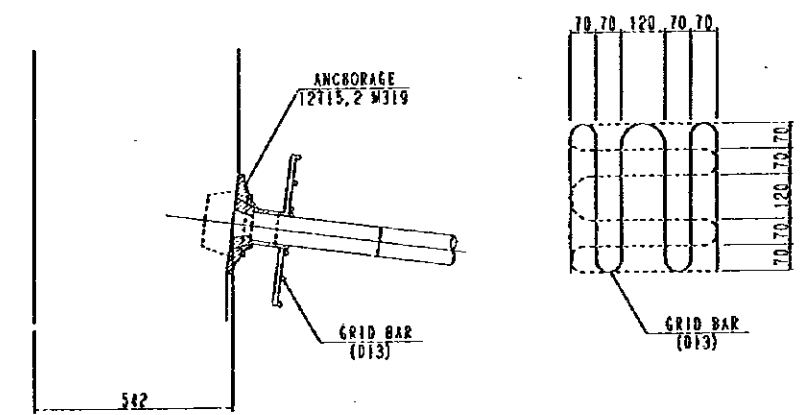
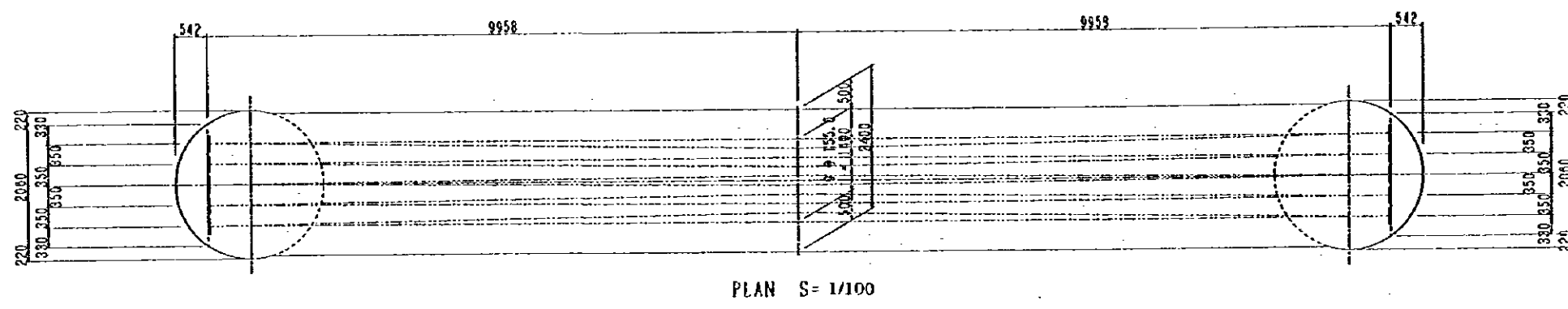
NOTES:	JAPAN INTERNATIONAL COOPERATION AGENCY (JICA)	CLIENT: MINISTRY OF COMMUNICATIONS, DIRECTORATE GENERAL OF ROADS
	JICA STUDY TEAM PACIFIC CONSULTANTS INTERNATIONAL FUKUYAMA CONSULTANTS INTERNATIONAL	PROJECT: D/D ON ROAD DEVELOPMENT PROJECT ON BATINAH HIGHWAY
		TITLE RE-BAR ARRANGEMENT OF TWO-COLUMN PIER FOR P6 AT B-LINE(2/3)
		DATE _____ DWGNO. B-66



RA/18 AQR



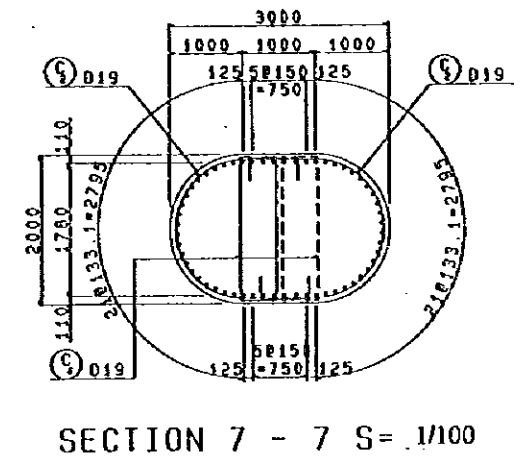
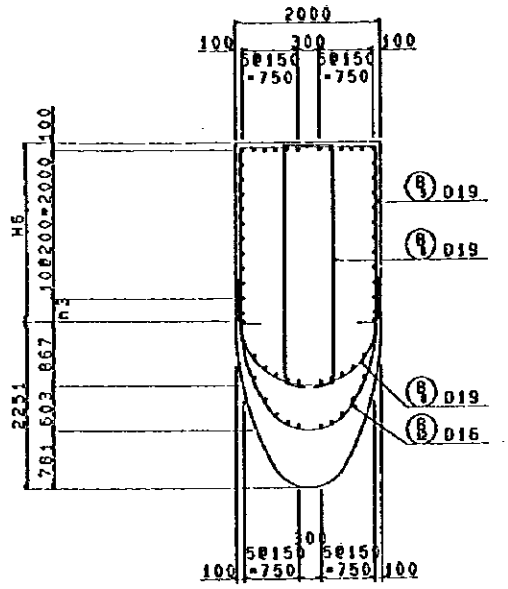
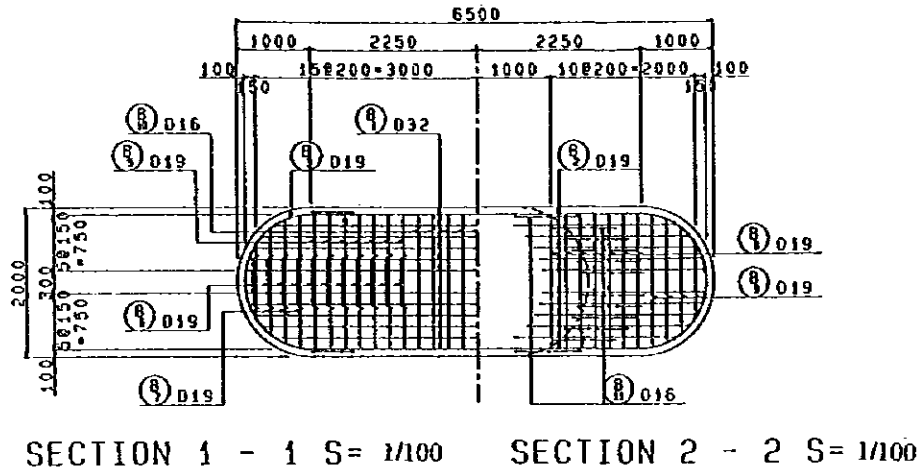
SECTION S= 1/100



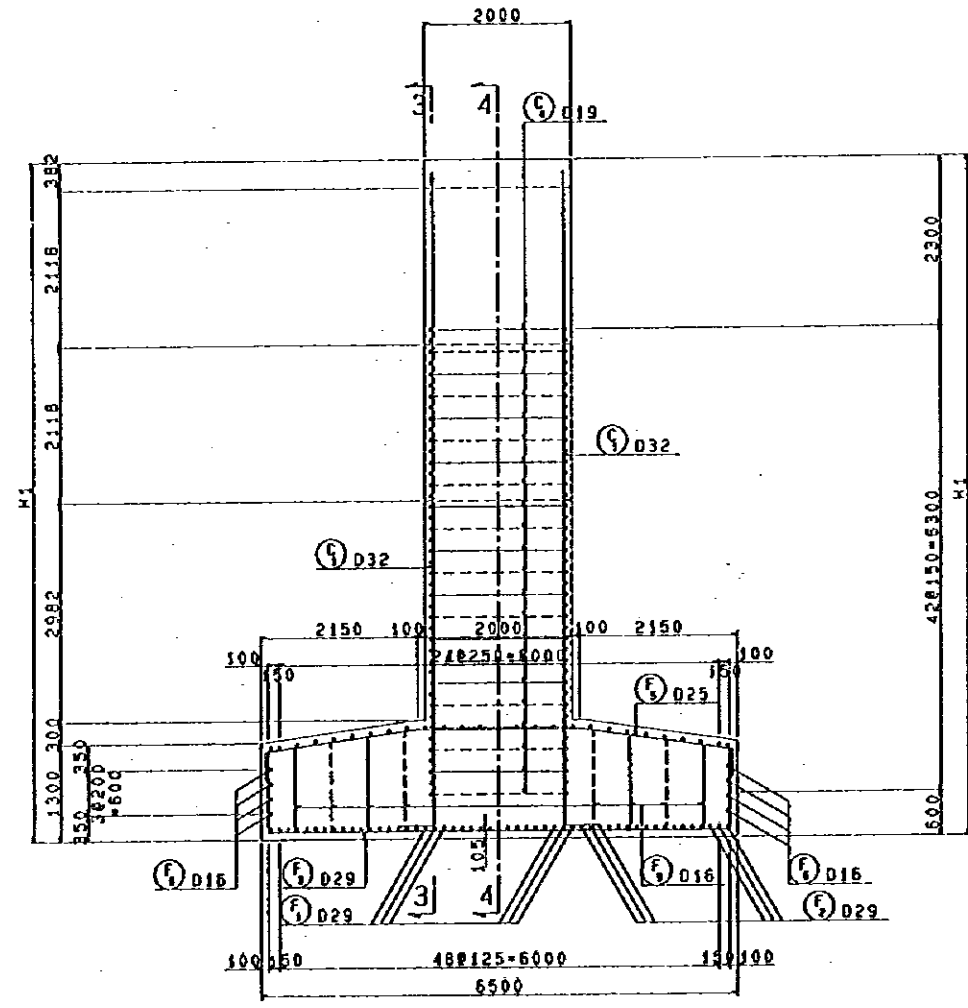
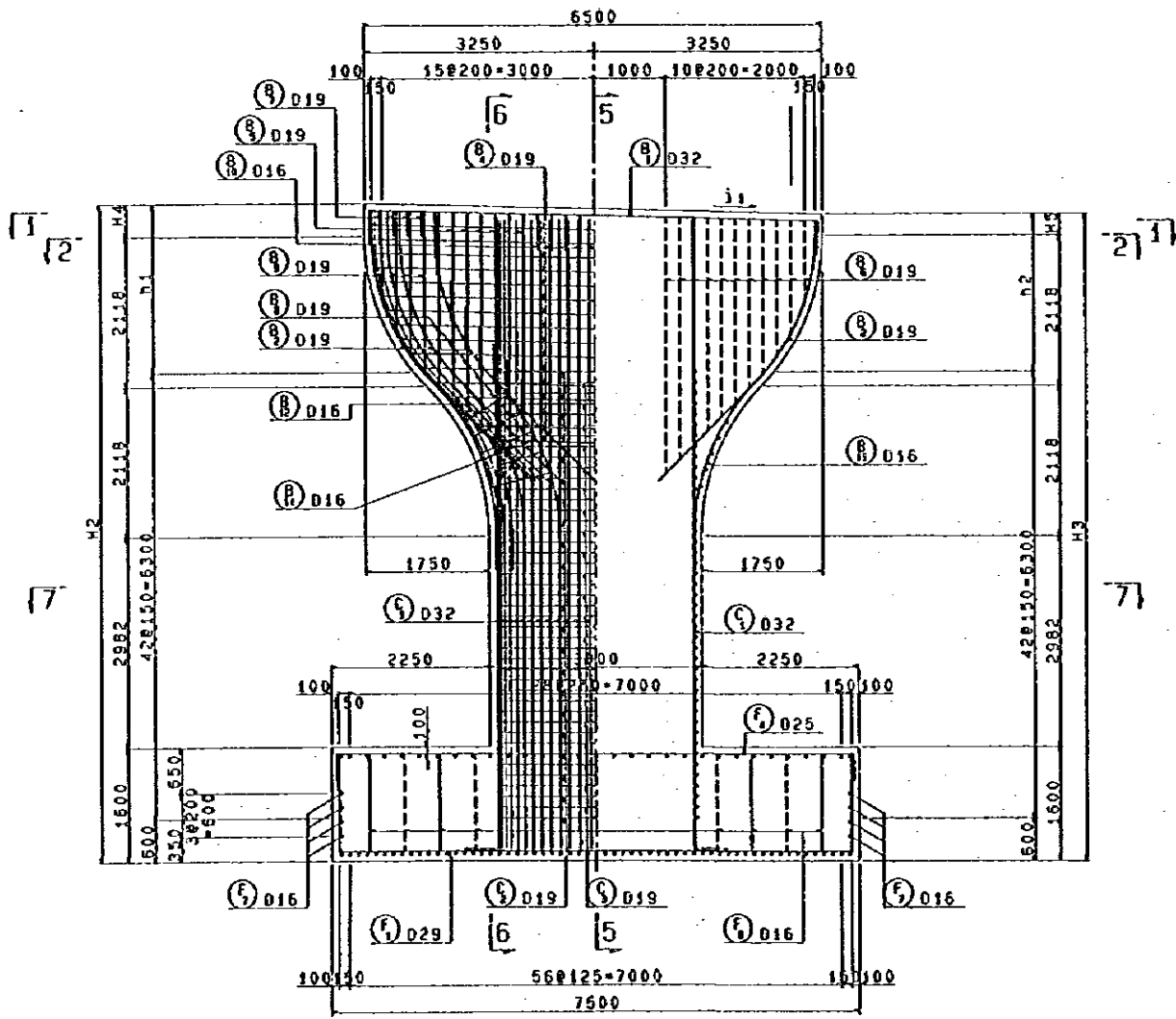
	L1	L2	L3	L4	L5	ΣL	5 X ΣL	W/Cable	W (kg)
(1)(2)(3)(4)(5)	8245	1047	1495	1047	8245	20089	100445	265.2	1326.0
(1)(2)(3)(4)(5)	8770	698	1056	698	8769	19991	99955	264.1	1320.5
(1)(2)(3)(4)(5)	9008	489	964	489	9007	19957	99785	263.7	1318.5
(1)(2)(3)(4)(5)	6020	279	7333	279	6018	19929	99645	263.3	1316.5
TOTAL									5281.5

DETAIL OF TENDONS FOR P5, 7 (A-LINE) P6, 8 (B-LINE)

NOTES:	JAPAN INTERNATIONAL COOPERATION AGENCY (JICA)	CLIENT: MINISTRY OF COMMUNICATIONS, DIRECTORATE GENERAL OF ROADS
	JICA STUDY TEAM PACIFIC CONSULTANTS INTERNATIONAL FUKUYAMA CONSULTANTS INTERNATIONAL	PROJECT: D/D ON ROAD DEVELOPMENT PROJECT ON BATINAH HIGHWAY
	DATE	TITLE: DETAIL OF TENDONS FOR P5,7(A-LINE) P6,8(B-LINE)
	DWGNO.	B-68



SECTION 6 - 6 S= 1/100



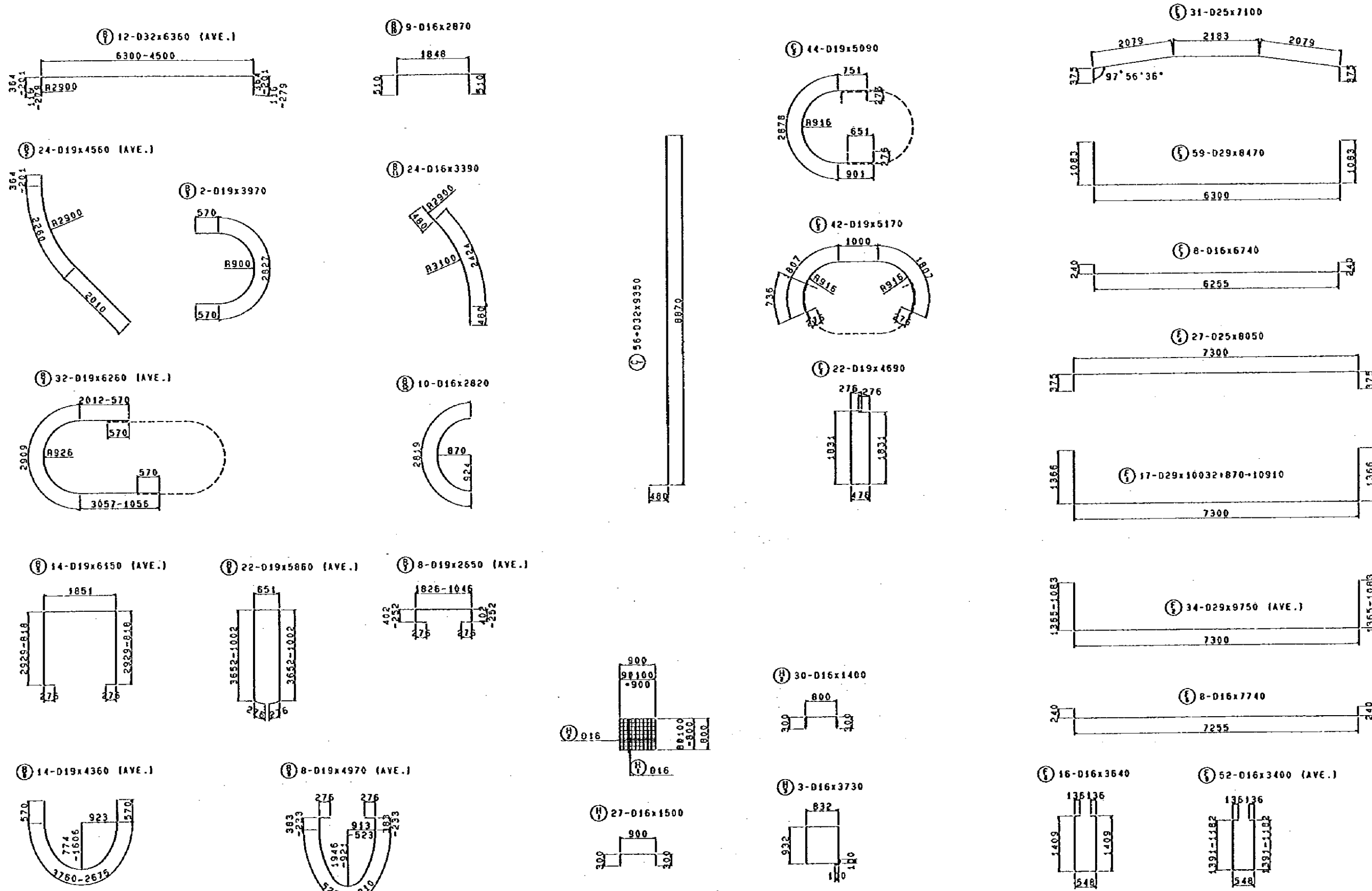
SECTION 3 - 3 S= 1/100 SECTION 4 - 4 S= 1/100

SECTION 5 - 5 S= 1/100

	A-LINE		B-LINE	
	P1	P11	P1	P11
H 1	9200	9200	9200	9200
H 2	9281	9119	9119	9196
H 3	9119	9281	9281	9204
H 4	463	301	301	378
H 5	301	463	463	386
H 6	2404	2328	2328	2364
h 1	2381	2219	2219	2296
h 2	2219	2381	2381	2304
h 3	304	228	228	264
i 1	2.50%	-2.50%	-2.50%	-0.11%

RE-BAR ARRANGEMENT OF T-WALL PIER FOR P1, P11 AT (A, B-LINE) (1/2)

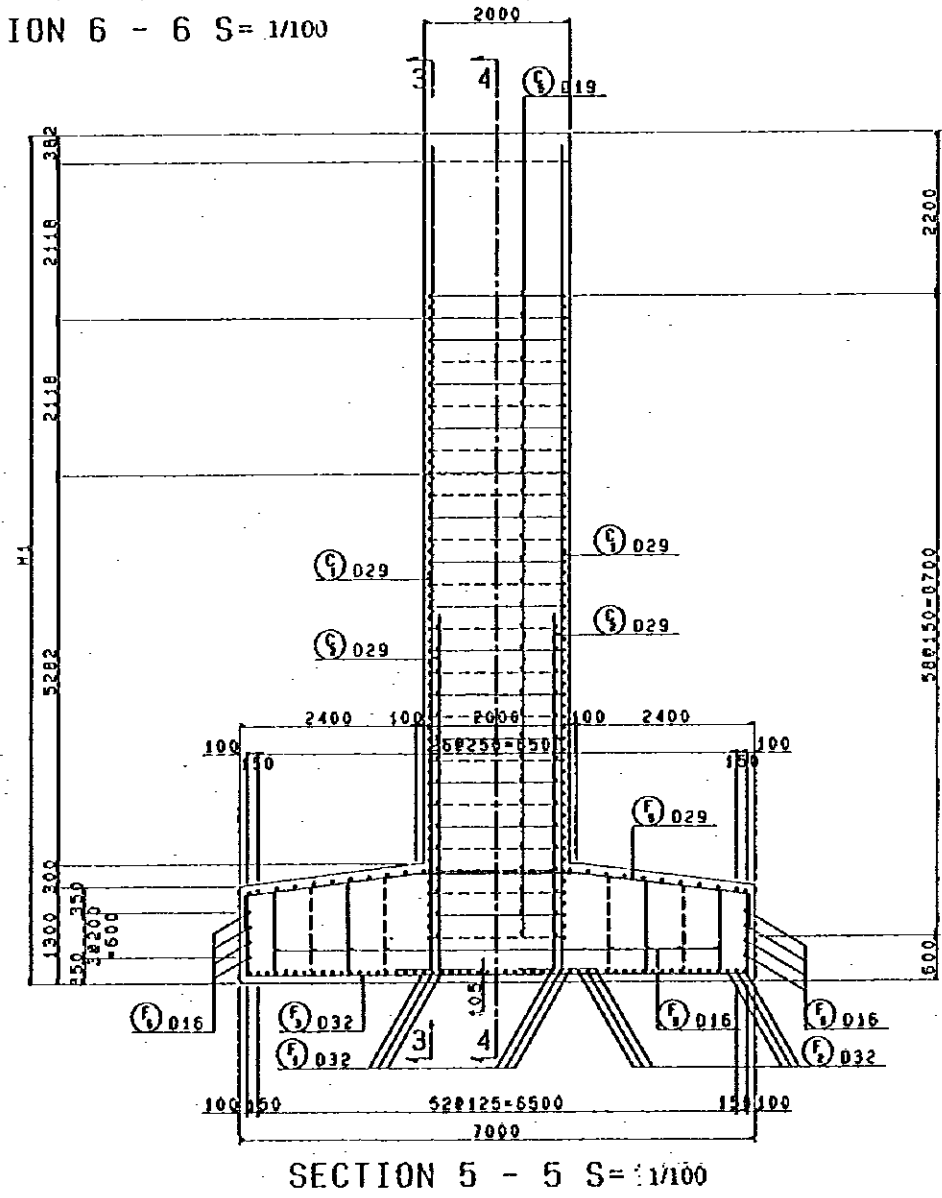
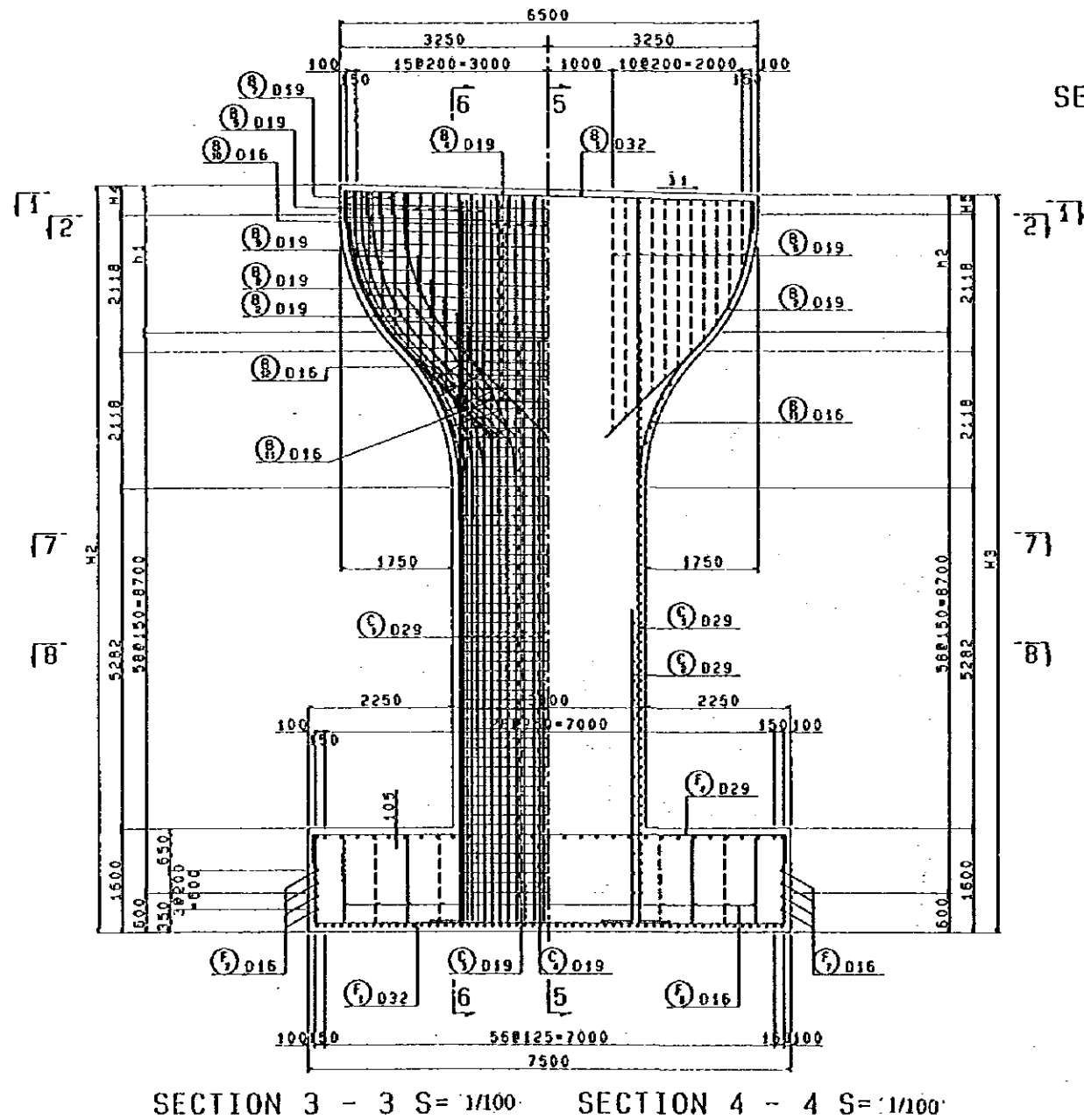
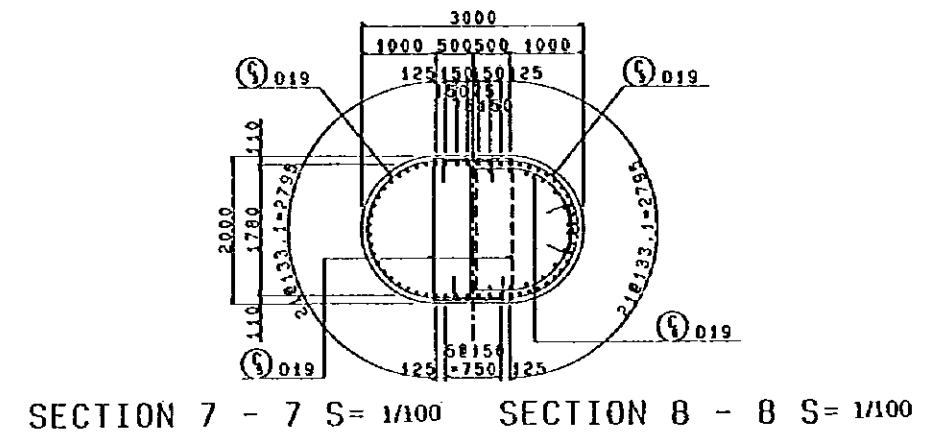
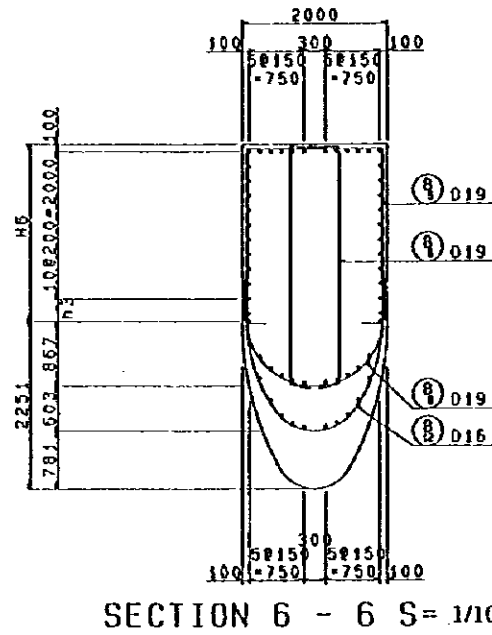
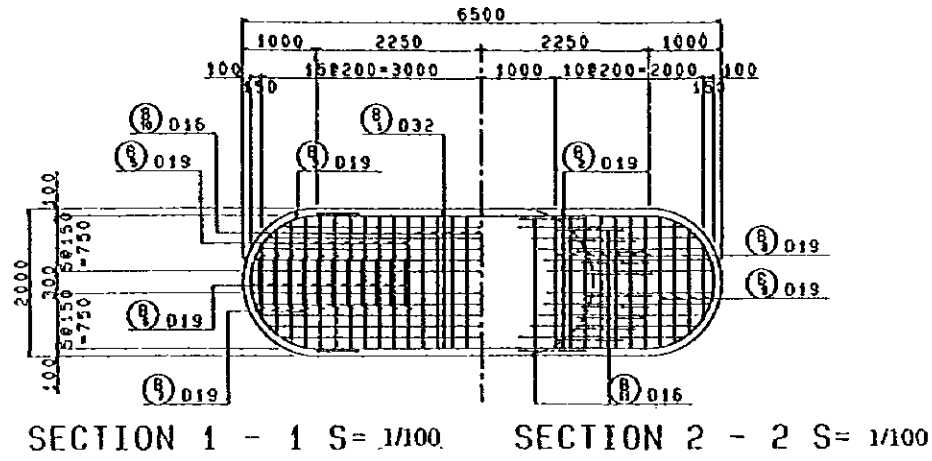
NOTES:	JAPAN INTERNATIONAL COOPERATION AGENCY (JICA)	CLIENT: MINISTRY OF COMMUNICATIONS, DIRECTORATE GENERAL OF ROADS
	JICA STUDY TEAM PACIFIC CONSULTANTS INTERNATIONAL FUKUYAMA CONSULTANTS INTERNATIONAL	PROJECT: D/D ON ROAD DEVELOPMENT PROJECT ON BATINAH HIGHWAY
	DATE	TITLE: RE-BAR ARRANGEMENT OF T-WALL PIER FOR P1, P11 AT A, B-LINE (1/2)
		DWGNO. B-69



DETAIL OF SHOEDED S= (1/100)

RE-BAR ARRANGEMENT OF T-WALL PIER FOR P1, P11 AT (A, B-LINE) (2/2)

NOTES:	JAPAN INTERNATIONAL COOPERATION AGENCY (JICA)		CLIENT: MINISTRY OF COMMUNICATIONS, DIRECTORATE GENERAL OF ROADS	
	JICA STUDY TEAM PACIFIC CONSULTANTS INTERNATIONAL FUKUYAMA CONSULTANTS INTERNATIONAL		PROJECT: D/D ON ROAD DEVELOPMENT PROJECT ON BATINAH HIGHWAY	
			TITLE: RE-BAR ARRANGEMENT OF T-WALL PIER FOR P1, P11 AT A, B-LINE (2/2)	
			DATE	DWGNO. B-70



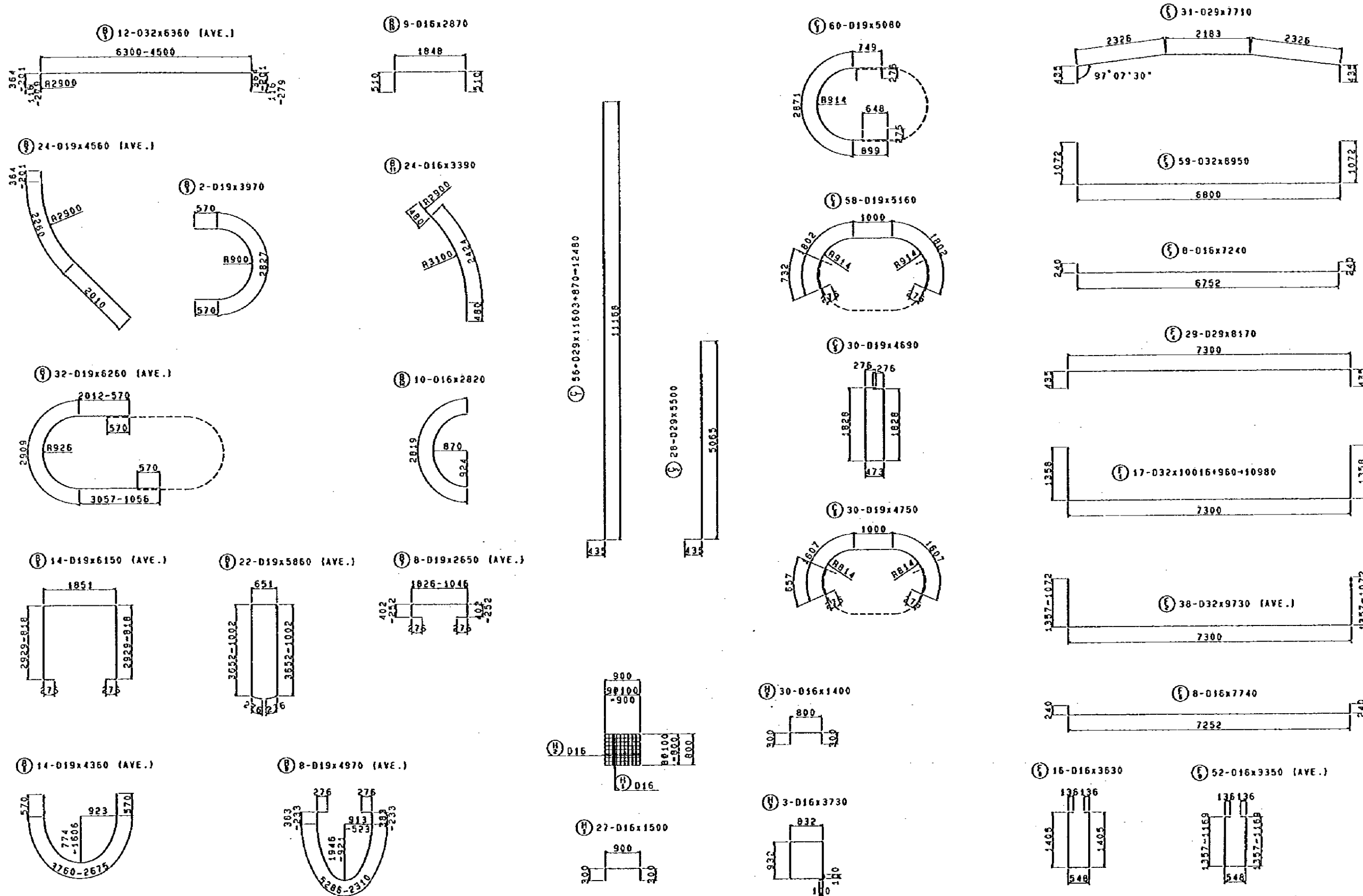
	A-LINE		B-LINE	
	P2	P10	P2	P10
H 1	11500	11500	11500	11500
H 2	11581	11438	11419	11427
H 3	11419	11562	11581	11573
H 4	463	320	301	309
H 5	301	444	463	455
H 6	2404	2337	2328	2332
h 1	2281	2138	2119	2127
h 2	2119	2262	2281	2273
h 3	304	237	228	232
I 1	2.50%	-1.91%	-2.50%	-2.26%

RE-BAR ARRANGEMENT OF T-WALL PIER FOR P2, P10 AT (A, B-LINE) (1/2)

NOTES:

JAPAN INTERNATIONAL COOPERATION AGENCY  
(JICA)  
JICA STUDY TEAM  
PACIFIC CONSULTANTS INTERNATIONAL  
FUKUYAMA CONSULTANTS INTERNATIONAL

CLIENT: MINISTRY OF COMMUNICATIONS, DIRECTORATE GENERAL OF ROADS  
PROJECT: D/D ON ROAD DEVELOPMENT PROJECT ON BATINAH HIGHWAY  
TITLE: RE-BAR ARRANGEMENT OF T-WALL PIER FOR P2, P10 AT A, B-LINE (1/2)  
DATE: \_\_\_\_\_ DWGNO. B-71

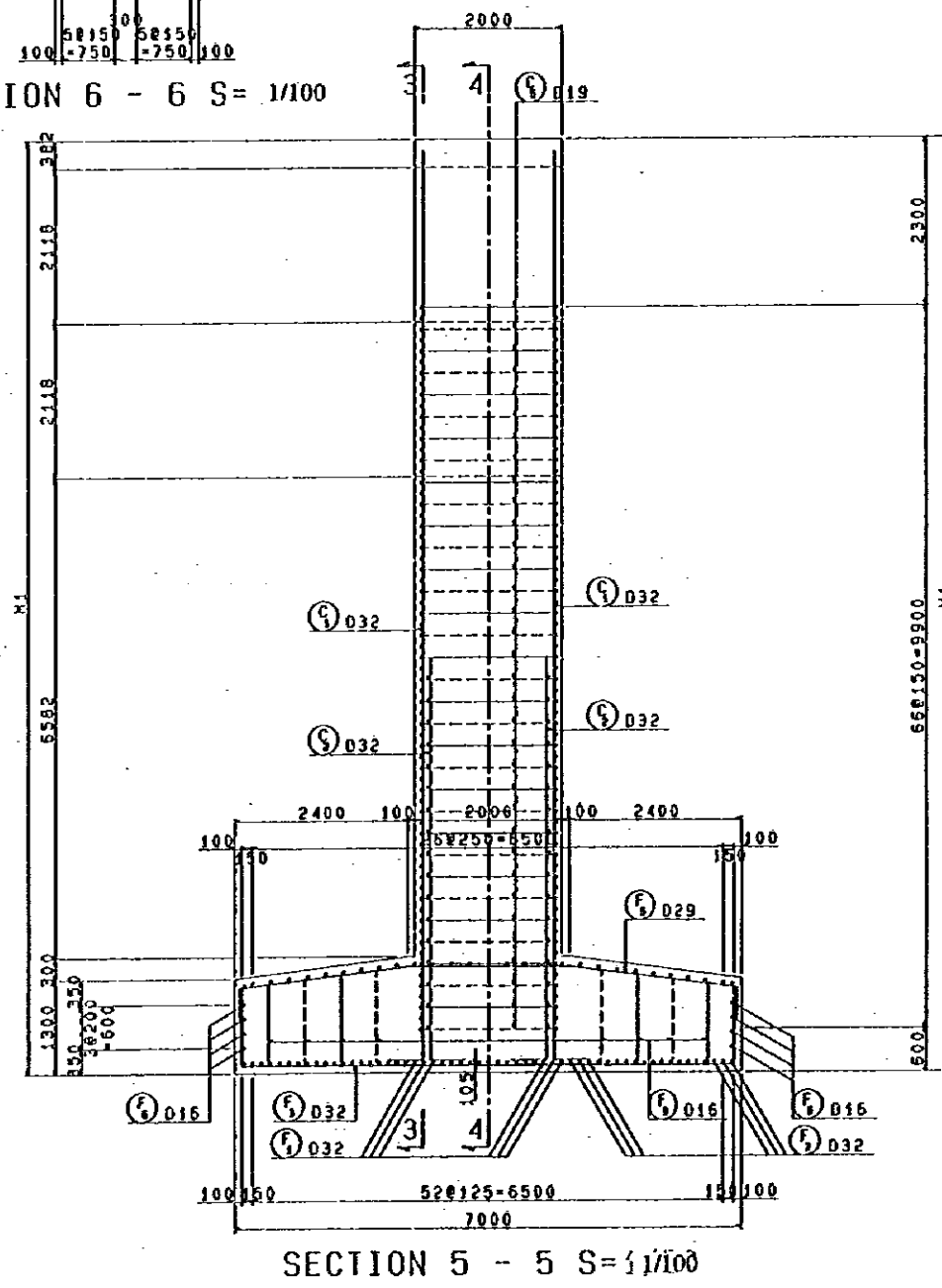
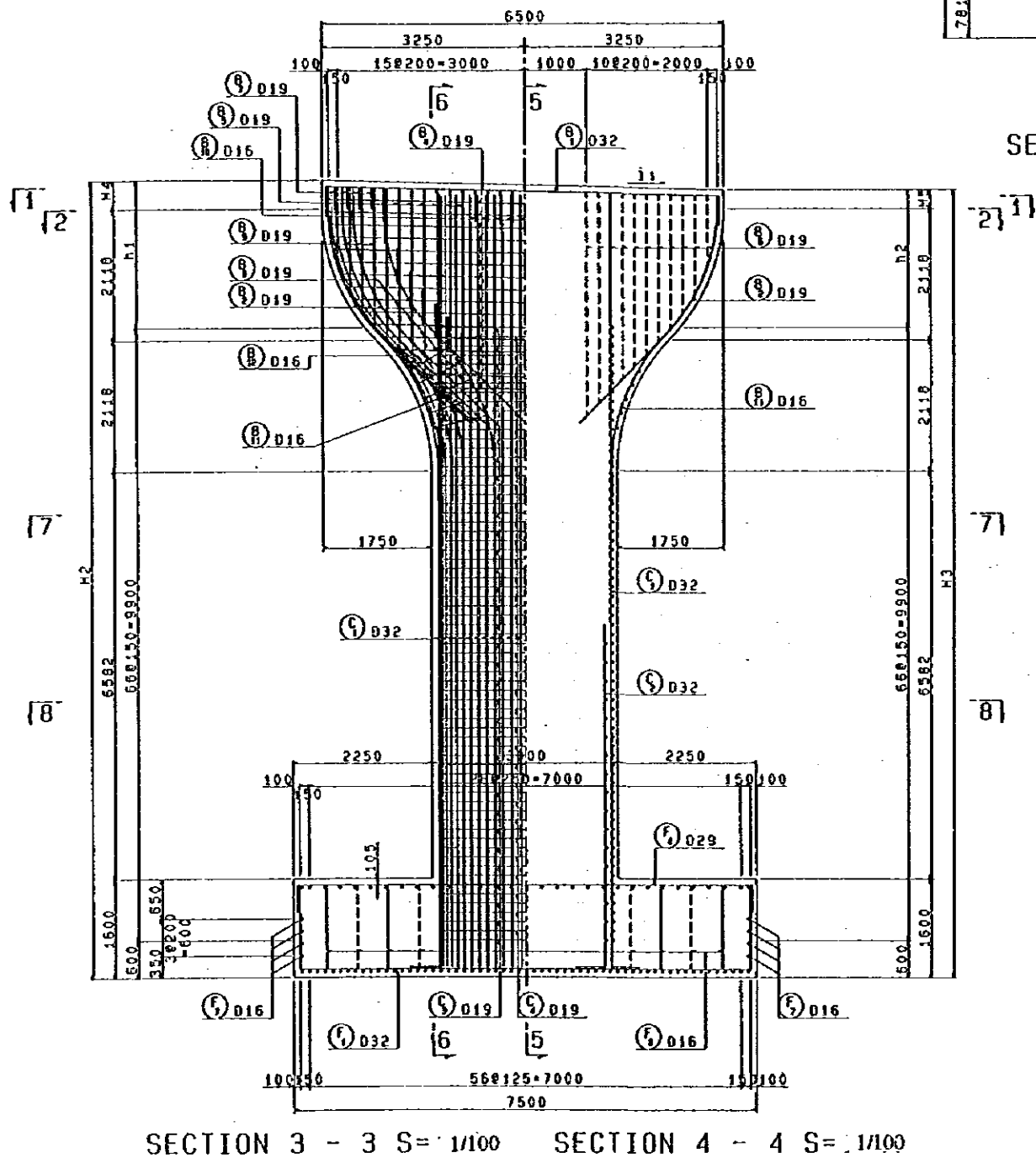
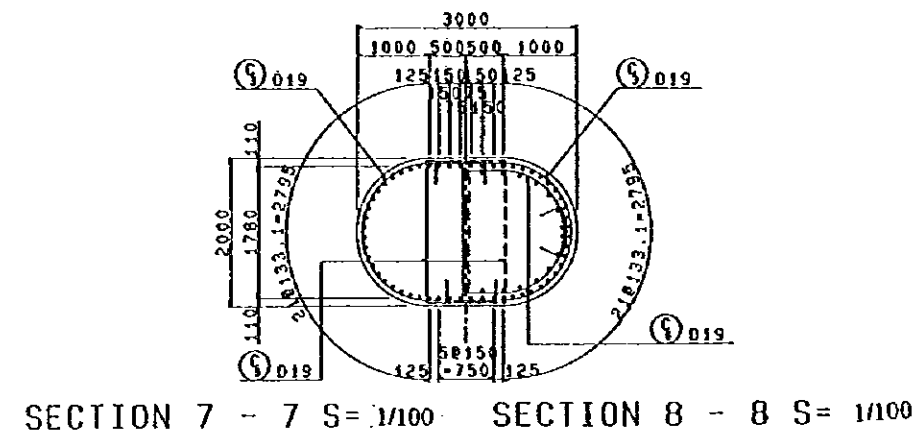
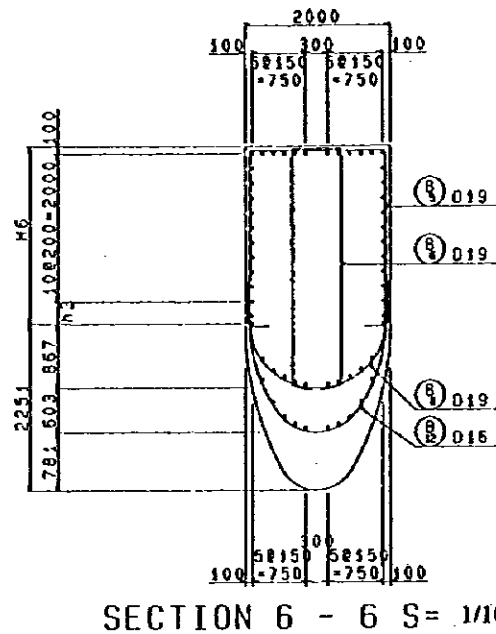
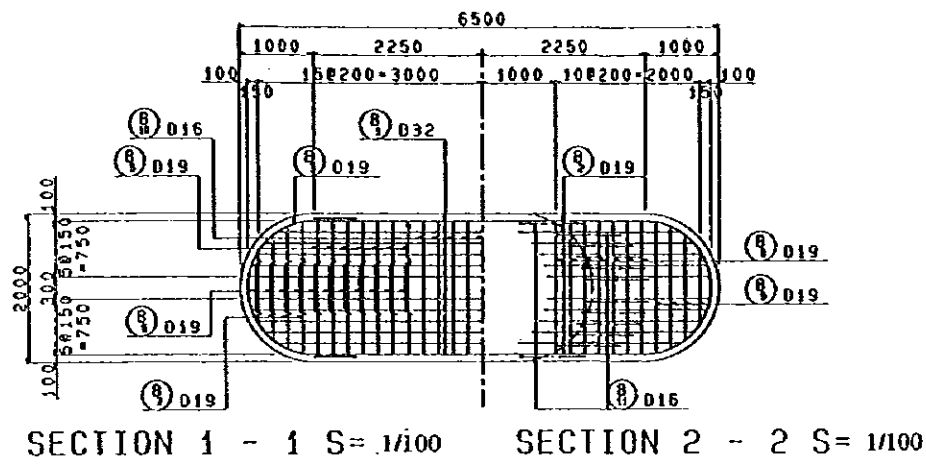


DETAIL OF SHOEBED S= 1/100

RE-BAR ARRANGEMENT OF T-WALL PIER FOR P2, P10 AT (A, B-LINE) (2/2)

NOTES:	JAPAN INTERNATIONAL COOPERATION AGENCY (JICA)	CLIENT: MINISTRY OF COMMUNICATIONS, DIRECTORATE GENERAL OF ROADS
	JICA STUDY TEAM PACIFIC CONSULTANTS INTERNATIONAL FUKUYAMA CONSULTANTS INTERNATIONAL	PROJECT: D/D ON ROAD DEVELOPMENT PROJECT ON BATINAH HIGHWAY
		TITLE: RE-BAR ARRANGEMENT OF T-WALL PIER FOR P2, P10 AT A, B-LINE (2/2)
		DATE: _____ DWGNO. B-72

RA/18 AGR



	A-LINE		B-LINE
	P4	P8	P4, P5, P7
H 1	12800	12800	12800
H 2	12881	12877	12719
H 3	12719	12723	12881
H 4	463	459	301
H 5	301	305	463
H 6	2404	2402	2328
h 1	2381	2377	2219
h 2	2219	2223	2381
h 3	304	302	228
i 1	2.50%	2.38%	-2.50%

RE-BAR ARRANGEMENT OF T-WALL PIER FOR P4, P8 (A-LINE) P4, P5, P7 (B-LINE) (1/2)

NOTES:

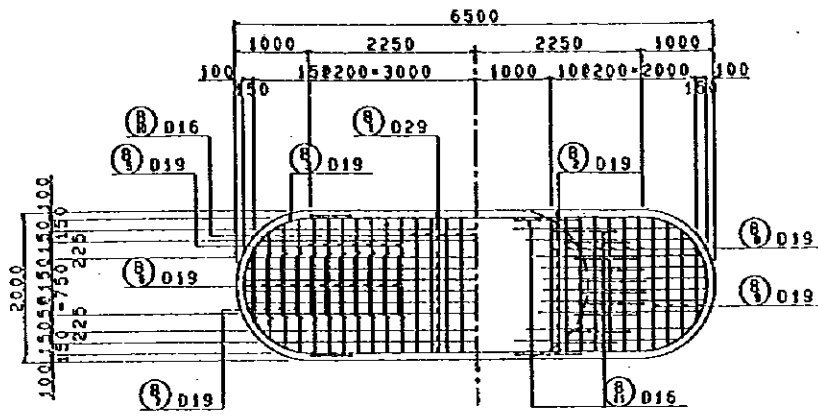
JAPAN INTERNATIONAL COOPERATION AGENCY  
(JICA)  
JICA STUDY TEAM  
PACIFIC CONSULTANTS INTERNATIONAL  
FUKUYAMA CONSULTANTS INTERNATIONAL

CLIENT: MINISTRY OF COMMUNICATIONS, DIRECTORATE GENERAL OF ROADS  
PROJECT: D/D ON ROAD DEVELOPMENT PROJECT ON BATINAH HIGHWAY  
TITLE: RE-BAR ARRANGEMENT OF T-WALL PIER FOR P4,(A-LINE) P4,P5,P7(B-LINE)(1/2)  
DATE: \_\_\_\_\_ DWGNO. B-73

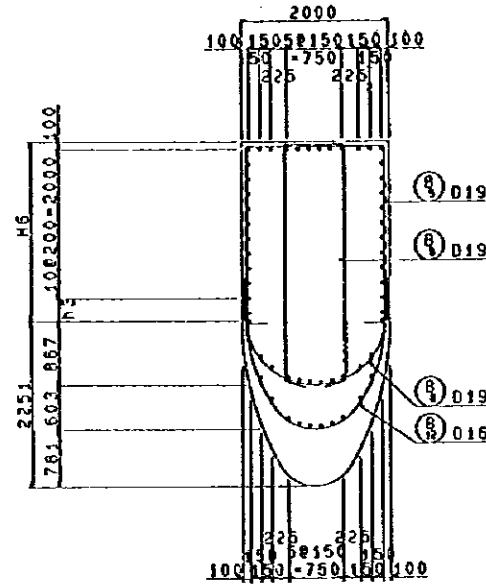




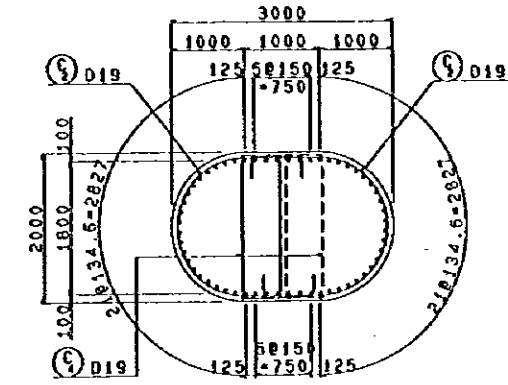
RA/18 AQR



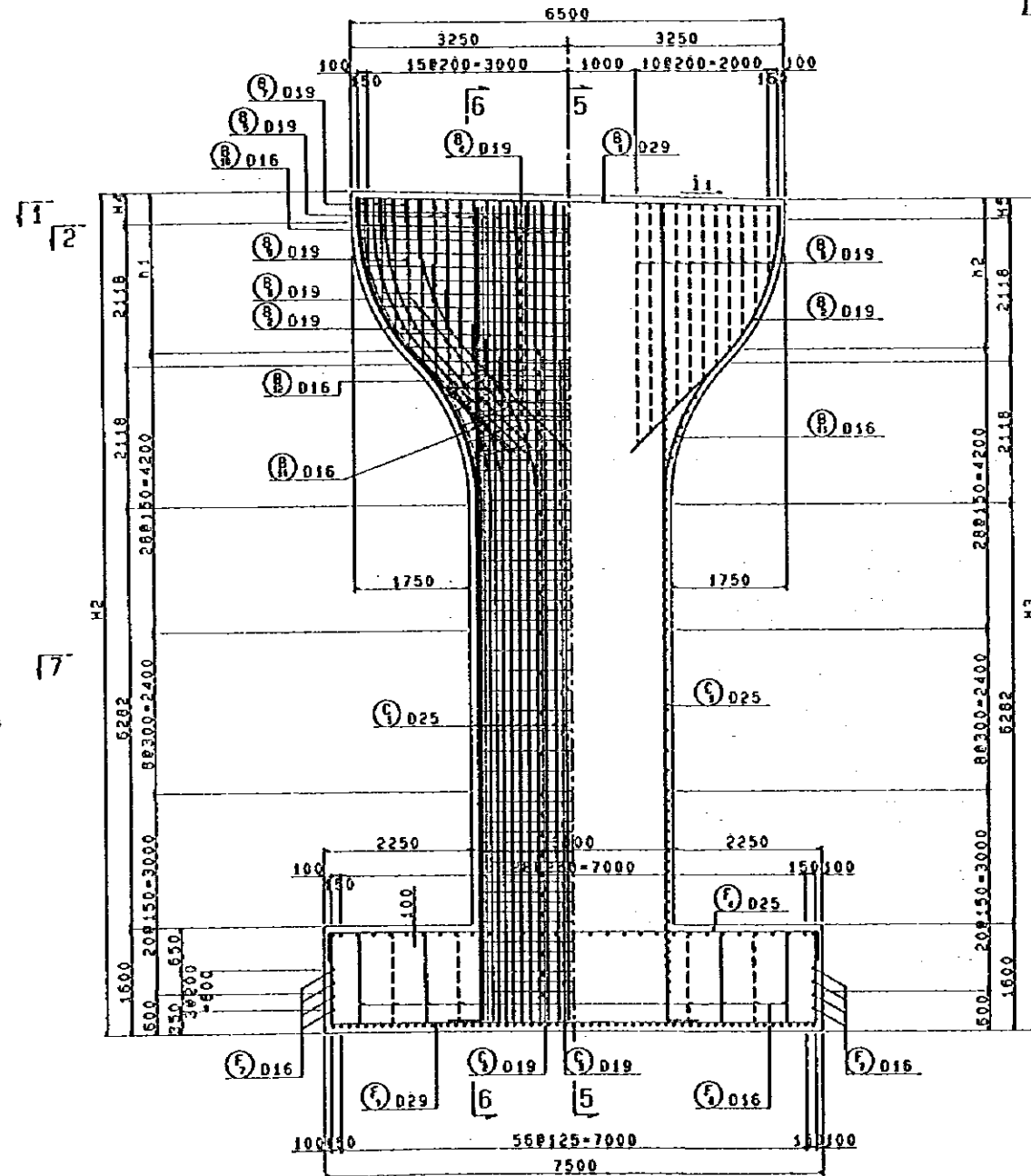
SECTION 1 - 1 S= 1/100 SECTION 2 - 2 S= 1/100



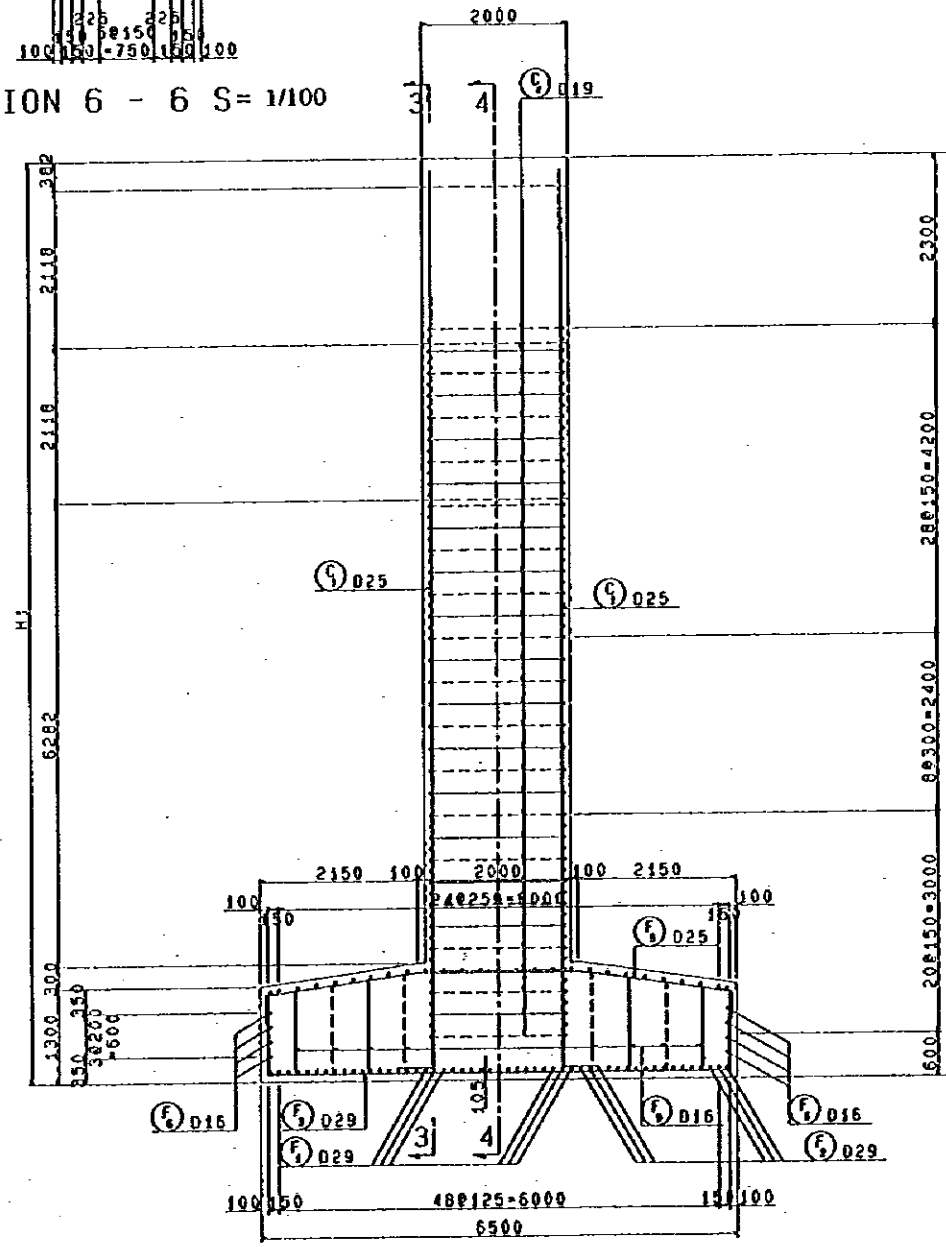
SECTION 6 - 6 S= 1/100



SECTION 7 - 7 S= 1/100



SECTION 3 - 3 S= 1/100 SECTION 4 - 4 S= 1/100



SECTION 5 - 5 S= 1/100

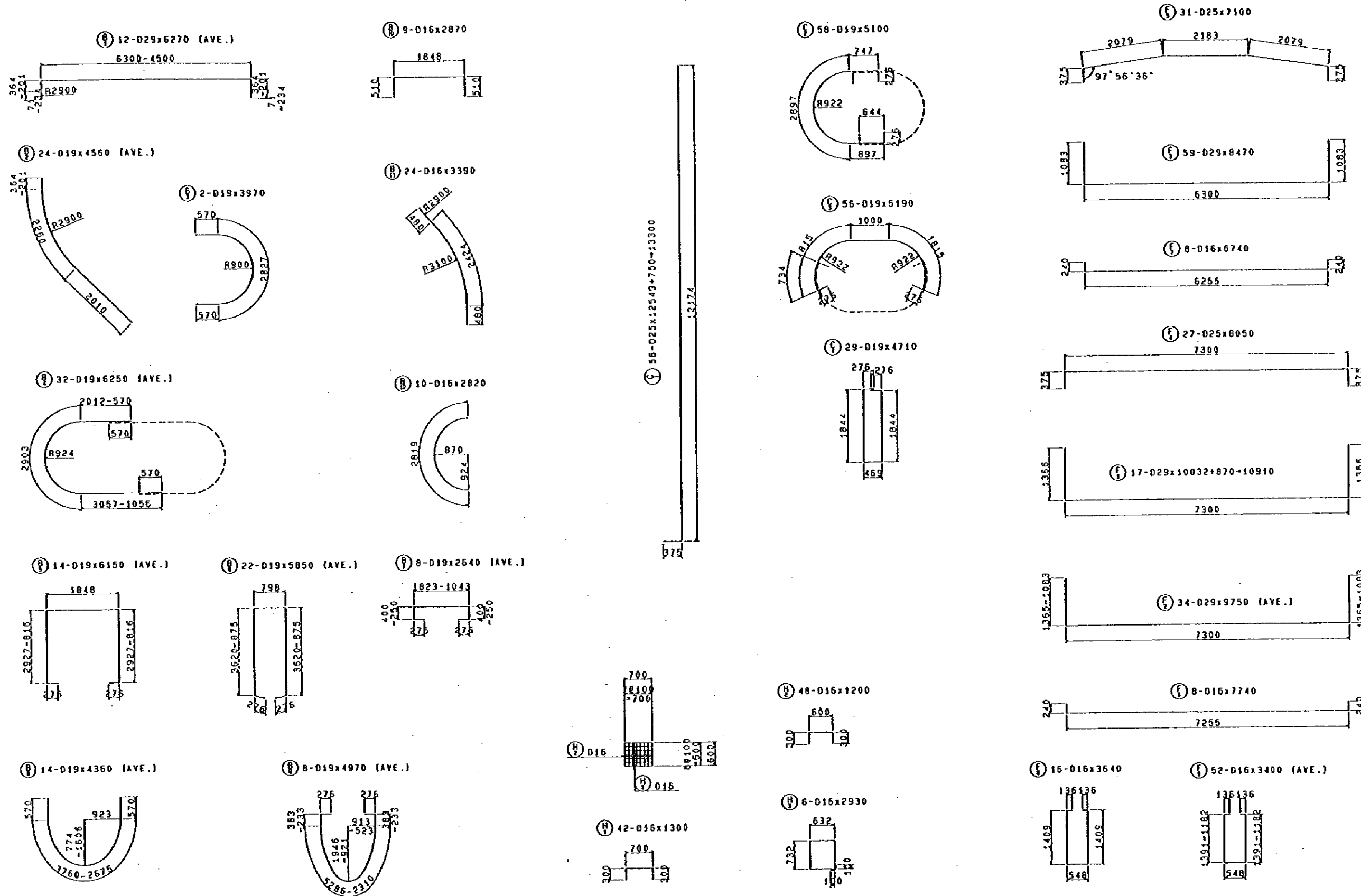
	A-LINE		B-LINE
	P3, P6	P9	P3, P9
H 1	12500	12500	12500
H 2	12581	12508	12419
H 3	12419	12492	12581
H 4	463	390	301
H 5	301	374	463
H 6	2404	2370	2328
h 1	2381	2308	2219
h 2	2219	2292	2381
h 3	304	270	228
I 1	2.50%	0.24%	-2.50%

RE-BAR ARRANGEMENT OF T-WALL PIER FOR P3, P6, P9 (A-LINE) P3, P9 (B-LINE) (1/2)

NOTES:

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PROJECT: D/D ON ROAD DEVELOPMENT PROJECT ON BATINAH HIGHWAY  
TITLE: RE-BAR ARRANGEMENT OF T-WALL PIER FOR P3, P6, P9 (A-LINE) P3, P9 (B-LINE) (1/2)  
DATE: \_\_\_\_\_ DWGNO. B-75



DETAIL OF SHOEBED S= 1/100


RE-BAR ARRANGEMENT OF T-WALL PIER FOR P3, P6, P9 (A-LINE) P3, P9 (B-LINE) (2/2)

NOTES:	JAPAN INTERNATIONAL COOPERATION AGENCY (JICA)	CLIENT: MINISTRY OF COMMUNICATIONS, DIRECTORATE GENERAL OF ROADS
	JICA STUDY TEAM PACIFIC CONSULTANTS INTERNATIONAL FUKUYAMA CONSULTANTS INTERNATIONAL	PROJECT: D/D ON ROAD DEVELOPMENT PROJECT ON BATINAH HIGHWAY
		TITLE: RE-BAR ARRANGEMENT OF T-WALL PIER FOR P3, P6, P9 (A-LINE) P3, P9 (B-LINE) (2/2)
		DATE: _____ DWGNO. B-76



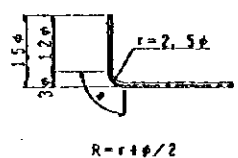
# BAR BENDING DIAGRAM

## LAP JOINT LENGTH

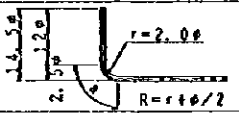
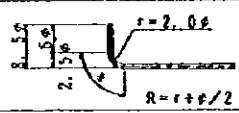
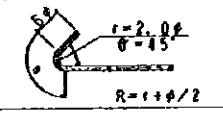
φ	a	LAP JOINT LENGTH
D13	390	
D16	480	
D19	570	
D22	660	
D25	750	
D29	870	
D32	960	

	JAPAN		OMAN	
	GROSS-SECTIONAL AREA (cm <sup>2</sup> )	NOMINAL WEIGHT (kg/m)	GROSS-SECTIONAL AREA (cm <sup>2</sup> )	NOMINAL WEIGHT (kg/m)
D13	1.267	0.995	1.290	0.994
D16	1.986	1.56	2.000	1.552
D19	2.865	2.25	2.839	2.235
D22	3.871	3.04	3.821	3.042
D25	5.067	3.98	5.097	3.973
D29	6.424	5.04	6.452	5.059
D32	7.942	6.23	8.194	6.403

## BENDING DIMENSION (MAIN REINFORCEMENT)

φ	θ ≤ 90°	θ > 90°	HOOK LENGTH
	R=3φ	R=5.5φ	
D13	39	71.5	
D16	48	88	
D19	57	104.5	
D22	66	121	
D25	75	137.5	
D29	87	159.5	
D32	96	176	

## BENDING DIMENSION (STIRRUP, ERECTION BAR)

φ	R=2.5φ	θ=90°		θ=45°		HOOK LENGTH		
		a	b	a	b	STIRRUP	ERECTION BAR	HOOP
D13	32.5	51	77					
D16	40	63	94					
D19	47.5	75	112					
D22	55	86	130					

NOTES:

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CLIENT: MINISTRY OF COMMUNICATIONS, DIRECTORATE GENERAL OF ROADS  
PROJECT: D/D ON ROAD DEVELOPMENT PROJECT ON BATINAH HIGHWAY  
TITLE: BAR BENDING DIAGRAM  
DATE: \_\_\_\_\_ DWGNO. B-78