LAO PEOPLE'S DEMOCRATIC REPUBLIC

PEACE INDEPENDENCE DEMOCRACY UNITY PROSPERITY

MINISTRY OF PUBLIC WORKS AND TRANSPORT (MPWT)

DEPARTMENT OF ROADS

NR 13 NORTH IMPROVEMENT AND MAINTENANCE PROJECT
(SIKEUTH JUNCTION – PHONHONG)
CONCEPTUAL DESIGN

CONTRACT 2

Km 19+400 – 56+777, Length of 37.377 Km

(BAN SONGPEUAY - PHONHONG)

VOLUME IV

DRAWINGS
PART D: STRUCTURES
(FINAL)

PREPARED BY:

ລ.ວ.ຄ

ລັດວິສາຫະກິດ ວິສະວະກຳ ຄົມມະນາຄົມ

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VIENTIANE

April, 2018

LTEC CODE: SD-262-17

GENERAL

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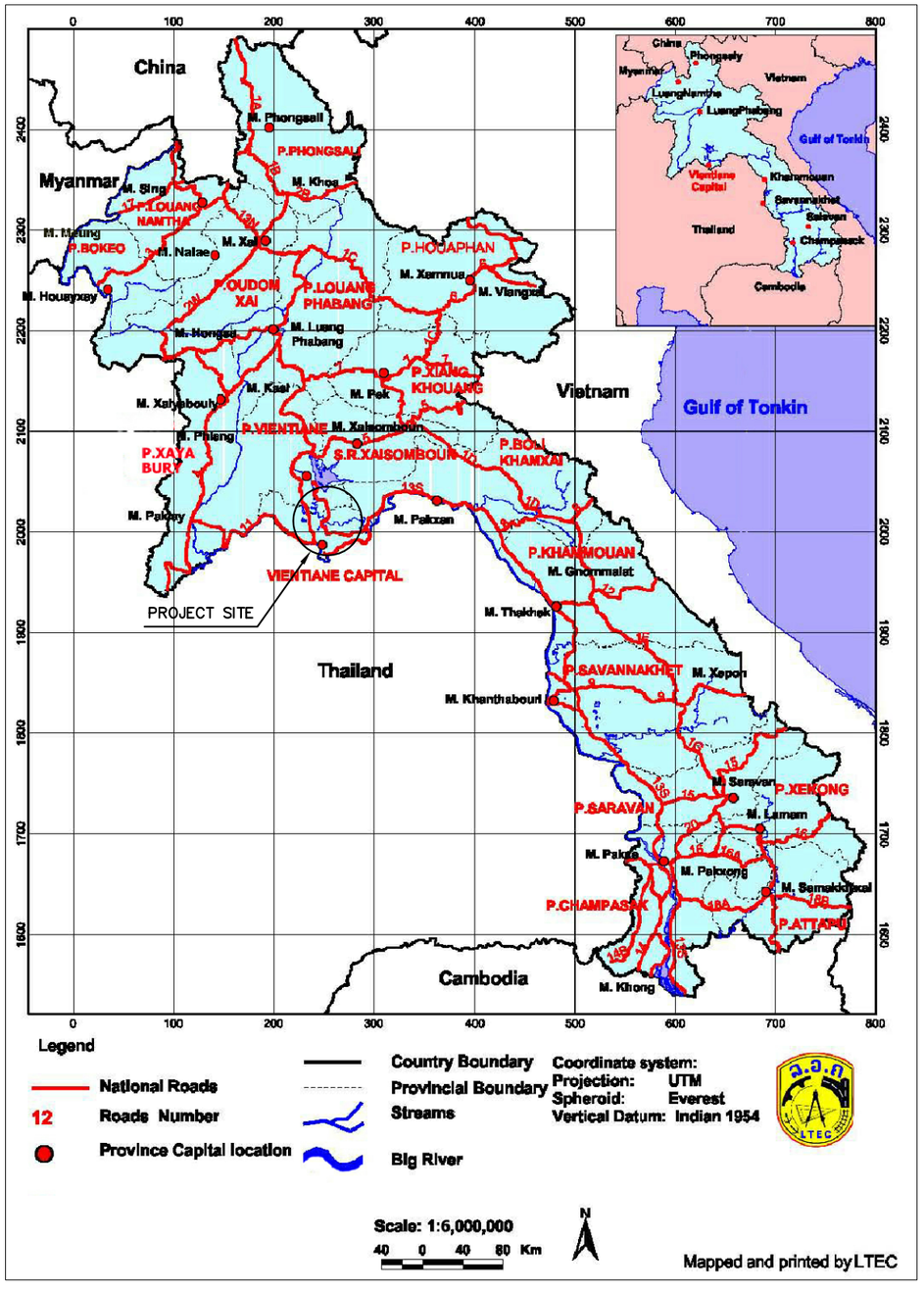
LAO TRANSPORT ENGINEERING CONSULTANT

NR 13N IMPROVEMENT AND MAINTENANCE PROJECT
CONTRACT 2 : BAN SONGPEUAY – PHONHONG

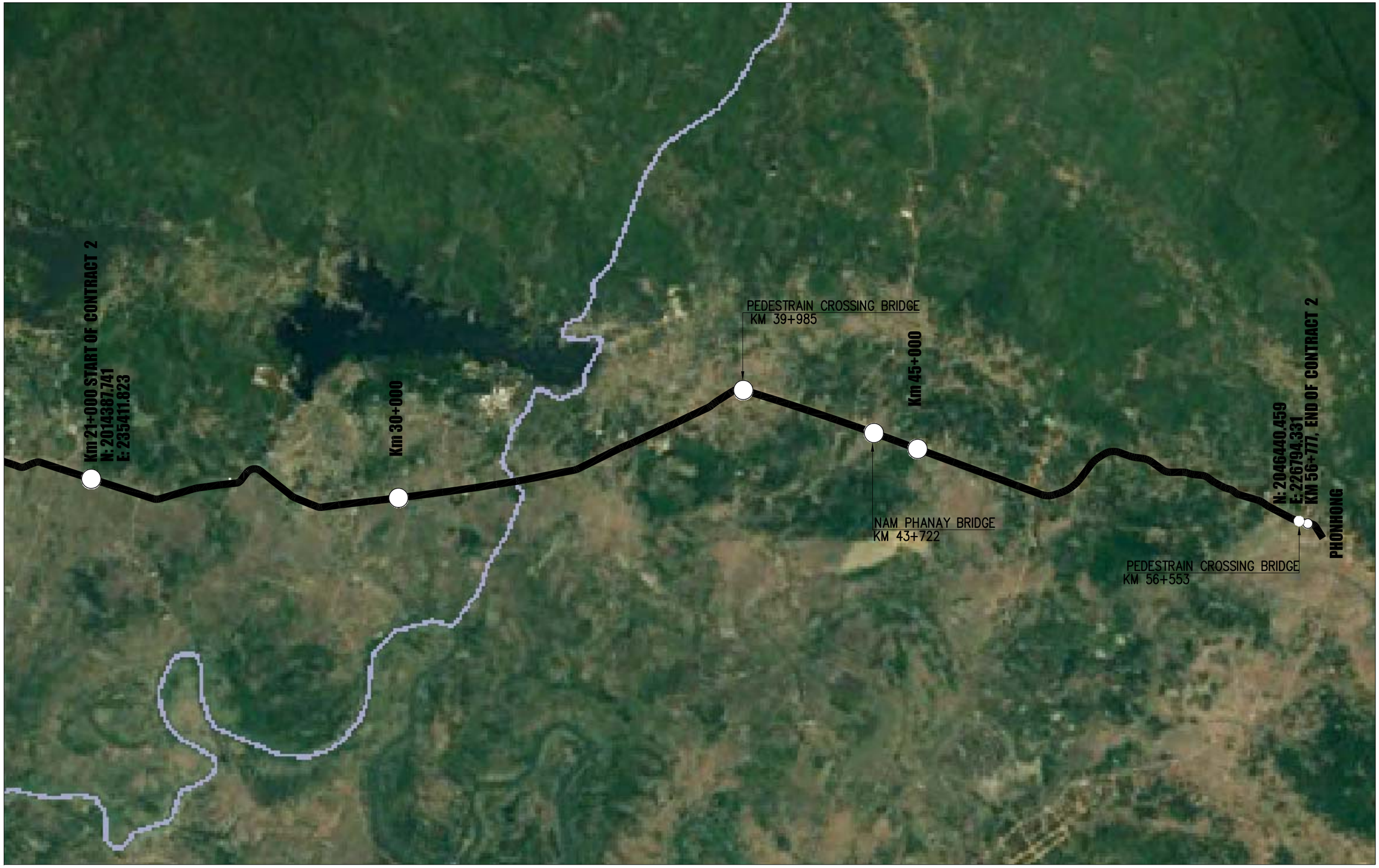
LIST OF DRAWINGS

REV.	DATE	DESCRIPTION	APPROVED		NAME	SIGNATURE	LTEC CODE: SD-262-17
				DESIGNED	Mr.Phonepasong SENSONGKHAM		DATE: April, 2018
				CHECKED	Mr.Khamphone SORPHABMIXAY		DRW No. LDW-01
				APPROVED	Mr.Vandy VORASACK		SCALE: –

GENERAL MAP



ລັດວິສາຫະກິດ ວິສະວະກຳ ຄົມມະນາຄົມ LAO TRANSPORT ENGINEERING CONSULTANT	NR 13N IMPROVEMENT AND MAINTENANCE PROJECT CONTRACT 2 : BAN SONGPEUAY – PHONHONG	REV.	DATE	DESCRIPTION	APPROVED		NAME	SIGNATURE	LTEC CODE: SD–262–17
						DESIGNED	Mr.Phonepasong SENSONGKHAM		DATE: April, 2018
	GENERAL MAP					CHECKED	Mr.Khamphone SORPHABMIXAY		DRW No. BGM–02
						APPROVED	Mr.Vandy VORASACK		SCALE: 1:6.000.000



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CONTRACT 2 : BAN SONGPEUAY – PHONHONG

LOCATION MAP

REV.	DATE	DESCRIPTION	APPROVED

	NAME	SIGNATURE
DESIGNED	Mr.Phonepasong SENSONGKHAM	
CHECKED	Mr.Khamphone SORPHABMIXAY	
APPROVED	Mr.Vandy VORASACK	

LTEC CODE: SD–262–17
DATE: April, 2018
DRW No. BLM–03
SCALE: 1:100000

SYMBOLS AND ABBREVIATIONS

AASHTO	AMERICAN ASSOCIATION OF STATE HIGHWAY TRANSPORTATION OFFICIALS
BC	BEGINNING OF CURVE
BH	BORE HOLE
BM	BENCH MARK
$\overset{\mathrm{C}}{\mathrm{L}}$	CENTER LINE
m^3	CUBIC METER
PVT	POINT OF VERTICAL TANGENT
PVC	POINT OF VERTICAL CURVE
PVI	POINT OF VERTICAL INTERSECTION
ø	DIAMETER
L.W.L	LOWEST WATER LEVEL
H.W.L	HIGH WATER LEVEL
Pw	EXTRA WIDENING IN HORIZONTAL CURVE
E	EASTING COORDINATE IN METER
EC	END OF CURVE
EP	END POINT
i	GRADIENT
m^2	SQUARE METER
@	SPACING
SP	START POINT
Se	SUPERELEVATION
KM	KILOMETER
kN	KILONEWTON
Kg	KILOGRAM
mm	MILLIMETER
MPa	MEGAPASCAL
m	METER
N	NORTHING COORDINATE IN METER
Lc	LENGTH OF CURVE

%	PERCENT
PI	POINT OF INTERSECTION FOR HORIZONTAL ALIGNMENT
PSC	PRESTRESS STEEL CONCRETE
R	RADIUS OF HORIZONTAL CIRCULAR CURVE
RV	RADIUS OF VERTICAL CURVE
R.L	ROAD LEVEL
T	TANGENT LENGTH OF CIRCULAR CURVE
B.G.L	BOTTOM OF GIRDER LEVEL
HC	HIGH OF CUTTING
HF	HIGH OF FILLING
PC	POINT OF TANGENT
X/E	EASTING COORDINATE IN METER
Y/N	NORTHING COORDINATE IN METER
Z/LEV.	VERTICAL COORDINATE IN METER (OR LEVEL)
	NORTH ARROW
	TREE
	BENCH MARK (BM)
	POINT INTERSECTIONS
	ROAD
	EXISTING ROAD
	CONTOUR LINE
	FLOW DIRECTION
	OLD BRIDGE
	SLOPE
	BOTTOM OF BANK
	FENCE
	WELL
	BORE HOLE (BH)
	STATION POINT

■	EDGE MARKER POST
1W	HOUSE, ONE STOREY WOOD
BW	HOUSE,TWO STOREY BRICK AND WOOD
2C	CONCRETE HOUSE WITH 2 FLOOR
1C	CONCRETE HOUSE WITH 1 FLOOR
PO	PORCH (VERANDA)
⊠	TELEGRAPH POLE (CONCRETE)
□	ELECTRIC POLE (CONCRETE)
	TO BAN PAKKAGNOUNG
A A	SECTION A–A
0.00	ELEVATION
0.00	(LOW OR HIGH) WATER LEVEL
	REINFORCEMENT BARS IN NEAR OR TOP FACE.
	REINFORCEMENT BARS IN FAR OR BOTTOM FACE.
21ø25@200 A4	21 : NUMBER OF BARS WITH IN MARKED AREA.
	ø25 : BAR DIAMETER IN mm.
	@200 : DISTANCE OF BARS CENTER TO BARS CENTER.
	A4 : BENDING TYPE AND REFERENCE NUMBER.

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NR 13N IMPROVEMENT AND MAINTENANCE PROJECT
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SYMBOLS AND ABBREVIATIONS

REV.	DATE	DESCRIPTION	APPROVED		NAME	SIGNATURE
				DESIGNED	Mr.Phonepasong SENSONGKHAM	
				CHECKED	Mr.Khamphone SORPHABMIXAY	
				APPROVED	Mr.Vandy VORASACK	

LTEC CODE: SD–262–17
DATE: April, 2018
DRW No. BSA–04
SCALE: –

GENERAL NOTES

I. LOAD SPECIFICATION:

THE LOADING SPECIFICATION USED FOR THE DESIGN OF STRUCTURE IS THE "AASHTO–LRFD 2007.

1. DEAD LOAD:

A. REINFORCED CONCRETE: 24.5 kN/m3.

B. EARTH PRESSURE.

EARTH PRESSURE WAS APPLIED IN ACCORDANCE WITH ARTICLE 3.11 OF AASHTO–LRFD 2007, USING RANKINE'S FORMULA FOR STRUCTURE RETAINING SOIL. BACKFILL WILL BE USED WITH ANGLE OF INTERNAL FRICTION GREATER THAN 30°; UNIT WEIGHTγ =18kN/m3; COMPACTION 98% AND FREE DRAINAGE.

2. LIVE LOAD:

– LIVE LOAD: AASHTO HL–93 AND HS–20–44+25% (HS–25) TRUCK AND LAND LOADING.

3. IMPACT:

$$I = \frac{15.24}{L+38} \leqslant 0.3$$

WHERE: L=SPAN (m)

4. WIND LOAD

SHALL BE APPLIED IN ACCORDANCE WITH PARAGRAPH 3.15 AASHTO–LRFD 2007

5. BRAKE AND FRICTION (LONGITUDINAL FORCE)

=5% OF THE LANE LOAD.

6. EARTH QUAK:

EARTH QUAKE WAS APPLIED IN ACCORDANCE WITH ARTICLE 3.10 OF AASHTO–LRFD 2007, SEISMIC ZONE1, A=0.08.

7. STRUCTURE ANALYSIS:

– THE LOAD DISTRIBUTION FOR PSC I GIRDER BRIDGE SHALL BE CALCULATED FOLLOWING PART C–SECTION 3 OF AASHTO–LRFD
– FOR REQUIREMENTS OF STRUCTURE DESIGN USED "AASHTO–LRFD" SPECIFICATION.
– THE DESIGN USE "SI" UNIT.

II. MATERIAL FOR STRUCTURE:

1. CONCRETE:

DESCRIPTION	STRENGTH f'c (AT 28 DAYS)
– PRECAST PRESTRESS CONCRETE I GIRDER AND PANEL	40 MPa
– DIAPHRAGMS	35 MPa
– REINFORCED CONCRETE DECK SLAB	30 MPa
– ABUTMENT AND RETAINING WALL	25 MPa
– APPROACH SLAB	25 MPa
– BLINDING CONCRETE	10 MPa

2. REINFORCING STEEL BAR:

– YIELD STRENGTH OF ROUND BAR: 240 MPa. (FOR BARS WITH DIAMETER ø6 AND ø8)
– YIELD STRENGTH OF DEFORMED BAR: 414 MPa (FOR BARS WITH DIAMETER ø>10, UNLESS OTHERWISE SHOWN ON DRAWING)

3. PRESTRESSING STEEL

UTILIZATION	NOMINAL DIAMETER (mm)	YIELD STRENGTH (MPa)	BREAKING STRENGTH (MPa)
PC I GIRDER	12.7–7 WIRE STRAND	1670	1860
DIAPHRAGM	ø29	850	1070

III. ALLOWABLE STRESSES:

STRUCTURE	COMPRESSION (MPa)	TENSION (MPa)
1. PRESTRESSING CONCRETE.		
1.1 TEMPORARY STRESS BEFORE LOSSES DUE TO CREEP AND SHRINKAGE	19.8	3.15
1.2 STRESS AT SERVICE LOAD AFTER LOSSES HAVE OCCURRED	16.0	3.15
2. REINFORCING CONCRETE	12.0	–
3. PRESTRESSING STEEL		
3.1 STRESS AFTER IMMEDIATE LOSS		1386
3.2 STRESS AT SERVICE LOAD AFTER LOSS		1336

IV. CONSTRUCTION:

– FORM WORK SHALL BE CONSTRUCTED TO PROVIDE A 20x20 mm SMOOTH (UNLESS OTHERWISE SHOWN ON DRAWING) STRAIGHT ON ALL EXPOSTED FACES OF STRUCTURE.
– MINIMUM COVER OF REINFORCING BAR IN SUBSTRUCTURE SHALL BE 40 mm. UNLESS NOTED OTHERWISE.
– NORMAL POSITION FOR TOP OF FOOTING IS 50 cm BELOW GROUND LEVEL EXCEPT AT RIVER SIDE.

V. OTHER DESIGN CONDITION:

– SPLICING OF REINFORCING BAR:
BASIC DEVELOPMENT OF LAP LENGTH Ld SHALL NOT BE LESS THAN 24Db OR 300 mm,
WHERE Db: NOMINAL DIAMETER OF INDIVIDUAL BAR IN mm.
– PRESTRESSING FORCE: OF PC STRAND: 150 KN.
OF PRESTRESS BAR: 480KN.
– MINIMUM N–VALUE FROM STANDARD PENETRATION TEST (SPT) OF BEARING STRATUM: 30

VI. OTHER:

– THE DIMENSIONS ARE SHOWN IN MILLIMETERS. EVERY ITEM OF SUBSTRUCTURE AND PROTECTION AROUND ABUTMENT SHALL BE REQUIRED TO COMPLETED BEFORE RAINY SEASON.
– EXISTING BRIDGE SHALL BE REMOVED BEFORE CONSTRUCTION OF NEW BRIDGE.
– THE QUANTITIES FOR BRIDGE AND STRUCTURE SHOWN ON THE DRAWINGS ARE APPROXIMATE AND FOR REFERENCE PURPOSES ONLY.
ANY DISCREPENCIES BETWEEN THESE ESTIMATED QUANTITIES AND THE FINALLY ACCEPTED SHALL NOT BE A REASON FOR CLAIMS OR DISPUTE.

1. ALL DIMENSIONS ARE IN mm, LEVELS ARE IN METERS.
2. ALL CONCRETE EDGES SHALL BE CHAMFER 20X20 mm.

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NR 13N IMPROVEMENT AND MAINTENANCE PROJECT
CONTRACT 2 : BAN SONGPEUAY – PHONHONG

GENERAL NOTES

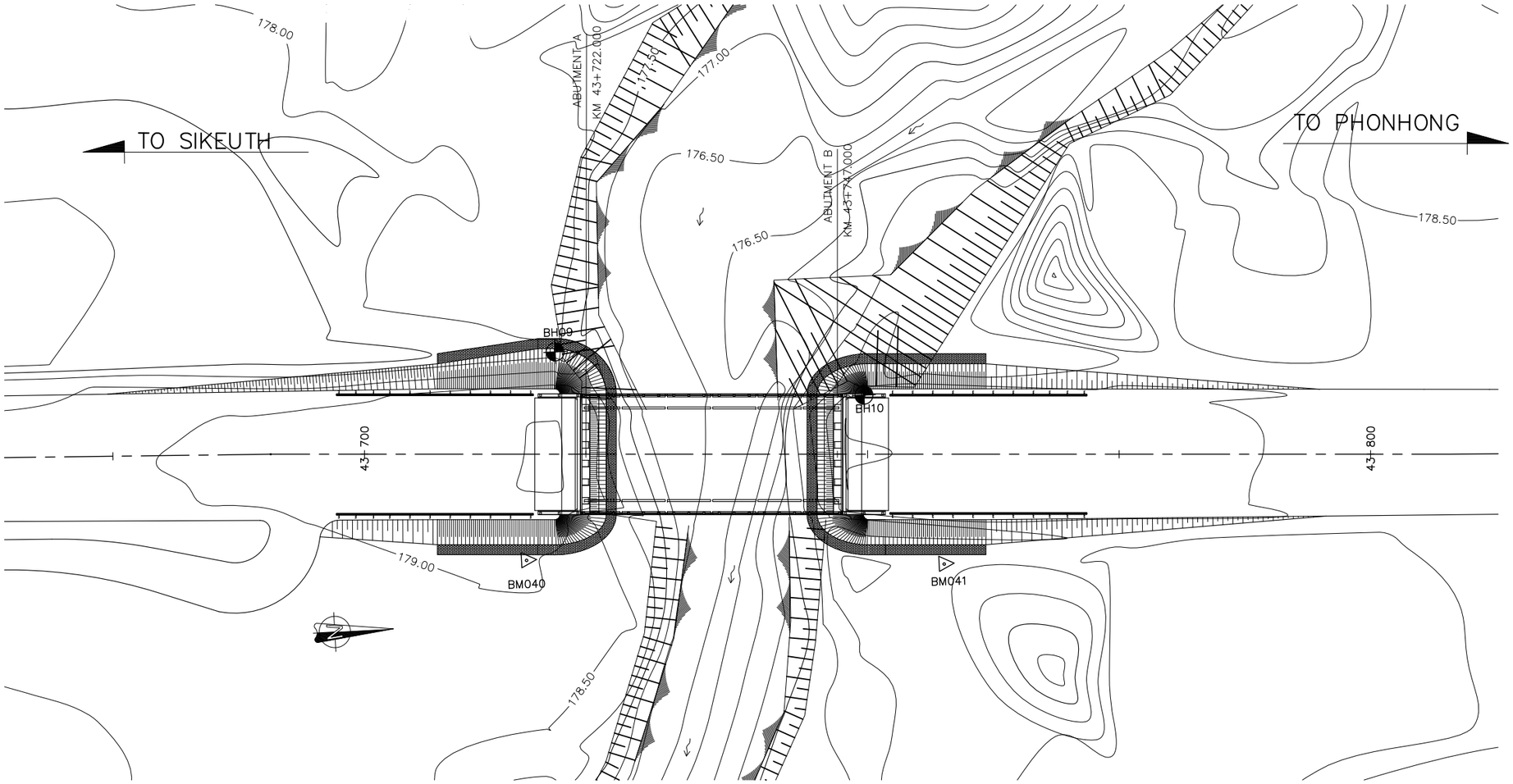
REV.	DATE	DESCRIPTION	APPROVED		NAME	SIGNATURE	LTEC CODE: SD–262–17
				DESIGNED	Mr.Phonepasong SENSONGKHAM		DATE: April, 2018
				CHECKED	Mr.Khamphone SORPHABMIXAY		DRW No. BGN–05
				APPROVED	Mr.Vandy VORASACK		SCALE: –

01.NAM PHANAY BRIDGE

I. GENERAL DRAWINGS

LIST OF COORDINATES

CODE	N (m)	E (m)	Z (m)
BM40	2034382.435	227942.221	179.213
BM41	2034423.865	227944.702	178.783
ABUTMENT A	2034388.856	227931.986	–
ABUTMENT B	2034413.823	227933.262	–



GENERAL PLAN OF BRIDGE

SCALE 1:500

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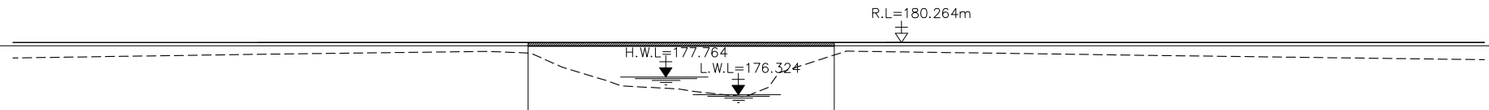
						DESIGNED	Mr.Phonepasong SENSONGKHAM		DATE: April, 2018
						CHECKED	Mr.Khamphone SORPHABMIXAY		DRW No. BGP–01
						APPROVED	Mr.Vandy VORASACK		SCALE: 1:500

ELEVETION OF BRIDGE

TO SIKEUTH

TO PHONHONG



VERTICAL CURVE	0.000%			0.000%		0.000%		
PROPOSE LEVEL	180.264	180.264	180.264	180.264	180.264	180.264	180.264	
EXISTING LEVEL	178.999	179.301	179.486	175.958	179.392	179.119	178.869	
HEIGHT DIFFERENCE	1.265	0.963	0.778	4.306	0.872	1.145	1.395	
STATION	43+680	43+700	43+720	43+740	43+760	43+780	43+800	

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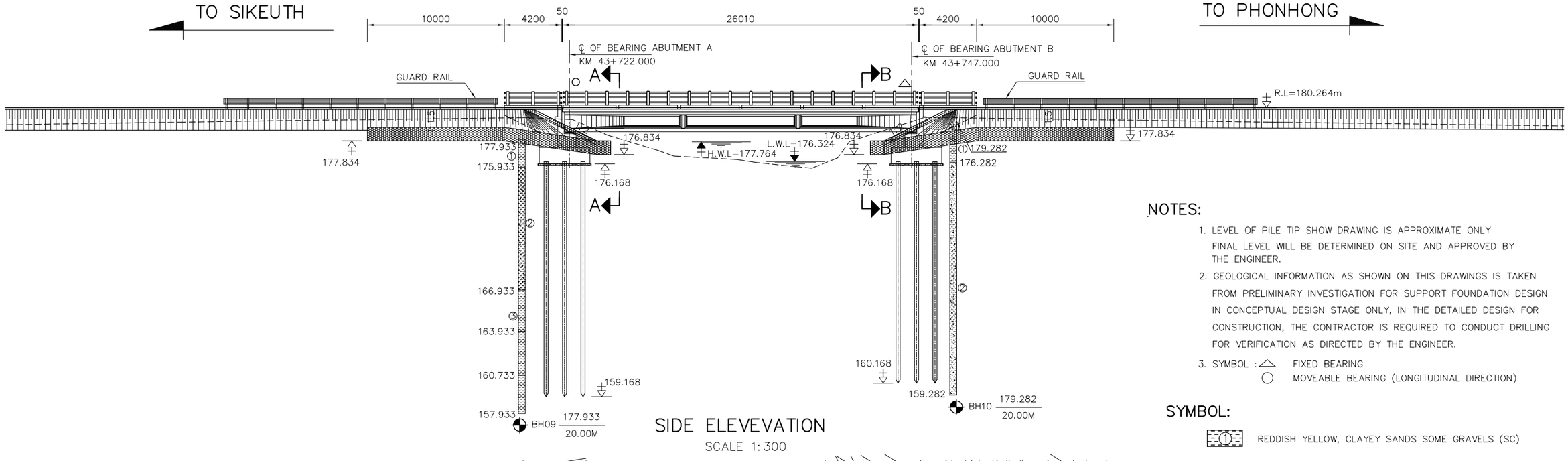
CONTRACT 2 : BAN SONGPEUAY – PHONHONG

NAM PHANAY BRIDGE

ELEVETION OF BRIDGE

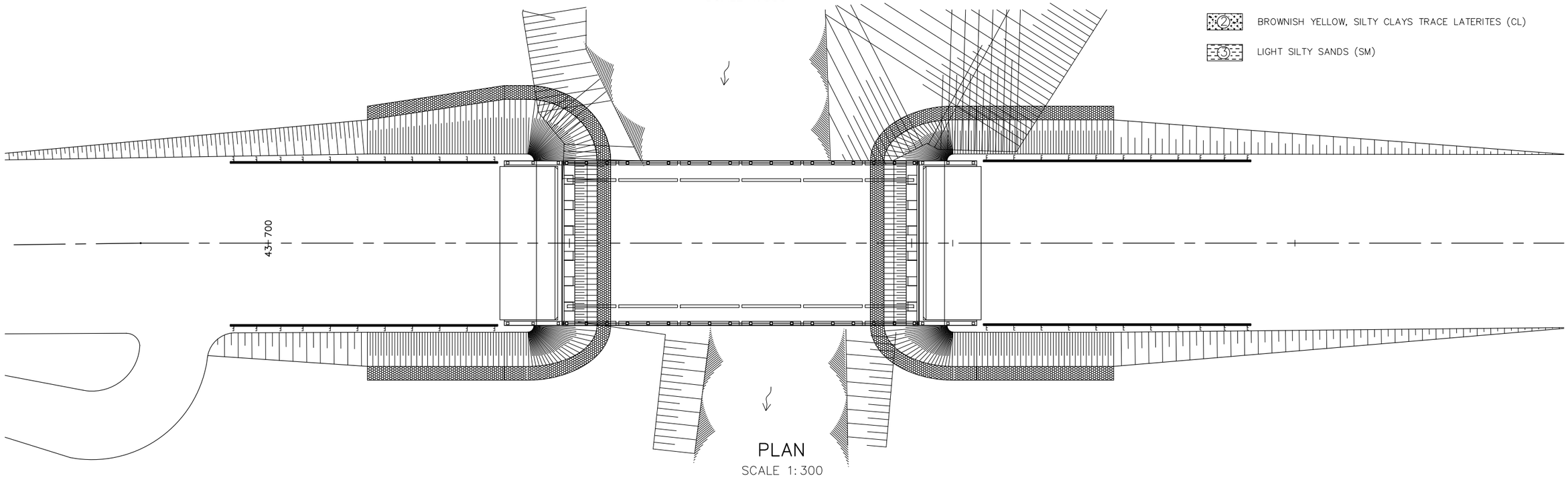
REV.	DATE	DESCRIPTION	APPROVED		NAME	SIGNATURE
				DESIGNED	Mr.Phonepasong SENSONGKHAM	
				CHECKED	Mr.Khamphone SORPHABMIXAY	
				APPROVED	Mr.Vandy VORASACK	

LTEC CODE: SD–262–17
DATE: April, 2018
DRW No. BAP–02
SCALE: 1: 2000



SIDE ELEVEVATION

SCALE 1:300



PLAN

SCALE 1:300

NOTES:

1. LEVEL OF PILE TIP SHOW DRAWING IS APPROXIMATE ONLY FINAL LEVEL WILL BE DETERMINED ON SITE AND APPROVED BY THE ENGINEER.
2. GEOLOGICAL INFORMATION AS SHOWN ON THIS DRAWINGS IS TAKEN FROM PRELIMINARY INVESTIGATION FOR SUPPORT FOUNDATION DESIGN IN CONCEPTUAL DESIGN STAGE ONLY, IN THE DETAILED DESIGN FOR CONSTRUCTION, THE CONTRACTOR IS REQUIRED TO CONDUCT DRILLING FOR VERIFICATION AS DIRECTED BY THE ENGINEER.
3. SYMBOL : △ FIXED BEARING
   ○ MOVEABLE BEARING (LONGITUDINAL DIRECTION)

SYMBOL:

① REDDISH YELLOW, CLAYEY SANDS SOME GRAVELS (SC)

② BROWNISH YELLOW, SILTY CLAYS TRACE LATERITES (CL)

③ LIGHT SILTY SANDS (SM)

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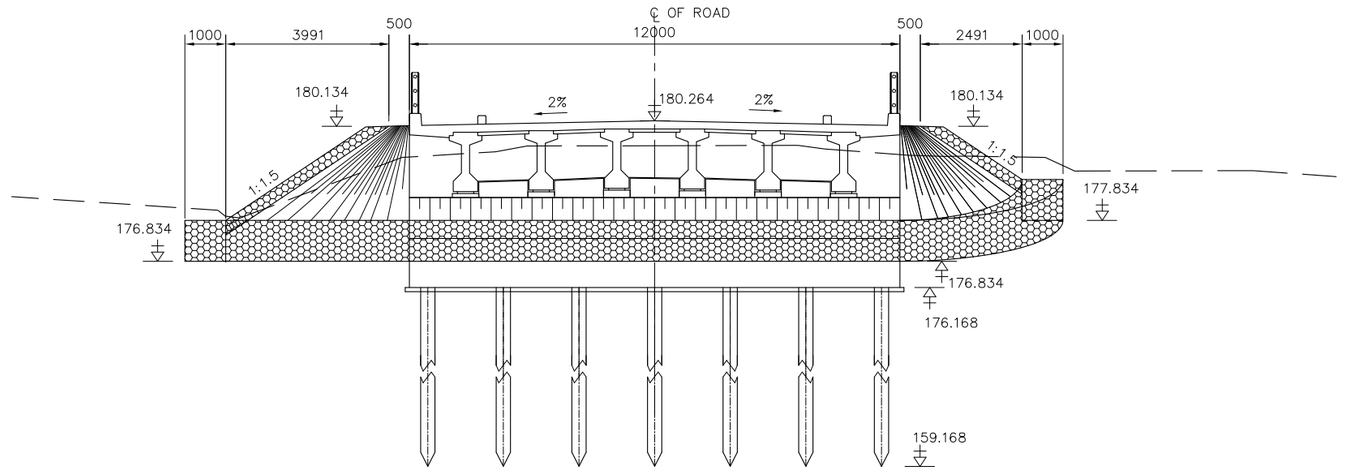
CONTRACT 2 : BAN SONGPEUAY – PHONHONG

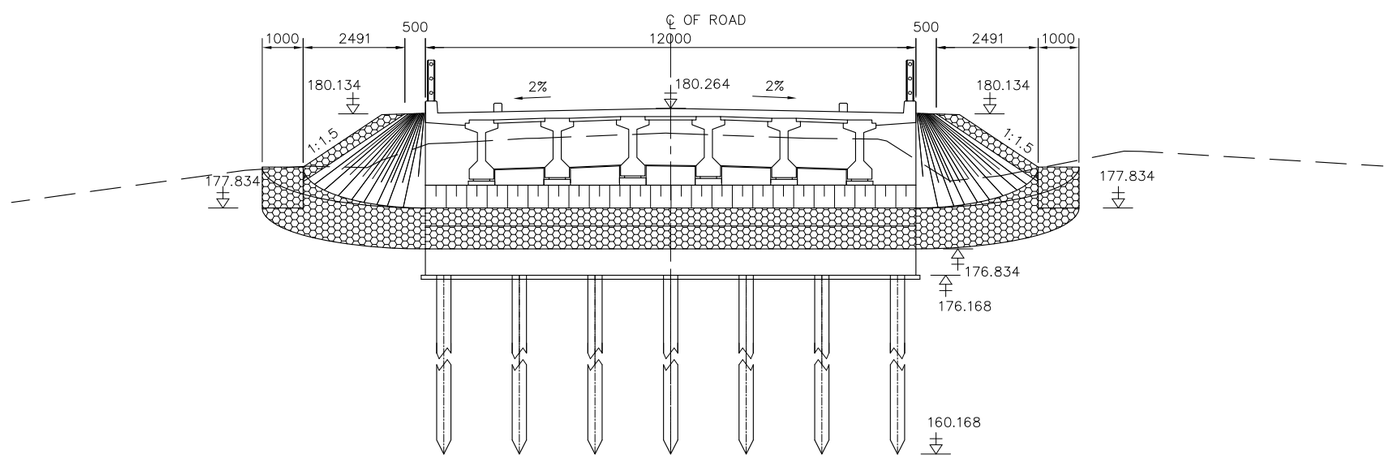
NAM PHANAY BRIDGE
GENERAL ARRANGEMENT OF BRIDGE
(SHEET 1 OF 2)

REV.	DATE	DESCRIPTION	APPROVED		NAME	SIGNATURE	
				DESIGNED	Mr.Phonepasong SENSONGKHAM		LTEC CODE: SD–262–17
				CHECKED	Mr.Khamphone SORPHABMIXAY		DATE: April, 2018
				APPROVED	Mr.Vandy VORASACK		DRW No. BGA–03
							SCALE: 1:300



SECTION A–A

SCALE 1:150



SECTION B–B

SCALE 1:150

NOTES:

1. ALL DIMENSIONS ARE IN MILLIMETERS, LEVEL ARE IN METERS.
2. GEOLOGICAL INFORMATION SEE IN SEPARATE REPORT ON SUB SOIL INVESTIGATION.

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	NAM PHANAY BRIDGE GENERAL ARRANGEMENT OF BRIDGE (SHEET 2 OF 2)					DESIGNED	Mr.Phonepasong SENSONGKHAM		DATE: April, 2018
						CHECKED	Mr.Khamphone SORPHABMIXAY		DRW No. BGA–04
						APPROVED	Mr.Vandy VORASACK		SCALE: AS SHOWN

SUMMARY QUANTITIES OF MAIN MATERIALS FOR BRIDGE

	MATERIAL / CATEGORIES	STEEL(t) PRES-TRESS STEEL	STEEL(t) REIN. BARS	HAND-RAIL (m)	CONCRETE (m3) GRADE (MPa) 40	35	30	25	15	10	CEMENT GROUT 40MPa (m3)	ELASTOMERIC BEARINGS TYPE1 (No)	RUBBER BEARINGS STRIP (No)	EXPAN-SION JOINT (m)	GUARD RAIL (m)	PC PILE 350x350 Cm (m)	RENO MAT-TRESS	GABION BOX (m3)	GEO-TEXTILE (m2)	STRUC.EX ROCK (m3)	STRUC.EX SOIL (m3)	EM-BANK MENT (m3)	ROCK FILL (m3)	CHANNEL EXCA VATION (m3)	MIX SAND AND GRAVEL (m3)
I-	SUPERSTRUCTURE																								
1	GIRDERS L=25m	5.00	15.90		99.00						2.00														
2	DAIPHRAGMS		0.973			10.00																			
3	DECK SLABS +PRECAST SLABS		12.10				86.00																		
4	HAND RAILS			69.00																					
5	ELASTOMERIC BEARINGS											12.00	24.00												
6	EXPANSION JOINTS													24.00											
7	BRIDGE GUARD RAIL														80.00										
	SUB TOTAL	5.00	28.97	69.00	99.00	10.00	86.00	0.00	0.00	0.00	2.00	12.00	24.00	24.00	80.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
II-	SUBSTRUCTURE																								
1	ABUTMENTS AND APPROACH SLABS		16.00				0.80	200.00		15.00						693.00									48.00
2	SLOPE PROTECTION AND EMBANKMENT																144.00	106.00	690.00		582.00	162.00			
3	CHANNEL EXCAVATION																								
	SUB TOTAL	0.00	16.00	0.00	0.00	0.00	0.80	200.00	0.00	15.00	0.00	0.00	0.00	0.00	0.00	693.00	144.00	106.00	690.00	0.00	582.00	162.00	0.00	0.00	48.00
	TOTAL	5.00	45.00	69.00	99.00	10.00	86.00	200.00	0.00	15.00	2.00	12.00	24.00	24.00	80.00	693.00	144.00	106.00	690.00	0.00	582.00	162.00	0.00	0.00	48.00

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LAO TRANSPORT ENGINEERING CONSULTANT

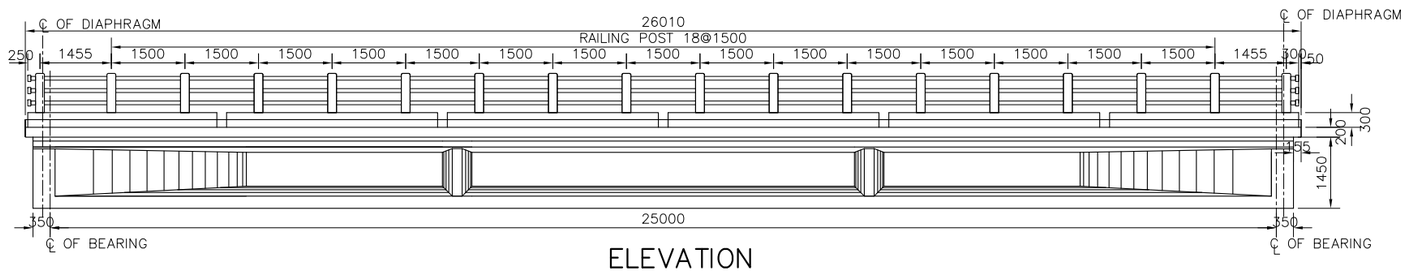
NR 13N IMPROVEMENT AND MAINTENANCE PROJECT
CONTRACT 2 : BAN SONGPEUAY – PHONHONG

NAM PHANAY BRIDGE
SUMMARY QUANTITIES OF MAIN MATTERIALS FOR BRIDGE

REV.	DATE	DESCRIPTION	APPROVED		NAME	SIGNATURE
				DESIGNED	Mr.Phonepasong SENSONGKHAM	
				CHECKED	Mr.Khamphone SORPHABMIXAY	
				APPROVED	Mr.Vandy VORASACK	

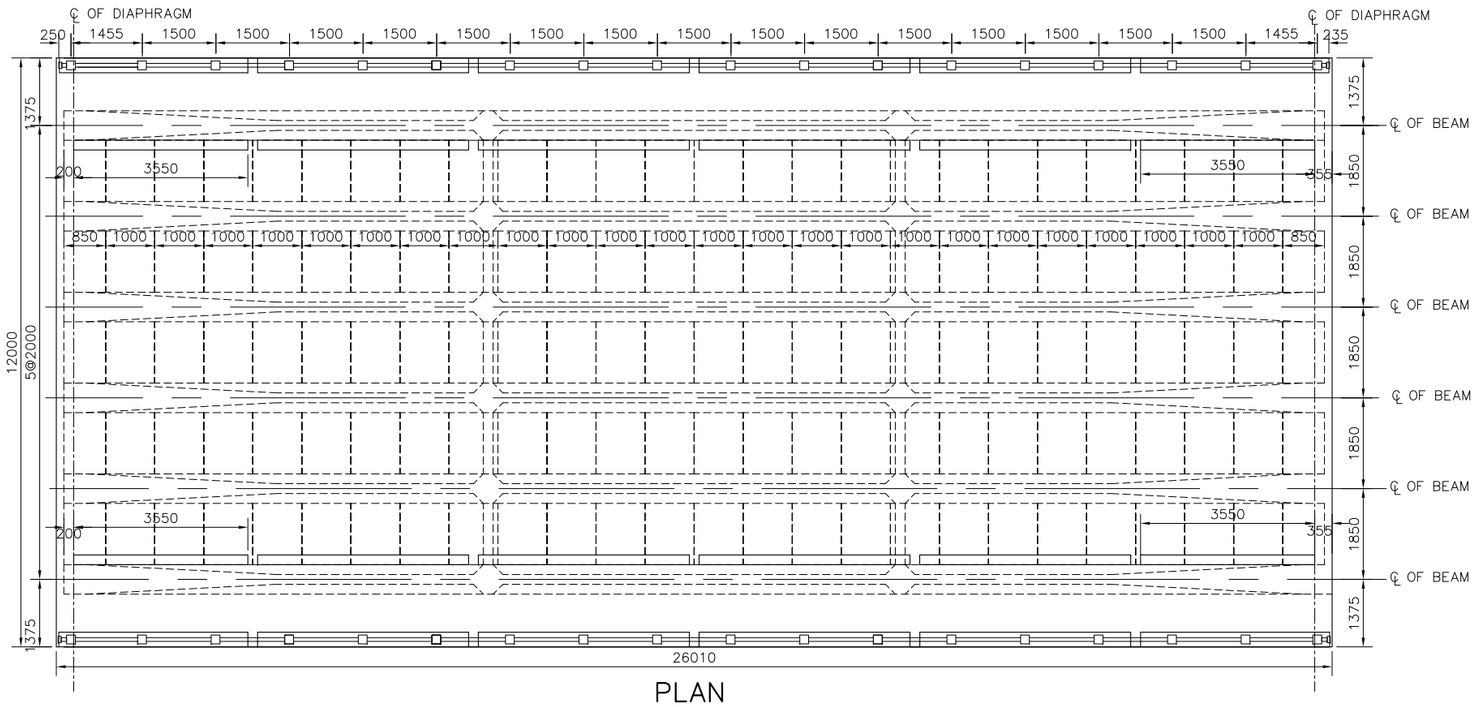
LTEC CODE: SD-262-17
DATE: April, 2018
DRW No. BQM-05
SCALE: -

II. STRUCTURE DRAWINGS



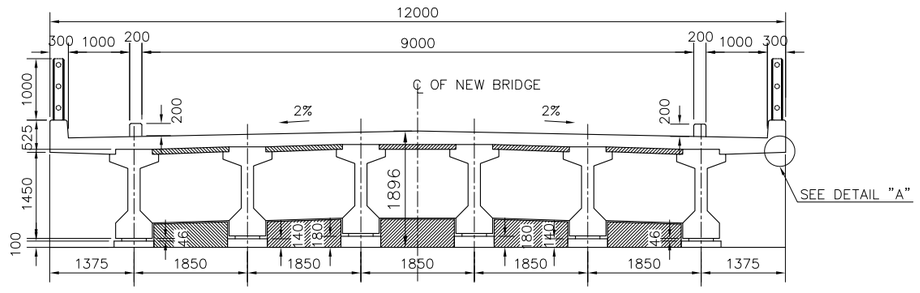
ELEVATION

SCALE: 1:125



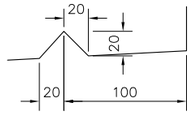
PLAN

SCALE: 1:125



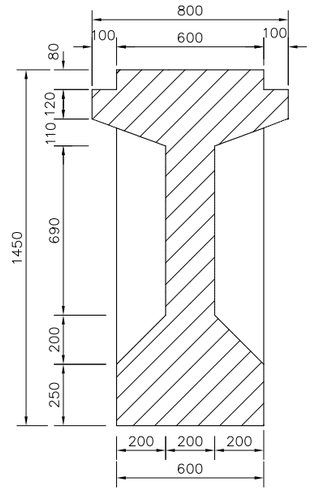
CROSS-SECTION

SCALE: 1:100



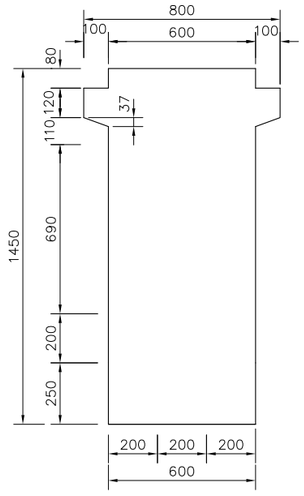
DETAIL "A"

SCALE 1:5



INTERNAL

SCALE 1:25



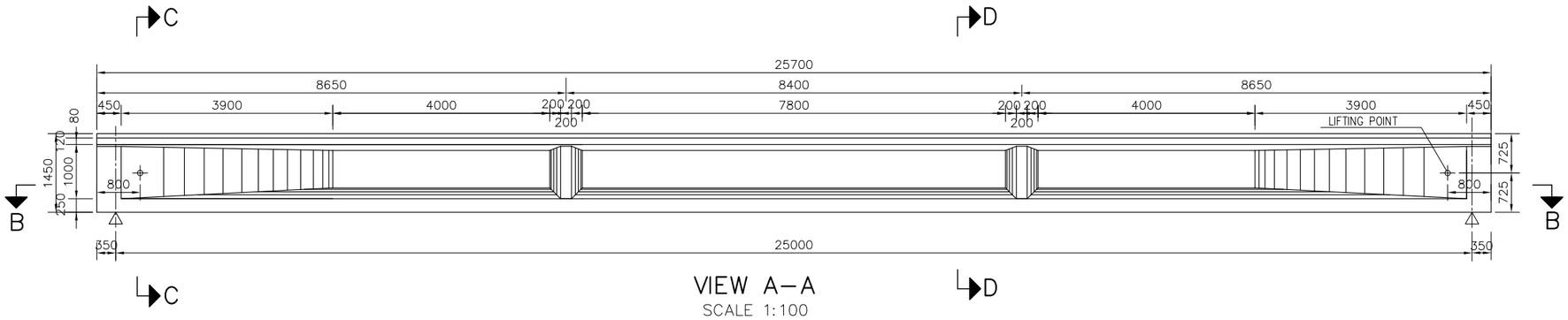
THE END

SCALE 1:25

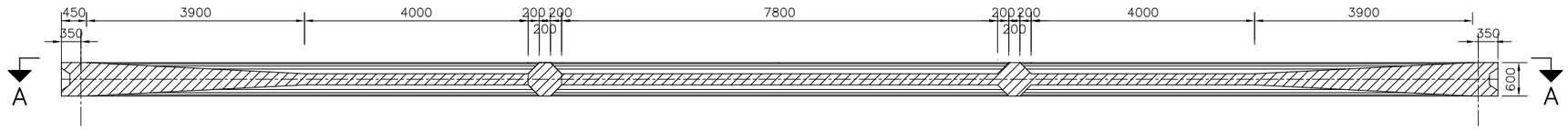
NOTE:

1. ALL DIMENSIONS ARE IN MILLIMETERS.

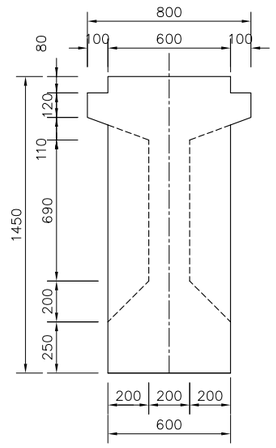
ລ.ວ.ຄ LTEC ລັດວິສາຫະກິດ ວິສະວະກຳ ຄົມມະນາຄົມ LAO TRANSPORT ENGINEERING CONSULTANT	NR 13N IMPROVEMENT AND MAINTENANCE PROJECT CONTRACT 2 : BAN SONGPEUAY – PHONHONG	REV.	DATE	DESCRIPTION	APPROVED		NAME	SIGNATURE	LTEC CODE: SD-262-17
	NAM PHANAY BRIDGE DIMENSIONS OF SUPERSTRUCTURE SPAN 25 m					DESIGNED	Mr.Phonepasong SENSONGKHAM		DATE: April, 2018
						CHECKED	Mr.Khamphone SORPHABMIXAY		DRW No. BDS-06
						APPROVED	Mr.Vandy VORASACK		SCALE: AS SHOWN



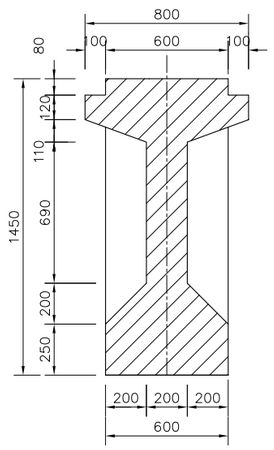
VIEW A–A
SCALE 1:100



SECTION B–B
SCALE 1:100



SECTION C–C
SCALE 1:30



SECTION D–D
SCALE 1:30

QUANTITY TABLE OF GIRDER

ITEM	UNIT	EXTERNAL GIRDER	INTERNAL GIRDER
REINFORCEMENT	Kg	2594.94	2645.66
CONCRETE GRADE 40 MPa	m^3	16.45	16.45
CEMEMT MORTAR	m^3	0.325	0.325
STEEL DUCT ø57/60	m	137.20	137.20
PC CABLE 7T 12.7	Kg	744.31	744.31
ANCHOR	SET	10	10

NOTES:

1. CONCRETE FOR PC GIRDER IS GRADE 40 MPa.
2. THIS DRAWING IS USED FOR EXTERNAL AND INTERNAL GIRDER.
3. ALL DIMENSIONS ARE IN MILLIMETERS.

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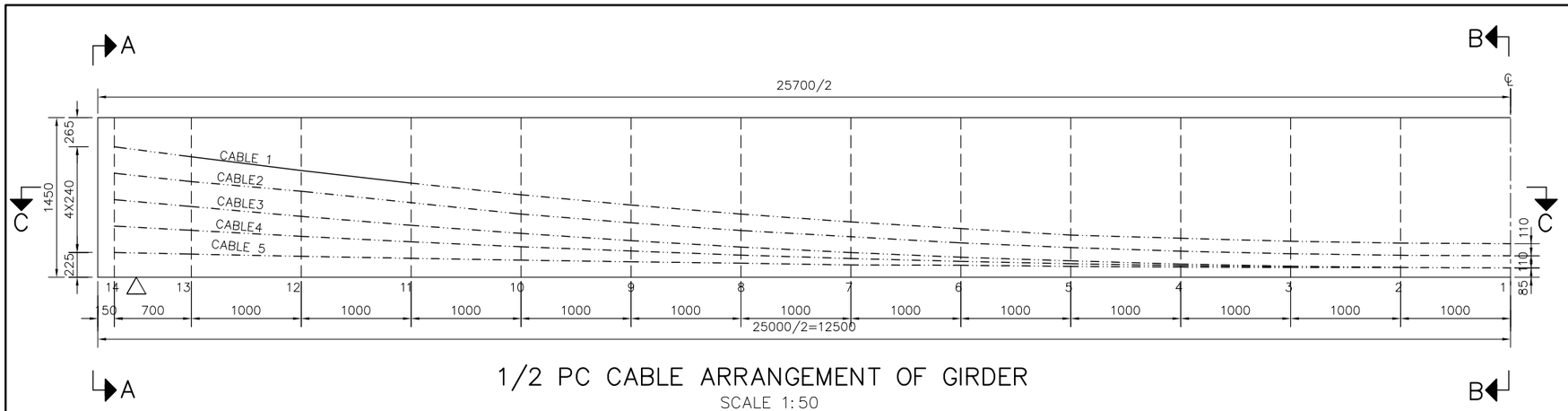
LAO TRANSPORT ENGINEERING CONSULTANT

NR 13N IMPROVEMENT AND MAINTENANCE PROJECT
CONTRACT 2 : BAN SONGPEUAY – PHONHONG

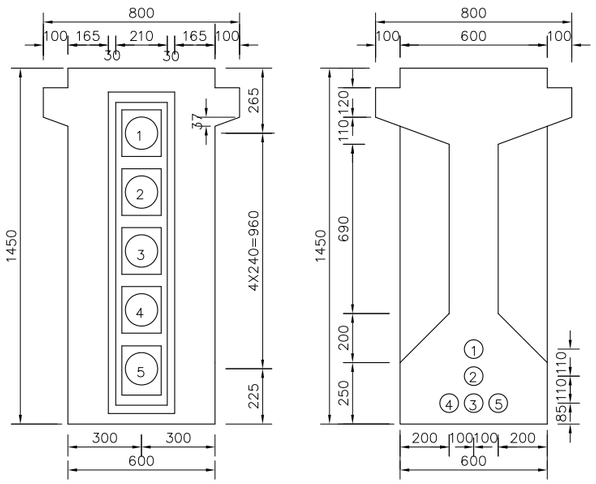
NAM PHANAY BRIDGE
DIMENSIONS OF PRECAST CONCRETE GIRDER

REV.	DATE	DESCRIPTION	APPROVED		NAME	SIGNATURE	
				DESIGNED	Mr.Phonepasong SENSONGKHAM		LTEC CODE: SD–262–17
				CHECKED	Mr.Khamphone SORPHABMIXAY		DATE: April, 2018
				APPROVED	Mr.Vandy VORASACK		DRW No. BDG–07
							SCALE: AS SHOWN



1/2 PC CABLE ARRANGEMENT OF GIRDER

SCALE 1:50

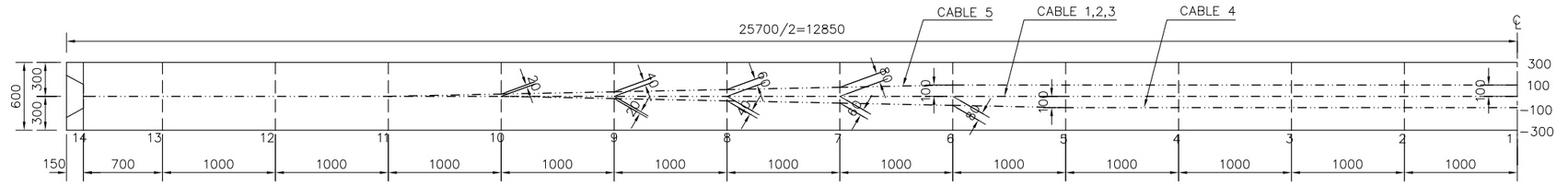


SECTION A–A

SCALE 1:25

SECTION B–B

SCALE 1:25



SECTION C–C

SCALE 1:50

POSITION OF CABLE'S CENTER FROM BOTTOM GIRDER

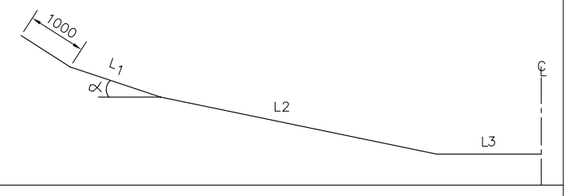
CABLE No.	SECTION	14	13	12	11	10	9	8	7	6	5	4	3	2	1
	X	12700	12000	11000	10000	9000	8000	7000	6000	5000	4000	3000	2000	1000	0
①	Y	1185.0	1095.8	969.3	854.8	749.7	656.4	574.0	502.6	442.3	392.8	354.4	327.0	310.5	305
	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0
②	Y	945.0	868.9	761.3	663.0	574.7	494.5	424.3	383.5	312.0	269.9	237.1	213.7	199.7	195
	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0
③	Y	705.0	642.3	553.3	472.0	398.5	332.7	274.6	224.3	181.8	146.9	119.8	100.5	88.9	85
	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0
④	Y	485	426.3	371.8	322.0	277.0	236.7	201.1	170.3	144.3	122.9	106.3	94.5	87.4	85
	Z	0	0	0	0	0	20	40	60	80	100	100	100	100	100
⑤	Y	225.0	210.3	190.3.	172.0	155.5	140.7	127.6	116.3	106.8	98.9	92.8	88.3	85.9	85
	Z	0	0	0	0	−20	−40	−60	−80	−100	−100	−100	−100	−100	−100

PC CABLE 5–7 (UNIT : mm)

CABLE No.	L1	L2	L3	2X ∑L	∝
①	1008	9732	2000	25481	7°16'
②	1006	9723	2000	25459	5°12'
③	1004	9716	2000	25440	5°7'
④	1001	9707	2000	25417	3°9'
⑤	1000	9701	2000	25402	1°12'

TOTAL LENGTH: ∑= 127199 mm

TOTAL WEIGHT: =(127.199m + 10m) x 5.425 Kg/m = 744.305 Kg



- QUANTITY OF ANCHORS: 10 SETS
- QUANTITY OF CABLE: 744.305 Kg
- STEEL DUCT ø57/60: 137.2 m
- CEMENT MORTAR (GRADE 40 MPa): 0.325 m^3
- CONCRETE GRADE 40 MPa: 16.45 m^3

NOTES:

1. CABLE SHALL BE STESSED FROM BOTH ENDS.
2. JACKING FORCE : 964 kN.
3. STRESSING SEQUENCE TOBE CABLES 1, 2, 3, 4, 5.
4. ALL DIMENSIONS ARE IN MILLIMETERS.

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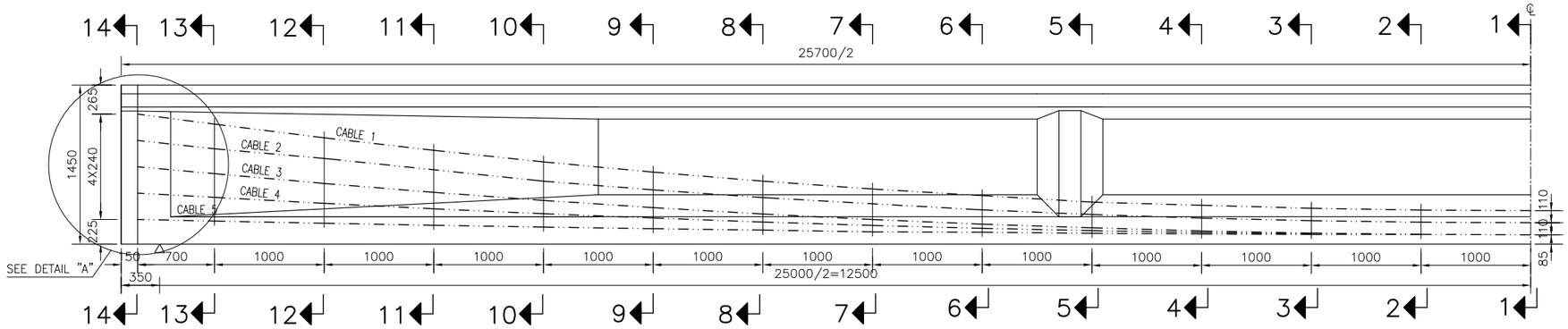
LAO TRANSPORT ENGINEERING CONSULTANT

NR 13N IMPROVEMENT AND MAINTENANCE PROJECT
CONTRACT 2 : BAN SONGPEUAY – PHONHONG

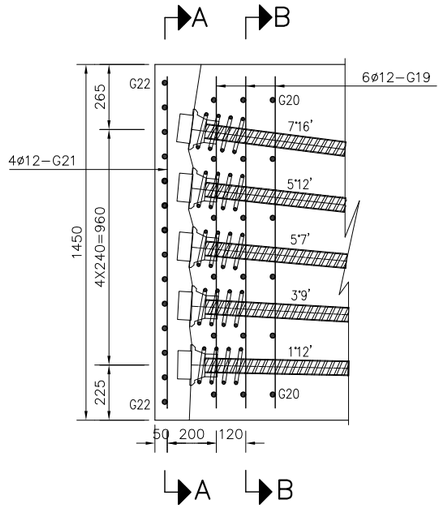
NAM PHANAY BRIDGE
ARRANGEMENT OF PC CABLE

REV.	DATE	DESCRIPTION	APPROVED		NAME	SIGNATURE	
				DESIGNED	Mr.Phonepasong SENSONGKHAM		LTEC CODE: SD–262–17
				CHECKED	Mr.Khamphone SORPHABMIXAY		DATE: April, 2018
				APPROVED	Mr.Vandy VORASACK		DRW No. BAC–08
							SCALE: AS SHOWN



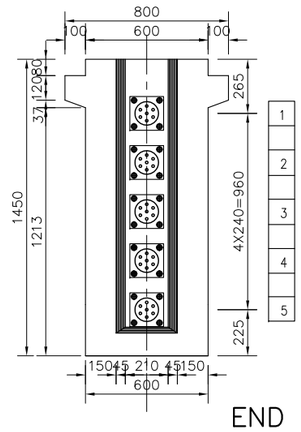
1/2 DETAILS OF LOCATION MESH FOR DUCT AND END GIRDER

SCALE 1:50



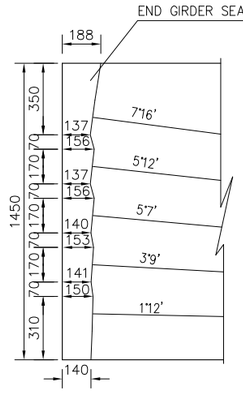
DETAIL "A"

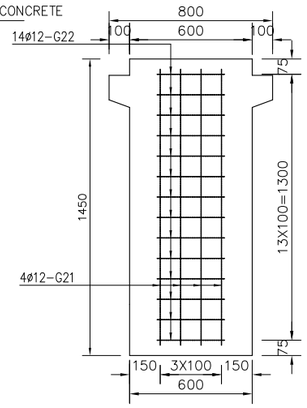
SCALE 1:25



END GIRDER

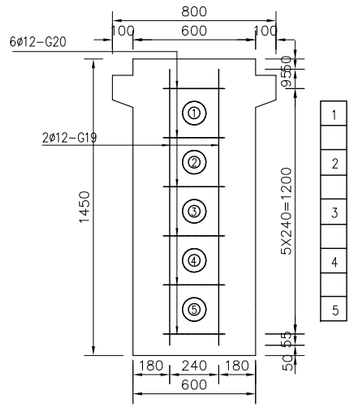
SCALE 1:30





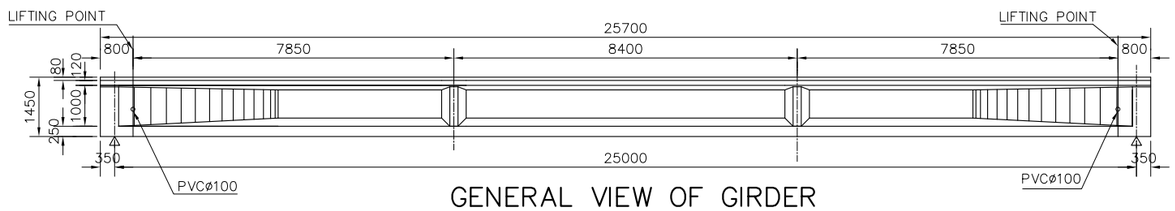
SECTION A–A

SCALE 1:30



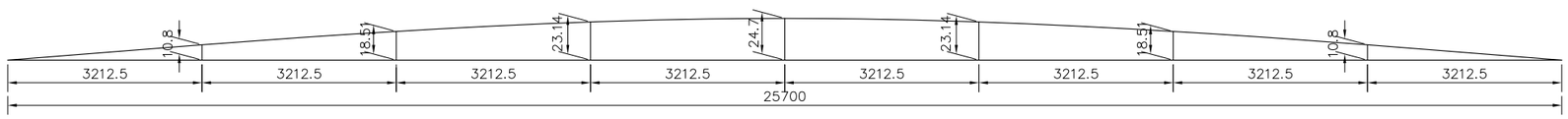
SECTION B–B

SCALE 1:30



GENERAL VIEW OF GIRDER

SCALE 1:150



CAMBER OF GIRDER

ELOMGATION OF GIRDER

PC CABLE 5–7		
CABLE No.	LENGTH (mm)	TOTAL ELOMGATION (mm)
①	25481	180
②	25459	179
③	25440	179
④	25417	179
⑤	25402	179

NOTES:

1. ANCHOR USE OF SINGLE ANCHOR HVM13–7.
2. GAVALNISE STEEL DUCTS SHALL BE TYPE ø57/60 mm.
3. ALL DIMENSIONS ARE IN MILLIMETERS.
4. ELOMGATION OF CABLES ARE UP TO MODULE ELASTIC OF CABLE.

ລັດວິສາຫະກິດ ວິສະວະກຳ ຄົມມະນາຄົມ

LAO TRANSPORT ENGINEERING CONSULTANT

NR 13N IMPROVEMENT AND MAINTENANCE PROJECT

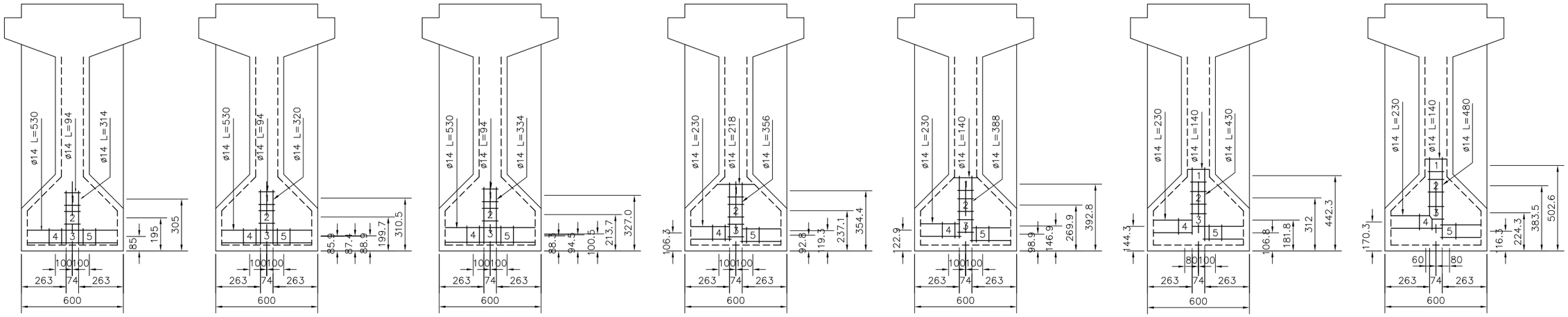
CONTRACT 2 : BAN SONGPEUAY – PHONHONG

NAM PHANAY BRIDGE

DETAIL OF LOCATION STEEL MESH

(SHEET 1 OF 2)

REV.	DATE	DESCRIPTION	APPROVED		NAME	SIGNATURE	
				DESIGNED	Mr.Phonepasong SENSONGKHAM		LTEC CODE: SD–262–17
				CHECKED	Mr.Khamphone SORPHABMIXAY		DRW No. BSM–09
				APPROVED	Mr.Vandy VORASACK		SCALE: AS SHOWN
							DATE: April, 2018



SECTION 1–1
SCALE 1:25

SECTION 2–2
SCALE 1:25

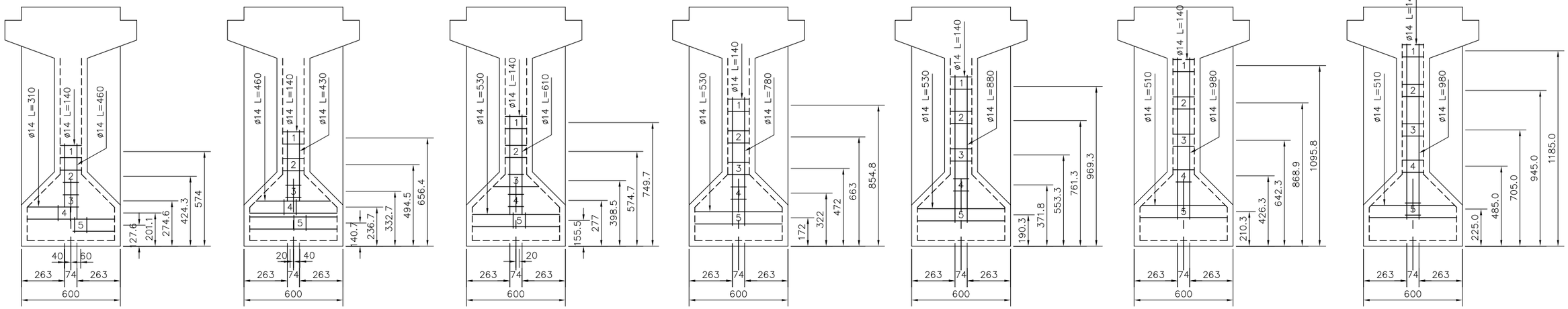
SECTION 3–3
SCALE 1:25

SECTION 4–4
SCALE 1:25

SECTION 5–5
SCALE 1:25

SECTION 6–6
SCALE 1:25

SECTION 7–7
SCALE 1:25



SECTION 8–8
SCALE 1:25

SECTION 9–9
SCALE 1:25

SECTION 10–10
SCALE 1:25

SECTION 11–11
SCALE 1:25

SECTION 12–12
SCALE 1:25

SECTION 13–13
SCALE 1:25

SECTION 14–14
SCALE 1:25

NOTES:

1. LOCATION OF REINFORCEMENT MESH SHOULD CONNECTED WITH TIES BY WELD.
2. ALL DIMENSIONS ARE IN MILLIMETERS.

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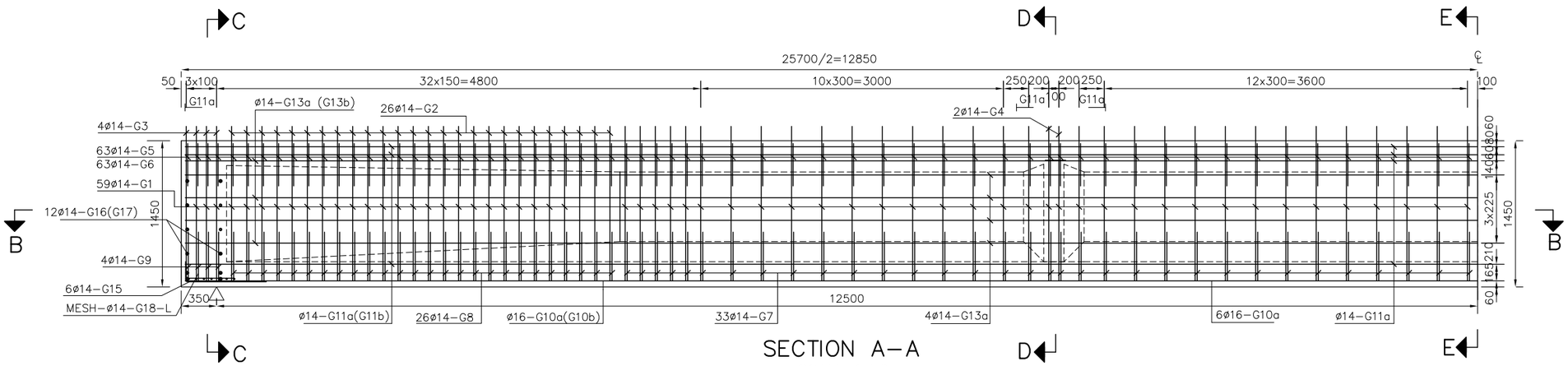
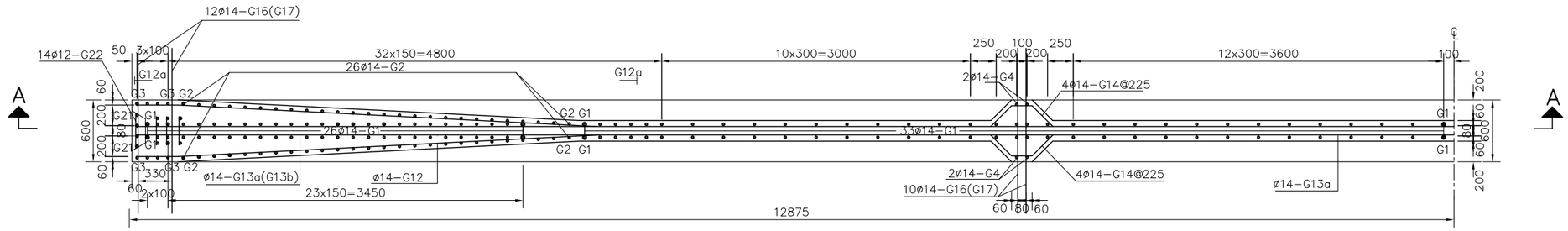
	NAM PHANAY BRIDGE DETAIL OF LOCATION STEEL MESH (SHEET 2 OF 2)					DESIGNED	Mr.Phonepasong SENSONGKHAM		DATE: April, 2018
						CHECKED	Mr.Khamphone SORPHABMIXAY		DRW No. BSM–10
						APPROVED	Mr.Vandy VORASACK		SCALE: 1:25



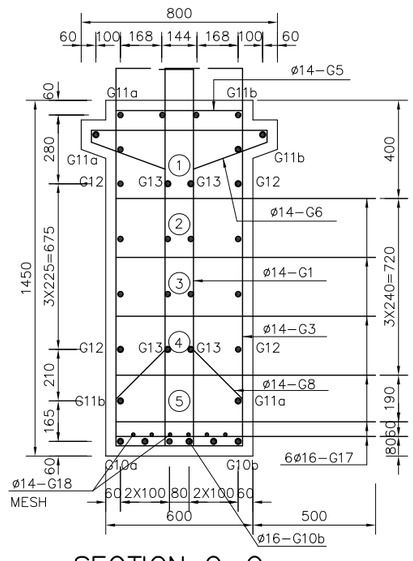
SECTION A–A

SCALE 1:50



SECTION B–B

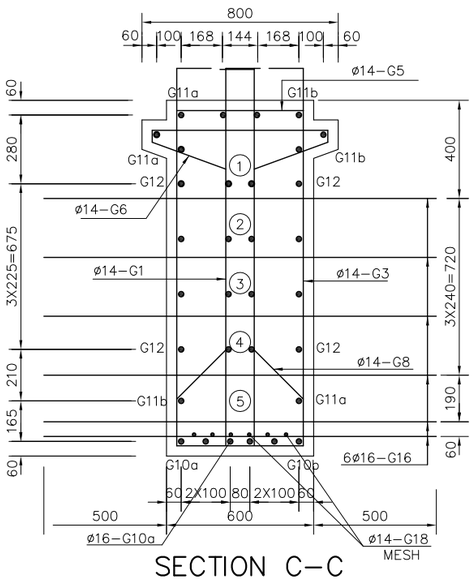
SCALE 1:50



SECTION C–C

EXTERNAL GIRDER

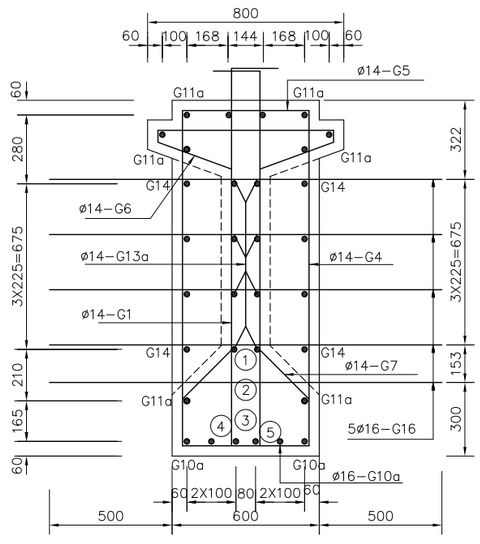
SCALE 1:25



SECTION C–C

INTERNAL GIRDER

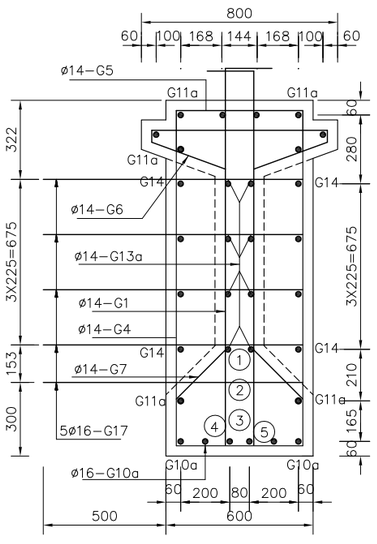
SCALE 1:25



SECTION D–D

INTERNAL GIRDER

SCALE 1:25



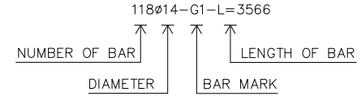
SECTION D–D

EXTERNAL GIRDER

SCALE 1:25

NOTES:

1. COVER TO REINFORCEMENT: 35 mm.
2. CONCRETE FOR PC GIRDER IS GRADE 40 MPa.
3. REINFORCEMENT STEEL: ACCORDING TO ASTM A615.
4. REINFORCEMENT IS DESIGNATED ON THE DRAWING AS FOLLOWS:



5. THE VALUE IN (...) IS USED FOR EXTERNAL GIRDER.
6. ALL DIMENSIONS ARE IN MILLIMETERS.

ລັດວິສາຫະກິດ ວິສະວະກຳ ຄົມມະນາຄົມ

LAO TRANSPORT ENGINEERING CONSULTANT

NR 13N IMPROVEMENT AND MAINTENANCE PROJECT
CONTRACT 2 : BAN SONGPEUAY – PHONHONG

NAM PHANAY BRIDGE
BAR ARRANGEMENT OF GIRDER
(SHEET 1 OF 2)

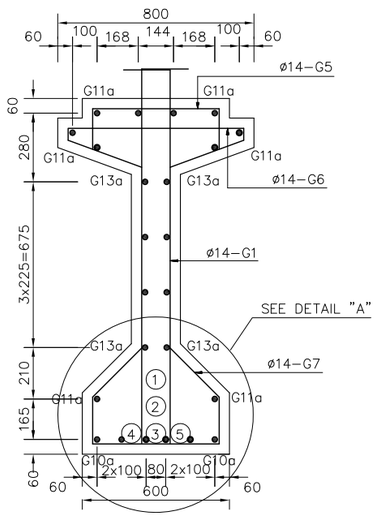
REV.	DATE	DESCRIPTION	APPROVED		NAME	SIGNATURE
				DESIGNED	Mr.Phonepasong SENSONGKHAM	
				CHECKED	Mr.Khamphone SORPHABMIXAY	
				APPROVED	Mr.Vandy VORASACK	

LTEC CODE: SD–262–17

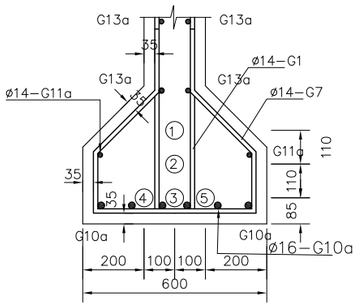
DATE: April, 2018

DRW No. BBA–11

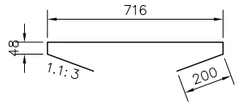
SCALE: AS SHOWN



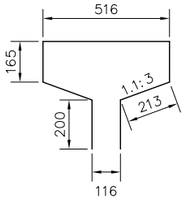
SECTION E–E
SCALE 1:25



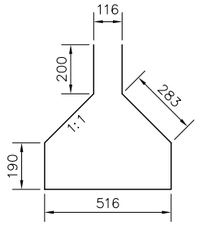
DETAIL "A"
SCALE 1:20



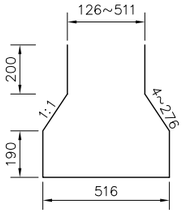
126ø14–G6–L=1212



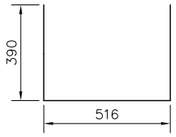
126ø14–G5–L=1672



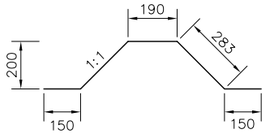
66ø14–G7–L=1862



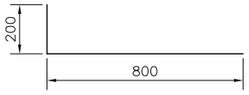
52ø14–G8–L=1576(Aver.)



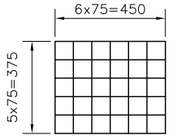
8ø14–G9–L=1296



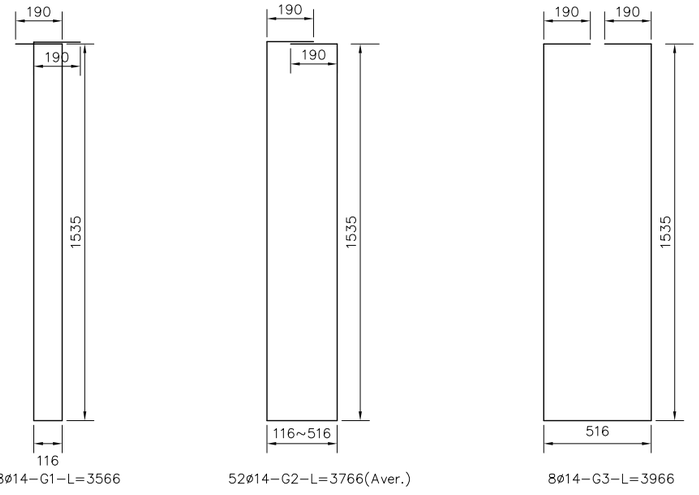
16ø14–G14–L=1056



12ø14–G15–L=1000



2 MESH–ø14–G18–L=5325



118ø14–G1–L=3566

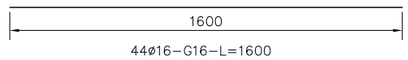
52ø14–G2–L=3766(Aver.)

8ø14–G3–L=3966

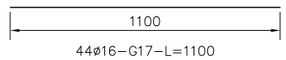
4ø14–G4–L=3966

QUANTITY TABLE OF MATERIAL FOR ONE GIRDER

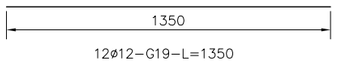
BAR MARK	DIAMETER (mm)	QUANTITY	LENGTH (mm)	UNIT WEIGHT (Kg/m)	WEIGHT (Kg)	REMARKS
G1	14	118	3566	1.208	508.31	
G2	14	52	3766	1.208	236.57	AVERAGE
G3	14	8	3966	1.208	38.33	
G4	14	4	3966	1.208	19.16	
G5	14	126	1672	1.208	254.49	
G6	14	126	1212	1.208	184.48	
G7	14	66	1862	1.208	148.45	
G8	14	52	1576	1.208	99.00	AVERAGE
G9	14	8	1296	1.208	12.52	
G10a	16	12	10000	1.578	189.36	
G10b	16	6	6900	1.578	65.33	
G11a	14	20	10000	1.208	241.60	
G11b	14	10	6740	1.208	81.42	
G12	14	16	4885	1.208	94.42	
G13a	14	16	10000	1.208	193.28	
G13b	14	8	6420	1.208	62.04	
G14	14	16	1056	1.208	20.41	
G15	14	12	1000	1.208	14.50	
G16	16	44	1600	1.578	111.10	INTERNAL
G17	16	44	1100	1.578	76.38	EXTERNAL
G18	14	2	5325	1.208	12.87	
G19	12	12	1350	0.888	14.39	
G20	12	36	300	0.888	9.59	
G21	12	8	1350	0.888	9.59	
G22	12	28	340	0.888	8.45	
TOTAL FOR INTERNAL GIRDER :						
REINFORCEMENT					2645.66	
ø12					42.02	
ø14					2221.85	
ø16					381.79	
CONCRETE GRADE 40Mpa : 16.45 m^3 / GIRDER						
TOTAL FOR EXTERNAL GIRDER :						
REINFORCEMENT					2594.94	
ø12					42.02	
ø14					2221.85	
ø16					331.07	
CONCRETE GRADE 40Mpa : 16.45 m^3 / GIRDER						



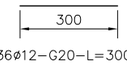
44ø16–G16–L=1600



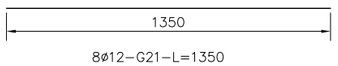
44ø16–G17–L=1100



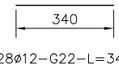
12ø12–G19–L=1350



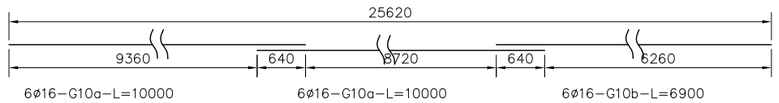
36ø12–G20–L=300



8ø12–G21–L=1350



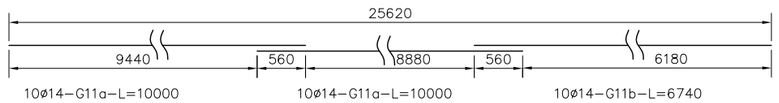
28ø12–G22–L=340



6ø16–G10a–L=10000

6ø16–G10a–L=10000

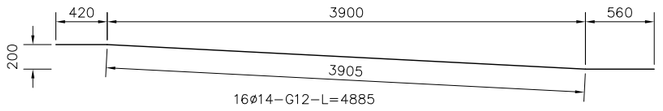
6ø16–G10b–L=6900



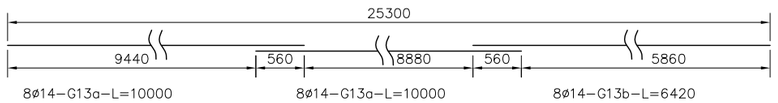
10ø14–G11a–L=10000

10ø14–G11a–L=10000

10ø14–G11b–L=6740



16ø14–G12–L=4885

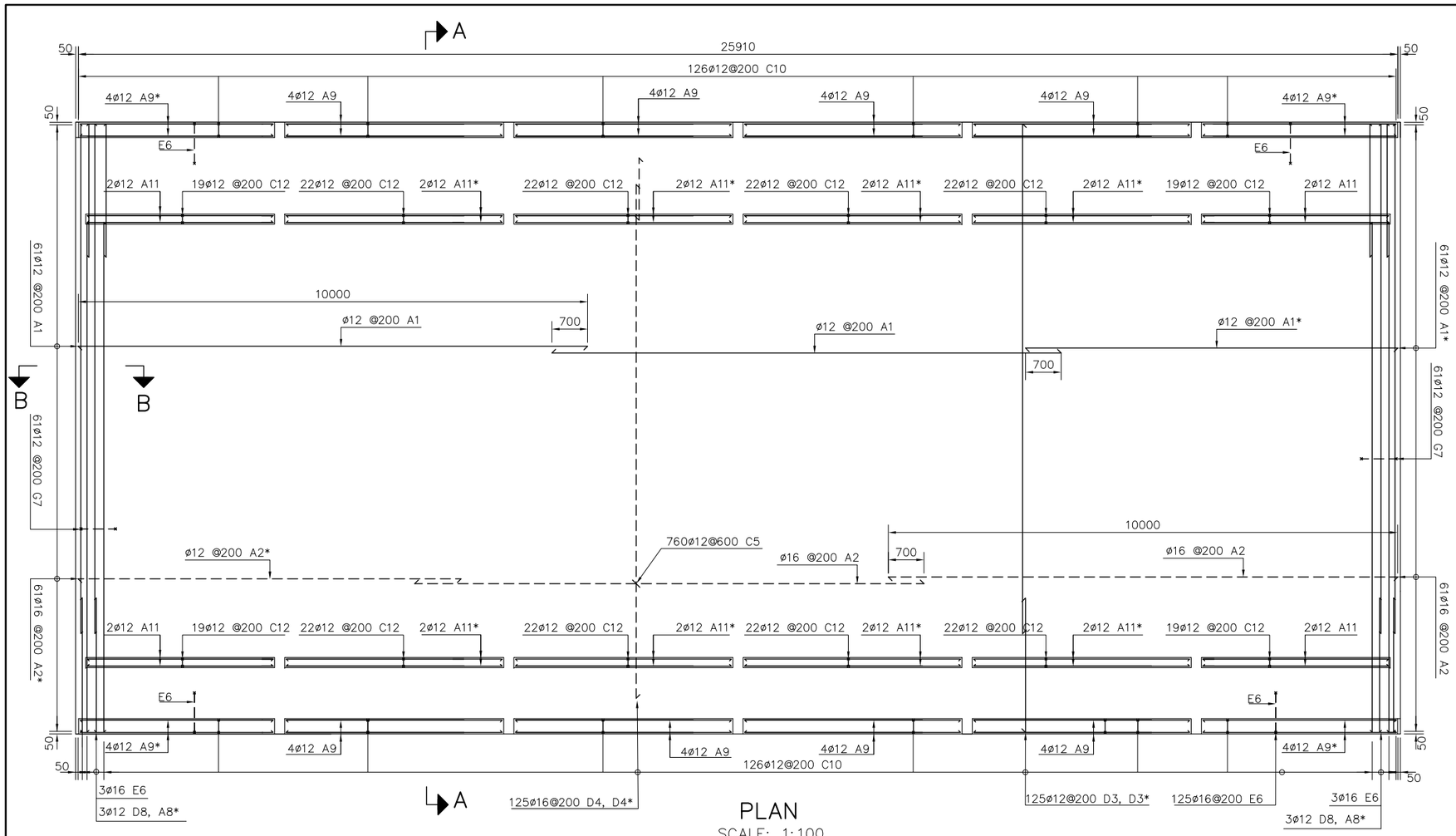


8ø14–G13a–L=10000

8ø14–G13a–L=10000

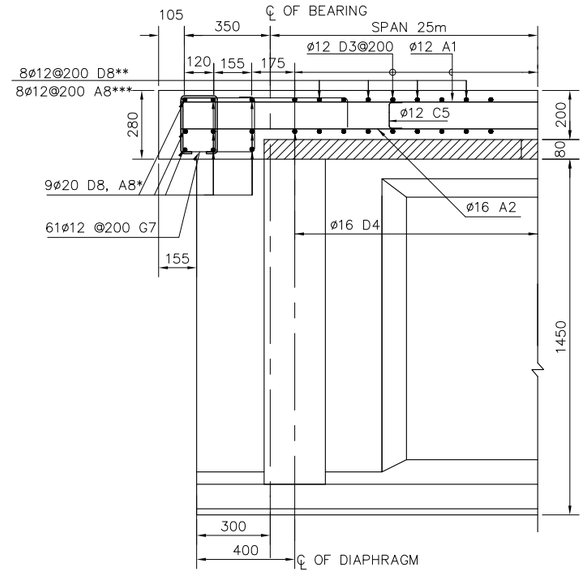
8ø14–G13b–L=6420

ລັດວິສາຫະກິດ ວິສະວະກຳ ຄົມມະນາຄົມ LAO TRANSPORT ENGINEERING CONSULTANT	NR 13N IMPROVEMENT AND MAINTENANCE PROJECT CONTRACT 2 : BAN SONGPEUAY – PHONHONG	REV.	DATE	DESCRIPTION	APPROVED		NAME	SIGNATURE	LTEC CODE: SD–262–17
	NAM PHANAY BRIDGE BAR ARRANGEMENT OF GIRDER (SHEET 2 OF 2)					DESIGNED	Mr.Phonepasong SENSONGKHAM		DATE: April, 2018
						CHECKED	Mr.Khamphone SORPHABMIXAY		DRW No. BBA–12
						APPROVED	Mr.Vandy VORASACK		SCALE: AS SHOWN



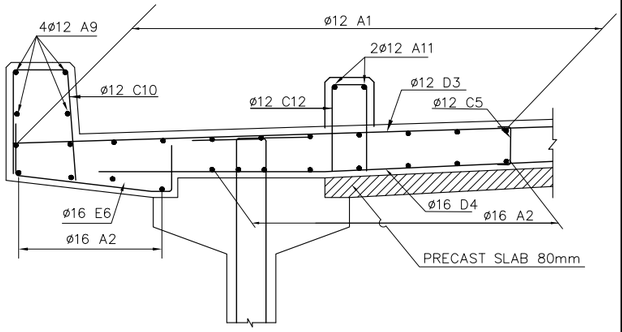
PLAN

SCALE: 1:100



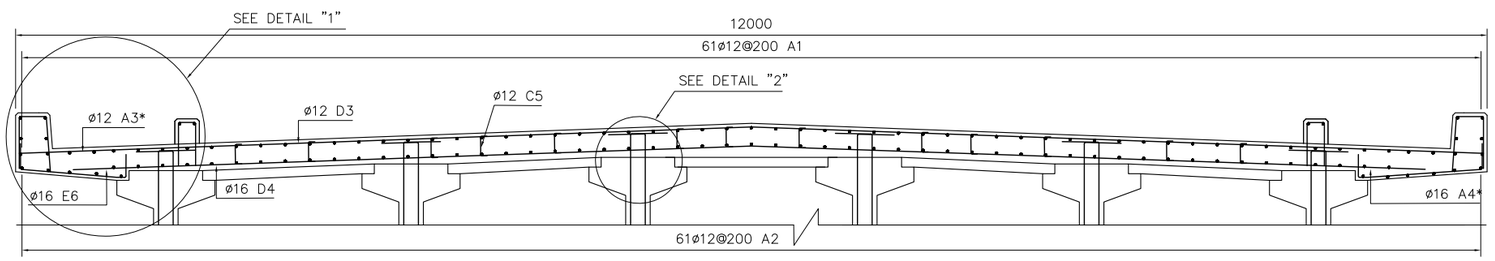
SECTION B–B

SCALE: 1:25



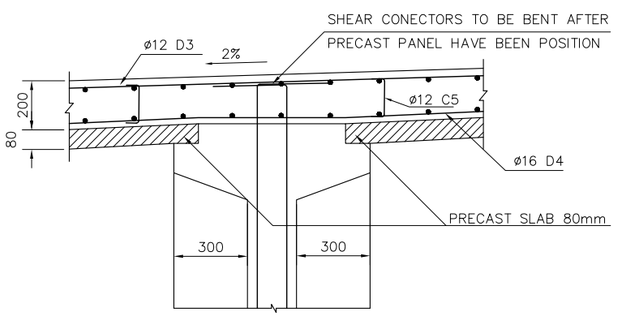
SEE DETAIL "1"

SCALE: 1:25



SECTION A–A

SCALE: 1:50



SEE DETAIL "2"

SCALE: 1:25

NOTES:

1. ALL DIMENSION ARE IN MILLIMETERS.
2. CONCRETE COVER SHALL BE MEASURED FROM THE SURFACE OF CONCRETE TO THE FACE OF NEAREST BARS
   – FOR TOP OF DECK 30 mm
   – FOR BOTTOM OF DECK 25 mm
3. THIS DRAWING TO BE READ IN CONJUNCTION WITH DRAWING No. BDS–06.

ລັດວິສາຫະກິດ ວິສະວະກຳ ຄົມມະນາຄົມ

LAO TRANSPORT ENGINEERING CONSULTANT

NR 13N IMPROVEMENT AND MAINTENANCE PROJECT
CONTRACT 2 : BAN SONGPEUAY – PHONHONG

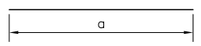
NAM PHANAY BRIDGE
BAR ARRANGEMENT OF DECK SLAB, CURB AND PARAPET

REV.	DATE	DESCRIPTION	APPROVED		NAME	SIGNATURE	
				DESIGNED	Mr.Phonepasong SENSONGKHAM		LTEC CODE: SD–262–17
				CHECKED	Mr.Khamphone SORPHABMIXAY		DATE: April, 2018
				APPROVED	Mr.Vandy VORASACK		DRW No. BBA–13
							SCALE: AS SHOWN

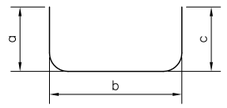
TABLE OF BAR ARRANGEMENT OF DECK SLAB, CURB AND PARAPET

STRUCTURE	SHAPE OF BAR	No	DIAMETER (mm)	LENGTH OF BAR (mm)	QUANTITY	TOTAL LENGTH (m)	SIZE OF BENDING (mm)						SPACE @ (mm)	REMARK
							a	b	c	d	e	F		
DECK SLAB	A	1	12	10000	122	1220.00	10000						200	
	A	1*	12	7500	61	457.50	7500						200	
	A	2	16	10000	122	1220.00	10000						200	
	A	2*	16	7500	61	457.50	7500						200	
	D	3	12	10000	125	1250.00	7475	2525					200	
	A	3*	12	2700	125	337.50	2700						200	
	D	4	16	10000	125	1250.00	7475	2525					200	
	A	4*	16	1700	125	212.50	1700						200	
	C	5	12	450	760	342	150	150	150				600	
	E	6	16	880	250	220	250	550	80	250			200	
	G	7	12	1070	122	130.54	150	700	220	300	220	100	200	
	D	8	20	10000	18	180	7475	2525					200	
	A	8*	20	2700	18	48.6	2700						200	
	D	8**	12	10000	18	180	7475	2525					200	
	A	8***	12	2700	18	48.6	2700						200	
PARAPET	A	9	12	4300	16	68.8	4300							
	A	9*	12	3750	8	30.0	3750							
	C	10	12	1150	252	289.8	450	220	480				200	
CURB	A	11	12	3550	8	28.4	3550							
	A	11*	12	4300	16	68.8	4300							
	C	12	12	780	252	196.6	320	140	320				200	

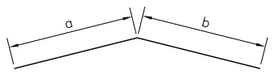
A



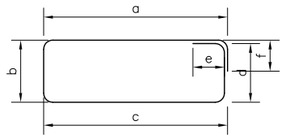
C



D



G



RADIUS FOR BENDING OF BAR

DIAMETRE OF BARS(mm)	RADIUS (mm)
10	35
12	42
16	56
20	100
25	125
32	224

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LAO TRANSPORT ENGINEERING CONSULTANT

NR 13N IMPROVEMENT AND MAINTENANCE PROJECT
CONTRACT 2 : BAN SONGPEUAY – PHONHONG

NAM PHANAY BRIDGE
TABLE OF BAR ARRANGEMENT FOR DECK SLAB, CURB AND PARAPET
(SHEET 1 OF 2)

REV.	DATE	DESCRIPTION	APPROVED		NAME	SIGNATURE
				DESIGNED	Mr.Phonepasong SENSONGKHAM	
				CHECKED	Mr.Khamphone SORPHABMIXAY	
				APPROVED	Mr.Vandy VORASACK	

LTEC CODE: SD–262–17
DATE: April, 2018
DRW No. BTB–14
SCALE: –

TABLE OF BAR ARRANGEMENT OF DECK SLAB, CURB AND PARAPET

No	NAME OF STRUCTURE	ITEM	UNITS	QUANTITIES				
				ø12	ø14	ø16	ø20	TOTAL
1	DECK SLAB	LENGTH OF BARS	m	3966.14	–	3360.00	228.60	7554.74
		WEIGHT OF BARS	Kg	3521.195	–	5303.209	563.762	9,388.17
		CONCRETE GRADE 30 MPa.	m^3	66.04				
2	PARAPET	LENGTH OF BARS	m	388.60	–	–	–	388.60
		WEIGHT OF BARS	Kg	345.01	–	–	–	345.01
		CONCRETE GRADE 30 MPa.	m^3	4.40				
3	CURB	LENGTH OF BARS	m	293.76	–	–	–	293.76
		WEIGHT OF BARS	Kg	260.80	–	–	–	260.80
		CONCRETE GRADE 30 MPa.	m^3	2.07				

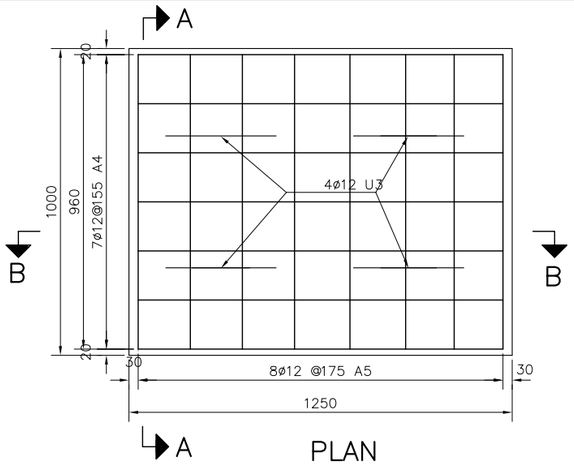
ລ.ວ.ຄ
LTEC
ລັດວິສາຫະກິດ ວິສະວະກຳ ຄົມມະນາຄົມ
LAO TRANSPORT ENGINEERING CONSULTANT

NR 13N IMPROVEMENT AND MAINTENANCE PROJECT
CONTRACT 2 : BAN SONGPEUAY – PHONHONG

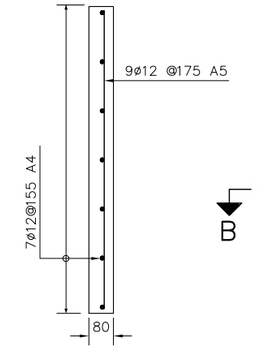
NAM PHANAY BRIDGE
TABLE OF BAR ARRANGEMENT FOR DECK SLAB, CURB AND PARAPET
(SHEET 2 OF 2)

REV.	DATE	DESCRIPTION	APPROVED		NAME	SIGNATURE
				DESIGNED	Mr.Phonepasong SENSONGKHAM	
				CHECKED	Mr.Khamphone SORPHABMIXAY	
				APPROVED	Mr.Vandy VORASACK	

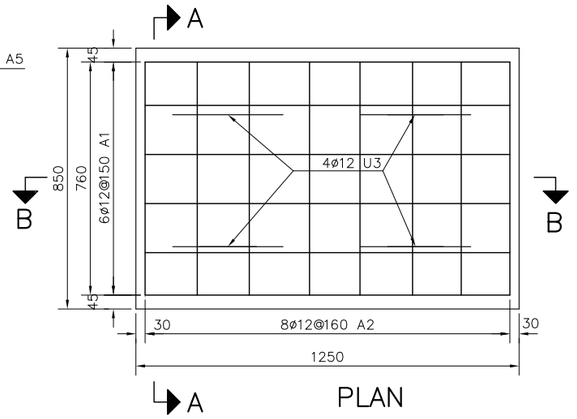
LTEC CODE: SD–262–17
DATE: April, 2018
DRW No. BTB–15
SCALE: –



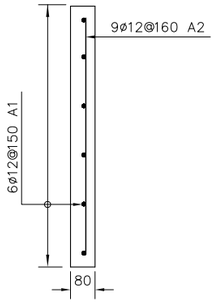
PLAN
SCALE: 1:20



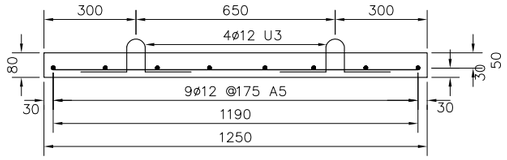
SECTION A–A
SCALE 1:20



PLAN
SCALE: 1:20



SECTION A–A
SCALE 1:20



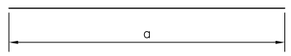
SECTION B–B
SCALE 1:20

SECTION B–B
SCALE 1:20

TABLE OF BAR REINFORCEMENT FOR PRECAST SLAB

SHAPE OF BAR	No	DIAMETER (mm)	LENGTH OF BAR (mm)	QUANTITY	TOTAL LENGTH (m)	SIZE OF BENDING (mm)				SPACE @ (mm)	REMARK
						a	b	c	d		
A	1	12	1340	6x5x2=60	80.4	1190				150	
A	2	12	790	9x2x5=90	71.1	790				160	
U	3	12	460	4x26x5=540	239.2	125x2=250	30x2=60	50x2=100	50	–	
A	4	12	1340	7x24x5=840	1125.6	1190				155	
A	5	12	940	8x24x5=960	1015.2	940				160	

A



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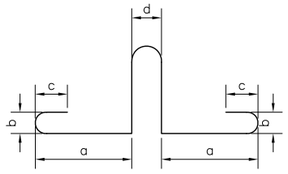

RADIUS FOR BENDING OF BAR

DIAMETRE OF BARS (mm)	RADIUS (mm)
10	35
12	42
16	56
20	100
25	125
32	224

SUMMARY OF QUANTITIES FOR PRECAST SLAB

No	NAME OF STRUCTURE	ITEM	UNITS	QUANTITIES		
				ø12	ø16	TOTAL
1	PRECAST	LENGTH OF BARS	m	2,283.70	–	2,283.70
		WEIGHT OF BARS	Kg	2,027.50	–	2,027.50
		CONCRETE GRADE 30 MPa.	m^3	12.85		

NOTES:

1. ALL DIMENSIONS ARE IN MILLIMETERS.
2. CONCRETE FOR THE PRECAST SLAB IS GRADE 30 MPa.
3. THIS DRAWING TO BE READ IN CONJUNCTION WITH DRAWING No. BDS–06

ລ.ວ.ທ
LTEC
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LAO TRANSPORT ENGINEERING CONSULTANT

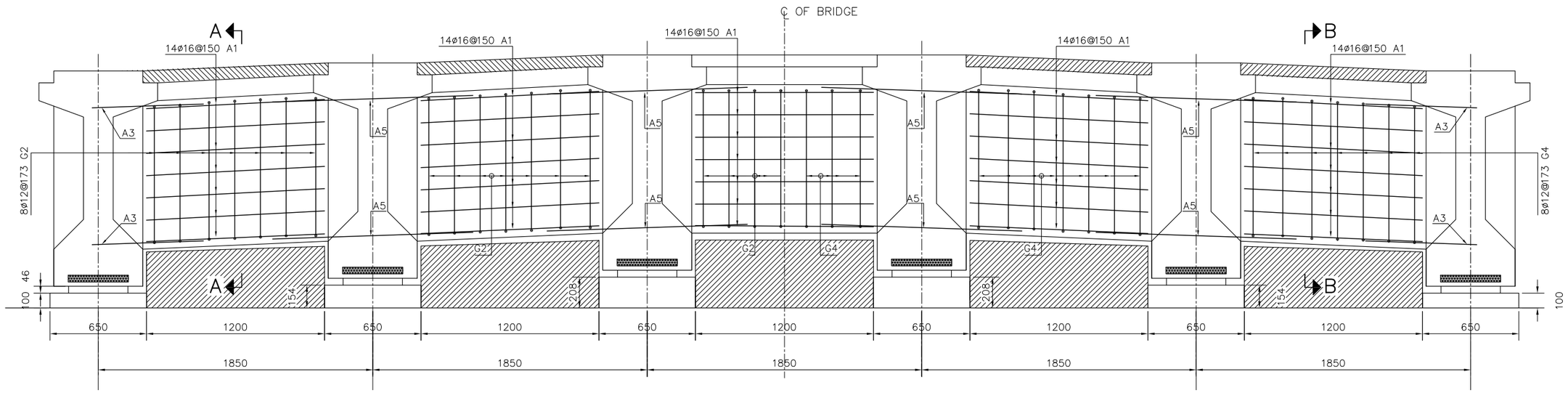
NR 13N IMPROVEMENT AND MAINTENANCE PROJECT
CONTRACT 2 : BAN SONGPEUAY – PHONHONG

NAM PHANAY BRIDGE
BAR ARRANGEMENT OF PRECAST SLAB

REV.	DATE	DESCRIPTION	APPROVED

	NAME	SIGNATURE
DESIGNED	Mr.Phonepasong SENSONGKHAM	
CHECKED	Mr.Khamphone SORPHABMIXAY	
APPROVED	Mr.Vandy VORASACK	

LTEC CODE: SD–262–17
DATE: April, 2018
DRW No. BBA–16
SCALE: 1:20



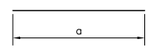
1/2 DIAPHRAGM AT INTERNAL
SCALE 1:30

1/2 DIAPHRAGM AT THE END
SCALE 1:30

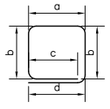
TABLE OF BAR REINFORCEMENT FOR DIAPHRAGM

SHAPE OF BAR	DIAMETER (mm)	LENGTH OF BAR (mm)	QUANTITIES	TOTAL LENGTH (m)	SIZE OF BENDING (mm)				SPACE @ (mm)	REMARK
					a	b	c	d		
A1	16	1.36	14x5x2=140	190.40	1210					
G2	12	2.28	7x5x2=70	182.40	140	940x2=1880	140	120		
A3	16	0.75	14x2x4=112	84.00	750					
G4	12	2.68	7x5x2=70	214.40	340	940x2=1880	340	120		
A5	16	0.75	14x4x4=224	168.00	750					

A



G

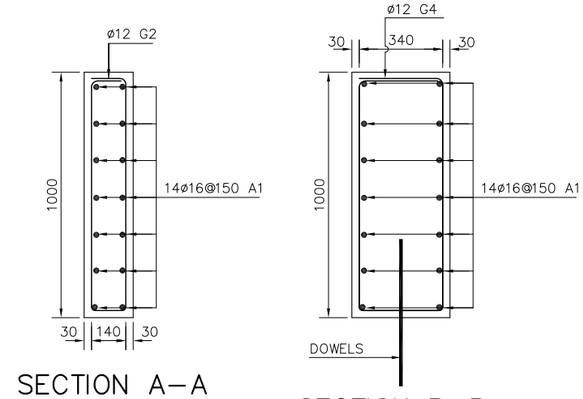


RADIUS FOR BENDING OF BAR

DIAMETER OF BARS (mm)	RADIUS (mm)
10	35
12	42
16	56
20	100
25	125
32	224

SUMMARY OF QUANTITIES FOR DIAPHRAGM

No	NAME OF STRUCTURE	ITEM	UNITS	QUANTITIES		
				ø12	ø16	TOTAL
1	DIAPHRAGM	LENGTH OF BARS	m	347.20	421.40	768.60
		WEIGHT OF BARS	Kg	308.249	665.111	973.36
		CONCRETE GRADE 35 Mpa	m^3	10.07		



SECTION A–A
SCALE 1:25

SECTION B–B
SCALE 1:25

NOTES:

1. ALL DIMENSIONS ARE IN MILLIMETERS.
2. FOR DOWELS BAR SEE DRAWING No. BSD–20

ລັດວິສາຫະກິດ ວິສະວະກຳ ຄົມມະນາຄົມ
LAO TRANSPORT ENGINEERING CONSULTANT

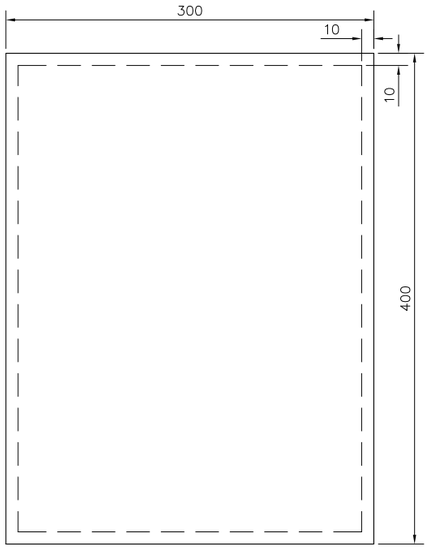
NR 13N IMPROVEMENT AND MAINTENANCE PROJECT
CONTRACT 2 : BAN SONGPEUAY – PHONHONG

NAM PHANAY BRIDGE
DETAIL OF DIAPHRAGM

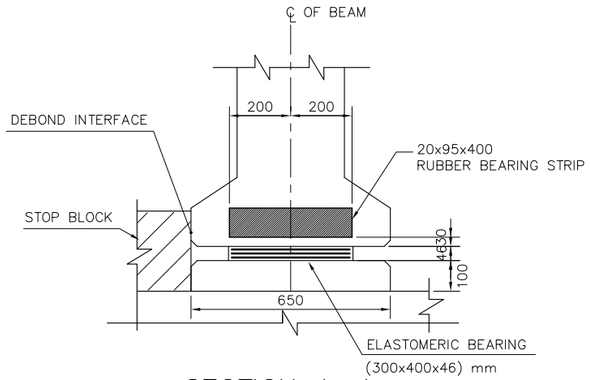
REV.	DATE	DESCRIPTION	APPROVED

	NAME	SIGNATURE
DESIGNED	Mr.Phonepasong SENSONGKHAM	
CHECKED	Mr.Khamphone SORPHABMIXAY	
APPROVED	Mr.Vandy VORASACK	

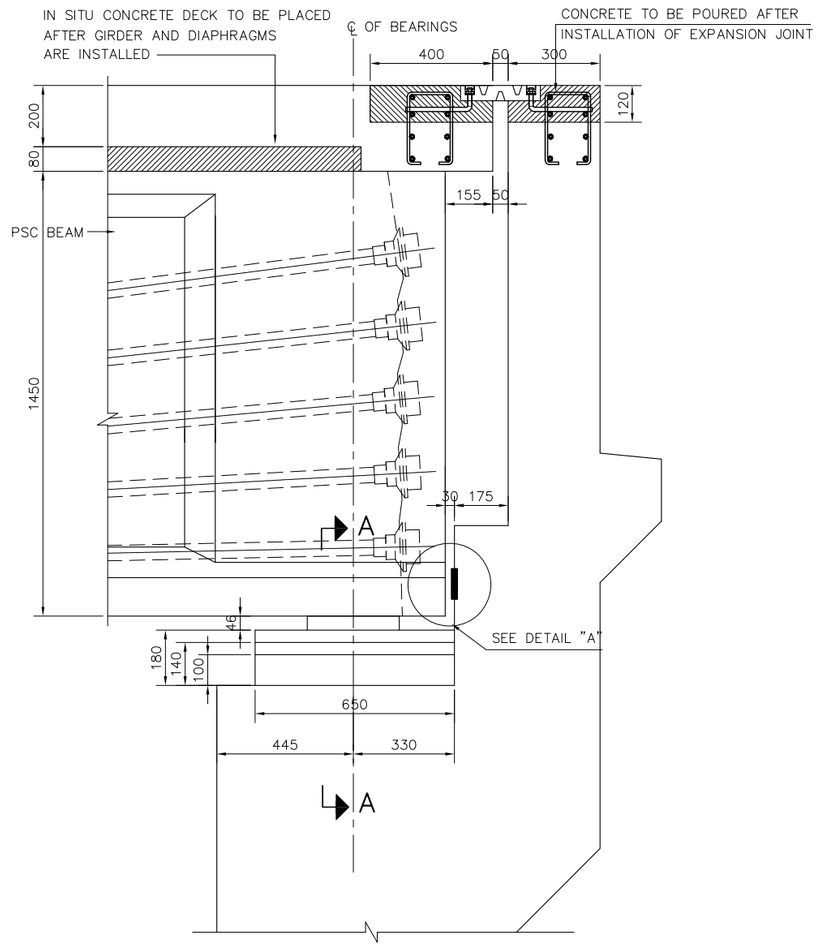
LTEC CODE: SD–262–17
DATE: April, 2018
DRW No. BDD–17
SCALE: AS SHOWN



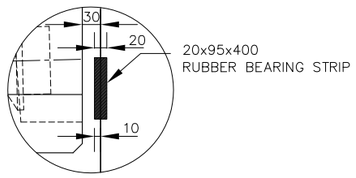
SECTION B–B
SCALE 1:5



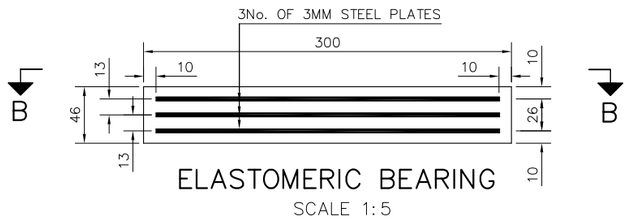
SECTION A–A
SCALE 1:20



JOINT DETAIL AT ABUTMENT
SCALE 1:20



DETAIL "A"
SCALE 1:10

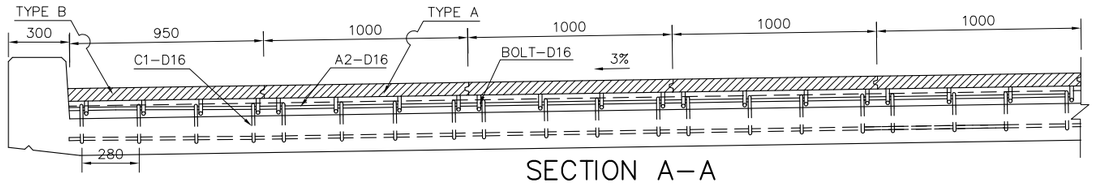


ELASTOMERIC BEARING
SCALE 1:5

NOTES:

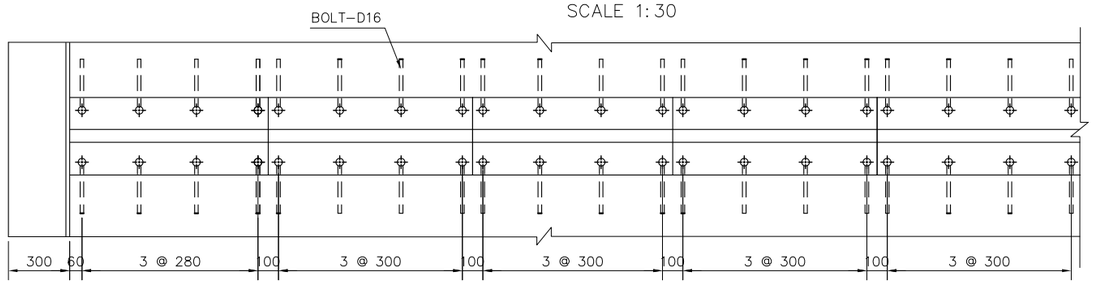
1. ALL DIMENSIONS ARE IN MILLIMETERS.
2. THIS DRAWING TO BE READ IN CONJUNCTION WITH DRAWING No. BBD–19.

ລ.ວ.ທ LTEC ລັດວິສາຫະກິດ ວິສະວະກຳ ຄົມມະນາຄົມ LAO TRANSPORT ENGINEERING CONSULTANT	NR 13N IMPROVEMENT AND MAINTENANCE PROJECT CONTRACT 2 : BAN SONGPEUAY – PHONHONG	REV.	DATE	DESCRIPTION	APPROVED		NAME	SIGNATURE	LTEC CODE: SD–262–17
	NAM PHANAY BRIDGE DETAIL OF BEARING AND DECK JOINT (SHEET 1 OF 2)					DESIGNED	Mr.Phonepasong SENSONGKHAM		DATE: April, 2018
						CHECKED	Mr.Khamphone SORPHABMIXAY		DRW No. BBD–18
						APPROVED	Mr.Vandy VORASACK		SCALE: AS SHOWN



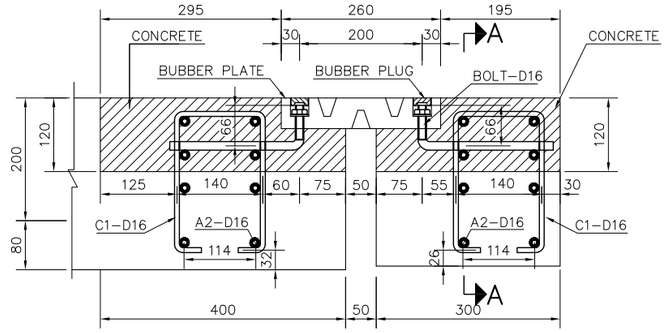
SECTION A–A

SCALE 1:30



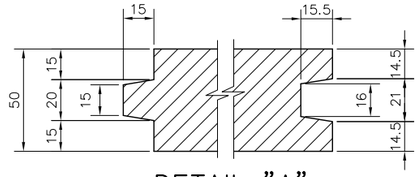
BOLT LAYOUT PLAN

SCALE 1:30



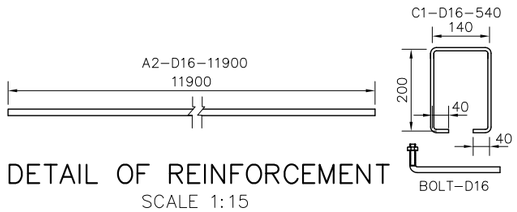
DETAIL OF EDGE OF EXPANSION JOINT FOR ABUTMENT

SCALE 1:10



DETAIL "A"

SCALE 1:3



DETAIL OF REINFORCEMENT

SCALE 1:15

MATERIAL FOR ONE EXPANSION JOINT AT ABUTMENT

FOR ONE EXPANSION JOINT							
BAR MARK	DAI	QUANTITY	LENGTH	TOTAL LENGTH	WEIGHT UNIT	TOTAL WEIGHT	CONCRETE
	mm	pcs	mm	m	kg/m	kg	30 MPa (m3)
C1	16	120	620	74.40	1.578	117.40	1.03
A2	16	8	11900	95.20	1.578	150.23	
BOLT	16	120	300	36.00	1.578	56.81	
TOTAL OF REINFORCEMENT (kg)						324.44	
RUBBER PLATE: 50x260x1000 (mm) OR SIMILAR = 11.9 m							
RUBBER PLATE: 50x260x950 (mm) OR SIMILAR = 1.90 m							

NOTES:

1. ALL DIMENSIONS ARE IN MILLIMETERS.
3. THIS DRAWING TO BE READ IN CONJUNCTION WITH DRAWING No. BBD–18.

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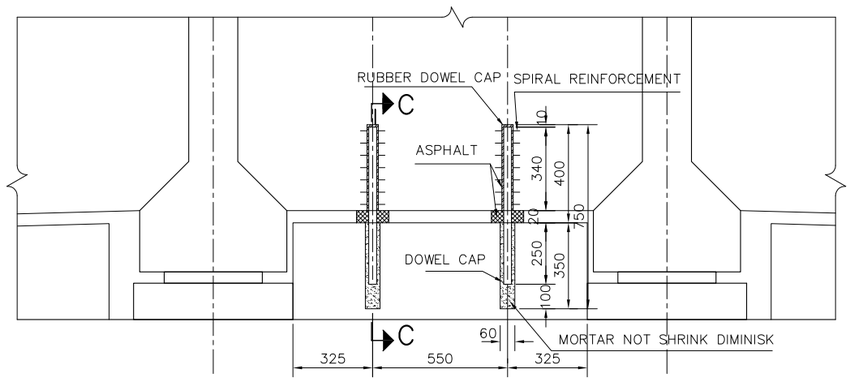
LAO TRANSPORT ENGINEERING CONSULTANT

NR 13N IMPROVEMENT AND MAINTENANCE PROJECT

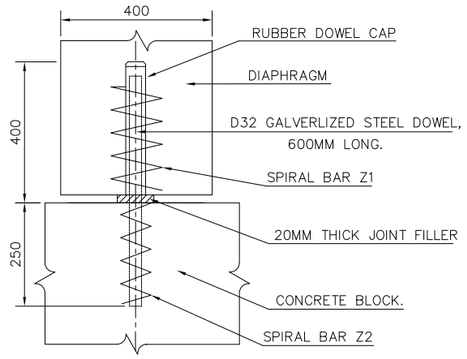
CONTRACT 2 : BAN SONGPEUAY – PHONHONG

NAM PHANAY BRIDGE
DETAIL OF BEARING AND
DECK JOINT (SHEET 2 OF 2)

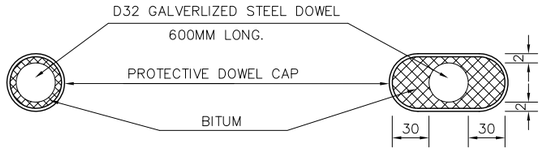
REV.	DATE	DESCRIPTION	APPROVED		NAME	SIGNATURE	LTEC CODE: SD–262–17
				DESIGNED	Mr.Phonepasong SENSONGKHAM		DATE: April, 2018
				CHECKED	Mr.Khamphone SORPHABMIXAY		DRW No. BBD–19
				APPROVED	Mr.Vandy VORASACK		SCALE: AS SHOWN



DETAIL OF DOWEL
SCALE 1:25

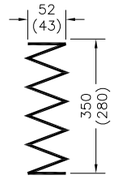


SECTION C–C
SCALE 1:25

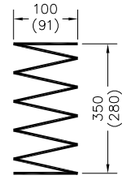


AT FIXED BEARING
SCALE 1:5

AT MOVABLE BEARING
SCALE 1:25



SPIRAL BAR 2
SCALE 1:20



SPIRAL BAR 1
SCALE 1:20

TABLE OF CONCRETE AND BAR REINFORCEMENT FOR DOWEL (ONE SPAN)

ITEM	UNIT	AT MOVABLE BEARING				AT FIXED BEARING			
		DIA (mm)	LENGTH OF BAR (mm)	QUANTITY	WEIGHT (Kg)	DIA (mm)	LENGTH OF BAR (mm)	QUANTITY	WEIGHT (Kg)
D32 GALVERLIZED STEEL DOWEL	Bar	32	600	10	37.93	32	600	10	37.93
SPIRAL REINFORCEMENT	Fiber	10	1000	10	6.17	10	1300	10	8.03
TOTAL					44.1				45.95
RUBBER DOWEL CAP	Each	65Ax450		10		65Ax450		10	

NOTES:

1. BEARINGS: GJZ LAMINATED ELASTOMERIC BEARING WITH MAXIMUMWORKING LOAD 1200 kN.
2. HORIZONTAL GRADIENT OF BEARING PAD WILL BE ADOPTED FOR BEARING'S NORMAL PERFORMANCE.
3. ALL DIMENSIONS ARE IN MILLIMETERS.

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LAO TRANSPORT ENGINEERING CONSULTANT

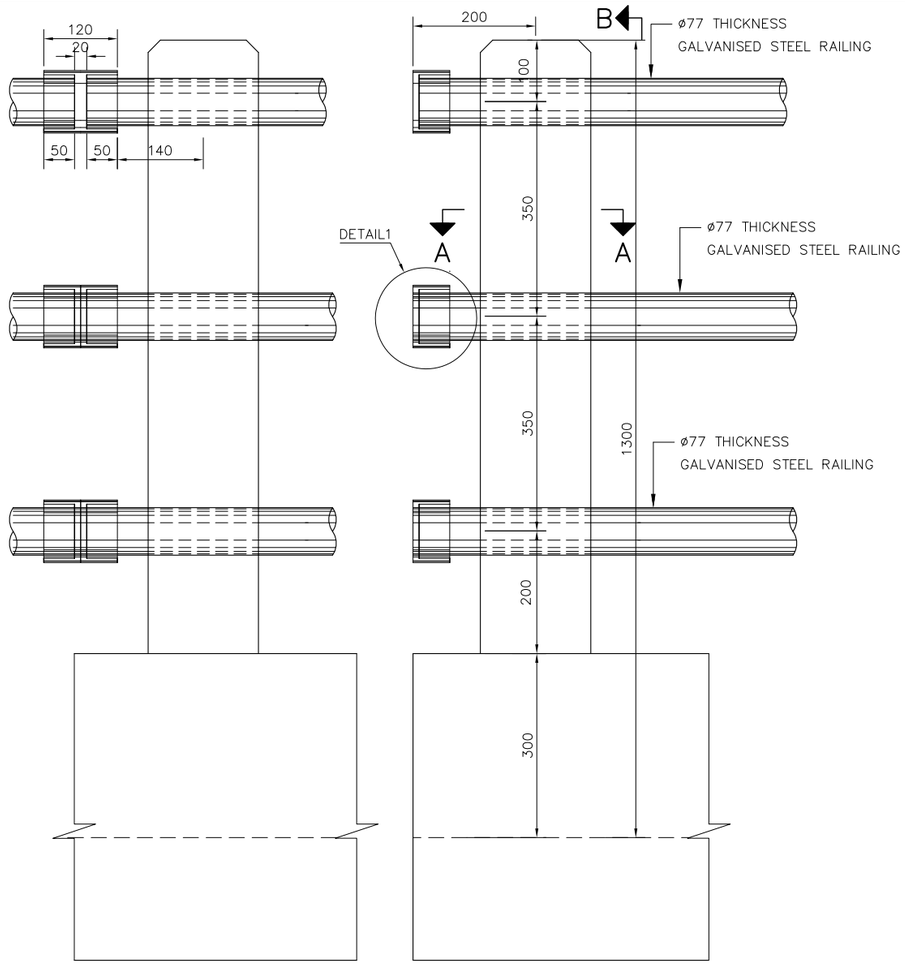
NR 13N IMPROVEMENT AND MAINTENANCE PROJECT
CONTRACT 2 : BAN SONGPEUAY – PHONHONG

NAM PHANAY BRIDGE
DETAIL OF STEEL DOWEL

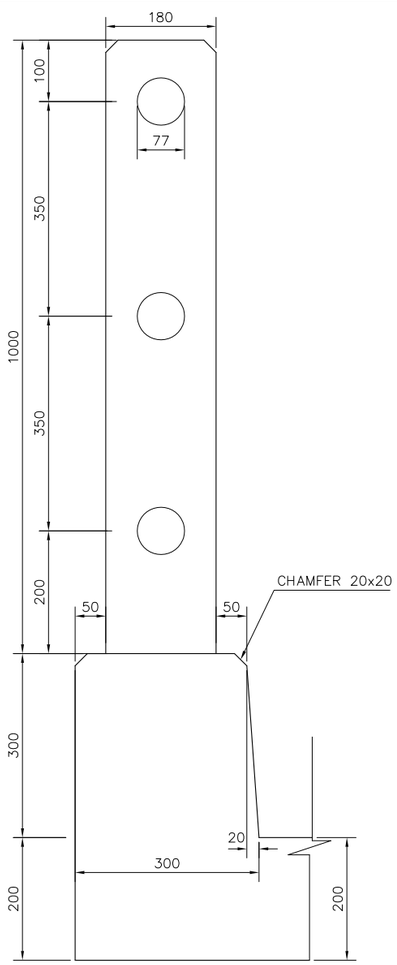
REV.	DATE	DESCRIPTION	APPROVED

	NAME	SIGNATURE
DESIGNED	Mr.Phonepasong SENSONGKHAM	
CHECKED	Mr.Khamphone SORPHABMIXAY	
APPROVED	Mr.Vandy VORASACK	

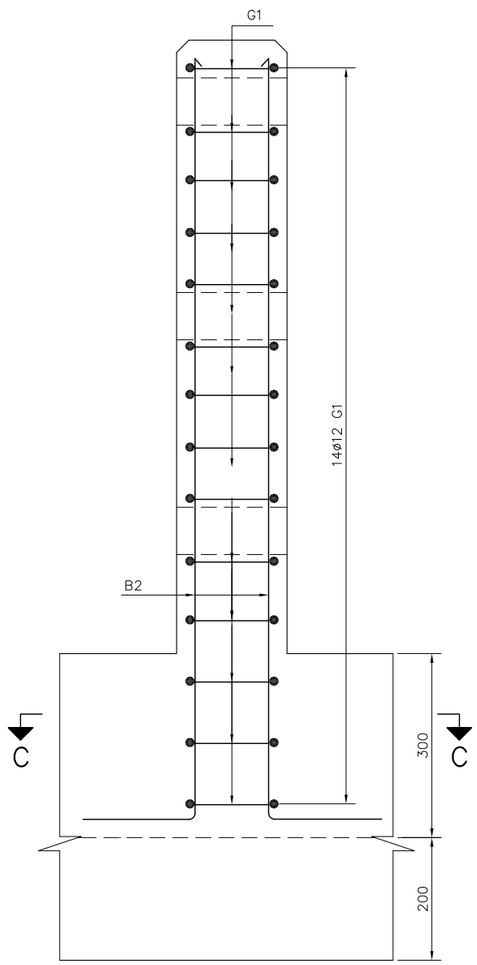
LTEC CODE: SD–262–17
DATE: April, 2018
DRW No. BSD–20
SCALE: AS SHOWN



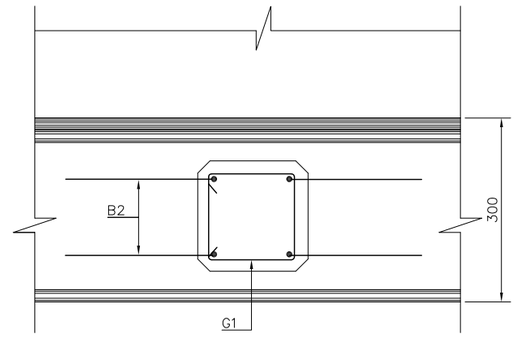
POST DIMENSIONS
SCALE 1:10



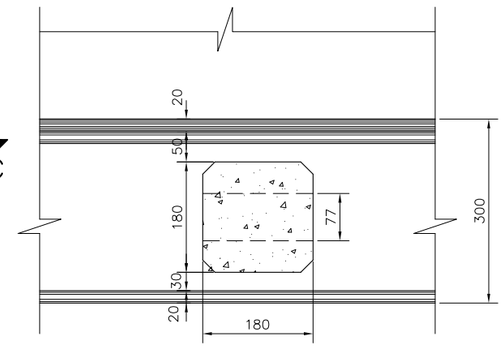
VIEW B–B
SCALE 1:10



POST REINFORCEMENT
SCALE 1:10



SECTION C–C
SCALE 1:10



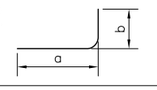
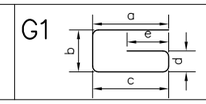
SECTION A–A
SCALE 1:10

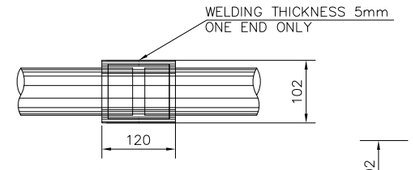
B

TABLE OF REINFORCEMENT FOR ONE SIDE

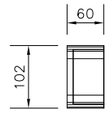
SHAPE OF BAR	No.	DIAMETER (mm)	LENGTH OF BAR (mm)	QUANTITY	TOTAL LENGTH (m)	SIZE OF BENDING (mm)						SPACE @ (mm)	REMARK
						a	b	c	d	e	f		
G	1	12	650	14x48=672	436.8	130	130	130	130	130		100	
B	2	16	1540	4x48=192	295.68	1240	300						

FORM OF BENDING

B2	G1
	
RADIUS FOR BENDING OF BAR	
DIAMETER OF BARS (mm)	RADIUS (mm)
12	12x35 = 420
16	16x35 = 560



CONNECTION OF PIPE
SCALE 1:10



DETAIL 1
SCALE 1:10

TABLE OF CONCRETE AND BAR REINFORCEMENT FOR ONE SIDE

No	NAME OF STRUCTURE	ITEM	UNITS	QUANTITIES		
				ø12	ø16	TOTAL
1	RAILING	LENGTH OF BARS	m	436.8	295.68	732.48
		WEIGHT OF BARS	kg	387.80	466.68	854.48
		CONCRETE GRADE 25MPa.	m3	48x0.026=1.25		1.25
		ROUND PIPE	m			206.4

NOTES:

1. ALL DIMENSIONS ARE IN MILLIMETERS.
2. CLEAR COVER TO REINFORCEMENT TO BE 30 mm.
3. STEEL RAILING SHALL BE STRUCTURAL CARBON STEEL IN ACCORDANCE WITH AASHTO M270 GRADE 36.
4. RAILINGS SHALL BE HOT–DIP GALVANISED IN ACCORDANCE WITH AASHTO M111.
5. ENDS RAILING PANELS SHALL BE SEALED WITH CAPPING PLATES.

ລັດວິສາຫະກິດ ວິສະວະກຳ ຄົມມະນາຄົມ
LAO TRANSPORT ENGINEERING CONSULTANT

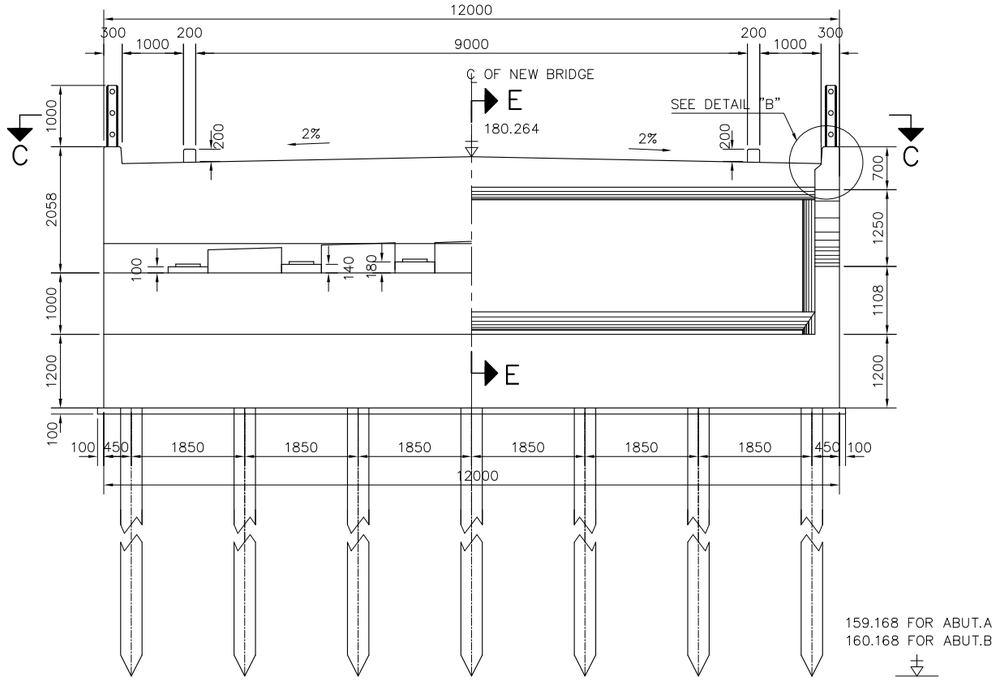
NR 13N IMPROVEMENT AND MAINTENANCE PROJECT
CONTRACT 2 : BAN SONGPEUAY – PHONHONG

NAM PHANAY BRIDGE
DETAIL OF BRIDGE RAILING

REV.	DATE	DESCRIPTION	APPROVED

	NAME	SIGNATURE
DESIGNED	Mr.Phonepasong SENSONGKHAM	
CHECKED	Mr.Khamphone SORPHABMIXAY	
APPROVED	Mr.Vandy VORASACK	

LTEC CODE: SD–262–17
DATE: April, 2018
DRW No. BDR–21
SCALE: AS SHOWN

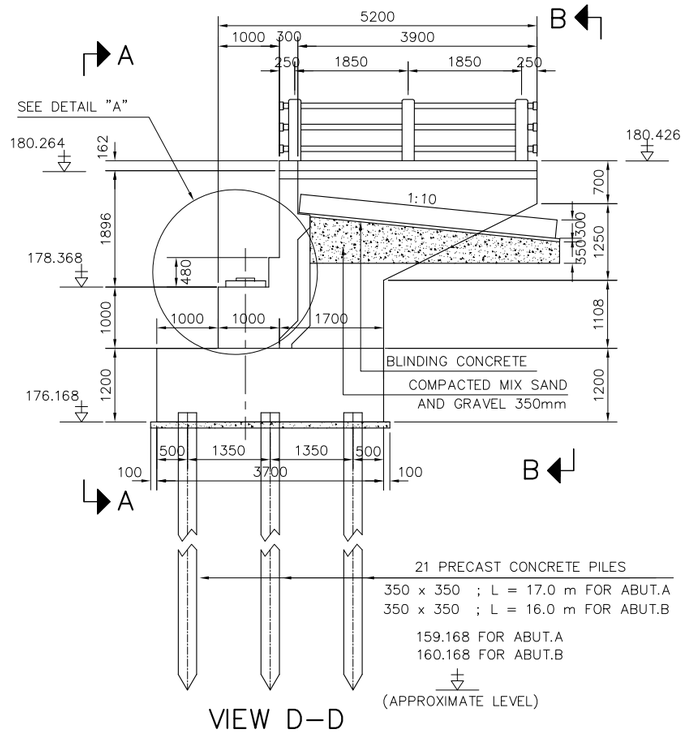


1/2 FRONT VIEW A–A

SCALE 1:100

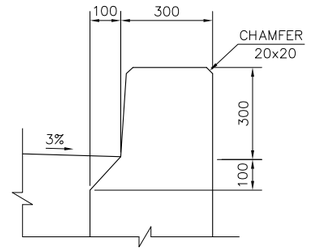
1/2 BACK VIEW B–B

SCALE 1:100



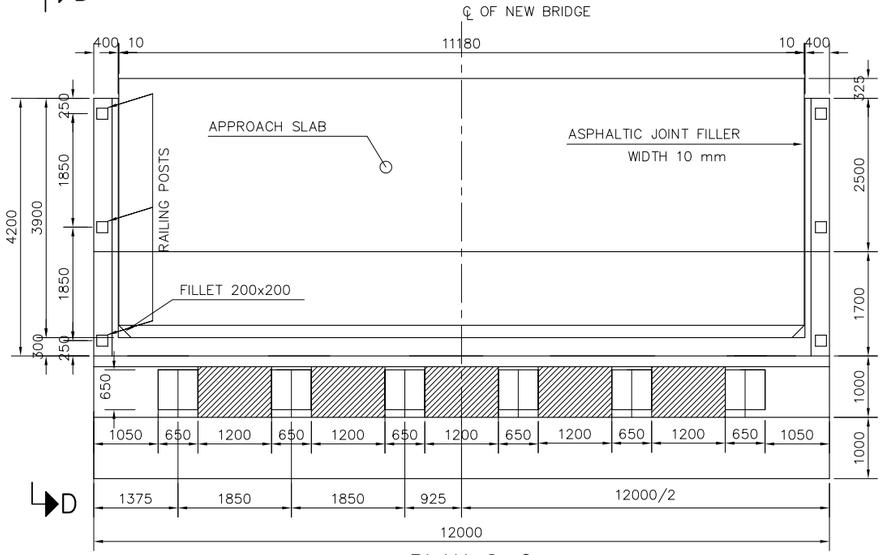
VIEW D–D

SCALE 1:100



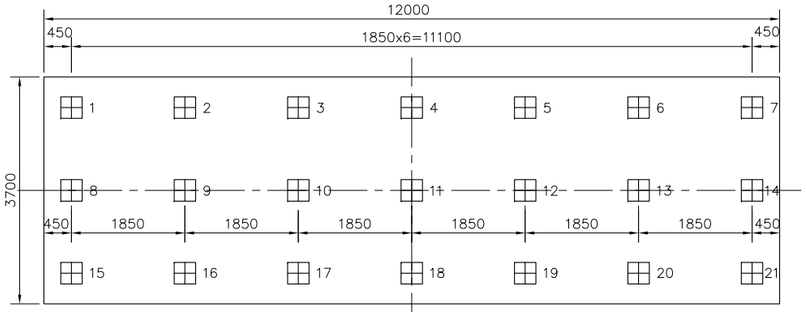
DETAIL "B"

SCALE 1:20



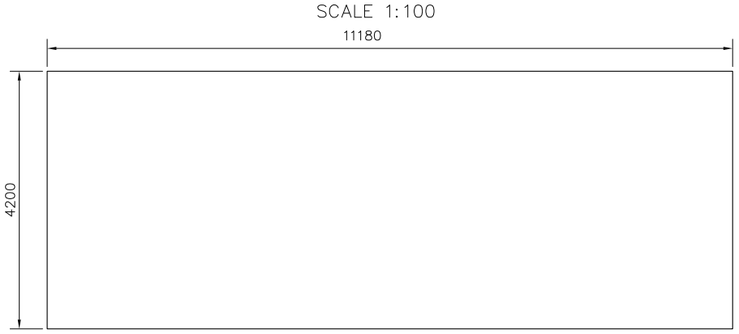
PLAN C–C

SCALE 1:100



PILE CAP PLAN

SCALE 1:100



APPROACH SLAB

SCALE 1:100

NOTES:

1. ALL DIMENSIONS ARE IN MILLIMETERS; LEVELS ARE IN METERS.
2. LENGTH OF PILES ARE GIVEN AS A GUIDE ONLY
   ACTUAL LENGTH OF PILES WILL BE DETERMINED
   AT SITE AFTER TEST PILE DRIVING BY THE ENGINEER.
3. THIS DRAWING TO BE READ IN CONJUNCTION WITH
   DRAWINGS No. BDA–23, BBA–24, BBA–25 AND BBA–26.
4. PRESTRESSED CONCRETE PILE SHALL BE CONFIRMED TO AASHTO "LRFD BRIDGE DESIGN SPECIFICATION" CURRENT EDITION, DIMENSION 350x350 mm AND SAFETY LOAD 60 TONS.

ລັດວິສາຫະກິດ ວິສະວະກຳ ຄົມມະນາຄົມ

LAO TRANSPORT ENGINEERING CONSULTANT

NR 13N IMPROVEMENT AND MAINTENANCE PROJECT
CONTRACT 2 : BAN SONGPEUAY – PHONHONG

NAM PHANAY BRIDGE
DETAIL OF ABUTMENT A AND B
(SHEET 1 OF 2)

REV.	DATE	DESCRIPTION	APPROVED

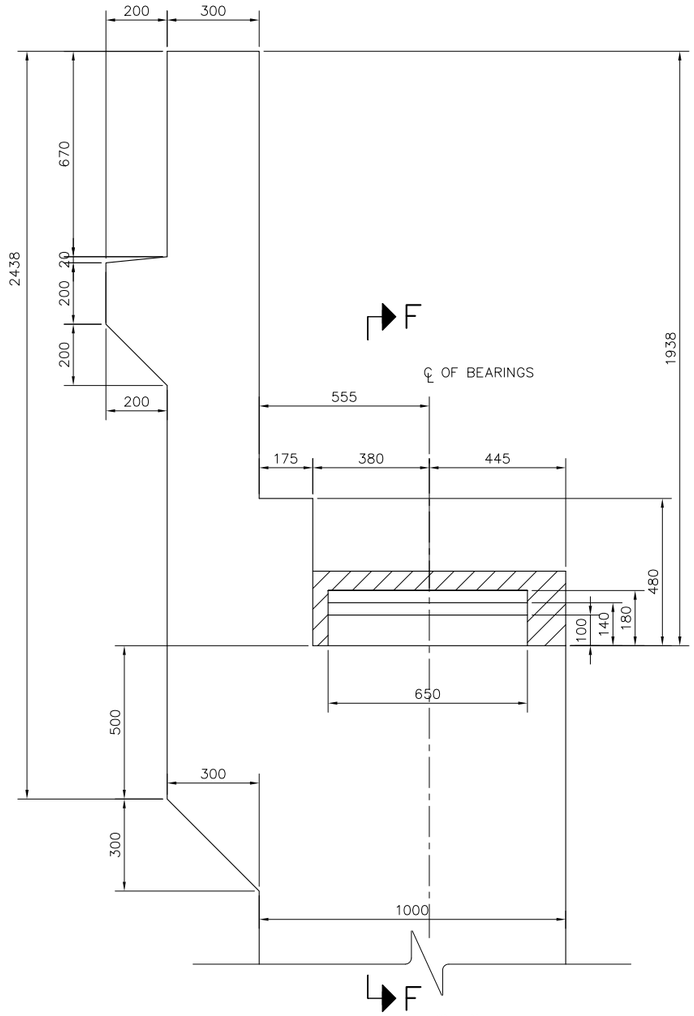
	NAME	SIGNATURE
DESIGNED	Mr.Phonepasong SENSONGKHAM	
CHECKED	Mr.Khamphone SORPHABMIXAY	
APPROVED	Mr.Vandy VORASACK	

LTEC CODE: SD–262–17

DATE: April, 2018

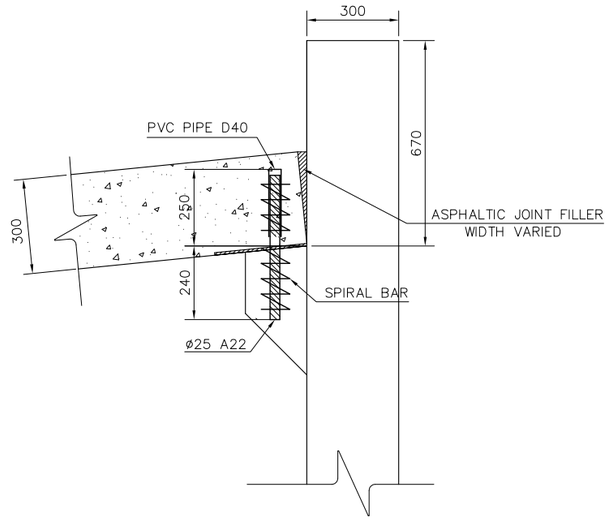
DRW No. BDA–22

SCALE: AS SHOWN



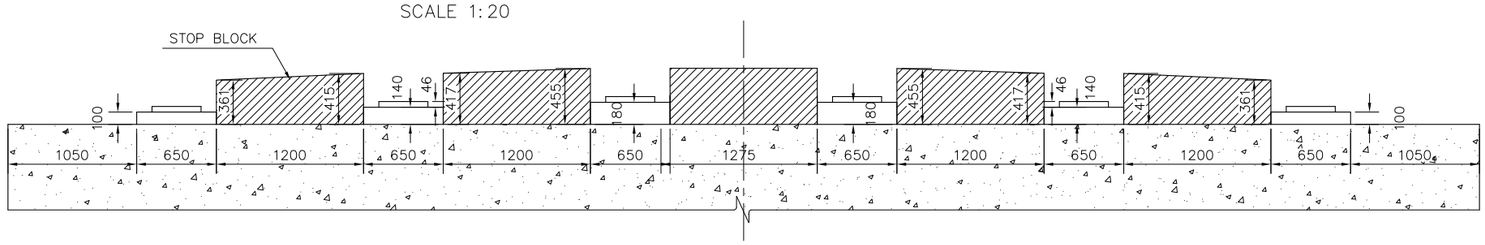
DETAIL "A"

SCALE 1:20



SECTION E–E

SCALE 1:20



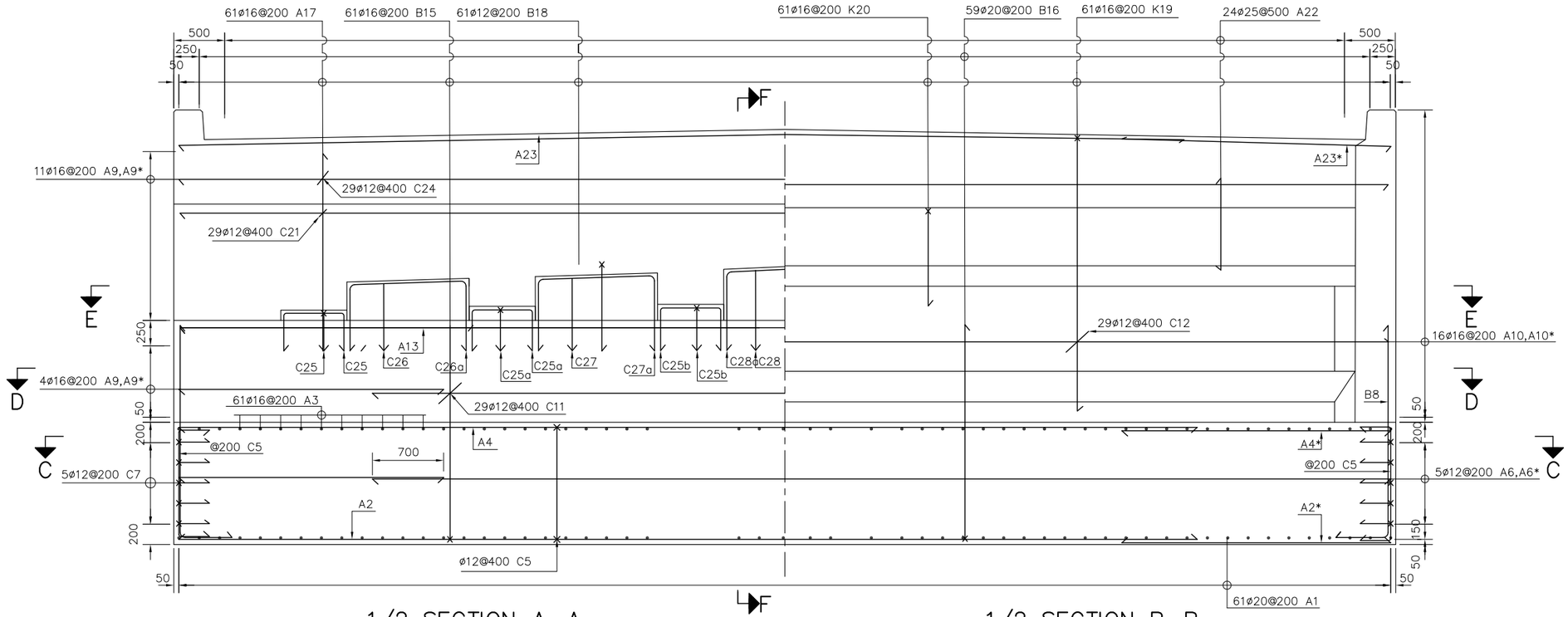
ONE SECTION F–F

SCALE 1:50

NOTES:

1. ALL DIMENSIONS ARE IN MILLIMETERS.
2. THIS DRAWING TO BE READ IN CONJUNCTION WITH DRAWINGS No. BDA–22, BBA–24, BBA–25, BBA–26 AND BBA–27.

ລ.ວ.ທ LTEC ລັດວິສາຫະກິດ ວິສະວະກຳ ຄົມມະນາຄົມ LAO TRANSPORT ENGINEERING CONSULTANT	NR 13N IMPROVEMENT AND MAINTENANCE PROJECT CONTRACT 2 : BAN SONGPEUAY – PHONHONG	REV.	DATE	DESCRIPTION	APPROVED		NAME	SIGNATURE	LTEC CODE: SD–262–17
	NAM PHANAY BRIDGE DETAIL OF ABUTMENT A AND B (SHEET 2 OF 2)					DESIGNED	Mr.Phonepasong SENSONGKHAM		DATE: April, 2018
						CHECKED	Mr.Khamphone SORPHABMIXAY		DRW No. BDA–23
						APPROVED	Mr.Vandy VORASACK		SCALE: AS SHOWN

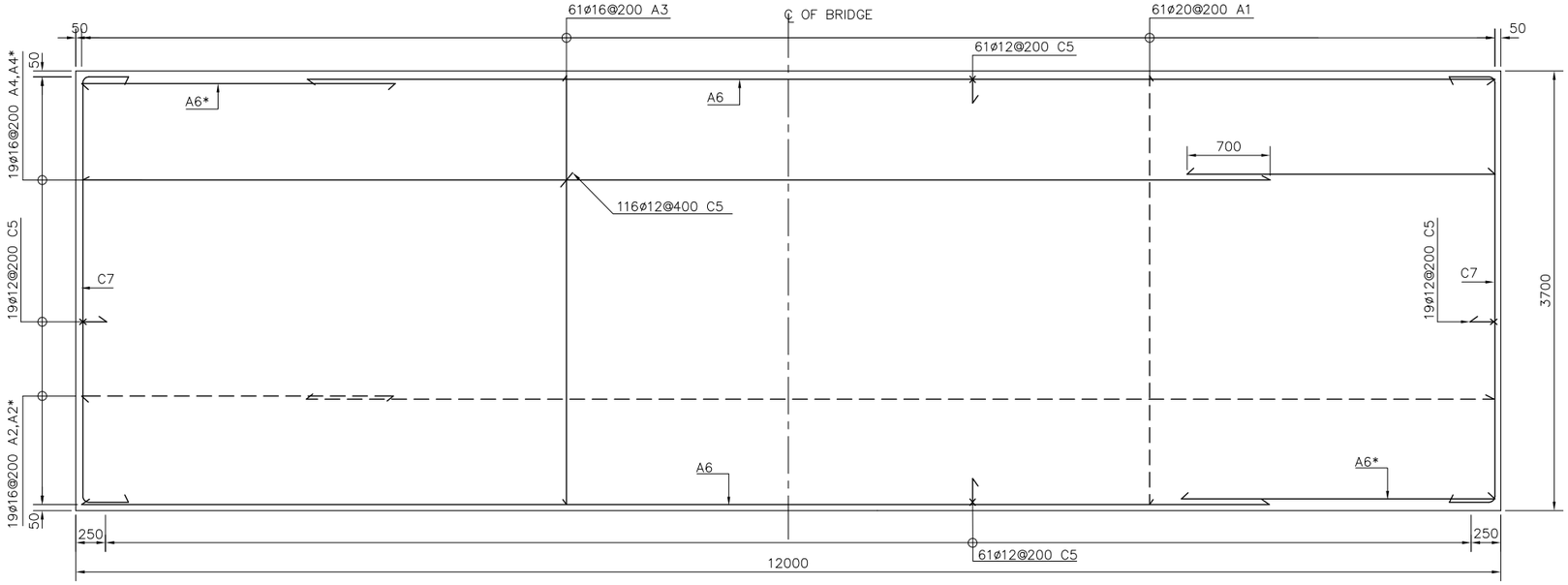


1/2 SECTION A–A

SCALE 1:50

1/2 SECTION B–B

SCALE 1:50



SECTION C–C

SCALE 1:50

NOTES:

1. ALL DIMENSIONS ARE IN MILLIMETERS.
2. CONCRETE COVER SHALL BE MEASURED FROM THE SURFACE OF CONCRETE TO THE FACE OF NEAREST BARS=50 mm.
3. THIS DRAWING TO BE READ IN CONJUNCTION WITH DRAWINGS No. BDA–22, BDA–23, BBA–25, BBA–26, AND BBA–27.

ລ.ວ.ຄ
LTEC

ລັດວິສາຫະກິດ ວິສະວະກຳ ຄົມມະນາຄົມ
LAO TRANSPORT ENGINEERING CONSULTANT

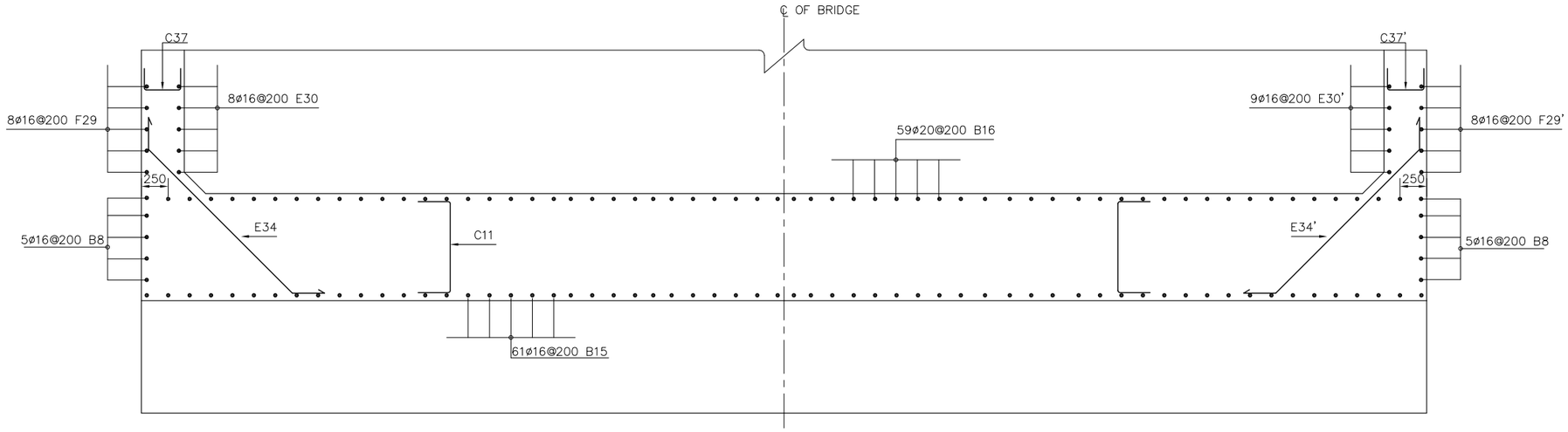
NR 13N IMPROVEMENT AND MAINTENANCE PROJECT
CONTRACT 2 : BAN SONGPEUAY – PHONHONG

NAM PHANAY BRIDGE
BAR ARRANGEMENT OF ABUTMENT A AND B (SHEET 1 OF 4)

REV.	DATE	DESCRIPTION	APPROVED

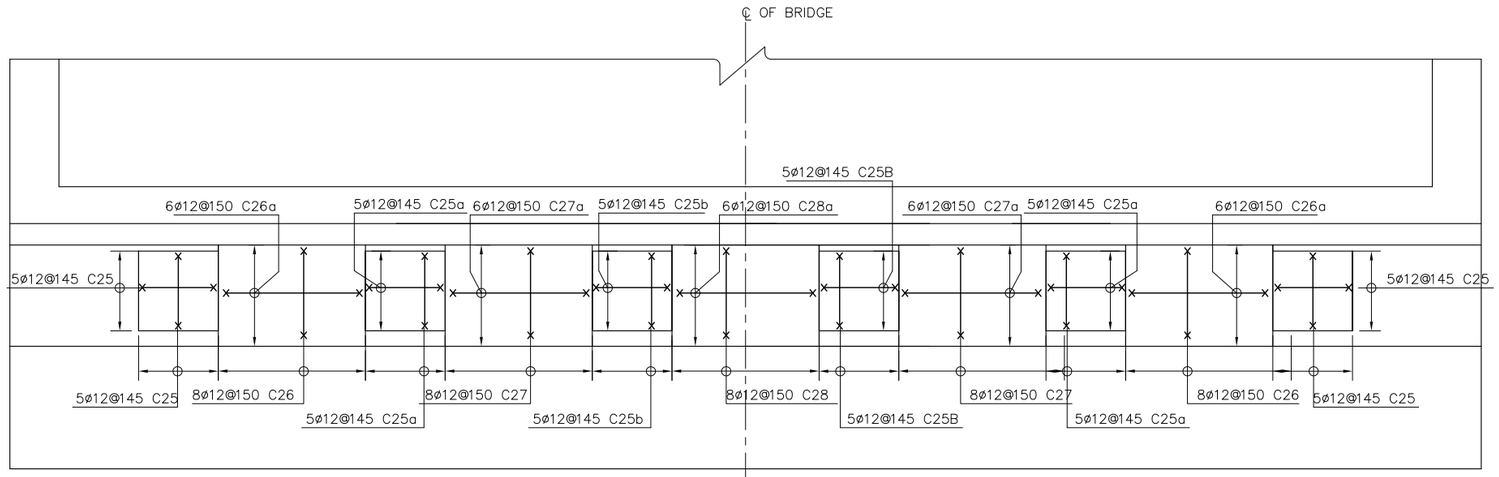
	NAME	SIGNATURE
DESIGNED	Mr.Phonepasong SENSONGKHAM	
CHECKED	Mr.Khamphone SORPHABMIXAY	
APPROVED	Mr.Vandy VORASACK	

LTEC CODE: SD–262–17
DATE: April, 2018
DRW No. BBA–24
SCALE: 1:50



SECTION D–D

SCALE 1:50



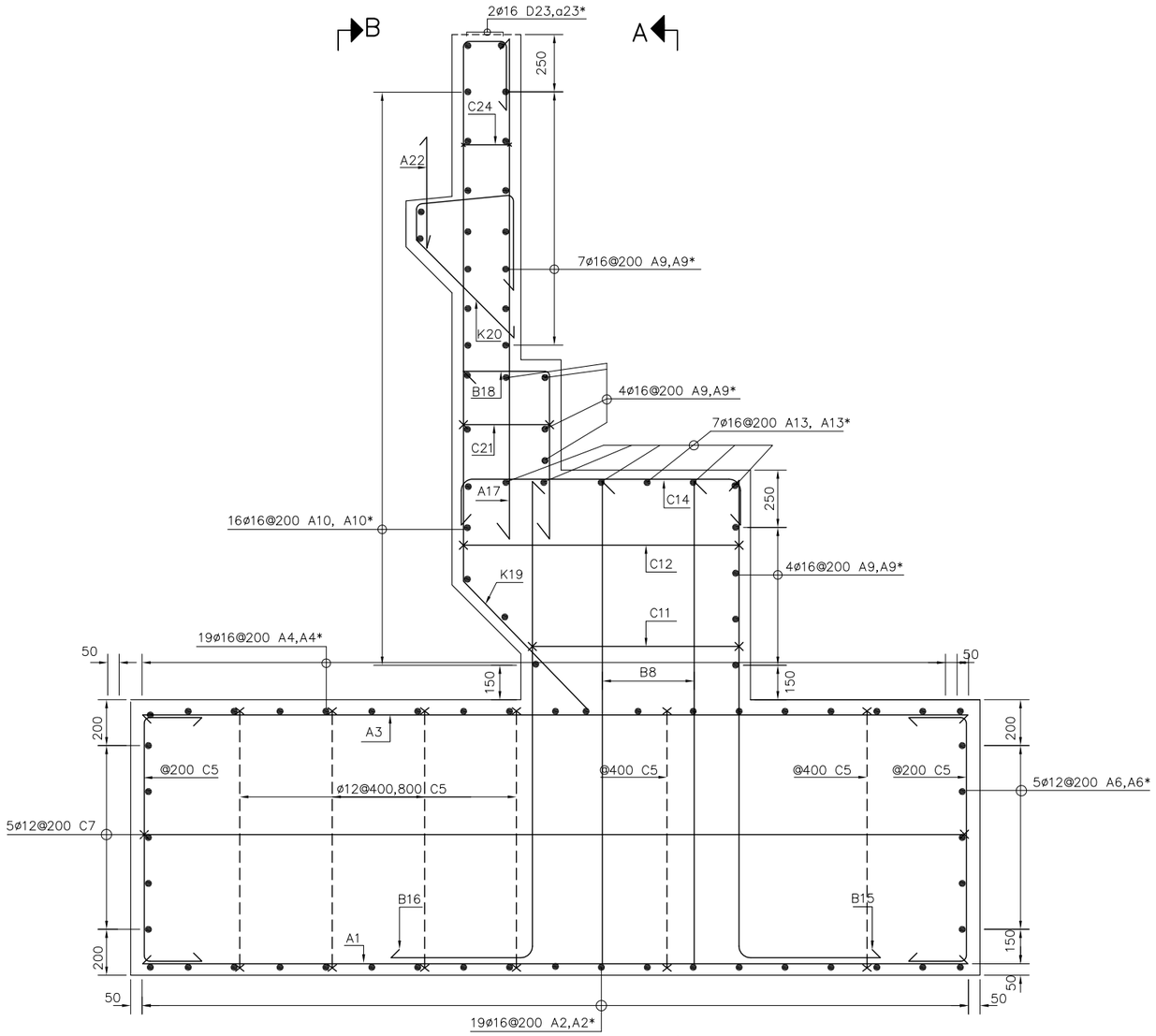
SECTION E–E

SCALE 1:50

NOTES:

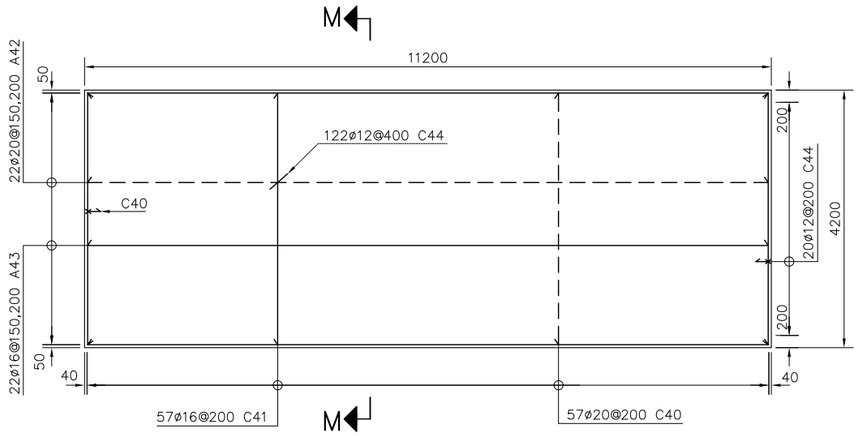
1. ALL DIMENSIONS ARE IN MILLIMETERS.
2. CONCRETE COVER SHALL BE MEASURED FROM THE SURFACE OF CONCRETE TO THE FACE OF NEAREST BARS=50 mm.
3. THIS DRAWING TO BE READ IN CONJUNCTION WITH DRAWINGS No. BDA–22, BDA–23, BBA–24, BBA–26, AND BBA–27.

ລ.ວ.ທ LTEC ລັດວິສາຫະກິດ ວິສະວະກຳ ຄົມມະນາຄົມ LAO TRANSPORT ENGINEERING CONSULTANT	NR 13N IMPROVEMENT AND MAINTENANCE PROJECT CONTRACT 2 : BAN SONGPEUAY – PHONHONG	REV.	DATE	DESCRIPTION	APPROVED		NAME	SIGNATURE	LTEC CODE: SD–262–17
	NAM PHANAY BRIDGE BAR ARRANGEMENT OF ABUTMENT A AND B (SHEET 2 OF 4)					DESIGNED	Mr.Phonepasong SENSONGKHAM		DATE: April, 2018
						CHECKED	Mr.Khamphone SORPHABMIXAY		DRW No. BBA–25
						APPROVED	Mr.Vandy VORASACK		SCALE: 1:50



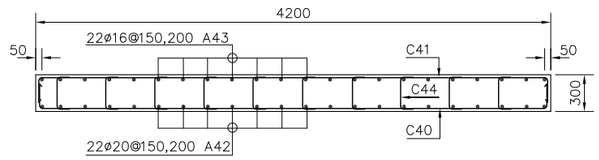
SECTION F–F

SCALE 1:25



APPROACH SLAB

SCALE 1:100



SECTION M–M

SCALE 1:50

NOTES:

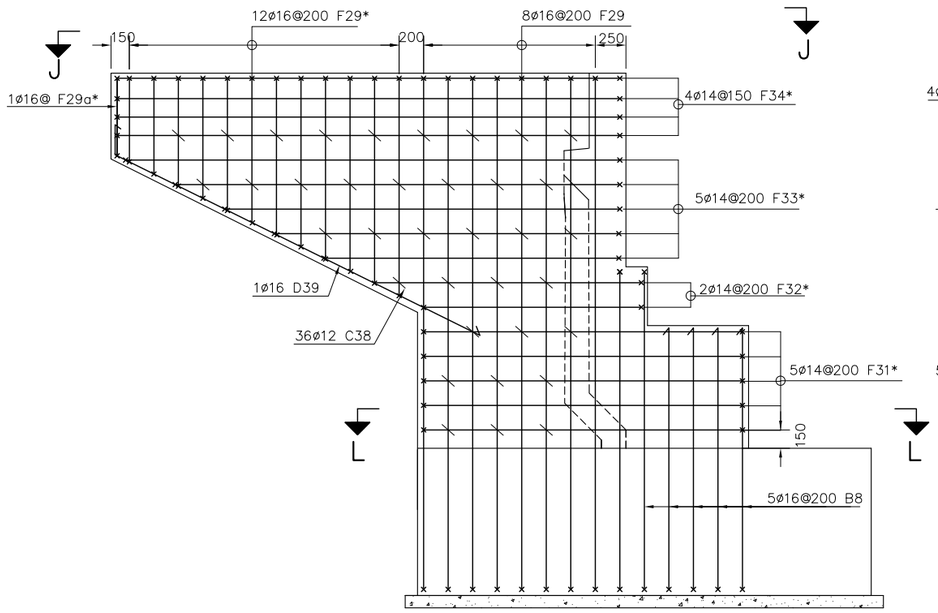
1. ALL DIMENSIONS ARE IN MILLIMETERS.
2. CONCRETE COVER SHALL BE MEASURED FROM THE SURFACE OF CONCRETE TO THE FACE OF NEAREST BARS=50 mm.
3. THIS DRAWING TO BE READ IN CONJUNCTION WITH DRAWINGS No. BDA–22, BDA–23, BBA–24, BBA–25, AND BBA–27.

ລັດວິສາຫະກິດ ວິສະວະກຳ ຄົມມະນາຄົມ
LAO TRANSPORT ENGINEERING CONSULTANT

NR 13N IMPROVEMENT AND MAINTENANCE PROJECT
CONTRACT 2 : BAN SONGPEUAY – PHONHONG

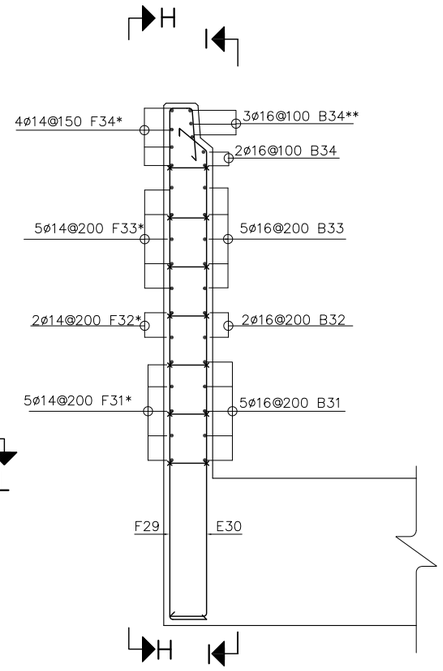
BAR ARRANGEMENT OF ABUTMENT A AND B (SHEET 3 OF 4)

REV.	DATE	DESCRIPTION	APPROVED		NAME	SIGNATURE	
				DESIGNED	Mr.Phonepasong SENSONGKHAM		LTEC CODE: SD–262–17
				CHECKED	Mr.Khamphone SORPHABMIXAY		DATE: April, 2018
				APPROVED	Mr.Vandy VORASACK		DRW No. BBA–26
							SCALE: AS SHOWN



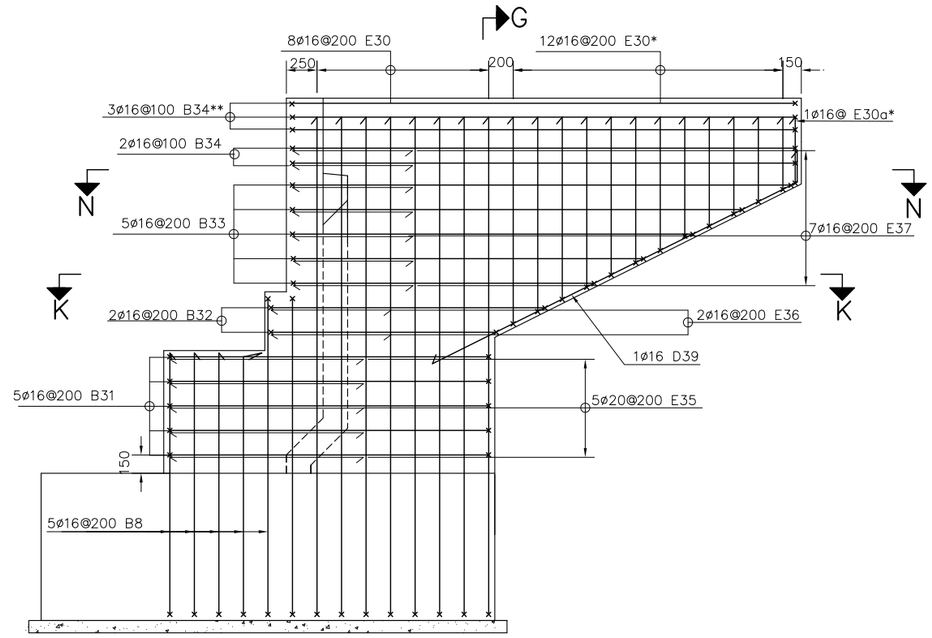
SECTION H–H

SCALE 1:50



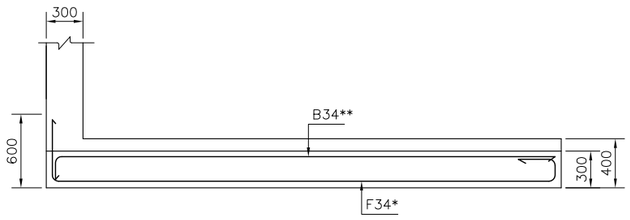
SECTION G–G

SCALE 1:50



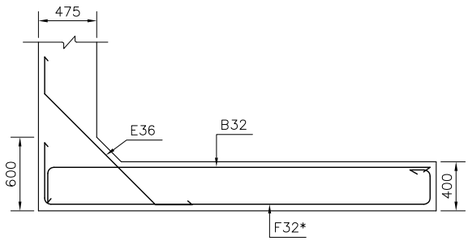
SECTION I–I

SCALE 1:50



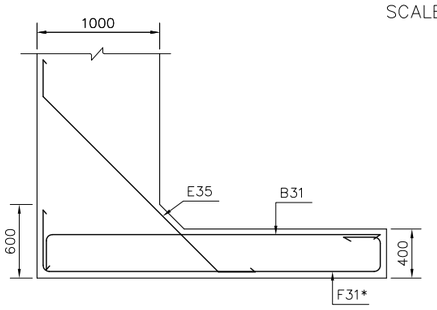
SECTION J–J

SCALE 1:50



SECTION K–K

SCALE 1:50



SECTION L–L

SCALE 1:50

SECTION N–N

SCALE 1:50

NOTES:

1. ALL DIMENSIONS ARE IN MILLIMETERS.
2. CONCRETE COVER SHALL BE MEASURED FROM THE SURFACE OF CONCRETE TO THE FACE OF NEAREST BARS=50 mm.
3. THIS DRAWING TO BE READ IN CONJUNCTION WITH DRAWINGS No. BDA–22, BDA–23, BBA–24, BBA–25, AND BBA–26.

ລັດວິສາຫະກິດ ວິສະວະກຳ ຄົມມະນາຄົມ
LAO TRANSPORT ENGINEERING CONSULTANT

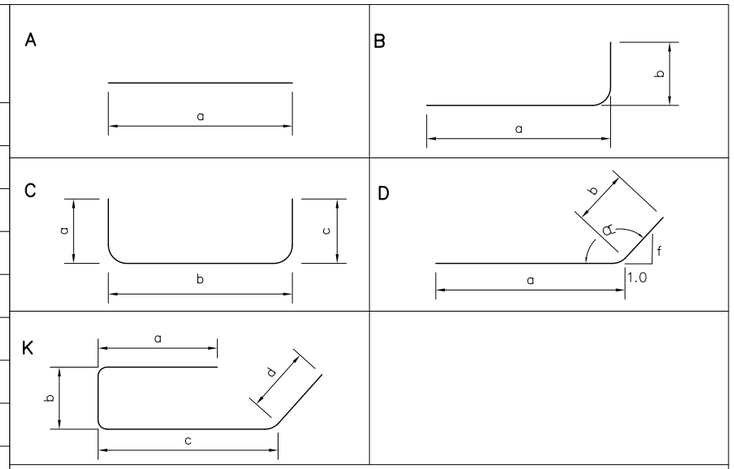
NR 13N IMPROVEMENT AND MAINTENANCE PROJECT
CONTRACT 2 : BAN SONGPEUAY – PHONHONG

NAM PHANAY BRIDGE
BAR ARRANGEMENT OF ABUTMENT A AND B (SHEET 4 OF 4)

REV.	DATE	DESCRIPTION	APPROVED		NAME	SIGNATURE	
				DESIGNED	Mr.Phonepasong SENSONGKHAM		LTEC CODE: SD–262–17
				CHECKED	Mr.Khamphone SORPHABMIXAY		DATE: April, 2018
				APPROVED	Mr.Vandy VORASACK		DRW No. BBA–27
							SCALE: 1:50

TABLE OF BAR ARRANGEMENT FOR ONE ABUTMENT A OR B

SHAPE OF BAR	No.	DIAMETER (mm)	LENGTH OF BAR (mm)	QUANTITY	TOTAL LENGTH (m)	SIZE OF BENDING (mm)						SPACE @ (mm)	REMARK
						a	b	c	d	e	f		
A	1	20	3600	61	219.6	3600						200	
A	2	16	10000	19	190	10000						200	
A	2*	16	2620	19	49.78	2620						200	
A	3	16	3600	61	219.6	3600						200	
A	4	16	10000	19	190	10000						200	
A	4*	16	2620	19	49.78	2620						200	
C	5	12	1500	272	408	200	1100	200				400	
A	6	12	10000	10	100	10000						200	
A	6*	12	2620	10	26.2	2620						200	
C	7	12	4200	10	42	300	3600	300				200	
B	8	16	2400	10	24	2100	300					200	
A	9	16	10000	15	150	10000						200	
A	9*	16	2620	15	39.3	2620						200	
A	10	16	10000	16	160	10000						200	
A	10*	16	2620	16	41.92	2620						200	
C	11	12	1300	29	37.7	200	900	200				400	
C	12	12	1600	29	46.4	200	1200	200				400	
A	13	16	10000	7	70	10000						200	
A	13*	16	2620	7	18.34	2620						200	
C	14	12	1800	61	109.8	300	1200	300				200	
B	15	16	2600	61	158.6	2100	500					200	
B	16	20	2600	59	153.4	2100	500					200	
A	17	16	2200	61	134.2	2200						200	
B	18	16	1085	61	66.19	335	750					200	
K	19	16	3750	61	228.75	300	300	2350	800			200	
K	20	16	1450	61	88.45	300	400	150	600			200	
C	21	12	600	29	17.4	200	200	200				400	
A	22	25	500	24	12	500						500	
A	23	16	10000	2	20	10000						–	
A	23*	16	2620	2	5.24	2620						–	
C	24	12	600	29	17.4	200	200	200				400	



RADIUS OF BAR BENDING

DIAMETER OF BARS (mm)	RADIUS (mm)
10	35
12	42
16	56
20	100
25	125
32	224

NOTES:

1. △ IS DIFFERENT LENGTH OF BAR WITH THE SAME NUMBER.
2. THE TABLE OF QUANTITY OF REINFORCEMENT IS FOR ONE ABUTMENT ONLY.

ລັດວິສາຫະກິດ ວິສະວະກຳ ຄົມມະນາຄົມ
LAO TRANSPORT ENGINEERING CONSULTANT

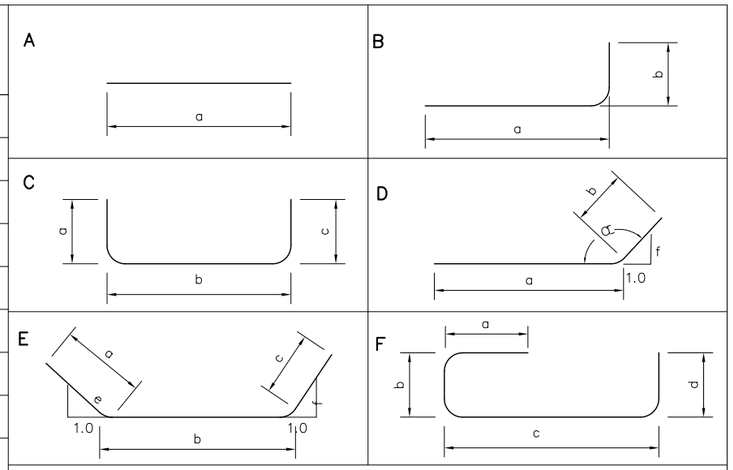
NR 13N IMPROVEMENT AND MAINTENANCE PROJECT
CONTRACT 2 : BAN SONGPEUAY – PHONHONG

NAM PHANAY BRIDGE
TABLES OF BAR ARRANGEMENTS
FOR ABUTMENT A OR B (SHEET 1 OF 3)

REV.	DATE	DESCRIPTION	APPROVED		NAME	SIGNATURE	
				DESIGNED	Mr.Phonepasong SENSONGKHAM		LTEC CODE: SD–262–17
				CHECKED	Mr.Khamphone SORPHABMIXAY		DATE: April, 2018
				APPROVED	Mr.Vandy VORASACK		DRW No. BTB–28
							SCALE: _

TABLE OF BAR ARRANGEMENT FOR ONE ABUTMENT A OR B

SHAPE OF BAR	No.	DIAMETER (mm)	LENGTH OF BAR (mm)	QUANTITY	TOTAL LENGTH (m)	SIZE OF BENDING (mm) a	b	c	d	e	f	SPACE @ (mm)	REMARK
C	25	12	1390	20	27.8	400	590	400				145	
C	25a	12	1490	20	29.8	450	590	450				145	
C	25b	12	1590	20	31.8	500	590	500				145	
C	26	12	2115	16	33.84	700	715	700				150	
C	26a	12	2540	12	28.68	700	940	750				150	
C	27	12	2315	16	37.04	800	715	800				150	
C	27a	12	2740	12	31.08	800	940	850				150	
C	28	12	2515	8	20.12	900	715	900				150	
C	28a	12	2940	6	16.74	900	940	950				150	
F	29	16	5350	16	85.6	300	300	4150	600			200	
F	29*	16	2370 1880	24	51	300	300	1170 680	600			200	△ = 105
F	29a*	16	1840	2	3.68	300	300	640	600			–	
E	30	16	4300	16	68.8	300	200	3800				200	
E	30*	16	2200 1080	24	39.36	400	1400 280	400				200	△ = 105
E	30a*	16	1100	2	2.2	300	500	300				200	
B	31	16	3000	10	30	300	2700					200	
F	31*	14	3900	10	39	300	300	2700	600			200	
B	32	16	2665 2285	4	9.9	2365 1985	300					200	△ = 380
F	32*	14	3565 3185	4	13.5	300	300	2365 1985	600			200	△ = 380
B	33	16	4350 2865	10	36.08	4050 2565	300					200	△ = 380
F	33*	14	5250 3765	10	45.08	300	300	4050 2565	600			200	△ = 380
B	34	16	4400	4	17.6	4100	300					100	
F	34*	14	5300	8	42.4	300	300	4100	600			150	
B	34**	16	4400	6	26.4	4100	300					100	
E	35	16	2600	10	26	300	2000	300				200	
E	36	16	1875	4	7.5	300	1275	300				200	
E	37	16	1770	14	24.78	300	1170	300				200	
C	38	12	700	72	50.4	200	300	200				400	
D	39	16	3700	4	14.8	500	3200					–	
C	40	20	4500	57	256.5	200	4100	200				200	
C	41	16	4500	57	256.5	200	4100	200				200	



RADIUS OF BAR BENDING

DIAMETER OF BARS (mm)	RADIUS (mm)
10	35
12	42
16	56
20	100
25	125
32	224

NOTES:

1. △ IS DIFFERENT LENGTH OF BAR WITH THE SAME NUMBER.
2. THE TABLE OF QUANTITY OF REINFORCEMENT IS FOR ONE ABUTMENT ONLY.

ລັດວິສາຫະກິດ ວິສະວະກຳ ຄົມມະນາຄົມ
LAO TRANSPORT ENGINEERING CONSULTANT

NR 13N IMPROVEMENT AND MAINTENANCE PROJECT
CONTRACT 2 : BAN SONGPEUAY – PHONHONG

NAM PHANAY BRIDGE

TABLES OF BAR ARRANGEMENTS
FOR ABUTMENT A OR B (SHEET 2 OF 3)

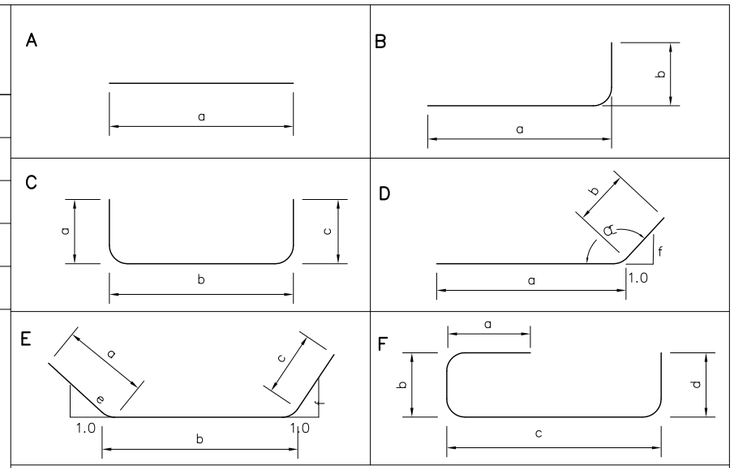
REV.	DATE	DESCRIPTION	APPROVED

	NAME	SIGNATURE
DESIGNED	Mr.Phonepasong SENSONGKHAM	
CHECKED	Mr.Khamphone SORPHABMIXAY	
APPROVED	Mr.Vandy VORASACK	

LTEC CODE: SD–262–17
DATE: April, 2018
DRW No. BTB–29
SCALE: –

TABLE OF BAR ARRANGEMENT FOR ONE ABUTMENT A OR B

SHAPE OF BAR	No.	DIAMETER (mm)	LENGTH OF BAR (mm)	QUANTITY	TOTAL LENGTH (m)	SIZE OF BENDING (mm)						SPACE @ (mm)	REMARK
						a	b	c	d	e	f		
A	42	20	10000	22	220	10000						200	
800	42*	20	1800	22	39.6	1800						200	
A	43	16	10000	22	220	10000						200	
A	43*	16	1800	22	39.6	1800						200	
C	44	12	500	162	81	150	200	150				400,800	



RADIUS OF BAR BENDING

DIAMETER OF BARS (mm)	RADIUS (mm)
10	35
12	42
16	56
20	100
25	125
32	224

NOTES:

1. △ IS DIFFERENT LENGTH OF BAR WITH THE SAME NUMBER.
2. THE TABLE OF QUANTITY OF REINFORCEMENT IS FOR ONE ABUTMENT ONLY.

SUMMARY OF QUANTITIES FOR ONE ABUTMENT A OR B

ITEM	CONCRETE (m^3)			REINFORCEMENT (Kg)						MIX SAND AND GRAVEL (m3)	PRECAST CONCRETE PILE 350x350 mm (m)
	GRADE 10MPa.	GRADE 25MPa.	GRADE 30MPa.	ø12	ø14	ø16	ø20	ø25	TOTAL		
1. ABUTMENT	4.76	85.97	0.40	987.43	169.15	3705.70	919.87	46.24		24.00	FOR ABUT.A = 357.00 FOR ABUT.B = 336.00
2. APPROACH SLAB	2.35	14.09	–	71.91	–	814.58	1272.78	–			
TOTAL	7.11	100.06	0.40	1059.34	169.15	4520.28	2192.65	46.24	7987.66	24.00	693.00

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LAO TRANSPORT ENGINEERING CONSULTANT

NR 13N IMPROVEMENT AND MAINTENANCE PROJECT
CONTRACT 2 : BAN SONGPEUAY – PHONHONG

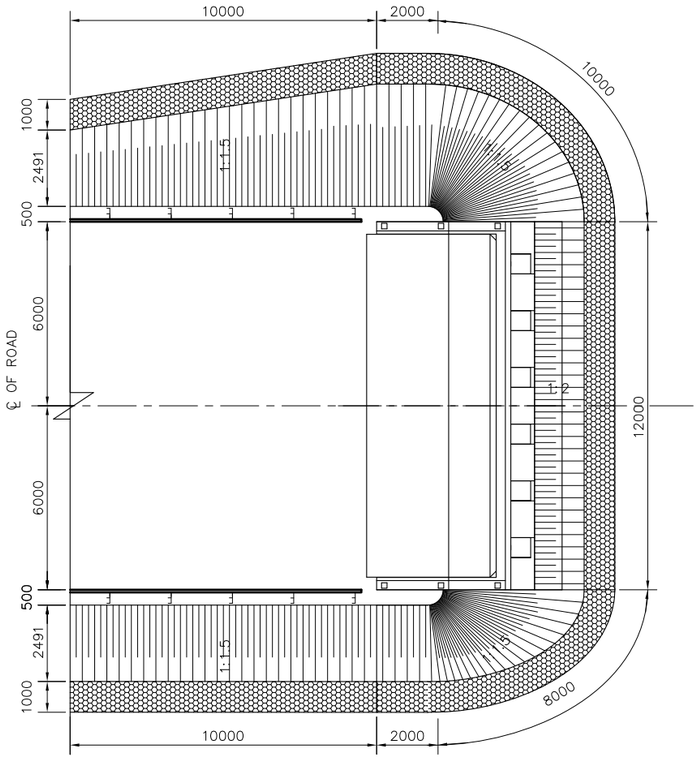
NAM PHANAY BRIDGE
TABLES OF BAR ARRANGEMENTS
FOR ABUTMENT A OR B (SHEET 3 OF 3)

REV.	DATE	DESCRIPTION	APPROVED

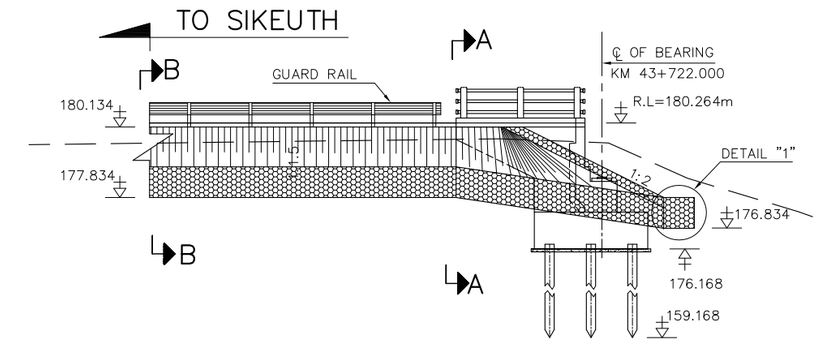
	NAME	SIGNATURE
DESIGNED	Mr.Phonepasong SENSONGKHAM	
CHECKED	Mr.Khamphone SORPHABMIXAY	
APPROVED	Mr.Vandy VORASACK	

LTEC CODE: SD–262–17
DATE: April, 2018
DRW No. BTB–30
SCALE: –

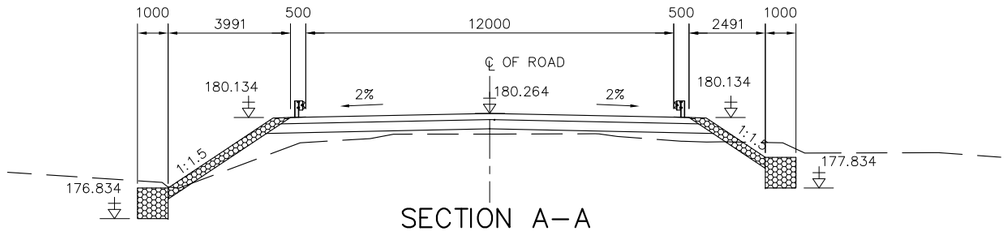
III. MISCELLANEOUS DRAWINGS



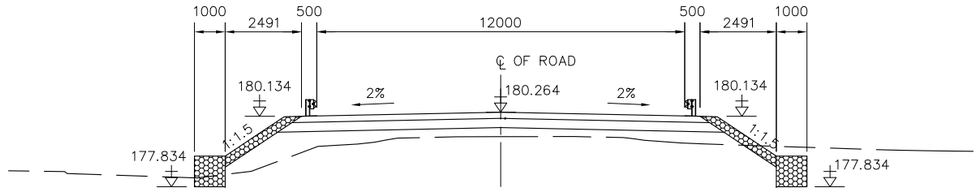
PLAN
SCALE 1:200



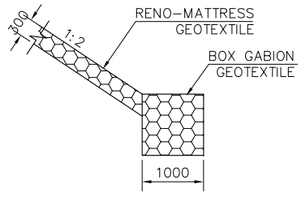
SIDE ELEVATION
SCALE 1:200



SECTION A–A
SCALE 1:200



SECTION B–B
SCALE 1:200



DETAIL "1"
SCALE 1:100

TABLE OF QUANTITIES OF SLOPE PROTECTION

ITEMS	DESCRIPTIONS	UNIT	QUANTITIES
1	GABION BOX	m^3	54.00
2	GEOTEXTILE	m^2	355.19
3	RENO–MATTRESS	m^3	74.16
4	EMBANKMENT	m^3	68.68
5	STRUCTURE EXCAVATION (COMMON)	m^3	291.60

NOTE:

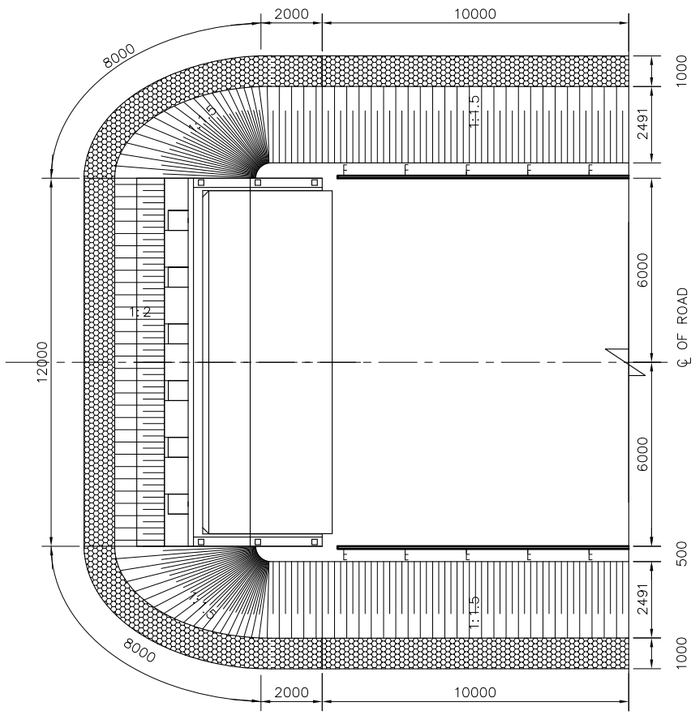
1. ALL DIMENSIONS ARE IN MILLIMETERS, LEVELS ARE IN METERS.

ລັດວິສາຫະກິດ ວິສະວະກຳ ຄົມມະນາຄົມ
LAO TRANSPORT ENGINEERING CONSULTANT

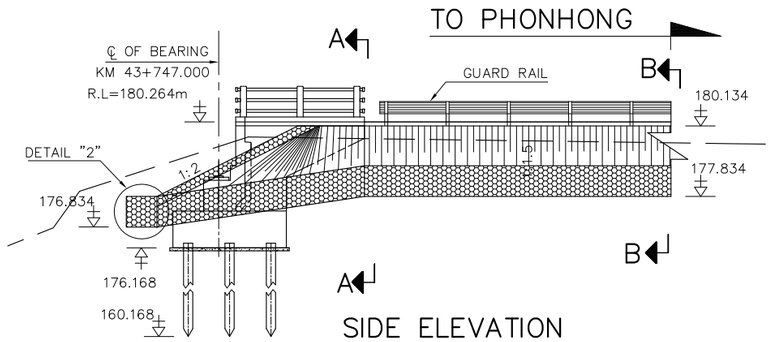
NR 13N IMPROVEMENT AND MAINTENANCE PROJECT
CONTRACT 2 : BAN SONGPEUAY – PHONHONG

NAM PHANAY BRIDGE
SLOPE PROTECTION
AROUND ABUTMENT A

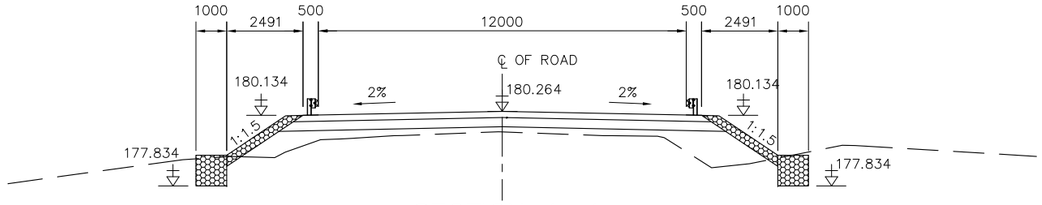
REV.	DATE	DESCRIPTION	APPROVED		NAME	SIGNATURE	
				DESIGNED	Mr.Phonepasong SENSONGKHAM		LTEC CODE: SD–262–17
				CHECKED	Mr.Khamphone SORPHABMIXAY		DATE: April, 2018
				APPROVED	Mr.Vandy VORASACK		DRW No. BSP–31
							SCALE: AS SHOWN



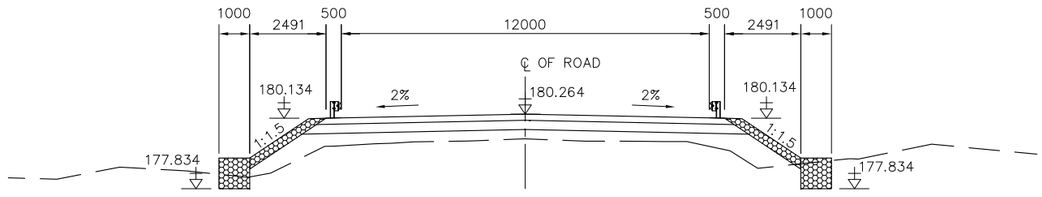
PLAN
SCALE 1:200



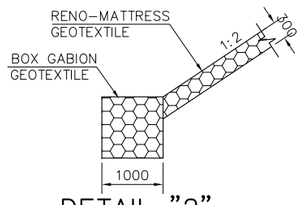
SIDE ELEVATION
SCALE 1:200



SECTION A–A
SCALE 1:200



SECTION B–B
SCALE 1:200



DETAIL "2"
SCALE 1:100

TABLE OF QUANTITIES OF SLOPE PROTECTION

ITEMS	DESCRIPTIONS	UNIT	QUANTITIES
1	GABION BOX	m^3	52.00
2	GEOTEXTILE	m^2	335.19
3	RENO–MATTRESS	m^3	69.36
4	EMBANKMENT	m^3	93.12
5	STRUCTURE EXCAVATION (COMMON)	m^3	290.44

NOTE:

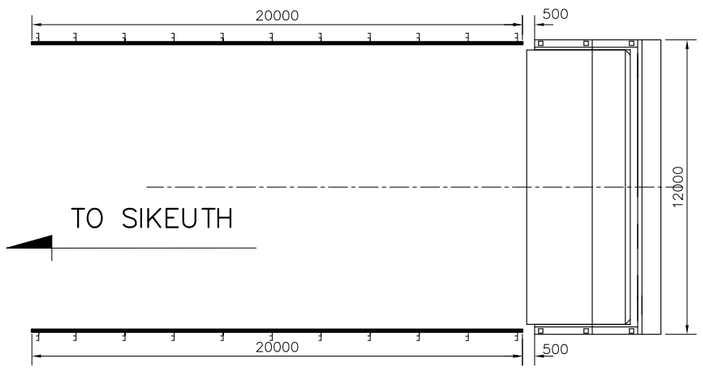
1. ALL DIMENSIONS ARE IN MILLIMETERS, LEVELS ARE IN METERS.

ລດວ ວິສາຫະກິດ ວິສະວະກຳ ຄົມມະນາຄົມ
LAO TRANSPORT ENGINEERING CONSULTANT

NR 13N IMPROVEMENT AND MAINTENANCE PROJECT
CONTRACT 2 : BAN SONGPEUAY – PHONHONG

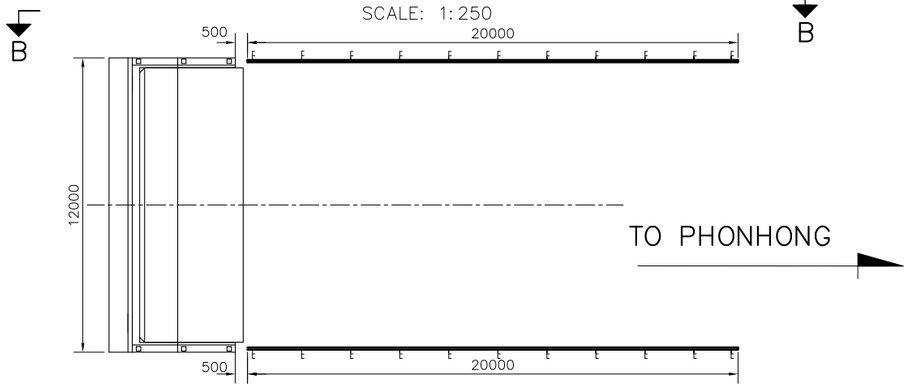
NAM PHANAY BRIDGE
SLOPE PROTECTION
AROUND ABUTMENT B

REV.	DATE	DESCRIPTION	APPROVED		NAME	SIGNATURE	
				DESIGNED	Mr.Phonepasong SENSONGKHAM		LTEC CODE: SD–262–17
				CHECKED	Mr.Khamphone SORPHABMIXAY		DATE: April, 2018
				APPROVED	Mr.Vandy VORASACK		DRW No. BSP–32
							SCALE: AS SHOWN



GENERAL PLAN SIDE SIKEUTH

SCALE: 1:250

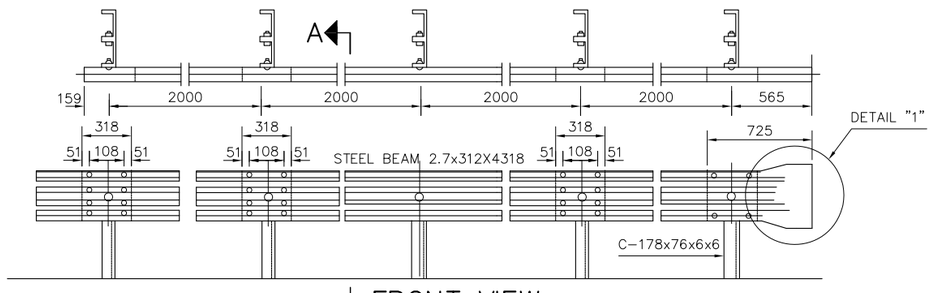


GENERAL PLAN SIDE PHONHONG

SCALE: 1:250

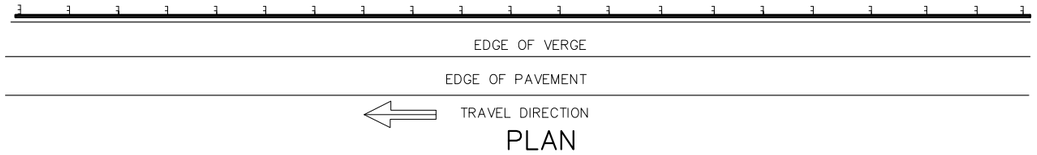
SIDE ELEVATION B–B

NOT TO SCALE



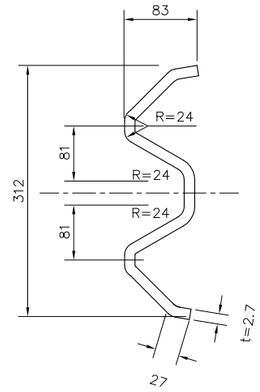
FRONT VIEW

NOT TO SCALE



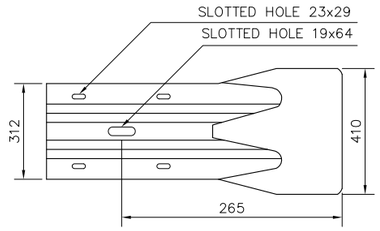
PLAN

NOT TO SCALE



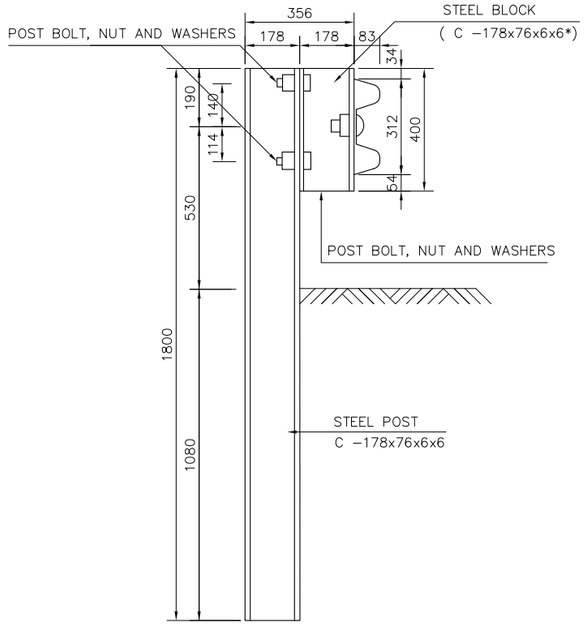
SECTION A–A

NOT TO SCALE



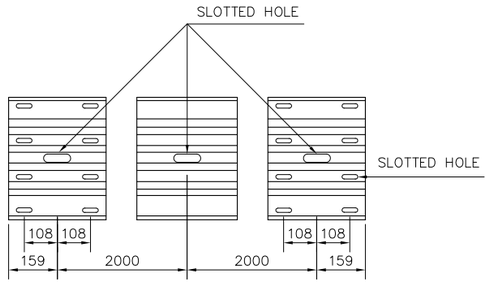
DETAIL "1"

SCAL 1:20



SECTION A–A
VERTICAL TRANSPORTION

SCAL 1:20



STEEL BEAM

NOT TO SCALE

TABLE OF QUANTITIES

ITEMS	DESCRIPTIONS	UNIT	QUANTITIES
1	GUARDRAILL (ABUTMENT A SIDE)	m	40.00
2	GUARDRAILL (ABUTMENT B SIDE)	m	40.00
	TOTAL	m	80.00

NOTES :

1. ALL DIMENSIONS ARE IN MILLIMETERS.
2. GUARD RAIL STANDARD SHALL MEET THE REQUIREMENTS OF AASHTO M 180, TYPE I CLASS A, W-BEAM.

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LAO TRANSPORT ENGINEERING CONSULTANT

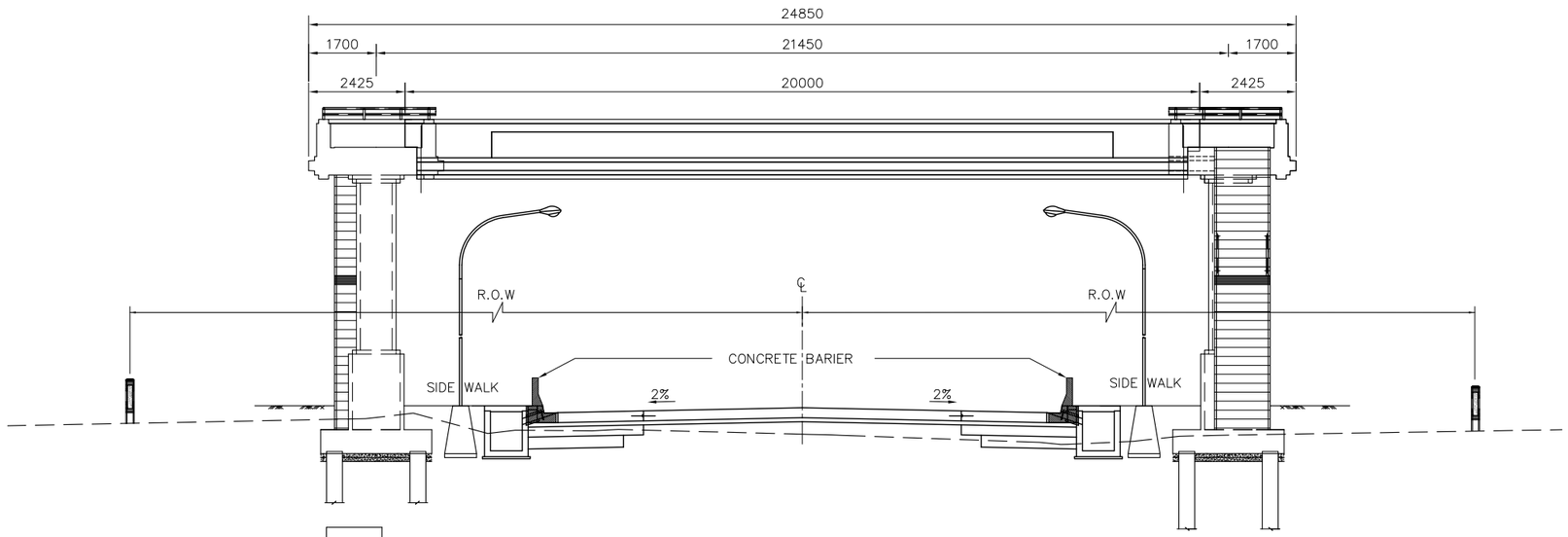
NR 13N IMPROVEMENT AND MAINTENANCE PROJECT
CONTRACT 2 : BAN SONGPEUAY – PHONHONG

NAM PHANAY BRIDGE
GUARD RAIL

REV.	DATE	DESCRIPTION	APPROVED		NAME	SIGNATURE	
				DESIGNED	Mr.Phonepasong SENSONGKHAM		LTEC CODE: SD–262–17
				CHECKED	Mr.Khamphone SORPHABMIXAY		DATE: April, 2018
				APPROVED	Mr.Vandy VORASACK		DRW No. RGR–33
							SCALE: AS SHOWN

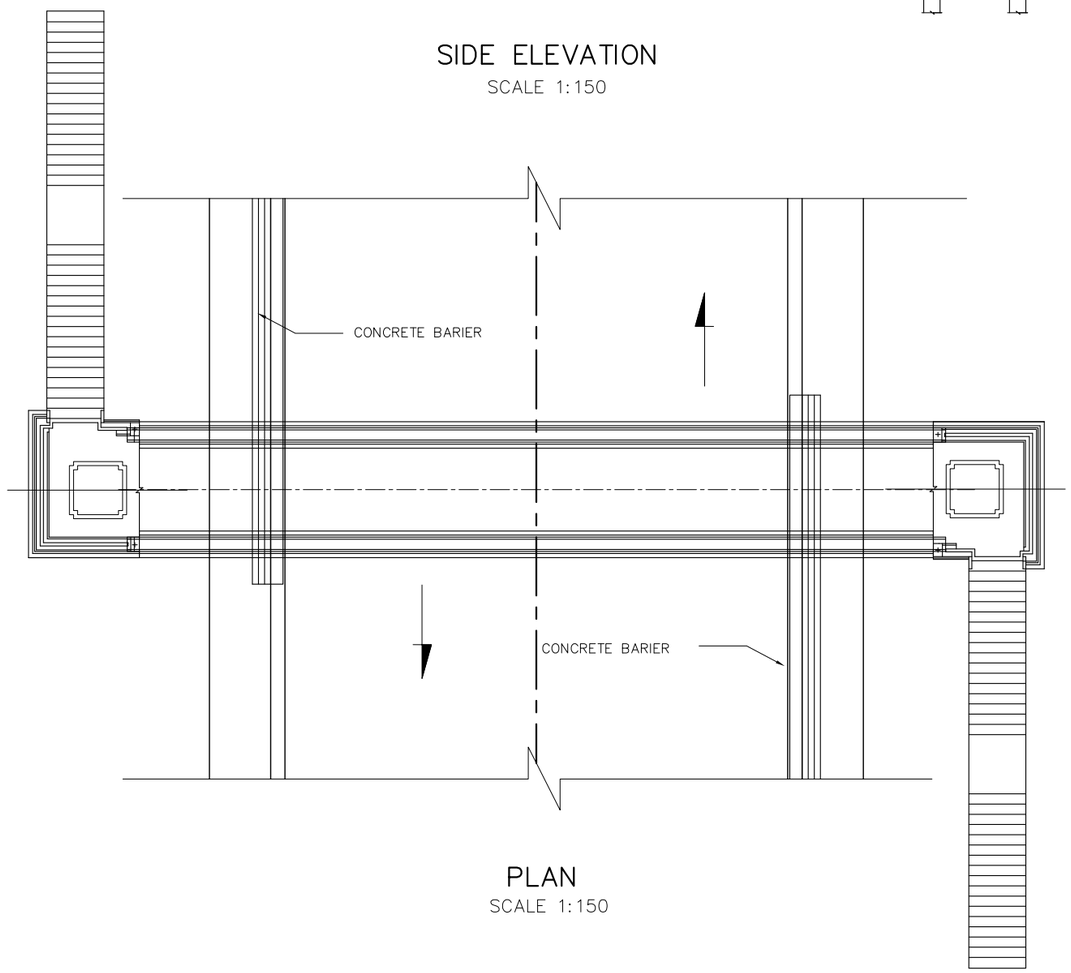
PREDESTRIAN CROSSING BRIDGE

I. GENERAL DRAWINGS



SIDE ELEVATION

SCALE 1:150



PLAN

SCALE 1:150

NOTE:

1. ALL DIMENSIONS ARE IN MILLIMETERS, UNLESS OTHERWISE STATED.
2. WHEN ERECTION OF RIGHT OF WAY MONUMENT THE WIDTH OF RIGHT OF WAY SHALL BE AS DIRECTED BY DEPARTMENT OF ROAD MINISTRY OF PUBLIC WORKS AND TRANSPORT.

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LAO TRANSPORT ENGINEERING CONSULTANT

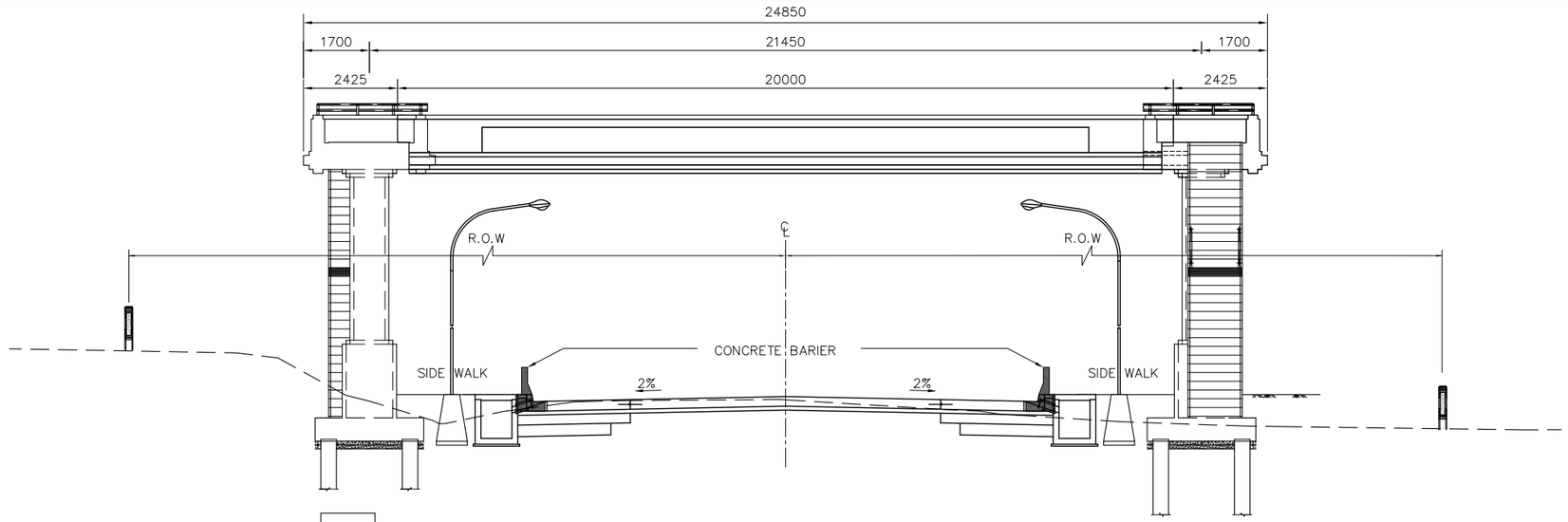
NR 13N IMPROVEMENT AND MAINTENANCE PROJECT
CONTRACT 2 : BAN SONGPEUAY – PHONHONG

GENERAL ARRANGEMENT OF PREDESTRIAN CROSSING BRIDGE Km 39+985

REV.	DATE	DESCRIPTION	APPROVED

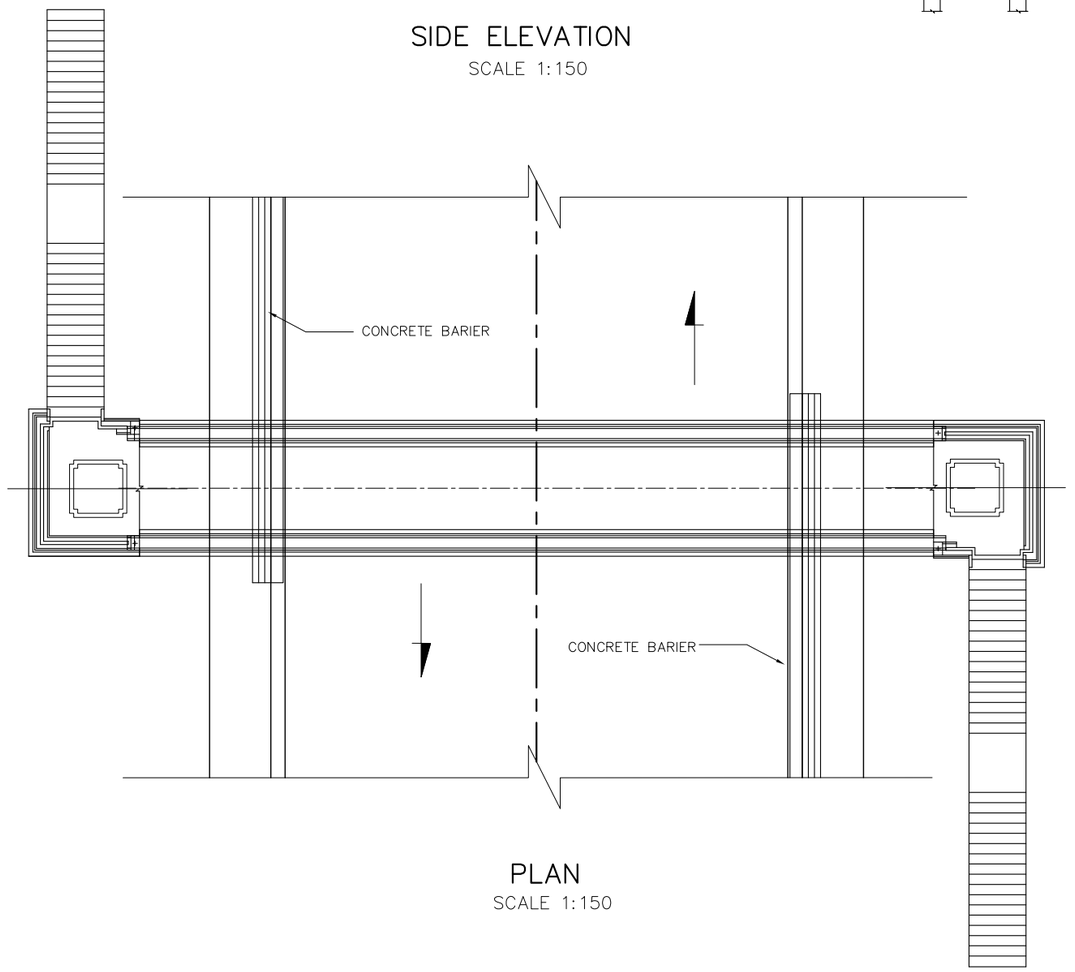
	NAME	SIGNATURE
DESIGNED	Mr.Phonepasong SENSONGKHAM	
CHECKED	Mr.Khamphone SORPHABMIXAY	
APPROVED	Mr.Vandy VORASACK	

LTEC CODE: SD–262–17
DATE: April, 2018
DRW No. BGA–01
SCALE: 1:150



SIDE ELEVATION

SCALE 1:150



PLAN

SCALE 1:150

NOTE:

1. ALL DIMENSIONS ARE IN MILLIMETERS, UNLESS OTHERWISE STATED.
2. WHEN ERECTION OF RIGHT OF WAY MONUMENT THE WIDTH OF RIGHT OF WAY SHALL BE AS DIRECTED BY DEPARTMENT OF ROAD MINISTRY OF PUBLIC WORKS AND TRANSPORT.

ລັດວິສາຫະກິດ ວິສະວະກຳ ຄົມມະນາຄົມ

LAO TRANSPORT ENGINEERING CONSULTANT

NR 13N IMPROVEMENT AND MAINTENANCE PROJECT
CONTRACT 2 : BAN SONGPEUAY – PHONHONG

GENERAL ARRANGEMENT OF PREDESTRIAN CROSSING BRIDGE KM 56+553

REV.	DATE	DESCRIPTION	APPROVED

	NAME	SIGNATURE
DESIGNED	Mr.Phonepasong SENSONGKHAM	
CHECKED	Mr.Khamphone SORPHABMIXAY	
APPROVED	Mr.Vandy VORASACK	

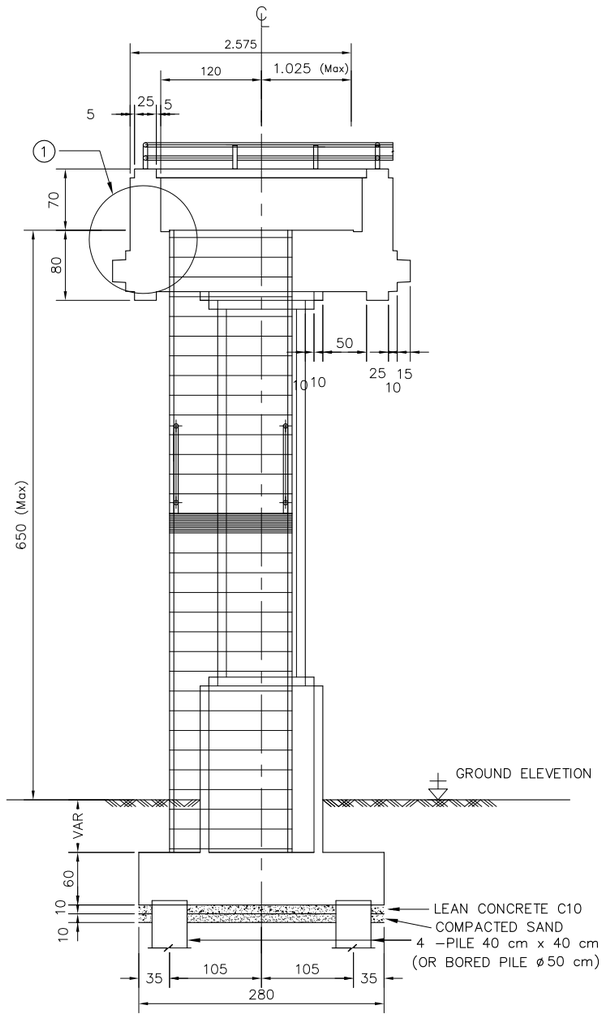
LTEC CODE: SD–262–17

DATE: April, 2018

DRW No. BGA–02

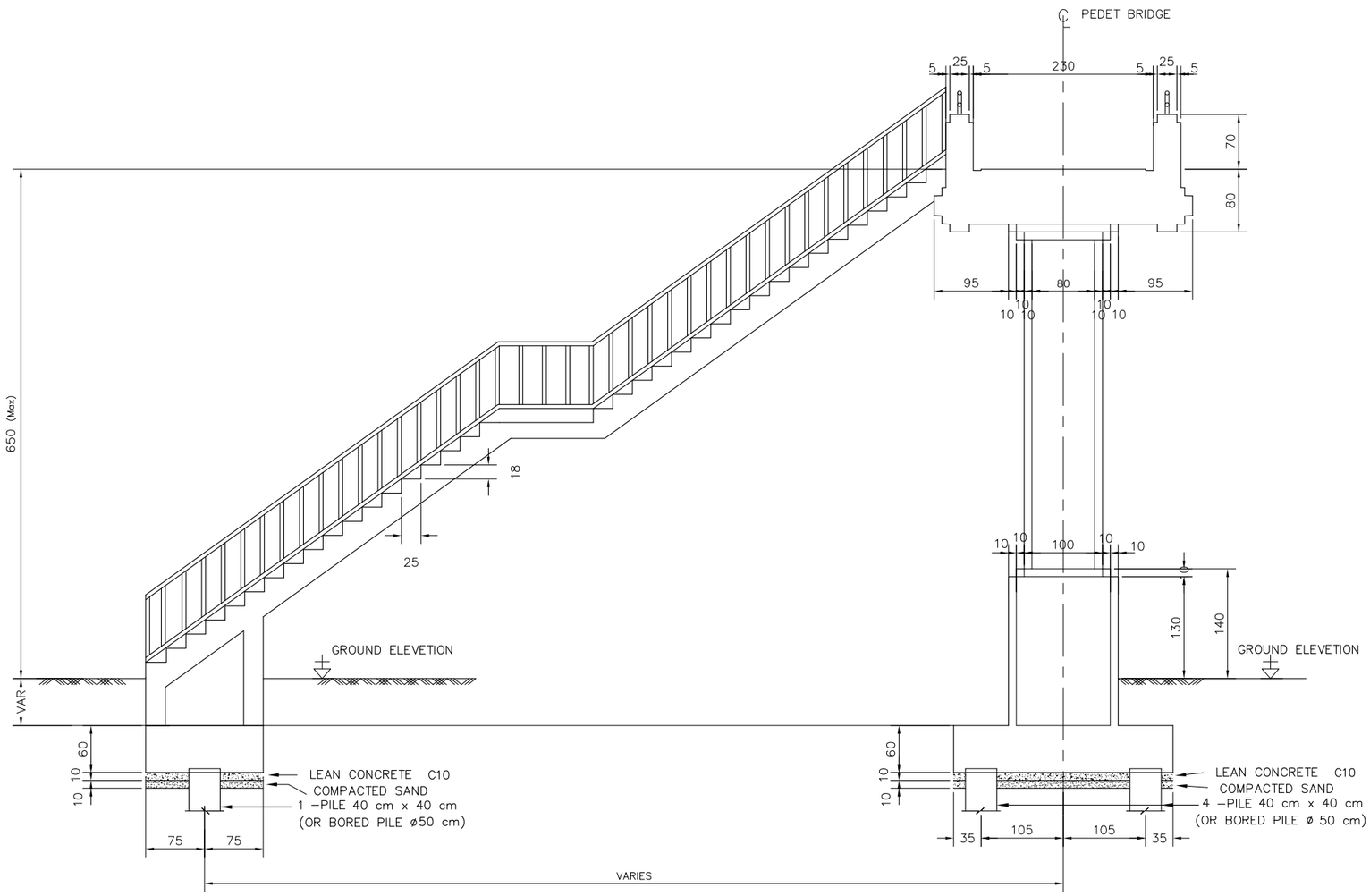
SCALE: 1:150

II. STRUCTURE DRAWINGS



SECTION A–A

SCALE 1: 70



SECTION B–B

SCALE 1: 70

NOTE:

1. ALL DIMESIONS ARE IN CENTIMETERS UNLESS OTHERWISE INDICATED.
2. ALL CONCRETE SHALL BE GRADE 25 MPA UNLESS OTHERWISE INDICATED
   CONCRETE SHALL HAVE MINIMUM UTIMATE STRENGTH AT AGE 28 DAYS f'c=25 Mpa,fc=10 Mpa.
3. ALL REINFORCING BAR SHALL BE AGE DEFORMED BAR (AASHTO M31,Grade 60)
   DEFORMED BAR AND ROUND BAR SHALL BE GRADE 40.
4. CLEAR CONCRETE COVER SHALL BE 40 mm.
5. ALL EDGES OF CONCRETE SHALL BE CHAMFERED 20mm.
6. THE LENGTH OF OVERLAP STEEL BAR SHALL BE WITH THE REQUIREMENTS SET OUT IN THE TECHNICAL SPECIFICATION.
7. PILES SHOWN IN THE DRAWING IS A PRELIMINARY ESTIMATE ONLY, IN THE IMPECMENTATION STAGE, THE CONCTRACTOR ISREQUIRID TO INVESTIGATE THE FOUNDATION AND MAKE DETAILE DESIGN FOR CONSTRUCTION AS DIRECTED BY THE ENGINEER.
8. PRESTRESSED CONCRETE PILE SHALL BE CONFIRMED TO AASHTO "LRFD BRIDGE DESIGN SPECIFICATION" CURRENT EDITION, DIMENSION 400x400 mm AND SAFETY LOAD 60 TONS.

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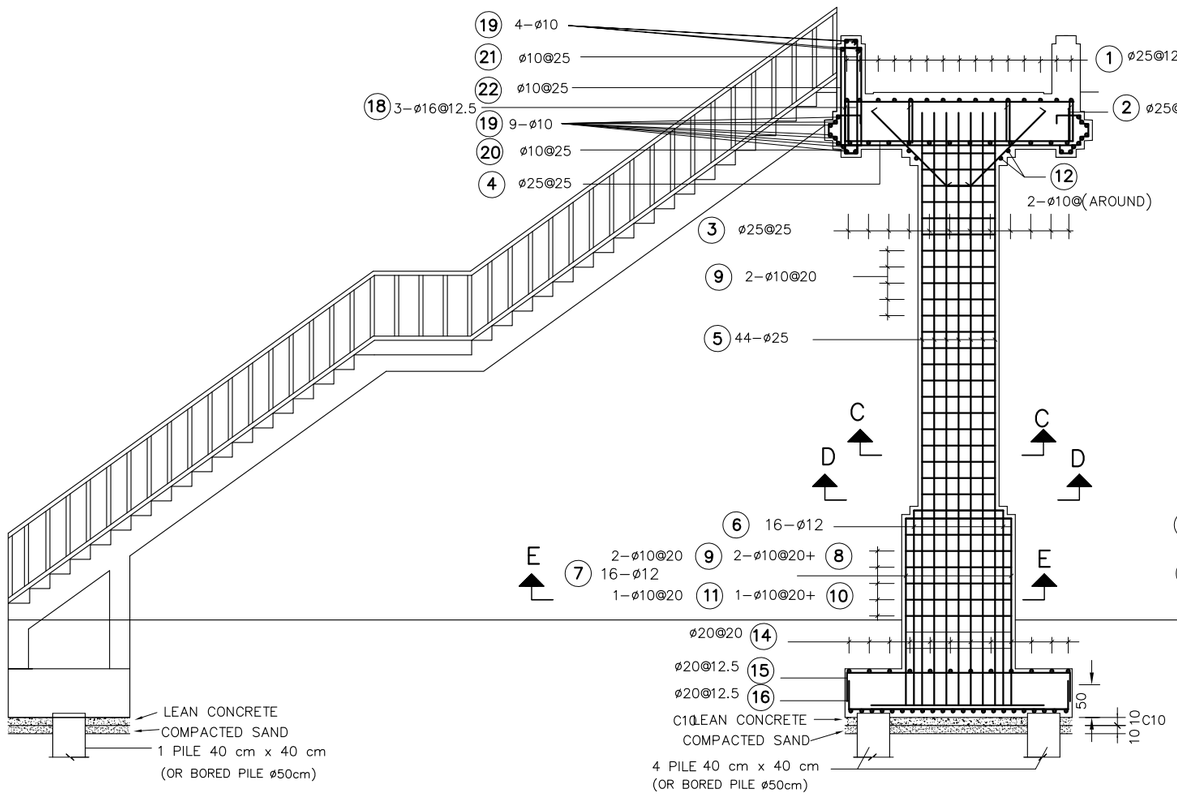
LAO TRANSPORT ENGINEERING CONSULTANT

NR 13N IMPROVEMENT AND MAINTENANCE PROJECT
CONTRACT 2 : BAN SONGPEUAY – PHONHONG

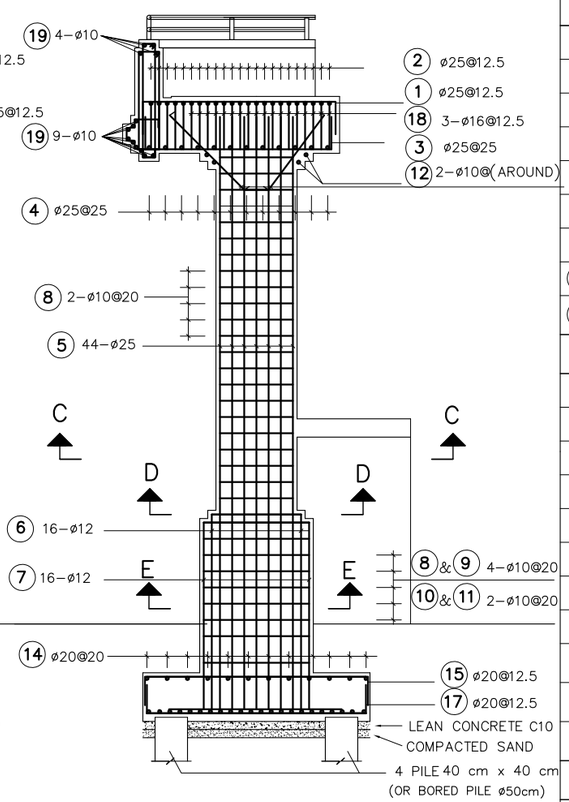
STAIR CASE SPAN 20.00m

REV.	DATE	DESCRIPTION	APPROVED		NAME	SIGNATURE	LTEC CODE: SD–262–17
				DESIGNED	Mr.Phonepasong SENSONGKHAM		DATE: April, 2018
				CHECKED	Mr.Khamphone SORPHABMIXAY		DRW No. SBR–03
				APPROVED	Mr.Vandy VORASACK		SCALE: 1: 70



SECTION B–B

SCALE 1:75

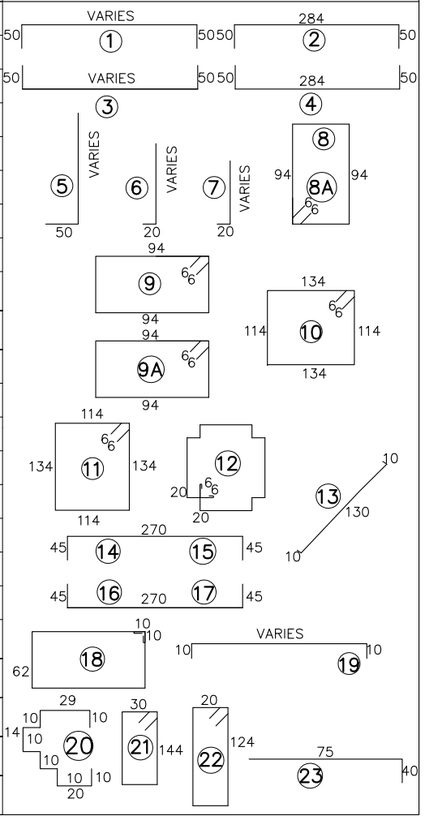


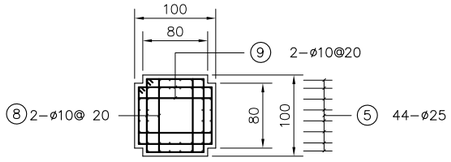
SECTION A–A

SCALE 1:75

EXTERIOR PIERS

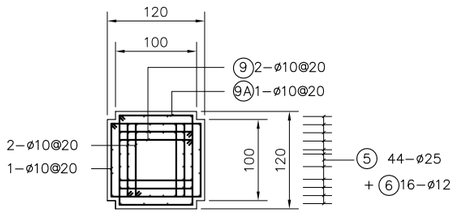
TABLE OF REINFORCMENT		
BAR MARK	BAR DIA (mm)	DEFORMED BAR REINFORCING
1	ø 25	
2	ø 25	
3	ø 25	
4	ø 25	
5	ø 25	
6	ø 12	
7	ø 12	
8 & 8A	ø 10	
9 & 9A	ø 10	
10	ø 10	
11	ø 10	
12	ø 10	
13	ø 20	
14	ø 20	
15	ø 20	
16	ø 20	
17	ø 20	
18	ø 16	
19	ø 10	
20	ø 10	
21	ø 10	
22	ø 10	
23	ø 25	





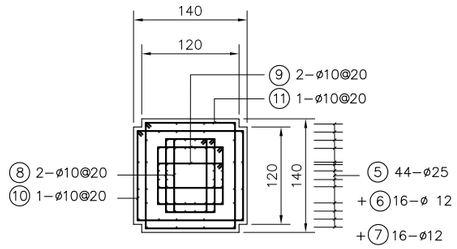
SECTION C–C

SCALE 1:75



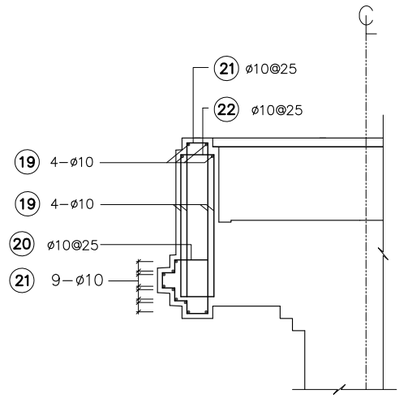
SECTION D–D

SCALE 1:75



SECTION E–E

SCALE 1:75



DETAIL 1

SCALE 1:50

NOTE:

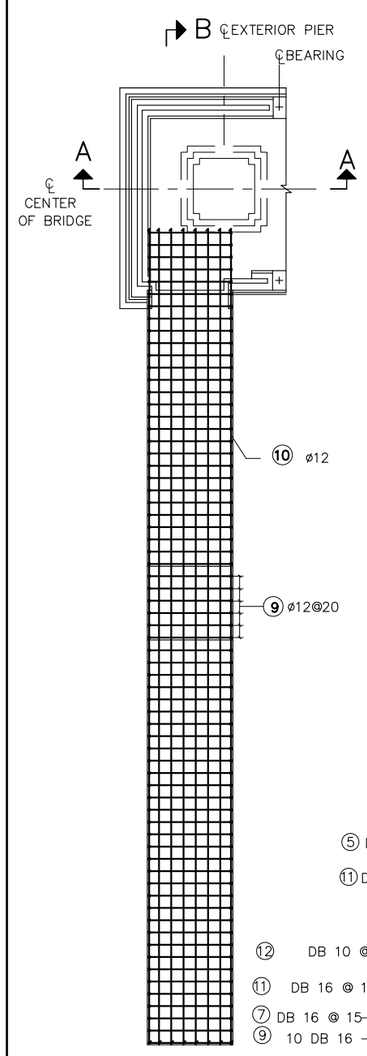
1. ALL DIMESIONS ARE IN CENTIMETERS UNLESS OTHERWISE INDICATED.
2. ALL CONCRETE SHALL BE GRADE 25 MPA UNLESS OTHERWISE INDICATED
   CONCRETE SHALL HAVE MINIMUM UTIMATE STRENGTH AT AGE 28 DAYS f'c=25 Mpa,fc=10 Mpa.
3. ALL REINFORCING BAR SHALL BE AGE DEFORMED BAR (AASHTO M31,Grade 60)
   DEFORMED BAR AND ROUND BAR SHALL BE GRADE 40.
4. CLEAR CONCRETE COVER SHALL BE 40 mm.
5. ALL EDGES OF CONCRETE SHALL BE CHAMFERED 20mm.
6. THE LENGTH OF OVERLAP STEEL BAR SHALL BE WITH THE REQUIREMENTS SET OUT IN THE TECHNICAL SPECIFICATION.
7. PILES SHOWN IN THE DRAWING IS A PRELIMINARY ESTIMATE ONLY, IN THE IMPECMENTATION STAGE, THE CONCTRACTOR ISREQUIRID TO INVESTIGATE THE FOUNDATION AND MAKE DETAILE DESIGN FOR CONSTRUCTION AS DIRECTED BY THE ENGINEER.
8. CONSTRUCTION CONTRACTORS MUST PENETRATE THE BASE
   FOLLOW THE DESIGN CALCULATIONS ROOTED TAILORED TO THE ACTUAL LOCATION.
9. THIS DRAWING SHALL BE READ IN CONJUNCTION WITH DRAWING NO: SBR–03.

ລ.ວ.ຄ
LTEC
ລັດວິສາຫະກິດ ວິສະວະກຳ ຄົມມະນາຄົມ
LAO TRANSPORT ENGINEERING CONSULTANT

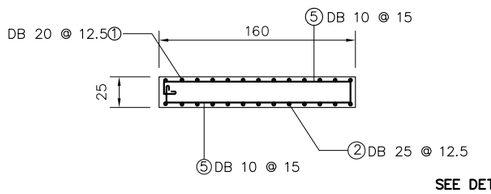
NR 13N IMPROVEMENT AND MAINTENANCE PROJECT
CONTRACT 2 : BAN SONGPEUAY – PHONHONG

DETAIL REINFORCEMENT
OF STAIR CASE SPAN 20.00m

REV.	DATE	DESCRIPTION	APPROVED		NAME	SIGNATURE	
				DESIGNED	Mr.Phonepasong SENSONGKHAM		LTEC CODE: SD–262–17
				CHECKED	Mr.Khamphone SORPHABMIXAY		DATE: April, 2018
				APPROVED	Mr.Vandy VORASACK		DRW No. SBR–04
							SCALE: AS SHOWN

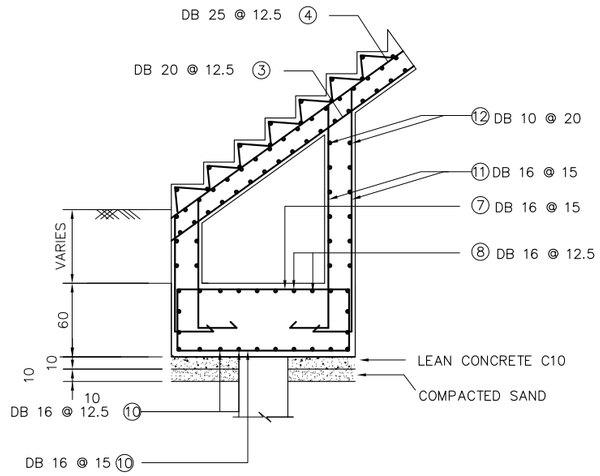


B
PLAN
SCALE 1:100

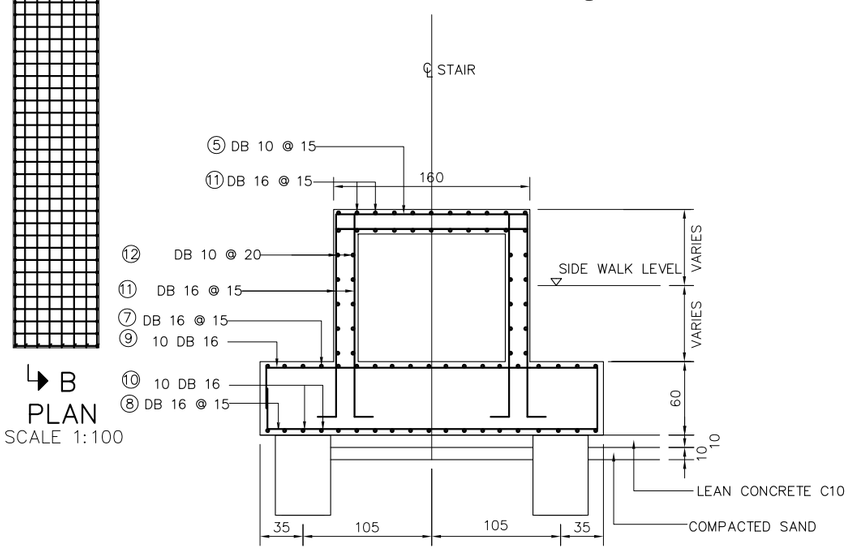


SECTION 1–1
SCALE 1:50

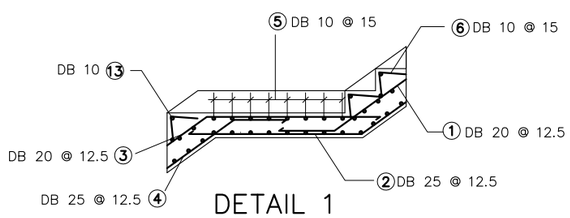
SECTION B–B
SCALE 1:100



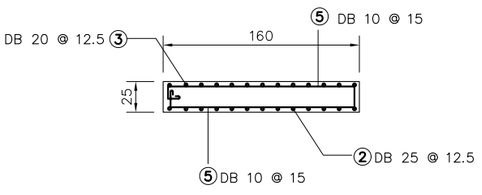
DETAIL 2
SCALE 1:50



SECTION 3–3
SCALE 1:50

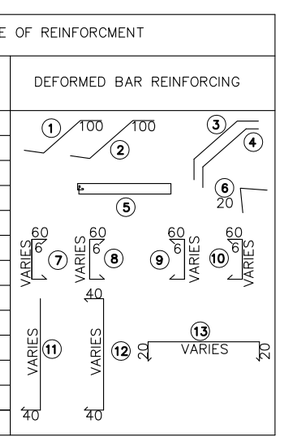


DETAIL 1
SCALE 1:50



SECTION 2–2
SCALE 1:50

TABLE OF REINFORCMENT		
BAR MARK	BAR DIA (mm)	DEFORMED BAR REINFORCING
①	ø 20	
②	ø 25	
③	ø 20	
④	ø 25	
⑤	ø 10	
⑥	ø 10	
⑦	ø 16	
⑧	ø 16	
⑨	ø 16	
⑩	ø 16	
⑪	ø 16	
⑫	ø 10	
⑬	ø 10	



NOTE:

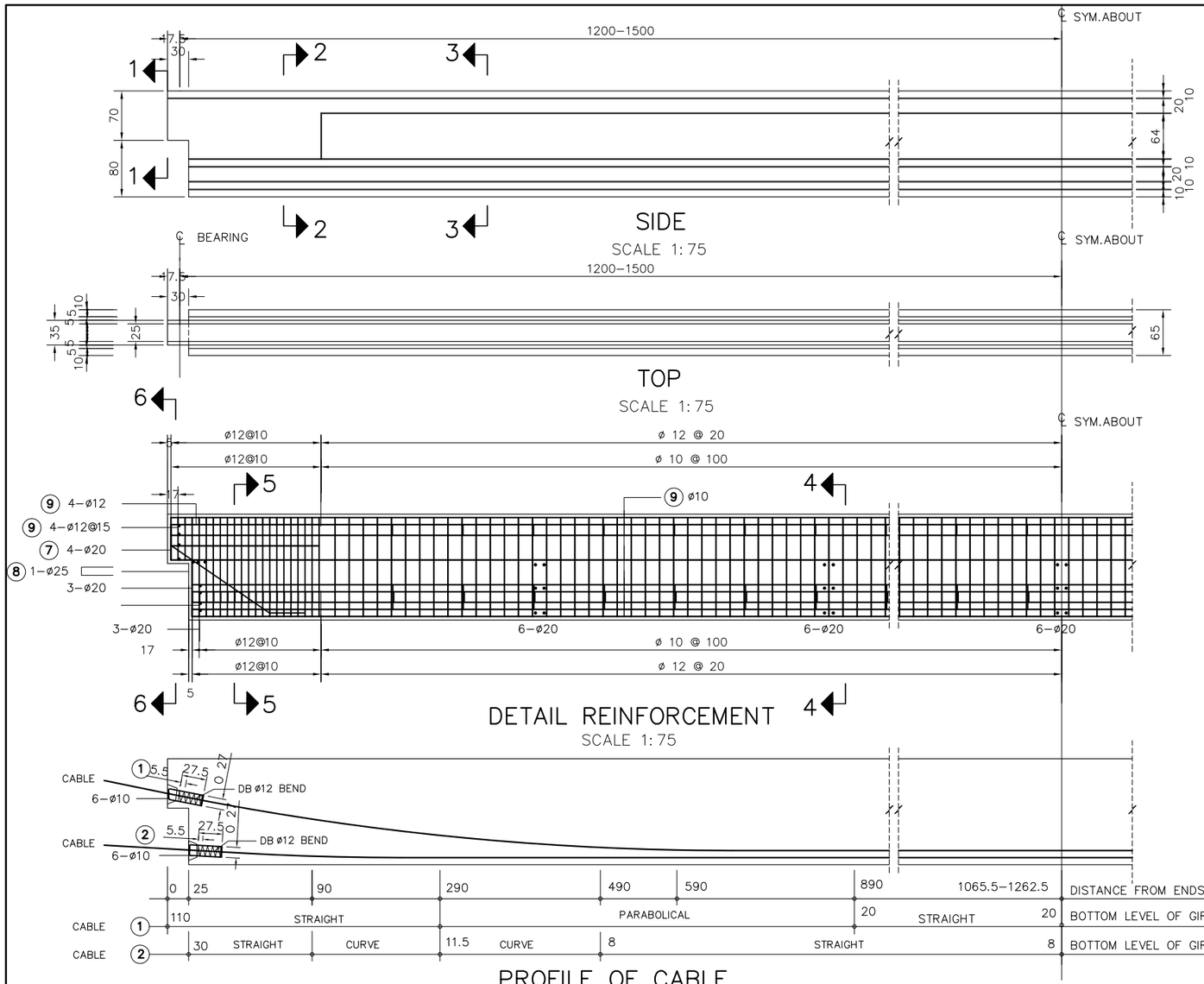
1. ALL DIMESIONS ARE IN CENTIMETERS UNLESS OTHERWISE INDICATED.
2. PILES SHOWN IN THE DRAWING IS A PRELIMINARY ESTIMATE ONLY, IN THE IMPECMENTATION STAGE, THE CONCTRACTOR ISREQUIRID TO INVESTIGATE THE FOUNDATION AND MAKE DETAILE DESIGN FOR CONSTRUCTION AS DIRECTED BY THE ENGINEER.
3. CONSTRUCTION CONTRACTORS MUST PENETRATE THE BASE FOLLOW THE DESIGN CALCULATIONS ROOTED TAILORED TO THE ACTUAL LOCATION.
4. THIS DRAWING SHALL BE READ IN CONJUNCTION WITH DRAWING NO: SBR–03.

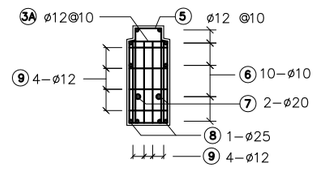
ລັດວິສາຫະກິດ ວິສະວະກຳ ຄົມມະນາຄົມ
LAO TRANSPORT ENGINEERING CONSULTANT

NR 13N IMPROVEMENT AND MAINTENANCE PROJECT
CONTRACT 2 : BAN SONGPEUAY – PHONHONG

DETAIL OF STAIR

REV.	DATE	DESCRIPTION	APPROVED		NAME	SIGNATURE	
				DESIGNED	Mr.Phonepasong SENSONGKHAM		LTEC CODE: SD–262–17
				CHECKED	Mr.Khamphone SORPHABMIXAY		DATE: April, 2018
				APPROVED	Mr.Vandy VORASACK		DRW No. SBR–05
							SCALE: AS SHOWN





SECTION 6–6
SCALE 1:50

TABLE OF REINFORCEMENT		
BAR MARK	BAR DIA (mm)	BEND REINFORCING
1	ø 12	
1A	ø 12	
2	ø 10	
2A	ø 12	
3	ø 10	
4	ø 10	
5	ø 12	
5A	ø 12	
6	ø 10	
7	ø 20	
8	ø 25	
9	ø 12	

NOTE:

1. ALL DIMESIONS ARE IN CENTIMETERS UNLESS OTHERWISE INDICATED.
2. ALL EDGE OF CONCRETE SHALL BE NOT REMOVE.
3. PULL PRESTRESSED CABLES ARE BASED ON STANDARD TERMS OF AASHTO
4. ALL CABLES SHALL BE INCLUDE 2 PRESTRESSED CABLES HAD MINIMUM FORCE 2200 KN MINIMUM FORCED SHALL BE MORE THAN 1,670 AND 1,860 N/mm^2 RESPECTIVELY.
5. All CABLES NEED TO BE COMPRESSED 1,540 KN WHEN CABLES ARE LOCKED.
6. AFTER FINISHED COMPRESS SHALL BE CLOSE AHEAD OF CABLE AND STEEL PLATE BY LIQUID CEMENT
7. COVER CONCRETE OF REINFORCMENT ARE 30 mm.
8. REINFORCMENT:
   - ROUND BAR(RB)ARE ACCORDING TO SPECIFICATION OF AASHTO
   - DEFORMED BAR(DB)ARE ACCORDING TO SPECIFICATION OF AASHTO
9. CONCRETE SHALL HAVE THE 28 DAYS MINIMUM ULTIMATE COMPRESSIVE STRENGTH, fć=25 Mpa,fc=10 Mpa.
10. BEARING
    10.1 BEARING SHALL BE LAMINATED BEARING CONFRMING TO THE LATEST AASHTO OR BRITISH STANDARDS AND SHALL MEET WITH THE FOLLOWING PERFORMANCE REQUIREMENTS:

MAX VERT. LOAD	=	300 KN.
MIN VERT. LOAD	=	150 KN.
HOR. LONG LOAD (FIXED BEARING)	=	10 KN.
HOR. TRANS, LOAD	=	8 KN.
HOR. MOVEMENT	=	–
EXPANSION	=	3 mm.
CONTRACTION	=	8 mm.
ROTATION	=	Q05 RAD.

    10.2 BEARING MUST BE PLACED HORIZONTALLY. NON SHRING AGE MATERIAL SHALL BE USED.

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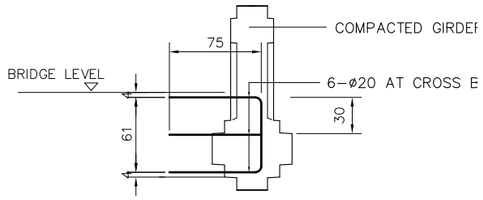
LAO TRANSPORT ENGINEERING CONSULTANT

NR 13N IMPROVEMENT AND MAINTENANCE PROJECT
CONTRACT 2 : BAN SONGPEUAY – PHONHONG

DETAIL OF POST TENSION GIRDER
SPAN 20.00m

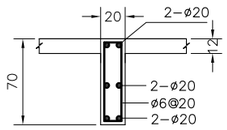
REV.	DATE	DESCRIPTION	APPROVED		NAME	SIGNATURE
				DESIGNED	Mr.Phonepasong SENSONGKHAM	
				CHECKED	Mr.Khamphone SORPHABMIXAY	
				APPROVED	Mr.Vandy VORASACK	

LTEC CODE: SD–262–17
DATE: April, 2018
DRW No. SBR–06
SCALE: AS SHOWN



DETAIL OF REINFORCEMENT
GIRDER CONCRETE POST TENSION

SCALE 1:50

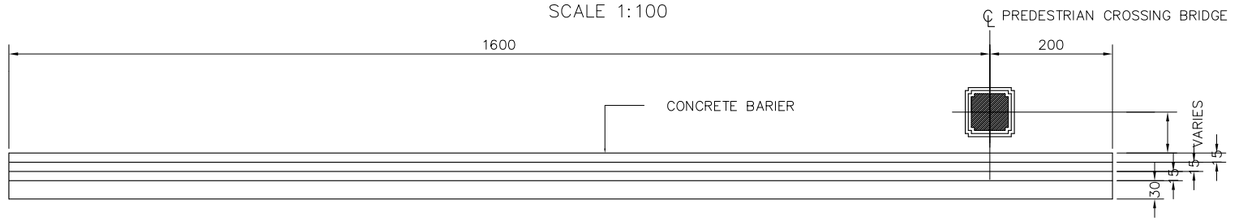


CROSS REINFORCEMENT DETAIL

SCALE 1:50

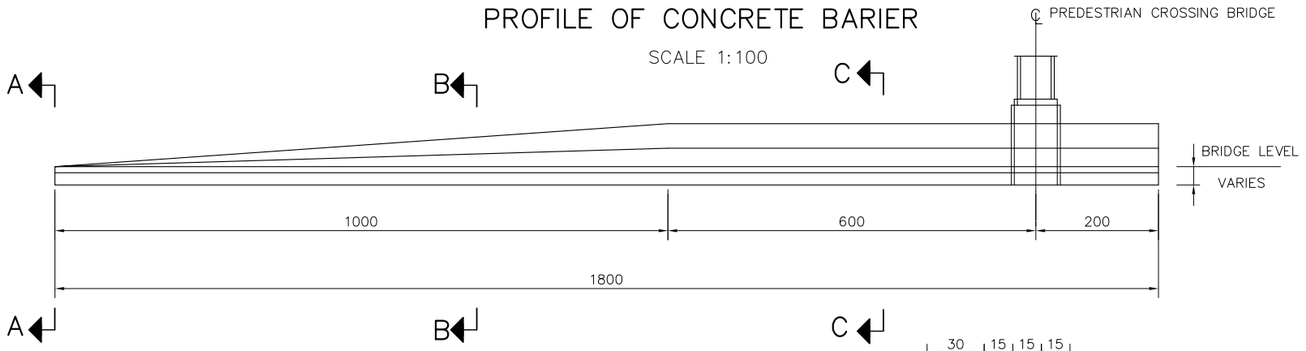
PLAN

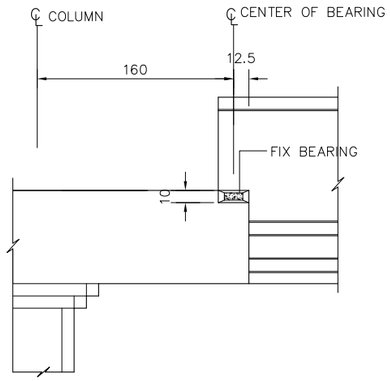
SCALE 1:100



PROFILE OF CONCRETE BARIER

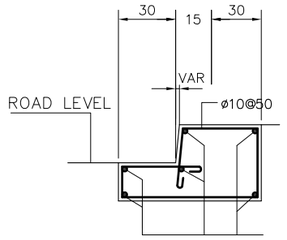
SCALE 1:100





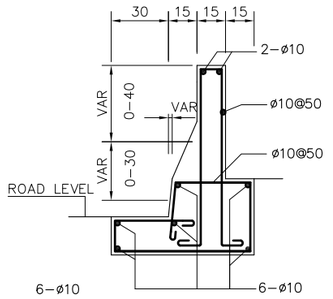
DETAIL OF BEARING

SCALE 1:50



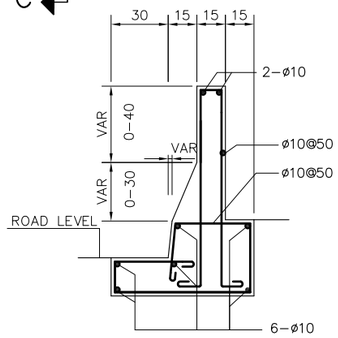
SECTION A–A

SCALE 1:50



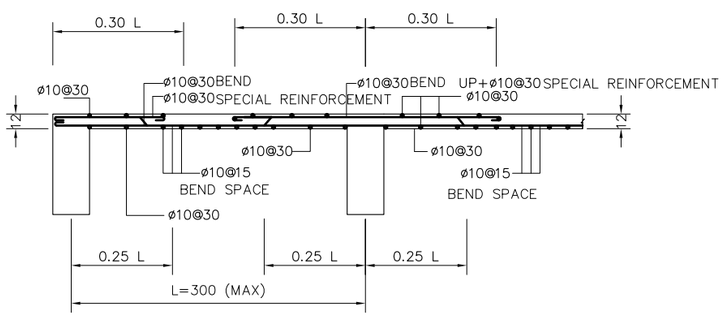
SECTION B–B

SCALE 1:50



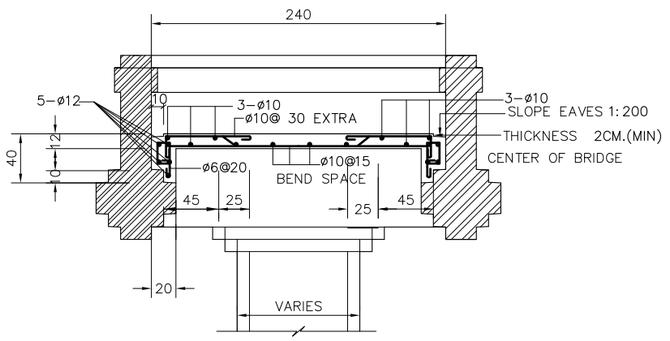
SECTION C–C

SCALE 1:50



SLAB REINFORCEMENT DETAIL

SCALE 1:50



SECTION OF SLAB REINFORCEMENT

SCALE 1:50

NOTE:

1. STAINLESS STELL PIPE SHALL BE CONFORMED TO THE REQUIREMENT AS SPECIFIED IN THE SPECIFICATION AND APPROVED BY THE ENGINEER.

1.1 GUARD RAIL OF STAIR

- TOP GUARD RAIL AND BOTTOM 64 mm THICNESS 1.5 mm (Min) ANCHOR TO BALUSTRADE WITH GUARD RAIL TOP, BOTTOM AND ANCHOR TO COLUMN
- COLUMN 64 mm THICKNESS 1.5 mm (Min) WITH BOTTOM AND TOP ANCHOR TO GUARD RAIL AND FIX BOARD 100x100 mm THICKNESS 6 mm ANCHOR TO CONCRETE
- BALUSTRADE 38 mm THICKNESS 1.2 mm (Min) ANCHOR TO GUARD RAILS

1.2 GUARD RAIL

–RAIL 64 mm THICKNESS 1.5 mm (Min)ANCHOR TO BALUSTRADE

–COLUMN 64 mm THICKNESS 1.5 mm (Min) CONNECT RAIL 2 SIDE, TOP AND BOTTOM, STEEL FIX 100x100 mm THICKNESS 6 mm ANCHOR TO BRIDGE AND CONCRETE LID

2. ANCHORING INCLUDE TO SPECIFICATION AISC
3. STAIR , COLUMN AND LID NOT TO PAINT DARK COLOR

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LAO TRANSPORT ENGINEERING CONSULTANT

NR 13N IMPROVEMENT AND MAINTENANCE PROJECT
CONTRACT 2 : BAN SONGPEUAY – PHONHONG

DETAIL OF SLAB
AND CONCRETE BARIER

REV.	DATE	DESCRIPTION	APPROVED		NAME	SIGNATURE	
				DESIGNED	Mr.Phonepasong SENSONGKHAM		DATE: April, 2018
				CHECKED	Mr.Khamphone SORPHABMIXAY		DRW No. SBR–07
				APPROVED	Mr.Vandy VORASACK		SCALE: AS SHOWN

LTEC CODE: SD–262–17

TABLE OF FOR STAIR CASE REINFORCEMENT

NO	BAR DIA (mm)	LENGTH (mm)	NUMBER	TOTAL LENGTH (mm)	SPACING @ (mm)	REMARK
1	25	3400	24	81.6	125	
2	25	3840	20	76.8	125	
3	25	3400	13	44.2	250	
4	25	3840	11	42.24	250	
5	25	7900	44	347.6	–	
6	12	2600	16	41.6	–	
7	12	2700	16	43.2	–	
8	10	3200	66	211.2	200	
8a	10	4200	10	42	200	
9	10	3200	66	211.2	200	
9a	10	4280	10	42.8	200	
10	10	5080	9	45.72	200	
11	10	5080	9	45.72	200	
12	10	5720	1	5.72	–	
12	10	5320	1	5.32	–	
13	20	1500	32	48	200	
14	20	1170	15	17.55	200	
15	20	1170	23	26.91	125	
16	20	1170	23	26.91	125	
17	20	1170	23	26.91	125	
18	16	3840	60	230.4	125	
19	10	3020	9	27.18	–	
19	10	3020	4	12.08	–	
19	10	2600	18	46.8	–	
19	10	2600	4	10.4	–	
20	10	1330	32	42.56	250	
21	10	3680	26	95.68	250	
22	10	3080	26	80.08	250	
23	25	1150	14	16.1	–	

TABLE OF STAIR REINFORCEMENT

NO	BAR DIA (mm)	LENGTH (mm)	NUMBER	TOTAL LENGTH (mm)	SPACING @ (mm)	REMARK
1	20	6891	13	89.58	250	
2	25	6891	13	89.58	250	
3	20	7110	13	92.43	250	
4	25	7110	13	92.43	250	
5	10	3400	182	618.8	250	
6	10	772	420	324.24	250	
7	16	3800	20	76	100	
8	16	3200	12	38.4	125	
9	16	3200	12	38.4	150	
10	16	3800	20	76	150	
11	16	1800	18	32.4	150	
12	10	2310	42	97.02	200,350	
13	16	1860	35	65.1	200,350	

SUMMARIZE THE VOLUME OF FOR STAIR CASE

STRUCTURE	CONCRETE (M3)			REINFORCMENT (KG)						MATERIAL MIX FILL (m3)	Pile (m)	Railing (m)
	GRADE 10MPa.	GRADE 25MPa.	GRADE 30MPa.	ø10	ø12	ø16	ø20	ø25	TOTAL			
1. OUTSIDE PIER	0.78	21.58	–	–	75.29	363.65	360.75	2344.92		0.99	–	36.00
2. STAIR	0.21	9.57	–	728.23	–	292.31	448.86	701.35				
TOTAL	0.99	31.15	–	728.23	75.29	655.96	808.96	3046.27	5228.205	0.99	–	36.00

NOTE:

1. TABLE OF REINFORCEMENT FOR HEAD OF COLUMN ONLY.

ລັດວິສາຫະກິດ ວິສະວະກຳ ຄົມມະນາຄົມ
LAO TRANSPORT ENGINEERING CONSULTANT

NR 13N IMPROVEMENT AND MAINTENANCE PROJECT
CONTRACT 2 : BAN SONGPEUAY – PHONHONG

SUMMARY OF QUANTITIES
FOR STAIR CASE

REV.	DATE	DESCRIPTION	APPROVED		NAME	SIGNATURE	
				DESIGNED	Mr.Phonepasong SENSONGKHAM		LTEC CODE: SD–262–17
				CHECKED	Mr.Khamphone SORPHABMIXAY		DATE: April, 2018
				APPROVED	Mr.Vandy VORASACK		DRW No. BTB–08
							SCALE: –

TABLE OF CONCRETE BARIER REINFORCEMENT

NO	BAR DIA (mm)	LENGTH (mm)	NUMBER	TOTAL LENGTH (m)	SPACING @ (mm)	REMARK
1	10	19000	6	114	–	
2	10	19000	1	19	–	
3	10	19000	2	38	–	
4	10	3685	37	136.35	500	
5	10	3375	37	124.88	500	

SUMMARIZE THE VOLUME OF CONCRETE BARIER

STRUCTURE	CONCRETE (M3)			REINFORCMENT (KG)					MATERIAL MIX FILL (m3)	Pile (m)
	GRADE 10MPa.	GRADE 25MPa.	GRADE 30MPa.	ø10	ø12	ø16	ø20	TOTAL		
1.CONCRETE BARIER	–	14.24	–	266.49	–	–	–		–	–
TOTAL	–	14.24	–	266.49	–	–	–	266.49	–	–

NOTE:

1. TABLE OF REINFORCEMENT FOR HEAD OF COLUMN ONLY.

ລັດວິສາຫະກິດ ວິສະວະກຳ ຄົມມະນາຄົມ
LAO TRANSPORT ENGINEERING CONSULTANT

NR 13N IMPROVEMENT AND MAINTENANCE PROJECT
CONTRACT 2 : BAN SONGPEUAY – PHONHONG

SUMMARY OF QUANTITIES
FOR CONCRETE BARIER

REV.	DATE	DESCRIPTION	APPROVED		NAME	SIGNATURE	
				DESIGNED	Mr.Phonepasong SENSONGKHAM		LTEC CODE: SD–262–17
				CHECKED	Mr.Khamphone SORPHABMIXAY		DATE: April, 2018
				APPROVED	Mr.Vandy VORASACK		DRW No. BTB–09
							SCALE: –

TABEL OF GIRDER SPANS 20 m REINFORCEMENT

NO	BAR DIA (mm)	LENGTH (mm)	NUMBER	TOTAL LENGTH (mm)	SPACING @ (mm)	REMARK
1	12	3600	84	302.4	200	
1a	12	3500	44	154	100	
2	12	1200	84	100.8	200	
2a	12	3260	44	143.44	100	
3	10	1700	201	341.7	100	
4	10	4100	201	824.1	100	
5	12	1900	8	15.2	100	
6	10	22000	20	440	–	
7	20	2500	4	10	100	
8	25	2775	4	11.1	–	
9	12	600	540	324	150	
9	12	960	540	518.4	150	
10	12	2000	4	8	–	
11	10	25000	12	300	–	
12	20	800	60	48		

TABLE OF DECK SLAB SPAN 20 m REINFORCEMENT

NO	BAR DIA (mm)	LENGTH (mm)	NUMBER	TOTAL LENGTH (mm)	SPACING @ (mm)	REMARK
1	20	2400	54	129.6	–	
2	10	1760	108	190.08	200	
3	12	22000	10	220	–	
4	10	22000	6	132	–	
5	10	22000	7	154	150	
6	10	900	136	122.4	300	
7	10	620	202	125.24	200	
8	10	2400	135	324	150	
9	10	1000	16	16	300	
10	10	2400	56	134.4	300	

SUMMARIZE THE VOLUME OF SUPER STRUCTURE SPAN 20 m

STRUCTURE	CONCRETE (M3)			REINFORCMENT (KG)						MATERIAL MIX FILL (m3)	Pile (m)	Railing (m)
	GRADE 10MPa.	GRADE 25MPa.	GRADE 30MPa.	ø10	ø12	ø16	ø20	ø25	TOTAL			
1. 2GIRDERS	–	21.04	–	2349.994	2781.06	–	286.074	85.544		–	–	40.00
2. DECK SLAB	–	8.87	–	738.69	195.32	–	319.61	–				
TOTAL	–	29.90	–	3088.68	2976.38	–	605.69	85.54	6756.29	–	–	40.00

NOTE:

1. TABLE OF REINFORCEMENT FOR HEAD OF COLUMN ONLY.

ລ.ວ.ທ
LTEC
ລັດວິສາຫະກິດ ວິສະວະກຳ ຄົມມະນາຄົມ
LAO TRANSPORT ENGINEERING CONSULTANT

NR 13N IMPROVEMENT AND MAINTENANCE PROJECT
CONTRACT 2 : BAN SONGPEUAY – PHONHONG

SUMMARY OF QUANTITIES
FOR GIRDER SPANS 20 m

REV.	DATE	DESCRIPTION	APPROVED		NAME	SIGNATURE	
				DESIGNED	Mr.Phonepasong SENSONGKHAM		LTEC CODE: SD–262–17
				CHECKED	Mr.Khamphone SORPHABMIXAY		DATE: April, 2018
				APPROVED	Mr.Vandy VORASACK		DRW No. BTB–10
							SCALE: –