

NO.	SECTOR	DRAWING TITLE	DRAWING NO.
1.	EXISTING GAS AND OIL PIPE WORK	EXISTING PLAN OF GAS AND OIL PIPE	EX - GOP - 01
2.	EXISTING POWER SUPPLY WORK	EXISTING PLAN OF POWER SUPPLY	EX - PS - 01
3.	EXISTING ROAD WORK	EXISTING PLAN OF ROAD	EX - RD - 01
4.	EXISTING WATER SUPPLY WORK	EXISTING PLAN OF WATER SUPPLY	EX - WS - 01
5.	EXISTING DRAINAGE WORK	EXISTING PLAN OF DRAINAGE	EX - DR - 01
6.	EXISTING TELECOMMUNICATION WORK	EXISTING PLAN OF TELECOMMUNICATION	EX - TELE - 01
7.	GENERAL	LOT LAYOUT PLAN	GN - 01
8.	ROAD WORK	PLAN OF ROAD	GN - RD - 01
9.	ROAD WORK	TYPICAL CROSS SECTION OF ROAD 35 M.	GN - RD - 02
10.	ROAD WORK	PLAN OF UNDERGROUND PASSAGE AND SKY WALK	GN - RD - 03
11.	WATER SUPPLY WORK	PLAN OF WATER SUPPLY	GN - WS - 01
12.	DRAINAGE WORK	PLAN OF DRAINAGE	GN - DR - 01
13.	SEWERAGE WORK	PLAN OF SEWER	GN - SW - 01
14.	POWER SUPPLY WORK	PLAN OF POWER SUPPLY	GN - PS - 01

JICA SURVEY TEAM

Data Collection Survey on
Urban Redevelopment in Bang Sue Area

SECTOR :

LIST OF DRAWINGS

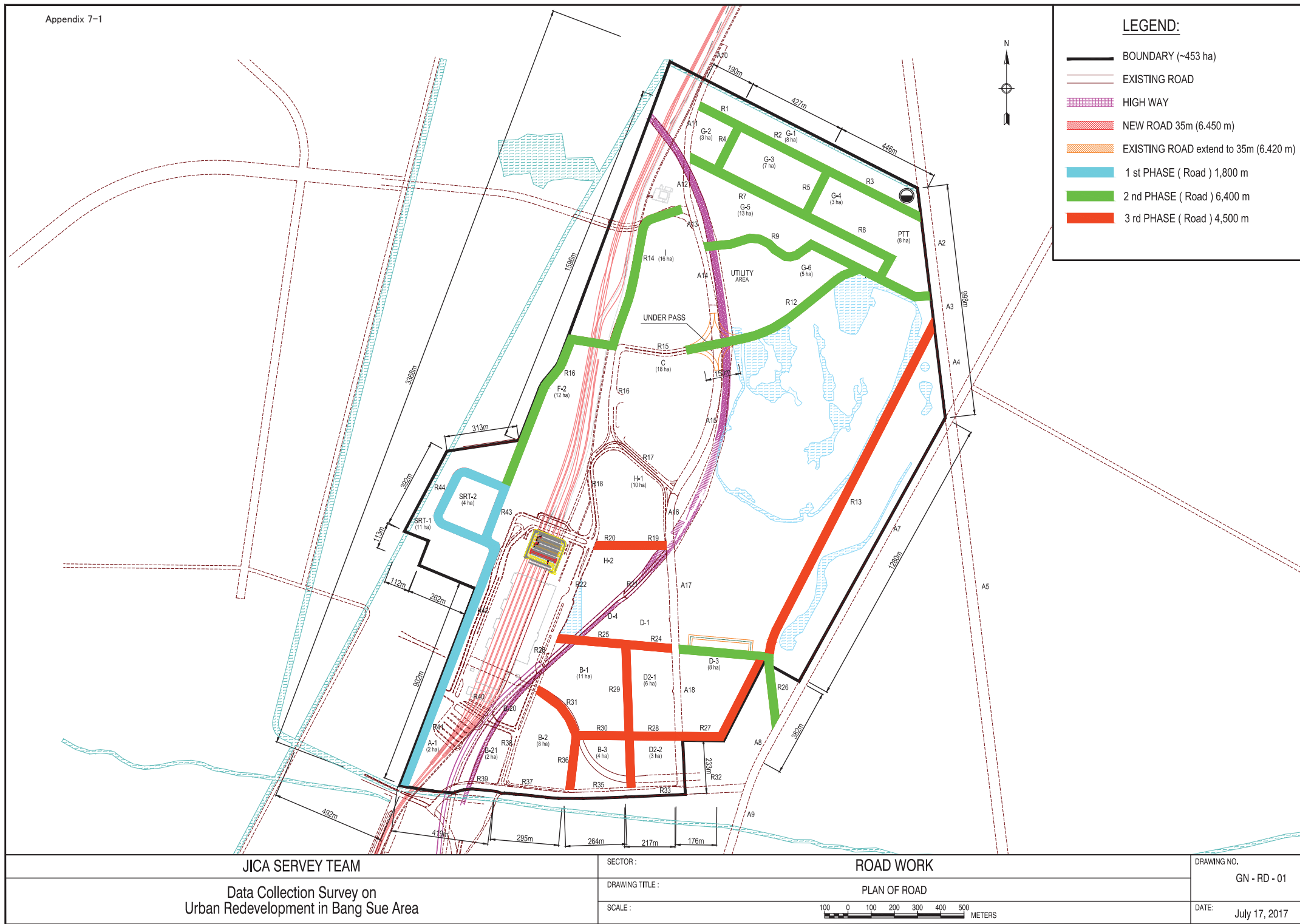
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SCALE :

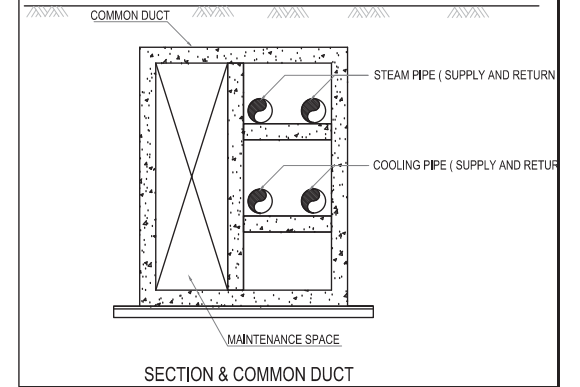
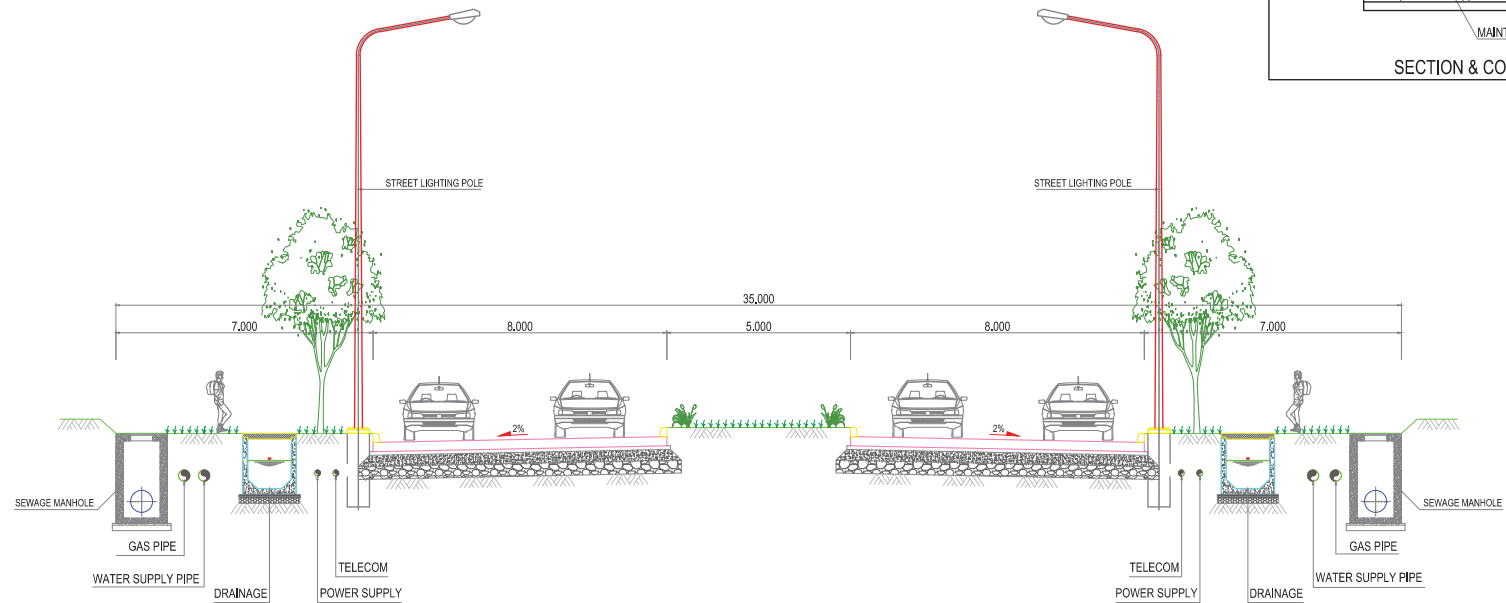

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DRAWING NO.

DATE: July 17, 2017



TYPICAL CROSS SECTION OF ROAD 35m



JICA SERVEY TEAM
Data Collection Survey on
Urban Redevelopment in Bang Sue Area

SECTOR :

ROAD WORK

DRAWING TITLE :

TYPICAL CROSS SECTION OF ROAD 35m

SCALE :

1 0 1 2 3 4 5 METERS

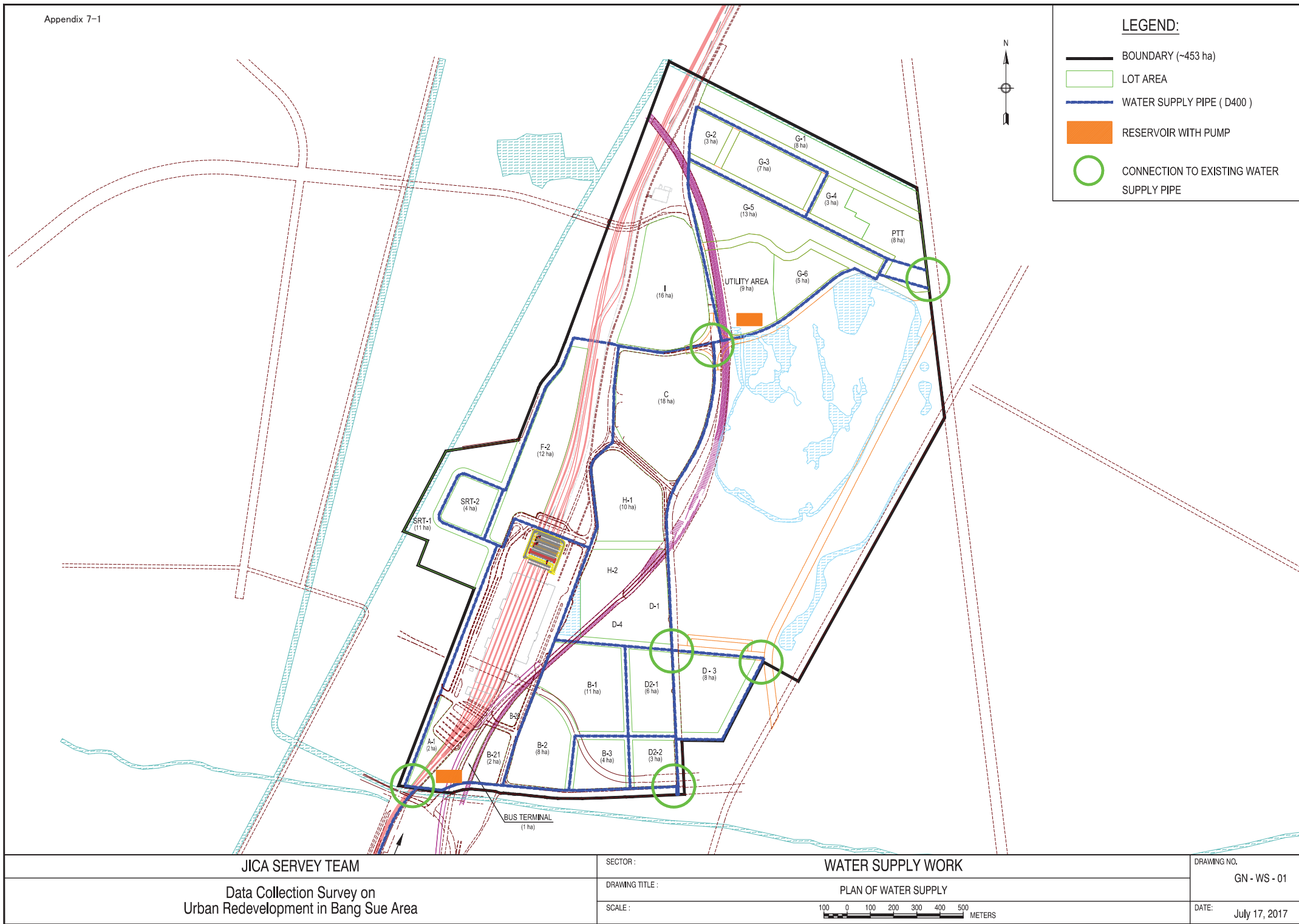
DRAWING NO.

GN - RD - 02

DATE:

July 17, 2017





JICA SURVEY TEAM

Data Collection Survey on
Urban Redevelopment in Bang Sue Area

SECTOR :

DRAWING TITLE :

SCALE :

WATER SUPPLY WORK

PLAN OF WATER SUPPLY

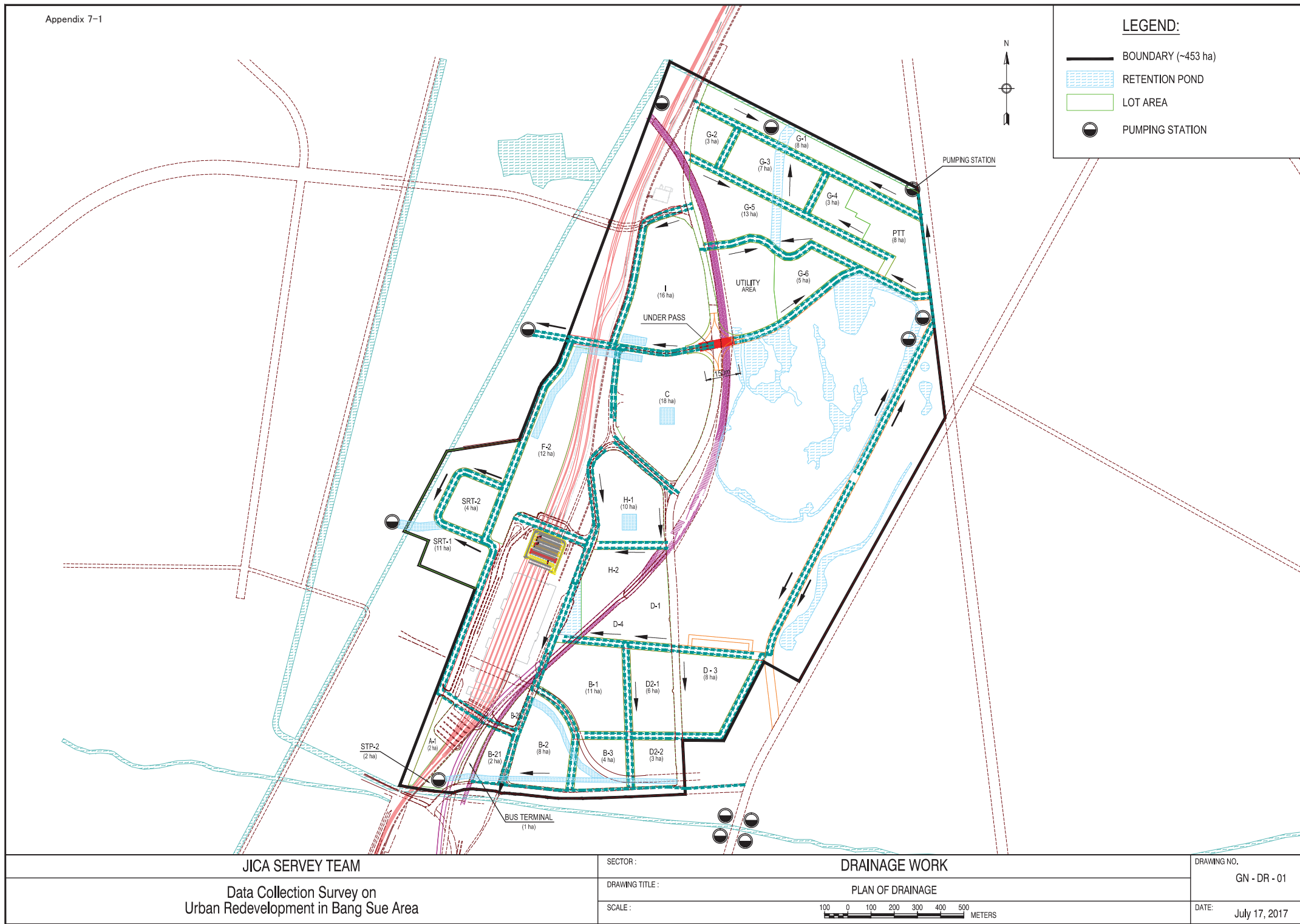
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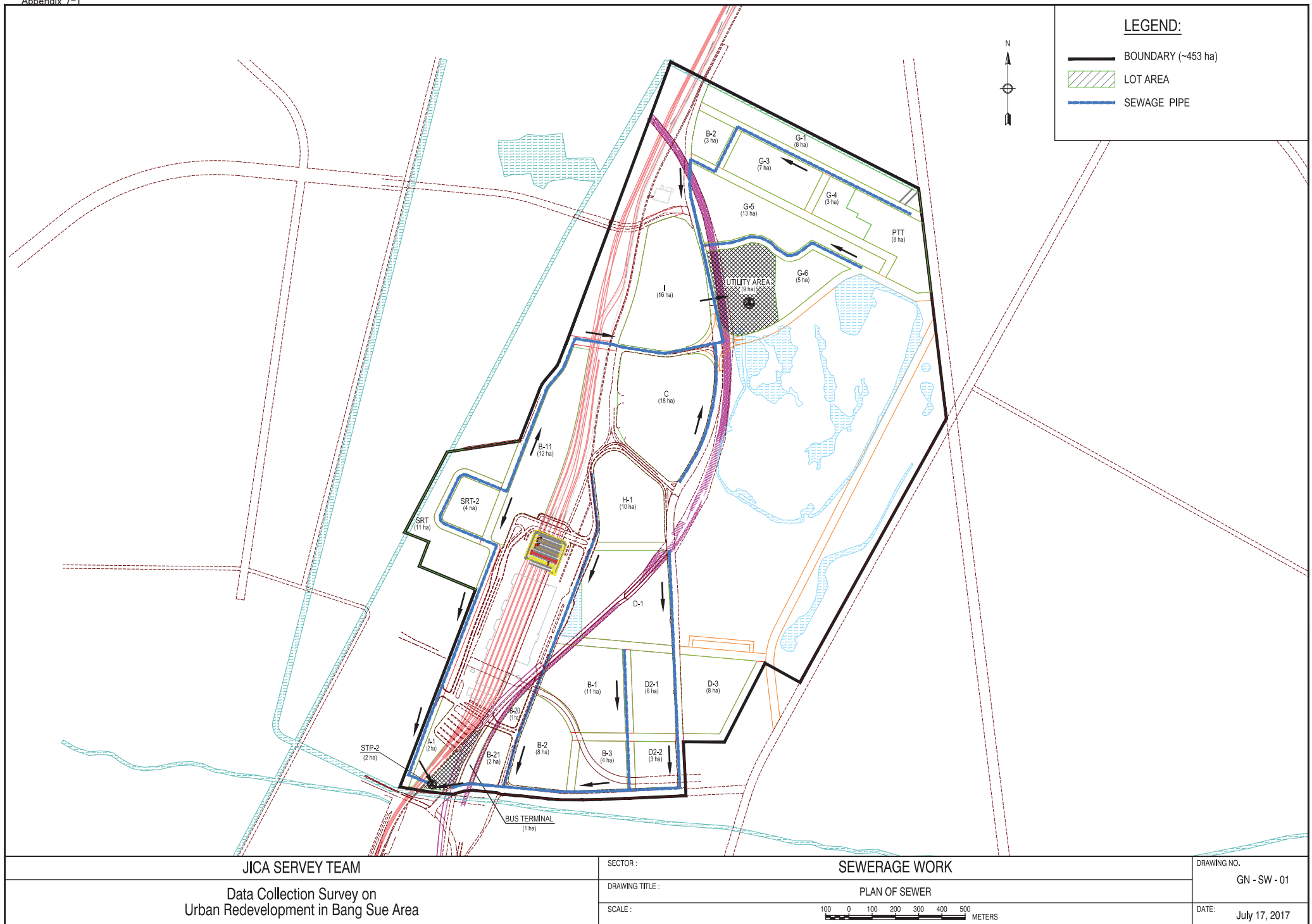
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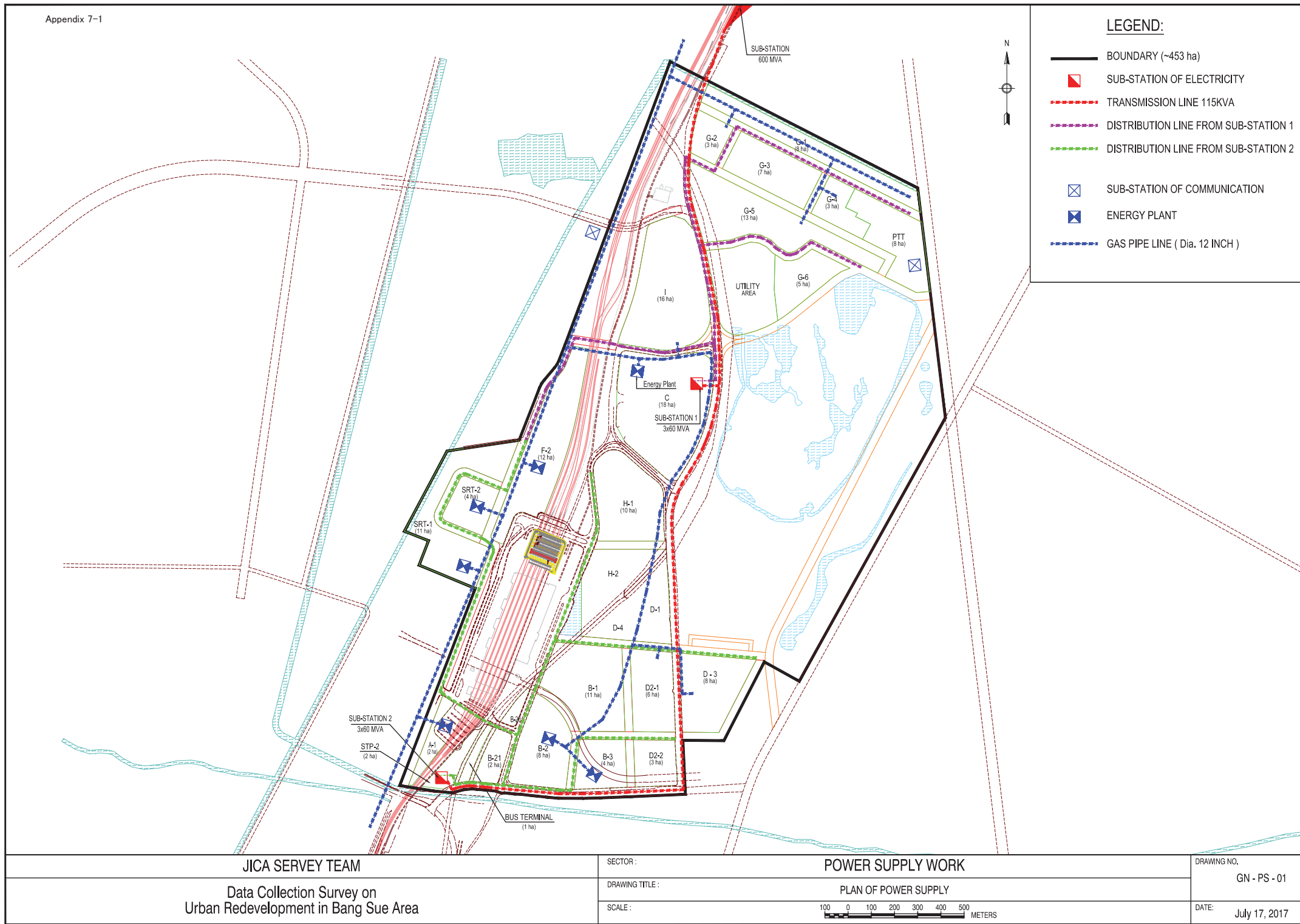
GN - WS - 01

DATE:

July 17, 2017







JICA SURVEY TEAM

Data Collection Survey on
Urban Redevelopment in Bang Sue Area

SECTOR :

DRAWING TITLE :

SCALE :

POWER SUPPLY WORK

PLAN OF POWER SUPPLY

100 0 100 200 300 400 500
METERS

DRAWING NO.

GN - PS - 01

DATE:

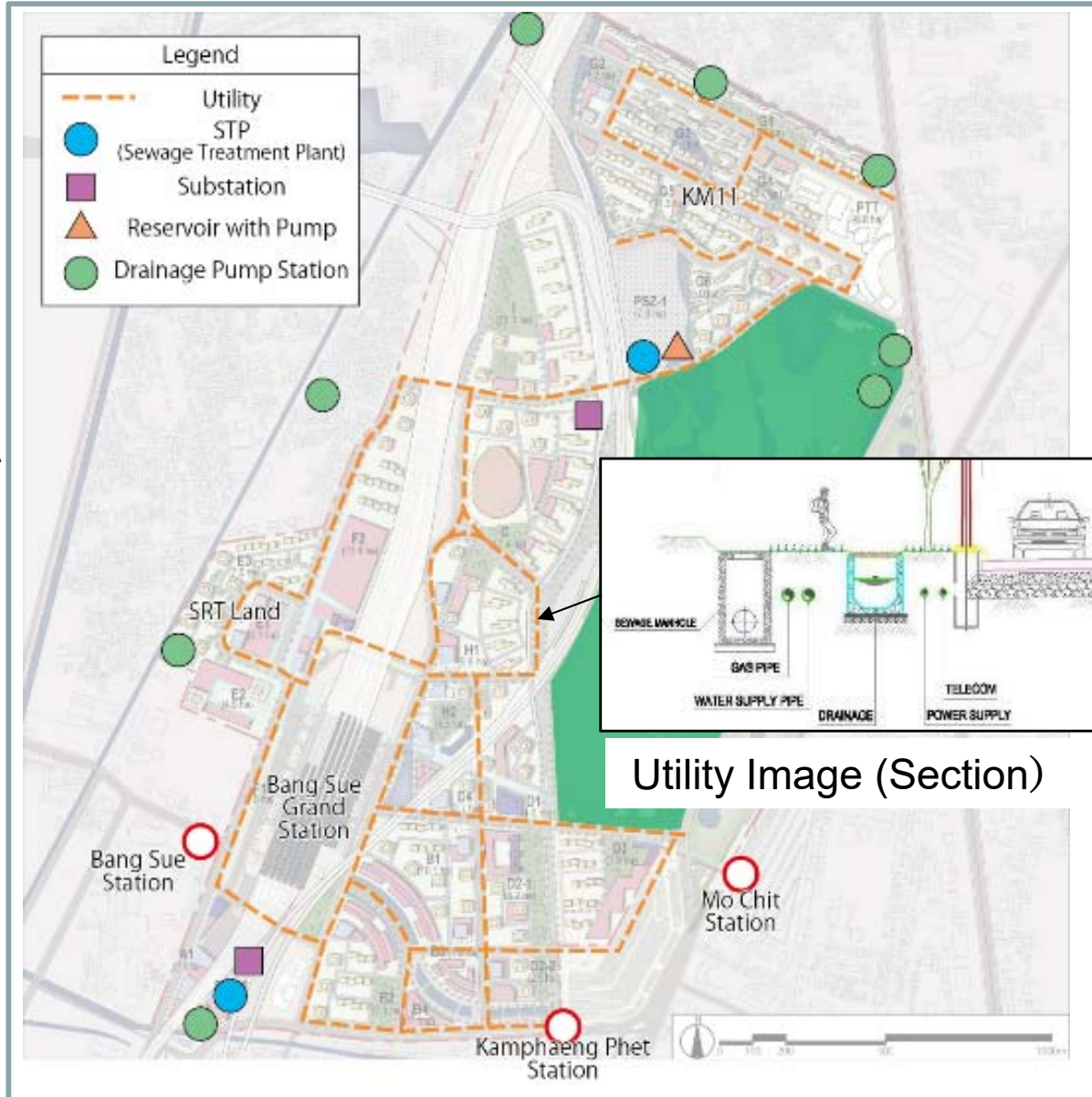
July 17, 2017

Appendix 7–2

Facility Plan

Development Plan

(1) Urban Infrastructure



[Basic Policy]

Each block is planned with 250m width, and infrastructure such as utility is planned under the road. The concept of this area is “Energy Saving” and “Disaster Prevention”

1. Stable Power Supply

Substation (115/24kV) is planned at 2 locations. For emergency cases, loop system of 24kV cable is adopted.

2. Stable Water Supply

By installing water reservoir, water supply system becomes stable.

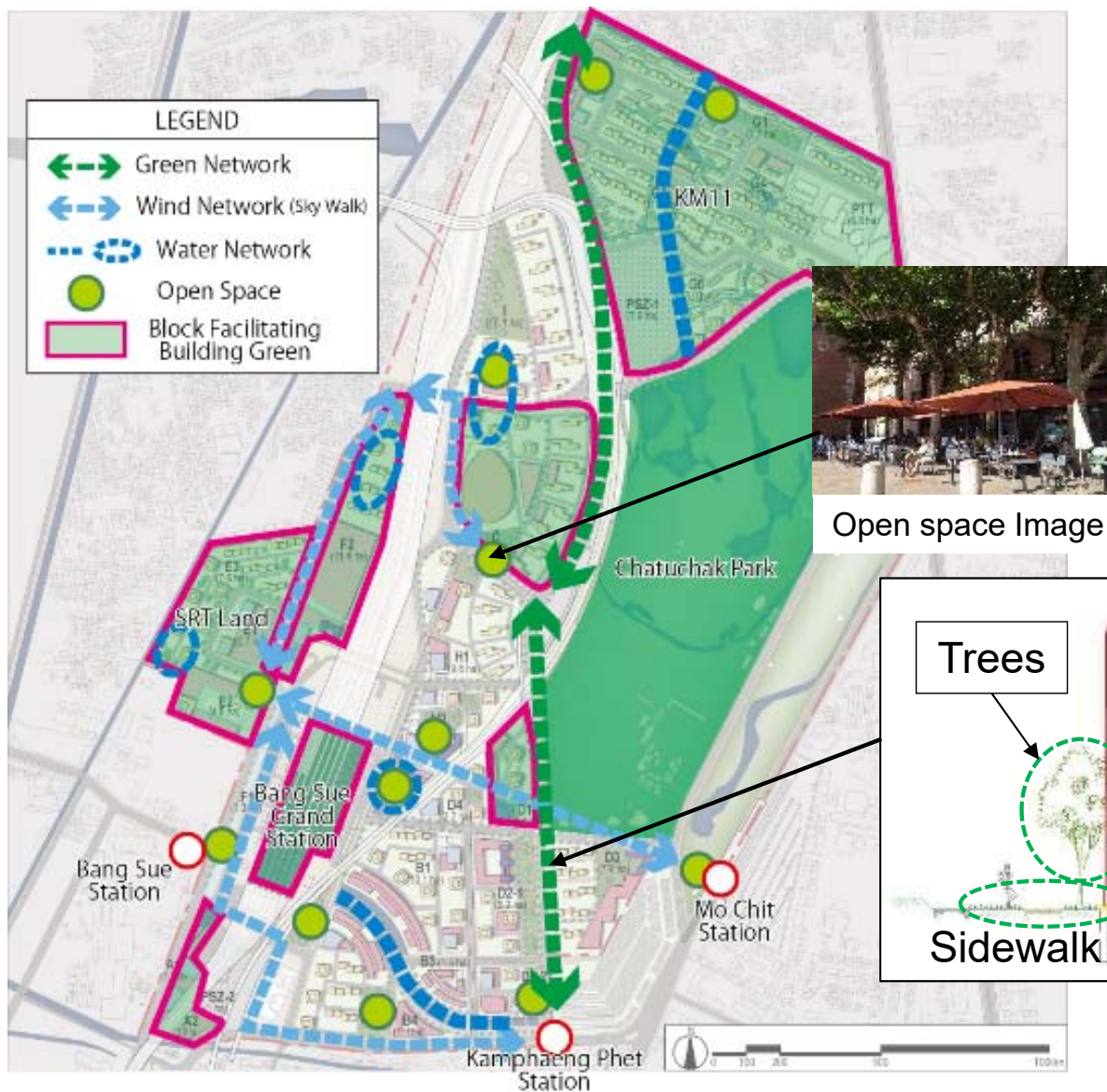
3. Advanced Processing of Waste Water Treatment

By sewerage of separated system, it is possible to prevent untreated water from discharging to outside.

4. Energy Saving (Co-generation)

By utilizing gas, Co-generation system is adopted.

(2) Green Network



Open space Image

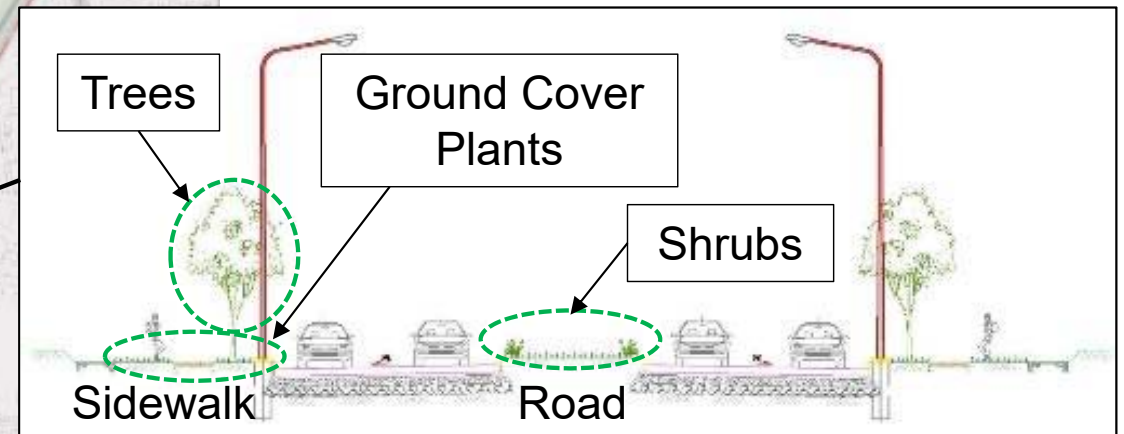
[Basic Policy]

It regards Chatuchak Park as a Large Green Core, and builds Green Network to place Green path, Wind path and trees in Bang Sue Area. Create a comfortable and convenient movement space for whole area.

1. Green, Water and Wind Network

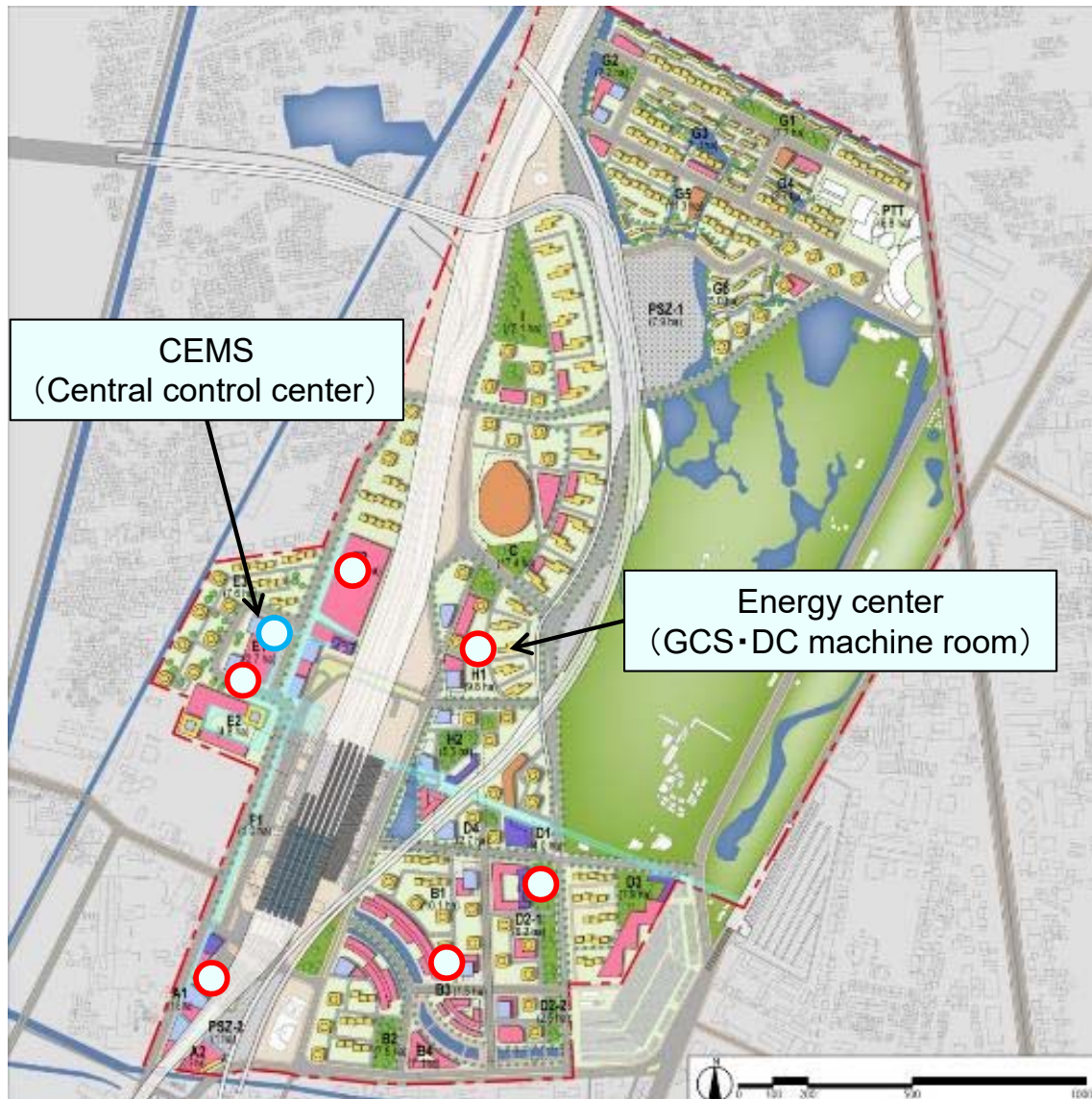
2. Creating Open Spaces

3. Greening Buildings



Green Network Image (Section)

(3) Environmental Protection



[Basic Policy]

Energy efficiency, optimization of energy consumption and balance of supply and demand are realized as district level.

1. Gas Cogeneration System(GCS)- District cooling(DC)

GCS and DC promote Energy efficiency in whole Bang Sue Area.

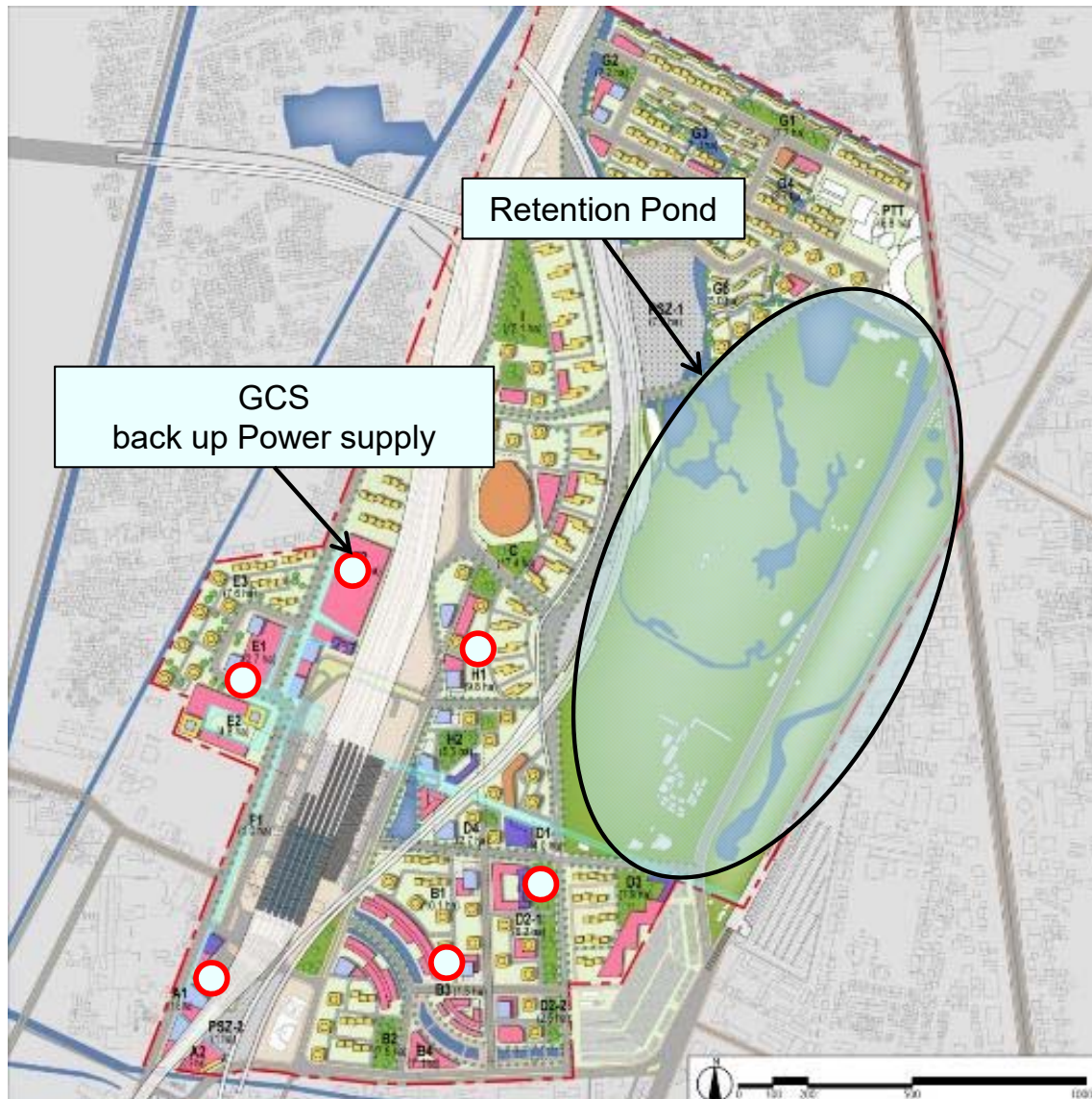
2. CEMS(Community Energy Management System)

Energy management of CEMS realizes optimization of consumption and balance of supply and demand.

3. ESP(Energy Service Provider)

Equipment(GCS, DC, CEMS) operation of ESP promotes Energy efficiency in whole Bang Sue Area.

(4) Disaster Prevention and BCP



[Basic Policy]

Implement measures against flood damage .

1.Retention Pond

The rainfall probability of 10 years is set as the peak time and the rainfall amount of 6 hours is stored.

2.Building raising and Inundation Prevention

Take measures against flooding in the entrance height of the building and the opening.

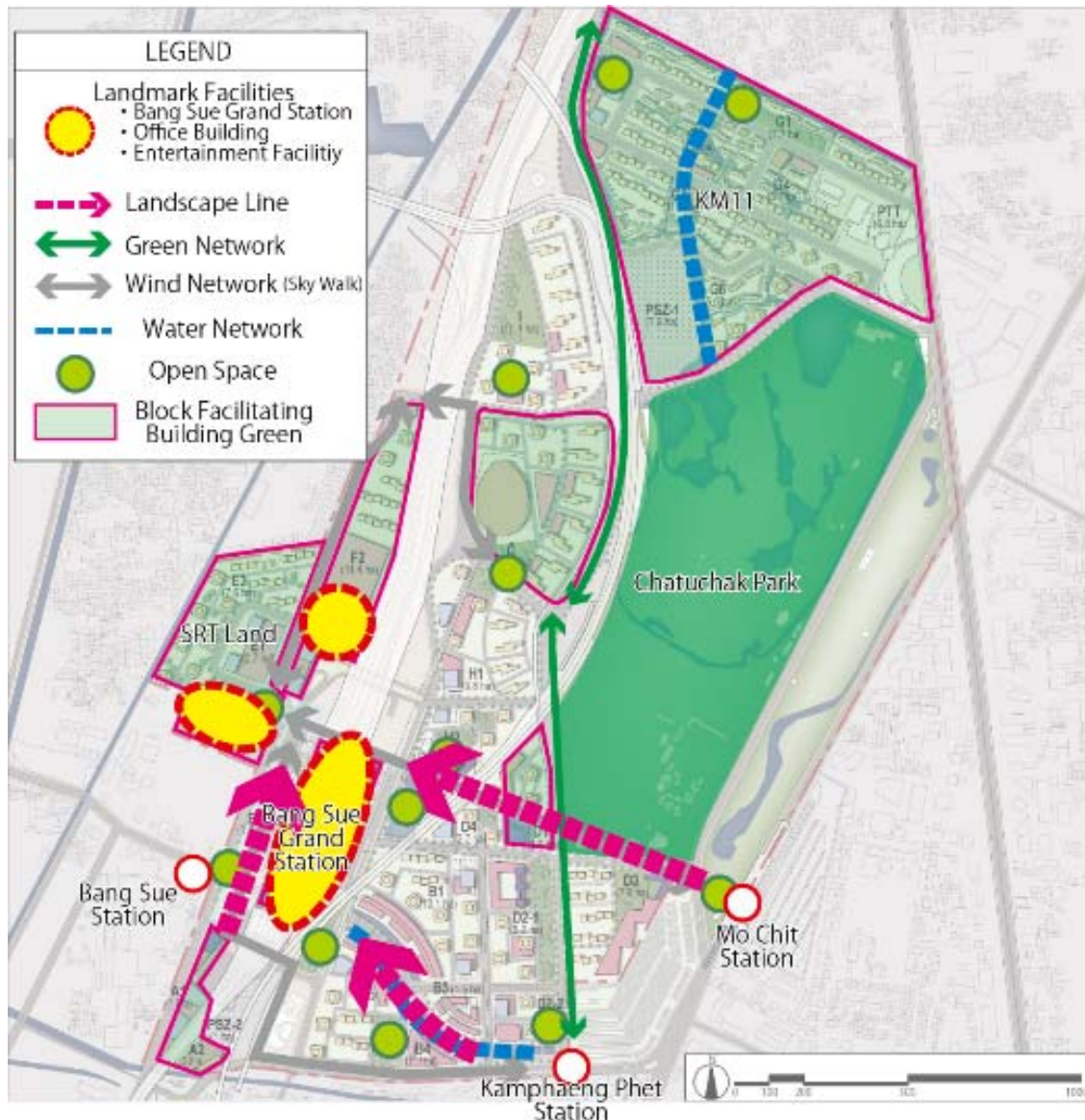
3. Back Up Power Supply

Utilize GCS for backups on power failure.

4. Hazard Map, Shelter, Disaster Counter Measure Head Quarter

Establish BCP and disaster prevention system with in Bang Sue Area.

(5) Landscape Creation

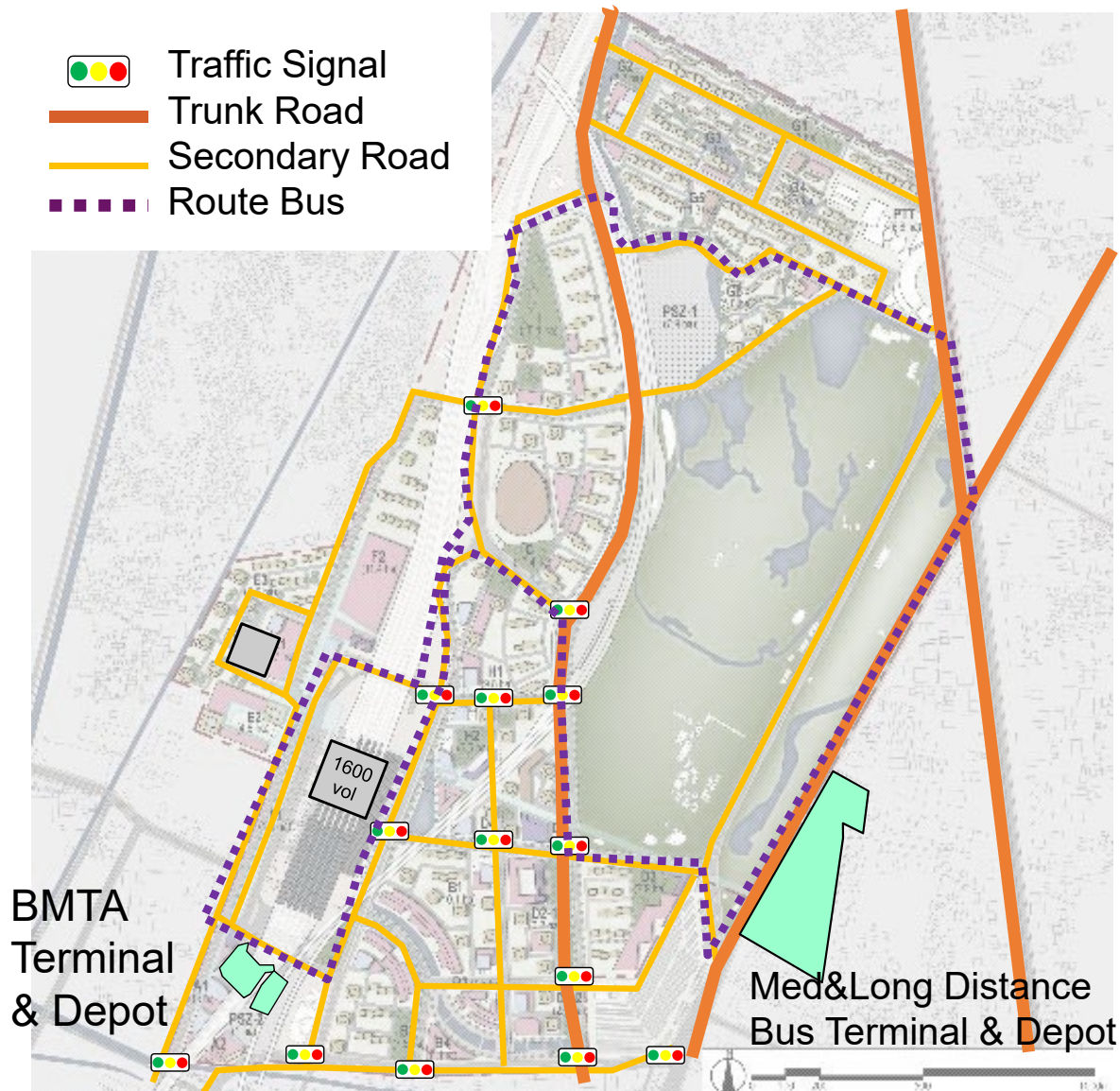


[Basic Policy]

Create new Bang Sue Landmark centered upon Bang Sue Grand Station and considering for the landscape of whole area.

1. Forming Landmark
2. Considering for Building Color, Sign, Advertising
3. Open Space and Walking Space

(6) Transport Network



1. Road Planning

Trunk Road & Secondary Road is planned considering restriction of vehicle passing through Bang Sue Area.

2. Public Transportation

- Medium & Long Distance Bus Terminal and depot will be relocated to Old Mo Chit.
- BMTA Terminal and depot will be relocated to near Bang Sue Grand Station.
- Route Bus (BRT) is operated within Bang Sue Area to connect major facilities and each zone.

(7) Upgrading Facilities



■ Skywalk ■ Underground Path



ITS system : VMS at Nana



Skywalk



Under Path in Fukuoka

1.Skywalk

Based on TOD, Skywalk shall be built to connect surrounding facilities with Bang Sue Grand Station.

2.Underground Path

The Underground Path provides a comfortable walking space and connects directly with the developed building to increase the value of the facility.

3. ITS

ITS technology realizes a smooth traffic flow by optimizing traffic volume.

4. Data center

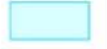
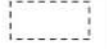
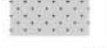
Data center attracts and activates IT industry in Bang Sue Area.



ITS system : Information on Parking Availability

Appendix 7—3

Development Images

LEGEND	
	Office
	Hotel
	Retail
	Residential
	Public Facility
	Office & Residential
	Skywalk
	Underground Path
	Park / Greenspace
	Public Service Zone



Development Image (Bang Sue Area)

Japan International Cooperation Agency



Skywalk connects Office Towers and stations (①③)

Two stations(①②) are connected each other through Shopping Mall and water path

Appendix 8–1

Fund Allocation Plan (details)

(1) Fundraising (Overall Funding Requirement by Organization)**(Billion Baht)**

Layer	Layer		Item	Unit	Unit Price	Short Term			Midium Term			Long Term				
					[K Baht]	Volume	Price	Sub Total	Volume	Price	Sub Total	Volume	Price	Sub Total	Total	
5	Retail, Office, Residence, Hotel			m ²	51.0	681,000	34,731	34,731	2,249,900	114,745	114,745	2,675,800	136,466	136,466	285,942	
	MICE	Arena		m ²	68.0		0		50,000	3,400			0			
		Exhibition Center		m ²	17.0		0		50,000	850			0			
		Education and Medical Center		m ²	51.0		0		100,000	5,100			0		14,450	
	SRT Office / Civic Center			m ²	51.0		0		100,000	5,100			0			
4	TOD	Underpass		m ²	101.8		0		3,000	305			0			
		Pedestrian		m ²	17.0	45,000	763			0			0			
		Underground passage		m ²	33.9	3,600	122		24,000	814		36,000	1,220			
		ITS		Set	407,094.0		0		1	407			0			
		Feeder		unit	473,200.0		0		0	0		24	11,357			
		Data center		m ²	128.9		0		10,000	1,289			0			
	Smart-City	Gas Pipe		m	1.7	3,600	6		11,380	19			10,420	18		
		Cooling Pipe		m	1.7	3,600	6		11,380	19			10,420	18		
		GCS, DC		set	2,161,000.0	32%	692		23%	497		1,712	45%	972		1,078
		Common Duct		m	33.9	130	4		620	21			250	8		
		CEMS		set	1,155,401.0		0		1	1,155				0		
		Solar power generation		Unit	61,742.6		0			0			1	62		
		3	Bus	BRT Civil		Set	15,869,960.0	0	0		1	15,870		0	0	
BRT Vehicle				unit	473,200.0	0	0	271	18	8,518	30,428	0	0		30,700	
Medium/Long distance Bus				m ²	17.0	16,000	271		356,175	6,041		0	0			
Road	Underground parking		m ²	33.9	10,000	339			0		204		0		814	
	Road facility		Unit	33,924.5	8	271	611	6	204			0				
2	Green/Plantation			m ²	0.3	10,000	3	3	200,000	68	68	400,000	136	136	207	
	Retention Pond			ha	3,392.5	1	3	3	4	12	12	6	19	19	34	
	Generator			MVA	1.0	1,000,000	1,020	1,020		0	0		0	0	1,020	
	Embankment			m ³	0.4	100,000	41	41	600,000	246	246	700,000	287	287	574	
	Major Road			m	61.1	1,800	110	115	5,690	348	362	5,210	318	332	808	
	Street lighting			No.	25.4	180	5		569	14		521	13			
	Concrete pipe			m	6.8	3,600	24		11,380	77		10,420	71			
	Manhole			No.	33.9	90	3		285	10		261	9			
	Sewage treatment			m ³	10.2	24,000	245	462	24,000	245	785		0	433	1,680	
	Drainage			m	33.9	3,600	122		11,380	386		10,420	353			
	Pumping Station			No.	33,925.0	2	68		2	68			0			
	Water Plant			m ³	10.2	30,000	306		30,000	306			0			
	Reservoir			m ³	4.4	5,000	22	352	5,000	22	405		0	71	828	
	Water Pipe			m	6.8	3,600	24		11,380	77		10,420	71			
	Transmission cable			m	101.8	5,000	509			0			0			
	Substation			No.	339,245.0	1	339	892	1	339	474		0	118	1,483	
	RMU			No.	1,696.0	4	7		11	19		7	12			
	24kcable			m	6.8	5,400	37		17,070	116		15,630	106			
	Cable conduit			m	0.3	10,800	4	6	34,140	12	17	31,260	11	16	39	
	Optic fiber cable			m	0.3	5,400	2		17,070	6		15,630	5			
								40,100			166,724			151,531	358,355	

Appendix 10—1

Outline of “Act on Special Measures concerning Urban
Regeneration”

Basic Framework of Measures toward Urban Renaissance

The Urban Renaissance Headquarters (Head : Prime Minister)

Basic Policies of Urban Renaissance

Urban Renaissance by utilizing Private Sector Initiative

Priority Urban Redevelopment Areas [53 Area 8,592ha]
(Designated by cabinet ordinance)

Enhancement of International Competitiveness of a City

Special Area [13 Area 4,011ha]
(Designated by cabinet ordinance)

Area Development Policy [by Headquarters]

Supporting Measures

Special District for Urban Renaissance
Relaxation of FAR
Buildings above roads
(81 Area)

Urban Planning Proposal System

Acceleration of Approval on Urban
Redevelopment Projects

Approved by MLIT
Minister

Private project for
Urban
Redevelopment
(108 plans approved)

Financial
Assistance

Taxation Exception

Safety Ensuring Plan for Urban Renaissance
(18 Plans)

Urban Renaissance by Public Facility development in PPP Scheme

Urban Redevelopment Plan
(Planned by Municipalities)

Planned for 2,819 areas as of August 2017

Financial Assistance (Grant)
by the Government

The grant for public infrastructure development
Budget for FY 2017 : 80 billion USD

Legal System for District Vitalization

Area Management Promotion Agreement
Special Exception for Road Occupancy

Urban Redevelopment Plan by
Private Sector

Approved by MLIT
Minister (42 plans approved)

Financial Support

As of August 2nd, 2017

Major Supporting Measures toward Urban Renaissance

Support in Regal System

■ Special District for Urban Renaissance

Flexible urban redevelopment plan including relaxation of Floor Area Ratio (FAR), to contribute urban renaissance and Intensive Land Use in the area of the special district.



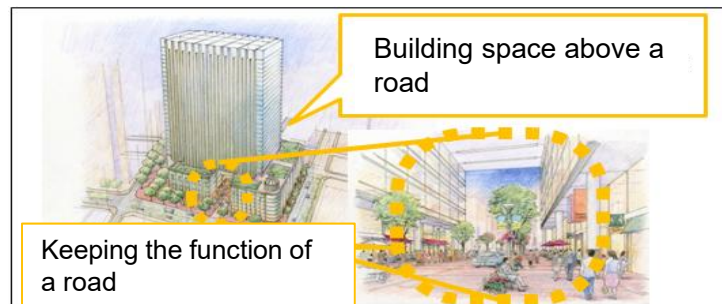
Nihonbashi (Tokyo)
FAR: 8:1, 7:1% → 19.9:1% etc.



Osaka Station North District (Osaka)
FAR: 8:1% → 16:1% etc.

■ Realization for Utilizing a Space above Roads

To state it (utilization of a space above roads) in the urban development plan for a Special District for Urban Renaissance, it can be implemented without replacement or closing a road.



■ Other Supports in Legal System

- Proposal of urban planning by urban redevelopment project implementers
- Acceleration of approval process (within 3 months, etc.)
- FAR relaxation for public facilities stated in a Safety Ensuring Plan
- Relaxation of regulation to promote utilizing unused energy (Only for special areas)

Financial Assistance (Grant)

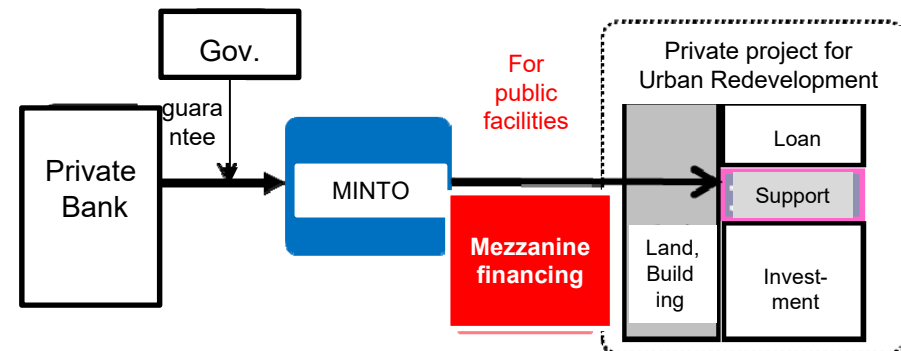
■ Project for Enhancement of International Competitiveness of a City
＜Only for special areas＞

■ Project for Improvement of Environment for International Business and City Sales ＜Only for special area＞

■ Project for Ensuring & Enhancing Urban Safety

Financial Assistance (Financial System)

■ Mezzanine Financing
by Organization for Promoting Urban Development (MINTO)



Taxation Exception

■ Income Tax ・ Corporate Tax

■ Registration License Tax

■ Property Acquisition Tax

■ Fixed Property Tax ・ City Planning Tax

Priority Urban Redevelopment Areas As of July 24th, 2015

Special District for Urban Renaissance 77 Areas

Sapporo (4) • Sendai(2) • Tokyo(36) • Yokohama(2) • Hamamatsu(1) • Nagoya(6) • Gifu(1) • Osaka(17) • Takatsuki(1) • Kobe(1) • Hiroshima(3) • Takamatsu(2) • Kita-Kyushu(1)

Approved Private project for Urban Redevelopment 77 Plans

Sapporo(1) • Kawaguchi(1) • Tokyo(38) • Yokohama(5) • Kawasaki(3) • Fujisawa(1) • Sagami-hara(1) • Nogoya(6) • Kyoto(1) • Osaka(10) • Sakai(1) • Toyonaka(2) • Moriguchi(1) • Kobe(1) • Okayama(1) • Hiroshima(2) • Takamatsu(1) • Fukuoka(1)

Project for Enhancement of International Competitiveness of a City 7 Areas

Sapporo(1) • Tokyo(2) • Yokohama(1) • Nagoya(1) • Osaka(1) • Fukuoka(1)

Legend

Priority Urban Redevelopment Area

Special Area

Kyoto City, Muko City, Nagaoka-kyo City. 4 Area 411ha

Gifu City 1 Area 30ha

Kobe City, Amagasaki City, 4 Area 416ha

Okayama City 1 Area 113ha

Hiroshima City, Fukuyama City, 2 Area 84ha

Fukuoka City 2 Area 790ha
Kita-Kyushu City 2 Area 160ha

Central District of Fukuoka City 231ha

Takamatsu City 1 Area 51ha

Osaka City, Sakai City, Moriguchi City, Neyagawa City, Toyonaka City, Takatsuki City 13 Area 1,133ha

Central Business District of Osaka City 209ha, Others 53ha

Naha City
1 Area 11ha

Sapporo City 1 Area 225ha

Central District of Sapporo City 145ha

Sendai City 2 Area 125ha

Saitama City, Kawaguchi City 2 Area 115ha

Tokyo 8 Area 2,903ha

Central District • Water front 1,991ha
Shinjuku Area 220ha
Shibuya Area 139ha
Shinagawa, Tamachi Area 184ha
Ikebukuro Area 143ha

Chiba City, Kashiwa City 4 Area 185ha

Yokohama City 4 Area 286ha
Kawasaki City 3 Area 534ha
Sagami-hara City, Fujisawa City, Atsugi City 3 Area 139ha

Yokohama Central. Waterfront 233ha
Kawasaki 43ha

Shizuoka City, Hamamatsu City 2 Area 91ha

Nagoya City 3 Area 570ha

Central District of Nagoya City 303ha

Projects in Priority Urban Redevelopment Areas [Examples]

Nissay Sapporo Building (Sapporo)

- ◆ Commercial・Office use
- ◆ Directly connected to Sapporo Station Underground passage
- ◆ Rooftop gardening, Outdoor air cooling, Connected to energy supply sharing network
- ◆ Special District for Urban Renaissance (FAR 8:1→10:1)



Ichiban-cho, 3, South Area, (Aoba-ward, Sendai)

- ◆ Commercial・Office use
- ◆ Walking passage, Interior plaza, Rooftop gardening
- ◆ Special District for Urban Renaissance (FAR 6:1→10.5:1)



Tokyo Midtown (Tokyo)

- ◆ Government-owned land was sold and developed by private company
- ◆ Mixed use of Residential, Office, Commercial & Leisure
- ◆ Approved as Private project for Urban Redevelopment
- ◆ Acceleration EIA and other procedure (Project schedule 24months →11months)



Midland Square (Nagoya)

- ◆ Special District for Urban Renaissance (FAR10:1→14.2:1)
- ◆ Approved as Private project for Urban Redevelopment



Daimaru Shinsaibashi (Osaka)

- ◆ Special District for Urban Renaissance (FAR10:1→13:1)



Mint Kobe (Kobe)

- ◆ Mixed use of Commercial・Office, Cinema complex, Bus terminal, etc.
- ◆ Complementary space for station plaza, free walking passage for public
- ◆ Special District for Urban Renaissance (FAR 8:1→16:1)
- ◆ Approved as Private project for Urban Redevelopment



(Okayama Inter-parks) (Okayama)

- ◆ Development of a public land lot (formerly an elementary school) by a private developer by open bid
- ◆ A combined project including Condominium with fixed-term leasehold, Rental apartment, elder care facility, sports gym, park, etc.



Takamatsu Marugame-machi Shopping District (Takamatsu)

- ◆ Commercial・Community Facilities・Residential
- ◆ Redevelopment project by local redevelopment association for revitalization of the local community
- ◆ Special District for Urban Renaissance (Relaxation of)
- ◆ Approved as Private project for Urban Redevelopment



Tenjin Underground Mall (Fukuoka)

- ◆ Strengthening the function as a transport hub, reducing congestion on ground, shopping facilities for train passengers
- ◆ Approved as Private project for Urban Redevelopment



Naha Asahi-bridge East Area (Naha, Okinawa)

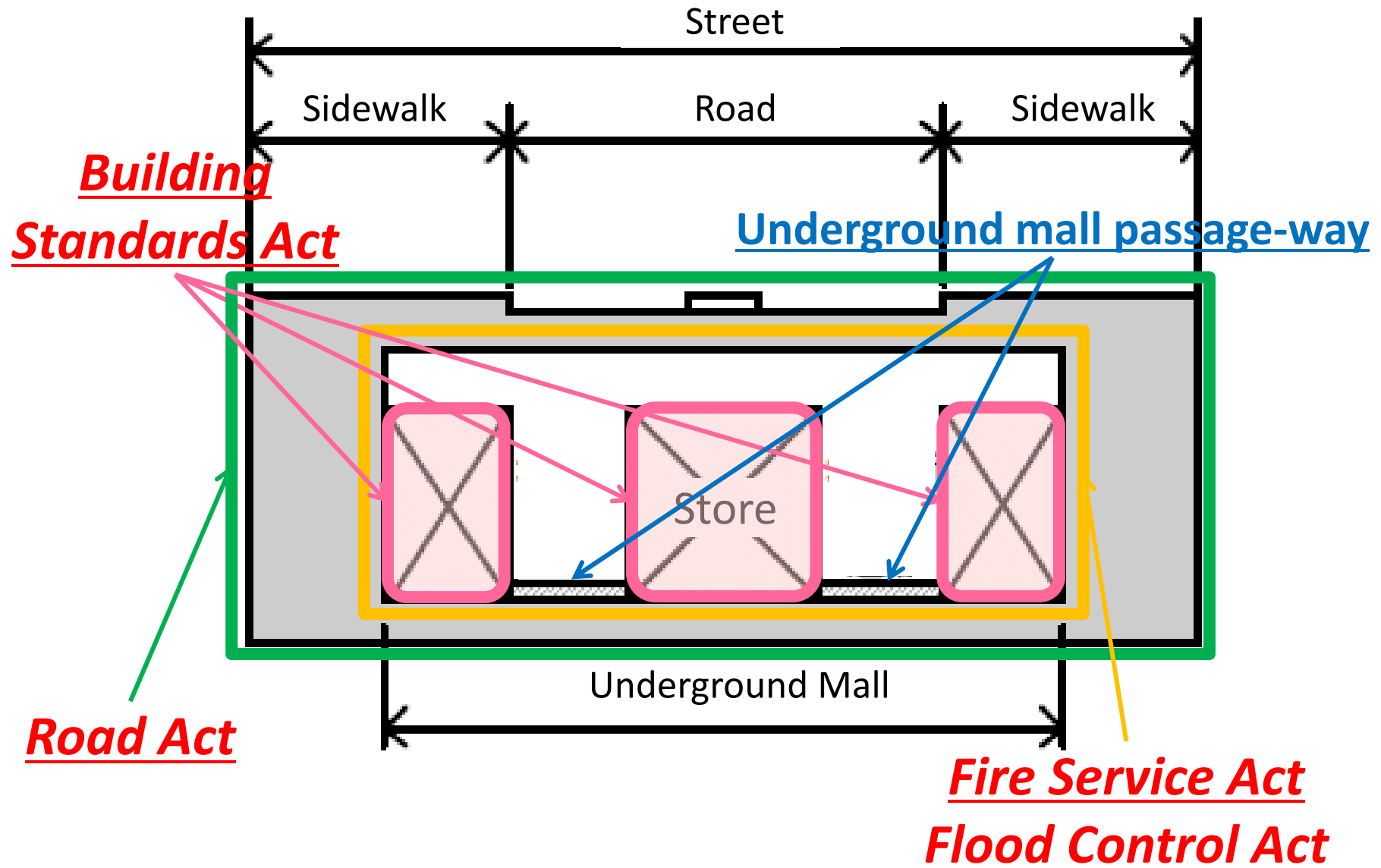
- ◆ Mixed use of Office・Hotel, Residential, Government office・Public hall, Bus terminal, Parking
- ◆ Land use conversion, Intensive land use
- ◆ Pedestrian Deck to connect the concourse of monorail and other buildings to enhance user-friendliness as a transport hub



Appendix 10—2

Outline of Regulations Regarding Underpass Development

Laws concerning underground mall



Road Act

- A street occupancy permit shall be obtained.
- To obtain the permit, the following requirements shall be met:
 - The structure to be built shall be robust and durable.
 - Structures of the street and other underground facilities occupying part of the street shall not be obstructed.
 - If the structure is to be built under traffic lanes, it shall not affect the road strength. Etc.

Fire Service Act

- Plans for fire protection and other measures shall be formulated.
 - Designation of fire prevention manager.
 - Implementation of drills for firefighting, emergency reporting and evacuation.
 - Inspection and maintenance of equipment used for firefighting and facilities required for firefighting activities such as fire water tanks.
 - Supervision of use or handling of fire.
 - Maintenance and management of structures and equipment necessary for evacuation and fire protection.
- No obstacles to evacuation shall be placed.
 - The mall shall be free of any obstacles to evacuation that could block passage-ways, stairways, escape gates or other facilities required for evacuation or impede fire doors closing.
 - Etc.

- The following requirements regarding compartments shall be met:
 - At least 2meters of each compartment shall face the underground passage.
 - Flooring or walls of fireproof structure shall be used for partitioning.
 - Walking distance from each part of the room to the exit to street level through the underground passage shall be 30meters or less. Etc.

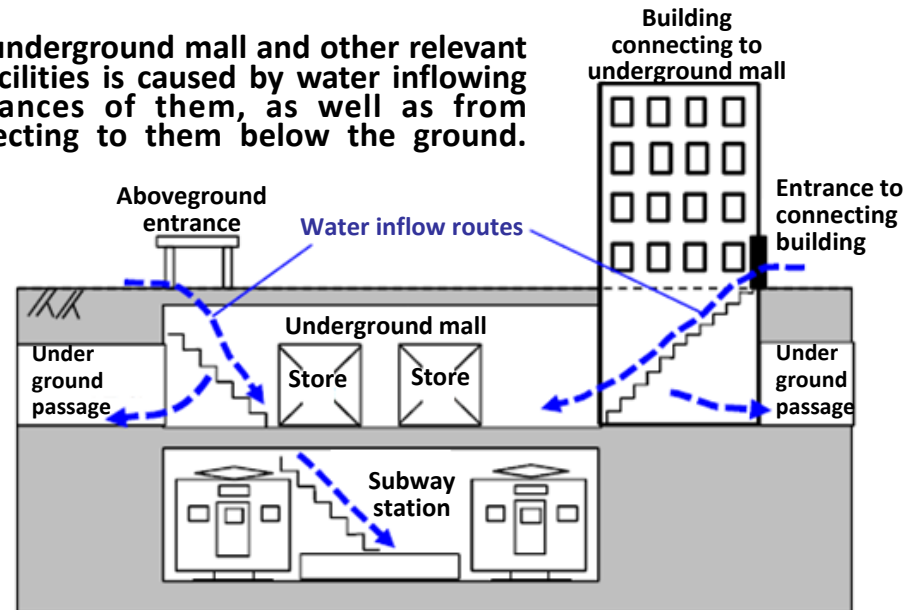
Flood Control Act

- Measures shall be taken to ensure smooth and quick evacuation and prevent inundation in areas that are expected from river flood, high tide or inland water*.
 - Formulation of plans for ensuring smooth and quick evacuation of mall users and implementing required drills to prevent inundation.
 - Hearing of opinions at the stage of plan formulation from the owners and managers of facilities connecting to the underground mall.
 - Establishment of a private flood control team. Etc.

*Inland water : flood due to failure to drain rainwater in public waters

Flood Control in underground mall

Flooding of an underground mall and other relevant underground facilities is caused by water inflowing from the entrances of them, as well as from buildings connecting to them below the ground.



[Illustration of a building connecting to an underground mall and relevant facilities]

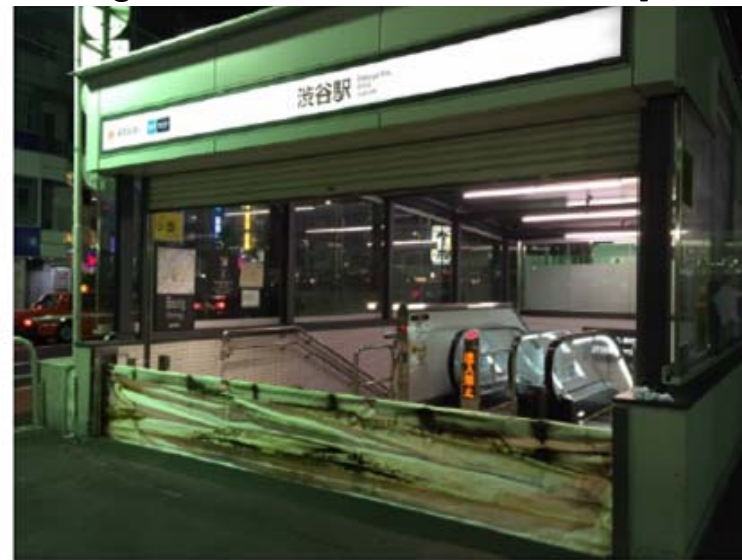


Photo: Examples of water stops installed