

REPUBLIC OF THE PHILIPPINES DEPARTMENT OF PUBLIC WORKS AND HIGHWAYS REGION XI DAVAO DEL NORTE 2ND DISTRICT ENGINEERING OFFICE TAGUM CITY

C.Y. 2025 PROJECT DETAILED ENGINEERING DESIGN PLAN FOR **CONCRETING OF ROAD IN BARANGAY TUBOD**, **CARMEN, DAVAO DEL NORTE**

SECTION	:	BRGY. T
LOCATION	:	CARMEN
STATION LIMITS	:	STA. 0+0
NET LENGTH	:	178.00 LN

SUBMITTED:

RECOMMENDED:

GARRY E. VERANO OFFICER-IN-CHARGE OFFICE OF ASSISTANT DISTRICT ENGINEER DATE:

JEZABEL E. TULING, MPA CHIEF, PLANNING & DESIGN SECTION

DATE:

UBOD ROAD N, DAVAO DEL NORTE 00.00 - STA. 0+178.00 N.M CONCRETING/0.356 LANE.KM

APPROVED:



ARTURO P. LONGYAPON DISTRICT ENGINEER

DATE:

PROJECT LIMITS :

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DATE:

DATE:

DATE:



GENERAL NOTES

SPECIFICATIONS

1. ALL WORKS SHALL COMPLY WITH THE "DPWH STANDARD SPECIFICATION VOLUME II, HIGHWAYS, BRIDGES AND AIRPORTS 2013", SPECIAL PROVISION AND SUPPLEMENTAL SPECIFICATIONS PERTAINING TO THIS PROJECT.

DIMENSIONS

- 1. DISTANCE BETWEEN THE HORIZONTAL CONTROL POINTS INCLUDING REFERENCE POINTS ARE MEASURED AND EXPRESSED IN METERS
- 2. UNLESS OTHERWISE SPECIFIED, DIMENSIONS OF PIPES, BOX CULVERTS, BRIDGES AND OTHER STRUCTURES ARE MEASURED AND EXPRESSED IN MILLIMETERS.
- ALL OTHER DIMENSIONS ARE EXPRESSED IN METERS.

SURVEY SPECIFICATIONS

- 1. ALL PROJECT CONTROL POINTS ARE PROJECTED IN PRS '92 GRID COORDINATE SYSTEM (ZONE 5)
- 2. SURVEY INSTRUMENT USED, STONEX S9111 PLUS STNS95321007 (BASE), STONEX S9111 PLUS STNS95491002 (ROVER)
- 3. DATE SURVEYED: JULY 2, 2024
- PROJECT CONTROL POINTS, REFER TO PLAN AND PROFILE

ELEVATIONS AND GRADES

- 1. FINISHED GRADE ELEVATION SHOWN ON PLAN AND PROFILE SHEETS REFERS TO FINISHED PAVEMENT LEVEL AS INDICATED IN THE TYPICAL ROADWAY SECTION.
- 2. GROUND GRADE SHOWN ON THE PLAN AND PROFILE SHEETS REFERS TO THE ELEVATION OF THE ORIGINAL GROUND ALONG THE CENTERLINE OF THE PROJECT ROAD.

OTHER GENERAL REQUIREMENTS

- 1. ALIGNMENT AND GRADES ARE SUBJECT TO ADJUSTMENTS TO SUIT ACTUAL FIELD CONDITIONS.
- 2. DISTANCES AND ELEVATIONS ARE IN METER UNLESS OTHERWISE INDICATED.
- 3. GRADES SHOWN ARE TOP OF FINISHED PAVEMENT.
- 4. ALL WORKS SHALL COMPLY WITH THE STANDARD SPECIFICATIONS FOR HIGHWAYS AND BRIDGES, REVISED 2013 AND "A POLICY ON GEOMETRIC DESIGN", AASHTO 2011,
- 5. WHERE NO DETOURS ARE AVAILABLE, TRAFFIC SHALL BE HANDLED IN ACCORDANCE TO THE PROVISIONS OF CLAUSE 75 OF THE DPWH STANDARD SPECIFICATIONS, VOLUME 1, REQUIREMENTS AND CONDITIONS OF CONTRACT (2013).
- 6. THE CONTRACTOR SHALL CONTINUOUSLY KEEP THE ROAD UNDERGOING IMPROVEMENT AND THE SECTION DETOURS IN SUCH CONDITION SATISFACTORY TO THE ENGINEER THAT TRAFFIC WILL BE ACCOMMODATED DURING THE ENTIRE CONTRACT PERIOD WITHOUT ANY INCONVENIENCE TO THE TRAVELING PUBLIC IN ACCORDANCE TO CLAUSE 38 OF THE DPWH STANDARDS SPECIFICATIONS, VOLUME 1, REQUIREMENTS AND CONDITIONS OF CONTRACT (2013). THE CONTRACTOR SHALL BEAR ALL EXPENSES FOR CONSTRUCTING, RECONSTRUCTING IF NECESSARY AND MAINTAINING SUCH ROAD DETOURS, APPROACHES, INCLUDING RUN-AROUND TEMPORARY BRIDGES WITHOUT COMPENSATION.
- 7. THE APPARENT SILENCE OF SPECIFICATIONS, PLANS, SPECIAL PROVISIONS AND SUPPLEMENTARY SPECIFICATIONS, AS TO ANY DETAIL OR THE APPARENT OMISSION FROM THEM OF A DETAILED DESCRIPTION CONCERNING ANY POINT SHALL BE REGARDED AS MEANING THAT ONLY THE BEST GENERAL PRACTICE IS TO PREVAIL AND THAT ONLY MATERIAL AND WORKMANSHIP OF FIRST CLASS QUALITY ARE TO BE USED.
- 8. ROADS CLOSED TO TRAFFIC SHALL BE PROTECTED BY EFFECTIVE BARRICADES, AND OBSTRUCTIONS SHALL BE ILLUMINATED AT NIGHT. SUITABLE WARNING SIGNS, ILLUMINATED AT NIGHT BY LANTERNS OF FLARES, SHALL BE PROVIDED. ALL LIGHTS FOR THIS PURPOSE SHALL BE KEPT BURNING FROM SUNSET TO SUNRISE.
- 9. THE CONTRACTOR WILL BE REQUIRED TO ERECT WARNING SIGNS OUTSIDE OF, AND 150M FROM, EACH END OF THE PROJECT, AND 150M IN ADVANCE AT ANY PLACE ON THE PROJECT WHERE OPERATIONS INTERFERE WITH THE USE OF THE ROAD BY TRAFFIC, AND AT ALL INTERMEDIATE POINTS WHERE THE NEW WORK CROSSES OR COINCIDES WITH AN EXISTING ROAD.
- 10. BEFORE THE START OF ACTUAL CONSTRUCTION, THE AS-STAKED PLAN SHOULD BE SUBMITTED TO THE DAVAO DEL NORTE 2ND DISTRICT ENGINEERING OFFICE IN ORDER THAT IMMEDIATE STEPS MAY BE TAKEN TO CORRECT OR ADJUST WHATEVER APPRECIABLE DEVIATION THERE MAY BE FROM THE ORIGINAL PLAN.
- 11. THE IMPLEMENTING OFFICE SHALL IDENTIFY THE LOCATIONS OF AND PROVIDE ACCESSIBILITY FACILITIES FOR PERSONS WITH DISABILITIES IN ACCORDANCE WITH DO NO. 37, S. 2009
- 12. QUARRY SITE FOR ITEM 200 AND ITEM 104 IS MABUHAY, CARMEN (30.27 KM. FROM THE PROJECT SITE), DISPOSAL SITE IS ONE (1) KMS. WITHIN PROJECT LIMIT.
- 13. DESIGN WAS BASED ON SURVEY DATA SUBMITTED BY THE SURVEY INVESTIGATION UNIT OF THE PLANNING AND DESIGN SECTION OF THE DPWH-DAVAO DEL NORTE ENGINEERING 2ND DISTRICT.

SUBBASE AND BASE COURSE

TAGUM CITY

1. RE-PREPARATION AND COMPACTION OF THE EXISTING BASE/ SUBBASE TO THE REOUIRED DENSITY SHALL BE DONE PRIOR TO GRAVEL RESURFACING IN ACCORDANCE WITH DPWH STANDARD SPECIFICATIONS, VOLUME II. 2004. USING VIBRATING ROLLERS AND PNEUMATIC TIRE ROLLERS. IN AREAS WHERE THE SAID EQUIPMENT CANNOT BE USED, A PORTABLE MECHANICAL COMPACTOR SHALL BE USED.

PROJECT NAME AND LOCATION:

REMOVAL OF EXISTING STRUCTURES AND OBSTRUCTIONS

- PAYMENT
- 2. IMPROVEMENTS AND OTHER SIMILAR STRUCTURES THAT WILL BE AFFECTED DURING THE IMPLEMENTATION OF THIS PROJECT SHALL 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 REFLECTORIZED BLACK AND WHITE STRIPES.
- 2. THE APPLICATION OF PAINT FOR PAVEMENT MARKINGS SHALL BE PREFERABLY CARRIED OUT BY A MACHINE SPECIALLY CONTACT WITH THE SURFACE BEING PAINTED.
- 3. THE APPLIED THERMOPLASTIC PAVEMENT MARKINGS SHALL HAVE A MINIMUM OF 2 YEARS OF LONGEVITY/DURABILITY.
- THE SATISFACTION OF THE ENGINEER.

CONSTRUCTION REQUIREMENTS

STAKING ACTIVITIES SHALL BE INCLUDED IN THE CONSTRUCTION SCHEDULE TO BE SUBMITTED BY THE CONTRACTOR. DATES AND SEQUENCE OF EACH STAKING ACTIVITY SHALL BE INCLUDED.

THE ENGINEER SHALL SET INITIAL REFERENCE LINES, HORIZONTAL AND VERTICAL CONTROL POINTS, AND SHALL FURNISH THE DATA FOR USE IN ESTABLISHING CONTROL FOR THE COMPLETION OF EACH ELEMENT OF THE WORK. DATA RELATING TO HORIZONTAL AND VERTICAL ALIGNMENTS, THEORETICAL SLOPE STAKE CATCH POINTS, AND OTHER DESIGN DATA SHALL BE FURNISHED.

THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE TRUE SETTLING OF THE WORKS OR IMPROVEMENTS AND FOR CORRECTNESS OF POSITIONS, LEVELS, DIMENSIONS AND ALIGNMENT OF ALL PARTS OF THE WORKS. HE SHALL PROVIDE ALL NECESSARY INSTRUMENTS, APPLIANCES, MATERIALS AND SUPPLIES, AND LABOR IN CONNECTION THEREWITH. THE CONTRACTOR SHALL PROVIDE A SURVEY CREW SUPERVISOR AT THE PROJECT SITE WHENEVER SURVEYING/STAKING ACTIVITY IS IN PROGRESS.

PRIOR TO CONSTRUCTION, THE ENGINEER SHALL BE NOTIFIED OF ANY MISSING INITIAL REFERENCE LINES, CONTROLS, POINTS, OR STAKES. THE ENGINEER SHALL REESTABLISH MISSING INITIAL REFERENCE LINES, CONTROLS, POINTS, OR STAKES.

THE CONTRACTOR FOR CONVENIENT USE OF GOVERNMENT-FURNISHED DATA SHALL PERFORM ADDITIONAL CALCULATIONS. IMMEDIATE NOTIFICATION OF APPARENT ERRORS IN THE INITIAL STAKING OR IN THE FURNISHED DATA SHALL BE PROVIDED.

ALL INITIAL REFERENCE AND CONTROL POINTS SHALL BE PRESERVED. AT THE START OF CONSTRUCTION, ALL DESTROYED OR DISTURBED INITIAL REFERENCE OR CONTROL POINTS NECESSARY TO THE WORK SHALL BE REPLACED.

BEFORE SURVEYING AND STAKING, THE CONTRACTOR SHALL DISCUSS AND COORDINATE THE FOLLOWING WITH THE ENGINEER:

- SURVEYING AND STAKING METHODS
- STAKE MARKING/CONCRETE MONUMENTS
- GRADE CONTROL FOR COURSES OF MATERIAL
- REFERENCING STRUCTURE CONTROL 5.
- ANY OTHER PROCEDURES AND CONTROLS NECESSARY FOR THE WORK 6.

REFERENCES:

1. REVISED DPWH MANUAL ON HIGHWAY SAFETY DESIGN STANDARDS, MAY 2012 EDITION SUCH AS THE PROPER WAY OF INSTALLING ,APPLYING ROAD SIGNS,ROAD SAFETY DEVICES AND PAVEMENT MARKINGS -D.O. 41,S. 2012

LABOR CODE OF THE PHILIPPINES AND ITS IMPLEMENTING RULES AND REGULATIONS DOLE DO NO. 13,S. 1998, OCCUPATIONAL SAFETY AND HEALTH STANDARDS AND ITS PROCEDURAL GUIDELINES. - FOR MONITORING, ENFORCEMENT AND IMPLEMENTATION OF CONSTRUCTION SAFETY AND HEALTH - D.O. 56,S. 2005

3. DESIGN REFERENCES - DPWH DESIGN GUIDELINES, CRITERIA & STANDARDS (DGCS), 2015 EDITION - 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

- AASHTO A POLICY ON GEOMETRIC DESIGN STANDARD OF HIGHWAYS AND STREETS, 2011 6TH EDITION - AASHTO GUIDE ON PAVEMENT DESIGN, 1993 EDITION - HIGHWAY SAFETY DESIGN STANDARDS: PART 1 - ROAD SAFETY DESIGN, AND PART 2 - ROAD SIGNS AND PAVEMENT MARKINGS, 2012 EDITION



SHEET CONTENTS

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

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

MADE FOR THIS PROPOSE BUT WHERE BRUSHED ARE USED, ONLY ROUND OR OVAL BRUSHES NOT EXCEEDING 100MM IN WIDTH WILL BE PERMITTED. THE PAINT SHALL BE SO APPLIED AS TO PRODUCE A UNIFORM, EVEN COATING IN CLOSE

4. MATERIALS WHICH ARE DEFECTIVE OR HAVE BEEN APPLIED IN AN UNSATISFACTORY MANNER OR TO INCORRECT DIMENSIONS OR IN A WRONG LOCATION SHALL BE REMOVED. THE ROAD PAVEMENT SHALL BE MADE GOOD AND MATERIALS REPLACED, RECONSTRUCTED AND/OR PROPERLY LOCATED, ALL AT THE CONTRACTOR'S EXPENSE AND TO

- FOR ROAD SAFETY PLANNING AND DESIGN ACTIVITIES AS WELL AS ROAD SAFETY MAINTENANCE ACTIVITIES



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BABAG						
	BENILDA S. PACQUIAO	JEZABEL E. TULING, MPA	GARRY E. VERANO	ARTURO P. LONGYAPON	K	<u>2</u>
	ENGINEER III	CHIEF, PLANNING AND DESIGN SECTION		DISTRICT ENGINEER	11/	18 /
Z	DATE:	DATE:	DATE:	DATE:		

GENERAL NOTES

1. DESIGN STANDARDS

- A. ALL WORKS SHALL COMPLY WITH THE DPWH DESIGN GUIDLINES CRITERIA AND STANDARDS (DGCS), VOLUME IV - 2015 EDITION, AASHTO - A POLICY ON GEOMETRIC DESIGN STANDARD OF HIGHWAYS AND STREETS, 2011, 6TH EDITION AND AASHTO GUIDE ON PAVEMENT DESIHN 1993 EDITION.
- B. THE PROVISION FOR ROADWAY SAFETY SHALL COMPLY WITH THE HIGHWAY SAFETY DESIGN STANDARDS: PART 1 - ROAD SAFETY DESIGN, AND PART 2 - ROAD SIGNS AND PAVEMENT MARKINGS, 2012 EDITION

2. DESIGN SPECIFICATIONS:

- FOR GEOMETRIC DESIGN CRITERIA (IN GENERAL)
- A. THE DESIGN MUST BE SUITABLE FOR THE TRAFFICE VOLUME, BOTH DAILY AND AT THE DESIGN PEAK HOUR, FOR THE DESIGN SPPED AND FOR THE CHARACTER OF THE VEHICLES TO USE THE FACILITY.
- B. THE DESIGN MUST BE CONSISTENT AND MUST AVOID SURPRISE CHANGES IN ALIGNMENT, GRADE AND SIGHT DISTANCE, AND MUST BE PLEASING TO THE USER AND TO THOSE WHO LIVE ALONG IT.
- C. THE DESIGN MUST BE COMPLETE HOWEVER, FOR THE DESIGNER TO BE ABLE TO ENSURE THE EFFECTIVENESS OF HIS DESIGN TO A LARGE DEGREE, THE NECESSARY ROADSIDE TREATMENT AND THE PROVISION OF CONTROL DEVICES, SUCH AS LANE MARKERS AND SPECIAL SIGNS, ARE TAKEN INTO ACCOUNT.
- D. THE DESIGN SHALL BE AS SIMPLE AS POSSIBLE FROM THE STANDPOINT OF THE BUILDER. EXCESSIVE CHANGES IN CROSS SECTIONAL DESIGN OR THE USE OF VARIETY OF TYPES WITHIN A PROJECT WILL IN MANY CASES INCREASE THE COST AND DIFFICULTY OF CONSTRUCTION BEYOND THE COMMENSURATE VALUE OF SUCH "UNIQUENESS".
- E. THE DESIGN SHOULD BE SUCH THAT THE FINISHED ROAD CAN BE MAINTAINED AT THE LEAST COST, AND MUST BE SAFE FOR DRIVING AND SHOULD ENSURE CONFIDENCE FOR MOTORIST.
- FOR GEOMETRIC DESIGN CRITERIA (HORIZONTAL ALIGNMENT AND CONTROLS)
- A. FOR THE DESIGN SPEEDOF 30KPH, THE MINIMUM RADIUS IS 30M AND A SUPERELEVATION OF
- B. THE RECOMMENDED MINIMUM LENGTH OF TANGENT BETWEEN REVERSED CURVES SHOULD BE 50M.
- C. IN NO CASES SHALL THE TANGENT LENGTH BE LESS THAN 30M. THE TANGENT IS NECESSARY TO EFFECT THE TRANSITION FROM SUPERELEVATION IN ONE DIRECTION TO SUPERELEVTATION IN THE OPPOSITE DIRECTION
- D. A SUPERELEVATED SECTION IS PROCEESED BY A TRANSITION SECTION. THE VALUES OD SUPERELEVATION ARE DETERMINED FROM THE AASHTO POLICY ON GEOMETRIC DESIGN AND ARE A FUNCTION OF THE RATE OF SUPERELEVATION AND THE CURVE RADIUS.
- E. SUPERELEVATION IS USUALLY NOT PROVIDED ON LOCAL STREETS IN RESIDENTIAL AND COMMERCIAL AREAS WHERE WIDE PAVEMENTS, PROXIMITY OF ADJACENT DEVELOPMENT, CONTROL OF CROSS SLOPE, DRAINAGE PROFILES, FREQUENCY OF CROSS STREETS, AND OTHE URBAN FEATURES MAKE ITS USE IMPRACTICAL.
- F. ON SIMPLE CURVES, WIDENING SHOULD BE APPLIED ON THE INSIDE EDGE ONLY WITH A RECOMMENDED MINIMUM WIDTH OF 0.60 METERS.
- G. ON CURVE DESIGN WITH SPIRAL, WIDENING MAY BE PLACES ON THE INSIDE OR DIVIDED EQUALLY BETWEEN THE INSIDE AND OUTSIDE CURVE.
- H. CURVE WIDENING SHOULD BE ATTAINED GRADUALLY OVER A LENGTH SUFFICIENT TO MAKE THE WHOLE OF THE TRAVELED WAY FULLY USABLE.
- I. ALIGNMENT SHOULD BE AS DIRECTIONAL AS POSSIBLE BUT SHOULD BE CONSISTENT WITH THE TOPOGRAPHY AND WITH PRESERVING DEVELOPED PROPERTIES.
- J. ALIGNMENT SHOULD BE CONSISTENT AND SHARP CURVES SHOULD NOT BE INTRODUCED AT THE LONG TANGENTS
- K. FOR SMALL DEFLECTION ANGLE, CURVES SHOULD BE SUFFICIENTLY LONG TO AVOID THE APPEARANCE OF KINK.
- L. TANGENTS OR FLAT CURVATURE SHOULD BE USED ON HIGH, LONG FILLS.

- A. CAUTION SHOULD BE EXERCISED IN THE USE OF COMPOUND CURVE. WHERE TOPOGRAPHY OR RROW RESTRICTIONS MAKE THEIR USE NECESSARY, THE RADIUS OF THE FLATTER CURVE SHOULD NOT BE MORE THAN 50% GREATER THAN THE RADIUS OF THE SHARPER CURVE.
- ANY ABRUPT REVERSAL IN ALIGNMENT SHOULD BE AVOIDED. THE REVERSION LENGTH OF TANGENT BETWEEN REVERSED CURVES SHOULD BE 50 METERS AND IN NO CASE SHOULD BE LESS THAN 30 METERS.
- C. THE "BROKEN-BACK" OR "FLAT-BACK" ARRANGEMENT OF CURVE (HAVING A SHORT TANGENT BETWEEN TWO CURVES IN THE SAME DIRECTION) SHOULD BE AVOIDED EXCEPT WHEN VERY UNUSUAL TOPOGRAPHICAL OR R-O-W DICTATE OTHERWISE.
- D. TO AVOID THE APPEARANCE OF INCONSISTENT DISTORTION, THE HORIZONTAL ALIGNMENT SHOULD BE COORDINATED CAREFULLY WITH THE PROFILE DESIGN.
- E. ENDING A CURVE ON A BRIDGE IS UNDESIRABLE, UNSIGHTLY AND ADDS NEEDLESS COMPLICATIONS TO DESIGN AND CONSTRUCTION. LIKEWISE CURVES BEGINNING OR ENDING NEAR A BRIDGE SHOULD BE PLACED SUCH THAT NO PART OF THE SUPPERELEVATION TRANSITION EXTENDS ON TO THE BRIDGE. COMPOUND CURVES ON A BRIDGE ARE EQUALLY UNDESIRABLE. IF CURVATURE IS UNAVOIDABLE, THE BRIDGE SHOULD BE ENTIRELY ON A SIMPLE CURVE AS FLAT AS PHYSICAL CONDITIONS PERMIT.
- FOR GEOMETRIC DESIGN CRITERIA (VERTICAL ALIGNMENT AND CONTROLS)
- A. IN AREAS SUBJECTED TO INUNDATION, GRADES SHOULD BE ESTABLISHED 0.50M. ABOVE WATER LEVEL.
- B. GRADES OF BRIDGES SHOULD ALLOW 1.50M FREEBOARD ABOVE THE MAXIMUM FLOOD WATER ELEVATION.
- C. MAXIMUM GRADES OF 5% ARE CONSIDERED APPROPRIATE FOR A DESIGN SPEED OF 110KPH. FOR A DESIGN OF 50KPH MAXIMUM GRADES ARE GENERALLY IN THE RANGE OF 7 TO 12%, DEPENDING ON TOPOGRAPHY. IN THE PHILIPPINES THE MAXIMUM GRADE WIDELY USED ID
- LONGITUDINAL DRAINAGE.
- E. A MINIMUM OF 0.35% MAY BE USED ON HIGH TYPE PAVEMENTS AND ACCURATELY CROWNED TO FACILITATE DRAINAGE DISCHARGE.
- F. THE FOLLOWING CRITICAL LENGTH OF UPGRADES WHEN APPROACHED BY A LEVEL SECTION SHOULD NOT BE USED A CONTROL BUT REFERRED TO AS A GUIDE:

CRITICAL LENGTH (m)
500
500
340
240
200
170
150

- G. THE MINIMUM REQUIREMENT OF VERTICAL CURVE LENGTH IS 60M.
- A SMOOTH GRADE LINE WITH GRADUAL CHANGES SHOULD BE SOUGHT FOR IN PREFERENCE Н. TO A LINE WITH NUMEROUS BREAKS/SHORT LENGTH OF GRADES.
- I. THE "ROLLER COASTER" OR THE HIDDEN-DIP TYPE OF PROFILE SHOULD BE AVOIDED.
- J. A "BROKEN-BACK" GRADE LINE SHOULD BE AVOIDED.
- K. ON LONG GRADES, IT MAY PREFERABLE TO PLACE THE STEEPEST GRADES AT THE BOTTOM AND FLATTER THE GRADES NEAR THE TOP OF THE ASCENT.
- L. WHERE AT-GRADE INTERSECTIONS OCCUR ON ROADWAY SECTORS WITH MODERATE TO STEEP GRADES, IT IS DESIRABLE TO REDUCE THE GRADES THROUGH THE INTERSECTION.
- M. SAG VERTICAL CURVES SHOULD BE AVOIDED IN CUTS UNLESS ADEQUATE DRAINAGE CAN BE PROVIDED.



SHEET CONTENTS

PROJECT NAME AND LOCATION:

D. ON THROUGH CUT SECTION, GRADES SHOULD AT LEAST BE 0.50% TO PROVIDE

UPGRADE (%)
3
4
5
6
7
8

FOR GEOMETRIC DESIGN CRITERIA (CROSS SECTIONS)

A. FOR MULTILANE HIGHWAY, THE TWO LANES ADJACENT TO THE CROWN LINE SHOULD BE PITCHED AT THE NORMAL MINIMUM SLOPE, AND ON EACH SUCCESSIVE PAIR OF LANES OR PORTION THEREOF OUTWARD, THE RATE MAY BE INCREASED BY ABOUT 0.50 TO 1%. THE FOLLOWING CROSS-SLOPE RATING SHALL BE APPLIED FOR EACH SURFACE TYPE:

SURFACE TYPE CROSS SLOPE RATI	
HIGH	1.50 - 2.0%
INTERMEDIATE	2.00 - 3.0%
LOW	3.00 - 4.0%

- B. DESIRABLE LANE WIDTH IS 3.65M WHICH ALLOWS LARGE VEHICLES TO PASS WITHOUT EITHER VEHICLE HAVING TO MOVE SIDEWAYS TOWARDS THE EDGE OF PAVEMENT.
- C. LANE WIDTH AS LOW AS 2.75M MAY BE USED ON GROUNDS OF ECONOMY.
- D. ROADS WITH PAVEMENT WIDTHS LESS THAN 5.5M SHOULD REGARDED AS SINGLE LANE.
- E. PAVEMENT WIDTH GREATER THAN 7.32M FOR 2-WAY MOVEMENT IS NOT RECOMMENDED FOR 2-LANE ROADS AS SOME DRIVERS WILL ATTEMPT TO TRAVEL THREE VEHICLES ABREAST ON WIDE PAVEMENT.
- F. SHOULDERS ON FILL PREFERABLY SHOULD BE WIDER THAN IN CUTS ALTHOUGH THE PRESENT PRACTICE IS TO MAKE THEM EQUAL.
- G. REGARDLESS OF THE WIDTH, SHOULDERS SHOULD BE CONTINUOUS.
- H. ALTHOUGH, IT IS DESIRABLE THAT SHOULDER BE WIDE ENOUGH FOR A VEHICLE TO BE DRIVEN COMPLETELY OFF THE TRAVEL WAY, NARROWER SHOULDERS ARE BETTER THAN NONE AT ALL.
- I. SHOULDER WIDTH OF 0.60M MAY BE CONSIDERED ON DIFFICULT TERRAIN AND ON LOW-VOLUME HIGHWAY.
- J. PAVING OF SHOULDERS WITH A MINIMUM WIDTH OF 1.5M SHALL BE CONSIDERED WHEN AADT IS GREATER THAN 1,250 VEHICLES, WHEN CLOSELY SPACED DRIVEWAYS AND/OR FREQUENT TURNING MOVEMENTS AFFECT MAINTENANCE, ON HIGH EMBANKMENT SECTIONS, ON CURVED ALIGNMENT WITH MORE THAN 7% SUPERELEVATION, WHERE PEDESTRIANS ARE NORMALLY CONCENTRATED, AND IN AREAS WITH STEEP (>6%) AND LONG (>100M) GRADIENTS.

THIS IS TO CERTIFY THAT THE DETAILED ENGINEERING SURVEYS AND DESIGNS HAVE BEEN CONDUCTED ACCORDING TO THE PRESCRIBED AGENCY STANDARDS AND SPECIFICATIONS IN CONFORMANCE WITH THE PROVISIONS OF ANNEX"A" OF THE REVISED IMPLEMENTING RULES AND REGULATIONS OF RA 9184, AND THAT THE DETAILED ENGINEERING OUTPUTS ARE ADEQUATE FOR THE PROCUREMENT AT HAND.

> WARREN S. PIÑEZ HEAD, SURVEY & INVESTIGATION UNIT

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	ENGINEER III	CHIEF, PLANNING AND DESIGN SECTION	OFFICER-IN-CHARGE	DISTRICT ENGINEER	\1 1/	18 /
Z	DATE:	DATE:	DATE:	DATE:		



2ND DISTRICT ENGINEERING OFFICE TAGUM CITY

CUT:			
	SI OPE	FILL/EMBANKMENT:	
		HEIGHT	SLOPE
	1:1 10 2:1	3.00M OR LESS	2:1
SOFT/RIPPABLE ROCK	<u>₁</u> :1 TO 1:1		1.5:1
HARD ROCK	¹ / ₄ :1 TO ¹ / ₂ :1		

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	ENGINEER III	CHIEF, PLANNING AND DESIGN SECTION	OFFICER-IN-CHARGE	DISTRICT ENGINEER	\1 1/	\ 18 /
IEZ	DATE:	DATE:	DATE:	DATE:		



TABLE 1

TABLE SPACING OF TIE BARS (L=600 mm)				
SLAB THICKNESS SPACING S1 (mm)				
(mm)	12 mm dia.	16 mm dia.		
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		

BASED ON AASHTO GUIDE FOR DESIGN OF **PAVEMENT STRUCTURES 1993**

TABLE 1

TABLE SPACING OF PLAIN DOWEL BARS (L=600 mm)				
SLAB THICKNESS (mm)	DIAMETER,D (mm)	SPACING, S2(mm)		
230	28	300		
240	30	300		
250	32	300		
260	32	300		
270	34	300		
280	36	300		

NOTE:

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

- 1. Materials and workmanship shall conform with the DPWH Standard Specification for Highways, Bridges and Airport, 2013
- 2. Contraction 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 place within 1.50 m. from the weakened plane joint.
- 3. At construction joint (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 round steel bar free from rust and other defects which might restrict their movement.
- 5. Type of weakened plane joint to be use specified in the plans and only one type should be used for the whole project.
- 6. Material for the metal side form shall be brand new sheet metal Gauge no. 15 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.
- The groove or cracks above joints (longitudinal or transverse) shall be sealed with 30-50 penetration asphalt seal or cold applied liquid rubber compound after the concrete had been cured and before opening pavement to traffic. Asphalt sealed should be poured in such manner that spalling shall be prevented/ eliminated, thus, provide a smooth leveling/ riding surface.
- 9. All transverse joints except construction joint shall be continuous from edge to edge
- 10. All longitudinal joints shall met at intersections with no gaps or offset.
- 11. All dimensions are in millimeters unless otherwise specified.
- 12. Avoided stoppage of formworks along curves.
- 13. Constructed expansion joint at every 90 meters and/or every adjacent existing structures.

	REVIEWED:	SUBMITTED:	RECOMMENDED:	APPROVED:	SET NO.	SHEET NO.
BABAG						
	BENILDA S. PACQUIAO	JEZABEL E. TULING, MPA	GARRY E. VERANO	ARTURO P. LONGYAPON		6
	ENGINEER III	CHIEF, PLANNING AND DESIGN SECTION	OFFICER-IN-CHARGE	DISTRICT ENGINEER	\1 1/	\ 18 /
EZ	DATE:	DATE:	OFFICE OF THE ASSISTANT DISTRICT ENGINEER DATE:	DATE:		



DPWH STANDARD PROJECT BILLBOARD



		EPARTMI 2NE	ENT OF P DAVA DISTRICT	PUBLIC N REGION XI AO DEL NO ENGINEE FAGUM CITY	NORKS AN RTE ERING OFFICE	ID HIGHW	IAYS	
Project Locatio	: n:				Cost: Fund Sc	ource/s:		
Contrac Brief De Project	brient F stor/Sup escriptic	oplier: on of Proje	ect:					
Duration Started c		Target Date of Completion	Target Date Percentage f Completion of Completion		Percentage Completion As of (Date) Cost Incurred to Date 0		REMARKS	2 440 mm (8 ft
		For particul or Cluster COA Regio Address: Contact No	lars or compl which has au onal Office No	lain about th dit jurisdictio p./Cluster:o	nis project, pleas on on this projec	se contact the it: zen's Desk at t	Regional Office	



SIZE (PIPE	DF		CONCRETE 317 KG./SQ. CM. (4					.,500 LB/SQ.IN.)		
IN.	М.	WALL THICKNESS (M)	TON (1	GUE M)	GRC (1	OVE M)	DEPTH (M)	MINIMUM REINFORCEMENT SQ.CM./M. OF PIPE *		
		W	А	В	С	E	Р	CIRCULAR REINFORCEMENT		
48"	1.220	0.108	1.315	1.334	1.321	1.340	0.064	2 LINE EACH 6.56		

TAGUM CITY

DATE:

DATE:

DATE:



SECTION



PLAN

CONCRETE MANHOLE for 36 " Ø RCCP scale NTS

 REPUBLIC OF THE PHILIPPINES	PROJECT NAME AND LOCATION:	SHEET CONTENTS:	DRAFTED:	REVIEWED:	SUBMITTED:	RECOMMENDED:	APPROVED:	SET NO.	SHEET NO.
DEPARTMENT OF PUBLIC WORKS AND HIGHWAYS REGION XI DAVAO DEL NORTE 2ND DISTRICT ENGINEERING OFFICE TAGUM CITY	CONCRETING OF ROAD IN BARANGAY TUBOD, CARMEN, DAVAO DEL NORTE	CONCRETE MANHOLE DETAILS, CONCRETE LINED CANAL DETAILS AND DRAINAGE SCHEDULE	HERWIN EVAN J. HABABAG ENGINEER II PREPARED: WARREN S. PIÑEZ ENGINEER II	BENILDA S. PACQUIAO ENGINEER III DATE:	JEZABEL E. TULING, MPA CHIEF, PLANNING AND DESIGN SECTION DATE:	GARRY E. VERANO OFFICER-IN-CHARGE OFFICE OF THE ASSISTANT DISTRICT ENGINEER DATE:	ARTURO P. LONGYAPON DISTRICT ENGINEER DATE:) 9 18



CONCRETE LINED CANAL DETAILS

SCALE

NTS



	DRAINAGE SC	HEDULE						DRAIN	INAGE PARAMETERS	
Station	Description	101(4)a3	103(1)a	103(6)a	500(3)a	1718(1)b3	502(3)a3	Q	A	V
	1	l.m.	cu.m.	cu.m.	I.m.	l.m.	ea			
0+003.00	0+003.00 REMOVE EXISTING 1-24" X 6.00 LN.M AND REPLACE WITH 1-36" X 7.00 LN.M RCPC AND PROVIDE CONCRETE CATCH BASIN WITH 1-36" RCPC B/S INLET I.E = 15.695; OUTLET I.E = 15.555			11.64		9.00	2.00			
0+003.00 - 0+174.00 LS			601.46		227.00					
0+108.00 - 0+174.00 RS			091.40		237.00					
0+174.00	REMOVE EXISTING 1-24" X 8.00 LN.M AND REPLACE WITH 1-36" X 8.00 LN.M RCPC AND PROVIDE CONCRETE CATCH BASIN WITH 1-36" RCPC B/S INLET I.E = 14.925; OUTLET I.E = 14.765	8.00		13.04		10.00	2.00			
	TOTAL	14.00	691.46	24.68	237.00	19.00	4.00			
	SAY	14.00	691.00	24.68	237.00	19.00	4.00			

GENERAL NOTES FOR WARNING SIGNS

- 1. ALL POST SHALL BE THOROUGHLY CLEANED, FREE FROM GREASE, SCALE AND RUSTS BE GIVEN ONE COAT OF RUST-INHIBITING PRIMING PAINT AND TWO COATS OF INTERNATIONAL ORANGE IN ACCORDANCE WITH ITEM 411, PAINT DPWH STANDARD SPECIFICATION.
- 2. ALL DETAILS SHALL COMPLY WITH THE DPWH STANDARD SPECIFICATIONS FOR ROAD SIGN, DO. 158, S. 2015

DESIGN

- 3. IN GENERAL, WARNING SIGNS ARE TRIANGULAR IN SHAPE (WITH ONE ANGLE VERTICAL), WITH A BLACK SYMBOL, REFLECTORIZED RED BORDER ON A RETRO-REFLECTIVE WHITE, OR FLUORESCENT YELLOW GREEN BACKGROUND.
- 4. THE SIDE OF ONE SIDE OF EQUILATERAL TRIANGULAR SHAPED SIGNS SHALL NOT BE LESS THAN 600 mm. FOR HIGH-SPEED EXPRESSWAYS, LARGER SIGNS (UP TO 1200 mm) ARE USUALLY ADOPTED.

LOCATION

5. AS WARNING SIGNS ARE PLACED PRIMARILY FOR THE PROTECTIONOF THE DRIVER WHO IS NOT FAMILIAR WITH THE ROAD, IT IS VERY IMPORTANT THAT THEIR LOCATION AND INSTALLATION MUST BE UNDERTAKEN WITH CARE.

5.1 TEST RUNS SHOULD BE MADE BY DAY AND BY NIGHT FROM BOTH DIRECTIONS TO CHECK THE LOCATION AND MOUNTING OF EACH INSTALLATION.

5.2 A WARNING SIGN SHOULD BE GENERALLY BE INSTALLED ON THE RIGHT SIDE OF THE ROAD AND BE POSITIONED SO THAT IT WILL CONVEY ITS MESSAGE WITHOUT RESTRICTING LATERAL CLEARANCE OR SIGHT DISTANCE.

5.3 IN URBAN AREAS, ADVANCE WARNING SIGN SHOULD BE PLACED AT NOT LESS THAN 30.0 m. IN ADVANCE OF THE HAZARDOUS AREA.

5.4 EXACT LOACTION OF ALL WARNING SIGNS TO BE INSTALLED SHALL BE DETERMINED IN THE FIELD BY THE ENGINEER.

POST (min. 75mm DIA., 3.25mm THK.)

-welded CLAMP (SS/GS)

MOUNTING DETAILS

NTS

PROJECT NAME AND LOCATION:





TAGUM CITY

SCALE

CONCRETING OF ROAD IN BARANGAY TUBOD, CARMEN, DAVAO DEL NORTE

ROADSIGN DETAILS AND SCHEDULE

SHEET CONTENTS:





	Х	600	
	Y	520	
	а	25	
	b	250	
	с	125	
	d	75	
	Z	50	
_			

W2-4



-|a1|-





WARNING SIGN SCHEDULE

ТҮРЕ	QTY	LOCATION
W2 - 1B	1	0 + 035.00 @ L/S
T W2 - 4B	1	0 + 145.00 @ L/S

REVIEWED: SUBMITTED: RECOMMENDED: APPROVED: SET NO. SHEET NO. 10 Κ **BENILDA S. PACQUIAO** GARRY E. VERANO JEZABEL E. TULING, MPA ARTURO P. LONGYAPON OFFICER-IN-CHARGE OFFICE OF THE ASSISTANT DISTRICT ENGINEER DATE: 18 CHIEF, PLANNING AND DESIGN SECTION ENGINEER III DISTRICT ENGINEER ∖1|1 DATE: DATE: DATE:



REFLECTORIZED THERMOPLASTIC PAVEMENT MARKINGS

SCALE 1:100



REFLECTORIZED THERMOPLASTIC PAVEMENT MARKINGS DETAIL

REFLECTORIZED THERMOPLASTIC PAVEMENT MARKINGS SCHEDULE

	EDGE LINE	BROKEN LINES (W	= 0.15 m L = 3.0 m)	SOLID CENTERLINE	AREA	DESCRIPTION	
STATION	(W = 0.10 m)	LENGTH	No. OF STRIPS	(W = 0.15 m)	(SQ.M.) WHITE		
STA. 0+000.00 - STA. 0+178.00	178.00 X 2				35.60	WHITE , EDGELINE (BOTHSIDES)	
STA. 0+000.00 - STA. 0+178.00		178.00	20.00		9.00	WHITE , CENTER , BROKENLINE	
TOTAL							

REPUBLIC OF THE PHILIPPINES	PROJECT NAME AND LOCATION:	SHEET CONTENTS:	DRAFTED:	REVIEWED:	SUBMITTED:	RECOMMENDED:	APPROVED:	SET NO.	SHEET NO.
DEPARTMENT OF PUBLIC WORKS AND HIGHWAYS REGION XI DAVAO DEL NORTE 2ND DISTRICT ENGINEERING OFFICE TAGUM CITY	CONCRETING OF ROAD IN BARANGAY TUBOD, CARMEN, DAVAO DEL NORTE	REFLECTORIZED THERMOPLASTIC PAVEMENT MARKING DETAILS AND SCHEDULES	HERWIN EVAN J. HABABAG ENGINEER II PREPARED: WARREN S. PIÑEZ ENGINEER II	BENILDA S. PACQUIAO ENGINEER III DATE:	JEZABEL E. TULING, MPA CHIEF, PLANNING AND DESIGN SECTION DATE:	GARRY E. VERANO OFFICER-IN-CHARGE OFFICE OF THE ASSISTANT DISTRICT ENGINEER DATE:	ARTURO P. LONGYAPON DISTRICT ENGINEER DATE:	К 1 1	11 18

Reflectorized Thermoplastic Pavement Markings (3.20 mm thk. min. x 100 mm. wide, White , Edge Line)

GENERAL NOTES:

- 1. THE MATERIALS, DIMENSIONS, SHAPE, COLOR, SIZE OF NUMERALS, LETTERS AND INSTALLATION SHALL CONFORM IN ACCORDANCE WITH SPECIFICATIONS OF DPWH MANUAL ON PAVEMENT MARKINGS.
- 2. REFLECTORIZED THERMOPLASTIC PAVEMENT STRIPPING MATERIAL SHALL CONFORM TO AASHTO M249 IN WHICH THE ROAD MUST BE APPLIED IN A MOLTEN STATE BY MECHANICAL MEANS W/ SURFACE APPLICATION OF GLASS BEADS AT A RATE OF NOT LESS THAN 350 G/L OF GLASS BEADS HAVING A SIZE RANGE OF DROP-IN TYPE AND WILL PRODUCE AN ADHERENT REFLECTORIZED STRIPE OF SPECIFIED THICKNESS AND WIDTH CAPABLE OF RESISTING DEFORMATION BY TRAFFIC.



SHEET CONTENTS: PROJECT NAME AND LOCATION: REPUBLIC OF THE PHILIPPINES DEPARTMENT OF PUBLIC WORKS AND HIGHWAYS HERWIN EVAN J. HAR ENGINEER II **REGION XI** CONCRETING OF ROAD IN PREPARED: TRAFFIC MANAGEMENT LAYOUT BARANGAY TUBOD, DAVAO DEL NORTE CARMEN, DAVAO DEL NORTE 2ND DISTRICT ENGINEERING OFFICE WARREN S. PIÑI ENGINEER II

TAGUM CITY

& BRIDGE WORK SI	TE TEMPORARY SIGNAGE	SIGN No.	SIZE (mm) (WidthxHeight)		
LEGI	END:				
40	SPEED RESTRICTION	R4-10	600X800		
A D W O R K H E A D	ROADWORK AHEAD	T1-1	1800x600		
END ADWORK	END ROADWORK	T2-16	1800x600		
\mathbf{O}	END SPEED RESTRICTION	R4-2	600x800		
	WORKMEN AHEAD (SYMBOLIC)	T1-5	900x600		
PREPARE TO STOP	PREPARE TO STOP	T1-18	900x600		
	TEMPORARY HAZARD MARKER	T5-5	550x450		
0	TEMPORARY BOLLARDS				
	TEMPORARY BOLLARDS WITH FLASHER				

	REVIEWED:	SUBMITTED:	RECOMMENDED:	APPROVED:	SET NO.	SHEET NO.
BABAG					\frown	\frown
	BENILDA S. PACQUIAO	JEZABEL E. TULING, MPA	GARRY E. VERANO	ARTURO P. LONGYAPON	<u> </u>	<u> </u>
	ENGINEER III	CHIEF, PLANNING AND DESIGN SECTION	OFFICER-IN-CHARGE	DISTRICT ENGINEER	\1 1 /	\ 18 /
EZ	DATE:	DATE:	DATE:	DATE:	\mathbf{i}	\smile



TAGUM CITY

	DETAILS OF THE TWO	SIDED SIGN FRAMES				
	REVIEWED:	SUBMITTED:	RECOMMENDED:	APPROVED:	SET NO.	SHEET NO.
BABAG						
	BENILDA S. PACQUIAO	JEZABEL E. TULING, MPA	GARRY E. VERANO	ARTURO P. LONGYAPON	(<u> </u>	
	ENGINEER III	CHIEF, PLANNING AND DESIGN SECTION	OFFICER-IN-CHARGE	DISTRICT ENGINEER	\1 1/	\ 18 /
EZ	DATE:	DATE:	DATE:	DATE:		\searrow

LEGEND:

8



CHEVRON

EXISTING CROSS DRAIN

PROPOSED PCCP

VARIOUS TREES

ELEMENTS O	F CURVE													
PI No.	PI STATION	NORTHING	EASTING	Ι	Dc	R	Lc	Т	Е	Pc	Pt	е	w	V(kph)
PI - 1	0+019.145	814736.1036	569443.9490	3-25-17	5-43-46	200.000	11.943	5.973	0.089	0+013.171	0+025.114			
PI - 2	0+096.314	814768.0862	569514.1822	1-04-45	5-43-46	200.000	3.767	1.884	0.009	0+094.430	0+098.197			
PI - 3	0+143.986	814787.0226	569557.9327	1-55-42	5-43-46	200.000	6.732	3.366	0.028	0+140.620	0+147.352			

	TRAVERSE (N	EW)
PI No.	DISTANCE	AZIMUTH
L1	13.171	248-56-16.844
L2	69.316	245-30-59.670
L3	42.423	246-35-44.715
L4	30.514	244-40-02.234



BM - 1	814729.2234	569426.0833	17.63m								
BM - 1 : UNAILED ON TOP CL PCCP											



CONTOUR	PI No.	DISTANCE	AZIMUTH						BENCHMARK		
	L1	13.171	248-56-16.844	3.17	<u>8.197</u>	7.352		BM. # NORTH	INGS EASTINGS ELEVATION		
WARNING SIGN	L2	69.316	245-30-59.670	0+07		0+14		BM - 1 814798	.8185 569591.0014 16.73m		
FENCES	L3	42.423	246-35-44.715				74.00	BM - 1 : U	VAILED ON TOP CL PCCP		
	L4	30.514	244-40-02.234	U.L		REP REP	LACE WITH 1-36" X 8.00 LN.M RCPC AND				
DENOUMARK					0.0100	PRO PRO INLE	VIDE CONCRETE CATCH BASIN WITH $1-30$ ET I.E = 14.925; OUTLET I.E = 14.765	6" RCPC B/S			
					* • • • • • • • • • • • • • • • • • • •						
BM. # NORTHINGS EASTINGS F	17.63m			REMOVE EXISTING 1-24" DIA		10.0					
BM - 1 : UNAILED ON TOP CL F	PCCP			PROVIDE CONCRETE CATCH	LN.M AND H BASIN WITH 1-36" X 1.00 LN.M B/S						
				INLET I.E = 15.695; OUTLET I.	I.E = 15.555						
							Λ				
			/	/ /							
			/				$\backslash \backslash$				
					PLAN						
					SCALE 1:1250mts						
					PROFII	╸ᡛ ╸ ╷					
			BEG. OF PROJECT / BE		SCALE 1:1250mts H		JECT / END OF CONCRETI				
			NORTHING: 822988.4317m; E	ASTING: 564458.4620m	SCALE 1:125mts VEI	RT. NORTHING: 8	AI SIA. 0+1/8.00 23288.8893m; EASTING: 564458.0113m				
					PVI	24 8					
					0+093.937 ELEV:16.905						
					LVC:100.00						
						20 //					
		+++++				20					
						18/					
				-0.771%							
					7% -0.577%	WATER FLOW					
				0+003.00	EXISTING GR						
				REMOVE EXISTING 1-24" DI REPLACE WITH 1-36" × 7.00	IA. x 6.00 LN.M AND	14_0+17	4,00				
				PROVIDE CONCRETE CATC	CH BASIN WITH 1-36" X 1.00 LN.M B/S	REMO REPL	DVE EXISTING 1-24" X 8.00 LN.M AND ACE WITH 1-36" X 8.00 LN.M RCPC AND				
							IDE CONCRETE CATCH BASIN WITH 1-36	" R¢PC B/S			
				0+000	0+100	0+179					
STATION				3 21 22 59	<u>33 [56 44 66 701 +0 70</u>	4 0					
FINISHED GRADE ELEVATON				17.6 [.] 17.4 [.] 17.3 [.]	16.9 16.8	16.7					
				14 00 09 09 00 00 00 00 00 00 00 00 00 00	1008 164 168 178	6 68					
EXISTING GROUND ELEVATION				17.6 17.0	16.6 16.3 16.3	16.5					
	LS			.711 .596 .596	.1365 	.903					
EXISTING GROUND ELEVATION				166 166 166 166	0 4 0 10 10 10	1 1 1 1					
	RS				16.01	15.82					
WIDENING											
WIDENING					w = 0.00						
SUPER ELEVATION					NORMAL CROWN = -1.50%						
				I	NORMAL CROWN = -1.50%		1	1		1 1	
		PROJECT NAME AN	ND LOCATION:	SHEET CONTENTS:		REVIEWED:	SUBMITTED:	RECOMMENDED:	APPROVED:	SET NO.	SHEET NO.
REGION XI		CONC	CRETING OF ROAD IN		HERWIN EVAN J. HABABAG					K	14
		BA CARME	ARANGAY TUBOD, EN, DAVAO DEL NORTE	PLAN AND PROFILE	IPREPARED:	ENGINEER III	CHIEF, PLANNING AND DESIGN SECTION	OFFICER-IN-CHARGE	DISTRICT ENGINEER	$\left \begin{pmatrix} 1 \\ 1 \\ 1 \\ 1 \end{pmatrix} \right $	
						DATE:	DATE:	OFFICE OF THE ASSISTANT DISTRICT ENGINEER DATE:	DATE:		



REPUBLIC OF THE PHILIPPINES DEPARTMENT OF PUBLIC WORKS AND HIGHWAYS REGION XI DAVAO DEL NORTE AND DIOT DIOT ENIONISEEDING OFFICIE	PROJECT NAME AND LOCATION:	-10 -5 -5 -5 -5 -5 -5 -5 -5 -5 -5 -5 -5 -5	STA. 0-000.00 STA. 0-000.00 ELEV. = 17.629 Image: Comparison of the second		20 25 APPROVED: SET NO. ARTURO P. LONGYAPON K DISTRICT ENGINEER 1
			RROW = 10.00 MTS. (MIN.) - 2.500 + 2.500 + 2.500 + 2.500 + 17.629 + 3.00 % + 3		FILL = 1.593 sq.m. $105(1)$ = 6.200 $h.m.$ 200 = 1.336 $sq.m.$ 300 = 0.180 $sq.m.$ $100(1)$ = $h.m.$ $103(1)$ = $sq.m.$
		-10 -10 -10 -10 -10 -5 REMOVE REP ROVIDE CONCE INLE	STA. 0+003.00 5 ELEV. = 17.541 5 EXISTING 1-24" DIA. x 6.00 LN.M AND 1.4CE WITH 1-36" x 7.00 LN.M AND LACE WITH 1-36" x 7.00 LN.M AND 1.00 LN.M B/S T I.E = 15.695 OUTLET I.E = 15.555 1.555		20 25 25 25 25 25 25 25 25 25 25 25 25 25
			RROW = 10.00 MTS. (MIN.)	10.736,17.554	CUT = 9.095 $sq.m.$ FILL = 5.471 $sq.m.$ $105(1)$ = - $h.m.$ 200 = 1.338 $sq.m.$ 300 = 0.181 $sq.m.$ $100(1)$ = $h.m.$ 103 = 23.388 $sq.m.$
		-10 -10	-2.500 - 2.500 - 2.500 - 2.5002.50		$\begin{array}{c ccccccccccccccccccccccccccccccccccc$
			STA. 0-040.00 ELEV. = 16.908 RROW = 10.00 MTS. (MIN.)		$\begin{array}{c c c c c c c c c c c c c c c c c c c $
			RROW = 10.00 MTS. (MIN.) $-2.500 - 2.500 - 0.600 for a start s$		CUT = 0.181 sq.m. FILL = 2.034 sq.m. $105(1)$ = 5.210 lh.m. 200 = 1.336 sq.m. 300 = 0.180 sq.m. $100(1)$ = lh.m. 103 = 1.871 sq.m.
		-10 -10 -10	-1.50 % -1.50 % -3.00 % € 5 -1.50 % -3.00 % € 5 -3.00 %		$\begin{array}{c ccccccccccccccccccccccccccccccccccc$
			RROW = 10.00 MTS. (MIN.)		CUT = 0.410 sq.m. FILL = 2.062 sq.m. 105(1) = 4.748 lh.m. 200 = 1.336 sq.m. 300 = 0.180 sq.m.

		= 1.50%	-3.00 % +			CUI = 0.4 FILL = 2.3 105(1) = 4.9 200 = 1.3 300 = 0.1 100(1) = 1.6	26 sq.m. 71 sq.m. 19 lh.m. 36 sq.m. 80 sq.m. 11.m. 32 sq.m.
-25 -20	-15 -15	-10 -5 0 STA. 0+160.00 ELEV. = 16.409	5 				25
		= 10.00 MTS (MIN.) $= 10.00 MTS (MIN.)$ $= 2.500 - 2.$	0.600 7 00 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0			CUI = 0.0 FILL = 2.1 105(1) = 3.2 200 = 1.3 300 = 0.1 100(1) = 1.6	53 sq.m. 57 sq.m. 57 sq.m. 79 lh.m. 36 sq.m. 80- sq.m. 1h.m. lh.m. 62 sq.m.
$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$		-10 STA. 0-140.00 ELEV. = 16.378 RROW = 10.00 MTS. (MIN.) $ \begin{array}{c} & & & & & & & & & & & & & & & & & & &$	0-600 ++ 			$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	25 25 59 sq.m. 20 sq.m. 61 lh.m. 36 sq.m. 80 sq.m. 80 sq.m. 1h.m.
		-10 -5 - 0 STA. 0+120.00 ELEV. = 16.464 STA. 0+108.00 BEG. OF CONCRETE LINED CAN 	AL R/S			20 20 CUT = 0.3 FILL = 1.9	25 282 sq.m. 41 sq.m.
		$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$	0:660			$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	91 In.m. 36 sq.m. 80 sq.m. In.m. 39 sq.m. 25
		ELEV. = 16.599 $= 10.00 MTS. (MIN.)$ $= 10.00 MTS. (MIN.)$ $= 10.00 MTS. (MIN.)$ $= 10.00 MTS. (MIN.)$ $= 1.50%$				$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	07 sq.m. 71 sq.m. 04 lh.m. 36 sq.m. 80 sq.m. 49 sq.m. 25 25
REPUBLIC OF THE PHILIPPINES DEPARTMENT OF PUBLIC WORKS AND HIGHWAYS REGION XI DAVAO DEL NORTE 2ND DISTRICT ENGINEERING OFFICE TAGUM CITY	PROJECT NAME AND LOCATION:	STA. 0=080.00 ELEV. = 16.608 SHEET CONTENTS: CROSS SECTION PREPARED: WARREN S. PIÑEZ	REVIEWED: BAG BENILDA S. PACQUIAO ENGINEER III DATE:	SUBMITTED: JEZABEL E. TULING, MPA CHIEF, PLANNING AND DESIGN SECTION DATE:	RECOMMENDED:	APPROVED: APPROVED: ARTURO P. LONGYAPON DISTRICT ENGINEER DATE:	SET NO. SHEET NO. K 1 1 1

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								+			+								EMO		±LEV ISTIN	<u> </u>	<u>16.54</u> -24".)	8 X 8
	-25			-20			· ·	-15			-10				-5				+	+	STA.	0+1	174.0	
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	16												7.126,15.				-3.794,15	-3,00	%	-1.5	50 %		<u>16.</u> - <u>1</u> .	700 50
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