REPUBLIC OF THE PHILIPPINES

DEPARTMENT OF PUBLIC WORKS AND HIGHWAYS

REGIONAL OFFICE I

SAN FERNANDO CITY, LA UNION

QUICK RESPONSE FUND

DETAILED ENGINEERING DESIGN PLAN FOR

EMERGENCY REPAIR/RESTORATION OF DAMAGED SLOPE PROTECTION ALONG PANGASINAN-NUEVA VIZCAYA ROAD, K0224+625-K0224+665, K0225+565-K0225+577, K0225+900-K0225+930

LOCATION: SAN NICOLAS, PANGASINAN

STATION LIMITS: K0224+625-K0224+665, K0225+565-K0225+577, K0225+900-K0225+930

NET LENGTH: 0.082 KM
NET AREA: 1476 SQ.M.

SUBMITTED:

DEXTER L. CAVANEYRO
CHIEF, PLANNING AND DESIGN DIVISION

DATE:

RECOMMENDED:

RICHARD A. RAGASA, CESE
ASSISTANT REGIONAL DIRECTOR

DATE:

APPROVED:

RONNEL M. TAN, CESO III
REGIONAL DIRECTOR

DATE:

INDEX OF DRAWINGS

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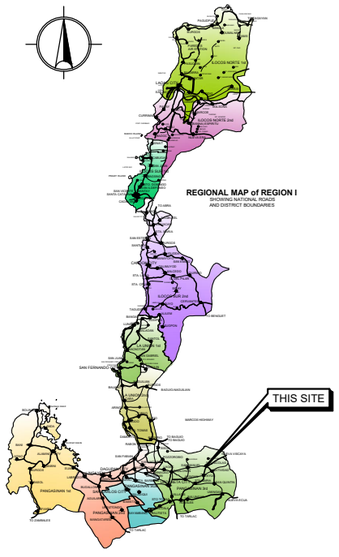
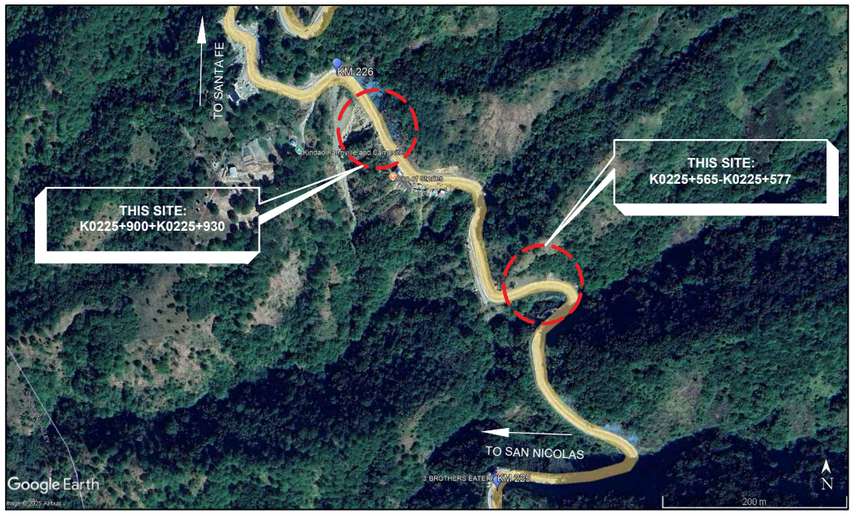


LOCATION MAP
SCALE NTS



VICINITY MAP
SCALE NTS

REPUBLIC OF THE PHILIPPINES **DEPARTMENT OF PUBLIC WORKS AND HIGHWAYS** REGIONAL OFFICE I SAN FERNANDO CITY, LA UNION	PROJECT NAME AND LOCATION: **EMERGENCY REPAIR/RESTORATION OF DAMAGED SLOPE PROTECTION ALONG PANGASINAN-NUEVA VIZCAYA ROAD, K0224+625-K0224+665, K0225+565-K0225+577, K0225+900+K0225+930** **SAN NICOLAS, PANGASINAN**	SHEET CONTENTS: **VICINITY MAP LOCATION MAP**	DRAFTED: **CHRISTINA D. GACHALLAN** ENGINEER I PREPARED: **JASON JOSE C. ORPILLA** ENGINEER II	REVIEWED: **MARIA MONINA P. DELIZO** OIC, FLOOD CONTROL, SOCIAL AND ENVIRONMENTAL SECTION DATE:	SUBMITTED: **DEXTER L. CAVANEYRO** CHIEF, PLANNING AND DESIGN DIVISION DATE:	RECOMMENDED: **RICHARD A. RAGASA, CESE** ASSISTANT REGIONAL DIRECTOR DATE:	APPROVED: **RONNEL M. TAN, CESO III** REGIONAL DIRECTOR DATE:	SET NO.	SHEET NO. 02 06

GENERAL NOTES

I. STANDARD SPECIFICATIONS

I.1. ALL WORKS SHALL COMPLY WITH DPWH STANDARD SPECIFICATIONS FOR HIGHWAYS, BRIDGES, AND AIRPORTS, VOLUME II, REVISED 2013 AND SPECIAL PROVISIONS AND SUPPLEMENTAL SPECIFICATIONS PERTAINING TO THE PROJECT.

I.2. THE DPWH ROAD SLOPE PROTECTION MANUAL 2019 OR THE LATEST APPLICABLE EDITION MAY BE USED FOR THE SELECTION AND IMPLEMENTATION OF APPROPRIATE COUNTERMEASURES.

II. DIMENSIONS

1. UNLESS OTHERWISE SPECIFIED ALL DIMENSIONS WHICH INCLUDES STATIONING, DISTANCE BETWEEN CONTROL POINTS AND DIMENSIONS OF PIPES AND BOX CULVERTS AS SHOWN IN THE PLAN PROFILE, AND CROSS SECTION ARE IN METERS AND THE UNIT OF MEASUREMENT AS SHOWN IN THE DETAILS OF STRUCTURES ARE IN MILLIMETERS (mm) AND IN METERS (m).

III. STATIONINGS

1. THE ROAD STATIONING AND ELEMENTS OF CURVES ARE RELATIVE TO THE ULTIMATE CENTERLINE OF THE ROAD.

2. EQUATION OF STATIONS WHEN USED (BACK STATION/AHEAD STATION) ARE PROVIDED AT THE BEGINNING OR END OF THE CURVE AND/OR AT FULL STATION.

IV. HORIZONTAL CONTROL

1. BASIC TRAVERSE STATIONS WERE ESTABLISHED BASED ON EXISTING PERMANENT STRUCTURES AT THE PROJECT SITE.

V. VERTICAL CONTROL

1. ELEVATIONS WERE ASSUMED AT THE FIRST BENCH MARK AT THE BEGINNING OF EACH SECTION OF THE PROJECT

2. BENCH MARKS WERE ESTABLISHED AT EXISTING UNDISTURBED STRUCTURES AT DIFFERENT INTERVALS ALONG THE PROJECT.

VI. HORIZONTAL ALIGNMENT

1. ALL WORKS SHALL COMPLY WITH THE STANDARD SPECIFICATION FOR PUBLIC WORKS AND HIGHWAYS, 2013.

2. PORTIONS OF EXISTING UTILITIES, SUCH AS WATER MAINS. IRRIGATION CHANNELS, TELEPHONE POST AND TRUNKLINES, ETC. THAT MAY CAUSE OBSTRUCTION TO THE CONSTRUCTION OF THIS PROJECT SHALL BE RELOCATED BY THE ENTITY OR OWNER CONCERNED, EXTREME PRECAUTION SHALL BE EXERCISED BY THE CONTRACTOR NOT TO DAMAGE ANY SECTION OF THE EXISTING PUBLIC UTILITIES DURING CONSTRUCTION. ANY REPAIR OF DAMAGE THEREOF SHALL BE ON THE ACCOUNT OF THE CONTRACTOR,ANY REMOVAL OF MISCELLANEOUS STRUCTURES THAT MAY BE REQUIRED SHALL BE CONSIDERED SUBSIDIARY WORK PERTAINING TO OTHER CONTRACT ITEM. NO DIRECT PAYMENT SHALL BE MADE FOR THIS WORK EXCEPT FOR SPECIFIC ITEMS EXPLICITLY FOR PAYMENT IN THE BID SCHEDULE.

VIII. DRAINAGE STRUCTURES

1. EXACT LOCATIONS, SLOPES, OUTFALLS, AND INVERT ELEVATIONS OF DRAINAGE STRUCTURES SHALL BE CHECKED IN THE FIELD BY THE ENGINEER. MINOR ADJUSTMENT MAY BE MADE WITH THE APPROVAL OF THE ENGINEER TO SUIT ACTUAL FIELD CONDITIONS.

2. ANY REVISIONS REMOVAL AND /OR RELAYING OF DRAINAGE STRUCTURE AS DIRECTED BY THE ENGINEER TO SUIT EXISTING FIELD CONDITIONS SHALL BE CONSIDERED AS SUBSIDIARY WORK PERTAINING TO OTHER CONTRACT ITEMS NO DIRECT PAYMENT SHALL BE MADE FOR THIS WORK UNLESS OTHERWISE SPECIFICALLY IDENTIFIED FOR PAYMENT IN THE BID SCHEDULE.

3. EXISTING DRAINAGE STRUCTURES OR PART THEREOF REMOVED BY THE CONTRACTOR THAT ARE STILL SERVICEABLE SHALL BE TURNED OVER TO THE GOVERNMENT AND SHALL BE DEPOSITED AT A PLACE WITHIN THE PROJECT SITE DESIGNATED BY THE ENGINEER WITHOUT ANY EXTRA COMPENSATION. EXTREME PRECAUTION SHALL BE EXERCISED BY THE CONTRACTOR NOT TO DAMAGE THESE MATERIALS DURING THE REMOVAL AND HANDLING.

IX. STRUCTURAL CONCRETE STRUCTURES

1. CONCRETE

a) UNLESS OTHERWISE INDICATED ON THE PLANS. THE MINIMUM CYLINDER STRENGTH OF STRUCTURAL CONCRETE AT 28 DAYS SHALL BE 21.00 MPa.

b) THE MINIMUM COVERING FOR SURFACE OF CONCRETE TO THE FACE OF THE NEAREST BAR SHALL BE 50mm. ALL CONCRETE SHALL BE POURED WHERE THERE IS A PERMISSIBLE WEATHER CONDITION AND NO OTHER ENVIRONMENT HAZARD WILL AFFECT THE POURING.

2. REINFORCING STEEL

a) REINFORCING BARS FOR ALL STRUCTURES SHALL BE GRADE 60 (FY=414 MPa) FOR BARS LARGER THAN 16 MM DIAMETER . GRADE 40 (Fy=275.8 MPa) FOR BARS 16 MM. DIAMETER OR SMALLER. ALL REBARS SHALL BE FREE OF MILL SCALES, OIL OR ANY SUBSTANCE THAT MAY IMPAIR/WEAKER BOND WITH CONCRETE.

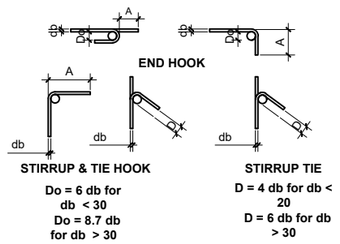
3. REINFORCING BAR SPLICING

WHERE SPLICING IS PERMITTED THE MINIMUM LAP LENGTH OF BARS SHALL BE AS PER AASHTO ARTICLE 8.32 ALL SPLICES SHALL BE STAGGERED AT LEAST 40 BAR DIAMETER. WHERE BUTT WELD IS USED INLIEU OF LAPPED CONNECTIONS, THIS SHALL DEVELOP AT LEAST 125% OF THE SPECIFIED YIELD STRENGTH OF THE REINFORCING STEEL BAR. REINFORCING BARS SHALL BE ACCURATELY FORMED TO THE SHAPES AND DIMENSIONS INDICATED ON THE PLAN UNLESS OTHERWISE PERMITTED. ALL REINFORCING BARS REQUIRING BENDING SHALL BE BENT COLD. WHEN REINFORCING BARS ARE BENT BY HEATING THE ENTIRE OPERATION SHALL BE APPROVED BY THE ENGINEER.

4. HOOKS AND BENDS

HOOKS AND BENDS SHALL BE AS SHOWN IN THE FOLLOWING TABLE:

SIZE OF BARS	END HOOKS		STIRRUP & TIE		STIRRUP TIE
	180°	90°	90°	135°	135°
10	125	150	100	100	125
12	150	200	113	113	163
16	175	250	150	138	200



END HOOK

STIRRUP & TIE HOOK

Do = 6 db for db < 30
Do = 8.7 db for db > 30

STIRRUP TIE

D = 4 db for db < 20
D = 6 db for db > 30

STRUCTURAL STEEL SHEET PILE

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 CONDITIONS, THE DRIVING OF PILES MAY BE STOPPED AT A 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 REQUIRED DRIVING AND THAT THE PILES CAN BE DRIVEN TO THE PLAN ELEVATION WITH THE PROPER USE OF THIS EQUIPMENT.

THE TOP OF 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 400, PILING.

RIPRAP AND GROUTED RIPRAP

STONES OF RIPRAP SHALL CONSIST OF ROCK AS NEARLY AS RECTANGULAR IN SECTION AS IS PRACTICAL, E XCEPT THAT CLASS A MAY CONSIST OF ROUND NATURAL STONES. THE STONES SHALL BE ROUND, TOUGH, DURABLE, DENSE, RESISTANT TO THE ACTION OF AIR AND WATER, AND SUITABLE IN ALL RESPECTS FOR THE PURPOSE INTENDED.

CLASS A - STONES RANGING FROM A MINIMUM OF 15KG TO A MAXIMUM OF 25KG WITH AT LEAST 50 PERCENT OF THE STONES WEIGHING MORE THAN 20KG.

STONES SHALL BE PLACED BY HAND, OR INDIVIDUALLY BY MACHINE AS SPECIFIED FOR RIPRAP PLACED ABOVE THE WATER LINE. THE SPACES BETWEEN THE STONES SHALL BE FILLED WITH CEMENT MORTAR THROUGHOUT THE THICKNESS OF THE RIPRAP AS SPECIFIED IN SUBSECTION 505.2.3, MORTAR.

GROUT SHALL BE PLACED FROM BOTTOM TO TOP OF THE SURFACE SWEPT WITH A STIFF BROOM. THE STONES SHALL BE LAID IN A MANNER THAT THE VERTICAL AND HORIZONTAL ALIGNMENTS OF THE EXPOSED FACE SHALL, AS POSSIBLE BE MAINTAINED IN A STRAIGHT LINE.

THE REQUIREMENTS GOVERNING THE INSTALLATION OF MORTAR AND GROUTING SHALL CONFORM IN GENERAL AS SET FORTH UNDER ITEM 505, RIPRAP AND GROUTED RIPRAP.

MINIMUM SPACING AND FREQUENCY OF BOREHOLES	FOR SLOPE HEIGHT(H) < 5.0M: ONE (1) AT EVERY PROPOSED SLOPE PROTECTION STRUCTURE TO BE LOCATED AT AN IDENTIFIED CRITICAL LOCATION. ADDITIONAL INTERMEDIATE BOREHOLE FOR EVERY 100M INTERVAL ALONG THE LENGTH OF THE SLOPE, IF NECESSARY.
	FOR SLOPE HEIGHT(H) ≥ 5.0M: ONE (1) AT THE TOP AND ONE(1) AT THE TOE (STAGGERED) OF THE SLOPE AND TO BE LOCATED AT THE SECTION WITH THE HIGHEST VERTICAL POINT OR AT ANY IDENTIFIED CRITICAL LOCATION. ADDITIONAL INTERMEDIATE BOREHOLE FOR EVERY 100M INTERVAL ALONG THE LENGTH OF THE SLOPE, IF NECESSARY. NOTE: NO BOREHOLE DRILLING IS TO BE CONDUCTED IF THE EXISTING SLOPE IS DESIGNED FOR RESHAPING ONLY.
MINIMUM DEPTH OF BOREHOLES	EXTEND BORINGS DEPTH UP TO 0.75 AND 1.5 TIMES THE HEIGHT OF THE WALL. WHERE STRATIFICATION INDICATES A POSSIBLE DEEP STABILITY OR SETTLEMENT PROBLEM; BORINGS SHOULD EXTEND UNTIL THREE (3) SUCCESIVE SPT N-VALUES 30 ARE OBTAINED.
REQUIRED LABORATORY TEST	MINIMUM REQUIREMENTS: • MECHANICAL SIEVE ANALYSIS • SPECIFIC GRAVITY • ATTERBERG LIMITS • NATURAL MOISTURE CONTENT • SOIL/ROCK STRENGTH TEST CONDITIONAL TEST BASED ON ACTUAL SITE CONDITION: • PERMEABILITY TEST • CONSOLIDATION TEST • HYDROMETER TEST ROCK MASS RATING • GEOPHYSICAL SURVEY METHOD

THE CONTRACTOR IS SOLELY RESPONSIBLE FOR ENSURING THAT THE "AS-STAKED" PLAN CONFORMS TO THE DEPARTMENT'S CRITERIA AND DESIGN REQUIREMENTS ESTABLISHED IN THE DED PLAN. IF CHANGE IS NECESSARY, THE CONTRACTOR SHALL SUBMIT SHOP DRAWINGS TO THE PROJECT ENGINEER FOR EVALUATION AND APPROVAL BY THE CHIEF OF PLANNING AND DESIGN SECTION OR DIVISION.

THE MAXIMUM VERTICAL ("A") AND HORIZONTAL ("B") SPACING OF SOIL NAILS AS SHOWN IN THE PLANS, SHALL BE ADOPTED/FOLLOWED AND NOT TO EXCEED 2.0 METERS CENTER TO CENTER IN A STAGGERED MANNER. IT SHOULD BE BASED ON THE RESULT OF THE DESIGN CALCULATION.

A MINIMUM OF TWO (2) SPOT WELDING SHOULD BE PROVIDED BETWEEN THE NUT AND STEEL PLATE CONNECTION (I.E. ONE AT THE TOP AND ONE AT THE BOTTOM OF THE NUT). THE DETAILS SHOULD BE INCLUDED BY THE CONTRACTOR IN THE "AS-STAKED" PLAN.

CENTRALIZER SHOULD BE INSTALLED AT REGULAR INTERVALS, NOT EXCEEDING 3 METERS CENTER-TO-CENTER SPACING WITH THE UPPER ONE LOCATED AT A MAXIMUM OF 1.50M FROM THE TOP OF THE SOIL NAIL LENGTH AND THE LOWER ONE LOCATED AT 0.30M FROM THE BOTTOM OF THE SOIL NAIL BOND LENGTH. CENTRALIZERS MUST BE SECURELY ATTACHED TO THE ANCHOR BOLT / SOIL NAIL AND MUST BE ADEQUATELY FITTED TO ALLOW:

- POSITIONING THE SOIL NAIL/ANCHOR BOLT WITHIN 25MM OF THE CENTER OF THE DRILL-HOLE;
- INSERTING THE SOIL NAIL/ANCHOR BOLT TO THE BOTTOM OF THE DRILL HOLE; AND
- GROUT TO FREELY FLOW UP THE DRILL HOLE

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SAN NICOLAS, PANGASINAN

SHEET CONTENTS:
GENERAL NOTES

DRAFTED:
CHRISTINA D. GACHALLAN
ENGINEER I

PREPARED:
JASON JOSE C. ORPILLA
ENGINEER II

REVIEWED:
MARIA MONINA P. DELIZO
OIC, FLOOD CONTROL, SOCIAL AND ENVIRONMENTAL SECTION
DATE:

SUBMITTED:
DEXTER L. CAVANEYRO
CHIEF, PLANNING AND DESIGN DIVISION
DATE:

RECOMMENDED:
RICHARD A. RAGASA, CESE
ASSISTANT REGIONAL DIRECTOR
DATE:

APPROVED:
RONNEL M. TAN, CESO III
REGIONAL DIRECTOR
DATE:

SET NO.

SHEET NO.
03
06

SUMMARY OF QUANTITIES

ITEM NO.	DESCRIPTION	UNIT	TOTAL QUANTITIES	REMARKS
PART A	**FACILITIES FOR THE ENGINEER**			
A.1.1 (8)	Provision of Field Office for the Engineer (Rental Basis)	mo.	7.10	For Project Engineer and Staff
A.1.1 (16)	Operation and Maintenance of Field Office for the Engineer	mo.	7.10	For Project Engineer and Staff
PART B	**OTHER GENERAL REQUIREMENTS**			
B.5	Project Billboard / Signboard (for DPWH)	ea.	2.00	For Project Information Posting
B.5	Project Billboard / Signboard (for COA)	ea.	1.00	For Project Information Posting
B.7 (1)	Occupational Safety and Health Program	mo.	7.10	For Safety of Manpower on Site
B.8 (2)	Traffic Management	l.s.	1.00	For Safety of Manpower on Site
B.9	Mobilization / Demobilization	l.s.	1.00	For Mobilization & Demobilization
PART C	**EARTHWORKS**			
100(1)	Clearing and Grubbing	ha.	0.05	For Roadway Clearing
101(3)b5	Removal of Actual Structures/Obstruction, 0.28m thick, PCCP (Unreinforced)	sq.m.	414.10	For Roadway Clearing
102(2)a	Surplus Rock Excavation (Soft)	cu.m.	164.00	Roadway Cut
103(1)a	Structure Excavation (Common Soil)	cu.m.	916.00	Structure Excavation
104(8)	Air-Mortar Embankment (Low Density - Controlled Low Strength Material)	cu.m.	1,695.35	For Roadway Embankment
105(1)a	Subgrade Preparation (Common Material)	sq.m.	414.40	For Roadway Subgrade Preparation
PART D	**SUBBASE AND BASE COURSE**			
200(1)	Aggregate Subbase Course	cu.m.	83.00	For Roadway Subbase Material
PART E	**SURFACE COURSES**			
311(1)e1	Portland Cement Concrete Pavement (Unreinforced), 0.28m thick, 14 days	sq.m.	414.10	For Roadway Surface Material
PART G	**DRAINAGE AND SLOPE PROTECTION STRUCTURES**			
400(6)	Structural Steel Sheet Piles, Furnished	l.m.	3,708.00	For Sheet Pile Slope Protection
400(12)	Structural Steel Sheet Piles, Driven	l.m.	2,472.00	For Sheet Pile Slope Protection
404(1)a	Reinforcing Steel, Grade 40	kg.	1,077.00	For Sheet Pile Slope Protection
404(1)b	Reinforcing Steel, Grade 60	kg.	4,424.00	For Sheet Pile Capping
405(1)a3	Structural Concrete, 20.68MPa, Class A, 28 days	cu.m.	21.00	For Sheet Pile Slope Protection
505(2)a	Grouted Riprap	cu.m.	71.34	For Cross Drainage
513(1)	Permanent Ground Anchor	ln.m.	504.00	For Slope Protection
517(1)b	Drain Pipe, PVC	l.m.	82.00	For Slope Protection Drainage
715(2)	Separation Geotextile	sq.m.	590.40	For Slope Protection
PART H	**MISCELLANEOUS STRUCTURES**			
603(3)a1	Metal Guardrails (Metal Beam) Including Post, Single, W-Beam	l.m.	82.00	For Road Safety
603(4)b	Metal Beam End Piece, Bull Nose	ea.	20.00	For Road Safety

NOTE: QUANTITY OF VARIOUS WORK ITEMS ARE SUBJECT TO DECREASE OR INCREASE DEPENDING ON THE ACTUAL FIELD CONDITION
BEFORE THE START OF ACTUAL CONSTRUCTION, THE AS- STAKED PLAN SHALL BE SUBMITTED TO THE REGIONAL OFFICE IN ORDER THAT IMMEDIATE STEPS MAY BE UNDERTAKEN TO CORRECT OR ADJUST WHATEVER APPRECIABLE DEVIATION THERE MAY BE FROM THE ORIGINAL PLAN. THE REFERENCE FOR IMPLEMENTATION SHALL BE THE AS- STAKED PLAN.

C E R T I F I C A T I O N

This is to certify that the Detailed Engineering Surveys and Designs for the project **EMERGENCY REPAIR/RESTORATION OF DAMAGED SLOPE PROTECTION ALONG PANGASINAN-NUEVA VIZCAYA ROAD, K0224+625-K0224+665, K0225+565-K0225+577, K0225+900-K0225+930** with Project ID No._____ had been conducted in accordance with the DPWH Standards and Specifications, 2013 edition.

This Certification is being issued for all legal intents and purposes.

Given this ____ day of _____, year _____.

DEXTER L. CAVANEYRO
Chief, Planning and Design Division

REPUBLIC OF THE PHILIPPINES
DEPARTMENT OF PUBLIC WORKS AND HIGHWAYS
REGIONAL OFFICE I
SAN FERNANDO CITY, LA UNION

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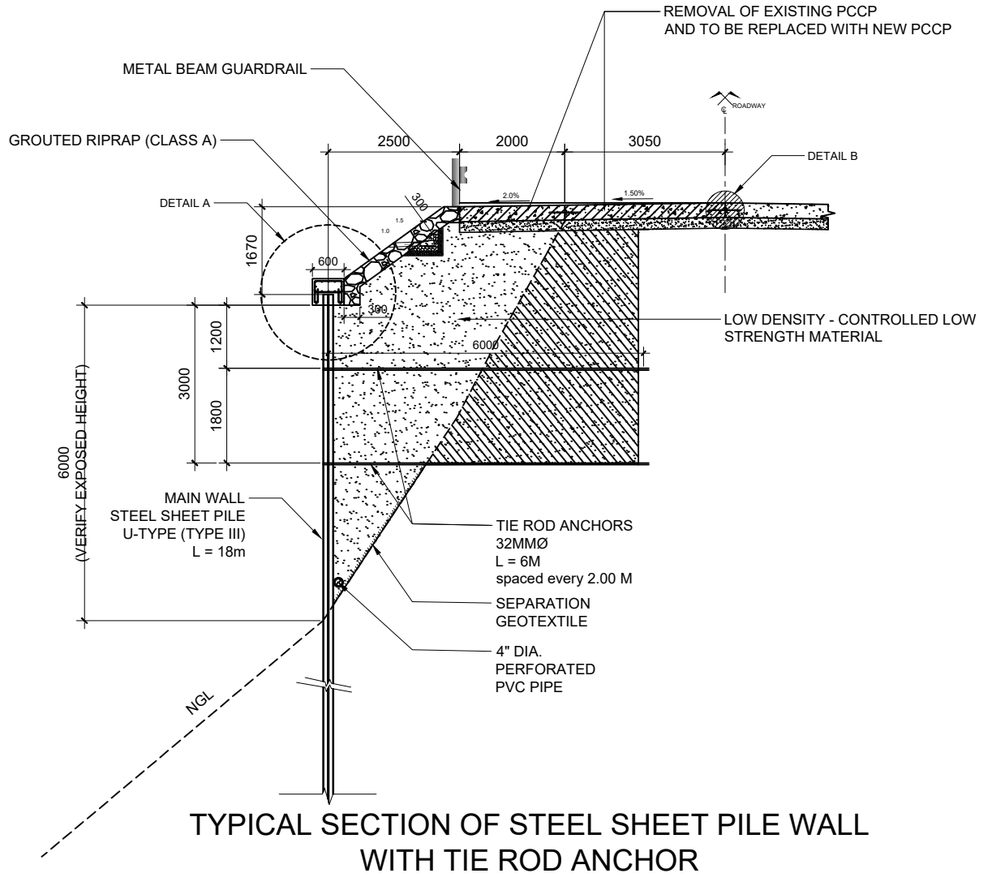
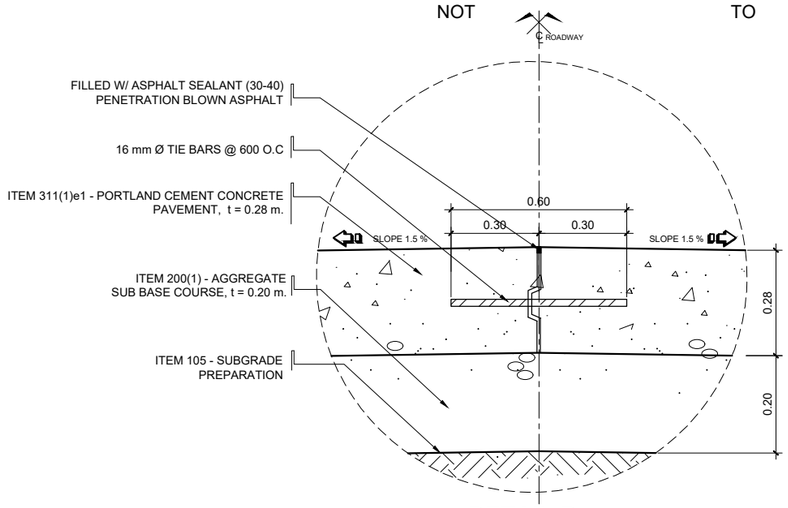


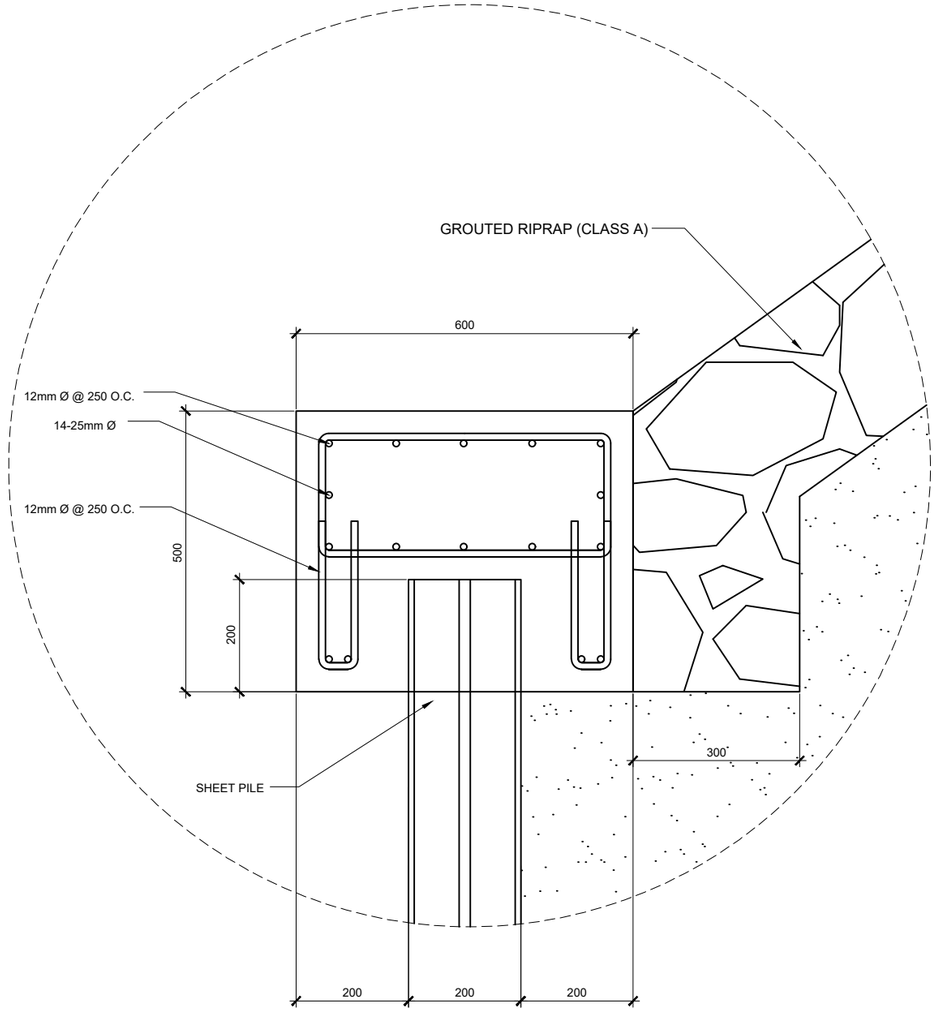
TYPICAL SECTION OF STEEL SHEET PILE WALL WITH TIE ROD ANCHOR

NOT TO SCALE



DETAIL B
CONSTRUCTION/LONGITUDINAL JOINT ON CARRIAGEWAY

SCALE: 1:5 MTS



DETAIL A

NOT TO SCALE

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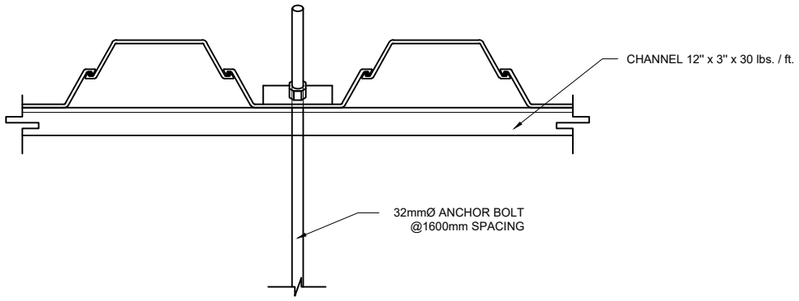
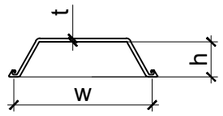


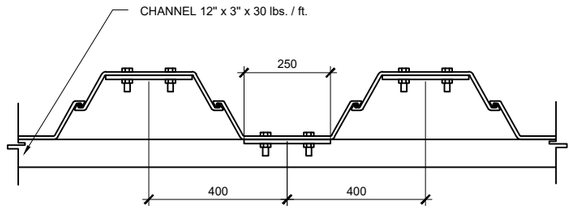
PLAN VIEW



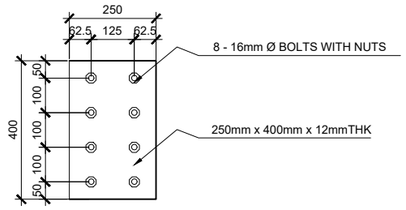
SCHEDULE

	DIMENSIONS			SECTIONAL AREA	WEIGHT		MOMENT OF INERTIA		SECTION MODULUS	
	WIDTH w (mm)	HEIGHT h (mm)	THICKNESS t (mm)	PER PILE (cm^2)	PER PILE (kg/m)	PER LINEAR METER OF WALL (kg/m^2)	PER PILE (cm^4)	PER LINEAR METER OF WALL (cm^4/m)	PER PILE (cm^3)	PER LINEAR METER OF WALL (cm^3/m)
SHEET PILE	400	125	13.0	76.42	60.0	150		16,800		1,340

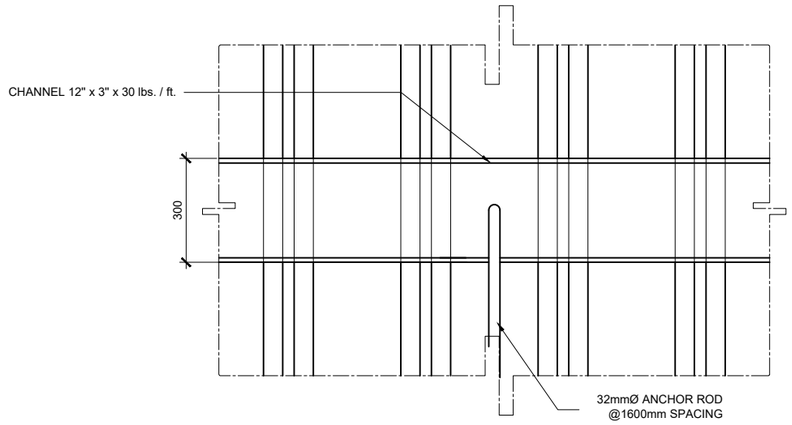
SHEET PILE SCHEDULE

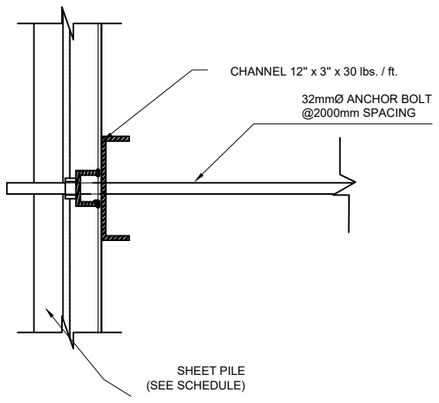


SHEET PILE PLAN VIEW



SPLICE DETAIL OF SHEET PILE





DETAIL B

FRONT ELEVATION VIEW

SIDE ELEVATION VIEW

SHEET PILE/GROUND ANCHOR DETAILS

REPUBLIC OF THE PHILIPPINES
DEPARTMENT OF PUBLIC WORKS AND HIGHWAYS
REGIONAL OFFICE I
SAN FERNANDO CITY, LA UNION

PROJECT NAME AND LOCATION:	SHEET CONTENTS:	DRAFTED:	REVIEWED:	SUBMITTED:	RECOMMENDED:	APPROVED:	SET NO.	SHEET NO.
EMERGENCY REPAIR/RESTORATION OF DAMAGED SLOPE PROTECTION ALONG PANGASINAN-NUEVA VIZCAYA ROAD, K0224+625-K0224+665, K0225+565-K0225+577, K0225+900+K0225+930 **SAN NICOLAS, PANGASINAN**	**SHEET PILE/ TIE ROD ANCHOR DETAILS**	**CHRISTINA D. GACHALLAN** ENGINEER I PREPARED: **JASON JOSE C. ORPILLA** ENGINEER II	**MARIA MONINA P. DELIZO** OIC, FLOOD CONTROL, SOCIAL AND ENVIRONMENTAL SECTION DATE:	**DEXTER L. CAVANEYRO** CHIEF, PLANNING AND DESIGN DIVISION DATE:	**RICHARD A. RAGASA, CESE** ASSISTANT REGIONAL DIRECTOR DATE:	**RONNEL M. TAN, CESO III** REGIONAL DIRECTOR DATE:		06 06