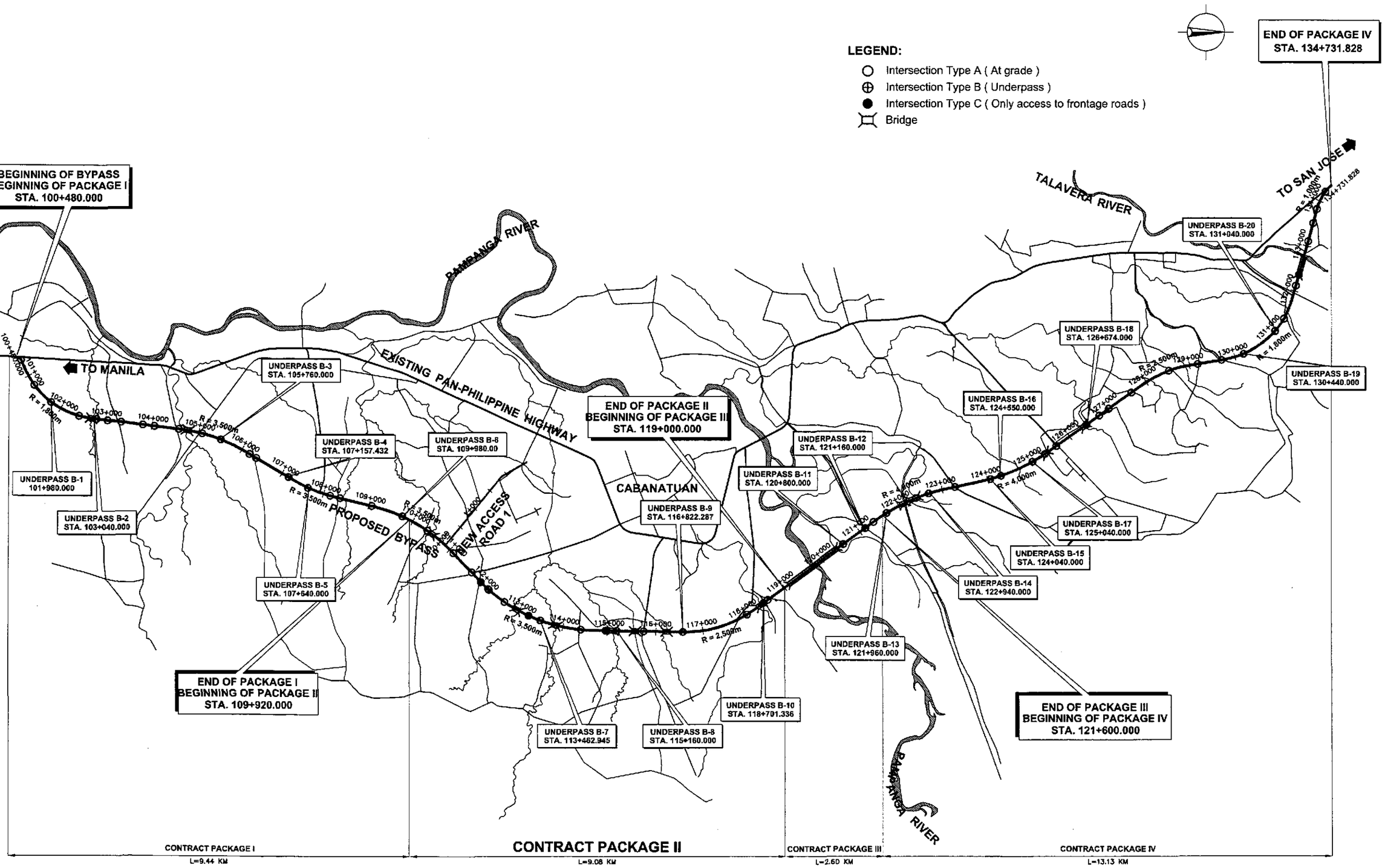
UNDERPASS CROSSING (BOX CULVERT)



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

SCALE 1:40,000

JICA JAPAN INTERNATIONAL COOPERATION AGENCY

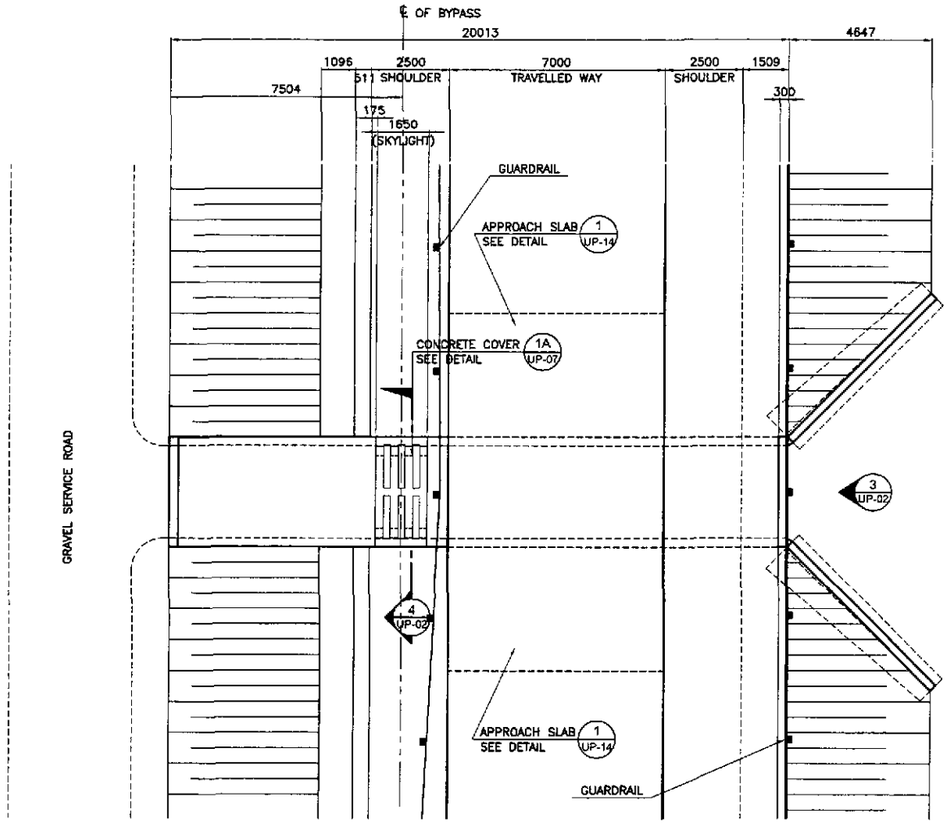
KEI KATAHIRA & ENGINEERS INTERNATIONAL — yec YACHIYO ENGINEERING CO., LTD.

	DATE	SIGNATURE
DESIGNED	10/16/02	M. CHAN
CHECKED	10/16/02	A. HAKIM
SUBMITTED	10/18/02	L. PASCUA, TEAM LEADER

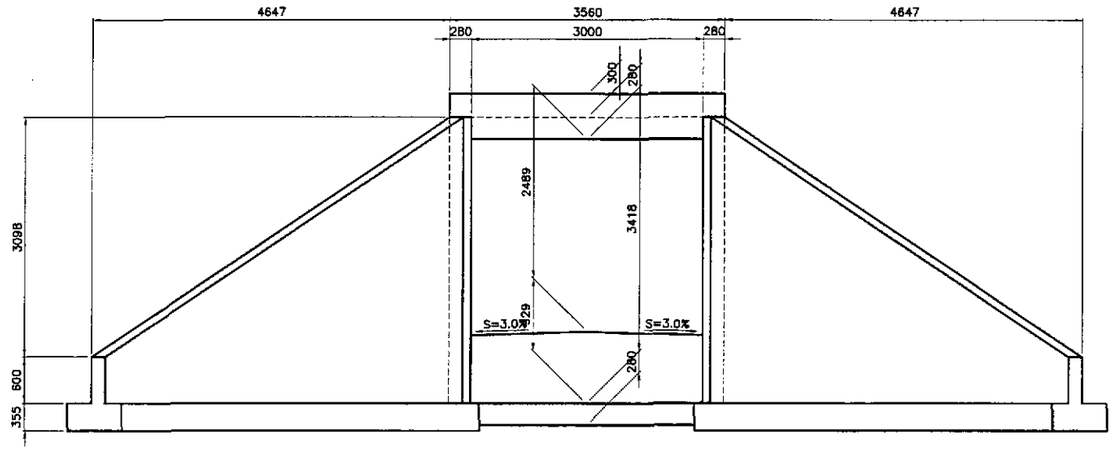
REPUBLIC OF THE PHILIPPINES
DEPARTMENT OF PUBLIC WORKS AND HIGHWAYS

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. BONGAN	SIMEON A. DATUMANONG
Project Director	Chief, Highways Division	OIC, Director IV	Undersecretary	Secretary

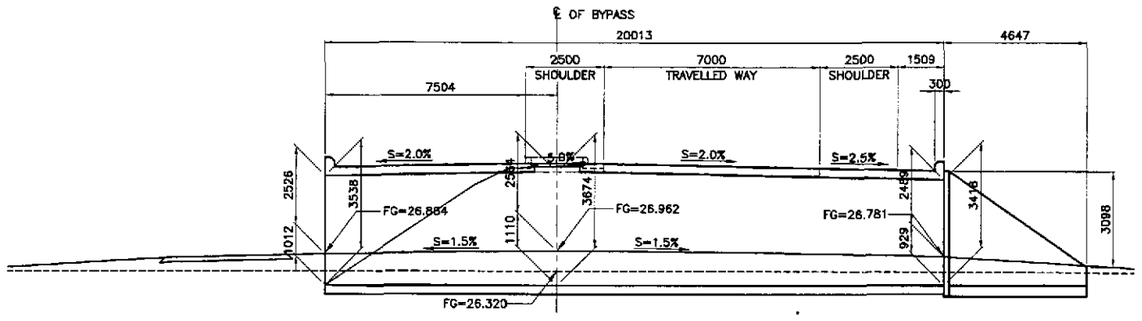
PROJECT AND LOCATION :	SCALE :	SHEET CONTENTS :	SHEET NO. :
THE DETAILED DESIGN STUDY ON UPGRADING INTER-URBAN HIGHWAY SYSTEM ALONG THE PAN-PHILIPPINE HIGHWAY (Plaridel, Cabanatuan and San Jose Bypasses)	1:40,000	SITE DEVELOPMENT PLAN UNDERPASSES ALONG BYPASS	UP-01
CABANATUAN BYPASS - CONTRACT PACKAGE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



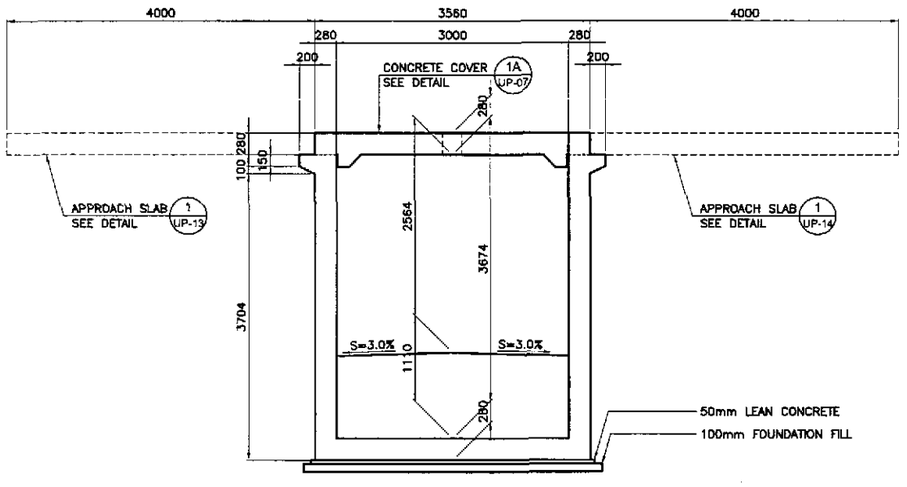
1 UP-02 GENERAL PLAN
SCALE 1:100



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

KATAHIRA & ENGINEERS INTERNATIONAL
YACHIYO ENGINEERING CO., LTD.

	DATE	SIGNATURE
DESIGNED	10/14/02	TEAM LEADER
CHECKED	10/14/02	AKIM
SUBMITTED	10/10/02	TEAM LEADER

REPUBLIC OF THE PHILIPPINES
DEPARTMENT OF PUBLIC WORKS AND HIGHWAYS

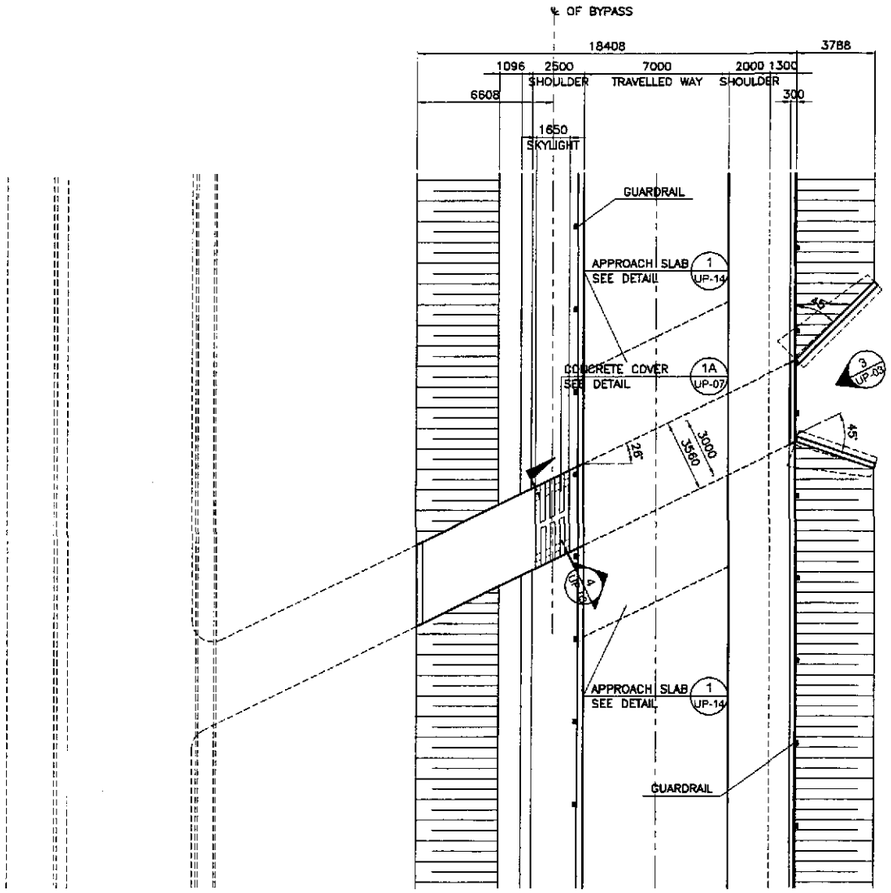
PJHL – PMO	BUREAU OF DESIGN		OFFICE OF THE SECRETARY	
Submitted By:	Reviewed By:	Recommended By:	Recommended By: (See cover sheet for Signature)	Approved By: (See cover sheet for Signature/Approval)
DANILO C. TRAJANO	JOSEFINA M. ALAGAR	GILBERTO S. REYES	MANUEL M. BONOAN	SIMEON A. DATUMANONG
Project Director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

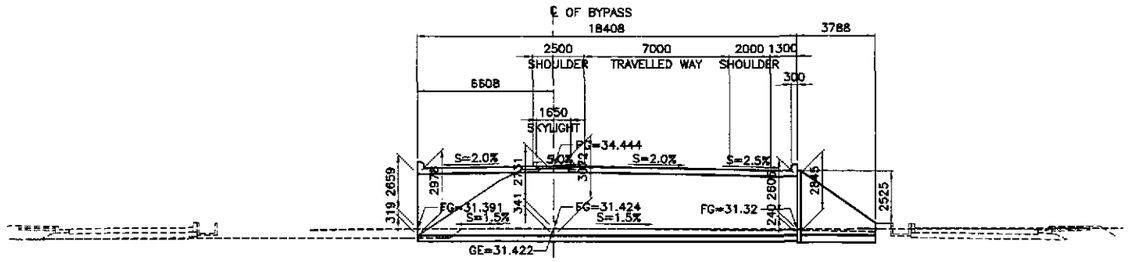
SCALE :
AS SHOWN
FULL SIZE A1

SHEET CONTENTS :
BOX CULVERT
GENERAL PLAN, ELEVATION & SECTION
(INITIAL STAGE)
B-6 (STA. 109+980.00)

SHEET NO. :
UP-02

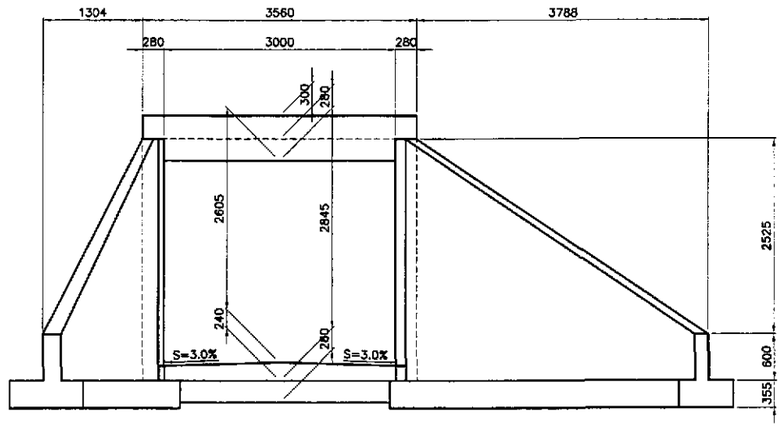


1 / UP-03 GENERAL PLAN
SCALE 1:150

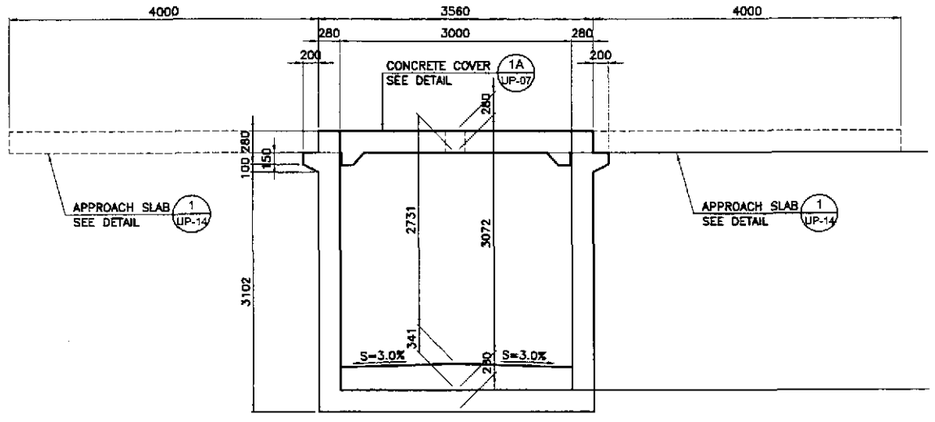


NOTE:
ALL THE DIMENSIONS ARE BASE ON LENGTH OF SKEW.

2 / UP-03 GENERAL ELEVATION
SCALE 1:150



3 / UP-03 ELEVATION
SCALE 1:40



4 / UP-03 SECTION
SCALE 1:40

JICA
JAPAN INTERNATIONAL COOPERATION AGENCY

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

	DATE	SIGNATURE
DESIGNED	10/16/02	M. ARAKI
CHECKED	10/16/02	A. HAKIM
SUBMITTED	10/18/02	TEAM LEADER

REPUBLIC OF THE PHILIPPINES
DEPARTMENT OF PUBLIC WORKS AND HIGHWAYS

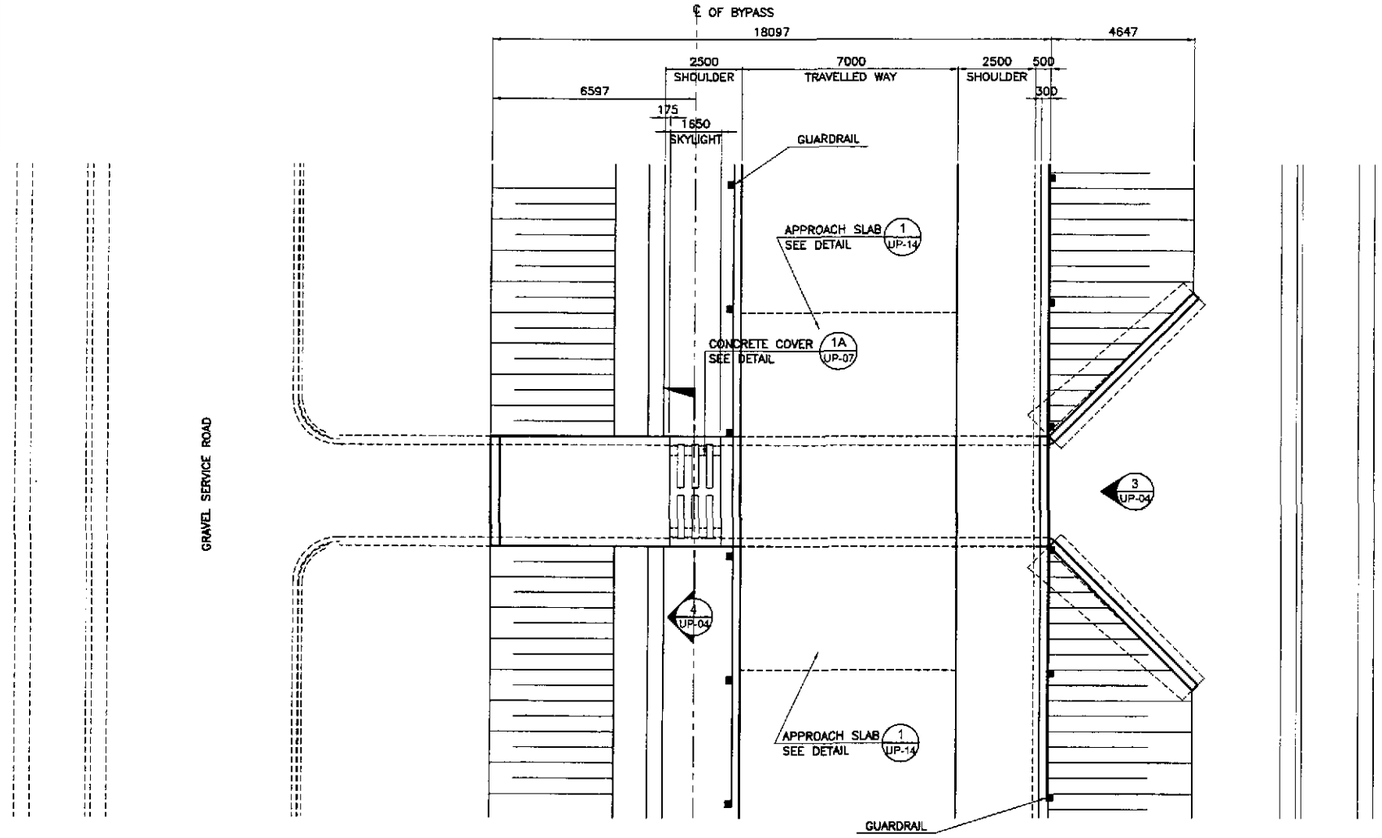
PJHL – PMO	BUREAU OF DESIGN		OFFICE OF THE SECRETARY	
Submitted By:	Reviewed By:	Recommended By:	Recommended By: (See cover sheet for Signature)	Approved By: (See cover sheet for Signature/Approval)
DANILO C. TRAJANO	JOSEFINA M. ALAGAR	GILBERTO S. REYES	MANUEL M. BONDAN	SIMEON A. DATUMANONG
Project Director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

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

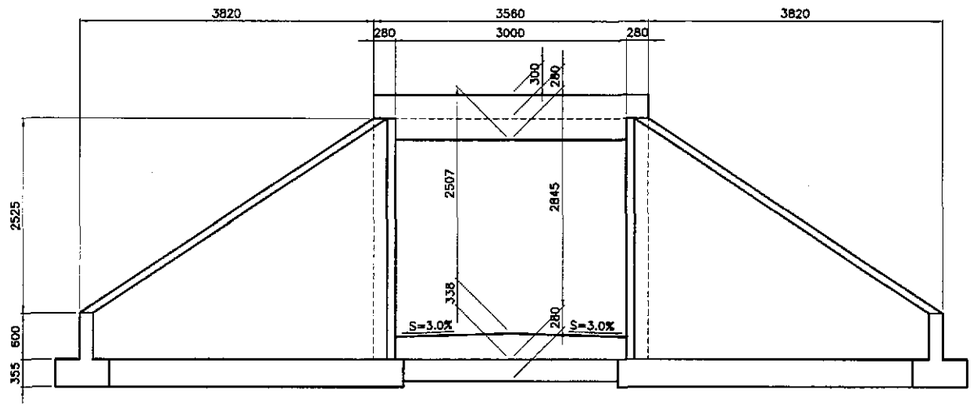
SCALE :
AS SHOWN
FULL SIZE A1

SHEET CONTENTS :
BOX CULVERT
GENERAL PLAN, ELEVATION & SECTION
(INITIAL STAGE)
B-7 (STA. 113+463.714)

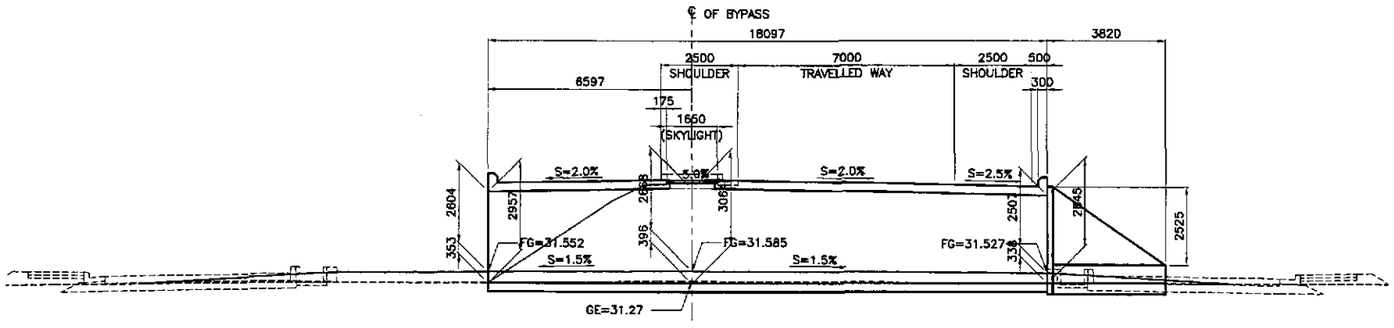
SHEET NO. :
UP-03



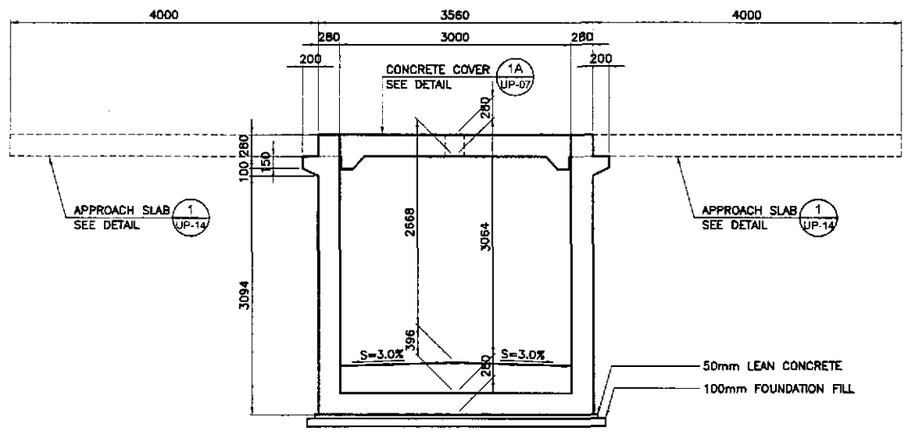
1 UP-04 GENERAL PLAN
SCALE 1:100



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	10/16/02	ARNEL PEREZ
CHECKED	10/16/02	H. KATAHIRA
SUBMITTED	10/16/02	K. KIUCHI TEAM LEADER

REPUBLIC OF THE PHILIPPINES
DEPARTMENT OF PUBLIC WORKS AND HIGHWAYS

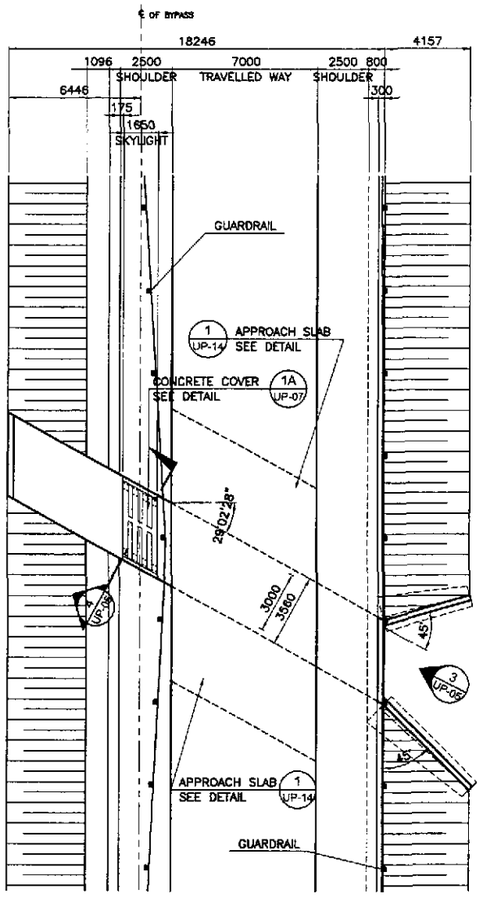
PJHL – PMO	BUREAU OF DESIGN		OFFICE OF THE SECRETARY	
Submitted By:	Reviewed By:	Recommended By:	Recommended By: (See cover sheet for Signature)	Approved By: (See cover sheet for Signature/Approval)
DANILO C. TRAJANO Project Director	JOSEFINA M. ALAGAR Chief, Highways Division	GILBERTO S. REYES OIC,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

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

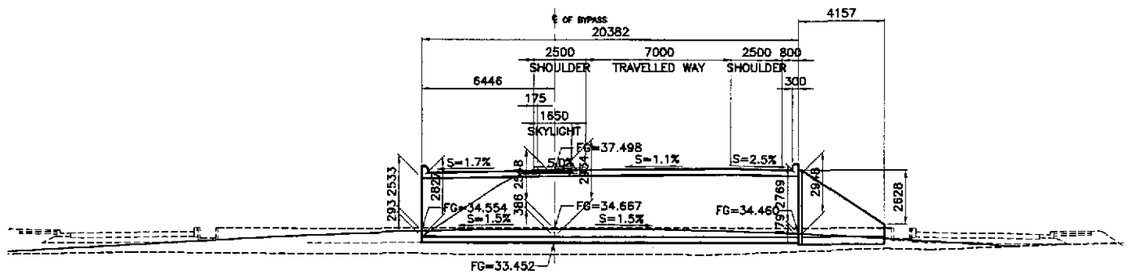
SCALE : AS SHOWN
FULL SIZE A1

SHEET CONTENTS :
BOX CULVERT
GENERAL PLAN, ELEVATION & SECTION
(INITIAL STAGE)
B-8 (STA. 115+160.00)

SHEET NO. : UP-04

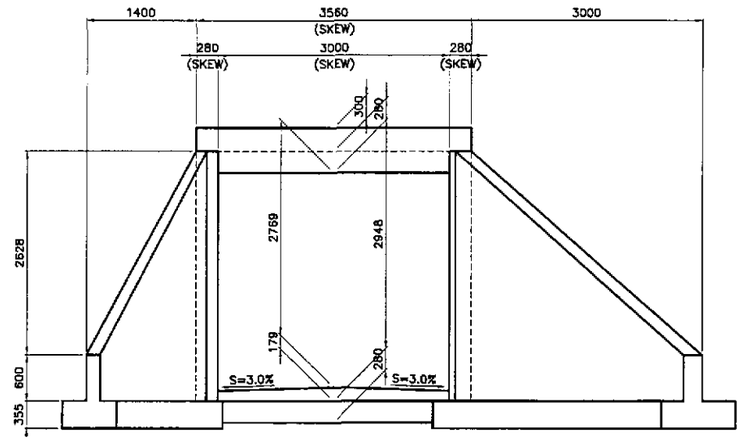


1 UP-05 GENERAL PLAN
SCALE 1:150

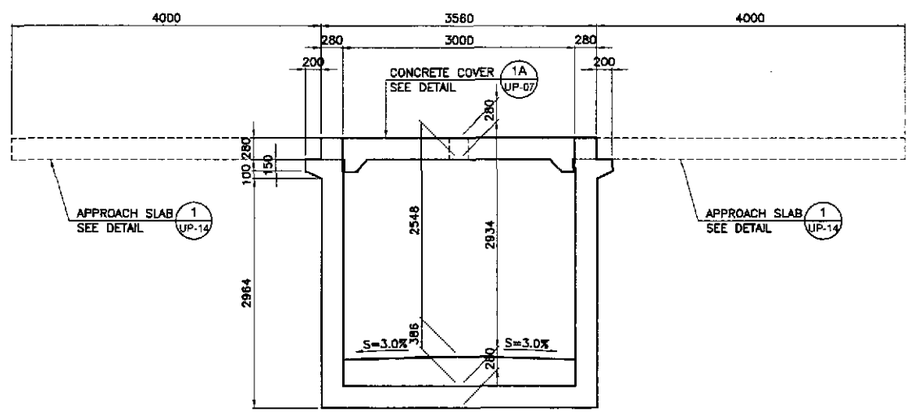


NOTE:
ALL THE DIMENSIONS ARE BASE ON LENGTH OF SKEW.

2 UP-05 GENERAL ELEVATION
SCALE 1:150



3 UP-05 ELEVATION
SCALE 1:40



4 UP-05 SECTION
SCALE 1:40

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

	DATE	SIGNATURE
DESIGNED	10/14/02	
CHECKED	10/14/02	HAKIM
SUBMITTED	10/14/02	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 :
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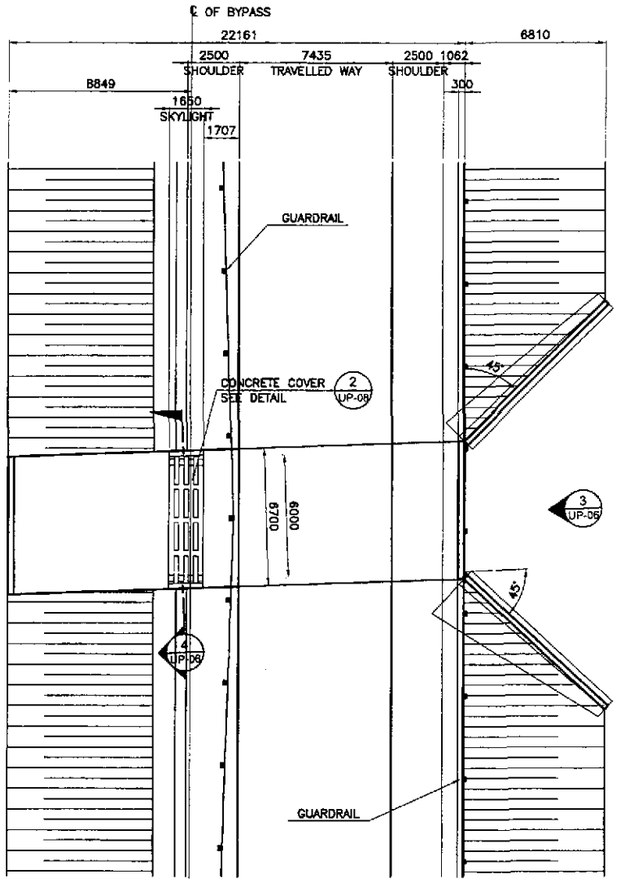
CABANATUAN BYPASS - CONTRACT PACKAGE II

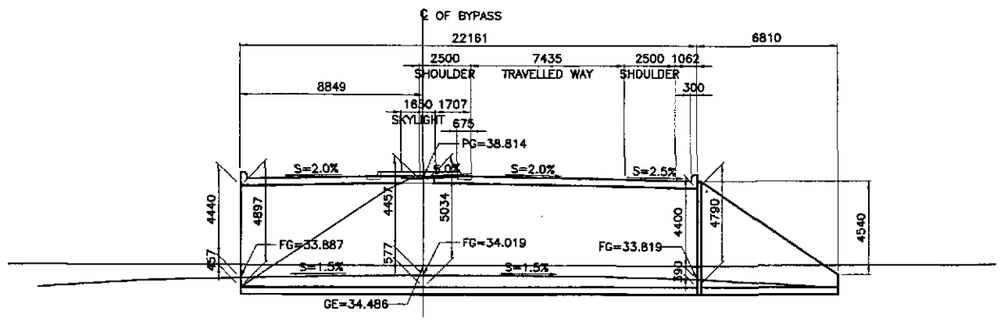
SCALE :
AS SHOWN
FULL SIZE A1

SHEET CONTENTS :
BOX CULVERT
GENERAL PLAN, ELEVATION & SECTION
(INITIAL STAGE)
B-9 (STA. 116+822.287)

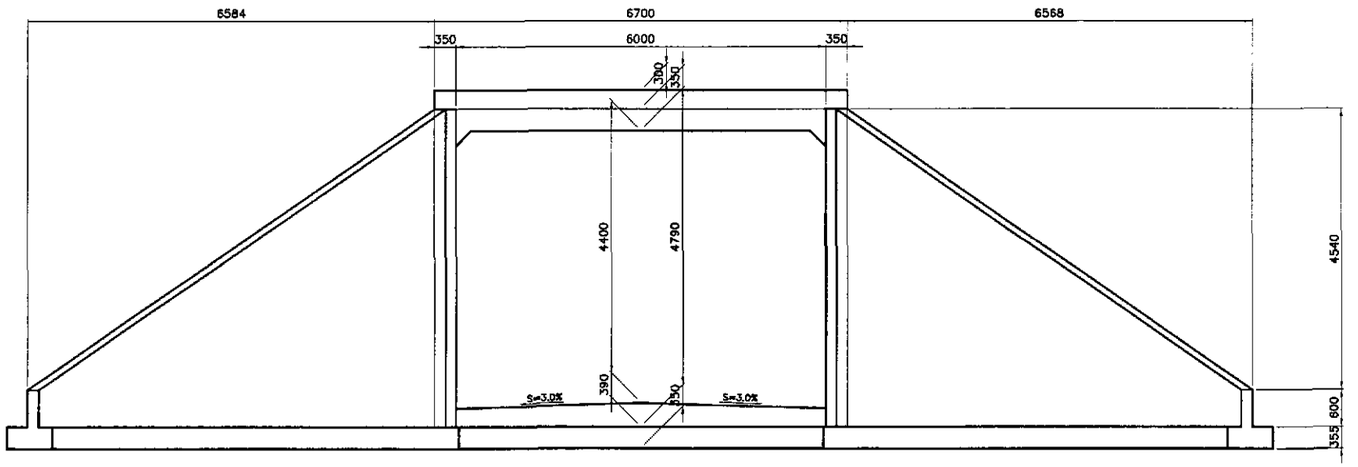
SHEET NO. :
UP-05



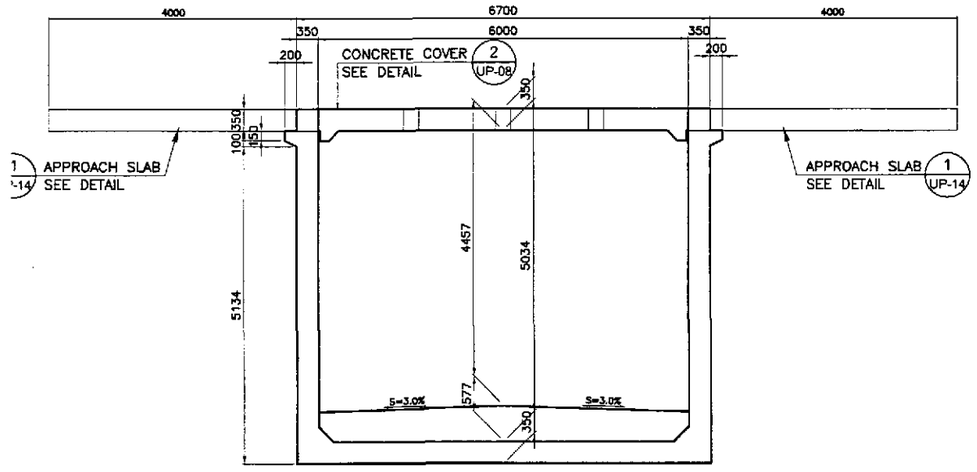
1 UP-06 GENERAL PLAN
SCALE 1:150



2 UP-06 GENERAL ELEVATION
SCALE 1:150



3 UP-06 ELEVATION
SCALE 1:50



4 UP-06 SECTION
SCALE 1:50

JICA
JAPAN INTERNATIONAL COOPERATION AGENCY

KATAHIRA & ENGINEERS INTERNATIONAL
YACHIYO ENGINEERING CO., LTD.

	DATE	SIGNATURE
DESIGNED	10/4/02	
CHECKED	10/16/02	
SUBMITTED	10/22/02	TEAM LEADER

REPUBLIC OF THE PHILIPPINES
DEPARTMENT OF PUBLIC WORKS AND HIGHWAYS

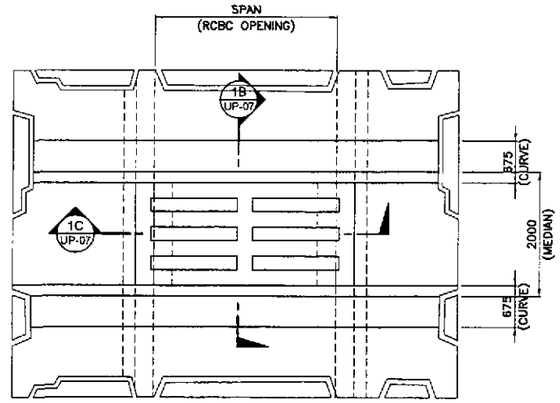
PJHL – PMO	BUREAU OF DESIGN		OFFICE OF THE SECRETARY	
Submitted By:	Reviewed By:	Recommended By:	Recommended By: (See cover sheet for Signature)	Approved By: (See cover sheet for Signature/Approval)
DANILO C. TRAJANO	JOSEFINA M. ALAGAR	GILBERTO S. REYES	MANUEL M. BONOAN	SIMEON A. DATUMANONG
Project Director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

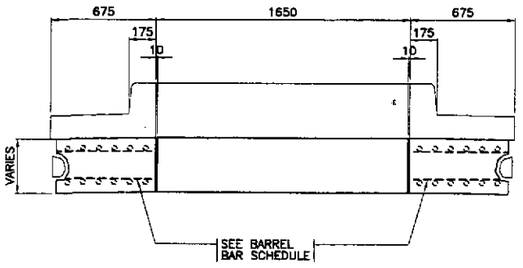
SCALE :
AS SHOWN
FULL SIZE A1

SHEET CONTENTS :
BOX CULVERT
GENERAL PLAN, ELEVATION & SECTION
(INITIAL STAGE)
B-10 (STA. 118+701.336)

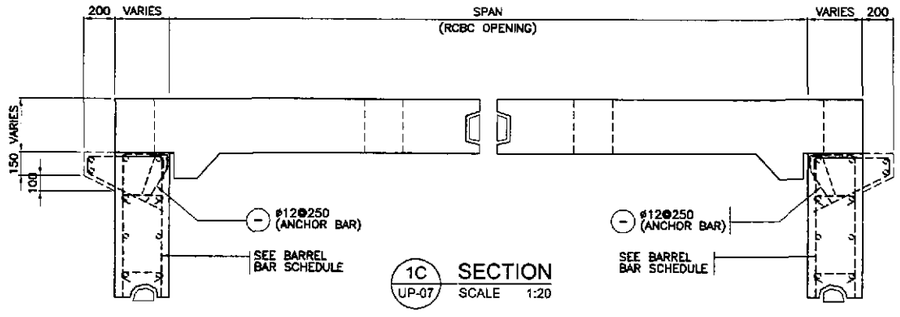
SHEET NO. :
UP-06



1A UP-07 PARTIAL PLAN
SCALE 1:50

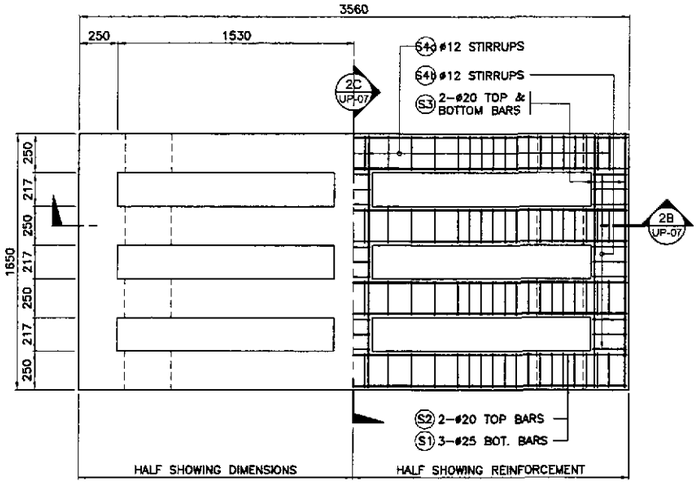


1B UP-07 SECTION
SCALE 1:20

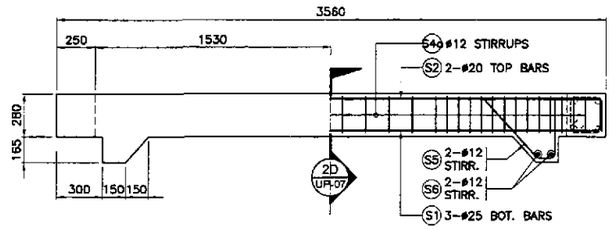


1C UP-07 SECTION
SCALE 1:20

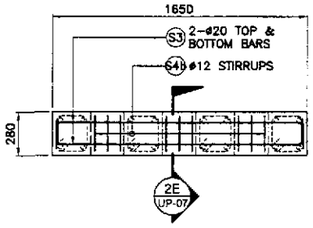
1 UP-07 PARTIAL BOX SUPPORT DETAILS
SCALE AS SHOWN



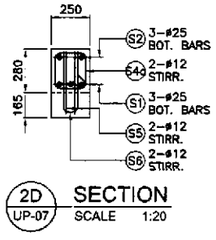
2A UP-07 PLAN DETAIL
SCALE 1:20



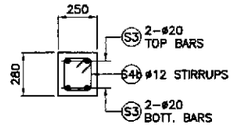
2B UP-07 SECTION
SCALE 1:20



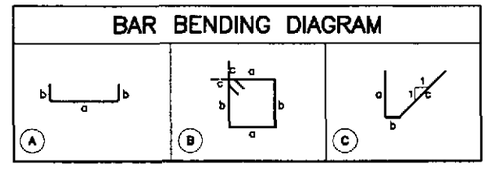
2C UP-07 SECTION
SCALE 1:20



2D UP-07 SECTION
SCALE 1:20



2E UP-07 SECTION
SCALE 1:20



2 UP-07 CONCRETE COVER DETAILS (3.0 M.)
SCALE AS SHOWN

SCHEDULE OF REINFORCEMENTS

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. (m^3)
3.0 M SPAN	S1	25	12	AS DWG	A	3510	206	–	–	–	–	3922	47.06	3.854	182	1.2
	S2	20	8	AS DWG	A	3510	206	–	–	–	–	3922	31.38	2.466	78	
	S3	20	12	AS DWG	A	1600	206	–	–	–	–	2012	24.14	2.466	60	
	S4a	12	144	AS DWG	B	200	206	115	–	–	–	1042	150.05	0.888	134	
	S4b	12	27	AS DWG	B	200	206	115	–	–	–	1042	28.13	0.888	25	
	S5	12	16	AS DWG	C	395	125	560	–	–	–	1080	17.28	0.888	16	
	S6	12	16	AS DWG	A	100	385	–	–	–	–	870	13.92	0.888	13	
													GRAND TOTAL =		508 KG	1.2

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

	DATE	SIGNATURE
DESIGNED	10/11/02	
CHECKED	10/11/02	
SUBMITTED	10/11/02	M. KUSUHARA TEAM LEADER

REPUBLIC OF THE PHILIPPINES
DEPARTMENT OF PUBLIC WORKS AND HIGHWAYS

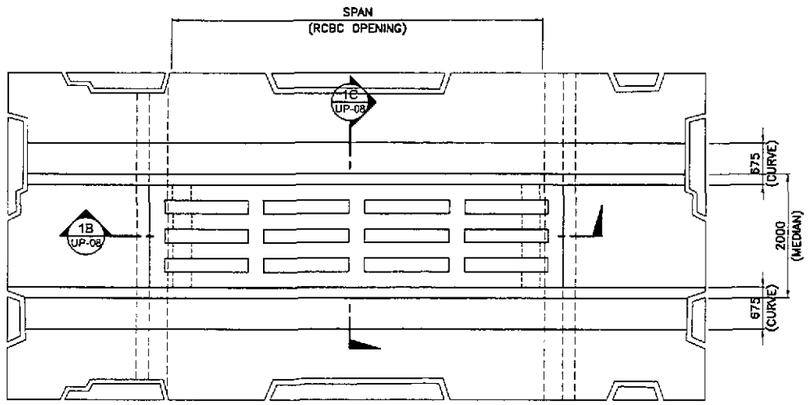
PJHL – PMO	BUREAU OF DESIGN		OFFICE OF THE SECRETARY	
Submitted By:	Reviewed By:	Recommended By:	Recommended By: (See cover sheet for Signature)	Approved By: (See cover sheet for Signature/Approval)
DANILO C. TRAJANO Project Director	JOSEFINA M. ALAGAR Chief, Highways Division	GILBERTO S. REYES OIC,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

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

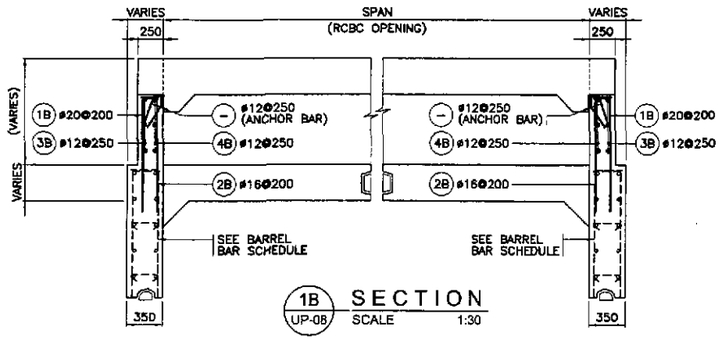
SCALE :
AS SHOWN
FULL SIZE A1

SHEET CONTENTS :
BOX CULVERT
CONCRETE COVER DETAILS (3.0 M.) WITH
BOX SUPPORT (RCBC OPENING)
(INITIAL STAGE)

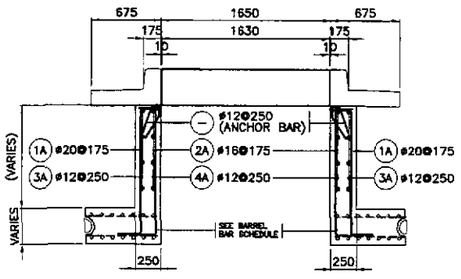
SHEET NO. :
UP-07



1A UP-08 PARTIAL PLAN SCALE 1:50

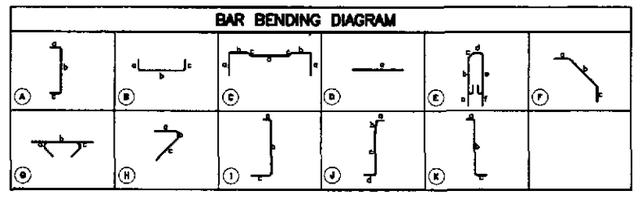


1B UP-08 SECTION SCALE 1:30



1C UP-08 SECTION SCALE 1:30

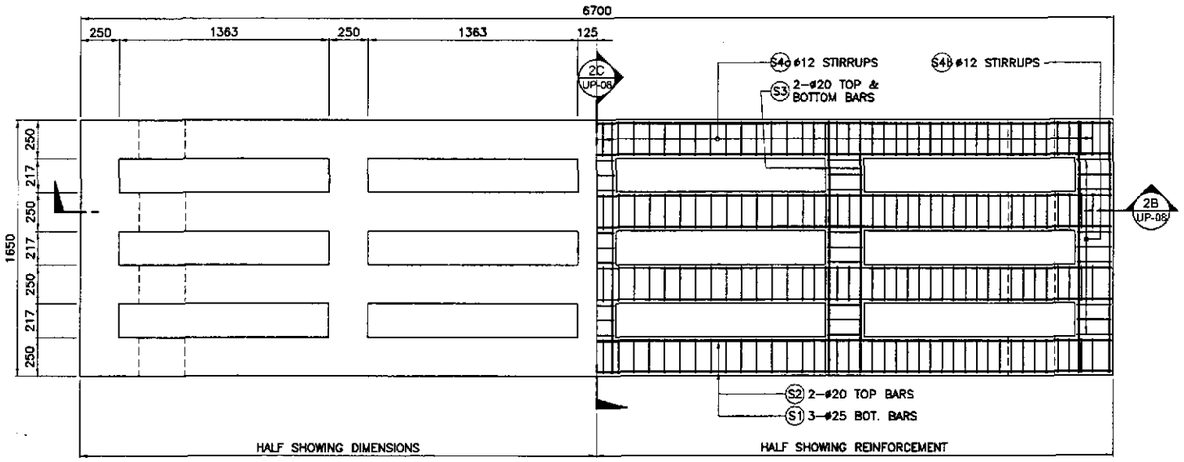
BAR BENDING DIAGRAM



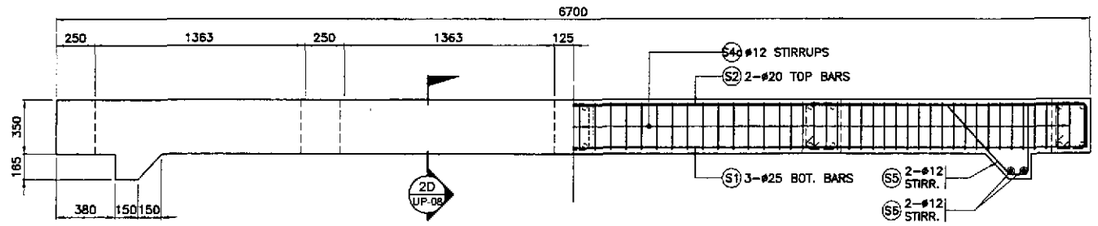
1 UP-08 PARTIAL BOX SUPPORT DETAILS SCALE AS SHOWN

SCHEDULE OF REINFORCEMENTS

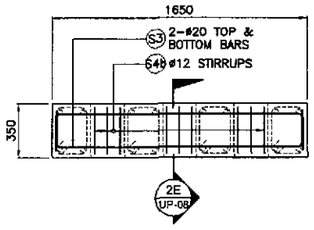
STRUCTURE COMMENT	BAR MARK	BAR SIZE	QTY.	SPACING	BAR SHAPE	DIMENSIONS (mm) a	b	c	d	e	f	LENGTH EA. BAR	TOTAL LENGTH	UNIT WT. (KG/M)	WEIGHT IN (KG)	VOLUME OF CONC. (m³)
BOX SUPPORT	1a	20	44	200	L	305	1330	–	–	–	–	1635	71.94	2.466	178	2.85
	1b	20	16	200	D	1330	–	–	–	–	–	1330	21.28	2.466	53	
	2a	16	44	200	L	254	1330	–	–	–	–	1584	69.7	1.579	111	
	2b	16	16	200	D	1330	–	–	–	–	–	1330	21.28	1.579	34	
	3a	12	12	250	B	203	3400	203	–	–	–	3806	45.67	0.888	41	
	3b	12	12	250	B	150	3400	150	–	–	–	3700	44.4	0.888	40	
	4a	12	12	250	B	203	1860	203	–	–	–	2266	27.19	0.888	25	
	4b	12	12	250	B	150	1860	150	–	–	–	2160	25.92	0.888	24	
	5	12	68	500	G	114	150	114	–	–	–	378	24.95	0.888	23	
												GRAND TOTAL =			529 KG	2.85



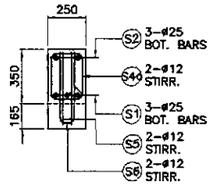
2A UP-08 PLAN SCALE 1:20



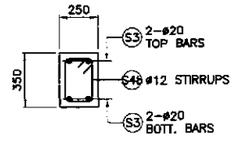
2B UP-08 SECTION SCALE 1:50



2C UP-08 SECTION SCALE 1:20



2D UP-08 SECTION SCALE 1:20



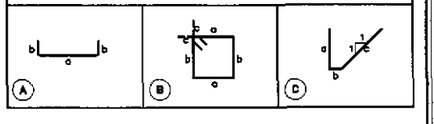
2E UP-08 SECTION SCALE 1:20

2 UP-08 CONCRETE COVER DETAILS (6.0 M.) SCALE AS SHOWN

SCHEDULE OF REINFORCEMENTS

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)
6.0 M SPAN	S1	32	8	AS DWG	A	5650	276	–	–	–	–	7202	57.62	6.313	364	2.7
	S2	20	8	AS DWG	A	5650	276	–	–	–	–	7202	57.62	2.466	143	
	S3	20	20	AS DWG	A	1600	276	–	–	–	–	2152	43.04	2.466	107	
	S4a	12	312	AS DWG	B	200	276	115	–	–	–	1182	368.78	0.888	328	
	S4b	12	45	AS DWG	B	200	276	115	–	–	–	1182	53.19	0.888	48	
	S5	12	16	AS DWG	C	465	125	660	–	–	–	1250	20	0.888	18	
	S6	12	16	AS DWG	A	100	465	–	–	–	–	1030	16.48	0.888	15	
														GRAND TOTAL =	1023 KG	2.7

BAR BENDING DIAGRAM



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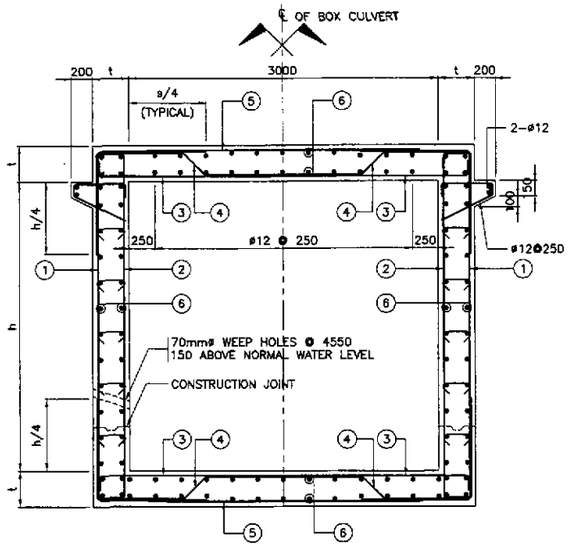
JAPAN INTERNATIONAL COOPERATION AGENCY
KEI KATAHIRA & ENGINEERS INTERNATIONAL
YEC YACHIYO ENGINEERING CO., LTD.

	DATE	SIGNATURE
DESIGNED	10/4/02	
CHECKED	10/16/02	HAKIM
SUBMITTED	10/18/02	TEAM LEADER

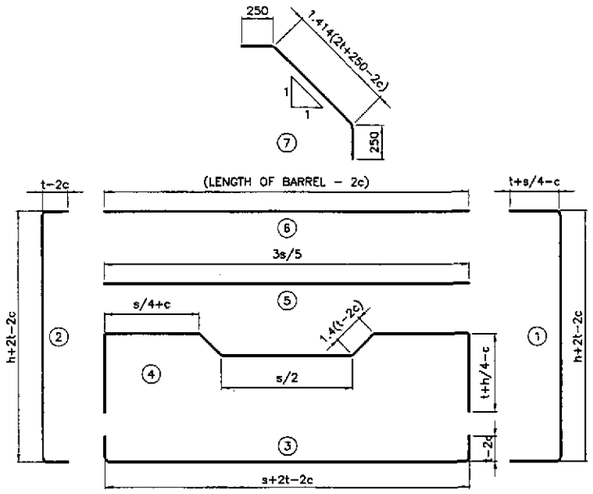
REPUBLIC OF THE PHILIPPINES
DEPARTMENT OF PUBLIC WORKS AND HIGHWAYS

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

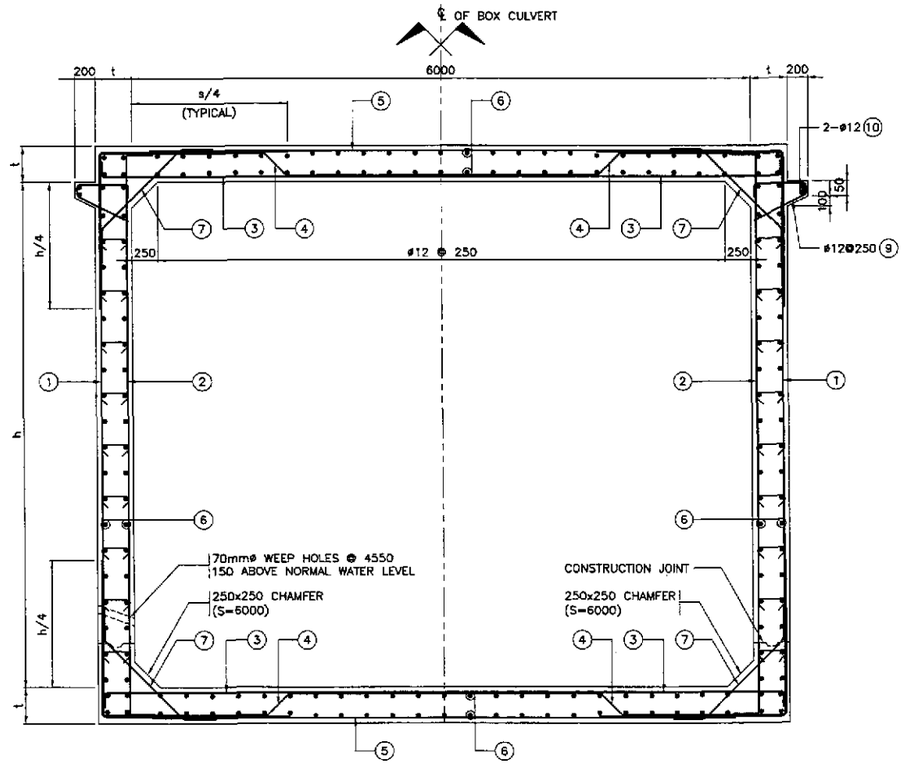
PROJECT AND LOCATION :	SCALE :	SHEET CONTENTS :	SHEET NO. :
THE DETAILED DESIGN STUDY ON UPGRADING INTER-URBAN HIGHWAY SYSTEM ALONG THE PAN-PHILIPPINE HIGHWAY (Plaridel, Cabanatuan and San Jose Bypasses) CABANATUAN BYPASS - CONTRACT PACKAGE II	AS SHOWN FULL SIZE A1	BOX CULVERT CONCRETE COVER DETAILS (6.0 M.) WITH BOX SUPPORT (RCBC OPENING) (INITIAL STAGE)	UP-08



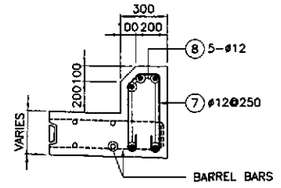
1 UP-09 **SECTION - SINGLE BARREL**
NOT TO SCALE



3 UP-09 **BAR BENDING DIAGRAM - SINGLE BARREL**
NOT TO SCALE



2 UP-09 **SECTION - SINGLE BARREL**
NOT TO SCALE



4 UP-09 **PARAPET DETAIL**
SCALE 1:20

DESIGN NOTES :

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

LOAD FACTORS:

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:
ULTIMATE SHEAR, $v = 0.16\sqrt{f'c}$ 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-6	3000	370	280	16	200	16	180	16	200	16	200	12	200	12	250	–	–	FLUSHED TO ROADWAY
B-7	3000	3100	280	20	200	16	180	20	200	20	200	16	200	12	250	–	–	FLUSHED TO ROADWAY (SKEW 26° RF)
B-8	3000	3100	280	16	200	16	180	16	200	16	200	12	200	12	250	–	–	FLUSHED TO ROADWAY
B-9	3000	2900	280	16	200	16	180	16	200	16	200	12	200	12	250	–	–	FLUSHED TO ROADWAY
B-10	6000	5000	350	20	200	20	200	20	200	20	200	12	200	12	250	16	200	FLUSHED TO ROADWAY

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yec YACHIYO ENGINEERING CO., LTD.

	DATE	SIGNATURE
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CHECKED	10/1/02	
SUBMITTED	10/1/02	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. BONGAN	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)
CABANATUAN BYPASS - CONTRACT PACKAGE II

SCALE : AS SHOWN
FULL SIZE A1

SHEET CONTENTS :
BOX CULVERT
SPECIAL RCBC BARREL DETAILS
(INITIAL STAGE)

SHEET NO. :
UP-09

SCHEDULE OF REINFORCEMENTS (B6 – STA. 109+180.00)

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=20.013m.	1	16	202	200	A	980	4008	980	–	–	–	5966	1205.13	1.579	1903	81.24
	2	16	222	180	A	180	4008	180	–	–	–	4366	969.25	1.579	1531	
	3	16	202	200	B	180	3460	180	–	–	–	3820	771.64	1.579	1219	
	4	16	200	200	C	1116	800	255	1500	–	–	5842	1168.42	1.579	1845	
	5	12	202	200	D	2000	–	–	–	–	–	2000	404	0.888	359	
	6	12	128	250	D	19913	–	–	–	–	–	19913	2548.86	0.888	2264	
	7	12	30	250	E	114	380	71	150	480	114	1309	39.26	0.888	35	
	8	12	10	AS DWG	D	3480	–	–	–	–	–	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)=3.826m.	W1	12	4	AS DWG	D	600	8259	–	–	–	–	8859	35.44	0.888	32	20.05
	W2	12	28	300	D	4002	–	–	–	–	–	4002	104.04	0.888	93	
	W3a	25	30	200	I	1213	3384	150	–	–	–	4747	142.41	3.854	549	
	W3b	16	24	175	I	753	2174	150	–	–	–	3077	73.85	1.579	117	
	W3c	12	8	350	I	703	1233	150	–	–	–	2086	16.69	0.888	15	
	W4	12	48	300	I	203	2443	150	–	–	–	2796	134.21	0.888	120	
	W5a	25	14	400	D	1897	–	–	–	–	–	1897	26.56	3.854	103	
	W5b	20	12	350	D	1458	–	–	–	–	–	1458	17.5	2.466	44	
	W5c	12	8	350	D	815	–	–	–	–	–	815	6.52	0.888	6	
	W6	12	14	AS DWG	D	7122	–	–	–	–	–	7122	99.71	0.888	89	
													GRAND TOTAL =		10438 KG	101.3

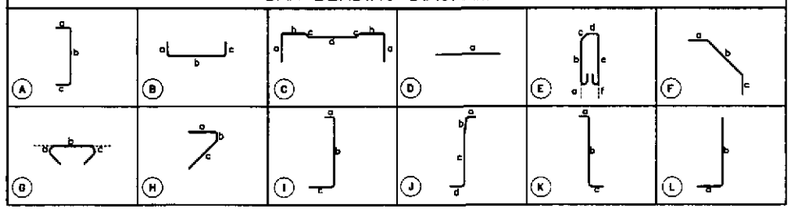
SCHEDULE OF REINFORCEMENTS (B7 – STA. 113+463.714)

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=20.522m.	1	16	208	200	A	980	3418	980	–	–	–	5378	1118.73	1.579	1767	78.25
	2	16	228	180	A	180	3418	180	–	–	–	3778	861.5	1.579	1361	
	3	16	208	200	A	180	3460	180	–	–	–	3820	794.56	1.579	1255	
	4	16	206	200	B	970	800	255	1500	–	–	5548	1142.96	1.579	1805	
	5	12	208	200	C	2000	–	–	–	–	–	2000	416	0.888	370	
	6	12	120	250	C	20422	–	–	–	–	–	20422	2450.64	0.888	2177	
	7	12	32	250	E	114	380	71	150	480	114	1309	41.88	0.888	38	
	8	12	10	AS DWG	D	3449	–	–	–	–	–	3449	34.49	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	
WINGWALL (h+t)=3.238m. L=5.856m.	W1	12	2	AS DWG	D	600	6798	–	–	–	–	7398	14.8	0.888	14	7.31
	W2	12	11	300	D	3396	–	–	–	–	–	3396	37.35	0.888	34	
	W3a	20	12	200	I	830	2919	150	–	–	–	3899	46.79	2.466	116	
	W3b	16	7	250	I	730	1929	150	–	–	–	2809	19.67	1.579	32	
	W3c	12	3	350	I	680	1160	150	–	–	–	1990	5.97	0.888	6	
	W4	12	20	300	I	203	2149	150	–	–	–	2502	50.05	0.888	45	
	W5a	25	5	400	D	1715	–	–	–	–	–	1715	8.58	3.854	34	
	W5b	16	7	250	D	1229	–	–	–	–	–	1229	8.6	1.579	14	
	W5c	12	3	350	D	822	–	–	–	–	–	822	2.47	0.888	3	
	W6	12	7	AS DWG	D	5906	–	–	–	–	–	5906	41.34	0.888	37	
WINGWALL (h+t)=3.238m. L=4.483m.	W1	12	2	AS DWG	D	800	5384	–	–	–	–	5984	11.97	0.888	11	5.82
	W2	12	11	300	D	2877	–	–	–	–	–	2677	29.44	0.888	27	
	W3a	20	10	200	I	830	2919	150	–	–	–	3899	38.99	2.466	97	
	W3b	16	5	250	I	730	1929	150	–	–	–	2809	14.05	1.579	23	
	W3c	12	3	350	I	680	1160	150	–	–	–	1990	5.97	0.888	6	
	W4	12	16	300	I	203	2149	150	–	–	–	2502	40.04	0.888	36	
	W5a	25	4	400	D	1715	–	–	–	–	–	1715	6.86	3.854	27	
	W5b	16	5	250	D	1229	–	–	–	–	–	1229	6.14	1.579	10	
	W5c	12	3	350	D	822	–	–	–	–	–	822	2.47	0.888	3	
	W6	12	7	AS DWG	D	4730	–	–	–	–	–	4730	33.11	0.888	30	
													GRAND TOTAL =		9492 KG	89.4

SCHEDULE OF REINFORCEMENTS (B8 – STA. 115+160.00)

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=18.087m.	1	16	182	200	A	980	3418	980	–	–	–	5378	978.89	1.579	1546	67.67
	2	16	202	180	A	180	3418	180	–	–	–	3778	763.26	1.579	1206	
	3	16	182	200	B	180	3460	180	–	–	–	3820	695.24	1.579	1098	
	4	16	180	200	C	970	800	255	1500	–	–	5548	998.71	1.579	1577	
	5	12	182	200	D	2000	–	–	–	–	–	2000	364	0.888	324	
	6	12	120	250	D	17997	–	–	–	–	–	17997	2159.64	0.888	1918	
	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)=3.236m.	W1	12	4	AS DWG	D	600	6798	–	–	–	–	7398	29.59	0.888	27	14.62
	W2	12	22	300	D	3396	–	–	–	–	–	3396	74.7	0.888	67	
	W3a	20	24	200	I	830	2919	150	–	–	–	3899	93.57	2.466	231	
	W3b	16	14	250	I	730	1929	150	–	–	–	2809	39.33	1.579	63	
	W3c	12	6	350	I	680	1160	150	–	–	–	1990	11.94	0.888	11	
	W4	12	40	300	I	203	2149	150	–	–	–	2502	100.09	0.888	89	
	W5a	25	10	400	D	1715	–	–	–	–	–	1715	17.15	3.854	67	
	W5b	16	14	250	D	1229	–	–	–	–	–	1229	17.2	1.579	28	
	W5c	12	6	350	D	822	–	–	–	–	–	822	4.93	0.888	5	
	W6	12	14	AS DWG	D	5906	–	–	–	–	–	5906	82.69	0.888	74	
													GRAND TOTAL =		8480 KG	82.3

BAR BENDING DIAGRAM



SCHEDULE OF REINFORCEMENTS (B10 – STA. 118+701.336)

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=22.175m.	1	20	224	200	A	1800	5512	1800	–	–	–	9112	2041.09	2.466	5034	182.63
	2	20	222	200	A	250	5512	250	–	–	–	6012	1334.65	2.466	3292	
	3	20	224	200	B	250	6600	250	–	–	–	7100	1580.4	2.466	3922	
	4	20	222	200	C	1528	1550	354	3000	–	–	9863	2189.61	2.466	5400	
	5	12	224	200	D	4000	–	–	–	–	–	4000	896	0.888	796	
	6	12	200	250	D	22075	–	–	–	–	–	22075	4414.9	0.888	3921	
	7	16	112	200	D	22075	–	–	–	–	–	22075	2472.34	1.579	3904	
	8	16	68	200	E	114	450	71	150	550	114	1449	98.51	1.579	156	
	9	12	10	AS DWG	D	6600	–	–	–	–	–	6600	66	0.888	59	
	10	12	38	250	H	500	70	707	–	–	–	1277	74.07	0.888	66	
	11	12	4	AS DWG	D	6904	–	–	–	–	–	5904	27.62	0.888	25	
WINGWALL (h+t)=5.262m. L=9.931m.	W1	12	2	AS DWG	D	600	11935	–	–	–	–	12535	25.07	0.888	23	20.12
	W2	12	18	300	D	5530	–	–	–	–	–	5530	99.54	0.888	89	
	W3a	32	24	175	I	1760	4521	150	–	–	–	8431	154.34	6.313	975	
	W3b	25	16	200	I	1270	2772	150	–	–	–	4192	67.08	3.854	259	
	W3c	16	6	350	I	810	1413	150	–	–	–	2373	14.24	1.579	23	
	W4	12	34	300	I	203	3161	150	–	–	–	3514	119.48	0.888	107	
	W5a	25	23	175	D	2344	–	–	–	–	–	2344	53.92	3.854	208	
	W5b	25	8	400	D	1900	–	–	–	–	–	1900	15.2	3.854	59	
	W5c	16	6	350	D	1135	–	–	–	–	–	1135	6.81	1.579	11	
	W6	12	7	AS DWG	D	10181	–	–	–	–	–	10181	71.27	0.888	64	
WINGWALL (h+t)=5.262m. L=9.812m.	W1	12	2	AS DWG	D	600	11552	–	–	–	–	12152	24.3	0.888	22	19.48
	W2	12	18	300	D	5350	–	–	–	–	–	5350	96.31	0.888	86	
	W3a	32	23	175	I	1760	4521	150	–	–	–	8431	147.81	6.313	934	
	W3b	25	15	200	I	1270	2772	150	–	–	–	4192	62.89	3.854	243	
	W3c	16	6	350	I	810	1413	150	–	–	–	2373	14.24	1.579	23	
	W4	12	33	300	I	203	3161	150	–	–	–	3514	115.98	0.888	103	
	W5a	25	22	175	D	2344	–	–	–	–	–	2344	51.58	3.854	199	
	W5b	25	7	400	D	1900	–	–	–	–	–	1900	13.3	3.854	52	
	W5c	16	6	350	D	1135	–	–	–	–	–	1135	6.81	1.579	11	
	W6	12	7	AS DWG	D	9862	–	–	–	–	–	9862	69.03	0.888	62	
													GRAND TOTAL =		30128 KG	222.23

SCHEDULE OF REINFORCEMENTS (B9 – STA. 116+822.287)

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=20.886m.	1	16	210	200	A	1050	3481	1050	–	–	–	5581	1172.06	1.579	1851	97.74
	2	16	232	180	A	250	3481	250	–	–	–	3981	923.65	1.579	1459	
	3	16	210	200	A	250	3600	250	–	–	–	4100	861	1.579	1360	
	4	16	208	200	B	1020	800	354	1500	–	–	5848	1216.33	1.579	1921	
	5	12	210	200	C	2000	–	–	–	–	–	2000	420	0.888	373	
	6	12	120	250	C	20786	–	–	–	–	–	20786	2491.95	0.888	2213	
	7	12	34	250	E	114	450	71	150	550	114	1449	49.26	0.888	44	
	8	12	10	AS DWG	D	3586	–	–	–	–	–	3586	35.86	0.888	32	
	9	12	58	250	H	500	70	707	–	–	–	1277	74.07	0.888	66	
	10	12	4	AS DWG	D	6900	–	–	–	–	–	6900	27.6	0.888	25	
WINGWALL (h+t)=3.231m. L=6.023m.	W1	12	2	AS DWG	D	600	7239	–	–	–	–	7839	15.68	0.888	14	7.88
	W2	12	11	300	D	3620	–	–	–	–	–	3620	39.82	0.888	36	
	W3a	25	13	200	I	1189	2913	150	–	–	–	4252	55.28	3.854	214	
	W3b	16	7	250	I	729	1926	150	–	–	–	2805	19.64	1.579	32	
	W3c	12	4	350	I	679	1159	150	–	–	–	1988	7.95	0.888	8	
	W4	12	21	300	I	203	2146	150	–	–	–	2499	52.47	0.888	47	
	W5a	25	6	400	D	1808	–	–	–	–	–	1808	10.85	3.854	42	
	W5b	16	7	250	D	1224	–	–	–	–	–	1224	8.57	1.579	14	
	W5c	12	4	350	D	820	–	–	–	–	–	820	3.28	0.888	3	
	W6	12	7	AS DWG	D	6273	–	–	–	–	–	6273	43.91	0.888	39	
WINGWALL (h+t)=3.231m. L=4.510m.	W1	12	2	AS DWG	D	600	5420	–	–	–	–	6020	12.04	0.888	11	5.83
	W2	12	11	300	D	2695	–	–	–	–	–	2695	29.65	0.888	27	
	W3a	25	10	200	I	1189	2913	150	–	–	–	4252	42.52	3.854	164	
	W3b	16	5	250	I	729	1926	150	–	–	–	2805	14.03	1.579	23	
	W3c	12	3	350	I	679	1159	150	–	–	–	1988	5.96	0.888	6	
	W4	12	16	300	I	203	2146	150	–	–	–	2499	39.98	0.888	36	
	W5a	25	4	400	D	1808	–	–	–	–	–	1808	7.23	3.854	28	
	W5b	16	5	250	D	1224	–	–	–	–	–	1224	6.12	1.579	10	
	W5c	12	3	350	D	820	–	–	–	–	–	820	2.46	0.888	3	
	W6	12	7	AS DWG	D	4760	–	–	–	–	–	4760	33.32	0.888	30	
													GRAND TOTAL =		10131 KG	111.53

JICA
JAPAN INTERNATIONAL COOPERATION AGENCY

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

	DATE	SIGNATURE
DESIGNED	10/14/02	J.M. CHAN
CHECKED	10/16/02	A. HAKIM
SUBMITTED	10/18/02	M. KUCHAI TEAM LEADER

REPUBLIC OF THE PHILIPPINES
DEPARTMENT OF PUBLIC WORKS AND HIGHWAYS

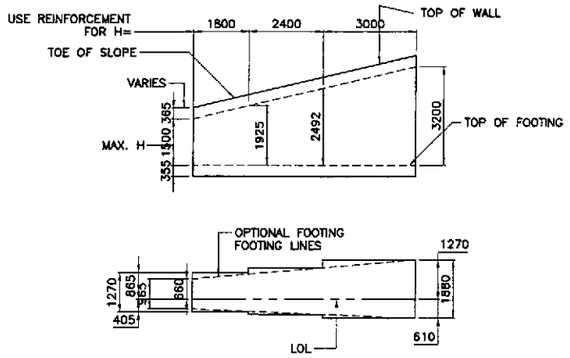
PJHL – PMO	BUREAU OF DESIGN		OFFICE OF THE SECRETARY	
Submitted By:	Reviewed By:	Recommended By:	Recommended By: (See cover sheet for Signature)	Approved By: (See cover sheet for Signature/Approval)
DANILO C. TRAJANO	JOSEFINA M. ALAGAR	GILBERTO S. REYES	MANUEL M. BONDAN	SIMEON A. DATUMANONG
Project Director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

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

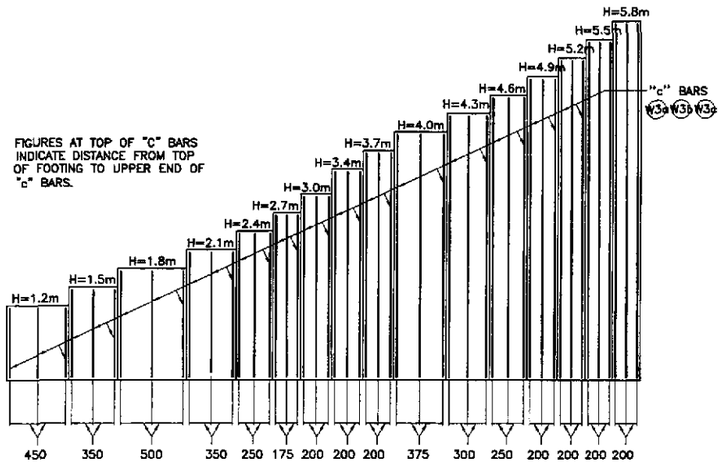
SCALE :
AS SHOWN
FULL SIZE A1

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

SHEET NO. :
UP-10



1 UP-11 TYPICAL LAYOUT EXAMPLE
SCALE 1:100



REINFORCED CONCRETE WINGWALLS																
H	1200	1500	1800	2100	2400	2700	3000	3400	3700	4000	4300	4600	4900	5200	5500	5800
W	965	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

NOTES

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

MAXIMUM TOE PRESSURE = 160 kPa

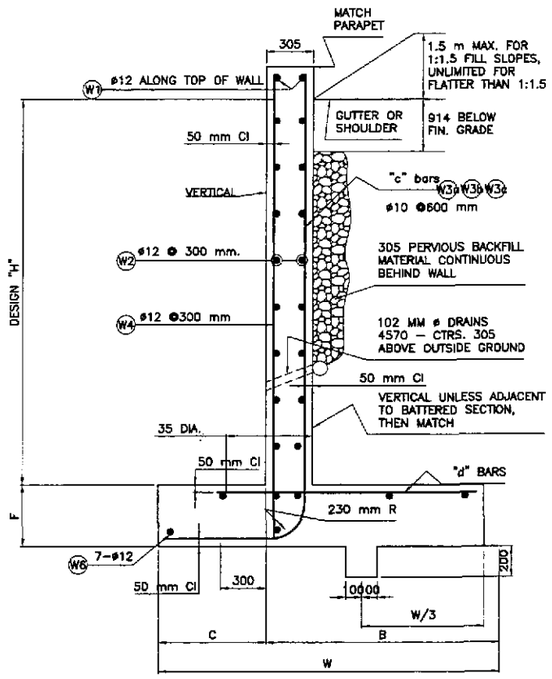
ELEVATIONS, LENGTH AND ANGLE OF FLARE OF WINGS MAY BE VARIED BY THE ENGINEER TO SUIT CONDITIONS ENCOUNTERED IN THE FIELD. WALLS DESIGNED FOR 600 mm LIVELOAD SURCHARGE, 1 : 1.5 SLOPING SURCHARGE NOT TO EXCEED 1.5 m IN ELEVATION PLUS 600 mm LIVELOAD SURCHARGE, OR UNLIMITED 1:2 SURCHARGE

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

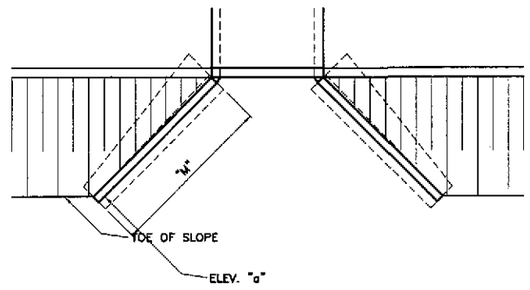
WALL HEIGHT MAY BE EXCEEDED BY 150 mm BEFORE GOING TO NEXT GREATER "H".

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

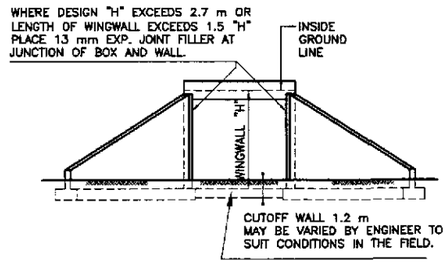
FOR WALL OFFSET VALUES, SEE STANDARD PLAN B3-8



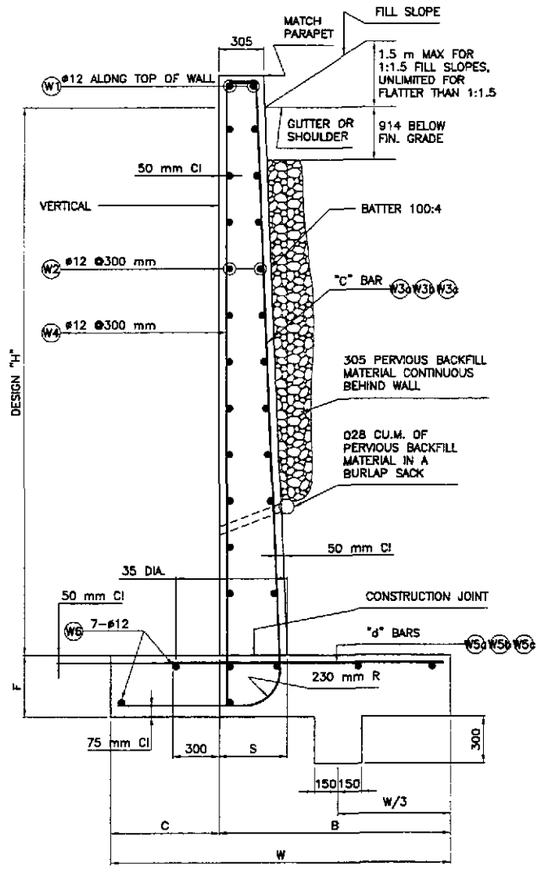
2 UP-11 TYPICAL SECTION H=1.2 m THRU 3.7 m
SCALE 1:20



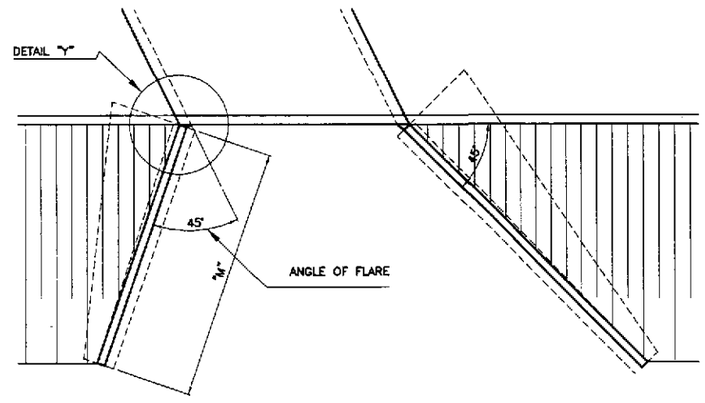
4 UP-11 PLAN
SCALE 1:100



5 UP-11 END ELEVATION
SCALE 1:100



3 UP-11 TYPICAL SECTION H=4.0 m THRU 4.9 m
SCALE 1:20



6 UP-11 PLAN
SCALE 1:100

JICA
JAPAN INTERNATIONAL COOPERATION AGENCY

KATAHIRA & ENGINEERS INTERNATIONAL
YACHIYO ENGINEERING CO., LTD.

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

REPUBLIC OF THE PHILIPPINES
DEPARTMENT OF PUBLIC WORKS AND HIGHWAYS

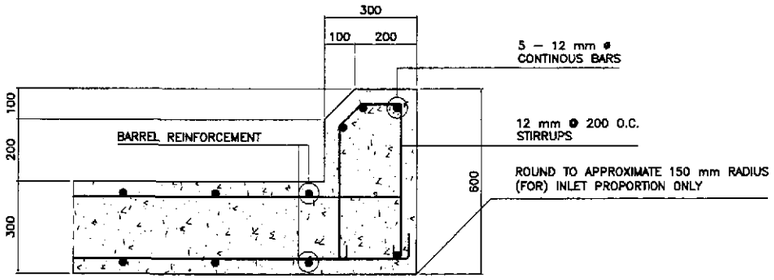
PJHL – PMO	BUREAU OF DESIGN		OFFICE OF THE SECRETARY	
Submitted By:	Reviewed By:	Recommended By:	Recommended By: (See cover sheet for Signature)	Approved By: (See cover sheet for Signature/Approval)
DANILO C. TRAJANO	JOSEFINA M. ALAGAR	GILBERTO S. REYES	MANUEL M. BONGAN	SIMEON A. DATUMANONG
Project Director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

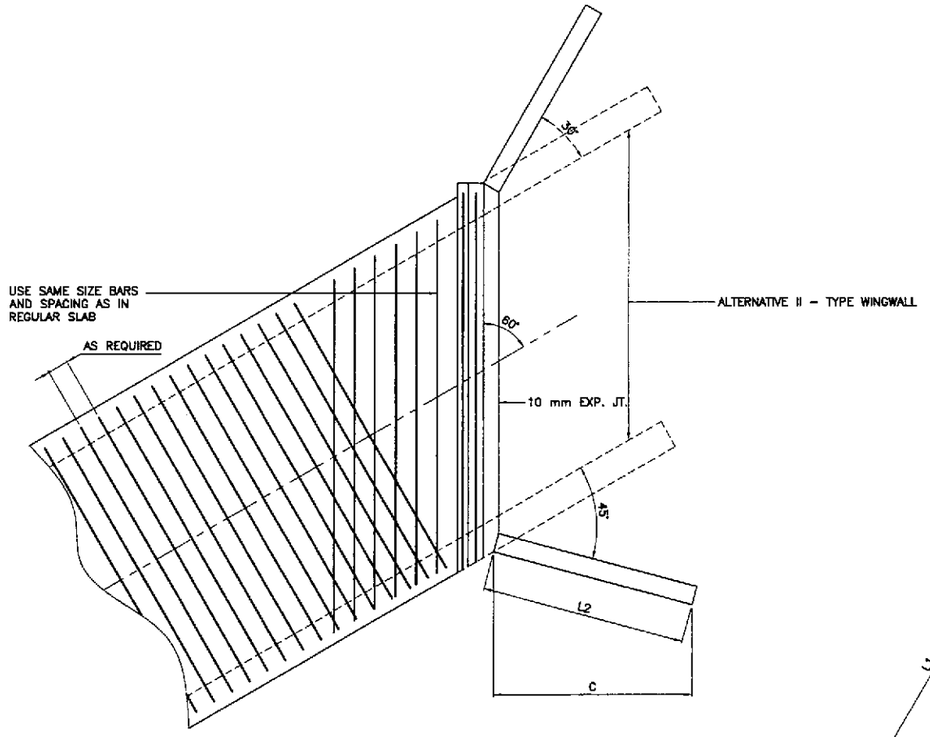
SCALE : AS SHOWN FULL SIZE A1

SHEET CONTENTS :
BOX CULVERT
WINGWALL DETAIL
(INITIAL STAGE)

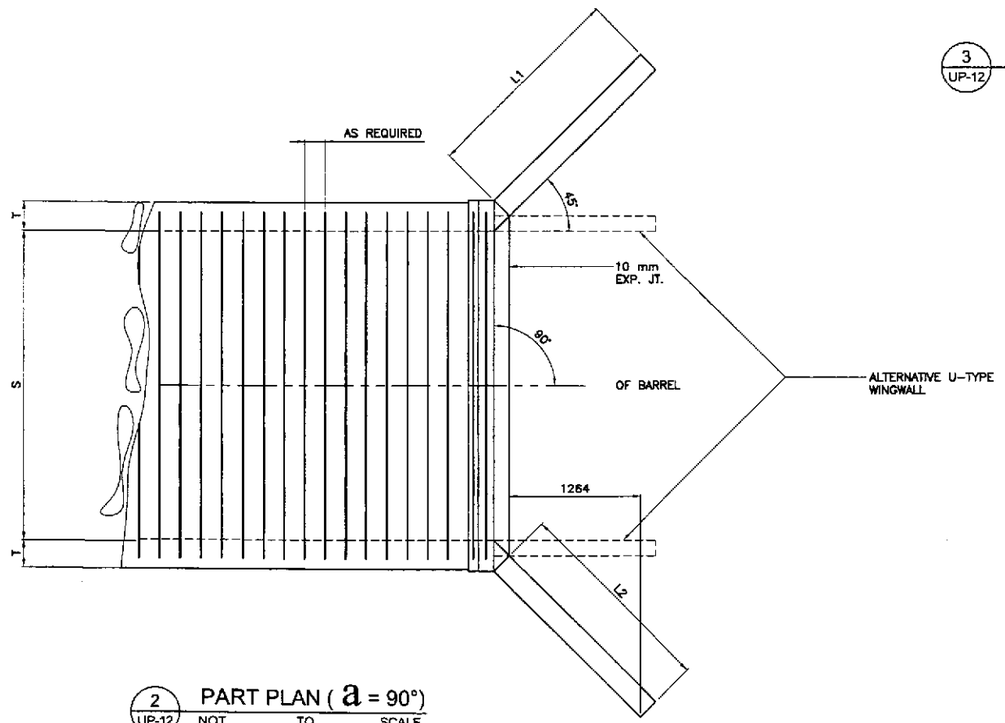
SHEET NO. : UP-11



1 UP-12 **CURB DETAIL**
SCALE 1:10



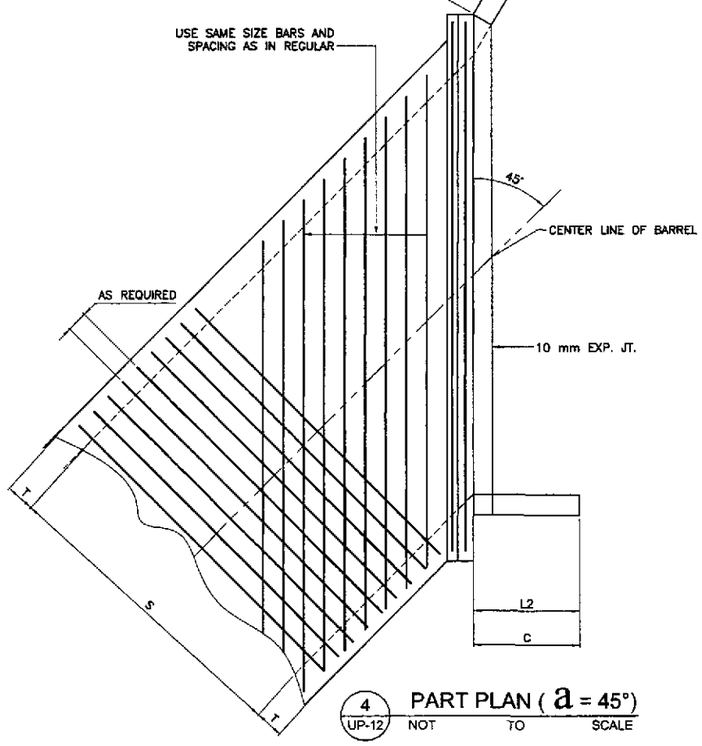
3 UP-12 **PART PLAN (a = 60°)**
NOT TO SCALE



2 UP-12 **PART PLAN (a = 90°)**
NOT TO SCALE

N O T E

ALL DIMENSIONS ARE IN MILIMETERS UNLESS OTHERWISE SPECIFIED



4 UP-12 **PART PLAN (a = 45°)**
NOT TO SCALE

JAPAN INTERNATIONAL COOPERATION AGENCY

KATAHIRA & ENGINEERS INTERNATIONAL

YACHIYO ENGINEERING CO., LTD.

	DATE	SIGNATURE
DESIGNED	10/14/02	
CHECKED	10/16/02	H. OKAMURA
SUBMITTED	10/18/02	TEAM LEADER

REPUBLIC OF THE PHILIPPINES
DEPARTMENT OF PUBLIC WORKS AND HIGHWAYS

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Submitted By:	Reviewed By:	Recommended By:	Recommended By: (See cover sheet for Signature)	Approved By: (See cover sheet for Signature/Approval)
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Project Director	Chief, Highways Division	OIC, Director IV	Undersecretary	Secretary

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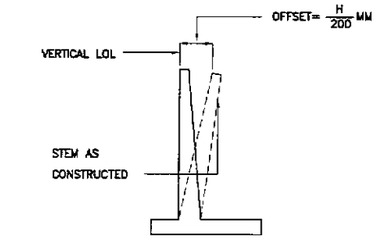
(Plaridel, Cabanatuan and San Jose Bypasses)

CABANATUAN BYPASS - CONTRACT PACKAGE II

SCALE : AS SHOWN
FULL SIZE A1

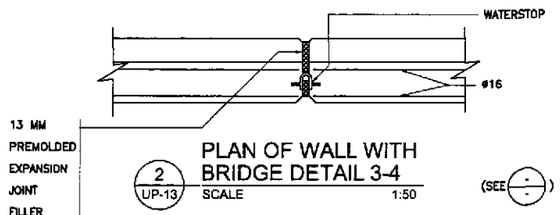
SHEET CONTENTS :
BOX CULVERT
TYPICAL PLAN REINFORCED CONCRETE AT END BOX CULVERT AND CURB DETAIL (INITIAL STAGE)

SHEET NO. : **UP-12**



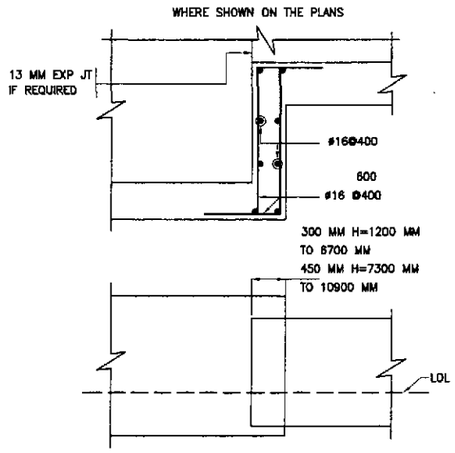
1 UP-13 APPROXIMATE WALL OFFSET VALUES
NOT TO SCALE

NOT REQUIRED FOR WALL TYPES 3 AND 4
VALUES FOR OFFSETING FORMS TO BE DETERMINED BY THE ENGEER

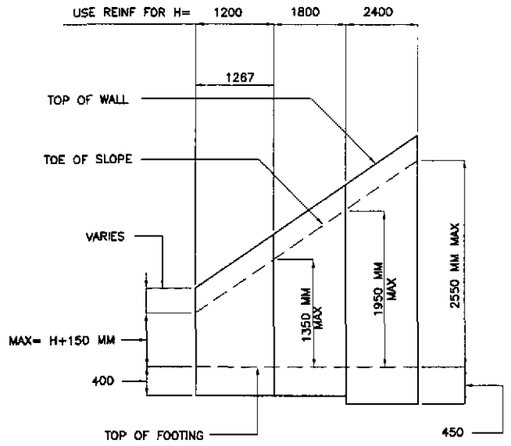


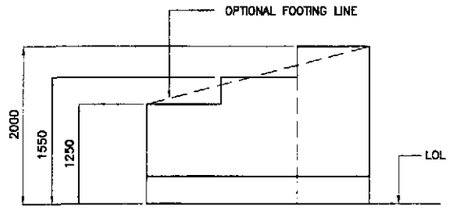
2 UP-13 PLAN OF WALL WITH BRIDGE DETAIL 3-4
SCALE 1:50 (SEE -/-)

3 UP-13 PLAN OF WALL WITH EXPANSION JOINT ONLY
NOT TO SCALE

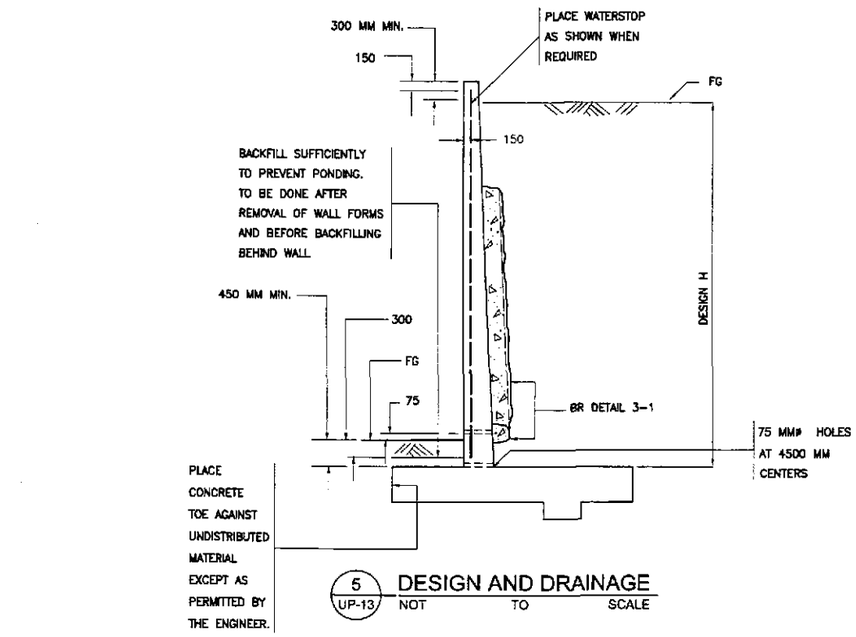


4 UP-13 FOOTING ONLY
NOT TO SCALE

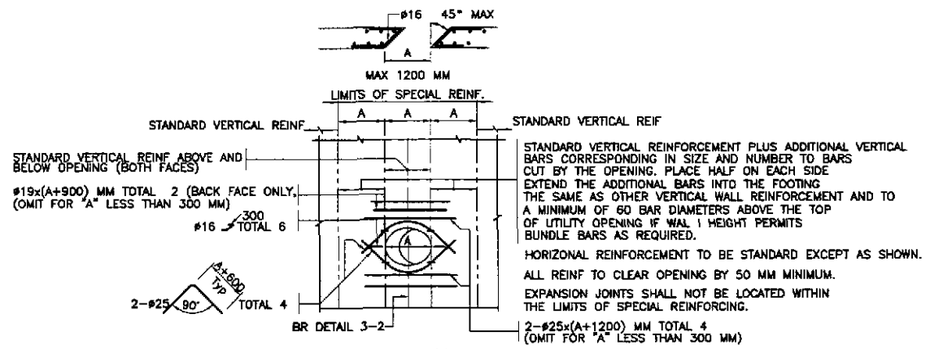




6 UP-13 TYPICAL LAYOUT EXAMPLE
NOT TO SCALE



5 UP-13 DESIGN AND DRAINAGE
NOT TO SCALE



7 UP-13 RETAINING WALL UTILITY OPENING
NOT TO SCALE

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

	DATE	SIGNATURE
DESIGNED	10/4/02	
CHECKED	10/16/02	A. RAKIM
SUBMITTED	10/17/02	TEAM LEADER

REPUBLIC OF THE PHILIPPINES
DEPARTMENT OF PUBLIC WORKS AND HIGHWAYS

PJHL – PMO	BUREAU OF DESIGN		OFFICE OF THE SECRETARY	
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Project Director	Chief, Highways Division	OIC, Director IV	Undersecretary	Secretary

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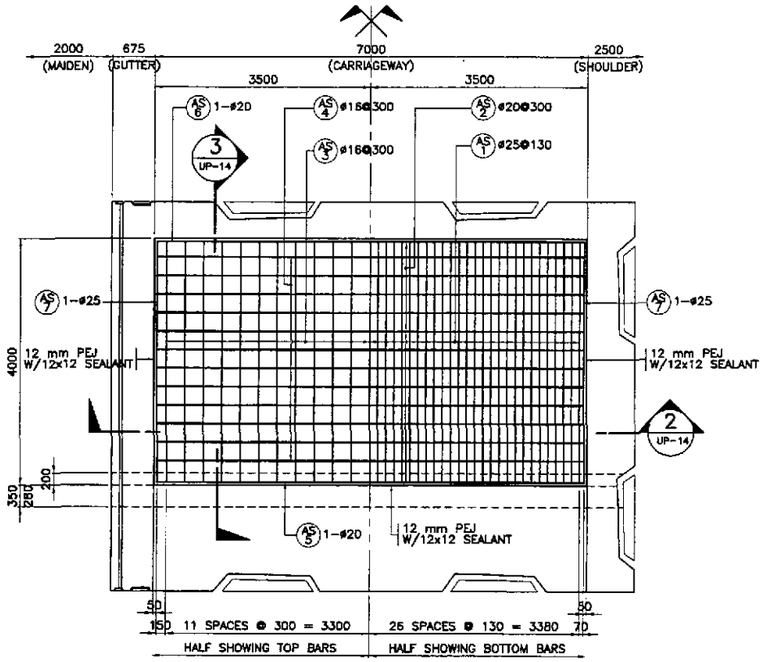
CABANATUAN BYPASS - CONTRACT PACKAGE II

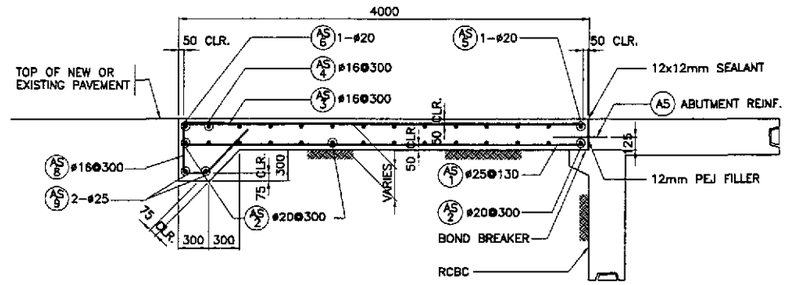
SCALE : AS SHOWN
FULL SIZE A1

SHEET CONTENTS :
BOX CULVERT
RETAINING WALL TYPE I
H=1200 THROUGH 9100 mm
(INITIAL STAGE)

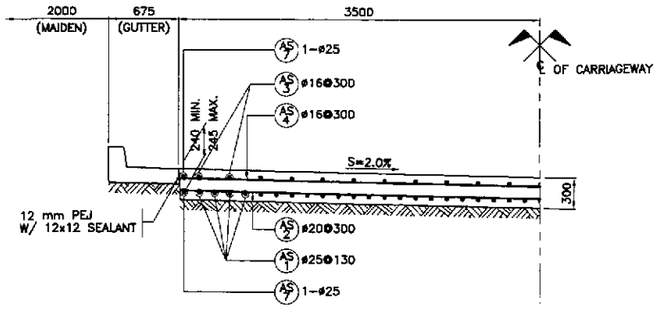
SHEET NO. : UP-13



1 UP-14 PLAN SCALE 1:50



3 UP-14 SECTION SCALE 1:30



2 UP-14 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)	AS1	25	69	130	B	3900	150	–	4050	226.80	3.853	874		1. QUANTITIES ARE FOR ONE (1) APPROACH SLAB
	AS2	20	14	300	A	7900	–	–	7900	55.30	2.466	136		
a (B) b	AS3	16	25	300	B	3900	150	–	4050	101.25	1.578	160		
	AS4	16	12	300	A	7900	–	–	7900	47.40	1.578	75		
	AS5	20	1	AS SHOWN	A	7200	–	–	7200	7.20	2.466	18		
	AS6	20	1	AS SHOWN	A	7900	–	–	4050	53.20	1.578	84	9.58	
	AS7	25	4	AS SHOWN	A	1965	1965	–	3930	15.72	3.853	61		
400 a c b (C)	AS8	16	27	300	C	415 MIN. 475 MAX.	250	650	1745	47.11	1.578	74		
	AS9	25	2	AS SHOWN	A	7900	–	–	7900	15.80	3.853	61		
											GRAND TOTAL =	1543	9.58	

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

	DATE	SIGNATURE
DESIGNED	10/9/02	CHAN
CHECKED	10/16/02	AKIM
SUBMITTED	10/8/02	TEAM LEADER

REPUBLIC OF THE PHILIPPINES
DEPARTMENT OF PUBLIC WORKS AND HIGHWAYS

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

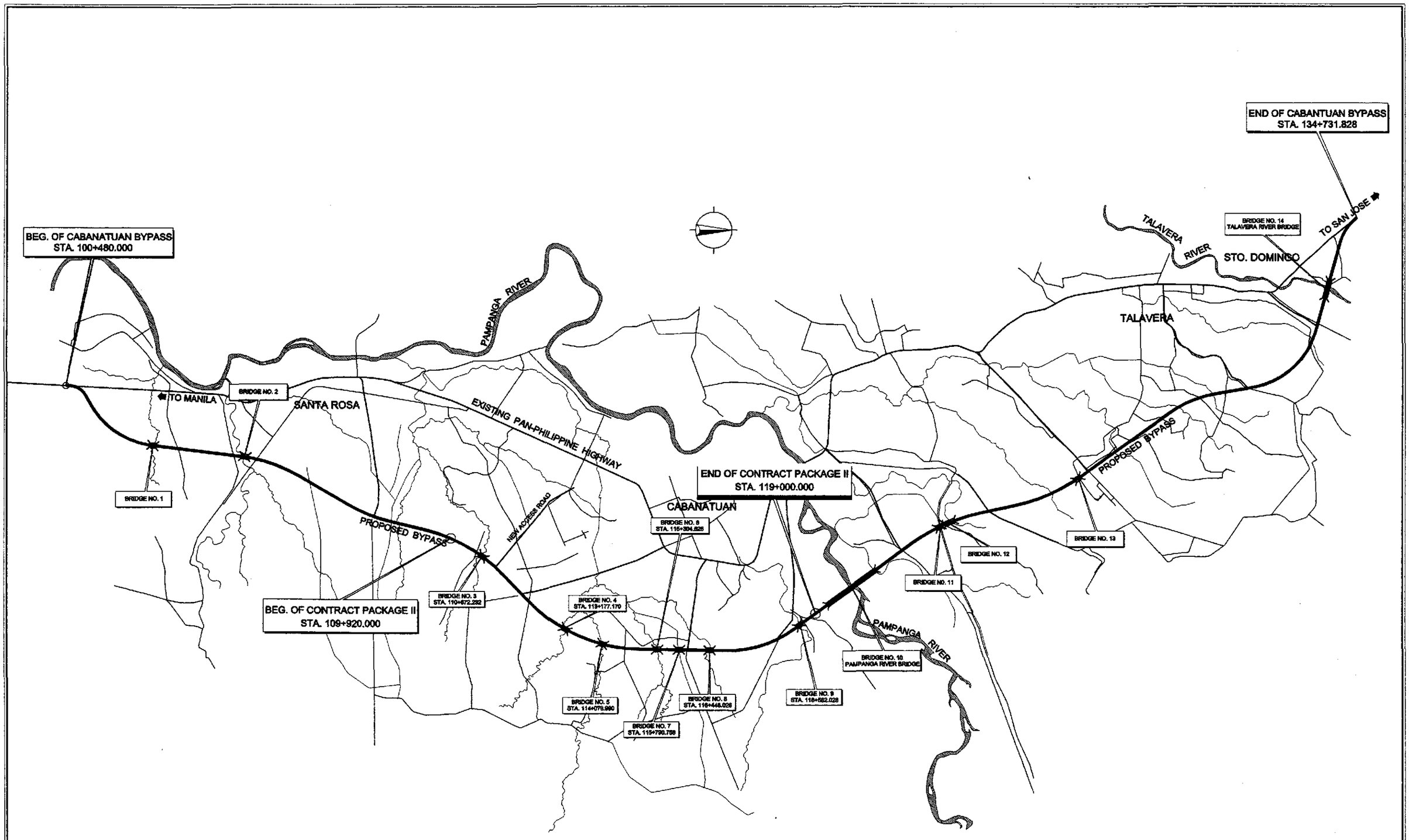
PROJECT AND LOCATION :
THE DETAILED DESIGN STUDY ON UPGRADING INTER-URBAN HIGHWAY SYSTEM ALONG THE PAN-PHILIPPINE HIGHWAY (Plaridel, Cabanatuan and San Jose Bypasses)
CABANATUAN BYPASS - CONTRACT PACKAGE II

SCALE : AS SHOWN FULL SIZE A1

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

SHEET NO. : UP-14

BRIDGES



A NOT TO SCALE

CABANATUAN BYPASS BRIDGE LOCATION MAP

JAPAN INTERNATIONAL COOPERATION AGENCY

KATAHIRA & ENGINEERS INTERNATIONAL

YACHIYO ENGINEERING CO., LTD.

	DATE	SIGNATURE
DESIGNED	10/4/02	E. N. SALLAN
CHECKED	10/11/02	
SUBMITTED	10/12/02	M. KUSHI TEAM LEADER

REPUBLIC OF THE PHILIPPINES
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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
CABANATUAN BYPASS - CONTRACT PACKAGE II	FULL SIZE A1	(INITIAL 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)

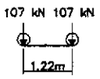
3. LOADING

3.1 DEAD LOADS

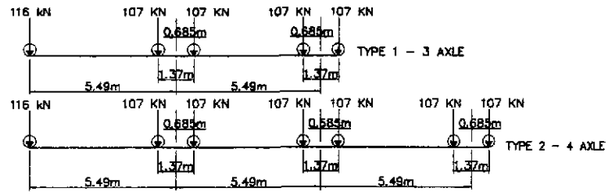
	WEIGHT
A. CONCRETE	24.00 kN/m^3
B. STEEL	77.00 kN/m^3
C. EARTH	19.00 kN/m^3
D. WEARING SURFACE	1.10 kN/m^2

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/cm2 (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.

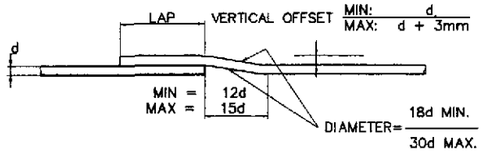
(3) BAR SPLICING NOT INDICATED ON DRAWINGS SHALL BE SUBJECT TO THE APPROVAL OF THE ENGINEER.

(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.

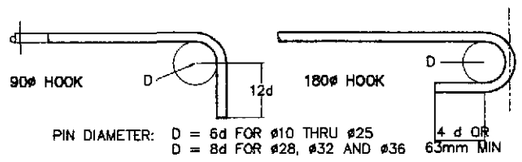
(6) UNLESS OTHERWISE SHOWN ON DRAWINGS, THE CLEAR DISTANCE BETWEEN PARALLEL BARS IN A LAYER SHALL NOT BE LESS THAN 1.5 TIMES THE NOMINAL DIAMETER OF THE BAR NOR LESS THAN 1.5 TIMES THE MAXIMUM SIZE OF COARSE AGGREGATE. THE CLEAR DISTANCE BETWEEN LAYERS SHALL NOT LESS THAN 25mm NOR ONE BAR DIAMETER. THE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

(7) CRANKED SPLICES



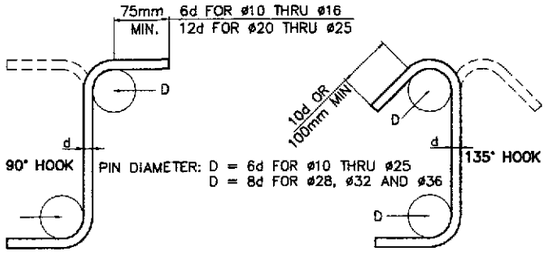
(8) HOOKS AND BENDS

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.

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

	DATE	SIGNATURE
DESIGNED	10/16/02	E.N. SALLAN
CHECKED	10/16/02	M. KUDO
SUBMITTED	10/18/02	M. KUDO, 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. DORDY	GILBERTO S. REYES	MANUEL M. BONOAN	SIMEON A. DATUMANONG
Project Director	Chief, Bridges Division	Director IV (OIC)	Undersecretary	Secretary

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CABANATUAN BYPASS - CONTRACT PACKAGE II

SCALE : AS SHOWN
FULL SIZE A1

SHEET CONTENTS : GENERAL NOTES FOR BRIDGES (SHEET 1 OF 2) (INITIAL 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.

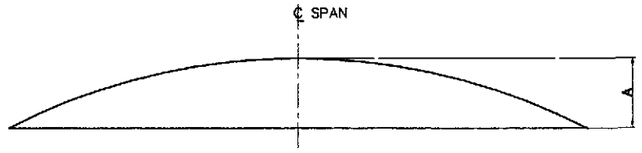
g.) CONTRACTOR SHALL SUBMIT FOR APPROVAL BY THE ENGINEER THE CALCULATED ELONGATION OF THE PRESTRESSING TENDONS CORRESPONDING TO THE REQUIRED JACKING FORCES.

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

14. DRAWINGS

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

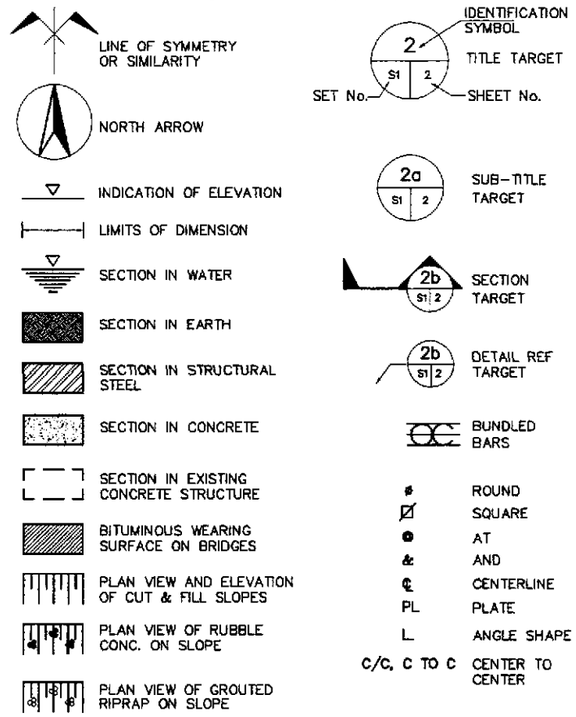
b.) ALL QUANTITIES SHALL BE VERIFIED DURING CONSTRUCTION.



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

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

	DATE	SIGNATURE
DESIGNED	10/4/02	E.N. SALLAN
CHECKED	10/16/02	
SUBMITTED	10/18/02	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, Project Director	ADRIANO M. DOROY, Chief, Bridges Division	GILBERTO S. REYES, Director IV (OIC)	MANUEL M. BONOAN, Undersecretary	SIMEON A. DATUMANONG, Secretary

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

SCALE : AS SHOWN — FULL SIZE A1

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

SHEET NO. : BG-03

BRIDGE NAME : BRIDGE NO. 3 (INITIAL 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 "		
103(2)a	Bridge Excavation, Common, Above O.W.L.	cu.m.	114.00	115.00		229.00
104(3)	Embankment from Borrow Pit	cu.m.	252.00	319.00		571.00
104(4)	Embankment for Bridge Approach	cu.m.	226.00	261.00		487.00
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.	432.00	539.00		971.00
400(13)b	RC Piles (450 mm x 450 mm) Driven	l.m.	400.00	504.00		904.00
400(15)b	Test Piles (450 mm x450 mm)	l.m.	19.25	21.25		40.50
400(19)b	Pile Shoes for 450 mm x 450 mm Piles	each	26.00	29.00		55.00
401(1)a	Concrete Post and Railing	l.m.			70.00	70.00
404(1)	Reinforcing Steel, Grade 40	kg	3,821.00	4,003.00	16,915.00	24,739.00
404(2)	Reinforcing Steel, Grade 60	kg	7,636.00	8,344.00	1,546.00	17,526.00
405(1)b	Structural Concrete Class "A" (fc'= 21MPa)	cu.m.	134.00	149.00		283.00
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	15.00	25.00
405(6)	Structural Concrete Class "B" (Lean Concrete) fc'= 17MPa	cu.m.	25.00	26.00		51.00
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.	24.00	26.00		50.00
510(1)	Rubble Concrete Slope Protection	cu.m.	47.00	53.00		100.00
506(1)	Hand Laid Rock	cu.m.	55.00	57.00		112.00

BRIDGE NAME : BRIDGE NO. 4 (INITIAL 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 "		
103(2)a	Bridge Excavation, Common, Above O.W.L.	cu.m.	89.00	95.00		184.00
104(3)	Embankment from Borrow Pit	cu.m.	216.00	205.00		421.00
104(4)	Embankment for Bridge Approach	cu.m.	216.00	205.00		421.00
200(1)	Aggregate Subbase Course	cu.m.	14.00	14.00		28.00
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.	138.00	160.00		298.00
400(13)b	RC Piles (450 mm x 450 mm) Driven	l.m.	110.00	132.00		242.00
400(15)b	Test Piles (450 mm x450 mm)	l.m.	8.25	9.25		17.50
400(19)b	Pile Shoes for 450 mm x 450 mm Piles	each	23.00	23.00		46.00
401(1)a	Concrete Post and Railing	l.m.			48.00	48.00
404(1)	Reinforcing Steel, Grade 40	kg	3,226.00	3,204.00	12,190.00	18,620.00
404(2)	Reinforcing Steel, Grade 60	kg	6,919.00	6,919.00	1,087.00	14,925.00
405(1)b	Structural Concrete Class "A" (fc'= 21MPa)	cu.m.	113.00	113.00		226.00
405(1)d	Structural Concrete Class "A1" (fc'= 21MPa)	cu.m.			75.00	75.00
405(3)a	Structural Concrete Class "C" (fc' = 21MPa)	cu.m.	4.00	4.00	8.00	16.00
405(6)	Structural Concrete Class "B" (Lean Concrete) fc'= 17MPa	cu.m.	24.00	23.00		47.00
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	21.00		40.00
510(1)	Rubble Concrete Slope Protection	cu.m.	57.00	41.00		98.00
507(2)b	Steel Sheet Pile (85x400x8mm Thk.), Furnished and Driven	l.m.	398.00	367.00		765.00

BRIDGE NAME : BRIDGE NO. 5 (INITIAL 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 "		
103(2)a	Bridge Excavation, Common, Above O.W.L.	cu.m.	87.00	87.00		174.00
104(3)	Embankment from Borrow Pit	cu.m.	263.00	258.00		521.00
104(4)	Embankment for Bridge Approach	cu.m.	238.00	238.00		476.00
200(1)	Aggregate Subbase Course	cu.m.	14.00	14.00		28.00
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.	167.00	167.00		334.00
400(13)b	RC Piles (450 mm x 450 mm) Driven	l.m.	138.00	138.00		276.00
400(15)b	Test Piles (450 mm x450 mm)	l.m.	9.25	9.25		18.50
400(19)b	Pile Shoes for 450 mm x 450 mm Piles	each	24.00	24.00		48.00
401(1)a	Concrete Post and Railing	l.m.			48.00	48.00
404(1)	Reinforcing Steel, Grade 40	kg	3,067.00	3,067.00	12,190.00	18,324.00
404(2)	Reinforcing Steel, Grade 60	kg	7,433.00	7,433.00	1,087.00	15,953.00
405(1)b	Structural Concrete Class "A" (fc'= 21MPa)	cu.m.	121.00	121.00		242.00
405(1)d	Structural Concrete Class "A1" (fc'= 21MPa)	cu.m.			75.00	75.00
405(3)	Structural Concrete Class "C" (fc' = 21MPa)	cu.m.	4.00	4.00	8.00	16.00
405(6)	Structural Concrete Class "B" (Lean Concrete) fc'= 17MPa	cu.m.	6.00	6.00		12.00
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.	1.20	1.20		3.00
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.	89.00	89.00		178.00
506(1)	Hand Laid Rock	cu.m.	55.00	55.00		110.00

BRIDGE NAME : BRIDGE NO. 6 (INITIAL STAGE)
BRIDGE LENGTH : 31.00 m
SPECIFICATION : 1 - 31.00 m SPAN TYPE IV-B PSCG ON SEAT TYPE ABUTMENT

SUMMARY OF QUANTITIES

PAY ITEM NO.	DESCRIPTION	UNIT	ABUTMENT		SUPER-STRUCTURE	TOTAL
			" A1 "	" A2 "		
103(2)a	Bridge Excavation, Common, Above O.W.L.	cu.m.	110.00	116.00		226.00
104(3)	Embankment from Borrow Pit	cu.m.	312.00	312.00		624.00
104(4)	Embankment for Bridge Approach	cu.m.	250.00	250.00		500.00
200(1)	Aggregate Subbase Course	cu.m.	14.00	14.00		28.00
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.	215.00	188.00		403.00
400(13)b	RC Piles (450 mm x 450 mm) Driven	l.m.	182.00	156.00		338.00
400(15)b	Test Piles (450 mm x450 mm)	l.m.	10.25	9.25		19.50
400(19)b	Pile Shoes for 450 mm x450 mm piles	each	27.00	27.00		54.00
401(1)a	Concrete Post and Railing	l.m.			62.00	62.00
404(1)	Reinforcing Steel, Grade 40	kg	3,701.00	3,701.00	15,394.00	22,796.00
404(2)	Reinforcing Steel, Grade 60	kg	8,126.00	8,126.00	1,336.00	17,588.00
405(1)b	Structural Concrete Class "A" (fc'= 21MPa)	cu.m.	144.00	144.00		288.00
405(1)d	Structural Concrete Class "A1" (fc'= 21MPa)	cu.m.			98.00	98.00
405(3)	Structural Concrete Class "C" (fc' = 21MPa)	cu.m.	4.00	4.00	10.00	18.00
405(6)	Structural Concrete Class "B" (Lean Concrete) fc'= 17MPa	cu.m.	20.00	26.00		46.00
406(1)f	Prestressed Concrete Girder Type IV-B L=31.00m	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.	1.20	1.20		3.00
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.	26.00	26.00		52.00
510(1)	Rubble Concrete	cu.m.	59.00	58.00		117.00
506(1)	Hand Laid Rock	cu.m.	58.00	57.00		115.00

NOTE: ALL QUANTITIES SHALL BE VERIFIED DURING CONSTRUCTION

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

	DATE	SIGNATURE
DESIGNED	10/4/02	E.N. GALLAN
CHECKED	10/4/02	N. HOSHIYAMA
SUBMITTED	10/8/02	T. HIDUCHI 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)
CABANATUAN BYPASS - CONTRACT PACKAGE II

SCALE : N. T. S. FULL SIZE A1

SHEET CONTENTS :
BRIDGE NO. 3, 4, 5 & 6
SUMMARY OF QUANTITIES
(INITIAL STAGE)

SHEET NO. : BG-04

BRIDGE NAME : BRIDGE NO. 7 (INITIAL STAGE)
BRIDGE LENGTH : 32.00 m
SPECIFICATION : (10.00 - 12.00 - 10.00) m SPAN FLAT SLAB ON SEAT TYPE ABUTMENT

SUMMARY OF QUANTITIES

PAY ITEM NO.	DESCRIPTION	UNIT	ABUTMENT		PIER		SUPER-STRUCTURE	TOTAL
			" A1 "	" A2 "	" P1 "	" P2 "		
103(2)a	Bridge Excavation, Common, Above O.W.L.	cu.m.	72.00	72.00				144.00
103(2)c	Bridge Excavation, Common, Below O.W.L.	cu.m.			66.00	66.00		132.00
104(3)	Embankment from Borrow Pit	cu.m.	244.00	244.00				488.00
104(4)	Embankment for Bridge Approach	cu.m.	222.00	222.00				444.00
200(1)	Aggregate Subbase Course	cu.m.	14.00	14.00				28.00
311(2)	PCC Pavement (Reinforced) t=300mm, Including Dowel Bars (Approach Slab)	sq.m.	58.00	58.00				116.00
400(4)a	RC Piles (400 mm x 400 mm) Furnished	l.m.	175.00	175.00	157.00	157.00		664.00
400(13)a	RC Piles (400 mm x 400 mm) Driven	l.m.	153.00	153.00	136.00	136.00		578.00
400(15)a	Test Piles (400 mm x400 mm)	l.m.	12.25	12.25	11.25	11.25		47.00
400(19)a	Pile Shoes for 400 mm x 400 mm Piles	each	18.00	18.00	18.00	18.00		72.00
401(1)a	Concrete Post and Railing	l.m.					64.00	64.00
404(1)	Reinforcing Steel, Grade 40	kg	2,020.00	2,020.00	2,191.00	2,191.00	7,713.00	16,133.00
404(2)	Reinforcing Steel, Grade 60	kg	5,933.00	5,933.00	5,428.00	5,426.00	19,233.00	42,033.00
405(1)b	Structural Concrete Class "A" (fc'= 21MPa)	cu.m.	99.00	99.00	40.00	40.00		278.00
405(1)c	Structural Concrete Class "A1" (fc'= 21MPa)	cu.m.					192.00	192.00
405(3)	Structural Concrete Class "C" (fc' = 21MPa)	cu.m.	2.00	2.00			10.00	14.00
405(6)b	Structural Concrete Class "B" (Lean Concrete) fc'= 17MPa	cu.m.	5.00	5.00	3.00	3.00		16.00
407(1)g	Elastomeric Bearing Pad (550x300x50, Duro 60)	each	3.00	3.00				6.00
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.	88.00	88.00				176.00

BRIDGE NAME : BRIDGE NO. 8 (INITIAL STAGE)
BRIDGE LENGTH : 31.00 m
SPECIFICATION : 1 - 31.00 m SPAN TYPE IV-B PSCG ON SEAT TYPE ABUTMENT

SUMMARY OF QUANTITIES

PAY ITEM NO.	DESCRIPTION	UNIT	ABUTMENT		SUPER-STRUCTURE	TOTAL
			" A1 "	" A2 "		
103(2)a	Bridge Excavation, Common, Above O.W.L.	cu.m.	112.00	124.00		236.00
104(3)	Embankment from Borrow Pit	cu.m.	349.00	376.00		725.00
104(4)	Embankment for Bridge Approach	cu.m.	261.00	283.00		544.00
200(1)	Aggregate Subbase Course	cu.m.	14.00	14.00		28.00
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.	215.00	231.00		446.00
400(13)b	RC Piles (450 mm x 450 mm) Driven	l.m.	182.00	196.00		378.00
400(15)b	Test Piles (450 mm x450 mm)	l.m.	10.25	10.25		20.50
400(19)b	Pile Shoes for 450 mm x 450 mm Piles	each	27.00	29.00		56.00
401(1)a	Concrete Post and Railing	l.m.			62.00	62.00
404(1)	Reinforcing Steel, Grade 40	kg	3,818.00	3,880.00	15,540.00	23,238.00
404(2)	Reinforcing Steel, Grade 60	kg	8,571.00	8,992.00	1,336.00	18,899.00
405(1)b	Structural Concrete Class "A" (fc'= 21MPa)	cu.m.	150.00	158.00		308.00
405(1)d	Structural Concrete Class "A1" (fc'= 21MPa)	cu.m.			98.00	98.00
405(3)	Structural Concrete Class "C" (fc' = 21MPa)	cu.m.	4.00	4.00	10.00	18.00
405(6)	Structural Concrete Class "B" (Lean Concrete) fc'= 17MPa	cu.m.	26.00	26.00		52.00
406(1)f	Prestressed Concrete Girder Type IV-B L=31.00m	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.	27.00	27.00		54.00
510(1)	Rubble Concrete	cu.m.	62.00	62.00		124.00
506(1)	Hand Laid Rock	cu.m.	58.00	58.00		116.00

BRIDGE NAME : BRIDGE NO. 9 (INITIAL STAGE)
BRIDGE LENGTH : 60.00 m
SPECIFICATION : 3 - 20.00 m SPAN TYPE IV PSCG ON SEAT TYPE ABUTMENT

SUMMARY OF QUANTITIES

PAY ITEM NO.	DESCRIPTION	UNIT	ABUTMENT		PIER		SUPER-STRUCTURE	TOTAL
			" A1 "	" A2 "	" P1 "	" P2 "		
103(2)a	Bridge Excavation, Common, Above O.W.L.	cu.m.	126.00	131.00				257.00
103(2)c	Bridge Excavation, Common, Below O.W.L.	cu.m.			198.00	154.00		352.00
104(3)	Embankment from Borrow Pit	cu.m.	451.00	410.00				861.00
104(4)	Embankment for Bridge Approach	cu.m.	302.00	284.00				586.00
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.	267.00	318.00	215.00	215.00		1,015.00
400(13)b	RC Piles (450 mm x 450 mm) Driven	l.m.	234.00	286.00	182.00	182.00		884.00
400(15)b	Test Piles (450 mm x450 mm)	l.m.	12.25	14.25	10.25	10.25		47.00
400(19)b	Pile Shoes for 450 mm x 450 mm Piles	each	27.00	27.00	27.00	27.00		108.00
401(1)a	Concrete Post and Railing	l.m.					123.00	123.00
404(1)	Reinforcing Steel, Grade 40	kg	3,738.00	3,718.00	2,842.00	2,842.00	30,277.00	43,417.00
404(2)	Reinforcing Steel, Grade 60	kg	9,968.00	9,735.00	15,431.00	15,583.00	7,106.00	57,823.00
405(1)b	Structural Concrete Class "A" (fc'= 21MPa)	cu.m.	175.00	170.00	128.00	129.00		602.00
405(1)d	Structural Concrete Class "A1" (fc'= 21MPa)	cu.m.					208.00	208.00
405(3)	Structural Concrete Class "C" (fc' = 21MPa)	cu.m.	4.00	4.00			26.00	34.00
405(6)	Structural Concrete Class "B" (Lean Concrete) fc'= 17MPa	cu.m.	30.00	29.00	7.00	7.00		73.00
406(1)a	Prestressed Concrete Girder Type IV L=20.00m	each					15.00	15.00
407(1)c	Elastomeric Bearing Pad (600x350x50, Duro 60)	each	5.00	5.00	10.00	10.00		30.00
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.	1.70	1.70				3.00
407(4)	Metal Drain (150 mm ø G.I. Drain Pipe)	l.m.					6.00	6.00
504(1)	Grouted Riprap, Class "A"	cu.m.	26.00	25.00				51.00
506(1)	Hand Laid Rock	cu.m.	66.00	63.00				129.00
510(1)	Rubble Concrete	cu.m.	90.00	80.00				170.00
509(1)	Gabions	cu.m.			176.00	176.00		352.00

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	10/4/02	E. N. SALLAM
CHECKED	10/16/02	[illegible]
SUBMITTED	10/18/02	[illegible]

REPUBLIC OF THE PHILIPPINES
DEPARTMENT OF PUBLIC WORKS AND HIGHWAYS

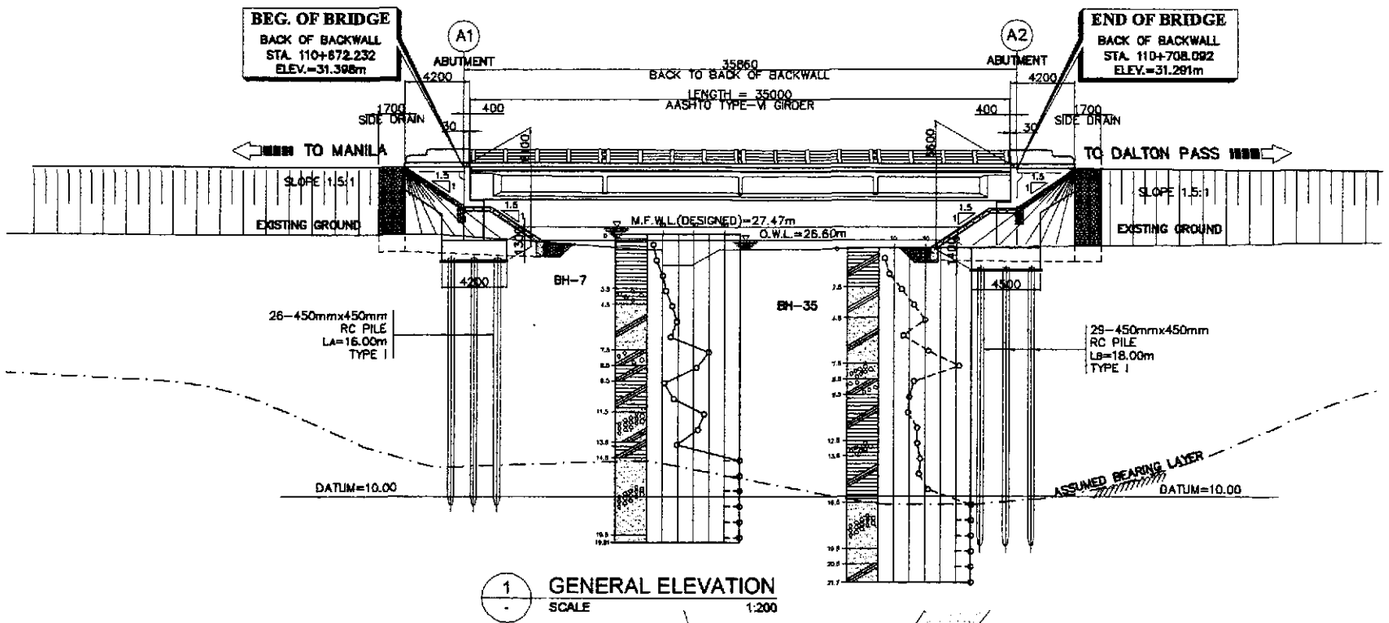
PJHL - PMO	BUREAU OF DESIGN		OFFICE OF THE SECRETARY	
Submitted By:	Reviewed By:	Recommended By:	Recommended By: (See cover sheet for Signature)	Approved By: (See cover sheet for Signature/Approval)
DANILO C. TRAJANO	ADRIANO M. DOROY	GILBERTO S. REYES	MANUEL M. BONOAN	SIMEON A. DATUMANONG
Project Director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

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

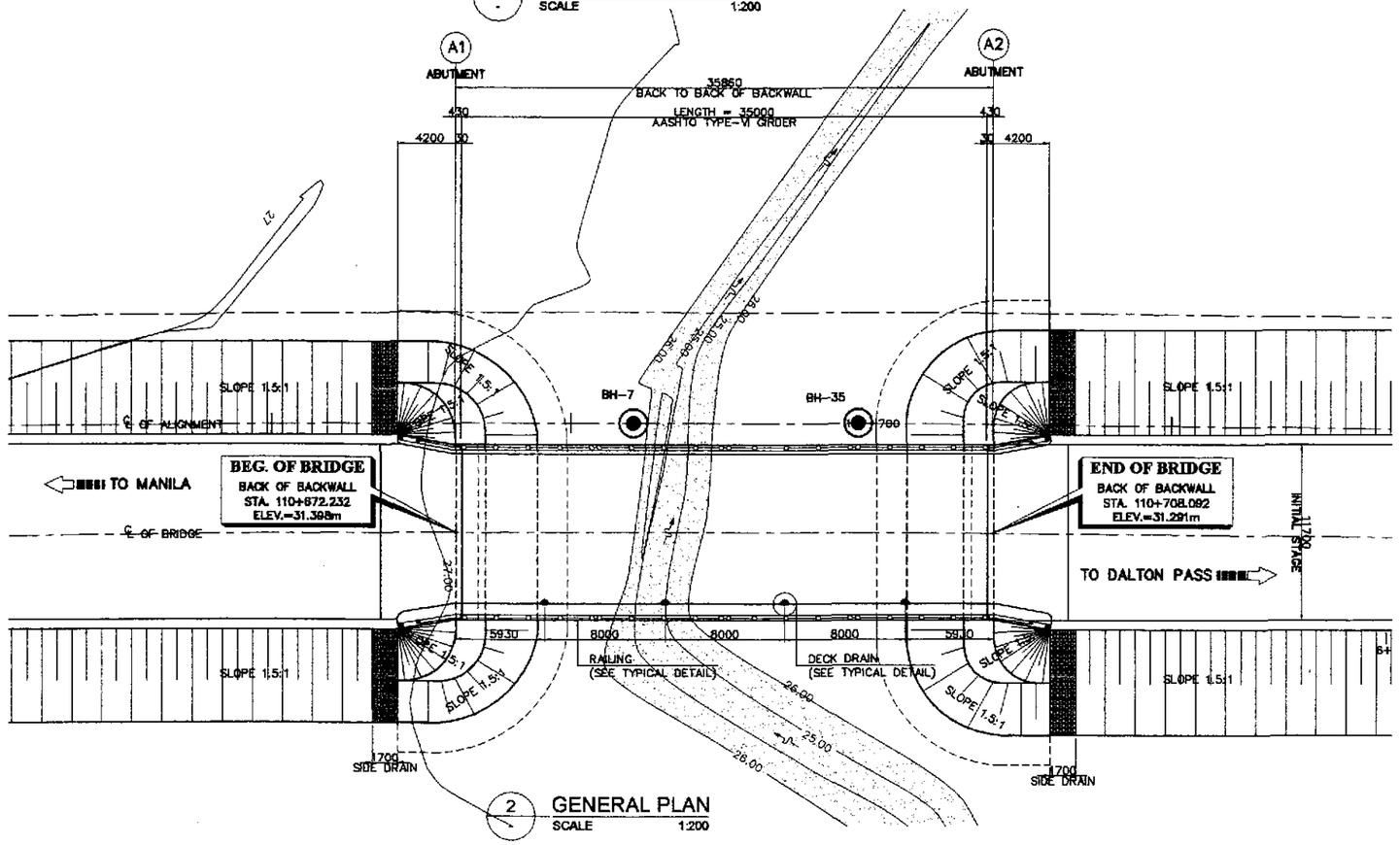
SCALE : N. T. S. FULL SIZE A1

SHEET CONTENTS :
BRIDGE NO. 7, 8 & 9
SUMMARY OF QUANTITIES
(INITIAL STAGE)

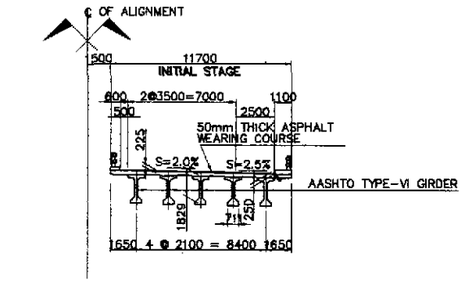
SHEET NO. : BG-05



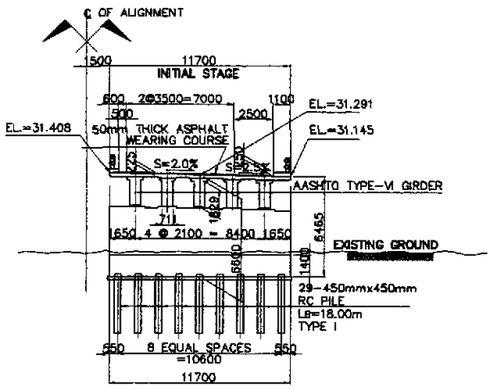
1 / - GENERAL ELEVATION
SCALE 1:200



2 / - GENERAL PLAN
SCALE 1:200



3 / - SECTION @ MIDSPAN
SCALE 1:200



4 / - SECTION @ ABUTMENT A2
SCALE 1:200

HYDRAULIC DESIGN DATA	
VELOCITY @ 50 YEARS, Vso	2.235 m/sec
DISCHARGE @ 50 YEARS, Qso	40.600 cu.m/sec
CATCHMENT AREA, CA	11.175 sq. km

NOTE :

PRIOR TO CONSTRUCTION SOIL INVESTIGATION AT ABUTMENT A2 AND PIER P1 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 / - CABANATUAN BYPASS BRIDGE NO. 3 (STA.110+672.232)
SCALE AS SHOWN

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

	DATE	SIGNATURE
DESIGNED	10/4/02	E. N. SALLAN
CHECKED	10/16/02	E. N. SALLAN
SUBMITTED	10/19/02	E. N. SALLAN TEAM LEADER

REPUBLIC OF THE PHILIPPINES
DEPARTMENT OF PUBLIC WORKS AND HIGHWAYS

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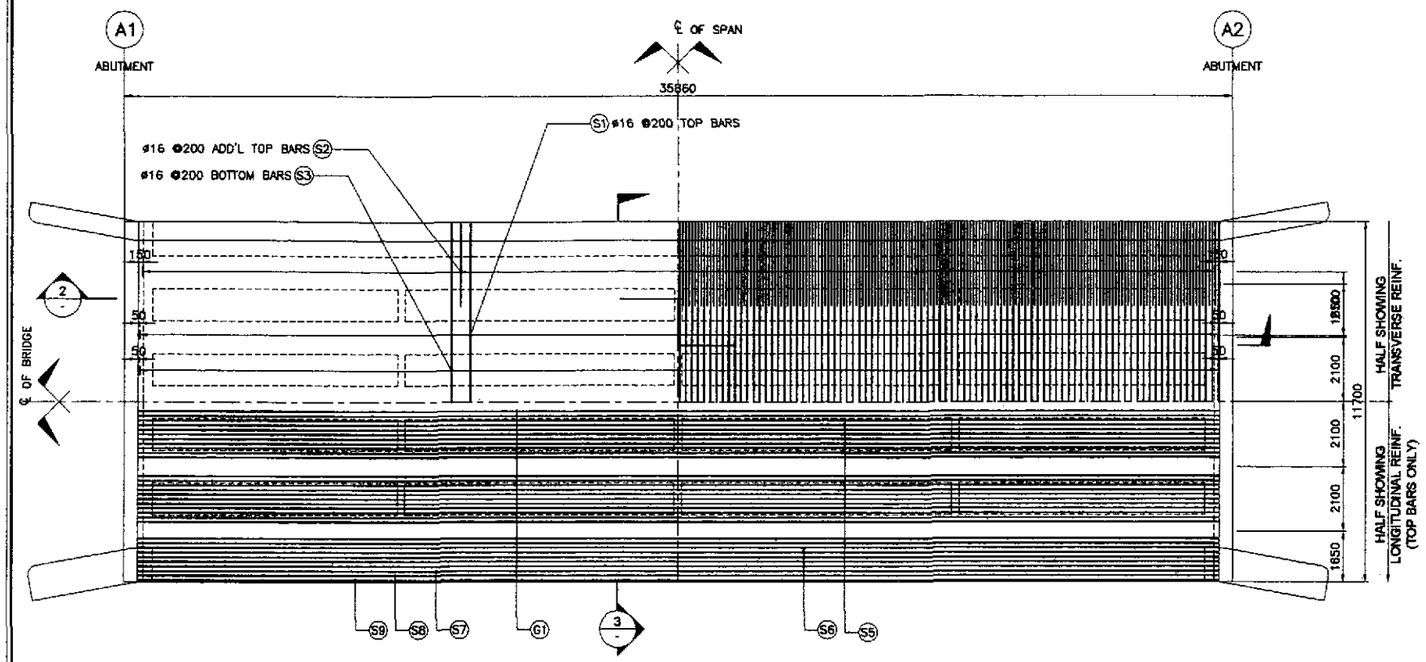
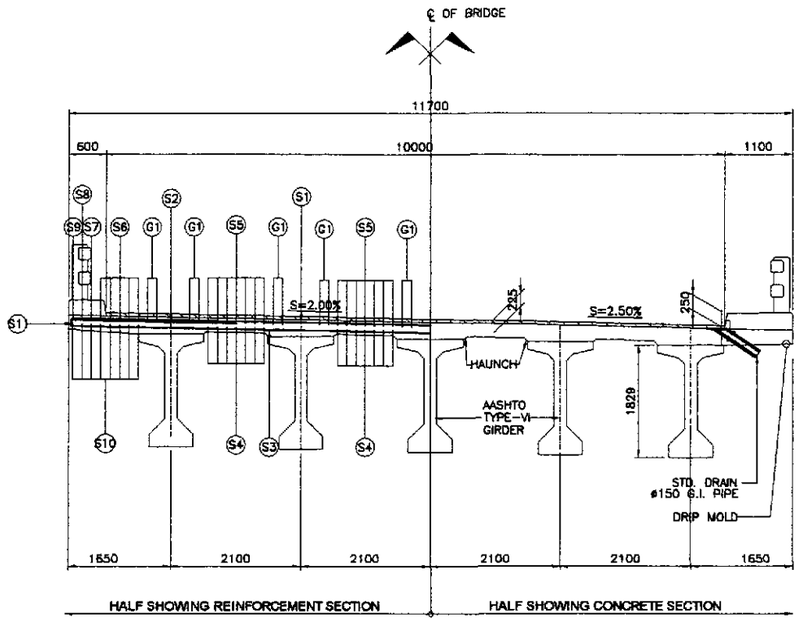
Project Director	Chief, Bridges Division	Director IV (OIC)	Undersecretary	Secretary

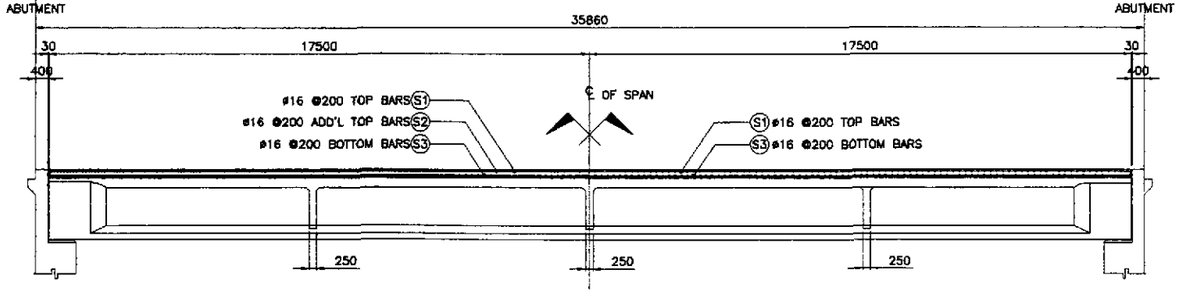
PROJECT AND LOCATION :	SCALE :	SHEET CONTENTS :	SHEET NO. :
THE DETAILED DESIGN STUDY ON UPGRADING INTER-URBAN HIGHWAY SYSTEM ALONG THE PAN-PHILIPPINE HIGHWAY (Plaridel, Cabanatuan and San Jose Bypasses)	1 : 200	BRIDGE NO. 3 GENERAL PLAN, ELEVATION AND SECTIONS (INITIAL STAGE)	B3-01
CABANATUAN BYPASS - CONTRACT PACKAGE II	FULL SIZE A1		



1 FRAMING PLAN
SCALE 1 : 100



3 TYPICAL CROSS-SECTION
SCALE 1 : 50

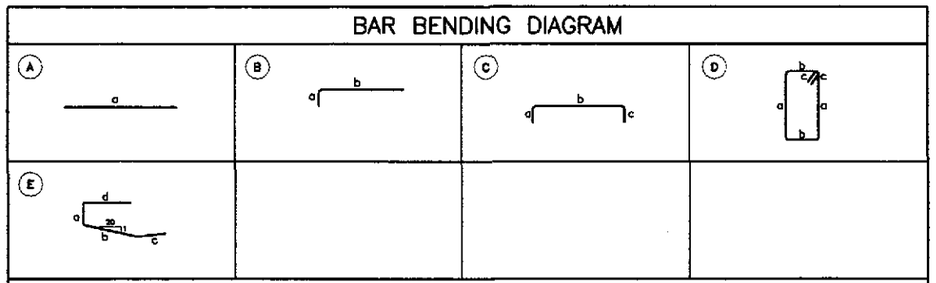


2 LONGITUDINAL SECTION
SCALE 1 : 100

ESTIMATED QUANTITIES OF SUPERSTRUCTURE

ITEM NO.	DESCRIPTION	UNIT	TOTAL
404(1)a	REINFORCING STEEL GRADE 40	kgs.	29222
	DECK SLAB	14503	
	DIAPHRAGM	442	
	GIRDER	9680	
	SIDEWALK, RAILING, & POST	3255	
	APPROACH SLAB	1342	
404(1)b	REINFORCING STEEL GRADE 60	kgs.	14855
	DECK SLAB	0	
	DIAPHRAGM	1546	
	GIRDER	8385	
	SIDEWALK, RAILING, & POST	708	
	APPROACH SLAB	4216	
405(1)	STRUCTURAL CONCRETE	cu. m.	300.22
	DECK SLAB	101.91	
	DIAPHRAGM	15.32	
	GIRDER	132.75	
	SIDEWALK, RAILING, & POST	14.88	
	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	142.32
		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	0.888	383	
TOTAL	101.91												GRADE 40 = 14,503 kgs.		

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

	DATE	SIGNATURE
DESIGNED	10/4/02	E. N. SALLAN
CHECKED	10/4/02	M. KOBAYASHI
SUBMITTED	10/10/02	M. KUDO TEAM LEADER

REPUBLIC OF THE PHILIPPINES
DEPARTMENT OF PUBLIC WORKS AND HIGHWAYS

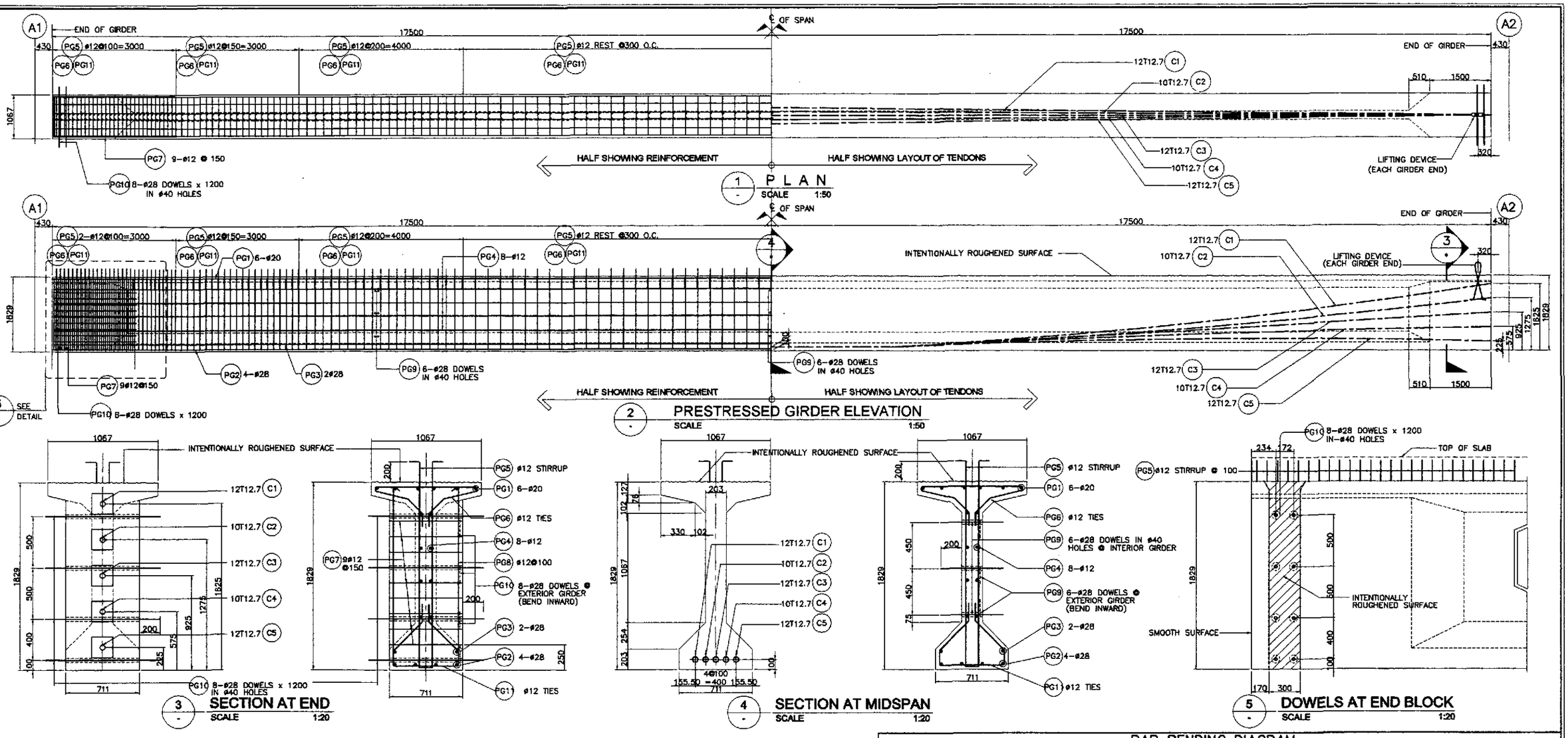
PUHL – PMO	BUREAU OF DESIGN		OFFICE OF THE SECRETARY	
Submitted By:	Reviewed By:	Recommended By:	Recommended By: (See cover sheet for Signature)	Approved By: (See cover sheet for Signature/Approval)
DANILO C. TRAJANO	ADRIANO M. DOROY	GILBERTO S. REYES	MANUEL M. BONOAN	SIMEON A. DATUMANONG
Project Director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

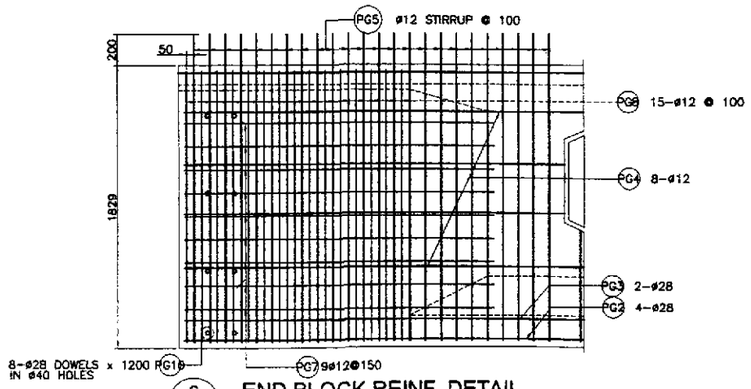
PROJECT AND LOCATION :
THE DETAILED DESIGN STUDY ON UPGRADING INTER-URBAN HIGHWAY SYSTEM ALONG THE PAN-PHILIPPINE HIGHWAY (Plaridel, Cabanatuan and San Jose Bypasses)
CABANATUAN BYPASS - CONTRACT PACKAGE II

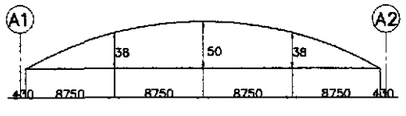
SCALE : AS SHOWN FULL SIZE A1

SHEET CONTENTS :
BRIDGE NO. 3
DECK FRAMING PLAN AND SECTIONS (INITIAL STAGE)

SHEET NO. : B3-02







NOTES :

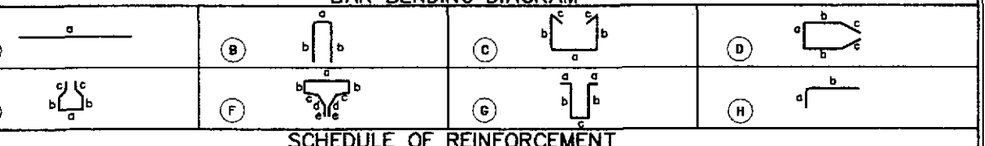
1.) SEE GENERAL NOTES, -2, FOR GIRDER DESIGN GUIDE.

2.) JACKING FORCE PER GIRDER, Pj = 7,710 KN.

3.) JACKING WILL BE DONE AT BOTH ENDS.

4.) FINAL PRESTRESSING FORCE @ MIDSPAN, F_{NET} = 6,842 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	18	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

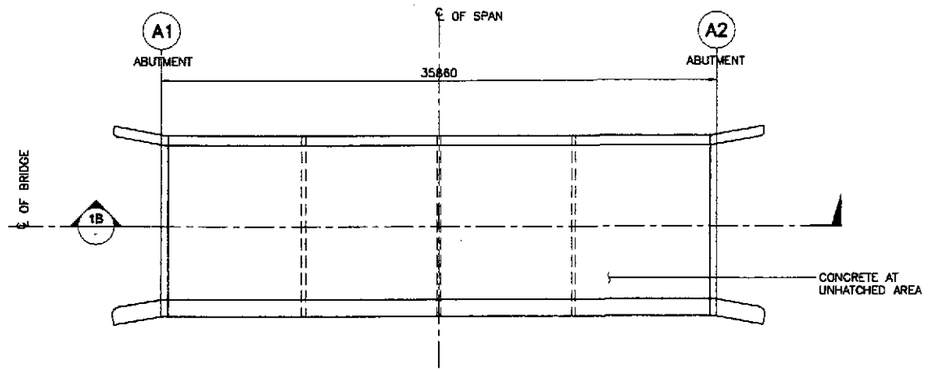
KATAHIRA & ENGINEERS INTERNATIONAL
YACHIYO ENGINEERING CO., LTD.

	DATE	SIGNATURE
DESIGNED	10/4/02	E. N. SALLAN
CHECKED	10/10/02	
SUBMITTED	10/8/02	D.YKUCHI 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 N. DOROY Chief, Bridges Division	GILBERTO S. REYES Director IV (OIC)	MANUEL M. BONDAN Undersecretary	SIMEON A. GATUMANONG Secretary

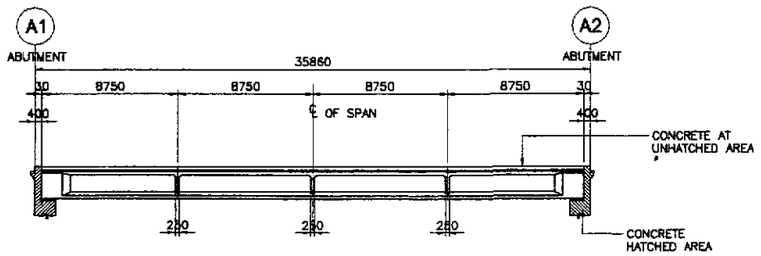
PROJECT AND LOCATION :	SCALE :	SHEET CONTENTS :	SHEET NO. :
THE DETAILED DESIGN STUDY ON UPGRADING INTER-URBAN HIGHWAY SYSTEM ALONG THE PAN-PHILIPPINE HIGHWAY (Plaridel, Cabanatuan and San Jose Bypasses)	AS SHOWN	BRIDGE NO. 3 AASHTO TYPE VI GIRDER (INITIAL STAGE)	B3-03
CABANATUAN BYPASS - CONTRACT PACKAGE II	FULL SIZE A1		



NOTES:

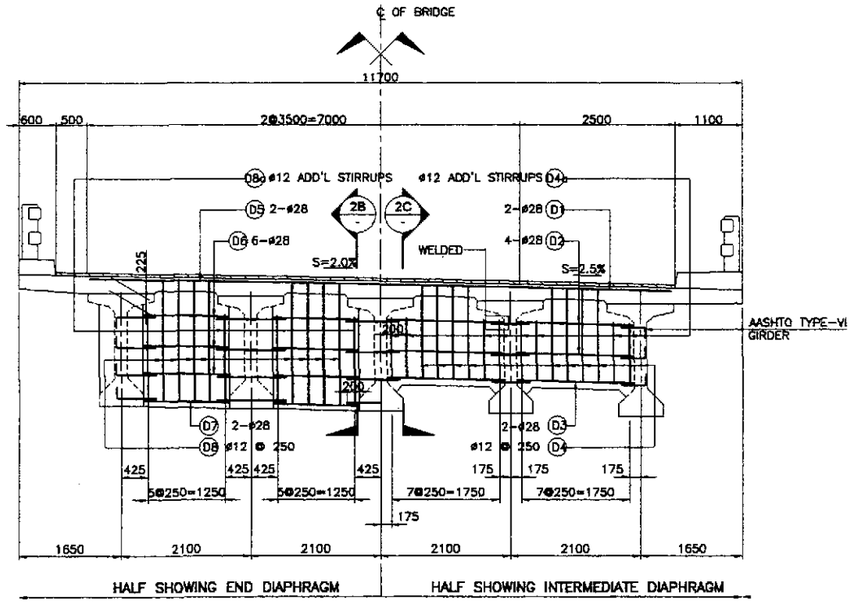
1. CONCRETE AT HATCHED AREAS SHALL BE PLACED AT LEAST TWENTY ONE (21) DAYS AHEAD OF CONCRETE AT UNHATCHED AREAS.
2. SEE GIRDER DETAIL FOR SPACING OF ø28 DOWELS.

1A / - PLAN
SCALE 1:200



1B / - LONGITUDINAL SECTION
SCALE 1:200

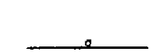
1 / - CONCRETE POURING SEQUENCE
SCALE 1:200



2A / - ELEVATION
SCALE 1:25

BAR BENDING DIAGRAM

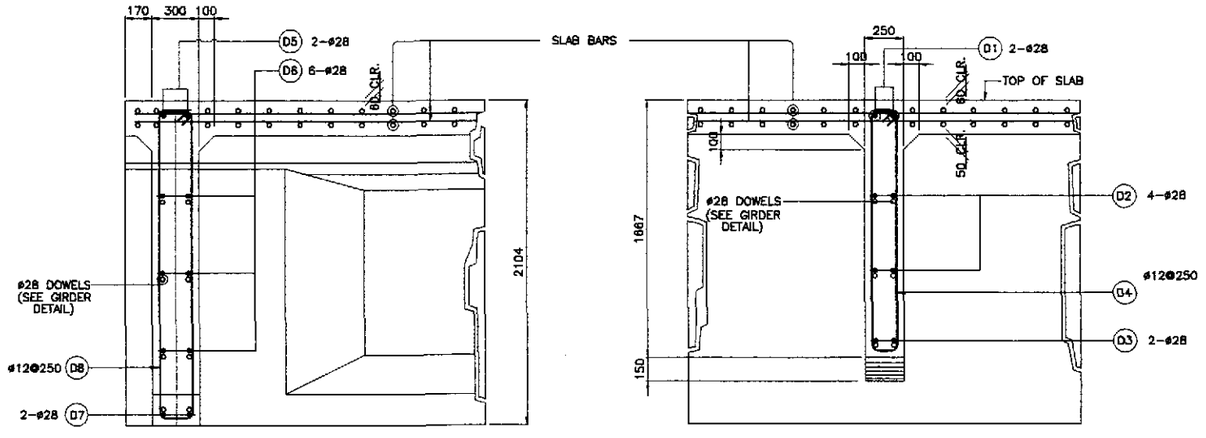
(A)



(B)

SCHEDULE OF REINFORCEMENT

STRUCTURE COMPONENT	LOCATION	CONCRETE VOLUME (m^3)	BAR MARK	BAR SIZE	QTY.	SPACING	BAR SHAPE	DIMENSIONS (mm) OUT TO OUT a	b	c	d	LENGTH PER BAR (mm)	TOTAL LENGTH (m)	UNIT WT. (kg/m)	TOTAL WEIGHT IN (kg)	REBAR RATIO (kg/m^3)
DIAPHRAGM	INTERMEDIATE DIAPHRAGM	9.06	D1	28	6	AS SHOWN	A	9400				9400	56.40	4.833	273	131.79
			D2	28	48	AS SHOWN	A	1895				1895	90.96	4.833	440	
			D3	28	24	AS SHOWN	A	1895				1895	45.48	4.833	220	
			D4	12	48	250	B	150	1500	150		3600	172.80	0.888	154	
			D4a	12	48	AS SHOWN	B	150	950	150		2500	120.00	0.888	107	
	END DIAPHRAGM	6.26	D5	28	4	AS SHOWN	A	9400				9400	37.60	4.833	182	126.84
			D6	28	48	AS SHOWN	A	1390				1390	66.72	4.833	323	
			D7	28	16	AS SHOWN	A	1390				1390	22.24	4.833	108	
			D8	12	32	250	B	200	1950	150		4600	147.20	0.888	131	
			D8a	12	16	AS SHOWN	B	200	1400	150		3500	56.00	0.888	50	
	TOTAL	15.32											GRADE 60 TOTAL = 1548 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

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

	DATE	SIGNATURE
DESIGNED	10/1/02	E. N. SALLAN
CHECKED	10/16/02	
SUBMITTED	10/18/02	TEAM LEADER

REPUBLIC OF THE PHILIPPINES
DEPARTMENT OF PUBLIC WORKS AND HIGHWAYS

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Submitted By:	Reviewed By:	Recommended By:	Recommended By: (See cover sheet for Signature)	Approved By: (See cover sheet for Signature/Approval)
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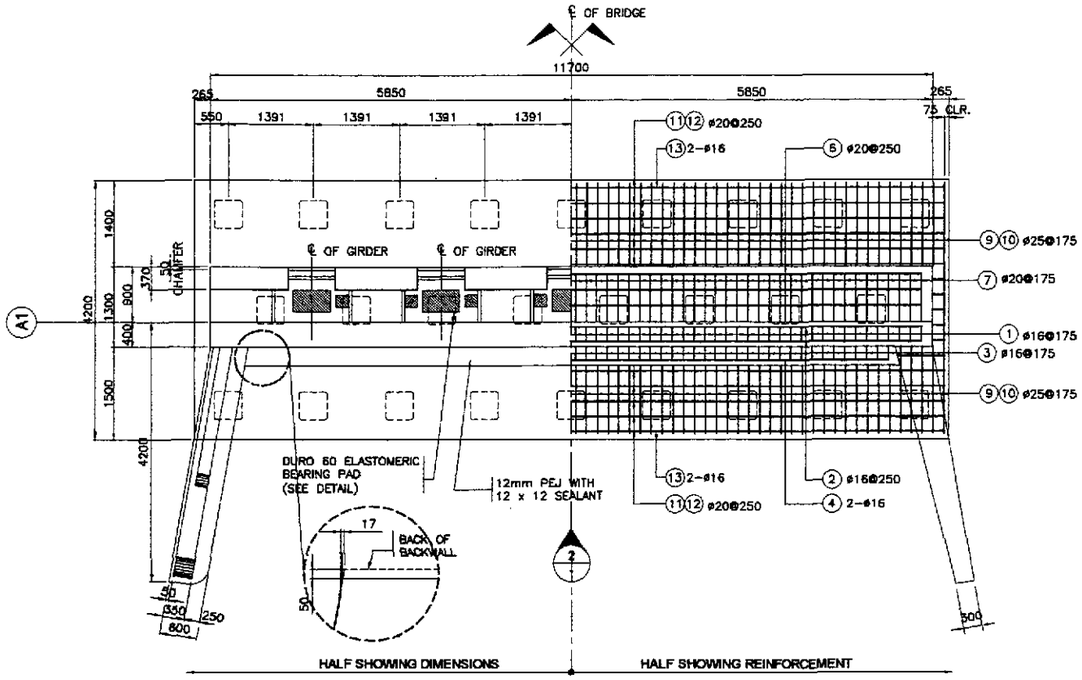
Project Director	Chief, Bridges Division	Director IV (OIC)	Undersecretary	Secretary

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

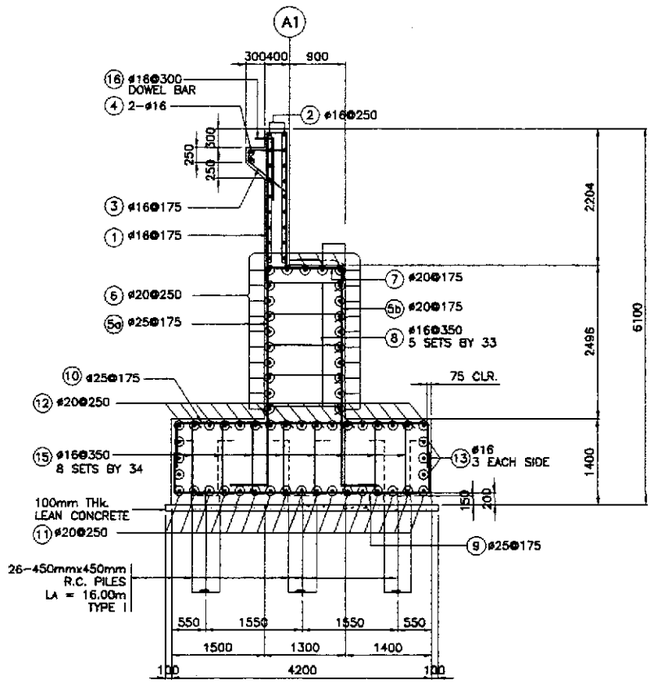
SCALE :
AS SHOWN
FULL SIZE A1

SHEET CONTENTS :
BRIDGE NO. 3
CONCRETE POURING SEQUENCE
AND DIAPHRAGM DETAILS
(INITIAL STAGE)

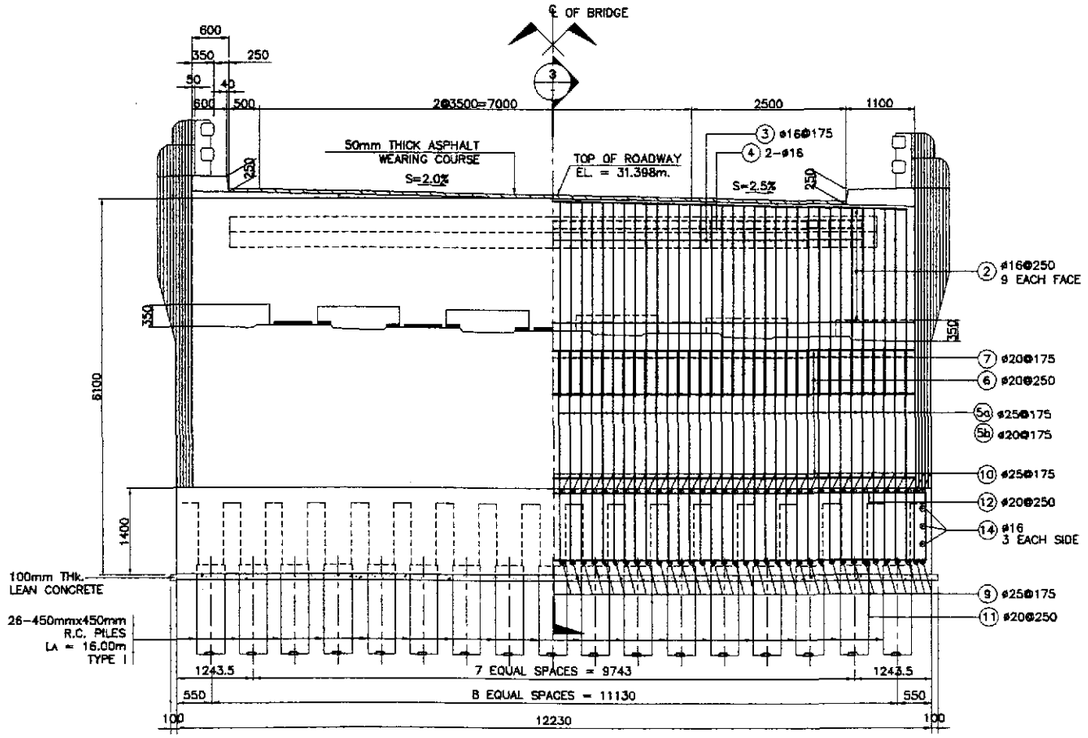
SHEET NO. :
B3-04



1 — PLAN
SCALE 1:50

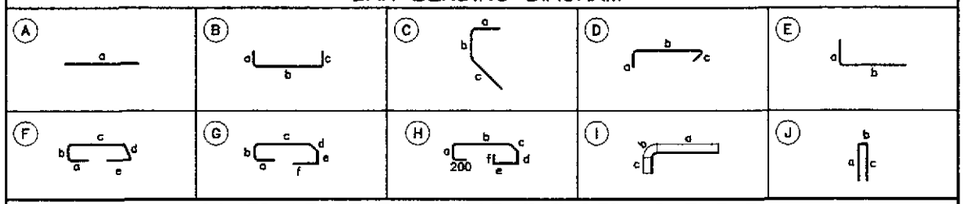


3 — SECTION
SCALE 1:50



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	67	175	B	2600	300	2600	–	–	–	5500	368.50	1.579	582	94.59
		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	37.96	⑤a	25	67	175	E	400	3650	–	–	–	–	4050	271.35	3.854	1046	81.62
		⑤b	20	67	175	E	400	3650	–	–	–	–	4050	271.35	2.466	670	
		⑥	20	23	250	A	11600	–	–	–	–	–	11600	266.80	2.466	658	
		⑦	20	67	175	B	250	1200	250	–	–	–	1700	113.90	2.466	281	
		⑧	16	185	350	D	250	1200	250	–	–	–	1700	280.50	1.579	443	
FOOTING	71.70	⑨	25	70	175	B	700	4050	700	–	–	–	5450	381.50	3.854	1471	69.41
		⑩	25	70	175	B	700	4050	700	–	–	–	5450	381.50	3.854	1471	
		⑪	20	17	250	B	700	12050	700	–	–	–	13450	228.65	2.466	564	
		⑫	20	17	250	B	700	12050	700	–	–	–	13450	228.65	2.466	564	
		⑬	16	6	AS SHOWN	A	12050	–	–	–	–	–	12050	72.30	1.579	115	
		⑭	16	6	AS SHOWN	A	4050	–	–	–	–	–	4050	24.30	1.579	39	
		⑮	16	272	350	D	250	1250	250				1750	476.00	1.579	752	
DOWEL		⑯	16	34	300	E	650	500	–	–	–	–	1150	39.10	1.579	62	
TOTAL	121.10													GRADE 40 TOTAL = 2,493 kgs. GRADE 60 TOTAL = 6,725 kgs.			

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

	DATE	SIGNATURE
DESIGNED	10/4/02	V. P. GONZALES
CHECKED	10/15/02	
SUBMITTED	10/18/02	M. BARCELI TEAM LEADER

REPUBLIC OF THE PHILIPPINES
DEPARTMENT OF PUBLIC WORKS AND HIGHWAYS

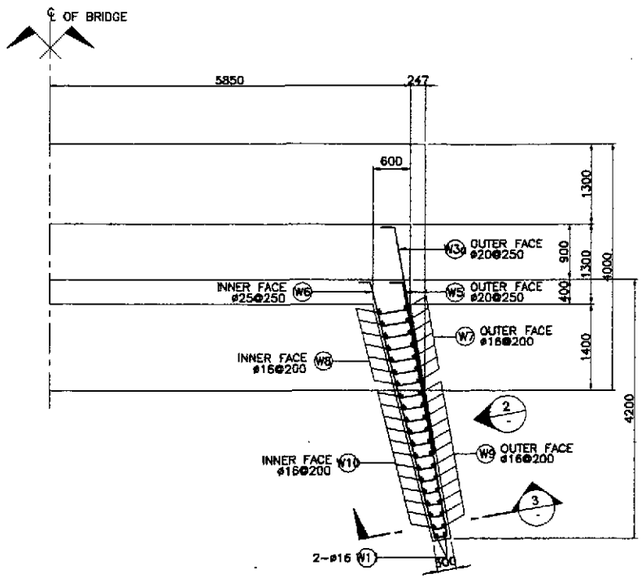
PJHL – PMO	BUREAU OF DESIGN		OFFICE OF THE SECRETARY	
Submitted By:	Reviewed By:	Recommended By:	Recommended By: (See cover sheet for Signature)	Approved By: (See cover sheet for Signature/Approval)
DANILO C. TRAJANO	ADRIANO M. DOROY	GILBERTO S. REYES	MANUEL M. BONOAN	SIMEON A. DATUMANONG
Project Director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

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

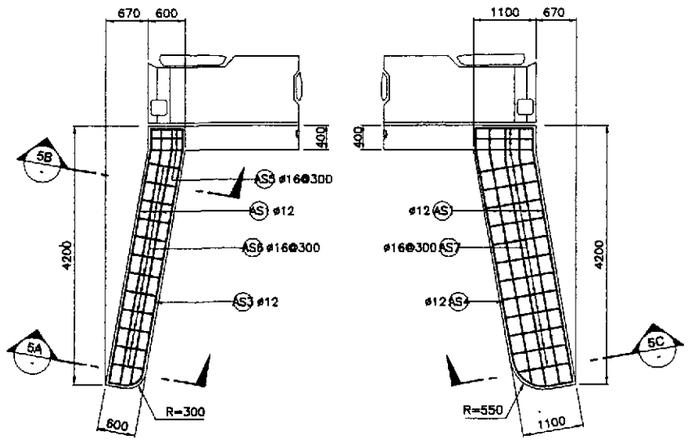
SCALE :
1 : 50
FULL SIZE A1

SHEET CONTENTS :
BRIDGE NO. 3
ABUTMENT A1
MAINWALL REINFORCEMENT DETAILS
(INITIAL STAGE)

SHEET NO. :
B3-05

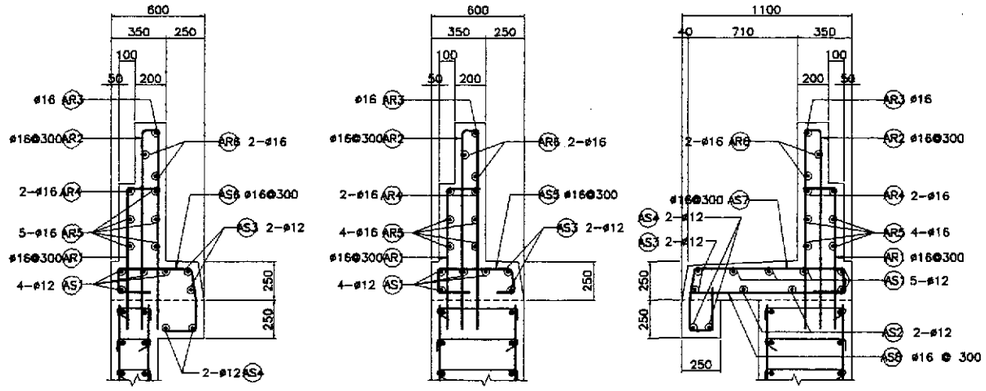


1 - PLAN
SCALE 1:50



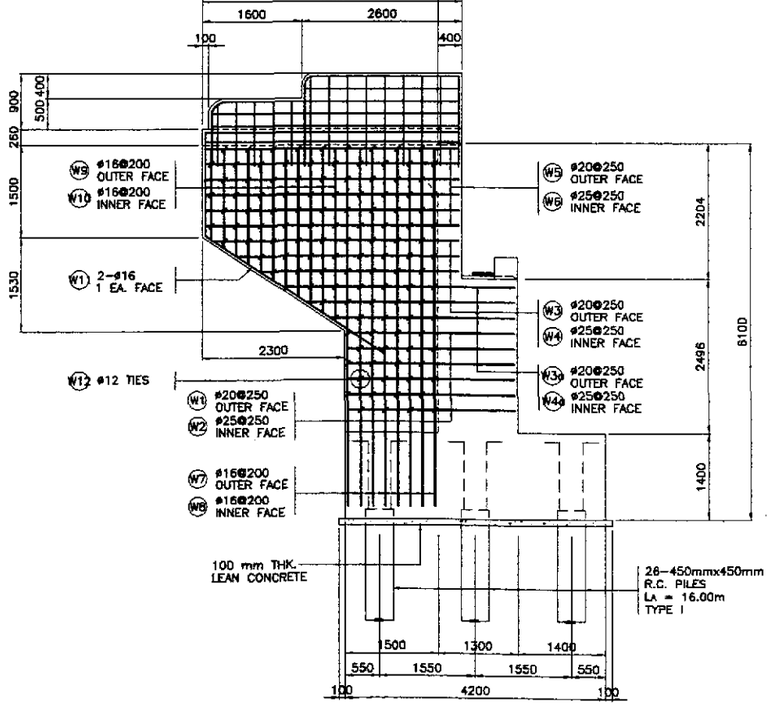
LEFT SIDE RIGHT SIDE

4 - SIDEWALK DETAIL
SCALE 1:50

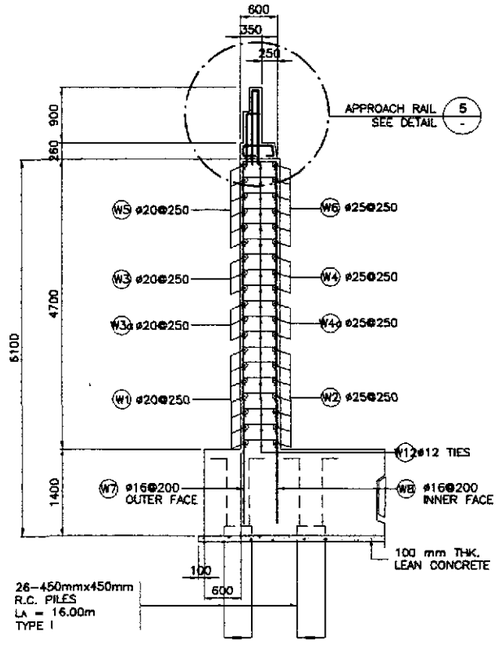


5A - SECTION SCALE 1:20
5B - SECTION SCALE 1:20
5C - SECTION SCALE 1:20

5 - APPROACH RAIL DETAILS
SCALE 1:20

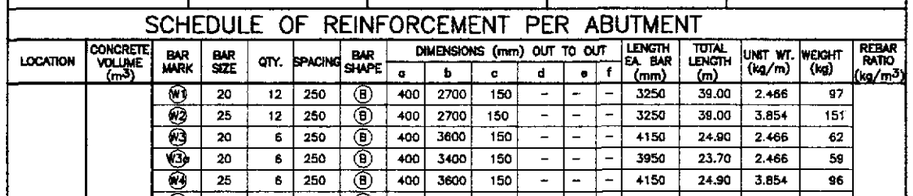


2 - WINGWALL ELEVATION
SCALE 1:50



3 - SECTION
SCALE 1:50

BAR BENDING DIAGRAM



SCHEDULE OF REINFORCEMENT PER ABUTMENT

LOCATION	CONCRETE VOLUME (m³)	BAR MARK	BAR SIZE	QTY.	SPACING	BAR SHAPE	DIMENSIONS (mm) OUT TO OUT a	b	c	d	e	f	LENGTH EA. BAR (mm)	TOTAL LENGTH (m)	UNIT WT. (kg/m)	WEIGHT (kg)	REBAR RATIO (kg/m³)
WINGWALL	11.03	W1	20	12	250	B	400	2700	150	–	–	–	3250	39.00	2.466	97	144.56
		W2	25	12	250	B	400	2700	150	–	–	–	3250	39.00	3.854	151	
		W3	20	6	250	B	400	3600	150	–	–	–	4150	24.90	2.466	62	
		W3a	20	6	250	B	400	3400	150	–	–	–	3950	23.70	2.466	59	
		W4	25	6	250	B	400	3600	150	–	–	–	4150	24.90	3.854	96	
		W4a	25	6	250	B	400	3400	150	–	–	–	3950	23.70	3.854	92	
		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	16	200	E	250	5850	–	–	–	–	6100	97.60	1.579	155	
		W8	16	16	200	E	250	5850	–	–	–	–	6100	97.60	1.579	155	
		W9	16	22	200	E	250	2150	–	–	–	–	2400	52.80	1.579	84	
		W10	16	22	200	E	250	2150	–	–	–	–	2400	52.80	1.579	84	
		W11	16	4	AS SHOWN	C	250	1500	3500	–	–	–	5250	21.00	1.579	34	
		W12	12	244	AS SHOWN	D	170	450	170	–	–	–	790	192.76	0.888	172	
														GRADE 60 TOTAL = 911 GRADE 40 TOTAL = 684			
APPROACH RAILING AND SIDEWALK	4.12	AS1	12	9	AS SHOWN	A	4100	–	–	–	–	–	4100	36.90	0.888	33	95.48
		AS2	12	2	AS SHOWN	A	4100	–	–	–	–	–	4100	8.20	0.888	8	
		AS3	12	4	AS SHOWN	A	4100	–	–	–	–	–	4100	16.40	0.888	15	
		AS4	12	4	AS SHOWN	A	4100	–	–	–	–	–	4100	16.40	0.888	15	
		AS5	16	3	300	F	200	170	480	200	200	–	1250	3.75	1.579	6	
		AS6	16	12	300	G	200	170	480	200	170	200	1420	17.04	1.579	27	
		AS7	16	15	300	H	200	170	980	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	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 TOTAL = 393			
TOTAL	15.15	GRADE 60 TOTAL = 911 kgs. GRADE 40 TOTAL = 1,077 kgs.															

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

	DATE	SIGNATURE
DESIGNED	10/4/02	A. P. GONZALES
CHECKED	10/16/02	H. KATAYAMA
SUBMITTED	10/18/02	M. MUSHA TEAM LEADER

REPUBLIC OF THE PHILIPPINES
DEPARTMENT OF PUBLIC WORKS AND HIGHWAYS

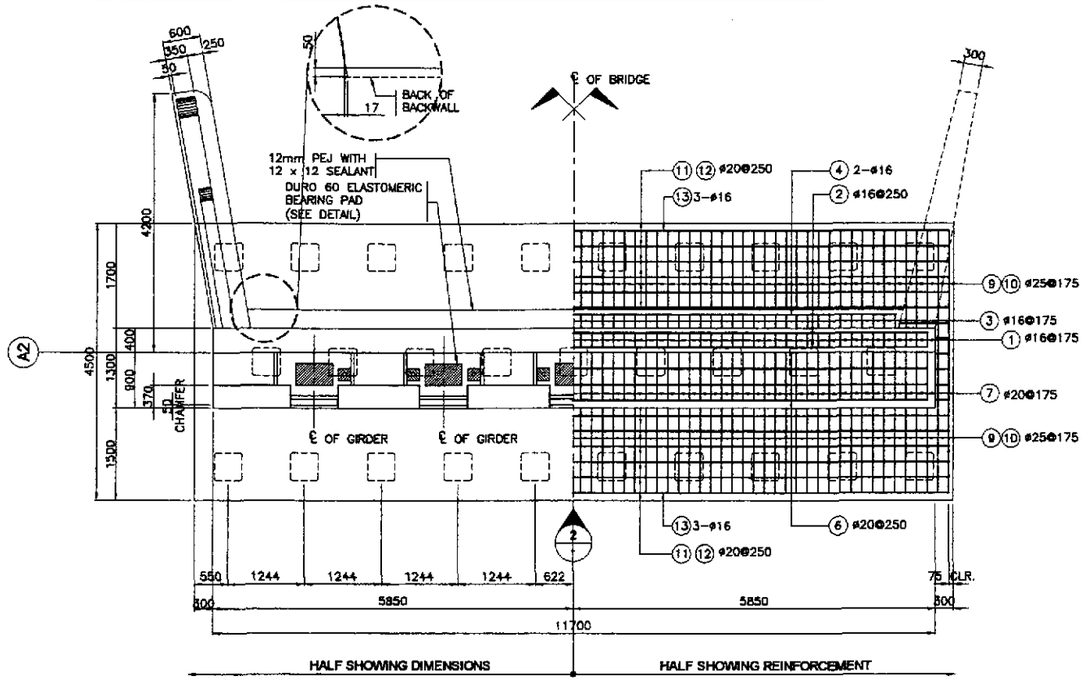
FUHL – PMO	BUREAU OF DESIGN		OFFICE OF THE SECRETARY	
Submitted By:	Reviewed By:	Recommended By:	Recommended By: (See cover sheet for Signature)	Approved By: (See cover sheet for Signature/Approval)
DANILO C. TRAJANO Project Director	ADRIANO M. DORDY Chief, Bridges Division	GILBERTO S. REYES Director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

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

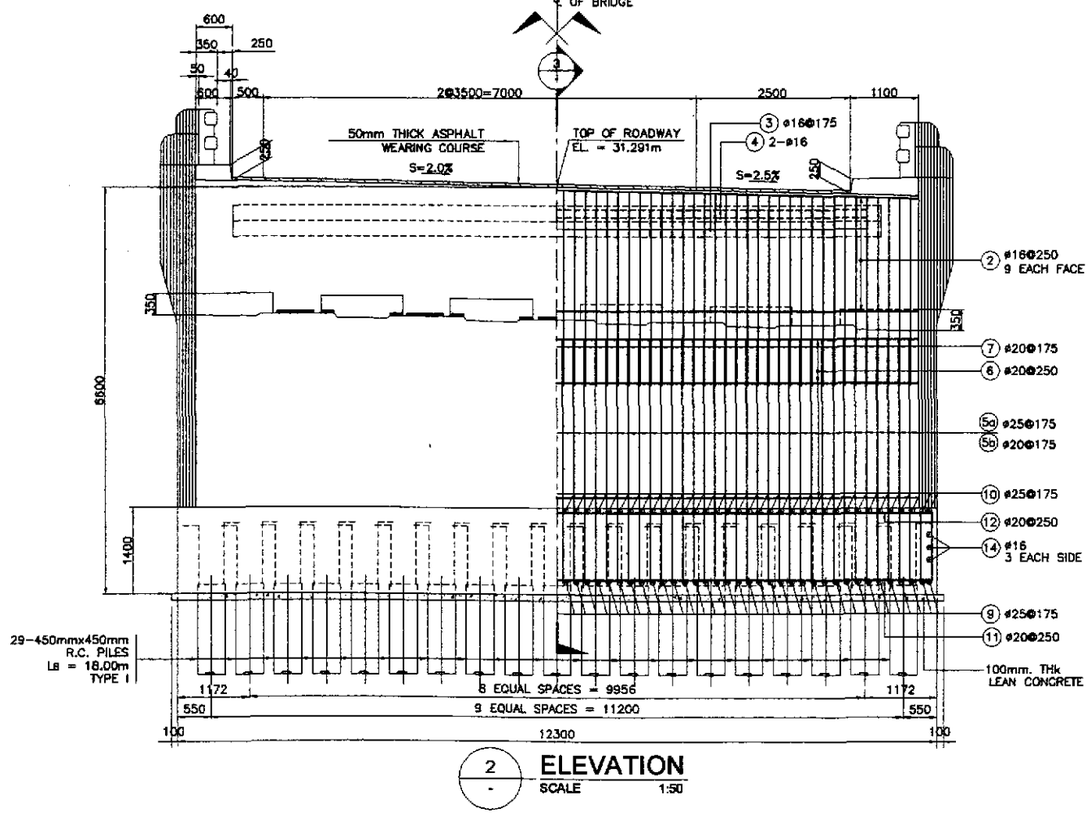
SCALE :
AS SHOWN
FULL SIZE A1

SHEET CONTENTS :
BRIDGE NO. 3
ABUTMENT A1
WINGWALL REINFORCEMENT DETAILS
(INITIAL STAGE)

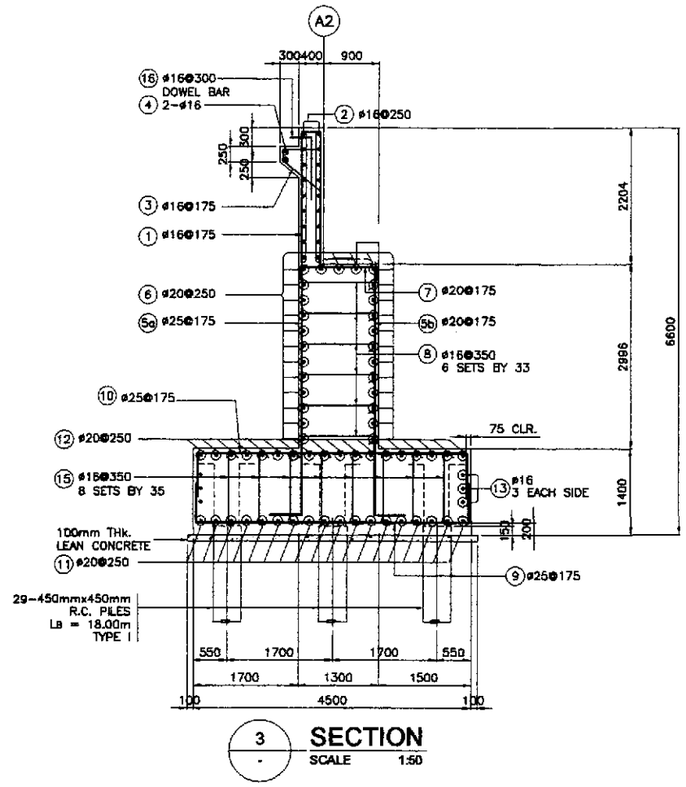
SHEET NO. :
B3-06



1 PLAN
SCALE 1:50

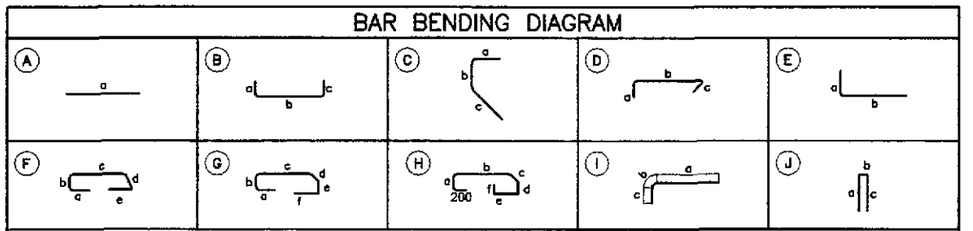


2 ELEVATION
SCALE 1:50



3 SECTION
SCALE 1:50

BAR BENDING DIAGRAM



SCHEDULE OF REINFORCEMENT PER ABUTMENT

LOCATION	CONCRETE VOLUME (m^3)	BAR MARK	BAR SIZE	QTY.	SPACING	BAR SHAPE	DIMENSIONS (mm) OUT TO OUT a	b	c	d	e	f	LENGTH EA. BAR (mm)	TOTAL LENGTH (m)	UNIT WT. (kg/m)	WEIGHT (kg)	REBAR RATIO (kg/m^3)
BACKWALL	11.44	①	16	67	175	B	2600	300	2600	–	–	–	5500	368.50	1.579	582	94.58
		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	45.57	⑤a	25	67	175	E	400	4150	–	–	–	–	4550	304.85	3.854	1175	77.09
		⑤b	20	67	175	E	400	4150	–	–	–	–	4550	304.85	2.466	752	
		⑥	20	27	250	A	11600	–	–	–	–	–	11600	313.20	2.466	773	
		⑦	20	67	175	B	250	1200	250	–	–	–	1700	113.90	2.466	281	
		⑧	16	198	350	D	250	1200	250	–	–	–	1700	336.60	1.579	532	
FOOTING	77.49	⑨	25	70	175	B	700	4350	700	–	–	–	5750	402.50	3.854	1552	67.62
		⑩	25	70	175	B	700	4350	700	–	–	–	5750	402.50	3.854	1552	
		⑪	20	18	250	B	700	12150	700	–	–	–	13550	243.90	2.466	602	
		⑫	20	18	250	B	700	12150	700	–	–	–	13550	243.90	2.466	602	
		⑬	16	6	AS SHOWN	A	12150	–	–	–	–	–	12150	72.90	1.579	116	
		⑭	16	6	AS SHOWN	A	4350	–	–	–	–	–	4350	26.10	1.579	42	
		⑮	16	280	350	D	250	1250	250				1750	490.00	1.579	774	
DOWEL		⑯	16	34	300	E	650	500	–	–	–	–	1150	39.10	1.579	62	
TOTAL	134.50	GRADE 40 TOTAL = 2,508 kgs. GRADE 60 TOTAL = 7,289 kgs.															

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

	DATE	SIGNATURE
DESIGNED	10/19/02	A. P. GONZALES
CHECKED	10/19/02	H. KAWASHIMA
SUBMITTED	10/19/02	M. KUCHI TEAM LEADER

REPUBLIC OF THE PHILIPPINES
DEPARTMENT OF PUBLIC WORKS AND HIGHWAYS

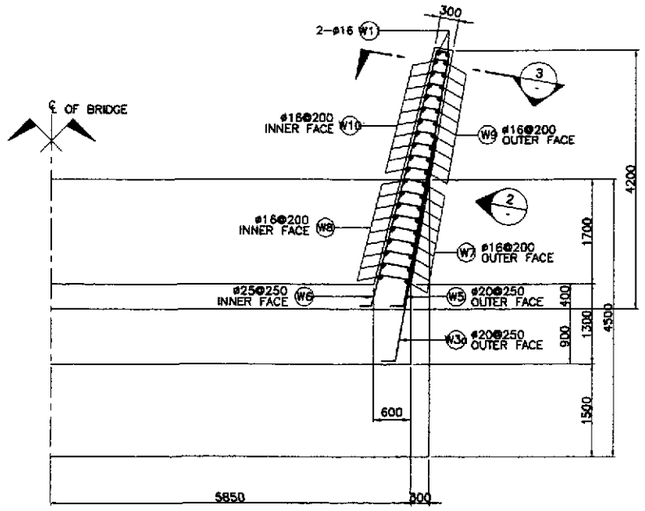
PJHL – PMO	BUREAU OF DESIGN		OFFICE OF THE SECRETARY	
Submitted By:	Reviewed By:	Recommended By:	Recommended By: (See cover sheet for Signature)	Approved By: (See cover sheet for Signature/Approval)
DANILO C. TRAJANO, Project Director	ADRIANO M. DOROY, Chief, Bridges Division	GILBERTO S. REYES, Director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

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

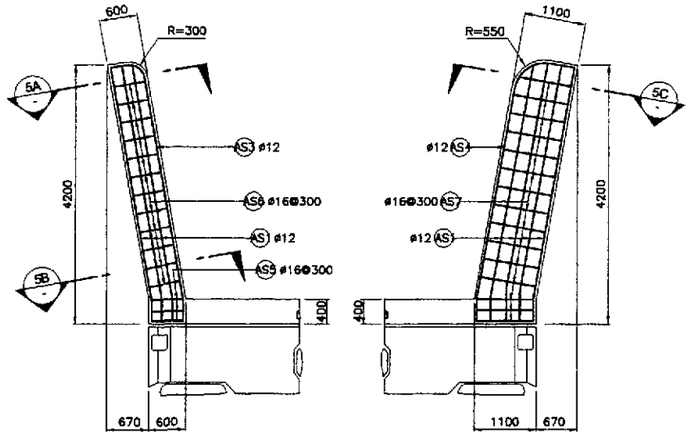
SCALE :
1 : 50
FULL SIZE A1

SHEET CONTENTS :
BRIDGE NO. 3
ABUTMENT A2
MAINWALL REINFORCEMENT DETAILS
(INITIAL STAGE)

SHEET NO. :
B3-07

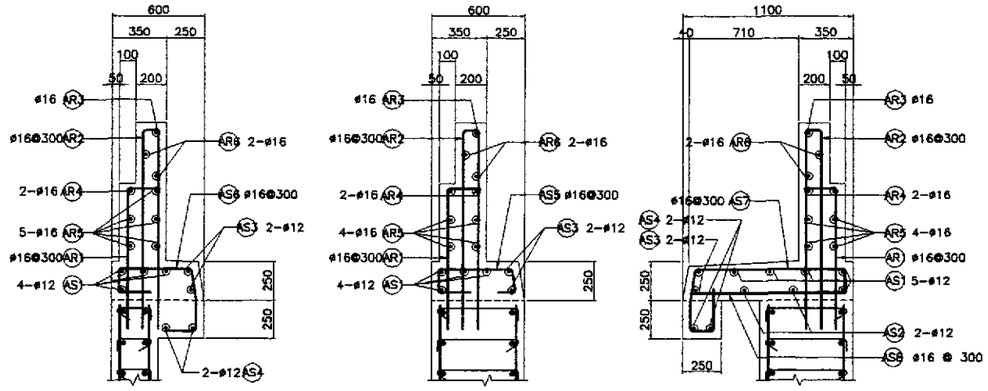


1 — PLAN
SCALE 1:50



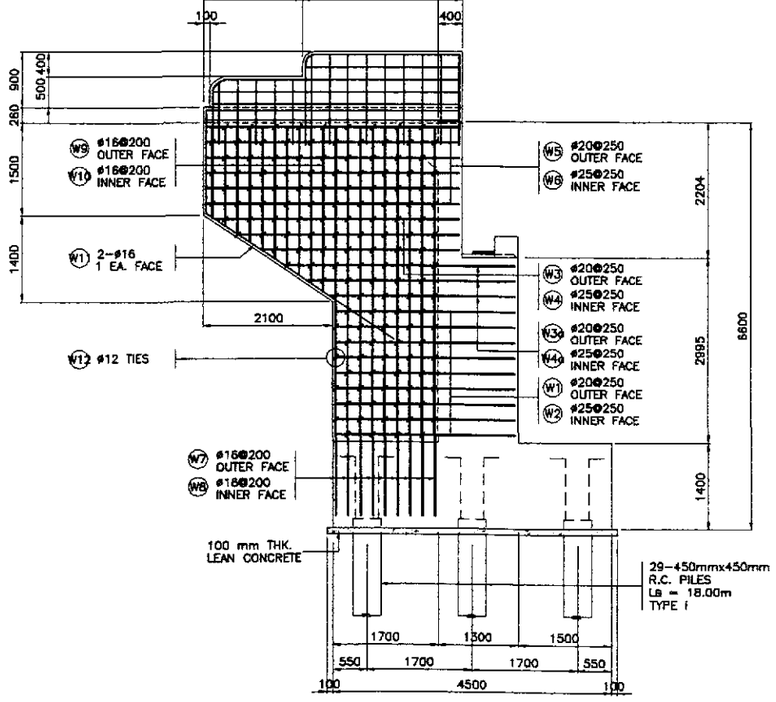
LEFT SIDE RIGHT SIDE

4 — SIDEWALK DETAIL
SCALE 1:50

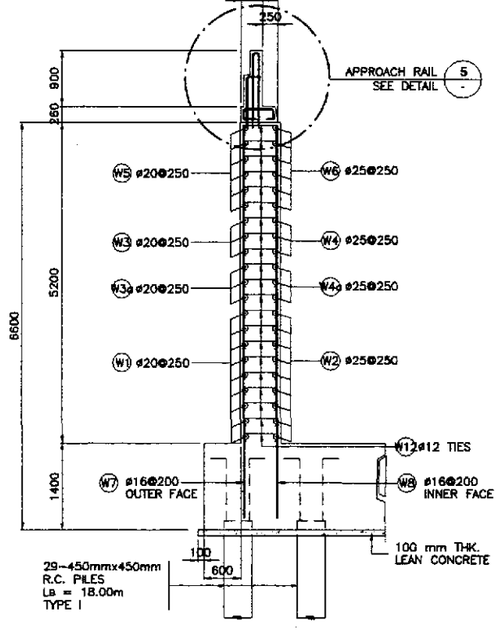


5A — SECTION, SCALE 1:20
5B — SECTION, SCALE 1:20
5C — SECTION, SCALE 1:20

5 — APPROACH RAIL DETAILS
SCALE 1:20

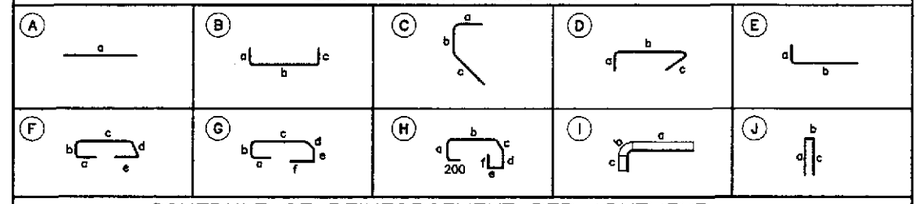


2 — WINGWALL ELEVATION
SCALE 1:50



3 — SECTION
SCALE 1:50

BAR BENDING DIAGRAM



SCHEDULE OF REINFORCEMENT PER ABUTMENT

LOCATION	CONCRETE VOLUME (m³)	BAR MARK	BAR SIZE	QTY.	SPACING	BAR SHAPE	DIMENSIONS (mm) OUT TO OUT a	b	c	d	e	f	LENGTH EA. BAR (mm)	TOTAL LENGTH (m)	UNIT WT. (kg/m)	WEIGHT (kg)	REBAR RATIO (kg/m³)
WINGWALL	12.11	W1	20	18	250	B	400	2900	150	–	–	–	3450	62.10	2.466	154	149.08
		W2	25	18	250	B	400	2900	150	–	–	–	3450	62.10	3.854	240	
		W3	20	6	250	B	400	3575	150	–	–	–	4125	24.75	2.466	62	
		W3a	20	6	250	B	400	3350	150	–	–	–	3900	23.40	2.466	58	
		W4	25	6	250	B	400	3575	150	–	–	–	4125	24.75	3.854	96	
		W4a	25	6	250	B	400	3350	150	–	–	–	3900	23.40	3.854	91	
		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	6350	–	–	–	–	6600	118.80	1.579	188	
		W8	16	18	200	E	250	6350	–	–	–	–	6600	118.80	1.579	188	
		W9	16	20	200	E	250	2100	–	–	–	–	2350	47.00	1.579	75	
		W10	16	20	200	E	250	2100	–	–	–	–	2350	47.00	1.579	75	
		W11	16	4	AS SHOWN	C	250	1500	3500	–	–	–	5250	21.00	1.579	34	
		W12	12	272	AS SHOWN	D	170	450	170	–	–	–	790	214.88	0.888	191	
														GRADE 60 TOTAL = 1,055 GRADE 40 TOTAL = 751			
APPROACH RAILING AND SIDEWALK	4.12	AS1	12	9	AS SHOWN	A	4100	–	–	–	–	–	4100	36.90	0.888	33	95.48
		AS2	12	2	AS SHOWN	A	4100	–	–	–	–	–	4100	8.20	0.888	8	
		AS3	12	4	AS SHOWN	A	4100	–	–	–	–	–	4100	16.40	0.888	15	
		AS4	12	4	AS SHOWN	A	4100	–	–	–	–	–	4100	16.40	0.888	15	
		AS5	16	3	300	F	200	170	480	200	200	–	1250	3.75	1.579	6	
		AS6	16	12	300	G	200	170	480	200	170	200	1420	17.04	1.579	27	
		AS7	16	15	300	H	200	170	980	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	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 TOTAL = 393			
TOTAL	16.23	GRADE 60 TOTAL = 1,055 kgs. GRADE 40 TOTAL = 1,144 kgs.															

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

	DATE	SIGNATURE
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CHECKED	10/16/02	
SUBMITTED	10/18/02	M. KUCHI TEAM LEADER

REPUBLIC OF THE PHILIPPINES
DEPARTMENT OF PUBLIC WORKS AND HIGHWAYS

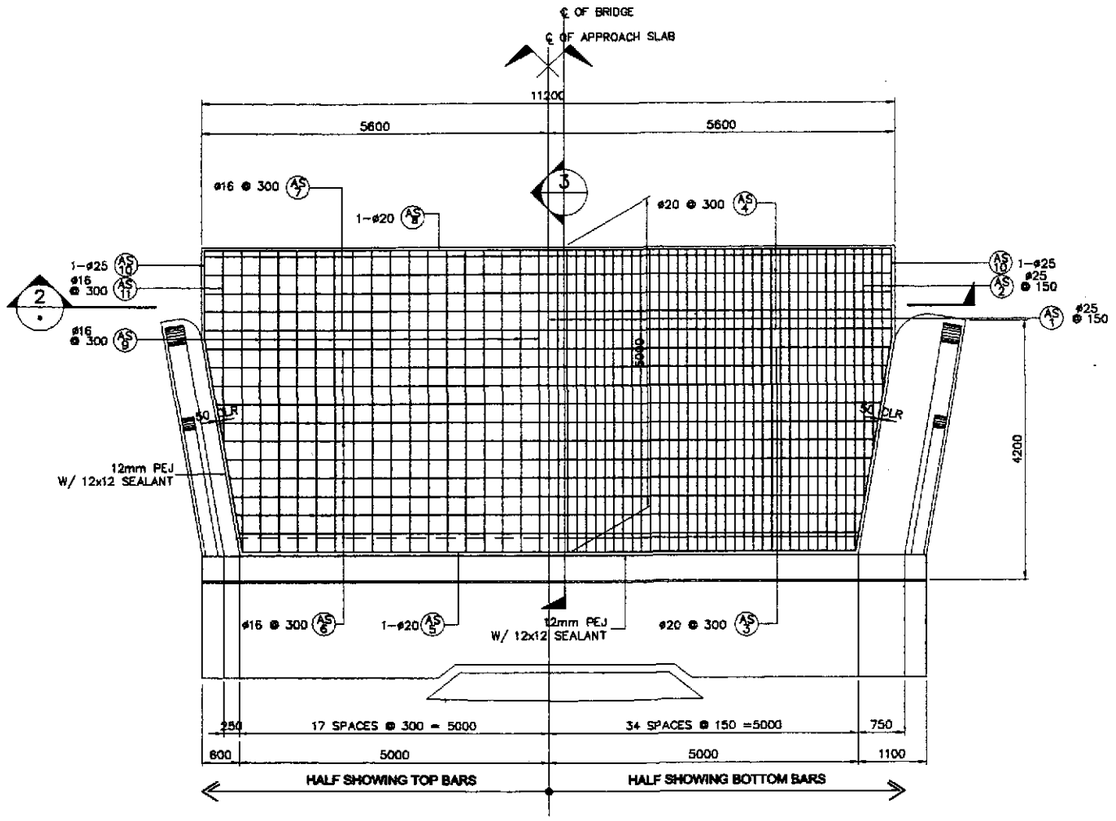
PJHL – PMO	BUREAU OF DESIGN		OFFICE OF THE SECRETARY	
Submitted By:	Reviewed By:	Recommended By:	Recommended By: (See cover sheet for Signature)	Approved By: (See cover sheet for Signature/Approval)
DANILO G. TRAJANO Project Director	ADRIANO N. DOROY Chief, Bridges Division	GILBERTO S. REYES Director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

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

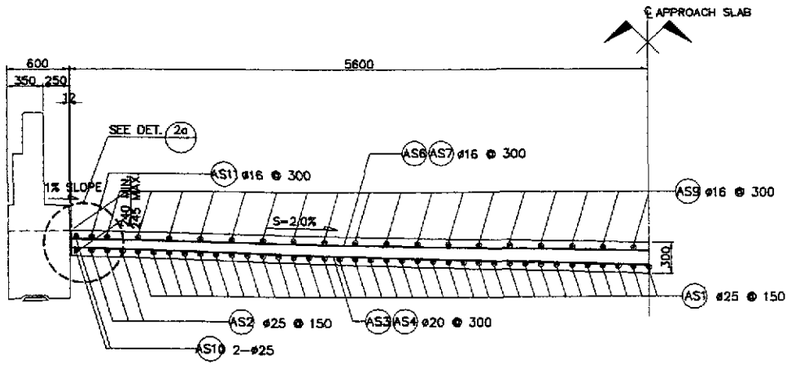
SCALE :
AS SHOWN
FULL SIZE A1

SHEET CONTENTS :
BRIDGE NO. 3
ABUTMENT A2
WINGWALL REINFORCEMENT DETAILS
(INITIAL STAGE)

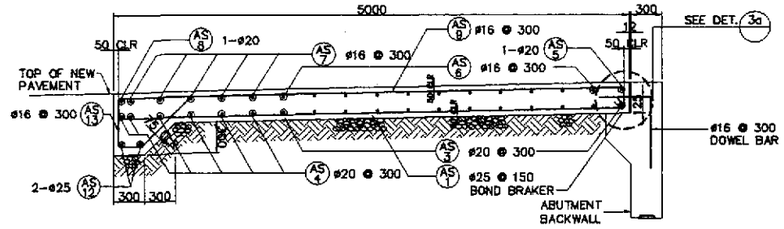
SHEET NO. :
B3-08



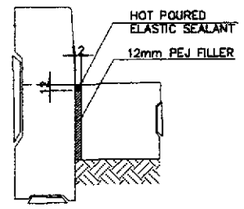
1 / - PLAN
SCALE 1:50



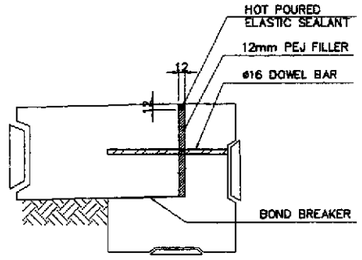
2 / - SECTION
SCALE 1:30



3 / - SECTION
SCALE 1:30

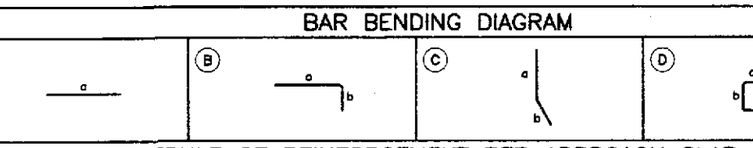


2a / - DETAIL
SCALE 1:10



3a / - DETAIL
SCALE 1:10

BAR BENDING DIAGRAM



SCHEDULE OF REINFORCEMENT PER APPROACH SLAB

LOCATION	CONCRETE VOLUME (m³)	BAR MARK	BAR SIZE	QTY.	SPACING	BAR SHAPE	DIMENSIONS (mm) OUT TO OUT a	b	c	d	e	f	LENGTH EA. BAR (mm)	TOTAL LENGTH (m)	UNIT WEIGHT (kg/m)	WEIGHT (kg)	REBAR RATIO (kg/cu.m.)
APPROACH SLAB	17.68	AS1	25	68	150	B	4900	200	–	–	–	–	5100	346.80	3.854	1337	157.19
		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	700	–	–	1800	68.40	1.579	109	
TOTAL	17.68	GRADE 40 TOTAL = 671 kgs. GRADE 60 TOTAL = 2,108 kgs.															

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

	DATE	SIGNATURE
DESIGNED	10/4/02	E/N. SALLAN
CHECKED	10/16/02	K. KOYASHIKI
SUBMITTED	10/13/02	M. BRUCE TEAM LEADER

REPUBLIC OF THE PHILIPPINES
DEPARTMENT OF PUBLIC WORKS AND HIGHWAYS

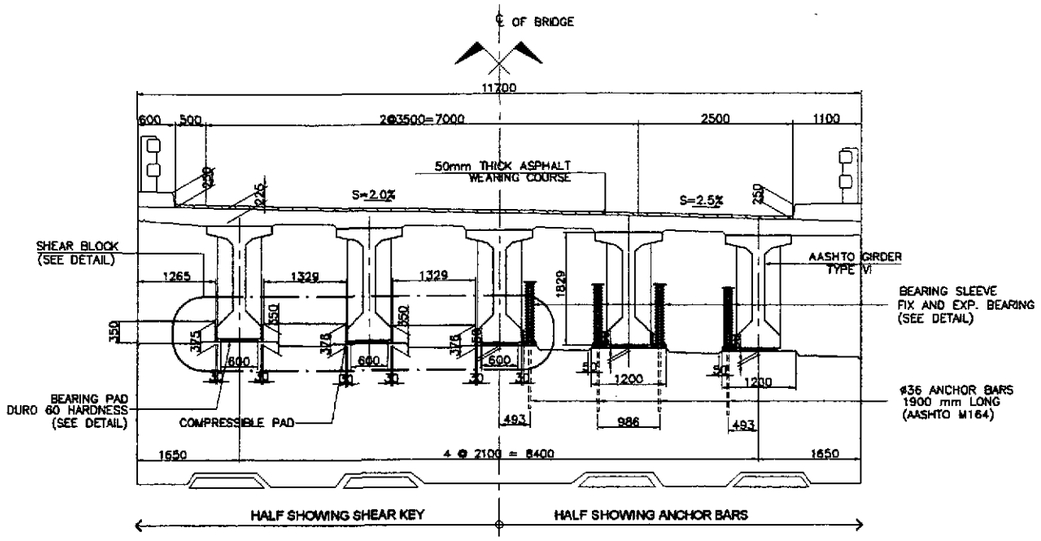
PJHL – PNO	BUREAU OF DESIGN		OFFICE OF THE SECRETARY	
Submitted By:	Reviewed By:	Recommended By:	Recommended By: (See cover sheet for Signature)	Approved By: (See cover sheet for Signature/Approval)
DANILO C. TRAJANO	ADRIANO M. DOROY	GILBERTO S. REYES	MANUEL M. BONOAN	SIMEON A. DATUMANONG
Project Director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

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

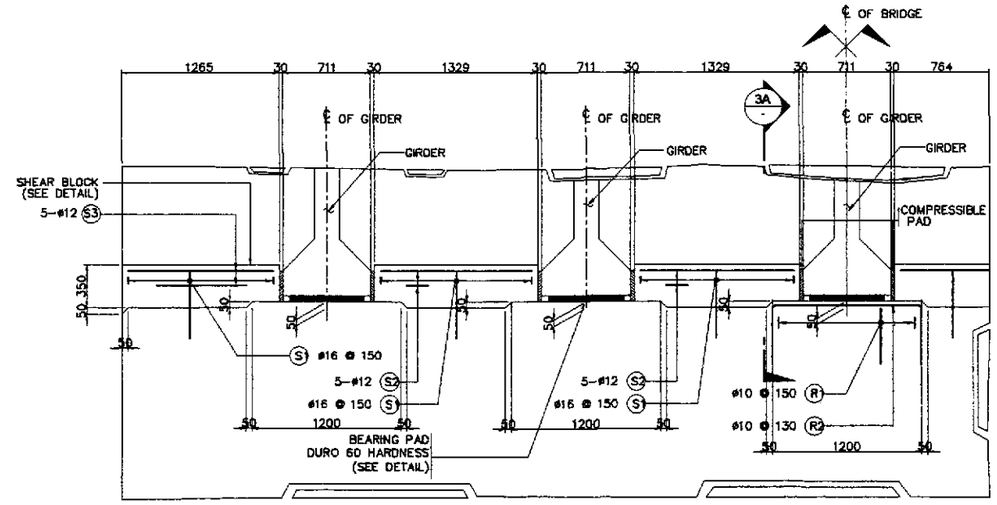
SCALE :
AS SHOWN
FULL SIZE A1

SHEET CONTENTS :
BRIDGE NO. 3
APPROACH SLAB PLAN, SECTIONS AND DETAILS (INITIAL STAGE)

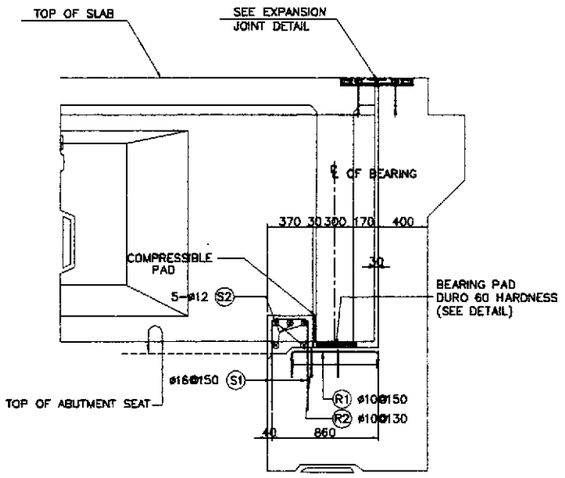
SHEET NO. :
B3-09



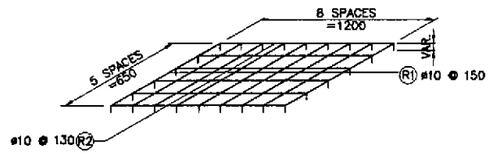
1 — SECTION AT ABUTMENT SEAT
SCALE 1:50



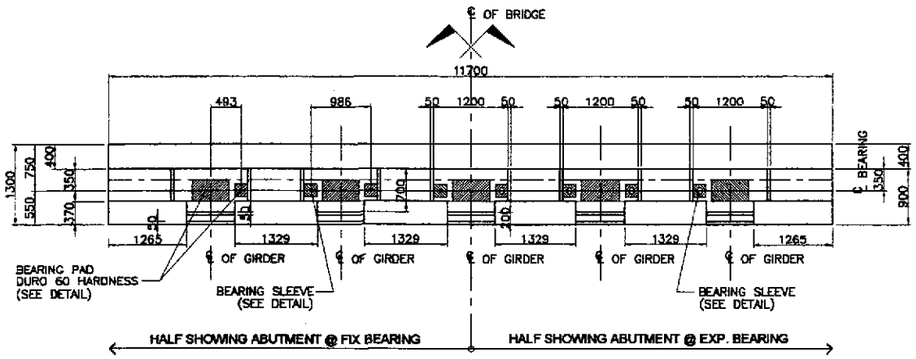
3 — SHEAR BLOCK DETAIL
SCALE 1:25



3A — SECTION
SCALE 1:25



4 — RISER REINFORCEMENT
NOT TO SCALE



2 — PLAN AT ABUTMENT SEAT
SCALE 1:50

BAR BENDING DIAGRAM

(A) a

(B) 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	1.50	S1	16	58	150	(B)	560	290	560			1410	81.78	1.579	130	142.34
		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	650	500			1650	74.25	0.616	46	
		R2	10	30	130	(B)	500	1200	500			2200	66.00	0.616	41	
TOTAL	1.50	GRADE 40 TOTAL = 251 Kgs.														

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

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

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

REPUBLIC OF THE PHILIPPINES
DEPARTMENT OF PUBLIC WORKS AND HIGHWAYS

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

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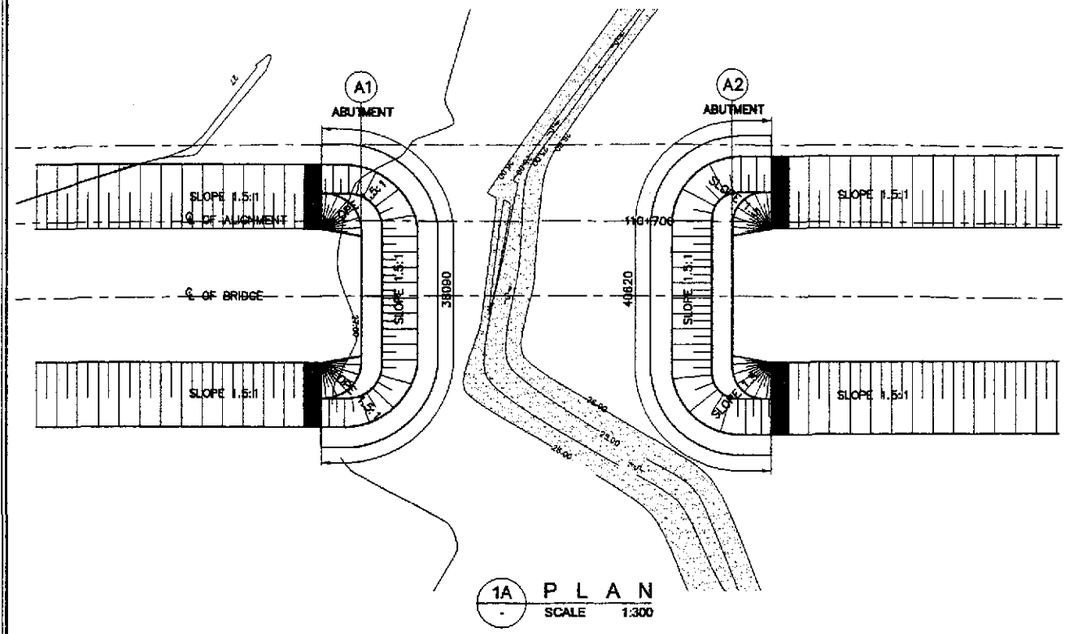
THE DETAILED DESIGN STUDY ON UPGRADING INTER-URBAN HIGHWAY SYSTEM ALONG THE PAN-PHILIPPINE HIGHWAY (Plaridel, Cabanatuan and San Jose Bypasses)
CABANATUAN BYPASS - CONTRACT PACKAGE II

SCALE : AS SHOWN
FULL SIZE A1

SHEET CONTENTS :
BRIDGE NO. 3
SHEAR KEY AND RISER DETAILS AT ABUTMENT (INITIAL STAGE)

SHEET NO. : B3-10



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 – 1.3KN/m

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

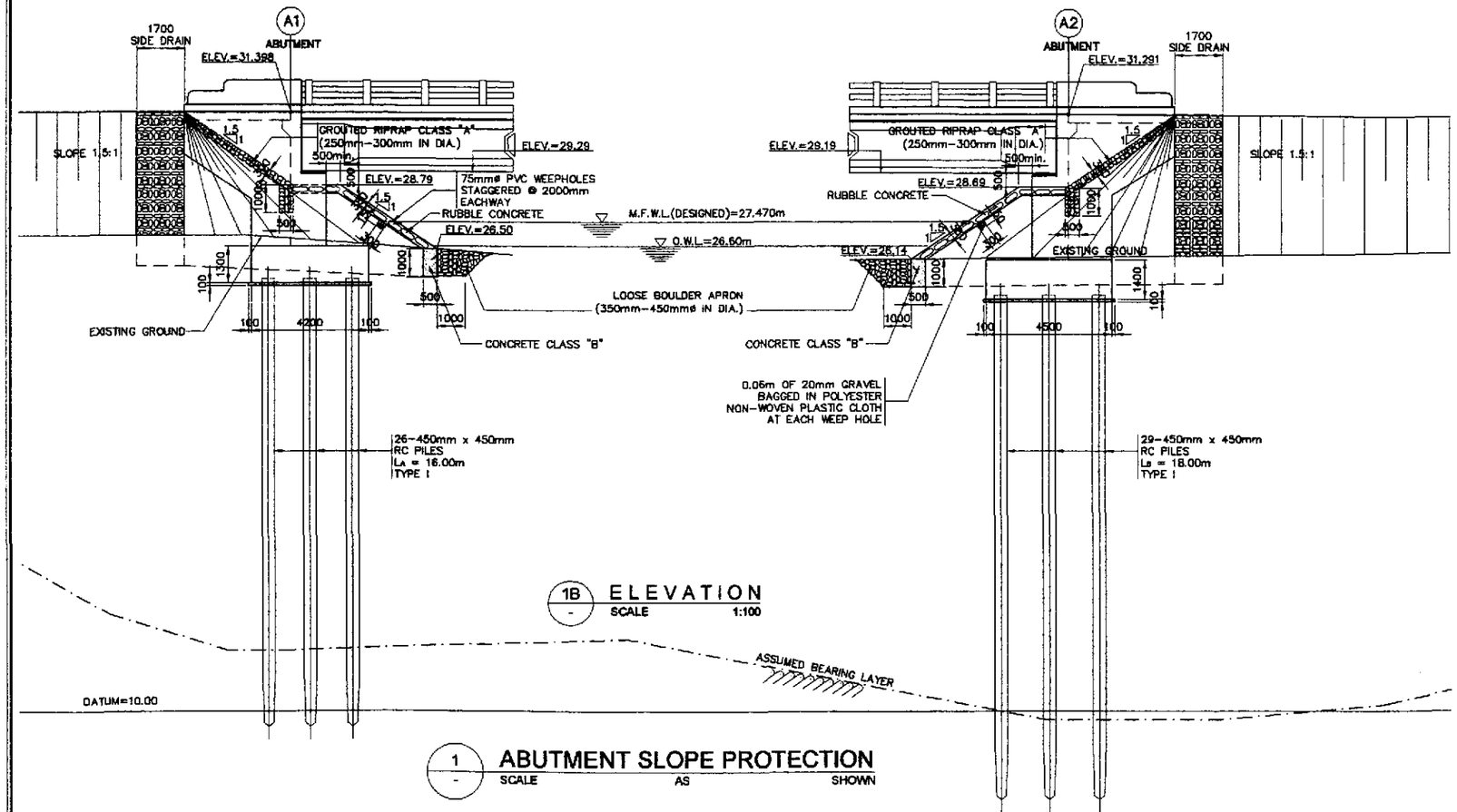
4. RUBBLE CONCRETE SHALL BE CLASS "B" (1:2.5:5) MIX CONCRETE WITH BOULDERS EMBEDDED THEREIN. BOULDERS 250–300mmø SHALL BE CAREFULLY HAND–LAID WITHIN THE CONCRETE SECTION. THE BOULDERS SHALL BE THOROUGHLY INCORPORATED INTO THE CONCRETE MASS WITH A COVER OF 30mm AND NOT LESS THAN 30mm APART. THE RUBBLE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

5. FOR THE LOOSE BOULDER APRON, BOULDERS 350–450mmø SHALL BE HAND–LAID, CLOSE TOGETHER AND SHALL BE FIRMLY BEDDED. ALL VOIDS BETWEEN BOULDERS SHALL BEFILLED WITH GRAVEL AND THE JOINTS FILLED WITH TIGHTLY DRIVEN SPALLS.

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

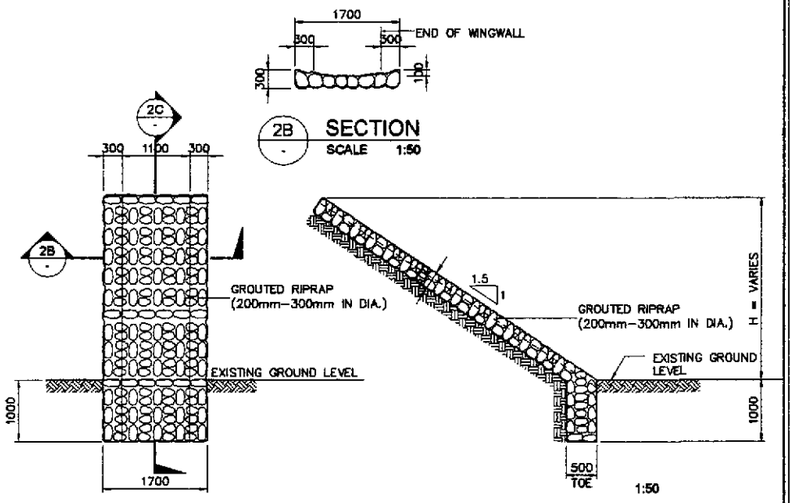
7. NO CONCRETING UNDER WATER SHALL BE PERMITTED.

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



1B ELEVATION
SCALE 1:100

1 ABUTMENT SLOPE PROTECTION
SCALE AS SHOWN



2B SECTION
SCALE 1:50

2A ELEVATION
SCALE 1:50

2C SECTION
SCALE

2 TYPICAL SIDE DRAIN DETAIL
SCALE AS SHOWN

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

PER ABUTMENT

LOCATION	SIZES	QUANTITY	
		ABUT. A1	ABUT. A2
CONC. CLASS "B"	1000 x 500 x LENGTH	18.02 cu. m.	18.89 cu. m.
BOULDER APRON	350mm–450mm IN DIA.	54.07 cu. m.	56.66 cu. m.
RUBBLE CONCRETE	250mm–300mm IN DIA.	46.97 cu. m.	54.22 cu. m.
SIDE DRAIN	200mm–300mm IN DIA.	9.30 cu. m.	10.28 cu. m.
GROUTED RIPRAP	250mm–300mm IN DIA.	514.45 cu. m.	15.12 cu. m.

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KATAHIRA & ENGINEERS INTERNATIONAL
YACHIYO ENGINEERING CO., LTD.

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

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

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CABANATUAN BYPASS - CONTRACT PACKAGE II

SCALE : AS SHOWN FULL SIZE A1

SHEET CONTENTS :
BRIDGE NO. 3
ABUTMENT PROTECTION AND SIDE DRAIN DETAILS (INITIAL STAGE)

SHEET NO. : B3-11