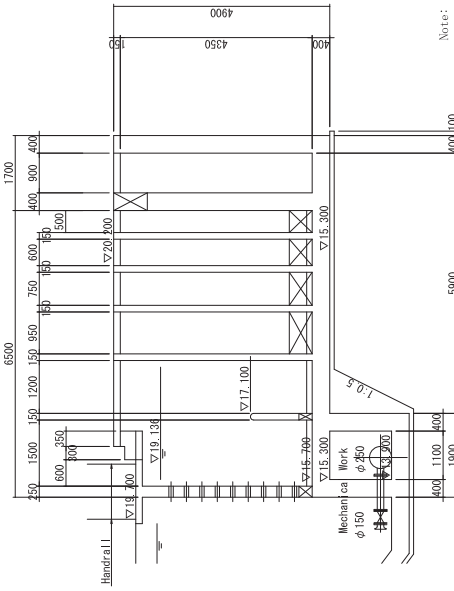


A - A section

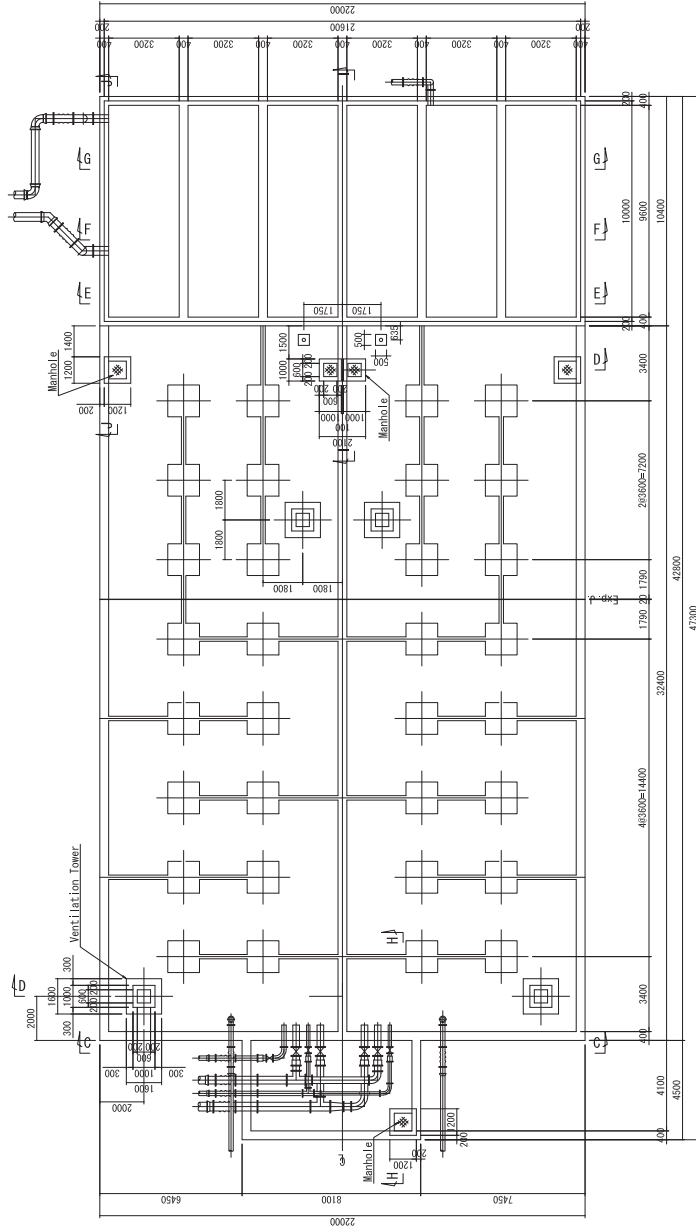


B - B section

Note:
The Contractor shall confirm bearing capacity of the soil and shall have approval from the Consultant before starting the construction work. If the bearing capacity is insufficient, the Contractor shall take necessary measures under the Contractor's responsibilities against the bearing capacity. The Costs required for the confirmation of the bearing capacity and measure against the low bearing capacity, if necessary shall be borne the Contractor.

PROJECT THE PREPARATORY SURVEY ON THE PROJECT ON ADDITIONAL NEW WATER TREATMENT PLANTS FOR KAMPONG CHAM AND HATTAMBANG WATERWORKS カンボジア国地方上水道拡張整備計画準備調査	DESCRIPTION Section of WTP(4) 断面図(4)		APPROVE BY	DATE	DRAWING No K-17
			PREPARED BY	DATE	SCALE 1:100
			NIHON SUDO CONSULTANTS CO., LTD. WATER AND SEWER BUREAU, CITY OF KITAKYUSHU CIT ENGINEERING INTERNATIONAL CO., LTD.		

Service Reservoir and Pumping Station
Structure (1/9)
Scale=1/200

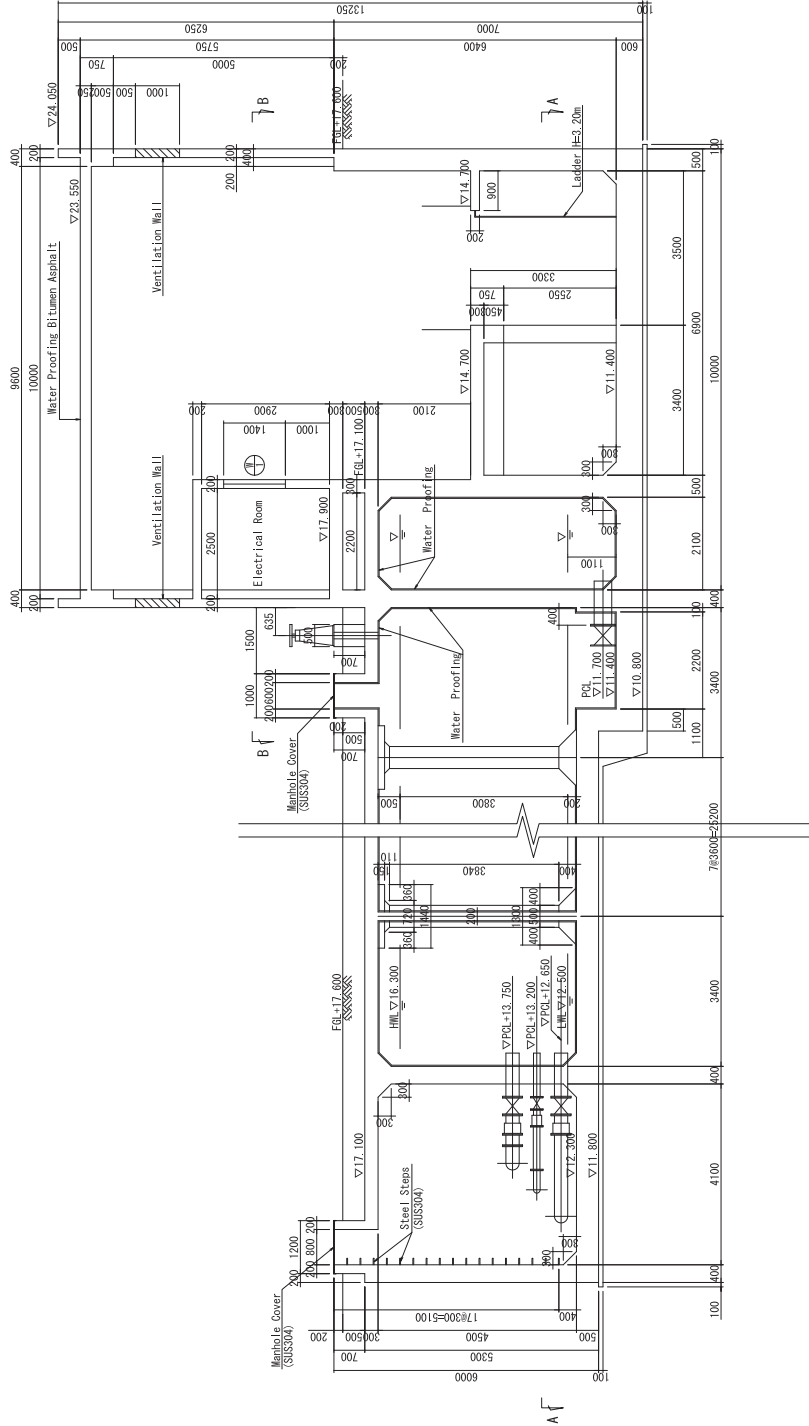


PLAN

Note:
The Contractor shall confirm bearing capacity of the soil and shall have approval from the Consultant before starting the construction work. If the bearing capacity is insufficient, the Contractor shall be responsible for the necessary measures under the Contractor's responsibility against low bearing capacity. The Costs required for the confirmation of the bearing capacity and measure against the low bearing capacity, if necessary shall be borne the Contractor.

PROJECT	THE PREPARATORY SURVEY ON THE PROJECT ON ADDITIONAL NEW WATER TREATMENT PLANTS FOR KAMPONG CHAM AND HATTAMBANG WATERWORKS カンボジア国地方上水道拡張整備計画準備調査	DESCRIPTION	Service Reservoir and Pumping Station Structure (1) コンボーンチャン配水池構造図(1)	APPROVE BY	DATE	DRAWING No	K-TS
				PREPARED BY	DATE	SCALE	1:200

Service Reservoir and Pumping Station
Structure (8/9)
Scale=1/100

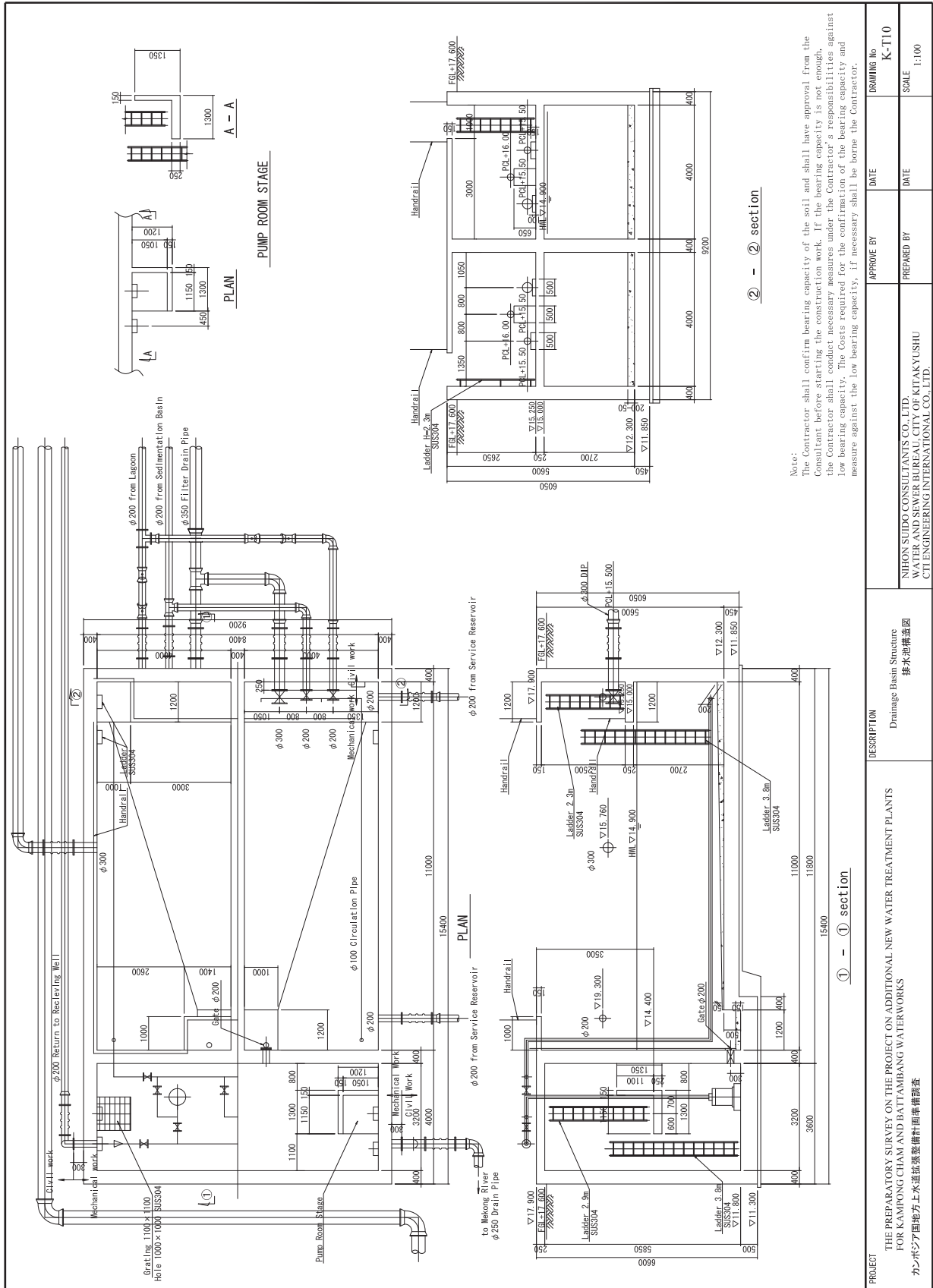


H - H section

I - I section

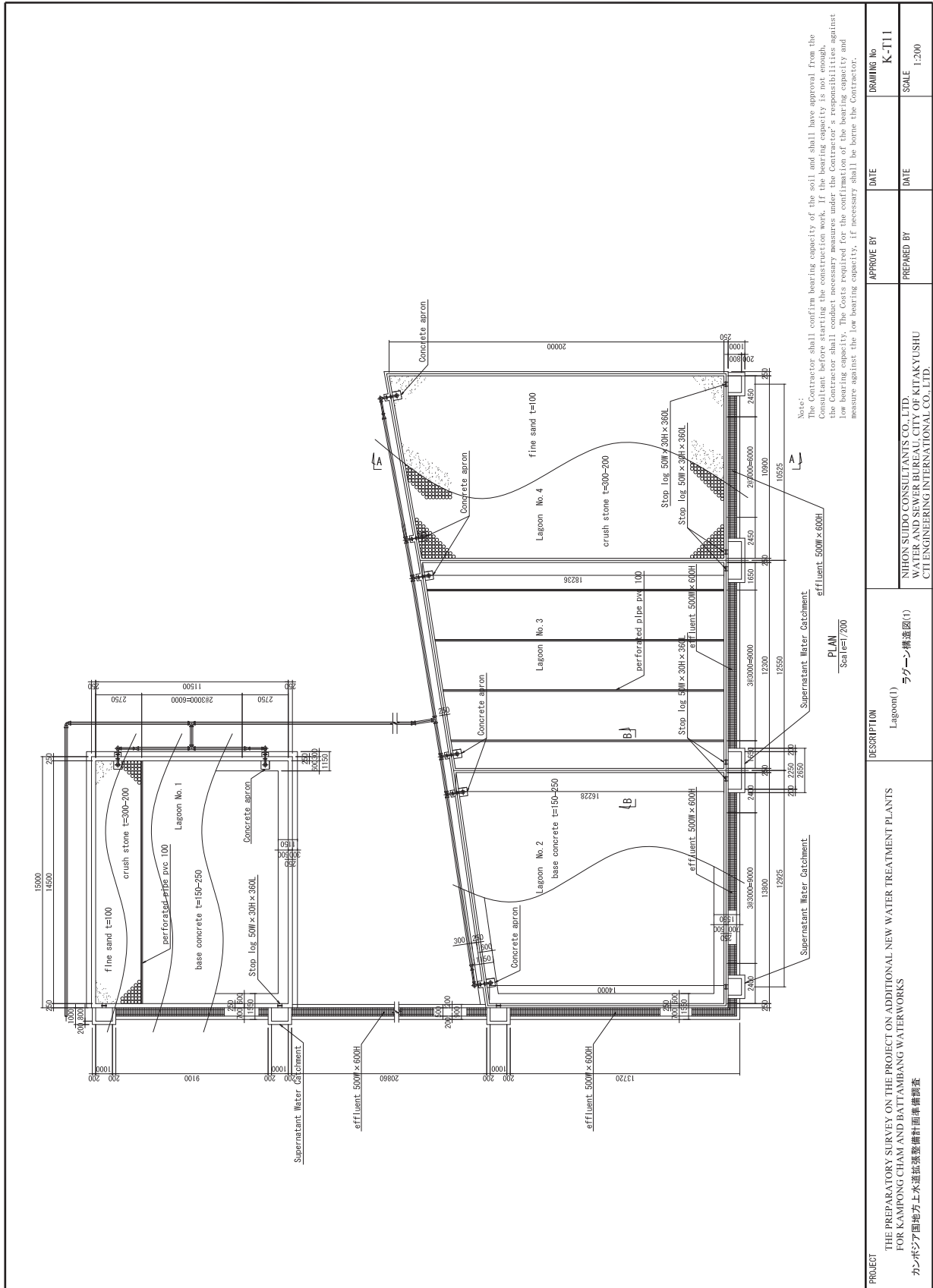
Note:
The Contractor shall confirm bearing capacity of the soil and shall have approval from the Consultant before starting the construction work. If the bearing capacity is not enough, the Contractor shall conduct necessary measures under the Contractor's responsibilities against low bearing capacity. The Costs required for the confirmation of the bearing capacity and measure against the low bearing capacity, if necessary shall be borne the Contractor.

PROJECT	DESCRIPTION		APPROVE BY	DATE	DRAWING No
	Service Reservoir and Pumping Station Structure (2) マンボウマンホール配水設備図(2)				K-T9
THE PREPARATORY SURVEY ON THE PROJECT ON ADDITIONAL NEW WATER TREATMENT PLANTS FOR KAMPONG CHAM AND HATTAMBANG WATERWORKS カンボジア国地方上水道拡張整備計画調査		PREPARED BY		DATE	SCALE
		NIHON SUDO CONSULTANTS CO.,LTD. WATER AND SEWER BUREAU, CITY OF KITAKYUSHU			1:100
		CIT ENGINEERING INTERNATIONAL CO., LTD.			

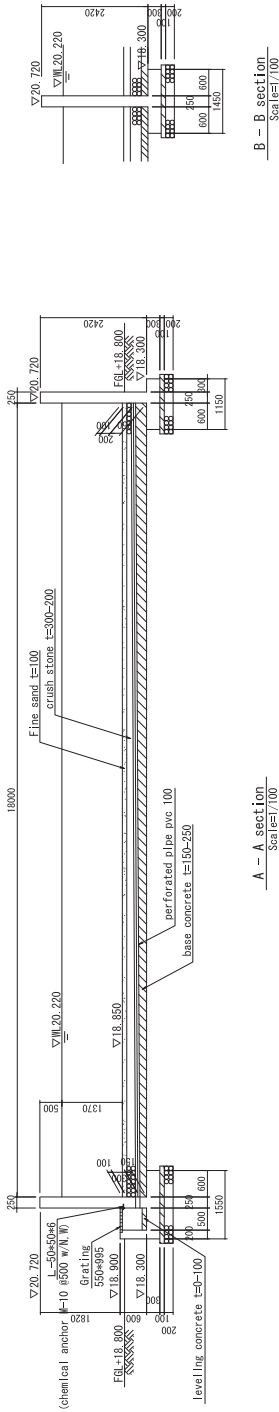


Notes:
 The Contractor shall confirm bearing capacity of the soil and shall have approval from the Consultant before starting the construction work. If the bearing capacity is not enough, the Contractor shall be responsible under the Contract for the bearing capacity against the low bearing capacity. The Costs required for the confirmation of the bearing capacity and measure against the low bearing capacity, if necessary shall be borne the Contractor.

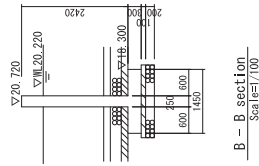
PROJECT	THE PREPARATORY SURVEY ON THE PROJECT ON ADDITIONAL NEW WATER TREATMENT PLANTS FOR KAMPONG CHAM AND BATTAMBANG WATERWORKS		Drainage Basin Structure 排水池構造図		DRAWING No
	カンボジア国地方上水道拡張整備計画準備調査				K-110
DESCRIPTION			APPROVE BY	DATE	SCALE
			PREPARED BY	DATE	1:100



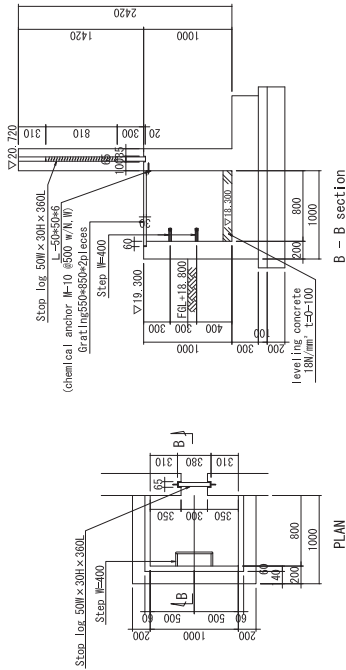
PROJECT	DESCRIPTION	APPROVE BY	DATE
THE PREPARATORY SURVEY ON THE PROJECT ON ADDITIONAL NEW WATER TREATMENT PLANTS FOR KAMPONG CHAM AND BATTAMBANG WATERWORKS カンボジア国地方上水道拡張整備計画準備調査	Lagoon (1) ラグーン構造図(1)	PREPARED BY	DATE
		DRAWING No	SCALE
			K-T11 1:500



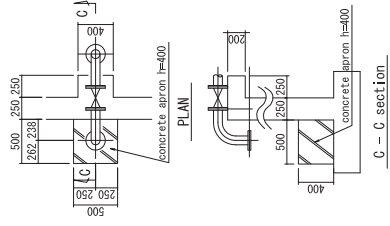
A - A section
Scale=1/100



B - B section
Scale=1/100



Supernatant Water catchment
Scale=1/50

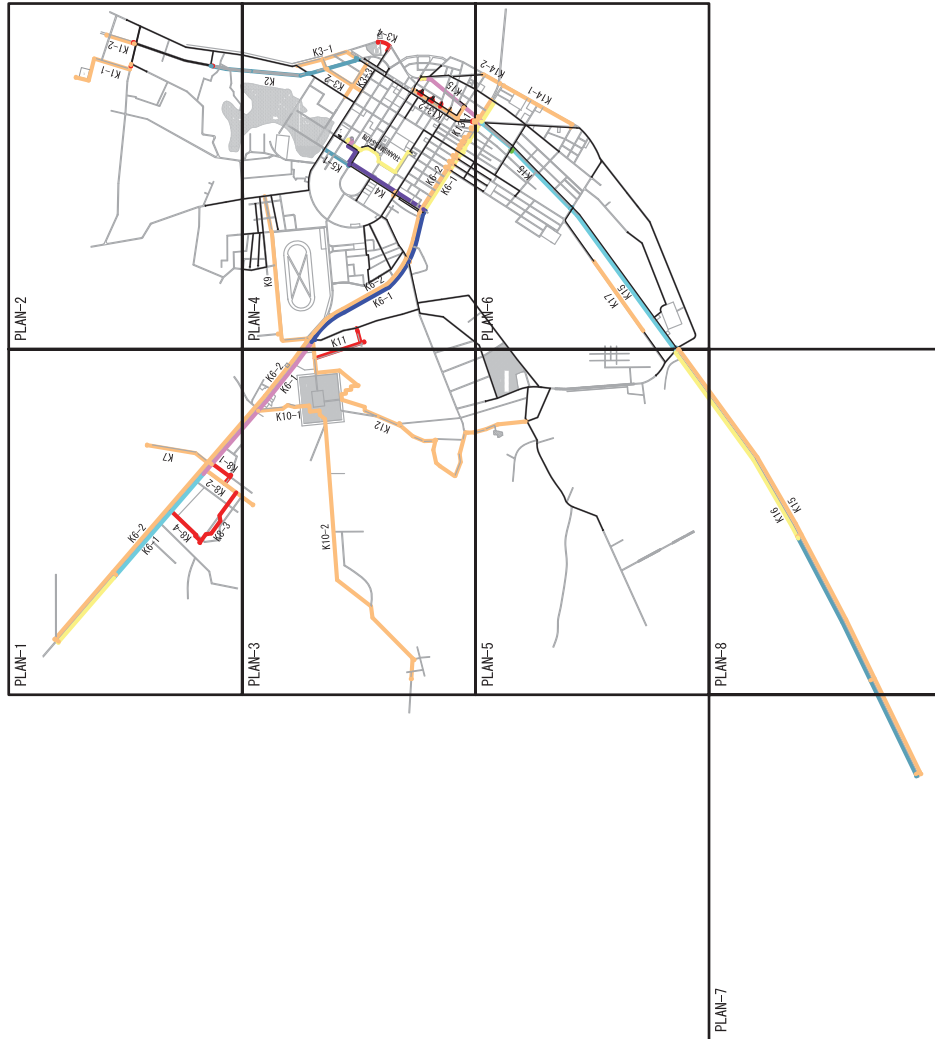


Valve Support and Apron
Scale=1/50

Notes:
The Contractor shall confirm bearing capacity of the soil and shall have approval from the Consultant before starting the construction work. If the bearing capacity is not enough, the Contractor shall conduct necessary measures under the Contractor's responsibilities against low bearing capacity. The Costs required for the confirmation of the bearing capacity and measure against the low bearing capacity, if necessary shall be borne the Contractor.

PROJECT	DESCRIPTION	APPROVE BY	DATE
THE PREPARATORY SURVEY ON THE PROJECT ON ADDITIONAL NEW WATER TREATMENT PLANTS FOR KAMPONG CHAM AND BATTAMBANG WATERWORKS カンボジア国地方上水道拡張整備計画準備調査	Lagoon(2) ラグーン構造図(2)	APPROVED BY	K-T12
		PREPARED BY	SCALE 1:100, 1:50

LOCALITY MAP Scale: 1/20,000



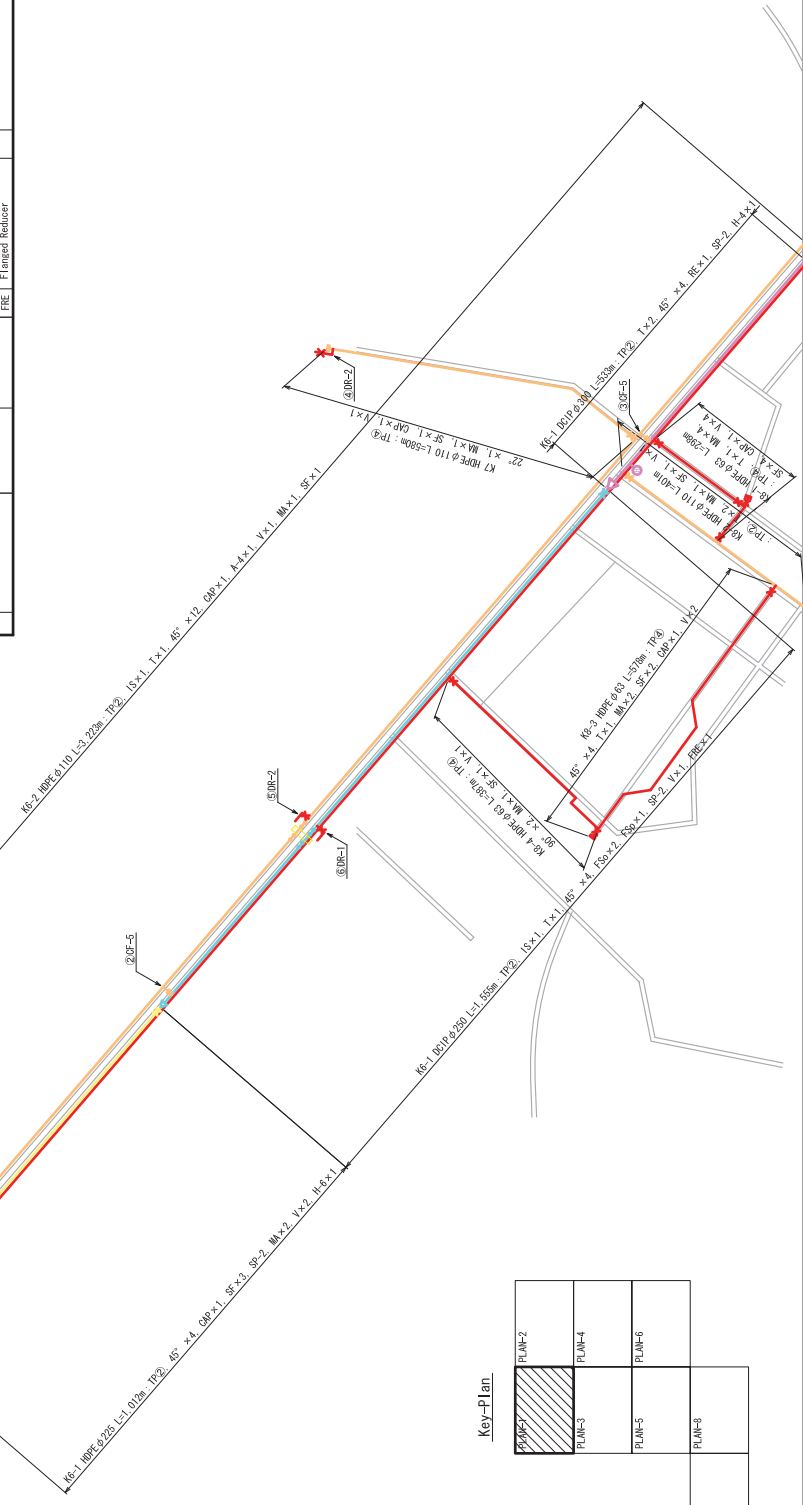
LEGEND	
Type of Diameter	
	DCIP ϕ 500
	DCIP ϕ 400
	DCIP ϕ 350
	DCIP ϕ 300
	DCIP ϕ 250
	DCIP ϕ 200
	HDPE ϕ 225
	HDPE ϕ 180
	HDPE ϕ 110
	HDPE ϕ 83
	Existing Pipe

PLAN-1 S=1/4,000



LEGEND

Type of Pavement (TP)	Type of Diameter	Abbreviation
(1) Asphalt National Road H=1.20m	DCIP φ500	IS Inverted Siphon
(2) Asphalt City Road H=1.20m	DCIP φ400	IS Inverted siphon Railway A
	DCIP φ350	BAP Bridge-attached Pipe
Road Shoulder H=0.80m	DCIP φ300	PE Pipe beam
	DCIP φ250	DR Drain Pipe
Sidewalk Pavement H=0.80m	DCIP φ200	RE Reducer
	HDPE φ225	T Tee
Bypassment Road H=1.20m	HDPE φ160	BF Blank Flange
	HDPE φ110	F52 Flanged SJ/SJlet
Concrete H=1.20m	HDPE φ63	F52 Flanged SJ/SJlet
	Existing Pipe	MA Flange Manicor
		SP Flanged Reducer
		PRE Flanged Reducer



Key-Plan

PLAN-2	PLAN-4	PLAN-6
PLAN-3	PLAN-5	PLAN-7

コンポニチャム送配水管路敷設詳細図 (1)
Plan (1) for Transmission and Distribution Pipeline, Kampong Cham

K-D2

PLAN-2 Set/4,000

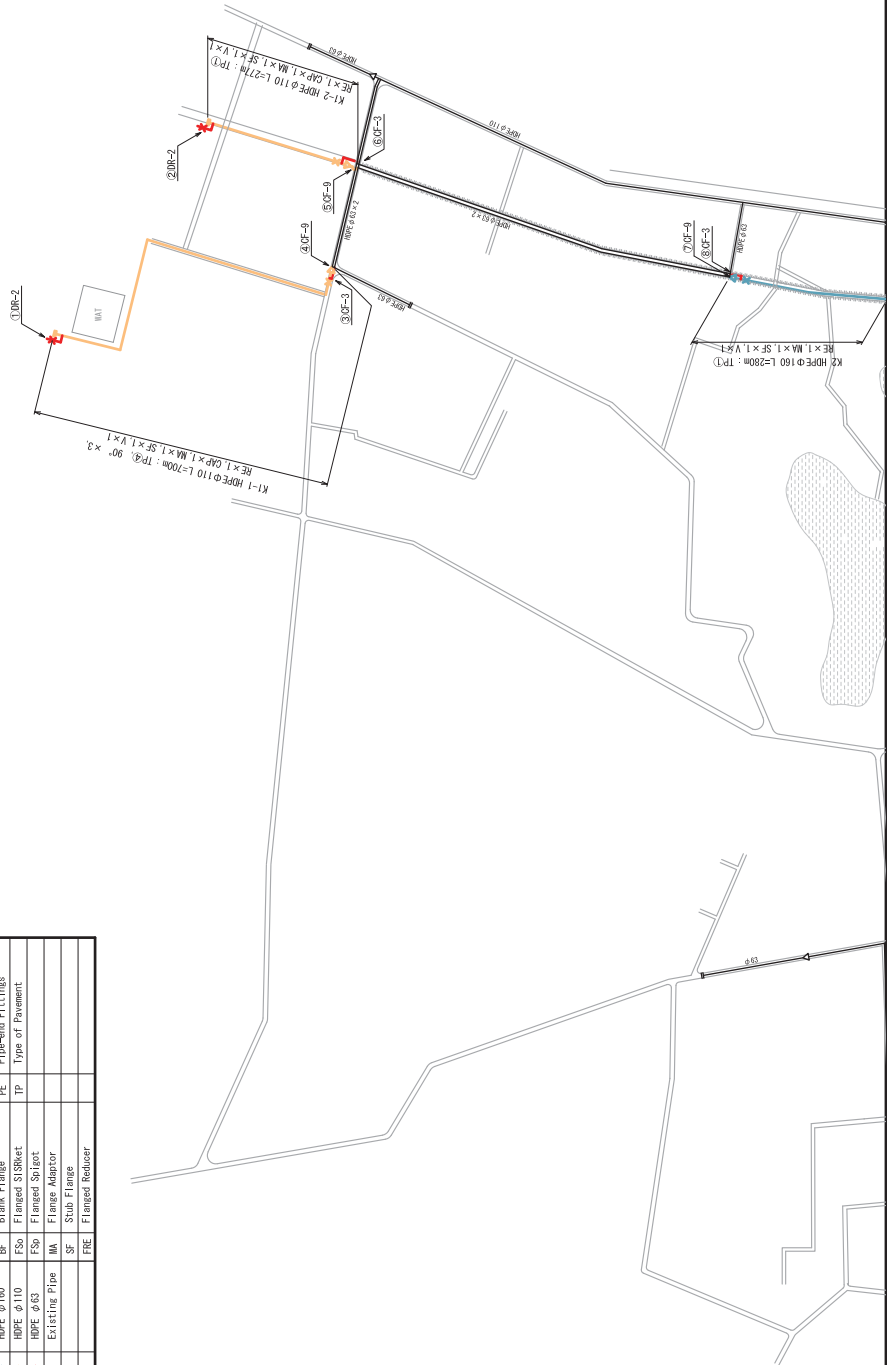


LEGEND

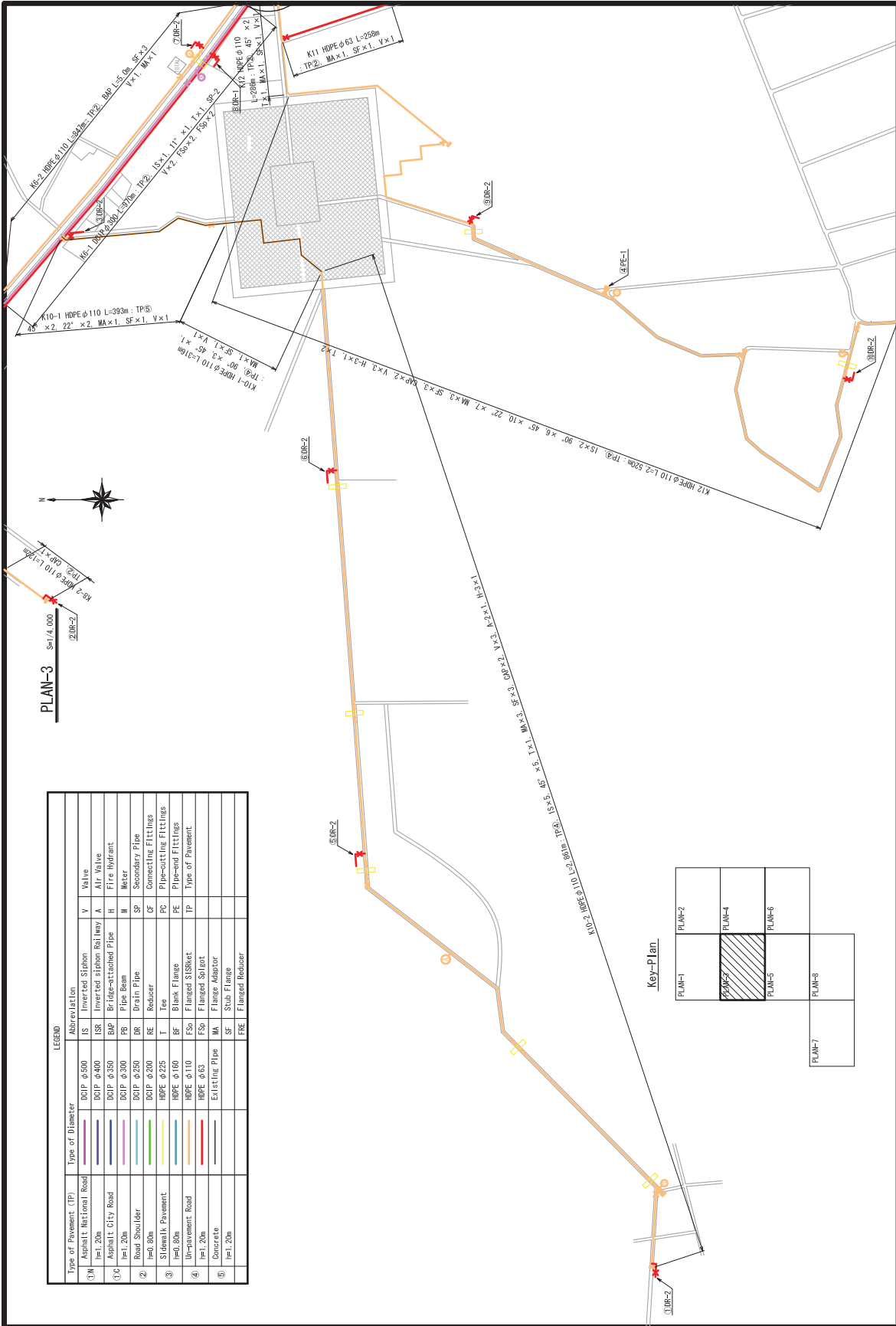
Type of Pavement (TP)	Type of Diameter	Abbreviation	V	Value
①) Asphalt National Road 1st 2.0m	DCIP φ500	IS	Inverted Siphon	Valve
	DCIP φ400	ISR	Inverted siphon Railway	Air Valve
①C Asphalt City Road 1st 2.0m	DCIP φ350	BAP	Br idge-attached Pipe	Fire hydrant
	DCIP φ300	PB	Pipe Beam	Meter
② Road Shoulder 1st 0.8m	DCIP φ250	DR	Drain Pipe	Secondary Pipe
	DCIP φ200	RE	Reducer	Connecting Fittings
③ Sidewalk Pavement 1st 0.8m	HDPE φ225	T	Tree	Pipe-cutting Fittings
	HDPE φ180	BF	Blank Flange	Pipe-end Fittings
④ Improvement Road 1st 2.0m	HDPE φ110	FSS	Flanged Socket	Type of Pavement
Concrete	HDPE φ63	FSS	Flanged Socket	
1st 2.0m	Existing Pipe	MA	Flange Manhole	
		SP	Stub Flange	
		FRE	Flanged Reducer	

Key-Plan

PLAN-1	PLAN-2	PLAN-3	PLAN-4
PLAN-5	PLAN-6	PLAN-7	

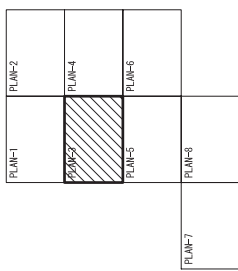


K-D3



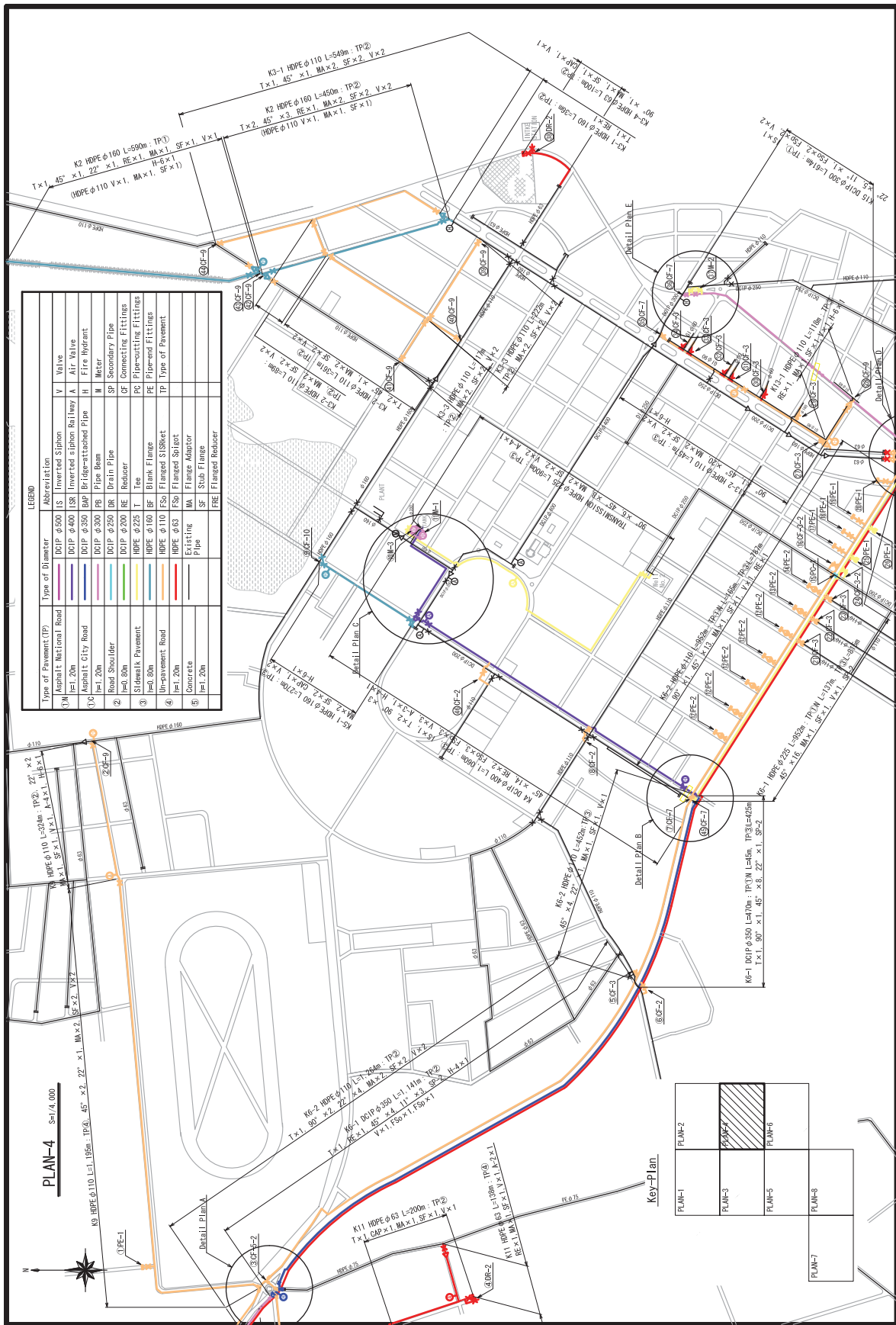
LEGEND

Type of Pavement (TP)	Type of Diameter	Abbreviation
① Asphalt National Road	DCIP φ500	IS Inverted Siphon
② Asphalt City Road	DCIP φ400	ISR Inverted siphon riserway
③ Street Pavement	DCIP φ350	EAP Bridge-attached Pipe
④ Un-pavement Road	DCIP φ300	EB Pipe Box
⑤ Concrete	DCIP φ250	DR Drain Pipe
	DCIP φ200	RE Reducer
	HDPE φ225	T Tee
	HDPE φ110	BF Blank Flange
	HDPE φ63	FSo Flanged Sisket
	Existing Pipe	FSa Flange Spigot
		MA Flange Adaptor
		SF Stub Flange
		FRE Flanged Reducer



コンポンチャム送配水管路敷設詳細図 (3)
Plan (3) for Transmission and Distribution Pipeline, Kampong Cham

K-D4

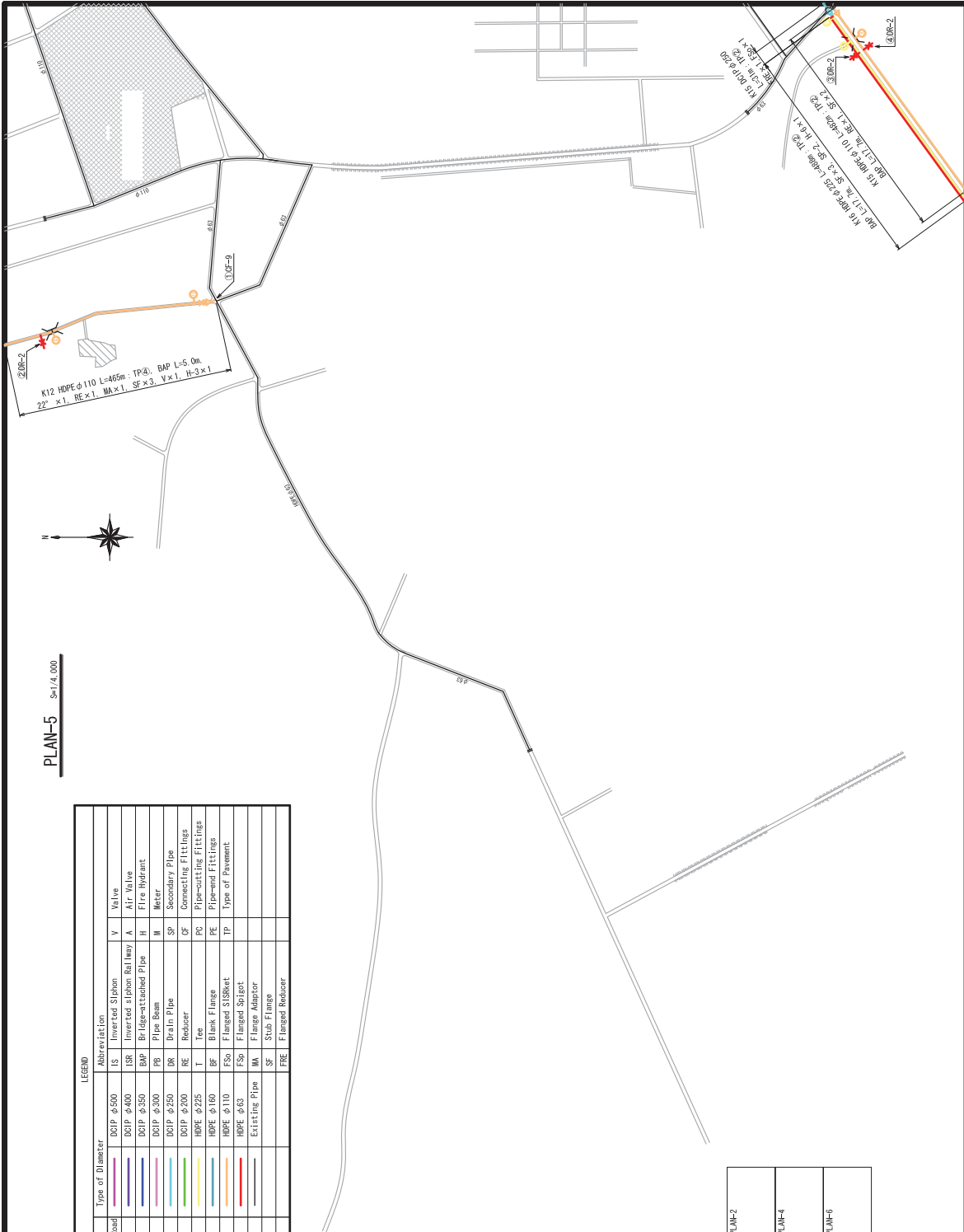


コンボーンチャム送配水管路設計詳細図 (4)
 Plan (4) for Transmission and Distribution Pipeline, Kampong Cham

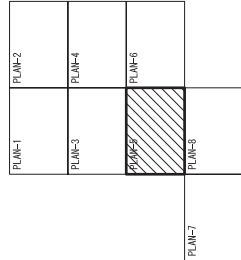
PLAN-5
Scale: 1/4,000

LEGEND	
Type of Pavement (TP)	Type of Diameter
① Asphalt National Road 1st, 20m	BCIP φ500
② Asphalt City Road 1st, 20m	BCIP φ400
③ Road Shoulder 1st, 80m	BCIP φ350
④ Strengthen Pavement 1st, 20m	BCIP φ300
⑤ Unpaved Road 1st, 20m	BCIP φ250
⑥ Concrete 1st, 20m	BCIP φ200
	HDPE φ225
	HDPE φ180
	HDPE φ110
	HDPE φ85
	Existing Pipe
	IS
	ISR
	PR
	DR
	RE
	T
	BF
	FSS
	MA
	SF
	FRE

Abbreviation	
Inverted Siphon	V
Inverted siphon Real Way	A
Bridge-attached Pipe	H
Pipe Beam	M
Drain Pipe	SP
Reducer	CF
Te	PC
Pipe-casting Fittings	PE
Blank Flange	TP
Fanged Subport	
Fanged Stript	
Flange Adaptor	
Stub Flange	
Fanged Reducer	



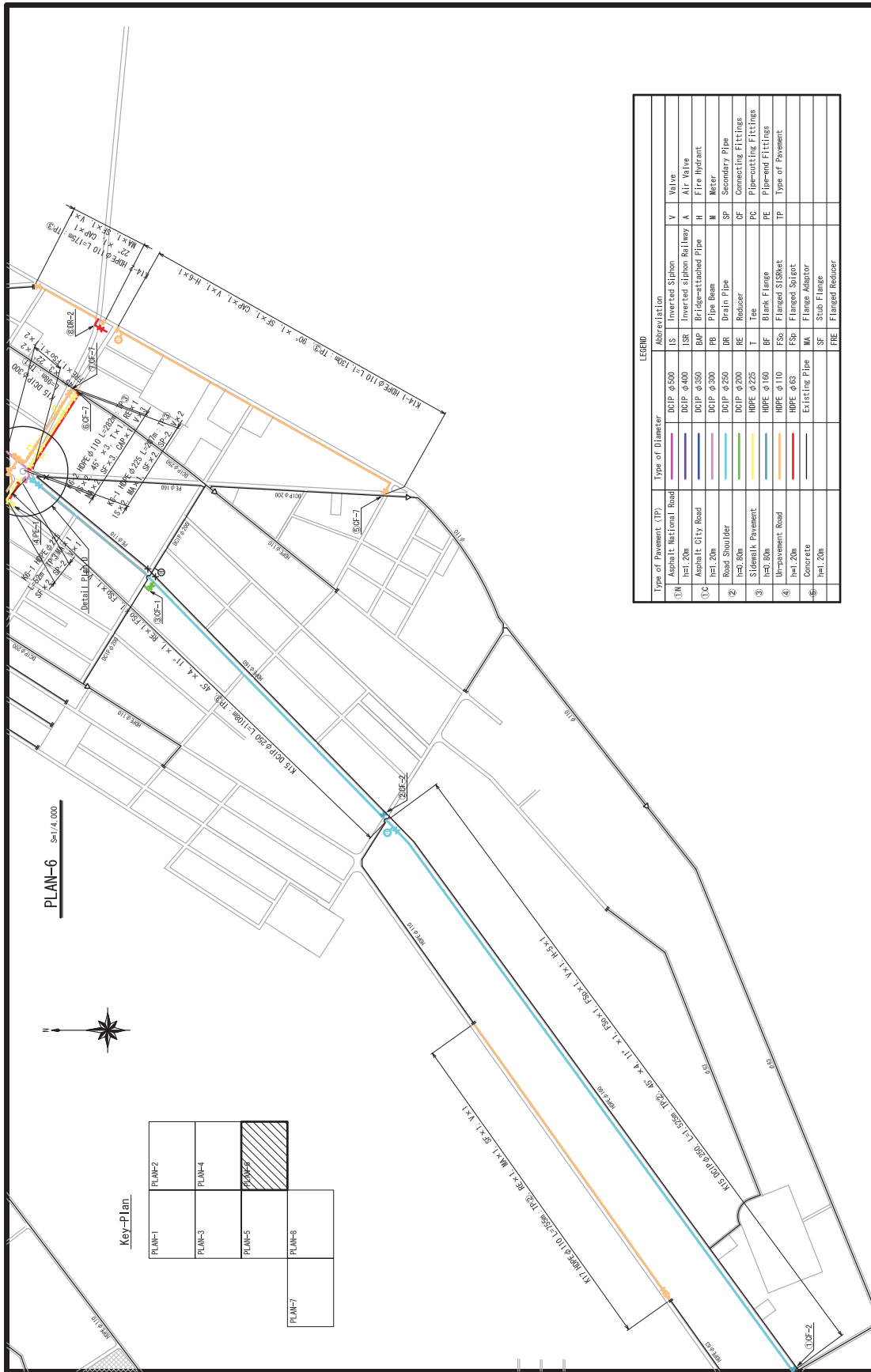
Key-Plan



コンポンチャム送配水管路敷設詳細図 (5)

Plan (5) for Transmission and Distribution Pipeline, Kampong Cham

K-D6



Type of Pavement (TP)	Type of Diameter	Abbreviation	
CTM Asphalt National Road	DNIP Ø500	IS	Inverted Siphon
	DNIP Ø400	IS	Inverted Siphon
	DNIP Ø300	BP	Bridg-attached Pipe
	DNIP Ø250	PP	Pipe Beam
	DNIP Ø200	DR	Drain Pipe
	DNIP Ø150	RE	Reducer
	DNIP Ø100	T	Te
	DNIP Ø75	BF	Blank Flange
	DNIP Ø50	F50	Flanged Socket
	DNIP Ø30	F50	Flanged Socket
	DNIP Ø25	MA	Flange Adaptor
	DNIP Ø20	SE	Stah Flange
	DNIP Ø15	RE	Flanged Reducer

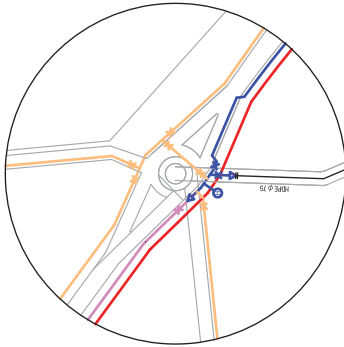
コンボンチャム送配水管路敷設詳細図 (7)
 Plan (7) for Transmission and Distribution Pipeline, Kampong Cham

K-D8

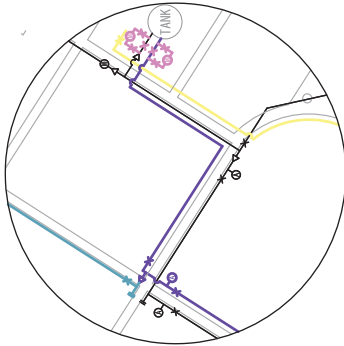
PLAN-7
Scale: 1/4,000



Detail Plan A

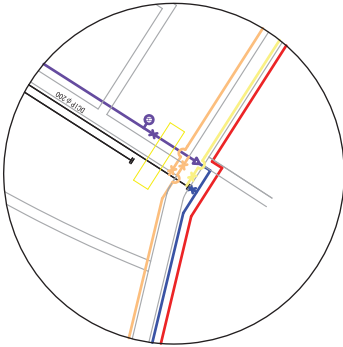


Detail Plan C

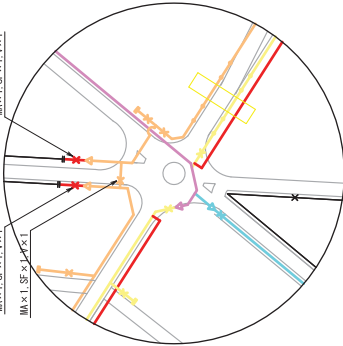


Type of Pavement (TP)		Type of Diameter		Abbreviation		
①M	Asphalt National Road H=1.20m	DCIP φ500	IS	Inverted Siphon	V	Valve
		DCIP φ400	ISR	Inverted siphon Riseline	A	Air Valve
①C	Asphalt City Road H=1.20m	DCIP φ350	BAP	Bridge-attached Pipe	R	Fire Hydrant
		DCIP φ300	FB	Pipe Beam	M	Meter
②	Road Shoulder H=0.20m	DCIP φ250	DR	Drain Pipe	SP	Secondary Pipe
		DCIP φ200	RE	Reducer	CF	Connecting Fittings
③	Sidewalk Pavement H=0.20m	HPPE φ225	T	Tee	PC	Pipe-cutting Fittings
		HPPE φ160	BF	Blank Flange	PE	Pipe-end Fittings
④	Un-pavement Road H=1.20m	HPPE φ110	FSa	Flanged Socket	TP	Type of Pavement
		HPPE φ83	FSb	Flanged Socket	MA	Flange Adaptor
⑤	Concrete	EXISTING PIPE	SF	Stub Flange		
			PRE	Flanged Reducer		

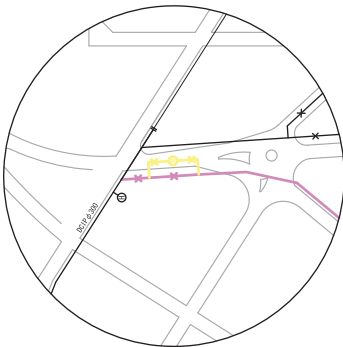
Detail Plan B



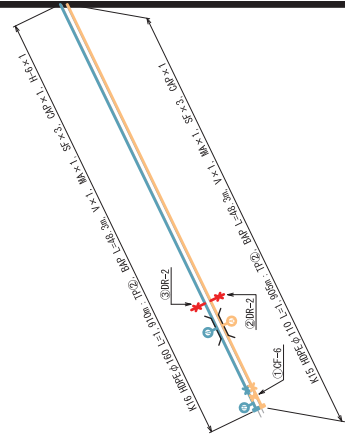
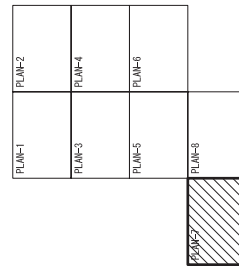
Detail Plan D

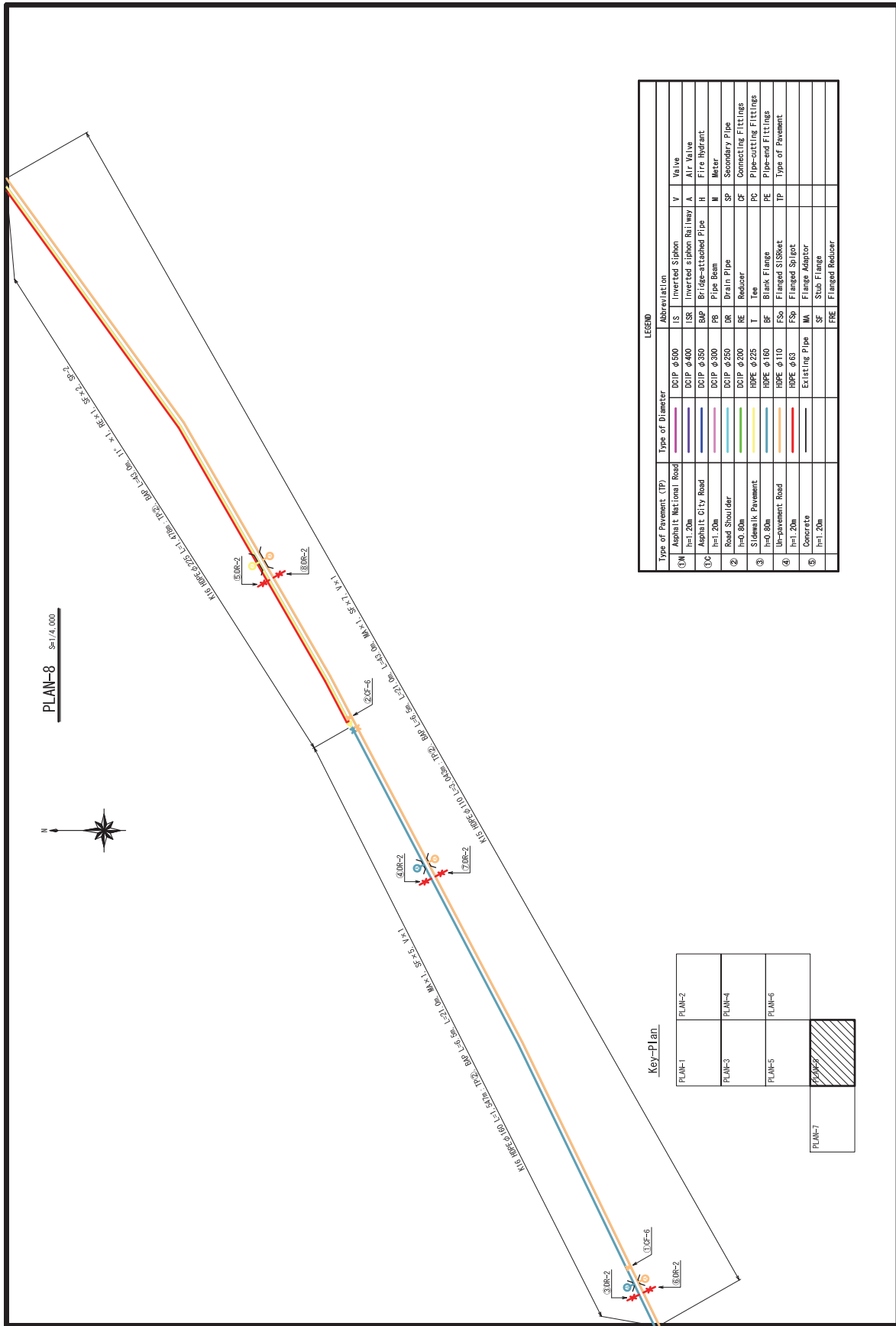


Detail Plan E



Key-Plan





LEGEND

Type of Pavement (TP)	Type of Diameter	Abbreviation	
0M Asphalt National Road	DCIP φ500	IS	Inverted Siphon
	DCIP φ400	ISR	Inverted siphon Risley
	DCIP φ350	BAP	Bridge-attached Pipe
0C Asphalt City Road	DCIP φ300	FB	Pipe Beam
	DCIP φ250	DR	Drain Pipe
② Road Shoulder	DCIP φ200	RE	Reducer
	DCIP φ150	T	Tee
③ Sidewalk Pavement	HPPE φ225	BF	Blank Flange
	HPPE φ180	FSa	Flanged SSKnot
④ Ur-pavement Road	HPPE φ110	ESa	Flanged Socket
	HPPE φ83	MA	Flange Adaptor
⑤ Concrete	Existing Pipe	SF	Stub Flange
		RF	Flanged Reducer

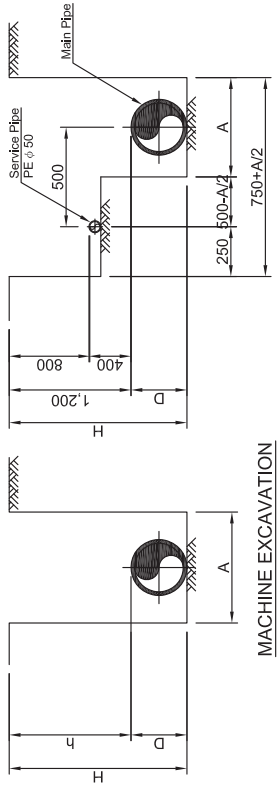
Key-Plan

PLAN-1	PLAN-2
PLAN-3	PLAN-4
PLAN-5	PLAN-6
PLAN-7	PLAN-8

コンポンチャン送配水管路敷設詳細図 (9)
Plan (9) for Transmission and Distribution Pipeline, Kampong Cham

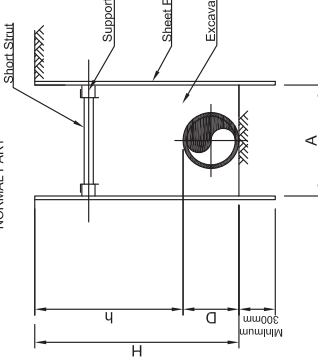
K-D10

General Earth Work for Pipe Laying

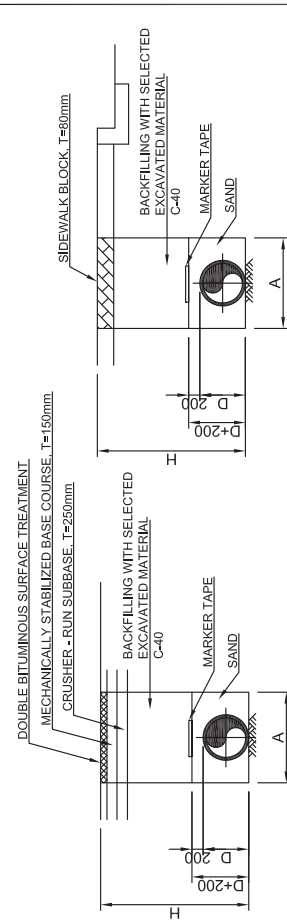


MACHINE EXCAVATION
NORMAL PART, Main Pipe with Service Pipe

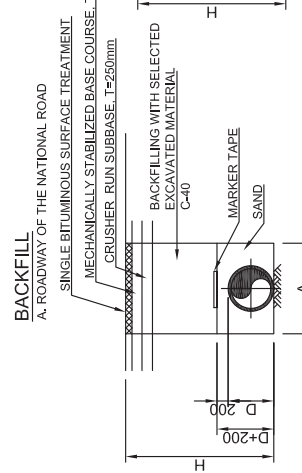
Notice : Backfill is shown on the drawings in right side.
Service pipe is not needed to install in above pile part.
Location of service pipe refer to cross section drawing.



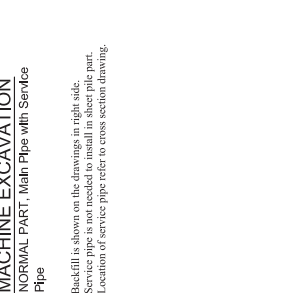
MACHINE EXCAVATION
NORMAL PART



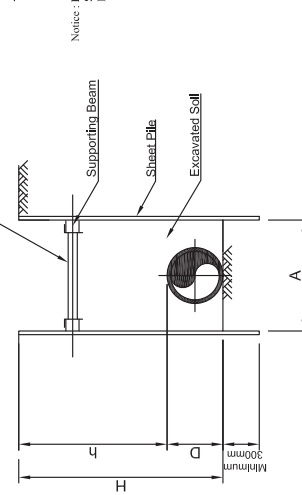
BACKFILL
C. SIDEWALK



BACKFILL
A. ROADWAY OF THE NATIONAL ROAD



BACKFILL
B1. CITY ROAD (PAVING) SHOULDER OF THE NATIONAL ROAD



BACKFILL
D. UN-PAVING SURFACE

MACHINE EXCAVATION (MACHINE EXCAVATION)

PIPE MATERIAL	NOMINAL PIPE DIAMETER (D) (mm)	TRENCH WIDTH (A) (mm)		EXCAVATION DEPTH (H) (mm)		TRENCH WIDTH (A) (mm)		DEPTH OF COVER (H) (mm)		SHEET PILE PART	
		Shallow	Standard	Shallow	Standard	Shallow	Standard	Shallow	Standard	Shallow	Standard
HOPE	50	0.50	0.6	1.2	0.87	1.27	0.70	0.6	1.2	0.6	1.2
	75	0.50	0.6	1.2	0.89	1.29	0.70	0.6	1.2	0.6	1.2
	100	0.50	0.6	1.2	0.93	1.33	0.75	0.6	1.2	0.6	1.2
	150	0.50	0.6	1.2	0.98	1.38	0.80	0.6	1.2	0.6	1.2
	200	0.50	0.6	1.2	1.05	1.45	0.85	0.6	1.2	0.6	1.2
	250	0.50	0.6	1.2	1.05	1.45	0.85	0.6	1.2	0.6	1.2
DIP	200	0.50	0.6	1.2	1.08	1.48	0.85	0.6	1.2	0.6	1.2
	250	0.50	0.6	1.2	1.13	1.53	0.90	0.6	1.2	0.6	1.2
	300	0.50	0.6	1.2	1.18	1.58	0.95	0.6	1.2	0.6	1.2
	350	0.50	0.6	1.2	1.23	1.63	1.00	0.6	1.2	0.6	1.2
	400	0.50	0.6	1.2	1.28	1.68	1.05	0.6	1.2	0.6	1.2
	450	0.50	0.6	1.2	1.33	1.73	1.10	0.6	1.2	0.6	1.2
Main Pipe with Service Pipe	200	1.00	0.6	1.2	1.05	1.45	1.20	0.6	1.2	0.6	1.2
	250	1.00	0.6	1.2	1.08	1.48	1.20	0.6	1.2	0.6	1.2
	300	1.05	0.6	1.2	1.13	1.53	1.20	0.6	1.2	0.6	1.2
	350	1.05	0.6	1.2	1.18	1.58	1.25	0.6	1.2	0.6	1.2
	400	1.10	0.6	1.2	1.23	1.63	1.25	0.6	1.2	0.6	1.2
	450	1.15	0.6	1.2	1.28	1.68	1.25	0.6	1.2	0.6	1.2

TYPICAL SIZE OF TRENCH EXCAVATION (MACHINE EXCAVATION)

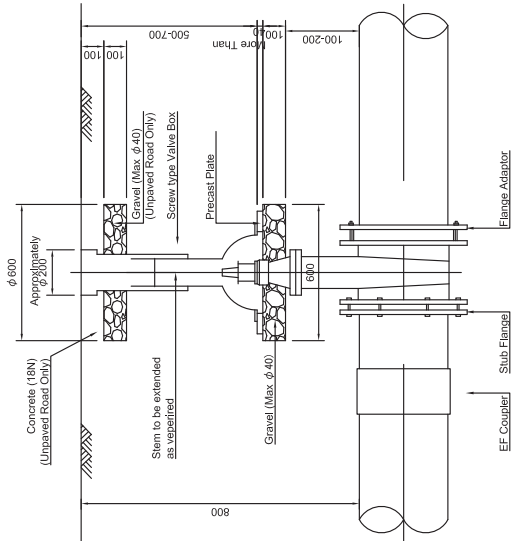
THE PREPARATORY SURVEY ON THE PROJECT ON ADDITIONAL NEW WATER TREATMENT PLANTS FOR KAMPONG CHAM AND BATTAMBANG WATERWORKS

カンボジア国地方上水道拡張整備計画準備調査

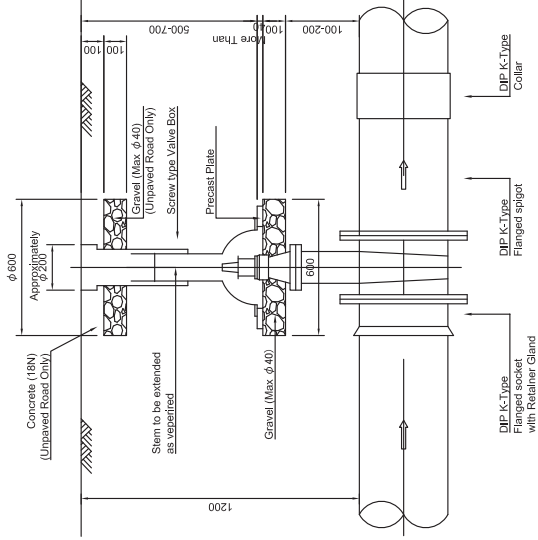
PROJECT DESCRIPTION
General Earth Work for Pipe Line

APPROVE BY	DATE	DRAWING No
PREPARED BY	DATE	K-D11
NIHON SUDO CONSULTANTS CO., LTD. WATER AND SEWER BUREAU, CITY OF KITAKYUSHU		SCALE
CTI ENGINEERING INTERNATIONAL CO., LTD.		

Typical Drawing for Installation of Sluice Valve



SLUICE VALVE INSTALLATION
(HDPEφ50-φ200mm)



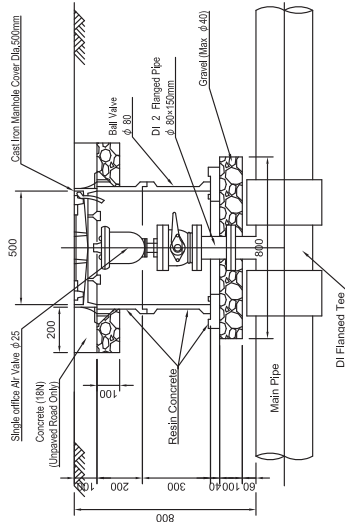
SLUICE VALVE INSTALLATION
(DIPφ250-φ500mm)

NOTE

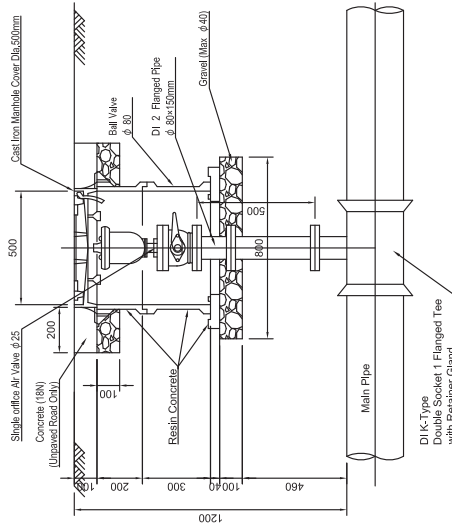
1. ALL SLUICE VALVES LESS THAN 400mm DIA. WILL HAVE NO CHAMBERS AND WILL BE INSTALLED SEEMILY TO WASH OUT VALVES HEAVY-DUTY SURFACE BOXES AT THE ROAD LEVEL TO OPERATE THEM.
2. ALL DIMENSIONS ARE IN mm.

<p>PROJECT</p> <p>THE PREPARATORY SURVEY ON THE PROJECT ON ADDITIONAL NEW WATER TREATMENT PLANTS FOR KAMPONG CHAM AND BATTAMBANG WATERWORKS カンボジア国地方上水道拡張整備計画準備調査</p>	<p>DESCRIPTION</p> <p>Typical Drawing for Installation of Sluice Valve</p>	<p>APPROVE BY</p> <p>DATE</p>	<p>DRAWING No</p> <p>K-D12</p>
<p>PREPARED BY</p> <p>NIHON SUIDO CONSULTANTS CO., LTD. WATER AND SEWER BUREAU, CITY OF KITAKYUSHU CTI ENGINEERING INTERNATIONAL CO., LTD.</p>	<p>DATE</p>	<p>SCALE</p>	<p>DATE</p>

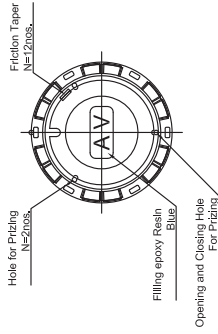
Typical Drawing for Installation of Air Valve and Washout



SINGLE ORIFICE AIR VALVE CHAMBER
(MAIN PIPE ϕ 200(HDPE))

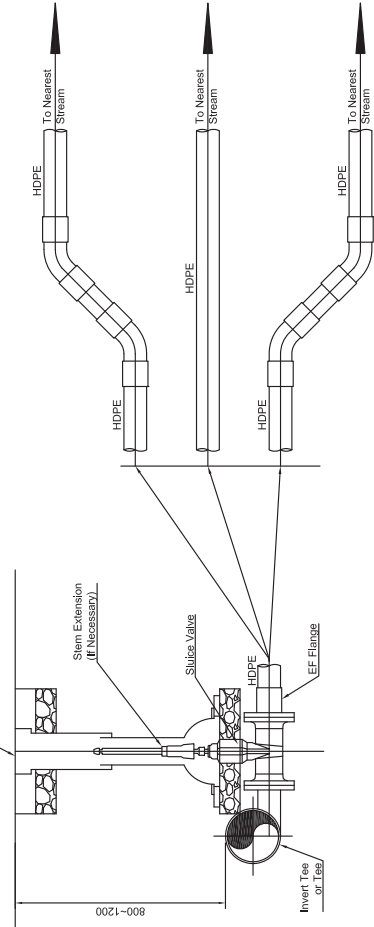


SINGLE ORIFICE AIR VALVE CHAMBER
(MAIN PIPE ϕ 250~ ϕ 500(DIP))



CAST IRON MANHOLE COVER
 ϕ 500(No.3 Type)

Screw Type Valve Box
(For detail, see drawing "Typical drawing for Sluice Valve")



CRITERIA FOR AIR VALVE AND WASH OUT

MAIN PIPE MATERIAL	MAIN PIPE MATERIAL	BRANCH PIPE for AIR VALVE	BRANCH PIPE WASH OUT
ϕ 50	HDPE	ϕ 80	ϕ 50
ϕ 75		ϕ 80	ϕ 50
ϕ 100		ϕ 80	ϕ 75
ϕ 150		ϕ 80	ϕ 75
ϕ 200	DIP	ϕ 80	ϕ 75
ϕ 250		ϕ 80	ϕ 75
ϕ 300		ϕ 80	ϕ 75
ϕ 350		ϕ 80	ϕ 100
ϕ 400		ϕ 80	ϕ 150
ϕ 450		ϕ 80	ϕ 200
ϕ 500		ϕ 80	ϕ 200

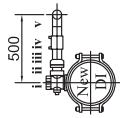
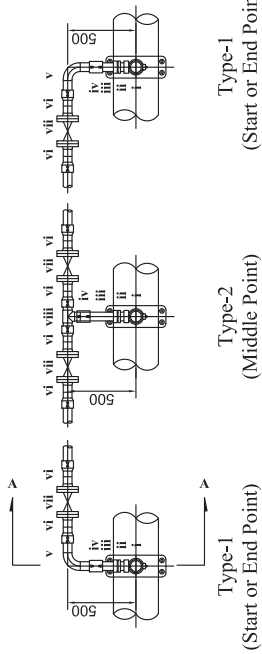
NOTE

1. THE THICKNESS OF THE BLINDING LAYER SPECIFIED IN THE DRAWING IS FOR NORMAL SOIL TYPES, HOWEVER IF THE STRUCTURE IS FOUNDED ON VERY WEAK SOIL SUCH AS PEAT.
2. THE TOP OF THE AIR VALVE CHAMBER SHOULD BE AT THE SAME LEVEL AS THE ROAD TOP LEVEL.
3. THE VALVE BOXES FOR WASHOUT MAY BE ON THE BANK OF THE ROAD.
4. ALL DIMENSIONS ARE IN mm.

PROJECT THE PREPARATORY SURVEY ON THE PROJECT ON ADDITIONAL NEW WATER TREATMENT PLANTS FOR KAMPONG CHAM AND BATTAMBANG WATERWORKS カンボジア国地方上水道拡張整備計画策劃調査	DESCRIPTION Typical Drawing for Installation of Air Valve and Washout	APPROVE BY	DATE	DRAWING No K-D13
		PREPARED BY	DATE	SCALE

Typical Drawing for Branch of Service Pipe

Branch of Service Pipe (DI×HDPE φ 50)
Saddle Cramp



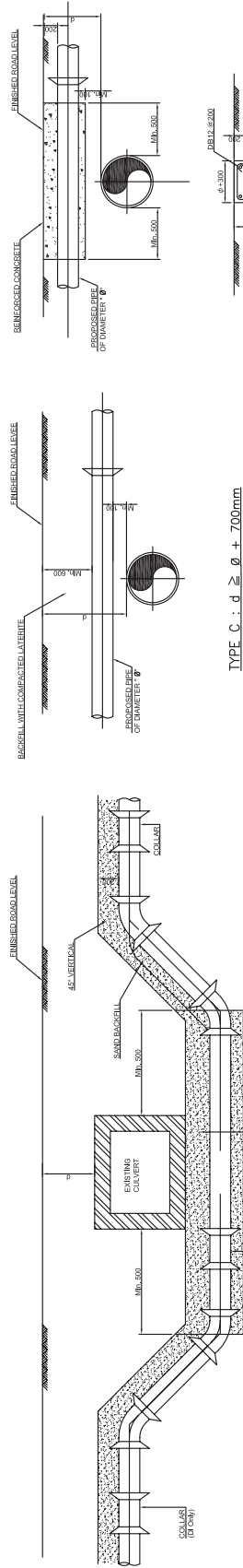
A-A Section

Material	Specification
I FGD Saddle Cramp for DIP	φ D × φ 50
II CAC Metal Socket of HDPE for Meter	φ 50
III HDPE Double Socket Pipe	φ 50 L=500mm (Minimum)
IV HDPE EF Socket	φ 50
V HDPE 90° Bend	φ 50
VI HDPE EF Flange	PN10 φ 50
VII FGD Soft Seal Sluice Valve	PN10 φ 50 JisBis Screw type
VIII HDPE Tee	φ 50 × φ 50

Note : Flange joints shall be SUS304 PN10.

PROJECT	DESCRIPTION	APPROVE BY	DATE	DRAWING No
			DATE	
THE PREPARATORY SURVEY ON THE PROJECT ON ADDITIONAL NEW WATER TREATMENT PLANTS FOR KAMPONG CHAM AND BATTAMBANG WATERWORKS カンボジア国地方上水道拡張整備計画準備調査	Typical Drawing for Branch of Service Pipe	PREPARED BY	DATE	K-D14

Typical Drawing for Structure Crossing



Note : DI Pipe is assumed to be K type.
K type Retainer Gland shall be installed at DI Pipe.

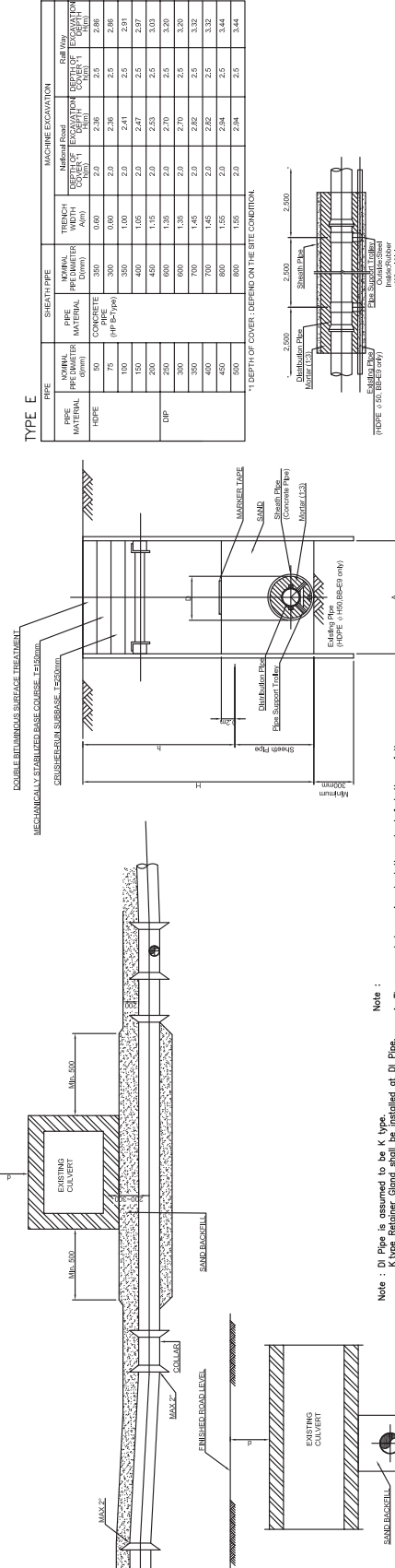
TYPE A : REQUIRED VERTICAL BEND 45°

TYPE C : $d \geq \varnothing + 700\text{mm}$

PIPE OVER CROSSING THE CULVERT
APPLICABLE TO ALL TYPES OF CULVERTS

SECTION (B)

TYPE D : $\varnothing + 400\text{mm} < d < \varnothing + 700\text{mm}$



- Note :
- The space between invert at the culvert & bottom of the trench in type A, AB shall be filled with sand to the full trench width.
 - The cover of the trench shall be 12mm above the top of the pipe at the corners & 10mm deformed bars 200mm intervals with concrete cover of 40mm.
 - In the event of under crossing all types of culverts, the contractor shall be responsible for using an appropriate supporting system, as approved by the consultant.

Note : DI Pipe is assumed to be K type.
K type Retainer Gland shall be installed at DI Pipe.

TYPE B : WITHIN ALLOWABLE DEFLECTION (MAXIMUM 2)

SECTION (A)

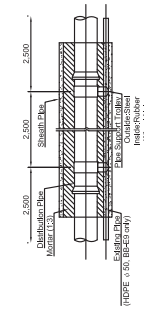
PIPE UNDER CROSSING THE CULVERT

TYPE E :
PIPE UNDER CROSSING THE NATIONAL ROAD AND RAIL WAY

TYPE E

PIPE MATERIAL	PIPE DIAMETER (mm)	TRENCH WIDTH (mm)	MACHINE EXCAVATION	
			DEPTH OF EXCAVATION (mm)	DEPTH OF EXCAVATION (mm)
HOPE	50	600	2.0	2.48
	75	600	2.0	2.5
	100	600	2.0	2.58
	150	600	2.0	2.67
DIP	200	450	1.15	2.0
	250	450	1.20	2.53
	300	450	1.25	2.70
	350	450	1.35	2.82
CONCRETE PIPE (H-P Type)	300	600	1.45	2.0
	400	700	1.45	2.0
	450	700	1.55	2.0
	500	800	1.55	2.0
CONCRETE PIPE (H-P Type)	500	600	1.55	2.0
	600	600	1.55	2.0
	700	600	1.55	2.0
	800	600	1.55	2.0

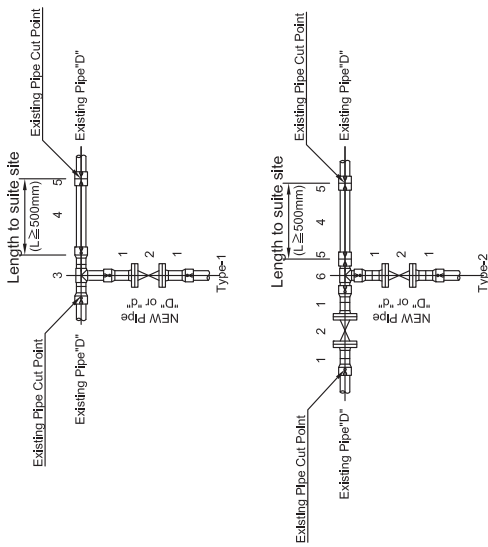
*1. DEPTH OF COVER: DEPEND ON THE SITE CONDITION.



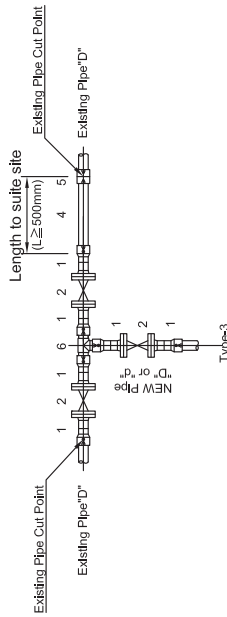
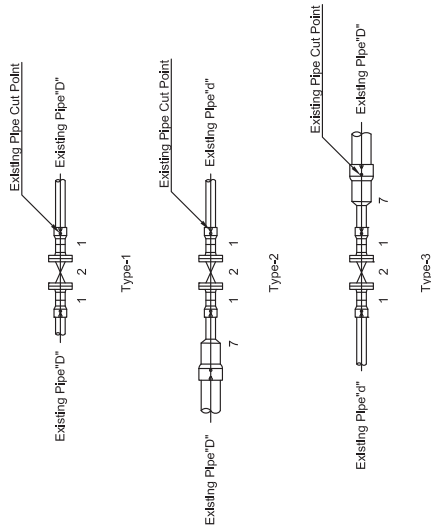
PROJECT	THE PREPARATORY SURVEY ON THE PROJECT ON ADDITIONAL NEW WATER TREATMENT PLANTS FOR KAMPONG CHAM AND BATTAMBANG WATERWORKS カンボジア国地方上水道拡張整備計画準備調査		APPROVE BY	DATE	DRAWING No
	DESCRIPTION Typical Drawing for Structure Crossing		PREPARED BY	DATE	SCALE
					K-D15

Typical Drawing for Connection of New Pipe and Existing Pipe (1)

HDPE(new) x HDPE(Existing) Tee Connection



HDPE(new) x HDPE(Existing) Strate Connection



Note :

- $\phi < D$
- Taper pipe is to be installed at new pipe, when the calibers of new pipe and existing pipe differ.
- In the case of uPVC pipe, read "EF" as "TS" instead of HDPE.
- Flange joints shall be SUS304 PN10.

No.	Material	Specification
1	HDPE EF Flange	PN10 ϕ D or ϕ d
2	FGD Soft Seal Sluice Valve	PN10 ϕ D or ϕ d Inside Screw type
3	HDPE EF Tee	PN10 ϕ D x ϕ D or ϕ d
4	HDPE Double Spigot Pipe	PN10 ϕ D, L=500mm (Minimum)
5	HDPE EF Socket	PN10 ϕ D
6	HDPE Tee	PN10 ϕ D x ϕ D or ϕ d
7	HDPE EF Reducer	PN10 ϕ D x ϕ d

PROJECT
THE PREPARATORY SURVEY ON THE PROJECT ON ADDITIONAL NEW WATER TREATMENT PLANTS
FOR KAMPONG CHAM AND BATTAMBANG WATERWORKS
カンボジア国地方上水道拡張整備計画準備調査

DESCRIPTION
Typical Drawing for
Connection of New Pipe and
Existing Pipe (1)

NIHON SUIDO CONSULTANTS CO., LTD.
WATER AND SEWER BUREAU, CITY OF KITAKYUSHU
CTI ENGINEERING INTERNATIONAL CO., LTD.

APPROVE BY

DRAWING No
K-D16

DATE

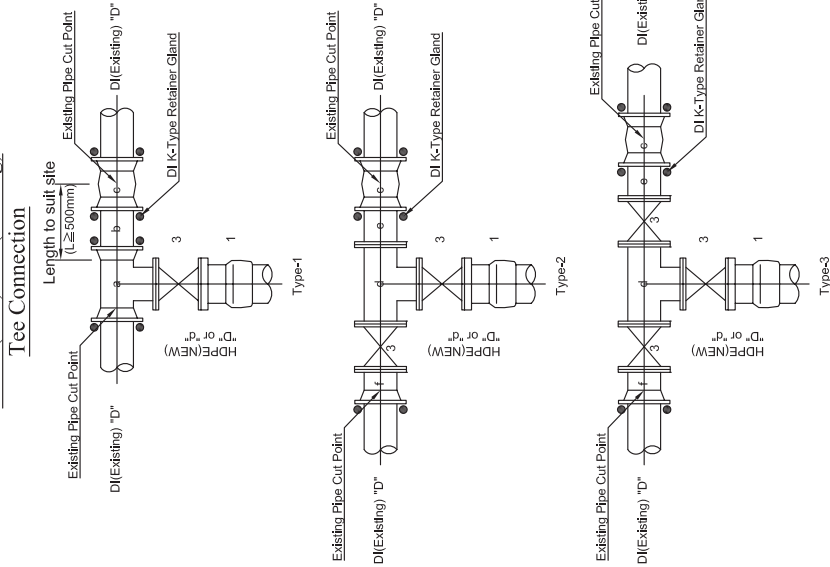
SCALE

PREPARED BY

DATE

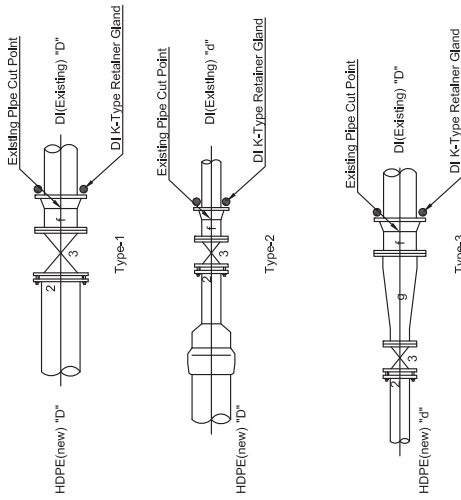
Typical Drawing for Connection of New Pipe and Existing Pipe (2)

HDPE(new) x DI(existing) Tee Connection



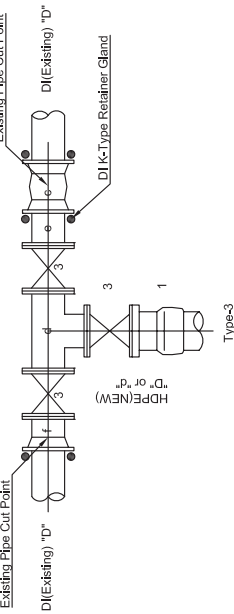
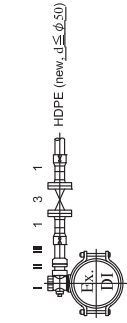
HDPE(new, > φ 50) x DI(existing) Starate Connection

Starate Connection



HDPE(new, ≤ φ 50) x DI(existing, ≤ φ 250) Saddle Cramp

Saddle Cramp



Note :

- d < D
- Taper pipe is to be installed at new pipe, when the colibers of new pipe and existing pipe differ.
- In the case of uPVC pipe, read "EF" as "TS" instead of HDPE.
- Flange joints shall be SUS304 PN10.

No.	Material	Specification
1	HDPE EF Flange	PN10
2	HDPE Flange Adaptor	PN10
3	FCD Soft Seal Slitice Valve	PN10 φ D or φ d Inside Screw type
a	DI Double Socket Tee with Flanged Branch	K type PN10 φ D x φ D or φ d
b	DI Double Spigot Pipe	φ D, L=500mm (Minimum)
c	DI Collar	K type φ D
d	DI All Flanged Tee	PN10 φ D x φ D or φ d
e	DI Flanged Spigot	PN10 φ D
f	DI Flanged Socket	K type PN10 φ D
g	DI Double Flanged Taper	PN10 φ D x φ d
l	FCD Saddle Cramp for DJP	φ D x φ d
ii	CAC Metal Socket of HDPE for Meter	φ d
iii	HDPE Double Spigot Pipe	φ d, L=300mm (Minimum)

PROJECT
THE PREPARATORY SURVEY ON THE PROJECT ON ADDITIONAL NEW WATER TREATMENT PLANTS FOR KAMPONG CHAM AND BATTAMBANG WATERWORKS
カンボジア国地方上水道拡張整備計画準備調査

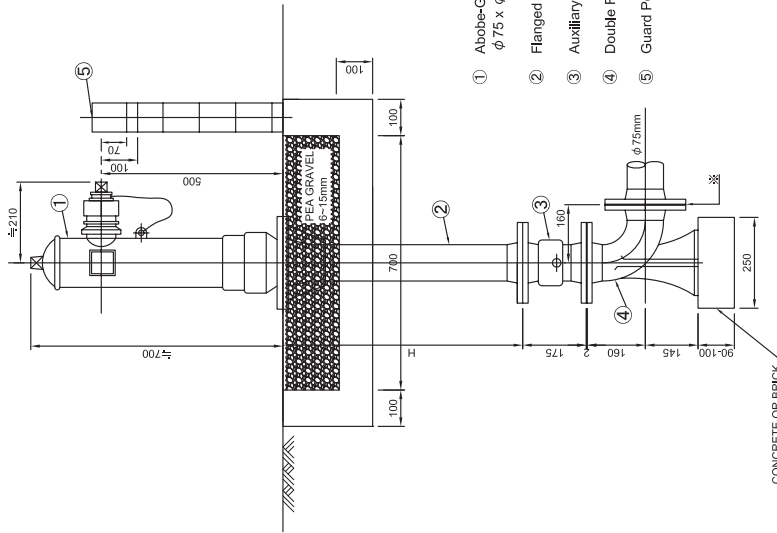
DESCRIPTION
Typical Drawing for Connection of New Pipe and Existing Pipe (2)

APPROVE BY
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WATER AND SEWER BUREAU, CITY OF KITAKYUSHU
CTI ENGINEERING INTERNATIONAL CO., LTD.

DATE
DATE
DRAWING No
K-D17
SCALE

SINGLE MOUTH TYPE FIRE HYDRANT

Pipeline (mm)	H	
	Type I	Type II
φ 100	900	500
φ 150	950	550
φ 200	950	550
φ 250	1000	600

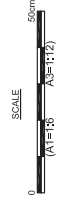


- ① Above-ground Double Mouths Type Fire Hydrant
φ75 x φ65, One-Way Strike-To-Fall Type
- ② Flanged Extension Pipe
- ③ Auxiliary Valve
- ④ Double Flanged 90° Bend with Duck-Foot
- ⑤ Guard Post Type A Equipped with Reduced Memorial Plate

※ PN10 - φ75 FLANGE

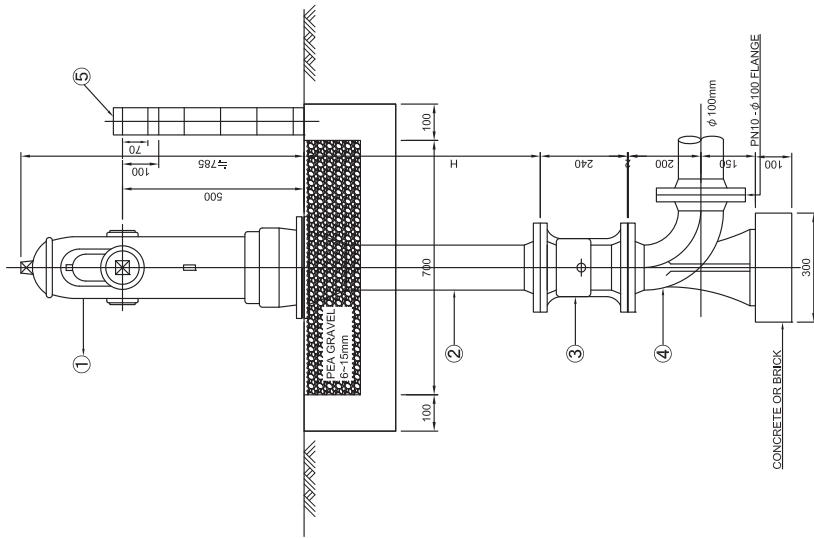
TYPE - I H=1.2m
TYPE - II H=0.8m

SINGLE MOUTH TYPE FIRE HYDRANT



PROJECT THE PREPARATORY SURVEY ON THE PROJECT ON ADDITIONAL NEW WATER TREATMENT PLANTS FOR KAMPONG CHAM AND BATTAMBANG WATERWORKS カンボジア地方上水道拡張整備計画準備調査	DESCRIPTION Single Mouth Type Fire Hydrant	APPROVE BY	DATE	DRAWING No. K-D118
		PREPARED BY	DATE	SCALE

NIHON SUIDO CONSULTANTS CO., LTD.
WATER AND SEWER BUREAU, CITY OF KITAKYUSHU
CTI ENGINEERING INTERNATIONAL CO., LTD.



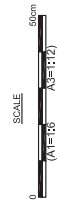
TYPE - I H=1.2m
 TYPE - II H=0.8m

DOUBLE MOUTHS TYPE FIRE HYDRANT

Pipeline (mm)	H	
	TYPE I	TYPE II
φ 300	900	500
φ 350	950	550
φ 400	950	550

- ① Above-Ground Double Mouths Type Fire Hydrant
φ 100 x (φ 65 x 2nos.), Two-Ways Stifke-To-Fall type
- ② Flanged Extension Pipe
- ③ Auxiliary Valve
- ④ Double Flanged 90° Bend with Duck-Foot
- ⑤ Guard Post Type A Equipped with Reduced Memorial Plate

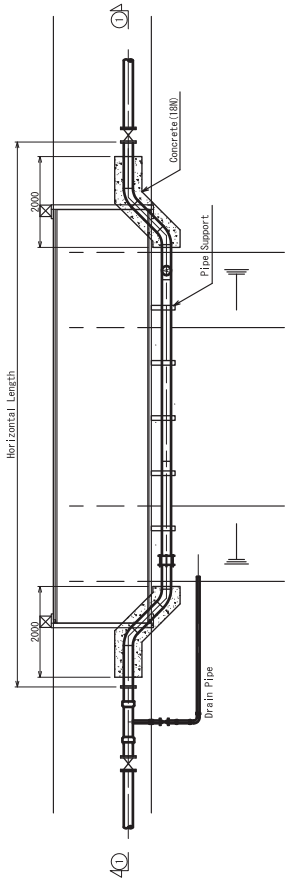
DOUBLE MOUTHS TYPE FIRE HYDRANT



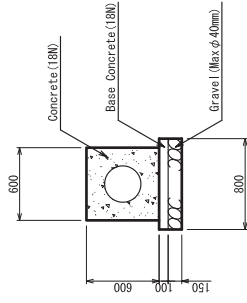
PROJECT THE PREPARATORY SURVEY ON THE PROJECT ON ADDITIONAL NEW WATER TREATMENT PLANTS FOR KAMPONG CHAM AND BATTAMBANG WATERWORKS カンボジア地方上水道拡張整備計画準備調査	DESCRIPTION Double Mouths Type Fire Hydrant	APPROVE BY	DATE	DRAWING No. K-D19
		PREPARED BY	DATE	SCALE

Standard Drawing for Bridge Attached Pipe

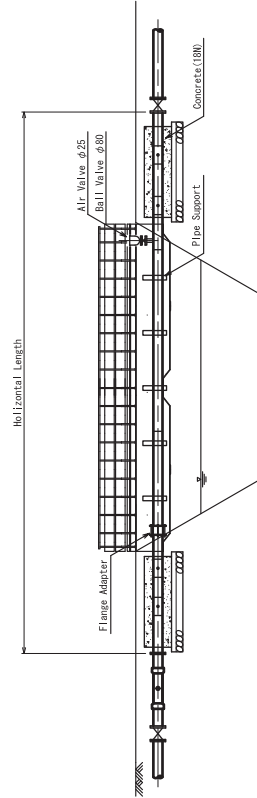
BAP (Bridge Attached Pipe)



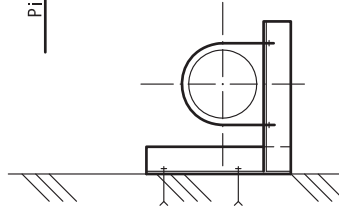
Concrete



Section 1-1



Pipe Support



Pipe Support

Diameter	Main Material	U-band	Anchor
φ 100	L-65 × 65 × 6	φ 100用	M12 × 100L
φ 150	L-75 × 75 × 6	φ 150用	M12 × 100L
φ 200	L-90 × 90 × 6	φ 200用	M16 × 100L
φ 250	L-90 × 90 × 6	φ 250用	M20 × 160L

PROJECT

THE PREPARATORY SURVEY ON THE PROJECT ON ADDITIONAL NEW WATER TREATMENT PLANTS
FOR KAMPONG CHAM AND BATTAMBANG WATERWORKS
カンボジア地方上水道拡張整備計画準備調査

DESCRIPTION

Standard Drawing for
Bridge Attached Pipe

APPROVE BY

DATE

DRAWING No

NIHON SUIDO CONSULTANTS CO., LTD.
WATER AND SEWER BUREAU, CITY OF KITAKYUSHU
CTI ENGINEERING INTERNATIONAL CO., LTD.

PREPARED BY

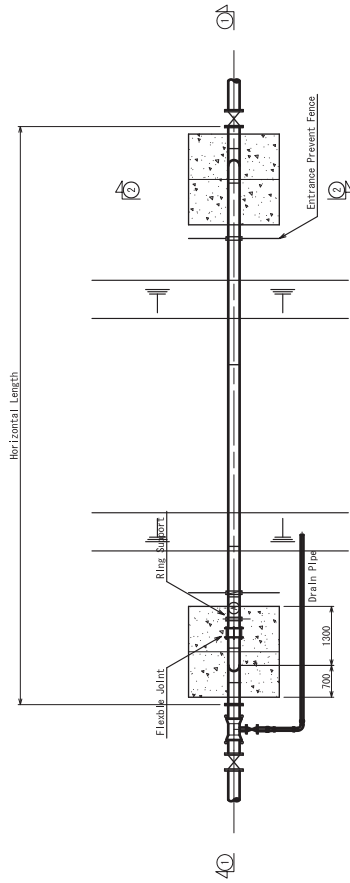
DATE

SCALE

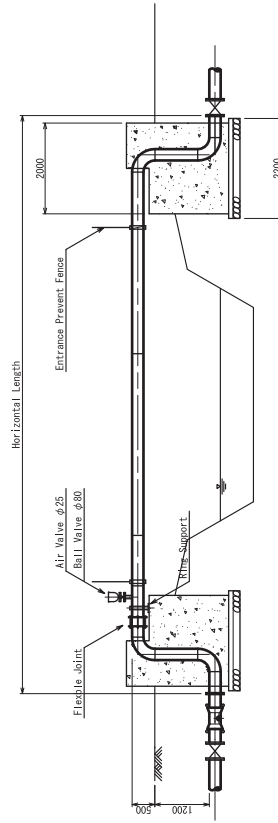
K-D20

Standard Drawing for Pipe Beam

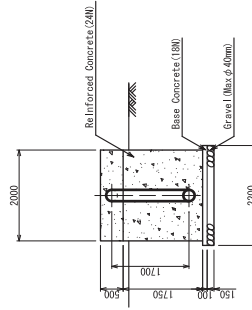
PB (Pipe beam)



Section ①-①



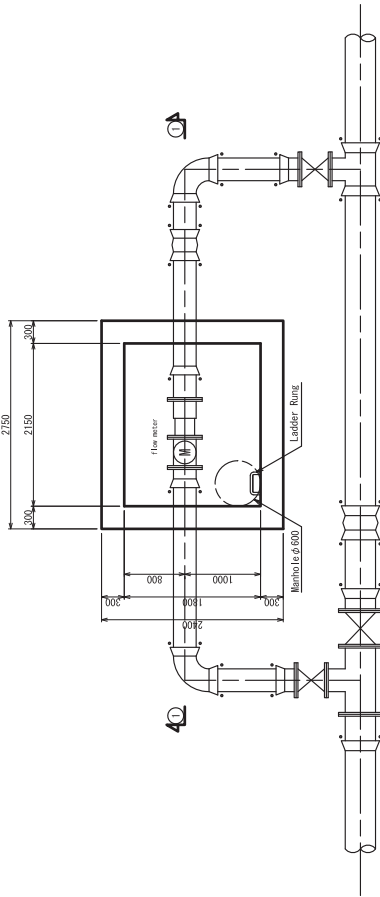
Section ②-②



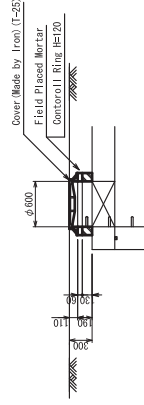
PROJECT	DESCRIPTION	APPROVE BY	DATE	DRAWING No
				K-D21
THE PREPARATORY SURVEY ON THE PROJECT ON ADDITIONAL NEW WATER TREATMENT PLANTS FOR KAMPONG CHAM AND BATTAMBANG WATERWORKS カンボジア即地方上水道拡張整備計画準備調査	Standard Drawing for Pipe Beam	PREPARED BY	DATE	SCALE
				NIHON SUIDO CONSULTANTS CO., LTD. WATER AND SEWER BUREAU, CITY OF KITAKYUSHU CTI ENGINEERING INTERNATIONAL CO., LTD.

Standard Drawing for Flow Meter Chamber

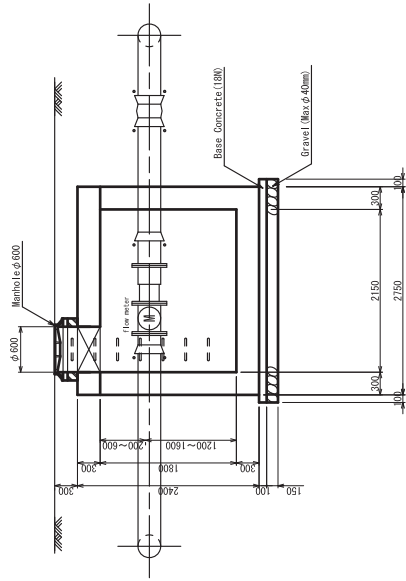
Plan



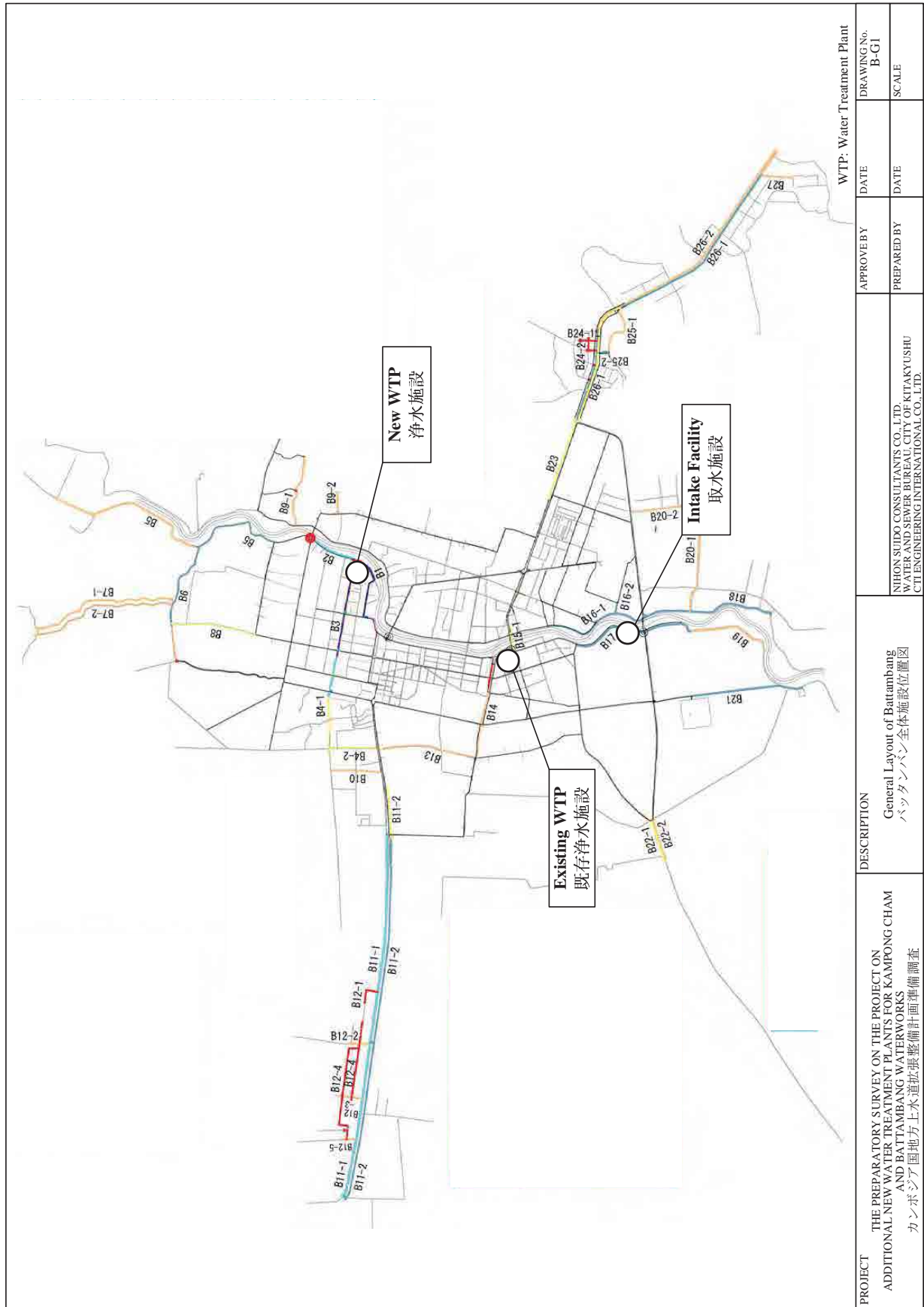
Enlarged



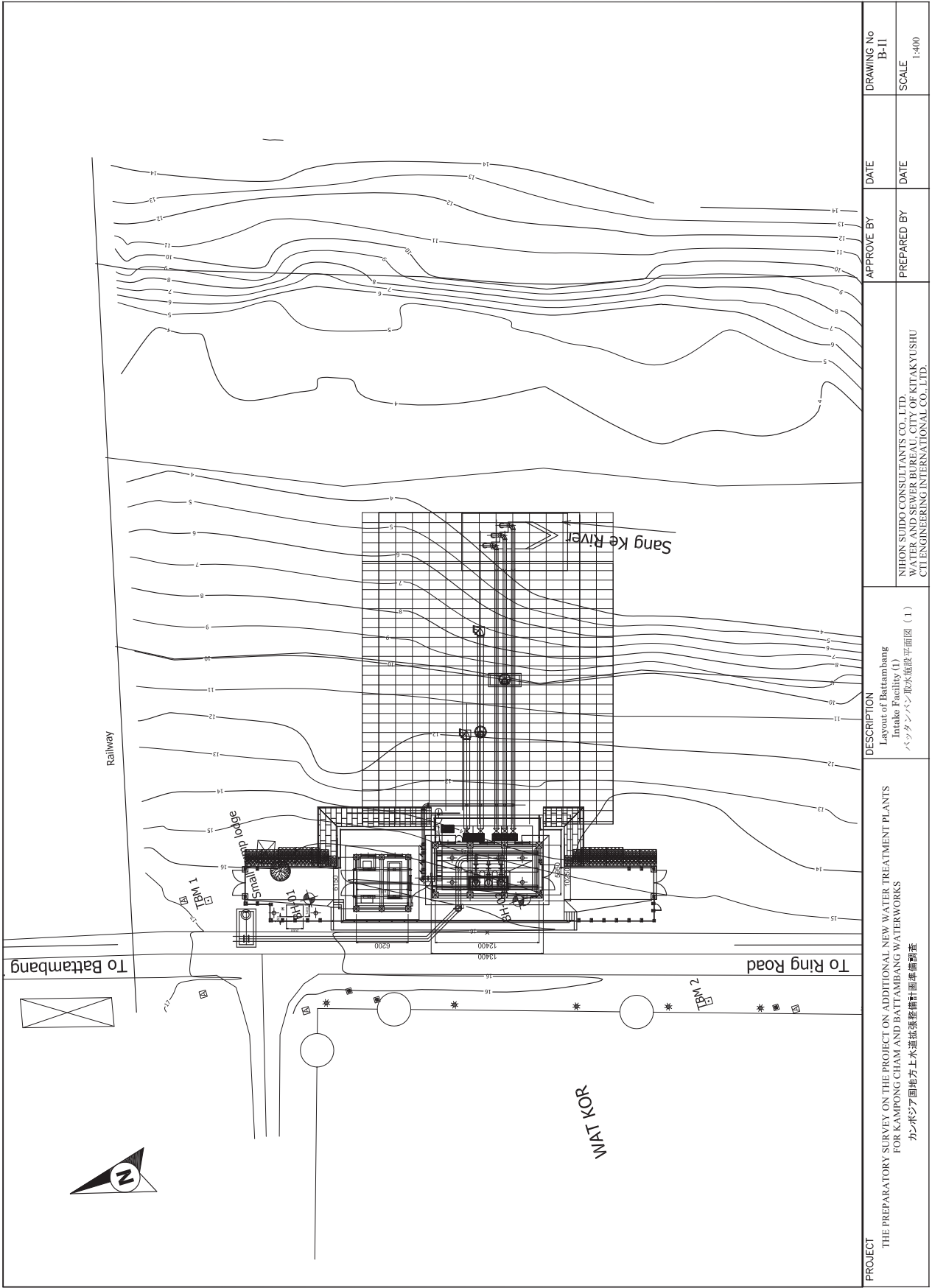
Section ①-①



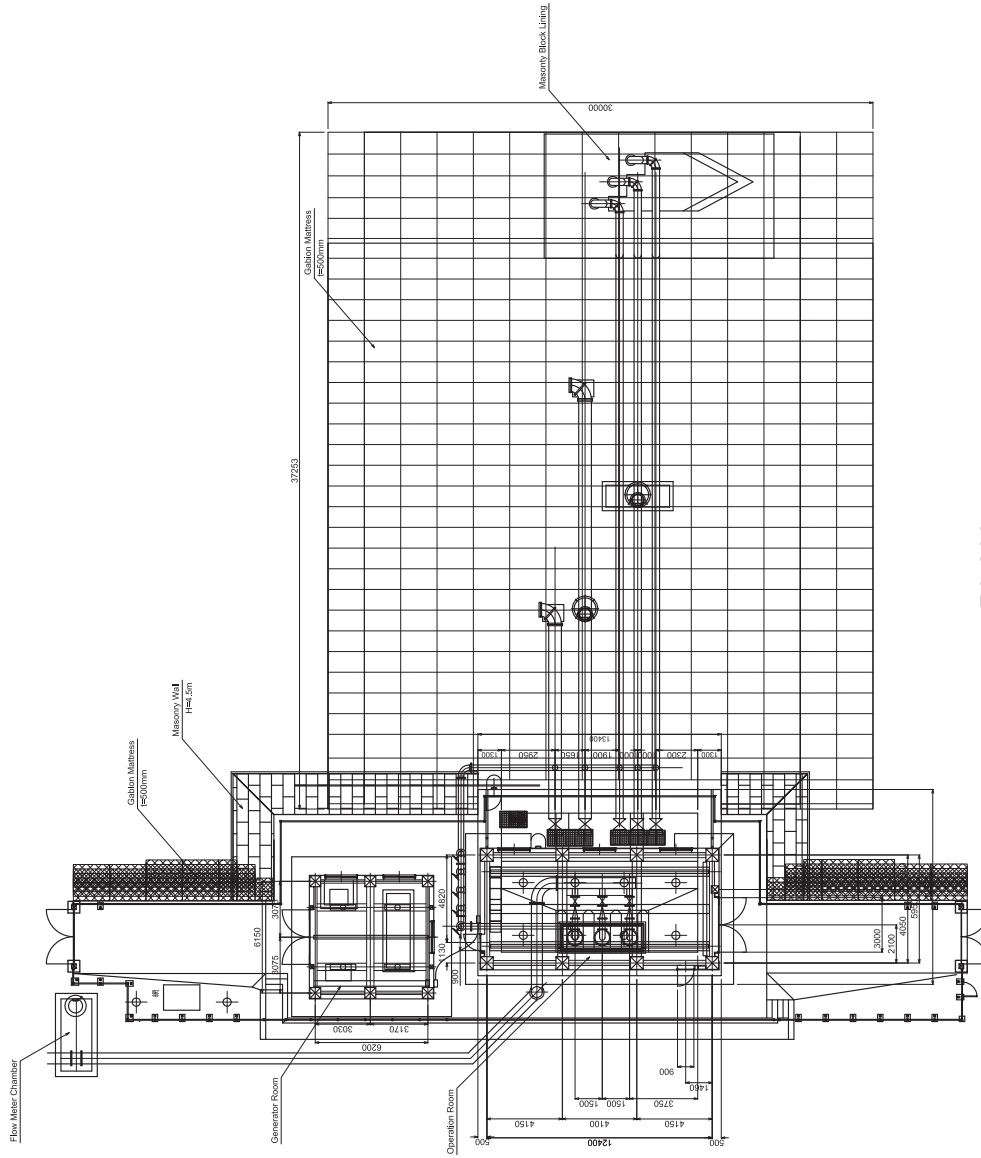
PROJECT	THE PREPARATORY SURVEY ON THE PROJECT ON ADDITIONAL NEW WATER TREATMENT PLANTS FOR KAMPONG CHAM AND BATTAMBANG WATERWORKS カンボジア即地方上水道拡張整備計画準備調査	DESCRIPTION	Standard Drawing for Flow Meter Chamber	APPROVE BY	DATE	DRAWING No
				PREPARED BY	DATE	SCALE
						K-D22



PROJECT THE PREPARATORY SURVEY ON THE PROJECT ON ADDITIONAL NEW WATER TREATMENT PLANTS FOR KAMPONG CHAM AND BATTAMBANG WATERWORKS カンボジア 国地方上水道拡張整備計画準備調査	DESCRIPTION General Layout of Battambang បាត់ដំបងទូទាំងទីក្រុងទីតាំងទីតាំង	WTP: Water Treatment Plant	
		APPROVE BY	DATE
NIHON SUDO CONSULTANTS CO., LTD. WATER AND SEWER BUREAU, CITY OF MIYAKUSHU C/I ENGINEERING INTERNATIONAL CO., LTD.		PREPARED BY	DATE
		DRAWING No. B-G1	SCALE

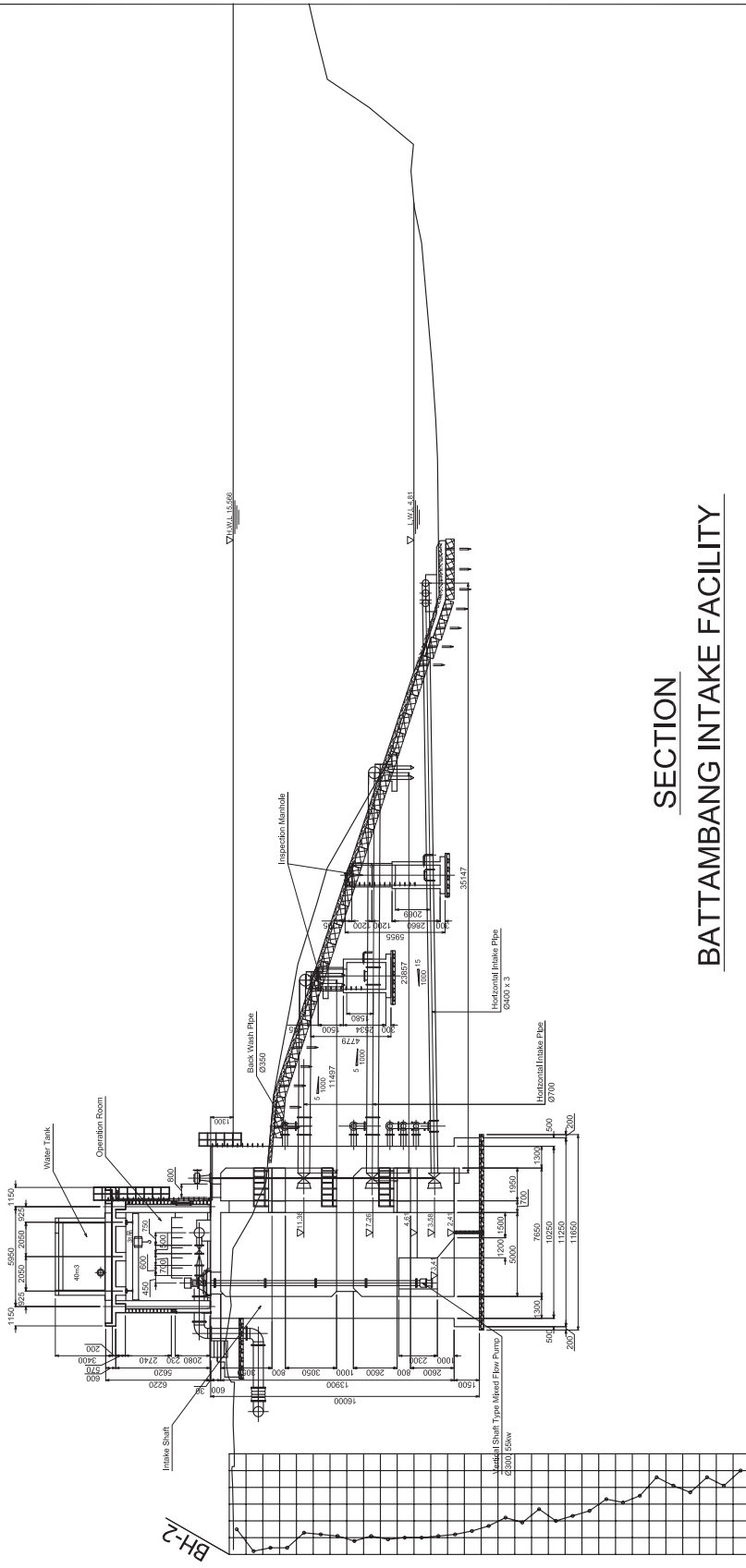


PROJECT THE PREPARATORY SURVEY ON THE PROJECT ON ADDITIONAL NEW WATER TREATMENT PLANTS FOR KAMPONG CHAM AND BATTAMBANG WATERWORKS カンボジア地方上水道拡張整備計画準備調査	DESCRIPTION Layout of Battambang Intake Facility (1) バットアンバン取水施設平面図 (1)	APPROVE BY	DATE	DRAWING No B-11
		PREPARED BY	DATE	SCALE 1:400
NIHON SUIDO CONSULTANTS CO., LTD. WATER AND SEWER BUREAU, CITY OF KITAKYUSHU CTI ENGINEERING INTERNATIONAL CO., LTD.				



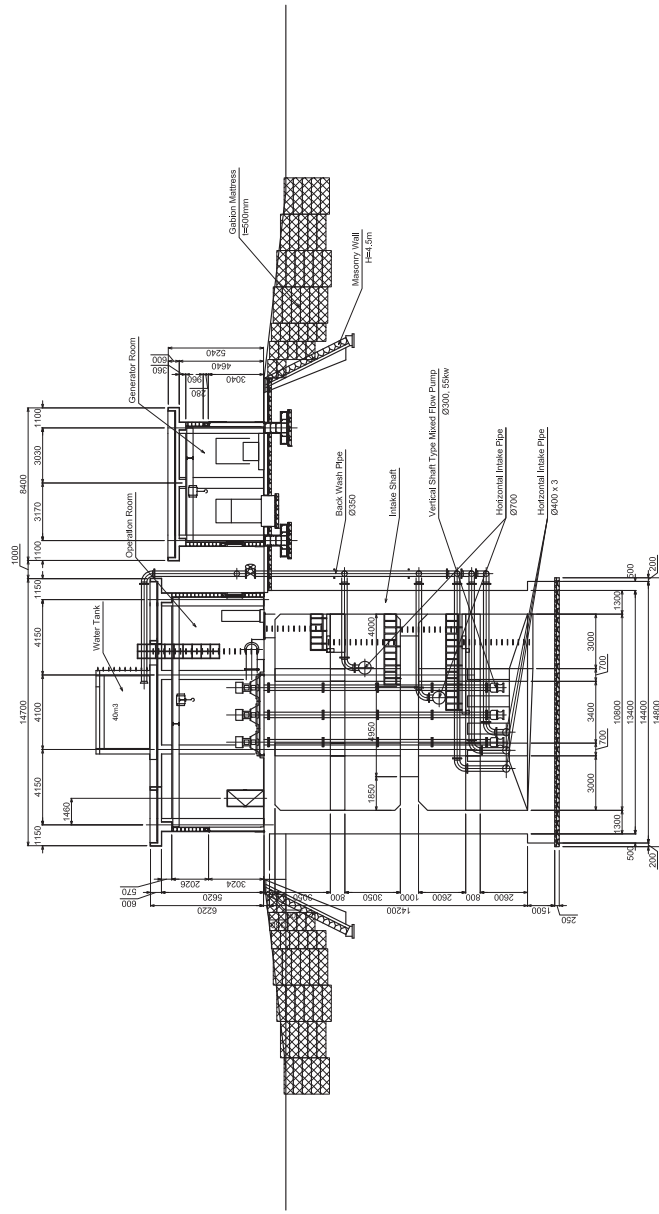
PLAN
BATTAMBANG INTAKE FACILITY

PROJECT THE PREPARATORY SURVEY ON THE PROJECT ON ADDITIONAL NEW WATER TREATMENT PLANTS FOR KAMPONG CHAM AND BATTAMBANG WATERWORKS カンボジア即地方上水道拡張整備計画準備調査	DESCRIPTION Layout of Battambang Intake Facility (2) バンタンバン取水施設平面図 (2)	APPROVE BY	DATE	DRAWING No B-12
		PREPARED BY	DATE	SCALE 1:250



SECTION BATTAMBANG INTAKE FACILITY

<p>PROJECT</p> <p>THE PREPARATORY SURVEY ON THE PROJECT ON ADDITIONAL NEW WATER TREATMENT PLANTS FOR KAMPONG CHAM AND BATTAMBANG WATERWORKS カンボジア地方上水道拡張整備計画準備調査</p>	<p>DESCRIPTION</p> <p>Section View of Battambang Intake Facility バタンバン取水施設構断面図 (1)</p>	<p>APPROVE BY</p> <p>DATE</p>	<p>DRAWING No</p> <p>B-13</p>
<p>PREPARED BY</p> <p>NIHON SUIDO CONSULTANTS CO., LTD. WATER AND SEWER BUREAU, CITY OF KITAKYUSHU CTI ENGINEERING INTERNATIONAL CO., LTD.</p>	<p>DATE</p> <p>DATE</p>	<p>SCALE</p> <p>1:250</p>	



FRONT
BATTAMBANG INTAKE FACILITY

PROJECT THE PREPARATORY SURVEY ON THE PROJECT ON ADDITIONAL NEW WATER TREATMENT PLANTS FOR KAMPONG CHAM AND BATTAMBANG WATERWORKS カンボジア即地方上水道拡張整備計画準備調査	DESCRIPTION Front View of Battambang Intake Facility バンタンバン取水施設構造断面図 (2)	APPROVE BY	DATE	DRAWING No B-14
		PREPARED BY	DATE	SCALE 1:250