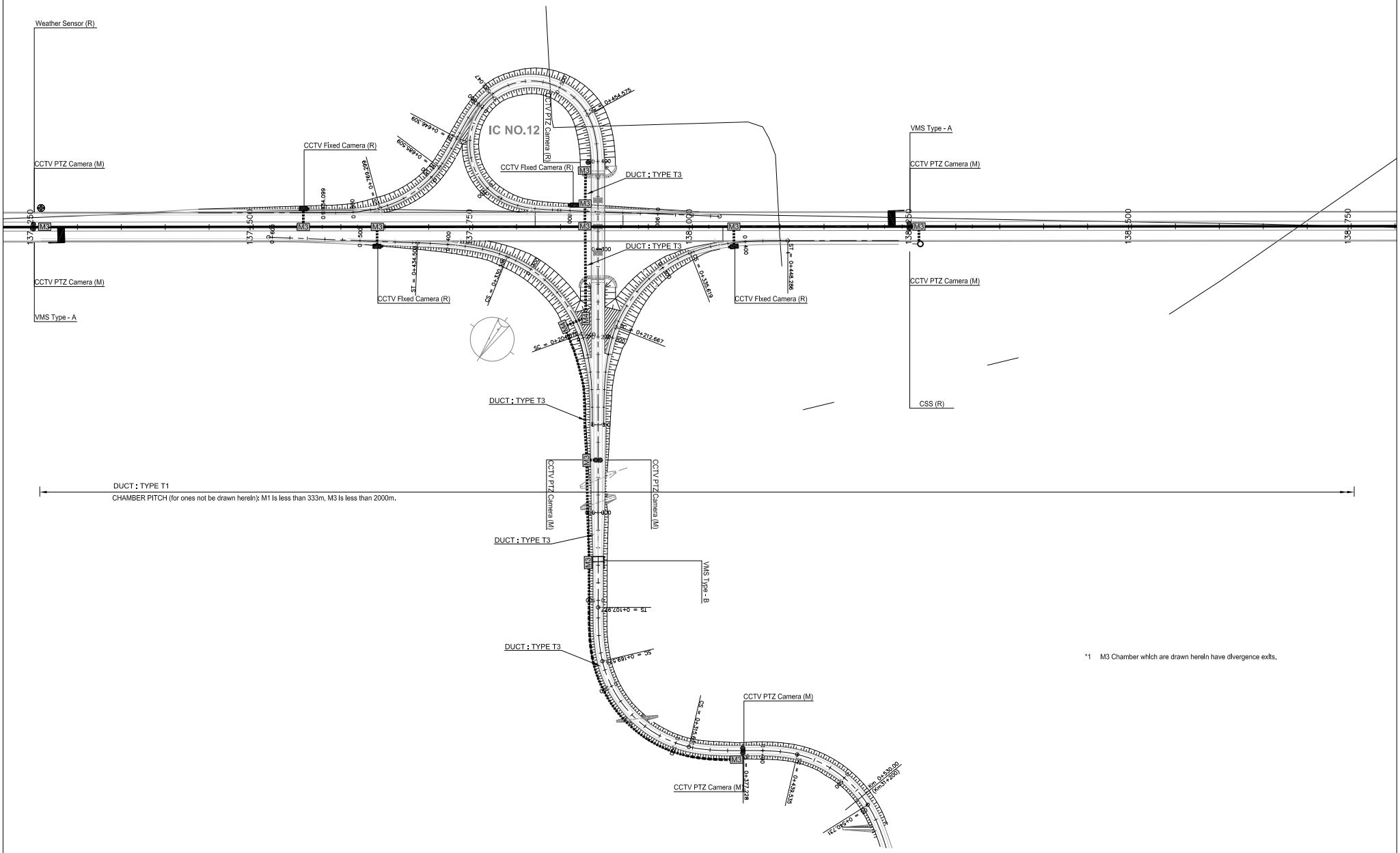
HANOI - BAC NINH EXPRESSWAY



*1 M3 Chamber which are drawn herein have divergence exits.

CONSULTANT				
ORIENTAL CONSULTANTS CO., LTD NEXCO EAST ENGINEERING CO., LTD NIPPON KOEI CO., LTD TRANSPORTATION RESEARCH INSTITUTE CO., LTD LANDTEC JAPAN INC.	TITLE	NAME	SIGNATURE	DATE
	PREPARED BY			
	CHECKED BY			
	APPROVED BY			

SOCIALIST REPUBLIC OF VIETNAM

MINISTRY OF TRANSPORT

ITS INTEGRATION PROJECT ON
NEW NATIONAL HIGHWAY NO.3 & NORTHERN AREA OF VIETNAM

PACKAGE:

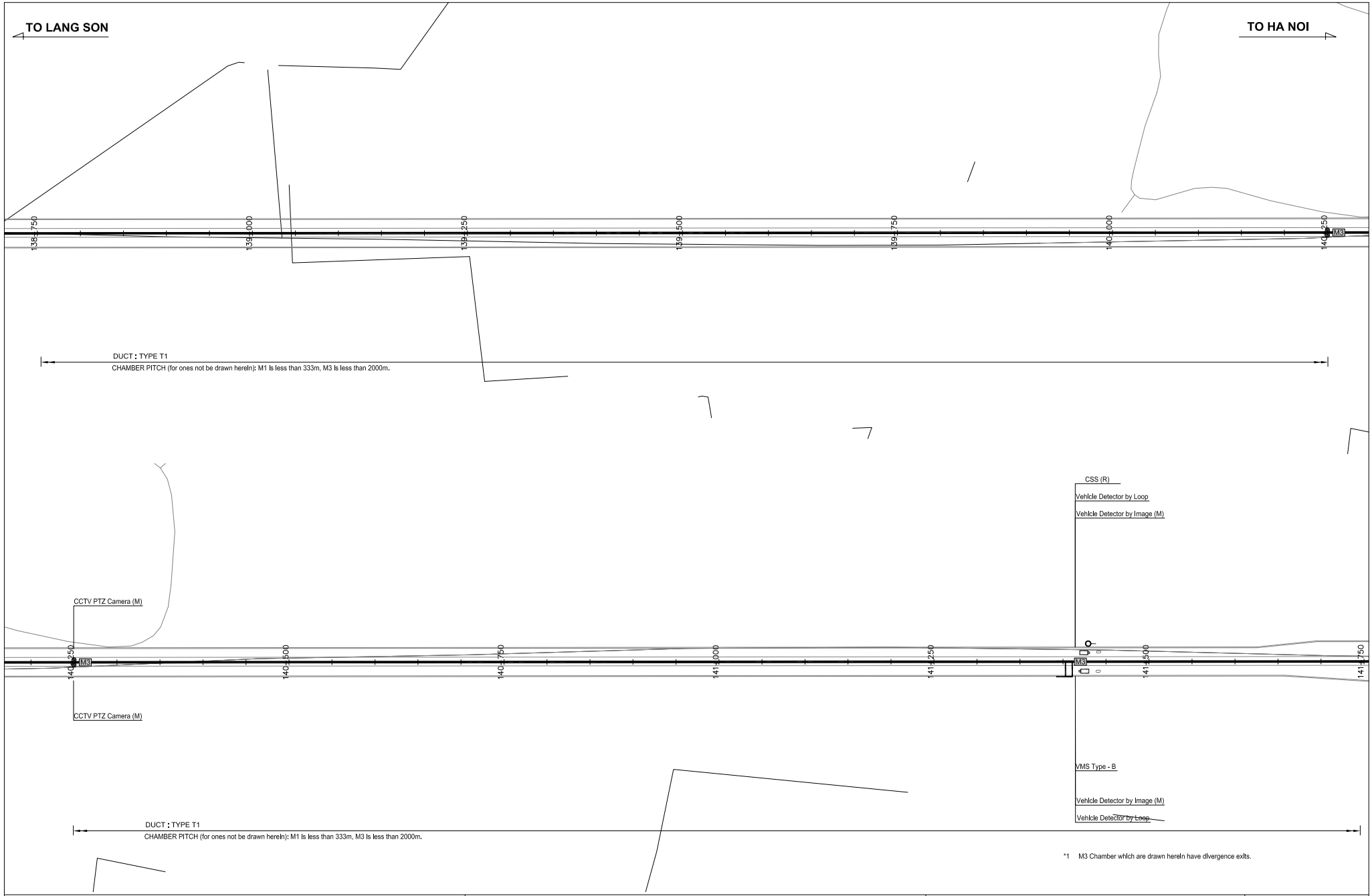
DRAWING TITLE:
LAYOUT PLAN OF ROADSIDE EQUIPMENT & COMMUNICATION DUCT
(KM 137+250 ~ KM 138+750 , HA NOI - BAC NINH EXP.)

SCALE: 1/4000

DRAWING No.: IX. 1 - 01

SHEET No.: Sheet of

Rev:



CONSULTANT					SOCIALIST REPUBLIC OF VIETNAM	ITS INTEGRATION PROJECT ON NEW NATIONAL HIGHWAY NO.3 & NORTHERN AREA OF VIETNAM	PACKAGE:	
ORIENTAL CONSULTANTS CO., LTD NEXCO EAST ENGINEERING CO., LTD NIPPON KOEI CO., LTD TRANSPORTATION RESEARCH INSTITUTE CO., LTD LANDTEC JAPAN INC.	TITLE	NAME	SIGNATURE	DATE	MINISTRY OF TRANSPORT	DRAWING TITLE: LAYOUT PLAN OF ROADSIDE EQUIPMENT & COMMUNICATION DUCT (KM 138+750 ~ KM 141+750, HA NOI - BAC NINH EXP.)	DRAWING No.: IX. 1 - 02	
	PREPARED BY						SHEET No.: Sheet of	Rev:
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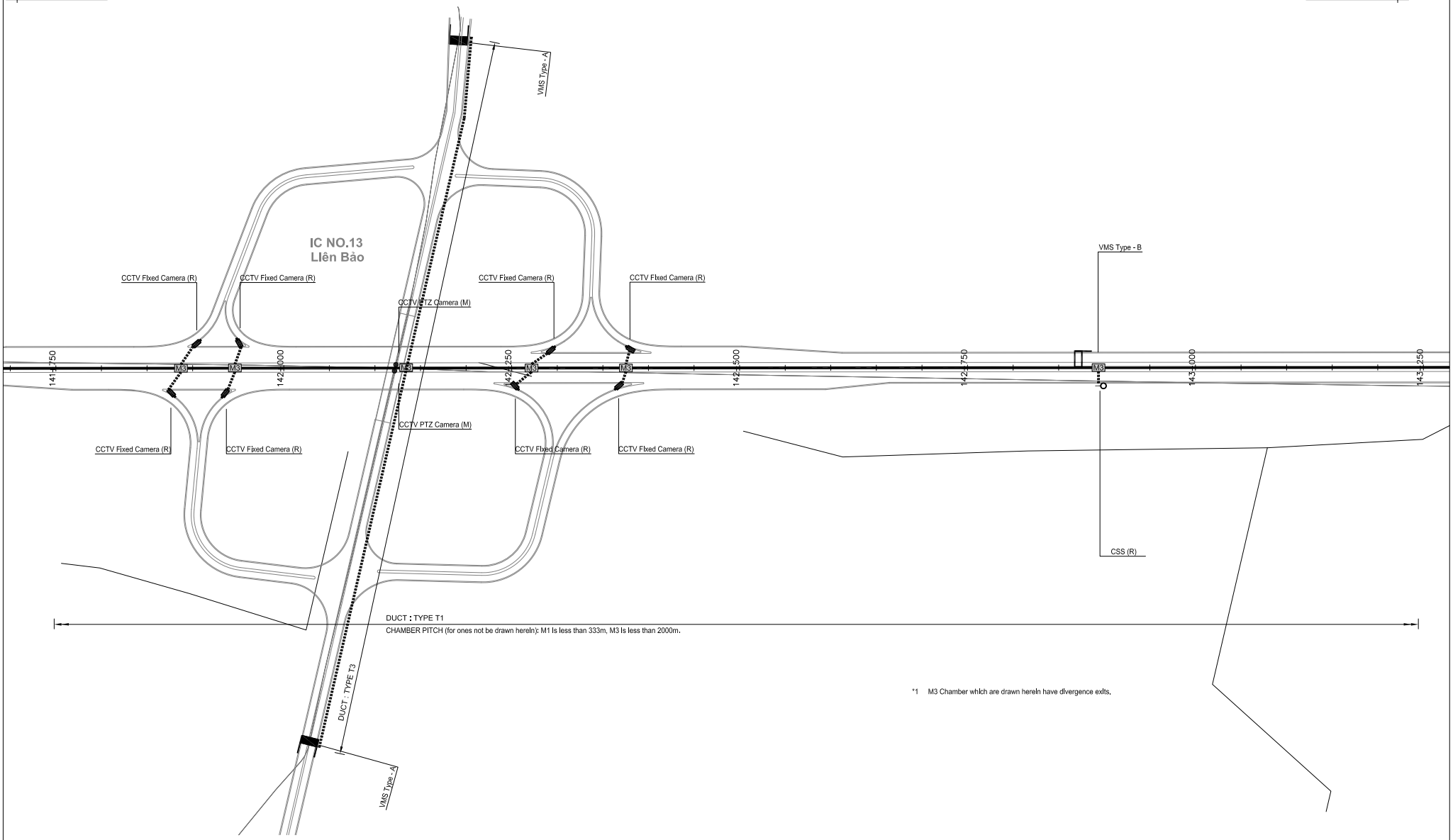

CONSULTANT					SOCIALIST REPUBLIC OF VIETNAM	ITS INTEGRATION PROJECT ON NEW NATIONAL HIGHWAY NO.3 & NORTHERN AREA OF VIETNAM	PACKAGE:
ORIENTAL CONSULTANTS CO., LTD NEXCO EAST ENGINEERING CO., LTD NIPPON KOEI CO., LTD TRANSPORTATION RESEARCH INSTITUTE CO., LTD LANDTEC JAPAN INC.	TITLE	NAME	SIGNATURE	DATE	MINISTRY OF TRANSPORT	DRAWING TITLE: LAYOUT PLAN OF ROADSIDE EQUIPMENT & COMMUNICATION DUCT (KM 141+750 ~ KM 143+250, HA NOI - BAC NINH EXP.)	DRAWING No.: IX. 1 - 03
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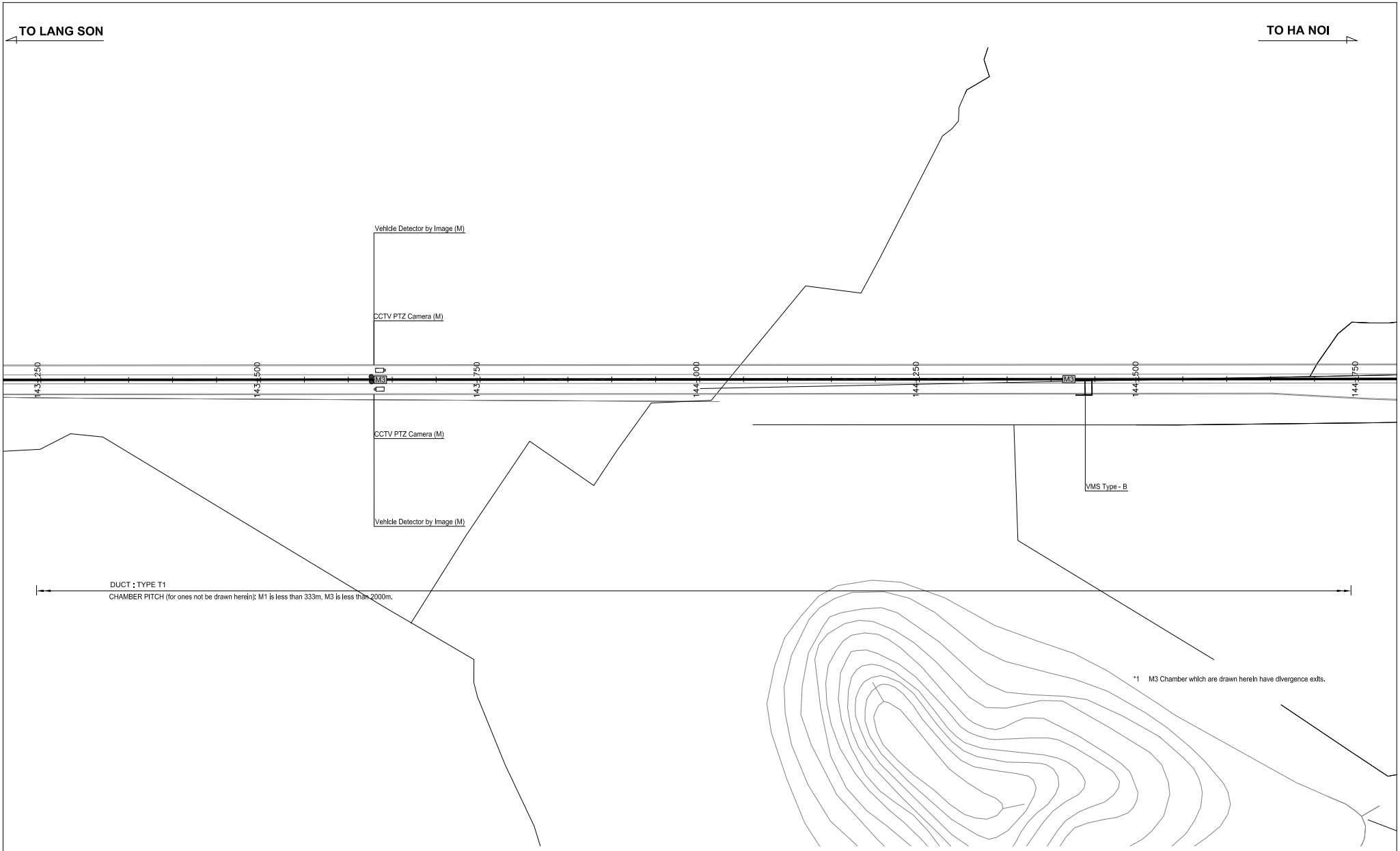

CONSULTANT				
ORIENTAL CONSULTANTS CO., LTD NEXCO EAST ENGINEERING CO., LTD NIPPON KOEI CO., LTD TRANSPORTATION RESEARCH INSTITUTE CO., LTD LANDTEC JAPAN INC.	TITLE	NAME	SIGNATURE	DATE
	PREPARED BY			
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SOCIALIST REPUBLIC OF VIETNAM

MINISTRY OF TRANSPORT

ITS INTEGRATION PROJECT ON
NEW NATIONAL HIGHWAY NO.3 & NORTHERN AREA OF VIETNAM

PACKAGE:

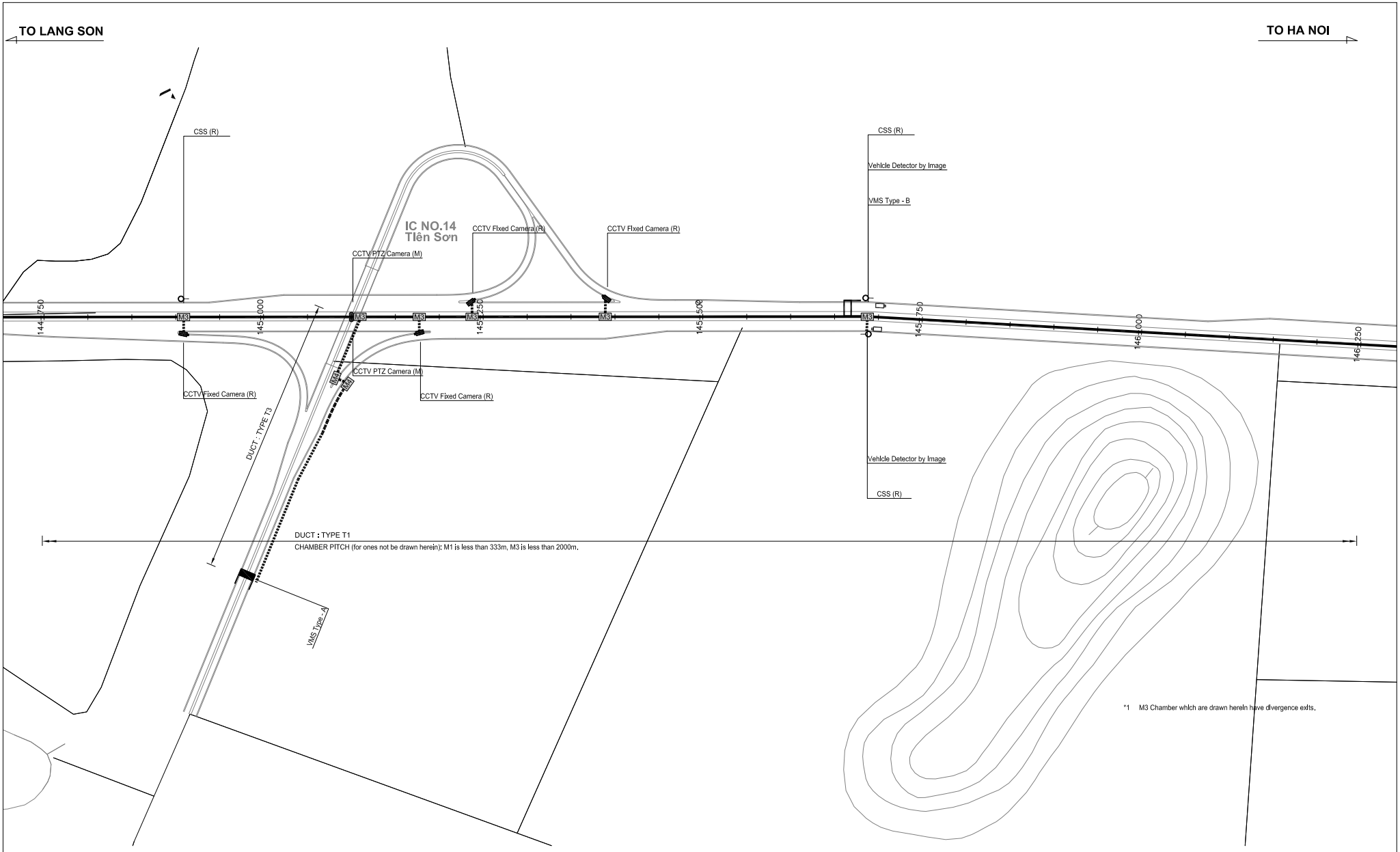
DRAWING TITLE:
LAYOUT PLAN OF ROADSIDE EQUIPMENT & COMMUNICATION DUCT
(KM 143+250 ~ KM 144+750, HA NOI - BAC NINH EXP.)

SCALE: 1/4000

DRAWING No.: IX. 1 - 04

SHEET No.: Sheet of

Rev:



CONSULTANT					SOCIALIST REPUBLIC OF VIETNAM	ITS INTEGRATION PROJECT ON NEW NATIONAL HIGHWAY NO.3 & NORTHERN AREA OF VIETNAM	PACKAGE:	
ORIENTAL CONSULTANTS CO., LTD NEXCO EAST ENGINEERING CO., LTD NIPPON KOEI CO., LTD TRANSPORTATION RESEARCH INSTITUTE CO., LTD LANDTEC JAPAN INC.	TITLE	NAME	SIGNATURE	DATE	MINISTRY OF TRANSPORT	DRAWING TITLE: LAYOUT PLAN OF ROADSIDE EQUIPMENT & COMMUNICATION DUCT (KM 144+750 ~ KM 146+250, HA NOI - BAC NINH EXP.)	DRAWING No.: IX. 1 - 05	
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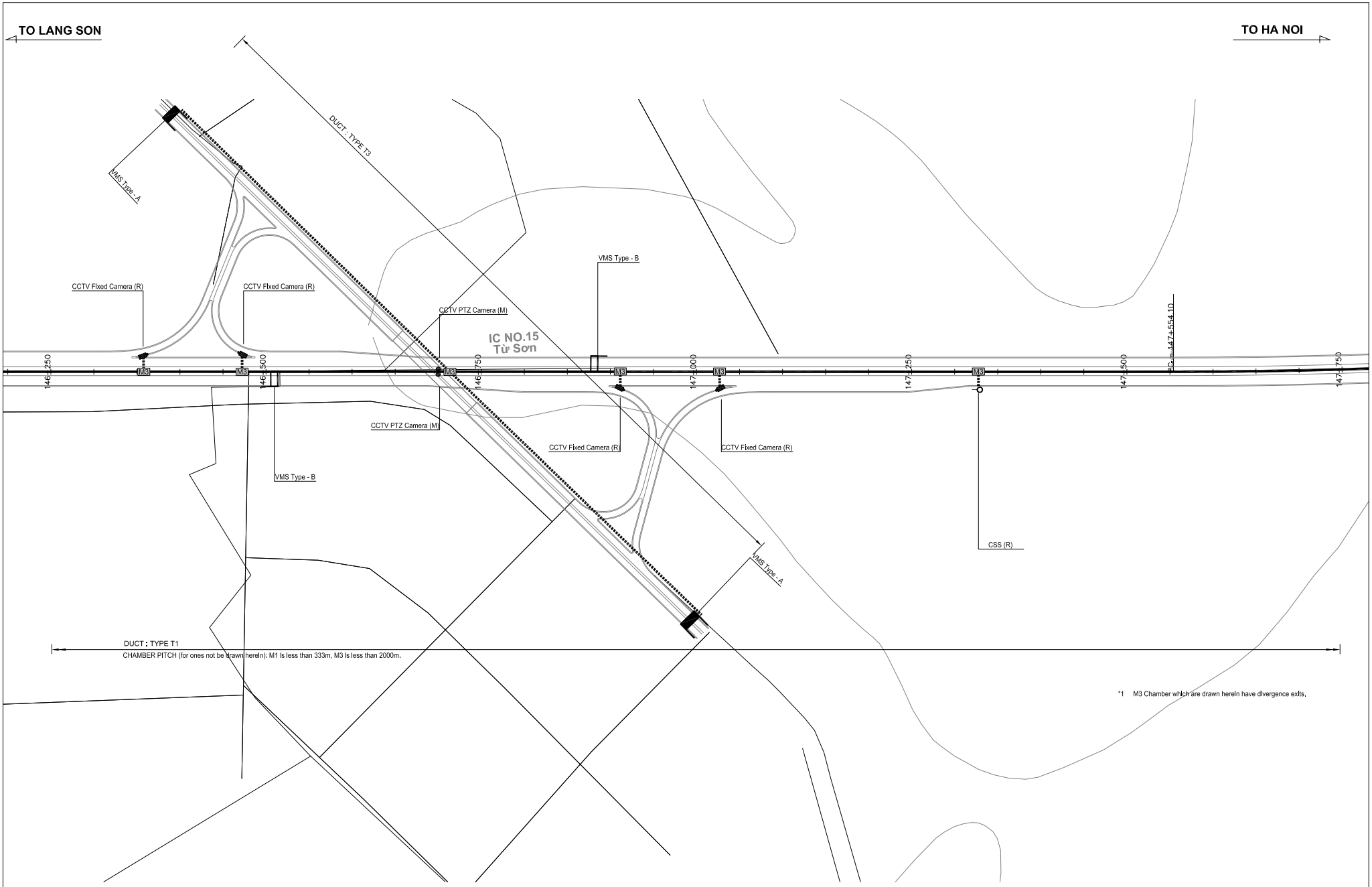

CONSULTANT				
ORIENTAL CONSULTANTS CO., LTD NEXCO EAST ENGINEERING CO., LTD NIPPON KOEI CO., LTD TRANSPORTATION RESEARCH INSTITUTE CO., LTD LANDTEC JAPAN INC.	TITLE	NAME	SIGNATURE	DATE
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SOCIALIST REPUBLIC OF VIETNAM

MINISTRY OF TRANSPORT

ITS INTEGRATION PROJECT ON
NEW NATIONAL HIGHWAY NO.3 & NORTHERN AREA OF VIETNAM

PACKAGE:

DRAWING TITLE:
LAYOUT PLAN OF ROADSIDE EQUIPMENT & COMMUNICATION DUCT
(KM 146+250 ~ KM 147+750, HA NOI - BAC NINH EXP.)

SCALE: 1/4000

DRAWING No.: IX. 1 - 06

SHEET No.: Sheet of

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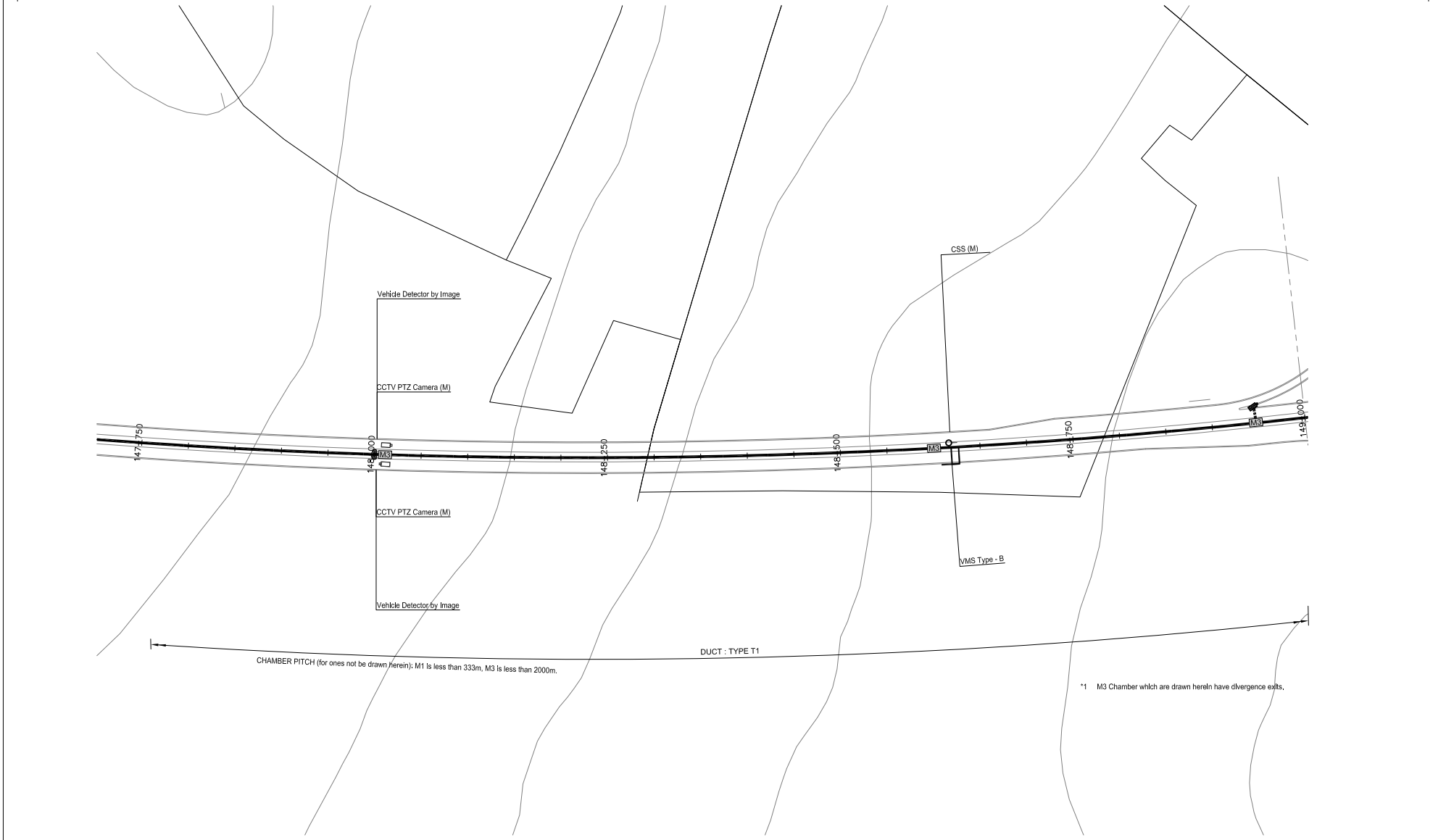
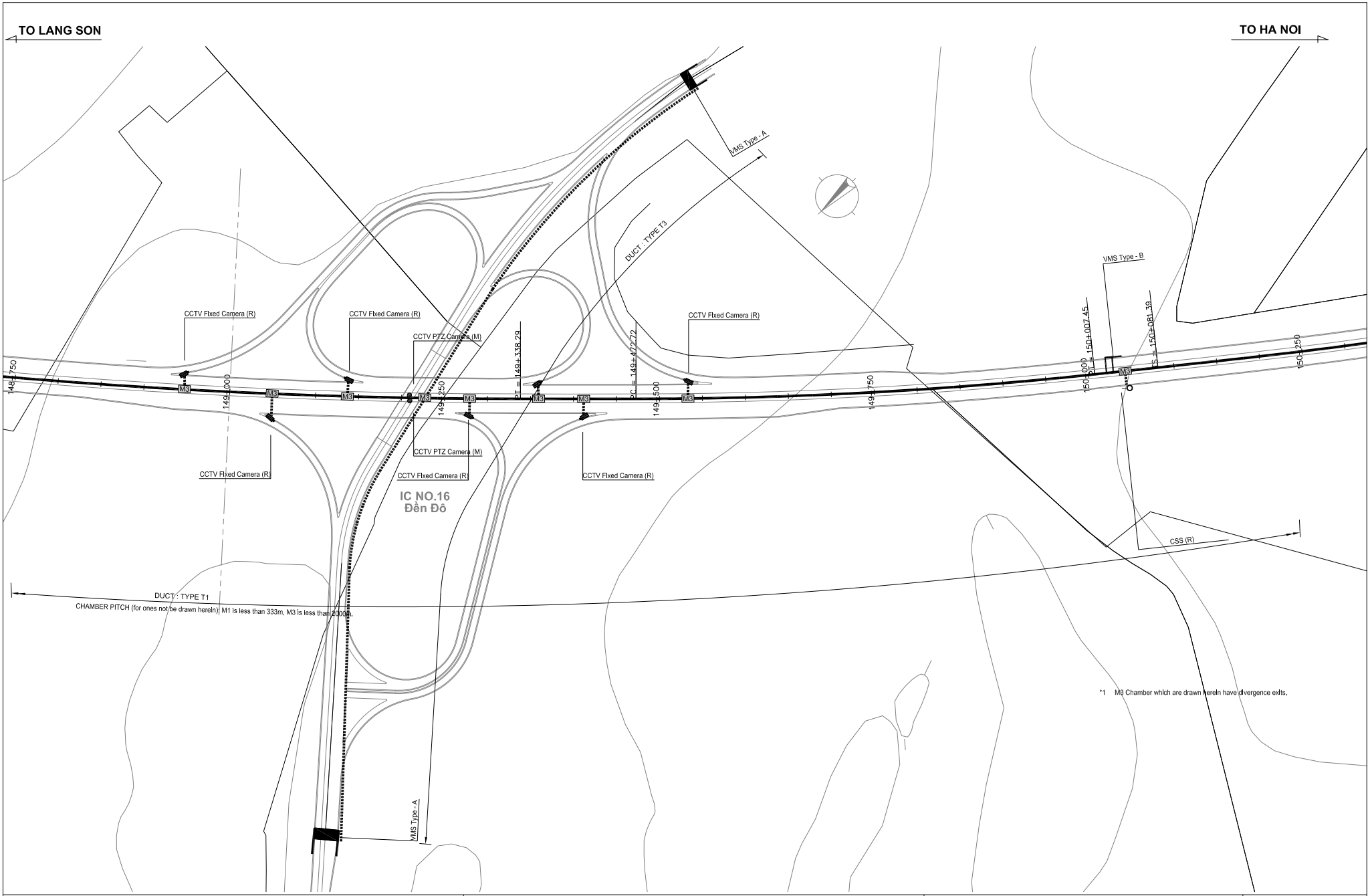


CONSULTANT					SOCIALIST REPUBLIC OF VIETNAM	ITS INTEGRATION PROJECT ON NEW NATIONAL HIGHWAY NO.3 & NORTHERN AREA OF VIETNAM	PACKAGE:	
ORIENTAL CONSULTANTS CO., LTD NEXCO EAST ENGINEERING CO., LTD NIPPON KOEI CO., LTD TRANSPORTATION RESEARCH INSTITUTE CO., LTD LANDTEC JAPAN INC.	TITLE	NAME	SIGNATURE	DATE	MINISTRY OF TRANSPORT	DRAWING TITLE: LAYOUT PLAN OF ROADSIDE EQUIPMENT & COMMUNICATION DUCT (KM 147+750 ~ KM 149+000, HA NOI - BAC NINH EXP.)	DRAWING No.: IX. 1 - 07	
	PREPARED BY						SHEET No.: Sheet of	Rev:
	CHECKED BY					SCALE: 1/4000		
	APPROVED BY							



CONSULTANT				
ORIENTAL CONSULTANTS CO., LTD NEXCO EAST ENGINEERING CO., LTD NIPPON KOEI CO., LTD TRANSPORTATION RESEARCH INSTITUTE CO., LTD LANDTEC JAPAN INC.	TITLE	NAME	SIGNATURE	DATE
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SOCIALIST REPUBLIC OF VIETNAM

MINISTRY OF TRANSPORT

ITS INTEGRATION PROJECT ON
NEW NATIONAL HIGHWAY NO.3 & NORTHERN AREA OF VIETNAM

PACKAGE:

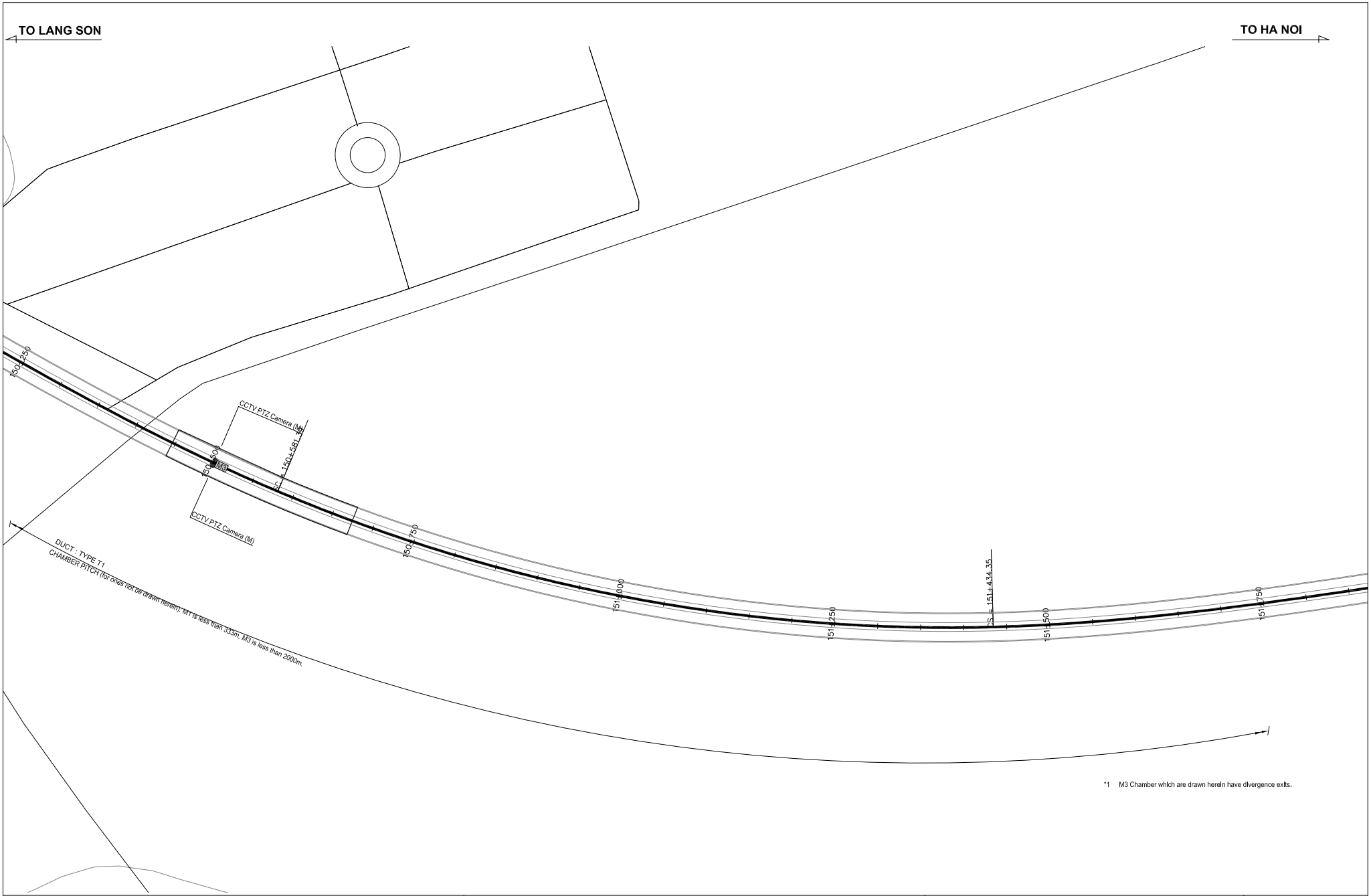
DRAWING TITLE:
LAYOUT PLAN OF ROADSIDE EQUIPMENT & COMMUNICATION DUCT
(KM 149+000 ~ KM 150+250, HA NOI - BAC NINH EXP.)

SCALE: 1/4000

DRAWING No.: IX. 1 - 08

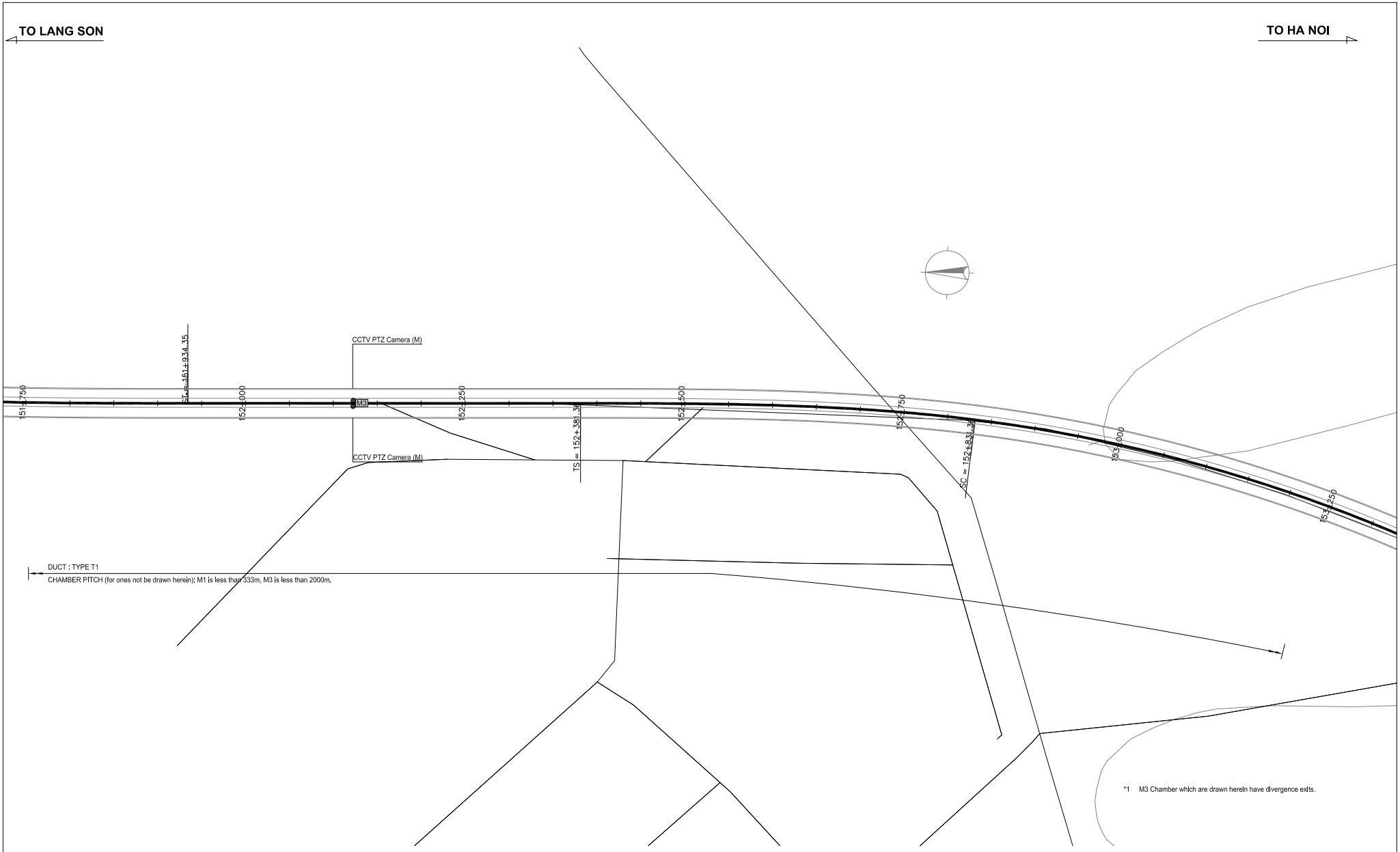
SHEET No.: Sheet of

Rev:



*1 M3 Chamber which are drawn herein have divergence exits.

CONSULTANT					SOCIALIST REPUBLIC OF VIETNAM	ITS INTEGRATION PROJECT ON NEW NATIONAL HIGHWAY NO.3 & NORTHERN AREA OF VIETNAM	PACKAGE:
ORIENTAL CONSULTANTS CO., LTD NEXCO EAST ENGINEERING CO., LTD NIPPON KOEI CO., LTD TRANSPORTATION RESEARCH INSTITUTE CO., LTD LANDTEC JAPAN INC.	TITLE	NAME	SIGNATURE	DATE	MINISTRY OF TRANSPORT	DRAWING TITLE: LAYOUT PLAN OF ROADSIDE EQUIPMENT & COMMUNICATION DUCT (KM 150+250 ~ KM 151+750, HA NOI - BAC NINH EXP.)	DRAWING No.: IX. 1 - 09
	PREPARED BY						SHEET No.: Sheet of / Rev:
	CHECKED BY					SCALE: 1/4000	
	APPROVED BY						



CONSULTANT				
ORIENTAL CONSULTANTS CO., LTD NEXCO EAST ENGINEERING CO., LTD NIPPON KOEI CO., LTD TRANSPORTATION RESEARCH INSTITUTE CO., LTD LANDTEC JAPAN INC.	TITLE	NAME	SIGNATURE	DATE
	PREPARED BY			
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SOCIALIST REPUBLIC OF VIETNAM

MINISTRY OF TRANSPORT

ITS INTEGRATION PROJECT ON
NEW NATIONAL HIGHWAY NO.3 & NORTHERN AREA OF VIETNAM

PACKAGE:

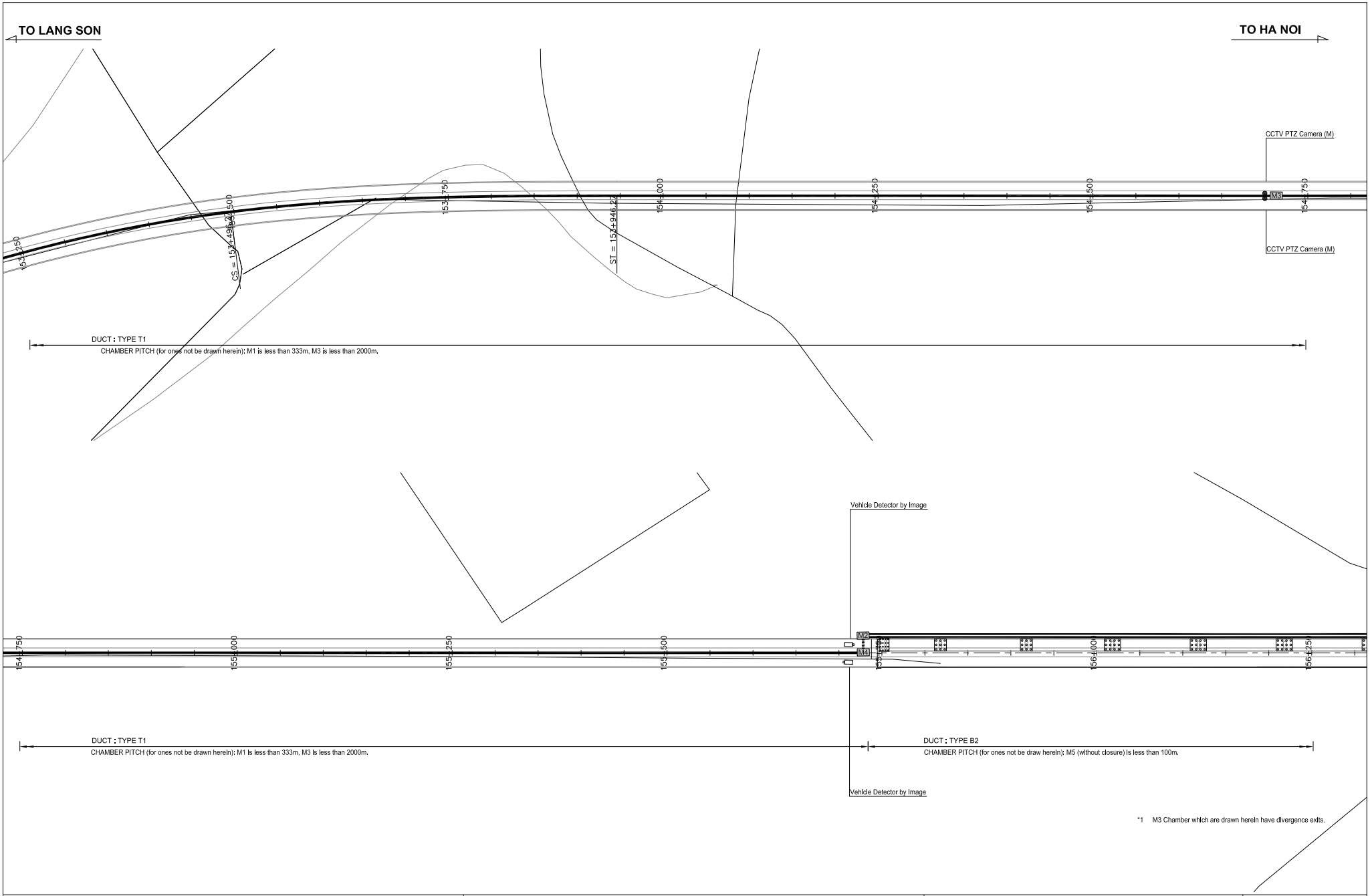
DRAWING TITLE:
LAYOUT PLAN OF ROADSIDE EQUIPMENT & COMMUNICATION DUCT
(KM 151+750 ~ KM 153+250, HA NOI - BAC NINH EXP.)

SCALE: 1/4000

DRAWING No.: IX. 1 - 10

SHEET No.: Sheet of

Rev:

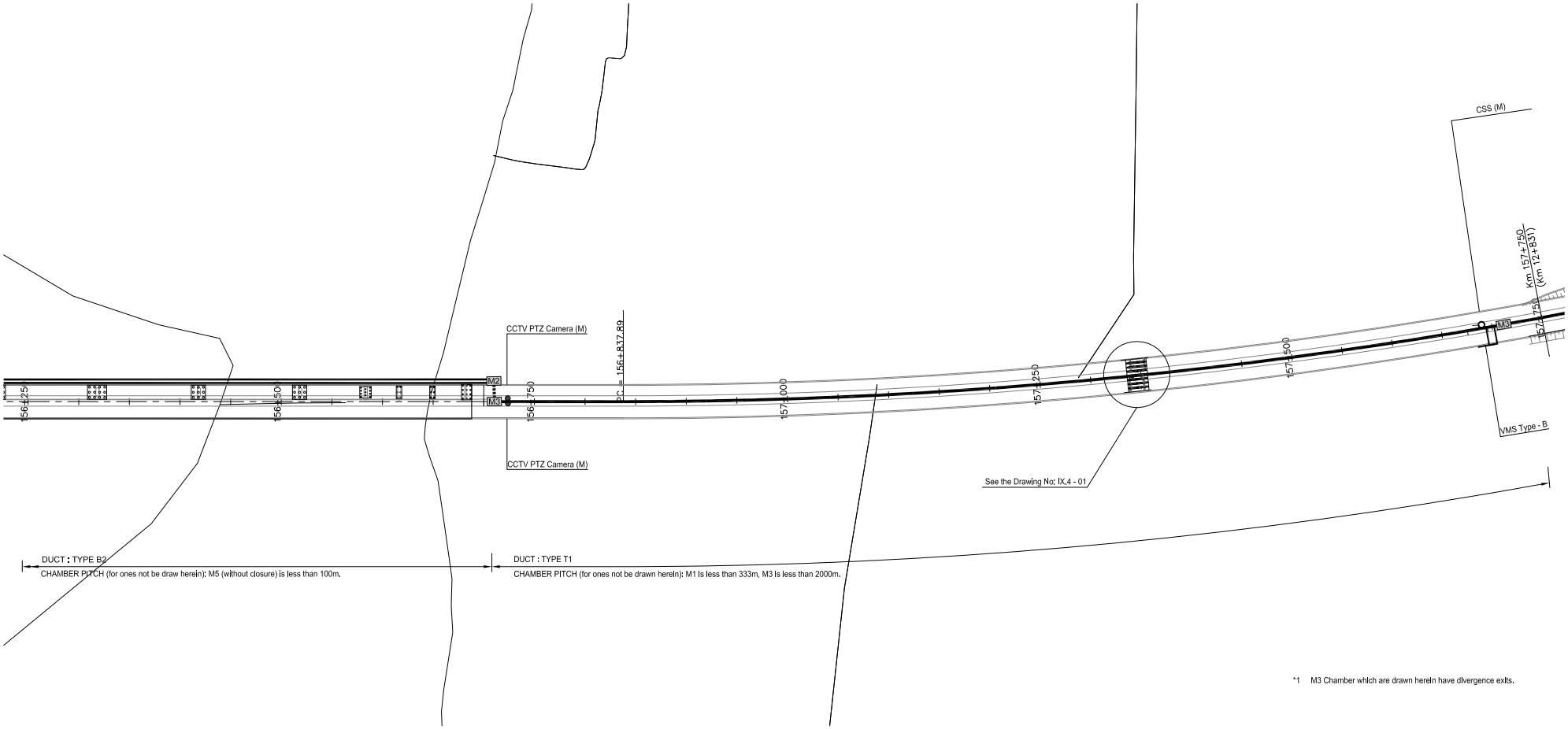


*1 M3 Chamber which are drawn herein have divergence exits.

CONSULTANT					SOCIALIST REPUBLIC OF VIETNAM	ITS INTEGRATION PROJECT ON NEW NATIONAL HIGHWAY NO.3 & NORTHERN AREA OF VIETNAM	PACKAGE:	
ORIENTAL CONSULTANTS CO., LTD NEXCO EAST ENGINEERING CO., LTD NIPPON KOEI CO., LTD TRANSPORTATION RESEARCH INSTITUTE CO., LTD LANDTEC JAPAN INC.	TITLE	NAME	SIGNATURE	DATE	MINISTRY OF TRANSPORT	DRAWING TITLE: LAYOUT PLAN OF ROADSIDE EQUIPMENT & COMMUNICATION DUCT (KM 153+250 ~ KM 156+250, HA NOI - BAC NINH EXP.)	DRAWING No.: IX. 1 - 11	
	PREPARED BY						SHEET No.: Sheet of	Rev:
	CHECKED BY							
	APPROVED BY					SCALE: 1/4000		

TO LANG SON

TO HA NOI



*1 M3 Chamber which are drawn herein have divergence exits.

CONSULTANT					SOCIALIST REPUBLIC OF VIETNAM	ITS INTEGRATION PROJECT ON NEW NATIONAL HIGHWAY NO.3 & NORTHERN AREA OF VIETNAM	PACKAGE:	
ORIENTAL CONSULTANTS CO., LTD NEXCO EAST ENGINEERING CO., LTD NIPPON KOEI CO., LTD TRANSPORTATION RESEARCH INSTITUTE CO., LTD LANDTEC JAPAN INC.	TITLE	NAME	SIGNATURE	DATE	MINISTRY OF TRANSPORT	DRAWING TITLE: LAYOUT PLAN OF ROADSIDE EQUIPMENT & COMMUNICATION DUCT (KM 156+250 ~ KM 157+750, HA NOI - BAC NINH EXP.)	DRAWING No.: IX. 1 - 12	
	PREPARED BY						SHEET No.: Sheet of	Rev:
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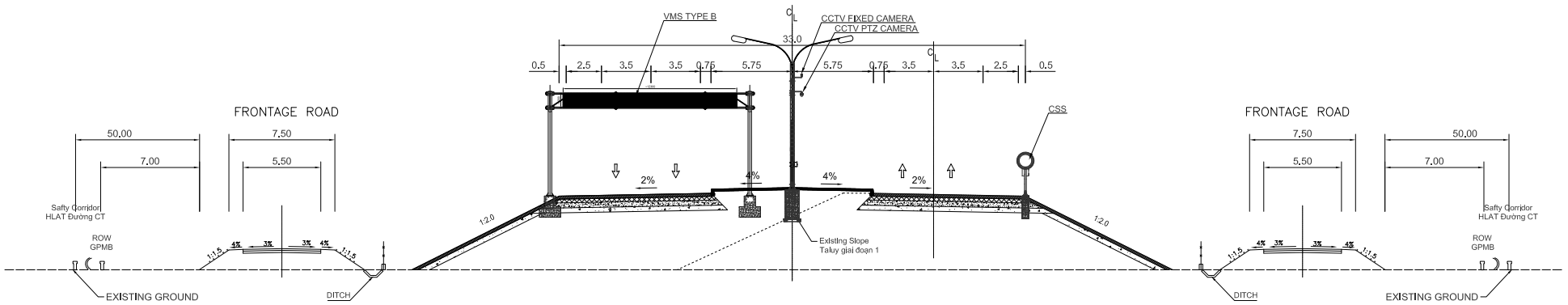
TYPICAL CROSS SECTION



CONSULTANT					SOCIALIST REPUBLIC OF VIETNAM	ITS INTEGRATION PROJECT ON NEW NATIONAL HIGHWAY NO.3 & NORTHERN AREA OF VIETNAM	PACKAGE:	
ORIENTAL CONSULTANTS CO., LTD NEXCO EAST ENGINEERING CO., LTD NIPPON KOEI CO., LTD TRANSPORTATION RESEARCH INSTITUTE CO., LTD LANDTEC JAPAN INC.	TITLE	NAME	SIGNATURE	DATE	MINISTRY OF TRANSPORT	DRAWING TITLE: TYPICAL CROSS SECTION OF EQUIPMENT ARRANGEMENT OF HA NOI - BAC NINH EXP.	DRAWING No.: IX. 2 - 01	
	PREPARED BY						SHEET No.: Sheet of	Rev:
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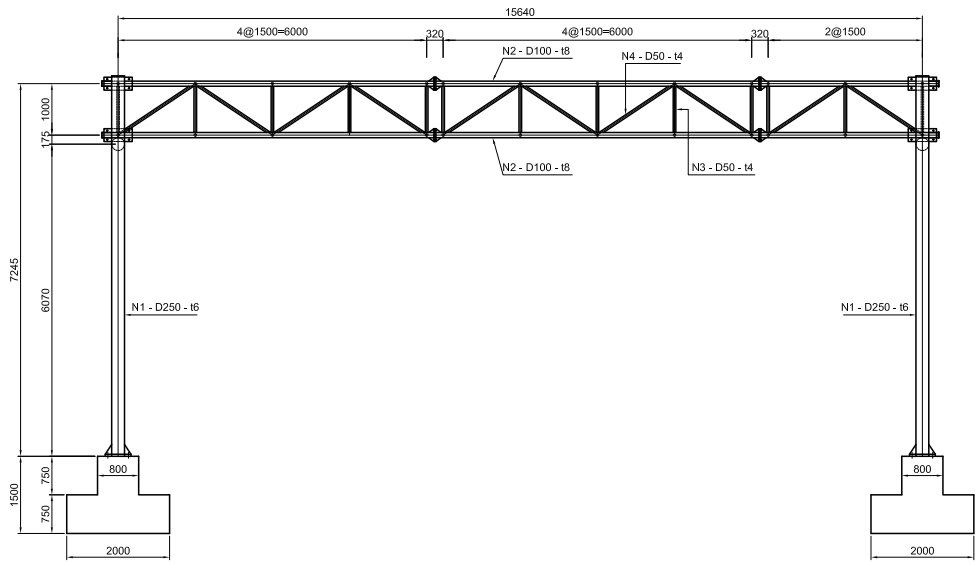
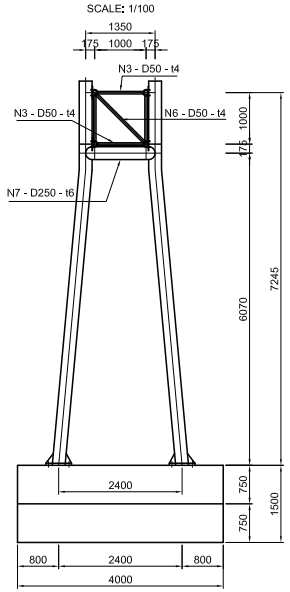
MAIN VIEW

SCALE: 1/100



SIDE VIEW

SCALE: 1/100



GENERAL VIEW

SCALE: 1/300

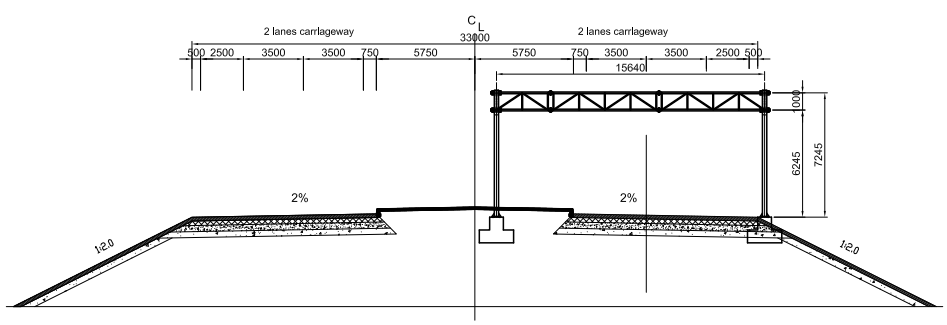


TABLE OF QUANTITY

Element	Type	Weight of 1 element	Number of element	Total weight	Notes
	(mm)	(kg)	(items)	(kg)	
N1	Tube D250 t=6 L=7494	270.57	4	1082.27	Main column (upper part)
N2	Tube D100 t=8 L=16270	295.31	4	1181.26	Top chord, Bottom chord
N3	Tube D50 t=4 L=1000	4.54	52	235.96	Vertical web bar
N4	Tube D50 t=5 L=1803	10.00	40	400.18	Diagonal web bar
N6	Tube D50 t=5 L=1414	7.85	13	102.00	Diaphragm
N7	Tube D250 t=6 L=1350	48.74	2	97.48	Diaphragm
Total steel				3099.15	
Concrete M200				16.80m3	Assumed

NOTES:

1. Dimensions are in millimeter.
2. Structural steel conforms ASTM A-709M Grade 250 or equivalence with:
   Yield strength: Fy = 250 MPa
   Tensile strength: Fu = 400 MPa
3. Concrete structure equivalence with:
   Concrete strength: Fc' = 18Mpa
   Reinforcing Bar (CB300-II) : Yield strength: Fy = 300 MPa
   Tensile strength: Fu = 450 MPa
4. The depth of foundation is just an estimated value.
   The final depth of foundation shall be based on the real soil condition.
   These structure should be redesigned to meet site condition.
5. In case without any recommendation about zincing in details
   all metal member exposed to weather or soil must be zinced
   with amouth of 500g/m2

CONSULTANT					SOCIALIST REPUBLIC OF VIETNAM	ITS INTEGRATION PROJECT ON NEW NATIONAL HIGHWAY NO.3 & NORTHERN AREA OF VIETNAM	PACKAGE:
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	PREPARED BY					SCALE: varied	SHEET No.: Sheet of / Rev:
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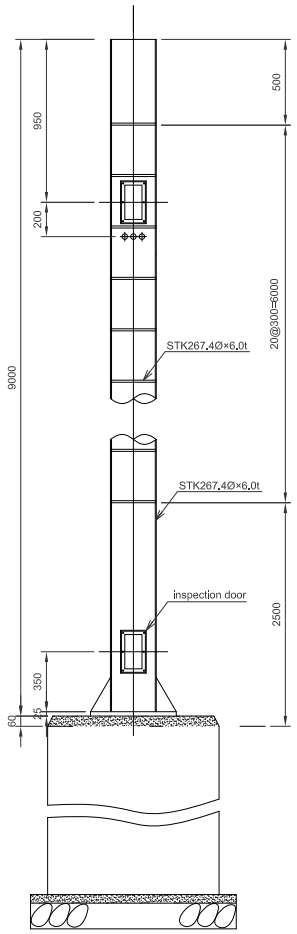
SUPPORT POLE FOR CAMERA

SUPPORT POLE FOR CAMERA scale:1/30



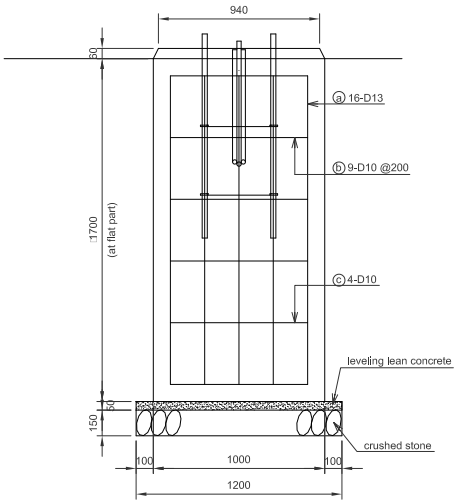
Volume table of support pole

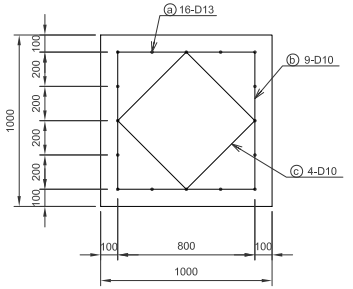
	Material	Dimension	Weight (kg)
Pole	Steel	267.4Φx6t	348.3
Step	Steel	RB13Φ	9.4
Base	Steel	25t	49.2
Base	Steel	12t	9.0
		Total weight	416

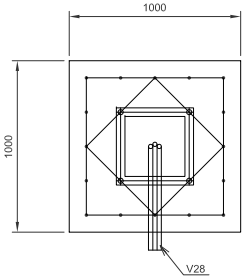
Volume table of foundation

Items	class	unit	volume		remarks
			at flat part	at embankment	
concrete	M200	m³	1.700	2.200	
formwork		m²	6.800	8.800	
rebar	D13	kg	28.66	36.62	
rebar	D10	〃	22.87	26.71	
anchor bolt	M30x1000lx4	set	1	1	
normal bend	VE28	m	4.5	4.5	1.5mx3
crushed stone		m³	0.216	0.216	
leveling lean concrete		m³	0.072	0.072	
excavation		m³	7.600	8.491	
backfill		m³	5.612	6.220	
disposal of waste soil		m³	1.988	2.272	

FOUNDATION scale:1/30







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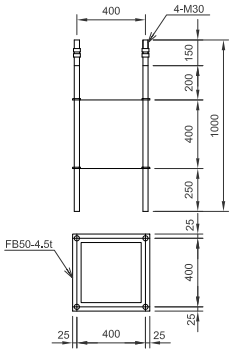

Volume table of rebar at flat part

type	shape	length (m)	volume	weight (kg)
a	D13	1.80	16	28.66
b	D10	3.43	9	17.29
c	D10	2.49	4	5.58

Volume table of rebar at embankment part

type	shape	length (m)	volume	weight (kg)
a	D13	2.30	16	36.62
b	D10	3.43	11	21.13
c	D10	2.49	4	5.58

*1 Structural steel conforms ASTM A-709M Grade 250 or equivalence with:
Yield strength: Fy = 250 MPa
Tensile strength: Fu = 400 MPa
*2 Concrete structure equivalence with:
Concrete strength: Fc' = 18Mpa
Reinforcing Bar (CB300-II) : Yield strength: Fy = 300 MPa
Tensile strength: Fu = 450 MPa
*3 In case without any recommendation about zincing in details, all metal members exposed to weather or soil must be zinced with amount of 550g/m².
*4 This drawing be based on NEXCO(Japan) drawings.
*5 These structures should be redesigned to meet site condition.

CONSULTANT					SOCIALIST REPUBLIC OF VIETNAM	ITS INTEGRATION PROJECT ON NEW NATIONAL HIGHWAY NO.3 & NORTHERN AREA OF VIETNAM	PACKAGE:
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	PREPARED BY					SCALE: 1/30	SHEET No.: Sheet of / Rev:
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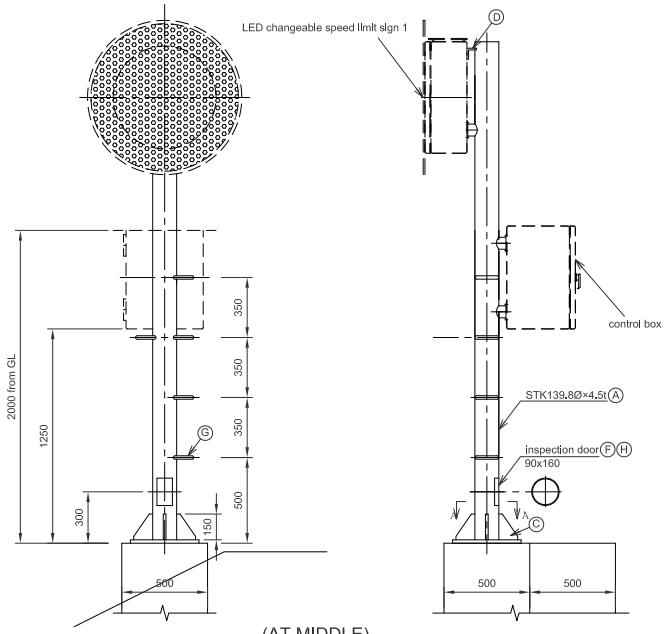
	APPROVED BY						

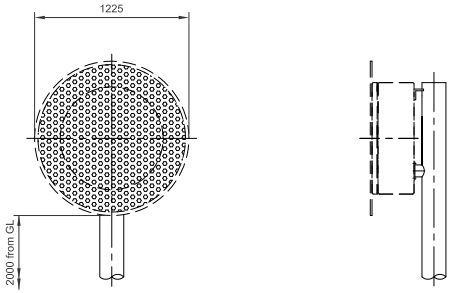
SUPPORT POLE FOR CHANGEABLE SPEED LIMIT SIGN

SUPPORT POLE FOR CHANGEABLE SPEED LIMIT SIGN scale:1/30

(AT ENDS)



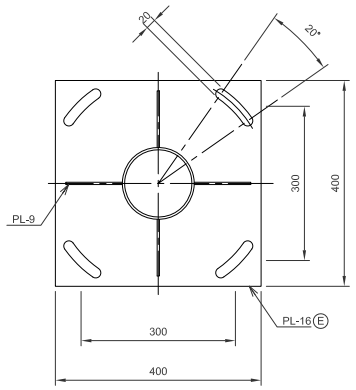
(AT MIDDLE)



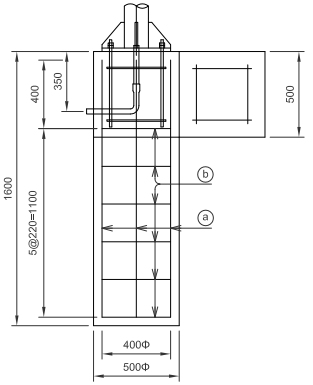
Volume table of support pole

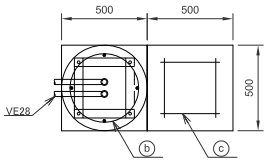
	Materlal	Dlmenslon	Welght (kg)	
			at ends	at mlddle
Ⓐ	Steel	139.8Φx4.5t	47.0	42.0
Ⓒ	Steel	9t	18.0	16.0
Ⓓ	Steel	6t	1.4	1.4
Ⓔ	Steel	16t	20.0	20.0
Ⓕ	Steel	3.2t	1.4	1.4
Ⓖ	Steel	RB13Φ	4.0	4.0
Ⓗ	Steel	FB50x6t	1.0	1.0
		Total weight	95	87

BASE PLATE SCALE:1/10

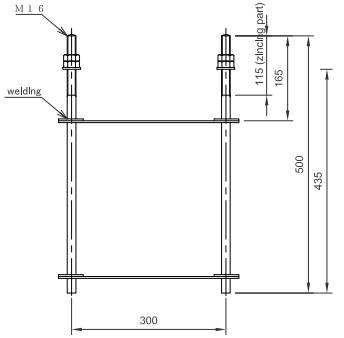


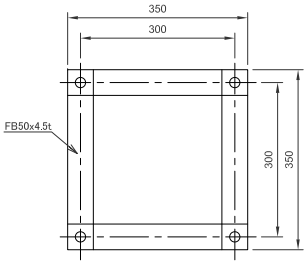
FOUNDATION scale:1/30





ANCHOR BOLT scale:1/10





Rebar processing table of foundation

type	shape	volume at embankment
a	D13	4
b	D10	6
c	D13	12

*c Is used for maintenance.

Volume table of foundation

Items	class	unit	volume at embankment
concrete		m³	0.466
rebar	D13	kg	9.719
rebar	D10	〃	5.860
formwork		m²	1.5
dlsposal of waste soll		m³	0.316
anchor bolt	16Φx500lx4	set	1
normal bend	VE28	plpe	2

*1 Structural steel conforms ASTM A-709M Grade 250 or equlvalence wlth:
Yleld strength: Fy = 250 MPa
Tensile strength: Fu = 400 MPa
*2 Concrete structure equlvalence wlth:
Concrete strength: Fc' = 18Mpa
Reinforcing Bar (CB300-II) : Yield strength: Fy = 300 MPa
Tensile strength: Fu = 450 MPa
*3 In case without any recommendation about zincing in details, all metal members exposed to weather or soil must be zinced with amount of 550g/m².
*4 This drawing be based on NEXCO(Japan) drawings.
*5 These structures should be redesigned to meet site condition.

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	PREPARED BY						SHEET No.: Sheet of	Rev:
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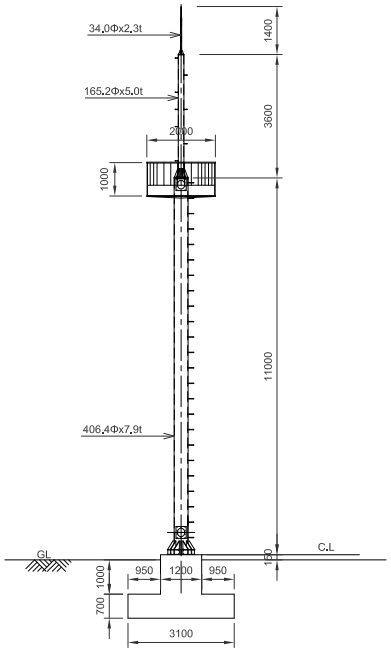
	APPROVED BY							

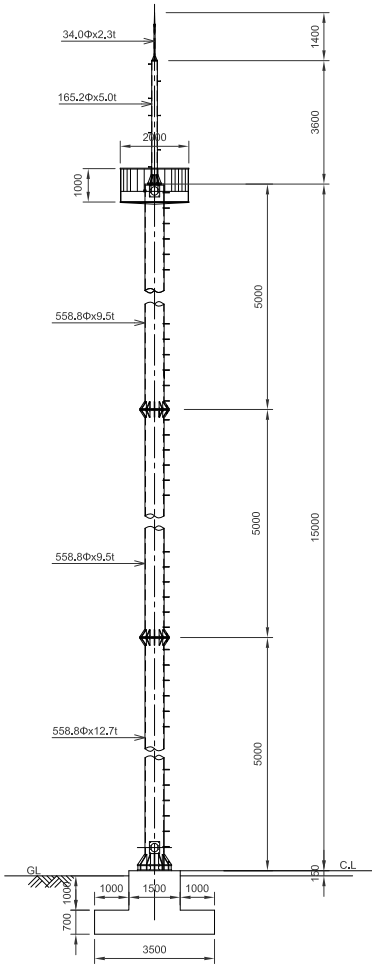
RADIO COMMUNICATION ANTENNA TOWER

RADIO COMMUNICATION TOWER scale:1/150

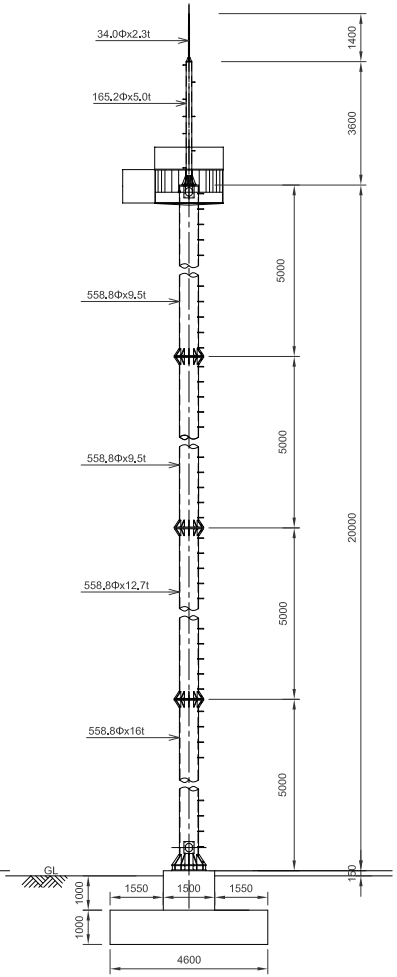
TYPE 1
(11m of pole)



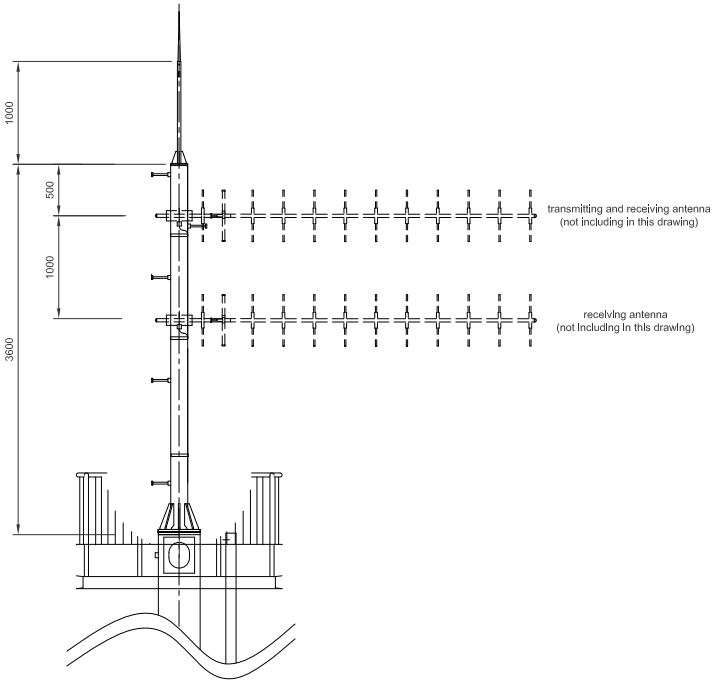
TYPE 2
(15m of pole)



TYPE 3
(20m of pole)



SUPPORT FOR ANTENNA scale:1/150



Volume table for TYPE 1

	Material	Dimension	Volume	Remarks
Pole	Steel	406.4Φx7.9t	855kg	
	Steel	165.2Φx5.0t	75kg	
	Steel	34.0Φx2.3t	3kg	
Foundation	RC	3100x3100	8.5m³	

Volume table for TYPE 2

	Material	Dimension	Volume	Remarks
Pole	Steel	558.8Φx12.7t	855kg	
	Steel	558.8Φx9.5t	1290kg	
	Steel	165.2Φx5.0t	75kg	
	Steel	34.0Φx2.3t	3kg	
Foundation	RC	3500x3500	11.5m³	

Volume table for TYPE 3

	Material	Dimension	Volume	Remarks
Pole	Steel	558.8Φx16t	1070kg	
	Steel	558.8Φx12.7t	855kg	
	Steel	558.8Φx9.5t	1290kg	
	Steel	165.2Φx5.0t	75kg	
	Steel	34.0Φx2.3t	3kg	
Foundation	RC	3100x3100	24.0m³	

*1 Structural steel conforms ASTM A-709M Grade 250 or equivalence with:
Yield strength: Fy = 250 MPa
Tensile strength: Fu = 400 MPa
*2 Concrete structure equivalence with:
Concrete strength: Fc' = 18Mpa
Reinforcing Bar (CB300-II) : Yield strength: Fy = 300 MPa
Tensile strength: Fu = 450 MPa

*3 In case without any recommendation about zincing in details, all metal members exposed to weather or soil must be zinced with amount of 550g/m².
*4 This drawing be based on NEXCO(Japan) drawings.
*5 These structures should be redesigned to meet site condition.

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	PREPARED BY					SCALE: Various	SHEET No.: Sheet of / Rev:
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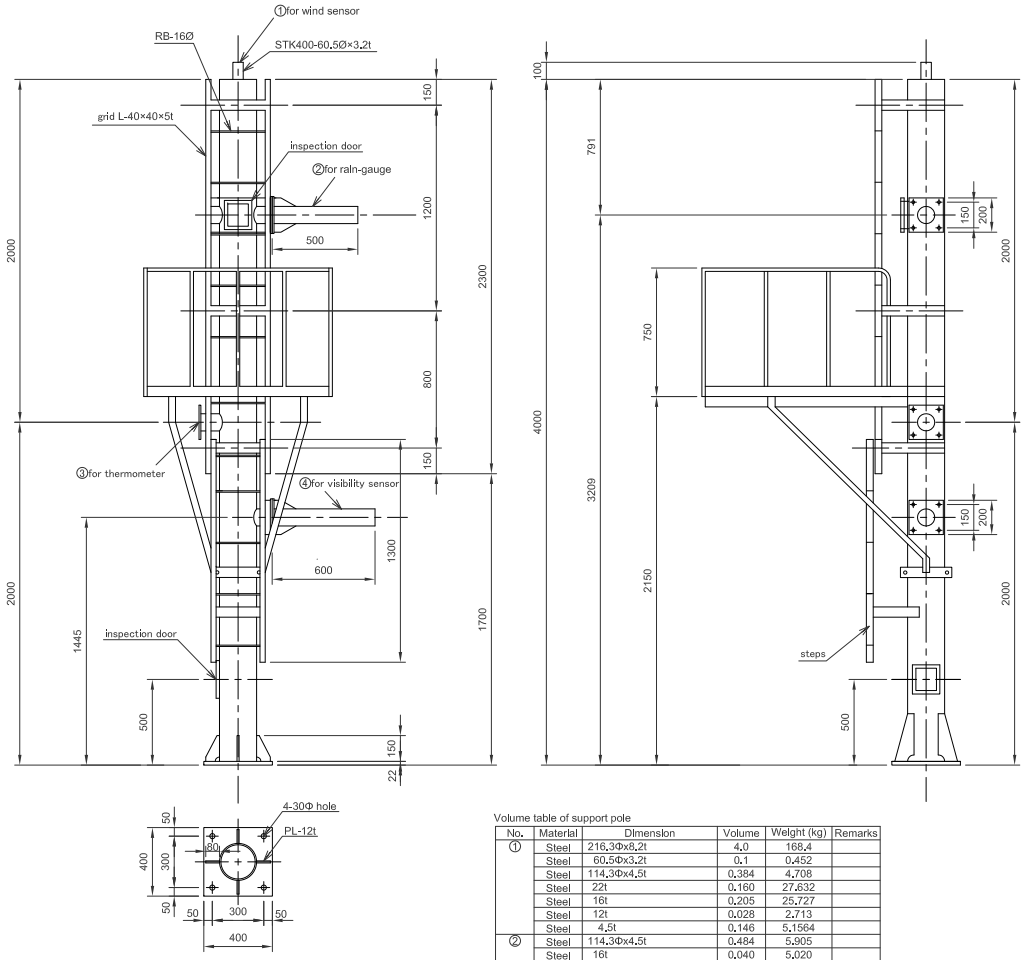
SUPPORT POLE FOR WEATHER SENSOR

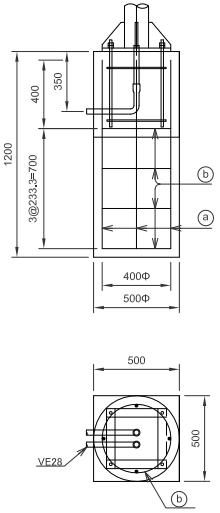
SUPPORT POLE FOR WEATHER SENSOR scale:1/30



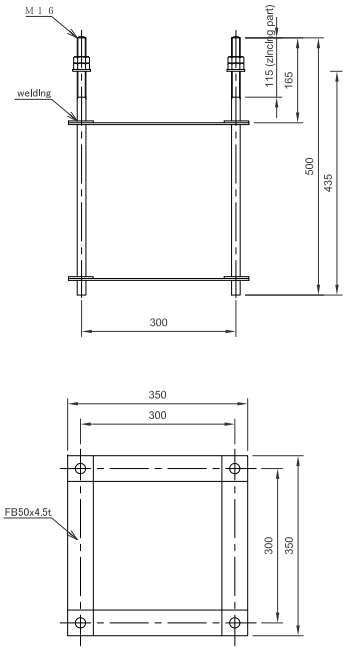
Volume table of support pole

No.	Material	Dimension	Volume	Weight (kg)	Remarks
①	Steel	216.3Φx8.2t	4.0	168.4	
	Steel	60.5Φx3.2t	0.1	0.452	
	Steel	114.3Φx4.5t	0.384	4.708	
	Steel	22t	0.160	27.632	
	Steel	16t	0.205	25.727	
	Steel	12t	0.028	2.713	
	Steel	4.5t	0.146	5.1564	
②	Steel	114.3Φx4.5t	0.484	5.905	
	Steel	16t	0.040	5.020	
	Steel	12t	0.035	3.297	
④	Steel	114.3Φx4.5t	0.584	7.125	
	Steel	16t	0.040	5.020	
	Steel	12t	0.035	0.339	
stage		50x50x6t	9.100	40.313	
		FB-50-6t	3.900	4.9842	
		XG-21	1.000	13.70	
		SGP-20A	14.0	23.52	
steps		40x40x5t	7.2	21.240	
		RB-16Φ	3.64	3.860	
			Total weight	369kg	

FOUNDATION scale:1/30



ANCHOR BOLT scale:1/10



Rebar processing table of foundation

type	shape	volume in flat part
a	D13	4
b	D10	4

Volume table of foundation

items	class	unit	volume in flat part
concrete		m³	0.262
rebar	D13	kg	4.378
rebar	D10	〃	3.907
formwork		m²	1.0
disposal of waste soil		m³	0.236
anchor bolt	16Φx500lx4	set	1
normal bend	VE28	pipe	2

*1 Structural steel conforms ASTM A-709M Grade 250 or equivalence with:
Yield strength: Fy = 250 MPa
Tensile strength: Fu = 400 MPa
*2 Concrete structure equivalence with:
Concrete strength: Fc' = 18Mpa
Reinforcing Bar (CB300-II): Yield strength: Fy = 300 MPa
Tensile strength: Fu = 450 MPa
*3 In case without any recommendation about zincing in details, all metal members exposed to weather or soil must be zinced with amount of 550g/m².
*4 This drawing be based on NEXCO(Japan) drawings.
*5 These structures should be redesigned to meet site condition.

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	PREPARED BY					SCALE: Various	SHEET No.: Sheet of	Rev:
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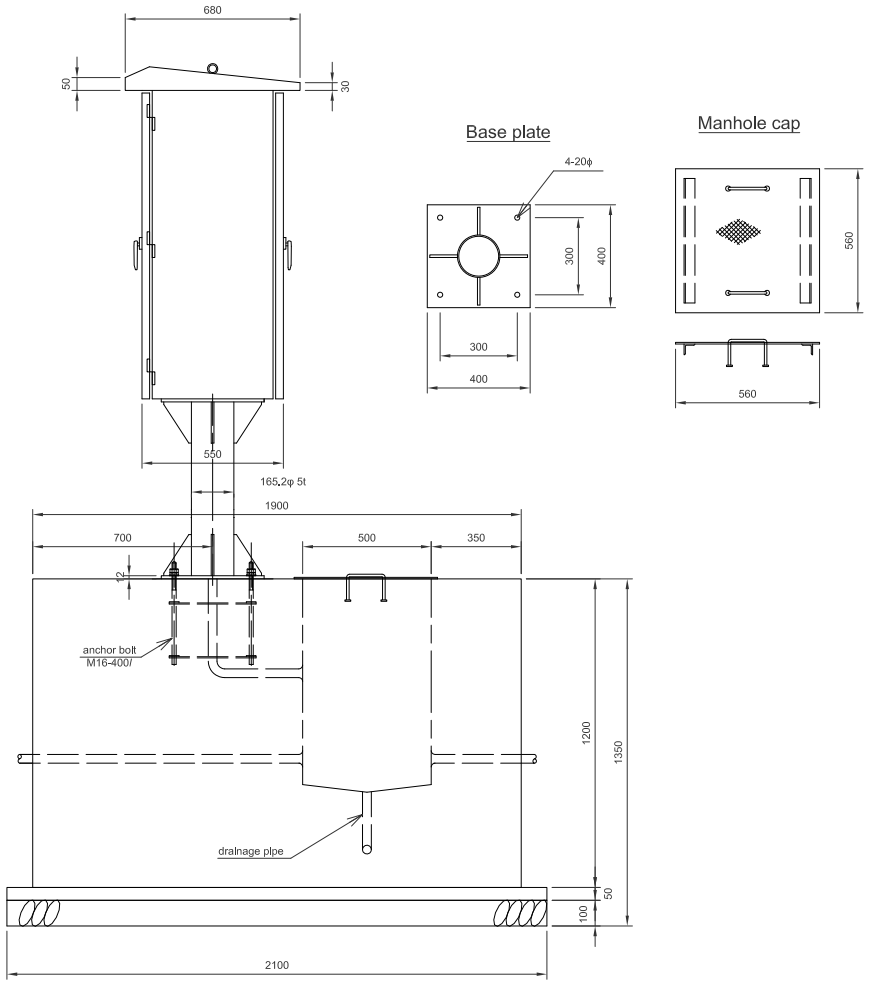
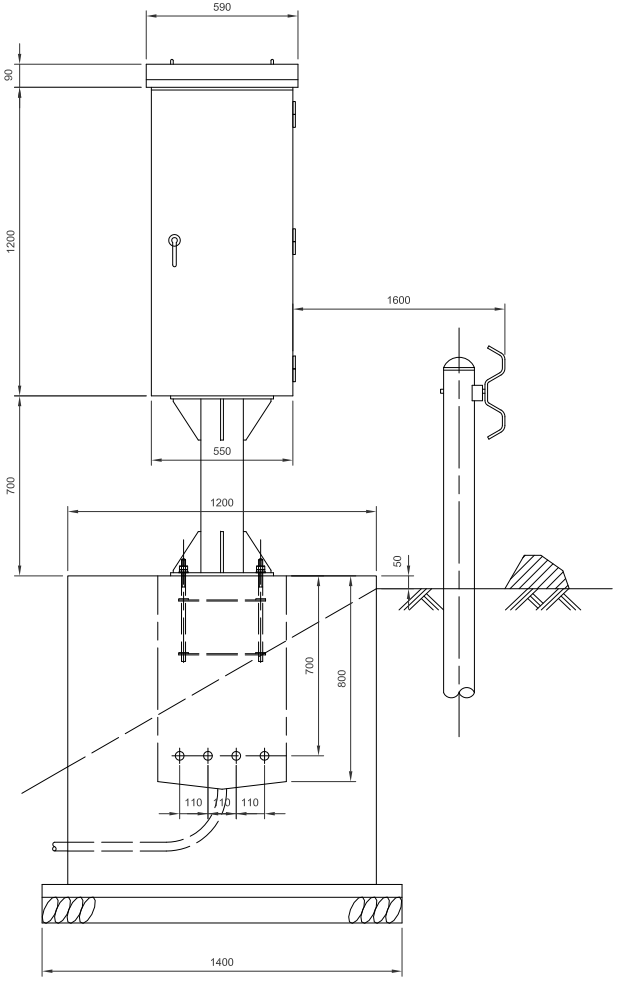
HOUSING BOX FOR WEATHER SENSOR

STANCE FIGURE scale:1/20

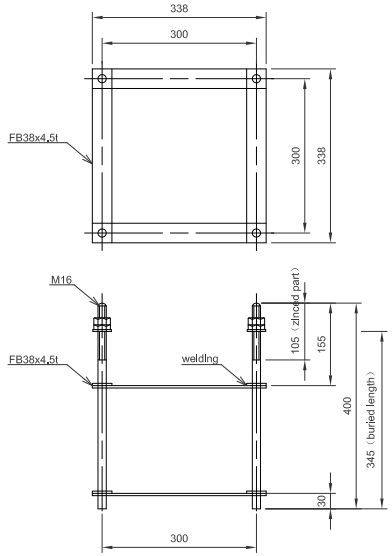


Base plate

Manhole cap



ANCHOR BOLT scale:1/10



Volume table

	Material	Dimension	Volume
Box	Steel	1290x590	105 kg
Pole	Steel	165.2Φx5t	14 kg
Base plate	Steel	400x400	20 kg
Manhole cap	Steel	560x560	15 kg
Anchor bolt		M16-400l	30 kg
Concrete			2.6m³

*1 Structural steel conforms ASTM A-709M Grade 250 or equivalence with:
Yield strength: Fy = 250 MPa
Tensile strength: Fu = 400 MPa
*2 Concrete structure equivalence with:
Concrete strength: Fc' = 18Mpa
Reinforcing Bar (CB300-II) : Yield strength: Fy = 300 MPa
Tensile strength: Fu = 450 MPa
*3 In case without any recommendation about zincing in details, all metal members exposed to weather or soil must be zinced with amount of 550g/m².
*4 This drawing be based on NEXCO(Japan) drawings.
*5 These structures should be redesigned to meet site condition.

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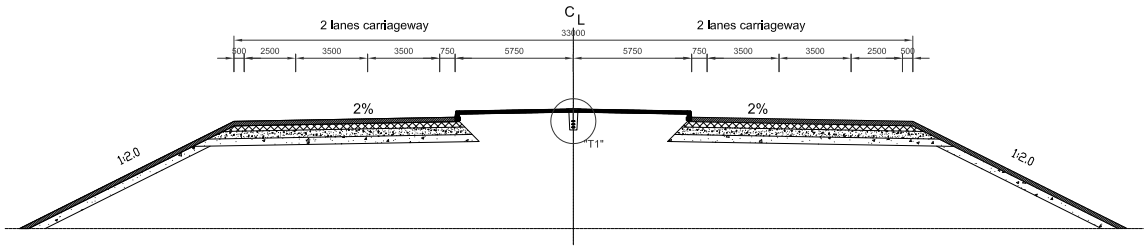
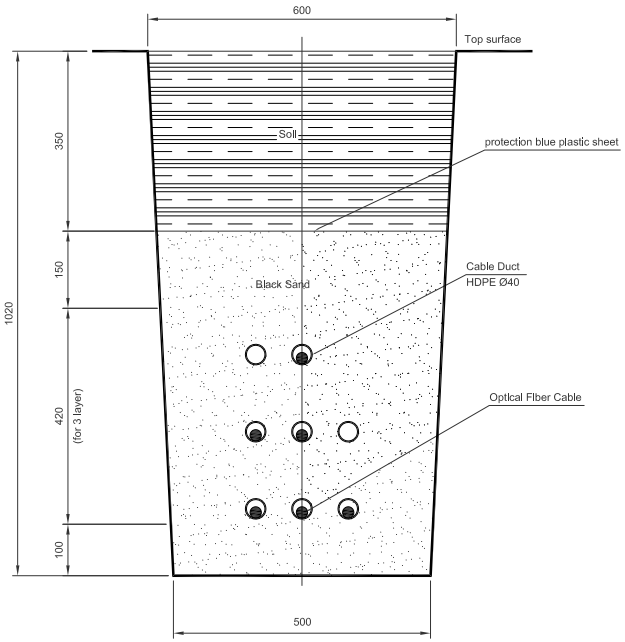
TYPICAL CROSS SECTION OF COMMUNICATION DUCT(TYPE T1) IN EARTHWORK SECTION

ARRANGEMENT OF COMMUNICATION DUCT IN MEDIAN (T1 TYPE)



T1 DETAIL scale:1/10



PROTECTION BLUE PLASTIC SHEET scale:1/20

Volume table of T1 Duct (for 1 kilometer in length)

	Volume
Disposal soil	561 m³
Black sand	357 m³
Backfill soil	204 m³
Protection blue plastic sheet	500 m²

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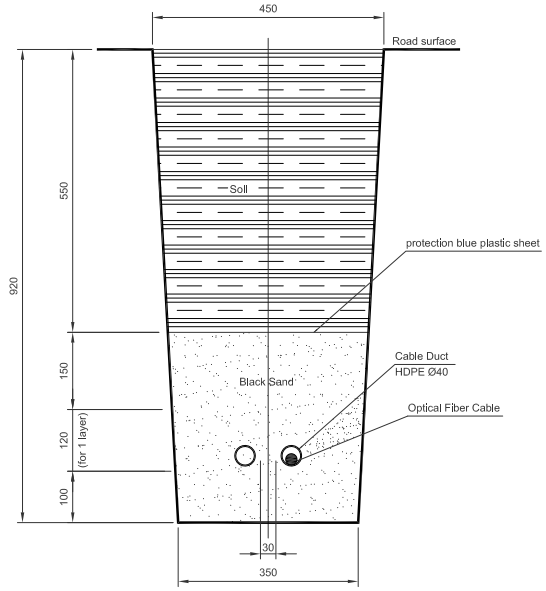
	PREPARED BY						SHEET No.: Sheet of	Rev:
	CHECKED BY					SCALE: varied		
	APPROVED BY							

TYPICAL CROSS SECTION OF COMMUNICATION DUCT(TYPE T3) IN EARTHWORK SECTION

COMMUNICATION DUCT TYPE T3 DETAIL scale:1/10

(USE FOR COMMUNICATION DUCT SPREAD FOR ROADSIDE EQUIPMENT)



Volume table of T3 Duct (for 1 kilometer in length)

	Volume
Disposal soil	368 m³
Black sand	137 m³
Backfill soil	231 m³
Protection blue plastic sheet	350 m²

PROTECTION BLUE PLASTIC SHEET scale:1/20

CONSULTANT					SOCIALIST REPUBLIC OF VIETNAM	ITS INTEGRATION PROJECT ON NEW NATIONAL HIGHWAY NO.3 & NORTHERN AREA OF VIETNAM	PACKAGE:	
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	PREPARED BY						SHEET No.: Sheet of	Rev:
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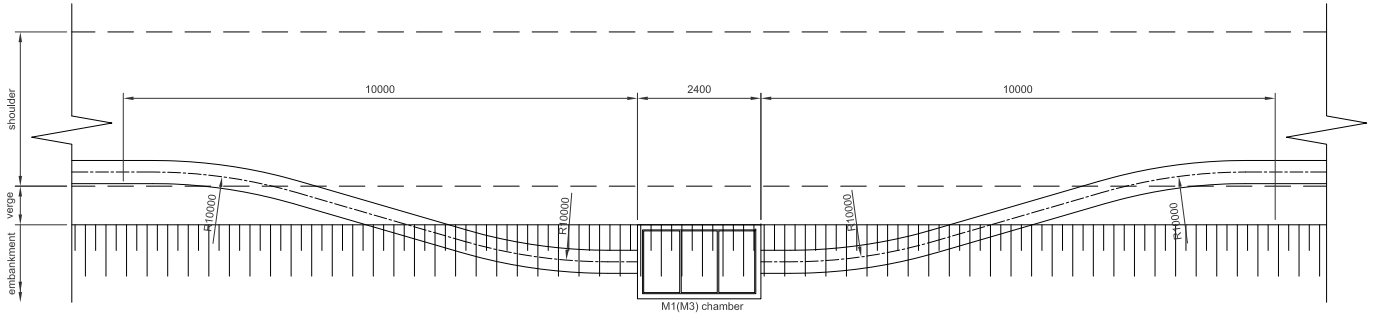
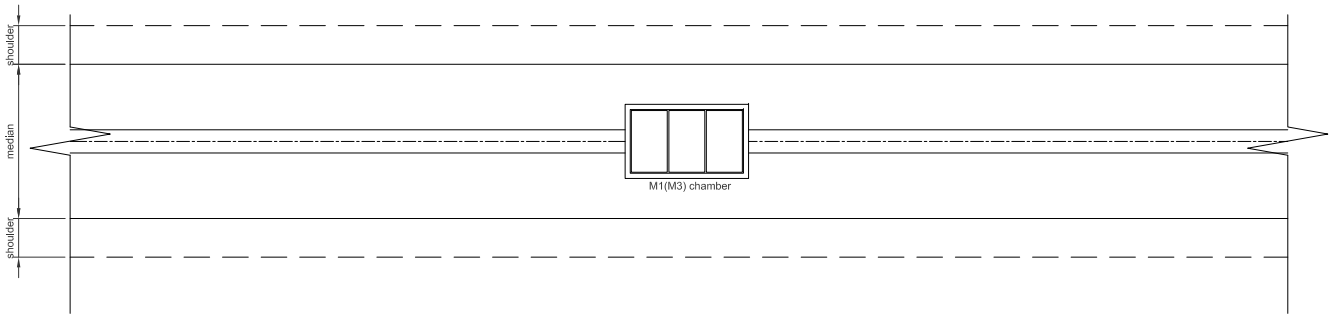
	APPROVED BY							

ARRANGEMENT OF COMMUNICATION DUCT AT CHAMBER (1)

CHAMBER FOR COMMUNICATION DUCT ON ROAD scale: 1/100



CHAMBER FOR COMMUNICATION DUCT ON MEDIAN scale: 1/100



CONSULTANT					SOCIALIST REPUBLIC OF VIETNAM	ITS INTEGRATION PROJECT ON NEW NATIONAL HIGHWAY NO.3 & NORTHERN AREA OF VIETNAM	PACKAGE:
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	PREPARED BY					SCALE: 1/100	SHEET No.: Sheet of / Rev:
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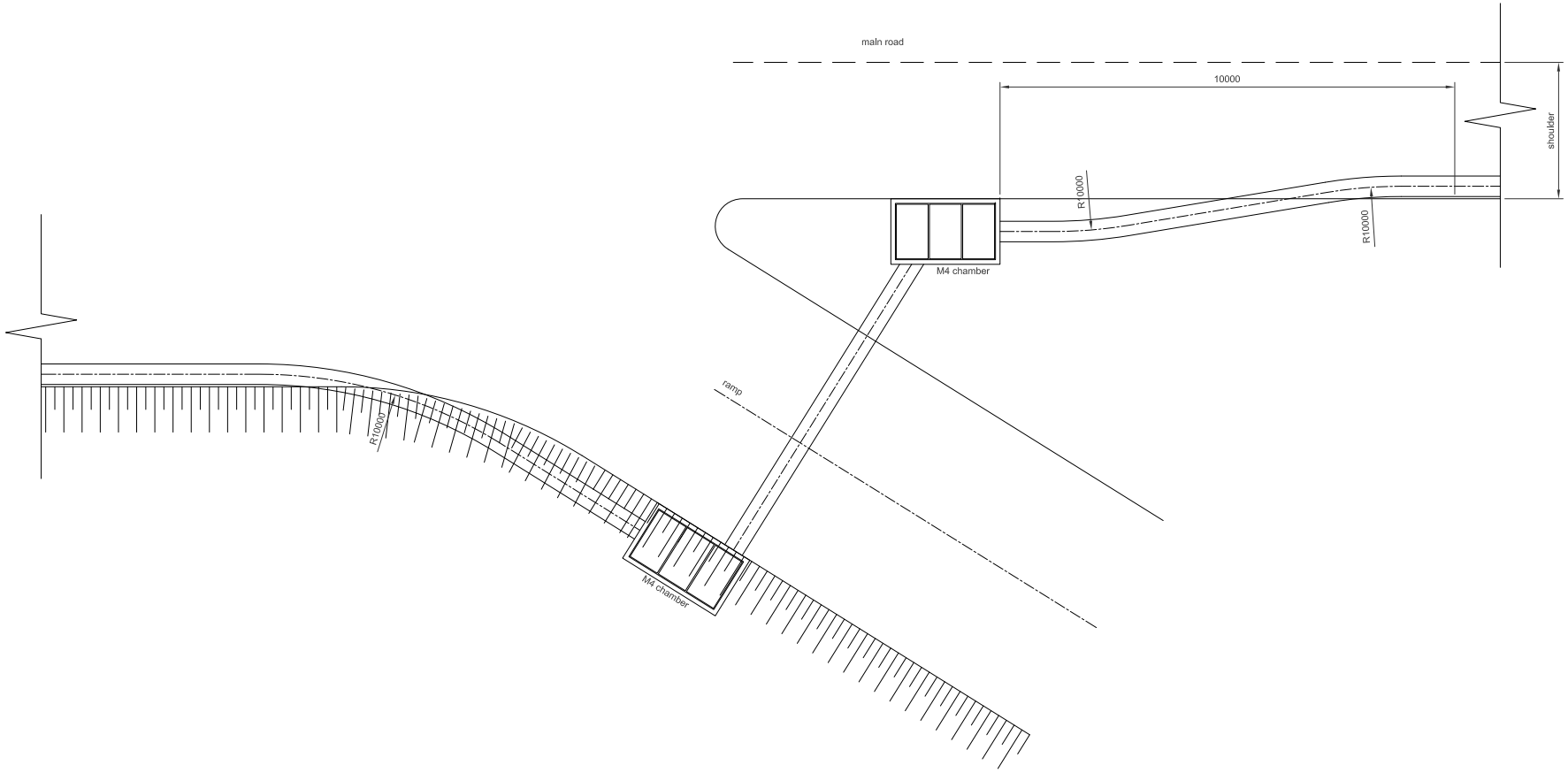
ARRANGEMENT OF COMMUNICATION DUCT AT CHAMBER (2)

CHAMBER FOR CHANGING DIRECTION OF COMMUNICATION DUCT ON ROAD scale: 1/100



CONSULTANT					SOCIALIST REPUBLIC OF VIETNAM	ITS INTEGRATION PROJECT ON NEW NATIONAL HIGHWAY NO.3 & NORTHERN AREA OF VIETNAM	PACKAGE:
ORIENTAL CONSULTANTS CO., LTD NEXCO EAST ENGINEERING CO., LTD NIPPON KOEI CO., LTD TRANSPORTATION RESEARCH INSTITUTE CO., LTD LANDTEC JAPAN INC.	TITLE	NAME	SIGNATURE	DATE	MINISTRY OF TRANSPORT	DRAWING TITLE: HA NOI - BAC NINH EXPRESSWAY ARRANGEMENT OF COMMUNICATION DUCT AT CHAMBER (2)	DRAWING No.: IX.3-04
	PREPARED BY					SCALE: 1/100	SHEET No.: Sheet of / Rev:
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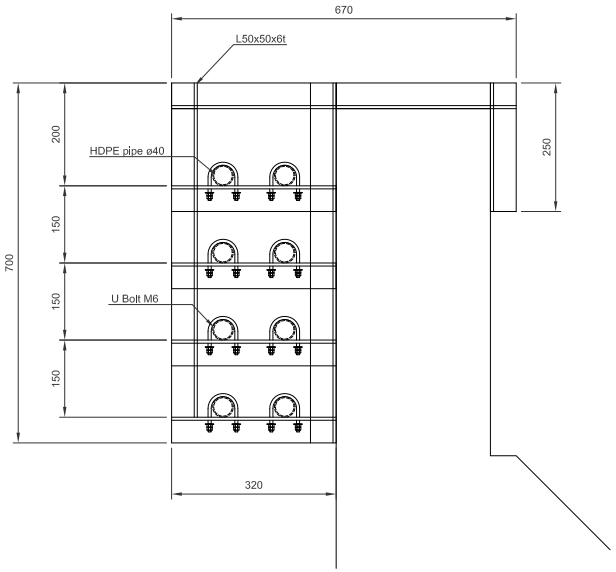
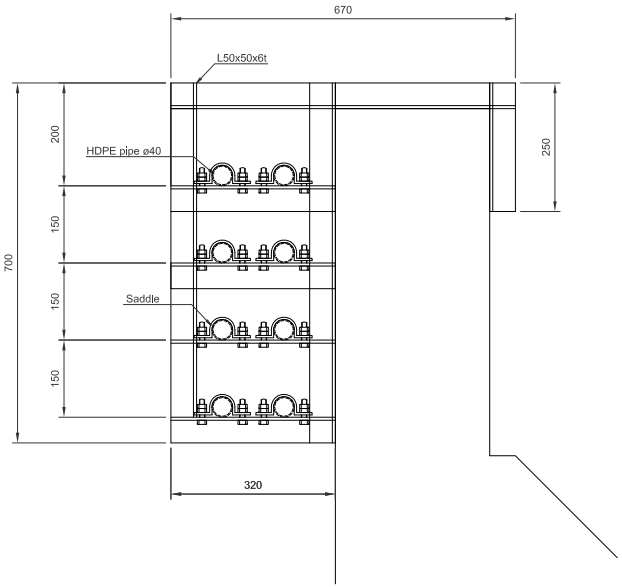
DETAIL OF COMMUNICATION DUCT (TYPE B1) ON BRIDGE

ARRANGEMENT OF COMMUNICATION DUCT ON BRIDGE (CROSS SECTION VIEW) scale:1/10

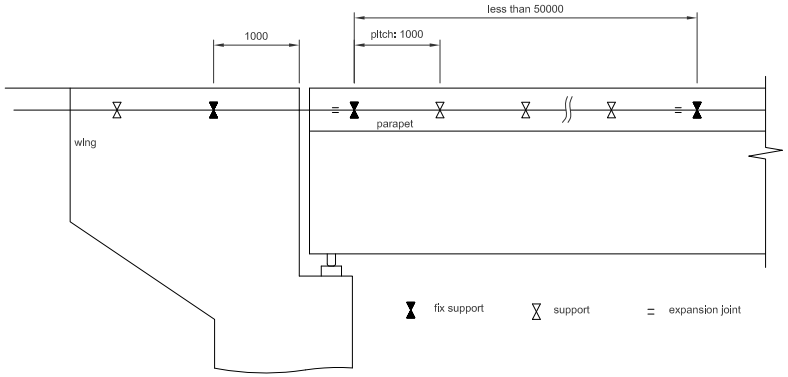
Support



Fix Support



ARRANGEMENT OF COMMUNICATION DUCT ON BRIDGE (SIDE VIEW)



Volume table of supporting rack(for 1 place)

	Weight(kg)
L50x50x6t	16

*1 Structural steel conforms ASTM A-709M Grade 250 or equivalent with the
Yield strength: Fy = 250 MPa
Tensile strength: Fu = 400 MPa
*2 Concrete structure equivalence with:
Concrete strength: F'c = 18 MPa;
Reinforcing Bar (CB300-II): Yield strength: Fy = 300 MPa;
Tensile strength: Fu = 450 MPa;
commendation about zincing in details, all metal members be exposed to weather or soil must be zinced with amount of 550g/m².
*4 This drawing be based on NEXCO(Japan) drawings.
*5 These structures should be redesigned to meet site condition.

CONSULTANT					SOCIALIST REPUBLIC OF VIETNAM	ITS INTEGRATION PROJECT ON NEW NATIONAL HIGHWAY NO.3 & NORTHERN AREA OF VIETNAM	PACKAGE:	
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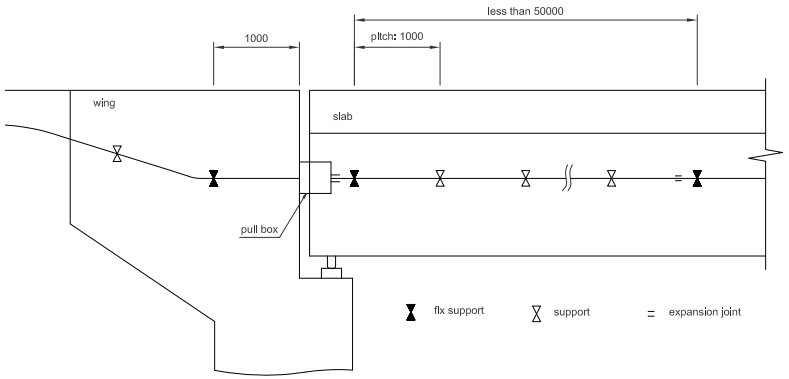
	PREPARED BY						SHEET No.: Sheet of	Rev:
	CHECKED BY					SCALE: varied		
	APPROVED BY							

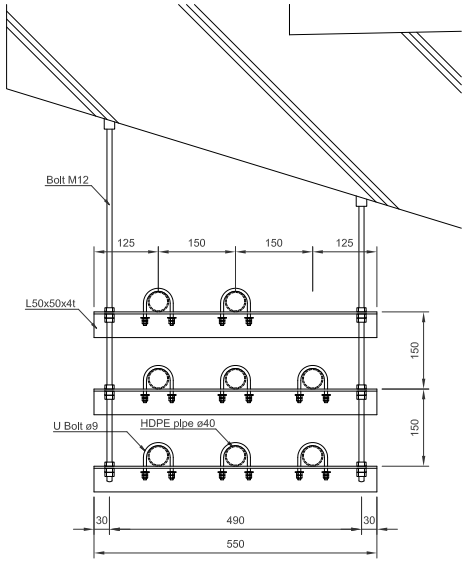
DETAIL OF COMMUNICATION DUCT (TYPE B2) ON BRIDGE (1)

ARRANGEMENT OF COMMUNICATION DUCT ON BRIDGE (SIDE VIEW)

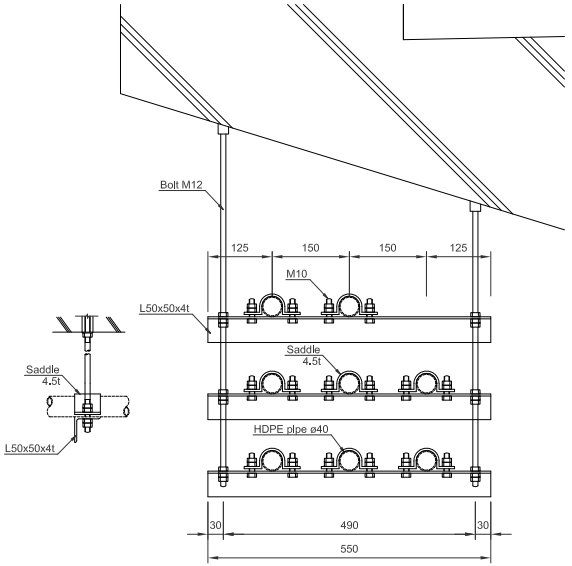


"A" DETAIL SCALE: 1/10

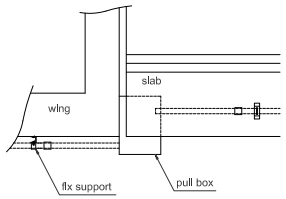
Support



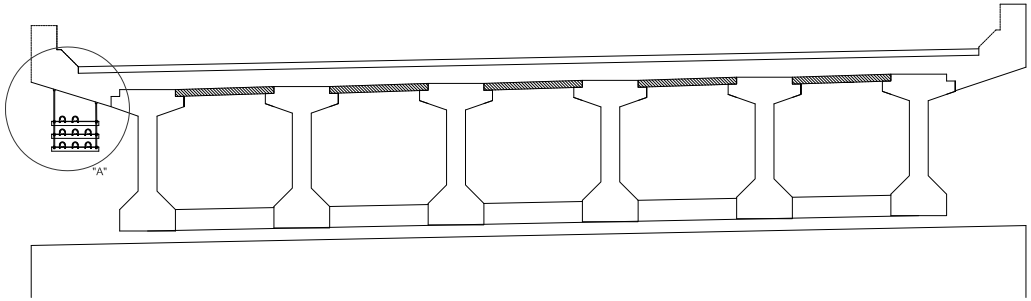
Fix Support

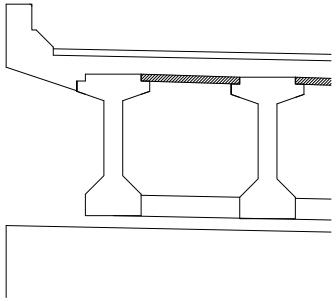


ARRANGEMENT OF COMMUNICATION DUCT AT JOINT AREA (PLAN VIEW)



ARRANGEMENT OF COMMUNICATION DUCT ON BRIDGE (CROSS SECTION VIEW)





Volume table of supporting rack B2(for 1 place)

	Weight(kg)
L50x50x4t	6
Anchor bolt M12	1.3

*1 Structural steel conforms ASTM A-709M Grade 250 or equivalence with:
Yield strength: Fy = 250 MPa
Tensile strength: Fu = 400 MPa
*2 Concrete structure equivalence with:
Concrete strength: F'c = 18 MPa;
Reinforcing Bar (CB300-II): Yield strength: Fy = 300 MPa;
Tensile strength: Fu = 450 MPa;
*3 In case without any recommendation about zincing in details, all metal members be exposed to weather or soil must be zinced with amount of 550g/m².
*4 This drawing be based on NEXCO(Japan) drawings.
*5 These structures should be redesigned to meet site condition.

CONSULTANT					SOCIALIST REPUBLIC OF VIETNAM	ITS INTEGRATION PROJECT ON NEW NATIONAL HIGHWAY NO.3 & NORTHERN AREA OF VIETNAM	PACKAGE:	
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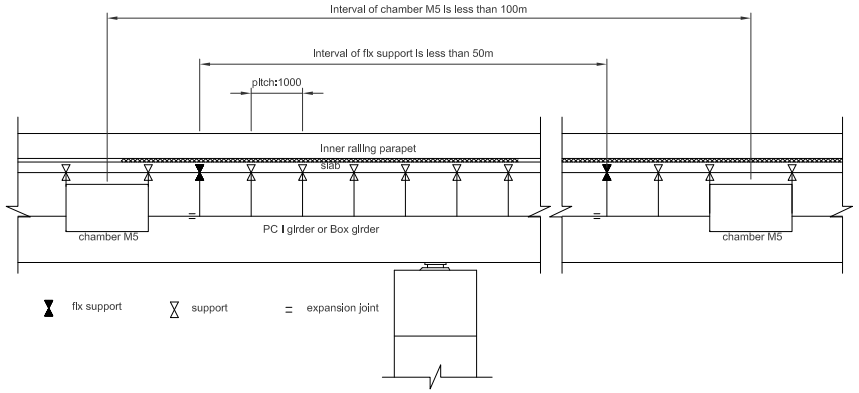
	APPROVED BY							

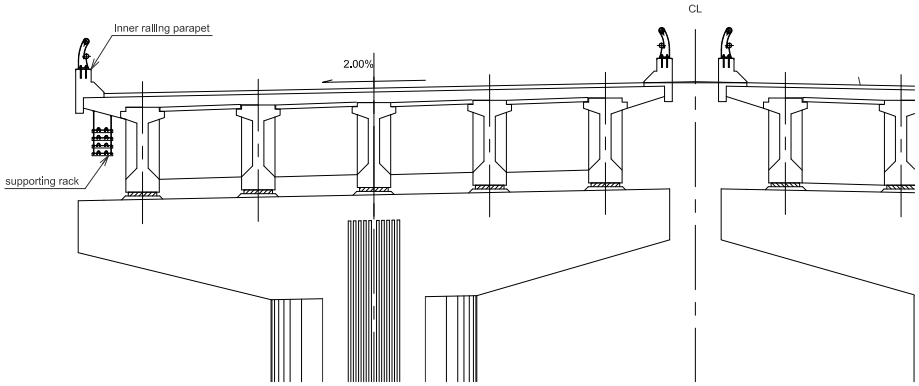
DETAIL OF COMMUNICATION DUCT (TYPE B2) ON BRIDGE(2)

SIDE VIEW



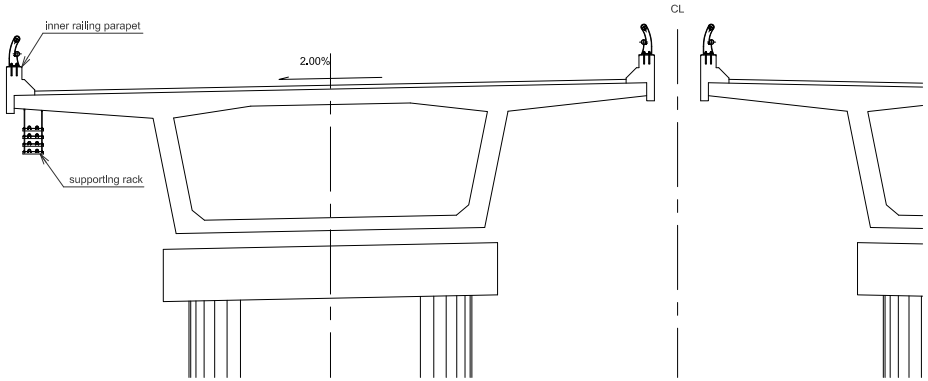
CROSS SECTION VIEW

(PC I girder section)



CROSS SECTION VIEW

(Box girder section)



*1 Structural steel conforms ASTM A-709M Grade 250 or equivalence with:
Yield strength: Fy = 250 MPa
Tensile strength: Fu = 400 MPa
*2 Concrete structure equivalence with:
Concrete strength: F'c = 18 MPa;
Reinforcing Bar (CB300-II): Yield strength: Fy = 300 MPa;
Tensile strength: Fu = 450 MPa;
*3 In case without any recommendation about zincing in details, all metal members be exposed to weather or soil must be zinced with amount of 550g/m².
*4 This drawing be based on NEXCO(Japan) drawings.
*5 These structures should be redesigned to meet site condition.

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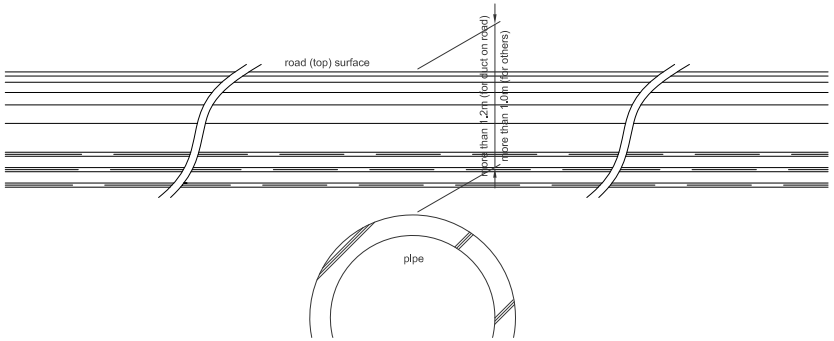
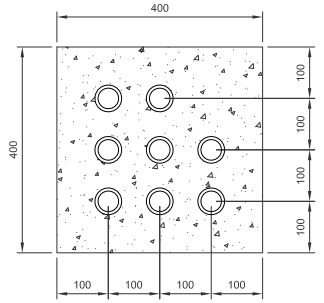
	APPROVED BY					SCALE: 1/100		

ARRANGEMENT OF COMMUNICATION DUCT IN BURIED OBJECT AREAS

ARRANGEMENT OF COMMUNICATION DUCT IN BURIED OBJECT AREA scale: 1/50
(WHEN EARTH COVERING LESS THAN 1.2M)



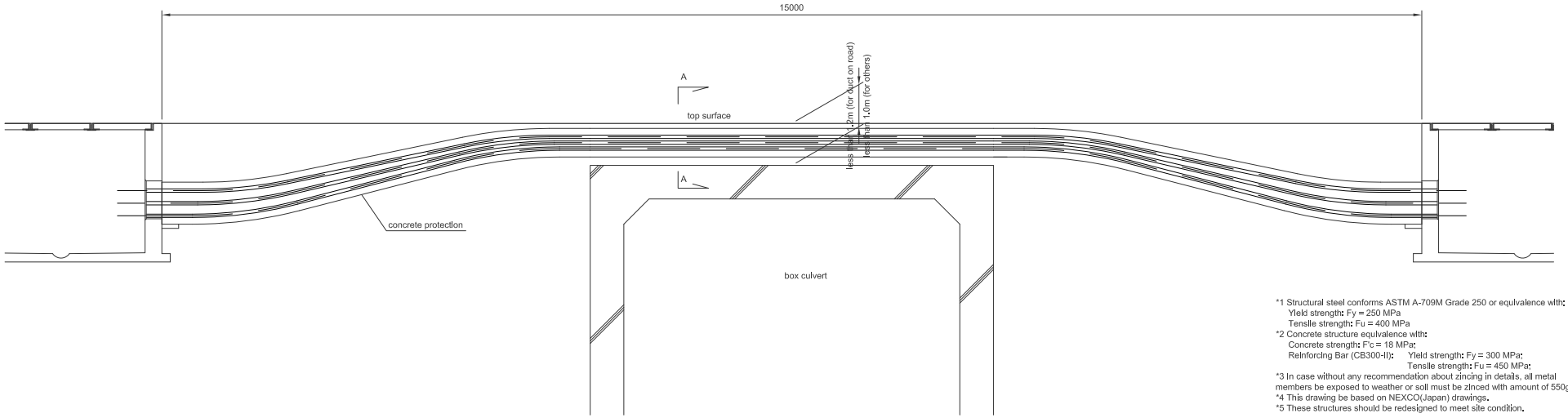
A-A SECTION scale: 1/10



Volume table of TYPE C1 (for 15 meters In length)

	Volume
Concrete	3.0 m³

ARRANGEMENT OF COMMUNICATION DUCT IN BURIED OBJECT AREA(TYPE C1) scale: 1/50
(WHEN EARTH COVERING MORE THAN 1.2M)



*1 Structural steel conforms ASTM A-709M Grade 250 or equivalence with:
Yield strength: Fy = 250 MPa
Tensile strength: Fu = 400 MPa
*2 Concrete structure equivalence with:
Concrete strength: F'c = 18 MPa;
Reinforcing Bar (CB300-II): Yield strength: Fy = 300 MPa;
Tensile strength: Fu = 450 MPa;
*3 In case without any recommendation about zincing in details, all metal members be exposed to weather or soil must be zinced with amount of 550g/m².
*4 This drawing be based on NEXCO(Japan) drawings.
*5 These structures should be redesigned to meet site condition.

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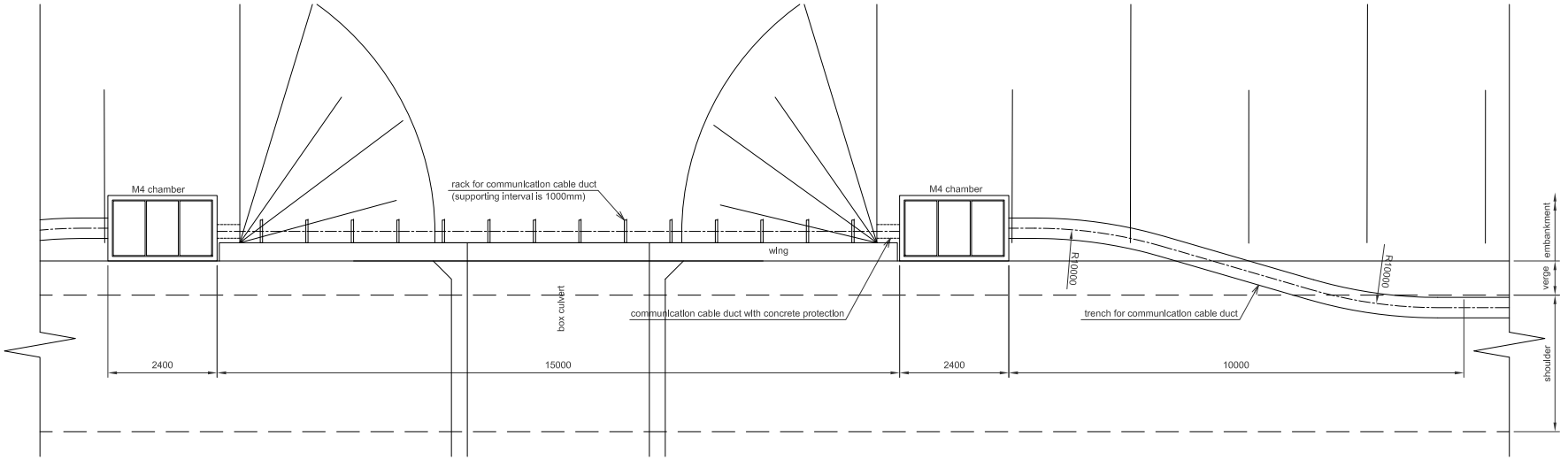
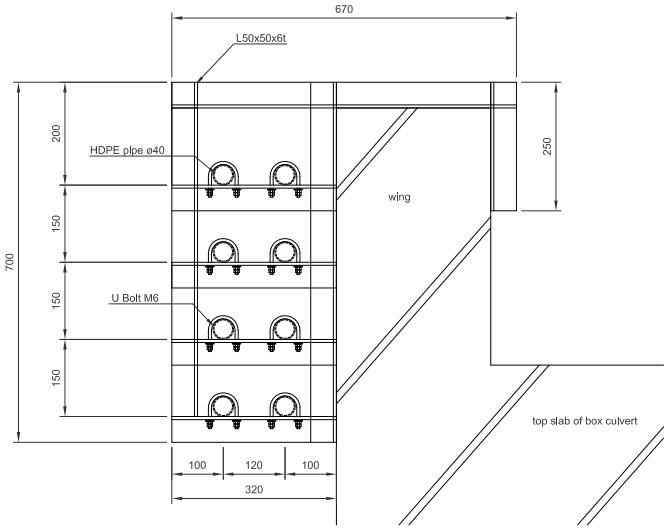
	PREPARED BY							
	CHECKED BY							
	APPROVED BY					SCALE: varied	SHEET No.: Sheet of	Rev:

ARRANGEMENT OF COMMUNICATION DUCT ON WING OF BOX CULVERT

PLAN VIEW scale: 1/100

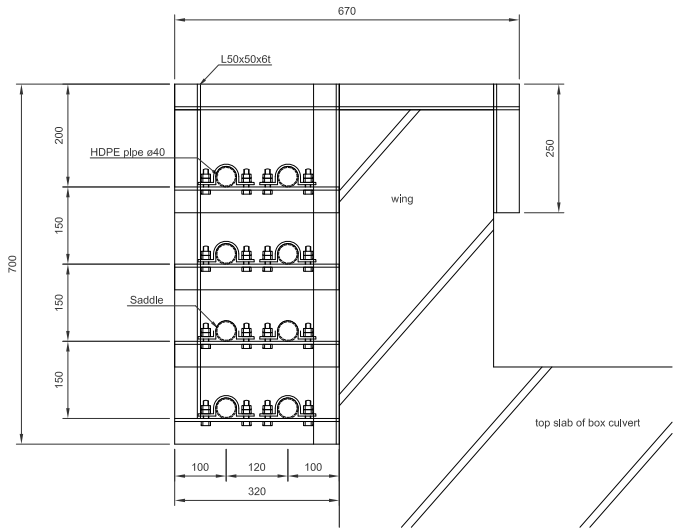


SUPPORT RACK scale: 1/10



FIX SUPPORT RACK scale: 1/10

(2 points on wing)



*1 Structural steel conforms ASTM A-709M Grade 250 or equivalence with:
Yield strength: Fy = 250 MPa
Tensile strength: Fu = 400 MPa
*2 Concrete structure equivalence with:
Concrete strength: F'c = 18 MPa;
Reinforcing Bar (CB300-II): Yield strength: Fy = 300 MPa;
Tensile strength: Fu = 450 MPa;
*3 In case without any recommendation about zincing in details, all metal members be exposed to weather or soil must be zinced with amount of 550g/m².
*4 This drawing be based on NEXCO(Japan) drawings.
*5 These structures should be redesigned to meet site condition.

CONSULTANT					SOCIALIST REPUBLIC OF VIETNAM	ITS INTEGRATION PROJECT ON NEW NATIONAL HIGHWAY NO.3 & NORTHERN AREA OF VIETNAM	PACKAGE:
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	PREPARED BY					SCALE: 1/100	SHEET No.: Sheet of / Rev:
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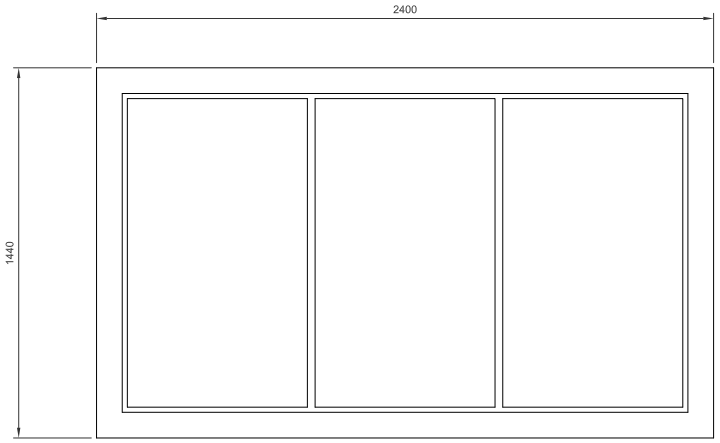
	APPROVED BY						

DETAIL OF COMMUNICATION DUCT CHAMBER (TYPE M1)

(INSTALL AT MEDIAN or ON EMBANKMENT; WITH PITCH LESS THAN 333m)

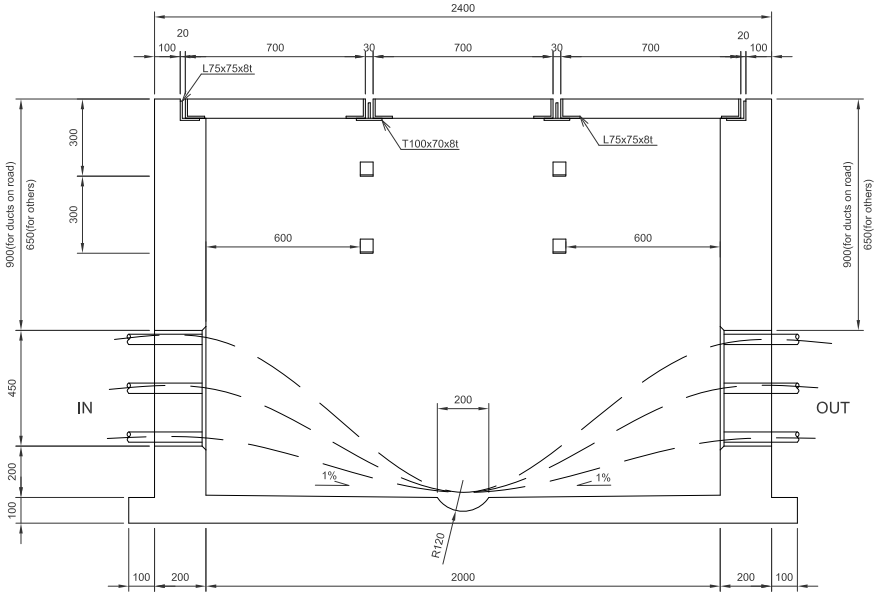


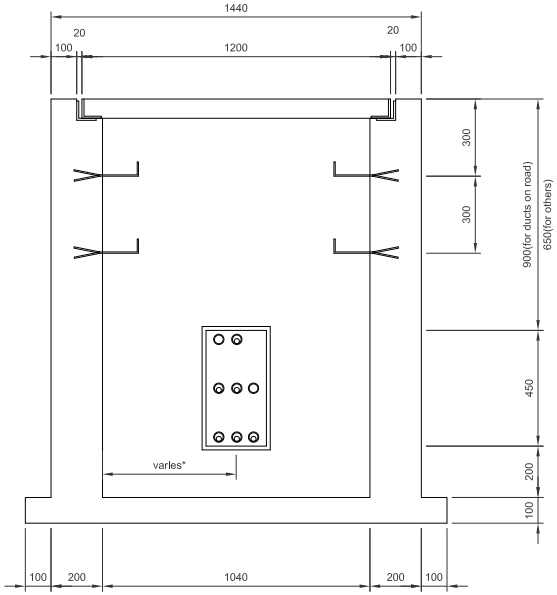
Volume table of chamber for ducts on road

	Volume
L75x75x8t	183 kg
PL80x8t	10 kg
T100x70x8t	26 kg
Concrete M300	1,9 m³

Volume table of chamber for others

	Volume
L75x75x8t	183 kg
PL80x8t	10 kg
T100x70x8t	26 kg
Concrete M300	1,7 m³





* Dependlng to duct arrangement.

*1 Concrete structure equivalence with:
Concrete strength: F'c = 18 MPa;
Reinforcing Bar (CB300-II): Yield strength: Fy = 300 MPa;
Tensile strength: Fu = 450 MPa;

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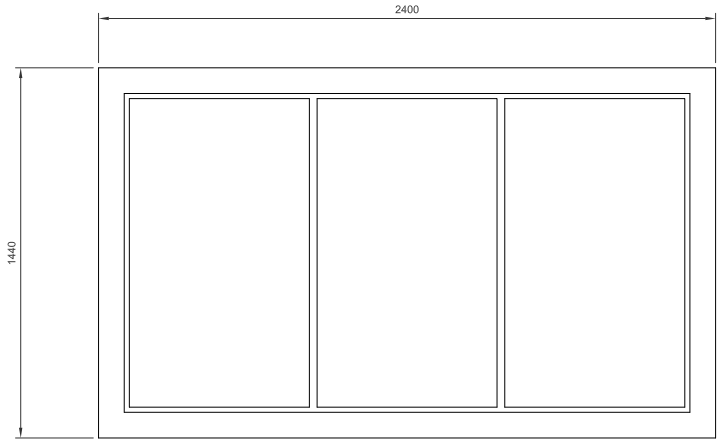
	PREPARED BY						SHEET No.: Sheet of	Rev:
	CHECKED BY							
	APPROVED BY					SCALE: 1/20		

DETAIL OF COMMUNICATION DUCT CHAMBER (TYPE M2)

(INSTALL AT BACK OF ABUTMENT)

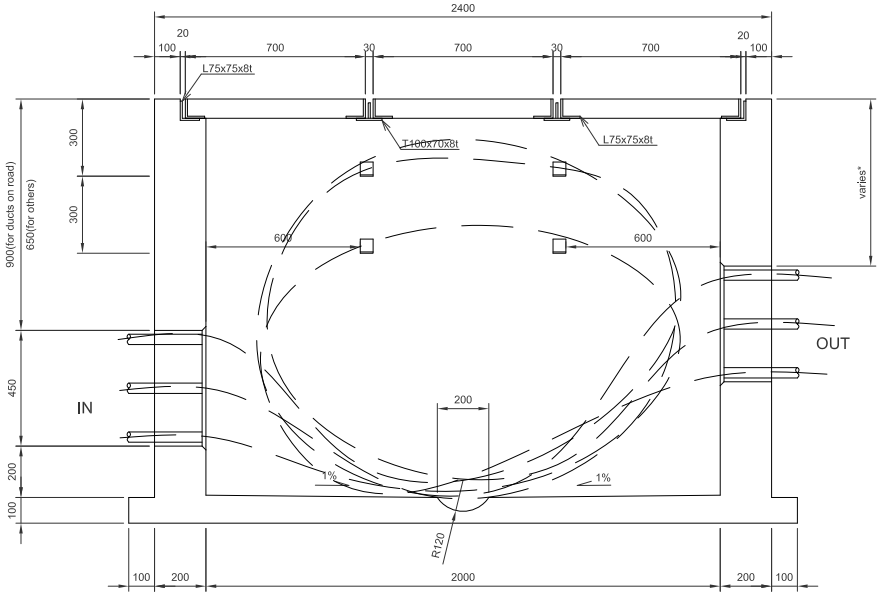


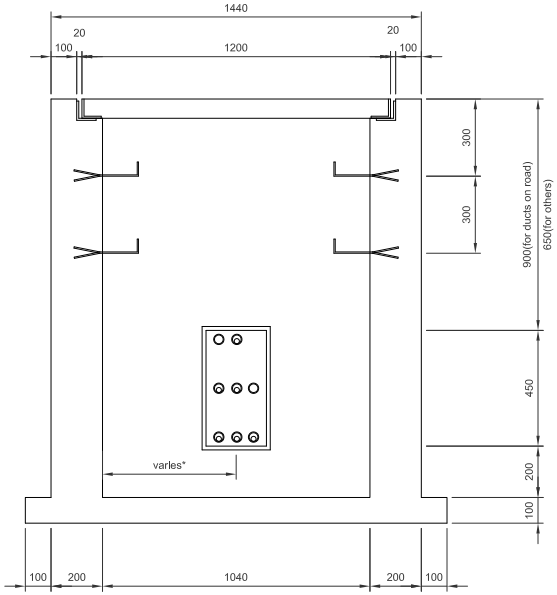
Volume table of chamber for ducts on road

	Volume
L75x75x8t	183 kg
PL80x8t	10 kg
T100x70x8t	26 kg
Concrete M300	1,9 m³

Volume table of chamber for others

	Volume
L75x75x8t	183 kg
PL80x8t	10 kg
T100x70x8t	26 kg
Concrete M300	1,7 m³





* Dependlng to duct arrangement.

*1 Concrete structure equivalence with:
Concrete strength: F'c = 18 MPa;
Reinforcing Bar (CB300-II): Yield strength: Fy = 300 MPa;
Tensile strength: Fu = 450 MPa;

CONSULTANT					SOCIALIST REPUBLIC OF VIETNAM	ITS INTEGRATION PROJECT ON NEW NATIONAL HIGHWAY NO.3 & NORTHERN AREA OF VIETNAM	PACKAGE:	
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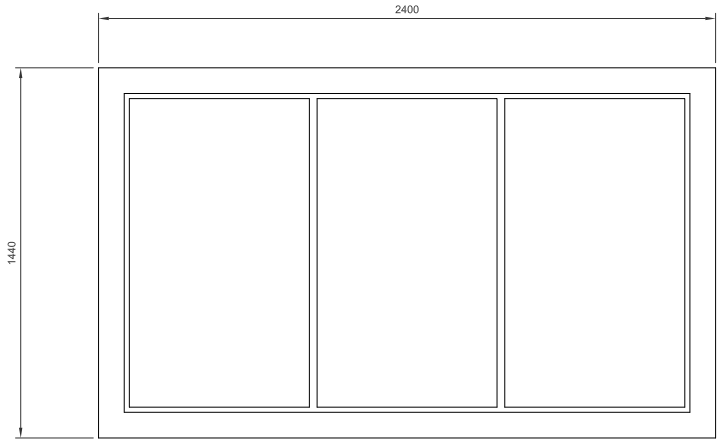
	PREPARED BY						SHEET No.: Sheet of	Rev:
	CHECKED BY					SCALE: 1/20		
	APPROVED BY							

DETAIL OF COMMUNICATION DUCT CHAMBER (TYPE M3)

(INSTALL AT MEDIAN or EMBANKMENT; WITH PITCH LESS THAN 2000M)

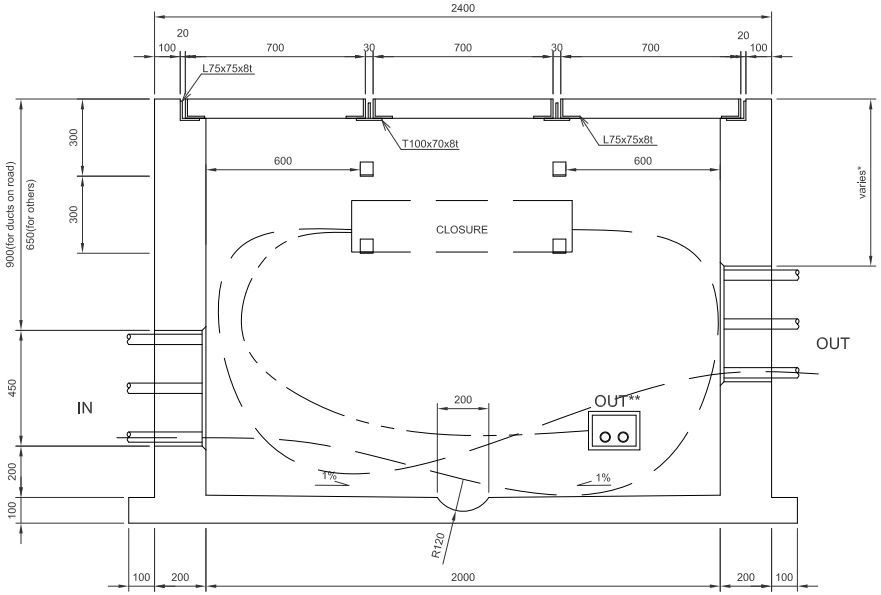


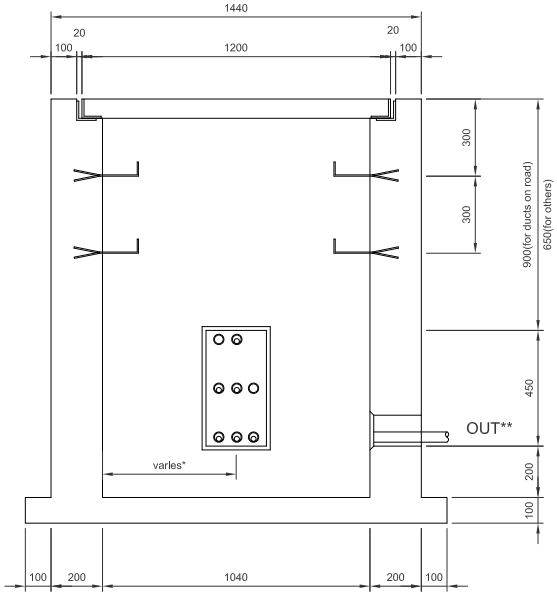
Volume table of chamber for ducts on road

	Volume
L75x75x8t	183 kg
PL80x8t	10 kg
T100x70x8t	26 kg
Concrete M300	1,9 m³

Volume table of chamber for others

	Volume
L75x75x8t	183 kg
PL80x8t	10 kg
T100x70x8t	26 kg
Concrete M300	1,7 m³





* Depending to duct arrangement.
** Divergence exits be used for roadside equipments.

*1 Concrete structure equivalence with:
Concrete strength: F'c = 18 MPa;
Reinforcing Bar (CB300-II): Yield strength: Fy = 300 MPa;
Tensile strength: Fu = 450 MPa;

CONSULTANT					SOCIALIST REPUBLIC OF VIETNAM	ITS INTEGRATION PROJECT ON NEW NATIONAL HIGHWAY NO.3 & NORTHERN AREA OF VIETNAM	PACKAGE:
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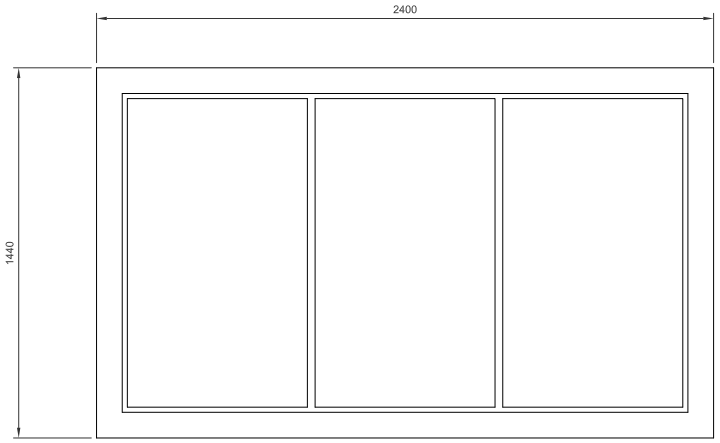
	PREPARED BY					SCALE: 1/20	SHEET No.: Sheet of / Rev:
	CHECKED BY						
	APPROVED BY						

DETAIL OF COMMUNICATION DUCT CHAMBER (TYPE M4)

(INSTALL AT MEDIAN or EMBANKMENT; FOR CHANGING DUCT DIRECTION)

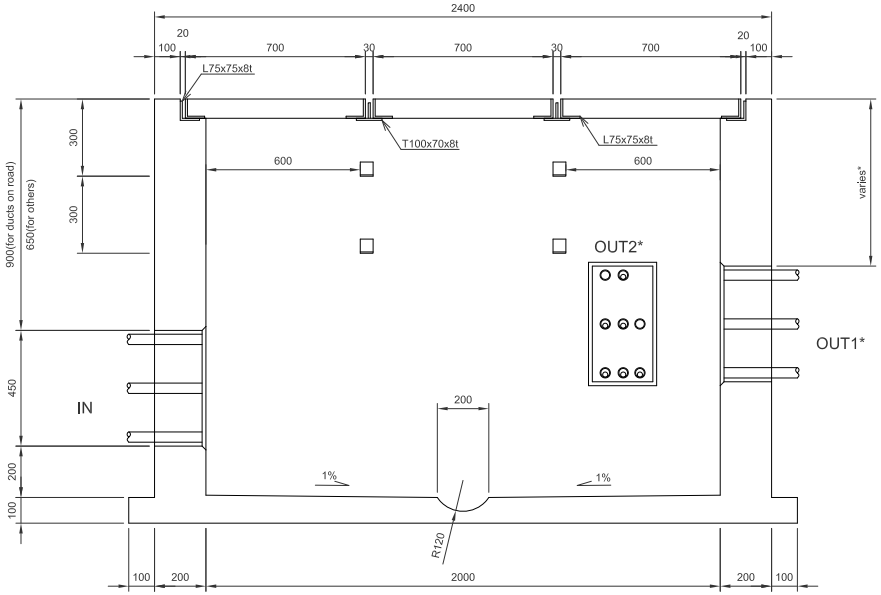


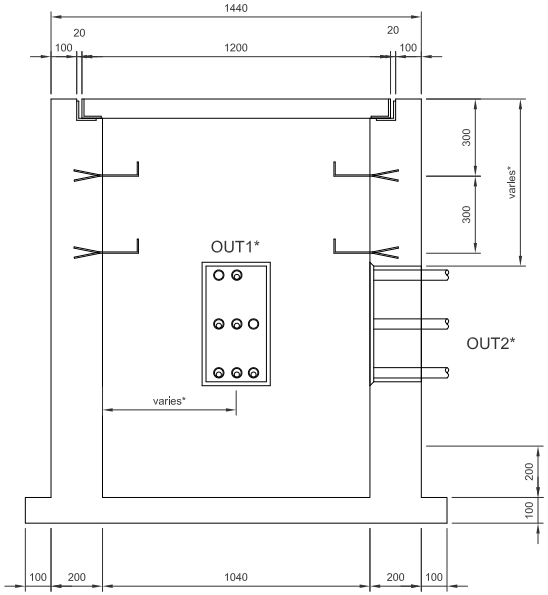
Volume table of chamber for ducts on road

	Volume
L75x75x8t	183 kg
PL80x8t	10 kg
T100x70x8t	26 kg
Concrete M300	1,9 m³

Volume table of chamber for others

	Volume
L75x75x8t	183 kg
PL80x8t	10 kg
T100x70x8t	26 kg
Concrete M300	1,7 m³





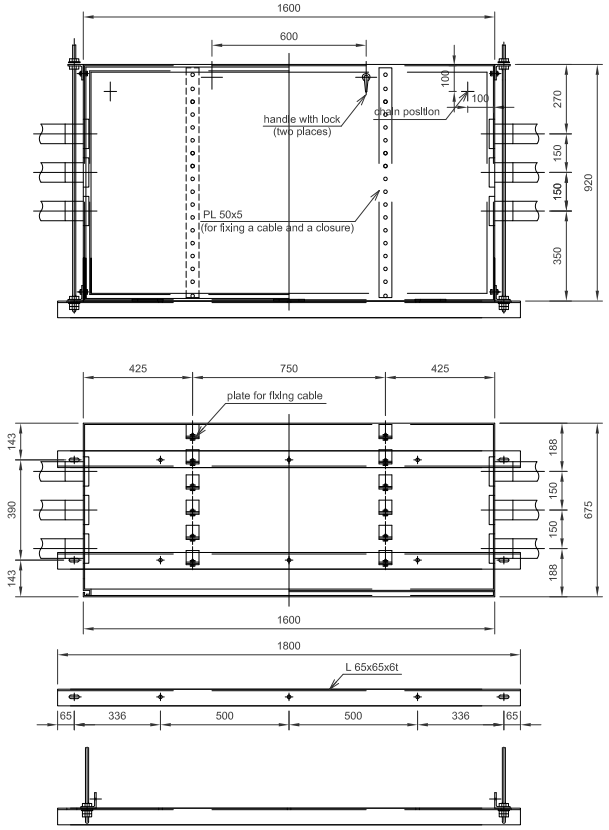
* Dependlng to duct arrangement.

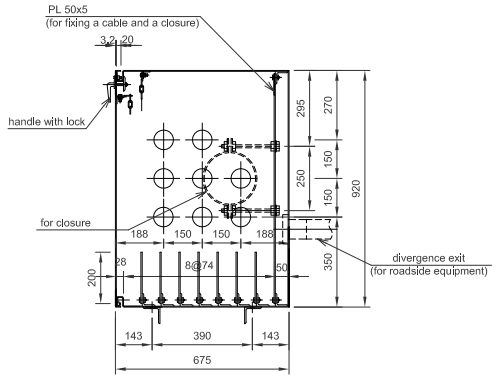
*1 Concrete structure equivalence with:
Concrete strength: F'c = 18 MPa;
Reinforcing Bar (CB300-II): Yield strength: Fy = 300 MPa;
Tensile strength: Fu = 450 MPa;

CONSULTANT					SOCIALIST REPUBLIC OF VIETNAM	ITS INTEGRATION PROJECT ON NEW NATIONAL HIGHWAY NO.3 & NORTHERN AREA OF VIETNAM	PACKAGE:
ORIENTAL CONSULTANTS CO., LTD NEXCO EAST ENGINEERING CO., LTD NIPPON KOEI CO., LTD TRANSPORTATION RESEARCH INSTITUTE CO., LTD LANDTEC JAPAN INC.	TITLE	NAME	SIGNATURE	DATE	MINISTRY OF TRANSPORT	DRAWING TITLE: HA NOI - BAC NINH EXPRESSWAY DETAIL OF COMMUNICATION DUCT CHAMBER (TYPE M4)	DRAWING No.: IX.3-13
	PREPARED BY						
	CHECKED BY						
	APPROVED BY					SCALE: 1/20	SHEET No.: Sheet of / Rev:

DETAIL OF COMMUNICATION DUCT CHAMBER (TYPE M5)

(INSTALL AT BRIDGE SECTION IN WHICH DUCT IS HUNG ON CANTILEVER SLAB)





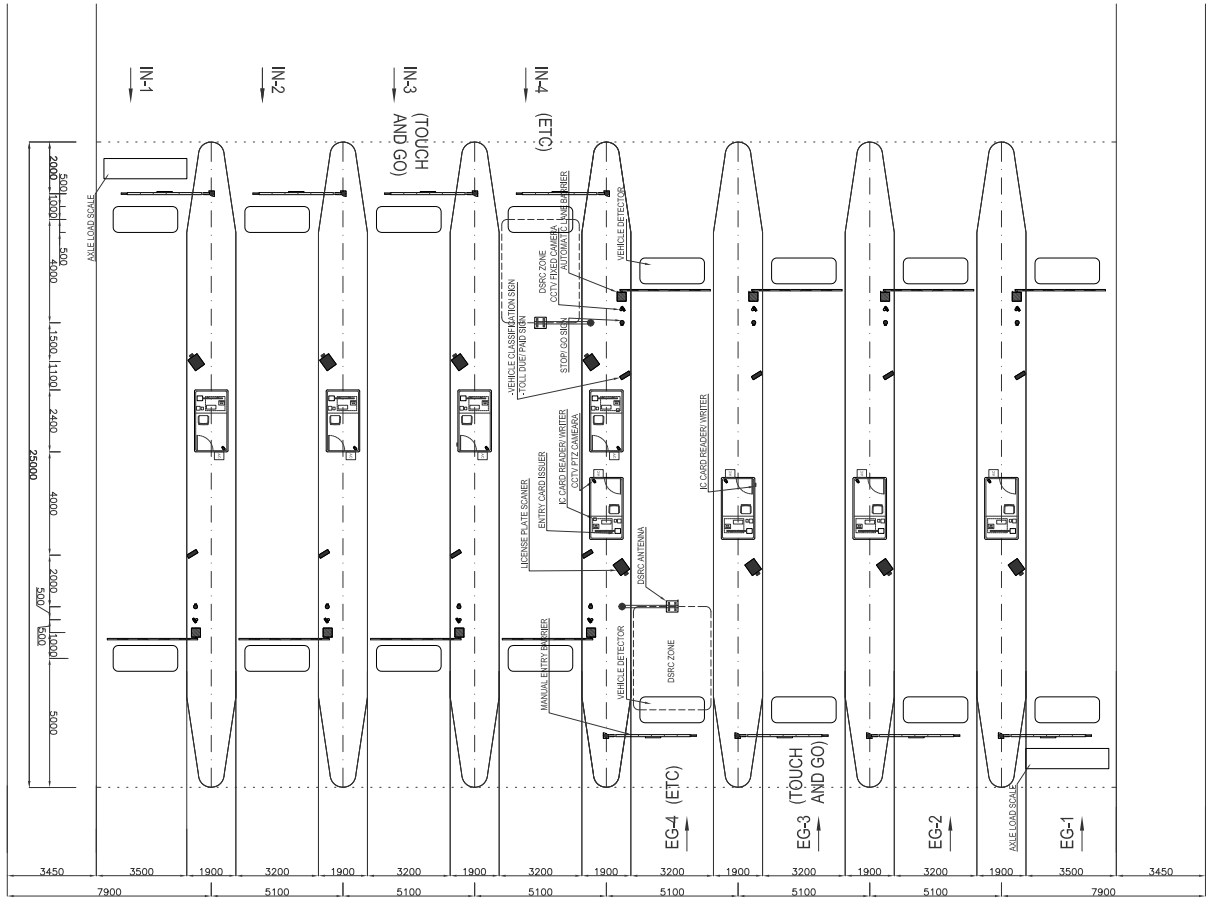
Volume table

	Length(mm)	Volume	Weight (kg)
L 65x65x6t	1800	2	22.0
L 65x65x6t	60	4	2.0
L 50x50x6t	50	18	4.0
PL 50x5	750	2	3.0
PL 50x5	200	14	6.0
PL920x3.2	1600	2	74.0
PL 675x3.2	1600	2	55.0
PL 675x3.2	920	2	32.0

*1 Structural steel conforms ASTM A-709M Grade 250 or equivalence with:
Yield strength: Fy = 250 MPa
Tensile strength: Fu = 400 MPa
*2 Concrete structure equivalence with:
Concrete strength: F'c = 18 MPa;
Reinforcing Bar (CB300-II): Yield strength: Fy = 300 MPa;
Tensile strength: Fu = 450 MPa;
*3 In case without any recommendation about zincing in details, all metal members be exposed to weather or soil must be zinced with amount of 550g/m².
*4 This drawing be based on NEXCO(Japan) drawings.
*5 These structures should be redesigned to meet site condition.

CONSULTANT					SOCIALIST REPUBLIC OF VIETNAM	ITS INTEGRATION PROJECT ON NEW NATIONAL HIGHWAY NO.3 & NORTHERN AREA OF VIETNAM	PACKAGE:
ORIENTAL CONSULTANTS CO., LTD NEXCO EAST ENGINEERING CO., LTD NIPPON KOEI CO., LTD TRANSPORTATION RESEARCH INSTITUTE CO., LTD LANDTEC JAPAN INC.	TITLE	NAME	SIGNATURE	DATE	MINISTRY OF TRANSPORT	DRAWING TITLE: HA NOI - BAC NINH EXPRESSWAY DETAIL OF COMMUNICATION DUCT CHAMBER (TYPE M5)	DRAWING No.: IX.3-14
	PREPARED BY					SCALE: 1/20	SHEET No.: Sheet of / Rev:
	CHECKED BY						
	APPROVED BY						

TYPICAL LAYOUT OF TOLL EQUIPMENT FOR 8 LANES



NOTES:
IN 3: INGRESS LANE-3
EG 1 : EGRESS LANE-1

CONSULTANT					SOCIALIST REPUBLIC OF VIETNAM	ITS INTEGRATION PROJECT ON NEW NATIONAL HIGHWAY NO.3 & NORTHERN AREA OF VIETNAM	PACKAGE:
ORIENTAL CONSULTANTS CO., LTD NEXCO EAST ENGINEERING CO., LTD NIPPON KOEI CO., LTD TRANSPORTATION RESEARCH INSTITUTE CO., LTD LANDTEC JAPAN INC.	TITLE	NAME	SIGNATURE	DATE	MINISTRY OF TRANSPORT	DRAWING TITLE: **EQPT. ARRANGEMENT AT PHUC LOI TOLLGATE (Km 159+000, HA NOI - BAC NINH EXP.)**	DRAWING No.: IX.4-01
	PREPARED BY						
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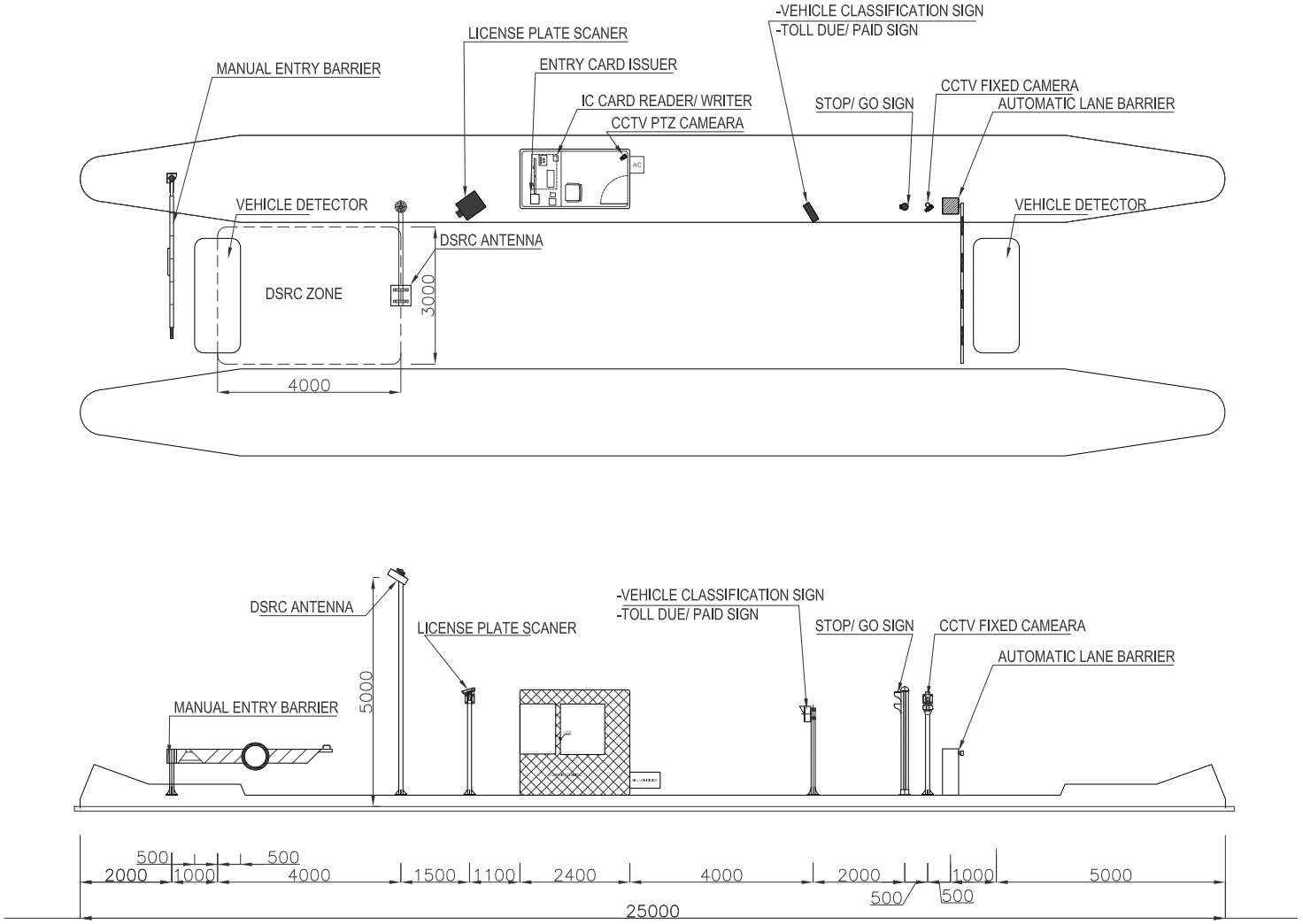

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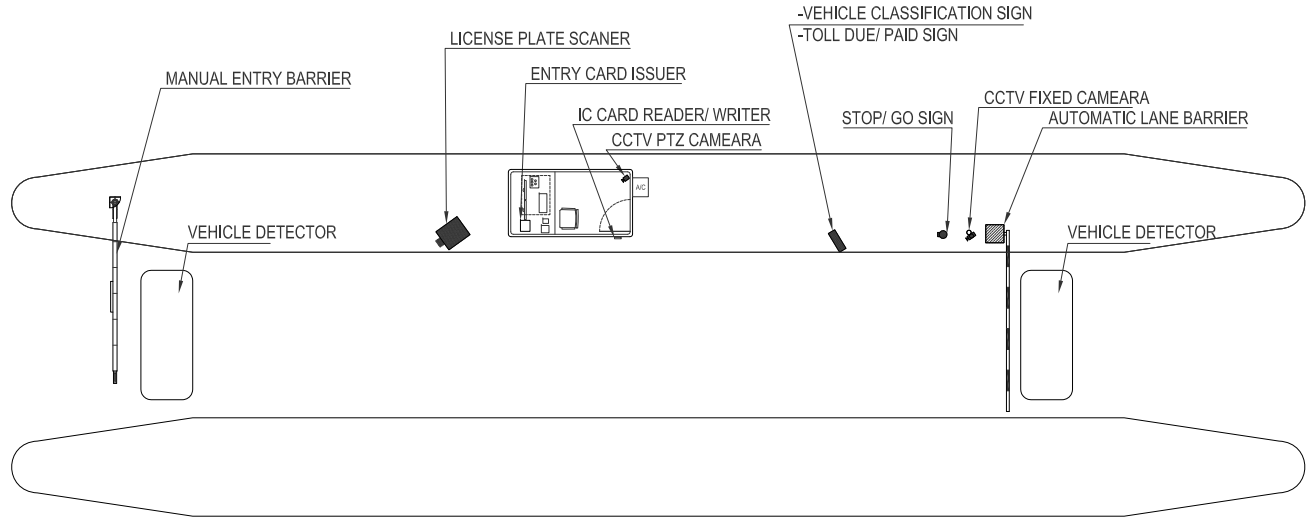

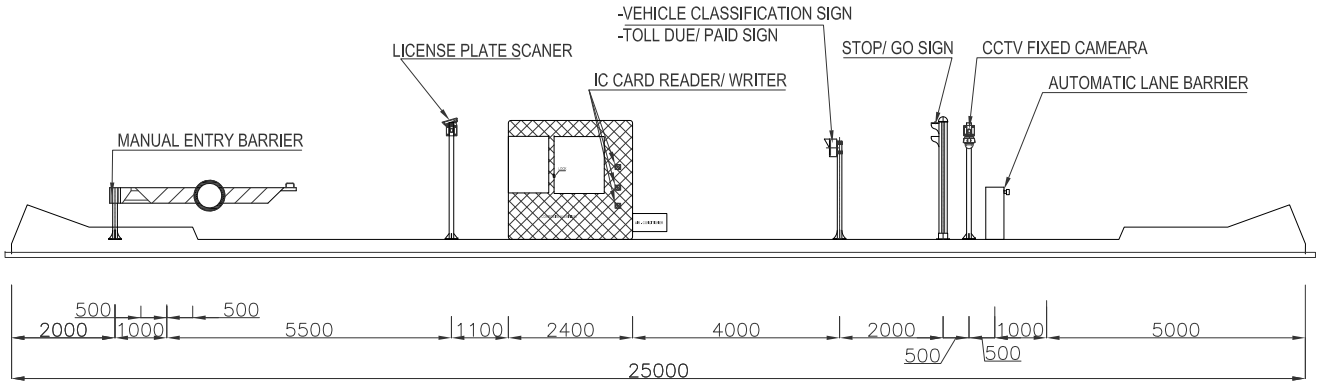

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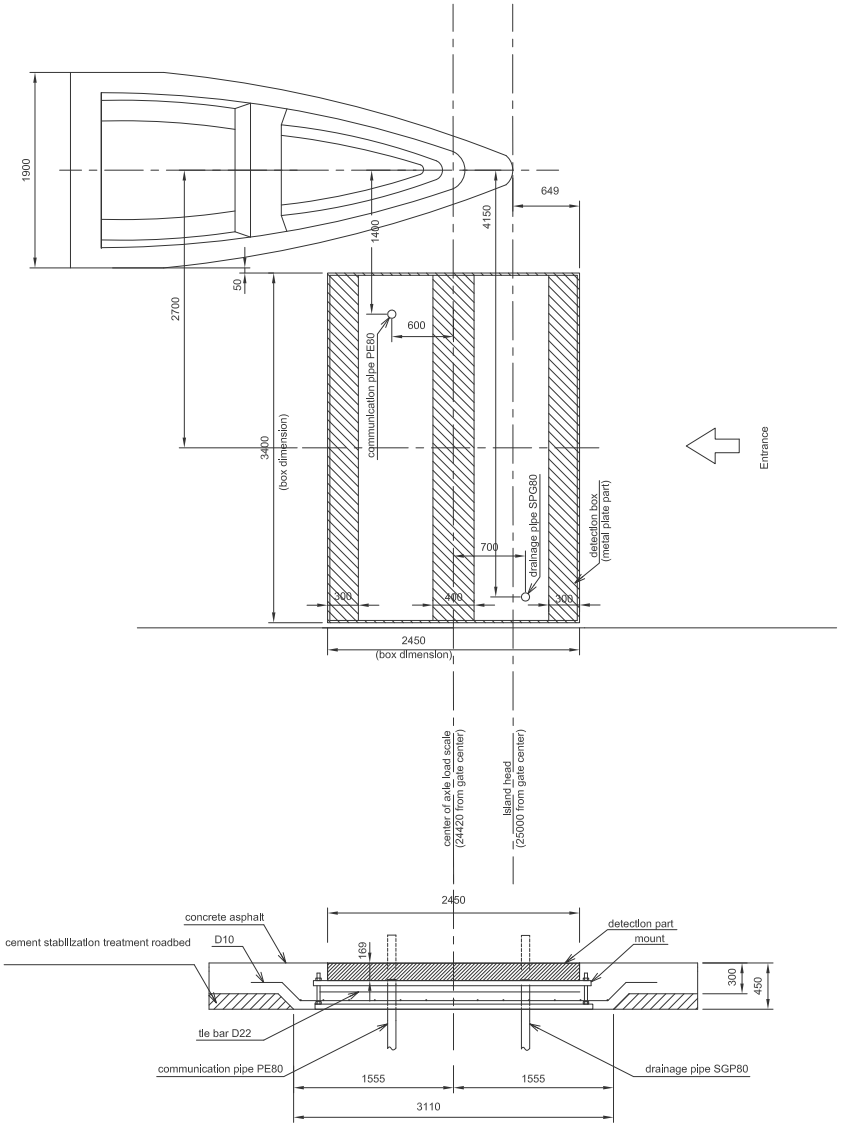
BASE STRUCTURE FOR AXLE LOAD SCALE (for reference)



*1 All works belong to equipment makers.

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