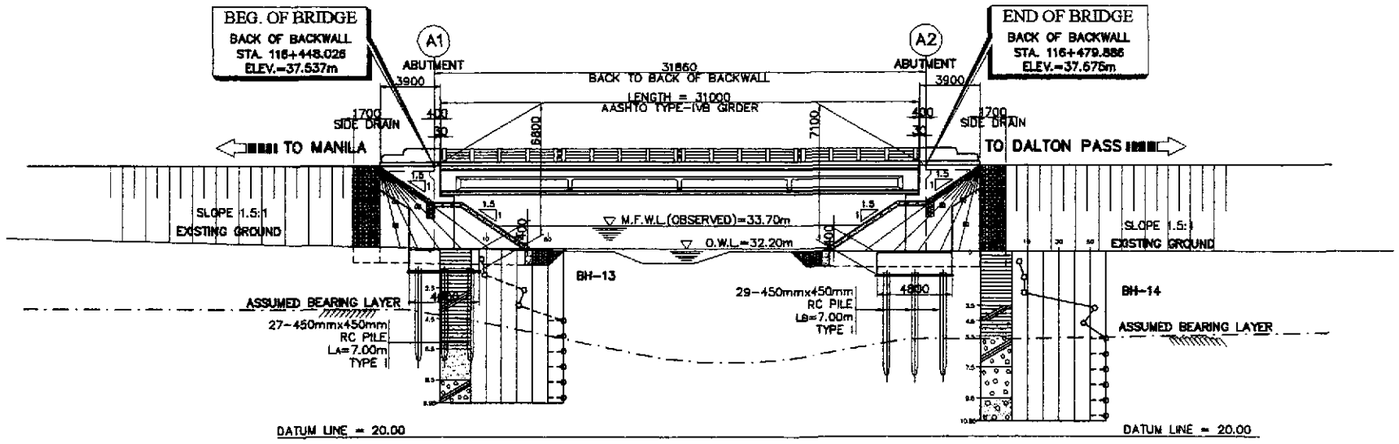
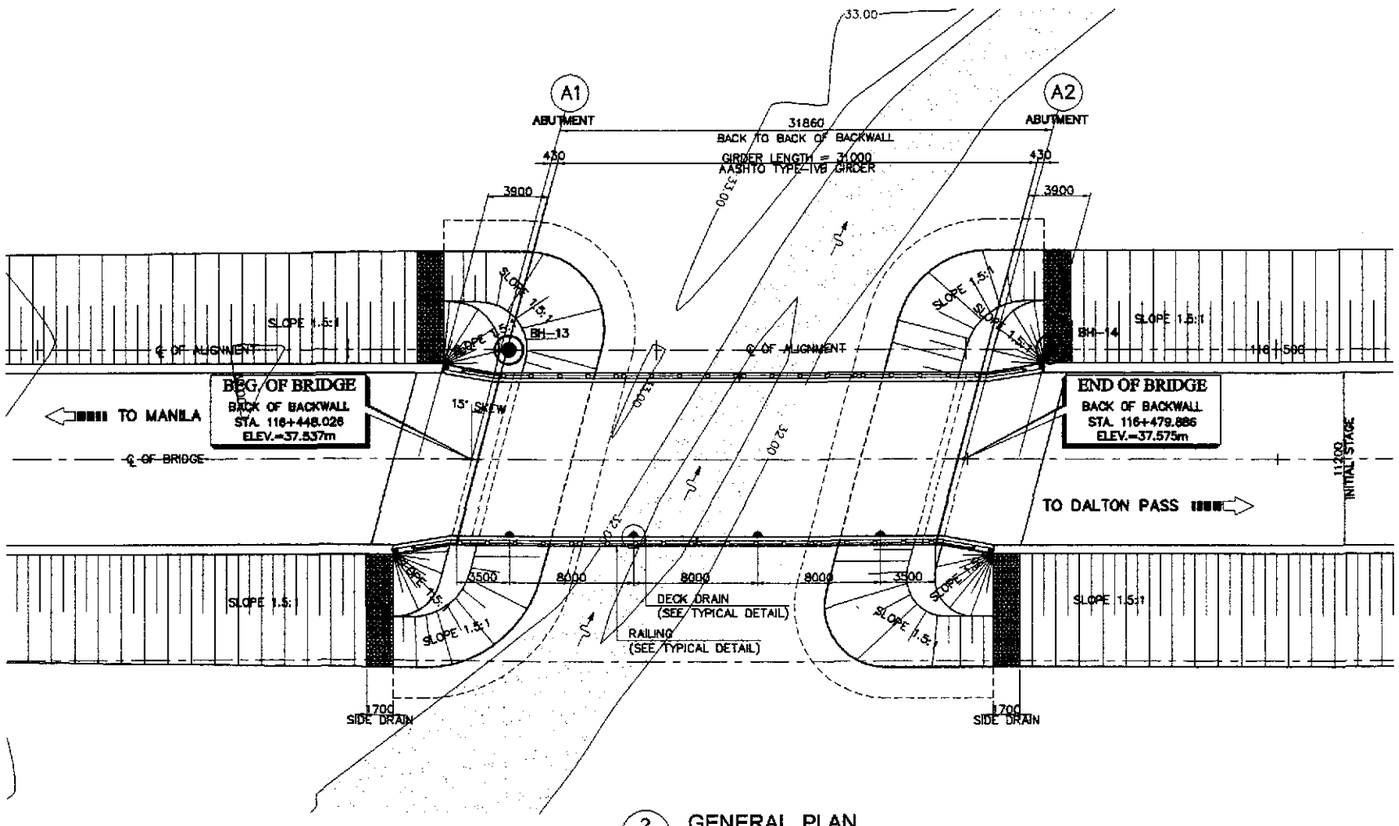
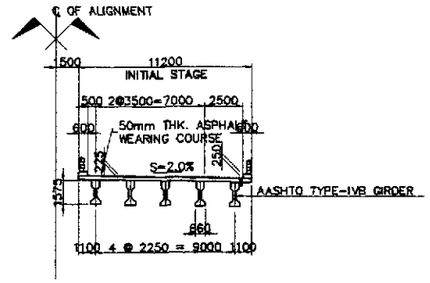


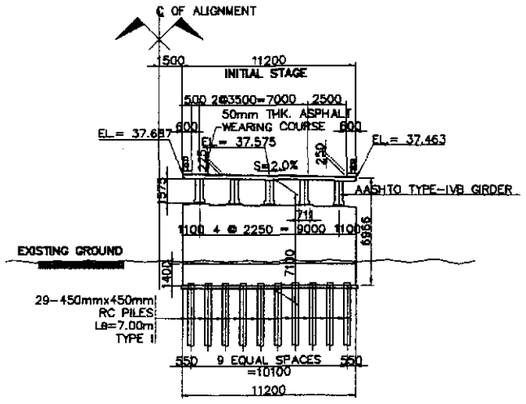
1 - GENERAL ELEVATION
SCALE 1:200



2 - GENERAL PLAN
SCALE 1:200



3 - SECTION @ MIDSPAN
SCALE 1:200



4 - SECTION @ ABUTMENT A2
SCALE 1:200

HYDRAULIC DESIGN DATA	
VELOCITY @ 50 YEARS, V_{50}	2.677 m/sec
DISCHARGE @ 50 YEARS, Q_{50}	32.300 cu.m/sec
CATCHMENT AREA, CA	2.050 sq. km

NOTE :

PRIOR TO CONSTRUCTION SOIL INVESTIGATION AT ABUTMENT A2 SHALL BE CONDUCTED FOR CONFIRMATION OF ASSUMED BEARING CAPACITY AND FOOTING ELEVATION.

THE PILE LENGTH RECOMMENDED ARE MINIMUM. SHOULD THE SOIL AT THE RECOMMENDED LENGTH BE INADEQUATE BEARING MATERIAL, LENGTH SHALL BE INCREASED. THE MINIMUM EMBEDMENT LENGTH INTO ADEQUATE SOIL FOR 400 x 400 R. C. PILE IS 1000mm WHILE FOR 450 x 450 R. C. PILE IS 1200mm.

A - CABANATUAN BYPASS BRIDGE NO. 8 (STA. 116+448.026)
SCALE AS SHOWN

PERFECTO L. ZAPLAN JR.
OIC Chief, Hydraulics Division, BOD

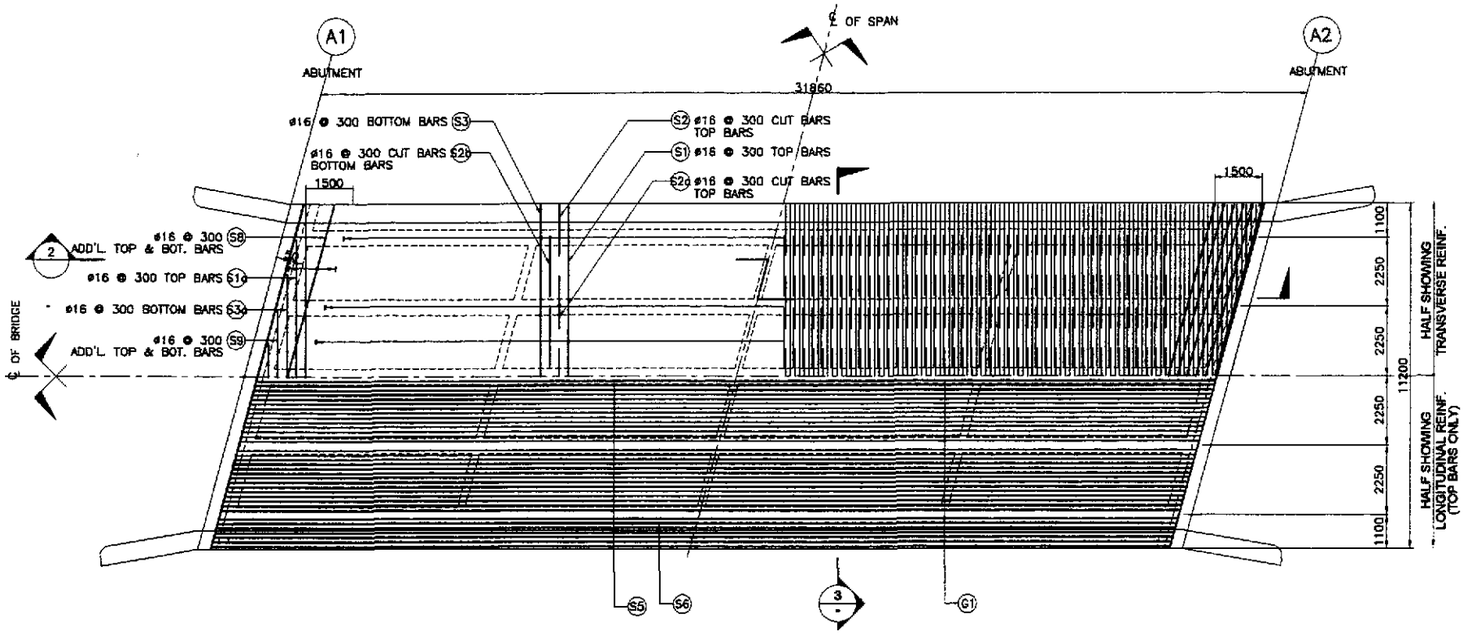
JICA
JAPAN INTERNATIONAL COOPERATION AGENCY
KEI KATAHIRA & ENGINEERS INTERNATIONAL
YACHIYO ENGINEERING CO., LTD.

	DATE	SIGNATURE
DESIGNED	10/4/02	E. N. SALLAN
CHECKED	10/8/02	
SUBMITTED	10/8/02	TEAM LEADER

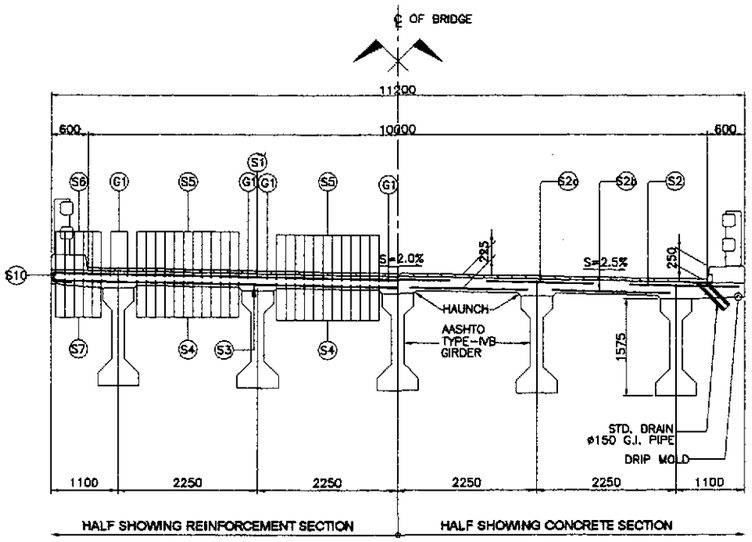
REPUBLIC OF THE PHILIPPINES
DEPARTMENT OF PUBLIC WORKS AND HIGHWAYS

PJHL - PMO	BUREAU OF DESIGN		OFFICE OF THE SECRETARY	
Submitted By:	Reviewed By:	Recommended By:	Recommended By: (See cover sheet for Signature)	Approved By: (See cover sheet for Signature/Approval)
DANILO C. TRAJANO, Project Director	ADRIANO M. DOROY, Chief, Bridges Division	GILBERTO S. REYES, Director IV (OIC)	MANUEL M. BONOAN, Undersecretary	SIMEON A. DATUMANONG, Secretary

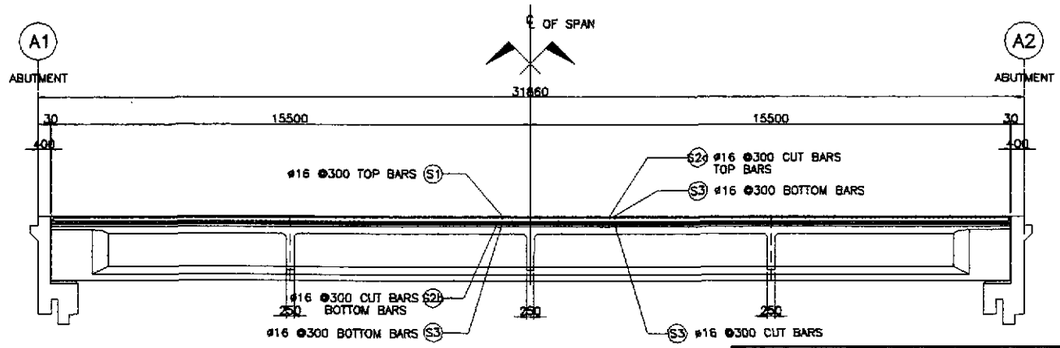
PROJECT AND LOCATION :	SCALE :	SHEET CONTENTS :	SHEET NO. :
THE DETAILED DESIGN STUDY ON UPGRADING INTER-URBAN HIGHWAY SYSTEM ALONG THE PAN-PHILIPPINE HIGHWAY (Plaridel, Cabanatuan and San Jose Bypasses)	1 : 200	BRIDGE NO. 8 GENERAL PLAN, ELEVATION AND SECTIONS (INITIAL STAGE)	B8-01
CABANATUAN BYPASS - CONTRACT PACKAGE II	FULL SIZE A1		



1 / - **FRAMING PLAN**
SCALE 1 : 100

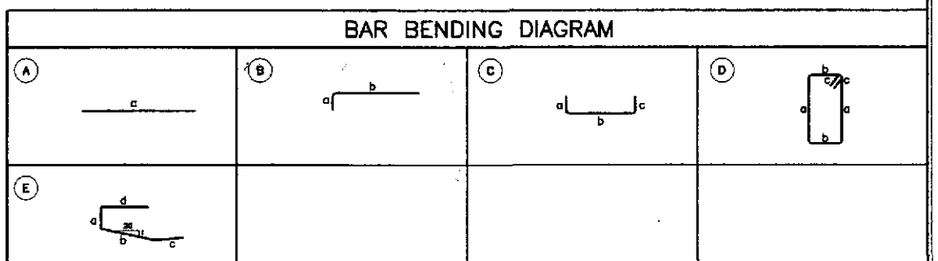


3 / - **TYPICAL CROSS-SECTION**
SCALE 1 : 50



2 / - **LONGITUDINAL SECTION**
SCALE 1 : 100

BAR BENDING DIAGRAM



ESTIMATED QUANTITIES OF SUPERSTRUCTURE

ITEM NO.	DESCRIPTION	UNIT	TOTAL
404(1)a	REINFORCING STEEL GRADE 40	kgs.	24059
	DECK SLAB	13720	
	DIAPHRAGM	468	
	GIRDER	5995	
	SIDEWALK, RAILING, & POST	2482	
	APPROACH SLAB	1394	
404(1)b	REINFORCING STEEL GRADE 60	kgs.	13510
	DECK SLAB	0	
	DIAPHRAGM	1336	
	GIRDER	7260	
	SIDEWALK, RAILING, & POST	590	
	APPROACH SLAB	4324	
405(1)	STRUCTURAL CONCRETE	cu. m.	246.96
	DECK SLAB	82.44	
	DIAPHRAGM	15.51	
	GIRDER	97.16	
	SIDEWALK, RAILING, & POST	16.51	
	APPROACH SLAB	35.34	

SCHEDULE OF REINFORCEMENT

LOCATION	CONCRETE VOLUME (m^3)	BAR MARK	BAR SIZE	QTY.	SPACING	BAR SHAPE	DIMENSIONS (mm) OUT TO OUT a	b	c	d	LENGTH EACH BAR (mm)	TOTAL LENGTH (m)	UNIT WT. (kg/m)	WEIGHT IN (kg)	REBAR RATIO (kg/m^3)
DECK SLAB	82.44	G1	16	10	AS SHOWN	A	30900	–	–	–	30900	309.00	1.579	488	166.41
		S1	16	94	300	C	145	11100	145	–	11390	1070.00	1.579	1691	
		S1a	16	22	300	C	145	6150	145	–	6440	141.68	1.579	224	
		S2	16	188	300	B	145	1800	–	–	1945	365.66	1.579	578	
		S2a	16	282	300	A	1700	–	–	–	1700	479.40	1.579	757	
		S2b	16	376	3200	A	1950	–	–	–	1950	733.20	1.579	1158	
		S3	16	94	2300	A	11100	–	–	–	11100	1043.40	1.579	1648	
		S3a	16	22	200	A	6150	–	–	–	6150	135.30	1.579	214	
		S4	16	48	150	A	30900	–	–	–	30900	1483.20	1.579	2342	
		S5	16	48	150	A	30900	–	–	–	30900	1483.20	1.579	2342	
		S6	16	12	AS SHOWN	A	30900	–	–	–	30900	370.80	1.579	586	
		S7	16	12	AS SHOWN	A	30900				30900	370.80	1.579	586	
		S8	16	24	AS SHOWN	A	11500	–	–	–	11500	276.00	1.579	436	
		S9	16	44	AS SHOWN	A	6150	–	–	–	6150	270.60	1.579	428	
		S10	12	140	450	E	145	900	600	300	1945	272.30	0.888	242	
TOTAL	82.44										GRADE 40 TOTAL = 13,720 kgs.				

JAPAN INTERNATIONAL COOPERATION AGENCY

KATAHIRA & ENGINEERS INTERNATIONAL — YACHIYO ENGINEERING CO., LTD.

	DATE	SIGNATURE
DESIGNED	10/4/02	E.N. SALLAN
CHECKED	10/16/02	[illegible]
SUBMITTED	10/18/02	M. KUSUMI TEAM LEADER

REPUBLIC OF THE PHILIPPINES
DEPARTMENT OF PUBLIC WORKS AND HIGHWAYS

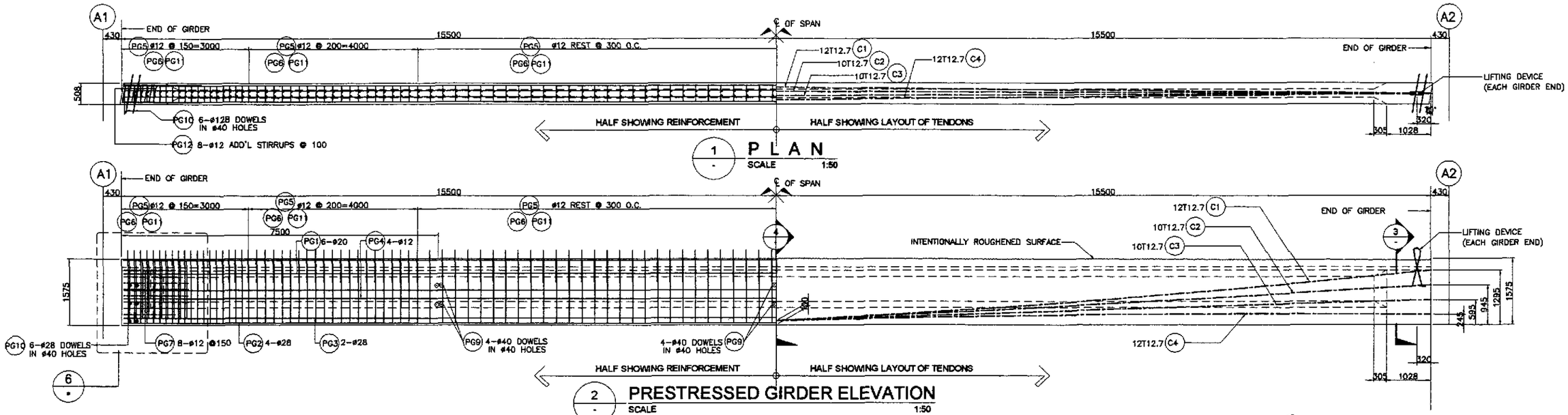
PUHL – PMO	BUREAU OF DESIGN		OFFICE OF THE SECRETARY	
Submitted By:	Reviewed By:	Recommended By:	Recommended By: (See cover sheet for Signature)	Approved By: (See cover sheet for Signature/Approval)
DANILO C. TRAJANO	ADRIANO M. DOROY	GILBERTO S. REYES	MANUEL M. BONOAN	SIMEON A. DATUMANONG
Project Director	Chief, Bridges Division	Director IV (OIC)	Undersecretary	Secretary

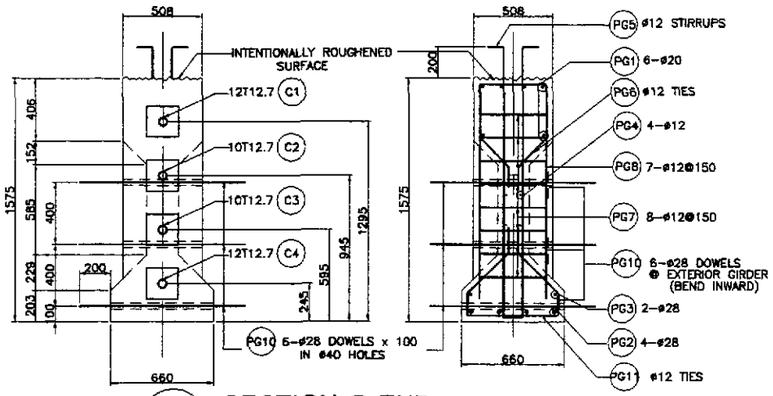
PROJECT AND LOCATION :
THE DETAILED DESIGN STUDY ON UPGRADING INTER-URBAN HIGHWAY SYSTEM ALONG THE PAN-PHILIPPINE HIGHWAY (Plaridel, Cabanatuan and San Jose Bypasses)
CABANATUAN BYPASS - CONTRACT PACKAGE II

SCALE : AS SHOWN — FULL SIZE A1

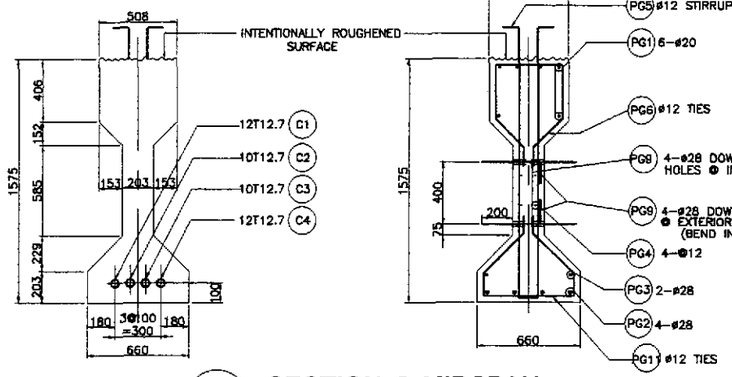
SHEET CONTENTS :
BRIDGE NO. 8
DECK FRAMING PLAN AND SECTIONS (INITIAL STAGE)

SHEET NO. : **B8-02**

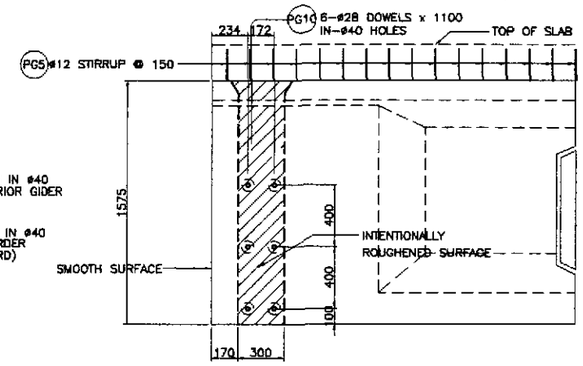




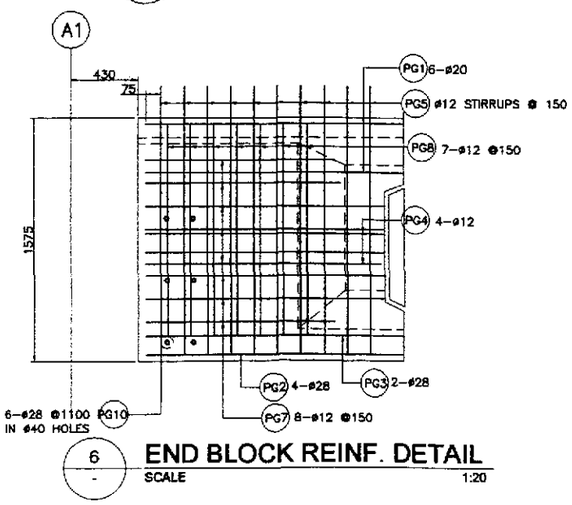
3 - SECTION @ END SCALE 1:20



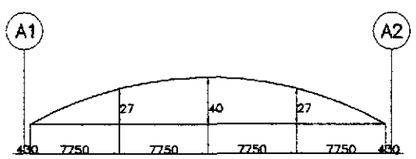
4 - SECTION @ MIDSPAN SCALE 1:20



5 - DOWELS @ END BLOCK SCALE 1:20



6 - END BLOCK REINF. DETAIL SCALE 1:20



7 - CAMBER DIAGRAM SCALE 1:20

NOTES ;

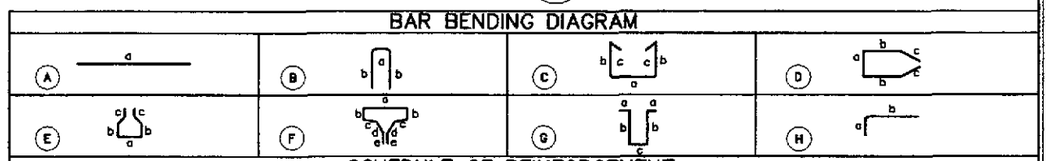
1.) SEE GENERAL NOTES, -2, FOR GIRDER DESIGN GUIDE.

2.) JACKING FORCE PER GIRDER, Pj = 6058 KN.

3.) JACKING WILL BE DONE AT BOTH ENDS.

4.) FINAL PRESTRESSING FORCE @ MIDSPAN, FNET = 4783 KN.

BAR BENDING DIAGRAM



SCHEDULE OF REINFORCEMENT

STRUCTURE COMPONENT	BAR MARK	SIZE (mm)	QTY.	SPACING	BAR SHAPE	DIMENSION(mm) a	b	c	d	e	LENGTH PER BAR (mm)	TOTAL LENGTH (m)	UNIT WEIGHT (kg/m)	TOTAL WEIGHT (kg)	CONC. VOLUME (cu.m)	REBAR RATIO (kg/cu.m)	REMARKS
GIRDER	PG1	20	6	AS SHOWN	A	30920	–	–	–	–	30920	185.52	2.466	458	19.43	136.42	QUANTITIES ARE FOR ONE (1) GIRDER ONLY
	PG2	28	4	AS SHOWN	A	30920	–	–	–	–	30920	123.68	4.833	598			
	PG3	28	2	AS SHOWN	A	30920	–	–	–	–	30920	61.84	4.833	299			
	PG4	12	4	AS SHOWN	A	30920	–	–	–	–	30920	123.68	0.888	110			
	PG5	12	138	150	G	100	1750	103	–	–	3803	524.81	0.888	467			
	PG6	12	138	150	E	430	350	150	260	–	1950	269.10	0.888	239			
	PG7	12	16	150	D	430	1000	550	–	–	3530	56.48	0.888	51			
	PG8	12	14	150	C	430	1500	150	–	–	3730	52.22	0.888	47			
	PG9	28	12	AS SHOWN	A	603	–	–	–	–	603	7.24	4.833	35			
	PG10	28	12	AS SHOWN	A	1060	–	–	–	–	1060	12.72	4.833	62			
	PG11	12	138	150	E	580	160	150	360	–	1920	264.96	0.888	236			
	PG12	12	16	100	B	430	1500	–	–	–	3430	54.88	0.888	49			
													GRADE 40 TOTAL = 1,199kgs.				
													GRADE 60 TOTAL = 1,452 kgs.				

JICA
JAPAN INTERNATIONAL COOPERATION AGENCY
KATAHIRA & ENGINEERS INTERNATIONAL
YACHIYO ENGINEERING CO., LTD.

	DATE	SIGNATURE
DESIGNED	10/16/02	E. M. SALLAN
CHECKED	10/16/02	N. KAWAHARA
SUBMITTED	10/18/02	M. INOCENTI TEAM LEADER

REPUBLIC OF THE PHILIPPINES
DEPARTMENT OF PUBLIC WORKS AND HIGHWAYS

PJHL – PMO	BUREAU OF DESIGN		OFFICE OF THE SECRETARY	
Submitted By:	Reviewed By:	Recommended By:	Recommended By: (See cover sheet for Signature)	Approved By: (See cover sheet for Signature/Approval)
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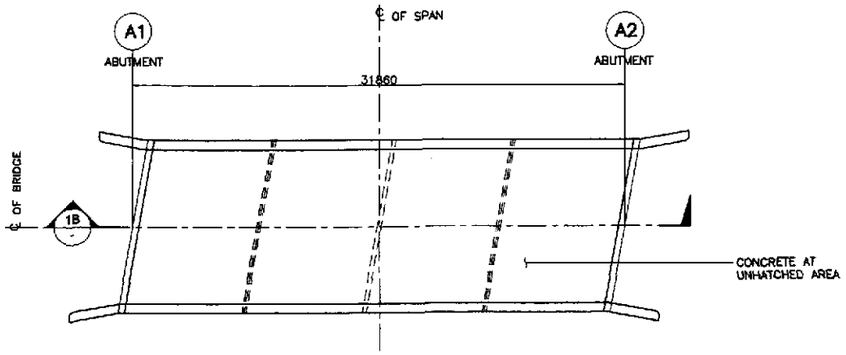
Project Director	Chief, Bridges Division	Director IV (OIC)	Undersecretary	Secretary

PROJECT AND LOCATION :
THE DETAILED DESIGN STUDY ON UPGRADING INTER-URBAN HIGHWAY SYSTEM ALONG THE PAN-PHILIPPINE HIGHWAY (Plaridel, Cabanatuan and San Jose Bypasses)
CABANATUAN BYPASS - CONTRACT PACKAGE II

SCALE : AS SHOWN
FULL SIZE A1

SHEET CONTENTS :
BRIDGE NO. 8
AASHTO TYPE IV-B GIRDER
(INITIAL STAGE)

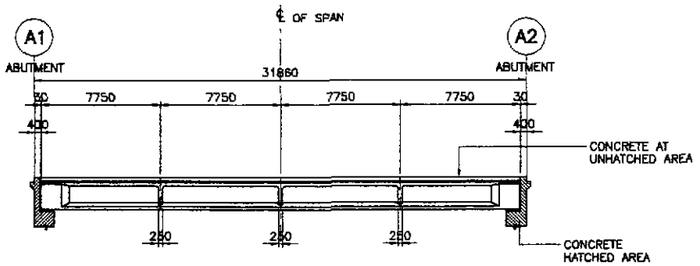
SHEET NO. : B8-03



NOTES:

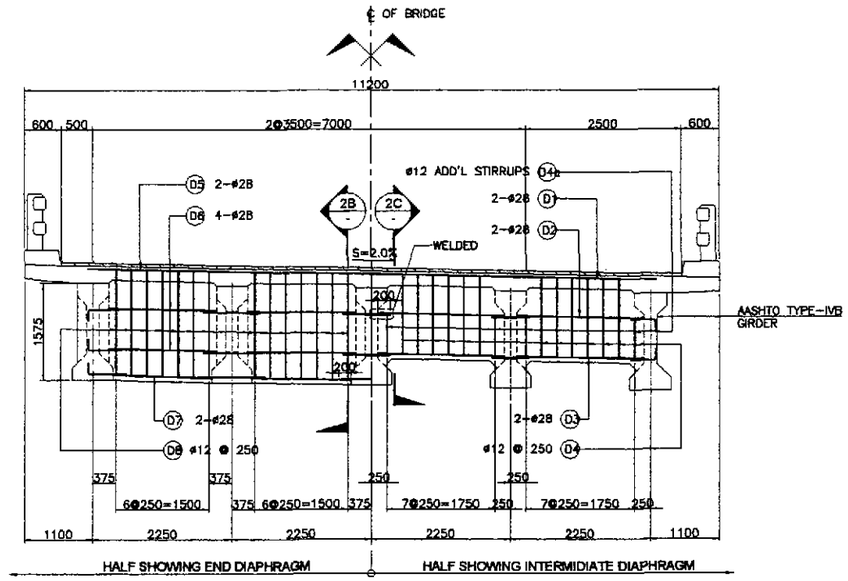
1. CONCRETE AT HATCHED AREAS SHALL BE PLACED AT LEAST TWENTY ONE (21) DAYS AHEAD OF CONCRETE AT UNHATCHED AREAS.
2. SEE GIRDER DETAIL FOR SPACING OF ø28 DOWELS.

1A - PLAN
SCALE 1:200



1B - LONGITUDINAL SECTION
SCALE 1:200

1 - CONCRETE POURING SEQUENCE
SCALE 1:200



2A - ELEVATION
SCALE 1:50

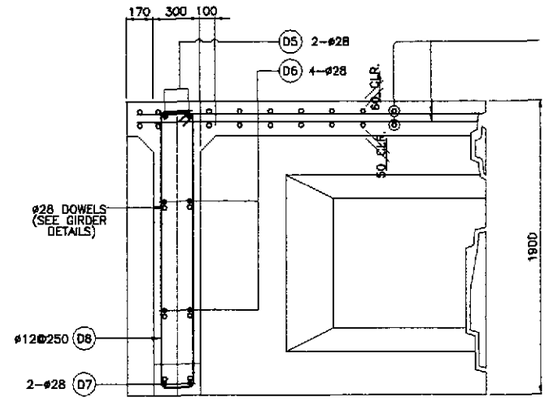
BAR BENDING DIAGRAM

(A)

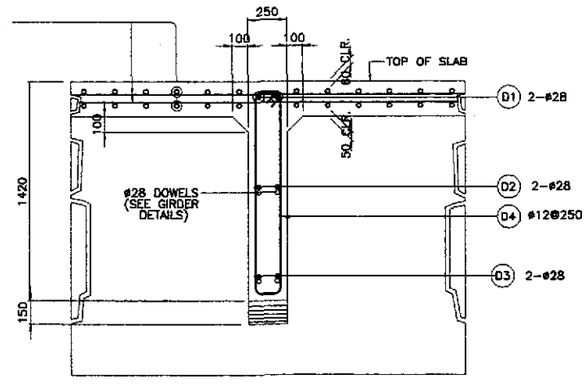
(B)

SCHEDULE OF REINFORCEMENT

STRUCTURE COMPONENT	LOCATION	CONCRETE VOLUME (m^3)	BAR MARK	BAR SIZE	QTY.	SPACING	BAR SHAPE	DIMENSIONS (mm) OUT TO OUT a	b	c	d	LENGTH PER BAR (mm)	TOTAL LENGTH (m)	UNIT WT. (kg/m)	TOTAL WEIGHT IN (kg)	REBAR RATIO (kg/m^3)
DIAPHRAGM	INTERMEDIATE DIAPHRAGM	8.51	D1	28	6	AS SHOWN	A	9400				9400	56.40	4.833	273	117.93
			D2	28	24	AS SHOWN	A	2045				2045	49.08	4.833	238	
			D3	28	24	AS SHOWN	A	2045				2045	49.08	4.833	238	
			D4	12	72	250	C	150	1350	150		3300	237.60	0.888	211	
			D4a	12	24	200	C	150	700	150		2000	48.00	0.888	43	
	END DIAPHRAGM	7.00	D5	28	4	AS SHOWN	A	9400				9400	37.60	4.833	182	114.38
			D6	28	32	AS SHOWN	A	1740				1740	55.68	4.833	270	
			D7	28	16	AS SHOWN	A	1740				1740	27.84	4.833	135	
			D8	12	56	250	C	200	1800	150		3000	240.80	0.888	214	
													GRADE 60 TOTAL =		1336 kgs.	
	TOTAL	15.51											GRADE 40 TOTAL =		468 kgs.	



2B - SECTION
SCALE 1:20



2C - SECTION
SCALE 1:20

2 - DETAIL OF END & INTERMEDIATE DIAPHRAGM
SCALE AS SHOWN

JAPAN INTERNATIONAL COOPERATION AGENCY

KATAHIRA & ENGINEERS INTERNATIONAL

YACHIYO ENGINEERING CO., LTD.

	DATE	SIGNATURE
DESIGNED	10/4/02	E. N. SALLAN
CHECKED	10/16/02	
SUBMITTED	10/18/02	TEAM LEADER

REPUBLIC OF THE PHILIPPINES
DEPARTMENT OF PUBLIC WORKS AND HIGHWAYS

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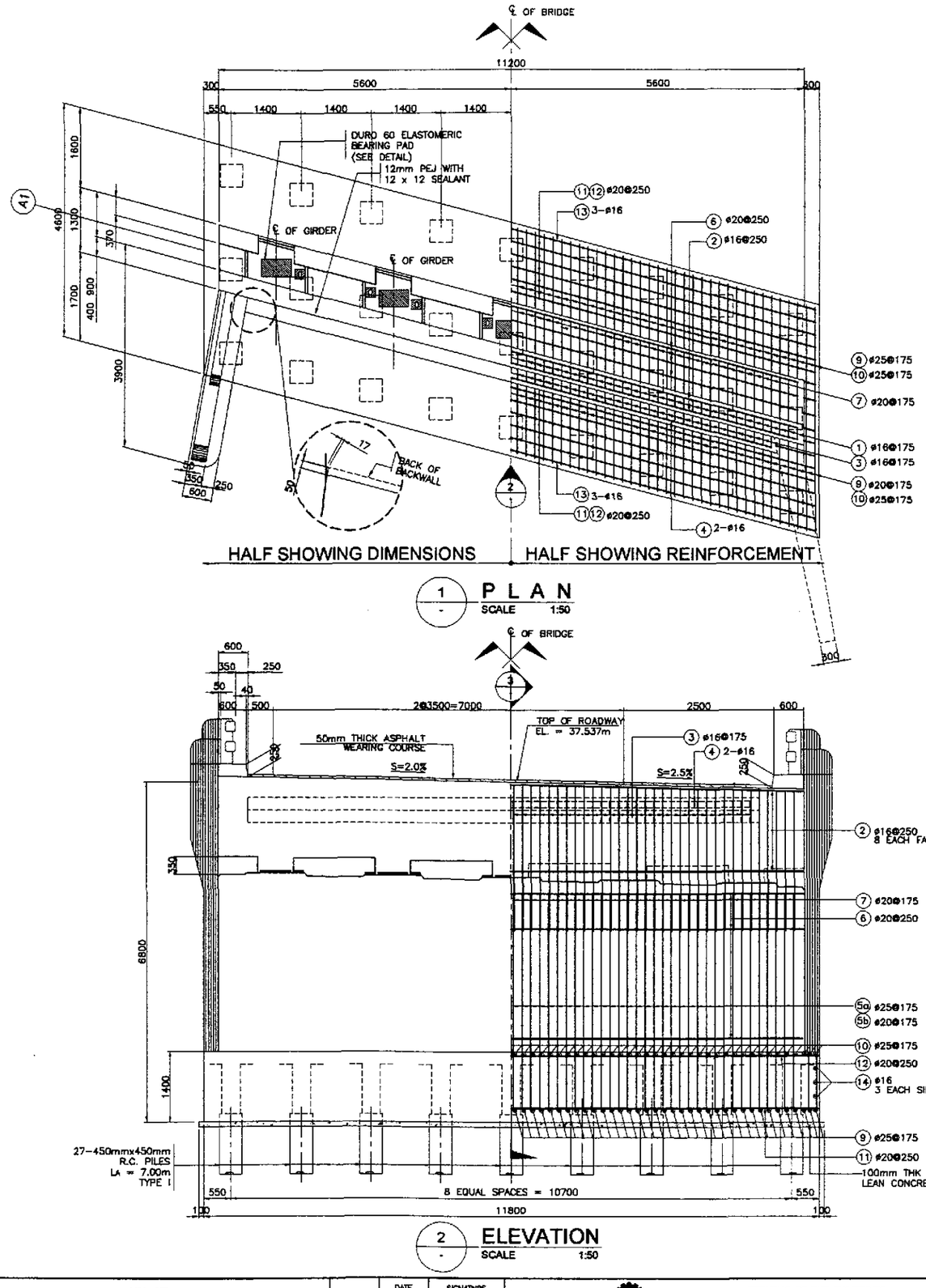
Project Director	Chief, Bridges Division	Director IV (OIC)	Undersecretary	Secretary

PROJECT AND LOCATION :
THE DETAILED DESIGN STUDY ON
UPGRADING INTER-URBAN HIGHWAY SYSTEM
ALONG THE PAN-PHILIPPINE HIGHWAY
(Plaridel, Cabanatuan and San Jose Bypasses)
CABANATUAN BYPASS - CONTRACT PACKAGE II

SCALE :
AS SHOWN
FULL SIZE A1

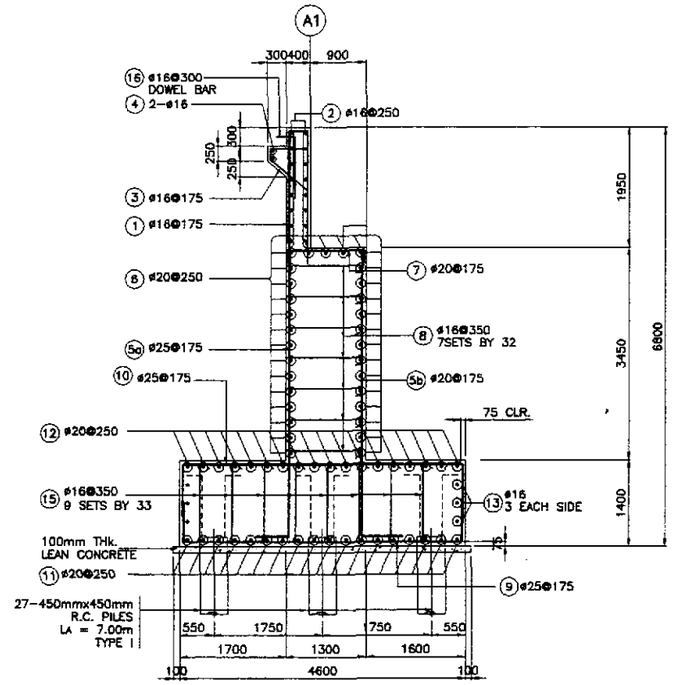
SHEET CONTENTS :
BRIDGE NO. 8
CONCRETE POURING SEQUENCE
AND DIAPHRAGM DETAILS
(INITIAL STAGE)

SHEET NO. :
B8-04



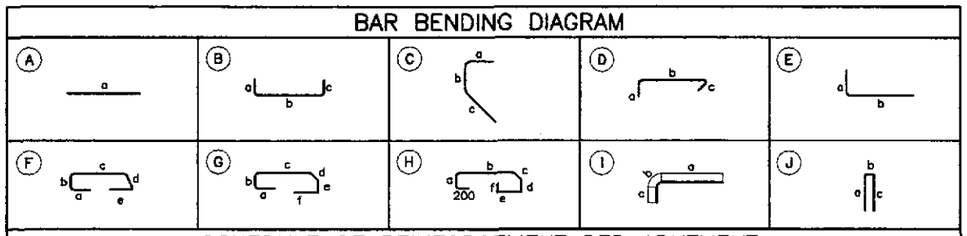
1 PLAN
SCALE 1:50

2 ELEVATION
SCALE 1:50



3 SECTION
SCALE 1:50

BAR BENDING DIAGRAM



SCHEDULE OF REINFORCEMENT PER ABUTMENT

LOCATION	CONCRETE VOLUME (m^3)	BAR MARK	BAR SIZE	QTY.	SPACING	BAR SHAPE	DIMENSIONS (mm) OUT TO OUT a	b	c	d	e	f	LENGTH EA. BAR (mm)	TOTAL LENGTH (m)	UNIT WT. (kg/m)	WEIGHT (kg)	REBAR RATIO (kg/m^3)
BACKWALL	9.86	①	16	64	175	B	2200	300	2200	–	–	–	4700	300.80	1.579	475	95.02
		②	16	16	250	A	11500	–	–	–	–	–	11500	184.00	1.579	291	
		③	16	58	175	C	600	150	750	–	–	–	1500	87.00	1.579	138	
		④	16	2	AS SHOWN	A	10250	–	–	–	–	–	10250	20.50	1.579	33	
MAINWALL	50.23	⑤a	25	64	175	E	400	4600	–	–	–	–	5000	320.00	3.854	1234	75.15
		⑤b	20	64	175	E	400	4600	–	–	–	–	5000	320.00	2.466	790	
		⑥	20	31	250	A	11500	–	–	–	–	–	11500	356.50	2.466	880	
		⑦	20	64	175	B	250	1200	250	–	–	–	1700	108.80	2.466	269	
		⑧	16	224	350	D	250	1200	250	–	–	–	1700	380.80	1.579	602	
FOOTING	75.99	⑨	25	68	175	B	700	4450	700	–	–	–	5850	397.80	3.854	1534	69.86
		⑩	25	68	175	B	700	4450	700	–	–	–	5850	397.80	3.854	1534	
		⑪	20	19	250	B	700	12050	700	–	–	–	13450	255.55	2.466	631	
		⑫	20	19	250	B	700	12050	700	–	–	–	13450	255.55	2.466	631	
		⑬	16	6	AS SHOWN	A	12050	–	–	–	–	–	12050	72.30	1.579	115	
		⑭	16	6	AS SHOWN	A	4450	–	–	–	–	–	4450	26.70	1.579	43	
		⑮	16	297	350	D	250	1250	250				1750	519.75	1.579	821	
DOWEL		⑯	16	34	300	E	650	500	–	–	–	–	1150	39.10	1.579	62	
TOTAL	136.09														GRADE 40 TOTAL =		2,580 kgs.
															GRADE 60 TOTAL =		7,503 kgs.

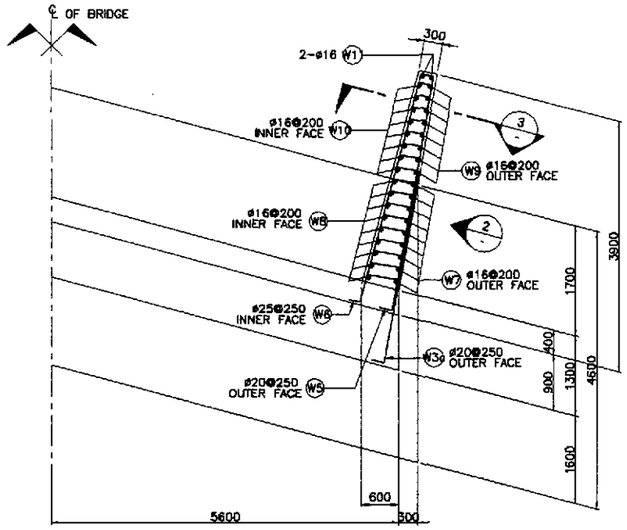
JICA
JAPAN INTERNATIONAL COOPERATION AGENCY
KATAHIRA & ENGINEERS INTERNATIONAL
YACHIYO ENGINEERING CO., LTD.

	DATE	SIGNATURE
DESIGNED	10/4/12	M. GONZALES
CHECKED	10/16/12	
SUBMITTED	10/18/12	M. KUSHI TEAM LEADER

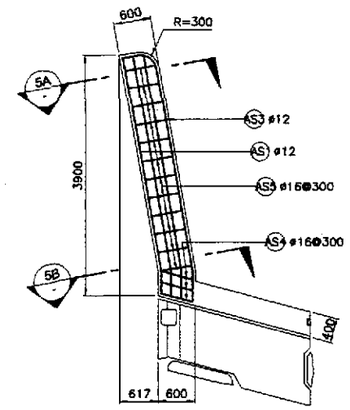
REPUBLIC OF THE PHILIPPINES
DEPARTMENT OF PUBLIC WORKS AND HIGHWAYS

PJHL – PMO	BUREAU OF DESIGN		OFFICE OF THE SECRETARY	
Submitted By:	Reviewed By:	Recommended By:	Recommended By: (See cover sheet for Signature)	Approved By: (See cover sheet for Signature/Approval)
DANILO C. TRAJANO Project Director	ADRIANO M. DORDY Chief, Bridges Division	GILBERTO S. REYES Director IV (OIC)	MANUEL M. BONOAN Undersecretary	SIMEON A. DATUMANONG Secretary

PROJECT AND LOCATION :	SCALE :	SHEET CONTENTS :	SHEET NO. :
THE DETAILED DESIGN STUDY ON UPGRADING INTER-URBAN HIGHWAY SYSTEM ALONG THE PAN-PHILIPPINE HIGHWAY (Plaridel, Cabanatuan and San Jose Bypasses)	1 : 50	BRIDGE NO. 8 ABUTMENT A1 MAINWALL REINFORCEMENT DETAILS (INITIAL STAGE)	B8-05
CABANATUAN BYPASS - CONTRACT PACKAGE II	FULL SIZE A1		

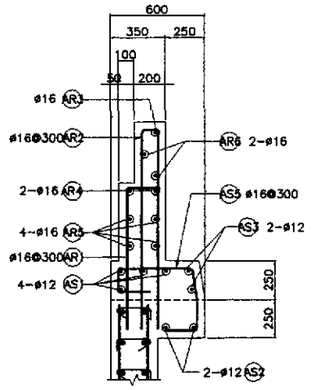


1 - PLAN
SCALE 1:50

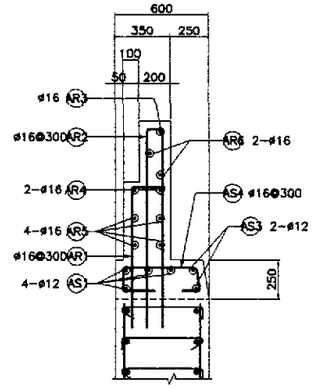


LEFT SIDE

4 - SIDEWALK DETAIL
SCALE 1:50

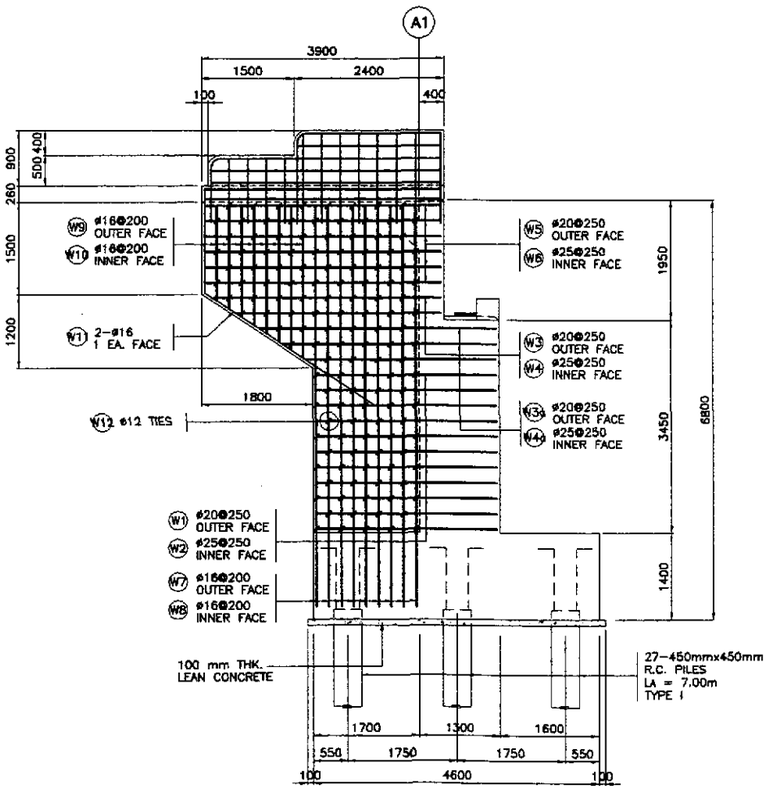


5A - SECTION
SCALE 1:20

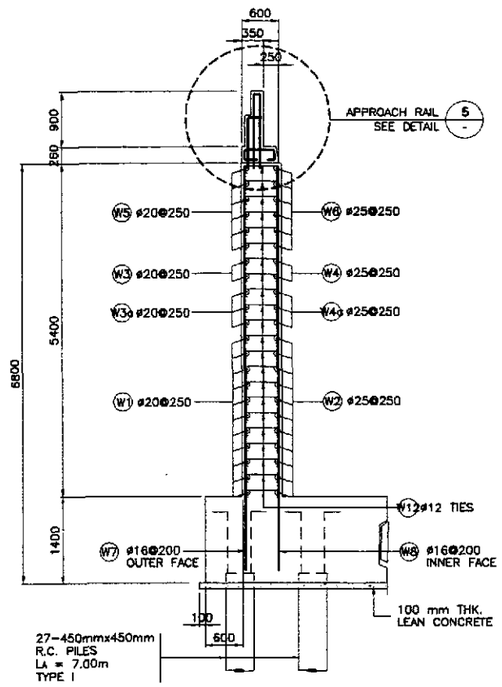


5B - SECTION
SCALE 1:20

5 - APPROACH RAIL DETAILS
SCALE 1:20

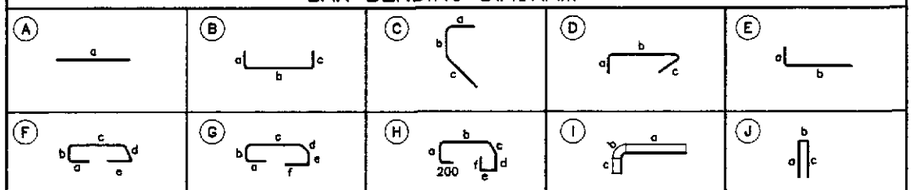


2 - WINGWALL ELEVATION
SCALE 1:50



3 - SECTION
SCALE 1:50

BAR BENDING DIAGRAM



SCHEDULE OF REINFORCEMENT PER ABUTMENT

LOCATION	CONCRETE VOLUME (m³)	BAR MARK	BAR SIZE	QTY.	SPACING	BAR SHAPE	DIMENSIONS (mm) OUT TO OUT a	b	c	d	e	f	LENGTH EA. BAR (mm)	TOTAL LENGTH (m)	UNIT WT. (kg/m)	WEIGHT (kg)	REBAR RATIO (kg/m³)
WINGWALL	11.66	W1	20	22	250	B	400	2900	150	–	–	–	3450	75.90	2.466	188	153.55
		W2	25	22	250	B	400	2900	150	–	–	–	3450	75.90	3.854	293	
		W3	20	4	250	B	400	3500	150	–	–	–	4050	16.20	2.466	40	
		W3a	20	6	250	B	400	3450	150	–	–	–	4000	24.00	2.466	60	
		W4	25	4	250	B	400	3500	150	–	–	–	4050	16.20	3.854	63	
		W4a	25	6	250	B	400	3450	150	–	–	–	4000	24.00	3.854	93	
		W5	20	12	250	B	400	3800	150	–	–	–	4350	52.20	2.466	129	
		W6	25	12	250	B	400	3800	150	–	–	–	4350	52.20	3.854	202	
		W7	16	18	200	E	250	6550	–	–	–	–	6800	122.40	1.579	194	
		W8	16	18	200	E	250	6550	–	–	–	–	6800	122.40	1.579	194	
		W9	16	16	200	E	250	2000	–	–	–	–	2250	36.00	1.579	57	
		W10	16	16	200	E	250	2000	–	–	–	–	2250	36.00	1.579	57	
		W11	16	4	AS SHOWN	C	250	1500	3500	–	–	–	5250	21.00	1.579	34	
		W12	12	266	AS SHOWN	D	170	450	170	–	–	–	790	210.14	0.888	187	
														GRADE 60 SUB-TOTAL = 1,068 kgs.			
														GRADE 40 SUB-TOTAL = 723 kgs.			
APPROACH RAILING AND SIDEWALK	3.28	AS	12	8	AS SHOWN	A	3800	–	–	–	–	–	3800	30.40	0.888	27	94.48
		AS2	12	4	AS SHOWN	A	3800	–	–	–	–	–	3800	15.20	0.888	14	
		AS3	12	4	AS SHOWN	A	3800	–	–	–	–	–	3800	15.20	0.888	14	
		AS4	16	6	300	F	200	170	480	200	200	–	1250	7.50	1.579	12	
		AS5	16	24	300	G	200	170	480	200	170	200	1420	34.08	1.579	54	
		AR	16	8	300	E	200	900	–	–	–	–	1100	8.80	1.579	14	
		AR2	16	16	300	J	1300	120	1300	–	–	–	2720	43.52	1.579	69	
		AR3	16	2	AS SHOWN	I	2300	236	1300	–	–	–	3836	7.67	1.579	13	
		AR4	16	4	AS SHOWN	I	3700	236	900	–	–	–	4836	19.34	1.579	31	
		AR5	16	8	AS SHOWN	A	3700	–	–	–	–	–	3700	29.60	1.579	47	
		AR6	16	4	AS SHOWN	A	2300	–	–	–	–	–	2300	9.20	1.579	15	
														GRADE 40 SUB-TOTAL = 310 kgs.			
TOTAL	15.80													GRADE 60 TOTAL = 1,068 kgs. GRADE 40 TOTAL = 1,033 kgs.			

JICA
JAPAN INTERNATIONAL COOPERATION AGENCY

KATAHIRA & ENGINEERS INTERNATIONAL
YACHIYO ENGINEERING CO., LTD.

	DATE	SIGNATURE
DESIGNED	10/16/02	P. GONZALES
CHECKED	10/16/02	K. KOBAYASHI
SUBMITTED	10/18/02	M. KNIGHT TEAM LEADER

REPUBLIC OF THE PHILIPPINES
DEPARTMENT OF PUBLIC WORKS AND HIGHWAYS

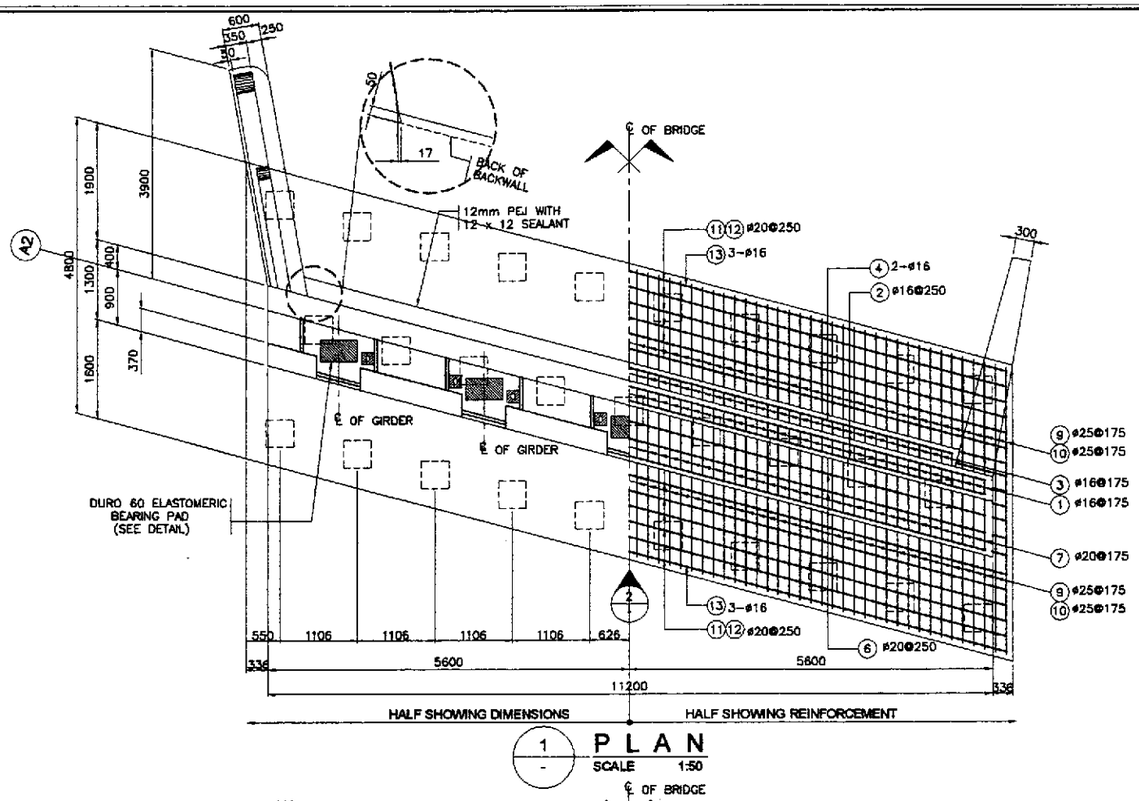
PJHL – PMO	BUREAU OF DESIGN		OFFICE OF THE SECRETARY	
Submitted By:	Reviewed By:	Recommended By:	Recommended By: (See cover sheet for Signature)	Approved By: (See cover sheet for Signature/Approval)
DANILO C. TRAJANO Project Director	ADRIANO M. DOROY Chief, Bridges Division	GILBERTO S. REYES Director IV (OIC)	MANUEL M. BONOAN Undersecretary	SIMEON A. DATUMANONG Secretary

PROJECT AND LOCATION :
THE DETAILED DESIGN STUDY ON
UPGRADING INTER-URBAN HIGHWAY SYSTEM
ALONG THE PAN-PHILIPPINE HIGHWAY
(Plaridel, Cabanatuan and San Jose Bypasses)
CABANATUAN BYPASS - CONTRACT PACKAGE II

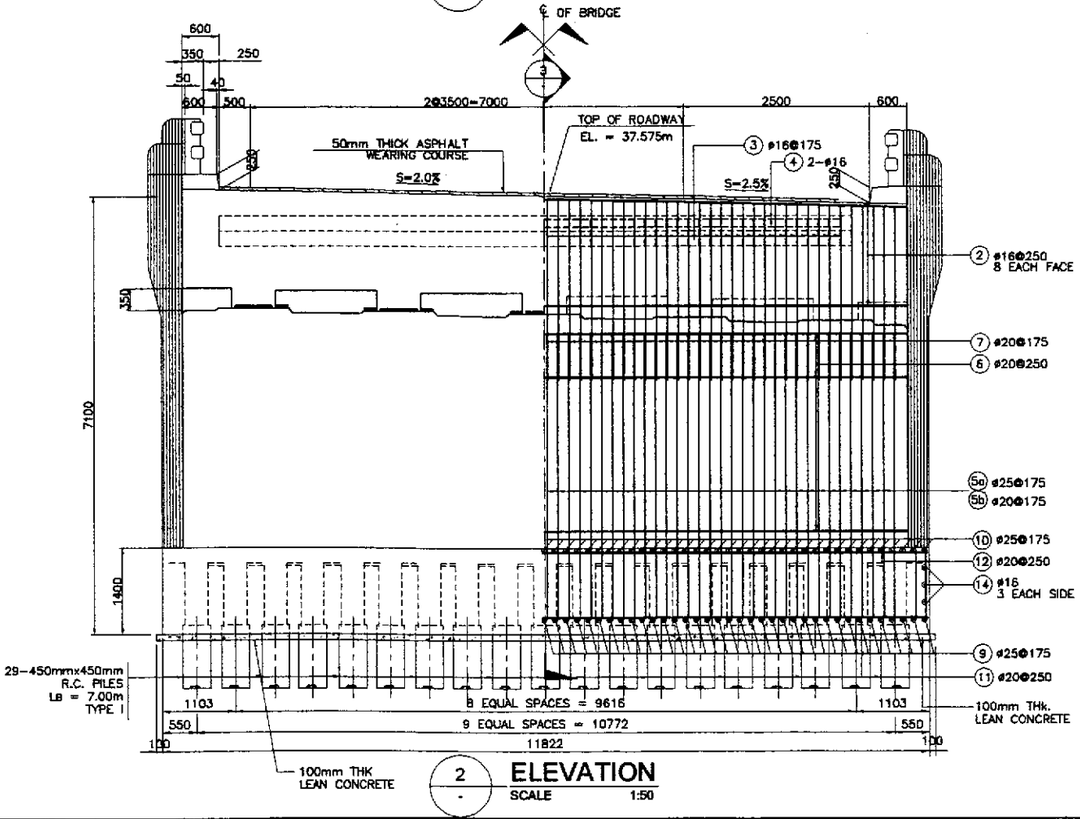
SCALE :
AS SHOWN
FULL SIZE A1

SHEET CONTENTS :
BRIDGE NO. 8
ABUTMENT A1
WINGWALL REINFORCEMENT DETAILS
(INITIAL STAGE)

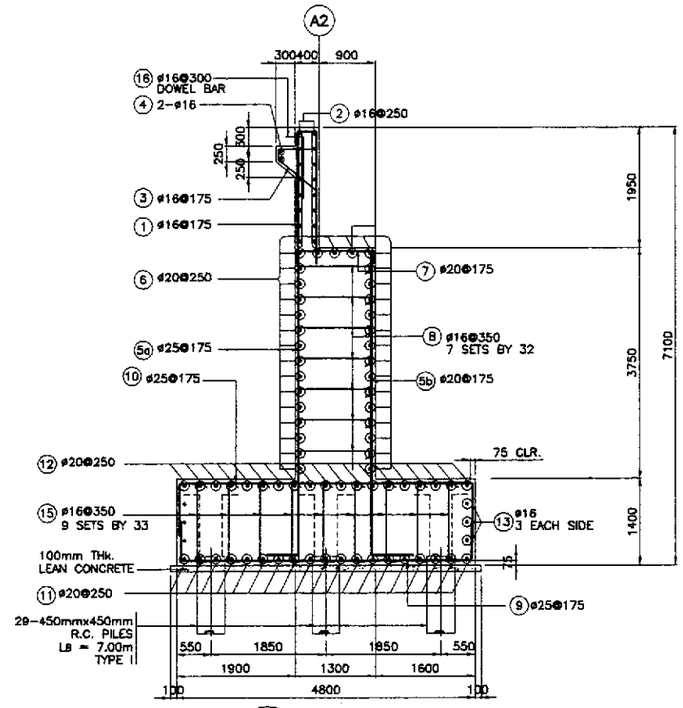
SHEET NO. :
B8-06



1 - PLAN
SCALE 1:50

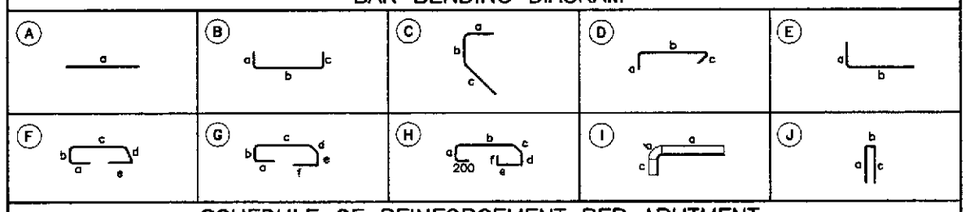


2 - ELEVATION
SCALE 1:50



3 - SECTION
SCALE 1:50

BAR BENDING DIAGRAM



SCHEDULE OF REINFORCEMENT PER ABUTMENT

LOCATION	CONCRETE VOLUME (m^3)	BAR MARK	BAR SIZE	QTY.	SPACING	BAR SHAPE	DIMENSIONS (mm) OUT TO OUT a	b	c	d	e	f	LENGTH EA. BAR (mm)	TOTAL LENGTH (m)	UNIT WT. (kg/m)	WEIGHT (kg)	REBAR RATIO (kg/m^3)
BACKWALL	9.86	①	16	64	175	B	2200	300	2200	–	–	–	4700	300.80	1.579	475	95.02
		②	16	16	250	A	11500	–	–	–	–	–	11500	184.00	1.579	291	
		③	16	58	175	C	600	150	750	–	–	–	1500	87.00	1.579	138	
		④	16	2	AS SHOWN	A	10250	–	–	–	–	–	10250	20.50	1.579	33	
MAINWALL	54.60	⑤a	25	64	175	E	400	4900	–	–	–	–	5300	339.20	3.854	1308	72.38
		⑤b	20	64	175	E	400	4900	–	–	–	–	5300	339.20	2.466	837	
		⑥	20	33	250	A	11500	–	–	–	–	–	11500	379.50	2.466	936	
		⑦	20	64	175	B	250	1200	250	–	–	–	1700	108.80	2.466	269	
		⑧	16	224	350	D	250	1200	250	–	–	–	1700	380.80	1.579	602	
FOOTING	79.30	⑨	25	68	175	B	700	4650	700	–	–	–	6050	411.40	3.854	1586	69.12
		⑩	25	68	175	B	700	4650	700	–	–	–	6050	411.40	3.854	1586	
		⑪	20	20	250	B	700	12050	700	–	–	–	13450	269.00	2.466	664	
		⑫	20	20	250	B	700	12050	700	–	–	–	13450	269.00	2.466	664	
		⑬	16	6	AS SHOWN	A	12050	–	–	–	–	–	12050	72.30	1.579	115	
		⑭	16	6	AS SHOWN	A	4650	–	–	–	–	–	4650	27.90	1.579	45	
		⑮	16	297	350	D	250	1250	250				1750	519.75	1.579	821	
DOWEL		⑯	16	34	300	E	650	500	–	–	–	–	1150	39.10	1.579	62	
TOTAL	143.76														GRADE 40 TOTAL = 2,582 kgs. GRADE 60 TOTAL = 7,850 kgs.		

JICA
JAPAN INTERNATIONAL COOPERATION AGENCY
KATAHIRA & ENGINEERS INTERNATIONAL
YACHIYO ENGINEERING CO., LTD.

	DATE	SIGNATURE
DESIGNED	10/4/02	E. GONZALES
CHECKED	10/16/02	N. KAWASHIMA
SUBMITTED	10/18/02	TEAM LEADER

REPUBLIC OF THE PHILIPPINES
DEPARTMENT OF PUBLIC WORKS AND HIGHWAYS

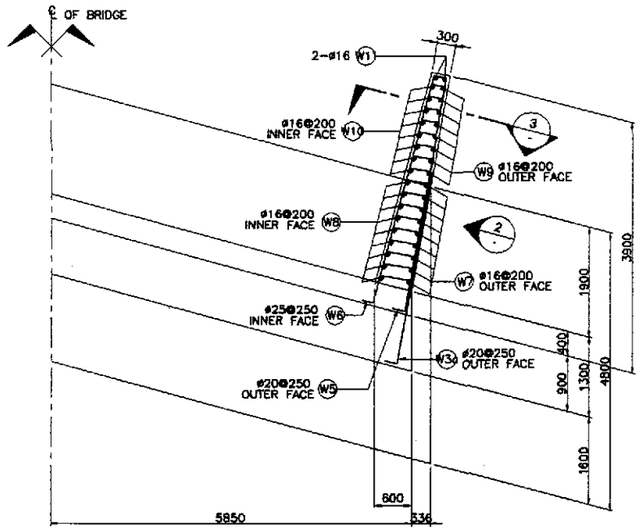
PJHL – PMO	BUREAU OF DESIGN		OFFICE OF THE SECRETARY	
Submitted By:	Reviewed By:	Recommended By:	Recommended By: (See cover sheet for Signature)	Approved By: (See cover sheet for Signature/Approval)
DANILO C. TRAJANO	ADRIANO M. DOROY	GILBERTO S. REYES	MANUEL M. BONOAN	SIMEON A. DATUMANONG
Project Director	Chief, Bridges Division	Director IV (OIC)	Undersecretary	Secretary

PROJECT AND LOCATION :
THE DETAILED DESIGN STUDY ON UPGRADING INTER-URBAN HIGHWAY SYSTEM ALONG THE PAN-PHILIPPINE HIGHWAY (Plaridel, Cabanatuan and San Jose Bypasses)
CABANATUAN BYPASS - CONTRACT PACKAGE II

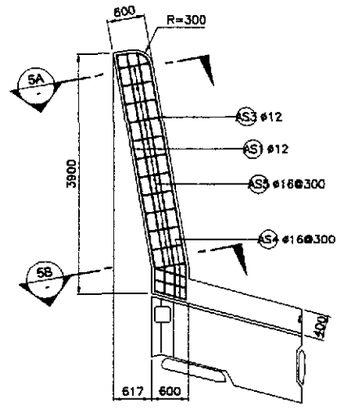
SCALE :
1 : 50
FULL SIZE A1

SHEET CONTENTS :
BRIDGE NO. 8
ABUTMENT A2
MAINWALL REINFORCEMENT DETAILS
(INITIAL STAGE)

SHEET NO. :
B8-07

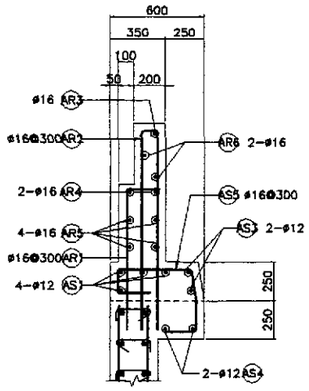


1 / - PLAN
SCALE 1:50

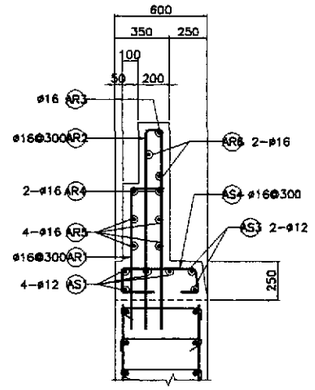


LEFT SIDE

4 / - SIDEWALK DETAIL
SCALE 1:50

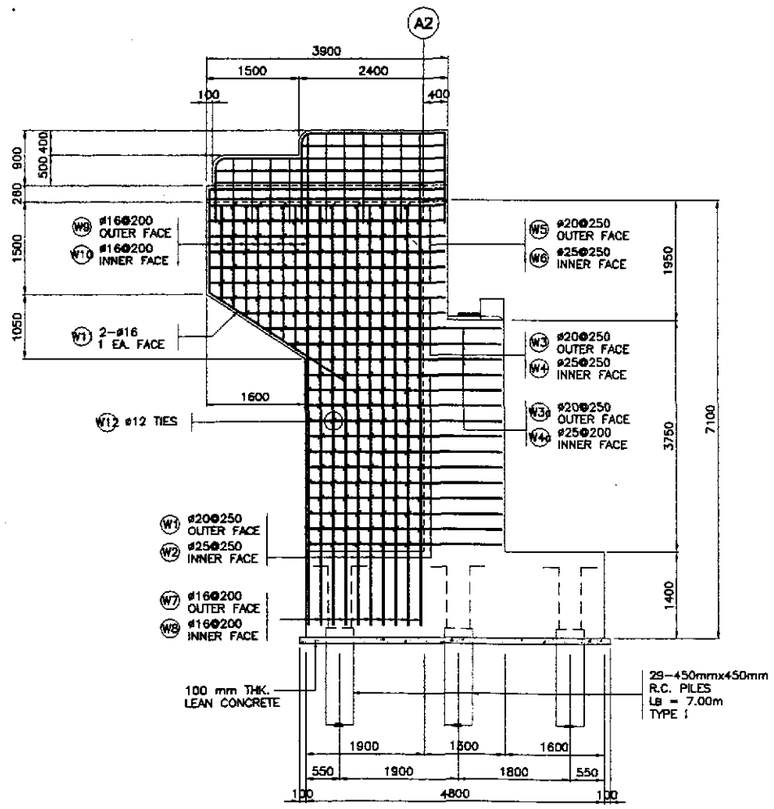


5A / - SECTION
SCALE 1:20

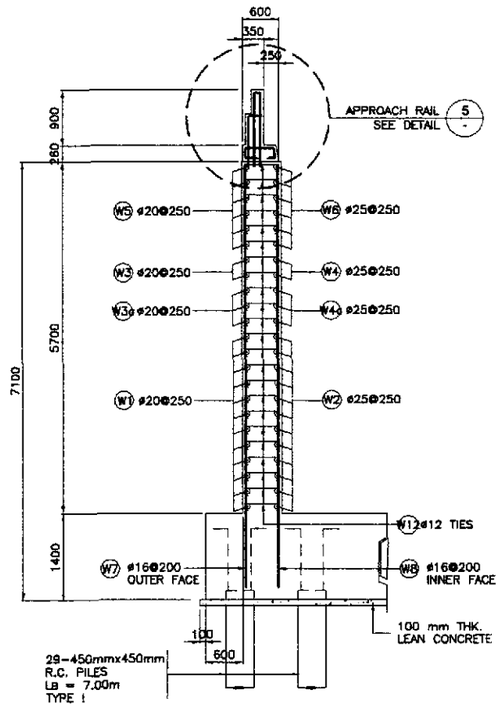


5B / - SECTION
SCALE 1:20

5 / - APPROACH RAIL DETAILS
SCALE 1:20



2 / - WINGWALL ELEVATION
SCALE 1:50



3 / - SECTION
SCALE 1:50

BAR BENDING DIAGRAM

SCHEDULE OF REINFORCEMENT PER ABUTMENT

LOCATION	CONCRETE VOLUME (m³)	BAR MARK	BAR SIZE	QTY.	SPACING	BAR SHAPE	DIMENSIONS (mm) OUT TO OUT a	b	c	d	e	f	LENGTH EA. BAR (mm)	TOTAL LENGTH (m)	UNIT WT. (kg/m)	WEIGHT (kg)	REBAR RATIO (kg/m³)
WINGWALL	12.66	W1	20	24	250	B	400	3100	150	–	–	–	3650	87.60	2.466	217	152.02
		W2	25	24	250	B	400	3100	150	–	–	–	3650	87.60	3.854	338	
		W3	20	4	250	B	400	3500	150	–	–	–	4050	16.20	2.466	40	
		W3a	20	6	250	B	400	3450	150	–	–	–	4000	24.00	2.466	60	
		W4	25	4	250	B	400	3500	150	–	–	–	4050	16.20	3.854	63	
		W4a	25	6	250	B	400	3450	150	–	–	–	4000	24.00	3.854	93	
		W5	20	12	250	B	400	3800	150	–	–	–	4350	52.20	2.466	129	
		W6	25	12	250	B	400	3800	150	–	–	–	4350	52.20	3.854	202	
		W7	16	20	200	E	250	6850	–	–	–	–	7100	142.00	1.579	225	
		W8	16	20	200	E	250	6850	–	–	–	–	7100	142.00	1.579	225	
		W9	16	14	200	E	250	1900	–	–	–	–	2150	30.10	1.579	48	
		W10	16	14	200	E	250	1900	–	–	–	–	2150	30.10	1.579	48	
		W11	16	4	AS SHOWN	C	250	1500	3500	–	–	–	5250	21.00	1.579	34	
		W12	12	288	AS SHOWN	D	170	450	170	–	–	–	790	227.52	0.888	203	
														GRADE 60 SUB-TOTAL = 1,142 kgs.			
														GRADE 40 SUB-TOTAL = 783 kgs.			
APPROACH RAILING AND SIDEWALK	3.28	AS	12	8	AS SHOWN	A	3800	–	–	–	–	–	3800	30.40	0.888	27	94.48
		AS2	12	4	AS SHOWN	A	3800	–	–	–	–	–	3800	15.20	0.888	14	
		AS3	12	4	AS SHOWN	A	3800	–	–	–	–	–	3800	15.20	0.888	14	
		AS4	16	6	300	F	200	170	480	200	200	–	1250	7.50	1.579	12	
		AS5	16	24	300	G	200	170	480	200	170	200	1420	34.08	1.579	54	
		AR	16	8	300	E	200	900	–	–	–	–	1100	8.80	1.579	14	
		AR2	16	16	300	J	1300	120	1300	–	–	–	2720	43.52	1.579	69	
		AR3	16	2	AS SHOWN	I	2300	236	1300	–	–	–	3836	7.67	1.579	13	
		AR4	16	4	AS SHOWN	I	3700	236	900	–	–	–	4836	19.34	1.579	31	
		AR5	16	8	AS SHOWN	A	3700	–	–	–	–	–	3700	29.60	1.579	47	
		AR6	16	4	AS SHOWN	A	2300	–	–	–	–	–	2300	9.20	1.579	15	
														GRADE 40 SUB-TOTAL = 310 kgs.			
TOTAL	14.94													GRADE 60 TOTAL = 1,142 kgs.			
														GRADE 40 TOTAL = 1,093 kgs.			

JICA
JAPAN INTERNATIONAL COOPERATION AGENCY

KEI KATAHIRA & ENGINEERS INTERNATIONAL
YCO YACHIYO ENGINEERING CO., LTD.

	DATE	SIGNATURE
DESIGNED	10/4/02	P. GONZALES
CHECKED	10/4/02	
SUBMITTED	10/8/02	TEAM LEADER

REPUBLIC OF THE PHILIPPINES
DEPARTMENT OF PUBLIC WORKS AND HIGHWAYS

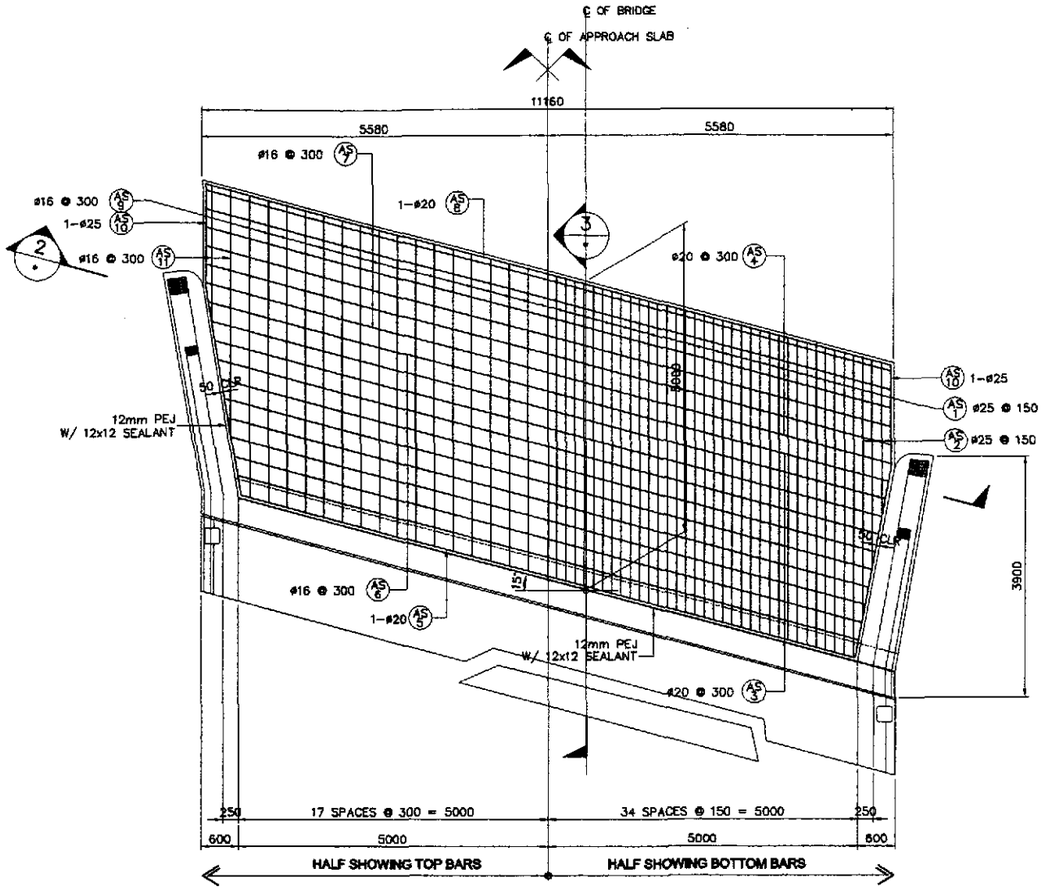
PJHL – PMO	BUREAU OF DESIGN		OFFICE OF THE SECRETARY	
Submitted By:	Reviewed By:	Recommended By:	Recommended By: (See cover sheet for Signature)	Approved By: (See cover sheet for Signature/Approval)
DANILO C. TRAJANO, Project Director	ADRIANO M. DOROY, Chief, Bridges Division	GILBERTO S. REYES, Director IV (OIC)	MANUEL M. BONGAN, Undersecretary	SIMEON A. DATUMANONG, Secretary

PROJECT AND LOCATION :
THE DETAILED DESIGN STUDY ON
UPGRADING INTER-URBAN HIGHWAY SYSTEM
ALONG THE PAN-PHILIPPINE HIGHWAY
(Plaridel, Cabanatuan and San Jose Bypasses)
CABANATUAN BYPASS - CONTRACT PACKAGE II

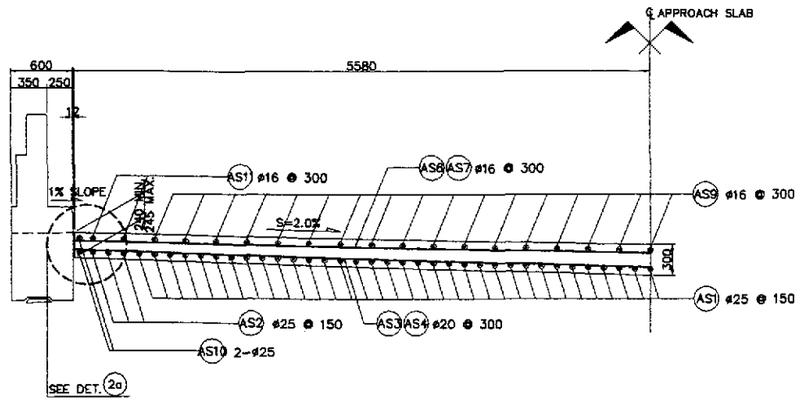
SCALE :
AS SHOWN
FULL SIZE A1

SHEET CONTENTS :
BRIDGE NO. 8
ABUTMENT A2
WINGWALL REINFORCEMENT DETAILS
(INITIAL STAGE)

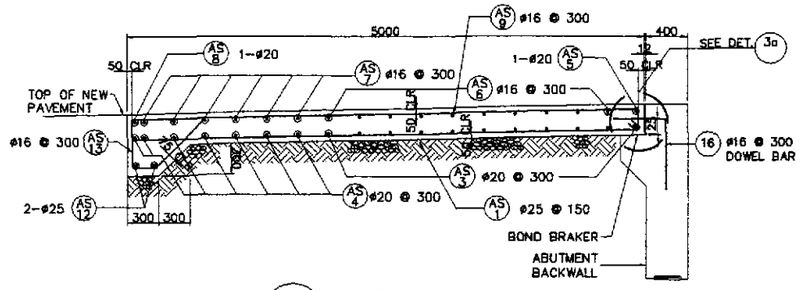
SHEET NO. :
B8-08



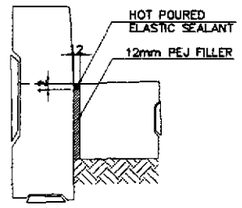
1 / - PLAN
SCALE 1:50



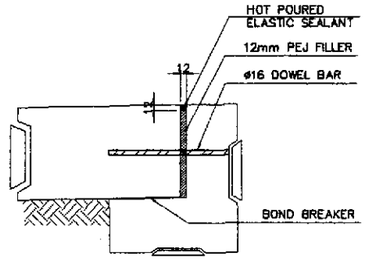
2 / - SECTION
SCALE 1:30



3 / - SECTION
SCALE 1:30

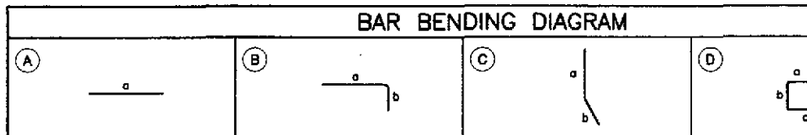


2a / - DETAIL
SCALE 1:10



3a / - DETAIL
SCALE 1:10

BAR BENDING DIAGRAM



SCHEDULE OF REINFORCEMENT PER APPROACH SLAB

LOCATION	CONCRETE VOLUME (m³)	BAR MARK	BAR SIZE	QTY.	SPACING	BAR SHAPE	DIMENSIONS (mm) OUT TO OUT a	b	c	d	e	f	LENGTH EA. BAR (mm)	TOTAL LENGTH (m)	UNIT WEIGHT (kg/m)	WEIGHT (kg)	REBAR RATIO (kg/cu.m)
APPROACH SLAB	17.67	AS1	25	68	150	B	4900	200	–	–	–	–	5100	346.80	3.854	1337	161.78
		AS2	25	6	150	B	3350	200	–	–	–	–	3550	21.30	3.854	83	
		AS3	20	11	300	A	11250	–	–	–	–	–	11250	123.75	2.466	306	
		AS4	20	7	300	A	11950	–	–	–	–	–	11950	83.65	2.466	207	
		AS5	20	1	AS SHOWN	A	10700	–	–	–	–	–	10700	10.7	2.466	27	
		AS6	16	10	300	A	11300	–	–	–	–	–	11300	113	1.579	179	
		AS7	16	6	300	A	11950	–	–	–	–	–	11950	71.7	1.579	114	
		AS8	20	1	AS SHOWN	A	11950	–	–	–	–	–	11950	11.95	2.466	30	
		AS9	16	34	300	B	4900	200	–	–	–	–	5100	173.40	1.579	274	
		AS10	25	4	AS SHOWN	C	1700	3400	–	–	–	–	5100	20.40	3.854	79	
		AS11	16	4	300	B	3050	200	–	–	–	–	3250	13.00	1.579	21	
		AS12	25	2	AS SHOWN	A	11950	–	–	–	–	–	11950	23.9	3.854	93	
		AS13	16	38	300	D	400	500	200	700	–	–	1800	68.40	1.579	109	
TOTAL	17.67														GRADE 40 TOTAL = 697 kgs. GRADE 60 TOTAL = 2162 kgs.		

JICA
JAPAN INTERNATIONAL COOPERATION AGENCY
KATAHIRA & ENGINEERS INTERNATIONAL
YACHIYO ENGINEERING CO., LTD.

	DATE	SIGNATURE
DESIGNED	10/10/07	E.N. SALLAN
CHECKED	10/16/07	
SUBMITTED	10/18/07	TEAM LEADER

REPUBLIC OF THE PHILIPPINES
DEPARTMENT OF PUBLIC WORKS AND HIGHWAYS

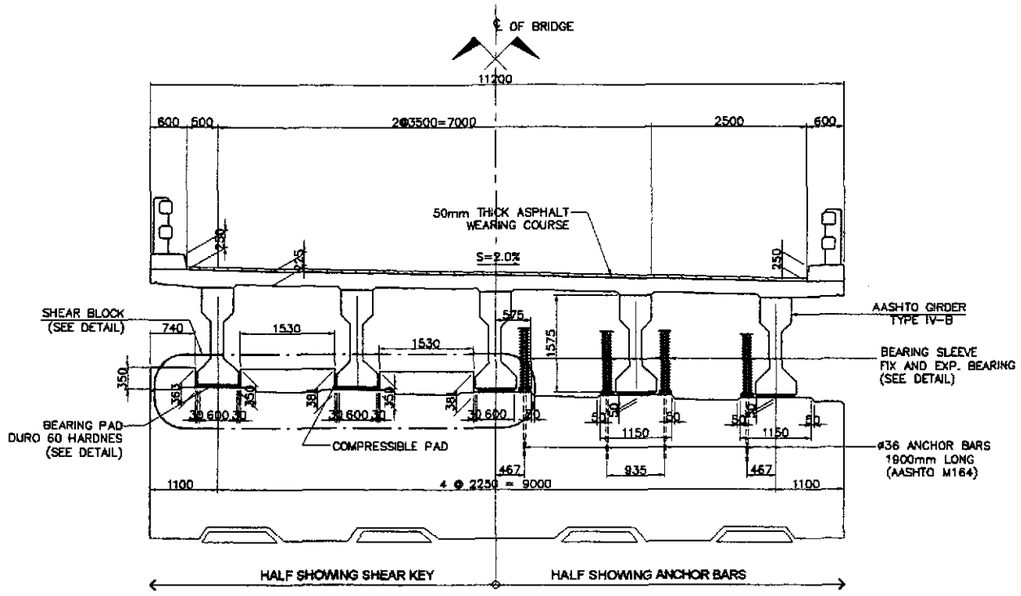
PUHL – PMO	BUREAU OF DESIGN		OFFICE OF THE SECRETARY	
Submitted By:	Reviewed By:	Recommended By:	Recommended By: (See cover sheet for Signature)	Approved By: (See cover sheet for Signature/Approval)
DANILO C. TRAJANO, Project Director	ADRIANO M. DOROY, Chief, Bridges Division	GILBERTO S. REYES, Director IV (OIC)	MANUEL M. BONOAN, Undersecretary	SIMEON A. DATUMANONG, Secretary

PROJECT AND LOCATION :
THE DETAILED DESIGN STUDY ON UPGRADING INTER-URBAN HIGHWAY SYSTEM ALONG THE PAN-PHILIPPINE HIGHWAY (Plaridel, Cabanatuan and San Jose Bypasses)
CABANATUAN BYPASS - CONTRACT PACKAGE II

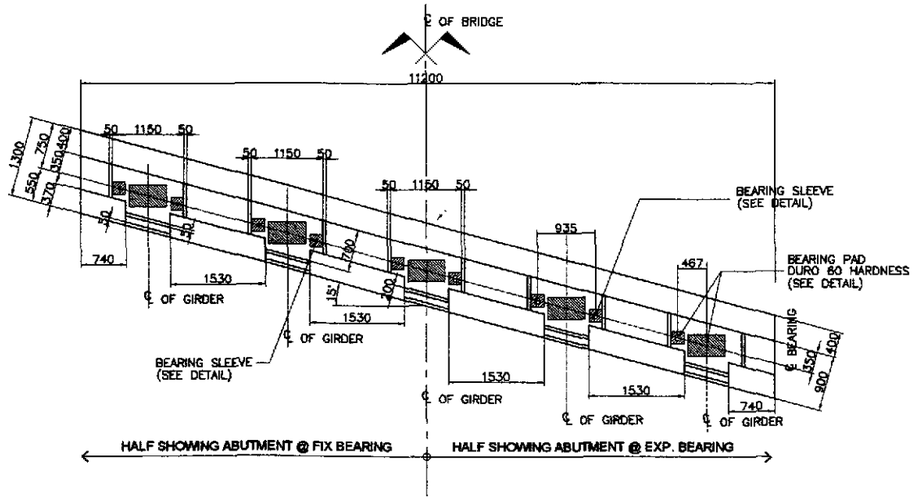
SCALE : AS SHOWN
FULL SIZE A1

SHEET CONTENTS :
BRIDGE NO. 8
APPROACH SLAB PLAN' SECTIONS AND DETAILS (INITIAL STAGE)

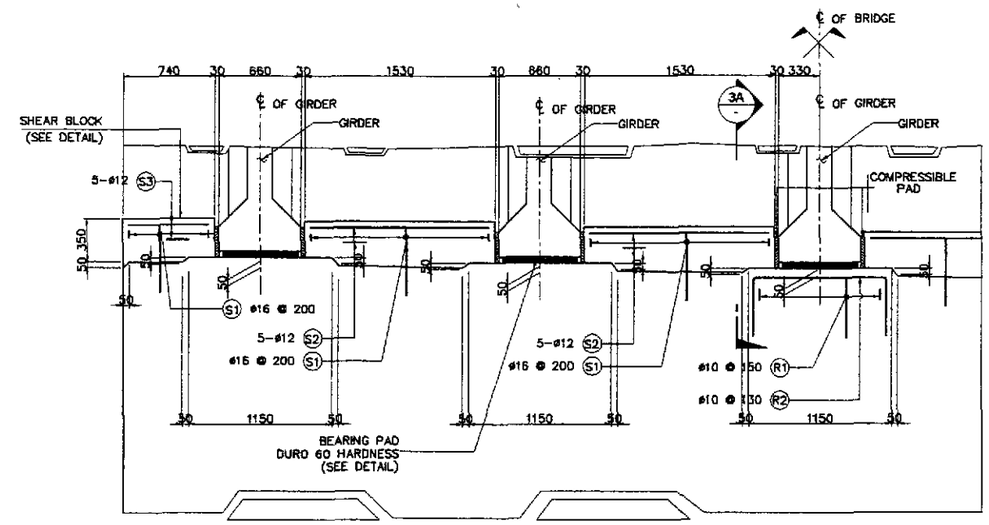
SHEET NO. : B8-09



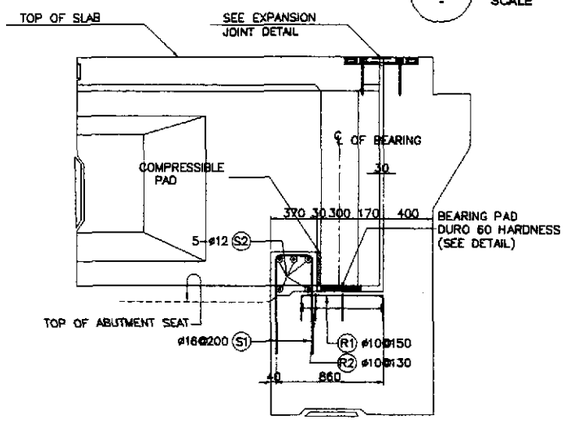
1 / - **SECTION AT ABUTMENT SEAT**
SCALE 1:50



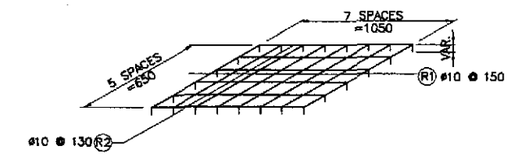
2 / - **PLAN AT ABUTMENT SEAT**
SCALE 1:50



3 / - **SHEAR BLOCK DETAIL**
SCALE 1:25



3A / - **SECTION**
SCALE 1:25



4 / - **RISER REINFORCEMENT**
NOT TO SCALE

BAR BENDING DIAGRAM

(A) a

(B) a b c

SCHEDULE OF REINFORCEMENT

LOCATION	CONCRETE VOLUME (m^3)	BAR MARK	BAR SIZE	QTY.	SPACING	BAR SHAPE	DIMENSION(mm) OUT TO OUT a	b	c	d	e	LENGTH EACH BAR (m)	TOTAL LENGTH (m)	UNIT WEIGHT (kg/m)	WEIGHT (kg)	REBAR RATIO (kg/m^3)
SHEAR KEY & RISER	1.42	S1	16	40	200	B	560	300	560			1420	56.80	1.579	90	144.83
		S2	12	20	AS SHOWN	A	1500					1500	30.00	0.888	27	
		S3	12	10	AS SHOWN	A	680					680	6.80	0.888	7	
		R1	10	40	150	B	500	670	500			1670	66.80	0.616	42	
		R2	10	30	130	B	500	1090	500			2090	62.70	0.616	39	
TOTAL	1.42	GRADE 40 TOTAL = 205 kgs.														

THE REINFORCEMENT SHOWN ON THIS TABLE IS FOR REFERENCE ONLY. THE CONTRACTOR SHOULD CHECK AND VERIFY ALL DIMENSIONS, SIZES AND QUANTITIES OF REINFORCEMENT.

JICA JAPAN INTERNATIONAL COOPERATION AGENCY
KEI KATAHIRA & ENGINEERS INTERNATIONAL — YEC YACHIYO ENGINEERING CO., LTD.

	DATE	SIGNATURE
DESIGNED	10/4/02	E.N. SALLAN
CHECKED	10/2/02	
SUBMITTED	9/18/02	TEAM LEADER

REPUBLIC OF THE PHILIPPINES
DEPARTMENT OF PUBLIC WORKS AND HIGHWAYS

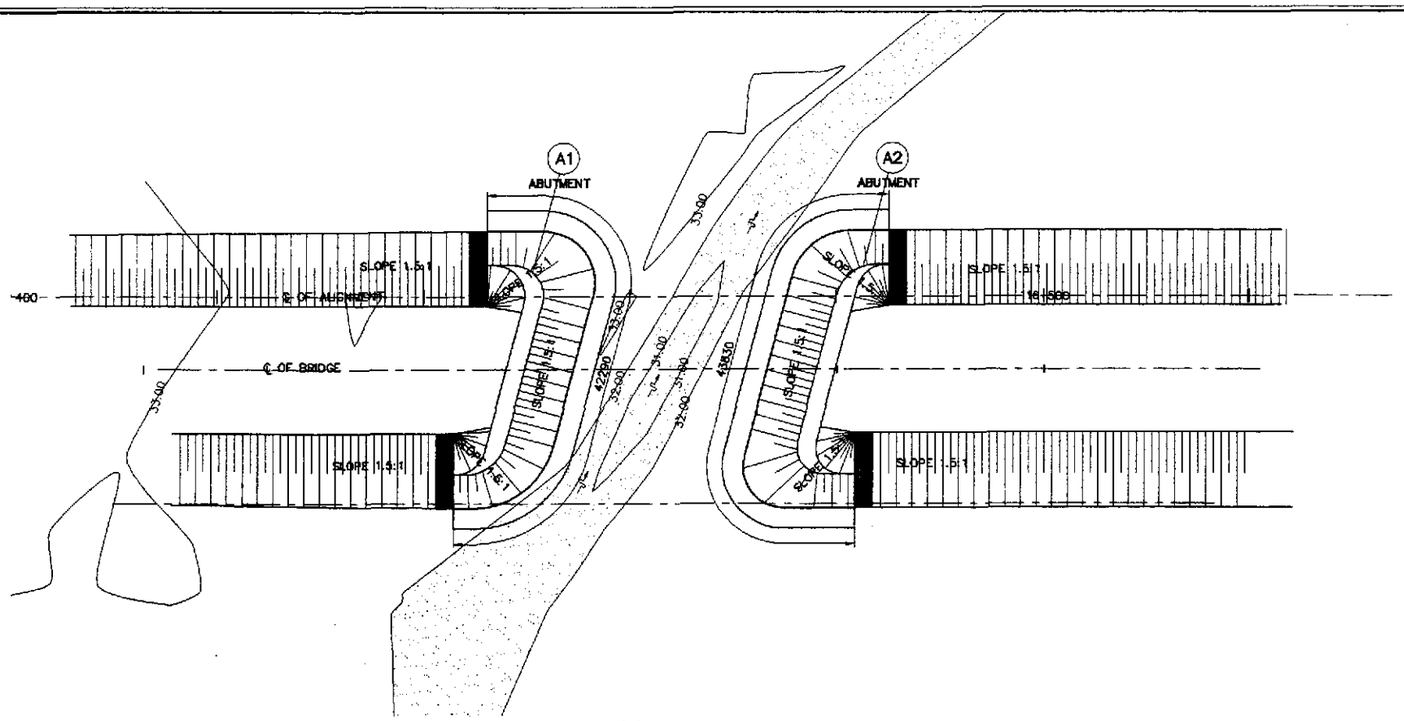
FUNC. – PMO	BUREAU OF DESIGN		OFFICE OF THE SECRETARY	
Submitted By:	Reviewed By:	Recommended By:	Recommended By: (See cover sheet for Signature)	Approved By: (See cover sheet for Signature/Approval)
DANILO C. TRAJANO, Project Director	ADRIANO M. DOROY, Chief, Bridges Division	GILBERTO S. REYES, Director IV (OIC)	MANUEL M. BONOAN, Undersecretary	SIMEON A. DATUMANONG, Secretary

PROJECT AND LOCATION :
THE DETAILED DESIGN STUDY ON UPGRADING INTER-URBAN HIGHWAY SYSTEM ALONG THE PAN-PHILIPPINE HIGHWAY (Plaridel, Cabanatuan and San Jose Bypasses)
CABANATUAN BYPASS - CONTRACT PACKAGE II

SCALE : AS SHOWN — FULL SIZE A1

SHEET CONTENTS :
BRIDGE NO. 8
SHEAR KEY AND RISER DETAILS AT ABUTMENT (INITIAL STAGE)

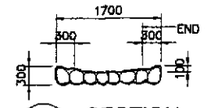
SHEET NO. : B8-10



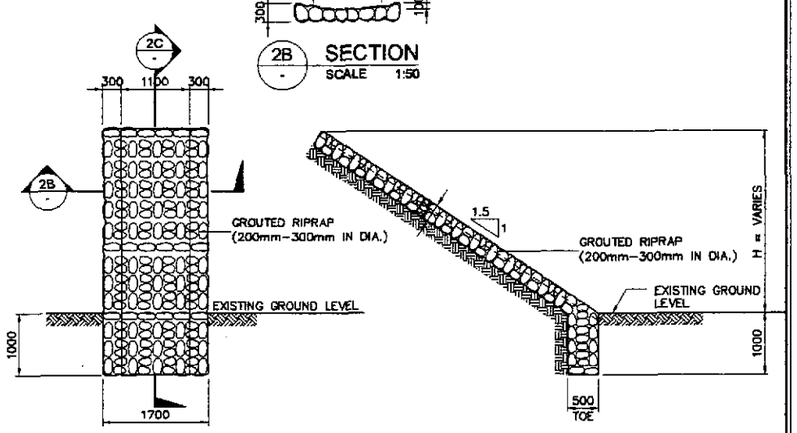
1A PLAN
SCALE 1:300

GENERAL NOTES:

1. GROUTED RIPRAP (250mm–300mmDIA.) SHALL BE USED FOR THE FACING AND SHALL BE CAREFULLY HANDLAID WITH THE LONGEST DIMENSIONS PERPENDICULAR TO THE SLOPE AND FIRMLY BEDDED INTO THE SLOPE AND ADJACENT TO THE ADJOINING BOULDERS SPACED BETWEEN THE BOULDERS. THE SPACE BETWEEN THE BOULDERS SHALL BE COMPLETELY FILLED WITH MORTAR. THE OUTSIDE SURFACE OF THE BOULDERS SHALL BE LEFT EXPOSED AND THE SURFACE OF THE MORTAR SHALL BE SWEPT WITH A STIFF BROOM.
2. GEOTEXTILE
   THE FOLLOWING SPECIFICATIONS ARE REQUIRED:
   1. POLYESTER OR POLYPROPELINE – 100%
   2. MECHANICALLY BONDED/HEAT BONDED
   3. NON–WOVEN
   4. EFFECTIVE OPENING SIZE – 110 MICRONS (MAX.)
   5. THICKNESS UNDER PRESSURE – 0.80mm (MIN.)
   6. WEIGHT – 200g/sq. m. (MIN.)
   7. CBR PUNCTURE STRENGTH – 400N (MIN.)
   8. MULTI–DIRECTIONAL TENSILE STRENGTH – 13KN/m
3. GRAVEL FILTER SHALL BE COARSE AGGREGATES MATERIALS WHICH SATISFY THE REQUIREMENTS FOR ITEM 405, STRUCTURAL CONCRETE, GRADING B OF TABLE 405.1 AS REVISED.
4. RUBBLE CONCRETE SHALL BE CLASS "B" (1:2.5:5) MIX CONCRETE WITH BOULDERS EMBEDDED THEREIN. BOULDERS 250–300mmø SHALL BE CAREFULLY HAND–LAID WITHIN THE CONCRETE SECTION. THE BOULDERS SHALL BE THOROUGHLY INCORPORATED INTO THE CONCRETE MASS WITH A COVER OF 30mm AND NOT LESS THAN 30mm APART. THE RUBBLE CONCRETE SHALL BE COMPOSED OF 40 % CLASS "B" CONCRETE AND 60 % BOULDERS.
5. FOR THE LOOSE BOULDER APRON, BOULDERS 350–450mmø SHALL BE HAND–LAID, CLOSE TOGETHER AND SHALL BE FIRMLY BEDDED. ALL VOIDS BETWEEN BOULDERS SHALL BEFILLED WITH GRAVEL AND THE JOINTS FILLED WITH TIGHTLY DRIVEN SPALLS.
6. CURTAIN WALLS SHALL BE USED AT BOTH ENDS OF THE LOOSE BOULDER APRON BANK PROTECTION WORKS. BOULDERS SHALL BE CAREFULLY HAND–LAID AND EMBEDDED INTO THE CONCRETE SECTION.
7. NO CONCRETING UNDER WATER SHALL BE PERMITTED.
8. PROVIDE 1.0 m. BERM WHEN HEIGHT (H) IS > 4.0 m.

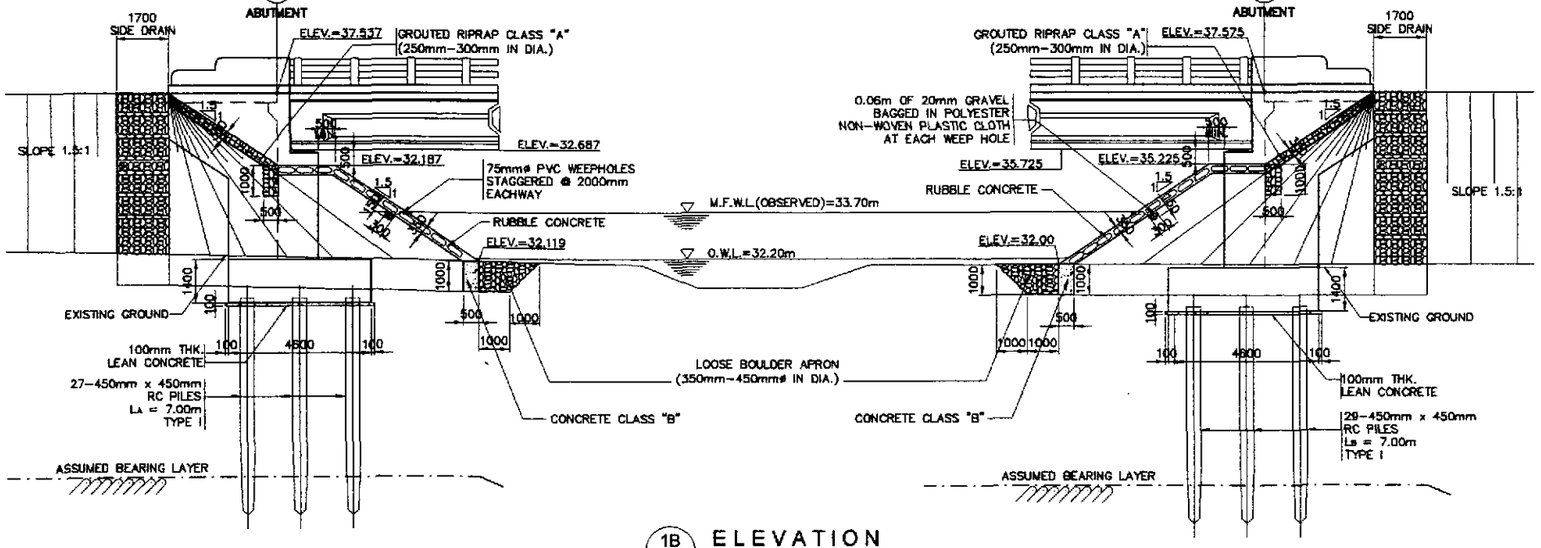


2B SECTION
SCALE 1:50



2A ELEVATION
SCALE 1:50

2C SECTION
SCALE 1:50



1B ELEVATION
SCALE 1:100

1 ABUTMENT SLOPE PROTECTION
SCALE AS SHOWN

VELOCITY (m/sec)	ROCK SIZE (mm)	
	VERY TURBULENT FLOW	SMOOTH FLOW
1.00	40	–
1.50	135	–
2.00	170	–
2.50	255	137
3.00	370	197
3.50	515	270
4.00	690	350
4.50	825	425
5.00	>900	590

PER ABUTMENT

LOCATION	SIZES	QUANTITY	
		ABUT. A1	ABUT. A2
CONC. CLASS "B"	1000 x 500 x LENGTH	19.27 cu. m.	19.27 cu. m.
BOULDER APRON	350mm–450mm IN DIA.	57.80 cu. m.	57.80 cu. m.
RUBBLE CONCRETE	250mm–300mm IN DIA.	61.25 cu. m.	61.25 cu. m.
SIDE DRAIN	200mm–300mm IN DIA.	10.52 cu. m.	10.52 cu. m.
GROUTED RIPRAP	250mm–300mm IN DIA.	15.78 cu. m.	15.78 cu. m.

JICA
JAPAN INTERNATIONAL COOPERATION AGENCY
KATAHIRA & ENGINEERS INTERNATIONAL
YACHIYO ENGINEERING CO., LTD.

	DATE	SIGNATURE
DESIGNED	10/4/02	P. GONZALES
CHECKED	10/16/02	
SUBMITTED	10/18/02	TEAM LEADER

REPUBLIC OF THE PHILIPPINES
DEPARTMENT OF PUBLIC WORKS AND HIGHWAYS

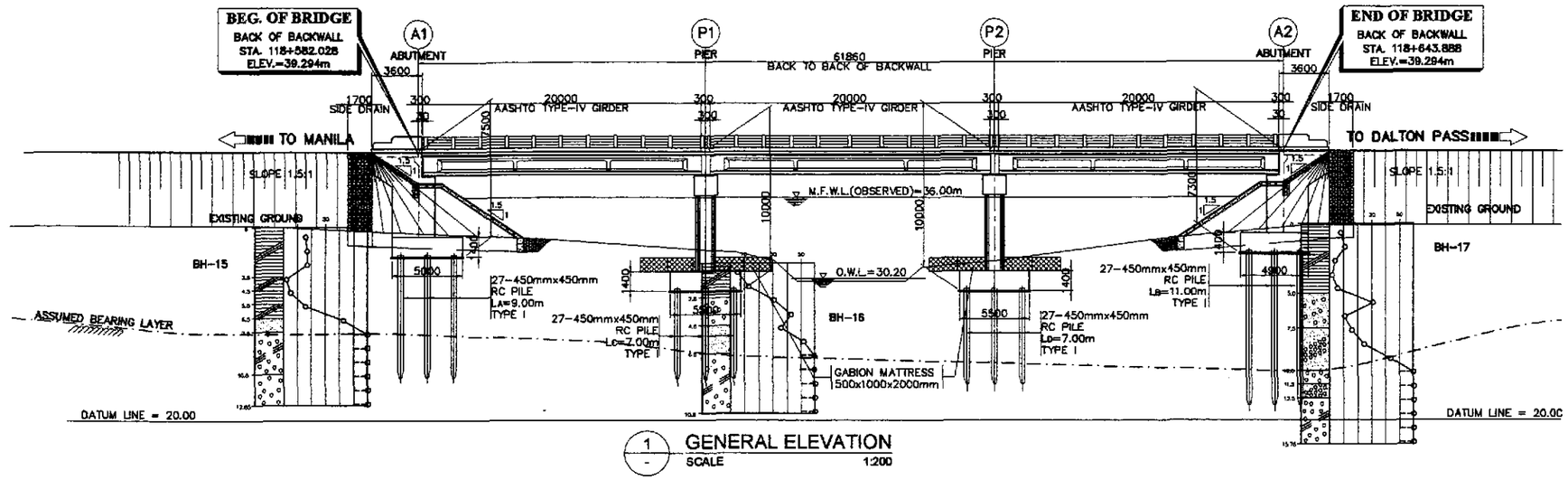
PUHL – PMO	BUREAU OF DESIGN		OFFICE OF THE SECRETARY	
Submitted By:	Reviewed By:	Recommended By:	Recommended By: (See cover sheet for Signature)	Approved By: (See cover sheet for Signature/Approval)
DANILO C. TRAJANO	PERFECTO L. ZAPLAN JR.	GILBERTO S. REYES	MANUEL M. BONOAN	SIMEON A. DATUMANONG
Project Director	Chief, Hydraulics Division (OIC)	Director IV (OIC)	Undersecretary	Secretary

PROJECT AND LOCATION :
THE DETAILED DESIGN STUDY ON
UPGRADING INTER-URBAN HIGHWAY SYSTEM
ALONG THE PAN-PHILIPPINE HIGHWAY
(Plaridel, Cabanatuan and San Jose Bypasses)
CABANATUAN BYPASS - CONTRACT PACKAGE II

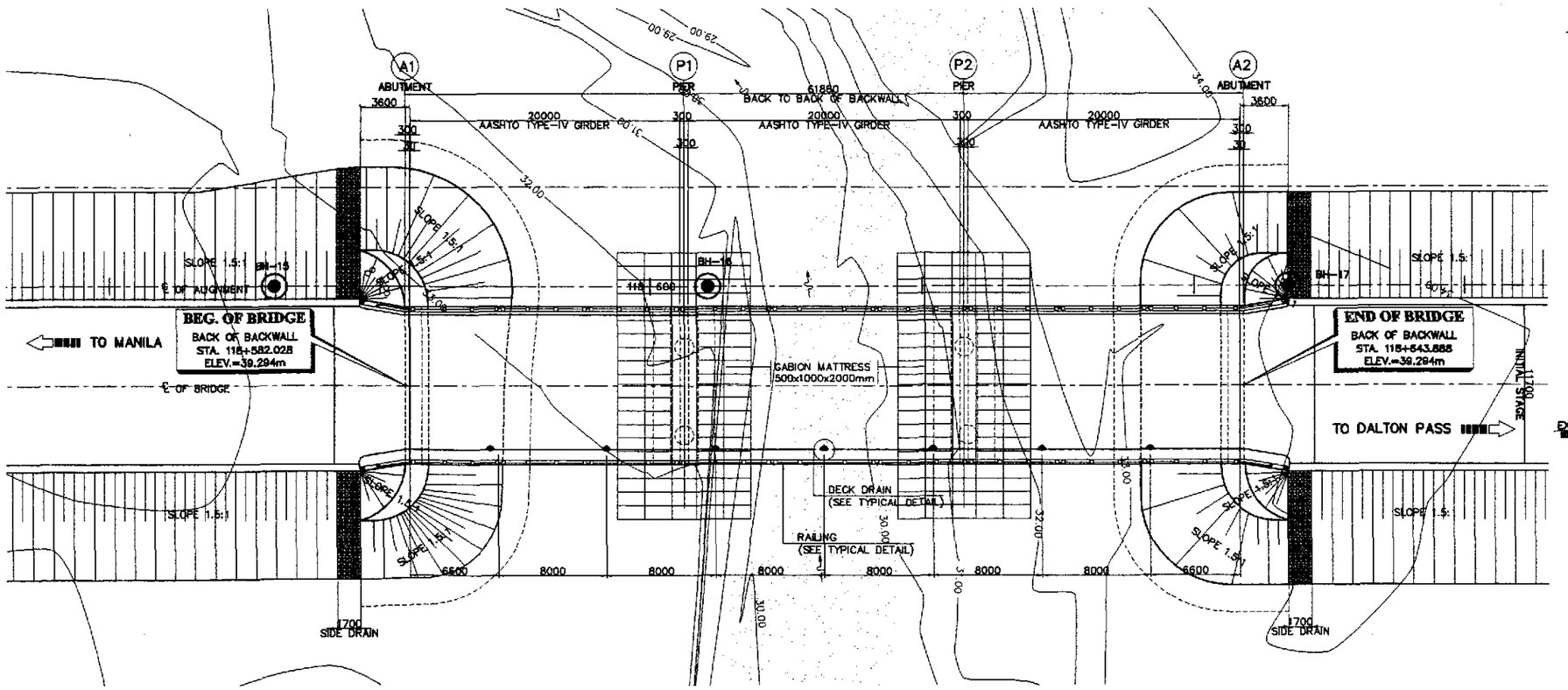
SCALE : AS SHOWN FULL SIZE A1

SHEET CONTENTS :
BRIDGE NO. 8
ABUTMENT PROTECTION
AND SIDE DRAIN DETAILS
(INITIAL STAGE)

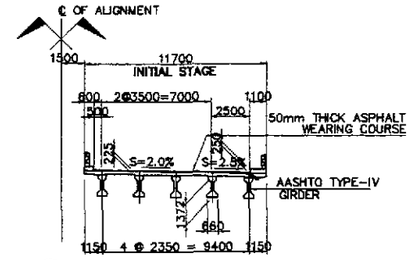
SHEET NO. : B8-11



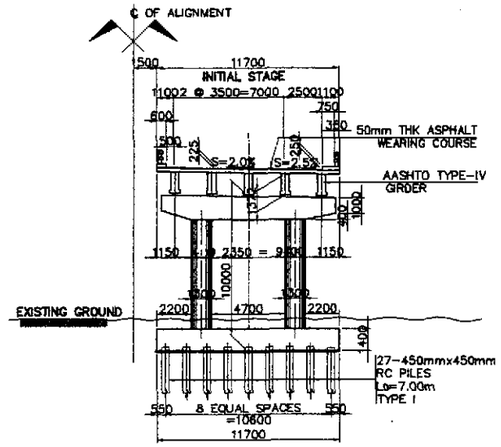
1 - GENERAL ELEVATION
SCALE 1:200



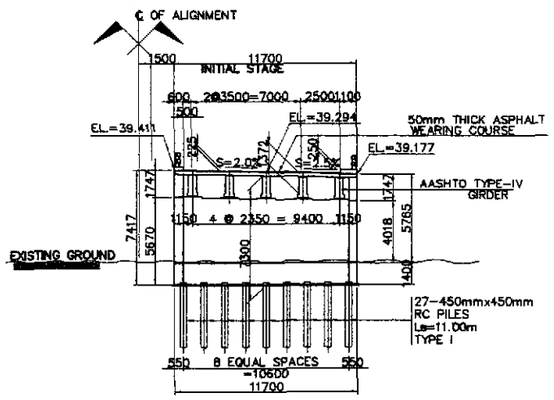
2 - GENERAL PLAN
SCALE 1:200



3 - SECTION @ MIDSPAN
SCALE 1:200



4 - SECTION @ PIER P2
SCALE 1:200



5 - SECTION @ ABUTMENT A2
SCALE 1:200

HYDRAULIC DESIGN DATA	
VELOCITY @ 50 YEARS, Vso	2.097 m/sec
DISCHARGE @ 50 YEARS, Qso	65.000 cu.m/sec
CATCHMENT AREA, CA	11.950 sq. km

NOTE :
PRIOR TO CONSTRUCTION SOIL INVESTIGATION AT ABUTMENT A1 AND PIER P2 SHALL BE CONDUCTED FOR CONFIRMATION OF ASSUMED BEARING CAPACITY AND FOOTING ELEVATION.

THE PILE LENGTH RECOMMENDED ARE MINIMUM. SHOULD THE SOIL AT THE RECOMMENDED LENGTH BE INADEQUATE BEARING MATERIAL, LENGTH SHALL BE INCREASED. THE MINIMUM EMBEDMENT LENGTH INTO ADEQUATE SOIL FOR 400 x 400 R. C. PILE IS 1000mm WHILE FOR 450 x 450 R. C. PILE IS 1200mm.

A - CABANATUAN BRIDGE NO. 9 (STA.118+582.028)
SCALE AS SHOWN

PERFECTO L. ZAPLAN JR.
OIC Chief, Hydraulics Division, BOD

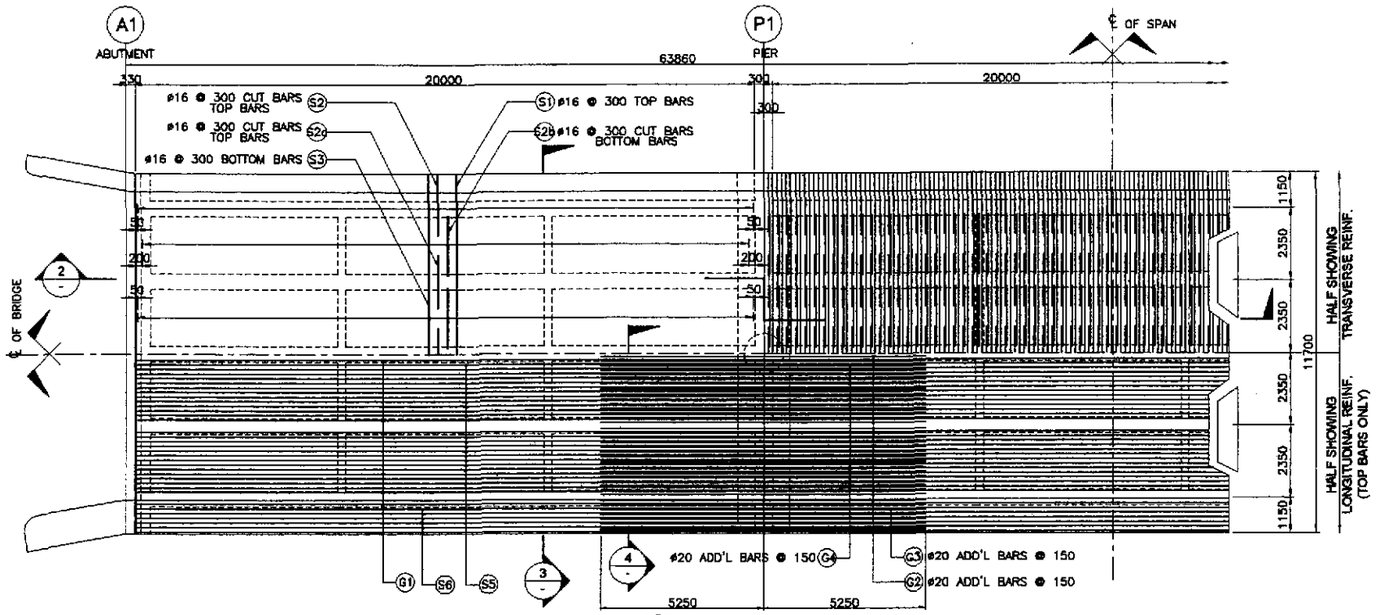
JAPAN INTERNATIONAL COOPERATION AGENCY
KATAHIRA & ENGINEERS INTERNATIONAL
YACHIYO ENGINEERING CO., LTD.

	DATE	SIGNATURE
DESIGNED	10/8/02	A. P. GONZALES
CHECKED	10/8/02	
SUBMITTED	10/8/02	M. KUSUNOKI TEAM LEADER

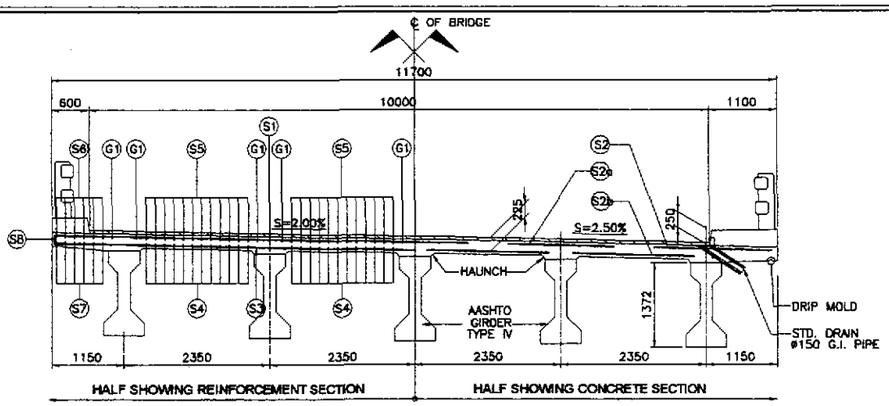
REPUBLIC OF THE PHILIPPINES
DEPARTMENT OF PUBLIC WORKS AND HIGHWAYS

PJHL - PMO	BUREAU OF DESIGN		OFFICE OF THE SECRETARY	
Submitted By:	Reviewed By:	Recommended By:	Recommended By: (See cover sheet for Signature)	Approved By: (See cover sheet for Signature/Approval)
DANILO C. TRAJANO, Project Director	ADRIANO M. BORCY, Chief, Bridges Division	GILBERTO S. REYES, Director IV (OIC)	MANUEL M. BONOAN, Undersecretary	SIMEON A. DATUMANONG, Secretary

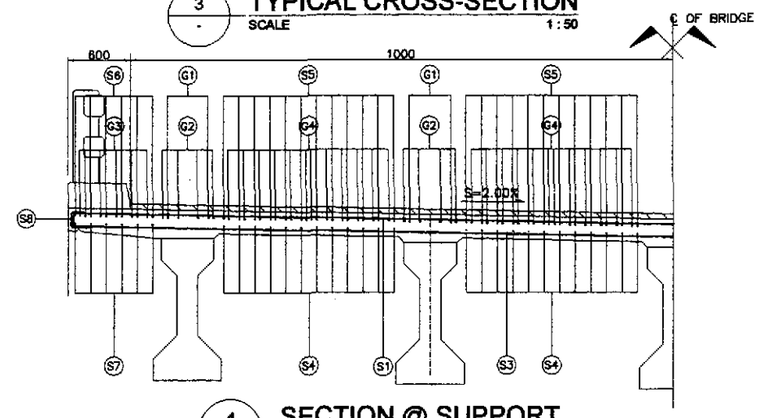
PROJECT AND LOCATION :	SCALE :	SHEET CONTENTS :	SHEET NO. :
THE DETAILED DESIGN STUDY ON UPGRADING INTER-URBAN HIGHWAY SYSTEM ALONG THE PAN-PHILIPPINE HIGHWAY (Plaridel, Cabanatuan and San Jose Bypasses)	1 : 200	BRIDGE NO. 9 GENERAL PLAN, ELEVATION AND SECTIONS (INITIAL STAGE)	B9-01
CABANATUAN BYPASS - CONTRACT PACKAGE II	FULL SIZE A1		



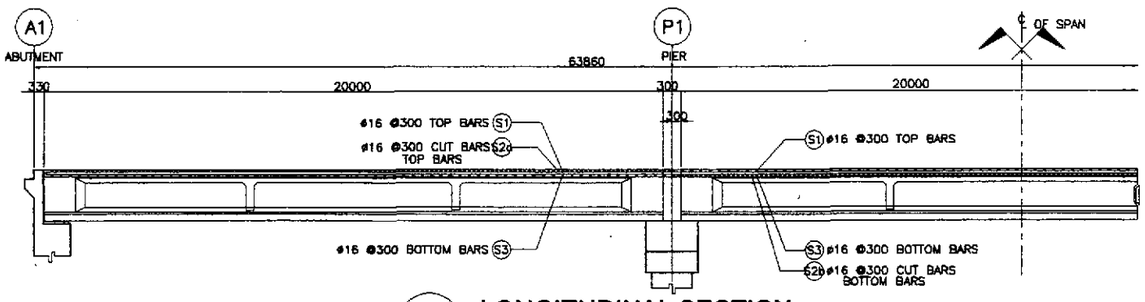
1 - FRAMING PLAN
SCALE 1:100



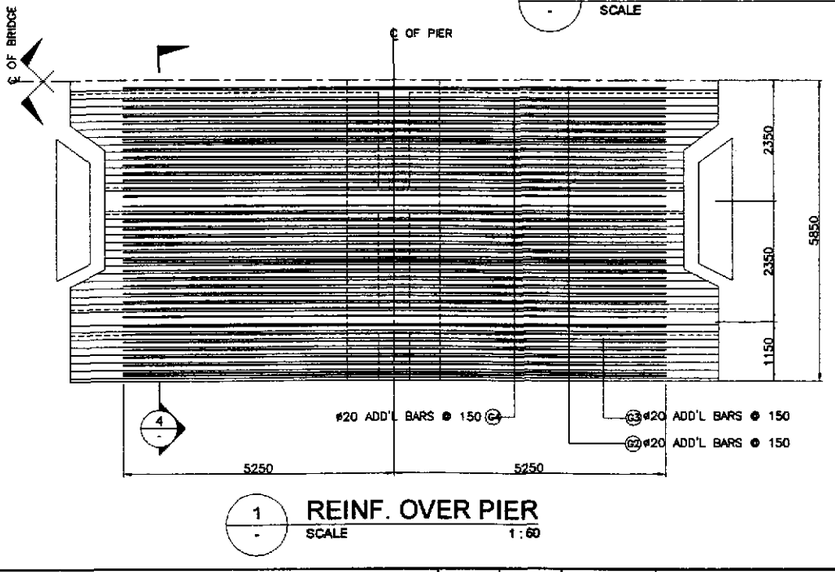
3 - TYPICAL CROSS-SECTION
SCALE 1:50



4 - SECTION @ SUPPORT
SCALE 1:30



2 - LONGITUDINAL SECTION
SCALE 1:100

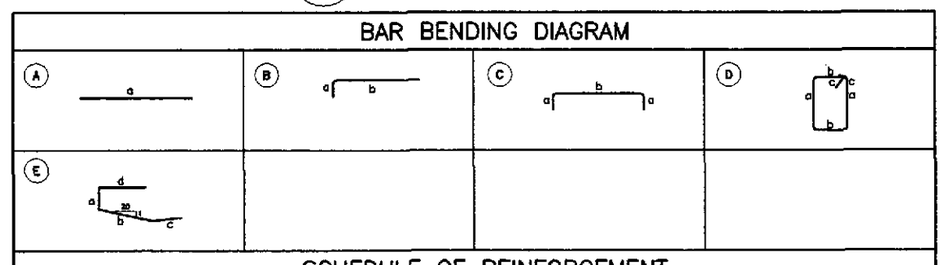


1 - REINF. OVER PIER
SCALE 1:60

ESTIMATED QUANTITIES OF SUPERSTRUCTURE

ITEM NO.	DESCRIPTION	UNIT	TOTAL
404(1)a	REINFORCING STEEL GRADE 40	kgs.	45267
	DECK SLAB	25838.00	
	DIAPHRAGM	1005.00	
	GIRDER	11415.00	
	SIDEWALK, RAILING, & POST	5693.00	
	APPROACH SLAB	1316.00	
404(1)b	REINFORCING STEEL GRADE 60	kgs.	27451
	DECK SLAB	4144.00	
	DIAPHRAGM	3406.00	
	GIRDER	14385.00	
	SIDEWALK, RAILING, & POST	1328.00	
	APPROACH SLAB	4188.00	
405(1)	STRUCTURAL CONCRETE	cu. m.	422.67
	DECK SLAB	166.32	
	DIAPHRAGM	20.97	
	GIRDER	159.58	
	SIDEWALK, RAILING, & POST	40.67	
	APPROACH SLAB	35.13	

BAR BENDING DIAGRAM



SCHEDULE OF REINFORCEMENT

LOCATION	CONCRETE VOLUME (m^3)	BAR MARK	BAR SIZE	QTY.	SPACING	BAR SHAPE	DIMENSIONS (mm) OUT TO OUT a	b	c	d	LENGTH EACH BAR (mm)	TOTAL LENGTH (m)	UNIT WT. (kg/m)	WEIGHT IN (kg)	REBAR RATIO (kg/m^3)
DECK SLAB	166.32	G1	16	10	AS SHOWN	A	61100	–	–	–	61100	611.00	1.579	965	180.27
		G2	20	40	150	A	10500	–	–	–	10500	420.00	2.466	1036	
		G3	20	24	150	A	10500	–	–	–	10500	252.00	2.466	622	
		G4	20	96	150	A	10500	–	–	–	10500	1008.00	2.466	2486	
		S1	16	201	300	C	145	11600	145	–	11890	2389.89	1.579	3774	
		S2	16	396	300	B	145	6590	–	–	2145	849.42	1.579	1342	
		S2a	16	594	300	A	1700	–	–	–	1700	1009.80	1.579	1595	
		S2b	16	792	300	A	1950	–	–	–	1950	1544.40	1.579	2439	
		S3	16	201	300	A	11600	–	–	–	11600	2331.60	1.579	3682	
		S4	16	48	150	A	61100	–	–	–	61100	2932.80	1.579	4631	
		S5	16	48	150	A	61100	–	–	–	61100	2932.80	1.579	4631	
		S6	16	12	AS SHOWN	A	61100	–	–	–	61100	733.20	1.579	1158	
		S7	16	12	AS SHOWN	A	61100				61100	733.20	1.579	1158	
		S8	12	268	450	E	145	900	600	300	1945	521.26	0.888	463	
TOTAL	166.32														

GRADE 40 TOTAL = 25,838 kgs.
GRADE 60 TOTAL = 4144 kgs.

JICA
JAPAN INTERNATIONAL COOPERATION AGENCY
KEI KATAHIRA & ENGINEERS INTERNATIONAL
YEO YACHIYO ENGINEERING CO., LTD.

	DATE	SIGNATURE
DESIGNED	10/17/02	E. N. SALLAN
CHECKED	10/16/02	
SUBMITTED	10/18/02	K. KUSUDA TEAM LEADER

REPUBLIC OF THE PHILIPPINES
DEPARTMENT OF PUBLIC WORKS AND HIGHWAYS

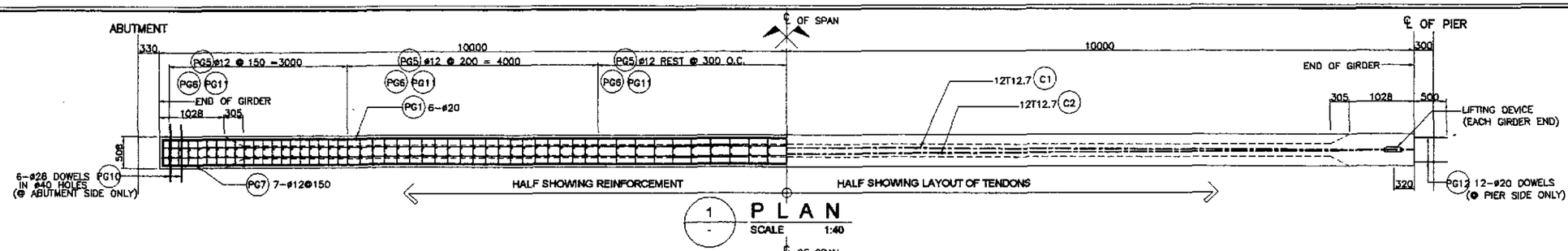
FUHL – PMO	BUREAU OF DESIGN		OFFICE OF THE SECRETARY	
Submitted By:	Reviewed By:	Recommended By:	Recommended By: (See cover sheet for Signature)	Approved By: (See cover sheet for Signature/Approval)
DANILO C. TRAJANO	ADRIANO M. DOROY	GILBERTO S. REYES	MANUEL M. BONOAN	SIMEON A. DATUMANONG
Project Director	Chief, Bridges Division	Director IV (OIC)	Undersecretary	Secretary

PROJECT AND LOCATION :
THE DETAILED DESIGN STUDY ON UPGRADING INTER-URBAN HIGHWAY SYSTEM ALONG THE PAN-PHILIPPINE HIGHWAY (Plaridel, Cabanatuan and San Jose Bypasses)
CABANATUAN BYPASS - CONTRACT PACKAGE II

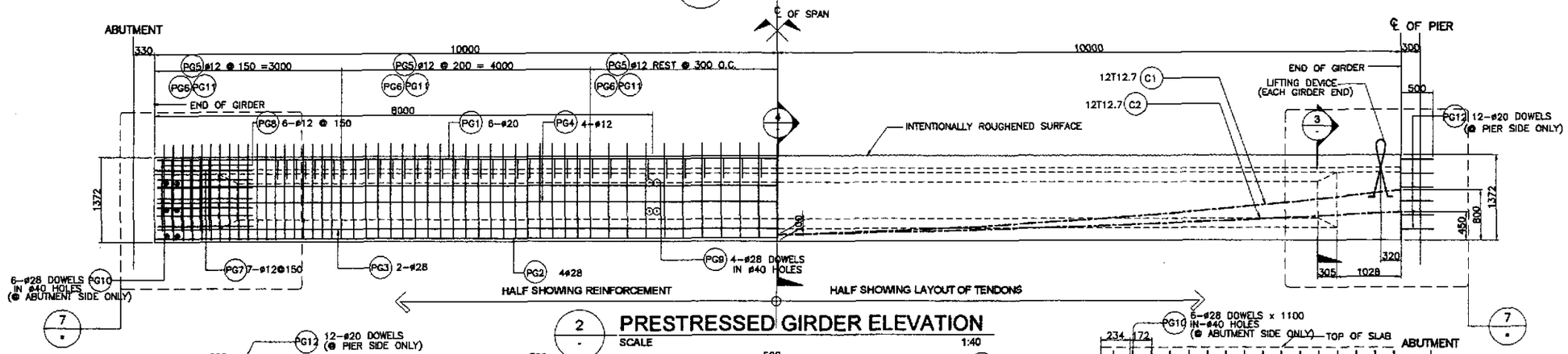
SCALE : AS SHOWN
FULL SIZE A1

SHEET CONTENTS :
BRIDGE NO. 9
DECK FRAMING PLAN AND SECTIONS (INITIAL STAGE)

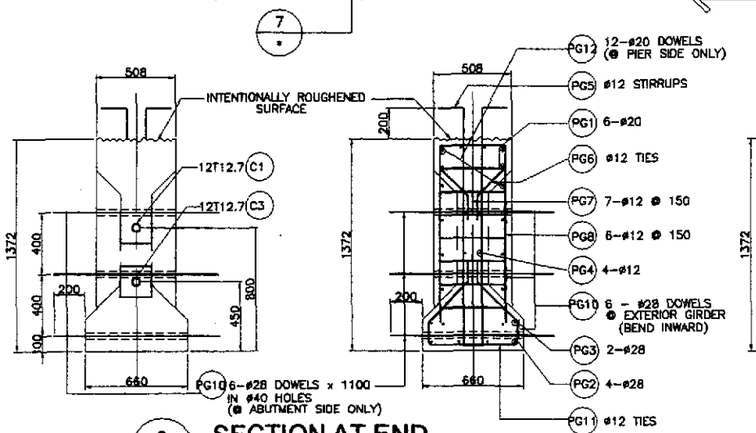
SHEET NO. :
B9-02



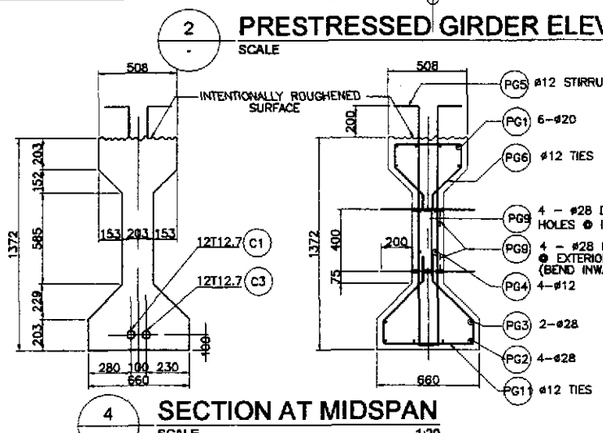
1 PLAN
SCALE 1:40



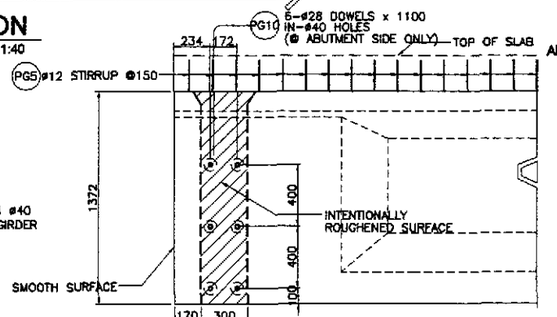
2 PRESTRESSED GIRDER ELEVATION
SCALE 1:40



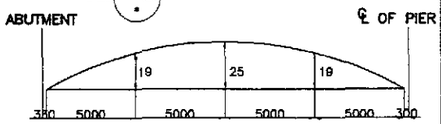
3 SECTION AT END
SCALE 1:20



4 SECTION AT MIDSPAN
SCALE 1:20

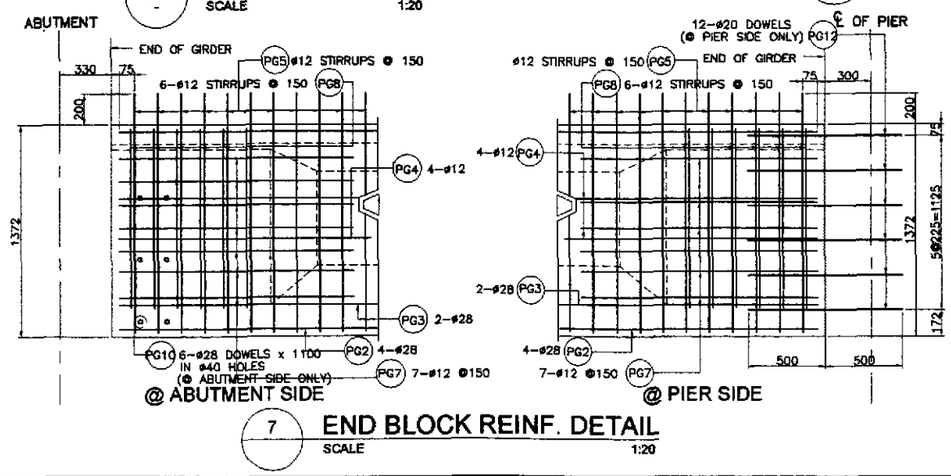


5 DOWELS @ END BLOCK
SCALE 1:20

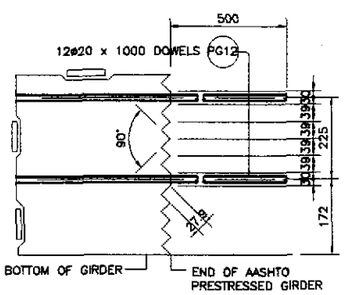


6 CAMBER DIAGRAM
NOT TO SCALE

NOTES :
1.) SEE GENERAL NOTES, -2, FOR GIRDER DESIGN GUIDE.
2.) JACKING FORCE PER GIRDER, Pj = 3,304 KN.
3.) JACKING WILL BE DONE AT BOTH ENDS.
4.) FINAL PRESTRESSING FORCE @ MIDSPAN,
FNET = 2430 kN.



7 END BLOCK REINF. DETAIL
SCALE 1:20



8 TOOTH DETAIL
SCALE N.T.S.

BAR BENDING DIAGRAM

(A) (B) (C) (D) (E) (F) (G) (H)

SCHEDULE OF REINFORCEMENT

STRUCTURE COMPONENT	BAR MARK	SIZE (mm)	QTY.	SPACING	BAR SHAPE	DIMENSION(mm) a	b	c	d	e	LENGTH PER BAR (mm)	TOTAL LENGTH (m)	UNIT WEIGHT (kg/m)	TOTAL WEIGHT (kg)	CONC. VOLUME (cu.m)	REBAR RATIO (kg/cu.m)	REMARKS
GIRDER	PG1	20	6	AS SHOWN	A	19920	–	–	–	–	19920	119.52	2.466	295	10.64	161.68	QUANTITIES ARE FOR ONE (1) GIRDER ONLY
	PG2	28	4	AS SHOWN	A	19920	–	–	–	–	19920	79.68	4.833	386			
	PG3	28	2	AS SHOWN	A	19920	–	–	–	–	19920	39.84	4.833	193			
	PG4	12	4	AS SHOWN	A	19920	–	–	–	–	19920	79.68	0.888	71			
	PG5	12	100	150	G	100	1540	103	–	–	3383	338.30	0.888	301			
	PG6	12	100	150	E	430	160	150	260	–	1570	157.00	0.888	140			
	PG7	12	14	150	D	430	1000	550	–	–	3530	49.42	0.888	44			
	PG8	12	12	150	C	430	1230	150	–	–	3190	38.28	0.888	34			
	PG9	28	8	AS SHOWN	A	603	–	–	–	–	603	4.82	4.833	24			
	PG10	28	6	AS SHOWN	A	1060	–	–	–	–	1060	6.36	4.833	31			
	PG11	12	100	150	E	580	160	150	360	–	1920	192.00	0.888	171			
	PG12	20	12	AS SHOWN	A	1000	–	–	–	–	1000	12.00	2.466	30			

GRADE 40 TOTAL = 761 kgs.
GRADE 60 TOTAL = 959 kgs.

JICA
JAPAN INTERNATIONAL COOPERATION AGENCY
KATAHIRA & ENGINEERS INTERNATIONAL
YACHIYO ENGINEERING CO., LTD.

	DATE	SIGNATURE
DESIGNED	10/18/02	E. N. SALLAN
CHECKED	10/18/02	
SUBMITTED	10/18/02	R. KUCHI, TEAM LEADER

REPUBLIC OF THE PHILIPPINES
DEPARTMENT OF PUBLIC WORKS AND HIGHWAYS

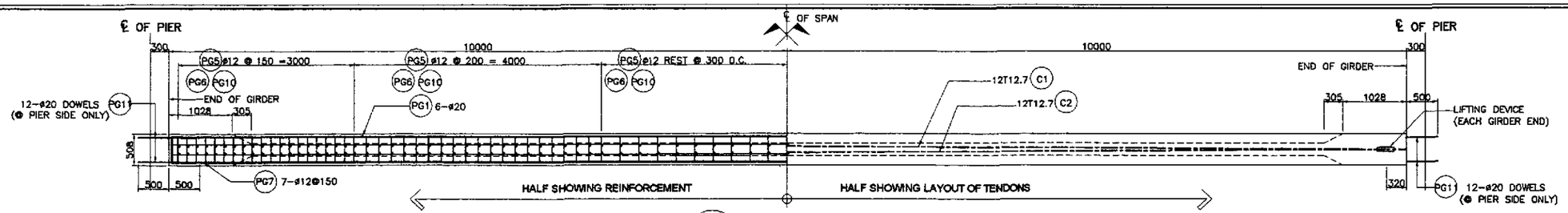
PJHL – PMO	BUREAU OF DESIGN		OFFICE OF THE SECRETARY	
Submitted By:	Reviewed By:	Recommended By:	Recommended By: (See cover sheet for Signature)	Approved By: (See cover sheet for Signature/Approval)
DANILO C. TRAJANO, Project Director	ADRIANO M. DOROY, Chief, Bridges Division	GILBERTO S. REYES, Director IV (OIC)	MANUEL M. BONOAN, Undersecretary	SIMEON A. DATUMANONG, Secretary

PROJECT AND LOCATION :
THE DETAILED DESIGN STUDY ON UPGRADING INTER-URBAN HIGHWAY SYSTEM ALONG THE PAN-PHILIPPINE HIGHWAY (Plaridel, Cabanatuan and San Jose Bypasses)
CABANATUAN BYPASS - CONTRACT PACKAGE II

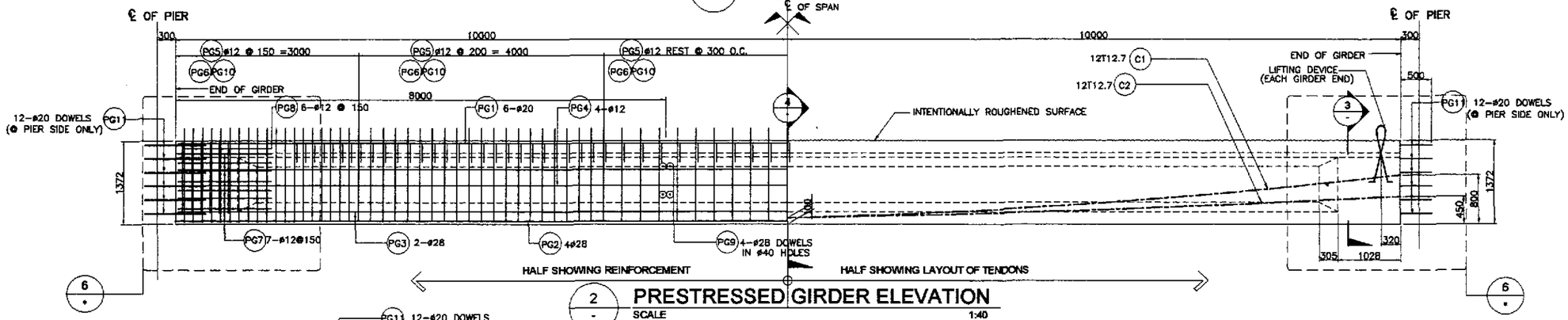
SCALE :
AS SHOWN
FULL SIZE A1

SHEET CONTENTS :
BRIDGE NO. 9
AASHTO TYPE IV GIRDER (EXTERIOR SPAN)
(INITIAL STAGE)

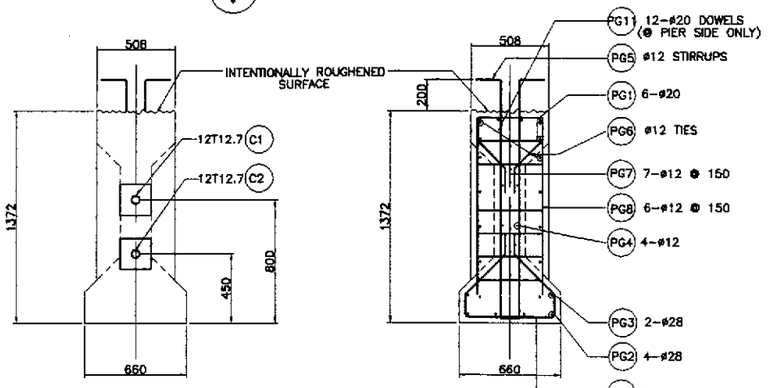
SHEET NO. :
B9-03



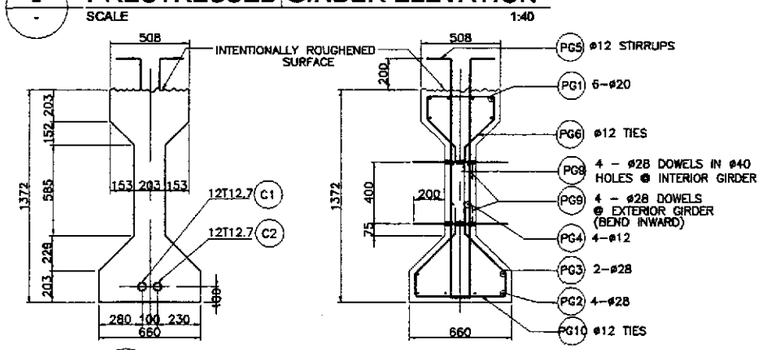
1 PLAN
SCALE 1:40



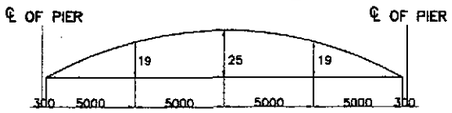
2 PRESTRESSED GIRDER ELEVATION
SCALE 1:40



3 SECTION AT END
SCALE 1:20

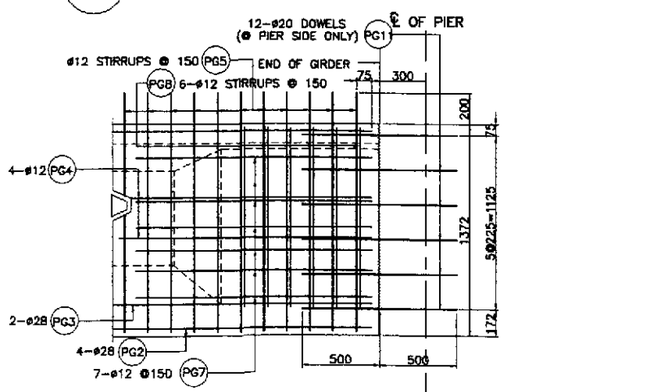


4 SECTION AT MIDSPAN
SCALE 1:20

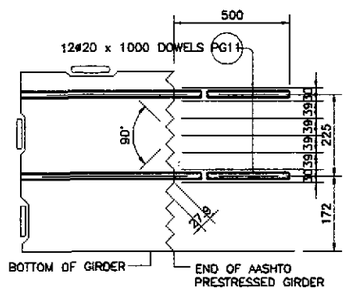


5 CAMBER DIAGRAM
NOT TO SCALE

NOTES :
1.) SEE GENERAL NOTES, -2, FOR GIRDER DESIGN GUIDE.
2.) JACKING FORCE PER GIRDER, Pj = 3,304 KN.
3.) JACKING WILL BE DONE AT BOTH ENDS.
4.) FINAL PRESTRESSING FORCE @ MIDSPAN,
F_{NET} = 2430 kN.

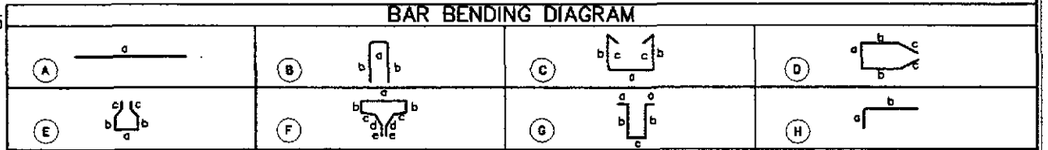


6 END BLOCK REINF. DETAIL @ PIER SIDE
SCALE 1:20



7 TOOTH DETAIL
SCALE N.T.S.

BAR BENDING DIAGRAM



SCHEDULE OF REINFORCEMENT

STRUCTURE COMPONENT	BAR MARK	SIZE (mm)	QTY.	SPACING	BAR SHAPE	DIMENSION(mm) a	b	c	d	e	LENGTH PER BAR (mm)	TOTAL LENGTH (m)	UNIT WEIGHT (kg/m)	TOTAL WEIGHT (kg)	CONC. VOLUME (cu.m)	REBAR RATIO (kg/cu.m)	REMARKS
GIRDER	PG1	20	6	AS SHOWN	A	19920	–	–	–	–	19920	119.52	2.466	295	10.64	161.58	QUANTITIES ARE FOR ONE (1) GIRDER ONLY
	PG2	28	4	AS SHOWN	A	19920	–	–	–	–	19920	79.68	4.833	386			
	PG3	28	2	AS SHOWN	A	19920	–	–	–	–	19920	39.84	4.833	193			
	PG4	12	4	AS SHOWN	A	19920	–	–	–	–	19920	79.68	0.888	71			
	PG5	12	100	150	G	100	1540	103	–	–	3383	338.30	0.888	301			
	PG6	12	100	150	E	430	160	150	260	–	1570	157.00	0.888	140			
	PG7	12	14	150	D	430	1000	550	–	–	3530	49.42	0.888	44			
	PG8	12	12	150	C	430	1230	150	–	–	3190	38.28	0.888	34			
	PG9	28	8	AS SHOWN	A	603	–	–	–	–	603	4.82	4.833	24			
	PG10	12	100	150	E	580	160	150	360	–	1920	192.00	0.888	171			
	PG11	20	24	AS SHOWN	A	1000	–	–	–	–	1000	24.00	2.466	60			

GRADE 40 TOTAL = 761 kgs.
GRADE 60 TOTAL = 958 kgs.

JAPAN INTERNATIONAL COOPERATION AGENCY
KATAHIRA & ENGINEERS INTERNATIONAL
YACHIYO ENGINEERING CO., LTD.

	DATE	SIGNATURE
DESIGNED	10/16/02	E. N. SALLAN
CHECKED	10/16/02	
SUBMITTED	10/18/02	TEAM LEADER

REPUBLIC OF THE PHILIPPINES
DEPARTMENT OF PUBLIC WORKS AND HIGHWAYS

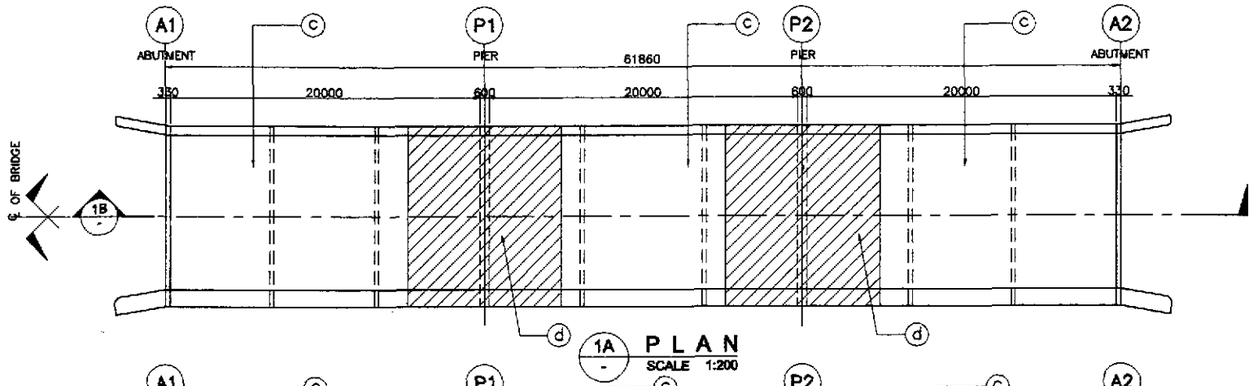
PJHL – PMO	BUREAU OF DESIGN		OFFICE OF THE SECRETARY	
Submitted By:	Reviewed By:	Recommended By:	Recommended By: (See cover sheet for Signature)	Approved By: (See cover sheet for Signature/Approval)
DANILO C. TRAJANO, Project Director	ADRIANO M. DOROY, Chief, Bridges Division	GILBERTO S. REYES, Director IV (OIC)	MANUEL M. BONOAN, Undersecretary	SIMEON A. DATUMANONG, Secretary

PROJECT AND LOCATION :
THE DETAILED DESIGN STUDY ON
UPGRADING INTER-URBAN HIGHWAY SYSTEM
ALONG THE PAN-PHILIPPINE HIGHWAY
(Plaridel, Cabanatuan and San Jose Bypasses)
CABANATUAN BYPASS - CONTRACT PACKAGE II

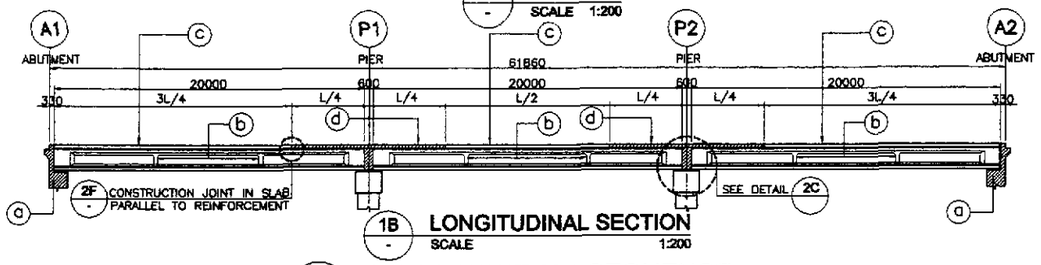
SCALE : AS SHOWN
FULL SIZE A1

SHEET CONTENTS :
BRIDGE NO. 9
AASHTO TYPE IV GIRDER
(INTERIOR SPAN)
(INITIAL STAGE)

SHEET NO. : B9-04

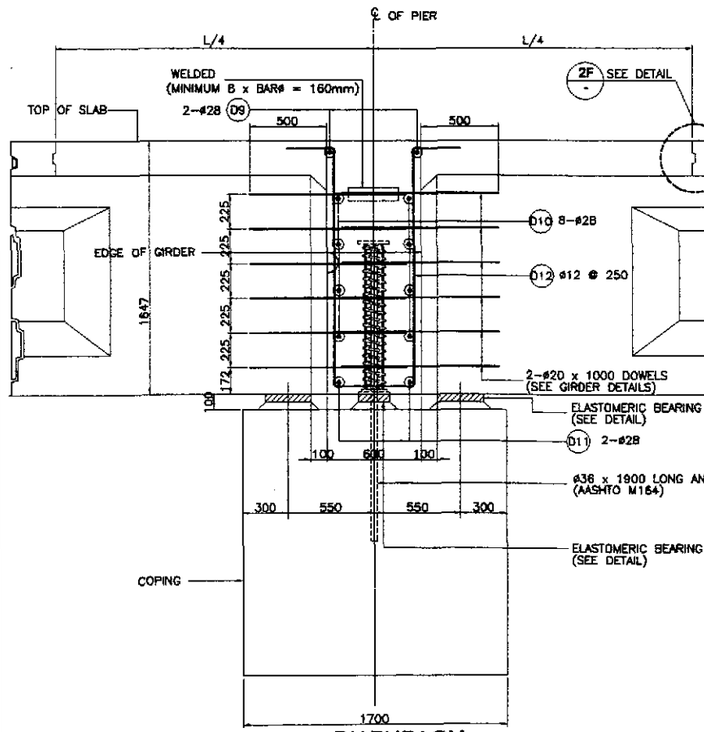


1A PLAN SCALE 1:200

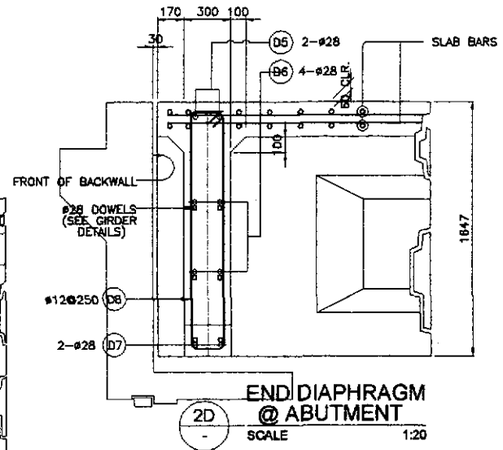


1B LONGITUDINAL SECTION SCALE 1:200

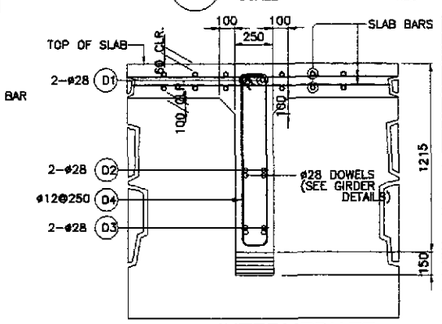
1 CONC. POURING SEQUENCE SCALE 1:200



2C DIAPHRAGM @ PIER SCALE 1:20

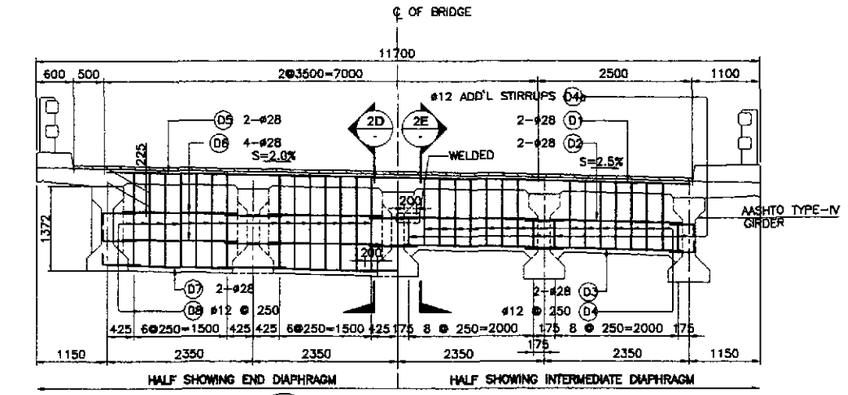


2D END DIAPHRAGM @ ABUTMENT SCALE 1:20

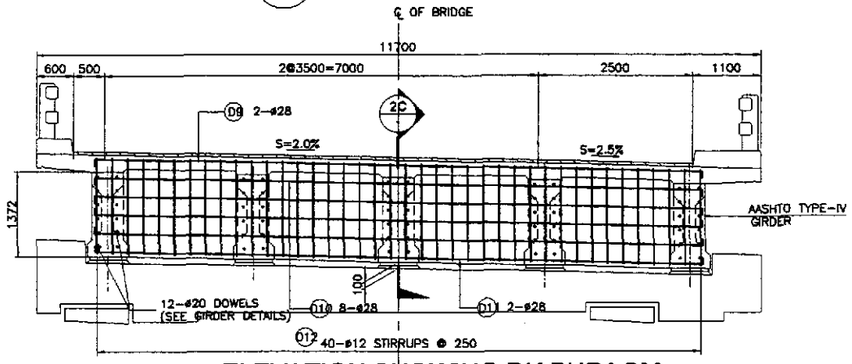


2E INTERMEDIATE DIAPHRAGM SCALE 1:20

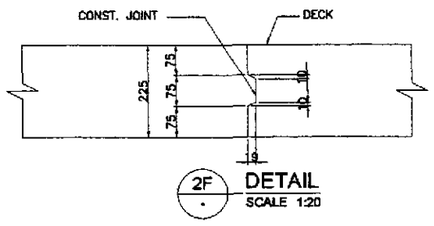
2 DIAPHRAGM DETAILS SCALE AS SHOWN



2A ELEVATION SCALE 1:50



2B ELEVATION SHOWING DIAPHRAGM REINFORCEMENT @ PIER SCALE 1:50

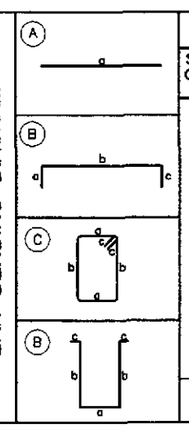


2F DETAIL SCALE 1:20

NOTES:

1. CONCRETE AT ⓐ AREAS SHALL BE PLACED AT LEAST 21 DAYS AHEAD OF CONCRETE AT ⓑ AREAS.
2. CONCRETE AT ⓑ AREAS SHALL BE PLACED AT LEAST ONE DAY AHEAD OF CONCRETE AT ⓒ AREAS. POUR ⓓ AREAS LAST.
3. REINFORCEMENT SHALL BE CONTINUOUS AT CONSTRUCTION JOINTS.
4. SEE GIRDER DETAILS FOR SPACING OF ø28 DOWELS.

BAR BENDING DIAGRAM



SCHEDULE OF REINFORCEMENT

STRUCTURE COMPONENT	LOCATION	CONCRETE VOLUME (m^3)	BAR MARK	BAR SIZE	QTY.	SPACING	BAR SHAPE	DIMENSIONS (mm) OUT TO OUT a	b	c	d	LENGTH PER BAR (mm)	TOTAL LENGTH (m)	UNIT WT. (kg/m)	TOTAL WEIGHT IN (kg)	REBAR RATIO (kg/m^3)
DIAPHRAGM	INTERMEDIATE DIAPHRAGM	14.69	D1	28	12	AS SHOWN	A	9400				9400	112.80	4.833	546	140.21
			D2	28	48	AS SHOWN	A	2145				2145	102.96	4.833	498	
			D3	28	48	AS SHOWN	A	2145				2145	102.96	4.833	498	
			D4	12	168	250	C	150	1200	150		3000	504.00	0.888	448	
			D4a	12	48	AS SHOWN	C	150	500	150		1600	76.80	0.888	69	
	END DIAPHRAGM	6.29	D5	28	4	AS SHOWN	A	9400				9400	37.60	4.833	182	127.10
			D6	28	32	AS SHOWN	A	1840				1840	58.88	4.833	285	
			D7	28	16	AS SHOWN	A	1840				1840	29.44	4.833	143	
			D8	12	56	250	C	200	1550	150		3800	212.80	0.888	189	
	DIAPHRAGM AT PIER	16.91	D9	28	4	AS SHOWN	B	500	9810	500		10810	43.24	4.833	209	91.86
			D10	28	16	AS SHOWN	B	500	9810	500		10810	172.96	4.833	836	
			D11	28	4	AS SHOWN	B	500	9810	500		10810	43.24	4.833	209	
			D12	12	80	250	D	500	1550	500		4200	336.00	0.888	299	
	TOTAL	20.97													GRADE 60 TOTAL = 3408 kgs.	
															GRADE 40 TOTAL = 1,005 kgs.	

JICA
JAPAN INTERNATIONAL COOPERATION AGENCY
KATAHIRA & ENGINEERS INTERNATIONAL
YACHIYO ENGINEERING CO., LTD.

	DATE	SIGNATURE
DESIGNED	10/9/07	E. N. SALLAN
CHECKED	10/16/07	
SUBMITTED	10/18/07	TEAM LEADER

REPUBLIC OF THE PHILIPPINES
DEPARTMENT OF PUBLIC WORKS AND HIGHWAYS

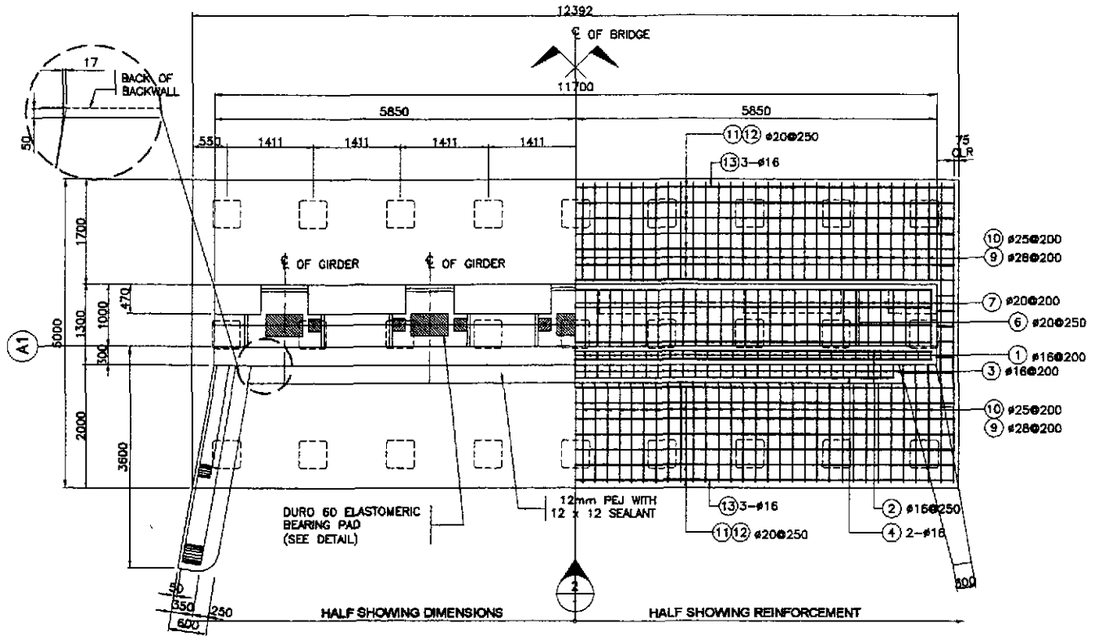
PJHL – PMO	BUREAU OF DESIGN		OFFICE OF THE SECRETARY	
Submitted By:	Reviewed By:	Recommended By:	Recommended By: (See cover sheet for Signature)	Approved By: (See cover sheet for Signature/Approval)
DANILO C. TRAJANO	ADRIANO M. DOROY	GILBERTO S. REYES	MANUEL M. BONDAN	SIMEON A. DATUMANONG
Project Director	Chief, Bridges Division	Director IV (OIC)	Undersecretary	Secretary

PROJECT AND LOCATION :
THE DETAILED DESIGN STUDY ON UPGRADING INTER-URBAN HIGHWAY SYSTEM ALONG THE PAN-PHILIPPINE HIGHWAY (Plaridel, Cabanatuan and San Jose Bypasses)
CABANATUAN BYPASS - CONTRACT PACKAGE II

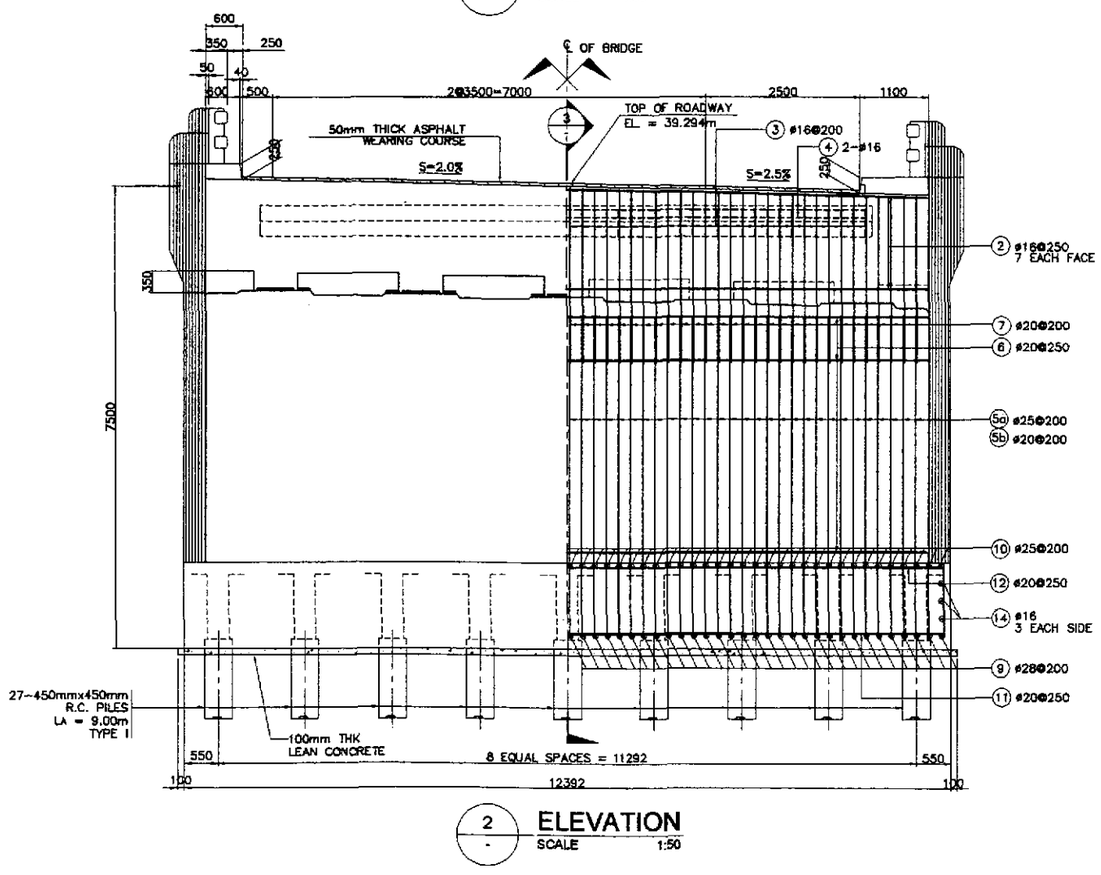
SCALE :
AS SHOWN
FULL SIZE A1

SHEET CONTENTS :
BRIDGE NO.9
CONCRETE POURING SEQUENCE AND DIAPHRAGM DETAILS (INITIAL STAGE)

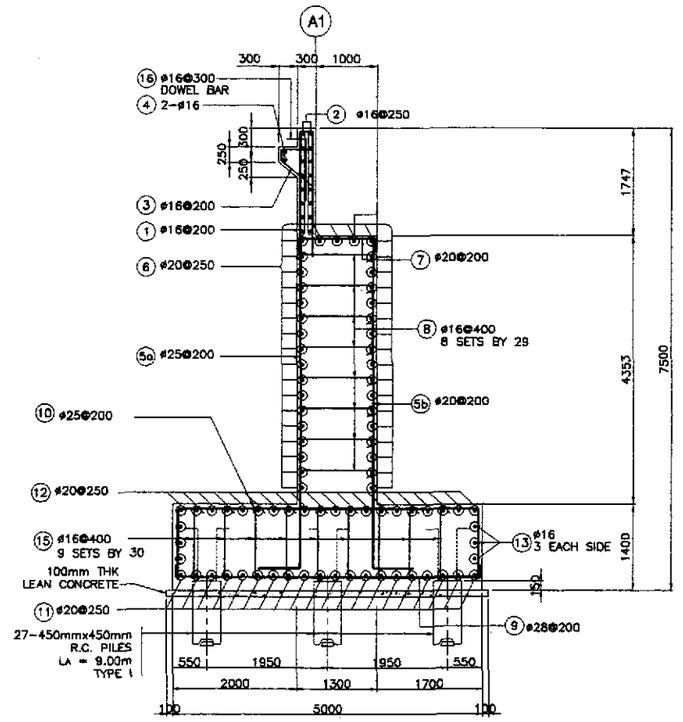
SHEET NO. :
B9-05



1 - PLAN
SCALE 1:50

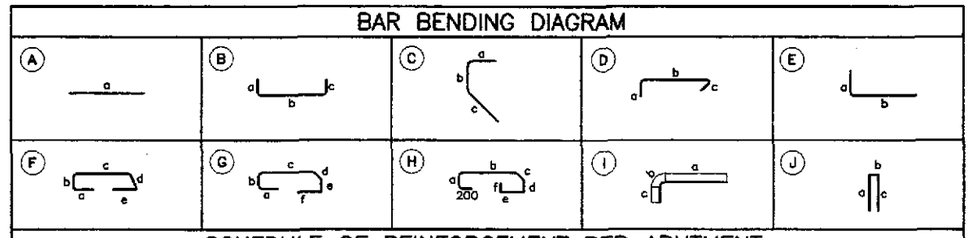


2 - ELEVATION
SCALE 1:50



3 - SECTION
SCALE 1:50

BAR BENDING DIAGRAM



SCHEDULE OF REINFORCEMENT PER ABUTMENT

LOCATION	CONCRETE VOLUME (m^3)	BAR MARK	BAR SIZE	QTY.	SPACING	BAR SHAPE	DIMENSIONS (mm) OUT TO OUT a	b	c	d	e	f	LENGTH EA. BAR (mm)	TOTAL LENGTH (m)	UNIT WT. (kg/m)	WEIGHT (kg)	REBAR RATIO, (kg/m^3)
BACKWALL	7.26	①	16	59	200	B	2000	200	2000	–	–	–	4200	247.80	1.579	392	110.51
		②	16	14	250	A	11600	–	–	–	–	–	11600	162.40	1.579	257	
		③	16	51	200	C	600	150	750	–	–	–	1500	76.50	1.579	121	
		④	16	2	AS SHOWN	A	9900	–	–	–	–	–	9900	19.80	1.579	32	
MAINWALL	66.21	⑤a	25	59	200	E	400	5500	–	–	–	–	5900	348.10	3.854	1342	62.39
		⑤b	20	59	200	E	400	5500	–	–	–	–	5900	348.10	2.466	859	
		⑥	20	37	250	A	11600	–	–	–	–	–	11600	429.20	2.466	1059	
		⑦	20	59	200	B	250	1200	250	–	–	–	1700	100.30	2.466	248	
		⑧	16	232	400	D	250	1200	250	–	–	–	1700	394.40	1.579	623	
FOOTING	86.74	⑨	28	62	200	B	700	4850	700	–	–	–	6250	387.50	4.833	1873	64.85
		⑩	25	62	200	B	700	4850	700	–	–	–	6250	387.50	3.854	1494	
		⑪	20	20	250	B	700	12250	700	–	–	–	13650	273.00	2.466	674	
		⑫	20	20	250	B	700	12250	700	–	–	–	13650	273.00	2.466	674	
		⑬	16	6	AS SHOWN	A	12250	–	–	–	–	–	12250	73.50	1.579	117	
		⑭	16	8	AS SHOWN	A	4850	–	–	–	–	–	4850	29.10	1.579	46	
		⑮	16	270	400	D	250	1250	250				1750	472.50	1.579	747	
DOWEL		⑯	16	34	300	E	650	500	–	–	–	–	1150	39.10	1.579	62	
TOTAL	160.21												GRADE 40 TOTAL = 2,397 kgs. GRADE 60 TOTAL = 8,223 kgs.				

JICA
JAPAN INTERNATIONAL COOPERATION AGENCY
KEI KATAHIRA & ENGINEERS INTERNATIONAL
YEC YACHIYO ENGINEERING CO., LTD.

	DATE	SIGNATURE
DESIGNED	10/18/02	J. P. GONZALES
CHECKED	10/18/02	
SUBMITTED	10/18/02	TEAM LEADER

REPUBLIC OF THE PHILIPPINES
DEPARTMENT OF PUBLIC WORKS AND HIGHWAYS

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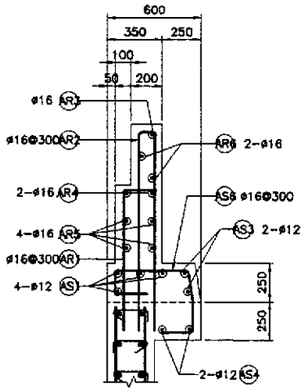
Submitted By:	Reviewed By:	Recommended By:	Recommended By: (See cover sheet for Signature)	Approved By: (See cover sheet for Signature/Approval)
DANILO C. TRAJANO	ADRIANO M. DORCY	GILBERTO S. REYES	MANUEL M. BONOAN	SIMEON A. DATUMANONG
Project Director	Chief, Bridges Division	Director IV (OIC)	Undersecretary	Secretary

PROJECT AND LOCATION :
THE DETAILED DESIGN STUDY ON
UPGRADING INTER-URBAN HIGHWAY SYSTEM
ALONG THE PAN-PHILIPPINE HIGHWAY
(Plaridel, Cabanatuan and San Jose Bypasses)
CABANATUAN BYPASS - CONTRACT PACKAGE II

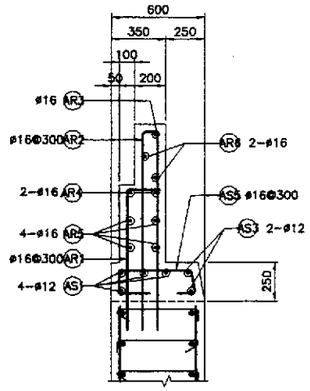
SCALE :
1 : 50
FULL SIZE A1

SHEET CONTENTS :
BRIDGE NO. 9
ABUTMENT A1
MAINWALL REINFORCEMENT DETAILS
(INITIAL STAGE)

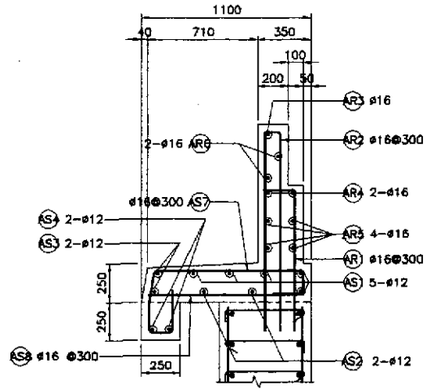
SHEET NO. :
B9-06



5A SECTION
SCALE 1:20

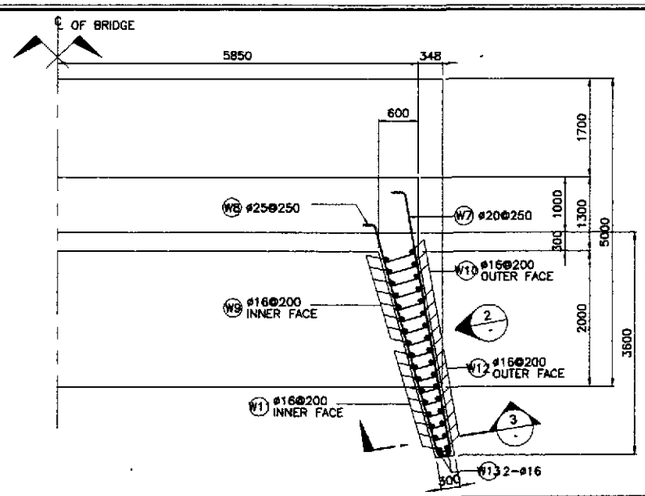


5B SECTION
SCALE 1:20

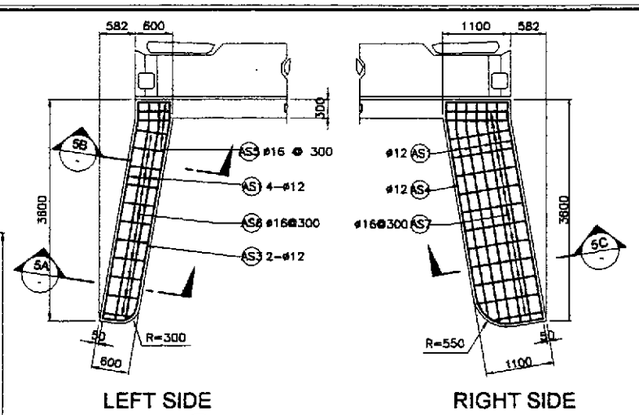


5C SECTION
SCALE 1:20

5 APPROACH RAIL DETAILS
SCALE 1:20



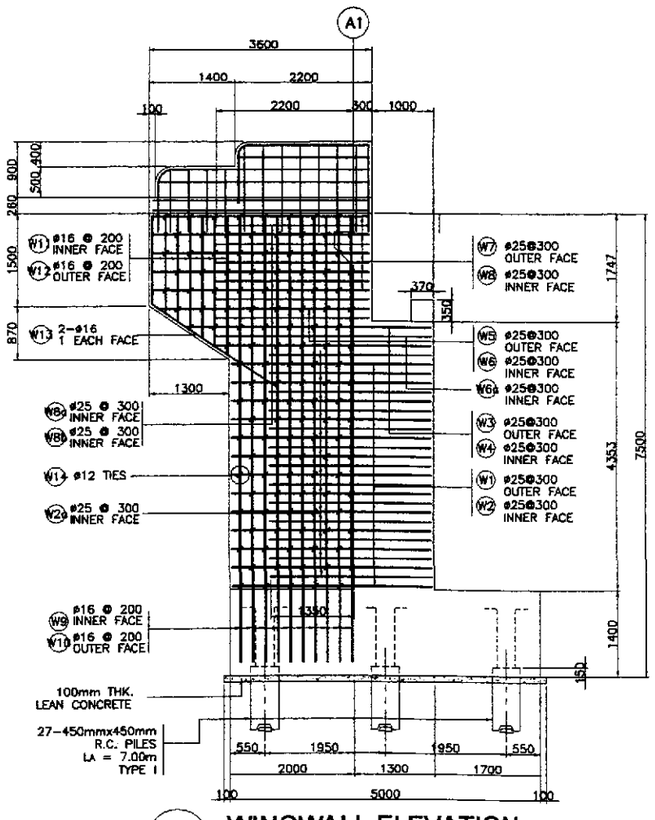
1 PLAN
SCALE 1:50



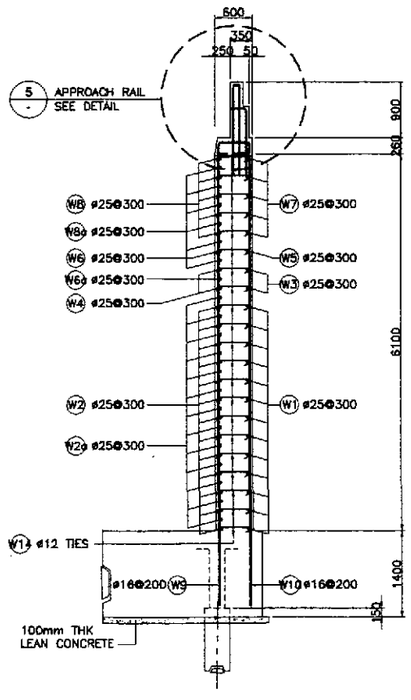
LEFT SIDE

RIGHT SIDE

4 SIDEWALK DETAIL
SCALE 1:50

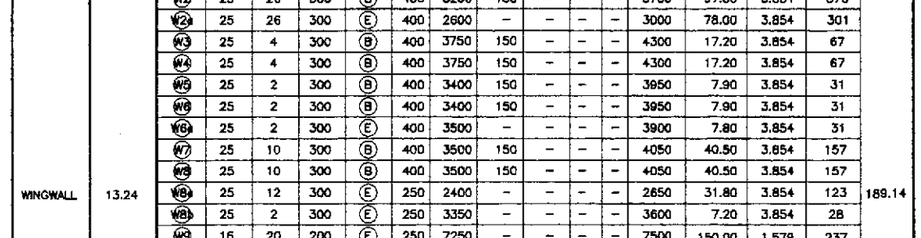


2 WINGWALL ELEVATION
SCALE 1:50



3 SECTION
SCALE 1:50

BAR BENDING DIAGRAM



SCHEDULE OF REINFORCEMENT PER ABUTMENT

LOCATION	CONCRETE VOLUME (m³)	BAR MARK	BAR SIZE	QTY.	SPACING	BAR SHAPE	DIMENSIONS (mm) OUT TO OUT a	b	c	d	e	f	LENGTH EA. BAR (mm)	TOTAL LENGTH (m)	UNIT WT. (kg/m)	WEIGHT (kg)	REBAR RATIO (kg/m³)
WINGWALL	13.24	W1	25	26	300	B	400	3200	150	–	–	–	3750	97.50	3.854	376	189.14
		W2	25	26	300	B	400	3200	150	–	–	–	3750	97.50	3.854	376	
		W2a	25	26	300	E	400	2600	–	–	–	–	3000	78.00	3.854	301	
		W3	25	4	300	B	400	3750	150	–	–	–	4300	17.20	3.854	67	
		W4	25	4	300	B	400	3750	150	–	–	–	4300	17.20	3.854	67	
		W5	25	2	300	B	400	3400	150	–	–	–	3950	7.90	3.854	31	
		W6	25	2	300	B	400	3400	150	–	–	–	3950	7.90	3.854	31	
		W6a	25	2	300	E	400	3500	–	–	–	–	3900	7.80	3.854	31	
		W7	25	10	300	B	400	3500	150	–	–	–	4050	40.50	3.854	157	
		W8	25	10	300	B	400	3500	150	–	–	–	4050	40.50	3.854	157	
		W8a	25	12	300	E	250	2400	–	–	–	–	2650	31.80	3.854	123	
		W8b	25	2	300	E	250	3350	–	–	–	–	3600	7.20	3.854	28	
		W9	16	20	200	E	250	7250	–	–	–	–	7500	150.00	1.579	237	
		W10	12	20	200	E	250	7250	–	–	–	–	7500	150.00	1.579	237	
		W11	16	12	200	E	250	1900	–	–	–	–	2150	25.80	1.579	41	
		W12	16	12	200	E	250	1900	–	–	–	–	2150	25.80	1.579	41	
		W13	16	4	AS SHOWN	C	250	1500	2000	–	–	–	4250	17.00	1.579	27	
		W14	12	252	AS SHOWN	D	170	450	170	–	–	–	790	199.08	0.888	177	
														GRADE 60 TOTAL = 1745 GRADE 40 TOTAL = 760			
APPROACH RAILING AND SIDEWALK	3.53	AS	12	9	AS SHOWN	A	3500	–	–	–	–	–	3500	31.50	0.888	28	98.34
		AS2	12	2	AS SHOWN	A	3500	–	–	–	–	–	3500	7.00	0.888	7	
		AS3	12	4	AS SHOWN	A	3500	–	–	–	–	–	3500	14.00	0.888	13	
		AS4	12	4	AS SHOWN	A	3500	–	–	–	–	–	3500	14.00	0.888	13	
		AS5	16	3	300	F	200	170	480	200	200	–	1250	3.75	1.579	6	
		AS6	16	11	300	G	200	170	480	200	170	200	1420	15.62	1.579	25	
		AS7	16	14	300	H	200	170	980	200	170	200	2120	29.68	1.579	47	
		AS8	16	14	300	E	200	1020	–	–	–	–	1220	17.08	1.579	27	
		AR1	16	8	300	E	200	900	–	–	–	–	1100	8.80	1.579	14	
		AR2	16	16	300	J	1300	120	1300	–	–	–	2720	43.52	1.579	69	
		AR3	16	2	AS SHOWN	I	2100	236	1300	–	–	–	3636	7.27	1.579	12	
		AR4	16	4	AS SHOWN	I	3400	236	900	–	–	–	4536	18.14	1.579	29	
		AR5	16	8	AS SHOWN	A	3400	–	–	–	–	–	3400	27.20	1.579	43	
		AR6	16	4	AS SHOWN	A	2100	–	–	–	–	–	2100	8.40	1.579	14	
														GRADE 40 TOTAL = 347			
TOTAL	16.77													GRADE 60 TOTAL = 1,745 kgs. GRADE 40 TOTAL = 1,107 kgs.			

JICA
JAPAN INTERNATIONAL COOPERATION AGENCY
KEI KATAHIRA & ENGINEERS INTERNATIONAL
YEO YACHIYO ENGINEERING CO., LTD.

	DATE	SIGNATURE
DESIGNED	10/6/01	A.P. GONZALES
CHECKED	10/10/01	N. KOBAYASHI
SUBMITTED	10/10/01	M. KUCHI TEAM LEADER

REPUBLIC OF THE PHILIPPINES
DEPARTMENT OF PUBLIC WORKS AND HIGHWAYS

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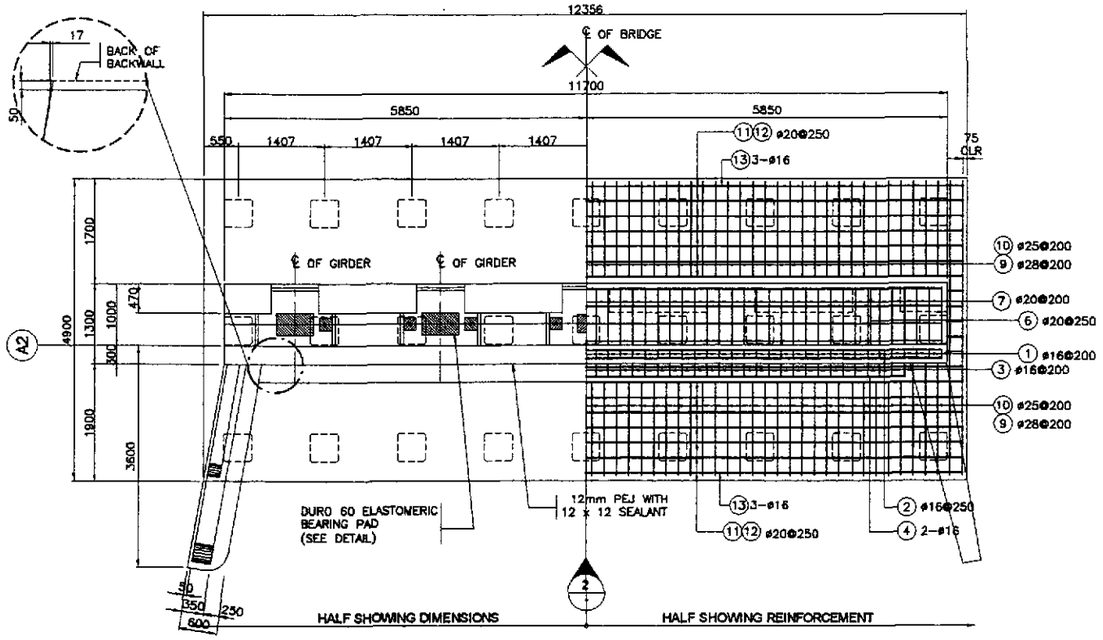
Submitted By:	Reviewed By:	Recommended By:	Recommended By: (See cover sheet for Signature)	Approved By: (See cover sheet for Signature/Approval)
DANILO C. TRAJANO Project Director	ADRIANO M. DOROY Chief, Bridges Division	GILBERTO S. REYES Director IV (OIC)	MANUEL M. BONOAN Undersecretary	SIMEON A. DATUMANONG Secretary

PROJECT AND LOCATION :
THE DETAILED DESIGN STUDY ON UPGRADING INTER-URBAN HIGHWAY SYSTEM ALONG THE PAN-PHILIPPINE HIGHWAY (Plaridel, Cabanatuan and San Jose Bypasses)
CABANATUAN BYPASS - CONTRACT PACKAGE II

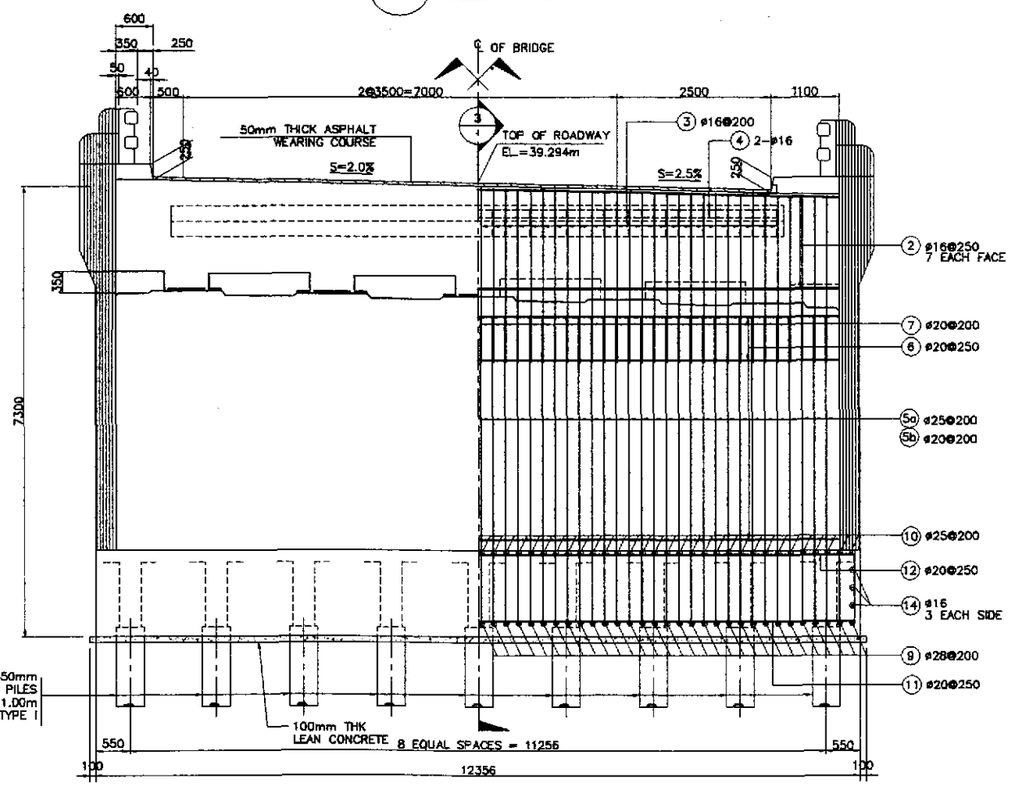
SCALE :
AS SHOWN
FULL SIZE A1

SHEET CONTENTS :
BRIDGE NO. 9
ABUTMENT A1
WINGWALL REINFORCEMENT DETAILS
(INITIAL STAGE)

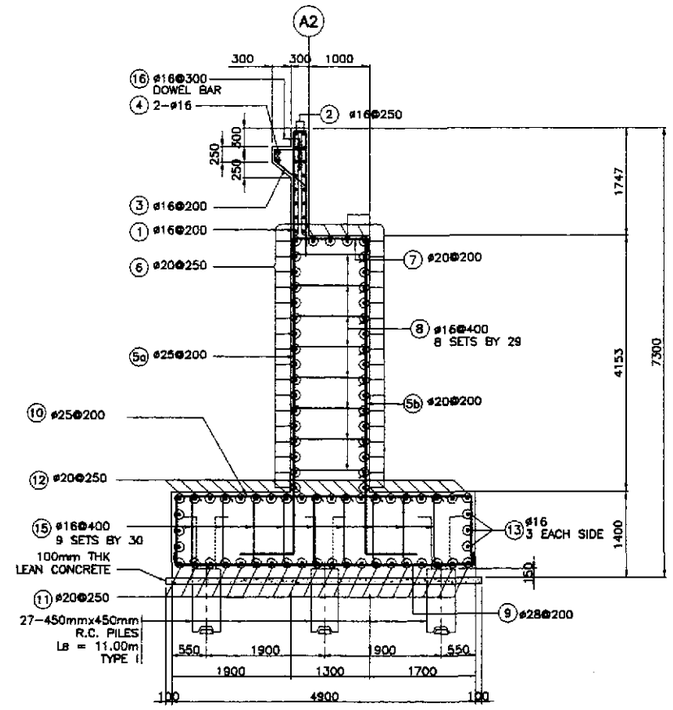
SHEET NO. :
B9-07



1 - PLAN
SCALE 1:50

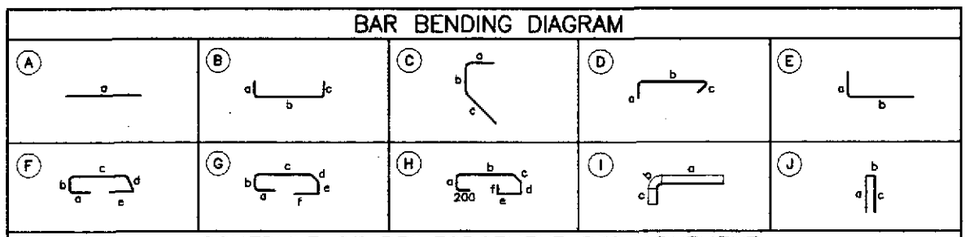


2 - ELEVATION
SCALE 1:50



3 - SECTION
SCALE 1:50

BAR BENDING DIAGRAM



SCHEDULE OF REINFORCEMENT PER ABUTMENT

LOCATION	CONCRETE VOLUME (m^3)	BAR MARK	BAR SIZE	QTY.	SPACING	BAR SHAPE	DIMENSIONS (mm) OUT TO OUT a	b	c	d	e	f	LENGTH EA. BAR (mm)	TOTAL LENGTH (m)	UNIT WT. (kg/m)	WEIGHT (kg)	REBAR RATIO (kg/m^3)
BACKWALL	7.26	①	16	59	200	B	2000	200	2000	–	–	–	4200	247.80	1.579	392	110.51
		②	16	14	250	A	11600	–	–	–	–	–	11600	162.40	1.579	257	
		③	16	51	200	C	600	150	750	–	–	–	1500	76.50	1.579	121	
		④	16	2	AS SHOWN	A	9900	–	–	–	–	–	9900	19.80	1.579	32	
MAINWALL	63.17	5a	25	59	200	E	400	5300	–	–	–	–	5700	336.30	3.854	1297	64.23
		5b	20	59	200	E	400	5300	–	–	–	–	5700	336.30	2.466	830	
		⑥	20	37	250	A	11600	–	–	–	–	–	11600	429.20	2.466	1058	
		⑦	20	59	200	B	250	1200	250	–	–	–	1700	100.30	2.466	248	
		⑧	16	232	400	D	250	1200	250	–	–	–	1700	394.40	1.579	623	
FOOTING	84.76	⑨	28	62	200	B	700	4750	700	–	–	–	6150	381.30	4.833	1843	65.64
		⑩	25	62	200	B	700	4750	700	–	–	–	6150	381.30	3.854	1470	
		⑪	20	20	250	B	700	12200	700	–	–	–	13600	272.00	2.466	671	
		⑫	20	20	250	B	700	12200	700	–	–	–	13600	272.00	2.466	671	
		⑬	16	6	AS SHOWN	A	12200	–	–	–	–	–	12200	73.20	1.579	116	
		⑭	16	6	AS SHOWN	A	4750	–	–	–	–	–	4750	28.50	1.579	46	
		⑮	16	270	400	D	250	1250	250				1750	472.50	1.579	747	
DOWEL		⑯	16	34	300	E	650	500	–	–	–	–	1150	39.10	1.579	62	
TOTAL	155.19	GRADE 40 TOTAL = 2,396 kgs. GRADE 60 TOTAL = 8,089 kgs.															

JICA
JAPAN INTERNATIONAL COOPERATION AGENCY

KATAHIRA & ENGINEERS INTERNATIONAL
YACHIYO ENGINEERING CO., LTD.

	DATE	SIGNATURE
DESIGNED	10/16/02	A.P. GONZALES
CHECKED	10/16/02	K. TASHIRO
SUBMITTED	10/18/02	M. KAICHI TEAM LEADER

REPUBLIC OF THE PHILIPPINES
DEPARTMENT OF PUBLIC WORKS AND HIGHWAYS

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Project Director	Chief, Bridges Division	Director IV (OIC)	Undersecretary	Secretary

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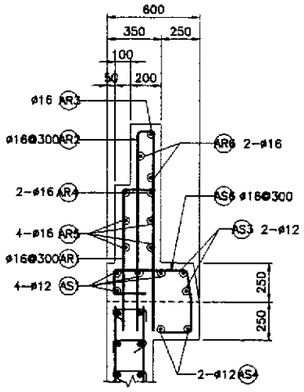
CABANATUAN BYPASS - CONTRACT PACKAGE II

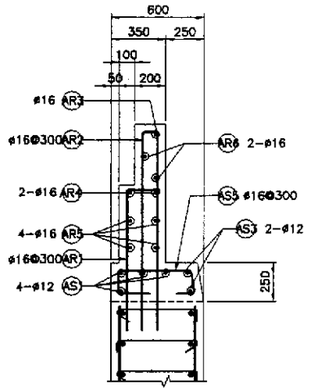
SCALE :
1 : 50
FULL SIZE A1

SHEET CONTENTS :
BRIDGE NO. 9
ABUTMENT A2
MAINWALL REINFORCEMENT DETAILS
(INITIAL STAGE)

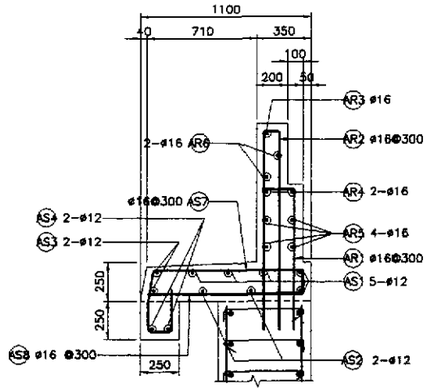
SHEET NO. :
B9-08



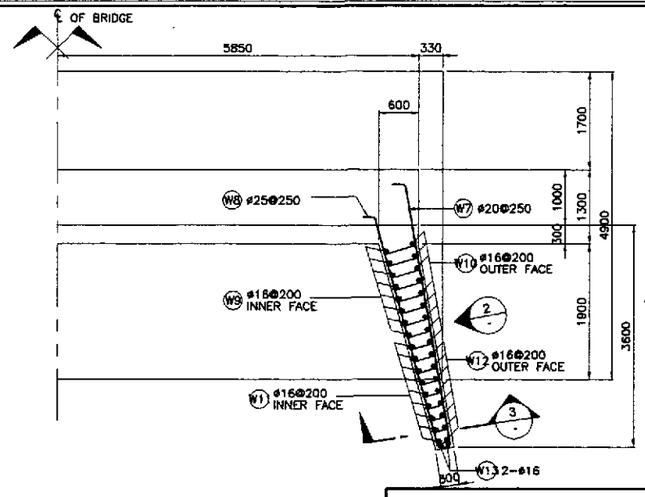
5A SECTION
SCALE 1:20



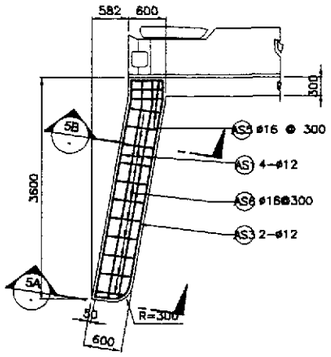
5B SECTION
SCALE 1:20



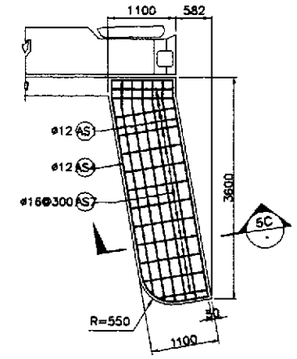
5C SECTION
SCALE 1:20



1 PLAN
SCALE 1:50



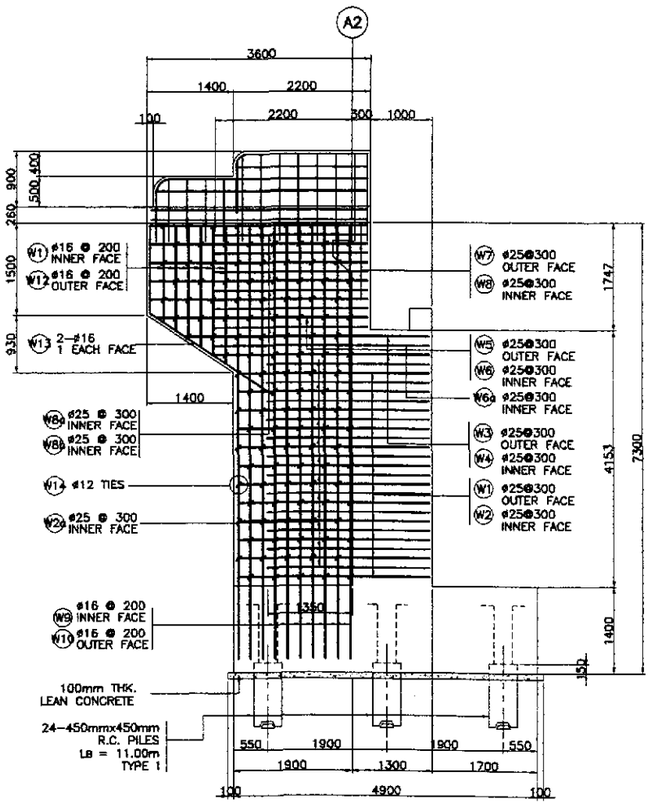
LEFT SIDE



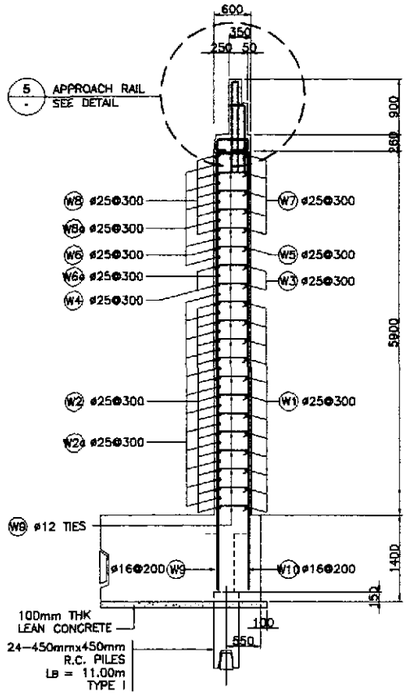
RIGHT SIDE

4 SIDEWALK DETAIL
SCALE 1:50

5 APPROACH RAIL DETAILS
SCALE 1:20

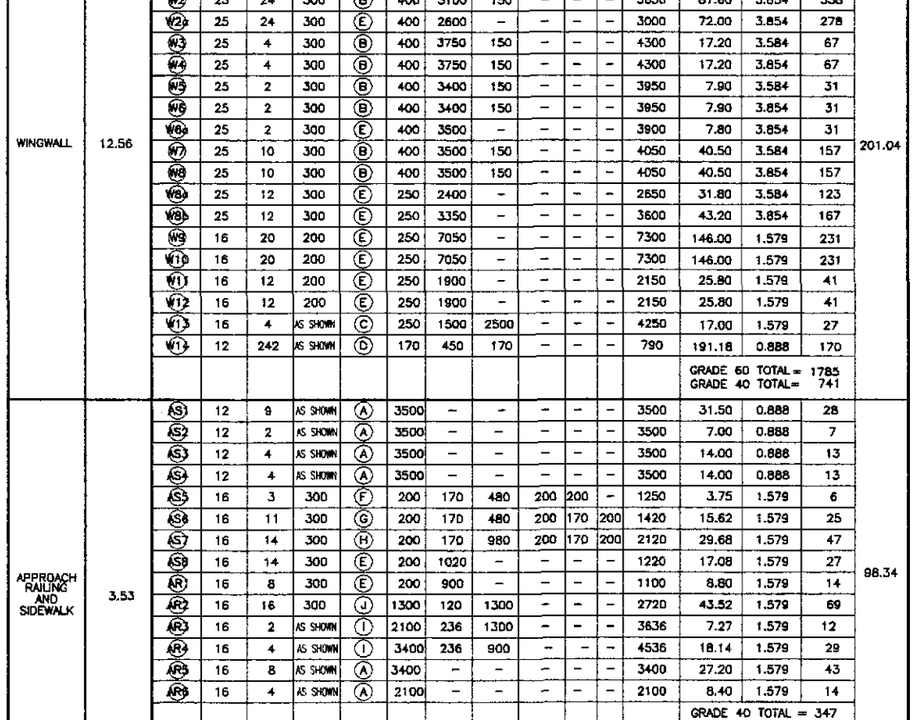


2 WINGWALL ELEVATION
SCALE 1:50



3 SECTION
SCALE 1:50

BAR BENDING DIAGRAM



SCHEDULE OF REINFORCEMENT PER ABUTMENT

LOCATION	CONCRETE VOLUME (m³)	BAR MARK	BAR SIZE	QTY.	SPACING	BAR SHAPE	DIMENSIONS (mm) OUT TO OUT a	b	c	d	e	f	LENGTH EA. BAR (mm)	TOTAL LENGTH (m)	UNIT WT. (kg/m)	WEIGHT (kg)	REBAR RATIO (kg/m³)
WINGWALL	12.56	W1	25	24	300	B	400	3100	150	–	–	–	3650	87.60	3.854	338	201.04
		W2	25	24	300	B	400	3100	150	–	–	–	3650	87.60	3.854	338	
		W2a	25	24	300	E	400	2600	–	–	–	–	3000	72.00	3.854	278	
		W3	25	4	300	B	400	3750	150	–	–	–	4300	17.20	3.584	67	
		W4	25	4	300	B	400	3750	150	–	–	–	4300	17.20	3.854	67	
		W5	25	2	300	B	400	3400	150	–	–	–	3950	7.90	3.584	31	
		W6	25	2	300	B	400	3400	150	–	–	–	3950	7.90	3.854	31	
		W6a	25	2	300	E	400	3500	–	–	–	–	3900	7.80	3.854	31	
		W7	25	10	300	B	400	3500	150	–	–	–	4050	40.50	3.584	157	
		W8	25	10	300	B	400	3500	150	–	–	–	4050	40.50	3.854	157	
		W8a	25	12	300	E	250	2400	–	–	–	–	2650	31.80	3.584	123	
		W8b	25	12	300	E	250	3350	–	–	–	–	3600	43.20	3.854	167	
		W9	16	20	200	E	250	7050	–	–	–	–	7300	146.00	1.579	231	
		W10	16	20	200	E	250	7050	–	–	–	–	7300	146.00	1.579	231	
		W11	16	12	200	E	250	1900	–	–	–	–	2150	25.80	1.579	41	
		W12	16	12	200	E	250	1900	–	–	–	–	2150	25.80	1.579	41	
		W13	16	4	AS SHOWN	C	250	1500	2500	–	–	–	4250	17.00	1.579	27	
		W14	12	242	AS SHOWN	D	170	450	170	–	–	–	790	191.18	0.888	170	
														GRADE 60 TOTAL = 1785 GRADE 40 TOTAL = 741			
APPROACH RAILING AND SIDEWALK	3.53	AS1	12	8	AS SHOWN	A	3500	–	–	–	–	–	3500	31.50	0.888	28	98.34
		AS2	12	2	AS SHOWN	A	3500	–	–	–	–	–	3500	7.00	0.888	7	
		AS3	12	4	AS SHOWN	A	3500	–	–	–	–	–	3500	14.00	0.888	13	
		AS4	12	4	AS SHOWN	A	3500	–	–	–	–	–	3500	14.00	0.888	13	
		AS5	16	3	300	F	200	170	480	200	200	–	1250	3.75	1.579	6	
		AS6	16	11	300	G	200	170	480	200	170	200	1420	15.62	1.579	25	
		AS7	16	14	300	H	200	170	980	200	170	200	2120	29.68	1.579	47	
		AS8	16	14	300	E	200	1020	–	–	–	–	1220	17.08	1.579	27	
		AR	16	8	300	E	200	900	–	–	–	–	1100	8.80	1.579	14	
		AR2	16	16	300	J	1300	120	1300	–	–	–	2720	43.52	1.579	69	
		AR3	16	2	AS SHOWN	I	2100	236	1300	–	–	–	3636	7.27	1.579	12	
		AR4	16	4	AS SHOWN	I	3400	236	900	–	–	–	4536	18.14	1.579	29	
		AR5	16	8	AS SHOWN	A	3400	–	–	–	–	–	3400	27.20	1.579	43	
		AR6	16	4	AS SHOWN	A	2100	–	–	–	–	–	2100	8.40	1.579	14	
														GRADE 40 TOTAL = 347			
TOTAL	16.09													GRADE 60 TOTAL = 1,785 kgs. GRADE 40 TOTAL = 1,088 kgs.			

JICA
JAPAN INTERNATIONAL COOPERATION AGENCY
KATAHIRA & ENGINEERS INTERNATIONAL
YACHIYO ENGINEERING CO., LTD.

	DATE	SIGNATURE
DESIGNED	10/18/02	P. GONZALES
CHECKED	10/18/02	
SUBMITTED	10/18/02	M. MORIOKA TEAM LEADER

REPUBLIC OF THE PHILIPPINES
DEPARTMENT OF PUBLIC WORKS AND HIGHWAYS

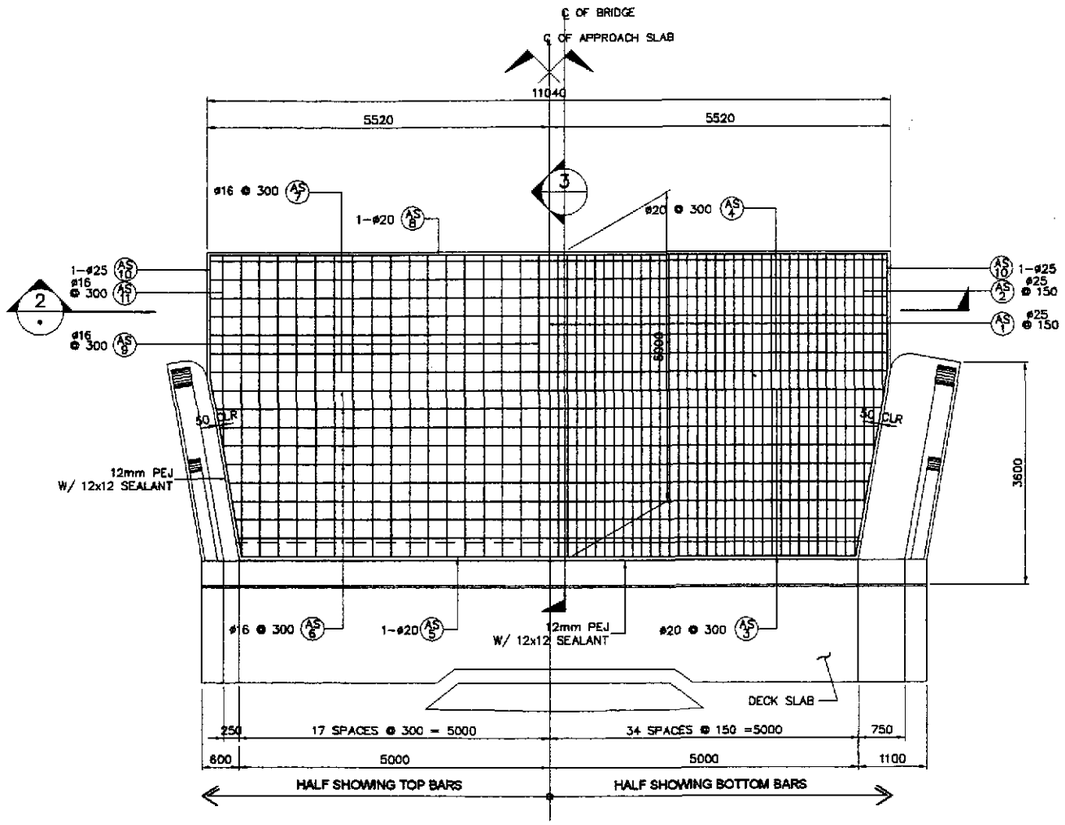
PJHL – PMO	BUREAU OF DESIGN		OFFICE OF THE SECRETARY	
Submitted By:	Reviewed By:	Recommended By:	Recommended By: (See cover sheet for Signature)	Approved By: (See cover sheet for Signature/Approval)
DANILO C. TRAJANO	ADRIANO M. DOROY	GILBERTO S. REYES	MANUEL M. BONOAN	SIMEON A. DATUMANONG
Project Director	Chief, Bridges Division	Director IV (OIC)	Undersecretary	Secretary

PROJECT AND LOCATION :
THE DETAILED DESIGN STUDY ON UPGRADING INTER-URBAN HIGHWAY SYSTEM ALONG THE PAN-PHILIPPINE HIGHWAY (Plaridel, Cabanatuan and San Jose Bypasses)
CABANATUAN BYPASS - CONTRACT PACKAGE II

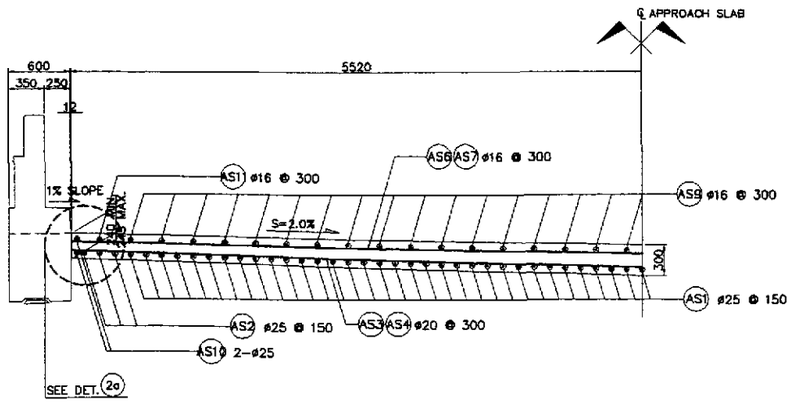
SCALE :
AS SHOWN
FULL SIZE A1

SHEET CONTENTS :
BRIDGE NO. 9
ABUTMENT A2
WINGWALL REINFORCEMENT DETAILS
(INITIAL STAGE)

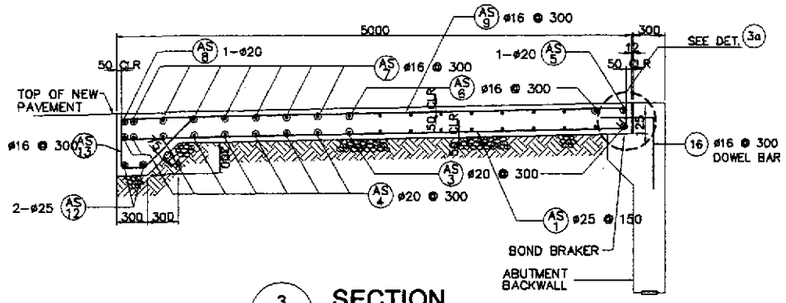
SHEET NO. :
B9-09



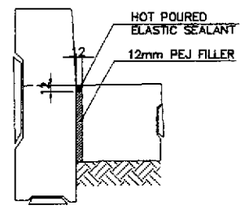
1 / - PLAN
SCALE 1:50



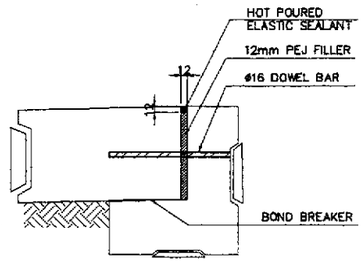
2 / - SECTION
SCALE 1:30



3 / - SECTION
SCALE 1:30



2a / - DETAIL
SCALE 1:10



3a / - DETAIL
SCALE 1:10

BAR BENDING DIAGRAM

(A) a

(B) a, b

(C) a, b

(D) a, b, c, d

SCHEDULE OF REINFORCEMENT PER APPROACH SLAB

LOCATION	CONCRETE VOLUME (m^3)	BAR MARK	BAR SIZE	QTY.	SPACING	BAR SHAPE	DIMENSIONS (mm) OUT TO OUT a	b	c	d	e	f	LENGTH EA. BAR (mm)	TOTAL LENGTH (m)	UNIT WEIGHT (kg/m)	WEIGHT (kg)	REBAR RATIO (kg/cu.m)
APPROACH SLAB	17.57	AS1	25	68	150	B	4800	200	–	–	–	–	5100	346.80	3.854	1337	156.64
		AS2	25	6	150	B	3200	200	–	–	–	–	3400	20.40	3.854	79	
		AS3	20	10	300	A	9980	–	–	–	–	–	9980	99.80	2.466	247	
		AS4	20	8	300	A	10940	–	–	–	–	–	10940	87.52	2.466	216	
		AS5	20	1	AS SHOWN	A	9900	–	–	–	–	–	9900	9.90	2.466	25	
		AS6	16	9	300	A	10040	–	–	–	–	–	10040	90.36	1.579	143	
		AS7	16	7	300	A	10940	–	–	–	–	–	10940	76.58	1.579	121	
		AS8	20	1	AS SHOWN	A	10940	–	–	–	–	–	10940	10.94	2.466	27	
		AS9	16	34	300	B	4900	200	–	–	–	–	5100	173.40	1.579	274	
		AS10	25	4	AS SHOWN	C	2000	3000	–	–	–	–	5000	20.00	3.854	78	
		AS11	16	2	300	B	3100	200	–	–	–	–	3300	6.60	1.579	11	
		AS12	25	2	AS SHOWN	A	10940	–	–	–	–	–	10940	21.88	3.854	85	
		AS13	16	38	300	D	400	500	200	700	–	–	1800	68.40	1.579	109	
TOTAL	17.57															GRADE 40 TOTAL = 658 kgs. GRADE 60 TOTAL = 2,094 kgs.	

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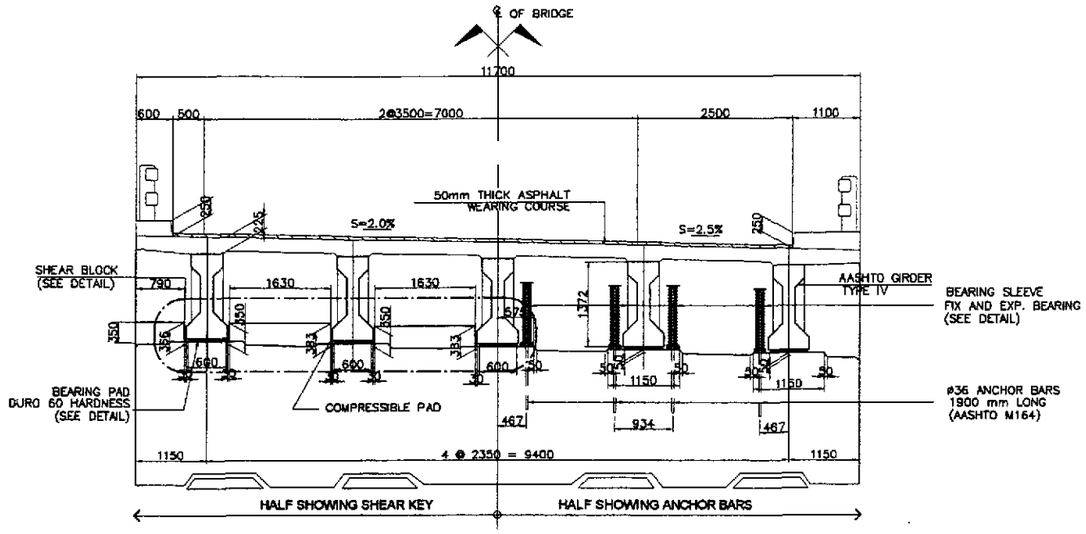
JAPAN INTERNATIONAL COOPERATION AGENCY
KEI KATAHIRA & ENGINEERS INTERNATIONAL
YACHIYO ENGINEERING CO., LTD.

	DATE	SIGNATURE
DESIGNED	10/16/01	E. N. SALLAN
CHECKED	10/16/01	M. KOBAYASHI
SUBMITTED	10/16/01	N. KIKUCHI TEAM LEADER

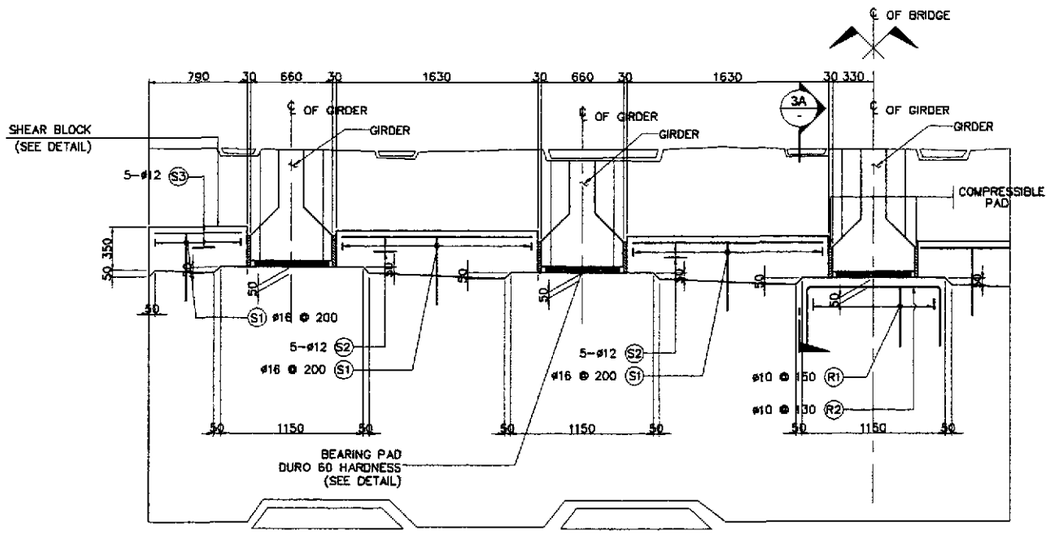
REPUBLIC OF THE PHILIPPINES
DEPARTMENT OF PUBLIC WORKS AND HIGHWAYS

PJHL – PMO	BUREAU OF DESIGN		OFFICE OF THE SECRETARY	
Submitted By:	Reviewed By:	Recommended By:	Recommended By: (See cover sheet for Signature)	Approved By: (See cover sheet for Signature/Approval)
DANILO C. TRAJANO Project Director	ADRIANO M. DOROY Chief, Bridges Division	GILBERTO S. REYES Director IV (OIC)	MANUEL M. BONOAN Undersecretary	SIMEON A. DATUMANONG Secretary

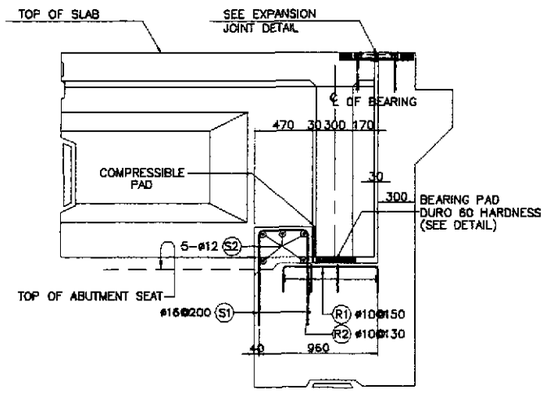
PROJECT AND LOCATION :	SCALE :	SHEET CONTENTS :	SHEET NO. :
THE DETAILED DESIGN STUDY ON UPGRADING INTER-URBAN HIGHWAY SYSTEM ALONG THE PAN-PHILIPPINE HIGHWAY (Plaridel, Cabanatuan and San Jose Bypasses) **CABANATUAN BYPASS - CONTRACT PACKAGE II**	AS SHOWN FULL SIZE A1	**BRIDGE NO. 9** APPROACH SLAB PLAN, SECTIONS AND DETAILS (INITIAL STAGE)	B9-10

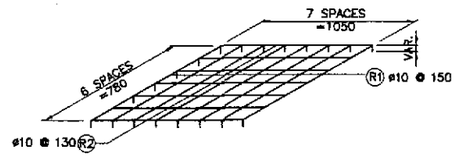


1 - SECTION AT ABUTMENT SEAT
SCALE 1:50

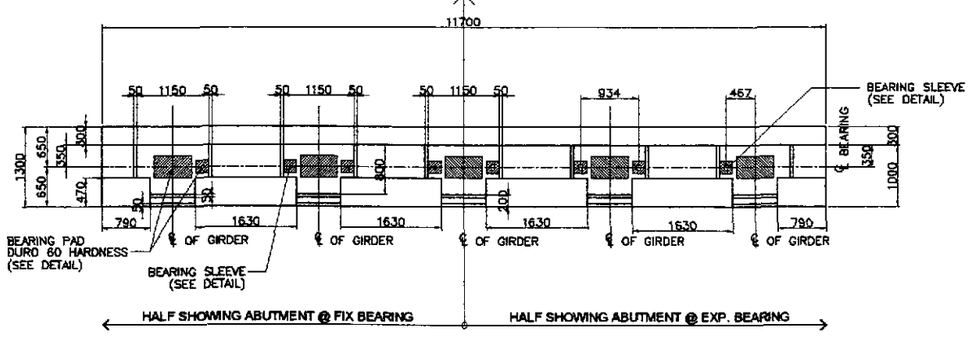


3 - SHEAR BLOCK DETAIL
SCALE 1:25





4 - RISER REINFORCEMENT
NOT TO SCALE



2 - PLAN AT ABUTMENT SEAT
SCALE 1:50

3A - SECTION
SCALE 1:25

BAR BENDING DIAGRAM

(A) a

(B) a b c

SCHEDULE OF REINFORCEMENT

LOCATION	CONCRETE VOLUME (m^3)	BAR MARK	BAR SIZE	QTY.	SPACING	BAR SHAPE	DIMENSION(mm) OUT TO OUT a	b	c	d	e	LENGTH EACH BAR (m)	TOTAL LENGTH (m)	UNIT WEIGHT (kg/m)	WEIGHT (kg)	REBAR RATIO (kg/m^3)
SHEAR KEY & RISER	1.55	S1	16	46	200	B	560	390	560			1510	69.46	1.579	110	150.97
		S2	12	20	AS SHOWN	A	1550					1550	31.00	0.888	28	
		S3	12	10	AS SHOWN	A	710					710	71.00	0.888	7	
		R1	10	40	150	B	500	780	500			1780	71.20	0.616	44	
		R2	10	35	130	B	500	1050	500			2050	71.75	0.616	45	
TOTAL	1.55	GRADE 40 TOTAL = 234 kgs.														

THE REINFORCEMENT SHOWN ON THIS TABLE IS FOR REFERENCE ONLY. THE CONTRACTOR SHOULD CHECK AND VERIFY ALL DIMENSIONS, SIZES AND QUANTITIES OF REINFORCEMENT.

JICA
JAPAN INTERNATIONAL COOPERATION AGENCY
KATAHIRA & ENGINEERS INTERNATIONAL
YACHIYO ENGINEERING CO., LTD.

	DATE	SIGNATURE
DESIGNED	10/4/02	E. N. SALLAN
CHECKED	10/10/02	A. YOSHII
SUBMITTED	10/18/02	TEAM LEADER

REPUBLIC OF THE PHILIPPINES
DEPARTMENT OF PUBLIC WORKS AND HIGHWAYS

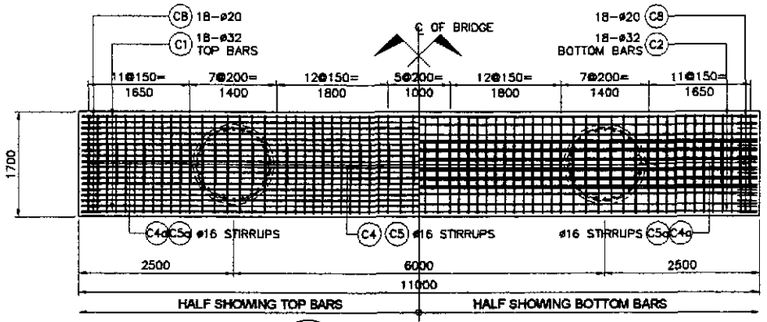
PJHL – PMO	BUREAU OF DESIGN		OFFICE OF THE SECRETARY	
Submitted By:	Reviewed By:	Recommended By:	Recommended By: (See cover sheet for Signature)	Approved By: (See cover sheet for Signature/Approval)
DANILO C. TRAJANO	ADRIANO M. DORCY	GILBERTO S. REYES	MANUEL M. BONOAN	SIMEON A. DATUMANONG
Project Director	Chief, Bridges Division	Director IV (OIC)	Undersecretary	Secretary

PROJECT AND LOCATION :
THE DETAILED DESIGN STUDY ON UPGRADING INTER-URBAN HIGHWAY SYSTEM ALONG THE PAN-PHILIPPINE HIGHWAY (Plaridel, Cabanatuan and San Jose Bypasses)
CABANATUAN BYPASS - CONTRACT PACKAGE II

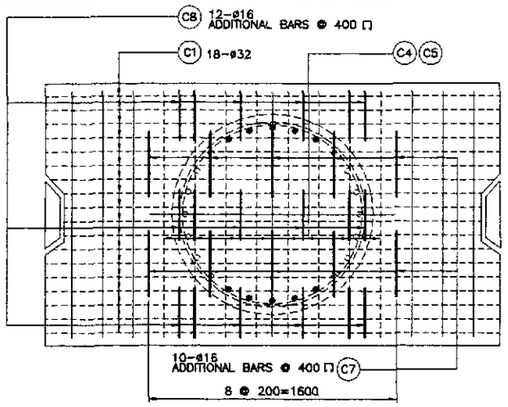
SCALE : AS SHOWN
FULL SIZE A1

SHEET CONTENTS :
BRIDGE NO. 9
SHEAR KEY AND RISER DETAILS AT ABUTMENT (INITIAL STAGE)

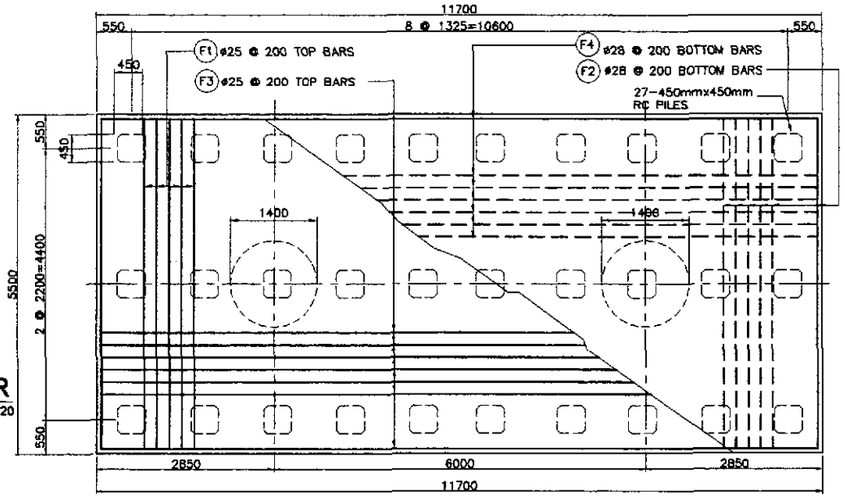
SHEET NO. : B9-11



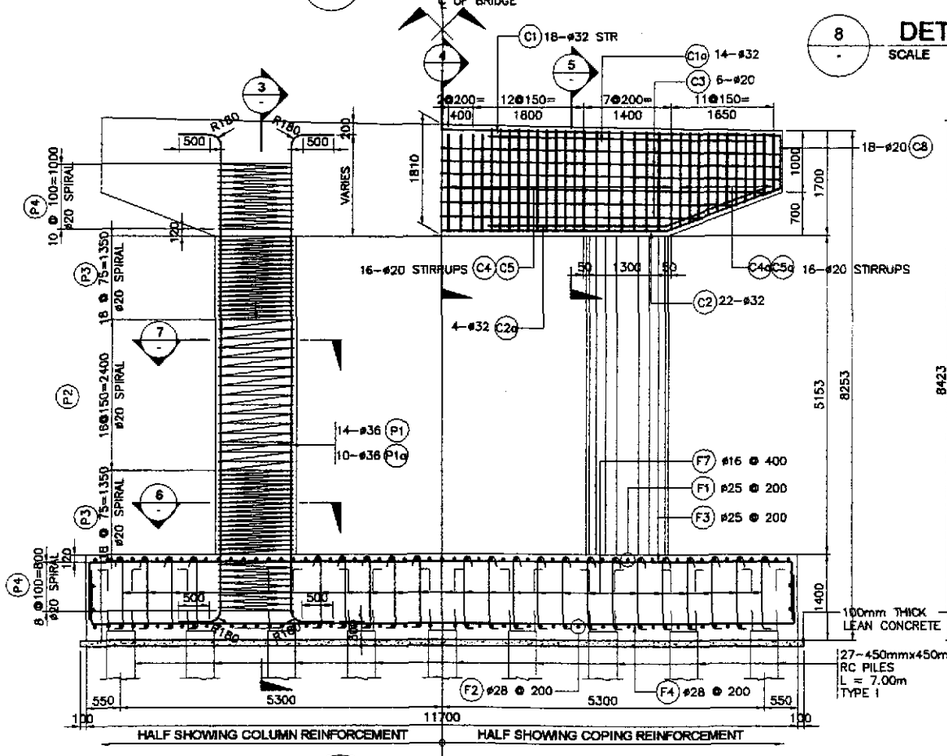
1 - SCALE 1:50 **COPING PLAN**



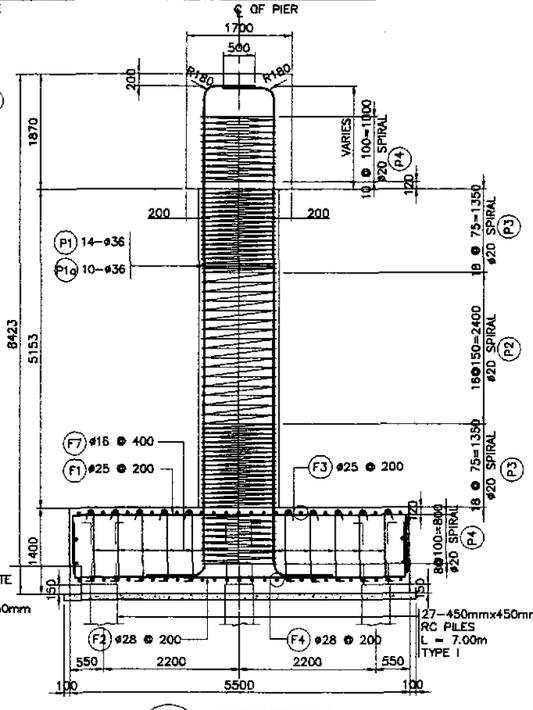
8 - SCALE 1:20 **DETAIL OF ADDITIONAL REINFORCEMENT @ PIER**



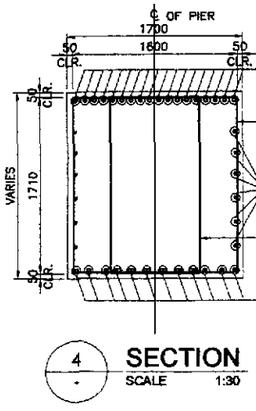
9 - SCALE 1:50 **FOOTING PLAN**



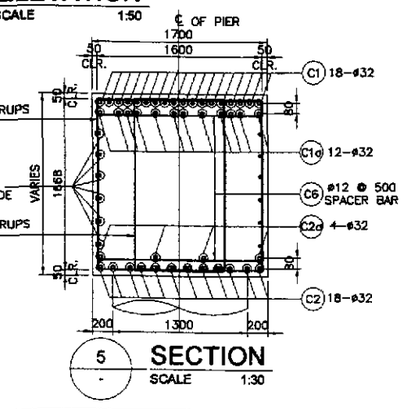
2 - SCALE 1:50 **ELEVATION**



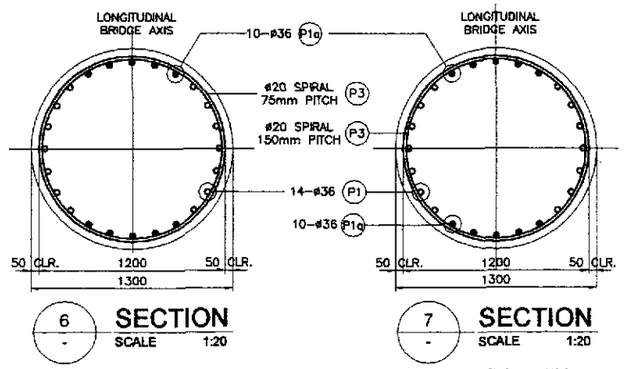
3 - SCALE 1:50 **SECTION**



4 - SCALE 1:30 **SECTION**



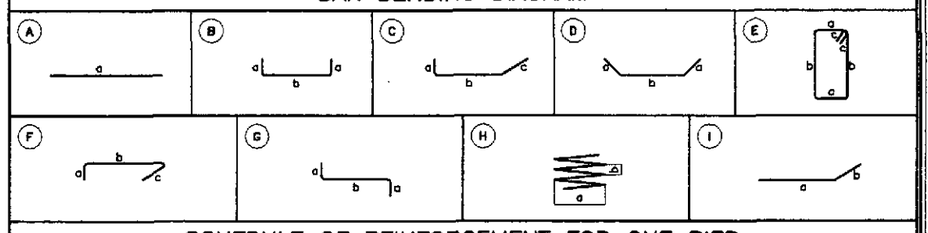
5 - SCALE 1:30 **SECTION**



6 - SCALE 1:20 **SECTION**

7 - SCALE 1:20 **SECTION**

BAR BENDING DIAGRAM



SCHEDULE OF REINFORCEMENT FOR ONE PIER

LOCATION	CONCRETE VOLUME (m^3)	BAR MARK	BAR SIZE	QTY.	SPACING	BAR SHAPE	DIMENSIONS (mm) OUT TO OUT a	b	c	d	LENGTH EACH BAR (mm)	TOTAL LENGTH (m)	UNIT WT (kg/m)	TOTAL WEIGHT (kg)	REBAR RATIO (kg/m^3)
COPING	31.29	C1	32	18	AS SHOWN	A	10900	–	–	–	10900	196.20	6.313	1239	172.38
		C1a	32	24	AS SHOWN	A	4500	–	–	–	4500	108.00	6.313	682	
		C2	32	18	AS SHOWN	D	2000	7200	–	–	11200	201.60	6.313	1273	
		C2a	32	8	AS SHOWN	I	1800	3200	–	–	5000	40.00	6.313	253	
		C3	20	6	AS SHOWN	A	10900	–	–	–	10900	65.40	2.466	162	
		C3a	20	6	AS SHOWN	A	9500	–	–	–	9500	57.00	2.466	141	
		C4	16	44	150	E	1600	1725	150	–	6950	305.80	1.579	483	
		C4a	16	22	150	E	1600	1425	150	–	6350	139.70	1.579	221	
		C5	16	44	150	E	900	1725	150	–	5550	244.20	1.579	386	
		C5a	16	22	150	E	900	1425	150	–	4950	108.90	1.579	172	
		C6	12	40	150	B	150	1600	–	–	1900	76.00	0.888	68	
		C7	20	36	AS SHOWN	C	350	900	350	–	1600	57.60	2.466	143	
		C8a	16	24	400	B	330	1700	–	–	2360	56.64	1.579	90	
		C8b	16	20	400	B	430	1700	–	–	2560	51.20	1.579	81	
COLUMN	13.68	P1	36	28	AS SHOWN	B	600	7750	–	–	8950	250.60	7.991	2003	
		P1a	36	20	AS SHOWN	G	600	7750	–	–	8950	179.00	7.991	1431	
		P2	20	32	150	H	1200	150	–	–	3770	120.64	2.466	298	
		P3	20	72	75	H	1200	75	–	–	3770	271.43	2.466	670	
		P4	20	36	100	H	1200	100	–	–	3770	135.72	2.466	335	
FOOTING	90.09	F1	25	59	200	B	925	5350	–	–	7200	424.80	3.854	1638	346.29
		F2	28	59	200	B	925	5350	–	–	7200	424.80	4.833	2054	
		F3	25	28	200	B	925	11550	–	–	13400	375.20	3.854	1447	
		F4	28	28	200	B	925	11550	–	–	13400	375.20	4.833	1814	
		F5	16	4	AS SHOWN	A	11550	–	–	–	11550	46.20	1.579	73	
		F6	16	4	AS SHOWN	A	5350	–	–	–	5350	21.40	1.579	34	
		F7	16	364	400	F	200	1250	150	–	1600	582.40	1.579	920	
TOTAL	125.47													GRADE 40 TOTAL = 2,528 kgs. GRADE 60 TOTAL = 15,583 kgs.	

JICA
JAPAN INTERNATIONAL COOPERATION AGENCY

KRI KATAHIRA & ENGINEERS INTERNATIONAL
YEC YACHIYO ENGINEERING CO., LTD.

	DATE	SIGNATURE
DESIGNED	10/18/02	M. P. GONZALES
CHECKED	10/18/02	
SUBMITTED	10/18/02	M. SUGIURA TEAM LEADER

REPUBLIC OF THE PHILIPPINES
DEPARTMENT OF PUBLIC WORKS AND HIGHWAYS

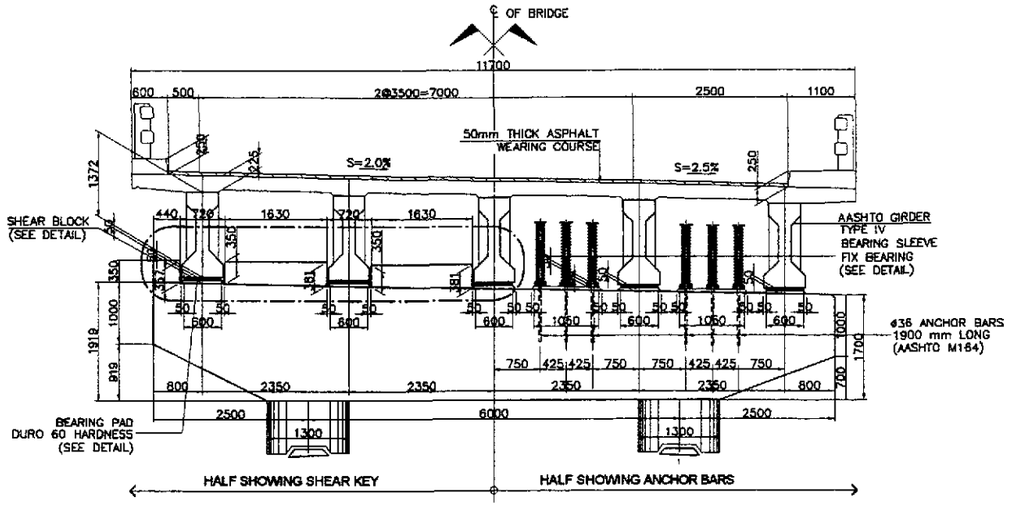
RJHE. – PMO	BUREAU OF DESIGN		OFFICE OF THE SECRETARY	
Submitted By:	Reviewed By:	Recommended By:	Recommended By: (See cover sheet for Signature)	Approved By: (See cover sheet for Signature/Approval)
DANILO C. TRAJANO	ADRIANO M. DOROY	GILBERTO S. REYES	MANUEL M. BONOAN	SIMEON A. DATUMANONG
Project Director	Chief, Bridges Division	Director IV (OIC)	Undersecretary	Secretary

PROJECT AND LOCATION :
THE DETAILED DESIGN STUDY ON
UPGRADING INTER-URBAN HIGHWAY SYSTEM
ALONG THE PAN-PHILIPPINE HIGHWAY
(Plaridel, Cabanatuan and San Jose Bypasses)
CABANATUAN BYPASS - CONTRACT PACKAGE II

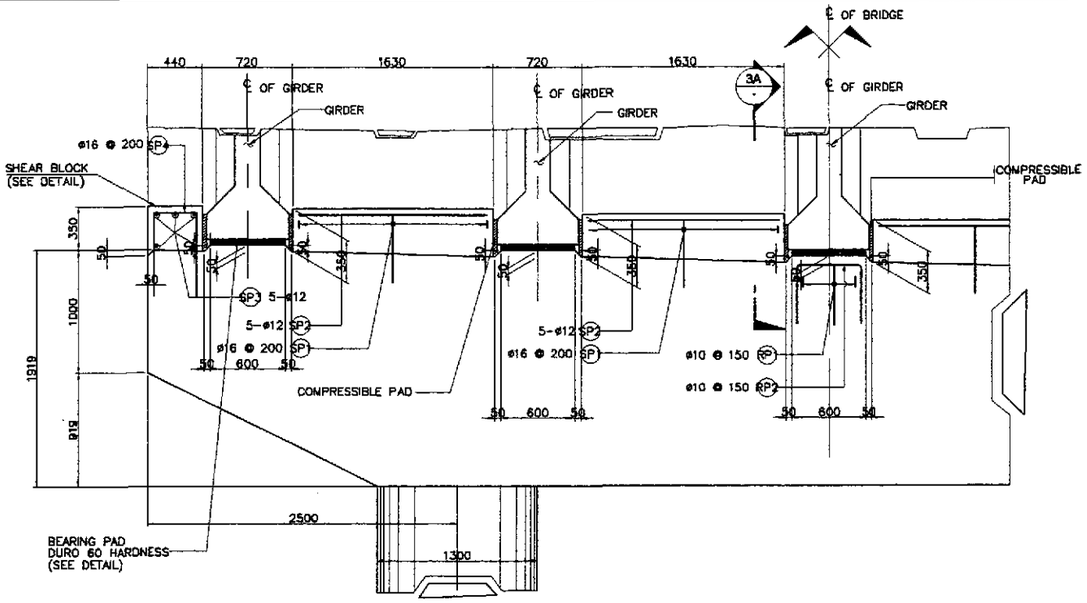
SCALE :
AS SHOWN
FULL SIZE A1

SHEET CONTENTS :
BRIDGE NO. 9
PIER P1 AND PIER P2
BAR ARRANGEMENT
(INITIAL STAGE)

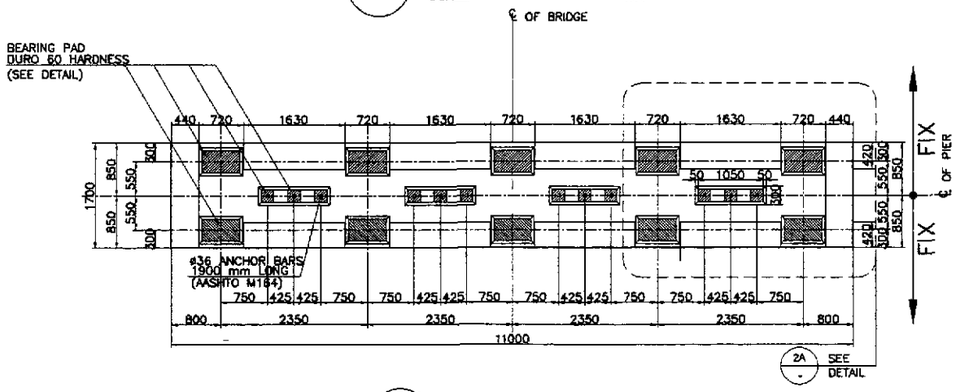
SHEET NO. :
B9-12



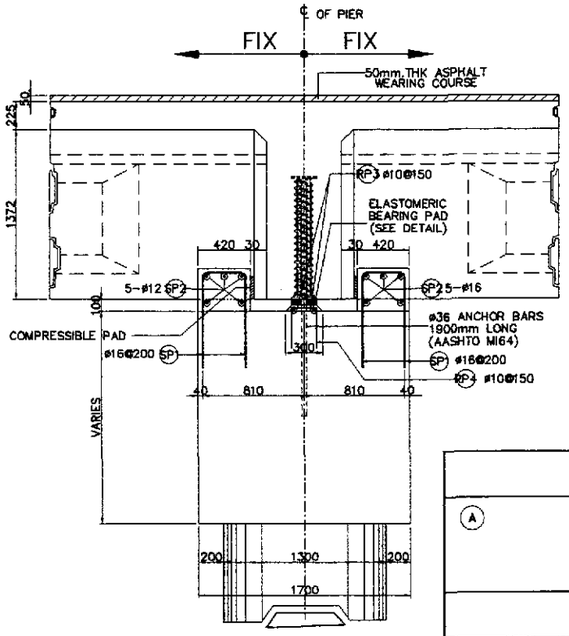
1 - SECTION AT PIER
SCALE 1:50



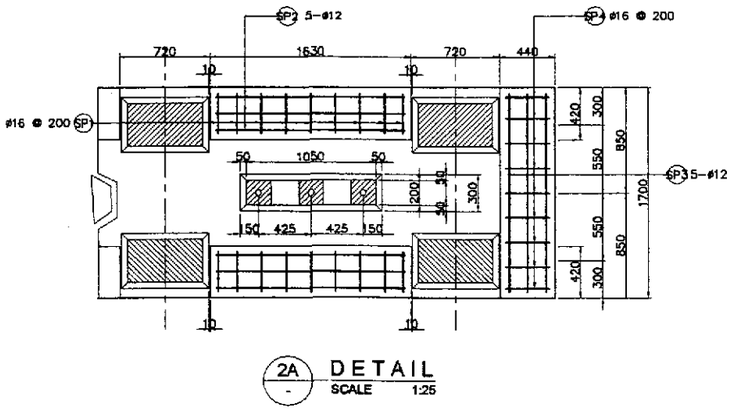
3 - SHEAR BLOCK DETAIL AT PIER
SCALE 1:25



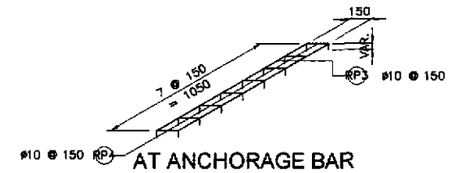
2 - PLAN AT PIER
SCALE 1:50



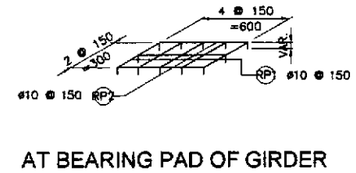
3A - SECTION
SCALE 1:25



2A - DETAIL
SCALE 1:25



AT ANCHORAGE BAR



AT BEARING PAD OF GIRDER

4 - RISER REINFORCEMENT
NOT TO SCALE

BAR BENDING DIAGRAM

(A) a

(B) a b c

SCHEDULE OF REINFORCEMENT (FOR ONE PIER ONLY)

LOCATION	CONCRETE VOLUME (m^3)	BAR MARK	BAR SIZE	QTY.	SPACING	BAR SHAPE	DIMENSION(mm) OUT TO OUT a	b	c	d	e	LENGTH EACH BAR (m)	TOTAL LENGTH (m)	UNIT WEIGHT (kg/m)	WEIGHT (kg)	REBAR RATIO (kg/m^3)
SHEAR KEY & RISER	2.65	SP1	16	72	200	B	560	340	560			1460	105.12	1.579	166	146.82
		SP2	12	40	AS SHOWN	A	1550					1550	62.00	0.888	56	
		SP3	12	10	AS SHOWN	A	1620					1620	16.20	0.888	15	
		SP4	16	18	200	B	560	360	560			1480	26.64	1.579	43	
		RP1	10	50	150	B	500	600	500			1600	80.00	0.616	50	
		RP2	10	30	150	B	500	300	500			1300	39.00	0.616	25	
		RP3	10	8	150	B	500	1050	500			2050	16.40	0.616	11	
		RP4	10	32	150	B	500	150	500			1150	36.80	0.616	23	
TOTAL	2.65	GRADE 40 TOTAL = 389 kgs.														

THE REINFORCEMENT SHOWN ON THIS TABLE IS FOR REFERENCE ONLY. THE CONTRACTOR SHOULD CHECK AND VERIFY ALL DIMENSIONS, SIZES AND QUANTITIES OF REINFORCEMENT.

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JAPAN INTERNATIONAL COOPERATION AGENCY
KATAHIRA & ENGINEERS INTERNATIONAL
YACHIYO ENGINEERING CO., LTD.

	DATE	SIGNATURE
DESIGNED	10/4/02	E. N. SALLAN
CHECKED	10/16/02	K. KAWASHIMA
SUBMITTED	10/18/02	M. IKEUCHI TEAM LEADER

REPUBLIC OF THE PHILIPPINES
DEPARTMENT OF PUBLIC WORKS AND HIGHWAYS

PJHL – PMO	BUREAU OF DESIGN		OFFICE OF THE SECRETARY	
Submitted By:	Reviewed By:	Recommended By:	Recommended By: (See cover sheet for Signature)	Approved By: (See cover sheet for Signature/Approval)
DANILO C. TRAJANO Project Director	ADRIANO M. DOROY Chief, Bridges Division	GILBERTO S. REYES Director IV (OIC)	MANUEL M. BONOAN Undersecretary	SIMEON A. DATUMANONG Secretary

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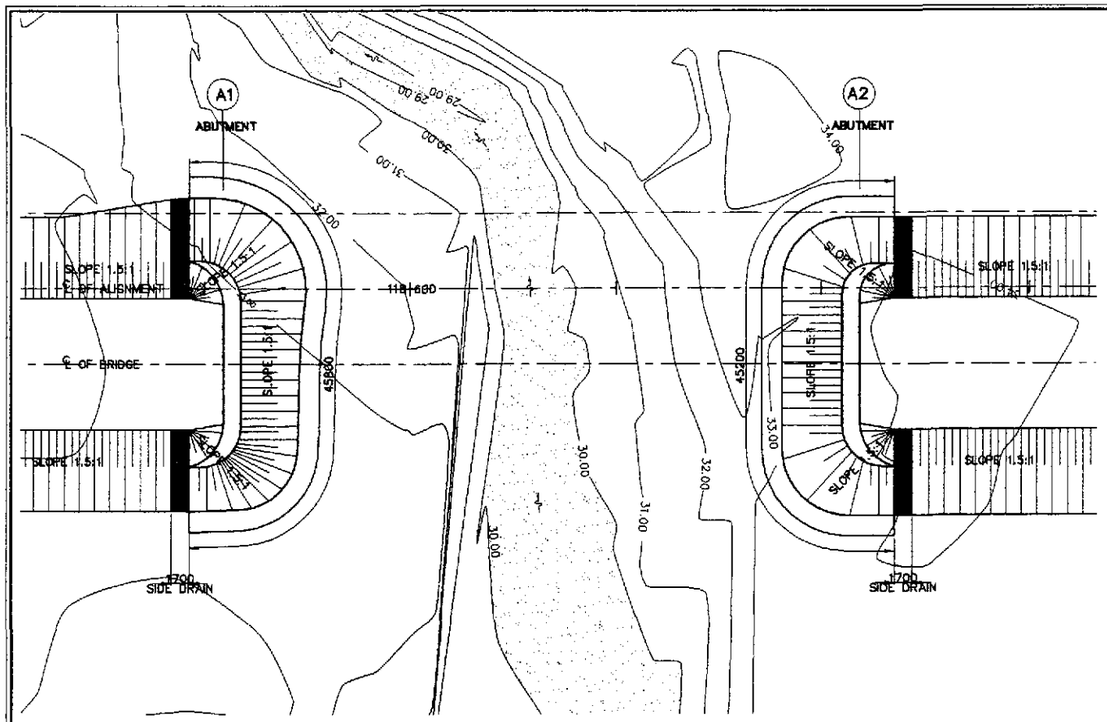
CABANATUAN BYPASS - CONTRACT PACKAGE II

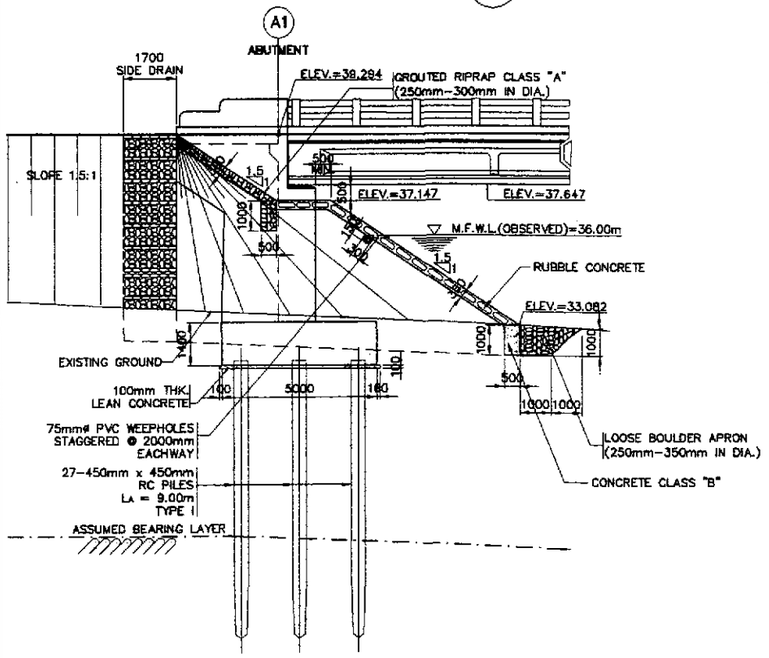
SCALE : AS SHOWN
FULL SIZE A1

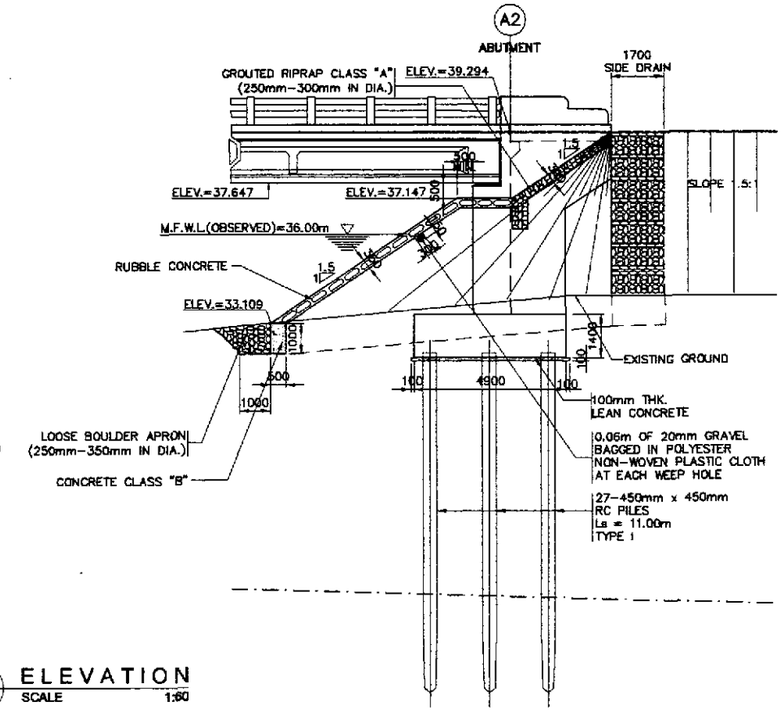
SHEET CONTENTS :
BRIDGE NO. 9
SHEAR KEY AND RISER DETAILS AT PIER (INITIAL STAGE)

SHEET NO. : B9-13



1A PLAN
SCALE 1:300





1B ELEVATION
SCALE 1:60

1 ABUTMENT SLOPE PROTECTION
SCALE AS SHOWN

GENERAL NOTES:

1. GROUTED RIPRAP (250mm-300mmDIA.) SHALL BE USED FOR THE FACING AND SHALL BE CAREFULLY HANDLAID WITH THE LONGEST DIMENSIONS PERPENDICULAR TO THE SLOPE AND FIRMLY BEDDED INTO THE SLOPE AND ADJACENT TO THE ADJOINING BOULDERS SPACED BETWEEN THE BOULDERS. THE SPACE BETWEEN THE BOULDERS SHALL BE COMPLETELY FILLED WITH MORTAR. THE OUTSIDE SURFACE OF THE BOULDERS SHALL BE LEFT EXPOSED AND THE SURFACE OF THE MORTAR SHALL BE SWEPT WITH A STIFF BROOM.

2. WIRE MESH GABIONS/MATTRESS
   A. WIRE-THE WIRE MESH SHALL BE MADE OF GALVANIZED STEEL HAVING A MINIMUM SIZE OF 3.40mm DIAMETER (U.S. WIRE GAUGE NO.11) THE TENSILE STRENGTH OF THE WIRE HALL BE IN THE RANGE OF 413.70 TO 586.10 MPa. (60,000 TO 85,000 Psi) THE MINIMUM ZINC COATING OF THE WIRE SHALL BE 22.70 GRAMS PER 0.0929m2 OF UNCOATED WIRE SURFACES AS DETERMINED BY TEST CONDUCTED IN ACCORDANCE WITH AASHTO T85.
   B. ROCK FILL - ROCK USED IN THE GABIONS SHALL CONSIST OF HARD, DURABLE ROCK PIECES THAT WILL NOT DETERIORATE WHEN SUBMERGED IN WATER OR EXPOSED TO SEVERE WEATHER CONDITIONS. ROCK PIECES SHALL BE GENERALLY UNIFORMLY GRADED IN SIZES RANGING FROM 100mm TO 200mm. FILLED GABIONS SHALL HAVE A MINIMUM DENSITY OF 1,400Kg./m3. VOIDS SHALL BE EVENLY DISTRIBUTED.
   THE ROCKS SHALL MEET THE REQUIREMENTS OF AASHTO M63 EXCEPT THAT THE SODIUM SULFATE SOUNDNESS LOSS SHALL NOT EXCEED 9% AFTER 5 CYCLES.

3. GEOTEXTILE
   THE FOLLOWING SPECIFICATIONS ARE REQUIRED:
   1. POLYESTER OR POLYPROPELINE - 100%
   2. MECHANICALLY BONDED/HEAT BONDED
   3. NON-WOVEN
   4. EFFECTIVE OPENING SIZE - 110 MICRONS (MAX.)
   5. THICKNESS UNDER PRESSURE - 0.80mm (MIN.)
   6. WEIGHT - 200g/sq. m. (MIN.)
   7. CBR PUNCTURE STRENGTH - 400N (MIN.)
   8. MULTI-DIRECTIONAL TENSILE STRENGTH - 13KN/m

4. GRAVEL FILTER SHALL BE COARSE AGGREGATES MATERIALS WHICH SATISFY THE REQUIREMENTS FOR ITEM 405, STRUCTURAL CONCRETE, GRADING B OF TABLE 405.1 AS REVISED.

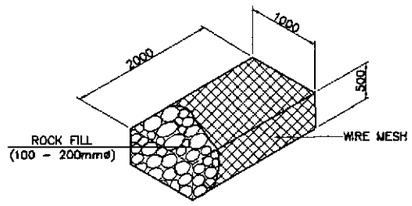
5. RUBBLE CONCRETE SHALL BE CLASS "B" (1:2.5:5) MIX CONCRETE WITH BOULDERS EMBEDDED THEREIN. BOULDERS 250-300mmø SHALL BE CAREFULLY HAND-LAID WITHIN THE CONCRETE SECTION. THE BOULDERS SHALL BE THOROUGHLY INCORPORATED INTO THE CONCRETE MASS WITH A COVER OF 30mm AND NOT LESS THAN 30mm APART. THE RUBBLE CONCRETE SHALL BE COMPOSED OF 40 % CLASS "B" CONCRETE AND 60 % BOULDERS.

6. FOR THE LOOSE BOULDER APRON, BOULDERS 250-350mmø SHALL BE HAND-LAID, CLOSE TOGETHER AND SHALL BE FIRMLY BEDDED. ALL VOIDS BETWEEN BOULDERS SHALL BEFILLED WITH GRAVEL AND THE JOINTS FILLED WITH TIGHTLY DRIVEN SPALLS.

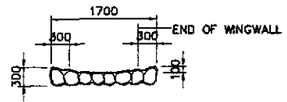
7. CURTAIN WALLS SHALL BE USED AT BOTH ENDS OF THE LOOSE BOULDER APRON BANK PROTECTION WORKS. BOULDERS SHALL BE CAREFULLY HAND-LAID AND EMBEDDED INTO THE CONCRETE SECTION.

8. NO CONCRETING UNDER WATER SHALL BE PERMITTED.

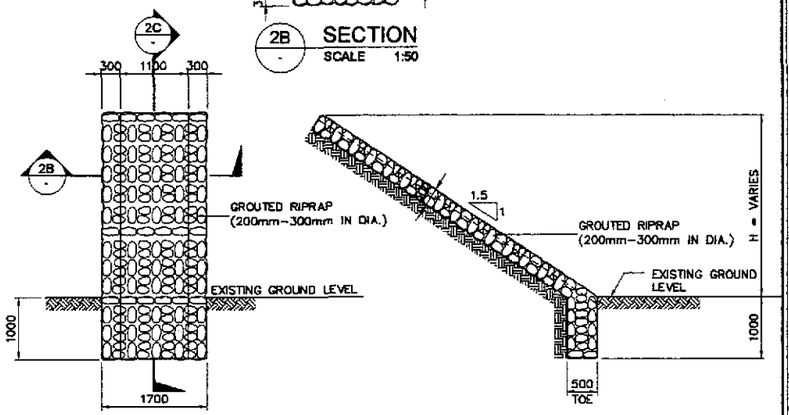
9. PROVIDE 1.0 m. BERM WHEN HEIGHT (H) IS > 4.0 m.



3 GABION MATTRESSES
SCALE 1:50



2B SECTION
SCALE 1:50



2A ELEVATION
SCALE 1:50

2C SECTION
SCALE 1:50

2 TYPICAL SIDE DRAIN DETAIL
SCALE AS SHOWN

VELOCITY (m/sec)	ROCK SIZE (mm)	
	VERY TURBULENT FLOW	SMOOTH FLOW
1.00	40	-
1.50	135	-
2.00	170	-
2.50	255	137
3.00	370	197
3.50	515	270
4.00	690	350
4.50	825	425
5.00	>900	590

PER ABUTMENT

LOCATION	SIZES	QUANTITY			
		ABUT. A1	ABUT. A2	PIER P1	PIER P2
CONC. CLASS "B"	1000 x 500 x LENGTH	21.75 cu. m.	20.85 cu. m.	-	-
BOULDER APRON	250mm-350mm IN DIA.	65.26 cu. m.	62.55 cu. m.	-	-
RUBBLE CONCRETE	250mm-300mm IN DIA.	89.59 cu. m.	79.87 cu. m.	-	-
SIDE DRAIN	200mm-300mm IN DIA.	12.55 cu. m.	11.63 cu. m.	-	-
GROUTED RIPRAP	250mm-300mm IN DIA.	13.18 cu. m.	13.18 cu. m.	-	-
GABION MATTRESS	500 x 1000 x 2000mm	-	-	96 pcs.	96 pcs.

JAPAN INTERNATIONAL COOPERATION AGENCY
KATAHIRA & ENGINEERS INTERNATIONAL
YACHIYO ENGINEERING CO., LTD.

	DATE	SIGNATURE
DESIGNED	10/16/02	A. GONZALES
CHECKED	10/16/02	M. KOBAYASHI
SUBMITTED	10/18/02	M. KINOSHITA, TEAM LEADER

REPUBLIC OF THE PHILIPPINES
DEPARTMENT OF PUBLIC WORKS AND HIGHWAYS

PJHL - PMO	BUREAU OF DESIGN		OFFICE OF THE SECRETARY	
Submitted By:	Reviewed By:	Recommended By:	Recommended By: (See cover sheet for Signature)	Approved By: (See cover sheet for Signature/Approval)
DANILO C. TRAJANO	PERFECTO L. ZAPLAN JR.	GILBERTO S. REYES	MANUEL M. BONOAN	SIMEON A. DATUMANONG
Project Director	Chief, Hydraulics Division (OIC)	Director IV (OIC)	Undersecretary	Secretary

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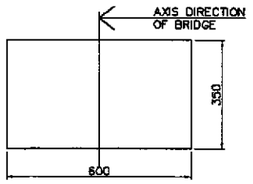
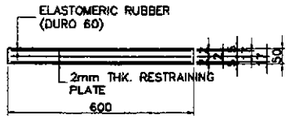
SCALE : AS SHOWN
FULL SIZE A1

SHEET CONTENTS :
BRIDGE NO. 9
ABUTMENT PROTECTION
AND SIDE DRAIN DETAILS
(INITIAL STAGE)

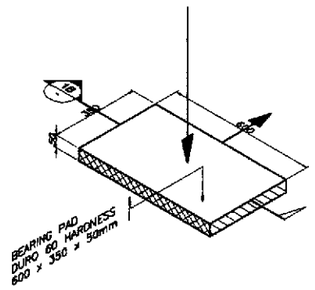
SHEET NO. : B9-14



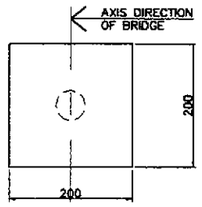
1A PLAN
SCALE 1:10



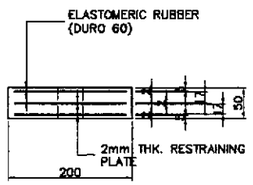
1B ELEVATION
SCALE 1:10



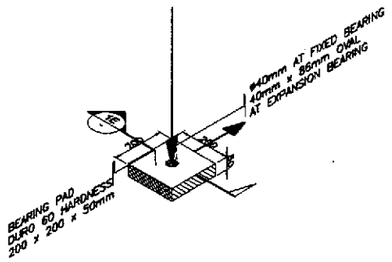
1C ISOMETRIC VIEW
N T S



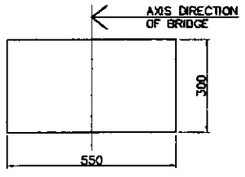
1D PLAN
SCALE 1:5



1E ELEVATION
SCALE 1:5

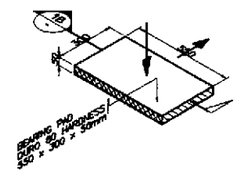


1F ISOMETRIC VIEW
N T S



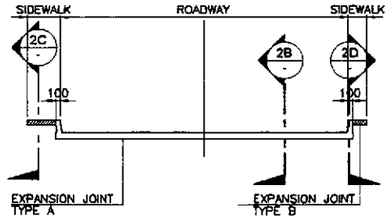
1G PLAN
SCALE 1:10

1H ELEVATION
SCALE 1:10

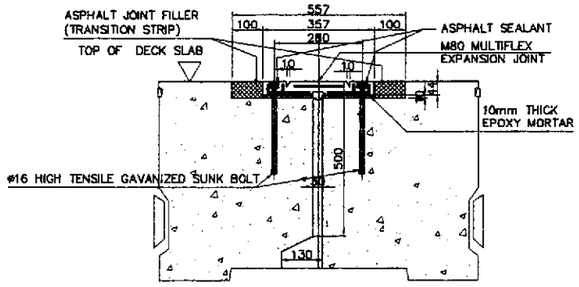


1I ISOMETRIC VIEW
N T S

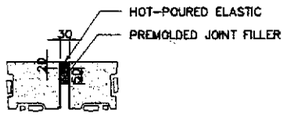
1 BEARING PAD DETAIL
SCALE AS SHOWN



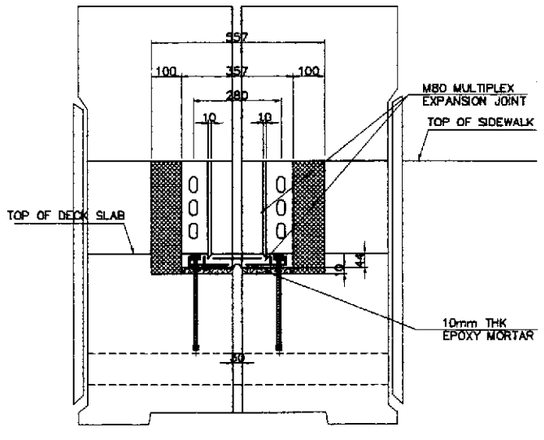
2A ELEVATION
N T S



2B SECTION (TYPE A)
SCALE 1:10



2C SECTION (TYPE B)
SCALE 1:10



2D SECTION (TYPE A)
SCALE 1:10

2 EXPANSION JOINT DETAIL
SCALE AS SHOWN

A.) QUALITY TESTING OF RUBBER COMPOUND

PROPERTIES	SPECIFICATION
HARDNESS (SHORE A)	50 ± 5
TENSILE STRENGTH (MPa)	13 MIN
ELONGATION AT BREAK (%)	400 MIN
COMPRESSION SET (AFTER 22h AT 70°C)	20% MAX
OZONE RESISTANCE (AFTER 72h AT 40°C, 20% STRAIN 100 pphm	NO CRACK
OIL RESISTANCE IN ASTM NO. 3 OIL (168h AT 25°C VOLUME CHANGE)	15% MAX

B.) DIMENSION CHECK ON METAL PLATES

DIMENSION	SPECIFICATION
LENGTH	± 1
WIDTH	0 TO -1.5 MIN
THICKNESS	±0.5 MIN

C.) QUALITY CHECK

PROPERTY	SPECIFICATION
DIMENSION	ACCORDING TO PRODUCT DRAWING
SURFACE APPEARANCE	NO VISIBLE CRACK
RUBBER COVER HARDNESS (SHORE A)	50 ± 5

INSTALLATION MATERIALS

1. EPOXY BEDDING
2. EPOXY NOSING
3. BOLT/NUTS
4. SEALANT

LOCATION	EXPANSION JOINT TYPE	MOVEMENT (mm)	LENGTH (m)
BRIDGE 3	MULTIFLEX 80	30	21
BRIDGE 4	MULTIFLEX 80	30	21
BRIDGE 5	MULTIFLEX 80	30	21
BRIDGE 6	MULTIFLEX 80	30	21
BRIDGE 7	MULTIFLEX 80	30	21
BRIDGE 8	MULTIFLEX 80	30	21
BRIDGE 9	MULTIFLEX 80	30	21

LOCATION	ELASTOMERIC BEARING PAD SIZE	QUANTITY
BRIDGE 3	600x350x50	10 PCS.
	200x200x50	16 PCS.
BRIDGE 4	600x350x50	10 PCS.
	200x200x50	16 PCS.
BRIDGE 5	600x350x50	10 PCS.
	200x200x50	16 PCS.
BRIDGE 6	600x350x50	10 PCS.
	200x200x50	16 PCS.
BRIDGE 7	550x300x50	8 PCS.
	200x200x50	16 PCS.
BRIDGE 8	600x350x50	10 PCS.
	200x200x50	18 PCS.
BRIDGE 9	600x350x50	30 PCS.
	200x200x50	40 PCS.

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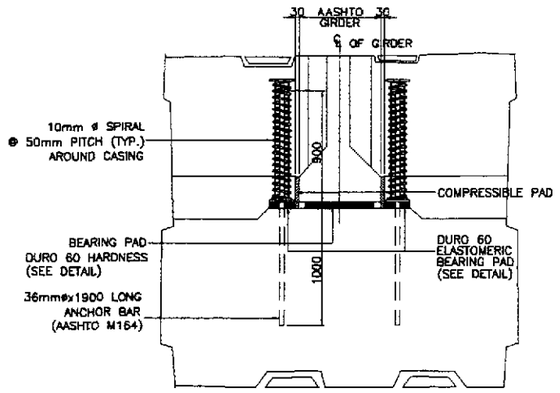
PJHL - PMO	BUREAU OF DESIGN		OFFICE OF THE SECRETARY	
Submitted By:	Reviewed By:	Recommended By:	Recommended By: (See cover sheet for Signature)	Approved By: (See cover sheet for Signature/Approval)
DANILO C. TRAJANO, Project Director	ADRIANO M. DOROY, Chief, Bridges Division	GILBERTO S. REYES, Director IV (OIC)	MANUEL M. BONOAN, Undersecretary	SIMEON A. DATUMANONG, Secretary

PROJECT AND LOCATION :
THE DETAILED DESIGN STUDY ON UPGRADING INTER-URBAN HIGHWAY SYSTEM ALONG THE PAN-PHILIPPINE HIGHWAY (Plaridel, Cabanatuan and San Jose Bypasses)
CABANATUAN BYPASS - CONTRACT PACKAGE II

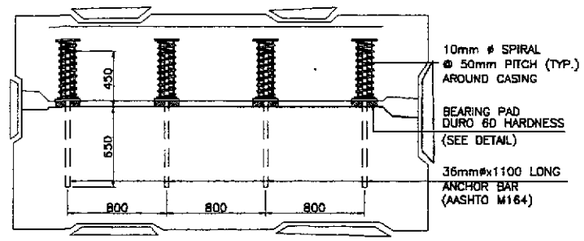
SCALE :
AS SHOWN
FULL SIZE A1

SHEET CONTENTS :
BRIDGE NO. 3, 4, 5, 6, 7, 8 & 9
TYP. BEARING PAD & EXPANSION JOINT (INITIAL STAGE)

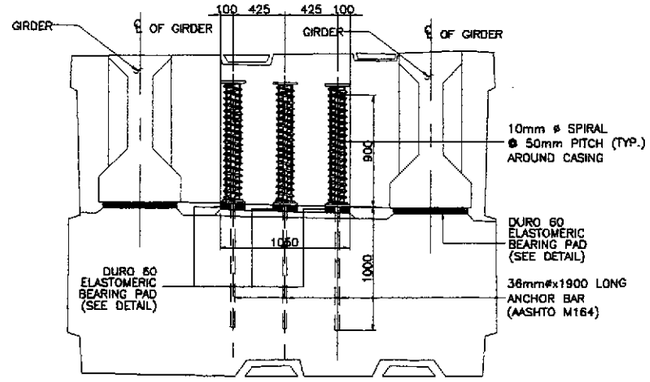
SHEET NO. :
BS-01



AT ABUTMENT (FOR BR. 3, 4, 5, 6, 8 & 9)

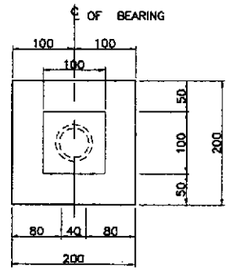


AT ABUTMENT (FOR BR. 7)

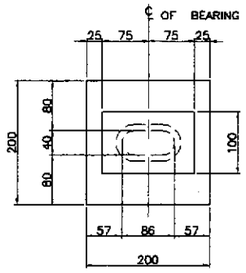


AT PIER

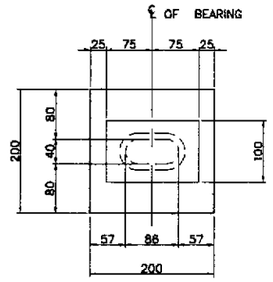
3A — ANCHOR BAR
SCALE 1:25



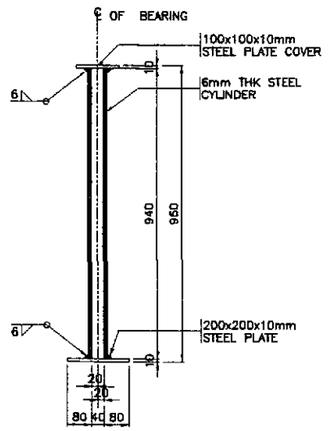
PLAN



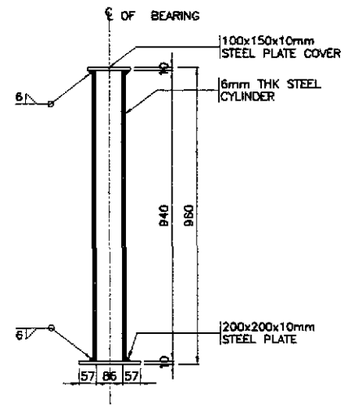
PLAN



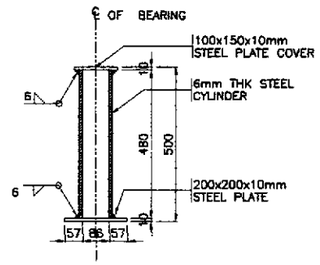
PLAN



ELEVATION



ELEVATION



ELEVATION

3B — FIXED BEARING
SCALE 1:10

3C — EXPANSION BEARING
SCALE 1:10

3D — EXPANSION BEARING (FOR BR. 7)
SCALE 1:10

3 — BEARING SLEEVE AND ANCHOR BAR DETAIL
SCALE AS SHOWN

JICA
JAPAN INTERNATIONAL COOPERATION AGENCY
KATAHIRA & ENGINEERS INTERNATIONAL
YACHIYO ENGINEERING CO., LTD.

	DATE	SIGNATURE
DESIGNED	10/16/02	E. N. SALLAN
CHECKED	10/16/02	
SUBMITTED	10/18/02	TEAM LEADER

REPUBLIC OF THE PHILIPPINES
DEPARTMENT OF PUBLIC WORKS AND HIGHWAYS

PUHL – PMO	BUREAU OF DESIGN		OFFICE OF THE SECRETARY	
Submitted By:	Reviewed By:	Recommended By:	Recommended By: (See cover sheet for Signature)	Approved By: (See cover sheet for Signature/Approval)
DANILO C. TRAJANO	ADRIANO M. DOROY	GILBERTO S. REYES	MANUEL M. BONOAN	SIMEON A. DATUMANONG
Project Director	Chief, Bridges Division	Director IV (OIC)	Undersecretary	Secretary

PROJECT AND LOCATION :
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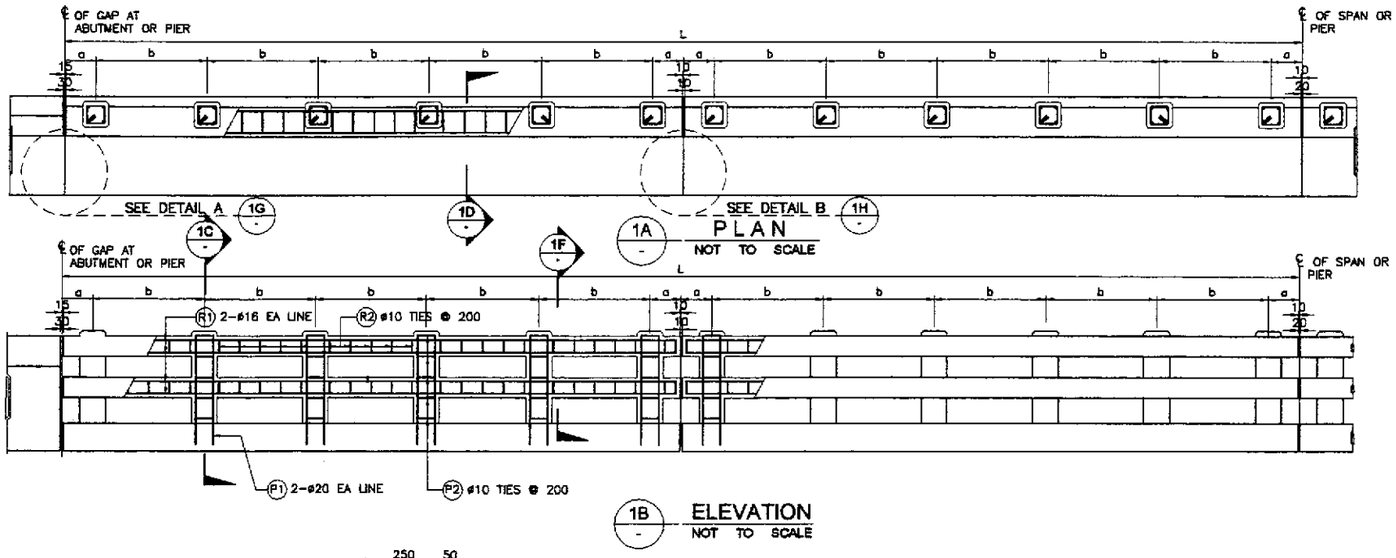
UPGRADING INTER-URBAN HIGHWAY SYSTEM
ALONG THE PAN-PHILIPPINE HIGHWAY
(Plaridel, Cabanatuan and San Jose Bypasses)
CABANATUAN BYPASS - CONTRACT PACKAGE II

SCALE : AS SHOWN FULL SIZE A1

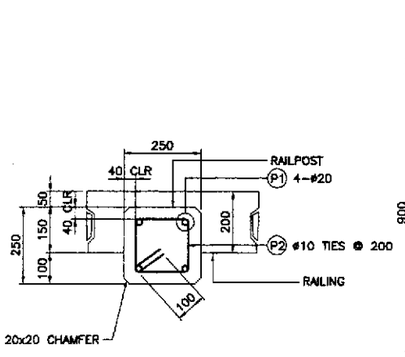
SHEET CONTENTS :
BRIDGE NO. 3, 4, 5, 6, 7, 8 & 9
TYP. BEARING SLEEVE &
ANCHOR BAR DET.
(INITIAL STAGE)

SHEET NO. : BS-01a

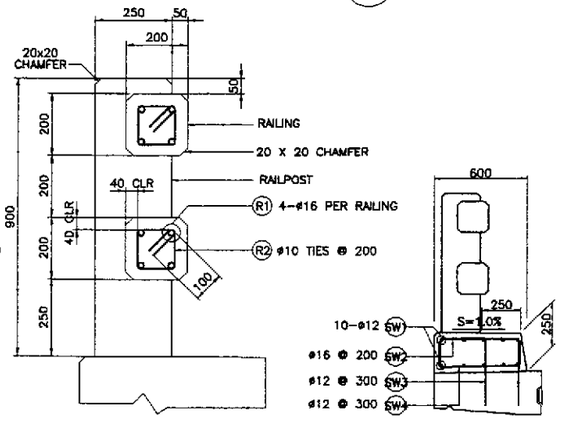


1A PLAN — NOT TO SCALE

1B ELEVATION — NOT TO SCALE



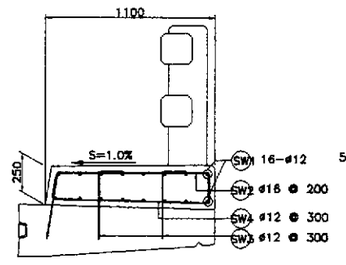
1E DETAIL — SCALE 1:10



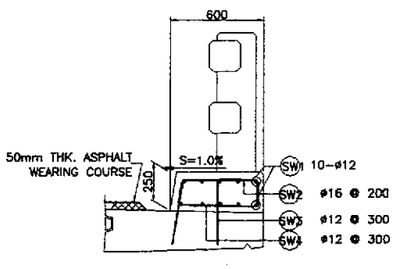
1F SECTION — SCALE 1:10

@ LEFT SIDE

SIDEWALK SHALL BE PLACED AFTER THE SHORING UNDER THE SUPERSTRUCTURE HAS BEEN RELEASED SUFFICIENTLY TO PERMIT THE SPANS TO ATTAIN FULL DEAD LOAD DEFLECTION.

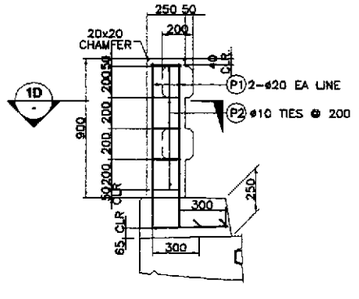


@ RIGHT SIDE FOR BRIDGE 3 & 9

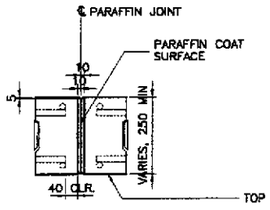


@ RIGHT SIDE FOR BRIDGE 4 TO 7

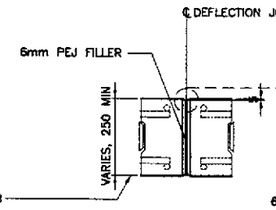
1D SIDEWALK DETAIL — SCALE 1:20



1C SECTION — SCALE 1:20

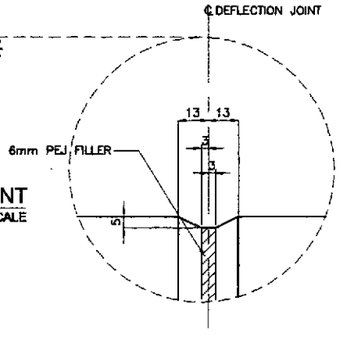


1G DETAIL A PARAFFIN JOINT — NOT TO SCALE

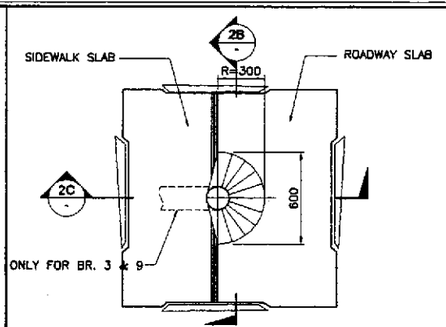


1H DETAIL B DEFLECTION JOINT — NOT TO SCALE

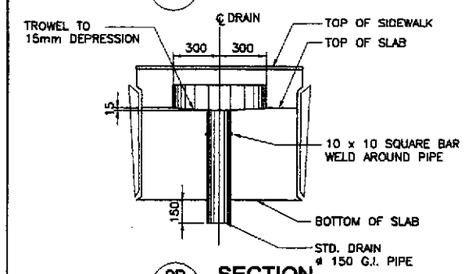
NOTE :
FOR LOCATION OF JOINTS SEE GENERAL PLAN OF BRIDGE.



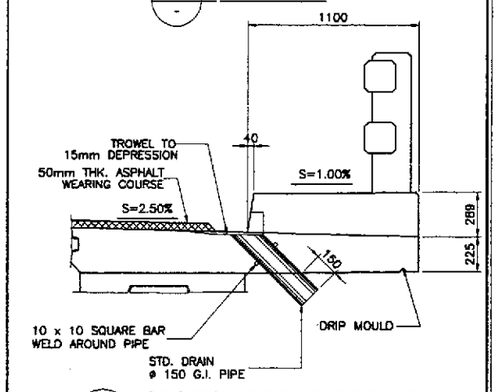
1 TYPICAL RAILING AND SIDE — SCALE AS



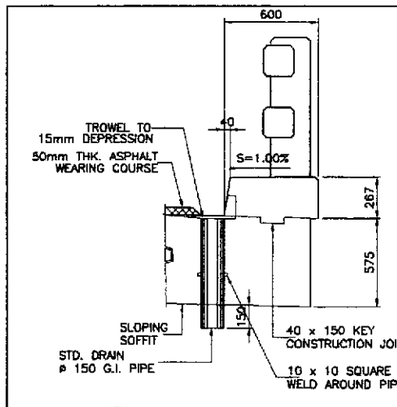
2A PLAN



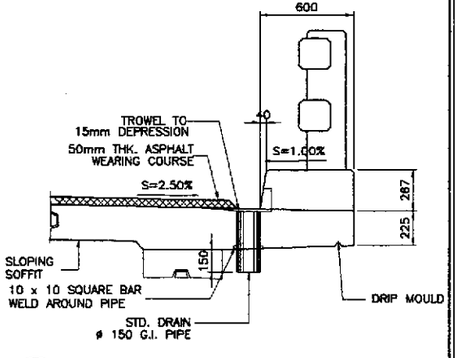
2B SECTION



2C SECTION FOR BRIDGE 3 & 9



2E SECTION FOR BRIDGE 7



2D SECTION FOR BRIDGE 4, 5, 6 & 8

2 TYPICAL DRAIN DETAILS — SCALE 1:20

JAPAN INTERNATIONAL COOPERATION AGENCY

KATAHIRA & ENGINEERS INTERNATIONAL — YACHIYO ENGINEERING CO., LTD.

	DATE	SIGNATURE
DESIGNED	10/Apr.	E. N. SALLAN
CHECKED	10/Apr.	N. KATAHIRA
SUBMITTED	10/Apr.	N. KANCHO TEAM LEADER

REPUBLIC OF THE PHILIPPINES
DEPARTMENT OF PUBLIC WORKS AND HIGHWAYS

PUHL – PMO	BUREAU OF DESIGN		OFFICE OF THE SECRETARY	
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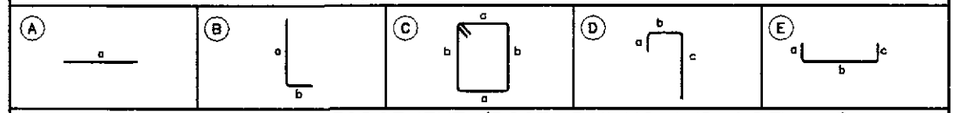
CABANATUAN BYPASS - CONTRACT PACKAGE II

SCALE : AS SHOWN — FULL SIZE A1

SHEET CONTENTS :
BRIDGE 3, 4, 5, 6, 7, 8 & 9
TYPICAL SIDEWALK, RAILING AND DRAIN DETAILS (INITIAL STAGE)

SHEET NO. : BS-02

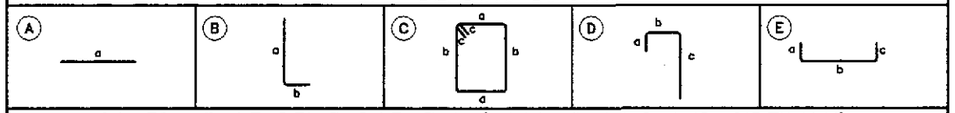
BAR BENDING DIAGRAM



SCHEDULE OF REINFORCEMENT (POST, RAILING AND SIDEWALK)

	LOCATION	CONCRETE VOLUME (m^3)	BAR MARK	BAR SIZE	QTY.	SPACING	BAR SHAPE	DIMENSIONS (mm) OUT TO OUT a	b	c	d	e	LENGTH EA. BAR (mm)	TOTAL LENGTH (m)	UNIT WEIGHT (kg/m)	WEIGHT (kg)	REBAR RATIO (kg/m)
BRIDGE 3	POST	2.70	P1	20	192	AS SHOWN	B	1045	450	–	–	–	1495	287.04	2.466	708	310.74
			P2	10	240	200	C	170	170	100	–	–	880	211.20	0.616	131	
	RAILING	5.60	R1	16	16	AS SHOWN	A	35000	–	–	–	–	35000	560.00	1.579	885	206.07
			R2	10	640	200	C	120	120 (avg.)	100	–	–	680	435.20	0.616	269	
	SIDEWALK	14.88	SW1	12	26	AS SHOWN	A	35000	–	–	–	–	35000	910.00	0.888	809	132.44
			SW2	16	176	200	D	170	980	400	–	–	1550	272.80	1.579	431	
			SW2a	16	176	200	D	170	480	400	–	–	1050	184.80	1.579	292	
			SW3	12	351	300	B	400	250	–	–	–	650	229.45	0.888	204	
			SW4	12	118	300	E	170	1020	170	–	–	1360	160.48	0.888	143	
			SW4a	12	118	300	E	170	520	170	–	–	860	101.48	0.888	91	
	TOTAL	23.18	GRADE 40 GRAND TOTAL = 3,255 kgs. GRADE 60 GRAND TOTAL = 708 kgs.														
BRIDGE 4 & 5	POST	1.69	P1	20	120	AS SHOWN	B	1045	450	–	–	–	1495	179.40	2.466	443	311.11
			P2	10	150	200	C	170	170	100			880	132.00	0.616	82	
	RAILING	3.84	R1	16	16	AS SHOWN	A	24000	–	–	–	–	24000	384.00	1.579	607	205.99
			R2	10	438	200	C	120	120 (ave.)	100	–	–	680	297.84	0.616	184	
	SIDEWALK	7.20	SW1	12	20	AS SHOWN	A	24000	–	–	–	–	24000	480.00	0.888	427	145.42
			SW2	16	242	200	D	170	480	400	–	–	1050	254.10	1.579	402	
			SW3	12	162	300	B	400	250	–	–	–	650	105.30	0.888	94	
			SW4	12	162	300	E	170	520	170	–	–	860	139.32	0.888	124	
	TOTAL	12.73	GRADE 40 GRAND TOTAL = 1,920 kgs. GRADE 60 GRAND TOTAL = 443 kgs.														
BRIDGE 6 & 8	POST		P1	20	160	AS SHOWN	B	1045	450	–	–	–	1495	239.20	2.466	590	310.67
			P2	10	200	200	C	170	170	100	–	–	880	176.00	0.616	109	
	RAILING		R1	16	16	AS SHOWN	A	31000	–	–	–	–	31000	496.00	1.579	784	208.33
			R2	10	564	200	C	120	120 (avg.)	100	–	–	680	383.52	0.616	237	
	SIDEWALK		SW1	12	20	AS SHOWN	A	31000	–	–	–	–	31000	620.00	0.888	551	132.47
			SW2	16	312	200	D	170	480	400	–	–	1050	327.00	1.579	518	
			SW3	12	210	300	B	400	250	–	–	–	650	136.50	0.888	122	
			SW4	12	210	300	E	170	520	170	–	–	860	180.60	0.888	161	
	TOTAL	16.51	GRADE 40 GRAND TOTAL = 2,482 kgs. GRADE 60 GRAND TOTAL = 590 kgs.														

BAR BENDING DIAGRAM



SCHEDULE OF REINFORCEMENT (POST, RAILING AND SIDEWALK)

	LOCATION	CONCRETE VOLUME (m^3)	BAR MARK	BAR SIZE	QTY.	SPACING	BAR SHAPE	DIMENSIONS (mm) OUT TO OUT a	b	c	d	e	LENGTH EA. BAR (mm)	TOTAL LENGTH (m)	UNIT WEIGHT (kg/m)	WEIGHT (kg)	REBAR RATIO (kg/m)
BRIDGE 7	POST	2.25	P1	20	160	AS SHOWN	B	1045	450	–	–	–	1495	239.20	2.466	590	310.67
			P2	10	200	200	C	170	170	100	–	–	880	176.00	0.616	109	
	RAILING	5.12	R1	16	16	AS SHOWN	A	32000	–	–	–	–	32000	512.00	1.579	809	205.86
			R2	10	584	200	C	120	120 (avg.)	100	–	–	680	397.12	0.616	245	
	SIDEWALK	9.60	SW1	12	20	AS SHOWN	A	32000	–	–	–	–	32000	640.00	0.888	569	145.10
			SW2	16	322	200	D	170	480	400	–	–	1050	338.10	1.579	534	
			SW3	12	216	300	B	400	250	–	–	–	650	140.40	0.888	125	
			SW4	12	216	300	E	170	520	170	–	–	860	185.76	0.888	165	
	TOTAL	16.97	GRADE 40 GRAND TOTAL = 2,556 kgs. GRADE 60 GRAND TOTAL = 590 kgs.														
BRIDGE 9	POST	5.06	P1	20	360	AS SHOWN	B	1045	450	–	–	–	1495	538.20	2.466	1328	310.52
			P2	10	450	200	C	170	170	100			880	396.00	0.616	244	
	RAILING	9.60	R1	16	16	AS SHOWN	A	61200	–	–	–	–	61200	979.20	1.579	1547	214.80
			R2	10	1228	200	C	120	120	100	–	–	680	835.04	0.616	515	
	SIDEWALK	25.50	SW1	12	26	AS SHOWN	A	61200	–	–	–	–	61200	1591.20	0.888	1413	134.67
			SW2	16	307	200	D	170	980	400	–	–	1550	475.85	1.579	752	
			SW2a	16	307	200	D	170	480	400	–	–	1050	322.35	1.579	509	
			SW3	12	615	300	B	400	250	–	–	–	650	399.75	0.888	355	
			SW4	12	205	300	E	170	1020	170	–	–	1360	278.80	0.888	248	
			SW4a	12	205	300	E	170	520	170	–	–	860	176.30	0.888	157	
	TOTAL	40.18	GRADE 40 GRAND TOTAL = 5,740 kgs. GRADE 60 GRAND TOTAL = 1,328 kgs.														

RAILING FOR BRIDGES

BRIDGE NO.	SPAN LENGTH (m)	NO. OF EXP. JT. INSIDE SPAN	NO. OF POST W/IN EXP. JT.	NO. OF RAIL POST PER SPAN	L (mm)	a (mm)	b (mm)
BR. 3	35.00	3	6	48	17515	250	1652
BR. 4	24.00	2	5	30	12015	250	1878
BR. 5	24.00	2	5	30	12015	250	1878
BR. 6	31.00	3	5	40	15515	250	1815
BR. 7	10.00	1	4	32	10015	250	1503
	12.00	1	4	16	12000	250	1834
BR. 8	31.00	3	5	40	15515	250	1815
BR. 9	20.00	2	5	30	10015	250	1545
	20.00	2	5	30	20000	250	1542

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JAPAN INTERNATIONAL COOPERATION AGENCY

KEI KATAHIRA & ENGINEERS INTERNATIONAL
YEO YACHIYO ENGINEERING CO., LTD.

	DATE	SIGNATURE
DESIGNED	10/16/12	E. N. SALLAN
CHECKED	10/16/12	
SUBMITTED	10/18/12	TEAM LEADER

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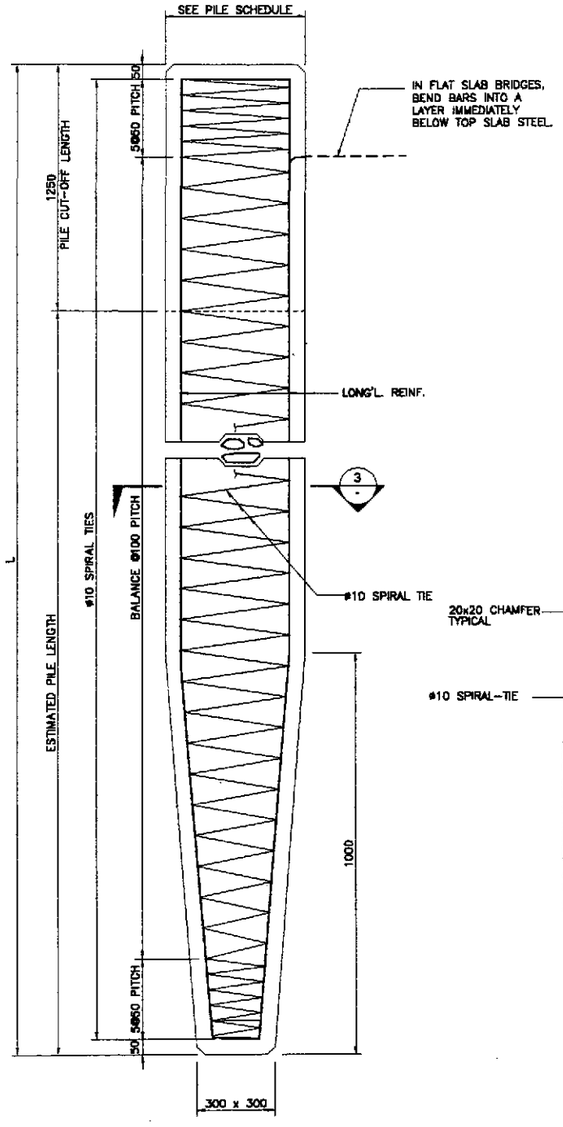
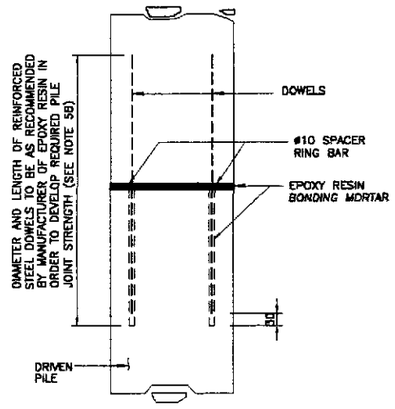
SCALE :
AS SHOWN
FULL SIZE A1

SHEET CONTENTS :
BRIDGE 3, 4, 5, 6, 7, 8 & 9
SCHEDULE OF REINFORCEMENT
(POST, RAILING AND SIDEWALK)
(INITIAL STAGE)

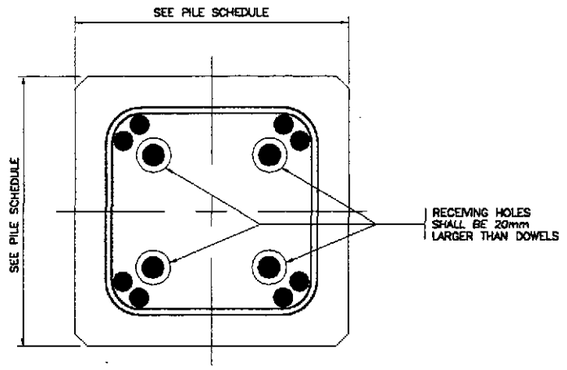
SHEET NO. :
BS-02a



1 PILE ELEVATION
NOT TO SCALE



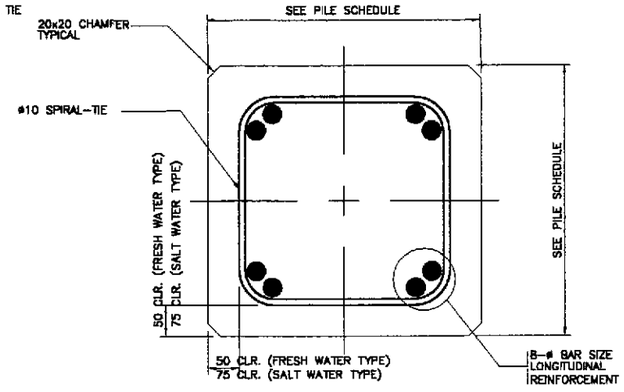
2A ELEVATION
N T S



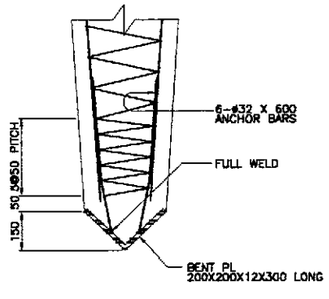
2B SECTION
N T S

2 PILE SPLICE DETAIL
NOT TO SCALE

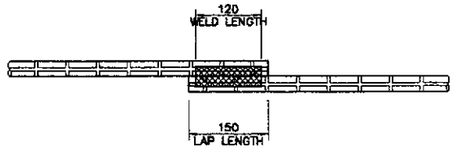
PILE SCHEDULE				
TYPE	SIZE (mm)	LONGITUDINAL REINF.		ALLOWABLE BEARING CAPACITY (kN)
		QTY.	BAR SIZE	
I	450 x 450	8	28	680
II	450 x 450	8	32	680
III	400 x 400	8	28	490



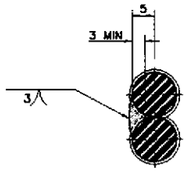
3 SECTION
NOT TO SCALE



4 PILE TIP FOR HARD DRIVING
NOT TO SCALE



5A ELEVATION
N T S



5B SECTION
N T S

5 WELDED SPIRAL TIE SPLICE DETAIL
NOT TO SCALE

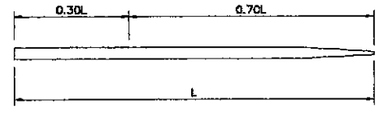
NOTES

1. CONCRETE :
   CONCRETE SHALL CONFORM TO THE REQUIREMENTS OF CLASS AA CONCRETE. WITH 28 MPa CYLINDER STRENGTH AND 19.0mm MAXIMUM AGGREGATE SIZE.
2. REINFORCENMENT :
   A. ALL REINFORCING STEEL SHALL BE DEFORMED BARS COMFORMING TO ASSHTO M31 (ASTM A615) GRADE 40 AND 60.
   B. SPLICES OF ADJACENT LONGITUDINAL STEEL SHALL BE STAGGERRED 100 BAR DIAMETERS APART. LENGTH OF SPLICES SHALL BE 1000mm FOR #25 AND 1300mm FOR #28 AND 1700mm FOR #32.
   C. SPIRAL-TIES SHALL BE WELDED AT SPLICES.
3. DRIVING :
   A. PILE HEADS SHALL BE PROTECTED FROM DIRECT IMPACT OF THE HAMMER BY CUSHION BLOCKS CONSISTING OF SEVERAL BLOCKS OF WOOD OR OF OTHER APPROVED MATERIALS.
   B. PILES SHALL BE DRIVEN TO A DEPTH THAT WILL PRODUCE THE REQUIRED ALLOWABLE BEARING CAPACITY.
4. PILE FOUNDATION DESIGN:
   A. IN PILE-BENT PIERS, PILE LENGTHS SHALL BE DETERMINED BY THE ENGINEER/ CONSULTANT BASED ON THE ALLOWABLE PILE BEARING CAPACITY SPECIFIED BELOW.
   B. IN COLUMN-BENT PIERS, THE NUMBER, LOCATION AND LENGTH OF PILES SHALL BE DETERMINED BY THE ENGINEER/CONSULTANT BASED ON THE LOADING INFORMATION GIVEN IN THE PIER DETAILS.
5. PILE SPLICE :
   A. PILES MAY BE SPLICED ONLY IF STRICTLY NECESSARY AND APPROVED BY THE ENGINEER/CONSULTANT. PILE SPLICES SHALL BE LOCATED AT LEAST 10m BELOW THE EXISTING GROUND LEVEL.
   B. PILE SPLICE SHALL DEVELOP 100% AXIAL, AND 50% BENDING OF THE CAPACITY OF THE PILE SECTION WHERE THE SPLICE IS LOCATED.
6. ALLOWABLE PILE BEARING CAPACITY : (SEE PILE SCHEDULE)
7. MINIMUM HAMMER ENERGY RATING = 55 kN-m
8. BASIS FOR COMPUTING ALLOWABLE PILE BEARING CAPACITY:

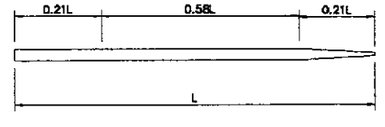
$$Pall = \left(\frac{167\ eh\ Eh}{S + 2.54}\right)\left(\frac{Wr + 0.16\ Wp}{Wr + Wp}\right)$$

WHERE:
Pall = ALLOWABLE PILE BEARING CAPACITY (kN)
eh = HAMMER EFFICIENCY
Eh = HAMMER ENERGY RATING (kN-m)
Wr = WEIGHT OF RAM (kN)
Wp = WEIGHT OF PILE AND OTHER DRIVEN WEIGHTS (kN)
S = AVERAGE PENETRATION PER BLOW FOR THE LAST 150mm OF DRIVING (mm)

9. TEST PILES
   TEST PILES SHALL BE DRIVEN WITH THE SAME HAMMER USED FOR DRIVING REGULAR PILES AND MAY BE PART OF FOUNDATION IF APPROVED BY THE ENGINEER/CONSULTANT.
10. PICK-UP POINTS :
    PICK-UP POINTS SHALL BE MARKED ON ALL PILES AND ALL LIFTING SHALL BE DONE AT THESE POINTS.



1-POINT PICK-UP



2-POINT PICK-UP

THE USE OF SPECIAL EMBEDDED OR ATTACHED LIFTING DEVICES SHALL BE SUBJECT TO THE APPROVAL OF THE ENGINEER/CONSULTANT.

JICA JAPAN INTERNATIONAL COOPERATION AGENCY
KEI KATAHIRA & ENGINEERS INTERNATIONAL
YEC YACHIYO ENGINEERING CO., LTD.

	DATE	SIGNATURE
DESIGNED	10/16/02	E. ANY SALLAN
CHECKED	10/16/02	
SUBMITTED	10/16/02	B. KUSHI TEAM LEADER

REPUBLIC OF THE PHILIPPINES
DEPARTMENT OF PUBLIC WORKS AND HIGHWAYS

PUHL - PMO	BUREAU OF DESIGN		OFFICE OF THE SECRETARY	
Submitted By:	Reviewed By:	Recommended By:	Recommended By: (See cover sheet for Signature)	Approved By: (See cover sheet for Signature/Approval)
DANILO C. TRAJANO Project Director	ADRIANO M. DORDY Chief, Bridges Division	GILBERTO S. REYES Director IV (OIC)	MANUEL M. BONDAD Undersecretary	SIMEON A. DATUMANONG Secretary

PROJECT AND LOCATION :
THE DETAILED DESIGN STUDY ON UPGRADING INTER-URBAN HIGHWAY SYSTEM ALONG THE PAN-PHILIPPINE HIGHWAY (Plaridel, Cabanatuan and San Jose Bypasses)
CABANATUAN BYPASS - CONTRACT PACKAGE II

SCALE : AS SHOWN FULL SIZE A1

SHEET CONTENTS :
BRIDGE NO. 3, 4, 5, 6, 7, 8 & 9
TYPICAL PRECAST CONCRETE PILE DETAILS (INITIAL STAGE)

SHEET NO. : BS-03