

REPUBLIC OF THE PHILIPPINES  
**DEPARTMENT OF PUBLIC WORKS AND HIGHWAYS**  
NATIONAL CAPITAL REGION  
QUEZON CITY 1<sup>st</sup> DISTRICT ENGINEERING OFFICE  
STA. CATALINA ST., BRGY. HOLY SPIRIT, QUEZON CITY

C.Y. 2025 PROJECT  
DETAILED ENGINEERING DESIGN PLAN FOR  
REPAIR/REHABILITATION OF DAMAGED REVETMENT WALL STRUCTURE ALONG TULLAHAN  
RIVER AT BARANGAY GULOD, QUEZON CITY

LOCATION: QUEZON CITY  
NET LENGTH: 40 l.m.

SUBMITTED:

**GUILMAR FRANCIS C. GALLA**  
OFFICER-IN-CHARGE,  
PLANNING AND DESIGN SECTION

DATE:

RECOMMENDED:

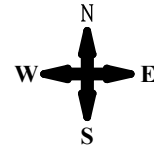
**SEVERINO S. DE GUZMAN, JR.**  
OFFICER-IN-CHARGE  
OFFICE OF THE ASSISTANT DISTRICT ENGINEER

DATE:

APPROVED:

**ARTURO L. GONZALES, JR.**  
DISTRICT ENGINEER

DATE:



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SUMMARY OF QUANTITIES			
ITEM NO.	DESCRIPTION	QTY	UNIT
<b>PART A</b>	<b>FACILITIES FOR THE ENGINEER</b>		
A.1.1 (8)	Provision of Field Office for the Engineer (Rental Basis)	10.00	months
<b>PART B</b>	<b>OTHER GENERAL REQUIREMENTS</b>		
B.5(1)	Project Billboard/ Signboard	1.00	each
B.7(1)	Occupational Safety and Health	1.00	l.s.
B.9(1)	Mobilization / Demobilization	1.00	l.s.
B.15(1)	Detour/Access Road	1.00	l.s.
<b>PART C</b>	<b>EARTHWORK</b>		
801(1)	Removal of Structures and Obstruction	1.00	l.s.
<b>PART D</b>	<b>REINFORCED CONCRETE</b>		
900(1)b	Structural Concrete, 3000psi, Class A, 14 days	265.00	cu.m.
902(1)a1	Reinforcing Steel, Deformed, Grade 40	15,590.00	kgs.
902(1)a2	Reinforcing Steel, Deformed, Grade 60	77,090.00	kgs.
<b>PART L-A</b>	<b>EARTHWORK</b>		
1702(1)b	Structure Excavation, Soft Rock	30.00	cu.m.
1702(4)b	Shoring, cribbing and drain excavation, Cribbing/Cofferdamming	1.00	l.s.
1704(1)b	Embankment, from Borrow	1,033.00	cu.m.
<b>PART L-B</b>	<b>BANK AND SLOPE PROTECTION WORKS</b>		
1710(1)a	Riprap, Class A	104.00	cu.m
1716(6)	Structural Steel Sheet Piles, Furnished	2,700.00	m.
1716(12)	Structural Steel Sheet Piles, Driven	2,600.00	m.
<b>PART L-C</b>	<b>DRAINAGE WORKS</b>		
1718(13)	Polyvinyl Chloride (PVC) Sewer Pipe and Drain Pipe	36.00	l.m.

# GENERAL NOTES

## 1. STANDARD SPECIFICATION:

ALL WORKS SHALL COMPLY WITH DPWH STANDARD SPECIFICATION FOR HIGHWAYS, BRIDGES, AND AIRPORTS REVISED 2013.

## 2. DIMENSIONS:

UNLESS OTHERWISE SPECIFIED, ALL DIMENSIONS WHICH INCLUDE STATIONING, DISTANCES BETWEEN CONTROL POINTS AND ELEVATIONS ARE MEASURED IN METERS.

## 3. ALIGNMENT AND GRADE:

NO ALTERATION OR CHANGE IN ALIGNMENT AND GRADE SHALL BE MADE UNLESS EXISTING FIELD CONDITION SO WARRANT AND ONLY UPON WRITTEN ORDER BY THE ENGINEERS AND APPROVED BY THE PROPER AUTHORITY CONCERNED.

## 4. REMOVAL OF EXISTING STRUCTURES AND OBSTRUCTIONS:

A. ALL WORKS SHALL COMPLY WITH ITEM 101, VOLUME II OF THE STANDARD SPECIFICATIONS FOR PUBLIC WORKS AND HIGHWAYS, 2013.

B. PORTION OF EXISTING UTILITIES, SUCH AS WATER MAINS IRRIGATION CHANNELS, TELEPHONE POST AND TRUNK LINES ETC., THAT MAY CAUSE OBSTRUCTIONS TO THE CONSTRUCTION OF THIS PROJECTS SHALL BE RELOCATED BY THE ENTITY OR OWNER CONCERNED. EXTREME PRECAUTIONS SHALL BE EXERCISED, DAMAGED THEREOF SHALL BE THE ACCOUNT OF THE CONTRACTOR.

## 5. REINFORCED CONCRETE:

### A. CONCRETE

UNLESS OTHERWISE SPECIFIED, THE MINIMUM COMPRESSIVE STRENGTH SHALL BE  $f_c' = 20.70$  MPa at 28 DAYS CLASS "A" WITH MAXIMUM WATER CEMENT RATIO OF 0.53, SLUMP RANGE OF 50 - 100 mm AND MAXIMUM SIZE OF AGGREGATES SHALL BE 40mm.

### B. REINFORCEMENTS

BARS SHALL BE INTERMEDIATE GRADE,  $f_y = 414$  MPa.

SPLICING OF BARS SHALL BE LAPPING OR BUTT WELDING AT 20 BAR DIA. OR A MINIMUM OF 30 cm.

ADJACENT BARS SHALL BE SECURELY HELD TOGETHER BY #16 TIE WIRES, EACH HAVING A MINIMUM LENGTH OF 25 cm.

CLEAR CONCRETE COVER BETWEEN REINFORCEMENT BARS AND EMBANKMENT MATERIALS SHALL BE 75 mm AND PRECAST SHOULD BE PROVIDED WITH THIS PURPOSE.

### C. WATER MIXING

WATER TO BE USED SHOULD BE CLEAN AND FREE FROM INJURIOUS AMOUNTS OF OIL, ACID, ALKALI, SALT, ORGANIC MATERIAL AND SUBSTANCES THAT MAY BE DELETERIOUS TO CONCRETE AND REINFORCEMENTS.

## 6. WEEPHOLES

ALL WALLS AND ABUTMENTS SHALL BE PROVIDED WITH THE WEEPHOLES UNLESS OTHERWISE SHOWN ON THE PLANS OR DIRECTED BY THE ENGINEER. THE WEEPHOLES SHALL BE PLACED HORIZONTALLY AT THE LOWEST POINT WHERE FREE OUTLETS FOR WATER CAN BE OBTAINED AND SHALL BE SPACED AT NOT MORE THAN 2 METERS CENTER TO CENTER IN A STAGGERED MANNER. THE LENGTH OF THE WEEPHOLES SHALL NOT BE LESS THAN THE THICKNESS OF THE WALLS OF ABUTMENT AND SHALL BE AT LEAST 50MM Ø PVC OR OTHER PIPE MATERIALS ACCEPTED BY THE ENGINEER. WEEPHOLES MUST BE PROVIDED WITH FILTER BAGS AS SPECIFIED IN SPECIAL PROVISION OR AS DIRECTED BY THE ENGINEER AND SHALL BE INCIDENTAL TO PAY 505.

## 6. CONSTRUCTION STAKES:

A. THE CONTRACTOR WILL BE RESPONSIBLE FOR THE TRUE AND PROPER SETTING - OUT OF THE WORK OR IMPROVEMENT AND FOR CORRECTNESS OF POSITION, LEVEL, SLOPE AND CONTINUOUS PROFILE GRADE IN ROAD WORK. HE WILL SET CONSTRUCTION STAKES, ESTABLISHING LINES, SLOPE AND CONTINUOUS PROFILE WORK AND OTHER LINE AND BENCHMARK FOR BRIDGE WORK, GRADE IN ROAD PROTECTIVE AND NECESSARY STRUCTURES AND APPURTENANCES CULVERT WORK, AS ARE DEEMED NECESSARY FROM THE REFERENCE DATE TO BE FURNISHED BY THE ENGINEER IN WRITING.

B. THE CHECKING OF CONSTRUCTION STAKES BY THE ENGINEER SHALL NOT IN ANY WAY RELIEVE THE CONTRACTOR OF HIS RESPONSIBILITY FOR THE CORRECTNESS THEREOF AND THE CONTRACTOR SHALL CAREFULLY PROTECT AND PRESERVE ALL BENCHMARK, PEGS AND OTHER THINGS USED IN SETTING OUT THE WORK.

C. IN THE CASE OF "CHARGES" OR "CHANGE IN CONDITION" WHICH INVOLVES ANY CHANGES IN STAKE OUT, THE CONTRACTOR SHALL COORDINATE WITH THE ENGINEER AND FACILITATE THE PROMPT RE - ESTABLISHMENT OF THE FIELD CONTRACT FOR THE ALTERNATIVE OR ADJUSTED WORK.

## 7. STANDARD DRAWING:

THE NECESSARY DRAWING CONTAINED IN THE DPWH STANDARD DRAWING FOR ROAD SHALL BE UTILIZED FOR THE PROJECT UNLESS OTHERWISE A MORE DETAILED.

## 8. QUANTITY:

QUANTITY OF VARIOUS WORK ITEM INVOLVED ARE SUBJECT TO DECREASE OR INCREASE DEPENDING ON THE ACTUAL FIELD CONDITION.

## 9. SURVEY:

AFTER THE DEMOLITION AND REMOVAL OF STRUCTURES ALONG THE ROAD RIGHT - OF -WAY. AS- STAKES SURVEY SHALL BE CONDUCTED WITH STANDARD INTERVALS TO VERIFY ACTUAL TERRAIN CONDITIONS.

## CONSTRUCTION REQUIREMENTS

CONSTRUCTION SPECIFICATION: 2013 DPWH STANDARD SPECIFICATIONS FOR HIGHWAYS, BRIDGES AND AIRPORTS, VOLUME II

### 1. SETTING OUT

THE SETTING OUT AND THE ELEVATIONS OF THE DIFFERENT COMPONENTS OF THE STRUCTURE SHALL BE APPROVED BY THE ENGINEER PRIOR TO THE START OF ANY CONSTRUCTION WORK.

### 2. REINFORCED CONCRETE

a. CONCRETE MIX AND PLACING

a1. DESIGN OF CONCRETE MIX SHALL MEET THE DESIGN CONCRETE STRENGTH GIVEN UNDER ITEM 1 OF MATERIALS.

a2. CONCRETE SHALL BE DEPOSITED, VIBRATED AND CURED IN ACCORDANCE WITH SPECIFICATIONS.

a3. FOR CONCRETE DEPOSITED AGAINST THE GROUND, LEAN CONCRETE WITH A MINIMUM THICKNESS OF 200 MM SHALL BE LAID FIRST BEFORE INSTALLING THE REINFORCEMENT. THE LEAN CONCRETE SHALL NOT BE CONSIDERED IN MEASURING THE STRUCTURAL DEPTH OF THE CONCRETE SECTION.

a4. THE CONSTRUCTOR SHALL SUBMIT TO THE ENGINEER FOR APPROVAL PLACING SEQUENCES FOR ALL CONCRETE WORK.

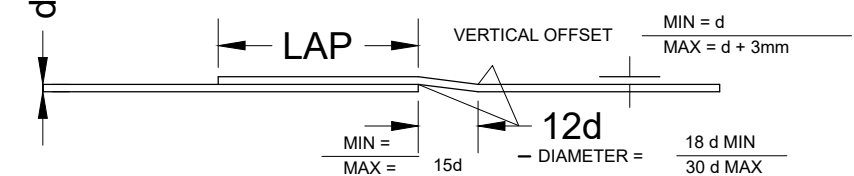
### b. BAR BENDING, SPLICING AND PLACING

b1. THE CONSTRUCTOR SHALL SUBMIT TO THE ENGINEER FOR APPROVAL OF SHOP DRAWINGS INDICATING THE BENDING, CUTTING, SPLICING AND INSTALLATION OF ALL REINFORCING BARS.

b2. BARS SHALL BE BENT COLD, BARS PARTIALLY EMBEDDED IN THE CONCRETE SHALL NOT BE FIELD BENT UNLESS PERMITTED BY THE ENGINEER.

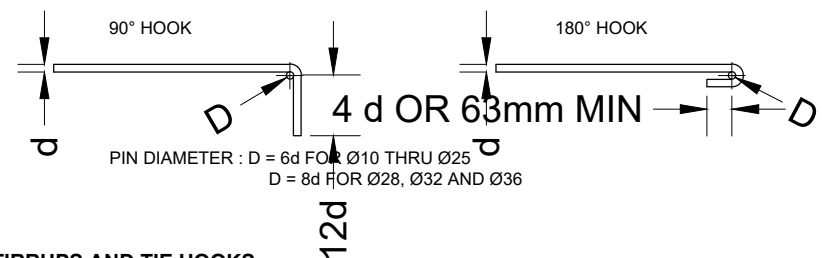
b3. BAR SPLICING NOT INDICATED ON DRAWINGS SHALL BE SUBJECT TO THE APPROVAL OF THE ENGINEER.

### 3. CRANKED SPLICES

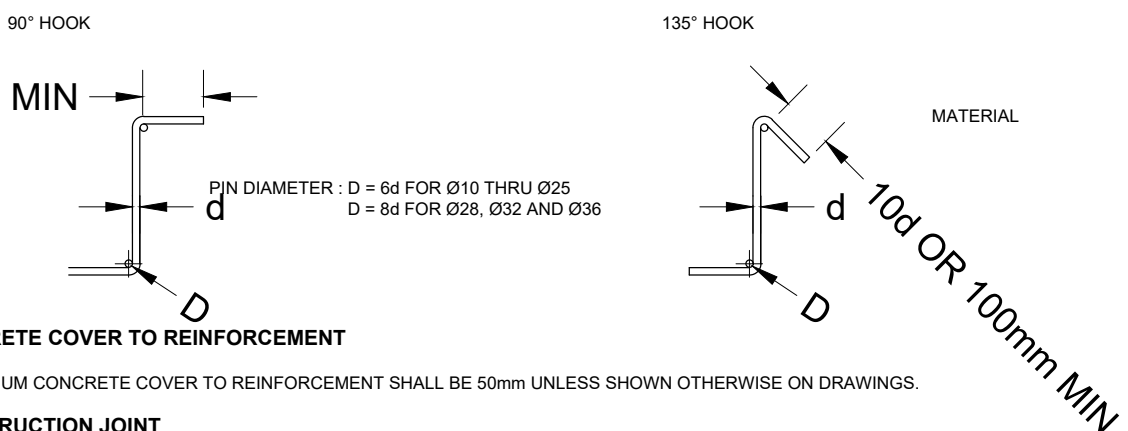


### 4. HOOKS AND BENDS

4a. DIMENSIONS OF 90° AND 180° HOOKS



### 5. DIMENSIONS STIRRUPS AND TIE HOOKS



### 6. CONCRETE COVER TO REINFORCEMENT

MINIMUM CONCRETE COVER TO REINFORCEMENT SHALL BE 50mm UNLESS SHOWN OTHERWISE ON DRAWINGS.

### 7. CONSTRUCTION JOINT

a. THE POSITION AND FORM OF ANY CONSTRUCTION JOINT SHALL BE AS SHOWN ON DRAWINGS OR AS AGREED WITH THE ENGINEER.

b. THE INTERFACE BETWEEN THE FIRST AND SECOND POUR CONCRETES SHALL BE ROUGHENED WITH AN AMPLITUDE OF 6mm MINIMUM.

### 8. FALSEWORK

ALL FALSEWORKS SHALL BE DESIGNED BY THE CONTRACTOR SUBJECT TO THE APPROVAL OF THE ENGINEER.

### 9. FORMWORK

FORMWORKS SHALL BE CONSTRUCTED SUCH THAT IT WILL NOT YIELD UNDER THE LOAD AND SHALL BE SUCH AS TO AVOID THE FORMATION OF FINE. ALL CORNERS OF CONCRETE MEMBERS SHALL BE CHAMFERED TO 20mm UNLESS NOTED OTHERWISE ON DRAWINGS. STRIPPING OF FORMS AND SHORES SHALL BE AS DESIGNATED BY THE ENGINEER. THE FOLLOWING MAY BE USED AS A GUIDE:

## DESIGN CRITERIA

1. DESIGN SPECIFICATION:

1.1 NATIONAL STRUCTURAL CODE OF THE PHILIPPINES, VOLUME II-BRIDGES, 2ND EDITION, 1997.

1.2 THE AMERICAN ASSOCIATION OF STATE HIGHWAY AND TRANSPORTATION OFFICIAL (AASHTO) STANDARD SPECIFICATIONS FOR HIGHWAY BRIDGES 16TH EDITION, 1995 DIVISION I AND IA.

## HYDRAULIC DESIGN DATA

1. DESIGN RETURN PERIOD = 50 YEAR

2. DESIGN DISCHARGE = 199.53 m<sup>3</sup>/s

3. FREEBOARD = 1 METER

4. MANNING'S COEFFICIENT, n = 0.03

5. SLOPE = 0.00260

## ABBREVIATION

DFL, DESIGN FLOOD LEVEL

DRB, DESIGN RIVERBED

ERB, EXISTING RIVERBED



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QUEZON CITY**  
LOCATION: BRGY. GULOD, QUEZON CITY

SHEET CONTENTS:

DRAFTED:

**MARK ANTHONY P. DELA TORRE**  
ENGINEERING I (J.O.)

PREPARED:

**JOHN PAUL D. DUMANDAL**  
ENGINEER II

CHECKED:

**JOHN MICHAEL F. DE LEON**  
ENGINEER II  
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SUBMITTED:

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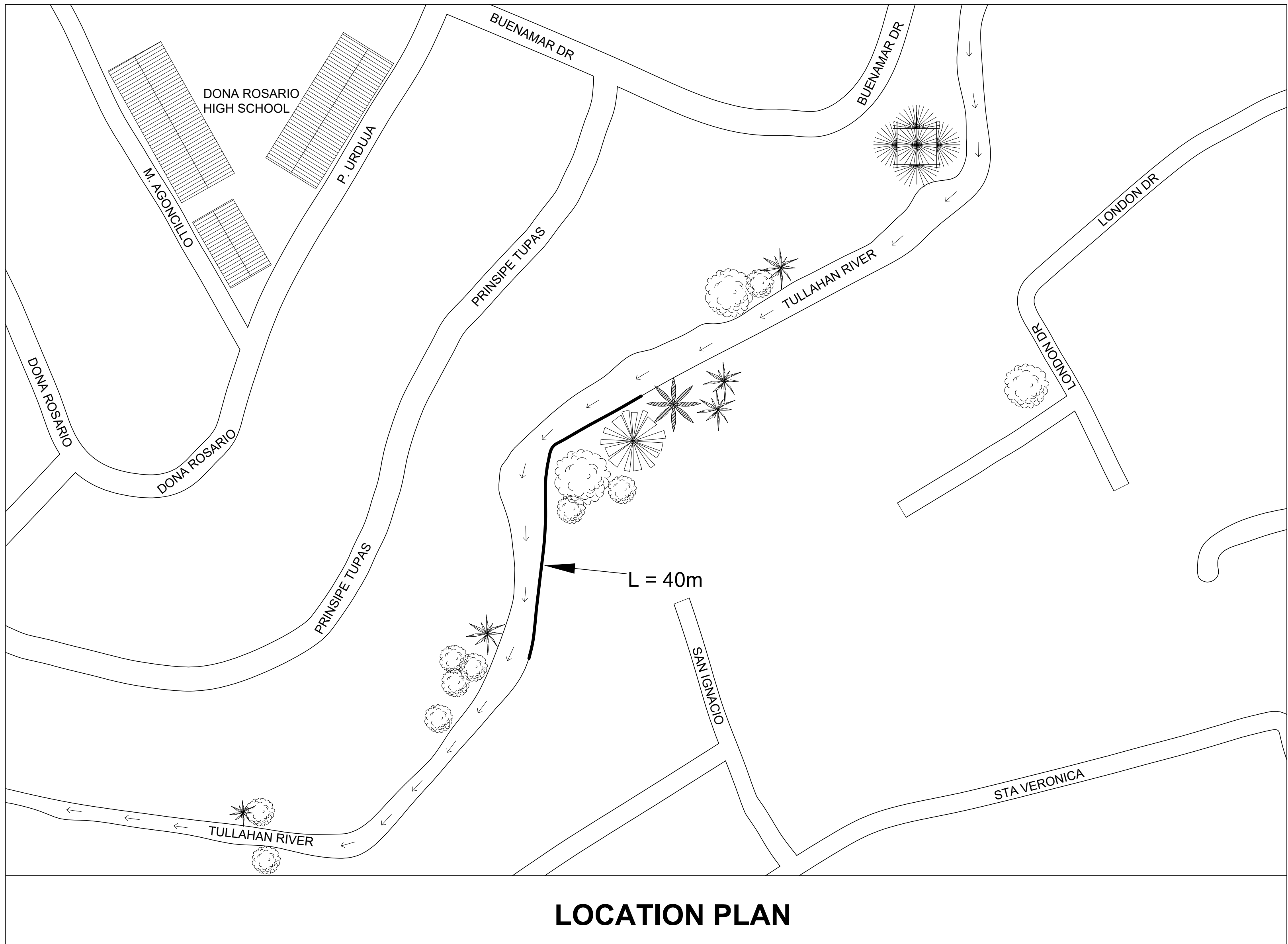
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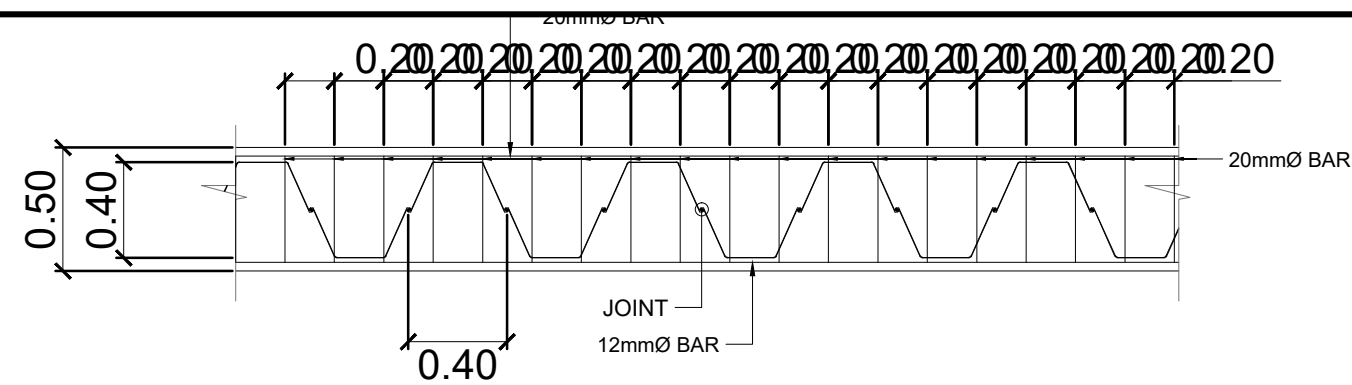
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Technical drawing of a pile cap cross-section. The drawing shows a vertical section of a pile cap with a width of 0.50. The height of the pile cap is 1.00. The pile cap is made of concrete (Class A) and contains 12mm diameter stirrups. The pile cap is supported by a steel sheet pile, which is welded to the pile cap using tack welding. The length of the pile is indicated as 0.50. The drawing includes a break line to indicate that the pile continues below the shown section.

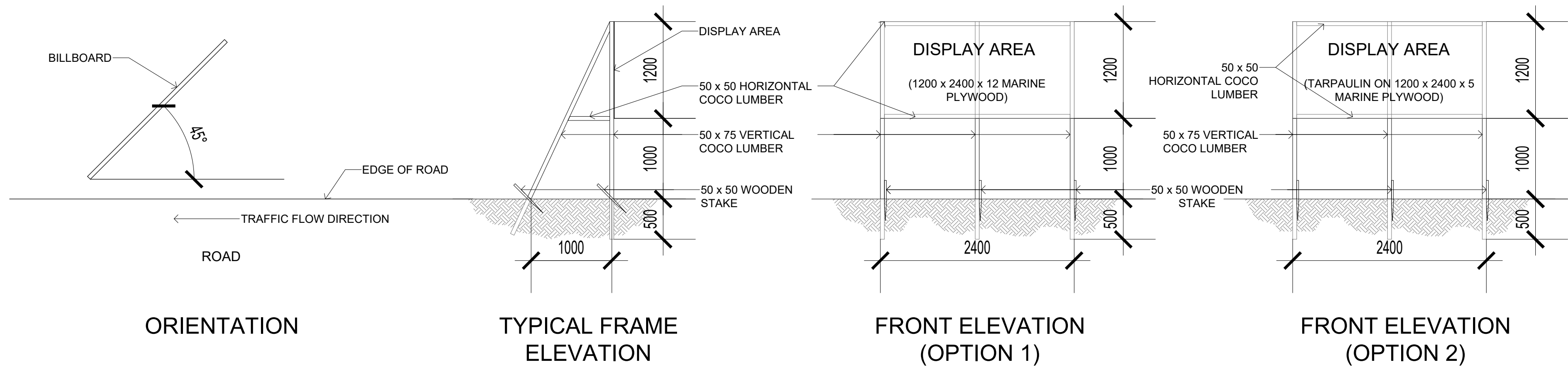
Labels and dimensions:

- 0.50 (Width of pile cap)
- 1.00 (Height of pile cap)
- 0.50 (Length of pile)
- 12mmØ STIRRUPS
- PILE CAP CONCRETE (CLASS A)
- TACK WELDING
- STEEL SHEET PILE
- LENGTH OF PILE

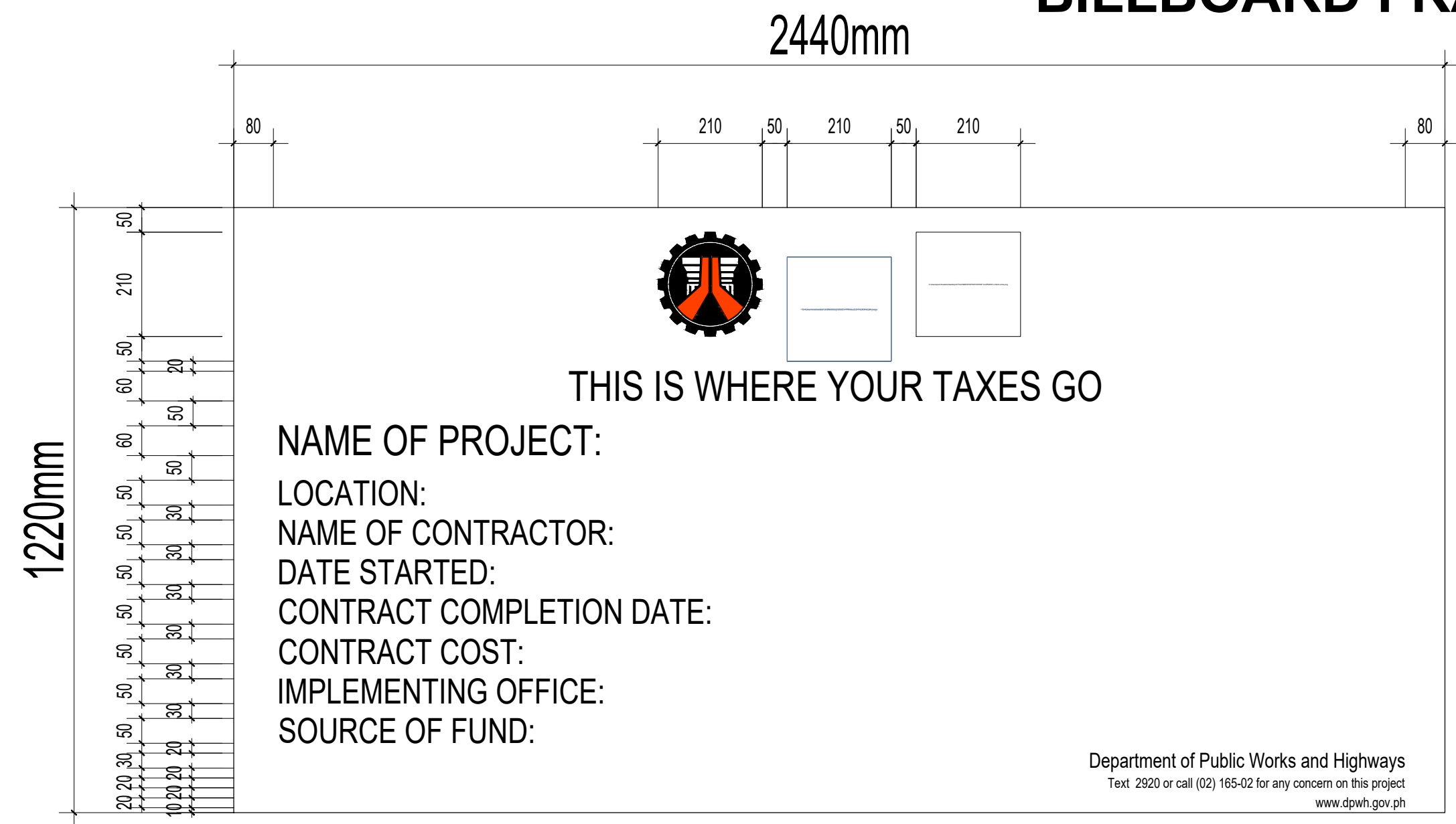
DETAIL OF L-W REVETMENT SHEET PILE

SCALE: 1:30 mts





**BILLBOARD FRAME**



**NOTES:**

1. HE BILLBOARD STANDARD SHALL CONTAIN THE STATEMENT "THIS IS WHERE YOUR TAXES GO" TOGETHER WITH THE LOGOS OF DEPARTMENT OF PUBLIC WORKS AND HIGHWAYS (DPWH), THE BUREAU OF INTERNAL REVENUE (BIR) AND DEPARTMENT OF FINANCE (DOF) PLACED IN THE UPPER PART OF BILLBOARD WITH THE DIMENSION AS SHOWN IN THE LAYOUT DRAWING. THE SAID STATEMENT SHALL BE LOCATED ON THE UPPER PART OF THE BILLBOARD WITH THE FRONT SIZE 60 mm.
2. THE NAME OF THE GOVERNMENT AGENCY AND LOGOS SHALL BE PRINTED ON THE SAME WHITE BACKGROUND OF THE BILLBOARD AS SHOWN ON ANNEX "A".
3. THE NAME OF THE PROJECT AND LOCATION SHALL BE SEPERATED FOR CLARITY.
4. THE CONTACT NO. AND WEBSITE OF DPWH SHALL BE PLACED AT THE LOWER RIGHT SIDE.

**DPWH STANDARD PROJECT BILLBOARD**



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