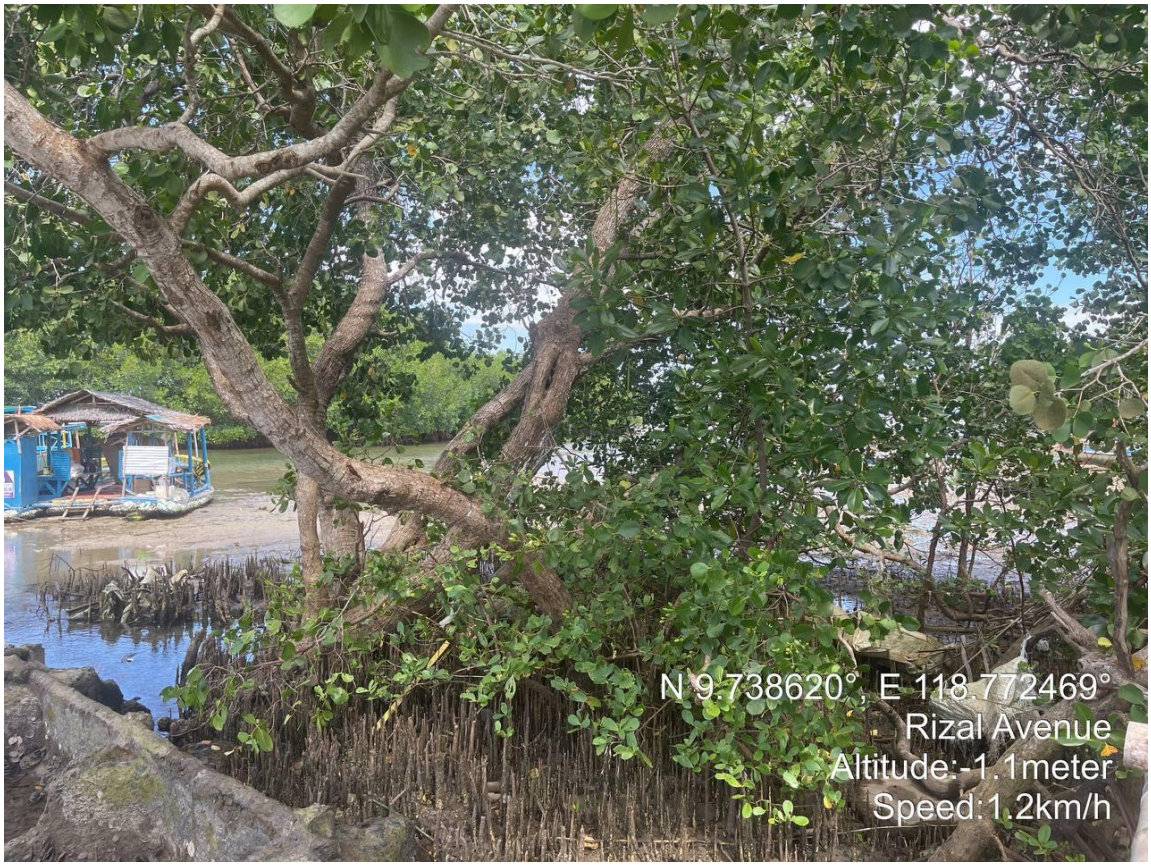
ANNEX A
Mangrove Area

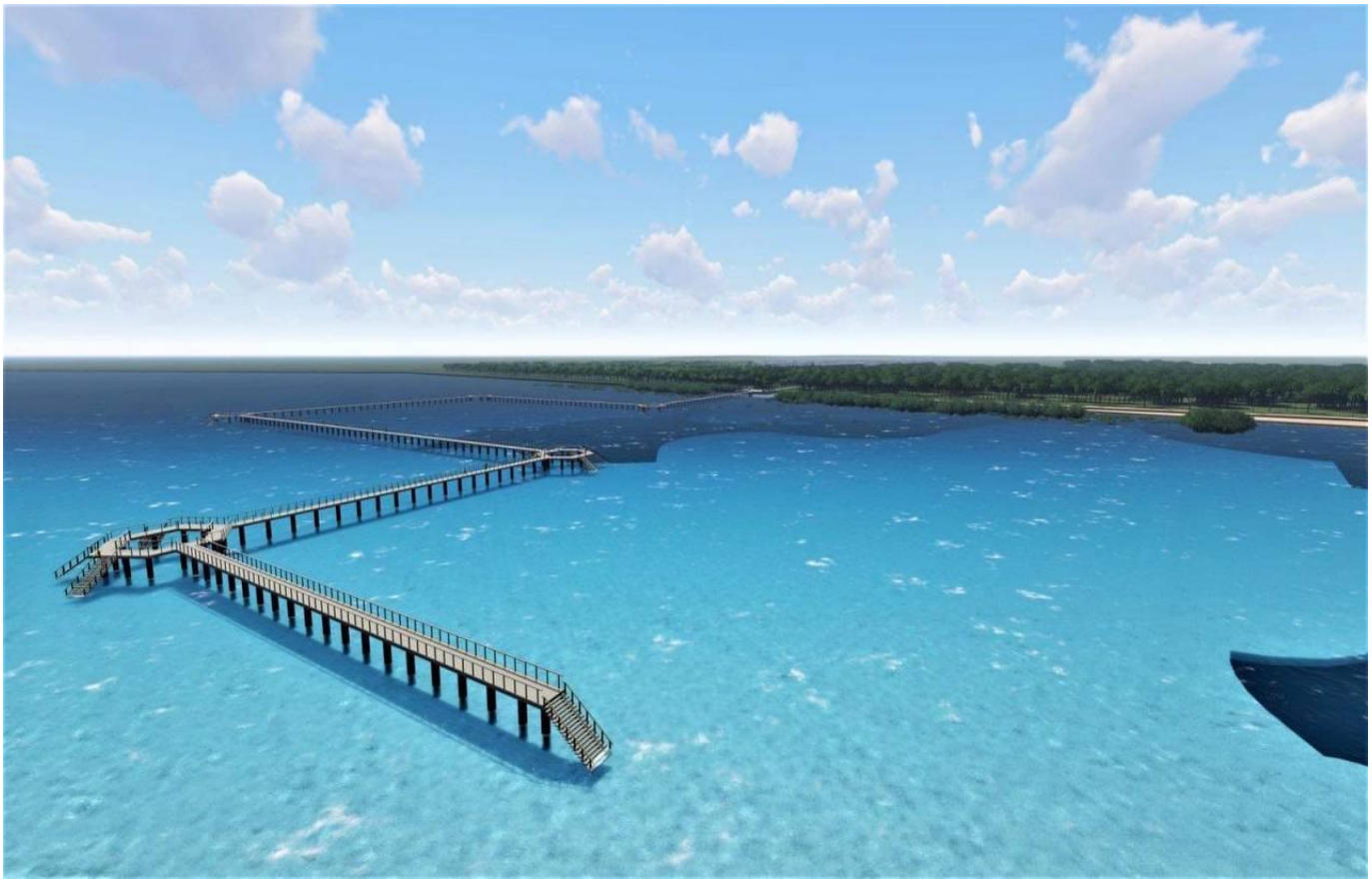

N 9.738572° , E 118.772167°
Bancao-bancao
Altitude:17.7meter
Speed:2.9km/h


N 9.738620° , E 118.772469°
Rizal Avenue
Altitude:-2.8meter
Speed:1.9km/h


N 9.738620°, E 118.772469°
Rizal Avenue
Altitude:-1.1meter
Speed:1.2km/h

ANNEX B

PERSPECTIVE



REPUBLIC OF THE PHILIPPINES

DEPARTMENT OF PUBLIC WORKS AND HIGHWAYS

REGIONAL OFFICE IV - B, MIMAROPA

EDSA, Diliman, QUEZON CITY

C.Y. 2023 PROJECT

DETAILED ENGINEERING DESIGN PLAN FOR THE

CONVERGE AND SPECIAL SUPPORT PROGRAM

SUSTAINABLE INFRASTRUCTURE PROJECTS ALLEVIATING GAPS (SIPAG)

ACCESS ROADS AND/OR BRIDGES FROM THE NATIONAL ROAD/S LEADING TO

MAJOR/STRATEGIC PUBLIC BUILDINGS/ FACILITIES

CONSTRUCTION OF RIZAL AVENUE EXTENSION BOARDWALK BARANGAY BANCAO-BANCAO, PUERTO PRINCESA CITY, PALAWAN

PUERTO PRINCESA CITY, PALAWAN

STA. 00+000.00 - STA. 00+600.00

PROJECT LENGTH: 600.00 L.M.

PROJECT ID: P00736310LZ

SUBMITTED :

GENE RYAN A. ALTEA
CHIEF, PLANNING AND DESIGN DIVISION

DATE:

RECOMMENDED :

MELQUIADES H. STO. DOMINGO
ASSISTANT REGIONAL DIRECTOR

DATE:

APPROVED:

GERALD A. PACANAN, CESO III
REGIONAL DIRECTOR

DATE:

INDEX OF SHEET

SHEET CONTENT	SET NUMBER	SHEET NUMBER
GENERAL		
COVER SHEET/TITLE SHEET		
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REPUBLIC OF THE PHILIPPINES
DEPARTMENT OF PUBLIC WORKS AND HIGHWAYS
REGION IV-B
OFFICE OF THE REGIONAL DIRECTOR
EDSA, DILIMAN, QUEZON CITY

PROJECT NAME AND LOCATION:
DETAILED ENGINEERING DESIGN PLAN FOR THE CONVERGE AND SPECIAL SUPPORT PROGRAM SUSTAINABLE INFRASTRUCTURE PROJECTS ALLEVIATING GAPS (SIPAG) ACCESS ROADS AND/OR BRIDGES FROM THE NATIONAL ROAD/S LEADING TO MAJOY/STRATEGIC PUBLIC BUILDINGS/FACILITIES CONSTRUCTION OF RIZAL AVENUE EXTENSION BOARDWALK BARANGAY BANCAO-BANCAO, PUERTO PRINCESA CITY, PALAWAN
PUERTO PRINCESA CITY, PALAWAN

SHEET CONTENTS:
INDEX OF SHEET

DRAFTED:
CHRISTIAN JADE A. BEATO
ENGINEER I (COS)

PREPARED:
GLEN AILEN P. OJEÑAR
ENGINEER II

REVIEWED:
CALVIN D. CADATAL
ENGINEER II
DATE:

SUBMITTED:
GENE RYAN A. ALTEA
CHIEF, PLANNING AND DESIGN DIVISION
DATE:

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ASSISTANT REGIONAL DIRECTOR
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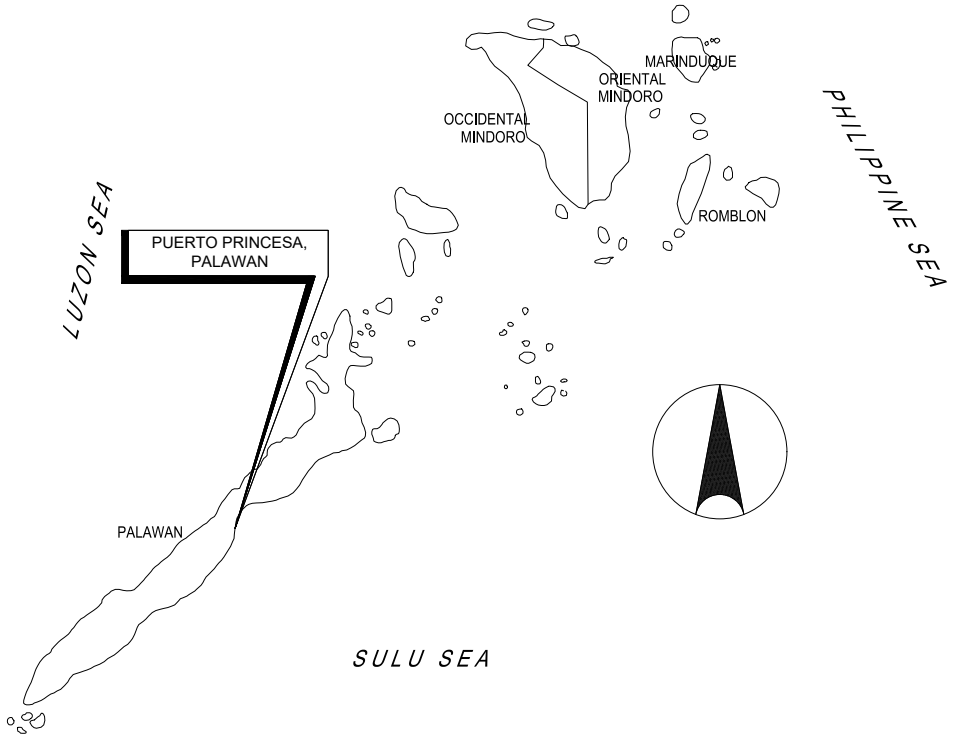
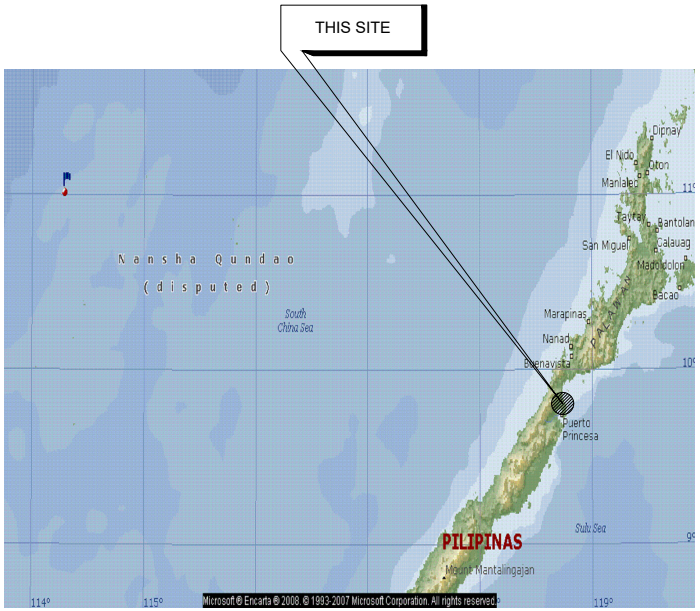
APPROVED:
GERALD A. PACANAN,CESO III
REGIONAL DIRECTOR
DATE:

SET NO.: G 01 12

SHEET NO.: 01 14



KEY MAP



LOCATION MAP

VICINITY MAP

REPUBLIC OF THE PHILIPPINES DEPARTMENT OF PUBLIC WORKS AND HIGHWAYS REGION IV-B OFFICE OF THE REGIONAL DIRECTOR EDSA, DILIMAN, QUEZON CITY	PROJECT NAME AND LOCATION: DETAILED ENGINEERING DESIGN PLAN FOR THE CONVERGE AND SPECIAL SUPPORT PROGRAM SUSTAINABLE INFRASTRUCTURE PROJECTS ALLEVIATING GAPS (SIPAG) ACCESS ROADS AND/OR BRIDGES FROM THE NATIONAL ROAD/S LEADING TO MAJOY/STRATEGIC PUBLIC BUILDINGS/FACILITIES CONSTRUCTION OF RIZAL AVENUE EXTENSION BOARDWALK BARANGAY BANCAO-BANCAO, PUERTO PRINCESA CITY, PALAWAN PUERTO PRINCESA CITY, PALAWAN	SHEET CONTENTS: KEY MAP LOCATION MAP VICINITY MAP	DRAFTED: CHRISTIAN JADE A. BEATO ENGINEER I (COS) PREPARED: GLEN AILEN P. OJEÑAR ENGINEER II	REVIEWED: CALVIN D. CADATAL ENGINEER II DATE:	SUBMITTED: GENE RYAN A. ALTEA CHIEF, PLANNING AND DESIGN DIVISION DATE:	RECOMMENDED: MELQUIADES H. STO. DOMINGO ASSISTANT REGIONAL DIRECTOR DATE:	APPROVED: GERALD A. PACANAN,CESO III REGIONAL DIRECTOR DATE:	SET NO. G 02 | 12	SHEET NO. 02 14

SUMMARY OF QUANTITIES

Item	Description	QUANTITY		
		Qty	Unit	REMARKS
Part A	A.1.1Field Office/Storage Facility			
A.1.1(6)	Provision of Combined Field Office, Laboratory and Living Quarters Building for the Engineer (Rental Basis)	12.00	mos.	
A.1.1(11)	Provision of Furniture/Fixture, Equipment and Appliances for Field Office for the Engineer	1.00	l.s.	
A.1.1(14)	Provision of the Laboratory Testing Equipment, Apparatus and Publications for the Engineer	1.00	l.s.	
A.1.1(15)	Operation and Maintenance of Temporary Field Office, Laboratory and Living Quarters Building for the Engineer	12.00	mos.	
A.1.2(4)	Provision of 4x2 Pick-up Type Service Vehicle for the Engineer on Bare Rental Basis	12.00	mos.	
A.1.2(6)	Operation and Maintenance of 4x2 Pick Up Type Service Vehicle for the Engineers	12.00	mos.	
A.1.3(3)	Provision of Survey Personnel for the Assistance to the Engineer	12.00	mos.	
A.1.4(1)	Provision of Progress Photographs	600.00	ea.	
Part B	**OTHER GENERAL REQUIREMENTS**			
B.2	Medical Room and First Aid Facilities	1.00	l.s.	
B.5	Project Billboard/Signboard	2.00	ea.	
B.7(2)	Occupational Safety and Health Program	1.00	l.s.	
B.9	Mobilization and Demobilization	1.00	l.s.	
B.15(1)	Detour/Access Road	1.00	l.s.	
PART C	**EARTHWORKS**			
104(2)a	Embankment from Borrow	2,632.35	cu.m.	
PART D	**SUBBASE COURSE**			
200(1)	Aggregate Subbase Course	700.00	cu.m.	
PART G				
505(2)a	Grouted Riprap, Class A	338.90	cu.m.	
Part J	**Flood Control and Drainage Part I-A Earthworks**			
1702(1)a	Structure Excavation	5,111.97	cu.m.	
1702(5)a	Shoring, Cribbing and Related Works, Cribbing/Cofferdamm	1.00	l.s.	
1705(1)	Fill and Backfill	3,840.54	cu.m.	

Item	Description	QUANTITY		
		Qty	Unit	REMARKS
Part I-B	**Bank and Slope Protection Works**			
506(1)	Stone Masonry	2,144.00	cu.m.	
508	Handlaid Rock Embankment	5,285.88	cu.m.	
Part III	**Civil, Mechanical, Electrical and Sanitary/Plaumbing Works**			
900(1)c2	Structural Concrete Class "A" (Footing & lean Concrete)	502.08	cu.m.	
900(1)c4	Structural Concrete Class "A" (column)	271.35	cu.m.	
900(1)c5	Structural Concrete Class "A" (Slab, Parapet & Stairs)	662.79	cu.m.	
900(1)c6	Structural Concrete "A" (Beam)	128.94	cu.m.	
902(1)a	Reinforcing Steelbar (Deformed) Grade 40	211,682.51	kg.	
903(2)	Forms and Falseworks	9,674.25	cu.m.	
Part C	**Finishings and Other Civil Works**			
1716(6)a	Sheet Piles, Furnished	2,025.00	l.m.	
1716(12)	Sheet Piles, Driven	1,913.00	l.m.	
715(8)	Geotextile	36.00	bags	
1021(1)c	Floor Finishes with floor Hardener	3,919.38	sq.m.	
1027(1)	Cement plaster finish	8,514.69	sq.m.	
1032(1)a	Painting Works, Masonry/Concrete	8,334.79	sq.m.	
1051(6)	Railings	2,663.48	lm	
624(8)	Solar LED Street Light (Integrated Street Light)	244.00	ea.	

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PUERTO PRINCESA CITY, PALAWAN

SHEET CONTENTS:
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RECOMMENDED: MELQUIADES H. STO. DOMINGO, ASSISTANT REGIONAL DIRECTOR, DATE:
APPROVED: GERALD A. PACANAN,CESO III, REGIONAL DIRECTOR, DATE:

SET NO. G 03 12
SHEET NO. 03 14

GENERAL NOTES:

1.0 STANDARDS AND REFERENCES

THE FOLLOWING SHALL GOVERN THE DESIGN, FABRICATION & CONSTRUCTION OF THE PROJECT.

1.1 NATIONAL STRUCTURE CODE OF THE PHILIPPINES (N.S.C.P.) VOL. 1 , 6th EDITION, 2010

2.0 DESIGN CRITERIA

2.1 LOADINGS

A. DEAD LOAD

CONCRETE	-23.56 kN/m³
STEEL	-76.93 kN/m³
150 mm THK. CHB WALL	-2.73 kPa
100 mm THK. CHB WALL	-2.11 kPa

B. LIVE LOAD

ROOF	-1.00 kPa
CLASSROOMS, LABORATORY	-1.90 kPa
TOILETS	-2.40 kPa
CORRIDORS ABOVE, STAIRS	-3.80 kPa
CORRIDORS ON GROUND	-4.80 kPa

C. WIND LOAD (NSCP 2010)

BASIC WIND VELOCITY, V = 250 KPH

P = qh (GCpf) - (GCpi) (DESIGN WIND PRESSURE)

WHERE: qh = VELOCITY PRESSURE kPa)
GCpf = EXTERNAL PRESSURE COEFFICIENT
GCpi = INTERNAL PRESSURE COEFFICIENT

D. SEISMIC LOAD (NSCP 2010)

$V = \frac{Cvl}{RT}\ W$ (DESIGN BASE SHEAR)

$Vmax = \frac{2.50\ Cal}{R}\ W$ Vmin = 0.11 CalW

WHERE: W = TOTAL DEAD LOAD
T = NATURAL PERIOD = C (h)
WHERE: C = NUMERICAL COEFFICIENT
h = BUILDING HEIGHT
I = IMPORTANT FACTOR = 1.50
R = NUMERICAL FACTOR = 8.50
SEISMIC COEFFICIENT Cv = 0.44 Nv
Ca = 0.64 Nv
NEAR SOURCE FACTOR (10 km) Nv = 1.2
Na = 1.0
Z = SEISMIC ZONE = 0.40 (ZONE 4)
S = SOIL TYPE = D

2.2 DESIGN STRESSES

A. CONCRETE	
COMPRESSIVE STRENGTH @ 28 DAYS	fc' = 20.7 MPa (3,000 psi)
B. REINFORCING BARS	
a. FOR BARS 10 mm Ø AND GREATER	fy = 275 MPa (40,000 psi)
C. STRUCTURAL STEEL, ASTM - A36	
FOR TRUSSES, BRACING, & STRUTS	fy = 248 MPa (36,000 psi)
D. PURLINS	
COLD FORMED LIGHT CAGE SHAPES	fy = 248 MPa (36,000 psi)
E. MASONRY UNIT (CHB)	
NON- LOAD BEARING CHB WALLS	fm' = 3.45 MPa (500 psi)

F. WELDS - USED E - 60 xx ELECTRODE

G. STRUCTURAL BOLTS, ASTM - A307

a. Ft = 96.60 MPa (14,000 psi) b. Fv = 69 MPa (10,000 psi)

3.0 FOUNDATION

3.1 ASSUMED SOIL BEARING CAPACITY SHALL BE 96 KPa (2,000 PSF)

3.1.1. IN CASE IN THE ACTUAL LOCATION OF THE STRUCTURE IS LESS THAN THE ASSUMED DISTANCE FROM THE SEISMIC SOURCE OF 40 km; NOTIFY THE DIRECTOR, BUREAU OF DESIGN FOR PROPER REVISION OF THE DESIGN. REFER TO THE SEISMIC SOURCE MAP PROVIDED IN THE NATION STRUCTURAL CODE OF THE PHILIPPINES OR PHIVOLCS SEISMIC SOURCE MAP.

3.1.2. SOIL TEST SHALL BE CONDUCTED PRIOR TO START OF CONSTRUCTION.

3.1.3. IN CASE THE ACTUAL SOIL BEARING CAPACITY IS FOUND LESS THAN THE ASSUMED , 96 KPa; NOTIFY THE DIRECTOR, BUREAU OF DESIGN FOR PROPER REVISION OF FOUNDATION.

3.1.4. NO FOOTING SHALL REST ON FILL.

3.1.6. SOIL BEARING CAPACITY SHALL BE INCREASED BY 33 WHEN IN COMBINATION WITH SEISMIC OR WIND LOAD.

3.2 ALL COLUMN FOOTINGS & TIE BEAMS SHALL REST ON 100 mm THICK WELL COMPACTED GRAVEL BASE COURSE.

3.3 BACK FILL SHALL BE PLACED IN LAYER AND EACH LAYER SHALL BE 200 mm THICK AND SHALL BE COMPACTED TO 95 MAXIMUM DRY DENSITY.

3.4 WHERE LOOSE SOFT MATERIAL IS ENCOUNTERED AT DEPTH OF EMBEDMENT INDICATED, EXCAVATE TO FIRM LAYER AND REPLACE LOOSE MATERIALS UNDERNEATH THE FOOTING WITHIN THE FOOTING AREA PLUS 1/2 DEPTH OF SOFT MATERIALS ON ALL SIDES WITH SELECT GRANULAR BACKFILL. COMPACT SELECT GRANULAR BACKFILL TO 95 MAXIMUM DRY DENSITY.

4.0 MATERIALS

4.1 CONCRETE

4.1.1 CONCRETE COVER OVER REINFORCING BARS SHALL BE AS FOLLOWS:

A. FOOTINGS, FOOTING-TIE BEAMS (CAST AGAINST EARTH)	75 mm
B. BEAMS AND COLUMNS (TO STIRRUPS AND TIES)	40 mm
C. WALLS, SIDE OF FOOTING-TIE BEAMS (CAST AGAINST FORM)	40 mm
D. SUSPENDED SLAB	20 mm

4.1.2 BEFORE CONCRETE IS POURED, CHECK WITH ALL TRADES TO ENSURE PROPER PLACEMENT OF ALL OPENINGS, SLEEVES, CURBS, CONDUITS, ETC., RELATING TO THE WORK.

4.2 REINFORCING BARS

4.2.1 ALL REINFORCING BARS SHALL BE CLEAN OF RUST, GREASE OR OTHER MATERIALS THAT WILL IMPAIR BOND.

4.2.2 ALL REINFORCING BARS SHALL BE ACCURATELY AND SECURELY PLACED BEFORE POURING CONCRETE OR APPLYING MORTAR OR GROUT.

4.2.3 LAPPED SPLICES SHALL BE STAGGERED WHERE POSSIBLE.

4.2.4 UNLESS OTHERWISE INDICATED, SPLICING OR REINFORCEMENT SHALL BE IN ACCORDANCE WITH AC1-318M, EXCEPT THAT THE MINIMUM LAP SPLICE SHALL BE 40 BAR DIAMETER BUT NOT LESS THAN 600 mm.

4.2.5 UNLESS SHOWN OTHERWISE ON PLANS, SPLICES SHALL BE AS FOLLOWS:

A. INTERMEDIATE BEAMS; TOP BARS SHALL BE SPLICED AT MID SPAN, AND BOTTOM BARS AT THE SUPPORT.

B. BEAMS FRAMING TO COLUMNS; TOP BARS SHALL BE SPLICED AT MID-SPAN AND BOTTOM BARS SHALL NOT BE SPLICED WITHIN THE COLUMN OR WITHIN A DISTANCE OF TWICE THE MEMBER DEPTH FROM THE FACE OF THE COLUMN. THE SPLICED LENGTH SHALL NOT BE LESS THAN 1:4 TIMES THE DEVELOPMENT LENGTH (Ld) IN 4.2.8 BELOW BUT NOT LESS THAN 600 mm.

COLUMNS; LAP SPLICES SHALL BE MADE WITHIN THE CENTER HALF OF HEIGHT AND THE SPLICE SHALL NOT BE LESS THAN 30 BAR DIAMETER, WELDING OR THE USE OF APPROVED MECHANICAL DEVICES MAY BE PERMITTED PROVIDED NOT MORE THAN ALTERNATE BARS ARE WELDED OR SPLICED AT ANY LEVEL AND THE MINIMUM VERTICAL DISTANCE BETWEEN TWO ADJACENT BAR SPLICES

A. CHB WALLS; VERTICAL BARS SHALL BE SPLICED AT THE TOP OF WALL FOOTINGS OR FOOTING-TIE BEAMS AND AT THE BOTTOM OF REINFORCED CONCRETE LINTEL BEAMS OR BEAMS.

4.2.6 UNLESS OTHERWISE INDICATED: ALL BEAMS TERMINATING AT A COLUMN SHALL HAVE TOP AND BOTTOM BARS EXTENDING TO THE FAR FACE OF THE COLUMN, TERMINATING IN A STANDARD 90 HOOK LENGTH OF ANCHORAGE SHALL NOT BE LESS THAN 600 mm.

4.2.7 SHOP DRAWINGS FOR REINFORCEMENT SHALL BE SUBMITTED FOR APPROVAL OF THE ENGINEER PRIOR TO FABRICATION AND INSTALLATION.

4.2.8 DEVELOPMENT LENGTH (Ld) OF REINFORCING BARS SHALL BE AS FOLLOWS:

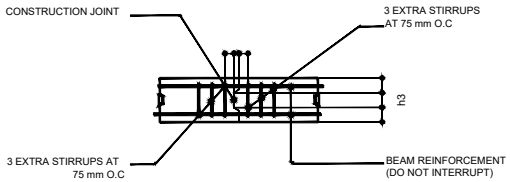
SIZE OF REBARS	DEVELOPMENT LENGTH
10 mm	170 mm
12 mm	220 mm
16 mm	270 mm
20 mm	380 mm

5.0 CONSTRUCTION JOINT

5.1 CONSTRUCTION JOINT NOT INDICATED ON THE PLANS SHALL BE MADE SO AS TO LEAST IMPAIR THE STRENGTH OF THE STRUCTURE AND SHALL BE SUBJECT TO THE APPROVAL OF THE ENGINEER EXCEPT SLAB ON GRADE.

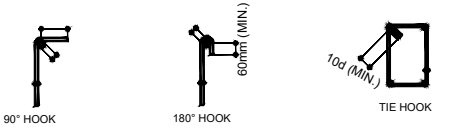
5.2 UNLESS SHOWN OTHERWISE, SLAB ON GRADE SHALL HAVE CONTROL JOINTS SPACED AT 6000 mm MAXIMUM CENTER TO CENTER.

5.3 BEAMS CONSTRUCTION JOINT SHALL BE LOCATED WITHIN THE MIDDLE THIRD OF THE SPAN, IT SHALL BE PROVIDED WITH 3 EXTRA STIRRUPS @ 75 mm O.C. ON EACH SIDE OF THE JOINT.

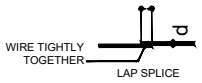


BEAM CONST. JOINT

SCALE 1:10 MTS



BAR SIZE	D	
	90 ° HOOK	180 ° HOOK
10 mm Ø THRU 25 mm Ø	6d	4d



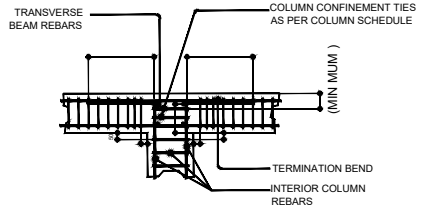
NOTE:

1. ALL BENDS SHOWN IN DETAILS SCHEDULES SHALL BE STANDARD HOOK OTHERWISE NOTED.

2.180° HOOKS MAY BE SUBSTITUTED FOR 90° HOOKS.

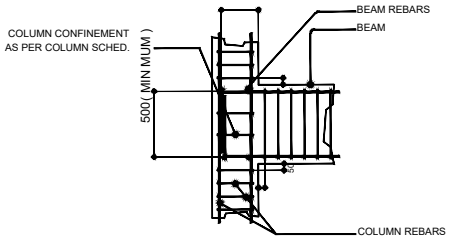
TYPICAL REINFORCEMENT DETAIL

SCALE 1:10 MTS



INTERIOR COLUMN TERMINATION BEND

SCALE 1:50 MTS



BEAM RE–BAR TERMINATION BEND

SCALE 1:50 MTS

REPUBLIC OF THE PHILIPPINES DEPARTMENT OF PUBLIC WORKS AND HIGHWAYS REGION IV-B OFFICE OF THE REGIONAL DIRECTOR EDSA, DILIMAN, QUEZON CITY	PROJECT NAME AND LOCATION: DETAILED ENGINEERING DESIGN PLAN FOR THE CONVERGE AND SPECIAL SUPPORT PROGRAM SUSTAINABLE INFRASTRUCTURE PROJECTS ALLEVIATING GAPS (SIPAG) ACCESS ROADS AND/OR BRIDGES FROM THE NATIONAL ROAD/S LEADING TO MAJOY/STRATEGIC PUBLIC BUILDINGS/FACILITIES CONSTRUCTION OF RIZAL AVENUE EXTENSION BOARDWALK BARANGAY BANCAO-BANCAO, PUERTO PRINCESA CITY, PALAWAN PUERTO PRINCESA CITY, PALAWAN	SHEET CONTENTS: GENERAL NOTES (1/3)	DRAFTED: CHRISTIAN JADE A. BEATO ENGINEER I (COS) PREPARED: GLEN AILEN P. OJEÑAR ENGINEER II	REVIEWED: CALVIN D. CADATAL ENGINEER II DATE:	SUBMITTED: GENE RYAN A. ALTEA CHIEF, PLANNING AND DESIGN DIVISION DATE:	RECOMMENDED: MELQUIADES H. STO. DOMINGO ASSISTANT REGIONAL DIRECTOR DATE:	APPROVED: GERALD A. PACANAN,CESO III REGIONAL DIRECTOR DATE:	SET NO. G 04 12	SHEET NO. 04 14

GENERAL NOTES

DRAINAGE PIPE / WEEP HOLE

DRAINAGE PIPES/WEEP HOLES SHOULD BE DESIGNED AND PROVIDED FOR BOTH TYPES OF REVETMENT FOR DIKED AND NON-DIKED RIVERS. DURING FLOOD TIMES, THE RISE OF FLOOD WATER LEVEL IN THE RIVER IS ALMOST COINCIDING WITH THE RISE OF GROUNDWATER BEHIND THE REVETMENT ESPECIALLY WHEN THE GROUND HAS BEEN ALREADY SATURATED. AFTER THE FLOODS, THE RATE OF SUBSIDENCE OF FLOODWATER IN THE RIVER IS USUALLY GREATER THAN THE RECESSION OF GROUNDWATER LEVEL BEHIND THE REVETMENT WITHOUT DRAINAGE PIPES/WEEP HOLES. IF THE DISPARITY BETWEEN THE SUBSIDING FLOODWATER AND GROUNDWATER STAGES IS SIGNIFICANTLY HIGH, RESIDUAL HYDRAULIC PRESSURE EXISTS AT BACK OF THE REVETMENT WHICH MIGHT BECOME HIGHER (FIGURE 2.6). WEEP HOLES SHOULD BE PROVIDED IN THE REVETMENT USING 50~75 MM DIAMETER PVC DRAINPIPES, STAGGEREDLY PLACED IN THE HORIZONTAL DIRECTION AND SPACED 2 METERS CENTER TO CENTER. ONE OF THE MAIN CAUSES OF CAVING IN OF SOIL PARTICLES BEHIND THE REVETMENT IS THE FLOWING OUT OF FINE BACKFILL MATERIALS THROUGH THE JOINTS OF REVETMENT AND WEEP HOLES. THIS PHENOMENON LEADS TO THE COLLAPSE OF THE REVETMENT IN ORDER TO PREVENT THE OUTFLOW OF THESE FINE MATERIALS. MOREOVER, PERVIOUS MATERIALS CONSISTING OF CRUSHED GRAVEL OR GEO-TEXTILE IS PLACED BETWEEN THE REVETMENT AND ORIGINAL GROUND TO PREVENT THE OUTFLOW OF THE BANK MATERIALS THROUGH THE WEEP HOLES. THE LOWEST WEEP HOLES SHALL BE INSTALLED JUST ABOVE THE ORDINARY WATER LEVEL.

STRENGTHENING UPPER AND LOWER ENDS

GENERALLY, THE END POINTS OF REVETMENT ARE ALWAYS SUBJECTED TO EXTERNAL FORCES, WHICH MAKE THESE PORTIONS OF THE STRUCTURE BECOME WEAK AND PRONE TO DAMAGE OR POSSIBLE COLLAPSE. IN CONSTRUCTING A PIECE-MEAL PROJECT, TEMPORARY PROTECTION WORKS (E.G., BOULDER AND GABION) SHALL BE PROVIDED. THE END PROTECTION WORK IS INDISPENSABLE TO THE RIGID STRUCTURE TYPE REVETMENTS. THE END PROTECTION SHALL COVER THE EXTENT OF THE COVERING WORK AND CREST WORK. THE THICKNESS OF THE END PROTECTION WORK SHALL BE FROM THE SURFACE OF REVETMENT UP TO THE BACKFILL MATERIAL. THE THICKNESS OF THE END PROTECTION SHALL BE MORE THAN 50 CM.

B. MATERIALS SPECIFICATION & CONST. METHODS

1. **STONE MASONRY**

DESCRIPTION

THIS ITEM SHALL CONSIST OF STONE MASONRY IN MINOR STRUCTURES, IN HEADWALLS FOR CULVERTS, IN RETAINING WALLS AT THE TOES OF SLOPES, AND AT OTHER PLACES CALLED FOR ON THE PLANS, CONSTRUCTED ON THE PREPARED FOUNDATION BED, IN ACCORDANCE WITH THIS SPECIFICATION AND IN CONFORMITY WITH THE LINES, GRADES, SECTIONS, AND DIMENSIONS SHOWN ON THE PLANS OR AS ORDERED IN WRITING BY THE ENGINEER. ALL WORKS SHALL COMPLY WITH ITEM 506 OF THE STANDARD SPECIFICATION FOR HIGHWAYS, BRIDGES AND AIRPORTS 2013 EDITION.

2. **SHEET PILES**

THIS SHALL CONSIST OF FURNISHING, DRIVING AND CUTTING OFF OF SHEET PILING COVERED BY THE 2013 STANDARD SPECIFICATION FOR HIGHWAYS, BRIDGES AND AIRPORTS.

STEEL SHEET PILES

STEEL SHEET PILES SHALL BE THE TYPE, WEIGHT AND SECTION MODULUS INDICATED ON THE PLANS OR SPECIAL PROVISIONS, AND SHALL CONFORM TO THE REQUIREMENT OF ITEM 400, PILING, SUBSECTION 400.2.7, SHEET PILES, PAINTING SHALL CONFORM TO THE REQUIREMENTS FOR ITEM 411, PAINT, SUBSECTION 411.3.6.2, PAINTING STRUCTURAL STEEL.

3. **CONCRETE**

ALL CONCRETE MIXTURE SHALL BE CLASS "A" (1:2:4 MIX) FOR R.C. REVETMENT

NOTE:

THE CEMENT CONTENT OF THE DESIGN MIX SHALL BE ADJUSTED IN ACCORDANCE WITH THE AASHTO PROVISIONS WHEN CONCRETING UNDER WATER TO COMPENSATE FOR THE LOSS OF STRENGTH DUE TO WATER INFILTRATION.

4. **REINFORCING STEEL**

(a) REINFORCING STEEL SHALL CONFORM TO AASHTO M31 (ASTM A615), GRADE 40 AND 60, DEFORMED WITH MINIMUM YIELD STRENGTH AS DESCRIBED BELOW:

REBAR GRADE	YIELD STRENGTH fy (MPa)	SIZE (mm)
40	276 (40 Ksi)	16mmØ & BELOW, UNLESS OTHERWISE NOTED
60	414 (60 Ksi)	20mmØ & ABOVE

(b) REINFORCING STEEL SHALL BE FREE OF MILL SCALES, OIL OR ANY SUBSTANCES WHICH WILL WEAKEN THE BOND WITH CONCRETE.

(c) REINFORCING STEEL SHALL BE WELDABLE TYPE. WELDING REINFORCING STEEL SHALL CONFORM TO ANSI / AWS D1.4.

5. BEDDING/ GRAVEL LAYER

STONES SHOULD BE WELL BLENDED. THE STONES WITH THE LARGEST DIMENSION, GRATER THAN THREE TIMES THE LEAST DIMENSION SHOULD NOT CONSTITUTE MORE THAN 10 PERCENT OF THE TOTAL.

MATERIALS SHOULD BE INERT TO CHEMICAL AND BIOLOGICAL DEGRADATION IN SEA WATER.

GRADATION REQUIREMENTS OF THE BEDDING LAYER OF FILTER BLANKET SHALL BE 015 (FILTER)< 5 085 (FOUNDATION); i.e, THE DIAMETER EXCEEDED BY THE COARSEST 85 PERCENT OF THE FILTER MATERIAL MUST BE LESS THAN OR EQUAL TO FIVE TIMES THE DIAMETER EXCEEDED BY THE COARSEST 15 PERCENT OF THE FOUNDATION MATERIAL. QUARRY SPALLS RANGING IN SIZE FROM 0.45 KG TO 23 KG WILL GENERALLY SUFFICE IF THE BEDDING LAYER IS PLACED ON A FILTER CLOTH OR A COARSE GRAVEL (OR CRUSHED STONE) FILTER LAYER WHICH MEETS THE STATED FILTER DESIGN CRITERIA.

THE FOLLOWING STANDARD TESTS SHALL BE CONDUCTED TO ESTABLISH MATERIAL DURABILITY:

ABRASION TEST	ASTM C-535 OR EQUIVALENT
TOUGHNESS TEST	ASTM C-170 OR EQUIVALENT
HARDNESS TEST	ASTM C-235 OR EQUIVALENT
APPARENT SPECIFIC GRAVITY AND ABSORPTION TEST	ASTM C-127 OR EQUIVALENT

6. GEOTEXTILE

GEOTEXTILES SHALL BE WOVEN AND/ OR NONWOVEN FABRIC AS SPECIFIED IN THE DRAWINGS SPECIALLY ENGINEERED TO PROVIDE EXCELLENT ROBUSTNESS, UV PROTECTION AND DURABILITY IN MARINE AND HYDRAULIC CONDITION (SEE DRAWINGS AND SPECIFICATIONS). THE GEOTEXTILES TO BE USED SHALL HAVE HIGH MODULUS AND EXTREMELY HIGH STRENGTH AT LOW STRAIN. IT MUST HAVE A GOOD WATER PERMEABILITY AND IS RESISTANT TO CHEMICAL AND BACTERIOLOGICAL ATTACK. PLACEMENT AND MATERIAL STRENGTH IS AS SPECIFIED IN THE SECTION DRAWINGS.

7. GEOTUBES

GEOTUBES TO BE USED SHALL BE MANUFACTURED FROM HIGH MODULUS POLYPROPYLENE ENGINEERED FABRICS COMBINED WITH HIGH CAPACITY SEAMS TO PRODUCE TUBULAR CONTAINERS WITH ENSURED INTEGRITY DURING FILLING AND DURING OPERATIONAL LIFE. THE TENSILE STRENGTH IS AS SPECIFIED ON THE SECTION DRAWINGS. GEOTUBES MANUFACTURED FROM POLYESTER FIBER SHALL NOT BE ACCEPTED. THE GEOTUBE SUPPLIER/ MANUFACTURER SHALL CERTIFY COMPLIANCE OF THESE REQUIREMENTS.

8. SAND FILL

THE SAND INFILL MATERIAL SHALL CONSIST OF NATURALLY OCCURRING OR PROCESSED MATERIAL WHICH AT THE TIME OF FILLING IS CAPABLE OF FULFILLING THE SPECIFIED REQUIREMENTS TO PROVIDE MASS AND INTEGRITY. THE FILL MATERIAL SHALL NOT CONTAIN MATERIALS SUSCEPTIBLE TO VOLUME CHANGE (i.e. MARINE MUD, SWELLING CLAYS AND COLLAPSIBLE SOILS), PEAT, VEGETATION, TIMBER, ORGANIC, SOLUBLE OR PERISHABLE MATERIAL, TOXIC, COMBUSTIBLE OR DANGEROUS MATERIAL, METAL, RUBBER OR OTHER UNSUITABLE MATERIAL.

CODES AND REFERENCES

1. DPWH DESIGN GUIDELINES, CRITERIA AND STANDARDS (DGCS) - VOL. III, 2015 ED.

2. DPWH STANDARD SPECIFICATIONS FOR HIGHWAYS. BRIDGES AND AIRPORTS - VOL. II, 2013 ED

3. DPWH STANDARD SPECIFICATIONS FOR PUBLIC WORKS STRUCTURES (BUILDINGS, PORTS AND HARBORS, FLOOD CONTROL AND DRAINAGE STRUCTURES AND WATER SUPPLY SYSTEMS) VOL. III, 2019 EDITION

CONSTRUCTION

THESE NOTES ARE PROVIDED FOR QUICK REFERENCE ONLY AND SHALL BE READ IN CONJUNCTION WITH THE TECHNICAL SPECIFICATIONS FOR THE PROJECT.

THE DESIGN OF BRIDGES IS BASED ON THE CONSTRUCTION SEQUENCE SHOWN IN THE DRAWING. ANY VARIATION FROM THE SEQUENCE MUST BE APPROVED BY THE ENGINEEER.

CONSTRUCTION SHALL COMPLY WITH 1995 DPWH STANDARD SPECIFICATION FOR HIGHWAYS, BRIDGES AND AIRPORTS OR MODIFIED BY SPECIAL PROVISIONS.

1. DIMENSIONS

1.1 SECTION, DIMENSIONS AND DISTANCES SHALL NOT BE SCALED FOR CONSTRUCTION PURPOSES. THE INDICATED DIMENSION SHALL GOVERN UNLESS OTHERWISE SPECIFIED.

1.2 ALL DIMENSION SHOWN ARE IN MILLIMETERS UNLESS OTHERWISE NOTED.

1.3 ALL STATIONING ARE IN KILOMETER PLUS METER AND ELEVATION IN METER.

2. 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.

3. REINFORCED CONCRETE

3.1 CAST IN PLACE CONCRETE SHALL BE CLASS "A" EXCEPT RAILINGS WHICH SHALL BE CLASS "C" UNLESS OTHERWISE NOTED ON THE PLANS. ALL EXPOSED EDGES SHALL BE CHAMPERED 25mm EXCEPT RAILINGS AND RE-ENTRANT ANGLES WHICH SHALL BE CHAMPERED AND FILLETED 13mm RESPECTIVELY.

3.2 CONCRETE MIX AND PLACING

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

(2) CONCRETE SHALL BE DEPOSITED, VIBRATED AND CURED IN ACCORDANCE WITH THE SPECIFICATIONS.

(3) FOR CONCRETE DEPOSITED AGAINST THE GROUND. LEAN CONCRETE WITH A MINIMUM THICKNESS OF 50mm SHALL LAID FIRST BEFORE INSTALLING THE REINFORCEMENT. THIS LEAN CONCRETE SHALL NOT BE CONSIDERED IN MEASURING THE STRUCTURAL DEPTH OF CONCRETE SECTION.

(4) THE CONTRACTOR SHALL SUBMIT TO THE ENGINEER FOR APPROVAL POURING SEQUENCES FOR ALL CONCRETE WORKS.

3.3 BAR BENDING, SPLICING AND PLACING

(1) THE CONTRACTOR SHALL SUBMIT TO THE ENGINEER FOR APPROVAL SHOP DRAWINGS INDICATING THE BENDING, CUTTING, SPLICING AND INSTALLATION OF ALL REINFORCING BARS.

(2) BARS SHALL BE BENT COLD. BARS PARTIALLY EMBEDDED IN CONCRETE SHALL NOT BE FIELD BENT UNLESS PERMITTED BY THE ENGINEER.

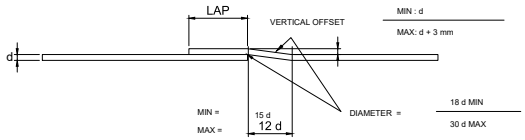
(3) BAR SPLICING NOT INDICATED ON DRAWINGS SHALL BE SUBJECT TO THE APPROVAL OF THE ENGINEER.

(4) WELDED SPLICES, IF APPROVED BY THE ENGINEER, SHALL DEVELOP IN TENSION AT LEAST 125% OF THE SPECIFIED YIELD STRENGTH OF THE BARS.

(5) NOT MORE THAN 50% OF THE BARS AT ANY ONE SECTION SHALL BE SPLICED.

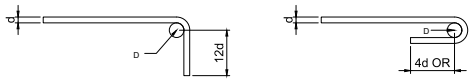
(6) UNLESS OTHERWISE SHOWN ON DRAWINGS. THE CLEAR DISTANCE BETWEEN PARALLEL BARS IN LAYER SHALL NOT BE LESS THAN 1.5 TIMES THE NOMINAL DIAMETER OF THE BAR NOR LESS THAN 1.5 TIMES THE MAXIMUM SIZE OF COARSE AGGREGATE. THE CLEAR DISTANCE BETWEEN LAYERS SHALL NOT BE LESS THAN 25mm NOR ONE BAR DIAMETER. THE BARS IN THE UPPER LAYER SHALL BE PLACED DIRECTLY ABOVE THOSE IN THE BOTTOM LAYER.

(7) CRANKED SPLICES



(8) HOOKS AND BENDS

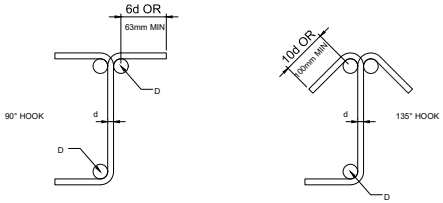
DIMENSIONS OF 90 - DEGREE AND 180 - DEGREE HOOKS



90° HOOK 180° HOOK

PIN DIAMETER : D = 6d FOR Ø10 THRU Ø25
D = 8d FOR Ø28, Ø32 AND Ø36

DIMENSIONS FOR STIRRUPS AND TIE HOOKS



PIN DIAMETER : D = 6d FOR Ø10 THRU Ø25
D = 8d FOR Ø28, Ø32 AND Ø36

3.4 CONCRETE COVER TO REINFORCEMENT

UNLESS OTHERWISE NOTED, ALL BAR DIMENSIONS ARE REFERED TO THE CENTER OF BARS AND THE MINIMUN COVERING MEASURED FROM THE SURFACE OF THE CONCRETE TO THE FACE OF ANY BAR SHALL BE 40mm.

FOR SUBSTRUCTURE, COVERING SHALL BE
1. PERMANENTLY EXPOSED TO EARTH AND WEATHER
a. FRESH WATER.....75
b. SALT WATER.....100

RUBBLE CONCRETE SPECIFICATION

1. ALL CONCRETE MIXTURE SHOULD BE CLASS " B " (1: 2.5 : 5) MIX.

2. EMBEDDED BOULDERS FOR THE FACING SHOULD NOT BE LESS THAN THIRTY (30mm) APART AND SHALL BE AT LEAST THIRTY (30mm) BELOW THE OUTSIDE.

3.3 CONCRETE COVER TO REINFORCEMENT

UNLESS OTHERWISE NOTED, ALL DIMENSIONS ARE REFERRED TO THE CENTER OF BARS AND THE MINIMUM COVERING MEASURED FROM THE SURFACE OF THE CONCRETE TO THE FACE OF ANY BAR SHALL BE 40mm.

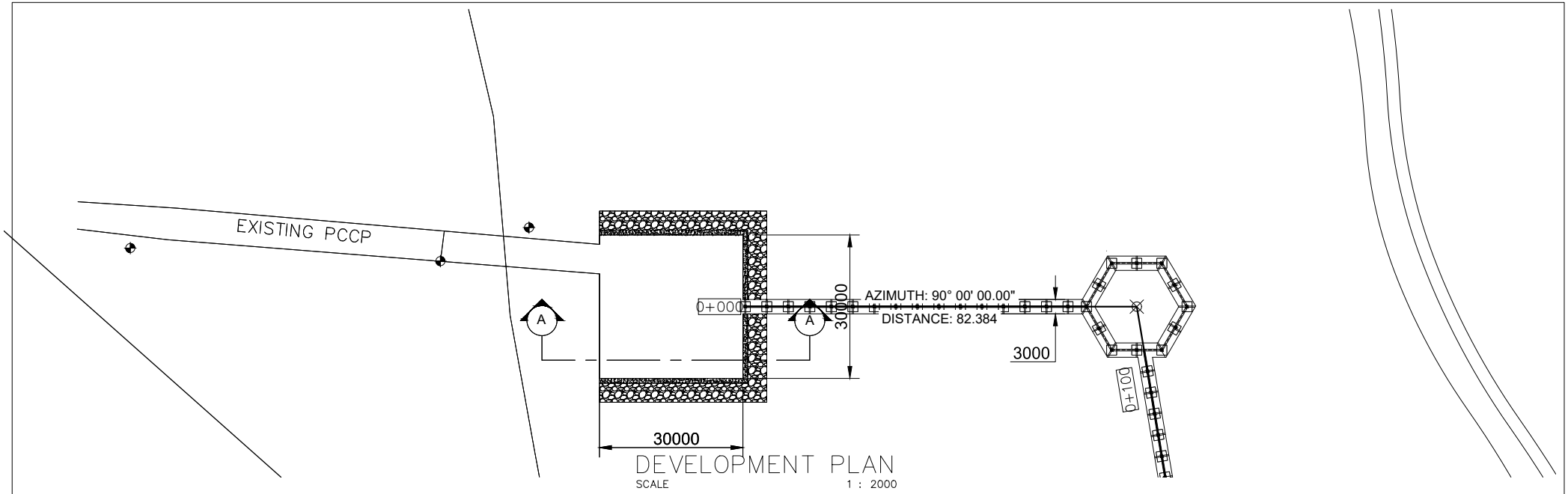
FOR SUBSTRUCTURE, COVERING SHALL BE
1. PERMANENTLY EXPOSED TO EARTH AND WEATHEr
a. FRESH WATER..... 75
b. SALT WATER..... 100

3.4 CONSTRUCTION JOINT

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

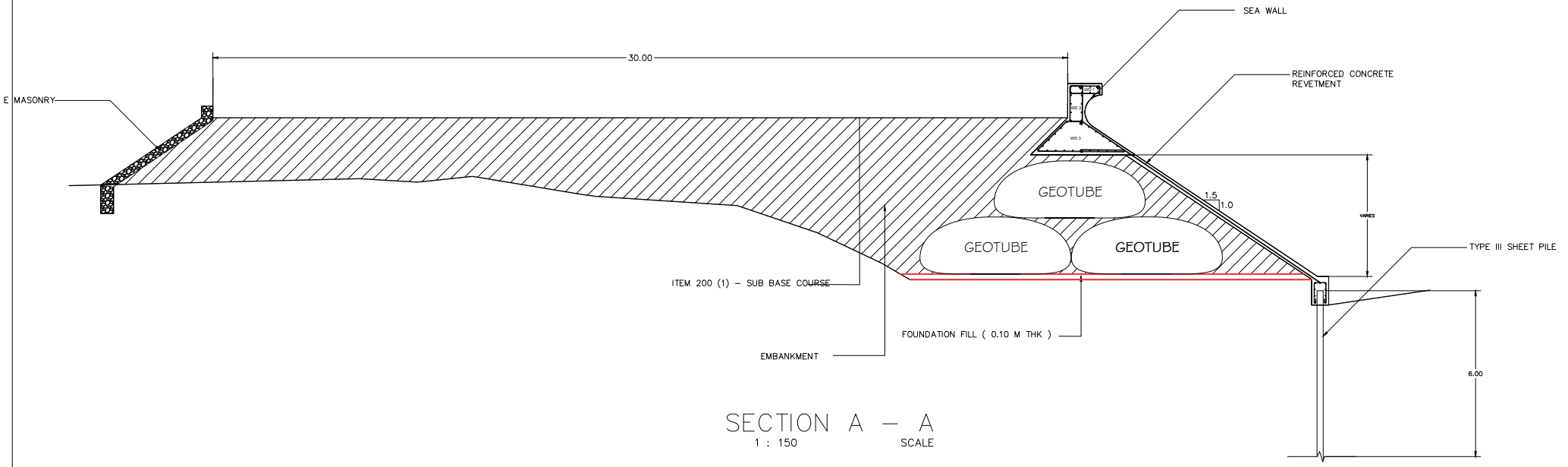
(2) THE INTERFACE BETWEEN THE FIRST AND SECOND POUR CONCRETES SHALL BE ROUGHENED WITH AN AMPLITUDE OF 6mm MINIMUM.

REPUBLIC OF THE PHILIPPINES DEPARTMENT OF PUBLIC WORKS AND HIGHWAYS REGION IV-B OFFICE OF THE REGIONAL DIRECTOR EDSA, DILIMAN, QUEZON CITY	PROJECT NAME AND LOCATION: DETAILED ENGINEERING DESIGN PLAN FOR THE CONVERGE AND SPECIAL SUPPORT PROGRAM SUSTAINABLE INFRASTRUCTURE PROJECTS ALLEVIATING GAPS (SIPAG) ACCESS ROADS AND/OR BRIDGES FROM THE NATIONAL ROAD/S LEADING TO MAJOY/STRATEGIC PUBLIC BUILDINGS/FACILITIES CONSTRUCTION OF RIZAL AVENUE EXTENSION BOARDWALK BARANGAY BANCAO-BANCAO, PUERTO PRINCESA CITY, PALAWAN PUERTO PRINCESA CITY, PALAWAN	SHEET CONTENTS: GENERAL NOTES (3/3)	DRAFTED: CHRISTIAN JADE A. BEATO ENGINEER I (COS) PREPARED: GLEN AILEN P. OJEÑAR ENGINEER II	REVIEWED: CALVIN D. CADATAL ENGINEER II DATE:	SUBMITTED: GENE RYAN A. ALTEA CHIEF, PLANNING AND DESIGN DIVISION DATE:	RECOMMENDED: MELQUIADES H. STO. DOMINGO ASSISTANT REGIONAL DIRECTOR DATE:	APPROVED: GERALD A. PACANAN,CESO III REGIONAL DIRECTOR DATE:	SET NO. G 06 12	SHEET NO. 06 14



DEVELOPMENT PLAN

SCALE 1 : 2000



SECTION A – A

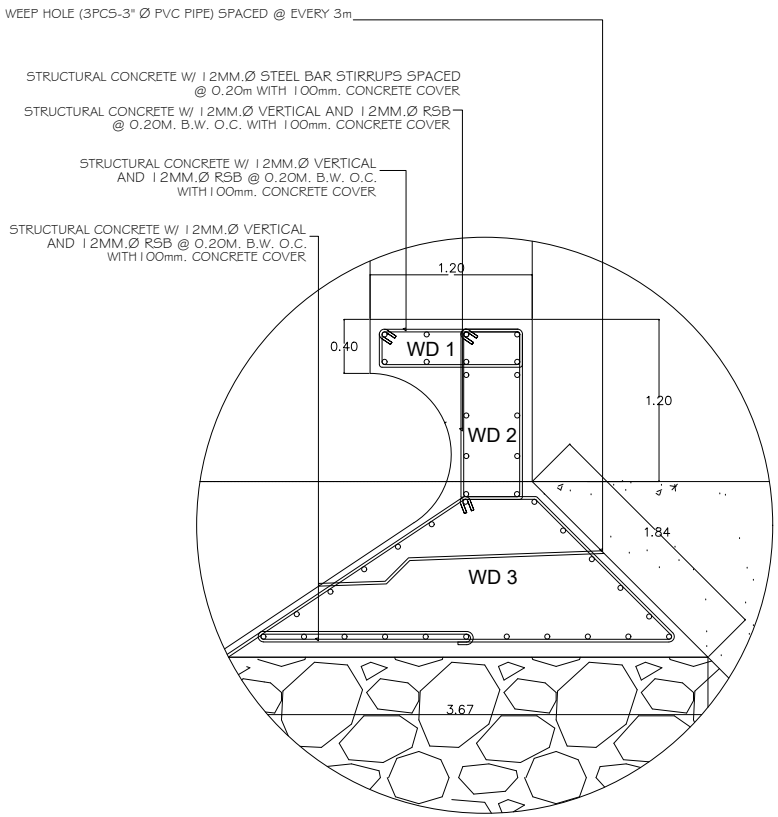
1 : 150 SCALE

REPUBLIC OF THE PHILIPPINES
DEPARTMENT OF PUBLIC WORKS AND HIGHWAYS
REGION IV-B
OFFICE OF THE REGIONAL DIRECTOR
EDSA, DILIMAN, QUEZON CITY

PROJECT NAME AND LOCATION:
DETAILED ENGINEERING DESIGN PLAN FOR THE CONVERGE AND SPECIAL SUPPORT PROGRAM SUSTAINABLE INFRASTRUCTURE PROJECTS ALLEVIATING GAPS (SIPAG) ACCESS ROADS AND/OR BRIDGES FROM THE NATIONAL ROAD/S LEADING TO MAJOY/STRATEGIC PUBLIC BUILDINGS/FACILITIES CONSTRUCTION OF RIZAL AVENUE EXTENSION BOARDWALK BARANGAY BANCAO-BANCAO, PUERTO PRINCESA CITY, PALAWAN
PUERTO PRINCESA CITY, PALAWAN

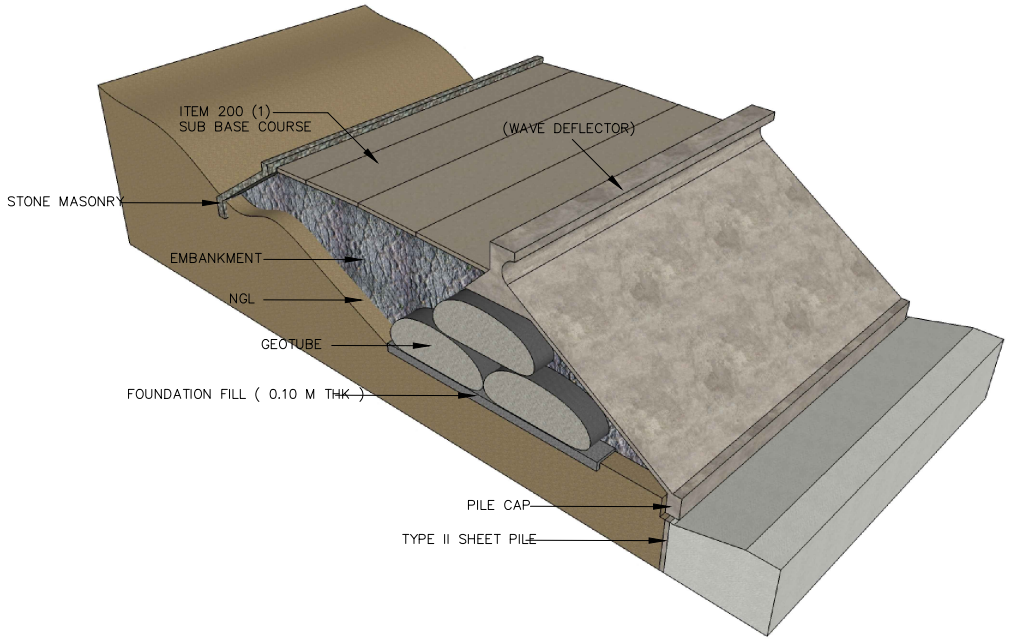
SHEET CONTENTS:
TYPICAL (1/6)

DRAFTED:	REVIEWED:	SUBMITTED:	RECOMMENDED:	APPROVED:	SET NO.	SHEET NO.
CHRISTIAN JADE A. BEATO ENGINEER I (COS)	CALVIN D. CADATAL ENGINEER II	GENE RYAN A. ALTEA CHIEF, PLANNING AND DESIGN DIVISION	MELQUIADES H. STO. DOMINGO ASSISTANT REGIONAL DIRECTOR	GERALD A. PACANAN,CESO III REGIONAL DIRECTOR	G 07 | 12	07 14
PREPARED: GLEN AILEN P. OJEÑAR ENGINEER II	DATE:	DATE:	DATE:	DATE:		



WAVE DEFLECTOR DETAIL

SCALE N T S



ISOMETRIC VIEW

SCALE N T S

REPUBLIC OF THE PHILIPPINES DEPARTMENT OF PUBLIC WORKS AND HIGHWAYS REGION IV-B OFFICE OF THE REGIONAL DIRECTOR EDSA, DILIMAN, QUEZON CITY	PROJECT NAME AND LOCATION: DETAILED ENGINEERING DESIGN PLAN FOR THE CONVERGE AND SPECIAL SUPPORT PROGRAM SUSTAINABLE INFRASTRUCTURE PROJECTS ALLEVIATING GAPS (SIPAG) ACCESS ROADS AND/OR BRIDGES FROM THE NATIONAL ROAD/S LEADING TO MAJOY/STRATEGIC PUBLIC BUILDINGS/FACILITIES CONSTRUCTION OF RIZAL AVENUE EXTENSION BOARDWALK BARANGAY BANCAO-BANCAO, PUERTO PRINCESA CITY, PALAWAN PUERTO PRINCESA CITY, PALAWAN	SHEET CONTENTS: TYPICAL (2/6)	DRAFTED: CHRISTIAN JADE A. BEATO ENGINEER I (COS) PREPARED: GLEN AILEN P. OJEÑAR ENGINEER II	REVIEWED: CALVIN D. CADATAL ENGINEER II DATE:	SUBMITTED: GENE RYAN A. ALTEA CHIEF, PLANNING AND DESIGN DIVISION DATE:	RECOMMENDED: MELQUIADES H. STO. DOMINGO ASSISTANT REGIONAL DIRECTOR DATE:	APPROVED: GERALD A. PACANAN,CESO III REGIONAL DIRECTOR DATE:	SET NO. G 08 | 12	SHEET NO. 08 14

SPLICING REQUIREMENT OF REINFORCING BARS "Ls" OR "Ld"

BEAMS					COLUMNS			FLOOR SLAB	
BAR SIZE	SINGLE & 2 BAR BUNDLE		THREE BAR BUNDLE		BAR SIZE	VERTICAL REINFORCEMENT		BAR SIZE	SINGLE & 2 BAR BUNDLE
16 Ø	600 mm	750 mm	800 mm	925 mm	20 Ø	1000 mm		10 Ø	400 mm
								12 Ø	500 mm

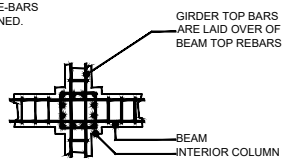
NOTE:
Ld = DEVELOPMENT LENGTH OF RE-BARS ABOVE VALUES SHALL BE THE MINIMUM SPLICE OR DEVELOPMENT LENGTH, ADDITIONAL MODIFICATION FACTORS OF ACI (CHAPTER 12) SHALL BE USED WHEREVER APPLICABLE, 38 mm Ø, BARS FOR BEAMS SHALL NOT BE BUNDLED .

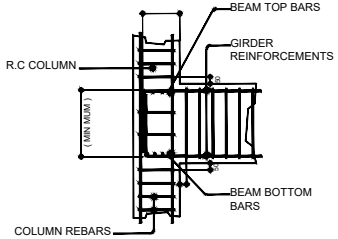
STRUCTURAL ELEMENTS	CLEAR SPAN BETWEEN SUPPORTS	MINIMUM TIME PERIOD (DAYS)
WALLS, COLUMNS, BEAMS, GIRDERS, SIDES & SLAB ON GRADE	—	1
JOIST, BEAMS & GIRDER SOFFIT	UNDER 3.00 M	7
	3.00 M TO 6.00 M	14
	OVER 6.00 M	21
ONE - WAY FLOOR SLABS	UNDER 3.00 M	4
	3.00 M TO 6.00 M	7
	OVER 6.00 M	10

ELEMENT	MINIMUM CAMBER
R.C. BEAMS	6.00mm FOR EVERY 4.50 M SPAN
CANTILEVER R.C. BEAMS	18mm FOR EVERY 3.00 M SPAN
R.C. SLABS	3mm FOR EVERY 3.00 M SHORTER SPAN

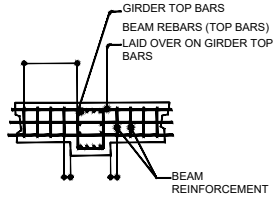
NOTE:

CLEAR DISTANCE BETWEEN RE-BARS ARE TO BE STRICTLY MAINTAINED.





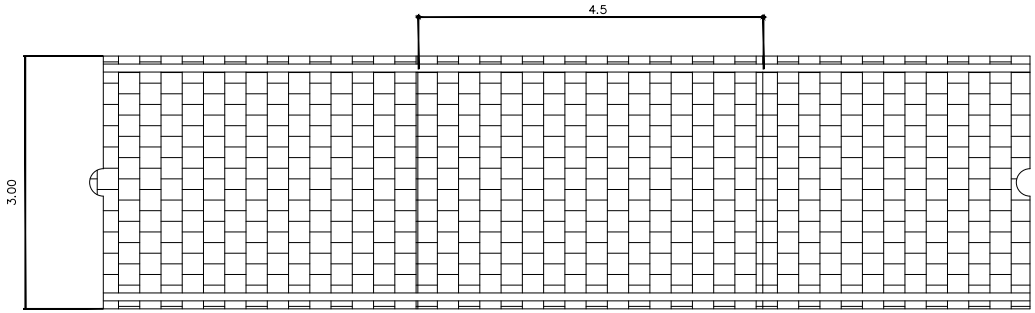
@ COLUMN INTERSECTION



@ GIRDER SPAN

01 TYPICAL PLAN OF BEAM GIRDER COLUMN JOINT
04|51 SCALE NTS

02 TYP. BEAM & GIRDER RE-BAR LAYOUT
04|51 SCALE NTS



03 TYPICAL BOARDWALK PLAN
04|51 SCALE NTS

REPUBLIC OF THE PHILIPPINES
DEPARTMENT OF PUBLIC WORKS AND HIGHWAYS
REGION IV-B
OFFICE OF THE REGIONAL DIRECTOR
EDSA, DILIMAN, QUEZON CITY

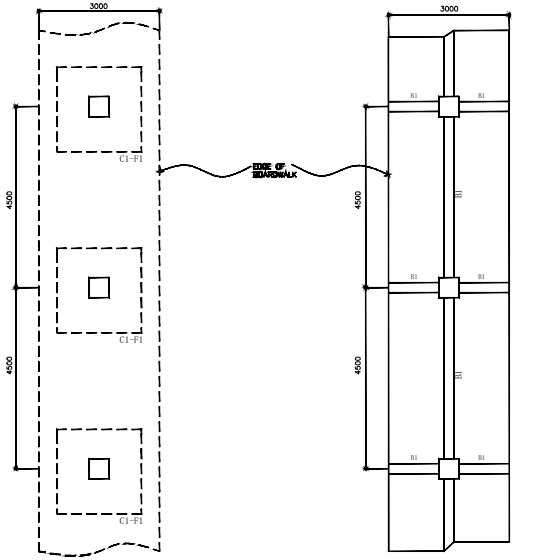
PROJECT NAME AND LOCATION:
DETAILED ENGINEERING DESIGN PLAN FOR THE CONVERGE AND SPECIAL SUPPORT PROGRAM SUSTAINABLE INFRASTRUCTURE PROJECTS ALLEVIATING GAPS (SIPAG) ACCESS ROADS AND/OR BRIDGES FROM THE NATIONAL ROAD/S LEADING TO MAJOY/STRATEGIC PUBLIC BUILDINGS/FACILITIES CONSTRUCTION OF RIZAL AVENUE EXTENSION BOARDWALK BARANGAY BANCAO-BANCAO, PUERTO PRINCESA CITY, PALAWAN
PUERTO PRINCESA CITY, PALAWAN

SHEET CONTENTS:
TYPICAL (3/6)

DRAFTED: CHRISTIAN JADE A. BEATO, ENGINEER I (COS)
PREPARED: GLEN AILEN P. OJEÑAR, ENGINEER II

REVIEWED: CALVIN D. CADATAL, ENGINEER II, DATE:
SUBMITTED: GENE RYAN A. ALTEA, CHIEF, PLANNING AND DESIGN DIVISION, DATE:
RECOMMENDED: MELQUIADES H. STO. DOMINGO, ASSISTANT REGIONAL DIRECTOR, DATE:
APPROVED: GERALD A. PACANAN,CESO III, REGIONAL DIRECTOR, DATE:

SET NO. G 09|12
SHEET NO. 09|14

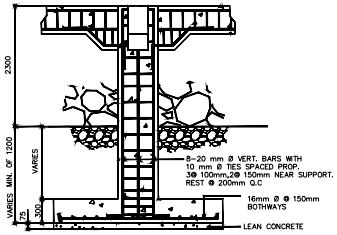


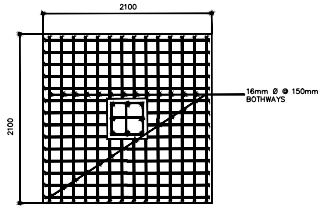
FOUNDATION PLAN

SCALE NTS

FLOOR FRAMING PLAN

SCALE NTS





COLUMNFOOTING DETAIL

SCALE NTS

SCHEDULE OF REINFORCEMENT

Structure Component		Bar Size (mm)	Qty per component	Bar Qty	Total Qty	Length Each Bar (m)	Total Length (m)	Unit Weight (kg/m)	Total Weight (kg)
Footing	Typical	16 mm dia.	224	30	6720	2.25	15120	1.579	23,874.48
	Layby	16 mm dia.	9	30	270	2.25	607.5	1.579	959.24
	hexagonal	16 mm dia.	12	30	360	2.35	846	1.579	1,335.83
Column	Vertical Bar (Typical & Layby)	20 mm dia.	233	8	1864	5.25	9786	2.466	24,132.28
	Vertical Bar (Hexagonal)	20 mm dia.	12	8	96	7.25	696	2.466	1,716.34
	Outer Ties	10 mm dia.	245	89.77	21994.32	1.6	35190.91	0.617	21,712.79
	Inner Ties	10 mm dia.	245	179.55	43988.64	0.4	17595.45	0.617	10,856.40
Beam 1 at typical - longitudinal	Main Bars	16 mm dia.	1	4	4	1122.42	4489.68	1.579	7,089.20
	Extra Bar (Top)	16 mm dia.	232	1	232	2.5	580	1.579	915.82
	Extra Bar (Top-End Beam)	16 mm dia.	2	1	2	1.73	3.46	1.579	5.46
	Extra Bar (Bottom)	16 mm dia.	223	1	223	2.4	535.2	1.579	845.08
	Web Bar	12 mm dia.	1	2	2	1090	2180	0.888	1,935.84
	Ties	10 mm dia.	223	25	5575	0.8	4460	0.617	2,751.82
Beam 1 at typical - transverse	Main Bars	16 mm dia.	233	6	1398	3.46	4837.08	1.579	7,637.75
	Web Bar	12 mm dia.	233	2	466	2.92	1360.72	0.888	1,208.32
	Ties	10 mm dia.	233	24	5592	0.8	4473.6	0.617	2,760.21
Beam 2 at Hexagonal - longitudinal	Main Bars	25 mm dia.	12	4	48	7.75	372	3.853	1,433.32
	Extra Bar Top	25 mm dia.	6	2	12	2.875	34.5	3.853	132.93
	Extra Bar (Top-End Beam)	25 mm dia.	12	2	24	2.0675	49.62	3.853	191.19
	Extra Bar (Bottom)	25 mm dia.	12	2	24	2.85	68.4	3.853	263.55
	Ties	10 mm dia.	12	42	504	1.58	796.32	0.617	491.33
Beam 3 at Hexagonal - transverse	Main Bars	12 mm dia.	10	5	50	3.46	173	0.888	153.62
	Ties	10 mm dia.	2	110	220	1.08	237.6	0.617	146.60
Beam 3 at Hexagonal - intersection	Main Bars	12 mm dia.	2	5	10	2.342	23.42	0.888	20.80
	Ties	10 mm dia.	13	12	156	1.08	168.48	0.617	103.95
Corbel	Main Bars	16 mm dia.	245	4	980	5.12	5017.6	1.579	7,922.79
	Ties	10 mm dia.	245	4	980	1.72	1685.6	0.617	1,040.02
	Ties	10 mm dia.	245	4	980	0.66	646.8	0.617	399.08

REPUBLIC OF THE PHILIPPINES
DEPARTMENT OF PUBLIC WORKS AND HIGHWAYS
REGION IV-B
OFFICE OF THE REGIONAL DIRECTOR
EDSA, DILIMAN, QUEZON CITY

PROJECT NAME AND LOCATION:
DETAILED ENGINEERING DESIGN PLAN FOR THE CONVERGE AND SPECIAL SUPPORT PROGRAM SUSTAINABLE INFRASTRUCTURE PROJECTS ALLEVIATING GAPS (SIPAG) ACCESS ROADS AND/OR BRIDGES FROM THE NATIONAL ROAD/S LEADING TO MAJOY/STRATEGIC PUBLIC BUILDINGS/FACILITIES CONSTRUCTION OF RIZAL AVENUE EXTENSION BOARDWALK BARANGAY BANCAO-BANCAO, PUERTO PRINCESA CITY, PALAWAN
PUERTO PRINCESA CITY, PALAWAN

SHEET CONTENTS:
TYPICAL (4/6)

DRAFTED:
CHRISTIAN JADE A. BEATO
ENGINEER I (COS)

PREPARED:
GLEN AILEN P. OJEÑAR
ENGINEER II

REVIEWED:
CALVIN D. CADATAL
ENGINEER II
DATE:

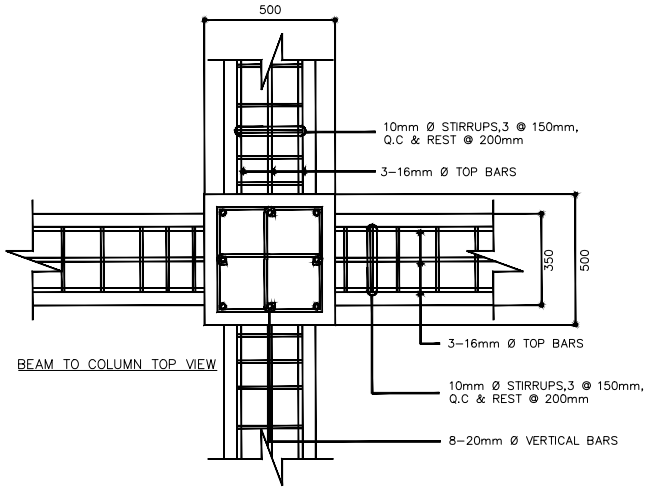
SUBMITTED:
GENE RYAN A. ALTEA
CHIEF, PLANNING AND DESIGN DIVISION
DATE:

RECOMMENDED:
MELQUIADES H. STO. DOMINGO
ASSISTANT REGIONAL DIRECTOR
DATE:

APPROVED:
GERALD A. PACANAN,CESO III
REGIONAL DIRECTOR
DATE:

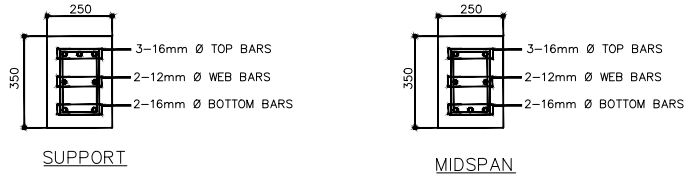
SET NO. G 10 12

SHEET NO. 10 14

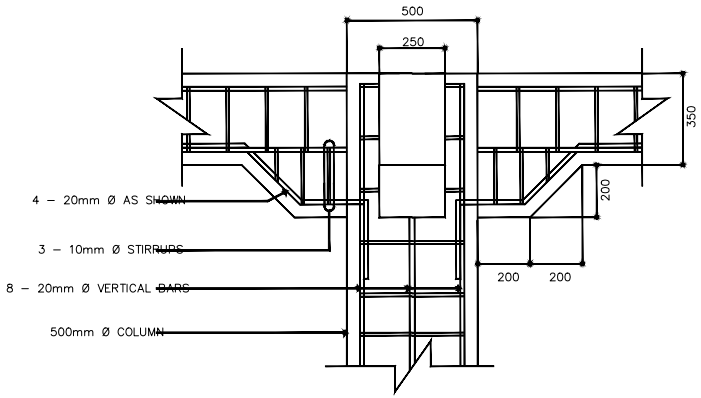


COLUMN BEAM DETAIL

SCALE NTS

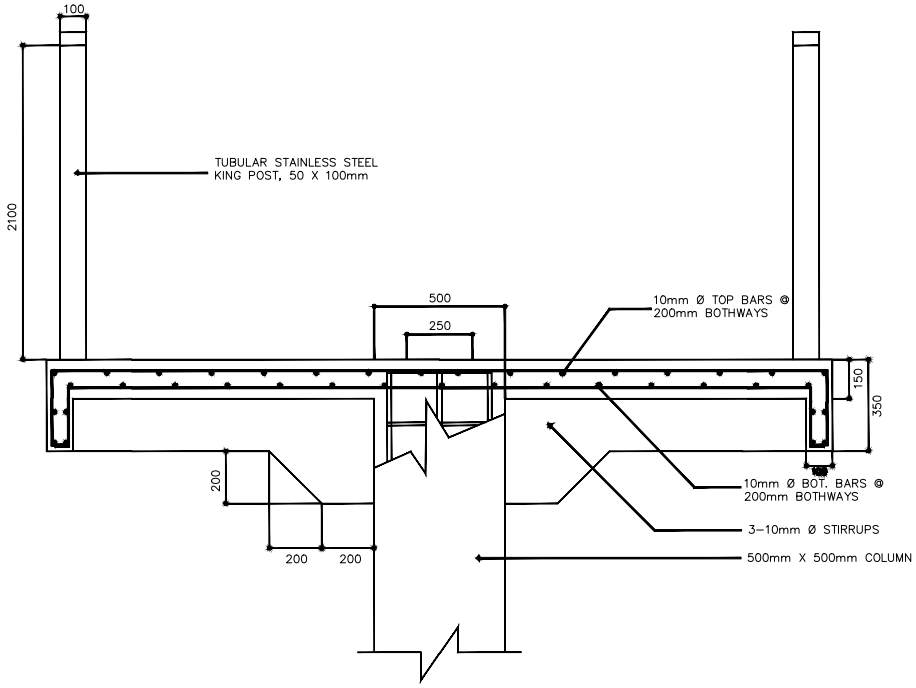


BEAM DETAIL



COLUMN CONNECTION DETAIL

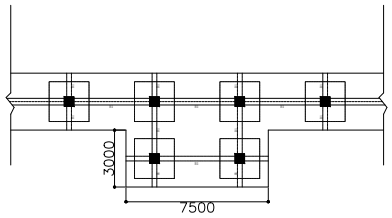
SCALE NTS



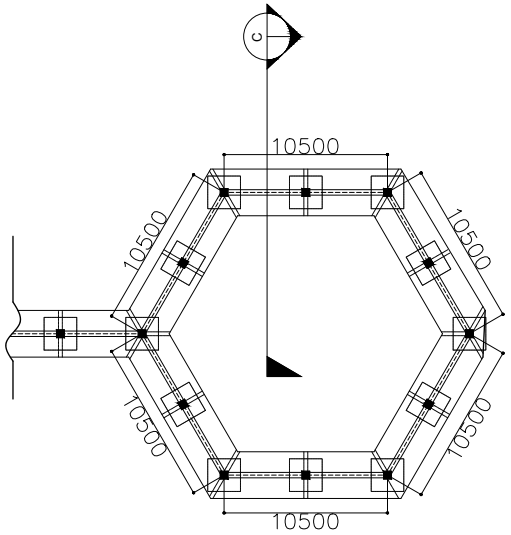
BOARDWALK SLAB SECTION

SCALE NTS

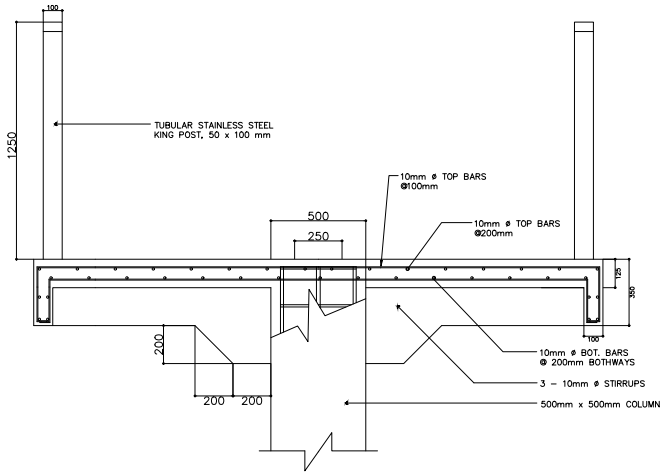
REPUBLIC OF THE PHILIPPINES DEPARTMENT OF PUBLIC WORKS AND HIGHWAYS REGION IV-B OFFICE OF THE REGIONAL DIRECTOR EDSA, DILIMAN, QUEZON CITY	PROJECT NAME AND LOCATION: DETAILED ENGINEERING DESIGN PLAN FOR THE CONVERGE AND SPECIAL SUPPORT PROGRAM SUSTAINABLE INFRASTRUCTURE PROJECTS ALLEVIATING GAPS (SIPAG) ACCESS ROADS AND/OR BRIDGES FROM THE NATIONAL ROAD/S LEADING TO MAJOY/STRATEGIC PUBLIC BUILDINGS/FACILITIES CONSTRUCTION OF RIZAL AVENUE EXTENSION BOARDWALK BARANGAY BANCAO-BANCAO, PUERTO PRINCESA CITY, PALAWAN PUERTO PRINCESA CITY, PALAWAN	SHEET CONTENTS: TYPICAL (5/6)	DRAFTED: CHRISTIAN JADE A. BEATO ENGINEER I (COS) PREPARED: GLEN AILEN P. OJEÑAR ENGINEER II	REVIEWED: CALVIN D. CADATAL ENGINEER II DATE:	SUBMITTED: GENE RYAN A. ALTEA CHIEF, PLANNING AND DESIGN DIVISION DATE:	RECOMMENDED: MELQUIADES H. STO. DOMINGO ASSISTANT REGIONAL DIRECTOR DATE:	APPROVED: GERALD A. PACANAN,CESO III REGIONAL DIRECTOR DATE:	SET NO. G 11 | 12	SHEET NO. 11 14



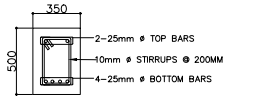
A LAY - BY FRAMING PLAN
SCALE NTS



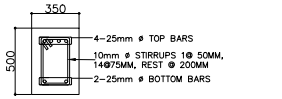
B HEXAGONAL FRAMING PLAN
SCALE NTS



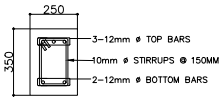
C BOARDWALK SLAB SECTION
SCALE 1:10M



D BEAM "B-2" DETAIL @ MIDSPAN
SCALE 1:10M

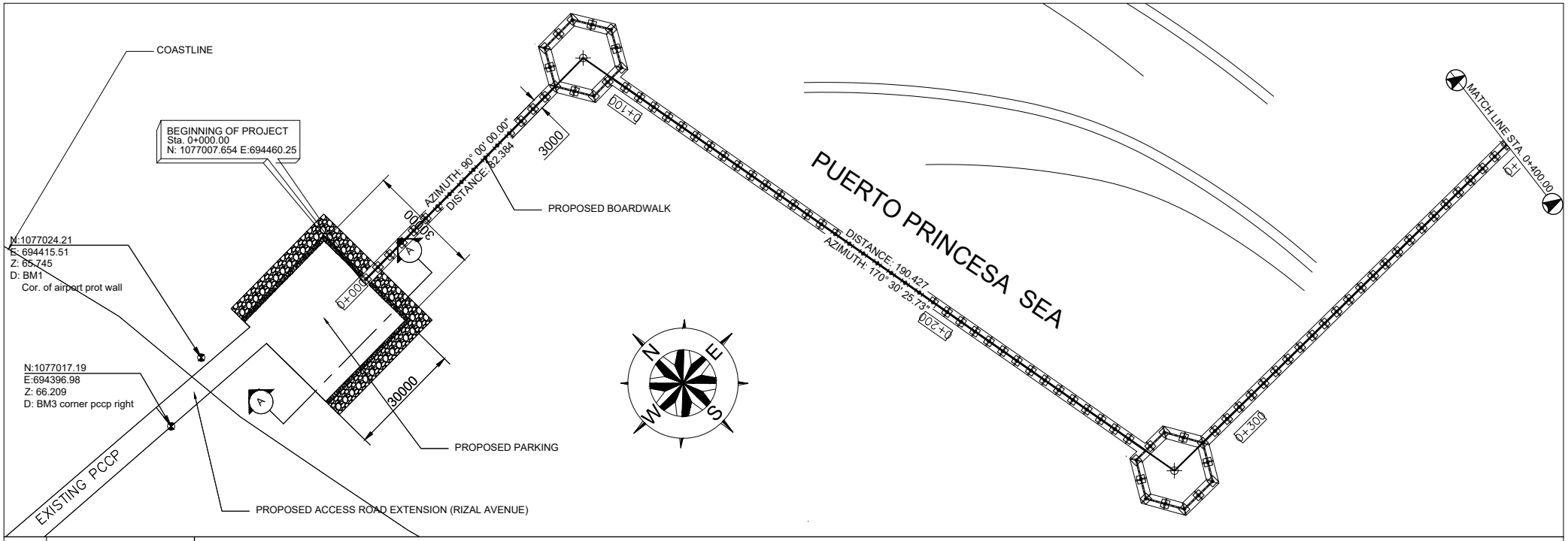


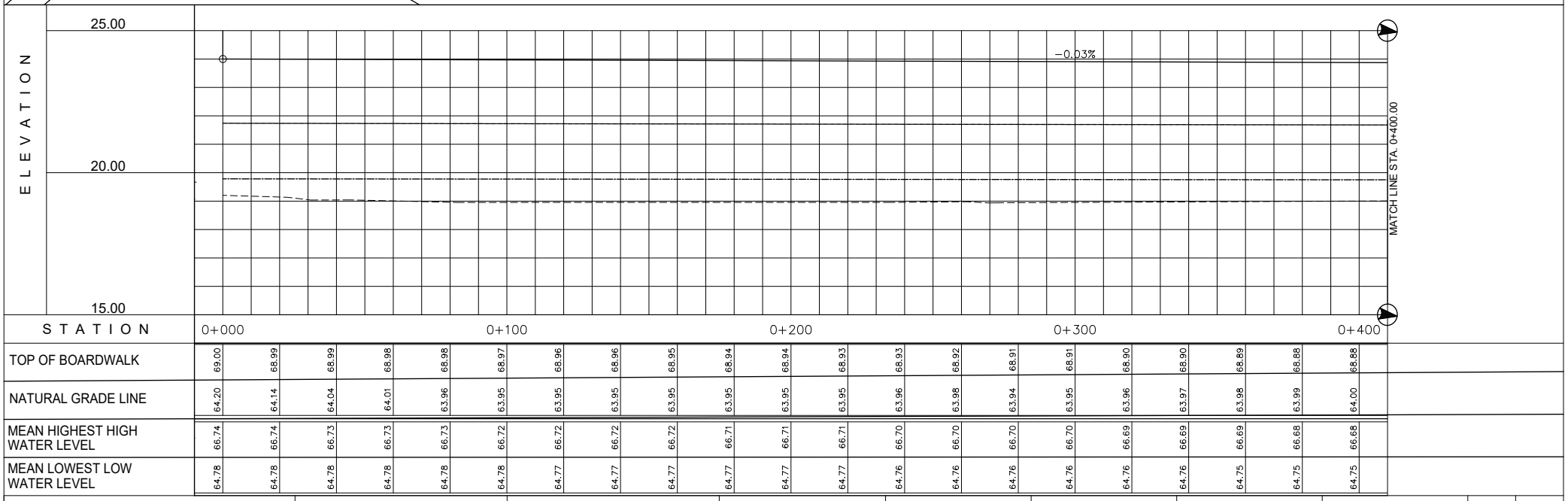
E BEAM "B-2" DETAIL @ SUPPORT
SCALE 1:10M



F BEAM "B-3" DETAIL
SCALE 1:10M

REPUBLIC OF THE PHILIPPINES DEPARTMENT OF PUBLIC WORKS AND HIGHWAYS REGION IV-B OFFICE OF THE REGIONAL DIRECTOR EDSA, DILIMAN, QUEZON CITY	PROJECT NAME AND LOCATION: DETAILED ENGINEERING DESIGN PLAN FOR THE CONVERGE AND SPECIAL SUPPORT PROGRAM SUSTAINABLE INFRASTRUCTURE PROJECTS ALLEVIATING GAPS (SIPAG) ACCESS ROADS AND/OR BRIDGES FROM THE NATIONAL ROAD/S LEADING TO MAJOY/STRATEGIC PUBLIC BUILDINGS/FACILITIES CONSTRUCTION OF RIZAL AVENUE EXTENSION BOARDWALK BARANGAY BANCAO-BANCAO, PUERTO PRINCESA CITY, PALAWAN PUERTO PRINCESA CITY, PALAWAN	SHEET CONTENTS: TYPICAL (6/6)	DRAFTED: CHRISTIAN JADE A. BEATO ENGINEER I (COS) PREPARED: GLEN AILEN P. OJEÑAR ENGINEER II	REVIEWED: CALVIN D. CADATAL ENGINEER II DATE:	SUBMITTED: GENE RYAN A. ALTEA CHIEF, PLANNING AND DESIGN DIVISION DATE:	RECOMMENDED: MELQUIADES H. STO. DOMINGO ASSISTANT REGIONAL DIRECTOR DATE:	APPROVED: GERALD A. PACANAN,CESO III REGIONAL DIRECTOR DATE:	SET NO. G 12 | 12	SHEET NO. 12 14





STATION	0+000																			
TOP OF BOARDWALK	69.00	68.99	68.99	68.98	68.98	68.97	68.96	68.96	68.95	68.94	68.94	68.93	68.93	68.92	68.91	68.91	68.90	68.90	68.89	68.88	68.88
NATURAL GRADE LINE	64.20	64.14	64.04	64.01	63.96	63.95	63.95	63.95	63.95	63.95	63.95	63.95	63.96	63.98	63.94	63.95	63.96	63.97	63.98	63.99	64.00
MEAN HIGHEST HIGH WATER LEVEL	66.74	66.74	66.73	66.73	66.73	66.72	66.72	66.72	66.72	66.71	66.71	66.71	66.70	66.70	66.70	66.70	66.69	66.69	66.69	66.68	66.68
MEAN LOWEST LOW WATER LEVEL	64.78	64.78	64.78	64.78	64.78	64.78	64.77	64.77	64.77	64.77	64.77	64.77	64.76	64.76	64.76	64.76	64.76	64.76	64.75	64.75	64.75

REPUBLIC OF THE PHILIPPINES
DEPARTMENT OF PUBLIC WORKS AND HIGHWAYS
REGION IV-B
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EDSA, DILIMAN, QUEZON CITY

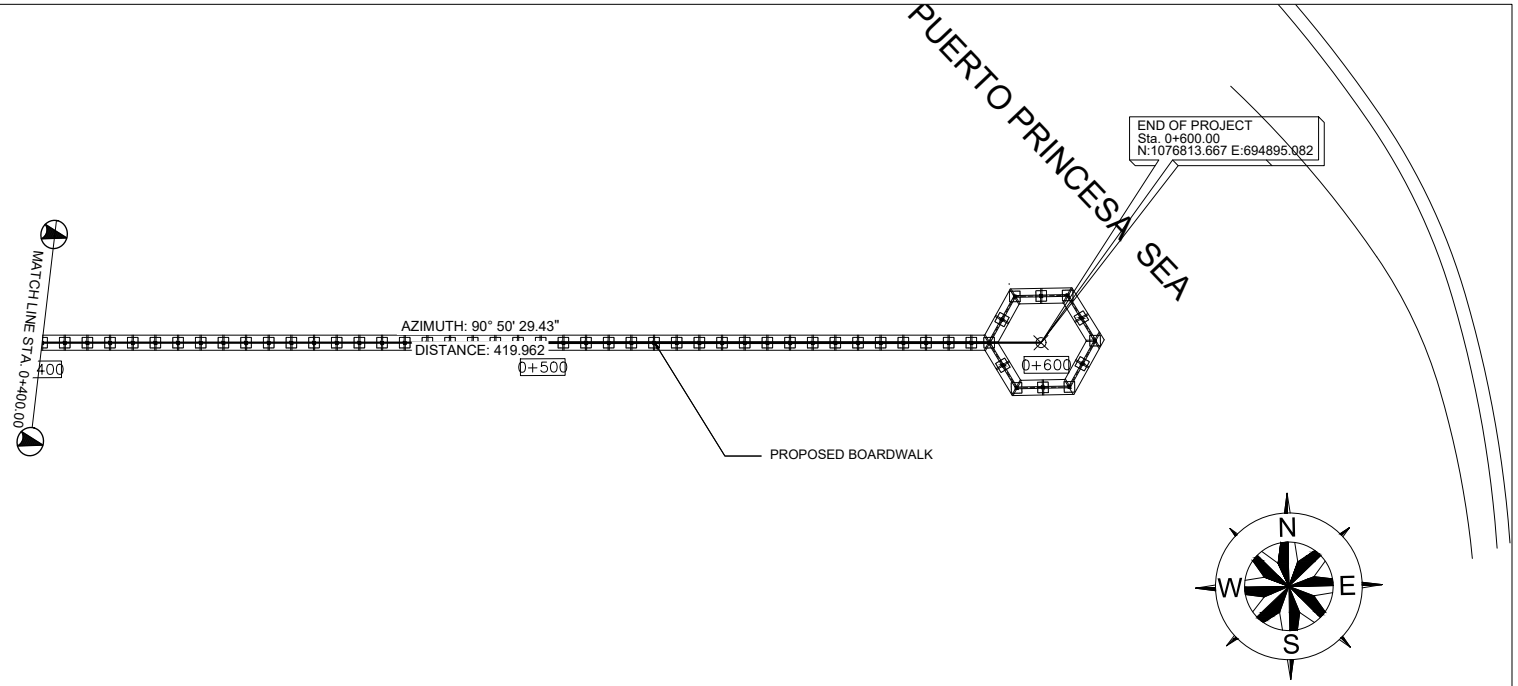
PROJECT NAME AND LOCATION:
DETAILED ENGINEERING DESIGN PLAN FOR THE CONVERGE AND SPECIAL SUPPORT PROGRAM SUSTAINABLE INFRASTRUCTURE PROJECTS ALLEVIATING GAPS (SIPAG) ACCESS ROADS AND/OR BRIDGES FROM THE NATIONAL ROAD/S LEADING TO MAJOY/STRATEGIC PUBLIC BUILDINGS/FACILITIES
CONSTRUCTION OF RIZAL AVENUE EXTENSION BOARDWALK BARANGAY BANCAO-BANCAO, PUERTO PRINCESA CITY, PALAWAN
PUERTO PRINCESA CITY, PALAWAN

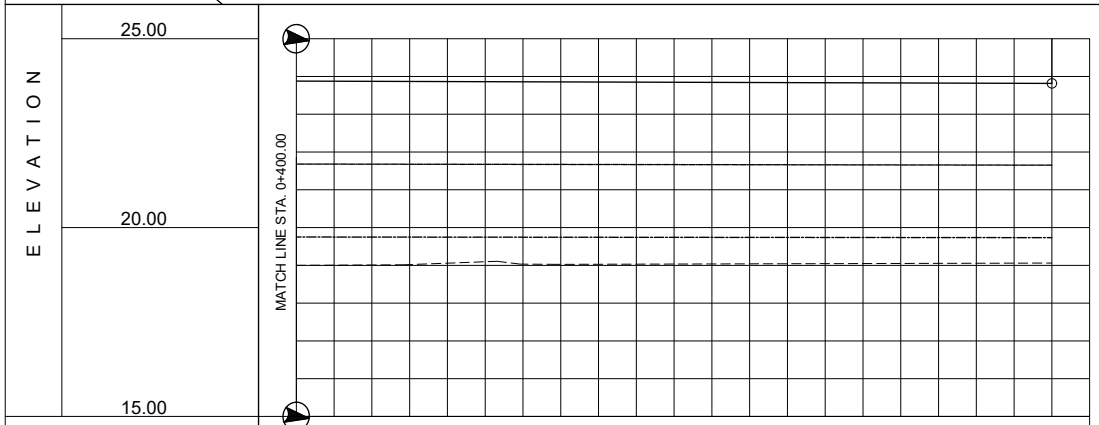
SHEET CONTENTS:
PLAN AND PROFILE (1/2)

DRAFTED: CHRISTIAN JADE A. BEATO, ENGINEER I (COS)
PREPARED: GLEN AILEN P. OJEÑAR, ENGINEER II

REVIEWED: CALVIN D. CADATAL, ENGINEER II, DATE:
SUBMITTED: GENE RYAN A. ALTEA, CHIEF, PLANNING AND DESIGN DIVISION, DATE:
RECOMMENDED: MELQUIADES H. STO. DOMINGO, ASSISTANT REGIONAL DIRECTOR, DATE:
APPROVED: GERALD A. PACANAN,CESO III, REGIONAL DIRECTOR, DATE:

SET NO.: CS 01 02
SHEET NO.: 13 14





STATION	0+400				0+500					0+600
TOP OF BOARDWALK	68.87	68.86	68.86	68.85	68.85	68.84	68.83	68.83	68.82	68.81
NATURAL GRADE LINE	64.01	64.06	64.03	64.03	64.03	64.04	64.04	64.05	64.06	64.06
MEAN HIGHEST HIGH WATER LEVEL	66.68	66.68	66.67	66.67	66.67	66.66	66.66	66.66	66.66	66.65
MEAN LOWEST LOW WATER LEVEL	64.75	64.75	64.74	64.74	64.74	64.74	64.74	64.74	64.73	64.73

REPUBLIC OF THE PHILIPPINES
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EDSA, DILIMAN, QUEZON CITY

PROJECT NAME AND LOCATION:
DETAILED ENGINEERING DESIGN PLAN FOR THE CONVERGE AND SPECIAL SUPPORT PROGRAM SUSTAINABLE INFRASTRUCTURE PROJECTS ALLEVIATING GAPS (SIPAG) ACCESS ROADS AND/OR BRIDGES FROM THE NATIONAL ROAD/S LEADING TO MAJOY/STRATEGIC PUBLIC BUILDINGS/FACILITIES
CONSTRUCTION OF RIZAL AVENUE EXTENSION BOARDWALK BARANGAY BANCAO-BANCAO, PUERTO PRINCESA CITY, PALAWAN
PUERTO PRINCESA CITY, PALAWAN

SHEET CONTENTS:
PLAN AND PROFILE (2/2)

DRAFTED: CHRISTIAN JADE A. BEATO, ENGINEER I (COS)
PREPARED: GLEN AILEN P. OJEÑAR, ENGINEER II

REVIEWED:	SUBMITTED:	RECOMMENDED:	APPROVED:	SET NO.	SHEET NO.
CALVIN D. CADATAL, ENGINEER II	GENE RYAN A. ALTEA, CHIEF, PLANNING AND DESIGN DIVISION	MELQUIADES H. STO. DOMINGO, ASSISTANT REGIONAL DIRECTOR	GERALD A. PACANAN,CESO III, REGIONAL DIRECTOR	CS 02 02	14 14
DATE:	DATE:	DATE:	DATE:		