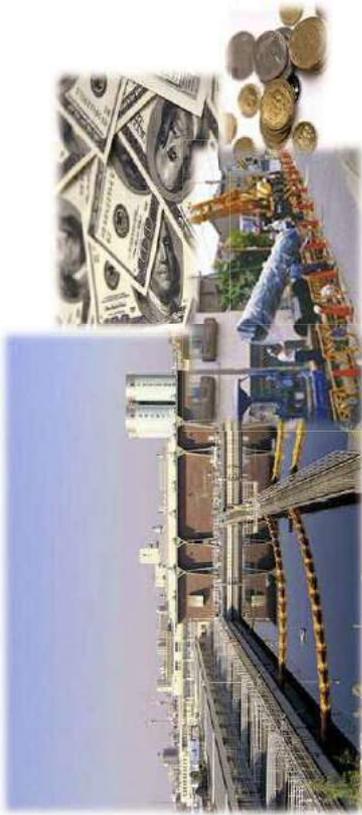


Rate Systems for Sound Management



The 4th Seminar in Delhi
3rd March, 2015

Kenji OZAWA
Manager of Shinjuku Service Station,
Bureau of Waterworks, Tokyo Metropolitan Government



Today's Topic

1 Water rate types

2 Key points in water rate setting

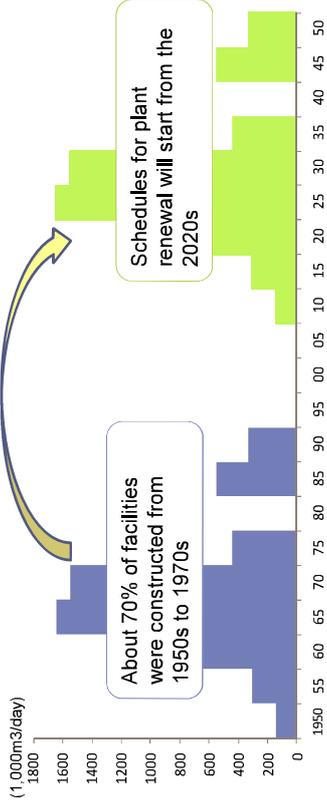
3 Evolution of Tokyo Waterworks' rate systems



Asset Management and Rate Systems

Why asset management is currently required in Japan?

Timeline: Development of Water Purification Plants



About 70% of facilities were constructed from 1950s to 1970s

Schedules for plant renewal will start from the 2020s

- Utilize asset management for life extensions of those plants and equalization of such extensions
- Comprehensive measures to secure revenues for plant renewal.



1 Water Rate Types



Number of Water Suppliers by Water Rate Type and Rate Examples in Japan

	1965		1975		1985		2000		2013	
	Number of water suppliers	Share								
By customer class	1,095	99.0	1,100	70.2	868	47.1	781	41.1	431	33.7
By meter size	11	1.0	295	18.8	705	38.3	875	46.0	708	55.4
Others	-	-	172	11.0	270	14.7	246	12.9	140	10.9
Total	1,106	100	1,567	100	1,843	100	1,902	100	1,279	100

Typical example (Osaka City)

Minimum water	General use			Commercial use			Public bath		
	Service charge (Yen)	Volumetric charge (Yen/m ³)	Minimum water	Service charge (Yen)	Volumetric charge (Yen/m ³)	Minimum water	Service charge (Yen)	Volumetric charge (Yen/m ³)	
10m ³	97	11-20m ³	97	97	11-30m ³	209	97	11m ³ -	58
	124	21-30m ³	124	285	31-50m ³	285	950	10m ³	950
	168	31-50m ³	168	368	51m ³ -	368			
	230	950/51-100m ³	230						
	293	101-200m ³	293						
	342	201-1,000m ³	342						
	368	1,001m ³ -	368						

■ Features of this water rate system

- Differentiated rates depending on tax bearing capacities of users
- It is relatively simple, but there is no objective criteria in rate differentiation setting



5

6

	1965		1975		1985		2000		2013	
	Number of water suppliers	Share								
By customer class	1,095	99.0	1,100	70.2	868	47.1	781	41.1	431	33.7
By meter size	11	1.0	295	18.8	705	38.3	875	46.0	708	55.4
Others	-	-	172	11.0	270	14.7	246	12.9	140	10.9
Total	1,106	100	1,567	100	1,843	100	1,902	100	1,279	100

Typical example (Tokyo)

Meter size (mm)	Service charge (Yen)										Volumetric charge (Yen/m ³)									
	1-5m ³	6-10m ³	11-20m ³	21-30m ³	31-50m ³	51-100m ³	101-200m ³	201-1000m ³	101-200m ³	201-1000m ³	101-200m ³	201-1000m ³	101-200m ³	201-1000m ³	101-200m ³	201-1000m ³	101-200m ³	201-1000m ³		
13	860																			
20	1,170	0	22	128	163	202	213													
25	1,460																			
30	3,435																			
40	6,865																			
50	20,720																			
75	45,623																			
100	94,568																			
150	159,094																			
200	349,434																			
250	480,135																			
300	816,145																			
Public bath		0	22																	

※ Same as general use (Over 40 mm: 6,865 yen)

- Features of this water rate system
- Differentiated rates based on clear criteria (meter size)
- Fair rates on a pay-as-you-benefit basis



2 Key Points in Water Rate Setting

By customer class	1965		1975		1985		2000		2013	
	Number of water suppliers	Share								
By customer class	1,095	99.0	1,100	70.2	868	47.1	781	41.1	431	33.7
By meter size	11	1.0	295	18.8	705	38.3	875	46.0	708	55.4
Others	-	-	172	11.0	270	14.7	246	12.9	140	10.9
Total	1,106	100	1,567	100	1,843	100	1,902	100	1,279	100

Typical example (Mooka City, Tochigi Prefecture)

Minimum water	Service charge (Yen)		Volumetric charge (Yen/m ³)	
	Service charge (Yen)	Minimum water	Volumetric charge (Yen/m ³)	Minimum water
10m ³	1,400	150	170	190
				210

- Features of this water rate system
- Rates that are related to neither customer class nor meter size



7

2

8

2.1 Process of Water Rate Setting

- Determine the rate setting period
- Decide the basic policy on demand and supply planning, etc.
- Estimate the fiscal balance

Formulate a financial plan



Calculate the rate level (Calculate the full cost)



Set up a rate system



Finalize a tariff



- Calculate the total charge income
- Subtract related income
- Include business rewards

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2.2.2 Estimation of fiscal revenue and expenditure

Determination of criteria

Population served; water coverage; number of service connections; annual water distribution (daily maximum and average); revenue water rate; bond issuance condition

Estimation of the inflation rate

Rates of increase in consumer and corporate goods prices; rate of changes in employee payroll

Estimation of the capital revenue and expenditure

Facility development and improvement cost; amount of bond issuance and refund; other capital revenues

Estimation of the operating revenue and expenditure

Maintenance costs based on the operational plan (personnel, repair, power and chemicals costs, etc.); interest cost; depreciation cost



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2.2 Financial Plan Formulation

2.2.1 Decision on the basic policy on financial planning

Planning period

Periods for financial and facility-development estimation

Supply and Demand planning

Prospect of ensuring water resources; water coverage and water distribution planning

Facility planning

Planning for facility expansion and improvement

Financial resource planning

Bond issue planning; prospect of subsidies

Operational planning

Operational methods (e.g. facility maintenance); staffing planning; subcontracting planning



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2.3 Calculation of the Rate Level

Formulate a financial plan



Calculate the rate level (Calculate the full cost)

- Calculate the total charge income
- Subtract related income
- Include business rewards



Set up a rate system



Finalize a tariff



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2.3.1 Key points in full cost calculation

Revenue

- Trend in government subsidies (esp. for facility construction)
- Balance between charge and bond
- Amount of cumulative profits and losses

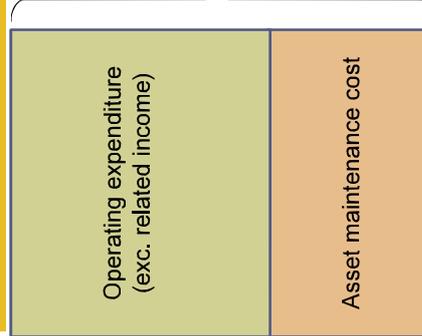
Expenditure

- Methods of full cost estimation
- Estimate based on the actual required funds during the plan period → "Fund balance method"
 - Estimate by adding the asset maintenance cost calculated based on theoretical values to the actual required operating expenditure → "Profit and loss balance method"

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Profit and Loss Balance Method



- ◆ Calculate the operating expenditure during the plan period
- ◆ Calculate, on the other hand, the asset maintenance cost as an expense related to facility development
- ◆ Calculate the asset maintenance cost by multiplying the asset balance by the asset maintenance ratio ("Standard asset maintenance ratio is 3% and is to be determined by each water supplier with consideration of the renewal status of facilities" – *Water Rate Manual*, Japan Water Works Association)

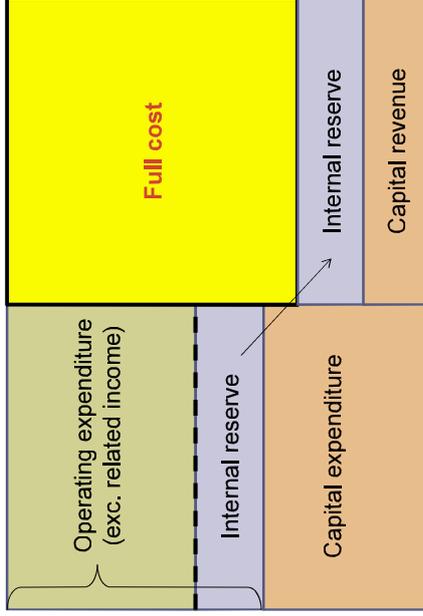
- ◆ Merit
 - Funding can be secured towards the future investments depending on the setting of the asset maintenance cost.

- ◆ Demerit
 - Difficulty to explain whether the full cost is appropriate because the asset maintenance cost is calculated with the theoretical values.

Appropriate estimation method during the maintenance period

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Fund Balance Method



- ◆ Calculate the operating and capital expenditure within the plan period
- ◆ The full cost is calculated by subtracting the internal reserve (e.g. depreciation cost) and revenues other than those from water charges from the above value.

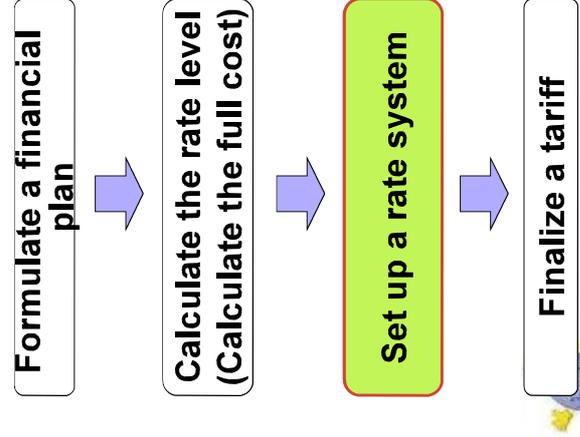
- ◆ Merits
 - Easier to secure actually required funds for facility construction
 - Easier to gain understanding of residents due to its clear surplus/deficit account

- ◆ Demerits
 - Possibility of over-investment
 - No secured funding for future investments

Appropriate estimation method for the period of facility expansion

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2.4 Setting Up of the Rate System



- Select a rate type
- Cost separation
- Cost allocation



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2.4.1 Key points in setting up the rate system

1 Service charge level

Service charge: fixed rate that is charged regardless of water usage. It is to recover a large amount of costs (e.g. those of facility maintenance, depreciation and meters) that is included in the full cost and necessary regardless of water usage.

Full cost

Customer costs
Costs associated with the existence of customers (e.g. meter cost)

Fixed costs
Costs that are necessary regardless of usage (e.g. facility maintenance and depreciation costs)

Variable costs
Costs associated with water usage (e.g. electricity cost for pumps)

Rate setting

Service charge

Volumetric charge

Allocate most of fixed costs to volumetric charge

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2 Level of the minimum water

What is the minimum water?

This is a certain amount of water that is included in the service charge.

- Purpose: From the perspective of public health improvement, this is intended to promote water use and achieve lower charges by setting a fixed rate up to a certain water usage.
- Target: Household usage (The rate by customer class is for general users, while the rate by meter size is for users of small meter)

Issues

- This might promote wasteful water use because users can use whatever amount of water up to the minimum water at the same price.
- For users of water less than the minimum water, such a system is not a good option.
- Japan has already achieved good water coverage and thus has accomplished our goal of public health improvement.

- This system can be effective at the stage of improving public health by increasing water coverage.
- It is required to set an appropriate amount by surveying actual water usage.

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2.5 Finalize a Tariff

Formulate a financial plan

Calculate the rate level
(Calculate the full cost)

Set up a rate system

Finalize a tariff

Water tariff of Osaka City: An example

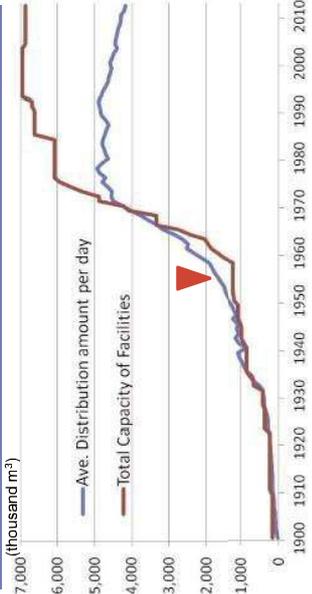
General use		Commercial use	
Minimum Water	Service Charge (Yen)	Minimum Water	Service Charge (Yen)
10m ³	11-20m ³	11-30m ³	209
	21-30m ³	31-50m ³	285
	31-50m ³	51m ³	368
950	51-100m ³	950	
	101-200m ³	950	
	201-1,000m ³	950	
	1,001m ³	950	

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3 Evolution of Tokyo Waterworks' Rate System

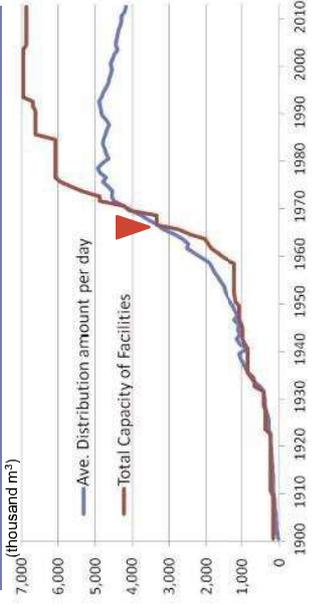


3.2 Rates in 1956



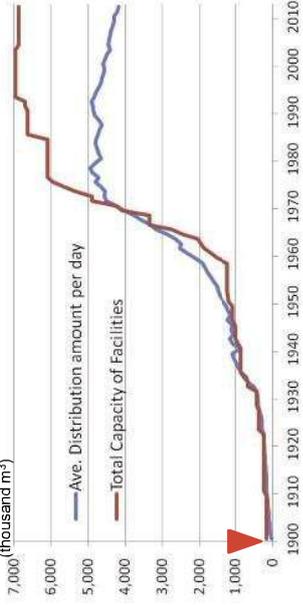
- Time background
 - Completed the meter installation to all the water taps
 - Just before the beginning of the long economic growth period
- Features
 - Abolished the fixed rate system and fully introduced the meter rate system
 - Rate setting by customer class (higher rate setting for commercial use)

3.3 Rates in 1966



- Time background
 - Sharp rise in water usage due to the long economic growth
 - Increasing needs for funds and deficit due to facility expansion
- Features
 - Transition from the rate system by customer class to the one by meter size
 - Rates for smaller meters were set lower

3.1 Rates in 1898



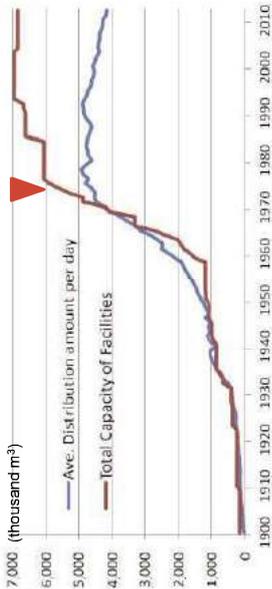
- Time background
 - Meters were installed at only limited facilities (e.g. government offices)
 - Shared taps were common
- Features
 - Fixed charge was common
 - Rates for shared taps were cheaper
 - Annual charge

Measured water supply		Unlimited watering (fixed charge)	
Government and public offices, schools, hospitals etc.	Fountain	Dedicated	Shared tap
Up to 100m ³ per month	Up to 5 yen/members for a house	5 yen/Up to 6 Yearhouses	8 yen/year
0.03 yen/m ³	Over 100m ³ 0.045yen/m ³	2 yen for up to 5 persons	Over 6 0.5yen/house

Customer class and charges			
General use	Commercial use	Public bath	Shared tap
10 m ³	120 yen/10 m ³	120 yen	80 yen
Over 10 m ³	16 yen/m ³ Over 10 m ³	12 yen/m ³ Over 10 m ³	12 yen/m ³
	28 yen/m ³ Over 10 m ³	120 yen 8 m ³	80 yen

Meter size	Service charge	Volumetric charge
25 mm or less	Up to 8 m ³ 120 yen Up to 10 m ³ 140 yen	Over 10 m ³ and under 50 m ³ 20 yen/m ³ Over 50 m ³ 32 yen/m ³
30 mm	200 yen	1 m ³ to 50 m ³ 32 yen/m ³ Over 50m ³ 45 yen/m ³
40 mm	400 yen	
50 mm	700 yen	
75 mm	1,500 yen	
100 mm	2,700 yen	
150 mm	5,000 yen	
200 mm	8,000 yen	
250 mm	11,000 yen	
300 mm or more	18,000 yen	
Public bath	Up to 10 m ³ 140 yen Up to 8 m ³ for a house 80 yen	Over 10m ³ 15 yen/m ³ Over 8m ³ 15 yen/m ³
Shared		

3.4 Rates in 1975



- Time background
- Sharp rise in water usage
- Increase in accumulated deficit
- Features
- Promotion of water saving through more detailed categorization of usage levels and reinforcement of the progressivity
- Higher rate setting for larger meters

Meter size (mm)	Service charge (Yen)	Volumetric charge (Yen/m ³)						
		1-10m ³	11-20m ³	21-30m ³	31-100m ³	101-200m ³	201-1,000m ³	1,001m ³ -
13	300							
20	400	0	60	75	90	120	150	180
25	500							
30	1,200		90					
40	2,400							
50	8,000				150			
75	17,000							
100	35,000							
150	60,000							
200	130,000							
250	180,000							
300-	300,000							
Public bath	300	0				50		25
Shared	200	0				50		

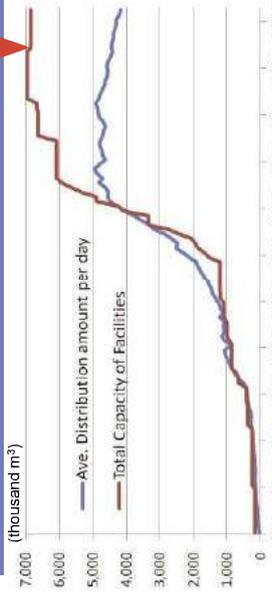
Conclusion

- Appropriate rate setting is the basis of sound financial management and appropriate business operations.
- Formulating appropriate financial plans and accurate estimates of cost prices are essential.
- There are various types of water rates

For sound financial management, we must set water rates which correspond to the financial and social conditions



3.5 Current rates (since 2005)

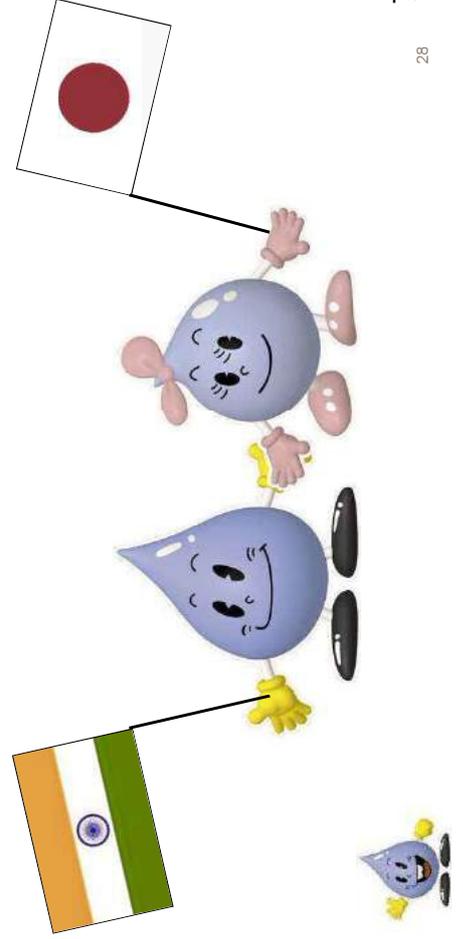


- Time background
- Decrease in water usage
- Stable finance
- Features
- Changed the minimum water from 10m³ to 5m³ corresponding to the actual usage situation
- 2.2% price cut on average by management efforts

Meter size (mm)	Service charge (Yen)	Volumetric charge (Yen/m ³)								
		1-5m ³	6-10m ³	11-20m ³	21-30m ³	31-50m ³	51-100m ³	101-200m ³	201-1,000m ³	1,001m ³ -
13	860									
20	1,170	0	22	128	163	202	213	298	372	404
25	1,460									
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40	6,865									
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75	45,623									
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200	349,434									404
250	480,135									
300-	816,145									
Public bath	※	0	22				109			26

※Same as general use (Over 40mm: 6,865Yen)

Thank you for listening!



Construction Management

HIROSHI KOJIMA
WATER SUPPLY MANAGEMENT
JICA EXPERT

Contents

1. About Me
2. What is construction supervision (Introduction)
3. Comparison of the construction site of Delhi and Tokyo
4. About trenchless method (video)
5. Summary

1. About Me

Name: Hiroshi Kojima

Company: TSS TOKYO WATER CO., LTD

6-14-1, Nishishinjuku, Shinjuku, Tokyo 160-0023, Japan

Career:

- ▶ I joined TSS TOKYO WATER CO., LTD on April 2008.
- ▶ Since joining for five years, I was involved Design and integration of water distribution mains (more 400mm) construction.
- ▶ In 2013, I transferred to the Business Department and I have mainly involved in overseas operations.
- ▶ From June 2013, I have participated in "THE ASSISTANCE RELATED TO DELHI WATER SUPPLY IMPROVEMENT PROJECT" with Mr. Yamamoto (Water Supply Management).
- ▶ My main role is to Hold these seminars and assist Mr. Yamamoto.

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2. About Construction Supervision

5

Role of construction supervisor

- ▶ Understanding construction purpose and contents
- ▶ Compliance with relevant laws and regulations
- ▶ Understanding the progress of construction work
- ▶ Have a process in place to instruct the contractor
- ▶ Safety and security
- ▶ Measures to be taken in the event of an emergency (accident, etc.)
- ▶ Coordination with local residents

6

3. Comparison of the construction site of Delhi and Tokyo

7

Breaking the Payment

Soon there is a pedestrian behind.
Dangerous!



Japan



Barricade for outsiders entry restriction.

8

Excavation

Traffic induction members?



Fall prevention measures?

Barricade



sheeting

in Tokyo

Traffic induction members



guide board

Cutting of pipe

inner surface of the mortar lining is peeled off.



pipe has not been cut straight. No water leakage?

Tokyo



Using special equipment, straight, and clean cut is achieved.

Delhi



Tokyo



Pipe junction (bent pipe)



Pipe junction (bent pipe)

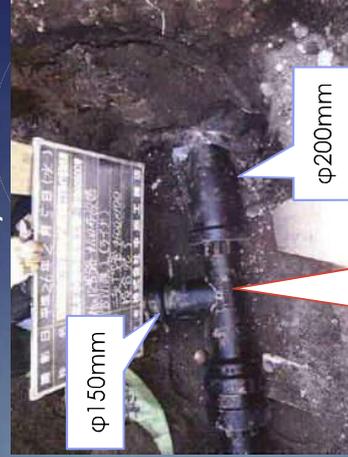


Pipe junction (T-shaped)

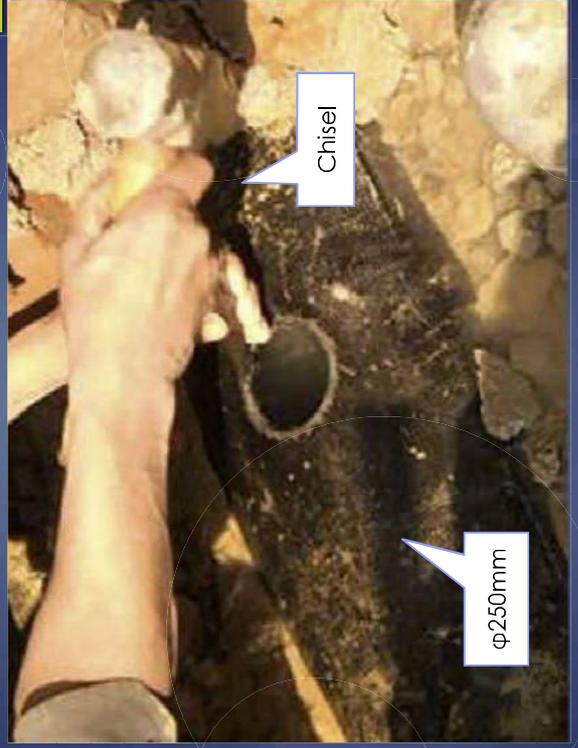
Delhi



Tokyo



In ϕ 250mm . . .

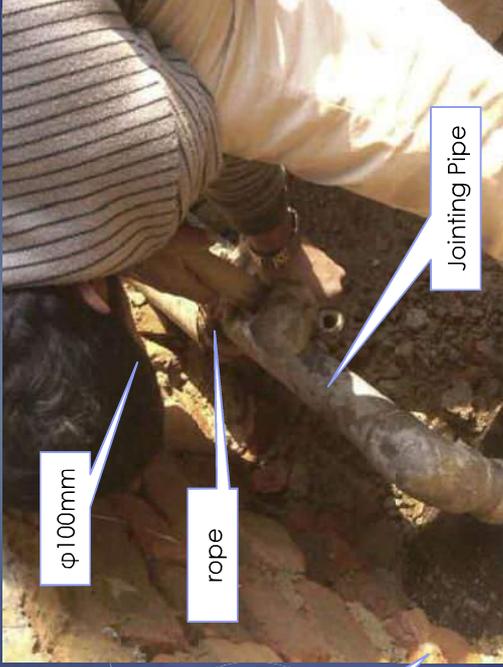


Joint pipe?



17

connection by filling the gap with a rope



18

Each trench

Ground is unstable. Is the soil retaining itself?



Installation of Sheet piling



19

Influx of sewage into the new pipe



20

Storage conditions of the Pipe

Material is stock in material storage.



Pipe is placed on the pedestal

Don't the pipes get damaged and dirty?

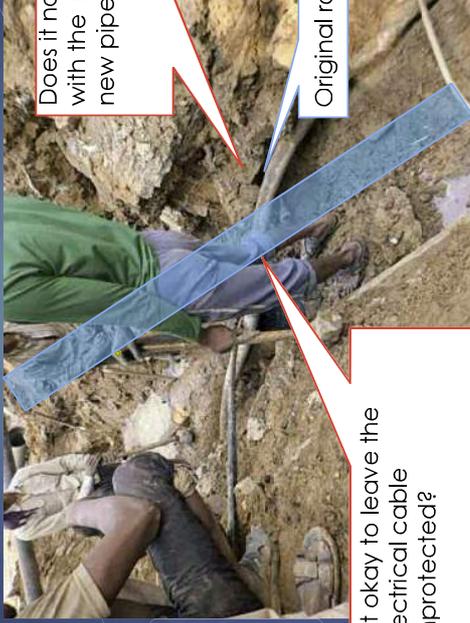


Are they put directly on the ground?

21

Other companies Pipes (electricity) buried situation

Does it not interfere with the root of the new pipe ?



Original route

Is it okay to leave the electrical cable unprotected?

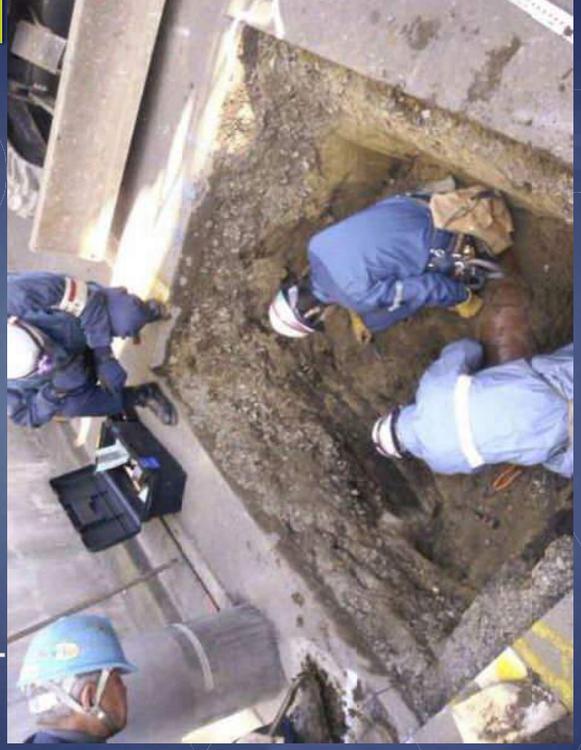
22

After the electric cable was discovered to avoid damage to the cable the worker rushed through his work and hurt himself



23

In Japan



24

Refilling

Delhi



Is it okay to use the concrete gada as it is?

Tokyo



Using improved soil and adequate compaction

25

Pipe explicitly sheet



26

After refilling

Is the rolling sufficient?



Is it ok to leave waste as it is?

Tokyo



Enough rolling and restore the asphalt.

27

4. About trenchless method

28

5. Summary

29

Thank You

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Role of construction supervisor

- ▲ Understanding construction purpose and contents
- ▲ Compliance with relevant laws and regulations
- ▲ Understanding the progress of construction work
- ▲ Have a process in place to instruct the contractor
- ▲ Safety and security
- ▲ Measures to be taken in the event of an emergency (accident, etc.)
- ▲ Coordination with local residents

30

Drawings Management in Tokyo

(東京都における図面管理について)

Tomoyuki Tanimoto
Director, Water Supply Section
East Area 1st Branch Office
Bureau of Waterworks
Tokyo Metropolitan Government

1

Integration of service pipes in a private road and replacement sub mains (私道内給水管整備)

Before integration (施工前)



In a private road, many service pipes are laid,

There are a lot of **water leakage** which is **caused by corrosion and damage of pipe.**

For **prevention of water leakage and earthquake resistance of pipes**, we have been working on the **laying of sub mains** in private roads and the **changing the existing service pipes with stainless steel ones.**

In addition, by **installing a drain plug** which has the same function as a **fire hydrant**, we can **extinguish a fire** in its early stages.

And at the time of an **earthquake** we can **supply emergency water** from this equipment.

私道には給水管が多数布設され、劣化や破損による漏水発生の原因となっています。
既設給水管をステンレス化することにより、私道内給水管の漏水の未然防止や耐震性の向上に取り組んでいます。
配水管の末端等に、濁水の排除などに使用する、消火栓と同じ構造を持つ排水栓を設置することで、震災時の応急給水への使用や火災時の初期消火に使用できます。

2

The Last Inspection in Tokyo

(前回の本邦視察)

Explanation of our business
(事業概要説明)



Connecting Sub main
(配水管連絡工事)



Laying service pipe
(給水管敷設作業)



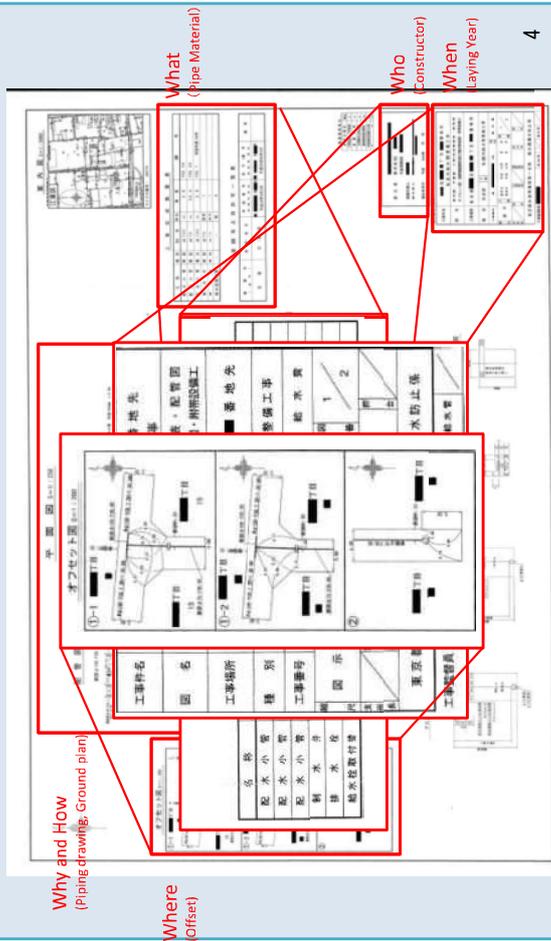
Emergency water supply Demo
(応急給水)



3

Complement drawing (Sub main)

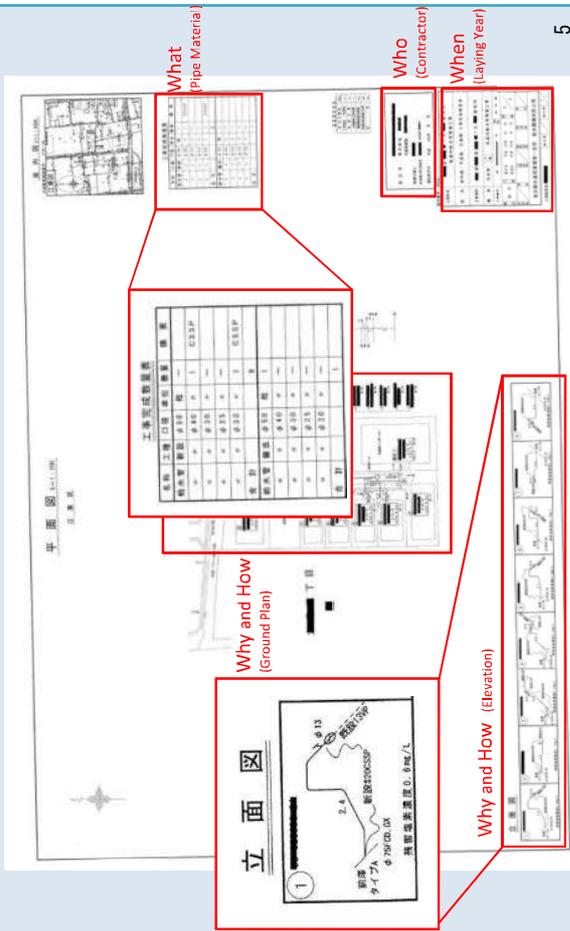
(完成図-配水小管-)



4

Complement drawing (Service pipe)

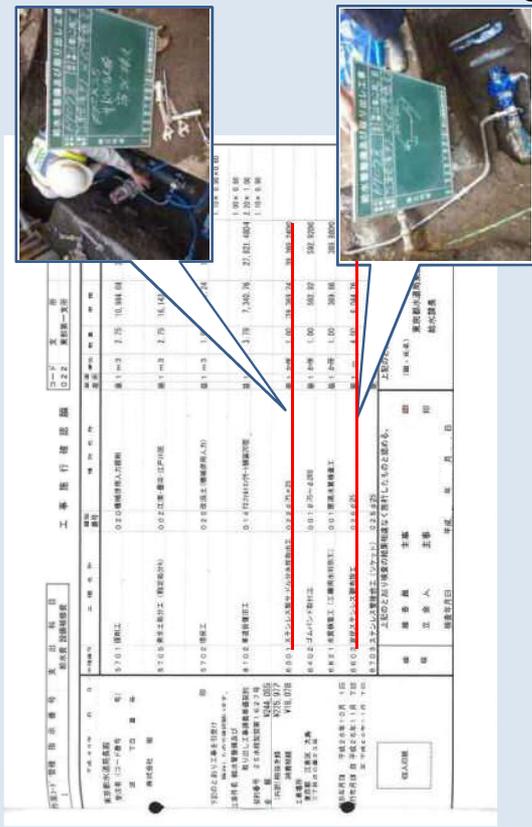
(完成図-配水小管-)



5

Bill

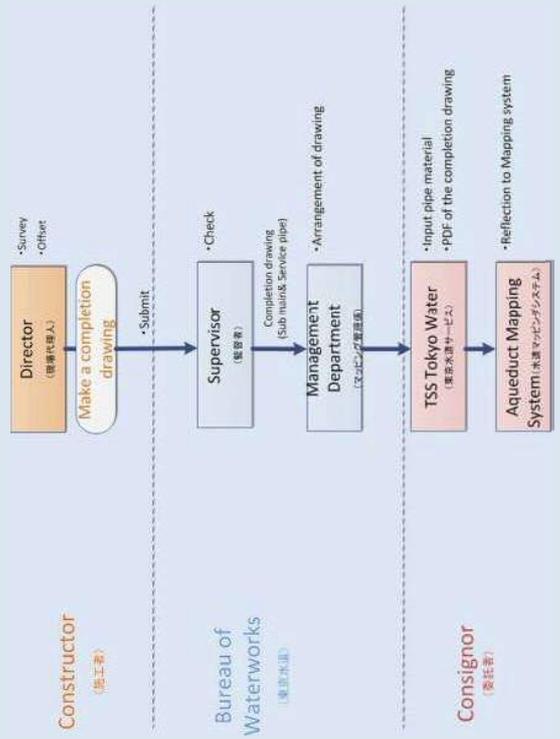
(確認願-請求書-)



6

Flow of updating Mapping System

(マッピングシステムへの反映フロー)



7

Drawings Management in Tokyo

Tomoyuki Tanimoto
 Director, Water Supply Section
 East Area 1st Branch Office
 Bureau of Waterworks
 Tokyo Metropolitan Government

8 2

第5回セミナー

2017年8月29日に、クラウンプラザホテルで開催された。出席者数はDJB、JICA本部、JICAインド事務所、東京都水道局、JETを含む約100人であった。DJBのピタンプラ地区の機電エンジニアとJETによる合同発表形式とした。発表内容は次の通りであった。

- 1) 均等給水の実現とNRW管理について：東京都水道局東部第一支所給水課長 山本陽一
- 2) 持続的水道事業のための人材育成：東京都水道局新宿営業所長 春日井知恵
- 3) ピタンプラパイロットエリアにおける均等給水とNRW管理のためのSCADAシステムについて：JET 専門家（SCADA） 福島学、Mr. U. K. Rastogi, E. E. (NW) E&M, DJB



Japan International Cooperation Agency

**THE FIFTH SEMINAR UNDER
"THE ASSISTANCE RELATED TO DELHI WATER SUPPLY IMPROVEMENT PROJECT"**

Organized By

Delhi Jal Board AND Japan International Cooperation Agency

Date: 29th of August 2017

Venue: Crystal Ball Room-1, Hotel Crowne Plaza, Rohini Location: Delhi, India

10:30 ~11:00	Registrations
Opening Speech	
11:00 ~ 11:10	<u>DJB</u> Mr. Keshav Chandra, Chief Executive Officer, DJB
11:10 ~ 11:20	<u>JICA</u> Mr. Takema Sakamoto, Chief Representative, JICA India Office
Inauguration	
11:20 ~ 11:30	<u>SCADA Demonstration</u> Mr. U. K. Rastogi, EE (NW) E&M, DJB & Mr. Manabu Fukushima (SCADA Expert)
Tea break	
11:30 ~ 11:45	Tea Break
SCADA Session	
11:45 ~ 12:45	<u>Presentation</u> 1. Progress, achievements, tasks, future developments, etc. of SCADA by experts by (tentative title) Mr. U. K. Rastogi, EE (NW) E&M, DJB & Mr. Manabu Fukushima (SCADA Expert) 2. The realization of Equitable Water Supply and the management of NRW - <i>The Installation of SCADA System</i> - Mr. Yoichi Yamamoto, Tokyo Waterworks
Human Resource Development Session	
12:45 ~ 13:45	<u>Presentation</u> 1. Training and development facility in DJB (tentative title) Mr. xxx xxx, Training Cell, DJB 2. Human Resources Development for Sustainable Water Supply Business - <i>Examples of Tokyo Metropolitan Waterworks Bureau</i> - Ms. Chie Kasugai, Tokyo Waterworks
Closing Speech	
13:45 ~ 14:00	<u>DJB</u> Ms. Nidhi Srivastava, Additional. CEO, DJB
14:00 ~ 14:45	Lunch
The 7th JCC	
15:00 ~ 16:30	The 7 th Joint Coordination Committee Meeting (Same hotel, to be attended by JCC members only)



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Date: 29th of Aug 2017

Venue: Crystal Ball Room, Crowne Plaza	10.30 AM	Contact Number	Location: Delhi, India
21	R-K Gargali	EE (E&M)	[Redacted]
22	Sandeep Kataria	EE (E&M)	[Redacted]
23	Phatta Thapa	JET Pipe-Jet	[Redacted]
24	V.P. Sharma	SE (SW) DTB	[Redacted]
25	Pawan Sharma	EE (E&M) III	[Redacted]
26	Ravi Kumar Singh	Elect Eng	[Redacted]
27	Vinod K. Prasad	Exec. Insp.	[Redacted]
28	Abhishek Kachhap	Design Eng (RDS)	[Redacted]
29	S.K. Mahapatra	CEM PM PMSO	[Redacted]
30	Swati Grover	GIS Specialist PMS	[Redacted]
31	Noboru Saito	TSB Tokyo W	[Redacted]
32	YOSHINARI SINGH	SE (E&M) II	[Redacted]
33	SANDEEP SHARMA	SE (E&M) II	[Redacted]
34	S.K. Dalmiya	SE (SW) II	[Redacted]
35	MUNISH KUMAR	EE (SW) I	[Redacted]
36	Sudhraj Singh	AE (E&M) I	[Redacted]
37	Amit Chhabra	JF (PR) II	[Redacted]
38	Badreep Kumar	AE (Prog) III	[Redacted]
39	Yasunato Yoichi	JICA Expert	[Redacted]
	Chie Kasugai	JICA Expert	[Redacted]
	Yoshioke Saito	JICA Expert	[Redacted]
	Kazuto Ogasawara	"	[Redacted]
	Touseef Hussain	WWS Consultant	[Redacted]
	Vinod Sarni	Consultant-GIS	[Redacted]

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Date: 29th of Aug 2017

Venue: Crystal Ball Room, Crowne Plaza	10.30 AM	Contact Number	Location: Delhi, India
24	LOBAL SINGH	EE (E&M) III	[Redacted]
25	Sukhpal Chachra	EE (E&M) III	[Redacted]
26	PANKAJ GUPTA	EE (PR) VIII	[Redacted]
27	Shash Ram Singh	SE (E&M) III	[Redacted]
28	K. C. Verma	E-E (E&M) II	[Redacted]
29	Bhupesh KV	SE (SD) III	[Redacted]
30	MUNISH KUMAR	EE (SW) DTB	[Redacted]
31	ANIL KUMAR	EE (SW) DTB	[Redacted]
32	Rajiv Singh	EE (SW) DTB	[Redacted]
33	Harsh Kumar	SE (E&M) II	[Redacted]
34	D.K. Gupta	SE (E&M) II	[Redacted]
35	Naveed Kumar	EE (SW) DTB	[Redacted]
36	NARESH K. DARGAN	EE (SW) DTB	[Redacted]
37	RAKESH SARNI	SE (E&M) II	[Redacted]
38	Anesh Kumar	AE (PR) I	[Redacted]
39	Fuad Fayaz	EE (SW) DTB	[Redacted]
40	Rakish Sharma	SE (E&M) II	[Redacted]
41	K.S. SHARMA	Consultant	[Redacted]
42	SANDEEP SHAR	SE (SW) DTB	[Redacted]
43	Yogendra Singh	JICA	[Redacted]
44	S. L. Meen	CE	[Redacted]
45	SWATI GROVER	GIS Specialist	[Redacted]
46	S K MALHOTRA	CEM PMSO	[Redacted]

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Date: 29th of Aug 2017

Venue: Crystal Ball Room, Crowne Plaza	10:30 AM	Location: Delhi, India	
Name	Designation	Contact Number	Signature
48	V. K. Nangal	EE (E&M) JICA	[Signature]
49	U. K. Rastogi	EE (E&M) JICA	[Signature]
50	S. S. BHARADWAJ	EE (E&M) JICA	[Signature]
51	Rajesh Mittal	CE (W) JICA	[Signature]
52	P. S. Salunke	EE (E&M) JICA	[Signature]
53	B. S. Rawat	EE (Prog.) JICA	[Signature]
54	Jyoti Kumar	CE (C&W)	[Signature]
55	Bhupendra Singh	Top Coord	[Signature]
56	Noboru Saito	EE (E&M) JICA	[Signature]
57	Hiroshi Inoue	JICA	[Signature]
58	[Name]	EE (E&M) JICA	[Signature]
59	S. K. Dahiya	EE (E&M) JICA	[Signature]
60	Fujita Atsuko	JICA	[Signature]
61	Bikash Kumar	EE (DMA)	[Signature]
62	S. K. Shrivastava	SE (E&M) JICA	[Signature]
63	S. K. Goel	EE (E&M) JICA	[Signature]
64	S. C. [Name]	SE (W) JICA	[Signature]
65	Vijay Singh	SE (E&M) JICA	[Signature]
66	Hareesh Chander	EE (N)-1	[Signature]
67	Shalabh Kumar	SE (Spatial)	[Signature]
68	Dwivedi Kumar	EE (E&M) JICA	[Signature]
69	Anurag	JE (Prog.) JICA	[Signature]
70	M. K. Jain	SE (Centre)	[Signature]
71	R. K. Suman	EE (Central) JICA	[Signature]