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REPUBLIC OF THE PHILIPPINES
DEPARTMENT OF PUBLIC WORKS AND HIGHWAYS
REGIONAL OFFICE NO. VIII
BARAS, PALO, LEYTE

C.Y. 2025 PROJECTS
DETAILED ENGINEERING DESIGN PLAN FOR

SIPAG - ACCESS ROADS AND/OR BRIDGES FROM THE NATIONAL ROADS LEADING TO MAJOR / STRATEGIC PUBLIC BUILDINGS / FACILITIES - CONSTRUCTION OF BORONGAN DIVERSION ROAD, BARANGAY LOCSOON-BARANGAY LALAWIGAN SECTION, BORONGAN CITY, EASTERN SAMAR

EASTERN SAMAR L.D.
STA. 0+000.00 - STA. 0+728.00

CW1 - CONSTRUCTION OF CONCRETE ROAD: 2.912 LANE-KM
CW2 - CONSTRUCTION OF DRAINAGE STRUCTURE ALONG ROAD 1,456.00 L.M.

BEG OF PROJECT : LAT = 11.568526° N. ; LONG = 125.460207° E
END OF PROJECT: LAT = 11.569177° N. ; LONG = 125.454354° E

SUBMITTED:

AGNES M. BARONDA
CHIEF, PLANNING AND DESIGN DIVISION
DATE:

RECOMMENDED:

MA. MARGARITA C. JUNIA, D.M.
ASSISTANT REGIONAL DIRECTOR
DATE:

APPROVED:

EDGAR B. TABACON, CESO IV
REGIONAL DIRECTOR
DATE:

A-3720

INDEX OF SHEETS

LEGENDS AND SYMBOLS

1.8 EXISTING TOPOGRAPHICAL FEATURES

ROADWAY CENTERLINE		EDGE OF ROAD (PROPOSED)	
EXISTING ROAD		NORTH ARROW INDICATOR	
RIVER, CREEK		CONTOUR @ 5m	
DIRECTION OF WATER FLOW		SWAMP	
HOUSES		RICEFIELD	
COCONUT TREE		PREMIUM TREE	

1.10 DESIGN FEATURES ON PROFILE

PIPE CULVERT		SUPERELEVATION INNER	
BOX CULVERT		SUPERELEVATION OUTER	
		FINISHED GRADE ON PROFILE	
POINT OF VERTICAL INTERSECTION STATION AND ELEVATION		LENGTH OF VERTICAL CURVE	
MATCHLINE	MATCHLINE STA. 0+000		

1.9. DESIGN FEATURES ON PLAN

CENTERLINE		STONE MASONRY SLOPE PROTECTION			
BENCHMARK	BM	CHEVRON			
REFERENCE POINT		RIGHT OF WAY LINE		EDGE OF RROW LIMIT	
POINT OF TANGENCY		POINT OF INTERSECTION AND NUMBER			
MATCHLINE	MATCHLINE STA. 0+000	INTERMEDIATE BENCHMARK			
INTERMEDIATE CONTROL (BM)	BM-1	GRID COORDIONATES			

ABBREVIATIONS

ABUTMENT	ABUT	KILOGRAM	KG
AHEAD STATIONING	AH STA	KILOMETER	km
AND	&	KILOMETER PER HOUR	KPH
AREA	A	LEFT	LL
ASPHALT CONCRETE PAVEMENT	ACP	LENGTH OF CIRCULAR CURVE	LC
AT	@	LENGTH OF VERTICAL CURVE	VC
AZIMUTH	AZM	LONGITUDINAL	LONGIT
BACK STATION	BK. STA	MAXIMUM	MAX.
BARANGAY	BRGY.	MAXIMUM FLOOD LEVEL	MFL
BEGINNING OF CIRCULAR CURVE	BCC	MEAN SEA LEVEL	MSL
BEARING	BRG.	METER	m
BEGINNING	BEG.	MILLIMETER	mm.
BELOW MEAN SEA LEVEL	BMSL	MINIMUM	MIN.
BENCHMARK	BM	MONUMENT	MON
BORE HOLE	BET.	NORTHING	N
BOTH HOLE	BH	NOT APPLICABLE	NA
BOTH WAYS	BS	NUMBER	NO.
BOTTOM	BW	ORDINARY WATER LEVEL	OWL
BRIDGE	BOT.	ORIGINAL GROUND LEVEL	OGL
SUBDIVISION OF DECREASED PROPERTY	BR	OUTSIDE DIAMETER	bc
BY BUREAU OF LANDS LOCATION MONUMENT	BSD	PAVEMENT WIDTH	PW
BUREAU OF LANDS AND LOCATION MONUMENT	BLLM	PERCENT	%
CENTER	CTR.	PHILIPPINES	PHL.
CENTERLINE	℄	PIECES	PCS.
CENTIMETER	cm	PLUS/ MINUS	±
CONCRETE HOLLOW BLOCK	CHB	PUBLIC LAND SUBDIVISION	PLS
CLEAR	CLR	POINT OF INTERSECTION	PI
COLUMN	COL.	POINT OF CURVATURE	PC
CONCRETE	CONC.	POINT OF VERTICAL CURVE	PVC
CONCRETE MONUMENT	CONC. MON	POINT OF VERTICAL INTERSECTION	PVI
CONSTRUCTION	CONST	POINT OF VERTICAL TANGENT	PVT
CORNER	COR.	POINT OF TANGENT	POT
COVER	COV.	PORTLAND CEMENT CONCRETE PAVEMENT	PCCP
CROSS PIPE	CP	PROJECT	PROJ.
CUBIC METER	cu.m/ m^3	PROJECT ROAD	PROJ. RD
CYLINDRICAL	CYL.	PRIVATE SURVEY	P. S
DEGREE OF CURVE	D	RADIUS	R
DEPARTMENT OF PUBLIC WORKS AND HIGHWAYS	DPWH	REFERENCE POINT	RP
DETAIL	DET.	REINFORCED CONCRETE BOX CULVERT	RCBC
DIAMETER	DIA./ Ø	REINFORCED CONCRETE PIPE CULVERT	RCPC
DIAPHRAGM	DIAP.	RETAINING WALL	RET. WALL
DISTANCE	DIST.	RIGHT OF WAY	ROW
DRAWING	DRWG.	ROAD	RD
EAST	E	SOUTH	S
ELEVATION	ELEV./EL	SIDEWALK	SDWK
END OF CIRCULAR CURVE	ECC	SUBDIVISION OF UNDECREASED PROPERTY	Csd
END OF PAVEMENT	EOP	SQUARE	SQ.
ENDING POINT	EP	SQUARE METER	sq.m/ m^2
ENGINEER	ENGR.	STANDARD	STD
EQUATION	EQ.	STARTING POINT	SP
EQUALIZATION CANAL	EC	STATION	STA.
EXCAVATION	EXCA	STRAIGHT	STR
EXISTING	EXIST./EXTG	STREET	ST.
EXPANSION	EXPN.	STRUCTURE	STRUCT
EXTENSION	EXTN.	TANGENT DISTANCE	T
EXTERIOR	EXTR.	TEMPERATURE	TEMP
EXTERNAL DISTANCE/EASTING	E	TEMPORARY BENCH MARK	TBM
FINISHED	FIN	VERTICAL	VERT
FINISHED GRADE	FG	WIDTH	w
FINISHED PAVEMENT LEVEL	FPL	WITH	w/
GENERAL	GEN		
GROUND LEVEL	GL		
HEAD WALL(S)	HW/ HWS		
HIGH FLOOD LEVEL	HFL		
HIGH TIDE LEVEL	HTL		
HIGH WATER LEVEL	HWL		
HORIZONTAL	HOR.		
INCHES	IN		
INTERSECTION ANGLE	I		
INSIDE DIAMETER	ID		
INTERIOR	INT		
INTERMEDIATE BENCH MARK	IBM		

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PROJECT NAME AND LOCATION: SIPAG - ACCESS ROADS AND/OR BRIDGES FROM THE NATIONAL ROADS LEADING TO MAJOR / STRATEGIC PUBLIC BUILDINGS / FACILITIES - CONSTRUCTION OF BORONGAN DIVERSION ROAD, BARANGAY LOCSOON BARANGAY LALAWIGAN SECTION, BORONGAN CITY, EASTERN SAMAR
EASTERN SAMAR 1 D

SHEET CONTENTS: LEGENDS AND SYMBOLS, ABBREVIATIONS, INDEX OF SHEETS

PREPARED: JAKE CHARLES S. HECHANOVA, ENGINEER II (DEO), DATE

REVIEWED: FELIX B. BACUS, CHIEF, HIGHWAY DESIGN SECTION, DATE

SUBMITTED: AGGESM. BARONDA, CHIEF PLANNER AND DESIGN DIVISION, DATE

RECOMMENDED: MA. MARGARITA C. JUNIA, O.M., ASSISTANT REGIONAL DIRECTOR, DATE

APPROVED: EDGAR B. TABACON, CESO IV, REGIONAL DIRECTOR, DATE

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GENERAL NOTES

I. DESIGN

A.) THE REHABILITATION/ CONSTRUCTION PROJECT FOLLOWS THE EXISITNG TRAVERSE AND GROUND ELEVATION.

II. DESIGN STANDARDS

A.) DPWH DESIGN GUIDELINES, CRITERIA AND STANDARDS (DGCS), VOLUME 4, 2015 EDITION
B.) AASHTO A POLICY ON GEOMETRIC DESIGN STANDARDS OF HIGHWAYS AND STREETS, 2011, 6TH EDITION
C.) AASHTO GUIDE ON PAVEMENT DESIGN, 1993 EDITION
D.) HIGHWAY SAFETY DESIGN STANDARDS: PART 1 - ROAD SAFETY DESIGN, AND PART 2 - ROAD SIGNS AND PAVEMENT MARKINGS, 2012 EDITION

III. STANDARD SPECIFICATIONS

A.) ALL WORKS SHALL COMPLY WITH THE DPWH STANDARD SPECIFICATIONS FOR HIGHWAYS, BRIDGES AND AIRPORTS, 2013 EDITION VOLUME 2.
B.) SPECIAL PROVISIONS AND SUPPLEMENTAL SPECIFICATIONS PERTAINING TO THE PROJECT.

IV. DIMENSIONS

A.) UNLESS OTHERWISE SPECIFIED, ALL DIMENSIONS WHICH INCLUDES STATIONING, DISTANCE BETWEEN CONTROL POINTS AND AS SHOWN IN THE PLAN ARE IN METER AND THE UNIT OF MEASURE AS SHOWN IN DETAILS OF STRUCTURE ARE IN MILLIMETERS.

V. TOPOGRAPHIC SURVEY

A.) SHALL BE DONE AS PER TERMS OF REFERENCE.

V.1.) STATIONING

A.) THE ROAD STATIONING AND ELEMENTS OF ELEMENTS OF HORIZONTAL AND VERTICAL CURVES SHOWN ON THE PLAN AND PROFILE SHEETS ARE RECKONED FROM THE ROADWAY CENTERLINE.
B. STATIONING OF THE BRIDGES, RCPC, RCBC, AND OTHER STRUCTURES ARE RECKONED FROM THE STATIONING OF THE ROADWAY CENTERLINE SHOWN ON THE PLAN.

VI. ELEVATIONS AND GRADES

A. FINISHED GRADE ELEVATION SHOWN ON PLAN AND PROFILE SHEETS REFERS TO THE FINISHED PAVEMENT LEVEL SHOWN ON THE TYPICAL ROADWAY SECTION.
B. GROUND GRADE SHOWN ON THE PLAN AND PROFILE SHEET REFERS TO THE ELEVATION OF THE ORIGINAL GROUND ALONG THE CENTERLINE OF THE PROJECT ROAD.
C. FINISHED GRADE FOR THIS PROJECT ARE SUBJECT TO CHANGE TO SUIT EXISTING FIELD CONDITION HOWEVER THAT IT IS MORE ADVANTAGEOUS AND MORE ECONOMICAL ON THE PART OF THE GOVERNMENT AND THE DESIGN STANDARD FOR HIGHWAYS PER REQUIREMENT OF A ASHTO ARE PROPERLY FOLLOWED.
D. WIDENING IN CURVES IS SUBJECTED TO ADJUSTMENT TO SUIT EXISTING FIELD CONDITION AND SHALL BE BACKFIELD WITH APPROVED MATERIALS.
E. PROPER ROAD CONNECTION AT THE BEGINNING AND END OF THE PROJECT SHALL BE PROVIDED TO ENSURE SMOOTH RIDING SURFACE.

VII. ROAD CONNECTIONS AND PRIVATE ENTRANCES

A. APPROACHES AND CONNECTIONS SHALL BE CONSTRUCTED BY THE CONTRACTOR AS SHOWN ON THE PLAN OR AS DIRECTED BY THE ENGINEER IN SUCH MANNER AS TO ENSURE SMOOTH CONNECTION AND GOOD RIDING QUAILITY.
B. EXACT LOCATIONS OF THE INTERSECTING ROADS WHERE ITEM VII.A ABOVE APPLIES SHALL BE DETERMINED I THE FIELD BY ENGINEER.
C.) NO OPENING FOR DRIVEWAYS OR PRIVATE ENTRANCES SHALL BE ALLOWED EXCEPT WITH THE PRIOR APPROVAL FROM THE PROPER AUTHORITIES.

VIII. REMOVAL OF EXISTING STRUCTURES AND OBSTRUCTIONS

A.) ALL WORKS SHALL COMPLY WITH ITEM 101 OF THE DPWH STANDARD SPECIFICATIONS VOLUME II, HIGHWAYS, BRIDGES AND AIRPORTS, 2013.

IX. EMBANKMENT AND SLOPE PROTECTION WORKS

A.) FOUNDATION OF THE SLOPE AND EMBANKMENT PROTECTION WORKS SHALL SIT ON A FIRM AND SUITABLE FOUNDATION SOFT SPOTS UNDER THE FOUNDATION SHALL BE REMOVED AND REPLACED WITH SUITABLE BEDDING MATERIALS OR CONCRETE CLASS "B".
B.)SOFT SPOTS BETWEEN THE OUT FACE AND SLOPE/ EMBANKMENT PROTECTION WALLS MUST BE FILLED WITH ROCKS OR SUITABLE MATERIALS SUCH AS BACKFILL MATERIALS PLACED BEHIND THE WALL SHALL BE FREE DRAINING, NON EXPENSIVE AND WATER SHALL BE DRAINED BY WHEEP HOLES PLACED AT SUITABLE INTERVALS AND ELEVATIONS.
C.) THE DEPTH PENETRATION SHALL BE MEASURED FROM LEVEL OF THE ORIGINAL GROUND SURFACE AND SHALL NOT INCLUDE EXCAVATED MATERIALS.

X. THE IMPLEMENTING OFFICE SHALL IDENTIFY THE LOCATIONS OF AND PROVIDE ACCESSIBILITY FACILITIES FOR PERSONS WITH DISABILITY IN ACCORDANCE WITH D.O. 37 SERIEES OF 2009

XI. RIGHT OF WAY

A.) ROAD CLASSIFICATION DICTATES THE RIGHT-OF-WAY LIMITS.

NOTE
THIS PLAN SHALL ONLY BE USED AS A GUIDE. SPECIFICALLY IN THE PRE-CONSTRUCTION STAGE. THE ACTUAL IMPLEMENTATION FOR THE PROJECT, ON THE HAND, WILL BE BASED ON THE "AS-STAKED PLAN" WHICH WILL BE DONE JOINTLY BY THE CONTRACTOR, THE IMPLEMENTING OFFICE, AND THE PLANNING AND DESIGN DIVISION. THE SAME SHALL BE SUBMITTED TO THE REGIONAL OFFICE ATTN: CHIEF, PLANNING AND DESIGN DIVISION, FOR THE THE ADDITIONAL REVIEW AND APPROVAL OF THE REGIONAL DIRECTOR.

REVISE THE TEMPLATE AND/OR STAKE OUT THE LOCATION OF LINED CANAL AND OTHER STRUCTURES AS PER TYPICAL ROADWAY SECTION BEFORE COMMENCING CONSTRUCTION. ADDITIONALLY, ANY CHANGES IN THE QUANTITY OF WORKS ITEM INVOLVED AS A RESULT OF REVISION MUST BE COMPUTED AND RE-CONSIDERED IN THE "AS-STAKED PLAN".

X. DESIGN SPECIFICATIONS

1.) PAVEMENT DESIGN CRITERIA

1.A) PAVEMENT DESIGN PARAMETER:

ITEM	DESIGN REQUIREMENTS
A. PERFORMANCE PERIOD FOR PCCP	20 years
B.DESIGN TRAFFIC: ESAL	0.855 x 10
C.DESIGN RELIABILITY: R	85 %
D. STANDARD DEVIATION: So	0.35
E. DESIGN SERVICEABILITY LOSS: APSI	2.50
F. PCCP MODULUS OF RUPTURE: Sc	635.55 psi
G. PCCP MODULUS OF ELASTICITY: Ec	3.360 X 10
H. SUBGRADE DESIGN CBR	22.63
I. EFFECTIVE ROADBED RESILIENT MODULUS: MR	33937.74
J. SUBBASE ELASTIC MODULUS: ESB	15,000 psi
K. SUBBASE THICKNESS	8" (200 mm)
L. EFFECTIVE MODULUS AT SUBGRADE REACTION: K (pci)	590.00
M. DRAINAGE COEFFICIENT: Cd	1.00
N. LOAD TRANSFER COEFFICIENT: J	3.90
O. LOSS OF SUPPORT: Ls	1.00
P. K (corrected):	215.00

2.) SLOPE STABILITY AND SLOPE PROTECTION CRITERIA

2.A) EMBANKMENT PROTECTION PARAMETERS: STONE MASONRY

ITEM	DESIGN REQUIREMENTS
1. UNIT WEIGHT OF STONE MASONRY, W^{SM}	24.00 kN/cu.m
2. SURCHARGE DUE TO LIVE LOAD, S	9.81 kN/sq.m
3. UNIT WEIGHT OF SOIL, W^{S}	19.00 kN/cu.m
4. ANGLE OF FRICTION OF SOIL, Ø	40°
5. SLOPE OF SOIL FACE, β	6.0°
6. COEFFICIENT OF FRICTION b/n GROUND & SM, U	0.60
7. BOTTOM THICKNESS OF STONE MASONRY, B	3.00 m
8. TOP THICKNESS OF MASONRY, b	0.50 m
9. HEIGHT OF ACTIVE SOIL PRESSURE, H	6.00 m
10. HEIGHT OF PASSIVE SOIL PRESSURE, h	1.00 m
11. HEIGHT OF EQUIVALENT OF SURCHARGE, h'	0.52 m
12. CONSIDERED STRIP OF MASONRY, bw	1.00 m

3.) HYDROLOGIC ANALYSIS AND HYDRAULIC PARAMETERS

3.A LINED CANAL

ITEM	DESIGN REQUIREMENTS
A. DESIGN STORM FREQUENCY	2 years
B. COEFFICIENT OF RUN-OFF, C	1.00
C. RAINFALL INTENSITY, I	132.66 mm/hr
D. CATCHMENT AREA, A	0.0019975 sq.km
E. RUN-OFF DISCHARGE, Q_R	0.07367 cu.m/sec
F. HEIGHT, H	0.70 m
G. WIDTH, W	0.70 m
H. FREE BOARD	0.07 m
I. DEPTH, D	0.63 m
G. SLOPE, S	0.09311
H. ROUGHNESS COEFFICIENT, N	0.018
I. WETTED PERIMETER, P	1.96
J. HYDRAULIC RADIUS, R	0.23
K. VELOCITY, V	6.27 m/s
L. DESIGN DISCHARGE, Q_D	2.766 cu.m./sec

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EASTERN SAMAR L.D.

SHEET CONTENTS: GENERAL NOTES

PREPARED	REVIEWED	SUBMITTED	RECOMMENDED	APPROVED
JAKE CHARLES S. HECHANOVA ENGINEER II (SB) DATE	FELIX R. BACUS CHIEF, HIGHWAY DESIGN SECTION DATE	AGNES M. BARONDA CHIEF, PLANNING AND DESIGN DIVISION DATE	MA. MARGARITA C. LUNIA, D.M ASSISTANT REGIONAL DIRECTOR DATE	EDGAR B. TABACON, CESO IV REGIONAL DIRECTOR DATE

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CONSTRUCTION REQUIREMENT

1. **ALL CONSTRUCTION SHALL CONFORM TO:**
   - A. CONDITIONS OF CONTRACT
   - B. THE SPECIAL PROVISIONS
   - C. THE SPECIFICATIONS OF ITEMS OF WORK FOR THIS PROJECT SHALL BE THE DPWH STANDARD SPECIFICATIONS FOR PUBLIC WORKS & HIGHWAYS 2013 EDITION, VOLUME II - HIGHWAYS BRIDGES & AIRPORTS OR SPECIAL PROVISION AS PRESENTED IN THE TENDER DOCUMENTS OF THE PROJECT

2. **SETTING OUT**
   - A. THE SETTING OUT AND ELEVATION OF THE DIFFERENT COMPONENTS OF THE STRUCTURE SHALL BE APPROVED BY THE ENGINEER PRIOR TO THE START OF ANY CONSTRUCTION WORK.

3. **EXCAVATION**
   - A. EXCAVATION FOR STRUCTURES SHALL BE NEAT LINES AS SHOWN IN THE PLANS AND THE SOIL UNDERNEATH STRUCTURE FOUNDATION SHALL NOT BE DISTURBED

4. **REINFORCED CONCRETE**
   - A. 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 SPECIFACTIONS.
     3. FOR CONCRETE DEPOSITED AGAINST THE GROUND, LEAN CONCRETE WITH A MINIMUM THICKNESS OF 50 MM SHALL BE 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 FOR APPROVAL PLACING SEQUENCES FOR ALL CONCRETE WORKS.
   - B. CONSTRUCTION JOINT
     1. THE POSITION AND FORM OF ANY CONSTRUCTION JOINT SHALL AS SHOWN ON DRAWINGS OR AS AGREED WITH THE ENGINEERS
   - C. FALSEWORK
     1. ALL FALSEWORK SHALL BE DESIGNED BY THE CONTRACTOR SUBJECT TO THE APPROVAL BY THE ENGINEER.

5. **EMBANKMENT**
   - A. PRIOR TO CONSTRUCTION OF EMBANKMENT, ALL NECESSARY CLEARING & GRUBBING IN THE AREA SHALL BE PERFORMED IN CONFORMITY WITH ITEM 100.
   - B. ALL UNSUITABLE MATERIALS, OTHER THAN DELIVERED SUITABLE MATERIALS, SHALL BE DISPOSED OF IN THE MANNER SPECIFIED IN THIS ITEM OR AS DIRECTED BY THE ENGINEER.
   - C. CONSTRUCTION OF ROADWAY EMBANKMENTS INCLUDES PREPARATION OF THE AREAS UPON WHICH SELECTED MATERIALS ARE TO BE PLACED, PLACING AND COMPACTING EMBANKMENT MATERIALS IN HOLES, PITS AND OTHER DEPRESSION WITHIN THE ROADWAY AREA

6. **SUB-GRADE, SUB- BASE AND BASE**
   - A. UNSUITABLE SUB-GRADE MATERIALS SHALL BE EXCAVATED BELOW THE GROUND SURFACE TO THE REQUIRED WIDTH AND DEPTH, THE AREA EXCAVATED SHALL BE BACKFILLED WITH THE APPROVED MATERIALS.
   - B. NO EMBANKMENT MATERIALS SHALL BE PLACED UNTIL THE FOUNDATION IS STABLE.

7. **CONCRETE AND CONCRETE PAVEMENT**
   - A.) CONCRETE STRENGTH BY CLASS

CLASS	28 DAYS CYLINDER STRENGTH		MAX. SIZE OF COARSE AGGREGATES
	MPa	PSI	mm (in)
A	20.7	3,000	38 (1-1/2)
B	16.5	2,400	50 (2)
C	20.7	3,000	12.50
P	27.7	5,000	19 (3/4)
LEAN	9.9	1,400	

B. THE CONTRACTOR SHALL SUBMIT A SUPERSTRUCTURE PLACING SEQUENCE FOR THE ENGINEER'S APPROVAL.
C. TRAFFIC SHALL BE REQUIRED TO REDUCE SPEED WHEN PASSING THE VICINITY OF THE NEWLY LAID CONCRETE PAVEMENT UNTIL SUCH TIME THAT IT HAS OBTAINED THE FOURTEEN (14) DAYS REQUIRED CURING PERIOD.
D. NO ADMIXTURES OR ADDITIVES WILL BE ALLOWED FOR ALL CONCRETE WORKS WITHOUT PRIOR APPROVAL FROM THE SECRETARY OF DPWH OR HIS DULY APPOINTED REPRESENTATIVES.
E. WHEN CONCRETING OF PAVEMENT PROGRESSES TRAFFIC SHALL BE MADE TO PASS OUTSIDE THE EMBANKMENT PRISM IN ORDER TO MINIMIZE THE EFFECT OF VIBRATION TO THE SETTING CONCRETE.
F. THE EXISTING CONCRETE CURB AND GUTTER THAT INTERFERES IN THE CONSTRUCTION SHALL BE REMOVED.

8. **DRAINAGE STRUCTURE**

A. EXACT LOCATIONS, SLOPES, OUTFALL, AND INVERT ELEVATIONS OF DRAINAGE STRUCTURES SHALL BE CHECKED IN THE FIELD. ADJUSTMENT MAY BE MADE TO SUIT ACTUAL FIELD CONDITIONS WITH THE APPROVAL OF THE ENGINEER.
B. EXISTING DRAINAGE STRUCTURES OR PARTS THEREOF REMOVED BY THE CONTRACTOR WHICH ARE STILL SERVICEABLE SHALL BE DEPOSITED AT A PLACE DESIGNATED BY THE ENGINEER WITHIN THE PROJECT SITE WITHOUT ANY COMPENSATION. EXTREME PRECAUTIONS SHALL BE EXCERCISED BY THE CONTRACTOR SO AS NOT TO DAMAGE THESE MATERIALS DURING THE REMOVAL AND HANDLING

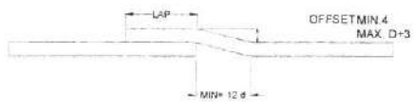
B.) PORTIONS OF EXISTING UTILITIES SUCH AS WATER MAINS, IRRIGATION CHANNELS, TELEPHONE POSTS AND TRUNK LINE, ETC. THAT MAY CAUSE OBSTRUCTION TO THE CONSTRUCTIONS OWNER CONCERNED, EXTREME PRECAUTION SHALL BE EXERCISED BY THE CONTRACTOR NOT TO DAMAGE ANY SECTION OF THE EXISTING PUBLIC UTILITIES DURING CONSTRUCTION , ANY REPAIR OF DAMAGE HEREOF SHALL BE ON THE ACCOUNT OF THE CONTRACTOR. ANY REMOVAL OF THE MISCELLANEOUS STRUCTURES THAT MAY BE REQUIRED SHALL BE SUBSIDIARY WORK PERTAINING TO OTHER CONTRACT ITEM. NO DIRECT PAYMENT SHALL BE MADE FOR THIS EXCEPT FOR SPECIFIC ITEMS EXPLICITLY IDENTIFIED FOR PAYMENT IN THE BID SCHEDULE.

9. **MISCELLANEOUS STRUCTURES**

A.) LOCATION AND LENGTH OF SLOPE PROTECTIONS, GUARDRAILS, STONE MASONRY RETAINING WALLS AND OTHER STRUCTURES MAY BE ADJUSTED BY THE CONTRACTOR TO SUIT ACTUAL FIELD CONDITIONS WITH THE APPROVAL OF THE ENGINEER.

10. **REINFORCING STEEL**

A. THE CONTRACTOR /BIDDER SHALL SUBMIT SHOP DRAWINGS TO THE ENGINEER FOR APPROVAL PRIOR TO FABRICATION. SHOP DRAWING SHOULD SHOW DETAILS FOR FABRICATION AND FOR PLACING REINFORCING STEEL ONLY THOSE NECESSARY FOR THE PROPER LOCATION OF THE STEEL ARE REQUIRED ON THE DRAWINGS. BENDING DETAILS MAY BE SHOWN ON A SEPARATE SHEET.
B. NO MORE THAN ONE BAR IN THREE SHALL BE SPLICED AT THE SAME SECTION UNLESS OTHERWISE SHOWN. SPLICING SHALL BE KEPT TO A MINIMUM AND SHOULD BE STAGGERED AND LAPPED NOT LESS THAN 40 BAR DIAMETER UNLESS OTHERWISE SHOWN ON DRAWING. WHERE THE CLEAR DISTANCE BETWEEN LAPPED BARS DO NOT MEET THE REQUIREMENTS IN ITEM 12.4. THE CONTRACTOR SHALL USED CRANKED SPLICES AS DETAILED BELOW.



11. PAVEMENT MARKINGS
    - A. THE MATERIALS, DIMENSIONS, SHAPES, COLOR, SIZE OF NUMERALS, LETTERS AND INSTALLATION SHALL CONFORM IN ACCORDANCE WITH SPECIFICATION OF DPWH MANUAL OR PAVEMENT MARKINGS, 2012.

12. ROAD SIGNS
    - A. THE MATERIALS, DIMENSIONS, SHAPES, COLOR, SIZE OF NUMERALS/LETTERS AND INSTALLATION SHALL BE IN ACCORDANCE WITH THE DPWH ROAD SIGN MANUAL, 2012.

13. **TREE PLANTING**

A.) TREE PLANTING OF THIS PROJECT ROAD SHALL BE PROVIDED IN COMPLIANCE WITH THE DEPARTMENT ORDER NO. 15, SERIES OF 2000 (DO # 15) IMPLEMENTING UNIT MEMORANDUM ORDER NO. 4, SERIES OF 2001 (MO # 40. THE KIND OF TREES TO BE USED SHALL BE ACCEPTABLE TO DPWH, THE QUANTITIES TO BE CONSIDERED SHALL BE AS INDICATED IN THE BILL OF QUANTITIES.

COORDINATE SYSTEM

SURVEY SPECIFICATION

- A. COORDINATE REFERENCE SYSTEM: PRS92 / Philippines zone 5 / WGS84
- B. PROJECTION: TRANSVERSE MERCATOR (TM) IN ZONE OF 2° NET WIDTH
- C. DATUM: PRS 92 / WGS 84
- D. EPSG CODE: 3125

DATE OF SURVEY:

JANUARY 28, 2025 - MARCH 1, 2025

EQUIPMENT USED:

HI-TARGET/RTKS, ROVER, BASED, HOL460A, CONTROLLER Q-MINI A10(UWB)

REFERENCE BENCHMARK DETAILS

A.) THE POSITION OF PROJECT CONTROL POINTS SHALL BE DEFINED AND MARKED ON THE GROUND BY MONUMENTS OF PERMANENT NATURE.
B.) CRITERIA FOR LOCATION OF MONUMENTS:
1. ACCESSIBILITY
2. GROUND STABILITY
3. SECURITY FROM POSSIBLE ACTS OF DISTURBANCE

C.) INTERVAL OF MONUMENTS:

1	PRIMARY GPS CONTROL (GPS)	3KM INTERVAL
2	PRIMARY PROJECT CONTROL (BM)	500M INTERVAL
3	INTERMEDIATE CONTROL (IBM)	EVERY 250M
	INTERVAL IN BETWEEN BMs	

BM/IBM NO.	COORDINATES		ELEVATION	REMARKS
BM-1	1,383,094.36	462,188.60	56.01 m	R/S OF STA. 0+000.00
IBM-1	1,382,983.24	462,414.54	54.36 m	L/S OF STA. 0+250.00
BM-2	1,382,821.81	462,607.78	57.79 m	R/S OF STA. 0+500.00

REPUBLIC OF THE PHILIPPINES
DEPARTMENT OF PUBLIC WORKS AND HIGHWAYS
REGIONAL OFFICE NO. VIII
TACLOBAN CITY, LEYTE

PROJECT NAME AND LOCATION:
SIPAG - ACCESS ROADS AND/OR BRIDGES FROM THE NATIONAL ROADS LEADING TO MAJOR / STRATEGIC PUBLIC BUILDINGS / FACILITIES - CONSTRUCTION OF BORONGAN DIVERSION ROAD, BARANGAY LOCSON-BARANGAY LALAWIGAN SECTION, BORONGAN CITY, EASTERN SAMAR
EASTERN SAMAR, I.D.

SHEET CONTENTS: GENERAL NOTES

PREPARED: JAKE CHARLES S. HECHANOVA, ENGINEER II (DESIGN), DATE

REVIEWED: FELIX R. BACUS, CHIEF HIGHWAY DESIGN SECTION, DATE

SUBMITTED: AGNES M. BARONDA, CHIEF PLANNING AND DESIGN DIVISION, DATE

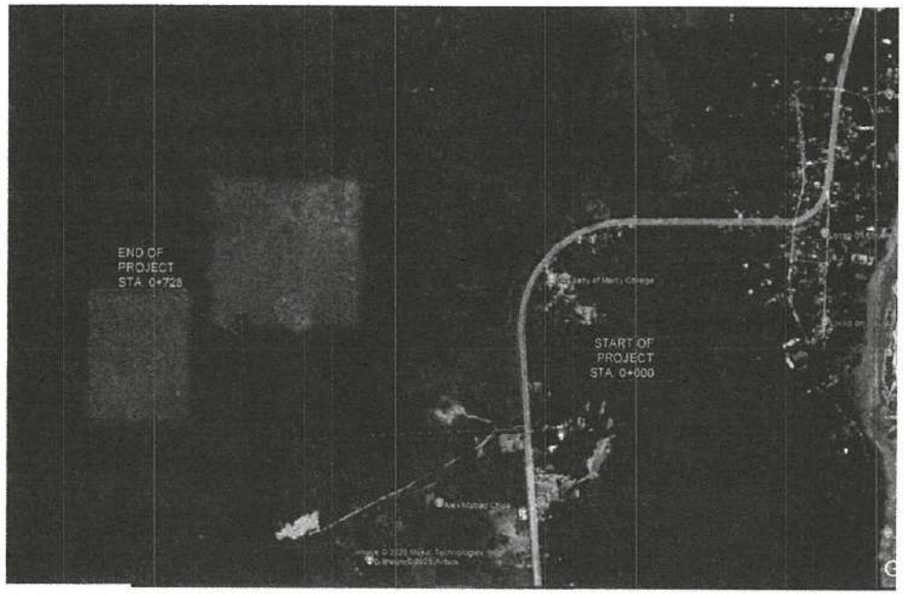
RECOMMENDED: MA. MARGARITA C. JUNIA, O.M., ASSISTANT REGIONAL DIRECTOR, DATE

APPROVED: EDGAR B. TABACON, CESO III, REGIONAL DIRECTOR, DATE

SET NO: A, 4 22

SHEET NO: 4, 58

LOCATION MAP
NTS



LOCATION PLAN
NTS

REPUBLIC OF THE PHILIPPINES DEPARTMENT OF PUBLIC WORKS AND HIGHWAYS REGIONAL OFFICE NO. VIII BARAC, PALO, LEYTE	PROJECT NAME AND LOCATION RIPAD - ACCESS ROADS AND/OR BRIDGES FROM THE NATIONAL ROADS LEADING TO MAJOR / STRATEGIC PUBLIC BUILDINGS / FACILITIES - CONSTRUCTION OF BORONGAN DIVERSION ROAD, BARANGAY LOCSON-BARANGAY LALAWIGAN SECTION, BORONGAN CITY, EASTERN SAMAR EASTERN SAMAR LD	SHEET CONTENTS LOCATION MAP AND LOCATION PLAN	PREPARED JAKE CHARLES S. HECHANOVA ENGINEER II (ISG) DATE	REVIEWED FELIX R. [illegible] CHIEF, HIGHWAY DESIGN SECTION DATE	SUBMITTED AGNES M. BARONDA CHIEF PLANNING AND DESIGN DIVISION DATE	RECOMMENDED MA. MARGARITA C. JUNIA, D.M. ASSISTANT REGIONAL DIRECTOR DATE	APPROVED EDGAR B. TABACON, CESO IV REGIONAL DIRECTOR DATE	SET NO A 5 | 22	SHEET NO 5 58

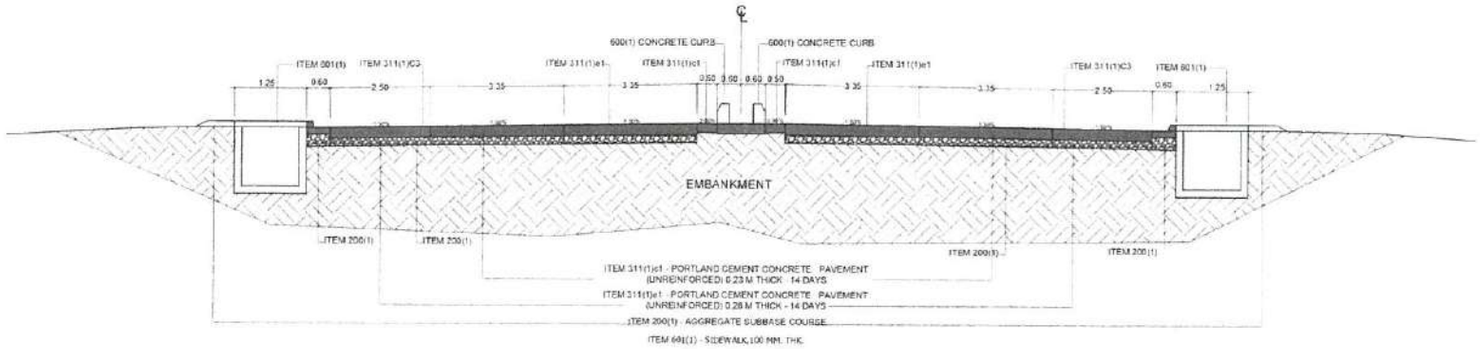
SUMMARY OF QUANTITIES

ITEM NO.	DESCRIPTION	UNIT	QUANTITY	REMARKS
VOLUME II				
PART B	**OTHER GENERAL REQUIREMENTS**			
B.3	Permits and Clearances	L.S.	1.00	
B.4(1)	Construction survey and staking	Km	0.728	
B.5	Project Billboard / Signboard	Each	8.00	
B.7(2)	Occupational Safety and Health Program	L.S.	1.00	
B.8(1)	Traffic Management	Month	12.00	
B.9	Mobilization/Demobilization	L.S.	1.00	
B.14	Environmental Manangement and Monitoring	Month	12.00	
PART C	**EARTHWORK**			
100(1)	Clearing and Grubbing	Ha.	3.695	
100(3)a1	Individual Removal of Trees, 150-300 mm dia., Small	Each	207.00	For Premium Trees and Coconut
102(2)	Surplus Common Excavation	Cu.m.	55,175.00	
102(3)a	Surplus Rock Excavation, Soft	Cu.m.	291,175.00	
103(1)a	Structure Excavation, Common Soil	Cu.m.	286.00	
104(1)a	Embankment from roadway/structure excavation, Common Soil	Cu. m.	18,196.00	
105(1)a	Subgrade Preparation, Common Material	Sq. m.	11,788.00	
PART D	**SUBBASE AND BASE COURSE**			
200(1)	Aggregate Subbase Course	Cu.m.	2,788.00	Compacted
PART E	**SURFACE COURSES**			
311(1)c1	PCC Pavement (Unreinforced), 0.23m thick, 14 days	Sq.M.	3,640.00	Bike Lane
311(1)e1	PCC Pavement (Unreinforced), 0.28m thick, 14 days	Sq.M.	9,755.00	4 Lanes PCCP (Main Road)
PART F	**BRIDGE CONSTRUCTION**			
404(1)a	Reinforcing Steel, Grade 40	Kg.	175,418.50	Slope Protection and Drainage
405(1)a3	Structural Concrete, 20.68 Mpa, Class A, 28 days	Cu.M.	1,758.00	Slope Protection and Drainage
PART G	**DRAINAGE AND SLOPE PROTECTION STRUCTURES**			
505(2)a	Grouted Riprap, Class A	Cu.M.	480.00	Slope Protection
506(1)	Stone Masonry	Cu.M.	306.00	Slope Protection
509(1)b1	Sheet Pile, Steel ,Slope Protection	L.M.	588.00	Slope Protection
PART H	**MISCELLANEOUS STRUCTURES**			
600(1)	Concrete Curb, Cast-in-place	L.M.	1,396.00	
600(7)	Curb and Gutter, Precast	Pcs.	1,456.00	
601(1)	Sidewalk, 100 mm thk.	Sq.m.	728.00	
602(2)a	Maintenance Marker Posts, Cast-in-Place	Each	3.00	
605(1)e1	Warning Signs, 600mm, W1-5A, Horizontal Alignment Winding Road L or R	Each	3.00	
605(1)aa1	Warning Signs, 600mm, W5-4B, Road Obstacle Signs Steep Descent	Each	1.00	
605(6)e1	Hazard Markers (450x600 mm), Chevron Signs	Each	12.00	
611(3)	Seedlings/Saplings for Other Programs/Initiative	Each	4,900.00	
612(1)	Reflectorized Thermoplastic Pavement Markings White	Sq.M	510.00	
612(2)	Reflectorized Thermoplastic Pavement Markings Yellow	Sq.M	65.00	
VOLUME III				
PART E	**FINISHING AND OTHER CIVIL WORKS**			
1001(5)a	Catch Basin, Concrete	Each	148.00	

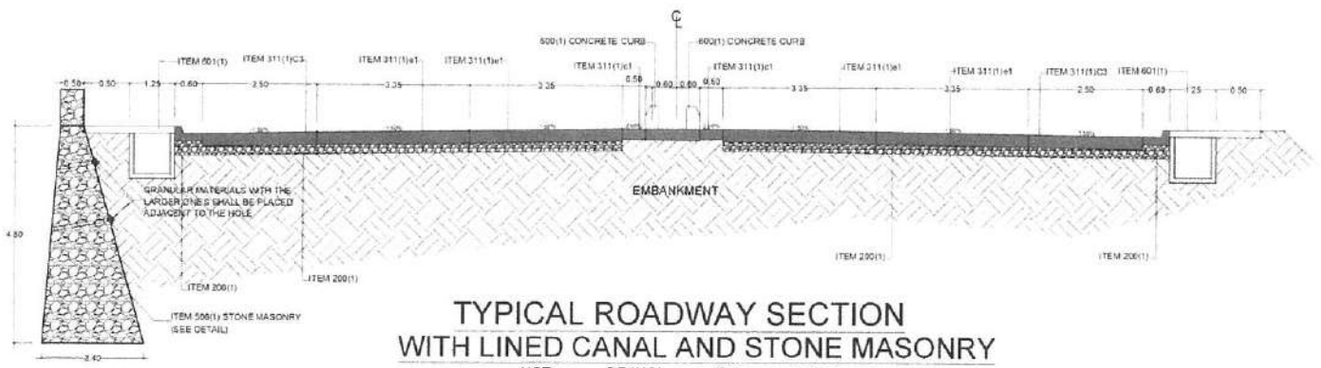
NOTE:

1. THE CONTRACTOR SHALL SUBMIT AS-STAKED PLAN TO VALIDATE CONTRACT QUANTITIES IN COMPLIANCE WITH D.O # 15 SERIES OF 2018.
2. THE QUANTITIES SHOWN ARE SUBJECT TO CHANGE IF SIGNIFICANT IMPROVEMENT HAVE OCCURRED BETWEEN THE APPROVED DETAILED ENGINEERING PLAN AND ACTUAL CONDITION OF THE PROJECT DURING THE CONDUCT OF AS-STAKED SURVEY.

REPUBLIC OF THE PHILIPPINES DEPARTMENT OF PUBLIC WORKS AND HIGHWAYS REGIONAL OFFICE NO. VIII BARAS, PALO, LEYTE	PROJECT NAME AND LOCATION	SHEET CONTENTS	PREPARED	REVIEWED	SUBMITTED	RECOMMENDED	APPROVED	SET NO	SHEET NO
	SIPAG - ACCESS ROADS AND/OR BRIDGES FROM THE NATIONAL ROADS LEADING TO MAJOR / STRATEGIC PUBLIC BUILDINGS / FACILITIES - CONSTRUCTION OF BORONGAN DIVERSION ROAD, BARANGAY LOCSOON-BARANGAY LALAWIGAN SECTION, BORONGAN CITY, EASTERN SAMAR EASTERN SAMAR LD.	SUMMARY OF QUANTITIES	JAKE CHARLES S. HECHANOVA ENGINEER II (DES) DATE	FELIX R. BACUS CHIEF, HIGHWAY DESIGN SECTION DATE	AGNES M. BARONDA CHIEF PLANNING AND DESIGN DIVISION DATE	MA. MARGARITA S. JUNIA, D.M. ASSISTANT REGIONAL DIRECTOR DATE	EDGAR B. TABACON, CESO IV REGIONAL DIRECTOR DATE	A 6 22	6 58



TYPICAL ROADWAY SECTION
WITH LINED CANAL
NOT DRAWN TO SCALE



TYPICAL ROADWAY SECTION
WITH LINED CANAL AND STONE MASONRY
NOT DRAWN TO SCALE

PAVEMENT DESIGN PARAMETERS

ITEM	DESIGN REQUIREMENTS
1. PERFORMANCE PERIOD FOR PCCP	20 years
2.DESIGN TRAFFIC: ESAL	7.277×10^{6}
3.DESIGN RELIABILITY: R	85 %
4. STANDARD DEVIATION: So	0.35
5. DESIGN SERVICEABILITY LOSS: APSI	2.50
6. PCCP MODULUS OF RUPTURE: Sc	464.45 psi
7. PCCP MODULUS OF ELASTICITY: Ec	3.360×10^{6}
8. SUBGRADE DESIGN CBR	5.31
9. EFFECTIVE ROADBED RESILIENT MODULUS: MR	7,965.00
10. SUBBASE ELASTIC MODULUS: ESB	15,000 psi
11. SUBBASE THICKNESS	8" (200 mm)
12. EFFECTIVE MODULUS AT SUBGRADE REACTION: K (pci)	175.00
13. DRAINAGE COEFFICIENT: Cd	1.00
14. LOAD TRANSFER COEFFICIENT: J	3.90
15. LOSS OF SUPPORT: Ls	1.00
16. K (corrected):	100.00

REPUBLIC OF THE PHILIPPINES
DEPARTMENT OF PUBLIC WORKS AND HIGHWAYS
REGIONAL OFFICE NO. VIII
BARAS, PALO, LEYTE

PROJECT NAME AND LOCATION:
SPAG - ACCESS ROADS AND/OR BRIDGES FROM THE NATIONAL ROADS LEADING TO MAJOR / STRATEGIC PUBLIC BUILDINGS / FACILITIES - CONSTRUCTION OF BORONGAN DIVERSION ROAD, BARANGAY LOGE DON-BARANGAY LALAWIGAN SECTION, BORONGAN CITY, EASTERN SAMAR
EASTERN SAMAR, I.D.

SHEET CONTENTS: TYPICAL ROADWAY SECTION

PREPARED: JAKE CHARLES S. HECHANOVA, ENGINEER II (SSS), DATE

REVIEWED: FELIX R. BACUS, CHIEF, HIGHWAY DESIGN SECTION, DATE

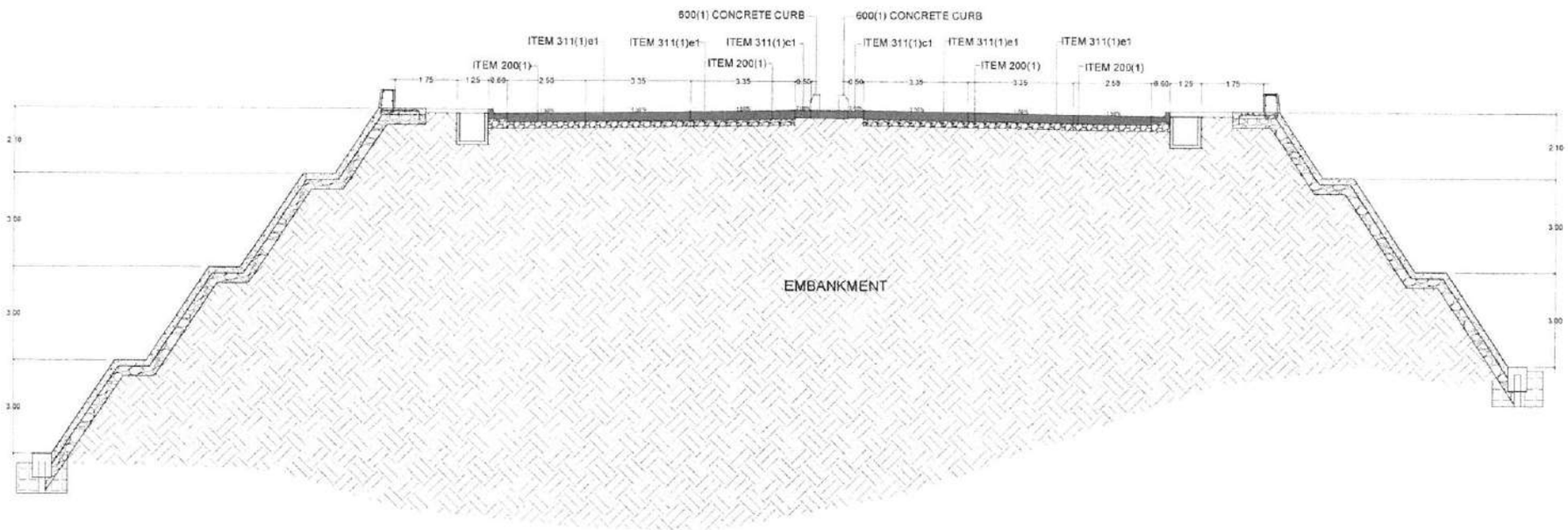
SUBMITTED: AGNES M. BARONDA, CHIEF PLANNING AND DESIGN DIVISION, DATE

RECOMMENDED: MA. MARGARITA C. JUNIA, O.M., ASSISTANT REGIONAL DIRECTOR, DATE

APPROVED: EDGAR B. TABACON, CESO IV, REGIONAL DIRECTOR, DATE

SET NO: A | 7 | 22

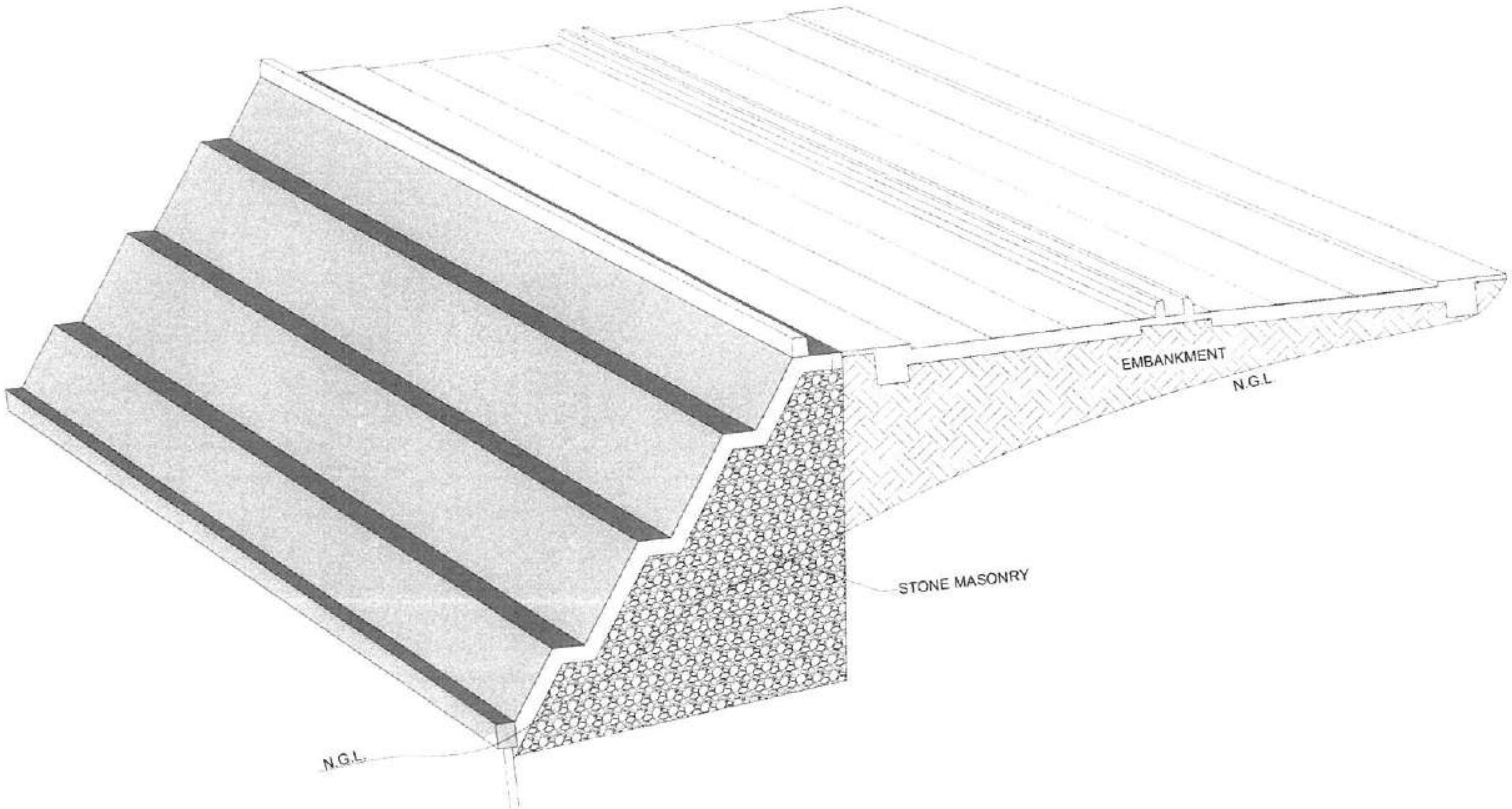
SHEET NO: 7 | 58



TYPICAL ROADWAY SECTION WITH DOUBLE SLOPE PROTECTION

N T S

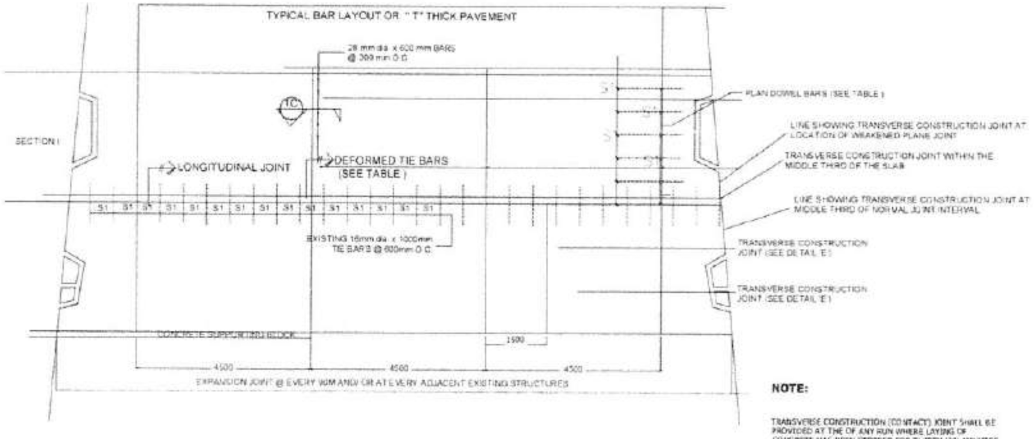
REPUBLIC OF THE PHILIPPINES DEPARTMENT OF PUBLIC WORKS AND HIGHWAYS REGIONAL OFFICE NO. VIII BARAS, PALO, LEYTE	PROJECT NAME AND LOCATION SIPAG - ACCESS ROADS AND/OR BRIDGES FROM THE NATIONAL ROADS LEADING TO MAJOR / STRATEGIC PUBLIC BUILDINGS / FACILITIES - CONSTRUCTION OF BORONGAN DIVERSION ROAD, BARANGAY LOCSON-BARANGAY LALAWIGAN SECTION, BORONGAN CITY, EASTERN SAMAR EASTERN SAMAR, I.D.	SHEET CONTENTS TYPICAL ROADWAY SECTION	PREPARED JAKE CHARLES S. HECHANOVA ENGINEER II (ABE) DATE	REVIEWED FELIX R. [illegible] CHIEF, HIGHWAY DESIGN SECTION DATE	SUBMITTED AGNES N. BARONDA CHIEF PLANNING AND DESIGN DIVISION DATE	RECOMMENDED MA. MARGARITA C. JUNIA, D.M. ASSISTANT REGIONAL DIRECTOR DATE	APPROVED EDGAR B. TABACON, CESO IV REGIONAL DIRECTOR DATE	SET NO A 8 22	SHEET NO 8 58



ISOMETRIC VIEW FOR END CLOSURE

N T S

REPUBLIC OF THE PHILIPPINES DEPARTMENT OF PUBLIC WORKS AND HIGHWAYS REGIONAL OFFICE NO. VIII BARAS PALO LEYTE	PROJECT NAME AND LOCATION SIPAG - ACCESS ROADS AND/OR BRIDGES FROM THE NATIONAL ROADS LEADING TO MAJOR / STRATEGIC PUBLIC BUILDINGS / FACILITIES - CONSTRUCTION OF BORONGAN DIVERSION ROAD, BARANGAY LOCSOON-BARANGAY LALAWIGAN SECTION, BORONGAN CITY, EASTERN SAMAR EASTERN SAMAR L.D.	SHEET CONTENTS ISOMETRIC VIEW FOR END CLOSURE	PREPARED JAKE CHARLES S. HECHANOVA ENGINEER II (BBB) DATE	REVIEWED FELIX R. BACUS CHIEF, HIGHWAY DESIGN SECTION DATE	SUBMITTED AGNES M. BARONDA CHIEF PLANNING AND DESIGN DIVISION DATE	RECOMMENDED MA. MARGARITA C. JUNIA, D.M. ASSISTANT REGIONAL DIRECTOR DATE	APPROVED EDGAR B. TABACON, CESO IV REGIONAL DIRECTOR DATE	SET NO. A 9 22	SHEET NO. 9 58



TYPICAL PLAN OF A TWO- LANE UNDOWELED PAVEMENT

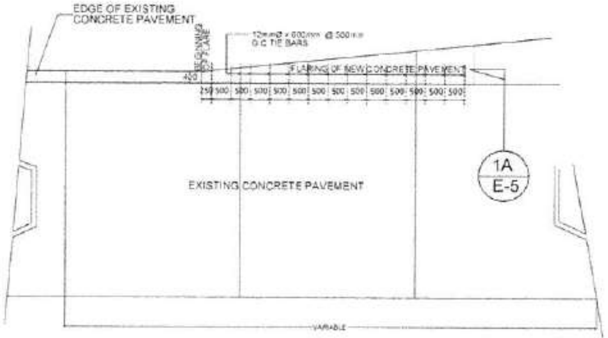
SCALE 1 : 100 M

NOTE:

TRANSVERSE CONSTRUCTION (CONTACT) JOINT SHALL BE PROVIDED AT THE OF ANY RUN WHERE LAYING OF CONCRETE HAS BEEN STOPPED FOR THIRTY (30) MINUTES LONGER.

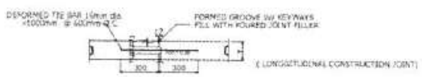
ALL TRANSVERSE CONSTRUCTION JOINT SHOULD BE BUTT JOINTS WITH DOWELS.

SPACING (S1, AND S2) VARIES DEPENDING ON THE DISTANCE OF PAVEMENT TO CLOSET FREE EDGE.



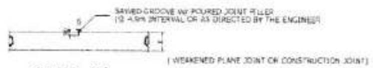
PLAN

1I FLARING OF EXISTING CONCRETE PAVEMENT)



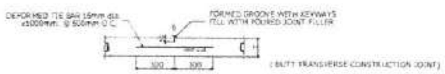
1A DETAIL 'B'

NOT TO SCALE



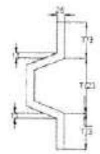
1C DETAIL 'B'

NOT TO SCALE



1D DETAIL 'C'

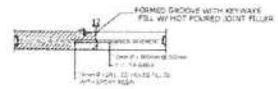
NOT TO SCALE



METAL SIDE FORM (KEYED JOINT)

1E DETAIL OF SIDE FORM

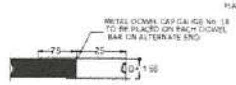
NOT TO SCALE



SECTION

1I CONSTRUCTION JOINT TO BE USED FOR FLARING EXISTING CONCRETE PAVEMENT

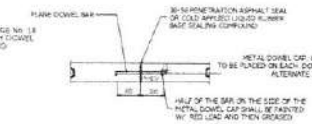
NOT TO SCALE



SECTION

1L METAL DOWEL CAP DETAIL

NOT TO SCALE



SECTION

1K EXPANSION JOINT

NOT TO SCALE

TABLE FOR SPACING OF TIE BARS (L=600 mm)		
SLAB THICKNESS	SPACING	
(mm)	[illegible]	[illegible]
[illegible]	600	750
[illegible]	600	750
[illegible]	600	750
[illegible]	500	750
[illegible]	500	750
[illegible]	500	750
[illegible]	500	750
[illegible]	500	750
[illegible]	400	750
[illegible]	400	750
[illegible]	400	750
[illegible]	400	750

Based on AASHTO Guide for the Design of Pavement Structures 1993

TABLE FOR SPACING OF PLAIN DOWEL BARS (L=500 mm)		
SLAB THICKNESS	DIAMETER	SPACING
(mm)	(mm)	(mm)
230	28	300
240	30	300
250	32	300
260	32	300
270	34	300
280	36	300

NOTE:

DIAMETER AND SPACING OF PLAIN DOWEL BARS MAYBE MODIFIED AS LONG AS THE EQUIVALENT STEEL AREAS I S SUSTAINED.

GENERAL NOTES:

1. MATERIALS AND WORKMANSHIP SHALL CONFORM WITH THE DPWH STANDARD SPECIFICATIONS FOR HIGHWAYS, BRIDGES AND AIRPORTS 2013 AND SPECIALS PROVISIONS.
2. CONSTRUCTION (CONTRACT) JOINTS ARE FORMED WHEN CONCRETE ON ONE SIDE OF THE JOINT IS POURED AHEAD AND ALLOWED TO SET BEFORE POURING ON THE OTHER SIDE.
3. AT CONSTRUCTION JOINTS (LONGITUDINAL OR TRANSVERSE) CARE SHOULD BE TAKEN THAT NO CONCRETE FROM THE LAST SLAB PLACED OVERHANGS ANY PORTION OF THE FIRST SLAB.
4. THE BARS SHOULD BE DEFORMED STEEL BARS. ALL THE DOWEL BARS BE SMOOTH ROUND STEEL BARS FREE FROM THE RUST AND OTHER THE DEFECTS WHICH MIGHT RESTRICT THEIR MOVEMENT.
5. TYPE OF WEAKENED PLAN JOINT TO BE USED SHALL BE AS SPECIFIED IN THE PLANS AND ONLY ONE TYPE SHALL BE USED FOR THE WHOLE PROJECT.
6. MATERIAL FOR THE METAL SIDE FROM SHALL BE BRAND NEW SHEET METAL GAUGE No. 18 OF BLOCK IRON FREE FROM THE RUST AND KINKS.
7. AT LEAST SIX (6) SUCCESSIVE DOWELED BUTT JOINTS AT NORMAL JOINT SPACING SHALL BE PROVIDED BEFORE ON AFTER IN EXPANSION JOINT.
8. THE GROOVE OR CRACK ABOVE JOINTS (LONGITUDINAL OR TRANSVERSE) SHALL BE SEALED WITH 30 - 50 PENETRATION ASPHALT SEAL OR COLD APPLIED LIQUID RUBBER COMPOUND AFTER THE CONCRETE HAD BEEN CURED AND BEFORE OPENING THE PAVEMENT TO TRAFFIC. ASPHALT SEAL SHOULD BE POURED IN SUCH MANNER THAT SPILLING SHALL BE PRESENTED/ELIMINATED.THIS PROVIDE A SMOOTH RIDING SURFACE.
9. ALL TRANSVERSE JOINTS EXCEPT CONSTRUCTION JOINT BE CONTINUOUS FROM THE EDGE TO EDGE.
10. ALL LONGITUDINAL JOINTS SHALL MEET AT INTERSECTIONS WITH NO GAPS OR OFFSETS
11. ALL DIMENSIONS ARE IN MILLIMETERS, UNLESS OTHERWISE SPECIFIED.
12. AVOID STOPPAGE OF FORM WORKS ALONG CURVES.
13. CONSTRUCT EXPANSION JOINT AT EVERY 90 METERS AND/OR AT EVERY ADJACENT EXISTING STRUCTURES.

1 STANDARD PORTLAND CEMENT CONCRETE PAVEMENT JOINTS

NOT TO SCALE

REPUBLIC OF THE PHILIPPINES
DEPARTMENT OF PUBLIC WORKS AND HIGHWAYS
REGIONAL OFFICE NO. VIII
BARAS, PALO, LEYTE

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EASTERN SAMAR L.D.

SHEET CONTENTS: STANDARD PORTLAND CEMENT CONCRETE PAVEMENT JOINTS

PREPARED: JAKE CHARLES S. HECHANOVA, ENGINEER II (BBB)
DATE

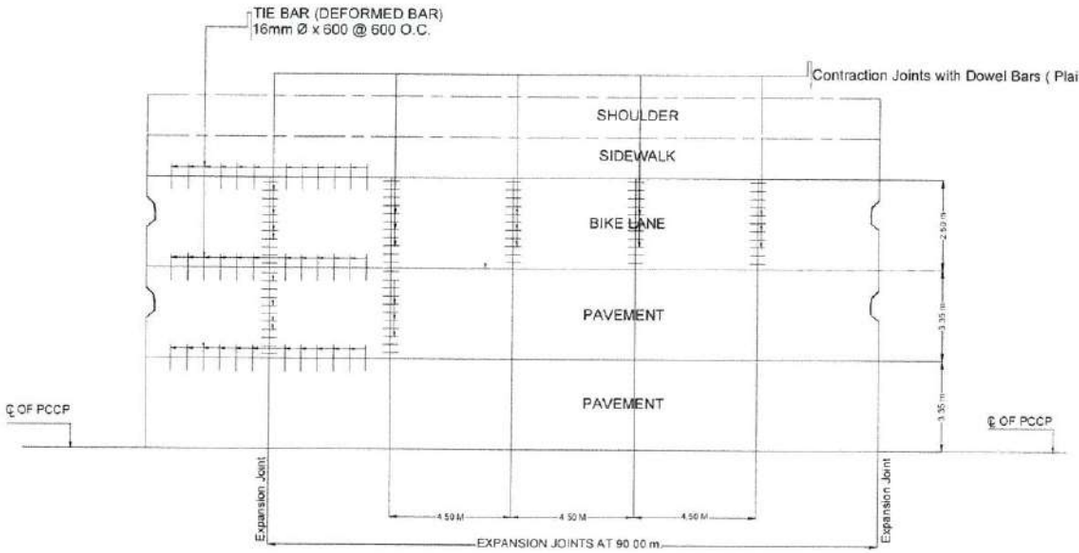
REVIEWED: FELIX R. BACUS, CHIEF, HIGHWAY DESIGN SECTION
DATE

SUBMITTED: AGNES R. BARONDA, CHIEF, PLANNING AND DESIGN DIVISION
DATE

RECOMMENDED: MA. MARGARITA C. JUNIA, D.M., ASSISTANT REGIONAL DIRECTOR
DATE

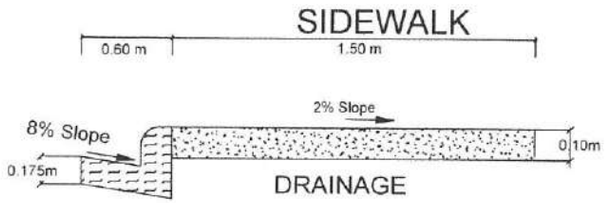
APPROVED: EDGAR B. TABACON, CESO IV, REGIONAL DIRECTOR
DATE

SET NO. A 10 22
SHEET NO. 10 58

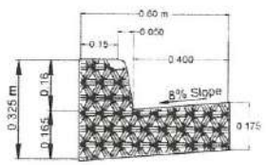


WIDENING PAVEMENT LAYOUT PLAN
NOT TO SCALE

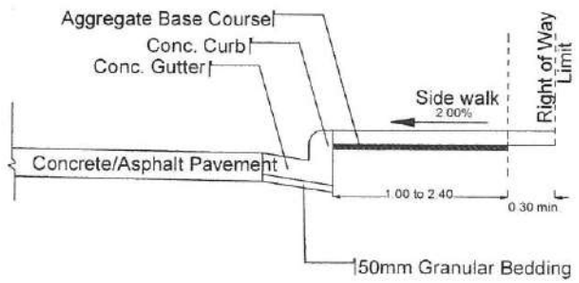
SPACING OF DOWEL BAR (Diameter 36 mm/ L = 600 mm)	
SLAB DEPTH, (T) (mm)	SPACING, S (mm)
280	300
290	295
300	274
310	255
320	238
330	223
340	209



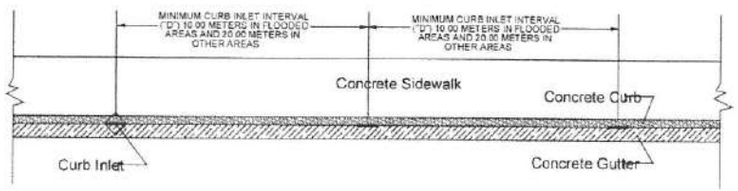
DETAIL OF SIDEWALK W/ CURB & GUTTER
NOT TO SCALE



DETAILS OF CONCRETE CURB & GUTTER (CAST IN PLACE)
NOT TO SCALE



TYPICAL SECTION (CAST IN PLACE)
NOT TO SCALE



TYPICAL LAY-OUT OF CONCRETE CURB AND GUTTER WITH CURB INLET
NOT TO SCALE

REPUBLIC OF THE PHILIPPINES
DEPARTMENT OF PUBLIC WORKS AND HIGHWAYS
REGIONAL OFFICE NO. VIII
BARAS, PALO, LEYTE

PROJECT NAME AND LOCATION: SIPAG - ACCESS ROADS AND/OR BRIDGES FROM THE NATIONAL ROADS LEADING TO MAJOR / STRATEGIC PUBLIC BUILDINGS / FACILITIES - CONSTRUCTION OF BORONGAN DIVERSION ROAD, BARANGAY LOCSON-BARANGAY LALAWIGAN SECTION, BORONGAN CITY, EASTERN SAMAR
EASTERN SAMAR 1 ED

SHEET CONTENTS: WIDENING PAVEMENT LAYOUT PLAN, DETAIL OF SIDEWALK W/ CURB & GUTTER, AND TYPICAL LAY-OUT OF CONCRETE CURB AND GUTTER WITH CURB INLET

PREPARED: JAKE CHARLES S. HECHANOVA, ENGINEER I (DEB), DATE

REVIEWED: FELIX B. BACUS, CHIEF, HIGHWAY DESIGN SECTION, DATE

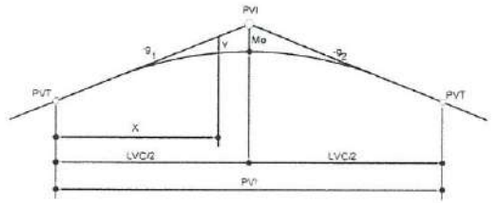
SUBMITTED: AGNES M. BARONDA, CHIEF PLANS AND DESIGN DIVISION, DATE

RECOMMENDED: MA. MARGARITA C. JUNIA, O.M., ASSISTANT REGIONAL DIRECTOR, DATE

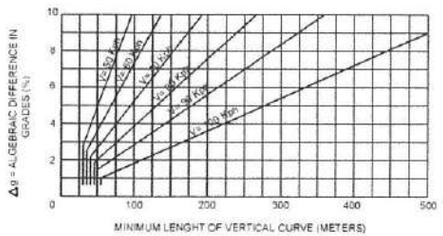
APPROVED: EDGAR B. TABACON, CESO IV, REGIONAL DIRECTOR, DATE

SET NO. A 11 22

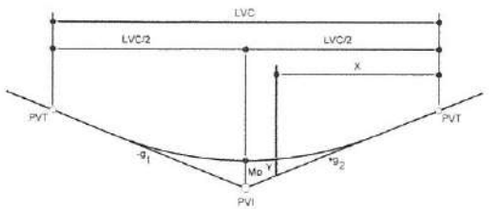
SHEET NO. 11 58



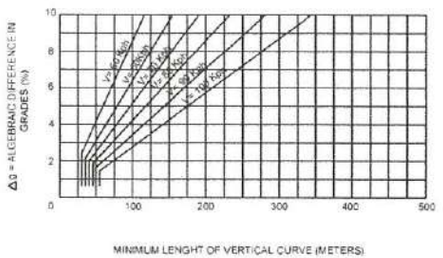
SYMMETRICAL VERTICAL PARABOLIC CURVES (CREST)



DESIGN CONTROL FOR VERTICAL CURVES (CREST)



SYMMETRICAL VERTICAL PARABOLIC CURVES (SAG)



DESIGN CONTROL FOR VERTICAL CURVES (SAG)

IN ANY VERTICAL PARABOLIC CURVE :

1. $Mo = \frac{(g_1 - g_2)(LVC)}{800}$

2. $Mo = \frac{1}{2}\left[\left(\frac{ELEV.\ PVC + ELEV.\ PVT}{2}\right) - ELEV.\ PVI\right]$

3. $Y = 4Mo$

LEGEND:

PVI - POINT OF VERTICAL INTERSECTION

PVC - POINT OF VERTICAL CURVATURE

PVT - POINT OF VERTICAL TANGENCY

LVC - LENGTH OF VERTICAL CURVES - METER

Mo - MIDDLE ORDINATE

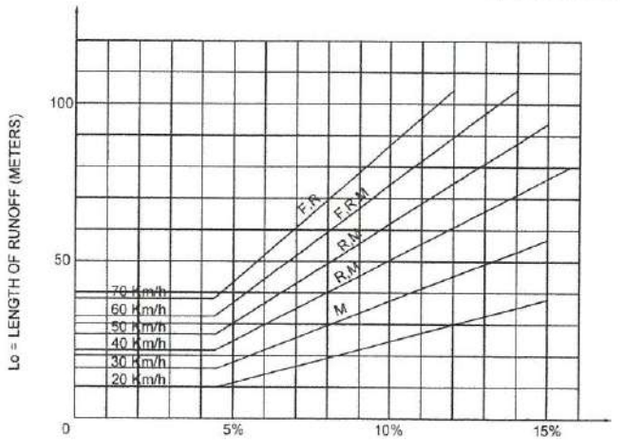
g_1 g_2 - GRADE RATES PERCENT

X - DISTANCE FROM PVC OR PVT TO ANY POINT ON CURVE - METERS

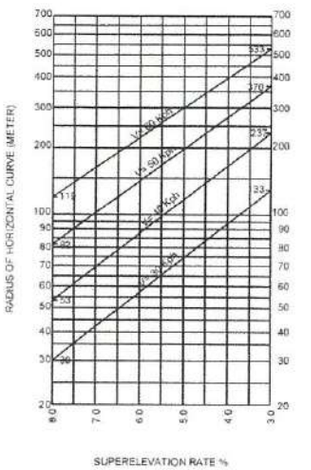
Y - VERTICAL OFFSET AT DISTANCE X - METERS

NOTES:

1. GRADES ASCENDING FORWARD ARE POSITIVE, GRADES DESCENDING FORWARD ARE NEGATIVE.
2. NO VERTICAL CURVE IS REQUIRED WHEN THE ALGEBRAIC DIFFERENCE IN GRADE IS 0.5% OR LESS.



SUPERELEVATION RUNOFF CHART



LEGEND:

F - FLAT

R - ROLLING

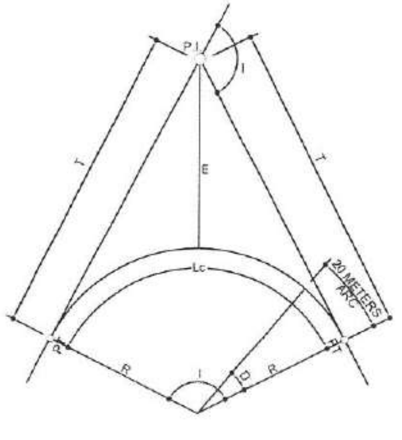
M - MOUNTAINOUS

V - DESIGN SPEED

Kph - KILOMETER PER HOUR

DESIGN SUPERELEVATION RATES

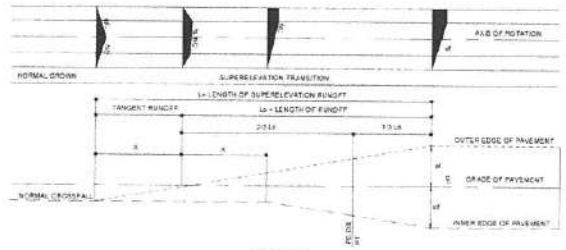
REPUBLIC OF THE PHILIPPINES DEPARTMENT OF PUBLIC WORKS AND HIGHWAYS REGIONAL OFFICE NO. VIII BARAS, PALO LEYTE	PROJECT NAME AND LOCATION SIPAG - ACCESS ROADS AND/OR BRIDGES FROM THE NATIONAL ROADS LEADING TO MAJOR / STRATEGIC PUBLIC BUILDINGS / FACILITIES - CONSTRUCTION OF BORONGAN DIVERSION ROAD, BARANGAY LOCSOON-BARANGAY LALAWIGAN SECTION, BORONGAN CITY, EASTERN SAMAR EASTERN SAMAR L.D.	SHEET CONTENTS GEOMETRIC DESIGN STANDARD FOR VERTICAL (PARABOLIC CURVE) AND SUPERELEVATION CHART	PREPARED JAKE CHARLES S. HECHANOVA ENGINEER II (DEO) DATE	REVIEWED FELIX R. BAGUS CHIEF, HIGHWAY DESIGN SECTION DATE	SUBMITTED AGNES N. BARONDA CHIEF PLANS AND DESIGN DIVISION DATE	RECOMMENDED MA. MARGARITA C. JUNIA, D.M ASSISTANT REGIONAL DIRECTOR DATE	APPROVED EDGAR B. TABACON, CESO IV REGIONAL DIRECTOR DATE	SET NO A 12 22	SHEET NO 12 58



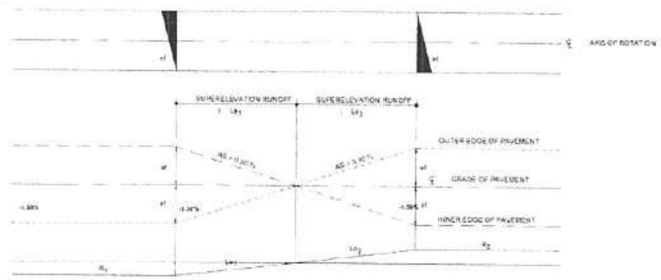
HORIZONTAL CURVE (CIRCULAR)

LEGEND

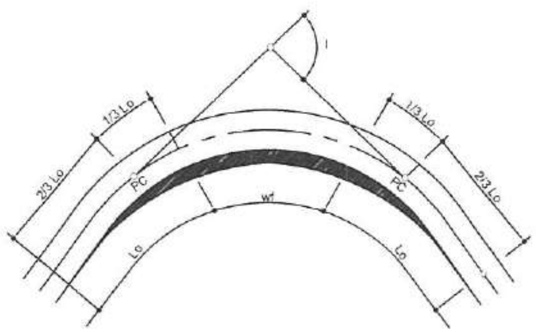
- wf - FULL WIDENING
- PI - POINT OF INTERSECTION
- I - INTERSECTION ANGLE (CENTRAL ANGLE)
- T - TANGENT DISTANCE
- R - HORIZONTAL RADIUS
- Lc - LENGHT OF CIRCULAR CURVE
- E - EXTERNAL DISTANCE
- D - DEGREE OF CURVE (ARC DEFINITION)
- PC - POINT OF CURVATURE
- PT - POINT OF TANGENCY
- L - LENGHT OF SUPERELEVATION RUNOFF
- Lo - LENGTH OF SUPERELEVATION RUNOFF
- ef - FULL SUPERELEVATION
- X - LENGTH BETWEEN SUPERELEVATION 0% & N.C. %
- S- SLOPE OF EDGE OF PAVEMENT IN % RELATIVE TO
- Vd - DESIGN SPEED
- N.C. - NORMAL CROSSFALL



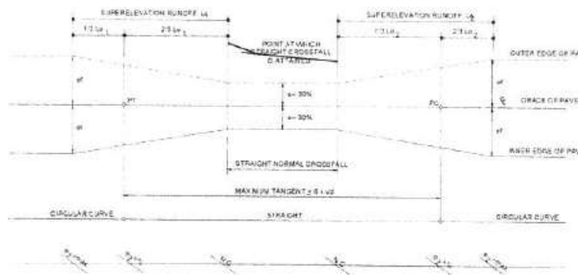
CASE 1
SUPERELEVATION TRANSITION



CASE 2
TRANSITION : CIRCULAR CURVE - REVERSED CIRCULAR



METHOD OF WIDENING



CASE 3
TRANSITION : CIRCULAR CURVE - STRAIGHT- CIRCULAR CURVE

NOTES:

1. FOR EFFECTIVE DRAINAGE S HAS TO BE > 0.30%.
2. WHERE S < 0.30% A SPECIAL METHOD OF SUPERELEVATION TRANSITION HAS TO BE ADOPTED AS INDICATED IN THE DOTTED LINE.
3. ROUNDING OFF ONLY NECESSARY IF S > 0.60%.

Vd	≤50 Km/H	80 Km/H	≥80Km/H
R	500 m	1,000 m	2,000 m

4. ef CAN BE TAKEN FROM CHART OF SUPERELEVATION RATE.
5. SUPERELEVATION CAN BE ATTAINED BY REVOLVING THE PAVEMENT ABOUT THE CENTERLINE PFOFILE.
6. THE SLOPE OF THE SIDEWALK SHALL ALWAYS FALL TOWARD THE TRAVELLED WAY.
7. THE SLOPE OF THE SHOULDER SHALL ALWAYS FALL IN THE DIRECTION OF THE OUTSIDE EDGE OF TRAVELLED WAY.
8. WHEN SUPERELEVATION IS LARGER THAN 4% THEN THE SLOPE OF LOWER SHOULDER SHALL BE THE SAME FOR THE TRAVELLED WAY.
9. WHEN THE SUPERELEVATION IS LESS THAN 6%, THE HIGHER SHOULDER SHALL HAVE A SLOPE OF 4% OR 5% FOR PAVED AND UNPAVED SHOULDER RESPECTIVELY.
10. IF THE SUPERELEVATION VARIES FROM 6% TO 8% (BEING THE MAXIMUM PERMITTED IN GEOMETRIC STANDARD FOR THE SECONDARY ROAD) THEN THE SLOPE OF THE HIGHER SHOULDER VARY FROM 4% TO 2%. THE aLGEBRAIC SUM OF THE SLOPES OF TRAVELLED WAY AND THE SHOULDER WHEN SUPERELEVATED SHALL ALWAYS BE EQUAL TO 10%.
11. USE CASE 3 WHEN MINIMUM TANGENT BETWEEN CURVES IS GRATER THAN 2/3 (Lo + Lo).
12. NO HORIZONTAL CURVE IS REQUIRED WHEN THE INTERSECTION I (CENTRAL ANGLE) IS LESS THA ONE DEGREE (1).

RADIUS (m)	DESIGN SPEED (km / h)						
	40	50	60	70	80	100	120
50	1.75						
80	1.50	1.50					
100	1.50	1.00					
125	1.25	1.25	1.25				
150	1.00	1.25	1.25				
160	1.00	1.25	1.25	1.25			
200	0.75	0.75	1.00	1.00	1.25		
250	0.75	0.75	1.00	1.00	1.00		
300	0.75	0.75	1.00	1.00	1.00		
400	50	0.75	0.75	0.75	1.00	1.00	
500	50	50	0.75	0.75	1.00	1.00	
600		50	50	0.75	0.75	1.00	1.00
800			50	50	0.75	0.75	1.00
1200				50	0.75	0.75	0.75
1200	NO WIDENING				50	0.75	0.75
1500						0.75	0.75

COMMENTS

THE VALUE GIVEN IN THE TABLE ARE VALID FOR CARRIAGE-WAY WIDTH OF 6.1 METERS

FOR 7.00 METERS THE GIVEN VALUES ARE TO BE REDUCED BY 0.75 m AND 0.25 m RESPECTIVELY

WHERE A SIGNIFICANT NUMBER OF SPECIALLY LARGE VEHICLES IS ENVISAGED EXTRA WIDENING MAY HAVE TO BE CONSIDERED

VALUES LESS THAN 0.5 MAY BE DISREGARDED

THE WIDENING IS ATTAINED LINEARLY OVER THE WHOLE SUPERELEVATION RUN OFF AND APPLIED ON THE INSIDE OF THE CURVE

WIDENING OF CURVES

REPUBLIC OF THE PHILIPPINES
DEPARTMENT OF PUBLIC WORKS AND HIGHWAYS
REGIONAL OFFICE NO. VIII
BABAS, PALO, LEYTE

PROJECT NAME AND LOCATION:
SIPAG - ACCESS ROADS AND/OR BRIDGES FROM THE NATIONAL ROADS LEADING TO MAJOR / STRATEGIC PUBLIC BUILDINGS / FACILITIES - CONSTRUCTION OF BORONGAN DIVERSION ROAD, BARANGAY LOCSOON-BARANGAY LALAWIGAN SECTION, BORONGAN CITY, EASTERN SAMAR
EASTERN SAMAR L.D.

SHEET CONTENTS:
GEOMETRIC DESIGN STANDARD FOR HORIZONTAL (CIRCULAR CURVE) SUPERELEVATION, WIDENING

PREPARED: JAKE CHARLES S. HECHANOVA, ENGINEER II (SE8), DATE

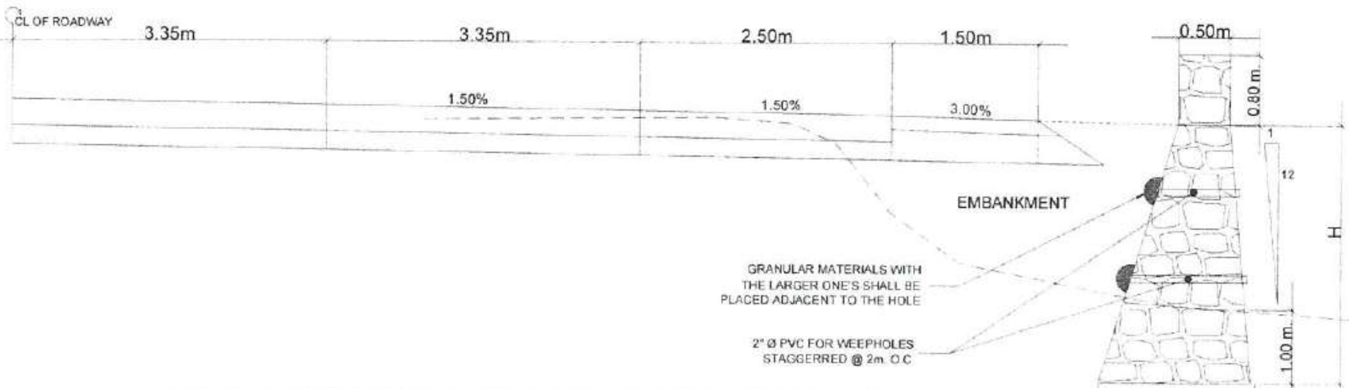
REVIEWED: FELIX R. MACUS, CHIEF, HIGHWAY DESIGN SECTION, DATE

SUBMITTED: AGNES M. BARONDA, CHIEF, PLANNING AND DESIGN DIVISION, DATE

RECOMMENDED: MA. MARGARITA C. JUNIA, D.M., ASSISTANT REGIONAL DIRECTOR, DATE

APPROVED: EDGAR B. TABACON, CESO IV, REGIONAL DIRECTOR, DATE

SET NO. A 13/22 — SHEET NO. 13/58

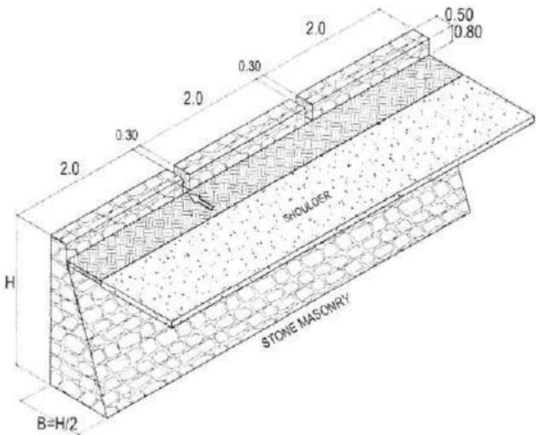


DETAIL OF STONE MASONRY FOR EMBANKMENT PROTECTION

NOT DRAWN TO SCALE

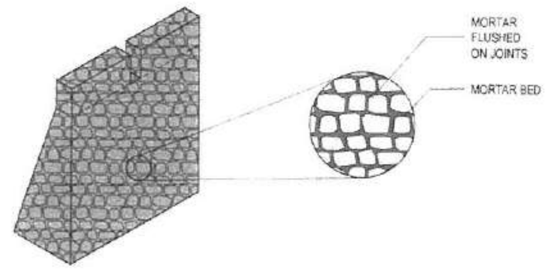
SCHEDULE OF STONE MASONRY

STATION LIMITS		TOTAL LENGTH	LOCATION
0+220.00	0+240.00	20.00	L/S
0+430.00	0+440.00	10.00	L/S
0+700.00	0+710.00	10.00	L/S

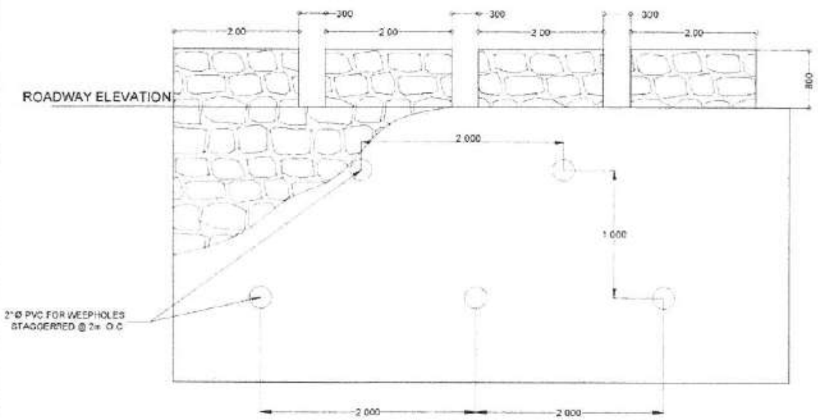


STONE MASONRY (SHOWING 0.30m. GAP STORM DRAIN

SCALE NTS



ISOMETRIC VIEW FOR STONE MASONRY



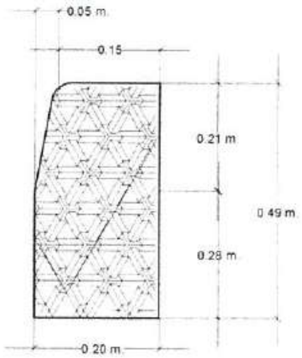
STONE MASONRY PLAN

NOT DRAWN TO SCALE

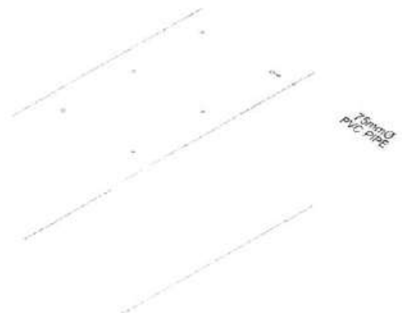
NOTE (STONE MASONRY)

PRIOR TO CONSTRUCTION CONDUCT SOIL BEARING INVESTIGATION IN ACCORDANCE WITH THE STANDARD TESTING REQUIREMENT ALONG THE ALIGNMENT OF STONE MASONRY WALL TO VERIFY THE REQUIRED DESIGN SOIL BEARING CAPACITY OF THE FOUNDATION BED ALLOWABLE SOIL BEARING CAPACITY (qa) = 196 kPa

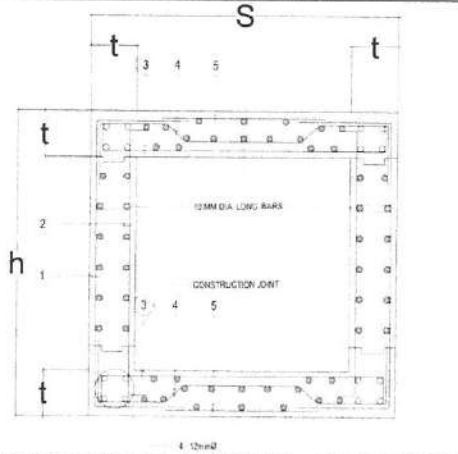
REPUBLIC OF THE PHILIPPINES DEPARTMENT OF PUBLIC WORKS AND HIGHWAYS REGIONAL OFFICE NO. VIII BARAS, PALO, LEYTE	PROJECT NAME AND LOCATION: SIPAG - ACCESS ROADS AND/OR BRIDGES FROM THE NATIONAL ROADS LEADING TO MAJOR / STRATEGIC PUBLIC BUILDINGS / FACILITIES - CONSTRUCTION OF BORONGAN DIVERSION ROAD, BARANGAY LOCSOON-BARANGAY LALAWIGAN SECTION, BORONGAN CITY, EASTERN SAMAR EASTERN SAMAR L.D.	SHEET CONTENTS: DETAILS, & PLAN OF STONE MASONRY, SCHEDULE OF STONE MASONRY.	PREPARED: JAKE CHARLES S. HECHANOVA ENGINEER II (BSB) DATE	REVIEWED: FELIX R. BACUS CHIEF, HIGHWAY DESIGN SECTION DATE	SUBMITTED: AGNES M. BARONDA CHIEF PLANNING AND DESIGN DIVISION DATE	RECOMMENDED: MA. MARGARITA C. JUNIA, D.M. ASSISTANT REGIONAL DIRECTOR DATE	APPROVED: EDGAR B. TABACON, CESO IV REGIONAL DIRECTOR DATE	SET NO. A 14 | 22	SHEET NO. 14 58



DETAILS OF CONCRETE CURB (CAST IN PLACE)
NOT TO SCALE



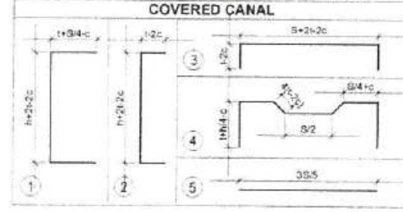
ISOMETRIC (COVERED CANAL)
SCALE NTS



COVERED CANAL SECTION
SCALE 1:100 MTS

COVERED CANAL												
CLEAR		t	BAR 1		BAR 2		BAR 3		BAR 4		BAR 5	
SPAN	HEIGHT											
S	h		dia	SPACING	dia	SPACING	dia	SPACING	dia	SPACING	dia	SPACING
1.25	1.25	15	12	300	12	300	12	300	12	300	12	300

BAR BENDING DIAGRAM
COVERED CANAL



HYDROLOGIC ANALYSIS AND HYDRAULIC PARAMETERS
COVERED CANAL

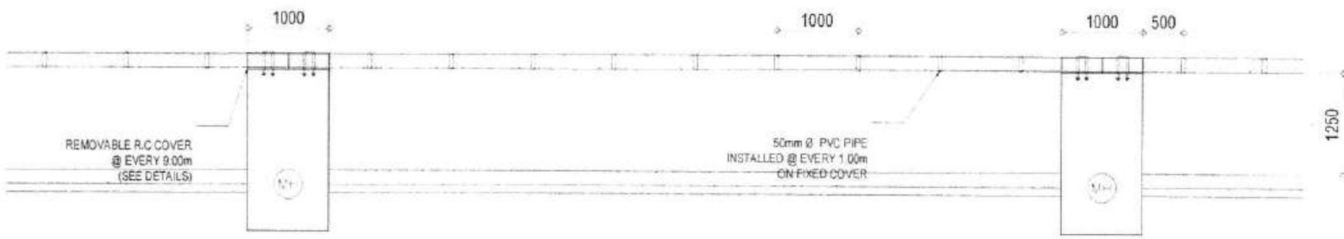
DESIGN STORM FREQUENCY	=	25 years
COEFFICIENT OF RUN-OFF, C	=	0.30
RAINFALL INTENSITY, I	=	85.526 mm/hr
CATCHMENT AREA, A	=	6.123 sq.km
RUN-OFF DISCHARGE, Q_R	=	43.675 cu.m/sec
HEIGHT, H	=	3.00 m
BASE, B	=	6.00 m
FREE BOARD	=	0.30 m
DEPTH, H_1	=	2.70 m
SLOPE, S	=	0.01000
ROUGHNESS COEFFICIENT, n	=	0.018
WETTED PERIMETER, P	=	11.40
HYDRAULIC RADIUS, R	=	1.42
VELOCITY, V	=	3.74 m/s (V_i)
DESIGN DISCHARGE, Q_D	=	60.59 cu.m/sec
INLET CONTROL HW/D (RCBC)	=	1.60
OUTLET VELOCITY, HW (RCBC)	=	0.70
OUTLET VELOCITY (RCBC)	=	3.17 m/s (V_o)

NOTE:

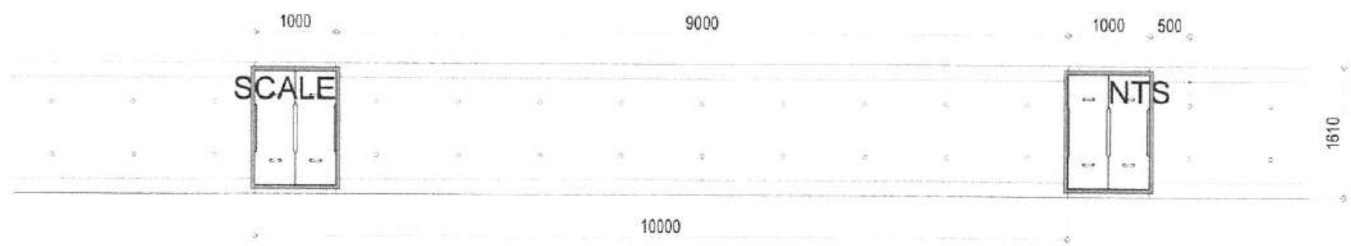
FOR WALL THICKNESS LESS THAN 240 STAGGER HORIZONTAL REINFORCEMENT AS SHOWN

LEGEND:

c = CONCRETE CLEAR COVER (50mm)
h = CLEAR HEIGHT
S = SPAN OR WIDTH OF CULVERT
t = THICKNESS



SECTION VIEW FOR COVERED CANAL



TOP VIEW FOR COVERED CANAL
SCALE NTS

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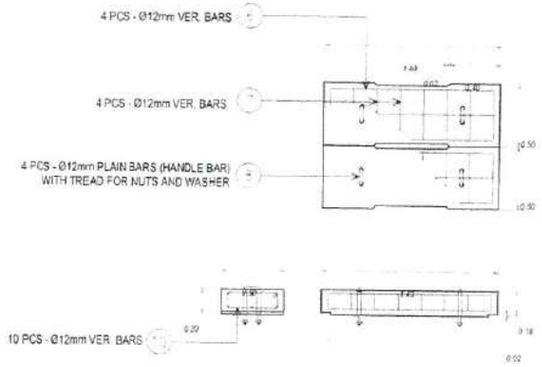
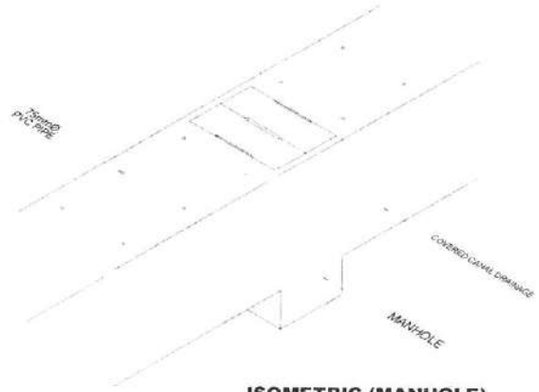


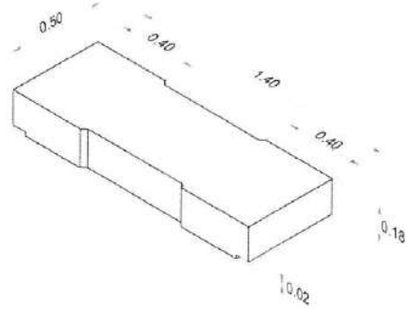
REMOVABLE COVER

SCALE 1:50



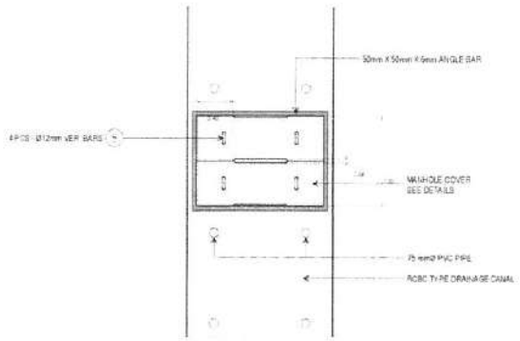
ISOMETRIC (MANHOLE)

SCALE NTS



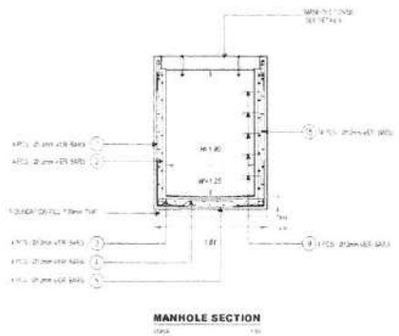
ISOMETRIC (MANHOLE COVER)

SCALE NTS



MANHOLE PLAN

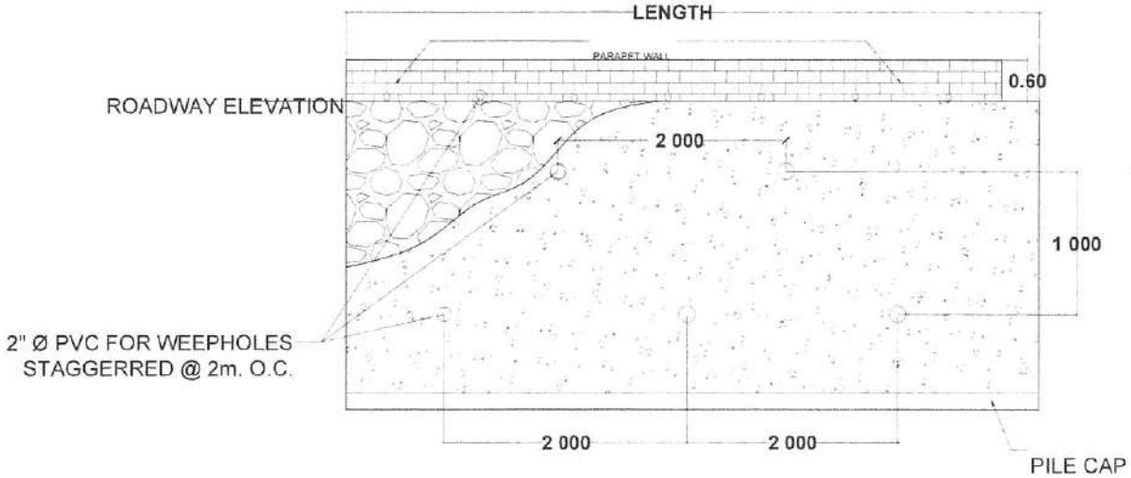
SCALE 1:30

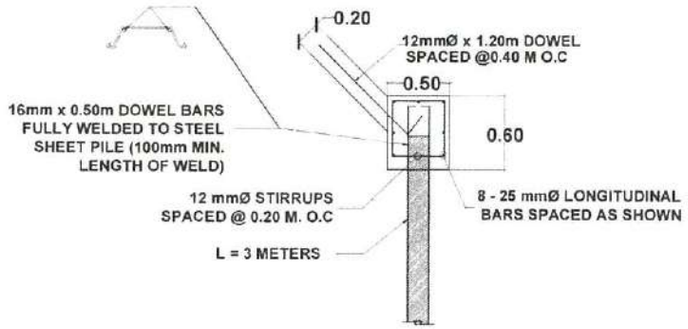


MANHOLE SECTION

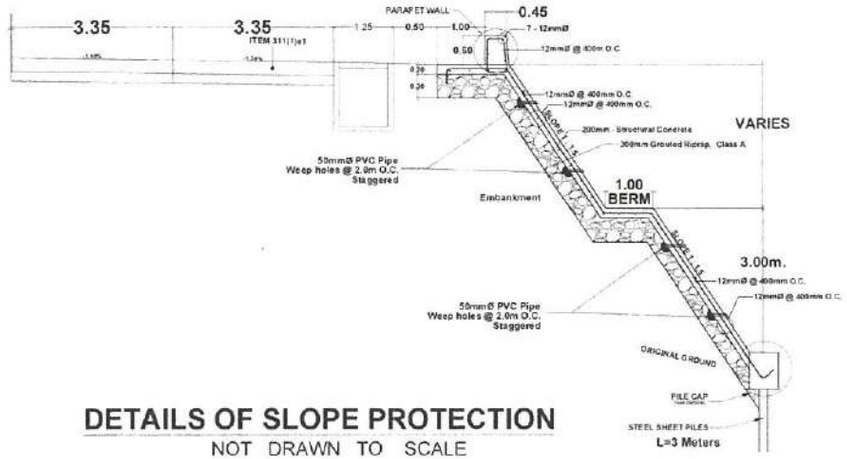
Total Weight per 1meter Length - Catch Basin with Manhole - 1.25 x 1.80						
Rebar No.	Length (mm)	Pieces	Total Length (m)	Bar Diameter	Factor (kg/m)	Weigth (kg)
1	2,671.73 mm	4.00 Pcs.	10.69 m	12 mm	0.89 kg/m	9.5 Kg.
2	2,738.62 mm	4.00 Pcs.	10.95 m	12 mm	0.89 kg/m	9.7 Kg.
3	1,670.00 mm	4.00 Pcs.	6.68 m	12 mm	0.89 kg/m	5.9 Kg.
4	2,882.33 mm	4.00 Pcs.	11.53 m	12 mm	0.89 kg/m	10.2 Kg.
5	1,000.00 mm	4.00 Pcs.	4.00 m	12 mm	0.89 kg/m	3.6 Kg.
6	2,714.50 mm	4.00 Pcs.	10.86 m	12 mm	0.89 kg/m	9.6 Kg.
7	2,890.50 mm	4.00 Pcs.	11.56 m	12 mm	0.89 kg/m	10.3 Kg.
8	1,617.97 mm	4.00 Pcs.	6.47 m	12 mm	0.89 kg/m	5.7 Kg.
9	1,360.00 mm	4.00 Pcs.	5.44 m	12 mm	0.89 kg/m	4.8 Kg.
10	670.00 mm	10.00 Pcs.	6.70 m	12 mm	0.89 kg/m	5.9 Kg.
11	400.00 mm	8.00 Pcs.	3.20 m	12 mm	0.89 kg/m	2.8 Kg.
14	110.00 mm	7.00 Pcs.	0.77 m	12 mm	0.89 kg/m	0.7 Kg.
15	1,000.00 mm	74.00 Pcs.	74.00 m	12 mm	0.89 kg/m	65.7 Kg.
					Total (Reinforcing Steel Bars Deformed Grade 40) :	**144.61 Kg.**
					Total (Add 5% wastage):	**151.84 Kg.**
12	518	4	2.07	16 mm	1.578	3.3 Kg.
13	1520	5	7.6	16 mm	1.578	12.0 Kg.
					Total (Reinforcing Steel Bars Plain Grade 40) :	**15.26 Kg.**
					Total (Add 5% wastage):	**16.02 Kg.**
					Nut and Washer:	**8.00 Pcs.**
					50mm x 50mm x 6mm ANGLE BAR:	**23.44 Kg.**

REPUBLIC OF THE PHILIPPINES DEPARTMENT OF PUBLIC WORKS AND HIGHWAYS REGIONAL OFFICE NO. VIII BARAS, PALO, LEYTE	PROJECT NAME AND LOCATION SIPAG - ACCESS ROADS AND/OR BRIDGES FROM THE NATIONAL ROADS LEADING TO MAJOR / STRATEGIC PUBLIC BUILDINGS / FACILITIES - CONSTRUCTION OF BORONGAN DIVERSION ROAD, BARANGAY LOGSOON-BARANGAY LALAWIGAN SECTION, BORONGAN CITY, EASTERN SAMAR EASTERN SAMAR 1.D.	SHEET CONTENTS DETAILS OF CONCRETE CATCH BASIN & MANHOLE	PREPARED JAKE CHARLES S. HECHANOVA ENGINEER II (SG8) DATE	REVIEWED FELIX R. BACUS CHIEF, HIGHWAY DESIGN SECTION DATE	CHECKED AGNES M. BARONDA CHIEF, PLANNING AND DESIGN DIVISION DATE	RECOMMENDED MA. MARGARITA D. JUNIA, O.M. ASSISTANT REGIONAL DIRECTOR DATE	APPROVED EDGAR B. TABACON, CESO IV REGIONAL DIRECTOR DATE	SET NO A 15 22	SHEET NO 16 58

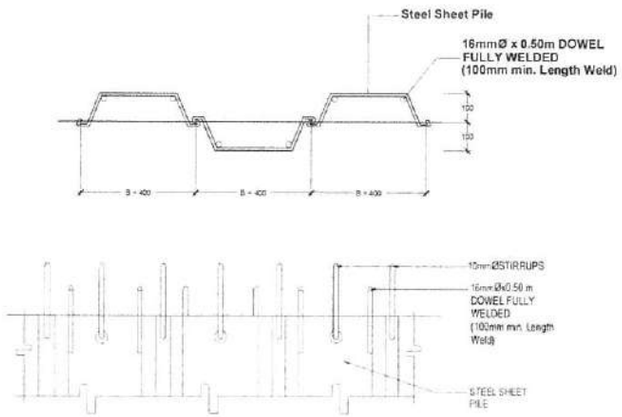




PILE CAP DETAIL
NOT DRAWN TO SCALE



DETAILS OF SLOPE PROTECTION
NOT DRAWN TO SCALE



SHEET PILE DIMENSION AND SECTIONAL PROPERTIES

SECTION TYPE	DIMENSIONS			PER PILE			
	WIDTH B	HEIGHT h	THICKNESS t	SECTIONAL AREA A	WEIGHT W	MOMENT OF INERTIA Ix	SECTION MODULUS Zx
	mm	mm	mm	sq.cm.	kg./m.	cm^4	cm^3
YSP-II	400	100	10.50	61.18	48.00	1,240.00	152.00

DETAIL OF STEEL SHEET PILE
NOT DRAWN TO SCALE

A. STEEL SHEET PILE
Fy = 251 MPa.

STEEL SHEET PILE SHALL BE OF TYPE, WEIGHT, AND SECTION MODULUS INDICATED ON THE TABLE ABOVE AND SHALL CONFORM TO THE REQUIREMENTS OF STEEL SHEET PILE.

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EASTERN SAMAR, 1.D.

SHEET CONTENTS: DETAIL OF SLOPE PROTECTION, PILE CAP, DETAIL OF STEEL SHEET PILE

PREPARED: JAKE CHARLES S. HECHANOVA, ENGINEER II (RSE), DATE

REVIEWED: FELIX R. BACUS, CHIEF, HIGHWAY DESIGN SECTION, DATE

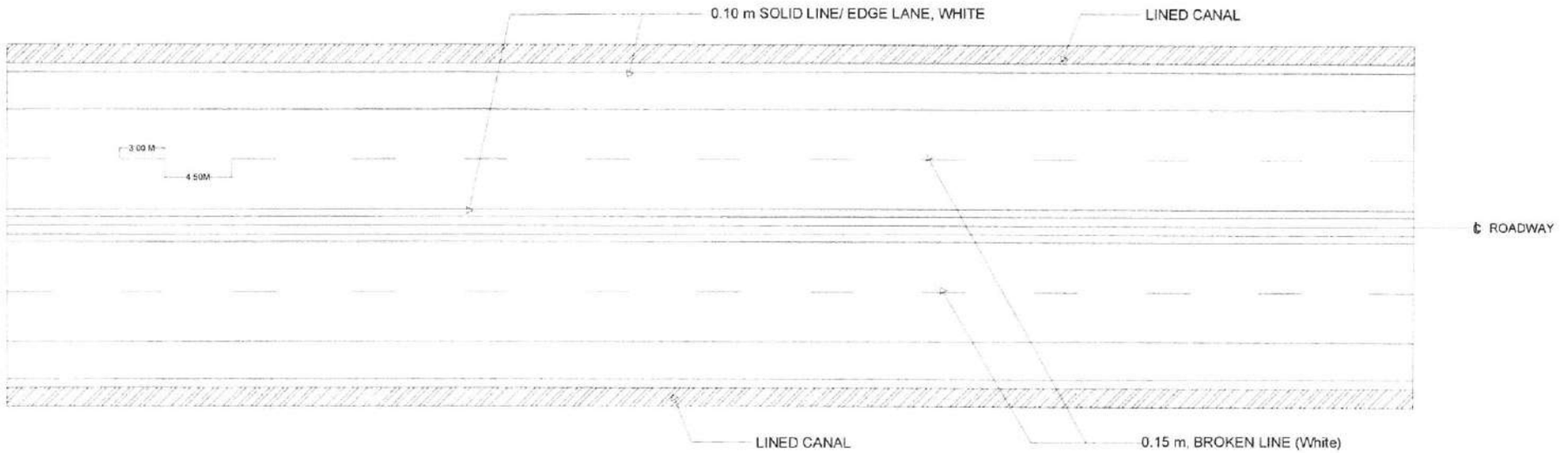
SUBMITTED: AGNES M. BARONDA, CHIEF PLANNING AND DESIGN DIVISION, DATE

RECOMMENDED: MA. MAGDALENA L. JUNIA, D.M., ASSISTANT REGIONAL DIRECTOR, DATE

APPROVED: EDGAR B. TABACON, CESO IV, REGIONAL DIRECTOR, DATE

SET NO: A 17 | 22

SHEET NO: 17 / 58



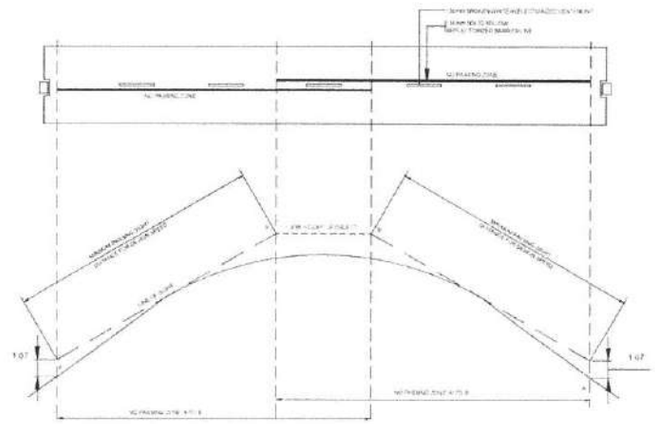
REFLECTORIZED THERMOPLASTIC PAVEMENT MARKINGS

NOT DRAWN TO SCALE

DESIGN SPEED (KPH)	MINIMUM PASSING SIGHT DISTANCE M
30	200
40	285
50	345
60	407
40	482
40	541
40	605
100	670
110	735
120	792

PAVEMENT MARKING APPLICATION OF NO PASSING ZONES

(WHERE PASSING MUST BE PROHIBITED BECAUSE OF HAZARDOUS CONDITIONS)



METHOD OF LOCATING AND DETERMINING THE LIMIT OF NO - PASSING ZONES ON VERTICAL CURVES

NOT TO SCALE

STANDARD PAVEMENT MARKING

NOT TO SCALE

REPUBLIC OF THE PHILIPPINES
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EASTERN SAMAR L.D.

SHEET CONTENTS: REFLECTORIZED THERMOPLASTIC PAVEMENT MARKINGS & STANDARD PAVEMENT MARKINGS

PREPARED: JAKE CHARLES S. HECHANOVA, ENGINEER II (OIC), DATE

REVIEWED: FELIX R. BACUS, CHIEF, HIGHWAY DESIGN SECTION, DATE

SUBMITTED: AGNES B. BARONDA, CHIEF, PLANNING AND DESIGN DIVISION, DATE

RECOMMENDED: MA. MARGARITA S. JUNIA, D.M., ASSISTANT REGIONAL DIRECTOR, DATE

APPROVED: EDGAR B. TABACON, CESO IV, REGIONAL DIRECTOR, DATE

SET NO: A (18 / 22)

SHEET NO: 18 / 58