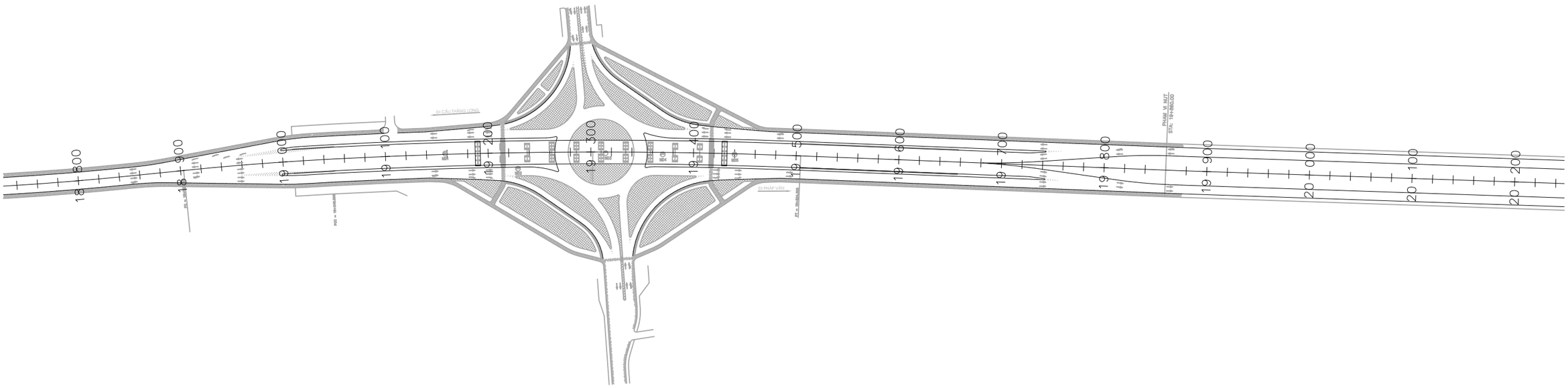
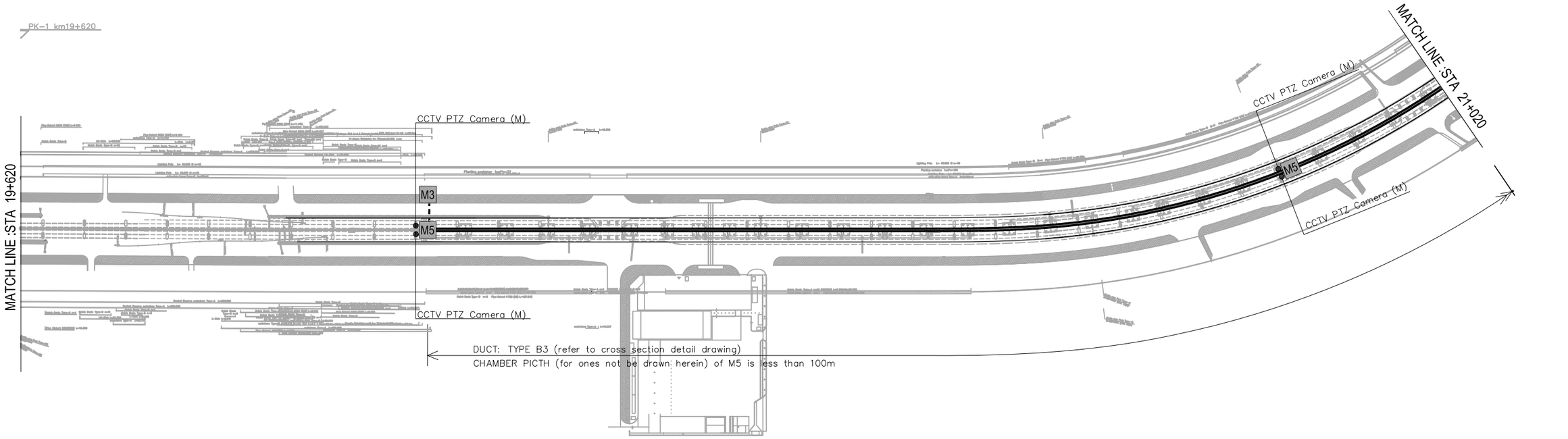
RING ROAD NO.3

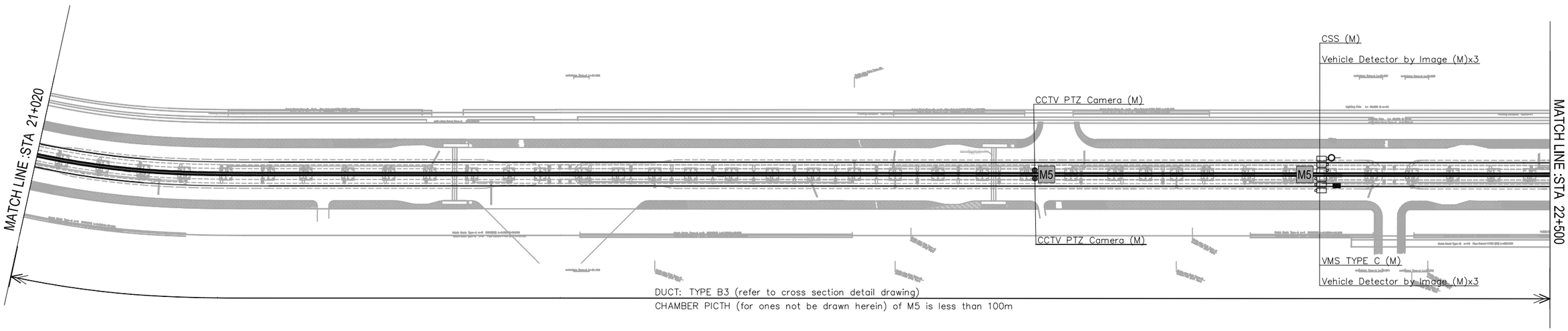


CONSULTANT					SOCIALIST REPUBLIC OF VIETNAM	ITS INTEGRATION PROJECT IN NORTHERN AREA OF VIETNAM	PACKAGE:	
ORIENTAL CONSULTANTS GLOBAL CO., LTD METROPOLITAN EXPRESSWAY CO., LTD NEXCO EAST ENGINEERING CO., LTD TRANSPORTATION RESEARCH INSTITUTE CO., LTD ABEAM CONSULTING LTD.	TITLE	NAME	SIGNATURE	DATE	MINISTRY OF TRANSPORT	DRAWING TITLE: LAYOUT PLAN OF ROADSIDE EQUIPMENT & COMMUNICATION DUCT (KM 18+800 ~ KM 19+620, RING ROAD NO.3) MAI DICH IC	DRAWING No.: V.1-01	
	PREPARED BY							
	CHECKED BY							
	APPROVED BY					SCALE: 1/4000	SHEET No.: Sheet of	Rev:

ĐI CẦU THĂNG LONG
TO THANG LONG BRIDGE

ĐI LINH ĐÀM
TO LINH DAM





CONSULTANT					SOCIALIST REPUBLIC OF VIETNAM	ITS INTEGRATION PROJECT IN NORTHERN AREA OF VIETNAM	PACKAGE:	
ORIENTAL CONSULTANTS GLOBAL CO., LTD METROPOLITAN EXPRESSWAY CO., LTD NEXCO EAST ENGINEERING CO., LTD TRANSPORTATION RESEARCH INSTITUTE CO., LTD ABEAM CONSULTING LTD.	TITLE	NAME	SIGNATURE	DATE	MINISTRY OF TRANSPORT	DRAWING TITLE: LAYOUT PLAN OF ROADSIDE EQUIPMENT & COMMUNICATION DUCT (KM19+620 ~ KM22+500, RING ROAD NO.3)	DRAWING No.: V.1-02	
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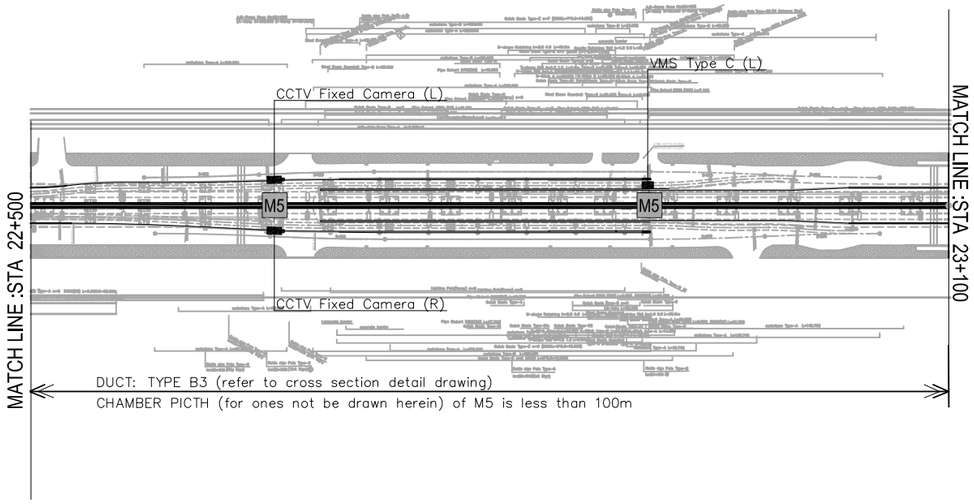

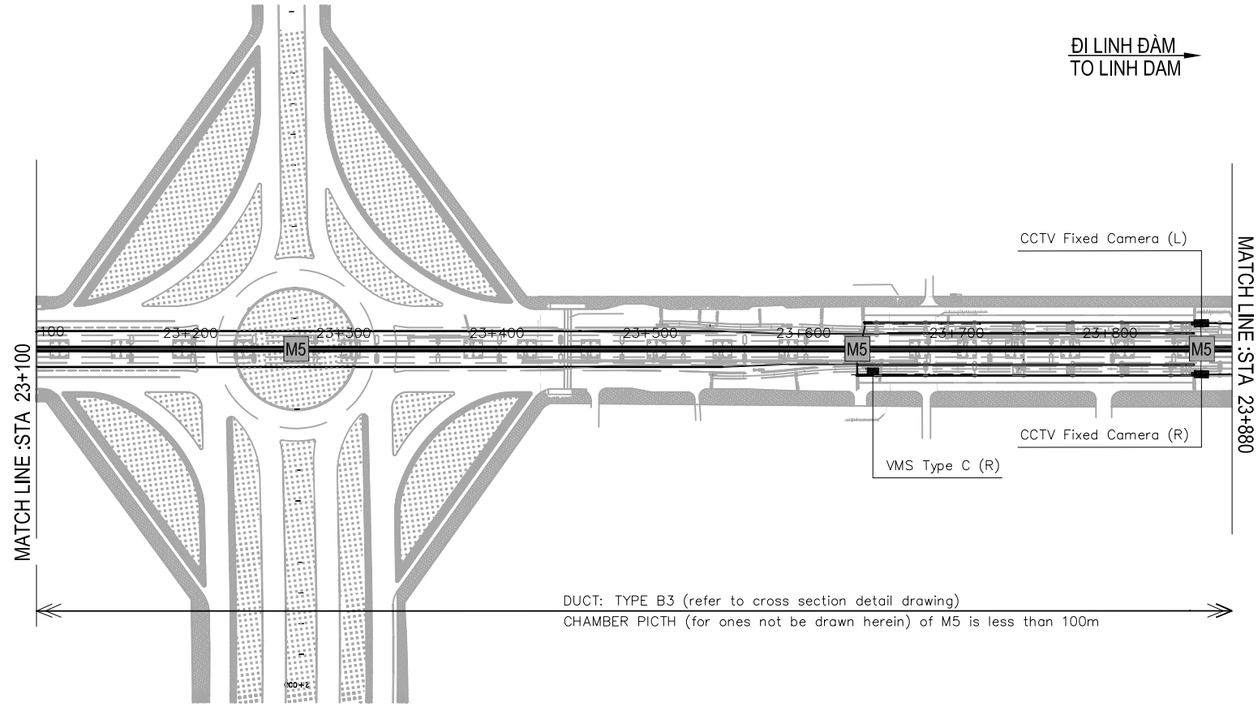

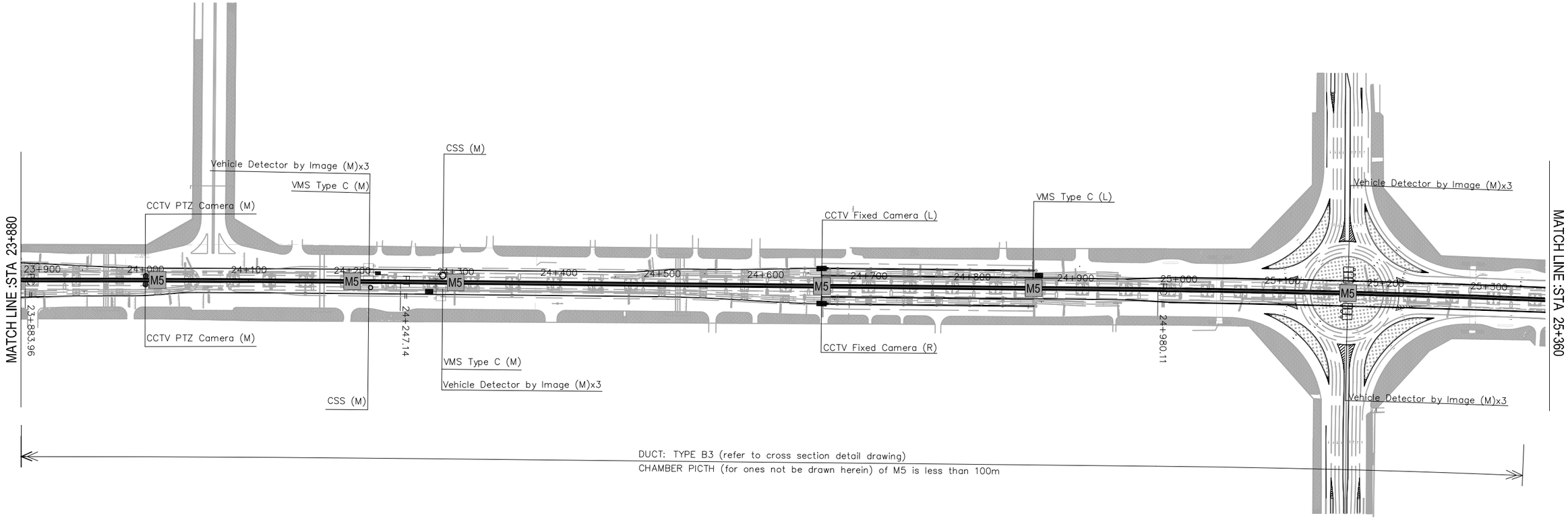

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ORIENTAL CONSULTANTS GLOBAL CO., LTD METROPOLITAN EXPRESSWAY CO., LTD NEXCO EAST ENGINEERING CO., LTD TRANSPORTATION RESEARCH INSTITUTE CO., LTD ABEAM CONSULTING LTD.	TITLE	NAME	SIGNATURE	DATE
	PREPARED BY			
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	APPROVED BY			

SOCIALIST REPUBLIC OF VIETNAM

MINISTRY OF TRANSPORT

ITS INTEGRATION PROJECT
IN NORTHERN AREA OF VIETNAM

PACKAGE:

DRAWING TITLE:
LAYOUT PLAN OF ROADSIDE EQUIPMENT & COMMUNICATION DUCT
(KM22+500 ~ KM25+360, RING ROAD NO.3)

SCALE: 1/4000

DRAWING No.: V.1-03

SHEET No.: Sheet of

Rev:

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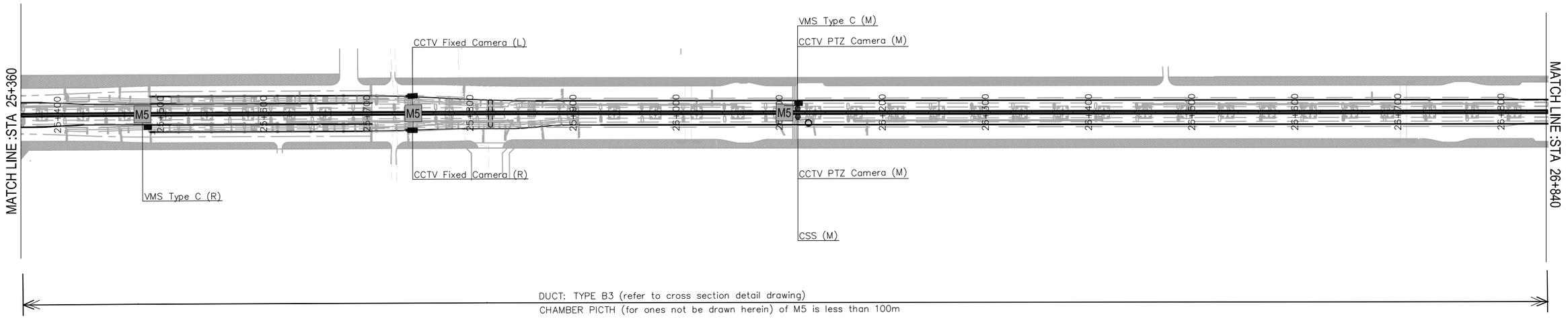
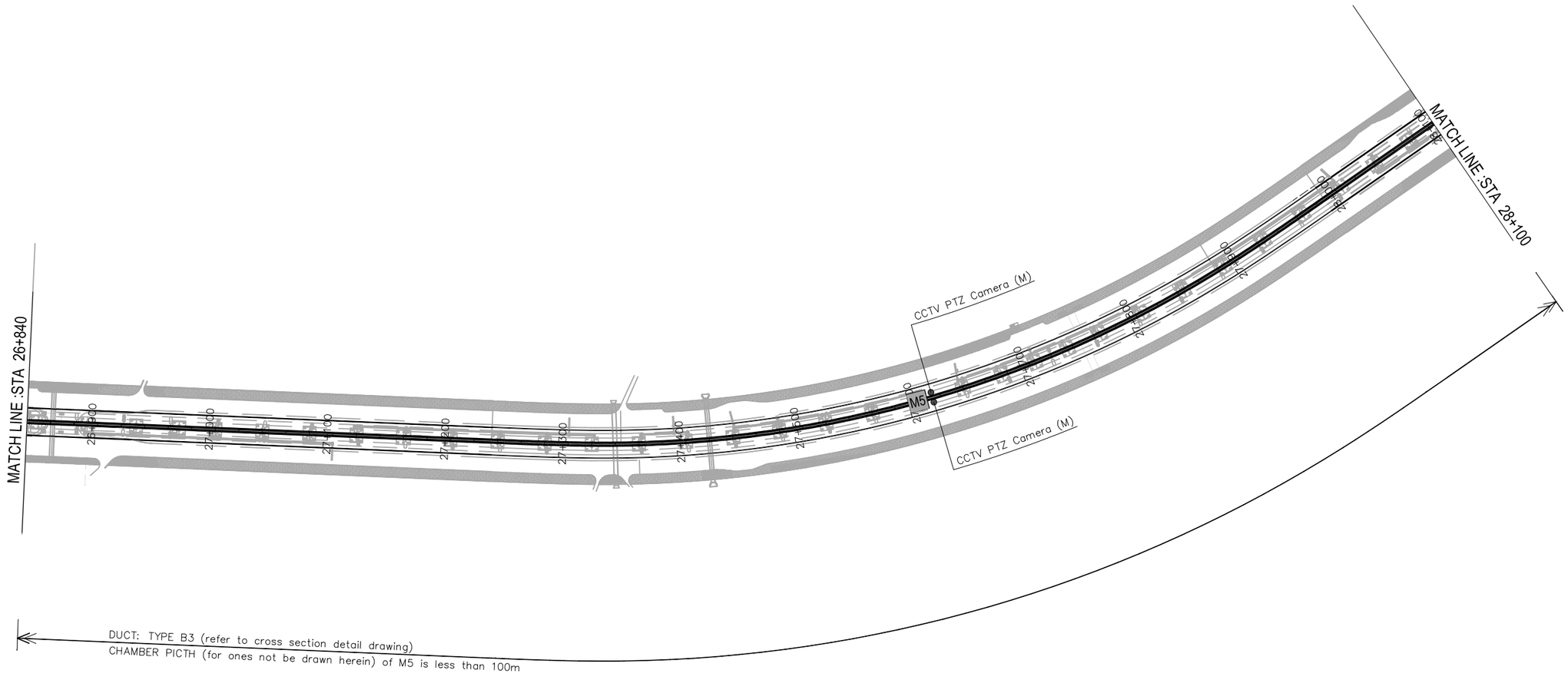
TO THANG LONG BRIDGE

ĐI LINH ĐÀM
TO LINH DAM





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	PREPARED BY						SHEET No.: Sheet of	Rev:
	CHECKED BY							
	APPROVED BY					SCALE: 1/4000		

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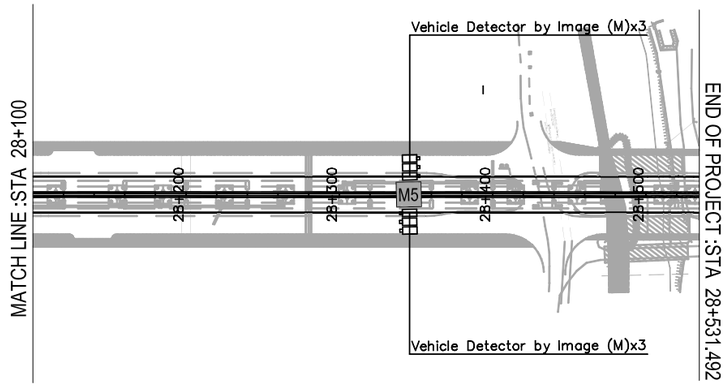
TO THANG LONG BRIDGE

ĐI LINH ĐÀM
TO LINH DAM



DUCT: TYPE B3 (refer to cross section detail drawing)
CHAMBER PICTH (for ones not be drawn herein) of M5 is less than 100m

CONSULTANT					SOCIALIST REPUBLIC OF VIETNAM	ITS INTEGRATION PROJECT IN NORTHERN AREA OF VIETNAM	PACKAGE:	
ORIENTAL CONSULTANTS GLOBAL CO., LTD METROPOLITAN EXPRESSWAY CO., LTD NEXCO EAST ENGINEERING CO., LTD TRANSPORTATION RESEARCH INSTITUTE CO., LTD ABEAM CONSULTING LTD.	TITLE	NAME	SIGNATURE	DATE	MINISTRY OF TRANSPORT	DRAWING TITLE: LAYOUT PLAN OF ROADSIDE EQUIPMENT & COMMUNICATION DUCT (KM 28+100 ~ KM 28+531.492, RING ROAD NO.3)	DRAWING No.: V.1-05	
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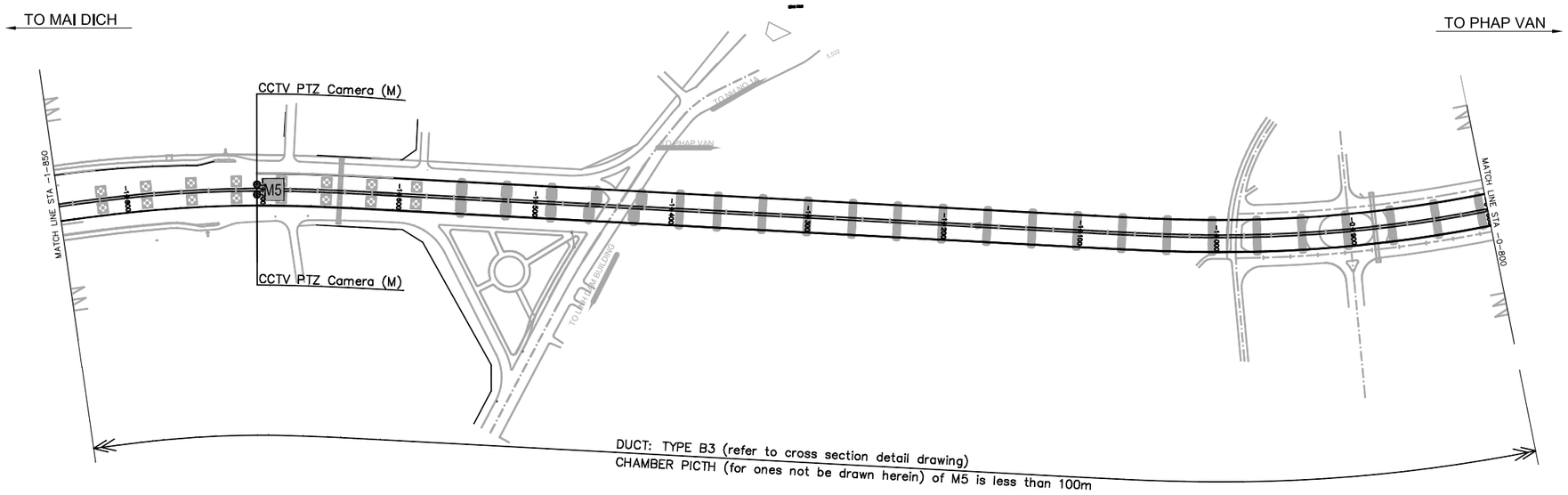

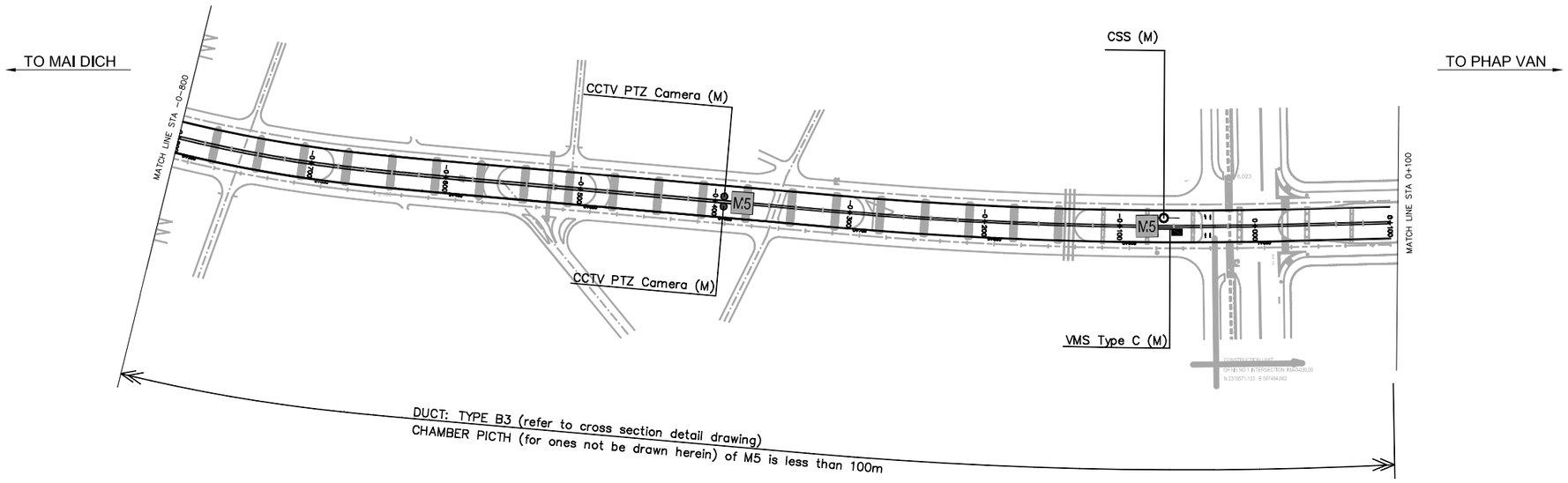

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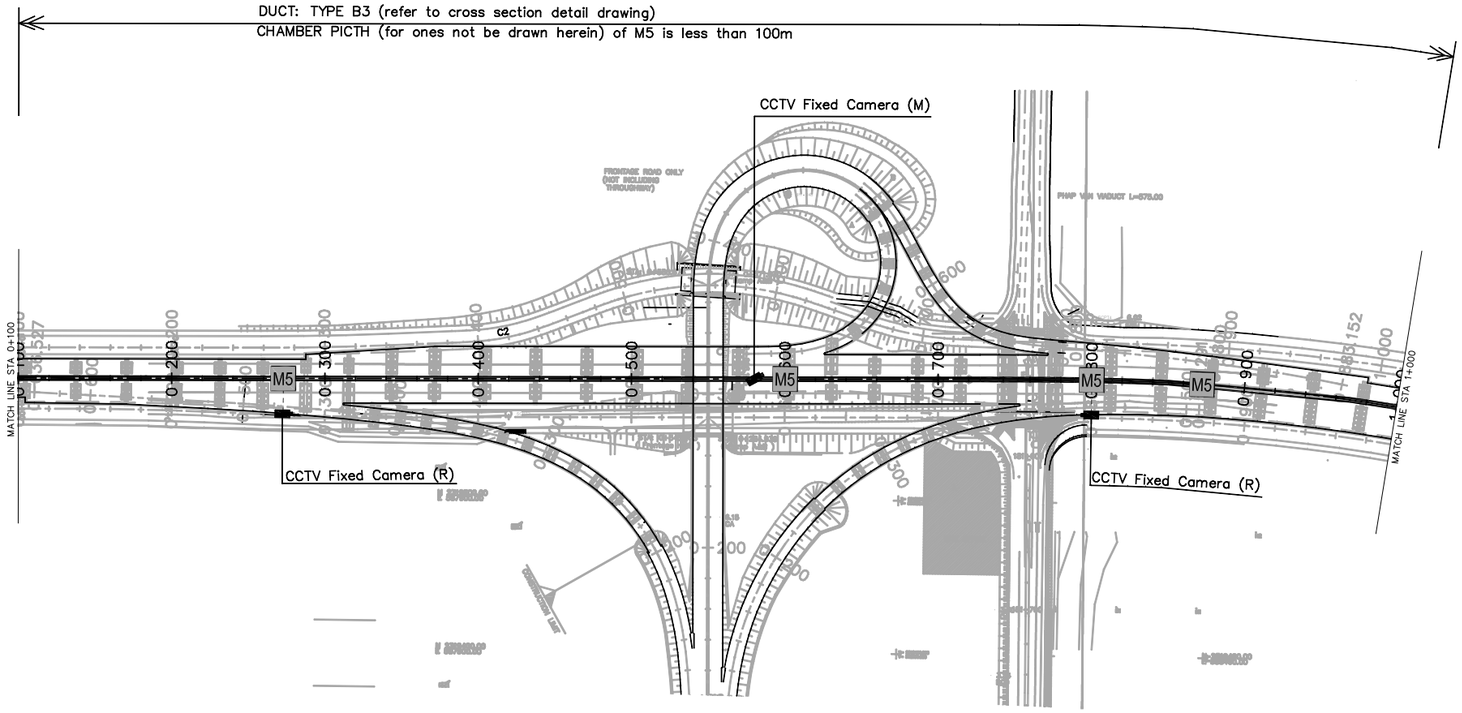
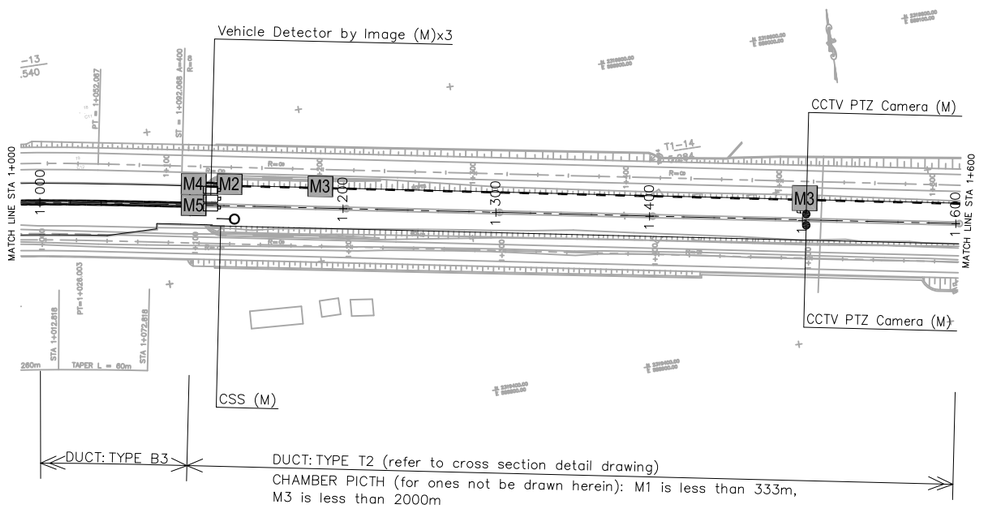
ORIENTAL CONSULTANTS GLOBAL CO., LTD METROPOLITAN EXPRESSWAY CO., LTD NEXCO EAST ENGINEERING CO., LTD TRANSPORTATION RESEARCH INSTITUTE CO., LTD ABEAM CONSULTING LTD.	TITLE	NAME	SIGNATURE	DATE
	PREPARED BY			
	CHECKED BY			
	APPROVED BY			

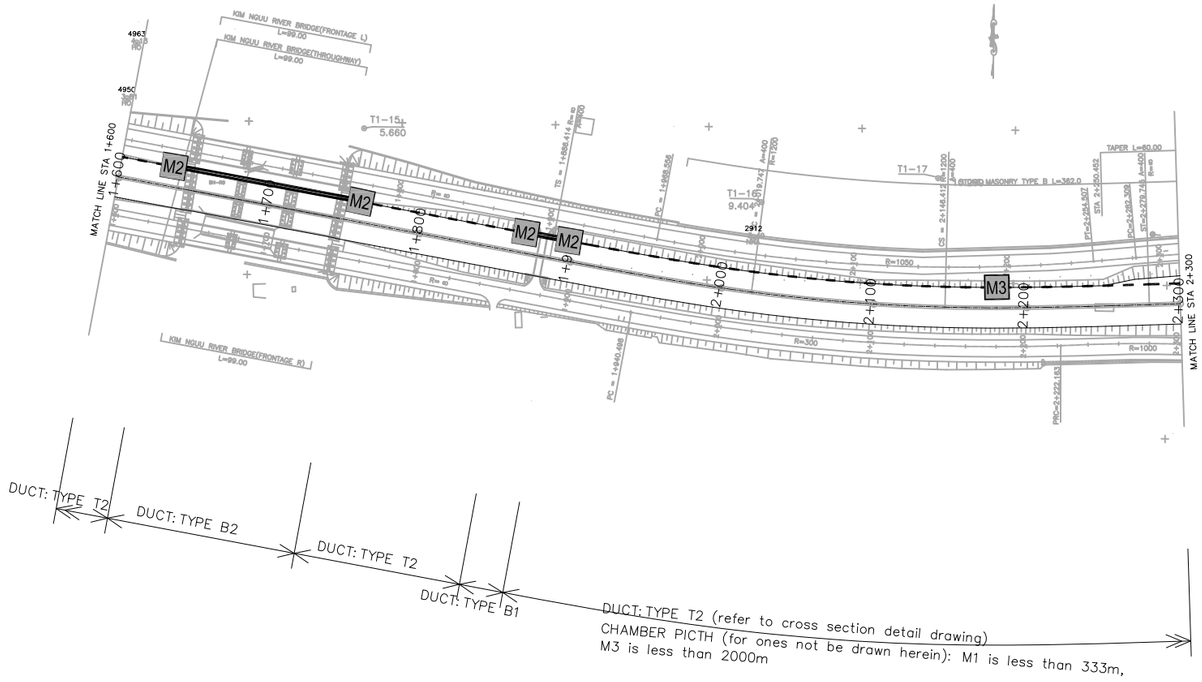
SOCIALIST REPUBLIC OF VIETNAM	ITS INTEGRATION PROJECT IN NORTHERN AREA OF VIETNAM	PACKAGE:
MINISTRY OF TRANSPORT	DRAWING TITLE: LAYOUT PLAN OF ROADSIDE EQUIPMENT & COMMUNICATION DUCT (KM -1-850 ~ KM 0+100, RING ROAD NO.3)	DRAWING No.: V.01-06
	SCALE: 1/4000	SHEET No.: Sheet of Rev:

TO MAI DICH

TO PHAP VAN







CONSULTANT				
ORIENTAL CONSULTANTS GLOBAL CO., LTD METROPOLITAN EXPRESSWAY CO., LTD NEXCO EAST ENGINEERING CO., LTD TRANSPORTATION RESEARCH INSTITUTE CO., LTD ABEAM CONSULTING LTD.	TITLE	NAME	SIGNATURE	DATE
	PREPARED BY			
	CHECKED BY			
	APPROVED BY			

SOCIALIST REPUBLIC OF VIETNAM

MINISTRY OF TRANSPORT

ITS INTEGRATION PROJECT
IN NORTHERN AREA OF VIETNAM

DRAWING TITLE:
LAYOUT PLAN OF ROADSIDE EQUIPMENT & COMMUNICATION DUCT
(KM 0+100 ~ KM 2+300, RING ROAD NO.3)

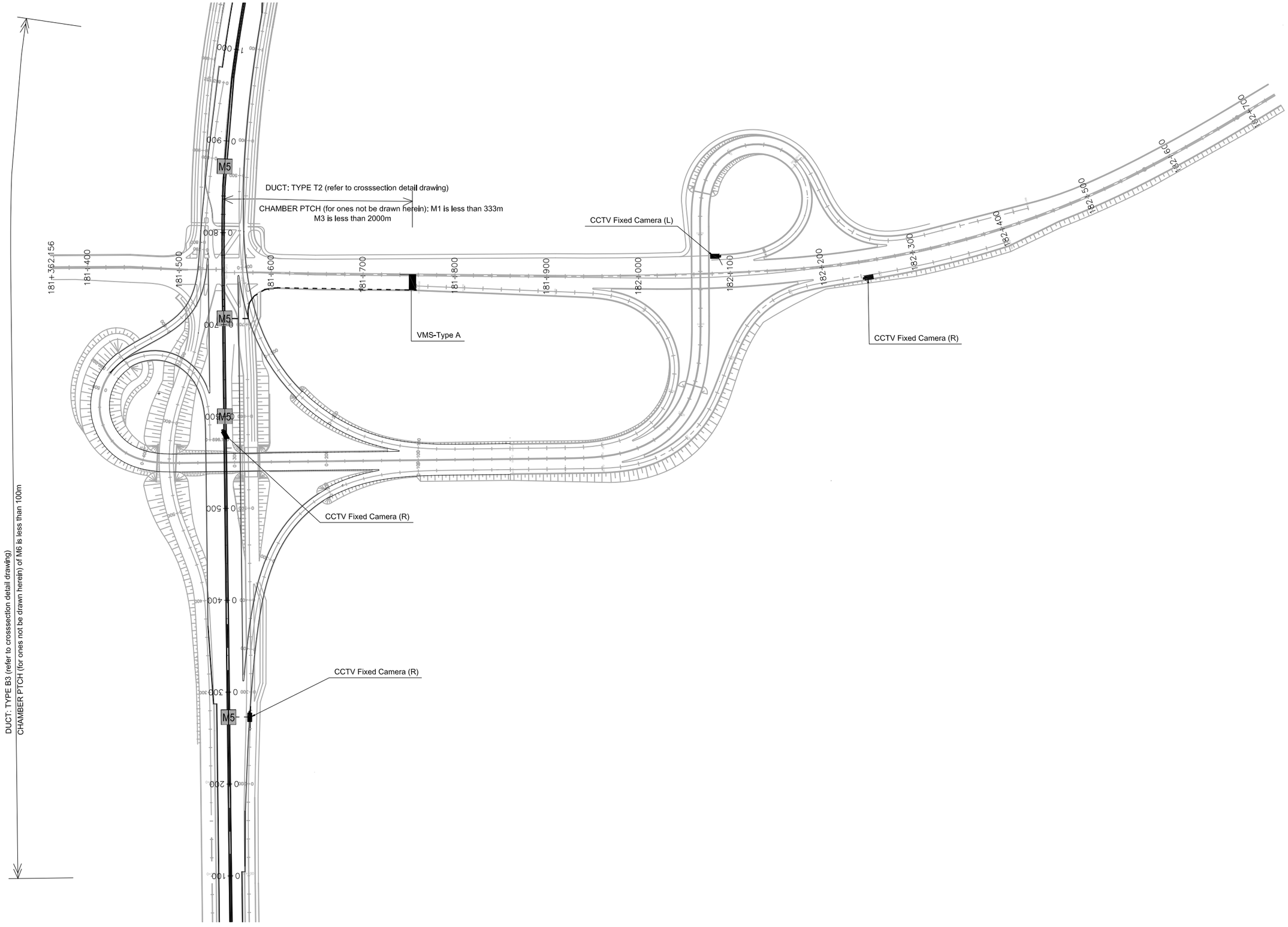
SCALE: 1/4000

PACKAGE:

DRAWING No.: V.01-07

SHEET No.: Sheet of

Rev:



CONSULTANT					SOCIALIST REPUBLIC OF VIETNAM	ITS INTEGRATION PROJECT IN NORTHERN AREA OF VIETNAM	PACKAGE:	
ORIENTAL CONSULTANTS GLOBAL CO., LTD METROPOLITAN EXPRESSWAY CO., LTD NEXCO EAST ENGINEERING CO., LTD TRANSPORTATION RESEARCH INSTITUTE CO., LTD ABEAM CONSULTING LTD.	TITLE	NAME	SIGNATURE	DATE	MINISTRY OF TRANSPORT	DRAWING TITLE: LAYOUT PLAN OF ROADSIDE EQUIPMENT & COMMUNICAITON DUCT (KM 0+700, RR 3) - PHAP VAN IC	DRAWING No.: V.1-08	
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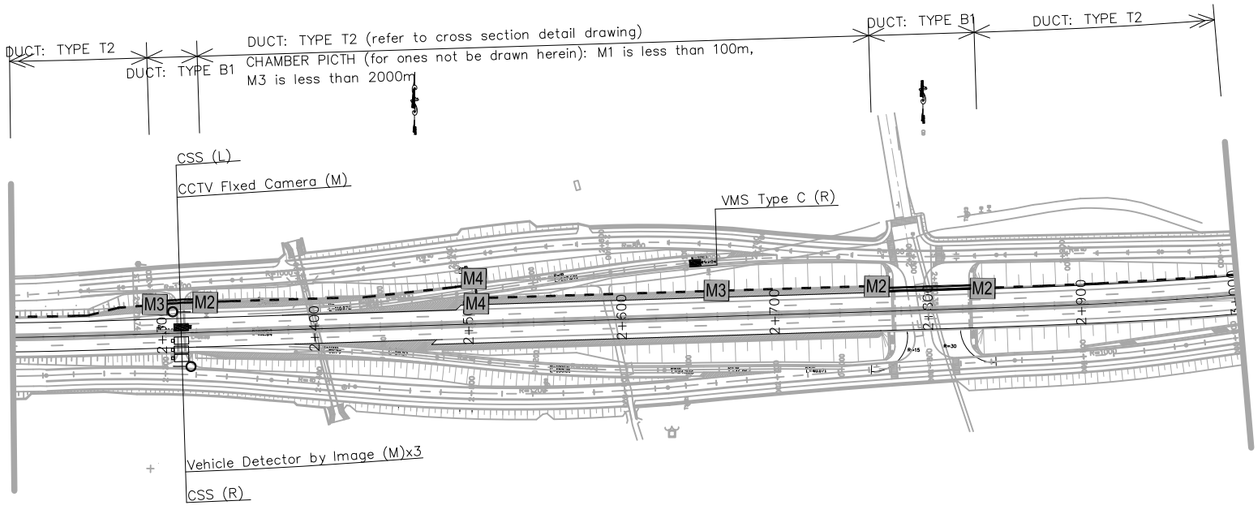

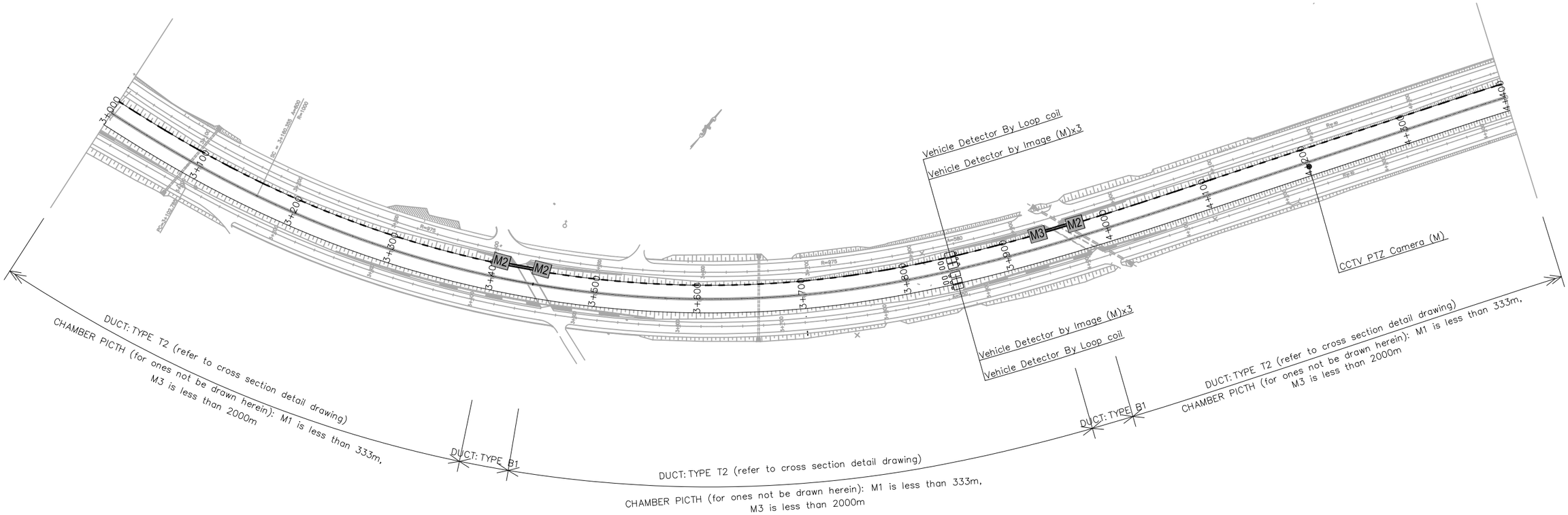

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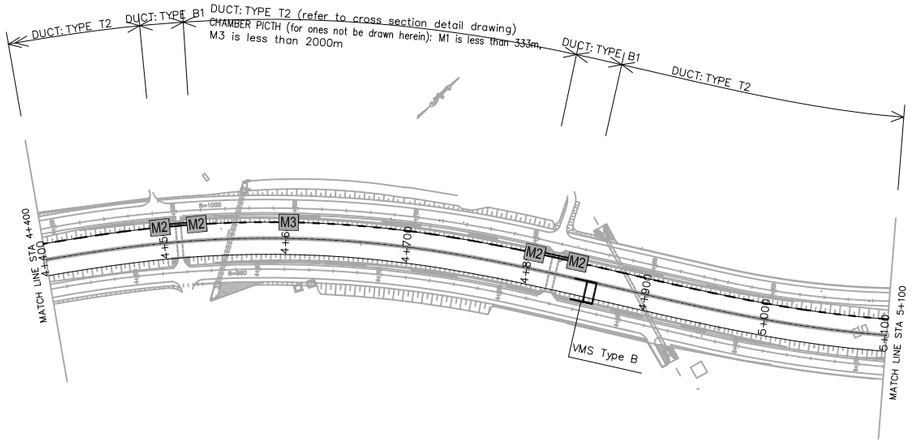

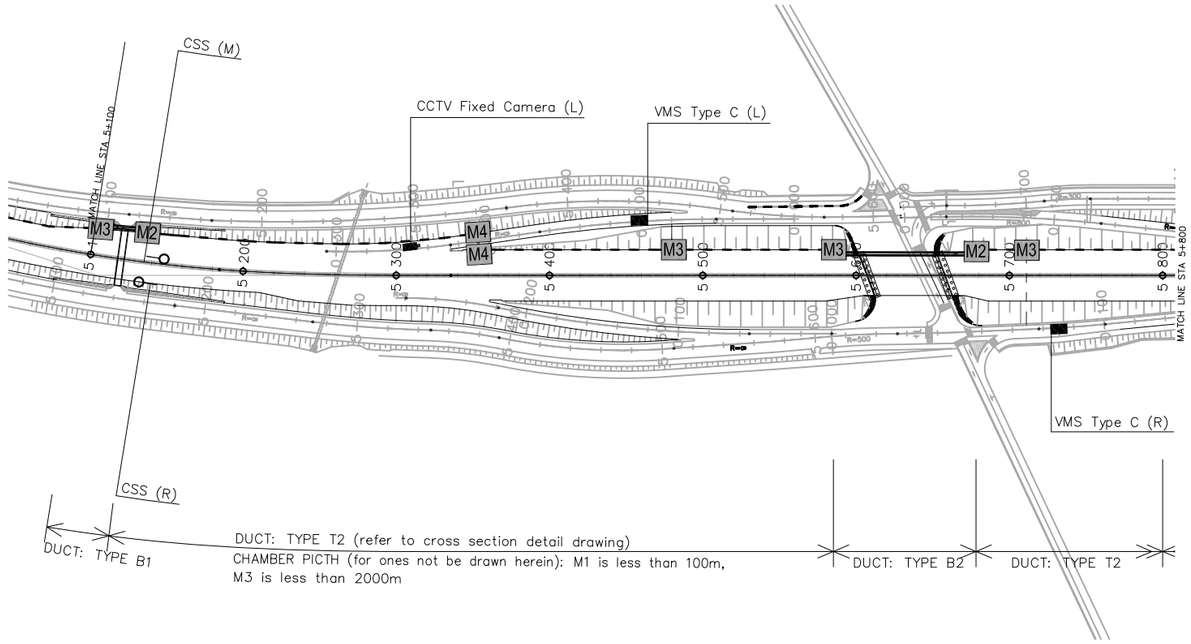

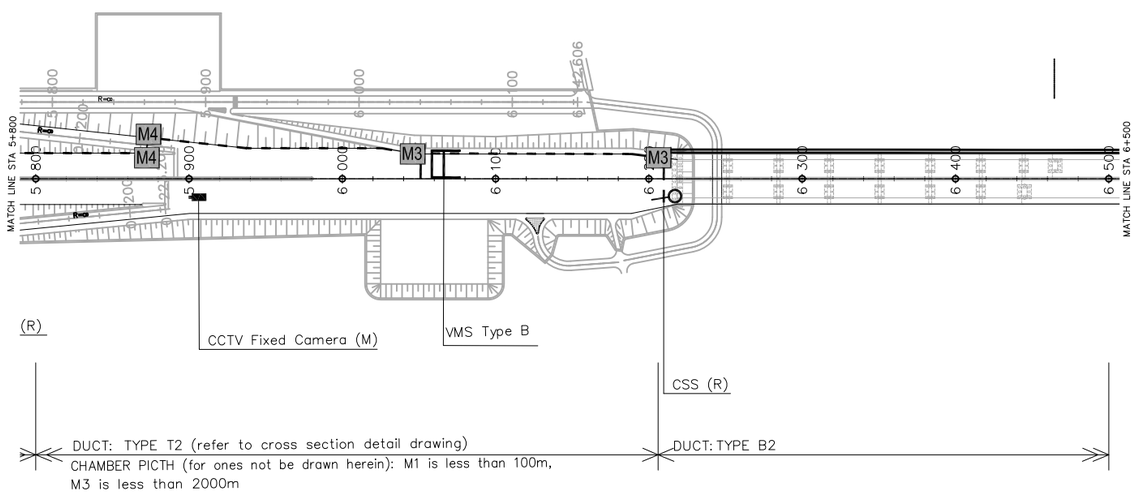

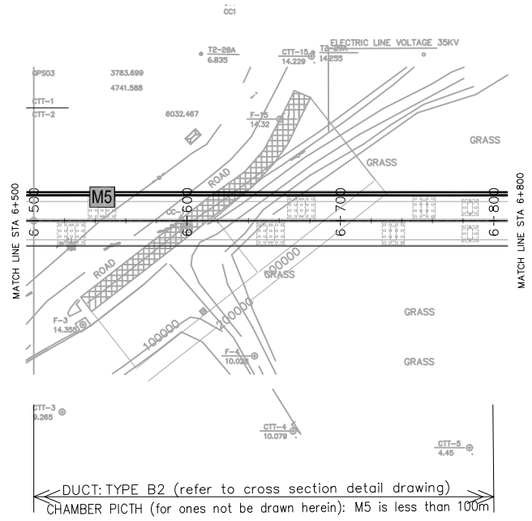

CONSULTANT					SOCIALIST REPUBLIC OF VIETNAM	ITS INTEGRATION PROJECT IN NORTHERN AREA OF VIETNAM	PACKAGE:	
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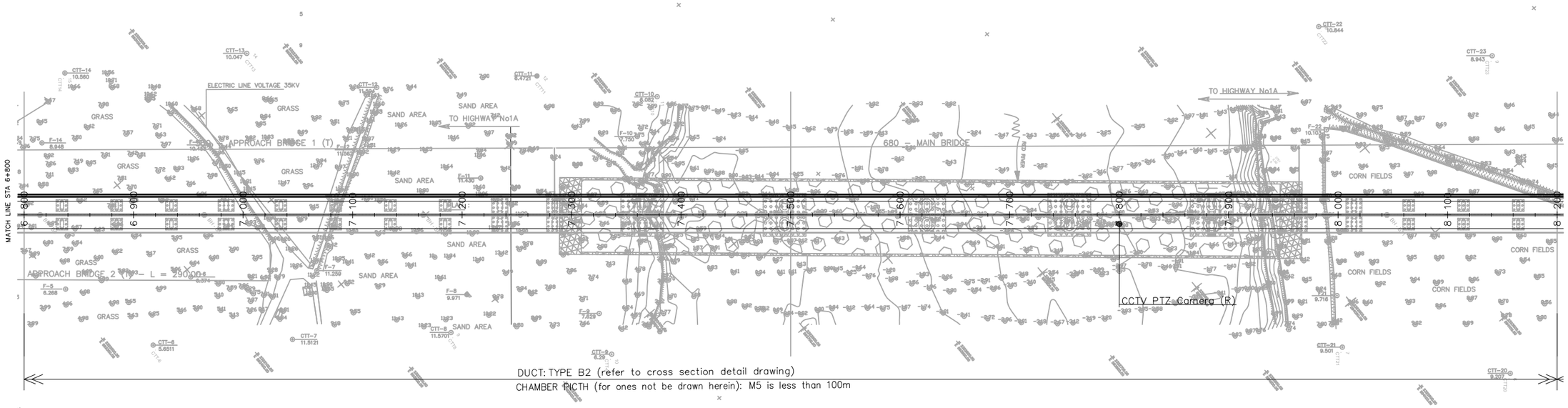

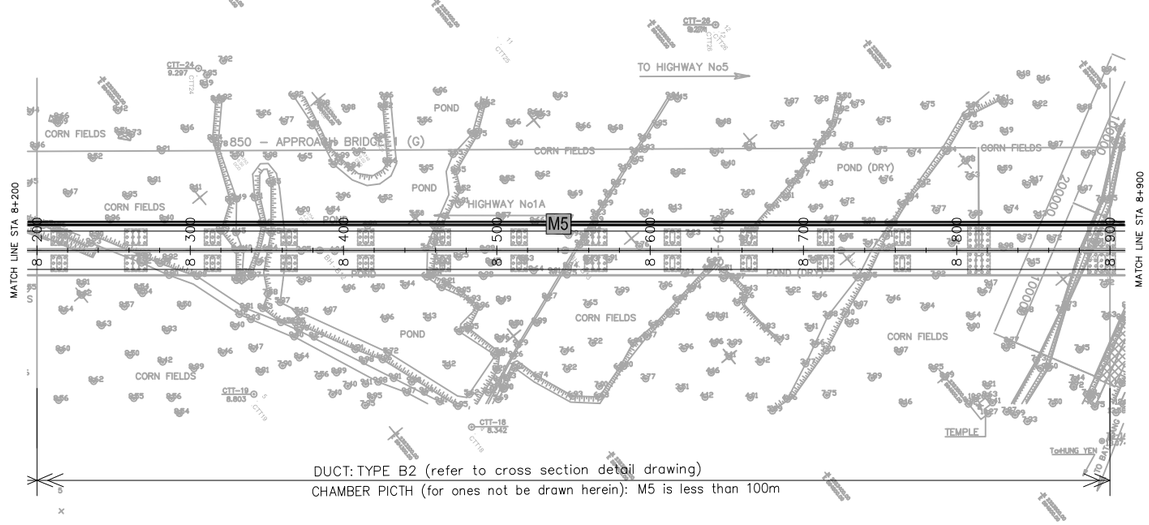

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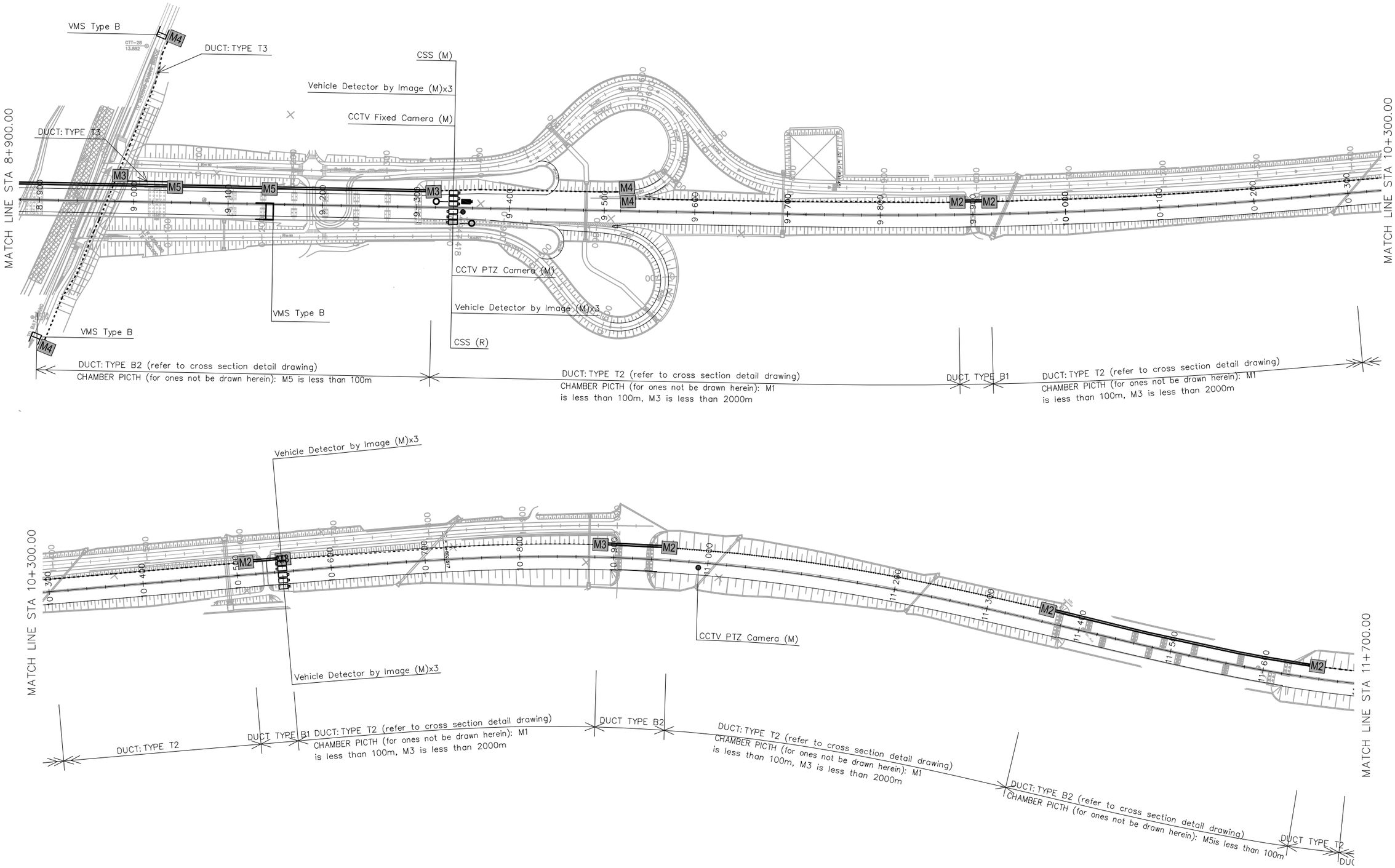

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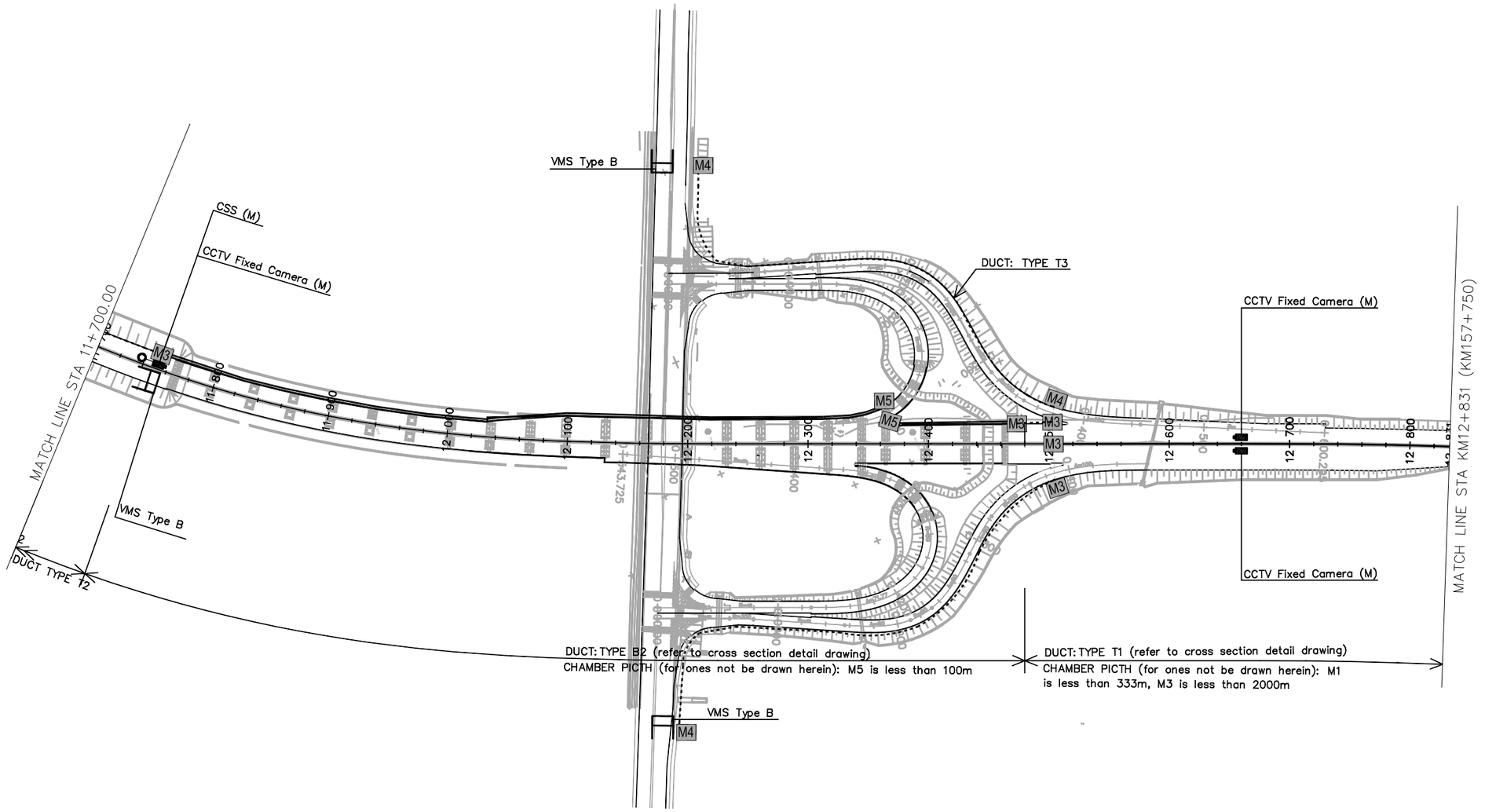

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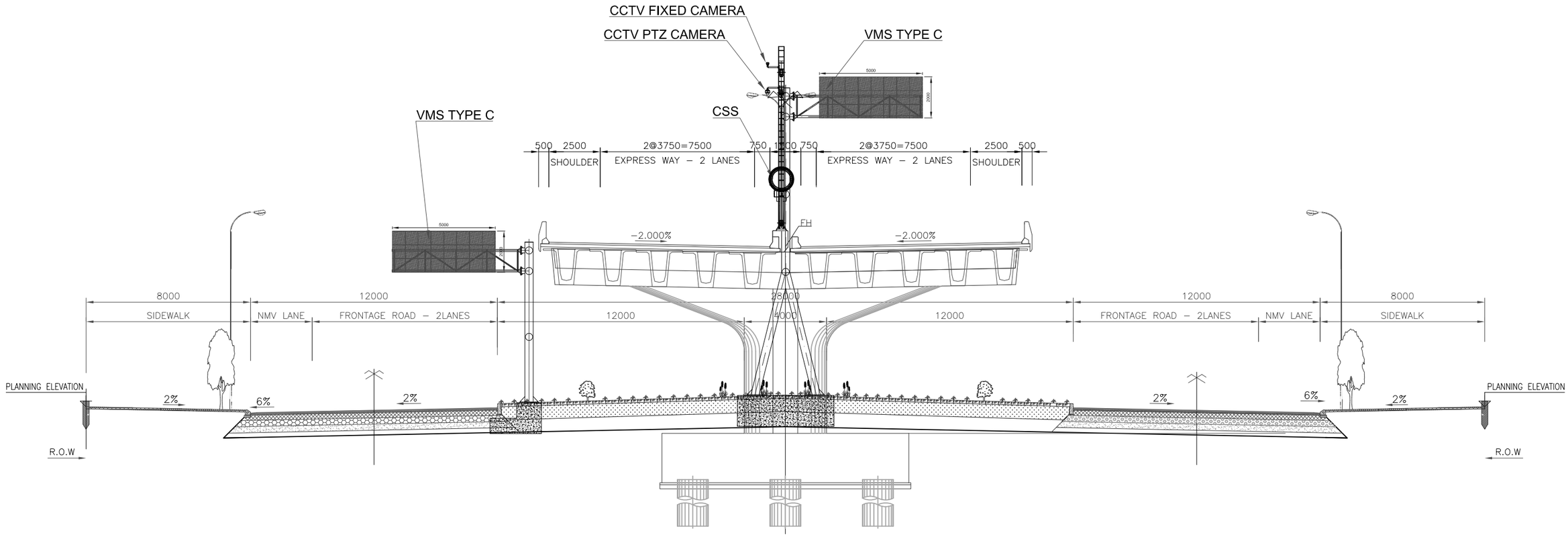
TYPICAL CROSS SECTION



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	PREPARED BY			
	CHECKED BY			
	APPROVED BY			

SOCIALIST REPUBLIC OF VIETNAM	ITS INTEGRATION PROJECT IN NORTHERN AREA OF VIETNAM	PACKAGE:	
MINISTRY OF TRANSPORT	DRAWING TITLE: TYPICAL CROSS SECTION OF EQUIPMENT ARRANGEMENT AT VIADUCTS SECTION OF RING ROAD NO.3	DRAWING No.: V. 2 - 01	
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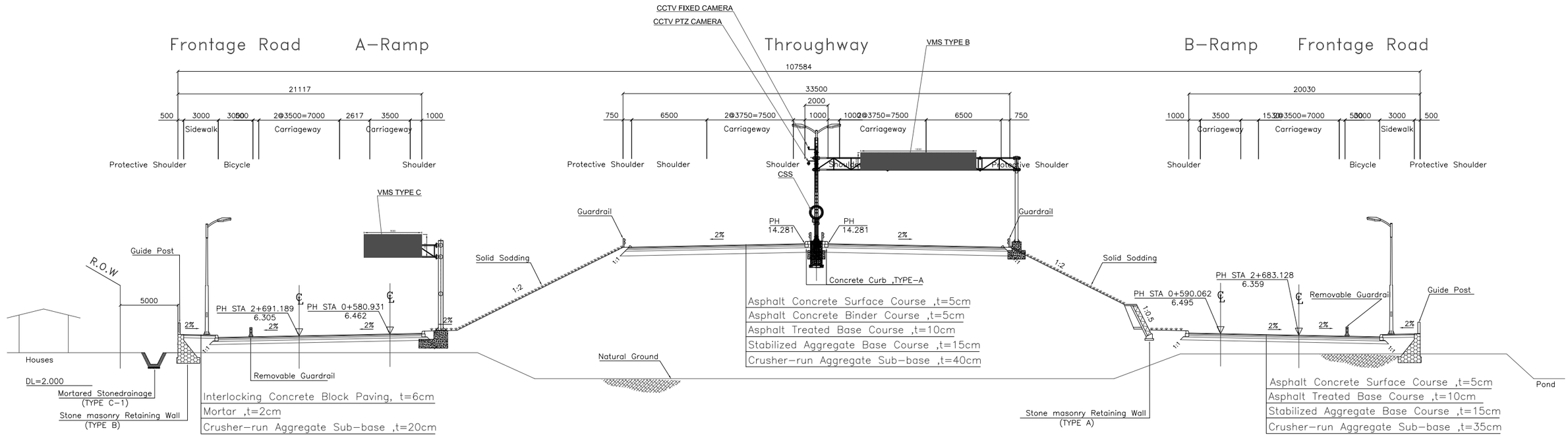
TYPICAL CROSS SECTION



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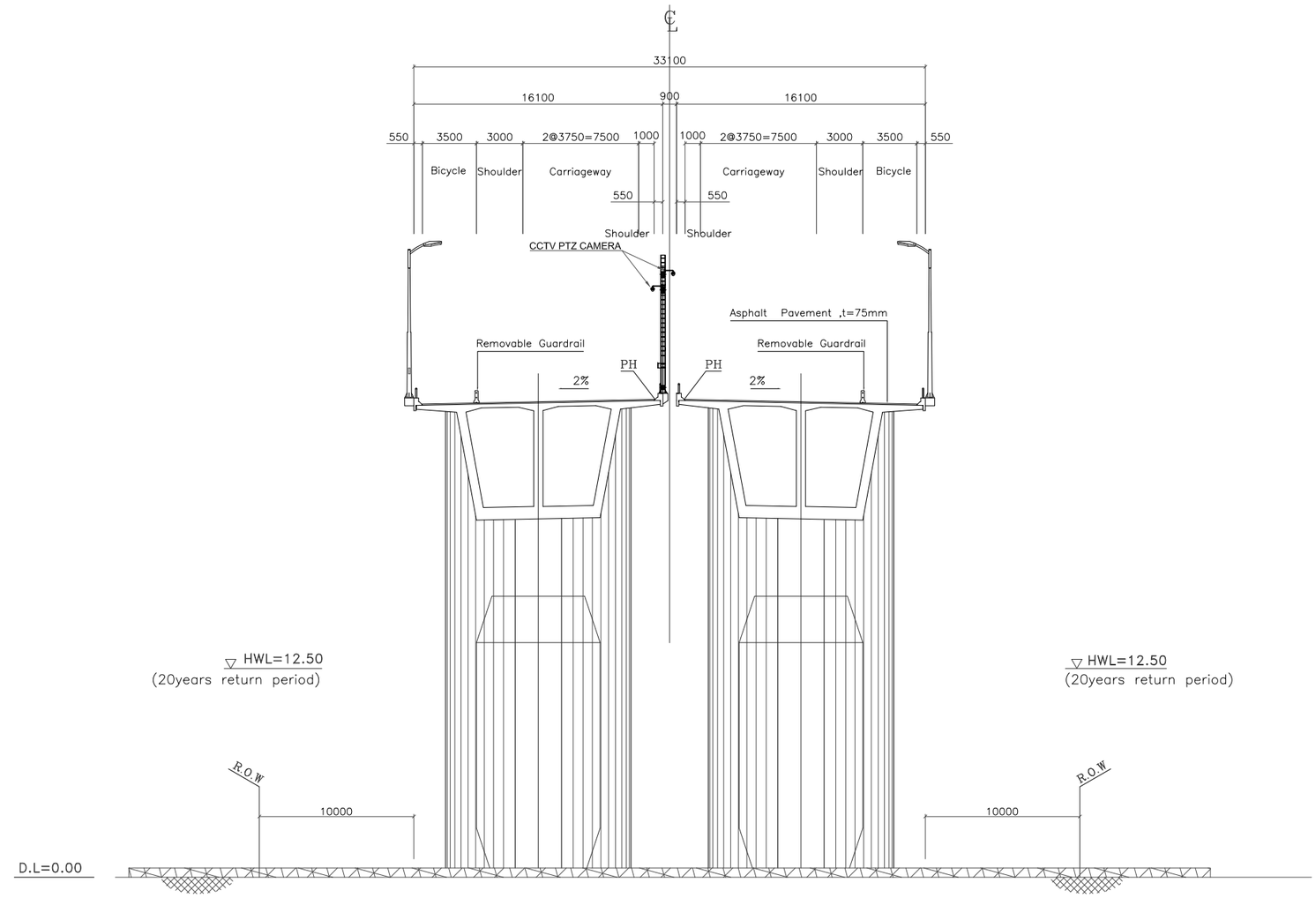

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	PREPARED BY						SHEET No.: Sheet of	Rev:
	CHECKED BY							
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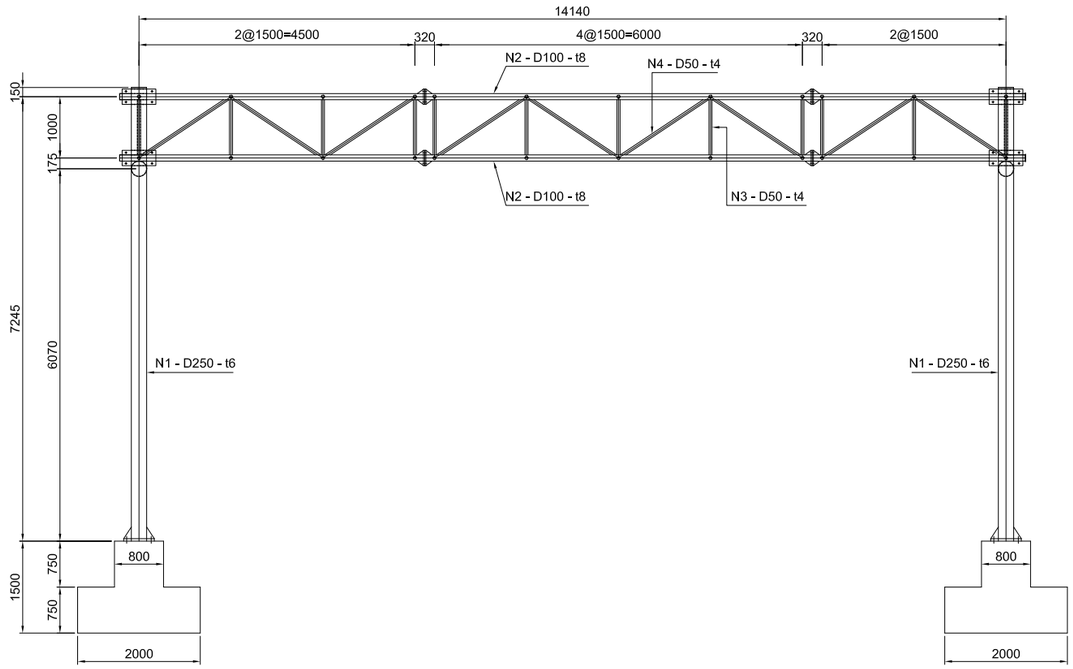
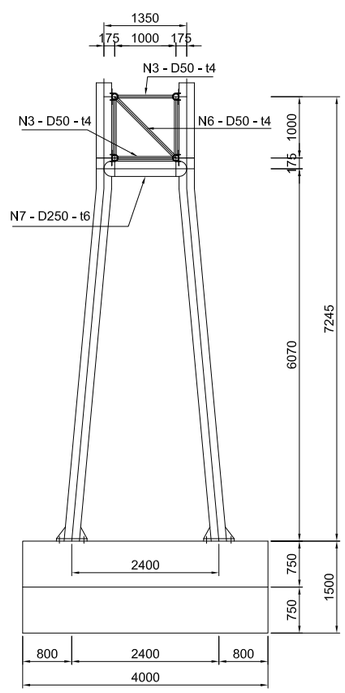
MAIN VIEW

SCALE: 1/100



SIDE VIEW

SCALE: 1/100



GENERAL VIEW

SCALE: 1/300

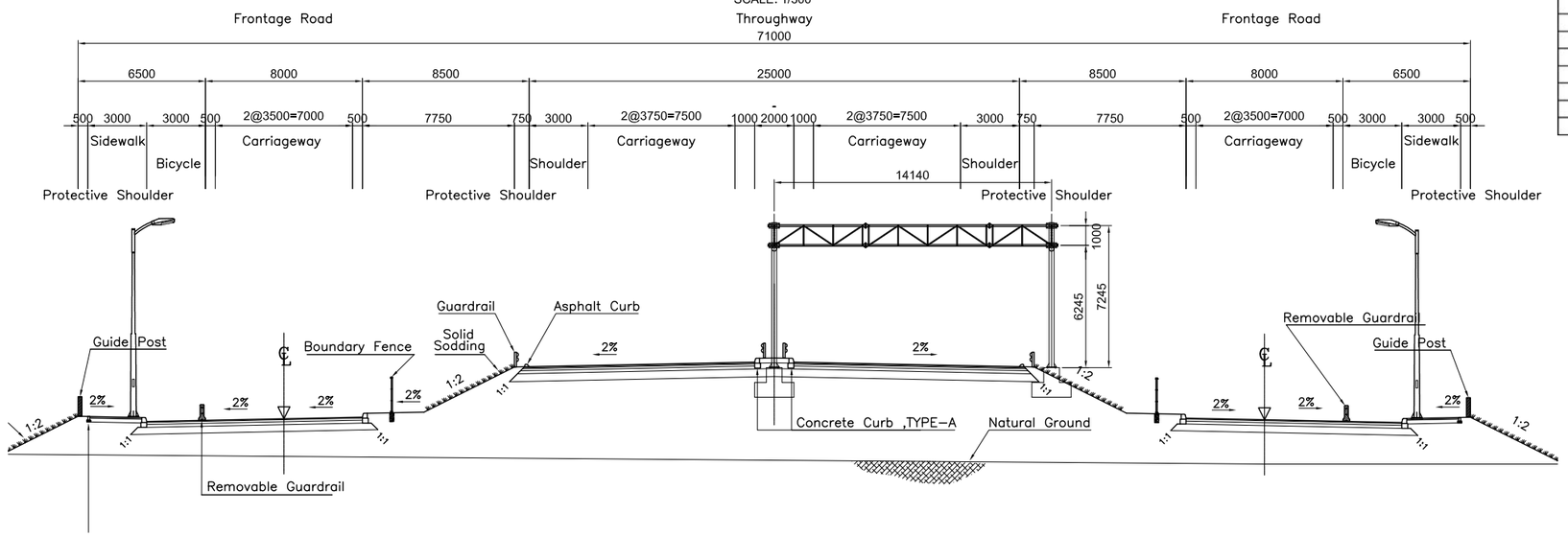


TABLE OF QUANTITY

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=14770	268.09	4	1072.35	Top chord ,bottom chord
N3	Tube D50 t=4 L=1000	4.54	48	217.81	Vertical web bar
N4	Tube D50 t=5 L=1803	10.00	36	360.16	Diagonal web bar
N6	Tube D50 t=5 L=1414	7.85	12	94.15	Diaphragm
N7	Tube D250 t=6 L=1350	48.74	2	97.48	Diaphragm
Total steel				2924.23	
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				
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SOCIALIST REPUBLIC OF VIETNAM

MINISTRY OF TRANSPORT

ITS INTEGRATION PROJECT
IN NORTHERN AREA OF VIETNAM

PACKAGE:

DRAWING TITLE:
RING ROAD NO.3
DETAIL OF GANTRY AT EARTH SECTION (1)

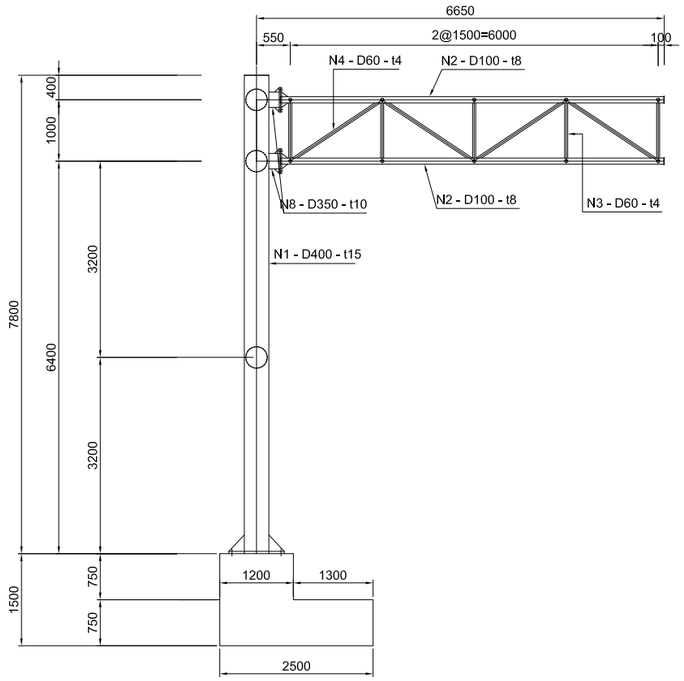
DRAWING No.: V.2-04

SCALE: Varies

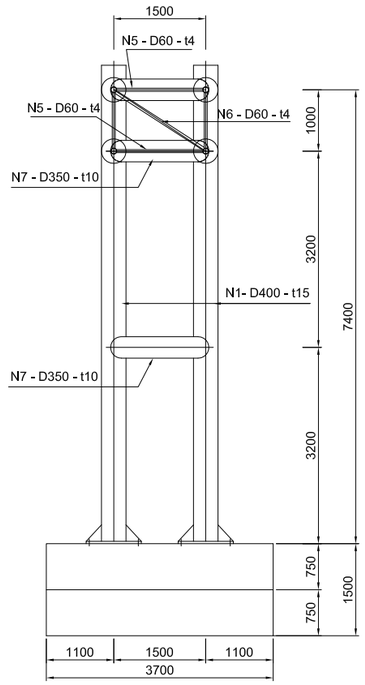
SHEET No.: Sheet of

Rev:

MAIN VIEW
SCALE: 1/100



SIDE VIEW
SCALE: 1/100



GENERAL VIEW
SCALE: 1/300

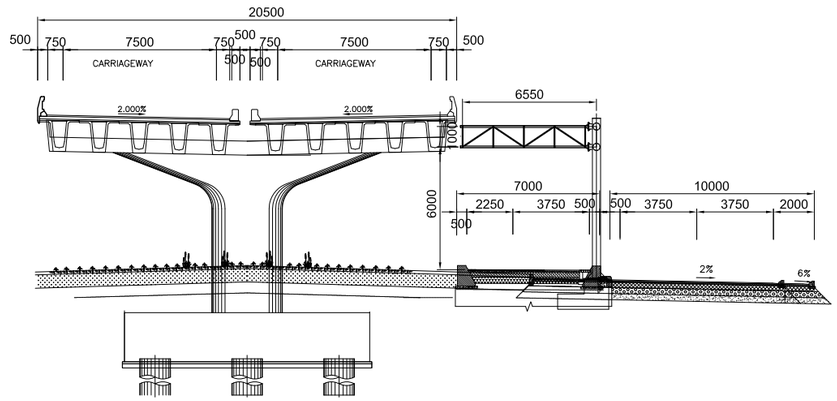


TABLE OF QUANTITY

Element	Type	Weight of 1 element	Number of element	Total weight	Notes
	(mm)	(kg)	(items)	(kg)	
N1	Tube D400 t=15 L=8400	1196.33	2	2392.66	Main column (upper part)
N2	Tube D100 t=8 L=6650	120.70	4	482.81	Top chord ,bottom chord
N3	Tube D60 t=4 L=1000	5.52	10	55.24	Vertical web bar
N4	Tube D60 t=4 L=1803	9.96	8	79.68	Diagonal web bar
N5	Tube D60 t=4 L=1500	8.29	10	82.86	Diaphragm
N6	Tube D60 t=4 L=1803	9.96	13	129.48	Diaphragm
N7	Tube D350 t=10 L=1500	125.77	3	377.32	Diaphragm
Total steel				3222.74	
Concrete M200				11.10m3	Assumed

NOTES:

1. Dimensions are in milimeter.
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

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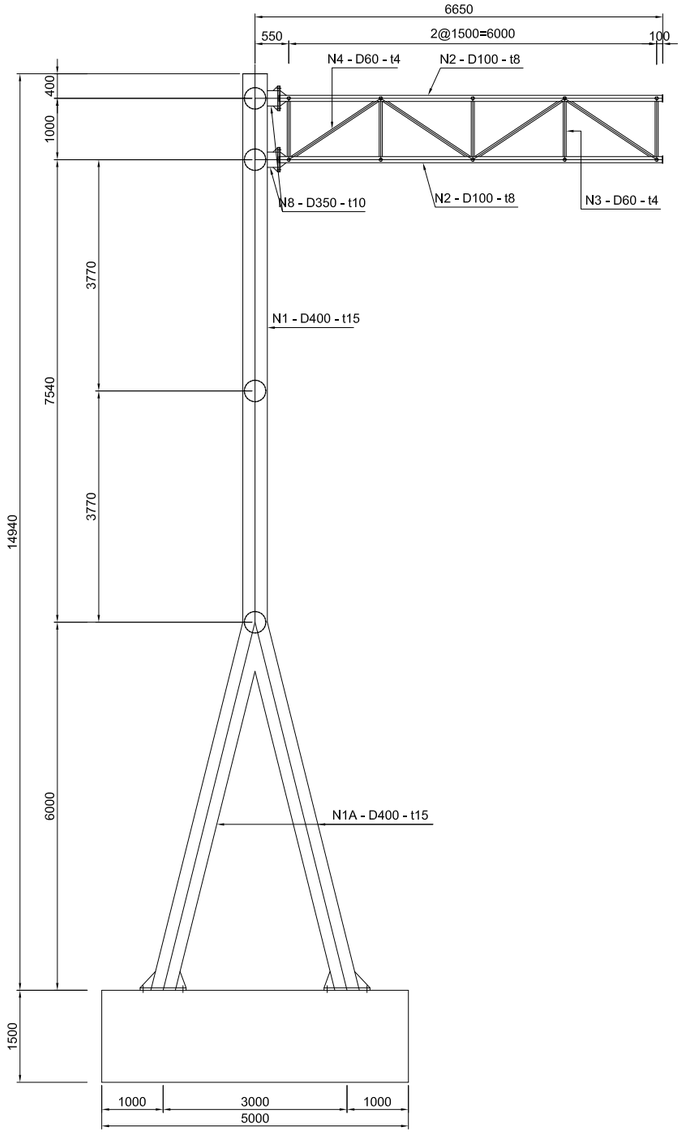
	PREPARED BY						SHEET No.: Sheet of	Rev:
	CHECKED BY					SCALE: Varies		
	APPROVED BY							

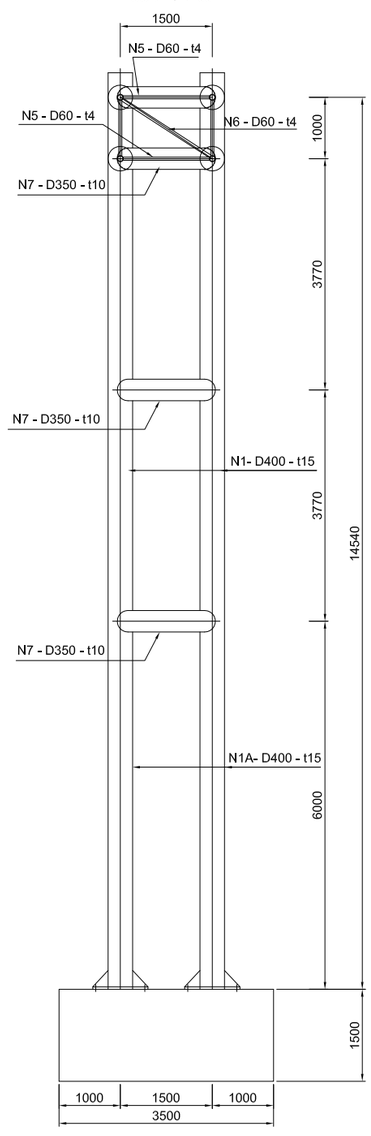
MAIN VIEW

SCALE: 1/100



SIDE VIEW

SCALE: 1/100



GENERAL VIEW

SCALE: 1/300

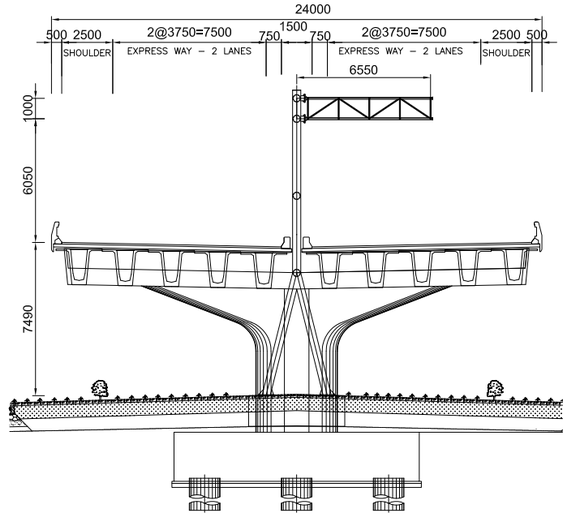


TABLE OF QUANTITY

Element	Type	Weight of 1 element	Number of element	Total weight	Notes
	(mm)	(kg)	(items)	(kg)	
N1	Tube D400 t=15 L=8940	1273.24	2	2546.47	Main column (upper part)
N1A	Tube D400 t=15 L=6185	880.87	4	3523.48	Main column (bottom part)
N2	Tube D100 t=8 L=6650	120.70	4	482.81	Top chord ,bottom chord
N3	Tube D60 t=4 L=1000	5.52	10	55.24	Vertical web bar
N4	Tube D60 t=4 L=1803	9.96	8	79.68	Diagonal web bar
N5	Tube D60 t=4 L=1500	8.29	10	82.86	Diaphragm
N6	Tube D60 t=4 L=1803	9.96	13	129.48	Diaphragm
N7	Tube D350 t=10 L=1500	125.77	4	503.09	Diaphragm
Total steel				6900.03	
Concrete M200				26.30m3	Assumed

NOTES:

1. Dimensions are in milimeter.
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

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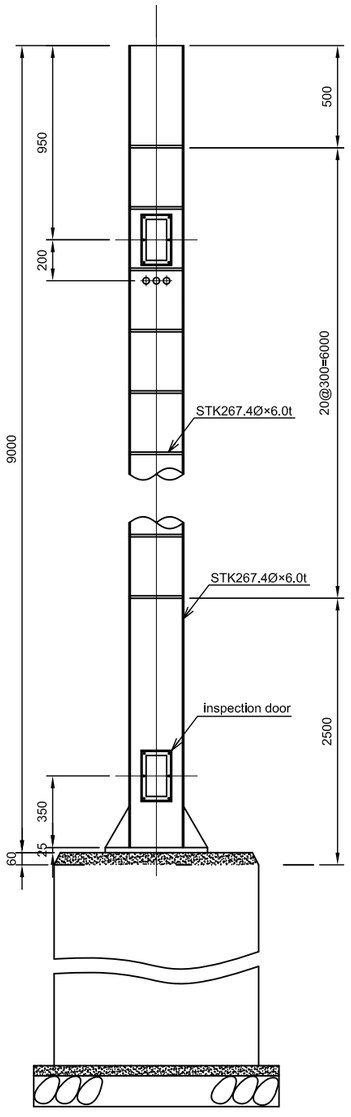
	APPROVED BY							

SUPPORT POLE FOR CAMERA(1)

SUPPORT POLE FOR CAMERA scale:1/30



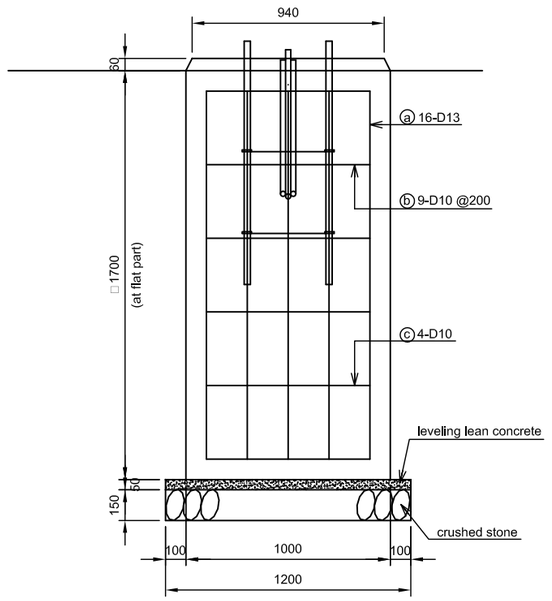
Volume table of support pole

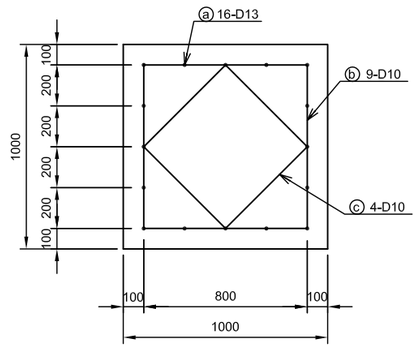
	Material	Dimension	Weight (kg)
Pole	Steel	267.4Φx6t	348.3
Step	Steel	RB13Φ	9.4
Base	Steel	25t	49.2
Base	Steel	12t	9.0
		Total weight	416

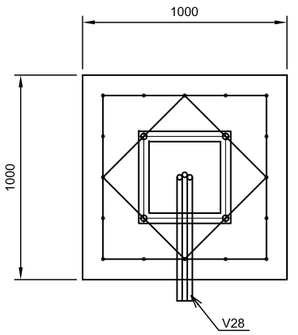
Volume table of foundation

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	

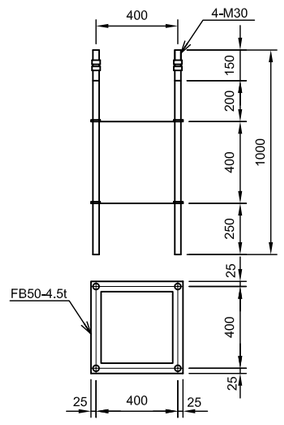
FOUNDATION scale:1/30







ANCHOR BOLT scale:1/30



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 Thls drawlng be based on NEXCO(Japan) drawlngs.
*5 These structures should be redesigned to meet site condition.

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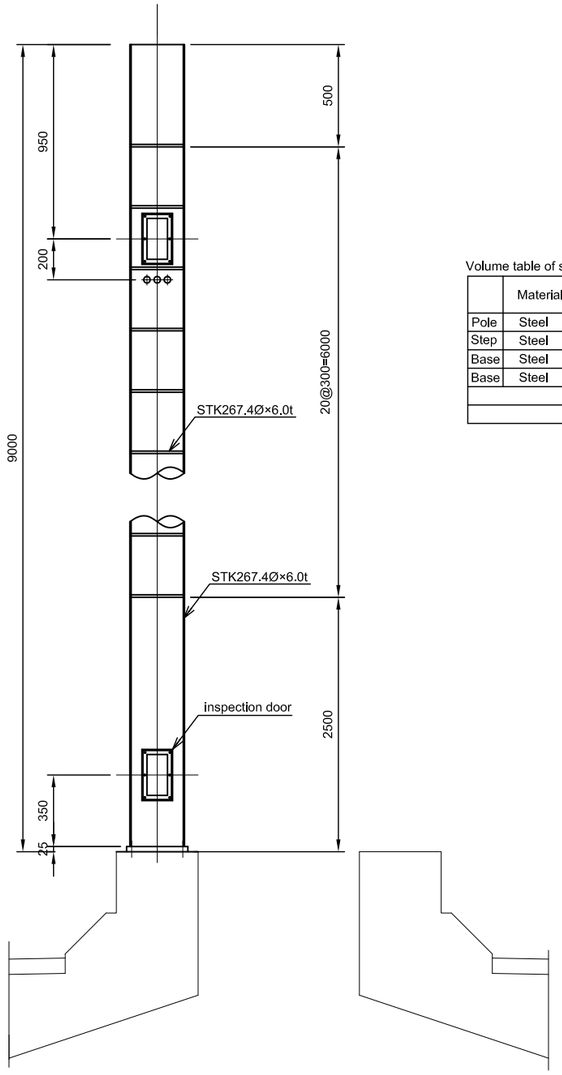
	PREPARED BY						SHEET No.: Sheet of	Rev:
	CHECKED BY					SCALE: 1/30		
	APPROVED BY							

SUPPORT POLE FOR CAMERA(2)

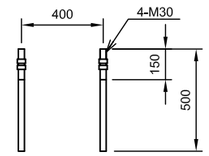
SUPPORT POLE FOR CAMERA scale:1/30

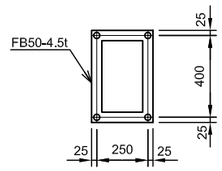


Volume table of support pole

	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

ANCHOR BOLT scale:1/30





*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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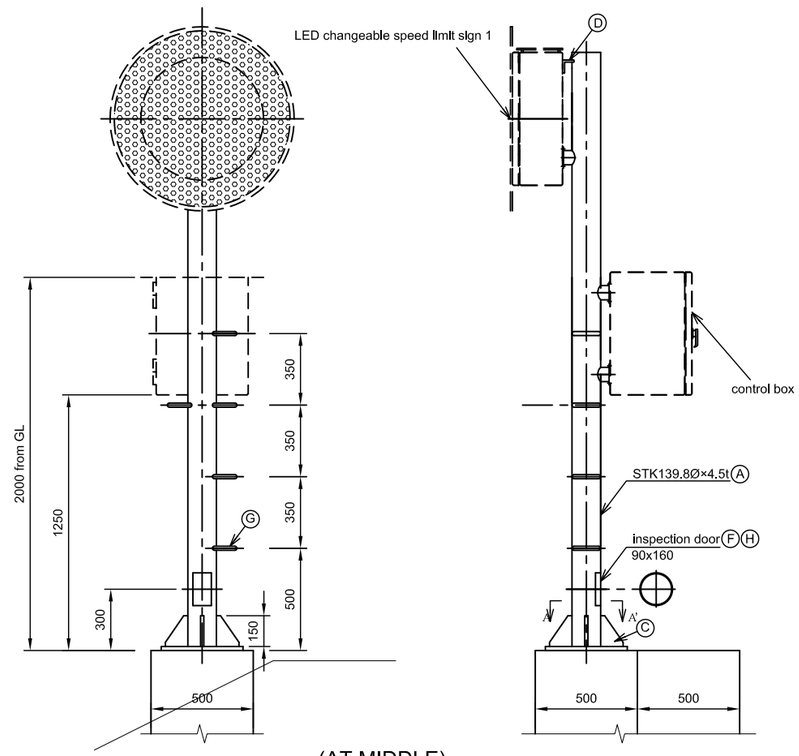
	PREPARED BY						SHEET No.: Sheet of	Rev:
	CHECKED BY					SCALE: 1/30		
	APPROVED BY							

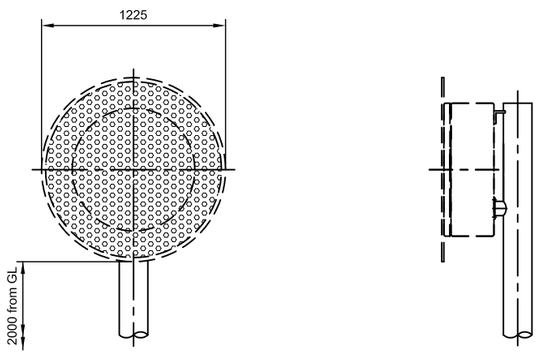
SUPPORT POLE FOR CHANGEABLE SPEED LIMIT SIGN

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

(AT ENDS)



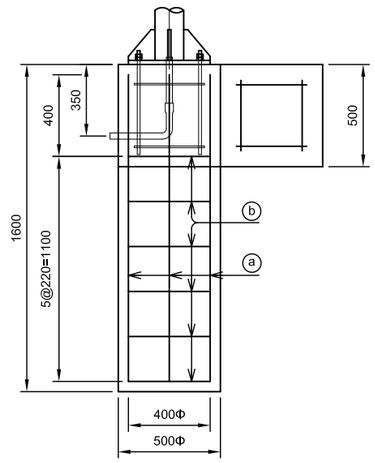
(AT MIDDLE)

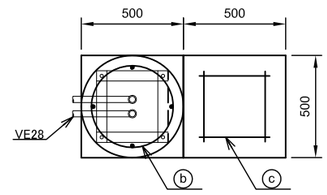


Volume table of support pole

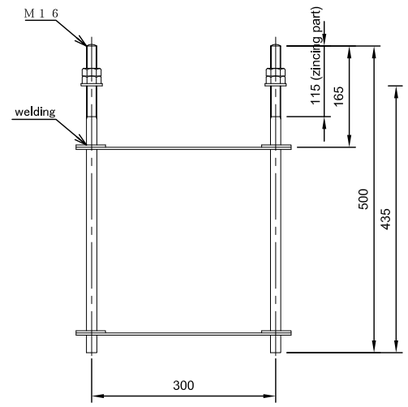
	Material	Dimension	Weight (kg)	
			at ends	at middle
Ⓐ	Steel	139.8Φx4.5t	47.0	42.0
Ⓒ	Steel	9t	18.0	16.0
Ⓓ	Steel	6t	1.4	1.4
Ⓔ	Steel	16t	20.0	20.0
Ⓕ	Steel	3.2t	1.4	1.4
Ⓖ	Steel	RB13Φ	4.0	4.0
Ⓗ	Steel	FB50x6t	1.0	1.0
		Total weight	95	87

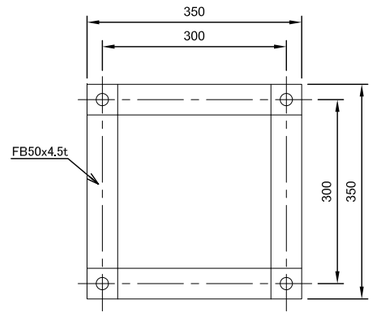
FOUNDATION scale:1/30



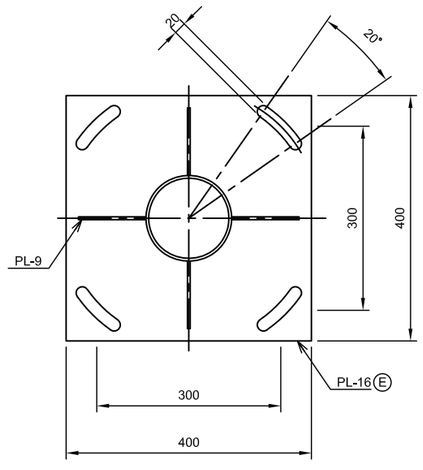


ANCHOR BOLT scale:1/10





BASE PLATE 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
disposal of waste soil		m³	0.316
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.

CONSULTANT				
ORIENTAL CONSULTANTS GLOBAL CO., LTD METROPOLITAN EXPRESSWAY CO., LTD NEXCO EAST ENGINEERING CO., LTD TRANSPORTATION RESEARCH INSTITUTE CO., LTD ABEAM CONSULTING LTD.	TITLE	NAME	SIGNATURE	DATE
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SOCIALIST REPUBLIC OF VIETNAM

MINISTRY OF TRANSPORT

ITS INTEGRATION PROJECT
IN NORTHERN AREA OF VIETNAM

PACKAGE:

DRAWING TITLE:
RING ROAD NO.3
SUPPORT POLE FOR CHANGEABLE SPEED LIMIT SIGN

SCALE: Varies

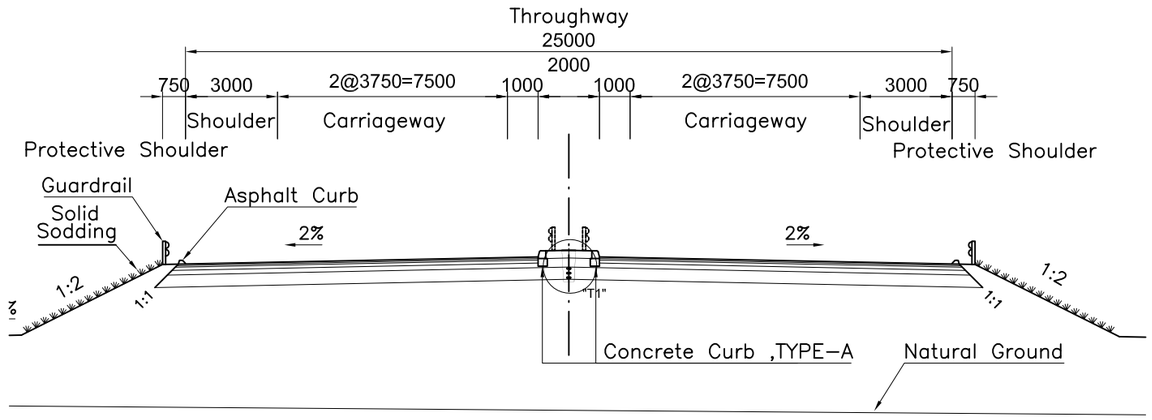
DRAWING No.: V.2-09

SHEET No.: Sheet of

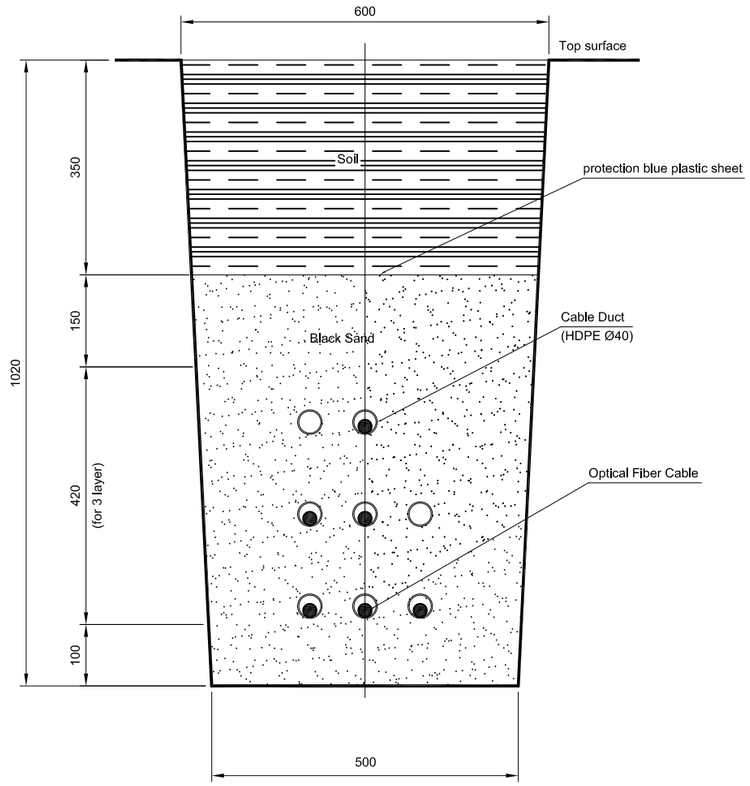
Rev:

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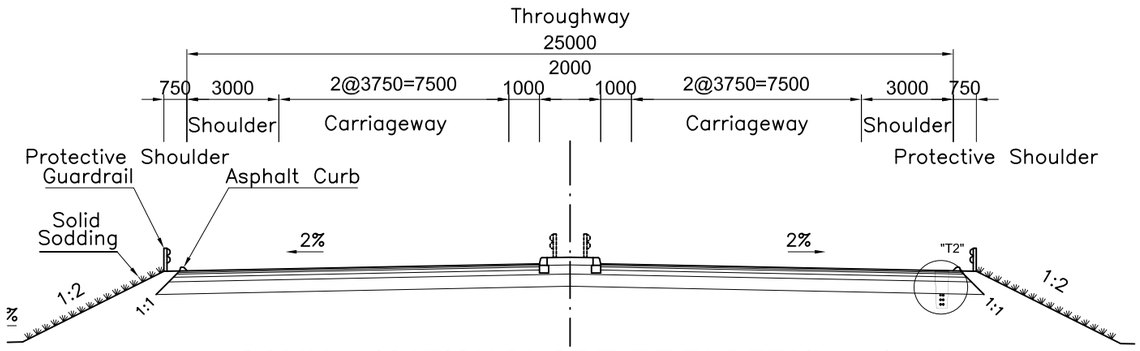
	PREPARED BY						SHEET No.: Sheet of	Rev:
	CHECKED BY					SCALE: varies		
	APPROVED BY							

TYPICAL CROSS SECTION OF COMMUNICATION DUCT(TYPE T2,T3) IN EARTHWORK SECTION

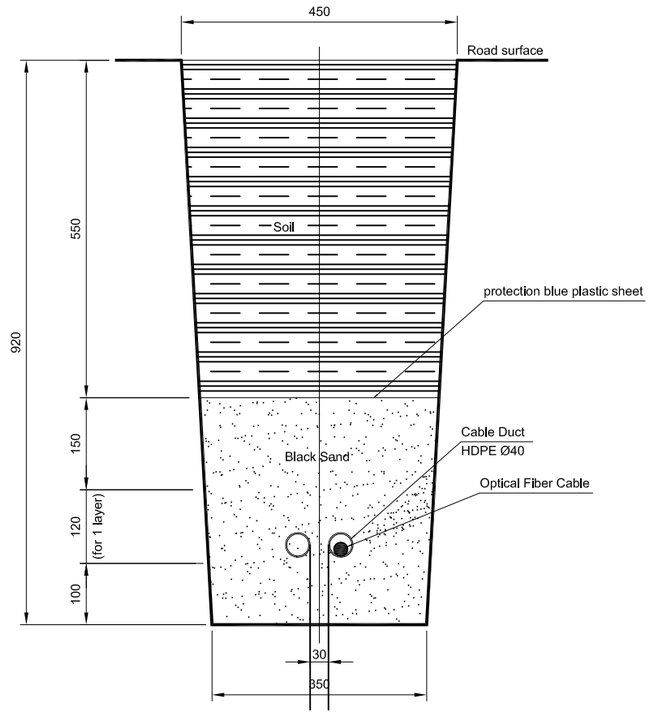
ARRANGEMENT OF COMMUNICATION DUCT IN SHOULDER (T2 TYPE)

(WHEN MEDIAN WIDTH BE LESS THAN 2.0M)

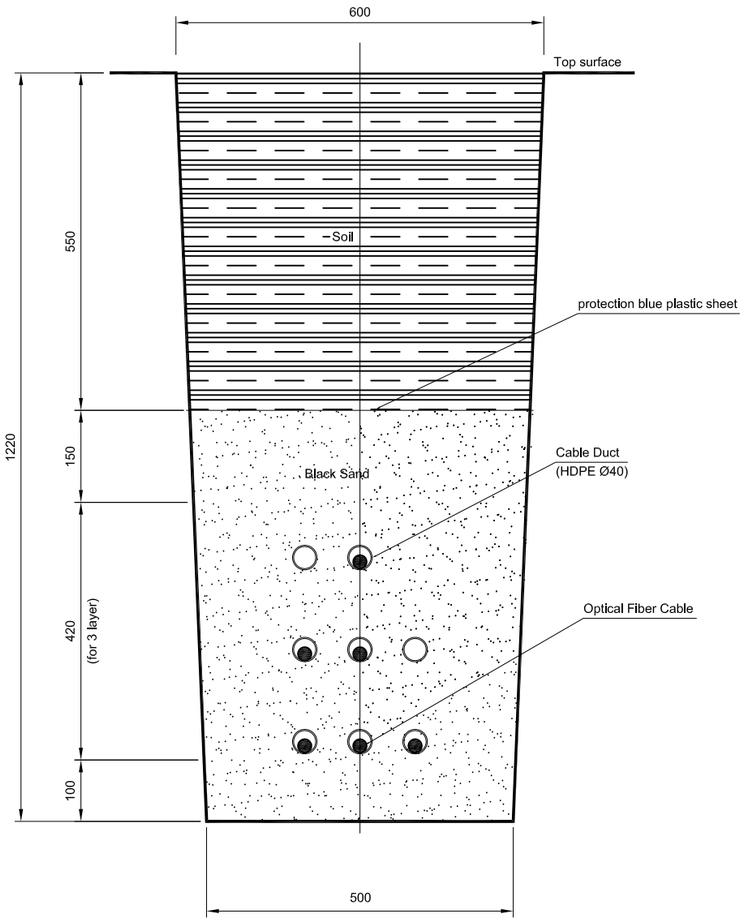


COMMUNICATION DUCT TYPE T3 DETAIL scale:1/10

(USE FOR COMMUNICATION DUCT SPREAD FOR ROADSIDE EQUIPMENT)



T2 DETAIL scale:1/10



Volume table of T2 Duct (for 1 kilometer in length)

	Volume
Disposal soil	671 m³
Black sand	353 m³
Backfill soil	318 m³
Protection blue plastic sheet	500 m²

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 IN NORTHERN AREA OF VIETNAM	PACKAGE:	
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	PREPARED BY						SHEET No.: Sheet of	Rev:
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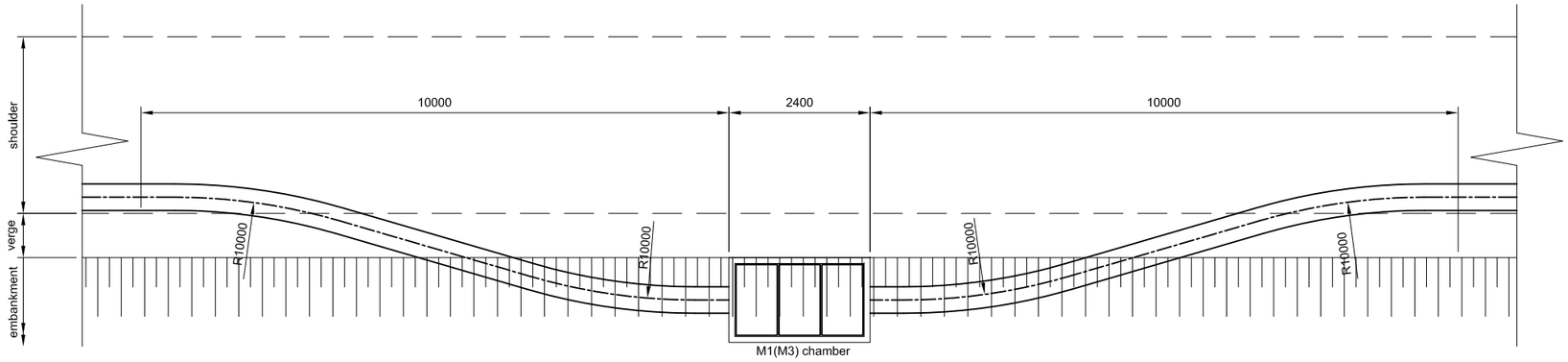
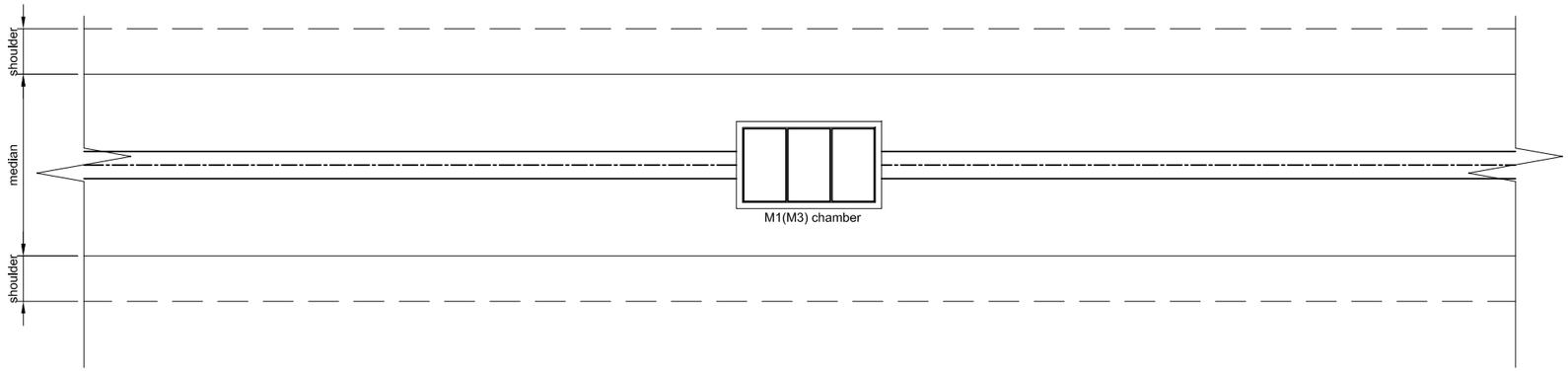
	APPROVED BY					SCALE: varies		

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 IN NORTHERN AREA OF VIETNAM	PACKAGE:	
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	PREPARED BY						SHEET No.: Sheet of	Rev:
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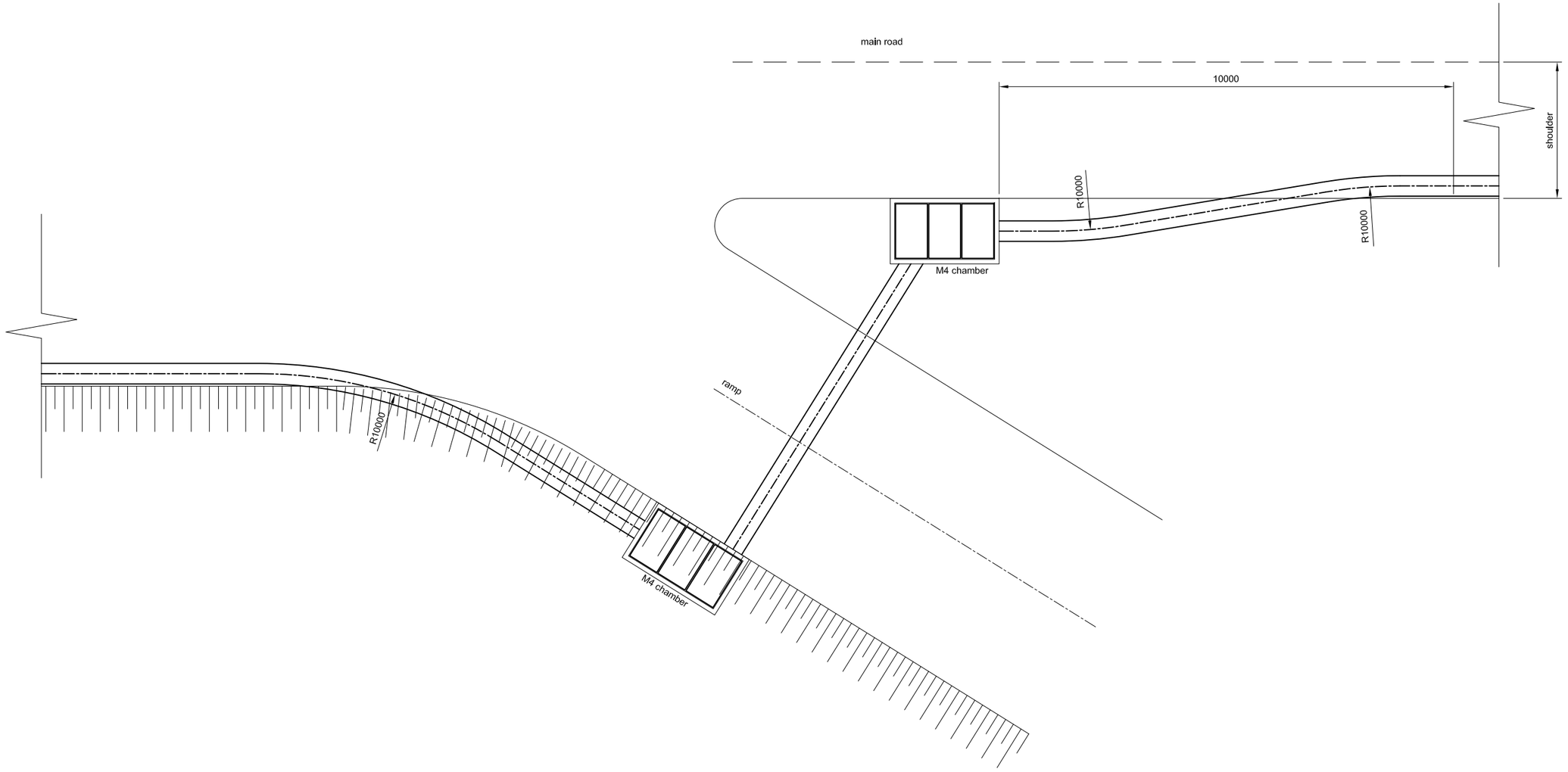
	APPROVED BY					SCALE: 1/100		

ARRANGEMENT OF COMMUNICATION DUCT AT CHAMBER (2)

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



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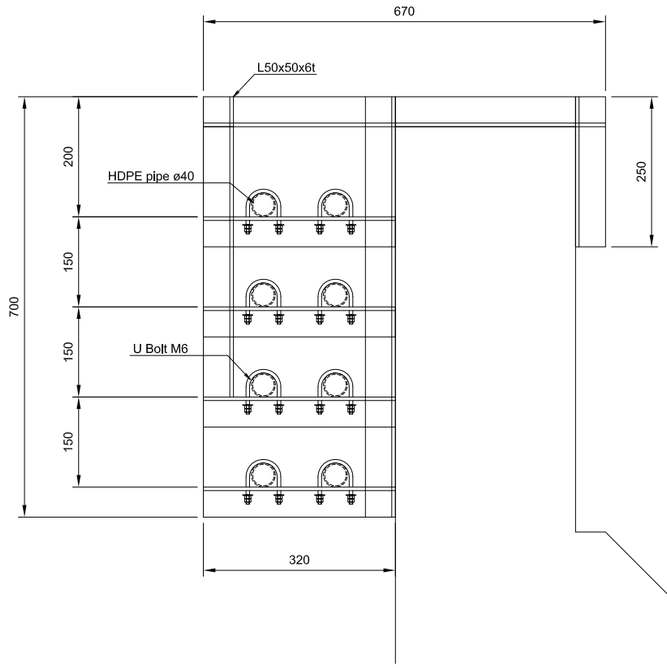
	APPROVED BY					SCALE: 1/100		

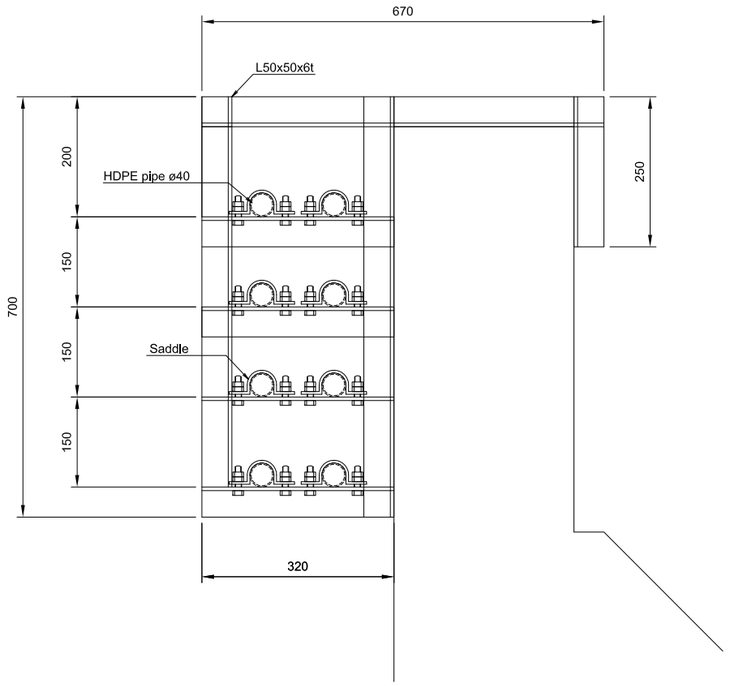
DETAIL OF COMMUNICATION DUCT (TYPE B1) ON BRIDGE

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

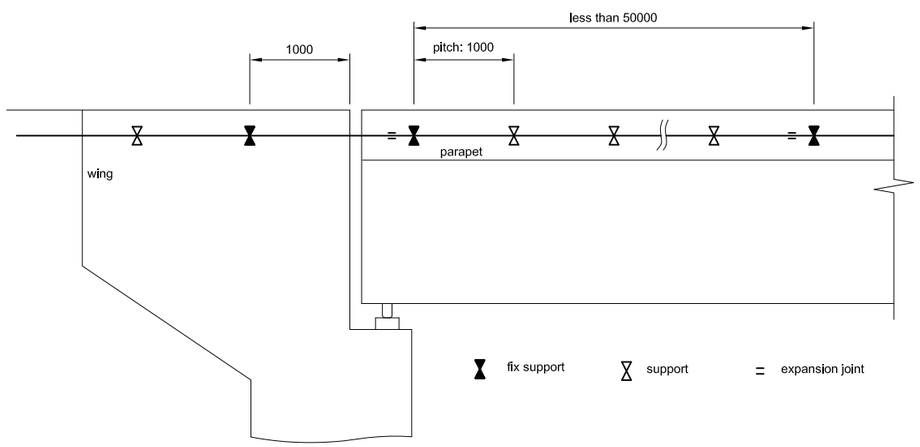
Support



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 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				
ORIENTAL CONSULTANTS GLOBAL CO., LTD METROPOLITAN EXPRESSWAY CO., LTD NEXCO EAST ENGINEERING CO., LTD TRANSPORTATION RESEARCH INSTITUTE CO., LTD ABEAM CONSULTING LTD.	TITLE	NAME	SIGNATURE	DATE
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SOCIALIST REPUBLIC OF VIETNAM

MINISTRY OF TRANSPORT

ITS INTEGRATION PROJECT
IN NORTHERN AREA OF VIETNAM

DRAWING TITLE:
RING ROAD NO.3
DETAIL OF COMMUNICATION DUCT (TYPE B1) ON BRIDGE

SCALE: varies

PACKAGE:

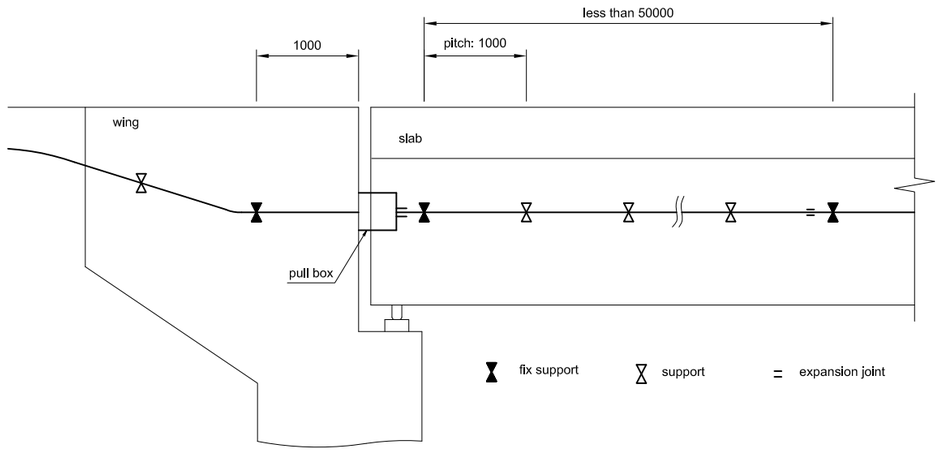
DRAWING No.: V.3-05

SHEET No.: Sheet of

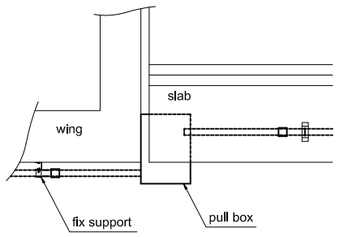
Rev:

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

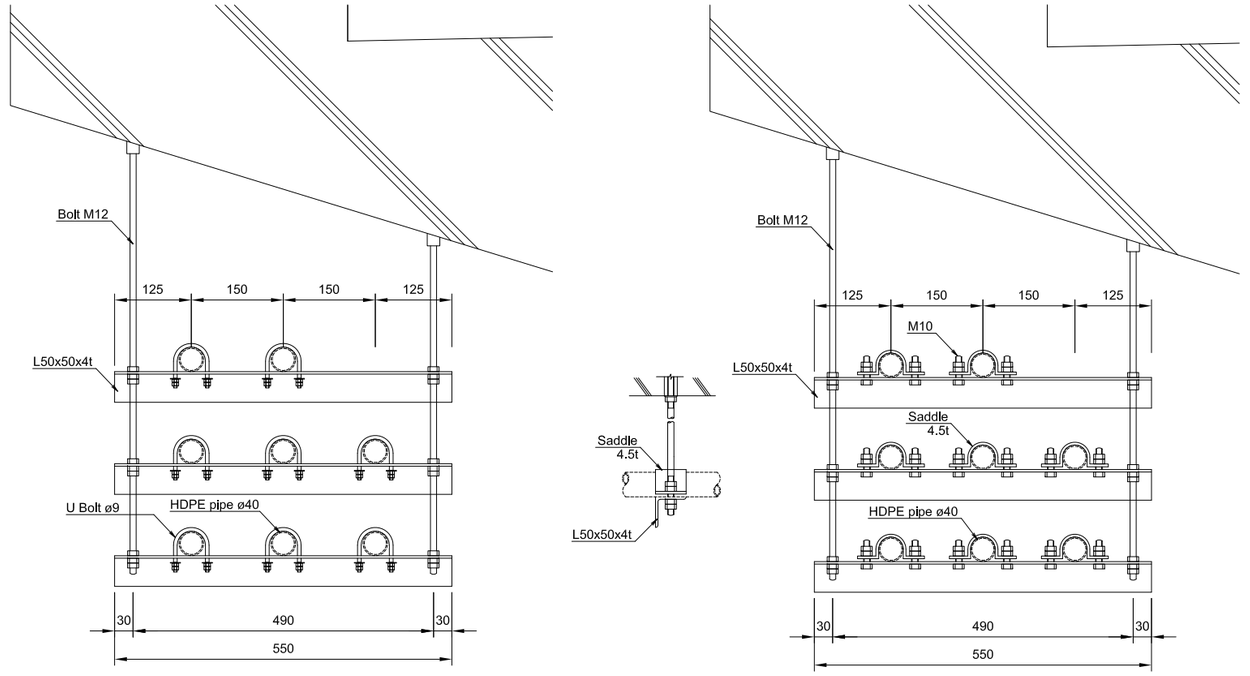
ARRANGEMENT OF COMMUNICATION DUCT ON BRIDGE (SIDE VIEW)



ARRANGEMENT OF COMMUNICATION DUCT AT JOINT AREA (PLAN VIEW)



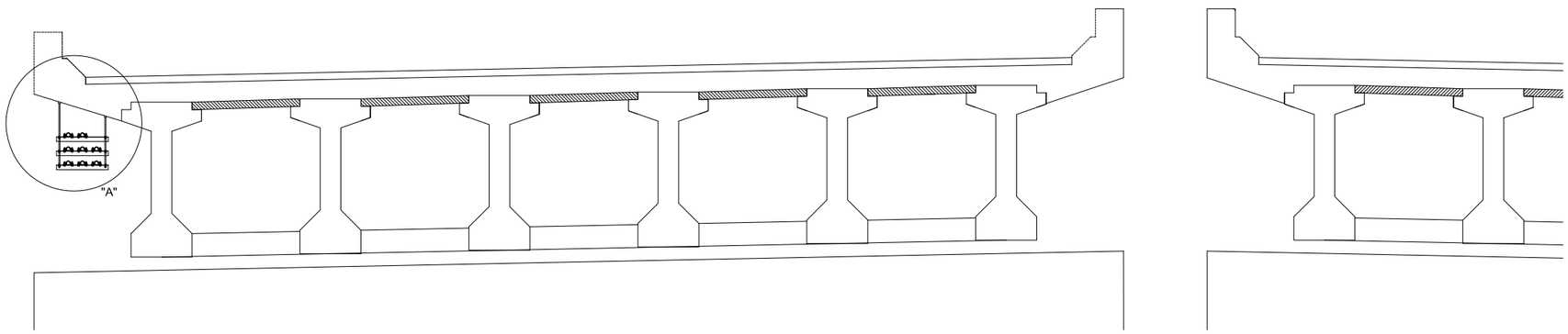
"A" DETAIL scale: 1/10



Volume table of supporting rack B2(for 1 place)

	Weight(kg)
L50x50x4t	6
Anchor bolt M12	1.3

ARRANGEMENT OF COMMUNICATION DUCT ON BRIDGE (CROSS SECTION VIEW)



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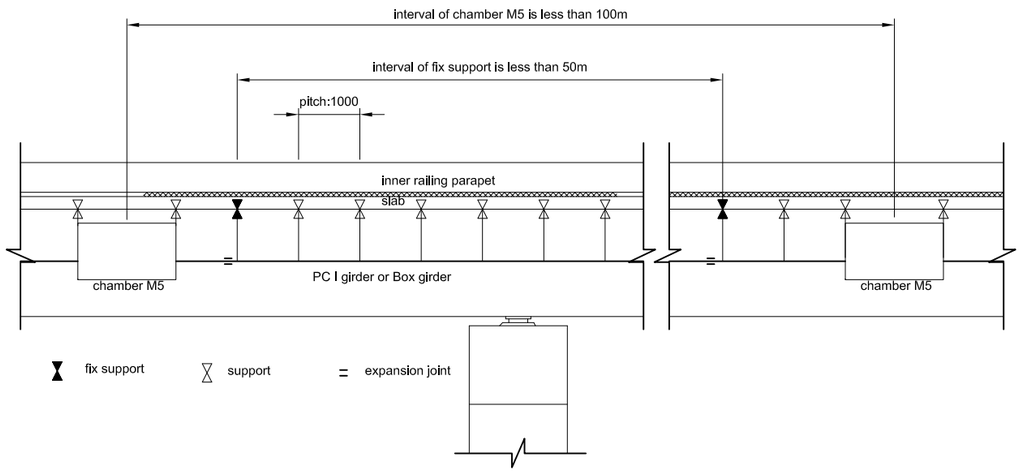
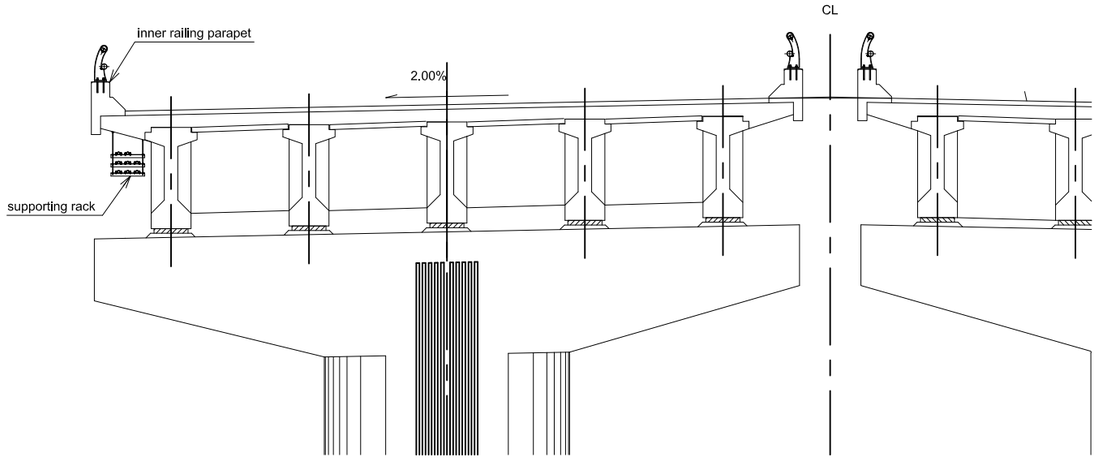
DETAIL OF COMMUNICATION DUCT (TYPE B2) ON BRIDGE(2)

SIDE VIEW



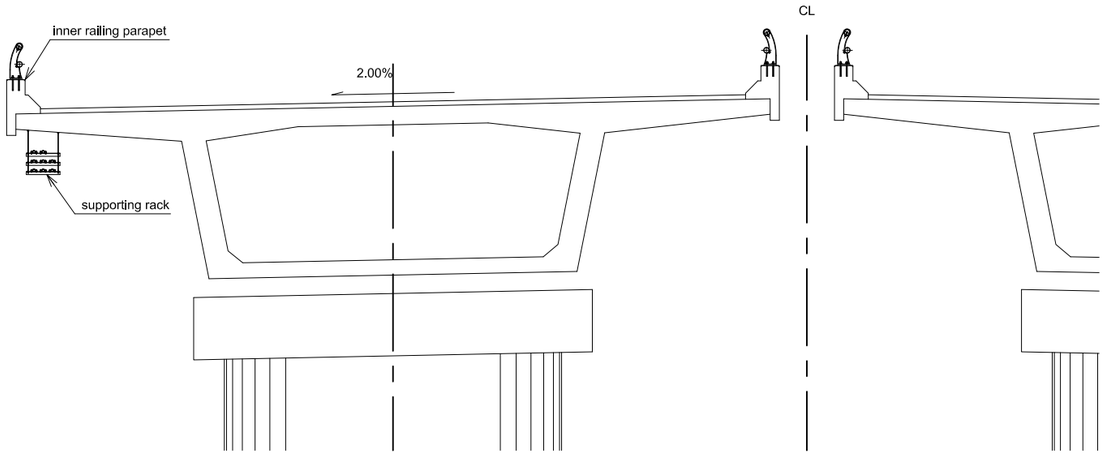
CROSS SECTION VIEW

(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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	PREPARED BY						SHEET No.: Sheet of	Rev:
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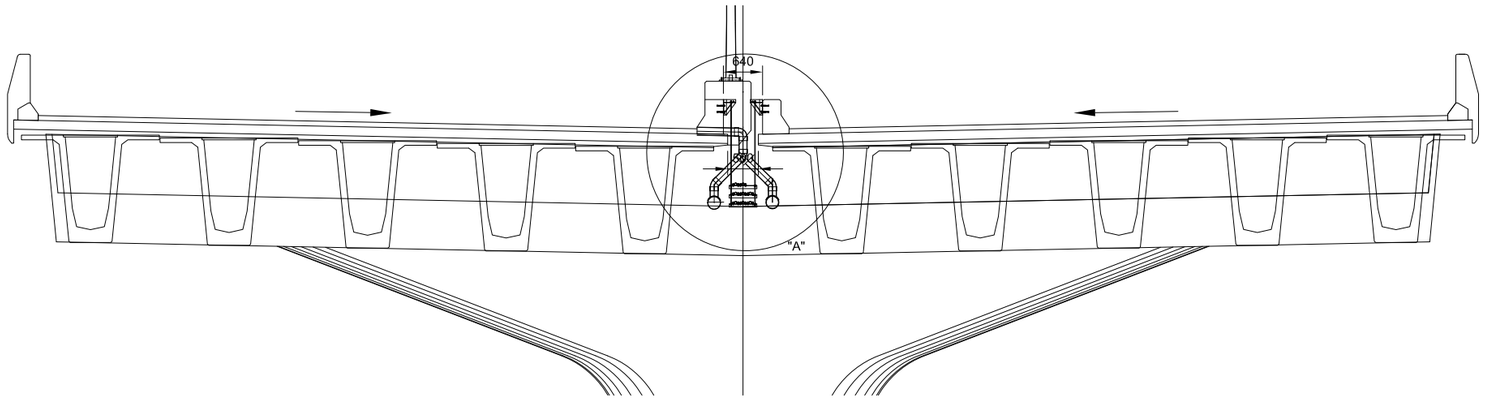
	APPROVED BY					SCALE: 1/100		

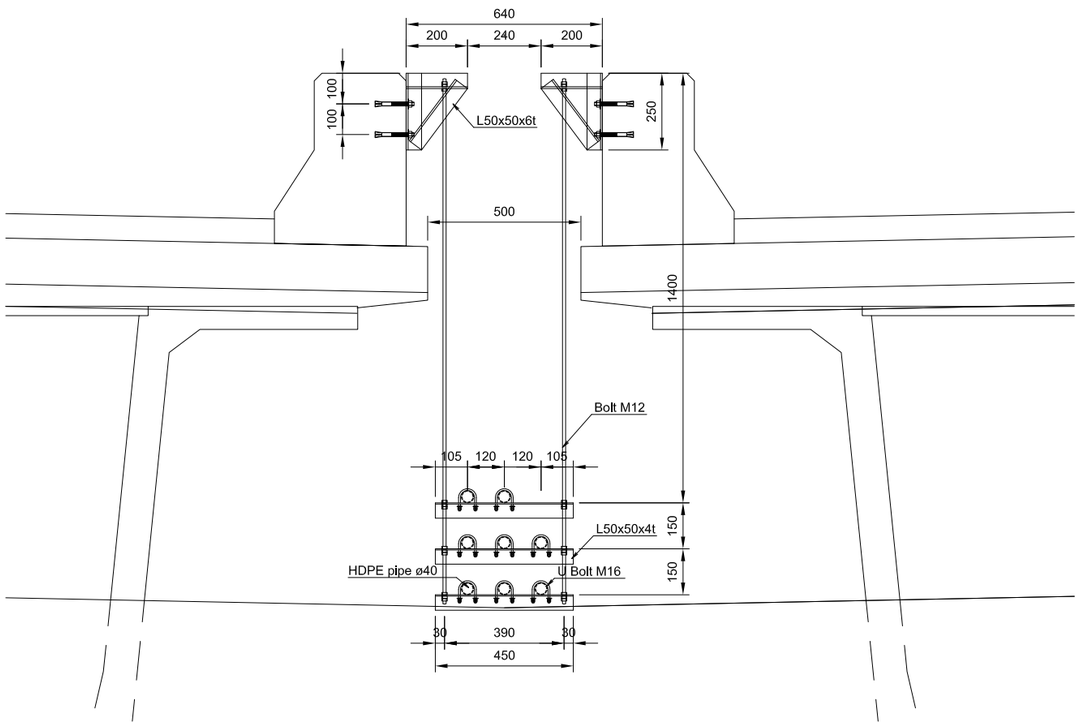
DETAIL OF COMMUNICATION DUCT (TYPE B3) ON BRIDGE(1)

ARRANGEMENT OF COMMUNICATION DUCT ON BRIDGE (CROSS SECTION VIEW) SCALE:1/100

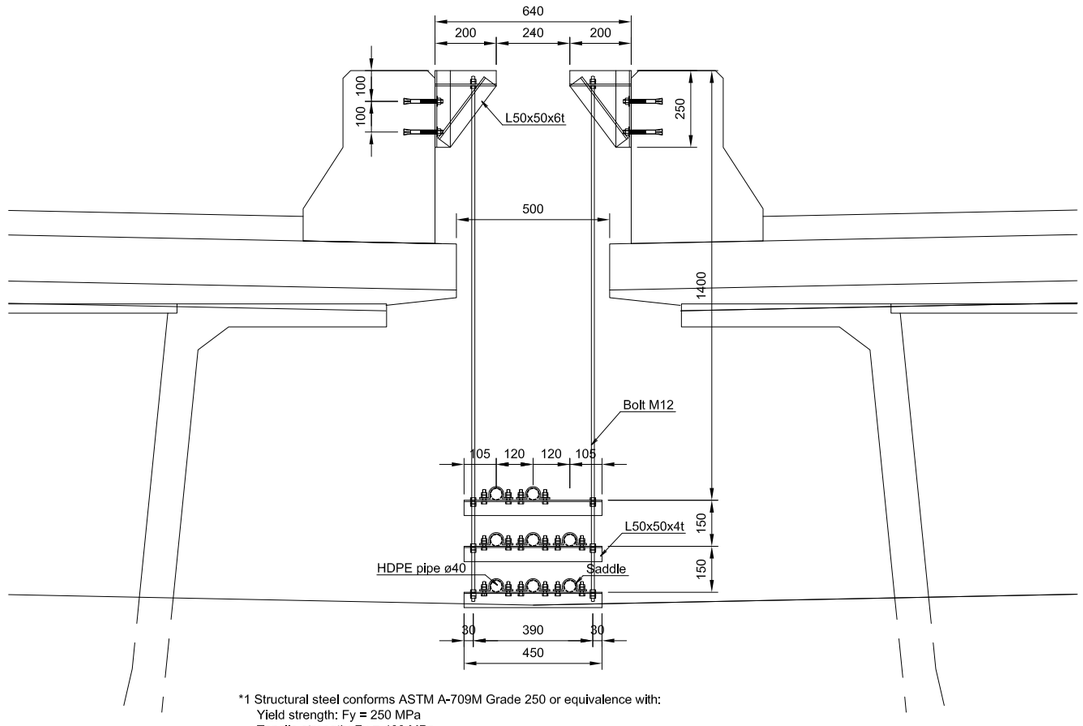


"A" DETAIL scale: 1/20

Support



Fix Support



Volume table of supporting rack B3(1)(for 1 place)

	Weight(kg)
L50x50x6t	7
L50x50x4t	5
Anchor bolt M12	2.2

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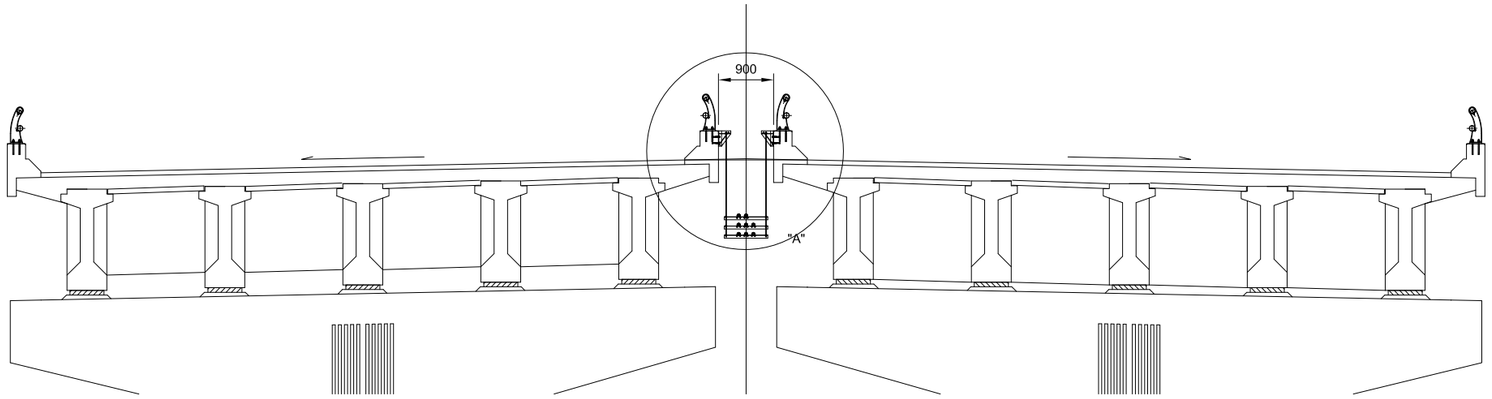
	APPROVED BY							

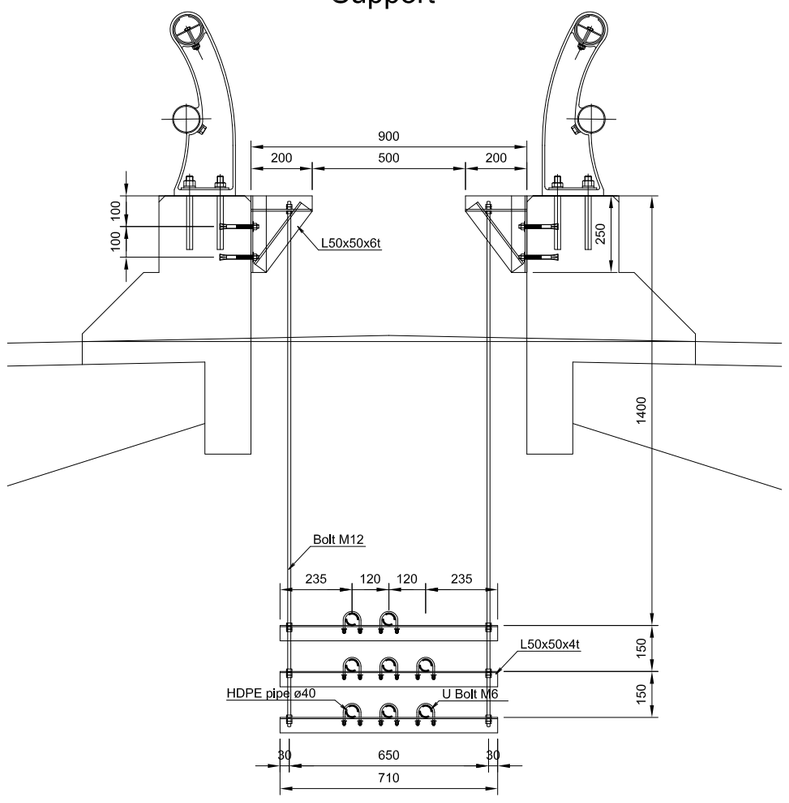
DETAIL OF COMMUNICATION DUCT (TYPE B3) ON BRIDGE (2)

ARRANGEMENT OF COMMUNICATION DUCT ON BRIDGE (CROSS SECTION VIEW) scale:1/100

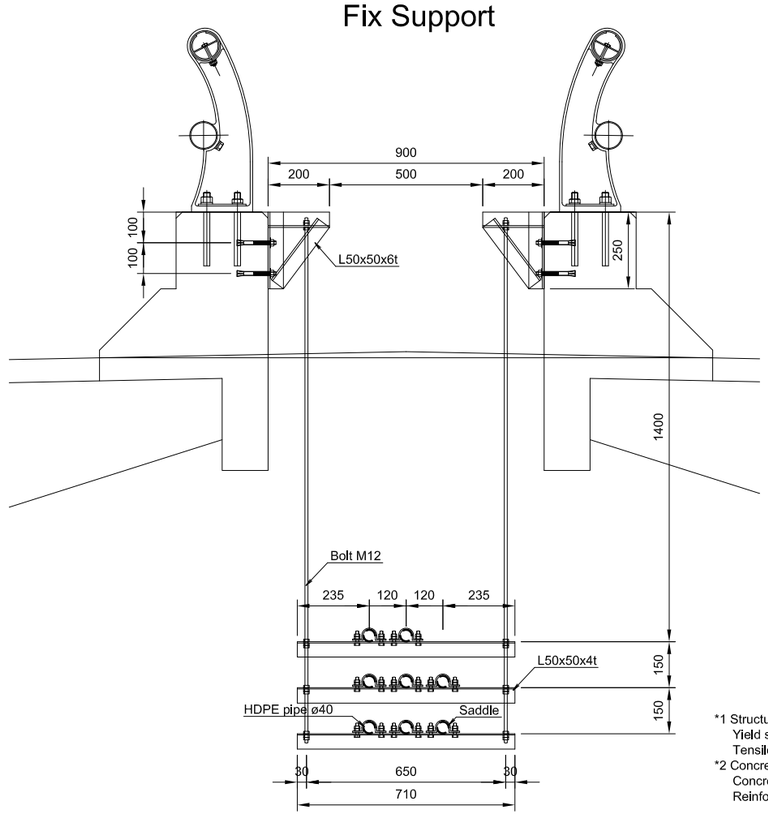


"A" DETAIL scale: 1/20

Support



Fix Support



Volume table of supporting rack B3(2)(for 1 place)

	Weight(kg)
L50x50x6t	7
L50x50x4t	5
Anchor bolt M12	2.2

*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: 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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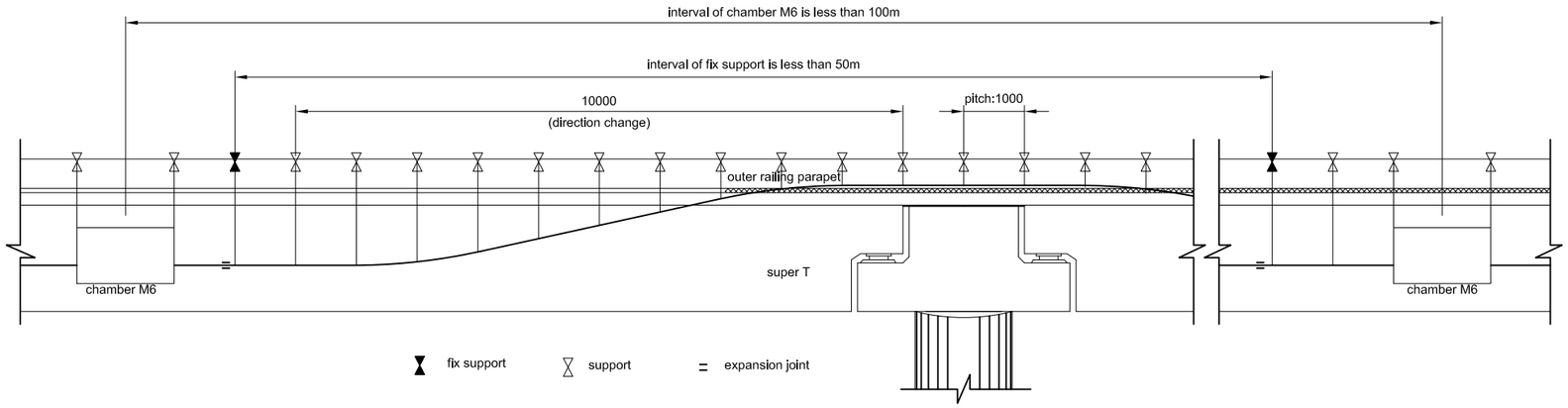
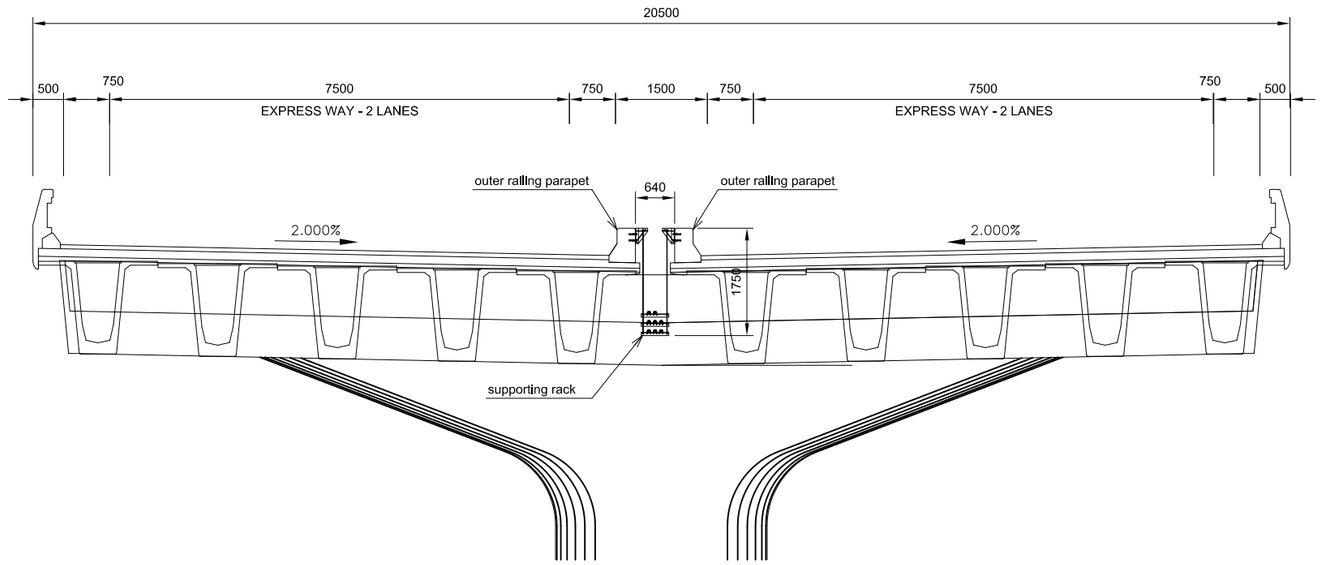
	APPROVED BY					SCALE: varies		

DETAIL OF COMMUNICATION DUCT(TYPE B3) ON BRIDGE(3)

SIDE VIEW



CROSS SECTION VIEW



*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 IN NORTHERN AREA OF VIETNAM	PACKAGE:	
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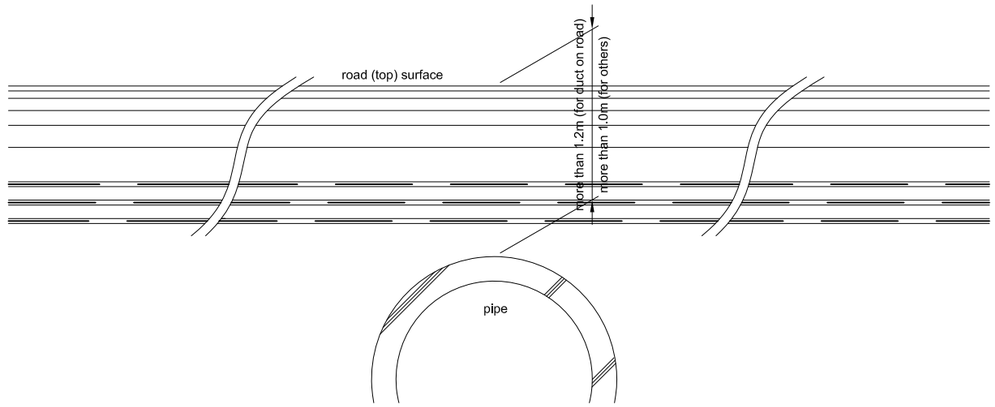
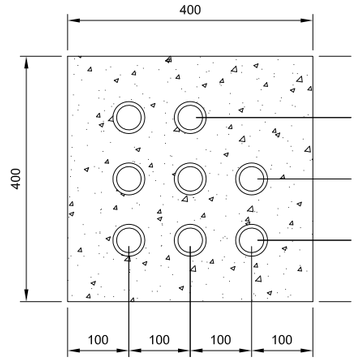
	PREPARED BY						SHEET No.: Sheet of	Rev:
	CHECKED BY							
	APPROVED BY					SCALE: 1/100		

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)



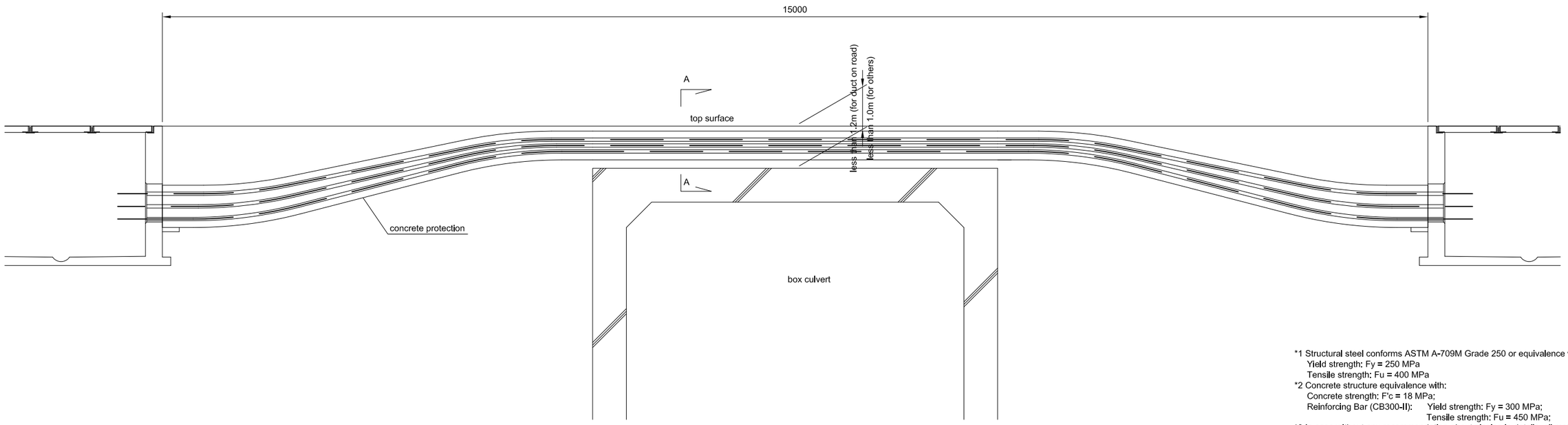
A-A SECTION scale: 1/10



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)

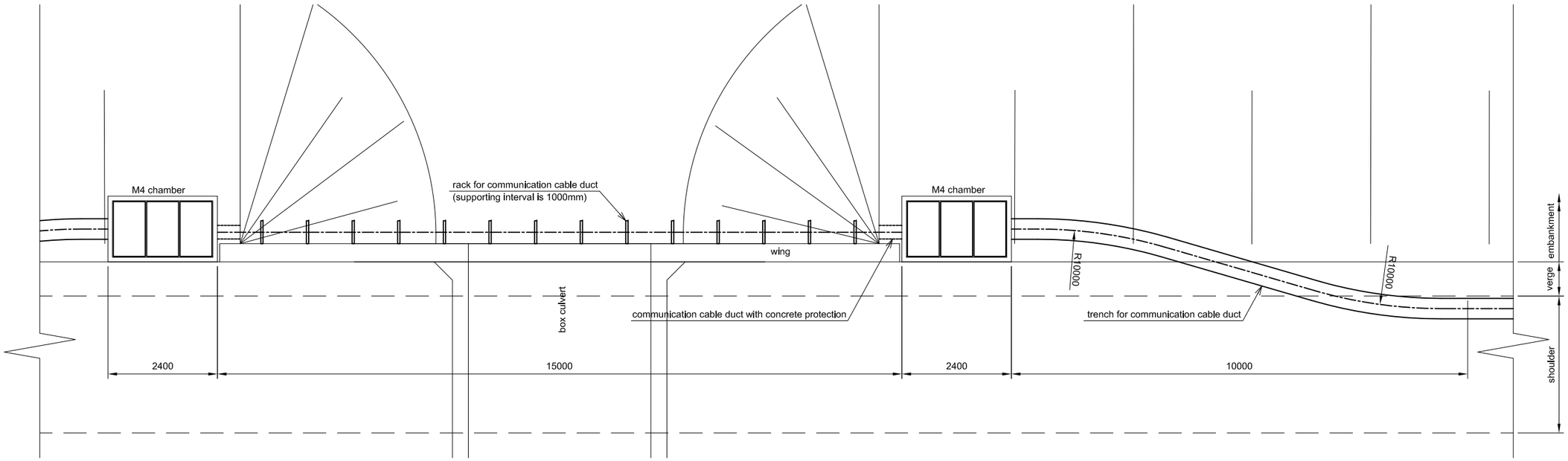


*1 Structural steel conforms ASTM A-709M Grade 250 or equivalence with:
Yield strength: Fy = 250 MPa
Tensile strength: Fu = 400 MPa
*2 Concrete structure equivalence with:
Concrete strength: F'c = 18 MPa;
Reinforcing Bar (CB300-II): Yield strength: Fy = 300 MPa;
Tensile strength: Fu = 450 MPa;
*3 In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

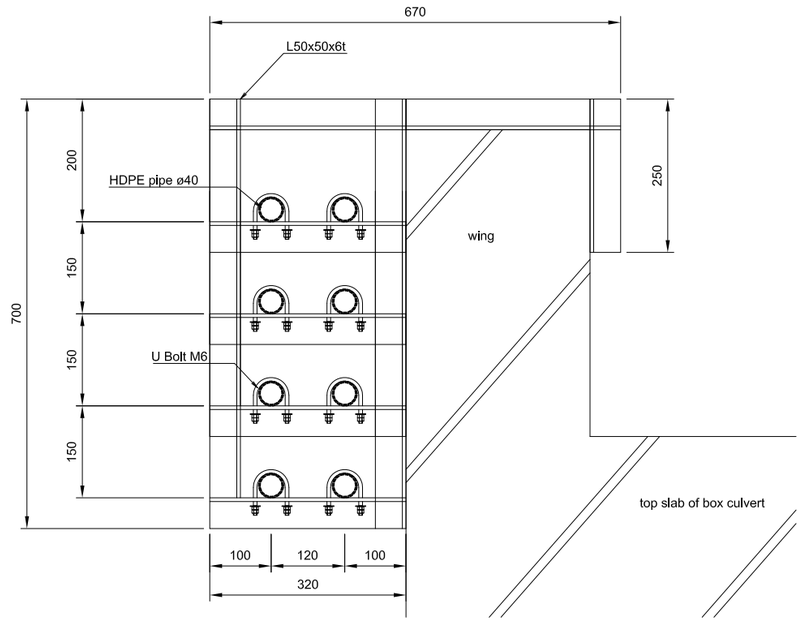
CONSULTANT					SOCIALIST REPUBLIC OF VIETNAM	ITS INTEGRATION PROJECT IN NORTHERN AREA OF VIETNAM	PACKAGE:	
ORIENTAL CONSULTANTS GLOBAL CO., LTD METROPOLITAN EXPRESSWAY CO., LTD NEXCO EAST ENGINEERING CO., LTD TRANSPORTATION RESEARCH INSTITUTE CO., LTD ABEAM CONSULTING LTD.	TITLE	NAME	SIGNATURE	DATE	MINISTRY OF TRANSPORT	DRAWING TITLE: RING ROAD NO.3 ARRANGEMENT OF COMMUNICATION DUCT IN BURIED OBJECT AREAS	DRAWING No.: V.3-11	
	PREPARED BY							
	CHECKED BY							
	APPROVED BY					SCALE: varies	SHEET No.: Sheet of	Rev:

ARRANGEMENT OF COMMUNICATION DUCT ON WING OF BOX CULVERT

PLAN VIEW scale: 1/100

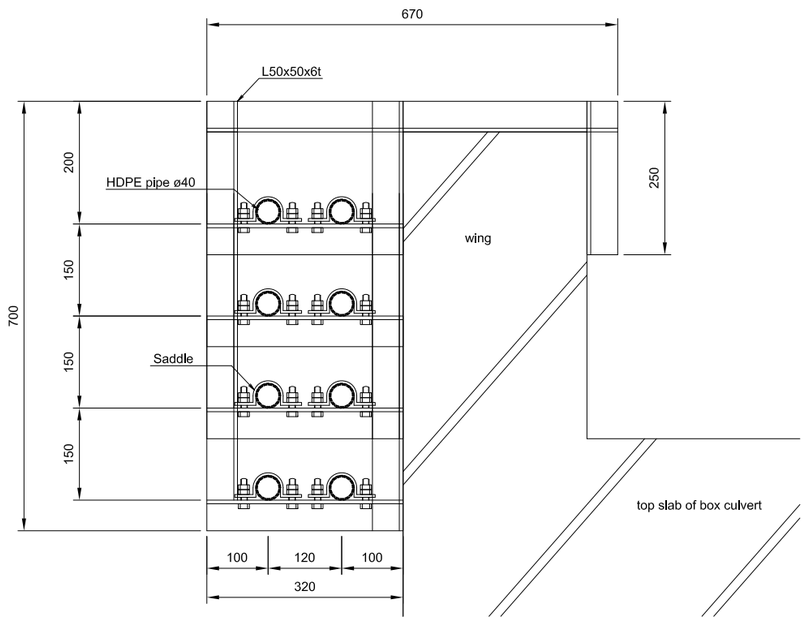


SUPPORT RACK scale: 1/10



FIX SUPPORT RACK scale: 1/10

(2 points on wing)

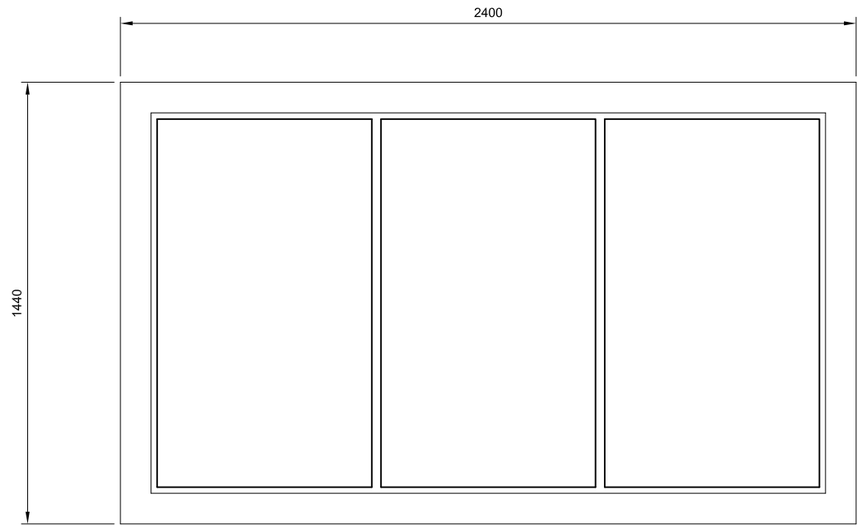


*1 Structural steel conforms ASTM A-709M Grade 250 or equivalence with:
Yield strength: Fy = 250 MPa
Tensile strength: Fu = 400 MPa
*2 Concrete structure equivalence with:
Concrete strength: F'c = 18 MPa;
Reinforcing Bar (CB300-II): Yield strength: Fy = 300 MPa;
Tensile strength: Fu = 450 MPa;
*3 In 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 IN NORTHERN AREA OF VIETNAM	PACKAGE:	
ORIENTAL CONSULTANTS GLOBAL CO., LTD METROPOLITAN EXPRESSWAY CO., LTD NEXCO EAST ENGINEERING CO., LTD TRANSPORTATION RESEARCH INSTITUTE CO., LTD ABEAM CONSULTING LTD.	TITLE	NAME	SIGNATURE	DATE	MINISTRY OF TRANSPORT	DRAWING TITLE: RING ROAD NO.3 ARRANGEMENT OF COMMUNICATION DUCT ON WING OF BOX CULVERT	DRAWING No.: V.3-12	
	PREPARED BY						SHEET No.: Sheet of	Rev:
	CHECKED BY							
	APPROVED BY					SCALE: 1/100		

DETAIL OF COMMUNICATION DUCT CHAMBER (TYPE M1)

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

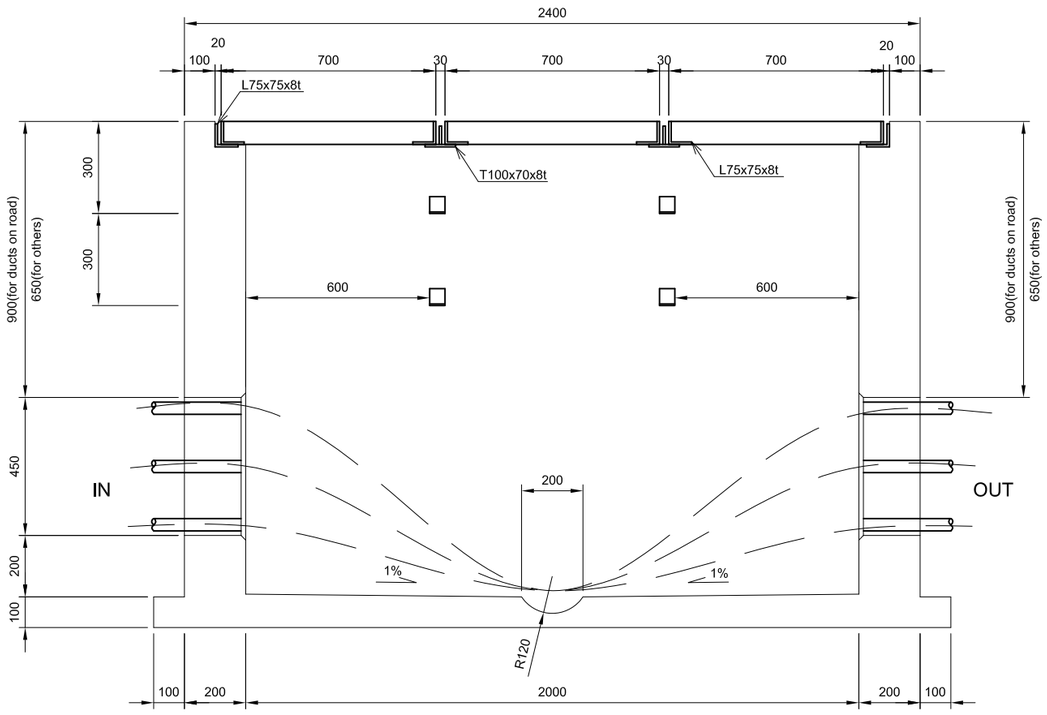


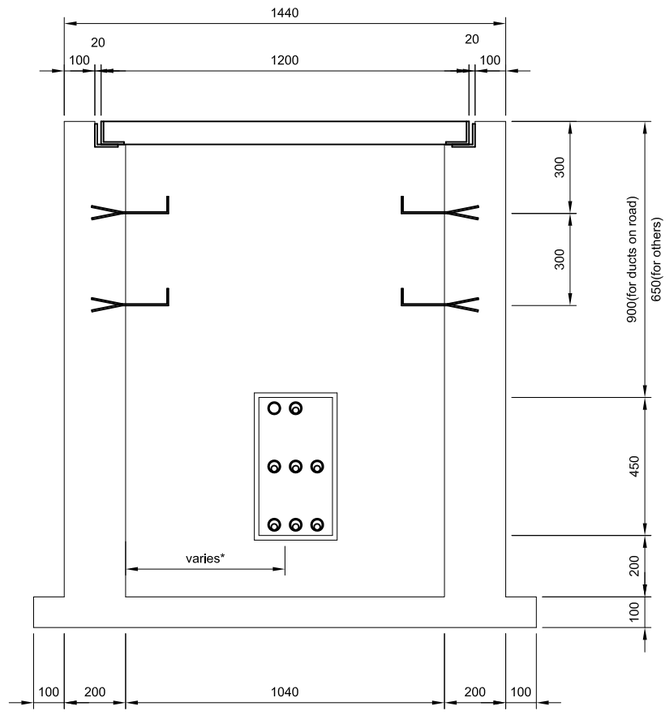
Volume table of chamber for ducts on road

	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





* Depending 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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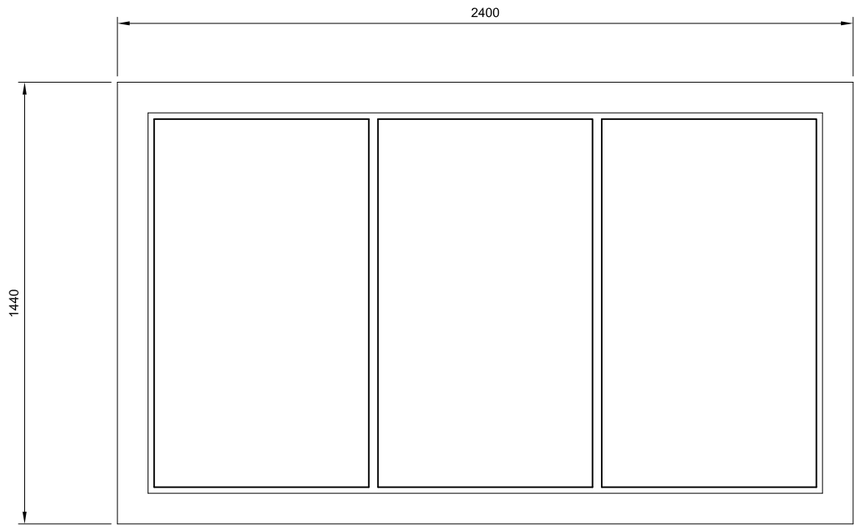
DETAIL OF COMMUNICATION DUCT CHAMBER (TYPE M2)

(INSTALL AT BACK OF ABUTMENT)

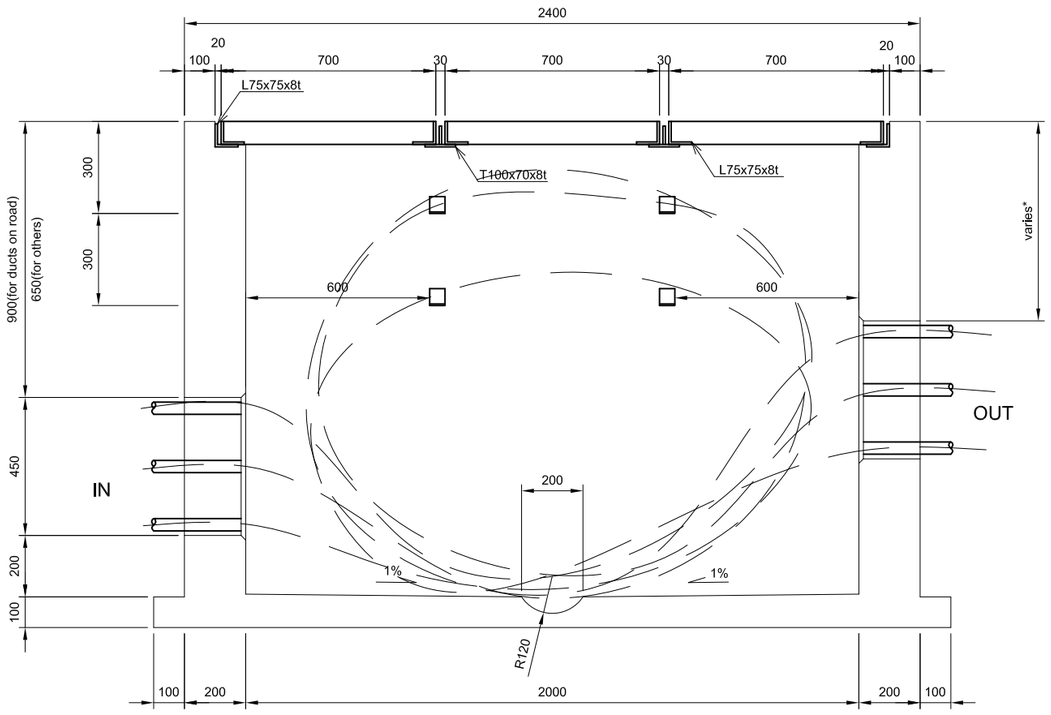


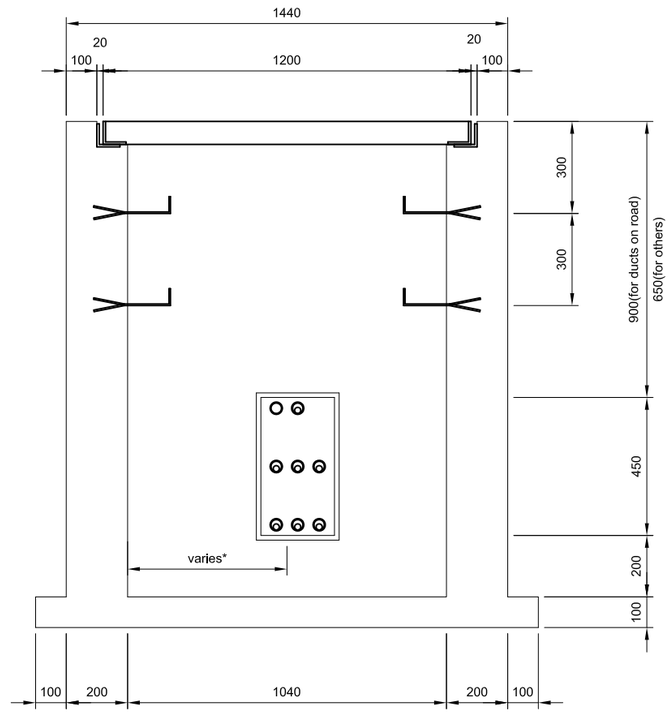
Volume table of chamber for ducts on road

	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





* Depending 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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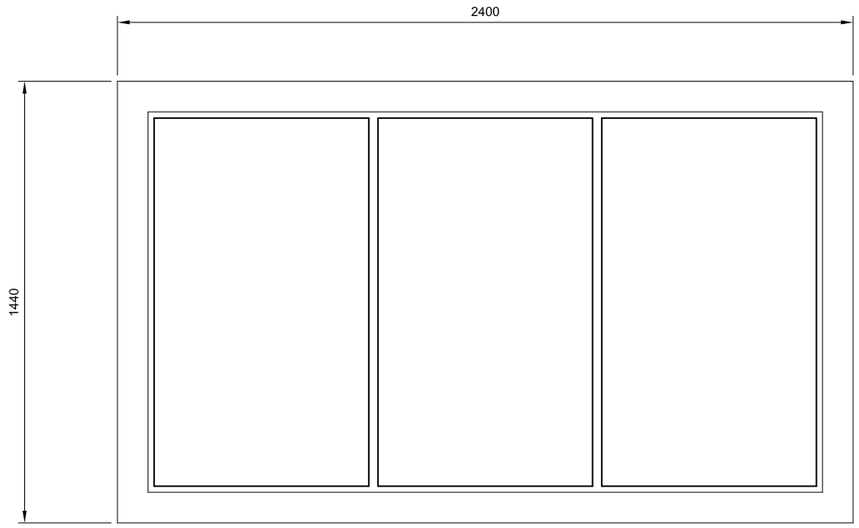
DETAIL OF COMMUNICATION DUCT CHAMBER (TYPE M3)

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

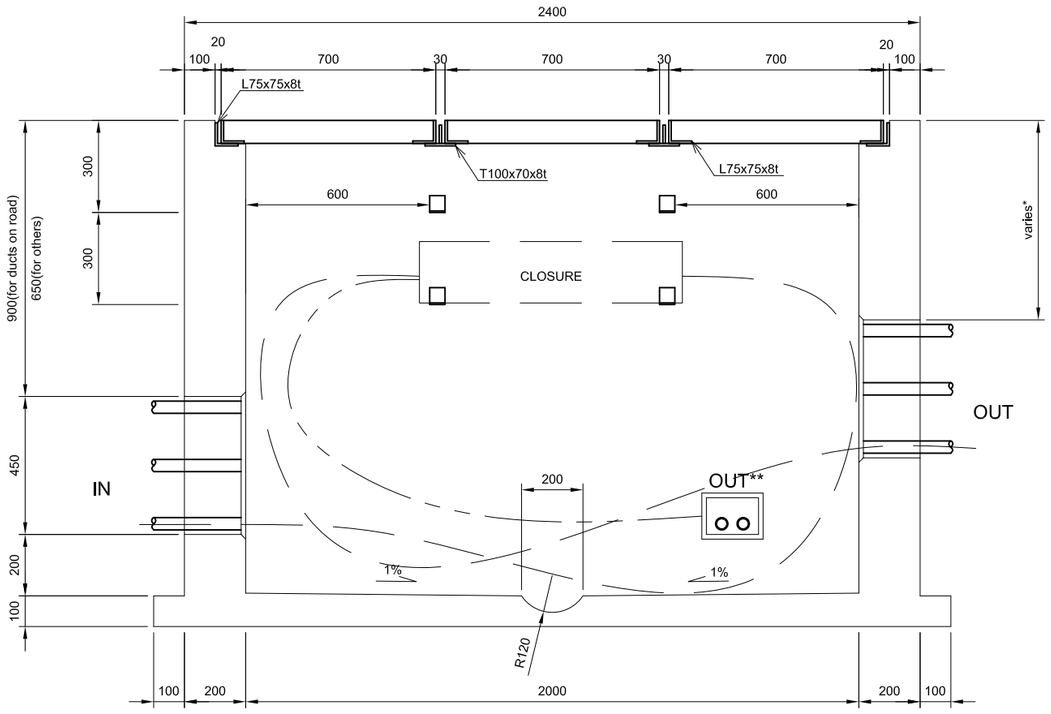


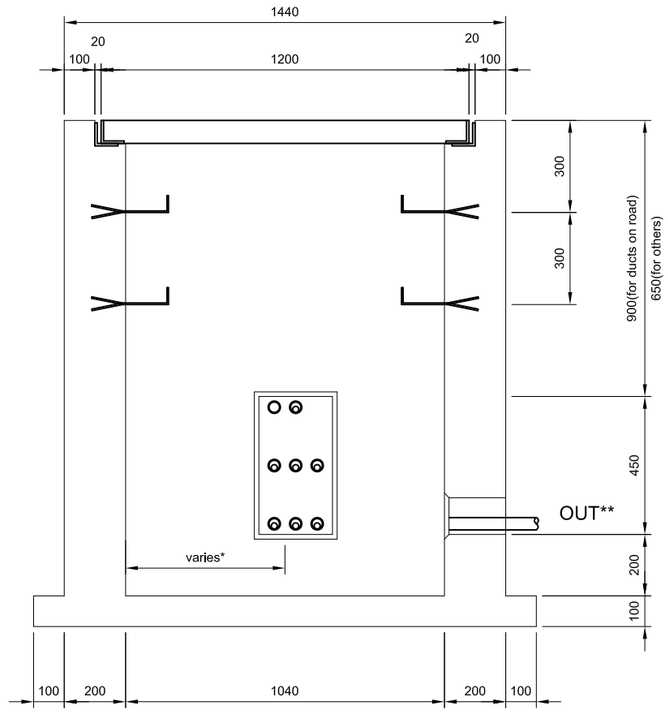
Volume table of chamber for ducts on road

	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;

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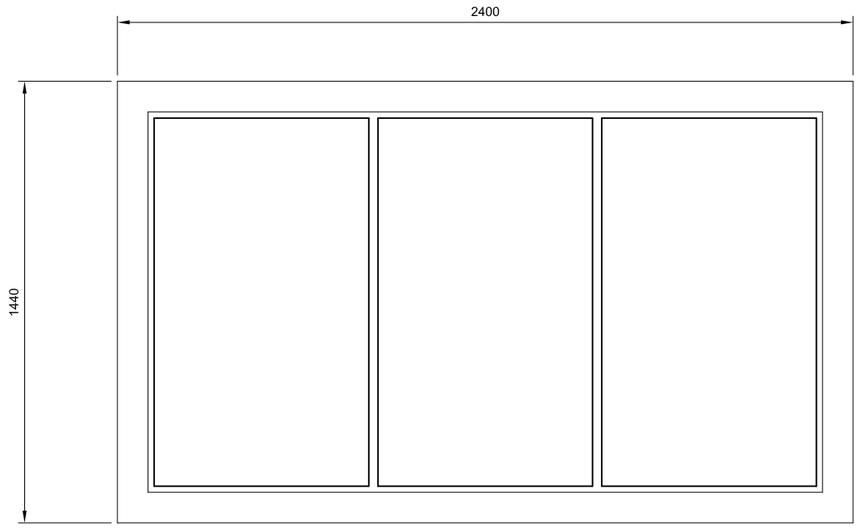
DETAIL OF COMMUNICATION DUCT CHAMBER (TYPE M4)

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

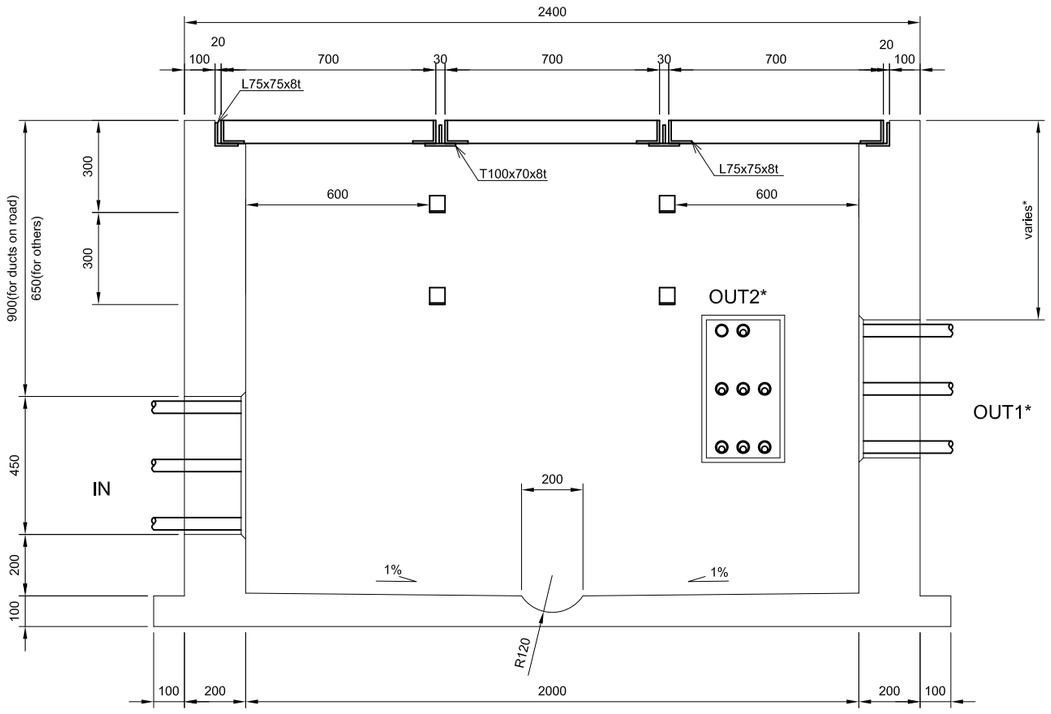


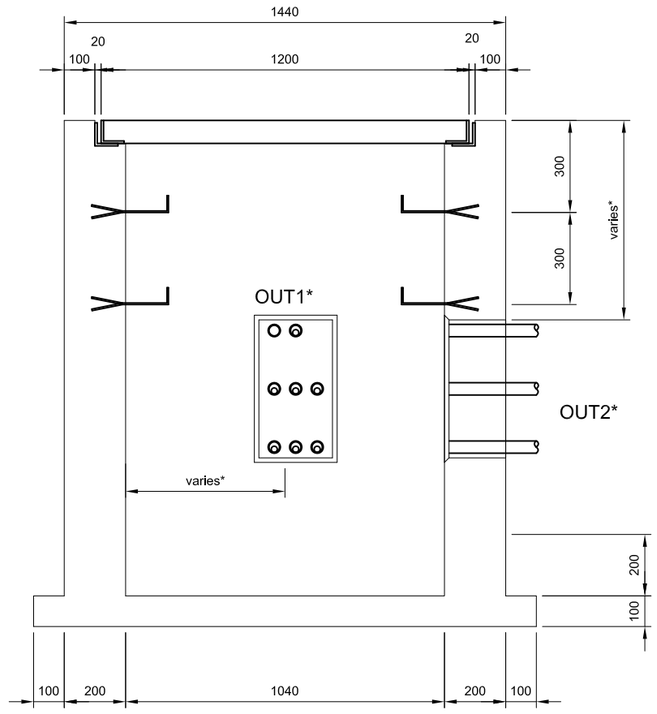
Volume table of chamber for ducts on road

	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





* Depending 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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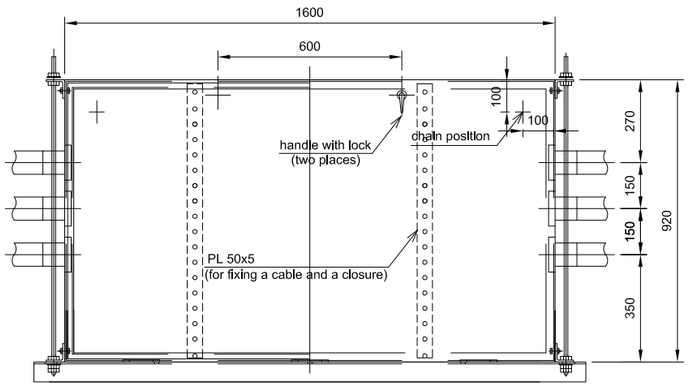
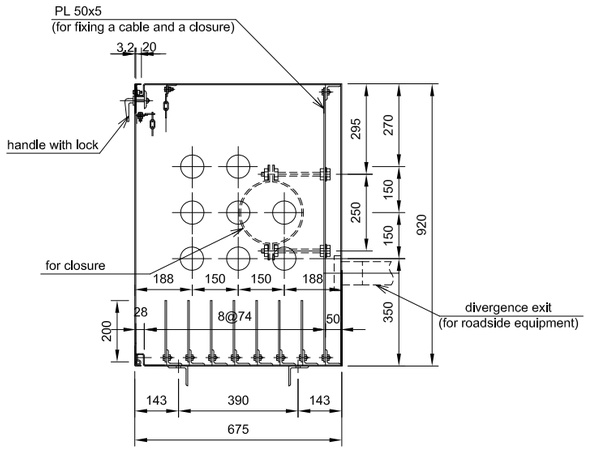
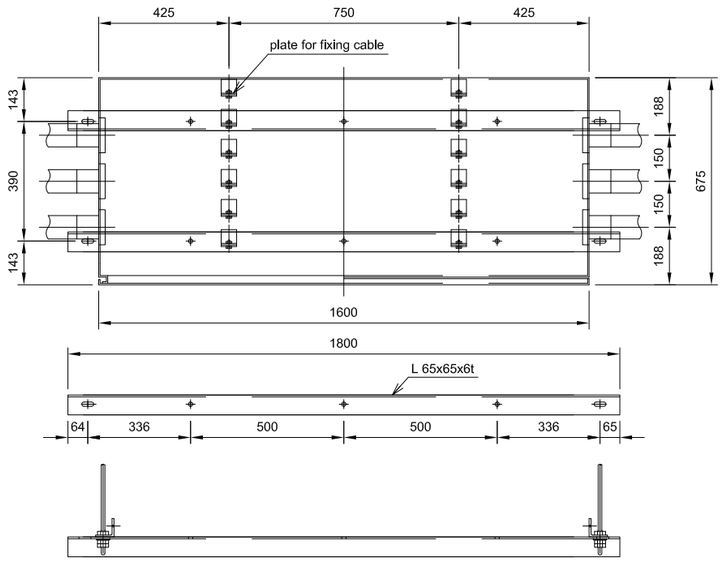
DETAIL OF COMMUNICATION DUCT CHAMBER (TYPE M5)

(INSTALL AT BRIDGE SECTION IN WHICH DUCT IS HUNG ON RAILING PARAPET)







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.

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