

REPUBLIC OF THE PHILIPPINES DEPARTMENT OF PUBLIC WORKS AND HIGHWAYS

REGIONAL OFFICE III
PAMPANGA 3RD DISTRICT ENGINEERING OFFICE
SAN FRANCISCO ST., BRGY. PAMPANG, ANGELES CITY

QRF FY 2025 PROJECT DETAILED ENGINEERING DESIGN PLAN FOR THE

REPAIR / REHABILITATION OF FLOOD CONTROL STRUCTURES ALONG ALASAS CREEK (LEFT DIKE), BRGY. SAN AGUSTIN, MAGALANG, PAMPANGA.

NET LENGTH

269.00 m. / 1,505.06 sq.m. Slope Protection

SUBMITTED:

LOURDINO C. SORIANO CHIEF, PLANNING & DESIGN SECTION

DATE:

RECOMMENDED:

AGUSTIN R. DAGSAAN JR.

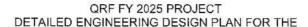
OIC, ASSISTANT DISTRICT ENGINEER

APPROVED:

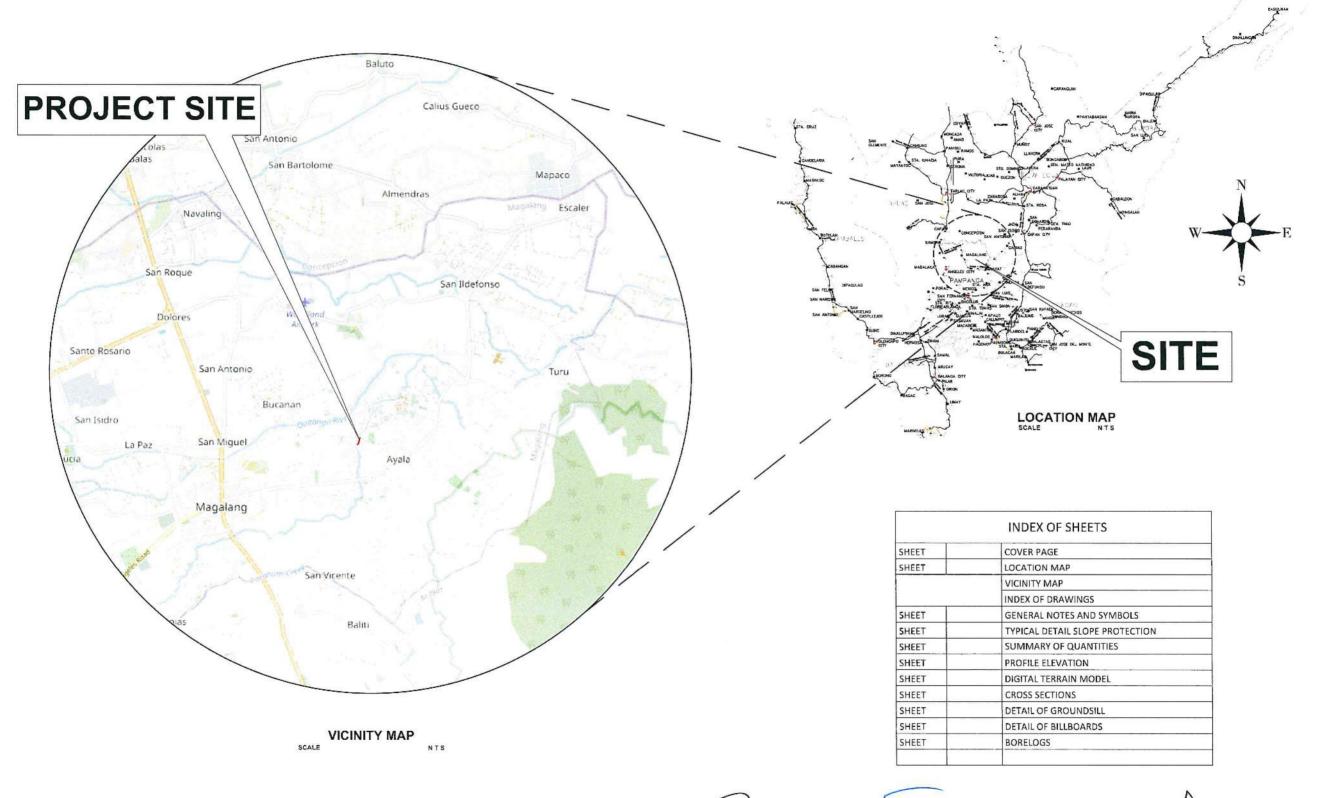
ARNOLD R. OCAMPO

DISTRICT ENGINEER

Plot Date. Monday, 30 June 2025 3:24:13 pm File Names Example On Page 0 20550055 to OPE ACTIVE









REPUBLIC OF THE PHILIPPINES

DEPARTMENT OF PUBLIC WORKS AND HIGHWAYS
REGONAL OFFICE NO HI

PAMPANGA 3RD DISTRICT ENGINEERING OFFICE
ANGELES CITY

PROJECT NAME AND LOCATION :

REPAIR / REHABILITAT
FLOOD CONTROL STRU

REPAIR / REHABILITATION OF FLOOD CONTROL STRUCTURES ALONG ALASAS CREEK (LEFT DIKE), BRGY. SAN AGUSTIN, MAGALANG, PAMPANGA.

TITLE PAGE INDEX OF SHEETS LOCATION MAP VICINITY MAP

SHEET CONTENTS :

BRAFTED

ERWIN S. DAVID

ENGINEERING ASSISTANT

PREPARED:

GIE VANE S. MIRANDA

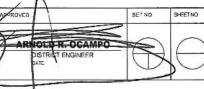
GILA. RIVERA
ENGINEER II

LOURDING C. SORIANO
CHEF, PLANNING & DESIGN SECTION
DATE

AGUSTUN R DAGSAGNAR

OIC SSISTAN DIE RICT EN INEER

DATE



GENERAL NOTES:

DESIGN CRITERIA

A. Design Codes and Standards

- DPWH Design Guidelines, Criteria and Standards, 2015 Edition National Structural Code of the Philippines (NSCP), Volume I Buildings, Towers and Other Vertical Structures, 5th Edition, 2001 National Structural Code of the Philippines (NSCP), Volume II Bridges
- and Edition 1997
- National Building Code of the Philippines (NBCP)
 Philippine National Standards (PNS)
- AASHTO Standard Specifications for Highway Bridges, 16 Edition, 1996
- Standard Drawings for concrete Bridges (DPWH)
 Teclinical Standards and Guidelines for Planning and Design (FCSEC), 2002

SURVEY

A. Specifications

1. DENR Administrative Order No. 2007-29

B. Horizontal and Vertical Control

- Basic traverse station were established based on station of existing KM post and permanent structures at the project site.
 Elevation were assumed at the first benchmark at the beginning of each section of the project.
 Benchmark were established at existing undisturbed structures at different intervals along the project.

		-
GENERAL	NOTES	

Reference Benchmark Details FI EVATION NORTHING: EASTING:

PRS 92.ZONE3

Date of Survey Faulpment Used

Leica Viva GNSS/GS15 Smart Antenna 555 channels (1) Leica Captivate Controller/CS20 Disto Field Controller (3) Leica Viva GNSS/GS15 Smart Antenna 555 channels (3)

III. CONSTRUCTION

A. Specifications

- DPWH Design Guidelines, Criteria, and Standards (DGCS) -Volume III, 2015 Edition
- The Item No. and description are taken from DPWH D.O. No. 5, series of 2017
- Series of 2017
 DPWH Standard Specifications for Highways, Bridges and Airports Vol. II, 2013 Edition
 DPWH Standard Specifications for Public Works Structures (Buildings,
- Ports and Harbors, Flood Control and Drainage Structures and Water Supply Systems) Vol. III, 2019 Edition

B. Dimensions, Elevations and Stations

- All dimensions are in millimeters unless otherwise specified. All stations are in km + meter and elevations are in meters.

- All stations are in km + meter and elevations are in meters. Figures shall govern over scaled dimension.

 Reference datum Plane shall be the mean sea level ,See General Plan, for benchmark locations
 All elevations are subject to change pending their verification during the Pre-construction Survey, based on the latest certified benchmarks of the NAMRIA.

C. Civil Works

1. Structure Excavation

- Depth of excavation shall be as specified in the drawings.
- Post excavation surface shall be compacted to the required degree as specified in the plans

2. Fill

- Filling materials shall be placed in layers of 250 mm max. thickness compacted and properly watered to attain at
- least 95 % of max. dry density.

 Truck dumping of materials in huge lumps shall not be permitted.

 The dump truck shall unload embankment materials by spreading it on top of the fill area sufficient to allow compaction by layers as specified.

Compaction

- Embankment materials shall be free from stones, twigs and other deleterious materials to ensure compaction and collesion. Lumps
- of filling materials should be pulverized prior to compaction.
 Field Density Tests (FDT) for each compaction layer shall be undertaken until the required degree of compaction is attained, and under the supervision of the Materials Engineer.

- Alignment and grades are subject to adjustment to suit existing field
- Clearing and grubbing shall be confined only within the limits of the acquired R O W
- acquired R.O.W. Unsuitable subgrade material shall be excavated to the required width and depth and replaced with approved material as directed by the Engineer. No embankment material shall be placed until foundation is suitable.
- Painting of metal beam guardrails pavement markings shall be considered subsidiary work only. No direct payment shall be made for this work except for specific items mentioned in the Bid

Material Requirement

- Embankment Fill (Lahar) Fill materials shall be obtained from borrow areas designated by
- the Consultant Malerials Engineer.

 At the designated source, the top 300 mm shall be scarified and should not be part of the filling material.

Reinforced Concrete

Concrete

- a. Unless otherwise indicated, the compressive strength shall be t'c=35MPa for Pre-cast Panel, 24MPa for PCCP, RCBC and Side drainage structures

 @ 28 days, with max. water cement ratio of 0.53, slump range of 50-100 mm
 and max. size of aggregates shall be 40 mm.
- Bars shall be of intermediate grade fy=275 MPa.
- Standard hooks shall be complied with at the free end of bar equivalent to 90 bend plus 12 db and minimum diameter for bends shall be 6db
- c. Splicing of bars shall be by lapping or butt welding at 20 bar Ø or a minimum of
- d. Adjacent bars shall be securely held together by #16 tie-wires, each having a minimum length of 25 cm.
- e. Clear concrete cover between reinforcement bars and embankment materials shall be 75 mm and precast mortar blocks should be provide for this purpose

f. Cranked Splices



DIMENSIONS OF 90-DEGREE AND 180-DEGREE HOOKS

D = 8d FOR Ø28, Ø32 AND Ø36



DIAMETER (mm)	80. HOOK	180° HOOK
10	160	105
12	195	115
16	26C	130
20	320	160
25	400	200
25	48C	255
32	545	290
36	515	325

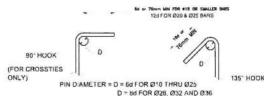
3. Mixing Water

- Water to be used shall be clean and free from injurious amounts of oil, acid, alkali, salt, organic material and substances that may be deleterious to concrete or reinforcement.
- Non-potable water shall not be used unless it passes equivalent strength of at least 90% of the strength results of similar samples made using potable water with same proportions through compressive strength tests (ASTM C109).

Gabion Mattress

- Mesh Properties Mesh Properties
 Wire Diameter =
 Scivage Wire Diameter =
 Tensile Strength (Minimun) =
 Compression Resistance =
 Filled Gabion Density =
 Minimum Zinc Coating =
 Mesh Size =
 Tying / Connecting Wire =
 Wire Should Be Triple Twisted 2.70 mm 3,40mm 4,700 kg./cm² (460 MPa)
- 4,700 kg,/cm² (460 MPa) 300 400 tons/m² 17 kn/cum (min) 244.00 gm/m (ASTM A 641-82) 6x8 2,70nini
- Product tests shall be conducted on the product sample prior to its acceptance. Stones should be of ourable pieces and resistant to weathering having a minimum density of 1.7 g/cc, at saturated surface dry (SSD) condition with sizes ranging from 100-200 mm in diameter, properly hand-laid for minimum voids.

DIMENSIONS FOR STIRRUPS AND CROSSTIE HOOKS



DIAMETER (mm)	90' HOOK	135° HOOK
10	120	125
12	125	150
16	160	230
20	323	250
25	400	313
28	480	365
32	545	420
35	615	479

Geolextile Filter - 100 % Polypropylene, non-woven geolextile,

cnem	lical environments.
=	100 - 180 l/m2 /sec
=	80 - 100 microns
=	10 KN/m (min)
=	2.1 KN (min)
=	600 N (min)
=	1.2 mm (min)
=	0.30 m (min.)
=	Mechanical (sewn)

End weights shall be 12mm Ø RSB wrapped around at both edges of the geotextile, parallel to the bank, and held together by sewing.

- The approved species of sod shall include roots and earth of at least 50 mm
- Prior to placing of sod, the top soil should be sufficiently watered. The newly planted sod should be regularly watered by the contractor until plant growth is fully established and until their demobilization
- Coconet with Hydro seeding

D. Others

Signboard showing name of project, station limits, package no. and name of contractor shall always be visible during construction until after the project has been accepted by the implementing agency. As-built drawings shall be done by the contractor based from the post construction survey of completed segments featuring deviations from the approved construction plans. The contractor shall prepare as built drawings on completed segment, as construction progresses to minimize the review period after construction. Subject for checking by the consultants.

DESIGN PARAMETERS

HYDRAULIC DESIGN DATA: CATCHMENT AREA RIVER LENGTH HIGHEST ELEVATION LOWEST ELEVATION DIFFERENCE IN ELEVATION SLOPE Lca MEAN VELOCITY LAG TIME ORDINARY WATER LEVEL MAXIMUM EXPERIENCE FLOOD ELEV. PEAK DISCHARGE (50 yrs. return period) DESIGN FLOOD ELEVATION (50 yrs. return period)

SYMBOLS AND ABBREVIATIONS

	CONTOUR		EMBANKMENT & SLOPE PROTECTION	
2 *	DIKE		ORIENTATION	
~~~	RIVER / CREEK	X X X X X X	SECTION VIEW OF SLOPE PROTECTION	
	CLAY/MOUNTAIN SOIL EARTH SECTION	© ©	BENCH MARK  BORE HOLE  TEST PIT	
LIMIT	LIVIT OF DIMENSION	(B1-2)	IDENTIFICATION OF SECTION/DETAIL SHEET OF WHICH SECTION/DETAIL IS SHOWN IF DRAWING IS ON ANOTHER SHEET	
	DESIGN GRADE LINE		EXISTING GRADE LINE	

PCCP	- PORTLAND CEMENT CONCRETE PAVEMENT	вм	- BENCH MARK
AZIM	- AZIMUTH	e	- RATE OF SUPER ELEVATION IN %
DIST	- DISTANCE	PC	- POINT OF CURVATURE
N	- NORTHING	PT	- POINT OF TANGENCY
E	- EASTING	AC	- ASPHALT CONCRETE
PI	- POINT OF HORIZONTAL INTERSECTION	cm	- CENTIMETER
R	- BADIUS	nım	- MILLIMETER
ΔR	- OFFSET OF THE CIRCULAR CURVE	Km	- KILOMETER
Т	- TOTAL TANGENT LENGTH OF THE CIRCULAR CURVE	NC	- NORMAL CROWN
Lc	- LENGTH OF CIRCULAR CURVE	RCPC	- REINFORCED CONC. PIPE CULVERT
D	- DEGREE OF CURVE	DIA(Ø)	- DIAMETER
E	- TOTAL EXTERNAL DISTANCE	VAR	- VARIES
PVI	- POINT OF VERTICAL INTERSECTION	INV ELEV(IE)	- INVERT ELEVATION
LVC	- LENGTH OF VERTICAL CURVE	WEP	- WOODEN ELECTRICAL POST
Mo	- MIDDLE ORDINATE	RCBC	- REINF, CONCRETE BOX CULVERT
q	- GRADE IN PERCENT	ER	- EDGE OF ROAD
ROW	- RIGHT OF WAY	EL OR ELEV	- ELEVATION



REPUBLIC OF THE PHILIPPINES
DEPARTMENT OF PUBLIC WORKS AND HIGHWAYS PAMPANGA 3RD DISTRICT ENGINEERING OFFICE PROJECT NAME AND LOCATION:

REPAIR / REHABILITATION OF FLOOD CONTROL STRUCTURES

ALONG ALASAS CREEK (LEFT MAGALANG PAMPANGA

GENERAL NOTES AND SYMBOLS

ERWIN S. DAVID GIE YANE S. MIRANDA GIL A. RIVERA

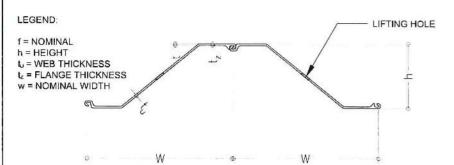
RNOLD R. OCAMPO

ENGINEER II

LOURDING C. SORIANO

AGUSTIN R DAGSAAN

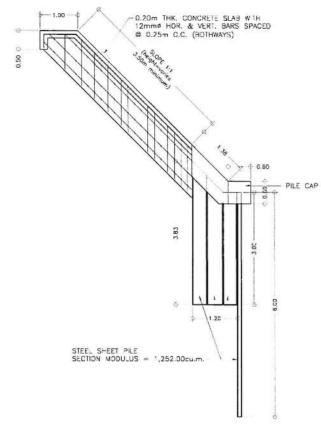
SHEET CONTENTS



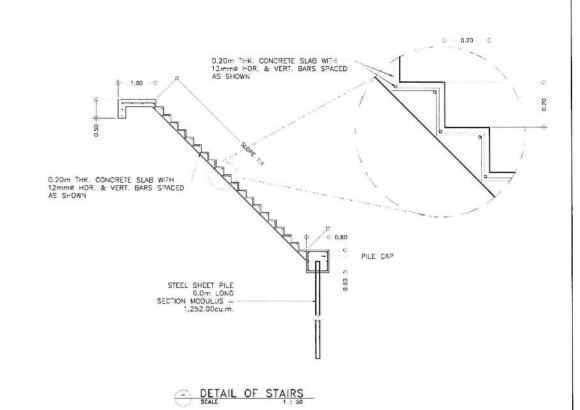
#### **GENERAL NOTES:**

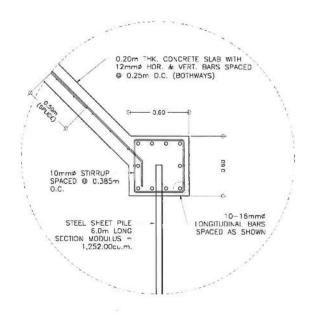
- CLASS "A" CONCRETE SHALL BE USED WITH A MINIMUM COMPRESSIVE STRENGTH OF 20.70 MPa.
- 2. ALL REINFORCING BARS SHALL HAVE THE MINIMUM GRADE OF 40 (fy =
- 3. ALLOWABLE STRESS FOR STEEL SHEET PILE SHALL BE 1800kg/cm²
- 4. THE CENTER OF LIFTING HOLE SHALL BE LOCATED AT DISTANCE OF 150mm FROM END OF EACH PILE. DIAMETER OF LIFTING HOLES SHALL BE
- ONE MAN BOULDERS (300-400mm DIA.) SHALL BE USED FOR THE BOULDER NEAR THE TOE OF THE FILL. ALL VOIDS BETWEEN BOULDERS SHALL BE FILLED WITH SAND AND GRAVEL AND SUFFICIENTLY WATERED TO SECURE COMPACTION.
- 6. DIMENSIONS ARE IN MILLIMETERS UNLESS OTHERWISE SPECIFIED.
- 7. FIGURES SHALL GOVERN OVER SCALED DIMENSIONS IN CASE OF

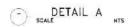
CROSS SECTION OF STEEL SHEET PILE

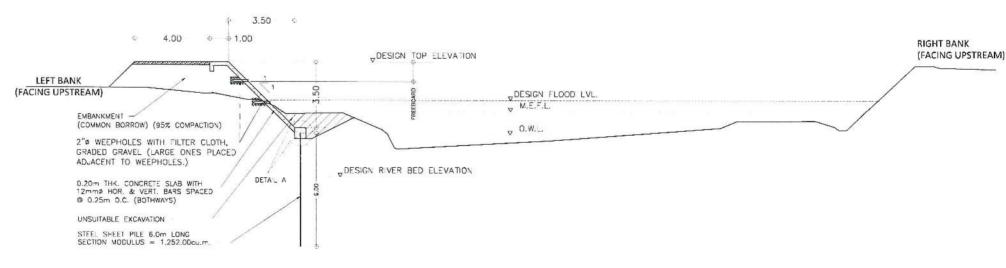


END PROTECTION









DETAIL OF SLOPE PROTECTION



DEPARTMENT OF PUBLIC WORKS AND HIGHWAYS
REGIONAL OFFICE NO III PAMPANGA 3RD DISTRICT ENGINEERING OFFICE ANGELES CITY

REPAIR / REHABILITATION OF FLOOD CONTROL STRUCTURES ALONG ALASAS CREEK (LEFT DIKE), BRGY, SAN AGUSTIN, MAGALANG, PAMPANGA.

PROJECT NAME AND LOCATION :

TYPICAL DETAIL OF SLOPE PROTECTION

SHEET CONTENTS

ERWIN S. DAVID ENGINEERING ASSISTANT GIL A. RIVERA GIE YANE S. MIRANDA ENGINEER II

CHIEF PLANNING DESIGN SECTION

OIC ASSISTAN DISPACE FOR DATE SET NO SHEET NO ARNOLU R. OCAMPO

	SUMMARY OF QUANTI		<u> </u>	
ITEM NO.	DESCRIPTION	QUANTITY	UNIT	REMARKS
B.4(10)	Miscellaneous Survey and Staking	1.00	l.s.	
B.5	Project Billboard / Signboard	1.00 ea.		
B.7(2)	Occupational Safety and Health Program	1.00 l.s.		
B.9	Mobilization / Demobilization	1.00	l.s.	
	TOTAL OF PART B			
PART C	EARTHWORKS			
101(1)	Removal of Structures and Obstruction	1.00	l.s.	
	TOTAL OF PART C			
PART F	BRIDGE CONSTRUCTION			
404(1)a	Reinforcing Steel (Grade 40)	7,070.78	kg	
405(1)a3	Structural Concrete (20.68 Mpa Class A, 28 days)	98.28	cu.m.	
	TOTAL OF PART F			
PART L	FLOOD AND RIVER CONTROL AND DRAINAGE			
1700(1)	Clearing and Grubbing	4,020.35 sq.m.		
1701(1)	Unsuitable Excavation	901.25 cu.m.		
1704(1)b	Embankment From Borrow (Common Soil)	2,585.65 cu.m.		
1712(2)	Concrete Slope Protection	338.94 cu.m		
1717(2)a1	Steel Sheet Pile (Slope Protection)	2,158.44	m.	



PROJECT NAME AND LOCATION : REPAIR / REHABILITATION OF FLOOD CONTROL STRUCTURES ALONG ALASAS CREEK (LEFT DIKE), BRGY. SAN AGUSTIN, MAGALANG, PAMPANGA.

SHEET CONTENTS : ERWIN S. DAVID ENGINEERING ASSISTANT SUMMARY OF QUANTITIES GIE YANE S. MIRANDA ENGINEER II

GIL A RIVERA

SET NO.

LOURDING C. SORIANO
CHEF, PLANNING & DESIGN SECTION
DATE

AGUSTIN R. DAGSAN JR.
O'D' ASSISTANT DISTRIPLATION DATE ARNOLD R. OCAMPO DISTRICT ENGINEER DATE

#### GUIDELINES ON THE INSTALLATION OF PROJECT BILLBOARDS:

- 1.) THE BILLBOARD DESIGN LAYOUT, DIMENSION AND LETTER SIZES ON WHITE BACKGROUND, AS SHOWN ON THE ATTACHED DRAWING, SHALL BE DEPICTED ON A STANDARD BILLBOARD MEASURING 1220mm X 2440mm (4ft. x 8ft.) USING 12.50mm (4 inch) THICK MARINE PLYWOOD OR TARPAULIN OF THE SAME SIZE POSTED ON 5mm (3 inch) MARINE PLYWOOD.
- 2.) ALL EXISTING BILLBOARD OF ON-GOING PROJECTS SHALL BE REPLACED WITH THE NEW ONE ADOPTING THE ABOVE GUIDELINES.
- 3.) FOR EACH BUILDING PROJECT, THE BILLBOARD SHALL BE INSTALLED IN FRONT OF THE PROJECT SITE.
- 4.) FOR EACH ROAD/BRIDGE/FLOOD CONTROL PROJECT, TWO BILLBOARDS SHALL BE INSTALLED, ONE AT BEGINNING AND ONE AT THE END OF THE PROJECT.
- 5.) FOR ROAD PROJECTS WITH LENGTH OF 10 KILOMETERS OR MORE, ADDITIONAL BILLBOARD SHALL ALSO BE INSTALLED AT EVERY 5 KILOMETER INTERVAL.
- 6.) NAME(S) AND/OR PICTURE(S) OF ANY PERSONAGES SHOULD NOT APPEAR IN THE
- 7.) NO OTHER BILLBOARDS SHALL BE ALLOWED TO BE INSTALLED 100 METERS BEFORE AND 100 METERS AFTER ALL DPWH PROJECTS AND IN-BETWEEN THE PROJECT LIMITS OR WITHIN THE ROAD RIGHT-OF WAY.

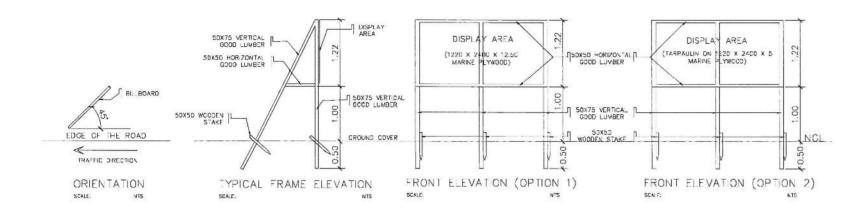
2. The display and/or affixture of the picture, image, motto, logo, color, motif,

signboards, is considered unnecessary.

initials or other symbol or graphic representation associated with the top

leadership of the project proponent or implementing agency/office, on

8.) DPWH CONTRACTORS SHALL NOT BE ALLOWED TO PLACE NAMES OF POLITICIANS OR CARRY POLITICAL BILLBOARD ON THEIR EQUIPMENT.



# 210 50 210 50 210 THIS IS WHERE YOUR TAXES GO NAME OF PROJECT: LOCATION: NAME OF CONTRACTOR DATE STARTED: CONTRACT COMPLETION DATE: CONTRACT COST: IMPLEMENTING OFFICE: SOURCES OF FUND:

### DPWH STANDARD PROJECT BILLBOARD

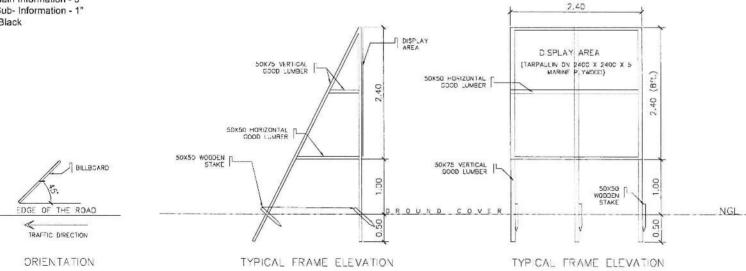
2440mm

#### Notes:

- 1. For infrastructure projects, a tarpaulin signboard must be suitably framed for outdoor display at the project location, and shall be posted as soon as the
  - Specifications: Tarpaulin, White, 8ft x 8ft Resolution: 70dpi Font: Helvetica Font Size: Main Information - 3"

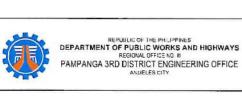
Sub-Information - 1"

Font Color: Black





**COA BILLBOARD** 



PROJECT NAME AND LOCATION SHEET CONTENTS REPAIR / REHABILITATION OF FLOOD CONTROL STRUCTURES ALONG ALASAS CREEK (LEFT DIKE), BRGY. SAN AGUSTIN, MAGALANG, PAMPANGA.

DRAFTED **ERWIN S. DAVID** DETAIL OF BILLBOARDS (COA AND DPWH) GIE YANE S. MIRANOA ENGINEERI

GIL A. RIVERA

LOURDINO C. SORIANO

ARNOLD R. OCAMPO

SPECING

AGUSTIN R. DAGSAR