



Republic of the Philippines
DEPARTMENT OF PUBLIC WORKS AND HIGHWAYS
REGIONAL OFFICE No. VIII
NORTHERN SAMAR FIRST
DISTRICT ENGINEERING OFFICE
Catarman, Northern Samar

C.Y. 2025 PROJECT
DETAILED ENGINEERING DESIGN PLAN FOR

**CONSTRUCTION OF CAG-ABACA - CULARIMA - GENERAL MALVAR ROAD,
CATARMAN, NORTHERN SAMAR**

CATARMAN, NORTHERN SAMAR

000+000.00 - 002+584.50

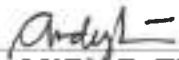
2,584.50 meters, 2 lanes (5.169 lane km., width = 6.10m, thickness = 230 mm)

Grouted Riprap = 1,861.49 cu.m

START: NORTHING: 1372029.835 ,EASTING: 454934.734

END: NORTHING: 1372460.287 ,EASTING: 452723.648

SUBMITTED:


ANDY S. EREÑO

CHIEF, PLANNING AND DESIGN SECTION
CPE

RECOMMENDED:


VIVIAN G. BIACO

ASST. DISTRICT ENGINEER
CPE

APPROVED:


ALVIN A. IGNACIO
DISTRICT ENGINEER

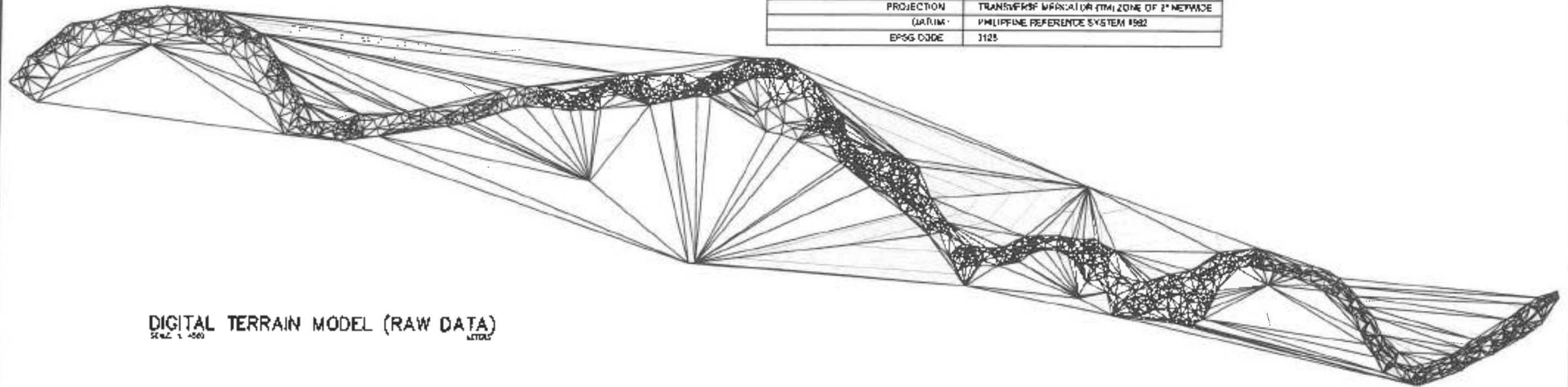
SURVEY DATA:

DATE OF SURVEY : MARCH 27, 2025
 EQUIPMENT USED : RTK-ROVER(Z35180802035), RTK-BASE(Z3518090038), RTK-ROVER(Z35180902046)
 GEOMAX REMOTE ZENIUS A, ZXA0138081038E, ZENIUS A, ZXA0139001909E
 CALIBRATION EXPIRY DATE : APRIL 22, 2025

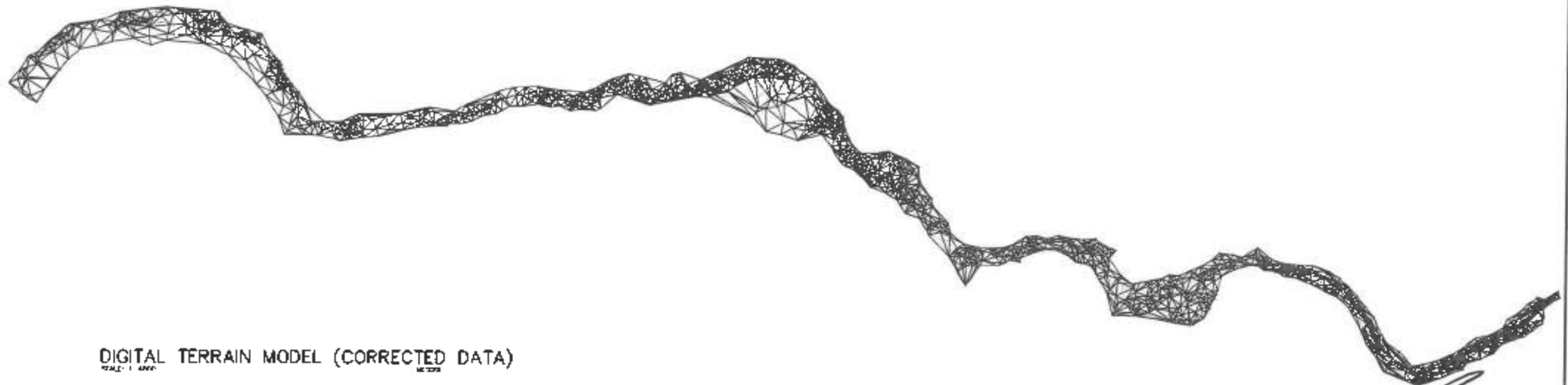
REFERENCE :

BM No / REF No	COORDINATES		ELEVATION	REMARKS
	NORTHING	EASTING		
BM#1	1385502.995	434873.961	83.55	STA 0+000 TO CENTER LINE (START OF THE PROJECT)
BM#2	1385112.822	434537.641	65.45	Sta. 0+000 TO CENTER LINE (END OF THE PROJECT)
REF-1	1385518.322	434867.700	83.77	CENTER LINE OF EXISTING PAVEMENT.

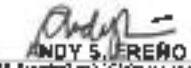
COORDINATE REFERENCE SYSTEM:	PR892 - PHILIPPINE ZONE V
PROJECTION:	TRANSVERSE MERCATOR (UTM) ZONE OF 2° NEPHECE
DAIUM:	PHILIPPINE REFERENCE SYSTEM 1982
EPSG CODE:	3125

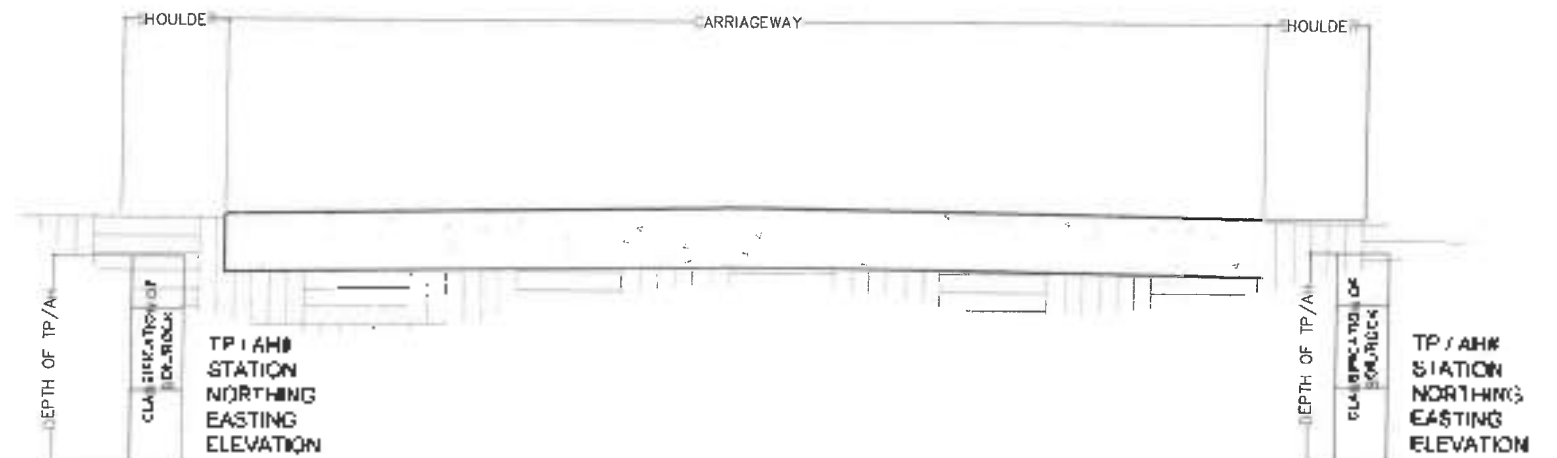
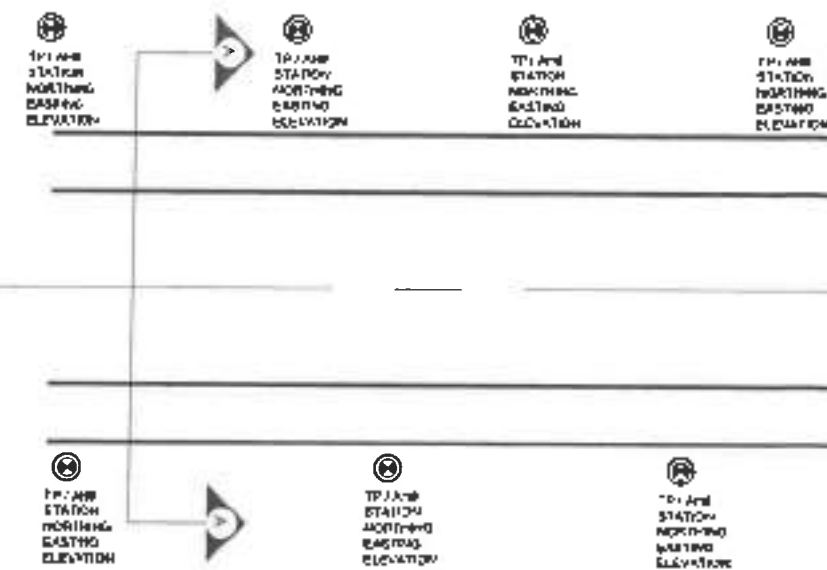


DIGITAL TERRAIN MODEL (RAW DATA)
 SCALE: 1:500
 METERS



DIGITAL TERRAIN MODEL (CORRECTED DATA)
 SCALE: 1:500
 METERS

 Republic of the Philippines DEPARTMENT OF PUBLIC WORKS AND HIGHWAYS REGIONAL OFFICE No. VI NORTHERN SAMAR FIRST DISTRICT ENGINEERING OFFICE CATARMAN, NORTHERN SAMAR	PROJECT NAME & LOCATION CONSTRUCTION OF CAB-ABACA - CULARTIMA - GENERAL MALVAR ROAD, CATARMAN, NORTHERN SAMAR	PROJECT NAME & LOCATION DIGITAL TERRAIN MODEL	DRAFTED:  PAUL M. DELA TORRE ENGINEER II	REVIEWED:  MARCIAL N. EIMAN PROJECT ENGINEER DATE: 5/20/25	SUBMITTED:  ANDY S. ERENO PROJECT ENGINEER DATE: 5/20/25	APPROVED:  ALVIN A. IGNACIO DISTRICT ENGINEER	MS No. 	Sheet No. 
	DATE: 5/20/25		DATE: 5/20/25		DATE: 5/20/25		DATE: 5/20/25	

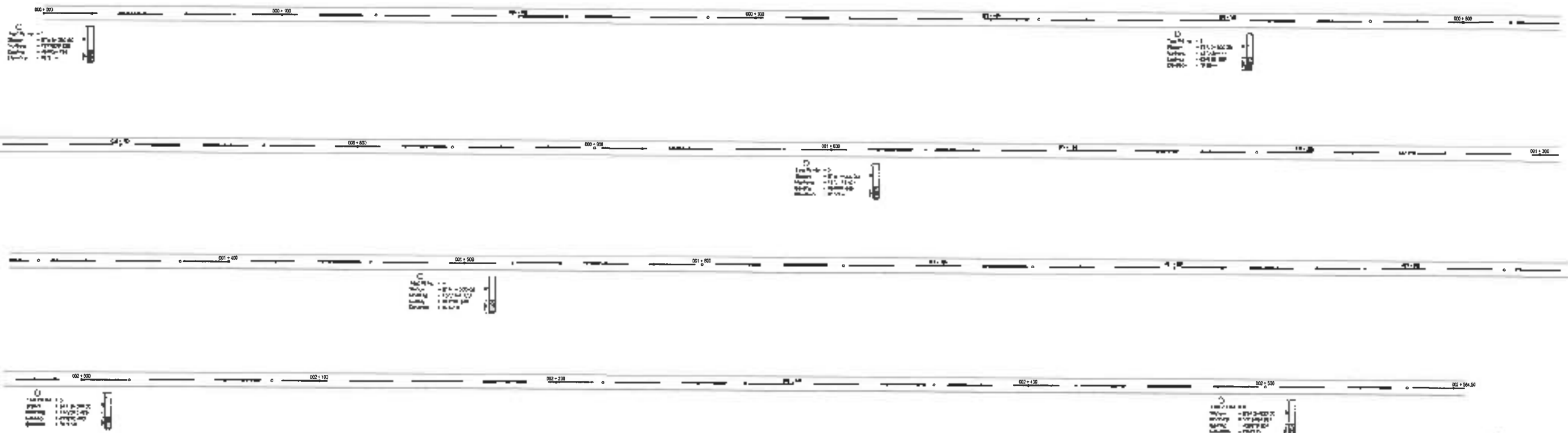


SECTION A - A

SCALE: NTS

TEST PITS / AUGER HOLES LOCATION PLAN

SCALE: NTS



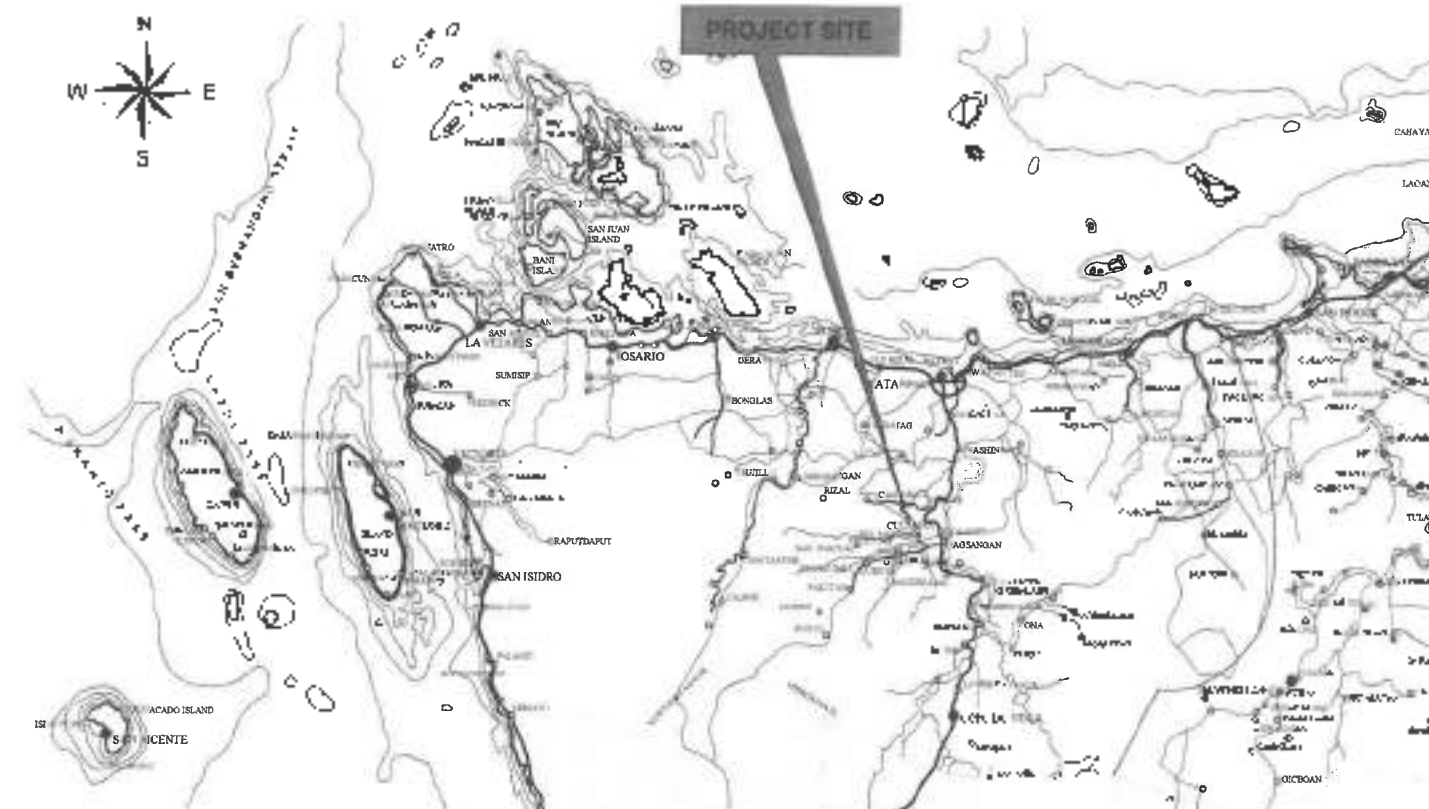
IDEALIZED SOIL PROFILE

SCALE: NTS

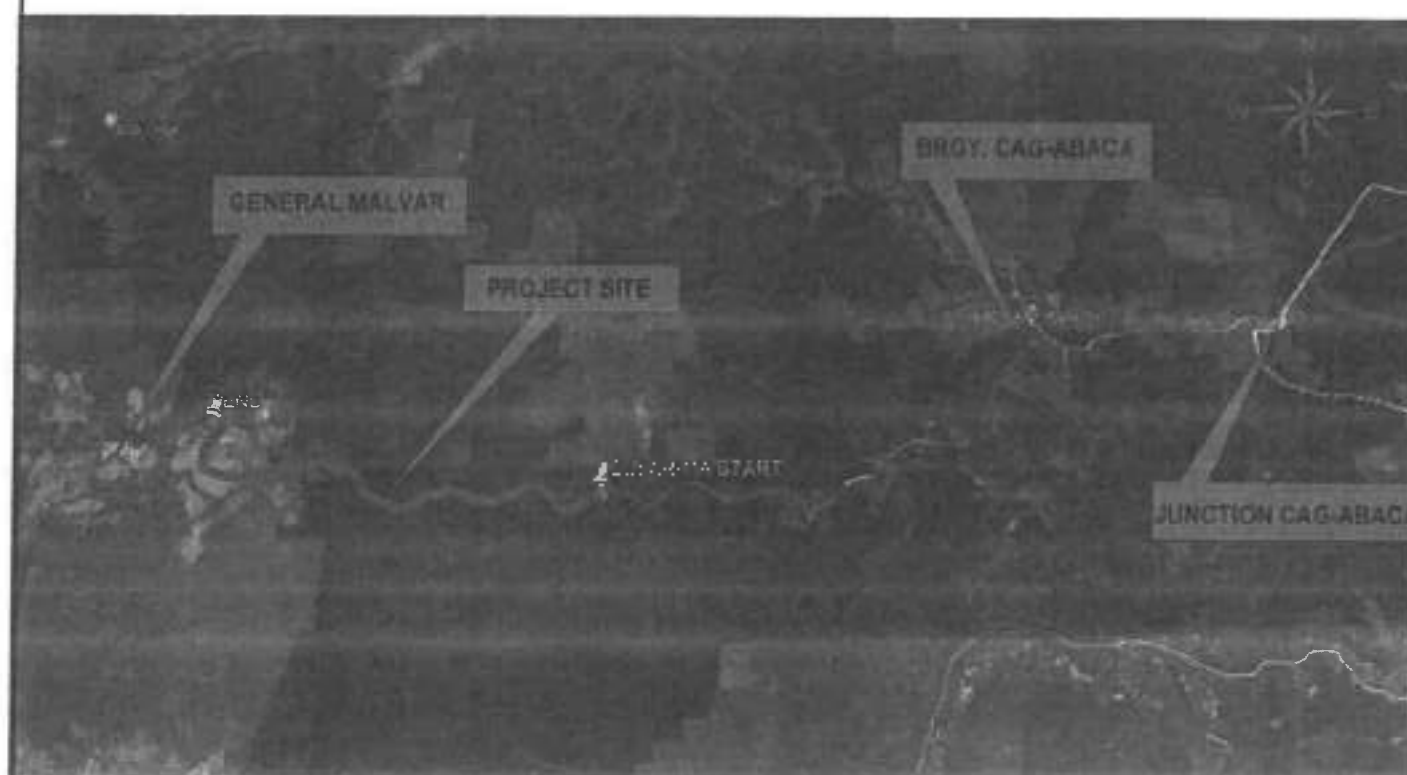
Logo of the Department of Public Works and Highways REGIONAL OFFICE No. VI NORTHERN SAMAR FIRST DISTRICT ENGINEERING OFFICE Cebu City, Philippines	PROJECT NAME & LOCATION CONSTRUCTION OF CAG-ABACA - CULABANA - GENERAL MALVAR ROAD, CATARMAN, NORTHERN SAMAR	PROJECT NAME & LOCATION TEST PITS / AUGER HOLES LOCATION PLAN SECTION A-A IDEALIZED SOIL PROFILE	DRAFTED: MARTIN A. TORRES DESIGNED BY: ANDY S. TREJO	REVIEWED: MARK DONALD N. EMAN ASST. CHIEF PLANNING AND DESIGN SECTION	SUBMITTED: ANDY S. TREJO CHIEF PLANNING AND DESIGN SECTION	APPROVED: VICTOR O. BRACO DISTRICT ENGINEER	APPROVED: ALVIN A. IGNACIO DISTRICT SUPERVISOR	DATE: 02/17/2024 PAGE: 02/48
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TITLE	SET NO.	SHEET NO.
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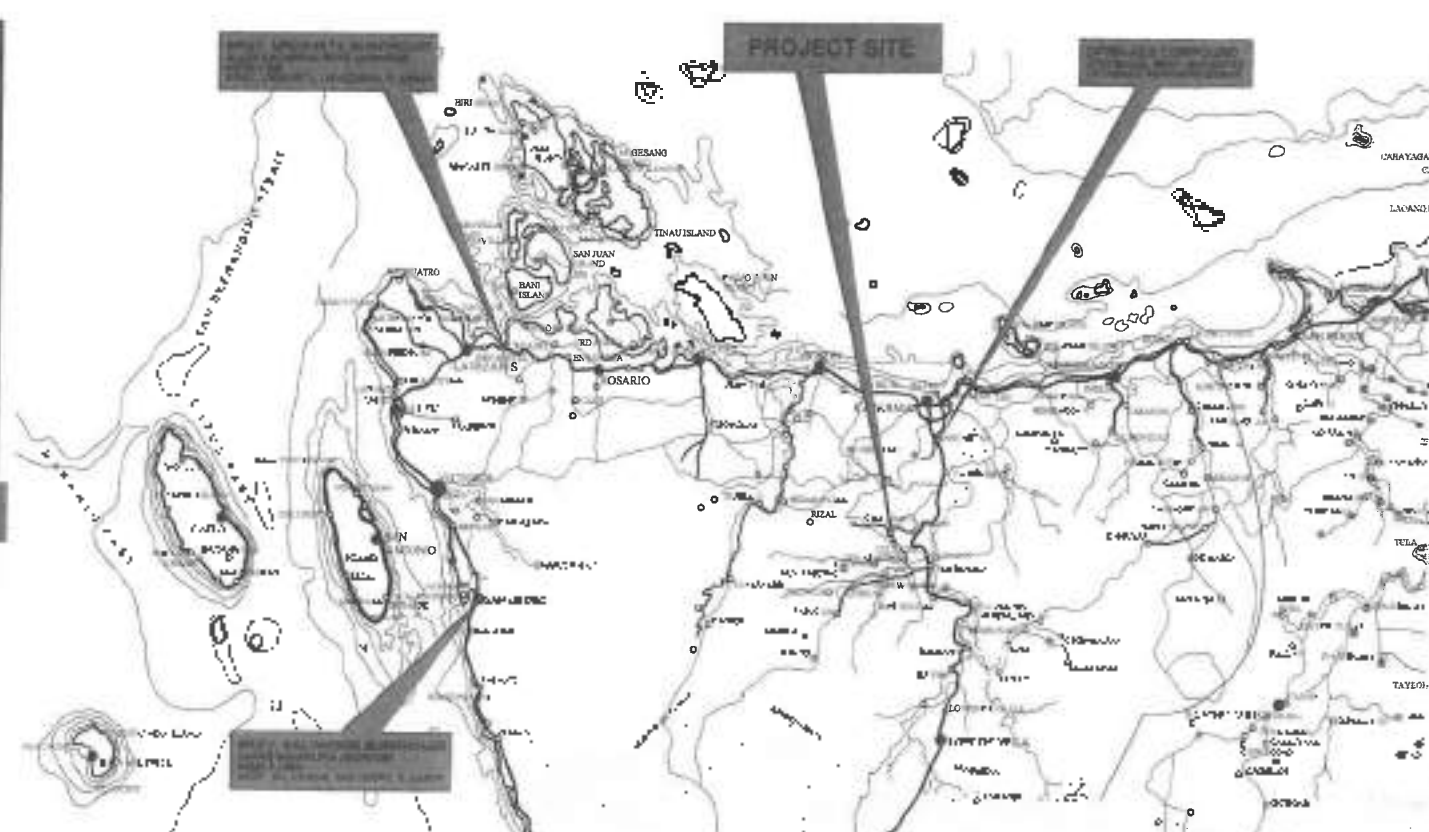
INDEX OF DRAWINGS



LOCATION MAP
NOT TO SCALE



VICINITY MAP
NOT TO SCALE



DISPOSAL MAP
NOT TO SCALE

 DEPARTMENT OF PUBLIC WORKS AND HIGHWAYS NORTHERN SAMAR DISTRICT ENGINEERING OFFICE	PROJECT NAME & LOCATION CONSTRUCTION OF CAG-ABACA - OULARIMA - GENERAL MALVAR ROAD, CATANDUANES, NORTHERN SAMAR	PROJECT NAME & LOCATION INDEX OF DRAWINGS LOCATION MAP VICINITY MAP DISPOSAL MAP	DESIGNED BY MARCELO A. TORRES ENGINEER II	REVIEWED BY MARCELO A. TORRES ENGINEER II	APPROVED BY ANDY S. BRENDO ENGINEER II	APPROVED BY ALVIN A. IGNACIO ENGINEER II	DATE 2022	SCALE 1:1000	DATE 2022
	PROJECT NAME & LOCATION CONSTRUCTION OF CAG-ABACA - OULARIMA - GENERAL MALVAR ROAD, CATANDUANES, NORTHERN SAMAR	PROJECT NAME & LOCATION INDEX OF DRAWINGS LOCATION MAP VICINITY MAP DISPOSAL MAP	DESIGNED BY MARCELO A. TORRES ENGINEER II	REVIEWED BY MARCELO A. TORRES ENGINEER II	APPROVED BY ANDY S. BRENDO ENGINEER II	APPROVED BY ALVIN A. IGNACIO ENGINEER II	DATE 2022	SCALE 1:1000	DATE 2022

SUMMARY OF QUANTITIES

ITEM NO.	DESCRIPTION	UNIT	QUANTITY	REMARKS
VOLUME II	HIGHWAYS, BRIDGES AND AIRPORTS			
PART B	OTHER GENERAL REQUIREMENTS			
B.3	Permits and Clearances	ls	1.00	
B.5	Project Billboard/Signboard (DPWH)	each	2.00	
B.5	Project Billboard/Signboard (COA)	each	1.00	
B.7(2)	Occupational Safety and Health Program	ls	1.00	
B.9	Mobilization/Demobilization	ls.	1.00	
PART C	EARTHWORKS			
100(1)	Clearing and Grubbing	ha	5.17	
100(3)a2	Individual Removal of Trees, 301-500mm, Small	each	575.00	
102(1)	Unsuitable Excavation	cu.m	2,284.38	
102(2)	Surplus Common Excavation	cu.m	116,154.33	
103(1)a	Structure Excavation (common soil)	cu.m	547.45	
103(1)b	Structure Excavation (soft rock)	cu.m	1,214.74	
104(1)a	Embankment from Roadway Excavation (common soil)	cu.m	19,452.50	
105(1)a	Subgrade Preparation (Common Material)	sq.m.	17,097.02	
PART D	SUBBASE AND BASE COURSES			
200(1)	Aggregate Subbase Course	cu.m.	3,419.40	
PART E	SURFACE COURSES			
311(1)c1	Portland Cement Concrete Pavement (Unreinforced), 0.23m thk, 14 days	sq.m.	17,097.02	
PART F	BRIDGE CONSTRUCTION			
404(1)a	Reinforcing Steel, Grade 40	kg.	2,783.92	
405(1)a3	Structural Concrete (Class A, 28 days), 20.68 Mpa	cu.m	39.12	
PART G	DRAINAGE AND SLOPE PROTECTION			
500(1)b	Pipe Culverts, Class II, RCPC	ln.m	128.00	
505(2)a	Grouted Riprap, Class A	cu.m	1,861.49	
517(1)b	Drain Pipe, PVC	ln.m	420.80	



Republic of the Philippines
DEPARTMENT OF PUBLIC WORKS AND HIGHWAYS
REGIONAL OFFICE No. VI
NORTHERN SAMAR FIRST
DISTRICT ENGINEERING OFFICE
Camarines Norte, Samar

PROJECT NAME & LOCATION
CONSTRUCTION OF CAGIABACA -
CULARINA - GENERAL MALVAR ROAD,
CATARMAN, NORTHERN SAMAR
CATARMAN, NORTHERN SAMAR

PROJECT TITLE & LOCATION
SUMMARY OF QUANTITIES

DATE PREPARED
MARTIN V. DELA TORRE
ENGINEER

REVIEWED
MAR DONALD N. EWMAN
ASST. CHIEF, P. & AMPL. & DATA SECTION
Date:

SUBMITTED
ANDY S. BREÑO
CHIEF, PLANNING AND DESIGN SECTION
Date:

RECOMMENDED
VIVIANO D. BUACO
CHIEF, ESTIMATION SECTION
Date:

APPROVED
ALVIN A. IGNACIO
DISTRICT ENGINEER
Date:

SHEET NO. 47
SHEET NO. 38

GENERAL NOTES:

SURVEY DATA:

DATE OF SURVEY : MARCH 27, 2025
EQUIPMENT USED : RTK-ROVER(Z35160802035), RTK-BASE(Z3518090022) RTK-ROVER(Z35190302046)
GCOMMA REMOTE: ZENIUS X, ZXAC130081038E, ZENIUS X, ZXAC130081045E
CALIBRATION EXPIRY DATE : APRIL 22, 2025

REFERENCE:

LINE NO.	COORDINATES		ELEVATION	REMARKS
	NORTHING	EASTING		
REF 1	737283.546	454932.305	89.73	CENTERLINE 5.88 METERS FROM BEGINNING OF PROJECT
BM 1	837466.876	454336.738	89.21	STATIONED ON CENTER LINE (BEGINNING OF THE PROJECT)
544.2	107466.767	457223.648	89.10	STATIONED ON CENTER LINE (END OF THE PROJECT)

COORDINATE REFERENCE SYSTEM:	PR92-1 PHILIPPINE ZONE V
PROJECTION:	TRANSVERSE MERCATOR (T.M.) ZONE OF 2° N. & 2° E.
DATUM:	PHILIPPINE REFERENCE SYSTEM 1992
SPRS CODE:	3123

REFERENCE BENCHMARK DETAILS

- 1) THE POSITION OF PROJECT CONTROL POINTS SHALL BE DEFINED AND MARKED ON THE BY MONUMENTS OF PERMANENT NATURE
- 2) CRITERIA FOR LOCATION OF MONUMENTS
 - ACCESSIBILITY
 - GROUND STABILITY
 - SECURITY FROM POSSIBLE ACTS OF DISTURBANCE
- 3) INTERVAL OF MONUMENTS
 - PRIMARY GPS CONTROL (GPS) 1 KM INTERVAL
 - PRIMARY PROJECT CONTROL (BM) 300 M INTERVAL
 - INTERMEDIATE CONTROL (BM): EVERY 250 M INTERVAL IN BETWEEN SMS

STANDARDS AND REFERENCES:

- DESIGN, GUIDELINES, CRITERIA, AND STANDARDS, VOLUME 4, 2013
- AASHTO A POLICY ON GEOMETRIC DESIGN STANDARD OF HIGHWAYS AND STREETS, 2011, 6TH EDITION
- AASHTO GUIDE ON PAVEMENT DESIGN, 1993 EDITION
- HIGHWAY SAFETY DESIGN STANDARDS PART 1 - ROAD SAFETY DESIGN, AND PART 2 - ROAD SIGNS AND PAVEMENT MARKINGS 2012 EDITION
- DPVH STANDARD SPECIFICATIONS FOR PUBLIC WORKS AND HIGHWAYS, 2014 EDITION VOLUME II, HIGHWAYS, BRIDGES AND AIRPORTS
- DEPARTMENT ORDER NO. 13 SERIES OF 2018 - GUIDELINES FOR THE PREPARATION OF COST ESTIMATES FOR TRAFFIC MANAGEMENT AND SAFETY AND HEALTH REQUIREMENTS FOR THE CONSTRUCTION AND MAINTENANCE OF ROADS, BRIDGES, AND SAFETY & HEALTH REQUIREMENTS FOR SCHOOL BUILDINGS
- DEPARTMENT ORDER NO. 32 SERIES OF 2020 - STANDARD SPECIFICATION FOR ITEM 405-STRUCTURAL CONCRETE
- DEPARTMENT ORDER NO. 220 SERIES OF 2024 - STANDARD PLANS FOR REINFORCED CONCRETE BOX CULVERT (RCBC) CROSS DRAINS

DESIGN SPECIFICATION:

1.0 PAVEMENT DESIGN PARAMETERS

- | | |
|--|-----------------------|
| 1. PERFORMANCE PERIOD | - 20 YEARS (FOR PCRP) |
| 2. DESIGN TRAFFIC ESAL | - 3.762×10^8 |
| 3. DESIGN RELIABILITY R | - 0.85 |
| 4. STANDARD DEVIATION S_u | - 0.35 |
| 5. DESIGN SERVICEABILITY LOSS ΔPSI | - 2.00 |
| 6. PCRP MODULUS OF RUPTURE S_c | - 500.00 |
| 7. PCRP MODULUS OF ELASTICITY E_c | - 3.360×10^5 |
| 8. SUBGRADE DESIGN CBR | - 7.7% |
| 9. EFFECTIVE ROADBED RESILIENT MODULUS M_R | - 11568.75 |
| 10. SUBBASE ELASTIC MODULUS E_{SB} | - 15000.00 |
| 11. SUBBASE THICKNESS | - 200 mm |
| 12. EFFECTIVE MODULUS AT SUBGRADE REACTION k_1 (psi) | - 590.00 |
| 13. DRAINAGE COEFFICIENT C_d | - 1.00 |
| 14. LOAD TRANSFER COEFFICIENT J | - 3.20 |
| 15. LOSS OF SUPPORT L_k | - 1.00 |
| 16. k_2 CORRECTED | - 170.00 |

HYDROLOGIC ANALYSIS AND
HYDRAULIC PARAMETERS FOR RCBC:

- | | | | |
|----|---------------------------|---|--------------------------------|
| 1 | DESIGN STORM FREQUENCY | - | 5 YEAR |
| 2 | COEFFICIENT OF RUN-OFF, C | - | 0.22 |
| 3 | RAINFALL INTENSITY, I | - | 0.50874 mm/hr |
| 4 | CATCHMENT AREA, A | - | 0.005142 sq km |
| 5 | RUN-OFF DISCHARGE, QR | - | 5.12273 m ³ /sec |
| 6 | DIAMETER D | - | 0.81 |
| 7 | DEPTH OF FLOW H1 | - | 0.82 |
| 8 | SLOPE, S | - | 0.11111 |
| 9 | ROUGHNESS COEFFICIENT, n | - | 0.018 |
| 10 | WETTED PERIMETER, P | - | 2.57267 |
| 11 | HYDRAULIC RADIUS, R | - | 0.2275 |
| 12 | VELOCITY V | - | 0.80 m/s |
| 13 | DESIGN DISCHARGE, Qd | - | 4.03964652 m ³ /sec |

DESIGN CRITERIA FOR RCBC:

LOADINGS

- b. DEAD LOAD: WEIGHT OF STRUCTURE, CONCRETE PAVEMENT, AND FUTURE BITUMINOUS WEARING COURSE
LIVE LOAD: DESIGNED USING HS-20 STANDARD LOADING. AXLE LOADS OF THE DESIGN VEHICLE ARE ORIENTED PARALLEL TO THE SPAN OF THE RCBC STRUCTURE TO MAXIMIZE THE FORCE EFFECT UNDER CONSIDERATION

(b. 3) HL-93 DESIGN TRUCK AND DESIGN LANE LOAD



(D.2) HL-82 DESIGN TANDEM AND DESIGN LANE LOAD



(b.3) MULTIPLE PRESENCE FACTOR: APPLY CORRESPONDING FACTORS BASED ON THE PROBABILITY OF FULLY LOADED LINES OCCURRING SIMULTANEOUSLY

NUMBER OF LOADED LANES	MULTIPLE PRESENCE FACTOR
1	1.20
2	1.00
3	0.85
≥3	0.65

(0.4) DYNAMIC LOAD ALLOWANCE: APPLICABLE FOR HL-93 TRUCK/TANDDEM LIVE LOAD ONLY. THE FACTOR TO BE APPLIED TO STATIC LOAD SHALL BE $(1 + \Delta/100)$, WHERE Δ IS AS SPECIFIED IN THE TABLE BELOW

COMPONENT	DECK JOINTS ALL LIMIT STATES	ALL OTHER COMPONENTS	
		FATIGUE & FRACTURE LIMIT STATES	ALL OTHER LIMIT STATES
RM	75%	15%	15%

6. LIVE LOAD SURCHARGE: HORIZONTAL PRESSURE ON OUTER SIDE WALLS IS DETERMINED USING EQUIVALENT ABUTMENT HEIGHT BASED ON SOIL EMBEDMENT.

ADJUSTMENT HEIGHT	TIME
1.5	1.7
3	0.9
4.0	0.8

d LATERAL EARTH PRESSURE HORIZONTAL LOAD APPLIED BY GWT AGAINST THE BOX CULVERT

DESIGN OF PAVEMENT:

NOTE:

TRANSVERSE CONSTRUCTION (CONTACT) JOINT SHALL BE PROVIDED 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 JOINTS SHOULD BE BUTT JOINTS WITH DOWELS. IF JOINT OCCURS IN THE MIDDLE THIRD OF THE WEAKENED JOINT INTERVAL (1500-2000mm) IT SHOULD BE KEVED JOINTS WITH TIE BARS

GENERAL NOTES

1. MATERIALS AND WORKMANSHIP SHALL CONFORM WITH THE 'DPW STANDARD SPECIFICATIONS FOR HIGHWAYS, BRIDGES AND AIRPORT' 2014 EDITION.
2. CONSTRUCTION JOINTS ARE FORMED WHEN CONCRETE ON ONE SIDE OF THE JOINT IS POURED AHEAD AND ALLOWED TO SET BEFORE POURING ON THE OTHER SIDE.
3. AT THE 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 BAR. ALL DOVEL BARS SHALL BE SMOOTH ROUND STEEL BAR FREE FROM RUST AND OTHER DEFECTS WHICH MIGHT RESTRICT THEIR MOVEMENT.
5. TYPE OF WEAKENED PLANE JOINT TO BE USED SHALL BE AS SPECIFIED IN THE PLANS AND ONLY ONE TYPE SHALL BE USED FOR THE WHOLE PROJECT.
6. MATERIALS FOR METAL SIDE FORM SHALL BE BRAND NEW SHEET METAL GAUGE NO. 18 OF BLACK IRON FREE FROM DUST, RUST AND LIME.
7. AT LEAST SIX (6) SUCCESSIVE DOVELLED BUTT JOINTS AT ADOINAL JOINT SPACING SHALL BE PROVIDED BEFORE OR AFTER AN EXPANSION JOINT.
8. THE GROOVE OR CRACK ABOVE JOINTS (LONGITUDINAL OR TRANSVERSE) SHALL BE SEALED WITH 30-50 PENETRATION ASPHALT OR COLO APPLIED LIQUID RUBBER COMPOUND AFTER THE CONCRETE HAD BEEN CURD AND BEFORE OPENING PAVEMENT TO TRAFFIC. PENETRATION ASPHALT SEAL ON CONCRETE JOINT SHOULD BE POURED IN SUCH A MANNER THAT SPILLING WILL BE ELIMINATED. THIS PROVIDE A SMOOTH RIDING SURFACE.
9. ALL TRANSVERSE JOINT, EXCEPT CONSTRUCTION JOINT, SHALL BE CONTINUOUS FROM EDGE TO EDGE.
10. ALL LONGITUDINAL JOINT SHALL MEET AT INTERSECTIONS WITH NO GAPS OR OFFSET.
11. ALL DIMENSION ARE IN MILLIMETERS UNLESS OTHERWISE SPECIFIED.
12. AVOID STOPPAGE OF FORMWORKS ALONG CURVES.
13. DRILLING OF HOLES ON EXISTING POOL OR OTHER STRUCTURES SHALL BE PERFORMED USING POWER TOOLS. THE HOLES SHALL BE PROPERLY CLEANED BEFORE GROUT/POXY INJECTION AND INSTALLATION OF DOVELS OR THE BARS.
14. APPLICABLE PROVISIONS OF D.O. NO. 28, SERIES OF 1998 IS HEREBY ENFORCED.

CONSTRUCTION REQUIREMENTS:

1. DIMENSIONS

- UNLESS OTHERWISE SHOWN, ALL DISTANCES ARE IN METERS

II. STATIONINGS

- 171 THE ROAD STATIONS AND ELEMENTS OF CURVES ARE RELATIVE TO THE CENTERLINE OF THE ROAD
- 172 ALL STATIONS ALONG ROAD CENTERLINE ARE ACQUIRED FROM NATIONAL ROAD

iv. ELEVATIONS AND GRADES

- (1) ELEVATIONS GIVEN IN THE COLUMN "FINISHED GRADE ELEVATION" REFER TO THE GRADE AS SHOWN IN THE TYPICAL ROADWAY SECTION.
- (2) GROUND LEVEL AND FINISHED ROAD LEVEL ON THE ROAD REFER TO THE GROUND PROFILE FOR THE ROAD CENTERLINE.

[illegible]

ITEM 505 - RIPRAP AND GROUTED RIPRAP

STONES FOR RIPRAP SHALL CONSIST OF ROCK AS NEARLY AS RECTANGULAR IN SECTION AS IS PRACTICAL. EXCEPT THAT RIPRAP OF CLASS A MAY CONSIST OF ROUND NATURAL STONES. THE STONES SHALL BE SOUND, TOUGH, DURABLE, DENSE, RESISTANT TO THE ACTION OF AIR AND WATER, AND SUITABLE IN ALL RESPECTS FOR THE PURPOSE INTENDED. STONE CONTAINING SHALE, UNSOUND SANDSTONE, OR ANY OTHER MATERIAL WHICH READILY DISINTEGRATES SHALL NOT BE USED.

CLASS A - STONES RANGING FROM A MINIMUM OF 15 KG TO A MAXIMUM OF 25 KG WITH AT LEAST 50 PERCENT OF THE STONES WEIGHING MORE THAN 20 KG. SOUND PIECES OF BROKEN CONCRETE OBTAINED FROM THE REMOVAL OF BRIDGES, PORTLAND CEMENT CONCRETE PAVEMENTS, CULVERT AND OTHER STRUCTURES MAY BE SUBSTITUTED FOR STONE WITH THE APPROVAL OF THE ENGINEER.

THE RECYCLED BROKEN CONCRETE SHALL BE AT LEAST 2,245 KG/CU.M (BASED ON BULK SPECIFIC GRAVITY) AND FREE OF PROTRUDING REINFORCEMENT. STOCKPILES OF RECYCLED CONCRETE SHALL BE KEPT SEPARATE FROM OTHER MATERIALS. STOCKPILES OF RECYCLED CONCRETE SHALL BE UNIFORM AND FREE OF SOIL, DEBRIS, EXCESSIVE AMOUNTS OF ASPHALT MATERIALS, AND FOREIGN MATTER.

2.0 THIS PLAN WILL SERVE ONLY AS A GUIDE IN THE IMPLEMENTATION PARTICULARLY IN THE CONSTRUCTION STAGE. IT MUST ALSO BE SUBJECTED TO AN AS-STAKED SURVEY TO BE CONSTRUCTED JOINTLY BY THE DIRECT IMPLEMENTING OFFICE AND THE CONTRACTOR AND SUBSEQUENT PLANS WILL BE PREPARED AND SUBMITTED FOR APPROVAL.

ABBREVIATIONS

AZIM	=	AZIMUTH
DIST	=	DISTANCE
I	=	INTERSECTION ANGLE
T	=	TANGENT
R	=	RADIUS
D	=	DEGREE OF CURVE
Lc	=	LENGTH OF CURVE
PC	=	POINT OF CURVATURE
PT	=	POINT OF TANGENCY
E	=	EXTERNAL DISTANCE
M	=	MIDDLE ORDINATE
c	=	ELEVATION
V	=	VELOCITY
W	=	WIDENING
BM	=	BENCH MARK
RP	=	REFERENCE POINT
ELEV	=	ELEVATION
VI	=	POINT OF VERTICAL INTERSECTION
STA	=	STATION
g	=	GRADE IN %
CL	=	CENTERLINE

LEGENDS AND ABBREVIATIONS

EXISTING TOPOGRAPHICAL FEATURES

NORTH ARROW	
EXISTING ROAD	
EXISTING ROAD WIDTH	
EXISTING CONTOUR	
KM POST	
EXISTING PIPE CULVERT	
EXISTING BOX CULVERT	
EXISTING CON. RAILINGS	
EXISTING RIPRAP	
EXISTING CANAL	
RIVER/CREEK	
HOUSES	
DIRECTION OF WATER FLOW	
TREES	
RICE FIELD	
SWAMP	
ELECTRICAL POST	
LIGHTING FIXTURES	
SOLAR STUDS	

DESIGN FEATURES ON PLAN

PROPOSED ROAD WIDTH	
CENTER LINE	
EDGE OF PAVEMENT	
ROW LIMIT	
BENCH MARK	
REFERENCE POINT	
CONTROL STATION	
POINT OF CURVATURE	
POINT OF TANGENCY	
POINT OF INTERSECTION	
REINFORCED CONCRETE BOX CULVERT (RCBC)	
REINFORCED CONCRETE PIPE CULVERT (RCPC)	
GROUTED RIPRAP W/ HEAD WALL (SLOPE PROT)	
STONE MASONRY LINED CANAL	
STONE MASONRY SLOPE PROTECTION	
CHEVRON SIGNS	

DESIGN FEATURES ON PROFILE

SUPER ELEVATION INNER	
SUPER ELEVATION OUTER	
POINT OF VERTICAL INTERSECTION, STATION AND ELEVATION	
REINFORCED CONCRETE BOX CULVERT (RCBC)	
REINFORCED CONCRETE PIPE CULVERT (RCPC)	



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NORTHERN SAMAR FIRST
DISTRICT ENGINEERING OFFICE
Calbayog, Northern Samar

PROJECT Description
CONSTRUCTION OF GAG-ABACA -
CULARIMA - GENERAL MALVAR ROAD,
CATARMAN, NORTHERN SAMAR
CATARMAN, NORTHERN SAMAR

PROJECT NAME/REVISION
GENERAL NOTES
LEGENDS & ABBREVIATIONS

DRAWN/DESIGNED

MARTIN DELA TORRE
Designer

REVIEWED

MAR DONALD M. EIMAN
Senior Field Engineer and Design Section Chief
Date

SUBMITTED

ANDY S. BRENO
Senior Planning and Design Section Chief
Date

BY SUBMITTED

VIVIANO D. BIAGO
Senior Planning and Design Section Chief
Date

APPROVED

ALVIN A. IGNACIO
District Engineer
Date

SET NO.

6
7

SHEET NO.

OF
68

ON CUT COMMON SOIL

10' 3" TOP of 4.5m
10' 3" TOP of 4.5m
ROUNDED SLOPE

7000 MAX

10 PAVEMENT DESIGN PARAMETERS

1. PERFORMANCE PERIOD - 20 YEARS (FOR PCRP)
2. DESIGN TRAFFIC ESAL - 3.762×10^7
3. DESIGN RELIABILITY R - 0.95
4. STANDARD DEVIATION S_o - 0.35
5. DESIGN SERVICEABILITY LOSS ΔPSI - 2.05
6. PCRP MODULUS OF RUPTURE S_c - 500.00
7. PCRP MODULUS OF ELASTICITY E_c - 3.300×10^9
8. SUBGRADE DESIGN CBR - 7.71
9. EFFECTIVE ROADBED RESILIENT MODULUS M_R - 1,500.00
10. SUBBASE ELASTIC MODULUS E_{SB} - 15000.00
11. SUBBASE THICKNESS - 200 mm
12. EFFECTIVE MODULUS AT SUBGRADE REACTION $K_1(psi)$ - 590.00
13. DRAINAGE COEFFICIENT: C_d - 1.00
14. LOAD TRANSFER COEFFICIENT: J - 3.20
15. LOSS OF SUPPORT L_s - 1.00
16. K_1 CORRECTED - 170.00

SPURTS (SEE ON DETAIL)
2111111: PORTLAND CEMENT CONCRETE PAVEMENT (AUTOCOMPACTED), 230mm THK.
220111: PORTLAND CEMENT CONCRETE PAVEMENT (AUTOCOMPACTED), 230mm THK.
230111: PORTLAND CEMENT CONCRETE PAVEMENT (AUTOCOMPACTED), 230mm THK.
240111: PORTLAND CEMENT CONCRETE PAVEMENT (AUTOCOMPACTED), 230mm THK.

TYPICAL ROADWAY SECTION ON CUT SCALE: 1:100 METERS

SPURTS (SEE ON DETAIL)
2111111: PORTLAND CEMENT CONCRETE PAVEMENT (AUTOCOMPACTED), 230mm THK.
220111: PORTLAND CEMENT CONCRETE PAVEMENT (AUTOCOMPACTED), 230mm THK.
230111: PORTLAND CEMENT CONCRETE PAVEMENT (AUTOCOMPACTED), 230mm THK.
240111: PORTLAND CEMENT CONCRETE PAVEMENT (AUTOCOMPACTED), 230mm THK.

TYPICAL ROADWAY SECTION SCALE: 1:100 METERS

GRADED ROAD CLASS A 300mm THK

ON FILL
UNSATURABLE SOIL

TYPICAL ROADWAY SECTION SCALE: 1:100 METERS

DESIGN SPEED (V) kph	MAXIMUM SUPERELEVATION (e_{max}) %	MAXIMUM WIDENING (w_{max}) m
40.00	8.00	1.40

*NOTE: ONLY SELECTED CURVES HAS WIDENING OF CURVE.
SEE TABLE ON PLAN



Department of Public Works and Highways
Regional Office No. 10
NORTHERN SAMAR FIRST
DISTRICT ENGINEERING OFFICE
Catarman, Northern Samar

PROJECT NAME AND LOCATION
CONSTRUCTION OF CAG-ABACA -
GULARMIA - GENERAL MALVAR ROAD,
CATARMAN, NORTHERN SAMAR

PROJECT NAME LOCATION
TYPICAL ROADWAY SECTION

DESIGNED BY
MARTIN M. DELA TORRE
ENGINEER II

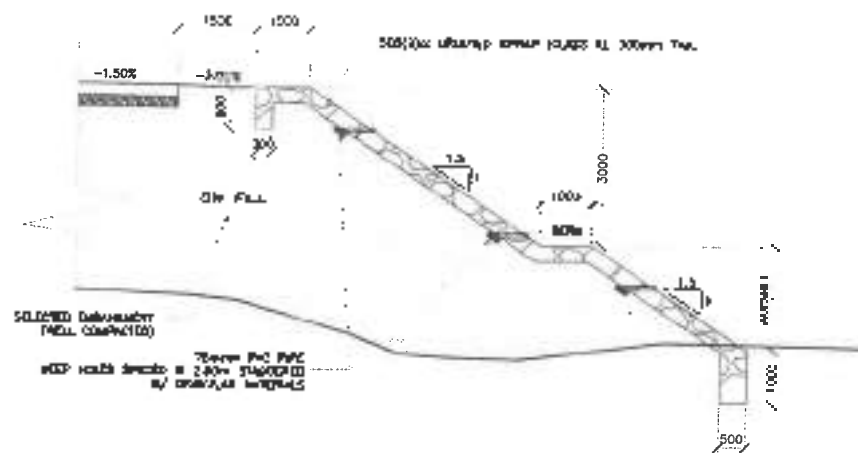
CHECKED BY
MAR DONALD N. EIMAN
JUNIOR ENGINEER

SUBMITTED BY
ANDY S. JEREND
JUNIOR ENGINEER

DESIGNED BY
VIMANG BIACO
JUNIOR ENGINEER

APPROVED BY
ALVIN A. ISNACIO
DISTRICT ENGINEER

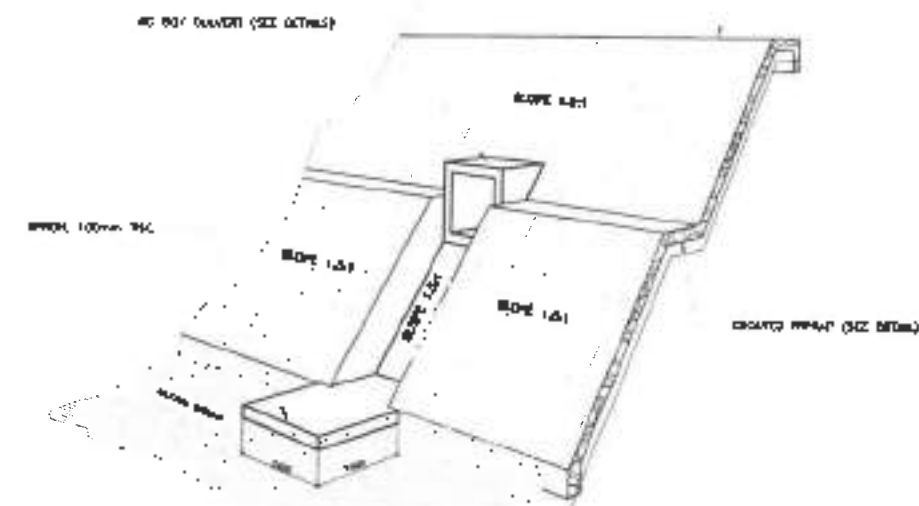
DATE NO
10/10/2020



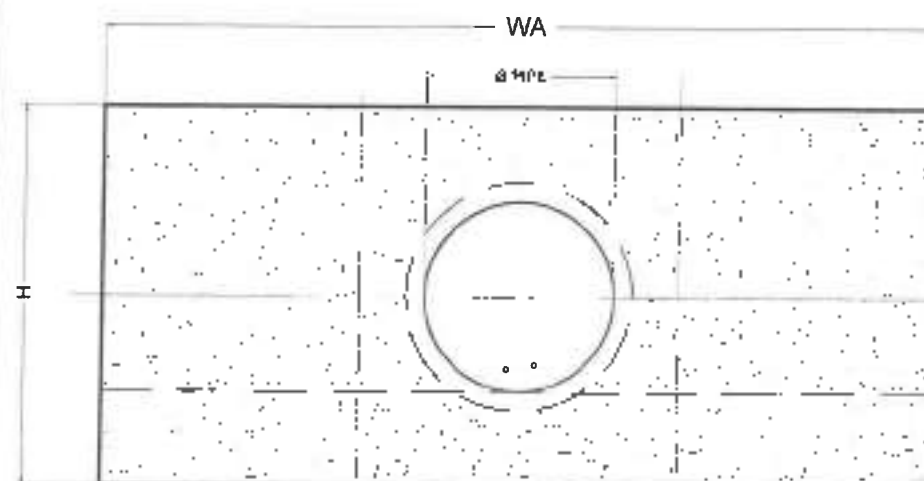
DETAILS OF GROUTED RIPRAP
SCALE 1:100M

GROUTED RIPRAP SCHEDULE

CHAINAGE	LENGTH	REMARKS
0+050 - 0+080	30.00m	LEFT SIDE
0+140 - 0+180	40.00m	LEFT SIDE
0+140 - 0+180	40.00m	RIGHT SIDE
0+550 - 0+570	20.00m	LEFT & RIGHT SIDE
0+520 - 0+600	80.00m	LEFT SIDE
0+680 - 0+850	170.00m	RIGHT SIDE
0+950 - 0+980	30.00m	RIGHT SIDE
0+980 - 1+040	60.00m	LEFT SIDE
0+980 - 1+080	40.00m	RIGHT SIDE
1+250 - 1+300	50.00m	LEFT SIDE
1+450 - 1+480	30.00m	LEFT & RIGHT SIDE
1+580 - 1+640	60.00m	LEFT SIDE
1+820 - 1+840	20.00m	RIGHT SIDE
1+710 - 1+720	10.00m	LEFT & RIGHT SIDE
2+080 - 2+380	300.00m	LEFT & RIGHT SIDE

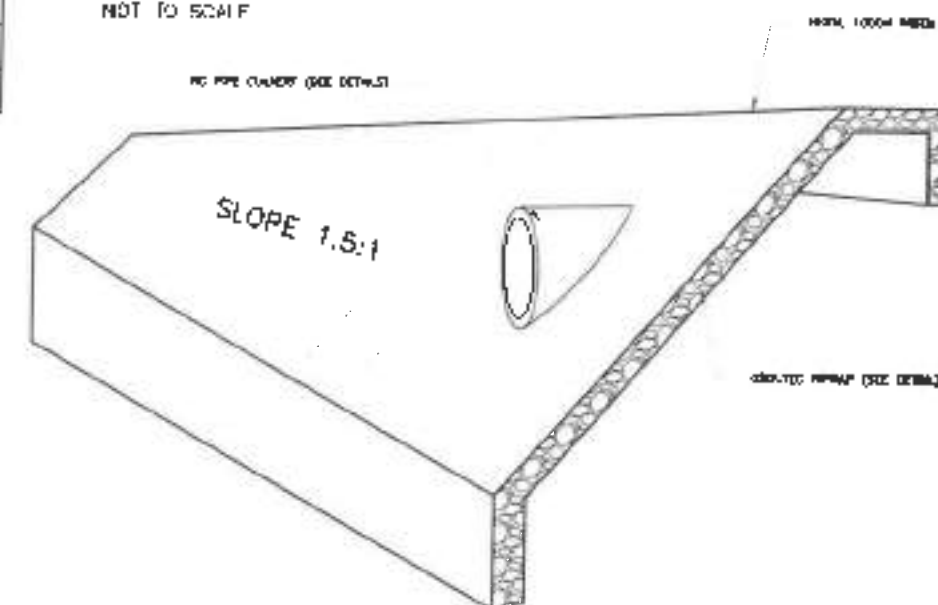


ISOMETRIC VIEW OF RCBC
NOT TO SCALE



DETAILS OF RCPC
NOT TO SCALE

CHAINAGE	DESCRIPTION	REMARKS
000+584.00	1-LINE 910mm x 17.00 Lm RCPC	INSTALL
000+653.00	1-LINE 910mm x 17.00 Lm RCPC	INSTALL
000+673.00	1-LINE 910mm x 15.00 Lm RCPC	INSTALL
000+685.00	1-LINE 910mm x 15.00 Lm RCPC	INSTALL
001+457.00	1-LINE 910mm x 14.96 Lm RCPC	INSTALL
001+464.00	1-LINE 910mm x 18.00 Lm RCPC	INSTALL
001+474.00	1-LINE 910mm x 15.00 Lm RCPC	INSTALL
002+148.00	1-LINE 910mm x 17.00 Lm RCPC	INSTALL



ISOMETRIC VIEW OF RCPC
NOT TO SCALE

TABLE A (ONE STRAIGHT TYPE HEADWALL)

DIA. & THICKNESS (PIPE) (mm)			DIMENSIONS (mm)			SINGLE PIPE		DOUBLE PIPE		TRIPLE PIPE		QUADRUPLE PIPE	
INTERNAL DIAMETER (mm)	MIN THK. SHELLO (mm)		A	B	H	VOLUME (m³)	AREA OF WATERWAY (m²)	VOLUME (m³)	AREA OF WATERWAY (m²)	VOLUME (m³)	AREA OF WATERWAY (m²)	VOLUME (m³)	AREA OF WATERWAY (m²)
	MACHINE MADE	HAND MADE											
450	50	75	300	540	1070	1830	0.13	0.31	0.26	1.10	0.39	1.34	0.52
610	50	90	410	750	1520	2440	0.21	0.48	0.46	1.98	0.69	2.78	0.82
760	80	100	510	1000	1870	3050	0.30	0.74	0.71	3.13	0.97	3.93	1.12
910	90	110	610	1260	2130	3680	0.51	1.08	1.00	4.59	1.54	6.21	1.85
1225	110	130	810	1580	2740	4890	0.81	1.75	1.62	6.76	2.23	8.99	2.64
1525	130	150	1010	2030	3530	6030	1.41	3.07	2.82	10.32	3.43	13.60	4.04



DEPARTMENT OF PUBLIC WORKS AND HIGHWAYS
REGIONAL OFFICE No. VII
NORTHERN SAMAR FIRST
DISTRICT ENGINEERING OFFICE
CATARAN, NORTHERN SAMAR

PROJECT NAME: CONSTRUCTION OF CAG-ABACA -
CULARIMA - GENERAL MALVAR ROAD,
CATARAN, NORTHERN SAMAR

PROJECT NAME: DETAILS OF GROUTED RIPRAP,
DETAILS OF RCPC,
ISOMETRIC VIEW OF RCPC

DESIGNED BY: MARTIN DELA TORRE
ENGINEER II

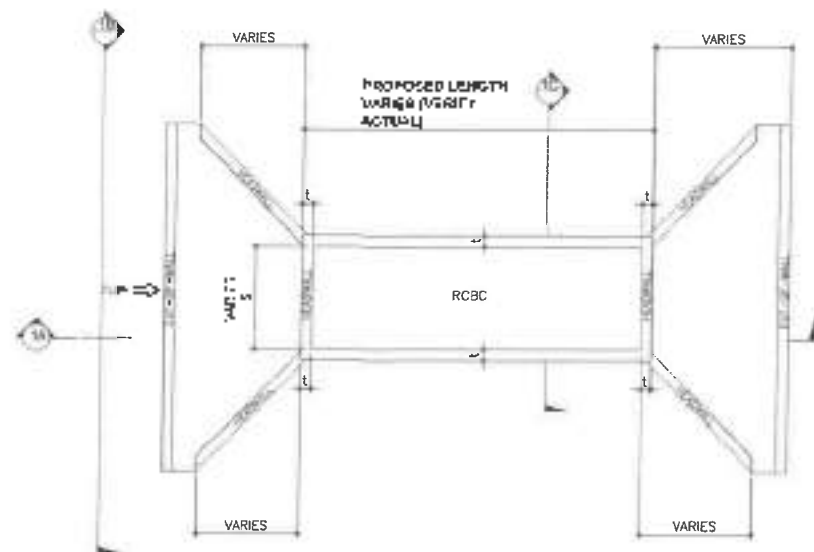
REVIEWED BY: MARICRISTO N. EIMAN
ASST. CHIEF, PLANNING AND DESIGN SECTION

SUBMITTED BY: ANDY E. BRENDO
CHIEF, PLANNING AND DESIGN SECTION

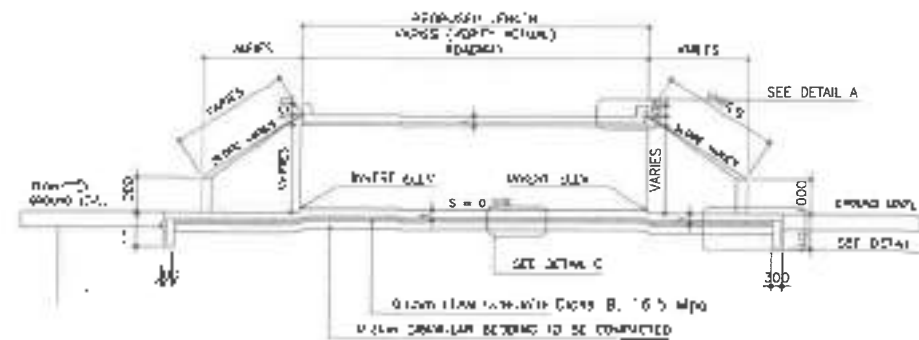
APPROVED BY: VIVIAN B. BIACO
CHIEF, PLANNING AND DESIGN SECTION

APPROVED BY: ALVIN A. IGNACIO
CHIEF, PLANNING AND DESIGN SECTION

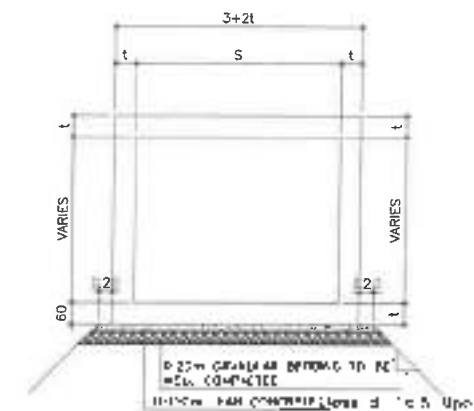
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PAGE: 2/10



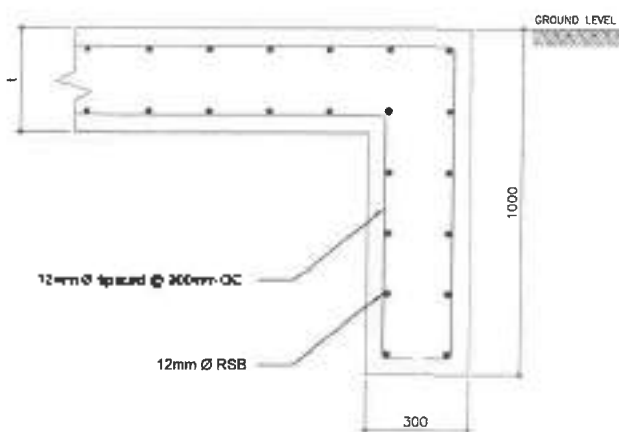
1 PLAN
SCALE 1:100



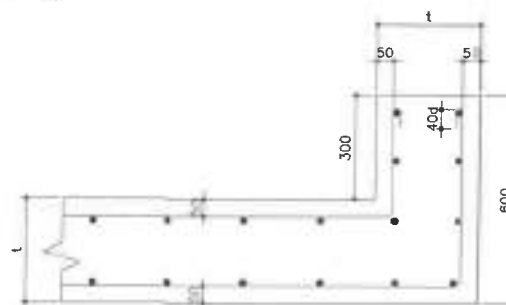
1A SECTION
SCALE 1:100



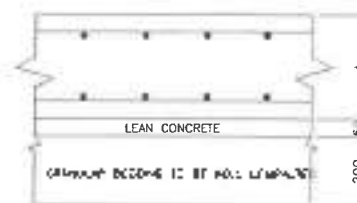
1B SECTION
SCALE 1:50



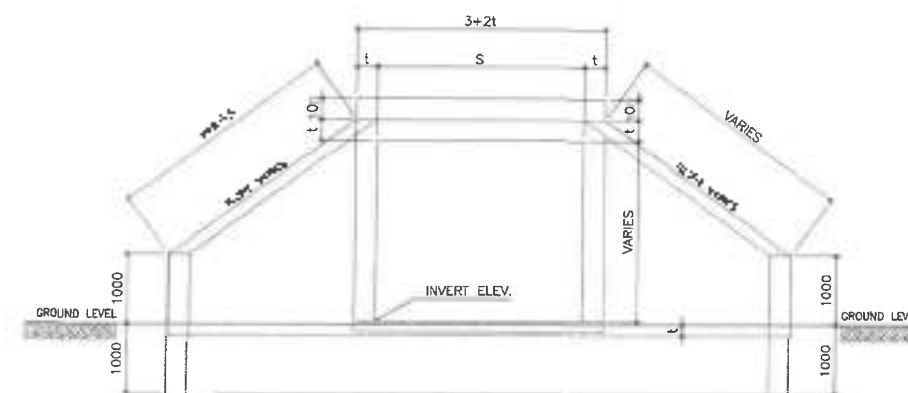
B DETAILS OF CUT-OFF-WALL
SCALE 1:10



A DETAILS OF HEADWALL
SCALE 1:10



C DETAILS OF BEDDING
SCALE 1:10



1C SECTION
SCALE 1:50

SCHEDULE OF RCBC				
STATION	LENGTH	Base Condition	TYPE OF STRUCTURE	QUANTITIES
800+140	2.50	SEE DETAILS	SINGLE BARREL 12.40m x 2.40m	SEE SHEET NO. 11



Regional Office
DEPARTMENT OF PUBLIC WORKS AND HIGHWAYS
REGIONAL OFFICE NO. 11
NORTHERN SAMAR FIRST
DISTRICT ENGINEERING OFFICE
Catarman, Northern Samar

PROJECT LOCATION
CONSTRUCTION OF CAO-ABACA -
CULARIMA - GENERAL MALVAR ROAD,
CATARMAN, NORTHERN SAMAR
CATARMAN, NORTHERN SAMAR

PROJECT NAME & LOCATION
STANDARD DETAIL OF RCBC

DESIGNED BY
MARITON DELA TORRE
ENGINEER

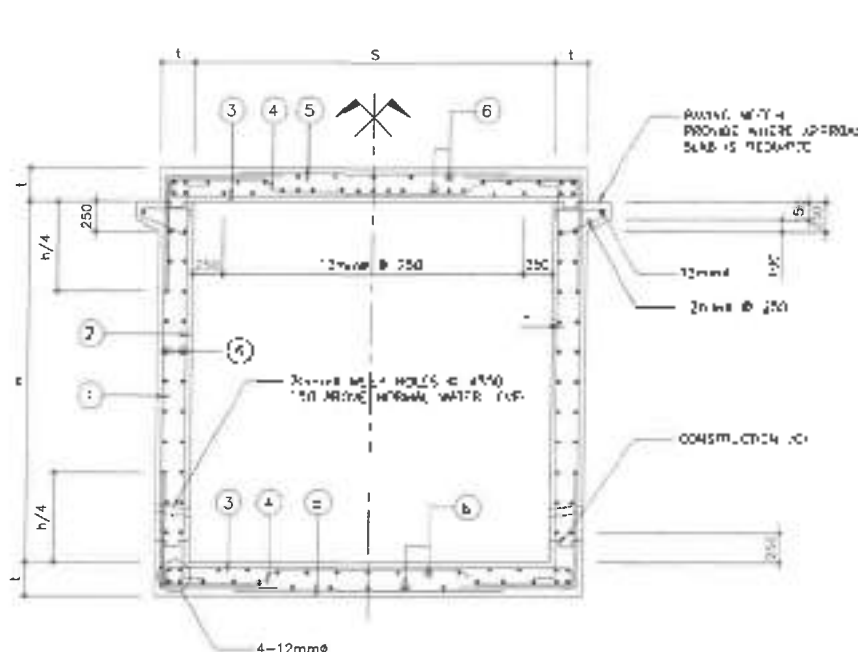
REVIEWED BY
MAR DONALD N. EIMAN
ASST. CHIEF, PLANNING AND DESIGN SECTION
Date

SUBMITTED BY
ANDY S. BREMO
CHIEF, PLANNING AND DESIGN SECTION
Date

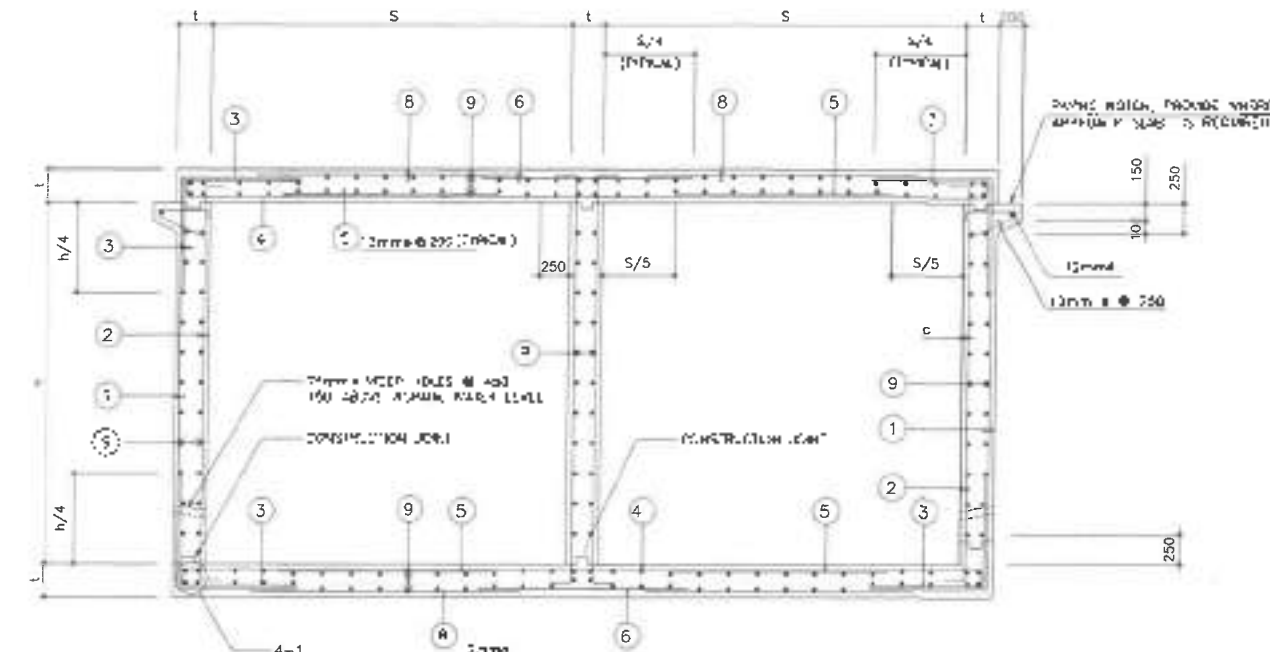
RECOMMENDED BY
VIVIAN B. BIAO
PROJECT ENGINEER
Date

APPROVED BY
ALVIN A. IGNACIO
DISTRICT ENGINEER
Date

DATE
2/10/18
PAGE
1/1



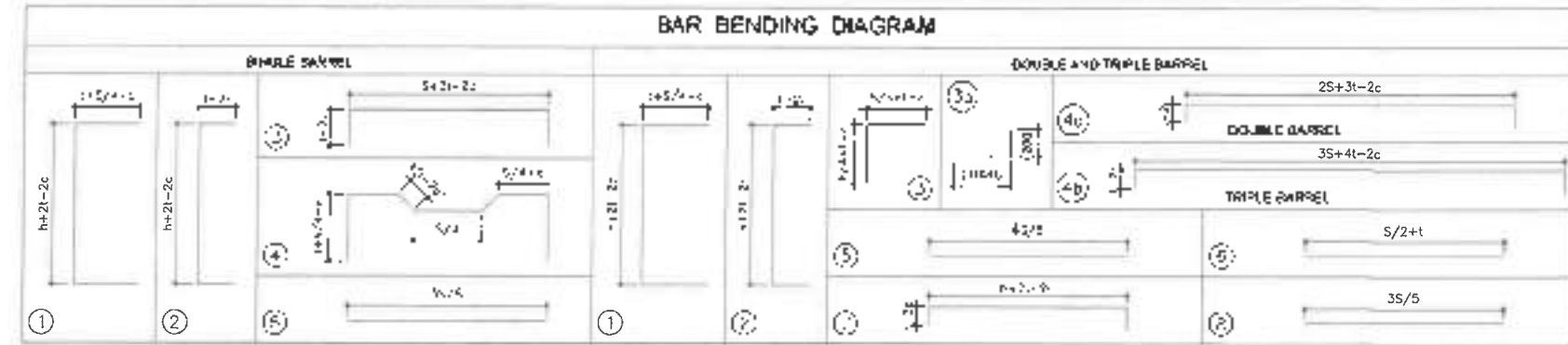
1A SINGLE BARREL SECTION
D-7 SCALE 1:30



2A DOUBLE BARREL SECTION
D-7 SCALE 1:30

A STANDARD SINGLE - DOUBLE CONCRETE BOX CULVERT
D-7 SCALE

- LEGEND:**
- c = CONCRETE CURB (200mm)
 - s = CULVERT SPAN
 - t = THICKNESS
 - h = Height



SPAN	HEIGHT h	L	BAR 1		BAR 2		BAR 3		BAR 4		BAR 5		BAR 6		BAR 7		BAR 8		BAR 9	
			#	SPACING	#	SPACING	#	SPACING	#	SPACING	#	SPACING	#	SPACING	#	SPACING	#	SPACING	#	SPACING
1100	800	300	18	250	18	250	18	250	16	300	18	250	18	250	18	200	8	250	12	300
	1200	300	18	250	18	250	18	250	16	300	18	250	18	250	18	200	8	250	12	300
	1600	300	18	250	18	250	18	250	16	300	18	250	18	250	18	200	8	250	12	300
	2000	300	18	250	18	250	18	250	16	300	18	250	18	250	18	200	8	250	12	300
1300	1000	300	18	250	18	250	18	250	16	300	18	250	18	250	18	200	8	250	12	300
	1400	300	18	250	18	250	18	250	16	300	18	250	18	250	18	200	8	250	12	300
	1600	300	18	250	18	250	18	250	16	300	18	250	18	250	18	200	8	250	12	300
	1800	300	18	250	18	250	18	250	16	300	18	250	18	250	18	200	8	250	12	300
1500	1000	300	18	250	18	250	18	250	16	300	18	250	18	250	18	200	8	250	12	300
	1400	300	18	250	18	250	18	250	16	300	18	250	18	250	18	200	8	250	12	300
	1600	300	18	250	18	250	18	250	16	300	18	250	18	250	18	200	8	250	12	300
	1800	300	18	250	18	250	18	250	16	300	18	250	18	250	18	200	8	250	12	300
1700	1000	300	18	250	18	250	18	250	16	300	18	250	18	250	18	200	8	250	12	300
	1400	300	18	250	18	250	18	250	16	300	18	250	18	250	18	200	8	250	12	300
	1600	300	18	250	18	250	18	250	16	300	18	250	18	250	18	200	8	250	12	300
	1800	300	18	250	18	250	18	250	16	300	18	250	18	250	18	200	8	250	12	300
1900	1000	300	18	250	18	250	18	250	16	300	18	250	18	250	18	200	8	250	12	300
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	1600	300	18	250	18	250	18	250	16	300	18	250	18	250	18	200	8	250	12	300
	1800	300	18	250	18	250	18	250	16	300	18	250	18	250	18	200	8	250	12	300
2100	1000	300	18	250	18	250	18	250	16	300	18	250	18	250	18	200	8	250	12	300
	1400	300	18	250	18	250	18	250	16	300	18	250	18	250	18	200	8	250	12	300
	1600	300	18	250	18	250	18	250	16	300	18	250	18	250	18	200	8	250	12	300
	1800	300	18	250	18	250	18	250	16	300	18	250	18	250	18	200	8	250	12	300
2300	1000	300	18	250	18	250	18	250	16	300	18	250	18	250	18	200	8	250	12	300
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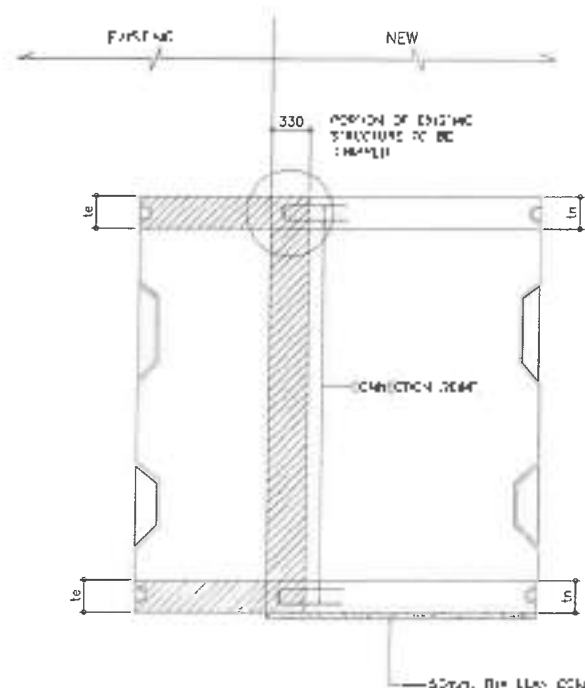
3A BAR SCHEDULE
D-7 NOT TO SCALE

QUANTITIES FOR STANDARD BOX CULVERTS

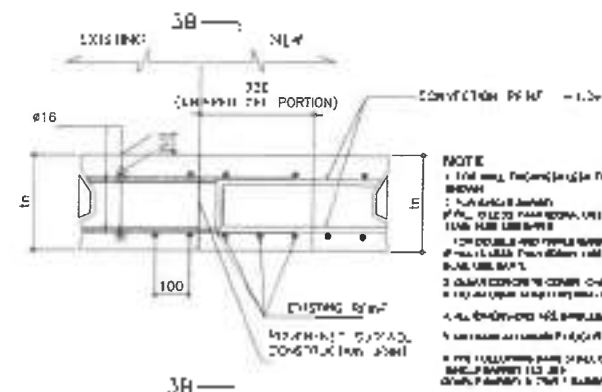
CLEAR SPAN	HEIGHT	QTY. PER METER OF SPAN (SINGLE)		QTY. PER METER OF SPAN (DOUBLE)		QTY. PER METER OF SPAN (TRIPLE)	
		CONC. (cu.m)	REINF. (kg)	CONC. (cu.m)	REINF. (kg)	CONC. (cu.m)	REINF. (kg)
1250	1000	1.71	178.34	2.84	325.73	4.77	488.92
	1250	1.89	191.35	3.12	353.91	4.97	497.94
	1500	2.04	202.87	3.39	381.88	5.17	528.81
	1800	2.19	215.88	3.66	410.27	5.38	579.95
1500	1000	1.88	195.50	3.24	407.34	4.82	508.14
	1250	2.01	208.90	3.47	431.85	4.92	512.43
	1500	2.18	218.94	3.69	452.97	5.22	555.37
	1800	2.34	238.98	3.98	511.22	5.69	704.31
1800	1250	2.19	225.10	3.83	506.18	5.48	602.96
	1500	2.34	238.94	4.05	557.50	5.78	692.48
	1800	2.52	248.98	4.37	608.88	6.12	804.00
	2100	2.70	268.13	4.69	711.26	6.48	887.44
2400	1800	2.88	339.95	5.04	821.88	7.29	1136.22
	2100	3.06	360.00	5.31	878.04	7.58	1226.43
	2400	3.24	384.14	5.58	924.81	7.82	1303.00
	2700	3.45	398.44	5.90	977.48	8.24	1358.37
3000	2100	3.42	312.70	5.03	1474.58	8.64	2548.34
	2400	3.89	633.35	6.30	1537.25	9.00	2621.91
	2700	3.91	646.81	6.42	1606.41	9.42	2732.88
	3000	3.98	677.17	6.84	1684.15	9.72	2800.04

HORIZONTAL SPAN METER	LENGTH OF WINGWALLS
50	L = 3 = 1.41m
100	L = 1.41m
150	L = 1.41m
200	L = 1.41m
250	L = 1.41m
300	L = 1.41m
350	L = 1.41m
400	L = 1.41m
450	L = 1.41m
500	L = 1.41m
550	L = 1.41m
600	L = 1.41m
650	L = 1.41m
700	L = 1.41m
750	L = 1.41m
800	L = 1.41m
850	L = 1.41m
900	L = 1.41m
950	L = 1.41m
1000	L = 1.41m
1050	L = 1.41m
1100	L = 1.41m
1150	L = 1.41m
1200	L = 1.41m
1250	L = 1.41m
1300	L = 1.41m
1350	L = 1.41m
1400	L = 1.41m
1450	L = 1.41m
1500	L = 1.41m
1550	L = 1.41m
1600	L = 1.41m
1650	L = 1.41m
1700	L = 1.41m
1750	L = 1.41m
1800	L = 1.41m
1850	L = 1.41m
1900	L = 1.41m
1950	L = 1.41m
2000	L = 1.41m
2050	L = 1.41m
2100	L = 1.41m
2150	L = 1.41m
2200	L = 1.41m
2250	L = 1.41m
2300	L = 1.41m
2350	L = 1.41m
2400	L = 1.41m
2450	L = 1.41m
2500	L = 1.41m
2550	L = 1.41m
2600	L = 1.41m
2650	L = 1.41m
2700	L = 1.41m
2750	L = 1.41m
2800	L = 1.41m
2850	L = 1.41m
2900	L = 1.41m
2950	L = 1.41m
3000	L = 1.41m

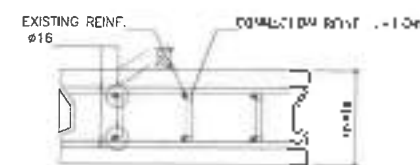
WINGWALL
L = 1.41m FOR SLOPE 1:1
L = 2.82m FOR SLOPE 1:2



1B TYPICAL PLAN
SCALE 1:30



2B DETAIL
SCALE 1:10



3B DETAIL
SCALE 1:10

4B TYPICAL RCBC EXTENSION
SCALE AS SHOWN

QUANTITIES FOR STANDARD WINGWALLS

H (m)	h ₁ (m)	L (m)	QUANTITY PER WINGWALL AND APPROX SLAB					
			SINGLE		DOUBLE		TOTAL	
			CONCRETE (cu.m)	REINFORCEMENT (kg)	CONCRETE (cu.m)	REINFORCEMENT (kg)	CONCRETE (cu.m)	REINFORCEMENT (kg)
1.25	1.41	2.82	7.41	150.00	2.44	141.32	5.48	150.00
1.50	1.41	2.82	7.41	150.00	2.44	141.32	5.48	150.00
1.75	1.41	2.82	7.41	150.00	2.44	141.32	5.48	150.00
2.00	1.41	2.82	7.41	150.00	2.44	141.32	5.48	150.00
2.25	1.41	2.82	7.41	150.00	2.44	141.32	5.48	150.00
2.50	1.41	2.82	7.41	150.00	2.44	141.32	5.48	150.00
2.75	1.41	2.82	7.41	150.00	2.44	141.32	5.48	150.00
3.00	1.41	2.82	7.41	150.00	2.44	141.32	5.48	150.00
3.25	1.41	2.82	7.41	150.00	2.44	141.32	5.48	150.00
3.50	1.41	2.82	7.41	150.00	2.44	141.32	5.48	150.00
3.75	1.41	2.82	7.41	150.00	2.44	141.32	5.48	150.00
4.00	1.41	2.82	7.41	150.00	2.44	141.32	5.48	150.00
4.25	1.41	2.82	7.41	150.00	2.44	141.32	5.48	150.00
4.50	1.41	2.82	7.41	150.00	2.44	141.32	5.48	150.00
4.75	1.41	2.82	7.41	150.00	2.44	141.32	5.48	150.00
5.00	1.41	2.82	7.41	150.00	2.44	141.32	5.48	150.00
5.25	1.41	2.82	7.41	150.00	2.44	141.32	5.48	150.00
5.50	1.41	2.82	7.41	150.00	2.44	141.32	5.48	150.00
5.75	1.41	2.82	7.41	150.00	2.44	141.32	5.48	150.00
6.00	1.41	2.82	7.41	150.00	2.44	141.32	5.48	150.00
6.25	1.41	2.82	7.41	150.00	2.44	141.32	5.48	150.00
6.50	1.41	2.82	7.41	150.00	2.44	141.32	5.48	150.00
6.75	1.41	2.82	7.41	150.00	2.44	141.32	5.48	150.00
7.00	1.41	2.82	7.41	150.00	2.44	141.32	5.48	150.00
7.25	1.41	2.82	7.41	150.00	2.44	141.32	5.48	150.00
7.50	1.41	2.82	7.41	150.00	2.44	141.32	5.48	150.00
7.75	1.41	2.82	7.41	150.00	2.44	141.32	5.48	150.00
8.00	1.41	2.82	7.41	150.00	2.44	141.32	5.48	150.00
8.25	1.41	2.82	7.41	150.00	2.44	141.32	5.48	150.00
8.50	1.41	2.82	7.41	150.00	2.44	141.32	5.48	150.00
8.75	1.41	2.82	7.41	150.00	2.44	141.32	5.48	150.00
9.00	1.41	2.82	7.41	150.00	2.44	141.32	5.48	150.00
9.25	1.41	2.82	7.41	150.00	2.44	141.32	5.48	150.00
9.50	1.41	2.82	7.41	150.00	2.44	141.32	5.48	150.00
9.75	1.41	2.82	7.41	150.00	2.44	141.32	5.48	150.00
10.00	1.41	2.82	7.41	150.00	2.44	141.32	5.48	150.00

GENERAL NOTES

SPECIFICATION

DESIGN 1994 HIGHWAY STANDARD SPECIFICATION FOR HIGHWAY BRIDGES 2TH EDITION

DESIGN LOAD

LINE LOAD HL-15 (HS 20-44)

CONCRETE

ALL CONCRETE SHALL HAVE A MINIMUM COMPRESSIVE STRENGTH OF 28 MPa (4000 PSI) AT 28 DAYS. ALL CONCRETE SHALL BE PLACED AND FINISHED IN ACCORDANCE WITH THE SPECIFICATIONS FOR CONCRETE. ALL CONCRETE SHALL BE PLACED AND FINISHED IN ACCORDANCE WITH THE SPECIFICATIONS FOR CONCRETE.

STEEL REINFORCEMENT

ALL REINFORCEMENT SHALL BE INTERMEDIATE GRADE (GRADE 40) WITH A YIELD STRENGTH OF 414 MPa (60,000 PSI). ALL REINFORCEMENT SHALL BE PLACED AND FINISHED IN ACCORDANCE WITH THE SPECIFICATIONS FOR REINFORCEMENT.

GENERAL

ALL STRUCTURES SHALL BE DESIGNED TO RESIST THE EFFECTS OF THE DESIGN LOADS. ALL STRUCTURES SHALL BE DESIGNED TO RESIST THE EFFECTS OF THE DESIGN LOADS. ALL STRUCTURES SHALL BE DESIGNED TO RESIST THE EFFECTS OF THE DESIGN LOADS.

LIVE LOAD DISTRIBUTION REINFORCEMENT

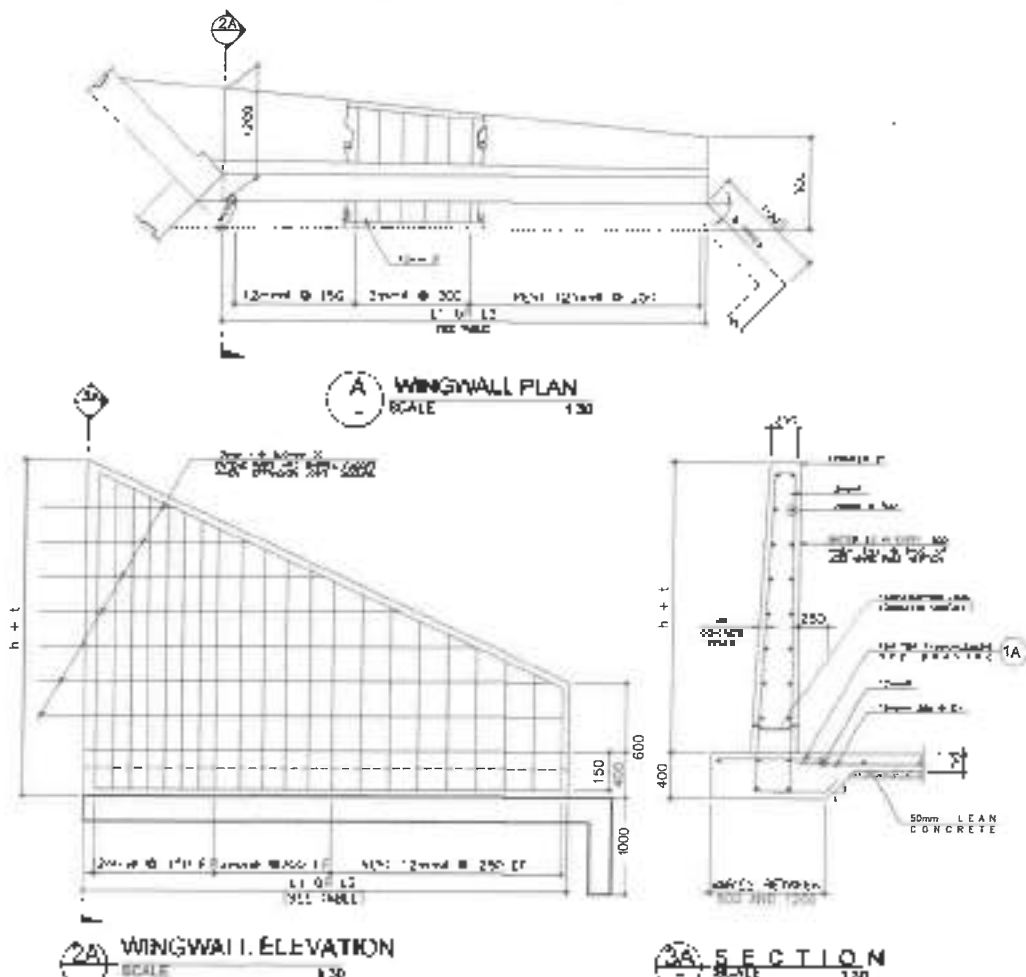
WHEN THERE IS LESS THAN 1000mm OF LIVE LOAD TOP SLAB OF CULVERT, ADDITIONAL REINFORCEMENT IN THE LIVE LOAD TOP SLAB IS REQUIRED TO THE BOTTOM OF THE LIVE LOAD TOP SLAB IN ACCORDANCE WITH THE SPECIFICATIONS.

HEIGHT OF FILL

WHEN HEIGHT OF FILL IS GREATER THAN 1000mm, SPECIAL DESIGN OF LIVE LOAD TOP SLAB IS REQUIRED.

DIMENSIONS

ALL DIMENSIONS ARE BY ALIGNMENT UNLESS OTHERWISE INDICATED.



2A WINGWALL ELEVATION
SCALE 1:30

3A SECTION
SCALE 1:30

4A WINGWALL DETAILS
SCALE AS SHOWN



Department of Public Works and Highways
Regional Office No. VI
NORTHERN SAMAR FIRST
DISTRICT ENGINEERING OFFICE
General, Northern Samar

PROJECT NAME & LOCATION
CONSTRUCTION OF CAGABACA -
CULARINA - GENERAL MALVAR ROAD,
CATARMAN, NORTHERN SAMAR

PROJECT NAME & LOCATION
STANDARD DETAIL OF RCBC

DESIGNER
MARVIN M. DELA TORRE
ENGINEER II

REVIEWER
MAR DONALD N. EIMAN
ASST. CHIEF PLANNING AND DESIGN DIVISION
Date:

SUBMITTED
ANDY S. URENO
CHIEF PLANNING AND DESIGN DIVISION
Date:

RECOMMENDED
VIVIANO BIACO
CHIEF PLANNING AND DESIGN DIVISION
Date:

APPROVED
ALVIN A. IGNACIO
CHIEF PLANNING AND DESIGN DIVISION
Date:

Scale: 1/50
Scale: 1/50



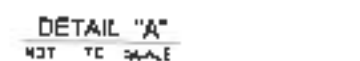
NOTES:

DETAIL OF APRON

NO. TO SCALE

Labels in diagram include:

- 12mm BAR @ 200 C/C
- 2mm BAR
- 2mm @ 200
- 12mm REINFORCING BARS
- 12mm MED. CL. STAPLES
- DRAINAGE CHANNEL



NOTE:

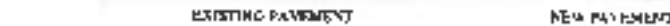
TRANSVERSE CONSTRUCTION JOIN IS WHICH OCCUR AT LOCATION OF WEARERED PLANE JOINTS SHOULD BE BUTT JOINTS WITH CORNER. IF JOINT OCCURS IN THE MIDDLE THIRD OF THE WEARERED JOINT INTERVAL (1900-3000mm) IS SUGGESTED REVEYED JOINTS WITH YE 80%

GENERAL NO 168



PAVEMENT LAYOUT PLAN

TRANSVERSE CONSTRUCTION JOINT AT WHEEL TRACKS OF NORMAL
JOINT INTERVAL WITH THE BARS (DEFORMED BARS)
(L=600mm, 16mm @ 600mm)



SECTION "A"



SECTION "B"

SPACING OF DOWEL BAR

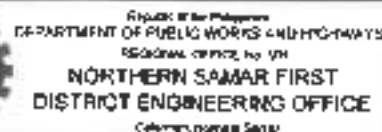


CONTRACTION JOINT SECTION

Steel Basket for Setting Dowels



SECTION "C"



CALIFORNIA NORTH-SOUTH BUREAU

DESIGN OF PAVEMENT


 MATTHEW M. DELA TORRE
 ENGINEER II

MAR DONALD N. EIMAN
-14-

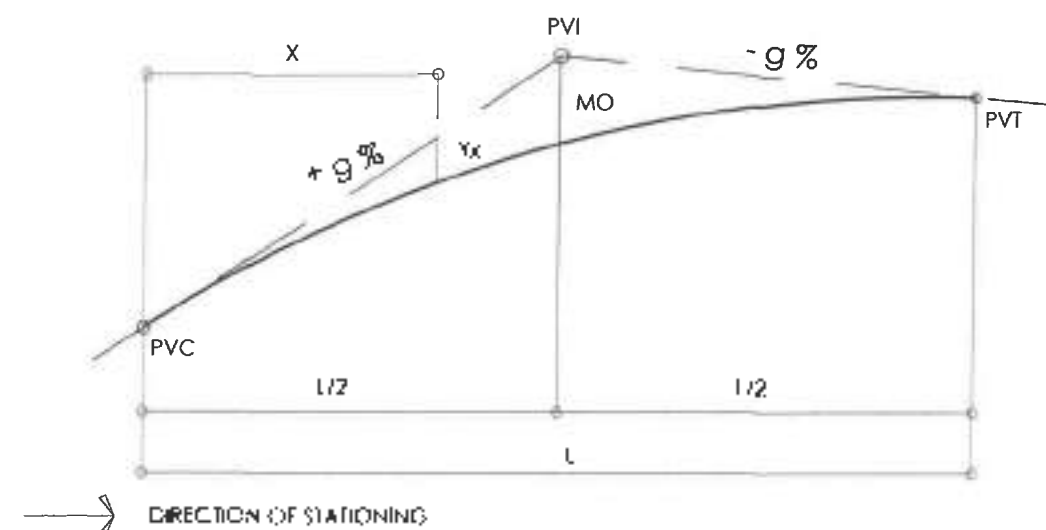
ANDY S. ERERO

VIVIANE BLACO

ALVIN A. IGNACIO

7 10

14



VERTICAL PARABOLIC CURVE (SYMMETRICAL)

LEGEND:

- PVI - VERTICAL POINT OF INTERSECTION
- PVC - VERTICAL POINT OF CURVATURE
- PVT - VERTICAL POINT OF TANGENCY
- L - LENGTH OF VERTICAL CURVE IN METERS
- g - GRADE IN PERCENT
- MO - MIDDLE ORDINATE
- X - DISTANCE FROM PVC OR PVT TO ANY POINT OF CURVATURE
- Yx - VERTICAL OFFSET IN METERS
- A - ALGEBRAIC DIFFERENCE OF GRADES

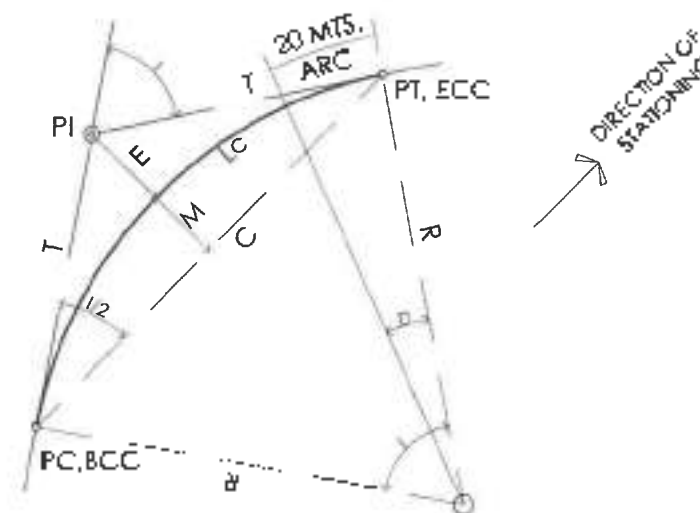
NOTE:

- 1 - NO VERTICAL CURVE IS REQUIRED WHEN THE ALGEBRAIC DIFFERENCE IS LESS THAN 0.50%

IN ANY VERTICAL PARABOLIC CURVE
SYMMETRICAL

$$MO = \frac{AL}{800} \quad Yx = \frac{x^2}{[L/2]^2} MO$$

WHERE: $A = (g_2 - g_1)$



HORIZONTAL CURVE (CIRCULAR)

LEGEND:

- PI - POINT OF INTERSECTION
- PC - POINT OF CURVATURE
- PT - POINT OF TANGENCY
- BCC - BEGINNING OF CIRCULAR CURVE
- ECC - END OF CIRCULAR CURVE
- I - INTERSECTION ANGLE
- Dc - DEGREE OF CURVATURE (ARC DEFINITION)
- Dc - DEGREE OF CURVATURE (CHORD DEFINITION)
- T - TANGENT LENGTH
- R - HORIZONTAL RADIUS
- Lc - LENGTH OF CIRCULAR CURVE
- C - CHORD LENGTH
- E - EXTERNAL DISTANCE
- M - MIDDLE ORDINATE

NOTE:

FOR "Dc" ASSUMED ARC = 100m

FOR "Dc" ASSUMED CHORD = 100m

NO HORIZONTAL CURVE IS REQUIRED WHEN THE INTERSECTION (CENTRAL) ANGLE Δ IS LESS THAN ONE DEGREE (1° 00')

ALGEBRAIC DIFFERENCE IS 50% OR LESS

FORMULAS:

$$T = R \tan I/2 \quad E = R (Sec. I/2 - 1)$$

$$C = 2R \sin I/2 \quad D = 1'45.916/R$$

$$M = R [1 - \cos I/2] \quad Lc = [20\pi \times I]/D$$

LEGEND

- AZIM - AZIMUTH
- BCC - POINT OF CURVATURE (SIMPLE CURVE)
- BM - BENCH MARK
- BEG. - BEGINNING
- CUM. - CUBIC METER (M³)
- D - DEGREE OF CIRCULAR CURVE (ARC DEFINITION)
- DIA - DIAMETER
- DIST - DISTANCE
- E - EXTERNAL DISTANCE (FROM PI TO CIRCULAR CURVE)
- e - SUPERELEVATION
- ECC - POINT OF TANGENCY (SIMPLE CURVE)
- ELEV - ELEVATION
- EMB - EMBANKMENT
- EXC - EXCAVATION
- g - GRADE IN PERCENT
- KM - KILOMETER
- Lc - LENGTH OF CIRCULAR CURVE
- LM - LINEAR MEIER
- LVC - LENGTH OF VERTICAL CURVE
- M - METER
- MAX. - MAXIMUM
- MIN. - MINIMUM
- MM - MILLIMETER
- MO - MIDDLE ORDINATE
- N - NORTHINGS
- PCCP - PORTLAND CEMENT CONCRETE PAVEMENT
- PI - HORIZONTAL POINT OF INTERSECTION
- PVI - VERTICAL POINT OF INTERSECTION
- PVC - BEGINNING OF VERTICAL CURVE
- PVT - END OF VERTICAL CURVE
- R - RADIUS OF CIRCULAR CURVE
- RCBC - REINFORCED CONCRETE BOX CULVERT
- RCPC - REINFORCED CONCRETE PIPE CULVERT
- ROW - RIGHT OF WAY
- RP - REFERENCE POINT
- SQ.M. - SQUARE METER
- SL - SLOPE
- STA - STATION
- SC - SIMPLE CURVE
- VAR - VARIABLE
- W - WIDENING



Department of Public Works and Highways
REGIONAL OFFICE No. 10
NORTHERN SAMAR FIRST
DISTRICT ENGINEERING OFFICE
Cebu City, Northern Samar

PROJECT NAME & LOCATION
CONSTRUCTION OF CAGABACA -
CULARIMA - GENERAL MALVAR ROAD,
CATARMAN, NORTHERN SAMAR

PROJECT NAME & LOCATION
DESIGN OF PAVEMENT

DESIGNED BY
MARTIN M. DELA TORRE
ENGINEER II

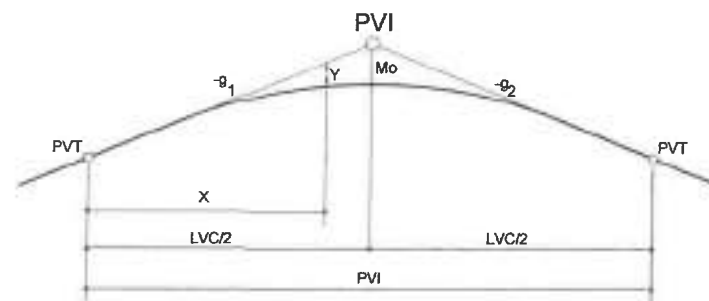
REVIEWED BY
MAR DONALD N. EIMAN
ASST. CHIEF, PLANNING AND DESIGN SECTION
Date:

DESIGNED BY
ANDY S. LERIO
CHIEF PLANNING AND DESIGN SECTION
Date:

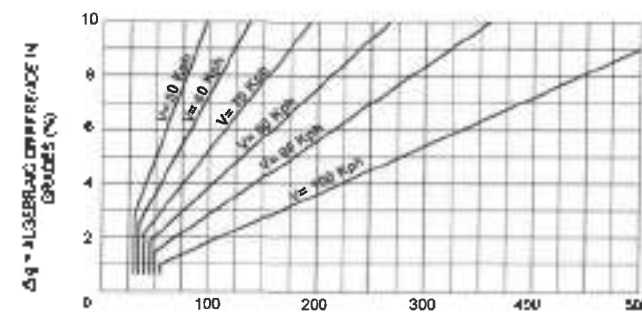
DESIGNED BY
VIVIAN G. BLAJO
CHIEF PLANNING AND DESIGN SECTION
Date:

DESIGNED BY
ALVIN A. RONACHO
CHIEF PLANNING AND DESIGN SECTION
Date:

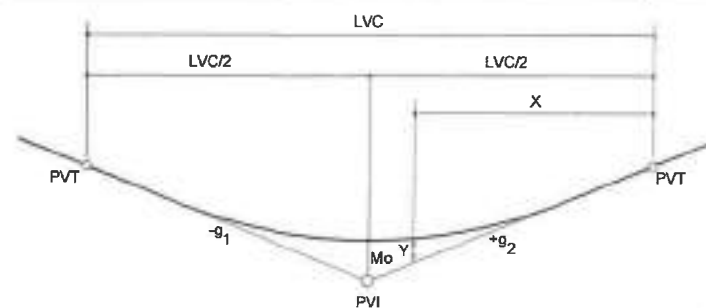
DATE
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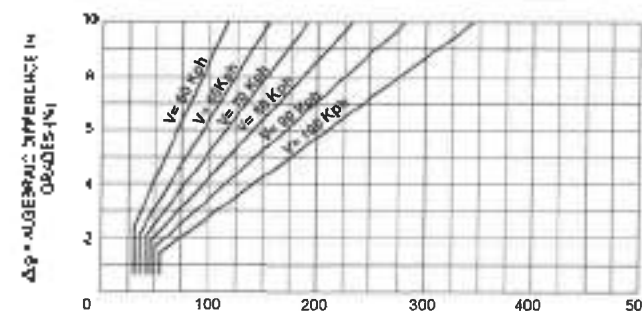
SYMMETRICAL VERTICAL PARABOLIC CURVES (CREST)



DESIGN CONTROL FOR VERTICAL CURVES (CREST)



SYMMETRICAL VERTICAL PARABOLIC CURVES (SAG)



DESIGN CONTROL FOR VERTICAL CURVES (SAG)

IN ANY VERTICAL PARABOLIC CURVE :

- $W_0 = \frac{(g_1 - g_2)(LVC)}{800}$
- $W_2 = \left[\frac{ELEV PVT - ELEV PVI}{2} \right] - ELEV P_1$
- $Y = 4W_0$

LEGEND:

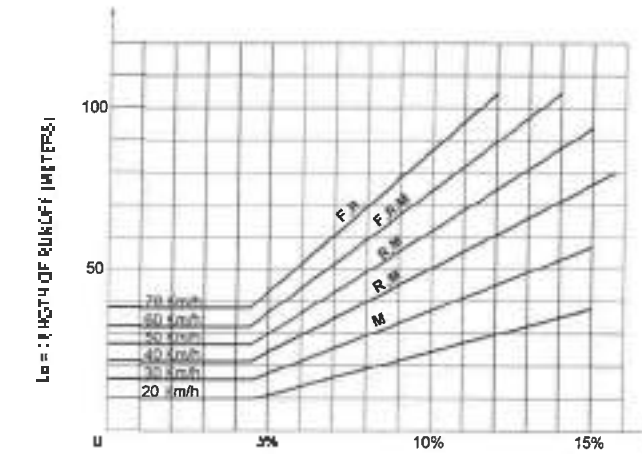
- PVI - POINT OF VERTICAL INTERSECTION
PVC - POINT OF VERTICAL CURVATURE
PVT - POINT OF VERTICAL TANGENCY
LVC - LENGTH OF VERTICAL CURVES - METER
No - KILOMETER PER HOUR
 g_1, g_2 - GRADE RATES PERCENT
X - DISTANCE FROM PVC OR PVT TO ANY POINT ON CURVE - METERS
Y - VERTICAL OFFSET AT DISTANCE X - METERS

NOTES:

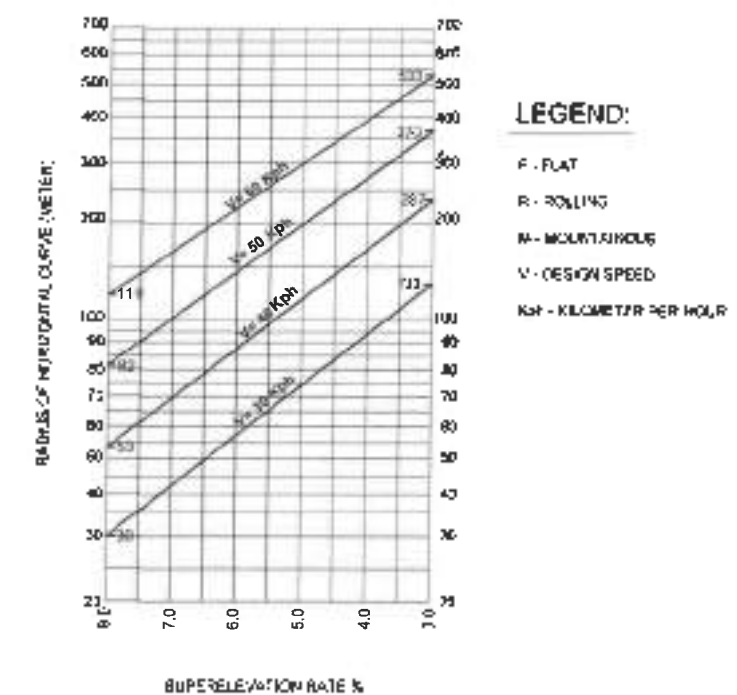
- GRADES ASCENDING FORWARD ARE POSITIVE GRADES
DESCENDING FORWARD ARE NEGATIVE
- NO VERTICAL CURVE IS REQUIRED WHEN THE ALGEBRAIC
DIFFERENCE IN GRADE IS 0.5% OR LESS

MINIMUM K VALUE (AASHTO 2011)

DESIGN SPEED (km/h)	20	30	40	50	60	70
STOPPING SIGHT DISTANCE	1	2	4	7	11	17
PASSING SIGHT DISTANCE	-	12	23	30	38	51
HEADLIGHT SIGHT DISTANCE	3	8	9	13	18	28



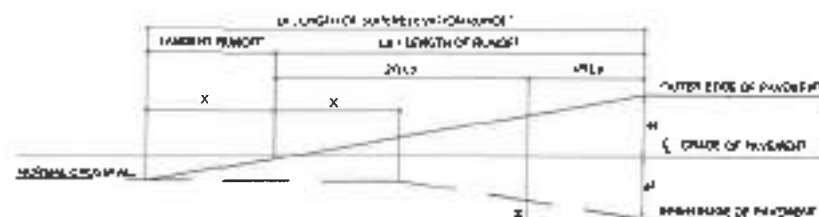
SUPERELEVATION RUNOFF CHART



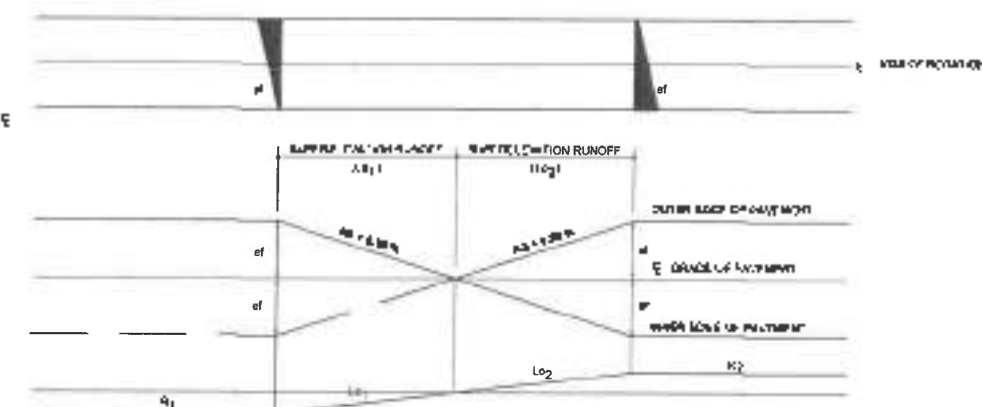
DESIGN SUPERELEVATION RATES



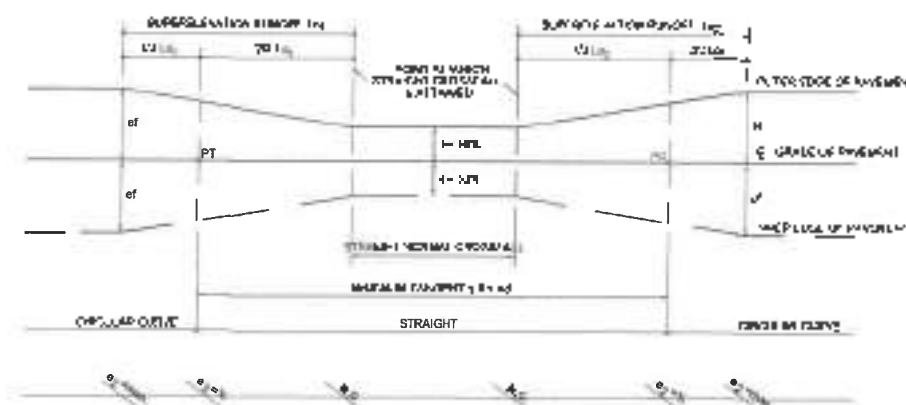
- 10. PAIR MATCHING:
 - A. POINT OF INFLECTION
 - 1. PERPENDICULAR DISTANCE FROM THE
 - 2. TANGENT DISTANCE
 - 3. DISTANCE FROM THE
 - B. LENGTH OF CIRCULAR CURVE
 - 4. EXTERNAL DISTANCE
 - 5. LENGTH OF CHORD; AND UNWINDING
 - C. POINT OF CURVATURE
 - 6. POINT OF TANGENCY
 - 7. LENGTH OF CHORDS IN TWO PORTIONS
 - 8. LENGTH OF CHORDS IN TWO PORTIONS
 - 9. PERPENDICULAR DISTANCE
 - 10. TANGENT DISTANCE
 - 11. DISTANCE BETWEEN TANGENT LINES
 - 12. DISTANCE BETWEEN TANGENT LINES
 - 13. DISTANCE BETWEEN TANGENT LINES
 - 14. DISTANCE BETWEEN TANGENT LINES
 - 15. DISTANCE BETWEEN TANGENT LINES
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 - 95. DISTANCE BETWEEN TANGENT LINES
 - 96. DISTANCE BETWEEN TANGENT LINES
 - 97. DISTANCE BETWEEN TANGENT LINES
 - 98. DISTANCE BETWEEN TANGENT LINES
 - 99. DISTANCE BETWEEN TANGENT LINES
 - 100. DISTANCE BETWEEN TANGENT LINES



CASE 1
SUPERELEVATION TRANSITION



CASE 2
TRANSITION: CIRCULAR CURVE - REVERSED CIRCULAR



CASE 3
TRANSITION : CIRCULAR CURVE - STRAIGHT- CIRCULAR CURVE

1. COEFFICIENT OF PERMEABILITY $k_{\text{H}_2\text{O}} = 0.001$
 2. WEIGHT $\Delta P = 2.104 \times 10^6 \text{ Pa}$, $\omega = 100 \text{ g}$ OF SUPERCOLDWATER THERMOMETER
 TO BE ADJUSTED $\omega = 100 \text{ g}$ OF H_2O IN THE LINE.
 3. DENSITY OF H_2O $\rho_{\text{H}_2\text{O}} = 1000 \text{ kg/m}^3$ $\Delta z = 0.001$

77	2004	1000000	1000000
78	2005	1000000	1000000

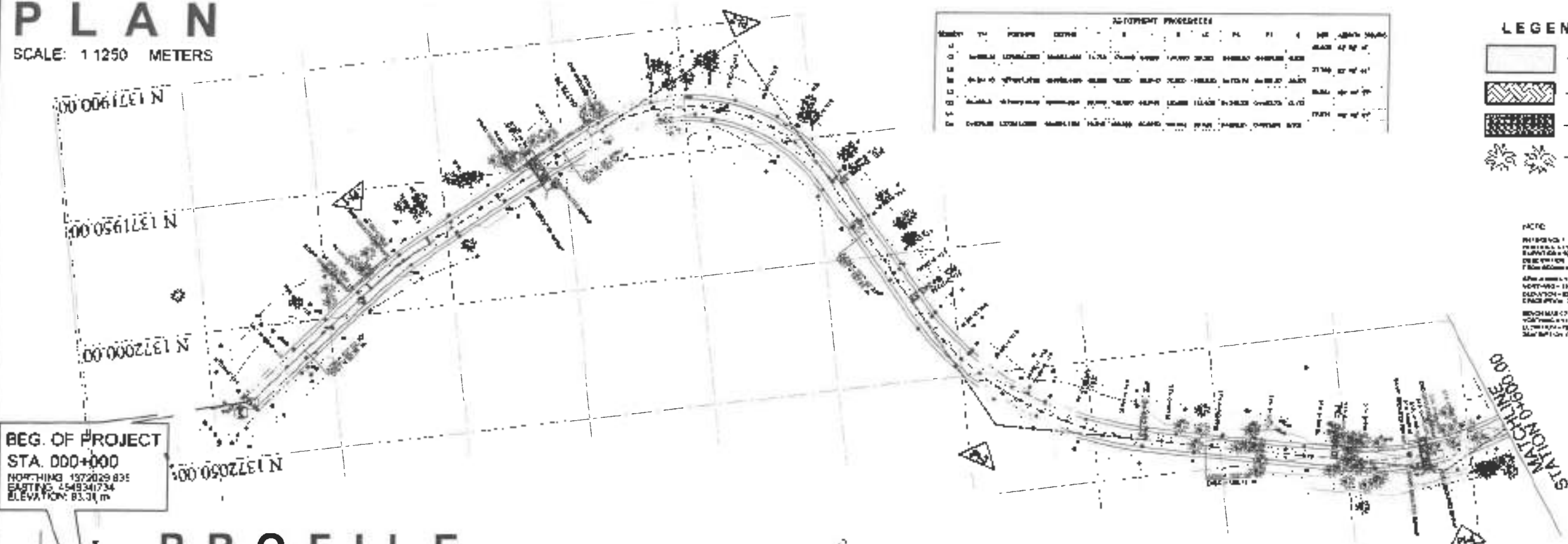
- [illegible]

[illegible]

NOTE
1. ΔH IS IN KJ/MOLE OF MONOMER
2. ΔG IS IN KJ/MOLE OF MONOMER
3. ΔG IS IN KJ/MOLE OF MONOMER

SCALE: 1 1250 METERS

SCALE: 1 1250 METERS

[illegible]

LEGEND:

-  ~ PROPOSED PCCP
 — EMBANKMENT
 — GROUTED FILLRAP
 — TREES

PLATE 1

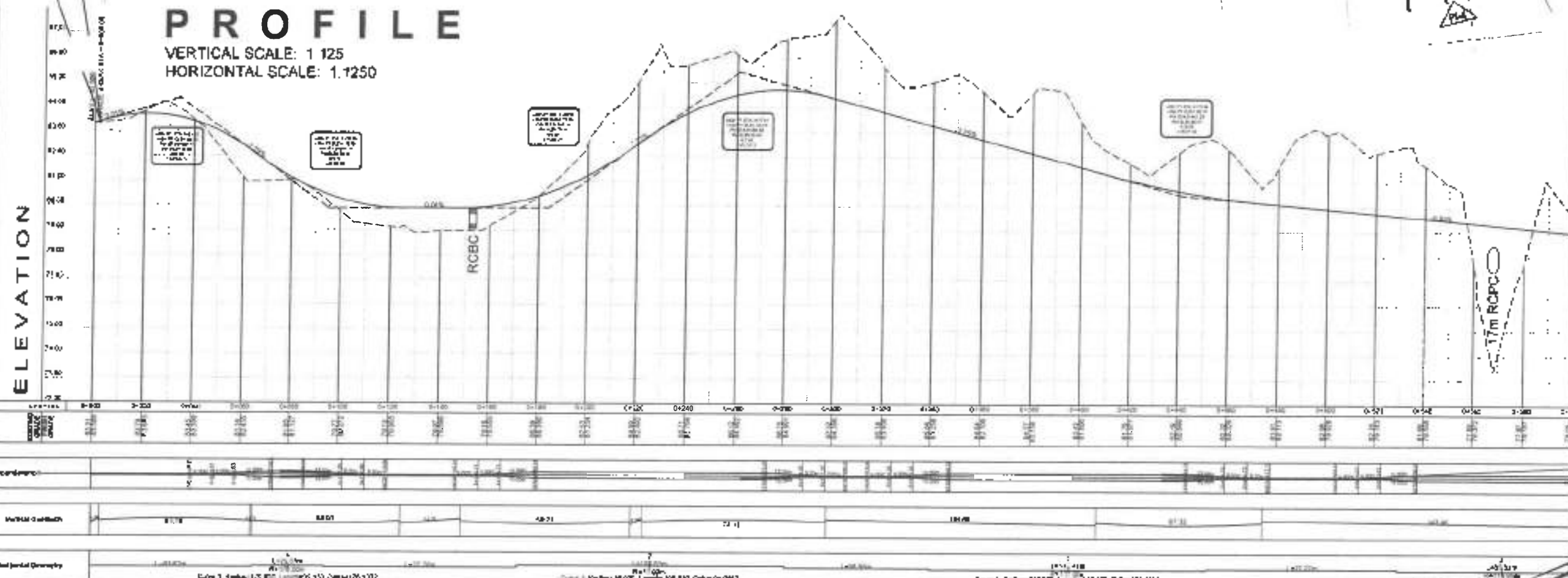
PHILIPPO: I
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 PHILIPPO: I AM NOT A
 PHILIPPO: I AM NOT A

4044-443 - 11728 888 444434 4444 44
 444-4444 - 4444
 44444444 44 44444444 44444444

1. H_2O is a polar molecule.
 2. H_2O is a liquid at room temperature.
 3. H_2O is a good solvent for many substances.
 4. H_2O is a good conductor of electricity.
 5. H_2O is a good insulator of heat.

PROFILE

VERTICAL SCALE: 1:125
HORIZONTAL SCALE: 1:1250



Republic of the Philippines
DEPARTMENT OF PUBLIC WORKS AND HIGHWAYS
REGIONAL OFFICE No. VII
NORTHERN SAMAR FIRST
DISTRICT ENGINEERING OFFICE
CANTALERO, BIRANGA, BIRANGA

PROGRAM # 704701
CONSTRUCTION OF CAG-ABACA -
CULARIMA - GENERAL MALVAR ROAD
CATARMAN, NORTHERN SAMAR
CATARMAN, NORTHERN SAMAR

PLAN & PROFILE

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CL
MARTIN M. DELA TORRE
L9044 MCF

RECEIVED

MAR. DONALD N. EIMAN
ASST. CHIEF, PLANNING AND DEVEL. SECTOR

Revised June 2006

ANDY B. BREMO
OF BREMO'S, APRIL 22, 1994 - 644 240-1100

● 2014年10月

VIVIAN G. BLAC
FOR FEDERAL POLICE

10000-0000

ALVIN A. IGNACIO
DIRECTOR (440-2640)

100

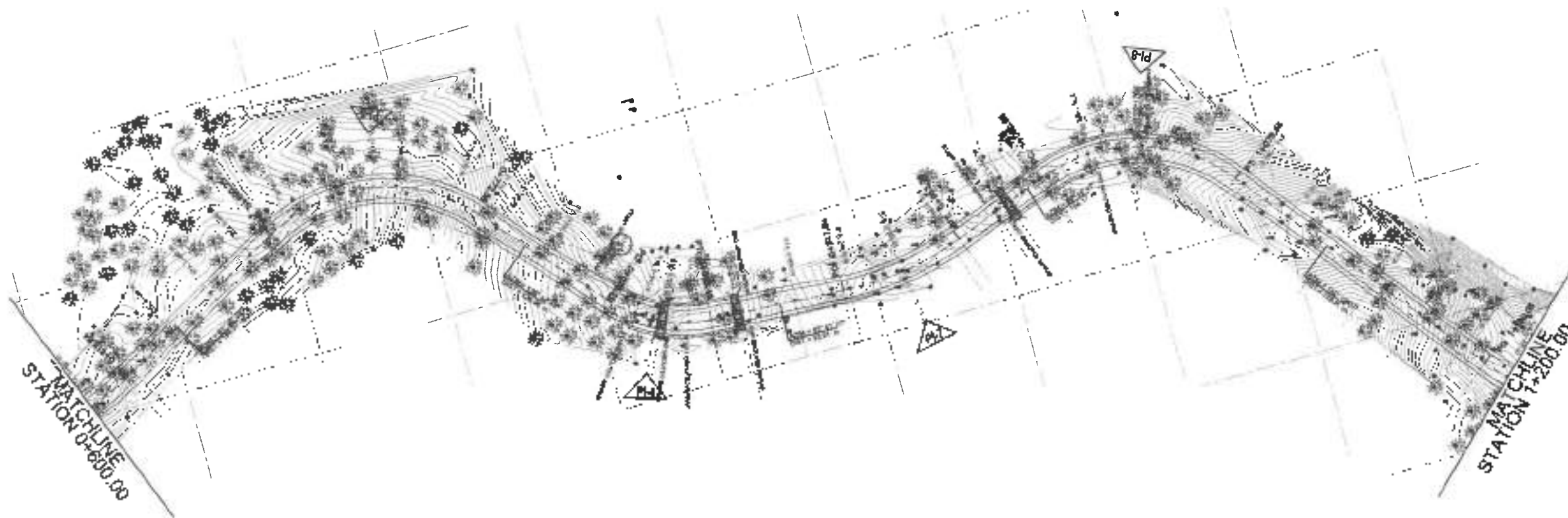
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SCALE: 1:1250 METERS

ALCOHOLIC SYMPTOMS													
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F	25	150	60	1	2	3	4	5	6	7	8	9	10
M	25	170	70	1	2	3	4	5	6	7	8	9	10
F	25	150	60	1	2	3	4	5	6	7	8	9	10
M	25	170	70	1	2	3	4	5	6	7	8	9	10
F	25	150	60	1	2	3	4	5	6	7	8	9	10
M	25	170	70	1	2	3	4	5	6	7	8	9	10
F	25	150	60	1	2	3	4	5	6	7	8	9	10

LEGEND:

-  — PROPOSED PCC
 — EMBANKMENT
 — GROUTED RIPRAP
 — TREES

[illegible]

REPUBLIC OF THE PHILIPPINES
 DEPARTMENT OF PUBLIC WORKS AND HIGHWAYS
 REGIONAL OFFICE No. VII
 NORTHERN SAMAR FIRST
 DISTRICT ENGINEERING OFFICE
 Linaoagan, Ormoc, Samar

PROJECT NAME & LOCATION

CONSTRUCTION OF CAG-ABACA -
CULARIMA - GENERAL MALVAR ROAD,
CATARMAN, NORTHERN SAMAR

CATA#mbr. v02115841616d

100% FeCl_3 1.0M + 1.0% FeCl_3

PLAN & PROFILE

Figure 7

ALBERT EINSTEIN
ENGINEER II

MEASUREMENTS

MARION D. EDMAN
138" O-17. 214-666-5475

Date: _____

SUBMITTED:

ANDY S. BRENQ

[illegible]

SUBJECTS

Digitized by Google

— 288 —

ALVIN A. RENACIO
DE LA FUENTE

DATE: _____

2:6

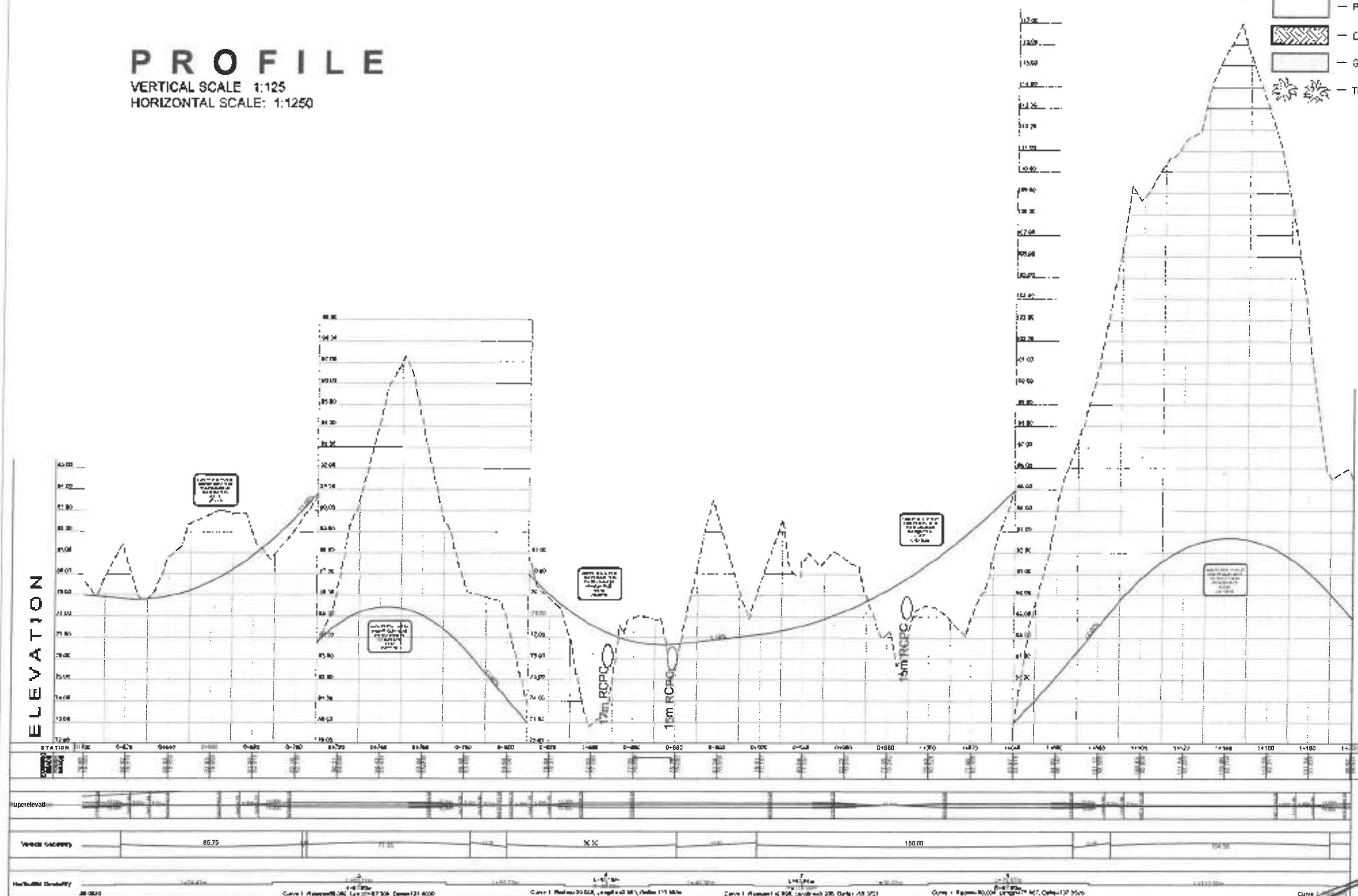
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18
88

VERTICAL SCALE 1:125
HORIZONTAL SCALE: 1:1250

VERTICAL SCALE 1:125
HORIZONTAL SCALE: 1:1250

 — PROPOSED PCOP
 — EMBANKMENT
 — GROUTED RIPRAP
 — TREES



A subsidiary of the Philippines
 DEPARTMENT OF PUBLIC WORKS AND HIGHWAYS
 REGIONAL OFFICE NO. VII
 NORTHERN SAMAR FIRST
 DISTRICT ENGINEERING OFFICE
 CEBUANA, BACOR, SAMAR

CONSTRUCTION OF CAG-ABACA -
CULARINA - GENERAL MALVAR ROAD,
CATARMAN, NORTHERN SAMAR

PLAN & PROFILE

DATE: 09/27/2012



MARTIN M. ZULA TORRE

NEAR DONALD N. EMMAN
ARREST, CHARGE, PLANNING AND SUBSTITUTION

ANDY S. BRENO
CHIEF PLANNING AND DESIGN SECTION

VIRIANG G. BIACO
MST COLLEGE ENGINEER

APPROVED: 
ALVIN A. IGNACIO
DISTRICT CLERK

	
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PLAN

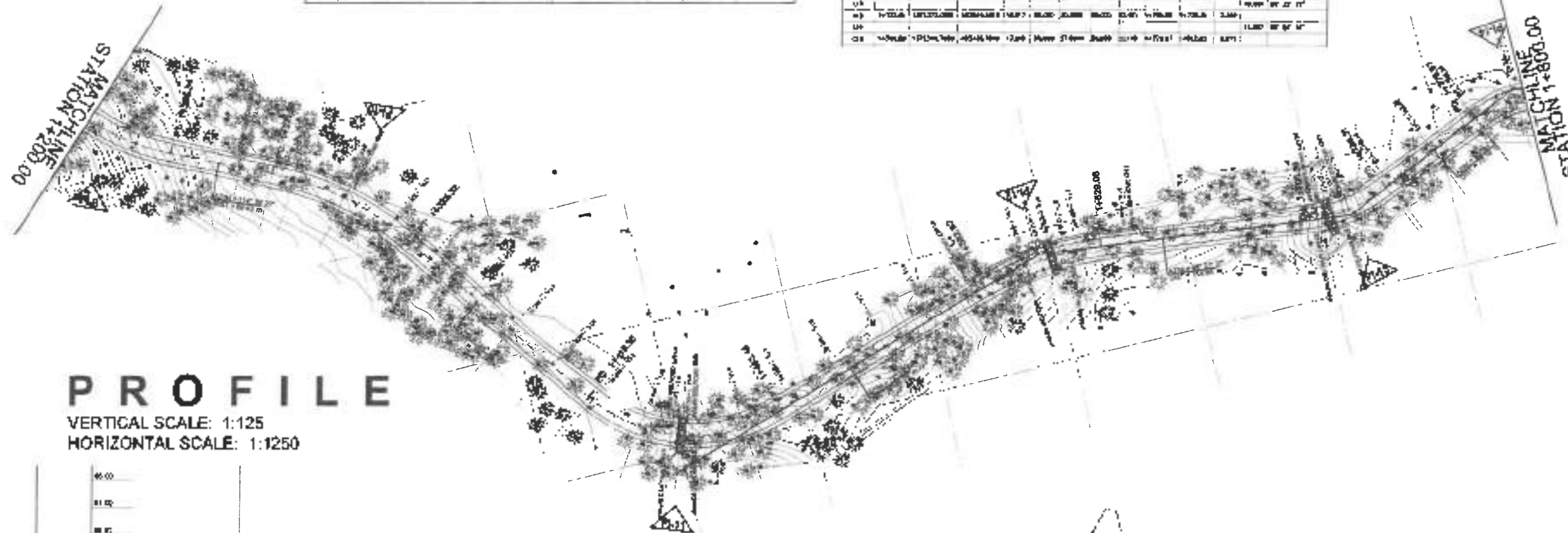
SCALE: 1:1250 METERS

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STATION	PC	PT	LC	EC	STATION	PC	PT	LC	EC
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1+000.00	1+000.00	1+000.00	1+000.00	1+000.00	1+000.00	1+000.00	1+000.00	1+000.00	1+000.00

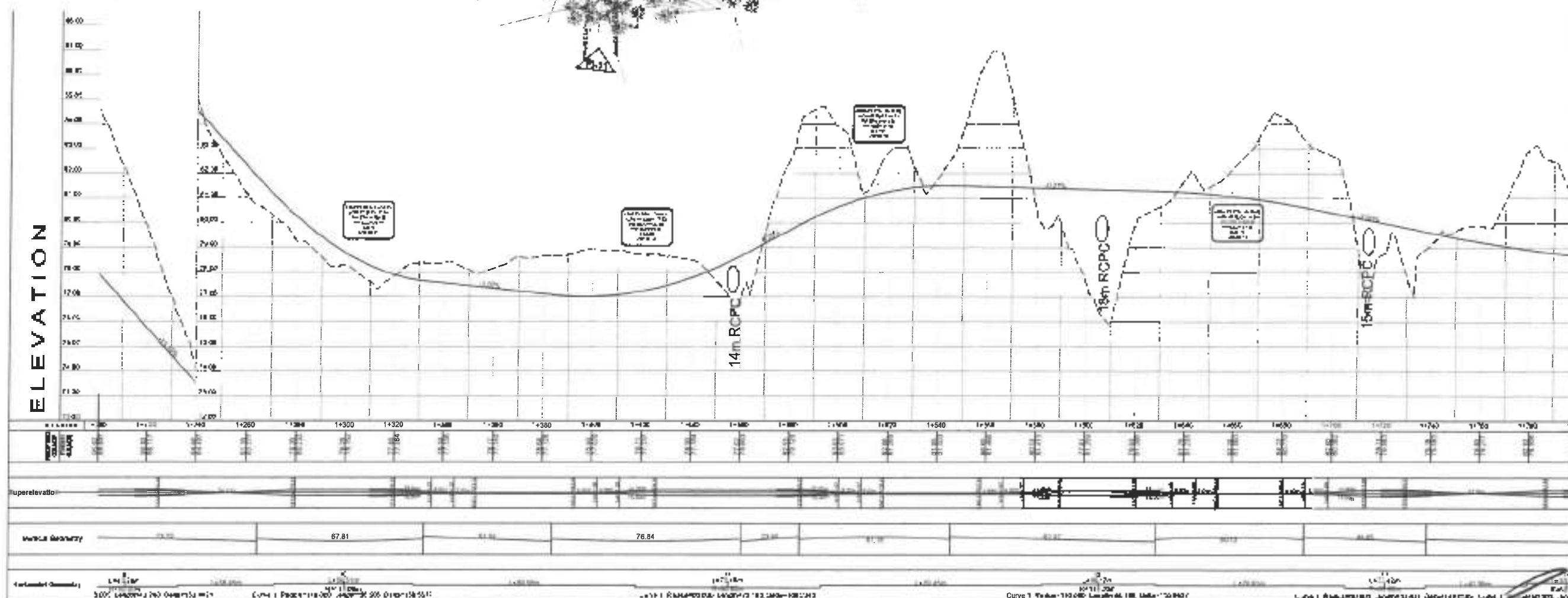
LEGEND:

- PROPOSED PCOP
- EMBANKMENT
- GROUTED RIPRAP
- TREES



PROFILE

VERTICAL SCALE: 1:125
HORIZONTAL SCALE: 1:1250



NOTE

1. PROFILE VIEW IS A REPRESENTATION OF THE PROPOSED ROAD ALIGNMENT AND ELEVATION. IT DOES NOT SHOW THE EXISTING TERRAIN OR THE ACTUAL ROAD CONSTRUCTION. THE PROFILE VIEW IS A REPRESENTATION OF THE PROPOSED ROAD ALIGNMENT AND ELEVATION. IT DOES NOT SHOW THE EXISTING TERRAIN OR THE ACTUAL ROAD CONSTRUCTION.



DEPARTMENT OF PUBLIC WORKS AND HIGHWAYS
REGIONAL OFFICE NO. VII
NORTHERN SAMAR DISTRICT ENGINEERING OFFICE
CULARIMA, NORTHERN SAMAR

CONSTRUCTION OF CAG-ABACA -
CULARIMA - GENERAL MALVAR ROAD,
CATARMAN, NORTHERN SAMAR

PLAN & PROFILE

DESIGNED BY
MARVIN DELA TORRE
ENGINEER II

REVIEWED BY
MAR DONALD N. EMAN
CHIEF, ENGINEERING DIVISION

APPROVED BY
ANDY S. ERENO
CHIEF, ENGINEERING DIVISION

APPROVED BY
VIRIANO BRAGA
CHIEF, ENGINEERING DIVISION

APPROVED BY
ALVIN A. IGNACIO
CHIEF, ENGINEERING DIVISION

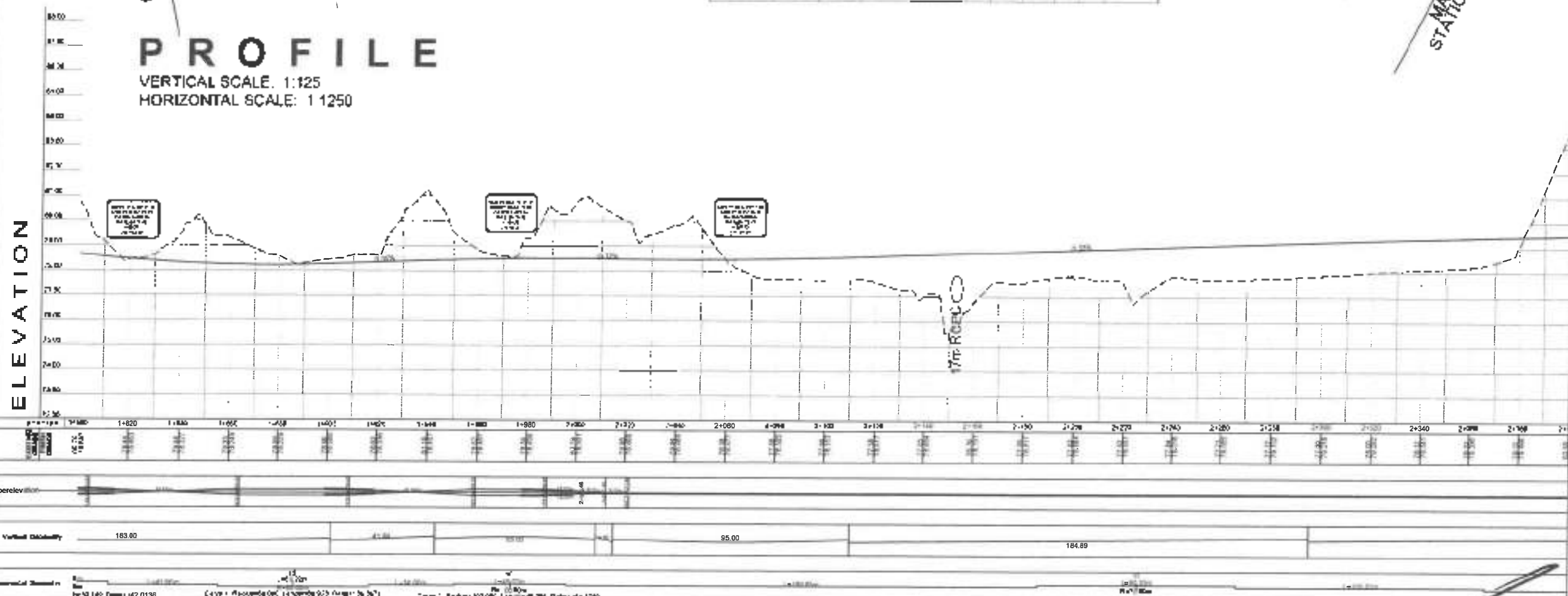
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PAGE: 11

SCALE: 1:1250 METERS



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VERTICAL SCALE. 1:125
HORIZONTAL SCALE: 1:1250



**NORTHERN SAMAR FIRST
DISTRICT ENGINEERING OFFICE**

PROJECT NAME & LOCATION
CONSTRUCTION OF CAG-ABACA-
CULARIMA - GENERAL MALVAR ROAD,
CATARAN, NORTHERN SAMAR

PLAN & PROFILE

29076 LYNCH, R. + MC C

MARTIN C. L. Spivey
ENGINEER II

RELATIVE RISK

MR DONALD N. EIMAN
 1000 10TH AVENUE
 SUITE 1000
 NEW YORK, NY 10018
 (212) 691-1000

Ca²⁺ Sensor

ANDY S. EREÑO

RECOMMENDATION



ANNOUNCED

ALVIN A. IGNACIO

DE 1.10

	
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1.000

PLAN

SCALE: 1:1250 METERS



LEGEND:

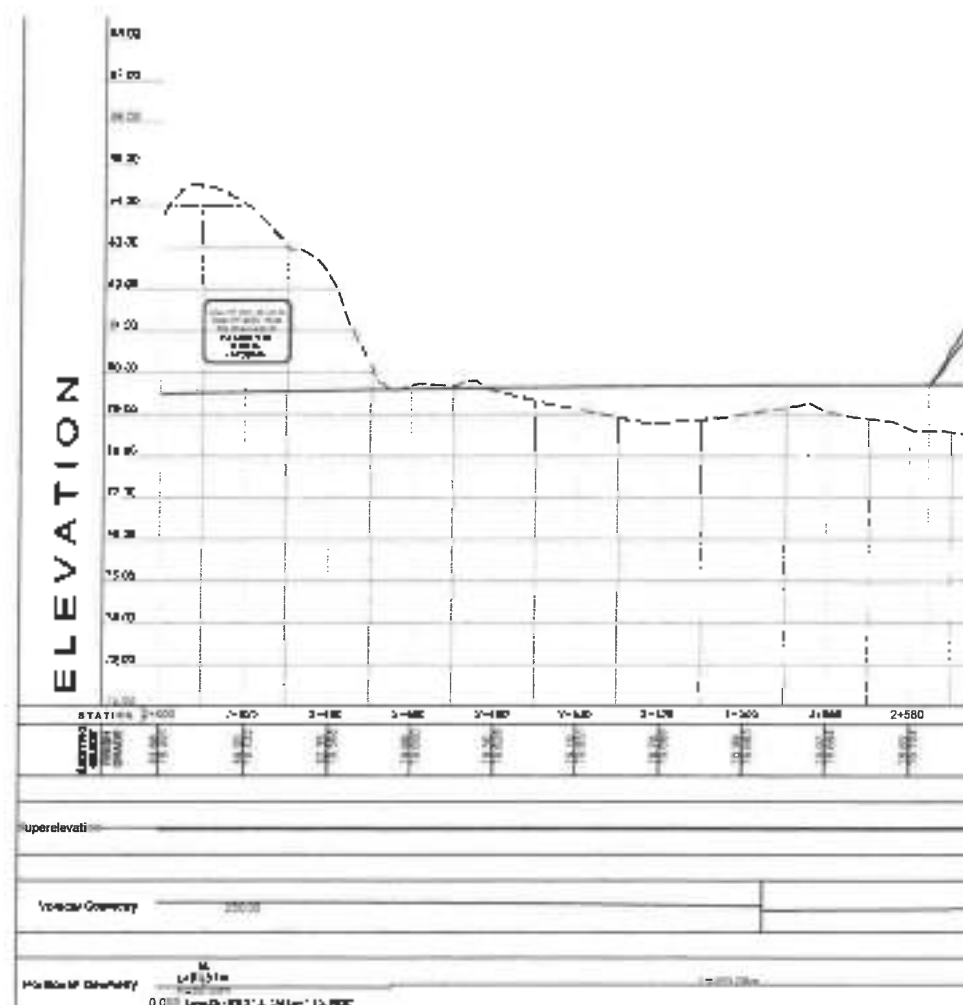
- PROPOSED PCCP
- EMBANKMENT
- GAOUTED RIPRAP
- TREES

NOTE:
 1. THE PLAN IS BASED ON THE DATA PROVIDED BY THE CLIENT.
 2. THE PLAN IS BASED ON THE DATA PROVIDED BY THE CLIENT.
 3. THE PLAN IS BASED ON THE DATA PROVIDED BY THE CLIENT.
 4. THE PLAN IS BASED ON THE DATA PROVIDED BY THE CLIENT.
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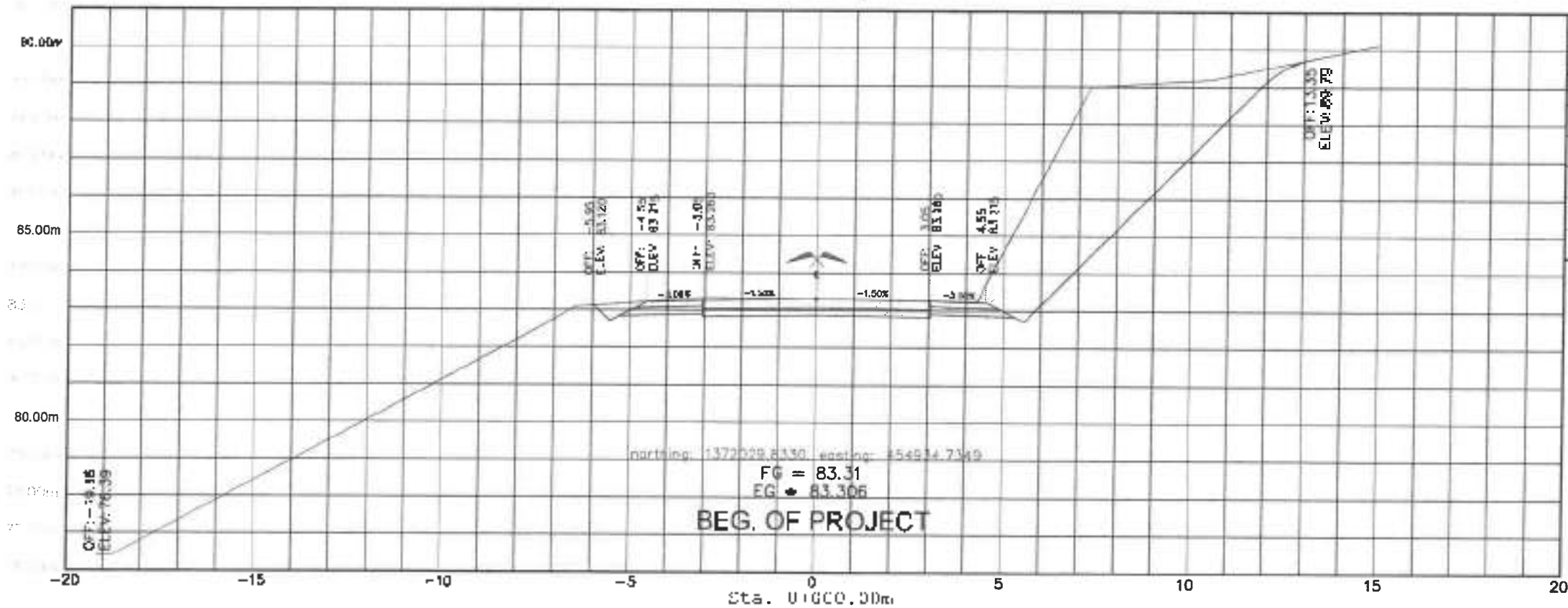
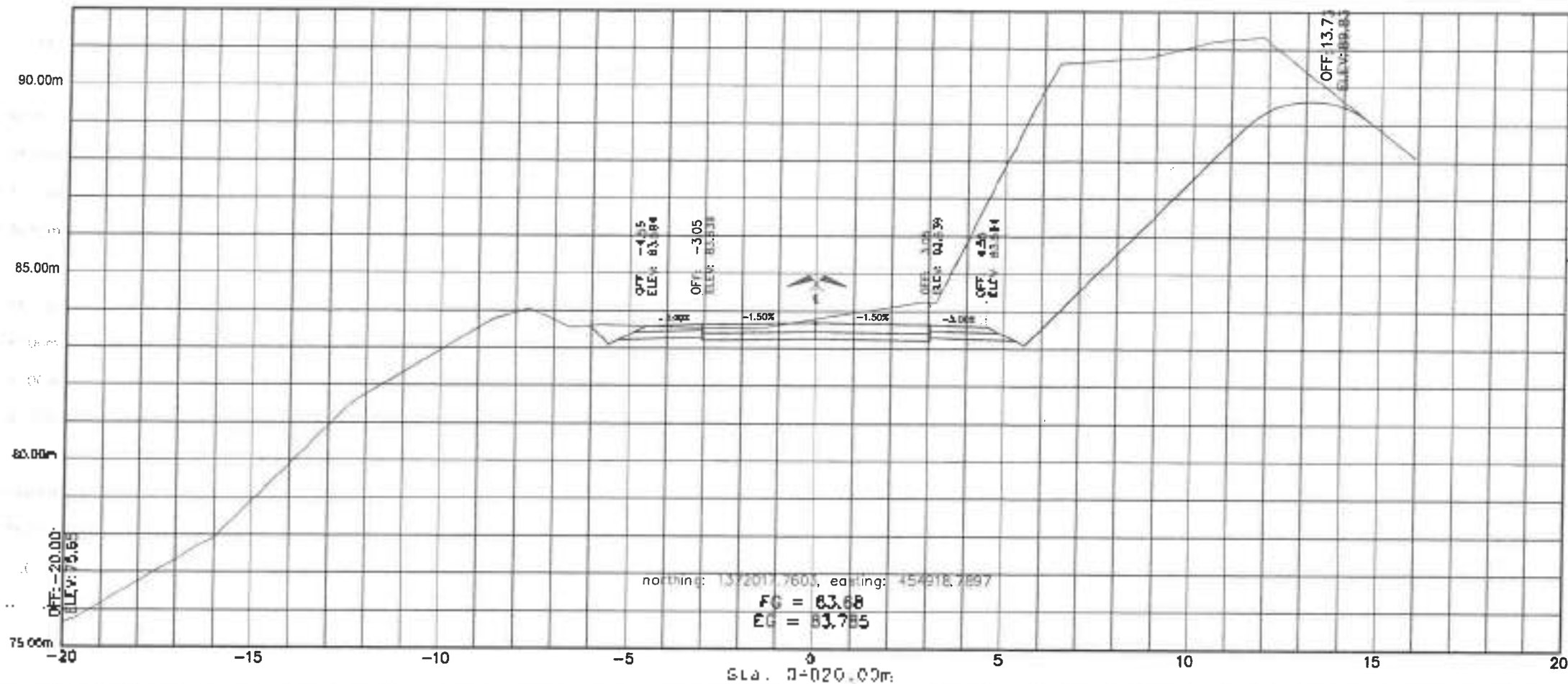
PROFILE

VERTICAL SCALE: 1:125
 HORIZONTAL SCALE: 1:1250

ALIGNMENT ELEVATIONS																											
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END OF PROJECT
 STA. 002+584.50
 NORTHING: 1372460.287
 EASTING: 452723.648
 ELEVATION: 79.70 m



DETAILED CROSS SECTION SCALE: 1:100 METERS



Republic of the Philippines
 DEPARTMENT OF PUBLIC WORKS AND HIGHWAYS
 REGIONAL OFFICE No. VI
NORTHERN SAMAR FIRST DISTRICT ENGINEERING OFFICE
 Cebu City, Northern Samar

PROJECT NAME & LOCATION
CONSTRUCTION OF CAG-ABACA - CULARIMA - GENERAL MALVAR ROAD, CATARMAN, NORTHERN SAMAR
 CATARMAN, NORTHERN SAMAR

PROJECT NAME & LOCATION
DETAILED CROSS SECTION

DESIGNED BY

MARTIN M. DELA TORRE
 ENGINEER II

CHECKED BY

MAX DONALD N. EIMAN
 ASST. CHIEF ENGINEER (CIVIL)
 Date: _____

SUBMITTED BY

ANDY S. EMANO
 CHIEF PLANNING AND DESIGN SECTION
 Date: _____

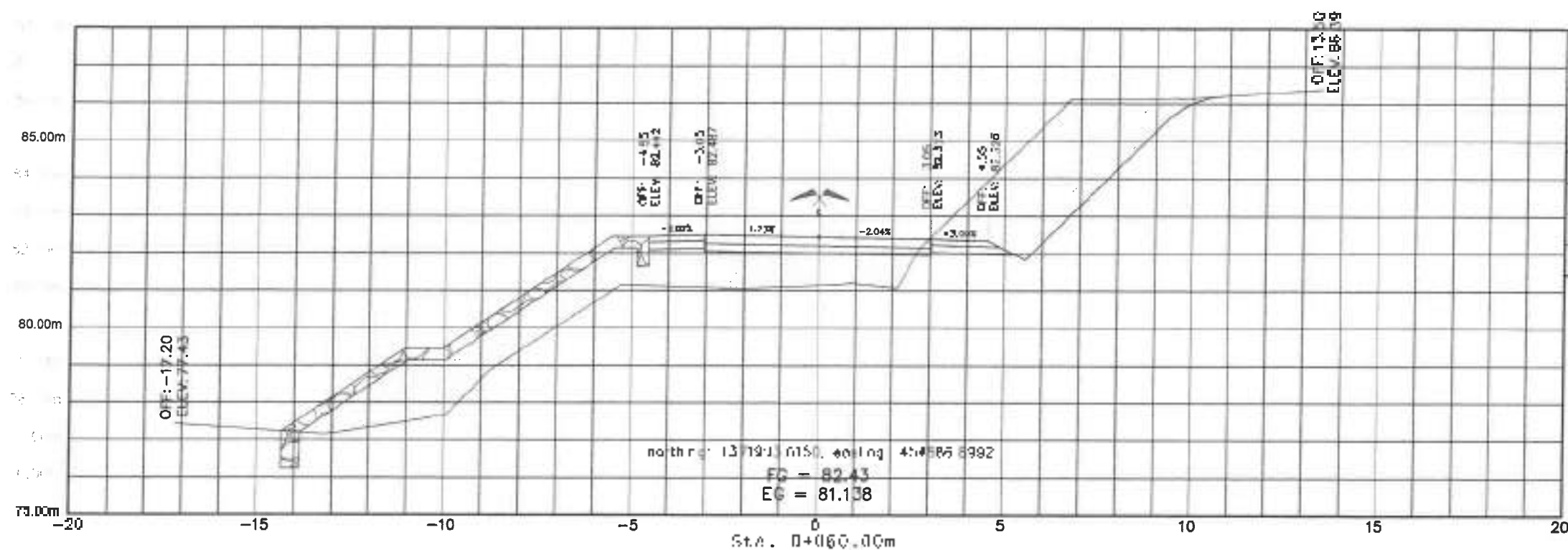
RECOMMENDED BY

VIVIAN E. BIACO
 DISTRICT ENGINEER
 Date: _____

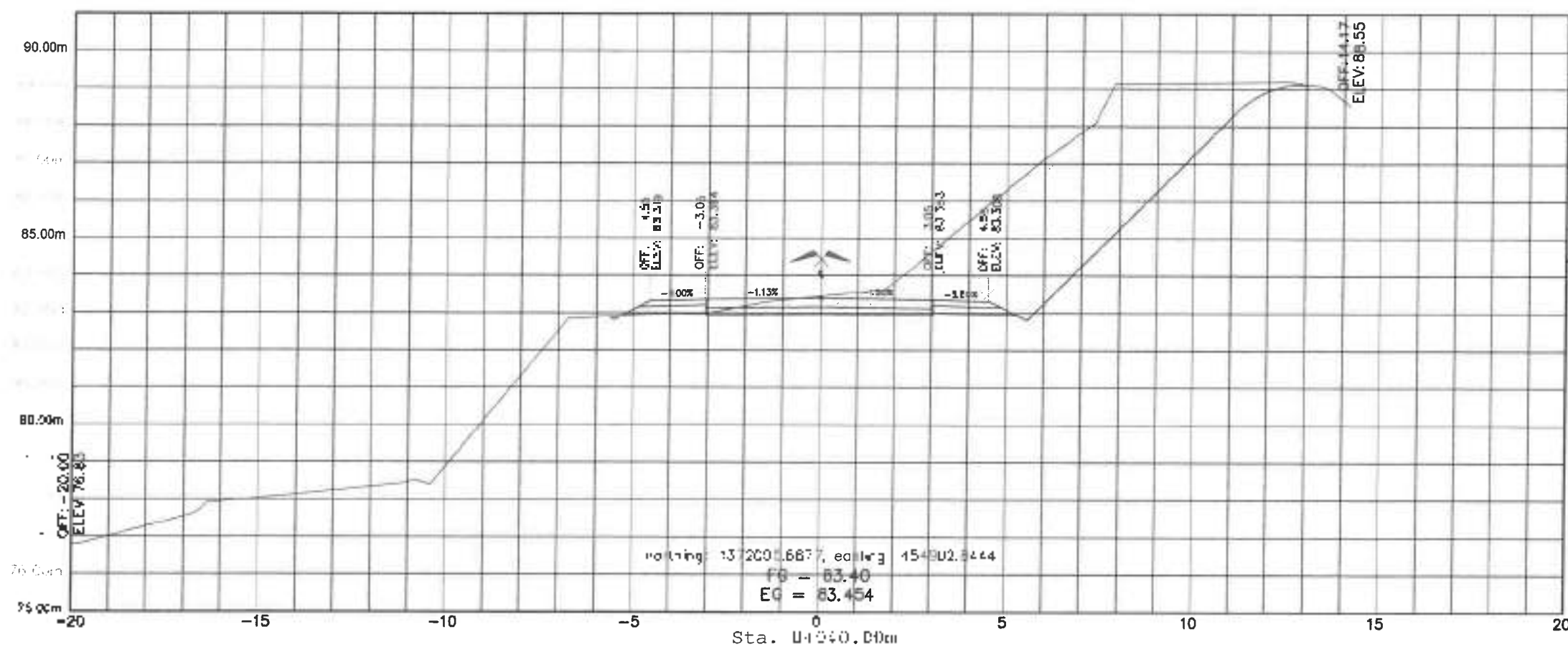
APPROVED BY

ALVIN A. IGNACIO
 DISTRICT ENGINEER
 Date: _____

DATE
 1/25/2020
 SHEET NO.
 1/1



Material(s) at Station 0+060.00m	
Material Name	Area
CUT	12.38
FILL	14.88
ITEM 103(1)a	0.50
ITEM 405(1)a	0.00
ITEM 505(2)a	3.83
ITEM 506(1)	0.00



Material(s) at Station 0+240.00m	
Material Name	Area
CUT	26.93
FILL	0.00
ITEM 103(1)a	0.00
ITEM 405(1)a	0.00
ITEM 505(2)a	0.00
ITEM 506(1)	0.00

DETAILED CROSS SECTION

SCALE: 1:100

METERS



DEPARTMENT OF PUBLIC WORKS AND HIGHWAYS
NORTHERN SAMAR FIRST
DISTRICT ENGINEERING OFFICE
Legazpi, Samar

PROJECT NAME & LOCATION
CONSTRUCTION OF CAG-ABACA -
CUEARIMA - GENERAL MALVAR ROAD,
CATARMAN, NORTHERN SAMAR

PROJECT NAME & LOCATION
DETAILED CROSS SECTION

DESIGNED BY
MARIN N. DELA TORRE
ENGINEER

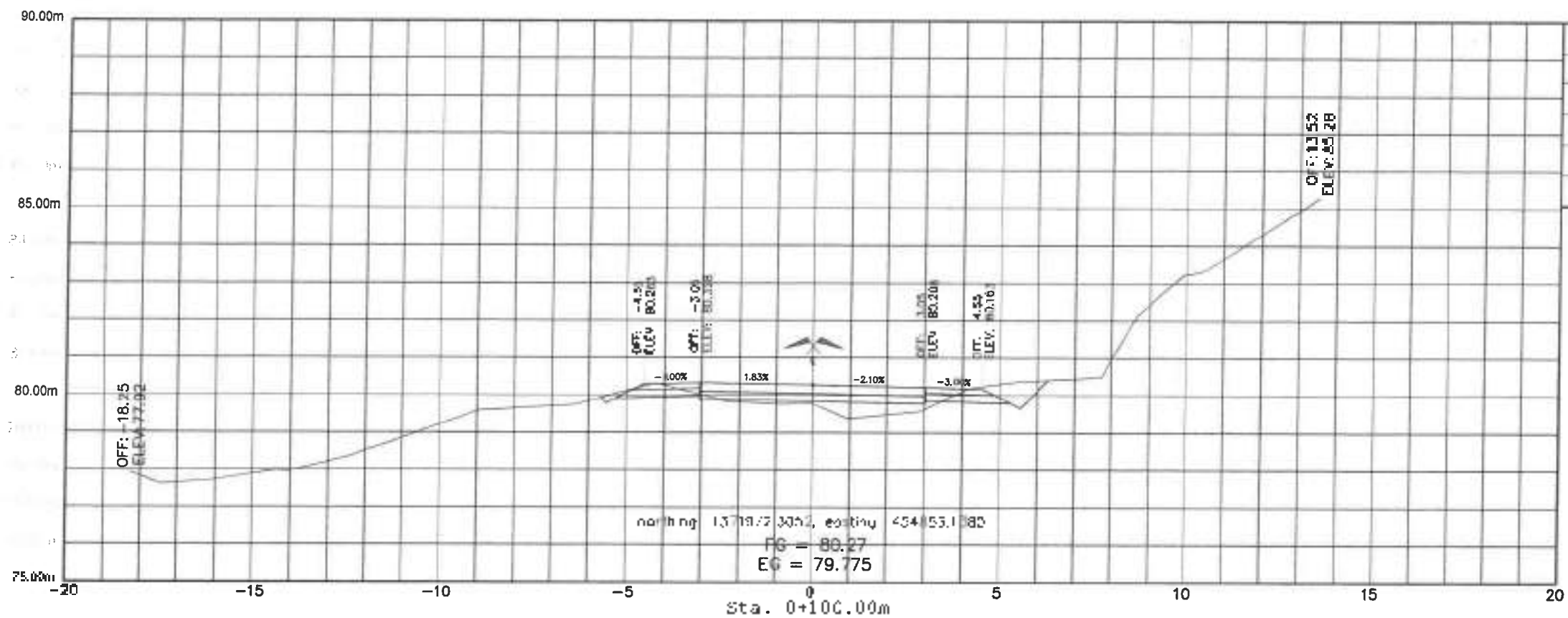
REVIEWED BY
MAR DONALD N. EIMAN
DISTRICT ENGINEER

SUBMITTED BY
ANDY S. BRERO
DISTRICT ENGINEER

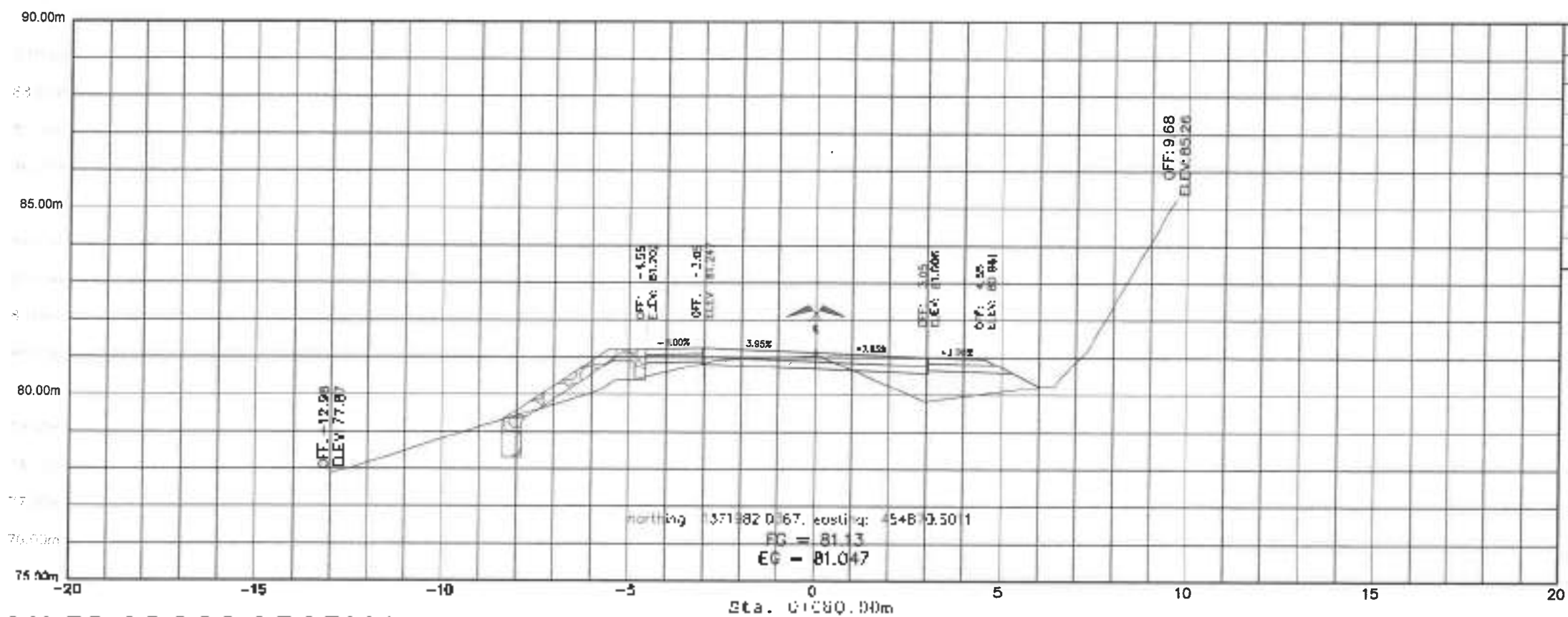
RECOMMENDED BY
VICTOR S. BIACO
DISTRICT ENGINEER

APPROVED BY
ALVIN A. IGNACIO
DISTRICT ENGINEER

DATE
2023



Materials at Station 4200+100.00	
Material Name	Area
CUT	0.72
FILL	1.12
ITEM 403(1)a	0.00
ITEM 506(1)	0.00



Materials at Station 4000+000.00	
Material Name	Area
CUT	0.85
FILL	4.87
ITEM 403(1)a	0.00
ITEM 405(1)a3	0.00
ITEM 506(2)a	1.73
ITEM 506(1)	0.00

DETAILED CROSS SECTION

SCALE: 1:100 METERS



Department of Public Works and Highways
Northern Samar District Engineering Office
General, Northern Samar

PROJECT NAME: CONSTRUCTION OF CAG-ABACA -
CULARIMA - GENERAL MALVAR ROAD,
CATARMAN, NORTHERN SAMAR
DATE: 10/15/2018

PROJECT NAME: DETAILED CROSS SECTION

DESIGNED BY: CL
MARINER, COLA TORRE
Designer

REVIEWED BY: MAR DONALD N. EIMAN
ASST. CHIEF PLANNING AND DESIGN SECTION
Date

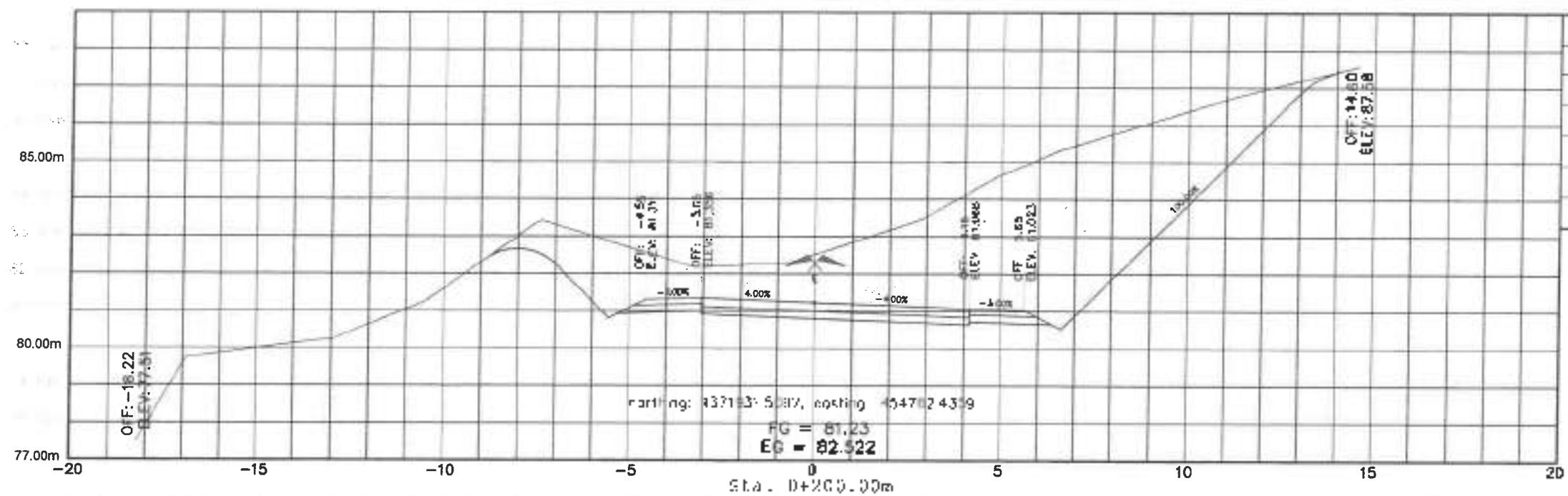
APPROVED BY: ANDY S. BREHO
CHIEF PLANNING AND DESIGN SECTION
Date

APPROVED BY: VIVIANO, BIACO
ASST. CHIEF PLANNING
Date

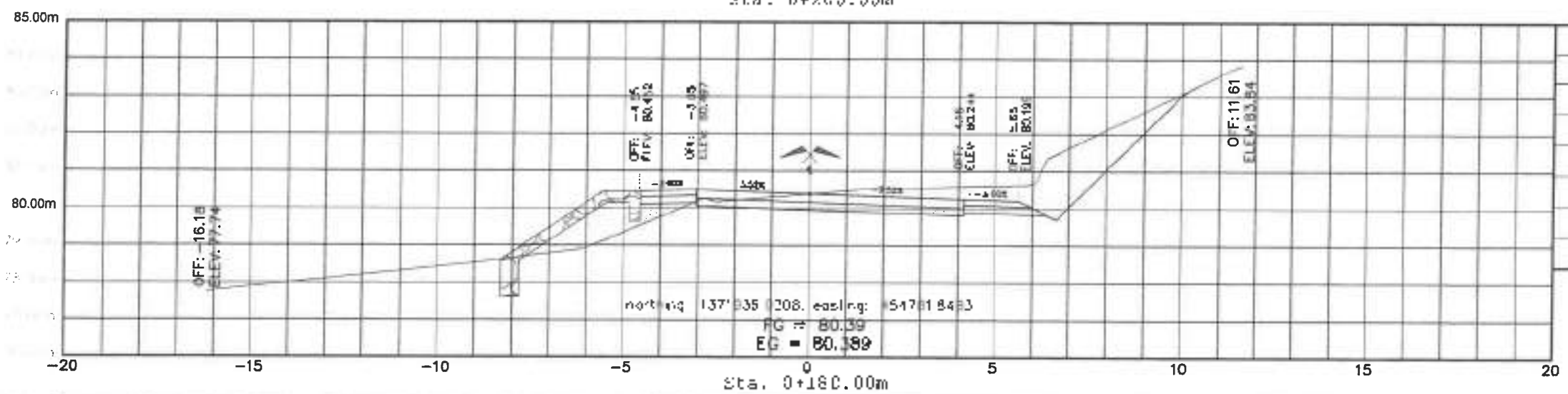
APPROVED BY: ALVIN A. BERNARDO
CHIEF PLANNING
Date

DATE: 10/15/2018

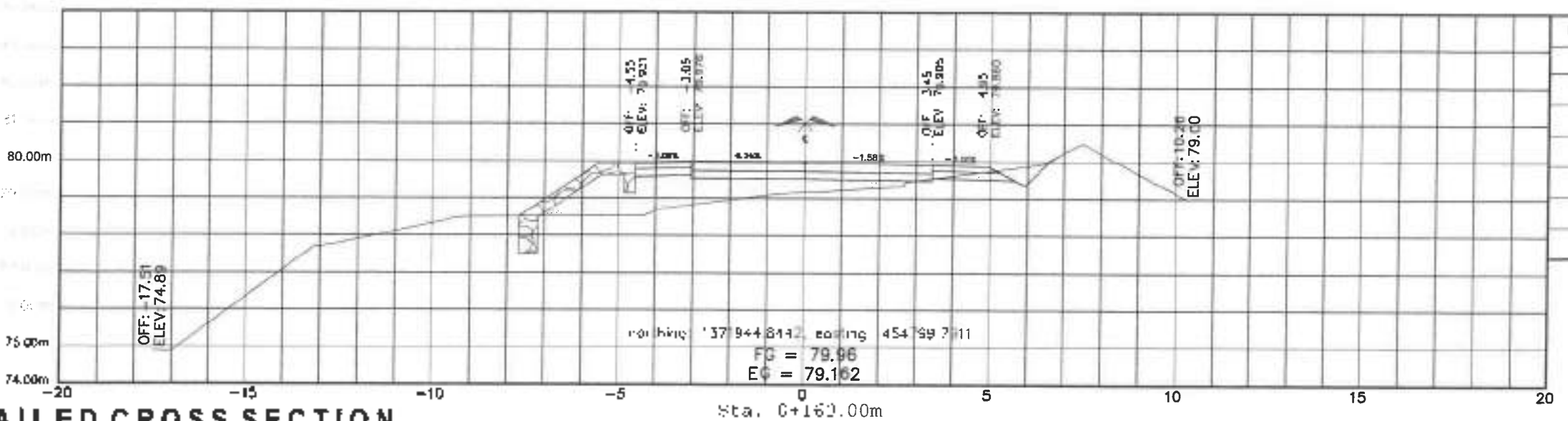
DATE: 10/15/2018



Material(s) at Station K00+200.00	
Material Name	Area
CUT	47.50
FILL	0.00
ITEM 102(1)	0.00
ITEM 103(1)	0.00
ITEM 500(1)	0.00



Material(s) at Station K00+180.00	
Material Name	Area
CUT	6.87
FILL	2.79
ITEM 102(1)	0.52
ITEM 405(1)	0.00
ITEM 505(2)	1.70
ITEM 506(1)	0.00



Material(s) at Station K00+160.00	
Material Name	Area
CUT	0.32
FILL	6.34
ITEM 102(1)	0.50
ITEM 405(1)	0.00
ITEM 505(2)	1.40
ITEM 506(1)	0.00

DETAILED CROSS SECTION SCALE 1:100 METERS



Department of Public Works and Highways
Regional Office No. 10
NORTHERN SAMAR FIRST DISTRICT ENGINEERING OFFICE
Cebu City, Northern Samar

Project Name: **CONSTRUCTION OF CAG-ABACA - CULAFIMA - GENERAL MALVAR ROAD, CATAPMAN, NORTHERN SAMAR**

Project No.: **DETAILED CROSS SECTION**

Design: **MARTIN M. DELA TORRE**

Checked: **MAN DONALD N. EMAN**

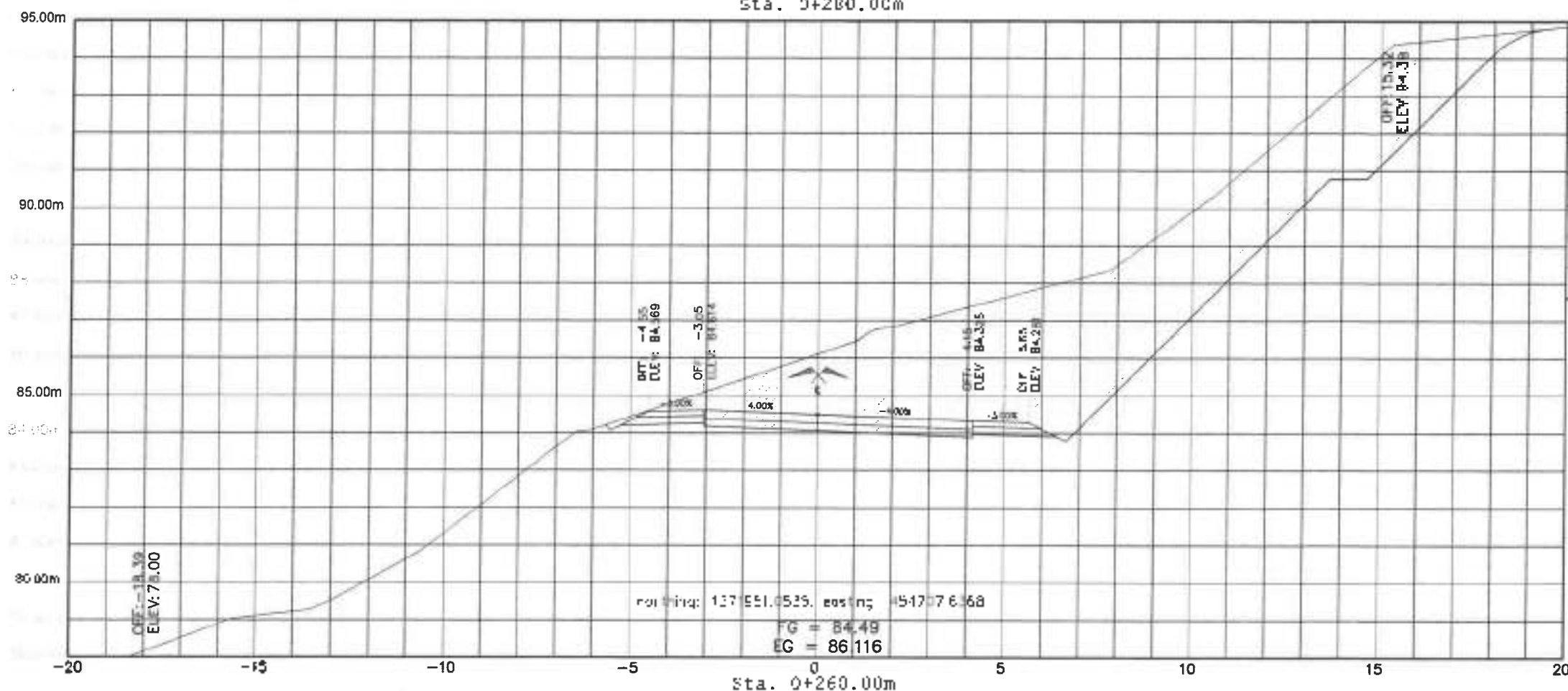
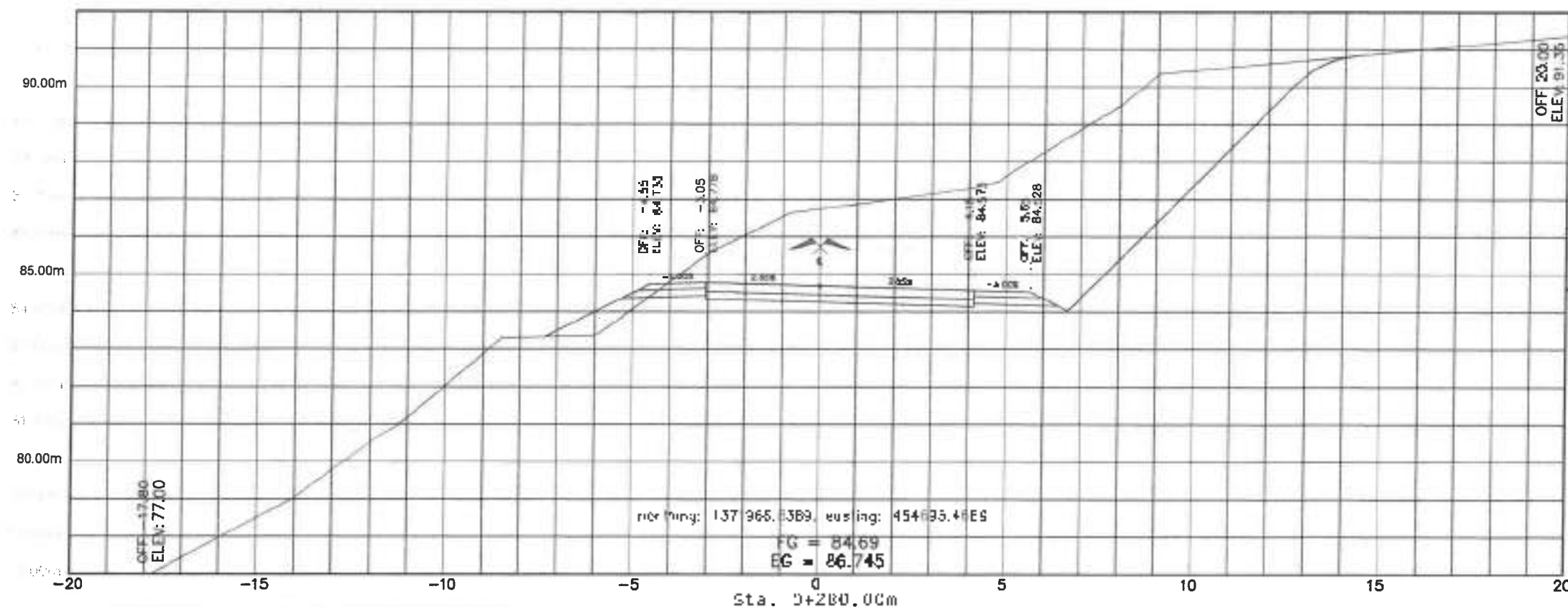
Submitted: **ANDY S. PERERO**

Submitted: **VIVIAN S. BIACO**

Approved: **ALVIN A. MONACIO**

Scale: **1:100**

Sheet: **28**



SCALE: 1:100 METERS

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