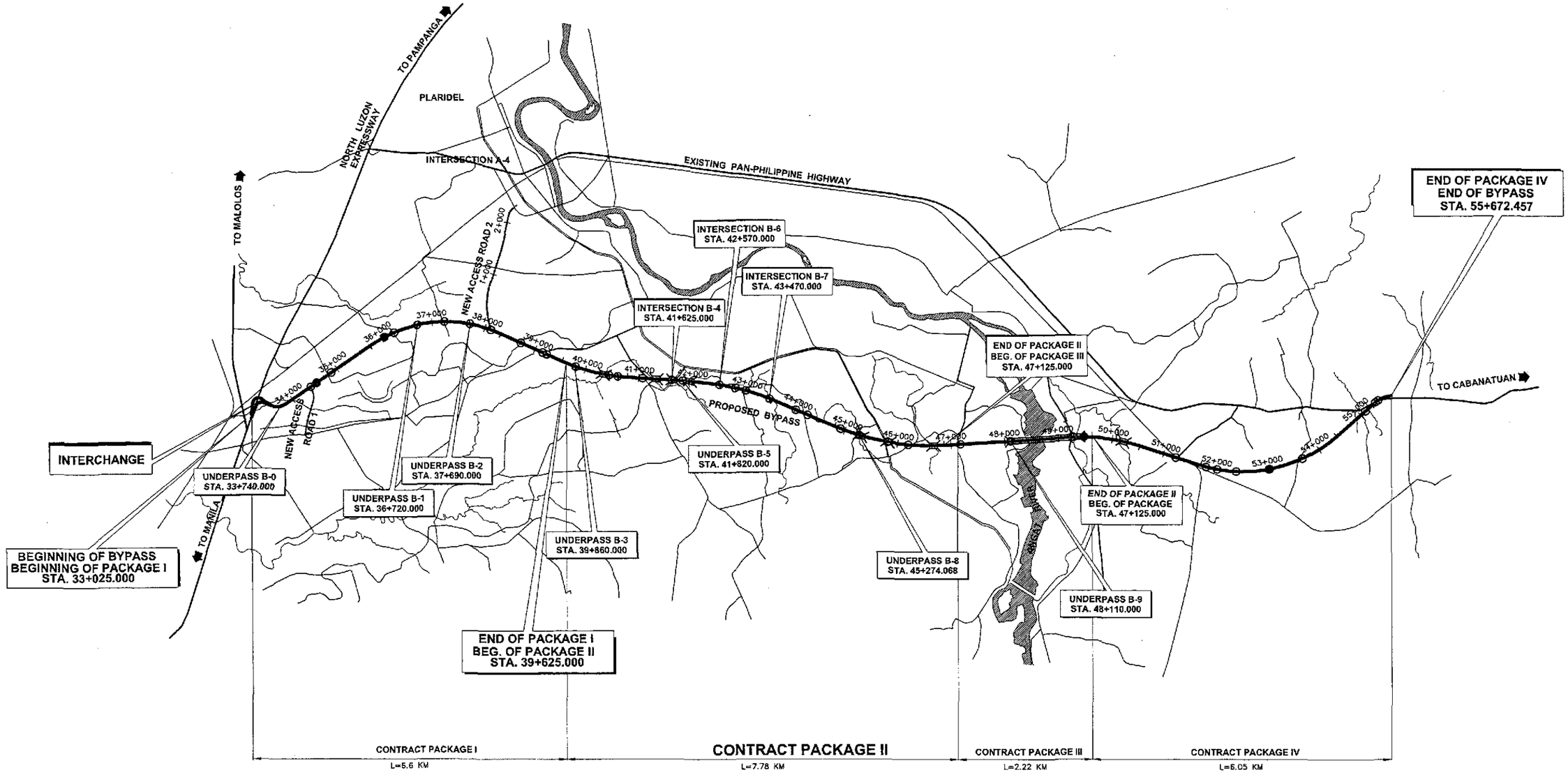
UNDERPASS CROSSING (BOX CULVERT)

LEGEND:

- ○ Intersection Type A (At grade)
- ⊕ Intersection Type B (Underpass)
- ● Intersection Type C (Only access to frontage roads)
- Bridge



A / UP-01 SITE DEVELOPMENT PLAN - UNDERPASSES ALONG BYPASS

SCALE 1:40,000

JICA JAPAN INTERNATIONAL COOPERATION AGENCY

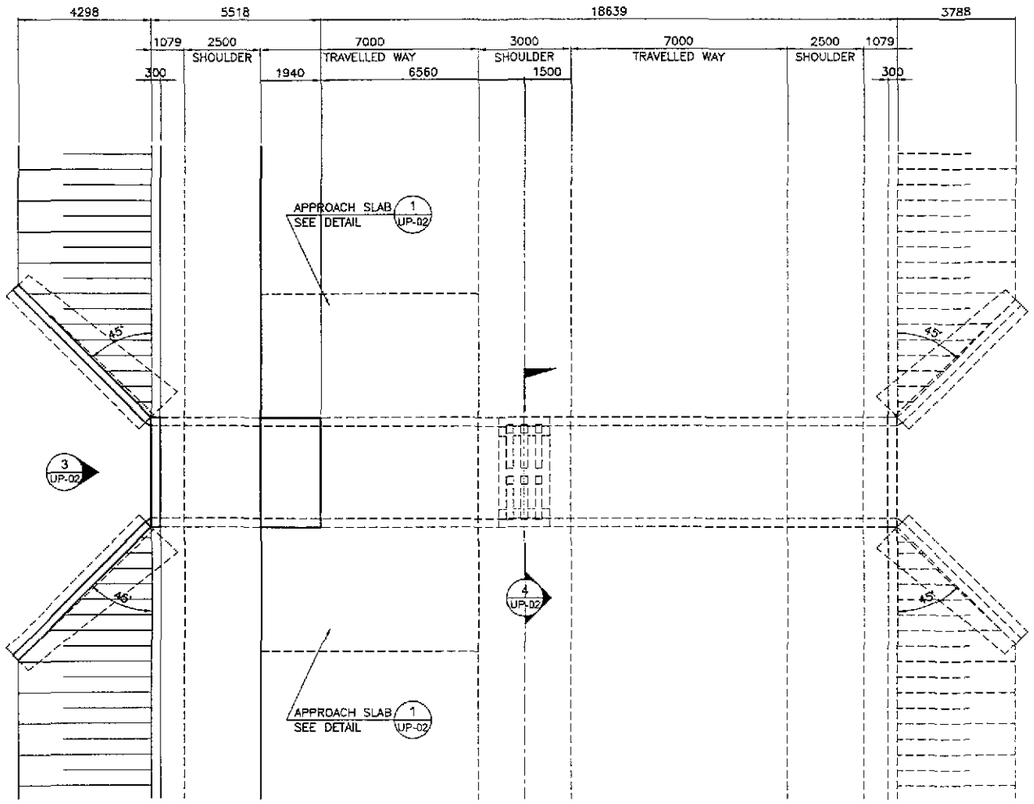
KEI KATAHIRA & ENGINEERS INTERNATIONAL — yec YACHIYO ENGINEERING CO., LTD.

	DATE	SIGNATURE
DESIGNED	10/21/02	
CHECKED	10/25/02	H. HAKIM
SUBMITTED	10/27/02	M. KUCHA TEAM LEADER

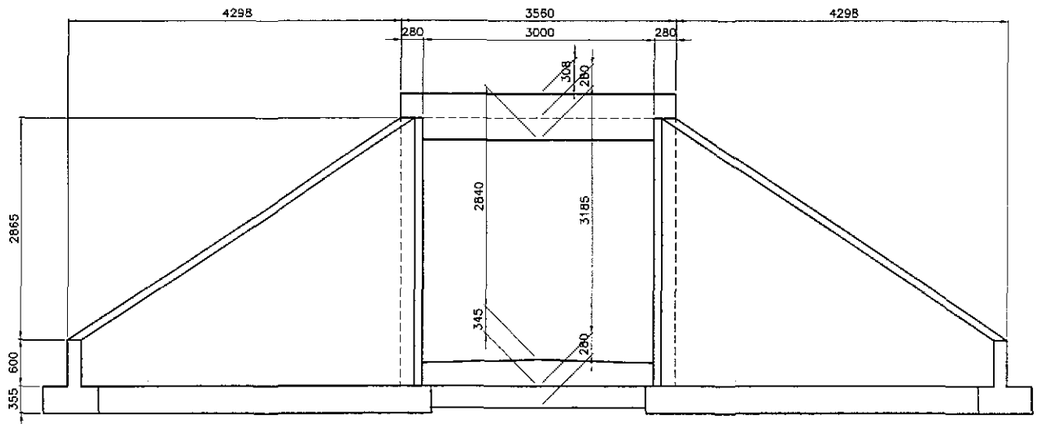
REPUBLIC OF THE PHILIPPINES
DEPARTMENT OF PUBLIC WORKS AND HIGHWAYS

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	JOSEFINA M. ALAGAR	GILBERTO S. REYES	MANUEL M. BONOAN	SIMEON A. DATUMANONG
Project Director	Chief, Highways Division	OIC, Director IV	Undersecretary	Secretary

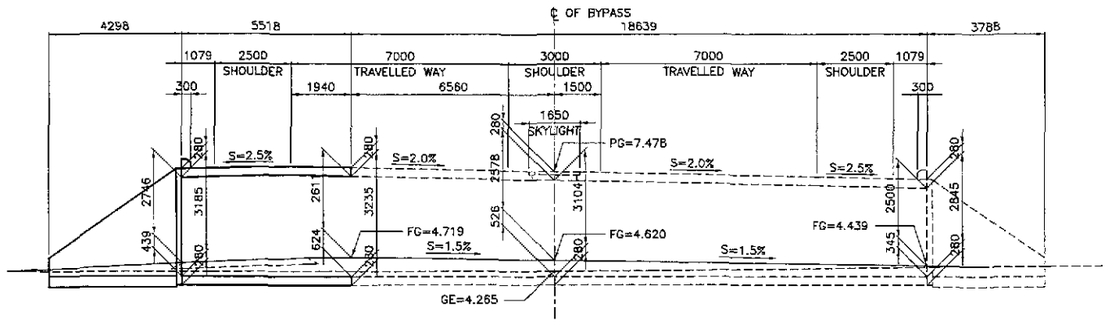
PROJECT AND LOCATION :	SCALE :	SHEET CONTENTS :	SHEET NO. :
THE DETAILED DESIGN STUDY ON UPGRADING INTER-URBAN HIGHWAY SYSTEM ALONG THE PAN-PHILIPPINE HIGHWAY (Plaridel, Cabanatuan and San Jose Bypasses)	1:40,000	SITE DEVELOPMENT PLAN UNDERPASSES ALONG BYPASS	UP-01
PLARIDEL BYPASS - CONTRACT PACKAGE II	FULL SIZE A1		



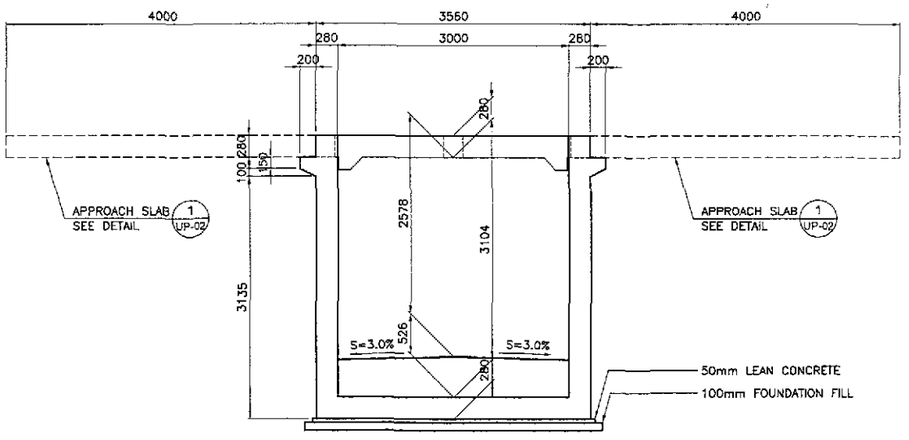
1 UP-02 GENERAL PLAN
SCALE 1:100



3 UP-02 ELEVATION
SCALE 1:40

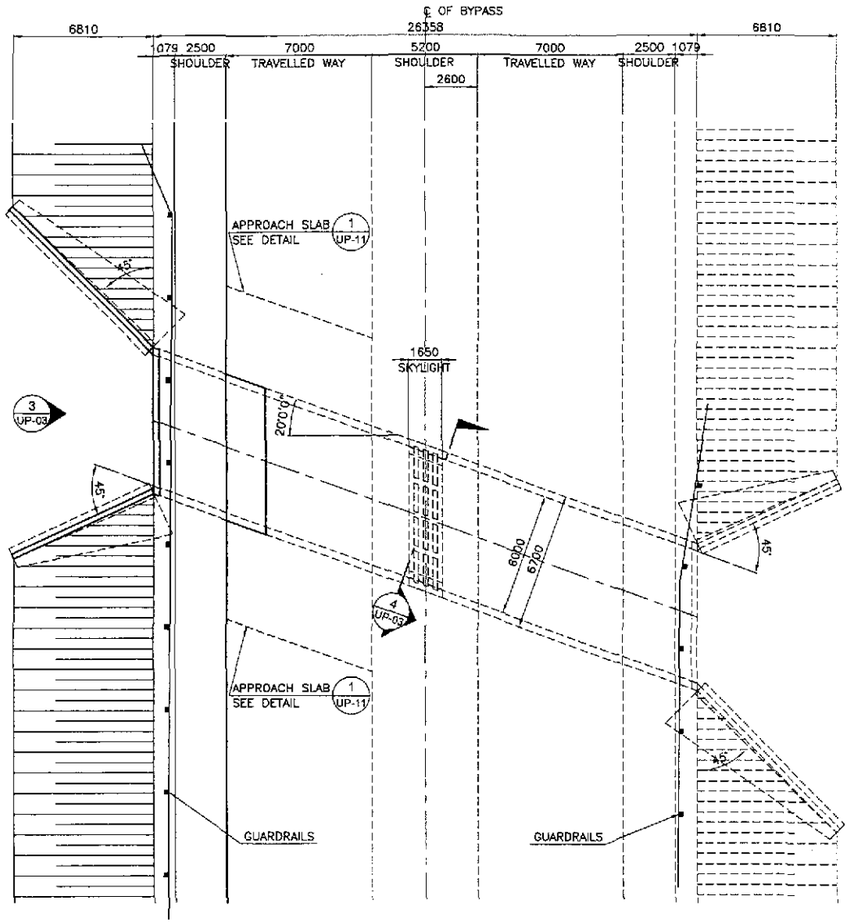


2 UP-02 GENERAL ELEVATION
SCALE 1:100

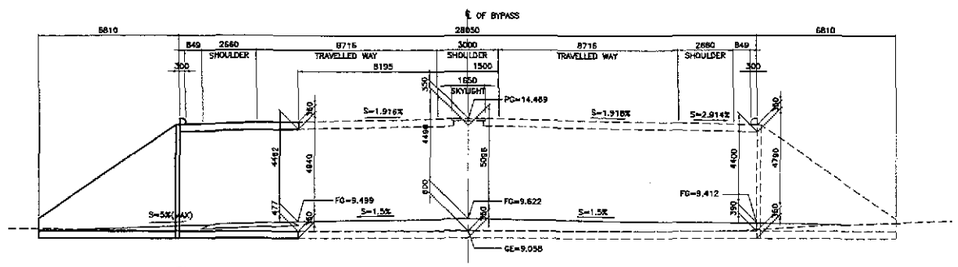


4 UP-02 SECTION
SCALE 1:40

JICA JAPAN INTERNATIONAL COOPERATION AGENCY KEI KATAHIRA & ENGINEERS INTERNATIONAL YEC YACHIYO ENGINEERING CO., LTD.		DATE	SIGNATURE	REPUBLIC OF THE PHILIPPINES DEPARTMENT OF PUBLIC WORKS AND HIGHWAYS				PROJECT AND LOCATION :	SCALE :	SHEET CONTENTS :	SHEET NO. :
	DESIGNED	10/21/22		PJHL – PMO	BUREAU OF DESIGN		OFFICE OF THE SECRETARY	THE DETAILED DESIGN STUDY ON UPGRADING INTER-URBAN HIGHWAY SYSTEM ALONG THE PAN-PHILIPPINE HIGHWAY (Plaridel, Cabanatuan and San Jose Bypasses)	AS SHOWN	BOX CULVERT GENERAL PLAN, ELEVATION & SECTION (ULTIMATE STAGE) B-3 (STA. 39+860.00)	UP-02
	CHECKED	10/25/22		Submitted By:	Reviewed By:	Recommended By:	Recommended By: (See cover sheet for Signature) / Approved By: (See cover sheet for Signature/Approval)				
	SUBMITTED	10/27/22	TEAM LEADER	DANILO C. TRAJANO Project Director	JOSEFINA M. ALAGAR Chief, Highways Division	GILBERTO S. REYES OIC, Director IV	MANUEL M. BONDAN Undersecretary / SIMEON A. DATUMANONG Secretary	PLARIDEL BYPASS - CONTRACT PACKAGE II	FULL SIZE A1		

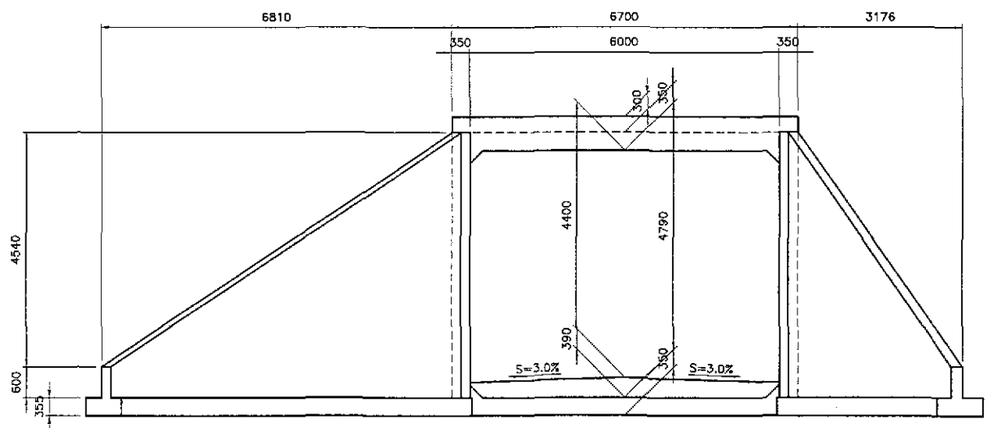


1 UP-03 GENERAL PLAN
SCALE 1:150

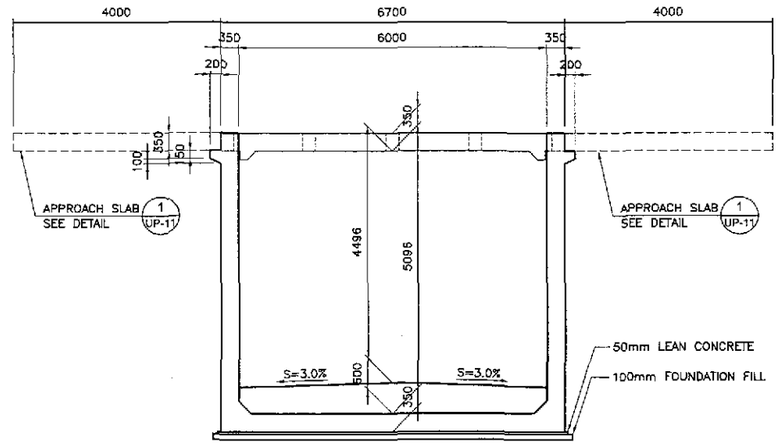


NOTE:
THE HORIZONTAL DIMENSIONS INDICATED IN THIS ELEVATION ARE SKEWED LENGTH

2 UP-03 GENERAL ELEVATION
SCALE 1:150



3 UP-03 ELEVATION
SCALE 1:60



4 UP-03 SECTION
SCALE 1:60

JAPAN INTERNATIONAL COOPERATION AGENCY

KATAHIRA & ENGINEERS INTERNATIONAL

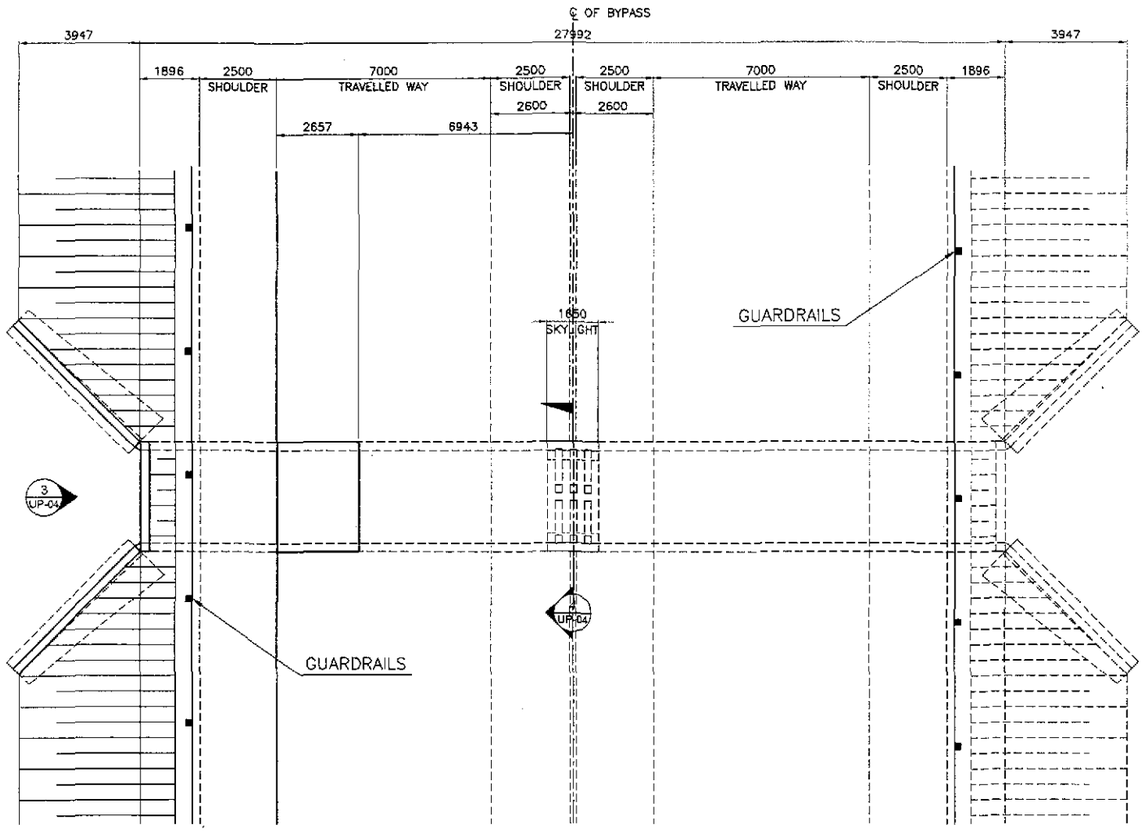
YACHIYO ENGINEERING CO., LTD.

	DATE	SIGNATURE
DESIGNED	10/21/02	
CHECKED	10/25/02	
SUBMITTED	10/27/02	TEAM LEADER

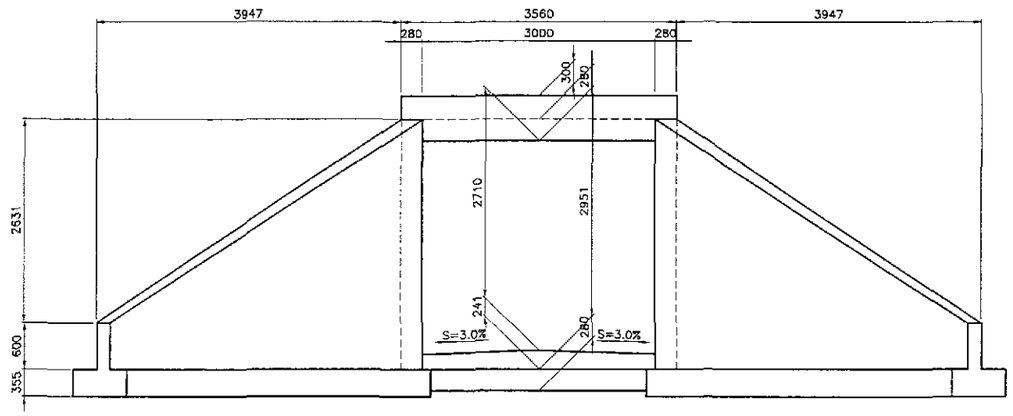
REPUBLIC OF THE PHILIPPINES
DEPARTMENT OF PUBLIC WORKS AND HIGHWAYS

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	JOSEFINA M. ALAGAR	GILBERTO S. REYES	MANUEL M. BONDAN	SIMEON A. DATUMANONG
Project Director	Chief, Highways Division	OIC, Director IV	Undersecretary	Secretary

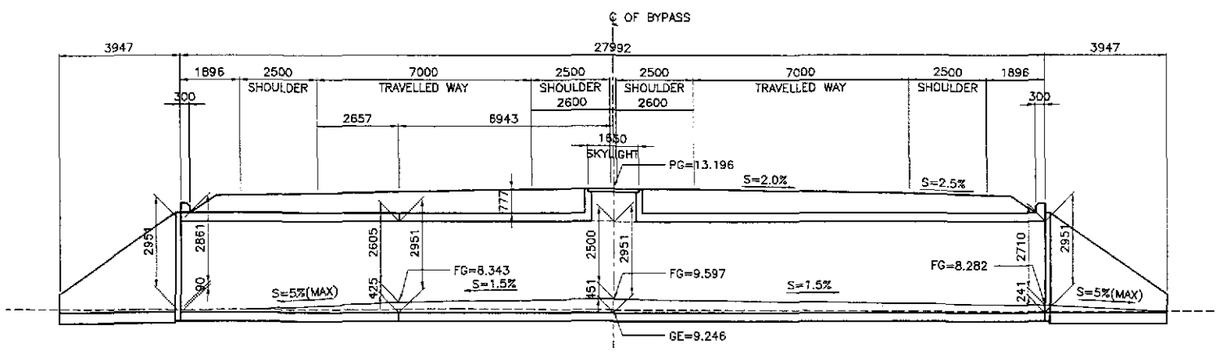
PROJECT AND LOCATION :	SCALE :	SHEET CONTENTS :	SHEET NO. :
THE DETAILED DESIGN STUDY ON UPGRADING INTER-URBAN HIGHWAY SYSTEM ALONG THE PAN-PHILIPPINE HIGHWAY (Plaridel, Cabanatuan and San Jose Bypasses) PLARIDEL BYPASS - CONTRACT PACKAGE II	AS SHOWN FULL SIZE A1	BOX CULVERT GENERAL PLAN, ELEVATION & SECTION (ULTIMATE STAGE) B-4 (STA. 41+625.00)	UP-03



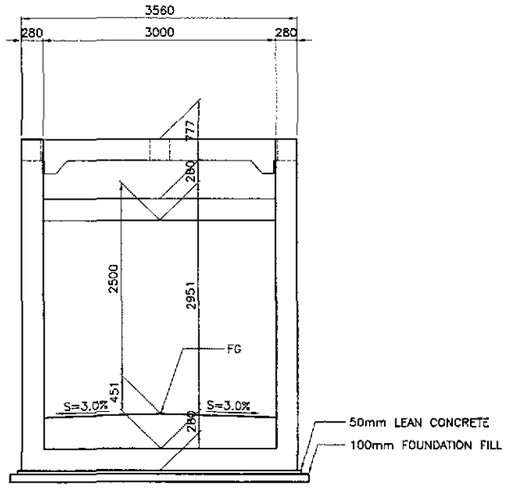
1 UP-04 **GENERAL PLAN**
SCALE 1:100



3 UP-04 **ELEVATION**
SCALE 1:40



2 UP-04 **GENERAL ELEVATION**
SCALE 1:100



4 UP-04 **SECTION**
SCALE 1:40

JICA
JAPAN INTERNATIONAL COOPERATION AGENCY

KATAHIRA & ENGINEERS INTERNATIONAL
YACHIYO ENGINEERING CO., LTD.

	DATE	SIGNATURE
DESIGNED	10/21/02	
CHECKED	10/25/02	
SUBMITTED	10/29/02	TEAM LEADER

REPUBLIC OF THE PHILIPPINES
DEPARTMENT OF PUBLIC WORKS AND HIGHWAYS

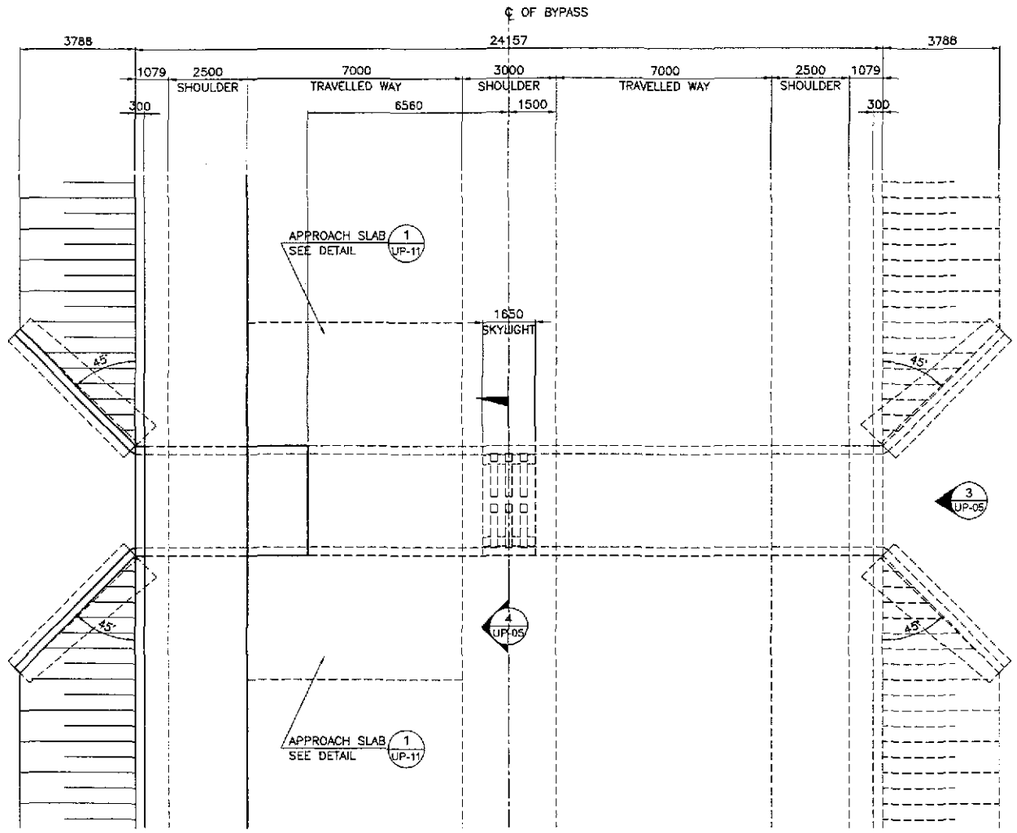
PUHL – PMO	BUREAU OF DESIGN		OFFICE OF THE SECRETARY	
Submitted By:	Reviewed By:	Recommended By:	Recommended By: (See cover sheet for Signature)	Approved By: (See cover sheet for Signature/Approval)
DANILO C. TRAJANO	JOSEFINA M. ALAGAR	GILBERTO S. REYES	MANUEL M. BONOAN	SIMEON A. DATUMANONG
Project Director	Chief, Highways Division	OIC, Director IV	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)
PLARIDEL BYPASS - CONTRACT PACKAGE II

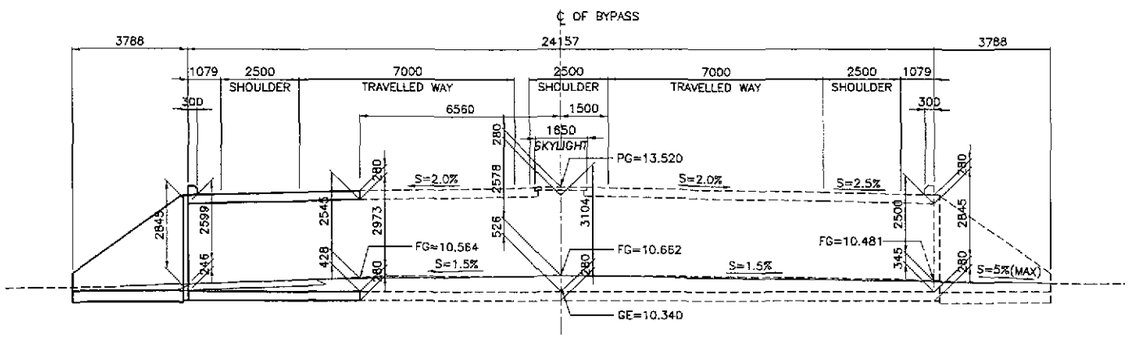
SCALE : AS SHOWN
FULL SIZE A1

SHEET CONTENTS :
BOX CULVERT
GENERAL PLAN, ELEVATION & SECTION
(ULTIMATE STAGE)
B-5 (STA. 41+820.00)

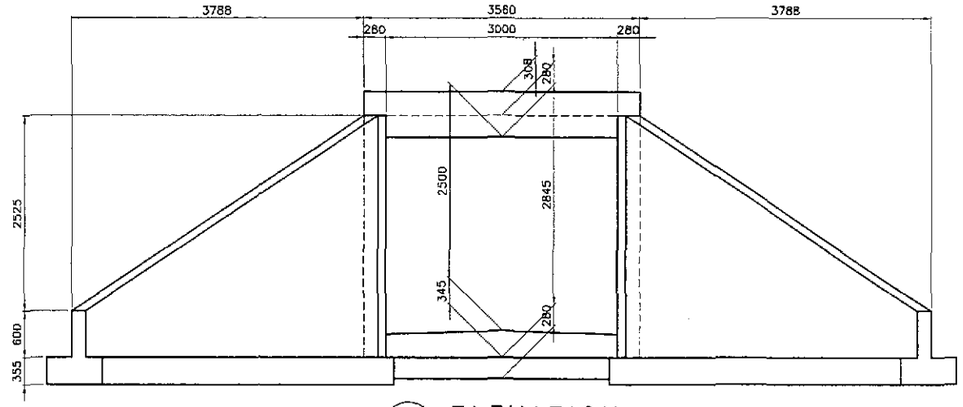
SHEET NO. :
UP-04



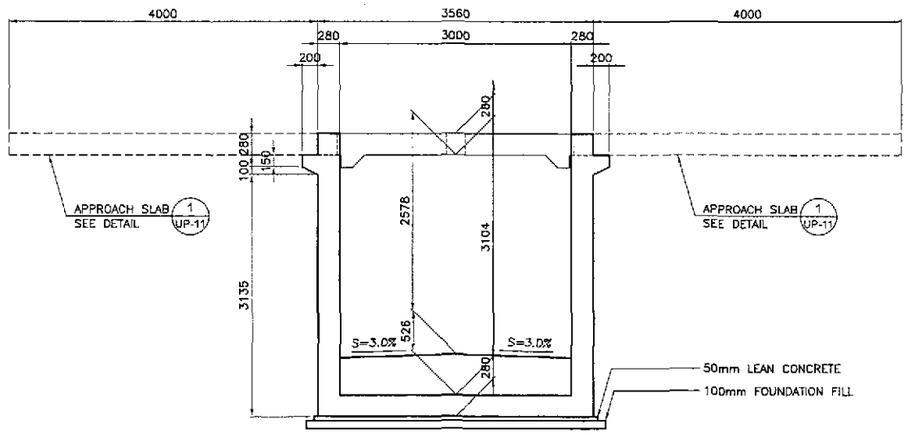
1 UP-05 GENERAL PLAN SCALE 1:100



2 UP-05 GENERAL ELEVATION SCALE 1:100

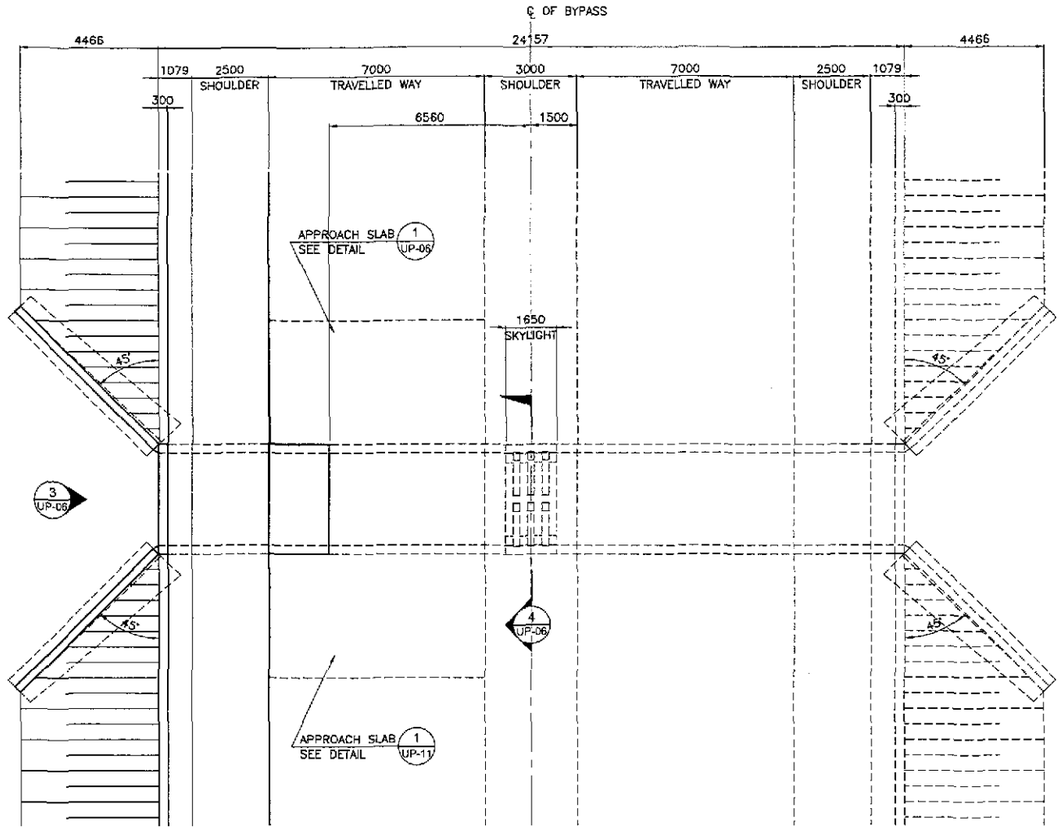


3 UP-05 ELEVATION SCALE 1:40

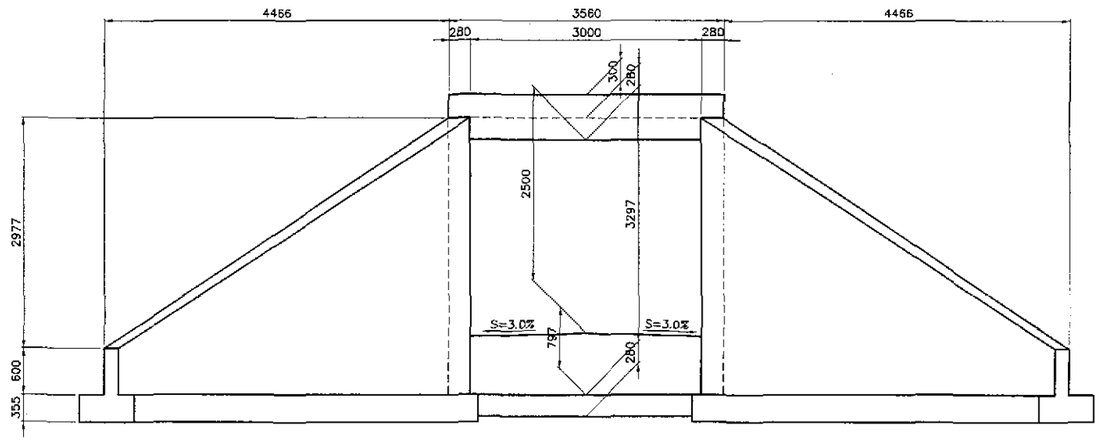


4 UP-05 SECTION SCALE 1:40

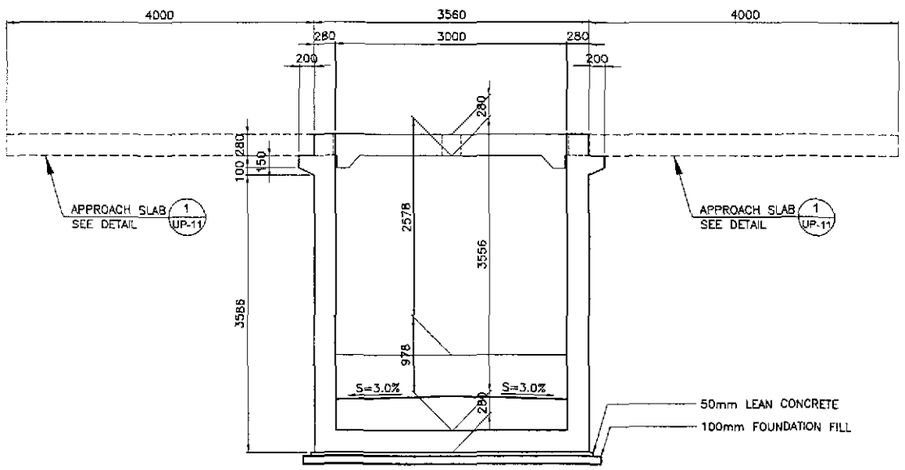
JICA JAPAN INTERNATIONAL COOPERATION AGENCY KEI KATAHIRA & ENGINEERS INTERNATIONAL yec YACHIYO ENGINEERING CO., LTD.		DATE	SIGNATURE	REPUBLIC OF THE PHILIPPINES DEPARTMENT OF PUBLIC WORKS AND HIGHWAYS				PROJECT AND LOCATION :	SCALE :	SHEET CONTENTS :	SHEET NO. :
	DESIGNED	10/31/02		PJHL – PMO	BUREAU OF DESIGN		OFFICE OF THE SECRETARY	THE DETAILED DESIGN STUDY ON UPGRADING INTER-URBAN HIGHWAY SYSTEM ALONG THE PAN-PHILIPPINE HIGHWAY (Plaridel, Cabanatuan and San Jose Bypasses)	AS SHOWN	BOX CULVERT GENERAL PLAN, ELEVATION & SECTION (ULTIMATE STAGE) B-6 (STA. 42+555.00)	UP-05
	CHECKED	10/25/02		Submitted By:	Reviewed By:	Recommended By:	Recommended By: (See cover sheet for Signature)	Approved By: (See cover sheet for Signature/Approval)			
	SUBMITTED	10/29/02		DANILO C. TRAJANO Project Director	JOSEFINA M. ALAGAR Chief, Highways Division	GILBERTO S. REYES OIC, Director IV	MANUEL M. BONDAN Undersecretary	SIMEON A. DATUMANONG Secretary	PLARIDEL BYPASS - CONTRACT PACKAGE II	FULL SIZE A1	
			TEAM LEADER								



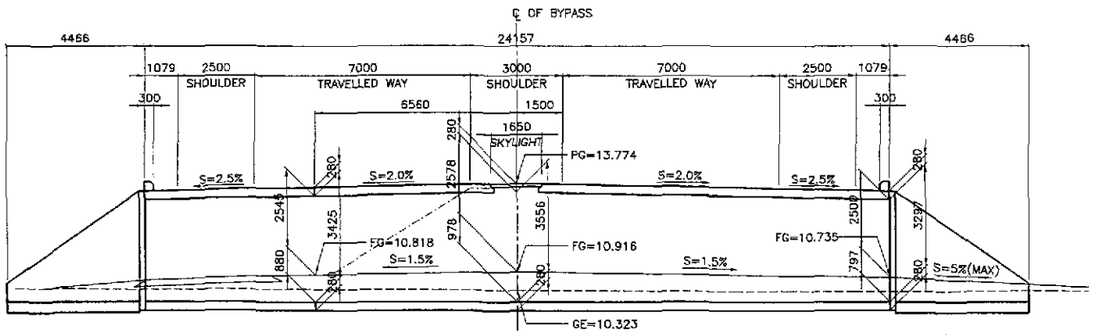
1 UP-06 GENERAL PLAN
SCALE 1:100



3 UP-06 ELEVATION
SCALE 1:40

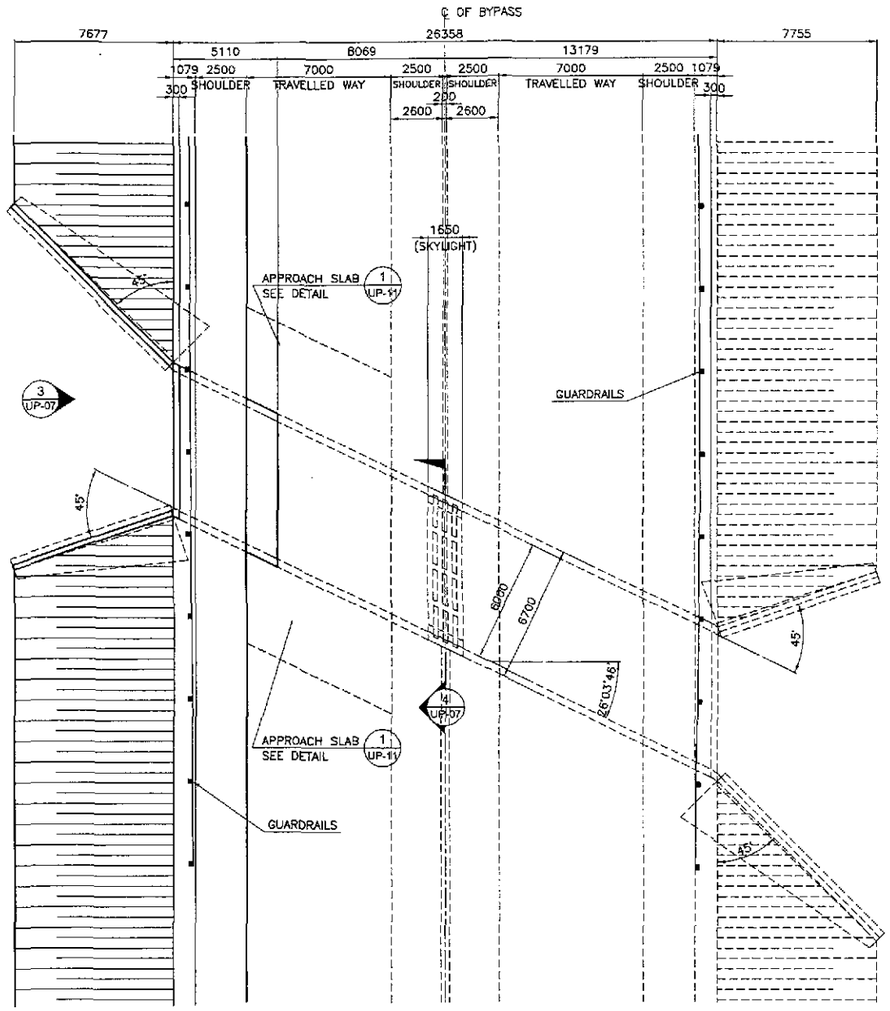


4 UP-06 SECTION
SCALE 1:40

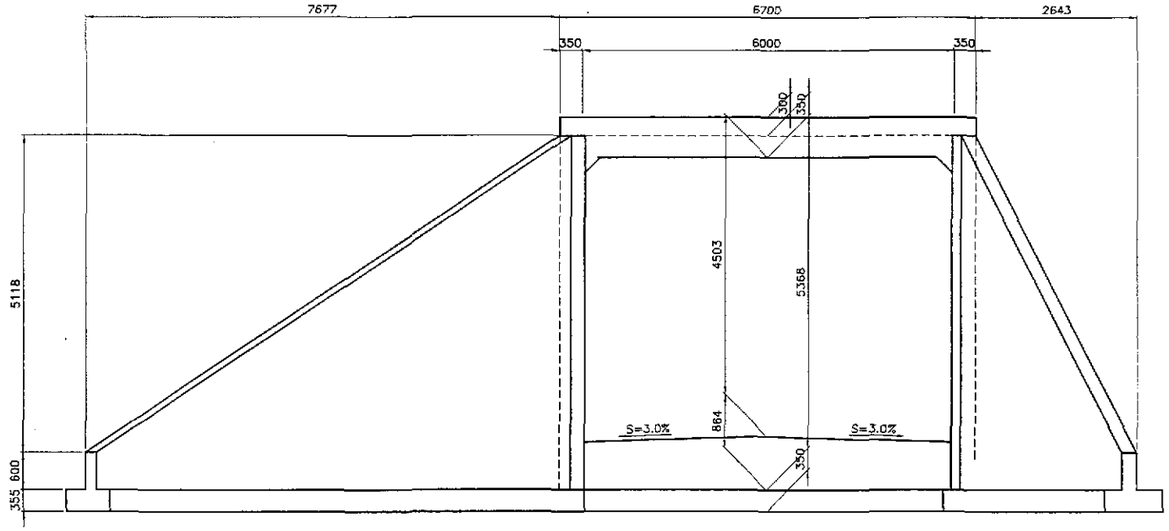


2 UP-06 GENERAL ELEVATION
SCALE 1:100

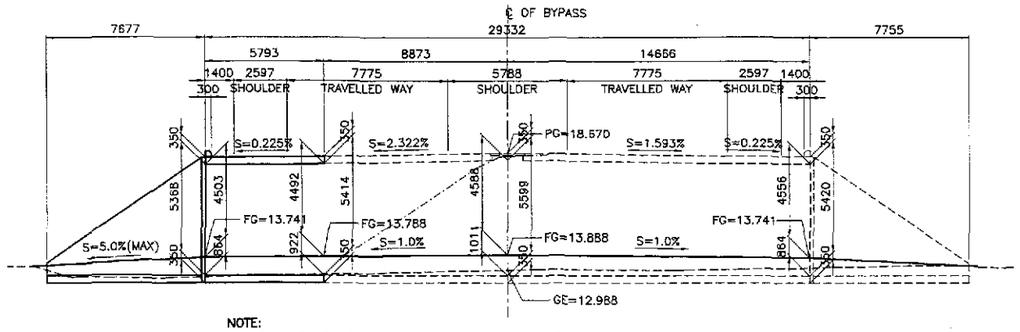
JICA JAPAN INTERNATIONAL COOPERATION AGENCY KEI KATAHIRA & ENGINEERS INTERNATIONAL YEC YACHIYO ENGINEERING CO., LTD.		DATE	SIGNATURE	REPUBLIC OF THE PHILIPPINES DEPARTMENT OF PUBLIC WORKS AND HIGHWAYS		PROJECT AND LOCATION :	SCALE :	SHEET CONTENTS :	SHEET NO. :
	DESIGNED	10/21/02		PJHL – PMO	BUREAU OF DESIGN	THE DETAILED DESIGN STUDY ON UPGRADING INTER-URBAN HIGHWAY SYSTEM ALONG THE PAN-PHILIPPINE HIGHWAY (Plaridel, Cabanatuan and San Jose Bypasses)	AS SHOWN	**BOX CULVERT** GENERAL PLAN, ELEVATION & SECTION (ULTIMATE STAGE) B-7 (STA. 43+440.00)	**UP-06**
	CHECKED	10/25/02		Submitted By: DANILO C. TRAJANO, Project Director	Reviewed By: JOSEFINA M. ALAGAR, Chief, Highways Division	Recommended By: GILBERTO S. REYES, OIC, Director IV	Recommended By: (See cover sheet for Signature) MANUEL M. BONOAN, Undersecretary	Approved By: (See cover sheet for Signature/Approval) SIMEON A. DATUMANONG, Secretary	
	SUBMITTED	10/27/02	TEAM LEADER				PLARIDEL BYPASS - CONTRACT PACKAGE II	FULL SIZE A1	



1 UP-07 GENERAL PLAN
SCALE 1:150

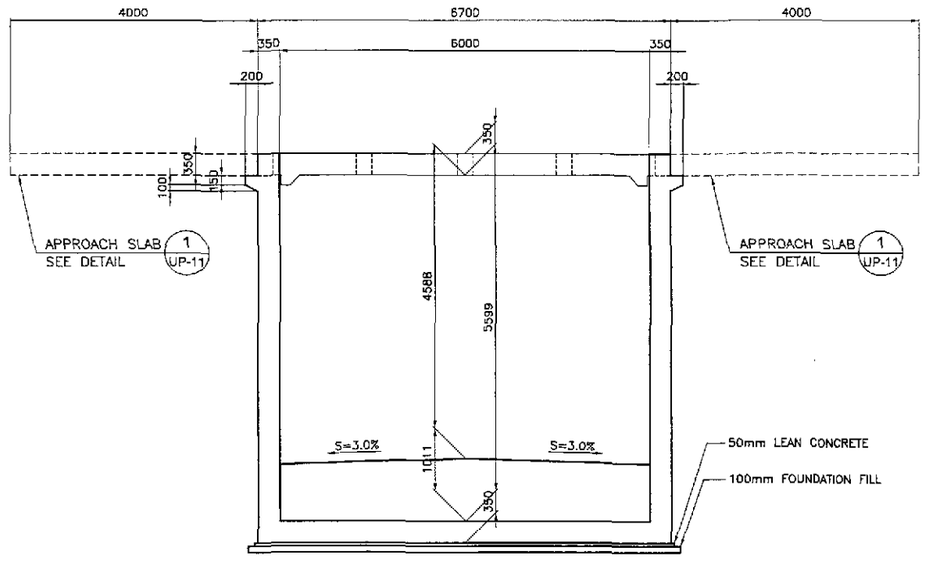


3 UP-07 ELEVATION
SCALE 1:50



NOTE:
THE HORIZONTAL DIMENSIONS INDICATED IN THIS ELEVATION ARE SKEWED LENGTH

2 UP-07 GENERAL ELEVATION
SCALE 1:150



4 UP-07 SECTION
SCALE 1:50

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

	DATE	SIGNATURE
DESIGNED	10/21/02	
CHECKED	10/25/02	
SUBMITTED	10/27/02	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	JOSEFINA M. ALAGAR	GILBERTO S. REYES	MANUEL M. BONOAN	SIMEON A. DATUMANONG
Project Director	Chief, Highways Division	OIC, Director IV	Undersecretary	Secretary

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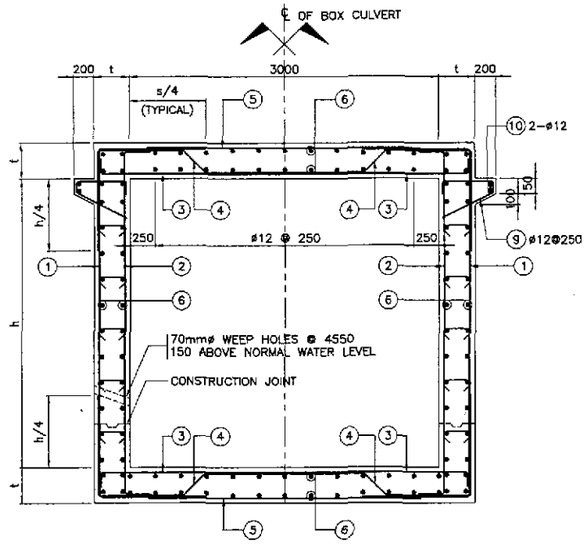
PLARIDEL BYPASS - CONTRACT PACKAGE II

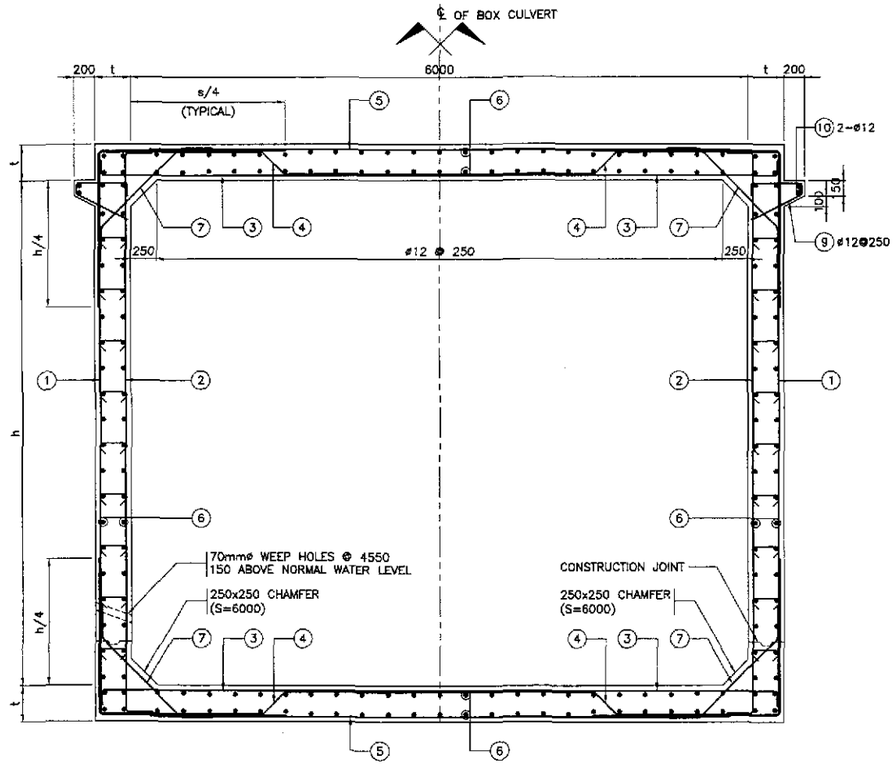
SCALE : AS SHOWN FULL SIZE A1

SHEET CONTENTS :
BOX CULVERT
GENERAL PLAN, ELEVATION & SECTION
(ULTIMATE STAGE)
B-8 (STA. 45+276.072)

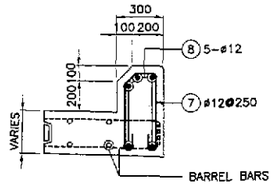
SHEET NO. : UP-07



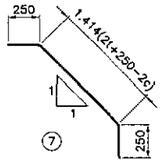
1 UP-08 SECTION - SINGLE BARREL
NOT TO SCALE

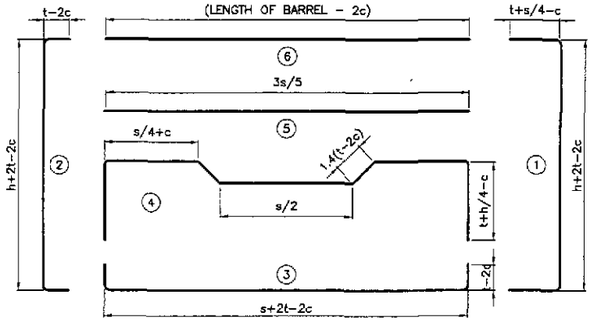


2 UP-08 SECTION - SINGLE BARREL
NOT TO SCALE



3 UP-08 PARAPET DETAIL
SCALE 1:20





4 UP-08 BAR BENDING DIAGRAM - SINGLE BARREL
NOT TO SCALE

DESIGN NOTES :

SPECIFICATIONS:
DESIGN:
BRIDGE DESIGN SPECIFICATION (1992 AASHTO SPECIFICATIONS)

LOAD FACTORS:
1.5 D 1.5 E + 2.5 (L + I)
1.3 (D + 1.67 LL + 1.00 E)
1.3 (D + 1.67 LL + 0.50 E)

WHERE:
D - DEAD LOAD
E - EARTH LOAD
L - LIVE LOAD
I - IMPACT
CAPACITY REDUCTION FACTOR IS INCLUDED.

LOADING:
LIVE LOAD:
HS20-44 TRUCK
APPLY IMPACT ONLY TO THE ROOF SLAB.

EARTH COVER (mm)	IMPACT (%)
Up to 300	30
301 to 600	20
601 to 900	10
Over 900	0

NO SURCHARGE ON WALL DUE TO LIVE LOAD.

EARTH LOAD:
EARTH PRESSURE FOR CONDITIONS:
18.8 KPa/m VERTICAL
9.4 KPa/M HORIZONTAL

UNIT STRESSES:
f'c = 28 MPa
fy = 276 MPa

DISTRIBUTION "d" BARS:
UP TO AND INCLUDING 3.0M COVER EXPRESSED AS A PERCENT OF MAIN POSITIVE REINFOCEMENT REQUIRED:
$\frac{55}{\sqrt{S}}$, MAX. 50%

OVER 3.0 COVER
ø12 @ 450 mm MAXIMUM.

SHEAR:
MAXIMUM ALLOWABLE SHEAR, $v = 0.291\sqrt{f'c}$ MPa

EXCLUSIONS:
COMPRESSIVE REINFORCEMENT AND NEGATIVE-MOMENT REDUCTION (FOR CONTINUITY) DO NOT APPLY.
AXIAL LOADING ON MEMBERS HAS NOT BEEN CONSIDERED.

BAR SCHEDULE SINGLE BARREL BOX CULVERT

NAME	S	h	t	BAR 1		BAR 2		BAR 3		BAR 4		BAR 5		BAR 6		BAR 7		REMARKS
	SPAN	HEIGHT	THICKNESS	ø	SPACING	ø	SPACING	ø	SPACING	ø	SPACING	ø	SPACING	ø	SPACING	ø	SPACING	
B-3	3000	3200	280	16	200	16	180	16	200	16	200	12	200	12	250	–	–	FLUSHED TO ROADWAY
B-4	6000	5100	350	20	200	20	200	20	200	20	200	12	200	12	250	16	200	FLUSHED TO ROADWAY (SKEW 20°LF)
B-5	3000	3000	280	16	200	16	180	16	200	16	200	12	200	12	250	–	–	ON FILL
B-6	3000	3100	280	16	200	16	180	16	200	16	200	12	200	12	250	–	–	FLUSHED TO ROADWAY
B-7	3000	3600	280	16	200	16	180	16	200	16	200	12	200	12	250	–	–	FLUSHED TO ROADWAY
B-8	6000	5600	350	20	200	20	200	20	200	20	200	12	200	12	250	16	200	FLUSHED TO ROADWAY (SKEW 26°LF)

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

	DATE	SIGNATURE
DESIGNED	10/25/02	M. CHAN
CHECKED	10/25/02	A. MAKIM
SUBMITTED	10/25/02	M. 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	JOSEFINA M. ALAGAR	GILBERTO S. REYES	MANUEL M. BONOAN	SIMEON A. DATUMANONG
Project Director	Chief, Highways Division	OIC, Director IV	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)
PLARIDEL BYPASS - CONTRACT PACKAGE II

SCALE : AS SHOWN
FULL SIZE A1

SHEET CONTENTS :
BOX CULVERT BARREL DETAILS (ULTIMATE STAGE)

SHEET NO. :
UP-08

SCHEDULE OF REINFORCEMENTS (B3 – STA. 39+860.000)

STRUCTURE COMMENT	BAR MARK	BAR SIZE	QTY.	SPACING	BAR SHAPE	DIMENSIONS (mm) a	b	c	d	e	f	LENGTH EA. BAR	TOTAL LENGTH	UNIT WT. (KG/M)	WEIGHT IN (KG)	VOLUME OF CONC. (m³)
BARREL L=5.815m.	1	16	60	200	A	980	3534	980	–	–	–	5494	329.64	1.579	521	
	2	16	64	180	A	180	3534	180	–	–	–	3894	249.21	1.579	394	
	3	16	60	200	B	180	3460	180	–	–	–	3820	229.2	1.579	362	
	4	16	58	200	C	988	800	255	1500	–	–	5606	325.15	1.579	514	
	5	12	60	200	D	2000	–	–	–	–	–	2000	120	0.888	107	
	6	12	120	250	D	5718	–	–	–	–	–	5718	686.16	0.888	610	22.43
	7	12	30	250	E	114	380	71	150	480	114	1309	39.26	0.888	35	
	8	12	10	AS DWG	D	3460	–	–	–	–	–	3460	34.6	0.888	31	
	9	12	58	250	H	430	70	608	–	–	–	1108	64.27	0.888	58	
	10	12	4	AS DWG	D	6900	–	–	–	–	–	6900	27.6	0.888	25	
WINGWALLS (h+t)=3.354m.	W1	12	4	AS DWG	D	600	7665	–	–	–	–	8265	33.06	0.888	30	
	W2	12	22	300	D	3836 (pro)	–	–	–	–	–	3836	84.4	0.888	75	
	W3a	25	26	200	I	1194	3010 (pro)	150	–	–	–	4354	113.21	3.854	437	
	W3b	16	16	250	I	734	1927 (pro)	150	–	–	–	2861	45.78	1.579	73	
	W3c	12	8	350	I	684	1174 (pro)	150	–	–	–	2008	16.07	0.888	15	
	W4	12	44	300	I	203	2207 (pro)	150	–	–	–	2560	112.64	0.888	101	16.96
	W5a	25	12	400	D	1801 (pro)	–	–	–	–	–	1801	21.62	3.854	84	
	W5b	16	16	250	D	1220 (pro)	–	–	–	–	–	1220	19.51	1.579	31	
	W5c	12	8	350	D	818 (pro)	–	–	–	–	–	818	6.54	0.888	6	
	W6	12	14	AS DWG	D	6626	–	–	–	–	–	6628	92.79	0.888	83	
														GRAND TOTAL =	3592 KG	39.4

SCHEDULE OF REINFORCEMENTS (B4 – STA. 41+625.000)

STRUCTURE COMMENT	BAR MARK	BAR SIZE	QTY.	SPACING	BAR SHAPE	DIMENSIONS (mm) a	b	c	d	e	f	LENGTH EA. BAR	TOTAL LENGTH	UNIT WT. (KG/M)	WEIGHT IN (KG)	VOLUME OF CONC. (m³)
BARREL L=6.100m.	1	20	66	200	A	1800	5510	1800	–	–	–	9110	601.23	2.466	1483	
	2	20	64	200	A	250	5510	250	–	–	–	6010	384.61	2.466	949	
	3	20	66	200	A	250	6600	250	–	–	–	7100	468.6	2.466	1156	
	4	20	64	200	B	1527	1550	354	3000	–	–	9882	631.16	2.466	1557	
	5	12	66	200	C	4000	–	–	–	–	–	4000	264	0.888	235	
	6	12	200	250	C	6391	–	–	–	–	–	6391	1278.3	0.888	1136	54.93
	7	16	124	200	D	560	1202	560	–	–	–	2322	287.92	1.579	455	
	8	12	58	250	E	114	450	71	150	550	114	1449	84.03	0.888	75	
	9	12	10	AS DWG	D	6594	–	–	–	–	–	6594	65.94	0.888	59	
	10	12	58	250	H	500	70	707	–	–	–	1277	74.07	0.888	66	
	11	12	4	AS DWG	D	6900	–	–	–	–	–	6900	27.6	0.888	25	
WINGWALL (h+t)=5.260m. L=9.931m.	W1	12	2	AS DWG	D	600	11835	–	–	–	–	12535	25.07	0.888	23	
	W2	12	18	300	D	5530 (pro)	–	–	–	–	–	5530	99.54	0.888	89	
	W3a	32	21	200	I	1760	4519 (pro)	150	–	–	–	6429	135	6.313	853	
	W3b	25	16	200	I	1270	2771 (pro)	150	–	–	–	4191	67.06	3.854	259	
	W3c	16	6	350	I	810	1412 (pro)	150	–	–	–	2372	14.23	1.579	23	
	W4	12	34	300	I	203	3160 (pro)	150	–	–	–	3513	119.43	0.888	107	20.11
	W5a	25	20	200	D	2344 (pro)	–	–	–	–	–	2344	46.89	3.854	181	
	W5b	25	8	400	D	1900 (pro)	–	–	–	–	–	1900	15.2	3.854	59	
	W5c	16	6	350	D	1135 (pro)	–	–	–	–	–	1135	6.81	1.579	11	
	W6	12	7	AS DWG	D	10181	–	–	–	–	–	10181	71.27	0.888	64	
WINGWALL (h+t)=5.260m. L=7.814m.	W1	12	2	AS DWG	D	600	9391	–	–	–	–	9991	19.98	0.888	18	
	W2	12	18	300	D	4339 (pro)	–	–	–	–	–	4339	78.1	0.888	70	
	W3a	32	16	200	I	1760	4519 (pro)	150	–	–	–	6429	102.86	6.313	650	
	W3b	25	12	200	I	1270	2771 (pro)	150	–	–	–	4191	50.3	3.854	194	
	W3c	16	6	350	I	810	1412 (pro)	150	–	–	–	2372	14.23	1.579	23	
	W4	12	27	300	I	203	3160 (pro)	150	–	–	–	3513	94.84	0.888	85	15.89
	W5a	25	15	200	D	2344 (pro)	–	–	–	–	–	2344	35.17	3.854	136	
	W5b	25	6	400	D	1900 (pro)	–	–	–	–	–	1900	11.4	3.854	44	
	W5c	16	5	350	D	1135 (pro)	–	–	–	–	–	1135	5.68	1.579	9	
	W6	12	7	AS DWG	D	8064	–	–	–	–	–	8064	56.45	0.888	51	
														GRAND TOTAL =	10145 KG	90.9

SCHEDULE OF REINFORCEMENTS (B5 – STA. 41+820.000)

STRUCTURE COMMENT	BAR MARK	BAR SIZE	QTY.	SPACING	BAR SHAPE	DIMENSIONS (mm) a	b	c	d	e	f	LENGTH EA. BAR	TOTAL LENGTH	UNIT WT. (KG/M)	WEIGHT IN (KG)	VOLUME OF CONC. (m³)
BARREL L=7.362m.	1	16	76	200	A	980	3411	980	–	–	–	5371	408.20	1.579	645	
	2	16	82	180	A	180	3411	180	–	–	–	3771	309.22	1.579	489	
	3	16	76	200	B	180	3460	180	–	–	–	3820	290.32	1.579	459	
	4	16	74	200	C	988	800	255	1500	–	–	5545	410.30	1.579	648	
	5	12	76	200	D	2000	–	–	–	–	–	2000	152.00	0.888	135	30.26
	6	12	120	250	D	7252	–	–	–	–	–	7252	870.24	0.888	773	
	7	12	30	250	E	114	380	71	150	480	114	1309	39.26	0.888	35	
	8	12	10	AS DWG	D	3460	–	–	–	–	–	3460	34.6	0.888	31	
WINGWALLS (h+t)=3.231m.	W1	12	4	AS DWG	D	600	7068	–	–	–	–	7668	30.67	0.888	28	
	W2	12	22	300	D	3533 (pro)	–	–	–	–	–	3533	77.72	0.888	70	
	W3a	25	24	200	I	1189	2913 (pro)	150	–	–	–	4252	102.05	3.854	394	
	W3b	16	14	250	I	729	1926 (pro)	150	–	–	–	2805	39.27	1.579	63	
	W3c	12	8	350	I	679	1159 (pro)	150	–	–	–	1988	15.9	0.888	15	
	W4	12	40	300	I	203	2146 (pro)	150	–	–	–	2498	99.84	0.888	89	15.38
	W5a	25	10	400	D	1811 (pro)	–	–	–	–	–	1811	18.11	3.854	70	
	W5b	16	14	250	D	1226 (pro)	–	–	–	–	–	1226	17.16	1.579	28	
	W5c	12	8	350	D	821 (pro)	–	–	–	–	–	821	6.57	0.888	6	
	W6	12	14	AS DWG	D	6131	–	–	–	–	–	6131	85.84	0.888	77	
														GRAND TOTAL =	4055 KG	45.6

SCHEDULE OF REINFORCEMENTS (B6 – STA. 42.550.000)

STRUCTURE COMMENT	BAR MARK	BAR SIZE	QTY.	SPACING	BAR SHAPE	DIMENSIONS (mm) a	b	c	d	e	f	LENGTH EA. BAR	TOTAL LENGTH	UNIT WT. (KG/M)	WEIGHT IN (KG)	VOLUME OF CONC. (m³)
BARREL L=5.815m.	1	16	60	200	A	980	3425	980	–	–	–	5385	323.10	2.466	511	
	2	16	64	180	A	180	3425	180	–	–	–	3785	242.24	1.579	383	
	3	16	60	200	B	180	3460	180	–	–	–	3820	229.20	2.466	362	
	4	16	58	200	C	971	800	255	1500	–	–	5552	321.89	2.466	509	
	5	12	60	200	D	2000	–	–	–	–	–	2000	120.00	0.888	107	
	6	12	120	250	D	5718	–	–	–	–	–	5718	686.16	0.888	610	22.08
	7	12	30	250	E	114	380	71	150	480	114	1309	39.26	0.888	35	
	8	12	10	AS DWG	D	3460	–	–	–	–	–	3460	34.6	0.888	31	
	9	12	58	250	H	430	70	608	–	–	–	1108	64.27	0.888	58	
	10	12	4	AS DWG	D	6900	–	–	–	–	–	6900	27.6	0.888	25	
WINGWALLS (h+t)=3.245m.	W1	12	4	AS DWG	D	600	6798	–	–	–	–	7398	29.59	0.888	27	
	W2	12	22	300	D	3396 (pro)	–	–	–	–	–	3396	74.7	0.888	67	
	W3a	20	24	200	I	830	2824 (pro)	150	–	–	–	3904	93.7	2.466	232	
	W3b	16	14	250	I	730	1932 (pro)	150	–	–	–	2812	39.37	1.579	63	
	W3c	12	6	350	I	680	1161 (pro)	150	–	–	–	1991	11.94	0.888	11	
	W4	12	40	300	I	203	2152 (pro)	150	–	–	–	2506	100.22	0.888	89	14.63
	W5a	25	10	400	D	1715 (pro)	–	–	–	–	–	1715	17.15	3.854	67	
	W5b	16	14	250	D	1229 (pro)	–	–	–	–	–	1229	17.2	1.579	28	
	W5c	12	6	350	D	822 (pro)	–	–	–	–	–	822	4.93	0.888	5	
	W6	12	14	AS DWG	D	5905	–	–	–	–	–	5906	82.69	0.888	74	
														GRAND TOTAL =	3294 KG	36.7

SCHEDULE OF REINFORCEMENTS (B7 – STA. 43+470.000)

STRUCTURE COMMENT	BAR MARK	BAR SIZE	QTY.	SPACING	BAR SHAPE	DIMENSIONS (mm) a	b	c	d	e	f	LENGTH EA. BAR	TOTAL LENGTH	UNIT WT. (KG/M)	WEIGHT IN (KG)	VOLUME OF CONC. (m³)
BARREL L=5.818m.	1	16	60	200	A	980	3886	980	–	–	–	5846	350.79	2.466	554	
	2	16	64	180	A	180	3886	180	–	–	–	4246	271.78	1.579	430	
	3	16	80	200	B	180	3460	180	–	–	–	3820	229.20	2.466	362	
	4	16	58	200	C	1087	800	255	1500	–	–	5782	335.38	2.466	530	
	5	12	60	200	D	2000	–	–	–	–	–	2000	120.00	0.888	107	
	6	12	128	250	D	5718	–	–	–	–	–	5718	731.9	0.888	650	25.96
	7	12	30	250	E	114	380	71	150	480	114	1309	39.26	0.888	35	
	8	12	10	AS DWG	D	3460	–	–	–	–	–	3460	34.6	0.888	31	
	9	12	58	250	H	430	70	608	–	–	–	1108	64.27	0.888	58	
	10	12	4	AS DWG	D	6900	–	–	–	–	–	6900	27.6	0.888	25	
WINGWALLS (h+t)=3.707m.	W1	12	4	AS DWG	D	600	7950	–	–	–	–	8550	34.2	0.888	31	
	W2	12	24	300	D	3850 (pro)	–	–	–	–	–	3850	92.4	0.888	83	
	W3a	25	28	200	I	1208	3289 (pro)	150	–	–	–	4647	130.12	3.854	502	
	W3b	16	24	175	I	748	2124 (pro)	150	–	–	–	3022	72.54	1.579	115	
	W3c	12	8	350	L	698	1218 (pro)	150	–	–	–	2066	16.53	0.888	15	
	W4	12	46	300	I	203	2383 (pro)	150	–	–	–	2736	125.87	0.888	112	19
	W5a	25	12	400	D	1902 (pro)	–	–	–	–	–	1902	22.82	3.854	88	
	W5b	20	12	350	D	1462 (pro)	–	–	–	–	–	1462	17.54	2.466	44	
	W5c	12	8	350	D	816 (pro)	–	–	–	–	–	816	6.53	0.888	6	
	W6	12	14	AS DWG	D	6865	–	–	–	–	–	6865	98.11	0.888	86	
														GRAND TOTAL =	3864 KG	43

SCHEDULE OF REINFORCEMENTS (B8 – STA. 45+276.072)

STRUCTURE COMMENT	BAR MARK	BAR SIZE	QTY.	SPACING	BAR SHAPE	DIMENSIONS (mm) a	b	c	d	e	f	LENGTH EA. BAR	TOTAL LENGTH	UNIT WT. (KG/M)	WEIGHT IN (KG)	VOLUME OF CONC. (m³)
BARREL L=5.800m.	1	20	66	200	A	1800	6096	1800	–	–	–	9696	639.97	2.466	1579	
	2	20	64	200	A	250	6096	250	–	–	–	6596	422.18	2.466	1042	
	3	20	66	200	A	250	6600	250	–	–	–	7100	468.6	2.466	1156	
	4	20	64	200	B	1674	1550	354	3000	–	–	10155	649.94	2.466	1603	
	5	12	66	200	C	4000	–	–	–	–	–	4000	264	0.888	235	
	6	12	208	250	C	6353	–	–	–	–	–	6353	1321.44	0.888	1174	57.35
	7	16	116	200	D	560	1202	560	–	–	–	2322	269.34	1.579	426	
	8	12	60	250	E	114	450	71	150	550	114	1449	86.92	0.888	78	
	9	12	10	AS DWG	D	6589	–	–	–	–	–	6589	65.89	0.888	59	
	10	12	58	250	H	500	70	707	–	–	–	1277	74.07	0.888	66	
	11	12	4	AS DWG	D	6900	–	–	–	–	–	6900	27.6	0.888	25	
WINGWALL (h+t)=5.847m. L=11.267m.	W1	12	2	AS DWG	D	600	13542	–	–	–	–	14142	28.28	0.888	26	
	W2	12	19	300	D	6241 (pro)	–	–	–	–	–	6241	118.57	0.888	106	
	W3a	32	24	200	I	1784	4983 (pro)	150	–	–	–	8917	166.02	6.313	1049	
	W3b	32	9	375	I	1784	3016 (pro)	150	–	–	–	4950	44.55	6.313	282	
	W3c	16	11	250	I	834	1486 (pro)	150	–	–	–	2470	27.17	1.579	43	
	W4	12	38	300	I	203	3453 (pro)	150	–	–	–	3806	144.64	0.888	129	24.89
	W5a	28	23	200	D	3529 (pro)	–	–	–	–	–	3529	81.17	4.833	393	
	W5b	25	9	375	D	1983 (pro)	–	–	–	–	–	1983	17.85	3.854	69	
	W5c	16	11	250	D	1227 (pro)	–	–	–	–	–	1227	13.5	1.579	22	
	W6	12	7	AS DWG	D	11517	–	–	–	–	–	11517	80.62	0.888	72	
WINGWALL (h+t)=5.847m. L=8.502m.	W1	12	2	AS DWG	D	600	10218	–	–	–	–	*10818*	*21.64*	*0.888*	*20*	
	W2	12	19	300	D	4695 (pro)	–	–	–	–	–	4695	89.21	0.888	80	
	W3a	32	18	200	I	1784	4983 (pro)	150	–	–	–	6917	124.51	6.313	787	
	W3b	32	7	375	I	1784	3016 (pro)	150	–	–	–	4950	34.65	6.313	219	
	W3c	16	11	250	I	834	1486 (pro)	150	–	–	–	2470	27.17	1.579	43	
	W4	12	29	300	I	203	3453 (pro)	150	–	–	–	3806	110.38	0.888	99	18.68
	W5a	28	17	200	D	3529 (pro)	–	–	–	–	–	3529	60	4.833	290	
	W5b	25	7	375	D	1983 (pro)	–	–	–	–	–	1983	13.88	3.854	54	
	W5c	16	8	250	D	1227 (pro)	–	–	–	–	–	1227	9.82	1.579	16	
	W6	12	7	AS DWG	D	8752	–	–	–	–	–	8752	61.26	0.888	55	
														GRAND TOTAL =	11297 KG	101.1

JICA
JAPAN INTERNATIONAL COOPERATION AGENCY

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

	DATE	SIGNATURE
DESIGNED	10/21/02	CHAN
CHECKED	10/25/02	HAMM
SUBMITTED	10/27/02	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)
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Project Director	Chief, Highways Division	OIC, Director IV	Undersecretary	Secretary

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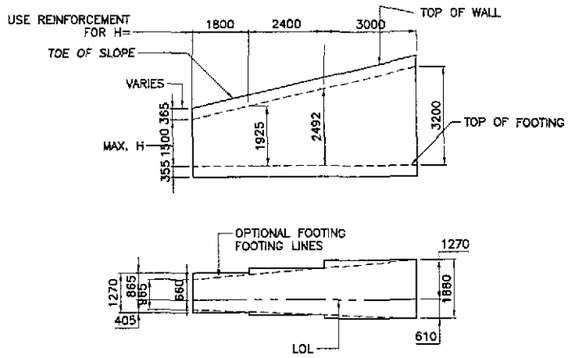
PLARIDEL BYPASS - CONTRACT PACKAGE II

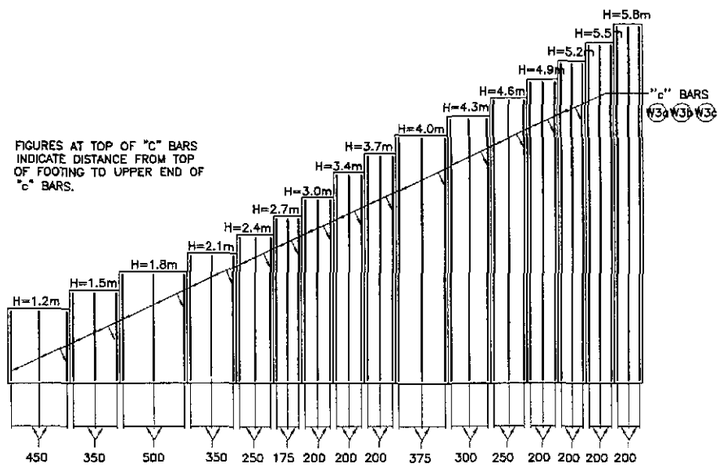
SCALE :
AS SHOWN
FULL SIZE A1

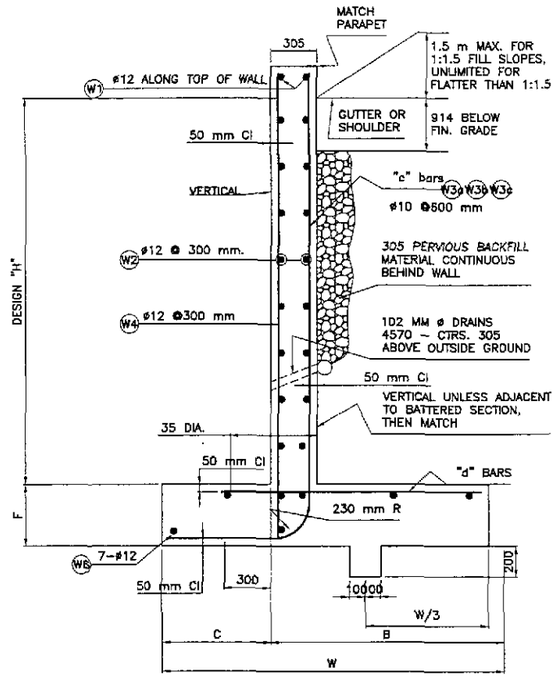
SHEET CONTENTS :
BOX CULVERT
BOX CULVERT BARREL BAR SCHEDULE
(ULTIMATE STAGE)

SHEET NO. :
UP-09

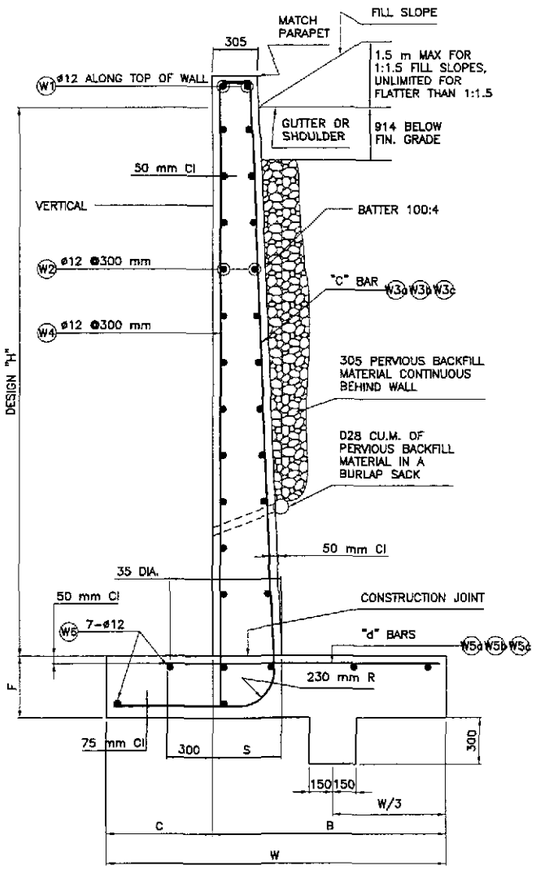


1 UP-10 **TYPICAL LAYOUT EXAMPLE**
SCALE 1:100



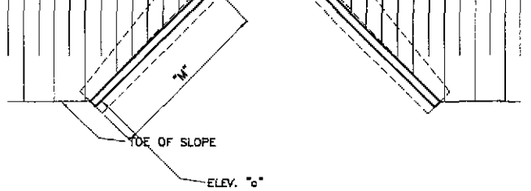


2 UP-10 **TYPICAL SECTION**
H=1.2 m THRU 3.7 m
SCALE 1:20

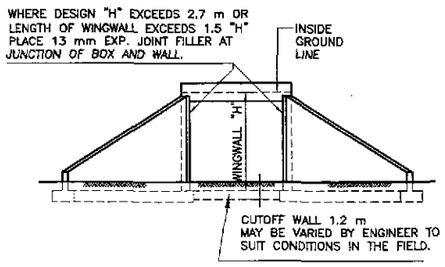


3 UP-10 **TYPICAL SECTION**
H=4.0 m THRU 4.9 m
SCALE 1:20

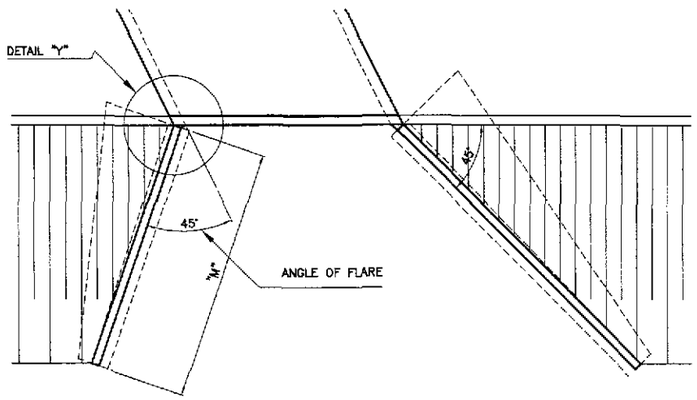
REINFORCED CONCRETE WINGWALLS																
H	1200	1500	1800	2100	2400	2700	3000	3400	3700	4000	4300	4600	4900	5200	5500	5800
W	955	1120	1270	1420	1575	1730	1880	2030	2185	2335	2490	2640	2795	2945	3050	3150
C	305	355	405	455	510	560	610	660	710	760	815	865	915	965	1015	1065
B	660	765	865	965	1065	1170	1270	1370	1475	1575	1675	1775	1880	1980	2035	2085
F	355	355	355	355	355	355	355	355	355	355	355	355	355	355	355	355
Batter	None	None	None	None	None	None	None	None	None	1:25	1:25	1:25	1:25	1:25	1:26	1:27
S	305	305	305	305	305	305	305	305	305	465	475	490	500	500	500	500
"c" Bars	12@450	12@350	12@275	16@350	16@250	16@175	20@200	25@200	25@200	32@375	32@300	32@250	32@200	32@175	32@200	32@200
"d" Bars	12@450	12@350	12@275	16@350	16@250	20@350	25@400	25@400	25@400	25@375	25@300	25@250	25@200	25@175	28@200	28@200



4 UP-10 **P L A N**
SCALE 1:100



5 UP-10 **END ELEVATION**
SCALE 1:100



6 UP-10 **P L A N**
SCALE 1:100

NOTES

UNIT STRESSES: f_c =165 MPa, f_c f =9 MPa, n=10

MAXIMUM TOE PRESSURE = 150 kPa

ELEVATIONS, LENGTH AND ANGLE OF FLARE OF WINGS MAY BE VARIED BY THE ENGINEER TO SUIT CONDITIONS ENCOUNTERED IN THE FIELD. WALLS DESIGNED FOR 600 mm *LIVELOAD SURCHARGE*, 1 : 1.5 SLOPING SURCHARGE NOT TO EXCEED 1.5 m IN ELEVATION PLUS 600 mm LIVELOAD SURCHARGE, OR UNLIMITED 1:2 SURCHARGE

DIMENSIONS "H", "L","M","N", ELEVATION "a" AND "ANGLE OF FLARES" (AS APPLY) ARE SHOWN ON THE PLANS

WALL HEIGHT MAY BE EXCEEDED BY 150 mm BEFORE GOING TO NEXT GREATER "H".

ELIMINATE CUTOFF WALL IF ADJACENT CHANNEL IS PAVED AND SKEW IS 20° MAXIMUM

FOR WALL OFFSET VALUES, SEE STANDARD PLAN B3-8

JAPAN INTERNATIONAL COOPERATION AGENCY

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

	DATE	SIGNATURE
DESIGNED	10/27/07	
CHECKED	10/27/07	
SUBMITTED	10/27/07	TEAM LEADER

REPUBLIC OF THE PHILIPPINES
DEPARTMENT OF PUBLIC WORKS AND HIGHWAYS

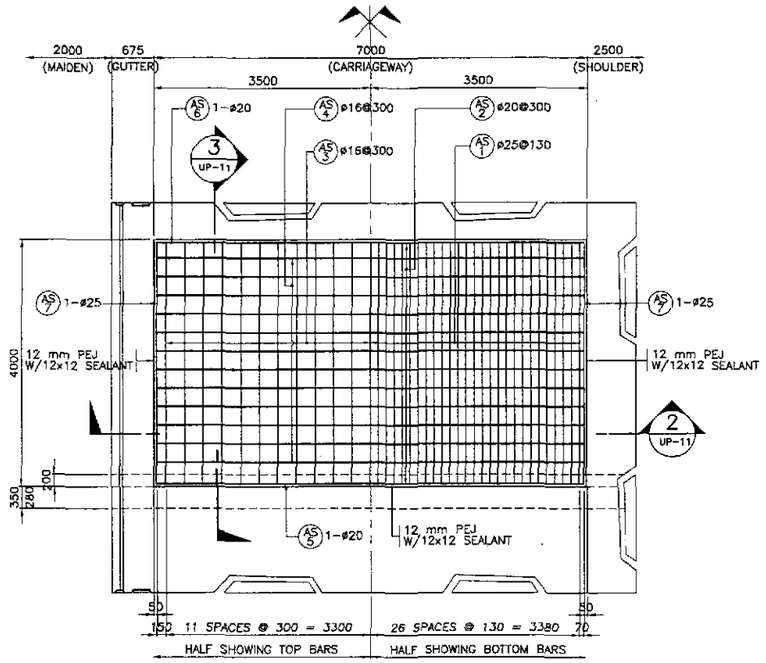
PJHL – PMO	BUREAU OF DESIGN		OFFICE OF THE SECRETARY	
Submitted By:	Reviewed By:	Recommended By:	Recommended By: (See cover sheet for Signature)	Approved By: (See cover sheet for Signature/Approval)
DANILO C. TRAJANO	JOSEFINA M. ALAGAR	GILBERTO S. REYES	MANUEL M. BONOAN	SIMEON A. DATUMANDNG
Project Director	Chief, Highways Division	OIC, Director IV	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)
PLARIDEL BYPASS - CONTRACT PACKAGE II

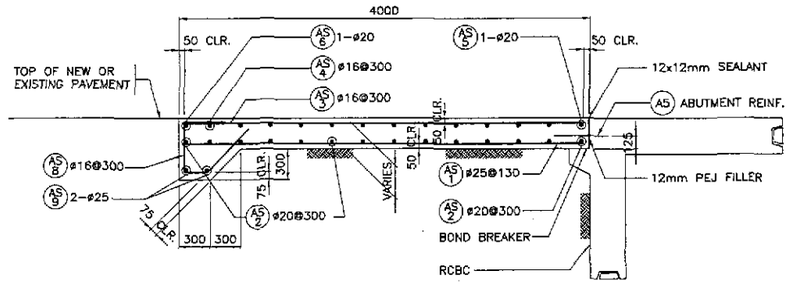
SCALE : AS SHOWN — FULL SIZE A1

SHEET CONTENTS : BOX CULVERT WINGWALL DETAIL (ULTIMATE STAGE)

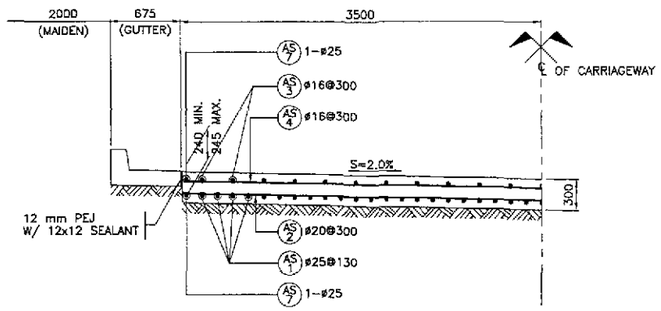
SHEET NO. : UP-10



1 UP-11 PLAN SCALE 1:50



3 UP-11 SECTION SCALE 1:30



2 UP-11 SECTION SCALE 1:30

REINFORCEMENT SCHEDULE & ESTIMATED QUANTITIES FOR TWO LANES APPROACH SLABS

BENDING DIAGRAM (DIMENSIONS ARE OUT TO OUT OF REBARS)	REINFORCEMENT											CONCRETE VOLUME (m^3)	REMARKS
	MARK	SIZE (mm)	QUANTITY	SPACING (mm)	SHAPE	BAR DIMENSIONS (mm) a	b	c	LENGTH PER BAR (mm)	TOTAL LENGTH (m)	UNIT WEIGHT (kg/m)	TOTAL WEIGHT (kg)		
a (A)	AS 1	25	69	130	B	3900	150	–	4050	226.80	3.853	874		1. QUANTITIES ARE FOR ONE (1) APPROACH SLAB
	AS 2	20	14	300	A	7900	–	–	7900	55.30	2.466	136		
a (B) b	AS 3	16	25	300	B	3900	150	–	4050	101.25	1.578	160		
	AS 4	16	12	300	A	7900	–	–	7900	47.40	1.578	75		
	AS 5	20	1	AS SHOWN	A	7200	–	–	7200	7.20	2.466	18		
	AS 6	20	1	AS SHOWN	A	7900	–	–	4050	53.20	1.578	84	9.58	
	AS 7	25	4	AS SHOWN	A	1965	1965	–	3930	15.72	3.853	61		
a 400 c b (C)	AS 8	16	27	300	C	415 MIN. 475 MAX.	250	650	1745	47.11	1.578	74		
	AS 9	25	2	AS SHOWN	A	7900	–	–	7900	15.80	3.853	61		
										GRAND TOTAL =		1543	9.58	

JICA JAPAN INTERNATIONAL COOPERATION AGENCY

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

	DATE	SIGNATURE
DESIGNED	10/21/02	
CHECKED	10/25/02	
SUBMITTED	10/27/02	TEAM LEADER

REPUBLIC OF THE PHILIPPINES
DEPARTMENT OF PUBLIC WORKS AND HIGHWAYS

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Project Director	Chief, Highways Division	OIC, Director IV	Undersecretary	Secretary

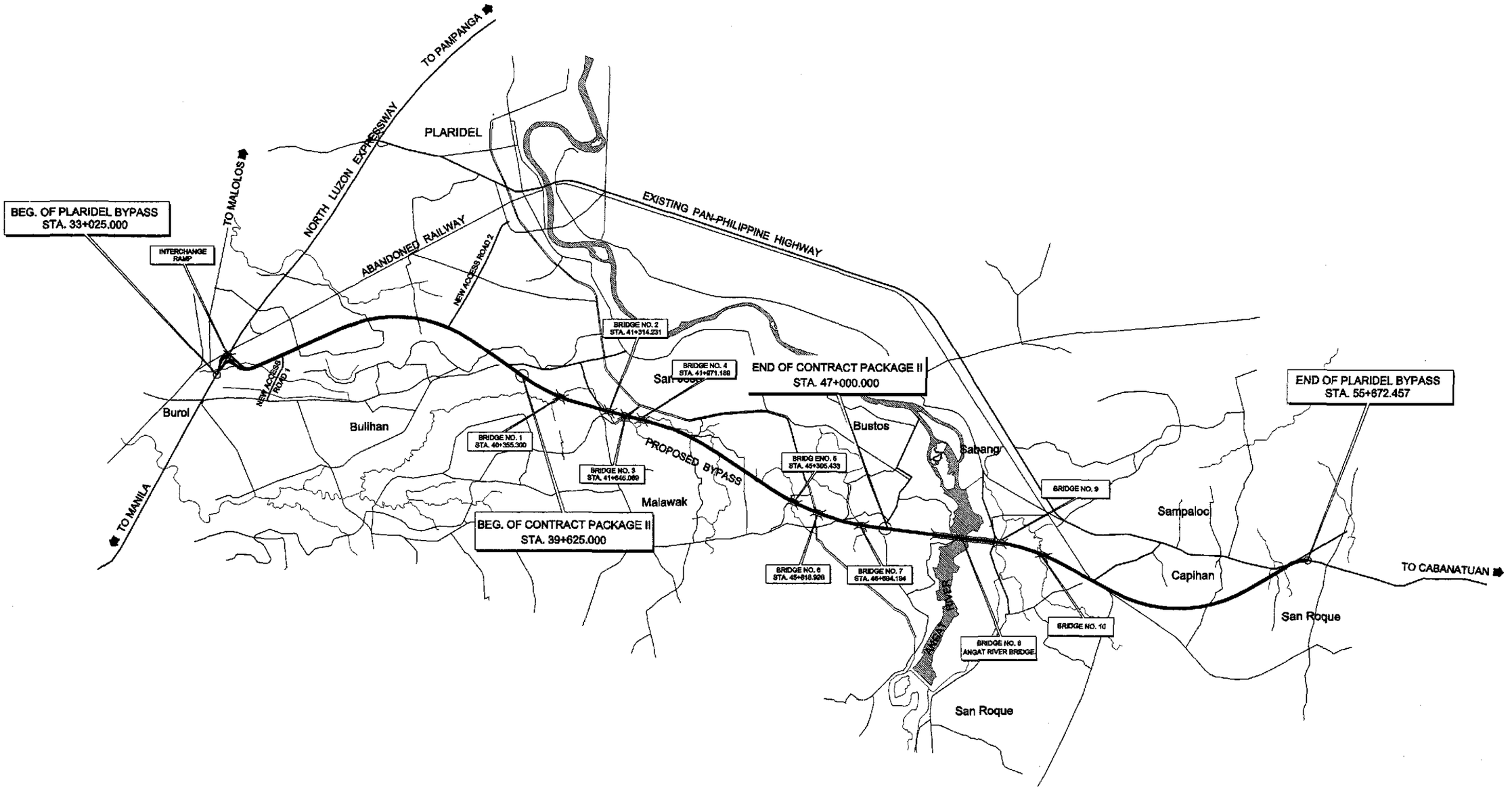
PROJECT AND LOCATION :
THE DETAILED DESIGN STUDY ON UPGRADING INTER-URBAN HIGHWAY SYSTEM ALONG THE PAN-PHILIPPINE HIGHWAY (Plaridel, Cabanatuan and San Jose Bypasses)
PLARIDEL BYPASS - CONTRACT PACKAGE II

SCALE : AS SHOWN — FULL SIZE A1

SHEET CONTENTS : BOX CULVERT APPROACH SLAB DETAIL (ULTIMATE STAGE)

SHEET NO. : UP-11

BRIDGES



A NOT TO SCALE

PLARIDEL BYPASS BRIDGE LOCATION MAP

JICA
JAPAN INTERNATIONAL COOPERATION AGENCY

KATAHIRA & ENGINEERS INTERNATIONAL
YACHIYO ENGINEERING CO., LTD.

	DATE	SIGNATURE
DESIGNED	10/21/02	E. N. SALIAN
CHECKED	10/25/02	M. KAKU
SUBMITTED	10/27/02	M. KAKU TEAM LEADER

REPUBLIC OF THE PHILIPPINES
DEPARTMENT OF PUBLIC WORKS AND HIGHWAYS

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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 :	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)	AS SHOWN	BRIDGE LOCATION MAP	BG-01
PLARIDEL BYPASS - CONTRACT PACKAGE II	FULL SIZE A1	(ULTIMATE STAGE)	

GENERAL NOTES FOR BRIDGES
(SHEET 1 OF 2)

A. DESIGN CRITERIA

1. DESIGN SPECIFICATION

(a) THE AMERICAN ASSOCIATION OF STATE HIGHWAY AND TRANSPORTATION OFFICIALS (AASHTO) STANDARD SPECIFICATIONS FOR HIGHWAY BRIDGES 16TH EDITION, 1996.

(b) NATIONAL STRUCTURAL CODE OF THE PHILIPPINES, VOLUME II–BRIDGES, 2ND EDITION, 1997.

2. DESIGN METHODOLOGY

LOAD FACTOR DESIGN METHOD (ULTIMATE STRENGTH DESIGN METHOD)

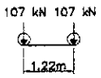
3. LOADING

3.1 DEAD LOADS

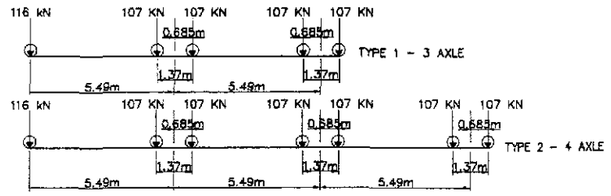
	WEIGHT
A. CONCRETE	24.00 kN/m^3
B. STEEL	77.00 kN/m^3
C. EARTH	19.00 kN/m^3
D. WEARING SURFACE	1.10 kN/m^2

3.2 LIVE LOADS

A. AASHTO HS20 (MS18) TRUCK AND EQUIVALENT LANE LOADING.
B. SIDEWALK LOAD 4.07 kN/m^2
C. ALTERNATE MILITARY LOADING.



D. PERMIT DESIGN LOAD (SPECIAL PERMIT REQUIRED BEFORE PASSING BRIDGE)



3.3 IMPACT

IN ACCORDANCE WITH DIVISION 1 OF AASHTO STANDARD SPECIFICATIONS,1996.

3.4 SEISMIC LOAD

IN ACCORDANCE WITH DIVISION 1A OF THE 1996 AASHTO STANDARD SPECIFICATIONS FOR HIGHWAY BRIDGES USING ACCELERATIONS COEFFICIENT OF 0.40 AND SEISMIC PERFORMANCE CATEGORY D.

3.5 OTHER LOADS

IN ACCORDANCE WITH AASHTO STANDARD SPECIFICATIONS, 1996.

3.6 LOAD COMBINATION

A. GROUP 1 = 1.3 [1.0 D + 1.67(L+1)n + 1.0 SF]
B. GROUP 1B = 1.3 [1.0 D + 1.0(L+1)p + 1.0 SF]
C. GROUP VII = 1.3 [1.0 D + 1.0 SF + EQ]

B. MATERIALS

1. CONCRETE

UNLESS OTHERWISE INDICATED ON PLANS, THE CONCRETE CLASS AND STRENGTH SHALL BE AS FOLLOWS:

STRUCTURAL MEMBER	CLASS	28 – DAY CYLINDER STRENGTH		MAX. SIZE OF COARSE AGGREGATE mm (in.)	REMARKS
		MPa	PSI		
CAST – IN PLACE GIRDERS, SLABS, DIAPHRAGMS, WINGWALLS, BACKWALLS, COPINGS, COLUMNS	A (MOD)	21	3045	20 (3/4)	
FOOTINGS	A	21	3045	38 (1–1/2)	
PRECAST R.C. PILES	AA	28	4060	20 (3/4)	
THIN REINFORCED SECTIONS RAILINGS AND RAILPOST	C	21	3045	12 (1/2)	
PRESTRESSED CONCRETE MEMBERS	P	35 41	5075 5946	20 (3/4) 20 (3/4)	@ TRANSFER @ SERVICE
LEAN CONCRETE	–	17	2465	50 (2)	

2. REINFORCING STEEL

(a) REINFORCING STEEL SHALL CONFORM TO AASHTO M31 (ASTM A615), GRADES 40 & 60 DEFORMED WITH MINIMUM YIELD STRENGTH.
GRADE 40 (16mmø AND SMALLER)
Fy = 276 MPa (40,000 psi)
GRADE 60 (20mmø AND LARGER)
Fy = 414 MPa (60,000 psi)

(b) REINFORCING STEEL SHALL BE FREE OF MILL SCALES, OIL OR ANY SUBSTANCES WHICH WILL WEAKEN THE BOND WITH CONCRETE.

3. PRESTRESSING STEEL

PRESTRESSING STEEL SHALL BE SEVEN–WIRE UNCOATED STRESS–RELIEVED STRANDS AND SHALL CONFORM TO AASHTO M203 (ASTM A416) *WITH MINIMUM ULTIMATE STRENGTH OF Fy = 1860 MPa (270,000psi).*

4. STRUCTURAL STEEL, BOLTS AND WELDS

MATERIALS	UNIT WEIGHT
STEEL PLATES AND ROLLED SHAPES	AASHTO M183 (ASTM A36)
BOLTS	AASHTO M164 (ASTM A325)
WELDS	AWS D1.1 – 183, E70XX SERIES

5. ELASTOMERIC BEARING PADS

ELASTOMERIC BEARING PADS SHALL BE 100% VIRGIN CHLOROPRENE (NEOPRENE) PADS WITH DUROMETER HARDNESS 60 AND SHALL BE LAMINATED WITH NON–CORROSIVE MILD STEEL SHEETS. ELASTOMERIC PADS SHALL CONFORM TO THE REQUIREMENTS AS PRESCRIBED IN *DPWH D.O. NO. 25 SERIES OF 1997* "REVISED DPWH STANDARD SPECIFICATION FOR ELASTOMERIC BEARING PAD."

SPECIFICATIONS

DURO HARDNESS, SHORE A (ASTM D–2240)–––––60	
TENSILE STRENGTH ASTM	D 412–175 Kg/cm^2 (min)
ULTIMATE ELONGATION %	350 % (min)
MATERIAL	NEOPRENE

C. CONSTRUCTION

ALL WORKS SHALL COMPLY WITH 1995 DPWH SPECIFICATION FOR ROADS AND BRIDGES OR MODIFIED BY SPECIAL PROVISIONS.

1. DIMENSIONS

1.1 SECTION, DIMENSIONS AND DISTANCES SHALL NOT BE SCALED FOR CONSTRUCTION PURPOSES. THE INDICATED DIMENSION SHALL GOVERN UNLESS OTHERWISE SPECIFIED.

1.2 ALL DIMENSIONS SHOWN ARE IN MILLIMETERS UNLESS OTHERWISE NOTED.

1.3 ALL STATIONING ARE IN KILOMETER PLUS METER AND ELEVATION IN METER.

2. SETTING OUT

THE SETTING OUT AND THE ELEVATIONS OF THE DIFFERENT COMPONENTS OF THE STRUCTURE SHALL BE APPROVED BY THE ENGINEER/CONSULTANT PRIOR TO THE START OF ANY CONSTRUCTION WORK.

3. REINFORCED CONCRETE

a. ALL CAST IN PLACE CONCRETE SHALL BE CLASS "A" EXCEPT RAILINGS WHICH SHALL BE CLASS "C" UNLESS OTHERWISE NOTED ON THE PLANS. ALL EXPOSED EDGES SHALL BE CHAMFERED 25mm EXCEPT RAILINGS AND RE–ENTRANT ANGLES WHICH SHALL BE CHAMFERED AND FILLETED 13mm RESPECTIVELY.

b. CONCRETE MIX AND PLACING

(1) DESIGN OF CONCRETE MIX SHALL MEET THE DESIGN CONCRETE STRENGTH GIVEN UNDER ITEM 1 OF MATERIALS.

(2) CONCRETE SHALL BE DEPOSITED, VIBRATED AND CURED IN ACCORDANCE WITH THE SPECIFICATION.

(3) FOR CONCRETE DEPOSITED AGAINST THE GROUND, LEAN CONCRETE WITH A MINIMUM THICKNESS OF 200mm SHALL LAID FIRST BEFORE INSTALLING THE REINFORCEMENT. THIS LEAN CONCRETE SHALL NOT BE CONSIDERED IN MEASURING THE STRUCTURAL DEPTH OF CONCRETE SECTION.

(4) THE CONTRACTOR SHALL SUBMIT TO THE ENGINEER/CONSULTANT FOR APPROVAL PLACING SEQUENCES FOR ALL CONCRETING WORK.

c. BAR BENDING, SPLICING AND PLACING

(1) THE CONTRACTOR SHALL SUBMIT TO THE ENGINEER/CONSULTANT FOR APPROVAL OF SHOP DRAWINGS INDICATING THE BENDING, CUTTING, SPLICING AND INSTALLATION OF ALL REINFORCING BARS.

(2) BARS SHALL BE BEND COLD. BARS PARTIALLY EMBEDDED IN CONCRETE SHALL NOT BE FIELD BENT UNLESS PERMITTED BY THE ENGINEER/CONSULTANT.

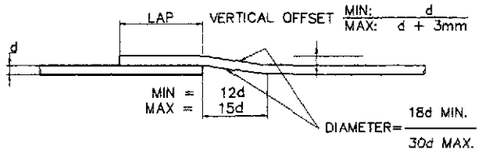
(3) BAR SPLICING NOT INDICATED ON DRAWINGS SHALL BE SUBJECT TO THE APPROVAL OF THE ENGINEER.

(4) WELDED SPLICES, IF APPROVED BY THE ENGINEER, SHALL DEVELOP IN TENSION AT LEST 125% OF THE SPECIFIED YIELD STRENGTH OF THE BARS.

(5) NOT MORE THAN 50% OF THE BARS AT ANY ONE SECTION SHALL BE SPLICED.

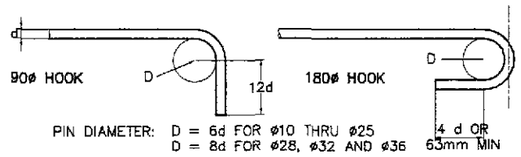
(6) UNLESS OTHERWISE SHOWN ON DRAWINGS, THE CLEAR DISTANCE BETWEEN PARALLEL BARS IN A LAYER SHALL NOT BE LESS THAN 1.5 TIMES THE NOMINAL DIAMETER OF THE BAR NOR LESS THAN 1.5 TIMES THE MAXIMUM SIZE OF COARSE AGGREGATE. THE CLEAR DISTANCE BETWEEN LAYERS SHALL NOT LESS THAN 25mm NOR ONE BAR DIAMETER. THE BARS IN THE UPPER LAYER SHALL BE PLACED DIRECTLY ABOVE THOSE IN THE BOTTOM LAYER.

(7) CRANKED SPLICES



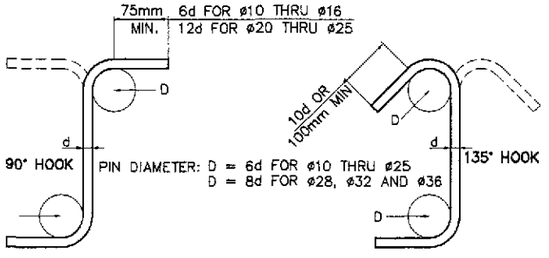
(8) HOOKS AND BENDS

DIMENSIONS OF 90–DEGREE AND 180–DEGREE HOOKS



PIN DIAMETER: D = 6d FOR ø10 THRU ø25
D = 8d FOR ø28, ø32 AND ø36

DIMENSIONS FOR STIRRUPS AND TIE HOOKS



PIN DIAMETER: D = 6d FOR ø10 THRU ø25
D = 8d FOR ø28, ø32 AND ø36

d. CONCRETE COVER TO REINFORCEMENT

UNLESS OTHERWISE NOTED, ALL BAR DIMENSIONS ARE REFERRED TO THE CENTER OF BARS AND THE MINIMUM COVERING MEASURED FROM THE SURFACE OF THE CONCRETE TO THE FACE OF ANY BAR SHALL BE 40mm. FOR SUBSTRUCTURE PERMANENTLY EXPOSED TO EARTH, COVERING SHALL BE 75mm.

e. CONSTRUCTION JOINT

(1) THE POSITION AND FORM OF ANY CONSTRUCTION JOINT SHALL BE AS SHOWN ON DRAWINGS OR AS AGREED WITH THE ENGINEER/CONSULTANT.

(2) THE INTERFACE BETWEEN THE FIRST AND SECOND POUR *CONCRETES* SHALL BE ROUGHENED WITH AN AMPLITUDE OF 6MM MINIMUM.

f. FALSEWORK

ALL FALSEWORK SHALL BE DESIGNED BY THE CONTRACTOR SUBJECT TO THE APPROVAL BY THE ENGINEER/CONSULTANT.

g. FORMWORK

FORMWORKS SHALL BE CONSTRUCTED SUCH THAT IT WILL NOT YIELD UNDER THE LOAD AND SHALL BE SUCH AS TO AVOID THE FORMATION OF FINE. ALL CORNERS OF CONCRETE MEMBERS SHALL BE CHAMFERED TO 25mm UNLESS NOTED OTHERWISE ON DRAWINGS. STRIPPING OF FORMS AND SHORES SHALL BE AS DESIGNATED BY THE ENGINEER/CONSULTANT. THE FOLLOWING MAYBE USED AS A GUIDE.

	MIN. TIME
SHORING UNDER GIRDERS, BEAMS, FRAMES.	14 DAYS
DECK SLABS	14 DAYS
WALLS.	7 DAYS
COLUMNS.	7 DAYS
SIDES OF BEAMS AND ALL OTHER VERTICAL SURFACES	2 DAYS

h. PROTECTION AND CURING OF CONCRETE

CONCRETE SURFACES SHALL BE PROTECTED FROM HARMFULS EFFECTS OF SUN, WIND AND RUNNING WATERS AND SHALL BE KEPT DAMP FOR AT LEAST 7 DAYS.

6. EMBANKMENT CONSTRUCTION SEQUENCE

APPROACH EMBANKMENT SHALL BE CONSTRUCTED PRIOR TO DRIVING OF ABUTMENT PILES.

7. (a) REINFORCED CONCRETE PILES/TEST PILES

ALL PILES SHALL BE 400mm x 400mm AND 450mm x 450mm PRECAST REINFORCED CONCRETE, FRESH OR SALT WATER TYPE, UNLESS OTHERWISE NOTED. ALL PRECAST R.C. PILES SHALL BE DRIVEN TO A MINIMUM BEARING CAPACITY OF 50 TONNES (490 KN) AND 70 TONNES (680 KN), RESPECTIVELY EACH AND TO THE FULL AUTHORIZED PAY LENGTH AND IN ACCORDANCE WITH ITEM 400 (13) (PILE DRIVING) OF THE STANDARD SPECIFICATIONS FOR ROADS AND BRIDGES, VOL.II 1995. ACTUAL CASTING LENGTH SHALL BE DETERMINED FROM THE RESULT OF DRIVING TEST PILE. CUT–OFF SHALL BE AUTHORIZED ONLY UPON PRIOR APPROVAL OF *THE ENGINEER/CONSULTANT.* ALL PILES SHALL BE PROVIDED WITH METAL SHOES FOR HARD DRIVING. TEST PILE SHALL BE DRIVEN AS DIRECTED BY THE ENGINEER/CONSULTANT.

(b) STEEL H–PILES/SHEET PILES

THE MINIMUM QUANTITY REQUIREMENT FOR FOUNDATION PILING SHALL ONFORM TO THE SPECIFICATION FOR STRUCTURAL STEEL FOR BRIDGES, AASHTO M270 (ASTM A 709) GRADE 36 AND/OR JIS G 3101 SS400.
FULL–LENGTH PILES SHALL BE USED WHERE PRACTICABLE. IF SPLICING IS PERMITTED, THE METHOD OF SPLICING SHALL BE AS SHOWN ON THE PLANS OR AS APPROVED BY THE ENGINEER/CONSULTANT.

JICA JAPAN INTERNATIONAL COOPERATION AGENCY

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

	DATE	SIGNATURE
DESIGNED	10/21/02	E.N. SALLAN
CHECKED	10/25/02	N. KOBAYASHI
SUBMITTED	10/25/02	M. KIKUCHI TEAM LEADER

REPUBLIC OF THE PHILIPPINES
DEPARTMENT OF PUBLIC WORKS AND HIGHWAYS

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)
PLARIDEL BYPASS - CONTRACT PACKAGE II

SCALE : AS SHOWN / FULL SIZE A1

SHEET CONTENTS : GENERAL NOTES FOR BRIDGES (SHEET 1 OF 2) (ULTIMATE STAGE)

SHEET NO. : BG-02

GENERAL NOTES FOR BRIDGES
(SHEET 2 OF 2)

8. STRUCTURAL STEEL

THE CONTRACTOR SHALL PREPARE AND SUBMIT SHOP DRAWINGS FOR ALL STRUCTURAL STEEL WORK. THESE SHOP DRAWINGS SHALL BE APPROVED BY THE ENGINEER BEFORE ANY FABRICATION COMMENCES.

9. SHORING

(a) CAMBER FOR REINFOCED CONCRETE SUPERSTRUCTURES WERE DETERMINED BASED ON THE USE OF SHORINGS DURING CONSTRUCTION.

(b) CAMBER FOR COMPOSITE SUPERSTRUCTURES WITH PRECAST PRESTRESSED GIRDERS WERE DETERMINED BASED ON UNSHORED CONDITIONS.

10. EXCAVATION

EXCAVATION FOR STRUCTURES SHALL BE TO THE NEAT LINES OF FOOTING OR AS SPECIFIED IN THE STANDARD SPECIFICATIONS.

11. WATER ELEVATION

WATER ELEVATIONS SHOWN ON PLANS ARE APPROXIMARE ONLY AND VARIATION FOUND DURING CONSTRUCTION SHALL NOT BE CONSIDERED AS A BASIS FOR EXTRA COMPENSATION.

12. DETOUR

THE CONTRACTOR SHALL CONSTRUCT AND MAINTAIN DETOUR BRIDGES, *AND/OR ROADS DURING CONSTRUCTION* TO ALLOW CONTINUOUS FLOW OF TRAFFIC. THEY SHALL BE CONSTRUCTED ON LOCATION AS SHOWN ON PLANS OR AS DIRECTED BY THE ENGINEER/CONSULTANT. NO ADDITIONAL COST SHALL BE ALLOWED FOR ANY RELOCATION OF DETOUR.

13. PRESTRESSED CONCRETE

GIRDER DESIGN GUIDE

a.) POST-TENSIONING ; THE PROPOSED TYPE OF TENDONS WHICH WILL BE USED IN THE POST-TENSIONED DESIGNS, ALL NECESSARY ADDITIONAL DETAILS INCLUDING THOSE FOR END ANCHORAGES, METHODS TO BE EMPLOYED AND PROCEDURES TO BE FOLLOWED, SHALL BE AS *APPROVED BY THE ENGINEERS/CONSULTANT.* A PORTION OF THE TENDONS SHALL BE DRAPED LONGITUDINAL IN PARABOLIC POSITIONS. ALL TENDONS SHALL BE PLACED SO THAT THEIR CENTER OF GRAVITY WILL BE AT THE POSITION SHOWN ON PLANS. THE TOTAL POST-TENSION FORCE AFTER LOSSES REQUIRED AT MIDSPAN SHALL BE PROVIDED AS CALLED FOR IN THE VARIOUS DESIGNS. THE REQUIRED FORCES AFTER LOSSES SHALL BE OBTAINED BY APPLYING INITIAL TENSILE FORCES OF SUFFICIENT MAGNITUDE TO ALLOW FOR ALL SUBSEQUENT LOSSES, INCLUDING THOSE FOR ELASTIC SHORTENING, SHRINKAGE, CREEP, RELAXATION, FRICTION, AND EFFICIENCY OF END ANCHORAGES. AFTER SECURING THE END ANCHORAGES ALL TENDONS SHALL BE PRESSURE GROUTED IN THEIR CONDUITS IN ACCORDANCE WITH "SPECIFICATIONS".

b.) CONCRETE FOR GIRDERS SHALL BE A MINIMUM STRENGTH OF 41 N/mm^2 (6,000 PSI) AT THE AGE OF 28 DAYS.

c.) CONCRETE FOR CAST-IN-PLACE SLAB HAVE A MINIMUM STRENGTH 21 N/mm^2 (3,000 PSI) AT THE AGE OF 28 DAYS.

d.) THE CONTRACTOR MAY PROPOSE ANY ALTERNATIVE TENDON SIZE AND LAYOUT AND SUBJECT SHALL MEET THE APPROVAL OF THE ENGINEER.

e.) THE REQUIRED STRENGTH OF CONCRETE AT TIME OF TENSIONING SHALL BE 35 MPa (5,000 PSI). A GRID CONSISTING OF ø12 BARS AT 100 CENTERS IN BOTH DIRECTIONS SHALL BE PLACED NEAR EACH ANCHORAGE OF THE POST-TENSIONING SYSTEM.

f.) HANDLING PRESTRESSED CONCRETE BEAMS : THE BEAMS SHALL BE MAINTAINED IN AN UPRIGHT POSITION AND SHALL BE LIFTED BY SUITABLE DEVICES PROVIDED AT THE ENDS OF THE BEAMS. ATTENTION IS DIRECTED TO THE INCREASED DIFFICULTY OF LIFTING BEAMS WITHOUT END BLOCKS. THE CONTRACTORS PROPOSED LIFTING DETAILS SHOULD BE GIVEN CAREFUL CONSIDERATION BEFORE BEING SUBMITTED ON SHOP DRAWING FOR APPROVAL. THE USE OF HOLES FOR LIFTING PURPOSES WILL NOT BE PERMITTED.

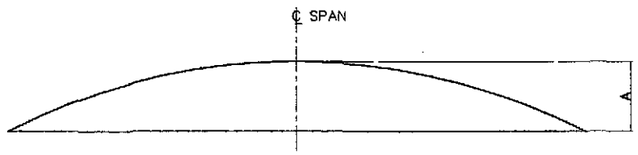
g.) *CONTRACTOR SHALL SUBMIT FOR APPROVAL BY THE ENGINEER THE* CALCULATED ELONGATION OF THE PRESTRESSING TENDONS CORRESPONDING TO THE REQUIRED JACKING FORCES.

h.) SHOP DRAWING SHALL SUBMIT FOR APPROVAL PRIOR TO FABRICATION.

14. DRAWINGS

a.) ALL ELEVATIONS, STATIONING AND DIMENSIONS SHALL BE VERIFIED PRIOR TO CONSTRUCTION.

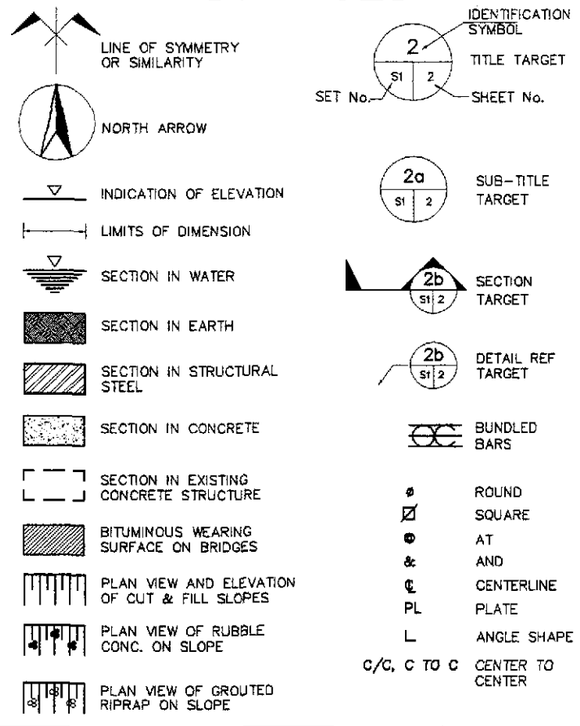
b.) ALL QUANTITIES SHALL BE VERIFIED DURING CONSTRUCTION.



DEAD LOAD CAMBER DIAGRAM

A = FABRICATION CAMBER – ESTIMATED PRESTRESS CAMBER LESS DEFLECTION DUE TO GIRDER DEAD LOAD

SYMBOLS



ABBREVIATIONS

ABT	ABOUT	kPa	KILOPASCAL
ABUT	ABUTMENT	m	METER
BEG	BEGINNING	mm	MILLIMETER
BET	BETWEEN	MAX	MAXIMUM
BOTT	BOTTOM	MFWL	MAX. FLOOD WATER LEVEL
BR	BRIDGE	MIN	MINIMUM
BRG	BEARING	MO	MIDDLE ORDINATE
CLR	CLEAR	MPa	MEGAPASCAL
cm	CENTIMETER	N	NEWTON
COL	COLUMN	NF	NEAR FACE
CONC	CONCRETE	No.	NUMBER
CONST	CONSTRUCTION	O.C.	ON CENTER
CTR	CENTER	PEJ	PREMOULDED EXPANSION JOINT
DET	DETAIL	PVC	POLYVINYL CHLORIDE
DIAM	DIAMETER	PVI	POINT OF VERT. INTERSECTION
DIAPH	DIAPHRAGM	QTY	QUANTITY
DWG	DRAWING	R	RADIUS
EA	EACH	RC	REINFORCED CONCRETE
EF	EACH FACE	RDWY	ROADWAY
ELEV	ELEVATION	REINF	REINFORCEMENT
ENGR	ENGINEER	SDWK	SIDEWALK
EQ	EQUAL	SL	SLOPE
EW	EACHWAY	SP	SPIRAL
EXP	EXPANSION	SPCD	SPACED
EXT	EXTERIOR	SPCS	SPACES
EXIST	EXISTING	STD	STANDARD
FF	FAR FACE	STIR	STIRRUP
FTG	FOOTING	STA	STATION
GEN	GENERAL	STRUCT	STRUCTURE
HOR	HORIZONTAL	SYMM	SYMMETRY
HW	HIGH WATER	THK	THICK
INT	INTERIOR	TYP	TYPICAL
INTERM	INTERMEDIATE	VAR	VARIABLE
JT	JOINT	VERT	VERTICAL
L	LENGTH	VOL	VOLUME
LG	LONG	W	WIDTH
kg	KILOGRAM	W/	WITH
kN	KILONEWTON	&	AND

JICA JAPAN INTERNATIONAL COOPERATION AGENCY

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

	DATE	SIGNATURE
DESIGNED	10/21/02	E. N. SALLAN
CHECKED	10/25/02	N. KOBAYASHI
SUBMITTED	10/27/02	M. KUCHI TEAM LEADER

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DEPARTMENT OF PUBLIC WORKS AND HIGHWAYS

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Project Director	Chief, Bridges Division	Director IV (OIC)	Undersecretary	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)	AS SHOWN	GENERAL NOTES FOR BRIDGES (SHEET 2 OF 2) (ULTIMATE STAGE)	BG-03
PLARIDEL BYPASS - CONTRACT PACKAGE II	FULL SIZE A1		

BRIDGE NAME : BRIDGE NO. 1 (ULTIMATE STAGE)
BRIDGE LENGTH : 35.00 m
SPECIFICATION : 1 - 35.00 m SPAN TYPE VI PSCG ON SEAT TYPE ABUTMENT

SUMMARY OF QUANTITIES

PAY ITEM NO.	DESCRIPTION	UNIT	ABUTMENT		SUPER-STRUCTURE	TOTAL
			" A1 "	" A2 "		
101(7)	Removal of Existing Slope Protection	cu.m.	32.00	39.00		71.00
101(8)	Removal of Existing Slope Protection (Hand Laid Rock)	cu.m.	21.00	20.00		41.00
103(2)a	Bridge Excavation, Common, Above O.W.L.	cu.m.	192.00	122.00		314.00
104(3)	Embankment from Borrow Pit	cu.m.	296.00	291.00		587.00
104(4)	Embankment for Bridge Approach	cu.m.	261.00	261.00		522.00
200(1)	Aggregate Subbase Course	cu.m.	15.00	15.00		30.00
311(2)	PCC Pavement (Reinforced) t=300mm, Including Dowel Bars (Approach Slab)	sq.m.	59.00	59.00		118.00
400(4)b	RC Piles (450 mm x 450 mm) Furnished	l.m.	269.00	259.00		528.00
400(13)b	RC Piles (450 mm x 450 mm) Driven	l.m.	232.00	224.00		456.00
400(15)b	Test Piles (450 mm x450 mm)	l.m.	11.25	11.25		22.50
400(19)b	Pile Shoes	each	30.00	29.00		59.00
401(1)a	Concrete Post and Railing	l.m.			70.00	70.00
404(1)	Reinforcing Steel, Grade 40	kg	4,847.00	3,959.00	16,912.00	25,718.00
404(2)	Reinforcing Steel, Grade 60	kg	10,773.00	8,496.00	1,702.00	20,971.00
405(1)b	Structural Concrete Class "A" (fc'= 21MPa)	cu.m.	174.00	147.00		321.00
405(1)d	Structural Concrete Class "A1" (fc'= 21MPa)	cu.m.			118.00	118.00
405(3)	Structural Concrete Class "C" (fc' = 21MPa)	cu.m.	5.00	5.00	5.00	15.00
405(6)	Structural Concrete Class "B" (Lean Concrete) fc'= 17MPa	cu.m.	23.00	21.00		44.00
406(1)j	Prestressed Concrete Girder Type VI L=35.00m	each			5.00	5.00
407(1)c	Elastomeric Bearing Pad (600x350x50, Duro 60)	each	5.00	5.00		10.00
407(2)a	Expansion Joint, (±40mm Movement)	l.m.	10.00	10.00		20.00
407(2)g	Expansion Joint, 30mm for Bridge Sidewalk	l.m.	2.00	2.00		4.00
407(4)	Metal Drain (150 mm ø G.I. Drain Pipe)	l.m.			3.00	3.00
504(1)	Grouted Riprap, Class "A"	cu.m.	22.00	21.00		43.00
510(1)	Rubble Concrete	cu.m.	46.00	39.00		85.00
506(1)	Hand Laid Rock	cu.m.	43.00	42.00		85.00

BRIDGE NAME : BRIDGE NO. 2 (ULTIMATE STAGE)
BRIDGE LENGTH : 33.50 m
SPECIFICATION : 1 - 33.50 m SPAN TYPE V PSCG ON SEAT TYPE ABUTMENT

SUMMARY OF QUANTITIES

PAY ITEM NO.	DESCRIPTION	UNIT	ABUTMENT		SUPER-STRUCTURE	TOTAL
			" A1 "	" A2 "		
101(7)	Removal of Existing Slope Protection	cu.m.	44.00	44.00		88.00
101(8)	Removal of Existing Slope Protection (Hand Laid Rock)	l.m.	22.00	22.00		44.00
103(2)a	Bridge Excavation, Common, Above O.W.L.	cu.m.	138.00	138.00		276.00
104(3)	Embankment from Borrow Pit	cu.m.	444.00	354.00		798.00
104(4)	Embankment for Bridge Approach	cu.m.	284.00	284.00		568.00
200(1)	Aggregate Subbase Course	cu.m.	15.00	15.00		30.00
311(2)	PCC Pavement (Reinforced) t=300mm, Including Dowel Bars (Approach Slab)	sq.m.	60.00	60.00		120.00
400(4)b	RC Piles (450 mm x 450 mm) Furnished	l.m.	298.00	269.00		567.00
400(13)b	RC Piles (450 mm x 450 mm) Driven	l.m.	261.00	232.00		493.00
400(15)b	Test Piles (450 mm x450 mm)	l.m.	12.25	11.25		23.50
400(19)b	Pile Shoes	each	30.00	30.00		60.00
401(1)a	Concrete Post and Railing	l.m.			67.00	67.00
404(1)	Reinforcing Steel, Grade 40	kg	4,127.00	4,127.00	16,809.00	25,063.00
404(2)	Reinforcing Steel, Grade 60	kg	9,576.00	9,576.00	1,702.00	20,854.00
405(1)b	Structural Concrete Class "A" (fc'= 21MPa)	cu.m.	172.00	172.00		344.00
405(1)d	Structural Concrete Class "A1" (fc'= 21MPa)	cu.m.			111.00	111.00
405(3)	Structural Concrete Class "C" (fc' = 21MPa)	cu.m.	4.00	4.00	15.00	23.00
405(6)	Structural Concrete Class "B" (Lean Concrete) fc'= 17MPa	cu.m.	23.00	23.00		46.00
406(1)i	Prestressed Concrete Girder Type V L=33.50m	each			5.00	5.00
407(1)c	Elastomeric Bearing Pad (600x350x50, Duro 60)	each	5.00	5.00		10.00
407(2)a	Expansion Joint, (±40mm Movement)	l.m.	10.00	10.00		20.00
407(2)g	Expansion Joint, 30mm for Bridge Sidewalk	l.m.	2.00	2.00		4.00
407(4)	Metal Drain (150 mm ø G.I. Drain Pipe)	l.m.			3.00	3.00
504(1)	Grouted Riprap, Class "A"	cu.m.	20.00	21.00		41.00
510(1)	Rubble Concrete	cu.m.	54.00	50.00		104.00
506(1)	Hand Laid Rock	cu.m.	44.00	44.00		88.00

BRIDGE NAME : BRIDGE NO. 3 (ULTIMATE STAGE)
BRIDGE LENGTH : 30.00 m
SPECIFICATION : 1 - 30.00 m SPAN TYPE IV-B PSCG ON SEAT TYPE ABUTMENT

SUMMARY OF QUANTITIES

PAY ITEM NO.	DESCRIPTION	UNIT	ABUTMENT		SUPER-STRUCTURE	TOTAL
			" A1 "	" A2 "		
101(7)	Removal of Existing Slope Protection	cu.m.	28.00	34.00		62.00
103(2)a	Bridge Excavation, Common, Above O.W.L.	cu.m.	127.00	127.00		254.00
104(3)	Embankment from Borrow Pit	cu.m.	201.00	273.00		474.00
104(4)	Embankment for Bridge Approach	cu.m.	226.00	226.00		452.00
200(1)	Aggregate Subbase Course	cu.m.	15.00	15.00		30.00
311(2)	PCC Pavement (Reinforced) t=300mm, Including Dowel Bars (Approach Slab)	sq.m.	60.00	60.00		120.00
400(4)b	RC Piles (450 mm x 450 mm) Furnished	l.m.	213.00	213.00		426.00
400(13)b	RC Piles (450 mm x 450 mm) Driven	l.m.	184.00	184.00		368.00
400(15)b	Test Piles (450 mm x450 mm)	l.m.	11.25	11.25		22.50
400(19)b	Pile Shoes	each	24.00	24.00		48.00
401(1)a	Concrete Post and Railing	l.m.			60.00	60.00
404(1)	Reinforcing Steel, Grade 40	kg	3,626.00	3,626.00	15,774.00	23,026.00
404(2)	Reinforcing Steel, Grade 60	kg	7,861.00	7,861.00	1,451.00	17,173.00
405(1)b	Structural Concrete Class "A" (fc'= 21MPa)	cu.m.	136.00	136.00		272.00
405(1)d	Structural Concrete Class "A1" (fc'= 21MPa)	cu.m.			99.00	99.00
405(3)	Structural Concrete Class "C" (fc' = 21MPa)	cu.m.	4.00	4.00	13.00	21.00
405(6)	Structural Concrete Class "B" (Lean Concrete) fc'= 17MPa	cu.m.	7.00	7.00		14.00
406(1)e	Prestressed Concrete Girder Type IV-B L=30.00m	each			5.00	5.00
407(1)c	Elastomeric Bearing Pad (600x350x50, Duro 60)	each	5.00	5.00		10.00
407(2)a	Expansion Joint, (±40mm Movement)	l.m.	10.00	10.00		20.00
407(2)g	Expansion Joint, 30mm for Bridge Sidewalk	l.m.	2.00	2.00		4.00
407(4)	Metal Drain (150 mm ø G.I. Drain Pipe)	l.m.			3.00	3.00
504(1)	Grouted Riprap, Class "A"	cu.m.	62.00	80.00		142.00

NOTE: ALL QUANTITIES SHALL BE VERIFIED DURING CONSTRUCTION

BRIDGE NAME : BRIDGE NO. 4 (ULTIMATE STAGE)
BRIDGE LENGTH : 24.00 m
SPECIFICATION : 1 - 24.00 m SPAN TYPE IV PSCG ON SEAT TYPE ABUTMENT

SUMMARY OF QUANTITIES

PAY ITEM NO.	DESCRIPTION	UNIT	ABUTMENT		SUPER-STRUCTURE	TOTAL
			" A1 "	" A2 "		
101(7)	Removal of Existing Slope Protection	cu.m.	43.00	33.00		76.00
101(8)	Removal of Existing Slope Protection (Hand Laid Rock)	l.m.	22.00	18.00		40.00
103(2)a	Bridge Excavation, Common, Above O.W.L.	cu.m.	119.00	90.00		209.00
104(3)	Embankment from Borrow Pit	cu.m.	353.00	238.00		591.00
104(4)	Embankment for Bridge Approach	cu.m.	296.00	243.00		539.00
200(1)	Aggregate Subbase Course	cu.m.	15.00	15.00		30.00
311(2)	PCC Pavement (Reinforced) t=300mm, Including Dowel Bars (Approach Slab)	sq.m.	59.00	59.00		118.00
400(4)b	RC Piles (450 mm x 450 mm) Furnished	l.m.	293.00	282.00		575.00
400(13)b	RC Piles (450 mm x 450 mm) Driven	l.m.	260.00	253.00		513.00
400(15)b	Test Piles (450 mm x450 mm)	l.m.	13.25	14.25		27.50
400(19)b	Pile Shoes	each	27.00	24.00		51.00
401(1)a	Concrete Post and Railing	l.m.			48.00	48.00
404(1)	Reinforcing Steel, Grade 40	kg	3,645.00	3,321.00	12,506.00	19,472.00
404(2)	Reinforcing Steel, Grade 60	kg	10,020.00	7,440.00	1,194.00	18,654.00
405(1)b	Structural Concrete Class "A" (fc'= 21MPa)	cu.m.	165.00	126.00		291.00
405(1)d	Structural Concrete Class "A1" (fc'= 21MPa)	cu.m.			78.00	78.00
405(3)	Structural Concrete Class "C" (fc' = 21MPa)	cu.m.	4.00	4.00	11.00	19.00
405(6)	Structural Concrete Class "B" (Lean Concrete) fc'= 17MPa	cu.m.	22.00	20.00		42.00
406(1)c	Prestressed Concrete Girder Type IV L=24.00m	each			5.00	5.00
407(1)c	Elastomeric Bearing Pad (600x350x50, Duro 60)	each	5.00	5.00		10.00
407(2)a	Expansion Joint, (±40mm Movement)	l.m.	10.00	10.00		20.00
407(2)g	Expansion Joint, 30mm for Bridge Sidewalk	l.m.	2.00	2.00		4.00
407(4)	Metal Drain (150 mm ø G.I. Drain Pipe)	l.m.			3.00	3.00
504(1)	Grouted Riprap, Class "A"	cu.m.	19.00	17.00		36.00
510(1)	Rubble Concrete	cu.m.	52.00	39.00		91.00
506(1)	Hand Laid Rock	cu.m.	44.00	41.00		85.00
507(2)b	Steel Sheet Pile (85x400x80mm Thk.) Furnished and Driven	l.m.	316.00	293.00		609.00

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

	DATE	SIGNATURE
DESIGNED	10/21/02	E. N. SALAN
CHECKED	10/25/02	N. KOBAYASHI
SUBMITTED	10/27/02	M. KOBAYASHI TEAM LEADER

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UPGRADING INTER-URBAN HIGHWAY SYSTEM
ALONG THE PAN-PHILIPPINE HIGHWAY
(Plaridel, Cabanatuan and San Jose Bypasses)
PLARIDEL BYPASS - CONTRACT PACKAGE II

SCALE : N. T. S. FULL SIZE A1

SHEET CONTENTS :
BRIDGE NO. 1, 2, 3 AND 4
SUMMARY OF QUANTITIES
(ULTIMATE STAGE)

SHEET NO. : BG-04

BRIDGE NAME : BRIDGE NO. 5 (ULTIMATE STAGE)
BRIDGE LENGTH : 33.50 m
SPECIFICATION : 1 - 33.50 m SPAN TYPE V PSCG ON SEAT TYPE ABUTMENT

SUMMARY OF QUANTITIES

PAY ITEM NO.	DESCRIPTION	UNIT	ABUTMENT		SUPER-STRUCTURE	TOTAL
			" A1 "	" A2 "		
101(7)	Removal of Existing Slope Protection	cu.m.	39.00	44.00		83.00
101(8)	Removal of Existing Slope Protection (Hand Laid Rock)	l.m.	21.00	23.00		44.00
103(2)a	Bridge Excavation, Common, Above O.W.L.	cu.m.	135.00	160.00		295.00
104(3)	Embankment from Borrow Pit	cu.m.	596.00	429.00		1,025.00
104(4)	Embankment for Bridge Approach	cu.m.	313.00	308.00		621.00
200(1)	Aggregate Subbase Course	cu.m.	15.00	15.00		30.00
311(2)	PCC Pavement (Reinforced) t=300mm, Including Dowel Bars (Approach Slab)	sq.m.	60.00	60.00		120.00
400(4)b	RC Piles (450 mm x 450 mm) Furnished	l.m.	414.00	414.00		828.00
400(13)b	RC Piles (450 mm x 450 mm) Driven	l.m.	377.00	377.00		754.00
400(15)b	Test Piles (450 mm x450 mm)	l.m.	16.25	16.25		32.50
400(19)b	Pile Shoes	each	30.00	30.00		60.00
401(1)a	Concrete Post and Railing	l.m.			67.00	67.00
404(1)	Reinforcing Steel, Grade 40	kg	4,250.00	4,250.00	16,809.00	25,309.00
404(2)	Reinforcing Steel, Grade 60	kg	11,475.00	11,475.00	1,702.00	24,652.00
405(1)b	Structural Concrete Class "A" (fc'= 21MPa)	cu.m.	183.00	183.00		366.00
405(1)d	Structural Concrete Class "A1" (fc'= 21MPa)	cu.m.			111.00	111.00
405(3)	Structural Concrete Class "C" (fc' = 21MPa)	cu.m.	4.00	4.00	15.00	23.00
405(6)	Structural Concrete Class "B" (Lean Concrete) fc'= 17MPa	cu.m.	8.00	8.00		16.00
406(1)i	Prestressed Concrete Girder Type V L=33.50m	each			5.00	5.00
407(1)c	Elastomeric Bearing Pad (600x350x50, Duro 60)	each	5.00	5.00		10.00
407(2)a	Expansion Joint, (±40mm Movement)	l.m.	10.00	10.00		20.00
407(2)g	Expansion Joint, 30mm for Bridge Sidewalk	l.m.	2.00	2.00		4.00
407(4)	Metal Drain (150 mm ø G.I. Drain Pipe)	l.m.			3.00	3.00
504(1)	Grouted Riprap, Class "A"	cu.m.	109.00	89.00		198.00
508(1)	Loose Boulder Apron (Hand Laid Rock)	cu.m.	46.00	45.00		91.00

BRIDGE NAME : BRIDGE NO. 6 (ULTIMATE STAGE)
BRIDGE LENGTH : 40.00 m
SPECIFICATION : 1 - 40.00 m SPAN TYPE VI PSCG ON SEAT TYPE ABUTMENT

SUMMARY OF QUANTITIES

PAY ITEM NO.	DESCRIPTION	UNIT	ABUTMENT		SUPER-STRUCTURE	TOTAL
			" A1 "	" A2 "		
101(7)	Removal of Existing Slope Protection	cu.m.	28.00	30.00		58.00
103(2)a	Bridge Excavation, Common, Above O.W.L.	cu.m.	192.00	128.00		320.00
104(3)	Embankment from Borrow Pit	cu.m.	165.00	212.00		377.00
104(4)	Embankment for Bridge Approach	cu.m.	226.00	226.00		452.00
200(1)	Aggregate Subbase Course	cu.m.	15.00	15.00		30.00
311(2)	PCC Pavement (Reinforced) t=300mm, Including Dowel Bars (Approach Slab)	sq.m.	60.00	60.00		120.00
400(4)b	RC Piles (450 mm x 450 mm) Furnished	l.m.	371.00	344.00		715.00
400(13)b	RC Piles (450 mm x 450 mm) Driven	l.m.	338.00	312.00		650.00
400(15)b	Test Piles (450 mm x450 mm)	l.m.	16.25	15.25		31.50
400(19)b	Pile Shoes	each	27.00	27.00		54.00
401(1)a	Concrete Post and Railing	l.m.			80.00	80.00
404(1)	Reinforcing Steel, Grade 40	kg	3,691.00	3,691.00	19,807.00	27,189.00
404(2)	Reinforcing Steel, Grade 60	kg	7,829.00	7,829.00	1,702.00	17,360.00
405(1)b	Structural Concrete Class "A" (fc'= 21MPa)	cu.m.	137.00	137.00		274.00
405(1)d	Structural Concrete Class "A1" (fc'= 21MPa)	cu.m.			134.00	134.00
405(3)	Structural Concrete Class "C" (fc' = 21MPa)	cu.m.	5.00	5.00	17.00	27.00
405(6)	Structural Concrete Class "B" (Lean Concrete) fc'= 17MPa	cu.m.	7.00	7.00		14.00
406(1)n	Prestressed Concrete Girder Type VI (Modified) L=40.00m	each			5.00	5.00
407(1)c	Elastomeric Bearing Pad (600x350x50, Duro 60)	each	5.00	5.00		10.00
407(2)a	Expansion Joint, (±40mm Movement)	l.m.	10.00	10.00		20.00
407(2)g	Expansion Joint, 30mm for Bridge Sidewalk	l.m.	2.00	2.00		4.00
407(4)	Metal Drain (150 mm ø G.I. Drain Pipe)	l.m.			4.00	4.00
504(1)	Grouted Riprap, Class "A"	cu.m.	61.00	61.92		122.00

BRIDGE NAME : BRIDGE NO. 7 (ULTIMATE STAGE)
BRIDGE LENGTH : 45.00 m
SPECIFICATION : 3 - 15.00 m SPAN RCDG ON SEAT TYPE ABUTMENT, 2 COLUMN BENT PIER ON PILES

SUMMARY OF QUANTITIES

PAY ITEM NO.	DESCRIPTION	UNIT	ABUTMENT		PIER		SUPER-STRUCTURE	TOTAL
			" A1 "	" A2 "	" P1 "	" P2 "		
101(7)	Removal of Existing Slope Protection	cu.m.	34.00	37.00				71.00
101(8)	Removal of Existing Slope Protection (Hand Laid Rock)	cu.m.	20.00	21.00				41.00
103(2)a	Bridge Excavation, Common, Above O.W.L.	cu.m.	90.00	171.00				261.00
103(2)c	Bridge Excavation, Common, Below O.W.L.	cu.m.			104.00	95.00		199.00
104(3)	Embankment from Borrow Pit	cu.m.	524.00	384.00				908.00
104(4)	Embankment for Bridge Approach	cu.m.	237.00	237.00				474.00
200(1)	Aggregate Subbase Course	cu.m.	15.00	15.00				30.00
311(2)	PCC Pavement (Reinforced) t=300mm, Including Dowel Bars (Approach Slab)	sq.m.	60.00	60.00				120.00
400(4)a	RC Piles (400 mm x 400 mm) Furnished	l.m.	282.00	319.00	192.00	192.00		985.00
400(13)a	RC Piles (400 mm x 400 mm) Driven	l.m.	253.00	286.00	170.00	170.00		879.00
400(15)a	Test Piles (400 mm x400 mm)	l.m.	14.25	14.25	13.25	13.25		55.00
400(19)a	Pile Shoes	each	24.00	27.00	18.00	18.00		87.00
401(1)a	Concrete Post and Railing	l.m.					90.00	90.00
404(1)	Reinforcing Steel, Grade 40	kg	2,854.00	3,114.00	3,513.00	3,513.00	20,231.00	33,225.00
404(2)	Reinforcing Steel, Grade 60	kg	7,278.00	8,305.00	9,842.00	9,842.00	23,891.00	59,158.00
405(1)b	Structural Concrete Class "A" (fc'= 21MPa)	cu.m.	126.00	151.00	79.00	79.00		435.00
405(1)d	Structural Concrete Class "A1" (fc'= 21MPa)	cu.m.					222.00	222.00
405(3)	Structural Concrete Class "C" (fc' = 21MPa)	cu.m.	4.00	4.00			20.00	28.00
405(6)	Structural Concrete Class "B" (Lean Concrete) fc'= 17MPa	cu.m.	8.00	7.00	4.00	4.00		21.00
407(1)a	Elastomeric Bearing Pad (400x300x50, Duro 60)	each	5.00	5.00				10.00
407(2)a	Expansion Joint, (±40mm Movement)	l.m.	10.00	10.00				20.00
407(2)g	Expansion Joint, 30mm for Bridge Sidewalk	l.m.	2.00	2.00				4.00
407(4)	Metal Drain (150 mm ø G.I. Drain Pipe)	l.m.					4.00	4.00
504(1)	Grouted Riprap, Class "A"	cu.m.	95.00	76.00				171.00
506(1)	Hand Laid Rock	cu.m.	42.00	42.00				84.00

NOTE: ALL QUANTITIES SHALL BE VERIFIED DURING CONSTRUCTION

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

	DATE	SIGNATURE
DESIGNED	10/21/02	SALLAN
CHECKED	10/25/02	N. KOBAYASHI
SUBMITTED	10/27/02	TEAM LEADER

REPUBLIC OF THE PHILIPPINES
DEPARTMENT OF PUBLIC WORKS AND HIGHWAYS

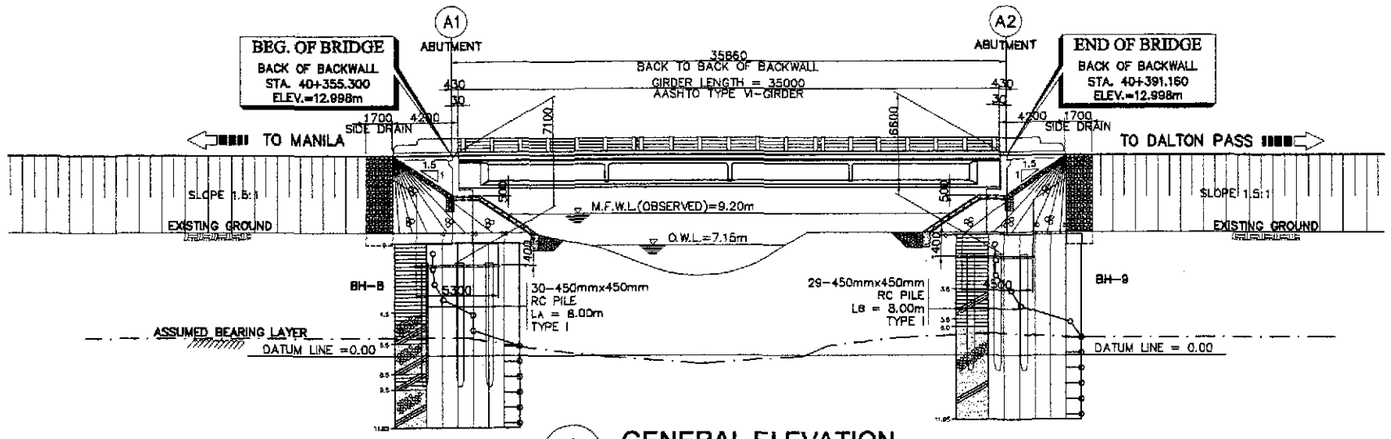
PJHL - PMO	BUREAU OF DESIGN		OFFICE OF THE SECRETARY	
Submitted By:	Reviewed By:	Recommended By:	Recommended By: (See cover sheet for Signature)	Approved By: (See cover sheet for Signature/Approval)
DANILO C. TRAJANO	ADRIANO M. DOROY	GILBERTO S. REYES	MANUEL M. BONOAN	SIMEON A. DATUMANONG
Project Director	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)
PLARIDEL BYPASS - CONTRACT PACKAGE II

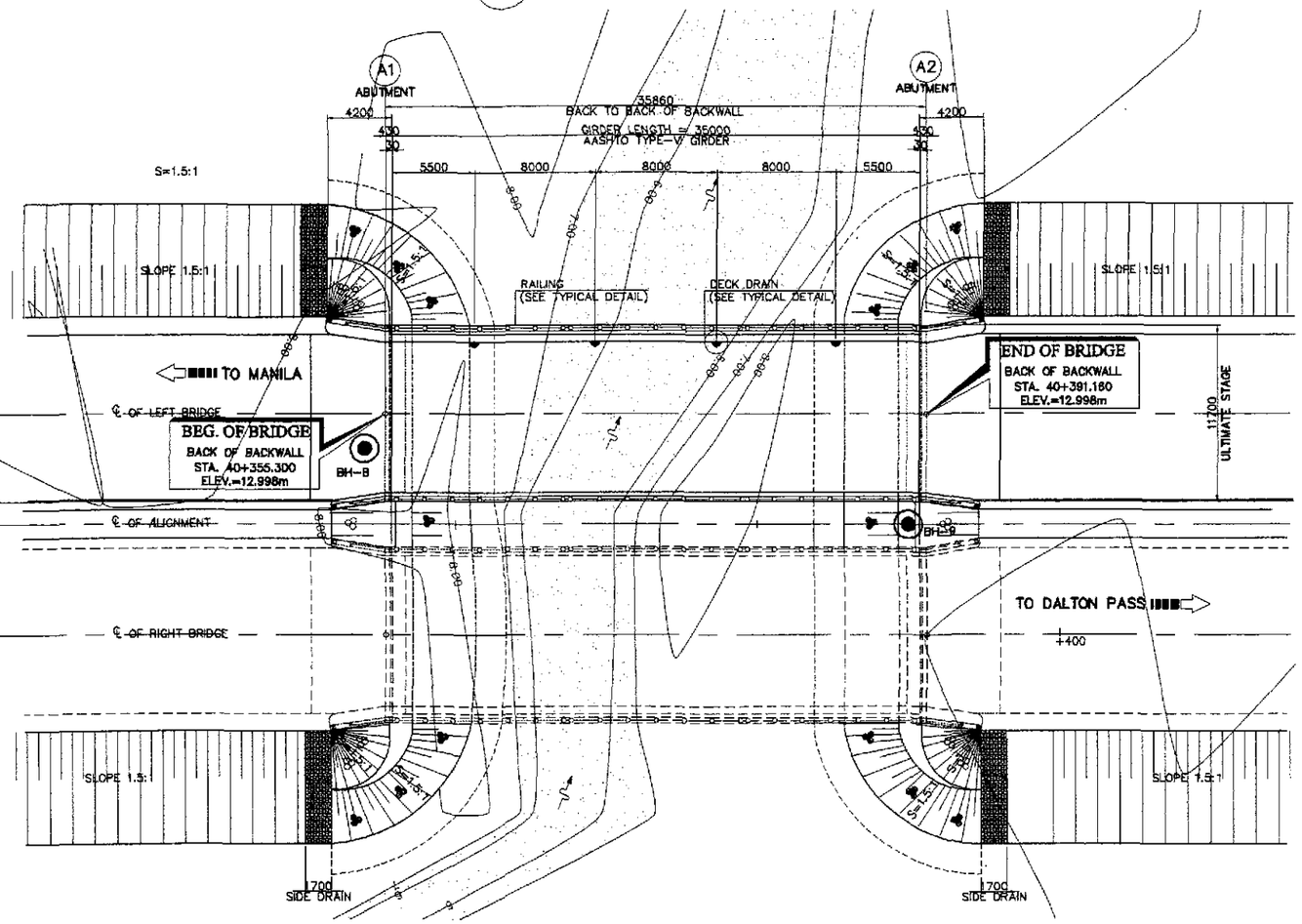
SCALE : N. T. S. FULL SIZE A1

SHEET CONTENTS :
BRIDGE NO. 5, 6 & 7
SUMMARY OF QUANTITIES
(ULTIMATE STAGE)

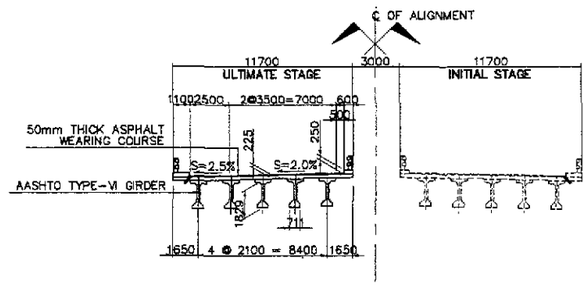
SHEET NO. : BG-05



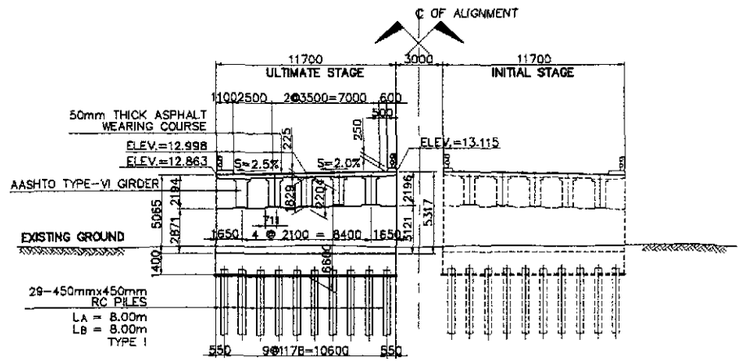
1 - GENERAL ELEVATION
SCALE 1:200



2 - GENERAL PLAN
SCALE 1:200



3 - SECTION @ MID SPAN
SCALE 1:200



4 - SECTION @ ABUTMENT A2
SCALE 1:200

HYDRAULIC DESIGN DATA	
VELOCITY @ 50 YEARS, Vso	2.699 m/sec
DISCHARGE @ 50 YEARS, Qso	125.400 cu.m/sec
CATCHMENT AREA, CA	18.710 sq. km

NOTE :

PRIOR TO CONSTRUCTION SOIL INVESTIGATION 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.

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

A - PLARIDEL BRIDGE NO.1 (STA. 40+355.300)
SCALE AS SHOWN

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

	DATE	SIGNATURE
DESIGNED	10/21/02	E. N. SALLAN
CHECKED	10/25/02	K. KOBAYASHI
SUBMITTED	10/27/02	M. MUCHI, TEAM LEADER

REPUBLIC OF THE PHILIPPINES
DEPARTMENT OF PUBLIC WORKS AND HIGHWAYS

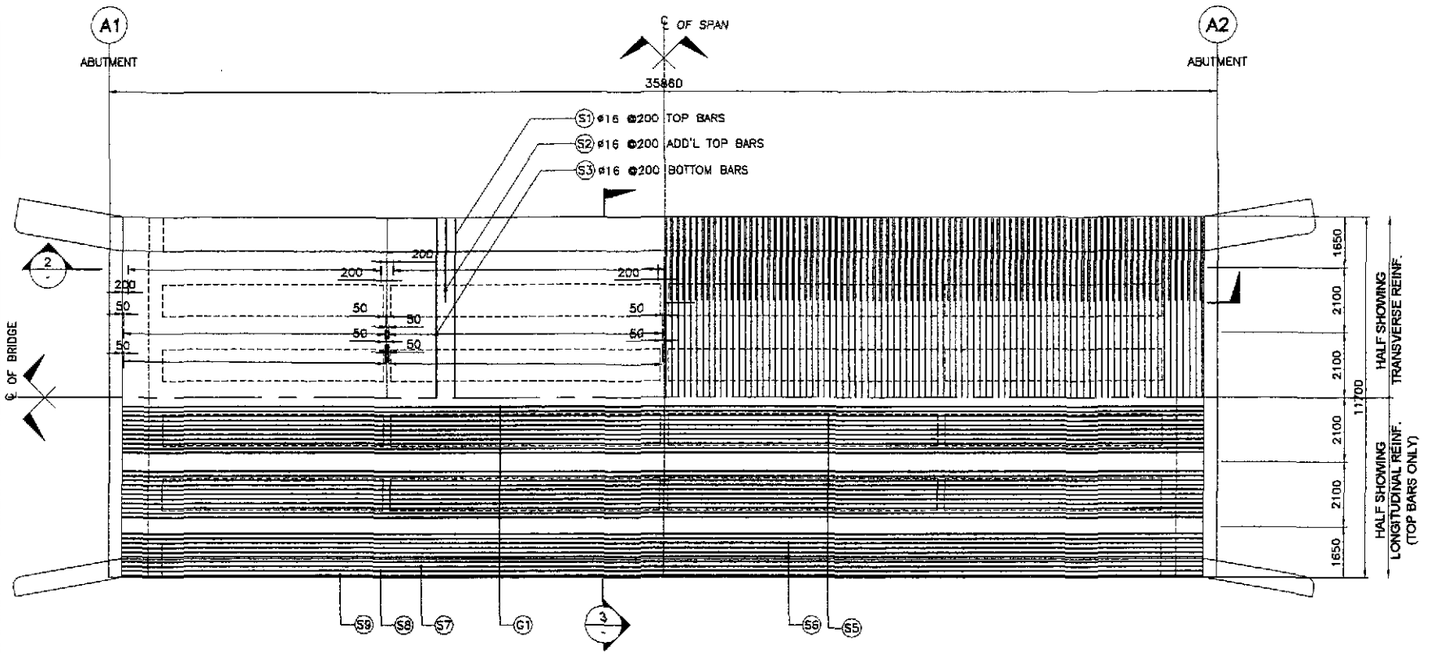
PJHL - PMO	BUREAU OF DESIGN		OFFICE OF THE SECRETARY	
Submitted By:	Reviewed By:	Recommended By:	Recommended By: (See cover sheet for Signature)	Approved By: (See cover sheet for Signature/Approval)
DANILO C. TRAJANO, Project Director	ADRIANO M. DOROY, Chief, Bridges Division	GILBERTO S. REYES, Director 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)
PLARIDEL BYPASS - CONTRACT PACKAGE II

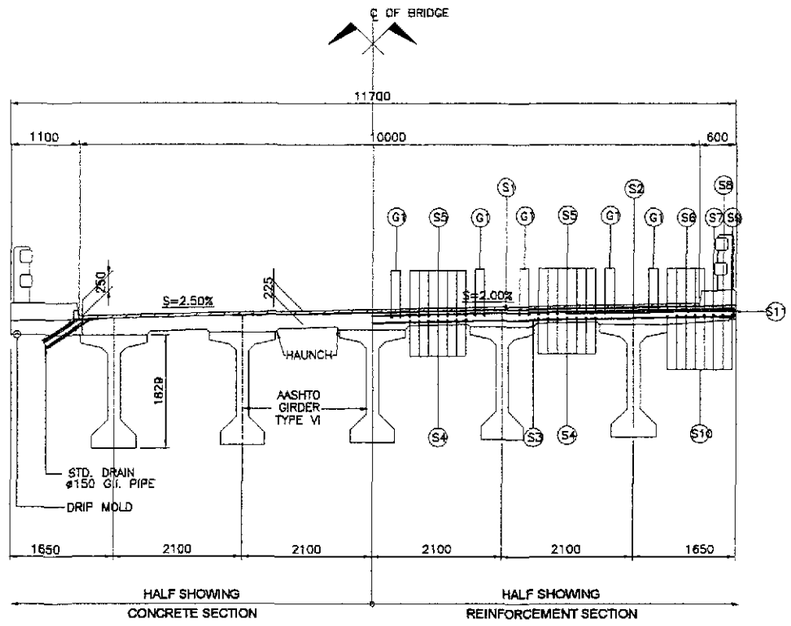
SCALE : 1 : 200 FULL SIZE A1

SHEET CONTENTS :
BRIDGE NO. 1
GENERAL PLAN, ELEVATION AND SECTIONS (ULTIMATE STAGE)

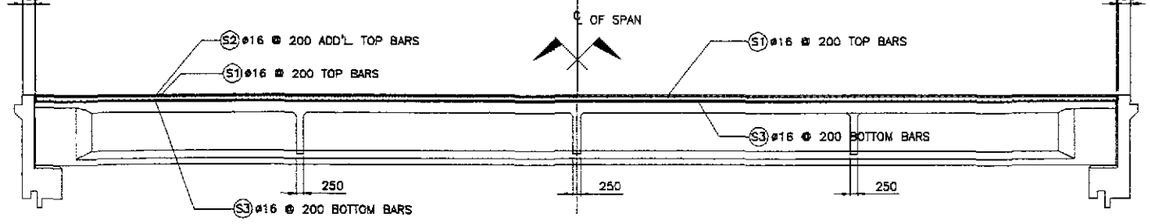
SHEET NO. : B1-01



1 — FRAMING PLAN
SCALE 1 : 100



3 — TYPICAL CROSS-SECTION
SCALE 1 : 50

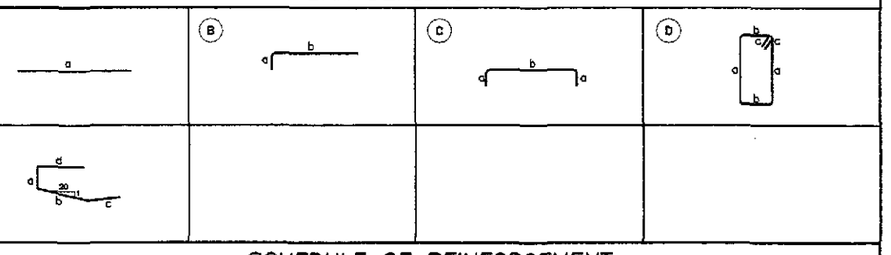


2 — LONGITUDINAL SECTION
SCALE 1 : 100

ESTIMATED QUANTITIES OF SUPERSTRUCTURE

ITEM NO.	DESCRIPTION	UNIT	TOTAL
404(1)a	REINFORCING STEEL GRADE 40	kgs.	29219
	DECK SLAB	14503	
	DIAPHRAGM	442	
	GIRDER	9680	
	SIDEWALK, RAILING, & POST	3252	
	APPROACH SLAB	1342	
404(1)b	REINFORCING STEEL GRADE 60	kgs.	15011
	DECK SLAB	0	
	DIAPHRAGM	1702	
	GIRDER	8385	
	SIDEWALK, RAILING, & POST	708	
	APPROACH SLAB	4216	
405(1)	STRUCTURAL CONCRETE	cu. m.	309
	DECK SLAB	101.91	
	DIAPHRAGM	15.32	
	GIRDER	132.75	
	SIDEWALK, RAILING, & POST	23.18	
	APPROACH SLAB	35.36	

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	101.91	G1	16	20	AS SHOWN	A	34900	–	–	–	34900	698.00	1.579	1103	142.31
		S1	16	176	200	C	145	11600	145	–	11890	2092.64	1.579	3305	
		S2	16	352	200	B	145	2650	–	–	2795	983.84	1.579	1554	
		S3	16	176	200	C	145	11600	145	–	11890	2092.64	1.579	3305	
		S4	16	28	150	A	34900	–	–	–	34900	977.20	1.579	1543	
		S5	16	28	150	A	34900	–	–	–	34900	977.20	1.579	1543	
		S6	16	10	AS SHOWN	A	34900	–	–	–	34900	349.00	1.579	552	
		S7	16	2	AS SHOWN	A	34900	–	–	–	34900	69.80	1.579	111	
		S8	16	2	AS SHOWN	A	34900	–	–	–	34900	69.80	1.579	111	
		S9	16	2	AS SHOWN	A	34900	–	–	–	34900	69.80	1.579	111	
		S10	16	16	AS SHOWN	A	34900	–	–	–	34900	558.40	1.579	882	
		S11	12	176	400	E	145	1100	900	300	2445	430.32	1.579	383	
TOTAL	101.91													GRADE 40 = 14,503 Kgs.	

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

	DATE	SIGNATURE
DESIGNED	10/21/04	E. N. SALLAN
CHECKED	10/25/04	N. KOBAYASHI
SUBMITTED	10/27/04	M. KUCHI TEAM LEADER

REPUBLIC OF THE PHILIPPINES
DEPARTMENT OF PUBLIC WORKS AND HIGHWAYS

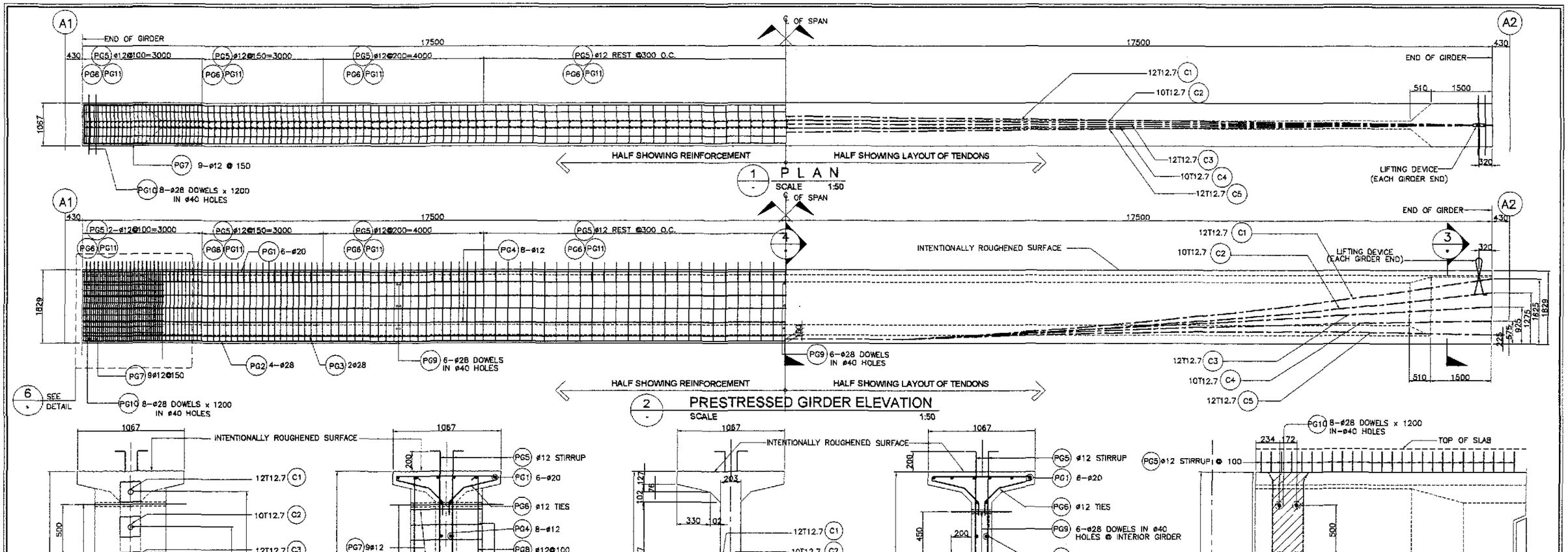
PJHL – PMO	BUREAU OF DESIGN		OFFICE OF THE SECRETARY	
Submitted By:	Reviewed By:	Recommended By:	Recommended By: (See cover sheet for Signature)	Approved By: (See cover sheet for Signature/Approval)
DANILO C. TRAJANO, Project Director	ADRIANO M. DOROY, Chief, Bridges Division	GILBERTO S. REYES, Director 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)
PLARIDEL BYPASS - CONTRACT PACKAGE II

SCALE : AS SHOWN
FULL SIZE A1

SHEET CONTENTS :
BRIDGE NO. 1
DECK FRAMING PLAN AND SECTIONS (ULTIMATE STAGE)

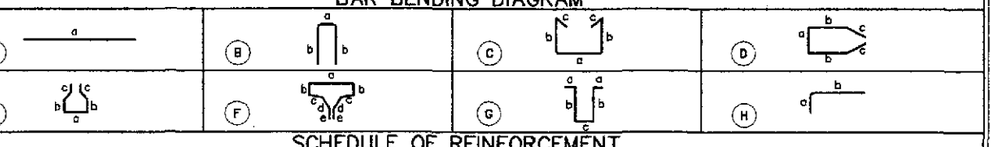
SHEET NO. : B1-02



NOTES ;

1.) SEE GENERAL NOTES, -2, FOR GIRDER DESIGN GUIDE.
2.) JACKING FORCE PER GIRDER, Pj = 7710 KN.
3.) JACKING WILL BE DONE AT BOTH ENDS.
4.) FINAL PRESTRESSING FORCE @ MIDSPAN,
FNET = 5302 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	34920	–	–	–	–	34920	209.52	2.466	517	26.55	136.09	QUANTITIES ARE FOR ONE (1) GIRDER ONLY
	PG2	28	4	AS SHOWN	A	34920	–	–	–	–	34920	139.68	4.833	676			
	PG3	28	2	AS SHOWN	A	34920	–	–	–	–	34920	69.84	4.833	338			
	PG4	12	8	AS SHOWN	A	34920	–	–	–	–	34920	279.36	0.888	249			
	PG5	12	190	100	G	100	2000	103	–	–	4303	817.57	0.888	727			
	PG6	12	190	100	F	1000	50	340	200	150	2480	471.20	0.888	419			
	PG7	12	18	150	D	635	1450	550	–	–	4635	83.43	0.888	75			
	PG8	12	30	100	C	635	1750	150	–	–	4435	133.05	0.888	119			
	PG9	28	18	AS SHOWN	A	603	–	–	–	–	603	10.85	4.833	53			
	PG10	28	16	AS SHOWN	A	1200	–	–	–	–	1200	19.20	4.833	93			
	PG11	12	190	100	E	635	160	400	150	–	2055	390.45	0.888	347			

GRADE 40 TOTAL = 1,936 kgs
GRADE 60 TOTAL = 1,677 kgs

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

	DATE	SIGNATURE
DESIGNED	10/31/07	E. SALLAN
CHECKED	10/31/07	K. SOBITASHI
SUBMITTED	11/2/07	M. KINOSHITA TEAM LEADER

REPUBLIC OF THE PHILIPPINES
DEPARTMENT OF PUBLIC WORKS AND HIGHWAYS

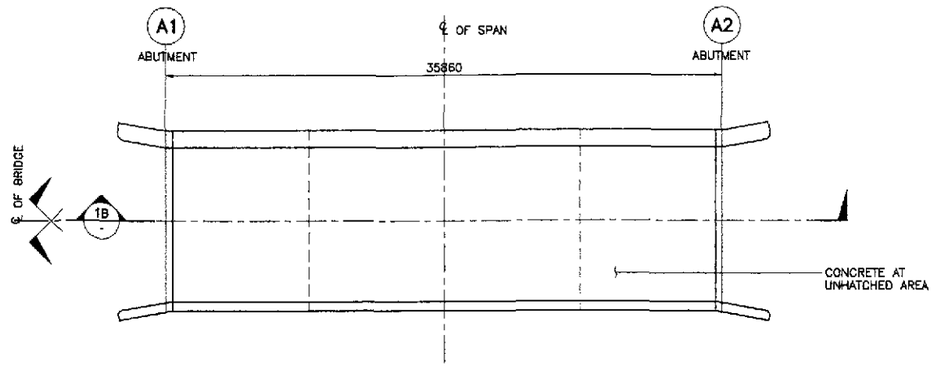
PJHL – PMO	BUREAU OF DESIGN		OFFICE OF THE SECRETARY	
Submitted By:	Reviewed By:	Recommended By:	Recommended By: (See cover sheet for Signature)	Approved By: (See cover sheet for Signature/Approval)
DANILO C. TRAJANO Project Director	ADRIANO M. DOROY Chief, Bridges Division	GILBERTO S. REYES Director 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)
PLARIDEL BYPASS - CONTRACT PACKAGE II

SCALE :
AS SHOWN
FULL SIZE A1

SHEET CONTENTS :
BRIDGE NO. 1
AASHTO TYPE VI GIRDER
(ULTIMATE STAGE)

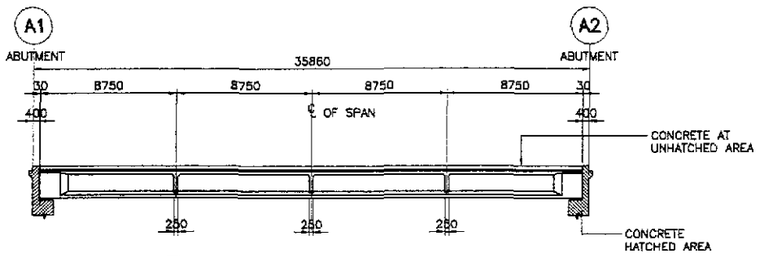
SHEET NO. :
B1-03



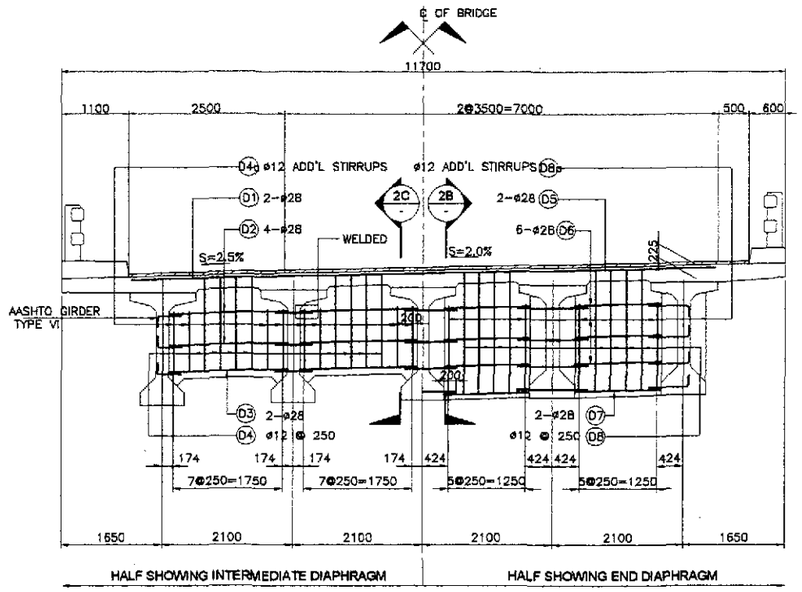
NOTES:

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

1A - PLAN
SCALE 1:200



1B - LONGITUDINAL SECTION
SCALE 1:200



2A - ELEVATION
SCALE 1:25

1 - CONCRETE POURING SEQUENCE
SCALE 1:200

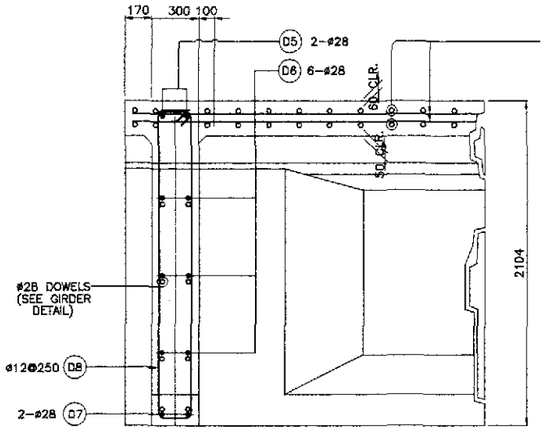
BAR BENDING DIAGRAM

(A) —— a

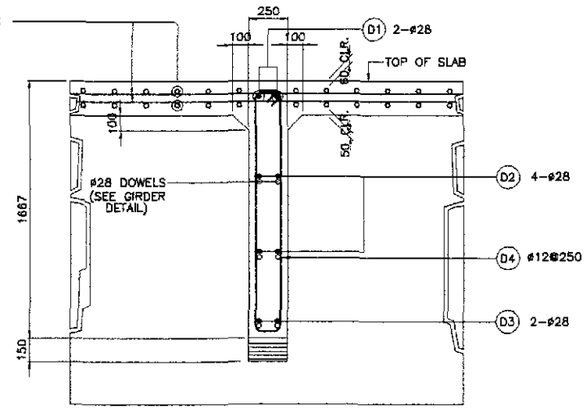
(B) 

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)	REMARKS
DIAPHRAGM	INTERMEDIATE DIAPHRAGM	9.06	D1	28	6	AS SHOWN	A	9400				9400	56.40	4.833	273	131.79	TOP BARS
			D2	28	48	AS SHOWN	A	1895				1895	90.96	4.833	440		DIST. BARS
			D3	28	24	AS SHOWN	A	1895				1895	45.48	4.833	220		BOTT. BARS
			D4	12	48	250	B	150	1500	150		3600	172.80	0.888	154		STIRRUPS
			D4a	12	48	200	B	150	950	150		2500	120.00	0.888	107		ADD'L. STIRRUPS
	END DIAPHRAGM	6.26	D5	28	4	AS SHOWN	A	9400				9400	37.60	4.833	182	151.66	TOP BARS
			D6	28	48	AS SHOWN	A	1895				1895	90.96	4.833	440		DIST. BARS
			D7	28	16	AS SHOWN	A	1895				1895	30.32	4.833	147		BOTT. BARS
			D8	12	32	250	B	200	1850	150		4600	147.20	0.888	131		STIRRUPS
			D8a	12	16	AS SHOWN	B	200	1400	150		3500	56.00	0.888	50		ADD'L. STIRRUPS
	TOTAL	15.32											GRADE 60 TOTAL = 1702 Kgs.				
													GRADE 40 TOTAL = 442 Kgs.				



2B - SECTION
SCALE 1:20



2C - SECTION
SCALE 1:20

2 - DETAIL OF END & INTERMEDIATE DIAPHRAGM
SCALE AS SHOWN

JICA
JAPAN INTERNATIONAL COOPERATION AGENCY

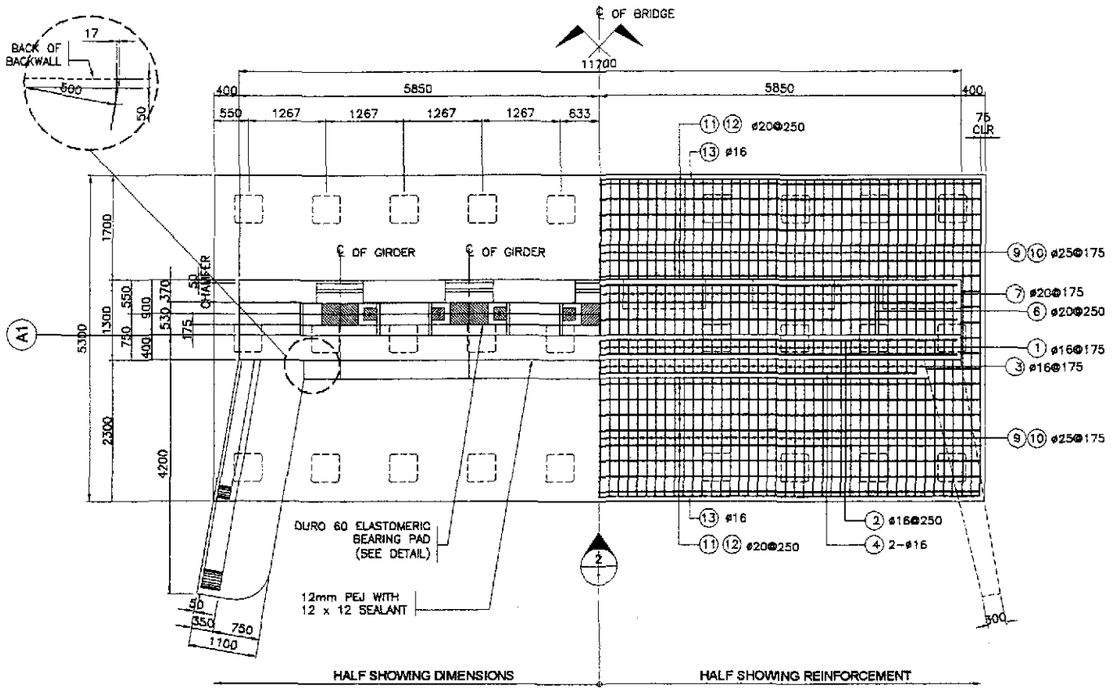
KATAHIRA & ENGINEERS INTERNATIONAL
YACHIYO ENGINEERING CO., LTD.

	DATE	SIGNATURE
DESIGNED	10/21/02	E. N. SALLAN
CHECKED	10/25/02	N. [illegible]
SUBMITTED	10/27/02	[illegible] TEAM LEADER

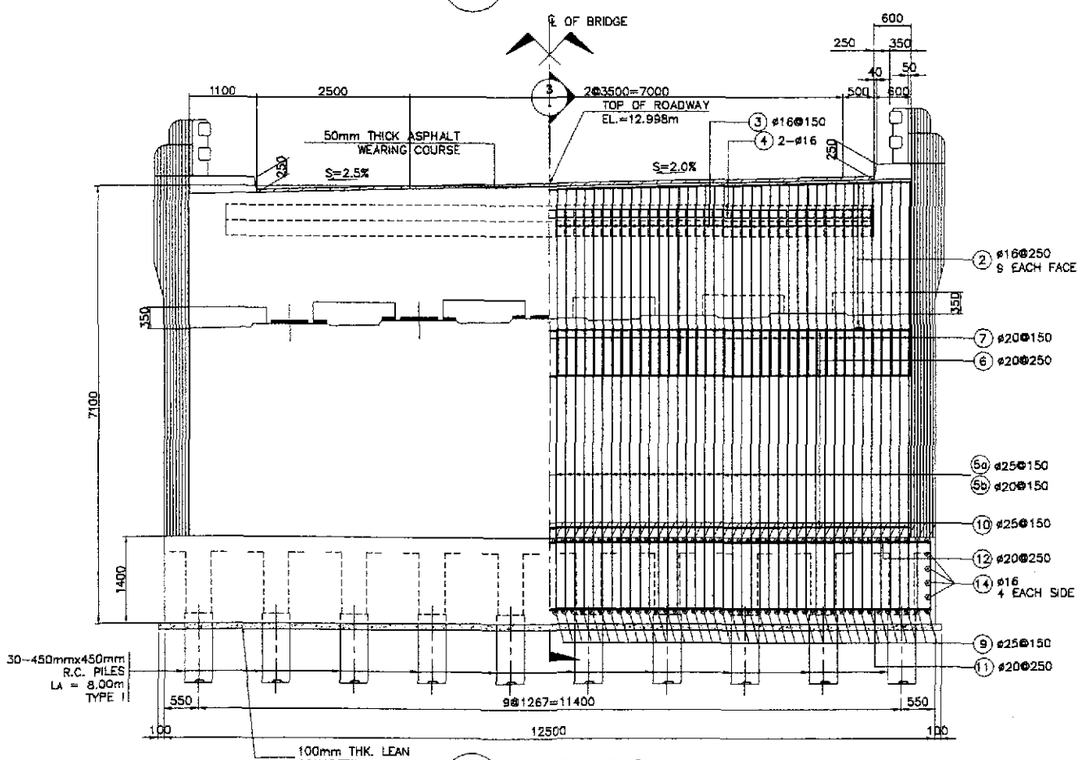
REPUBLIC OF THE PHILIPPINES
DEPARTMENT OF PUBLIC WORKS AND HIGHWAYS

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. BONGAN	SIMEON A. DATUMANONG
Project Director	Chief, Bridges Division	Director IV (OIC)	Undersecretary	Secretary

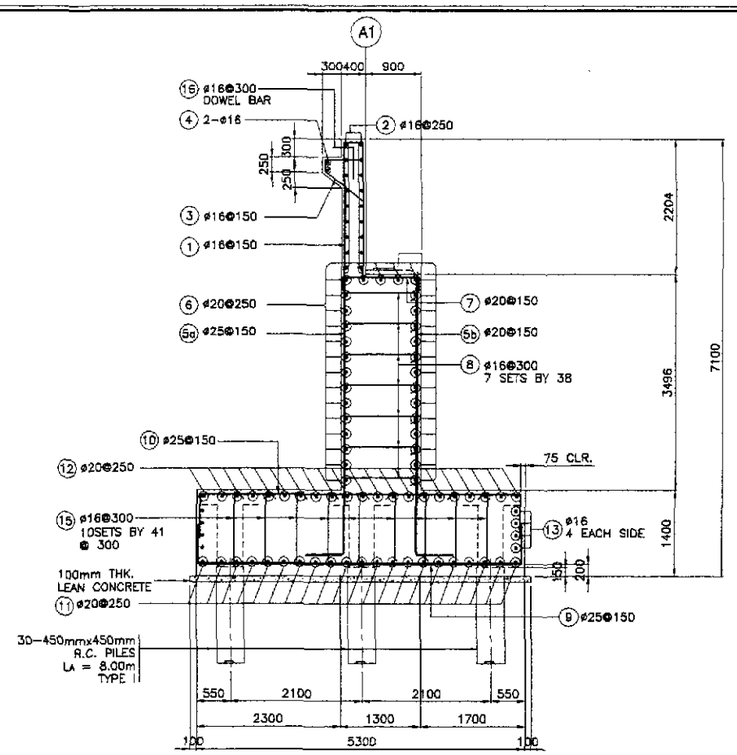
PROJECT AND LOCATION :	SCALE :	SHEET CONTENTS :	SHEET NO. :
THE DETAILED DESIGN STUDY ON UPGRADING INTER-URBAN HIGHWAY SYSTEM ALONG THE PAN-PHILIPPINE HIGHWAY (Plaridel, Cabanatuan and San Jose Bypasses)	AS SHOWN	BRIDGE NO. 1 CONCRETE POURING SEQUENCE AND DIAPHRAGM DETAILS (ULTIMATE STAGE)	B1-04
PLARIDEL BYPASS - CONTRACT PACKAGE II	FULL SIZE A1		



1 PLAN
SCALE 1:50

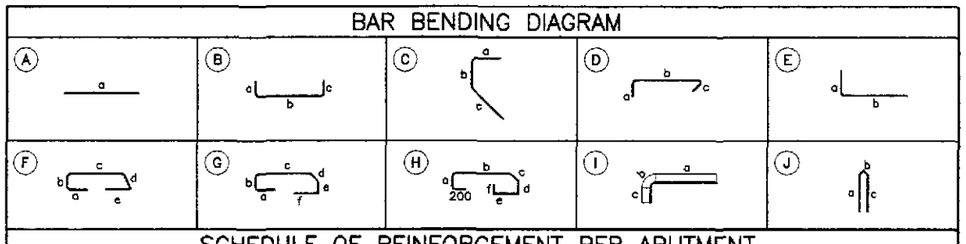


2 ELEVATION
SCALE 1:50



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	11.44	①	16	79	150	B	2600	300	2600	–	–	–	5500	434.50	1.579	687	105.60
		②	16	18	250	A	11600	–	–	–	–	–	11600	208.80	1.579	330	
		③	16	67	150	C	600	150	750	–	–	–	1500	100.50	1.579	159	
		④	16	2	AS SHOWN	A	9900	–	–	–	–	–	9900	19.80	1.579	32	
MAINWALL	53.17	⑤a	25	79	150	E	400	4650	–	–	–	–	5050	398.95	3.854	1538	83.80
		⑤b	20	78	150	E	400	4650	–	–	–	–	5050	398.95	2.466	984	
		⑥	20	31	250	A	11600	–	–	–	–	–	11600	359.60	2.466	887	
		⑦	20	79	150	B	250	1200	250	–	–	–	1700	134.30	2.466	332	
		⑧	16	266	500	D	250	1200	250	–	–	–	1700	452.20	1.579	715	
FOOTING	92.75	⑨	25	84	150	B	700	5150	700	–	–	–	6550	550.20	3.854	2121	75.74
		⑩	25	84	150	B	700	5150	700	–	–	–	6550	550.20	3.854	2121	
		⑪	20	21	250	B	700	12350	700	–	–	–	13750	288.75	2.466	713	
		⑫	20	21	250	B	700	12350	700	–	–	–	13750	288.75	2.466	713	
		⑬	16	8	AS SHOWN	A	12350	–	–	–	–	–	12350	98.80	1.579	157	
		⑭	16	8	AS SHOWN	A	5150	–	–	–	–	–	5150	41.20	1.579	66	
		⑮	16	410	500	D	250	1250	250				1750	717.50	1.579	1133	
DOWEL		⑯	16	34	300	E	650	500	–	–	–	–	1150	39.10	1.579	62	
TOTAL	148.24															GRADE 40 TOTAL = 3341 kgs. GRADE 60 TOTAL = 9409 kgs.	

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

	DATE	SIGNATURE
DESIGNED	10/31/02	A.P. GONZALES
CHECKED	10/25/02	K. KOBAYASHI
SUBMITTED	10/27/02	M. KUCHI TEAM LEADER

REPUBLIC OF THE PHILIPPINES
DEPARTMENT OF PUBLIC WORKS AND HIGHWAYS

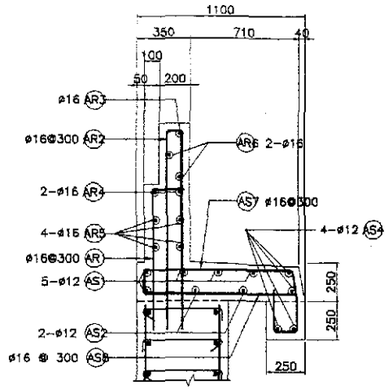
PUHL – PMO	BUREAU OF DESIGN		OFFICE OF THE SECRETARY	
Submitted By:	Reviewed By:	Recommended By:	Recommended By: (See cover sheet for Signature)	Approved By: (See cover sheet for Signature/Approval)
DANILO C. TRAJANO	ADRIANO M. DOROY	GILBERTO S. REYES	MANUEL M. BONOAN	SIMEON A. DATUMANONG
Project Director	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)
PLARIDEL BYPASS - CONTRACT PACKAGE II

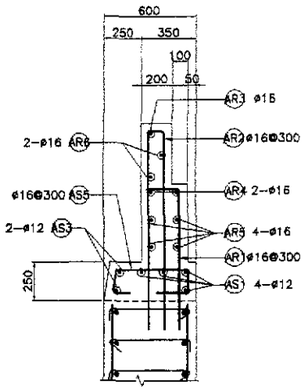
SCALE :
AS SHOWN
FULL SIZE A1

SHEET CONTENTS :
BRIDGE NO. 1
ABUTMENT A1
MAINWALL REINFORCEMENT DETAILS
(ULTIMATE STAGE)

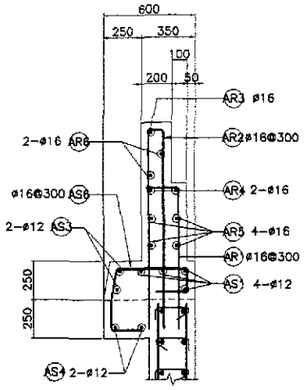
SHEET NO. :
B1-05



5A SECTION
SCALE 1:20

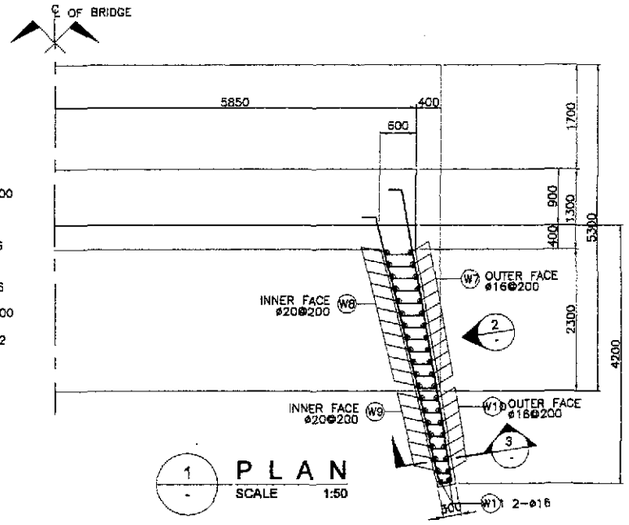


5B SECTION
SCALE 1:20

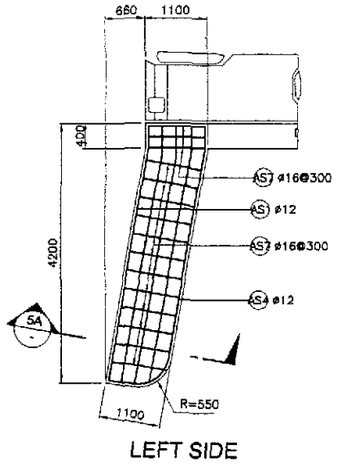


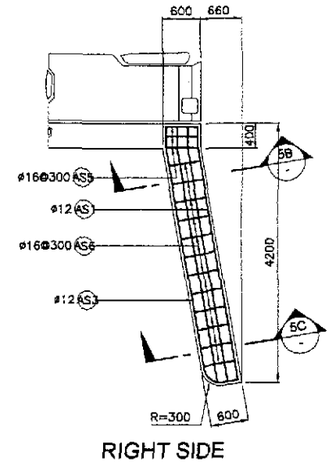
5C SECTION
SCALE 1:20

5 APPROACH RAIL DETAILS
SCALE 1:20

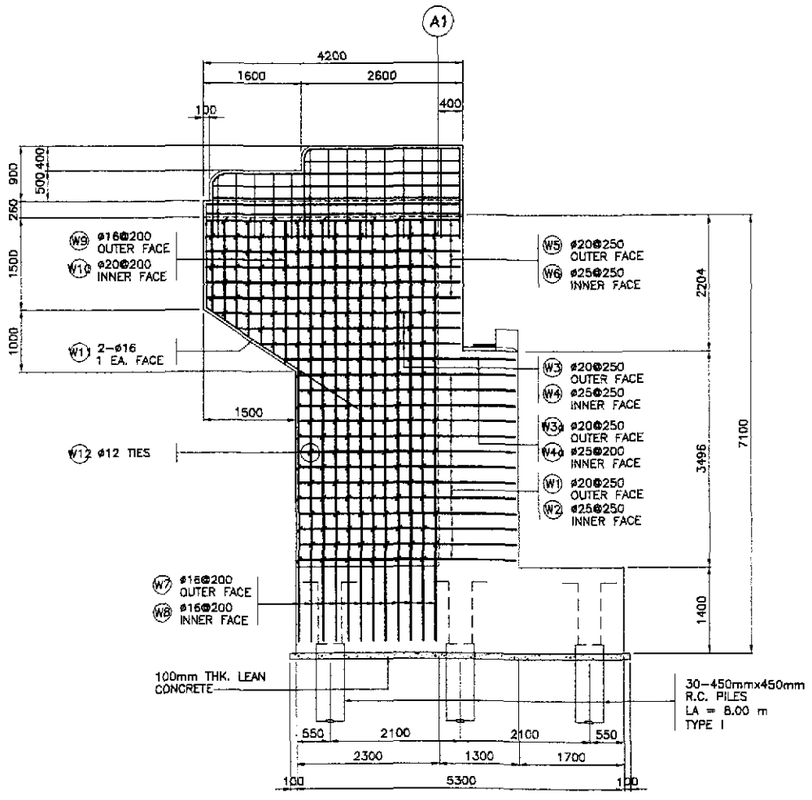


1 PLAN
SCALE 1:50

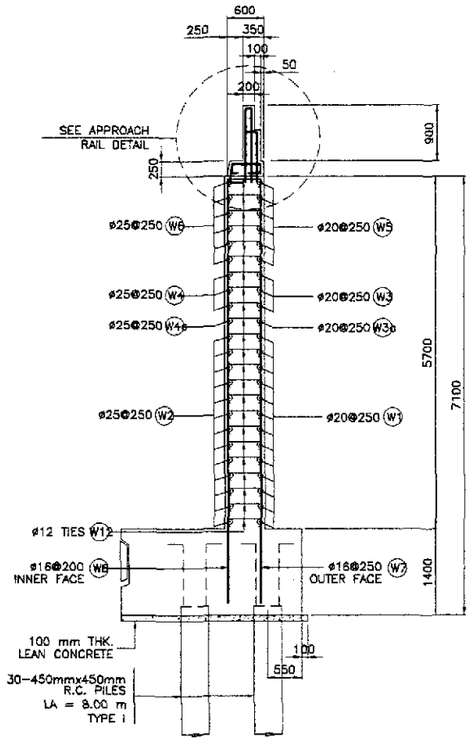




4 SIDEWALK DETAIL
SCALE 1:50



2 WINGWALL ELEVATION
SCALE 1:50



3 SECTION
SCALE 1:50

BAR BENDING DIAGRAM

(A) a	(B) a c b	(C) a b c	(D) b a c	(E) a b
(F) c b d a e	(G) c b d a f e	(H) b a c d 200 f e	(I) a c	(J) b a c

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	14.50	W1	20	28	250	B	400	3500	150	–	–	–	4050	113.40	2.466	280	152.97
		W2	25	28	250	B	400	3500	150	–	–	–	4050	113.40	3.854	438	
		W3	20	6	250	B	400	3600	150	–	–	–	4150	24.90	2.466	62	
		W3a	20	2	250	B	400	3750	150	–	–	–	4300	8.60	2.466	22	
		W4	25	6	250	B	400	3600	150	–	–	–	4150	24.90	3.854	96	
		W4a	25	2	250	B	400	3750	150	–	–	–	4300	8.60	3.854	34	
		W5	20	12	250	B	400	4100	150	–	–	–	4650	55.80	2.466	138	
		W6	25	12	250	B	400	4100	150	–	–	–	4650	55.80	3.854	216	
		W7	16	24	200	E	250	6850	–	–	–	–	7100	170.40	1.579	270	
		W8	16	24	200	E	250	6850	–	–	–	–	7100	170.40	1.579	270	
		W9	16	14	250	E	250	2000	–	–	–	–	2250	31.50	1.579	50	
		W10	20	14	250	E	250	2000	–	–	–	–	2250	31.50	2.466	78	
		W11	16	4	AS SHOWN	C	250	1500	3000	–	–	–	4750	19.00	1.579	31	
		W12	12	322	AS SHOWN	D	170	450	170	–	–	–	790	262.28	0.888	233	
														GRADE 60 = 1,364 Kgs.			
														GRADE 40 = 854 Kgs.			
APPROACH RAILING AND SIDEWALK	4.12	AS1	12	9	AS SHOWN	A	4200	–	–	–	–	–	4200	37.80	0.888	34	96.94
		AS2	12	2	AS SHOWN	A	4200	–	–	–	–	–	4200	8.40	0.888	8	
		AS3	12	2	AS SHOWN	A	4200	–	–	–	–	–	4200	8.40	0.888	8	
		AS4	12	6	AS SHOWN	A	4200	–	–	–	–	–	4200	25.20	0.888	23	
		AS5	16	4	300	F	200	170	460	200	200	–	1250	5.00	1.578	8	
		AS6	16	12	300	G	200	170	460	200	170	200	1420	17.04	1.579	27	
		AS7	16	15	300	H	200	170	960	200	170	200	2120	31.80	1.579	51	
		AS8	16	15	300	E	200	1020	–	–	–	–	1220	18.30	1.579	29	
		AR1	16	10	300	E	200	900	–	–	–	–	1100	11.00	1.579	18	
		AR2	16	18	300	J	1300	120	1300	–	–	–	2720	48.96	1.579	78	
		AR3	16	2	AS SHOWN	I	2500	236	1300	–	–	–	4036	8.07	1.579	13	
		AR4	16	4	AS SHOWN	I	4100	236	900	–	–	–	5236	20.94	1.579	34	
		AR5	16	8	AS SHOWN	A	4100	–	–	–	–	–	4100	32.80	1.579	52	
		AR6	16	4	AS SHOWN	A	2500	–	–	–	–	–	2500	10.00	1.579	16	
														GRADE 40 = 399 Kgs.			
TOTAL	18.62													GRADE 60 TOTAL = 1,364 kgs. GRADE 40 TOTAL = 1,253 kgs.			

JICA
JAPAN INTERNATIONAL COOPERATION AGENCY

KATAHIRA & ENGINEERS INTERNATIONAL
YACHIYO ENGINEERING CO., LTD.

	DATE	SIGNATURE
DESIGNED	10/21/12	L. P. GONZALES
CHECKED	10/25/12	[illegible]
SUBMITTED	12/27/12	M. KUDOH 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. DORDY	GILBERTO S. REYES	MANUEL M. BONDAN	SIMEON A. DATUMANONG
Project Director	Chief, Bridges Division	Director IV (OIC)	Undersecretary	Secretary

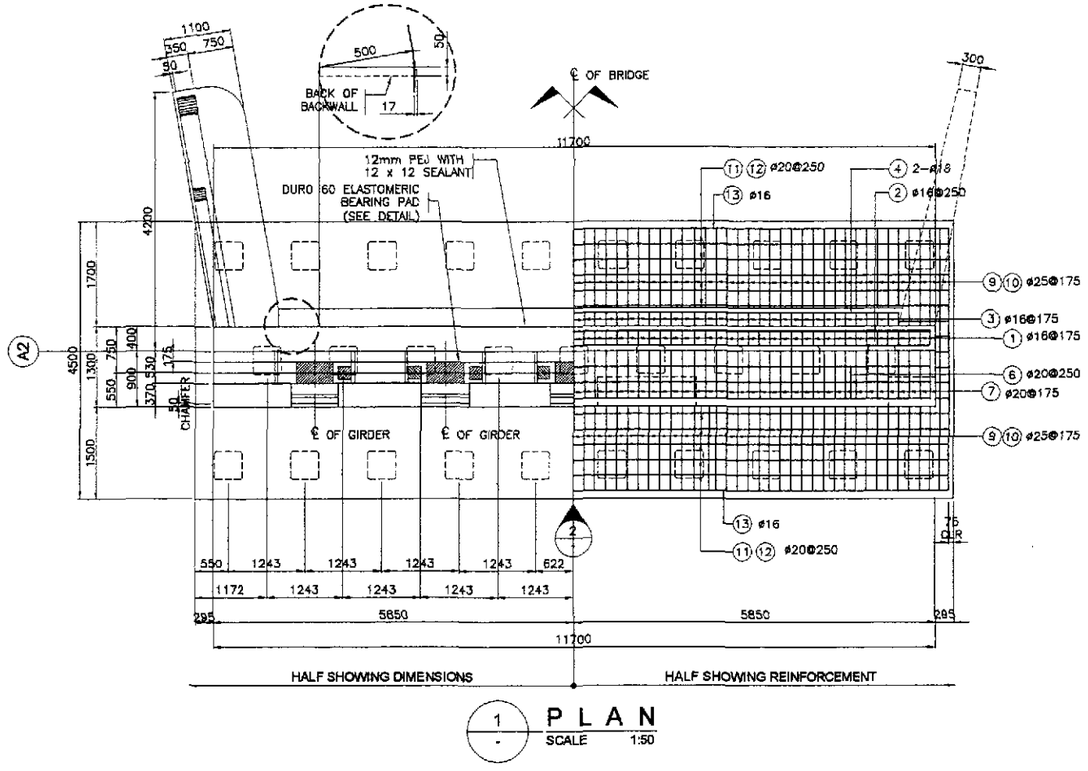
PROJECT AND LOCATION :
THE DETAILED DESIGN STUDY ON
UPGRADING INTER-URBAN HIGHWAY SYSTEM
ALONG THE PAN-PHILIPPINE HIGHWAY
(Plaridel, Cabanatuan and San Jose Bypasses)

PLARIDEL BYPASS - CONTRACT PACKAGE II

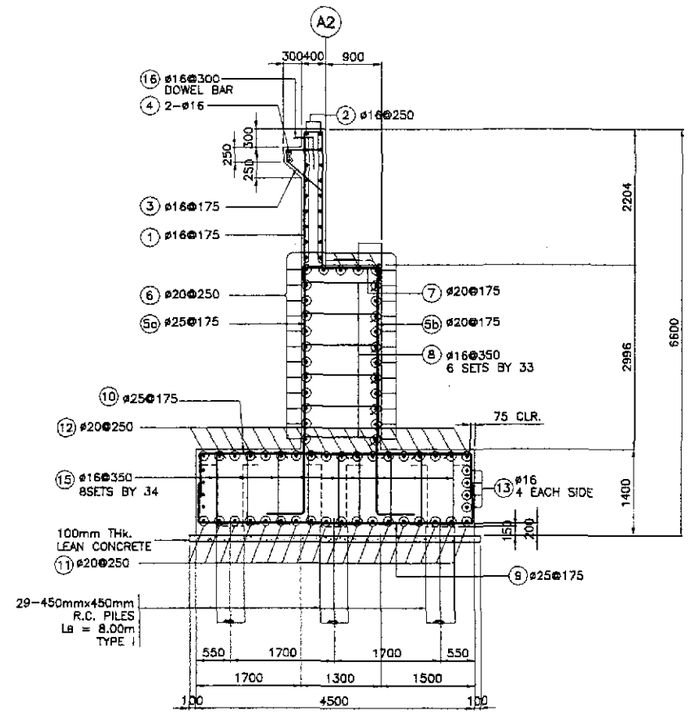
SCALE :
AS SHOWN
FULL SIZE A1

SHEET CONTENTS :
BRIDGE NO.1
ABUTMENT - A1
WINGWALL REINFORCEMENT DETAILS
(ULTIMATE STAGE)

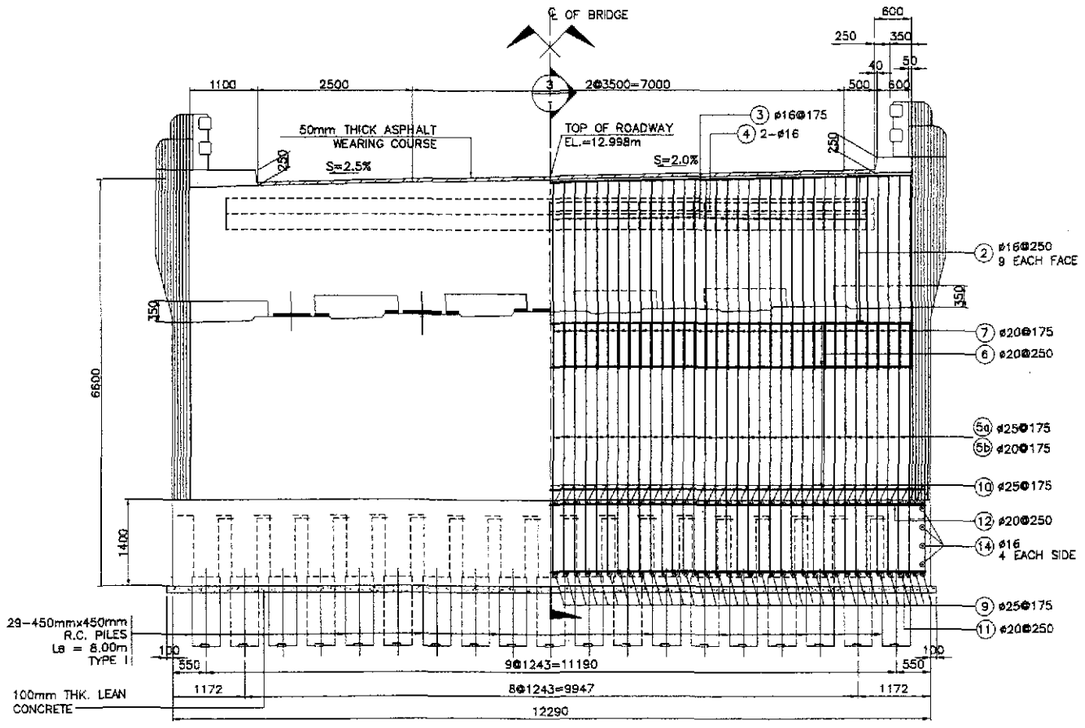
SHEET NO. :
B1-06



1 / - PLAN SCALE 1:50

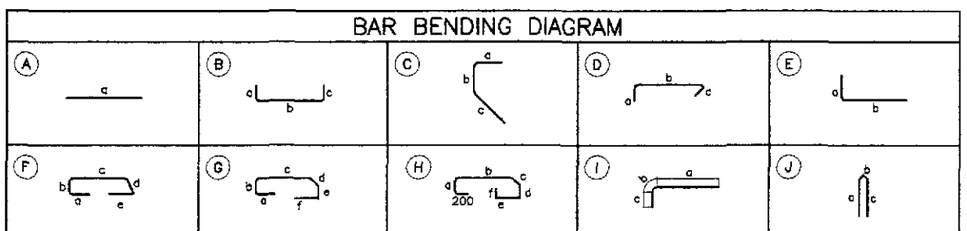


3 / - SECTION SCALE 1:50



2 / - ELEVATION 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	11.44	①	16	68	175	B	2000	300	2600	–	–	–	5500	374.00	1.579	591	95.37
		②	16	18	250	A	11600	–	–	–	–	–	11600	208.80	1.579	330	
		③	16	58	175	C	600	150	750	–	–	–	1500	87.00	1.579	138	
		④	16	2	AS SHOWN	A	9900	–	–	–	–	–	9900	19.80	1.579	32	
MAINWALL	44.05	⑤a	25	68	175	E	400	4150	–	–	–	–	4550	309.40	3.854	1193	80.53
		⑤b	20	68	175	E	400	4150	–	–	–	–	4550	309.40	2.466	763	
		⑥	20	27	250	A	11600	–	–	–	–	–	11600	313.20	2.466	773	
		⑦	20	68	175	B	250	1200	250	–	–	–	1700	115.60	2.466	286	
		⑧	16	198	350	D	250	1200	250	–	–	–	1700	336.60	1.579	532	
FOOTING	77.43	⑨	25	70	175	B	700	4350	700	–	–	–	5750	402.50	3.854	1552	67.78
		⑩	25	70	175	B	700	4350	700	–	–	–	5750	402.50	3.854	1552	
		⑪	20	18	250	B	700	12140	700	–	–	–	13540	243.72	2.466	602	
		⑫	20	18	250	B	700	12140	700	–	–	–	13540	243.72	2.466	602	
		⑬	16	8	AS SHOWN	A	12140	–	–	–	–	–	12140	97.12	1.579	154	
		⑭	16	8	AS SHOWN	A	4350	–	–	–	–	–	4350	34.80	1.579	55	
		⑮	16	272	350	D	250	1200	250				1700	462.40	1.579	731	
DOWEL		⑯	16	34	300	E	650	500	–	–	–	–	1150	39.10	1.579	62	
TOTAL	132.92													GRADE 40 TOTAL = 2625 kgs. GRADE 60 TOTAL = 7323 kgs.			

JAPAN INTERNATIONAL COOPERATION AGENCY

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

	DATE	SIGNATURE
DESIGNED	10/21/12	P. GONZALES
CHECKED	10/25/12	N. KOBAYASHI
SUBMITTED	10/29/12	T. KUSUI TEAM LEADER

REPUBLIC OF THE PHILIPPINES
DEPARTMENT OF PUBLIC WORKS AND HIGHWAYS

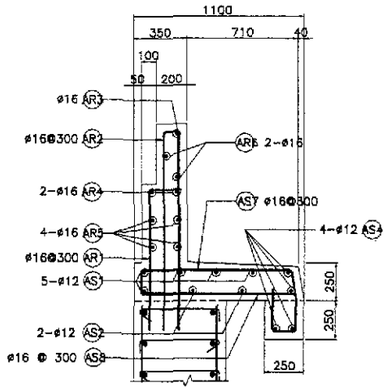
PJHL – PMO	BUREAU OF DESIGN		OFFICE OF THE SECRETARY	
Submitted By:	Reviewed By:	Recommended By:	Recommended By: (See cover sheet for Signature)	Approved By: (See cover sheet for Signature/Approval)
DANILO C. TRAJANO Project Director	ADRIANO M. DOROY Chief, Bridges Division	GILBERTO S. REYES Director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

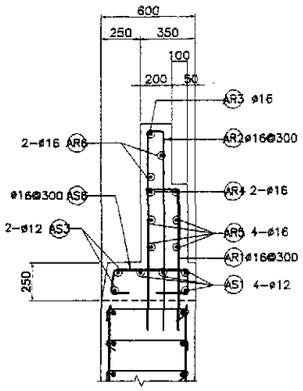
SCALE : AS SHOWN — FULL SIZE A1

SHEET CONTENTS :
BRIDGE NO. 1
ABUTMENT - A2
MAINWALL REINFORCEMENT DETAILS (ULTIMATE STAGE)

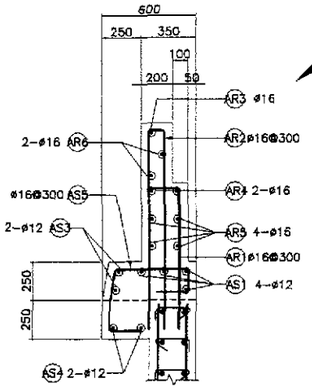
SHEET NO. : B1-07



5A SECTION
SCALE 1:20

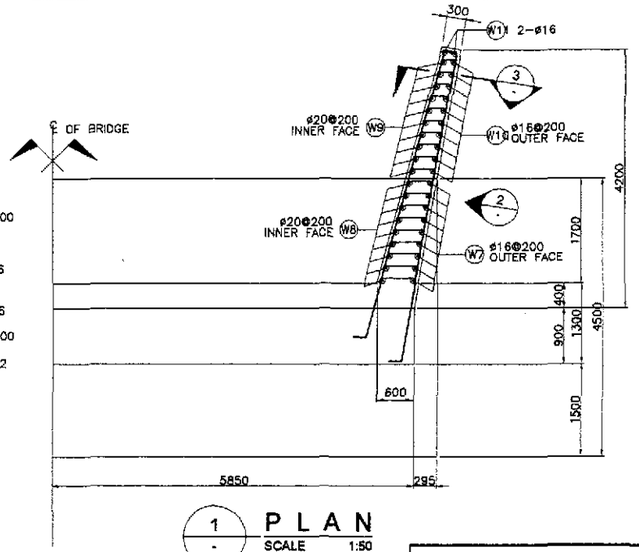


5B SECTION
SCALE 1:20

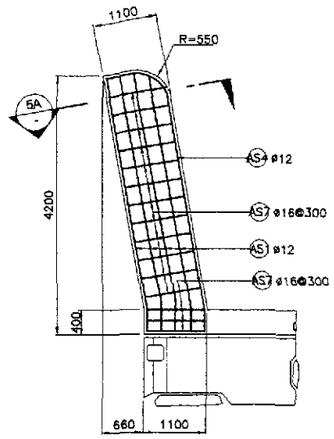


5C SECTION
SCALE 1:20

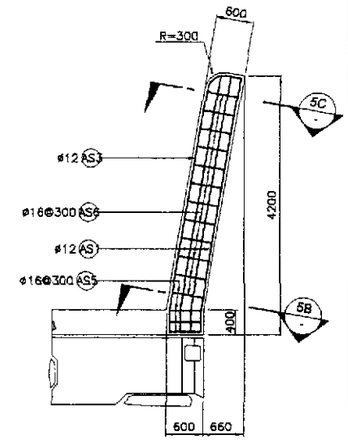
5 APPROACH RAIL DETAILS
SCALE 1:20



1 PLAN
SCALE 1:50

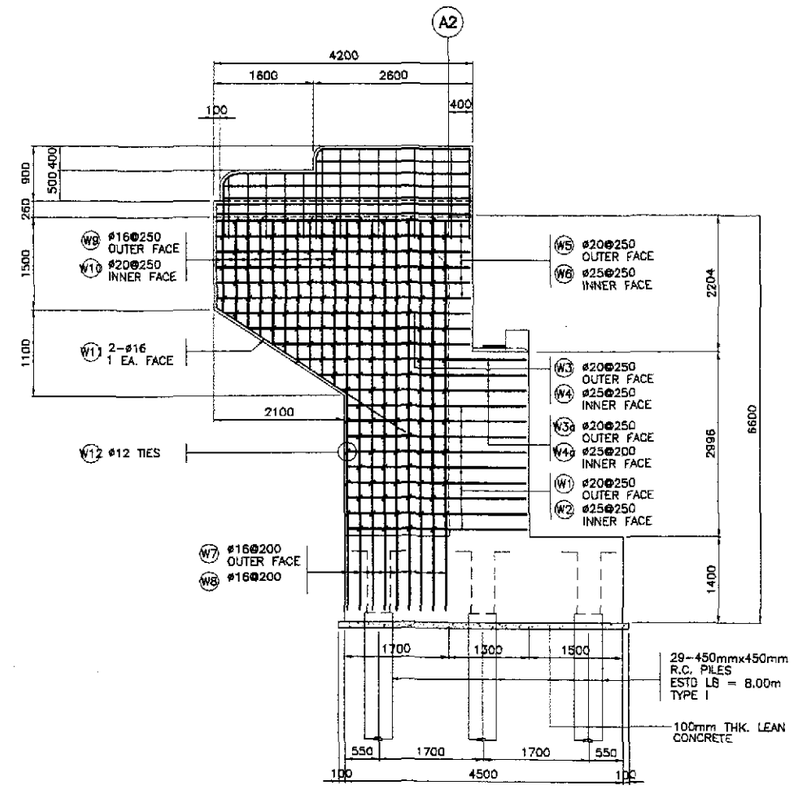


LEFT SIDE

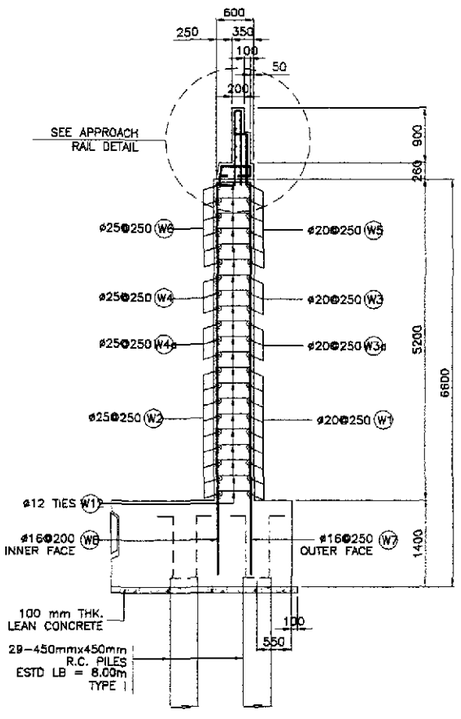


RIGHT SIDE

4 SIDEWALK DETAIL
SCALE 1:50

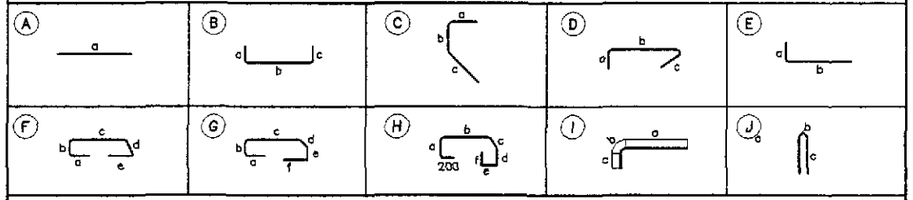


2 WINGWALL ELEVATION
SCALE 1:50



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 DUT a	b	c	d	e	f	LENGTH EA. BAR (mm)	TOTAL LENGTH (m)	UNIT WT. (kg/m)	WEIGHT (kg)	REBAR RATIO (kg/m³)
WINGWALL	11.68	W1	20	18	250	B	400	2900	150	–	–	–	3450	62.10	2.466	154	159.02
		W2	25	18	250	B	400	2900	150	–	–	–	3450	62.10	3.854	240	
		W3	20	6	250	B	400	3650	150	–	–	–	4200	25.20	2.466	63	
		W3a	20	6	250	B	400	3300	150	–	–	–	3850	23.10	2.466	57	
		W4	25	6	250	B	400	3700	150	–	–	–	4250	25.20	3.854	98	
		W4a	25	6	250	B	400	3300	150	–	–	–	3850	23.10	3.854	90	
		W5	20	12	250	B	400	4100	150	–	–	–	4650	55.80	2.466	138	
		W6	25	12	250	B	400	4100	150	–	–	–	4650	55.80	3.854	216	
		W7	16	18	200	E	250	6400	–	–	–	–	6550	119.70	1.579	190	
		W8	16	18	200	E	250	6400	–	–	–	–	6550	119.70	1.579	190	
		W9	16	20	250	E	250	2100	–	–	–	–	2350	47.00	1.579	75	
		W10	20	20	250	E	250	2100	–	–	–	–	2350	47.00	2.466	116	
		W11	16	4	AS SHOWN	C	250	1500	3700	–	–	–	5450	21.80	1.579	35	
		W12	12	275	AS SHOWN	D	170	450	170	–	–	–	790	218.04	0.888	194	
														GRADE 60 = 1,173 Kgs.			
														GRADE 40 = 684 Kgs.			
APPROACH RAILING AND SIDEWALK	4.12	AS	12	9	AS SHOWN	A	4200	–	–	–	–	–	4200	37.80	0.888	34	96.45
		AS2	12	2	AS SHOWN	A	4200	–	–	–	–	–	4200	8.40	0.888	8	
		AS3	12	2	AS SHOWN	A	4200	–	–	–	–	–	4200	8.40	0.888	8	
		AS4	12	6	AS SHOWN	A	4200	–	–	–	–	–	4200	25.20	0.888	23	
		AS5	16	4	300	F	200	170	480	200	200	–	1250	4.92	1.579	8	
		AS6	16	12	300	G	200	170	480	200	170	200	1420	15.40	1.579	27	
		AS7	16	15	300	H	200	170	980	200	170	200	2120	24.00	1.579	51	
		AS8	16	15	300	E	200	1020	–	–	–	–	1220	18.30	1.579	29	
		AR1	16	10	300	E	200	900	–	–	–	–	1100	11.00	1.579	18	
		AR2	16	18	300	J	1300	120	1300	–	–	–	2720	48.96	1.579	78	
		AR3	16	2	AS SHOWN	I	2500	236	1300	–	–	–	4036	8.07	1.579	13	
		AR4	16	4	AS SHOWN	I	4000	236	900	–	–	–	5136	20.54	1.579	33	
		AR5	16	8	AS SHOWN	A	4000	–	–	–	–	–	4000	32.00	1.579	51	
		AR6	16	4	AS SHOWN	A	2500	–	–	–	–	–	2500	10.00	1.579	16	
														GRADE 40 = 397 Kgs.			
TOTAL	15.80													GRADE 60 TOTAL = 1,173 kgs. GRADE 40 TOTAL = 1,081 kgs.			

JICA
JAPAN INTERNATIONAL COOPERATION AGENCY

KATAHIRA & ENGINEERS INTERNATIONAL
YACHIYO ENGINEERING CO., LTD.

	DATE	SIGNATURE
DESIGNED	10/2/02	A. P. GONZALES
CHECKED	10/25/02	
SUBMITTED	10/27/02	TEAM LEADER

REPUBLIC OF THE PHILIPPINES
DEPARTMENT OF PUBLIC WORKS AND HIGHWAYS

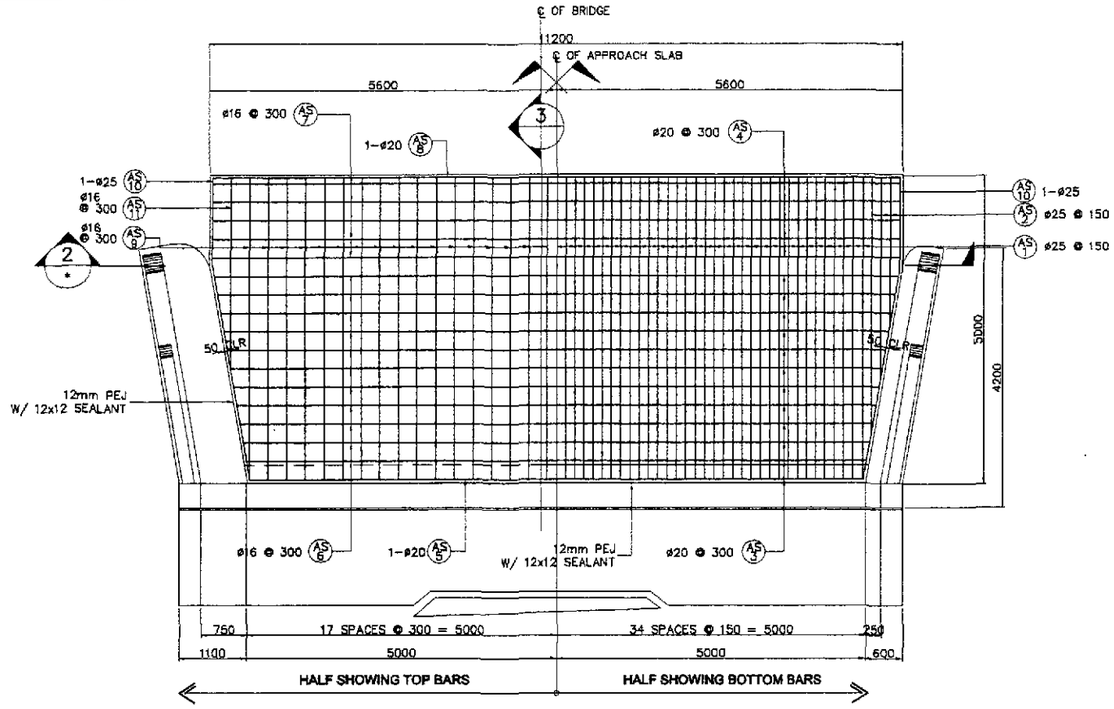
FHRL – PMO	BUREAU OF DESIGN		OFFICE OF THE SECRETARY	
Submitted By:	Reviewed By:	Recommended By:	Recommended By: (See cover sheet for Signature)	Approved By: (See cover sheet for Signature/Approval)
DANILO C. TRAJANO	ADRIANO M. DOROY	GILBERTO S. REYES	MANUEL M. BONOAN	SIMEON A. DATUMANONG
Project Director	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)
PLARIDEL BYPASS - CONTRACT PACKAGE II

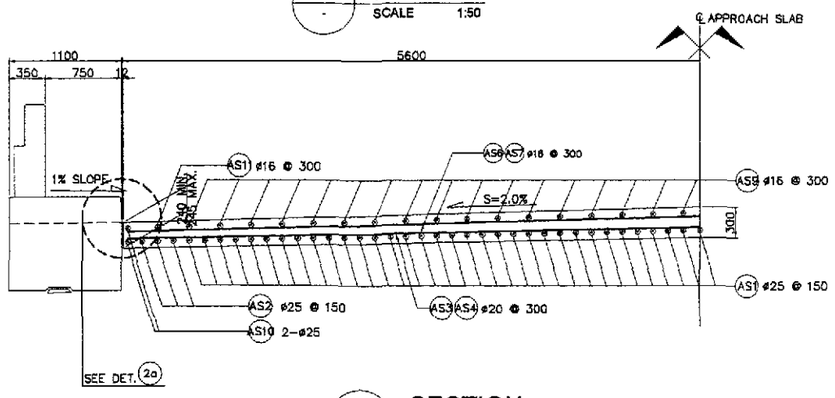
SCALE :
AS SHOWN
FULL SIZE A1

SHEET CONTENTS :
BRIDGE NO. 1
ABUTMENT A2
WINGWALL REINFORCEMENT DETAILS
(ULTIMATE STAGE)

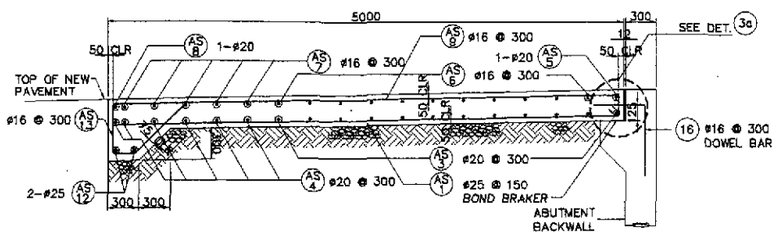
SHEET NO. :
B1-08



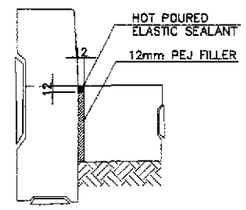
1 - PLAN
SCALE 1:50



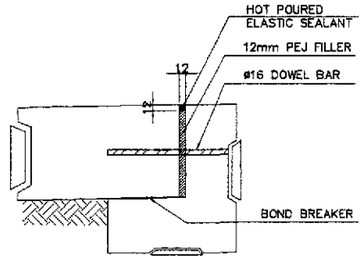
2 - SECTION
SCALE 1:30



3 - SECTION
SCALE 1:30

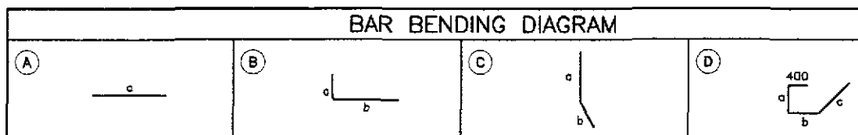


2a - DETAIL
SCALE 1:10



3a - DETAIL
SCALE 1:10

BAR BENDING DIAGRAM



SCHEDULE OF REINFORCEMENT PER APPROACH SLAB

LOCATION	CONCRETE VOLUME (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	17.68	AS1	25	68	150	B	4900	200	–	–	–	–	5100	346.80	3.854	1337	157.17
		AS2	25	6	150	B	3200	200	–	–	–	–	3400	20.40	3.854	79	
		AS3	20	12	300	A	10500	–	–	–	–	–	10500	126.00	2.466	311	
		AS4	20	6	300	A	11100	–	–	–	–	–	11100	66.60	2.466	165	
		AS5	20	1	AS SHOWN	A	9900	–	–	–	–	–	9900	9.90	2.466	25	
		AS6	16	11	300	A	10550	–	–	–	–	–	10550	116.05	1.579	184	
		AS7	16	5	300	A	11100	–	–	–	–	–	11100	55.50	1.579	88	
		AS8	20	1	AS SHOWN	A	11100	–	–	–	–	–	11100	11.10	2.466	28	
		AS9	16	34	300	B	4900	200	–	–	–	–	5100	173.40	1.579	274	
		AS10	25	4	AS SHOWN	C	1450	3500	–	–	–	–	4950	19.80	3.854	77	
		AS11	16	4	300	B	2300	200	–	–	–	–	2500	10.00	1.579	16	
		AS12	25	2	AS SHOWN	A	11100	–	–	–	–	–	11100	22.20	3.854	86	
		AS13	16	38	300	D	400	500	200	–	–	–	1800	68.40	1.579	109	
TOTAL	17.68															GRADE 40 TOTAL = 671 kgs. GRADE 60 TOTAL = 2108 kgs.	

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

	DATE	SIGNATURE
DESIGNED	10/21/07	E. N. SALLAN
CHECKED	10/25/07	K. KOBAYASHI
SUBMITTED	10/29/07	A. L. LUCHI TEAM LEADER

REPUBLIC OF THE PHILIPPINES
DEPARTMENT OF PUBLIC WORKS AND HIGHWAYS

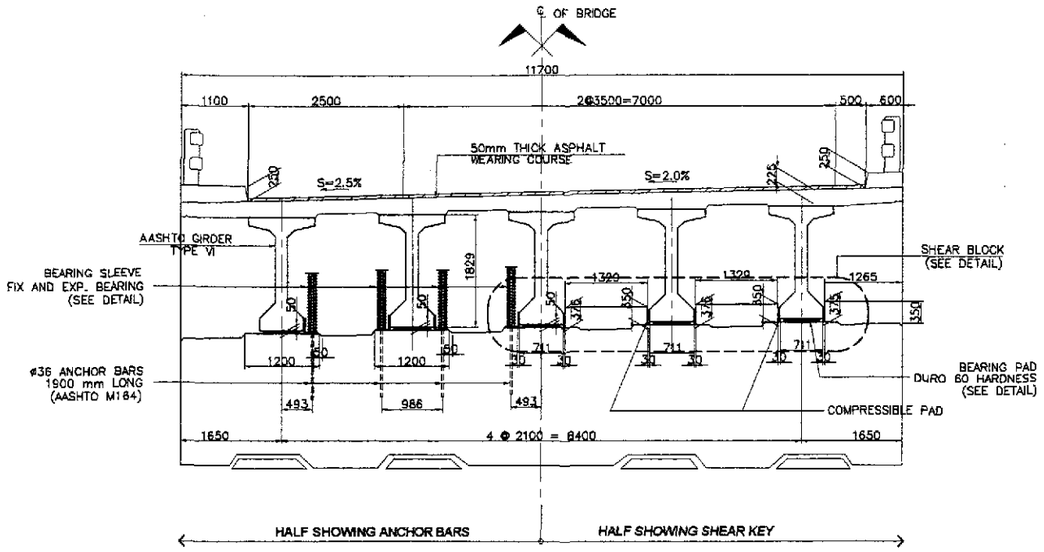
PUHL – PMO	BUREAU OF DESIGN		OFFICE OF THE SECRETARY	
Submitted By:	Reviewed By:	Recommended By:	Recommended By: (See cover sheet for Signature)	Approved By: (See cover sheet for Signature/Aproval)
DANILO C. TRAJANO Project Director	ADRIANO M. DOROY Chief, Bridges Division	GILBERTO S. REYES Director 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)
PLARIDEL BYPASS - CONTRACT PACKAGE II

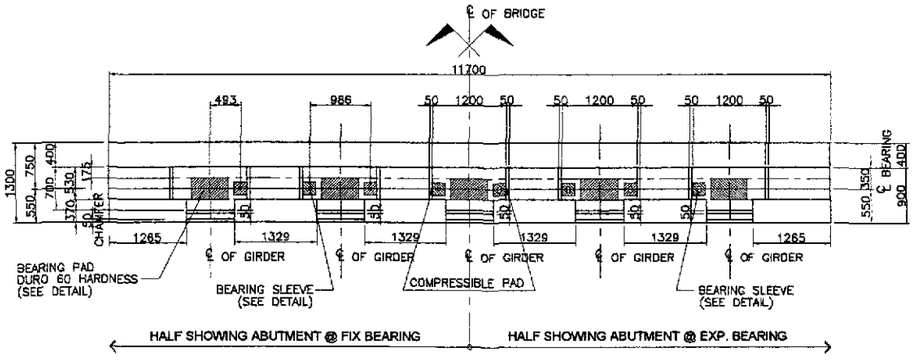
SCALE :
AS SHOWN
FULL SIZE A1

SHEET CONTENTS :
BRIDGE NO. 1
APPROACH SLAB PLAN,
SECTIONS AND DETAILS
(ULTIMATE STAGE)

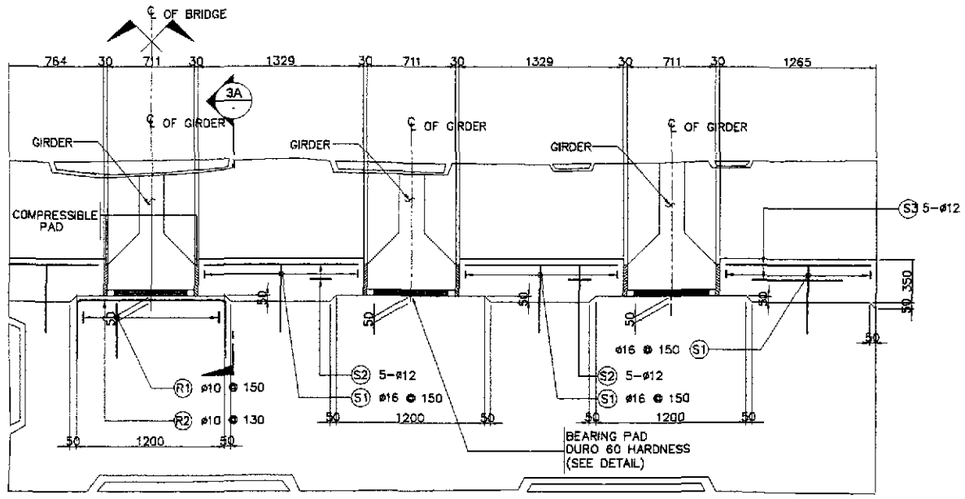
SHEET NO. :
B1-09



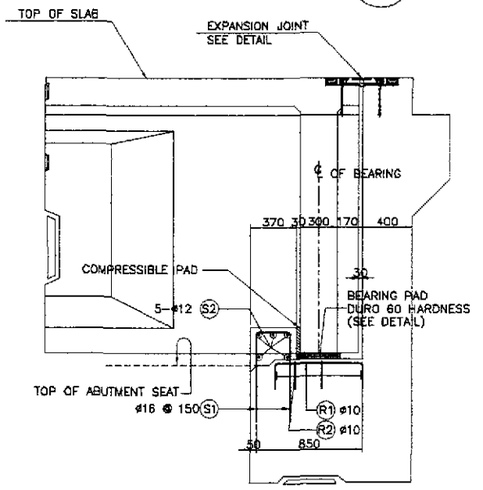
1 - SECTION AT ABUTMENT SEAT
SCALE 1:50



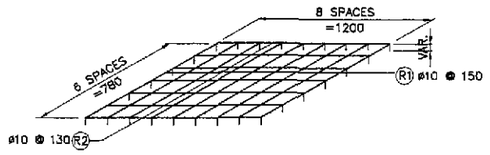
2 - PLAN AT ABUTMENT SEAT
SCALE 1:50



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	1.59	S1	16	42	150	(B)	560	290	560			1410	59.22	1.579	94	142.14
		S2	12	20	AS SHOWN	(A)	1250					1250	25.00	0.888	23	
		S3	12	10	AS SHOWN	(A)	1185					1185	11.85	0.888	11	
		R1	10	45	150	(B)	500	780	500			1780	80.10	0.616	50	
		R2	10	35	130	(B)	500	1200	500			2200	77.00	0.616	48	
TOTAL	1.59	GRADE 40 TOTAL = 226 Kgs.														

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

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

	DATE	SIGNATURE
DESIGNED	10/21/11	E. A. SALLAN
CHECKED	10/25/11	
SUBMITTED	10/27/11	TEAM LEADER

REPUBLIC OF THE PHILIPPINES
DEPARTMENT OF PUBLIC WORKS AND HIGHWAYS

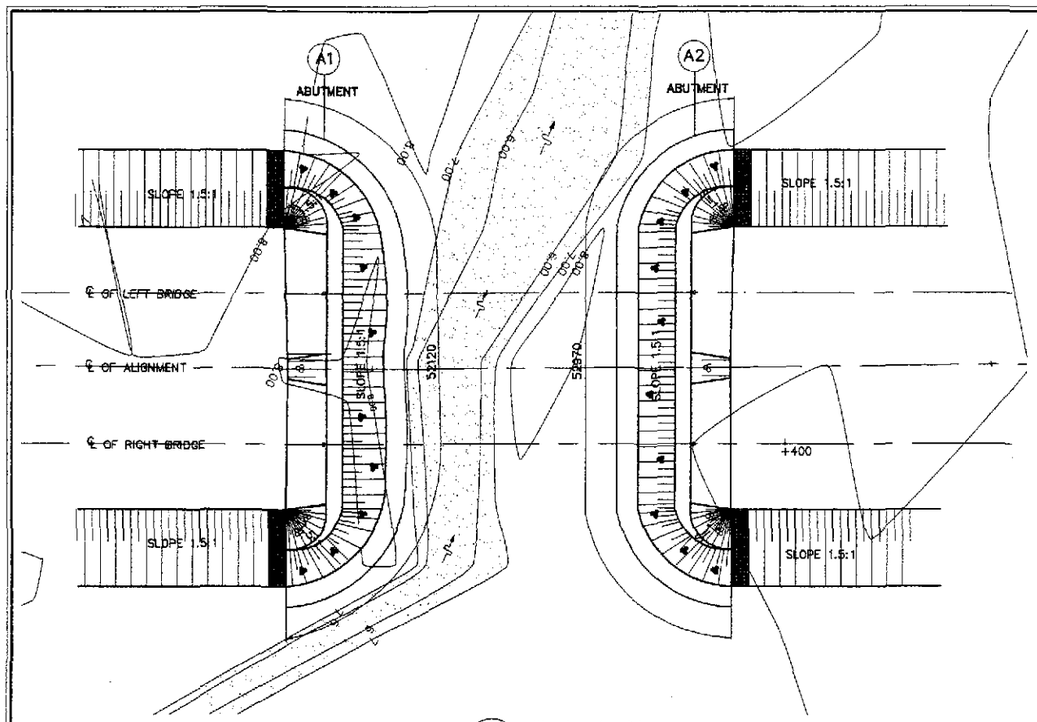
PJHL – PMO	BUREAU OF DESIGN		OFFICE OF THE SECRETARY	
Submitted By:	Reviewed By:	Recommended By:	Recommended By: (See cover sheet for Signature)	Approved By: (See cover sheet for Signature/Approval)
DANILO C. TRAJANO	ADRIANO M. DOROY	GILBERTO S. REYES	MANUEL M. BONOAN	SIMEON A. DATUMANONG
Project Director	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)
PLARIDEL BYPASS - CONTRACT PACKAGE II

SCALE :
AS SHOWN
FULL SIZE A1

SHEET CONTENTS :
BRIDGE NO. 1
SHEAR KEY AND
RISER DETAILS
(ULTIMATE STAGE)

SHEET NO. :
B1-10



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. HAND–LAID ROCK SHALL BE MORE THAN 0.015cu.m. IN VOLUME AND SHALL CONSISTS OF HARD AND DURABLE STONES. ALL SHALL BE LAID FLAT AND SECURELY PLACED WITH LARGER STONES GENERALLY LOCATED IN THE LOWER PART OF THE STRUCTURE.

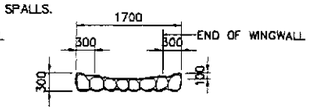
5. RUBBLE CONCRETE SHALL BE CLASS "B" (1:2.5:5) MIX CONCRETE WITH BOULDERS EMBEDDED THEREIN. BOULDERS 250–300mmø SHALL BE CAREFULLY HAND–LAID WITHIN THE CONCRETE SECTION. THE BOULDERS SHALL BE THOROUGHLY INCORPORATED INTO THE CONCRETE MASS WITH A COVER OF 30mm AND NOT LESS THAN 30mm APART. THE RUBBLE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

6. 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.

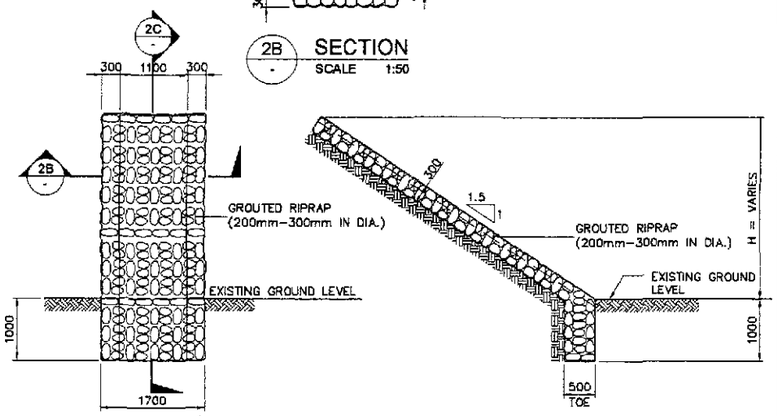
7. CURTAIN WALLS SHALL BE USED AT BOTH ENDS OF THE LOOSE BOULDER APRON BANK PROTECTION WORKS. BOULDERS SHALL BE CAREFULLY HAND–LAID AND EMBEDDED INTO THE CONCRETE SECTION.

8. NO CONCRETING UNDER WATER SHALL BE PERMITTED.

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

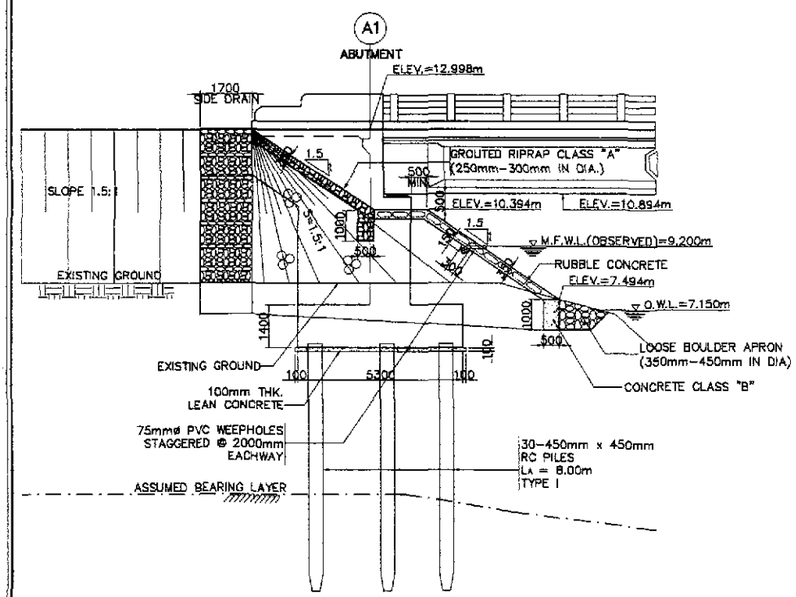


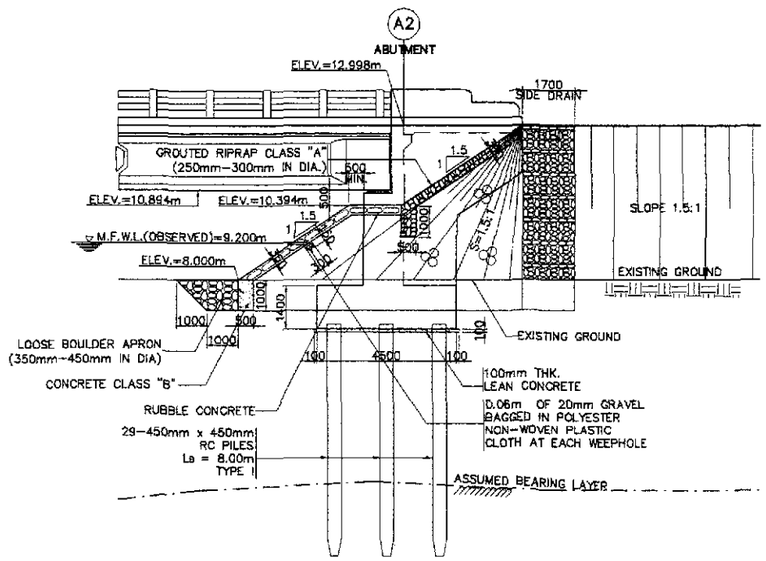
2B SECTION
SCALE 1:50



2A ELEVATION
SCALE 1:50

2C SECTION
SCALE 1:50





1B ELEVATION
SCALE 1:100

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

1 ABUTMENT SLOPE PROTECTION
SCALE AS SHOWN

PER ABUTMENT

LOCATION	SIZES	QUANTITY	
		ABUT. A1	ABUT. A2
CONC. CLASS "B"	1000 x 500 x LENGTH	14.18 cu. m.	13.79 cu. m.
BOULDER APRON	350mm–450mm IN DIA.	42.55 cu. m.	41.37 cu. m.
RUBBLE CONCRETE	200mm–300mm IN DIA.	45.39 cu. m.	38.89 cu. m.
SIDE DRAIN	200mm–300mm IN DIA.	5.39 cu. m.	5.39 cu. m.
GROUTED RIPRAP	250mm–300mm IN DIA.	15.72 cu. m.	15.17 cu. m.

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

	DATE	SIGNATURE
DESIGNED	10/21/07	A.P. GONZALES
CHECKED	10/25/07	
SUBMITTED	10/23/07	M. MATSUDA 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. BONDAN	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)
PLARIDEL BYPASS - CONTRACT PACKAGE II

SCALE : AS SHOWN FULL SIZE A1

SHEET CONTENTS :
BRIDGE NO. 1
ABUTMENT PROTECTION AND SIDE DRAIN DETAILS (ULTIMATE STAGE)

SHEET NO. : B1-11