



REPUBLIC OF THE PHILIPPINES
DEPARTMENT OF PUBLIC WORKS AND HIGHWAYS
REGIONAL OFFICE NO. XI
GOV. CHAVEZ ST., DAVAO CITY

C.Y. 2025 PROJECT
DETAILED ENGINEERING DESIGN PLAN FOR

**ROAD WIDENING - MAHARLIKA HIGHWAY - (S01364MN) K1478
+ 721 - K1478 + 867, (S00064MN) K1479 + 145 - K1479 + 291,
DAVAO DEL NORTE**

SECTION	:	BRGY. STO. NIÑO - BRGY. PANDAN
LOCATION	:	PANABO CITY, DAVAO DEL NORTE
STATION LIMITS (AS PER RBIA)	:	SECTION 1: K1478 + 721 - K1478 + 867 SECTION 2: K1479 + 145 - K1479 + 291
STATION LIMITS (AS PER PLAN)	:	SECTION 1: STA. 1478 + 707.521 - STA. 1478 + 852.864 (W/ EQUATION) SECTION 2: STA. 1478 + 852.864 - STA. 1478 + 707.521 (W/ EQUATION)
NET LENGTH	:	0.290 KM.
ROAD WIDENING	:	0.290 KM. (0.580 LANE KM.)
CONSTRUCTION OF DRAINAGE STRUCTURE ALONG ROAD	:	290.000 LN. M
OFF-CARRIAGEWAY IMPROVEMENT	:	0.290 KM. (2,900 SQ. M)
NO. OF TRAFFIC SIGNAL	:	1.00
ROAD SECTION ID	:	S00064MN, S01364MN

SUBMITTED :


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DATE:

APPROVED :


JUBY B. CORDON
REGIONAL DIRECTOR

DATE:

A. GENERAL INFORMATION AND DETAILS

PROJECT LIMITS

AS PER PLAN:

SECTION 1 : STA. 1478 + 707.521 - STA. 1478 + 852.864
SECTION 2 : STA. 1478 + 852.864 - STA. 1478 + 707.521

STATION EQUATIONS:

STA. 1478 + 719.657 BK = (0.343)
STA. 1478 + 720.000 AH

TOTAL EQUATION = (0.343)

SECTION 1:

STA. 1478 + 707.521 - STA. 1478 + 852.864 = 145.000 LN. M (W/ EQUATION)

SECTION 2:

STA. 1478 + 852.864 - STA. 1478 + 707.521 = 145.000 LN. M (W/ EQUATION)

NET LENGTH = 290.000 LN. M (W/ EQUATION)

AS PER RBIA:

ROAD ID: S01364MN

SECTION 1:

K1478 + 721 - K1478 + 857 = 145.000 LN. M

ROAD ID: S00064MN

SECTION 2:

K1479 + 145 - K1479 + 291 = 145.000 LN. M

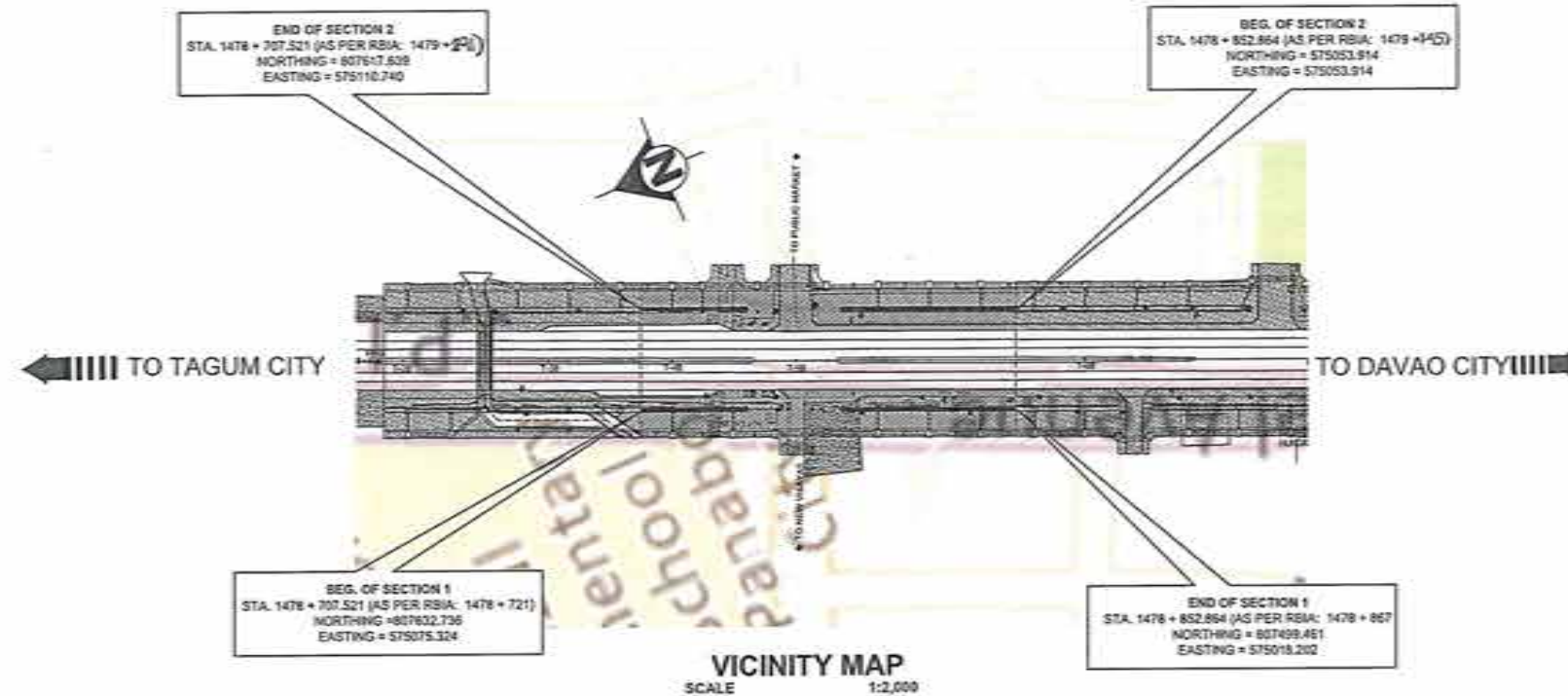
NET LENGTH = 290.000 LN. M

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LOCATION PLAN
NOT TO SCALE



VICINITY MAP
SCALE 1:2,000



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REGIONAL OFFICE NO. XI
GOV. CHAVEZ COR. R. MAGSAYSAY AVENUE, DAVAO CITY

PROJECT NAME AND LOCATION:
ROAD WIDENING - MAHARLAKA HIGHWAY - (S01364MN) K1478 + 721 - K1478 + 857, (S00064MN) K1479 + 291 - K1479 + 345, DAVAO DEL NORTE

SHEET CONTENTS:
PROJECT LIMIT
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VICINITY MAP
LOCATION PLAN

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DATE:

SET NO. A
SHEET NO. 01/50

GENERAL NOTES (ROAD, DRAINAGE AND STRUCTURES)

FACILITIES FOR ENGINEER

1. THE CONTRACTOR SHALL CONSTRUCT FIELD OFFICES, LABORATORIES AND LIVING QUARTERS, INCLUDING ALL THE NECESSARY AIR CONDITIONING, ELECTRICITY, WATER, DRAINAGE AND SECURITY SERVICES FOR THE USE OF THE ENGINEER AND HIS STAFF FOR 24 HOURS A DAY OR PROVIDE THE SAME ON A RENTAL BASIS UNTIL END OF CONTRACT. ON COMPLETION OF THE CONTRACT, THE FACILITIES INCLUDING UTILITIES SHALL REVERT TO THE GOVERNMENT UNLESS OTHERWISE SPECIFIED IN THE CONTRACT DOCUMENTS.
2. THE CONTRACTOR SHALL AT ALL TIMES DURING THE DURATION OF THE CONTRACT PROVIDE FOR THE USE OF THE ENGINEER ALL EQUIPMENT, INSTRUMENTS AND APPARATUS, ALL INFORMATION AND RECORDS. THE CONTRACTOR SHALL PROVIDE QUALIFIED AND EXPERIENCED OFFICE, SURVEY AND LABORATORY STAFF/PERSONNEL FOR THE ASSISTANCE OF THE ENGINEER.

OTHER GENERAL REQUIREMENTS

1. THE CONTRACTOR SHALL PROVIDE AND MAINTAIN OFFICES, SHOPS, STORES, AND WORKMENS ACCOMMODATION AS ARE NECESSARY. A MEDICAL ROOM TOGETHER WITH ALL NECESSARY SUPPLIES SHALL ALSO BE PROVIDED AND MAINTAINED AND A TRAINED MEDICAL AIDE SHALL BE EMPLOYED SOLELY ON MEDICAL DUTIES.
2. TWO (2) PROJECT BILLBOARDS SHALL BE INSTALLED, ONE AT THE BEGINNING AND ONE AT THE END OF THE PROJECT. FOR ROAD PROJECTS WITH LENGTH OF 10 KILOMETERS OR MORE, ADDITIONAL BILLBOARD SHALL BE INSTALLED EVERY 5-KILOMETER INTERVAL.
3. BASIC PERSONAL PROTECTIVE EQUIPMENT (PPE) FOR ALL CONSTRUCTION WORKERS SHALL BE PROVIDED AND OTHER REQUIRED SPECIALTY PPE AS PER DOLE DO 13, S. 1998, SAFETY PERSONNEL AND EMERGENCY OCCUPATIONAL HEALTH PERSONNEL AND FACILITIES ARE REQUIRED DEPENDING ON THE NUMBER OF WORKERS.
4. TRAFFIC MANAGEMENT LAYOUTS PROVIDED IN THE PLAN MAY NOT NECESSARILY BE SIMILAR ON SITE. ADJUSTMENTS MAY BE MADE TO PROVIDE THE NECESSARY TRAFFIC CONTROL DEVICES TO BE INSTALLED ON SITE. A TRAFFIC CONTROLLER MUST ALSO BE PROVIDED ESPECIALLY WHEN CLOSING A CERTAIN LANE OF THE ROAD HINDERS THE CONTINUOUS TRAFFIC FLOW FOR A TWO-WAY TRAFFIC.
5. ADEQUATE BARRICADES AND TRAFFIC WARNING SIGNS SHALL BE INSTALLED AND WORKING AREA SHALL BE ADEQUATELY ILLUMINATED AT NIGHT TO WARN MOTORISTS OF ONGOING CONSTRUCTION. FLAGMEN SHALL BE PROVIDED AT EACH END OF THE CLOSED SECTION TO DIRECT COUNTER FLOW TRAFFIC.
6. THE AS-STAKED PLAN SHALL BE PREPARED BY THE CONTRACTOR BASED ON THE PRE-CONSTRUCTION SURVEY JOINTLY CONDUCTED BY THE CONTRACTOR AND IMPLEMENTING OFFICE (CONSTRUCTION AND PLANNING AND DESIGN DIVISIONS).
7. ALL SURVEY, STAKING, RECORDING OF DATA, AND CALCULATIONS NECESSARY TO CONSTRUCT THE PROJECT FROM THE INITIAL LAYOUT TO FINAL COMPLETION SHALL BE PERFORMED. WORK SHALL BE STARTED AFTER STAKING FOR THE AFFECTED WORK IS ACCEPTED.
8. ANY EXISTING ROAD WHILE UNDERGOING IMPROVEMENT SHALL BE KEPT OPEN TO TRAFFIC CONTINUOUSLY IN SATISFACTORY CONDITION AND TRAFFIC SHALL BE ACCOMMODATED DURING THE ENTIRE CONTRACT PERIOD. CONSTRUCTING AND MAINTAINING DETOURS SHALL BE DONE AS LOCATED BY THE ENGINEER.
9. QUARRY SITE FOR ITEM 200 AND 300 IS LOCATED AT MASUKHY QUARRY. DISPOSAL SITE IS TWELVE KILOMETERS (12.00 KM) WITHIN PROJECT LIMIT.

EARTHWORK

1. CLEARING SHALL EXTEND ONE (1) METER BEYOND THE TOE OF THE FILL SLOPES OR BEYOND ROUNDING OF CUT SLOPES FOR THE ENTIRE LENGTH OF THE PROJECT PROVIDED THAT IT IS WITHIN THE RIGHT-OF-WAY LIMITS OF THE PROJECT.
2. ALL CONCRETE PAVEMENT, BASE COURSE, SIDEWALKS, CURBS, GUTTERS, ETC. DESIGNATED FOR REMOVAL, SHALL BE BROKEN INTO PIECES, THE SIZE OF WHICH SHALL NOT EXCEED 300MM IN ANY DIMENSION AND STOCKPILED AT DESIGNATED LOCATIONS ON THE PROJECT FOR USE BY THE GOVERNMENT OTHERWISE DEMOLISHED AND DISPOSED OF AS DIRECTED BY THE ENGINEER.
3. EXCAVATION OPERATIONS SHALL BE CONDUCTED SO THAT MATERIAL OUTSIDE OF THE LIMITS OF SLOPES WILL NOT BE DISTURBED.
4. ROADWAY EMBANKMENT OF EARTH MATERIALS SHALL BE PLACED IN HORIZONTAL LAYERS NOT EXCEEDING 200MM. LOOSE MEASUREMENT, AND SHALL BE COMPACTED AS SPECIFIED BEFORE THE NEXT LAYER IS PLACED. AS COMPACTION OF EACH LAYER PROGRESSES, CONTINUOUS LEVELING AND MANIPULATING WILL BE REQUIRED TO ASSURE UNIFORM DENSITY.
5. PRIOR TO FINAL ACCEPTANCE, THE INSPECTOR SHALL VISUALLY INSPECT THE ENTIRE SECTION OF THE COMPACTED EMBANKMENT. IF FOUND NOT UNIFORM OR THE TEST VALUES MAY NOT BE REPRESENTATIVE OF THE ENTIRE SECTION, ADDITIONAL TESTS MAY BE PERFORMED AND DEFICIENCIES SHALL BE CORRECTED BY THE CONTRACTOR.
6. ADEQUATE DUST CONTROL MUST BE MAINTAINED BY THE CONTRACTOR AT ALL TIMES DURING EARTHMOVING OPERATIONS THROUGH THE USE OF WATER.
7. THE CONTRACTOR SHALL NOT PLACE STOCKPILES AT LOCATIONS WHERE THEY ARE SUBJECT TO EROSION. THE CONTRACTOR SHALL MAINTAIN EROSION AND DRAINAGE CONTROL NEAR ALL STOCKPILES AND SHALL ENSURE THAT SURFACE DRAINAGE DOES NOT ADVERSELY AFFECT ADJACENT LANDS, WATERCOURSES OR FUTURE RECLAMATION SITES.
8. STOCKPILES SHALL NOT BE SITUATED AT LOCATIONS THAT WILL INTERFERE OR CAUSE DAMAGE TO UTILITIES. IT SHALL NOT BE SITUATED WITHIN 30M OF A WATERCOURSE OR PERMANENT STRUCTURE OR WITHIN 4M OF ADJACENT PROPERTY BOUNDARY UNLESS OTHERWISE PERMITTED IN WRITING BY THE PROPERTY OWNER.
9. FINISHED SURFACES IN ALL CASES SHALL CONFORM WITH LINES, GRADES, DIMENSIONS AND ADJUSTMENTS SHOWN ON THE APPROVED PLANS, EXCEPT AS MODIFIED BY WRITTEN ORDERS.
10. CUT SLOPES, EXCEPT IN ROCKS AND FILL SLOPES SHALL BE ADJUSTED AND WARPED FLOW INTO EACH OTHER OR INTO NATURAL GROUND SURFACE WITHOUT NOTICEABLE BREAK.

SUB-BASE AND BASE COURSE

1. FOR SUBBASE MATERIALS, WHERE THE REQUIRED THICKNESS IS 200MM OR LESS, THE MATERIAL SHALL BE SPREAD AND COMPACTED IN ONE (1) LAYER USING A VIBRATORY ROLLER EQUIPMENT. WHERE THE REQUIRED THICKNESS IS MORE THAN 200MM, 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 200MM.

SURFACE COURSES

1. WHEN RAIN APPEARS IMMINENT, ALL PAVING OPERATIONS SHALL STOP.
2. AT TRANSVERSE CONSTRUCTION JOINTS, HOLES OF 250MM DIAMETER AND SPACED AT 300MM SHALL BE DRILLED AT ONE-HALF (1/2) OF THE EXISTING CONCRETE PAVEMENT THICKNESS SO AS TO PERMIT THE LOAD TRANSFER DEVICE (30MM DIAMETER PLAIN DOWEL BARS) TO BE INSERTED AT ONE-HALF (1/2) OF ITS LENGTH. THE DEVICE SHALL BE INSTALLED FIRMLY AT THE HOLES AND SHALL BE HELD IN POSITION PARALLEL TO THE SURFACE OF THE SLAB. THE DOWEL BARS SHALL BE PAINTED WITH RED LEAD AND THE SURFACE OF ONE-HALF (1/2) OF THE LENGTH TO BE INSERTED SHALL BE COATED WITH CONCRETE EPOXY WHILE THE OTHER HALF SHALL BE COATED WITH APPROVED BITUMINOUS MATERIALS.
3. IN ORDER THAT THE CONCRETE MAY BE PROPERLY PROTECTED AGAINST THE EFFECTS OF RAIN BEFORE THE CONCRETE IS SUFFICIENTLY HARDENED, THE CONTRACTOR WILL BE REQUIRED TO PROTECT THE EDGES AND SURFACE OF THE UNHARDENED CONCRETE.

4. BEFORE OPENING TO TRAFFIC, THE PAVEMENT SHALL BE CLEANED AND JOINT SEALING COMPLETED.
5. ANY DAMAGE TO THE PAVEMENT, OCCURRING PRIOR TO FINAL ACCEPTANCE, SHALL BE REPAIRED OR THE PAVEMENT BE REPLACED.
6. NO ACCEPTANCE AND FINAL PAYMENT SHALL BE MADE ON COMPLETED PAVEMENT UNLESS CORE TEST FOR THICKNESS DETERMINATION IS CONDUCTED.
7. PURSUANT TO DEPARTMENT ORDER NO. 137, SERIES OF 2016, FOR NEWLY CONSTRUCTED CONCRETE AND ASPHALT ROAD PROJECTS, AN IRI VALUE OF NOT MORE THAN 3.00MM IS PRESCRIBED. NON-COMPLIANCE WITH THE SAID DO SHALL BE SUBJECT TO PAY ADJUSTMENTS CORRESPONDING TO THE ACQUIRED IRI VALUE. COMPLIANCE OF THE CONTRACTORS TO THE IRI REQUIREMENT AND STRICT IMPLEMENTATION OF PROPER BASE AND SUBBASE PREPARATION IS EMPHASIZED PRIOR TO CONCRETE POURING. PREPARATORY WORKS IN EXISTING SURFACES/ROADBED PRIOR TO ASPHALT LAYING AND PAVING AND FINISHING FOR CONCRETE PAVEMENT.

REMOVAL OF EXISTING STRUCTURES AND OBSTRUCTIONS

1. NO PAYMENT SHALL BE MADE FOR REMOVAL OF OTHER MISCELLANEOUS STRUCTURES THAT MAY BE REQUIRED AS SUBSIDIARY WORK PERTAINING TO OTHER CONTRACT ITEMS EXCEPT FOR SPECIFIC ITEMS EXPRESSLY IDENTIFIED FOR PAYMENT.
2. IMPROVEMENTS AND OTHER SIMILAR STRUCTURES THAT WILL BE PAID FOR UNDER THE ROAD RIGHT-OF-WAY IMPROVEMENT.

MISCELLANEOUS STRUCTURES

1. OBSTRUCTIONS WITHIN THE ROADWAY, IF NOT ILLUMINATED, SHALL BE MARKED WITH REFLECTORIZED HAZARD MARKERS (REFER TO SECTION 7 OF THE HIGHWAY SAFETY DESIGN STANDARDS PART 2 MAY 2012 EDITION). FOR ADDITIONAL EMPHASIS, IT IS ADVISABLE TO MARK OBSTRUCTIONS WITH NO LESS THAN FIVE ALTERNATING REFLECTORIZED BLACK AND WHITE STRIPES.
2. GUARDRAIL POSTS SHALL BE SET VERTICALLY IN THE POSITION SHOWN IN THE PLANS AND SHALL REMAIN UNDISTURBED FOR A MINIMUM OF 48 HOURS.
3. RAIL ELEMENTS SHALL BE ERECTED IN A MANNER RESULTING IN A SMOOTH CONTINUOUS INSTALLATION. ALL BOLTS, EXCEPT ADJUSTMENT BOLTS, SHALL BE DRAM TIGHT.
4. PAVEMENT MARKINGS SHALL NOT BE APPLIED DURING RAIN OR WET WEATHER OR WHEN THE AIR IS MISTY. PAINT SHALL NOT BE APPLIED UPON DAMP PAVEMENT SURFACES, OR UPON PAVEMENT WHICH HAS ABSORBED HEAT SUFFICIENT TO CAUSE THE PAINT TO BLISTER AND PRODUCE A POROUS FILM OF PAINT.
5. PAVEMENT MARKINGS THAT FAIL TO HAVE A UNIFORM SATISFACTORY APPEARANCE EITHER BY DAY OR NIGHT, SHALL BE CORRECTED BY THE CONTRACTOR AT NO COST TO THE GOVERNMENT.
6. TRAFFIC PAINT OF LANE MARKERS AND TRAFFIC STRIPS SHALL BE APPLIED TO THE PAVEMENT AT THE RATE OF 0.33 L/SQ.M. AND SHALL DRY SUFFICIENTLY TO BE FREE FROM CRACKING IN FROM 15 TO 30 MINUTES. THE AMOUNT OF GLASS BEADS TO BE MIXED WITH THE PAINT SHALL BE 500 GRAMS PER LITER OF PAINT.
7. JOINT SEALANT APPLICATION SHALL BE TAKEN CARE OF TO AVOID OVERFILLING OF THE JOINT SPACES. ANY EXCESS MATERIAL SHOULD BE IMMEDIATELY SCRAPED FROM THE PAVEMENT SURFACE.
8. ROAD SIGNS SHALL USE A REFLECTIVE SHEETING CONSISTING OF SPHERICAL LENS ELEMENTS EMBEDDED WITHIN A TRANSPARENT PLASTIC HAVING A SMOOTH, FLAT SURFACE WITH A PROTECTED PRECOAT ADHESIVE WHICH SHALL BE PRESSURE SENSITIVE FOR MANUAL APPLICATION, OR TACK FREE HEAT ACTIVATED FOR MECHANICAL VACUUM-HEAT APPLICATION.
9. THE REFLECTIVE BRIGHTNESS VALUES OF THE REFLECTIVE SHEETING AS COMPARED TO MAGNESIUM OXIDE (MGO) SHALL BE AS GIVEN IN TABLE S05-1 OF THE STANDARD SPECIFICATIONS MANUAL OR NOT LESS THAN 90% OF THE GIVEN VALUES WHEN TOTALLY WET BY RAIN.
10. THE PROJECT ENGINEER AND THE CONTRACTOR SHALL COORDINATE WITH THE CONCERNED IMPLEMENTING COMMUNITY ENVIRONMENT AND NATURAL RESOURCES OFFICES (CENRO) OF THE DENR REGARDING THE TURNOVER OF THE TIMBER AND OTHER DERIVABLE WOOD MATERIALS RECOVERED FROM THE TREES CUT/REMOVED.
11. THE CONTRACTOR SHALL PROPERLY CARE FOR ALL PLANTS FURNISHED, PLANTED OR STORED, PERFORMING SUCH WATERING, WEEDING, CULTIVATING OR OTHER ORDINARY MAINTENANCE WORK AS NECESSARY TO KEEP THE STOCK IN A LIVE AND HEALTHY CONDITION.
12. BEFORE COMPLETION AND FINAL ACCEPTANCE OF THE PROJECT, ALL TREES NOT HEALTHY OR THAT HAVE DIED SHALL BE REPLACED BY THE CONTRACTOR AT HIS OWN EXPENSE.
13. SIDEWALKS SHALL BE KEPT AS LEVEL AS POSSIBLE AND ANY CHANGES IN LEVEL AT SIDEWALKS SHALL BE EFFECTED BY SLIGHT RAMPS AND DROPPED CURBS PURSUANT TO B.P. 344 OR THE ACCESSIBILITY LAW.
14. BEAMS SHOULD BE GALVANIZED AFTER FABRICATION AND SHALL CONFORM WITH THE REQUIREMENTS OF AASHTO M 111.
15. ALL LAPS OF GUARDRAIL SHALL BE IN THE DIRECTION OF THE TRAFFIC FLOW.

SURVEY SPECIFICATION

1. ALL PROJECT CONTROL POINTS ARE PROJECTED IN PRSS2 GRID COORDINATE SYSTEM (ZONE 5)
2. SURVEY INSTRUMENT USED: BASE - ROVER - CHC (N80+) SN1007092, CHC (80+) SN1007098
3. DATE SURVEYED: AUGUST 23-25, 2023
4. PROJECT CONTROL NUMBER, REFER TO PLAN AND PROFILE

OTHERS

1. BEFORE FINAL ACCEPTANCE, THE RIGHT-OF-WAY, BORROW PITS AND ALL GROUND OCCUPIED BY THE CONTRACTOR SHALL BE CLEANED OF ALL RUBBISH, EXCESS MATERIALS, TEMPORARY STRUCTURES AND EQUIPMENT AND ALL PARTS OF THE WORK SHALL BE LEFT IN A NEAT AND PRESENTABLE CONDITION.
2. ANY DEFECTIVE WORK, WHETHER THE RESULT OF POOR WORKMANSHIP, USE OF DEFECTIVE MATERIALS, DAMAGE THROUGH CARELESSNESS, OR OF ANY OTHER CAUSE, FOUND PRIOR TO ACCEPTANCE, SHALL BE REMOVED IMMEDIATELY AND REPLACED BY WORK AND MATERIALS WHICH SHALL CONFORM TO THE SPECIFICATIONS.
3. DAMAGES TO ANY PORTION OF WORK BEFORE FINAL ACCEPTANCE EXCEPT DAMAGES DUE TO UNFORSEEABLE CAUSES BEYOND THE CONTROL OF AND WITHOUT FAULT OF NEGLIGENCE BY THE CONTRACTOR SHALL BE REBUILT, REPAIRED AND RESTORED.

REFERENCES

1. REVISED DPWH MANUAL ON HIGHWAY SAFETY DESIGN STANDARDS, MAY 2013 EDITION
- FOR ROAD SAFETY PLANNING AND DESIGN ACTIVITIES AS WELL AS ROAD SAFETY MAINTENANCE ACTIVITIES SUCH AS THE PROPER WAY OF INSTALLING/APPLYING ROAD SIGNS, ROAD SAFETY DEVICES AND PAVEMENT MARKINGS
- DO 41, s.2012

2. LABOR CODE OF THE PHILIPPINES AND ITS IMPLEMENTING RULES AND REGULATIONS DOLE DO NO. 12 s. 1998, OCCUPATIONAL SAFETY AND HEALTH STANDARDS AND ITS PROCEDURAL GUIDELINES
- FOR MONITORING, ENFORCEMENT AND IMPLEMENTATION OF CONSTRUCTION SAFETY AND HEALTH
- DO 58, s.2005
3. DPWH DESIGN CRITERIA, GUIDELINES AND STANDARDS, 2015.
4. GUIDELINES FOR THE PREPARATION OF COST ESTIMATES FOR TRAFFIC MANAGEMENT AND SAFETY & HEALTH REQUIREMENTS FOR THE CONSTRUCTION AND MAINTENANCE OF ROADS, BRIDGES AND SAFETY & HEALTH REQUIREMENTS FOR SCHOOL BUILDINGS, 2018.
5. AASHTO A POLICY ON GEOMETRIC DESIGN STANDARDS OF HIGHWAYS AND STREETS, 2011, 6TH EDITION.
6. AASHTO GUIDE ON PAVEMENT DESIGN, 1983 EDITION
7. HIGHWAY SAFETY DESIGN STANDARDS: PART 1- ROAD SAFETY DESIGN, AND PART 2 - ROAD SIGNS AND PAVEMENT MARKINGS, 2012 EDITION.

DESIGN SPECIFICATION

1. GEOMETRIC DESIGN CRITERIA
- NORMAL CROWN SHALL BE -1.50%, MAXIMUM SUPERELEVATION SHALL BE 8.00%
- MINIMUM RADIUS OF HORIZONTAL CURVES SHALL BE 30M
- MINIMUM LENGTH OF PARABOLIC VERTICAL CURVE SHALL BE 50M WITHOUT CONSIDERING K-VALUES

CONSTRUCTION REQUIREMENTS

1. B.P. 344 ACCESSIBILITY LAW
- PROVISION OF BATAS PAMBANSA BILANG 344 (ACCESSIBILITY LAW) AND ITS IMPLEMENTING RULES AND REGULATIONS, THE IMPLEMENTING OFFICE SHALL IDENTIFY THE LOCATIONS OF AND PROVIDE ACCESSIBILITY FACILITIES FOR PERSONS WITH DISABILITY IN ACCORDANCE WITH D.O. 37, SERIES OF 2009.
2. TREE PLANTING
- RATIO OF TREES REMOVED VS TREES PLANTED, 1:100
3. PAVEMENT
- THE BARS SHALL BE INSTALLED FIRMLY AT THE HOLES AT ONE HALF OF ITS LENGTH AND SHALL BE HELD IN POSITION PARALLEL TO THE SURFACE OF SLAB.
- THE BARS SHALL BE PAINTED WITH RED LEAD AND THE SURFACE SHALL BE COATED WITH APPROVED BITUMINOUS MATERIALS.
- THE BARS SHALL NOT BE PLACED WITHIN 375 MM OF TRANSVERSE JOINTS.
4. DRAINAGE
- EXACT LOCATIONS, SLOPES, OUTFALLS & INVERT ELEVATIONS OF DRAINAGE STRUCTURES SHALL BE CHECKED IN THE FIELD BY THE ENGINEER. MINOR ADJUSTMENTS MAY BE MADE WITH THE APPROVAL OF THE ENGINEER TO SUIT FIELD CONDITIONS.
- ANY REVISIONS, REMOVAL AND/OR RELAYING DRAINAGE STRUCTURES AS DIRECTED BY THE ENGINEER TO SUIT EXISTING FIELD CONDITIONS SHALL BE CONSIDERED AS SUBSIDIARY WORK PERTAINING TO OTHER CONTRACT ITEMS. NO DIRECT PAYMENT SHALL BE MADE FOR THIS WORK UNLESS OTHERWISE SPECIFICALLY IDENTIFIED FOR PAYMENT IN THE SCHEDULE.
- EXISTING DRAINAGE STRUCTURES OR PART THEREOF REMOVED BY THE CONTRACTOR THAT ARE STILL SERVICEABLE SHALL BE TURNED OVER TO THE GOVERNMENT & SHALL BE DEPOSITED AT A PLACE WITHIN THE PROJECT SITE DESIGNATED WITHOUT ANY EXTRA COMPENSATION. EXTREME PRECAUTION SHALL BE EXERCISED BY THE CONTRACTOR NOT TO DAMAGE THESE MATERIALS DURING THE REMOVAL & HANDLING.
- TEST REQUIREMENTS FOR DRAINAGE
FOR CROSS DRAINAGE PIPES (CLASS IV)
A. D-LOAD TO PRODUCE A 0.30MM CRACK OF 100MMMM OF DIAMETER
B. D-LOAD TO PRODUCE THE ULTIMATE LOAD OF 150 100NMMMM OF DIAMETER
FOR LATERAL PIPE (CLASS II)
A. D-LOAD TO PRODUCE A 0.30MM CRACK OF 50MMMM OF DIAMETER
B. D-LOAD TO PRODUCE THE ULTIMATE LOAD OF 75 100NMMMM
5. SLOPE/ EMBANKMENT PROTECTION
- EMBANKMENT WILL BE CONSTRUCTED ON A FOUNDATION BED SATISFACTORY TO THE ENGINEER. THE STONES SHALL NOT BE LESS THAN 0.15 CU.M. IN VOLUME, AND LAID UP TO THE LINES AND DIMENSIONS REQUIRED. THE STONES SHALL BE BONED TO SOME EXTENT AND SECURELY BEDDED. SPALLS SHALL BE USED TO FILL VOIDS. ANY SPACE BACK HAD LAD ROCK EMBANKMENT SHALL BE FILLED ENTIRELY WITH COMPACTED MATERIAL.
- ITEM S05(5), GROUTED RIPRAP PLACING OF STONES
FOR GROUTED RIPRAP, STONES SHALL BE LAID WITH CLOSE, BROKEN JOINTS AND SHALL BE FIRMLY BEDDED INTO SLOPE AND AGAINST THE ADJOINING STONES. EACH STONE SHALL BE LAID WITH ITS LONGEST AXIS PERPENDICULAR TO THE SLOPE.
- GROUTING
THE SPACES BETWEEN STONES SHALL BE FILLED WITH CEMENT MORTAR THROUGHOUT THE THICKNESS OF THE RIPRAP. SUFFICIENT MORTAR SHALL BE USED TO COMPLETELY VOIDS, EXCEPT THAT THE SURFACE OF THE STONES SHALL BE EXPOSED.
- WEEPHOLES
WEEPHOLES SHALL BE PLACED AT THE LOWEST POINT WHERE FREE OUTLETS CAN BE OBTAINED AND SHALL BE SPACED NOT MORE THAN (2) TWO METERS CENTER TO CENTER.



REPUBLIC OF THE PHILIPPINES
DEPARTMENT OF PUBLIC WORKS AND HIGHWAYS
REGIONAL OFFICE NO. XI
GOV. CHAVEZ COR. R. BINGSAY AVENUE, DAVAO CITY

PROJECT NAME AND LOCATION:	SHEET CONTENTS:	DRAFTED AND PREPARED:	REVIEWED:	SUBMITTED:	RECOMMENDING APPROVAL:	APPROVED:	SET NO.	SHEET NO.
ROAD WIDENING - MAHARLINA HIGHWAY - (10126+00M) K1478 + 721 - K1478 + 847, (32006+00M) K1479 + 291 - K1479 + 345, DAVAO DEL NORTE	GENERAL NOTES (ROAD, DRAINAGE AND STRUCTURES)	ARMANDO M. BASOC, JR. ENGINEER II	DENVR A. SEMPITO ENGINEER II, DIST. SECTION CHIEF	JUDY ANN T. BERNARDINO CHIEF, PLANNING AND DESIGN DIVISION	JOSE LITO B. CABALLERO ASST. CHIEF, REGIONAL DIRECTOR	JUBY B. CORDON REGIONAL DIRECTOR	A 02.A/17	02.A 50
		DATE:	DATE:	DATE:	DATE:	DATE:		

GENERAL NOTES (TRAFFIC LIGHTS)

TRAFFIC SIGNALIZATION

1. THE PROJECT ENGINEER AND CONTRACTOR SHALL CLOSELY COORDINATE WITH THE CITY GOVERNMENT OF PANABO TO ESTABLISH SIGNAL PHASING AND TIMING PARAMETERS THAT ALIGN WITH THE OVERALL TRAFFIC FLOW PLAN OF THE CITY.
2. THE PROPOSED REMOVAL AND RELOCATION OF TRAFFIC SIGNALS AT PANABO CITY ALONG MAHARLIKA HIGHWAY SHALL BE IN FIXED-TIME MODE. HOWEVER, THE PROPOSED INTERSECTIONS ALONG DAANG MAHARLIKA HIGHWAY - UNDER FLYOVER SHALL BE SENSORIZED USING VIDEO SENSOR IN ACTUATED MODE.
3. CONDITIONS:
 - 3.1. SUPPLY, DELIVER, INSTALLATION, INTEGRATION, CONFIGURATION, TESTING AND COMMISSIONING OF TRAFFIC SIGNAL SYSTEM SOFTWARE: THE SYSTEM SHALL BE PC BASED OR EQUIVALENT. EQUIVALENT SYSTEM SOFTWARE MUST BE ABLE TO COMMUNICATE WITH EXISTING TRAFFIC CONTROLLER AND ITS LOCAL OPERATING SOFTWARE.
 - 3.2. CONTROLLER SHOULD BE COMPATIBLE AND CAN BE INTEGRATED WITH THE PLATFORM OR TRAFFIC CONTROL AND MONITORING SOLUTION (TCMS) OF THE LOCAL GOVERNMENT WHERE PROJECT IS LOCATED WITHOUT LOSS OF ANY FUNCTIONALITY/FEATURE OF BOTH THE CONTROLLER AND THE PLATFORM/TCMS. THIS CONDITIONS IS IN COMPLIANCE WITH THE LGU'S REQUIREMENT.
 - 3.3. CONTROLLER SHOULD BE CAPABLE OF SYNCHRONIZATION, COORDINATION AND GREENWAVE WITH THE EXISTING TRAFFIC CONTROLLER NETWORK OF LOCAL GOVERNMENT WHERE PROJECT IS LOCATED VIA CABLE OR WIRELESS LINK IN COMPLIANCE WITH THE LGU'S REQUIREMENT.
 - 3.4. MANUFACTURER'S CERTIFICATE OF COMPATIBILITY OF THE PROPOSED TRAFFIC CONTROLLERS WITH THE EXISTING PLATFORM/TCMS. CERTIFICATE SHOULD INCLUDE GUARANTEE THAT THE PROPOSED CONTROLLER IS CAPABLE OF SYNCHRONIZATION, COORDINATION AND GREENWAVE WITH THE EXISTING TRAFFIC CONTROLLERS.
 - 3.5. BIDDER SHOULD NOT HAVE BEEN SUSPENDED AND/OR BLACKLISTED BY THE LOCAL GOVERNMENT WHERE TO PROJECT IS LOCATION IN VIOLATION OF RA8184 WITHIN THE LAST 10 YEARS.
 - 3.6. BIDDER SHOULD BE ISO 9001:2015 CERTIFIED.
4. THE SYSTEM REQUIREMENT OF THE TRAFFIC MANAGEMENT PLATFORM:
 - 4.1. RECENT OS AND BROWSER (CHROME, EDGE, FIREFOX)
 - 4.2. 16 GB OF RAM
 - 4.3. INTERNET CONNECTION SPEED AT 50 MBPS
5. THE TRAFFIC CONTROLLER SHALL BE STATE-OF-THE-ART; NON-PROPRIETARY; SHALL BE OPEN-ARCHITECTURE; SHALL RUN A RANGE OF TRAFFIC CONTROL PHILOSOPHIES AND SYSTEMS; AND CAN BE CONTROLLED BY THE WORLD'S MOST COMMON ADAPTIVE/EXTERNAL SYSTEMS SUCH AS:
 - 5.1. SCATS
 - 5.2. SCOOT/UTMC
 - 5.3. ARTIC
 - 5.4. ITAKA
 - 5.5. COOL
 - 5.6. SPOT/UTOPIA
6. THE TRAFFIC CONTROLLER SHALL BE STATE-OF-THE-ART AND SHOULD BE CAPABLE OF RUNNING DIFFERENT MODES OF OPERATIONS NAMELY:
 - 6.1. CENTRAL CONTROL MODE FOR ROAD TRAFFIC
 - 6.2. LOCAL MODE, FIXED TIME
 - 6.3. LOCAL CONTROL, TRAFFIC ACTUATED
 - 6.4. MANUAL MODE
 - 6.5. VEHICLE ACTUATED
 - 6.6. GROUP CONTROL
 - 6.7. PHASE/STAGE COORDINATION
 - 6.8. MASTER/SLAVE
 - 6.9. ADAPTIVE LOCAL GREEN/CORRIDOR
 - 6.10. AUTOMATIC MANUAL SWITCHING ROUTINE
7. THE SIGNAL CONTROLLER SHALL BE CAPABLE OF:
 - 7.1. AUTOMATIC SWITCHING TO FLASHING OPERATION ACCORDINT TO A TIME OF DAY (TOD) SHCEDULE AND ON MAJOR FAULT CONDITIONS
 - 7.2. PERFORMING LANTERN OFF OPERATION
 - 7.3. EXECUTING PHASE SKIP (OR PHASE RECALL) AND EXTENSION TYPE OPERATIONS BASED ON DETECTOR ACTURITON IN TWO OR MORE PHASES
8. SMART SIGNAL HEAD HOUSING
 - 8.1. THE HOUSING AND LENS OF THE SIGNAL HEAD SHALL BE MADE OF UV-STABILIZED POLYCARBONATE FOR 300MM AND 200MM DIAMETER, THE HOUSING SHALL HAVE A SLIM DESIGN ONLY BUILT FOR LED TECHNOLOGY.
 - 8.2. HOUSING COLOR RAL 9005
 - 8.3. ENVIRONMENTAL PROTECTION SHALL BE MINIMUM IP54
9. LED MODULE
 - 9.1. ENVIRONMENTAL PROTECTION SHALL BE MINIMUM IP65

VIDEO DETECTOR CAMERA

1. IMAGE SPECIFICATIONS:
 - 1.1. DETECTION FUNCTIONALITIES: VEHICLE PRESENCE
 - 1.2. DETECTION ZONES: 8
 - 1.3. DETECTION OUTPUTS: 4 VIA INTERFACE 1TL, 8 VIA INTERFACE 4TI ETH
2. CAMERA:
 - 2.1. RESOLUTION: 640X480 PIXELS (VGA)
 - 2.2. FRAME RATE: 20 FPS
 - 2.3. LENS TYPE: WIDE ANGLE, NARROW ANGLE
 - 2.4. FOCAL DISTANCE: 2.1MM, 6.0MM
 - 2.5. DETECTION DISTANCE: 0-25MM, 15-75MM
 - 2.6. MOUNTING HEIGHT: 3.5-12M
 - 2.7. CMOS TYPE: 2" BLACK AND WHITE
 - 2.8. COMPRESSION: JPEG
3. HOUSING:
 - 3.1. MATERIAL: ALUMINUM
 - 3.2. DIMENSIONS: VERTICALLY MOUNTED 45 CM X 16 CM X 12 CM
 - 3.3. DIMENSIONS: HORIZONTALLY MOUNTED 41 CM X 18 CM X 12 CM
4. POWER, OUTPUT, AND COMMUNICATION:
 - 4.1. OPERATING VOLTAGE: 12-26 VAC/DC
 - 4.2. COMMUNICATION PC - SENSOR: VIA INTERFACE
 - 4.3. INTERFACE(S): 1TL, 4TI ETH
 - 4.4. PC TOOL FOR SETUP: TRAFICAM PC TOOL
5. REGULATORY & ENVIRONMENTAL:
 - 5.1. EMC: ELECTROMAGNETIC COMPATIBILITY 2004/108/EG
 - 5.2. FCC: FCC PARTS 15 CLASS A
 - 5.3. TEMPERATURE RANGE: -34°C TO +80°C
 - 5.4. MATERIALS: WEATHERPROOF (UV-RESISTANT)
 - 5.5. PROTECTION GRADE: IP67

MANPOWER & EQUIPMENT REQUIREMENT

1. LIST OF MINIMUM TOOLS AND EQUIPMENT:
 - 1.1. 2- UNITS MANLIFT/CHERRY PICKER
 - 1.2. 2- UNITS BOOM CRANE TRUCK W/ BUCKET
 - 1.3. 3- UNITS SERVICE VEHICLE
 - 1.4. 2- UNITS BAGGER CONCRETE MIXER
 - 1.5. 2- UNITS COMPRESSOR AND JACKHAMMER/CONCRETE BREAKER
 - 1.6. 2- UNITS CONCRETE SAW CUTTER
 - 1.7. 2- UNITS TRUCK-MOUNTED KNEADING MACHINE
 - 1.8. 1- UNIT THERMOPLASTIC PAINT REMOVING MACHINE
 - 1.9. 1- UNIT ELECTRICAL BAR CUTTER
 - 1.10. 2- UNITS APPLICATORS 45CM, 30CM, 15CM, 10CM FOR THERMOPLASTIC MARKINGS
 - 1.11. 1- UNIT WELDING MACHINE
 - 1.12. 1- SET GENERATOR AND FLOODLIGHT
 - 1.13. 1- UNIT HORIZONTAL DIRECTIONAL DRILLING MACHINE
 - 1.14. HDD MACHINE TRANSPORTER



REPUBLIC OF THE PHILIPPINES
DEPARTMENT OF PUBLIC WORKS AND HIGHWAYS
REGIONAL OFFICE NO. XI
GOV. CHAVEZ COR. R. MAGSAYSAY AVENUE, DAVAO CITY

PROJECT NAME AND LOCATION:
ROAD WIDENING - MAHARLIKA HIGHWAY - (5013649K) K1478 +
721 - K1479 + 847, (5020644K) K1479 + 292 - K1479 + 145,
DAVAO DEL NORTE

GENERAL NOTES
(TRAFFIC LIGHT)

DRAFTED AND PREPARED:
ARMANDO M. BASOC, JR.
ENGINEER 3
DATE:

REVIEWED:
DENNIS ALDRIN A. SEMPIO
ENGINEER 3, OIC SECTION CHIEF
DATE:

SUBMITTED:
JUDY B. BERNARDINO
CHIEF, PLANNING AND DESIGN DIVISION
DATE:

RECOMMENDING APPROVAL:
JOSEPH B. CABALLERO
ASSISTANT REGIONAL DIRECTOR
DATE:

APPROVED:
JUDY B. CORDON
REGIONAL DIRECTOR
DATE:

SET NO.
A
02.B
17

SHEET NO.
02.B
50

ABBREVIATIONS

ABUTMENT	ABUT.	PAVEMENT WIDTH	PW
AHEAD STATIONING	AK STA	PERCENT	%
AREA	A	PHILIPPINES	PHIL.
ASPHALT CONCRETE PAVEMENT	ACP	PIECES	PCS.
AT	@	PLUS / MINUS	±
AZMUTH	AZM.	PUBLIC LAND SUBDIVISION	PLS.
BACK STATION	BK. STA	POINT OF INTERSECTION	PI
SARANGAY	SRGY.	POINT OF CURVATURE	PC
BEGINNING OF CIRCULAR CURVE	BCC	POINT OF VERTICAL CURVE	PVC
BEARING	BNG.	POINT OF VERTICAL INTERSECTION	PVI
BEGINNING	BEG.	POINT OF VERTICAL INTERSECTION	POT
BELOW MEAN SEA LEVEL	BMSL	POINT OF TANGENT	PT
BENCHMARK	BM	PORTLAND CEMENT CONCRETE PAVEMENT	PCCP
BETWEEN	BET.	PROJECT	PROJ.
BONE HOLE	BH	PROJECT ROAD	PROJ. RD
BOTH SIDES	BS	PRIVATE SURVEY	P.S.
BOTH WAYS	BW	RADIUS	R
BOTTOM	BOT.	REFERENCE POINT	RP
BRIDGE	BR	REINFORCED CONCRETE BOX CULVERT	RCBC
SUBDIVISION OF DECREASED PROPERTY	BSD.	REINFORCED CONCRETE PIPE CULVERT	RCPC
BY BUREAU OF LANDS SURVEYORS	BLSW	RETAINING WALL	RET. WALL
BUREAU OF LANDS LOCATION MONUMENT	BLSW	RIGHT OF WAY	ROW
CENTER	CTR.	ROAD	RD
CENTERLINE	CL	SOUTH	S
CENTIMETER	cm	SIDEWALK	SDWK
CONCRETE HOLLOW BLOCK	CHB	SUBDIVISION OF UNDECREASED PROPERTY	CUH
CLEAR	CLR	SQUARE	SQ.
COLUMN	COL.	SQUARE METER	Sq. m. / m ²
CONCRETE	CONC.	STANDARD	STD.
CONCRETE HOLLOW BLOCK	CHB	STATION	STA.
CONCRETE MONUMENT	CONC. MON.	STRAIGHT	STR.
CONSTRUCTION	CONGT.	STREET	ST.
CORNER	COR.	STRUCTURE	STRUCT.
COVER	COV.	TANGENT DISTANCE	T
CROSS PIPE	CP	TEMPERATURE	TEMP.
CUBIC METER	cu. m. / m ³	TEMP. VERT	TEMP. VERT
CYLINDRICAL	CYL.	WIDTH	W
DEGREE OF CURVE	D		
DEPARTMENT OF PUBLIC WORKS AND HIGHWAYS	DPWH		
DETAIL	DET.		
DIAMETER	DIA. / Ø		
DIAPHRAGM	DSP.		
DISTANCE	DIST.		
DRAWING	DRWG.		
EAST	E		
ELEVATION	ELEV. / EL.		
END OF CIRCULAR CURVE	ECC		
END OF PAVEMENT	EOP		
ENGINEER	ENGR.		
EQUATION	EQ.		
EXCAVATION	EXCA.		
EXISTING	EXIST. / EXIST.		
EXPANSION	EXPAN.		
EXTENSION	EXTN.		
EXTERIOR	EXTR.		
EXTERNAL DISTANCE / EASTING	E		
FINISHED	F		
FINISHED GRADE	FG.		
FINISHED PAVEMENT LEVEL	FPL		
GENERAL	GEN.		
GROUND LEVEL	GL		
HEAD WALL (H)	HWH / HWS		
HIGH FLOOD LEVEL	HFL		
HIGH TIDE LEVEL	HTL		
HIGH WATER LEVEL	HWL		
HORIZONTAL	HOR.		
INCHES	IN.		
INTERSECTION ANGLE	I		
INSIDE DIAMETER	ID		
INTERIOR	INT.		
KILOGRAM	KG.		
KILOMETER	km.		
KILOMETER PER HOUR	KPH		
LEFT	L		
LENGTH OF CIRCULAR CURVE	LC		
LENGTH OF VERTICAL CURVE	VC		
LONGITUDINAL	LONGIT.		
MAXIMUM	MAX.		
MAXIMUM FLOOD LEVEL	MFL		
MEAN SEA LEVEL	MSL		
METER	m		
MILLIMETER	mm		
MINIMUM	MIN.		
MONUMENT	MON.		
NORTHING	N		
NOT APPLICABLE	NA		
NUMBER	NO.		
ORDINARY WATER LEVEL	OWL		
ORIGINAL GROUND LEVEL	OGCL		
OUTSIDE DIAMETER	OD		
PAVEMENT WIDTH	PW		

LEGENDS AND SYMBOLS

DRAWING SYMBOLS			TOPOGRAPHIC FEATURES, INFRASTRUCTURE AND UTILITIES		
SYMBOL	ABBREVIATION	DESCRIPTION	SYMBOL	ABBREVIATION	DESCRIPTION
	E	ROADWAY CENTERLINE			MAJOR CONTOUR
		NORTH ARROW			MINOR CONTOUR
		ELEVATION CALL OUT			EDGE OF ROAD (EXISTING)
		WATER LEVEL			EDGE OF ROAD (PROPOSED)
		WATER FLOW			ASPHALT CONCRETE PAVEMENT
		POINT OF INTERSECTION		PCCP	PORTLAND CEMENT CONCRETE PAVEMENT
		MATCH LINE			CHISELED CONCRETE / EARTH CANAL
		GRID COORDINATES			NATIONAL HIGHWAY
	AZM	AZMUTH			EXISTING CANAL (PLAN)
		PLAN AND PROFILE CALL OUT			EXISTING CANAL (PROFILE)
		RCPC INVERSE ELEVATION PROFILE CALL OUT		BR	BRIDGE
		DIRECTION			CROSS DRAIN
		MAIN DRAWING TITLE			LATERAL PIPE
		SECONDARY DRAWING TITLE			RCBC
		CROSS SECTION SYMBOL (COMPLEX)			MANHOLE
		CROSS SECTION SYMBOL (COMPLEX)			GUARDRAIL
		DETAIL CALL OUT			CHISELED WALL FENCE
					WOOD OR BARBED WIRE FENCE
					CYCLONE FENCE
					CONCRETE SLOPE PROTECTION
					GRADED RIPRAP SLOPE PROTECTION
					RIVER / CREEK

DRAWING SYMBOLS		
SYMBOL	ABBREVIATION	DESCRIPTION
	BH	BORE HOLE
		CROSS SECTION MONUMENT
	BM	BENCHMARK
	IBM	INTERMEDIATE BENCHMARK
	PSM	PERMANENT BENCHMARK
	TP	TEST PIT
	GPS	GLOBAL POSITIONING SYSTEM
		TRAVERSE POINT
		TRAVERSE STATION AND LINE



REPUBLIC OF THE PHILIPPINES
DEPARTMENT OF PUBLIC WORKS AND HIGHWAYS
REGIONAL OFFICE NO. XI
GOV. CHARIZ COR. R. MAGSAYSAY AVENUE, DAVAO CITY

PROJECT NAME AND LOCATION:
ROAD WIDENING - MAHARLINA HIGHWAY - (S113640N) K1478 + 721 - K1478 + 847, (S100540N) K1479 + 291 - K1479 + 145, DAVAO DEL NORTE

ABBREVIATIONS,
LEGENDS AND SYMBOLS

DRAFTED AND PREPARED:

ARMANDO M. BASOC, JR.
ENGINEER

DATE:

REVIEWED:

DENNIS AVORIN A. SEMPIO
ENGINEER, CIVIL SECTION CHIEF

DATE:

SUBMITTED:

JUDY ANN T. BERNARDINO
CHIEF, PLANNING AND DESIGN DIVISION

DATE:

RECOMMENDING APPROVAL:

JOSE LITO B. CABALLERO
ASSISTANT REGIONAL DIRECTOR

DATE:

APPROVED:

JUBY B. CORDON
REGIONAL DIRECTOR

DATE:

SHEET NO.

A
03/17

SHEET NO.

03
50

SUMMARY OF QUANTITIES

ITEM No.	DESCRIPTION OF WORK	UNIT	QUANTITY	REMARKS
PART A. FACILITIES FOR ENGINEER				
A.1.1(3)	CONSTRUCTION OF FIELD OFFICE FOR THE ENGINEER	LS	1.00	BAHAY KUBO
A.1.1(16)	OPERATION AND MAINTENANCE OF FIELD OFFICE FOR THE ENGINEER	MONTH	5.00	
PART B. OTHER GENERAL REQUIREMENT				
B.4(1)	CONSTRUCTION SURVEY AND STAKING	KM	0.290	
B.5	PROJECT BILLBOARD / SIGNBOARD (2 DPWH)	EACH	2.00	
B.5	PROJECT BILLBOARD / SIGNBOARD (2 DENR-EMB)	EACH	2.00	
B.5	PROJECT BILLBOARD / SIGNBOARD (2 COA)	EACH	2.00	
B.7(2)	OCCUPATIONAL SAFETY AND HEALTH PROGRAM	LS	1.00	
B.8(1)	TRAFFIC MANAGEMENT	MONTH	5.00	USE APPROPRIATE TRAFFIC SCHEME LAYOUT PER D.O. 13 s. 2018; THE CONTRACTOR SHALL PREPARE A SEPARATE TRAFFIC OPERATIONAL PROGRAM (TOP) WHICH SHALL BE IMPLEMENTED DURING THE ENTIRE CONSTRUCTION DURATION.
B.9	MOBILIZATION / DEMOBILIZATION	LS	1.00	
PART C. EARTHWORKS				
100(1)	CLEARING & GRUBBING	HA	0.58	
101(2)	REMOVAL OF STRUCTURES/OBSTRUCTION (DRAINAGE STRUCTURES)	EACH	8.00	36" DIA MANHOLE = 5 EACH, 48" DIA MANHOLE = 3 EACH
101(3)b7	REMOVAL OF ACTUAL STRUCTURES/OBSTRUCTION, 0.33 M THICK PCCP (UNREINFORCED)	SQ.M	617.20	
101(4)c	REMOVAL OF ACTUAL STRUCTURES/OBSTRUCTION, CURB AND GUTTER	LN.M	270.39	
101(3)d	REMOVAL OF ACTUAL STRUCTURES/OBSTRUCTION, 0.10 M THICK, SIDEWALK	SQ.M	1,790.09	
102(2)	SURPLUS COMMON EXCAVATION	CU.M	2,768.00	
103(1)a	STRUCTURE EXCAVATION, COMMON SOIL	CU.M	198.00	FOR MANHOLE
103(3)	FOUNDATION FILL	CU.M	7.00	FOR MANHOLE
103(6)a	PIPE CULVERTS AND DRAIN EXCAVATION, COMMON SOIL	CU.M	1,722.00	FOR RCPC
104(1)a	EMBANKMENT FROM ROADWAY/STRUCTURE EXCAVATION, COMMON SOIL	CU.M	186.00	COMPACTED VOLUME
105(1)a	SUBGRADE PREPARATION, COMMON MATERIAL	SQ.M	4,255.00	
PART D. SUB-BASE & BASE COURSE				
200(1)	AGGREGATE SUBBASE COURSE	CU.M	877.00	
PART E. SURFACE COURSE				
311(1)c2	PORTLAND CEMENT CONCRETE PAVEMENT (UNREINFORCED), 0.23 M THICK, 7 DAYS	SQ.M	2,000.50	FOR SERVICE ROAD
311(1)g2	PORTLAND CEMENT CONCRETE PAVEMENT (UNREINFORCED), 0.33 M THICK, 7 DAYS	SQ.M	2,402.57	FOR ROAD WIDENING = 2,104.96 SQ.M, FOR CONCRETE TRANSITION RAMP = 297.61 SQ. M
PART G. DRAINAGE & SLOPE PROTECTION STRUCTURE				
500(1)b1	PIPE CULVERTS, 610 MM DIA., CLASS IV, RCPC	LN.M	80.00	SUBSIDIARY: FOUNDATION FILL
500(1)b7	PIPE CULVERTS, 1830 MM DIA., CLASS IV RCPC	LN.M	182.00	SUBSIDIARY: FOUNDATION FILL
502(1)a7	MANHOLES, 1830 MM DIA., CONCRETE	EACH	8.00	FOR MANHOLE
502(1)b1	MANHOLES, 610 MM DIA., CHB	EACH	10.00	FOR MANHOLE
502(2)a1	INLETS, TYPE 610 MM DIA. (CONCRETE WITH STEEL GRATING)	EACH	18.00	FOR INLET

NOTE: QUANTITIES ARE SUBJECT TO INCREASE/DECREASE DEPENDING ON THE ACTUAL FIELD CONDITIONS.



REPUBLIC OF THE PHILIPPINES
DEPARTMENT OF PUBLIC WORKS AND HIGHWAYS
REGIONAL OFFICE NO. XI
GOV. CHAVEZ COR. R. MAGSAYSAY AVENUE, DAVAO CITY

PROJECT NAME AND LOCATION:

ROAD WIDENING - MAHARLIKA HIGHWAY - (50136444) K1478 + 722 - K1478 + 867, (50000490) K1479 + 291 - K1479 + 145, DAVAO DEL NORTE

SHEET CONTENTS:

SUMMARY OF QUANTITIES

DRAFTED AND PREPARED:

ARMANDO M. BASOC, JR.
ENGINEER

DATE:

REVIEWED:

DENYRALDIN A. SEMPIO
ENGINEER & QC SECTION CHIEF

DATE:

SUBMITTED:

JUDY ANA T. BERNARDINO
CHIEF PLANNING AND DESIGN DIVISION

DATE:

RECOMMENDING APPROVAL:

JOSEITO B. CABALLERO
ASSISTANT REGIONAL DIRECTOR

DATE:

APPROVED:

JUBY B. CORDON
REGIONAL DIRECTOR

DATE:

SET NO.

A
04/17

SHEET NO.

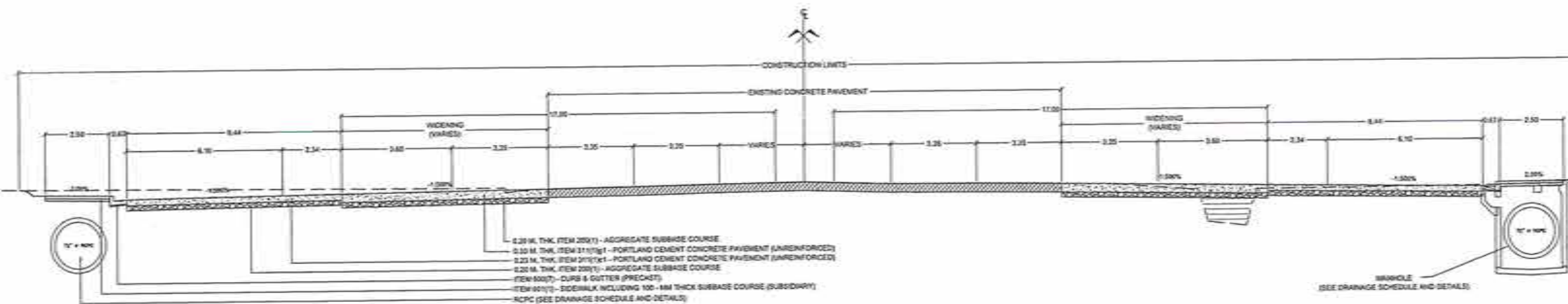
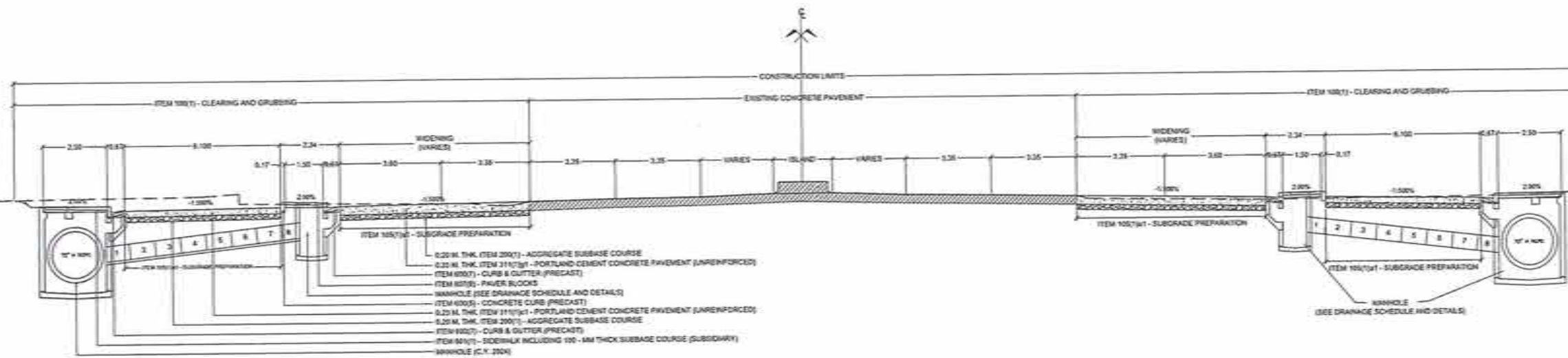
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SUMMARY OF QUANTITIES

ITEM No.	DESCRIPTION OF WORK	UNIT	QUANTITY	REMARKS
PART H. MISCELLANEOUS STRUCTURE				
600(5)	CONCRETE CURB, PRECAST	PC	452.00	FOR SUB-CENTER ISLAND
600(7)	CURB AND GUTTER, PRECAST	PC	1,012.00	
601(1)	SIDEWALK, 100 MM THK.	SQ.M	725.00	
605(1)g3	WARNING SIGNS, 750 MM, W2-1C, INTERSECTION AND JUNCTION SIGNS CROSS ROAD	EACH	2.00	SAME POST WITH W3-1B
605(1)q2	WARNING SIGNS, 750 MM, W3-1B, ADVANCE WARNING OF TRAFFIC CONTROL DEVICE SIGNS SIGNALS AHEAD	EACH	2.00	SAME POST WITH W2-1C
605(1)ai2	WARNING SIGNS, 750MM X 750MM, W6-1C, PEDESTRIAN AND SCHOOL SIGNS PEDESTRIAN CROSSING AHEAD	EACH	4.00	
605(2)ad1	REGULATORY SIGNS, 400 X 600 MM, R5-10, PARKING SIGNS DO NOT BLOCK INTERSECTION	EACH	4.00	SAME POST WITH R6-8C
605(2)ai3	REGULATORY SIGNS, 750MM, R6-8C, MISCELLANEOUS SIGNS PEDESTRIAN CROSSING	EACH	4.00	SAME POST WITH R5-10
612(1)	REFLECTORIZED THERMOPLASTIC PAVEMENT MARKINGS WHITE	SQ.M	295.02	
612(2)	REFLECTORIZED THERMOPLASTIC PAVEMENT MARKINGS YELLOW	SQ.M	59.18	
623(1)a	TRAFFIC SIGNAL CONTROLLER (8 SIGNAL GROUP)	LOT	1.00	
623(1)b	TRAFFIC SIGNAL CONTROLLER (16 SIGNAL GROUP)	LOT	1.00	INSTALLATION OF LOCAL CONTROLLER INC. TESTING & COMMISSIONING, TS40 = 1 LUMP SUM COMPLETE INSTALLATION OF LOCAL WIRING & CONNECTION TO LOCAL CONTROLLER, TS41 = 1 SITE CUSTOMIZATION OF LOCAL CONTROLLER, TS42 = 1 SITE
623(4)a	VEHICULAR SIGNAL HEAD, LED TYPE (200 MM - 3 SET ASPECT)	SET	1.00	TARGET BOARD POLYCARBONATE OR POWDER-COATED ALUMINUM SUBSTRATE FOR TRAFFIC SIGNAL HEAD, 200MM 3 ASPECT, TSP29 = 4 EACH
623(4)d	VEHICULAR SIGNAL HEAD, LED TYPE SET (200 MM - 6 ASPECT)	SET	1.00	VEHICULAR SIGNAL HEAD, LED TYPE SET (200MM - 6 ASPECT) = 2 SET TARGET BOARD POLYCARBONATE OR POWDER-COATED ALUMINUM SUBSTRATE FOR TRAFFIC SIGNAL HEAD, 200MM 6 ASPECT, TSP 32 = 2 EACH
623(4)e	VEHICULAR SIGNAL HEAD, LED TYPE SET (300 MM - 3 ASPECT)	SET	1.00	VEHICULAR SIGNAL HEAD, LED TYPE SET (300 MM - 3 ASPECT) = 4 SET TARGET BOARD POLYCARBONATE OR POWDER-COATED ALUMINUM SUBSTRATE FOR TRAFFIC SIGNAL HEAD, 300MM 3 ASPECT, TSP 33 = 4 EACH ARROW LED-TYPE, 300MM 3 ASPECT = 4 SET
623(4)h	VEHICULAR SIGNAL HEAD, LED TYPE SET (300 MM - 6 ASPECT)	SET	1.00	VEHICULAR SIGNAL HEAD, LED TYPE SET (300MM - 6 ASPECT) = 2 SET TARGET BOARD POLYCARBONATE OR POWDER-COATED ALUMINUM SUBSTRATE FOR TRAFFIC SIGNAL HEAD, 300MM 6 ASPECT, TSP36 = 2 EACH
623(5)	PEDESTRIAN SIGNAL HEAD, LED TYPE	EACH	12.00	
623(7)	VEHICLE DETECTOR VIDEO CAMERA TYPE	ZONE	1.00	THREE DIGIT COUNTDOWN TIMER SUBSIDIARY
623(10)a	TRAFFIC SIGNAL POLE TYPE A	UNIT	1.00	TRAFFIC SIGNAL POLE TYPE A = 2 UNIT LOCAL CONTROLLER FOOTING, TSC1 = 1 EACH REINFORCED CONCRETE PEDESTAL / POLE = 1 UNIT
623(10)b	TRAFFIC SIGNAL POLE TYPE B	UNIT	1.00	TRAFFIC SIGNAL POLE TYPE B = 4 UNIT FOOTING, TSC2, TYPE A (WITH PEDESTAL) = 4 EACH
623(10)c	TRAFFIC SIGNAL POLE TYPE C	UNIT	1.00	FOOTING, TSC3, TYPE A (W/O PEDESTAL) = 4 EACH
623(11)c	TRAFFIC SIGNAL CONDUIT TRENCHING ON ASPHALT PAVEMENT (100MM DIAM. SINGLE BARREL)	LM	155.00	
623(12)	TRAFFIC SIGNAL CABLING	LS	1.00	TRAFFIC SIGNAL CONTROL CABLE, 4 CORE, TSP37 = 280M TRAFFIC SIGNAL CONTROL CABLE, 19 CORE, TSP40 = 240M TRAFFIC SIGNAL CONTROL CABLE, 29 CORE, TSP41 = 240M ELECTRICITY/POWER SUPPLY CABLE, TSP47 = 150M MAIN CIRCUIT BREAKER, TSP48 = 1 EACH MOUNTING STRAP, TSP49 = 2 ROLL MOUNTING BUCKLE, TSP50 = 3 BOX
623(13)	TRAFFIC SIGNAL HANDHOLE	UNIT	12.00	HANDHOLE, TS36, TYPE B
623(14)	PROTECTION CAGE FOR TRAFFIC SIGNAL CONTROLLER	UNIT	1.00	PROTECTION CAGE FOR LOCAL CONTROLLER, TSC9 = 1 EACH
807(9)	PAVER BLOCKS	SQ.M	324.30	FOR SUB-CENTER ISLAND

NOTE: QUANTITIES ARE SUBJECT TO INCREASE/DECREASE DEPENDING ON THE ACTUAL FIELD CONDITIONS.

 REPUBLIC OF THE PHILIPPINES DEPARTMENT OF PUBLIC WORKS AND HIGHWAYS REGIONAL OFFICE NO. XI GOV. CHAVEZ COR. R. MAGSAYSAY AVENUE, DAUO CITY	PROJECT NAME AND LOCATION: ROAD WIDENING - MAKARLAKA ROADWAY - (S0135499) K1478 + 721 - K1478 + 867, (S0098499) K1479 + 291 - K1479 + 345, DAKRO DEL NORTE	SHEET CONTENTS: SUMMARY OF QUANTITIES	DRAFTED AND PREPARED: ARMANDO M. BASOC, JR. ENGINEER II DATE: _____	REVIEWED: DENNIS ANDRIN A. SEMPIO ENGINEER II, QC SECTION CHIEF DATE: _____	SUBMITTED: JUDY ANN T. BERNARDINO CHIEF, FINANCIAL MANAGEMENT DIVISION DATE: _____	RECOMMENDING APPROVAL: JOSELO B. CABALLERO ASSISTANT REGIONAL DIRECTOR DATE: _____	APPROVED: JUBY B. CORDON REGIONAL DIRECTOR DATE: _____	SET NO. A 05/17	SHEET NO. 05 50
	WP-1-PDO-126ARMANW2025 PROJECTS_DAWNG WWHRLKAZ. ROAD WIDENING - K1478 TO 1479 TYPICAL 2_TYPICAL - SUMMARY.DWG								



1 b AT SECTION WITHOUT ISLAND
SCALE 1:70

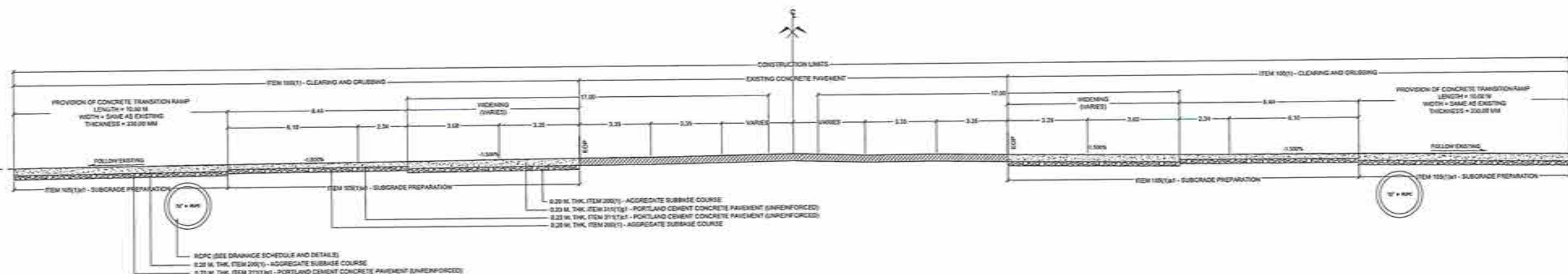
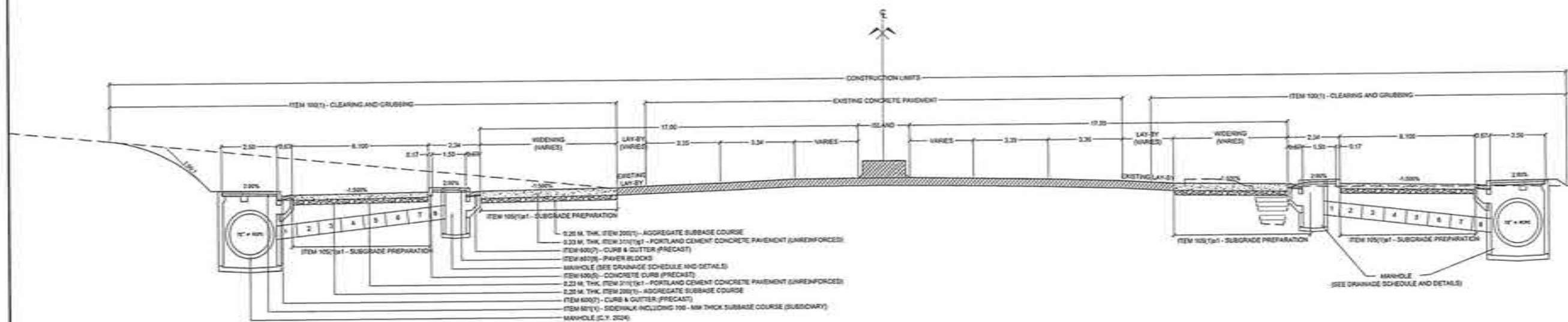
1 TYPICAL ROADWAY CROSS SECTIONS

WARPING AND ROUNDING SCHEDULE

HEIGHT OF CUT SLOPE (H)	SLOPE ROUNDING (SR)
0 ≤ H ≤ 4.50 M	1.50 M
H > 4.50 M	2.50 M

CUT/FILL SLOPE SCHEDULE

NATURE OF MATERIAL	CUT SLOPE	FILL SLOPE
COMMON EARTH	1:1 - 1/2:1	1.5:1
RIPPABLE ROCK	1/2:1 - 1/4:1	-
SOLID ROCK	1/4:1	-



WARPIING AND ROUNDING SCHEDULE

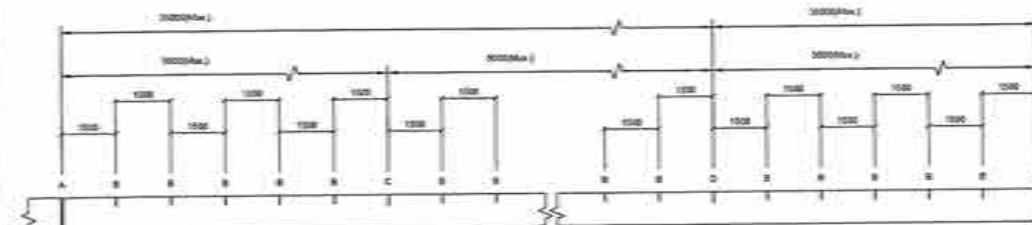
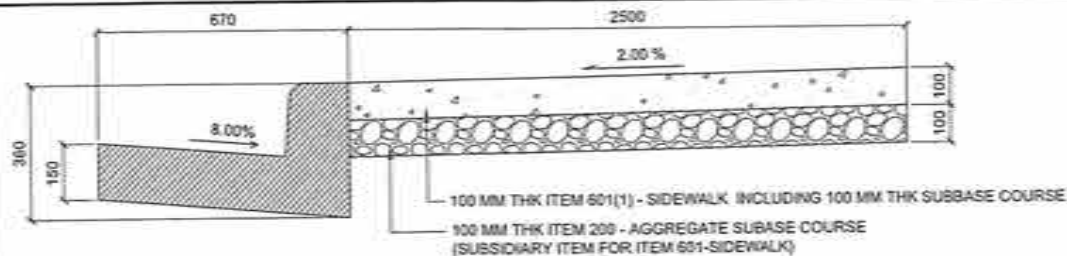
HEIGHT OF CUT SLOPE (H)	SLOPE ROUNDING (SR)
0 ≤ H ≤ 4.50 M	1.50 M
H > 4.50 M	2.50 M

CUTFILL SLOPE SCHEDULE

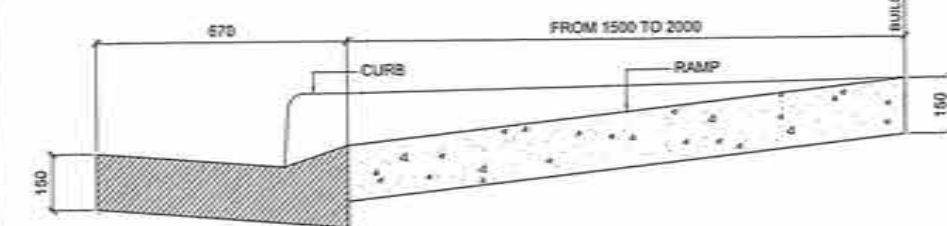
NATURE OF MATERIAL	CUT SLOPE	FILL SLOPE
COMMON EARTH	1:1 - 1/2:1	1.5:1
RIPPABLE ROCK	1/2:1 - 1/4:1	-
SOLID ROCK	1/4:1	-

1 TYPICAL ROADWAY CROSS SECTIONS

REPUBLIC OF THE PHILIPPINES DEPARTMENT OF PUBLIC WORKS AND HIGHWAYS REGIONAL OFFICE NO. XI GOV. CHAVEZ COR. R. MAGSAYSAY AVENUE, DAVAO CITY	PROJECT NAME AND LOCATION: ROAD WIDENING - HAKARILAKA HIGHWAY - (30136400) K3478 + 725 - K3478 + 887, (30064000) K3478 + 295 - K3478 + 545, DAVAO DEL NORTE	SHEET CONTENTS: TYPICAL ROADWAY CROSS SECTIONS	DRAFTED AND PREPARED: ARMANDO M. BASOC, JR. ENGINEER	REVIEWED: DENNIS ALON A. SEMPIO ENGINEER II, OIC SECTION CHIEF	SUBMITTED: JUDY ANN T. BERNARDINO CHIEF, PLANNING AND DESIGN DIVISION	RECOMMENDING APPROVAL: JOSE LITO B. CABALLERO ASSISTANT REGIONAL DIRECTOR	APPROVED: JUDY B. CORDON REGIONAL DIRECTOR	SET NO. A 07/17	SHEET NO. 07 50
	DATE: _____ DATE: _____ DATE: _____ DATE: _____ DATE: _____								

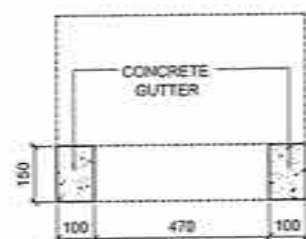


3 SIDEWALK DETAIL
SCALE 1:700

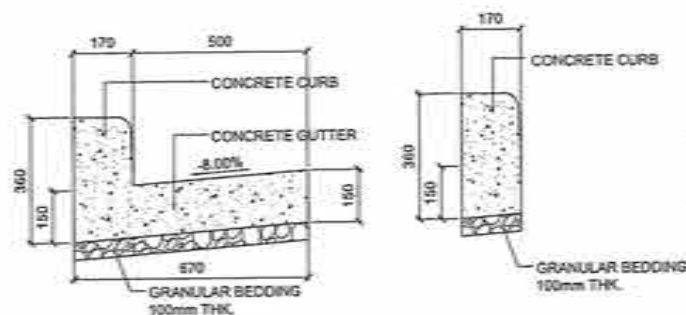


NOTE:
1. ENTRANCE SHALL INCLUDE ALL WALKS HAVING A WIDTH OF 1.00 m TO 2.00 m.
2. ALL CONCRETE SHALL BE CLASS "A".
3. DIMENSIONS ARE IN MILLIMETERS UNLESS OTHERWISE SPECIFIED.
4. EXACT LOCATION FOR DROP CURBS SHALL BE IDENTIFIED IN THE FIELD BY THE ENGINEER. DROP CURBS SHALL BE REQUIRED TO BE PROVIDED IN THE ENTRANCES AND DRIVEWAY PURSUANT TO S.P. 344 OR ACCESSIBILITY LAW.

3 DETAIL OF RAMP FOR ENTRANCE
SCALE 1:700



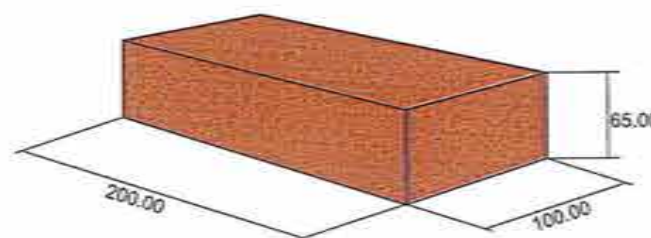
2 REAR ELEV. OF GUTTER
SCALE NTS



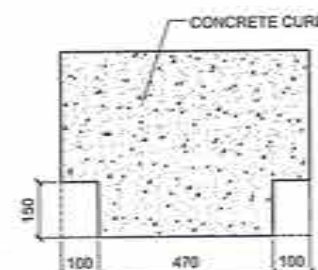
2 CURB & GUTTER DETAILS
SCALE NTS

2 CONCRETE CURB AND GUTTER DETAIL (PRECAST)
SCALE NTS

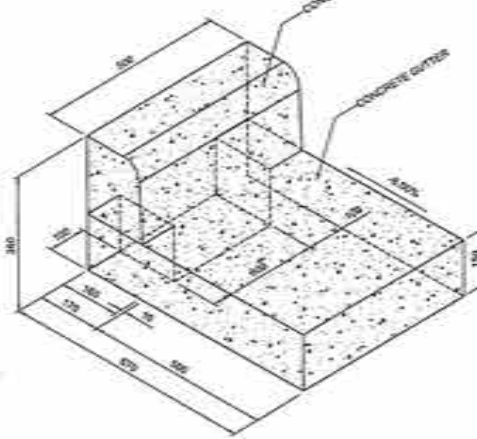
- NOTE:
- SIDEWALK WIDTH OF 1.50m SHALL BE THE MINIMUM PEDESTRIAN ACCESSIBLE ROUTE FREE OF VERTICAL AND HORIZONTAL OBSTRUCTIONS. DRAINAGE COVERS, JUNCTION BOXES, CABLE VAULTS, PULL BOXES AND OTHER APPURTENANCES WITHIN THE SIDEWALK MUST HAVE SLIP RESISTANT SURFACE AND BE FLUSH WITH SURFACE AND MATCH GRADE OF THE SIDEWALK.
 - FULL WIDTH CONCRETE SIDEWALK MAY BE PERMITTED WHEN CONSTRUCTED FOR THE ENTIRE BLOCK.
 - SIDEWALK SHALL HAVE A MINIMUM THICKNESS OF 150mm IF MOUNTABLE CURB IS USED, OR IF SIDEWALK IS INTENDED AS PORTION OF DRIVEWAY, OTHERWISE, SIDEWALK SHALL HAVE A MINIMUM THICKNESS OF 100mm.
 - JOINT LEGEND:
A - 10mm EXPANSION JOINTS (FULL DEPTH PERFORMED JOINT FILLER)
B - 5mm SAW CUT JOINTS, 40mm DEEP (WITHIN 96hrs.) MAXIMUM 1500mm CENTER
C - 5mm SAW CUT JOINTS, 40mm DEEP (WITHIN 12hrs.) MAXIMUM 9000mm CENTER
D - 10mm EXPANSION JOINT FOR 36000mm MAXIMUM LENGTH OF RUN OF SIDEWALK (FULL DEPTH PERFORMED JOINT FILLER)



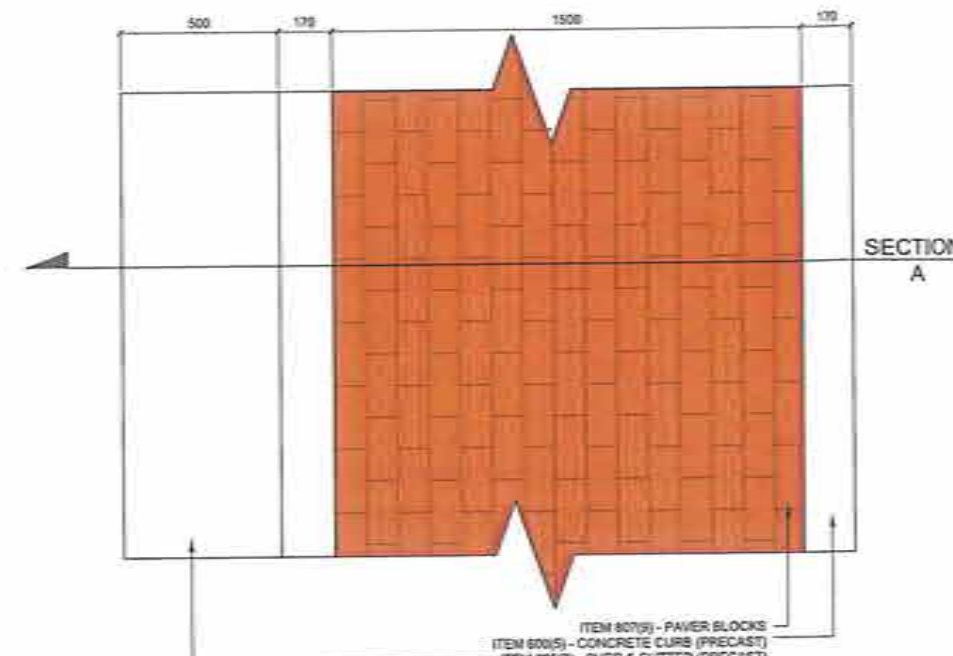
4 PAVER BLOCKS DETAIL
SCALE NTS



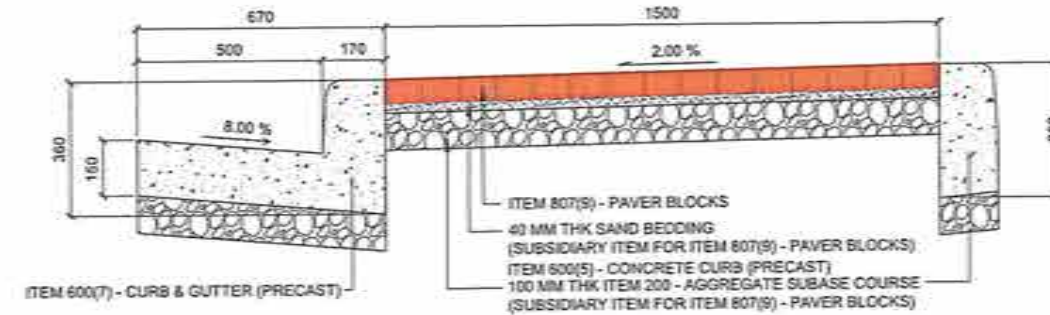
2 REAR ELEV. OF CURB
SCALE NTS



2 ISOMETRIC VIEW
SCALE NTS



4 TOP VIEW
SCALE NTS



4 SECTION A
SCALE NTS

4 SUB-CENTER ISLAND DETAIL
SCALE NTS

SUB-CENTER ISLAND SCHEDULE									
STATION LIMITS		STATION EQUATIONS		PERIMETER 1 (FACING MAIN ROAD) (M)	PERIMETER 2 (FACING SERVICE ROAD) (M)	ITEM 601(1) CURB AND GUTTER (PCS)	ITEM 601(1) CONCRETE CURB (PCS)	SIDE	WIDTH (M)
SECTION 1:		STA. 1478+707.521 - STA. 1478+715.012		41.00	43.76	62.00	87.98	RIGHT	1.50
STA. 1478+715.012 - STA. 1478+715.857		STA. 1478+715.857 - STA. 1478+720.000		87.00	89.48	134.00	128.00	RIGHT	1.50
SECTION 2:		STA. 1478+715.857 - STA. 1478+719.012		67.00	68.48	134.00	128.00	LEFT	1.50
STA. 1478+719.012 - STA. 1478+719.857		STA. 1478+719.857 - STA. 1478+720.000		41.00	43.76	62.00	87.98	LEFT	1.50
TOTAL				216.00	225.48	452.00	452.00		

CURB AND GUTTER WITH SIDEWALK										
STATION LIMITS		STATION EQUATIONS		LENGTH (M)	ITEM 601(1) CURB AND GUTTER, PRECAST (PCS)	SIDE	WIDTH (M)	ITEM 601 (2) SIDE WALK (SQ.M)		
		BACK	AHEAD							
SECTION 1:	STA. 1478+707.521	-	STA. 1478+803.864	STA. 1478+718.657	STA. 1478+720.000	141.00	290.00	RIGHT	3.50	263.50
SECTION 2:	STA. 1478+803.864	-	STA. 1478+707.521	STA. 1478+718.657	STA. 1478+720.000	141.00	290.00	LEFT	3.50	263.50
				TOTAL		282.00	580.00			727.00

1 CONCRETE CURB AND GUTTER WITH SIDEWALK SCHEDULE
SCALE NTS



REPUBLIC OF THE PHILIPPINES
DEPARTMENT OF PUBLIC WORKS AND HIGHWAYS
REGIONAL OFFICE NO. XI
GOV. CHAVEZ COR. R. MAGSAYSAY AVENUE, DAVAO CITY

PROJECT NAME AND LOCATION:
ROAD WIDENING - MARILAKA HIGHWAY - (381344M) K1478 + 721 - K1478 + 847, (380844M) K1478 + 391 - K1478 + 145, DAVAO DEL NORTE

SHEET CONTENTS:
CONCRETE CURB AND GUTTER WITH SIDEWALK SCHEDULE
CONCRETE CURB AND GUTTER DETAIL (PRECAST)
SIDEWALK DETAIL
DETAIL OF RAMP FOR ENTRANCE
SUB-CENTER ISLAND DETAIL

DRAFTED AND PREPARED:
ARMANDO M. BASCO, JR.
ENGINEER A
DATE:

REVIEWED:
DENNIS ALDRIN A. SEMPIO
ENGINEER & QC SECTION CHIEF
DATE:

SUBMITTED:
JUDY ANN T. BERNARDINO
CHIEF, PLANNING AND DESIGN DIVISION
DATE:

RECOMMENDING APPROVAL:
JOSEITO B. CABALLERO
ASSISTANT REGIONAL DIRECTOR
DATE:

APPROVED:
JUBY S. CORDON
REGIONAL DIRECTOR
DATE:

SET NO. 08/17
SHEET NO. 08/50

PCC PAVEMENT (UNREINFORCED), 0.23 M THICK SCHEDULE								
STATION LIMITS			STATION EQUATIONS		LENGTH (M)	WIDTH A (M)	WIDTH B (M)	AVE. WIDTH (M)
			BACK	AHEAD				AREA
SECTION 1:								
STA. 1478+707.521	-	STA. 1478+733.400	STA. 1478+719.657	STA. 1478+720.000	25.54	6.10	6.10	155.77
STA. 1478+733.400	-	STA. 1478+740.000			6.60	6.10	6.10	48.06
STA. 1478+740.000	-	STA. 1478+743.600			3.60	6.10	6.10	26.23
STA. 1478+743.600	-	STA. 1478+760.000			16.40	6.10	6.10	119.23
STA. 1478+760.000	-	STA. 1478+767.900			7.90	6.10	6.10	66.68
STA. 1478+767.900	-	STA. 1478+780.000			12.10	6.10	6.10	102.12
STA. 1478+780.000	-	STA. 1478+800.000			20.00	6.10	6.10	145.40
STA. 1478+800.000	-	STA. 1478+820.000			20.00	6.10	6.10	122.00
STA. 1478+820.000	-	STA. 1478+840.000			20.00	6.10	6.10	122.00
STA. 1478+840.000	-	STA. 1478+852.864			12.86	6.10	6.10	95.71
SECTION 2:								
STA. 1478+707.521	-	STA. 1478+733.400	STA. 1478+719.657	STA. 1478+720.000	25.54	6.10	6.10	155.77
STA. 1478+733.400	-	STA. 1478+740.000			6.60	6.10	6.10	48.06
STA. 1478+740.000	-	STA. 1478+743.600			3.60	6.10	6.10	26.17
STA. 1478+743.600	-	STA. 1478+760.000			16.40	6.10	6.10	138.42
STA. 1478+760.000	-	STA. 1478+767.900			7.90	6.10	6.10	66.68
STA. 1478+767.900	-	STA. 1478+780.000			12.10	6.10	6.10	102.12
STA. 1478+780.000	-	STA. 1478+800.000			20.00	6.10	6.10	145.40
STA. 1478+800.000	-	STA. 1478+820.000			20.00	6.10	6.10	122.00
STA. 1478+820.000	-	STA. 1478+840.000			20.00	6.10	6.10	122.00
STA. 1478+840.000	-	STA. 1478+852.864			12.86	6.10	6.10	78.47
TOTAL					290.00	6.10	6.10	2,000.50

1
a SERVICE ROAD SCHEDULE
SCALE (0.23 M THICK PCCP) NTS

PCC PAVEMENT (UNREINFORCED), 0.33 M THICK SCHEDULE								
STATION LIMITS			STATION EQUATIONS		LENGTH (M)	WIDTH A (M)	WIDTH B (M)	AVE. WIDTH (M)
			BACK	AHEAD				AREA
SECTION 1:								
STA. 1478+707.521	-	STA. 1478+733.400	STA. 1478+719.657	STA. 1478+720.000	25.54	5.14	5.43	135.01
STA. 1478+733.400	-	STA. 1478+740.000			6.60	5.43	7.44	42.48
STA. 1478+740.000	-	STA. 1478+743.600			3.60	7.44	7.44	26.78
STA. 1478+743.600	-	STA. 1478+760.000			16.40	7.44	8.09	127.35
STA. 1478+760.000	-	STA. 1478+767.900			7.90	8.09	8.09	63.91
STA. 1478+767.900	-	STA. 1478+780.000			12.10	8.09	8.09	97.89
STA. 1478+780.000	-	STA. 1478+800.000			20.00	8.09	7.44	155.30
STA. 1478+800.000	-	STA. 1478+820.000			20.00	7.44	7.44	148.80
STA. 1478+820.000	-	STA. 1478+840.000			20.00	7.44	7.44	148.80
STA. 1478+840.000	-	STA. 1478+852.864			12.86	7.44	7.44	95.71
SECTION 2:								
STA. 1478+707.521	-	STA. 1478+733.400	STA. 1478+719.657	STA. 1478+720.000	25.54	6.14	5.94	154.24
STA. 1478+733.400	-	STA. 1478+740.000			6.60	5.94	7.44	44.15
STA. 1478+740.000	-	STA. 1478+743.600			3.60	7.44	7.44	26.78
STA. 1478+743.600	-	STA. 1478+760.000			16.40	7.44	8.09	127.35
STA. 1478+760.000	-	STA. 1478+767.900			7.90	8.09	8.09	63.91
STA. 1478+767.900	-	STA. 1478+780.000			12.10	8.09	8.09	97.89
STA. 1478+780.000	-	STA. 1478+800.000			20.00	8.09	7.44	155.30
STA. 1478+800.000	-	STA. 1478+820.000			20.00	7.44	7.44	148.80
STA. 1478+820.000	-	STA. 1478+840.000			20.00	7.44	7.44	148.80
STA. 1478+840.000	-	STA. 1478+852.864			12.86	7.44	7.44	95.71
TOTAL					290.00	7.44	7.44	2,104.96

1
b ROAD WIDENING SCHEDULE
SCALE (0.33 M THICK PCCP) NTS

STATION LIMITS	AREA (SQ.M)
SECTION 1:	
STA. 1478+734.000 - STA. 1478+740.000	87.52
STA. 1478+747.832 - STA. 1478+765.285	35.97
STA. 1478+771.327 - STA. 1478+792.456	319.60
STA. 1478+797.023 - STA. 1478+824.189	51.82
SECTION 2:	
STA. 1478+852.864 - STA. 1478+714.228	1081.85
STA. 1478+733.663 - STA. 1478+747.278	37.15
TOTAL	1613.91

1
c REMOVAL OF EXISTING PCCP
SCALE (0.100 M THK) NTS

REMOVAL OF EXISTING CURB & GUTTER SCHEDULE		
STATION LIMITS	LENGTH (M)	
SECTION 1:		
STA. 1478+707.521 - STA. 1478+740.000	32.18	
STA. 1478+793.000 - STA. 1478+852.864	59.86	
SECTION 2:		
STA. 1478+852.864 - STA. 1478+714.228	100.17	
STA. 1478+761.752 - STA. 1478+707.521	78.18	
TOTAL	270.39	

REMOVAL OF EXISTING SIDEWALK SCHEDULE		
STATION LIMITS	AREA (SQ.M)	
SECTION 1:		
STA. 1478+707.521 - STA. 1478+740.000	48.26	
STA. 1478+793.000 - STA. 1478+852.864	89.80	
SECTION 2:		
STA. 1478+762.278 - STA. 1478+747.278	38.12	
TOTAL	176.18	

1
d REMOVAL OF EXISTING CURB & GUTTER
SCALE WITH SIDEWALK SCHEDULE NTS



REPUBLIC OF THE PHILIPPINES
DEPARTMENT OF PUBLIC WORKS AND HIGHWAYS
REGIONAL OFFICE NO. XI
GOV. CHARIEZ COR. R. MADRASKAY AVENUE, DAVAO CITY

PROJECT NAME AND LOCATION:

ROAD WIDENING - MAHARAJA HIGHWAY - (S0136400) K1478 + 722 - K1478 + 847, (S0006400) K1479 + 295 - K1479 + 145, DAVAO DEL NORTE

SHEET CONTENTS:

SERVICE ROAD SCHEDULE (0.23 M THICK PCCP)
ROAD WIDENING SCHEDULE (0.33 M THICK PCCP)
REMOVAL OF EXISTING PCCP (0.100 M THK)
REMOVAL OF EXISTING CURB & GUTTER WITH SIDEWALK SCHEDULE

DRAWN AND PREPARED:

ARMANDO M. BASOC, JR.
ENGINEER II

REVIEWED:

DENYR ALDRIN A. SEMPIO
ENGINEER II, CIVIL SECTION CHIEF

SUBMITTED:

JUDY B. T. BERNARDINO
CHIEF, PLANNING AND DESIGN DIVISION

RECOMMENDING APPROVAL:

JOSELO B. CABALLERO
ASSISTANT REGIONAL DIRECTOR

APPROVED:

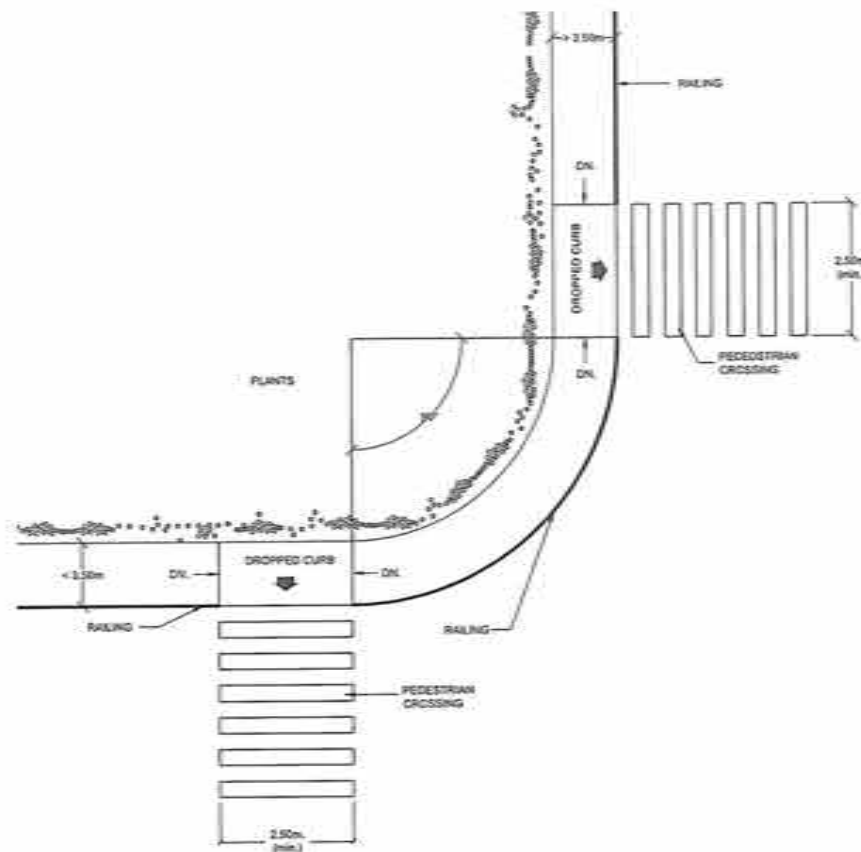
JUBY B. CORDON
REGIONAL DIRECTOR

SET NO.

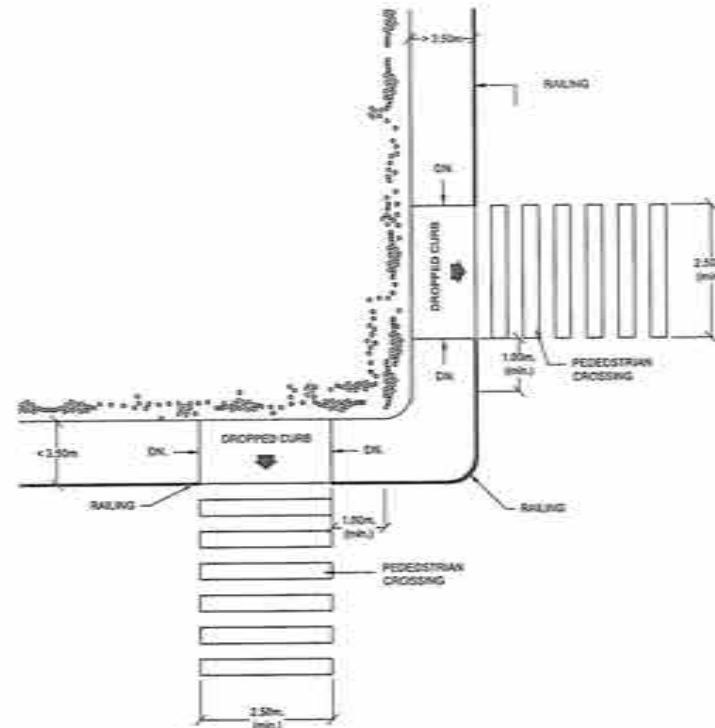
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09/17

SHEET NO.

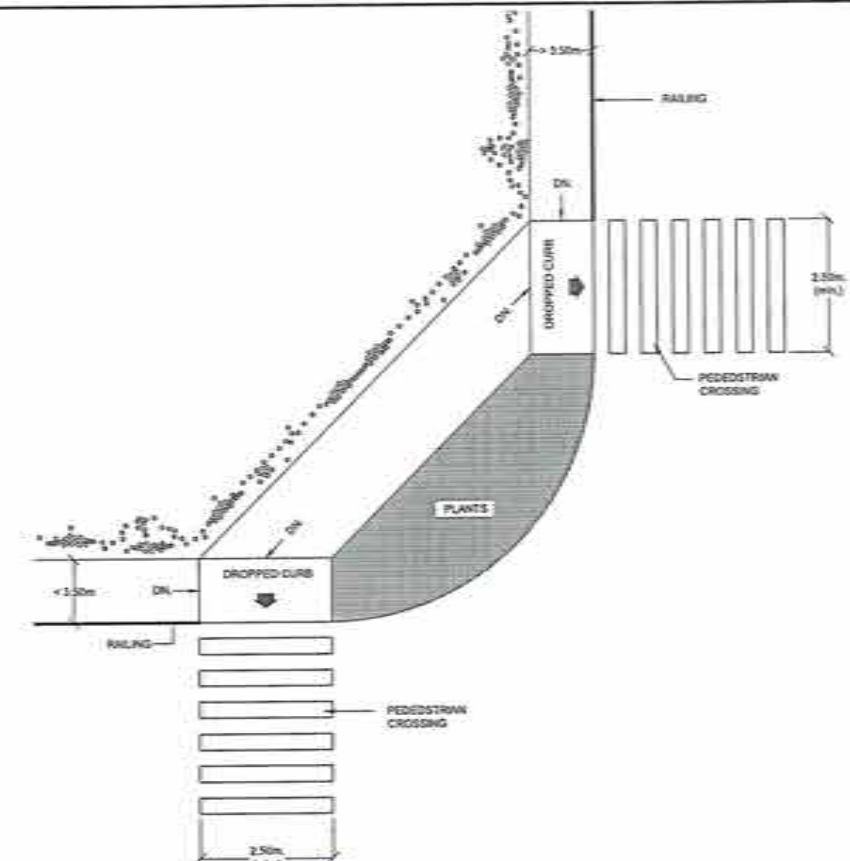
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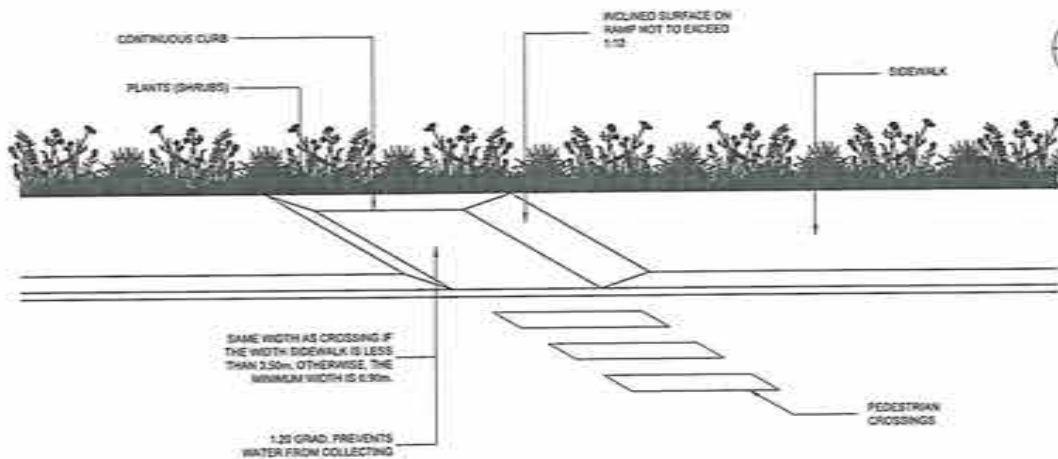
2 a DROPPED CURB AT ROUND CORNER
CASE ONE
SCALE NTS



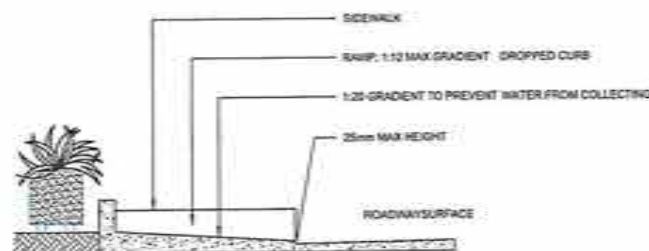
2 b DROPPED CURB AT PERPENDICULAR CORNER
CASE TWO
SCALE NTS



2 c DROPPED CURB AT CORNER WITH PLANTS
CASE THREE
SCALE NTS



1 a TYPICAL DROPPED CURB
SCALE NTS



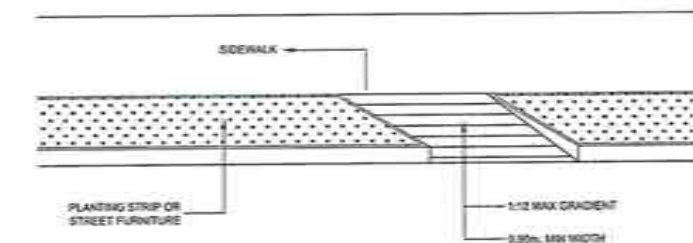
1 b TYPICAL CROSS SECTION OF DROPPED CURB
SCALE NTS

2 VARIATIONS OF DROPPED CURB AT CORNER
SCALE NTS

GENERAL NOTES FOR DROPPED CURBS:

- 1.1 CHANGES IN LEVEL AT SIDEWALKS SHOULD BE EFFECTED BY SLIGHT RAMP AND DROPPED CURBS.
- 1.2 DROPPED CURBS SHOULD BE PROVIDED AT PEDESTRIAN CROSSING AND AT THE END OF FOOTPATHS OF A PRIVATE STREET OR ACCESS ROAD; NO DROPPED CURBS SHALL BE PROVIDED AT CORNERS OF SIDEWALK.
- 1.3 DROPPED CURBS AT PEDESTRIAN CROSSINGS SHOULD HAVE A LENGTH CORRESPONDING TO THE WIDTH OF THE CROSSING IF THE SIDEWALK WIDTH IS LESS THAN 3.50m. OTHERWISE, THE MINIMUM WIDTH SHOULD BE 0.90m.
- 1.4 DROPPED CURBS SHALL BE SLOPED TOWARDS ADJOINING CURBS WITH A GRADIENT NOT MORE THAN 1:12.
- 1.5 DROPPED CURBS SHALL BE SLOPED TOWARDS THE ROAD WITH THE MAXIMUM CROSS GRADIENT OF 1:20 TO PREVENT WATER FROM COLLECTING AT THE SIDEWALK.
- 1.6 THE LOWEST POINT OF THE DROPPED CURBED SHOULD NOT EXCEED 25mm HEIGHT ABOVE THE ROAD GUTTER.

1 TYPICAL OF DROPPED CURB
SCALE NTS



3 TYPICAL CURB CUT-OUT
SCALE NTS

GENERAL NOTES FOR CUT-OUTS:

- 2.1 CURB CUT-OUTS SHOULD ONLY BE ALLOWED WHEN IT WILL NOT OBSTRUCT A SIDEWALK OR ANY WAY LESSEN THE WIDTH OF A SIDEWALK OR IF THE SIDEWALK WIDTH IS LESS THAN 3.5m. NO CURB CUT-OUTS SHALL BE PROVIDED AT CORNERS OF THE SIDEWALKS.
- 2.2 THE MINIMUM WIDTH OF A CURB CUT-OUTS SHOULD BE 0.90m.
- 2.3 CURB CUT-OUTS SHOULD NOT HAVE GRADIENT NOT MORE THAN 1:12.



REPUBLIC OF THE PHILIPPINES
DEPARTMENT OF PUBLIC WORKS AND HIGHWAYS
REGIONAL OFFICE NO. XI
GOV. CHAVEZ COR. R. MAGSAYSAY AVENUE, DAVAO CITY

PROJECT NAME AND LOCATION:
ROAD WIDENING - MAHARAJA HIGHWAY - (S11354000) K1478 + 711 - K1478 + 867, (S00064000) K1478 + 291 - K1478 + 145, DAVAO DEL NORTE

SHEET CONTENTS:
TYPICAL DROPPED CURB
TYPICAL CURB CUT-OUT
VARIATION OF DROPPED CURB AT CORNER

DRAFTED AND PREPARED BY:
ARMANDO M. BASOC, JR.
ENGINEER
DATE:

REVIEWED BY:
DENNIS ALDRIN A. SEMPIO
ENGINEER & SECTION CHIEF
DATE:

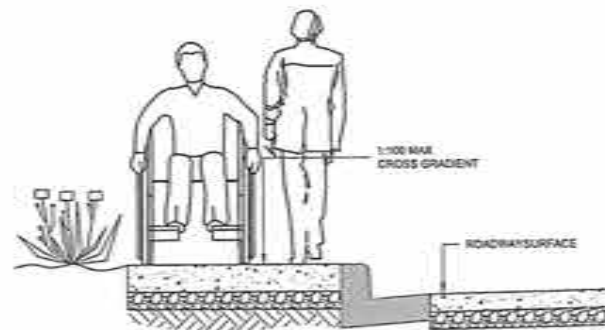
SUBMITTED BY:
JUDY ANN T. BERNARDINO
CHIEF PLANNING AND DESIGN DIVISION
DATE:

RECOMMENDING APPROVAL:
JOSE LITO B. CABALLERO
ASSISTANT REGIONAL DIRECTOR
DATE:

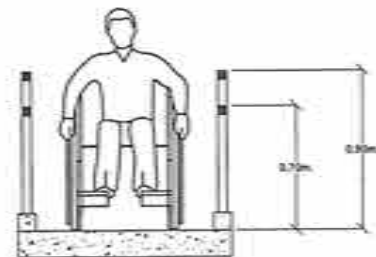
APPROVED BY:
JUDY S. CORDON
REGIONAL DIRECTOR
DATE:

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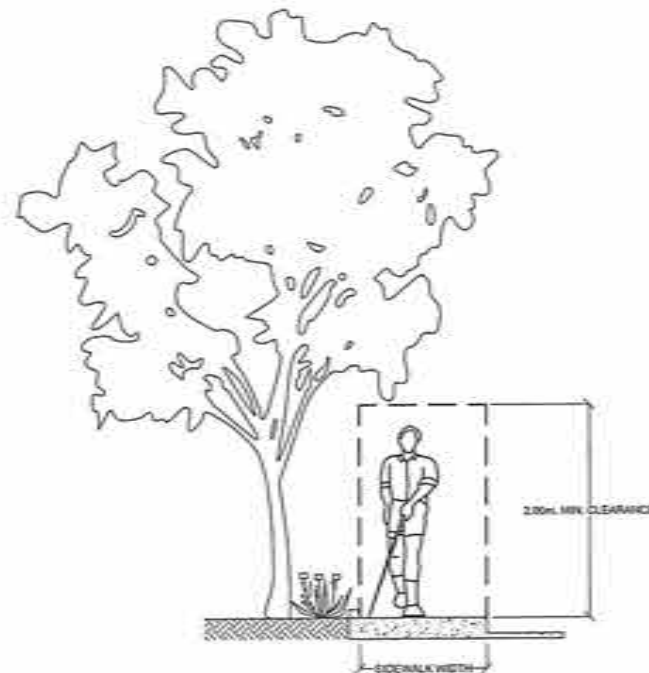
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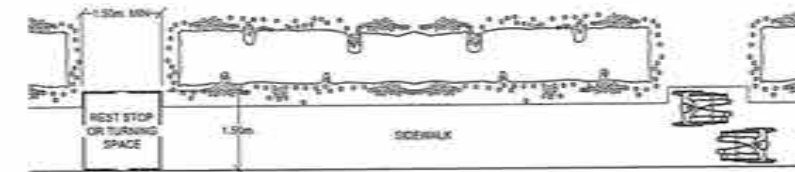
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a
TYPICAL SIDEWALK CROSS SECTION
SCALE NTS



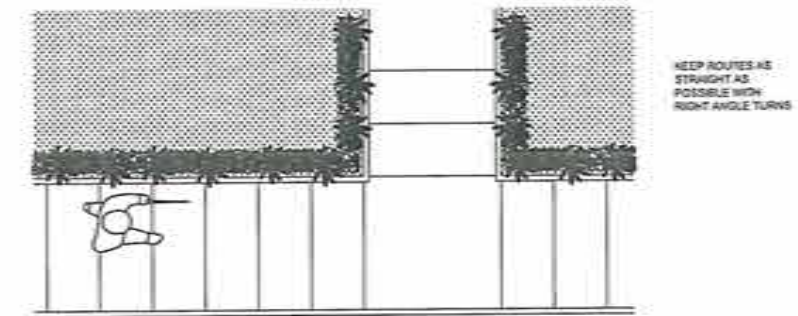
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b
TYPICAL HANDRAIL DETAILS
SCALE NTS



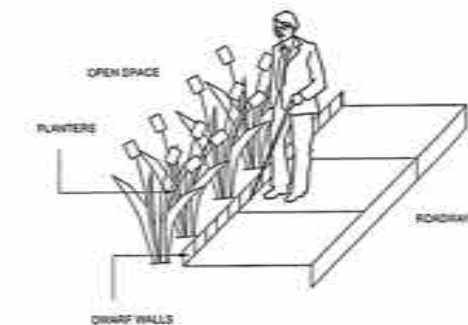
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c
SIDEWALK HEADROOM CLEARANCE
SCALE NTS



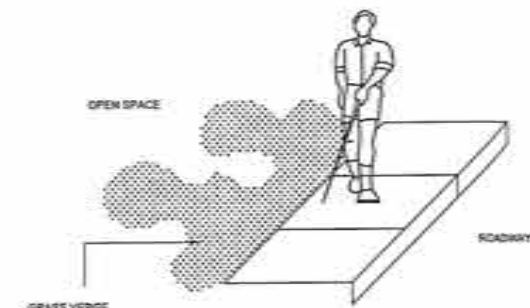
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d
TYPICAL REST STOP OR TURNING SPACE DETAILS
SCALE NTS



1
e
SIDEWALKS TO GUIDE THE BLIND
SCALE NTS



1
f
SIDEWALK WITH PLANTERS AND DWARF WALLS TO GUIDE THE BLIND
SCALE NTS



1
g
SIDEWALK WITH GRASS VERGE TO GUIDE THE BLIND
SCALE NTS

GENERAL NOTES FOR SIDE WALKS, HANDRAILS AND OPEN SPACES:

- 3.1 SIDEWALKS SHOULD BE KEPT AS LEVEL AS POSSIBLE AND PROVIDED WITH SLIP-RESISTANT MATERIAL;
- 3.2 WHENEVER AND WHEREVER POSSIBLE, SIDEWALKS SHOULD HAVE A GRADIENT NO MORE THAN 1:20 OR 5%.
- 3.3 SIDEWALKS SHOULD HAVE MAXIMUM CROSS GRADIENT OF 1:100;
- 3.4 SIDEWALKS SHOULD HAVE MINIMUM WIDTH OF 1.20 METERS;
- 3.5 IF POSSIBLE, GRATING SHOULD NEVER BE LOCATED ALONG SIDEWALKS; WHEN OCCURRING ALONG SIDEWALKS, GRATING OPENINGS SHOULD HAVE A MAXIMUM DIMENSION OF 13mm x 13mm AND SHALL NOT PROJECT MORE THAN 6.5mm ABOVE OR BELOW THE LEVEL OF THE SIDEWALK;
- 3.6 SIDEWALKS SHOULD HAVE A CONTINUING SURFACE WITHOUT ABRUPT PITCHES IN ANGLE OR INTERRUPTIONS BY CRACKS OR BREAKS CREATING EDGES ABOVE 6.5mm;
- 3.7 IN LENGTHY OR BUSY SIDEWALKS, SPACES SHOULD BE PROVIDED AT SOME POINT ALONG THE ROUTE SO THAT A WHEELCHAIR MAY PASS ANOTHER OR TURN AROUND; THESE SPACES SHOULD HAVE A MINIMUM DIMENSION OF 1.5 METERS AND SHOULD BE SPACES AT A MAXIMUM DISTANCE OF 12.00 METERS BETWEEN STOPS;
- 3.8 TO GUIDE THE BLIND, SIDEWALKS SHOULD AS MUCH AS POSSIBLE FOLLOW STRAIGHT FORWARD ROUTES WITH RIGHT ANGLE TURNS;
- 3.9 WHERE PLANTING IS PROVIDED ADJACENT TO THE SIDEWALK, REGULAR MAINTENANCE IS ESSENTIAL TO ENSURE BRANCHES OF TREES OR SHRUBS DO NOT OVERHANG SIDEWALKS OR PATHS, AS THEY DO NOT ONLY PRESENT A PARTICULAR DANGER TO THE BLIND, BUT THEY ALSO REDUCE THE EFFECTIVE FOOTWAY WIDTH AVAILABLE TO PEDESTRIANS;

- 3.10 SIDEWALK HEADROOM SHOULD NOT BE LESS THAN 2.00m AND SHOULD PREFERABLY BE HIGHER;
- 3.11 PASSAGEWAYS FOR THE DISABLED SHOULD NOT BE OBSTRUCTED BY STREET FURNITURE, BOLLARDS, SIGN POST OR COLUMNS ALONG THE DEFINED ROUTE AS THEY CAN BE HAZARDOUS;
- 3.12 HANDRAILS SHALL BE INSTALLED BOTH SIDES OF RAMPS AND STAIRS AND AT THE OUTER EDGES OF DROPPED CURBS AT CROSSING; HANDRAILS AT DROPPED CURBS SHOULD NOT BE INSTALLED BEYOND THE WIDTH OF ANY CROSSING SO AS NOT TO OBSTRUCT PEDESTRIAN FLOW;
- 3.13 HANDRAILS SHALL BE INSTALLED AT 0.90m AND 0.70m ABOVE STEPS OR RAMPS. HANDRAILS FOR PROTECTION AT GREAT HEIGHTS MAY BE INSTALLED AT 1.00m TO 1.06m;
- 3.14 A 0.30m LONG EXTENSION OF THE HANDRAIL SHOULD BE PROVIDED AT THE START AND END OF RAMPS AND STAIRS;
- 3.15 HANDRAILS THAT REQUIRE FULL GRIP SHOULD HAVE A DIMENSION OF 30mm TO 50mm;
- 3.16 HANDRAILS ATTACHED TO WALLS SHOULD HAVE A CLEARANCE NO LESS THAN 50mm FROM THE WALL; HANDRAILS ON LEDGES SHOULD HAVE A CLEARANCE NOT LESS THAN 4mm;
- 3.17 WHERE OPEN SPACES ARE PROVIDED ADJACENT TO SIDEWALK, THE BLIND CAN BECOME PARTICULARLY DISORIENTED. THEREFORE, IT IS EXTREMELY HELPFUL IF ANY SIDEWALK OR PATHS CAN BE GIVEN DEFINED EDGES EITHER BY THE USE OF PLANTERS WITH DWARF WALLS, OR A GRASS VERGE, OR SIMILAR, WHICH PROVIDES A TEXTURE DIFFERENT FROM THE PATH.

1
PWD PROVISION ON SIDEWALKS, HANDRAILS AND OPEN SPACES
SCALE NTS



REPUBLIC OF THE PHILIPPINES
DEPARTMENT OF PUBLIC WORKS AND HIGHWAYS
REGIONAL OFFICE NO. XI
GOV. CHAVEZ COR. R. SAGSAGAY AVENUE, DAVAO CITY

PROJECT NAME AND LOCATION:

ROAD WIDENING - MAHARAJA HIGHWAY - (50036490) K1478 + 721 - K1478 + 867, (50036490) K1479 + 231 - K1479 + 245, DAVAO DEL NORTE

SHEET CONTENTS:

PWD PROVISION ON SIDEWALKS, HANDRAILS AND OPEN SPACES

DRAFTED AND PREPARED:

ARMANDO M. BASOC, JR.
ENGINEER II

DATE:

REVIEWED:

DENVER ALONSO A. SEMPIO
ENGINEER II, QC SECTION CHIEF

DATE:

SUBMITTED:

JUDY B. BERNARDINO
CHIEF, PLANNING AND DESIGN DIVISION

DATE:

RECOMMENDING APPROVAL:

JOSELO B. CABALLERO
ASSISTANT REGIONAL DIRECTOR

DATE:

APPROVED:

JUDY B. CORDON
REGIONAL DIRECTOR

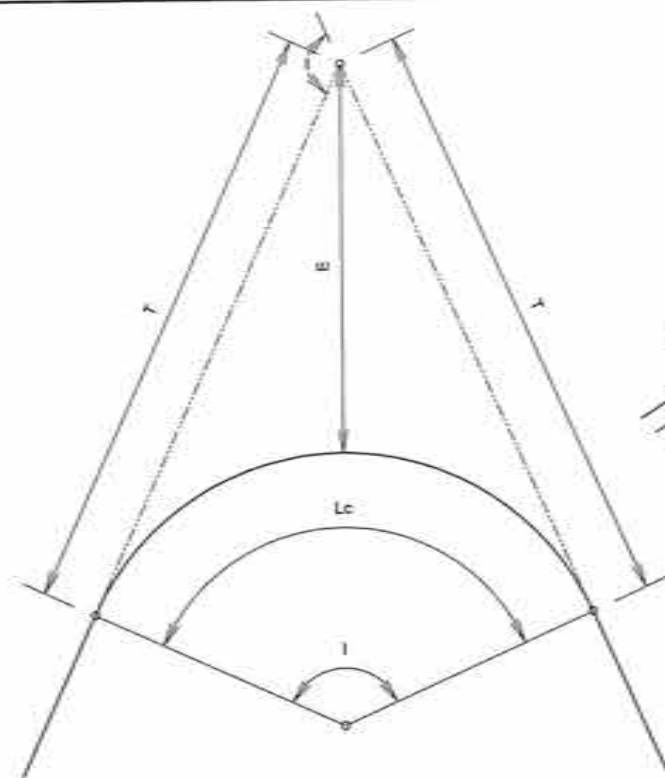
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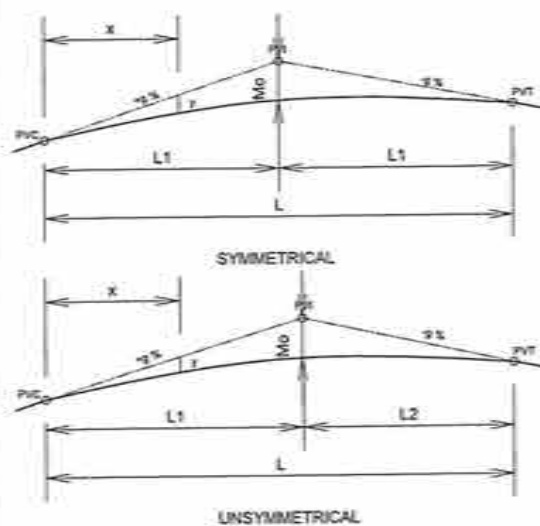
HORIZONTAL CURVE (CIRCULAR)

LEGEND: (HORIZONTAL CIRCULAR CURVE)

- PI = POINT OF INTERSECTION
- I = INTERSECTION ANGLE (CENTRAL ANGLE)
- T = TANGENT DISTANCE
- R = RADIUS
- Lc = LENGTH OF CURVE
- E = TOTAL EXTERNAL DISTANCE
- PC = POINT OF CURVATURE
- PT = POINT OF TANGENCY

NOTE:

1. NO HORIZONTAL CURVE IS REQUIRED WHEN THE INTERSECTION (CENTRAL ANGLE) IS LESS THAN ONE DEGREE (1°00').
2. LENGTH OF CIRCULAR CURVE, $L_c = (2\pi R) \sin \frac{I}{2}$



VERTICAL PARABOLIC CURVE

LEGEND: (HORIZONTAL CIRCULAR CURVE)

- PVI = POINT OF VERTICAL INTERSECTION
- PVC = POINT OF VERTICAL CURVATURE
- PVT = POINT OF VERTICAL TANGENCY
- L = LENGTH OF VERTICAL CURVE
- S = GRADE IN PERCENT
- M_o = MIDDLE ORDNATE
- x = DISTANCE FROM PVC OR PVT TO ANY POINT OF CURVE
- y = VERTICAL OFFSET IN METERS
- A = ALGEBRAIC DIFFERENCE OF GRADES

NOTE:

1. NO VERTICAL CURVE IS REQUIRED WHEN THE ALGEBRAIC DIFFERENCE IN GRADES IS LESS THAN 0.5% IN ANY VERTICAL PARABOLIC CURVE.

SYMMETRICAL

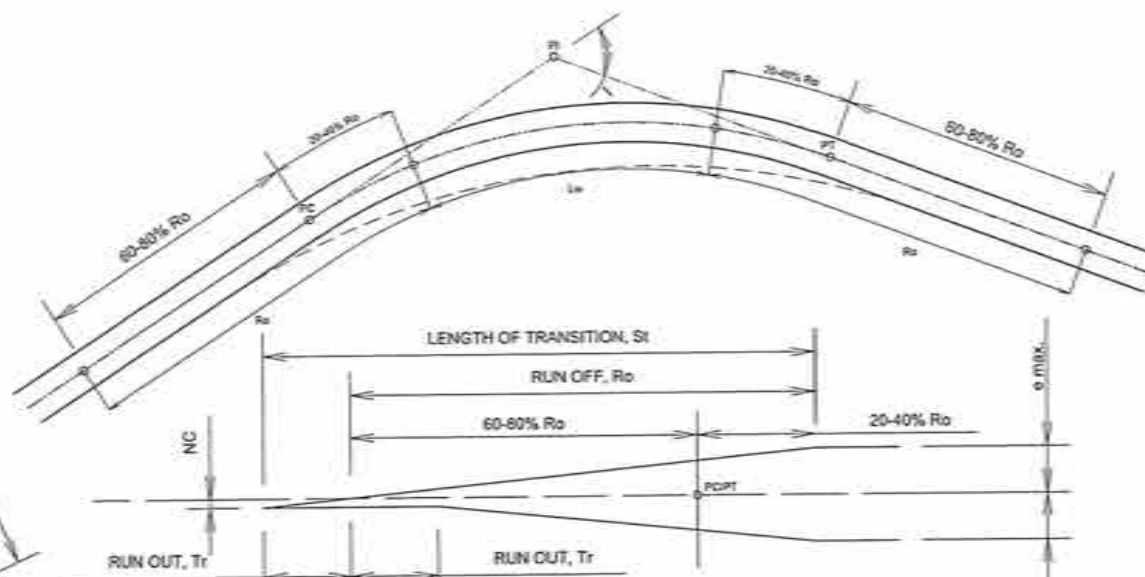
UNSYMMETRICAL

$$M_o = \frac{L^3 S}{480}$$

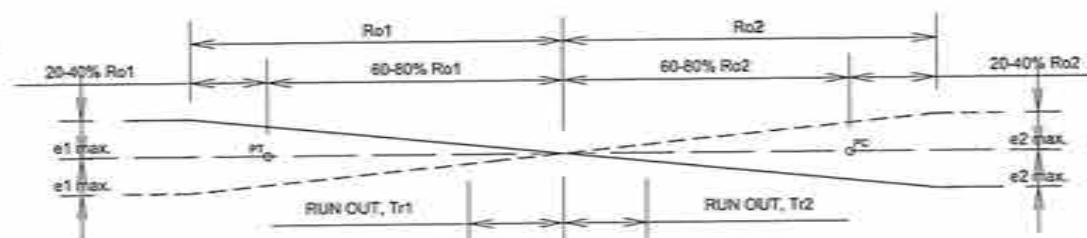
$$y = \frac{V^3 (PM)}{9.37}$$

$$M_o = \frac{L_1 L_2^2 S}{200}$$

$$y = \frac{V^3 (PM)}{3.17 (S_1 P + S_2 P)^2}$$



SHOWING HALF OF TRANSITION/EASEMENT - HORIZONTAL CURVATURE AND SUPERELEVATION
(DIAGRAMMATIC PROFILE - PAVEMENT REVOLVED ABOUT CENTERLINE)



SHOWING HALF OF TRANSITION/EASEMENT - REVERSED HORIZONTAL CURVATURE AND SUPERELEVATION
(DIAGRAMMATIC PROFILE - PAVEMENT REVOLVED ABOUT CENTERLINE)

WIDENING WHEN TRANSITIONS NOT USED

RADIUS OF CURVE	ROADWAY WIDTH = 6.00 MTS.					
	DESIGN SPEED (KPH)					
	50	60	70	80	90	100
3000	0.5	0.5	0.6	0.6	0.6	0.6
2500	0.5	0.6	0.6	0.6	0.6	0.6
2000	0.6	0.6	0.6	0.6	0.6	0.7
1500	0.6	0.6	0.7	0.7	0.7	0.7
1000	0.7	0.7	0.7	0.8	0.8	0.8
900	0.7	0.7	0.8	0.8	0.8	0.9
800	0.7	0.8	0.8	0.8	0.9	0.9
700	0.8	0.8	0.8	0.9	0.9	1.0
600	0.8	0.9	0.9	0.9	1.0	1.0
500	0.9	0.9	1.0	1.0	1.1	1.1
400	1.0	1.0	1.1	1.1	1.2	1.2
300	1.1	1.2	1.2	1.3	1.4	1.4
250	1.2	1.3	1.4	1.4	1.5	
200	1.4	1.5	1.5	1.5		
150	1.7	1.8	1.9	1.9		
140	1.8	1.9				
130	1.9	2.0				
120	2.0	2.1				
110	2.1	2.2				
100	2.2	2.3				
90	2.4					
80	2.6					
70	2.9					

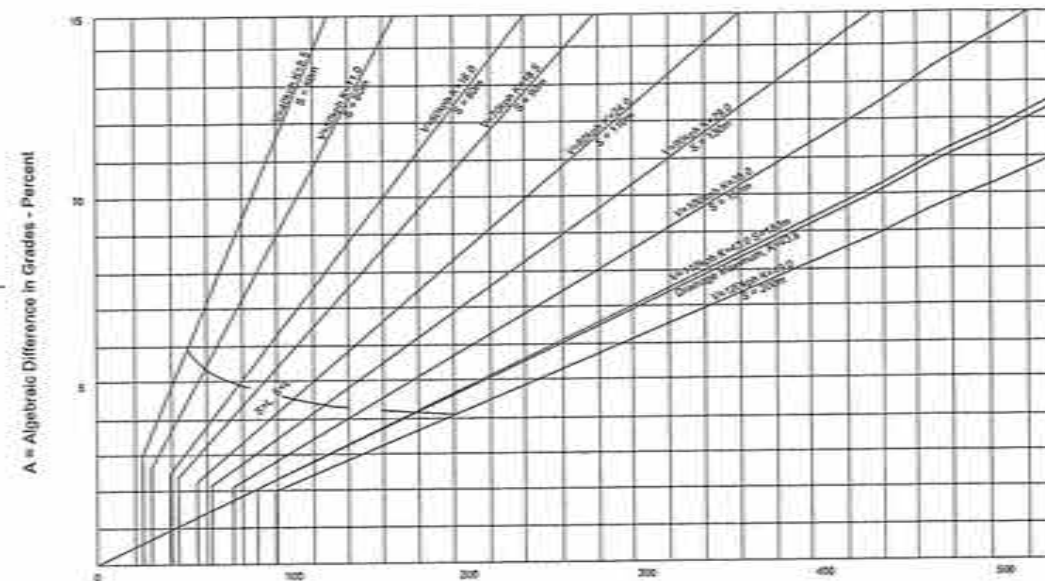
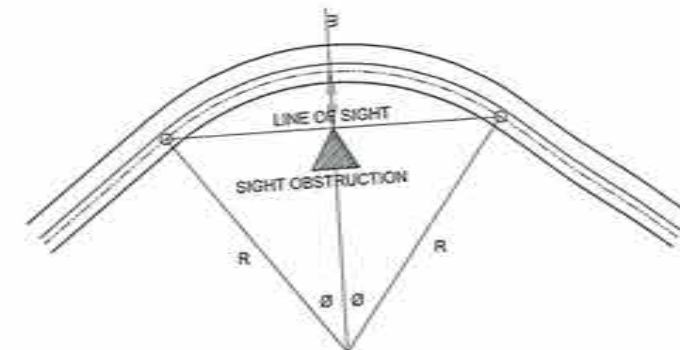
$$m = R \sin \frac{\theta}{2}$$

$$m = \frac{1145.92}{D} \sin \frac{SD}{2}$$

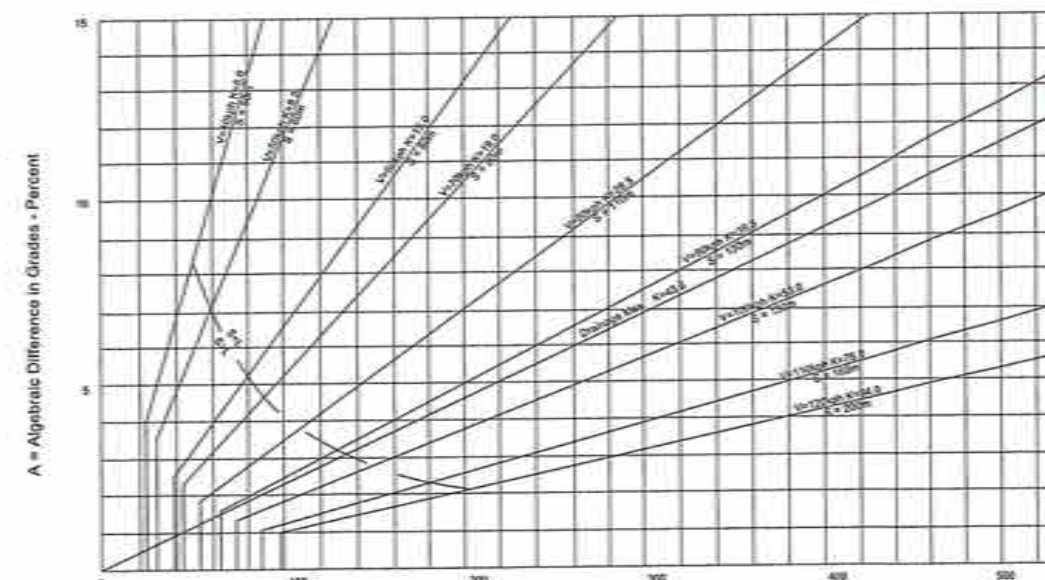
$$m = R \sin \frac{28.65 S}{R}$$

$$D = \frac{R}{28.65} \sin \frac{28.65 S}{R}$$

- D = DEGREE OF CURVE
- R = RADIUS OF CURVE
- S = ASSUMED DESIGN SPEED
- SD = STOPPING SIGHT DISTANCE
- m = MIDDLE ORDNATE
- θ = 1/2 OF INTERSECTION ANGLE



DESIGN CONTROLS FOR SAG VERTICAL CURVE
BASED ON MINIMUM STOPPING SIGHT DISTANCE (HEADLIGHT DISTANCE)



$$L = KA$$

$$K = \frac{S^3}{405} \quad (K \text{ ROUNDED})$$

DESIGN CONTROLS FOR CREST VERTICAL CURVE
BASED ON MINIMUM STOPPING SIGHT DISTANCE, (S)



REPUBLIC OF THE PHILIPPINES
DEPARTMENT OF PUBLIC WORKS AND HIGHWAYS
REGIONAL OFFICE NO. XI
GOV. CIRVEZ COR. R. BANGSAWAT AVENUE, DAUO CITY

PROJECT NAME AND LOCATION:

ROAD WIDENING - MAHARLIK HIGHWAY - (503649M) K1478 + 323 - K1479 + 367, (500649M) K1479 + 391 - K1479 + 545, DAUO DEL NORTE

SHEET CONTENTS:

DESIGN CRITERIA

DRAFTED AND PREPARED:

ARMANDO M. BASOC, JR.
ENGINEER

DATE:

REVIEWED:

JOSE R. ALDRIN A. SEMPIO
ENGINEER II, CIVIL SECTION CHIEF

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SUBMITTED:

JUDYANN T. BERNARDINO
CHIEF, PLANNING AND DESIGN DIVISION

DATE:

RECOMMENDING APPROVAL:

JOSEITO B. CABALLERO
ASSISTANT REGIONAL DIRECTOR

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APPROVED:

JUBY S. CORDON
REGIONAL DIRECTOR

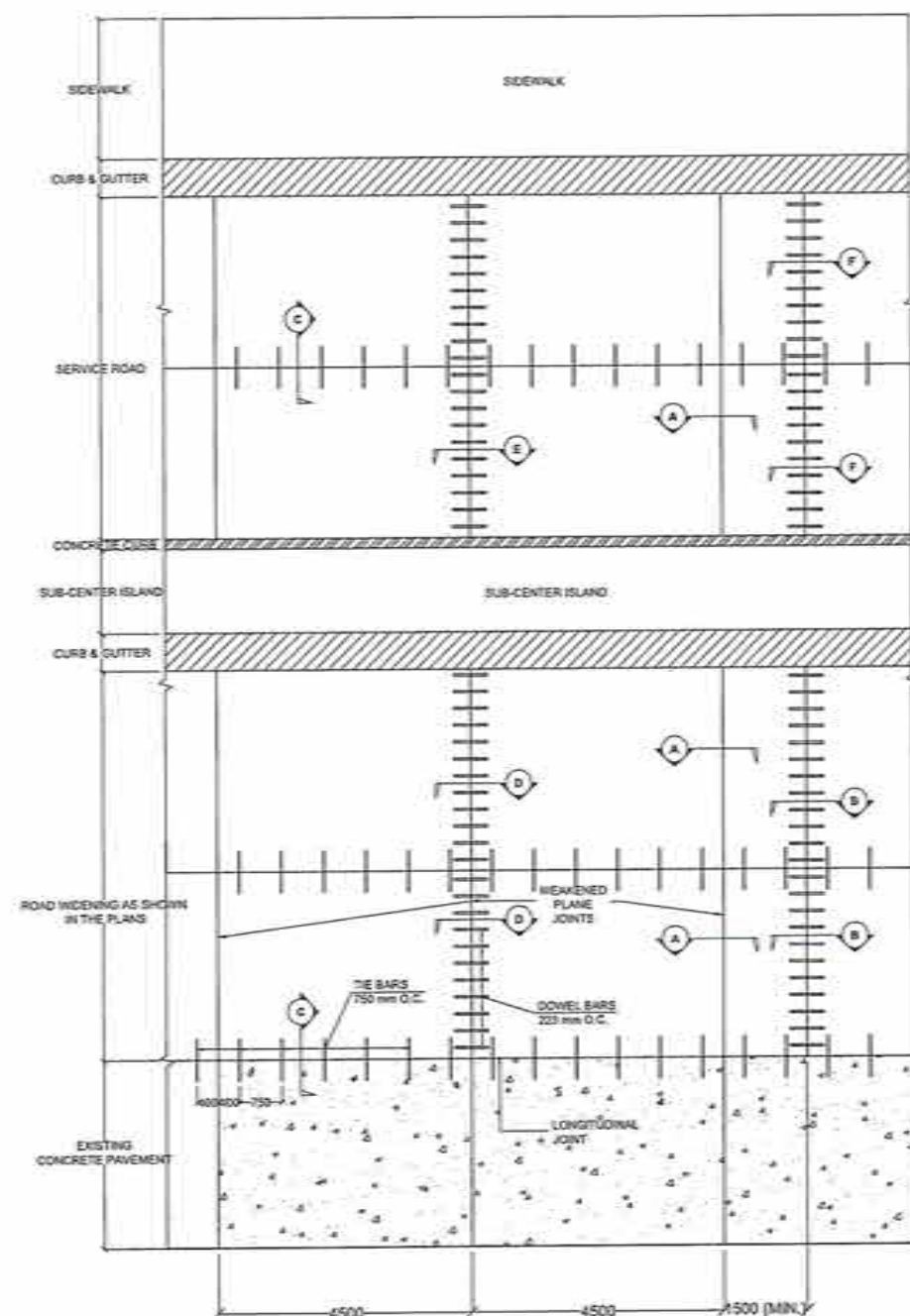
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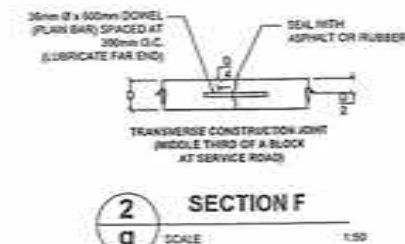
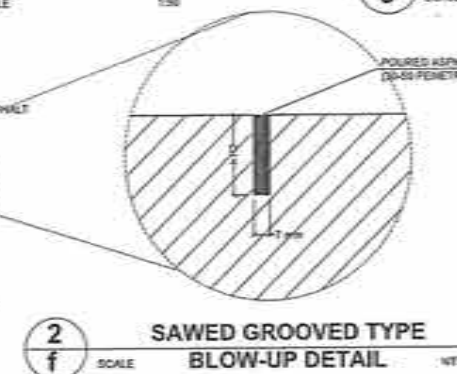
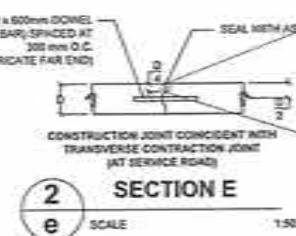
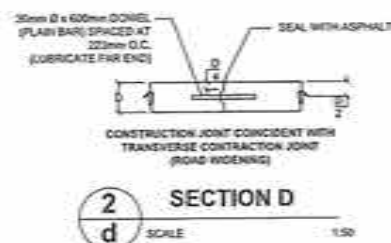
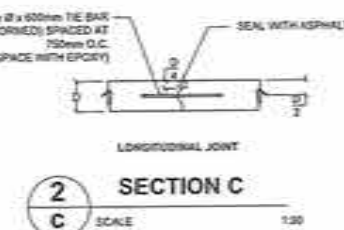
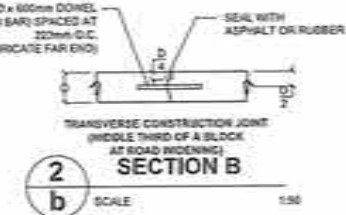
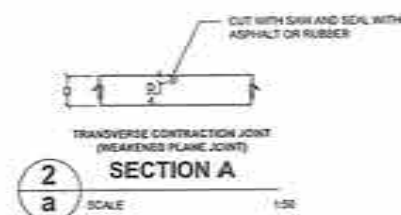
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1
a TYPICAL PLAN OF TEN-LANES PAVEMENT
WITH SERVICE ROAD
SCALE 1:100



2
e TYPICAL JOINT DETAIL
SCALE 1:100



1
b METAL SIDE FORM (KEYED JOINT) DETAIL
SCALE NTS

PAVEMENT DESIGN PARAMETERS

DESIGN LIFE	20	YEARS
TGR	4.00%	ASSUMED TRAFFIC GROWTH
R	85.00%	
Z _a	-1.037	
S _o	0.35	OVERALL STANDARD DEVIATION x 10 ⁶ (18 KIP ESAL)
W ₁₈		
PT	2.50	
ΔPSI	2.00	PRESENT SERVICEABILITY INDEX
S _c	751	PSI
Cd	1.00	
J	3.80	
E _c	3.605	x 10 ⁶ psi
k		psi

DESIGN CONDITIONS

DESIGN PERIOD		YEARS
ACTUAL LOADING		(INCLUDING OVERLOADED TRUCKS)
DESIGN ESAL		ONE DIRECTION
CONCRETE STRENGTH		PSI @ 28 DAYS

DESIGN CBR = MEAN CBR - $\frac{1}{2} S$

where: $S = \sqrt{\frac{1}{n} \sum (x_i - \bar{x})^2} / (n-1)$

MEAN CBR =

= $\left(\frac{1}{n} \sum CBR_i \right)^{0.5}$

CBR =

Resilient Modulus of Subgrade:

$M_R = CBR \times 1500$

$M_R =$

Resilient Modulus of Subgrade:

$k =$

Corrected k, (from the graphs):

$k_{corr} =$

3
f PAVEMENT DESIGN PARAMETERS
SCALE NTS

TABLE FOR SPACING OF TIE BARS (L=600mm)		
SLAB THICKNESS (mm)	SPACING, S _t (mm)	
	12mm Ø	16mm Ø
230	600	750
240	600	750
250	600	750
260	500	750
270	500	750
280	500	750
290	500	750
300	500	750
310	400	750
320	400	750
330	400	750
340	400	750

BASES ON AASHTO GUIDE FOR THE DESIGN OF PAVEMENT STRUCTURES 1993

TABLE FOR SPACING OF PLAIN DOWEL (L=600mm)		
SLAB THICKNESS (mm)	DIAMETER, D (mm)	SPACING, S _d (mm)
230	28	300
240	30	300
250	32	300
260	32	300
270	34	300
280	36	300
300	38	300

NOTE:
DIAMETER AND SPACING OF PLAIN DOWEL BARS MAY BE MODIFIED AS LONG AS THE EQUIVALENT STEEL AREA IS SUSTAINED.

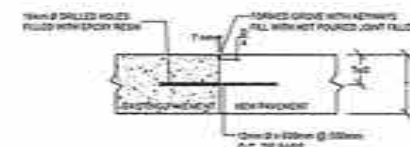
NOTE:

1. MATERIALS AND WORKMANSHIP SHALL CONFORM WITH THE "DPWH STANDARD SPECIFICATION FOR HIGHWAYS, BRIDGE AND AIRPORTS 2013".
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. NO CONSTRUCTION JOINT SHALL BE PLACED WITHIN 1.50m FROM THE WEAKENED PLANE JOINT.
3. AT CONSTRUCTION JOINTS (LONGITUDINAL OR TRANSVERSE) CARE SHOULD BE TAKEN THAT NO CONCRETE FROM THE LAST SLAB PLACED OVERHANGS ANY PORTION OF THE FIRST SLAB.
4. TIE BARS SHOULD BE DEFORMED STEEL BARS, ALL DOWEL BARS SHALL BE SMOOTH AROUND STEEL BAR FREE FROM RUST AND OTHER DEFECTS (REFER TO CLAUSE 3.1, 3, 12, THE STANDARD SPECIFICATION FOR ROADS AND BRIDGES 1995).
5. TYPE OF WEAKENED PLANE JOINT TO BE USED SHALL BE SPECIFIED IN THE PLANS AND ONLY ONE TYPE SHALL BE USED FOR THE WHOLE PROJECT.
6. MATERIAL FOR THE METAL SIDE FORM SHALL BE BRAND NEW SHEET METAL GAUGE NO. 18 OF BLACK IRON FREE FROM 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 SEAL OR COLD APPLIED LIQUID RUBBER COMPOUND AFTER THE CONCRETE HARDENS AND BEFORE OPENING THE PAVEMENT TO THE TRAFFIC. PENETRATION ASPHALT SEAL ON CONCRETE PAVEMENT JOINT SHALL BE POURED IN SUCH MANNER THAT SPILLING WILL BE ELIMINATED / PREVENTED. THUS, PROVIDING A SMOOTH LEVELING / RIDING SURFACE.
9. ALL TRANSVERSE JOINT EXCEPT CONSTRUCTION JOINT SHALL BE CONTINUOUS FROM EDGE TO EDGE.
10. ALL LONGITUDINAL JOINTS SHALL MEET AT INTERSECTION WITH NO GAPS OR OFFSET.
11. ALL DIMENSIONS ARE IN MILLIMETERS UNLESS OTHERWISE SPECIFIED.
12. AVOID STOPPAGE OF FORMWORKS ALONG CURVES.

MINIMUM STANDARDS (AS PER D.O. 40 S. 2014)			SUBSTITUTE	
SLAB DEPTH mm	DOWEL SIZE mm	SPACING mm	DOWEL SIZE mm	SPACING mm
280	36	300	32	250
			28	190
			25	150
290	36	295	32	230
			28	170
			25	140
300	36	274	32	210
			28	160
			25	130
310	36	255	32	200
			28	150
			25	120
320	36	238	32	190
			28	140
			25	110
330	36	223	32	180
			28	130
			25	110
340	36	209	32	170
			28	130
			25	100

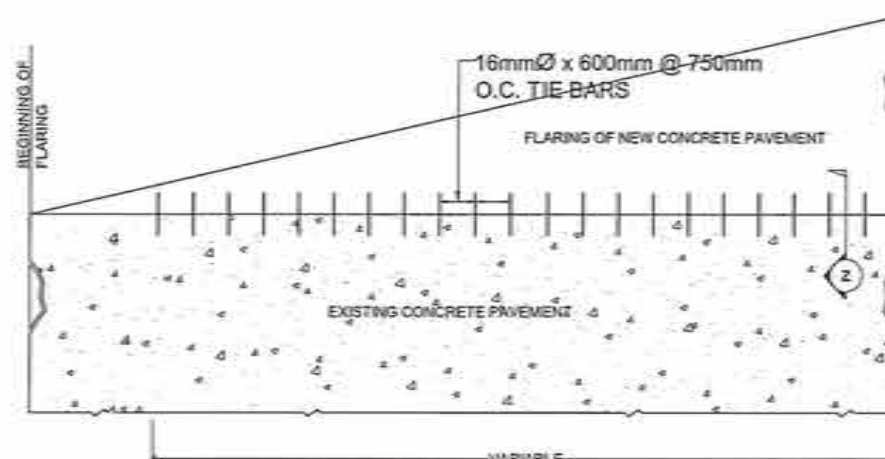
NOTE:

IF IN CASE THE REQUIRED DIAMETER OF 36mm IS NOT COMMERCIALY AVAILABLE, SMALLER DOWEL BARS CAN BE USED WITH ADJUSTMENT IN BAR SPACING AS SHOWN IN THE ABOVE TABLE.



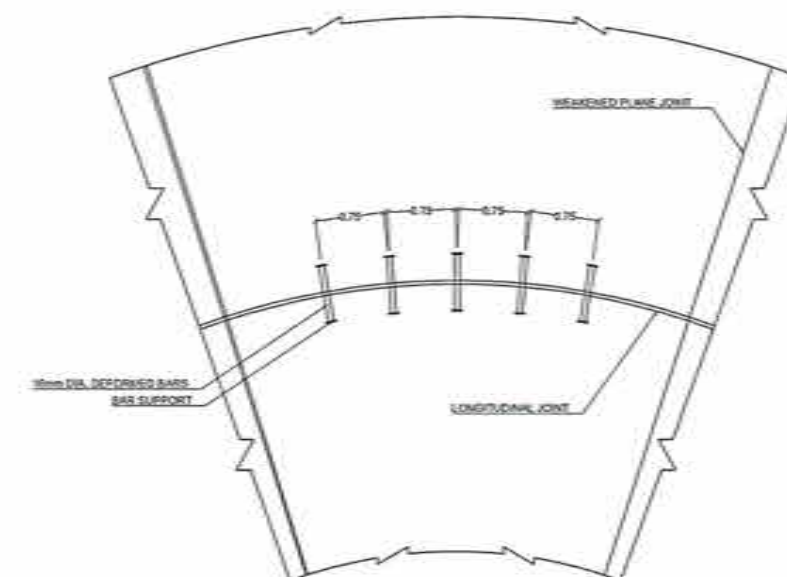
CONSTRUCTION JOINT TO BE USED FOR EXISTING CONCRETE PAVEMENT

2 SECTION Z
SCALE 1:25



PLAN

1 FLARING OF CONCRETE PAVEMENT
SCALE 1:75



3 TRANSVERSE CONSTRUCTION JOINT / WEAKENED JOINT
SCALE NTS



REPUBLIC OF THE PHILIPPINES
DEPARTMENT OF PUBLIC WORKS AND HIGHWAYS
REGIONAL OFFICE NO. XI
GOV. CHAVEZ COR. R. MAGSAYSAY AVENUE, DAVAO CITY

PROJECT NAME AND LOCATION:
ROAD WIDENING - MAHARLAKA HIGHWAY - (50136400) K1478 + 721 - K1478 + 847, (50006400) K1479 + 201 - K1479 + 145, DAVAO DEL NORTE

SHEET CONTENTS:
FLARING OF CONCRETE PAVEMENT
PAVEMENT DESIGN PARAMETERS
TRANSVERSE CONSTRUCTION JOINT / WEAKENED JOINT
SECTION Z

DRAFTED AND PREPARED:
ARMANDO M. BASOC, JR.
ENGINEER II
DATE:

REVIEWED:
DENNIS ALON A. SEMPIO
ENGINEER II, DCE SECTION CHIEF
DATE:

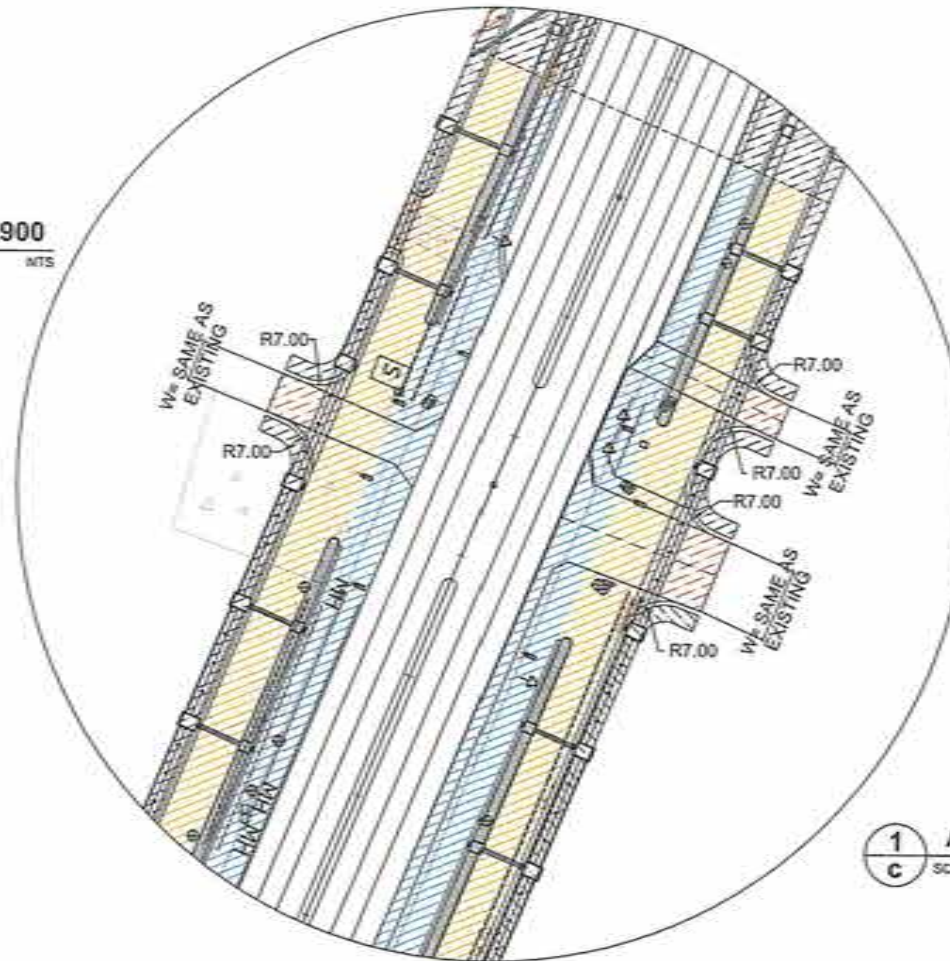
SUBMITTED:
JUDY ANN T. BERNARDINO
CHIEF, PLANNING AND DESIGN DIVISION
DATE:

RECOMMENDING APPROVAL:
JOSE LITO B. CABALLERO
ASSISTANT REGIONAL DIRECTOR
DATE:

APPROVED:
JUBY B. CORDON
REGIONAL DIRECTOR
DATE:

SET NO. 14/17
SHEET NO. 14/50

1 AT STA. 1478+767.900
a SCALE NTS



1 AT STA. 1478+740.000
b SCALE NTS

1 AT STA. 1478+767.900
c SCALE NTS

1 JUNCTION DETAILS
SCALE NTS

JUNCTION SCHEDULE						
STATION	TYPE	THICKNESS (MM)	AREA OF ITEM 311(1)g1 (SQ. M)	AREA OF ITEM 105(1)a (SQ. M)	VOLUME OF ITEM 200(1) (CU. M)	LOCATION
SECTION 1: STA. 1478+767.900	CONCRETE	330	84.32	84.32	15.86	RIGHT SIDE
SECTION 2: STA. 1478+767.900	CONCRETE	330	137.12	137.12	27.42	LEFT SIDE
STA. 1478+740.000	CONCRETE	330	76.17	76.17	15.23	LEFT SIDE
TOTAL			297.61	297.61	59.52	

2 JUNCTION SCHEDULE
SCALE NTS

REMOVAL OF PCCP, 330 MM THICK				
STATION	LENGTH (M)	WIDTH (M)	AREA (SQ. M)	LOCATION
SECTION 1: STA. 1478+767.900	26.53	6.40	169.79	RIGHT SIDE
SECTION 2: STA. 1478+767.900	26.53	11.49	304.94	LEFT SIDE
STA. 1478+740.000	25.88	5.51	142.47	LEFT SIDE
TOTAL		23.40	617.20	

3 REMOVAL OF PCCP AT JUNCTION SCHEDULE
SCALE NTS



REPUBLIC OF THE PHILIPPINES
DEPARTMENT OF PUBLIC WORKS AND HIGHWAYS
REGIONAL OFFICE NO. XI
GOV. CHAVEZ COR. R. SANSANAY AVENUE, DAVAO CITY

PROJECT NAME AND LOCATION:

ROAD WIDENING - MAHARLIKA HIGHWAY - (S0134+000) K1478 + 721 - K1478 + 847, (S00064000) K1479 + 201 - K1479 + 145, DAVAO DEL NORTE

SHEET CONTENTS:

JUNCTION DETAILS
JUNCTION SCHEDULE
REMOVAL OF PCCP AT JUNCTION SCHEDULE

DRAFTED AND PREPARED:

ARMANDO M. BASCO, JR.
ENGINEER II

REVIEWED:

DENVIRALDIN A. SEMPIO
ENGINEER II, C.E. SECTION CHIEF

SUBMITTED:

JUDYANN T. BERNARDINO
CHIEF, PLANNING AND DESIGN DIVISION

RECOMMENDING APPROVAL:

JOSE LITO B. CABALLERO
ASSISTANT REGIONAL DIRECTOR

APPROVED:

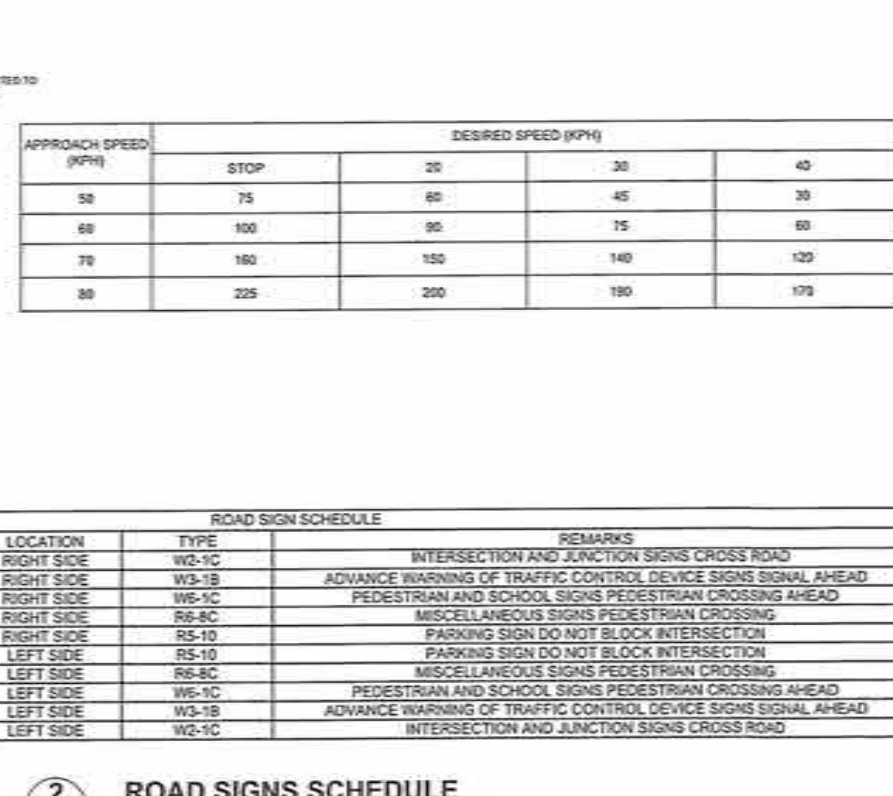
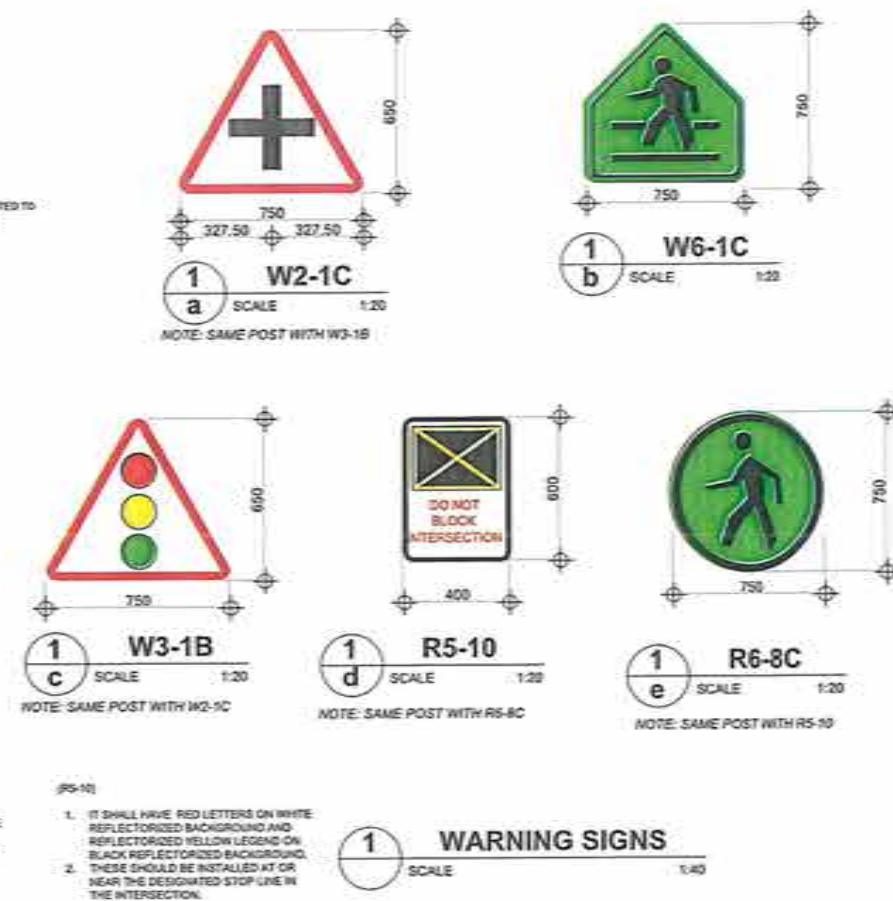
JUBY B. CORDON
REGIONAL DIRECTOR

SET NO.

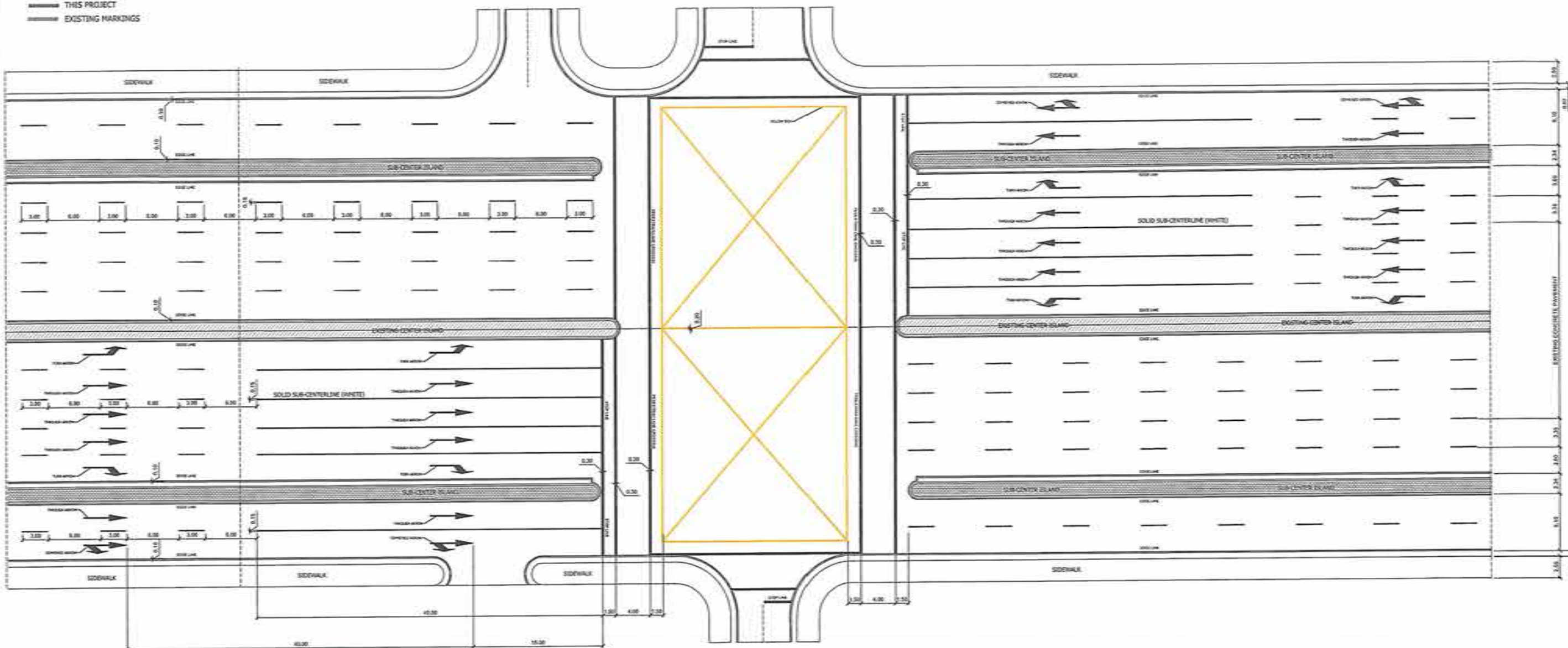
A
15/17

SHEET NO.

15
50



LEGENDS:
 THIS PROJECT
 EXISTING MARKINGS



1 a TYPICAL PAVEMENT MARKING DETAILS SCALE NTS

FOR CENTERLINE & SUB-CENTERLINE (ROAD WIDENING & SERVICE ROAD)

STATION LIMITS	BACK	AHEAD	LENGTH (M)	SOLID CENTERLINE (0.15M THK.)	SUB-CENTERLINE (BROKEN 0.15M X 3.00M)	AREA
SECTION 1: STA. 1478+708.320 - STA. 1478+708.813	STA. 1478+708.813	STA. 1478+708.813	49.49	49.49	-	30.00
STA. 1478+708.813 - STA. 1478+708.854	-	-	41.85	-	4.00	2.40
SECTION 2: STA. 1478+708.854 - STA. 1478+708.912	-	-	57.35	-	4.00	1.35
STA. 1478+708.912 - STA. 1478+708.912	STA. 1478+708.912	STA. 1478+708.912	40.00	40.00	-	30.00
STA. 1478+708.912 - STA. 1478+708.912	STA. 1478+708.912	STA. 1478+708.912	41.75	-	3.00	1.50
STA. 1478+708.912 - STA. 1478+708.912	STA. 1478+708.912	STA. 1478+708.912	41.75	-	3.00	1.50
TOTAL			217.493	85.000	17.000	65.100

FOR OUTER EDGE LINE (SERVICE ROAD)

STATION LIMITS	BACK	AHEAD	LENGTH OF EDGE LINE (0.15 M THK.)	AREA
SECTION 1: STA. 1478+707.521 - STA. 1478+708.854	STA. 1478+708.854	STA. 1478+708.854	145.00	21.75
SECTION 2: STA. 1478+708.854 - STA. 1478+708.912	STA. 1478+708.912	STA. 1478+708.912	145.00	21.75
TOTAL			290.000	43.500

FOR INNER EDGE LINE (SUB-CENTER ISLAND)

STATION LIMITS	PERIMETER (0.15 M THK.)	AREA
SECTION 1: STA. 1478+707.521 - STA. 1478+708.813	84.25	8.44
STA. 1478+708.813 - STA. 1478+708.854	136.50	13.65
SECTION 2: STA. 1478+708.854 - STA. 1478+708.912	136.50	13.65
STA. 1478+708.912 - STA. 1478+708.912	84.25	8.44
TOTAL		44.18

PAVEMENT ARROW SCHEDULE

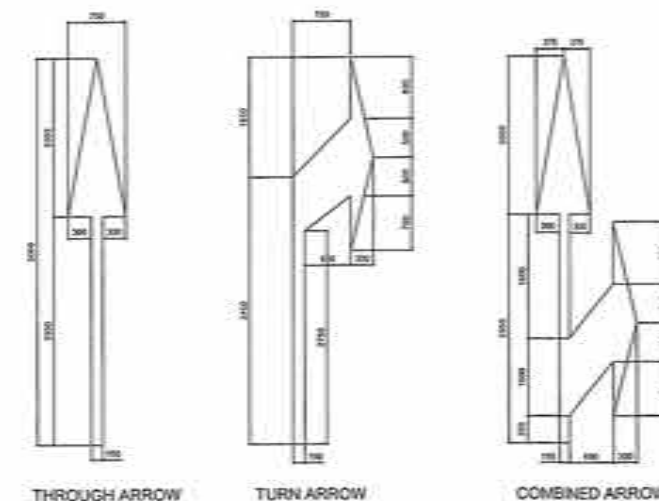
STATION	THROUGH ARROW A = 1.211 SQ.M	TURN ARROW A = 1.204 SQ.M	COMBINED ARROW A = 2.415 SQ.M	AREA (SQ. M)
SECTION 1: STA. 1478+707.521 - STA. 1478+708.854	8.00	4.00	2.00	20.00
SECTION 2: STA. 1478+708.854 - STA. 1478+708.912	8.00	4.00	2.00	20.00
TOTAL				40.00

PEDESTRIAN CROSSING MARKINGS

STATION	STOP LINE (M)	PEDESTRIAN CROSSING (M)	AREA (SQ. M)
STA. 1478+708.813 - STA. 1478+708.912	35.50	200.750	102.50
TOTAL			102.50

YELLOW BOX

STATION	LENGTH (M)	AREA (SQ. M)
STA. 1478+708.813 - STA. 1478+708.912	200.750	35.10
TOTAL		35.10



2 PAVEMENT MARKINGS SCHEDULE SCALE NTS

1 b TYPICAL ARROW PAVEMENT MARKING DETAILS SCALE NTS



REPUBLIC OF THE PHILIPPINES
 DEPARTMENT OF PUBLIC WORKS AND HIGHWAYS
 REGIONAL OFFICE NO. X
 GOV. CHAVEZ COR. R. MAGSAYSAY AVENUE, DAVAO CITY

PROJECT NAME AND LOCATION

ROAD WIDENING - MARARUKA HIGHWAY - (00334990) K1478 + 725 - K1478 + 867, (00064490) K1478 + 705 - K1478 + 745, DAVAO DEL NORTE

SHEET CONTENTS

TYPICAL PAVEMENT MARKING DETAILS
 TYPICAL ARROW PAVEMENT MARKING DETAILS
 PAVEMENT MARKINGS SCHEDULE

DRAFTED AND PREPARED

ARMANDO M. BASOC, JR.
 ENGINEER II

REVIEWED

DENVER A. SEMPIO
 ENGINEER II, DISTRICT CHIEF

SUBMITTED

JUDY M. T. BERNARDINO
 CHIEF, PLANNING AND DESIGN DIVISION

RECOMMENDING APPROVAL

JOSE LITO B. CABALLERO
 ASSISTANT REGIONAL DIRECTOR

APPROVED

JUDY B. CORDON
 REGIONAL DIRECTOR

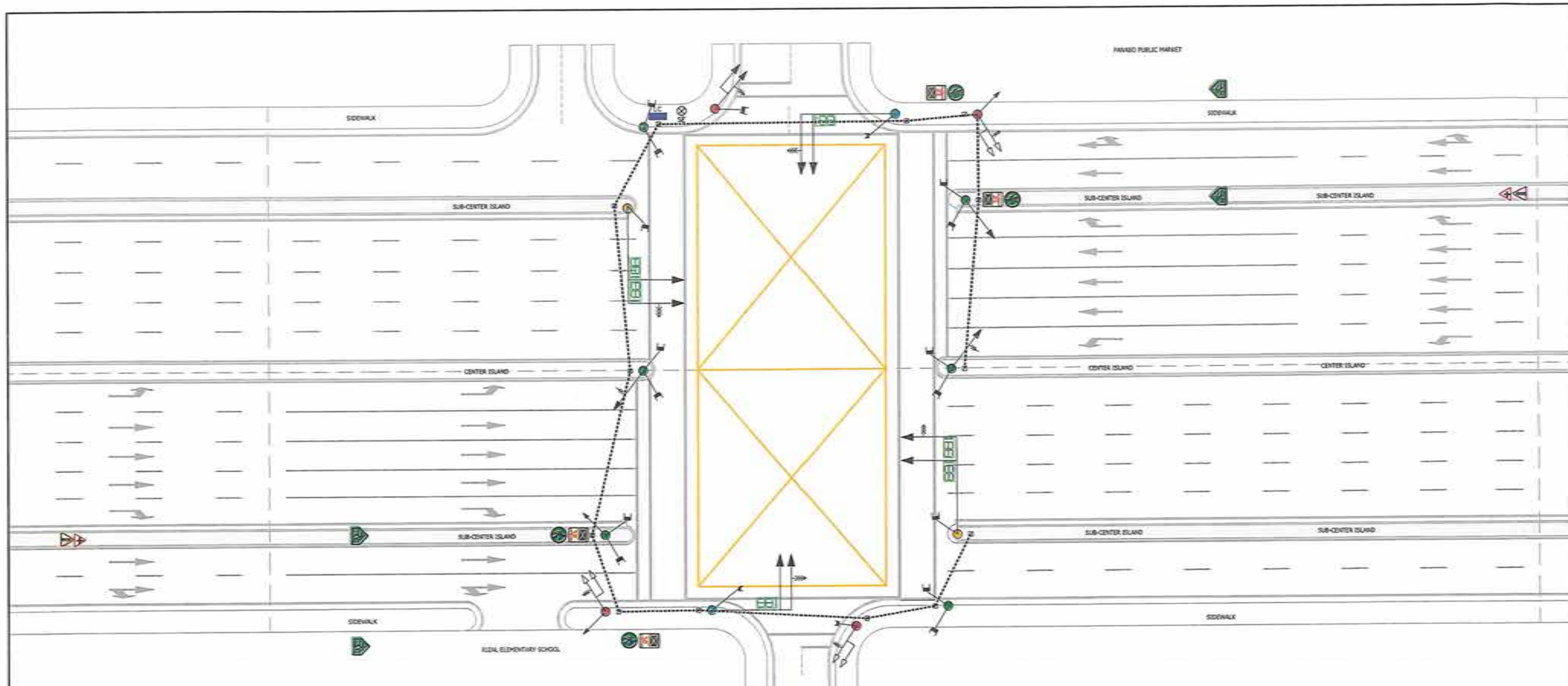
SET NO.

A
17/17

SHEET NO.

17
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B. INSTALLATION OF TRAFFIC SIGNALS



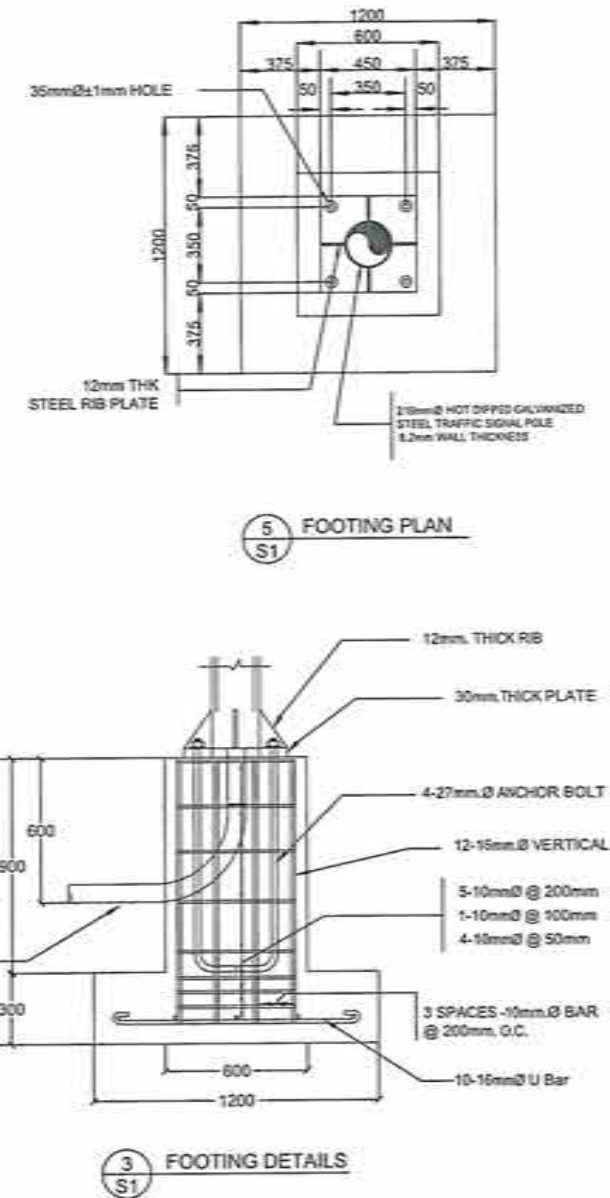
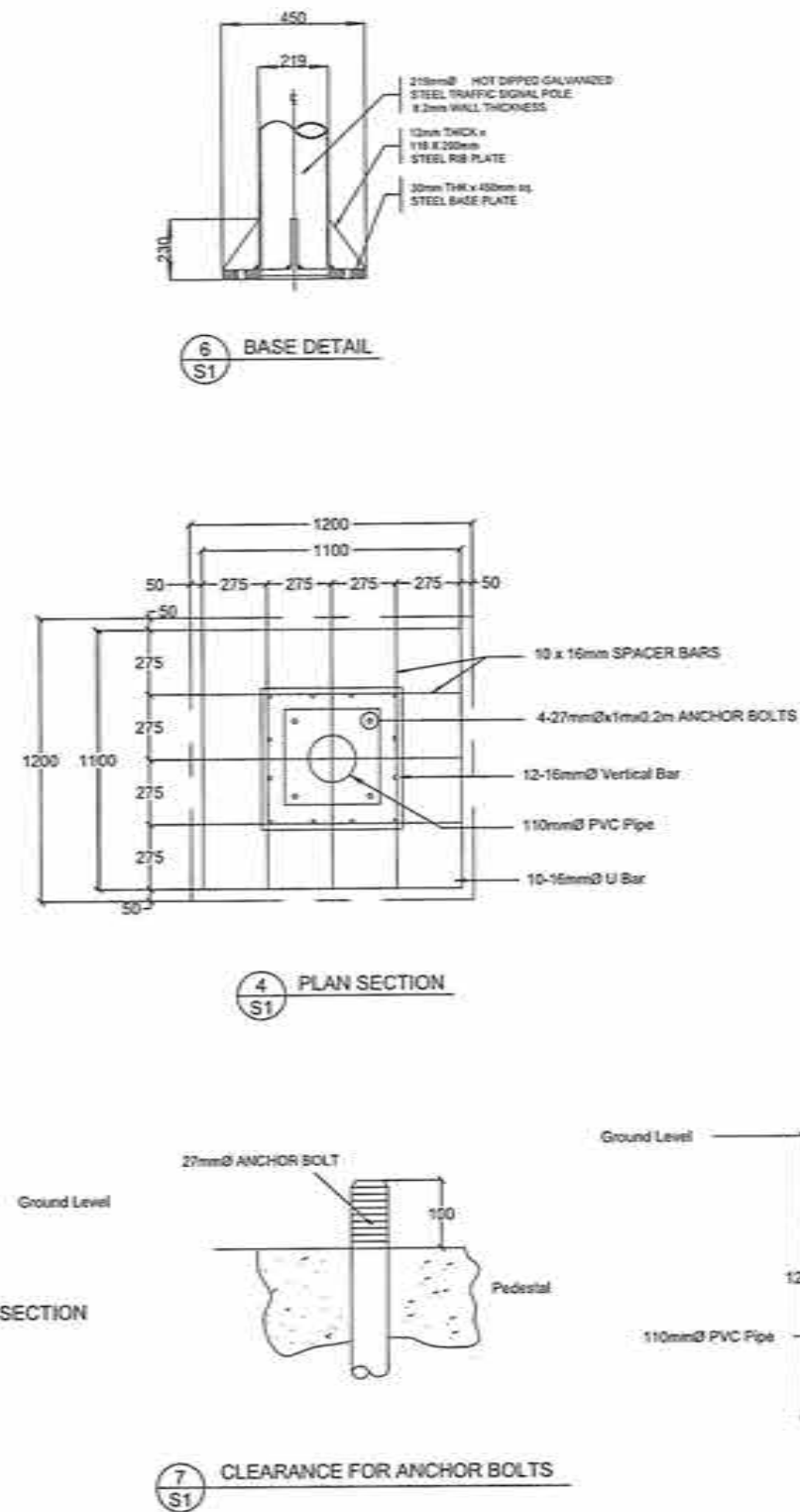
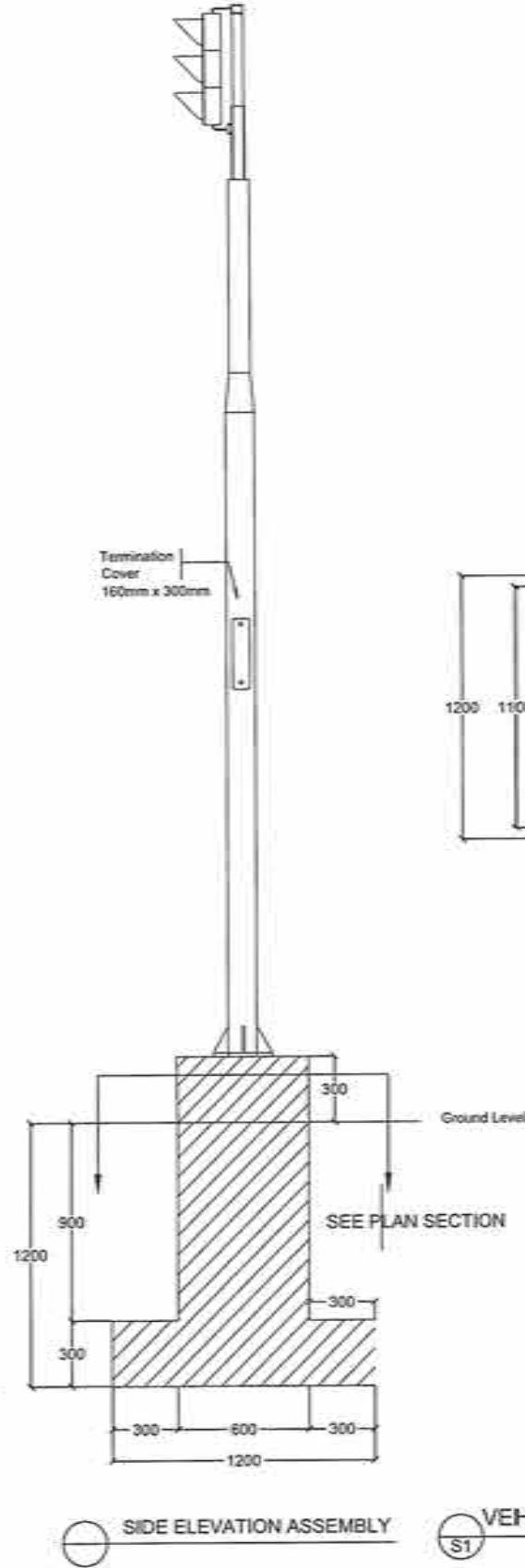
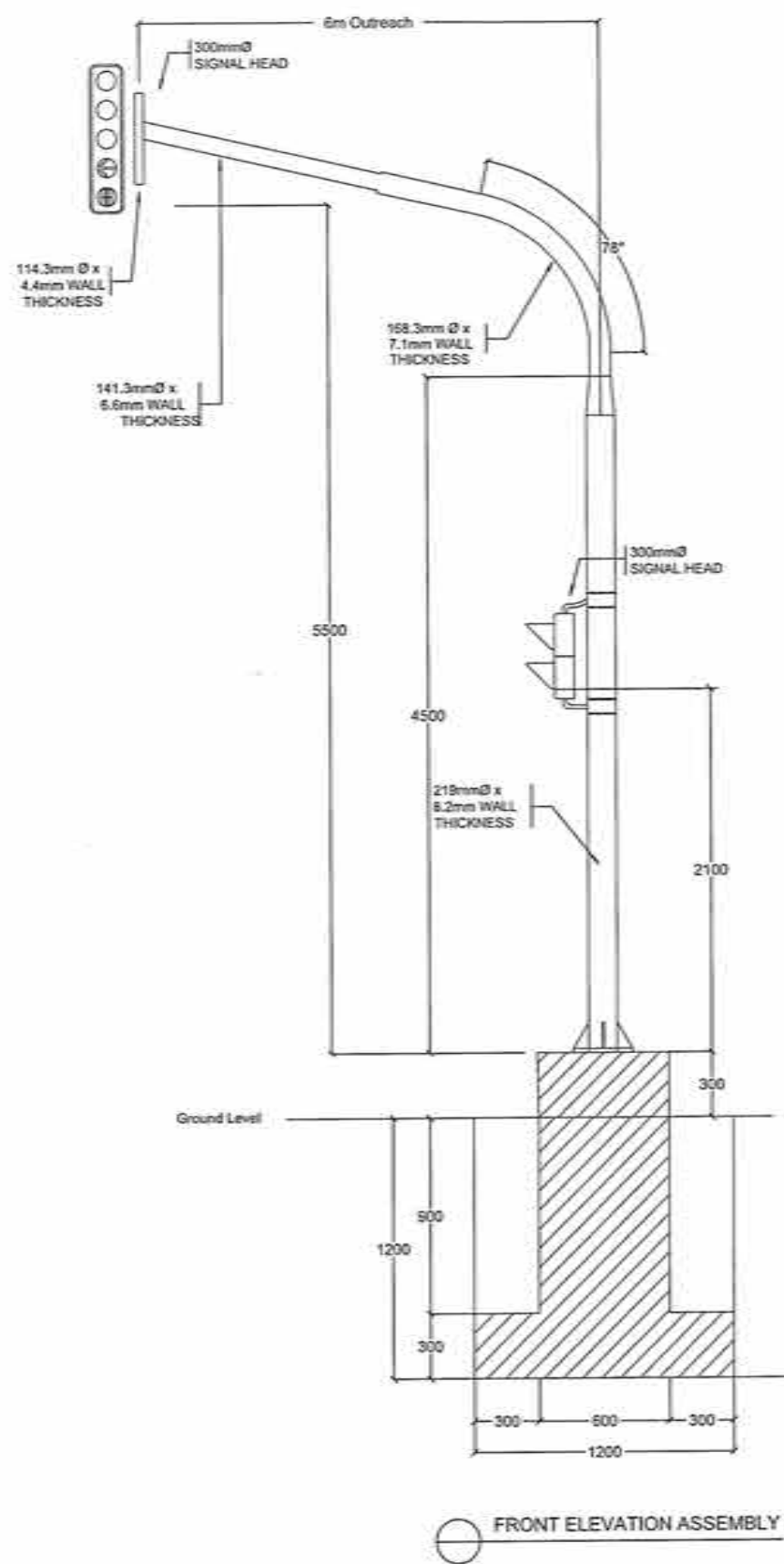
LEGEND:

- 6ASPECT (RB, YB, GB, RA, YA, GA)
- 3ASPECT (RB, YB, GB)
- 3ASPECT (RA, YA, GA)
- 2ASPECT pedestrian lantern
- 2SDIGIT countdown timer
- Type A12 Pole with 12m Arm
- Type B 4.2m Straight Pole
- Hand hole
- Local Controller
- Existing Type B 4.2m Straight Pole (Existing to be utilized)
- Existing Type A MMDA Pole with 6m Arm (Existing to be utilized)
- Service Entrance
- R6-SC Pedestrian Crossing
- R5-10 Do not Block Intersection
- W6-1C Pedestrian and School Signs Pedestrian Crossing Ahead
- W3-1B Traffic Lights Ahead
- W2-1C Intersection and Junction Signs Cross Road
- Trenching

PHASE 1	PHASE 2	PHASE 3	PHASE 4

1 TRAFFIC SIGNALS PLAN

REPUBLIC OF THE PHILIPPINES DEPARTMENT OF PUBLIC WORKS AND HIGHWAYS REGIONAL OFFICE NO. XI GOV. CHAVEZ COR. R. MAGSAYSAY AVENUE, DAVAO CITY	PROJECT NAME AND LOCATION:	SHEET CONTENTS:	DRAFTED AND PREPARED:	REVIEWED:	SUBMITTED:	RECOMMENDING APPROVAL:	APPROVED:	SET NO.	SHEET NO.
	ROAD WIDENING - MURARLIKAI HIGHWAY - (K1478 TO K1479 + 345, DAVAO DEL NORTE)	TRAFFIC SIGNALS PLAN	ARMANDO M. BASOC, JR. ENGINEER	DENVER ALDRIN A. SEMPID ENGINEER, CIVIL DESIGN CHIEF	JUDYANN T. BERNARDINO CHIEF, PLANNING AND DESIGN DIVISION	JOSEFINO B. CABALLERO ASSISTANT REGIONAL DIRECTOR	JUSY B. CORDON REGIONAL DIRECTOR	B 01/09	18 50



VEHICLE TRAFFIC SIGNAL POLE (TYPE A) - 6m MAST ARM



REPUBLIC OF THE PHILIPPINES
DEPARTMENT OF PUBLIC WORKS AND HIGHWAYS
REGIONAL OFFICE NO. XI
GOV. CHAVEZ COR. R. MAGSAYSAY AVENUE, DAVAO CITY

PROJECT NAME AND LOCATION:
ROAD WIDENING - INKARILKA HIGHWAY - (501364M) K1478 + 735 - K1478 + 867, (500064M) K1479 + 315 - K1479 + 345, DAVAO DEL NORTE

SHEET CONTENTS:
VEHICLE TRAFFIC SIGNAL POLE (TYPE A) - 6M MAST ARM DETAILS

DRAFTED AND PREPARED:
ARMANDO M. BASOC, JR.
ENGINEER
DATE:

REVIEWED:
DENNIS ALONSO A. SEMPIO
ENGINEER & QC SECTION CHIEF
DATE:

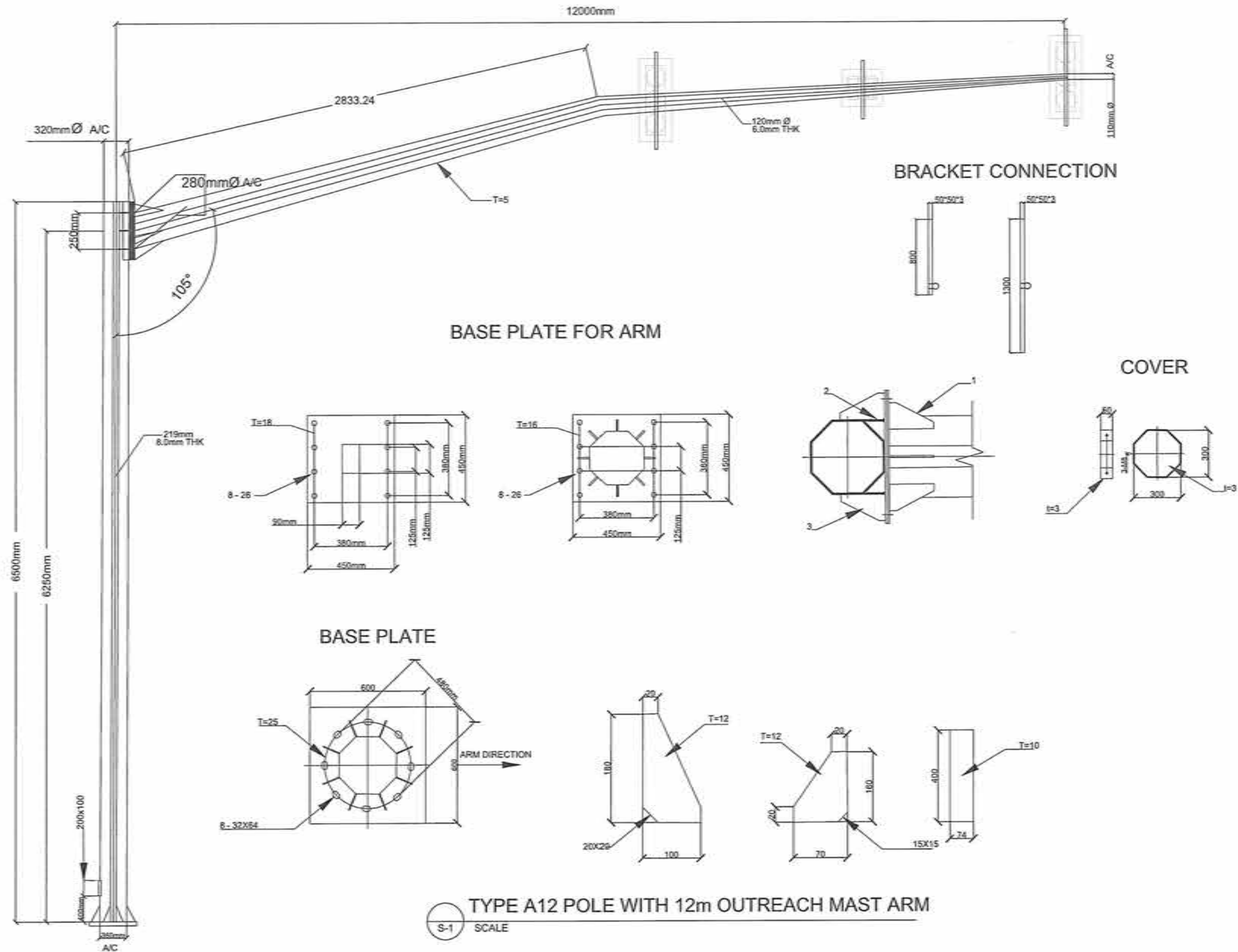
SUBMITTED:
JUDY B. BERNARDINO
CHIEF PLANNING AND DESIGN DIVISION
DATE:

RECOMMENDING APPROVAL:
JOSEITO B. CABALLERO
ASSISTANT REGIONAL DIRECTOR
DATE:

APPROVED:
JUDY B. CORDON
REGIONAL DIRECTOR
DATE:

SET NO.
B
02/09

SHEET NO.
19
50



REPUBLIC OF THE PHILIPPINES
DEPARTMENT OF PUBLIC WORKS AND HIGHWAYS
REGIONAL OFFICE NO. XI
GOV. CHAVEZ COR. R. WAGSAY AVENUE, DAVAO CITY

PROJECT NAME AND LOCATION:
ROAD WIDENING - MAHARLEGA HIGHWAY - (S015140M) K3478 + 721 - K3478 + 867, (S000540M) K3479 + 291 - K3479 + 345, DAVAO DEL NORTE

SHEET CONTENTS:
TYPE A12 POLE WITH 12M OUTREACH MAST ARM DETAILS

DRAFTED AND PREPARED:
ARMANDO M. BASOC, JR.
ENGINEER
DATE:

REVIEWED:
DENYR ACORIN A. SEMPIO
ENGINEER, OIC SECTION CHIEF
DATE:

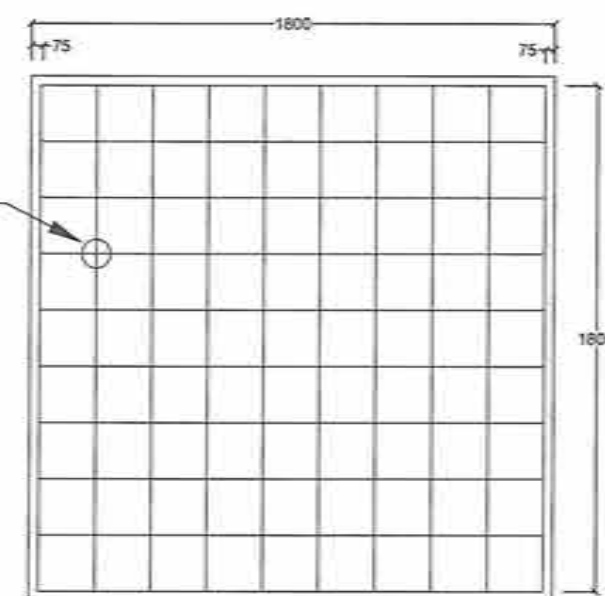
SUBMITTED:
JUDY ANN T. BERNARDINO
CHIEF, PLANNING AND DESIGN DIVISION
DATE:

RECOMMENDING APPROVAL:
JOSELO B. CABALLERO
ASSISTANT REGIONAL DIRECTOR
DATE:

APPROVED:
JUBY B. CORDON
REGIONAL DIRECTOR
DATE:

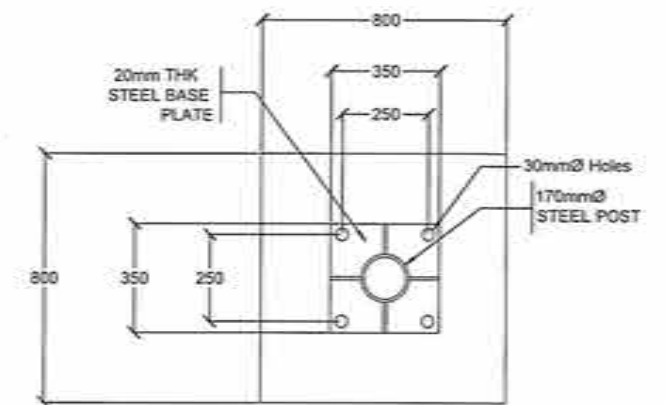
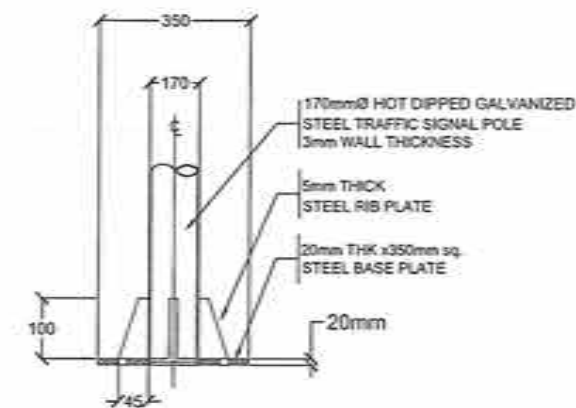
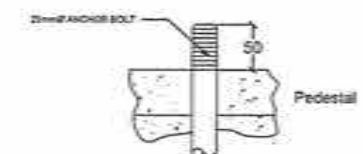
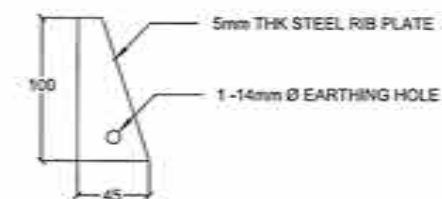
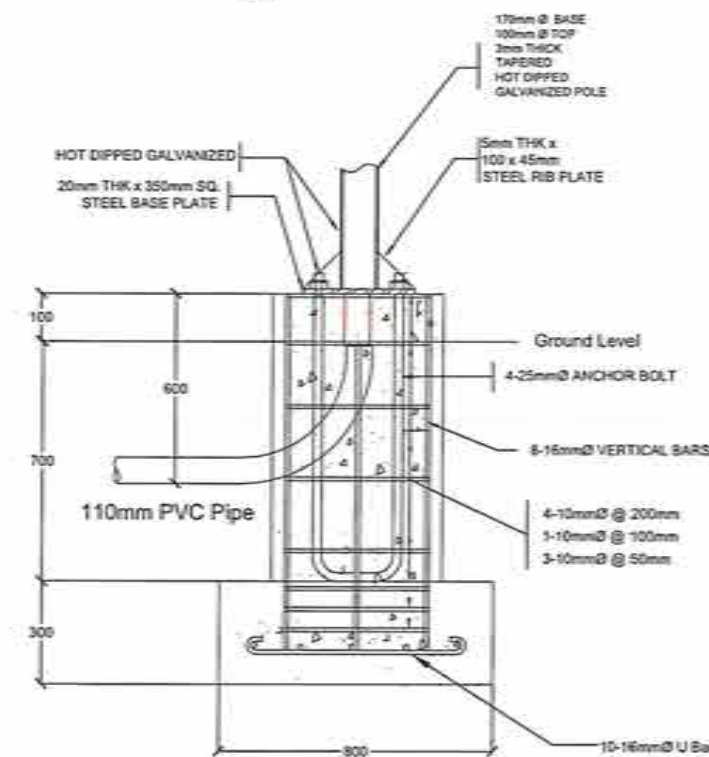
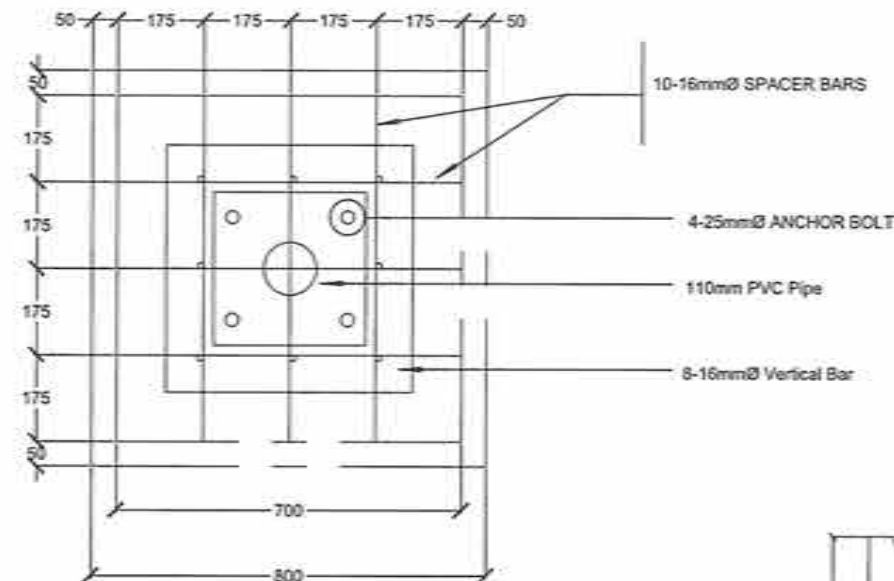
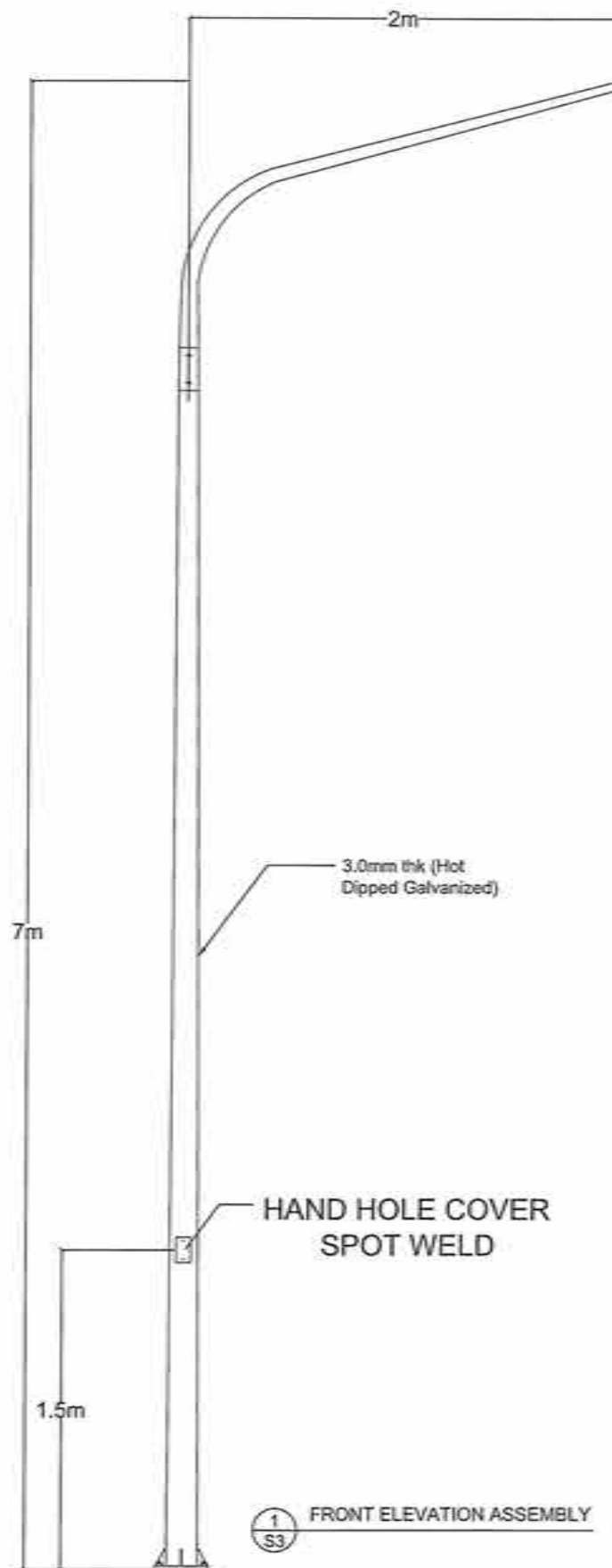
SET NO.
B
03/09

SHEET NO.
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FOOTING PLAN DETAIL

TYPE A12 POLE FOOTING



Primary Combination Straight Pole

S3



REPUBLIC OF THE PHILIPPINES
DEPARTMENT OF PUBLIC WORKS AND HIGHWAYS
REGIONAL OFFICE NO. XI
GEN. DIAZ COR. R. MAGSAYSAY AVENUE, DAVAO CITY

PROJECT NAME AND LOCATION

ROAD WIDENING - MANARULA HIGHWAY - (501364M) K1478 + 725 - K1478 + 867, (500964M) K1479 + 292 - K1479 + 345, SAKAD-DEL NORTE

SHEET CONTENTS:

PRIMARY COMBINATION
STRAIGHT POLE DETAILS

DRAFTED AND PREPARED:

ARMANDO M. BASCO, JR.
ENGINEER I

DATE:

REVIEWED:

DENVER ALDRIN A. SEMPJO
CHECK PLANNING AND DESIGN DIVISION

DATE:

SUBMITTED:

JUDY ANNE T. BERNARDINO
CHECK PLANNING AND DESIGN DIVISION

DATE:

RECOMMENDING APPROVAL:

JOSE LITO B. CABALLERO
ASSISTANT REGIONAL DIRECTOR

DATE:

APPROVED:

JUDY B. CORDON
REGIONAL DIRECTOR

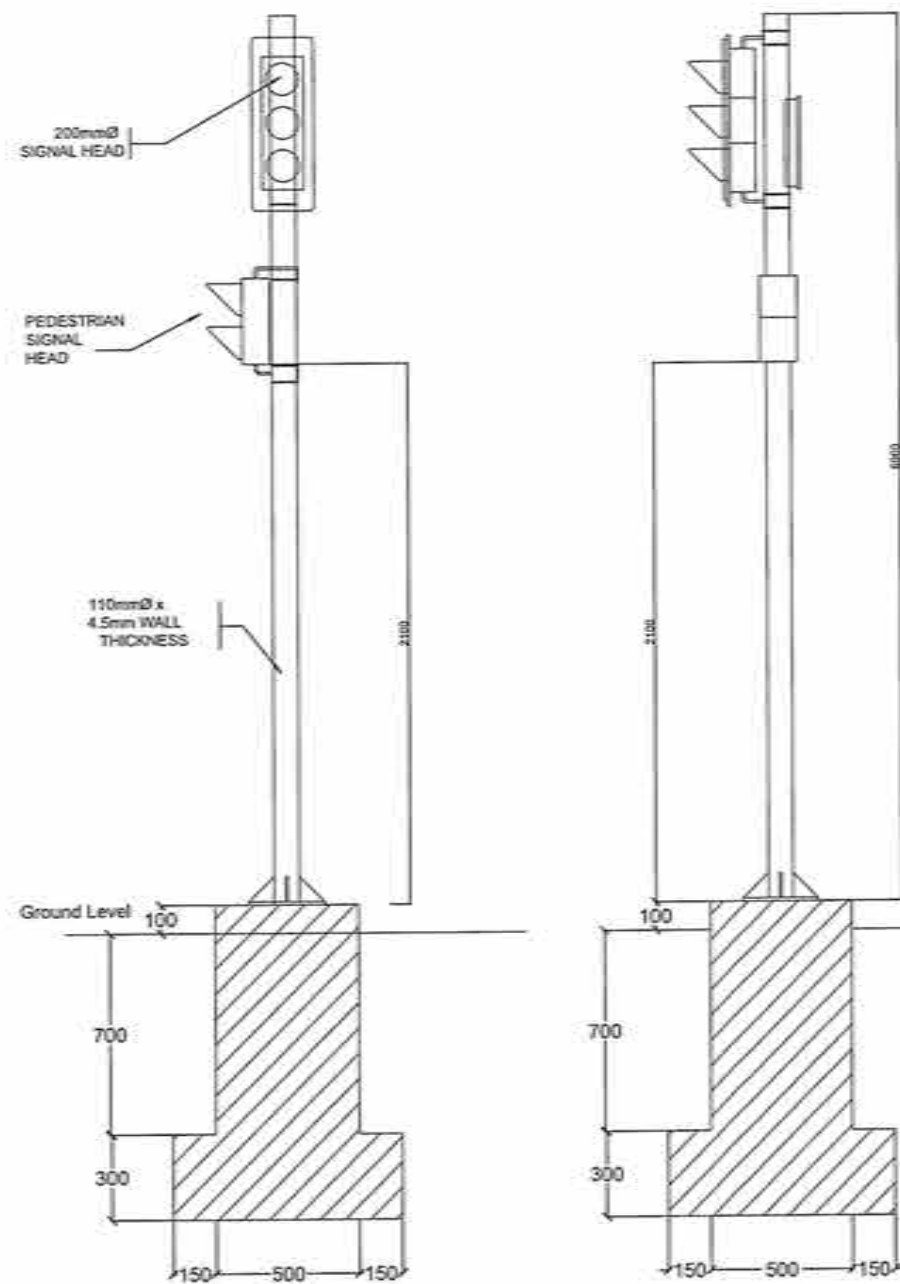
DATE:

SET NO.

B
05/09

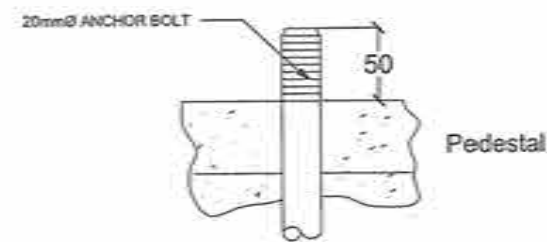
SHEET NO.

22
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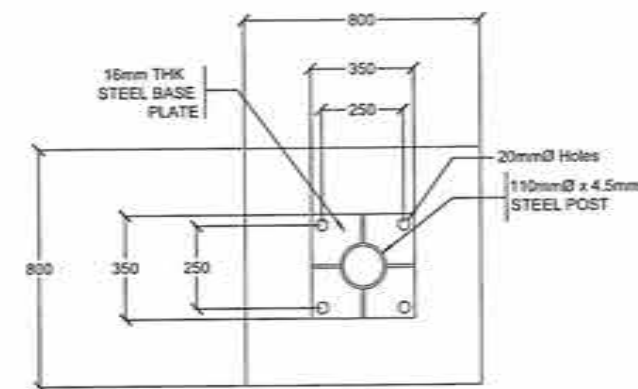


1 FRONT ELEVATION ASSEMBLY

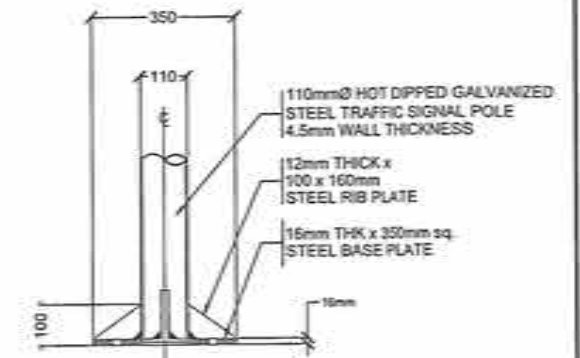
2 SIDE ELEVATION ASSEMBLY



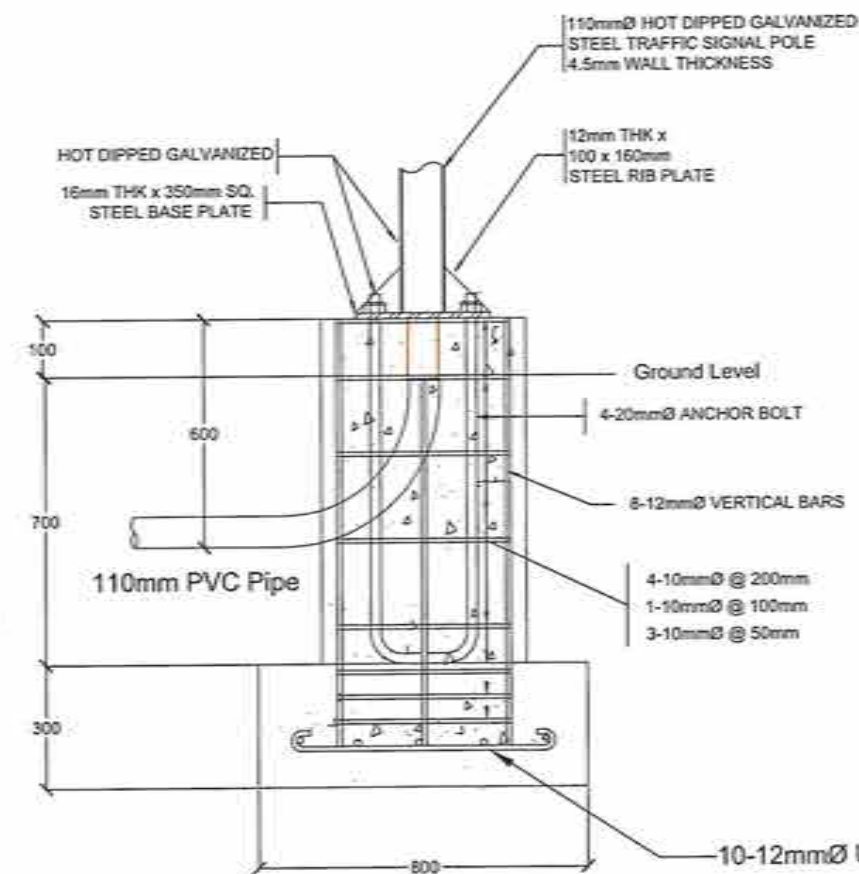
7 CLEARANCE FOR ANCHOR BOLTS



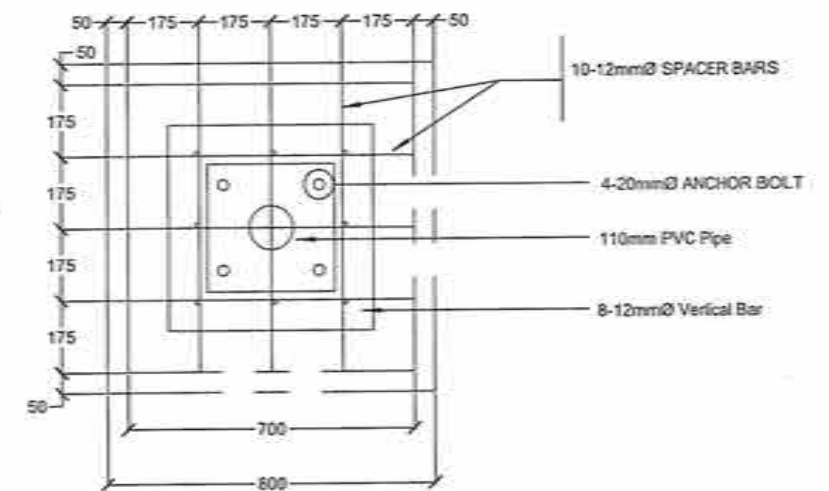
5 FOOTING PLAN



6 BASE DETAIL



3 SECTION FOOTING



4 PLAN SECTION

VEHICLE TRAFFIC SIGNAL POLE (TYPE B6)



REPUBLIC OF THE PHILIPPINES
DEPARTMENT OF PUBLIC WORKS AND HIGHWAYS
REGIONAL OFFICE NO. XI
GOV. CHAVEZ COR. R. MAGSAYSAY AVENUE, DAVAO CITY

PROJECT NAME AND LOCATION:
ROAD WIDENING - MAKALINGA HIGHWAY - (SR156499) K1478 + 721 - K1479 + 867, (SR160499) K1479 + 293 - K1479 + 345, DAVAO DEL NORTE

SHEET CONTENTS:
VEHICLE TRAFFIC SIGNAL POLE (TYPE B6) DETAILS

DRAFTED AND PREPARED:
ARMANDO M. BASOC, JR.
ENGINEER I
DATE:

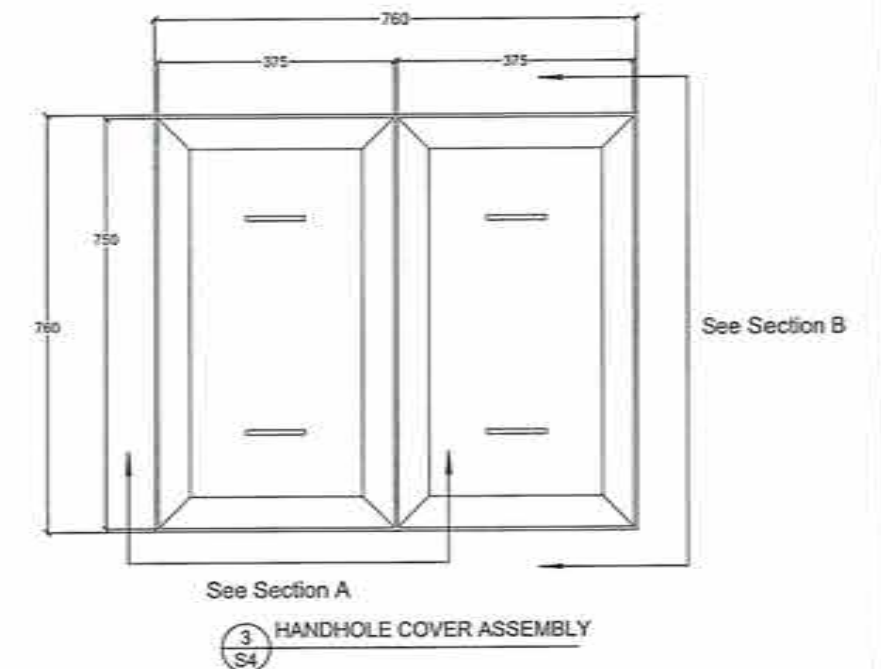
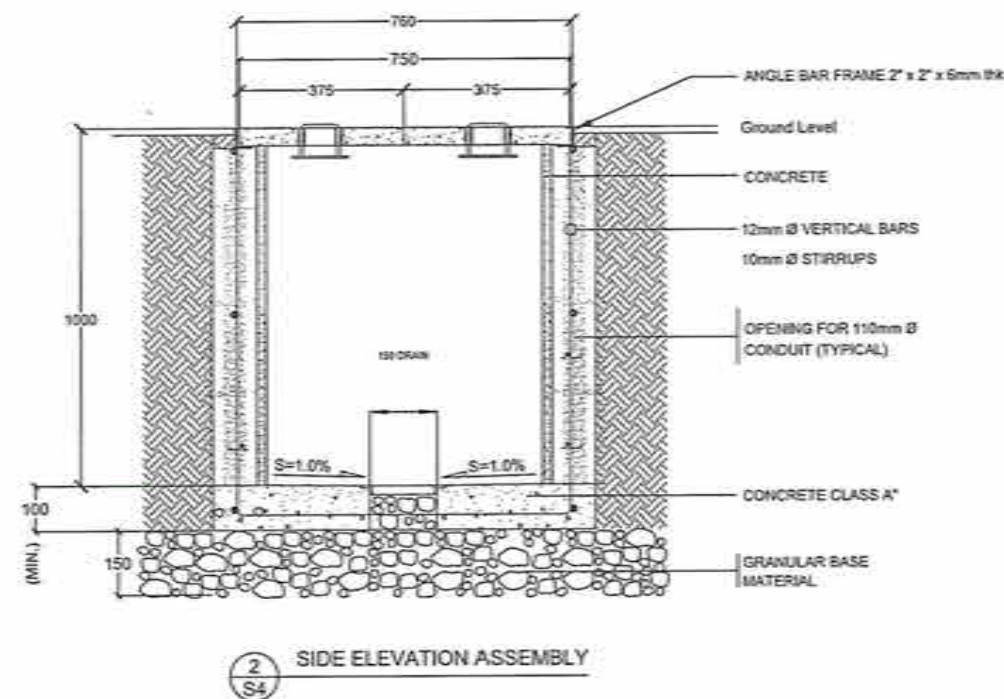
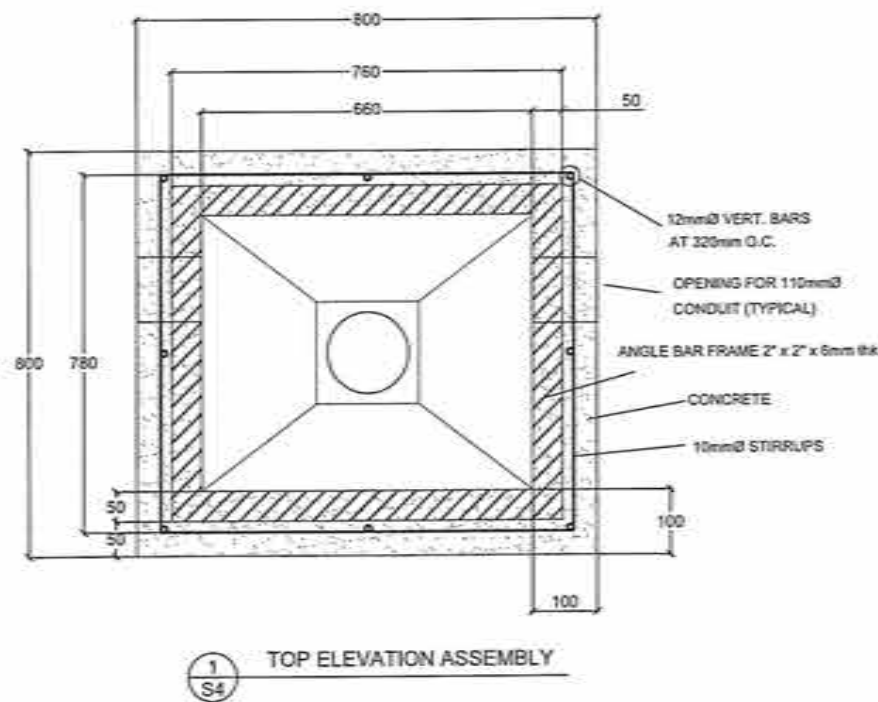
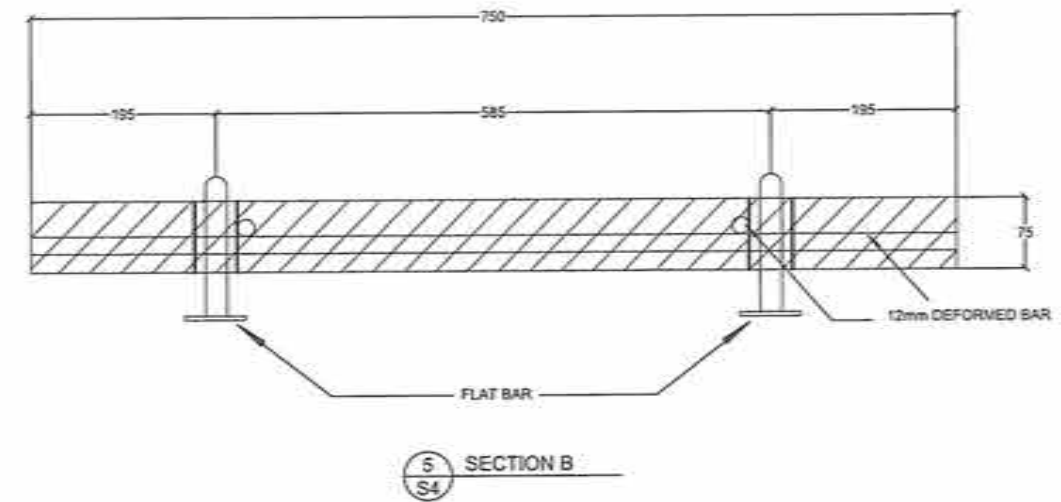
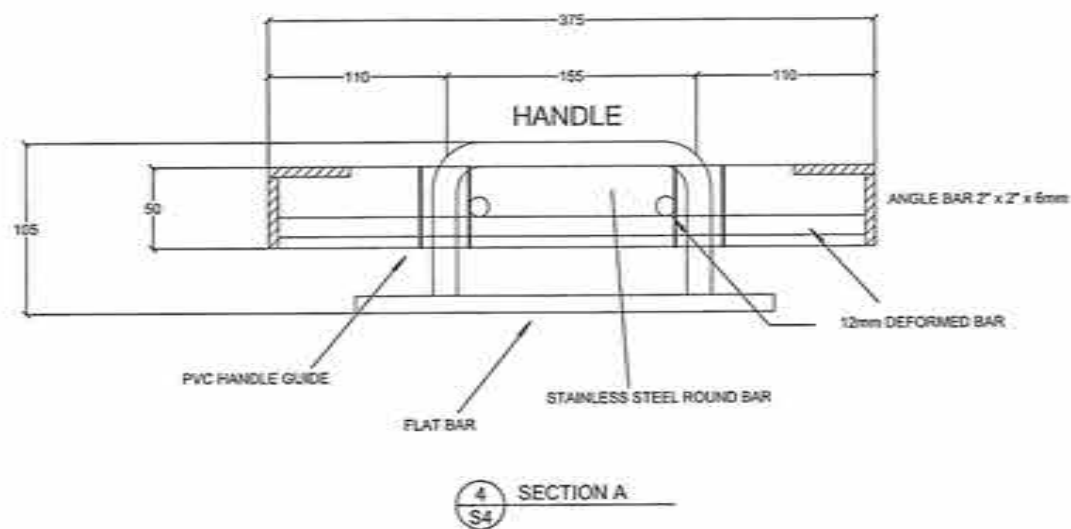
REVIEWED:
DENYALD A. SEMPIO
ENGINEER II, DESIGN DIVISION
DATE:

SUBMITTED:
JUDY B. CORDON
CHIEF, PLANNING AND DESIGN DIVISION
DATE:

RECOMMENDING APPROVAL:
JOSEITO B. CABALLERO
ASSISTANT REGIONAL DIRECTOR
DATE:

APPROVED:
JUDY B. CORDON
REGIONAL DIRECTOR
DATE:

SET NO. B
SHEET NO. 23/50



HANDHOLE DETAILS



REPUBLIC OF THE PHILIPPINES
DEPARTMENT OF PUBLIC WORKS AND HIGHWAYS
REGIONAL OFFICE NO. XI
GOV. CHAVEZ COR. R. MAGSAYSAY AVENUE, DAVAO CITY

PROJECT NAME AND LOCATION:
ROAD WIDENING - MAHARLIKA HIGHWAY - (K1478 TO K1479 + 221 - K1479 + 245, DAVAO DEL NORTE

SHEET CONTENTS:
HANDHOLE DETAILS

DRAFTED AND PREPARED:
ARMANDO M. BASOC, JR.
ENGINEER
DATE:

REVIEWED:
DENNIS A. SEMPJO
ENGINEER & DESIGN DIVISION CHIEF
DATE:

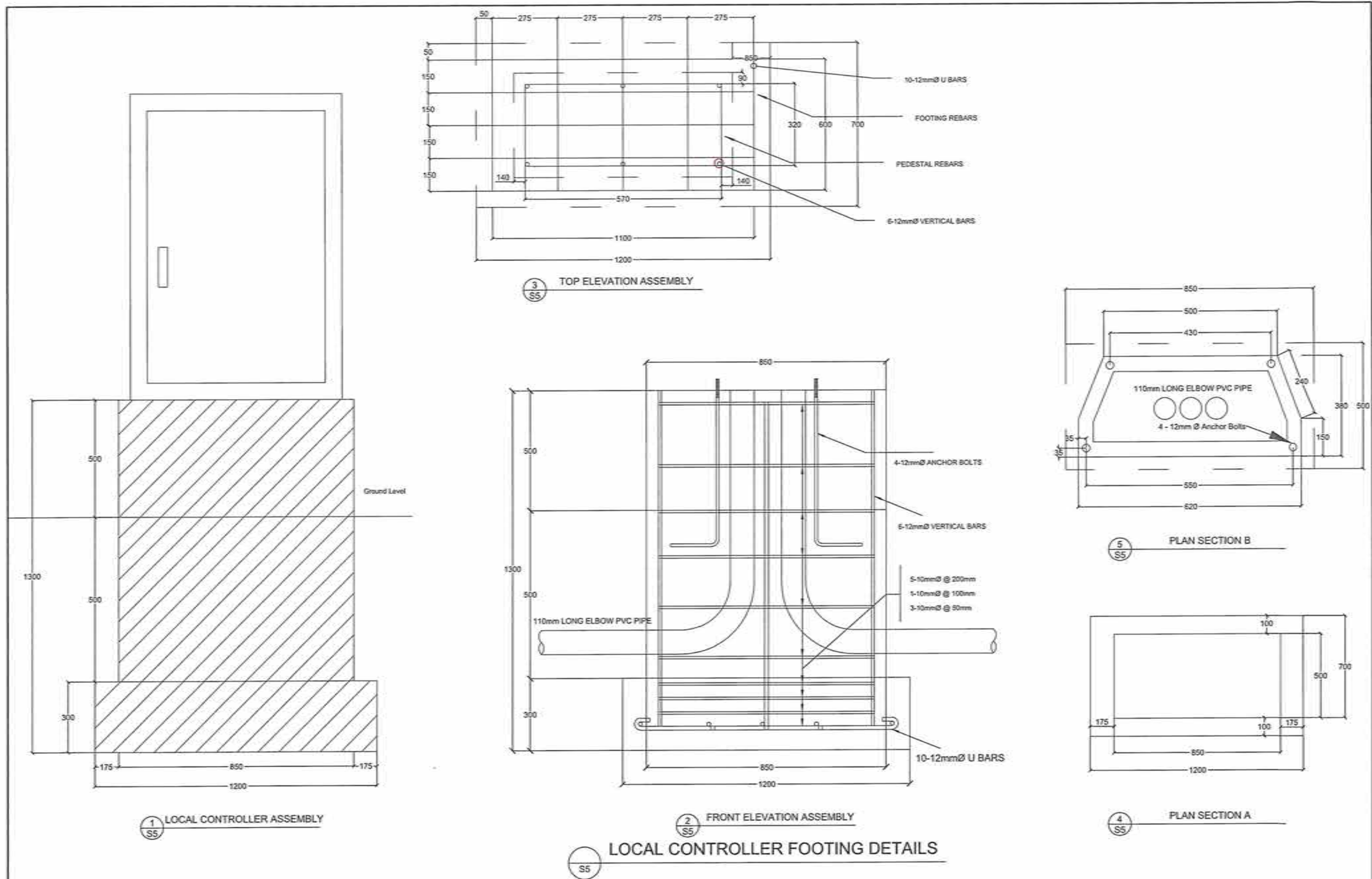
SUBMITTED:
JUDY ANN BERNARDINO
CHIEF, PLANNING AND DESIGN DIVISION
DATE:

RECOMMENDING APPROVAL:
JOSE LITO B. CABALLERO
ASSISTANT REGIONAL DIRECTOR
DATE:

APPROVED:
JUDY B. CORDON
REGIONAL DIRECTOR
DATE:

SET NO.
B
07/09

SHEET NO.
24
50



REPUBLIC OF THE PHILIPPINES
 DEPARTMENT OF PUBLIC WORKS AND HIGHWAYS
 REGIONAL OFFICE NO. XI
 GOV. CHAVEZ COR. R. MAGSAYSAY AVENUE, DAVAO CITY

PROJECT NAME AND LOCATION:
 ROAD WIDENING - MAHARAJA HIGHWAY - (50136498) K1478 + 721 - K1478 + 867, (50066498) K1479 + 295 - K1479 + 345, DAVAO DEL NORTE

SHEET CONTENTS:
 LOCAL CONTROLLER FOOTING DETAILS

DRAFTED AND PREPARED:
 ARMANDO M. BASOC, JR.
 ENGINEER I
 DATE: _____

REVIEWED:
 DENVER AEDRINA SEMPIO
 ENGINEER II, QC SECTION CHIEF
 DATE: _____

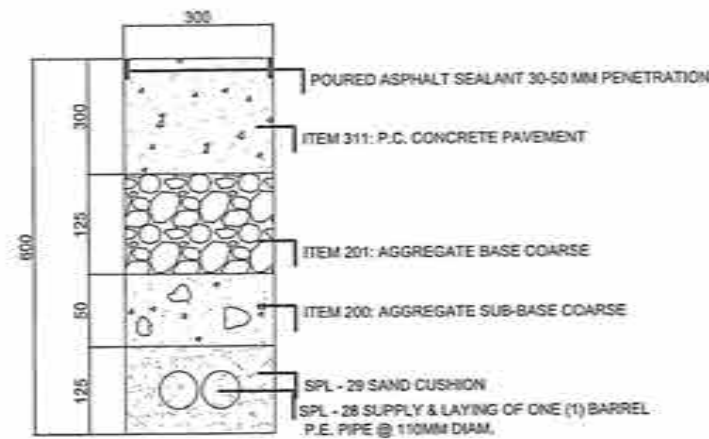
SUBMITTED:
 JUDY M. T. BERNARDINO
 CHIEF, PLANNING AND DESIGN DIVISION
 DATE: _____

RECOMMENDING APPROVAL:
 JOSELO B. CABALLERO
 ASSISTANT REGIONAL DIRECTOR
 DATE: _____

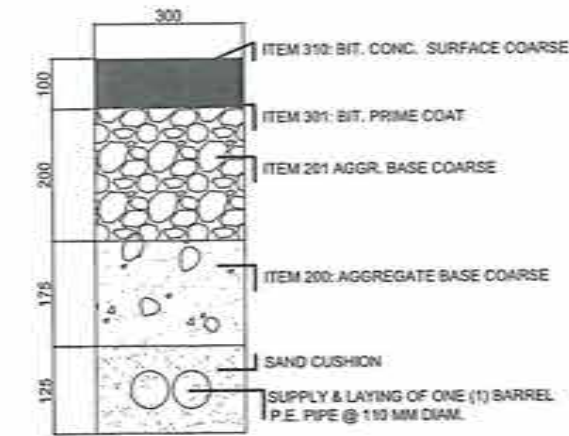
APPROVED:
 JUDY S. CORDON
 REGIONAL DIRECTOR
 DATE: _____

SET NO.
 B
 08/09

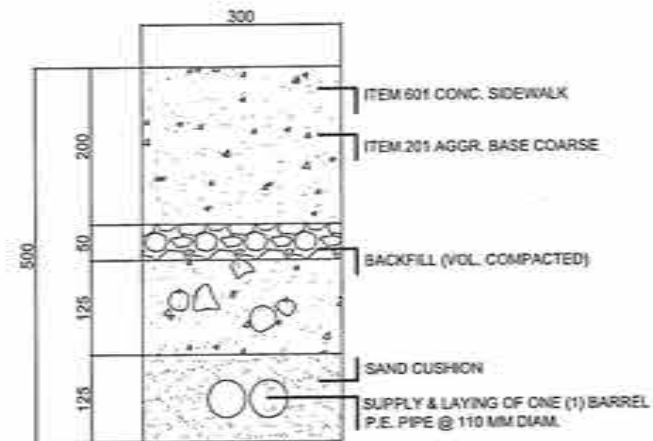
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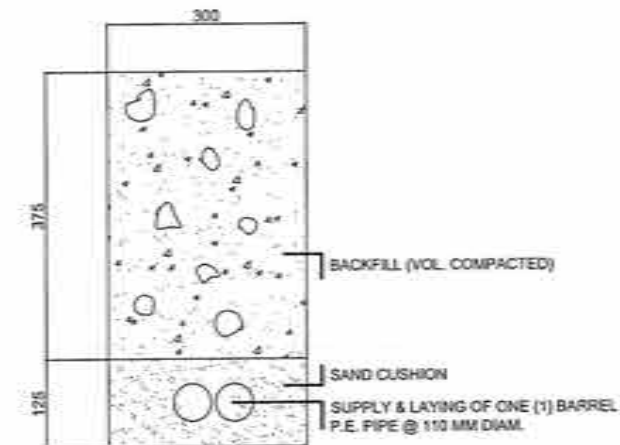
1A DOUBLE BARREL ON CONCRETE PAVEMENT
S7



1B DOUBLE BARREL ON ASPHALT PAVEMENT
S7



1C DOUBLE BARREL ON CONCRETE SIDEWALK
S7



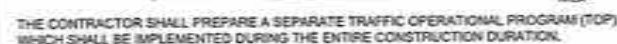
1D DOUBLE BARREL ON EARTH SURFACE
S7

S TRENCHING DETAILS
07

PROJECT NAME AND LOCATION:	SHEET CONTENTS:	DRAFTED AND PREPARED:	REVIEWED:	SUBMITTER:	RECOMMENDING APPROVAL:	APPROVED:	SET NO.	SHEET NO.
ROAD WIDENING - MAKULIGA HIGHWAY - (SR1364MM) K1478 + 721 - K1478 + 847, (SR0054MM) K3478 + 251 - K1479 + 145, DAUAG DEL NORTE	TRENCHING DETAILS	ARMANDO M. BASOC, JR. ENGINEER S	DENNIS ALDRIN A. SEMPID ENGINEER T, DISTRICT CHIEF	JUDY ANN T. BERNARDINO CHIEF, PLANNING AND DESIGN DIVISION	JOSE TO B. CABALLERO ASSISTANT REGIONAL DIRECTOR	JUBY B. CORDON REGIONAL DIRECTOR	B 09/09	26 50

SR11-P00-126/ARMAN2025 PROJECTS, DURING MAKULIGA ROAD WIDENING - K1478 TO 1479, TRAFFIC SIGNALS/TC-TL POLE DETAILS 1-25-2024 - WITH PAGING.DWG

C. TRAFFIC MANAGEMENT DETAILS



TRAFFIC MANAGEMENT STAGES		DESCRIPTION	QUANTITY
STAGE 1: ROAD HOVING OVER LANE		ROADWORK AHEAD (20-3)	1
		LANE CLOSED (24-12)	2
		ROAD WORK (20-2)	1
		SPEED RESTRICTION (20-1)	1
		ROADWORK AHEAD (20-3)	1
		LANE CLOSED (24-12)	1
		TEMPORARY TRAFFIC BARRIER (23-1)	1
		TEMPORARY TRAFFIC BARRIER (23-1)	3
		END ROADWORK (20-4)	1
		TRAFFIC CONE	30
	BARREL	12	
	PLASTIC SAFETY BARRIER (20 meters - Working Area Closed)	80	



TRAFFIC MANAGEMENT SYMBOLS	DESCRIPTION	QUANTITY
STAGE 1, HIGH-WIDENING, CUT-THRU LANE		
	ROADWORK AHEAD (75-1)	1
	LANE STATUS (75-2)	2
	ROAD NARROW (74-1)	2
	SPEED LIMIT 35 (70-1)	1
	ROADWORK AHEAD (STRIKED) (75-3)	1
	ROADWORK AHEAD (STRIKED) (75-3)	1
	ROADWORK AHEAD (STRIKED) (75-3)	1
	ROADWORK AHEAD (STRIKED) (75-3)	1
	ROADWORK AHEAD (STRIKED) (75-3)	1
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	ROADWORK AHEAD (STRIKED) (75-3)	1
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	ROADWORK AHEAD (STRIKED) (75-3)	1
	ROADWORK AHEAD (STRIKED) (75-3)	1
	ROADWORK AHEAD (STRIKED) (75-3)	1

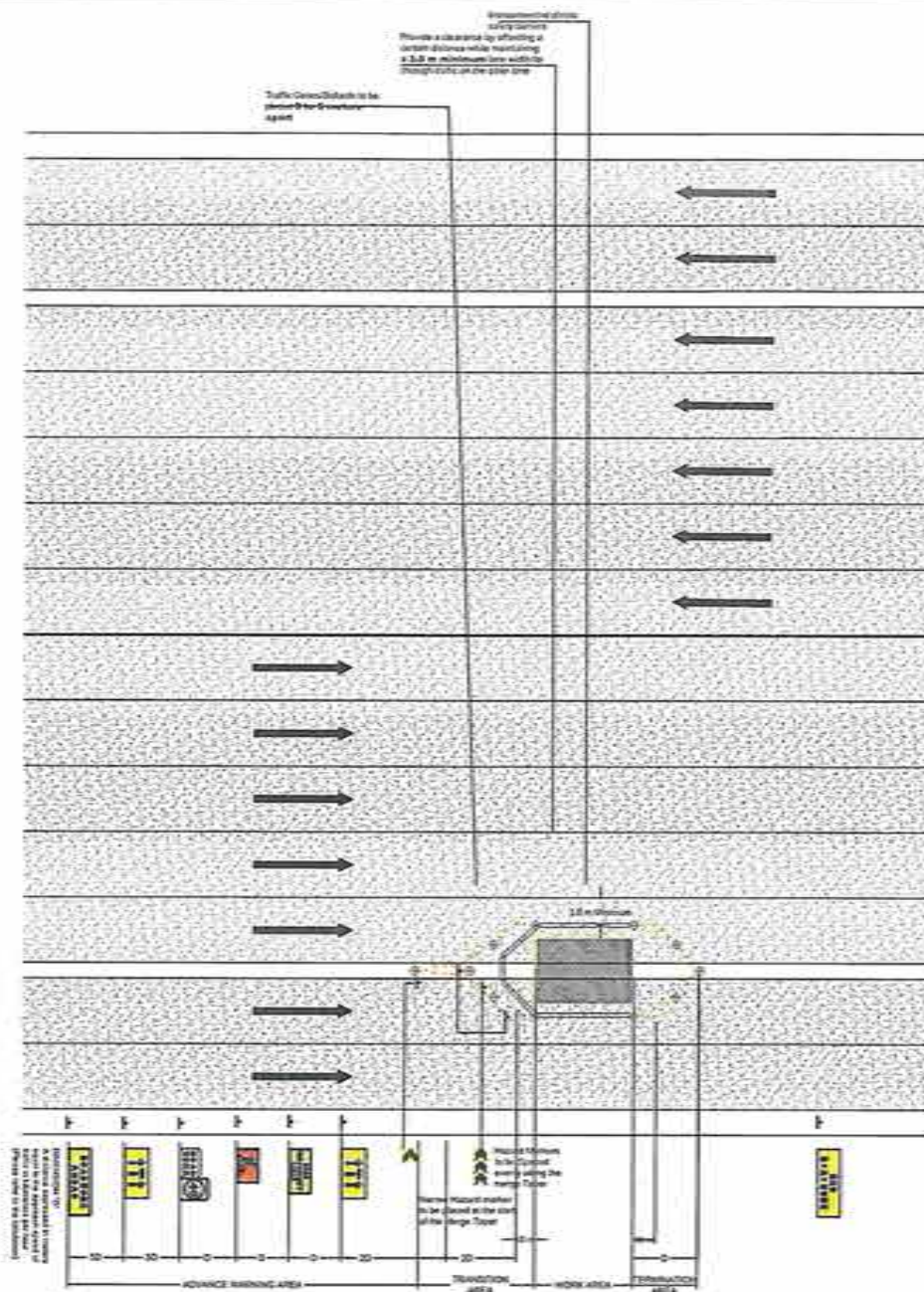
TRANSITION AREA			
SPEED OF TRAFFIC (KPH)	LENGTH OF DIVERGE/LATERAL SHIFT TAPER (m)	LENGTH OF MERGE TAPER (m)	LENGTH OF STRAIGHT SECTION BETWEEN MULTILANE CLOSURES (m)
≤ 40	40	80	60
50	50	100	75
60	60	120	90
70	70	140	105
80	80	160	120
90	90	180	135
100	100	200	150
110	110	220	165

GENERAL NOTE FOR TRAVEL MANAGEMENT PLAN:
A. - CONTACT NOTE:

1. ALL SIGNAGE MUST BE EVIDENT BY THE PROJECT SIGNAGER BASED ON ROAD CONDITIONS. FURTHER INVESTIGATION MUST BE CONDUCTED.
2. ALL "STOP-RESTRICTION" SIGNS MUST BE IDENTIFIED BY THE PROJECT SIGNAGER BASED ON SITE CONDITIONS. FURTHER INVESTIGATION MUST BE CONDUCTED.
3. SIGNS SHOULD BE INSTALLED SO THAT THEY ARE AT OR ABOVE THE DRIVER'S EYELEVEL OF APPROXIMATELY 1.6 METERS, WITH A MINIMUM MOUNTING HEIGHT OF 200 CM FROM THE GROUND.
4. "ROAD-HEAD AND" THE FIRST ADVANCE WARNING SIGN SEEN BY DRIVERS, SHOULD BE LOCATED AT MINIMUM DISTANCE "X" METERS (X) IS THE APPROXIMATED SIZE OF TRAFFIC JUNCTION TO THE START OF THE WORK, OR IF THERE IS A TRANSITION AREA, THE START OF THE TAPER.
5. OTHER SIGN ADVANCE WARNING AREA SHOULD BE SPACED "X" METERS AWAY.
6. LONGITUDINAL BUFFER SPACE SHOULD BE IN LINE TO TRAVELLERS LONG BUT NOT BE EXCEEDED IF THE WORK AREA IS SHOWN FROM APPROACHING ROAD-USER, AS BY A CURVE, OR CROWN.
7. LATERAL BUFFER SPACE SHOULD BE A MINIMUM OF 1.2 METERS IN SLOW SPEED AREAS, OR IN HIGH SPEED AND HIGH VOLUME AREAS, A LARGE ADJUSTED CLOSURE IN ORDERABLE WITH SAFETY BARRIERS ADJACENT TO THE WORK AREA.
8. LOCATION OF TRAFFIC CONTROLLER SHOULD BE 30 METERS IN ADVANCE OF WORK AREA, WITH 1000 SITE DISTANCE OF SHOWING TRAFFIC, WITH AN ESCAPE PATH IN AN EMERGENCY, WHERE THE OTHER TRAFFIC CONTROLLER IS VISIBLE, AND CAN BE SEEN BY THE ROAD-USER.
9. A MINIMUM CLEAR WIDTH OF 2.15 M FOR FORDS AND 2.25 M FOR TRUCKS IS RECOMMENDED AND EXCESSIVELY NARROW LANE SHOULD BE CLOSED TO NOT INDUCE STRESSING IN TRUCKS BY LOWER TRAFFIC VOLUMES.
10. USE OF TRAFFIC CONTROLLER'S FLASHERS:
11. THE TRAFFIC CONTROLLER USES A PORTABLE STOP/GO SIGN FLASH OR RED AND GREEN STOP/GO FLAG TO CONTROL THE TRAFFIC.
12. WHEN CONTROLLING TRAFFIC, A TRAFFIC CONTROLLER SHOULD CARRY OUT THAT A STOP/GO SIGN FLASH AND BE PREPARED TO STOP SIGN AND ADDITIONAL SIGNS AND DEVICES REQUIRED FOR THE OVERALL WORK SITE TRAFFIC MANAGEMENT SCHEME, ARE IN PLACE TO PROVIDE ADVANCE WARNING AND INFORMATION TO ROAD-USER.
13. THE TRAFFIC CONTROLLER SHOULD STAY APPROPRIATELY IN VEHICLE APPROACHING IN WORK AREA.
14. THE TRAFFIC CONTROLLER SHOULD BE VISIBLE TO THE APPROACHING ROAD-USER AND STAND ON THE CURB SIDE OR SHOULDER CLOSE BY THE TRAVELLER INSTEAD TO VIEW THE WORK AREA AND APPROACHING TRAFFIC.
15. TRAFFIC CONTROLLER MUST USE TWO-WAY HANDS TO ENSURE ADEQUATE COMMUNICATION DURING LONG DISTANCE OR WHERE THERE IS LIMITED VISIBILITY.

REFERENCES

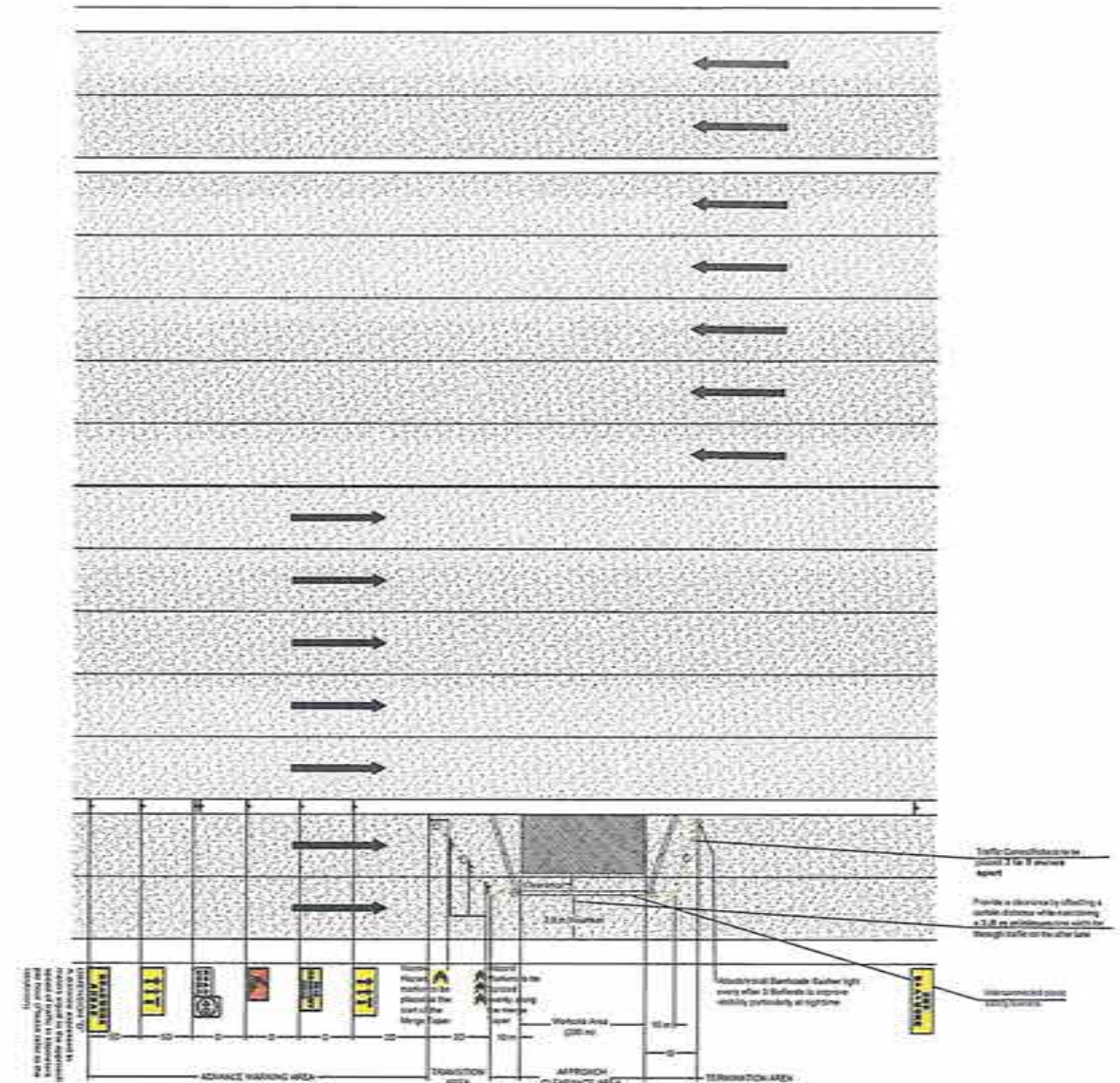
- DID (40-10), SERIES 2016 – GUIDELINE FOR THE PREPARATION OF COST ESTIMATES FOR THE TRAFFIC MANAGEMENT AND SAFETY AND HEALTH REQUIREMENTS FOR THE CONSTRUCTION AND MAINTENANCE OF ROADS, BRIDGES AND SAFETY AND HEALTH
- ROAD SAFETY MANUAL 2006
- PART 2, ROAD SAFETY AND PREVENTION DECISION MANUAL 2010



THE CONTRACTOR SHALL PREPARE A SEPARATE TRAFFIC OPERATIONAL PROGRAM (TOP) WHICH SHALL BE IMPLEMENTED DURING THE ENTIRE CONSTRUCTION DURATION.

STAGE 3 CONSTRUCTION OF SUB-CENTER ISLAND

TRAFFIC MANAGEMENT STAGES	DESCRIPTION	QUANTITY
STAGE 3: CONSTRUCTION OF SUB-CENTER ISLAND		
	ROADWORK AHEAD (P1-1)	1
	LANE CLOSURE (P2-1)	2
	ROAD WORK (P2-2)	1
	SPEED RESTRICTION (P2-3)	1
	ROADWORK AHEAD (THRU) (P2-4)	1
	ROADWORK AHEAD (WORK) (P2-5)	1
	TEMPORARY NIGHT MARKER (P2-6)	1
	TEMPORARY NIGHT MARKER (P2-7)	3
	END ROADWORK (P2-8)	1
	TRAFFIC CONE	30
	WATERMARK FLASHER LIGHT	10
	PLASTIC SAFETY BARRIER (200 meters - Working Area Construction)	50



THE CONTRACTOR SHALL PREPARE A SEPARATE TRAFFIC OPERATIONAL PROGRAM (TOP) WHICH SHALL BE IMPLEMENTED DURING THE ENTIRE CONSTRUCTION DURATION.

STAGE 4 CONSTRUCTION OF SERVICE ROAD FOR INNERLANE

TRAFFIC MANAGEMENT STAGES	DESCRIPTION	QUANTITY
STAGE 4: CONSTRUCTION OF SERVICE ROAD: INNER LANE (WITH ISLAND)		
	ROADWORK AHEAD (P1-1)	1
	LANE CLOSURE (P2-1)	2
	ROAD WORK (P2-2)	1
	SPEED RESTRICTION (P2-3)	1
	ROADWORK AHEAD (THRU) (P2-4)	1
	ROADWORK AHEAD (WORK) (P2-5)	1
	TEMPORARY NIGHT MARKER (P2-6)	1
	TEMPORARY NIGHT MARKER (P2-7)	3
	END ROADWORK (P2-8)	1
	TRAFFIC CONE	17
	WATERMARK FLASHER LIGHT	10
	PLASTIC SAFETY BARRIER (200 meters - Working Area Construction)	40

1 TRAFFIC MANAGEMENT LAYOUT



REPUBLIC OF THE PHILIPPINES
DEPARTMENT OF PUBLIC WORKS AND HIGHWAYS
REGIONAL OFFICE NO. XI
GOV. CHAVEZ COR. R. MANSAYAG AVENUE, DAVAO CITY

PROJECT NAME AND LOCATION:
ROAD WIDENING - MAKARLEKA HIGHWAY - (S00364M) K1478 + 725 - K1478 + 867, (S00054M) K1479 + 291 - K1479 + 545, DAKO DEL NORTE

SHEET CONTENTS:
TRAFFIC MANAGEMENT LAYOUT

DRAFTED AND PREPARED:
ARMANDO M. BASOC, JR.
ENGINEER A
DATE:

REVIEWED:
DENNIS ALDRIN A. SEMPIO
ENGINEER & QC SECTION CHIEF
DATE:

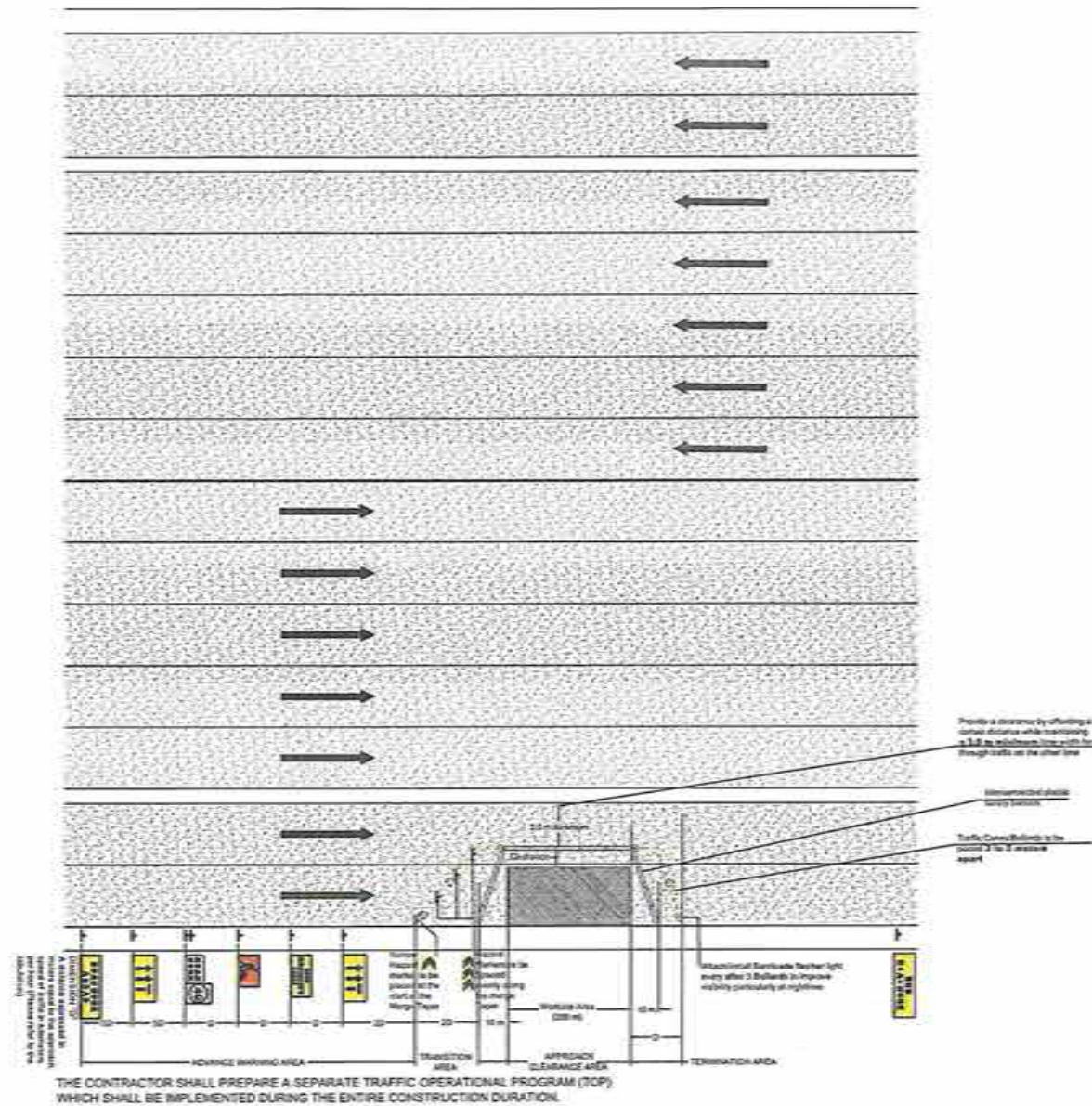
SUBMITTED:
JUDY ANN T. BERNARDINO
CHIEF, PLANNING AND DESIGN DIVISION
DATE:

RECOMMENDED:
JOSE LITO B. CABALLERO
ASSISTANT REGIONAL DIRECTOR
DATE:

APPROVED:
JUDY B. CORDON
REGIONAL DIRECTOR
DATE:

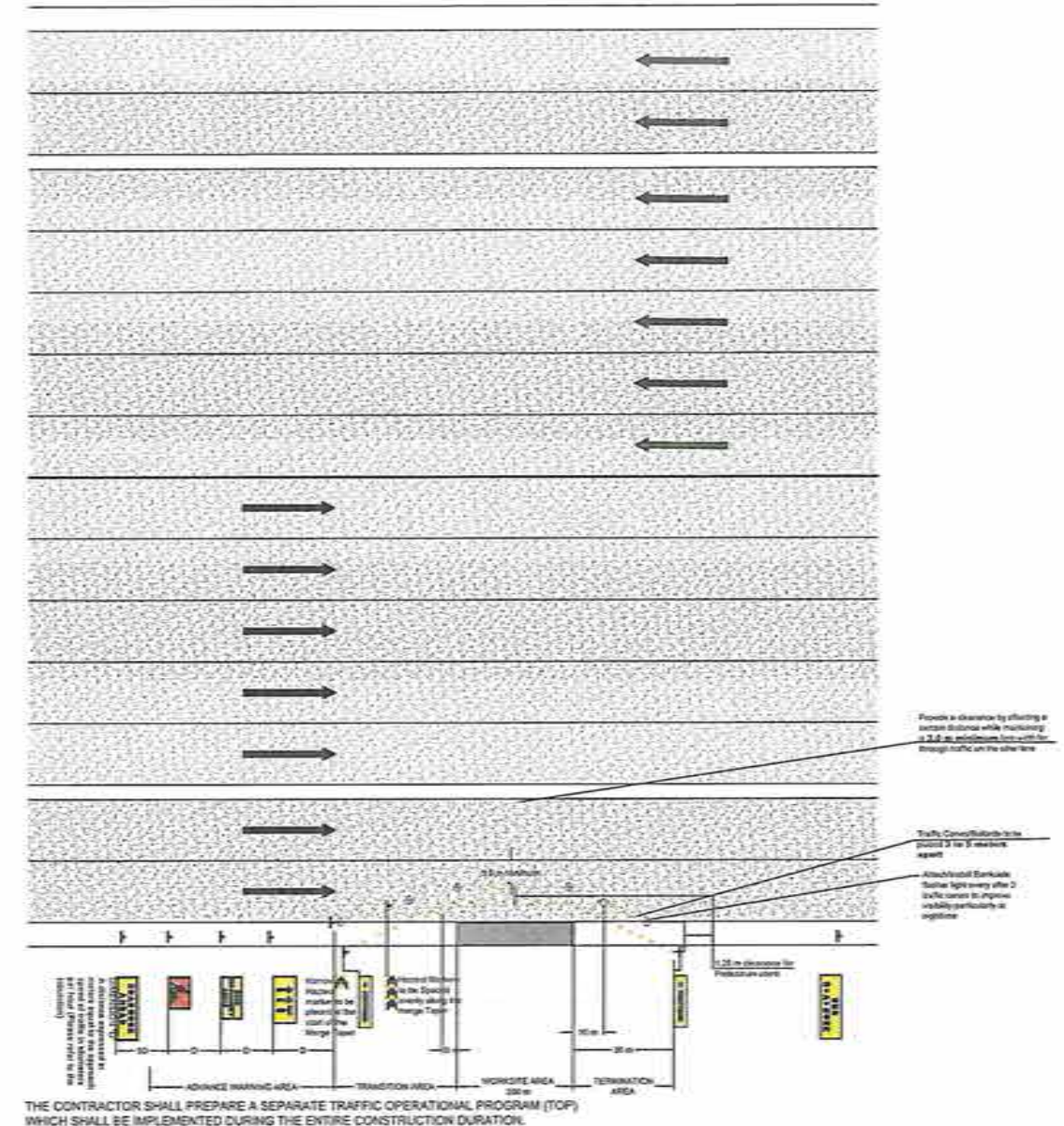
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STAGE 5 CONSTRUCTION OF SERVICE ROAD FOR OUTER LANE

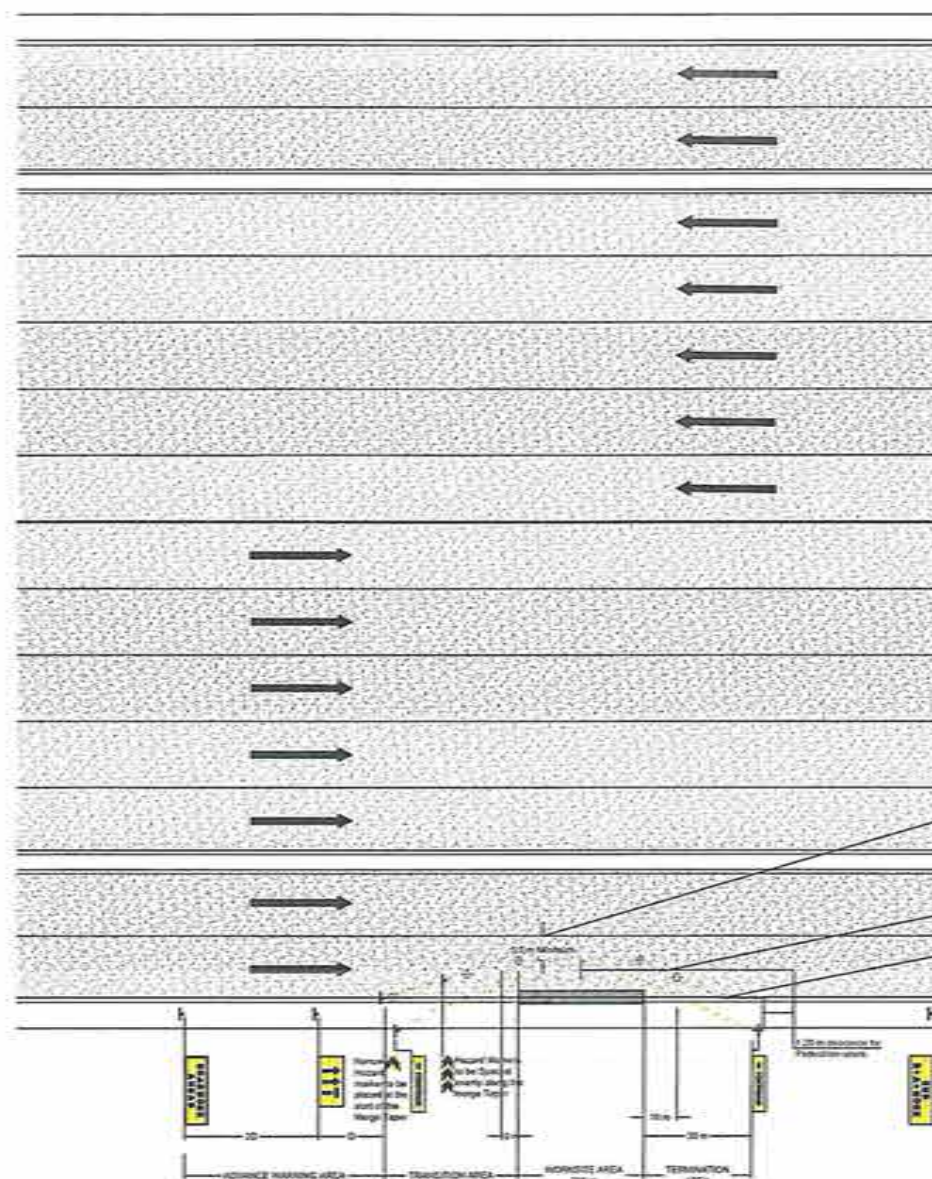
TRAFFIC MANAGEMENT STAGES	DESCRIPTION	QUANTITY
STAGE 5: CONSTRUCTION OF SERVICE ROAD - OUTER LANE (ENTIRE LENGTH)		
	ROADWORK AHEAD (W1-1)	1
	LANE STATUS (W1-2)	2
	ROADWORK AHEAD SYMBOLIC (W1-3)	1
	SPEED REDUCTION (W1-4)	1
	ROADWORK MACHINERY AHEAD (W1-5)	1
	TEMPORARY HAZARD MARKER (W1-6)	1
	TEMPORARY HAZARD MARKER (W1-7)	1
	END ROADWORK (W1-8)	1
	TRAFFIC CONES (200 meters - Working Area Considered)	10
	BARRICADE FLASHER LIGHT	10
	PLASTIC SAFETY BARRIER (200 meters - Working Area Considered)	10



STAGE 6 CONSTRUCTION OF SIDEWALK

TRAFFIC MANAGEMENT STAGES	DESCRIPTION	QUANTITY
STAGE 6: CONSTRUCTION OF SIDEWALK		
	ROADWORK AHEAD (W1-1)	1
	LANE STATUS (W1-2)	2
	ROADWORK AHEAD SYMBOLIC (W1-3)	1
	ROADWORK MACHINERY AHEAD (W1-5)	1
	TEMPORARY HAZARD MARKER (W1-6)	1
	TEMPORARY HAZARD MARKER (W1-7)	1
	END ROADWORK (W1-8)	1
	PEDESTRIANS (W1-9)	2
	TRAFFIC CONES (200 meters - Working Area Considered)	10
	BARRICADE FLASHER LIGHT	10

1 TRAFFIC MANAGEMENT LAYOUT SCALE: 1:100



THE CONTRACTOR SHALL PREPARE A SEPARATE TRAFFIC OPERATIONAL PROGRAM (TOP) WHICH SHALL BE IMPLEMENTED DURING THE ENTIRE CONSTRUCTION DURATION.

STAGE 7 PREPARING FOR THERMOPLASTIC PAVEMENT MARKINGS

TRAFFIC MANAGEMENT STAGES	DESCRIPTION	QUANTITY
STAGE 1: APPLICATION OF REFLECTORIZED THERMOPLASTIC PAVEMENT MARKINGS		
	ROADWORK AHEAD (T1-1)	1
	LANE STATUS (T4-2)	2
	TEMPORARY HAZARD MARKER (TS-3)	1
	TEMPORARY HAZARD MARKER (TS-4)	3
	END ROADWORK (T2-1B)	1
	PEDESTRIAN (T4-2L w/R)	2
	TRAFFIC CONES (200 meters - Working Area Considered)	17
	BARRICADE FLASHER LIGHT	10

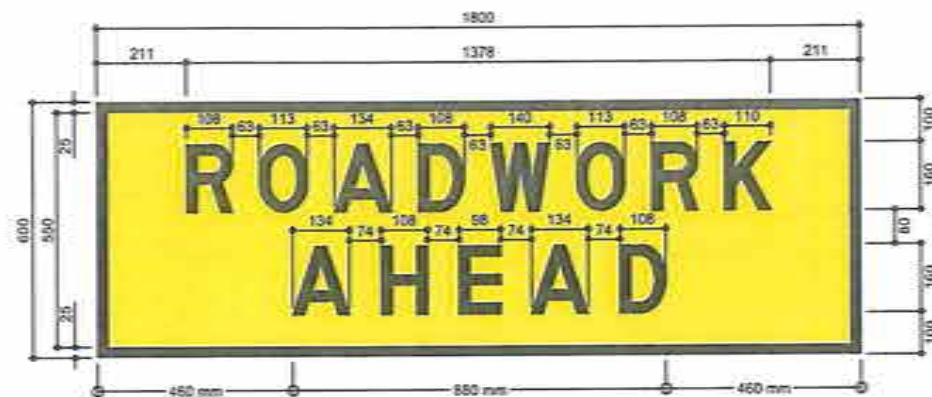
TRAFFIC MANAGEMENT FOR ROAD WIDENING								
	DESCRIPTION	STAGE 1: ROAD WIDENING - SHOULDER	STAGE 2: ROAD WIDENING - OVERLAP	STAGE 3: CONSTRUCTION OF NEW CENTER LINE	STAGE 4: CONSTRUCTION OF SERVICE ROAD	STAGE 5: CONSTRUCTION OF SERVICE ROAD	STAGE 6: CONSTRUCTION OF TIEBACK	STAGE 7: APPLICATION OF REFLECTORIZED THERMOPLASTIC PAVEMENT MARKINGS
		QUANTITY						
	ROADWORK AHEAD (T1-1)	1	1	1	1	1	1	1
	LANE STATUS (T4-2)	2	2	2	2	2	2	2
	ROAD WORK (R4-2)	1	1	1	1	1	1	1
	SPEED RESTRICTION (R4-1)	1	1	1	1	1	1	1
	WORKMEN AHEAD (T1B-1C) (T1-1C)	1	1	1	1	1	1	1
	ROADWORK MACHINERY AHEAD (T1-2)	1	1	1	1	1	1	1
	TEMPORARY HAZARD MARKER (TS-3)	1	1	1	1	1	1	1
	TEMPORARY HAZARD MARKER (TS-4)	3	3	3	3	3	3	3
	END ROADWORK (T2-1B)	1	1	1	1	1	1	1
	TRAFFIC CONES (200 meters - Working Area Considered)	10	17	10	17	17	17	17
	BARRICADE FLASHER LIGHT	10	10	10	10	10	10	10
	PLASTIC SAFETY BARRIER (200 meters - Working Area Considered)	30	40	30	40	40	40	40
	PEDESTRIAN (T4-2L w/R)	2	2	2	2	2	2	2

NOTE:

1. QUANTITY IS BASED ON THE ASSUMED 200-METER LENGTH ROADWORK, IF THE PROGRAMMED LENGTH IS INCREASED/DECREASED, CORRESPONDING ADJUSTMENT OF QUANTITIES SHALL BE MADE.
2. FOR ESTIMATION PURPOSES, APPROACH SPEED (EQUAL TO "D" IN METERS IS 40 KPH.

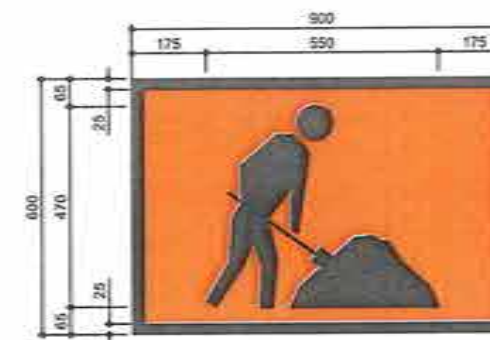
1 TRAFFIC MANAGEMENT LAYOUT

SCALE: NTS



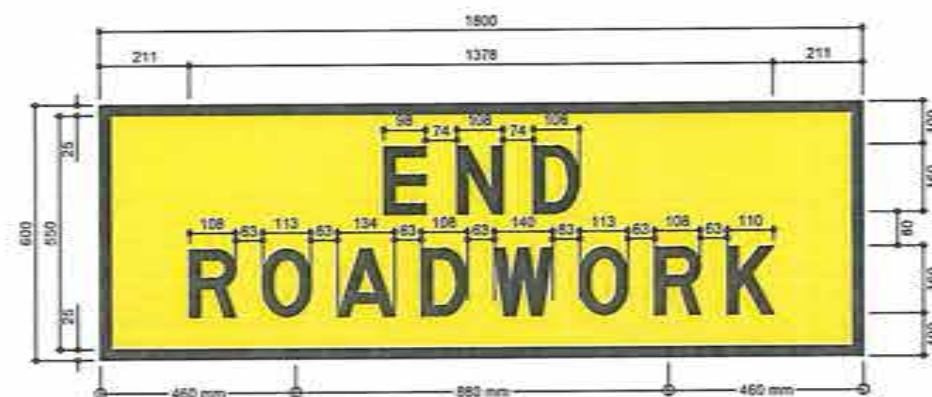
ROADWORK AHEAD DETAILS

SIGN NO.	SIZE (mm)	LETTERS/SYMBOLS	BACKGROUND	TYPE OF SIGNS
T1-1	1800 X 600	LINE 1 - BLACK 200 DM LINE 2 - BLACK 160 DM	YELLOW REFLECTORIZED	ADVANCE WARNING SIGNS



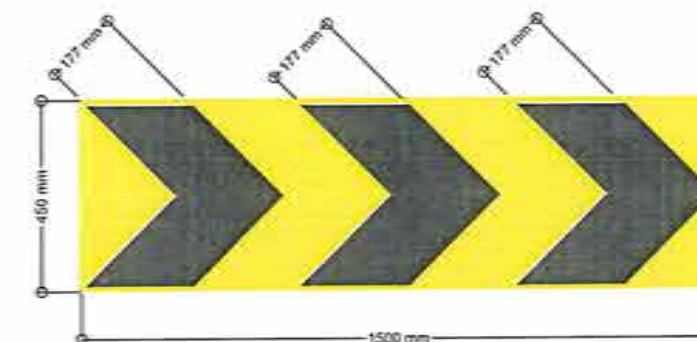
WORKMEN AHEAD (SYMBOLIC) DETAILS

SIGN NO.	SIZE (mm)	LETTERS/SYMBOLS	BACKGROUND	TYPE OF SIGNS
T1-5	900 X 600	BLACK	RED/ORANGE - FLUORESCENT FOR DAY USE - REFLECTORIZED FOR NIGHT	ADVANCE WARNING SIGNS



END ROADWORK DETAILS

SIGN NO.	SIZE (mm)	LETTERS/SYMBOLS	BACKGROUND	TYPE OF SIGNS
T2-16	1800 X 600	LINE 1 - BLACK 200 DM LINE 2 - BLACK 160 DM	YELLOW REFLECTORIZED	ADVANCE WARNING SIGNS



TEMPORARY HAZARD MARKER DETAILS

SIGN NO.	SIZE (mm)	LETTERS/SYMBOLS	BACKGROUND	TYPE OF SIGNS
T5-4	1500 X 450 TYPE B-1	BLACK 177 WIDE AT 45°	YELLOW REFLECTORIZED	TEMPORARY HAZARD MARKER



ROAD MACHINERY AHEAD DETAILS

SIGN NO.	SIZE (mm)	LETTERS/SYMBOLS	BACKGROUND	TYPE OF SIGNS
T1-3	1200 X 600	LINE 1 - BLACK 100 EM LINE 2 - BLACK 120 EM LINE 3 - BLACK 100 EM	YELLOW REFLECTORIZED	ADVANCE WARNING SIGNS



SPEED RESTRICTION DETAILS

SIGN NO.	SIZE (mm)	LETTERS/SYMBOLS	BACKGROUND	TYPE OF SIGNS
R4-1	600 X 600 (SIZE B)	BLACK 243 DM CIRCLE - 600 DIA. RED	WHITE REFLECTORIZED RED CIRCLE - REFLECTORIZED	REGULATORY SIGNS



REPUBLIC OF THE PHILIPPINES
DEPARTMENT OF PUBLIC WORKS AND HIGHWAYS
REGIONAL OFFICE NO. XI
GOV. CHAVEZ COR. R. MAGSAYSAY AVENUE, DAVAO CITY

PROJECT NAME AND LOCATION:

ROAD WIDENING - MAHARUKU2 HIGHWAY - (050544M) K5478 + 721 - K5479 + 867, (050544M) K5479 + 211 - K5479 + 345, DAVAO DEL NORTE

SHEET CONTENTS:

TRAFFIC MANAGEMENT PROGRAM SIGNAGE

DRAFTED AND PREPARED:

ARMANDO M. BASOC, JR.
ENGINEER I

DATE:

REVIEWED:

DENVER ALDRINA SEMPJO
ENGINEER II, DIST. SECTION CHIEF

DATE:

SUBMITTED:

JUDY ANN T. BERNARDINO
CHIEF, PLANNING AND DESIGN DIVISION

DATE:

RECOMMENDED:

JOSE LUIS B. CASALLERO
ASSISTANT REGIONAL DIRECTOR

DATE:

APPROVED:

JUDY B. CORDON
REGIONAL DIRECTOR

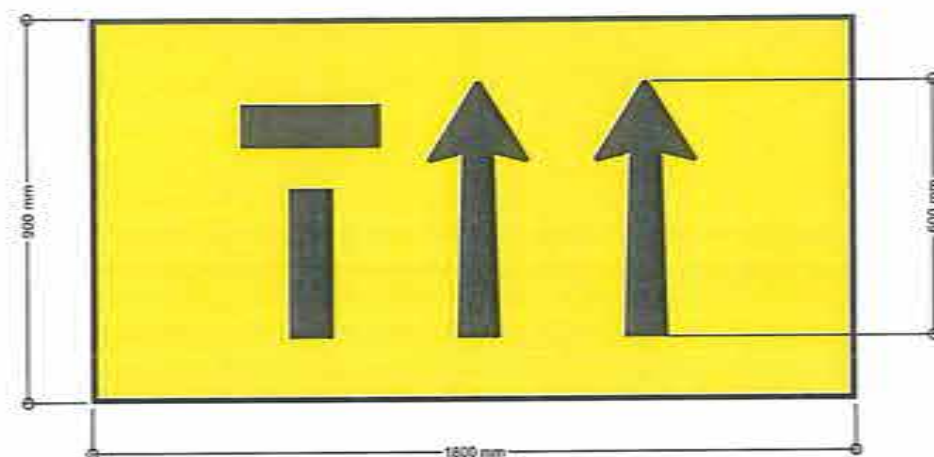
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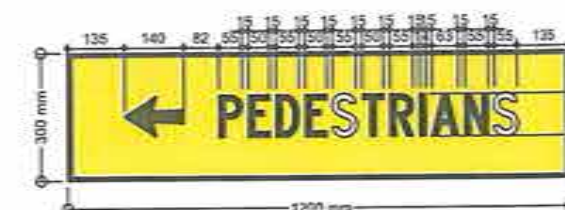
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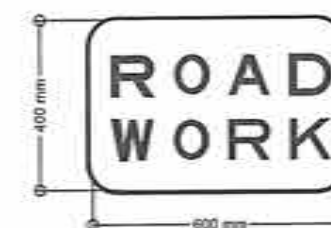
LANE STATUS DETAILS

SIGN NO.	SIZE (mm)	LETTERS/SYMBOLS	BACKGROUND	TYPE OF SIGNS
T2-6-2	1800 X 900	BLACK 600 HIGH	YELLOW REFLECTORIZED	SIGN FOR LANE & ROAD CLOSURES



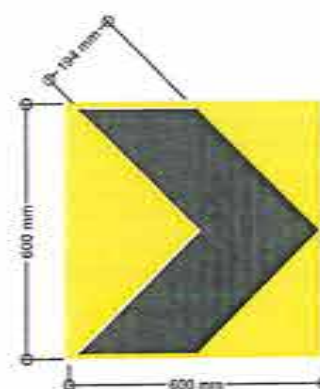
PEDESTRIAN (LEFT OR RIGHT) DETAILS

SIGN NO.	SIZE (mm)	LETTERS/SYMBOLS	BACKGROUND	TYPE OF SIGNS
T8-2	1200 X 300	BLACK 100 CM ARROW 140	YELLOW REFLECTORIZED	SIGNS FOR PEDESTRIAN CONTROL



ROADWORK

SIGN NO.	SIZE (mm)	LETTERS/SYMBOLS	BACKGROUND	TYPE OF SIGNS
R4-3	600 X 400 SIZE B	LINE 1 - BLACK 100 EM LINE 2 - WHITE 100 EM	WHITE REFLECTORIZED	REGULATORY SIGNS



SPEED RESTRICTION DETAILS

SIGN NO.	SIZE (mm)	LETTERS/SYMBOLS	BACKGROUND	TYPE OF SIGNS
TS-5	600 X 600 TYPE B-1	BLACK 194 WIDE AT 45°	YELLOW REFLECTORIZED	TEMPORARY HAZARD MARKER



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REGIONAL OFFICE NO. XI
GOV. CHAVEZ COR. R. MAGSAYSAY AVENUE, DAVAO CITY

PROJECT NAME AND LOCATION:
ROAD WIDENING - MAHARLIKA HIGHWAY - (50334690) K1478 + 711 - K1478 + 847, (50906490) K1479 + 131 - K1479 + 145, DAVAO DEL NORTE

SHEET CONTENTS:
TRAFFIC MANAGEMENT PROGRAM SIGNAGE

DRAFTED AND PREPARED:
ARMANDO M. BASOC, JR.
ENGINEER II
DATE: _____

REVIEWED:
DENNIS ALDRIN A. SEMPIO
ENGINEER I, CIVIL SECTION CHIEF
DATE: _____

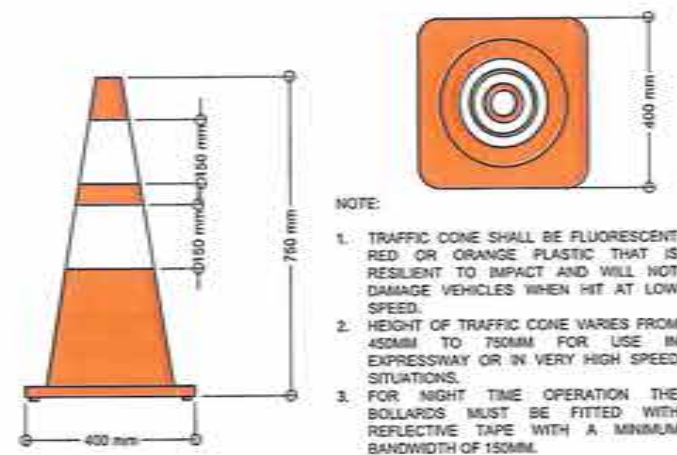
SUBMITTED:
JUDY ANN T. BERNARDINO
CHIEF, PLANNING AND DESIGN DIVISION
DATE: _____

RECOMMENDED:
JOSE LITO B. CABALLERO
ASSISTANT REGIONAL DIRECTOR
DATE: _____

APPROVED:
JUDY B. CORDON
REGIONAL DIRECTOR
DATE: _____

SET NO.
C
06/10

SHEET NO.
32
50

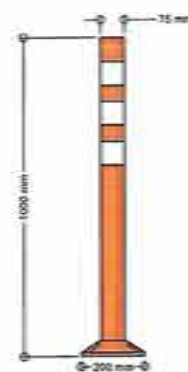


NOTE:

1. TRAFFIC CONE SHALL BE FLUORESCENT RED OR ORANGE PLASTIC THAT IS RESILIENT TO IMPACT AND WILL NOT DAMAGE VEHICLES WHEN HIT AT LOW SPEED.
2. HEIGHT OF TRAFFIC CONE VARIES FROM 450MM TO 750MM FOR USE IN EXPRESSWAY OR IN VERY HIGH SPEED SITUATIONS.
3. FOR NIGHT TIME OPERATION THE BOLLARDS MUST BE FITTED WITH REFLECTIVE TAPE WITH A MINIMUM BANDWIDTH OF 150MM.

SPACING	CONDITION
5 - 10 METERS	ON TAPER
	WHEN USED AROUND SMALL WORK SITES (MAY BE REDUCED TO 3m TO GUIDE PEDESTRIANS OR TO PREVENT TRAFFIC TAKING A WRONG TURN THROUGH A GAP IN THE LINE OF BOLLARDS)
10 - 20 METERS	WHEN USED AS LONGITUDINAL SEPARATION BETWEEN OPPOSING TRAFFIC FLOWS
	WHEN USED AS LONGITUDINAL SEPARATION OF TRAFFIC FROM THE WORKSITE OR CLOSED LANE (MAY BE INCREASED TO 50m WHERE THE LENGTH OF BOLLARDS EXCEEDS 1KM)

1 TRAFFIC CONE
SCALE NTS



PLAN

SPECIFICATION	
REFLECTIVE:	ROAD SAFETY POLE
COLOR:	ORANGE
MATERIAL:	PU MATERIAL, ELASTIC, FLEXIBLE
REFLECTIVE FILM:	CRYSTAL LATTICE

NOTE:

1. BOLLARDS SHALL BE FLUORESCENT RED OR ORANGE PLASTIC THAT IS RESILIENT TO IMPACT AND WILL NOT DAMAGE VEHICLES WHEN HIT AT LOW SPEED.
2. HEIGHT OF BOLLARDS MUST BE UP TO 1 METER.
3. FOR NIGHT TIME OPERATION THE BOLLARDS MUST BE FITTED WITH REFLECTIVE TAPE WITH A MINIMUM BANDWIDTH OF 250MM.
4. SPACING @ 0.50 M. O.C.

2 SECTION
SCALE NTS

2 ISOMETRIC VIEW
SCALE NTS

SPACING	CONDITION
5 - 10 METERS	ON TAPER
	WHEN USED AROUND SMALL WORK SITES (MAY BE REDUCED TO 3m TO GUIDE PEDESTRIANS OR TO PREVENT TRAFFIC TAKING A WRONG TURN THROUGH A GAP IN THE LINE OF BOLLARDS)
10 - 20 METERS	WHEN USED AS LONGITUDINAL SEPARATION BETWEEN OPPOSING TRAFFIC FLOWS
	WHEN USED AS LONGITUDINAL SEPARATION OF TRAFFIC FROM THE WORKSITE OR CLOSED LANE (MAY BE INCREASED TO 50m WHERE THE LENGTH OF BOLLARDS EXCEEDS 1KM)

2 FLEXIBLE BOLLARD DETAIL
SCALE NTS

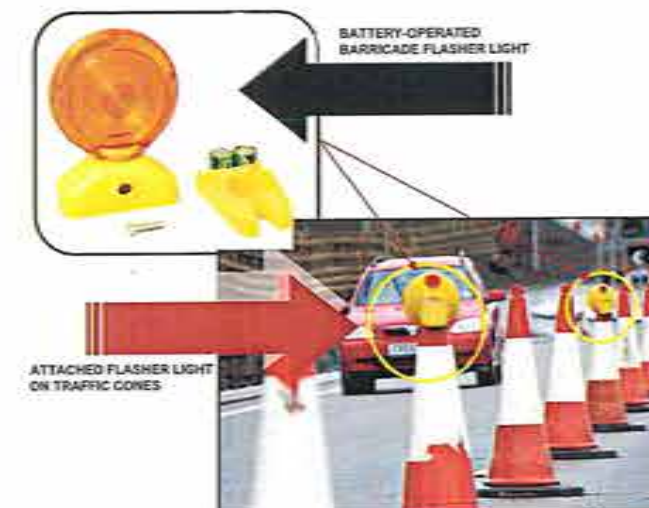
NOTE:

1. ALL PERSONNEL WORKING ON OR ADJACENT TO A ROADWORK SITE SHALL WEAR APPROPRIATE ROAD SAFETY MATERIALS SUCH AS HIGH VISIBILITY VEST (MADE FROM FLUORESCENT RED/ORANGE MATERIAL), HARD HAT AND SAFETY SHOES.
2. THE VEST SHALL BE WORN OVER NORMAL CLOTHING AND PROPERLY FASTENED SO THAT THE ENTIRE AVAILABLE AREA OF HIGH VISIBILITY MATERIAL CAN BE SEEN IN ANY DIRECTION. TO MAXIMIZE EFFECTIVENESS THE VEST SHOULD BE KEPT CLEAN AND IN GOOD CONDITION.
3. THE TRAFFIC SAFETY VEST SHALL BE MADE FROM FLUORESCENT RED OR ORANGE MATERIAL. THE VEST SHALL ALSO HAVE TWO (2) STRIPS OF YELLOW RETRO-REFLECTIVE MATERIAL AT THE FRONT AND THREE (3) STRIPS AT THE BACK. REFLECTIVE MATERIALS SHALL BE 50mm WIDE. DPWH LOGO SHALL BE 80mm DIAMETER. THE SAFETY VEST SHOULD HAVE A SECURE FASTENING PREFERABLY A ZIP.
4. THE JACKET MAY BE WORN OVER WET WEATHER CLOTHING. ALTERNATIVELY, WET WEATHER HIGH VISIBILITY CLOTHING SHALL BE MADE FROM WATER PROOF MATERIAL MATCHING THOSE PROPERTIES ABOVE FOR COLOR AND RETRO REFLECTIVITY.

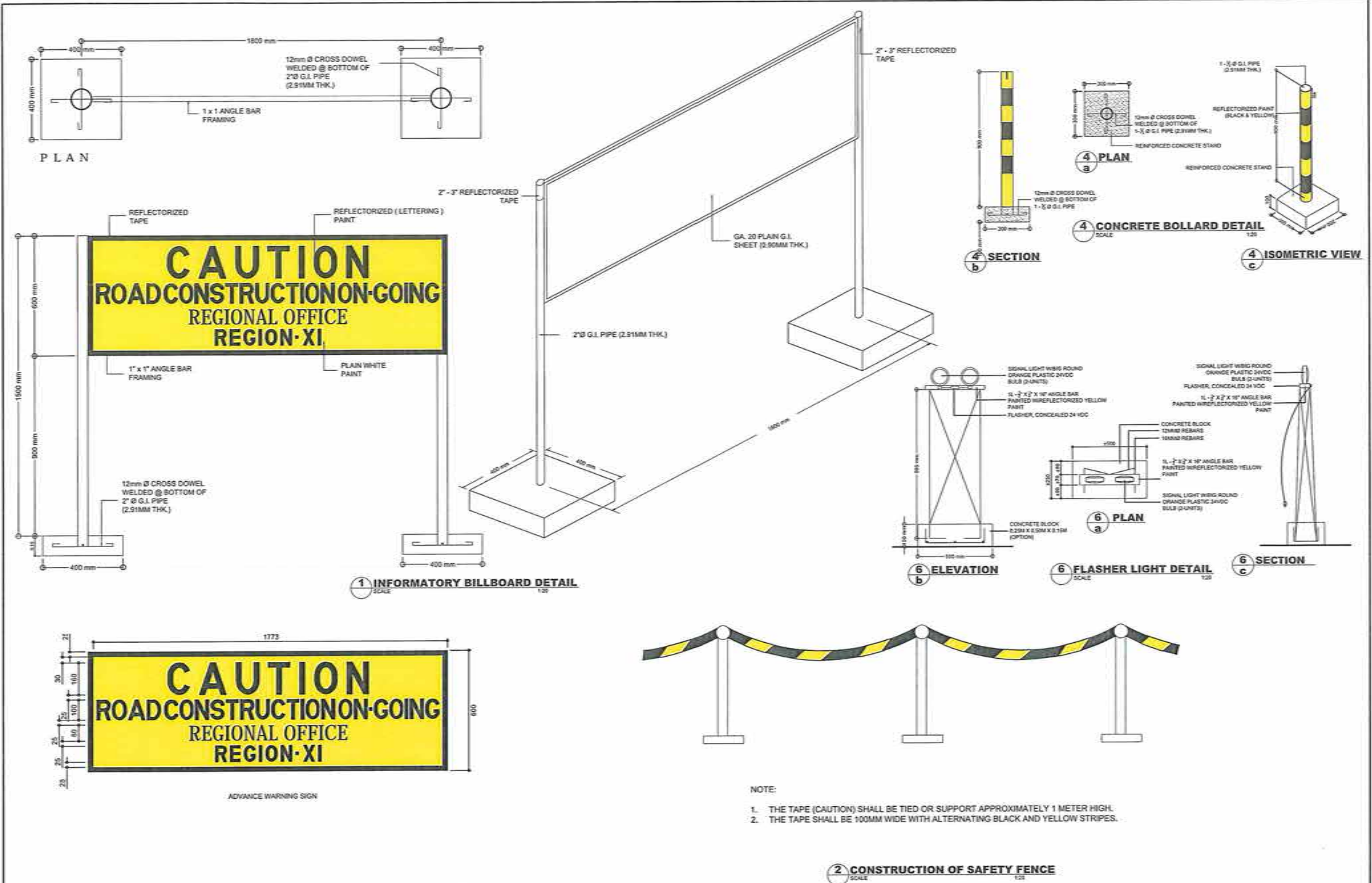


SIZE	A (mm)	B (mm)	C (mm)	D (mm)
MEDIUM	280	600	750	580
LARGE	295	625	775	610
EXTRA LARGE	310	650	800	640

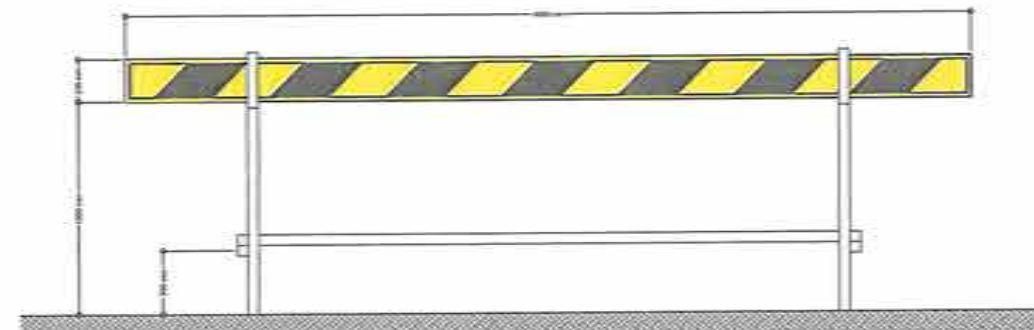
3 TRAFFIC SAFETY VEST DETAILS
SCALE NTS



4 BARRICADE FLASHER LIGHT
SCALE NTS



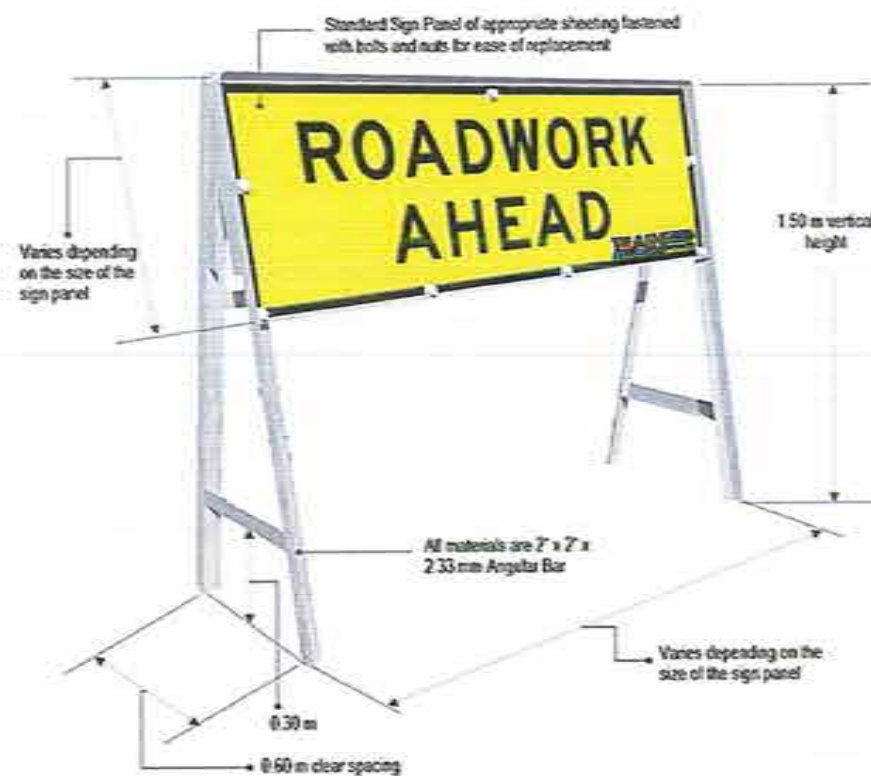
 REPUBLIC OF THE PHILIPPINES DEPARTMENT OF PUBLIC WORKS AND HIGHWAYS REGIONAL OFFICE NO. XI GOV. CHAVEZ COR. R. MAGSAYSAY AVENUE, DAVAO CITY	PROJECT NAME AND LOCATION: ROAD WIDENING - MAHARAJA HIGHWAY - (S0136490) K1478 + 721 - K1478 + 847, (S0006490) K1479 + 292 - K1479 + 345, DAVAO DEL NORTE	SHEET CONTENTS: INFORMATORY BILLBOARD DETAIL CONSTRUCTION OF SAFETY FENCE CONCRETE BOLLARD DETAILS FLASHER LIGHT DETAIL	DRAFTED AND PREPARED: ARMANDO M. BASOC, JR. ENGINEER I DATE:	REVIEWED: DEYANOR S. SEMPIO ENGINEER II, OIC SECTION CHIEF DATE:	SUBMITTED: JUDY ANN T. BERNARDINO CHIEF, PLANNING AND DESIGN DIVISION DATE:	RECOMMENDED: JOSE L. CABALLERO ASSISTANT REGIONAL DIRECTOR DATE:	APPROVED: JUDY B. CORDON REGIONAL DIRECTOR DATE:	SET NO. C SHEET NO. 34 50
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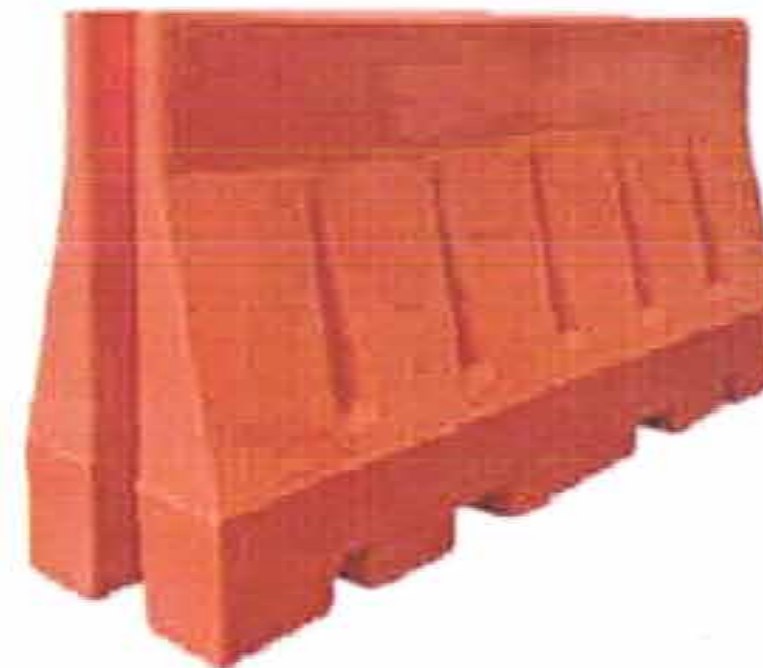
NOTE:

1. BOARD DIMENSIONS: (4M X 0.15M X 0.20M) WITH DIAGONAL BLACK AND REFLECTIVE YELLOW STRIPES PREFERABLY TERMINATING IN YELLOW AT EACH END.
2. MOUNTING HEIGHT: APPROXIMATELY 1 METER USING TRESTLES (SHOULD BE ERECTED PERPENDICULAR TO THE DIRECTION OF TRAFFIC FLOW).
3. BARRIER BOARD SHALL NOT BE USED FOR DELINEATION PURPOSES OR INSTALLED PARALLEL TO VEHICULAR TRAFFIC UNLESS THERE IS AN OFFSET OF AT LEAST FOUR (4) METERS FROM THE TRAVELLED PATH.

1 BARRIER BOARD DETAIL



2 ROAD SIGN DETAILS



3 PLASTIC SAFETY BARRIER



REPUBLIC OF THE PHILIPPINES
DEPARTMENT OF PUBLIC WORKS AND HIGHWAYS
REGIONAL OFFICE NO. XI
GOV. CHAVEZ COR. R. MAGSAYSAY AVENUE, DAVAO CITY

PROJECT NAME AND LOCATION:
ROAD WIDENING - MANARANGAL HIGHWAY - (501346910) K3476 + 721 - K3476 + 847, (500064894) K3479 + 252 - K3479 + 245, DAVAO DEL NORTE

SHEET CONTENTS:
ROAD SIGN DETAIL
BARRIER BOARD DETAIL
PLASTIC SAFETY BARRIER

DRAFTED AND PREPARED:
ARMANDO M. BASOC, JR.
ENGINEER
DATE:

REVIEWED:
DENNIS ALONIA SEMPYO
ENGINEER & DESIGN CHIEF
DATE:

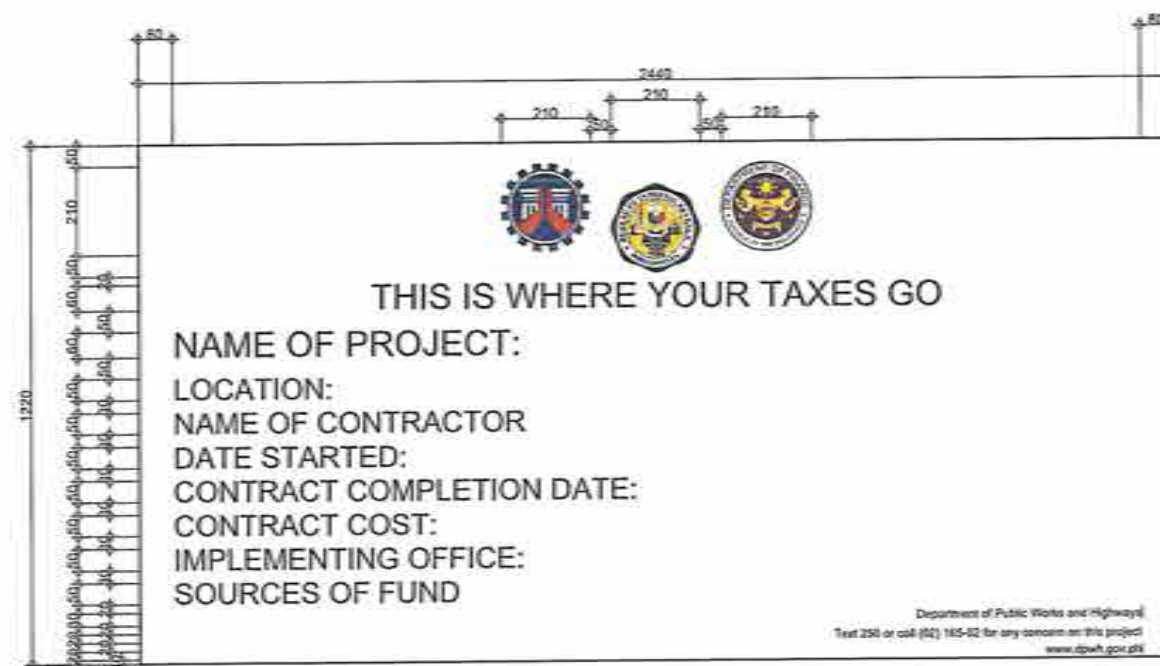
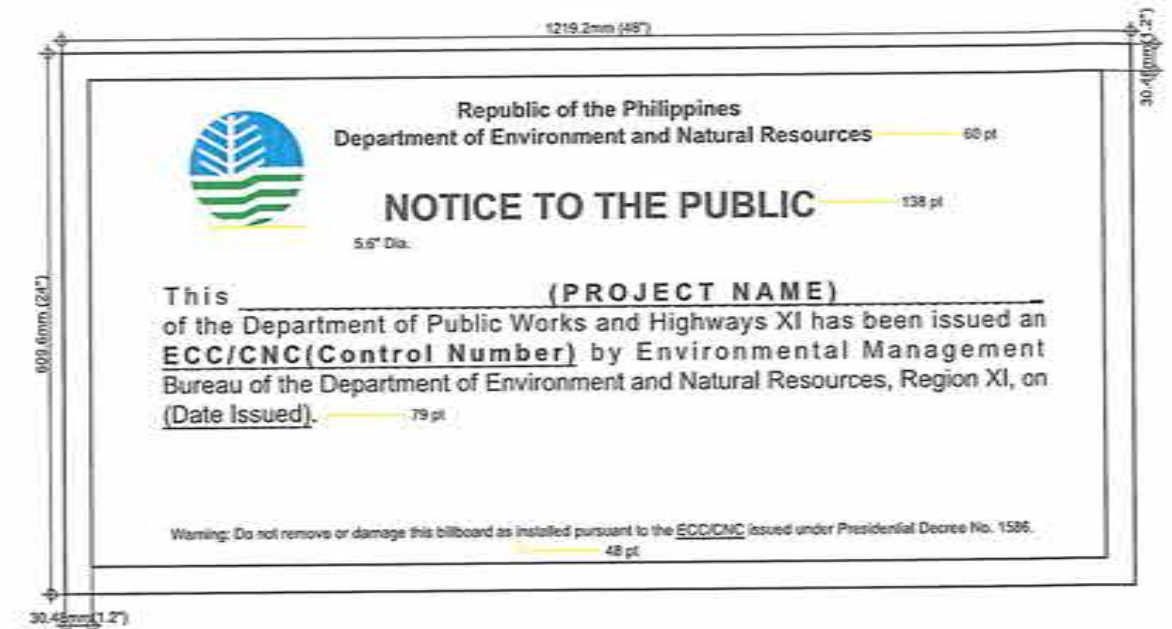
SUBMITTED:
JUDY ANN T. BERNARDINO
CHIEF, PLANNING AND DESIGN DIVISION
DATE:

RECOMMENDED:
JOSE LUIS S. CABALLERO
ASSISTANT REGIONAL DIRECTOR
DATE:

APPROVED:
JUBY S. CORDON
REGIONAL DIRECTOR
DATE:

SET NO.
C
09/10

SHEET NO.
35
50





Republic of the Philippines
DEPARTMENT OF PUBLIC WORKS AND HIGHWAYS
 Regional Office No. XI
 Gov. Chavez Cor. R. Magsaysay Avenue, Davao City

Project: _____ Cost: _____
 _____ Fund Source/s: _____
 Location: _____

Implementing Agency/ies: _____
 Development Partner/s: _____
 Contractor/Supplier: _____
 Brief Description of Project: _____

Project Details:

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

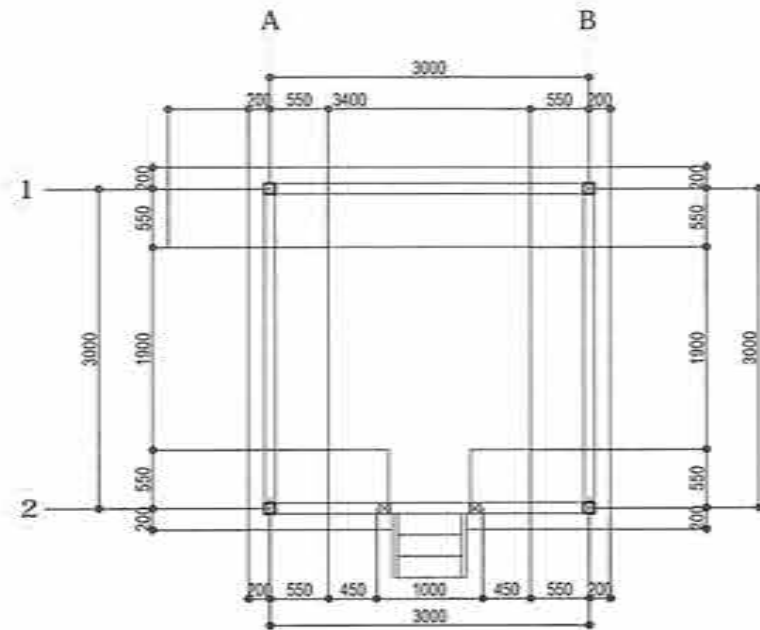
For Particular of complaints about this project, please contact the Regional Office or Cluster which has audit jurisdiction on this project:

COA Regional Office No./Cluster : XI
 Address : Buhangin, Davao City
 Contact No. : (082) 241-2941 or Text COA Citizens Desk (0915-5391-957)

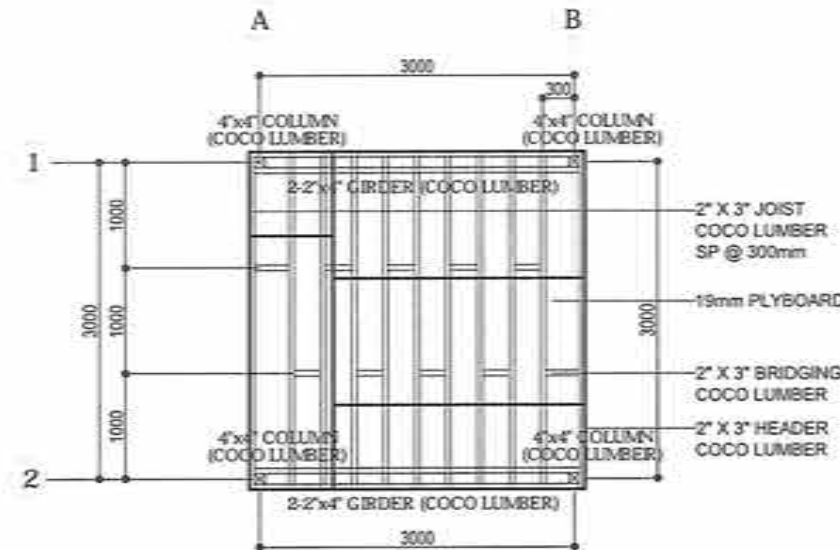
NOTES FOR COA BILLBOARD:

- TARPULIN, WHITE, 6FT x 8 FT
- RESOLUTION: 70DPI
- FONT: HELVETICA
- FONT SIZE : MAIN INFORMATION - 3"
: SUB-INFORMATION - 1"
- FONT COLOR: BLACK

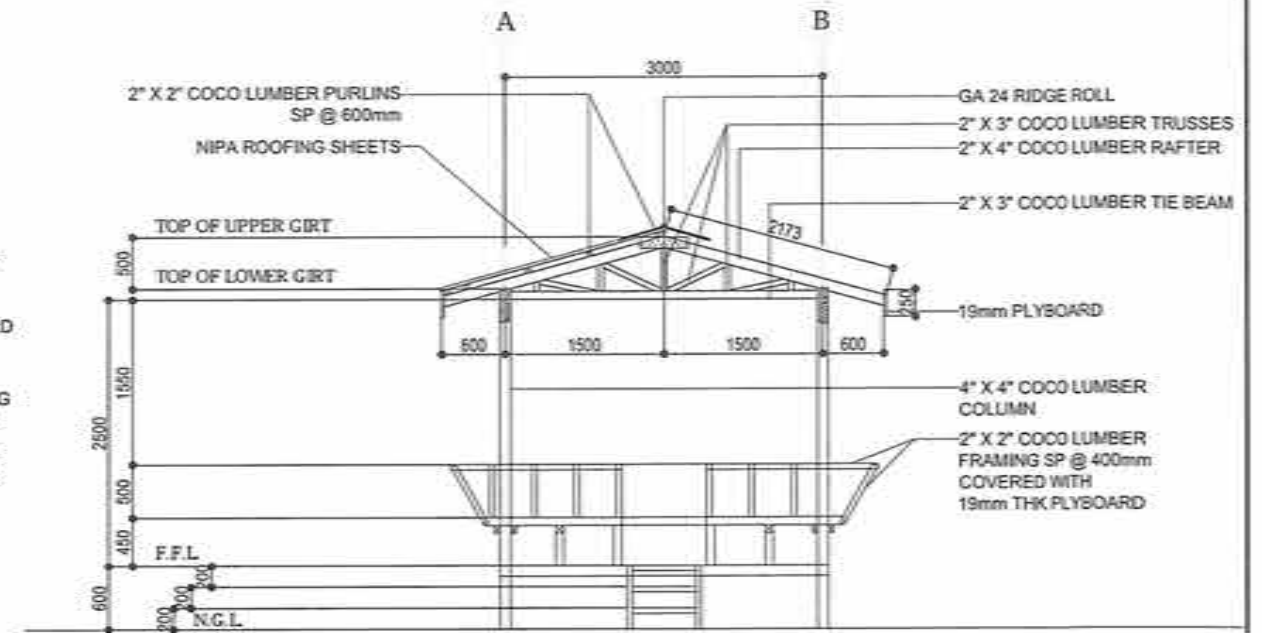
D. CAMPHOUSE (BAHAY KUBO) DETAILS



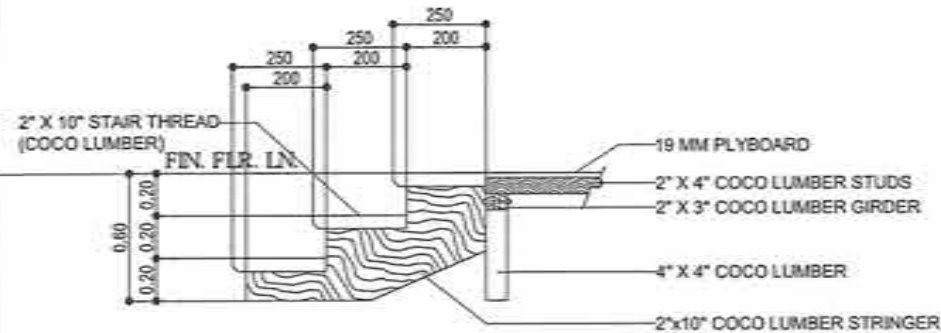
1 FLOOR PLAN
a



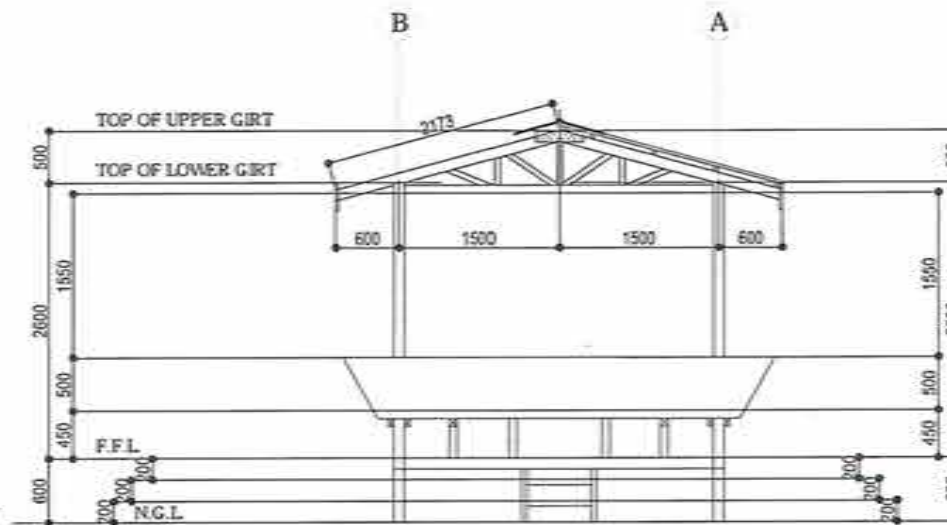
2 FLOOR FRAMING
a



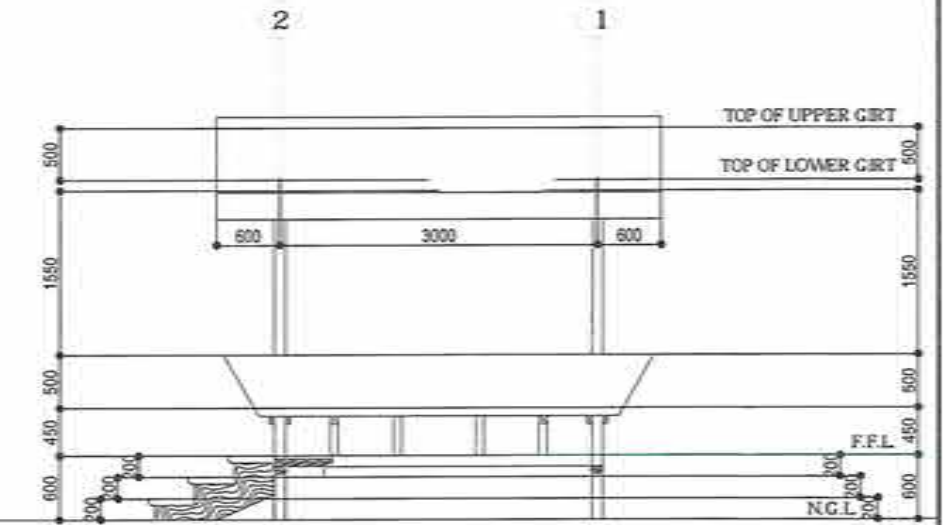
3 SECTION
a



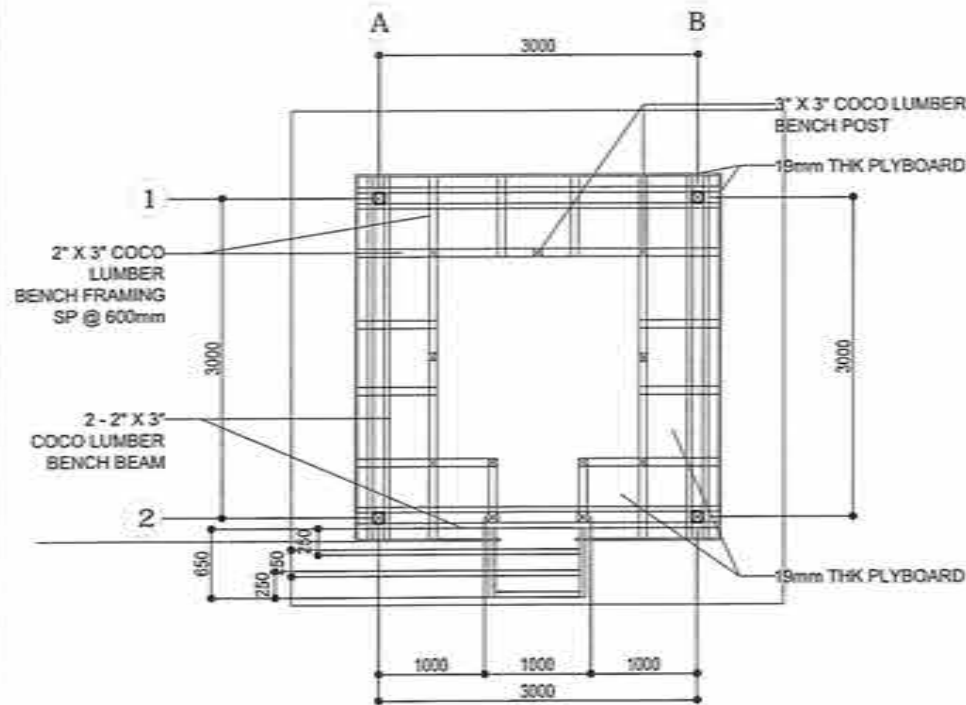
4 STAIR DETAIL
a



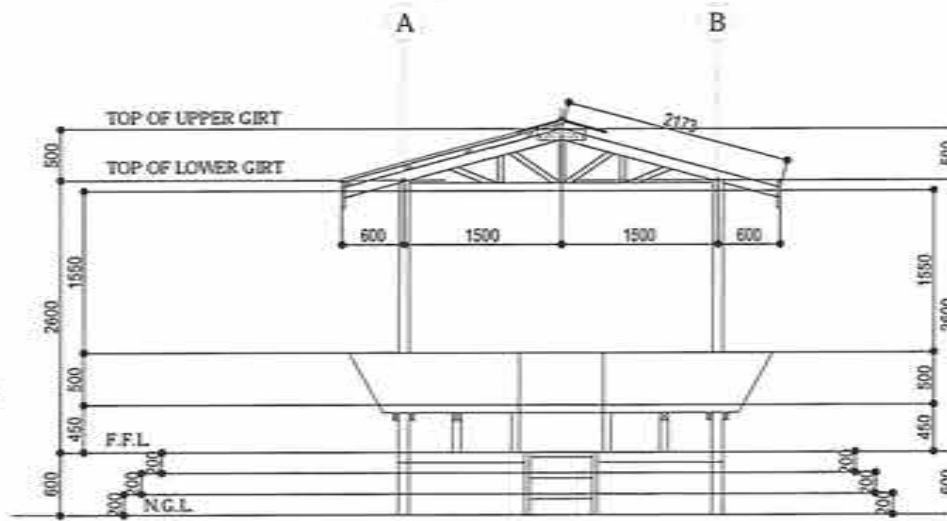
6 REAR ELEVATION
a



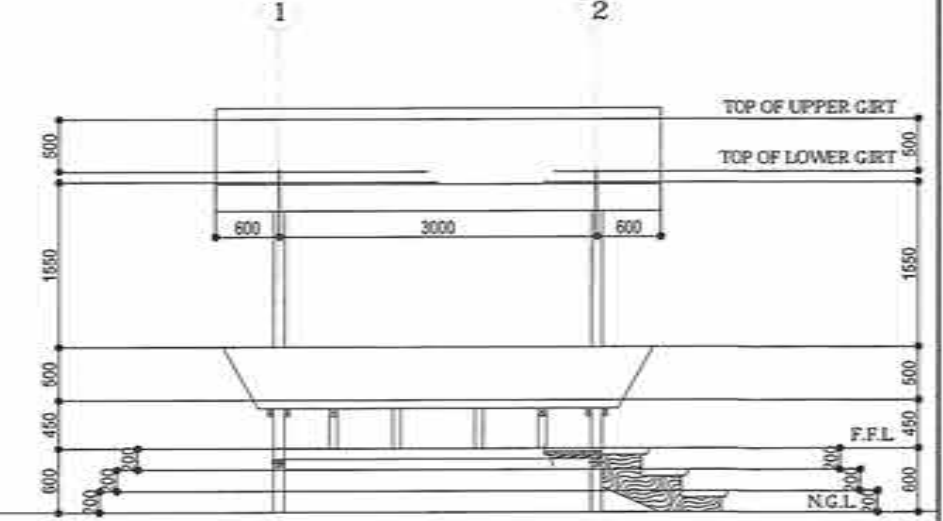
7 RIGHT SIDE ELEVATION
a



5 BENCH FRAMING
a



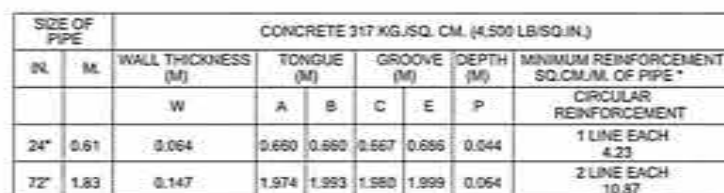
8 FRONT ELEVATION
a



9 LEFT SIDE ELEVATION
a

 REPUBLIC OF THE PHILIPPINES DEPARTMENT OF PUBLIC WORKS AND HIGHWAYS REGIONAL OFFICE NO. XI GOV. CORTEZ COR. R. MAGSAYSAY AVENUE, DAVAO CITY	PROJECT NAME AND LOCATION: ROAD WIDENING - MARABALNA HIGHWAY - (501364M) K1478 + 712 - K1478 + 867, (50064M) K1479 + 252 - K1479 + 245, DAVAO DEL NORTE	SHEET CONTENTS: CAMPOUSE TYPICAL DETAILS (BAHAY KLUBO)	DRAFTED AND PREPARED: FERDINAND M. RAROSA ARCHITECT I DATE: _____	REVIEWED: ALVIN A. GINGSAW ENGINEER I DATE: _____	SUBMITTED: JUDY ANN T. BERNARDINO CHIEF, PLANNING AND DESIGN DIVISION DATE: _____	RECOMMENDED: JOSELO B. CABALLERO ASSISTANT REGIONAL DIRECTOR DATE: _____	APPROVED: JUDY B. CORDON REGIONAL DIRECTOR DATE: _____	SET NO. D 01/01 SHEET NO. 37 50
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E. DRAINAGE DETAILS



NOTE: DESIGN REQUIREMENTS ARE BASED ON THE SPECIFICATIONS FOR MATERIALS OF AASHTO M-170

PORTLAND CEMENT MORTAR COLLAR

150

8
1

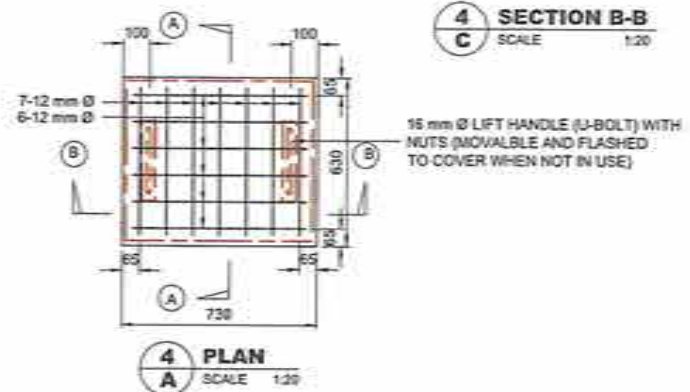
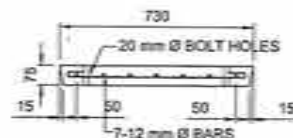
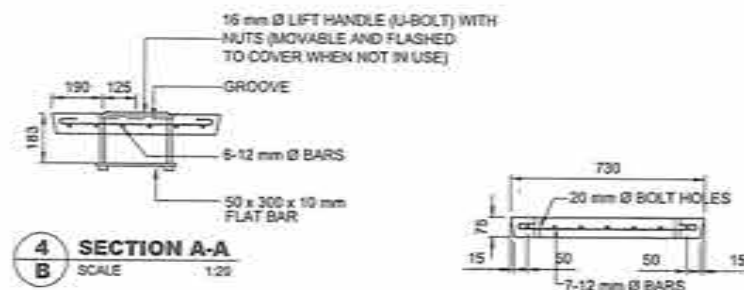
JOINTS SHOULD BE FINISHED SMOOTH ON THE INSIDE

100mm THK. SAND BEDDING

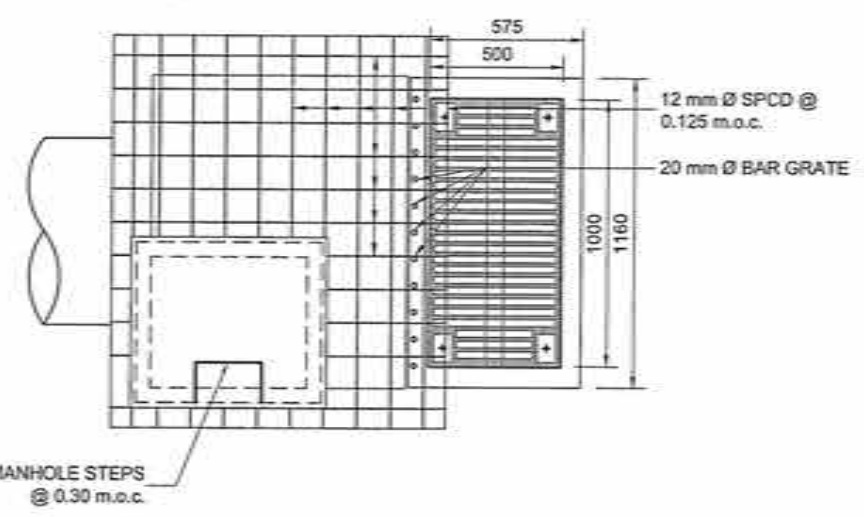
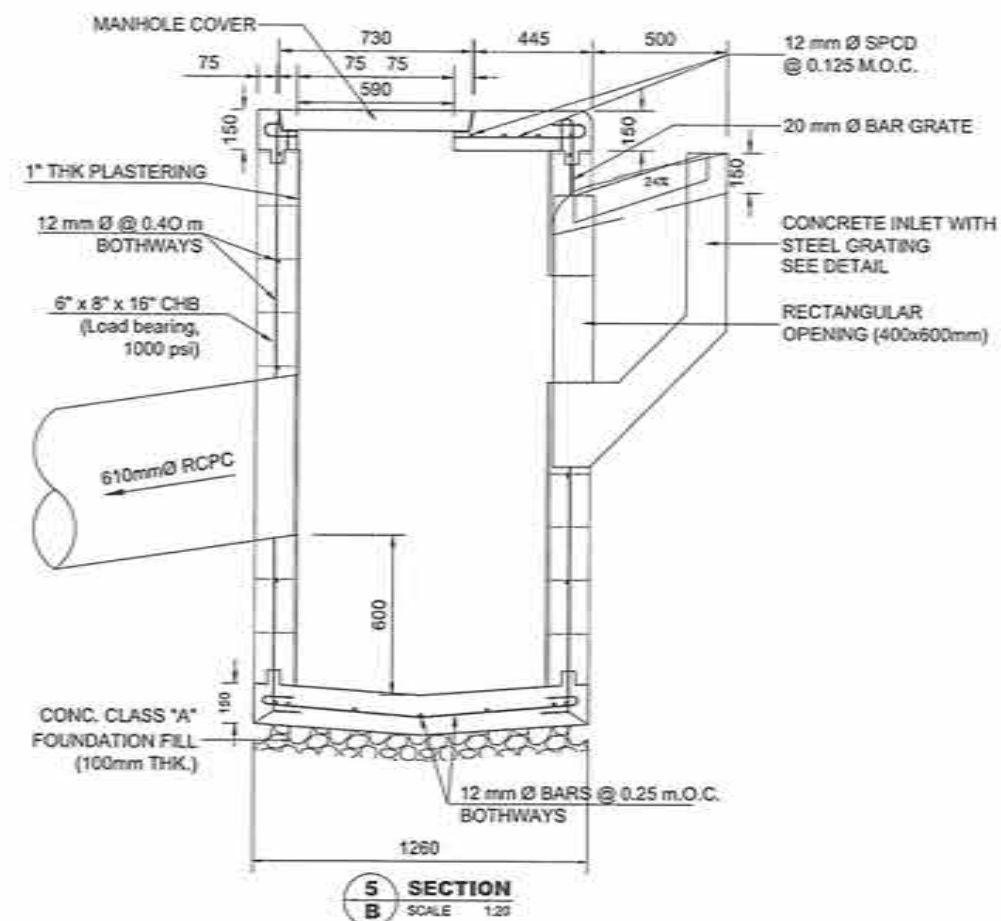
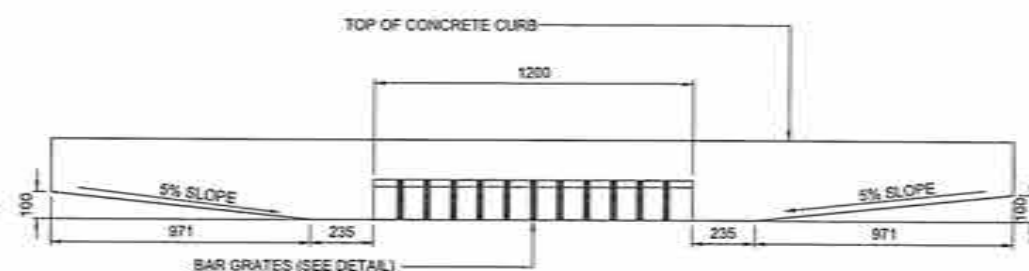
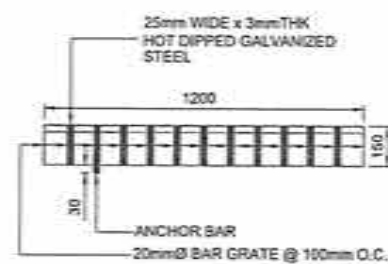
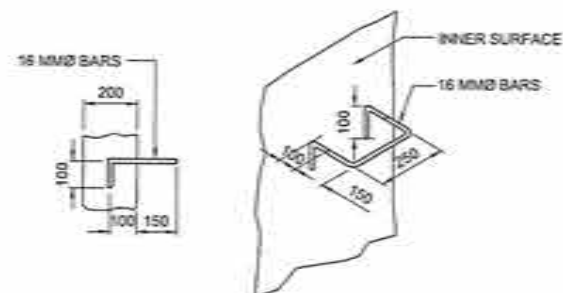
NOTES:

JOINTS SHALL BE MADE WITH (A) PORTLAND CEMENT MORTAR, AS MAY BE SPECIFIED. MORTAR JOINTS SHALL BE MADE WITH AN EXCESS OF MORTAR TO FORM A CONTINUOUS BEAD AROUND THE OUTSIDE OF THE CONDUIT AND FINISHED SMOOTH ON THE INSIDE. FOR GROUTED JOINTS, MOLDS AND RUNNERS SHALL BE USED TO RETAIN THE POURED GROUT.

L.D. (mm)	I (mm)		C
	MACHINE MADE	HAND MADE	
910	85	114	150
1220	110	-	150

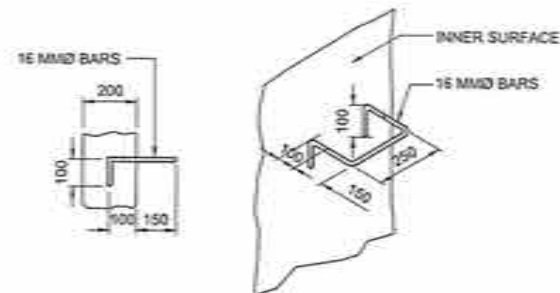


4 MANHOLE COVER
SCALE 1:20



5 CHB MANHOLE for 610mm Ø RCPC

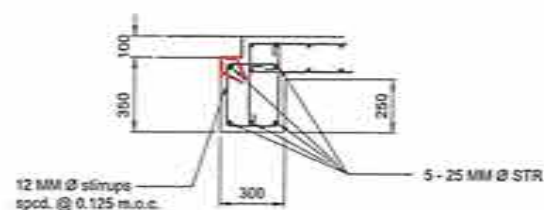
 REPUBLIC OF THE PHILIPPINES DEPARTMENT OF PUBLIC WORKS AND HIGHWAYS REGIONAL OFFICE NO. XI RAMON MAGSAYSAY AVE. CORNER GOV. CHAVEZ ST., DAVAO CITY	PROJECT NAME AND LOCATION: ROAD WIDENING - MANARUKA HIGHWAY - (501344M) K1478 + 722 - K1478 + 847, (500564M) K1479 + 291 - K1479 + 146, DAVAO DEL NORTE	SHEET CONTENTS: CHB MANHOLE for 610mm Ø RCPC MANHOLE COVER MANHOLE STEPS & STEEL GRATING WATER INLET	DRAFTED AND PREPARED: NOVELL V. PENONIA ENGINEER II	REVIEWED: ALAN JOHN B. SOTTO ENGINEER II, SECTION CHIEF	SUBMITTED: JUDY A. T. BERNARDINO CHIEF, PLANNING AND DESIGN DIVISION	RECOMMENDING APPROVAL: ROSELITO B. CABALLERO ASSISTANT REGIONAL DIRECTOR	APPROVED: JUBY B. CORDON REGIONAL DIRECTOR	SET NO. E 02 06 SHEET NO. 39 50
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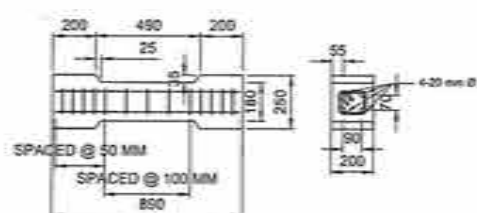
5 MANHOLE STEPS
SCALE 1:25



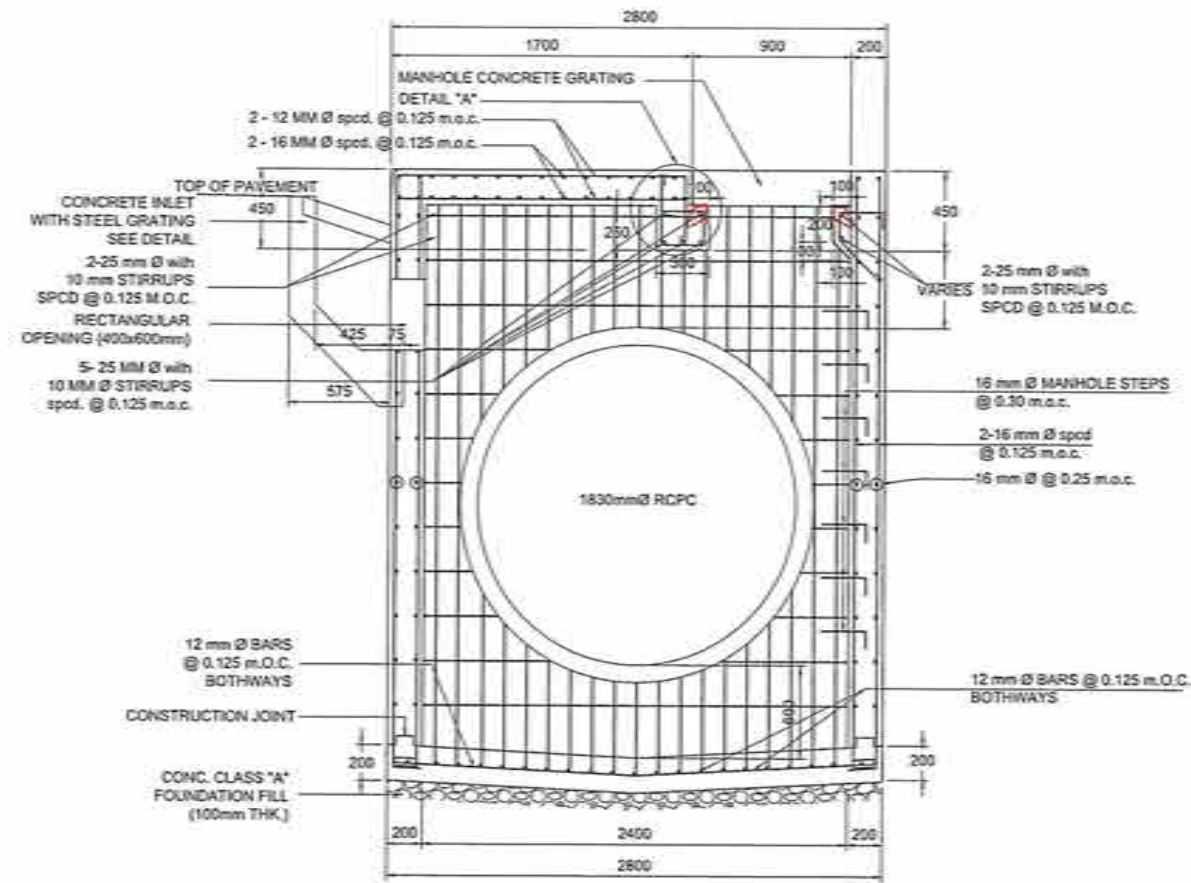
4 BUTT DETAIL
SCALE 1:25



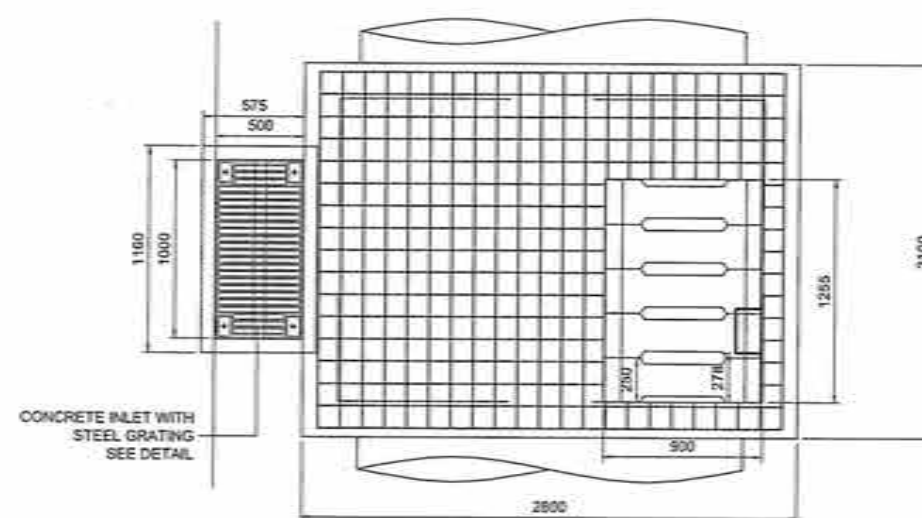
3 DETAIL "A"
SCALE 1:25



2 DETAIL OF CONC. GRATING
SCALE 1:25



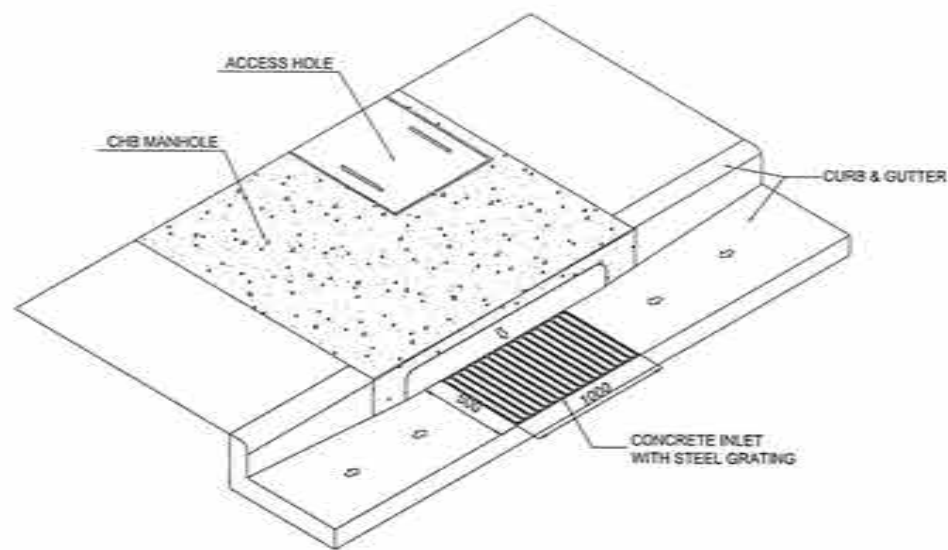
6 SECTION B
SCALE 1:30



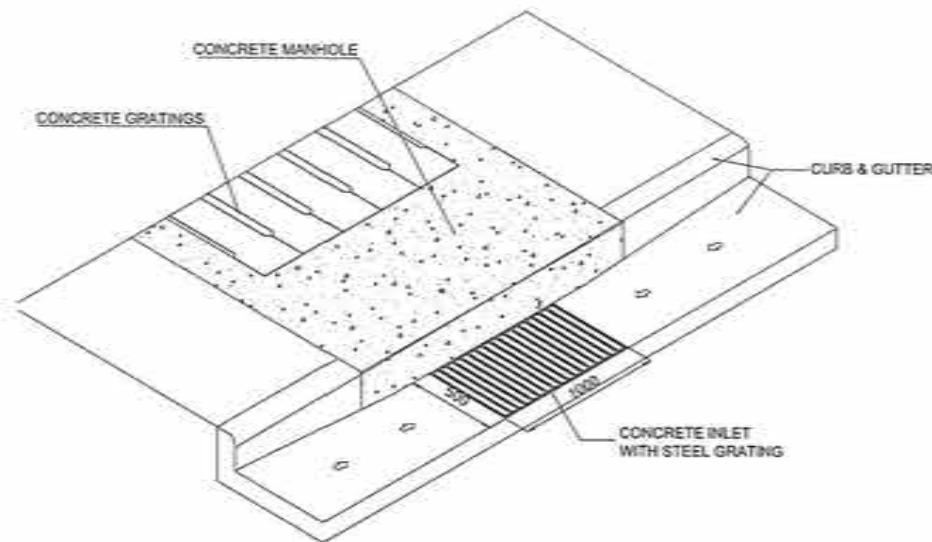
6 PLAN A
SCALE 1:30

6 CONC. MANHOLE for 1830mm Ø RCPC

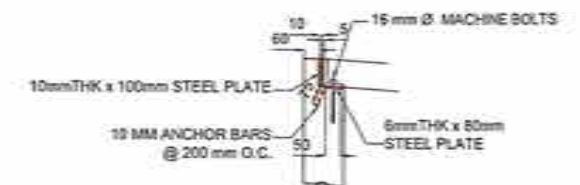
 REPUBLIC OF THE PHILIPPINES DEPARTMENT OF PUBLIC WORKS AND HIGHWAYS REGIONAL OFFICE NO. XI RAMON WINGSAKAY AVE. CORNER GOV. CHAVEZ ST., DAVAO CITY	PROJECT NAME AND LOCATION ROAD WIDENING - MAHARLIKA HIGHWAY - (50136490) K3478 + 722 - K3478 + 827, (500005490) K3479 + 292 - K3479 + 346, DAVAO DEL NORTE	SHEET CONTENTS CONC. MANHOLE FOR 1830mm Ø RCPC CONC. MANHOLE FOR 1830mm Ø RCPC DETAIL OF CONC. GRATING BUTT DETAIL MANHOLE STEPS	DRAFTED AND PREPARED:  HOWELL V. PENORIA ENGINEER II DATE: _____	REVIEWED:  MAIN JOHN R. SOTTO ENGINEER II, SECTION CHIEF DATE: _____	SUBMITTED:  JUDY B. BERNARDINO CHIEF, PLANNING AND DESIGN DIVISION DATE: _____	RECOMMENDING APPROVAL:  JOSEITO S. CABALLERO ASSISTANT REGIONAL DIRECTOR DATE: _____	APPROVED:  JUBY B. CORDON REGIONAL DIRECTOR DATE: _____	SET NO. SHEET NO. E 40 03/06 50
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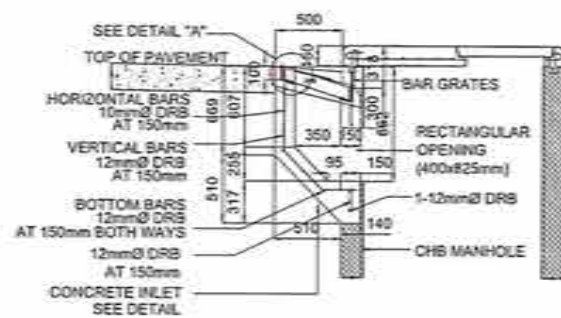
1 ISOMETRIC VIEW FOR CHB MANHOLE
SCALE 1:30



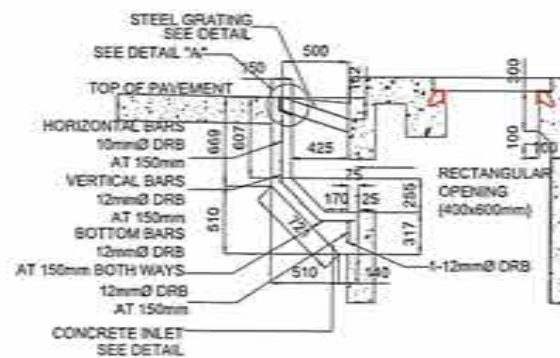
1 ISOMETRIC VIEW FOR CONCRETE MANHOLE
SCALE 1:30



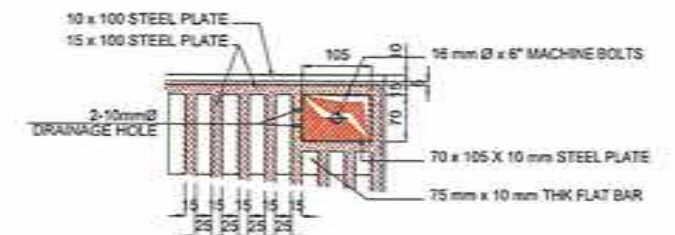
1 DETAIL "A"
SCALE 1:20



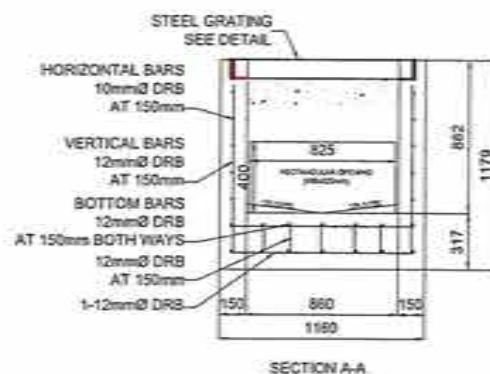
1 SECTION SHOWING INLET AT CHB MANHOLE
SCALE 1:40



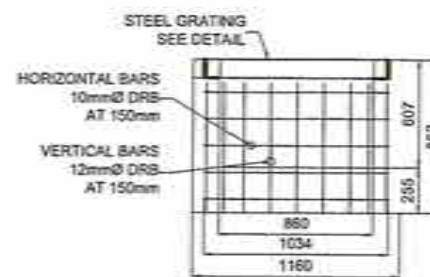
1 SECTION SHOWING INLET AT CONCRETE MANHOLE
SCALE 1:40



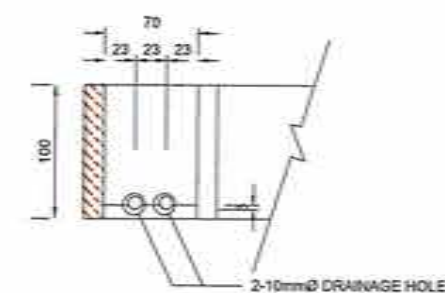
1 DETAIL "B"
SCALE 1:80



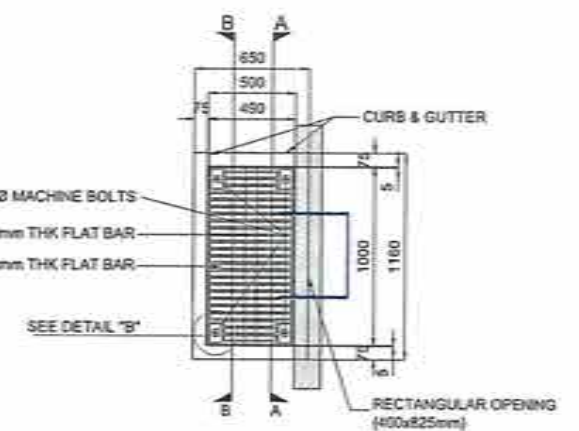
1 REINFORCING DETAIL
SCALE 1:30



1 CONCRETE INLET DETAIL



1 DRAINAGE HOLE DETAIL
SCALE 1:4



1 PLAN
SCALE 1:30



REPUBLIC OF THE PHILIPPINES
DEPARTMENT OF PUBLIC WORKS AND HIGHWAYS
REGIONAL OFFICE NO. XI
RAMON MACSAYSAY AVE. CORNER GOV. CHAVEZ ST., DAVAO CITY

PROJECT NAME AND LOCATION:
ROAD WIDENING - MAHARLAKA HIGHWAY - (50136400) K1478 +
721 - K1478 + 847, (50004900) K1479 + 251 - K1479 + 146,
DAVAO DEL NORTE

SHEET CONTENTS:
CONCRETE INLET DETAIL

DRAFTED AND PREPARED:
NOWELL V. PENONIA
ENGINEER II
DATE: _____

REVIEWED:
JUAN JOHN P. SOTTO
ENGINEER II, SECTION CHIEF
DATE: _____

SUBMITTAL:
JUDY ANN T. BERNARDINO
CHIEF, PLANNING AND DESIGN DIVISION
DATE: _____

RECOMMENDING APPROVAL:
JOSE LITO B. CABALLERO
ASSISTANT REGIONAL DIRECTOR
DATE: _____

APPROVED:
JUBY B. CORDON
REGIONAL DIRECTOR
DATE: _____

SET NO. E
SHEET NO. 41
04/06 50

DRAINAGE SCHEDULE														
STATION	DESCRIPTION	101(2)	103(1)a	103(3)	103(5)a	500(1)b1	500(1)b7	502(1)a7	502(1)b1	502(2)a1	REMARKS	DESIGN PARAMETERS		
		each	cu.m.	cu.m.	cu.m.	ln.m.	ln.m.	each	each	each		Q(cu.m/s.)	A(ha.)	v(m/s)
MANHOLE (LEFT SIDE)														
1478+731.669	CONSTRUCT 1830mmØ CONC. MANHOLE		11.67	0.59				1.00	-	1.00				
1478+752.981	CONSTRUCT 1830mmØ CONC. MANHOLE		11.91	0.59				1.00	-	1.00				
1478+780.000	CONSTRUCT 1830mmØ CONC. MANHOLE		11.85	0.59				1.00	-	1.00				
1478+720.000	CONSTRUCT 610mmØ CHB MANHOLE		10.40	0.19					1.00	1.00				
1478+731.669	CONSTRUCT 610mmØ CHB MANHOLE		10.40	0.19					1.00	1.00				
1478+800.000	CONSTRUCT 610mmØ CHB MANHOLE		10.07	0.19					1.00	1.00				
1478+820.000	CONSTRUCT 610mmØ CHB MANHOLE		10.17	0.19					1.00	1.00				
1478+840.000	CONSTRUCT 610mmØ CHB MANHOLE		10.14	0.19					1.00	1.00				
MANHOLE (RIGHT SIDE)														
1478+743.789	CONSTRUCT 1830mmØ CONC. MANHOLE		11.34	0.59				1.00	-	1.00				
1478+760.000	CONSTRUCT 1830mmØ CONC. MANHOLE		11.67	0.59				1.00	-	1.00				
1478+780.000	CONSTRUCT 1830mmØ CONC. MANHOLE		11.91	0.59				1.00	-	1.00				
1478+800.000	CONSTRUCT 1830mmØ CONC. MANHOLE		11.58	0.59				1.00	-	1.00				
1478+820.000	CONSTRUCT 1830mmØ CONC. MANHOLE		11.70	0.59				1.00	-	1.00				
1478+720.000	CONSTRUCT 610mmØ CHB MANHOLE		10.55	0.19					1.00	1.00				
1478+743.789	CONSTRUCT 610mmØ CHB MANHOLE		9.48	0.19					1.00	1.00				
1478+800.000	CONSTRUCT 610mmØ CHB MANHOLE		10.90	0.19					1.00	1.00				
1478+820.000	CONSTRUCT 610mmØ CHB MANHOLE		11.12	0.19					1.00	1.00				
1478+840.000	CONSTRUCT 610mmØ CHB MANHOLE		11.14	0.19					1.00	1.00				
LATERAL DRAIN (LEFT SIDE)														
1478+721.050 TO 1478+730.619	INSTALL 1830mmØ LATERAL RCPC				91.96	10.00								
1478+732.719 TO 1478+751.931	INSTALL 1830mmØ LATERAL RCPC				167.71	20.00								
1478+754.031 TO 1478+778.950	INSTALL 1830mmØ LATERAL RCPC				212.51	25.00								
1478+781.050 TO 1478+798.950	INSTALL 1830mmØ LATERAL RCPC				155.70	18.00								
LATERAL DRAIN (RIGHT SIDE)														
1478+721.050 TO 1478+742.739	INSTALL 1830mmØ LATERAL RCPC				179.02	22.00								
1478+744.839 TO 1478+758.950	INSTALL 1830mmØ LATERAL RCPC				124.49	15.00								
1478+761.050 TO 1478+778.950	INSTALL 1830mmØ LATERAL RCPC				160.10	18.00								
1478+781.050 TO 1478+798.950	INSTALL 1830mmØ LATERAL RCPC				158.60	18.00								
1478+801.050 TO 1478+818.950	INSTALL 1830mmØ LATERAL RCPC				157.40	18.00								
1478+821.050 TO 1478+838.950	INSTALL 1830mmØ LATERAL RCPC				164.20	18.00								
CROSS DRAIN (LEFT SIDE)														
1478+720.000	INSTALL 610mmØ CROSSDRAIN RCPC				14.47	8.00								
1478+731.669	INSTALL 610mmØ CROSSDRAIN RCPC				14.47	8.00								
1478+800.000	INSTALL 610mmØ CROSSDRAIN RCPC				14.08	8.00								
1478+820.000	INSTALL 610mmØ CROSSDRAIN RCPC				13.64	8.00								
1478+840.000	INSTALL 610mmØ CROSSDRAIN RCPC				13.69	8.00								
CROSS DRAIN (RIGHT SIDE)														
1478+720.000	INSTALL 610mmØ CROSSDRAIN RCPC				16.02	8.00								
1478+743.789	INSTALL 610mmØ CROSSDRAIN RCPC				15.97	8.00								
1478+800.000	INSTALL 610mmØ CROSSDRAIN RCPC				16.00	8.00								
1478+820.000	INSTALL 610mmØ CROSSDRAIN RCPC				16.02	8.00								
1478+840.000	INSTALL 610mmØ CROSSDRAIN RCPC				15.73	8.00								
1478+720.000 TO 1478+840.000	REMOVAL OF EXISTING MANHOLE	8.00												
TOTAL		8.00	198.00	6.62	1721.78	80.00	182.00	8.00	18.00	18.00				
SAY,		8.00	198.00	7.00	1722.00	80.00	182.00	8.00	18.00	18.00				



REPUBLIC OF THE PHILIPPINES
DEPARTMENT OF PUBLIC WORKS AND HIGHWAYS
REGIONAL OFFICE NO. XI
RAMON MAGSAYSAY AVE. CORNER GOV. DRAVEZ ST., DAVAO CITY

PROJECT NAME AND LOCATION:

ROAD WIDENING - MAHARAJA HIGHWAY - (S&D) K1478 + 721 - K1478 + 847, (S&D) K1478 + 731 - K1478 + 816, DAVAO DEL NORTE

SHEET CONTENTS:

DRAINAGE SCHEDULE

DRAFTED AND PREPARED:

NOVELL V. PENONIA
ENGINEER II

DATE:

REVIEWED:

ALAN JOHN R. SOTTO
ENGINEER IN CHARGE

DATE:

SUBMITTER:

JUDY ANN T. BERNARDINO
CHIEF PLANNING AND DESIGN DIVISION

DATE:

RECOMMENDING APPROVAL:

JOSE LITO B. CABALLERO
ASSISTANT REGIONAL DIRECTOR

DATE:

APPROVED:

JUBY B. CORDON
REGIONAL DIRECTOR

DATE:

SET NO.

E
05/06

SHEET NO.

42
50

SUMMARY OF QUANTITIES

ITEM #	DESCRIPTION	UNIT	QUANTITY	REMARKS
101(2)	REMOVAL OF ACTUAL STRUCTURES / OBSTRUCTION	each	8.00	36"Ø MH = 5 EACH, 48"Ø MH = 3 EACH
103(1)a	STRUCTURE EXCAVATION, COMMON SOIL	cu.m	198.00	FOR MANHOLE
103(3)	FOUNDATION FILL	cu.m	7.00	FOR MANHOLE
103(5)a	PIPE CULVERTS AND DRAIN EXCAVATION (COMMON SOIL)	cu.m	1,722.00	FOR RCPC
500(1)b1	PIPE CULVERTS, 610mmØ CLASS IV	ln.m	80.00	SUBSIDIARY: FOUNDATION FILL
500(1)b7	PIPE CULVERTS, 1830mmØ CLASS IV	ln.m	182.00	SUBSIDIARY: FOUNDATION FILL
502(1)a7	MANHOLES, 1830mmØ CONCRETE	each	8.00	FOR MANHOLE
502(1)b1	MANHOLES, 610mmØ CHB	each	10.00	FOR MANHOLE
502(2)a1	INLETS, 610mmØ	each	18.00	FOR INLET



REPUBLIC OF THE PHILIPPINES
DEPARTMENT OF PUBLIC WORKS AND HIGHWAYS
REGIONAL OFFICE NO. XI
RAMON MAGSAYSAY AVE. CORNER SOLO CHAVEZ ST., DAVAO CITY

PROJECT NAME AND LOCATION:

ROAD WIDENING - MAHARLIKA HIGHWAY - (K1478 + 121 - K1478 + 847, 0000000000) K1478 + 231 - K1478 + 146,
DAVAO DEL NORTE

SHEET CONTENTS:

SUMMARY OF QUANTITIES

DRAFTED AND PREPARED:

Nowell V. Penoria
NOWELL V. PENORIA
ENGINEER II

DATE:

REVIEWED:

Alain John R. Sotto
ALAIN JOHN R. SOTTO
ENGINEER II, TECHNICAL SUPERVISOR

DATE:

SUBMITTED:

Judy Ann T. Bernardino
JUDY ANN T. BERNARDINO
CHIEF, PLANNING AND DESIGN DIVISION

DATE:

RECOMMENDING APPROVAL:

Joseito S. Caballero
JOSEITO S. CABALLERO
ASSISTANT REGIONAL DIRECTOR

DATE:

APPROVED:

Juby B. Cordon
JUBY B. CORDON
REGIONAL DIRECTOR

DATE:

SET NO.

E
06/06

SHEET NO.

43
50

F. PLAN AND PROFILE

LEGEND:

- WOODEN / ANAHAW HOUSE
- WS WAITING SHED
- CH CONCRETE HOUSE
- S STORE
- ELECTRIC POST
- SB SIGN BOARD
- CONCRETE SLAB
- C.Y. 2024 PROJECT
- CURB AND GUTTER W/ SIDEWALK
- CONCRETE TRANSITION RAMP
- ROAD WIDENING
- SERVICE ROAD
- SUB-CENTER ISLAND
- DRAINAGE STRUCTURES (C.Y. 2024)

PI#	AZIMUTH	DISTANCE
T-1S TO T-2S	23°09'09"	54.559 M.
T-2S TO T-3S	23°12'52"	56.769 M.
T-3S TO T-4S	23°12'27"	47.617 M.
T-4S TO T-5S	23°08'14"	48.145 M.
T-5S TO T-6S	22°58'31"	111.452 M.

PI#	AZIMUTH	DISTANCE
T-6S TO T-7S	22°59'35"	92.399 M.
T-7S TO T-8S	23°03'05"	86.548 M.
T-1G TO T-2G	22°41'51"	19.766 M.
T-2G TO T-3G	22°57'21"	40.258 M.

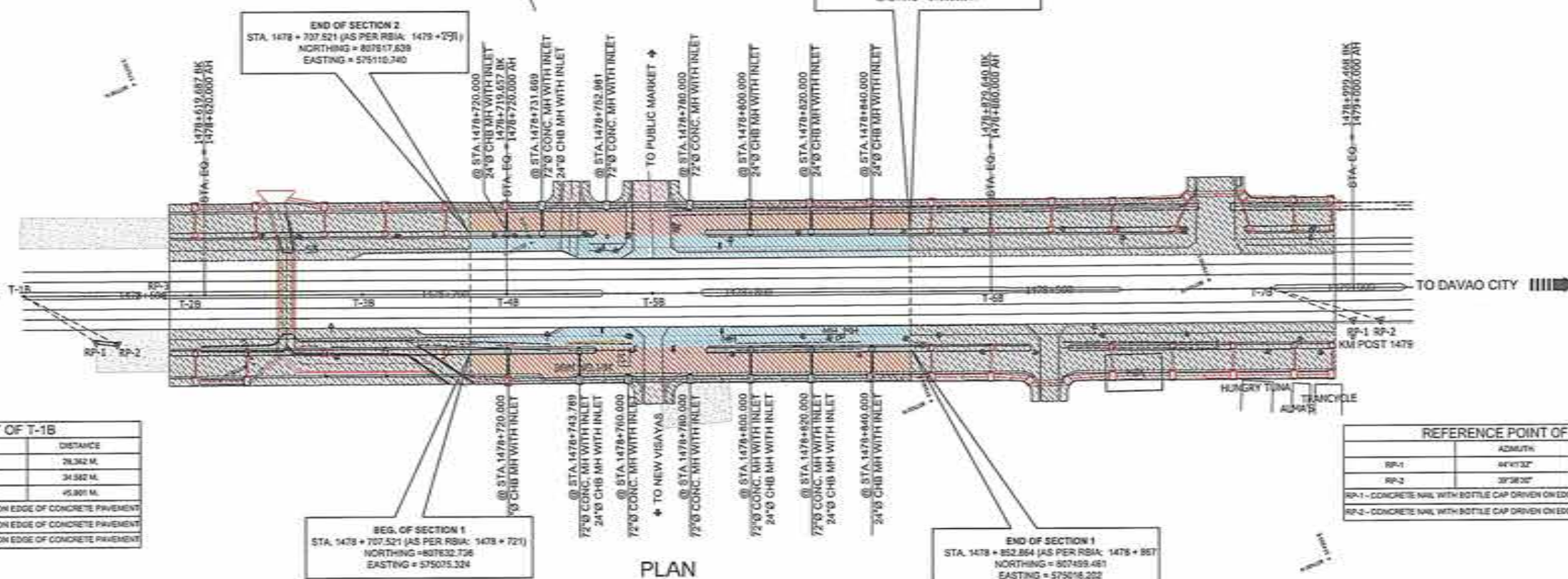
POINT	STATION	NORTHING	EASTING
T-1S	1478+500.000	807760.727	575150.513
T-2S	1478+554.959	807710.174	575128.005
T-3S	1478+612.041	807658.002	575106.628
T-4S	1478+670.000	807614.238	575087.864
T-5S	1478+768.148	807569.963	575066.545
T-6S	1478+879.640	807467.315	575025.426
T-7S	1478+972.399	807382.257	574989.333

REFERENCE POINT OF T-1B		
RP#	AZIMUTH	DISTANCE
RP-1	50°48'21"	76.362 M.
RP-2	50°40'37"	34.542 M.
RP-3	27°03'	45.801 M.

RP-1 - CONCRETE NAIL WITH BOTTLE CAP DRIVEN ON EDGE OF CONCRETE PAVEMENT
 RP-2 - CONCRETE NAIL WITH BOTTLE CAP DRIVEN ON EDGE OF CONCRETE PAVEMENT
 RP-3 - CONCRETE NAIL WITH BOTTLE CAP DRIVEN ON EDGE OF CONCRETE PAVEMENT

REFERENCE POINT OF T-7B		
RP#	AZIMUTH	DISTANCE
RP-1	44°11'32"	29.822 M.
RP-2	30°38'20"	37.953 M.

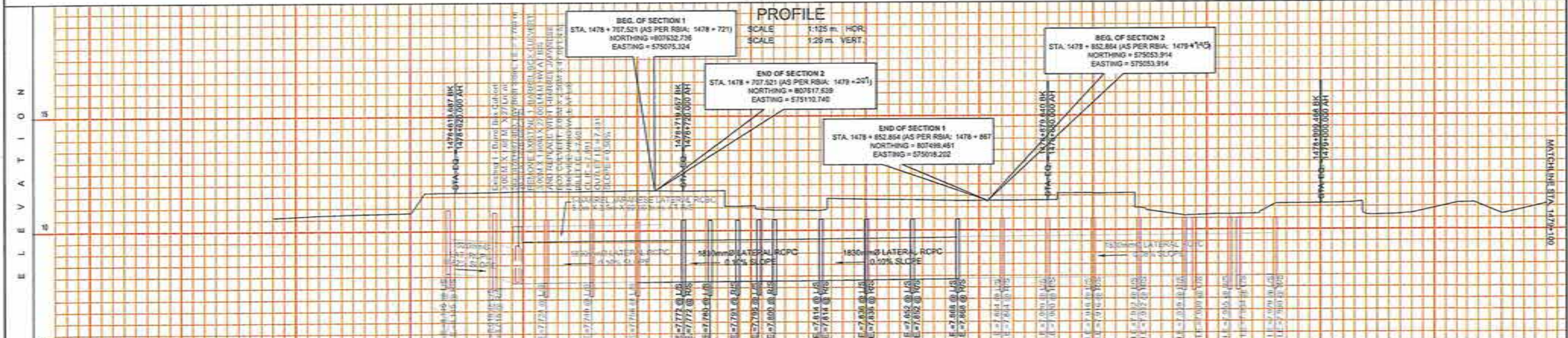
RP-1 - CONCRETE NAIL WITH BOTTLE CAP DRIVEN ON EDGE OF CONCRETE PAVEMENT
 RP-2 - CONCRETE NAIL WITH BOTTLE CAP DRIVEN ON EDGE OF CONCRETE PAVEMENT



PLAN
SCALE 1:1250 m.

PROFILE

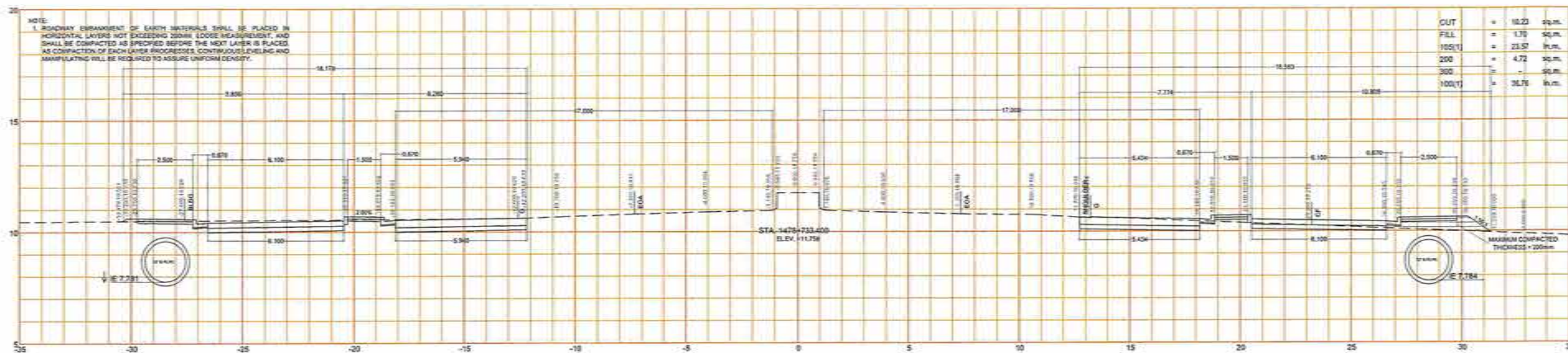
SCALE 1:125 m. HOR.
SCALE 1:25 m. VERT.



STATION	1478+500	1478+600	1478+700	1478+800	1478+900	1479+000	1479+100
FINISHED GRADE ELEVATION	10.621	10.713	10.770	10.809	11.088	11.688	11.139
GROUND ELEVATION	10.621	10.713	10.770	10.809	11.088	11.688	11.139
WIDENING DIAGRAM							
SUPER ELEVATION DIAGRAM							

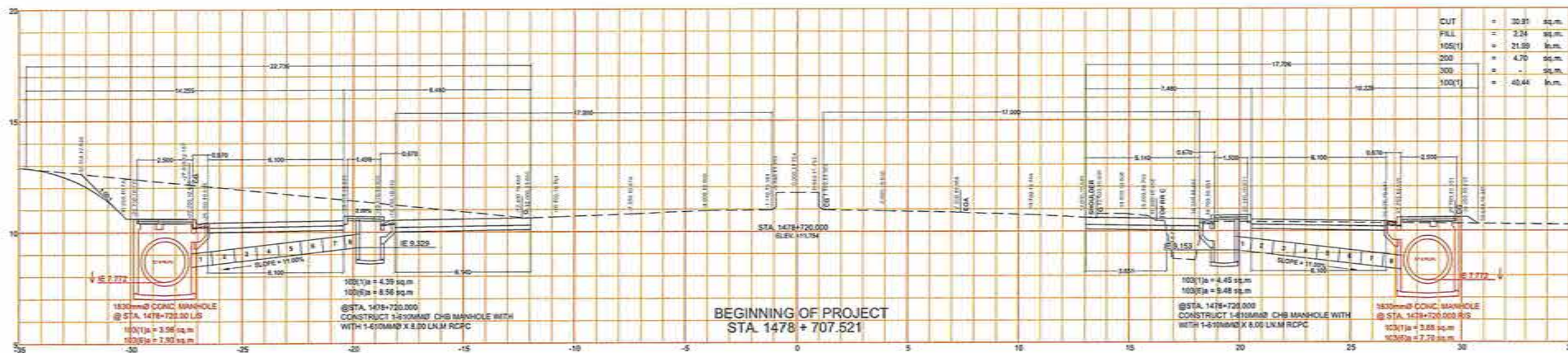
REPUBLIC OF THE PHILIPPINES DEPARTMENT OF PUBLIC WORKS AND HIGHWAYS REGIONAL OFFICE NO. XI GOV. CHAVEZ COR. R. MAGSAYSAY AVENUE, DAVAO CITY	PROJECT NAME AND LOCATION	SHEET CONTENTS	SURVEYED	PREPARED	SUBMITTED	RECOMMENDED	APPROVED	SET NO.	SHEET NO.	
	ROAD WIDENING - MAHARLIKA HIGHWAY - (SR136+000) K1478+721 - K1478+867, (SR005+000) K1478+721 - K1478+867, DAVAO DEL NORTE	PLAN AND PROFILE	DATE: 10/01/2024 REVIEWED: 10/01/2024 DATE: 10/01/2024	DATE: 10/01/2024 REVIEWED: 10/01/2024 DATE: 10/01/2024	DATE: 10/01/2024 REVIEWED: 10/01/2024 DATE: 10/01/2024	DATE: 10/01/2024 REVIEWED: 10/01/2024 DATE: 10/01/2024	DATE: 10/01/2024 REVIEWED: 10/01/2024 DATE: 10/01/2024	DATE: 10/01/2024 REVIEWED: 10/01/2024 DATE: 10/01/2024	F 01/01	44 50

G. DETAILED CROSS SECTIONS



— THIS PROJECT

- C.Y. 2024



SCALE 1:140



REPUBLIC OF THE PHILIPPINES
DEPARTMENT OF PUBLIC WORKS AND HIGHWAYS
REGIONAL OFFICE NO. XI
GOV. CHAVEZ COR. R. MAGSAYSAY AVENUE, DAVAO CITY

PROJECT NAME AND LOCATION:

ROAD WIDENING - MARARUKA HIGHWAY - (50136400) K1478 + 721 - K1478 + 867, (50006400) K1479 + 291 - K1479 + 246, DAVAO DEL NORTE

SHEET CONTENTS:

CROSS SECTIONS

SURVEYED:

HUEL B. BACAY
ENGINEER
DATE: 12/11/2024
REVIEWED: DAVIDO M. CARIAGA
ENGINEER II
DATE: 12/11/2024

PREPARED:

ARMANDO M. BASOC, JR.
ENGINEER
DATE: 12/11/2024
REVIEWED: DENNIS A. SEMPINO
ENGINEER II, CIVIL SECTION CHIEF
DATE: 12/11/2024

SUBMITTED:

JUDYANN T. BERNARDINO
CHIEF, TRAINING AND DESIGN DIVISION
DATE: 12/11/2024

RECOMMENDED:

JOSEFINO B. CABALLERO
ASSISTANT REGIONAL DIRECTOR
DATE: 12/11/2024

APPROVED:

JUBY B. CORDON
REGIONAL DIRECTOR
DATE: 12/11/2024

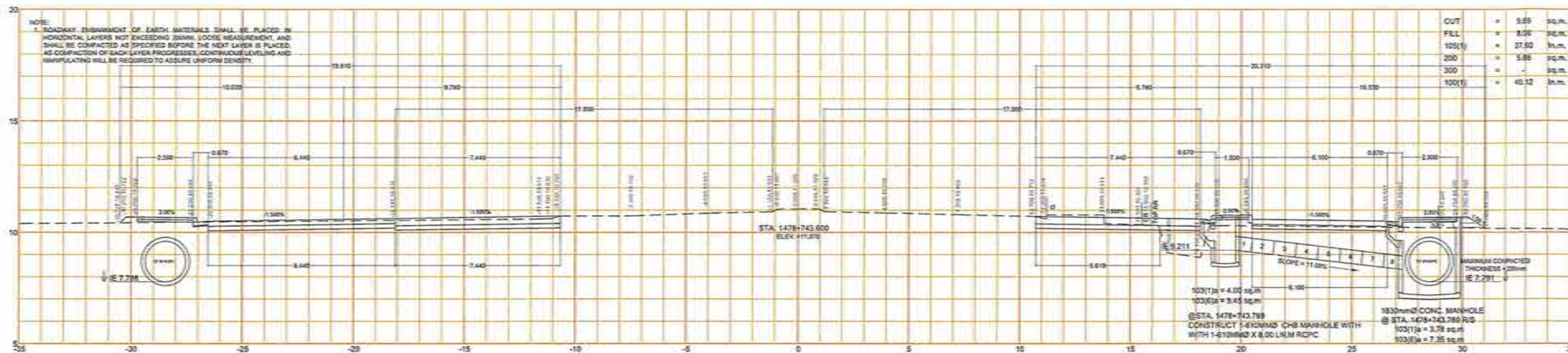
SET NO.

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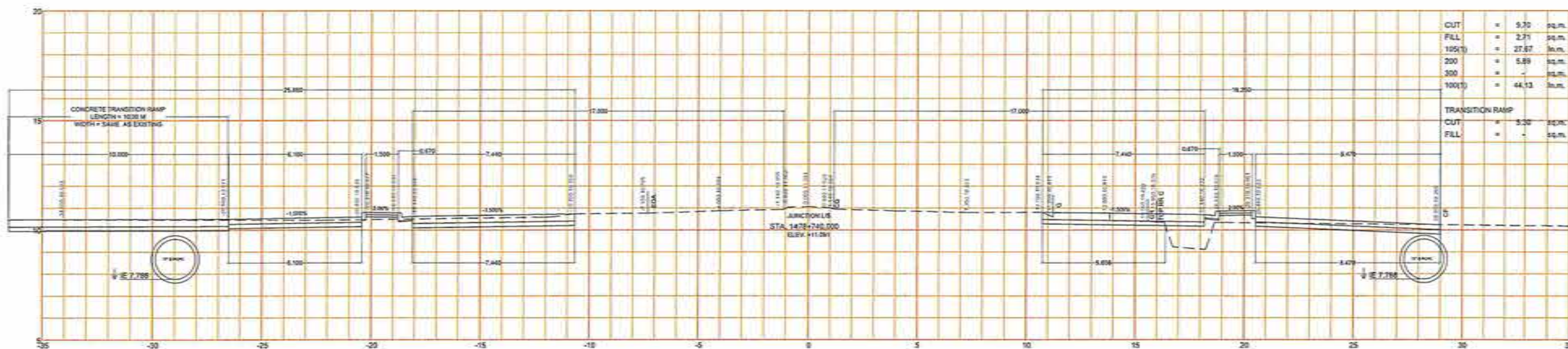
SHEET NO.

45 50

1R11-PD-136MAR2025 PROJECTS_DAAWG MARARUKA ROAD WIDENING - K1478 TO 1479_ARRANGED CROSS SECTION FINAL DWG

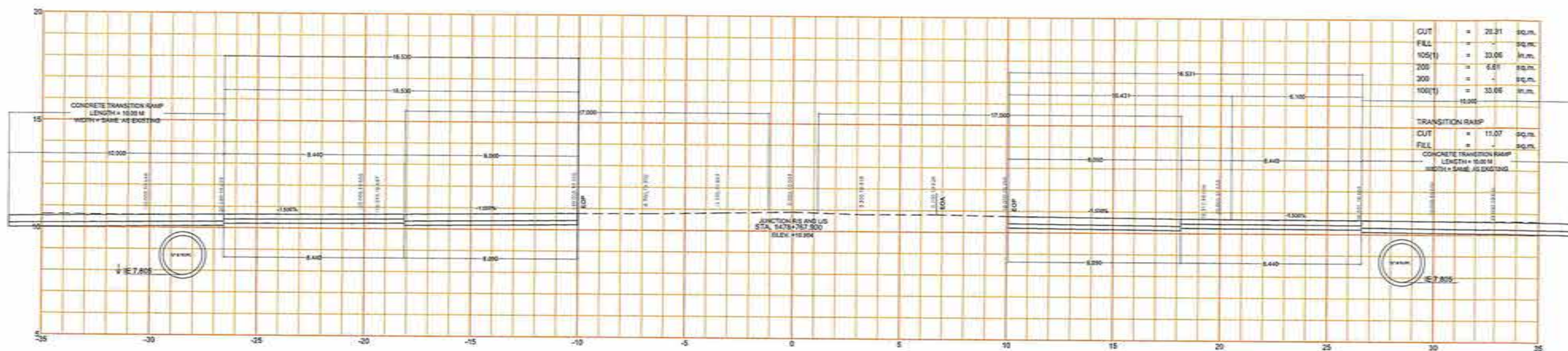


— THIS PROJECT
— C.Y. 2024

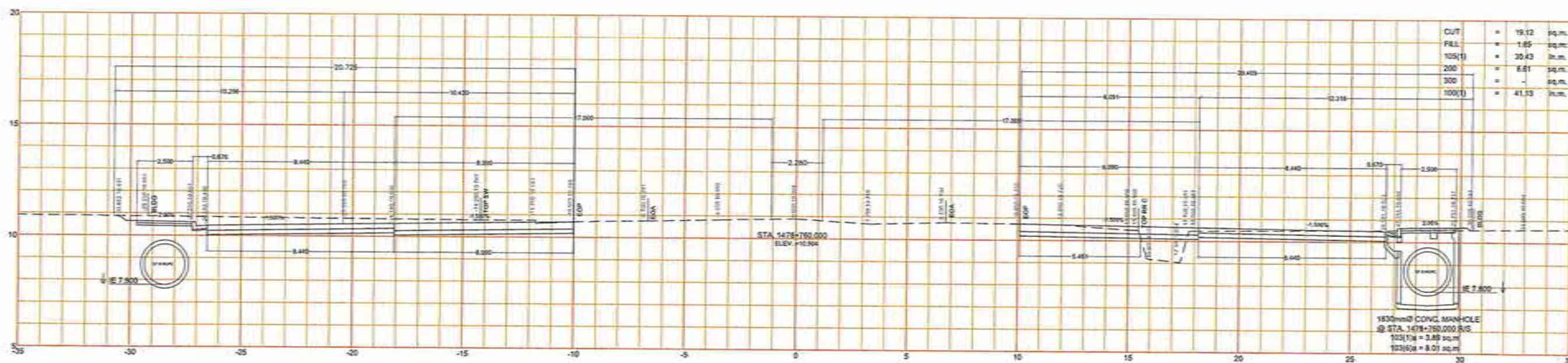


SCALE 1:140

REPUBLIC OF THE PHILIPPINES DEPARTMENT OF PUBLIC WORKS AND HIGHWAYS REGIONAL OFFICE NO. XI GOV. CHAVEZ COR. R. MAGSAYSAY AVENUE, DAVAO CITY	PROJECT NAME AND LOCATION:	SHEET CONTENTS:	SURVEYED:	PREPARED:	SUBMITTED:	RECOMMENDED:	APPROVED:	SET NO.	SHEET NO.
	ROAD WIDENING - KARAKULUKA HIGHWAY - (00136494) K3478 + 723 - K3478 + 867, (00006494) K3475 + 291 - K3475 + 146, DAKING DEL NORTE	CROSS SECTIONS	ARMANDO M. BASOC, JR. ENGINEER I	JUDY B. CORDON REGIONAL DIRECTOR	JUDY B. CORDON REGIONAL DIRECTOR	JUDY B. CORDON REGIONAL DIRECTOR	JUDY B. CORDON REGIONAL DIRECTOR	JUDY B. CORDON REGIONAL DIRECTOR	G 02/05



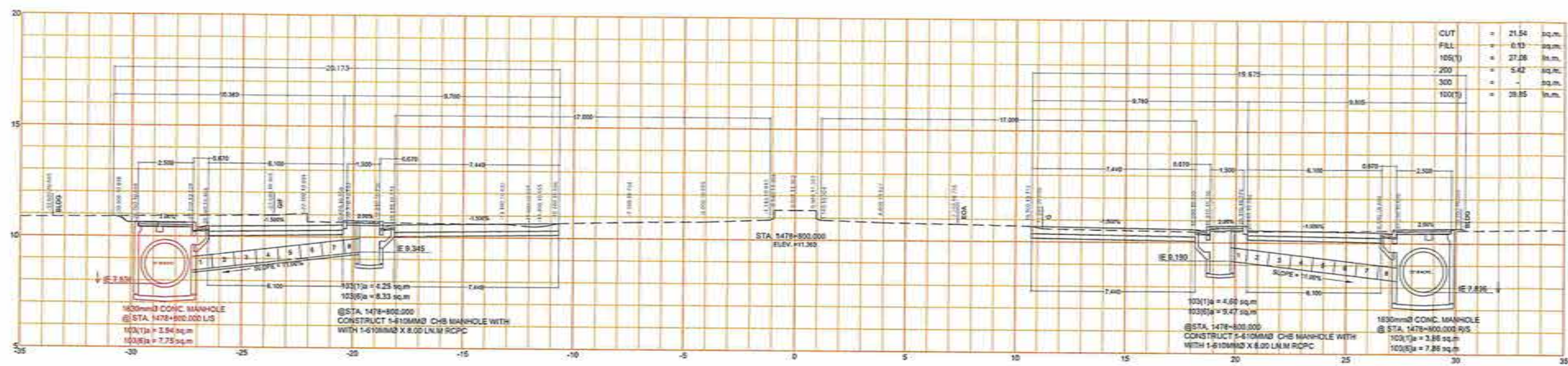
— THIS PROJECT
— C.Y. 2024



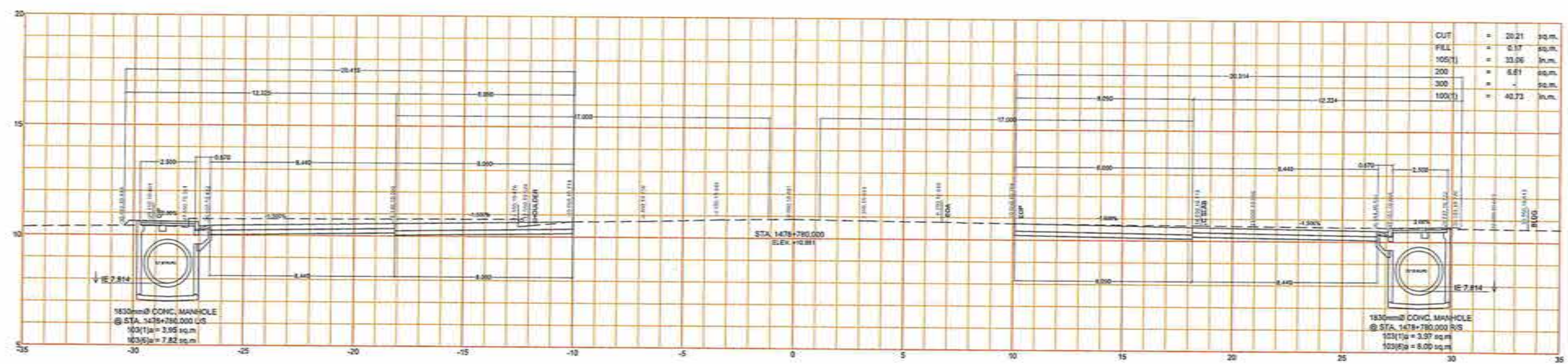
SCALE 1:140

REPUBLIC OF THE PHILIPPINES DEPARTMENT OF PUBLIC WORKS AND HIGHWAYS REGIONAL OFFICE NO. XI GOV. CHAVEZ COR. R. MAGSAYSAY AVENUE, SAVING CITY	PROJECT NAME AND LOCATION:	SHEET CONTENTS:	SURVEYED:	PREPARED:	SUBMITTED:	RECOMMENDED:	APPROVED:	SET NO.	SHEET NO.
	ROAD WIDENING - MARARILKA HIGHWAY - (S0236490) K1478 + 711 - K1478 + 847, (S0056490) K1479 + 251 - K1479 + 546, DAKIN DEL NORTE	CROSS SECTIONS	DATE: _____ REVIEWED: _____ DATE: _____	ARMANDO M. BASOC, JR. ENGINEER I DATE: _____ REVIEWED: _____ DATE: _____	JUDY ANN T. BERNARDINO CHIEF, PLANNING AND DESIGN DIVISION DATE: _____	JOSE LITO B. CABALLERO ASSISTANT REGIONAL DIRECTOR DATE: _____	JUDY B. CORDON REGIONAL DIRECTOR DATE: _____	G 03/05	47 50

WR11-PRO-12/ARMANV225 PROJECTS_DAKIN BIRARILKA2. ROAD WIDENING - K1478 TO 1479_ARRANGED CROSS SECTION FINAL.DWG

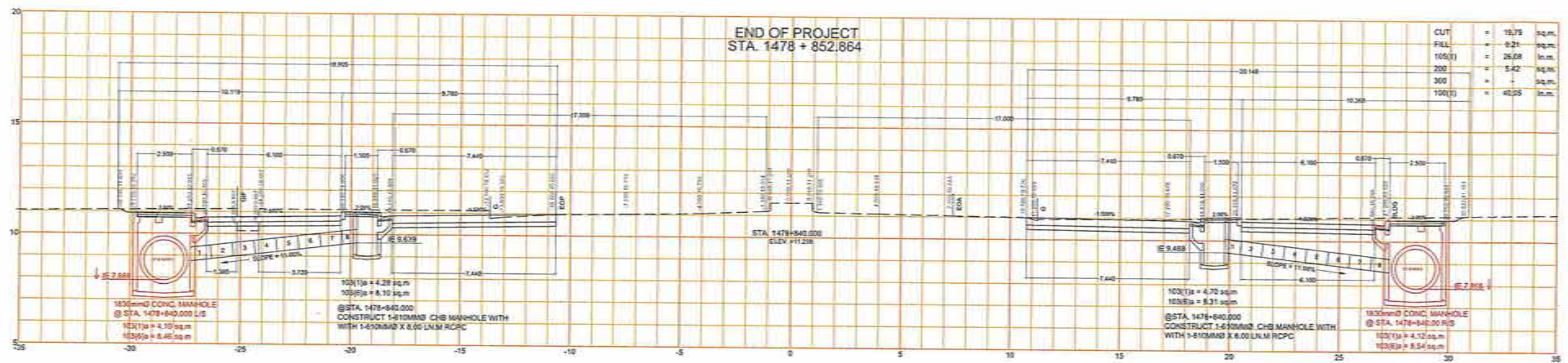


— THIS PROJECT
 — C.Y. 2024

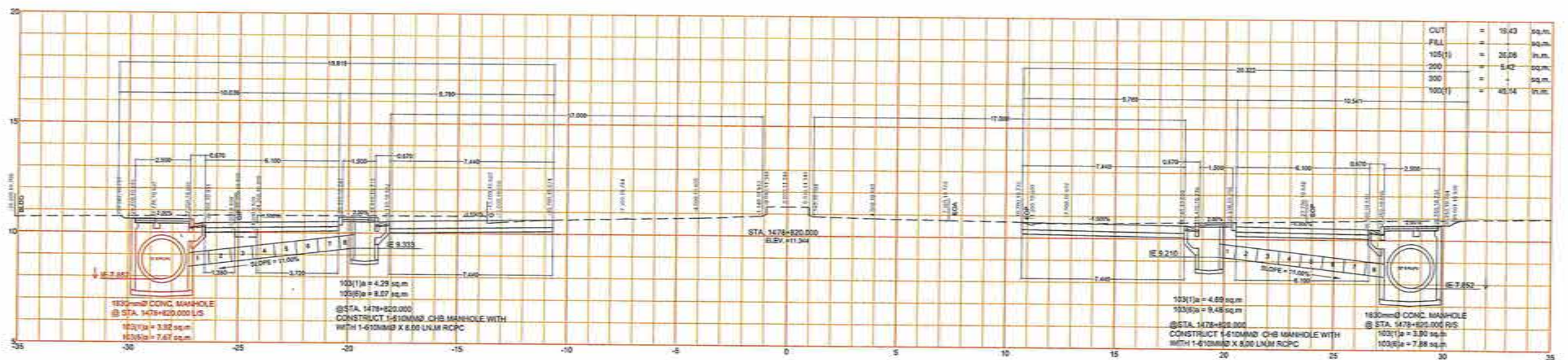


SCALE 1:140

REPUBLIC OF THE PHILIPPINES DEPARTMENT OF PUBLIC WORKS AND HIGHWAYS REGIONAL OFFICE NO. XI GOV. DRIVE COR. R. MAGSAYSAY AVENUE, DAVAO CITY	PROJECT NAME AND LOCATION: ROAD WIDENING - MARABALDO HIGHWAY - (50136400) K3478 + 721 - K3478 + 887, (50054000) K3479 + 250 - K3479 + 146, DAVAO DEL NORTE	SHEET CONTENTS: CROSS SECTIONS	SURVEYED: RUEL B. BAYAT ENGINEER I DATE: 10/10/2024 REVIEWED: DANIEL M. CARAGA ENGINEER II DATE: 10/10/2024	PREPARED: ARMANDO M. BASOC, JR. ENGINEER DATE: 10/10/2024 REVIEWED: DENNIS ALDRIN A. SEMPIO ENGINEER & DIVISION CHIEF DATE: 10/10/2024	SUPERVISOR: JUDY ANN T. BERNARDINO CHIEF, PLANNING AND DESIGN DIVISION DATE: 10/10/2024	RECOMMENDED: JOSEPH B. CABALLERO ASSISTANT REGIONAL DIRECTOR DATE: 10/10/2024	APPROVED: JUDY B. CORDON REGIONAL DIRECTOR DATE: 10/10/2024	SET NO. G 04/05	SHEET NO. 48 50
	1811-FWD-128ARMAN2025 PROJECTS_DAWING MARABALDO ROAD WIDENING - K3478 TO 1479_ARRANGED CROSS SECTION FINAL.DWG								



— THIS PROJECT
— C.Y. 2024



SCALE 1:140



REPUBLIC OF THE PHILIPPINES
DEPARTMENT OF PUBLIC WORKS AND HIGHWAYS
REGIONAL OFFICE NO. XI
GOV. CHAVEZ COR. R. MAGSAYSAY AVENUE, DAVAO CITY

PROJECT NAME AND LOCATION:
ROAD WIDENING - MAHARLIKA HIGHWAY - (30236400) K1478 + 721 - K1478 + 867, (30006400) K1475 + 251 - K1475 + 248, DIVISO DEL NORTE

SHEET CONTENTS:
CROSS SECTIONS

SURVEYED:
RUEL M. BASCO
ENGINEER I
DATE: 10/10/2024
REVIEWED:
DANIEL M. CARLOS
ENGINEER II
DATE: 10/10/2024

PREPARED:
ARMANDO M. BASCO, JR.
ENGINEER I
DATE: 10/10/2024
REVIEWED:
DENNIS ALDRIN A. SEMPIO
ENGINEER I, DIC SECTION CHIEF
DATE: 10/10/2024

SUBMITTED:
JUDY B. CORDON
CHIEF, PLANNING AND DESIGN DIVISION
DATE: 10/10/2024

RECOMMENDED:
JOSELO B. CABALLERO
ASSISTANT REGIONAL DIRECTOR
DATE: 10/10/2024

APPROVED:
JUDY B. CORDON
REGIONAL DIRECTOR
DATE: 10/10/2024

SET NO. 05/05
SHEET NO. 49/50

H. SOIL PROFILE

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