REPUBLIC OF THE PHILIPPINES

DEPARTMENT OF PUBLIC WORKS AND HIGHWAYS

CEBU 2ND DISTRICT ENGINEERING OFFICE

POBLACION DALAGUETE, CEBU, REGION VII

C.Y. 2025 PROJECT

DETAILED ENGINEERING DESIGN PLAN FOR

CONVERGENCE AND SPECIAL SUPPORT PROGRAM: SUSTAINABLE INFRASTRUCTURE PROJECTS ALLEVIATING GAPS (SIPAG), FLOOD MITIGATION STRUCTURES PROTECTING MAJOR/STRATEGIC PUBLIC BUILDINGS/FACILITIES, CONSTRUCTION OF FLOOD CONTROL STRUCTURE, BARANGAY LILOAN, SANTANDER, CEBU

Section 1 :Right Side Length = 132.30 m, Left Side Length = 132.30 m
Section 2 : Length = 80.50 m

SUBMITTED:

LENARD A. PANUGALINOG
CHIEF, PLANNING & DESIGN SECTION
DATE

RECOMMENDED:

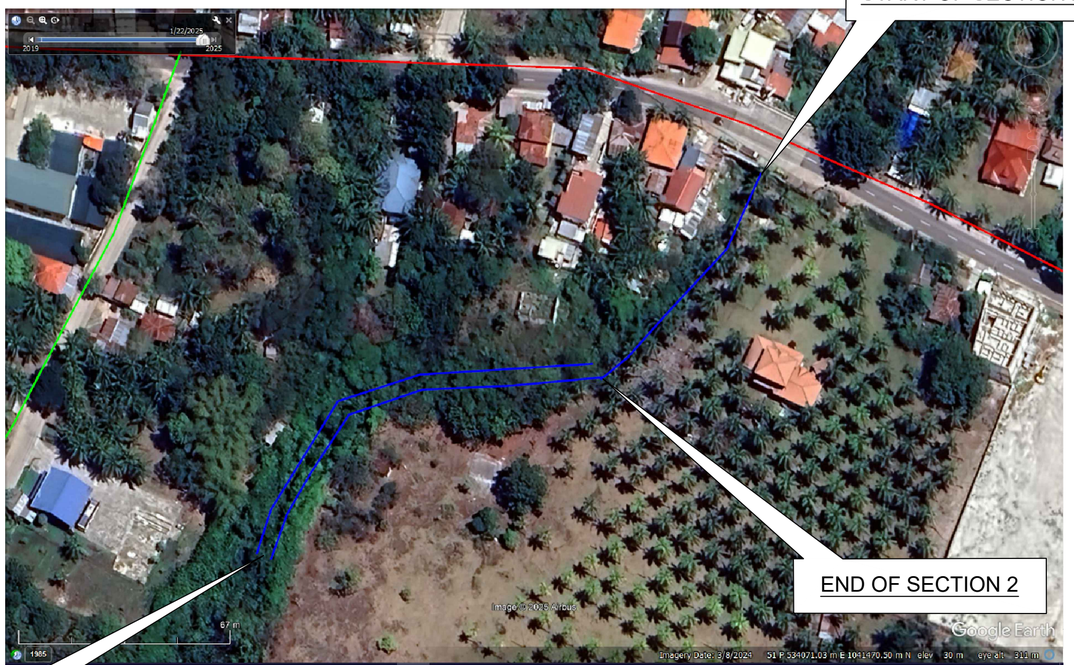
ROSALIND R. VASQUEZ
OIC - ASSISTANT DISTRICT ENGINEER
DATE

APPROVED:

SUSAN L. ORNOPIA-AROA
OIC - DISTRICT ENGINEER
DATE

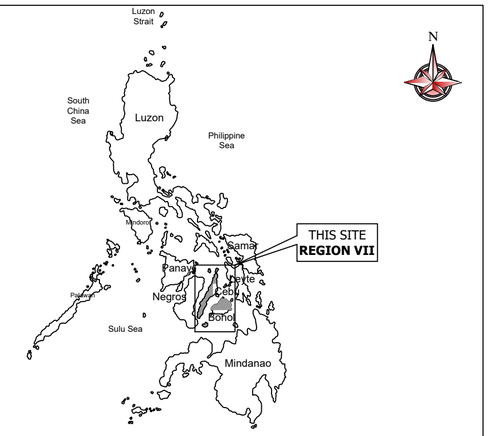
PROJECT DATA

SECTION 1 NET LENGTH	132.30 m
SECTION 2 NET LENGTH	80.50 m
LENGTH OF THE STEEL SHEET PILE SECTION 1	9 m
LENGTH OF THE STEEL SHEET PILE SECTION 2	6 m
STEEL SHEET PILE CODE	MHZ36-1
UNIT WEIGHT	118.70 kg/m
SECTION MODULUS	3596 cm^3/m

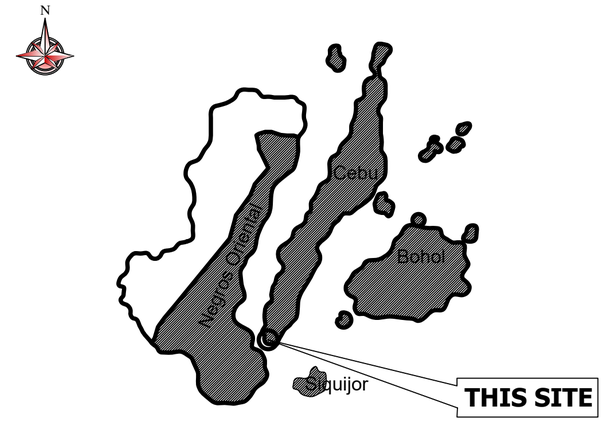


NOTE:
EXCAVATED SOIL TO BE USED
AS EMBANKMENT MATERIAL

LOCATION PLAN
SCALE NTS

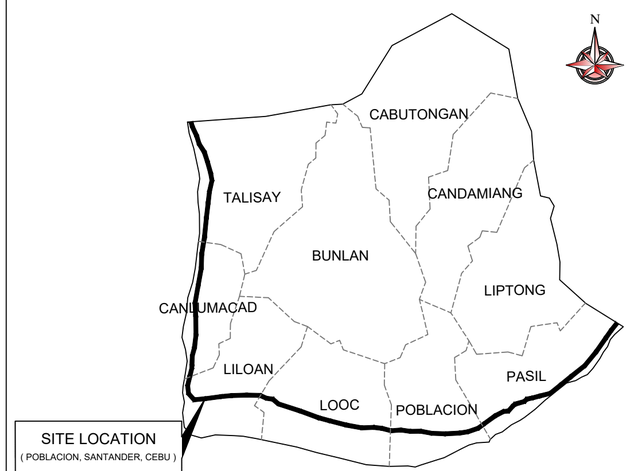


KEY MAP



REGION VII MAP

LOCATION MAP



BOLJOON VICINITY MAP

REPUBLIC OF THE PHILIPPINES
DEPARTMENT OF PUBLIC WORKS AND HIGHWAYS
CEBU 4TH DISTRICT ENG'G OFFICE
POBLACION DALAGUETE, CEBU, REGION VII

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SUMMARY OF QUANTITIES

ITEM NO.	DESCRIPTION	QUANTITY	UNIT	REMARKS
PART A	**FACILITIES FOR THE ENGINEER**			
A.1.1 (8)	Provision of Field Office for the Engineer (Rental Basis)	11.04	month	
A.1.1 (16)	Operation and Maintenance of Field Office for the Engineer	11.04	month	
PART B	**OTHER GENERAL REQUIREMENTS**			
B.4 (10)	Miscellaneous Survey and Staking	1.00	L.S.	
B.5 (1)	Project Billboard/Sign Board	2.00	each	
B.7 (1)	Occupational Safety and Health Program	1.00	L.S.	
B.9 (1)	Mobilization/Demobilization	1.00	L.S.	
B.13	Additional Geotechnical Investigation	1.00	L.S.	
PART D	**REINFORCED CONCRETE**			
900 (1) c	Structural Concrete, 3000 psi, Class A, 28 days	1,200.00	cu.m.	
902 (1) a1	Reinforcing Steel (Deformed), Grade 40	20,798.79	kg	
PART L	**FLOOD AND RIVER CONTROL AND DRAINAGE**			
PART L-A	**EARTHWORK**			
1701 (2)	Surplus Common Excavation	5,326.18	cu.m	
1704 (1) a	Embankment, From roadway/structure excavation	2,637.90	cu.m	
PART L-B	**BANK AND SLOPE PROTECTION WORKS**			
1711 (1)	Stone Masonry	4,098.95	cu.m	
1717 (4) b	Furnished and Driven of Steel Sheet Pile, Z-Type, Grade 50	4,092.00	meter	

PLEASE BE NOTED THAT THE QUANTITIES ARE SUBJECT TO INCREASE OR DECREASE AS PER ACTUAL ACCOMPLISHMENT

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GENERAL NOTES

FLOOD CONTROL (EARTHDIKE/LEVEE, 2M TO 6M GRAVITY WALL)

I. DESIGN CRITERIA AND SPECIFICATIONS

1. DPWH DESIGN GUIDELINES, CRITERIA & STANDARDS (DGCS) VOLUME III, 2015 EDITION.
2. DPWH STANDARD SPECIFICATIONS, VOLUME III, 2019 EDITION.

II. PROJECT CONTROLS & REFERENCES

1. HEIGHT AND CREST WIDTH OF DIKE
   a.) THE HEIGHT OF DIKE IS DETERMINED FROM THE DESIGN FLOOD ELEVATION PLUS AN ADDITIONAL FREEBOARD ALLOWANCE DEPENDING ON THE DESIGN DISCHARGE AS SHOWN IN THE FOLLOWING TABLE:

DESIGN FLOOD DISCHARGE Q (m^3/SEC)	FREEBOARD (m)
LESS THAN 200	0.60
200 LESS THAN 500	0.80
500 AND LESS THAN 2,000	1.00
2,000 AND LESS THAN 5,000	1.20
5,000 AND LESS THAN 10,000	1.50
10,000 AND OVER	2.00

   b.) THE TOP/CREST WIDTH OF THE DIKE SHALL BE BASED ON THE FLOOD DISCHARGE AND SHALL NOT BE LESS THAN VALUES GIVEN IN THE FOLLOWING TABLE:

DESIGN FLOOD DISCHARGE Q (m^3/SEC)	CREST WIDYH (m)
LESS THAN 500	3
500 LESS THAN 2,000	4
2,000 LESS THAN 5,000	5
5,000 LESS THAN 10,000	6
10,000 AND OVER	7

2. SIDE SLOPE (V:H)
   a.) 1:2 FOR EMBANKMENT <6.0m IN HEIGHT (LOW EMBANKMENT)
   b.) 1:3 FOR EMBANKMENT >6.0m IN HEIGHT (HIGH EMBANKMENT)
   c.) 1:4 FOR EMBANKMENT CONSISTING OF SAND AND SHALL BE PROTECTED BY PROVIDING A TOTAL COVER OF 300mm THICK OF GOOD SOIL AND SODDING.

3. BERM
   a.) RIVER SIDE: FOR HEIIGHT > 6.0m, PROVIDE BERM AT EVERY 3.0m TO 5.0m WITH A WIDTH OF 1.0m (MIN.)
   b.) LAND SIDE: FOR HEIGHT > 4.0m, PROVIDE BERM AT EVERY 2.0m TO 3.0m WITH A WIDTH OF 1.0m (MIN.)

III. DESIGN CONDITIONS

HYDRAULIC DESIGN DATA

RETURN PERIOD	100 Years
DESIGN DISCHARGE, Qd	208.1515 m^3/s
RUNOFF COEFFICIENT, C	1.20
RAINFALL INTENSITY, I	109.00 mm/hr
CATCHMENT AREA, A	41.029 km^2
DESIGN DISCHARGE CAP.,Qcap	616.05 m^3/s
VELOCITY	4.74 m/s
DEPTH OF GENERAL SCOUR,dgs	3.876 m

IV. MATERIAL AND CONSTRUCTION REQUIREMENTS

1. EMBANKMENT

   EMBANKMENT SHALL CONTAIN NO MUCK, PEAT, SOD, ROOTS OR OTHER DELETERIOUS MATTER.

   EMBANKMENT OF EARTH MATERIAL SHALL BE PLACED IN HORIZONTAL LAYERS NOT EXCEEDING 200mm LOOSE MEASUREMENT AND SHALL BE COMPACTED AS SPECIFIED BEFORE THE NEXT LAYER IS PLACED. THE MATERIALS PLACED IN ALL EMBANKMENT LAYERS AND THE MATERIALS SCARIFIED TO THE DESIGNATED DEPTH BELOW SUBGRADE IN CUT SECTIONS SHALL BE COMPACTED UNTIL A UNIFORM DENSITY OF NOT MOISTURE CONTENT DETERMINED BY THE ENGINEER TO BE SUITABLE FOR SUCH DENSITY.

2. STONES
   a.) THE STONES SHALL BE CLEAN, HARD AND DURABLE AND SHALL BE SUBJECTED TO THE ENGINEER'S APPROVAL ADOBE SHALL NOT BE USED UNLESS OTHERWISE SPECIFIED.

   b.) STONES SHALL HAVE A THICKNESS OF NOT LESS THAN 150mm, AND WIDTHS OF NOT LESS THAN ONE AND ONE-HALF TIMES THEIR RESPECTIVE THICKNESS, AND LENGTHS OF NOT LESS THAN ONE AND ONE-HALF TIMES THEIR RESPECTIVE WIDTHS.

3. THE FOUNDATION BED SHALL BE EXCAVATED TO THE LINES AND GRADES AS SHOWN IN THE PLANS AS DIRECTED BY THE ENGINEER AND SHALL BE THOROUGHLY COMPACTED IN ACCORDANCE WITH ITEM 140.3.3 OF DPWH STANDARD SPECIFICATIONS.

4. MORTAR

   THE MORTAR FOR THE MASONRY SHALL BE COMPOSED OF ONE PART OF PORTLAND CEMENT AND TWO PARTS OF FINE AGGREGATES BY VOLUME AND SUFFICIENT WATER TO MAKE THE MORTAR OF SUCH CONSISTENCY THAT IT CAN BE HANDLED EASILY AND SPREAD WITH A TROWEL.

5. PLACING OF STONES

   WHEN THE MASONRY IS TO BE PLACED ON A PREPARED FOUNDATION BED, THE BED SHALL BE FIRM AND NORMAL TO, OR IN STEPS NORMAL TO THE FACE OF THE WALL , AND SHALL HAVE BEEN APPROVED BY THE ENGINEER BEFORE ANY STONE IS PLACED.

   CARE SHALL BE TAKEN TO PREVENT THE BUNCHING OF SMALL STONE OR STONES OF THE SAME SIZE, LARGE STONES SHALL BE USED IN THE CORNER.

   THE STONES SHALL BE LAID WITH THEIR LONGEST FACES HORIZONTAL IN FULL BEDS OF MORTAR, AND THE JOINTS SHALL BE FLUSHED WITH MORTAR.

   HE EXPOSED FACES OF INDIVIDUAL STONES SHALL BE PARALLEL TO THE FACES OF THE WALLS IN WHICH THE STONES ARE SET.

   THE STONES SHALL BE HANDLED SO AS NOT TO JAR OR DISPLACE THE STONES ALREADY SET, SUITABLE EQUIPMENT SHALL BE PROVIDED FOR SETTING STONES LARGER THAN THOSE THAT CAN BE HANDLED BY TWO MEN. THE ROLLING OR TURNING OF STONES ON THE WALL WILL NOT BE PERMITTED. IF A STONE IS LOOSENED AFTER THE MORTAR HAS TAKEN INITIAL SET, IT SHALL BE REMOVED. THE MORTAR CLEANED OFF, AND THE STONES RELAID WITH FRESH MORTAR.

6. BED AND JOINTS

   BEDS FOR FACE STONES MAY VARY FROM 20mm TO 50mm IN THICKNESS. THEY SHALL NOT EXTEND IN AN UNBROKEN LINE THROUGH MORE THAN 5 STONES JOINTS MAY VARY FROM 20mm TO 50mm IN THICKNESS. THEY SHALL NOT EXTEND IN UNBROKEN LINE THROUGH MORE THAN TWO STONES. THEY MAY BE AT ANGLE WITH THE VERTICAL FROM 0° TO 45°. FACE STONE SHALL BOND AT LEAST 150mm LONGITUDINAL AND 50mm VERTICALLY AT NO PLACE SHALL CORNERS OF FOUR STONES BE ADJACENT AT EACH OTHER.

   CROSS BEDS FOR VERTICAL FACED WALL SHALL BE LEVEL AND FOR BATTERED WALLS MAY VARY FROM LEVEL TO NORMAL TO THE BATTER LINE OF THE FACE OF THE WALL.

7. AGGREGATE SURFACE COURSE

   THE AGGREGATE SHALL CONSIST OF HARD, DURABLE PARTICLES OR FRAGMENT OF STONE OR GRAVEL AND SAND OR OTHER FINE MINERAL PARTICLES FREE FROM VEGETABLE MATTER AND LUMPS OR BALLS OF CLAY AND OF SUCH NATURE THAT IT CAN BE COMPACTED READILY TO FORM A FIRM, STABLE LAYER.

   WHERE THE REQUIRED THICKNESS IS 150mm OR LESS, THE MATERIAL MAY BE SPREAD AND COMPACTED IN ONE LAYER WHERE THE REQUIRED THE THICKNESS IS MORE THAN 150mm, THE AGGREGATE SUBBASE SHALL BE SPREAD AND COMPACTED IN TWO OR MORE LAYERS OF APPROXIMATELY EQUAL THICKNESS, AND THE MAXIMUM COMPACTED THICKNESS OF LAYER SHALL NOT EXCEED 150mm. ALL SUBSEQUENT LAYERS SHALL BE SPREAD AND COMPACTED IN A SIMILAR MANNER.

8. ROADWAY AND SIDEWALK SURFACE MUST BE MADE TO CONFORM WITH THE NEW STANDARD SECTION FOR ESTERO CHANNEL IMPROVEMENT.

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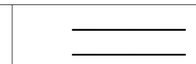
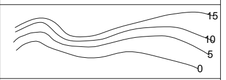
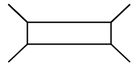
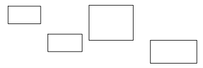
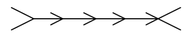
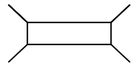
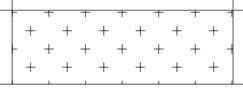
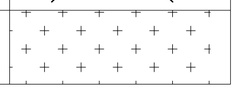
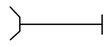
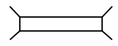
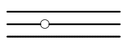
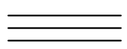
GENERAL NOTES - 2

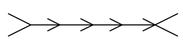
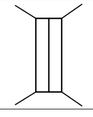
EXISTING TOPOGRAPHICAL FEATURES

EXISTING ROADS		NORTH ARROW INDICATOR	
RIVER,CREEK		EXISTING CONTOUR @ 5m	
DIRECTION OF FLOW OF WATER		EXISTING BRIDGE	
HOUSES		FLOOD WATER LEVEL IN m	
EXISTING PIPE CULVERT		EXISTING BOX CULVERT	
RICEFIELDS		RICEFIELDS	

DESIGN FEATURES ON PLAN

CENTERLINE		POINT OF INTERSECTION AND NUMBER	
BENCHMARK		RCPC WITH HEADWALLS	
REFERENCE POINT		BOX CULVERT	
POINT OF TANGENCY		RIGHT OF WAY LINE	

DESIGN FEATURES ON PROFILE

PIPE CULVERT		SUPERELEVATION INNER	
BOX CULVERT		SUPERELEVATION OUTER	
POINT OF VERTICAL INTERSECTION , STATION AND ELEVATION		LENGTH OF VERTICAL CURVE	

ABBREVIATIONS:

AZI. = AZIMUTH
PC = POINT OF CURVATURE
PT = POINT OF TANGENCY
PCC = POINT OF COMPOUND CURVATURE
I = INTERNAL ANGLE
D = DEGREE OF CURVATURE
R = RADIUS OF CURVATURE
T = TANGENT
Lc = LENGTH OF CURVE
E = EXTERNAL DISTANCE
e = SUPERELEVATION m/m
V = VEHICLE SPEED, kpm
V = VEHICLE SPEED, kpm
W = WIDENING
RP = REFERENCE POINT
BM = BENCH MARK
AH = AHEAD STATIONING
BK = BACK STATIONING
EQ = EQUATION
ELEV = ELEVATION
MFL = MAX.FLOOD LEVEL
PVI = POINT OF VERTICAL INTERSECTION
STA. = STATION
g = GRADE IN %

NOTE:

FOR " Da " ASSUMED ARC = 100m
FOR " Dc " ASSUMED CHORD = 100m
ASSUMED " I " IS SUBTENDED BY A 20m ARC
NO HORIZONTAL CURVE IS REQUIRED WHERE THE CENTRAL ANGLE IS LESS THAN ONE (1) DEGREE
ALGEBRAIC DIFFERENCE IS 0.50% OR LESS.

LEGEND:

PI = POINT OF INTERSECTION
PC = POINT OF CURVATURE
PT = POINT OF TANGENCY
I/IC = INTERSECTION ANGLE (CENTRAL ANGLE)
Da = DEGREE OF CURVE (ARC DEFINITION)
Dc = DEGREE OF CURVE (CHORD DEFINITION)
T = TANGENT LENGTH
R = HORIZONTAL RADIUS
Lc = LENGTH OF CURVE
C = CHORD LENGTH
E = EXTERNAL DISTANCE
M = MIDDLE ORDINATE
LVC = LENGTH OF VERTICAL CURVE
PVC = POINT OF VERTICAL CURVATURE
PVT = POINT OF VERTICAL TANGENCY
PVI = POINT OF VERTICAL INTERSECTION
Mo = MIDDLE ORDINATE
Rv = APPROXIMATE RADIUS OF VERTICAL CURVE
g1,g2 =GRADES IN %
Lo = DISTANCE TO LOWEST OR HIGHEST POINT
x = DISTANCE FROM PVC OR PVT TO ANY POINT ON CURVE
y = VERTICAL OFFSET AT DISTANCE x

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ITEM SPECIFICATION

ITEM B.4(10) - MISCELLANEOUS SURVEY AND STAKING

PRIOR TO THE COMMENCEMENT OF THE ACTUAL CONSTRUCTION, SURVEY AND STAKING SHALL BE CONDUCTED BY THE WINNING BIDDER IN COORDINATION WITH THE IMPLEMENTING OFFICE CONCERNED WHEREIN THE RESULTING DATA WILL BE REFLECTED ON THE AS-STAKED PLAN WHICH SHALL BE APPROVED BY THE PROPER AUTHORITIES. BEFORE THE START OF ACTUAL CONSTRUCTION, THE AS-STAKED PLAN SHOULD BE SUBMITTED TO THE DISTRICT OFFICE IN ORDER THAT IMMEDIATE STEPS MAY BE UNDERTAKEN TO CORRECT OR ADJUST WHATEVER APPRECIABLE DEVIATION THERE MAY BE FROM THE ORIGINAL PLAN.

ITEM B.5(1) - PROJECT BILLBOARD

THIS ITEM IS TO COMPLY WITH THE REQUIREMENT ISSUED BY THE DEPARTMENT AND THE COMMISSION ON AUDIT.

ITEM B.7(1) OCCUPATIONAL SAFETY AND HEALTH PROGRAM

THE CONTRACTOR HAS TO COMPLY WITH THE PROVISION OF SAFETY AND HEALTH PROGRAM AND THE REQUIREMENT OF THE CONSTRUCTION SAFETY PROTOCOLS.

ITEM B.9(1) MOBILIZATION / DEMOBILIZATION

THE MOBILIZATION OF THE CONTRACTORS EQUIPMENT AND MATERIALS ARE TAKEN INTO CONSIDERATION AS PROVIDED FOR IN THE CONTRACT BUT NOT TO EXCEED 10% OF THE ESTIMATED DIRECT COST FOR THE CONTRACT.

ITEM B.13 ADDITIONAL GEOTECHNICAL INVESTIGATION

PROVIDES UNIFORM APPROACH IN THE CONDUCT OF GEOLOGICAL AND GEOTECHNICAL INVESTIGATIONS AS DESIGN INPUT, MONITORING AND DESIGN ASSESSMENT OF INFRASTRUCTURE PROJECTS.

ITEM 801 (1) REMOVAL OF STRUCTURES AND OBSTRUCTION

THIS ITEM SHALL CONSIST OF THE REMOVAL WHOLLY OR IN PART, AND SATISFACTORY DISPOSAL OF ALL BUILDINGS, FENCES, STRUCTURES, OLD PAVEMENTS, ABANDONED PIPE LINES, AND ANY OTHER OBSTRUCTIONS WHICH ARE NOT DESIGNATED OR PERMITTED TO REMAIN, EXCEPT FOR THE OBSTRUCTIONS TO BE REMOVED AND DISPOSED OFF UNDER OTHER ITEMS IN THE CONTRACT. IT SHALL ALSO INCLUDE THE SALVAGING OF DESIGNATED MATERIALS, AND BACKFILLING THE RESULTING TRENCHES, HOLES AND PITS.

ITEM 900 (1) C - STRUCTURAL CONCRETE, CLASS A, 28 DAYS

(a) THIS ITEM WILL BE USE SPECIFICALLY AS FOUNDATION FOR ITEM 1711(1) STONE MASONRY

(b) UNLESS OTHERWISE INDICATED ON PLANS, THE CONCRETE CLASS AND STRENGTH SHALL BE IN ACCORDANCE WITH THE HIGHWAYS AND BRIDGES SPECIFICATIONS.

CLASS	28 DAYS CYLINDER STRENGTH		MAX SIZE OF COARSE AGGREGATES mm (in)
	MPa	Psi	
A	20.7	3000	38 (1-1/2)
B	16.50	2400.00	50 (2)
C	20.70	3000.00	12.7 (1/2)
P	37.70	5000.00	19 (3/4)
LEAN	9.90	1400.00	

(c) THIS ITEM SHALL CONSIST OF FURNISHING, PLACING AND FINISHING CONCRETE IN BUILDINGS AND RELATED STRUCTURES, FLOOD CONTROL AND DRAINAGE, PORTS, AND WATER SUPPLY STRUCTURES INACCORDANCE WITH THIS SPECIFICATION AND CONFORMING TO THE LINES, GRADES, AND DIMENSION SHOWN ON THE PLANS.

ITEM 902 (1) a1 - REINFORCING STEEL (DEFORMED), GRADE 40

THIS ITEM SHALL CONSIST OF FURNISHING, BENDING, FABRICATING AND PLACING OF STEEL REINFORCEMENT OF THE TYPE, SIZE, SHAPE AND GRADE REQUIRED IN ACCORDANCE WITH THIS SPECIFICATION AND IN CONFORMITY WITH THE REQUIREMENTS SHOWN ON THE PLANS OR AS DIRECTED BY THE ENGINEER.

ITEM 1702 (1) a - STRUCTURE EXCAVATION, COMMON SOIL

THIS ITEM SHALL CONSIST OF NECESSARY EXCAVATION FOR FOUNDATION OF BRIDGES, CULVERTS, UNDERDRAINS, AND OTHER STRUCTURES NOT OTHERWISE PROVIDED FOR IN THE SPECIFICATION. EXCEPT AS OTHERWISE PROVIDED FOR PIPE CULVERTS, THE BACKFILLING OF COMPLETED STRUCTURES AND THE DISPOSAL OF ALL EXCAVATED SURPLUS MATERIALS, SHALL BE IN ACCORDANCE WITH THESE SPECIFICATION AND IN REASONABLY CLOSE CONFORMITY WITH THE PLANS OR AS ESTABLISHED BY THE ENGINEER.

ITEM 1704 (1) b - EMBANKMENT, FROM BORROW

THIS ITEM SHALL CONSIST OF THE CONSTRUCTION OF EMBANKMENT IN ACCORDANCE WITH THIS SPECIFICATION AND IN CONFORMITY WITH THE LINES, GRADES AND DIMENSION SHOWN ON THE PLANS OR ESTABLISHED BY THE ENGINEER.

EMBANKMENTS SHALL BE CONSTRUCTED OF SUITABLE MATERIALS, IN CONSONANCE WITH THE FOLLOWING DEFINITIONS:

1. SUITABLE MATERIAL - MATERIAL WHICH IS ACCEPTABLE IN ACCORDANCE WITH THE CONTRACT AND WHICH CAN BE COMPACTED IN THE MANNER SPECIFIED IN THIS ITEM. IT CAN BE COMMON MATERIAL ROCK.

   SELECT BORROW, FOR TOPPING - SOIL OF SUCH GRADATION THAT ALL PARTICLES WILL PASS A SIEVE WITH 75 MM SQUARE OPENINGS AND NOT MORE THAN 15 MASS PERCENT WILL PASS THE 0.075 MM (#200) SIEVE, AS DETERMINED BY AASHTO T 11. THE MATERIAL SHALL HAVE A PLASTICITY INDEX OF NOT MORE THE 6 AS DETERMINED BY AASHTO T 90 AND A LIQUID LIMIT OF NOT MORE THAN 30 AS DETERMINED BY AASHTO T 89.

2. UNSUITABLE MATERIAL - MATERIAL OTHER THAN SUITABLE MATERIALS SUCH AS:

   (a) MATERIALS CONTAINING DETERMINED QUANTITIES OF ORGANIC MATERIALS, SUCH AS GRASS, ROOTS AND SEWERAGE.
   (b) ORGANIC SOILS SUCH AS PEAT AND MUCK.
   (c) SOILS WITH LIQUID LIMIT EXCEEDING 80 AND/OR PLASTICITY INDEX EXCEEDING 55.
   (d) SOILS WITH A NATURAL WATER CONTENT EXCEEDING 100%.
   (e) SOILS WITH VERY LOW NATURAL DENSITY, 800 kg/m³ OR LOWER.
   (f) SOILS THAT CANNOT BE PROPERLY COMPACTED AS DETERMINED BY THE ENGINEER.

ITEM 1711(1) - STONE MASONRY

ITEM 1711 - STONE MASONRY REFER TO ITEM 506, PART G, VOLUME II (BLUE BOOK 2013)

(a) SIZE AND SHAPE - UNLESS OTHER SIZE ARE SHOWN ON THE PLAN, STONES SHALL HAVE A THICKNESS OF NOT LESS THAN 150mm, AND WIDTHS OF NOT LESS THAN ONE AND ONE-HALF TIMES THEIR RESPECTIVE THICKNESS, AND LENGTHS OF NOT LESS THAN ONE AND ONE-HAFT TIMES THEIR RESPECTIVE WIDTHS. EACH STONE SHALL BE OF GOOD SHAPE AND BE FREE OF DEPRESSIONS AND PROJECTIONS THAT MIGHT WEAKEN OR PREVENT IT FROM BEING PROPERLY BEDDED.

(b) DRESSING - THE STONE SHALL BE DRESSED TO REMOVE ANY THIN OR WEAK PORTIONS. FACE STONES SHALL BE DRESSED TO PROVIDE BED AND JOINT LINES THAT DO NOT VARY MORE THAN 20mm FROM THE TRUE LINES AND TO ENSURE THE MEETING OF BED AND JOINT LINES WITHOUT THE ROUNDING OF CORNERS OF THE STONES IN EXCESS OF 30mm IN RADIUS. BED SURFACE OF THE FACE STONES SHALL BE APPROXIMATELY NORMAL TO THE FACE OF THE STONES FOR ABOUT 80mm AND FROM THIS POINT MAY DEPART FROM A NORMAL PLANE NOT TO EXCEED 50mm IN 300mm.

(c) EXPOSED FACE - FACE STONES SHALL BE PITCHED TO THE LINE ALONG THE BEDS AND JOINTS. THE MAXIMUM PROJECTION OF ROCK FACES BEYOND THE PITCH SHALL NOT BE MORE THAN 50mm.

ITEM 1717(4)b - FURNISH AND DRIVEN OF STEEL SHEET PILE

ITEM 1717 - SHEET PILES REFER TO ITEM 509, PART G, VOLUME II (BLUE BOOK 2013)

(a) STEEL SHEET PILES SHALL MEET THE REQUIREMENTS OF AASHTO M 202 (ASTM A 328), OR AASHTO M 223. ALL OTHER SHEET PILES SHALL MEET THE REQUIREMENTS PRESCRIBED ABOVE THE PARTICULAR MATERIAL SPECIFIED. THE JOINS SHALL BE PRACTICALLY WATER-TIGHT WHEN THE PILES ARE IN PLACE.

(b) ALL SHEET PILES TO BE USED SHOULD BE HOT-ROLLED STEEL SHEET PILES WITH THICK OF FLANGE 11.3mm AND 11.2mm FOR WEB, EFFECTIVE WIDTH OF 400mm, & UNIT WT. OF 95.8kg/m OR GREATER.

(c) STEEL SHEET PILE SHALL BE OF THE TYPE, WEIGHT AND SECTION MODULUS INDICATED ON THE PLANS OR SPECIAL PROVISIONS SHALL BE CONFORM TO THE REQUIREMENT OF ITEM 400, PILING SUB SECTION 400.2.7, SHEET PILES. SHEET PILES SHALL BE DRIVEN TO ELEVATION SHOWN ON THE PLANS OR AS DIRECTED BY THE ENGINEER, WHERE IMPRACTICAL TO DRIVE TO PLAN ELEVATION DUE TO SUBSURFACE CONDITION, THE DRIVING OF PILES MAY BE TOPPED AT THE HIGHER ELEVATION WITH THE WRITTEN PERMISSION OF THE ENGINEER. HOWEVER, BEFORE GRANTING SUCH PERMISSION, THE ENGINEER SHALL ASCERTAIN THAT THE CONTRACTOR HAS ADEQUATE EQUIPMENT FOR THE REQUESTED DRIVING AND THAT THE PILES CAN BE DRIVEN TO THE PLAN ELEVATION WITH THE PROPER USE OF THIS EQUIPMENT.

(d) THE TOP THE PILING SHALL BE DRIVEN OR CUT-OFF TO A STRAIGHT LINE AT THE ELEVATION INDICATED ON THE PLANS. THE REQUIREMENTS GOVERNING THE INSTALLATION OF SHEET PILING, SHALL CONFORM IN GENERAL TO THOSE GOVERNING BEARING PILES AS SET FORTH UNDER ITEM 1717, PILING CONFIRMATORY BORING TEST SHALL BE CONDUCTED PRIOR TO THE PROJECT IMPLEMENTATION.

(e) CLASS "A" STRUCTURAL CONCRETE SHALL BE USED WITH A MINIMUM COMPRESSIVE STRENGTH OF 20.70 Mpa FOR PILE CAP.

(f) ALL REINFORCEMENT SHALL HAVE A MINIMUM GRADE OF 40 (FY275.80 Mpa).

(g) ALLOWABLE STRESS FOR STEEL SHEET PILE SHALL BE 1800 kg/m²

(h) THE CENTER OF LIFTING HOLE SHALL BE LOCATED AT DISTANCE OF 150mm FROM END OF EACH PILE, DIAMETER OF LIFTING HOLES SHALL BE 32mm.

(i) VERTICAL AND HORIZONTAL REINFORCEMENT SHALL BE WELDED ON THE FACE OF THE SHEET PILE FOR CONNECTION.

REPUBLIC OF THE PHILIPPINES
DEPARTMENT OF PUBLIC WORKS AND HIGHWAYS
CEBU 4TH DISTRICT ENG'G OFFICE
POBLACION DALAGUETE, CEBU, REGION VII

PROJECT NAME AND LOCATION:	SHEET CONTENTS:	PREPARED:	REVIEWED:	SUBMITTED:	RECOMMENDED:	APPROVED:	SET NO.	SHEET NO.
C.Y. 2025 PROJECT DETAILED ENGINEERING DESIGN PLAN FOR **CONVERGENCE AND SPECIAL SUPPORT PROGRAM: SUSTAINABLE INFRASTRUCTURE PROJECTS ALLEVIATING GAPS (SIPAG), FLOOD MITIGATION STRUCTURES PROTECTING MAJOR/STRATEGIC PUBLIC BUILDINGS/FACILITIES, CONSTRUCTION OF FLOOD CONTROL STRUCTURE, BARANGAY LILOAN, SANTANDER, CEBU**	ITEM SPECIFICATION - 1	**CHRISTIAN JAHWEH S. SABADO** ENGINEER II DATE:	**SHANNEN B. MARABILES** ENGINEER II DATE:	**LENARD A. PANUGALINOG** CHIEF, PLANNING & DESIGN SECTION DATE:	**ROSALIND R. VASQUEZ** OIC - ASSISTANT DISTRICT ENGINEER DATE:	**SUSAN L. ORNOPIA-AROA** OIC - DISTRICT ENGINEER DATE:	B 3 | 4	6 34

CONSTRUCTION METHODOLOGY

FLOOD CONTROL (ROADS, DRAINAGE AND STRUCTURES)

IMMEDIATELY AFTER ALL MATERIALS TO BE USED IN THE PROJECT HAVE PASSED THE MINIMUM TESTING REQUIREMENTS BASED ON THE STANDARD SPECIFICATIONS FOR DPWH, THE MANNER OF OPERATION IN THIS PARTICULAR PROJECT SHALL HAVE THE FOLLOWING SEQUENCE:

1. STANDARD SPECIFICATIONS

   ALL WORKS SHALL COMPLY WITH DPWH STANDARD SPECIFICATIONS FOR HIGHWAYS, BRIDGES, AND AIRPORTS, VOLUME II 2013 EDITION, SPECIAL PROVISIONS AND SUPPLEMENTAL SPECIFICATIONS PERTAINING TO THE PROJECT, CONDITIONS OF THE CONTRACT (INTERNATIONATIONAL) FOR WORKS OF CIVIL ENGINEERING CONSTRUCION, 2nd EDITION, PREPARED BY F.I.D.C. SHALL ALSO GOVERN.

   UNLESS OTHERWISE SPECIFIED, DIMENSIONS ARE EXPRESSED IN MILLIMETER WHILE DISTANCES AND ELEVATIONS ARE IN TERMS OF METER.

   FIELD DATA OF THIS PROJECT IS BASED ON ACTUAL SURVEY CONDUCTED BY THE SURVEY TEAM OF THE DPWH CEBU 4TH DISTRICT ENGINEERING OFFICE.

   REFER TO A SEPARATE QUANTITY CALCULATION SHEETS FOR THE DETAILED COMPUTATIONS OF QUANTITIES OF THE ITEMS OF WORK OUTLINED FOR THIS PROJECT.

   THE IMPLEMENTING OFFICE SHALL IDENTIFY THE LOCATIONS AND PROVIDE ACCESSIBILITY FACILITIES FOR PERSONS WITH DISABILITY IN ACCORDANCE WITH D.O. 37, SERIES OF 2009.

   PRIOR TO THE COMMENCEMENT OF THE ACTUAL CONSTRUCTION, AN AS-STAKED SURVEY SHALL BE CONDUCTED BY THE WINNING BIDDER IN COORDINATION WITH THE IMPLEMENTING OFFICE CONCERNED WHEREIN THE RESULTING PLAN AS-STAKED PLAN SHALL BE APPROVED BY THE PROPER AUTHORITIES. DEGREE.

   BEFORE THE START OF ACTUAL CONSTRUCTION, THE AS- STAKED PLAN SHOULD BE SUBMITTED TO THE IMPLEMENTING OFFICE IN ORDER THAT IMMEDIATE STEPS MAY BE UNDERTAKEN TO CORRECT OR ADJUST WHATEVER APPRECIABLE DEVIATIONTHERE MAY BE FROM THE ORIGINAL PLAN.

2. QUALITY CONTROL

   SUBSTANDARD MATERIALS WILL RESULT IN SUB STANDARD WORK. THE RESPONSIBILITY FOR TESTING AND ACCEPTING LIES FULLY WITH THE CONTRACTOR, AND IT IS THE RESPONSIBILITY OF THE MATERIALS ENGINEER TO OVERSEE ALL TESTING AND TO ENSURE THAT THE TESTS COMPLY WITH THE SPECIFICATIONS AND PROCEDURES.

3. MOBILIZATION SHALL CONSIST OF MOBILIZATION OF EQUIPMENT AND MANPOWER, MATERIALS AND OTHER ITEMS THAT SHALL BE OF USE IN THE IMPLEMENTATION OF THE PROJECT. ALL CEMENT MATERIALS SHALL BE STORED IMMEDIATELY UPON DELIVERY AT SITE, INA WEATHER PROOF BUILDING WHICH WILL PROTECT THE CEMENT FROM DAMPNESS. THE FLOOR SHALL BE RAISED FROM THE GROUND BY 4 INCHES. ALL SIGNAGES AND PROJECT BILLBOARDS SHALL BE PLACED AT DESIGNATED LOCATIONS APPROVED BY THE PROJECT ENGINEER. DEMOBILIZATION FOLLOWS ONLY AFTER THE PROJECT WAS FINALLY ACCEPTED AND THE SURROUNDINGS ARE PROPERLY CLEANED

4. FACILITIES FOR ENGINEERS SHALL CONSISTS OF OFFICES AND LABORATORIES FOR PROJECT ENGINEERS. THE CONTRACTOR SHALL PROVIDE AND MAINTAIN FIELD OFFICES AND TESTING LABORATORIES, INCLUDING THE NECESSARY ELECTRICITY, WATER DRAINAGE AND TELEPHONE SERVICES FOR THE USE OF THE ENGINEER AND HIS STAFF. THEIR LOCATION AND FINAL PLAN SHALL REQUIRE THE APPROVAL OF THE PROJECT ENGINEER PRIOR TO THE START OF CONSTRUCTION. IT IS INTENT THAT THE LOCATION SITE SHOULD BE IN GOVERNMENT OWNED LOT SO THAT THE USE OF THE GOVERNMENT TO THESE FACILITIES CAN BE MAXIMIZED.
   OTHER GENERAL REQUIREMENTS SHALL BE PROVIDED BY THE CONTRACTOR AND SHALL MAINTAIN SUCH OFFICES, STORES, WORKSHOPS LATRINES AND MESSING ACCOMMODATIONS AS ARE NECESSARY. THESE SHOULD BE LOCATED IN THE CONTRACTORS COMPOUND, DISTINCT AND SEPARATE FROM ENGINEER'S COMPOUND. THE DIMENSIONS AND LAYOUT OF THE BUILDINGS AND PLACES SHALL BE SUBJECT TO THE APPROVAL OF THE PROJECT ENGINEER. THE CONTRACTOR SHALL PROVIDE AND MAINTAIN THROUGHOUT THE DURATION OF THE CONTRACT.

5. REMOVAL OF STRUCTURES AND OBSTRUCTION FOLLOWS. THIS ITEM SHALL CONSIST OF THE REMOVAL OF WHOLLY OR IN PART AND SATISFACTORY DISPOSAL OF ALL FENCES, STRUCTURES, OLD PAVEMENTS, ABANDONED PIPE LINES AND ANY OBSTRUCTIONS TO BE REMOVED AND DISPOSED UNDER THIS ITEM.

   THE CONTRACTOR SHALL PERFORM THE WORK DESCRIBED ABOVE, WITHIN AND ADJACENT TO THE ROADWAY, ON GOVERNMENT LAND OR EASEMENT, AS SHOWN ON THE PLANS OR AS DIRECTED BY THE ENGINEER. ALL DESIGNATED SALVABLE MATERIAL SHALL BE REMOVED, WITHOUT UNNECESSARY DAMAGE, IN SECTIONS OR PIECES WHICH MAY BE READILY TRANSPORTED, AND SHALL BE STORED BY THE CONTRACTOR AT SPECIFIED PLACES ON THE PROJECT OR AS OTHERWISE SHOWN IN THE SPECIAL PROVISIONS. PERISHABLE MATERIAL SHALL BE HANDLED AS DESIGNATED IN SUBSECTION 100.2.2 NONPERISHABLE MATERIAL MAY BE DISPOSED OFF OUTSIDE THE LIMITS OF VIEW FROM THE PROJECT WITH WRITTEN PERMISSION OF THE PROPERTY OWNER ON WHOSE PROPERTY THE MATERIAL IS PLACED. COPIES OF ALL AGREEMENTS WITH PROPERTY OWNERS ARE TO BE FURNISHED TO THE ENGINEER. BASEMENTS OR CAVITIES LEFT BY THE STRUCTURE REMOVAL SHALL BE FILLED WITH ACCEPTABLE MATERIAL TO THE LEVEL OF THE SURROUNDING GROUND AND, IF WITHIN THE PRISM OF CONSTRUCTION, SHALL BE COMPACTED TO THE REQUIRED DENSITY.

   ALL CONCRETE PAVEMENT, BASE COURSE, SIDEWALKS, CURBS, GUTTERS, ETC., DESIGNATED FOR REMOVAL, SHALL BE:

   i. BROKEN INTO PIECES AND USED FOR RIP-RAP ON THE PROJECT, OR BROKEN INTO PIECES. THE SIZE OF WHICH SHALL NOT EXCEED 300MM IN ANY DIMENSION AND STOCKPILED AT DESIGNATED LOCATIONS ON THE PROJECT FOR USE BY THE GOVERNMENT, OR OTHERWISE DEMOLISHED AND DISPOSED OFF AS DIRECTED BY THE ENGINEER. WHEN SPECIFIED BALLAST, GRAVEL,

   ii. BITUMINOUS MATERIALS OR OTHER SURFACING OR PAVEMENT MATERIALS SHALL BE REMOVED AND STOCKPILED AS

   iii. REQUIRED IN SUBSECTION 101.2.1, OTHERWISE SUCH MATERIALS SHALL BE DISPOSED OFF AS DIRECTED.
   THERE WILL BE NO SEPARATE PAYMENT FOR EXCAVATING FOR THE REMOVAL OF STRUCTURES AND OBSTRUCTIONS, OR FOR BACKFILLING AND COMPACTING THE REMAINING CAVITY.

6. EXCAVATION

   UNSUITABLE MATERIALS THAT MAY BE ENCOUNTERED DURING THE EXCAVATION SHOULD BE REMOVED TO THE SATISFACTION OF THE PROJECT ENGINEER.
   PHOTOGRAPHS SHOULD BE TAKEN BEFORE REPLACEMENT OF EXCAVATED MATERIALS AND SHALL BE MEASURED AND AGREED BY BOTH PARTIES THE CONTRACTOR AND THE PROJECT ENGINEER. THE VOLUME SHOULD BE RECORDED IN A LOG BOOK FOR RECORD PURPOSES. EXCAVATED MATERIALS SHOULD BE REMOVED FROM THE CONSTRUCTION SITE. THE HAULING AND THE DISPOSAL IS WITHIN THE AUTHORITY OF THE PROJECT ENGINEER.

7. FOUNDATION

   FOUNDATION OF STONE MASONRY WORKS SHALL SIT ON A FIRM AND STABLE FOUNDATION. SOFT SPOTS UNDER THE FOUNDATION SHALL BE REMOVED AND REPLACED WITH SUITABLE BEDDING MATERIALS OR CONCRETE CLASS "A".

8. EMBANKMENT
   SOFT SPOTS BETWEEN THE CUT FACE AND SLOPE/EMBANKMENT PROTECTION WALLS MUST BE FILLED WITH ROCKS OR SUITABLE MATERIALS. SUCH BACKFILL MATERIALS PLACED BEHIND THE WALL SHALL BE FREE DRAINING, NON EXPANSIVE AND WATER SHALL BE DRAINED BY WEEPHOLES PLACED AT SUITABLE INTERVALS AND ELEVATIONS.

   THE DEPTH OF PENETRATION SHALL BE MEASURED FROM THE LEVEL OF THE ORIGINAL GROUND SURFACE AND SHALL NOT INCLUDE EXCAVATED MATERIALS.

9. STRUCTURE EXCAVATION SHALL CONSISTS OF THE NECESSARY EXCAVATION WORK FOR FOUNDATION, CULVERTS, UNDER DRAINS, AND OTHER STRUCTURES. THE BACKFILLING OF COMPLETED STRUCTURES AND THE DISPOSAL OF EXCAVATED SURPLUS MATERIALS SHALL BE IN ACCORDANCE WITH THE SPECIFICATIONS AND IN REASONABLY CLOSE CONFORMITY WITH THE PLANS OR AS ESTABLISHED BY THE PROJECT ENGINEER.

   TRENCHES OR FOUNDATION PITS FOR STRUCTURES OR STRUCTURE FOOTINGS SHALL BE EXCAVATED TO THE LINES AND GRADES OR ELEVATIONS SHOWN ON THE PLANS OR AS STAKED BY THE PROJECT ENGINEER. THEY SHALL BE OF SUFFICIENT SIZE TO PERMIT THE PLACING OF STRUCTURES OF THE FULL WIDTH AND LENGTH SHOWN ON THE PLAN.

10. REINFORCING STEEL, GRADE 40 SHALL CONSIST OF FURNISHING, BENDING, FABRICATING AND PLACING OF STEEL REINFORCEMENT OF TYPE, SIZE, SHAPES AND GRADES REQUIRED IN ACCORDANCE WITH THE SPECIFICATIONS AND IN CONFORMITY WITH THE REQUIREMENTS SHOWN ON THE PLANS INTENDED FOR BOX CULVERTS, CATCH BASINS AND GUARDRAILS.

11. CONSTRUCTION OF STRUCTURAL CONCRETE CLASS "A" SHALL CONSIST OF FURNISHING, PLACING AND FINISHING CONCRETE FOR BOX CULVERT AND CATCH BASIN INCLUDING THE NECESSARY FORMWORKS IN CONFORMITY WITH LINES, GRADES AND DIMENSIONS SHOWN ON THE PLANS.
    CONCRETE SHALL HAVE THE CONSISTENCY SUCH THAT IT WILL BE WORKABLE IN THE REQUIRED POSITION, SUCH THAT IT WILL FLOW AROUND REINFORCING STEEL .

12. STONE MASONRY

    THE STONE SHALL BE CLEAN, HARD & DURABLE & SHALL BE SUBJECT TO ENGINEERS APPROVAL. STONES SHOULD HAVE A THICKNESS OF NOT LESS THAN 150 MM. AND WIDTH OF NOT LESS THAN ONE & ONE-HALF TIMES THEIR RESPECTIVE THICKNESS, AND LENGTH OF NOT LESS THAN ONE & ONE-HALF TIMES THEIR RESPECTIVE WIDTH. FACE STONE SHALL BE DRESSED TO PROVIDE BED & JOINT LINES THAT DO NOT VARY MORE THAN 20MM FROM THE TRUE LINES & TO ENSURE THE MEETING OF BED JOINT LINES WITHOUT THE ROUNDING OF THE CORNERS OF THE STONES IN EXCESS OF 30MM IN RADIUS. FACE STONES SHALL BE PITCHED TO THE LINE ALONG THE BEDS 7 JOINTS THE MAXIMUM PROJECTION OF THE ROCK FACES BEYOND THE PITCH LINES SHALL NOT BE MORE THAN 50MM.

    THE MORTAR FOR THE STONE MASONRY SHALL BE COMPOSED OF ONE PART OF PORTLAND CEMENT AND TWO PARTS OF FINE AGGREGATES.

13. PILING

    THIS ITEM SHALL CONSIST OF PILLING, FURNISHED, DRIVEN OR PLACED, CUT AND SPLICED IN ACCORDANCE WITH THIS SPECIFICATION AND IN REASONABLY CLOSE CONFORMITY WITH THE PLANS. ALL PILES SHALL BE DRIVEN WITHIN AN ALLOWED VARIATION OF 20MM PER METER OF PILE LENGTH FROM THE VERTICAL OR BATTER AS SHOWN ON THE PLANS. THE MAXIMUM ALLOWABLE VARIATION AT THE BUTT END OF THE PILE SHALL BE 75MM IN ANY DIRECTIONS FROM THE LOCATION SHOWN ON THE PLANS OR AS DIRECTED BY THE ENGINEER. EACH PILE SHALL, AFTER DRIVING, BE WITHIN 150MM FROM THE THEORETICAL LOCATION UNDERNEATH THE SUPERSTRUCTURE IN CASE OF PILE BENTS. ALL PILES PUSHED UP BY THE DRIVING OF ADJACENT PILES OR ANY OTHER CAUSE SHALL BE REDRIVEN.

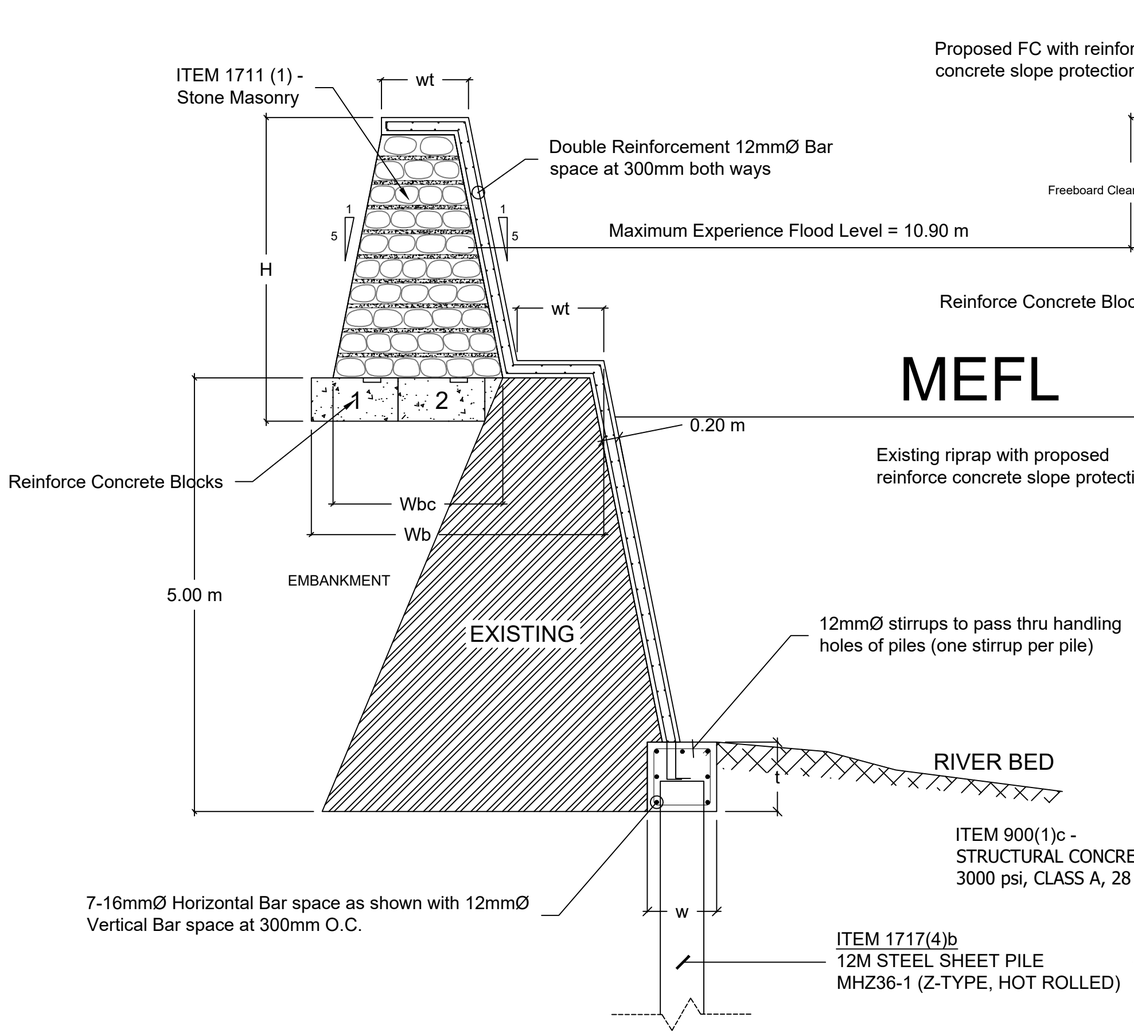
    ITEM 1717 - SHEET PILES REFER TO ITEM 400, PART F, VOLUME II (BLUE BOOK 2013)

REPUBLIC OF THE PHILIPPINES **DEPARTMENT OF PUBLIC WORKS AND HIGHWAYS** CEBU 4TH DISTRICT ENG'G OFFICE POBLACION DALAGUETE, CEBU, REGION VII	PROJECT NAME AND LOCATION: C.Y. 2025 PROJECT DETAILED ENGINEERING DESIGN PLAN FOR **CONVERGENCE AND SPECIAL SUPPORT PROGRAM: SUSTAINABLE INFRASTRUCTURE PROJECTS ALLEVIATING GAPS (SIPAG), FLOOD MITIGATION STRUCTURES PROTECTING MAJOR/STRATEGIC PUBLIC BUILDINGS/FACILITIES, CONSTRUCTION OF FLOOD CONTROL STRUCTURE, BARANGAY LILOAN, SANTANDER, CEBU**	SHEET CONTENTS: CONSTRUCTION METHODOLOGY	PREPARED: **CHRISTIAN JAHWEH S. SABADO** ENGINEER II DATE:	REVIEWED: **SHANNEN B. MARABILES** ENGINEER II DATE:	SUBMITTED: **LENARD A. PANUGALINOG** CHIEF, PLANNING & DESIGN SECTION DATE:	RECOMMENDED: **ROSALIND R. VASQUEZ** OIC - ASSISTANT DISTRICT ENGINEER DATE:	APPROVED: **SUSAN L. ORNOPIA-AROA** OIC - DISTRICT ENGINEER DATE:	SET NO. B 4 | 4	SHEET NO. 7 34

TYPICAL SECTION 2 DETAILS OF FLOOD CONTROL

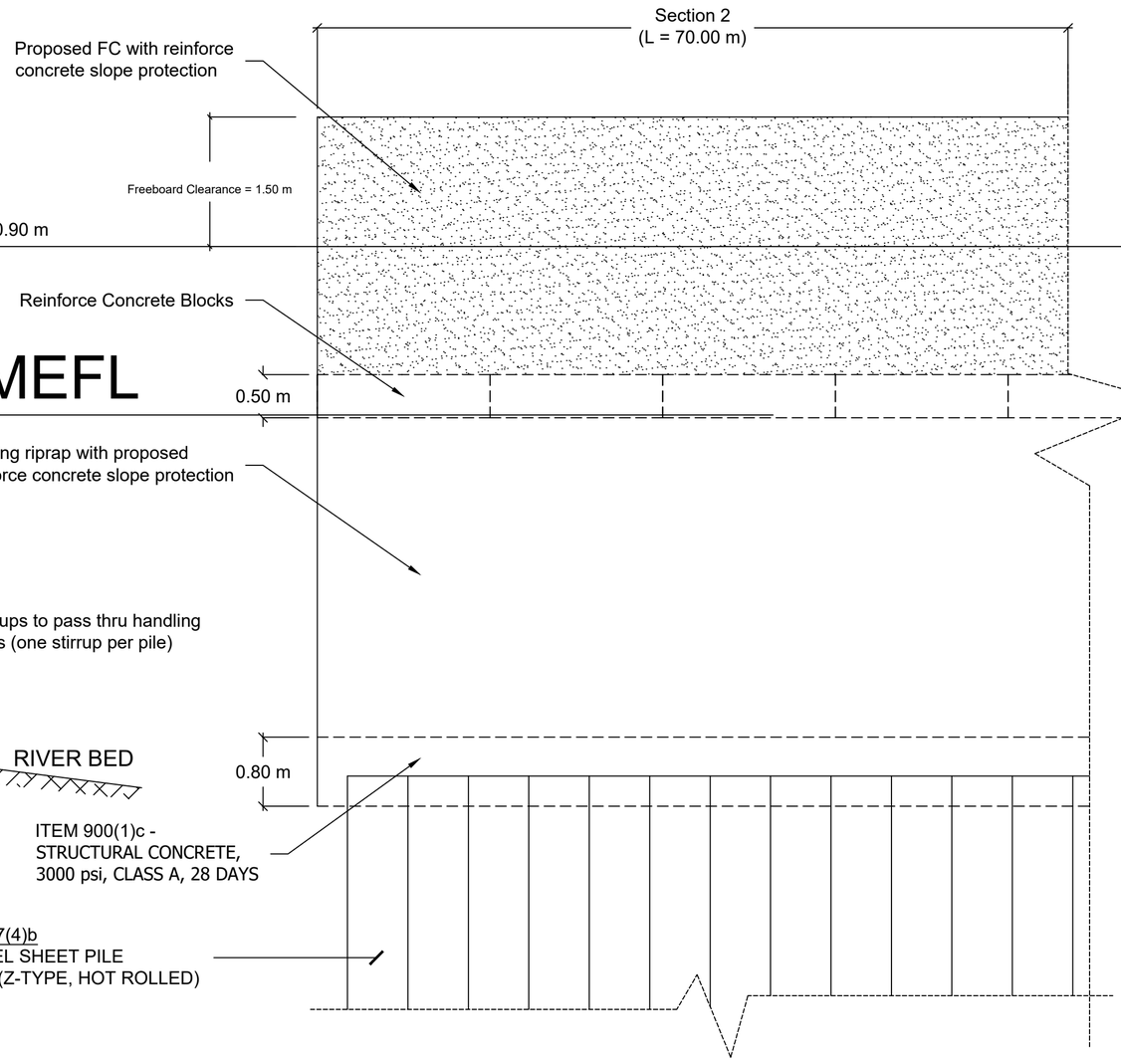
SECTION 2 LENGTH = 70.00 M

DIMENSIONS (mm)						TOTAL VOLUME		
Wt	Wb	Wbc	w	t	H	ITEM 1702(1)a	ITEM 1704(1)a	ITEM 1711(1)
1000	3370	1960	800	800	3500	92.180 cu.m	188.925 cu.m	274.330 cu.m



SECTION 2

SCALE 1 : 50 M



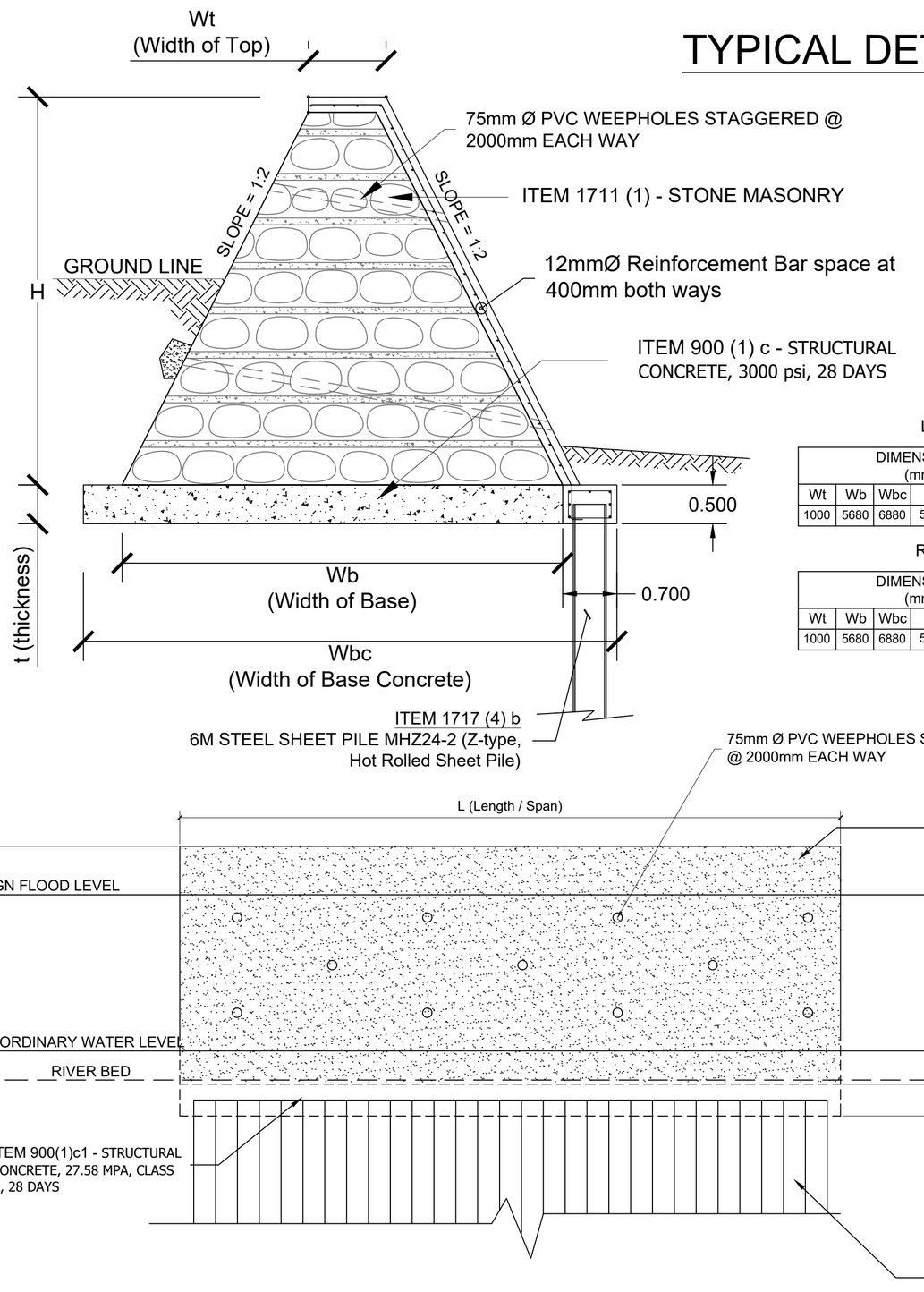
ELEVATION

SCALE 1 : 50 M

REPUBLIC OF THE PHILIPPINES
DEPARTMENT OF PUBLIC WORKS AND HIGHWAYS
CEBU 4TH DISTRICT ENG'G OFFICE
POBLACION DALAGUETE, CEBU, REGION VII

PROJECT NAME AND LOCATION:	SHEET CONTENTS:	PREPARED:	REVIEWED:	SUBMITTED:	RECOMMENDED:	APPROVED:	SET NO.	SHEET NO.
C.Y. 2025 PROJECT DETAILED ENGINEERING DESIGN PLAN FOR **CONVERGENCE AND SPECIAL SUPPORT PROGRAM: SUSTAINABLE INFRASTRUCTURE PROJECTS ALLEVIATING GAPS (SIPAG), FLOOD MITIGATION STRUCTURES PROTECTING MAJOR/STRATEGIC PUBLIC BUILDINGS/FACILITIES, CONSTRUCTION OF FLOOD CONTROL STRUCTURE, BARANGAY LILOAN, SANTANDER, CEBU**	TYPICAL SECTION 2 DETAILS OF FLOOD CONTROL	**CHRISTIAN JAHWEH S. SABADO** ENGINEER II DATE:	**SHANNEN B. MARABILES** ENGINEER II DATE:	**LENARD A. PANUGALINOG** CHIEF, PLANNING & DESIGN SECTION DATE:	**ROSALIND R. VASQUEZ** OIC - ASSISTANT DISTRICT ENGINEER DATE:	**SUSAN L. ORNOPIA-AROA** OIC - DISTRICT ENGINEER DATE:	D 7 | 11	8 40

TYPICAL DETAILS OF FLOOD CONTROL



LEFT SIDE LENGTH = 179.90 M

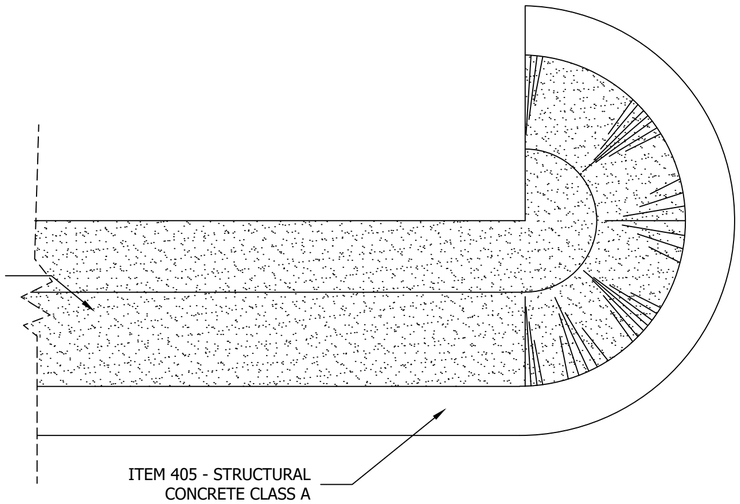
DIMENSIONS (mm)					TOTAL VOLUME		
Wt	Wb	Wbc	t	H	ITEM 1701(1)	ITEM 1701 (1) a	ITEM 1711 (1)
1000	5680	6880	500	5000	2937.111	1494.966	2829.287

RIGHT SIDE LENGTH = 172.20 M

DIMENSIONS (mm)					TOTAL VOLUME		
Wt	Wb	Wbc	t	H	ITEM 1701(1)	ITEM 1701 (1) a	ITEM 1711 (1)
1000	5680	6880	500	5000	2676.108	1126.800	2708.189

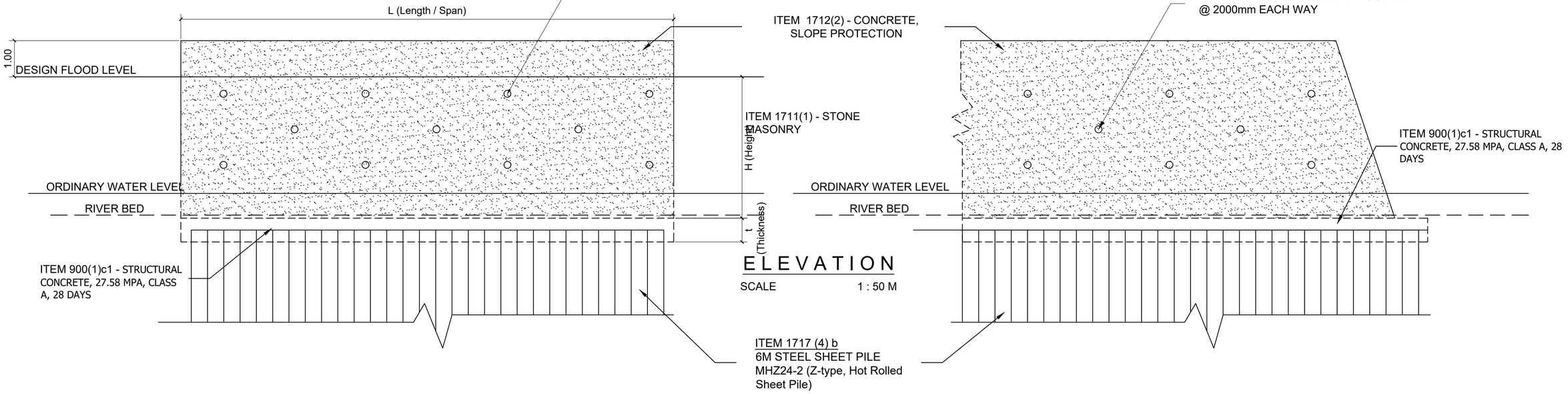
S E C T I O N

SCALE 1 : 50 M



PLAN- END PROTECTION WORKS

SCALE 1 : 50 M



E L E V A T I O N

SCALE 1 : 50 M

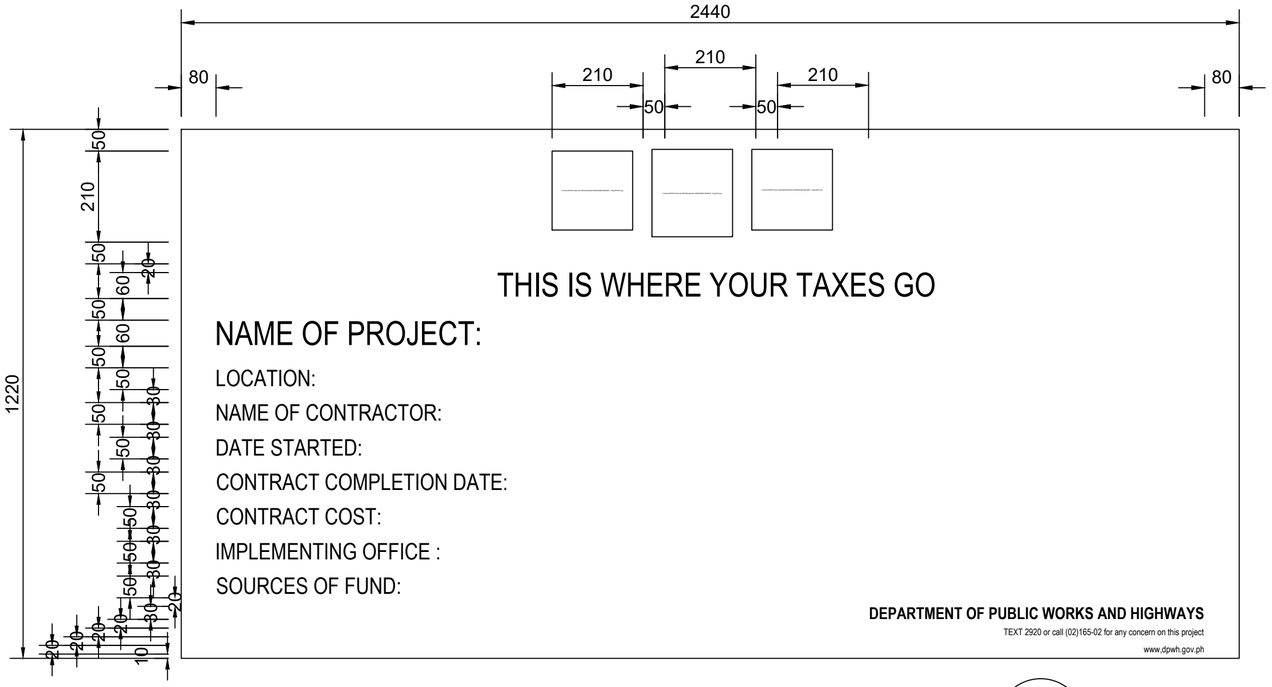
REPUBLIC OF THE PHILIPPINES
DEPARTMENT OF PUBLIC WORKS AND HIGHWAYS
CEBU 2ND DISTRICT ENG'G OFFICE
POBLACION DALAGUETE, CEBU, REGION VII

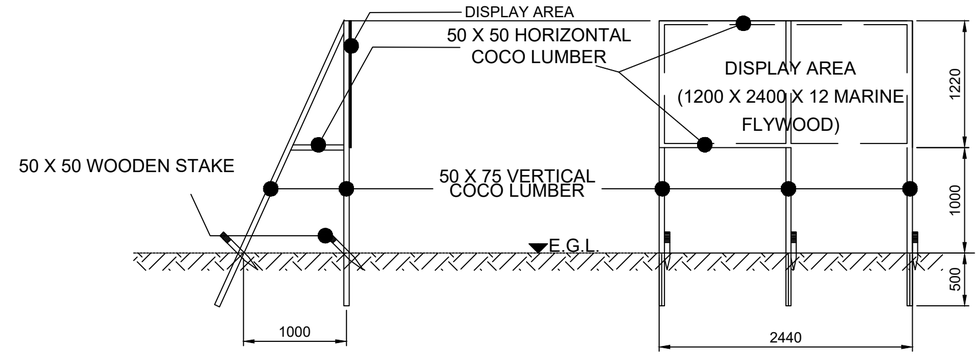
PROJECT NAME AND LOCATION:
C.Y. 2025 PROJECT
DETAILED ENGINEERING DESIGN PLAN FOR
CONVERGENCE AND SPECIAL SUPPORT PROGRAM: SUSTAINABLE INFRASTRUCTURE PROJECTS ALLEVIATING GAPS (SIPAG), FLOOD MITIGATION STRUCTURES PROTECTING MAJOR/STRATEGIC PUBLIC BUILDINGS/FACILITIES, CONSTRUCTION OF FLOOD CONTROL STRUCTURE, BARANGAY LILOAN, SANTANDER, CEBU

SHEET CONTENTS: TYPICAL DETAILS OF FLOOD CONTROL

	CHECKED:	SUBMITTED:	RECOMMENDED:	APPROVED:
	SHANNEN B. MARABILES	**LENARD A. PANUGALINOG**	**ROSALIND R. VASQUEZ**	**SUSAN L. ORNOPIA-AROA**
CHRISTIAN JAHWEH S. SABADO	ENGINEER II	CHIEF, PLANNING & DESIGN SECTION	OIC - ASSISTANT DISTRICT ENGINEER	OIC - DISTRICT ENGINEER
ENGINEER II	DATE:	DATE:	DATE:	DATE:
DATE:				

SET NO. | SHEET NO. 9 / 6

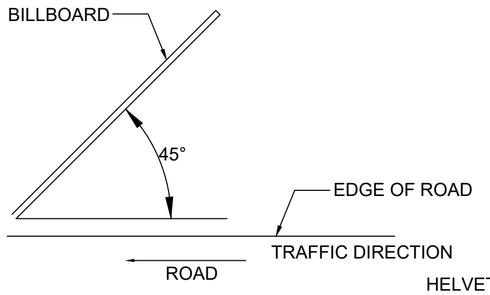




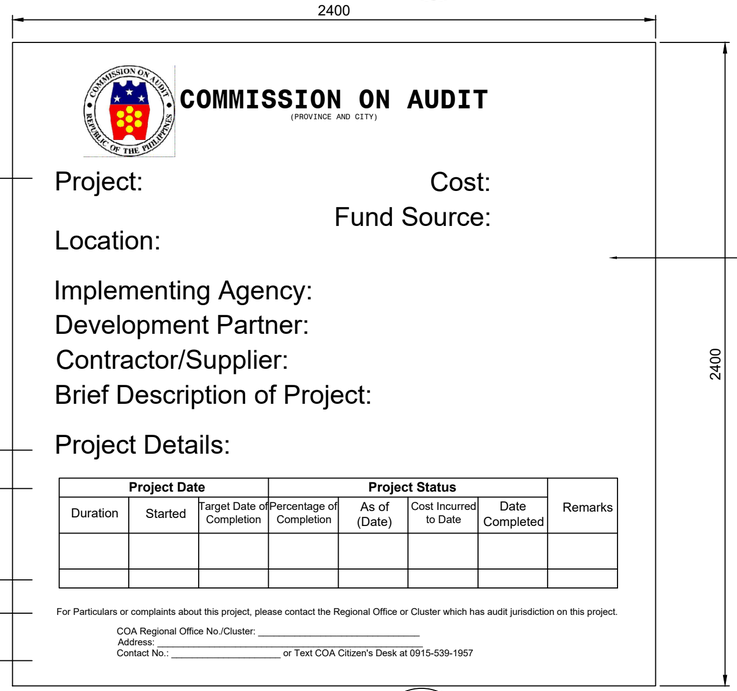
TYPICAL FRAME ELEVATION

FRONT ELEVATION

1 STANDARD DPWH PROJECT BILLBOARD
SCALE: NTS



BILLBOARD ORIENTATION



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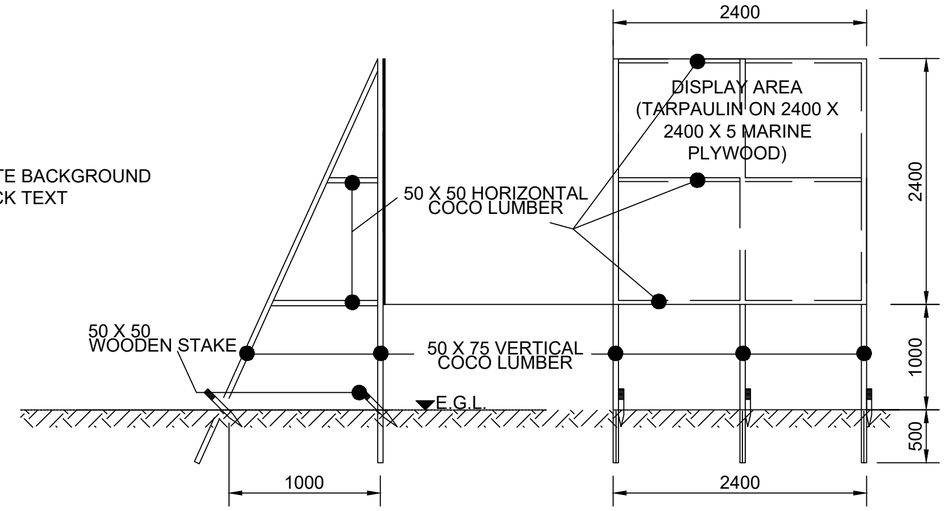

TYPICAL FRAME ELEVATION

FRONT ELEVATION

2 STANDARD COA PROJECT BILLBOARD
SCALE: NTS

REPUBLIC OF THE PHILIPPINES
DEPARTMENT OF PUBLIC WORKS AND HIGHWAYS
CEBU 4TH DISTRICT ENG'G OFFICE
POBLACION DALAGUETE, CEBU, REGION VII

PROJECT NAME AND LOCATION:	SHEET CONTENTS:	PREPARED:	REVIEWED:	SUBMITTED:	RECOMMENDED:	APPROVED:	SET NO.	SHEET NO.
C.Y. 2025 PROJECT DETAILED ENGINEERING DESIGN PLAN FOR **CONVERGENCE AND SPECIAL SUPPORT PROGRAM: SUSTAINABLE INFRASTRUCTURE PROJECTS ALLEVIATING GAPS (SIPAG), FLOOD MITIGATION STRUCTURES PROTECTING MAJOR/STRATEGIC PUBLIC BUILDINGS/FACILITIES, CONSTRUCTION OF FLOOD CONTROL STRUCTURE, BARANGAY LILOAN, SANTANDER, CEBU**	STANDARD DPWH PROJECT BILLBOARD STANDARD COA PROJECT BILLBOARD	**CHRISTIAN JAHWEH S. SABADO** ENGINEER II DATE:	**SHANNEN B. MARABILES** ENGINEER II DATE:	**LENARD A. PANUGALINOG** CHIEF, PLANNING & DESIGN SECTION DATE:	**ROSALIND R. VASQUEZ** OIC - ASSISTANT DISTRICT ENGINEER DATE:	**SUSAN L. ORNOPIA-AROA** OIC - DISTRICT ENGINEER DATE:	E 1 1	34 34