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

## Concreting of Brgy. De Maria to Brgy. San Jose FMR, Brgy. De Maria and Brgy. San Jose, Mondragon, Northern Samar

Mondragon, Northern Samar
000 + 000.00 - 000 + 180.00
Net Length = 0.180m (0.360 lane km)

BEG: NORTHING : 1370061.14 ; EASTING : 478213.62
END: NORTHING : 1370137.26 ; EASTING : 478548.34

SUBMITTED:

**ANDY S. EREÑO**
CHIEF, PLANNING & DESIGN SECTION
Date:

RECOMMENDED:

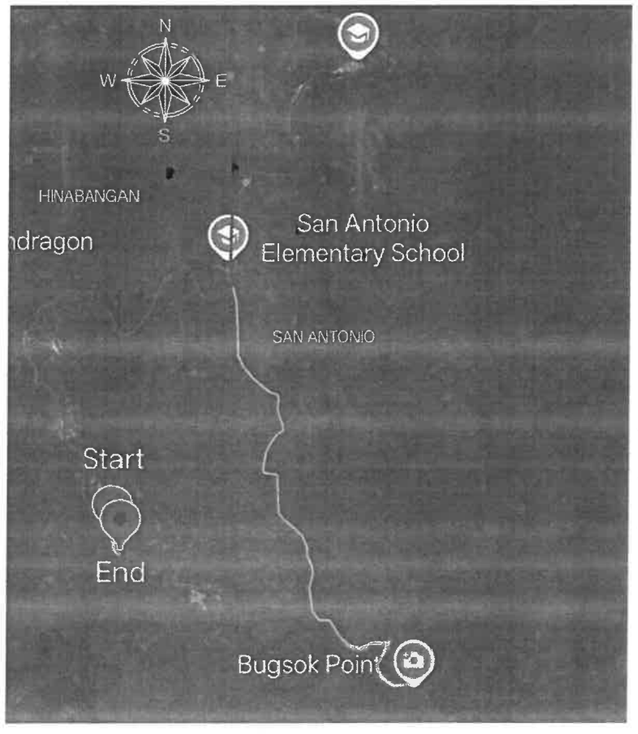
**VIVIAN G. BIACO**
ASST. DISTRICT ENGINEER
Date:

APPROVED:

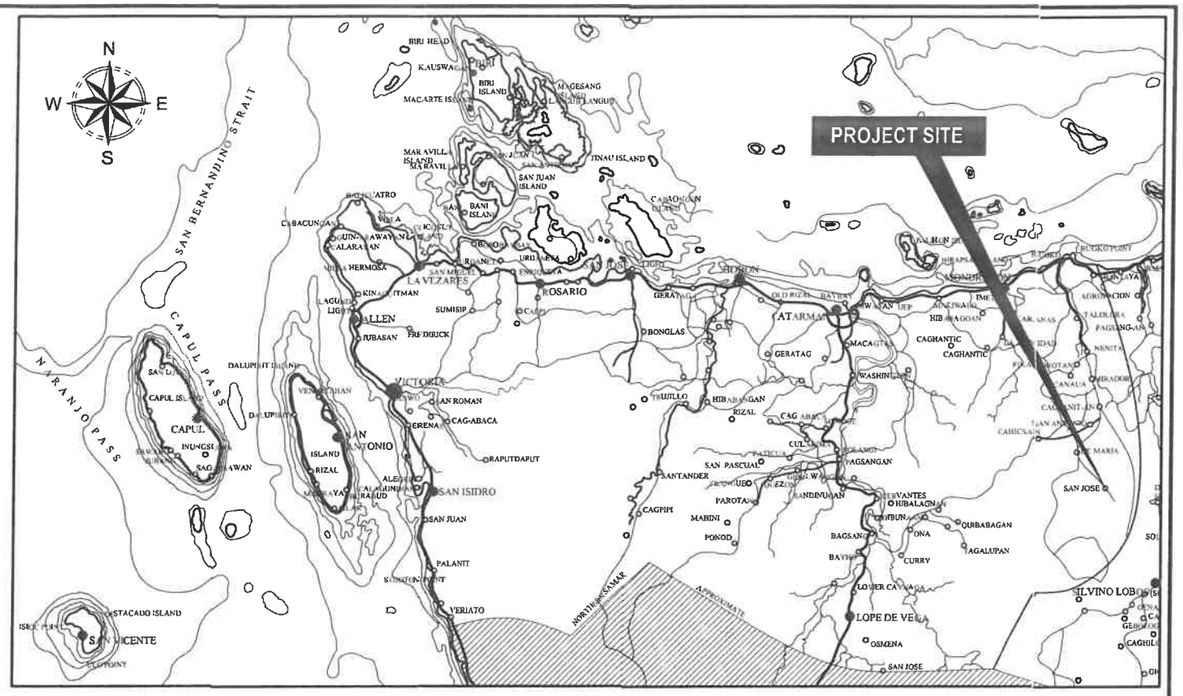
**ALVIN A. IGNACIO**
DISTRICT ENGINEER
Date:

# INDEX OF DRAWINGS

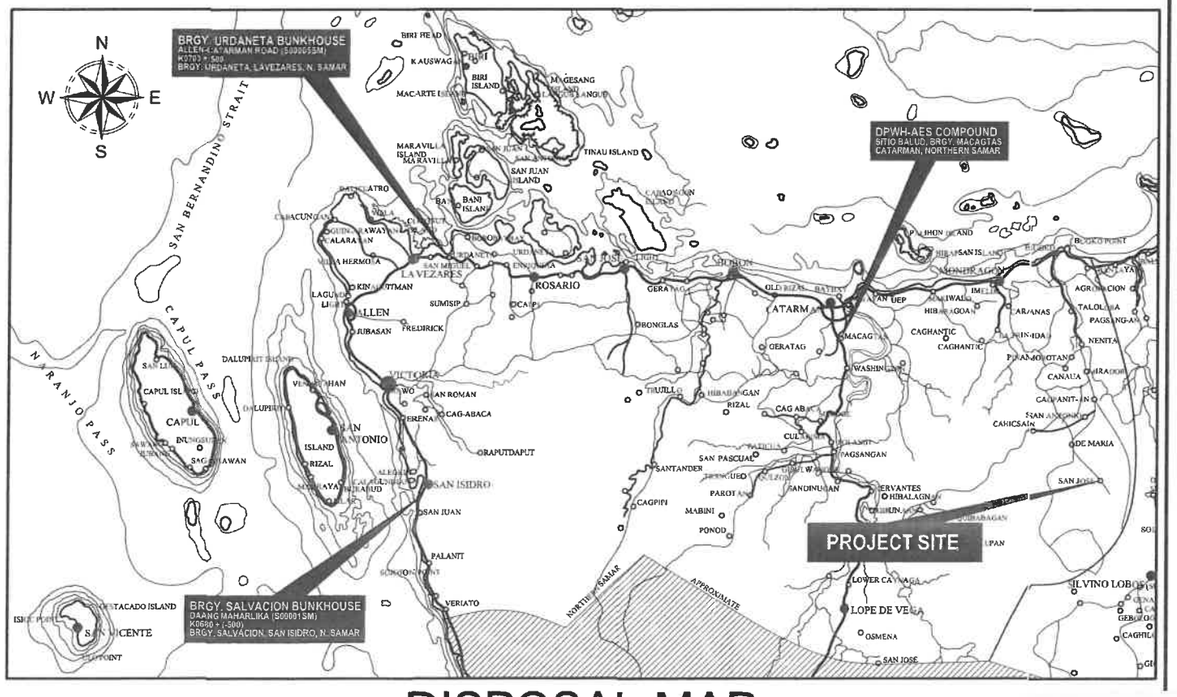





## VICINITY MAP
NOT TO SCALE




## LOCATION MAP
NOT TO SCALE




## DISPOSAL MAP
NOT TO SCALE

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

| PROJECT NAME AND LOCATION: | SHEET CONTENTS: | DRAFTED: | REVIEWED: | SUBMITTED: | RECOMMENDED: | APPROVED: | SET NO. | SHEET NO. |
|---|---|---|---|---|---|---|---|---|
| CONCRETING OF BRGY. POLANGI TO BRGY. PATICUA FMR, BRGY. POLANGI AND BRGY. PATICUA, CATARMAN, NORTHERN SAMAR<br>Catarman, Northern Samar | INDEX OF DRAWINGS<br>LOCATION MAP<br>VICINITY MAP<br>DISPOSAL MAP | GIAN PAUL S. PELITO<br>ENGINEER II<br>DESIGNED:<br>JEFF F. RECIOLA<br>ENGINEER | MAR DIONALD N. EIMAN<br>ASST. CHIEF, PLANNING & DESIGN SECTION<br>DATE: | ANDY S. EREÑO<br>CHIEF, PLANNING & DESIGN SECTION<br>DATE: | VIVIANO B. BIACO<br>ASSISTANT DISTRICT ENGINEER<br>DATE: | ALVIN A. IGNACIO<br>DISTRICT ENGINEER<br>DATE: | G<br>01 \| 05 | 02<br>20 |

# GENERAL NOTES:

## SURVEY DATA:

DATE OF SURVEY : APRIL 21, 2025
EQUIPMENT USED : RTK-BASE(Z35180101039), RTK-ROVER(Z35180402035), RTK-ROVER(Z35171102046), GEOMAX REMOTE (ZXAC139081038E),GEOMAX REMOTE (ZXAC139081085E)
CALIBRATION EXPIRY DATE : APRIL 22, 2025

## REFERENCE:

| BM No. | COORDINATES | | ELEVATION | REMARKS |
|---|---|---|---|---|
| | NORTHING | EASTING | | |
| 1 | 1370118.60 | 478555.22 | 25.11m | END OF EXISTING PATHWAY |

| | |
|---|---|
| COORDINATE REFERENCE SYSTEM : | PRS92 / PHILIPPINE ZONE V |
| PROJECTION : | TRANSVERSE MERCATOR (TM) ZONE OF 2° NETWIDE |
| DATUM : | PHILIPPINE REFERENCE SYSTEM 1992 |
| EPSG CODE : | 3125 |

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) : 3 KM INTERVAL
-PRIMARY PROJECT CONTROL (BM) : 300 M INTERVAL
-INTERMEDIATE CONTROL (IBM) : EVERY 250 M INTERVAL IN BETWEEN BMS

## STANDARDS AND REFERENCES:

- DESIGN, GUIDELINES, CRITERIA, AND STANDARDS, VOLUME 4, 2015
- 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
- DPWH STANDARD SPECIFICATIONS FOR PUBLIC WORKS AND HIGHWAYS, 2014 EDITION: VOLUME II, HIGHWAYS, BRIDGES AND AIRPORTS

# CONSTRUCTION REQUIREMENTS:

## i. DIMENSIONS

(1) STATIONS ARE GIVEN IN KILOMETERS WITH OR WITHOUT DECIMALS.
(2) RADII, ELEVATIONS, FLOOD LEVELS, ETC, ARE GIVEN IN METERS WITH OR WITHOUT DECIMALS.
(3) UNLESS OTHERWISE SHOWN, ALL DISTANCES ARE IN METERS.

## ii. STATIONINGS

(1) THE ROAD STATIONS AND ELEMENTS OF CURVES ARE RELATIVE TO THE CENTERLINE OF THE ROAD.
(2) ALL STATIONS ALONG ROAD CENTERLINE ARE RECKONED FROM NATIONAL ROAD.

## iii. 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 OF THE ROAD REFER TO THE GROUND PROFILE FOR THE ROAD CENTERLINE.

## ITEM 102 - EXCAVATION

**102.1.1** 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. ROADWAY EXCAVATION WILL BE CLASSIFIED AS "UNCLASSIFIED EXCAVATION", "ROCK EXCAVATION", "COMMON EXCAVATION", OR "MUCK EXCAVATION" AS INDICATED IN THE BILL OF QUANTITIES AND HEREINAFTER DESCRIBED.

(1) UNCLASSIFIED EXCAVATION. UNCLASSIFIED EXCAVATION SHALL CONSIST OF THE EXCAVATION AND DISPOSAL OF ALL MATERIALS REGARDLESS OF ITS NATURE, NOT CLASSIFIED AND INCLUDED IN THE BILL OF QUANTITIES UNDER OTHER PAY ITEMS.

(2) ROCK EXCAVATION. ROCK EXCAVATION SHALL CONSIST OF IGNEOUS, SEDIMENTARY AND METAMORPHIC ROCK 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.

(3) COMMON EXCAVATION. COMMON EXCAVATIONS SHALL CONSIST OF ALL EXCAVATION NOT INCLUDED IN THE BILL OF QUANTITIES UNDER "ROCK EXCAVATION" OR OTHER PAY ITEMS.

(4) MUCK EXCAVATION. MUCK EXCAVATION SHALL CONSIST OF THE REMOVAL AND DISPOSAL OF DEPOSITS OF SATURATED OR UNSATURATED MIXTURES OF SOILS AND ORGANIC MATTER NOT SUITABLE FOR FOUNDATION MATERIAL REGARDLESS OF MOISTURE CONTENT.

WHEN THERE IS EVIDENCE OF DISCREPANCIES ON THE ACTUAL ELEVATIONS AND THAT SHOWN ON THE PLANS, A PRE-CONSTRUCTION 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 EXCAVATED MATERIALS.

ALL EXCAVATIONS SHALL BE FINISHED TO REASONABLY SMOOTH AND UNIFORM SURFACES. NO MATERIALS SHALL BE WASTED WITHOUT AUTHORITY OF THE ENGINEER. EXCAVATION OPERATIONS SHALL BE CONDUCTED SO THAT MATERIAL OUTSIDE OF THE LIMITS OF SLOPES WILL NOT BE DISTURBED. PRIOR TO EXCAVATION, ALL NECESSARY CLEARING AND GRUBBING IN THAT AREA SHALL HAVE BEEN PERFORMED IN ACCORDANCE WITH ITEM 100, CLEARING AND GRUBBING

## ITEM 104 - EMBANKMENT

PRIOR TO CONSTRUCTION OF EMBANKMENT, ALL NECESSARY CLEARING AND GRUBBING IN THAT AREA SHALL HAVE BEEN PERFORMED IN CONFORMITY WITH ITEM 100, CLEARING AND GRUBBING.

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.

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.

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 (6 INCHES) AND TO THE SPECIFIED REQUIREMENTS OF THIS ITEM.

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.

**104.3.3** THE CONTRACTOR SHALL COMPACT THE MATERIAL PLACED IN ALL EMBANKMENT LAYERS AND THE MATERIAL SCARIFIED TO THE DESIGNATED DEPTH BELOW SUBGRADE IN CUT SECTIONS, UNTIL A UNIFORM DENSITY OF NOT LESS THAN 95 MASS PERCENT OF THE MAXIMUM DRY DENSITY DETERMINED BY AASHTO T 99 METHOD C, IS ATTAINED, AT A MOISTURE CONTENT DETERMINED BY ENGINEER TO BE SUITABLE FOR SUCH DENSITY. ACCEPTANCE OF COMPACTION MAY BE BASED ON ADHERENCE TO AN APPROVED ROLLER PATTERN DEVELOPED AS SET FORTH IN ITEM 106, COMPACTION EQUIPMENT AND DENSITY CONTROL STRIPS.

THE ENGINEER SHALL DURING PROGRESS OF THE WORK, MAKE DENSITY TESTS OF COMPACTED MATERIAL IN ACCORDANCE WITH AASHTO T 191, T 205, OR OTHER APPROVED FIELD DENSITY TESTS, INCLUDING THE USE OF PROPERLY CALIBRATED NUCLEAR TESTING DEVICES. A CORRECTION FOR COARSE PARTICLES MAY BE MADE IN ACCORDANCE WITH AASHTO T 224. IF, BY SUCH TESTS, THE ENGINEER DETERMINES THAT THE SPECIFIED DENSITY AND MOISTURE CONDITIONS HAVE NOT BEEN ATTAINED, THE CONTRACTOR SHALL PERFORM ADDITIONAL WORK AS MAY BE NECESSARY TO ATTAIN THE SPECIFIED CONDITIONS.

AT LEAST ONE GROUP OF THREE IN-SITU DENSITY TESTS SHALL BE CARRIED OUT FOR EACH 500 M OF EACH LAYER OF COMPACTED FILL.

## ITEM 105 - SUBGRADE PREPARATION

**105.3.2** 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 |
| | - | 30 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 % |

**105.3.3** 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.

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.

## ITEM 200 - AGGREGATE SUBBASE COURSE

**200.3.1** THE EXISTING SURFACE SHALL BE GRADED BY CONDUCTING PRE-CONSTRUCTION SURVEY TO BE UNDERTAKEN BY THE CONTRACTOR UNDER THE CONTROL OF THE ENGINEER AS PROVIDED UNDER ITEM 105, SUBGRADE PREPARATION, TO PROPERLY IMPLEMENT THE DESIGNED ELEVATION AND THICKNESS OF THE ROAD FOUNDATION BEFORE PLACING THE SUBBASE MATERIAL.

**200.3.2** 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/EQUIPMENT 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 OR COMPACTED, THE FINISHED LAYER SHALL 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.

**200.3.3** WHERE THE REQUIRED THICKNESS IS 200 MM OR LESS, THE MATERIAL SHALL BE SPREAD AND COMPACTED IN ONE (1) LAYER USING A VIBRATORY ROLLER EQUIPMENT WITH AT LEAST TEN (10) METRIC TONS CAPACITY. WHERE THE REQUIRED THICKNESS IS MORE THAN 200 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 200 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 MSHTO T 180, METHOD D HAS BEEN ACHIEVED. IN-PLACE DENSITY DETERMINATION SHALL BE MADE IN ACCORDANCE WITH MSHTO T 191.

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|---|---|---|---|---|---|---|---|
| Republic of the Philippines<br>DEPARTMENT OF PUBLIC WORKS AND HIGHWAYS<br>REGIONAL OFFICE No. VIII<br>NORTHERN SAMAR FIRST DISTRICT ENGINEERING OFFICE<br>Catarman, Northern Samar | PROJECT NAME AND LOCATION:<br>CONCRETING OF BRGY. POLANGI TO BRGY. PATICUA FMR, BRGY. POLANGI AND BRGY. PATICUA, CATARMAN, NORTHERN SAMAR<br>Catarman, Northern Samar | SHEET CONTENTS:<br>GENERAL NOTES | DRAFTED:<br>GIANPAUL C. PELITO<br>ENGINEER<br>DESIGNED:<br>JEFF F. PEDROLA<br>ENGINEER | REVIEWED:<br>MAR DIONALD N. EIMAN<br>ASST. CHIEF, PLANNING & DESIGN SECTION<br>DATE: | SUBMITTED:<br>ANDY S. EREÑO<br>CHIEF, PLANNING & DESIGN SECTION<br>DATE: | RECOMMENDED:<br>VIVIAN S. BIACO<br>ASSISTANT DISTRICT ENGINEER<br>DATE: | APPROVED:<br>ALVIN A. IGNACIO<br>DISTRICT ENGINEER<br>DATE: | SET NO.<br>G<br>02 05 | SHEET NO.<br>03<br>20 |

## ITEM 311 - PORTLAND CEMENT CONCRETE PAVEMENT

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.

**311.3.1** (1) THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE QUALITY CONTROL OF ALL MATERIALS DURING THE HANDLING, BLENDING, AND MIXING AND PLACEMENT OPERATIONS.

(2) THE CONTRACTOR SHALL FURNISH THE ENGINEER A QUALITY CONTROL PLAN DETAILING HIS PRODUCTION CONTROL PROCEDURES AND THE TYPE AND FREQUENCY OF SAMPLING AND TESTING TO INSURE THAT THE CONCRETE PRODUCES COMPLIES WITH THE SPECIFICATIONS. THE ENGINEER SHALL BE PROVIDED FREE ACCESS TO RECENT PLANT PRODUCTION RECORDS, AND IF REQUESTED, INFORMATIONAL COPIES OF MIX DESIGN, MATERIALS CERTIFICATIONS AND SAMPLING AND TESTING REPORTS.

(3) EXPERIENCED AND QUALIFIED PERSONNEL SHALL PERFORM ALL BATCHING OR MIXING OPERATION FOR THE CONCRETE MIX, AND SHALL BE PRESENT AT THE PLANT AND JOB SITE TO CONTROL THE CONCRETE PRODUCTIONS WHENEVER THE PLANT IS IN OPERATION. THEY SHALL BE IDENTIFIED AND DUTIES DEFINED AS FOLLOWS:

- CONCRETE BATCHER. THE PERSON PERFORMING THE BATCHING OR MIXING OPERATION SHALL BE CAPABLE OF ACCURATELY CONDUCTING AGGREGATE SURFACE MOISTURE DETERMINATION AND ESTABLISHING CORRECT SCALE WEIGHTS FOR CONCRETE MATERIALS. HE SHALL BE CAPABLE OF ASSURING THAT THE PROPORTIONED BATCH WEIGHTS OF MATERIALS ARE IN ACCORDANCE WITH THE MIX DESIGN.

- CONCRETE TECHNICIAN. THE PERSON RESPONSIBLE FOR CONCRETE PRODUCTION CONTROL AND SAMPLING AND TESTING FOR QUALITY CONTROL SHALL BE PROFICIENT IN CONCRETE TECHNOLOGY AND SHALL HAVE A SOUND KNOWLEDGE OF THE SPECIFICATIONS AS THEY RELATE TO CONCRETE PRODUCTION. HE SHALL BE CAPABLE OF CONDUCTING TESTS ON CONCRETE AND CONCRETE MATERIALS IN ACCORDANCE WITH THESE SPECIFICATIONS. HE SHALL BE CAPABLE OF ADJUSTING CONCRETE MIX DESIGNS FOR IMPROVING WORKABILITY AND SPECIFICATION COMPLIANCE AND PREPARING TRIAL MIX DESIGNS. HE SHALL BE QUALIFIED TO ACT AS THE CONCRETE BATCHER IN THE BATCHER'S ABSENCE.

(4) THE CONTRACTOR SHALL PERFORM ALL SAMPLING, TESTING AND INSPECTION NECESSARY TO ASSURE QUALITY CONTROL OF THE COMPONENT MATERIALS AND THE CONCRETE. THE CONTRACTOR SHALL BE RESPONSIBLE FOR DETERMINING THE GRADATION OF FINE AND COARSE AGGREGATES AND FOR TESTING THE CONCRETE MIXTURE FOR SLUMP, AIR CONTENT, WATER-CEMENT RATIO AND TEMPERATURE. HE SHALL CONDUCT HIS OPERATIONS SO AS TO PRODUCE A MIX CONFORMING TO THE APPROVED MIX DESIGN.

(5) THE CONTRACTOR SHALL MAINTAIN ADEQUATE RECORDS OF ALL INSPECTIONS AND TESTS. THE RECORDS SHALL INDICATE THE NATURE AND NUMBER OF OBSERVATIONS MADE, THE NUMBER AND TYPE OF DEFICIENCIES FOUND, THE QUANTITIES APPROVED AND REJECTED, AND NATURE OF ANY CORRECTIVE ACTION TAKEN.

THE ENGINEER MAY TAKE INDEPENDENT ASSURANCE SAMPLES AT RANDOM LOCATION FOR ACCEPTANCE PURPOSES AS HE DEEMS NECESSARY.

## DESIGN OF PAVEMENT:

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 -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 AIRPORT". 2014 EDITION.
2. CONSTRUCTION (CONTACT) 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 DOWEL 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 LINKS.
7. AT LEAST SIX (6) SUCCESSIVE DOWELLED BUTT JOINTS AT NORMAL 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 COLD APPLIED LIQUID RUBBER COMPOUND AFTER THE CONCRETE HAD BEEN CURED AND BEFORE OPENING PAVEMENT TO TRAFFIC, PENETRATION ASPHALT SEAL ON CONCRETE JOINT SHOULD BE POURED IN SUCH A MANNER THAT SPILLING WILL BE ELIMINATED. THUS, 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 PCCP AN OTHER STRUCTURES SHALL BE PERFORMED USING POWER TOOLS. THE HOLES SHALL BE PROPERLY CLEANED BEFORE GROUT/EPOXY INJECTION AND INSTALLATION OF DOWELS OR TIE BARS..

| | | | |
|---|---|---|---|
| 1.0 | PAVEMENT DESIGN PARAMETERS | | |
| | 1. PERFORMANCE PERIOD | - | 20 YEARS (FOR PCCP) |
| | 2. DESIGN TRAFFIC : ESAL | - | $3.086 \times 10^6$ |
| | 3. DESIGN RELIABILITY : R | - | 0.85 |
| | 4. STANDARD DEVIATION : So | - | 0.35 |
| | 5. DESIGN SERVICEABILITY LOSS: APSI | - | 2.00 |
| | 6. PCCP MODULOS OF RUPTURE: Sc | - | 636.00 |
| | 7. PCCP MODULOS OF ELASTICITY: Ec | - | $3.370 \times 10^6$ |
| | 8. SUBGRADE DESIGN CBR | - | 6.06 |
| | 9. EFFECTIVE ROADBED RESILIENT MODULUS: MR | - | 9087.75 |
| | 10.SUBBASE ELASTIC MODULUS: ESB | - | 15000.00 |
| | 11.SUBBASE THICKNESS | - | 200 mm |
| | 12.EFFECTIVE MODULUS AT SUBGRADE REACTION: K (pci) | - | 500.00 |
| | 13.DRAINAGE COEFFICIENT: Cd | - | 1.00 |
| | 14.LOAD TRANSFER COEFFICIENT: J | - | 3.20 |
| | 15.LOSS OF SUPPORT: Ls | - | 1.00 |
| | 16.K, CORRECTED | - | 170.00 |

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 SURVE TO BE CONSTRUCTED JOINTLY BY THE DIRECT IMPLEMENTING OFFICE AND THE CONTRACTOR AND SUBSEQUENT PLANS WILL BE PREPARED AND SUBMITTED FOR APPROVAL.

Republic of the Philippines
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PROJECT NAME AND LOCATION:
CONCRETING OF BRGY. POLANGI TO BRGY. PATICUA FMR, BRGY. POLANGI AND BRGY. PATICUA, CATARMAN, NORTHERN SAMAR
Catarman, Northern Samar

SHEET CONTENTS:
GENERAL NOTES

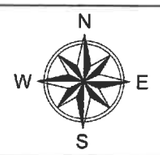
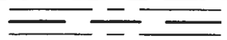
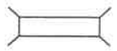
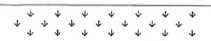
DRAFTED: GIAN PAUL G. PELITO, Engineer II
DESIGNED: JEFF F. IPERROLA, ENGINEER II

REVIEWED: MAR DIONALD N. EIMAN, ASST. CHIEF, PLANNING & DESIGN SECTION, DATE:
SUBMITTED: ANDY S. EREÑO, CHIEF, PLANNING & DESIGN SECTION, DATE:
RECOMMENDED: VIVIAN G. BIACO, ASSISTANT DISTRICT ENGINEER, DATE:
APPROVED: ALVIN A. IGNACIO, DISTRICT ENGINEER, DATE:

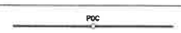
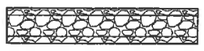
SET NO. G 03 05
SHEET NO. 04 20

# LEGENDS AND ABBREVIATIONS

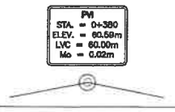
## EXISTING TOPOGRAPHICAL FEATURES

| | |
|---|---|
| NORTH ARROW |   |
| EXISTING ROAD |  |
| EXISTING ROAD WIDENED |  |
| 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 WIDENING |  |
| CENTER LINE |  |
| EDGE OF PAVEMENT |  |
| RROW 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) |  |

## 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 |
| e | = | ELEVATION |
| V | = | VELOCITY |
| W | = | WIDENING |
| BM | = | BENCH MARK |
| RP | = | REFERENCE POINT |
| ELEV | = | ELAVATION |
| PVI | = | POINT OF VERTICAL INTERSECTION |
| STA | = | STATION |
| g | = | GRADE IN % |
| CL | = | CENTERLINE |

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

PROJECT NAME AND LOCATION:
CONCRETING OF BRGY. POLANGI TO BRGY. PATICUA FMR, BRGY. POLANGI AND BRGY. PATICUA, CATARMAN, NORTHERN SAMAR
Catarman, Northern Samar

SHEET CONTENTS:
LEGENDS & ABBERVIATIONS

DRAFTED: GIAN PAUL C. PELITO, ENGINEER II
DESIGNED: JEFF F. PEDROLA, ENGINEER I

REVIEWED: MAR DIONALD N. EIMAN, ASST. CHIEF, PLANNING & DESIGN SECTION, DATE:
SUBMITTED: ANDY S. EREÑO, CHIEF, PLANNING & DESIGN SECTION, DATE:
RECOMMENDED: VIVIAN O. BIACO, ASSISTANT DISTRICT ENGINEER, DATE:
APPROVED: ALVIN A. IGNACIO, DISTRICT ENGINEER, DATE:

SET NO. G 04 05
SHEET NO. 05 20

# 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 | l.s. | 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 | l.s. | 1.00 | |
| B.9 | Mobilization/Demobilization | l.s. | 1.00 | |
| PART C | EARTHWORKS | | | |
| 100(3)a2 | Individual Removal of Trees, 301-500mm, Small | each | 11.00 | |
| 102(2) | Surplus Common Excavation | $m^3$ | 1,180.20 | |
| 105(1)a | Subgrade Preparation, Common Material | $m^2$ | 1,746.00 | |
| PART D | SUBBASE AND BASE COURSES | | | |
| 200(1) | Aggregate Subbase Course | $m^3$ | 349.20 | |
| PART E | SURFACE COURSES | | | |
| 300(2) | Crushed Aggregate Surface Course | $m^3$ | 81.00 | |
| 311(1)c1 | Portland Cement Concrete Pavement (Unreinforced), 0.23m thk - 14 days | $m^2$ | 1,206.00 | |
| PART H | MISCELLANEOUS STRUCTURES | | | |
| 602(2)a | Marker Post (Farm-to-Market Road Marker) | each | 2.00 | |

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SHEET CONTENTS: SUMMARY OF QUANTITIES

DRAFTED: GIAMPAUL G. PELITO, ENGINEER II
DESIGNED: JEFF F. PEDROLA, ENGINEER II

REVIEWED: MARDIONALD N. EIMAN, ASST. CHIEF, PLANNING & DESIGN SECTION, DATE:

SUBMITTED: ANDY S. EREÑO, CHIEF, PLANNING & DESIGN SECTION, DATE:

RECOMMENDED: VIVIAN D. BIACO, ASSISTANT DISTRICT ENGINEER, DATE:

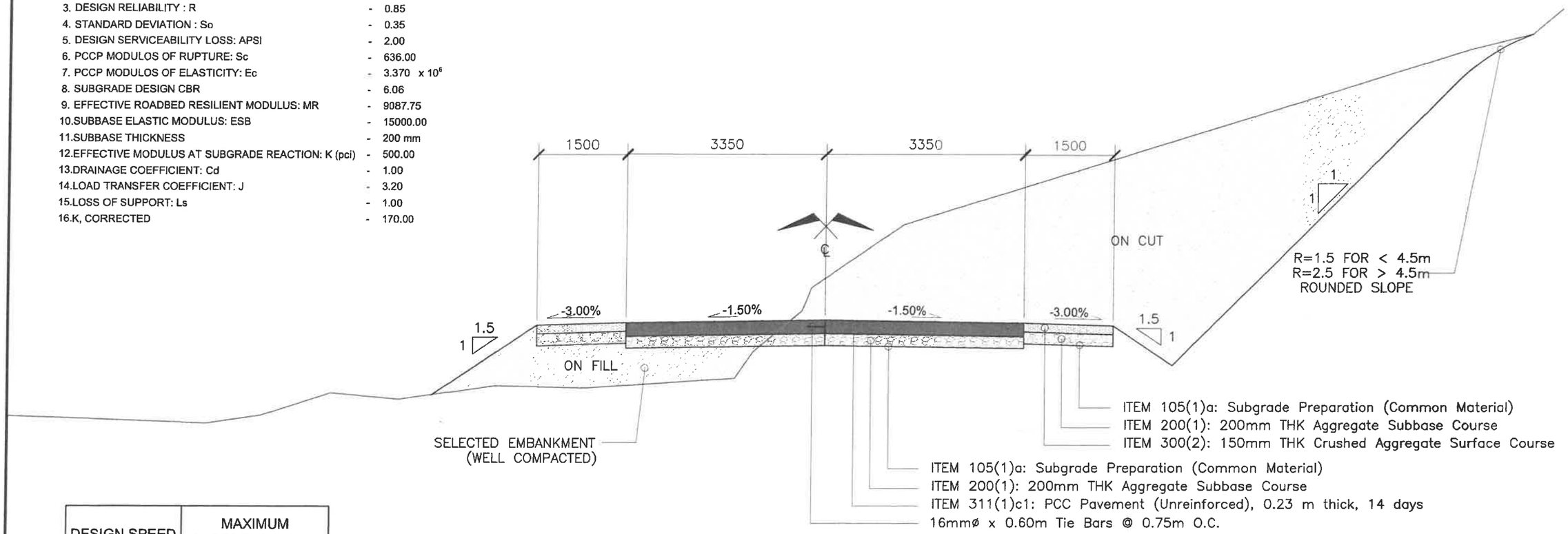
APPROVED: ALVIN A. IGNACIO, DISTRICT ENGINEER, DATE:

SET NO. G 05 05

SHEET NO. 06 20

1.0 PAVEMENT DESIGN PARAMETERS

| | | |
|---|---|---|
| 1. PERFORMANCE PERIOD | - | 20 YEARS (FOR PCCP) |
| 2. DESIGN TRAFFIC : ESAL | - | $3.086 \times 10^6$ |
| 3. DESIGN RELIABILITY : R | - | 0.85 |
| 4. STANDARD DEVIATION : So | - | 0.35 |
| 5. DESIGN SERVICEABILITY LOSS: APSI | - | 2.00 |
| 6. PCCP MODULOS OF RUPTURE: Sc | - | 636.00 |
| 7. PCCP MODULOS OF ELASTICITY: Ec | - | $3.370 \times 10^6$ |
| 8. SUBGRADE DESIGN CBR | - | 6.06 |
| 9. EFFECTIVE ROADBED RESILIENT MODULUS: MR | - | 9087.75 |
| 10.SUBBASE ELASTIC MODULUS: ESB | - | 15000.00 |
| 11.SUBBASE THICKNESS | - | 200 mm |
| 12.EFFECTIVE MODULUS AT SUBGRADE REACTION: K (pci) | - | 500.00 |
| 13.DRAINAGE COEFFICIENT: Cd | - | 1.00 |
| 14.LOAD TRANSFER COEFFICIENT: J | - | 3.20 |
| 15.LOSS OF SUPPORT: Ls | - | 1.00 |
| 16.K, CORRECTED | - | 170.00 |




| DESIGN SPEED ( V ) kph | MAXIMUM SUPERELEVATION ( emax ) % |
|---|---|
| 30.00 | 6.00 |

# TYPICAL ROADWAY SECTION

SCALE: 1: 50 METERS

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SHEET CONTENTS: TYPICAL SECTION

DRAFTED: GIAN PAUL C. PELITO, ENGINEER II

DESIGNED: JEFF F. FEDROLA, ENGINEER

REVIEWED: MAR DONALD N. EIMAN, ASST. CHIEF, PLANNING & DESIGN SECTION, DATE:

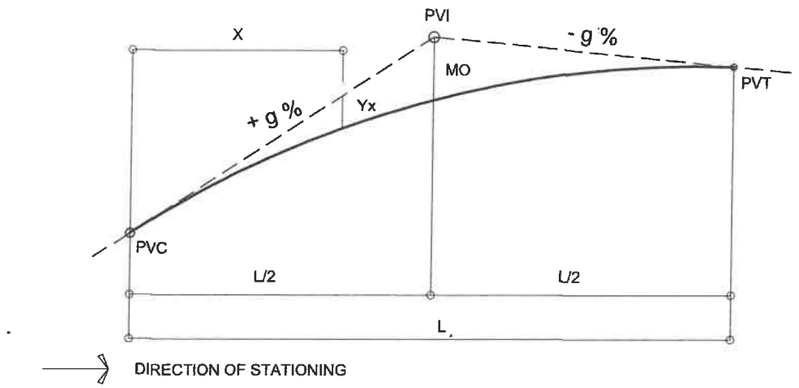
SUBMITTED: ANDY S. EREÑO, CHIEF, PLANNING & DESIGN SECTION, DATE:

RECOMMENDED: VIVIAN G. BIACO, ASSISTANT DISTRICT ENGINEER, DATE:

APPROVED: ALVIN A. IGNACIO, DISTRICT ENGINEER, DATE:

SET NO. R 01 06

SHEET NO. 07 20




## 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 VPC OR VPT TO ANY POINT OF CURVATURE
Yx - VERTICAL OFFSET IN METERS
A - ALGEBRAIC DIFFERENCE OF GRADES

NOTE:

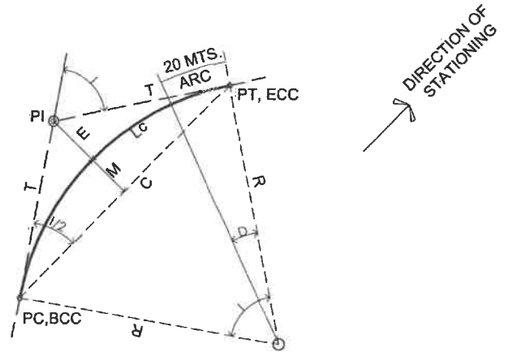
I - NO VERTICAL CURVE IS REQUIRED WHEN THE ALGEBRAIC DIFFERENCE IS LESS THAN 0.50%

IN ANY VERTICAL PARABOLIC CURVE

SYMMETRICAL

$$MO = \frac{AL}{800} \qquad Yx = \frac{X^2\ MO}{(L/2)^2}$$

WHERE: $A = (g2 - g1)$




DIRECTION OF STATIONING

## 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
Da - 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 " Da " ASSUMED ARC = 100m
FOR " Dc " ASSUMED CHORD = 100m

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

ALGEBRAIC DIFFERENCE IS 50% OR LESS

FORMULAS:

$T = R \tan I/2$ $\qquad E = R(\sec I/2 - 1)$

$C = 2R \sin I/2$ $\qquad D = 1145.916/R$

$M = R(1 \cos I/2)$ $\qquad Lc = (20 \times I)/D$

## LEGEND

AZIM - AZIMUTH
BCC - POINT OF CURVATURE ( SIMPLE CURVE )
BM - BENCH MARK
BEG. - BEGINNING
CU.M. - CUBIC METER ( $M^3$ )
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 METER
LVC - LENGTH OF VERTICAL CURVE
M - METER
M AX. - MAXIMUM
M IN. - MINIMUM
MM - MILLIMETER
MO - MIDLLE 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

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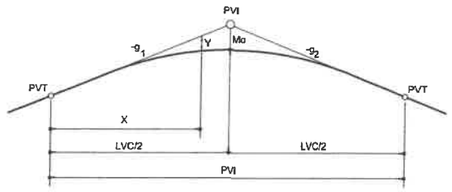
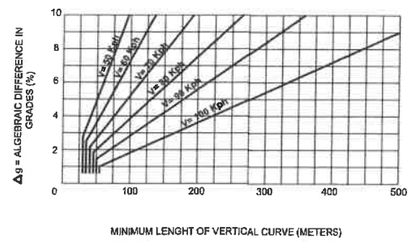
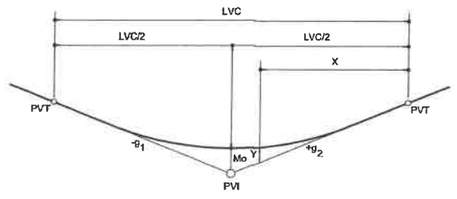
| PROJECT NAME AND LOCATION: | SHEET CONTENTS: | DRAFTED: | REVIEWED: | SUBMITTED: | RECOMMENDED: | APPROVED: | SET NO. | SHEET NO. |
|---|---|---|---|---|---|---|---|---|
| CONCRETING OF BRGY. POLANGI TO BRGY. PATICUA FMR, BRGY. POLANGI AND BRGY. PATICUA, CATARMAN, NORTHERN SAMAR<br>Catarman, Northern Samar | ELEMENTS OF VERTICAL PARABOLIC CURVE<br>ELEMENTS OF HORIZONTAL CURVE | GIAN PAUL G. PELITO<br>ENGINEER II<br>DESIGNED:<br>JEFF F. PEDNOLA<br>ENGINEER | MAR DIONALD N. EIMAN<br>ASST. CHIEF, PLANNING & DESIGN SECTION<br>DATE: | ANDY S. EREÑO<br>CHIEF, PLANNING & DESIGN SECTION<br>DATE: | VIVIAN B. BIACO<br>ASSISTANT DISTRICT ENGINEER<br>DATE: | ALVIN A. IGNACIO<br>DISTRICT ENGINEER<br>DATE: | R<br>03 06 | 09<br>20 |



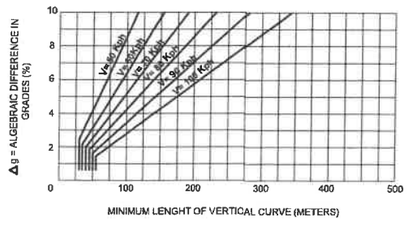

SYMMETRICAL VERTICAL PARABOLIC CURVES (CREST)




DESIGN CONTROL FOR VERTICAL CURVES (CREST)




SYMMETRICAL VERTICAL PARABOLIC CURVES (SAG)




DESIGN CONTROL FOR VERTICAL CURVES (SAG)

## IN ANY VERTICAL PARABOLIC CURVE :

1. $Mo = \frac{(g_1 - g_2)(LVC)}{800}$
2. $Mo = \frac{1}{2}\left[\left(\frac{\text{ELEV. PVC} + \text{ELEV. PVT}}{2}\right) - \text{ELEV. PVI}\right]$
3. $Y = 4\ Mo$

## LEGEND:

PVI - POINT OF VERTICAL INTERSECTION

PVC - POINT OF VERTICAL CURVATURE

PVT - POINT OF VERTICAL TANGENCY

LVC - LENGTH OF VERTICAL CURVES - METER

Mo - KILOMETER PER HOUR

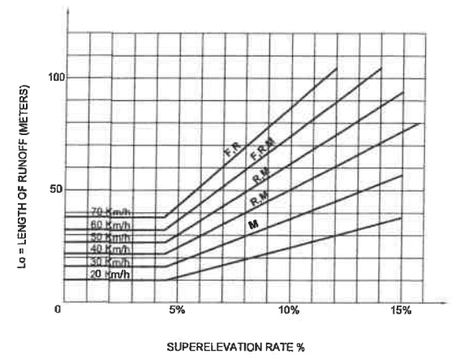
$g_1$ & $g_2$ - GRADE RATES PERCENT

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

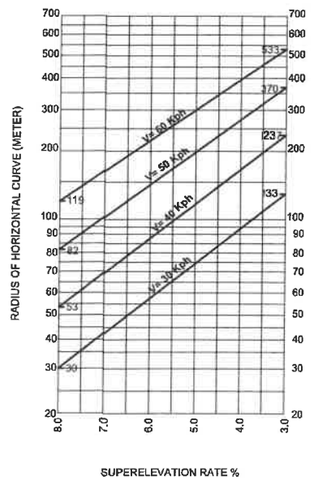
Y - VERTICAL OFFSET AT DISTANCE X - METERS

## NOTES:

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




SUPERELEVATION RUNOFF CHART




LEGEND:

F - FLAT

R - ROLLING

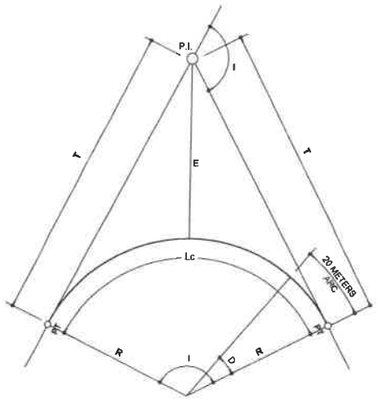
M - MOUNTAINOUS

V - DESIGN SPEED

Kph - KILOMETER PER HOUR

DESIGN SUPERELEVATION RATES

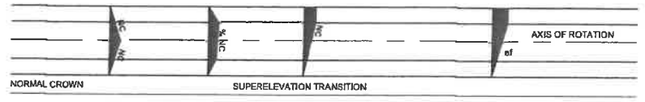
| | | | | | | | |
|---|---|---|---|---|---|---|---|
| Republic of the Philippines<br>DEPARTMENT OF PUBLIC WORKS AND HIGHWAYS<br>REGIONAL OFFICE No. VIII<br>NORTHERN SAMAR FIRST<br>DISTRICT ENGINEERING OFFICE<br>Catarman, Northern Samar | PROJECT NAME AND LOCATION:<br>CONCRETING OF BRGY. POLANGI TO BRGY. PATICUA FMR, BRGY. POLANGI AND BRGY. PATICUA, CATARMAN, NORTHERN SAMAR<br>Catarman, Northern Samar | SHEET CONTENTS:<br>GEOMETRIC STANDARD DESIGN FOR VERTICAL (PARABOLIC CURVE) AND SUPERELEVATION CHART | DRAFTED:<br>GIAN PAUL S. PELITO<br>ENGINEER II<br>DESIGNED:<br>JEFF F. PEÑOLA<br>ENGINEER II | REVIEWED:<br>MAR DIONALD N. EIMAN<br>ASST. CHIEF, PLANNING & DESIGN SECTION<br>DATE: | SUBMITTED:<br>ANDY S. EREÑO<br>CHIEF, PLANNING & DESIGN SECTION<br>DATE: | RECOMMENDED:<br>VIVIAN V. BIACO<br>ASSISTANT DISTRICT ENGINEER<br>DATE: | APPROVED:<br>ALVIN A. IGNACIO<br>DISTRICT ENGINEER<br>DATE: | SET NO.<br>R<br>04 06 | SHEET NO.<br>10<br>20 |

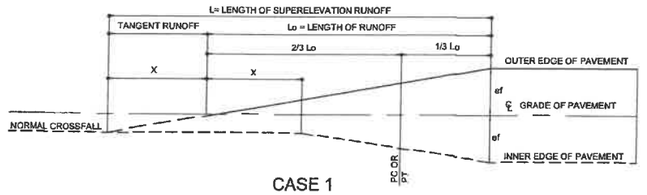



HORIZONTAL CURVE (CIRCULAR)

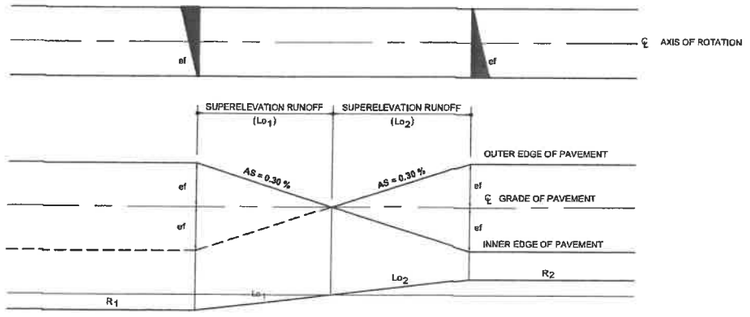
## LEGEND:

- 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
- Δ - LENGTH OF SUPERELEVATION RUNOFF
- ef - FULL SUPERELEVATION
- X - LENGTH BETWEEN SUPERELEVATION 0% & N.C. %
- S- SLOPE OF EDGE OF PAVEMENT IN % RELATIVE TO ℄
- Vd - DESIGN SPEED
- N.C. - NORMAL CROSSFALL



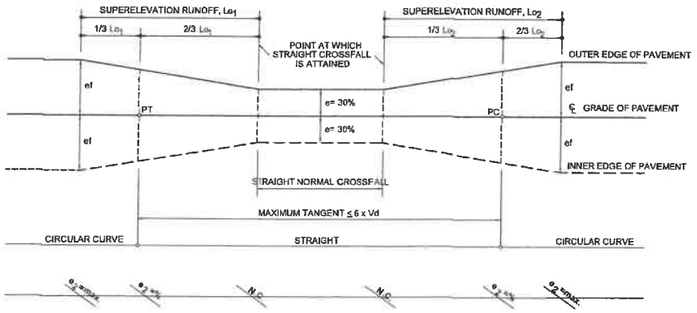




CASE 1
SUPERELEVATION TRANSITION

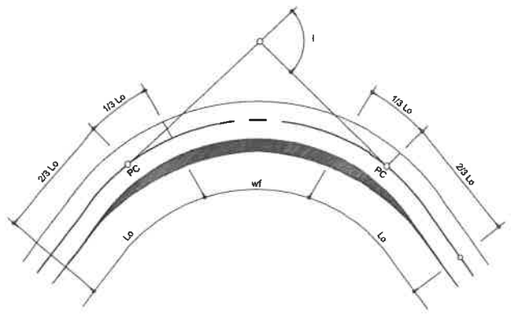



CASE 2
TRANSITION : CIRCULAR CURVE - REVERSED CIRCULAR






CASE 3
TRANSITION : CIRCULAR CURVE - STRAIGHT- CIRCULAR CURVE




METHOD OF WIDENING

## NOTES:

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

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

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

## WIDENING OF PAVEMENT ON CURVES

| DESIGN SPEED (Kph) | | 20 | 30 | 40 | 50 | 60 | 70 | 80 | 90 | 100 |
|---|---|---|---|---|---|---|---|---|---|---|
| D (degree) | R (m) | NORMAL PAVEMENT WIDTH = 6.10m | | | | | | | | |
| 0.5 | 2,291.83 | | | | 0.45 | 0.45 | 0.50 | 0.50 | 0.50 | 0.55 |
| 1.0 | 1,145.92 | | | | 0.50 | 0.55 | 0.55 | 0.60 | 0.70 | 0.70 |
| 1.5 | 763.94 | | | | 0.55 | 0.60 | 0.60 | 0.75 | 0.75 | 0.75 |
| 2.0 | 572.96 | | | | 0.60 | 0.75 | 0.75 | 0.75 | 0.90 | 0.90 |
| 2.5 | 458.37 | | | | 0.70 | 0.75 | 0.75 | 0.90 | 0.90 | 0.90 |
| 3.0 | 381.97 | | | | 0.70 | 0.75 | 0.90 | 0.90 | 0.90 | 1.05 |
| 3.5 | 327.41 | | | | 0.75 | 0.80 | 0.90 | 0.90 | 1.05 | 1.05 |
| 4.0 | 286.48 | | | | 0.80 | 0.90 | 0.90 | 1.05 | 1.05 | |
| 4.5 | 254.65 | | | | 0.80 | 0.90 | 1.05 | 1.05 | | |
| 5.0 | 229.18 | | | | 0.90 | 1.00 | 1.05 | 1.05 | | |
| 6.0 | 190.99 | | | | 0.90 | 1.05 | 1.05 | | | |
| 7.0 | 163.70 | | | | 1.05 | 1.05 | 1.20 | | | |
| 8.0 | 143.24 | | | 0.50 | 1.05 | 1.20 | | | | |
| 9.0 | 127.32 | | | 0.55 | 1.20 | 1.20 | | | | |
| 10.0 | 114.59 | | | 0.60 | 1.20 | 1.50 | | | | |
| 12.0 | 95.49 | | | 0.70 | 1.50 | 1.50 | | | | |
| 13.0 | 88.15 | | 0.50 | 0.80 | 1.50 | | | | | |
| 14.0 | 81.85 | | 0.60 | 1.00 | 1.50 | | | | | |
| 15.0 | 76.39 | | 0.65 | 1.05 | 1.50 | | | | | |
| 16.0 | 71.62 | | 0.70 | 1.10 | 1.50 | | | | | |
| 18.0 | 63.66 | | 0.80 | 1.20 | | | | | | |
| 19.0 | 60.31 | | 0.90 | 1.30 | | | | | | |
| 21.0 | 54.57 | | 1.00 | 1.40 | | | | | | |
| 23.0 | 49.82 | | 1.10 | 1.50 | | | | | | |
| 25.5 | 44.94 | 0.50 | 1.20 | | | | | | | |
| 28.5 | 40.21 | 0.60 | 1.30 | | | | | | | |
| 33.0 | 34.72 | 0.80 | 1.40 | | | | | | | |
| 38.0 | 30.16 | 1.00 | 1.50 | | | | | | | |
| 46.0 | 24.91 | 1.20 | | | | | | | | |
| 57.5 | 19.93 | 1.30 | | | | | | | | |
| 76.8 | 14.95 | 1.40 | | | | | | | | |
| 88.0 | 13.02 | 1.50 | | | | | | | | |

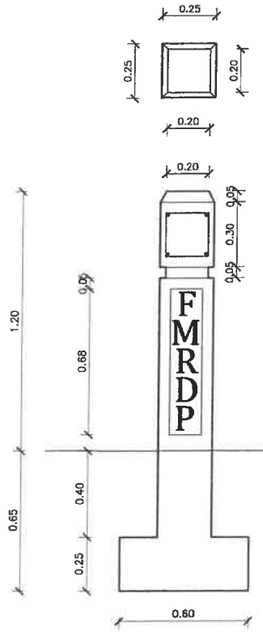
NOTE:
1. VALUES LESS THAN 0.50 m MAY BE DISREGARDED
2. FOR 3-LANE PAVEMENTS, MULTIPLY VALUES BY 1.5
3. FOR 4-LANE PAVEMENTS, MULTIPLY VALUES BY 2.0

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

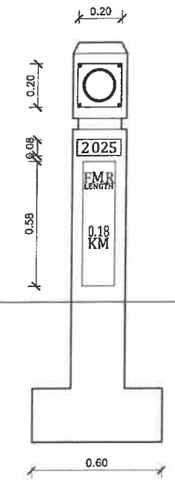
| PROJECT NAME AND LOCATION: | SHEET CONTENTS: | DRAFTED: | REVIEWED: | SUBMITTED: | RECOMMENDED: | APPROVED: | SET NO. | SHEET NO. |
|---|---|---|---|---|---|---|---|---|
| CONCRETING OF BRGY. POLANGI TO BRGY. PATICUA FMR, BRGY. POLANGI AND BRGY. PATICUA, CATARMAN, NORTHERN SAMAR<br>Catarman, Northern Samar | GEOMETRIC STANDARD DESIGN FOR HORIZONTAL (CIRCULAR CURVE) AND SUPERELEVATION WIDENING | GIAN PAUL O. PELITO<br>ENGINEER II<br>DESIGNED:<br>JEFF F. NEBROLA<br>ENGINEER II | MAR DIONALD N. EMAN<br>ASST. CHIEF, PLANNING & DESIGN SECTION<br>DATE: | ANDY S. EREÑO<br>CHIEF, PLANNING & DESIGN SECTION<br>DATE: | VIVIAN C. BIACO<br>ASSISTANT DISTRICT ENGINEER<br>DATE: | ALVIN A. IGNACIO<br>DISTRICT ENGINEER<br>DATE: | R<br>05 06 | 11<br>20 |

# FARM - TO - MARKET - ROAD MARKER

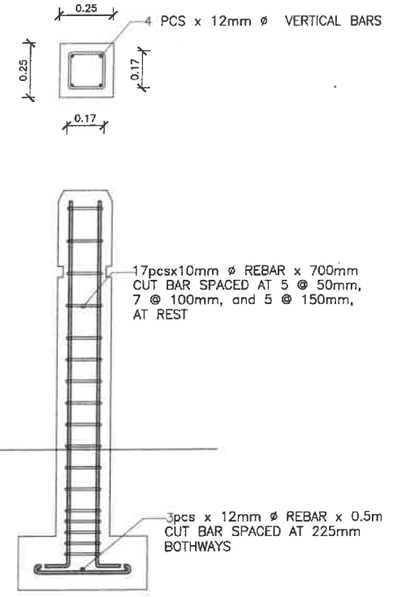
SCALE: 1:10 METERS



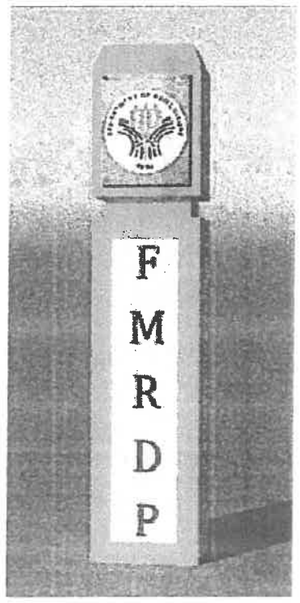

**FRONT VIEW ELEVATION**



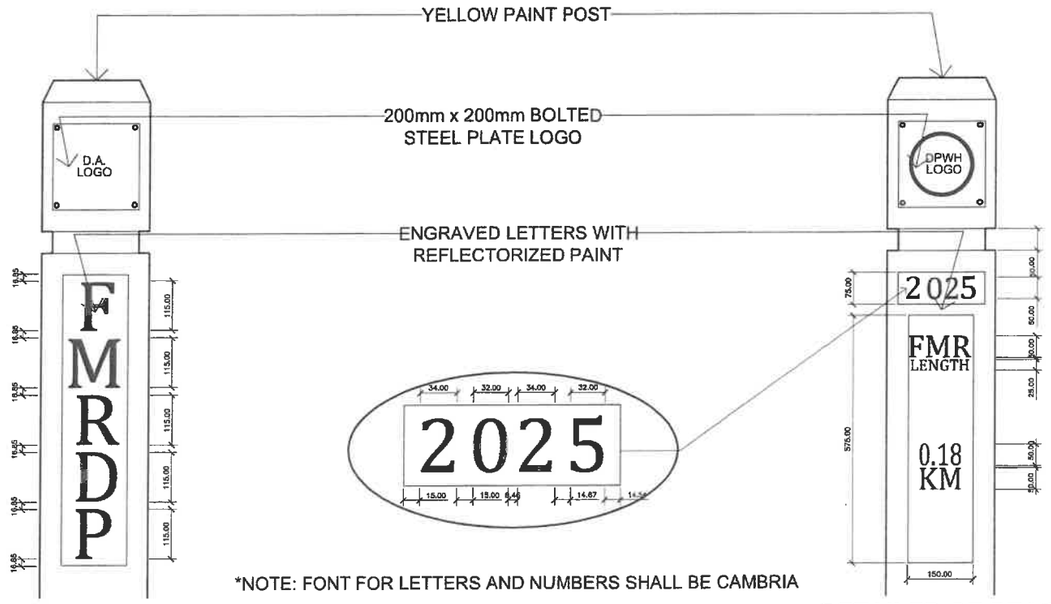

**REAR VIEW ELEVATION**




**SECTION DETAILS**



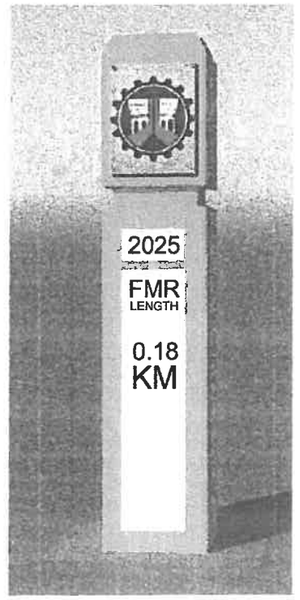

**SAMPLE PERSPECTIVE**




**DETAILED OF FRONT VIEW OF MARKER**

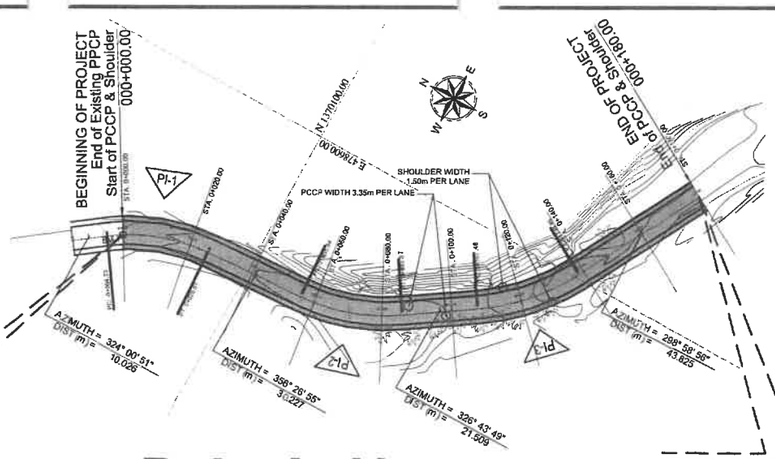
*NOTE: FONT FOR LETTERS AND NUMBERS SHALL BE CAMBRIA

**DETAILED OF REAR VIEW OF MARKER**




**SAMPLE PERSPECTIVE**

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Republic of the Philippines<br>**DEPARTMENT OF PUBLIC WORKS AND HIGHWAYS**<br>REGIONAL OFFICE No. VIII<br>NORTHERN SAMAR FIRST<br>DISTRICT ENGINEERING OFFICE<br>Catarman, Northern Samar | PROJECT NAME AND LOCATION:<br>**CONCRETING OF BRGY. POLANGI TO BRGY. PATICUA FMR, BRGY. POLANGI AND BRGY. PATICUA, CATARMAN, NORTHERN SAMAR**<br>Catarman, Northern Samar | SHEET CONTENTS:<br>FARM TO MARKET ROAD MARKER<br>FRONT STYLE DETAILS<br>ELEVATION VIEWS & SECTION DETAILS | DRAFTED:<br>**GIAN PAUL G. VELITO**<br>ENGINEER II<br>DESIGNED:<br>**JEFF R. PEDROLA**<br>ENGINEER II | REVIEWED:<br>**MAR DONALD N. EIMAN**<br>ASST. CHIEF, PLANNING & DESIGN SECTION<br>DATE: | SUBMITTED:<br>**ANDY S. BREÑO**<br>CHIEF, PLANNING & DESIGN SECTION<br>DATE: | RECOMMENDED:<br>**VIVIAN C. BIACO**<br>ASSISTANT DISTRICT ENGINEER<br>DATE: | APPROVED:<br>**ALVIN A. IGNACIO**<br>DISTRICT ENGINEER<br>DATE: | SET NO.<br>R<br>06 \| 06 | SHEET NO.<br>12<br>20 |




# PLAN

SCALE: 1:1250 METERS

BEG. OF PROJECT
STA. 000+000.00
NORTHING : 1370137.26 ELEV: 25.109
EASTING : 478548.34

END OF PROJECT
STA. 000+180.00
NORTHING : 1370061.14 ELEV: 24.346
EASTING : 478213.62

LEGENDS:

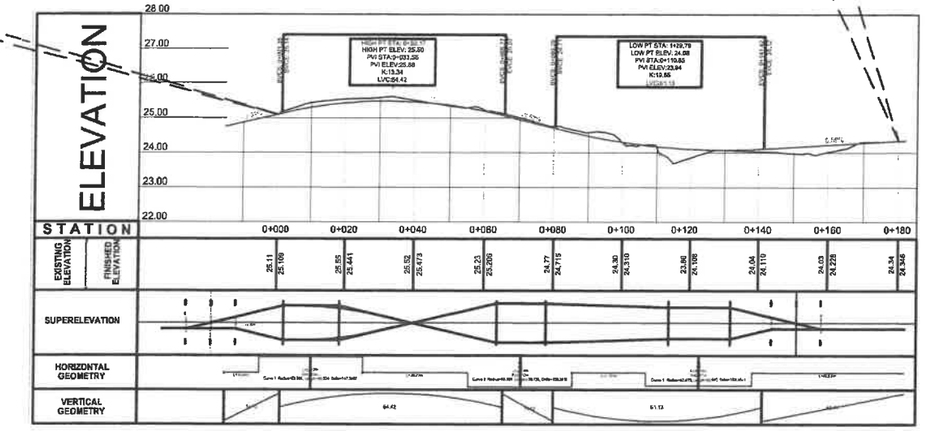
- PORTLAND CEMENT CONCRETE PAVEMENT
- CRUSHED AGGREGATE SURFACE COURCE
- CENTER LINE
- COCONUT TREE

**ALIGNMENT PROPERTIES**

| SEGMENT | STA | NORTHING | EASTING | T | R | I | D | LC | PC | PT | E | DIST | AZIMUTH (SOUTH) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| L1 | | | | | | | | | | | | 10.026 | 324° 00' 51" |
| C1 | 0+010.86 | 1370128.5873 | 478545.7361 | 15.586 | 53.586 | 32.4345 | 53.586 | 30.334 | -0+004.73 | 0+025.61 | 2.221 | | |
| L2 | | | | | | | | | | | | 30.227 | 356° 26' 55" |
| C2 | 0+071.25 | 1370067.4772 | 478557.7318 | 15.415 | 58.099 | 29.7185 | 58.099 | 30.135 | 0+055.84 | 0+085.97 | 2.010 | | |
| L3 | | | | | | | | | | | | 21.509 | 326° 43' 49" |
| C3 | 0+123.28 | 1370023.3937 | 478578.9425 | 15.801 | 63.975 | 27.7479 | 63.975 | 30.983 | 0+107.48 | 0+138.46 | 1.923 | | |
| L4 | | | | | | | | | | | | 43.825 | 298° 58' 56" |

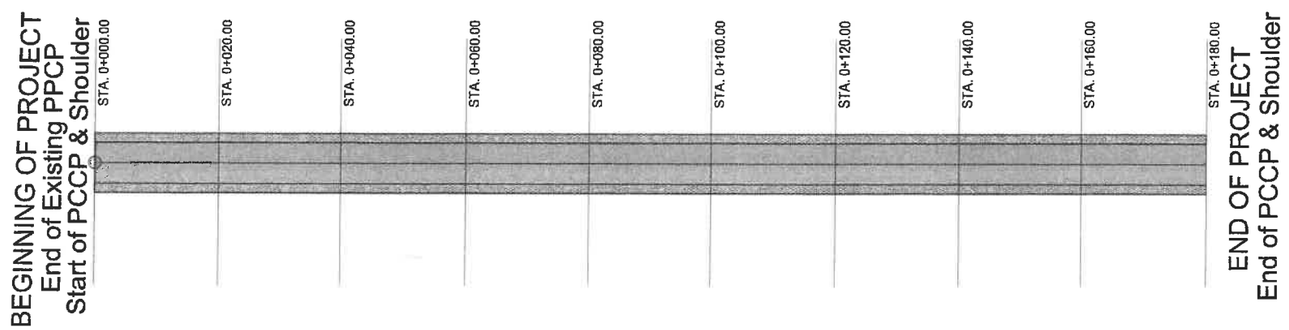
| BM No. | COORDINATES | | ELEVATION | REMARKS |
|---|---|---|---|---|
| | NORTHING | EASTING | | |
| 1 | 1370118.60 | 478555.22 | 25.11m | END OF EXISTING PATHWAY |

| DESIGN SPEED ( V ) kph | MAXIMUM SUPERELEVATION ( emax ) % |
|---|---|
| 30.00 | 6.00 |




# PROFILE

HOR. SCALE: 1:1250 METERS
VER. SCALE: 1:125 METERS




# STRAIGHT LINE DIAGRAM

SCALE: 1:1250 METERS

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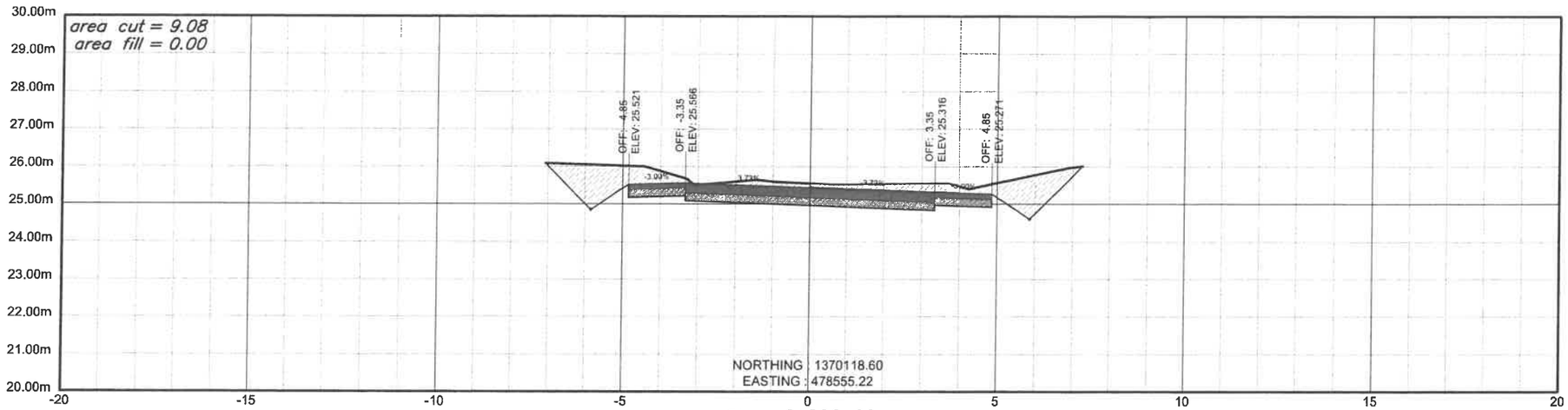
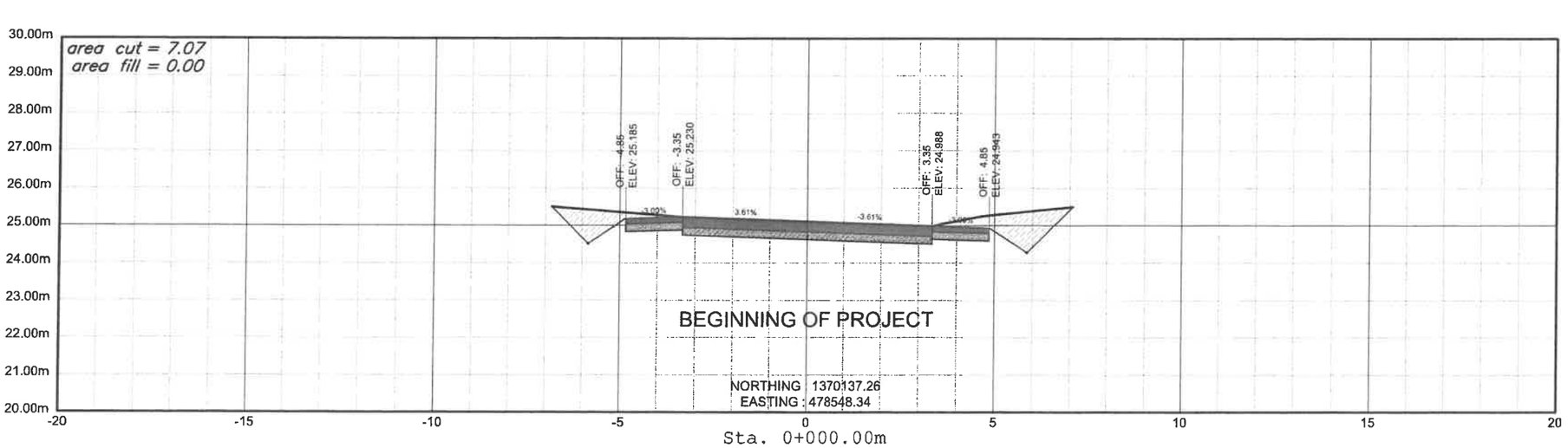
| CONCRETING OF BRGY. POLANGI TO BRGY. PATICUA FMR, BRGY. POLANGI AND BRGY. PATICUA, CATARMAN, NORTHERN SAMAR Catarman, Northern Samar | PLAN & PROFILE & STRAIGHT LINE DIAGRAM | GIAN PAUL G. PELITO ENGINEER II<br>DESIGNED: JEFF F. PEDROLA ENGINEER II | MAR DIONALD N. EIMAN ASST. CHIEF, PLANNING & DESIGN SECTION<br>DATE: | ANDY S. ERENO CHIEF, PLANNING & DESIGN SECTION<br>DATE: | VIVIAN A. BIACO ASSISTANT DISTRICT ENGINEER<br>DATE: | ALVIN A. IGNACIO DISTRICT ENGINEER<br>DATE: | PP 01 01 | 13 20 |




Sta. 0+020.00m
EG: 25.55
FG: 25.441




Sta. 0+000.00m
EG: 25.11
FG: 25.109

# DETAILED CROSS-SECTION

SCALE: 1:100m

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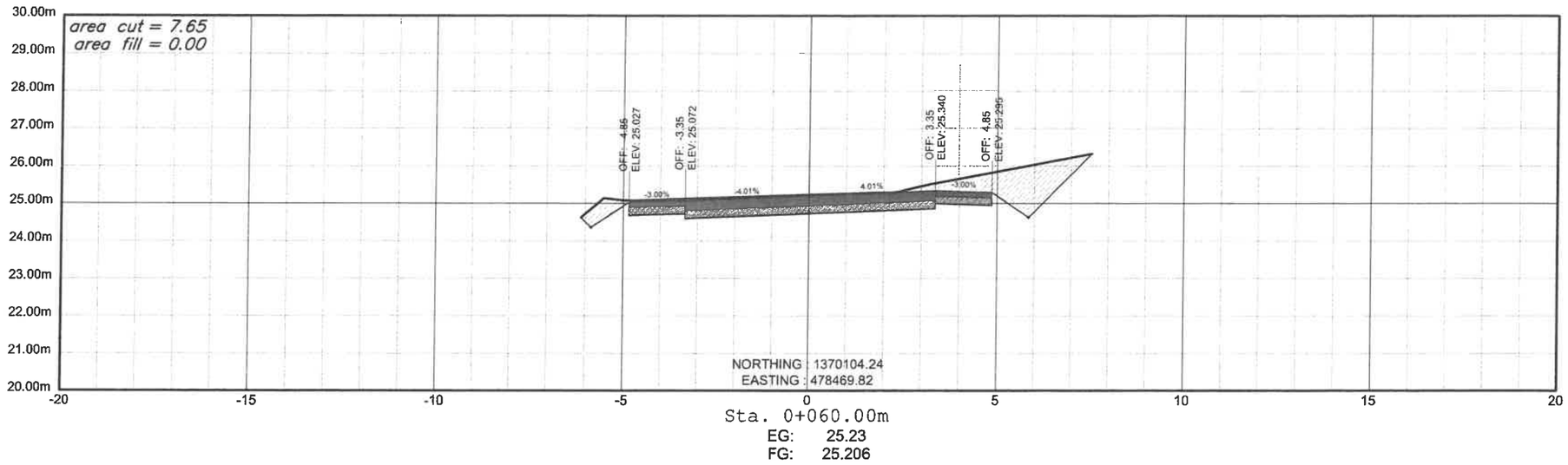
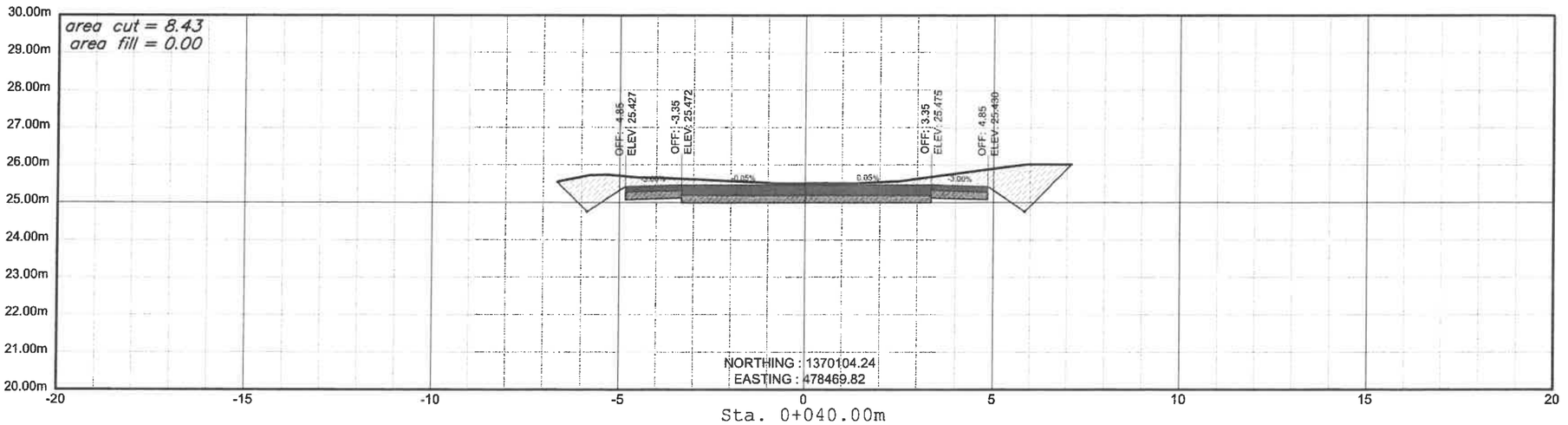
| CONCRETING OF BRGY. POLANGI TO BRGY. PATICUA FMR, BRGY. POLANGI AND BRGY. PATICUA, CATARMAN, NORTHERN SAMAR<br>Catarman, Northern Samar | CROSS SECTION | GIAN PAUL C. PELITO<br>ENGINEER II<br>DESIGNED:<br>JEFF F. LAGROLA<br>ENGINEER II | MAR DIONALD N. EIMAN<br>ASST. CHIEF, PLANNING & DESIGN SECTION<br>DATE: | ANDY S. EREÑO<br>CHIEF, PLANNING & DESIGN SECTION<br>DATE: | VIVIANO. BIACO<br>ASSISTANT DISTRICT ENGINEER<br>DATE: | ALVIN A. IGNACIO<br>DISTRICT ENGINEER<br>DATE: | CS<br>01 05 | 14<br>20 |




Sta. 0+060.00m
EG: 25.23
FG: 25.206




Sta. 0+040.00m
EG: 25.52
FG: 25.473

# DETAILED CROSS-SECTION

SCALE: 1:100m

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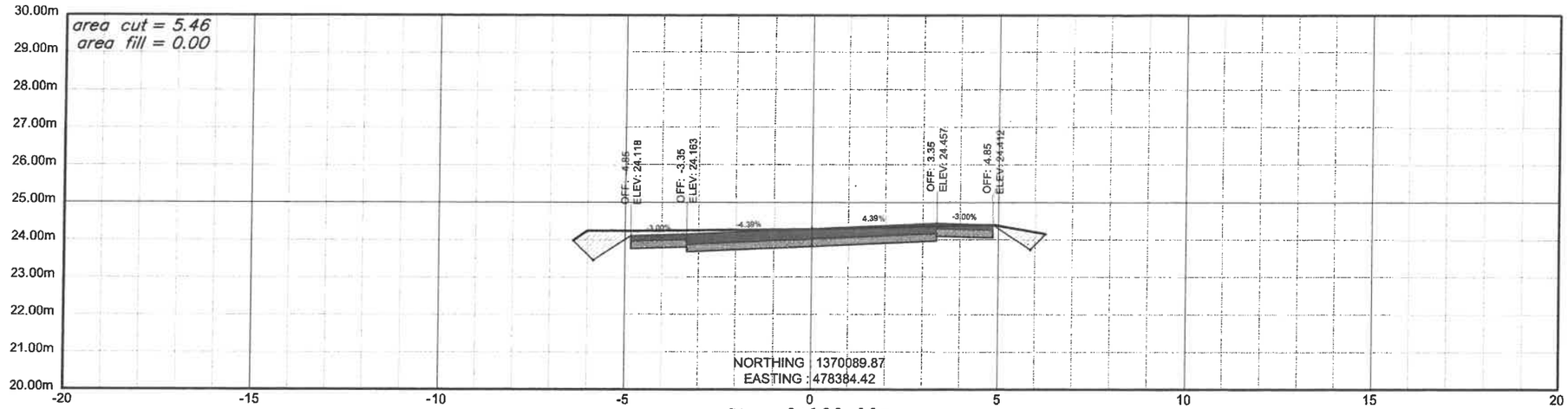
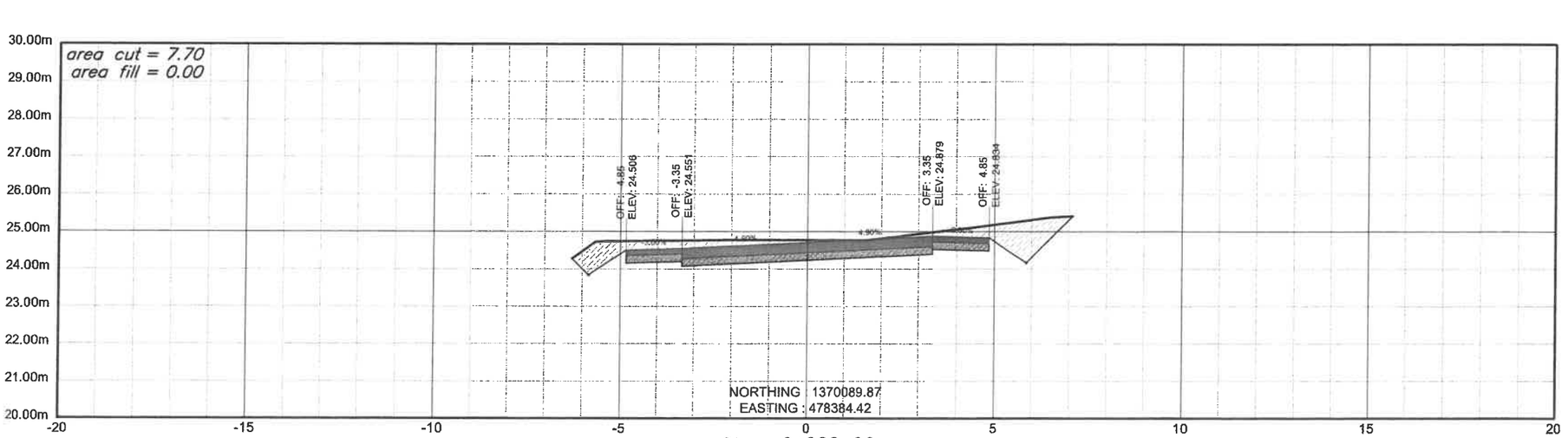
|---|---|---|---|---|---|---|---|---|
| CONCRETING OF BRGY. POLANGI TO BRGY. PATICUA FMR, BRGY. POLANGI AND BRGY. PATICUA, CATARMAN, NORTHERN SAMAR<br>Catarman, Northern Samar | CROSS SECTION | GIAN PAUL G. PELITO<br>ENGINEER II<br>DESIGNED:<br>JEFF F. PEDROLA<br>ENGINEER II | MAR DIONALD N. EIMAN<br>ASST. CHIEF, PLANNING & DESIGN SECTION<br>DATE: | ANDY S. EREÑO<br>CHIEF, PLANNING & DESIGN SECTION<br>DATE: | VIVIAN A. BIACO<br>ASSISTANT DISTRICT ENGINEER<br>DATE: | ALVIN A. IGNACIO<br>DISTRICT ENGINEER<br>DATE: | CS<br>02 05 | 15<br>20 |




Sta. 0+100.00m
EG: 24.30
FG: 24.310




Sta. 0+080.00m
EG: 24.77
FG: 24.715

# DETAILED CROSS-SECTION

SCALE: 1:100m

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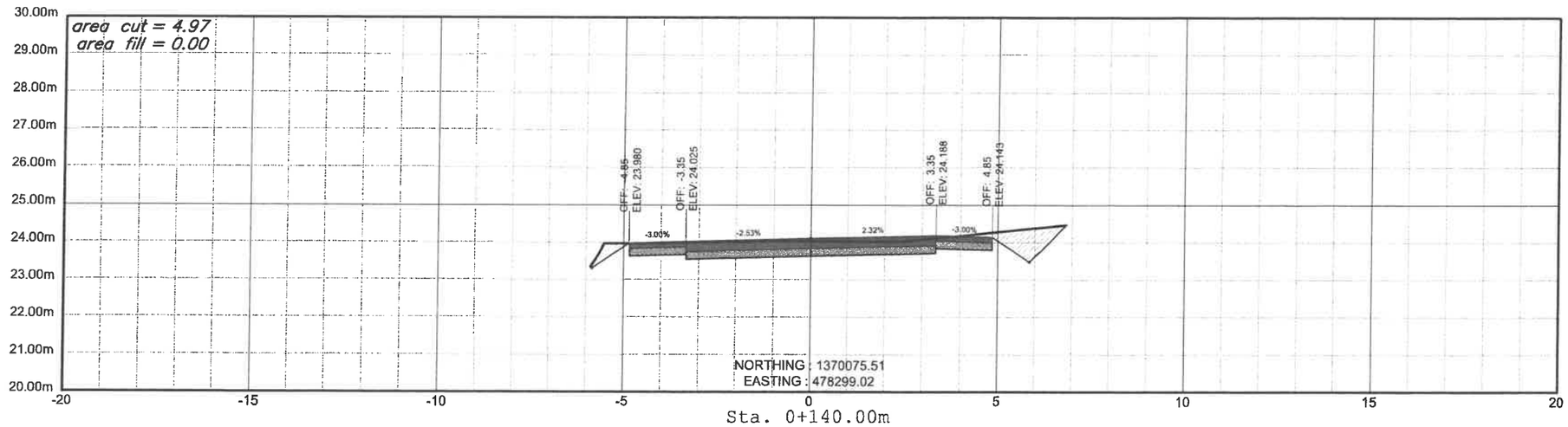
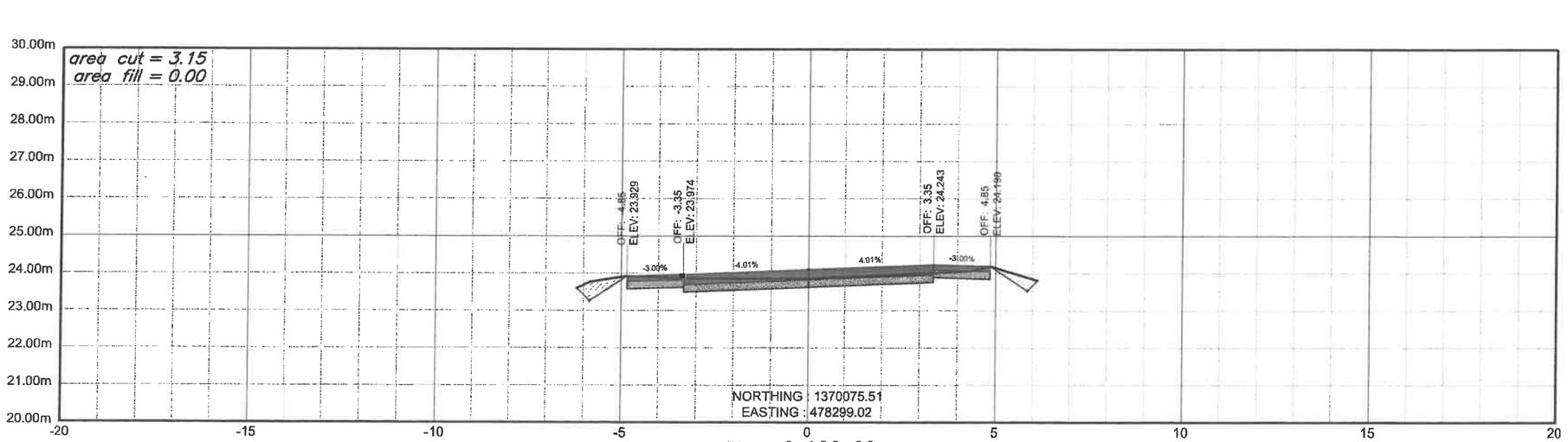
|---|---|---|---|---|---|---|---|---|
| CONCRETING OF BRGY. POLANGI TO BRGY. PATICUA FMR, BRGY. POLANGI AND BRGY. PATICUA, CATARMAN, NORTHERN SAMAR<br>Catarman, Northern Samar | CROSS SECTION | GIAN PAUL G. PELITO<br>ENGINEER<br>DESIGNED:<br>JEFF F. PEDROLA<br>ENGINEER III | MAR DIONALD N. EIMAN<br>ASST. CHIEF, PLANNING & DESIGN SECTION<br>DATE: | ANDY S. EREÑO<br>CHIEF, PLANNING & DESIGN SECTION<br>DATE: | VIVIANA I. BIACO<br>ASSISTANT DISTRICT ENGINEER<br>DATE: | ALVIN A. IGNACIO<br>DISTRICT ENGINEER<br>DATE: | CS 03 05 | 16 20 |




Sta. 0+140.00m
EG: 24.04
FG: 24.110




Sta. 0+120.00m
EG: 23.86
FG: 24.108

# DETAILED CROSS-SECTION

SCALE: 1:100m

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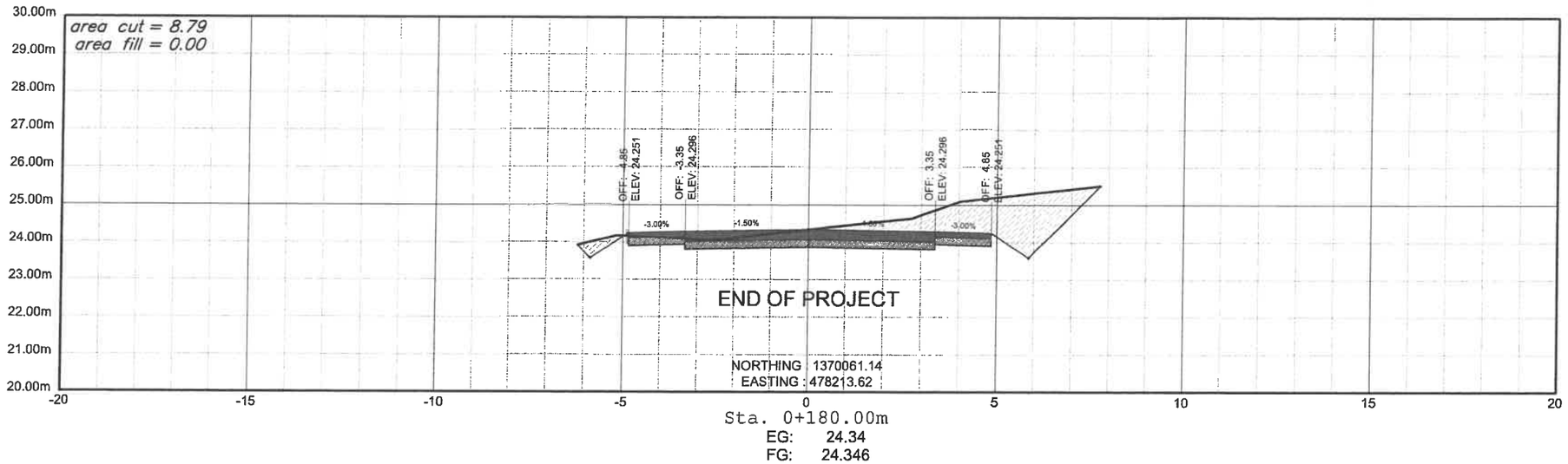
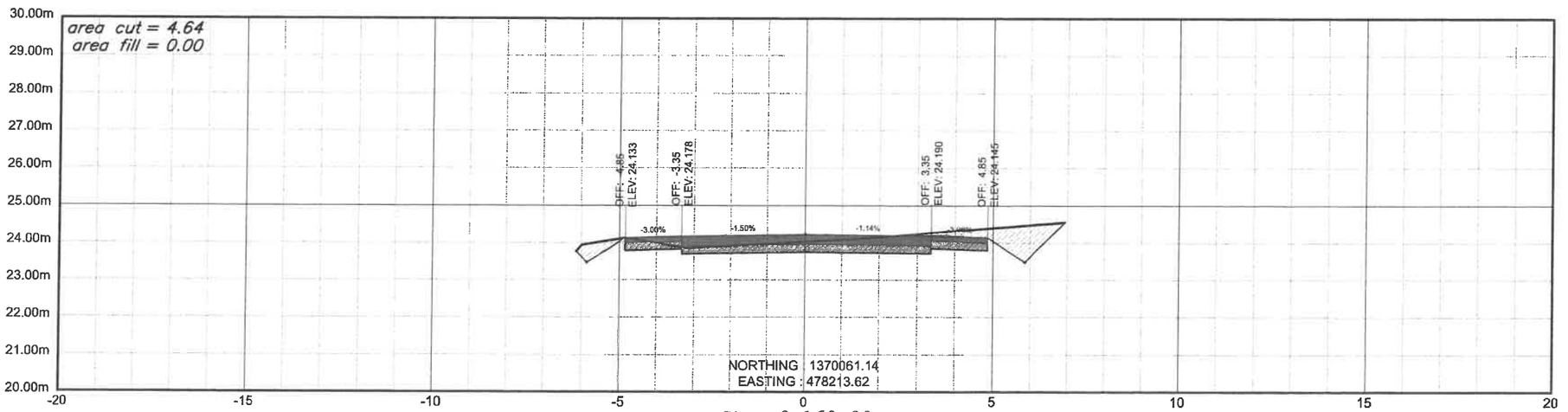
|---|---|---|---|---|---|---|---|---|
| CONCRETING OF BRGY. POLANGI TO BRGY. PATICUA FMR, BRGY. POLANGI AND BRGY. PATICUA, CATARMAN, NORTHERN SAMAR<br>Catarman, Northern Samar | CROSS SECTION | GIANT PAUL O. PELITO<br>ENGINEER II<br>DESIGNED:<br>JEFF F. PEDROLA<br>ENGINEER I | MAR DIONALD N. EIMAN<br>ASST. CHIEF, PLANNING & DESIGN SECTION<br>DATE: | ANDY S. EREÑO<br>CHIEF, PLANNING & DESIGN SECTION<br>DATE: | VIVIAN L. BIACO<br>ASSISTANT DISTRICT ENGINEER<br>DATE: | ALVIN A. IGNACIO<br>DISTRICT ENGINEER<br>DATE: | CS<br>04 05 | 17<br>20 |




Sta. 0+180.00m
EG: 24.34
FG: 24.346




Sta. 0+160.00m
EG: 24.03
FG: 24.228

# DETAILED CROSS-SECTION

SCALE: 1:100m

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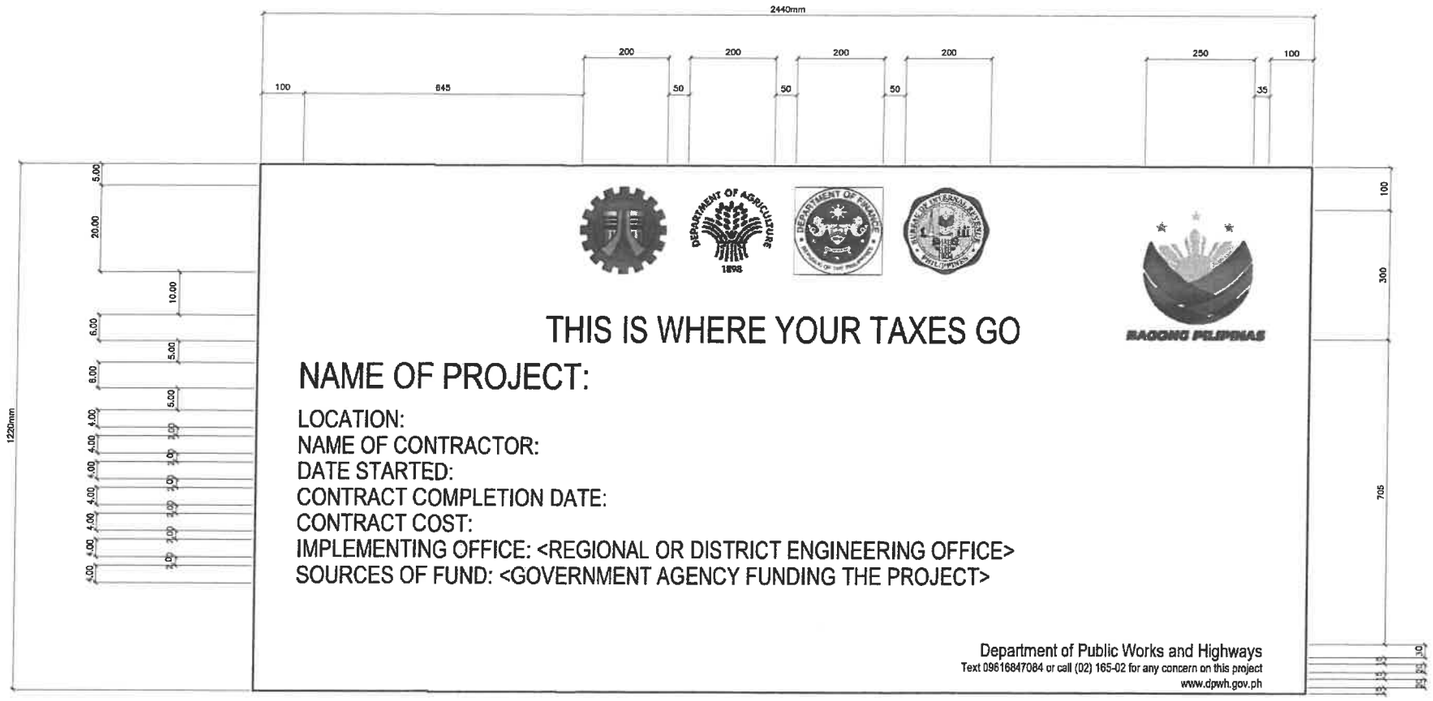
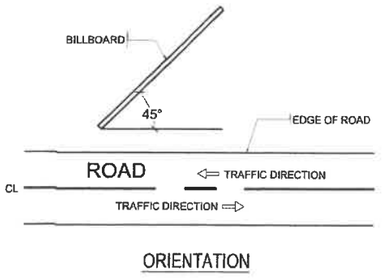
| PROJECT NAME AND LOCATION: | SHEET CONTENTS: | DRAFTED: | REVIEWED: | SUBMITTED: | RECOMMENDED: | APPROVED: | SET NO. | SHEET NO. |
|---|---|---|---|---|---|---|---|---|
| CONCRETING OF BRGY. POLANGI TO BRGY. PATICUA FMR, BRGY. POLANGI AND BRGY. PATICUA, CATARMAN, NORTHERN SAMAR<br>Catarman, Northern Samar | CROSS SECTION | GIAN PAUL G. PELITO<br>ENGINEER II<br>DESIGNED:<br>JEFFY V. PEDROLA<br>ENGINEER II | MAR DIONALD N. EIMAN<br>ASST. CHIEF, PLANNING & DESIGN SECTION<br>DATE: | ANDY S. BREÑO<br>CHIEF, PLANNING & DESIGN SECTION<br>DATE: | VIVIAN O. BIACO<br>ASSISTANT DISTRICT ENGINEER<br>DATE: | ALVIN A. IGNACIO<br>DISTRICT ENGINEER<br>DATE: | CS<br>05 05 | 18<br>20 |

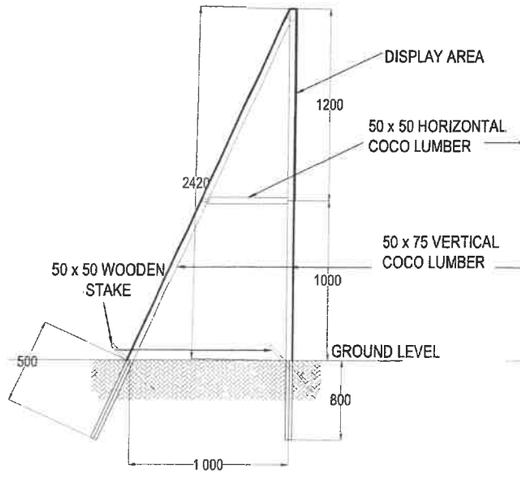



# DPWH STANDARD PROJECT BILLBOARD

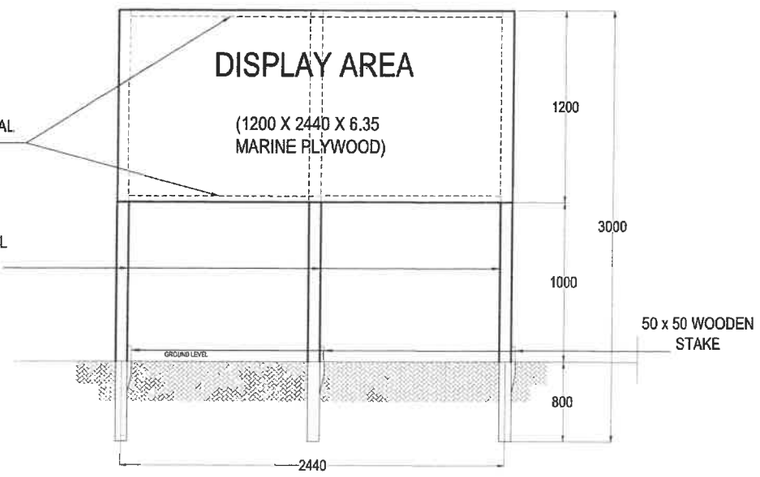
NOT TO SCALE




ORIENTATION




TYPICAL FRAME
ELEVATION




FRONT ELEVATION
(OPTION 1)

# BILLBOARD FRAME

NOT TO SCALE, ALL DIMENSIONS ARE IN MILLIMETERS

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Republic of the Philippines<br>**DEPARTMENT OF PUBLIC WORKS AND HIGHWAYS**<br>REGIONAL OFFICE No. VIII<br>NORTHERN SAMAR FIRST<br>DISTRICT ENGINEERING OFFICE<br>Catarman, Northern Samar | PROJECT NAME AND LOCATION:<br>CONCRETING OF BRGY. POLANGI TO BRGY. PATICUA FMR, BRGY. POLANGI AND BRGY. PATICUA, CATARMAN, NORTHERN SAMAR<br>Catarman, Northern Samar | SHEET CONTENTS:<br>PROJECT BILLBOARD DETAILS | DRAFTED:<br>**GIAN PAUL G. PELITO**<br>ENGINEER II<br>DESIGNED:<br>**JEFF F. PEDROLA**<br>ENGINEER II | REVIEWED:<br>**MAR DIONALD N. EIMAN**<br>ASST. CHIEF, PLANNING & DESIGN SECTION<br>DATE: | SUBMITTED:<br>**ANDY S. EREÑO**<br>CHIEF, PLANNING & DESIGN SECTION<br>DATE: | RECOMMENDED:<br>**VIVIAN G. BIACO**<br>ASSISTANT DISTRICT ENGINEER<br>DATE: | APPROVED:<br>**ALVIN A. IGNACIO**<br>DISTRICT ENGINEER<br>DATE: | SET NO.<br>PBB<br>01 02 | SHEET NO.<br>19<br>20 |