25I00181

Republic of the Philippines

Department of Public Works and Highways

Region VIII

Baras, Palo, Leyte

C.Y. 2025 PROJECT

SIPAG - COASTAL ROADS TO AUGMENT RESILIENCY OF COASTAL COMMUNITIES - CONSTRUCTION OF COASTAL ROAD, PHASE 3, LEYTE - LEYTE TO CAPOOCAN, LEYTE

LEYTE 3RD LD

STATION: 4+540.00 - 5+498.00, 6+677.00 - 7+020.00
CW1 - Construction of Concrete Road: 2.602 Lane Km.
CW2- Construction of Road Slope Protection: 5252.2 Sq.m.

BEG. OF SECTION 1	:	LAT= 11.43662414° N,	LONG= 124.50949146° E
END OF SECTION 1	:	LAT= 11.43710305° N,	LONG= 124.51820083° E
BEG. OF SECTION 2	:	LAT= 11.43165750° N,	LONG= 124.52607896° E
END OF SECTION 2	:	LAT= 11.42906668° N,	LONG= 124.52775830° 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:

3706

INDEX OF SHEETS

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

PROJECT NAME AND LOCATION: SIPAG - COASTAL ROADS TO AUGMENT RESILIENCY OF COASTAL COMMUNITIES - CONSTRUCTION OF COASTAL ROAD, PHASE 3, LEYTE - LEYTE TO CAPOOCAN, LEYTE
LEYTE 3RD LD

SHEET CONTENTS: INDEX OF SHEETS

PREPARED: JOEL PAUL C. ARORQUE, ENGINEER

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

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

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

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

SET NO.: A (2 / 30)

SHEET NO.: 2 / 104

LEGENDS

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

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 - COASTAL ROADS TO AUGMENT RESILIENCY OF COASTAL COMMUNITIES - CONSTRUCTION OF COASTAL ROAD, PHASE 3, LEYTE - LEYTE TO CAPOOCAN, LEYTE LEYTE 3RD LD	LEGENDS	ENGR. PAUL C. ARORQUE ENGINEER II	FELIX R. BACUS CHIEF HIGHWAY DESIGN SECTION DATE	AGNES N. BARONDA CHIEF PLANNING AND DESIGN DIVISION DATE	MA. MARGARITA C. JUNIA, D.M. ASSISTANT REGIONAL DIRECTOR DATE	EDGAR B. TABACON, CESO IV REGIONAL DIRECTOR DATE	A 30	3 104

SYMBOLS AND ABBREVIATIONS

DESIGN FEATURES ON PLAN

SYMBOL	ABBREVIATION	DESCRIPTION
		MAJOR CONTOUR
		MINOR CONTOUR
		EXISTING ROAD
	℄	ROADWAY CENTERLINE
		EDGE OF ROAD (PROPOSED)
	RROW	RIGHT OF WAY LIMIT
MATCHLINE STA 0+000		MATCHLINE
		GRID COORDINATES
	AZIM.	AZIMUTH
		NORTH ARROW INDICATOR
ELEV		ELEVATION CALLOUT
PI-1		POINT OF INTERSECTION NUMBER
		POINT OF INTERSECTION
POT	○	POINT OF TANGENCY
BM	BM	BENCHMARK
IBM	IBM	INTERMEDIATE BENCHMARK
RP 1		REFERENCE POINT
KM		KILOMETER POST
	ACP	ASPHALT CONCRETE PAVEMENT
	PCCP	PORTLAND CEMENT CONCRETE PAVEMENT
		EXISTING CANAL
		CONCRETE SLOPE PROTECTION
	SM	ITEM 506(1) SLOPE PROTECTION
	CNL	PROPOSED CANAL

EP	EP	ELECTRICAL POST
		BRIDGE
	RCPC	REINFORCED CONCRETE PIPE CULVERT
RCBC	RCBC	REINFORCED CONCRETE BOX CULVERT
		RIVER/CREEK
		SHORE LINE
		DIRECTION OF WATER FLOW
		TREES (PREMIUM / COCONUT)
		WOODS/RAINFOREST
		SCRUB
		RICE FIELD
		MANGROVE
AH CH WS CW		SCHOOL/ CHURCH/ AMAKAN HOUSE/ CONCRETE HOUSE/ WOODEN STORE/ COMB. OF CONC. AND WOODEN HOUSE
CUT		EMBANKMENT / EXCAVATION LIMIT
TP		TEST PIT
		CHEVRON
		TEST PIT

DESIGN FEATURES ON PROFILE

SYMBOL	ABBREVIATION	DESCRIPTION
LEFT RIGHT BOTH		CANAL / DITCH FLOW
	RCBC	REINFORCED CONCRETE BOX CULVERT
	RCPC	REINFORCED CONCRETE PIPE CULVERT
		SUPER ELEVATION INNER
		SUPER ELEVATION OUTER
		LENGTH OF VERTICAL CURVE
PVI STA 4+210.00 ELEV 16.00 M LVC 100.00 M M.O +0.125		POINT OF INTERSECTION STATION AND ELEVATION
OWL MWL		ORDINARY/ MAX WATER LEVEL
g=+3.00%		FINISHED GRADE
		ORIGINAL GRADE

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LEYTE 3RD LD

SHEET CONTENTS: SYMBOLS AND ABBREVIATION

PREPARED: JOEL PAUL C. ARCORQUE, ENGINEER II

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

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

RECOMMENDED: MA. MARGARITA G. JUNIA, O.I.C. - ASSISTANT REGIONAL DIRECTOR, DATE

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

SET NO: 30

SHEET NO: 4 / 104

GENERAL NOTES:

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

2.) DESIGN STANDARDS
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

3.) 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.

4.) HORIZONTAL CONTROL
A.) ALL TRAVERSE POINTS WHERE TIED TO THE CENTER TOP AT THE ENDS OF EXISTING CONCRETE PROVINCIAL ROAD.
B.) TRUE AZIMUTH WAS USED IN RUNNING THE TRAVERSE POINTS.
C.) SIMPLE CURVES WERE USED IN THE TRANSITION OF THE HORIZONTAL CURVATURES.
D.) ALL HORIZONTAL CURVE COMPUTATIONS ARE BASED ON THE 25.00M. ARC DEFINITION.
E.) SKEWED ANGLE IS DEFINED AS THE ANGLE BETWEEN THE LINE IN QUESTION AND A LINE NORMAL TO THE CENTERLINE OF THE ROAD.
F.) INTERSECTION POINTS (PI) ARE REFERRED TO AT LEAST TWO REFERENCE POINTS WITHIN OR OUTSIDE THE ROAD RIGHT - OF - WAY.

5.) VERTICAL CONTROL
A.) DATUM OF ALL ELEVATIONS IS MEAN SEA LEVEL.
B.) ALL ELEVATIONS WERE RECKONED FROM THE TOP OF THE CENTERLINE OF EXISTING PCCP.
C.) BENCHMARKS WERE PROVIDED AS SHOWN ON THE PLANS AND PROFILE DRAWINGS.

I. 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.

II. TOPOGRAPHIC SURVEY
A.) SHALL BE DONE AS PER TERMS OF REFERENCE

III. 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.

IV. 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.

6.) CLEARING AND GRUBBING
A.) THE EXTENT OF CLEARING AND GRUBBING SHALL BE 3.00M. BEYOND THE TOES OF FILL SLOPE OR BEYOND ROUNDING SLOPE OF CUT AS INDICATED IN THE TYPICAL ROADWAY SECTION.
B.) ALL MEASUREMENTS SHALL BE BY HORIZONTAL DISTANCES
C.) IN PLACES WHERE EXISTING CEMENT CONCRETE PAVEMENT AND OTHER STRUCTURES AND UTILITIES WILL NOT BE DAMAGED.

7.) RIGHT - OF - WAY
A.) THE PROPOSED ROAD RIGHT - OF - WAY IS 20.00M.

8.) REMOVAL OF EXISTING STRUCTURES AND OBSTRUCTIONS
A.) ALL WORKS SHALL COMPLY WITH CLAUSE 39 REQUIREMENTS AND CONDITIONS OF CONTRACTS VOLUME-1 OF THE STANDARD SPECIFICATIONS FOR PUBLIC WORKS AND HIGHWAYS 1995.
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.) 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.

10.) AGGREGATE SUBBASE COURSE
A.) AGGREGATE FOR SUBBASE SHALL CONSIST OF HARD, DURABLE PARTICLES OR FRAGMENTS OF CRUSHED STONE, CRUSHED SLAG, OR CRUSHED OR NATURAL GRAVEL AND FILLER OF NATURAL OR CRUSHED SAND AND OTHER FINELY DIVIDED MINERAL MATTER. THE COMPOSIT MATERIAL SHALL BE FREE FROM VEGETABLE MATTER AND SLUMPS OR BALLS OF CLAY, AND SHALL BE SUCH NATURE THAT IT CAN BE COMPACTED READILY TO FORM A FIRM, STABLE SUBBASE.

11.) PORTLAND CEMENT CONCRETE PAVEMENT
A.) THIS ITEM SHALL CONSIST OF PAVEMENT OF PORTLAND CEMENT CONCRETE, WITH OR WITHOUT REINFORCEMENT, CONSTRUCTED ON THE PREPARED BASE IN ACCORDANCE WITH THIS SPECIFICATION AND IN CONFORMITY WITH LINES, GRADES, THICKNESS AND TYPICAL CROSS-SECTION SHOWN ON THE PLANS.

12.) REINFORCING STEEL
A.) THIS ITEM SHALL CONSIST OF FURNISHING, BENDING, FABRICATING AND PLACING OF STEEL REINFORCEMENT OF THE SHAPE , TYPE, SIZE, AND GRADE REQUIRED IN ACCORDANCE WITH THIS SPECIFICATION AND IN CONFORMITY WITH THE REQUIREMENTS SHOWN ON THE PLANS OR AS DIRECTED BY THE ENGINEER

13.) STRUCTURAL CONCRETE
A.) THIS ITEM SHALL CONSIST OF FURNISHING, PLACING AND FINISHING CONCRETE IN ALL STRUCTURES EXCEPT PAVEMENTS IN ACCORDANCE WITH THIS SPECIFICATION AND CONFORMING TO THE LINES, GRADES, AND DIMENSIONS SHOWN ON THE PLANS.

14.) 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

COORDINATE SYSTEM

SURVEY SPECIFICATION
A. COORDINATE REFERENCE SYSTEM: PRS92 / Philippines zone 5
B. PROJECTION: TM
C DATUM: PRS92
D. EPSG CODE: 3125

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

DATE OF SURVEY:
JANUARY 5-15, 2025

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

NOTE:
1.) THIS PLAN SHALL ONLY BE USED AS A GUIDE, SPECIFICALLY IN THE PRE CONSTRUCTION STAGE. THE ACTUAL IMPLEMENTATION FOR THE PROJECT, ON THE OTHER 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 ADDITIONAL REVIEW AND APPROVAL OF THE REGIONAL DIRECTOR.

2.) 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 WORK ITEMS INVOLVED AS A RESULT OF REVISION MUST BE COMPUTED AND RE-CONSIDERED IN THE "AS-STAKED PLAN".

REPUBLIC OF THE PHILIPPINES DEPARTMENT OF PUBLIC WORKS AND HIGHWAYS REGIONAL OFFICE NO. VIII BARAS PALO, LEYTE	PROJECT NAME AND LOCATION SIPAG - COASTAL ROADS TO AUGMENT RESILIENCY OF COASTAL COMMUNITIES - CONSTRUCTION OF COASTAL ROAD, PHASE 3, LEYTE - LEYTE TO CAPOOCAN, LEYTE LEYTE 3RD LD	SHEET CONTENTS GENERAL NOTES	PREPARED JOEL PAUL C. ASORQUE ENGINEER	REVIEWED FELIX R. PACUS CHIEF, HIGHWAY DESIGN SECTION DATE	SUBMITTED AGNES M. BARONDA CHIEF PLANNING AND DESIGN DIVISION DATE	RECOMMENDED MA. MARGARITA T. JUNIA, D.M. ASSISTANT REGIONAL DIRECTOR DATE	APPROVED EDGAR B. TABACON, CESO IV REGIONAL DIRECTOR DATE	SET NO A S 30	SHEET NO 5 104

15.) DESIGN SPECIFICATIONS

1.) PAVEMENT DESIGN CRITERIA

1.A) PAVEMENT DESIGN PARAMETER: 0.28M thk.

DESIGN REQUIREMENTS

A.	PERFORMANCE PERIOD FOR PCCP	20 YEARS (FOR PCCP)
B.	DESIGN TRAFFIC: ESAL	7.277×10^6
C.	DESIGN RELIABILITY: R	0.85
D.	STANDARD DEVIATION: So	0.35
E.	DESIGN SERVICEABILITY LOSS: APSI	2.50
F.	PCCP MODULUS OF RUPTURE: Sc	464.45
G.	PCCP MODULUS OF ELASTICITY: Ec	3.360×10^5
H.	SUBGRADE DESIGN CBR	5.31 %
I.	EFFECTIVE ROADBED RESILIENT MODULUS: MR	7,965.00
J.	SUBBASE ELASTIC MODULUS: ESB	15,000.00
K.	SUBBASE THICKNESS	200.00 MM
L.	EFFECTIVE MODULUS AT SUBGRADE REACTION: K (pci)	175.00
M.	DRAINAGE COEFFICIENT: Cd	1.00
N.	LOAD TRANSFER COEFFICIENT: J	3.90
O.	LOSS OF SUPPORT: Ls	1.00
P.	K (corrected):	100.00

2.) SLOPE STABILITY AND SLOPE PROTECTION CRITERIA

2.A) EMBANKMENT PROTECTION PARAMETERS:

ITEM 506(1)

A.	UNIT WEIGHT OF ITEM 506(1), W_{gu}	24.00 Kn/m^3
B.	SURCHARGE DUE TO LIVE LOAD, S	9.81 Kn/m^2
C.	UNIT WEIGHT OF SOIL, W_s	19.0 Kn/m^2
D	ANGLE OF FRICTION OF SOIL, Ø	40°
E.	SLOPE OF SOIL FACE, β	60°
F	COEFF. OF FRICTION b/n GROUND & SM, u:	0.60
G	BOTTOM THICKNESS OF MASONRY, B	3.00 m
H	TOP THICKNESS OF MASONRY b:	0.50 m
I.	HEIGHT OF ACTIVE SOIL PRESSURE, H.	6.00 m
J.	HEIGHT OF PASSIVE SOIL PRESSURE, h	1.00 m.
K.	HEIGHT OF EQUIVALENT OF SURCHARGE, h'	0.52 m
L.	CONSIDERED STRIP OF MASONRY, bw	1.00 m.

3.) DRAINAGE DESIGN CRITERIA

HYDROLOGIC ANALYSIS AND HYDRAULIC PARAMETERS

3.A) SIDE DITCH

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	*2.766 cu.m./sec*

3.B) CONCRETE LINED CANAL

ITEM		*DESIGN REQUIREMENTS*
A.	DESIGN STORM FREQUENCY:	2 YEARS (FOR CANAL)
B.	COEFFICIENT OF RUN-OFF, C	0.30
C.	RAINFALL INTENSITY, I:	168.14 mm/hr
D.	CATCHMENT AREA, A	0.165 Sq km
E.	RUN-OFF DISCHARGE, Q_R:	2.5891 Cu m/Sec.
F.	DIAMETER, D	0.91 m
G	DEPTH OF FLOW H_1:	0.82 m
H	SLOPE, S	0.04898
I	ROUGHNESS COEFFICIENT, N	0.018
J.	WETTED PERIMETER, P	2.57297
K.	HYDRAULIC RADIUS, R.	0.23
L.	INLET VELOCITY, V_1:	4.58 m/s
M	OUTLET VELOCITY, V_2:	3.61 m/s
N	INLET CONTROL, HW/D	24.5
O.	OUTLET CONTROL, HW.	5.9

3.C)1 ROW - 1220 MM Ø PIPE CULVERT - STA. 4+550.00

ITEM	*DESIGN REQUIREMENTS*
1. DESIGN STORM FREQUENCY	*10 years*
2. COEFFICIENT OF RUN-OFF, C	*0.30*
3. RAINFALL INTENSITY, I	*206.25 mm/hr*
4. CATCHMENT AREA, A	*0.139 sq.km*
5. RUN-OFF DISCHARGE, Q	*2.4975 cu.m/sec*
6. DIAMETER, D	*0.91 m*
7. DEPTH OF FLOW, H	*0.82*
8. SLOPE, S	*0.04423*
9. ROUGHNESS COEFFICIENT, N	*0.018*
10. WETTED PERIMETER, P	*2.57297*
11. HYDRAULIC RADIUS, R	*0.23*
12. VELOCITY, V	*4.65 m/s*
13. DESIGN DISCHARGE, Q	*2.5685 cu.m./sec*
14. INLET CONTROL, HW/D	*28.50 m*
15. OUTLET CONTROL, HW	*4.50 m*
16. OUTLET VELOCITY	*3.61 m/s*

3.D)1 ROW - 1220 MM Ø PIPE CULVERT - STA. 5+420.00

ITEM	*DESIGN REQUIREMENTS*
1. DESIGN STORM FREQUENCY	*10 years*
2. COEFFICIENT OF RUN-OFF, C	*0.30*
3. RAINFALL INTENSITY, I	*206.25 mm/hr*
4. CATCHMENT AREA, A	*0.139 sq.km*
5. RUN-OFF DISCHARGE, Q	*2.4975 cu.m/sec*
6. DIAMETER, D	*0.91 m*
7. DEPTH OF FLOW, H	*0.82*
8. SLOPE, S	*0.04423*
9. ROUGHNESS COEFFICIENT, N	*0.018*
10. WETTED PERIMETER, P	*2.57297*
11. HYDRAULIC RADIUS, R	*0.23*
12. VELOCITY, V	*4.65 m/s*
13. DESIGN DISCHARGE, Q	*2.5685 cu.m./sec*
14. INLET CONTROL, HW/D	*28.50 m*
15. OUTLET CONTROL, HW	*4.50 m*
16. OUTLET VELOCITY	*3.61 m/s*

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. **CONSTRUCTION SURVEY AND STAKING**
   - A. SHALL CONSIST OF FURNISHING THE NECESSARY EQUIPMENT AND MATERIAL TO SURVEY, STAKE, CALCULATE, AND RECORD DATA FOR THE CONTROL OF WORK IN ACCORDANCE WITH THIS SPECIFICATION AND IN CONFORMITY WITH THE LINES, GRADES AND DIMENSIONS SHOWN ON THE PLANS OR AS ESTABLISHED BY THE ENGINEER.
   - B. STAKING ACTIVITIES SHALL BE INCLUDED IN THE CONSTRUCTION SCHEDULE TO BE SUBMITTED BY THE CONTRACTOR. DATES AND SEQUENCE OF EACH STAKING ACTIVITY SHALL BE INCLUDED.
   - C. PRIOR TO CONSTRUCTION, THE ENGINEER SHALL BE NOTIFIED OF ANY MISSING INITIAL REFERENCE LINES, CONTROLS, POINTS, OR STAKES. THE ENGINEER SHALL REESTABLISH MISSING INITIAL REFERENCE LINES, CONTROLS, POINTS, OR STAKES. THE CONTRACTOR FOR CONVENIENT USE OF GOVERNMENT-FURNISHED DATA SHALL PERFORM ADDITIONAL CALCULATIONS. IMMEDIATE NOTIFICATION OF APPARENT ERRORS IN THE INITIAL STAKING OR IN THE FURNISHED DATA SHALL BE PROVIDED.
   - D. BEFORE SURVEYING AND STAKING, THE CONTRACTOR SHALL DISCUSS AND COORDINATE THE FOLLOWING WITH THE ENGINEER:
     - a. SURVEYING AND STAKING METHODS
     - b. STAKE MARKING/CONCRETE MONUMENTS
     - c. GRADE CONTROL FOR COURSES OF MATERIAL
     - d. REFERENCING
     - e. STRUCTURE CONTROL
     - f. ANY OTHER PROCEDURES AND CONTROLS NECESSARY FOR THE WORK

4. **PROJECT BILLBOARD**
   - A. DO. 11, SERIES OF 2022 : AMENDMENT TO DEPARTMENT ORDER NO. 21 SERIES OF 2017 "REVISED GUIDELINES ON THE INSTALLATION OF PROJECT BILLBOARD"REVISED
   - B. GUIDELINES ON THE INSTALLATION OF PROJECT BILLBOARD (PER D.O. 21, S. 2017)

5. **TRAFFIC MANAGEMENT**
   - A. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE DEVELOPING AND MAINTAINING AN EFFECTIVE TRAFFIC CONTROL PLAN IN ACCORDANCE WITH THE SPECIAL PROVISIONS SUBJECT TO THE APPROVAL OF THE ENGINEER AND THE CORRESPONDING LOCAL AUTHORITIES.

6. **MOBILIZATION**
   - A. SHALL CONSIST OF MOBILIZATION OF EQUIPMENT AND MANPOWER, MATERIALS AND OTHER ITEMS THAT SHALL BE OF USE IN THE IMPLEMENTATION OF THE PROJECT.
   - B. ALL CEMENT MATERIALS SHALL BE STORED IMMEDIATELY UPON DELIVERY AT SITE, IN A WEATHER PROOF BUILDING WHICH WILL PROTECT THE CEMENT FROM DAMPNESS. THE FLOOR SHALL BE RAISED FROM THE GROUND BY 4 INCHES.
   - C. ALL SIGNAGES AND PROJECT BILLBOARDS SHALL BE PLACED AT DESIGNATED LOCATIONS APPROVED BY THE PROJECT ENGINEER.

7 **DEMOBILIZATION**
   - A. FOLLOWS ONLY AFTER THE PROJECT WAS FINALLY ACCEPTED AND THE SURROUNDINGS ARE PROPERLY CLEANED.

8. **CLEARING AND GRUBBING**
   - A. THE ENGINEER WILL ESTABLISH THE LIMITS OF WORK AND DESIGNATE ALL TREES, SHRUBS, PLANTS AND OTHER THINGS TO REMAIN. THE CONTRACTOR SHALL PRESERVE ALL OBJECTS DESIGNATED TO REMAIN. PAINT REQUIRED FOR CUT OR SCARRED SURFACE OF TREES OR SHRUBS SELECTED FOR RETENTION SHALL BE AN APPROVED ASPHALTUM BASE PAINT PREPARED ESPECIALLY FOR TREE SURGERY.
   - B. CLEARING SHALL EXTEND ONE (1) METER BEYOND THE TOE OF THE FILL SLOPES OR BEYOND ROUNDING OF CUT SLOPES AS THE CASE MAYBE FOR THE ENTIRE LENGTH OF THE PROJECT UNLESS OTHERWISE SHOWN ON THE PLANS OR AS DIRECTED BY THE ENGINEER AND PROVIDED IT IS WITHIN THE RIGHT OF WAY LIMITS OF THE PROJECT, WITH THE EXCEPTION OF TREES UNDER THE JURISDICTION OF THE FOREST MANAGEMENT BUREAU (FMB).

9. **INDIVIDUAL REMOVAL OF TREES OR STUMPS**
   - A. INDIVIDUAL TREES OR STUMPS DESIGNATED BY THE ENGINEER FOR REMOVAL AND LOCATED IN AREAS OTHER THAN THOSE ESTABLISHED FOR CLEARING AND GRUBBING AND ROADSIDE CLEANUP SHALL BE REMOVED AND DISPOSED OFF AS SPECIFIED UNDER SUBSECTION 109.2.2 EXCEPT TREES REMOVED SHALL BE CUT AS NEARLY FLUSH WITH THE GROUND AS PRACTICABLE WITHOUT REMOVING STUMPS.

10. **EXCAVATION**
   - A. SHALL CONSIST OF ROADWAY DRAINAGE AND BORROW EXCAVATION, AND THE DISPOSAL OF MATERIAL IN ACCORDANCE WITH THIS SPECIFICATION AND IN CONFORMITY WITH THE LINES, GRADES AND DIMENSIONS SHOWN ON THE PLANS OR ESTABLISHED BY THE ENGINEER.
   - B. **ROADWAY EXCAVATION** - ROADWAY EXCAVATION WILL INCLUDE EXCAVATION AND GRADING FOR ROADWAYS, PARKING AREAS, INTERSECTIONS, APPROACHES, SLOPE ROUNDING, BENCHING, WATERWAYS AND DITCHES; REMOVAL OF UNSUITABLE MATERIAL FROM THE ROADBED AND BENEATH EMBANKMENT AREAS; AND EXCAVATING SELECTED MATERIAL FOUND IN THE ROADWAY AS ORDERED BY THE ENGINEER FOR SPECIFIC USE IN THE IMPROVEMENT.
   - C. **COMMON EXCAVATION** - COMMON EXCAVATIONS SHALL CONSIST OF ALL EXCAVATION NOT INCLUDED IN THE BILL OF QUANTITIES UNDER "ROCK EXCAVATION" OR OTHER PAY ITEMS.
   - D. **ROCK EXCAVATION** - ROCK EXCAVATION SHALL CONSIST OF EXCAVATION OF IGNEOUS, SEDIMENTARY AND METAMORPHIC ROCKS WHICH CANNOT BE EXCAVATED WITHOUT BLASTING OR THE USE OF RIPPERS, AND ALL BOULDERS OR OTHER DETACHED STONES EACH HAVING A VOLUME OF 1 CUBIC METER OR MORE AS DETERMINED BY PHYSICAL MEASUREMENTS OR VISUALLY BY THE ENGINEER.
   - E. WHERE THERE IS EVIDENCE OF DISCREPANCIES ON THE ACTUAL ELEVATIONS AND THAT SHOWN ON THE PLANS, A PRECONSTRUCTION SURVEY REFERRED TO THE DATUM PLANE USED IN THE APPROVED PLAN SHALL BE UNDERTAKEN BY THE CONTRACTOR UNDER THE CONTROL OF THE ENGINEER TO SERVE AS BASIS FOR THE COMPUTATION OF THE ACTUAL VOLUME OF THE EMBANKMENT MATERIALS.

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11. **EMBANKMENT**

A. SHALL CONSIST OF THE CONSTRUCTION OF EMBANKMENT IN ACCORDANCE WITH THIS SPECIFICATION AND IN CONFORMITY WITH THE LINES, GRADES AND DIMENSIONS SHOWN ON THE PLANS OR ESTABLISHED BY THE ENGINEER.

B. PRIOR TO CONSTRUCTION OF EMBANKMENT, ALL NECESSARY CLEARING & GRUBBINGIN THE AREA SHALL BE PERFORMED IN CONFORMITY WITH ITEM 100, , CLEARING AND GRUBBING.

C. EMBANKMENT CONSTRUCTION SHALL CONSIST OF CONSTRUCTING ROADWAY EMBANKMENTS, INCLUDING PREPARATION OF THE AREAS UPON WHICH THEY ARE TO BE PLACED; THE CONSTRUCTION OF DIKES WITHIN OR ADJACENT TO THE ROADWAY; THE PLACING AND COMPACTING OF APPROVED MATERIAL WITHIN ROADWAY AREAS WHERE UNSUITABLE MATERIAL HAS BEEN REMOVED; AND THE PLACING AND COMPACTING OF EMBANKMENT MATERIAL IN HOLES, PITS, AND OTHER DEPRESSIONS WITHIN THE ROADWAY AREA.

D. EMBANKMENTS AND BACKFILLS SHALL CONTAIN NO MUCK, PEAT, SOD, ROOTS OR OTHER DELETERIOUS MATTER. ROCKS, BROKEN CONCRETE OR OTHER SOLID, BULKY MATERIALS SHALL NOT BE PLACED IN EMBANKMENT AREAS WHERE PILING IS TO BE PLACED OR DRIVEN.

E. WHERE SHOWN ON THE PLANS OR DIRECTED BY THE ENGINEER, THE SURFACE OF THE EXISTING GROUND SHALL BE COMPACTED TO A DEPTH OF 150 MM AND TO THE SPECIFIED REQUIREMENTS OF THIS ITEM.

F. WHERE PROVIDED ON THE PLANS AND BILL OF QUANTITIES THE TOP PORTIONS OF THE ROADBED IN BOTH CUTS AND EMBANKMENTS, AS INDICATED, SHALL CONSIST OF SELECTED BORROW FOR TOPPING FROM EXCAVATIONS.

12. **STRUCTURE EXCAVATION**

A. **CLEARING AND GRUBBING** - PRIOR TO STARTING EXCAVATION OPERATIONS IN ANY AREA, ALL NECESSARY CLEARING AND GRUBBING IN THAT AREA SHALL HAVE BEEN PERFORMED IN ACCORDANCE WITH ITEM 100, CLEARING AND GRUBBING.

B. **EXCAVATION** - GENERAL, ALL STRUCTURES. THE CONTRACTOR SHALL NOTIFY THE ENGINEER SUFFICIENTLY IN ADVANCE OF THE BEGINNING OF ANY EXCAVATION SO THAT CROSS-SECTIONAL ELEVATIONS AND MEASUREMENTS MAY BE TAKEN ON THE UNDISTURBED GROUND. THE NATURAL GROUND ADJACENT TO THE STRUCTURE SHALL NOT BE DISTURBED WITHOUT PERMISSION OF THE ENGINEER.
STRUCTURES OTHER THAN PIPE CULVERTS - ALL ROCK OR OTHER HARD FOUNDATION MATERIALS SHALL BE CLEANED OF ALL LOOSE MATERIALS, AND CUT TO A FIRM SURFACE, EITHER LEVEL, STEPPED, OR SERRATED AS DIRECTED BY THE ENGINEER. ALL SEAMS OR CREVICES SHALL BE CLEANED AND GROUTED. ALL LOOSE AND DISINTEGRATED ROCKS AND THIN STRATA SHALL BE REMOVED. WHEN THE FOOTING IS TO REST ON MATERIAL OTHER THAN ROCK, EXCAVATION TO FINAL GRADE SHALL NOT BE MADE UNTIL JUST BEFORE THE FOOTING IS TO BE PLACED. WHEN THE FOUNDATION MATERIAL IS SOFT OR MUCKY OR OTHERWISE UNSUITABLE, AS DETERMINED BY THE ENGINEER, THE CONTRACTOR SHALL REMOVE THE UNSUITABLE MATERIAL AND BACKFILL WITH APPROVED GRANULAR MATERIAL. THIS FOUNDATION FILL SHALL BE PLACED AND COMPACTED IN 150 MM LAYERS UP TO THE FOUNDATION ELEVATION.
PIPE CULVERTS - THE WIDTH OF THE PIPE TRENCH SHALL BE SUFFICIENT TO PERMIT SATISFACTORY JOINTING OF THE PIPE AND THOROUGH TAMPING OF THE BEDDING MATERIAL UNDER AND AROUND THE PIPE.

C. **UTILIZATION OF EXCAVATED MATERIALS** - ALL EXCAVATED MATERIALS, SO FAR AS SUITABLE, SHALL BE UTILIZED AS BACKFILL OR EMBANKMENT. THE SURPLUS MATERIALS SHALL BE DISPOSED OFF IN SUCH MANNER AS NOT TO OBSTRUCT THE STREAM OR OTHERWISE IMPAIR THE EFFICIENCY OR APPEARANCE OF THE STRUCTURE. NO EXCAVATED MATERIALS SHALL BE DEPOSITED AT ANY TIME SO AS TO ENDANGER THE PARTLY FINISHED STRUCTURE.

D. **BACKFILL AND EMBANKMENT FOR STRUCTURES OTHER THAN PIPE CULVERTS** - EXCAVATED AREAS AROUND STRUCTURES SHALL BE BACKFILLED WITH FREE DRAINING GRANULAR MATERIAL APPROVED BY THE ENGINEER AND PLACED IN HORIZONTAL LAYERS NOT OVER 150 MM IN THICKNESS, TO THE LEVEL OF THE ORIGINAL GROUND SURFACE. EACH LAYER SHALL BE MOISTENED OR DRIED AS REQUIRED AND THOROUGHLY COMPACTED WITH MECHANICAL TAMPERS.

E. **BEDDING, BACKFILL, AND EMBANKMENT FOR PIPE CULVERTS** - BEDDING, BACKFILL AND EMBANKMENT FOR PIPE CULVERTS SHALL BE DONE IN ACCORDANCE WITH ITEM 500, PIPE CULVERTS AND STORM DRAINS.

13 **SUBGRADE PREPARATION**

A. SHALL CONSIST OF THE PREPARATION OF THE SUBGRADE FOR THE SUPPORT OF OVERLYING STRUCTURAL LAYERS. IT SHALL EXTEND TO FULL WIDTH OF THE ROADWAY. UNLESS AUTHORIZED BY THE ENGINEER, SUBGRADE PREPARATION SHALL NOT BE DONE UNLESS THE CONTRACTOR IS ABLE TO START IMMEDIATELY THE CONSTRUCTION OF THE PAVEMENT STRUCTURE.

B. PRIOR TO COMMENCING PREPARATION OF THE SUBGRADE, ALL CULVERTS, CROSS DRAINS, DUCTS AND THE LIKE (INCLUDING THEIR FULLY COMPACTED BACKFILL), DITCHES, DRAINS AND DRAINAGE OUTLETS SHALL BE COMPLETED. ANY WORK ON THE PREPARATION OF THE SUBGRADE SHALL NOT BE STARTED UNLESS PRIOR WORK HEREIN DESCRIBED SHALL HAVE BEEN APPROVED BY THE ENGINEER.

C. SUBGRADE LEVEL TOLERANCE THE FINISHED COMPACTED SURFACE OF THE SUBGRADE SHALL CONFORM TO THE ALLOWABLE TOLERANCES AS SPECIFIED HEREUNDER:

PERMITTED VARIATION FROM DESIGN LEVEL OF SURFACE	20 MM
PERMITTED SURFACE IRREGULARITY MEASURED BY 3-M STRAIGHT EDGE	30 MM
PERMITTED VARIATION FROM DESIGN CROSSFALL OR CAMBER	0.5 %
PERMITTED VARIATION FROM DESIGN LONGITUDINAL GRADE OVER 25 M LENGTH	0. 1 %

D. **SUBGRADE IN COMMON EXCAVATION** UNLESS OTHERWISE SPECIFIED, ALL MATERIALS BELOW SUBGRADE LEVEL IN EARTH CUTS TO A DEPTH 150 MM OR OTHER DEPTH SHOWN ON THE PLANS OR AS DIRECTED BY THE ENGINEER SHALL BE EXCAVATED. THE MATERIAL, IF SUITABLE, SHALL BE SET SIDE FOR FUTURE USE OR, IF UNSUITABLE, SHALL BE DISPOSED OFF IN ACCORDANCE WITH THE REQUIREMENTS OF SUBSECTION 102.2.9. WHERE MATERIAL HAS BEEN REMOVED FROM BELOW SUBGRADE LEVEL, THE RESULTING SURFACE SHALL BE COMPACTED TO A DEPTH OF 150 MM AND IN ACCORDANCE WITH OTHER REQUIREMENTS OF SUBSECTION 104.3.3.

E. **SUBGRADE IN ROCK EXCAVATION** - SURFACE IRREGULARITIES UNDER THE SUBGRADE LEVEL REMAINING AFTER TRIMMING OF THE ROCK EXCAVATION SHALL BE LEVELED BY PLACING SPECIFIED MATERIAL AND COMPACTED TO THE REQUIREMENTS OF SUBSECTION 104.3.3.

F. ALL MATERIALS IMMEDIATELY BELOW SUBGRADE LEVEL IN EARTH CUTS TO A DEPTH OF 150 MM, OR TO SUCH GREATER DEPTH AS MAY BE SPECIFIED, SHALL BE COMPACTED IN ACCORDANCE WITH THE REQUIREMENTS OF SUBSECTION 104.3.3.

14. **AGGREGATE SUBBASE COURSE**

A. THIS ITEM SHALL CONSIST OF FURNISHING, PLACING AND COMPACTING AN AGGREGATE SUBBASE COURSE ON A PREPARED SUBGRADE IN ACCORDANCE WITH THIS SPECIFICATION AND THE LINES, GRADES AND CROSS-SECTIONS SHOWN ON THE PLANS, OR AS DIRECTED BY THE ENGINEER.

B. THE AGGREGATE SUBBASE MATERIAL SHALL BE PLACED AT A UNIFORM MIXTURE ON A PREPARED SUBGRADE IN A QUANTITY WHICH WILL PROVIDE THE REQUIRED COMPACTED THICKNESS. WHEN MORE THAN ONE LAYER IS REQUIRED, EACH LAYER SHALL BE SHAPED AND COMPACTED BEFORE THE SUCCEEDING LAYER IS PLACED. THE PLACING OF MATERIAL SHALL BEGIN AT THE POINT DESIGNATED BY THE ENGINEER. PLACING SHALL BE FROM VEHICLES ESPECIALLY EQUIPPED TO DISTRIBUTE THE MATERIAL IN A CONTINUOUS UNIFORM LAYER OR WINDROW, THE LAYER OR WINDROW SHALL BE OF SUCH SIZE THAT WHEN SPREAD AND COMPACTED THE FINISHED LAYER BE IN REASONABLY CLOSE CONFORMITY TO THE NOMINAL THICKNESS SHOWN ON THE PLANS. WHEN HAULING IS DONE OVER PREVIOUSLY PLACED MATERIAL, HAULING EQUIPMENT SHALL BE DISPERSED UNIFORMLY OVER THE ENTIRE SURFACE OF THE PREVIOUSLY CONSTRUCTED LAYER, TO MINIMIZE RUTTING OR UNEVEN COMPACTION.

C. **SPREADING AND COMPACTING** - WHEN UNIFORMLY MIXED, THE MIXTURE SHALL BE SPREAD TO THE PLAN THICKNESS, FOR COMPACTION. WHERE THE REQUIRED THICKNESS IS 150 MM OR LESS, THE MATERIAL MAY BE SPREAD AND COMPACTED IN ONE LAYER. WHERE THE REQUIRED THICKNESS IS MORE THAN 150 MM, THE AGGREGATE SUBBASE SHALL BE SPREAD AND COMPACTED IN TWO OR MORE LAYERS OF APPROXIMATELY EQUAL THICKNESS, AND THE MAXIMUM COMPACTED THICKNESS OF ANY LAYER SHALL NOT EXCEED 150 MM. ALL SUBSEQUENT LAYERS SHALL BE SPREAD AND COMPACTED IN A SIMILAR MANNER. THE MOISTURE CONTENT OF SUBBASE MATERIAL SHALL, IF NECESSARY, BE ADJUSTED PRIOR TO COMPACTION BY WATERING WITH APPROVED SPRINKLERS MOUNTED ON TRUCKS OR BY DRYING OUT, AS REQUIRED IN ORDER TO OBTAIN THE REQUIRED COMPACTION. IMMEDIATELY FOLLOWING FINAL SPREADING AND SMOOTHENING, EACH LAYER SHALL BE COMPACTED TO THE FULL WIDTH BY MEANS OF APPROVED COMPACTION EQUIPMENT.
ROLLING SHALL PROGRESS GRADUALLY FROM THE SIDES TO THE CENTER, PARALLEL TO THE CENTERLINE OF THE ROAD AND SHALL CONTINUE UNTIL THE WHOLE SURFACE HAS BEEN ROLLED. ANY IRREGULARITIES OR DEPRESSIONS THAT DEVELOP SHALL BE CORRECTED BY LOOSENING THE MATERIAL AT THESE PLACES AND ADDING OR REMOVING MATERIAL UNTIL SURFACE IS SMOOTH AND UNIFORM. ALONG CURBS, HEADERS, AND WALLS, AND AT ALL PLACES NOT ACCESSIBLE TO THE ROLLER, THE SUBBASE MATERIAL SHALL BE COMPACTED THOROUGHLY WITH APPROVED TAMPERS OR COMPACTORS. IF THE LAYER OF SUBBASE MATERIAL, OR PART THEREOF, DOES NOT CONFORM TO THE REQUIRED FINISH, THE CONTRACTOR SHALL, AT HIS OWN EXPENSE, MAKE THE NECESSARY CORRECTIONS.
COMPACTION OF EACH LAYER SHALL CONTINUE UNTIL A FIELD DENSITY OF AT LEAST 100 PERCENT OF THE MAXIMUM DRY DENSITY DETERMINED IN ACCORDANCE WITH AASHTO T 180, METHOD D HAS BEEN ACHIEVED. IN-PLACE DENSITY DETERMINATION SHALL BE MADE IN ACCORDANCE WITH AASHTO T 191.

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D. TRIAL BEFORE SUBBASE CONSTRUCTION IS STARTED, THE CONTRACTOR SHALL SPREAD AND COMPACT TRIAL SECTIONS AS DIRECTED BY THE ENGINEER. THE PURPOSE OF THE TRIAL SECTIONS IS TO CHECK THE SUITABILITY OF THE MATERIALS, THE EFFICIENCY OF THE EQUIPMENT AND THE CONSTRUCTION METHOD WHICH IS PROPOSED TO BE USED BY THE CONTRACTOR. THEREFORE, THE CONTRACTOR MUST USE THE SAME MATERIAL, EQUIPMENT AND PROCEDURES THAT HE PROPOSES TO USE FOR THE MAIN WORK. ONE TRIAL SECTION OF ABOUT 500 M2 SHALL BE MADE FOR EVERY TYPE OF MATERIAL AND/OR CONSTRUCTION EQUIPMENT/PROCEDURE PROPOSED FOR USE, AFTER FINAL COMPACTION OF EACH TRIAL SECTION, THE CONTRACTOR SHALL CARRY OUT SUCH FIELD DENSITY TESTS AND OTHER TESTS REQUIRED AS DIRECTED BY THE ENGINEER.
IF A TRIAL SECTION SHOWS THAT THE PROPOSED MATERIALS, EQUIPMENT OR PROCEDURES IN THE ENGINEER'S OPINION ARE NOT SUITABLE FOR SUBBASE, THE MATERIAL SHALL BE REMOVED AT THE CONTRACTOR'S EXPENSE, AND A NEW TRIAL SECTION SHALL BE CONSTRUCTED. IF THE BASIC CONDITIONS REGARDING THE TYPE OF MATERIAL OR PROCEDURE CHANGE DURING THE EXECUTION OF THE WORK, NEW TRIAL SECTIONS SHALL BE CONSTRUCTED.

15. GRAVEL SURFACE COURSE

A. THIS ITEM SHALL CONSIST OF A WEARING OR TOP COURSE COMPOSED OF GRAVEL OR CRUSHED AGGREGATE AND BINDER MATERIAL, WHICHEVER IS CALLED FOR IN THE BILL OF QUANTITIES, CONSTRUCTED ON A PREPARED BASE IN ACCORDANCE WITH THIS SPECIFICATION AND IN CONFORMITY WITH THE LINES, GRADES AND TYPICAL CROSS-SECTIONS SHOWN ON THE PLANS.

B. **PLACING** - AGGREGATE SURFACE COURSE SHALL BE PLACED IN ACCORDANCE WITH THE REQUIREMENTS OF ITEM 201, AGGREGATE BASE COURSE.

C. **COMPACTING REQUIREMENTS** - AGGREGATE SURFACE COURSE SHALL BE COMPACTED IN ACCORDANCE WITH THE REQUIREMENTS OF ITEM 201, AGGREGATE BASE COURSE.

D. **TRIAL SECTIONS** - TRIAL SECTIONS SHALL BE CARRIED OUT FOR AGGREGATE SURFACE COURSE IN ACCORDANCE WITH THE REQUIREMENTS OF ITEM 201, AGGREGATE BASE COURSE.

E. **SURFACE COURSE THICKNESS AND TOLERANCES** - THE AGGREGATE SURFACE COURSE SHALL BE LAID TO THE DESIGNED LEVEL AND TRANSVERSE SLOPES SHOWN ON THE PLANS. THE ALLOWABLE TOLERANCES SHALL BE AS SPECIFIED HEREUNDER:

PERMITTED VARIATION FROM DESIGN THICKNESS OF LAYER	+15 MM - 5MM
PERMITTED VARIATION FROM DESIGN LEVEL OF SURFACE	+15 MM - 5MM
PERMITTED SURFACE IRREGULARITY MEASURED BY 3-M STRAIGHT-EDGE	5 MM
PERMITTED VARIATION FROM DESIGN CROSSFALL OR CAMBER	+0.2%
PERMITTED VARIATION FROM DESIGN LONGITUDINAL GRADE OVER 25 M IN LENGTH	+0.1%

16. PORTLAND CEMENT CONCRETE PAVEMENT

A. **QUALITY CONTROL OF CONCRETE** — THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE QUALITY CONTROL OF ALL MATERIALS DURING THE HANDLING, BLENDING, AND MIXING AND PLACEMENT OPERATIONS.

B. **EQUIPMENT** - EQUIPMENT AND TOOLS NECESSARY FOR HANDLING MATERIALS AND PERFORMING ALL PARTS OF THE WORK SHALL BE APPROVED BY THE ENGINEER AS TO DESIGN, CAPACITY AND MECHANICAL CONDITION. THE EQUIPMENT SHALL BE AT THE JOBSITE SUFFICIENTLY AHEAD OF THE START OF CONSTRUCTION OPERATIONS TO BE EXAMINED THOROUGHLY AND APPROVED.

C. **PREPARATION OF GRADE** - AFTER THE SUBGRADE OR BASE HAS BEEN PLACED AND COMPACTED TO THE REQUIRED DENSITY, THE AREAS WHICH WILL SUPPORT THE PAVING MACHINE AND THE GRADE ON WHICH THE PAVEMENT IS TO BE CONSTRUCTED SHALL BE TRIMMED TO THE PROPER ELEVATION BY MEANS OF A PROPERLY DESIGNED MACHINE EXTENDING THE PREPARED WORK AREAS COMPACTED AT LEAST 60 CM BEYOND EACH EDGE OF THE PROPOSED CONCRETE PAVEMENT. IF LOSS OF DENSITY RESULTS FROM THE TRIMMING OPERATIONS, IT SHALL BE RESTORED BY ADDITIONAL COMPACTION BEFORE CONCRETE IS PLACED. IF ANY TRAFFIC IS ALLOWED TO USE THE PREPARED SUBGRADE OR BASE, THE SURFACE SHALL BE CHECKED AND CORRECTED IMMEDIATELY AHEAD OF THE PLACING CONCRETE. THE SUBGRADE OR BASE SHALL BE UNIFORMLY MOIST WHEN THE CONCRETE IS PLACED.

D. **SETTING FORMS** - WHEN ANY FORM HAS BEEN DISTURBED OR ANY GRADE HAS BECOME UNSTABLE, THE FORM SHALL BE RESET AND RECHECKED.

E. **CONDITIONING OF SUBGRADE OR BASE COURSE** - WHEN SIDE FORMS HAVE BEEN SECURELY SET TO GRADE, THE SUBGRADE OR BASE COURSE SHALL BE BROUGHT TO PROPER CROSS-SECTION. HIGH AREAS SHALL BE TRIMMED TO PROPER ELEVATION. LOW AREAS SHALL BE FILLED AND COMPACTED TO A CONDITION SIMILAR TO THAT OF SURROUNDING GRADE. THE FINISHED GRADE SHALL BE MAINTAINED IN A SMOOTH AND COMPACTED CONDITION UNTIL THE PAVEMENT IS PLACED, UNLESS WATERPROOF SUBGRADE OR BASE COURSE COVER MATERIAL IS SPECIFIED, THE SUBGRADE OR BASE COURSE SHALL BE UNIFORMLY MOIST WHEN THE CONCRETE IS PLACED. IF IT SUBSEQUENTLY BECOMES TOO DRY, THE SUBGRADE OR BASE COURSE SHALL BE SPRINKLED, BUT THE METHOD OF SPRINKLING SHALL NOT BE SUCH AS TO FORM MUD OR POOLS OF WATER.

F. **HANDLING, MEASURING AND BATCHING MATERIALS** - THE BATCH PLAN SITE, LAYOUT, EQUIPMENT AND PROVISIONS FOR TRANSPORTING MATERIAL SHALL BE SUCH AS TO ASSURE A CONTINUOUS SUPPLY OF MATERIAL TO THE WORK. STOCKPILES SHALL BE BUILT UP IN LAYERS OF NOT MORE THAN ONE (1) METER IN THICKNESS. EACH LAYER SHALL BE COMPLETELY IN PLACE BEFORE BEGINNING THE NEXT WHICH SHALL NOT BE ALLOWED TO "CONE" DOWN OVER THE NEXT LOWER LAYER. AGGREGATES FROM DIFFERENT SOURCES AND OF DIFFERENT GRADING SHALL NOT BE STOCKPILED TOGETHER. ALL WASHED AGGREGATES AND AGGREGATES PRODUCED OR HANDLED BY HYDRAULIC METHODS, SHALL BE STOCKPILED OR BINNED FOR DRAINING AT LEAST TWELVE (12) HOURS BEFORE BEING BATCHED.

G. **MIXING CONCRETE** - THE CONCRETE MAY BE MIXED AT THE SITE OF THE WORK IN A CENTRAL-MIX PLANT, OR IN TRUCK MIXERS. THE MIXER SHALL BE OF AN APPROVED TYPE AND CAPACITY, MIXING TIME WILL BE MEASURED FROM THE TIME ALL MATERIALS, EXCEPT WATER, ARE IN THE DRUM. READY-MIXED CONCRETE SHALL BE MIXED AND DELIVERED IN ACCORDANCE WITH REQUIREMENTS OF AASHTO M 157, EXCEPT THAT THE MINIMUM REQUIRED REVOLUTIONS AT THE MIXING SPEED FOR TRANSIT-MIXED CONCRETE MAY BE REDUCED TO NOT LESS THAN THAT RECOMMENDED BY THE MIXER MANUFACTURER. THE NUMBER OF REVOLUTIONS RECOMMENDED BY THE MIXER MANUFACTURER SHALL BE INDICATED ON THE MANUFACTURER'S SERIAL PLATE ATTACHED TO THE MIXER. THE CONTRACTOR SHALL FURNISH TEST DATA ACCEPTABLE TO THE ENGINEER VERIFYING THAT THE MAKE AND MODEL OF THE MIXER WILL PRODUCE UNIFORM CONCRETE CONFORMING TO THE PROVISION OF AASHTO M 157 AT THE REDUCED NUMBER OF REVOLUTIONS SHOWN ON THE SERIAL PLATE.

H. **LIMITATION OF MIXING** - NO CONCRETE SHALL BE MIXED, PLACED OR FINISHED WHEN NATURAL LIGHT IS INSUFFICIENT, UNLESS AN ADEQUATE AND APPROVED ARTIFICIAL LIGHTING SYSTEM IS OPERATED. DURING HOT WEATHER, THE ENGINEER SHALL REQUIRE THAT STEPS BE TAKEN TO PREVENT THE TEMPERATURE OF MIXED CONCRETE FROM EXCEEDING A MAXIMUM TEMPERATURE OF 32°C. CONCRETE NOT IN PLACE WITHIN NINETY (90) MINUTES FROM THE TIME THE INGREDIENTS WERE CHARGED INTO THE MIXING DRUM OR THAT HAS DEVELOPED INITIAL SET SHALL NOT BE USED. RETEMPERING OF CONCRETE OR MORTAR WHICH HAS PARTIALLY HARDENED, THAT IS REMIXING WITH OR WITHOUT ADDITIONAL CEMENT, AGGREGATE, OR WATER, SHALL NOT BE PERMITTED. IN ORDER THAT THE CONCRETE MAY BE PROPERLY PROTECTED AGAINST THE EFFECTS OF RAIN BEFORE THE CONCRETE IS SUFFICIENTLY HARDENED, THE CONTRACTOR WILL BE REQUIRED TO HAVE AVAILABLE AT ALL TIMES MATERIALS FOR THE PROTECTION OF THE EDGES AND SURFACE OF THE UNHARDENED CONCRETE.

I. **PLACING CONCRETE** - CONCRETE SHALL BE DEPOSITED IN SUCH A MANNER TO REQUIRE MINIMAL REHANDLING UNLESS TRUCK MIXERS OR NON-AGITATING HAULING EQUIPMENT ARE EQUIPPED WITH MEANS TO DISCHARGE CONCRETE WITHOUT SEGREGATION OF THE MATERIALS, THE CONCRETE SHALL BE UNLOADED INTO AN APPROVED SPREADING DEVICE AND MECHANICALLY SPREAD ON THE GRADE IN SUCH A MANNER AS TO PREVENT SEGREGATION. PLACING SHALL BE CONTINUOUS BETWEEN TRANSVERSE JOINTS WITHOUT THE USE OF INTERMEDIATE BULKHEADS. NECESSARY HAND SPREADING SHALL BE DONE WITH SHOVELS, NOT RAKES. WORKMEN SHALL NOT BE ALLOWED TO WALK IN THE FRESHLY MIXED CONCRETE WITH BOOTS OR SHOES COATED WITH EARTH OR FOREIGN SUBSTANCES.

J. **TEST SPECIMENS** - AS WORK PROGRESSES, AT LEAST ONE (1) SET CONSISTING OF THREE (3) CONCRETE BEAM TEST SPECIMENS, 150 MM X 150 MM X 525 MM SHALL BE TAKEN FROM EACH 330 M2 OF PAVEMENT, 230 MM DEPTH, OR FRACTION THEREOF PLACED EACH DAY. TEST SPECIMENS SHALL BE MADE UNDER THE SUPERVISION OF THE ENGINEER, AND THE CONTRACTOR SHALL PROVIDE ALL CONCRETE AND OTHER FACILITIES NECESSARY IN MAKING THE TEST SPECIMENS AND SHALL PROTECT THEM FROM DAMAGE BY CONSTRUCTION OPERATIONS. CYLINDER SAMPLES SHALL NOT BE USED AS SUBSTITUTE FOR DETERMINING THE ADEQUACY OF THE STRENGTH OF CONCRETE. THE BEAMS SHALL BE MADE, CURED, AND TESTED IN ACCORDANCE WITH AASHTO T 23 AND T 97.

K. **JOINTS** - JOINTS SHALL BE CONSTRUCTED OF THE TYPE AND DIMENSIONS, AND AT THE LOCATIONS REQUIRED BY THE PLANS OR SPECIAL PROVISIONS. ALL JOINTS SHALL BE PROTECTED FROM THE INTRUSION OF INJURIOUS FOREIGN MATERIAL UNTIL SEALED.

L. **SURFACE TEST** - AS SOON AS THE CONCRETE HAS HARDENED SUFFICIENTLY, THE PAVEMENT SURFACE SHALL BE TESTED WITH A 3-M STRAIGHT-EDGE OR OTHER SPECIFIED DEVICE. AREAS SHOWING HIGH SPOTS OF MORE THAN 3 MM BUT NOT EXCEEDING 12 MM IN 3 M SHALL BE MARKED AND IMMEDIATELY GROUND DOWN WITH AN APPROVED GRINDING TOOL TO AN ELEVATION WHERE THE AREA OR SPOT WILL NOT SHOW SURFACE DEVIATIONS IN EXCESS OF 3 MM WHEN TESTED WITH 3 M STRAIGHT-EDGE. WHERE THE DEPARTURE FROM CORRECT CROSS-SECTION EXCEEDS 12 MM, THE PAVEMENT SHALL BE REMOVED AND REPLACED BY AND AT THE EXPENSE OF THE CONTRACTOR, ANY AREA OR SECTION SO REMOVED SHALL BE NOT LESS THAN 1.5 M IN LENGTH AND NOT LESS THAN THE FULL WIDTH OF THE LANE INVOLVED. WHEN IT IS NECESSARY TO REMOVE AND REPLACE A SECTION OF PAVEMENT, ANY REMAINING PORTION OF THE SLAB ADJACENT TO THE JOINTS THAT IS LESS THAN 1.5 M IN LENGTH, SHALL ALSO BE REMOVED AND REPLACED.

M. **CURING** - IMMEDIATELY AFTER THE FINISHING OPERATIONS HAVE BEEN COMPLETED AND THE CONCRETE HAS SUFFICIENTLY SET, THE ENTIRE SURFACE OF THE NEWLY PLACED CONCRETE SHALL BE CURED IN ACCORDANCE WITH EITHER ONE OF THE METHODS DESCRIBED HEREIN. FAILURE TO PROVIDE SUFFICIENT COVER MATERIAL OF WHATEVER KIND THE CONTRACTOR MAY ELECT TO USE, OR THE LACK OF WATER TO ADEQUATELY TAKE CARE OF BOTH CURING AND OTHER REQUIREMENTS, SHALL BE A CAUSE FOR IMMEDIATE SUSPENSION OF CONCRETING OPERATIONS. THE CONCRETE SHALL NOT BE LEFT EXPOSED FOR MORE THAN 1/2 HOUR BETWEEN STAGES OF CURING OR DURING THE CURING PERIOD. IN ALL CONGESTED PLACES, CONCRETE WORKS SHOULD BE DESIGNED SO THAT THE DESIGNED STRENGTH IS ATTAINED.

N. **REMOVAL OF FORMS** - FORMS FOR CONCRETE SHALL REMAIN IN PLACE UNDISTURBED FOR NOT LESS IN THE REMOVAL OF THAN TWENTY FOUR (24) HOURS AFTER CONCRETE POURING. FORMS, CROWBARS SHOULD BE USED IN PULLING OUT NAILS AND PINS. CARE SHOULD BE TAKEN SO AS NOT TO BREAK THE EDGES OF THE PAVEMENT. PORTIONS OF THE CONCRETE ARE SPALLED, THEY SHALL BE IMMEDIATELY REPAIRED WITH FRESH MORTAR MIXED IN THE PROPORTION OF ONE PART OF PORTLAND CEMENT AND TWO PARTS FINE AGGREGATES. MAJOR HONEYCOMB AREAS WILL BE CONSIDERED AS DEFECTIVE WORK, AND SHALL BE REMOVED AND REPLACED AT THE EXPENSE OF THE CONTRACTOR. ANY AREA OR SECTION SO REMOVED SHALL NOT BE LESS THAN THE DISTANCE BETWEEN WEAKENED PLANE JOINT NOR LESS THAN THE FULL WIDTH OF THE LANE INVOLVED.

O. **SEALING JOINTS** - JOINTS SHALL BE SEALED WITH ASPHALT SEALANT SOON AFTER COMPLETION OF THE CURING PERIOD AND BEFORE THE PAVEMENT IS OPENED TO TRAFFIC, INCLUDING THE CONTRACTOR'S EQUIPMENT. JUST PRIOR TO SEALING, EACH JOINT SHALL BE THOROUGHLY CLEANED OF ALL FOREIGN MATERIALS INCLUDING MEMBRANE CURING COMPOUND AND THE JOINT FACES SHALL BE CLEAN AND SURFACE DRY WHEN THE SEAL IS APPLIED.

P. **PROTECTION OF PAVEMENT** - THE CONTRACTOR SHALL PROTECT THE PAVEMENT AND ITS APPURTENANCES AGAINST BOTH PUBLIC TRAFFIC, AND TRAFFIC CAUSED BY HIS OWN EMPLOYEES AND AGENTS. THIS SHALL INCLUDE WATCHMEN TO DIRECT TRAFFIC, AND THE ERECTION OF AND MAINTENANCE OF WARNING SIGNS, LIGHTS, PAVEMENT BRIDGES OR CROSS-OVERS, ETC. THE PLANS OR SPECIAL PROVISIONS WILL INDICATE THE LOCATION AND IN CASE TYPE OF DEVICE OR FACILITY REQUIRED TO PROTECT THE WORK AND PROVIDE ADEQUATELY FOR TRAFFIC. ALL BOREHOLES AFTER THICKNESS AND/OR STRENGTH DETERMINATIONS OF NEWLY CONSTRUCTED ASPHALT AND CONCRETE PAVEMENTS SHALL BE IMMEDIATELY FILLED/RESTORED WITH THE PRESCRIBED CONCRETE/ASPHALT MIX AFTER COMPLETION OF THE DRILLING WORKS. ANY DAMAGE TO THE PAVEMENT, OCCURRING PRIOR TO FINAL ACCEPTANCE, SHALL BE REPAIRED OR THE PAVEMENT BE REPLACED.

Q. **ACCEPTANCE OF CONCRETE** - THE STRENGTH LEVEL OF THE CONCRETE WILL BE CONSIDERED SATISFACTORY IF THE AVERAGES OF ALL SETS OF THREE (3) CONSECUTIVE STRENGTH TEST RESULTS EQUAL OR EXCEED THE SPECIFIED STRENGTH, FC' AND NO INDIVIDUAL STRENGTH TEST RESULT IS DEFICIENT BY MORE THAN 15% OF THE SPECIFIED STRENGTH, FC'. A SET SHALL CONSIST OF A MINIMUM OF THREE (3) CONCRETE BEAM SPECIMENS.

DEFICIENCY IN STRENGTH OF CONCRETE SPECIMENS, PRICE ALLOWED PERCENT (%)	PERCENT (%) OF CONTRACT PRICE PER LOT
LESS THAN 5	100
5 TO LESS THAN 10	80
10 TO LESS THAN 15	70
15 TO LESS THAN 20	60
20 TO LESS THAN 25	50
25 OR MORE	0

R. **OPENING TO TRAFFIC** - THE ENGINEER WILL DECIDE WHEN THE PAVEMENT MAY BE OPENED TO TRAFFIC. THE ROAD WILL NOT BE OPENED TO TRAFFIC UNTIL TEST SPECIMENS MOLDED AND CURED IN ACCORDANCE WITH AASHTO T 23 HAVE ATTAINED THE MINIMUM STRENGTH REQUIREMENTS IN SUBSECTION 311.2.12. IF SUCH TESTS ARE NOT CONDUCTED PRIOR TO THE SPECIFIED AGE, THE PAVEMENT SHALL NOT BE OPERATED TO TRAFFIC UNTIL 14 DAYS AFTER THE CONCRETE WAS PLACED. BEFORE OPENING TO TRAFFIC, THE PAVEMENT SHALL BE CLEANED AND JOINT SEALING COMPLETED.

S. **TOLERANCE IN PAVEMENT THICKNESS** - THE THICKNESS OF THE PAVEMENT WILL BE DETERMINED BY MEASUREMENT OF CORES FROM THE COMPLETED PAVEMENT IN ACCORDANCE WITH AASHTO T148. THE COMPLETED PAVEMENT SHALL BE ACCEPTED ON A LOT BASIS. A LOT SHALL BE CONSIDERED AS 1000 LINEAR METERS OF PAVEMENT WHEN A SINGLE TRAFFIC LANE IS POURED OR 500 LINEAR METERS WHEN TWO LANES ARE POURED CONCURRENTLY. THE LAST UNIT IN EACH SLAB CONSTITUTES A LOT IN ITSELF WHEN ITS LENGTH IS AT LEAST 1/2 OF THE NORMAL LOT LENGTH. IF THE LENGTH OF THE LAST UNIT IS SHORTER THAN 1/2 OF THE NORMAL LOT LENGTH, IT SHALL BE INCLUDED IN THE PREVIOUS LOT. OTHER AREAS SUCH AS INTERSECTIONS, ENTRANCES, CROSSOVERS, RAMP, ETC., WILL BE GROUPED TOGETHER TO FORM A LOT. SMALL IRREGULAR AREAS MAY BE INCLUDED WITH OTHER UNIT AREAS TO FORM A LOT. EACH LOT WILL BE DIVIDED INTO 5 EQUAL SEGMENTS AND ONE CORE WILL BE OBTAINED FROM EACH SEGMENT IN ACCORDANCE WITH AASHTO T 24.

17. REINFORCING STEEL

A. ORDER LISTS - BEFORE MATERIALS ARE ORDERED, ALL ORDER LISTS AND BENDING DIAGRAMS SHALL BE FURNISHED BY THE CONTRACTOR, FOR APPROVAL OF THE ENGINEER. THE APPROVAL OF ORDER LISTS AND BENDING DIAGRAMS BY THE ENGINEER SHALL IN NO WAY RELIEVE THE CONTRACTOR OF RESPONSIBILITY FOR THE CORRECTNESS OF SUCH LISTS AND DIAGRAMS. ANY EXPENSE INCIDENT TO THE REVISIONS OF MATERIALS FURNISHED IN ACCORDANCE WITH SUCH LISTS AND DIAGRAMS TO MAKE THEM COMPLY WITH THE PLANS SHALL BE BORNE BY THE CONTRACTOR.

B. PROTECTION OF MATERIAL - STEEL REINFORCEMENT SHALL BE STORED ABOVE THE SURFACE OF THE GROUND UPON PLATFORMS, SKIDS, OR OTHER SUPPORTS AND SHALL BE PROTECTED AS FAR AS PRACTICABLE FROM MECHANICAL INJURY AND SURFACE DETERIORATION CAUSED BY EXPOSURE TO CONDITIONS PRODUCING RUST. WHEN PLACED IN THE WORK, REINFORCEMENT SHALL BE FREE FROM DIRT, DETRIMENTAL RUST, LOOSE SCALE, PAINT, GREASE, OIL, OR OTHER FOREIGN MATERIALS. REINFORCEMENT SHALL BE FREE FROM INJURIOUS DEFECTS SUCH AS CRACKS AND LAMINATIONS. RUST, SURFACE SEAMS, SURFACE IRREGULARITIES OR MILL SCALE WILL NOT BE CAUSE FOR REJECTION, PROVIDED THE MINIMUM DIMENSIONS, CROSS SECTIONAL AREA & TENSILE PROPERTIES OF A HAND WIRE BRUSHED SPECIMEN MEETS THE PHYSICAL REQUIREMENTS FOR THE SIZE AND GRADE OF STEEL SPECIFIED.

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

PROJECT NAME AND LOCATION: SIPAG - COASTAL ROADS TO AUGMENT RESILIENCY OF COASTAL COMMUNITIES - CONSTRUCTION OF COASTAL ROAD, PHASE 3, LEYTE - LEYTE TO CAPOOCAN, LEYTE
LEYTE 3RD LD

SHEET CONTENTS: CONSTRUCTION REQUIREMENTS

PREPARED: JOEL PAUL C. AVERQUE, ENGINEER II

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

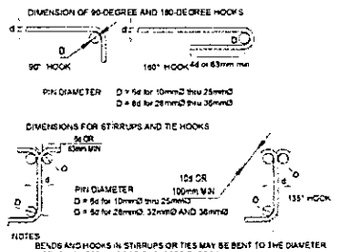
SUBMITTED: AGNES M. BARONDA, CHIEF PLANNING AND DESIGN DIVISION, DATE

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

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

SET NO: A (30)
SHEET NO: B (104)

C. **BENDING** - ALL REINFORCING BARS REQUIRING BENDING SHALL BE COLD-BENT TO THE SHAPES SHOWN ON THE PLANS OR AS REQUIRED BY THE ENGINEER. BARS SHALL BE BENT AROUND A CIRCULAR PIN HAVING THE FOLLOWING DIAMETERS (D) IN RELATION TO THE NOMINAL DIAMETER OF THE BAR (D):



D. **PLACING AND FASTENING** - ALL STEEL REINFORCEMENT SHALL BE ACCURATELY PLACED IN THE POSITION SHOWN ON THE PLANS OR AS REQUIRED BY THE ENGINEER AND FIRMLY HELD THERE DURING THE PLACING AND SETTING OF THE CONCRETE. BARS SHALL BE TIED AT ALL INTERSECTIONS EXCEPT WHERE SPACING IS LESS THAN 300 MM IN EACH DIRECTIONS, IN WHICH CASE, ALTERNATE INTERSECTIONS SHALL BE TIED. TIES SHALL BE FASTENED ON THE INSIDE. DISTANCE FROM THE FORMS SHALL BE MAINTAINED BY MEANS OF STAYS, BLOCKS, TIES, HANGERS, OR OTHER APPROVED SUPPORTS, SO THAT IT DOES NOT VARY FROM THE POSITION INDICATED ON THE PLANS BY MORE THAN 6MM. BLOCKS FOR HOLDING REINFORCEMENT FROM CONTACT WITH THE FORMS SHALL BE PRECAST MORTAR BLOCKS OF APPROVED SHAPES AND DIMENSIONS. LAYERS OF BARS SHALL BE SEPARATED BY PRECAST MORTAR BLOCKS OR BY OTHER EQUALLY SUITABLE DEVICES. THE USE OF PEBBLES, PIECES OF BROKEN STONE OR BRICK, METAL PIPE AND WOODEN BLOCKS SHALL NOT BE PERMITTED. UNLESS OTHERWISE SHOWN ON THE PLANS OR AS REQUIRED BY THE ENGINEER, THE MINIMUM DISTANCE BETWEEN BARS SHALL BE 40 MM. REINFORCEMENT IN ANY MEMBER SHALL BE PLACED AND THEN INSPECTED AND APPROVED BY THE ENGINEER BEFORE THE PLACING OF CONCRETE BEGINS. CONCRETE PLACED IN VIOLATION OF THIS PROVISION MAY BE REJECTED AND REMOVAL MAY BE REQUIRED. IF FABRIC REINFORCEMENT IS SHIPPED IN ROLLS, IT SHALL BE STRAIGHTENED BEFORE BEING PLACED. BUNDLED BARS SHALL BE TIED TOGETHER AT NOT MORE THAN 1.8 M INTERVALS.

E. **SPLICING** - ALL REINFORCEMENT SHALL BE FURNISHED IN THE FULL LENGTHS INDICATED ON THE PLANS SPLICING OF BARS, EXCEPT WHERE SHOWN ON THE PLANS, WILL NOT BE PERMITTED WITHOUT THE WRITTEN APPROVAL OF THE ENGINEER. SPLICES SHALL BE STAGGERED AS FAR AS POSSIBLE AND WITH A MINIMUM SEPARATION OF NOT LESS THAN 40 BAR DIAMETERS. NOT MORE THAN ONE-THIRD OF THE BARS MAY BE SPLICED IN THE SAME CROSS-SECTION, EXCEPT WHERE SHOWN ON THE PLANS. UNLESS OTHERWISE SHOWN ON THE PLANS, BARS SHALL BE LAPPED A MINIMUM DISTANCE OF:

SPLICE TYPE	GRADE 280	GRADE 420	BUT NOT LESS THAN
TENSION	24 BAR DIA	36 BAR DIA	300 MM
COMPRESSION	20 BAR DIA	24 BAR DIA	300 MM

IN LAPPED SPLICES, THE BARS SHALL BE PLACED IN CONTACT AND WIRED TOGETHER. LAPPED SPLICES WILL NOT BE PERMITTED AT LOCATIONS WHERE THE CONCRETE SECTION IS INSUFFICIENT TO PROVIDE MINIMUM CLEAR DISTANCE OF ONE AND ONE-THIRD THE MAXIMUM SIZE OF COARSE AGGREGATE BETWEEN THE SPLICE AND THE NEAREST ADJACENT BA R. WELDING OF REINFORCING STEEL SHALL BE DONE ONLY IF DETAILED ON THE P LANS OR IF AUTHORIZED BY THE ENGINEER IN WRITING. SPIRAL REINFORCEMENT SHALL BE SPLICED BY LAPPING AT LEAST ONE AND A HALF TURNS OR BY BUTT WELDING UNLESS OTHERWISE SHOWN ON THE PLANS.

16. STRUCTURAL CONCRETE

A. **PROPORTIONING AND STRENGTH OF STRUCTURAL CONCRETE** - THE CONCRETE MATERIALS SHALL BE PROPORTIONED IN ACCORDANCE WITH THE REQUIREMENTS FOR EACH CLASS OF CONCRETE AS SPECIFIED IN TABLE 405.2, USING THE ABSOLUTE VOLUME METHOD AS OUTLINED IN THE AMERICAN CONCRETE (ACI) STANDARD 211.1, "RECOMMENDED PRACTICE FOR SELECTING PROPORTIONS FOR NORMAL AND HEAVYWEIGHT CONCRETE". OTHER METHODS OF PROPORTIONING MAY BE EMPLOYED IN THE MIX DESIGN WITH PRIOR APPROVAL OF THE ENGINEER. THE MIX SHALL EITHER BE DESIGNED OR APPROVED BY THE ENGINEER.

A CHANGE IN THE SOURCE OF MATERIALS DURING THE PROGRESS OF WORK MAY NECESSITATE A NEW MIX DESIGN.
THE STRENGTH REQUIREMENTS FOR EACH CLASS OF CONCRETE SHALL BE AS SPECIFIED IN TABLE 405.2.

TABLE 405.2 - COMPOSITION AND STRENGTH OF CONCRETE FOR USE IN STRUCTURES

CLASS OF CONCRETE	MINIMUM CEMENT CONTENT PER M3 40KG/ (BAG*)	MAXIMUM WATER/ CEMENT RATIO KG/KG	CONSISTENCY RANGE SLUMP MM	DESIGNATED IN SIZE OF COARSE AGGREGATE SQUARE OPENING STD. MM	MINIMUM COMPRESSIVE STRENGTH OF 150X300 MM CONCRETE CYLINDER SPECIMEN AT 28DAYS, MN/m²
A	364 (9.1 BAGS)	0.53	50 - 100	37.5 - 4.75 (1-1/2" - NO. 4)	20.7
B	320 (8 BAGS)	0.58	50 - 100	50 - 4.75 (2" - NO. 4)	16.5
C	380 (9.5 BAGS)	0.55	50 - 100	12.5 - 4.75 (1/2" - NO. 4)	20.7
P	440 (11 BAGS)	0.49	100 MAX.	19.0 - 4.75 (3/4" - NO. 4)	37.7
SEAL	390 (9.5 BAGS)	0.58	100 - 200	25 - 4.75 (1" - NO. 4)	20.7

* THE MEASURED CEMENT CONTENT SHALL BE WITHIN PLUS OR MINUS 2 MASS PERCENT OF THE DESIGN CEMENT CONTENT.
** BASED ON 40 KG/BAG

B. **CONSISTENCY** - CONCRETE SHALL HAVE A CONSISTENCY SUCH THAT IT WILL BE WORKABLE IN THE REQUIRED POSITION. IT SHALL BE OF SUCH A CONSISTENCY THAT IT WILL FLOW AROUND REINFORCING STEEL BUT INDIVIDUAL PARTICLES OF THE COARSE AGGREGATE WHEN ISOLATED SHALL SHOW A COATING OF MORTAR CONTAINING IT PROPORTIONATE AMOUNT OF SAND. THE CONSISTENCY OF CONCRETE SHALL BE GAUGED BY THE ABILITY OF THE EQUIPMENT TO PROPERLY PLACE IT AND NOT BY THE DIFFICULTY IN MIXING AND TRANSPORTING. THE QUANTITY OF MIXING WATER SHALL BE DETERMINED BY THE ENGINEER AND SHALL NOT BE VARIED WITHOUT HIS CONSENT. CONCRETE AS DRY AS IT IS PRACTICAL TO PLACE WITH THE EQUIPMENT SPECIFIED SHALL BE USED.

C. **BATCHING** - MEASURING AND BATCHING OF MATERIALS SHALL BE DONE AT A BATCHING PLANT.

D. **MIXING AND DELIVERY** - CONCRETE MAY BE MIXED AT THE SITE OF CONSTRUCTION, AT A CENTRAL POINT OR BY A COMBINATION OF CENTRAL POINT AND TRUCK MIXING OR BY A COMBINATION OF CENTRAL POINT MIXING AND TRUCK AGITATING. MIXING AND DELIVERY OF CONCRETE SHALL BE IN ACCORDANCE WITH THE APPROPRIATE REQUIREMENTS OF AASHTO M 157 EXCEPT AS MODIFIED IN THE FOLLOWING PARAGRAPHS OF THIS SECTION, FOR TRUCK MIXING OR A COMBINATION OF CENTRAL POINT AND TRUCK MIXING OR TRUCK AGITATING. DELIVERY OF CONCRETE SHALL BE REGULATED SO THAT PLACING IS AT A CONTINUOUS RATE UNLESS DELAYED BY THE PLACING OPERATIONS. THE INTERVALS BETWEEN DELIVERY OF BATCHES SHALL NOT BE SO GREAT AS TO ALLOW THE CONCRETE INPLACE TO HARDEN PARTIALLY, AND IN NO CASE SHALL SUCH AN INTERVAL EXCEED 30 MINUTES.

19. DRAINAGE STRUCTURES

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.

C. 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.

20. PIPE CULVERTS AND STORM DRAINS

A. TRENCHES EXCAVATION - TRENCHES SHALL BE EXCAVATED IN ACCORDANCE WITH THE REQUIREMENT OF ITEM 103, STRUCTURE EXCAVATION, TO A WIDTH SUFFICIENT TO ALLOW FOR PROPER JOINTING OF THE CONDUIT AND THOROUGH COMPACTION OF THE BEDDING AND BACKFILL MATERIALS UNDER AND AROUND THE CONDUIT. WHERE FEASIBLE, TRENCH WALL SHALL BE VERTICAL.
THE COMPLETED TRENCH BOTTOM SHALL BE FIRM FOR ITS FULL LENGTH AND WIDTH. WHERE REQUIRED, IN THE CASE OF CROP DRAINS, THE TRENCH SHALL HAVE A LONGITUDINAL CAMBER OF THE MAGNITUDE SPECIFIED.
WHEN SO SPECIFIED ON THE PLANS, THE EXCAVATION FOR CONDUITS PLACED IN EMBANKMENT FILL, SHALL BE MADE AFTER THE EMBANKMENT HAS BEEN COMPLETED TO THE SPECIFIED OR DIRECTED HEIGHT ABOVE THE DESIGNED GRADE OF THE CONDUIT.

B. BEDDING - THE BEDDING SHALL CONFORM TO ONE OF THE CLASSES SPECIFIED. WHEN NO BEDDING CLASS IS SPECIFIED, THE REQUIREMENTS FOR CLASS C BEDDING SHALL APPLY.
CLASS A BEDDING SHALL CONSIST OF A CONTINUOUS CONCRETE CRADLE CONFORMING TO THE PLAN DETAILS.
CLASS B BEDDING SHALL CONSIST OF BEDDING THE CONDUIT TO A DEPTH OF NOT LESS THAN 30 PERCENT OF THE VERTICAL OUTSIDE DIAMETER OF THE CONDUIT. THE MINIMUM THICKNESS OF BEDDING MATERIAL BENEATH THE PIPE SHALL BE 100 MM. THE BEDDING MATERIAL SHALL BE SAND OR SELECTED SANDY SOIL ALL OF WHICH PASSES A 9.5 MM SIEVE AND NOT MORE THAN 10 PERCENT OF WHICH PASSES A 0.075 MM SIEVE. THE LAYER OF THE BEDDING MATERIAL SHALL BE SHAPED TO FIT THE CONDUIT FOR AT LEAST 15 PERCENT OF ITS TOTAL HEIGHT. RECESSES IN THE TRENCH BOTTOM SHALL BE SHAPED TO ACCOMMODATE THE BELL WHEN BELL AND SPIGOT CONDUIT IS USED.

CLASS C BEDDING SHALL CONSIST OF BEDDING THE CONDUIT TO A DEPTH OF NOT LESS THAN 10 PERCENT OF ITS TOTAL HEIGHT. THE FOUNDATION SURFACE, COMPLETED IN ACCORDANCE WITH ITEM 103, STRUCTURE EXCAVATION, SHALL BE SHAPED TO FIT THE CONDUIT AND SHALL HAVE RECESSES SHAPED TO RECEIVE THE BELLS, IF ANY.

C B. LAYING CONDUIT - THE CONDUIT LAYING SHALL BEGIN AT THE DOWNSTREAM END OF THE CONDUIT LINE. THE LOWER SEGMENT OF THE CONDUIT SHALL BE IN CONTACT WITH THE SHAPED BEDDING THROUGHOUT ITS FULL LENGTH. BELL OR GROOVE ENDS OF RIGID CONDUITS AND OUTSIDE CIRCUMFERENTIAL LAPS OF FLEXIBLE CONDUITS SHALL BE PLACED FACING UPSTREAM. FLEXIBLE CONDUIT SHALL BE PLACED WITH LONGITUDINAL LAPS OR SEAMS AT THE SIDES.

21. ITEM 506(1)

A. **THE STONE** SHALL BE CLEAN, HARD, AND DURABLE AND SHALL BE SUBJECT TO THE ENGINEER'S APPROVAL. ADOBE STONE SHALL NOT BE USED UNLESS OTHERWISE SPECIFIED.

B. STONES SHALL HAVE A THICKNESS OF NOT LESS THAN 150 MM, AND WIDTHS OF NOT LESS THAN ONE AND ONE-HALF TIMES THEIR RESPECTIVE THICKNESS, AND LENGTHS OF NOT LESS THAN ONE AND ONE HALF TIMES THEIR RESPECTIVE WIDTHS. FACE STONES SHALL BE DRESSED TO PROVIDE BED AND JOINT LINES THAT DO NOT VARY MORE THAN 20 MM FROM THE TRUE LINES AND TO ENSURE THE MEETING OF BED AND JOINT LINES WITHOUT THE ROUNDING OF CORNERS OF THE STONES IN EXCESS OF 30 MM IN RADIUS. BED SURFACES OF THE FACE STONES SHALL BE APPROXIMATELY NORMAL TO THE FACE OF THE STONES FOR ABOUT 80 MM AND FROM THIS POINT MAY DEPART FROM A NORMAL PLANE NOT TO EXCEED 50 MM IN 300 MM. FACE STONES SHALL BE PITCHED TO THE LINE ALONG THE BEDS AND JOINTS. THE MAXIMUM PROJECTION OF ROCK FACES BEYOND THE PITCH LINES SHALL NOT BE MORE THAN 50 MM.

C. CEMENT, FINE AGGREGATE, AND WATER SHALL CONFORM TO THE RESPECTIVE REQUIREMENTS FOR THOSE MATERIALS AS SPECIFIED UNDER ITEM 405, STRUCTURAL CONCRETE, EXCEPT AS TO THE GRADING OF FINE AGGREGATE WHICH SHALL ALL PASS THE 2.36 MM (NO. 8) SIEVE, NOT LESS THAN 15 NOR MORE THAN 40 PERCENT SHALL PASS THE 0.3 MM (NO. 50) SIEVE, AND NOT MORE THAN 10 PERCENT SHALL PASS THE 0.15 MM (NO.100) SIEVE.

D. **THE MORTAR** FOR THE MASONRY SHALL BE COMPOSED OF ONE PART OF PORTLAND CEMENT AND TWO PARTS OF FINE AGGREGATE BY VOLUME AND SUFFICIENT WATER TO MAKE THE MORTAR OF SUCH CONSISTENCY. MORTAR THAT IS NOT USED WITHIN 90 MINUTES AFTER THE WATER HAS BEEN ADDED SHALL BE DISCARDED. ALL STONES SHALL BE CLEANED THOROUGHLY AND WETTED IMMEDIATELY BEFORE BEING SET, AND THE BED WHICH IS TO RECEIVE THEM SHALL BE CLEANED AND MOISTENED BEFORE THE MORTAR IS SPREAD. THEY SHALL BE LAID WITH THEIR LONGEST FACES HORIZONTAL IN FULL BEDS OF MORTAR, AND THE JOINTS SHALL BE FLUSHED WITH MORTAR. THE EXPOSED FACES OF INDIVIDUAL STONES SHALL BE PARALLEL TO THE FACES OF THE WALLS IN WHICH THE STONES ARE SET.

E. **SELECTION AND PLACING** IS WHEN THE MASONRY IS TO BE PLACED ON A PREPARED FOUNDATION BED, THE BED SHALL BE FIRM AND NORMAL TO, OR IN STEPS NORMAL TO, THE FACE OF THE WALL, AND SHALL HAVE BEEN APPROVED BY THE ENGINEER BEFORE ANY STONE IS PLACED. CARE SHALL BE TAKEN TO PREVENT THE BUNCHING OF SMALL STONE OR STONES OF THE SAME SIZE. LARGE STONES SHALL BE USED IN THE CORNERS. ALL STONES SHALL BE CLEANED THOROUGHLY AND WETTED IMMEDIATELY BEFORE BEING SET, AND THE BED WHICH IS TO RECEIVE THEM SHALL BE CLEANED AND MOISTENED BEFORE THE MORTAR IS SPREAD. THEY SHALL BE LAID WITH THEIR LONGEST FACES HORIZONTAL IN FULL BEDS OF MORTAR, AND THE JOINTS SHALL BE FLUSHED WITH MORTAR. THE EXPOSED FACES OF INDIVIDUAL STONES SHALL BE PARALLEL TO THE FACES OF THE WALLS IN WHICH THE STONES ARE SET. THE STONES SHALL BE SO HANDLED AS NOT TO JAR OR DISPLACE THE STONES ALREADY SET. SUITABLE EQUIPMENT SHALL BE PROVIDED FOR SETTING STONES LARGER THAN THOSE THAT CAN BE HANDLED BY TWO MEN. THE ROLLING OR TURNING OF STONES ON THE WALLS WILL NOT BE PERMITTED. IF A STONE IS LOOSENED AFTER THE MORTAR HAS TAKEN INITIAL SET, IT SHALL BE REMOVED, THE MORTAR CLEANED OFF, AND THE STONE RELAID WITH FRESH MORTAR.

F. **BED AND JOINTS** - BEDS FOR FACE STONES MAY VARY FROM 20 MM TO 50 MM IN THICKNESS. THEY SHALL NOT EXTEND IN AN UNBROKEN LINE THROUGH MORE THAN 5 STONES. JOINTS MAY VARY FROM 20 MM TO 50 MM IN THICKNESS. THEY SHALL NOT EXTEND IN AN UNBROKEN LINE THROUGH MORE THAN TWO STONES. FACE STONE SHALL BOND AT LEAST 150 MM LONGITUDINALLY AND 50 MM VERTICALLY. AT NO PLACE SHALL CORNERS OF FOUR STONES BE ADJACENT TO EACH OTHER.

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 - COASTAL ROADS TO AUGMENT RESILIENCY OF COASTAL COMMUNITIES - CONSTRUCTION OF COASTAL ROAD, PHASE 3, LEYTE - LEYTE TO CAPOOCAN, LEYTE LEYTE 3RD LD	CONSTRUCTION REQUIREMENTS	JOEL PAUL C. AVORDUE ENGINEER	FELIX R. BACUS CHIEF HIGHWAYS DESIGN SECTION DATE	AGNES M. BELARMINO CHIEF PLANNING AND DESIGN DIVISION DATE	MA. MARGARITA C. JUNIA, O.M. ASSISTANT REGIONAL DIRECTOR DATE	EDGAR B. TABACON, CESO IV REGIONAL DIRECTOR DATE	A 9 30	9 104

G. **HEADERS** SHALL BE DISTRIBUTED UNIFORMLY THROUGHOUT THE WALLS OF THE STRUCTURES SO AS TO FORM AT LEAST ONE-FIFTH OF THE EXPOSED FACES. THEY SHALL BE OF SUCH LENGTHS AS TO EXTEND FROM THE FRONT FACE OF THE WALL INTO THE BACKING OF AT LEAST 300 MM. WHEN A WALL IS 450 MM OR LESS IN THICKNESS, THE HEADERS SHALL EXTEND ENTIRELY FROM FRONT TO BACK FACE.

H. **BACKING** SHALL BE BUILT MOSTLY OF LARGE STONES. THE INDIVIDUAL STONES COMPOSING THE BACKING AND HEARTING SHALL BE WELL BONDED WITH THE STONES IN THE FACE WALL AND WITH EACH OTHER. ALL OPENINGS AND INTERSTICES IN THE BACKING SHALL BE FILLED COMPLETELY WITH MORTAR OR WITH SPELLS SURROUNDED COMPLETELY BY MORTAR.

I. **THE WEEPHOLES** SHALL BE PLACED HORIZONTALLY AT THE LOWEST POINTS WHERE FREE OUTLETS FOR WATER CAN BE OBTAINED AND SHALL BE SPACED AT NOT MORE THAN 2 M CENTER TO CENTER IN A STAGGERED MANNER. THE LENGTH OF THE WEEPHOLES SHALL NOT BE LESS THAN THE THICKNESS OF THE WALLS OF THE ABUTMENT AND SHALL BE AT LEAST 50 MM DIAMETER PVC OR OTHER PIPE MATERIALS. WEEPHOLES MUST BE PROVIDED WITH FILTER BAGS.

J. **CLEANING EXPOSED FACES** - IMMEDIATELY AFTER BEING LAID, AND WHILE THE MORTAR IS FRESH, ALL FACE STONES SHALL BE THOROUGHLY CLEANED OF MORTAR STAINS AND SHALL BE KEPT CLEAN UNTIL THE WORK IS COMPLETED.

K. **CURING** - IN HOT OR DRY WEATHER, THE MASONRY SHALL 6E SATISFACTORY PROTECTED FROM THE SUN AND SHALL BE KEPT WET FOR A PERIOD OF AT LEAST THREE DAYS AFTER COMPLETION.

22. ROAD SIGN

A. THIS ITEM SHALL CONSIST OF FURNISHING AND INSTALLING ROAD SIGNS IN ACCORDANCE WITH THIS SPECIFICATION AND TO THE DETAILS SHOWN ON THE PLANS, OR AS REQUIRED BY THE ENGINEER. THE ROAD SIGNS SHALL COMPLY IN ALL RESPECTS WITH THE DPWH HIGHWAY SAFETY DESIGN STANDARDS PART 2: ROAD SIGNS AND PAVEMENT MARKING MANUAL (MAY 2012) PUBLISHED BY THE DPWH. THE CATEGORIES OF ROAD SIGNS ARE DESIGNATED IN THE MANUAL, NAMELY, DANGER WARNING SIGNS, REGULATORY SIGNS AND INFORMATIVE SIGNS, OR GUIDE SIGNS. THESE ARE REFERRED TO IN THE CONTRACT AS WARNING SIGNS AND INFORMATORY SIGNS, RESPECTIVELY.

B. ROAD SIGNS SHALL BE CLASSIFIED AS STANDARD OR NON-STANDARD. STANDARD SIGNS CONSIST OF ALL WARNING SIGNS, REGULATORY SIGNS AND INFORMATORY SIGNS WITH THE EXCEPTION OF DIRECTION SIGNS, PLACE IDENTIFICATION SIGNS AND THE LINE. NON-STANDARD SIGNS CONSIST OF ALL INFORMATORY SIGNS WHICH ARE NOT CLASSIFIED AS STANDARD SIGNS.

C. THE SIZE OF WARNING AND REGULATORY SIGNS IS THE LENGTH OF THE SIDE OF TRIANGULAR SIGNS (MEASURED FROM THE POINTS OF INTERSECTION OF THE EXTENSION OF THE EDGES), THE HORIZONTAL WIDTH OF OCTAGONAL SIGNS AND THE DIAMETER OF CIRCULAR SIGNS.

23. PAVEMENT MARKINGS

A. THE PAINTING OF LANE MARKERS AND TRAFFIC STRIPS SHALL INCLUDE THE CLEANING OF THE PAVEMENT SURFACES; THE APPLICATION, PROTECTION AND DRYING OF THE PAINT COATINGS; THE PROTECTION OF PEDESTRIANS, VEHICULAR OR OTHER TRAFFIC; THE PROTECTION OF ALL PARTS OF THE ROAD STRUCTURE AND ITS APPURTENANCES AGAINST DISFIGUREMENT BY SPATTERS, SPLASHES OR SMIRCHES OF PAINTS OR OF PAINT MATERIALS; AND THE SUPPLYING OF ALL TOOLS, LABOR AND TRAFFIC PAINT NECESSARY FOR THE ENTIRE WORK.

B. THE PAINT SHALL NOT BE APPLIED DURING RAIN OR WET WEATHER OR WHEN THE AIR IS MISTY, OR WHEN IN THE OPINION OF THE ENGINEER, CONDITIONS ARE UNFAVORABLE FOR THE WORK. PAINT SHALL NOT BE APPLIED UPON DAMP PAVEMENT SURFACES, OR UPON PAVEMENT WHICH HAS ABSORBED HEAT SUFFICIENT TO CAUSE THE PAINT TO BLISTER AND PRODUCE A POROUS FILM OF PAINT.

C. TRAFFIC PAINT SHALL BE APPLIED TO THE PAVEMENT AT THE RATE OF 0.33 L/M2 AND SHALL DRY SUFFICIENTLY TO BE FREE FROM CRACKING IN FROM 15 TO 30 MINUTES.

D. ALL MARKINGS SHALL PRESENT A CLEAN CUT, UNIFORM AND WORKMANLIKE APPEARANCE. MARKINGS THAT FAIL TO HAVE A UNIFORM, SATISFACTORY APPEARANCE EITHER BY DAY OR NIGHT, SHALL BE CORRECTED BY THE CONTRACTOR IN A MANNER ACCEPTABLE TO THE ENGINEER AND AT NO COST TO THE GOVERNMENT.

24. TREE PLANTING

A. **BALLING OF PLANTS AND TREES** - BALLING IS EMPLOYED IN PLANTS AND TREES TO BE TRANSPLANTED OR TRANSFERRED. TO BALL OUT THE TREES, THE DEPTH TO WHICH THE ROOT SYSTEM REACHES IS FIRST DETERMINED. DIGGING AROUND THE TREE IS THEN DONE, BEING CAREFUL NOT TO CUT MANY ROOTS.

B. **DIGGING PLANTS** - ALL PLANTS, NURSERY-GROWN OR COLLECTED, SHALL BE DUG WITH CARE AND SKILL IMMEDIATELY BEFORE SHIPPING AND AVOIDING ALL POSSIBLE INJURY TO THE PLANTS, LOSS OR DAMAGE OF THE ROOTS, PARTICULAR ATTENTION BEING GIVEN TO FIBROUS ROOTS IN THIS RESPECT. AFTER THE PLANTS ARE DUG, THEIR ROOTS SHALL NOT BE PERMITTED TO DRY OUT. THEY SHALL NOT BE EXPOSED TO HOT TEMPERATURES. ALL PLANTS SHALL BE DUG IN DORMANT STATE AND SHALL BE SO HELD UNTIL PLANTED.

C. **TEMPORARY STORAGE AND PLANT SPRAY** - AFTER DELIVERY AND INSPECTION, THE PLANTS SHALL BE SPRAYED WITH AN APPROVED ANTI-DESICCANT PRIOR TO PLANTING, HEELING-IN OR STORING, EXCEPT IN THE CASE OF COLLECTED STOCK WHICH SHALL NOT BE HEELED-IN OR STORED, BUT SHALL BE SPRAYED WITH ANTI-DESICCANT IMMEDIATELY AND PLANTED WITHIN 36 HOURS AFTER DIGGING.

D. **LAYOUT OF PLANTING** - BEFORE DIGGING POCKET HOLES OR BEDS, THE CONTRACTOR SHALL LAY OUT, BY SUITABLE STAKING, THE LOCATION OF ALL POCKET HOLES AND BEDS. THE LAYOUT OF PLANTING SHALL BE APPROVED BY THE ENGINEER.

E. **ROOTS AND TOP PRUNING** - THE ENDS OF ALL BROKEN AND DAMAGED ROOTS, 6 MM DIAMETER OR LARGER, SHALL BE PRUNED WITH A CLEAN CUT, REMOVING NO MORE THAN THE INJURED PORTION. ALL PLANTS SHALL BE PRUNED TO BALANCE THE TOP WITH THE ROOT SYSTEM KEEPING THE NATURAL SHAPE OF THE SPECIES. ALL DEAD WOODS SHALL BE REMOVED. ALL CUTS AND WOUNDS, 12 MM OR OVER IN DIAMETER, SHALL BE PAINTED WITH TREE WOUND DRESSING IMMEDIATELY AFTER THE PRUNING.

F. **POCKET HOLES** POCKET HOLES SHALL BE DUG AT THE LOCATIONS SHOWN ON THE PLANS OR AS DIRECTED BY ENGINEER. THE HOLES SHALL BE DUG TO THE DEPTH AND CROSS-SECTION SPECIFIED AND SHOULD BE OF SUFFICIENT SIZE TO PROVIDE FOR NOT LESS THAN 150 MM OF TOP SOIL BACKFILL BENEATH AND AROUND THE ROOT SYSTEM. THE HOLES SHALL BE DUG WITH THE SIDES VERTICAL. SURPLUS EXCAVATION FROM THE BED AND POCKET HOLES SHALL BE DISPOSED OFF AS DIRECTED BY THE ENGINEER.

G. **BACKFILL** - THE POCKET HOLES SHALL BE BACKFILLED WITH TOPSOIL AS EACH PLANT IS SET. THE TOPSOIL SHALL BE WELL-TAMPED BY THE WORKER'S FEET, RODS OR OTHER APPROVED TAMPING DEVICES AS IT IS SHOVELLED INTO THE HOLES. THE BACKFILL IN HOLES ON SLOPES SHALL BE BUILT-UP ON THE LOWER SIDE TO CATCH AND HOLD SET. DURING PLANTING THE TOPSOIL SURROUNDING THE PLANT BE S LIGHTLY DEPRESSED TO HOLD WATER.

H. **PLANTING** - THE PLANTS TO BE PLANTED SHALL BE THE SPECIE, VARIETY AND SIZE SPECIFIED. THE OPERATION OF THE ACTUAL PLANTING SHALL NOT BE PERFORMED AT ANY TIME WHEN THE SOIL IS NOT IN A FRIABLE OR WORKABLE CONDITION. THE ENGINEER SHALL ALSO APPROVE THE LOCATION OF EACH INDIVIDUAL PLANT TAKING INTO CONSIDERATION ITS SIZE AND SHAPE, IN ORDER THAT THE BEST POSSIBLE ARRANGEMENT WILL RESULT.

I. **TREE PLANTING ALONG NATIONAL ROAD** - THE TREES TO BE USED FOR THIS PURPOSE SHALL BE THE VARIETIES, THE ROOT SYSTEMS OF WHICH GROW DOWNWARD RATHER THAN SIDEWARD TO AVOID SITUATIONS WHERE THE ROOTS SPREAD SIDEWARD AND CONSEQUENTLY DESTROY THE ROAD AND SIDEWALK SLABS. TREES SHALL BE PLANTED IN A NEAT ROW, WITHIN THE ROAD RIGHT-OF-WAY (ROW) AND AS CLOSE AS POSSIBLE TO THE ROW LIMIT, WITH SUFFICIENT ALLOWANCE SO THAT THE TREES WHEN FULLY GROWN WILL NOT ENCROACH ON THE ADJOINING PROPERTY OR TOUCH ELECTRIC AND OTHER OVERHEAD UTILITY LINES. THE CENTER-TO-CENTER SPACING BETWEEN TREES SHALL BE 10-20 METERS (M). FOR ROAD SECTIONS WITH A GENERALLY NORTH-SOUTH ALIGNMENT, THE TREES ON ONE SIDE OF THE ROAD SHALL BE STAGGERED VIS-A-VIS THE TREES ON THE OTHER SIDE OF THE ROAD. THIS ARRANGEMENT WILL HELP TO ENSURE THAT ENOUGH SUNLIGHT WILL FALL ON THE ROAD AND THUS HELP TO KEEP THE ROAD DRY EVEN DURING THE RAINY SEASON.

J. **MULCHING** - WITHIN 24 HOURS AFTER PLANTING, MULCHING MATERIAL SHALL BE SPREAD TO COVER THE PLANT HOLE AND THE AREA 150 MM OUTSIDE THE PERIPHERY OF THE PLANT HOLE. THE DEPTH AND APPLICATION FOR WOOD CHIPS SHALL BE A MINIMUM OF 150 MM. FOR GROUND OR CRUSHED CORN COBS, SAWDUST OR PEAT MOSS THE MINIMUM DEPTH SHALL BE 100 MM.

K. **WATERING AND MAINTENANCE** - ALL PLANTS SHALL BE WATERED DURING THE PLANTING OPE RATIONS, SUBJECT TO DIRECTION AND APPROVAL OF THE ENGINEER. FROM TIME TO TIME DURING THE LIFE OF THE CONTRACT, SUFFICIENT WATER SHALL BE APPLIED SO THAT NOT ONLY WILL THE TOPSOIL BACKFILL ABOUT EACH PLANT BE KEPT MOIST, BUT ALSO FOR MOISTURE TO EXTEND INTO THE SURROUNDING SOIL.

L. **BRACING** - ALL DECIDUOUS AND EVERGREEN TREES SHALL BE BRACED IMMEDIATELY AFTER PLANTING. DECIDUOUS TREES FROM 1.20 M TO 1.80 M IN HEIGHT SHALL HAVE ONE VERTICAL SUPPORT STAKE. DECIDUOUS TREES FROM 1.80 M TO 2.50 M IN HEIGHT SHALL HAVE TWO VERTICAL SUPPORT STAKES.

M. **DEAD TREES** - BEFORE COMPLETION AND FINAL ACCEPTANCE OF THE PROJECT, ALL TREES NOT HEALTHY OR THAT HAVE DIED BACK INTO THE CROWN OR BEYOND THE NORMAL PRUNING LINE SHALL BE REPLACED BY THE CONTRACTOR AT HIS OWN EXPENSE WITH TREES OF THE SPECIFIED SPECIES OR VARIETY, SIZE AND QUALITY AND MEETING THE SPECIFICATION.

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.
	SIPAS - COASTAL ROADS TO AUGMENT RESILIENCY OF COASTAL COMMUNITIES - CONSTRUCTION OF COASTAL ROAD, PHASE 3, LEYTE - LEYTE TO CAPOOCAN, LEYTE LEYTE 3RD LD	CONSTRUCTION REQUIREMENTS	JOEL PAUL G. ARDONE ENGINEER	FELIX R. BAGUS CHIEF, HIGHWAY DESIGN SECTION DATE:	AGNES M. BARONDA CHIEF, PLANNING AND DESIGN DIVISION DATE	MA. MARGARITA C. JUNIA, O.M. ASSISTANT REGIONAL DIRECTOR DATE	EDGAR B. TABACON, CESO IV REGIONAL DIRECTOR DATE	A 10 30	10 104

SUMMARY OF QUANTITIES

Item No.	Description	Unit	Quantity	Remarks
PART B	GENERAL REQUIREMENTS			
B.3	Permits and Clearances	L.s.	1.00	
B.4(1)	Construction survey and staking	K.m.	1.30	
B.5	Project Billboard / Signboard	Each	8.00	
B.7(2)	Occupational Safety and Health Program	L.s.	1.00	
B.8(1)	Traffic Mangement	Month	10.17	
B.9	Mobilization/Demobilization	L.s.	1.00	
B.14	Environmental Management and Monitoring	Mo.	10.17	
PART C	EARTHWORKS			
100(1)	Clearing and Grubbing	Ha.	5.182	
100(3)a1	Individual Removal of Trees,150-300 mm dia., Small	Each	111.000	Coconut and Premium Trees
100(3)a2	Individual Removal of Trees, 301-500 mm dia., Small	Each	41.00	Premium Trees
100(3)a3	Individual Removal of Trees, 501-750 mm dia., Small	Each	8.00	Premium Trees
102(2)	Surplus Common Excavation	Cu. M.	125,026.17	
102(3)a	Surplus Rock Excavation, Soft	Cu. M.	110,168.43	
103(1)a	Structure Excavation, Common Soil	Cu. M.	1,814.51	
103(1)b	Structure Excavation, Soft Rock	Cu. M.	5,669.39	
104(1)a	Embankment from Roadway/Structure Excavation, Common Soil	Cu. M.	4,238.64	Compacted
105(1)a	Subgrade Preparation, Common Material	Sq.m.	12,084.13	
PART D	BASE AND SUBBASE COURSE			
200(1)	Aggregate Subbase Course	Cu. M.	2,719.09	Compacted
PART E	RIGID PAVEMENTS			
311(1)c1	PCC Pavement (Unreinforced), 0.23m thick, 14 days	Sq.M.	3,903.00	for Shoulder
311(1)e1	PCC Pavement (Unreinforced), 0.28m Thick, 14 days	Sq.M.	9,060.69	for 2 Lanes
PART F	REINFORCED CONCRETE			
404(1)a	Reinforcing Steels, Grade 40	Kgs.	170,260.00	For RCBC and Catchwall
405(1)a3	Structural Concrete, 20.68 Mpa,Class A, 28 days	Cu.M.	1,142.00	For RCBC and Catchwall
PART G	DRAINAGE AND SLOPE PROTECTION STRUCTURES			
500(1)b	Pipe Culvert, Class II, RCPC	L.m.	38.00	For Cross Drain, 1220mm dia.
500(3)a	Lined Canal, Rectangular Reinforced Concrete	L.m.	1,661.00	
506(1)	Stone Masonry	Cu. M.	7,843.65	For Retaining wall, Catch wall
507(1)	Rubble Concrete	Cu. M.	2,808.10	
PART H	MISCELLANEOUS STRUCTURES			
605(6)e1	Hazard Markers, 450x600 mm, Chevron Signs	Each	36.00	
611(3)	Seedlings/Saplings for Other Programs/Initiatives	Each	10,700.00	Premium Trees
612(1)	Reflectorized Thermoplastic Pavement Markings White	Sq.M.	325.45	
612(2)	Reflectorized Thermoplastic Pavement Markings Yellow	Sq.M.	47.50	
622(1)a	Coco-net, CN 400	Sq.M.	22,897.66	
622(2)b	Coco-logs/Fascine, CN 200	L.m.	13,981.20	
622(3)a	Vegetation, Grass-Cover	Sq.M.	22,897.66	

NOTE:

1. *THE CONTRACTOR SHALL SUBMIT AS-STAKED PLAN TO VALIDATE CONTRACT QUANTITIES IN COMPLIANCE WITH D.O. NO. 15 SERIES OF 2016.*
2. *THE QUANTITIES SHOWN ARE SUBJECT TO CHANGE IF SIGNIFICANT IMPROVEMENT HAVE OCCURED 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
SARAS, PALO, LEYTE

PROJECT NAME AND LOCATION: SIPAG - COASTAL ROADS TO AUGMENT RESILIENCY OF COASTAL COMMUNITIES - CONSTRUCTION OF COASTAL ROAD, PHASE 3, LEYTE - LEYTE TO CAPOOCAN, LEYTE
LEYTE 3RD LD

SHEET CONTENTS: SUMMARY OF QUANTIES
PAVING QUANTITIES

PREPARED: JOEL PAUL S. ENRIQUE, ENGINEER II

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

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

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

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

SET NO: A 11 | 30

SHEET NO: 11 / 104

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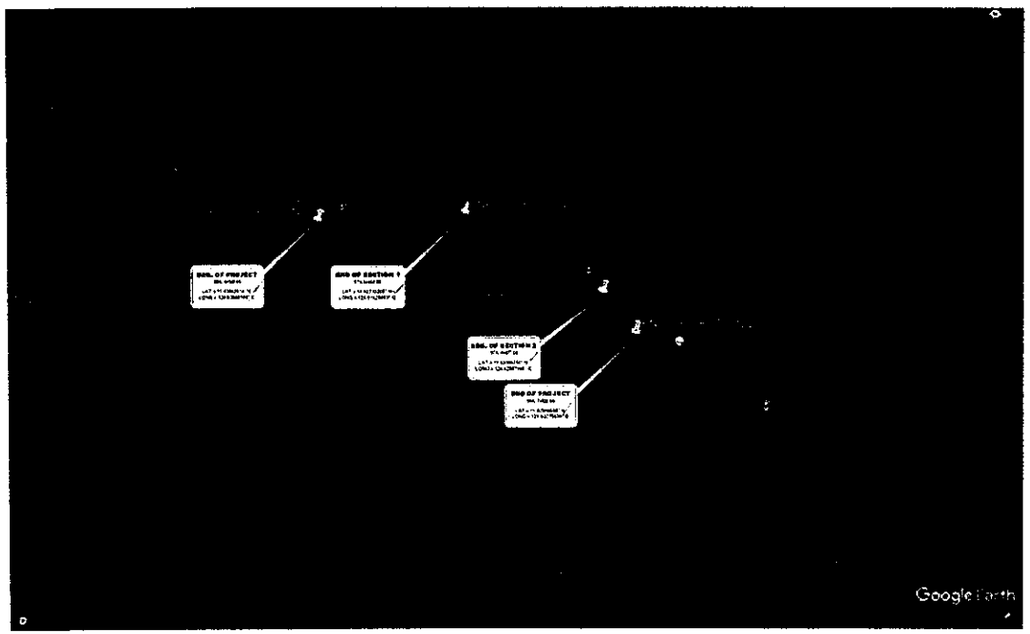
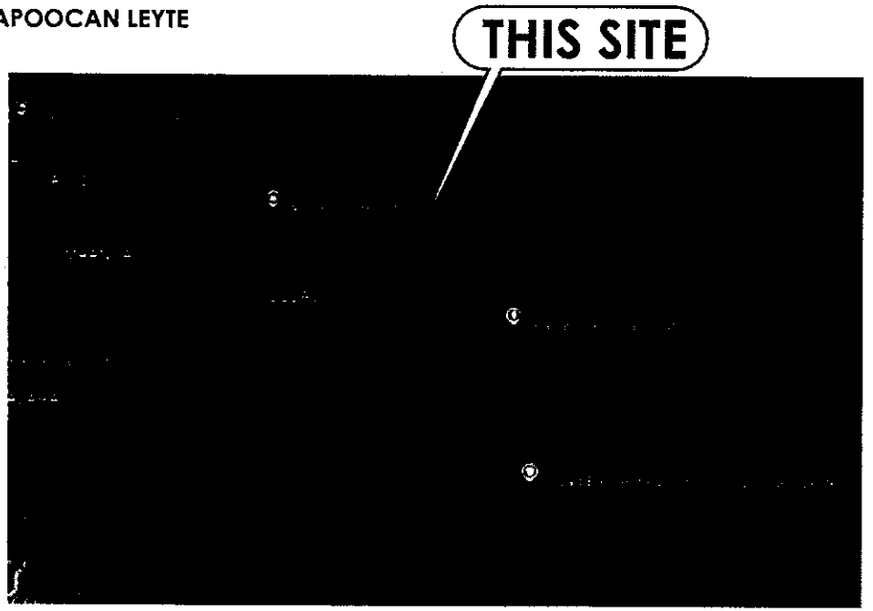
W E S

GENERAL PLAN



GENERAL PLAN
NTS

MAP OF CAPOOCAN LEYTE

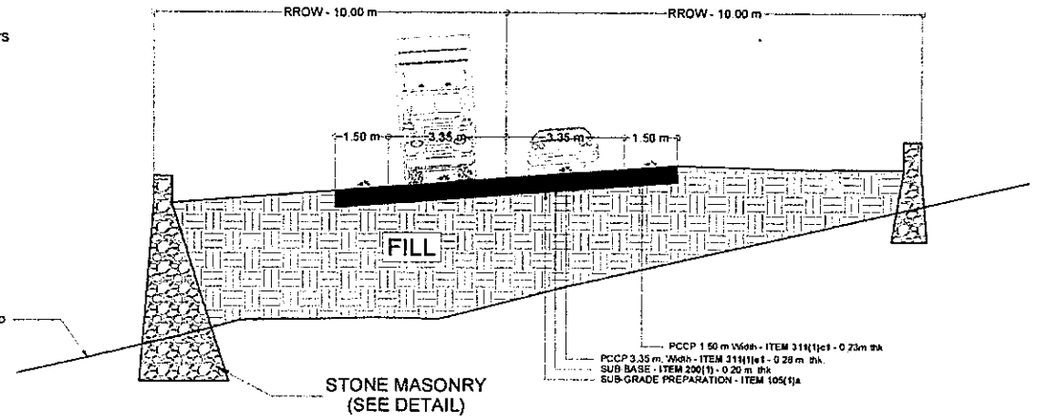


VICINITY MAP
NTS

REPUBLIC OF THE PHILIPPINES DEPARTMENT OF PUBLIC WORKS AND HIGHWAYS REGIONAL OFFICE NO. VIII BARAS, PALO LEYTE	PROJECT NAME AND LOCATION: SIPAG - COASTAL ROADS TO AUGMENT RESILIENCY OF COASTAL COMMUNITIES - CONSTRUCTION OF COASTAL ROAD, PHASE 3, LEYTE - LEYTE TO CAPOOCAN, LEYTE LEYTE 3RD LD	SHEET CONTENTS: GENERAL PLAN & VICINITY MAP	PREPARED: JOEL PAUL C. AVERQUE ENGINEER II	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: 12/30	SHEET NO: 12 104

PAVEMENT DESIGN PARAMETERS

ITEM	DESIGN REQUIREMENTS
1. PERFORMANCE PERIOD FOR PCCP	20 years
2.DESIGN TRAFFIC: ESAL	7.277 x 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 X 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

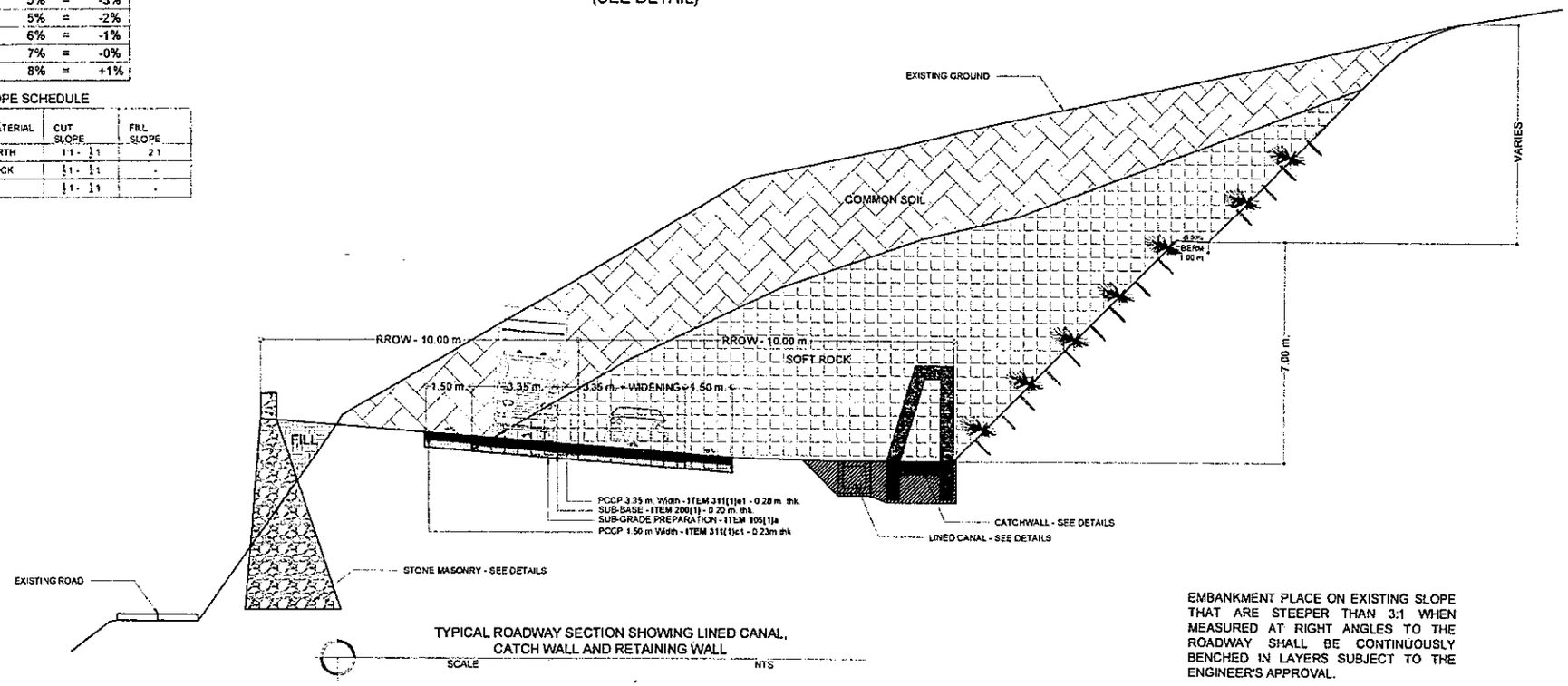


SCHEDULE FOR SHOULDER

+	e%	≤	5%	=	-3%
+	e%	≥	5%	=	-2%
+	e%	≥	6%	=	-1%
+	e%	≥	7%	=	-0%
+	e%	≥	8%	=	+1%

CUT/FILL SLOPE SCHEDULE

NATURE OF MATERIAL	CUT SLOPE	FILL SLOPE
COMMON EARTH	1:1 - 1:1	2:1
RIPPABLE ROCK	1:1 - 1:1	-
HARD ROCK	1:1 - 1:1	-



TYPICAL ROADWAY SECTION SHOWING LINED CANAL,
CATCH WALL AND RETAINING WALL

SCALE NTS

EMBANKMENT PLACE ON EXISTING SLOPE THAT ARE STEEPER THAN 3:1 WHEN MEASURED AT RIGHT ANGLES TO THE ROADWAY SHALL BE CONTINUOUSLY BENCHED IN LAYERS SUBJECT TO THE ENGINEER'S APPROVAL.

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
	SIPAO - COASTAL ROADS TO AUGMENT RESILIENCY OF COASTAL COMMUNITIES - CONSTRUCTION OF COASTAL ROAD, PHASE 3, LEYTE - LEYTE TO CAPOOCAN, LEYTE LEYTE, 3RD LD	TYPICAL ROADWAY SECTIONS	JOEL PAUL C. AVERQUE ENGINEER II	FELIX R. BACUS CHIEF, HIGHWAY DESIGN SECTION DATE	AGNES M. BARONDA CHIEF PLANNING AND DESIGN DIV SION DATE	MA. MARGARITA C. JUSAY, D.E. ASSISTANT REGIONAL DIRECTOR DATE	EDGAR B. TABACON, CESO IV REGIONAL DIRECTOR DATE	14 28 30	13 104

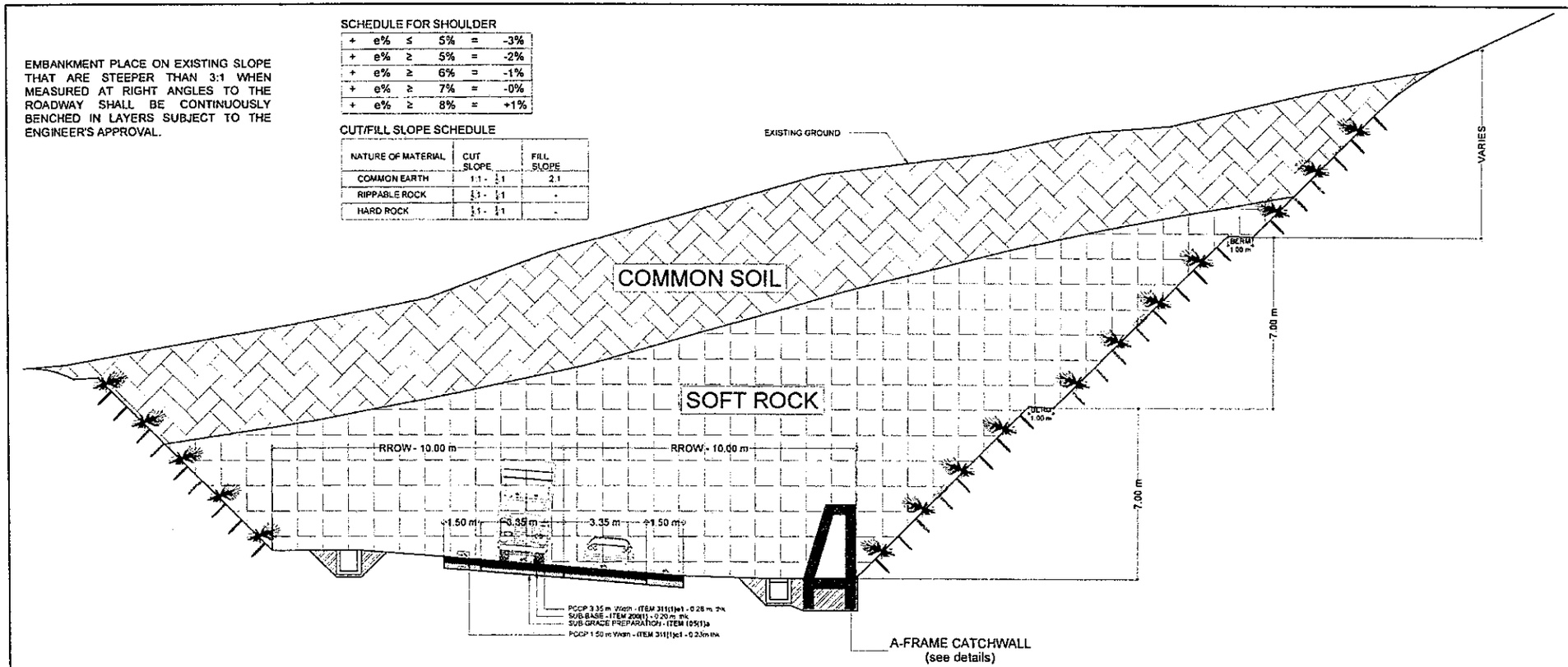
EMBANKMENT PLACE ON EXISTING SLOPE THAT ARE STEEPER THAN 3:1 WHEN MEASURED AT RIGHT ANGLES TO THE ROADWAY SHALL BE CONTINUOUSLY BENCHED IN LAYERS SUBJECT TO THE ENGINEER'S APPROVAL.

SCHEDULE FOR SHOULDER

+	e%	≤	5%	=	-3%
+	e%	≥	5%	=	-2%
+	e%	≥	6%	=	-1%
+	e%	≥	7%	=	-0%
+	e%	≥	8%	=	+1%

CUT/FILL SLOPE SCHEDULE

NATURE OF MATERIAL	CUT SLOPE	FILL SLOPE
COMMON EARTH	1:1 - 1:1	2:1
RIPPABLE ROCK	1:1 - 1:1	-
HARD ROCK	1:1 - 1:1	-



TYPICAL ROADWAY SECTION SHOWING LINED CANAL AND CATCH WALL
SCALE: NTS

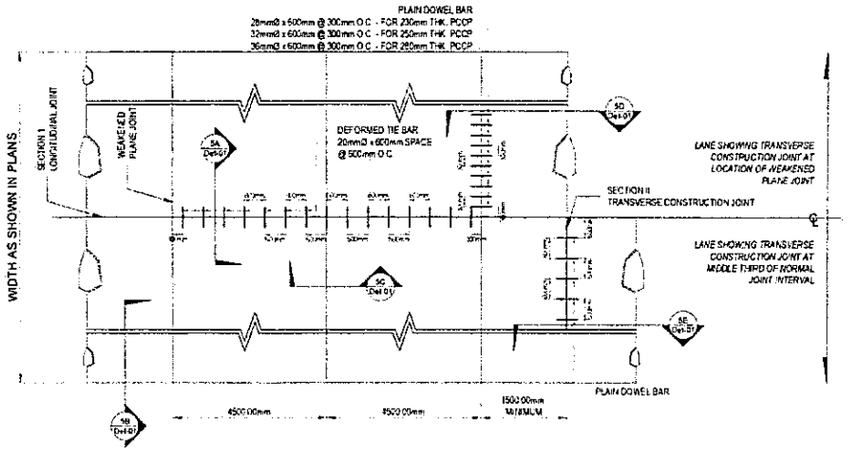
PAVEMENT DESIGN PARAMETERS

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

Item No. **311(1)e1**
Item Description: **PCC Pavement (Unreinforced), 0.28 m thick , 14 days**

Station	Distance	Width	Area
4+540.00		6.70 m	
	958.00 m		6,418.60 m²
5+498.00		6.70 m	
	GAP		
6+677.00		6.70 m	
	343.00 m		2,298.10 m²
7+020.00		6.70 m	
	TOTAL		8,716.70 m²
	WIDENING AREA(See Attached Computation)=		343.99 m²
	TOTAL		9,060.69 m²
	SAY		9,060.69 m²

REPUBLIC OF THE PHILIPPINES DEPARTMENT OF PUBLIC WORKS AND HIGHWAYS REGIONAL OFFICE NO. VIII BARAS PALO LEYTE	PROJECT NAME AND LOCATION SIPAG - COASTAL ROADS TO AUGMENT RESILIENCY OF COASTAL COMMUNITIES - CONSTRUCTION OF COASTAL ROAD, PHASE 3, LEYTE - LEYTE TO CAPOOCAN, LEYTE LEYTE 3RD LD	SHEET CONTENTS TYPICAL ROADWAY SECTIONS	PREPARED JOECAEL C. AVONGUE ENGINEER II	REVIEWED FELIX R. RACUS CHIEF HIGHWAYS 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 94 30	SHEET NO 14 104



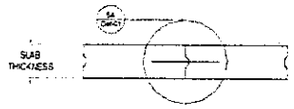
1 Det-01 **TYPICAL PLAN FOR TWO-LANE PAVEMENT**
NOT TO SCALE

CARRIAGE WAY = 280mm THICK

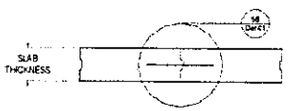
NOTE
TRANSVERSE CONSTRUCTION (CONTRACT) JOINT SHALL BE APPROVED AT THE END OF ANY RUN WHERE LAYING OF CONCRETE HAS BEEN STOPPED FOR THIRTY (30) MINUTES OR LONGER.
TRANSVERSE CONSTRUCTION JOINTS WHICH OCCUR AT LOCATION OF WEAKENED PLANE JOINT SHOULD BE BUTT JOINTS WITH DOWELS. IF JOINT OCCURS IN THE MIDDLE THIRD OF THE WEAKENED JOINT INTERVAL (1500mm - 3000mm) IT SHOULD BE KEYED JOINTS WITH TIE BARS.

GENERAL NOTES:

1. MATERIALS AND WORKMANSHIP SHALL CONFORM WITH THE DPWH STANDARD SPECIFICATIONS FOR HIGHWAYS, BRIDGES AND AIRPORTS 2013 AND SPECIAL 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.
2. 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 FOREIGN MATTER 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 FORM SHALL BE BRAND NEW SHEET METAL GAUGE NO. 18 OF BLOCK IRON, FREE FROM THE RUST AND KINKS.
7. AT LEAST TEN (10) SUCCESSIVE DOWELED BUTT JOINTS AT NORMAL JOINT SPACING SHALL BE PROVIDED BEFORE OR AFTER AN EXPANSION JOINT.
8. THE GROOVE OR CRACK INDUCE 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 PREVENTED/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. INSTALLATION OF DOWEL AND TIE BARS SHOULD START RESPECTIVELY FROM THE CENTER OF THE WIDTH AND LENGTH OF THE PAVEMENT AS SHOWN IN PLAN AND SHOULD BE SPACED ACCORDING TO THE TABLE ABOVE.
14. THE DESIGNER HAS THE DISCRETION OF USING PLAIN OR TIE SHOULDER DEPENDING ON THE VALUE OF THE LOAD TRANSFER COEFFICIENT "J" TO BE USED IN THE DETERMINATION OF THE THICKNESS OF THE PAVEMENT.

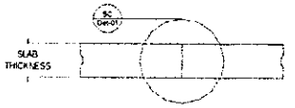


3A Det-01 **CONTRACTION JOINT (HALF-LANE PAVING)**
NOT TO SCALE

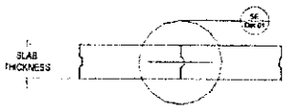


3B Det-01 **SEWED JOINT (TWO-LANE PAVING)**
NOT TO SCALE

3 Det-01 **SECTION - I (LONGITUDINAL JOINT)**
NOT TO SCALE

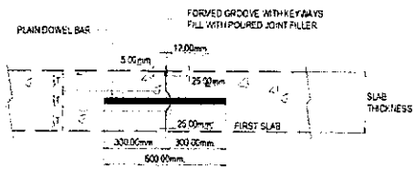


4A Det-01 **CONTRACTION JOINT**
NOT TO SCALE

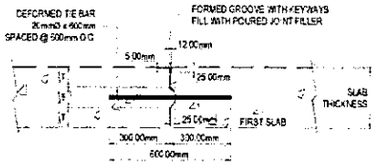


4B Det-01 **CONSTRUCTION JOINT**
NOT TO SCALE

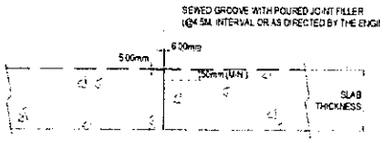
4 Det-01 **SECTION - II (TRANSVERSE JOINT)**
NOT TO SCALE



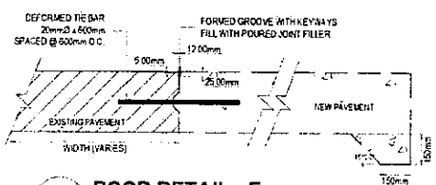
5E Det-01 **PCCP DETAIL - E**
NOT TO SCALE



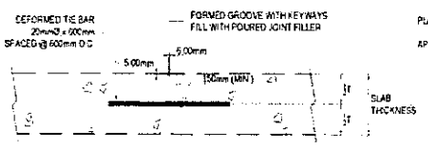
5A Det-01 **PCCP DETAIL - A**
NOT TO SCALE



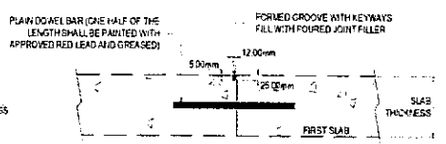
5C Det-01 **PCCP DETAIL - C**
NOT TO SCALE



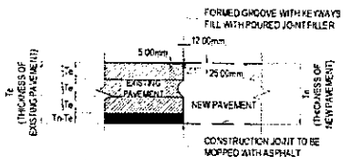
5F Det-01 **PCCP DETAIL - F**
NOT TO SCALE



5B Det-01 **PCCP DETAIL - B**
NOT TO SCALE



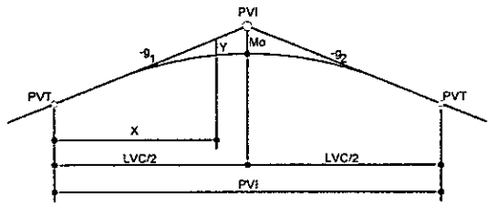
5D Det-01 **PCCP DETAIL - D**
NOT TO SCALE



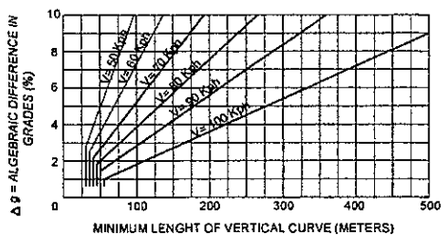
5G Det-01 **PCCP DETAIL - G**
NOT TO SCALE

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

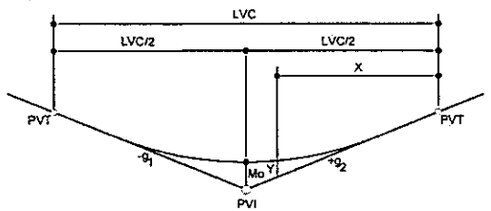
PROJECT NAME AND LOCATION	SHEET CONTENTS	PREPARED	REVIEWED	SUBMITTED	RECOMMENDED	APPROVED	SET NO	SHEET NO
SIPAG - COASTAL ROADS TO AUGMENT RESILIENCY OF COASTAL COMMUNITIES - CONSTRUCTION OF COASTAL ROAD, PHASE 3, LEYTE - LEYTE TO CAPOOCAN, LEYTE LEYTE 3RD LD	STANDARD PORTLAND CEMENT CONCRETE PAVEMENT JOINTS (PLAIN)	JOEL PAUL C. AVEROUE ENGINEER II	FELIX R. BACUS CHIEF HIGHWAYS ON SECTION DATE	AGNES M. BARONDA CHIEF PLANNING AND DESIGN DIVISION DATE	MA. MARGARITA C. JUNIA, DPM ASSISTANT REGIONAL DIRECTOR DATE	EDGAR B. TABACON, CESO IV REGIONAL DIRECTOR DATE	A 15 | 30	15 104



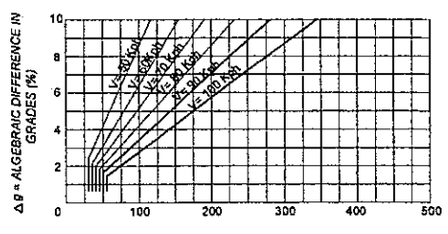
SYMETRICAL VERTICAL PARABOLIC CURVES (CREST)



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

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

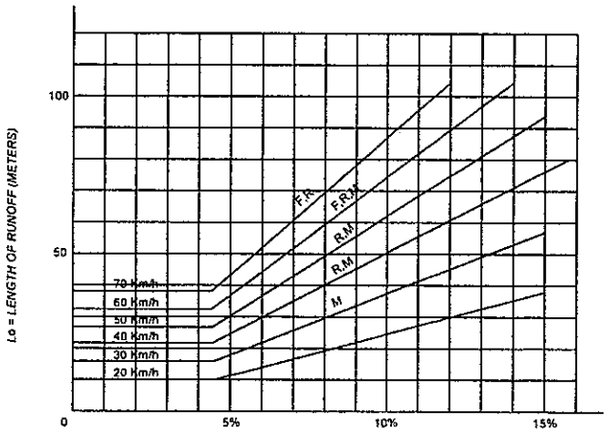
g_1 g_2 - GRADE RATES PERCENT

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

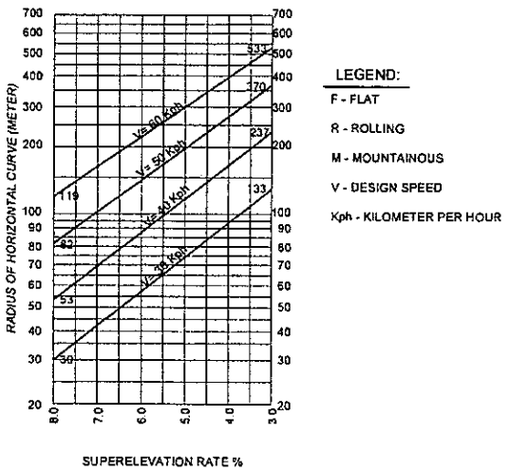
Y - VERTICAL OFFSET AT DISTANCE X - METERS

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

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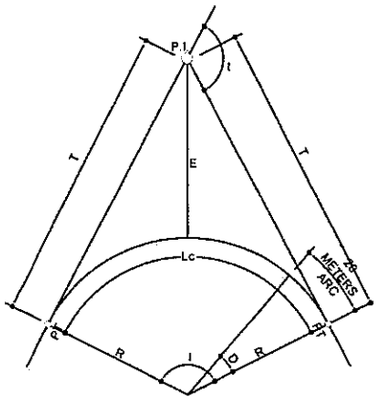
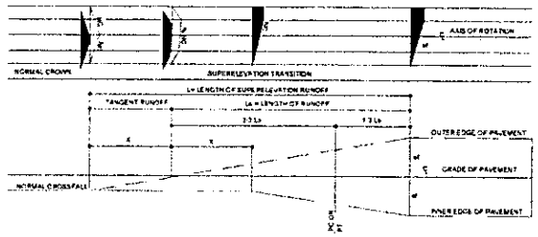


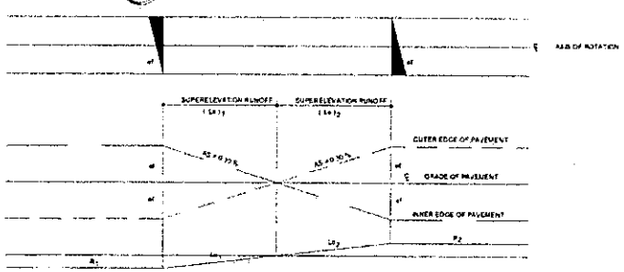
HORIZONTAL CURVE (CIRCULAR)

LEGEND

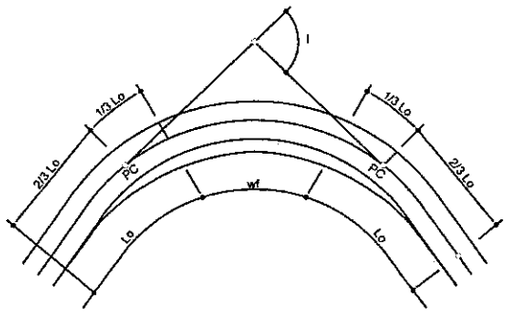
wf	- FULL WIDENING
PI	- POINT OF INTERSECTION
I	- INTERSECTION ANGLE (CENTRAL ANGLE)
T	- TANGENT DISTANCE
R	- HORIZONTAL RADIUS
Lc	- LENGHT OF CIRCULAR CURVE
E	- EXTERNAL DISTANCE
D	- DEGREE OF CURVE (ARC DEFINITION)
PC	- POINT OF CURVATURE
PT	- POINT OF TANGENCY
L	- LENGHT OF SUPERELEVATION RUNOFF
Lo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



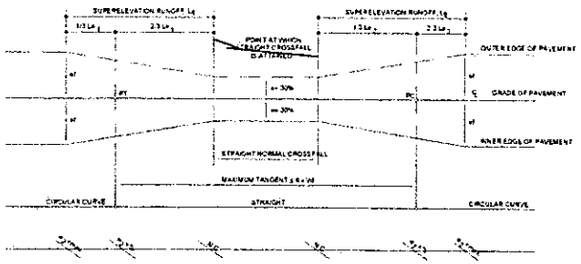
CASE 1
SUPERELEVATION TRANSITION



CASE 2
TRANSITION: CIRCULAR CURVE - REVERSED CIRCULAR



METHOD OF WIDENING



CASE 3
TRANSITION: CIRCULAR CURVE - STRAIGHT - CIRCULAR CURVE

NOTES:

1. FOR EFFECTIVE DRAINAGE Δ S HAS TO BE > 0.30%.
2. WHERE Δ 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 Δ S > 0.60%.

Vd	≤50 Km/H	60 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 PROFILE.
6. THE SLOPE OF THE SIDEWALK SHALL ALWAYS FALL TOWARD THE TRAVELED WAY. THE SLOPE OF THE SHOULDER SHALL ALWAYS FALL IN THE DIRECTION OF THE OUTSIDE EDGE OF TRAVELED WAY.
7. WHEN SUPERELEVATION IS LARGER THAN 4% THEN THE SLOPE OF LOWER SHOULDER SHALL BE THE SAME FOR THE TRAVELED WAY.
8. WHEN THE SUPERELEVATION IS LESS THAN 6%, THE HIGHER SHOULDER SHALL HAVE A SLOPE OF 4% OR 5% FOR PAVED AND UNPAVED SHOULDER RESPECTIVELY.
9. 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 TRAVELED WAY AND THE SHOULDER WHEN SUPERELEVATED SHALL ALWAYS BE EQUAL TO 10%.
10. USE CASE 3 WHEN MINIMUM TANGENT BETWEEN CURVES IS GRATER THAN 2/3 (Lo + Lo).
11. NO HORIZONTAL CURVE IS REQUIRED WHEN THE INTERSECTION I (CENTRAL ANGLE) IS LESS THAN ONE DEGREE (1°).

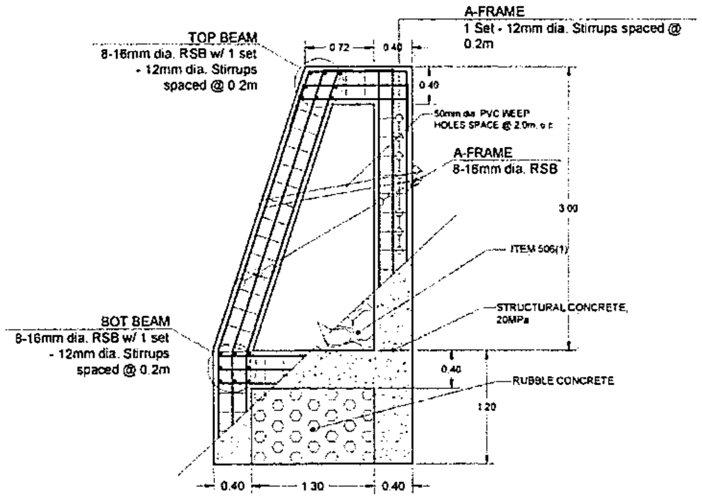
RADIUS (m)	DESIGN SPEED (km/h)							COMMENTS
	40	50	60	70	80	100	120	
90	1.75							THE VALUE GIVEN IN THE TABLE ARE VALID FOR CARRIAGE-WAY WIDTH OF 6.1 METERS
80	1.50	1.50						
100	1.50	1.50						FOR 7.00 METERS THE GIVEN VALUES ARE TO BE REDUCED BY 0.75 m AND 0.25 m RESPECTIVELY
125	1.25	1.25	1.25					
150	1.00	1.25	1.25					WHERE A SIGNIFICANT NUMBER OF SPECIALLY LARGE VEHICLES IS ENVISAGED EXTRA WIDENING MAY HAVE TO BE CONSIDERED
180	1.00	1.25	1.25	1.25				
200	0.75	0.75	1.00	1.00	1.25			VALUES LESS THAN 0.5 MAY BE DISREGARDED
250	0.75	0.75	1.00	1.00	1.00			
300	0.75	0.75	1.00	1.00	1.00			THE WIDENING IS ATTAINED LINEARLY OVER THE WHOLE SUPERELEVATION RUN-OFF AND APPLIED ON THE INSIDE OF THE CURVE
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	

WIDENING OF CURVES

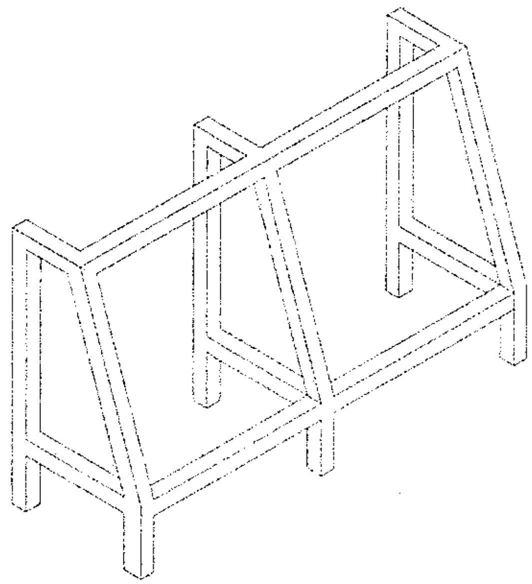
REPUBLIC OF THE PHILIPPINES DEPARTMENT OF PUBLIC WORKS AND HIGHWAYS REGIONAL OFFICE NO. VIII BARAS, PALO, LEYTE	PROJECT NAME AND LOCATION SIPAG - COASTAL ROADS TO AUGMENT RESILIENCY OF COASTAL COMMUNITIES - CONSTRUCTION OF COASTAL ROAD, PHASE 3, LEYTE - LEYTE TO CAPOOCAN, LEYTE LEYTE PROV'D	SHEET CONTENTS GEOMETRIC DESIGN STANDARD FOR HORIZONTAL (CIRCULAR CURVE) SUPERELEVATION, WIDENING	PREPARED JOEL A. C. ARROQUE ENGINEER II	REVIEWED FELIX P. RACUS CHIEF, HIGHWAYS DESIGN SECTION DATE	SUBMITTED AGNES M. BARONDA CHIEF PLANNING AND DESIGN DIVISION DATE	RECOMMENDED MA. MARGARITA C. LUNIA, D.M. ASSISTANT REGIONAL DIRECTOR DATE	APPROVED EDGAR B. TABACON, CESO IV REGIONAL DIRECTOR DATE	SET NO 17 of 30	SHEET NO 17 104

SCHEDULE OF REBARS @ CATCHWALL

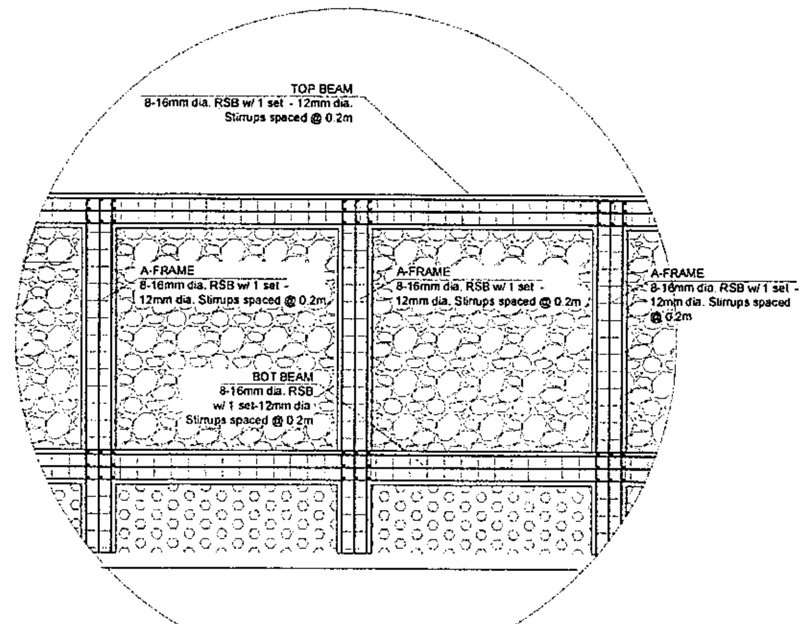
	b	h	MAIN BARS	STIRRUPS/TIES	REMARKS
TOP BEAM	0.4 M	0.4 M	8 - 16MM DIA. RSB	12 MM DIA SPACED @ 0.2M (1 SET)	
BOTTOM BEAM	0.4 M	0.4 M	8 - 16MM DIA. RSB	12 MM DIA SPACED @ 0.2M (1 SET)	
A-FRAME	0.4 M	0.4 M	8 - 16MM DIA. RSB	12 MM DIA SPACED @ 0.2M (1 SET)	



SIDE VIEW



ISOMETRIC VIEW



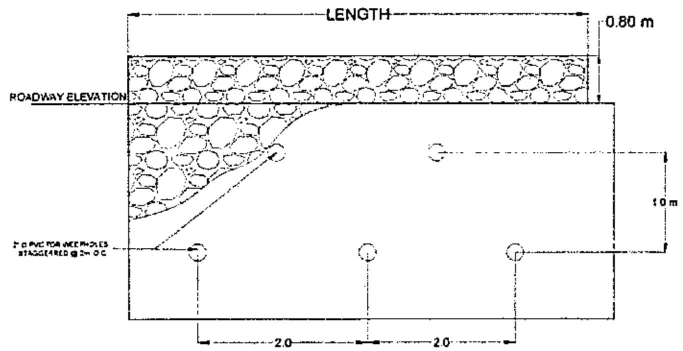
FRONT VIEW

FOR CATCHWALL:

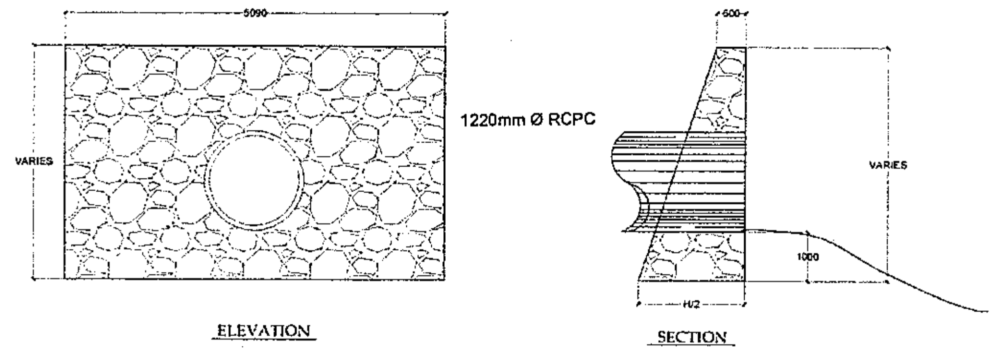
STA. LIMITS		LENGTH	TOTAL LENGTH OF SPLICE	TOTAL LENGTH	No. of A-FRAME	LOCATION
		958.00	61.31	1,019.31	321.00	R/S
					116.00	
TOTAL		**1,301.00**		**1,384.00**	**443.00**	

TYPICAL SECTION WITH CATCHWALL
NOT DRAWN TO SCALE

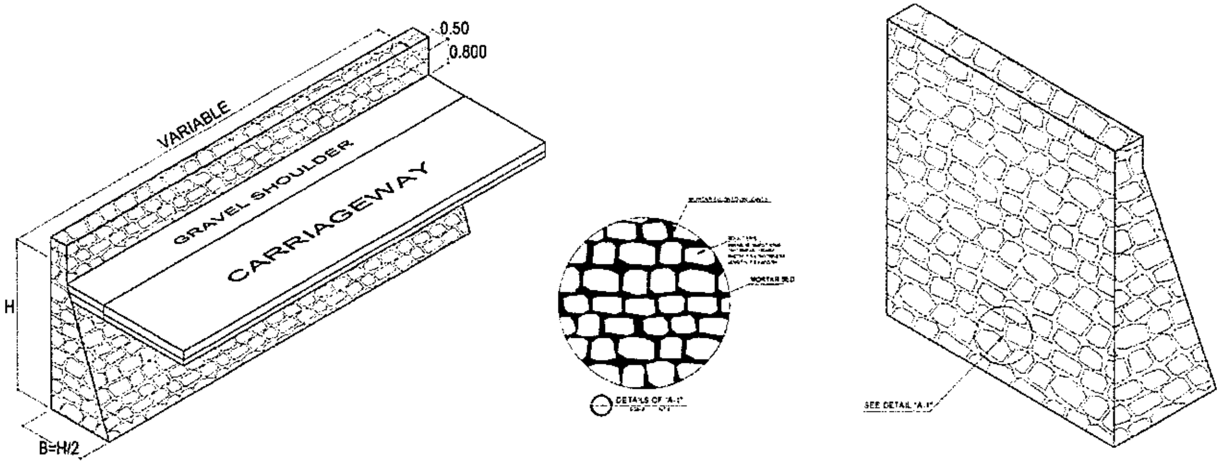
REPUBLIC OF THE PHILIPPINES DEPARTMENT OF PUBLIC WORKS AND HIGHWAYS REGIONAL OFFICE NO. VIII BARAS, PALO, LEYTE	PROJECT NAME AND LOCATION SIPAG - COASTAL ROADS TO AUGMENT RESILIENCY OF COASTAL COMMUNITIES - CONSTRUCTION OF COASTAL ROAD, PHASE 3, LEYTE - LEYTE TO CAPOOCAN, LEYTE LEYTE 3RD LD	SHEET CONTENTS DETAIL OF CATCH WALL & SCHEDULE OF CATCH WALL	PREPARED JOEL PAUL C. AVORQUE ENGINEER II	REVIEWED FELIX R. BACUS CHIEF, HIGHWAY DESIGN SECTION DATE	SUBMITTED AGNES M. BARONDA CHIEF, PLANNING AND DESIGN DIVISION DATE	RECOMMENDED MA. MARGARITA C. JUNIA, DM. ASSISTANT REGIONAL DIRECTOR DATE	APPROVED EDGAR B. TABACON, CESO IV REGIONAL DIRECTOR DATE	SET NO. A 18 30	SHEET NO. 18 104



ITEM 506(1) PLAN
NOT DRAWN TO SCALE



DETAIL OF STR. TYPE ITEM 506(1) HEADWALL (for 1-1.220 m Ø RCPC)
NOT DRAWN TO SCALE



ITEM 506(1)
ISOMETRIC VIEW
SCALE NTS

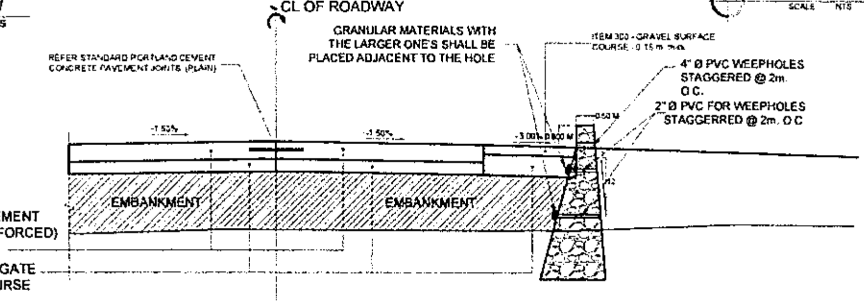
ISOMETRIC VIEW
SCALE NTS

SLOPE STABILITY AND SLOPE PROTECTION CRITERIA
EMBANKMENT PROTECTION PARAMETERS: ITEM 506(1)

ITEM	DESIGN REQUIREMENTS
1. UNIT WEIGHT OF ITEM 506(1), 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 ITEM 506(1), 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

Item No. **506(1)**
Item Description: **STONE MASONRY**

Station	Distance	Area	Volume	EXPOSED SLANT HEIGHT L/S	SURFACE AREA (LEFT SIDE)	EXPOSED SLANT HEIGHT R/S	SURFACE AREA (RIGHT SIDE)
4+540.00							
	958.00 m	94.56 m²	1,831.33 m³	49.77 m	963.07 m²	0.00 m	0.00 m²
5+498.00							
GAP							
6+677.00							
	363.00 m	34.52 m²	420.76 m³	17.86 m	229.70 m²	0.00 m	0.00 m²
7+020.00							
TOTAL			2,229.59 m³	STONE MASONRY SURFACE AREA	1,180.07 m²	STONE MASONRY SURFACE AREA	0.00 m²
CATCHWALL SURFACE AREA							4,072.13 m²
TOTAL SURFACE AREA OF SLOPE PROTECTION							5,252.20 m²

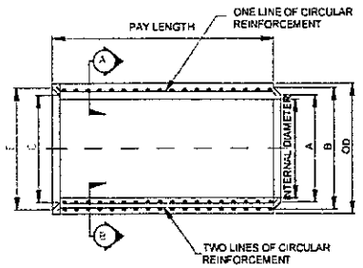


DETAIL OF ITEM 506(1) FOR EMBANKMENT PROTECTION

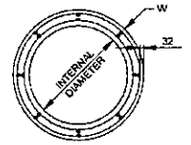
NOTE: (ITEM 506(1))

PRIOR TO CONSTRUCTION CONDUCT SOIL BEARING INVESTIGATION IN ACCORDANCE WITH THE STANDARD TESTING REQUIREMENT ALONG THE ALIGNMENT OF ITEM 506(1) 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 - COASTAL ROADS TO AUGMENT RESILIENCY OF COASTAL COMMUNITIES - CONSTRUCTION OF COASTAL ROAD, PHASE 3, LEYTE - LEYTE TO CAPOOCAN, LEYTE LEYTE 3RD LD	SHEET CONTENTS: ITEM 506(1) DETAILS, DETAILS OF ITEM 506(1) HEADWALL, SCHEDULE OF ITEM 506(1)	PREPARED: JOEL PAUL C. ABORQUE ENGINEER II	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 V REGIONAL DIRECTOR DATE	SET NO A 19 30	SHEET NO 19 104

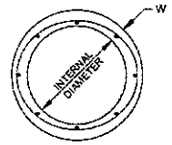


LONGITUDINAL SECTION

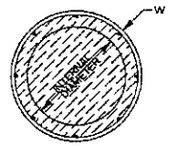


TWO LINES OF CIRCULAR REINFORCEMENT

SECTION A

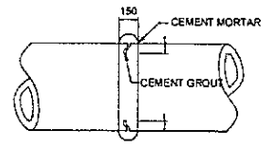


ONE LINE OF ELLIPTICAL REINFORCEMENT

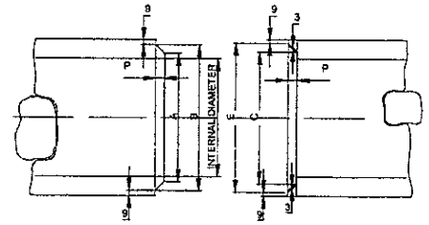


ONE LINE OF CIRCULAR REINFORCEMENT

SECTION B



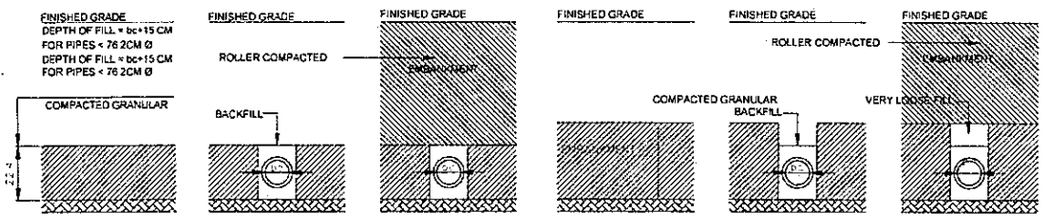
DETAIL OF PIPE COLLAR



TONGUE END GROOVE END

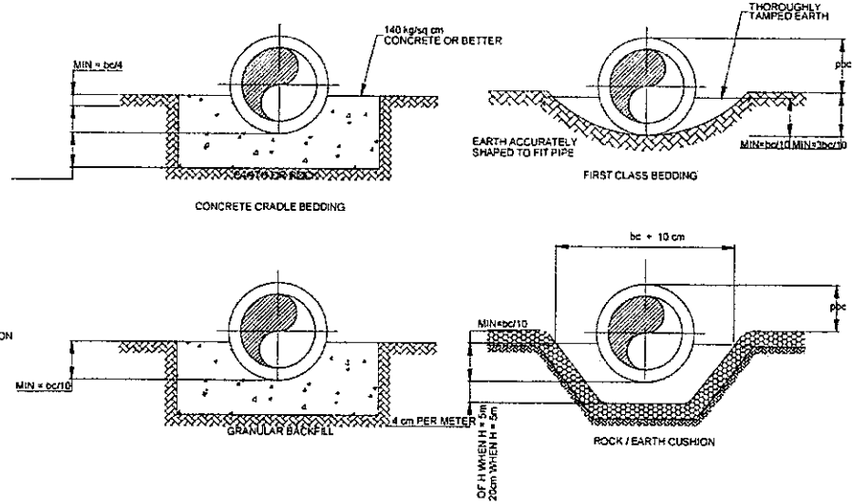
DETAIL OF RCPC ENDS

REINFORCED CONCRETE PIPE CULVERTS



CALIFORNIA METHOD " A "

CALIFORNIA METHOD " B "



DESIGN REQUIREMENT OF REINFORCED CONCRETE PIPE CULVERT

	STANDARD STRENGTH REINFORCED CONCRETE PIPE CULVERTS																		EXTRA STRENGTH REINFORCED CONCRETE PIPE CULVERTS									
	CONCRETE 247 kg/cm2 (3,500 lb/in2)															STRENGTH TEST REQUIREMENTS kg/m OF PIPE			CONCRETE 317 kg/cm2 (4,500 lb/in2)								STRENGTH REQUIREMENTS kg/m OF PIPE	
SIZE OF PIPE (mm)	WALL THICKNESS (mm)	TONGUE (mm)		GROOVE (mm)		DEPTH (mm)	MINIMUM REINFORCEMENT cm2 / m OF PIPE		WALL THICKNESS (mm)	TONGUE (mm)		GROOVE (mm)		DEPTH (mm)	MINIMUM REINFORCEMENT cm2 / m OF PIPE		THREE-EDGE-BEARING METHOD		WALL THICKNESS (mm)	TONGUE (mm)		GROOVE (mm)		DEPTH (mm)	MINIMUM REINFORCEMENT cm2 / m OF PIPE		THREE-EDGE-BEARING METHOD	
I.D	t	A.	B.	C.	E.	P	CIRCULAR REINFORCEMENT	ELLIPTICAL REINFORCEMENT	L	A.	B.	C.	E.	P	CIRCULAR REINFORCEMENT	ELLIPTICAL REINFORCEMENT	0.00025mCRACK LOAD	ULTIMATE LOAD	t	A	B	C	E	P	CIRCULAR REINFORCEMENT	ELLIPTICAL REINFORCEMENT	0.00025m CRACK LOAD	LOAD ULTIMATE
300	57	344	363	351	370	44	1 LINE 3.48		51	495	514	502	521	44	1 LINE 2.56		3.154	5.218										
380	57	344	363	351	370	44	1 LINE 3.90		51	495	514	502	521	44	1 LINE 2.33		3.914	6.06										
460	64	508	527	514	534	44	1 LINE 2.56	1 LINE 2.12	51	495	514	502	521	44	1 LINE 2.96		4.471	6.709										
610	76	673	692	680	699	44	1 LINE 3.80	1 LINE 2.75	64	660	680	667	686	44	1 LINE 4.23	1 LINE 3.60	4.473	7.454	76	673	692	680	699	44	1 LINE 5.50	1 LINE 4.23	5.964	8.945
760	89	853	857	845	864	51	1 LINE 4.66	1 LINE 3.60	76	825	845	832	851	51	1 LINE 5.92	1 LINE 4.44	5.012	8.573	89	838	857	845	864	51	1 LINE 6.56	2 LINE 5.08	7.454	11.182
910	102	1003	1022	1010	1029	64	2 LINES EACH 3.81	1 LINE 3.81	86	148	1007	994	1013	58	2 LINES EACH 4.66	1 LINE 4.66	6.038	9.84	102	1001	1427	1010	1029	58	2 LINES EACH 5.92	1 LINE 5.92	8.945	13.418
1070	114	1158	1187	1175	1194	64	2 LINES EACH 4.44	1 LINE 4.44	95	1150	1165	1156	1175	64	2 LINES EACH 5.29	1 LINE 5.29	7.045	10.958	114	1168	1187	1175	1194	64	2 LINES EACH 6.98	1 LINE 6.98	10.436	15.655
1220	127	1334	1383	1340	1369	64	2 LINES EACH 5.29	1 LINE 5.29		1315	1334	1321	1340	64	2 LINES EACH 8.56	1 LINE 5.56	8.051	11.927	127	1334			1359	64	2 LINES EACH 8.04	1 LINE 8.04	11.927	17.891
1520	152	1664	1083	1670	1690	64	2 LINES EACH 6.98	1 LINE 6.98	127	1630	1650	1645	1663	63	2 LINES EACH 8.68	1 LINE 4.48	8.945	14.908	152	1664			1860	64	2 LINES EACH 10.58	1 LINE 10.58	13.418	22.364

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

PROJECT NAME AND LOCATION: SIPAG - COASTAL ROADS TO AUGMENT RESILIENCY OF COASTAL COMMUNITIES - CONSTRUCTION OF COASTAL ROAD, PHASE 3, LEYTE - LEYTE TO CAPOOCAN, LEYTE
LEYTE SAMAR

SHEET CONTENTS: DETAILS OF STANDARD RCPC

PREPARED: JOEL PAUL C. AVEROUE, ENGINEER I

REVIEWED: FELIX R. BACUS, CHIEF HIGHWAYS ENGINEER, DATE

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

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

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

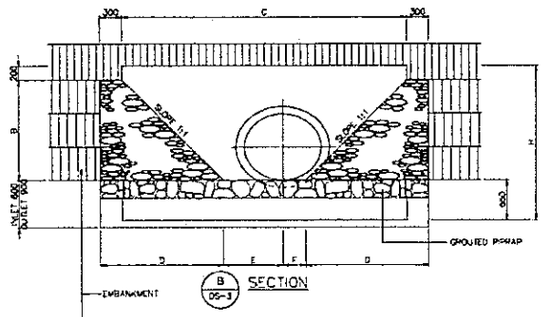
SET NO. 20

SHEET NO. 20 / 104

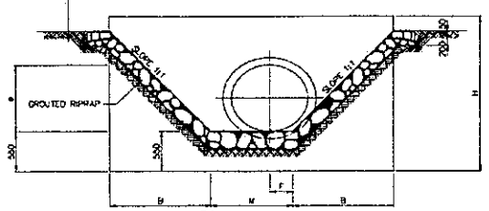
Item No. 500(1)b
Item Description: Pipe Culvert, Class II, RCPC

Drainage Schedule - Reinforced Concrete Pipe Culvert

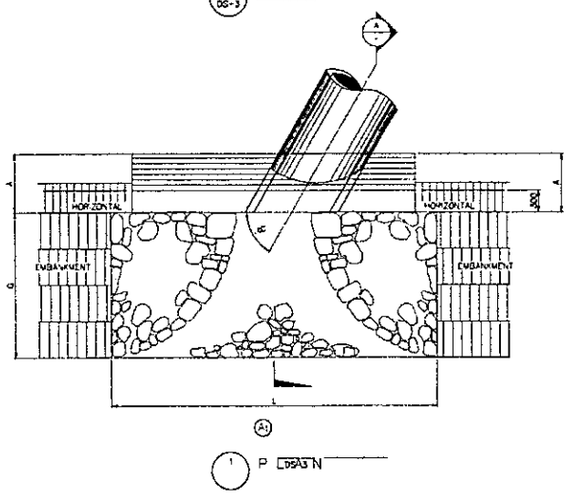
Type of Structure	Size	Alignment Reference	Side	Station	Length	QTY	FOR HEADWALL, ITEM 506(1) (Cu.m.)		Remarks
			Left Side, Right Side, Cross Drain	M	M	EACH	LEFT SIDE	RIGTH SIDE	
RCPC, 1 ROW	1.22MM Ø	Centerline Alignment	Cross Drain	4+550.00	19.00	1.00	Computation included in Stone Masonry	-	Install 1 Row RCPC, Stone Masonry Headwall on Both Sides
RCPC, 1 ROW	1.22MM Ø	Centerline Alignment	Cross Drain	5+420.00	19.00	1.00	Computation included in Stone Masonry	-	Install 1 Row RCPC, Stone Masonry Headwall on Both Sides
Total					38.00	2.00			



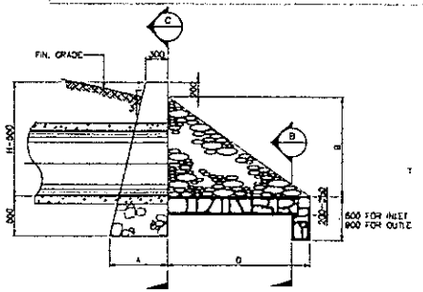
B / DS-3 SECTION



C / DS-3 SECTION



A1 / 1 PLAN

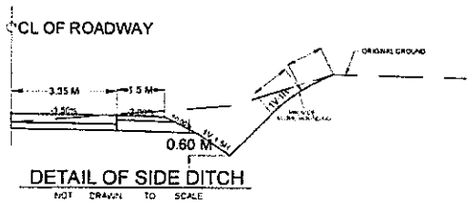


A / DS-3 SECTION

INLET OR OUTLET HEADWALL DIMENSIONS FOR SINGLE BARREL AND MULTI BARREL RCP

PIPE DIAMETER (mm)			610	760	910	1070	1220	1520
COMMON TO ALL SKEW		H	2060	2210	2360	2520	2670	2970
		A	987	1037	1087	1140	1190	1290
		B	1310	1460	1610	1770	1920	2220
		D	1610	1760	1910	2070	2220	2520
∝ = 60°	COMMON TO ALL BARREL	E	770	890	1010	1140	1260	1510
		F	230	290	350	410	470	590
		J*	1410	1760	2100	2470	2820	3520
	SINGLE BARREL	C	3820	4100	4580	5090	5570	6540
		M	1000	1160	1360	1550	1730	2100
	DOUBLE BARREL	C	5030	5860	6680	7550	8390	10050
		M	2410	2940	3480	4020	4550	5610
	TRIPLE BARREL	C	6440	7620	8780	10030	11210	13560
		M	3820	4700	5560	6490	7370	9120
∝ = 45°	COMMON TO ALL BARREL	E	1390	1590	1780	2000	2200	2600
		F	280	360	430	500	570	720
		J*	1750	2150	2570	3030	3450	4300
	SINGLE BARREL	C	4290	4870	5430	6040	6610	7760
		M	1670	1950	2210	2500	2770	3320
	DOUBLE BARREL	C	6020	7020	8000	9070	10060	12060
		M	3400	4100	4780	5530	6220	7620
	TRIPLE BARREL	C	7750	9170	10570	12100	13510	16350
		M	5130	6250	7350	8560	9670	11820
∝ = 30°	COMMON TO ALL BARREL	E	2000	2150	2300	2500	2650	2800
		F	410	510	610	710	810	1010
		J*	2440	3040	3640	4260	4880	6080
	SINGLE BARREL	C	5030	5580	6130	6750	7300	8250
		M	2410	2660	2910	3210	3460	3810
	DOUBLE BARREL	C	7470	8620	9770	11030	12180	14330
		M	4850	5700	6550	7490	8340	9890
	TRIPLE BARREL	C	9910	11660	13410	15310	17060	20410
		M	7290	8740	10190	11770	13220	15970
G FOR VARIOUS SLOPE OF EMBANKMENT		3/2	1970	2190	2420	2660	2880	3330
		2/1	2620	2920	3220	3540	3840	4440
		3/1	3930	4380	4830	5310	5760	6660
		4/1	5240	5840	6440	7080	7680	8880

* - FOR MULTI BARRELS ONLY.



DETAIL OF SIDE DITCH
NOT DRAWN TO SCALE

HYDROLOGIC ANALYSIS AND HYDRAULIC PARAMETERS

SIDE DITCH

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	0.22
K. VELOCITY, V	6.27 m/s
L. DESIGN DISCHARGE, Q_D	2.766 cu.m./sec

1 ROW -1220 MM Ø PIPE CULVERT

ITEM	DESIGN REQUIREMENTS
1. DESIGN STORM FREQUENCY	10 years
2. COEFFICIENT OF RUN-OFF, C	0.30
3. RAINFALL INTENSITY, I	209.99 mm/hr
4. CATCHMENT AREA, A	0.150 sq.km
5. RUN-OFF DISCHARGE, Q	2.3564 cu.m/sec
6. DIAMETER, D	0.91 m
7. DEPTH OF FLOW, H	0.82
8. SLOPE, S	0.04423
9. ROUGHNESS COEFFICIENT, N	0.013
10. WETTED PERIMETER, P	2.57297
11. HYDRAULIC RADIUS, R	0.23
12. VELOCITY, V	4.25 m/s
13. DESIGN DISCHARGE, Q	2.369 cu.m./sec
14. INLET CONTROL, HW/D	28.50 m
15. OUTLET CONTROL, HW	4.50 m
16. OUTLET VELOCITY	3.61 m/s

1 ROW - 1220 MM Ø PIPE CULVERT

ITEM	DESIGN REQUIREMENTS
1. DESIGN STORM FREQUENCY	10 years
2. COEFFICIENT OF RUN-OFF, C	0.30
3. RAINFALL INTENSITY, I	210.52 mm/hr
4. CATCHMENT AREA, A	0.146 sq.km
5. RUN-OFF DISCHARGE, Q_R	2.5548 cu.m/sec
6. DIAMETER, D	0.91 m
7. DEPTH OF FLOW, H_1	0.82
8. SLOPE, S	0.04423
9. ROUGHNESS COEFFICIENT, N	0.018
10. WETTED PERIMETER, P	2.57297
11. HYDRAULIC RADIUS, R	0.23
12. VELOCITY, V	4.65 m/s
13. DESIGN DISCHARGE, Q	2.436 cu.m./sec
14. INLET CONTROL, HW/D	28.50 m
15. OUTLET CONTROL, HW	4.50 m
16. OUTLET VELOCITY	3.61 m/s

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

PROJECT NAME AND LOCATION: SIPAD - COASTAL ROADS TO AUGMENT RESILIENCY OF COASTAL COMMUNITIES - CONSTRUCTION OF COASTAL ROAD, PHASE 3, LEYTE - LEYTE TO CAPOOCAN, LEYTE
LEYTE 3RD LD

SHEET CONTENTS: DETAILS OF STANDARD RCPC

PREPARED: JOEL PAUL C. AVERQUE, ENGINEER V

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

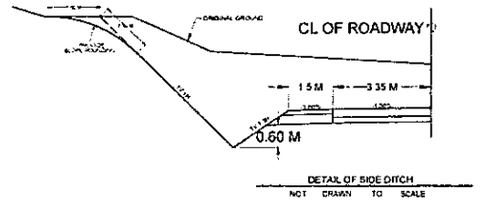
SUBMITTED: ASHLEY V. BALDERAS, CHIEF, PLANNING AND DESIGN DIVISION, DATE

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

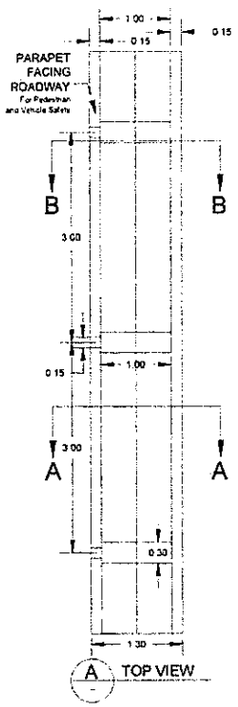
APPROVED: EDGAR B. TABACON, CESO IV, REGIONAL DIRECTOR, DATE

SET NO: A (21 | 30)

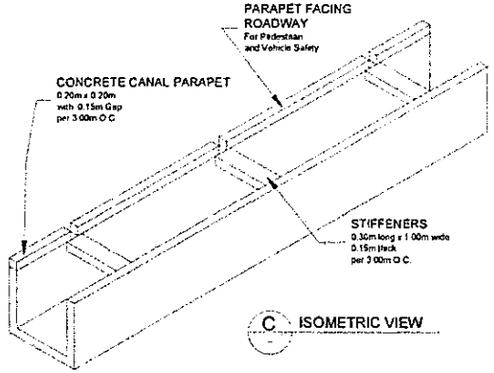
SHEET NO: 21 / 104



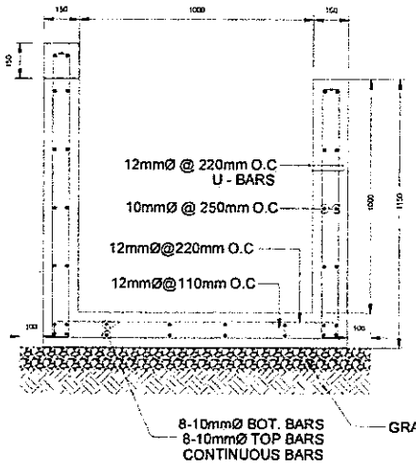
DETAIL OF SIDE DITCH
NOT DRAWN TO SCALE



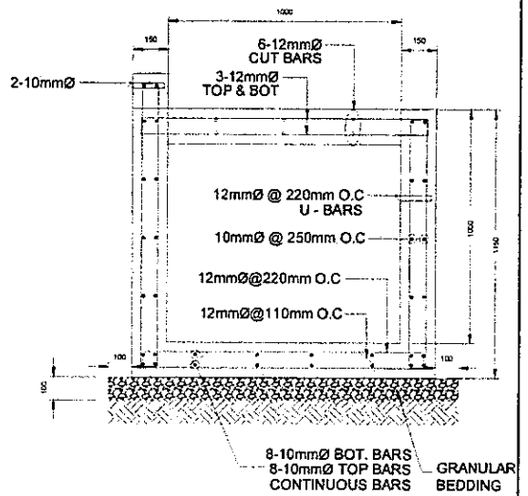
A TOP VIEW



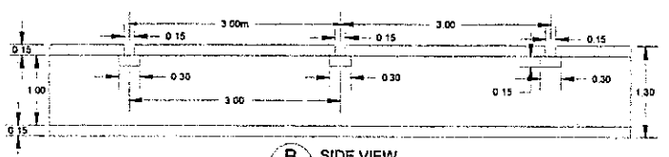
C ISOMETRIC VIEW



1 REINFORCED CONCRETE CANAL SECTION "A-A" (1.0m x 1.0m)
SCALE



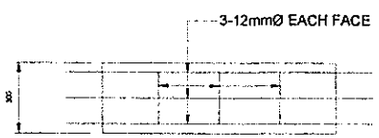
2 REINFORCED CONCRETE CANAL SECTION "B-B" (1.0m x 1.0m)
SCALE



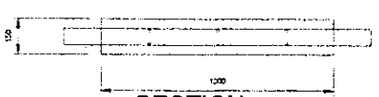
B SIDE VIEW

Item No. 500(3)a
Item Description: Lined Canal, Rectangular, Reinforced Concrete

Station	Distance	Location	Total Distance
	RIGHT SIDE		
4+540.00	958.00 m	Right Side	958.00 m
5+498.00			
	GAP		
6+677.00	343.00 m	Right Side	343.00 m
7+020.00			
4+730.00	120.00 m	Left Side	120.00 m
4+850.00			
	GAP		
5+090.00	240.00 m	Left Side	240.00 m
5+330.00			
	GAP		
7+190.00	100.00 m	Left Side	100.00 m
7+290.00			
	TOTAL		1,661.00 m³
	SAY		1,661.00 m³



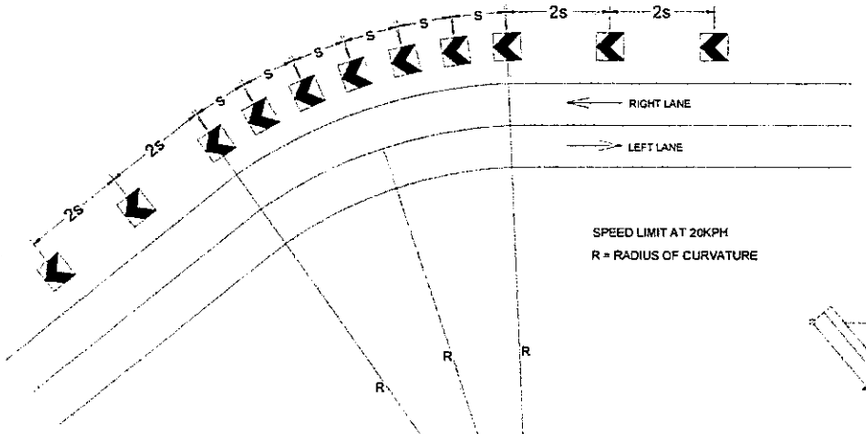
DETAIL PLAN



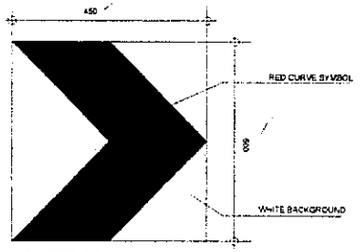
SECTION

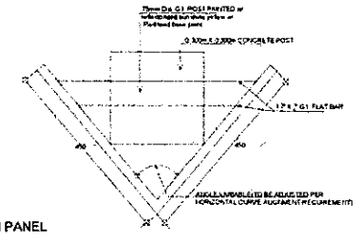
3 STIFFENER DETAILS
SCALE

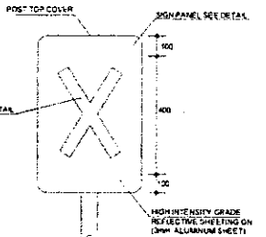
REPUBLIC OF THE PHILIPPINES DEPARTMENT OF PUBLIC WORKS AND HIGHWAYS REGIONAL OFFICE NO. VIII BARAS, PALO, LEYTE	PROJECT NAME AND LOCATION SIPAG - COASTAL ROADS TO AUGMENT RESILIENCY OF COASTAL COMMUNITIES - CONSTRUCTION OF COASTAL ROAD, PHASE 3, LEYTE - LEYTE TO CAPOOCAN, LEYTE LEYTE 3RD LD	SHEET CONTENTS DETAILS OF CATCH BASIN, DETAILS OF LINED CANAL WITH COVER, DETAILS OF CURB AND GUTTER	PREPARED JOEL PAUL C. AVOQUE ENGINEER II	REVIEWED FELIX R. BACUS CHIEF HIGHWAY DESIGN SECTION DATE	SUBMITTED AGNES B. BARONDA CHIEF PLANNING AND DESIGN DIVISION DATE	RECOMMENDED MA. MARGARITA C. JUNIA, DMD ASSISTANT REGIONAL DIRECTOR DATE	APPROVED EDGAR B. TABACON, CESO IV REGIONAL DIRECTOR DATE	SET NO A 22 30	SHEET NO 22 104



PLAN
SCALE NTS

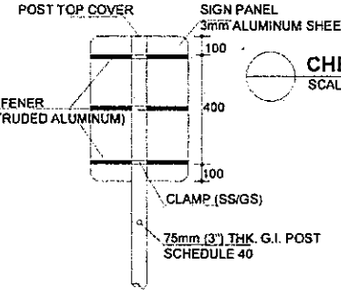




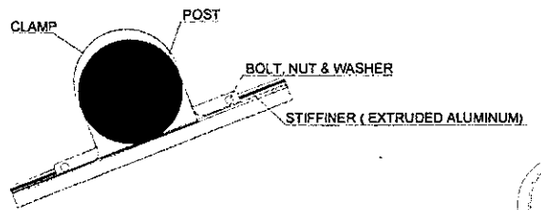


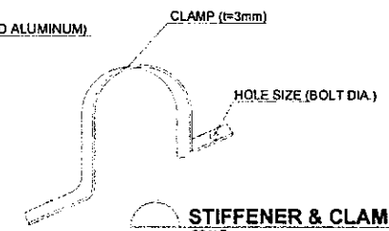
NOTE: ALL POSTS SHALL BE THOROUGHLY CLEANED, FREE FROM GREASE, SCALE AND RUSTS AND SHALL BE GIVEN ONE COAT OF RUST-INHIBITING PRIMING PAINT AND TWO COATS OF GRAY PAINT IN ACCORDANCE W/ ITEM 411, PAINT DPWH STANDARD SPEC.

THE NUMBER OF HAZARD MARKERS PER CURVE MAY BE CHANGED IF DEEMED NECESSARY. SPECIAL CARE SHOULD BE EXERCISED IN THE PLACEMENT OF SAID SIGNS TO ENSURE THEY ARE PROMINENTLY DISPLAYED TO APPROACHING DRIVERS.

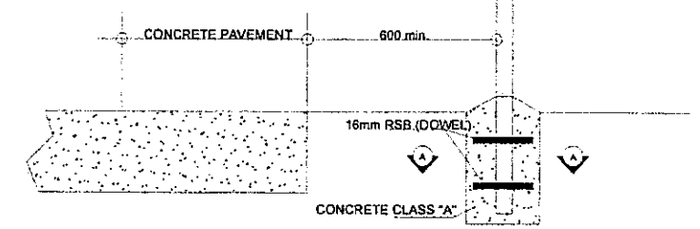


CHEVRON SIGN DETAILS
SCALE NTS





STIFFENER & CLAMP DETAILS
SCALE 1:5



SECTION A-A

RECOMMENDED SPACING FOR CHEVRON SIGNS

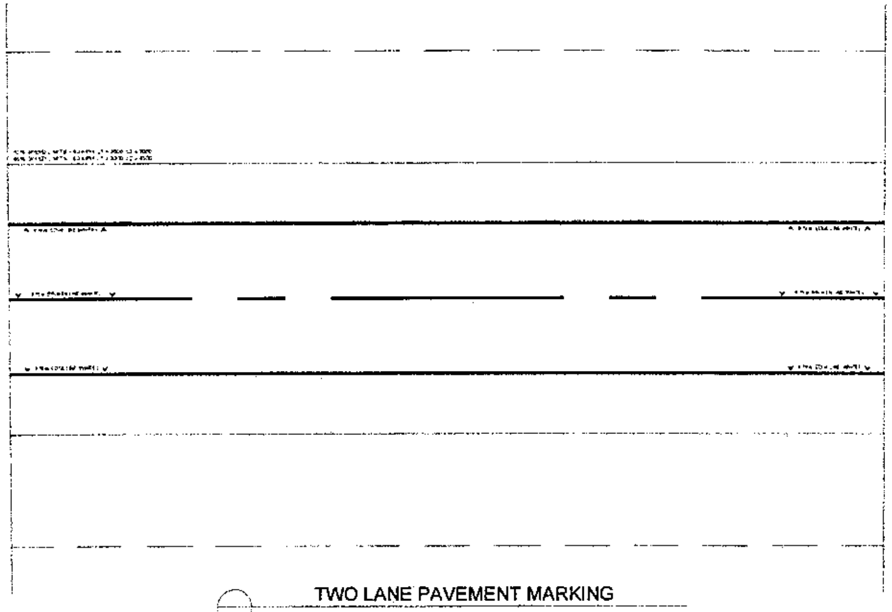
Advisory Speed limit (Kph)	Radius (m)	Chevron Spacing (m)
≤ 20	≤ 60	12
30-50	60-120	24
60-70	120-210	36
80-90	210-300	48
> 90	> 300	60

1. The above spacing distances shall apply to points within the curve. Approach and departure spacing distances shall be twice those shown above.

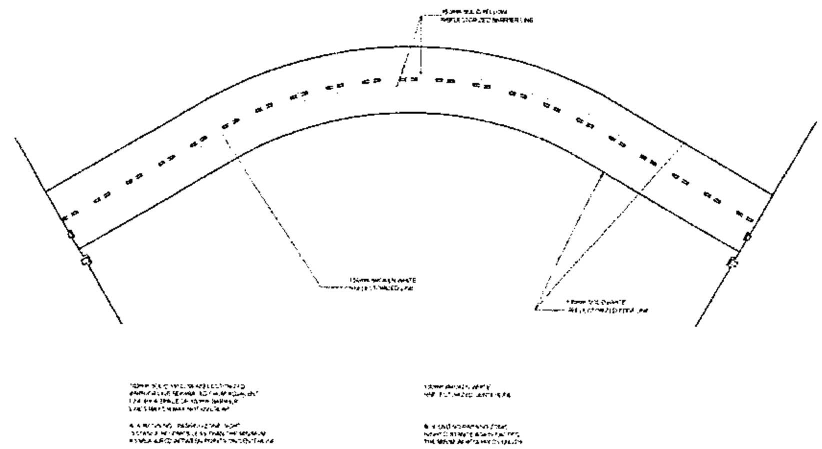
Item No. 603(6)a1
Item Description: Hazard Markers, 450x600 mm Chevron Signs — 36.00 Each

STATION PC	STATION PT	Tangent Distance (T)	Radius (R)	Length of curve (Lc)	CHEVRON SPACING (s)	Total Length of Curve	No. of Chevron
4+540.000	4+567.392	60.000	278.125	27.39	48	27.39	5
5+020.655	5+100.200	40.000	304.646	79.54	60	79.54	6
5+229.437	5+314.586	43.221	232.830	85.47	48	85.47	6
5+363.946	5+423.853	30.000	439.444	59.91	60	59.91	5
5+461.410	5+492.463	15.685	98.402	31.05	24	31.05	4
6+837.298	6+864.364	13.597	113.000	27.06	24	27.06	6
6+995.141	7+029.000	27.564	113.000	24.86	24	24.86	4
						No. of Chevrons:	36.00 Each

REPUBLIC OF THE PHILIPPINES DEPARTMENT OF PUBLIC WORKS AND HIGHWAYS REGIONAL OFFICE NO. VIII BARAS, PALO, LEYTE	PROJECT NAME AND LOCATION SIPAG - COASTAL ROADS TO AUGMENT RESILIENCY OF COASTAL COMMUNITIES - CONSTRUCTION OF COASTAL ROAD, PHASE 3, LEYTE - LEYTE TO CAPOOCAN LEYTE LEYTE 3RD LD	SHEET CONTENTS TYPICAL DETAIL FOR ROAD SIGN POST STIFFENER AND CLAMP DETAILS CHEVRON SIGN DETAILS	PREPARED JOEL PAUL C. AVORQUE ENGINEER	REVIEWED FELIX E. ERCUS CHIEF, HIGHWAY DESIGN SECTION DATE	SUBMITTED AGNES M. BARONDA CHIEF, PLANNING AND DESIGN DIVISION DATE	RECOMMENDED MA. MARGARITA C. JUNIA, DM. ASSISTANT REGIONAL DIRECTOR DATE	APPROVED EDGAR B. TABACON, CESO IV REGIONAL DIRECTOR DATE	SET NO A 23 30	SHEET NO 23 104



TWO LANE PAVEMENT MARKING



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

NOT TO SCALE

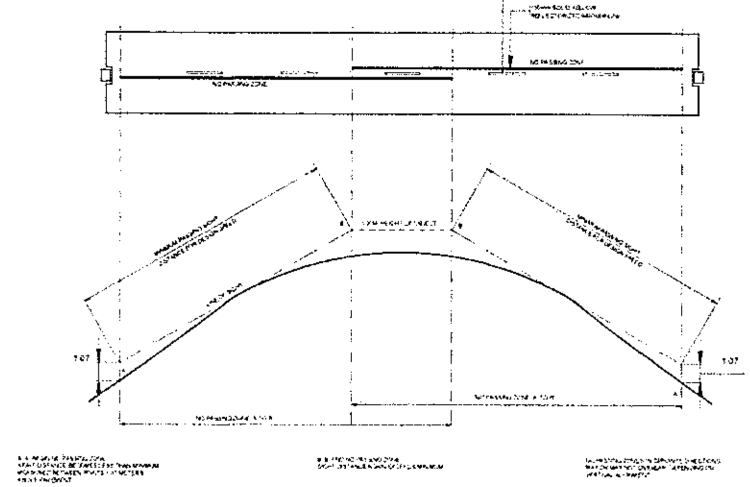
Item No. : 612(1)

Item Description: Reflectorized Thermoplastic Pavement Markings White

Station		Distance
4+540.00	5+498.00	958.00 m
6+677.00	7+020.00	343.00 m
	Total:	**1,301.00**

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	728
120	792

PAVEMENT MARKING APPLICATION OF NO PASSING ZONES



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

NOT TO SCALE

Item No. : 612(2)

Item Description: Reflectorized Thermoplastic Pavement Markings Yellow

Station		Distance
4+540.00	4+590.00	50.00 m
5+000.00	5+120.00	120.00 m
5+210.00	5+335.00	125.00 m
5+340.00	5+445.00	105.00 m
5+440.00	5+515.00	75.00 m
	Total:	**475.00**

STANDARD PAVEMENT MARKING

NOT TO SCALE

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SITE CONDITION:

A PROPOSED 3.12 KILOMETER ROAD OPENING / NETWORK DEVELOPMENT WITH SLOPE PROTECTION WORKS HAS THE FOLLOWING ROAD CONSTRUCTION AND TRAFFIC CONDITIONS TO BE CONSIDERED

ROAD LOCATION	RURAL AREA
DIRECTION OF THE TRAFFIC	TWO WAY TRAFFIC
NUMBER OF TRAFFIC	TWO LANES
MAXIMUM SPEED OF VEHICLES	20 KPH (LOW SPEED)
DESIGN STRENGTH OF CONCRETE FOR THE PCCP	14-DAYS CONCRETE

PROPOSED TRAFFIC MANAGEMENT LAYOUT

IN THIS CONDITION, THE ROADWAY SET- UP OR LAYOUT IS PLANNED TO BE 100 METERS IN LENGTH

ILLUSTRATED BELOW IS THE PROPOSED TRAFFIC MANAGEMENT SCHEME WITH A SINGLE SET-UP OPERATING THROUGH THE STRETCH UNTIL ALL CONSTRUCTION WORKS ARE COMPLETED.

LAYOUT FOR CONSTRUCTION OF NEW ROAD
PARRALEL TO AN EXISTING ROAD

NOT TO SCALE

TRAFFIC MANAGEMENT PLAN

NOT TO SCALE

LEGEND:

– (T2-25)

NOTES:

SAME SET-UP OF TRAFFIC MANAGEMENT LAYOUT APPLIES AS THE WORK PROGRESSES UP TO THE ENTIRE STRETCH UNTIL THE NEWLY CONSTRUCTED STRUCTURE MAY BE OPENED FOR TRAFFIC

DURING ACTUAL CONSTRUCTION, NECESSARY ADJUSTMENTS MAY BE MADE IN THE ILLUSTRATION AS PRESENTED HEREIN. CONSIDERATIONS SHOULD BE GIVEN IN THE AVAILABLE SPACE, EXISTING STRUCTURES, TRAFFIC AND OTHER FACTORS TO ALLOW SAFE MOBILITY OF WORKERS, EQUIPMENT, PEDESTRIANS, AND OTHER ROAD USERS DURING CONSTRUCTION OPERATION TO PROVIDE THE APPROPRIATE SIGNAGE, BARRIERS, AND THE NECESSARY TRAFFIC DEVICES

REPUBLIC OF THE PHILIPPINES DEPARTMENT OF PUBLIC WORKS AND HIGHWAYS REGIONAL OFFICE NO. VIII BARAS, PALO, LEYTE	PROJECT NAME AND LOCATION: SIPAG - INTERJURISDICTIONAL ROADS AND/OR BRIDGES (ROADS THAT TRAVERSE MULTIPLE LGU JURISDICTIONS) CONSTRUCTION OF ROAD, BARANGAY PADANG - BARANGAY CANCILEDES, HERNANI EASTERN SAMAR EASTERN SAMAR	SHEET CONTENTS: TRAFFIC MANAGEMENT PLAN	PREPARED: JOEL PAUL C. AVORQUE ENGINEER II 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	SHEET NO. 5 A 25 30

Item No. 611(3)

Item Description: **Seedlings/Saplings for Other Programs/Initiatives** = **10,700.00 pcs.**

NOTE: DENR Memorandum Order No. 2012-02 dated November 05, 2012 requires the uniform ratio for cut or relocated trees which shall be 1:50 for planted trees in private and forest lands and 1:100 for naturally growing trees found on the same areas for them to issue a Tree Cutting Permit.

TREES	Coconut Trees	Premium Trees
Small, 150 - 300 mm dia.	41.00 pcs.	70.00 pcs.
Small, 301 - 500 mm dia.	12.00 pcs.	29.00 pcs.
Small, 501-750 mm dia.	0.00 pcs.	8.00 pcs.
TOTAL	53.00 pcs.	107.00 pcs.
No. of Trees to be planted:		**10,700.00 pcs.**

NOTE: Coconut Trees that are removed shall be replaced by coconut seedlings which will be taken from PCA. Coconut seedlings are free of charges.

Item No. 622(2)b
Item Description: **Coco-logs/Fascine CN 200**

Station	Distance	Slant Height	Number of Pieces	Length
4+740.00				
	100.00 m	116.45 m	239	1245.00 m
4+840.00				
4+980.00				
	440.00 m	624.81 m	1272	7,464.00 m
5+420.00				
6+677.00				
	263.00 m	442.08 m	900	5,020.20 m
6+940.00				
7+000.00				
	20.00 m	19.29 m	40	252.00 m
7+020.00				

Item No. 622(1)a
Item Description: **Coco-net, CN 400**

Station	Distance	Slant Height	Area
4+740.00			
	100.00 m	116.45 m	2,027.14 m²
4+840.00			
4+980.00			
	440.00 m	624.81 m	12,226.18 m²
5+420.00			
6+677.00			
	263.00 m	442.08 m	8,235.18 m²
6+940.00			
7+000.00			
	20.00 m	19.29 m	409.16 m²
7+020.00			
		TOTAL	22,897.66 m²
		SAY	22,897.66 m²

CONSTRUCTION OF SAFETY AND HEALTH

PURSUANT TO DPWH D. O. NO. 56 SERIES OF 2005 AND IN CONSONANCE WITH DOLE D.O. NO. 13, SERIES OF 1998. GUIDELINES ARE SET COVERING OCCUPATIONAL SAFETY AND HEALTH IN CONSTRUCTION INDUSTRY.

THE CONTRACTOR IS REQUIRED TO FORM A SAFETY AND HEALTH COMMITTE TO LOOK FOR THE GENERAL WELFARE OF THE WORKERS THROUGH THE IMPLEMENTATION PERIOD OF THE PROJECT. THE HEALTH AND SAFETY COMMITTEE MUST BE COMPOSED OF CHAIRMAN (DESIGNATED BY THE CONTRACTOR). LICENSED/ACCREDITED PART TIME SAFETY PRACTITIONER, ACCREDITED FIRST AIDER AND MEMBERS (PROBABLY ALL WORKERS).

PRIOR TO START OF PROJECT, THE COMMITTEE WILL SET A MEETING TO TACKLE THE SAFETY AND HEALTH PROGRAM SET FORTH IN THIS PARTICULAR PROJECT RULES AND REGULATION ARE ALSO EXPLAINED AND ITS CORRESPONDING CONSEQUENCES SHOULD THERE BE VIOLATION.

THE CONTRACTOR IS REQUIRED TO PROVIDE THE FOLLOWING:

1. BUNK HOUSE WITH COMFORT ROOM
2. LIGHTS AND POTABLE WATER
3. MEDICAL SPACE FOR FIRST AIDE TREATMENT
4. MEDICAL SUPPLY (FIRST AIDE TREATMENT)
5. PERSONAL PROTECTIVE EQUIPMENT
6. SAFETY SIGNAGES
7. BODEGA FOR MATERIALS STOCK FILLING
8. HEAVY EQUIPMENT IN GOOD CONDITION

AS A PART OF SAFETY REQUIREMENTS, COMPETENT HEAVY EQUIPMENT OPERATOR IS REQUIRED AND MUST BE TESDA ACCREDITED.

PERSONAL PROTECTIVE EQUIPMENT


SAFETY SHOES

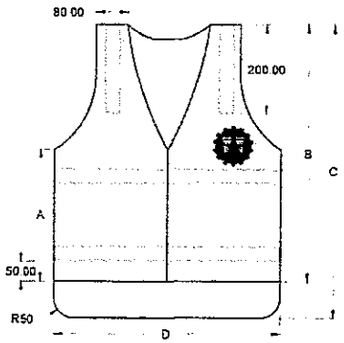

SAFETY GLOVES


SAFETY HELMET

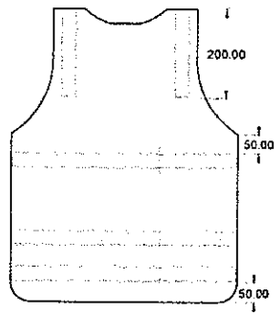

SAFETY BOOTS


TRAFFIC SAFETY VEST

SAFETY VEST SHOULD BE
- WORN AT ALL TIMES WHILE WORKING ON OR NEAR THE ROADWAY
- PROPERLY FASTENED
- CLEAN AND IN GOOD CONDITION



FRONT



BACK

	A	B	C	D
MEDIUM	280	600	750	580
LARGE	295	625	775	610
EXTRA LARGE	310	650	800	640

FABRIC

1.) A KNITTED ACRYLIC FABRIC ; C
2.) A WOVEN NYLON MESH

PETRO-REFLECTIVE MATERIALS

1.) SHALL BE 50mm WIDE OF FLUO
2.) 2 HORIZONTAL STRIPS ON THE
3.) 3 HORIZONTAL STRIPS ON THE

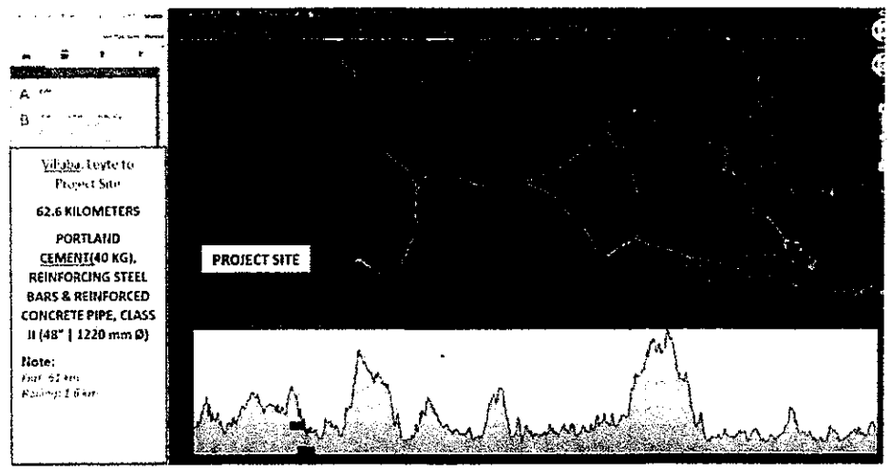
ZIP

1.) THE ZIP IS TO BE FITTED TO FRONT OF THE GARMENT WITH THI OPENING AT THE BOTTOM OF GARMENT

LOGO

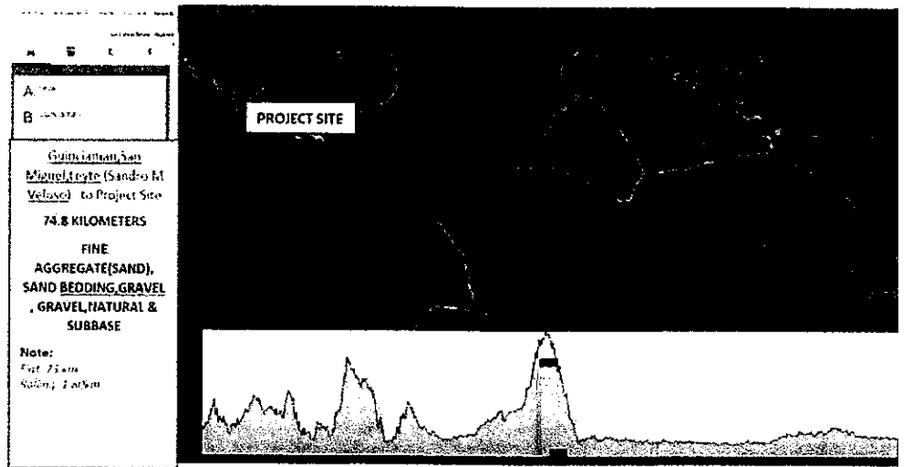
1.) SAFETY VEST WORN BY DPI PERSONNEL HAVE A DPWH LOGO OF APPROXIMATELY 80mm DIAMETER.

REPUBLIC OF THE PHILIPPINES DEPARTMENT OF PUBLIC WORKS AND HIGHWAYS REGIONAL OFFICE NO. VIII BARAS, PALO, LEYTE	PROJECT NAME AND LOCATION SIPAG - INTERJURISDICTIONAL ROADS AND/OR BRIDGES (ROADS THAT TRAVERSE MULTIPLE LGU JURISDICTIONS) CONSTRUCTION OF ROAD, BARANGAY PADANG - BARANGAY CANCILEDES, HERNANI EASTERN SAMAR EASTERN SAMAR LD	SHEET CONTENTS ROAD WORK SITE TEMPORARY SIGNAGE & CONSTRUCTION OF SAFETY & HEALTH	PREPARED JOEL PAUL C. AVOGUE ENGINEER DATE	REVIEWED FELIX R. BACUS CHIEF HIGHWAY DESIGN SECTION DATE	SUBMITTED AGNES M. BARONDA CHIEF PLANNING AND DESIGN DIVISION DATE	RECOMMENDED MA. MARGARITA C. LUNIA, D.M. ASSISTANT REGIONAL DIRECTOR DATE	APPROVED EDGAR B. TABACON, CESO IV REGIONAL DIRECTOR DATE	SET NO. A 25 / 30



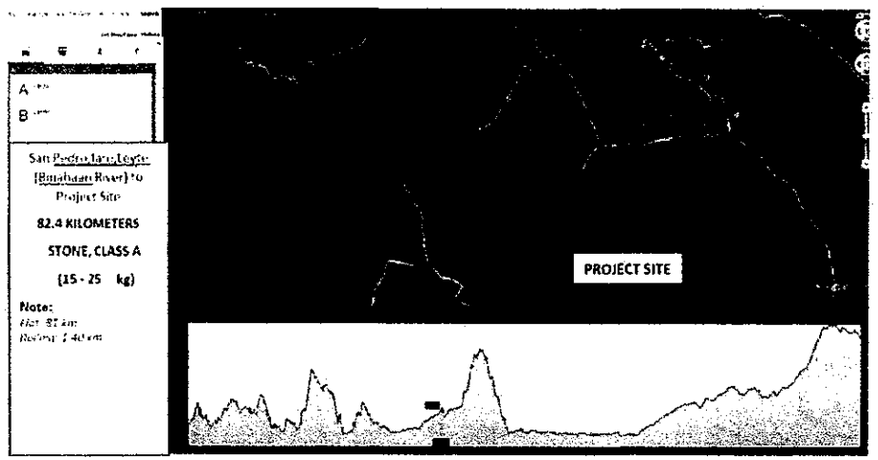
Reference: Google Earth Pro

Note: FLAT TERRAIN – 0% - 10%, ROLLING TERRAIN – 10% - 25%
Source: https://www.slideshare.net/slideshow/design-of-highway-highway-engineering-chapter-2/



Reference: Google Earth Pro

Note: FLAT TERRAIN – 0% - 10%, ROLLING TERRAIN – 10% -
Source: https://www.slideshare.net/slideshow/design-of-highway-highway-engineering-chapter-2/



Reference: Google Earth Pro

Note: FLAT TERRAIN – 0% - 10%, ROLLING TERRAIN – 10% - 25%
Source: https://www.slideshare.net/slideshow/design-of-highway-highway-engineering-chapter-2/

SOURCE MAP

REPUBLIC OF THE PHILIPPINES DEPARTMENT OF PUBLIC WORKS AND HIGHWAYS REGIONAL OFFICE NO. VIII BARAS, PALO, LEYTE	PROJECT NAME AND LOCATION: SIPAG - COASTAL ROADS TO AUGMENT RESILIENCY OF COASTAL COMMUNITIES - CONSTRUCTION OF COASTAL ROAD, PHASE 3, LEYTE - LEYTE TO CAPOOCAN, LEYTE LEYTE 2021	SHEET CONTENTS: SOURCE MAP	PREPARED: JOEL PAUL C. ENORQUE ENGINEER	REVIEWED: FELIX R. BACUS CHIEF HIGHWAYS 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	SHEET NO. 27 / 30

COCONET: MATERIAL REQUIREMENTS

A. **COCONUT COIR** - COIR FOR USE IN MAKING OF COCONETS AND COCOLOGS SHALL BE OF GRADES CH-3 AND/OR CH-2 IN ACCORDANCE WITH PNS/BAFPS 21:2008 ICS 59.060.10.

B. **COCONET AND COCO-LOG/FASCINE** - COCONET AND COCOLOG TO BE USED SHALL CONFORM WITH TABLES 1 AND 2, RESPECTIVELY.

TABLE 1: PHYSICAL PROPERTIES OF COCONET

PROPERTIES		COCONET 400	COCONET 700	COCONET 900
Minimum thickness, mm		10.0 + 1.0	10.0 + 1.0	10.0 + 1.0
Minimum width, m*		1.0	1.0	1.0
Minimum length, m*		25.0	25.0	25.0
Weight per square meter, g/m2 at 18-24% MC		400 + 20	700 + 35	900 + 45
Diameter of twine, mm (mechanically or manually spun)		5.0 + 1.0	5.0 + 1.0	5.0 + 1.0
No. of twines/m, (min)	Crosswise Direction**	40	40	70
	Lengthwise Direction***	40	70	70
Color		Woven netting made from high strength 100% coconut fiber twine Natural Earth Tone		
Tensile Strength, N/twine, (min)		150	150	150
Elongation, (min)	(Machine Direction), %	26	34	42
	(Cross Machine Direction), %	32	38	32
"C" Factor		0.002	0.002	0.002
Applicability in terms of water velocity (surface run-off), m/s, (min)		2.7	3.35	4.26
Water Absorption, 0/0, (min)		163	148	132
Applicability in terms of slope inclination		Less than or equal to 1:1 (45° and below)	Greater than 1:1 to 1:1.5 (46° to 60°)	Greater than 1:1.5 (61° to 70°)

NOTE *IN CASES WHERE THE NEEDED WIDTH OR LENGTH ARE BELOW THE MINIMUM, CUTTING IS ALLOWED EITHERCROSSWISE OR LENGTHWISE PROVIDED THAT THE ENDS OF EVERY TWO SUCCEEDING CUT TWINES ARE SECURELY LOCKED BY TYING TOGETHER.
** WEFT-THE CROSSWISE TWINES ON A LOOM OVER AND UNDER WHICH OTHER TWINES ARE PASSED.
*** WARP-THE LENGTHWISE TWINES ON A LOOM OVER AND UNDER WHICH THE WEFT ARE PASSED.
"C" FACTOR - SAFETY FACTOR

TABLE 1: PHYSICAL PROPERTIES OF COCO-LOG/FASCINE

TYPE	DIAMETER (MIN) (CM.)	WEIGHT (MIN) (KG/M)	MAX. WATER VELOCITY (SURFACE runoff) Resitability, m/sec
coco-log 100	10	2.0	2.0
coco-log 200	20	4.5	4.5
coco-log 300	30	10	10
coco-log 400	40	20	20
coco-log 500	50	30	30

NOTE ALL COCOLOGS MUST BE MADE OF 100% COIR FIBER NETTING WITH AT LEAST 2.5 EM EYE AND FILLED WITH 60% GRADEE COCOPEAT COVERED WITH 40% GRADE CH-WCOIR

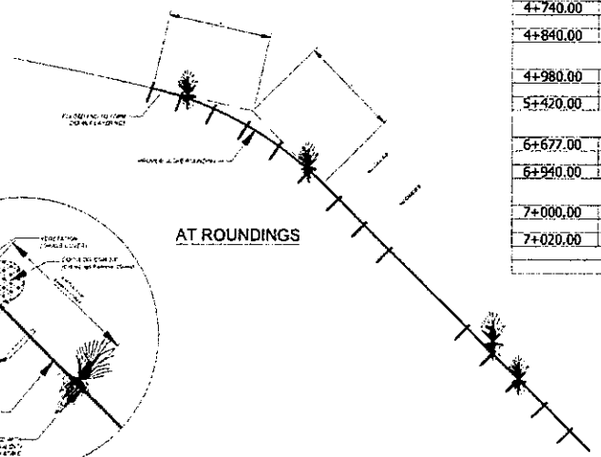
C. **BACKFILL** - BACKFILL SHALL BE IN ACCORDANCE WITH THE APPROVED PLAN AND SHALL CONFORM TO THE REQUIREMENTS OF ITEM 104 --- EMBANKMENT.

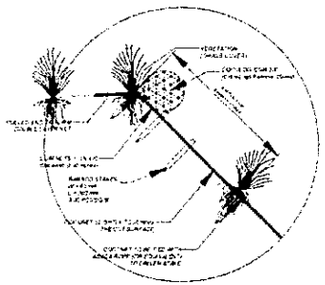
D. **BAMBOO STAKES** - BAMBOO STAKES SHALL BE MATURED WITH HEAD MEASURING AT LEAST 60 MM WIDE AND 30 MM LONG; NOTCH, AT LEAST 20 MM; AND BODY, AT LEAST 40 MM WIDE AND 300 MM LONG TAPERED AND SHARPENED AT THE END. THE HEAD SHALL COINCIDE WITH THE BAMBOO NODES TO ENSURE STRENGTH. STAKES SHALL BE EMBEDDED ON GROUND SO THAT ONLY THE NOTCH STICKS OUT FROM THE TOP OF THE COCONETS TO HOLD THE COCONETS IN PLACE. FOR COCOLOGS, STAKES LENGTH EQUIVALENT TO 1.5 TIMES THE DIAMETER SHALL BE ADDED.

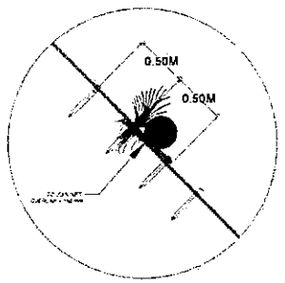
E. **LIVE PLANT STAKES (LIVE KAKAWATE "MADRE DE CACAO" OR IPIL-IPIL OR EQUIVALENT SPECIES)** - LIVE PLANT STAKES SHALL BE KEPT MOIST AND PLANTED WITHIN THE DAY WHEN PREPARED AND SHALL BE 20 MM TO 40 MM IN DIAMETER AND 300 TO 500 IN LENGTH FOR CUT SLOPE AND 500 MM TO 1,000MM IN LENGTH FOR EMBANKMENTS.

Item No. **622(3)a**
Item Description: **Vegetable, Grass-Cover**

Station	Distance	Slant Height	Area
4+740.00			
	100.00 m	116.45 m	2,027.14 m²
4+840.00			
4+980.00			
	440.00 m	624.81 m	12,226.18 m²
5+420.00			
6+677.00			
	263.00 m	442.08 m	8,235.18 m²
6+940.00			
7+000.00			
	20.00 m	19.29 m	409.16 m²
7+020.00			
		TOTAL	22,897.66 m²
		SAY	22,897.66 m²





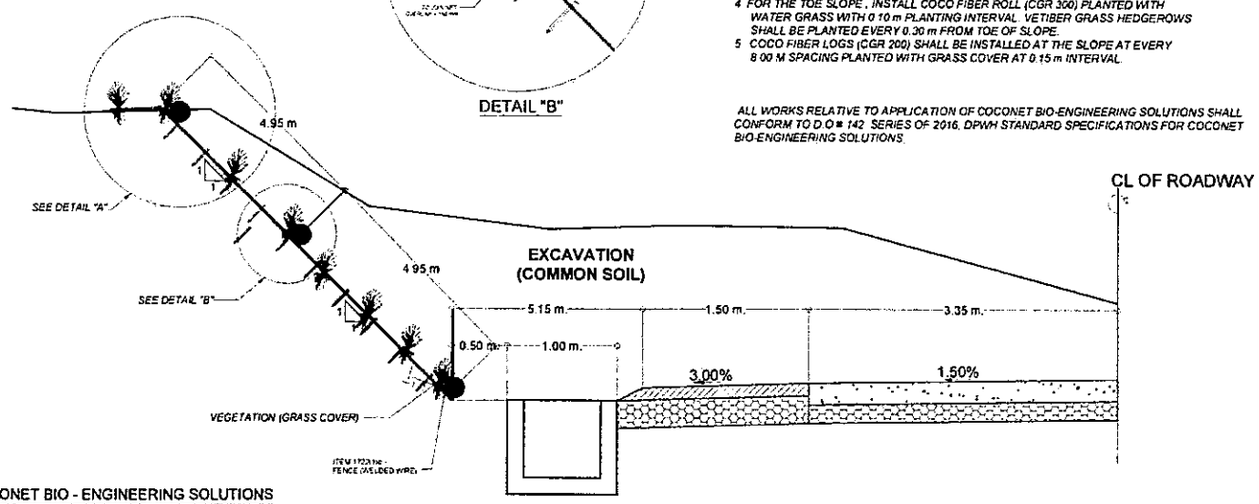


NOTE:
TO AVOID TEARING OF NET, APPLY MODERATE TENSION. UNIFORMLY STRETCH NET (BOTH DIRECTION)

GENERAL NOTES:

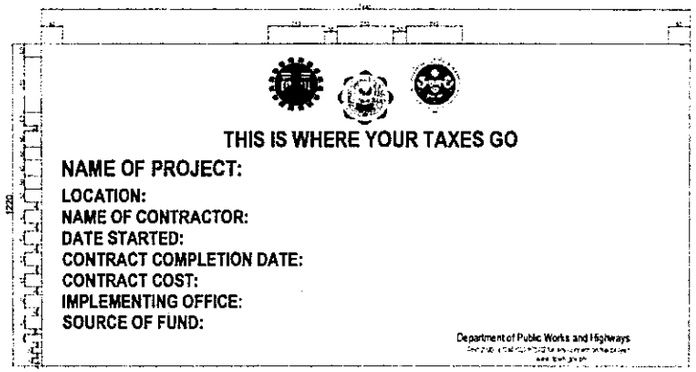
1 ALL DIMENSIONS ARE IN METERS UNLESS OTHERWISE SPECIFIED
2 EROSION CONTROL NET / COCONET (CGN 400) SHALL BE USED FOR THE SLOPE PROTECTION ANCHORED WITH BAMBOO STAKES AT 3 PCS PER SQ.M.
3 GRASS COVER SHALL BE INSTALLED AT EVERY 1.00 m SPACING WITH 0.15 M PLANTING INTERVAL O.C
4 FOR THE TOE SLOPE , INSTALL COCO FIBER ROLL (CGR 300) PLANTED WITH WATER GRASS WITH 0.10 m PLANTING INTERVAL. VETIBER GRASS HEDGEROWS SHALL BE PLANTED EVERY 0.30 m FROM TOE OF SLOPE.
5 COCO FIBER LOGS (CGR 200) SHALL BE INSTALLED AT THE SLOPE AT EVERY 8.00 M SPACING PLANTED WITH GRASS COVER AT 0.15 m INTERVAL.

ALL WORKS RELATIVE TO APPLICATION OF COCONET BIO-ENGINEERING SOLUTIONS SHALL CONFORM TO D.O.# 142 SERIES OF 2016, DPWH STANDARD SPECIFICATIONS FOR COCONET BIO-ENGINEERING SOLUTIONS.



TYPICAL SECTIONS FOR COCONET BIO - ENGINEERING SOLUTIONS
SCALE NTS

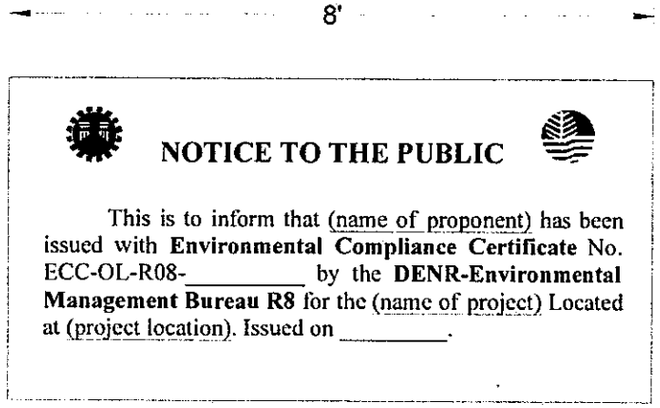
REPUBLIC OF THE PHILIPPINES DEPARTMENT OF PUBLIC WORKS AND HIGHWAYS REGIONAL OFFICE NO. VIII BARAS, PALO, LEYTE	PROJECT NAME AND LOCATION: SIPAG - COASTAL ROADS TO AUGMENT RESILIENCY OF COASTAL COMMUNITIES - CONSTRUCTION OF COASTAL ROAD, PHASE 3, LEYTE - LEYTE TO CAPOOCAN, LEYTE (LEYTE 3RD LD)	SHEET CONTENTS: TYPICAL SECTIONS FOR COCONET BIO - ENGINEERING SOLUTIONS	PREPARED: JOEL [illegible] ENGINEER II	REVIEWED: FELIX R. BACUS, CHIEF HIGHWAYS DESIGN SECTION, DATE	SUBMITTED: AGNES M. BARONDA, CHIEF PLANNING AND DESIGN DIVISION, DATE	RECOMMENDED: MA. MARGARITA E. JUNIA, DM, ASSISTANT REGIONAL DIRECTOR, DATE	APPROVED: EDGAR B. TABAGON, CESO IV, REGIONAL DIRECTOR, DATE	SET NO: A (28 30)	SHEET NO: 28 / 104



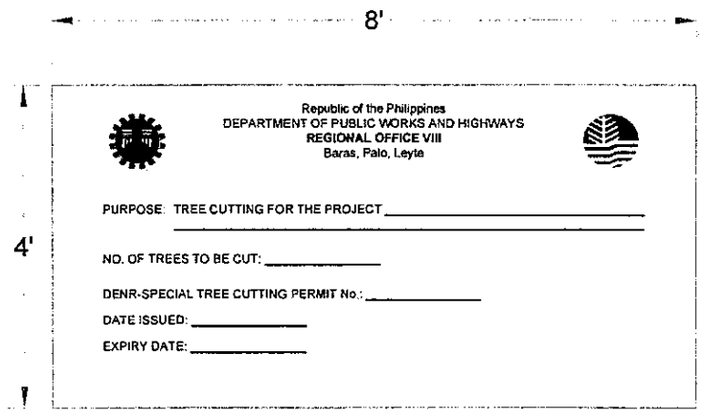
DPWH STANDARD PROJECT BILLBOARD

NOTE:

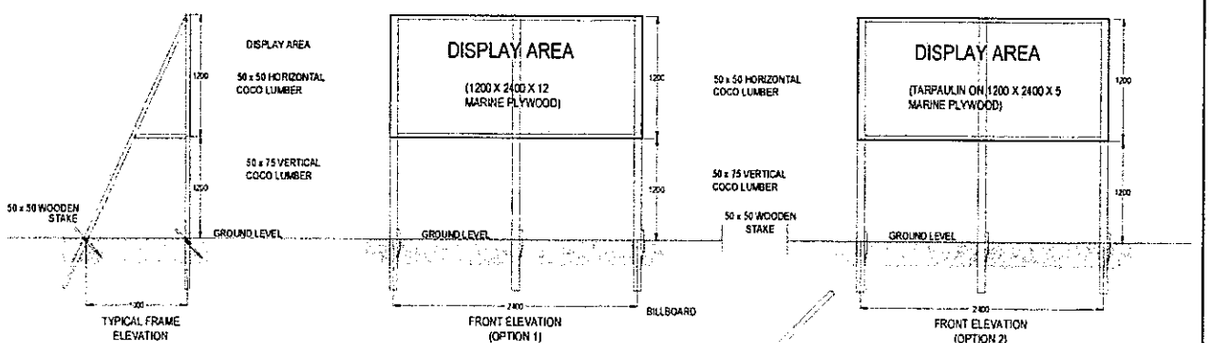
INSTALLATION OF BILLBOARD SHALL CONFORM WITH
DEPARTMENT ORDER NO 37, SERIES OF 2010
INSTALLATION OF REVISED PROJECT BILLBOARDS

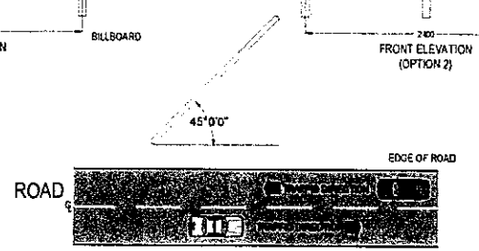


ECC BILLBOARD (4' x 8')



SPECIAL TREE CUTTING PERMIT BILLBOARD (4' x 8')

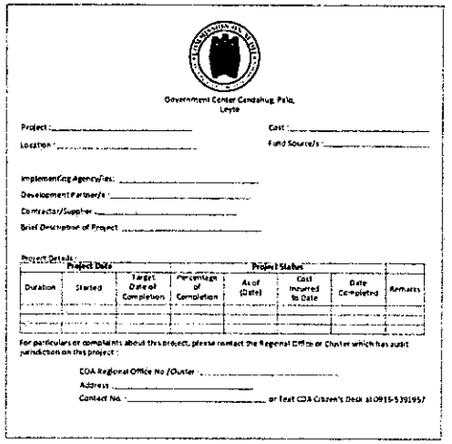




BILLBOARD FRAME

(NOT TO SCALE, ALL DIMENSIONS ARE IN MILLIMETERS)

REPUBLIC OF THE PHILIPPINES DEPARTMENT OF PUBLIC WORKS AND HIGHWAYS REGIONAL OFFICE NO. VIII BARAS, PALO, LEYTE	PROJECT NAME AND LOCATION SIPAG - COASTAL ROADS TO AUGMENT RESILIENCY OF COASTAL COMMUNITIES - CONSTRUCTION OF COASTAL ROAD, PHASE 3, LEYTE - LEYTE TO CAPOOCAN, LEYTE LEYTE 3RD LD	SHEET CONTENTS PROJECT BILLBOARD/SIGNBOARD	PREPARED JOEL PAUL O. ENORQUE DRAFTSMAN	REVIEWED FELIX R. BACUS CHIEF HIGHWAYS REGULATION DATE	SUBMITTED AGNES M. BARONDA CHIEF PLANNING AND DESIGN DIVISION DATE	RECOMMENDED MA. MARGARITA C. LUNIA, D.M. ASSISTANT REGIONAL DIRECTOR DATE	APPROVED EDGAR B. TABACON, CESO IV REGIONAL DIRECTOR DATE	SET NO A 29 30	SHEET NO 29 104


Government Center Candahug, Palo, Leyte

Project : _____ Cost : _____

Location : _____ Fund Source/s : _____

Implementing Agency/ies : _____

Development Partner/s : _____

Contractor/Supplier : _____

Brief Description of Project : _____

Project Details :

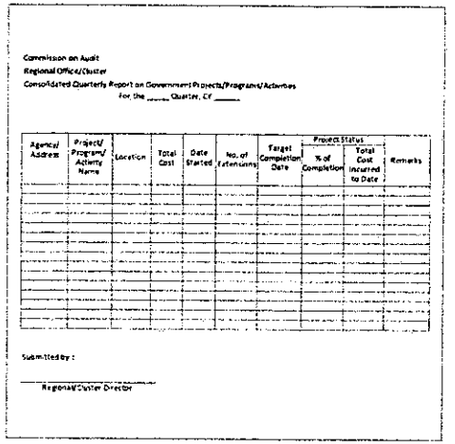
Project Data				Project Status			
Duration	Started	Target Date of Completion	Percentage of Completion	As of (Date)	Cost Incurred to Date	Date Completed	Remarks

For particulars or complaints about this project, please contact the Regional Office or Cluster which has audit jurisdiction on this project :

COA Regional Office No /Cluster : _____

Address : _____

Contact No. : _____ or Text COA Citizen's Desk at 0915-5391957


Commission on Audit

Regional Office/Cluster

Consolidated Quarterly Report on Government Projects/Programs/Activities

For the _____ Quarter, CY _____

Agency/ Address	Project/ Program/ Activity Name	Location	Total Cost	Date Started	No. of Extensions	Project Status			Remarks
						Target Completion Date	% of Completion	Total Cost Incurred to Date	

Submitted by :

_____

Regional/Cluster Director

SPECIFICATIONS :

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Sub-Information - 1"
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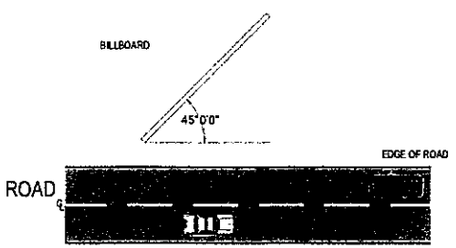
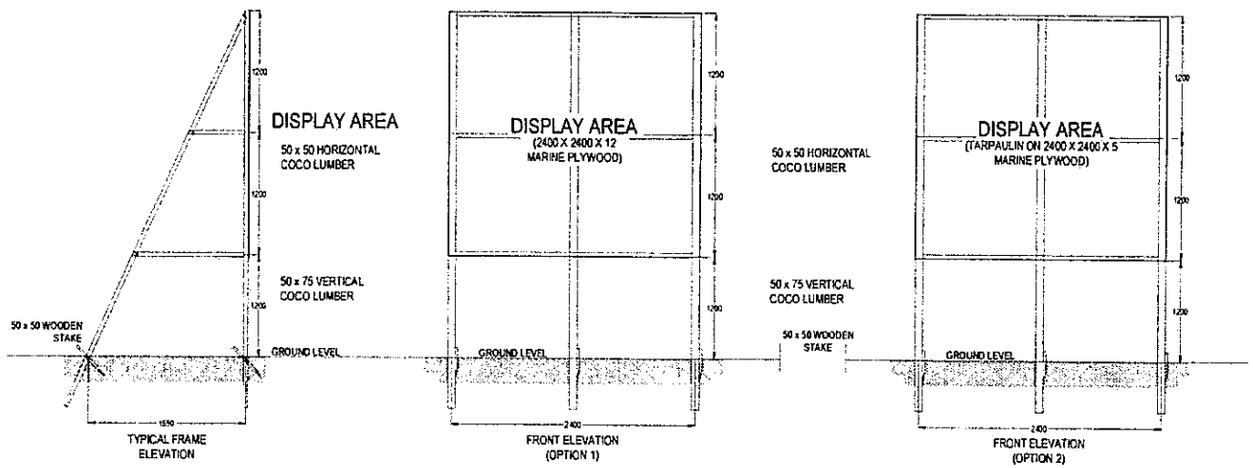
COA STANDARD PROJECT BILLBOARD

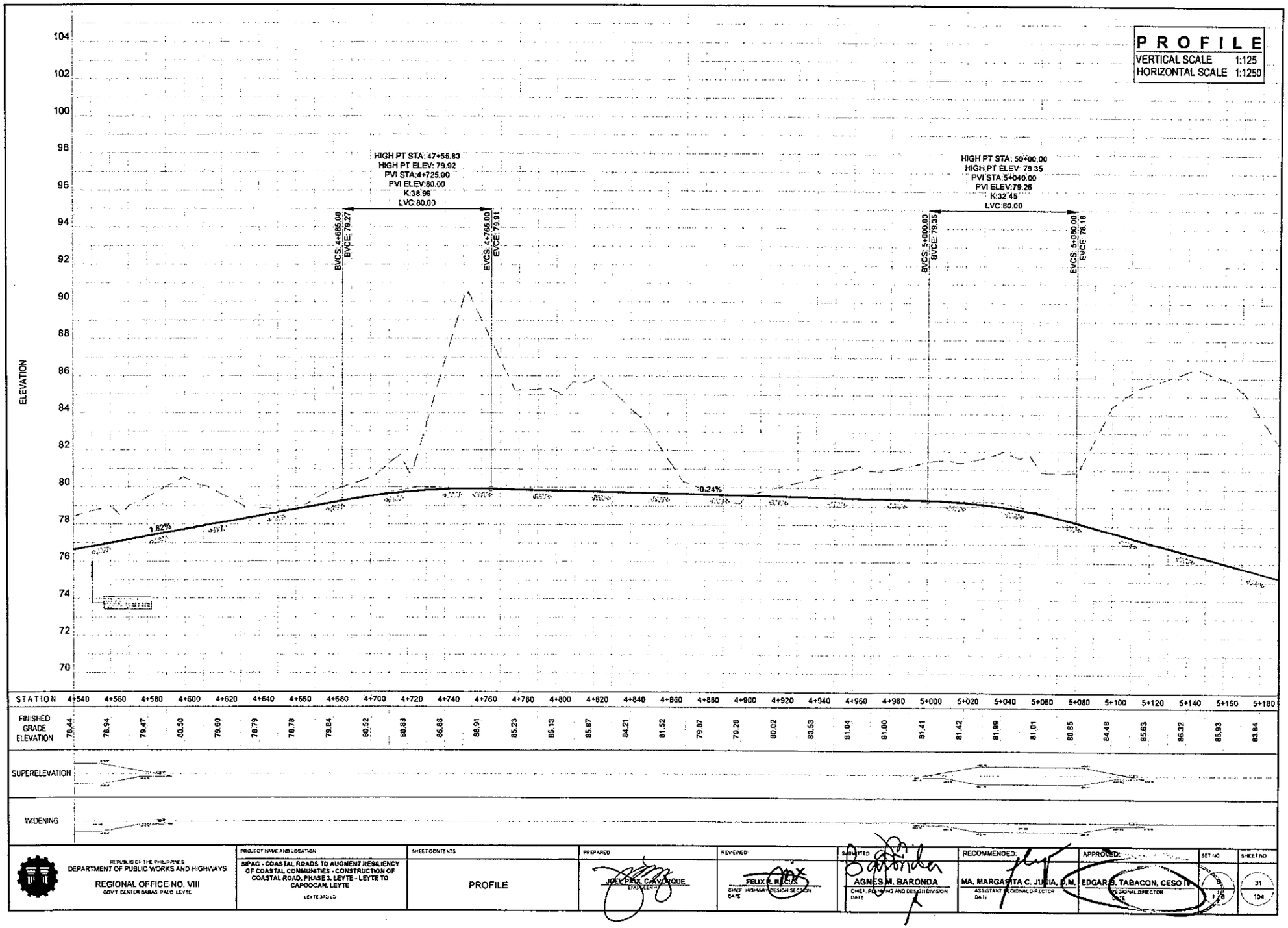




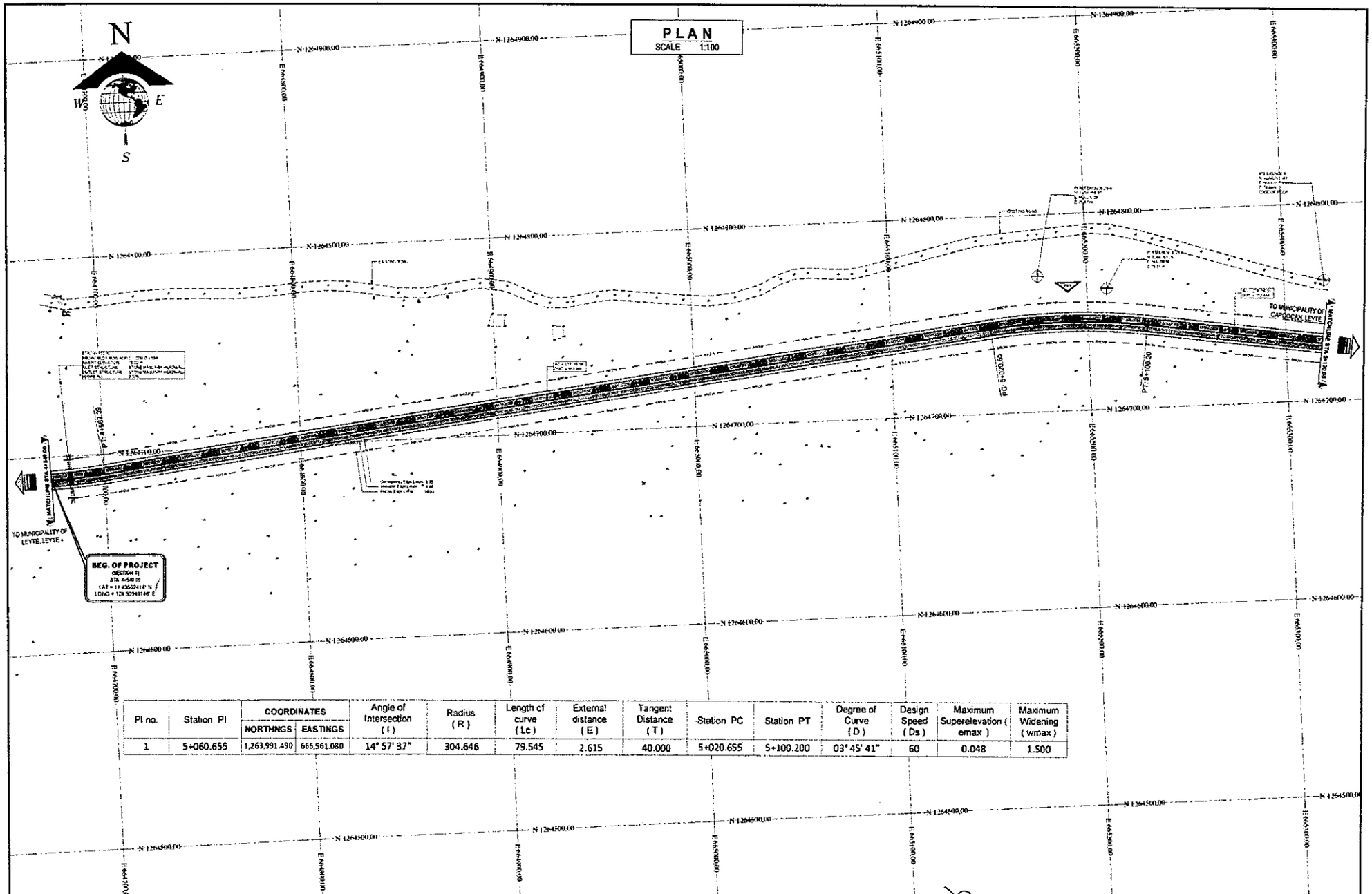
BILLBOARD FRAME

(NOT TO SCALE. ALL DIMENSIONS ARE IN MILLIMETERS)

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 - COASTAL ROADS TO AUGMENT RESILIENCY OF COASTAL COMMUNITIES - CONSTRUCTION OF COASTAL ROAD, PHASE 3, LEYTE - LEYTE TO GAPOOCAN, LEYTE (LEYTE 3RD D3)	PROJECT BILLBOARD/SIGNBOARD	JOEL PAUL C. APORQUE ENGINEER II	FELIX R. RACUS CHIEF, HIGHWAYS DESIGN SECTION DATE	AGNES M. BARONDA CHIEF PLANNING AND DESIGN DIVISION DATE	MA. MARGARITA C. LUNA, E.M. ASSISTANT REGIONAL DIRECTOR DATE	EDGAR B. TABACON, CESO IV REGIONAL DIRECTOR DATE	A 30 30	30 104



REPUBLIC OF THE PHILIPPINES DEPARTMENT OF PUBLIC WORKS AND HIGHWAYS REGIONAL OFFICE NO. VIII GOVT CENTER BARAS PALO LEYTE	PROJECT NAME AND LOCATION SIPAG - COASTAL ROADS TO AUGMENT RESILIENCY OF COASTAL COMMUNITIES - CONSTRUCTION OF COASTAL ROAD, PHASE 1, LEYTE - LEYTE TO CAPOOCAN, LEYTE LEYTE 3RD LD	SHEET CONTENTS PROFILE	PREPARED JOEL PAUL CAVERIQUE ENGINEER II	REVIEWED FELIX R. BICUS CHIEF, HIGHWAY DESIGN SECTION DATE	SUBMITTED AGNES M. BARONDA CHIEF, PLANNING AND DESIGN DIVISION DATE	RECOMMENDED: MA. MARGARITA C. JUCIA, D.M. ASSISTANT REGIONAL DIRECTOR DATE	APPROVED: EDGAR B. TABACON, CESO IV REGIONAL DIRECTOR DATE	SET NO 8 9 10	SHEET NO 31 104



PI no.	Station PI	COORDINATES		Angle of Intersection (I)	Radius (R)	Length of curve (Lc)	External distance (E)	Tangent Distance (T)	Station PC	Station PT	Degree of Curve (D)	Design Speed (Ds)	Maximum Superelevation (emax)	Maximum Widening (wmax)
		NORTHINGS	EASTINGS											
1	5+060.655	1,263,991.490	666,561.080	14° 57' 37"	304.646	79.545	2.615	40.000	5+020.655	5+100.200	03° 45' 41"	60	0.048	1.500

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

PROJECT NAME AND LOCATION: SIPAG - COASTAL ROADS TO AUGMENT RESILIENCY OF COASTAL COMMUNITIES - CONSTRUCTION OF COASTAL ROAD, PHASE 3, LEYTE - LEYTE TO CAPOCAN, LEYTE
LEYTE 3RD L.D

SHEET CONTENTS: PLAN

PREPARED: JOEL PAUL C. NAVARQUE, ENGINEER II

REVIEWED: FELIX E. BACOS, CHIEF, HIGHWAY DIVISION SECTION, DATE

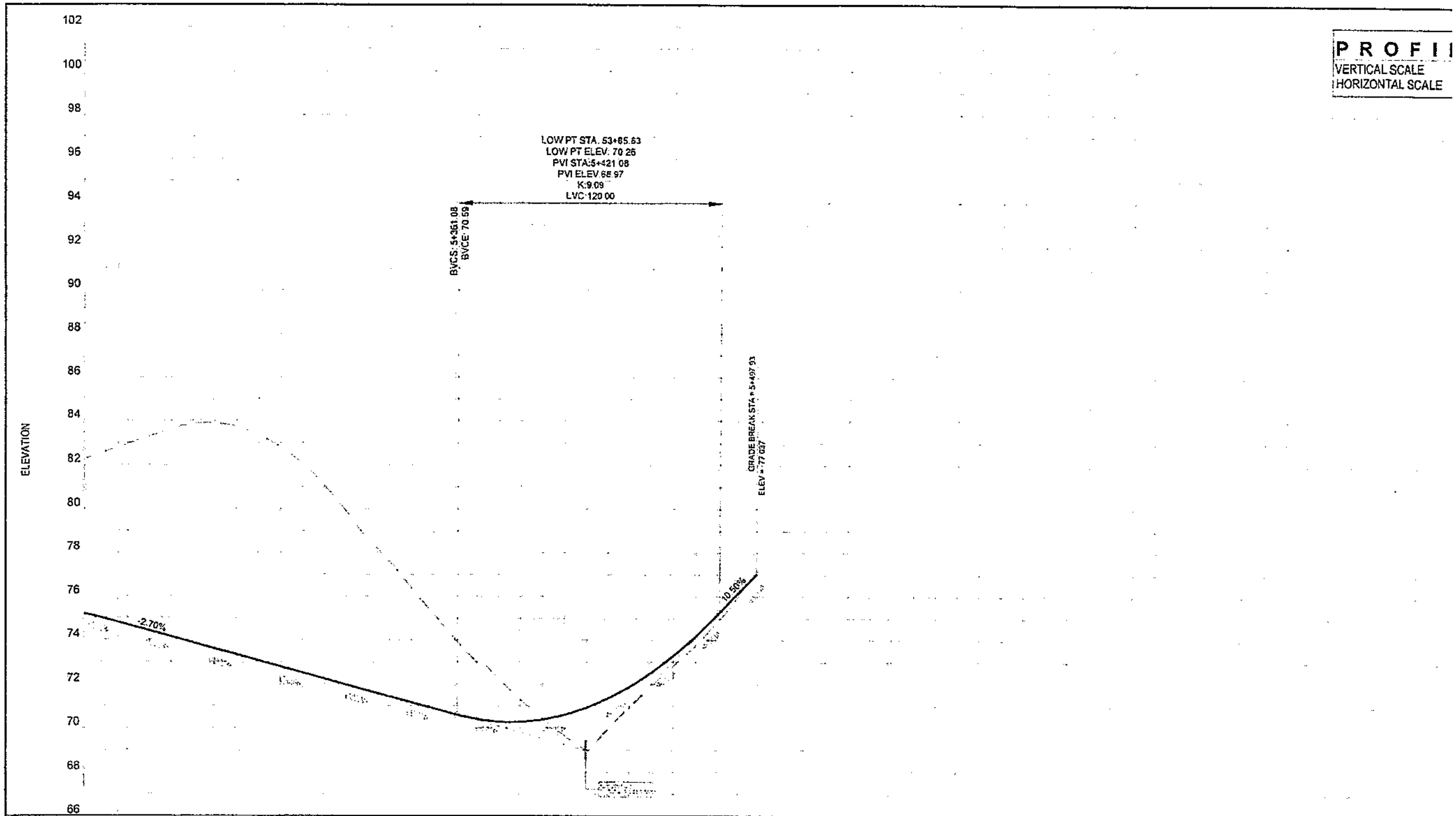
SUBMITTED: AGNES M. BARONDA, CHIEF, PLANNING AND DESIGN DIVISION, DATE

RECOMMENDED: MA. MARGARITA C. UNIA, PhD, ASSISTANT REGIONAL DIRECTOR, DATE

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

SET NO: 8 of 8

SHEET NO: 32 / 104

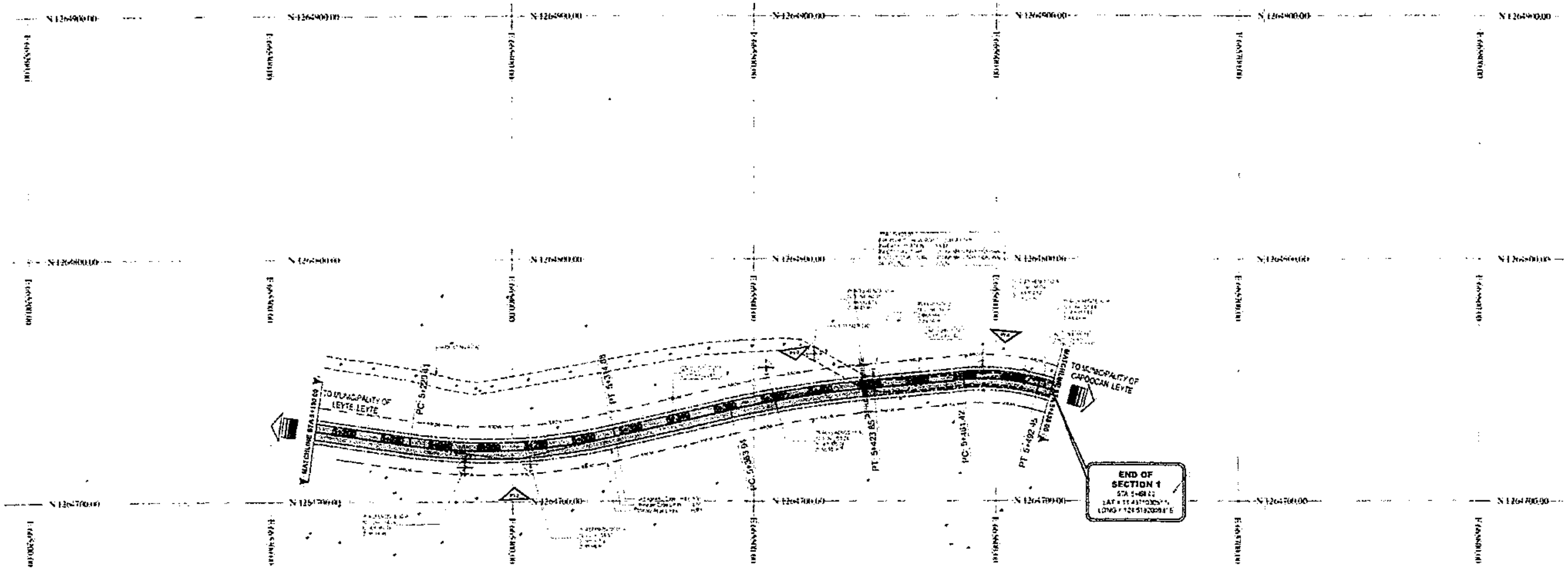


STATION	5+200	5+220	5+240	5+260	5+280	5+300	5+320	5+340	5+360	5+380	5+400	5+420	5+440	5+460	5+480
FINISHED GRADE ELEVATION	82.62	83.30	83.86	83.71	82.76	81.02	78.62	76.35	74.01	72.21	70.42	69.02	70.97	72.84	74.85

SUPERELEVATION

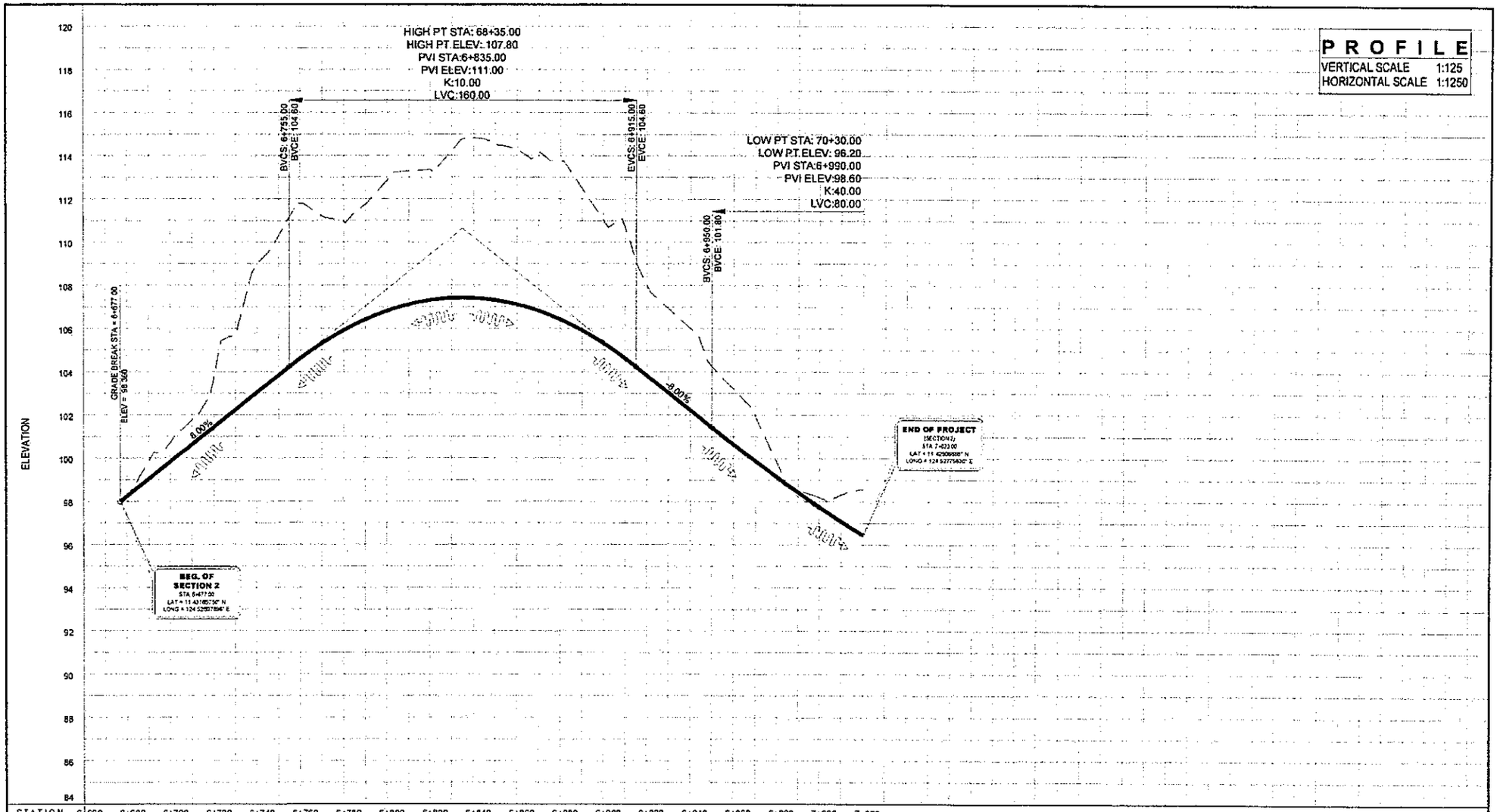
WIDENING

REPUBLIC OF THE PHILIPPINES DEPARTMENT OF PUBLIC WORKS AND HIGHWAYS REGIONAL OFFICE NO. VIII GOV'T CENTER BARAS PALO LEYTE	PROJECT NAME AND LOCATION SIPAG - COASTAL ROADS TO AUGMENT RESILIENCY OF COASTAL COMMUNITIES - CONSTRUCTION OF COASTAL ROAD, PHASE 3, LEYTE - LEYTE TO CAPOOCAN, LEYTE LEYTE 3RD D	SHEET CONTENTS PROFILE	PREPARED JOEL PAUL C. AVORQUE ENGINEER II	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. B 3 6



PI no.	Station PI	COORDINATES		Angle of Intersection (I)	Radius (R)	Length of curve (Lc)	External distance (E)	Tangent Distance (T)	Station PC	Station PT	Degree of Curve (D)	Design Speed (Ds)	Maximum Superelevation (emax)	Maximum Widening (wmax)
		NORTHNGS	EASTINGS											
2	5+272.638	1,264,747.62	665,190.05	21° 02' 04"	232.810	85.469	3.978	43.221	5+229.417	5+314.886	04° 55' 20"	60	1.500	1.500
3	5+393.946	1,264,717.16	665,400.30	07° 48' 39"	439.444	59.907	1.023	30.000	5+363.946	5+423.853	02° 36' 28"	60	1.500	1.500
4	5+477.095	1,264,744.23	665,519.55	19° 54' 05"	89.404	31.054	1.365	15.685	5+461.410	5+492.464	12° 49' 02"	40	0.071	1.500

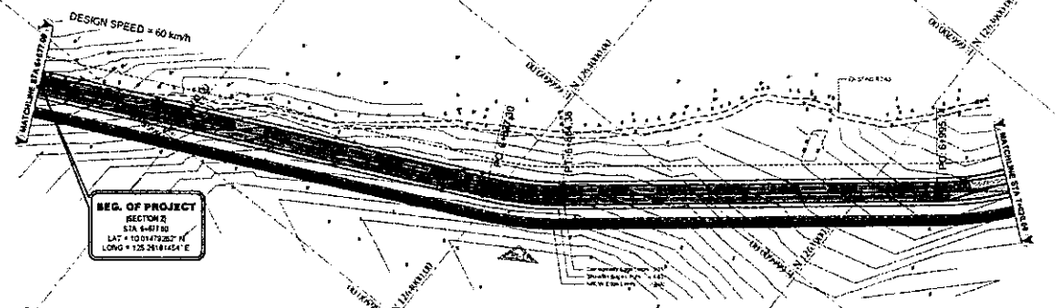
REPUBLIC OF THE PHILIPPINES DEPARTMENT OF PUBLIC WORKS AND HIGHWAYS REGIONAL OFFICE NO. VIII GOV'T CENTER BARAS, PALO, LEYTE	PROJECT NAME AND LOCATION SIPAG - COASTAL ROADS TO AUGMENT RESILIENCY OF COASTAL COMMUNITIES - CONSTRUCTION OF COASTAL ROAD, PHASE 3, LEYTE - LEYTE TO CAPOOCAN, LEYTE	SHEET CONTENTS PLAN	PREPARED JOEL PAUL C. AVORQUE ENGINEER	REVIEWED FELIX R. BACUS CHIEF, HIGHWAY DESIGN SECTION DATE	SUBMITTED AGNES M. BARONDA CHIEF, PLANNING AND DESIGN DIVISION DATE	RECOMMENDED MA. MARGARITA [illegible] JUNIA, D.M. ASSISTANT REGIONAL DIRECTOR DATE	APPROVED EDGAR B. TABACON, CESO IV REGIONAL DIRECTOR DATE	SET NO. 8 46



STATION	6+660	6+680	6+700	6+720	6+740	6+760	6+780	6+800	6+820	6+840	6+860	6+880	6+900	6+920	6+940	6+960	6+980	7+000	7+020
FINISHED GRADE ELEVATION		98.66	101.11	104.18	108.35	112.17	111.31	113.26	113.71	115.20	114.62	114.11	111.33	108.33	106.35	103.55	100.15	96.55	98.93
SUPERELEVATION																			
WIDENING																			

REPUBLIC OF THE PHILIPPINES DEPARTMENT OF PUBLIC WORKS AND HIGHWAYS REGIONAL OFFICE NO. VIII GOVT CENTER BARAS, PALO, LEYTE	PROJECT NAME AND LOCATION SIPAG - COASTAL ROADS TO AUGMENT RESILIENCY OF COASTAL COMMUNITIES - CONSTRUCTION OF COASTAL ROAD, PHASE 3, LEYTE - LEYTE TO CAPOOCAN, LEYTE LEYTE3RDLD	SHEET CONTENTS PROFILE	PREPARED JOEL PAUL C. MARQUE ENGINEER	REVIEWED FELIX R. [illegible] CHIEF, HIGHWAY DESIGN SECTION DATE	SUBMITTED AGNES M. BARONDA CHIEF, PLANNING AND DESIGN DIVISION DATE	RECOMMENDED MA. MARGARITA C. [illegible], D.M. ASSISTANT REGIONAL DIRECTOR DATE	APPROVED EDGAR B. TABACON, CESO IV REGIONAL DIRECTOR DATE	SET NO 8 2 | 6	SHEET NO 35 104

PLAN
SCALE 1:1250



PI no.	Station PI	COORDINATES		Angle of Intersection (I)	Radius (R)	Length of curve (Lc)	External distance (E)	Tangent Distance (T)	Station PC	Station PT	Degree of Curve (D)	Design Speed (Ds)	Maximum Superelevation (emax)	Maximum Widening (wmax)
		NORTHINGS	EASTINGS											
1	6+850.897	1,263,991.450	666,561.080	13° 43' 22"	113.000	27.064	0.815	13.597	006+837.299	06+864.364	10° 08' 27"	40	0.000	0.000

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

PROJECT NAME AND LOCATION:
SPAG - COASTAL ROADS TO AUGMENT RESILIENCY OF COASTAL COMMUNITIES - CONSTRUCTION OF COASTAL ROAD, PHASE 3, LEYTE - LEYTE TO CAPOOCAN, LEYTE
LEYTE 3RD DEO

SHEET CONTENTS: PLAN

PREPARED: JOEL PAUL C. ARDOQUE, ENGINEER II

REVIEWED: FELIXIR. BACUS, CHIEF HIGHWAY DESIGN SECTION, DATE

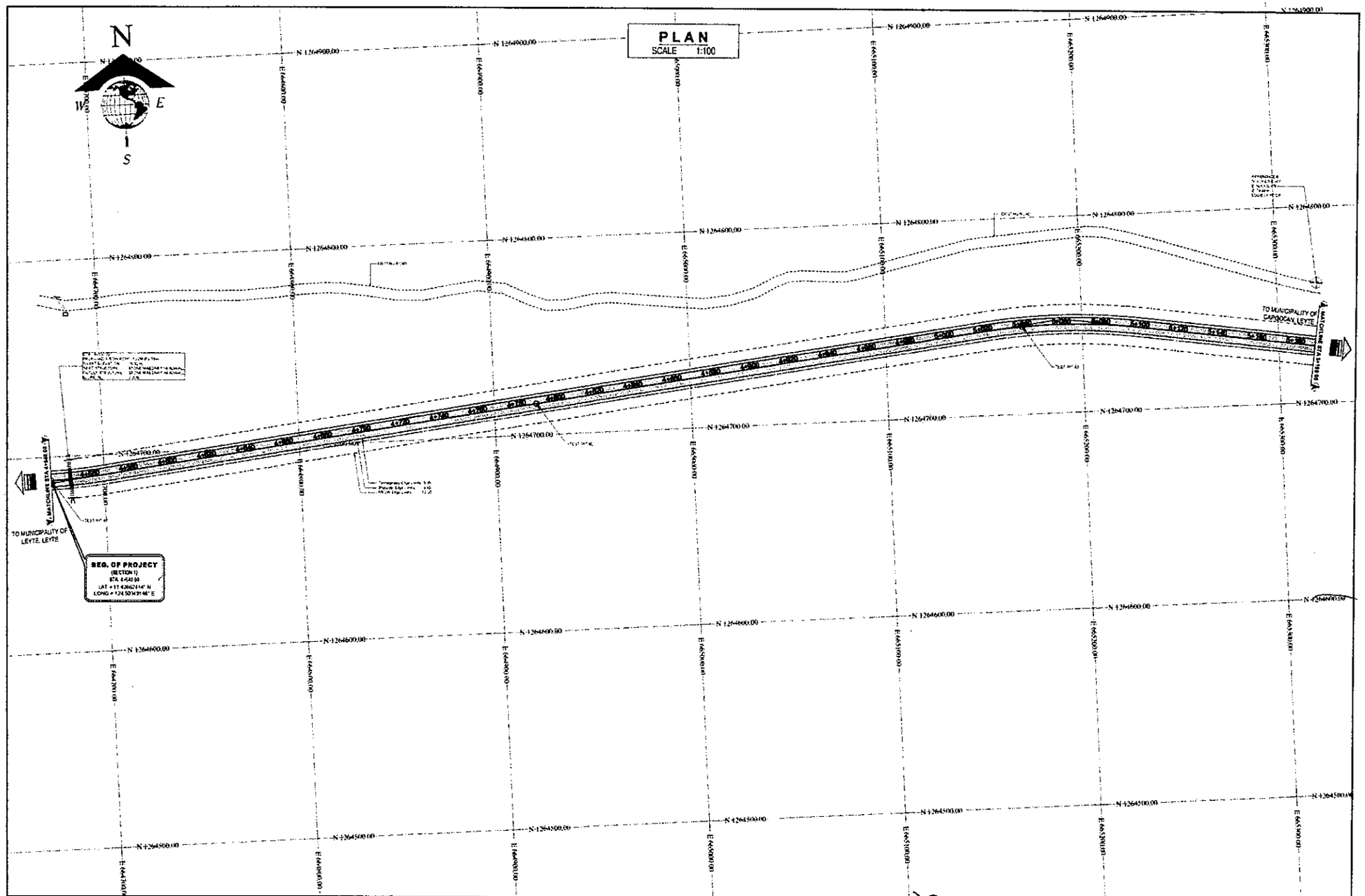
SUBMITTED: AGNES M. BARONDA, CHIEF, PLANS AND DESIGN DIVISION, DATE

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

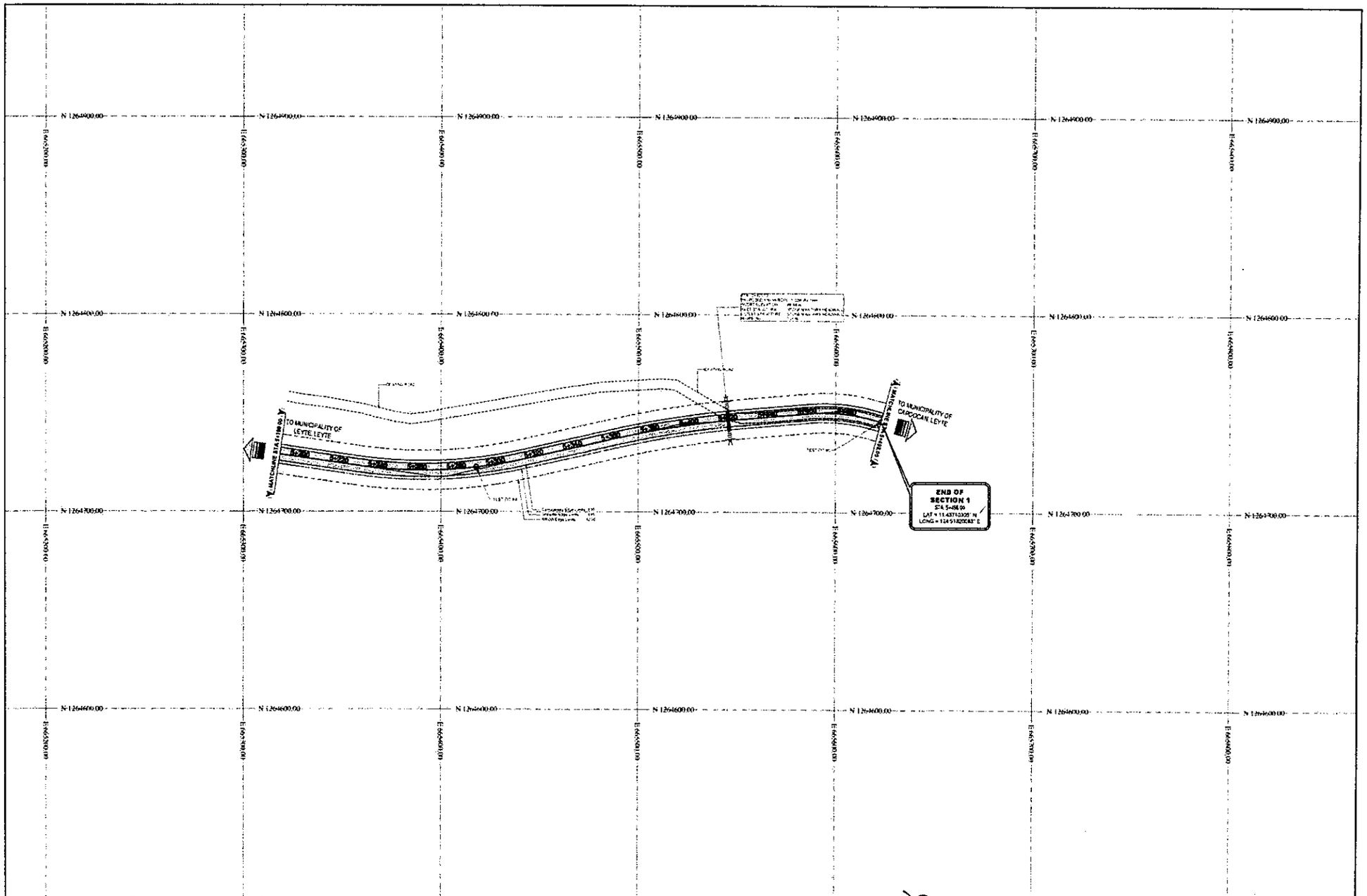
APPROVED: EDGAR B. TABACON, CESO IV, REGIONAL DIRECTOR, DATE

SET NO: 8 of 8

SHEET NO: 36 / 104



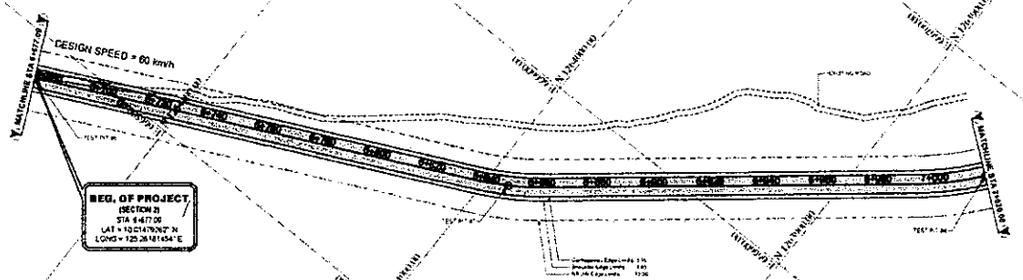
REPUBLIC OF THE PHILIPPINES DEPARTMENT OF PUBLIC WORKS AND HIGHWAYS REGIONAL OFFICE NO. VIII BARAS, PALO, LEYTE	PROJECT NAME AND LOCATION SIPAG - COASTAL ROADS TO ALIGNMENT RESILIENCY OF COASTAL COMMUNITIES - CONSTRUCTION OF COASTAL ROAD, PHASE 3, LEYTE - LEYTE TO CAPOOCAN, LEYTE LEYTE 3RD LD	SHEET CONTENTS TEST PIT	PREPARED JOPE PAUL C. AVORQUE ENGINEER	REVIEWED FELIX E. 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 C 3	SHEET NO 37 104



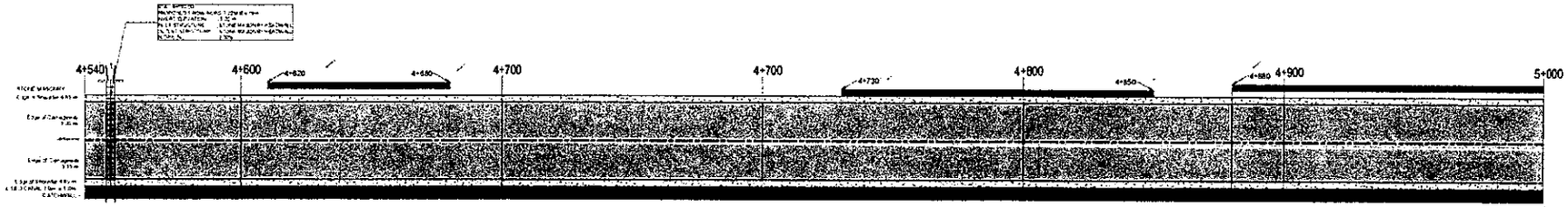
REPUBLIC OF THE PHILIPPINES
DEPARTMENT OF PUBLIC WORKS AND HIGHWAYS
REGIONAL OFFICE NO. VIII
BARAS, PALO, LEYTE

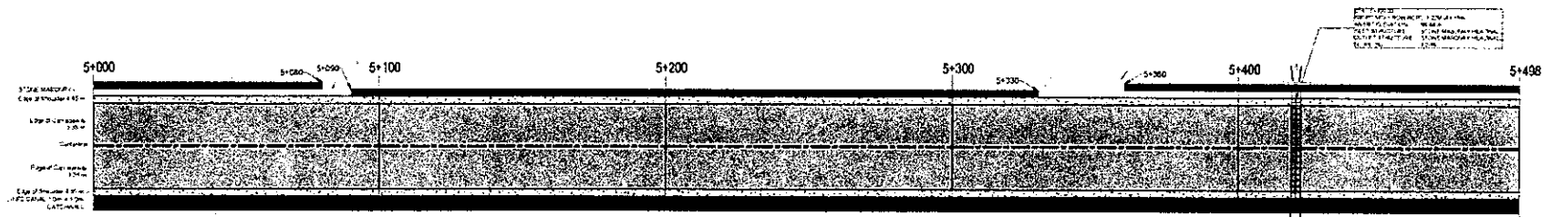
PROJECT NAME AND LOCATION	SHEET CONTENTS	PREPARED	REVIEWED	SUBMITTED	RECOMMENDED	APPROVED	SET NO	SHEET NO
SIPAG - COASTAL ROADS TO AUGMENT RESILIENCY OF COASTAL COMMUNITIES - CONSTRUCTION OF COASTAL ROAD, PHASE 3, LEYTE - LEYTE TO CAPOCAN, LEYTE LEYTE 3RD LD	TEST PIT	JHEC PAUL C. AVONQUE ENGINEER II	FELIX R. BACUS CHIEF, HIGHWAY DESIGN SECTION DATE	AGNES M. BARONDA CHIEF, PLANNING AND DESIGN DIVISION DATE	MA. MARGARITA C. JENIA, D.M. ASSISTANT REGIONAL DIRECTOR DATE	EDGAR B. TABACON, CESO IV REGIONAL DIRECTOR DATE	C 2 | 3	38 104

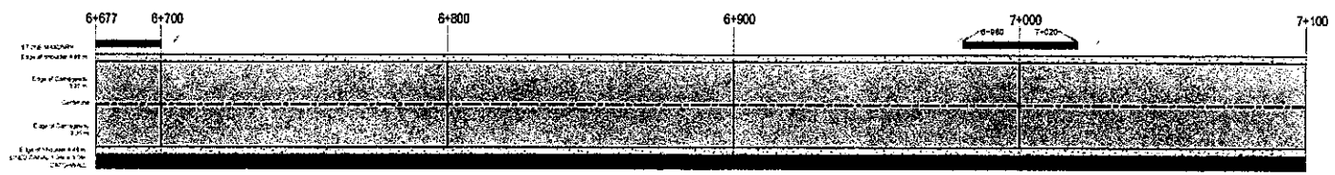
PLAN
SCALE 1:1250



REPUBLIC OF THE PHILIPPINES DEPARTMENT OF PUBLIC WORKS AND HIGHWAYS REGIONAL OFFICE NO. VIII BARAS PALO LEYTE	PROJECT NAME AND LOCATION SIPAG - COASTAL ROADS TO AUGMENT RESILIENCY OF COASTAL COMMUNITIES - CONSTRUCTION OF COASTAL ROAD, PHASE 3, LEYTE - LEYTE TO CAPOOCAN LEYTE LEYTE 3RD LD	SHEET CONTENTS TEST PIT	PREPARED JOEL PAUL C. AVORQUE ENGINEER II	REVIEWED FELIX B. BACUS CHIEF HIGHWAYS INSPECTION 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. TABAGON, CESO IV REGIONAL DIRECTOR DATE	SET NO C C 3 3	SHEET NO 39 104







CARRIAGEWAY 3.35m. WIDTH –

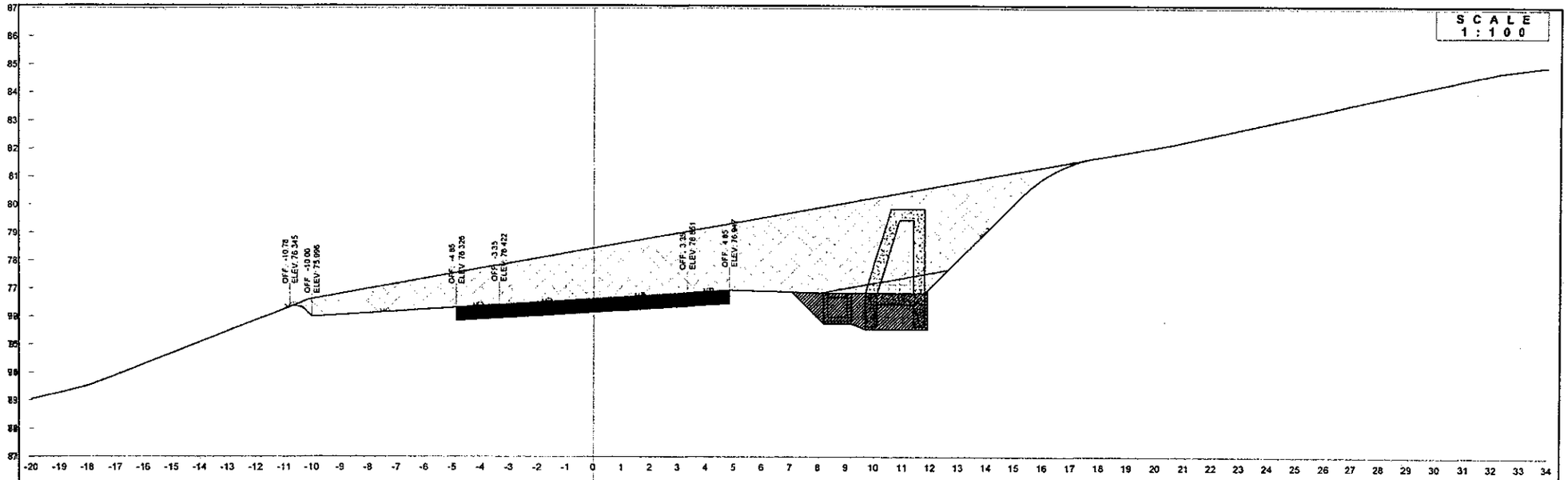
GRAVEL SHOULDER 1.50m. WIDTH –

LINED CANAL - 1.0m. x 1.0m. –

CATCHWALL –

ITEM 506(1) –

REPUBLIC OF THE PHILIPPINES DEPARTMENT OF PUBLIC WORKS AND HIGHWAYS REGIONAL OFFICE NO. VIII GOVT. CENTER BARAS, PALO, LEYTE	PROJECT NAME AND LOCATION SIPAG - COASTAL ROADS TO AUGMENT RESILIENCY OF COASTAL COMMUNITIES - CONSTRUCTION OF COASTAL ROAD, PHASE 3, LEYTE - LEYTE TO CAPOOCAN, LEYTE LEYTE 3RD LD	SHEET CONTENTS STRAIGHT LINE DIAGRAM	PREPARED JOEL PAUL C. AVEROUE ENGINEER III	REVIEWED FELIX R. RACUS CHIEF, HIGHWAY RES. CONSTRUCTION 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 0 SET 1	SHEET NO 40 104



STA. 4+540.00
OGE: 78.44
FGE: 76.636

Area$_{CUT}$ 50.50
Area$_{FILL}$: 0.00
ITEM 103(1)a Area: 0.00
ITEM 103(1)b Area: 5.10
ITEM 506(1): 0.00
Soft Rock: 1.54

NORTHING = 1264688.061
EASTING = 664672.868

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

PROJECT NAME AND LOCATION: SIPAG - COASTAL ROADS TO AUGMENT RESILIENCY OF COASTAL COMMUNITIES - CONSTRUCTION OF COASTAL ROAD, PHASE 3, LEYTE - LEYTE TO CAPOOCAN, LEYTE
LEYTE 3RD LD

SHEET CONTENTS: DETAILED CROSS SECTION

PREPARED: JOEL PAUL G. AVORQUE, ENGINEER II

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

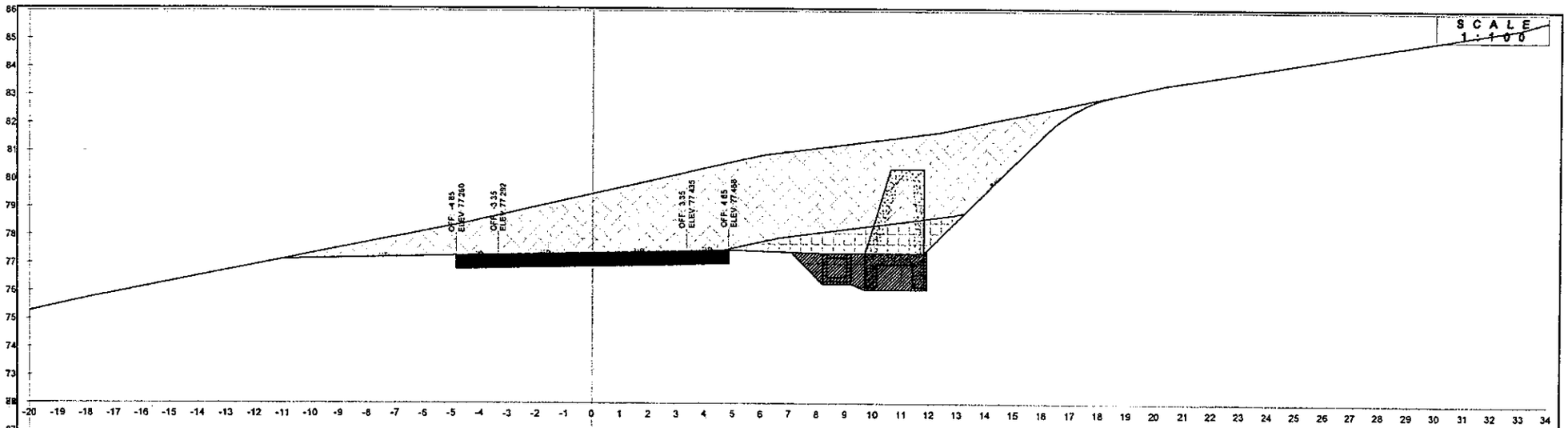
SUBMITTED: AGNES H. BARONDA, CHIEF PLANNING AND DESIGN DIVISION, DATE

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

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

SHEET NO: 1 of 3

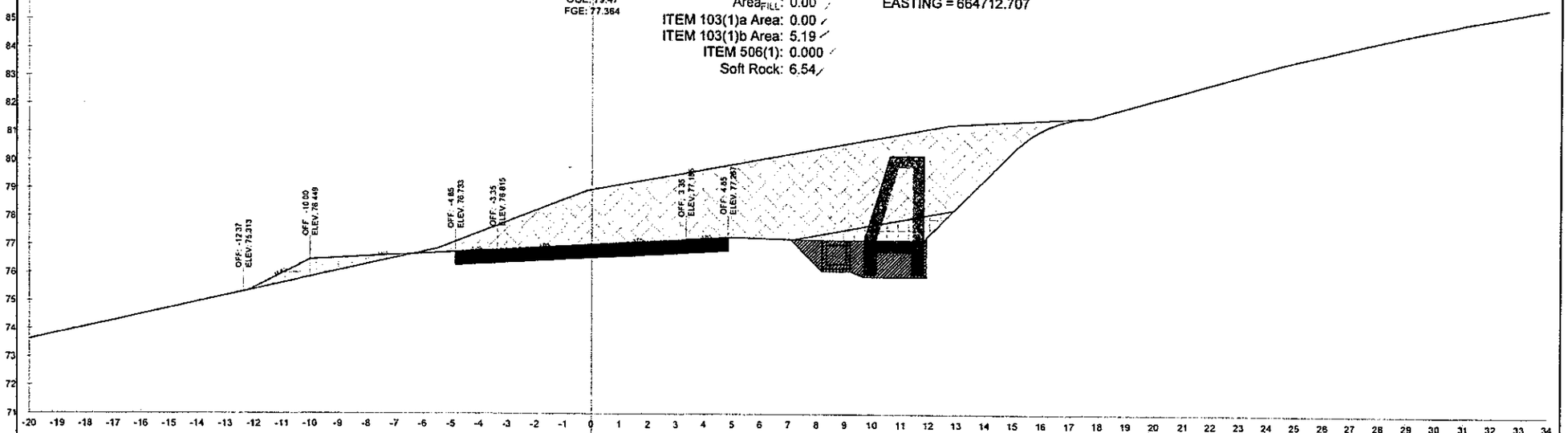
SHEET NO: 41 / 104



STA. 4+580.00
OGE: 79.47
FGE: 77.364

$Area_{CUT}$: 54.42
$Area_{FILL}$: 0.00
ITEM 103(1)a Area: 0.00
ITEM 103(1)b Area: 5.19
ITEM 506(1): 0.000
Soft Rock: 6.54

NORTHING = 1264691.396
EASTING = 664712.707



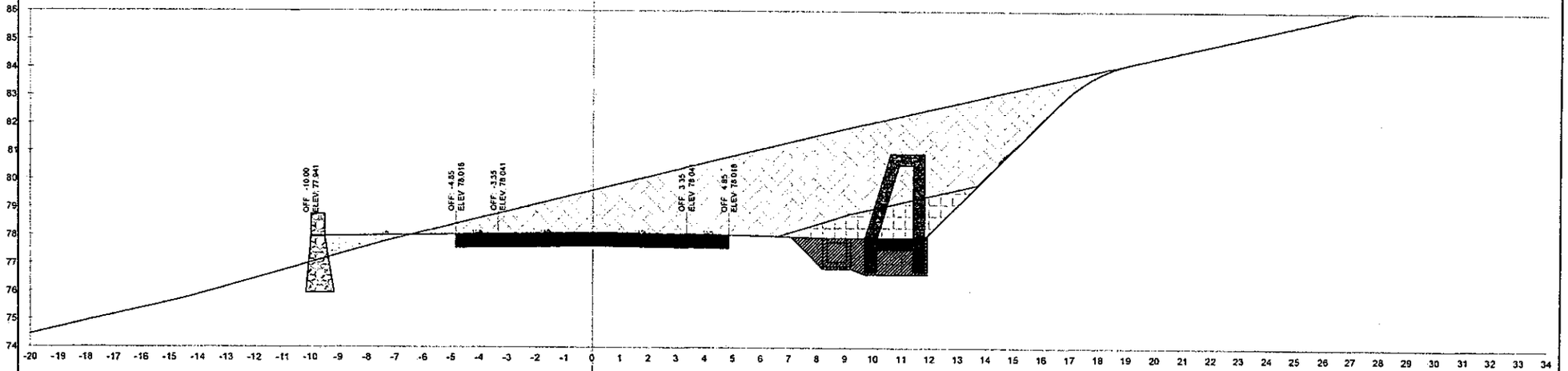
STA. 4+560.00
OGE: 78.94
FGE: 77.000

$Area_{CUT}$: 45.36
$Area_{FILL}$: 1.78
ITEM 103(1)a Area: 0.00
ITEM 103(1)b Area: 5.19
ITEM 506(1): 0.00
Soft Rock: 2.55

NORTHING = 1264689.154
EASTING = 664692.834

REPUBLIC OF THE PHILIPPINES DEPARTMENT OF PUBLIC WORKS AND HIGHWAYS REGIONAL OFFICE NO. VIII BARAS, PALO, LEYTE	PROJECT NAME AND LOCATION SIPAO - COASTAL ROADS TO AUGMENT RESILIENCY OF COASTAL COMMUNITIES - CONSTRUCTION OF COASTAL ROAD, PHASE 3, LEYTE - LEYTE TO CAPOOCAN, LEYTE LEYTE / BOHOL	SHEET CONTENTS DETAILED CROSS SECTION	PREPARED JOEL PAUL C. AVOROQUE ENGINEER II	REVIEWED FELIX R. DACUS CHIEF HIGHWAY DESIGN SECTION DATE	SUBMITTED AGNES M. BARONDA CHIEF PLANNING AND DESIGN DIVISION DATE	RECOMMENDED MA. MARGARITA C. [illegible] D.M. ASSISTANT REGIONAL DIRECTOR DATE	APPROVED EDGAR B. TABACON, CESO III REGIONAL DIRECTOR DATE	SET NO IE 27 / 63	SHEET NO 42 104

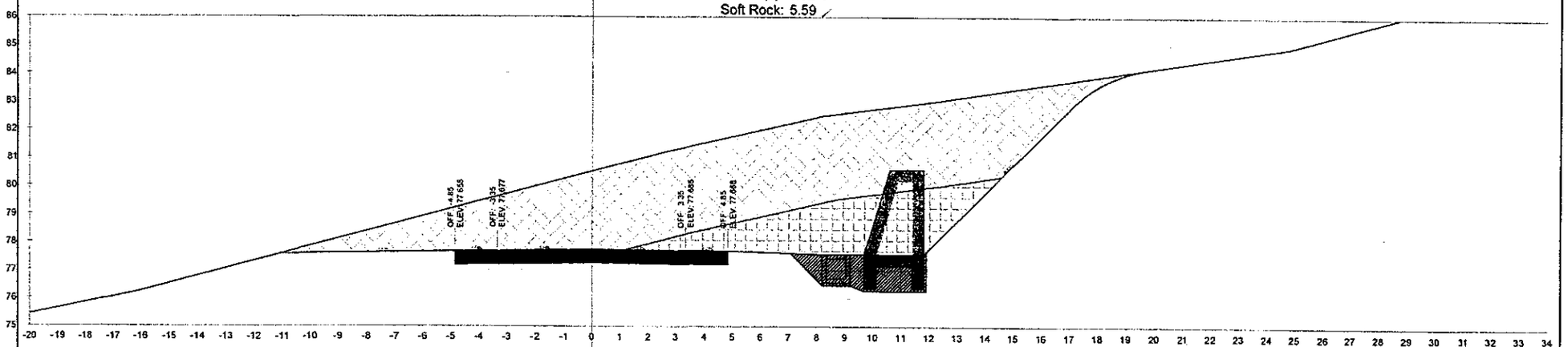
SCALE
1 : 100



STA. 4+620.00
OGE: 79.60
FGE: 78.091

Area$_{CUT}$: 48.59
Area$_{FILL}$: 1.11
ITEM 103(1)a Area: 0.00
ITEM 103(1)b Area: 5.19
ITEM 506(1): 1.92
Soft Rock: 5.59

NORTHING = 1264696.075
EASTING = 664752.432



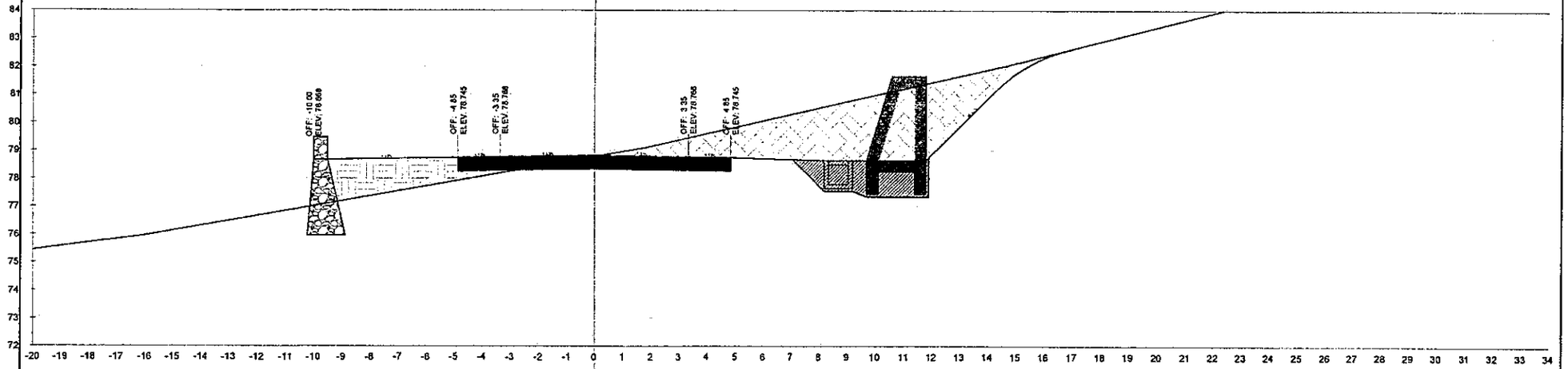
STA. 4+600.00
OGE: 80.50
FGE: 77.727

Area$_{CUT}$: 62.84
Area$_{FILL}$: 0.00
ITEM 103(1)a Area: 0.00
ITEM 103(1)b Area: 5.19
ITEM 506(1): 0.00
Soft Rock: 19.56

NORTHING = 1264693.735
EASTING = 664732.570

REPUBLIC OF THE PHILIPPINES DEPARTMENT OF PUBLIC WORKS AND HIGHWAYS REGIONAL OFFICE NO. VIII BARAS, PALO, LEYTE	PROJECT NAME AND LOCATION SIPAG - COASTAL ROADS TO AUGMENT RESILIENCY OF COASTAL COMMUNITIES - CONSTRUCTION OF COASTAL ROAD, PHASE 3, LEYTE - LEYTE TO CAPOOCAN, LEYTE LEYTE 3RD LD	SHEET CONTENTS DETAILED CROSS SECTION	PREPARED JOSE PAUL C. AVEROQUE ENGINEER II	REVIEWED FELIXR. BAGUS 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 S. TABACON, CESO IV REGIONAL DIRECTOR DATE	SET NO 3 of 3	SHEET NO 43 104

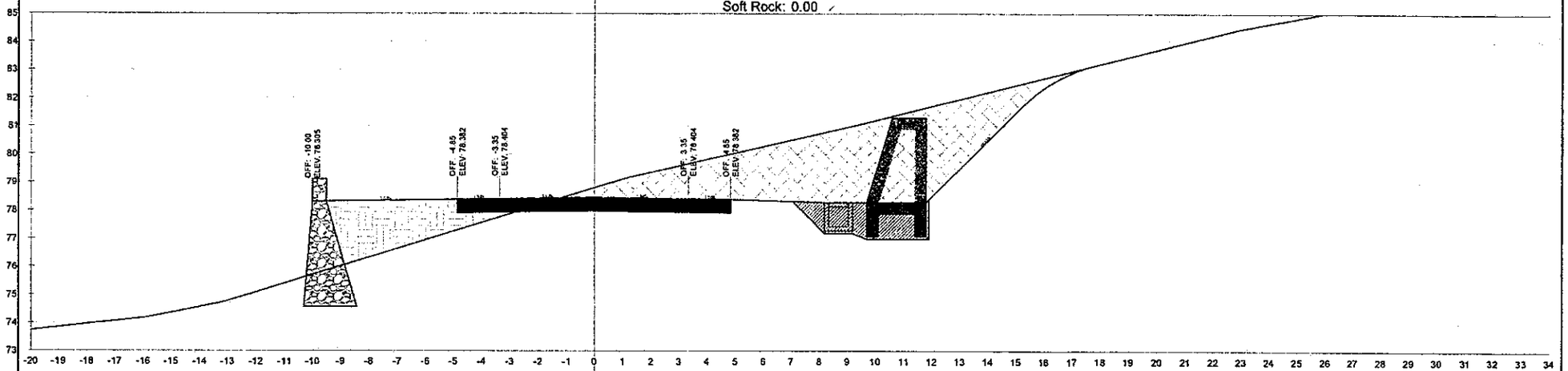
SCALE
1 : 1 0 0



STA. 4+660.00
OGE: 78.78
FGE: 78.818

$Area_{CUT}$: 18.50
$Area_{FILL}$: 5.65
ITEM 103(1)a Area: 5.19
ITEM 103(1)b Area: 0.00
ITEM 506(1): 2.91
Soft Rock: 0.00

NORTHING = 1264700.753
EASTING = 664792.158



STA. 4+640.00
OGE: 78.79
FGE: 78.455

$Area_{CUT}$: 28.47
$Area_{FILL}$: 8.06
ITEM 103(1)a Area: 5.19
ITEM 103(1)b Area: 0.00
ITEM 506(1): 4.84
Soft Rock: 0.00

NORTHING = 1264698.414
EASTING = 664772.295

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

PROJECT NAME AND LOCATION: SIPAG - COASTAL ROADS TO AUGMENT RESILIENCY OF COASTAL COMMUNITIES - CONSTRUCTION OF COASTAL ROAD, PHASE 3, LEYTE - LEYTE TO CAPOOCAN, LEYTE
LEYTE 3RD LD

SHEET CONTENTS: DETAILED CROSS SECTION

PREPARED: JOEL PAUL C. AVERIQUE, ENGINEER II

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

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

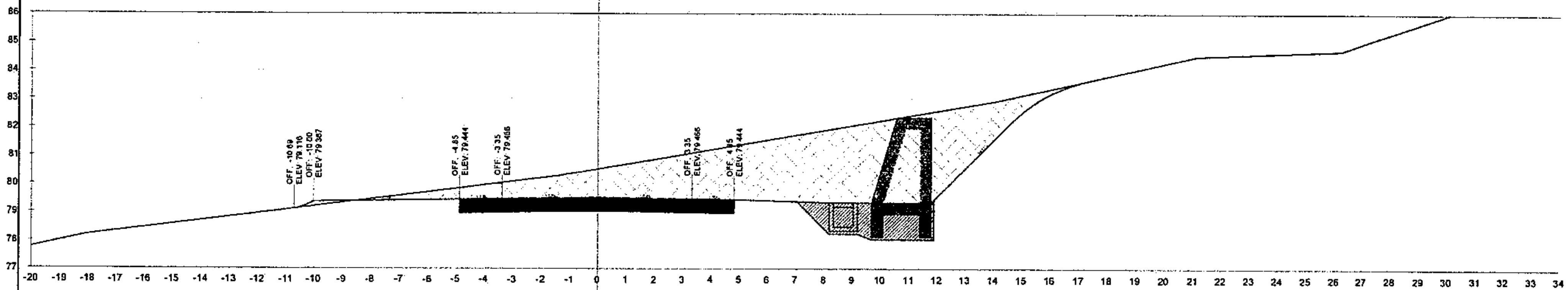
RECOMMENDED: MA. MARGARITA C. JUNIA, D.M., ASSISTANT REGIONAL DIRECTOR, DATE

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

SET NO: 4 of 5

SHEET NO: 44 / 104

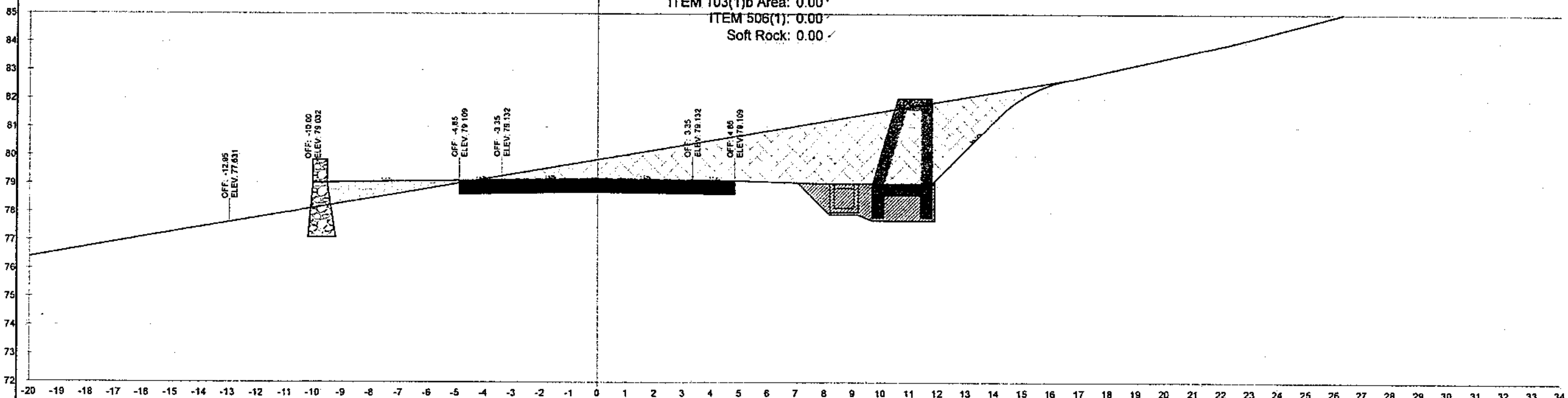
SCALE
1 : 100



STA. 4+700.00
OGE: 80.52
FGE: 79.517

Area$_{CUT}$: 34.96
Area$_{FILL}$: 0.16
ITEM 103(1)a Area: 5.19
ITEM 103(1)b Area: 0.00
ITEM 506(1): 0.00
Soft Rock: 0.00

NORTHING = 1264705.432
EASTING = 664831.883



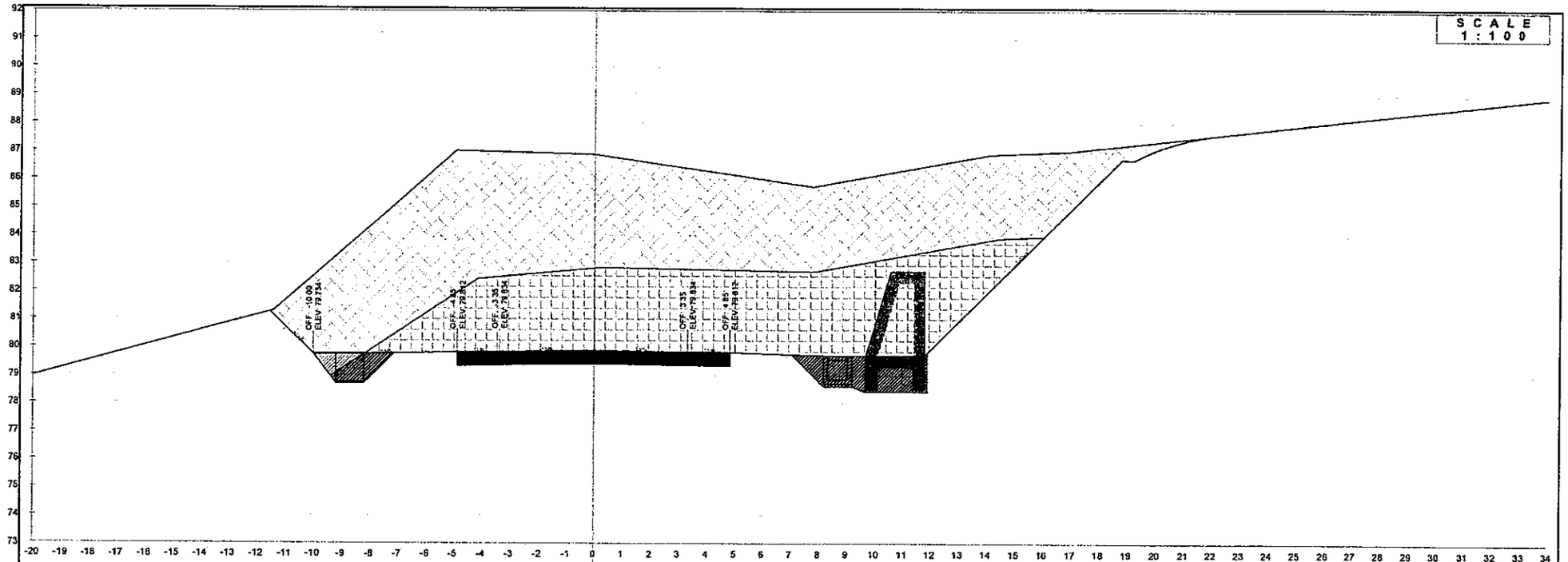
STA. 4+680.00
OGE: 79.84
FGE: 79.182

Area$_{CUT}$: 26.98
Area$_{FILL}$: 2.07
ITEM 103(1)a Area: 5.19
ITEM 103(1)b Area: 0.00
ITEM 506(1): 1.83
Soft Rock: 0.00

NORTHING = 1264703.093
EASTING = 664812.021

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 - COASTAL ROADS TO AUGMENT RESILIENCY OF COASTAL COMMUNITIES - CONSTRUCTION OF COASTAL ROAD, PHASE 3, LEYTE - LEYTE TO CAPOOCAN, LEYTE LEYTE 3RD LD	DETAILED CROSS SECTION	JOEL PAUL C. AVORQUE ENGINEER II	FELIX R. BACUS CHIEF, HIGHWAY DESIGN SECTION DATE:	AGNES M. BARONDA CHIEF, PLANNING AND DESIGN DIVISION DATE:	MA. MARGARITA C. JUNIA D.M. ASSISTANT REGIONAL DIRECTOR DATE:	EDGAR B. TABACON, CESO IV REGIONAL DIRECTOR DATE:	5/53	45 104

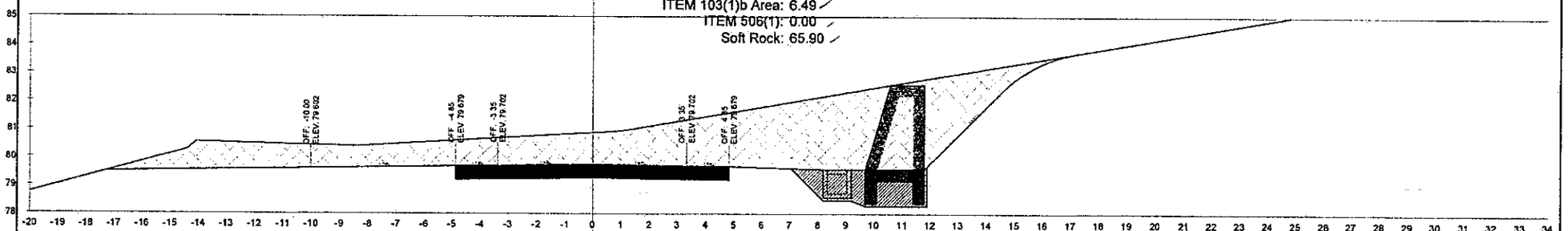
SCALE
1 : 100



STA. 4+740.00
OGE: 86.88
FGE: 79.884

$Area_{CUT}$: 98.70
$Area_{FILL}$: 0.00
ITEM 103(1)a Area: 0.74
ITEM 103(1)b Area: 6.49
ITEM 506(1): 0.00
Soft Rock: 65.90

NORTHING = 1264710.111
EASTING = 664871.609



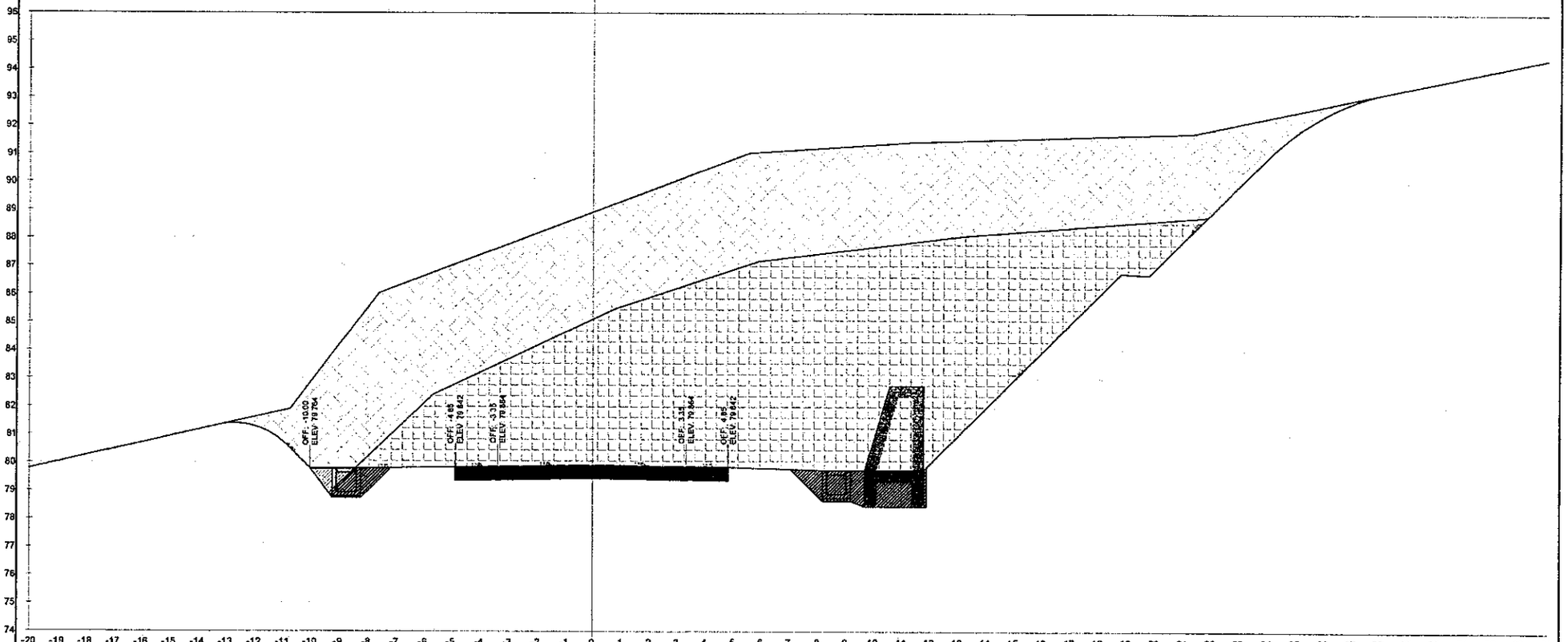
STA. 4+720.00
OGE: 80.88
FGE: 79.752

$Area_{CUT}$: 45.36
$Area_{FILL}$: 0.00
ITEM 103(1)a Area: 5.19
ITEM 103(1)b Area: 0.00
ITEM 506(1): 0.00
Soft Rock: 0.00

NORTHING = 1264707.771
EASTING = 664851.746

REPUBLIC OF THE PHILIPPINES DEPARTMENT OF PUBLIC WORKS AND HIGHWAYS REGIONAL OFFICE NO. VIII BARAS, PALO, LEYTE	PROJECT NAME AND LOCATION SIPAG - COASTAL ROADS TO AUGMENT RESILIENCY OF COASTAL COMMUNITIES - CONSTRUCTION OF COASTAL ROAD, PHASE 3, LEYTE - LEYTE TO CAPOOCAN, LEYTE LEYTE 3RD LD	SHEET CONTENTS DETAILED CROSS SECTION	PREPARED JOEL PAUL C. AVORQUE ENGINEER II	REVIEWED FELIX R. BACUS CHIEF, HIGHWAY DESIGN SECTION DATE	SUBMITTED AGNES M. BARONDA CHIEF, PLANNING AND DESIGN DIVISION DATE	RECOMMENDED MA. MARGARITA C. JUMIA D.M. ASSISTANT REGIONAL DIRECTOR DATE	APPROVED EDGAR B. TABACON, CESO IV REGIONAL DIRECTOR DATE	SET NO E 6 | 53	SHEET NO 46 104

SCALE
1 : 100



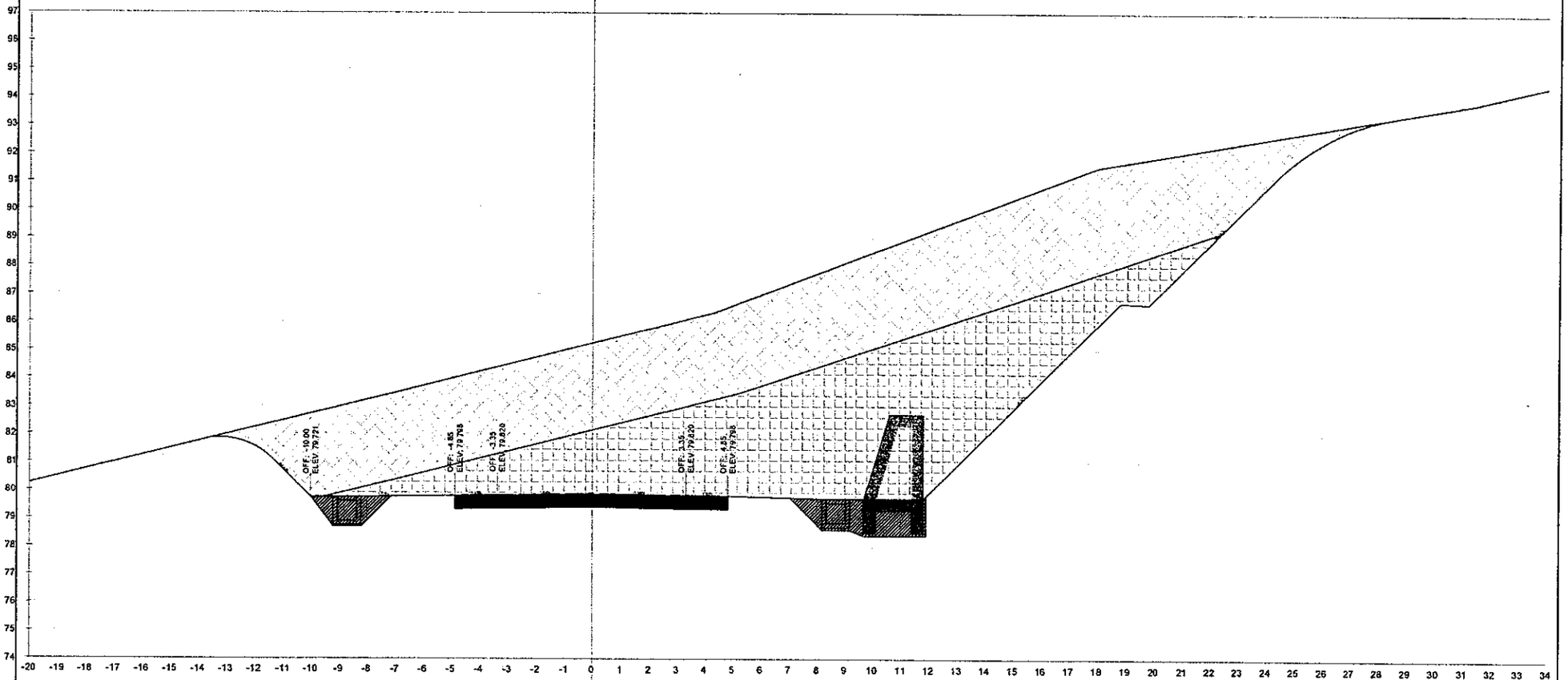
STA. 4+760.00
OGE: 88.91
FGE: 79.914

$Area_{CUT}$: 124.93
$Area_{FILL}$: 0.00
ITEM 103(1)a Area: 0.71
ITEM 103(1)b Area: 6.51
ITEM 506(1): 0.00
Soft Rock: 169.69

NORTHING = 1264712.450
EASTING = 664891.471

REPUBLIC OF THE PHILIPPINES DEPARTMENT OF PUBLIC WORKS AND HIGHWAYS REGIONAL OFFICE NO. VIII BARAS, PALO, LEYTE	PROJECT NAME AND LOCATION SIPAG - COASTAL ROADS TO AUGMENT RESILIENCY OF COASTAL COMMUNITIES - CONSTRUCTION OF COASTAL ROAD, PHASE 3, LEYTE - LEYTE TO CAPOOCAN, LEYTE LEYTE 3RD LD	SHEET CONTENTS DETAILED CROSS SECTION	PREPARED JOEL PAUL C. AYORQUE ENGINEER II	REVIEWED FELIX R. BACUS CHIEF, HIGHWAY DESIGN SECTION DATE	SUBMITTED ERNESTO M. BARONDA CHIEF, PLANNING AND DESIGN DIVISION DATE	RECOMMENDED MA. MARGARITA C. LUNA, D.M. ASSISTANT REGIONAL DIRECTOR DATE	APPROVED EDGAR B. TABACON, CESO IV REGIONAL DIRECTOR DATE	SET NO 7 of 63	SHEET NO 47 164

SCALE
1 : 1 0 0



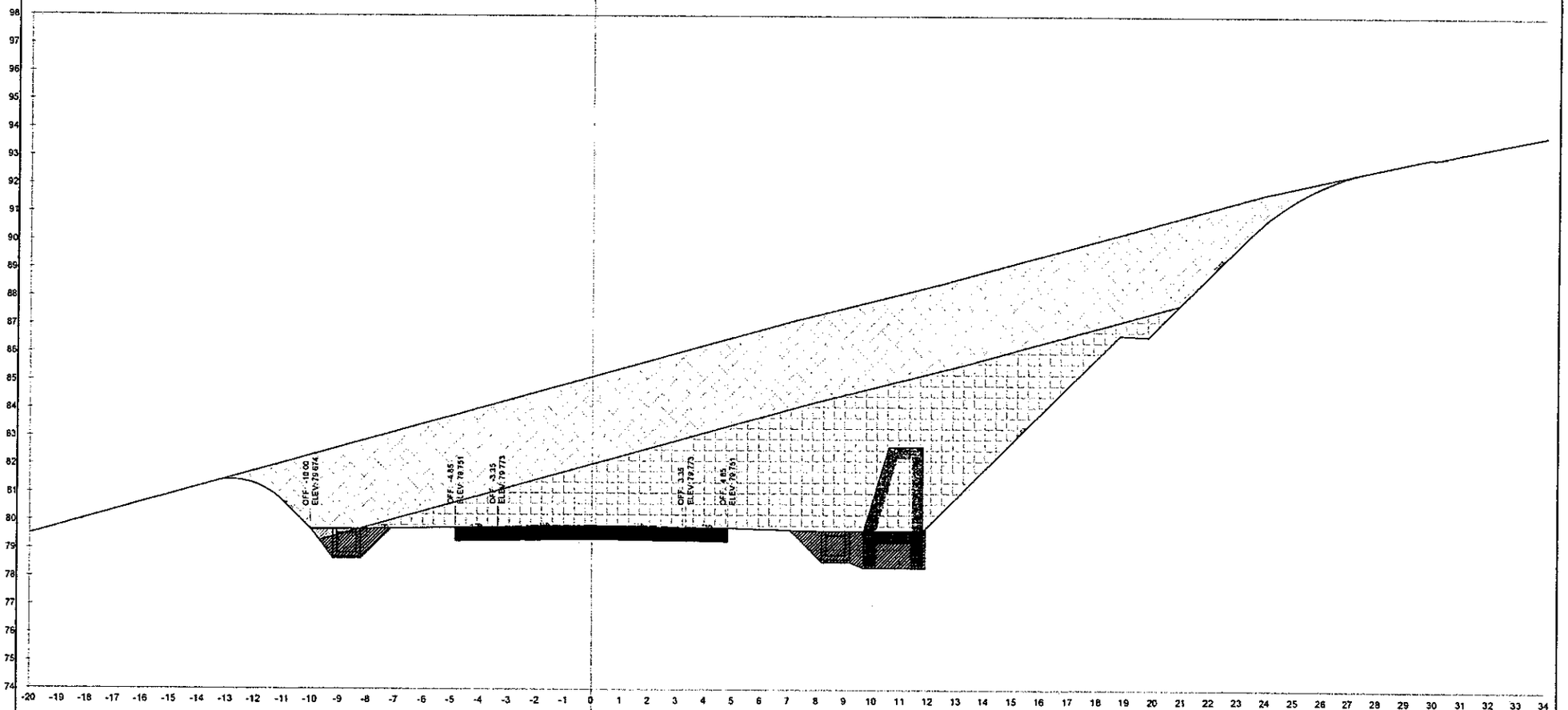
STA. 4+780.00
OGE: 85.23
FGE: 79.871

Area$_{CUT}$: 112.11
Area$_{FILL}$: 0.00
ITEM 103(1)a Area: 0.00
ITEM 103(1)b Area: 7.22
ITEM 506(1): 0.00
Soft Rock: 101.78

NORTHING = 1264714.790
EASTING = 664911.334

REPUBLIC OF THE PHILIPPINES DEPARTMENT OF PUBLIC WORKS AND HIGHWAYS REGIONAL OFFICE NO. VIII BARAS, PALO, LEYTE	PROJECT NAME AND LOCATION SIPAG - COASTAL ROADS TO AUGMENT RESILIENCY OF COASTAL COMMUNITIES - CONSTRUCTION OF COASTAL ROAD, PHASE 3, LEYTE - LEYTE TO CAPOOCAN, LEYTE LEYTE 3RD LD	SHEET CONTENTS DETAILED CROSS SECTION	PREPARED: JOEL PAUL C. AVOQUE ENGINEER II	REVIEWED FELIX R. RACUS CHIEF, HIGHWAY DESIGN SECTION DATE	SUBMITTED AGNES M. BARONDA CHIEF, PLANNING AND DESIGN DIVISION DATE	RECOMMENDED MA. MARGARITA V. JUNIA CSM. ASSISTANT REGIONAL DIRECTOR DATE	APPROVED EDGAR B. TABACON, CESO IV REGIONAL DIRECTOR DATE	SET NO E-3 S-153	SHEET NO. 48 104

SCALE
1 : 100



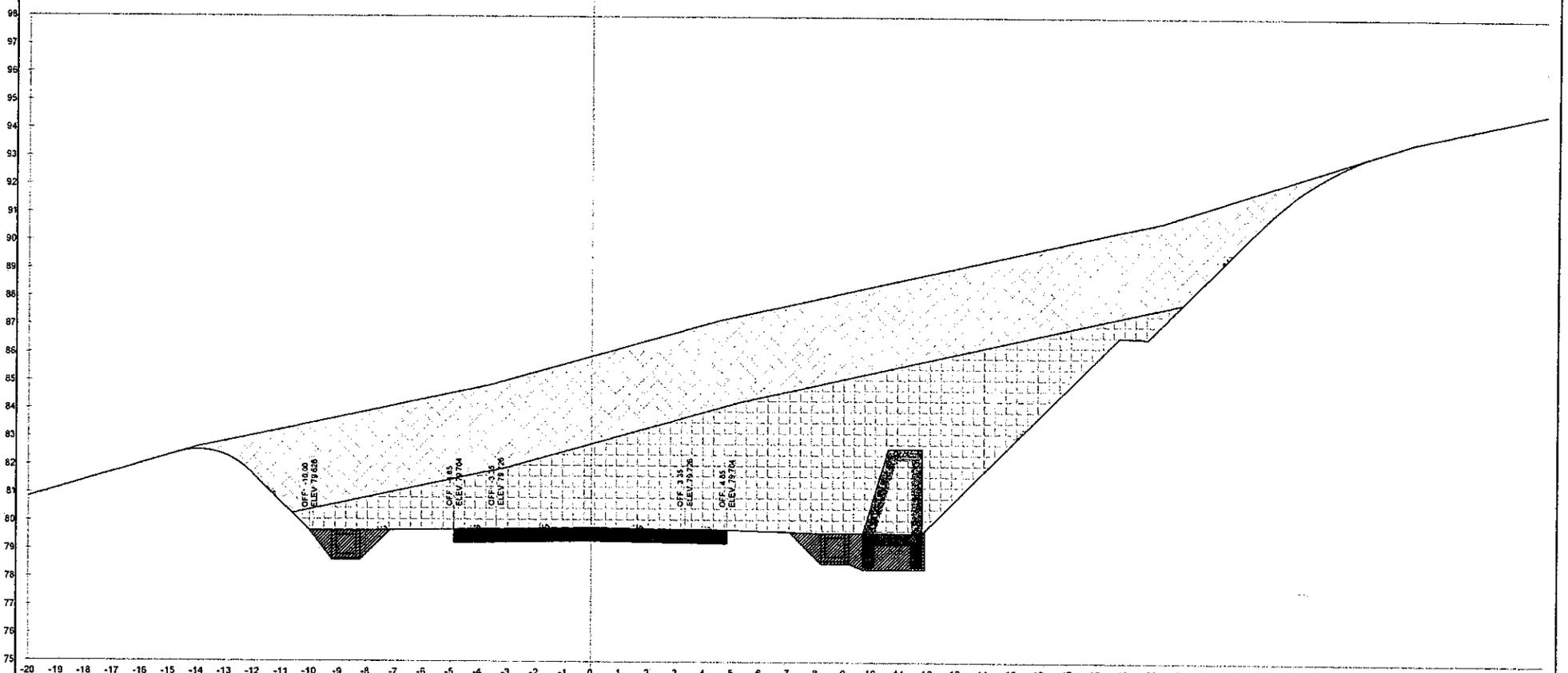
STA. 4+800.00
OGE: 85.13
FGE: 79.824

$Area_{CUT}$: 101.04
$Area_{FILL}$: 0.00
ITEM 103(1)a Area: 0.36
ITEM 103(1)b Area: 6.86
ITEM 506(1): 0.00
Soft Rock: 91.65

NORTHING = 1264717.129
EASTING = 664931.197

REPUBLIC OF THE PHILIPPINES DEPARTMENT OF PUBLIC WORKS AND HIGHWAYS REGIONAL OFFICE NO. VIII BARAS PALO, LEYTE	PROJECT NAME AND LOCATION SIPAG - COASTAL ROADS TO AUGMENT RESILIENCY OF COASTAL COMMUNITIES - CONSTRUCTION OF COASTAL ROAD, PHASE 3, LEYTE - LEYTE TO CAPOOCAN, LEYTE LEYTE 3RD LD	SHEET CONTENTS DETAILED CROSS SECTION	PREPARED JOEL PAUL C. AVOQUE ENGINEER III	REVIEWED FELIX R. BACUS CHIEF, HIGHWAY DESIGN SECTION DATE	SUBMITTED AGNES M. BARONDA CHIEF PLANNING AND DESIGN DIVISION DATE	RECOMMENDED MA. MARGARITA C. LUNA D.M. ASSISTANT REGIONAL DIRECTOR DATE	APPROVED EDGAR B. TABACON, CESO IV REGIONAL DIRECTOR DATE	SET NO 9	SHEET NO 49 104

SCALE
1 : 100



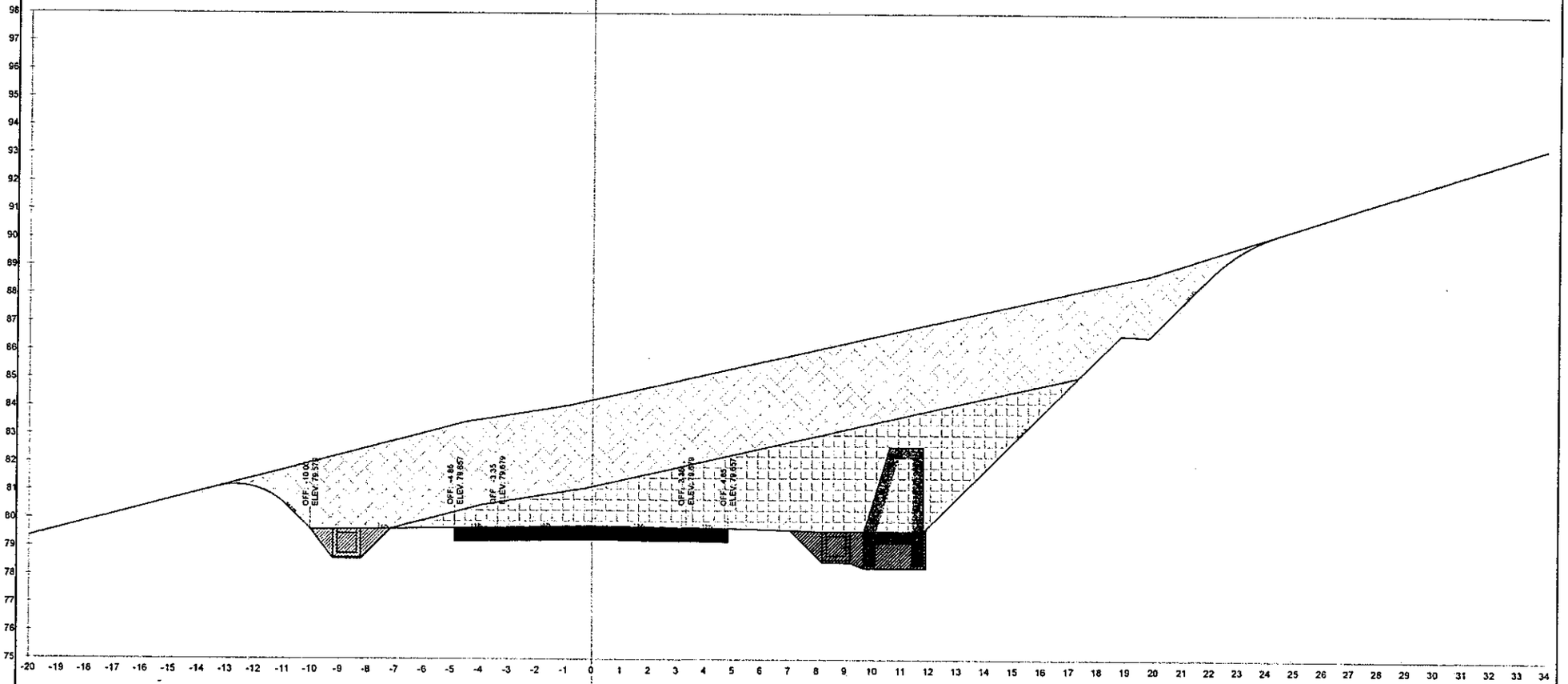
STA. 4+820.00
OGE: 85.87
FGE: 79.776

$Area_{CUT}$: 104.73
$Area_{FILL}$: 0.00
ITEM 103(1)a Area: 0.00
ITEM 103(1)b Area: 7.22
ITEM 506(1): 0.00
Soft Rock: 113.01

NORTHING = 1264719.468
EASTING = 664951.060

REPUBLIC OF THE PHILIPPINES DEPARTMENT OF PUBLIC WORKS AND HIGHWAYS REGIONAL OFFICE NO. VIII BARAS, PALO, LEYTE	PROJECT NAME AND LOCATION SIPAG - COASTAL ROADS TO AUGMENT RESILIENCY OF COASTAL COMMUNITIES - CONSTRUCTION OF COASTAL ROAD, PHASE 3, LEYTE - LEYTE TO CAPOOCAN, LEYTE LEYTE 3RD LD	SHEET CONTENTS DETAILED CROSS SECTION	PREPARED JOEL PAUL C. LADRQUE ENGINEER II	REVIEWED FELIX R. BAGUS CHIEF HIGHWAYS DESIGN SECTION DATE	SUBMITTED AGNES M. BARONDA CHIEF PLANNING AND DESIGN DIVISION DATE	RECOMMENDED MA. MARGARITA C. JUNIA, CM. ASSISTANT REGIONAL DIRECTOR DATE	APPROVED EDGAR B. TABACON, CESO IV REGIONAL DIRECTOR DATE	SET NO 10	SHEET NO 60 104

SCALE
1 : 100



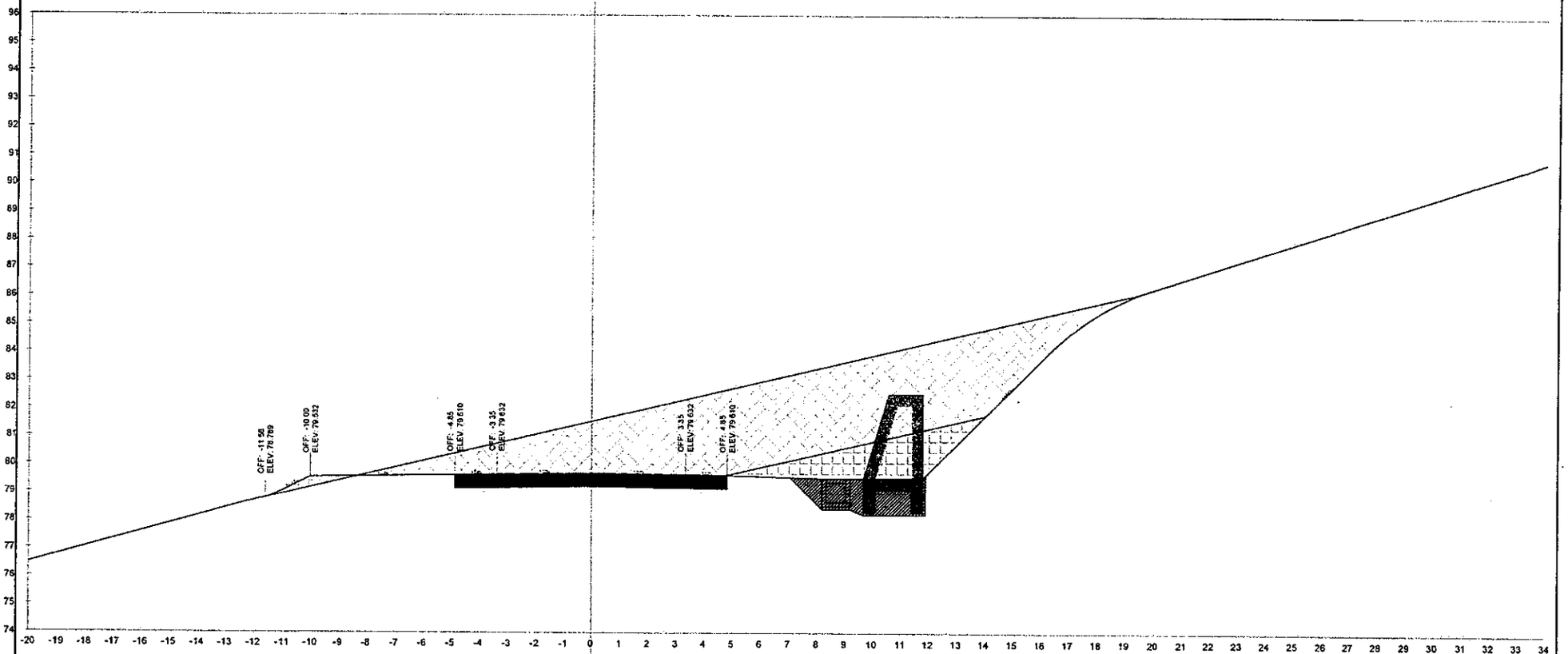
STA. 4+840.00
OGE: 84.21
FGE: 79.729

$Area_{CUT}$: 90.08
$Area_{FILL}$: 0.00
ITEM 103(1)a Area: 2.02
ITEM 103(1)b Area: 5.19
ITEM 506(1): 0.00
Soft Rock: 55.67

NORTHING = 1264721.808
EASTING = 664970.922

REPUBLIC OF THE PHILIPPINES DEPARTMENT OF PUBLIC WORKS AND HIGHWAYS REGIONAL OFFICE NO. VIII BARAS, PALO, LEYTE	PROJECT NAME AND LOCATION SIPAG - COASTAL ROADS TO AUGMENT RESILIENCY OF COASTAL COMMUNITIES - CONSTRUCTION OF COASTAL ROAD, PHASE 3, LEYTE - LEYTE TO CAPOOCAN, LEYTE LEYTE 3RD LD	SHEET CONTENTS DETAILED CROSS SECTION	PREPARED JOEL PAUL C. AMORQUE ENGINEER IV	REVIEWED FELIX R. BAGUS CHIEF HIGHWAY DESIGN SECTION DATE	SUBMITTED AGNES M. BARONDA CHIEF PLANNING AND DESIGN DIVISION DATE	RECOMMENDED MA. MARGARITA C. NUNEZ, O.M. ASSISTANT REGIONAL DIRECTOR DATE	APPROVED EDGAR B. TABACON, CESO IV REGIONAL DIRECTOR DATE	SET NO. LE 83	SHEET NO. 51 104

SCALE
1 : 100



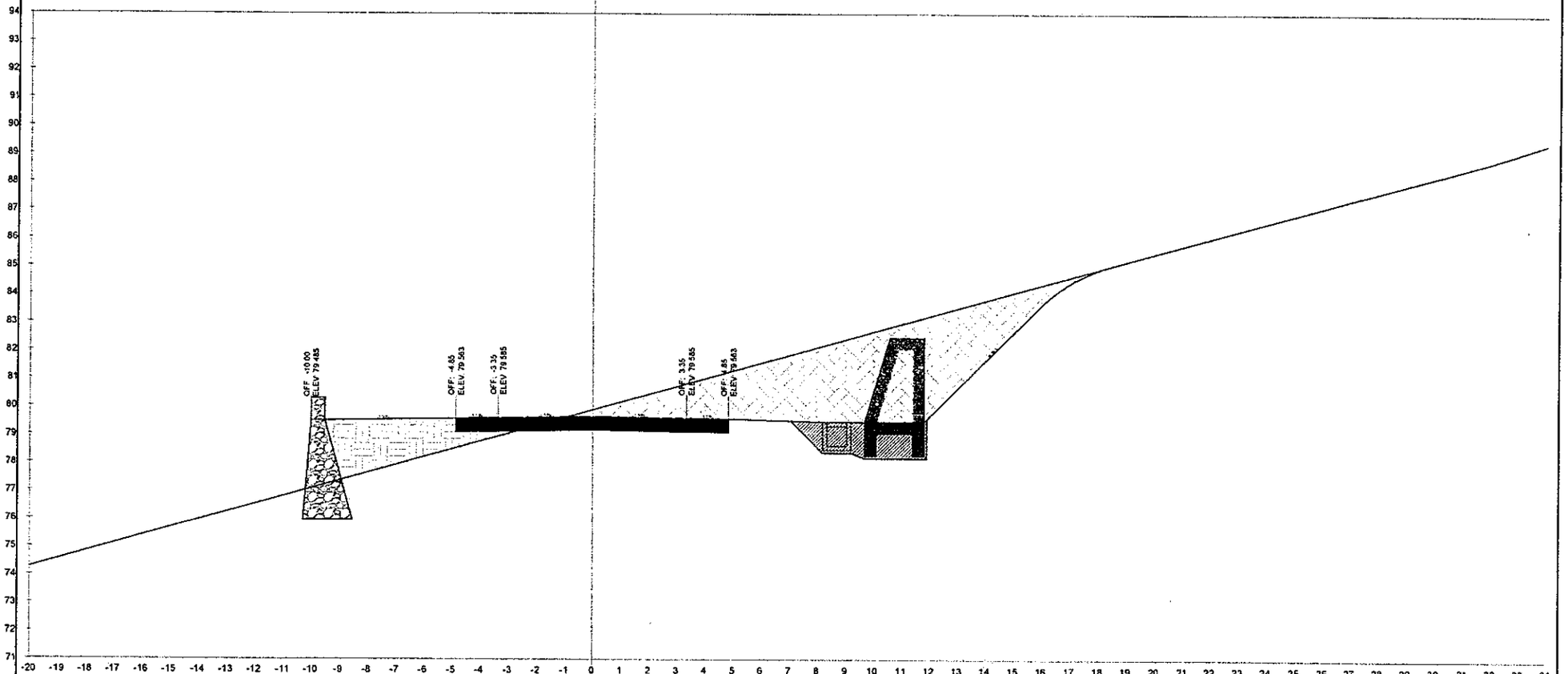
STA. 4+860.00
OGE: 81.52
FGE: 79.582

Area$_{CUT}$: 53.41
Area$_{FILL}$: 0.57
ITEM 103(1)a Area: 0.00
ITEM 103(1)b Area: 5.19
ITEM 506(1): 0.00
Soft Rock: 8.58

NORTHING = 1264724.147
EASTING = 664990.785

REPUBLIC OF THE PHILIPPINES DEPARTMENT OF PUBLIC WORKS AND HIGHWAYS REGIONAL OFFICE NO. VIII BARAS, PALO, LEYTE	PROJECT NAME AND LOCATION SIPAG - COASTAL ROADS TO AUGMENT RESILIENCY OF COASTAL COMMUNITIES - CONSTRUCTION OF COASTAL ROAD, PHASE 3, LEYTE - LEYTE TO CAPOOCAN, LEYTE LEYTE, 3435 LD	SHEET CONTENTS DETAILED CROSS SECTION	PREPARED JOEL JADE C. AVOQUE ENGINEER	REVIEWED FELIX B. BACUS CHIEF, HIGHWAY DESIGN SECTION DATE	SUBMITTED AGNES M. BARONDA CHIEF, PLANNING AND DESIGN DIVISION DATE	RECOMMENDED MA. MARGARITA C. [illegible], D.M. ASSISTANT REGIONAL DIRECTOR DATE	APPROVED FOR USE EDGAR B. TABACON, CESO IV REGIONAL DIRECTOR	SET NO 52 63	SHEET NO 52 104

SCALE
1 : 100



STA. 4+880.00
OGE: 79.87
FGE: 79.635

Area$_{CUT}$: 31.46
Area$_{FILL}$: 7.70
ITEM 103(1)a Area: 5.19
ITEM 103(1)b Area: 0.00
ITEM 506(1): 4.42
Soft Rock: 0.00

NORTHING = 1264726.486
EASTING = 665010.648

REPUBLIC OF THE PHILIPPINES DEPARTMENT OF PUBLIC WORKS AND HIGHWAYS REGIONAL OFFICE NO. VIII BARAS, PALO, LEYTE	PROJECT NAME AND LOCATION SIPAG - COASTAL ROADS TO AUGMENT RESILIENCY OF COASTAL COMMUNITIES - CONSTRUCTION OF COASTAL ROAD, PHASE 3, LEYTE - LEYTE TO CAPOOCAN, LEYTE LEYTE 3R3 LD	SHEET CONTENTS DETAILED CROSS SECTION	PREPARED JOEL PAUL C. AMORQUE ENGINEER II	REVIEWED FELIX R. BACUS CHIEF, HIGHWAY DESIGN SECTION DATE	SUBMITTED AGNES M. BARONDA CHIEF, PLANNING AND DESIGN DIVISION DATE	RECOMMENDED MA. MARGARITA C. LUNIA, M.M. ASSISTANT REGIONAL DIRECTOR DATE	APPROVED EDGAR B. TARACON, CESO IV REGIONAL DIRECTOR DATE	SET NO 53 63	SHEET NO 53 104