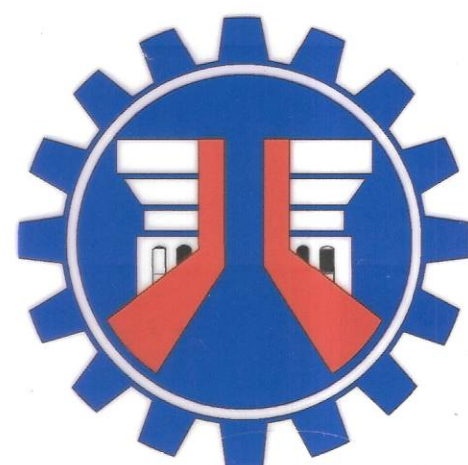




REPUBLIC OF THE PHILIPPINES
DEPARTMENT OF PUBLIC WORKS AND HIGHWAYS
REGION IV-B, MIMAROPA
OFFICE OF THE DISTRICT ENGINEER
BOAC, MARINDUQUE

C.Y. 2023 PROJECT

DETAILED ENGINEERING DESIGN PLAN FOR
REHABILITATION OF WATERWORKS SYSTEM,
CAIGANGAN, BUENAVISTA, MARINDUQUE

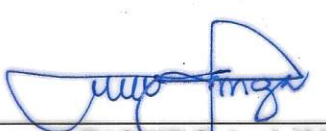
BUENAVISTA, MARINDUQUE

SUBMITTED:



FERNAN S. DIAZ
CHIEF, PLANNING AND DESIGN SECTION
DATE:

RECOMMENDED:



ARISTEO L. LINGA
ASSISTANT DISTRICT ENGINEER
DATE:

APPROVED:



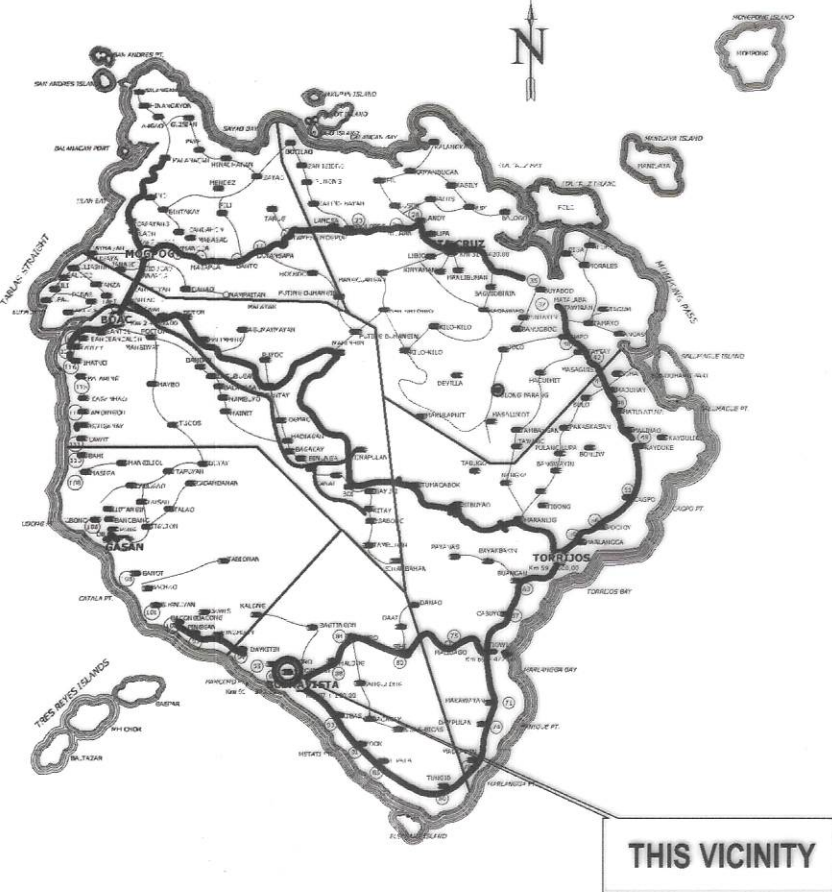
EVELYN R. PUERTOLLANO
DISTRICT ENGINEER
DATE:

INDEX OF SHEET		
CATEGORY	DESCRIPTION	SHEET NO.
GENERAL	FRONT PAGE	1
	INDEX OF SHEET & SUMMARY OF QUANTITIES	2
	KEY MAP & LOCATION MAP	4
	LOCATION PLAN	4
	TYPICAL DRAWINGS	5 - 14

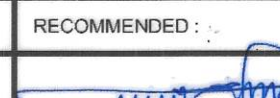
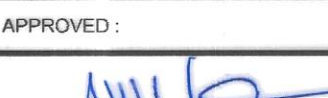
SUMMARY OF QUANTITIES				
ITEM NO.	DESCRIPTION	ORIGINAL QUANTITY	UNIT	REMARKS
PART A:	FACILITIES FOR THE ENGINEER			
A.1.1(8)	PROVISION OF FIELD OFFICE FOR THE ENGINEER (RENTAL BASIS)	3.17	mos.	
A.1.2(2)	PROVISION OF 4x4 PICK UP TYPE SERVICE VEHICLE FOR THE ENGINEER ON BARE RENTAL BASIS	3.17	mos.	
PART B:	OTHER GENERAL REQUIREMENTS			
B.4 (10)	MISCELLANEOUS SURVEY AND STAKING	1.00	LS	Staked Plan To be submitted by the contractor
B.5	PROJECT BILLBOARD / SIGNBOARD	1.00	each	DPWH Standard Billboard
B.7(2)	OCCUPATIONAL SAFETY AND HEALTH PROGRAM	1.00	LS	Includes Personal Protective Equipment (PPE), Safety Signages and Health Program
B.9	MOBILIZATION / DEMOBILIZATION	1.00	LS	
PART C:	EARTHWORKS			
803(1)a	STRUCTURE EXCAVATION (COMMON SOIL)	23.80	m³	For Foundation and Pipelines
804(4)	GRAVEL FILL	2.56	m³	For Concrete Foundation
PART D:	PLAIN AND REINFORCED CONCRETE WORKS			
900(1)c2	STRUCTURAL CONCRETE FOR FOOTING AND SLAB (CLASS A, 28 DAYS)	42.67	m³	For Elevated Water Tank & Pump Motor House
902(1)a	REINFORCING STEEL (DEFORMED), GRADE 40	3,602.15	kgs	For Pump Motor House
104(1)a	FORMWORKS AND FALSEWORKS	173.08	m2	For Water Tank
PART E:	FINISHING WORKS			
1027(1)	CEMENT PLASTER FINISH	185.20	m²	For Elevated Water Tank & Pump Motor House
1046(2)a1	100MM CHB NON-LOAD BEARING (INCLUDING REINFORCING STEEL)	21.60	m²	For Elevated Water Tank & Pump Motor House
1032(1)a	PAINTING WORKS (MASONRY CONCRETE)	156.05	m²	For Elevated Water Tank & Pump Motor House
1032(1)c	PAINTING WORKS (STEEL)	18.80	m²	For Elevated Water Tank & Pump Motor House
1018(1)	GLAZED TILES AND TRIMS	160.00	m²	For Elevated Water Tank & Pump Motor House
1047(1)	STRUCTURAL STEEL	1.00	LS	For Elevated Water Tank & Pump Motor House
PART F:	PLUMBING WORKS			
1201(1)	WATER PUMPING SYSTEM	1.00	LS	For Pipe Drilling & Pump Motor House
1001(10)	PIPES WITH FITTINGS CONNECTION	1.00	LS	
1802(5)	POLYETHYLENE PLASTIC PIPE (HDPE)	1.00	LS	For Distribution Line
1603(1)	VALVE	1.00	LS	
1002(27)	PLUMBING WORKS	1.00	LS	
PART G:	ELECTRICAL WORKS			
1100(10)	CONDUIT, BOXES, AND FITTINGS (CONDUIT WORKS/CONDUIT ROUGH-IN)	1.00	LS	For Pump Motor House
1101(33)	WIRES AND WIRING DEVICES	1.00	LS	For Pump Motor House
1102(1)	PANEL BOARD WITH MAIN & BRANCHES BREAKERS	1.00	LS	For Pump Motor House
1103(1)	LIGHTING FIXTURES AND LAMPS	1.00	LS	For Pump Motor House

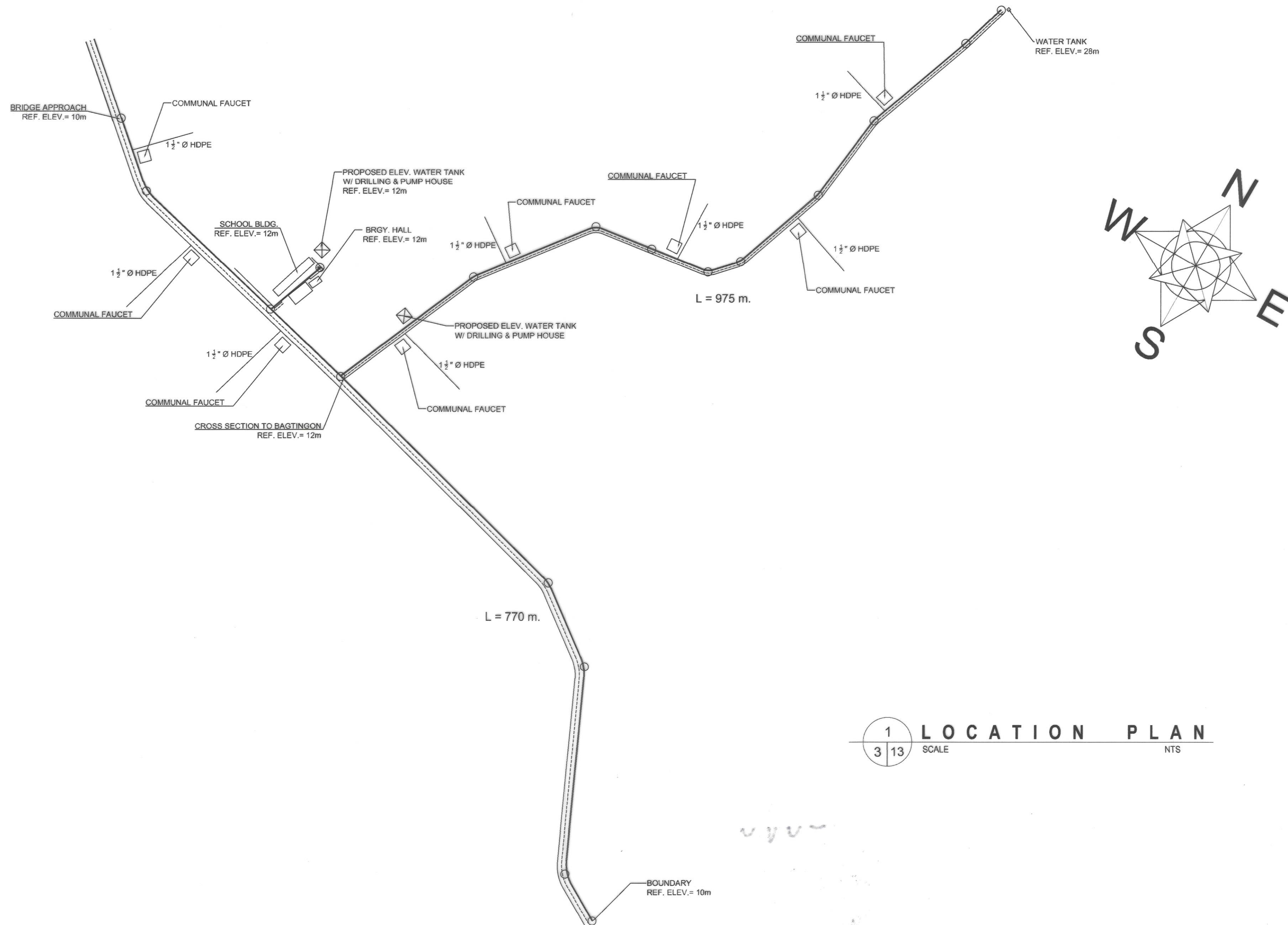


KEY MAP



LOCATION MAP

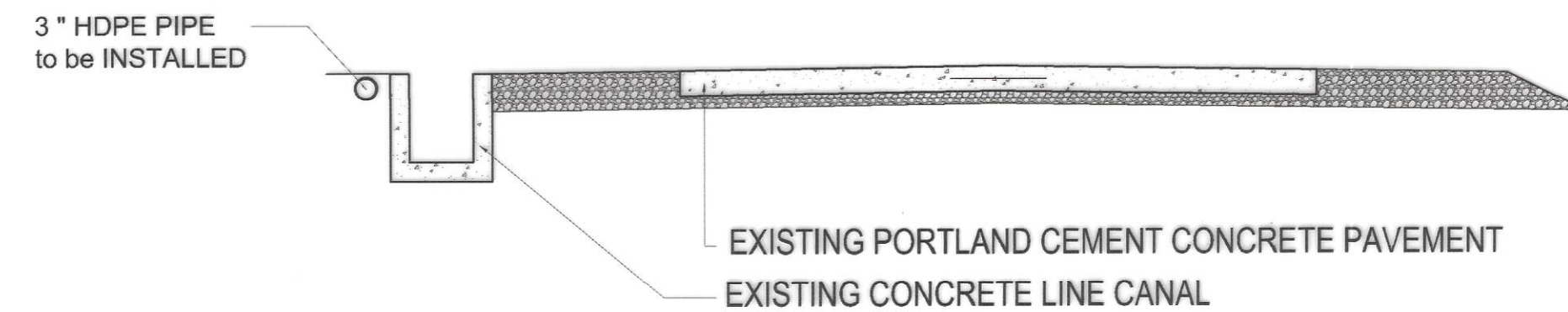
 REPUBLIC OF THE PHILIPPINES DEPARTMENT OF PUBLIC WORKS AND HIGHWAYS REGION IV - B , MIMAROPA OFFICE OF THE DISTRICT ENGINEER BOAC , MARINDUQUE	PROJECT NAME AND LOCATION : REHABILITATION OF WATERWORKS SYSTEM, CAIGANGAN, BUENAVISTA, MARINDUQUE BUENAVISTA, MARINDUQUE	SHEET CONTENTS : INDEX OF SHEETS SUMMARY OF QUANTITIES KEY MAP LOCATION MAP	DRAFTED :  ARTHUR M. TARDILEZA ENGINEERING ASSISTANT	REVIEWED :  JERSON O. MONTERO ENGINEER II	SUBMITTED :  FERNAN S. DIAZ CHIEF, PLANNING AND DESIGN SECTION	RECOMMENDED :  ARISTEO L. LINGA ASSISTANT DISTRICT ENGINEER	APPROVED :  EVELYN R. PUERTOLLANO DISTRICT ENGINEER	SET NO. 	SHEET NO. 2 13
			PREPARED :  JERSON O. MONTERO ENGINEER II	DATE :	DATE :	DATE :	DATE :	DATE :	



1 LOCATION PLAN
3 13 SCALE NTS

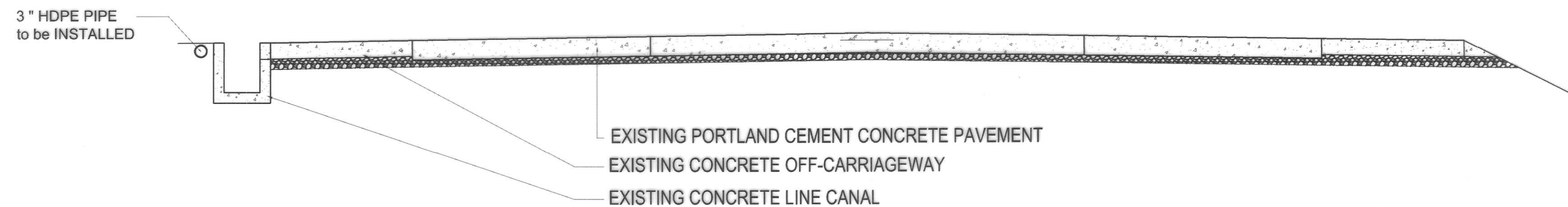
 REPUBLIC OF THE PHILIPPINES DEPARTMENT OF PUBLIC WORKS AND HIGHWAYS REGION IV - B, MIMAROPA OFFICE OF THE DISTRICT ENGINEER BOAC, MARINDUQUE	PROJECT NAME AND LOCATION : REHABILITATION OF WATERWORKS SYSTEM, CAIGANGAN, BUENAVISTA, MARINDUQUE BUENAVISTA, MARINDUQUE	SHEET CONTENTS : TYPICAL ROADWAY SECTION	DRAFTED : ARTHUR M. JARDECEZA ENGINEERING ASSISTANT PREPARED : MICHAEL M. MALITAI ENGINEER II	REVIEWED : JERSON O. MONTERA ENGINEER II DATE :	SUBMITTED : FERMAN S. DIAZ CHIEF, PLANNING AND DESIGN SECTION DATE :	RECOMMENDED : ARISTEO L. LINGA ASSISTANT DISTRICT ENGINEER DATE :	APPROVED : EVELYN R. HUERTOLLANO DISTRICT ENGINEER DATE :	SET NO. MQ	SHEET NO. 3 13
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TYPICAL ROADWAY SECTION



1
4 13 SCALE 1: 50m

SECTION THRU FARM TO MARKET ROAD



1
4 13 SCALE 1: 50m

SECTION THRU NATIONAL ROAD



REPUBLIC OF THE PHILIPPINES
DEPARTMENT OF PUBLIC WORKS AND HIGHWAYS
REGION IV - B, MIMAROPA
OFFICE OF THE DISTRICT ENGINEER
BOAC, MARINDUQUE

PROJECT NAME AND LOCATION :
REHABILITATION OF WATERWORKS SYSTEM,
CAIGANGAN, BUENAVISTA, MARINDUQUE
BUENAVISTA, MARINDUQUE

SHEET CONTENTS :
TYPICAL ROADWAY SECTION

DRAFTED :
ARTHUR M. JARDELEZA
ENGINEERING ASSISTANT
PREPARED :
MICHAEL P. MALITAO
ENGINEER II

REVIEWED :
JERSON O. MONTERA
ENGINEER II
DATE :

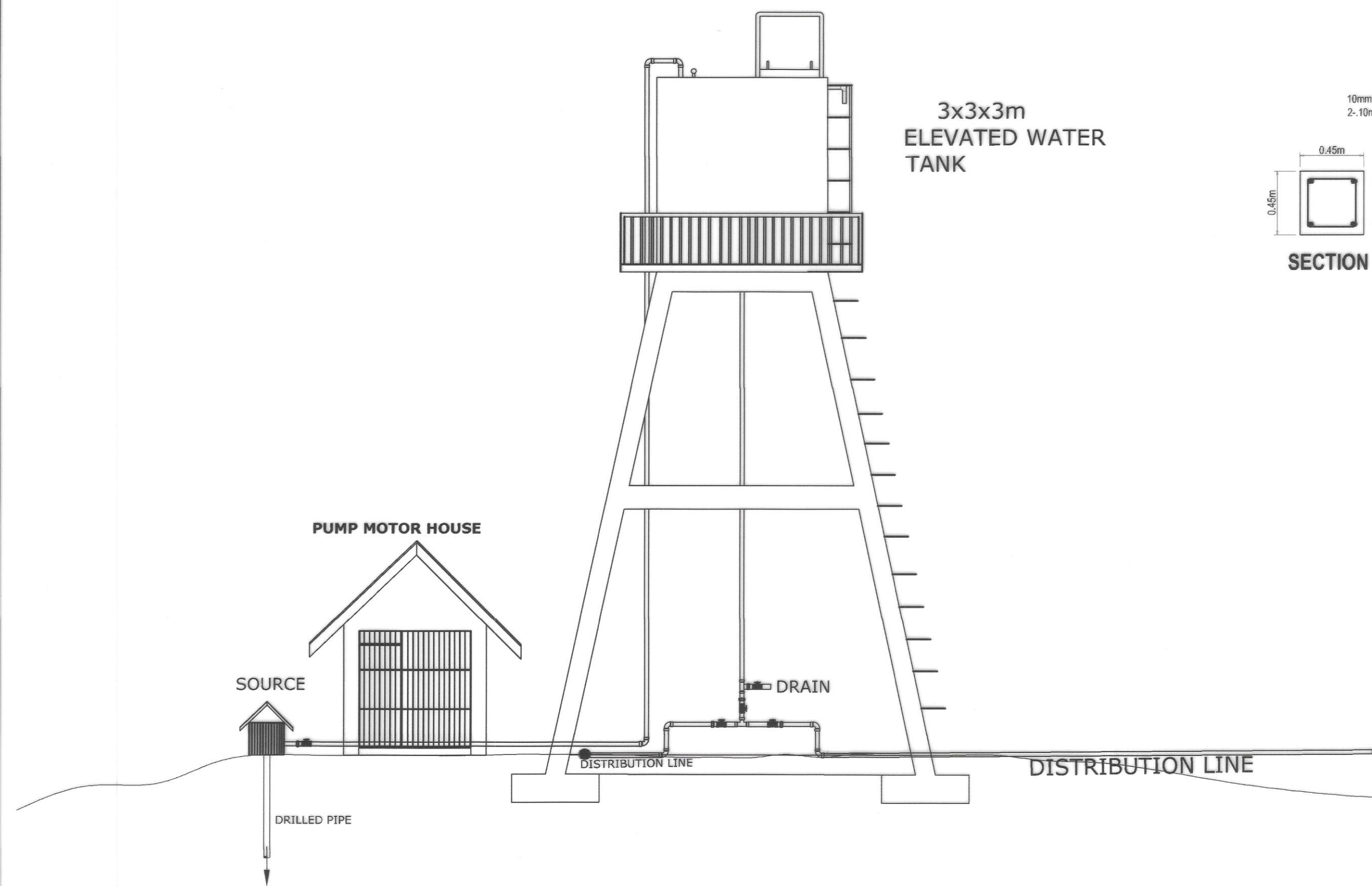
SUBMITTED :
FERNAN S. DIAZ
OIC - CHIEF, PLANNING AND DESIGN SECTION
DATE :

RECOMMENDED :
ARISTEO L. LINCA
ASSISTANT DISTRICT ENGINEER
DATE :

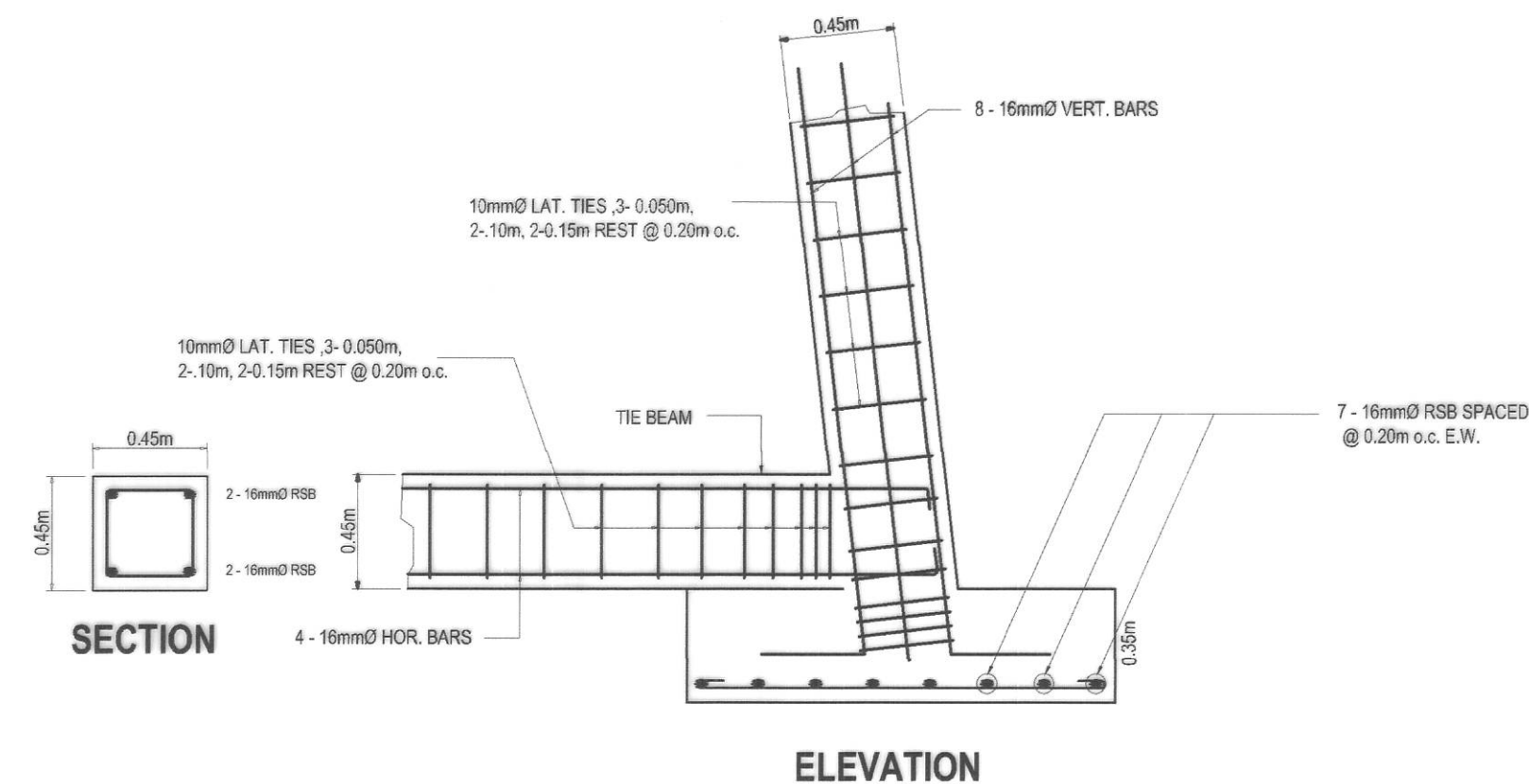
APPROVED :
EVELYN R. PUERTOLLANO
DISTRICT ENGINEER
DATE :

DPWH
REGION IV-B
CY - 2022
MQ

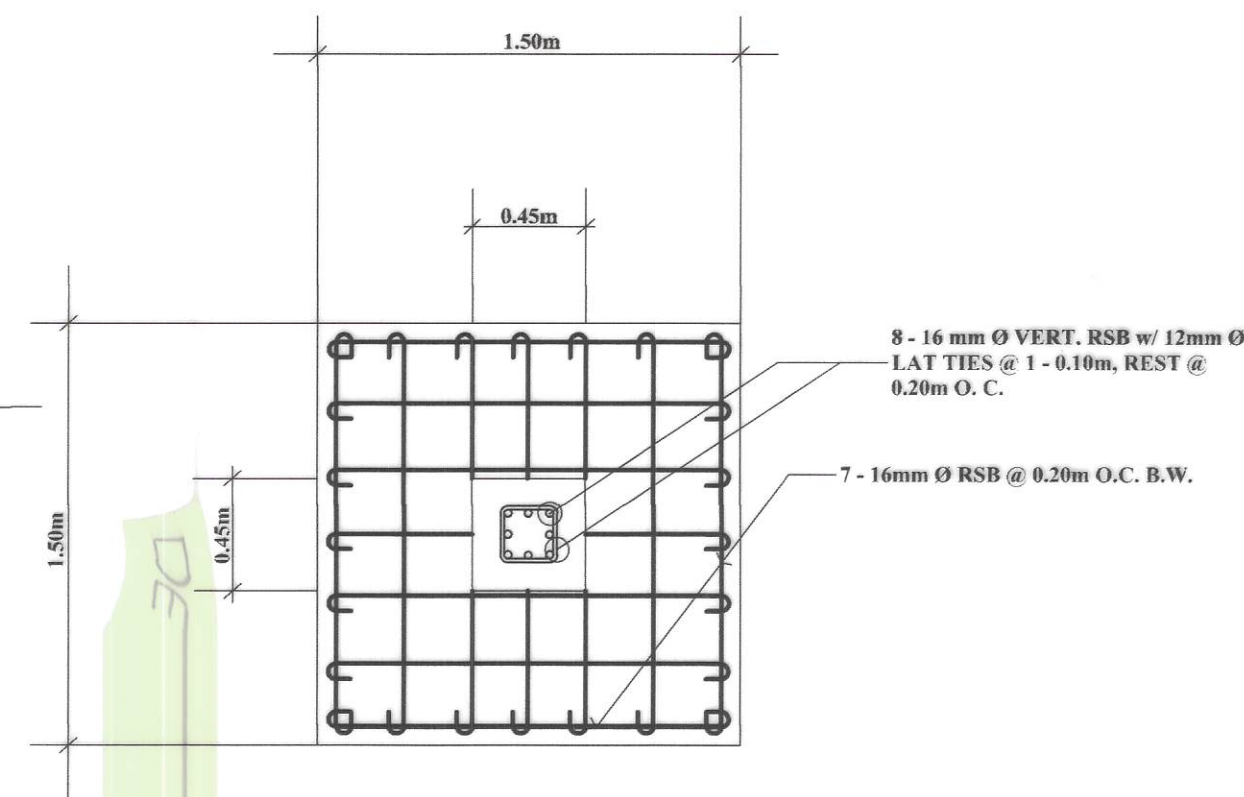
SET NO. 4
SHEET NO. 13



1
5 13
E L E V A T I O N
SCALE NTS

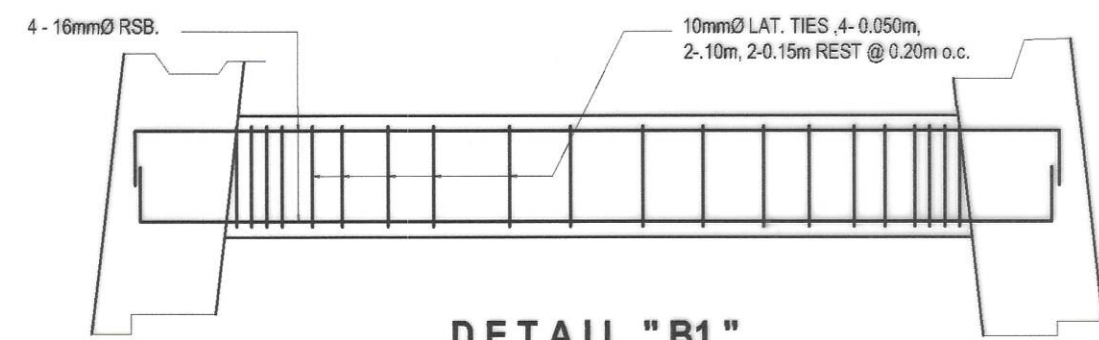


3
5 13
COULUMN FOOTING DETAIL
SCALE 1:20m

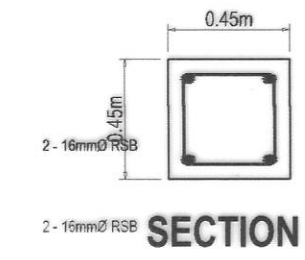


2
5 13
P L A N
SCALE 1:20m

	PROJECT NAME AND LOCATION : REHABILITATION OF WATERWORKS SYSTEM, CAIGANGAN, BUENAVISTA, MARINDUQUE BUENAVISTA, MARINDUQUE	SHEET CONTENTS : ELEVATED WATER TANK TYPICAL DRAWINGS	DRAFTED : ARTHUR M. BARGUELEZA ENGINEER ASSISTANT PREPARED : MICHAEL P. WALTON ENGINEER II	REVIEWED : JERSON O. MONTERA ENGINEER II DATE :	SUBMITTED : FERNAN S. DIAZ CHIEF, PLANNING AND DESIGN SECTION DATE :	RECOMMENDED : ARISTEO L. LINGA ASSISTANT DISTRICT ENGINEER DATE :	APPROVED : EVELYN R. PUERTOLLANO DISTRICT ENGINEER DATE :	SET NO. DPWH REGION IV-B CY - 2023 MQ	SHEET NO. 5 13
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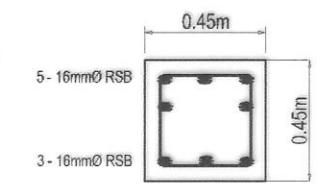
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SCALE 1:25m



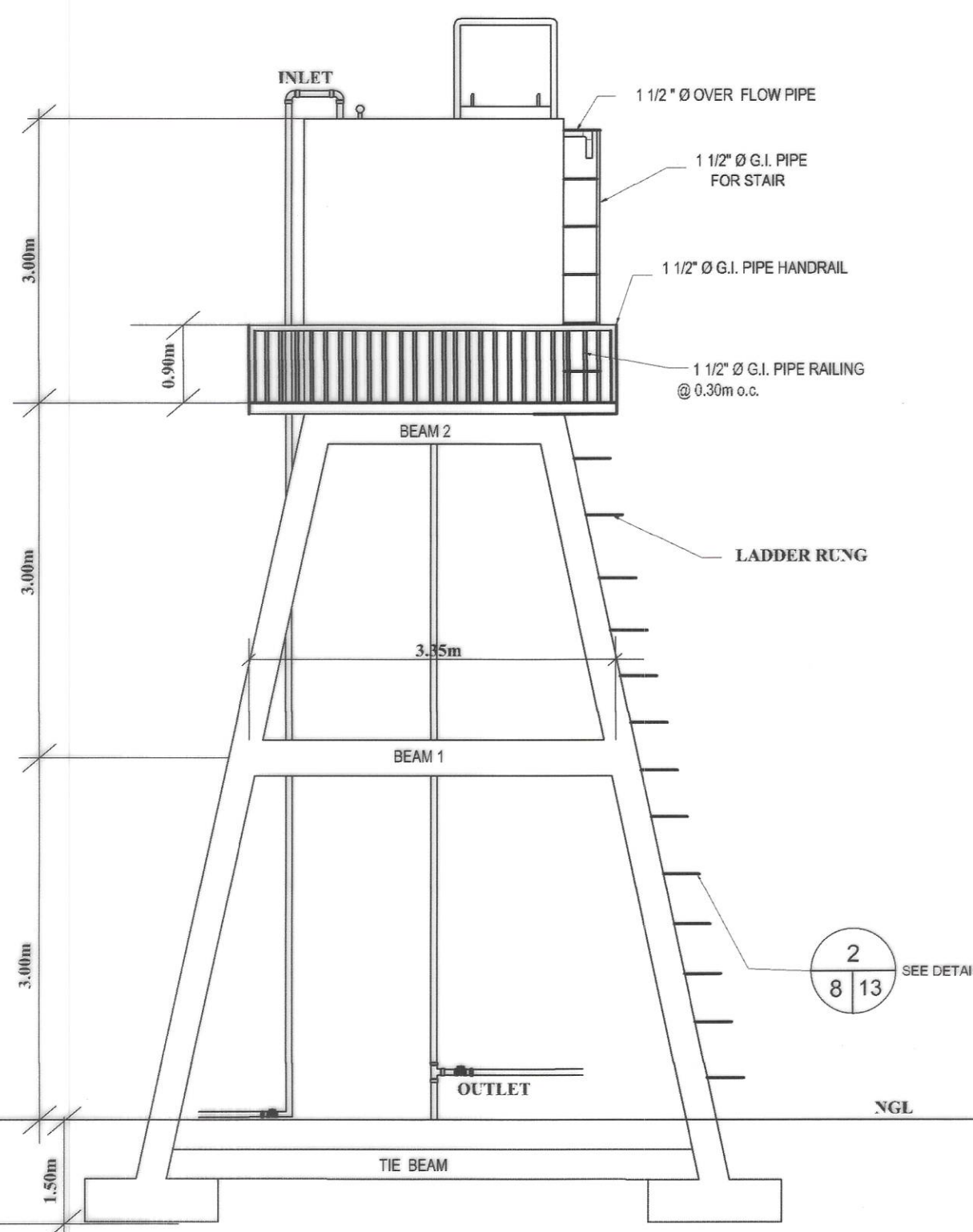
SECTION
SCALE 1:25m



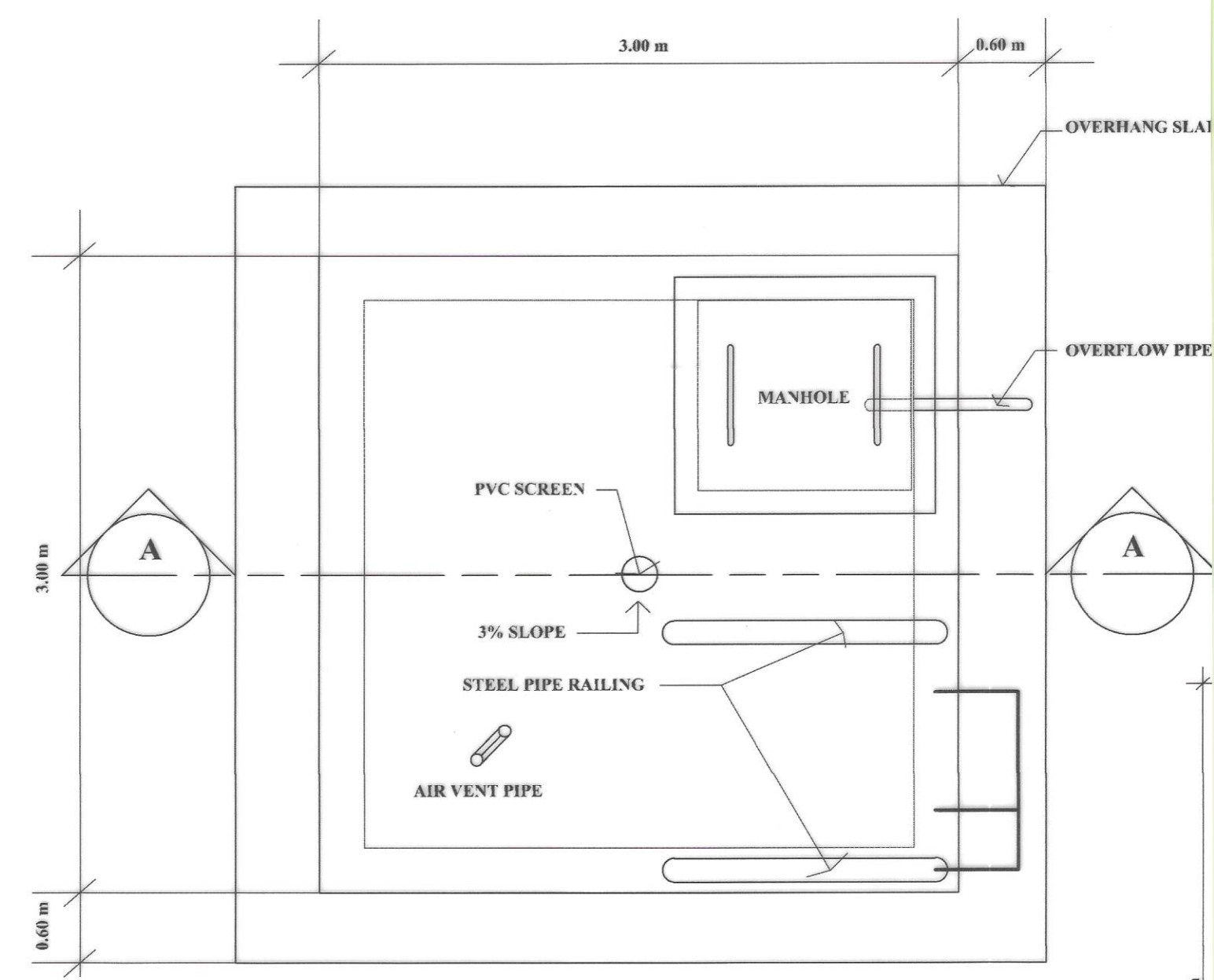
DETAIL "B2"
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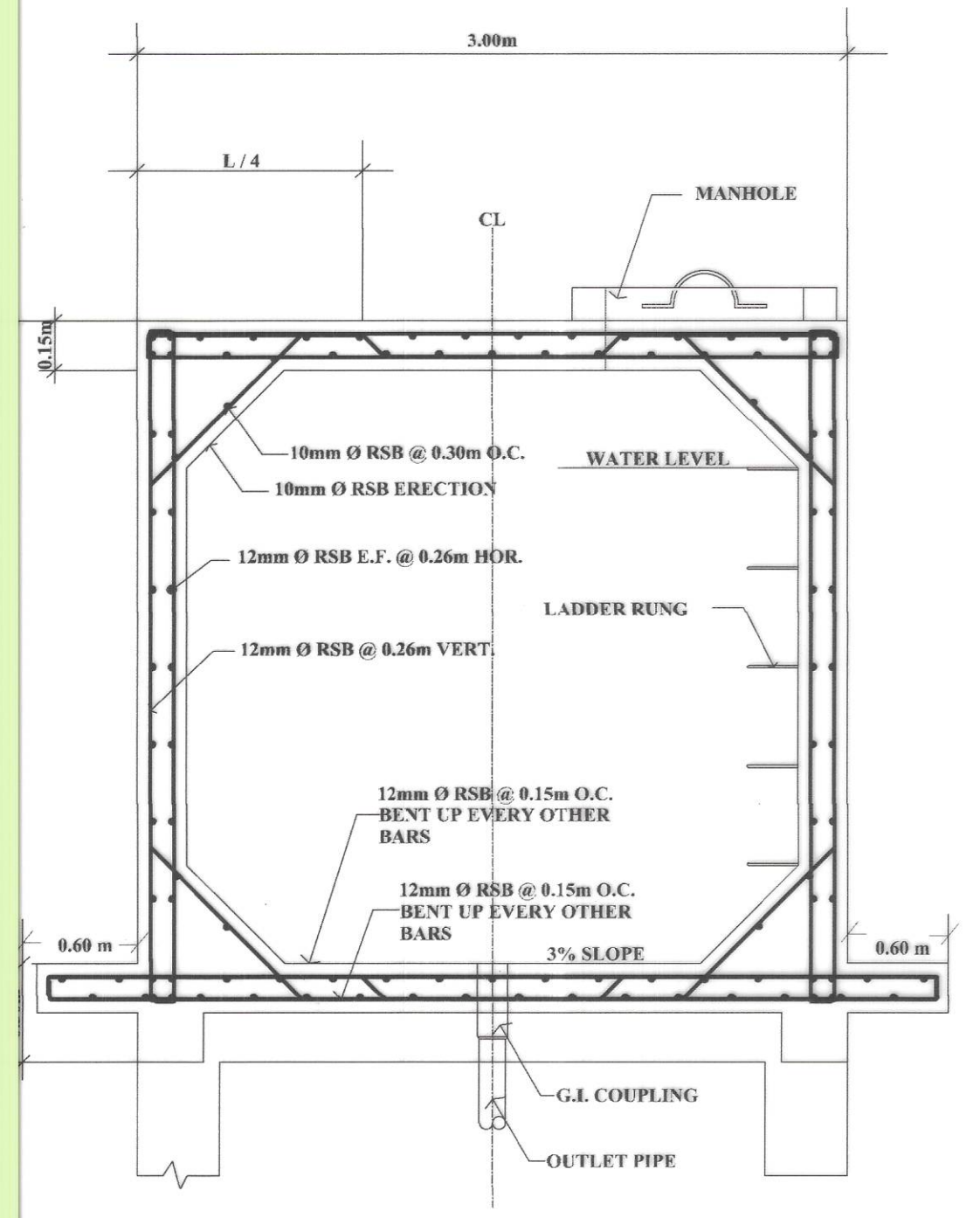
SECTION
SCALE 1:25m



ELEVATION
SCALE NTS

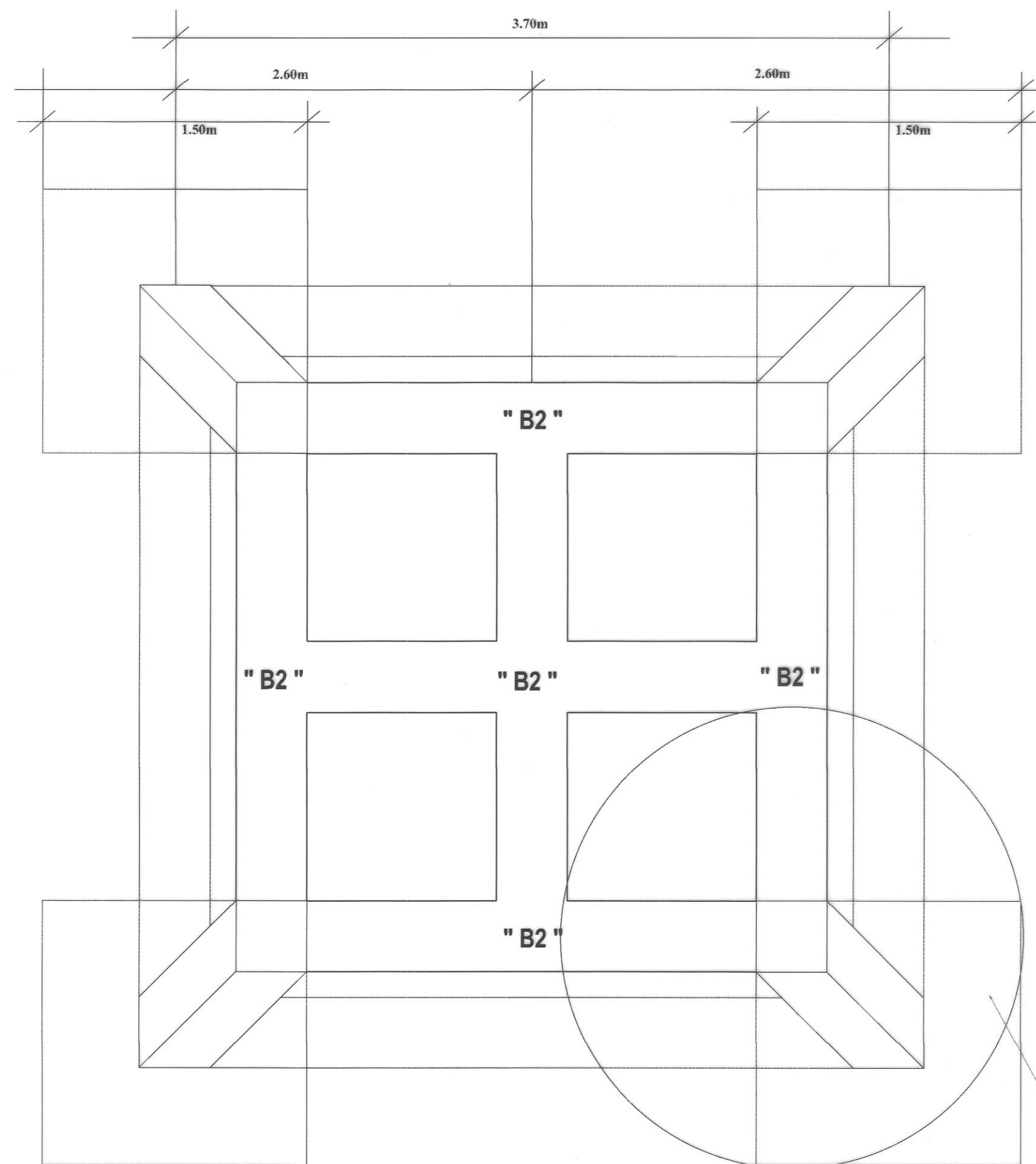


PLAN
SCALE 1:20m



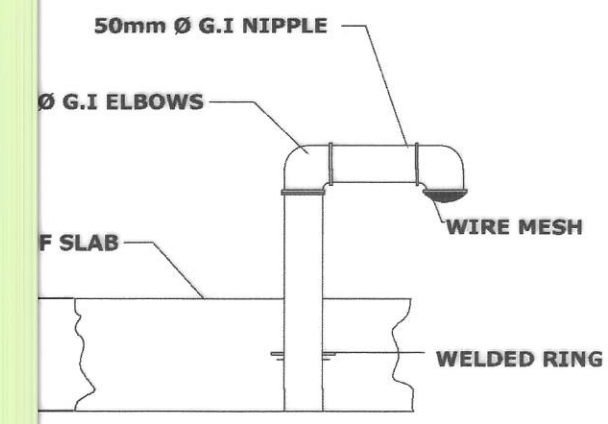
SECTION A-A
SCALE 1:20m

 REPUBLIC OF THE PHILIPPINES DEPARTMENT OF PUBLIC WORKS AND HIGHWAYS REGION IV - B, MIMAROPA OFFICE OF THE DISTRICT ENGINEER BOAC, MARINDUQUE	PROJECT NAME AND LOCATION : REHABILITATION OF WATERWORKS SYSTEM, CAIGANGAN, BUENAVISTA, MARINDUQUE BUENAVISTA, MARINDUQUE	SHEET CONTENTS : ELEVATED WATER TANK TYPICAL DRAWINGS	DRAFTED : ARTHUR M. MARQUEZ ENGINEERING ASSISTANT PREPARED : MICHAEL P. MARQUEZ ENGINEER II	REVIEWED : JERSON O. MONTERA ENGINEER II DATE : _____	SUBMITTED : FERNANDO CHIEF, PLANNING DATE : _____	RECOMMENDED : ARISTEO L. LINGA ASSISTANT DISTRICT ENGINEER DATE : _____	APPROVED : EVELYN R. PUERTOLLANO DISTRICT ENGINEER DATE : _____	SET NO. MQ	SHEET NO. 6 13
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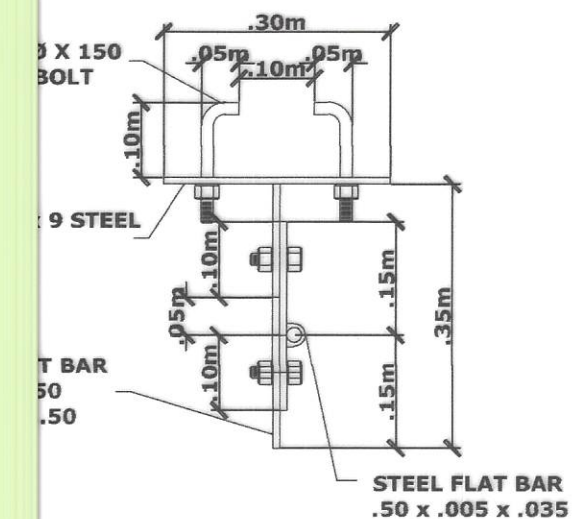
1 FOUNDATION PLAN
7 13 SCALE 1:20m

no detailed plan
3 4 13 SEE DETAIL



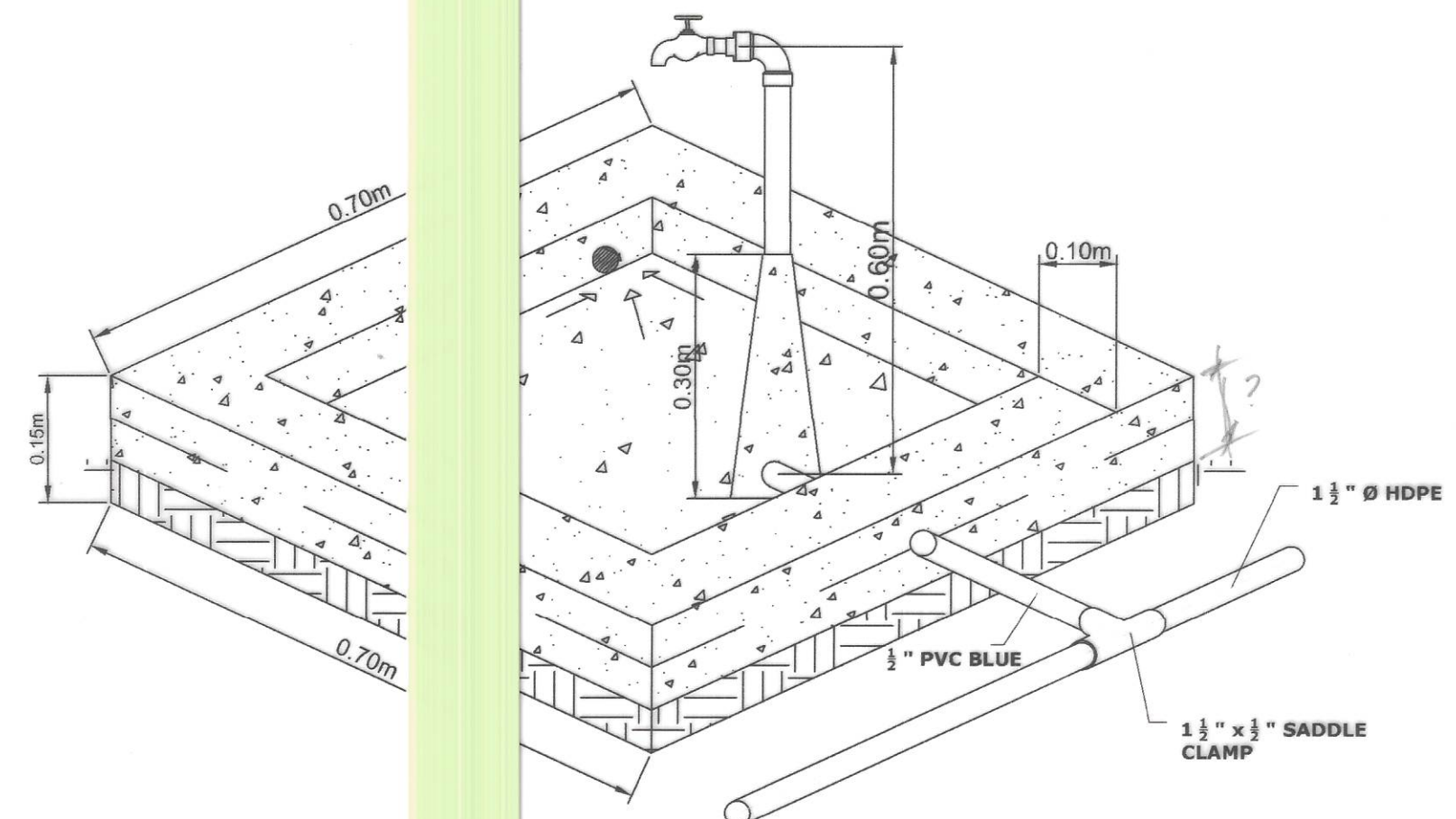
B 7 13

VENT DETAIL 1:10m



C 7 13

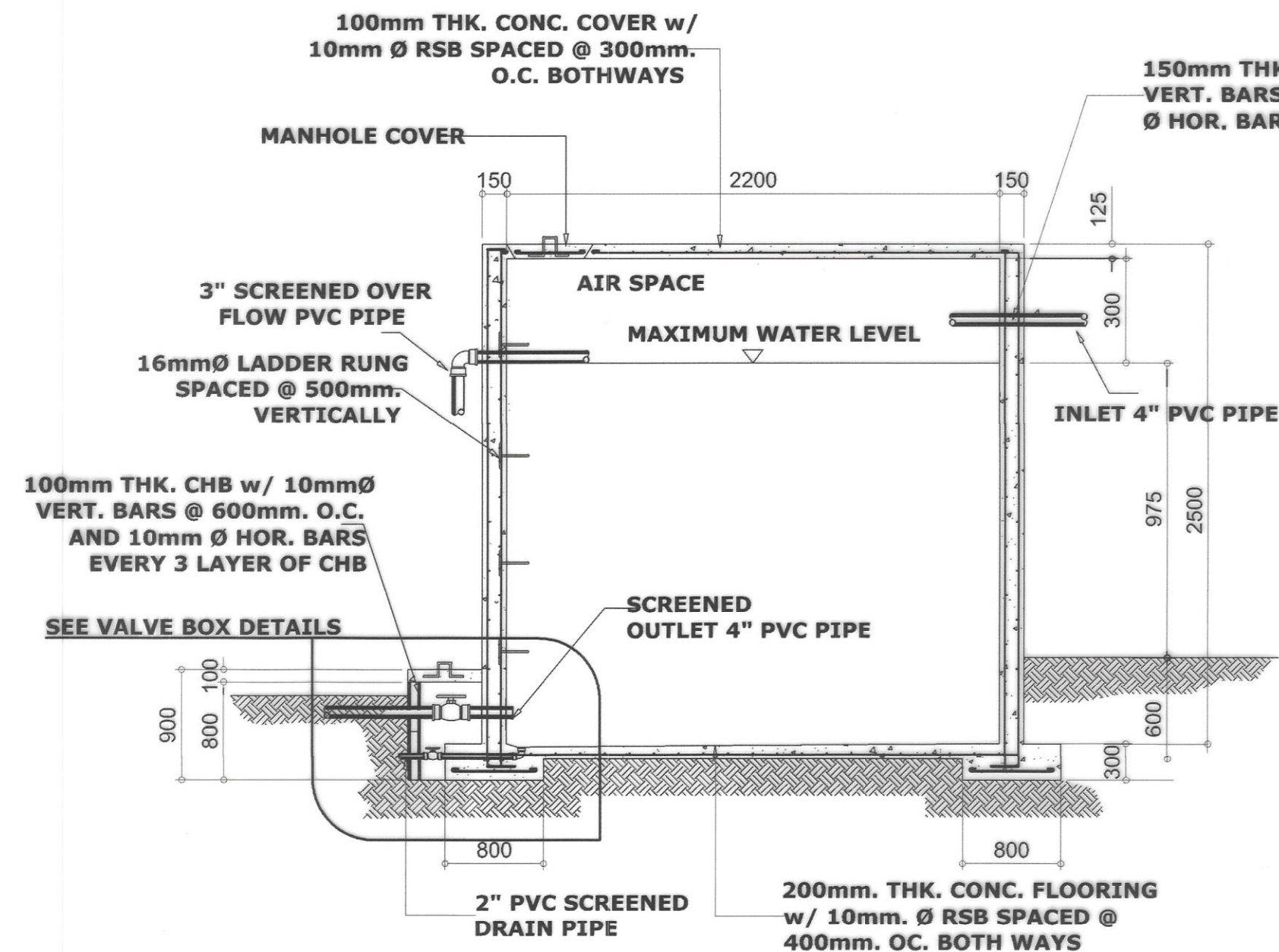
DETAIL OF PIPE HOLDER 1:10m



D 7 13

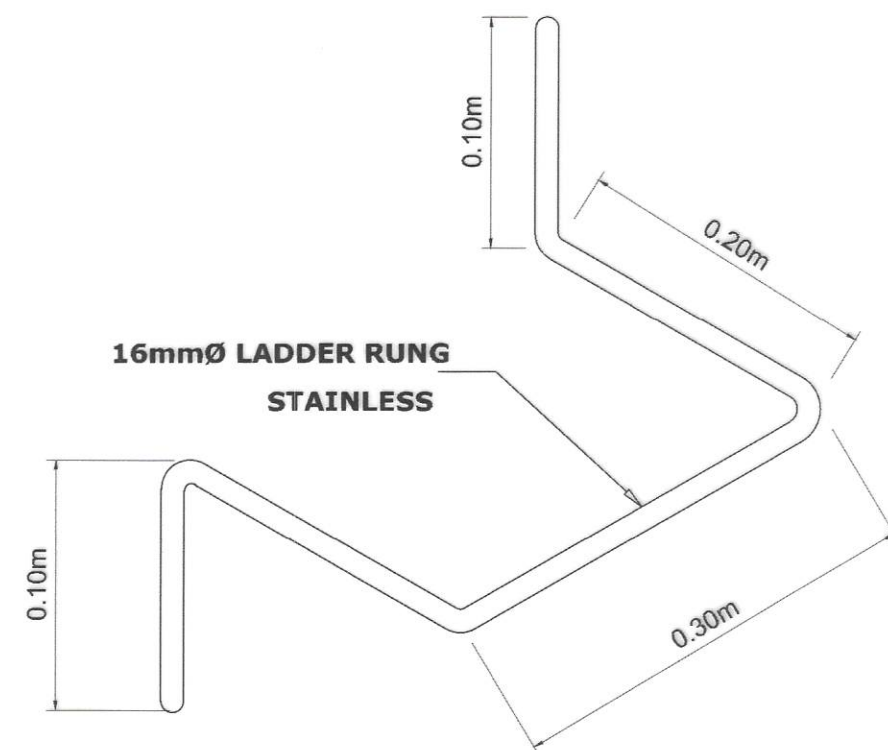
DETAIL OF COMMUNAL FAUCET 1:10m

	PROJECT NAME AND LOCATION : REHABILITATION OF WATERWORKS SYSTEM, CAIGANGAN, BUENAVISTA, MARINDUQUE BUENAVISTA, MARINDUQUE	SHEET CONTENTS : ELEVATED WATER TANK TYPICAL DRAWINGS	DRAFTED : ARTHUR L. LARREA ENGINEERING ASSISTANT PREPARED : MICHAEL S. NAVARRO ENGINEER II	REVIEWED : JERSON O. MONTERA ENGINEER II DATE :	SUBMITTED : FERNANDEZ CHIEF, PLANNING DATE :	RECOMMENDED : ARISTEO L. LINGA ASSISTANT DISTRICT ENGINEER DATE :	APPROVED : EVELYN R. PUERTOLLANO DISTRICT ENGINEER DATE :	SET NO. MQ	SHEET NO. 7 13
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SECTION

1
8 13 SCALE NTS
CONCRETE SPRING BOX



2
8 13 SCALE NTS
DETAIL OF LADDER RUNG

10mm Ø RSB
SPACED @ 300mm
O.C. BOTHWAYS

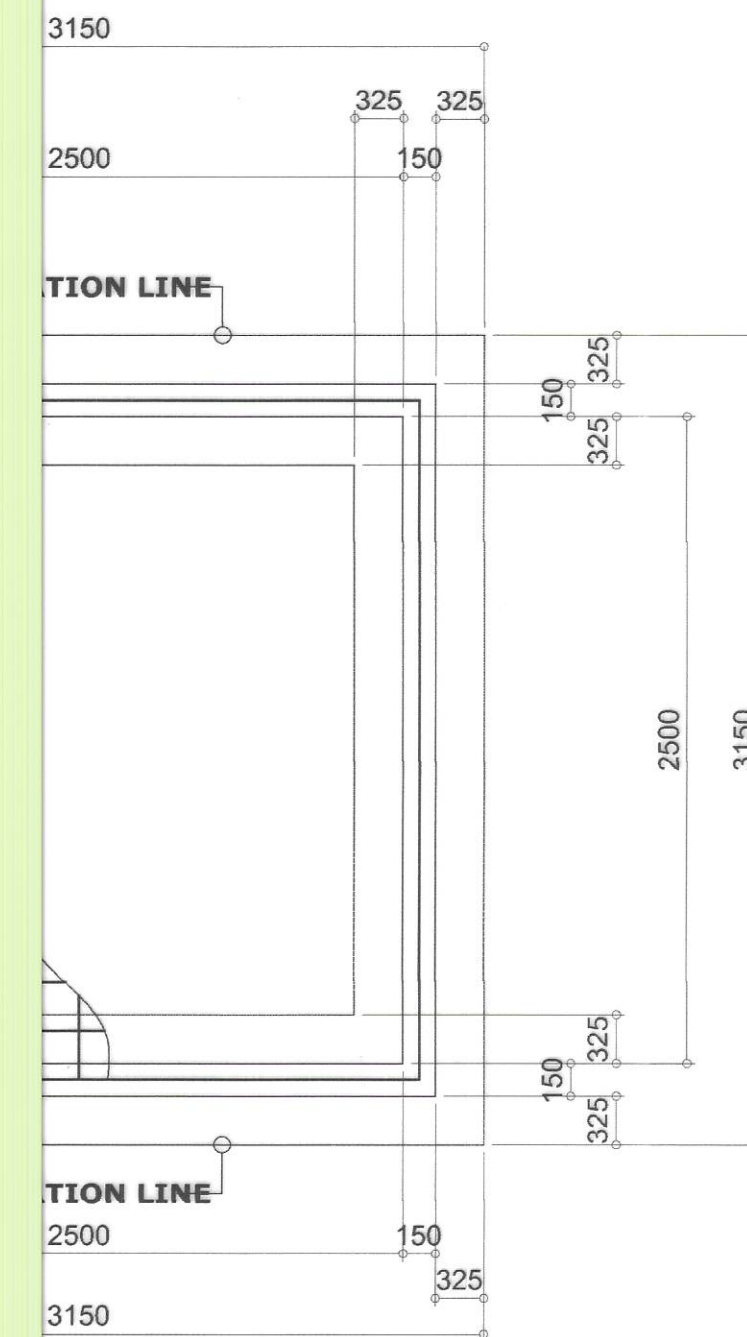
SCREENED
OUTLET PIPE

SCREENED
DRAIN PIPE

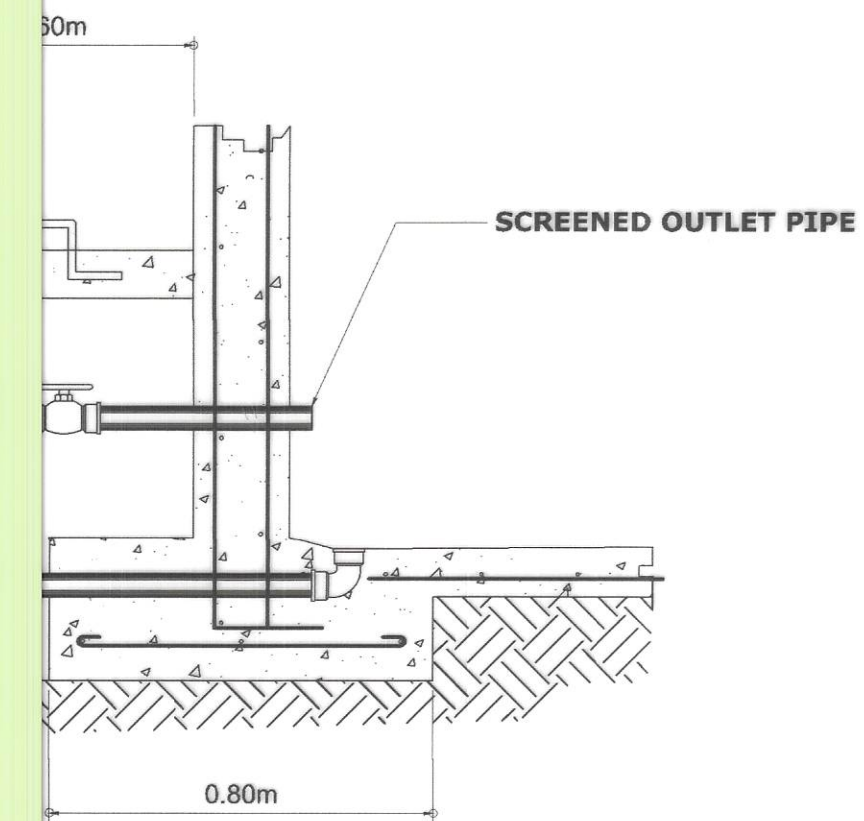
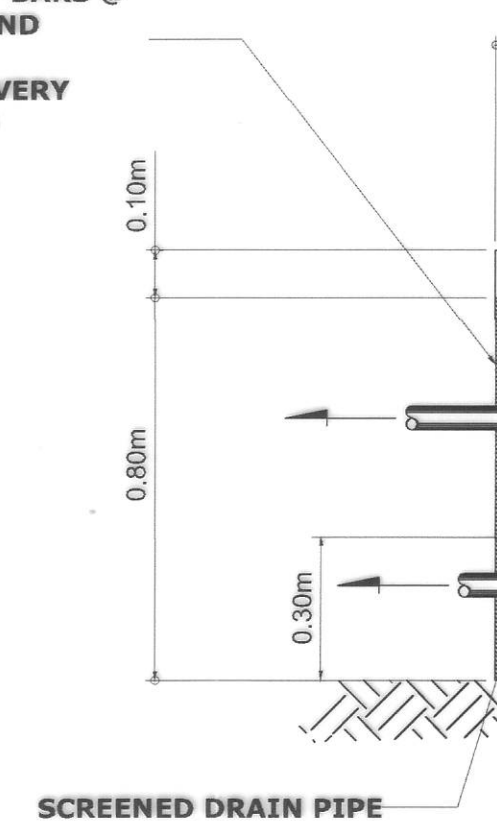
100mm THK CHB W/
10mmØ VERT BARS @
0.60m o.c , AND
10mmØ
HOR. BARS EVERY
3-LAYER CHB

SCREENED DRAIN PIPE

3
8 13 SCALE
V A



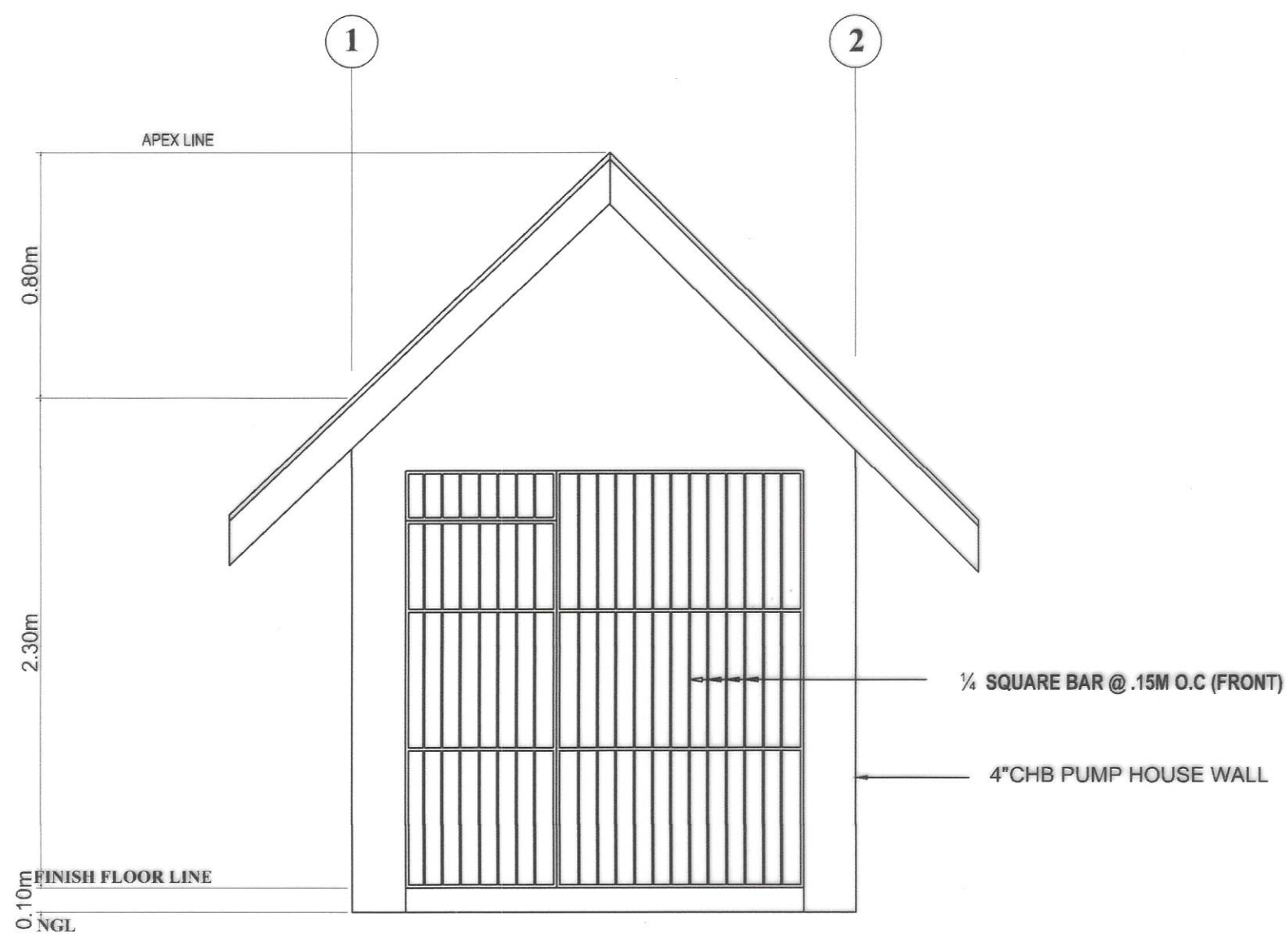
PLAN



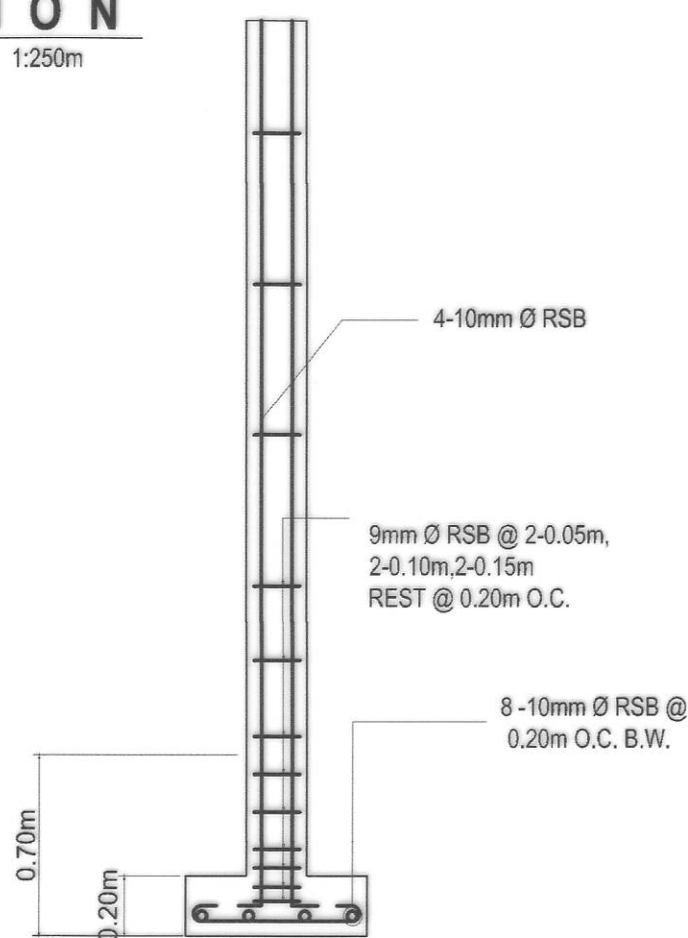
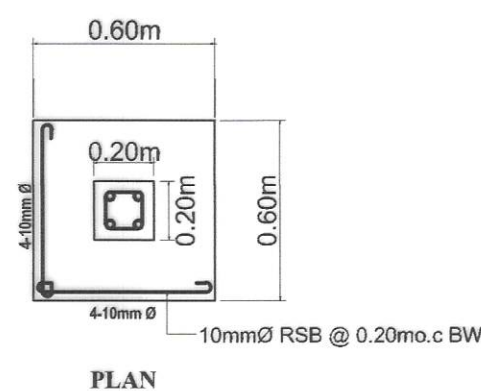
3
8 13 SCALE
E B O X

	PROJECT NAME AND LOCATION : REHABILITATION OF WATERWORKS SYSTEM, CAIGANGAN, BUENAVISTA, MARINDUQUE BUENAVISTA, MARINDUQUE	SHEET CONTENTS : CONCRETE SPRING BOX TYPICAL DRAWINGS	DRAFTED : ARTUR M. ARRIOLA ENGINEER ASSISTANT PREPARED : MICHAEL P. MANAYAO ENGINEER II	REVIEWED : JERSON O. MONTERA ENGINEER II DATE :	SUBMITTED : FERNANDO L. LINGA CHIEF, PLANNING DATE :	RECOMMENDED : ARISTEO L. LINGA ASSISTANT DISTRICT ENGINEER DATE :	APPROVED : EVELYN R. PUERTOLLANO DISTRICT ENGINEER DATE :	SET NO. DPWH REGION IV-B CY - 2023 MQ	SHEET NO. 8 13
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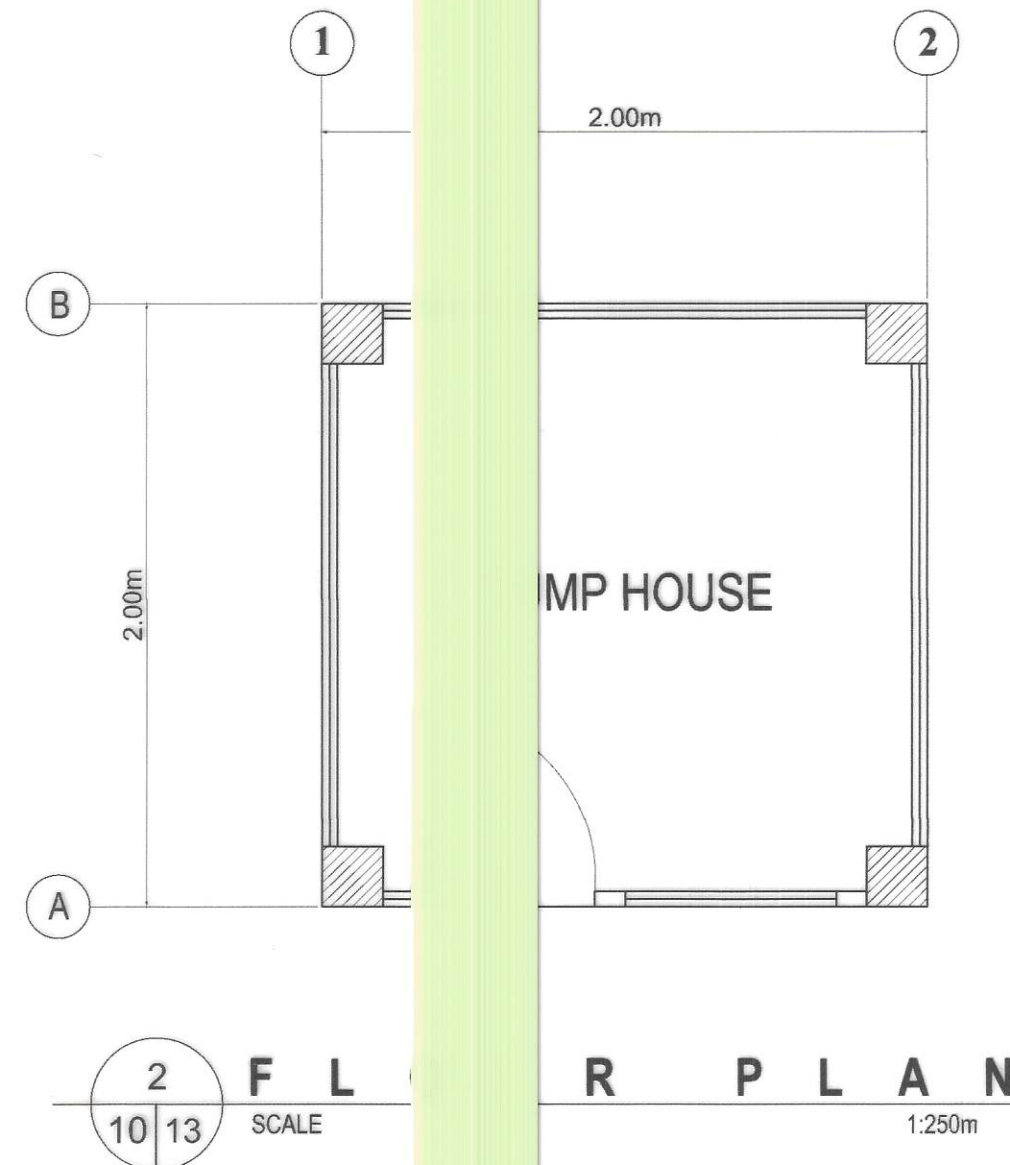


1 FRONT ELEVATION
10 13 SCALE 1:250m

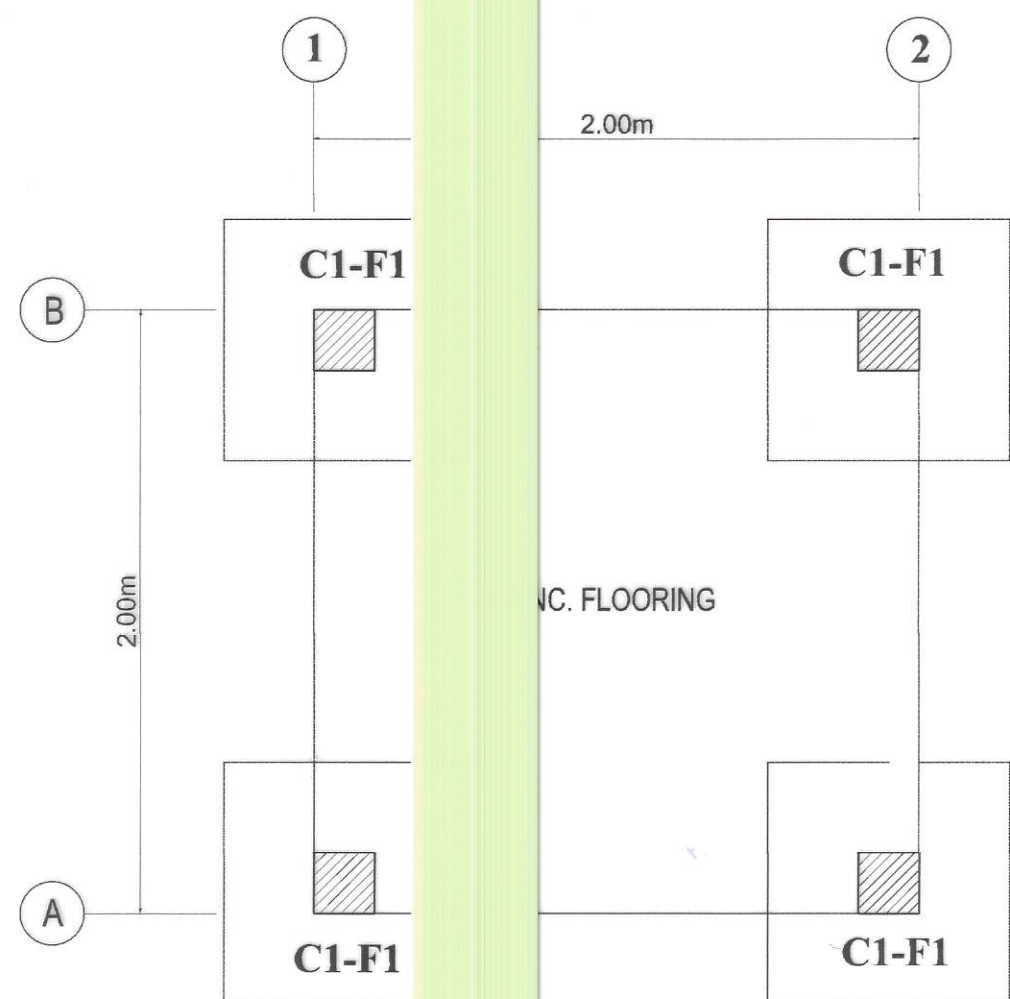


C1-F1

4 DETAIL OF C1-F1
10 13 SCALE 1:20m



2 FLOOR PLAN
10 13 SCALE 1:250m



3 FOUNDATION PLAN
10 13 SCALE 1:250m



REPUBLIC OF THE PHILIPPINES
DEPARTMENT OF PUBLIC WORKS AND HIGHWAYS
REGION IV - B, MIMAROPA
OFFICE OF THE DISTRICT ENGINEER
BOAC, MARINDUQUE

PROJECT NAME AND LOCATION :
REHABILITATION OF WATERWORKS SYSTEM,
CAIGANGAN, BUENAVISTA, MARINDUQUE
BUENAVISTA, MARINDUQUE

SHEET CONTENTS :
PUMP HOUSE
TYPICAL DRAWINGS

DRAFTED :
ARTHUR M. ASELEZA
ENGINEERING ASSISTANT
PREPARED :
MICHAEL P. WALYAO
ENGINEER II

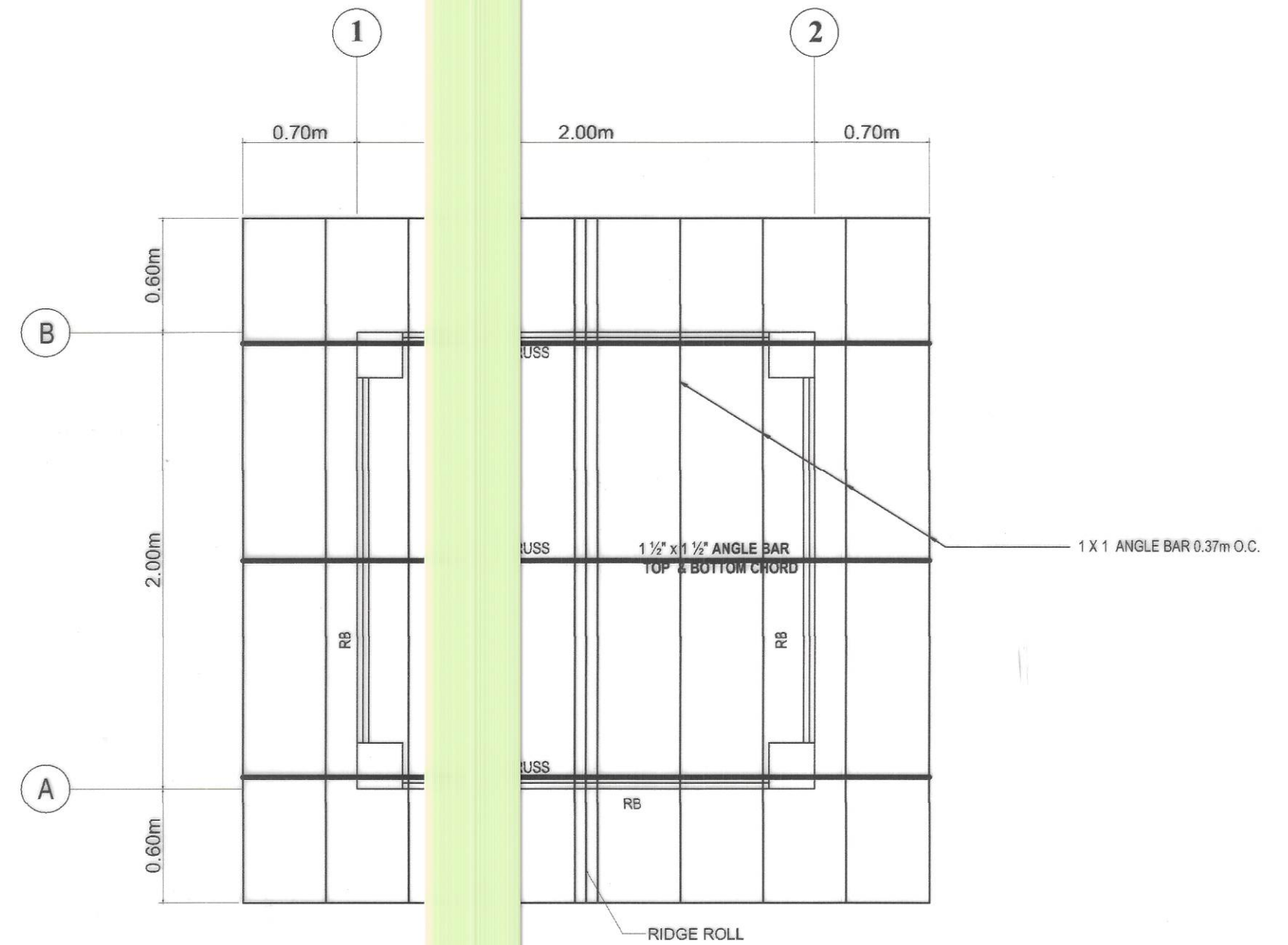
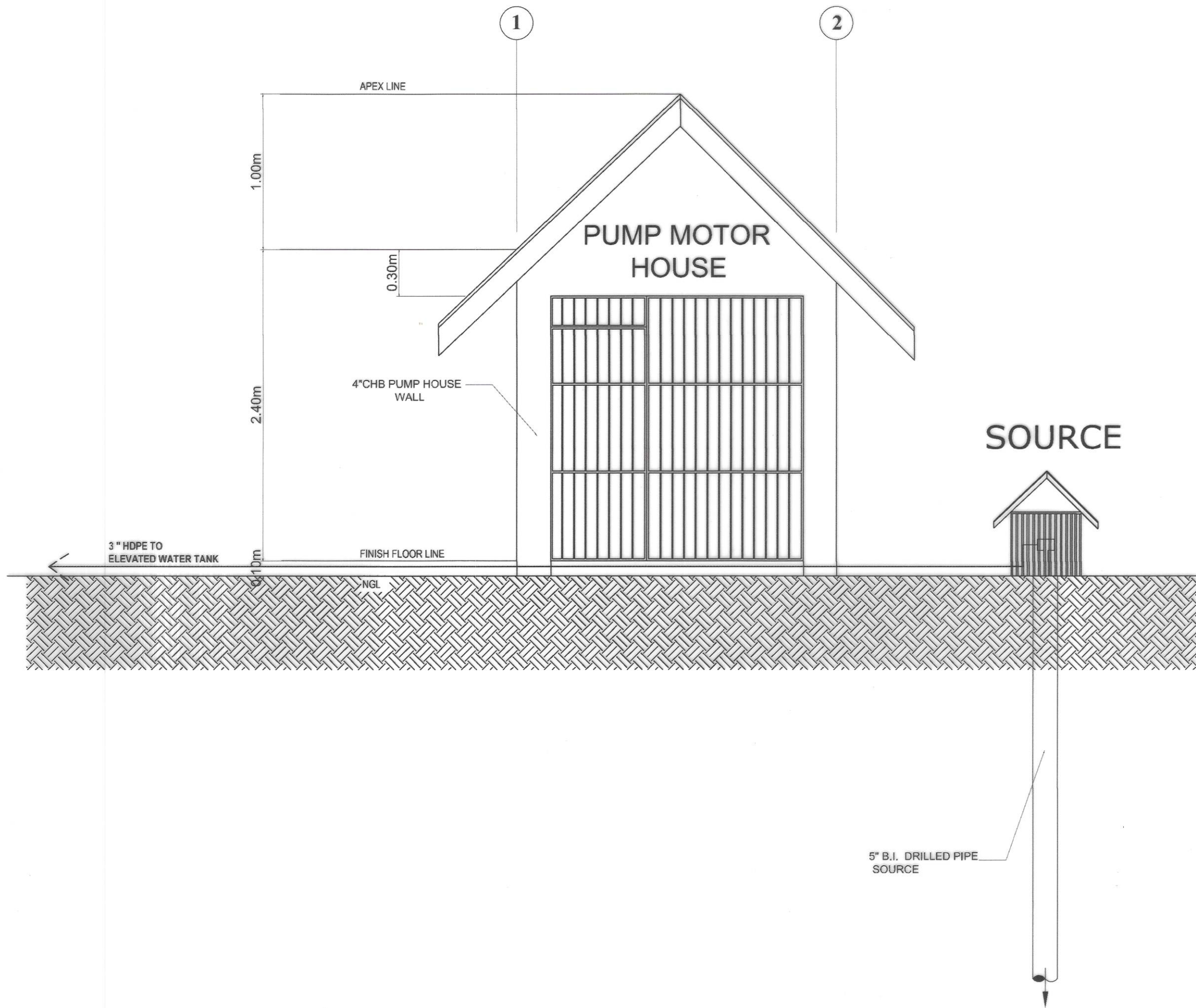
REVIEWED :
JERSON O. MONTERA
ENGINEER II
DATE :

SUBMITTED :
FERNANDEZ
CHIEF, PLANNING
DATE :

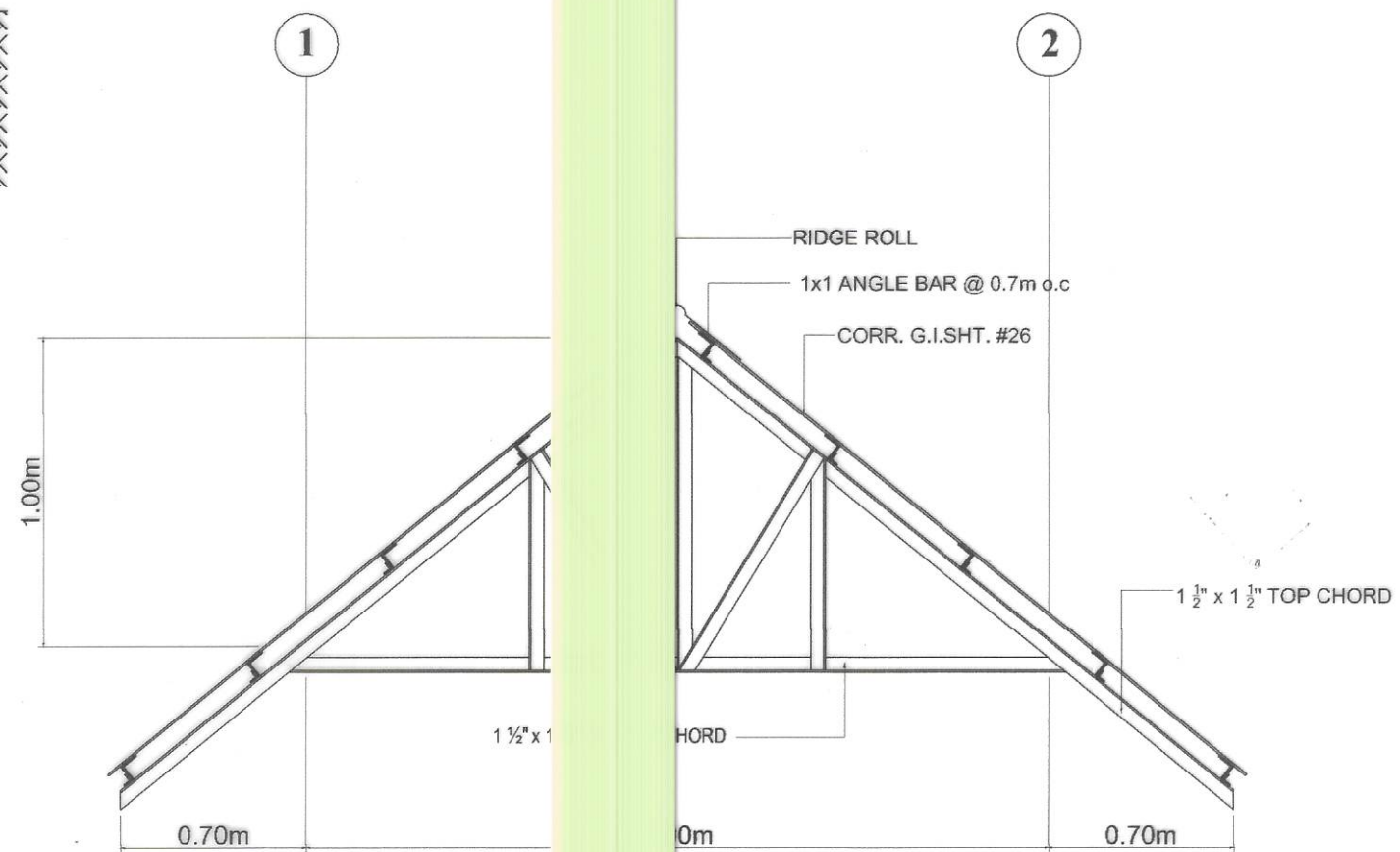
RECOMMENDED :
ARISTEO L. LINGA
ASSISTANT DISTRICT ENGINEER
DATE :

APPROVED :
EVELYN R. PUERTOLLANO
DISTRICT ENGINEER
DATE :

SET NO. SHEET NO.
10 13



1 ROOM RAMING PLAN
11 13 SCALE 1:250m



2 TRU S DETAIL
11 13 SCALE 1:20m

 REPUBLIC OF THE PHILIPPINES DEPARTMENT OF PUBLIC WORKS AND HIGHWAYS REGION IV - B, MIMAROPA OFFICE OF THE DISTRICT ENGINEER BOAC, MARINDUQUE	PROJECT NAME AND LOCATION : REHABILITATION OF WATERWORKS SYSTEM, CAIGANGAN, BUENAVISTA, MARINDUQUE BUENAVISTA, MARINDUQUE	SHEET CONTENTS : PUMP HOUSE TYPICAL DRAWINGS	DRAFTED : ARTHUR M. SILEZA ENGINEERING ASSISTANT PREPARED : MICHAEL P. MALITAO ENGINEER II	REVIEWED : JERSON O. MONTERA ENGINEER II DATE :	SUBMITTED : FERNANDO CHIEF, PLANNING DATE :	RECOMMENDED : ARISTEO L. LINGA ASSISTANT DISTRICT ENGINEER DATE :	APPROVED : EVELYN R. PUERTOLLANO DISTRICT ENGINEER DATE :	SET NO. MQ	SHEET NO. 11 13
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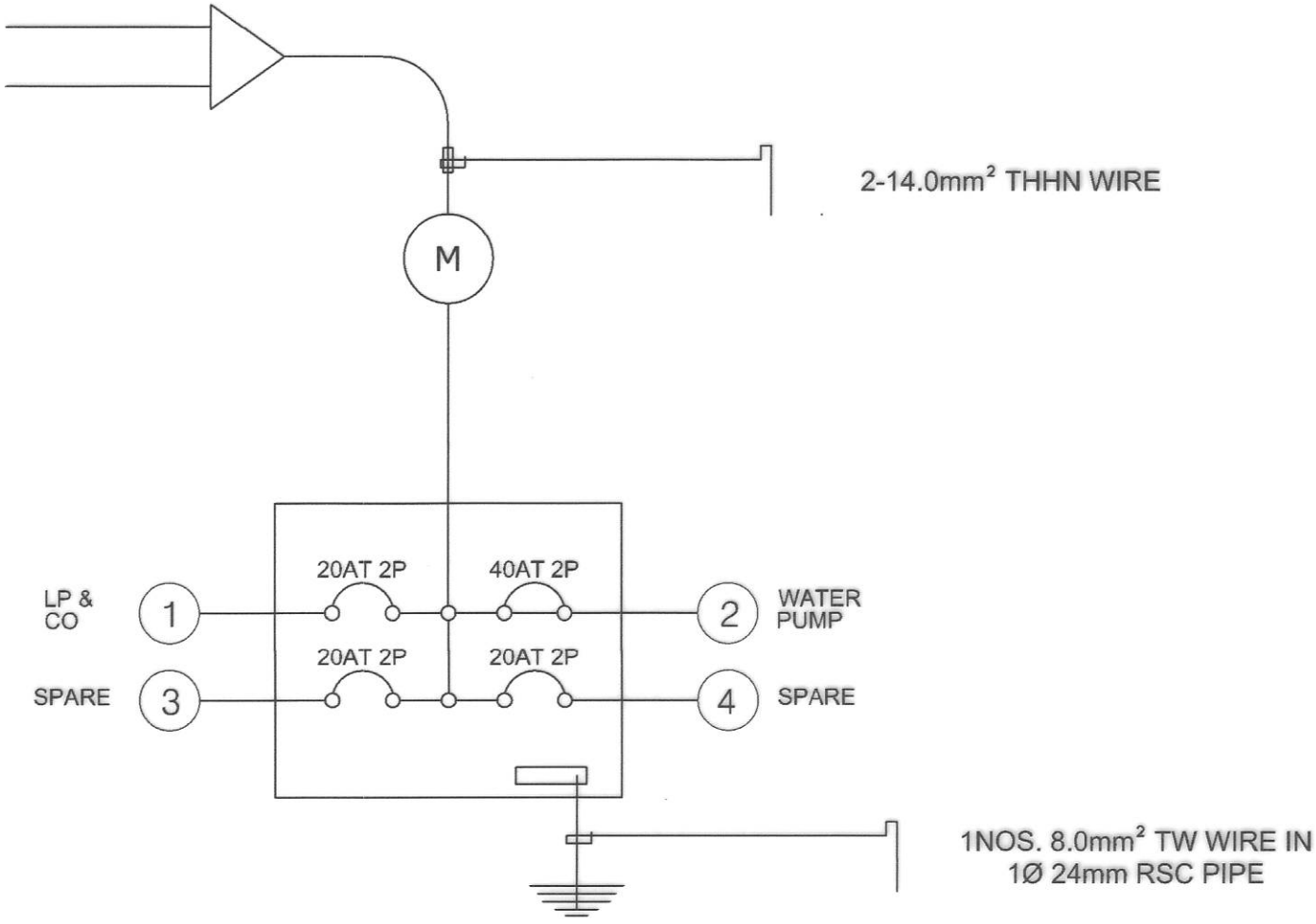
SCHEDULE OF LOADS																		
CIRCUIT NUMBER	LOAD DESCRIPTION	HP	OUTLETS				SWITCHES				VOLT. AMP.	AMP.	VOLTS	OCPD BOLT-ON				CONDUCTORS
			O.L.	MOTOR	C.O.	L.O.	S	S2	S3	S3W				AF	P	AT	KAIC	
1	LIGHTING POINTS AND CONVENIENCE OUTLET						1			380	1.652	230V	50	2	20	10	2 # 3.5 mm ² E= 1 # 2.0 mm ²	
2	WATER PUMP	3HP		1						3910	17.0	230V	50	2	40	10	2 # 5.5 mm ² E= 1 # 3.5 mm ²	
3	SPARE									1500	6.26	230V	50	2	20	10		
4	SPARE									1500	6.26	230V	50	2	20	10		
TOTAL										7290								
MAXIMUM DEMAND IN KVA:			7,290		O . C . P . D										SERVICE ENTRANCE CONDUCTOR:			
MAXIMUM DEMAND IN AMP:			57.19		BREAKER		QTY.	TYPE	AT	AF	P	KAIC	GROUNDING CONDUCTOR: MAIN CONDUIT:					
					MAIN		1	MCCB	60	100	2	10						
					BRANCHES		1	MCB	40	50	2	10						
							3	MCB	20	50	2	10						

COMPUTATONS
FOR MAIN SERVICE ENTRANCE
CONDUCTOR
 $I_T = \frac{7,290VA + (3910VA \times 0.25)}{230V}$
 $= 35.94A$
USE 2NOS. 14.0mm² THHN WIRE
1NO. 8.0mm² TW WIRE (G)
IN 1Ø 25mm²

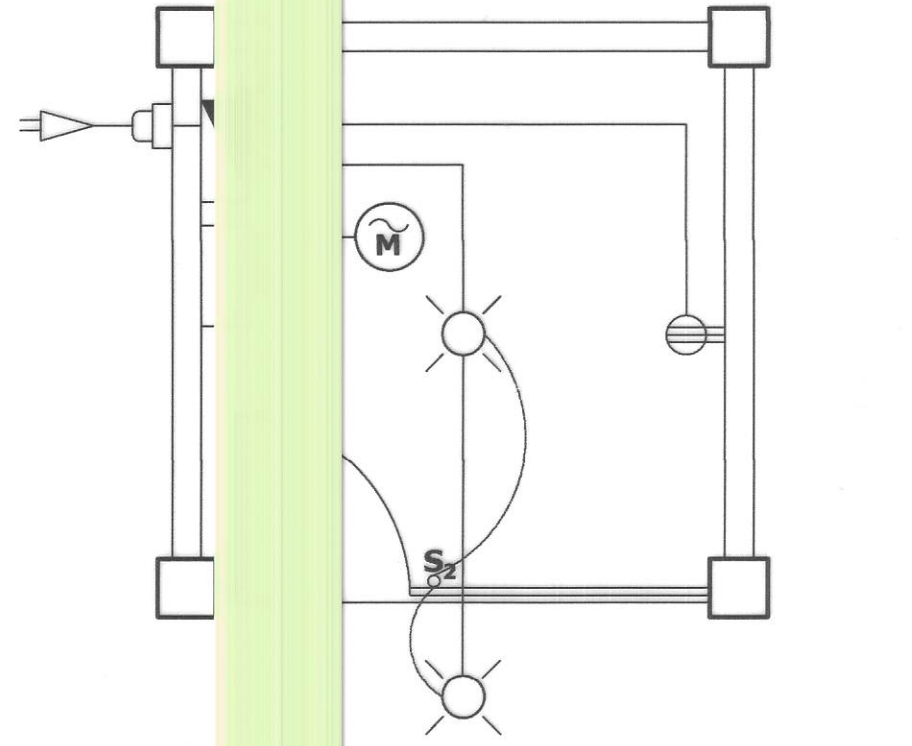
COMPUTATONS
FOR MAIN DISCONNECTION EQUIPMENT
 $I_T = \frac{7,290VA + (3910VA \times 1.50)}{230V}$
 $= 57.19A$
USE ONE 60AT, 100AF, 2P, 230V, MCCB
WITH GROUND BUS AND
BRANCHES:
1NO-40AT, 50AF, 2P

LEGEND :

-  SERVICE ENTRANCE
-  THREE GANG CONVENIENCE OUTLET
-  CEILING LIGHT BULB
-  MOTOR CONTROL
-  PANEL BOARD
-  KWHR METER
-  3HP, 230V, 60HZ, 1PHASE WATER PUMP MOTOR
-  TWO WAY SWITCH



1 SINGLE LINE DIAGRAM
SCALE 12/13 NTS



2 P H O U S E
SCALE 12/13 NTS

THIS IS WHERE YOUR TAXES GO

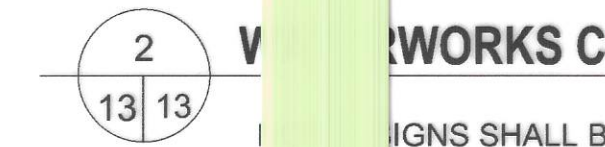
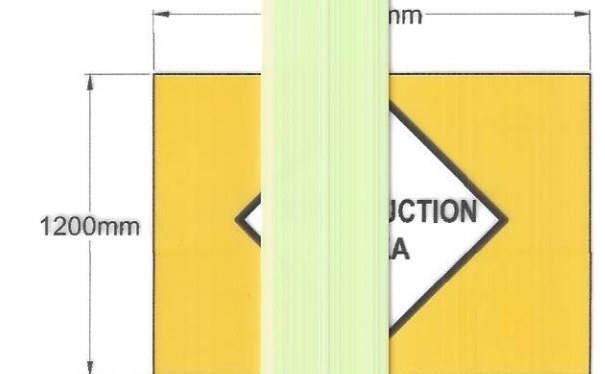
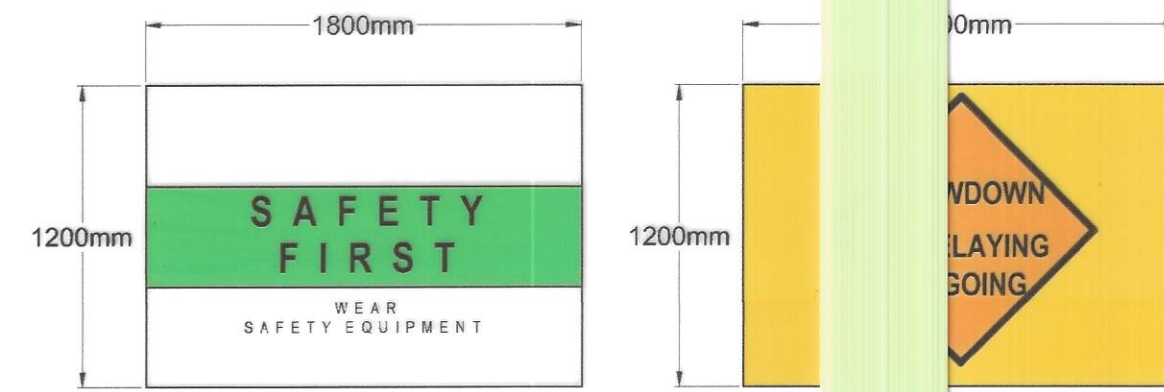
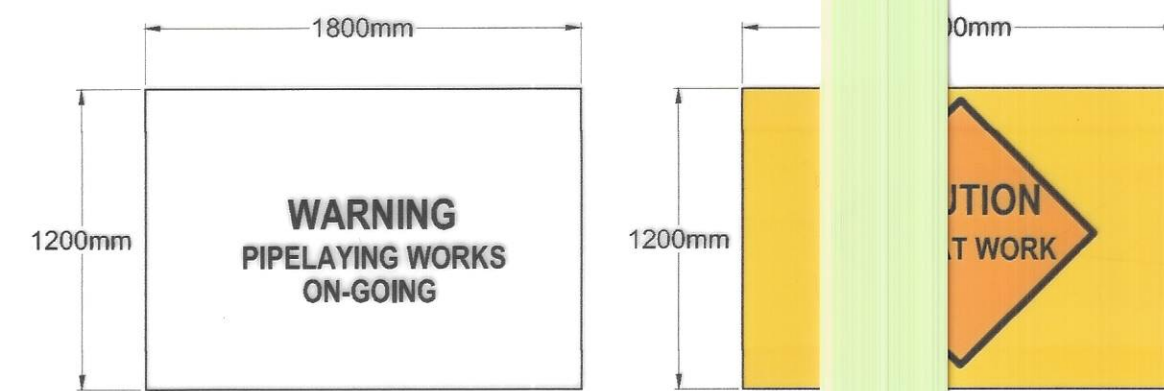
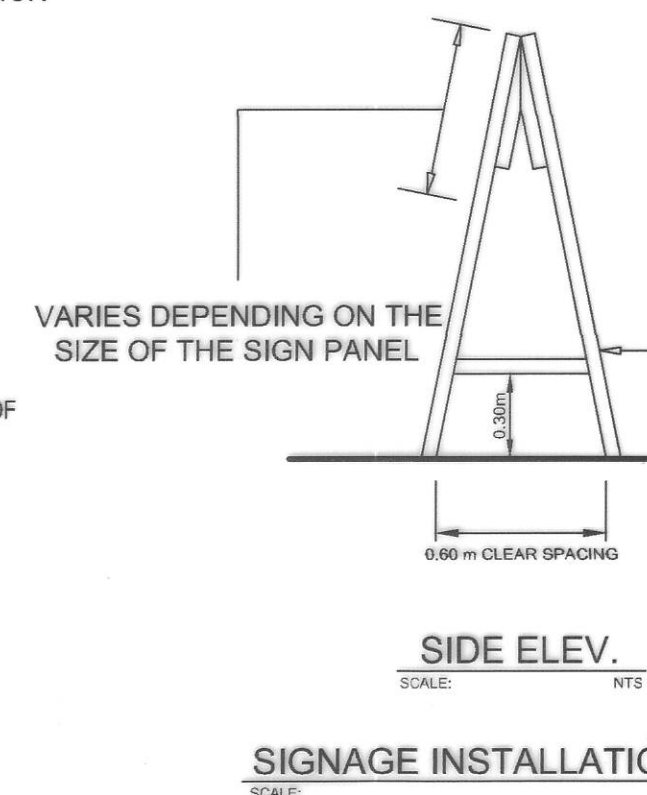
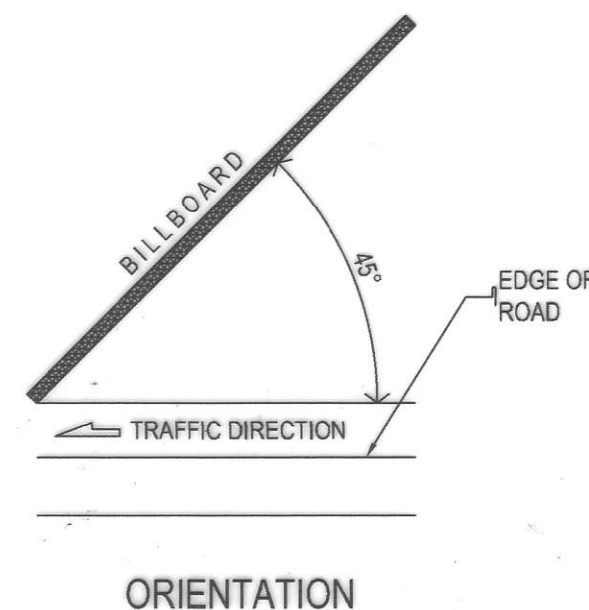
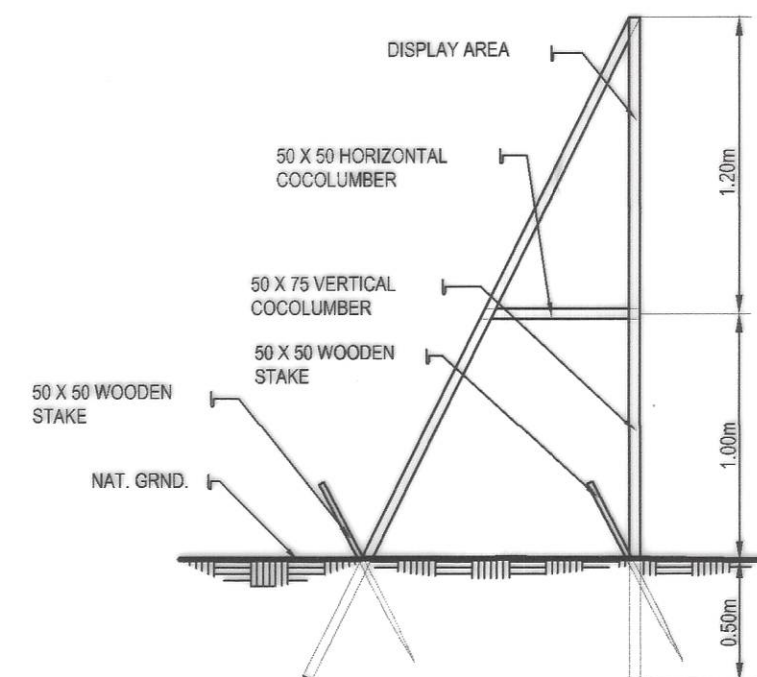
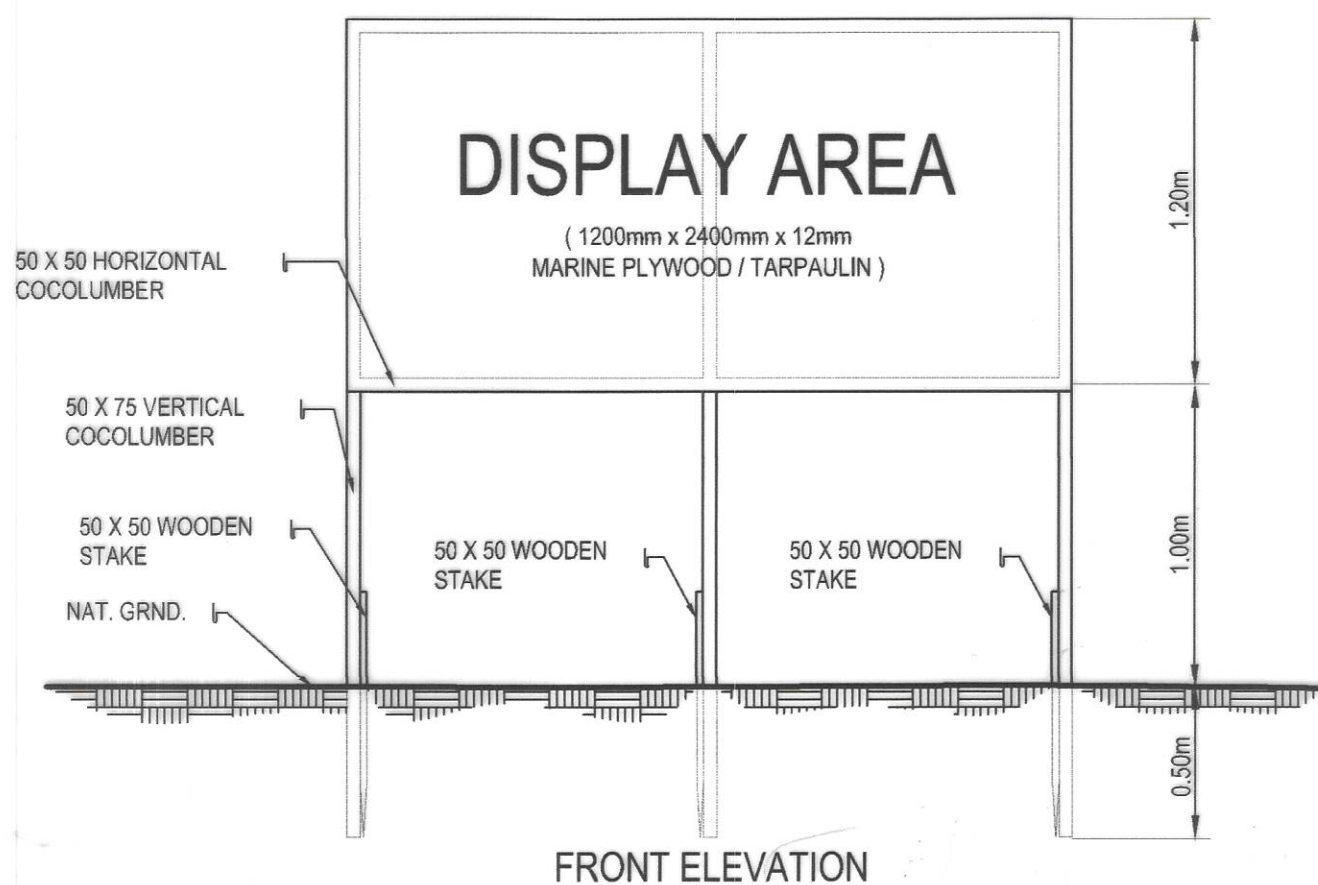
NAME OF PROJECT:
 LOCATION:
 NAME OF CONTRACTOR:
 DATE STARTED:
 CONTRACT COMPLETION DATE:
 CONTRACT COST:
 IMPLEMENTING OFFICE:
 SOURCES OF FUND:

Department of Public Works and Highways
 Text 2920 or call (02) 165-42 for any concern on this project
 www.dpwh.gov.ph

1 13 13 DETAIL OF BILLBOARD

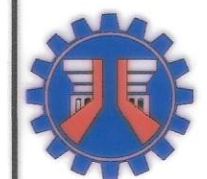
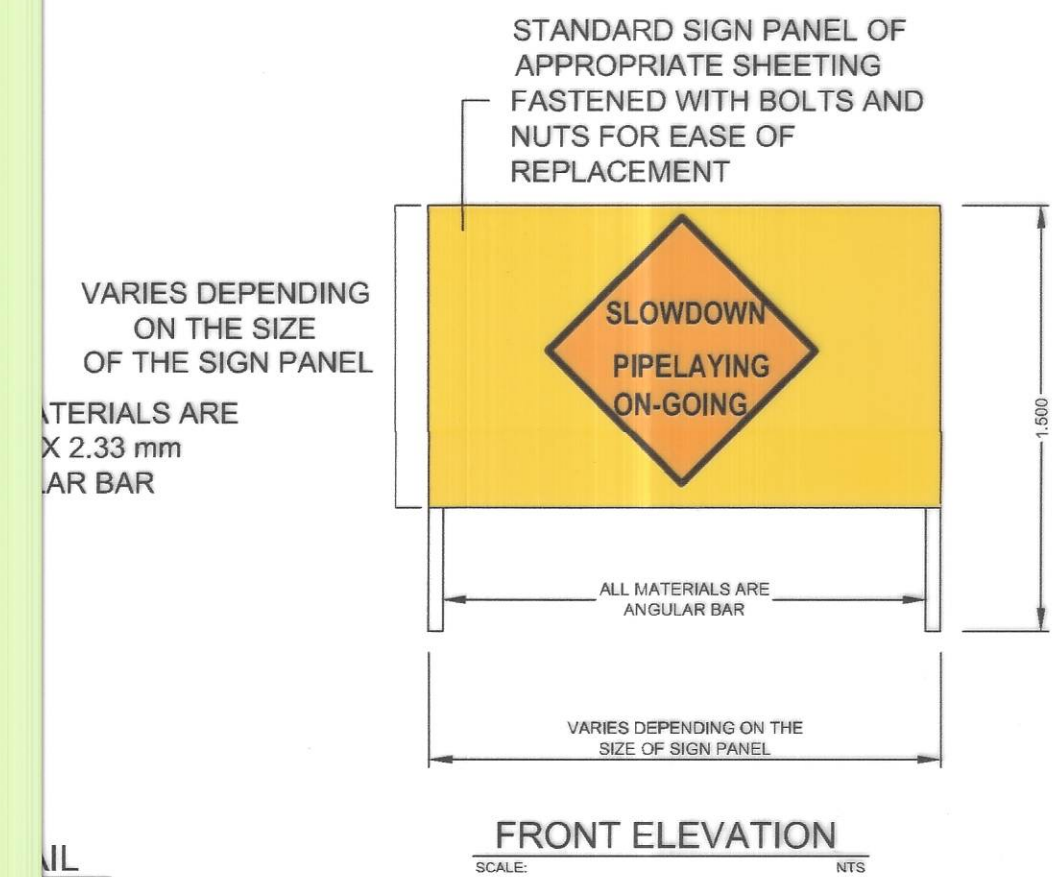
NOTES:

1. THE INSTALLATION OF THE REQUIRED STANDARD BILLBOARD SIZE (1200MM X 2400MM / 4 FT. X 8FT.) FOR ALL PROJECTS SHALL BE STRICTLY ENFORCED.
2. NO POLITICAL 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.
3. DPWH CONTRACTORS SHALL NOT BE ALLOWED TO PLACE NAMES OF POLITICIANS ON THEIR EQUIPMENT OR CARRY POLITICAL BILLBOARD ON THEIR EQUIPMENT.



WORKS CONSTRUCTION SIGNAGE

SIGNS SHALL BE MADE FROM RETROFLECTIVE
 CE MATERIAL AS PER DO 13 SERIES OF 2018



REPUBLIC OF THE PHILIPPINES
 DEPARTMENT OF PUBLIC WORKS AND HIGHWAYS
 REGION IV - B, MIMAROPA
 OFFICE OF THE DISTRICT ENGINEER
 BOAC, MARINDUQUE

PROJECT NAME AND LOCATION :
 REHABILITATION OF WATERWORKS SYSTEM,
 CAIGANGAN, BUENAVISTA, MARINDUQUE
 BUENAVISTA, MARINDUQUE

SHEET CONTENTS :
 TYPICAL DRAWINGS

DRAFTED :
 ARTHUR M. JARLEZA
 ENGINEERING ASSISTANT
 PREPARED :
 JERSON O. MONTERA
 ENGINEER II

REVIEWED :
 JERSON O. MONTERA
 ENGINEER II
 SUBMITTED :
 FERNAN
 CHIEF, PLANNING

RECOMMENDED :
 ARISTEO L. LINGA
 ASSISTANT DISTRICT ENGINEER

APPROVED :
 EVELYN P. PUERTOLLANO
 DISTRICT ENGINEER

SET NO.
 SHEET NO.
 13
 13