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

BABAK-SAMAL-KAPUTIAN RD - K1504+140 - K1506+054

SECTION	:	BABAK-SAMAL-KAPUTIAN ROAD
LOCATION	:	IGACOS, DAVAO DEL NORTE
STATION LIMITS	:	K 1504+140.00 - K 1506+054.00
NET LENGTH	:	1,915.00 LN.M ASPHALT OVERLAY/7.830 LANE.KM
ROAD SECTION I.D	:	S00095MN

SUBMITTED:

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

DATE:

RECOMMENDED:

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

DATE:

APPROVED:

ARTURO P. LONGYAPON
DISTRICT ENGINEER

DATE:

PROJECT LIMITS :

ROAD ASPHALT OVERLAY:

K 1504 + 140 - K 1506 + 054 = 1,915.00 LN.M.

NET LENGTH = 1,915.00 LN.M.

RBIA LENGTH:

K 1504 + 000 - K 1505 + 000 = 987.00 LN.M
K 1505 + 000 - K 1506 + 000 = 1,014.00 LN.M
K 1506 + 000 - K 1507 + 000 = 994.00 LN.M

INDEX OF DRAWINGS

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2	GENERAL NOTES AND LEGENDS
3	SUMMARY OF QUANTITIES
4	STRAIGHT LINE DIAGRAM, REMOVAL OF EXISTING ASPHALT SCHEDULE, AND SCHEDULE OF ASPHALT OVERLAY
5-6	TYPICAL ROADWAY SECTION
7-8	STANDARD PORTLAND CEMENT CONCRETE PAVEMENT JOINTS
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11	MANHOLE DETAILS
12	METHODS OF PIPE INSTALLATION, DRAINAGE SCHEDULE
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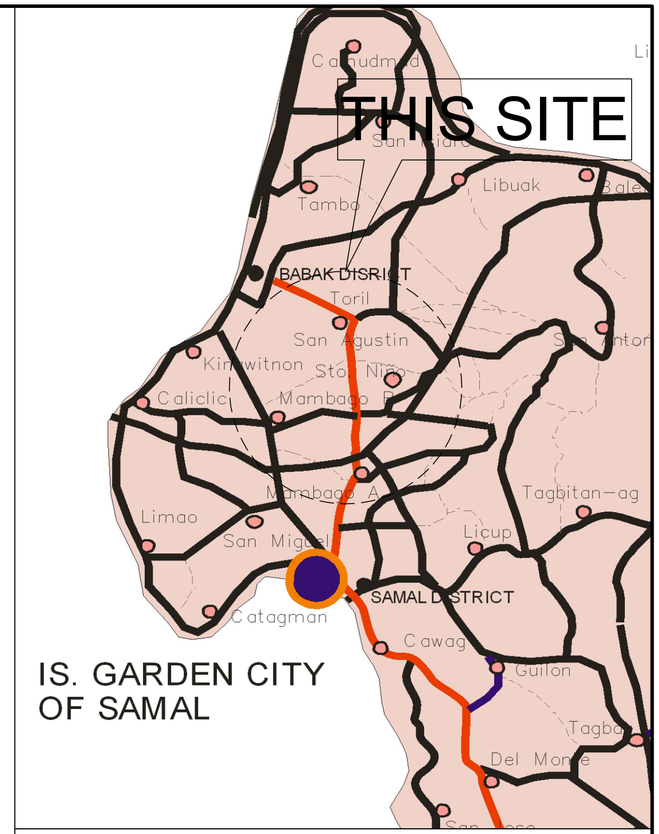
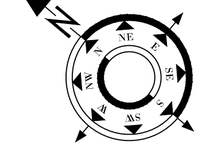
16	DPWH AND COA BILLBOARD DETAILS
17	FIELD OFFICE FOR THE ENGINEER
18-19	TRAFFIC MANAGEMENT PLAN AND DETAILS
20-22	PLAN AND PROFILE
23-39	CROSS SECTION

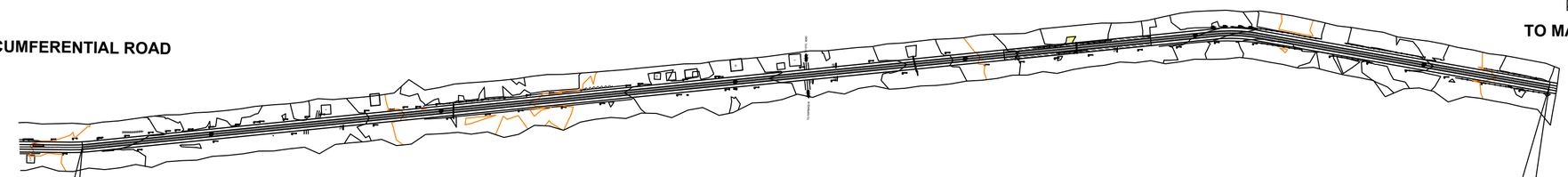


LOCATION MAP
DRAWN NOT TO SCALE



VICINITY PLAN
SCALE 1:5000 MTS.

TO CIRCUMFERENTIAL ROAD



TO MAMBAGO-A

BEG. OF 2 LANES ASPHALT OVERLAY AT STA. K1504+140.00
NORTHING: 830234.7833m; EASTING: 789559.2799m

END OF PROJECT
END OF 4 LANES ASPHALT OVERLAY AT K 1506+054.00
NORTHING: 830234.7833m; EASTING: 789559.2799m

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REGION XI
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2ND DISTRICT ENGINEERING OFFICE
TAGUM CITY

PROJECT NAME AND LOCATION:	SHEET CONTENTS:	DRAFTED:	REVIEWED:	SUBMITTED:	RECOMMENDED:	APPROVED:	SET NO.	SHEET NO.
BABAK-SAMAL-KAPUTIAN RD - K1504+140 - K1506+054	INDEX OF DRAWINGS, PROJECT LIMITS, VICINITY PLAN, LOCATION MAP	**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 R. LONGYAPON** DISTRICT ENGINEER DATE:	A 1 | 1	1 39

G E N E R A L N O T E S

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.
3. 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: January 15 - 16, 2024
4. 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 2004 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 (1988).
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 (1988). 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 Sub-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. Quarry site for Item 200 is located at Mabuhay, Carmen (29.28 km. from the project site). Disposal site is one (1) km. away from project limit.
12. Design was based on survey data submitted by the Survey and Investigation Section of the Planning and Design Section of the DPWH-Davao del Norte Engineering Sub-District Office.

SUBBASE AND BASE COURSE

1. Re-preparation and compaction of the existing base/subbase to the required 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.

SURFACE COURSE

1. Use steel forms for item 311- Portland Cement Concrete Pavement
2. When concrete is to be placed adjoining a previously constructed lane and mechanical equipment will be operated upon the existing lane, that previously constructed lane shall have attained the strength of fourteen (14) day concrete. If only finishing equipment is carried on the existing lane, paving in adjoining lanes may be permitted after three (3) days.
3. At transverse construction joints, holes of 60mm dia. and spaced at 300mm (for 230mm and 280mm thick concrete pavement) shall be drilled at one-half (1/2) of the existing concrete pavement thickness so as to permit the load transfer device (28mm dia. plain dowel bars for 230mm thick PCCP; 36mm dia plain dowel bars for 280mm thick PCCP; 36mm dia. for 300mm thick PCCP) to be inserted at one-half (1/2) of its length. The said 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.
-DO 54, s.2012
4. If reinforcing steel bars are used, mortar blocks of approved dimension shall be installed at specific intervals to maintain uniform clearance from the base.
5. Transverse contraction joint shall be cut using a concrete saw to the required depth (one-fourth to one-third of the concrete pavement thickness) and width as shown in the approved plans.
6. All joints shall be sufficiently sealed with asphalt sealant prior to opening to vehicular traffic.
7. The use of type III portland cement meeting the requirements of AASHTO M-85 for high-early strength mix or type I portland cement with accelerating admixtures conforming to the requrements of AASHTO M-194 shall be used.
8. The entire surface of the newly placed concrete shall be cured with either one of the curing materials specified in ITEM 708.1 of the DPWH Standard Specificationsm Volume II, 1995.

FOR ASPHALT OVERLAY

1. Item 310 shall consist of constructing a bituminous concrete surface course composed of aggregates, mineral filler, and bituminous material mixed in a central plant, constructed and laid hot on the prepared base in accordance with this specification and in conformity with lanes, grades, thickness and typical cross-section shown on the plans.
2. Bituminous material shall be either medium curing (MC) cut-back asphalt cement, whichever is called for in the bill of quantities. It shall conform to the requirements of ITEM 702, Bituminous Materials. The penetration grade, type and grade of bituminous material shall be specified in the special provisions.
3. Aggregates shall conform to the requirements of ITEM 307, Bituminous Plant Mix Surface.
4. The proportion of bituminous material on the basis of total dry aggregate shall be from 5.0 to 0.8 mass percent. The exact percentage to be used shall be fixed by the engineer in accordance with the job-mix formula and the other quality control requirements.
5. During the mixing operation, one half to one (0.50 to 1.0) mass percent of hydrated lime, dry aggregate basis shall be added to the mixture. The lower percentage limit is applicable to aggregate which are predominantly calcareous.
6. The construction requirements shall be in accordance whenever applicable with SECTION 307.3.
7. All deteriorated transverse and longitudinal joints shall be sealed with asphalt prior to laying of asphalt mix.
8. All cracks shall be sealed using machine pressurized epoxy injection. Spacing of copper tubes used in epoxy injection shall have a minimum and maximum spacing of 100 mm and 150 mm respectively depending on the extent of the cracks.
9. The contractor shall be responsible for handling materials and performing all parts of the work shall be approved by the engineer as to design, capacity and mechanical condition. The equipment shall be at the jobsite sufficiently ahead of the start of construction operations to be examined thoroughly and approved.
10. The Asphalt Overlay must attain an IRI of 3m/km.

EARTHWORK

1. 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 (12in) in any dimension and stockpiled at designated locations on the project or as directed by the Engineer.
2. All excavations shall be finished to reasonably smooth and uniform surfaces. No materials shall be wasted without authority of the Engineer. Excavation operations shall be conducted so that material outside of the limit of slopes will not be disturbed.
3. Spoils from demolished/ excavated materials shall not be allowed to be stockpiled at the shoulder or part of the traveled roadway and shall be removed immediately to prevent obstruction. Spoils removed shall be disposed off in designated areas approved by the Engineer.

MISCELLANEOUS STRUCTURES

1. The application of paint for pavement markings shall be preferably carried out by a machine specially 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 contact with the surface being painted.

REFERENCES:

1. Revised DPWH Manual on Highway Safety Design Standards,May 2012 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 - D.O. 41,s. 2012
2. 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

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 and Investigation Unit

LEGEND

SYMBOLS	DESCRIPTION	SYMBOLS	DESCRIPTION
CH	CONCRETE HOUSE		BENCH MARK
P	PUROK	CEP	CONCRETE ELECTRIC POST
WH	WOODEN HOUSE	WEP	WOODEN ELECTRIC POST
	EXISTING RCC PIPE		CENTERLINE
	SIDE SHOT REMARK		EDGELINE
	JUNCTION ROAD		SHOULDER LINE
	VARIOUS TREES		RROW LINE
RP-2 RP-2	REFERENCE POINTS		GRAVEL
	WATER FLOW DIRECTION		ASPHALT OVERLAY
	WATERWAY		REBLOCKING
	RCC PIPE PROFILE		CYLINDRICAL MONUMENT
	FENCE	PI	POINT OF INTERSECTION
	HEADWALL		BARBWIRE FENCE
	TURNING POINTS		REMOVAL OF EXISTING ASPHALT

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TAGUM CITY

PROJECT NAME AND LOCATION: **BABAK-SAMAL-KAPUTIAN RD - K1504+140 - K1506+054**

SHEET CONTENTS: GENERAL NOTES

DRAFTED: **HERWIN EVAN J. HABABAG** ENGINEER II
PREPARED: **WARREN S. PIÑEZ** ENGINEER II

REVIEWED: **BENILDA S. PACQUIAO** ENGINEER III DATE:

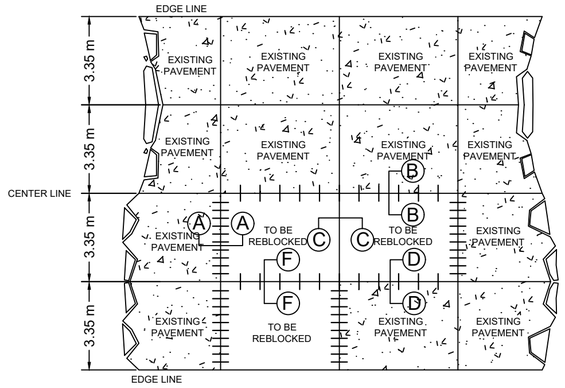
SUBMITTED: **JEZABEL E. TULING, MPA** CHIEF, PLANNING AND DESIGN SECTION DATE:

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

APPROVED: **ARTURO R. LONGYAPON** DISTRICT ENGINEER DATE:

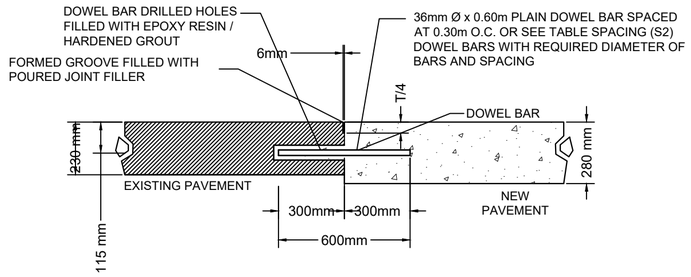
SET NO. A 1 1

SHEET NO. 2 39



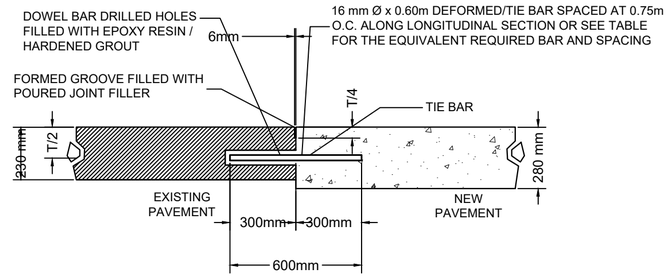
TYPICAL PLAN OF PCCP (4 LANES) - FOR REBLOCKING

SCALE NTS



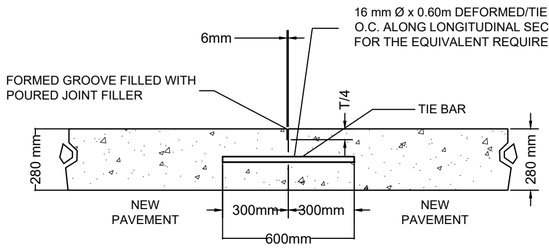
(TO BE USED FOR CONNECTIONS WITH EXISTING PAVEMENT AND NEW PAVEMENT WITH DIFFERENT THICKNESS)

A TRANSVERSE CONSTRUCTION JOINT (SECTION A - A) (NEW AND EXISTING PAVEMENT)

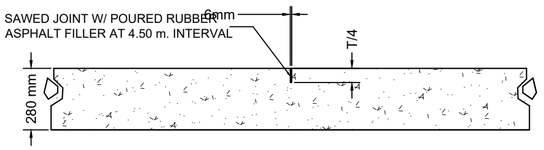


(TO BE USED FOR CONNECTIONS WITH EXISTING PAVEMENT AND NEW PAVEMENT WITH DIFFERENT THICKNESS)

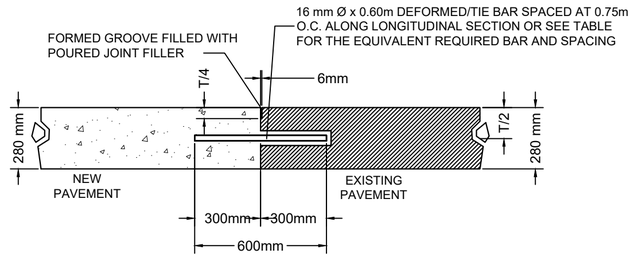
B LONGITUDINAL CONSTRUCTION JOINT (SECTION B - B) (NEW AND EXISTING PAVEMENT)



F LONGITUDINAL CONSTRUCTION JOINT (SECTION F - F)



C TRANSVERSE CONTRACTION JOINT (SECTION C-C)



(TO BE USED FOR CONNECTIONS WITH EXISTING PAVEMENT AND NEW PAVEMENT WITH SAME THICKNESS)

D LONGITUDINAL CONSTRUCTION JOINT (SECTION D - D) (NEW AND EXISTING PAVEMENT)

TABLE SPACING OF TIE BARS (L=600 mm)		
SLAB THICKNESS (mm)	SPACING S1 (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.
NOTE: THE BAR SPACING WILL BE BASED FROM THICKNESS OF THE NEW PAVEMENT

N O T E:

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 placed 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 used shall be as 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 doweled butt joints at normal joint spacing shall be provided before or after an expansion joint.
8. 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 meet at intersections with no gaps or offset.
11. All dimensions are in millimeters unless otherwise specified.
12. Avoid stoppage of formworks along curves.
13. Construct expansion joint at every 90 meters and/or every adjacent existing structures.

TABLE SPACING (S2) OF DOWEL BARS (L=600mm)				
SLAB DEPTH, (T) (mm)	SPACING FOR 36mm. dia, DOWEL BAR (mm)	SPACING FOR 32mm. dia, DOWEL BAR (mm)	SPACING FOR 28mm. dia, DOWEL BAR (mm)	SPACING FOR 25mm. dia, DOWEL BAR (mm)
280	300	250	190	160
290	290	230	170	140
300	270	210	160	130
310	250	200	150	120
320	230	190	140	110
330	220	180	130	110
340	200	170	130	100

BASED ON AASHTO GUIDE FOR DESIGN OF PAVEMENT STRUCTURES 1993.
NOTE: THE BAR SPACING WILL BE BASED FROM THICKNESS OF THE NEW PAVEMENT

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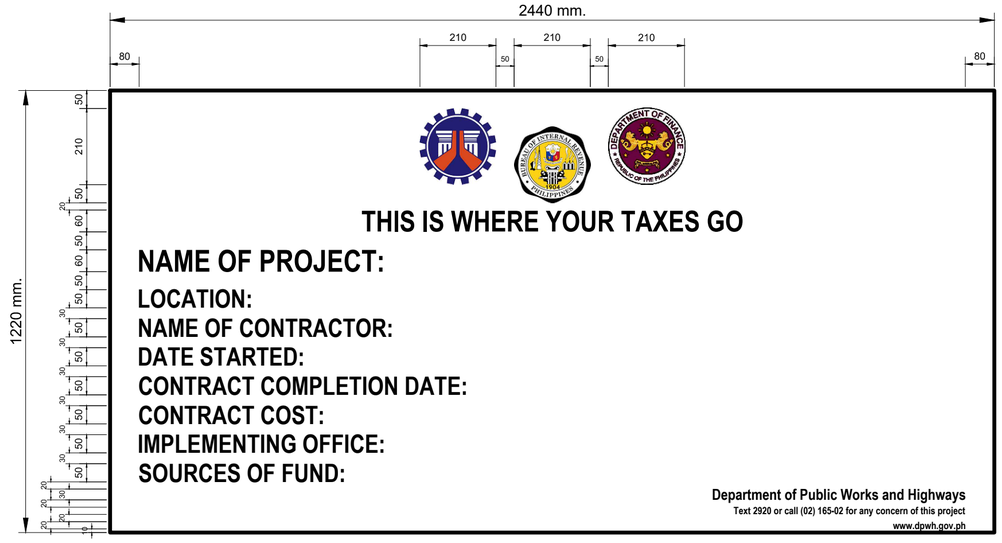
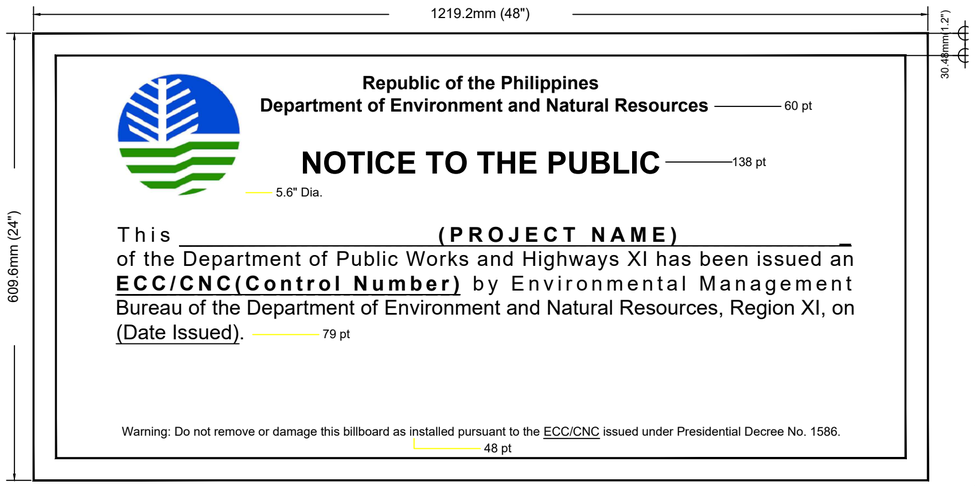
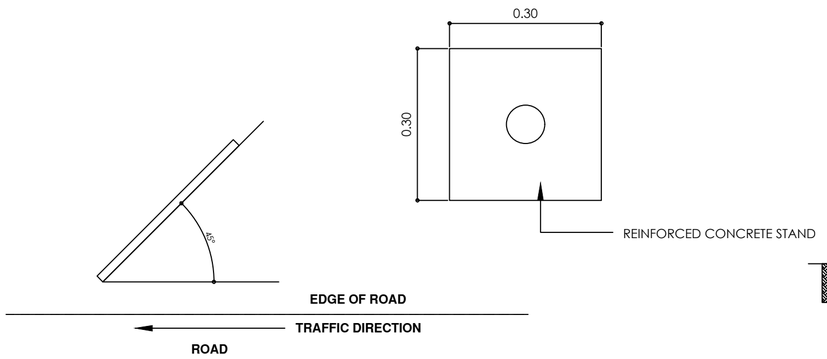
PROJECT NAME AND LOCATION:	SHEET CONTENTS:	DRAFTED:	REVIEWED:	SUBMITTED:	RECOMMENDED:	APPROVED:	SET NO.	SHEET NO.
BABAK-SAMAL-KAPUTIAN RD - K1504+140 - K1506+054	STANDARD PORTLAND CEMENT CONCRETE PAVEMENT JOINTS	**HERWIN EVAN J. HABABAG** ENGINEER II PREPARED: **WARREN S. PIÑEZ** ENGINEER II	**BENILDA 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 R. LONGYAPON** DISTRICT ENGINEER DATE:	A 1 1	3 39



DPWH STANDARD PROJECT BILLBOARD





BILLBOARD FRAME DETAIL

COA BILLBOARD

REPUBLIC OF THE PHILIPPINES
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REGION XI
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TAGUM CITY

Project:_____ Cost:_____
Location:_____ Fund Source/s:_____
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 particulars or complain about this project, please contact the Regional Office or Cluster which has audit jurisdiction on this project:

COA Regional Office No./Cluster:_____
Address:_____
Contact No.:_____or Text COA Citizen's Desk at 0915-5391957

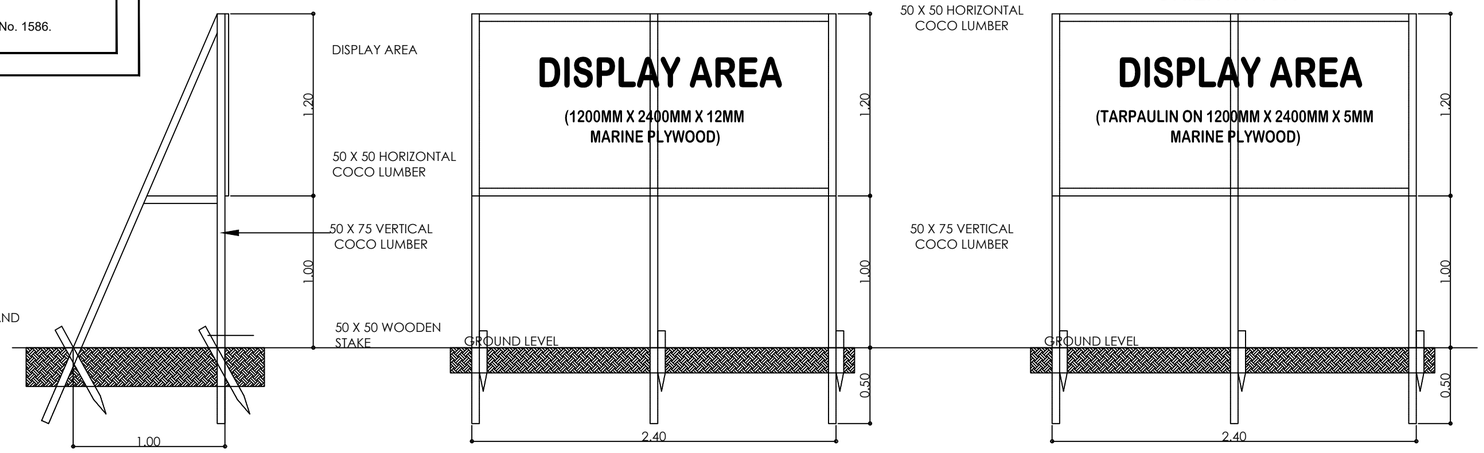
2440 mm. (8 ft.)

WHITE BACKGROUND

2440 mm. (8 ft.)

NOTE :
* INSTALLATION OF BILLBOARD SHALL BE ONE(1) AT THE BEGINNING & ONE(1) AT THE END OF THE PROJECT.
* NAMES OR PICTURES OF ANY PERSONAGES SHOULD NOT APPEAR IN THE BILLBOARD.
* NO POLITICAL BILLBOARD SHALL BE ALLOWED TO BE INSTALLED 100m BEFORE & 100m AFTER ALL DPWH PROJECTS & IN BETWEEN THE PROJECT LIMITS OR WITHIN THE ROAD-RIGHT-OF-WAY.
* DPWH CONTRACTORS SHALL NOT BE ALLOWED TO PLACE NAMES OF POLITICIANS ON THEIR EQUIPMENT OR CARRY POLITICAL BILLBOARD ON THEIR EQUIPMENT.

ORIENTATION



ELEVATION

FRONT ELEVATION (OPTION 1)

FRONT ELEVATION (OPTION 2)

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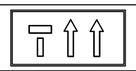
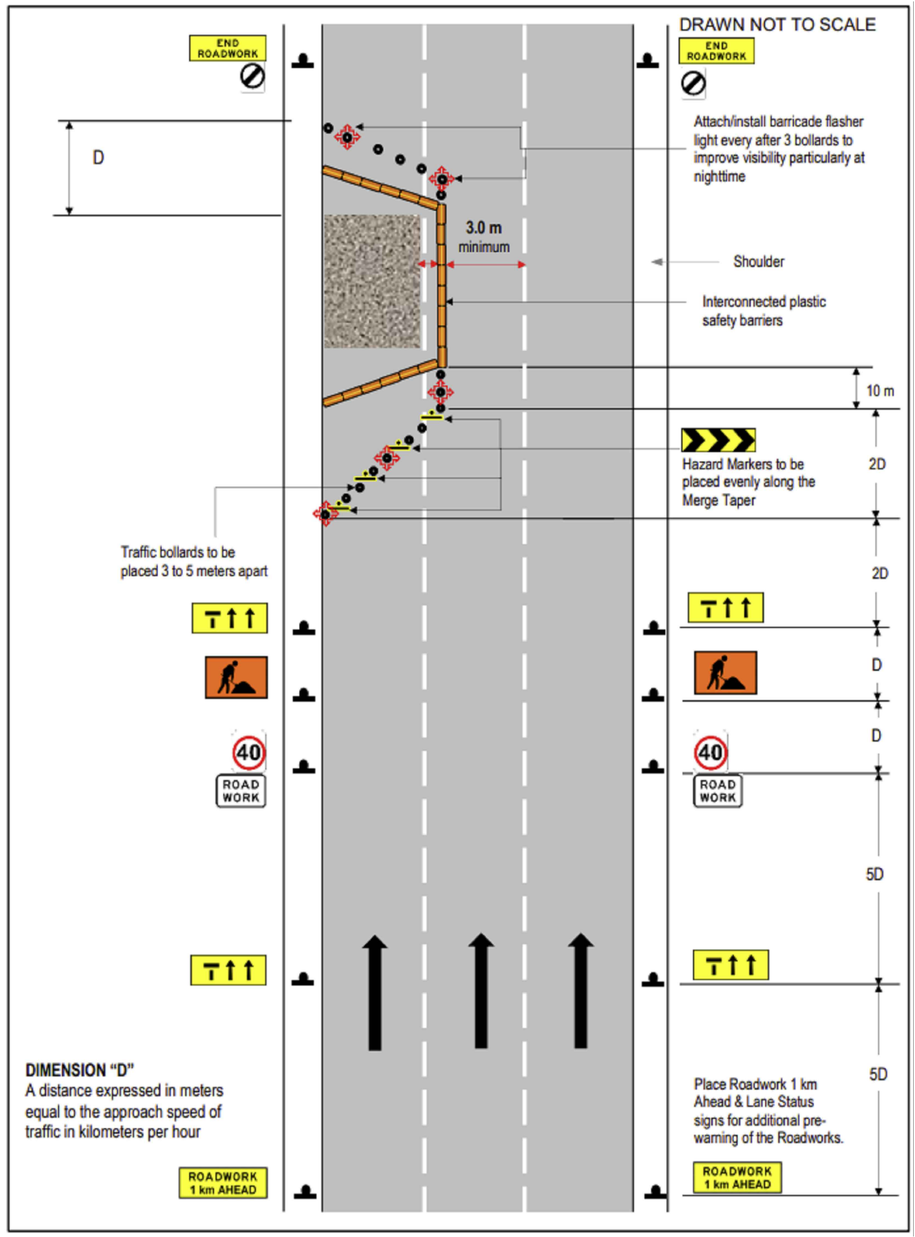
ROAD & BRIDGE WORK SITE TEMPORARY SIGNAGE		SIGNAGE DESCRIPTION			
		SIGN NO.	SIZE (mm) (WIDTH x HEIGHT)	LETTERS/SYMBOLS	BACKGROUND
ADVANCE WARNING SIGNS					
	ROADWORK AHEAD	T1-1	1800 x 600	**LINE 1 - BLACK 200 DM** **LINE 1 - BLACK 160 DM**	YELLOW REFLECTORIZED
	END ROADWORK	T2-16	1800 x 600	**LINE 1 - BLACK 200 DM** **LINE 1 - BLACK 160 DM**	YELLOW REFLECTORIZED
	WORKMEN AHEAD (SYMBOLIC)	T1-5	900 x 600	BLACK	RED ORANGE/REFLECTORIZED FOR NIGHT USE
	LANE STATUS	T2-6-2	1800 x 900	BLACK 600 HIGH	YELLOW REFLECTORIZED
	SPEED RESTRICTION	R4-3	600 x 800 (SIZE B)	**BLACK 240 DN** **CIRCLE - 600 DIA. RED**	**WHITE REFLECTORIZED** **RED CIRCLE REFLECTORIZED**
	TEMPORARY HAZARD MARKER	T5-4	1500 x 450	**CHEVRONS** **BLACK 177 WIDE AY 45°**	WHITE REFLECTORIZED
	END SPEED RESTRICTION	R4-2	600 x 800 (SIZE B)	SYMBOL - 600 DIA. BLACK	WHITE REFLECTORIZED
	ROAD WORK	R4-3	600 x 400 (SIZE B)	**LINE 1 - BLACK 100 EM** **LINE 2 - BLACK 100 EM**	WHITE REFLECTORIZED

TRAFFIC MANAGEMENT LAY-OUT (LAY-OUT 9, CLOSURE OF INNER LANE, MULTILANE ROAD, HIGH SPEED, LONG TERM)



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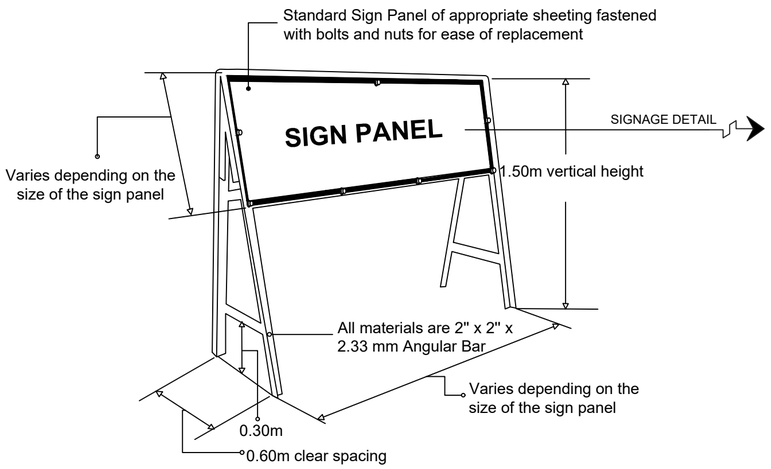
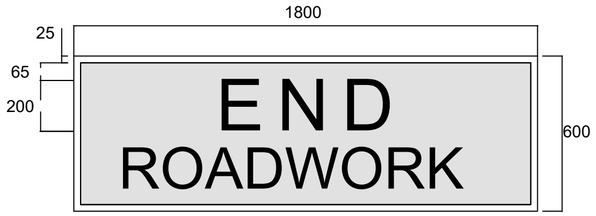
BABAK-SAMAL-KAPUTIAN RD - K1504+140 - K1506+054	TRAFFIC MANAGEMENT LAYOUT	**HERWIN EVAN J. HABABAG** ENGINEER II PREPARED: **WARREN S. PIÑEZ** ENGINEER II	**BENILDA S. PACQUIAO** ENGINEER III DATE:	**JEZABEL E. TULING, MPA** CHIEF, PLANNING AND DESIGN SECTION DATE:	**GARRY E. VERANO** OFFICER-IN-CHARGE OFFICE OF THE ASSISTANT DISTRICT ENGINEER DATE:	**ARTURO R. LONGYAPON** DISTRICT ENGINEER DATE:	A 1 | 1	5 39

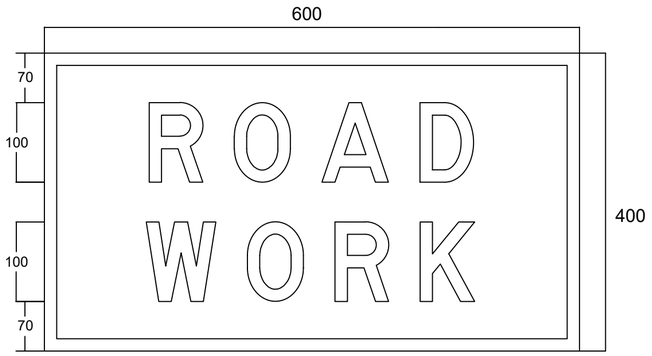


TWO SIDED SIGN FRAME DETAIL

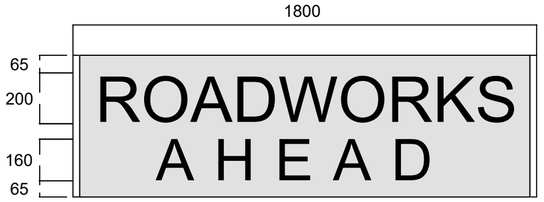


NOTE: BLACK LETTERS AND BORDER ON A YELLOW RETRO-REFLECTIVE BACKGROUND

END ROADWORK DETAIL

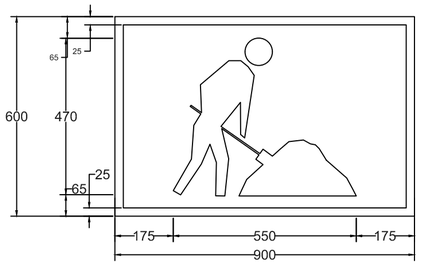


ROADWORK DETAIL



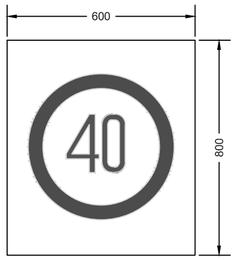
NOTE: BLACK LETTERS AND BORDER ON A YELLOW RETRO-REFLECTIVE BACKGROUND

ROAD WORK AHEAD DETAIL

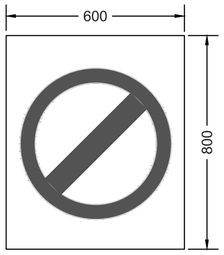


NOTE:
- BLACK SYMBOLS AND BORDER
- ORANGE RETRO-REFLECTIVE BACKGROUND

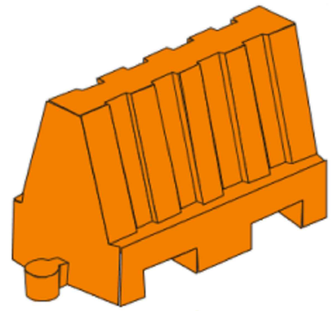
FOR NIGHTTIME USE



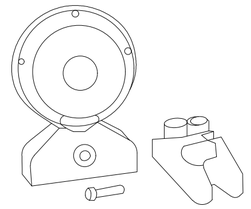
NOTE: BLACK NUMERALS ON A WHITE REFLECTORIZED BACKGROUND AND RED CIRCLE REFLECTORIZED



NOTE: BLACK SYMBOL ON A WHITE REFLECTORIZED BACKGROUND (600 DIA.)

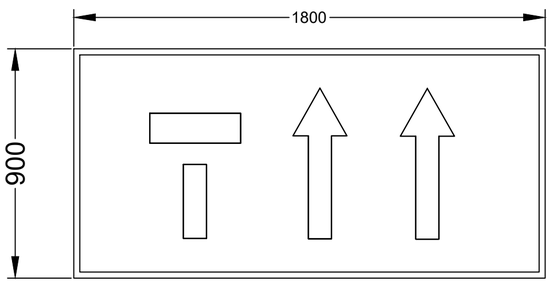


PLASTIC SAFETY BARRIER

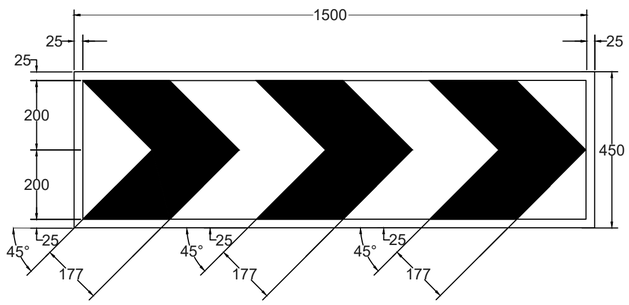


NOTE: FLASHER LIGHT 3 VOLTS, BATTERY OPERATED, AMBER COLOR W/ LIFESPAN CONSIDERATION OF 6 MONTHS

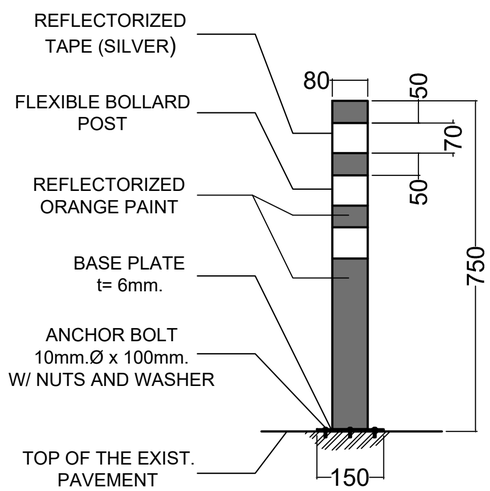
FLASHER LIGHT



NOTE: BLACK SYMBOLS AND BORDER ON A YELLOW RETRO-REFLECTIVE BACKGROUND

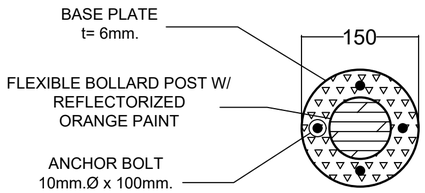


NOTE: BLACK SYMBOLS AND BORDER ON A YELLOW RETRO-REFLECTIVE BACKGROUND



NOTES:

1. Temporary bollards shall be fluorescent red or orange plastic that is resilient to impact and will not damage vehicles when hit at low speed.
2. The height of bollards is up to 1 meter
3. For night time operation the bollards must be fitted with reflective tape with a minimum bandwidth of 250mm. (SEE LAY-OUT PLAN FOR THE STANDARD SPACING)



FLEXIBLE BOLLARD POST

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