4. 協議議事録

別紙資料－3　基本設計現地調査時協議議事録

別紙資料－4　基本設計概要説明時協議議事録

5. 当該国の社会・経済事情

別紙資料－5　シリア・アラブ共和国の社会・経済事情

6. 収集資料リスト

1	Statical Abstract (1992)	Central Bureau of Statistics
2	-do- (1993)	-do-
3	-do- (1994)	-do-
4	The Oxford Business Guide (1995-6)	Oxford Business Guide Publications
5	Rapport Economique Syrien (1993-1994)	L'office Arabe de Presse et de Documentation
6	Report on the 1995 Syria's Budget	-do-
7	1995 Syria's Budget	-do-
8	開発途上国国別経済協力シリーズ「シリア」第4版	国際協力水深協会
9	Guide to Syria	Al Salhani Establishment
10	Travel survival kit Jordan & Syria	
11	Syria a Histrical and Architectural Guide	Scorpion Publishing Ltd.
12	Hotel Directory	Sheraton Hotel

以下の資料はダマスカス郊外県上下水道公団より入手

13	Syria in Viw	
14	Road Map Syria	1 : 1,000,000
15	Syria Road Map for Tourists	1 : 1,250,000
16	Plan of Project	
17	Profile of Project	
18	Typical Drawing of the Structures	
19	計画地区地形図	1 : 250,000
20	-do-	1 : 200,000
21	-do-	1 : 250,000
22	Technical Specification of Submersible Pumps	

23 Tender Document of Submersible Pumps
24 Technical Specification of Ductile Cast Iron Pipe
25 Tender Document of Ductile Cast Iron Pipe
26 シリア国水質基準
27 現況井戸水質調査（化学分析）
28 計画井戸の重金属分析（９地区）
29 計画井戸の水質調査（化学分析、1994、1995）
30 現況及び計画井戸のバクテリア分析（９地区）
31 井戸揚水能力
　i) 揚水試験データ
　ii) ヤブルードの揚水試験データダイヤグラム
　iii) Typical drawing of casing in wells
32 人口及び給水量
　- 1993年 統計的センサス
33 給水量
　- 1994年 料金徴収水量
34 維持管理費関係資料
　- 1994年 塩素注入量とコスト
　- 1994年 油脂コスト
35 8次5ヶ年計画に盛り込まれたダマスカス郊外県上下水道公団関連事業計画（1996-2000）
36 1993年度実施事業
37 1994年度実施事業
38 1995年度実施事業
39 その他
　- 管路の水理計算表
　- ディーゼル発電機の容量計算方法
　- Qodsaya Project の見直し案
40 中心線及び縦断測量結果
　- ジャラジール地区
　- ハラスタ／アルビン地区
　- ヤブルード地区
　- カラ地区
　- ルヘイバ地区
　- ドメイル地区

別紙資料－1　基本設計現地調査日程表

現地調査日程表

日順	月　日	日　程	官ベース調査団	コンサルタンツ調査団
	11月7日 (火)	成田・フランクフルト	移動日	
	8 (水)	フランクフルト・ダマスカス		
	9 (木)	ダマスカス郊外県 上下水道公団	表敬・インセプションレポート 説明	
	10 (金)	現地調査		成田、フランクフルト
	11 (土)	現地調査	現地調査	フランクフルト・ダマスカス
	12 (日)	JICA事務所、日本大使館 公共事業省、上下水道公団	表敬・インセプションレポート 説明	同左
	13 (月)	郊外県上下水道公団	現地調査	現地調査
	14 (火)	同上	議事録案作成協議	資料収集、路線図上選定
	15 (水)	同上	同上	同上
	16 (木)	公共事業省郊外県上下水道公団 日本大使館、JICA事務所	議事録署名 調査結果報告	同左
	17 (金)	休日	団内打合せ、現地調査	同左、測量再委託契約
	18 (土)	郊外県上下水道公団	ダマスカス・ロンドン	現地調査、路線選定
	19 (日)	同上	ロンドン発	同上
	20 (月)	同上	日本へ帰国	同上
	21 (火)	同上		同上
	22 (水)	同上		同上
	23 (木)	同上		資料整理・分析・検討
	24 (金)	休日		団内打合せ
	25 (土)	郊外県上下水道公団		補足協議及び資料収集
	26 (日)	同上		現地補足調査
	27 (月)	同上		同上
	28 (火)	同上		同上
	29 (水)	同上		資料整理・分析・検討
	30 (木)	同上		同上
	12月　1 (金)	休日		団内打合せ
	2 (土)	郊外県上下水道公団		補足資料収集
	3 (日)	同上		資料整理、測量成果受領
	4 (月)	同上		同上
	5 (火)	公共事業省郊外県上下水道公団		報告及び最終協議
	6 (水)	日本大使館、JICA事務所		最終報告、表敬
	7 (木)	ダマスカス・フランクフルト		移動日
	8 (金)	フランクフルト発		移動日
	9 (土)	成田		日本へ帰国

別紙資料－２　基本設計概要説明日程表

概要説明日程表

月	日	(曜)	日程
１月	１６日	(火)	成田 → フランクフルト
	１７日	(水)	フランクフルト → ダマスカス
	１８日	(木)	下記機関への表敬訪問 JICAシリア事務所 駐ダマスカス日本大使館 企画庁 (State Planning Commission) ダマスカス郊外県上下水道公団
	１９日	(金)	団内会議
	２０日	(土)	ダマスカス郊外県上下水道公団へ基本設計の概要の説明及び内容についての協議
	２１日	(日)	議事録案の作成
	２２日	(月)	議事録についての協議
	２３日	(火)	議事録署名
	２４日	(水)	JICAシリア事務所、駐ダマスカス日本大使館へ表敬訪問
	２５日	(木)	ダマスカス → フランクフルト
	２６日	(金)	フランクフルト →
	２７日	(土)	→ 成田

別紙資料－３　基本設計現地調査時議事録

MINUTES OF DISCUSSIONS

BASIC DESIGN STUDY ON THE PROJECT FOR WATER SUPPLY DEVELOPMENT IN THE RURAL PROVINCE OF DAMASCUS IN THE SYRIAN ARAB REPUBLIC

In response to the request from the Government of the Syrian Arab Republic, the Government of Japan decided to conduct a Basic Design Study on the Project for Water Supply Development in Rural Province of Damascus in the Syrian Arab Republic (hereinafter referred to as "the Project") and entrusted the study to the Japan International Cooperation Agency (JICA).

JICA sent to the Syrian Arab Republic a study team (hereinafter referred to as "the Team"), which was headed by Mr. Hisao, Ushiki Development Specialist, JICA, and was scheduled to stay in the country from 8 November to 7 December , 1995.

The Team held discussions with the officials concerned of Syrian Arab Republic and conducted a field survey at the study area.

In the course of the discussions and field survey, both sides confirmed the main items described in the attached sheets. The Team will proceed to further work and prepare a Basic Design Study report.

Damascus, 16 November, 1995

Mr. Hisao Ushiki
Leader
Basic Design Study Team
JICA

Mr. Adnan Deeb
General Director
Establishment of Drinking Water and Sewerage in the Rural Province of Damascus

ATTACHMENT

1. Objective

The objective of the Project is to supply safe drinking water for people living in the Rural Province of Damascus by procurement of the necessary equipment.

2. Project site

The project sits are located in the Rural Province of Damascus as shown in ANNEX I.

3. Executing Organization

The Ministry of Housing and Utilities is responsible for the administration of the project.

The Establishment of Drinking Water and Sewerage in the Rural Province of Damascus(hereinafter referred to as the Establishment)is responsible for the implementation of the Project.

4. Items requested by Syrian Arab Republic

After discussions with the Team, the items finally requested by the Syrian side are shown in Annex II.

However, the final components of the Project will be specifically decided after the completion of further studies.

5. Japan's Grant Aid System

(1) The Syrian side has understood Japan's Grant Aid system in ANNEX III as explained by the Team.

(2) The Syrian side will take necessary measures described in ANNEX IV for the smooth implementation of the Project, in the event the Grant Aid Assistance by the Japanese Government is extended to the Project.

6. Schedule of the Study

(1) The consultants of the Team will proceed to further studies in the Syrian Arab Republic until 7 December, 1995.

(2) JICA will prepare the draft final report and dispatch a mission in order to explain its contents at the end of January, 1996.

(3) In the event the contents of the report is accepted in principle by the Syrian sides,

JICA will complete a final report and send it to the Syrian Arab Republic by April. 1996.

7. Major Points of Discussions

(1)The following priority was confirmed.

A)First priority

Jarajir

Harasta/Urbin

Yabroud

Qara

Ruheibeh

B)Second priority

Deir Atiya

Nabek

Vehicle

C)Third priority

Domair

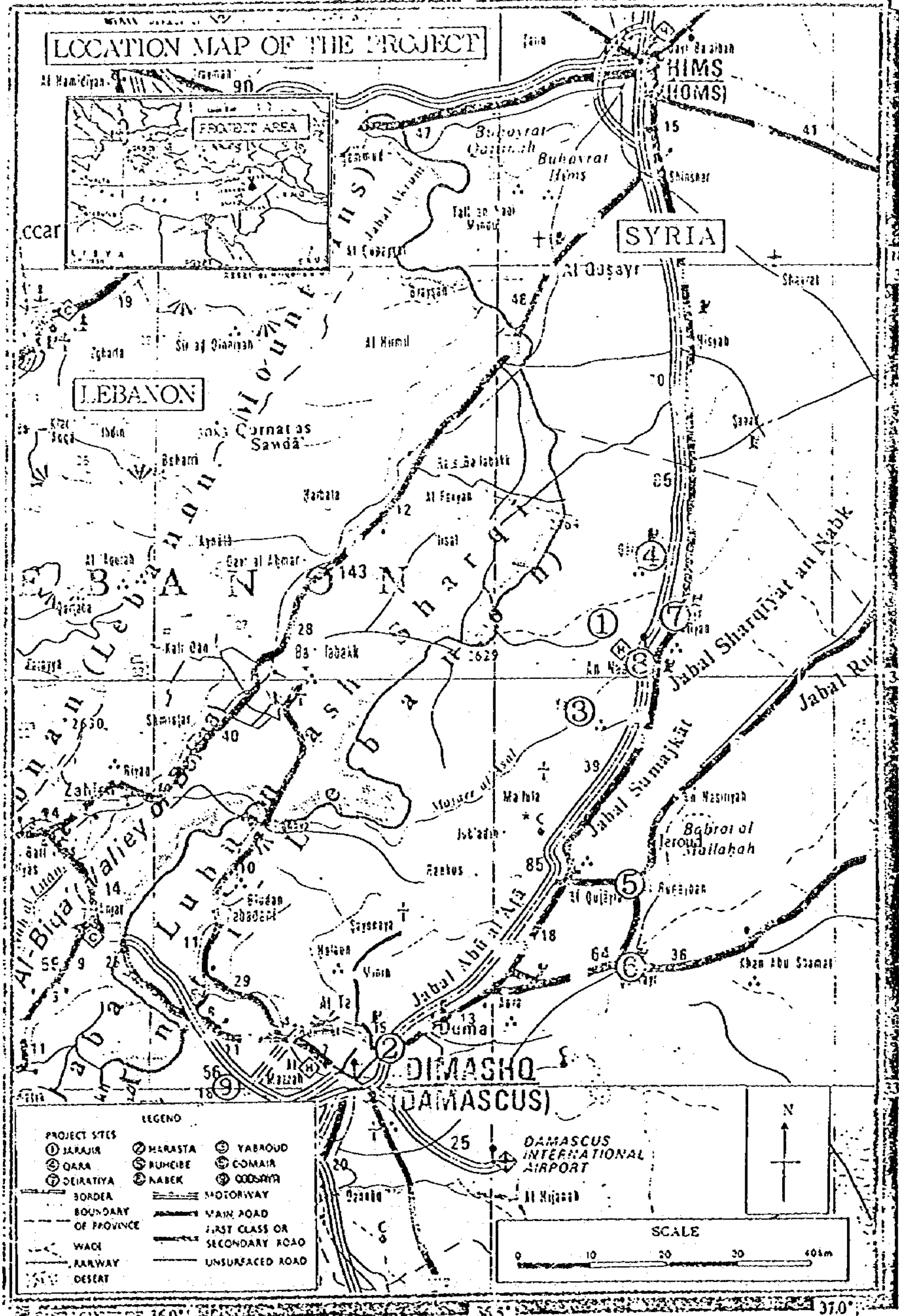
Qodsaya

(2)The following was confirmed;

1)Syrian side shall submit the data concerning quality and quantity of each water source to the Team by 7 December,1995. In the case, quality of water source can not satisfy the Syrian standard for potable water, based on WHO standard, including Pb and Hg, and/or productivity of water source is found insufficient, such sites shall be excluded from the original request, regardless of the priority mentioned 7-(1).

2)Syrian side shall make the financial plan to construct and maintain the water supply system, and submit it to the Team by 7 December,1995.

ANNEX—1


LOCATION MAP OF THE PROJECT
PROJECT AREA
HIMS
(HOMS)
SYRIA
Al Qusayr
LEBANON
Qornat as Sawda
Ba'labakk
DIMASHQ
(DAMASCUS)
DAMASCUS INTERNATIONAL AIRPORT
Jabal Sharqiyat an Nabk
Jabal Sumaykat
Jabal Abu al Ata
Bahrat al Mallahah
Buhayrat Hims
Zahleh
LEGEND
PROJECT SITES
① JARAJIR
② HARASTA
③ YABROUD
④ QARA
⑤ RUHEIBE
⑥ DOMAIR
⑦ DEIRATIYA
⑧ NABEK
⑨ QODSAYA
BORDER
BOUNDARY OF PROVINCE
WADI
RAILWAY
DESERT
MOTORWAY
MAIN ROAD
FIRST CLASS OR SECONDARY ROAD
UNSURFACED ROAD
SCALE
0
10
20
30
40km
N
34.5
34.0°
33.5°
EAST LONGITUDE 36.0°
36.5°
37.0°

ANNEX II
List of Equipment

Items			Unit	Original request	Priority
Jarajir	Ductile iron pipes	150mm dia	m	7,000	A
	Submersible pumps(50m^3/h,260m lift)		Unit	2	
	Diesel Generator(100KVA)		Unit	1	
Harasta/ Urbin	Ductile iron pipes	250mm	m	2,900	A
		400mm	m	1,530	
		500mm	m	5,500	
Yabroud	Ductile iron pipes	125mm	m	700	A
		250mm	m	2,000	
	Submersible pumps(45m^3/h,90m)		Unit	4	
Qara	Ductile iron pipes	250mm	m	11,500	A
	Submersible pumps(50m^3/h,275m)		Unit	3	
	Diesel Generator(300KVA)		Unit	1	
	Transformer(400KVA)		Unit	1	
Ruheibeh	Ductile iron pipes	150mm	m	250	A
		250mm	m	2,550	
	Submersible pumps(45m^3/h,250m)		Unit	4	
	Diesel Generator(500kVA)		Unit	1	
Domair	Ductile ion pipes	300mm	m	23,254	C
Deir Atiya	Submersible pump(45m^3/h,240m)		Unit	1	B
	Diesel Generator(325KVA)		Unit	1	
Nabek	Submersible pumps(55m^3/h,360m)		Unit	4	B
	Diesel Generator(365KVA)		Unit	1	
Qodsaya	Ductile iron pipes	200m	m	1,500	C
		300mm	m	1,570	
		450mm	m	900	
		500mm	m	13,715	
	Submersible pumps(90m^3/h,260m)		Unit	11	
	Horizontal pumps(130m^3/h,80m)		Unit	3	
	Diesel Generators	150KVA	Unit	1	
		900KVA	Unit	2	
	Transformers	200KVA	Unit	1	
		1800-2000KVA	Unit	1	
Vehicles	2WD pickups		Unit	3	B
	4WD pickups		Unit	2	
spare parts			set	adequate amount	——

Notes; Final components of the Project shall be decided after further studies.

ANNEX III

ON JAPAN'S GRANT AID PROGRAM

1. Japan's Grant Aid Procedures

(1) The Japan's Grant Aid Program is executed by the following procedures.

- **Application**
  (request made by a recipient country)
- **Study**
  (Preliminary Study / Basic Design Study conducted by JICA)
- **Appraisal & Approval**
  (Appraisal by the Government of Japan and Approval by the Cabinet of Japan)
- **Determination of Implementation**
  (Exchange of Notes between the both Governments)
- **Implementation**
  (Implementation of the Project)

(2) Firstly, an application or a request for a project made by the recipient country is examined by the Government of Japan (the Ministry of Foreign Affairs) to see whether or not it is suitable for Japan's Grand Aid. If the request is deemed suitable, the Government of Japan entrusts a study on the request to JICA (Japan International Cooperation Agency)

Secondly , JICA conducts the Study (Basic Design Study) , using a Japanese consulting firm. If the background and objective of the requested project are not clear, a Preliminary Study is conducted prior to a Basic Design Study.

Thirdly, the Government of Japan appraises to see whether or not the Project is suitable for Japan's Grant Aid Program, based on the Basic Design Study report prepared by JICA and the results are then submitted for approval by the Cabinet.

Fourthly, the Project approved by the Cabinet becomes official when pledged by the Exchange of Notes signed by the both Governments.

Finally, for the implementation of the Project, JICA assists the recipient country in preparing contracts and so on.

2. Basic design Study

1) Contents of the Study

The purpose of the Study (Preliminary Study/Basic Design Study) conducted on a project requested by JICA is to provide a basic document necessary for appraisal of the project by the Japanese Government. The contents of the Study are as follows:

a) to confirm background, objectives, benefits of the project and also institutional capacity of agencies concerned of the recipient country necessary for project implementation,
b) to evaluate appropriateness of the Project for the Grant Aid Scheme from a technical, social and economical point of view,
c) to confirm items agreed on by the both parties concerning a basic concept of the project,
d) to prepare a basic design of the project,
e) to estimate cost involved in the project.

Final project components are subject to approval by the Government of Japan and therefore may differ from an original request.

Implementing the project, the Government of Japan requests the recipient country to take necessary measures involved which are itemized on Exchange of Notes.

2) Selecting (a) Consulting Firm(s)

For smooth implementation of the study, JICA uses (a) consulting firm(s) registered. JICA selects (a) firm(s) through proposals submitted by firms which are interested. The firm(s) selected carry(ies) out a Basic Design Study and write(s) a report, based upon terms of reference made by JICA.

The consulting firm(s) used for the study is(are) recommended by JICA to a recipient country after Exchange of Notes, in order to maintain technical consistency and also to avoid possible undue delay in implementation caused if a new selection process is repeated.

(3) Status of a Preliminary Study in the Grant Aid Program

A Preliminary Study is conducted during the second step of a project formulation & preparation as mentioned above.

A result of the study will be utilized in Japan to decide if the Project is to be suitable for a Basic Design Study.

Based on the result of the Basic Design Study, the Government would proceed to the stage of decision making process(appraisal and approval).

It is important to notice that at the stage of Preliminary Study, no commitment is made by the Japanese side concerning the realization of the Project in the scheme of Grant Aid Program.

3. Japan's Grant Aid Scheme

1) What is Grant Aid?

The Grant Aid Program provides a recipient country with non reimbursable funds needed to procure facilities, equipment and services for economic and social development of the country under the following principles in accordance with relevant laws and regulations of Japan. The Grant Aid is not in a form of donation or such.

2) Exchange of Notes (E/N)

The Japan's Grant Aid is extended in accordance with the Exchange of Notes by both Governments, in which the objectives of the Project, period of execution, conditions and amount of the Grant etc. are confirmed.

3) "The period of the Grant Aid" means one Japanese fiscal year which the Cabinet approves the Project for. Within the fiscal year, all procedure such as Exchange of Notes, concluding a contract with (a) consulting firm(s) and (a) contractor(s) and a final payment to them must be completed.

4) Under the Grant, in principle, products and services of origins of Japan or the recipient country are to be purchased.

When the two Governments deem it necessary, the Grant may be used for the purchase of products or services of a third country origin.

However the prime contractors, namely, consulting, contractor and procurement firms, are limited to "Japanese nationals". (The term "Japanese nationals" means Japanese physical persons or Japanese juridical persons controlled by Japanese physical persons.)

5) Necessity of the "Verification"

The Government of the recipient country or its designated authority will conclude into contracts in Japanese yen with Japanese nationals. Those contracts shall be verified by the Government of Japan. The "Verification" is deemed necessary to secure accountability to Japanese tax payers.

6) Undertakings required to the Government of the recipient country

In the implementation of the Grant Aid, the recipient country is required to undertake necessary measures such as the following:

① to secure land necessary for the sites of the project and to clear and level the land prior to commencement of the construction work,

② to provide facilities for distribution of electricity, water supply and drainage and other incidental facilities in and around the sites,

③ to secure buildings prior to the installation work in case the Project is providing equipment,

④ to ensure all the expenses and prompt execution for unloading, customs clearance at the port of disembarkation and internal transportation of the products purchased under the Grant Aid,

⑤ to exempt Japanese nationals from customs duties, internal taxes and other fiscal levies which will be imposed in the recipient country with respect to the supply of the products and services under the Verified Contracts,

⑥ to accord Japanese nationals whose services may be required in connection with the

supply of the products and services under the Verified Contracts, such facilities as may be necessary for their entry into the recipient country and stay therein for the performance of their work.

7) Proper Use

The recipient country is required to maintain and use facilities constructed and equipment purchased under the Grant Aid properly and effectively and to assign staff necessary for their operation and maintenance as well as to bear all expenses other than those to be borne by the Grant Aid.

8) Re-export

The products purchased under the Grant Aid shall not be re-exported from the recipient country.

9) Banking Arrangement (B/A)

(a) The Government of the recipient country or its designated authority shall open an account in the name of the Government of the recipient country in an authorized foreign exchange bank in Japan (hereinafter referred to as "the Bank") . The Government of Japan will execute the Grant Aid by making payments in Japanese yen to cover the obligations incurred by Government of the recipient country or its designated authority under the contracts verified.

(b) The payments will be made when payment requests are presented by the Bank to the Government of Japan under an Authorization to Pay issued by the Government of the recipient country or its designated authority.

ANNEX IV

Necessary measures to be taken by the Syrian Arab Republic on condition that Japan's Grant Aid is executed:

1. To secure land necessary for sites of the project, such as final disposal site, and clear, level and reclaim the site prior to the procurement of the equipments.

2.To construct the access road to the site such as final disposal site, prior to procurement of the equipments.

3.To secure buildings prior to the procurement of the equipment.

4.To ensure all expanses and prompt execution for unloading, customs clearance at the port/airport of disembarkation and international transportation of the products purchased under the Grand Aid.

5.To exempt Japanese nationals from customs duties, international taxes and other fiscal lives which will be imposed in the recipient country with respect to the products and services under the verified Contract.

6. To accord Japanese nationals, whose services may be required in connection with the supply of products and the services under the verified contracts, such facilities as may be necessary for their entry into the Syrian Arab Republic and stay therein for the execution of the Project.

7."Proper use"

The Syrian Arab Republic is required to maintain and use the equipment purchased under the Grant Aid properly and effectively and to assign staff necessary for this operation and maintenance as well as to bear all the expenses other than those covered by the Grand Aid.

8."Re-export"

the products purchased under the Grant Aid shroud not be re-exported from the Syrian Arab Republic.

9.Banking Arrangements (B/A)

a) The Government of the Syrian Arab Republic or its designated authority shroud open an amount in the name of the Government of the Syrian Arab Republic in an authorized foreign exchange bank in Japan (hereinafter referred to as "Bank"). The Government of Japan will execute the Grand Aid

by making payments in Japanese yen to cover the obligations incurred by the Government of the Syrian Arab Republic or its designated

b) The payment will be made when payment request are presented by the Bank to the Government of Japan under an authorization to pay issued by the Bank to the government of the Syrian Arab Republic or its designated authority.

The detail are shown in ANNEX V.

ANNEX V

- Major Undertaking to be taken by Each Goverment

No.	Items	To be covered by Grant Aid	To be covered by Recipient Side
1	To secure land		●
2	To clear, level and reclaim the site when needed		●
3	To construct gates and fences in and around the site		●
4	To construct the parking lot	●	
5	To construct roads		
	1) Within the site	●	
	2) Outside the site		●
6	To construct the buildings	●	
7	To provide facilities for the distribution of electricity, water supply, drainage and other incidental facilities		
	1) Electricity		
	a. The distributing line to the site		●
	b. The drop wiring and internal wiring within the site	●	
	c. The main circuit breaker and transformer	●	
	2) Water Supply		
	a. The city water distribution main to the site		●
	b. The supply system within the site (receiving and elevated tanks)	●	
	3) Drainage		
	a. The city drainage main (for storm, sewer and others) to the site		●
	b. The drainage system (for toilet sewer, ordinary waste, storm drainage and others) within the site	●	
	4) Gas Supply		
	a. The city gas main to the site		●
	b. The gas supply system within the site	●	
	5) Telephone System		
	a. The telephone trunk line to the main distribution frame/panel (MDF) of the building		●
	b. The MDF and the extension after the frame/panel	●	
	6) Furniture and Equipment		
	a. General furniture		●
	b. Project equipment	●	
8	To bear the following commissions to the Japanese foreign exchange bank for the banking services based upon the B/A		
	1) Advising commission of A/P		●
	2) Payment commission		●
9	To ensure unloading and customs clearance at port of disembarkation in recipient country		
	1) Marine (Air) transportation of the products from Japan to the recipient country	●	
	2) Tax exemption and custom clearance of the products at the port of disembarkation		●
	3) Internal transportation from the port of disembarkation to the project site		●
10	To accord Japanese nationals whose services may be required in connection with the supply of the products and the services under the verified contact such facilities as may be necessary for their entry into the recipient country and stay therein for the performance of their work.		●
11	To exempt Japanese nationals from customs duties, internal taxes and other fiscal levies which may be imposed in the recipient country with respect to the supply of the products and services under the verified contracts.		●
12	To maintain and use properly and effectively the facilities constructed and equipment provided under the Grant.		●
13	To bear all the expenses, other than those to be borne by the Grant, necessary for construction of the facilities as well as for the transportation and installation of the equipment.		●

別紙資料－4　基本設計概要説明時議事録

MINUTES OF DISCUSSIONS

BASIC DESIGN STUDY ON THE PROJECT FOR WATER SUPPLY DEVELOPMENT IN THE RURAL PROVINCE OF DAMASCUS IN THE SYRIAN ARAB REPUBLIC
(CONSULTATION ON DRAFT REPORT)

In November 1995, the Japan International Cooperation Agency (hereinafter referred to as "JICA") dispatched a team to the Syrian Arab Republic for the Basic Design Study on the Project for Water Supply Development in the Rural Province of Damascus in the Syrian Arab Republic (hereinafter referred to as "the Project"). A study report was drafted through the technical examination of the field survey and discussions with the Syrian side : Establishment of Drinking Water and Sewerage in the Rural Province of Damascus (hereinafter referred to as "the Establishment")

In order to explain the report and consult the Syrian side on the components of the draft report, JICA has sent another study team (hereinafter referred to as "the Team") headed by Mr. Hisao Ushiki, a Development Specialist, JICA, with a schedule to stay in Syria from 17 to 25 January, 1996.

After a series of discussion, both sides have confirmed and agreed upon the main items described on the attached sheet.

Damascus, 23 January, 1996

Mr. Hisao Ushiki
Leader
Basic Design Study Explanation Team
JICA

Mr. Adnan Deeb
General Director
Establishment of Drinking Water
and Sewerage in the Rural Province
of Damascus

ATTACHMENT

1. Components of the Draft Report

The Government of the Syrian Arab Republic(referred to as "Syrian side" elsewhere in this document), represented by Mr.Adnan Deeb, General Director of the Establishment, has agreed and accepted in principle the components of the draft report proposed by the Team.

2.Japan's Grant Aid System

(1) The Government of the Syrian Arab Republic has understood the System of the Japanese Grant Aid explained by the Team, as described in ANNEX I.

(2) The Government of the Syrian Arab Republic will take the necessary measures, described in Annex II, for smooth implementation of the Project, so that the Grant Aid by the Government of Japan is extended to the Project.

3. Further Schedule

The Team will make the final report in accordance with the confirmed items, and submit it to the Government of the Syrian Arab Republic by the end of April, 1996.

4. Other Relevant Issues

The following has been confirmed;

(1) Syrian side will allocate the necessary budget, staff and system to construct the water supply systems with the materials and the equipment procured by the Project.

(2) Syrian side will complete the water supply systems promptly according to the prescribed schedule of the Project.

(3) Syrian side will prepare the warehouse and garage for the materials and equipment, and vehicles, respectively, procured by the Project.

(4) Syrian side will undertake the works such as constructing pump houses, water reservoirs and fuel tanks.

ANNEX I

ON JAPAN'S GRANT AID PROGRAM

1. Japan's Grant Aid Procedures

(1) The Japan's Grant Aid Program is executed by the following procedures.

- **Application**
  (request made by a recipient country)
- **Study**
  (Preliminary Study / Basic Design Study conducted by JICA)
- **Appraisal & Approval**
  (Appraisal by the Government of Japan and Approval by the Cabinet of Japan)
- **Determination of Implementation**
  (Exchange of Notes between the both Governments)
- **Implementation**
  (Implementation of the Project)

(2) Firstly, an application or a request for a project made by the recipient country is examined by the Government of Japan (the Ministry of Foreign Affairs) to see whether or not it is suitable for Japan's Grant Aid. If the request is deemed suitable, the Government of Japan entrusts a study on the request to JICA (Japan International Cooperation Agency).

Secondly, JICA conducts the Study (Basic Design Study), using a Japanese consulting firm. If the background and objective of the requested project are not clear, a Preliminary Study is conducted prior to a Basic Design Study.

Thirdly, the Government of Japan appraises to see whether or not the Project is suitable for Japan's Grant Aid Program, based on the Basic Design Study report prepared by JICA and the results are then submitted for approval by the Cabinet.

Fourthly, the Project approved by the Cabinet becomes official when pledged by the Exchange of Notes signed by the both Governments.

Finally, for the implementation of the Project, JICA assists the recipient country in preparing contracts and so on.

2. Basic design Study

(1)Contents of the Study

The purpose of the Study (Preliminary Study/Basic Design Study) conducted on a project requested by JICA is to provide a basic document necessary for appraisal of the project by the Japanese Government. The contents of the Study are as follows:

a) to confirm background, objectives, benefits of the project and also institutional capacity of agencies concerned of the recipient country necessary for project implementation,
b) to evaluate appropriateness of the Project for the Grant Aid Scheme from a technical, social and economical point of view,
c) to confirm items agreed on by the both parties concerning a basic concept of the project,
d) to prepare a basic design of the project,
e) to estimate cost involved in the project.

Final project components are subject to approval by the Government of Japan and therefore may differ from an original request.

Implementing the project, the Government of Japan requests the recipient country to take necessary measures involved which are itemized on Exchange of Notes.

(2)Selecting (a) Consulting Firm(s)

For smooth implementation of the study, JICA uses (a) consulting firm(s) registered. JICA selects (a) firm(s) through proposals submitted by firms which are interested. The firm(s) selected carry(ies) out a Basic Design Study and write(s) a report, based upon terms of reference made by JICA.

The consulting firm(s) used for the study is(are) recommended by JICA to a recipient country after Exchange of Notes, in order to maintain technical consistency and also to avoid possible undue delay in implementation caused if a new selection process is repeated.

(3)Status of a Preliminary Study in the Grant Aid Program

A Preliminary Study is conducted during the second step of a project formulation & preparation as mentioned above.

A result of the study will be utilized in Japan to decide if the Project is to be suitable for a Basic Design Study.

Based on the result of the Basic Design Study, the Government would proceed to the stage of decision making process(appraisal and approval).

It is important to notice that at the stage of Preliminary Study, no commitment is made by the Japanese side concerning the realization of the Project in the scheme of Grant Aid Program.

3. Japan's Grant Aid Scheme

(1)What is Grant Aid?

The Grant Aid Program provides a recipient country with non reimbursable funds needed to procure facilities, equipment and services for economic and social development of the country under the following principles in accordance with relevant laws and regulations of Japan. The Grant Aid is not in a form of donation or such.

(2)Exchange of Notes (E/N)

The Japan's Grant Aid is extended in accordance with the Exchange of Notes by both Governments, in which the objectives of the Project, period of execution, conditions and amount of the Grant etc. are confirmed.

(3)"The period of the Grant Aid" means one Japanese fiscal year which the Cabinet approves the Project for. Within the fiscal year, all procedure such as Exchange of Notes, concluding a contract with (a) consulting firm(s) and (a) contractor(s) and a final payment to them must be completed.

(4)Under the Grant, in principle, products and services of origins of Japan or the recipient country are to be purchased.

When the two Governments deem it necessary, the Grant may be used for the purchase of products or services of a third country origin.

However the prime contractors, namely, consulting, contractor and procurement firms, are limited to "Japanese nationals". (The term "Japanese nationals" means Japanese physical persons or Japanese juridical persons controlled by Japanese physical persons.)

(5)Necessity of the "Verification"

The Government of the recipient country or its designated authority will conclude into contracts in Japanese yen with Japanese nationals. Those contracts shall be verified by the Government of Japan. The "Verification" is deemed necessary to secure accountability to Japanese tax payers.

(6)Undertakings required to the Government of the recipient country

In the implementation of the Grant Aid, the recipient country is required to undertake necessary measures such as the following:

① to secure land necessary for the sites of the project and to clear and level the land prior to commencement of the construction work,

② to provide facilities for distribution of electricity, water supply and drainage and other incidental facilities in and around the sites,

③ to secure buildings prior to the installation work in case the Project is providing equipment,

④ to ensure all the expenses and prompt execution for unloading, customs clearance at the port of disembarkation and internal transportation of the products purchased under the Grant Aid,

⑤ to exempt Japanese nationals from customs duties, internal taxes and other fiscal levies which will be imposed in the recipient country with respect to the supply of the products and services under the Verified Contracts,

⑥ to accord Japanese nationals whose services may be required in connection with the supply of the products and services under the Verified Contracts, such facilities as may be necessary for their entry into the recipient country and stay therein for the performance of their work.

(7)Proper Use

The recipient country is required to maintain and use facilities constructed and equipment purchased under the Grant Aid properly and effectively and to assign staff necessary for their operation and maintenance as well as to bear all expenses other than those to be borne by the Grant Aid.

(8)Re-export

The products purchased under the Grant Aid shall not be re-exported from the recipient country.

(9)Banking Arrangement (B/A)

(a) The Government of the recipient country or its designated authority shall open an account in the name of the Government of the recipient country in an authorized foreign exchange bank in Japan (hereinafter referred to as "the Bank") . The Government of Japan will execute the Grant Aid by making payments in Japanese yen to cover the obligations incurred by Government of the recipient country or its designated authority under the contracts verified.

(b) The payments will be made when payment requests are presented by the Bank to the Government of Japan under an Authorization to Pay issued by the Government of the recipient country or its designated authority.

ANNEX II

Necessary measures to be taken by the Government of the Syrian Arab Republic on condition that Japan's Grant Aid is executed;

1. To provide necessary data and information for the Project.

2. To secure and clear the sites for the Project prior to the commencement of procurement under the Grant Aid Program.

3. To construct the access road to the sites prior to the commencement of the procurement.

4. To secure facilities such as garage for vehicles and warehouse for pipes, pumps, generators, and transformers until installing and laying them, and for spare parts procured by this project.

5. To undertake incidental work such as constructing pump houses, water reservoirs and fuel tanks.

6. To bear advising commission of Authorization to Pay (A/P) and payment commission to a Japanese foreign exchange bank for the banking services based on the Banking Arrangement (B/A).

7. To exempt taxes and to take necessary measures for customs clearance of the materials and equipment brought for the Project at the port /airport of disembarkation.

8. To ensure prompt unloading and internal transportation of the equipment procured under the Grant.

9. To accord Japanese nationals, whose services may be required in connection with the supply of products and the services under the verified contracts, such facilities as may be necessary for their entry into Syrian Arab Republic and stay therein for the execution of the Project.

10. To provide necessary permissions, licenses and other authorization for carrying out the project.

11. To provide necessary actions to expedite the approval for execution of the project by the authorities concerned in the Syrian Arab Republic.

12. To maintain and make proper and effective use of the equipment purchased under the Grant.

13. To bear all the expenses, other than those covered by the Grant, necessary for execution of this project.

別紙資料－５　シリア・アラブ共和国の社会・経済事情

国名	シリア・アラブ共和国
	Syrian Arab Republic

1995.05　1/2

一般指標					
政体	共和制	*1	面積	185.18 千Km^2	*1
元首	President Hafiz al-ASAD	*1	人口	14,338.527 千人 (1993年)	*1
独立年月日	1946年04月17日	*1	首都	ダマスカス	*1
人種(部族)構成	ｱﾗﾌﾞ人88%、ｸﾙﾄﾞ人	*1	主要都市名	ハラブ、ヒムス、ラタキア	*1
		*1	経済活動可人口	3,000 千人 (1992年)	*4
言語・公用語	ｱﾗﾋﾞｱ語（公用語）	*1	義務教育年数	6 年間 (1994年)	*6
宗教	ｲｽﾗﾑ教85%、（ｽﾝﾆｰ派70%、ｱﾗｳｨ12%）	*1	初等教育就学率	109.0 % (1990年)	*2
国連加盟	1945年10月	*1	識字率	67.0 % (1992年)	*4
世銀・IMF加盟	1947年04月	*1	人口密度	77.430213 人/Km^2 (1992年)	*2
			人口増加率	3.76 % (1993年)	*2
			平均寿命	平均66.12 男65.07 女67.22	*1
			5歳児未満死亡率	55/1000 (1992年)	*2
			ｶﾛﾘｰ供給量	3,120.0cal/日/人 (1990年)	*2

経済指標							
通貨単位	シリア・ポンド			*1	貿易量	(1992年)	*3
為替ﾚｰﾄ(1US$)	1US$= 11.225	(05月)		*3	輸出	3,263.0 百万ﾄﾞﾙ	*4
会計年度	1月～ 12月			*1	輸入	3,365.0 百万ﾄﾞﾙ	*4
国家予算		(1992年)		*2	輸入ｶﾊﾞｰ率	-- %	*4
歳入	6,322.1	百万ﾄﾞﾙ		*2	主要輸出品目	石油、農産物、繊維、リン酸鉱石	*1
歳出	6,830.9	百万ﾄﾞﾙ		*2	主要輸入品目	食品、飲料品、機械、金属製品	*1
国際収支	76.00	百万ﾄﾞﾙ	(1992年)	*2	日本への輸出	9.0 百万ﾄﾞﾙ (1992年)	*5
ODA受取額	163.00	百万ﾄﾞﾙ	(1992年)	*2	日本からの輸入	302.0 百万ﾄﾞﾙ (1992年)	*5
国内総生産(GDP)	--	百万ﾄﾞﾙ	(1992年)	*4			
一人当たりGNP	--	ﾄﾞﾙ	(1992年)	*4	外貨準備総額	193.0 百万ﾄﾞﾙ (1988年)	*1
GDP産業別構成	農業 30.0 %		(1991年)	*2	対外債務残高	16,513.0 百万ﾄﾞﾙ (1992年)	*4
	鉱工業 23.0 %		(1991年)		対外債務返済率	26.9 % (1990年)	*4
	ｻｰﾋﾞｽ業 47.0 %		(1991年)		ｲﾝﾌﾚ率	-- % (1992年)	*2
産業別雇用	農業 23.0 %			*2			
	鉱工業 29.0 %						
	ｻｰﾋﾞｽ業 48.0 %				国家開発計画	シンクトア経済開発５ヵ年計画（１９９５年）	*5
経済成長率	9.0 %		(1992年)	*4			

*7

気象(1970 年～ 1979 年平均) 場所：Damascus													(標高 720m)
月	1	2	3	4	5	6	7	8	9	10	11	12	平均/計
最高気温	12.0	14.0	18.0	24.0	29.0	33.0	36.0	37.0	33.0	27.0	19.0	13.0	24.5 ℃
最低気温	2.0	4.0	6.0	9.0	13.0	16.0	18.0	18.0	16.0	12.0	8.0	4.0	10.5 ℃
平均気温	7.0	9.0	12.0	16.5	21.0	24.5	27.0	27.5	24.5	19.5	13.5	8.5	17.5 ℃
降水量	43.0	43.0	8.0	13.0	3.0	0.0	0.0	0.0	18.0	10.0	41.0	41.0	18.3 mm
雨期/乾期					乾	乾	乾	乾	乾				

*1 The World Factbook(C.I.A)(1993)
*2 Human Development Report(UNDP)(1994)
*3 International Financial Statistics(IMF)(1995)
*4 World Debt Tables(WORLD)(1994)
*5 世界の国一覧(外務省外務報道官監修)(1993)
*6 最新世界各国要覧(1994)
*7 World Weather Guide(1990)

国名	シリア・アラブ共和国
	Syrian Arab Republic

1995.05 2/2

*8

我が国におけるＯＤＡの実績 （資金協力は約束額ベース、単位：億円）

項目＼年度	1989	1990	1991	1992
無償資金協力	2,043.46	2,382.47	2,515.30	2,699.97
技術協力	2,146.74	1,989.63	2,050.70	2,194.95
有償資金協力	5,161.42	5,676.39	7,364.47	5,852.05
総　額	9,351.62	10,048.49	11,930.47	10,746.97

*7

当該国に対する我が国ＯＤＡの実績 （支出純額、単位：百万ドル）

項目＼歴年	1989	1990	1991	1992
無償資金協力	4.38	4.08	4.24	4.45
技術協力	0.00	0.50	0.00	0.36
有償資金協力	37.82	0.95	111.08	4.49
総　額	42.20	5.53	115.32	9.30

*9

ＯＥＣＤ諸国の経済協力実績 （支出純額、単位：百万ドル）

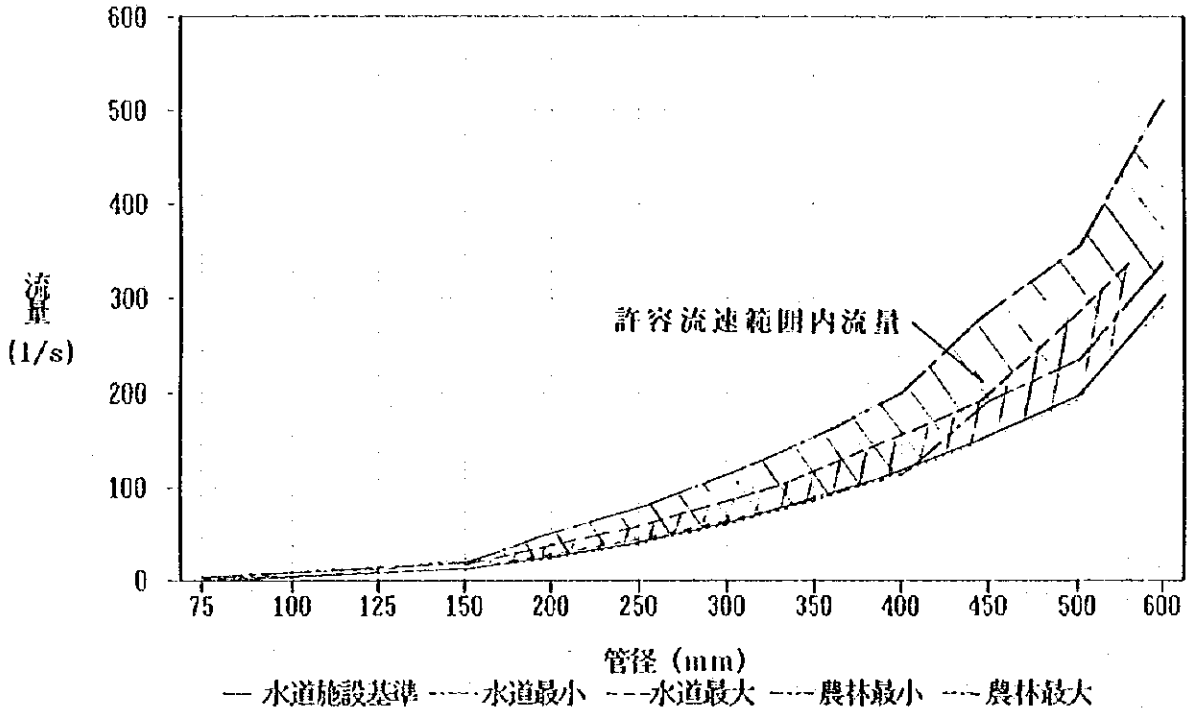
	贈　与 (1)		有償資金協力 (2)	政府開発援助 (ODA) (1)＋(2)＝(3)	その他政府資金及び民間資金 (4)	経済協力総額 (3)＋(4)
		技術協力				
二国間援助	29.80	27.00	20.60	77.40	0.00	77.40
(主要供与国)						
1. フランス	13.00	13.00	-0.30	25.70	0.00	25.70
2. ドイツ	9.20	8.00	8.00	25.20	0.00	25.20
3. 日本	4.80	4.50	4.50	13.80	0.00	13.80
4. オーストリア	1.00	0.90	0.00	1.90	0.00	1.90
多国間援助	26.00	7.80	25.60	59.40	-25.20	34.20
(主要援助機関)						
	0.00	0.00	0.00	0.00	0.00	0.00
	0.00	0.00	0.00	0.00	0.00	0.00
その他	5.40	0.00	0.60	6.00	52.80	58.80
合　計	61.20	34.80	46.80	142.80	27.60	170.40

*10

援助受入窓口機関	
技術	関係各省庁→経理府企画庁→企画大臣
無償	関係各省庁→経理府企画庁→企画大臣
協力隊	関係各省庁→経理府企画庁→企画大臣

*8 Japan's ODA(Annual Report)(1993)
*9 Geographical Distribution of Financial Flows of Developing Countris(OECD/OCDE)(1994)
*10 国別協力情報(JICA)

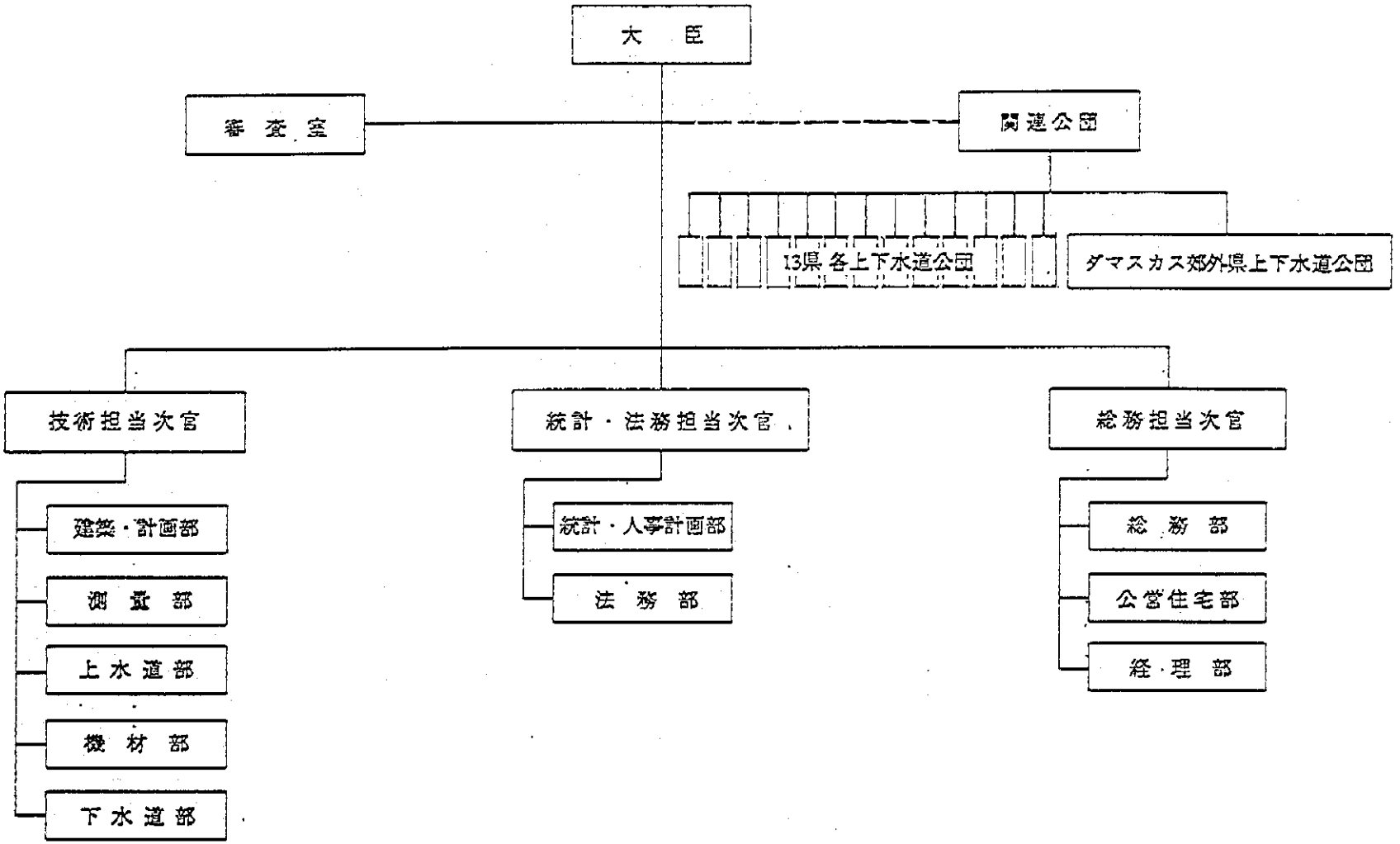
図－１　管径と管内単位時間流量



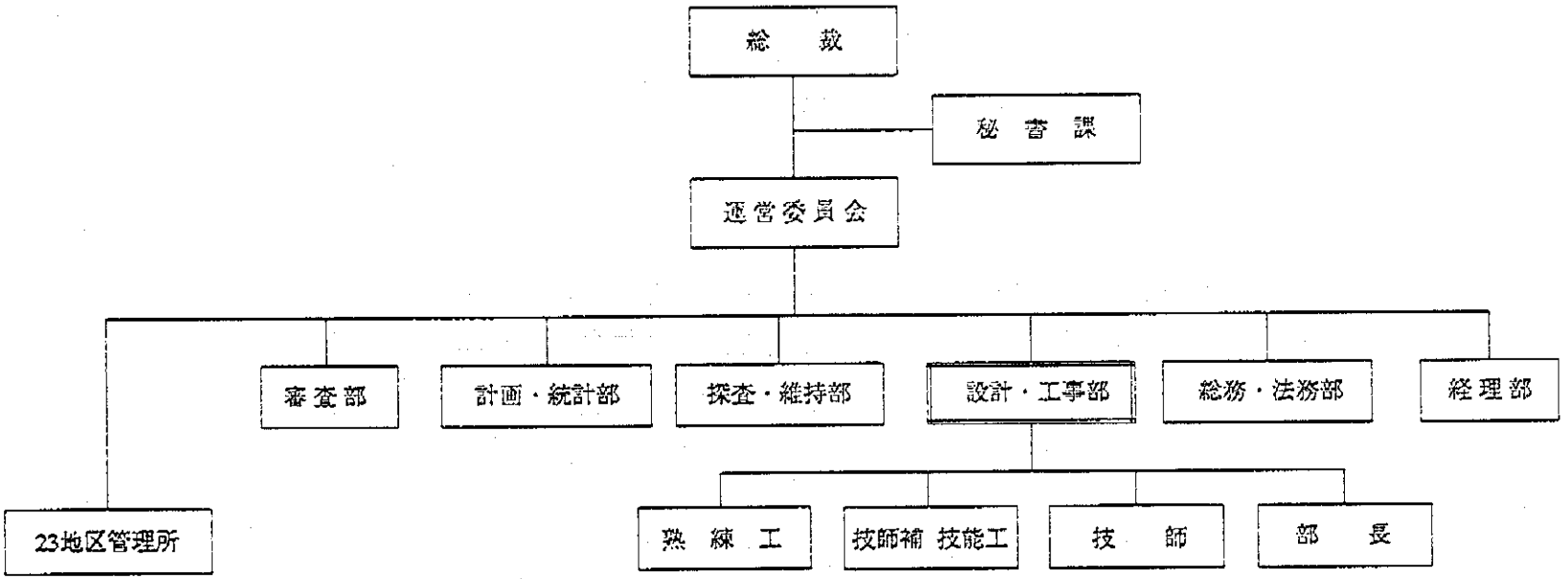
管径－管内許容流速－基準流量

管径	水道施設基準流速			農林基準流速		水道施設基準流量			農林基準流量	
d	V1	V1Min	V1Max	V2Min	V2Max	Q1	Q1Min	Q1Max	Q2Min	Q2Max
(mm)	(m/s)	(m/s)	(m/s)	(m/s)	(m/s)	(l/s)	(l/s)	(l/s)	(l/s)	(l/s)
75	0.570	-	0.595	0.700	1.000	2.52		4.67	3.00	4.00
100	0.620	0.595	0.640	0.700	1.000	4.88	4.67	7.85	5.00	8.00
125	0.660	0.640	0.680	0.700	1.000	8.14	7.85	12.02	9.00	12.00
150	0.700	0.680	0.730	0.700	1.000	12.37	12.02	22.93	12.00	18.00
200	0.760	0.730	0.785	0.900	1.600	23.94	22.93	38.53	28.00	50.00
250	0.810	0.785	0.835	0.900	1.600	39.96	38.53	59.02	44.00	78.00
300	0.860	0.835	0.880	0.900	1.600	60.79	59.02	84.67	64.00	113.00
350	0.900	0.880	0.920	0.900	1.600	86.59	84.67	115.61	87.00	154.00
400	0.940	0.920	0.955	0.900	1.600	117.62	115.61	151.89	113.00	201.00
450	0.970	0.955	0.985	1.200	1.800	154.11	151.89	193.40	191.00	286.00
500	1.000	0.985	1.030	1.200	1.800	196.35	193.40	291.23	235.00	353.00
600	1.060	1.030		1.200	1.800	298.29	291.23		339.00	509.00

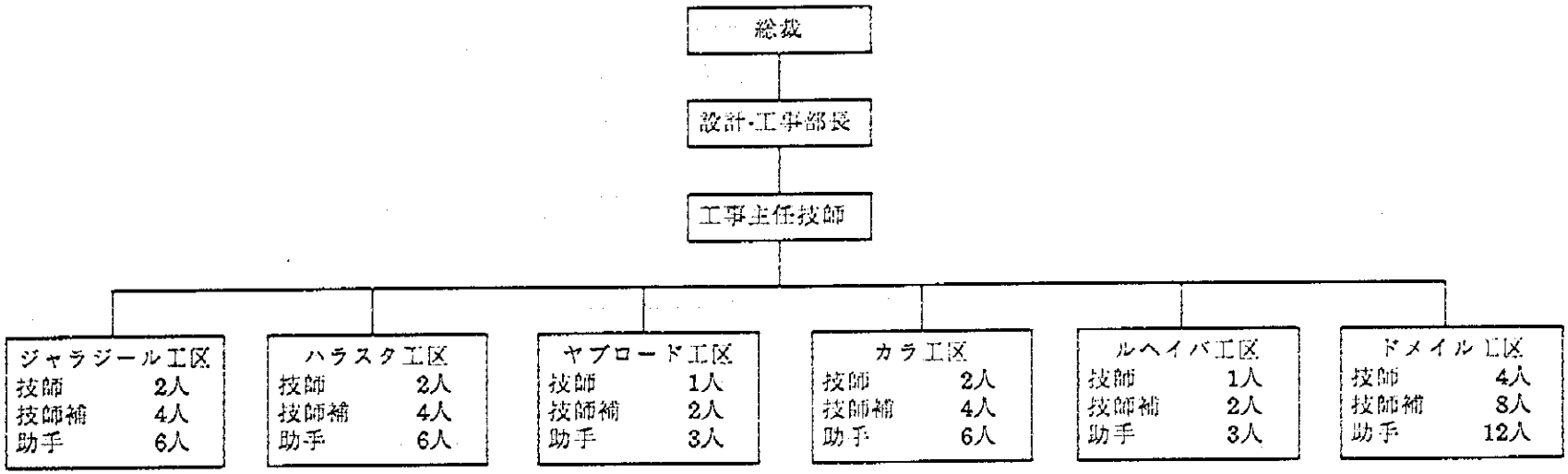
図－２　公共事業省組織図


大　臣
審 査 室
関連公団
13県 各上下水道公団
ダマスカス郊外県上下水道公団
技術担当次官
統計・法務担当次官
総務担当次官
建築・計画部
測 量 部
上 水 道 部
機 材 部
下 水 道 部
統計・人事計画部
法 務 部
総 務 部
公営住宅部
経 理 部

図－３　ダマスカス郊外県上下水道公団



図－4　給水開発計画工事組織図



図－5　工事工程表（1/2）

Construction Schedule

Description	Unit	Year / month Q'ty	1996 J	F	M	A	M	J	J	A	S	O	N	D	1997 J	F	M	A	M	J	J	A	S	O	N	D	1998 J	F	M	A	M	J	J	A	S	O
Jarajir																																				
Pumping House	lot	1 Achieve.																																		
Reservoir	lot	1 Achieve.																																		
Transformer Tower	lot	1																																		
Pipe Installation	km	7.0																																		
Generator Install	lot	1																																		
Pump Install	lot	2																																		
Fuel Tank	lot	1																																		
Digging Well No.1	lot	1																																		
Gr Reservoir	lot	1																																		
Pump House	lot	1																																		
Harasta/Urbin																																				
Pumping House	lot	2 Achieve																																		
Reservoir	lot	3 Achieve																																		
Transformer Build	lot	1 Achieve																																		
Pipe Install	km	9.9																																		
Generator Install	lot	2																																		
Pump Install	lot	6																																		
Gr Reservoir	lot	1																																		
Fuel Tank	lot	1																																		
Yobroud																																				
Pumping House	lot	2																																		
Reservoir	lot	1																																		
Pipe Install	km	2.7																																		
Pump Install	lot	4																																		
Qara																																				
Pumping House	lot	3 Achieve																																		
Reservoir	lot	1 Achieve																																		
Transformer Build	lot	1																																		
Pipe Install	km	11.5																																		
Generator Install	lot	1																																		
Pump Install	lot	3																																		
Transformer Inst.	lot	1																																		
Fuel Tank	lot	1																																		
Rabelbeh																																				
Pumping House	lot	3 Achieve.																																		
Reservoir	lot	1 Achieve																																		
Transformer Build	lot	1 Achieve																																		
Pipe Install	km	2.8																																		
Generator Install	lot	1																																		
Pump Install	lot	4																																		
Generator House	lot	1 Achieve																																		
Fuel Tank	lot	1																																		
Pump House	lot	1																																		

工事工程表 (2/2)

Construction Schedule

Description	Unit	Year / month / Q'ty	1996												1997												1998									
			J	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J	J	A	S	O
Domair																																			
Facilities Const.	lot	1 Achieve																																	
Pumping House	lot	1 Achieve																																	
Reservoir	lot	1 Achieve																																	
Pipe Install	km	23.3																																	
Generator Install	lot	1 Achieve																																	
Pump Install	lot	2 Achieve																																	
Deir Atiya																																			
Pumping House	lot	1 Achieve																																	
Reservoir	lot	1 Achieve																																	
Pipe Install	km	6 Achieve																																	
Generator Install	lot	1																																	
Pump Install	lot	1																																	
Nabek																																			
Pumping House	lot	1 Achieve																																	
Reservoir	lot	1 Achieve																																	
Pipe Install	km	7 Achieve																																	
Generator Install	lot	1																																	
Pump Install	lot	4																																	
Qodsaya																																			
Pumping House	lot	3																																	
Reservoir	lot	1																																	
Pipe Install	km	17.7																																	
Generator Install	lot	3																																	
Pump Install	lot	11																																	
Transformer Inst.	lot	1																																	

表

表－1　現況井戸の水質

項目	単位	ｼﾘｱ基準値(上限値又は範囲)	ｼﾞｬﾗｼﾞｰﾙ	ﾊﾗｽﾀ	ｱﾙﾋﾟﾝ	ﾔﾌﾞﾙｰﾄﾞ(ｺﾚｲﾈ)*	ｶﾗ	ﾙﾍｲﾊﾞ	ﾃﾞｨﾙｱﾃｲｱ(ﾜﾃﾞｨｱﾝﾔﾌﾞ)	ﾅﾍﾞｸ*	ﾄﾞﾒｲﾙ	ｸﾄﾞｾｲﾔ
採水日時			95.08.27	95.03.19	95.03.07	95.04.03	95.08.27	95.08.27	95.08.27	95.03.18	95.10.24	95.02.18
分析日時			95.08.28	95.03.19	95.03.07	95.04.03	95.08.28	95.08.28	95.08.28	95.03.18	95.10.24	95.02.18
濁度	NTU	5.00	0.90	1.80	1.60	0.40	1.90	1.20	3.40	1.40	0.60	1.50
電気伝導度	μs/cm		385.00	877.00	952.00	580.00	533.00	822.00	718.00	765.00	1,506.20	1,512.00
PH		6.5～8.5	7.40	7.96	7.53	8.05	7.90	7.90	8.10	7.90	6.96	7.79
蒸留残留物	mg/l	1,000.00	193.00	440.00	477.00	291.00	266.00	412.00	360.00	383.00	927.05	
NH4+	mg/l	0.05	0.03	0.00	0.00	0.03	0.01	0.06	0.13	0.03	0.02	0.00
Na+	mg/l	200.00	6.21	11.96	38.41	2.30	9.20	5.98	44.16	28.75	100.05	87.17
K+	mg/l		1.00	3.00	1.75	0.50	4.75	1.50	0.50	2.75		3.25
Ca++	mg/l		60.00	112.00	128.00	96.00	48.00	100.00	104.00	96.00	156.00	140.00
Mg++	mg/l		56.80	36.48	34.05	17.02	24.32	34.05	12.16	36.48	56.09	53.50
Fe+++	mg/l		0.03	0.02	0.01	0.02	0.02	0.04	0.29	0.01	0.12	0.05
陽イオン計	mg/l		124.07	163.16	202.22	115.87	86.30	141.63	161.24	164.02	312.28	283.97
F-	mg/l	0.70	0.10	0.14	0.18	0.30	0.20	0.60	0.29	0.50	1.08	
Cl-	mg/l	250.00	14.20	49.70	49.70	28.40	14.20	42.60	49.70	42.60	347.90	142.00
SO4—	mg/l	250.00	7.00	42.00	30.00	7.00	8.00	65.00	65.00	85.00	125.00	200.00
CO3—	mg/l		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
HCO3-	mg/l		256.20	300.40	488.00	305.00	244.00	329.40	317.20	366.00	244.00	390.40
NO3-	mg/l	40.00	7.07	30.94	53.04	19.90	19.89	7.07	10.61	7.51	13.56	41.99
NO2-	mg/l	0.01	0.00	0.03	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00
PO4—	mg/l		1.26	0.50	0.38	0.80	0.78	0.49	1.19	0.21	0.23	0.90
陰イオン計	mg/l		285.85	513.71	621.30	361.40	287.07	444.56	443.70	501.33	736.77	775.29
塩類合計	mg/l		409.90	677.17	823.52	477.27	373.37	586.19	604.94	665.35	1,049.05	1,059.26
全硬度	mg/l	500.00	230.00	430.00	460.00	310.00	220.00	390.00	310.00	390.00	620.00	570.00
遊離CO2	mg/l		7.80	4.40	4.40	4.40	4.40	4.40	4.40	8.80	8.80	8.80
水銀Hg	mg/l	0.001	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
鉛 Pb	mg/l	0.010	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
カドミCd	mg/l	0.005	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
クロムCr	mg/l	0.050	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
大腸菌類	/100ML	0.00	40.00	24.00	36.00	Nil	N.A.	N.A.	Negative	Negative	N.A.	N.A.
総細菌類	/100ML	200 or 2000colon	Layer of colonies	Layer of colonies	Layer of colonies	3colonies	N.A.	N.A.	Negative	Negative	N.A.	N.A.

摘要　1: * 印は計画井戸と同一の水源であることを示す。

表－2　計画井戸の水質

項目	単位	シリア基準値（上限値又は範囲）	ジャラジール	ハラスタ	ヤブルート（コレイヌ）(1)	ヤブルート（コレイヌ）(2)	（ラスアルアイン）	カラ	ルヘイバ	デイルアテイア（ワディアシヤフ）	ナベック（アルコウブ）(1)	ナベック（アルコウブ）(2)	ナベク（アドラ）(1)	ナベク（アドラ）(2)	クトゼイヤ ディマス（ワディマルクン）(1)	クトゼイヤ ディマス（ワディマルクン）(2)
採水日時			94. .	95.03.19	95.04.03	94. .	94.06.22	94. .	95.03.29	95.02.20	95.03.18	95.08.27	94.07.09	95.02.18	93.04.13	94. .
分析日時			94. .	95.03.19	95.04.03	94. .	94.06.23	94. .	95.03.29	95.02.21	95.03.18	95.08.28	94.07.09	95.02.18	93.04.13	94. .
濁度	NTU	5.00	0.00	2.00	0.40	0.50	1.90	1.00	1.00	1.00	1.40	0.60	1.60	1.00	3.50	
電気伝導度	μs/cm		663.00	668.00	580.00	593.00	265.80	662.00	518.00	660.00	765.00	691.00	551.00	667.00	186.00	884.00
PH		6.5～8.5	8.02	8.22	8.05		8.58	8.03	7.90	8.02	7.90	7.20	7.89	8.02	7.70	7.15
蒸留残留物	mg/l	1.000.00	330.00	333.00	291.00	297.00	196.51	331.00	260.00	330.00	383.00	349.00	372.87	334.00	166.66	441.00
NH4+	mg/l	0.05	0.00	0.00	0.03	0.00	0.00	0.00	0.00	0.00	0.03	0.00	0.00	0.00	0.00	0.05
Na+	mg/l	200.00	6.44	7.59	2.30	22.77	9.89	6.42	23.69	6.44	28.75	28.75	3.22	6.44	2.30	24.61
K+	mg/l		4.00	3.00	0.50	0.50	3.00	4.00	0.50	9.00	2.75	0.50	15.50	4.00		
Ca++	mg/l		72.00	80.00	96.00	80.00	52.00	70.00	72.00	72.00	96.00	112.00	68.00	72.00	36.00	72.00
Mg++	mg/l		41.30	29.18	17.02	24.32	7.30	41.20	7.30	41.34	36.48	24.32	38.91	41.34	17.07	17.02
Fe+++	mg/l		0.03	0.01	0.02	0.01	0.02	0.02	0.01	0.04	0.01	0.02	0.02	0.04	0.01	0.18
陽イオン計	mg/l		122.77	119.78	115.87	127.60	72.21	121.64	103.50	128.82	164.02	165.59	125.65	123.82	55.38	113.86
F-	mg/l	0.70		0.28	0.30	0.32			0.30		0.50	0.33	0.52		0.30	0.36
Cl-	mg/l	250.00	28.40	28.40	28.40	14.20	7.10	28.20	28.40	28.40	42.60	35.50	28.40	28.40	3.55	14.20
SO4--	mg/l	250.00	70.00	50.00	7.00	10.00	9.50	69.00	9.50	70.00	85.00	62.00	53.00	70.00	5.00	15.00
CO3--	mg/l		0.00	0.00	0.00	0.00	3.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
HCO3-	mg/l		310.00	292.80	305.00	366.00	183.00	309.00	244.00	305.00	366.00	390.40	305.00	305.00	170.80	317.20
NO3-	mg/l	40.00	6.50	9.28	19.90	22.10	12.82	6.40	13.26	6.60	7.51	8.40	12.38	6.60	16.79	8.80
NO2-	mg/l	0.01	0.00	0.01	0.00	0.01	0.00	0.00	0.01	0.00	0.01	0.00	0.02	0.00	0.00	0.06
PO4---	mg/l		0.60	0.61	0.80	0.30	0.38	0.50	0.36	0.65	0.21	0.54	0.40	0.65	0.24	0.69
陰イオン計	mg/l		415.50	381.38	361.40	412.93	215.80	413.10	295.53	410.65	501.33	497.17	399.72	410.65	196.68	356.31
塩類合計	mg/l		539.27	501.16	477.27	540.53	288.01	534.74	399.03	539.47	665.35	662.76	525.37	534.47	252.06	470.17
全硬度	mg/l	500.00	350.00	320.00	310.00	300.00	160.00	300.00	210.00	400.00	390.00	360.00	330.00	350.00	160.00	250.00
遊離CO2	mg/l		4.20	2.20	4.40	4.40	0.00	4.00	4.40	4.30	8.80	4.40	4.40	4.40	4.40	4.40
水銀Hg	mg/l	0.001	0.00087	0.00043	N.A.	N.A.	0.00040	0.00066	0.00049	0.00055	0.00045	N.A.	0.00095	N.A.	0.00064	N.A.
鉛 Pb	mg/l	0.010	0.00012	0.00052	N.A.	N.A.	0.00150	0.00037	0.00009	0.00089	0.00060	N.A.	0.00003	N.A.	0.00036	N.A.
カドミCd	mg/l	0.005	0.00023	0.00002	N.A.	N.A.	0.00008	0.00062	0.00007	0.00039	0.00003	N.A.	0.00060	N.A.	0.00006	N.A.
クロムCr	mg/l	0.050	0.00021	0.00038	N.A.	N.A.	0.00170	0.00049	0.00026	0.00001	0.00010	N.A.	0.00030	N.A.	0.00013	N.A.
大腸菌類	/100ML	0.00	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
総細菌類	/100ML	200 or 2000colon	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.

表－３　シリア国の水質基準

シリア国の水質基準　(Syrian Standard Specification No.45(Amended))

項目名	単位	シリア国	WHOガイドライン
色度（Co,Pt scale)		5以下	15(TCU)以下
味		異常でない	受容できること
臭気		異常でない	受容できること
濁度	NTU	2	1（平均で1NTU以下）
水素イオン濃度PH		6.5～8.5	
全溶解性物質TDS	mg/l	1,000	1,000
全硬度T. H	mg/l	500	
亜硝酸性窒素NO2-	mg/l	0.01	3（暫定）
硝酸性窒素NO3-		N<10, NO3-<40	50
燐酸イオンPO4---			
フッ素イオンF-		1.5	1.5
塩素イオンCl-		250	250
硫酸イオンSO4--		250	
鉄　Fe		0.3	0.3
マンガン　Mn		0.1	0.5（暫定）
銅　Cu		1.0	1.0
鉛　Pb		0.01	0.01
亜鉛　Zn		2.0	3.0（暫定）
水銀　Hg		0.001	0.001
クロム　Cr		0.05	0.05
カドミウムCd		0.005	0.003
アンモニア性窒素NH4+		0.05	
ナトリウムNa+		200	200
カリウム　K+			
カルシウムCa++			
マグネシウムMg++			
蒸発残留物		1,000	1,000

注）TCU : True Colour Unit（色度単位）
　　NTU : Nephelometric Turbidity Unit（濁度単位）

表－４　　計画の人口推移　及び　計画給水量

項目	単位	ハラスタ			計画一人一日平均給水量	ジャラジール	ヤブルード	カラ	ルヘイバ	ディル・アティア	ナベク	ドメイル	クトゼイヤダラヤ, ect	合計 又は平均
		ハラスタ	アルビン	合計										
計画一人一日平均給水量	l/人・日	200	200	200	-	110～125	110～125	110～125	110～125	110～125	110～125	110～125	200	-
人口増加率	%	4.00	4.00	4.00	-	3.35	3.35	3.35	3.35	3.35	3.35	3.35	4.00	-
給水人口														
１９９４年	人	70,192	40,945	111,137	-	3,928	51,241	17,500	25,099	24,201	43,562	27,598	N.A.	193,129
２０００年	人	88,815	51,808	140,624	-	4,787	62,443	21,326	30,586	29,491	53,085	33,631	N.A.	235,348
２００５年	人	108,057	63,033	171,090	-	5,644	73,626	25,145	36,064	34,774	62,593	39,655	N.A.	277,500
２０１０年	人	131,468	76,689	208,158	-	6,655	86,813	29,649	42,523	41,002	73,803	46,757	N.A.	327,201
２０１５年	人	159,951	93,304	253,255	-	7,847	102,362	34,959	50,139	48,345	87,022	55,131	N.A.	385,805
給水量														
１９９４年	m3/日	14,038	8,189	22,227	110	432	5,637	1,925	2,761	2,662	4,792	3,036	N.A.	43,472
２０００年	m3/日	17,763	10,362	28,125	110	527	6,869	2,346	3,364	3,244	5,839	3,699	N.A.	54,013
２００５年	m3/日	21,611	12,607	34,218	115	649	8,467	2,892	4,147	3,999	7,198	4,560	N.A.	66,131
２０１０年	m3/日	26,294	15,338	41,632	120	799	10,418	3,558	5,103	4,920	8,856	5,611	N.A.	80,896
２０１５年	m3/日	31,990	18,661	50,651	125	981	12,795	4,370	6,267	6,043	10,878	6,891	N.A.	98,877

表－５　　現況使用水量 及び 人口推定

地区名 / 項目	単位	ジャラジール	ハラスタ		ヤブルード	カラ	ルヘイバ	ディル・アティア	ナベク	ドメイル	クドセイヤ ダラヤ、etc	合計 又は 平均
			ハラスタ	アルビン								
１９９４年の給水人口	人	3,928	70,192	40,945	51,241	17,500	25,099	24,201	43,562	27,598	(159,000)	304,266
１９９４年年間使用水量	m3／年	146,000	3,000,000	1,218,000	1,300,000	603,000	796,000	625,000	1,392,000	964,000	N.A.	10,044,000
日平均使用水量	m3／日	400	8,219	3,337	3,562	1,652	2,181	1,712	3,814	2,641	N.A.	27,518
１９９４年における 一人一日平均使用水量	l/人・日	102	117	81	70	94	87	71	88	96	N.A.	90
１９９４年における 期別使用水量												
第１期(1.2.3月)	m3	15,000	600,000	250,000	250,000	105,000	125,000	100,000	250,000	175,000		1,870,000
〃 負荷率	%	42	81	83	78	71	64	65	73	74		76
第２期(4.5.6月)	m3	40,000	700,000	350,000	300,000	160,000	221,000	150,000	392,000	250,000		2,563,000
〃 負荷率	%	110	94	115	93	106	111	96	113	104		102
第３期(7.8.9月)	m3	71,000	1,000,000	368,000	500,000	228,000	300,000	250,000	450,000	339,000		3,506,000
〃 負荷率	%	193	132	120	153	150	150	159	128	140		138
第４期(10.11.12月)	m3	20,000	700,000	250,000	250,000	110,000	150,000	125,000	300,000	200,000		2,105,000
〃 負荷率	%	54	93	81	76	72	75	79	86	82		83
合計	m3／年	146,000	3,000,000	1,218,000	1,300,000	603,000	796,000	625,000	1,392,000	964,000		10,044,000
一日平均使用水量	m3／日	400	8,219	3,337	3,562	1,652	2,181	1,712	3,814	2,641		27,518
推定人口 （人口増加率より推定）												
1981	人	N.A.	N.A.	N.A.	N.A.	7,484	N.A.	N.A.	N.A.	N.A.	N.A.	
：												
1990	人	3,450	60,000	35,000	45,000	10,068	22,000	N.A.	N.A.	N.A.	N.A.	
1991	人	3,564	62,400	36,400	46,485	10,405	22,737	N.A.	N.A.	25,000	N.A.	
1992	人	3,681	64,896	37,856	48,019	10,753	23,499	N.A.	N.A.	25,838	N.A.	
1993	人	3,803	67,492	39,370	49,604	11,114	24,286	N.A.	N.A.	26,703	N.A.	
1994	人	3,928	70,192	40,945	51,241	11,486	25,099	24,201	43,562	27,598	159,000	457,252
1995	人	4,058	72,999	42,583	52,931	11,871	25,940	25,000	45,000	28,522	164,565	473,470
人口増加率（要請書）	%	3.30	4.00	4.00	3.30	3.35	3.35	3.30	3.30	3.35	3.50	3.48
2015	人	7,768	159,950	93,304	101,326	22,945	50,140	47,857	86,143	55,130	327,450	952,014

表－６　　計画送水量　及び　給水可能年

地区名：　ハラスク

計画対象年		年	1994	2000	2005	2010	2015	摘　要
給水人口	人口増加率 (A)R=4.00%	人	111,137	140,624	171,090	208,158	253,255	
計画１人１日平均給水量	(B)	l/人日	200	200	200	200	200	
計画１日平均給水量	①= A x B	m3/日	22,227	28,125	34,218	41,632	50,651	
計画１日最大給水量	②=1.5x①	m3/日	33,341	42,187	51,327	62,447	75,977	
計画全需要量	③=①/16 ③=②/24	m3/時	1,389	1,758	2,139	2,602	3,166	
現況井戸揚水量	④	m3/時	1,205	1,205	1,205	1,205	1,205	700 + 505
必要送水量	⑤=③-④	m3/時	184	553	934	1,397	1,961	
計画井戸揚水量	⑥	m3/時	600	600	600	600	600	120 x 5
過不足水量	⑦=⑥-⑤	m3/時	416	47	-334	-797	-1,361	
計画送水量	⑧=⑤or⑥	m3/時	184	553	600	600	600	
給水可能年	⑨	年		2000.62				

表－7　計画送水量　及び　給水可能年

地区名：ジャラジール

計画対象年		年	1994	2000	2005	2010	2015	摘要
給水人口	人口増加率 (A)R=3.35%	人	3,928	4,787	5,644	6,655	7,847	
計画１人１日平均給水量	(B)	l/人日	110	110	115	120	125	
計画１日平均給水量	①= A x B	m3/日	432	527	649	799	981	
計画１日最大給水量	②=1.5x①	m3/日	648	790	974	1,198	1,471	
計画全需要量	③=①/16 ③=②/24	m3/時	27	33	41	50	61	
現況井戸揚水量	④	m3/時	0	0	0	0	0	
必要送水量	⑤=③-④	m3/時	27	33	41	50	61	
			50x1本の場合					
計画井戸揚水量	⑥	m3/時	50	50	50	50	50	50 x 1
過不足水量	⑦=⑥-⑤	m3/時	23	17	9	0	-11	
計画送水量	⑧=⑤or⑥	m3/時	27	33	41	50	50	
給水可能年	⑨	年				2010		
			50x2本の場合					
計画井戸揚水量	⑥	m3/時	100	100	100	100	100	50 x 2
過不足水量	⑦=⑥-⑤	m3/時	73	67	59	50	39	
計画送水量	⑧=⑤or⑥	m3/時	27	33	41	50	61	
給水可能年	⑨	年					2015	

表－８　計画送水量　及び　給水可能年

地区名：　ヤブルード

計画対象年		年	1994	2000	2005	2010	2015	摘　要
給水人口	人口増加率 (A)R=3.35%	人	51,241	62,443	73,626	86,813	102,362	
計画１人１日平均給水量	(B)	l/人日	110	110	115	120	125	
計画１日平均給水量	①＝ A x B	m3/日	5,637	6,869	8,467	10,418	12,795	
計画１日最大給水量	②=1.5x①	m3/日	8,455	10,303	12,701	15,626	19,193	
計画全需要量	③=①/16 ③=②/24	m3/時	352	429	529	651	800	
現況井戸揚水量			120	120	120	120	120	60 x 2
計画井戸（コレイネ）	④	m3/時	180	180	180	180	180	45 x 4
必要送水量	⑤=③-④	m3/時	52	129	229	351	500	
計画井戸揚水量	⑥	m3/時	200	200	200	200	200	ラスアルアイン 100 x 2
過不足水量	⑦=⑥-⑤	m3/時	148	71	-29	-151	-300	
計画送水量	⑧=⑤or⑥	m3/時	52	129	200	200	200	
給水可能年	⑨	年		2003.55				

表－９　計画送水量　及び　給水可能年

地区名：　カラ

計画対象年		年	1994	2000	2005	2010	2015	摘　要
給水人口	人口増加率 (A)R=3.35%	人	17,500	21,326	25,145	29,649	34,959	
計画１人１日平均給水量	(B)	l/人日	110	110	115	120	125	
計画１日平均給水量	①＝ A x B	m3/日	1,925	2,346	2,892	3,558	4,370	
計画１日最大給水量	②＝1.5x①	m3/日	2,888	3,519	4,338	5,337	6,555	
計画全需要量	③＝①/16 ③＝②/24	m3/時	120	147	181	222	273	
現況井戸揚水量	④	m3/時	16	16	16	16	16	7 x 1 ＋ 9 x 1
必要送水量	⑤＝③－④	m3/時	104	131	165	206	257	
計画井戸揚水量	⑥	m3/時	135	135	135	135	135	50 x 2 ＋ 35 x 1
過不足水量	⑦＝⑥－⑤	m3/時	31	4	-30	-71	-122	
計画送水量	⑧＝⑤ or ⑥	m3/時	104	131	135	135	135	
給水可能年	⑨	年		2000.47				

表－１０　計画送水量　及び　給水可能年

地区名：　ルヘイバ

計画対象年		年	1994	2000	2005	2010	2015	摘　要
給水人口	人口増加率 (A)R=3.35%	人	25,099	30,586	36,064	42,523	50,139	
計画１人１日平均給水量	(B)	l/人日	110	110	115	120	125	
計画１日平均給水量	①＝Ａ ｘ Ｂ	m3/日	2,761	3,364	4,147	5,103	6,267	
計画１日最大給水量	②＝1.5x①	m3/日	4,141	5,047	6,221	7,654	9,401	
計画全需要量	③＝①/16 ③＝②/24	m3/時	173	210	259	319	392	
現況井戸揚水量	④	m3/時	105	105	105	105	105	50 ＋ 7 ＋ 17 ＋ 15 ＋ 16
必要送水量	⑤＝③－④	m3/時	68	105	154	214	287	
計画井戸揚水量	⑥	m3/時	180	180	180	180	180	45 ｘ 4
過不足水量	⑦＝⑥－⑤	m3/時	112	75	26	-34	-107	
計画送水量	⑧＝⑤ or ⑥	m3/時	68	105	154	180	180	
給水可能年	⑨	年			2007.17			

表－１１　計画送水量　及び　給水可能年

地区名：　ディル・アティア

計画対象年		年	1994	2000	2005	2010	2015	摘　要
給水人口	人口増加率 (A)R=3.35%	人	24,201	29,491	34,774	41,002	48,345	
計画１人１日 平均給水量	(B)	l/人日	110	110	115	120	125	
計画１日平均給水量	①＝ A x B	m3/日	2,662	3,244	3,999	4,920	6,043	
計画１日最大給水量	②=1.5x①	m3/日	3,993	4,866	5,998	7,380	9,065	
計画全需要量	③=①/16 ③=②/24	m3/時	166	203	250	308	378	
現況井戸揚水量	④	m3/時	147	147	147	147	147	35 x 1 + 15 x 1 + (35 + 20 + 42) x 1
必要送水量	⑤=③-④	m3/時	19	56	103	161	231	
計画井戸揚水量	⑥	m3/時	45	45	45	45	45	45 x 1
過不足水量	⑦=⑥-⑤	m3/時	26	-11	-58	-116	-186	
計画送水量	⑧=⑤or⑥	m3/時	-	-	-	-	-	管路は既設
給水可能年	⑨	年	1998.2					

表－１２　計画送水量　及び　給水可能年

地区名：　ナベク

計画対象年		年	1994	2000	2005	2010	2015	摘　要
給水人口	人口増加率 (A) R=3.35%	人	43,562	53,085	62,593	73,803	87,022	
計画１人１日平均給水量	(B)	l/人日	110	110	115	120	125	
計画１日平均給水量	①＝ A x B	m3/日	4,792	5,839	7,198	8,856	10,878	
計画１日最大給水量	②＝1.5x①	m3/日	7,188	8,759	10,797	13,285	16,317	
計画全需要量	③＝①/16 ③＝②/24	m3/時	299	365	450	554	680	
現況井戸揚水量	④	m3/時	115	115	115	115	115	50 x 2 + 15 x 1
必要送水量	⑤＝③－④	m3/時	184	250	335	439	565	
計画井戸揚水量	⑥	m3/時	220	220	220	220	220	55 x 4
過不足水量	⑦＝⑥－⑤	m3/時	36	-30	-115	-219	-345	
計画送水量	⑧＝⑤or⑥	m3/時	-	-	-	-	-	管路は既設
給水可能年	⑨	年	1997.27					

表－１３　計画送水量　及び　給水可能年

地区名：ドメイル

計画対象年		年	1994	2000	2005	2010	2015	摘　要
給水人口	人口増加率 (A)R=3.35%	人	27,598	33,631	39,655	46,757	55,131	
計画１人１日平均給水量	(B)	l/人日	110	110	115	120	125	
計画１日平均給水量	①＝Ａ ｘ Ｂ	m3/日	3,036	3,699	4,560	5,611	6,891	
計画１日最大給水量	②＝1.5x①	m3/日	4,554	5,549	6,840	8,416	10,337	
計画全需要量	③＝①/16 ③＝②/24	m3/時	190	231	285	351	431	
現況井戸揚水量	④	m3/時	30	30	30	30	30	15 ｘ 2
必要送水量	⑤＝③－④	m3/時	160	201	255	321	401	
計画井戸揚水量	⑥	m3/時	200	200	200	200	200	100 ｘ 2
過不足水量	⑦＝⑥－⑤	m3/時	40	-1	-55	-121	-201	
計画送水量	⑧＝⑤ or ⑥	m3/時	-	-	-	-	-	管路は既設
給水可能年	⑨	年	1999.85					

表－１４　　計画井戸の揚水試験結果

項　目	単　位	ｼﾞｬﾗｼﾞｰﾙ	ﾊﾗｽﾀ	ﾔﾌﾞﾙｰﾄﾞ（ﾗｽｱﾙｱｲﾝ）	ｶﾗ	ﾙﾍｲﾊﾞ	ﾃﾞｨﾙｱﾃｲｱ（ﾜﾃﾞｨｱﾝﾔﾌﾞ）	ﾅﾍﾞｸ	ﾄﾞﾒｲﾙ	ｸﾄﾞｾｲﾔ
試験日時		93.08.10	93.09.05	92.05.12	93.10.02	95.09.20	92.　.	93.08.25	93.10.15	
試験揚水量	m3/時	50.00	90.00	59.00	50.00	60.00	45.00	55.00	94.00	N.A.
井戸深さ	m	370.00		257.00	325.00		320.00	400.00		
ﾎﾟﾝﾌﾟ深さ	m	180.00	110.00		270.00	260.00	240.00	364.00	125.00	
ﾎﾟﾝﾌﾟ出力	Hp	60.00	120.00		90.00	100.00	50.00	120.00	70.00	
①初期水位	GL-(m)	171.00	85.00	23.30	260.00	180.00	180.00	320.00	90.80	
②平衡水位	GL-(m)	172.00	85.91	25.95	263.01	240.10	220.00	340.00	104.37	
③低下水位	(②-①)m	1.00	0.91	2.65	3.01	60.10	40.00	20.00	13.57	
④初期時刻	ti Hr	8.00	8.00		8.00	8.00	6.00	6.00	6.00	
⑤平衡時刻	tb Hr	52.00	58.00		46.00	44.00	30.00	60.00	72.00	
⑥低下時刻	(⑤-④)Hr	44.00	50.00		38.00	36.00	24.00	54.00	66.00	
⑦回復水位	GL-(m)	171.00	85.00		260.00	180.00	180.00	320.00	90.80	
⑧ﾎﾟﾝﾌﾟ停止時刻	tp Hr	70.00	70.00		70.00	36.00	72.00	72.00	72.00	
⑨水位回復時刻	tr Hr	75.00	72.00		84.00	46.00	84.00	77.00	75.00	
⑩回復時間	(⑨-⑧)Hr	5.00	2.00		14.00	10.00	12.00	5.00	3.00	
⑪比湧出量	m2/時	50.00	98.90	22.30	16.60	1.00	1.13	2.75	6.93	

表－１５　計画送水管路口径と井戸ポンプの容量及び台数

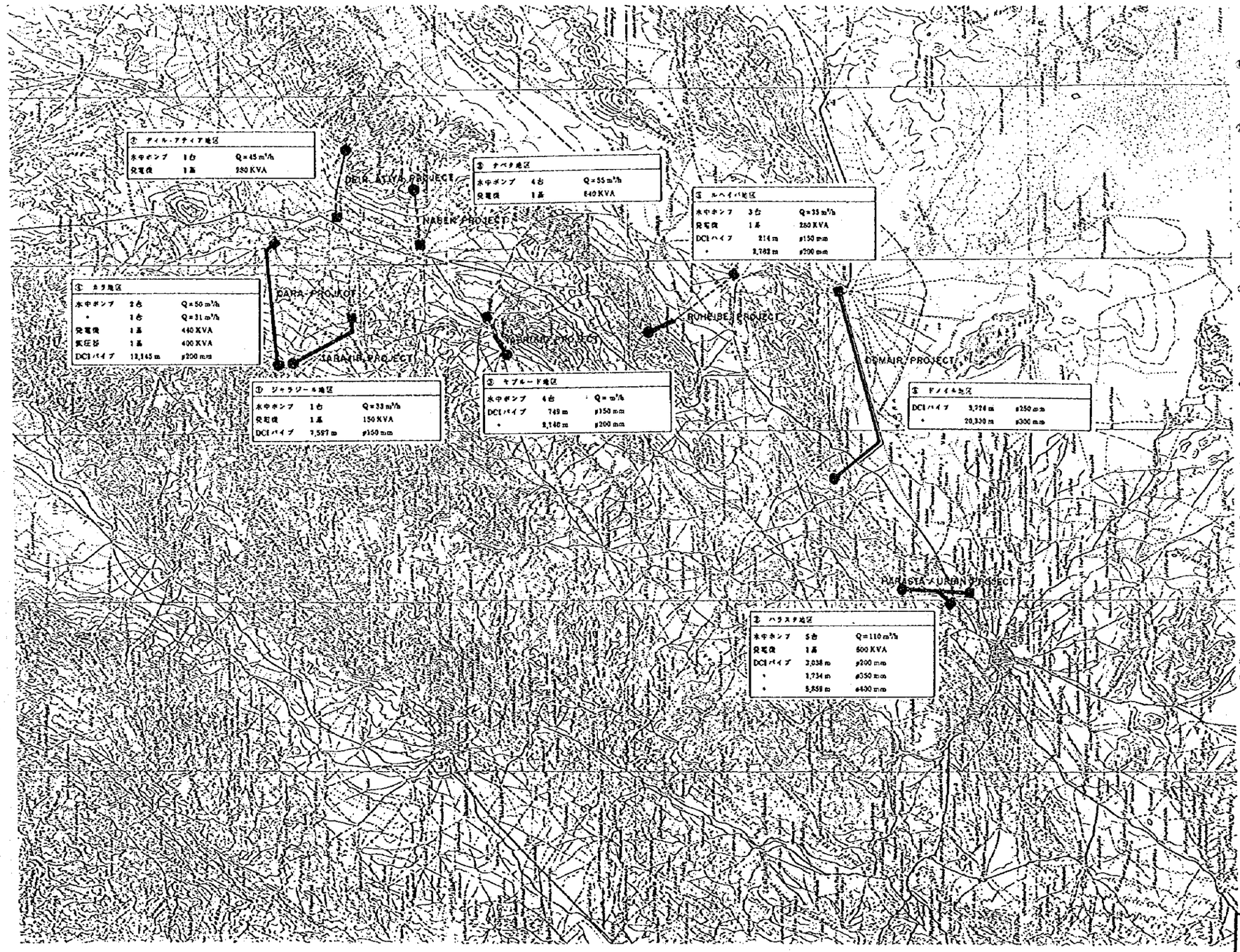
項　目	単　位	ｼﾞｬﾗｼﾞｰﾙ	ﾊﾗｽﾀ			ﾔﾌﾞﾙｰﾄﾞ	ｶﾗ	ﾙﾍｲﾊﾞ	ﾃﾞｨﾙ･ｱﾃｲｱ	ﾅﾍﾞｸ	ﾄﾞﾒｲﾙ	
			水源地－分岐点	分岐点－ﾊﾗｽﾀ	分岐点－ｱﾙﾋﾞﾝ						ｱﾄﾞﾗ－増圧ﾎﾟﾝﾌﾟ	増圧ﾎﾟﾝﾌﾟ－ﾄﾞﾒｲﾙ
目標年次 ２０００年 計画送水量	m3/時 l／s	33 9.2	553 153.6	410 113.9	143 39.7	129 35.8	131 36.4	105 29.2	56(45) －	250(220) －	200 55.6	200 55.6
適用標準口径	mm	125	400	350	200	200	200	200	－	－	300	250
流速	m/s	0.75	1.22	1.18	1.26	1.14	1.16	0.93	－	－	0.79	1.13
動水勾配	m/Km	5.84	3.73	4.10	8.92	7.38	7.59	5.04	－	－	2.30	5.60
管路延長	Km	7,100	5,475	1,620	2,839	2,000	11,350	2,300	－	－	19,000	3,480
損失水頭	m	41.48	20.40	6.65 27.05	25.34 45.74	14.75	86.13	11.59	－	－	43.78	19.49
有効水頭	m	186	(77)	59	72	44	490	102	－	－	50	-72
判定	－	OK	OK	OK	OK	OK	OK	OK	－	－	OK	－
要請吉口径	mm	150	500	400	250	250	250	250	－	－	300	300
計画全揚水量	m3/時	33	553	－	－	(129 +) 180	131	105	56(45)	250(220)	200	増圧ﾎﾟﾝﾌﾟ 200
要請吉ﾎﾟﾝﾌﾟ 揚水量x 台数	m3/時x台	50 x 2	(120 x) (5)	－	－	45 x 4	50 x 2 + 35 x 1	45 x 4	45 x 1	55 x 4	(100 x) (2)	－
計画ﾎﾟﾝﾌﾟ 揚水量x 台数	m3/時x台	33 x 1	(110 x) (5)	－	－	45 x 4	50 x 2 + 31 x 1	35 x 3	45 x 1	55 x 4	(100 x) (2)	－

表－１６　計画井戸ポンプ諸元表

項　目	単　位	ｼﾞｬﾗｼﾞｰﾙ	ﾊﾗｽﾀ	ﾔﾌﾞﾙｰﾄﾞ	カラ		ﾙﾍﾍﾟﾊﾞ	ﾃﾞｨﾙ･ｱﾃｲｱ	ﾌﾍﾞｸ	ﾄﾞﾒｲﾙ
計画揚水量	m3/時 m3/分	33 0.55	110 1.83	45 0.75	50 0.83	31 0.52	35 0.58	45 0.75	55 0.92	100 1.67
ポンプ及び揚水管口径	mm	80	125	100	100	80	80	100	100	-
揚水管長	m	185.00	115.00	65.00	270.00	270.00	265.00	245.00	355.00	-
揚水管流速	m/s	1.82	2.49	1.59	1.77	1.71	1.93	1.59	1.95	-
動水勾配	m/m	0.05134	0.05418	0.03074	0.03735	0.04573	0.05724	0.03074	0.04456	-
揚水管損失水頭	m	9.50	6.23	2.00	10.09	12.35	15.17	7.53	15.82	-
集合管口径	mm	125	200	150	150	125	150	150	150	-
集合管長	m	50.00	150.00	50.00	50.00	50.00	250.00	50.00	50.00	-
集合管流速	m/s	0.75	0.97	0.71	0.79	0.70	0.55	0.71	0.86	-
動水勾配	m/m	0.00584	0.00549	0.00427	0.00519	0.00520	0.00268	0.00427	0.00619	-
集合管損失水頭	m	0.29	0.82	0.21	0.26	0.26	0.67	0.21	0.31	-
損失水頭合計	m	9.79	7.05	2.21	10.34	12.61	15.84	7.74	16.13	-
井戸揚水位	m	172	86	172	265	265	245	220	340	-
ポンプ吐水位	m	5	50	5	5	5	5	5	5	-
計画ﾎﾟﾝﾌﾟ実揚程	m	177	136	177	270	270	250	225	345	-
計画ﾎﾟﾝﾌﾟ全揚程	m	187	143	179	280	283	266	233	361	-
モーター出力	KW	30	75	37	75	45	45	55	90	-

設　計　図

事 業 概 要 図



計画調達機材の内容

①	ジャラジール		
	・ ダクタイル鋳鉄管	φ150mm	7,597 m
	・ 水中ポンプ	(33m3/h、177m)	1台
	・ ディーゼル発電機	(150KVA)	1基
②	パラスタ		
	・ ダクタイル鋳鉄管	φ200mm	3,038 m
	・ 〃	φ350mm	1,734 m
	・ 〃	φ400mm	5,858 m
	・ 水中ポンプ	(110m3/h、135m)	5台
	・ ディーゼル発電機	(600KVA)	1基
③	ヤブルード		
	・ ダクタイル鋳鉄管	φ150mm	749 m
	・ 〃	φ200mm	8,140 m
	・ 水中ポンプ	(45m3/h、177m)	4台
④	カラ		
	・ ダクタイル鋳鉄管	φ200mm	12,145 m
	・ 水中ポンプ	(50m3/h、270m)	2台
	・ 水中ポンプ	(31m3/h、270m)	1台
	・ ディーゼル発電機	(440KVA)	1基
	・ 変圧器	(400KVA)	1基
⑤	ルヘイバ		
	・ ダクタイル鋳鉄管	φ150mm	214 m
	・ 〃	φ200mm	8,782 m
	・ 水中ポンプ	(35m3/h、250m)	3台
	・ ディーゼル発電機	(280KVA)	1基
⑥	ドメイル		
	・ ダクタイル鋳鉄管	φ250mm	3,724 m
	・ 〃	φ300mm	20,330 m
⑦	ディル・アティア		
	・ 水中ポンプ	(45m3/h、225m)	1台
	・ ディーゼル発電機	(280KVA)	1基
⑧	ナベク		
	・ 水中ポンプ	(55m3/h、345m)	4台
	・ ディーゼル発電機	(640KVA)	1基

その他全体計画の中で必要な機材として

⑨	・ 4WDピックアップ	2台
⑩	・ スペアパーツ	1式

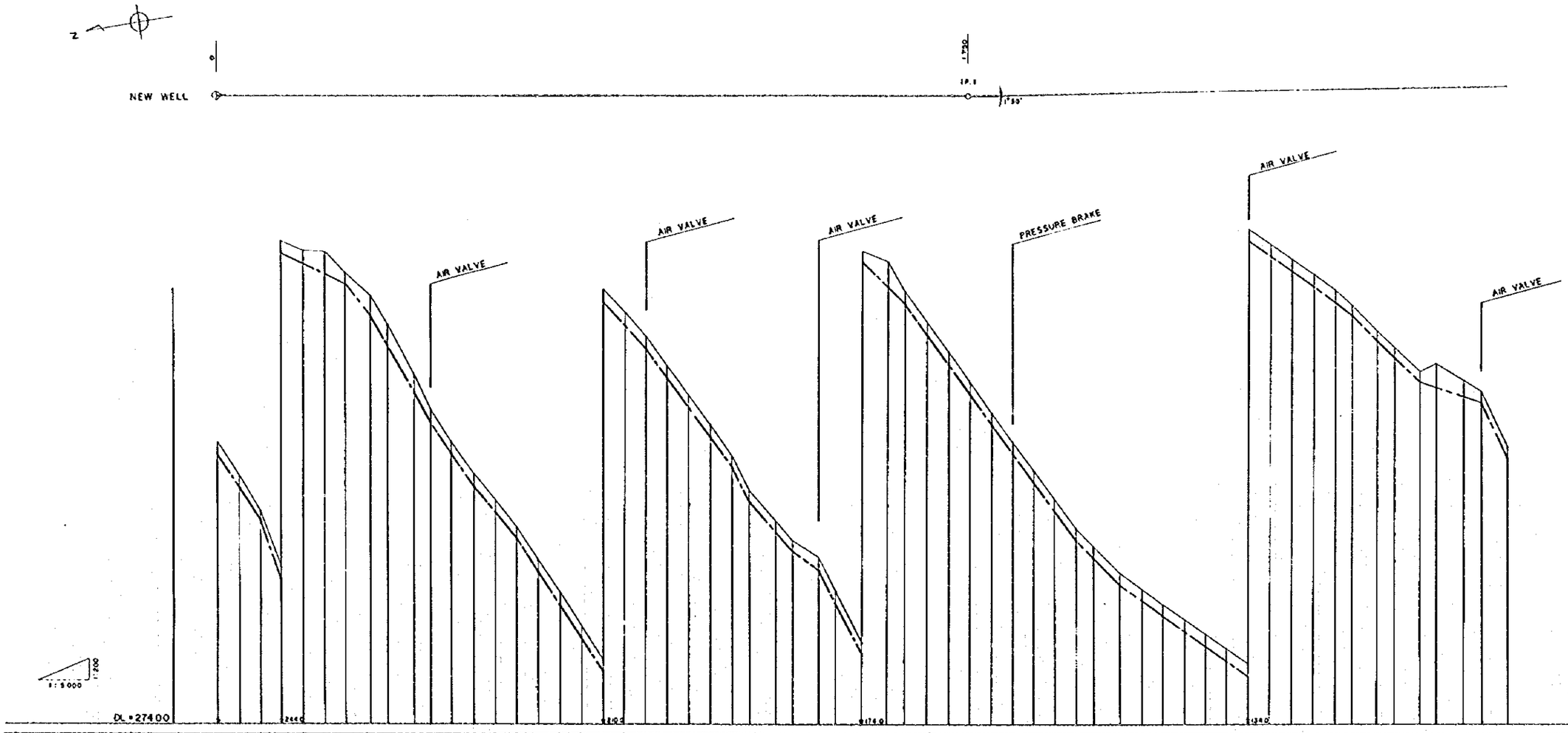
凡 例

- ● 水源井戸
- ■ 配水槽
- ——— 計画パイプライン
- ····· 既設パイプライン

THE SYRIAN ARAB REPUBLIC
THE PROJECT FOR WATER SUPPLY DEVELOPMENT IN RURAL PROVINCE OF DAMASCUS

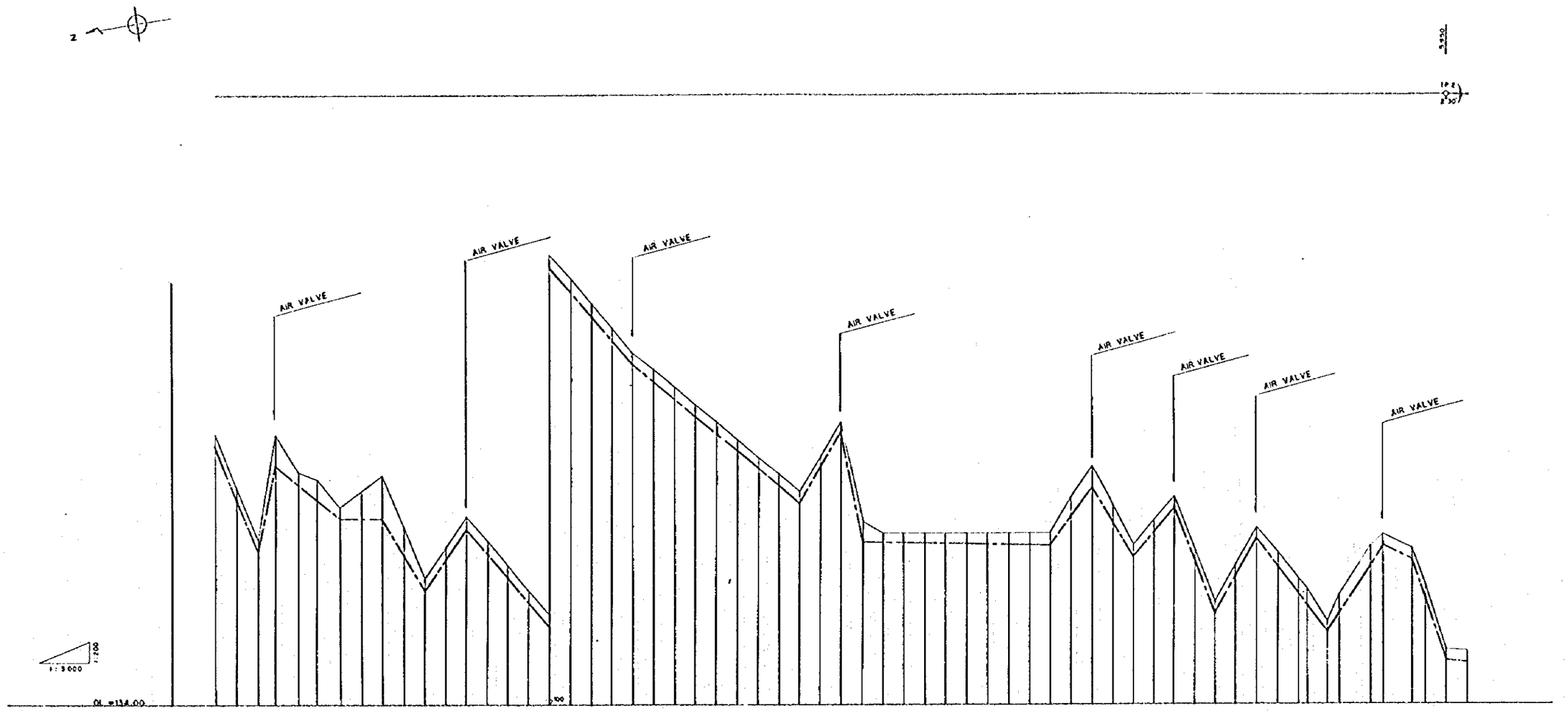
事業概要図	DRW. NO. 1

JAPAN INTERNATIONAL COOPERATION AGENCY



PLAN	PIPE SPECIFICATIONS	DIP φ150m K=9
	HYDRALIC ELEVATION	
	PIPE CENTER	
PRESENT CONDITION	GROUND ELEVATION	
	ACCUMULATED DISTANCE	
	DISTANCE	
	NUMBERAGE	
	ALIGNMENT	

THE SYRIAN ARAB REPUBLIC THE PROJECT FOR WATER SUPPLY DEVELOPMENT IN RURAL PROVINCE OF DAMASCUS	
ジャラジール地区 縦平面図 (1/3)	DRW. NO. 2
JAPAN INTERNATIONAL COOPERATION AGENCY	



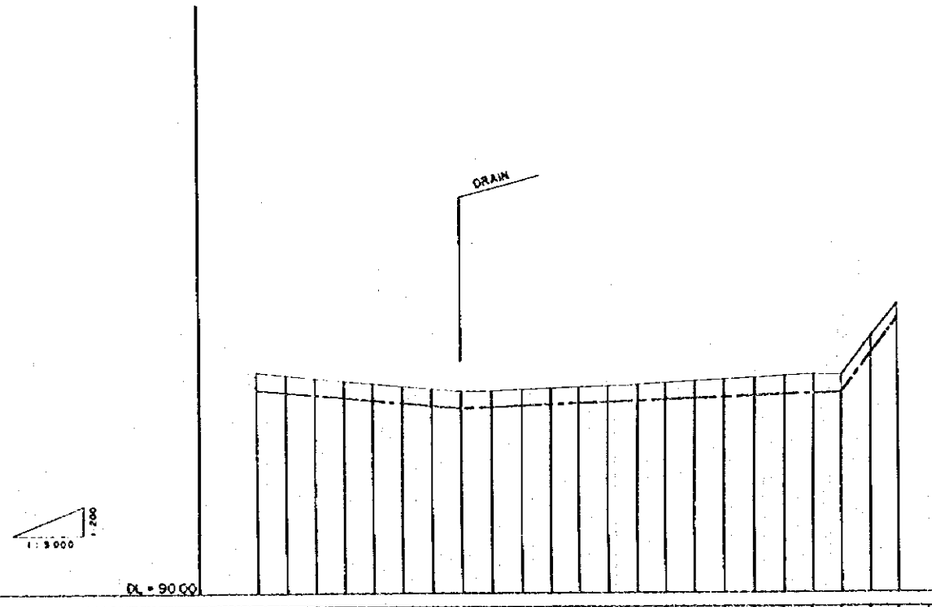
PLAN	PIPE SPECIFICATIONS	DIP φ150m K=9
	HYDRALIC ELEVATION	
	PIPE CENTER	
PRESENT CONDITION	GROUND ELEVATION	
	ACCUMULATED DISTANCE	
	DISTANCE	
	NUMBERAGE	
	ALIGNMENT	

THE SYRIAN ARAB REPUBLIC
THE PROJECT FOR WATER SUPPLY DEVELOPMENT IN RURAL PROVINCE OF DAMASCUS

ジャラジール地区
縦平面図 (2/3)

DRW. NO. 3

JAPAN INTERNATIONAL COOPERATION AGENCY



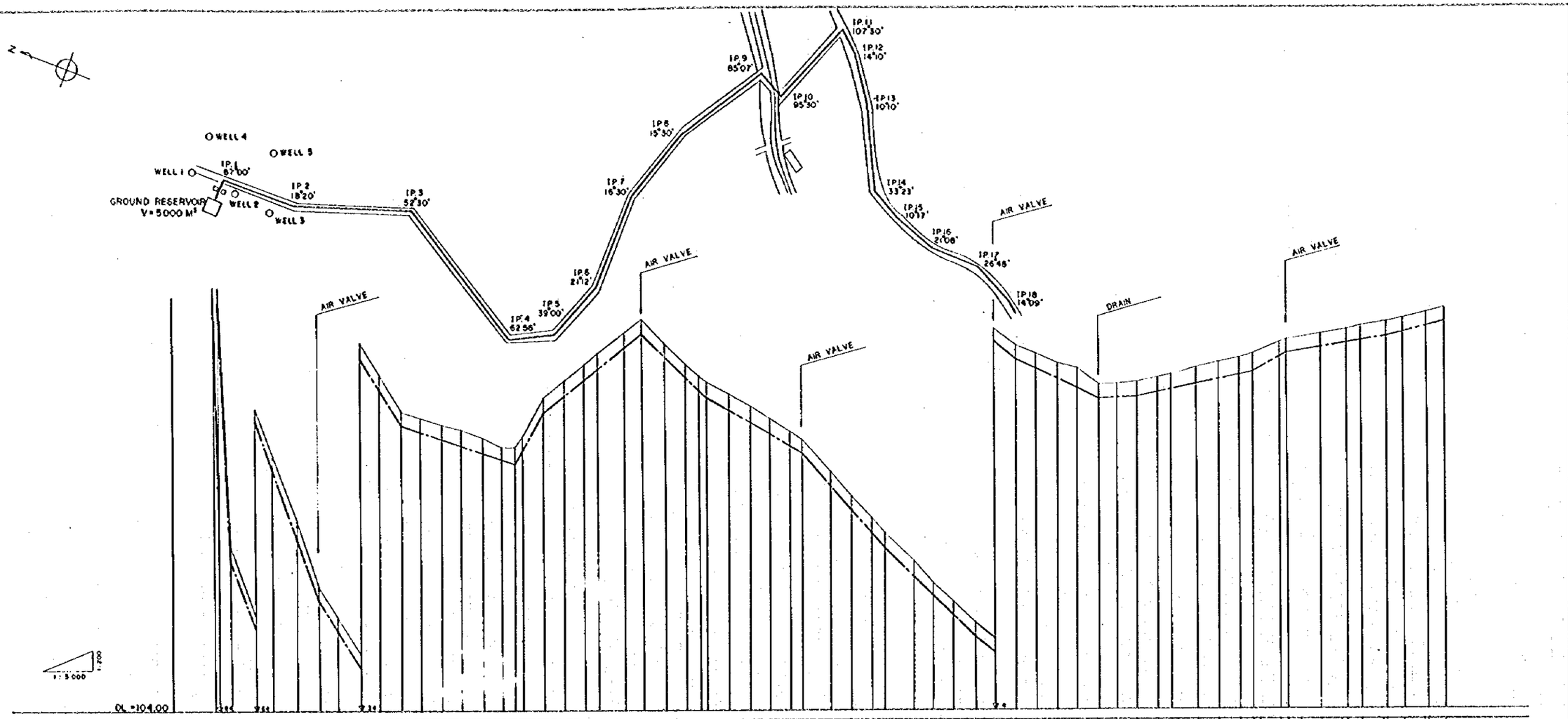
PLAN	PIPE SPECIFICATIONS	DIP φ150m K=9
	HYDRALIC ELEVATION	
	PIPE CENTER	
PRESENT CONDITION	GROUND ELEVATION	
	ACCUMULATED DISTANCE	
	DISTANCE	
	NUMBERAGE	
	ALIGNMENT	

THE SYRIAN ARAB REPUBLIC
THE PROJECT FOR WATER SUPPLY DEVELOPMENT IN RURAL PROVINCE OF DAMASCUS

ジャラジール地区
縦平面図 (3/3)

DRW. NO. 4

JAPAN INTERNATIONAL COOPERATION AGENCY



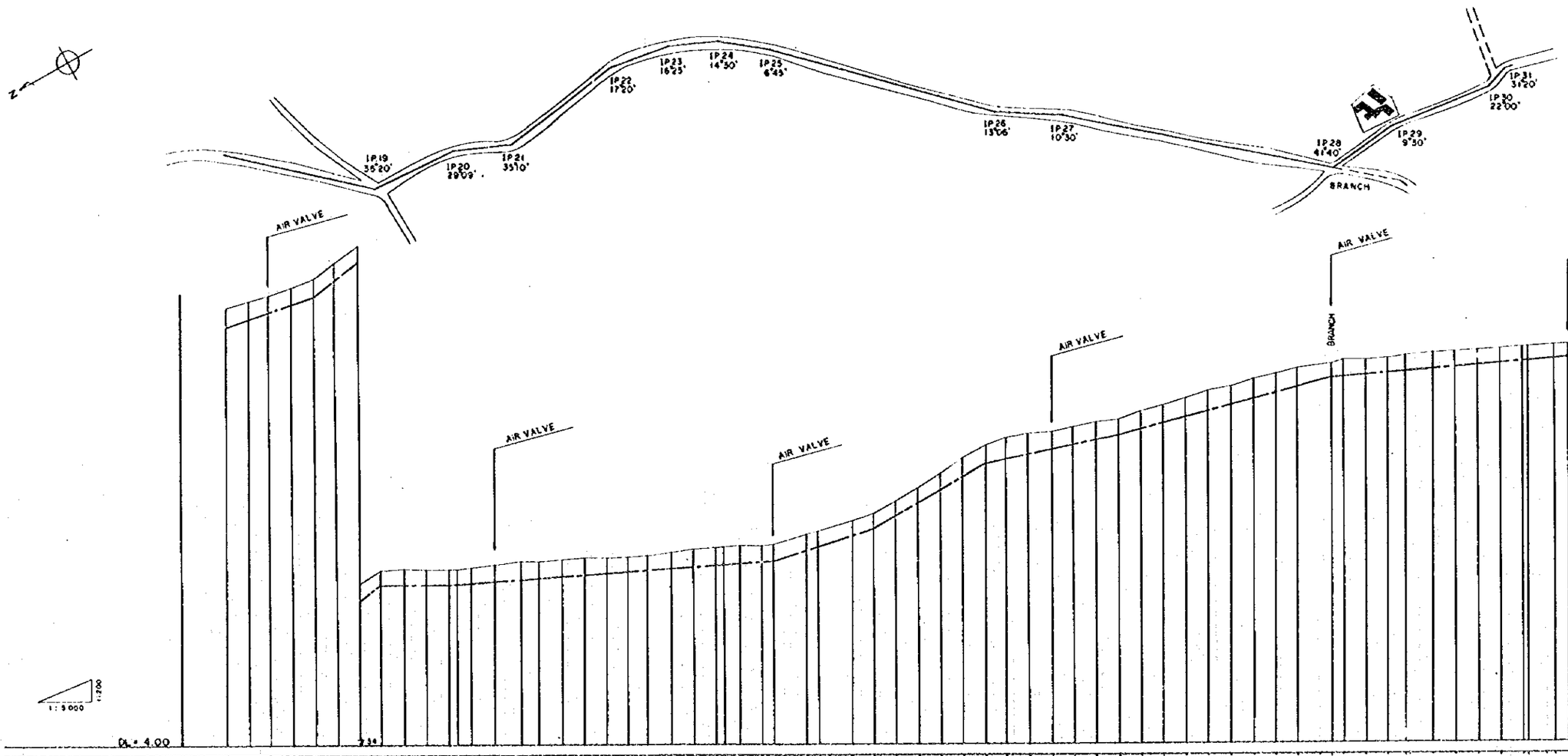
PLAN	PIPE SPECIFICATIONS	DIP ϕ400mm K=9
	HYDRALIC ELEVATION	
	PIPE CENTER	
PRESENT CONDITION	GROUND ELEVATION	
	ACCUMULATED DISTANCE	
	DISTANCE	
	NUMBERAGE	
	ALIGNMENT	IP 1 67°00' · IP 2 18°20' · IP 3 52°30' · IP 4 62°56' · IP 5 39°00' · IP 6 21°12' · IP 7 16°30' · IP 8 15°30' · IP 9 85°07' · IP 10 95°30' · IP 11 107°30' · IP 12 14°10' · IP 13 10°10' · IP 14 33°23' · IP 15 10°17' · IP 16 21°08' · IP 17 26°48' · IP 18 14°09'

THE SYRIAN ARAB REPUBLIC
THE PROJECT FOR WATER SUPPLY DEVELOPMENT IN RURAL PROVINCE OF DAMASCUS

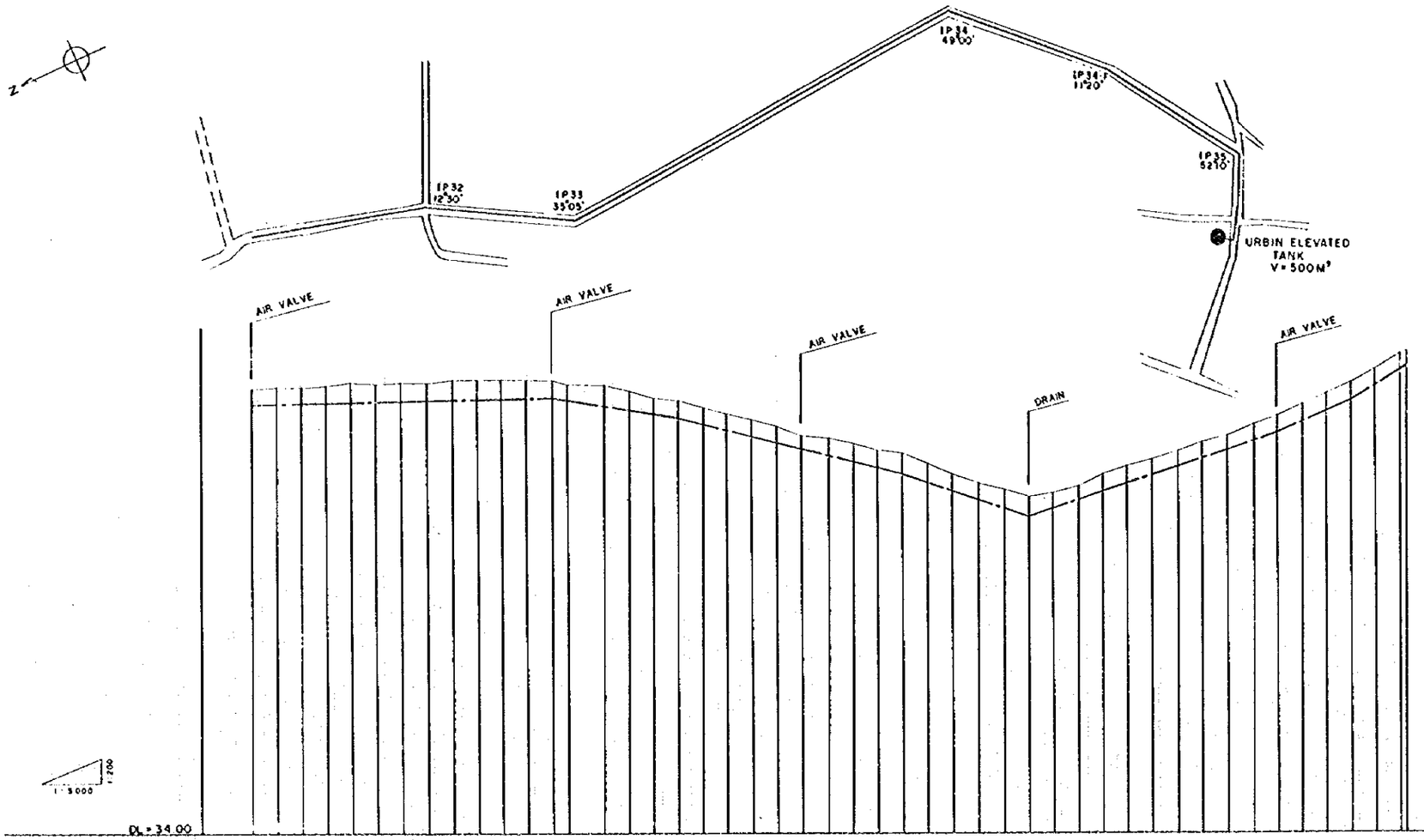
ハラスタ地区
縦平面図 (1/4)

DRW. NO. 5

JAPAN INTERNATIONAL COOPERATION AGENCY



THE SYRIAN ARAB REPUBLIC THE PROJECT FOR WATER SUPPLY DEVELOPMENT IN RURAL PROVINCE OF DAMASCUS	
ハラスタ地区 縦平面図 (2/4)	DRW. NO. 6
JAPAN INTERNATIONAL COOPERATION AGENCY	



PLAN	PIPE SPECIFICATIONS
	HYDRALIC ELEVATION
	PIPE CENTER
PRESENT CONDITION	GROUND ELEVATION
	ACCUMULATED DISTANCE
	DISTANCE
	NUMBERAGE
	ALIGNMENT

DIP ϕ200m K=9

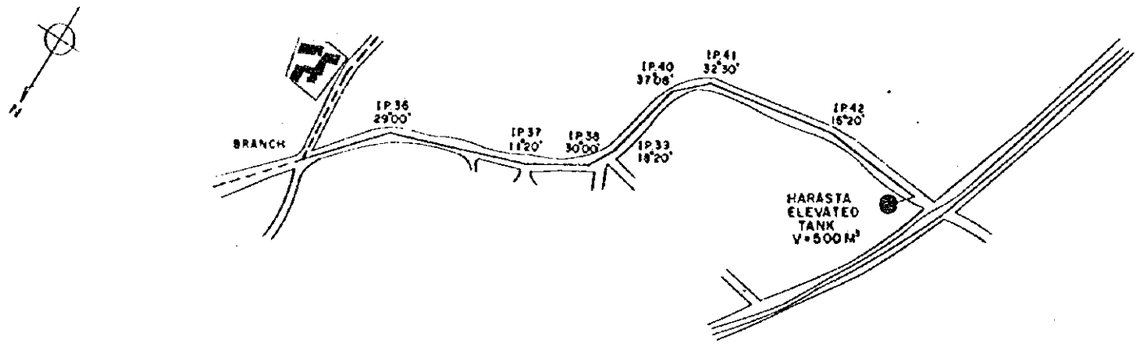
IP32 12°30' IP33 35°05' IP34 49°00' IP34-1 1°20' IP35 32°10'

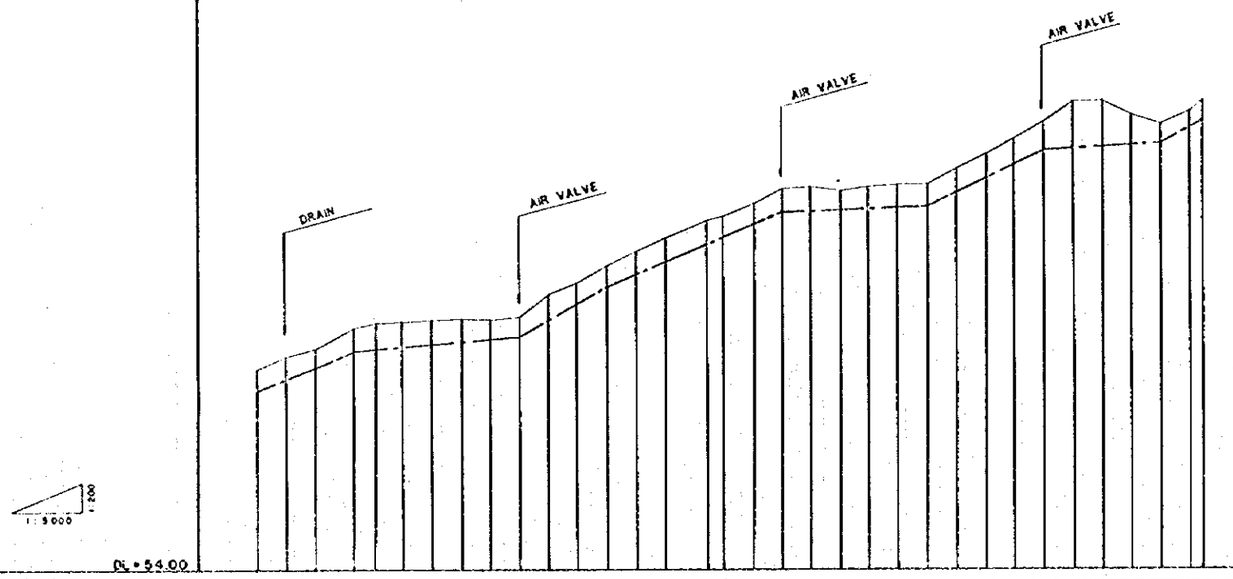
THE SYRIAN ARAB REPUBLIC
THE PROJECT FOR WATER SUPPLY DEVELOPMENT IN RURAL PROVINCE OF DAMASCUS

ハラスタ地区
縦平面図 (3/4)

DRW. NO. 7

JAPAN INTERNATIONAL COOPERATION AGENCY





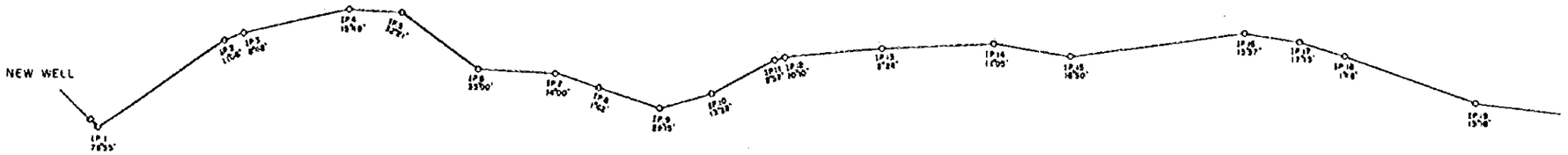
PLAN	PIPE SPECIFICATIONS	D I P φ 3 5 0 m/m K=9
	HYDRALIC ELEVATION	
	PIPE CENTER	
PRESENT CONDITION	GROUND ELEVATION	
	ACCUMULATED DISTANCE	
	DISTANCE	
	NUMBERAGE	
	ALIGNMENT	IP 36 29°00' / IP 37 11°20' / IP 38 30°00' / IP 39 18°20' / IP 40 37°08' / IP 41 32°30' / IP 42 15°20'

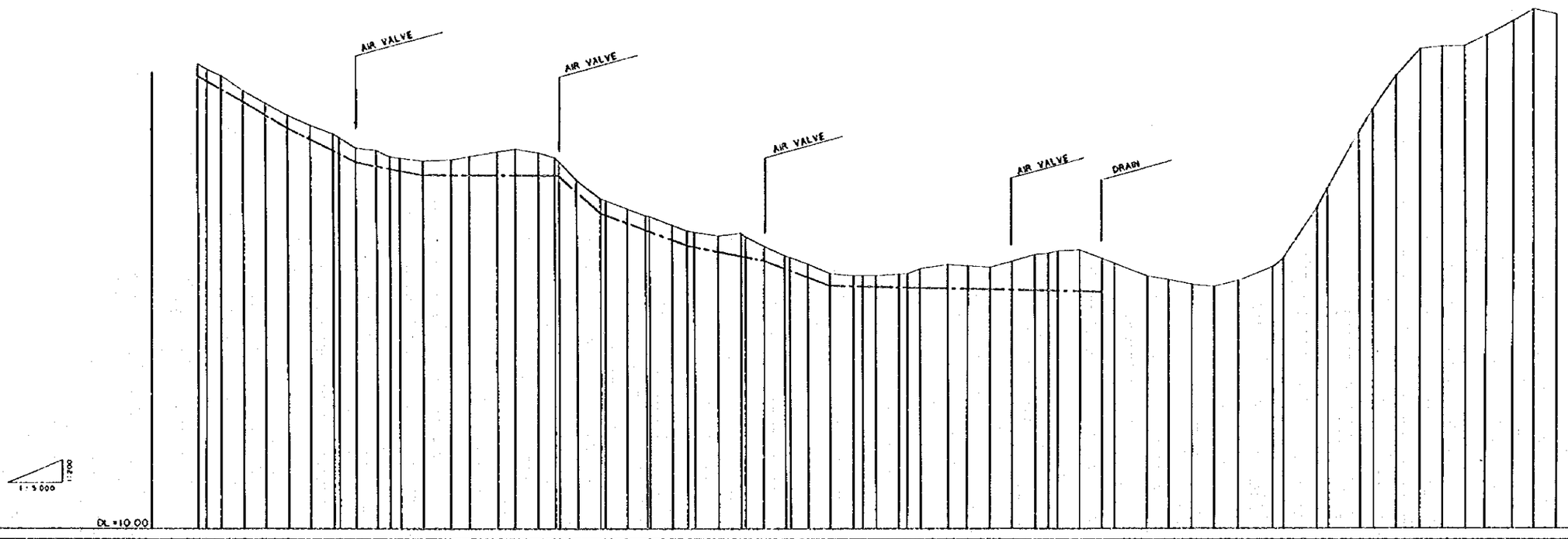
THE SYRIAN ARAB REPUBLIC
THE PROJECT FOR WATER SUPPLY DEVELOPMENT IN RURAL PROVINCE OF DAMASCUS

ハラスタ地区
縦平面図 (4/4)

DRW. NO. 8

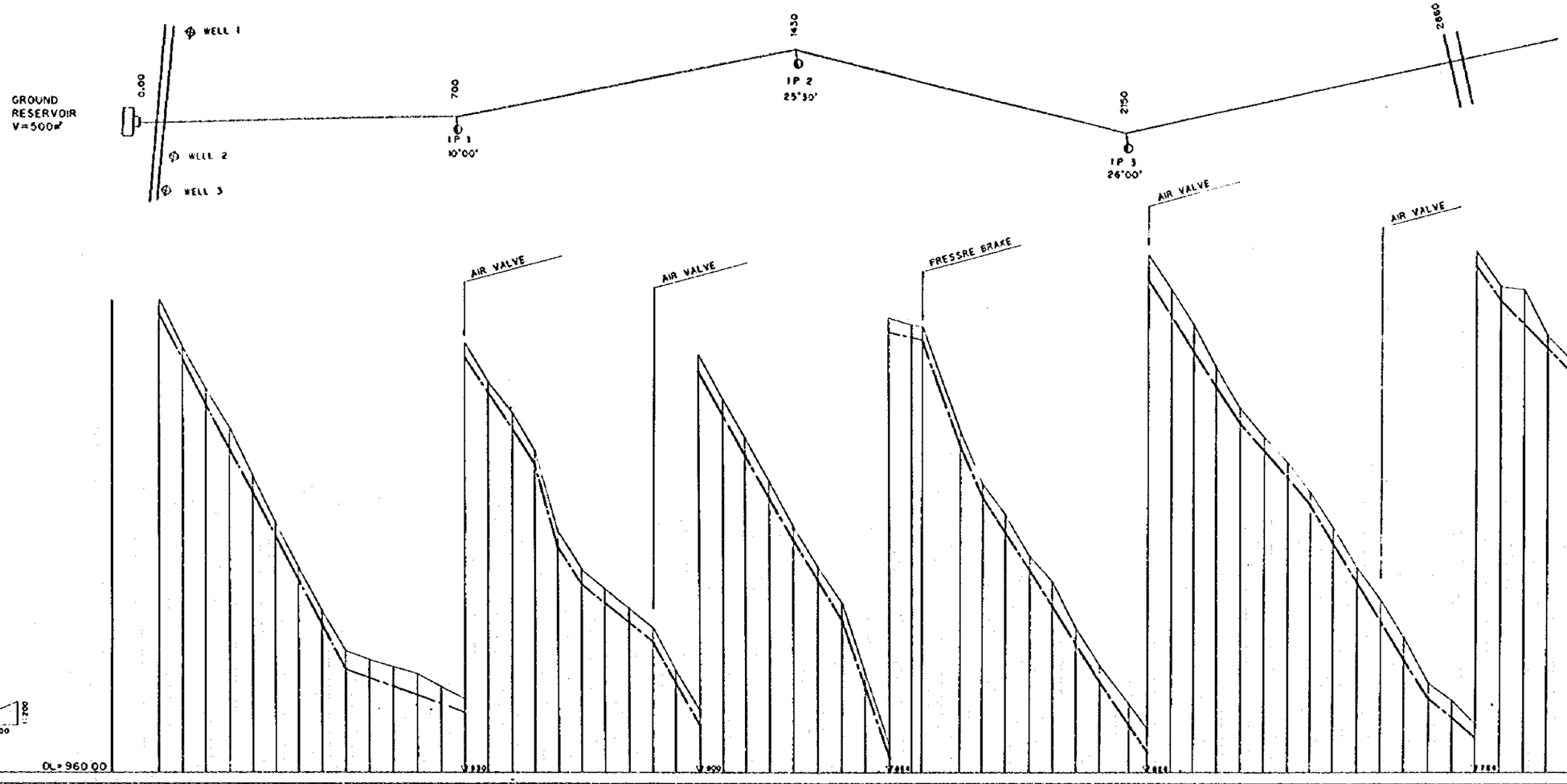
JAPAN INTERNATIONAL COOPERATION AGENCY

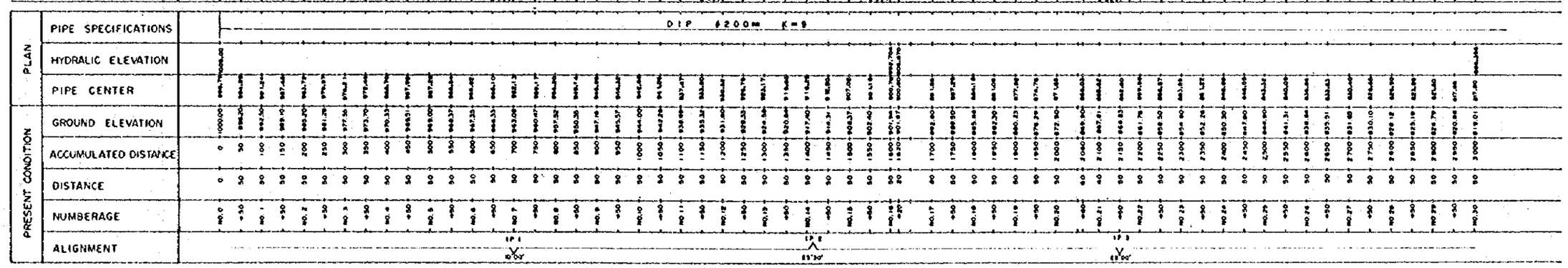




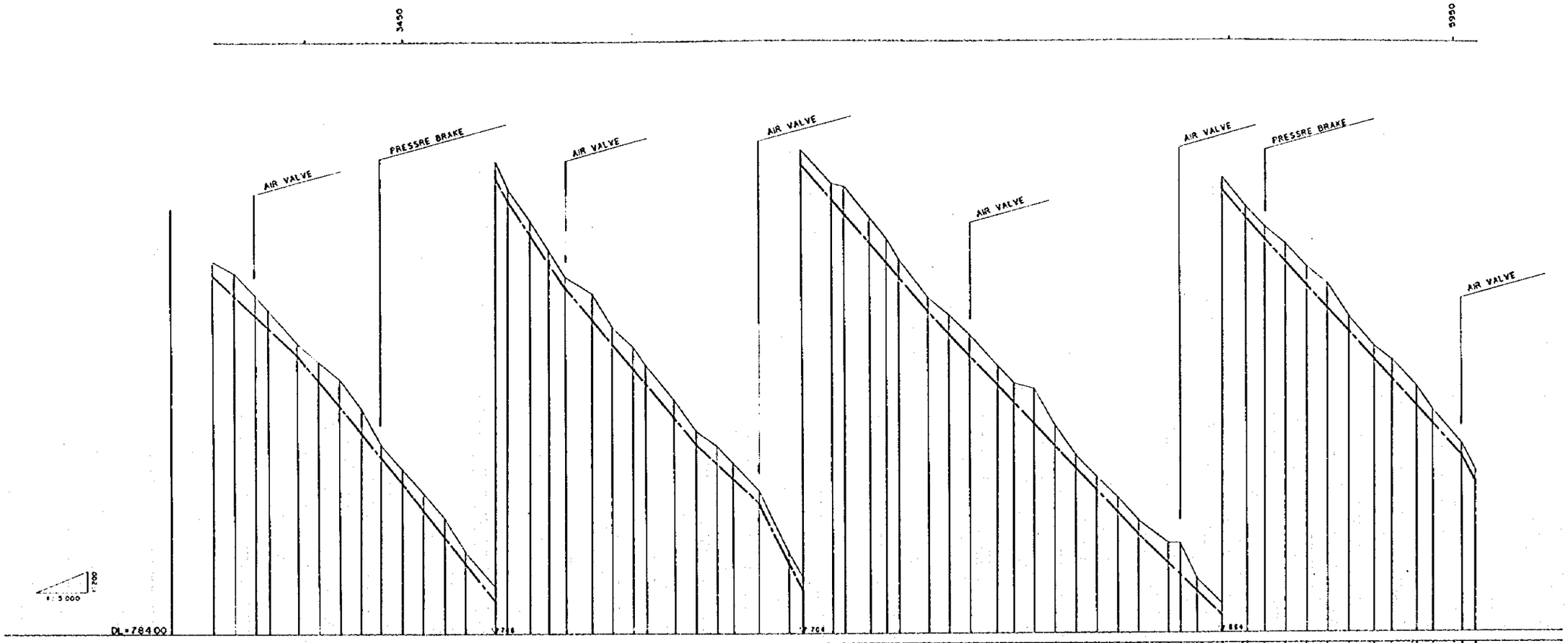
PLAN	PIPE SPECIFICATIONS	DIP φ200m K=9
	HYDRALIC ELEVATION	
	PIPE CENTER	
PRESENT CONDITION	GROUND ELEVATION	
	ACCUMULATED DISTANCE	
	DISTANCE	
	NUMBERAGE	
	ALIGNMENT	

THE SYRIAN ARAB REPUBLIC THE PROJECT FOR WATER SUPPLY DEVELOPMENT IN RURAL PROVINCE OF DAMASCUS	
ヤブロード地区 縦平面図 (1/1)	DRW. NO. 9
JAPAN INTERNATIONAL COOPERATION AGENCY	





THE SYRIAN ARAB REPUBLIC THE PROJECT FOR WATER SUPPLY DEVELOPMENT IN RURAL PROVINCE OF DAMASCUS	
カラ地区 縦平面図 (1/4)	DRW. NO. 10
JAPAN INTERNATIONAL COOPERATION AGENCY	



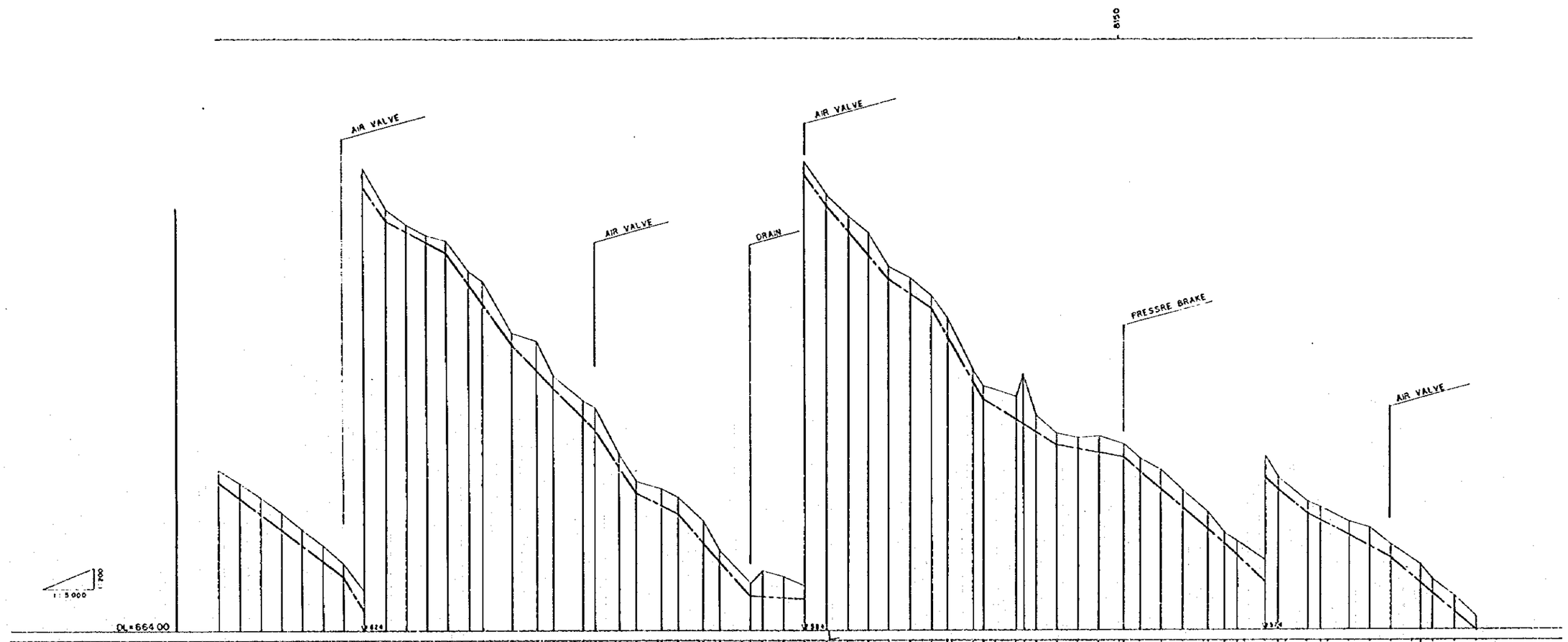
PLAN	PIPE SPECIFICATIONS	DIP ϕ200m K=9
	HYDRALIC ELEVATION	
	PIPE CENTER	
PRESENT CONDITION	GROUND ELEVATION	
	ACCUMULATED DISTANCE	
	DISTANCE	
	NUMBERAGE	
	ALIGNMENT	

THE SYRIAN ARAB REPUBLIC
THE PROJECT FOR WATER SUPPLY DEVELOPMENT IN RURAL PROVINCE OF DAMASCUS

カラ地区
縦平面図 (2/4)

DRW. NO. 11

JAPAN INTERNATIONAL COOPERATION AGENCY



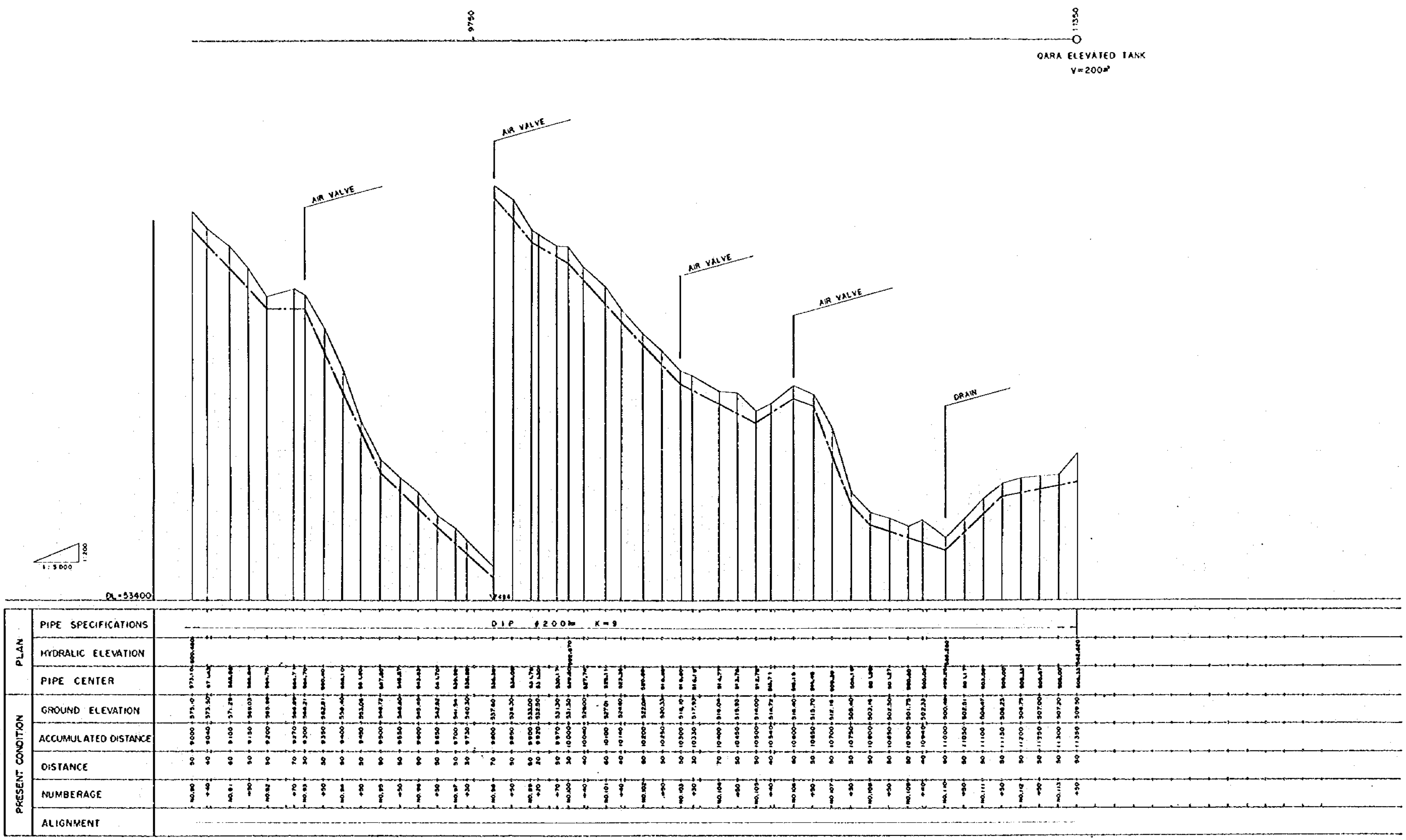
PLAN	PIPE SPECIFICATIONS	D.I.P φ200mm K=9
	HYDRALIC ELEVATION	
	PIPE CENTER	
PRESENT CONDITION	GROUND ELEVATION	
	ACCUMULATED DISTANCE	
	DISTANCE	
	NUMBERAGE	
	ALIGNMENT	

THE SYRIAN ARAB REPUBLIC
THE PROJECT FOR WATER SUPPLY DEVELOPMENT IN RURAL PROVINCE OF DAMASCUS

カラ地区
縦平面図 (3/4)

DRW. NO. 12

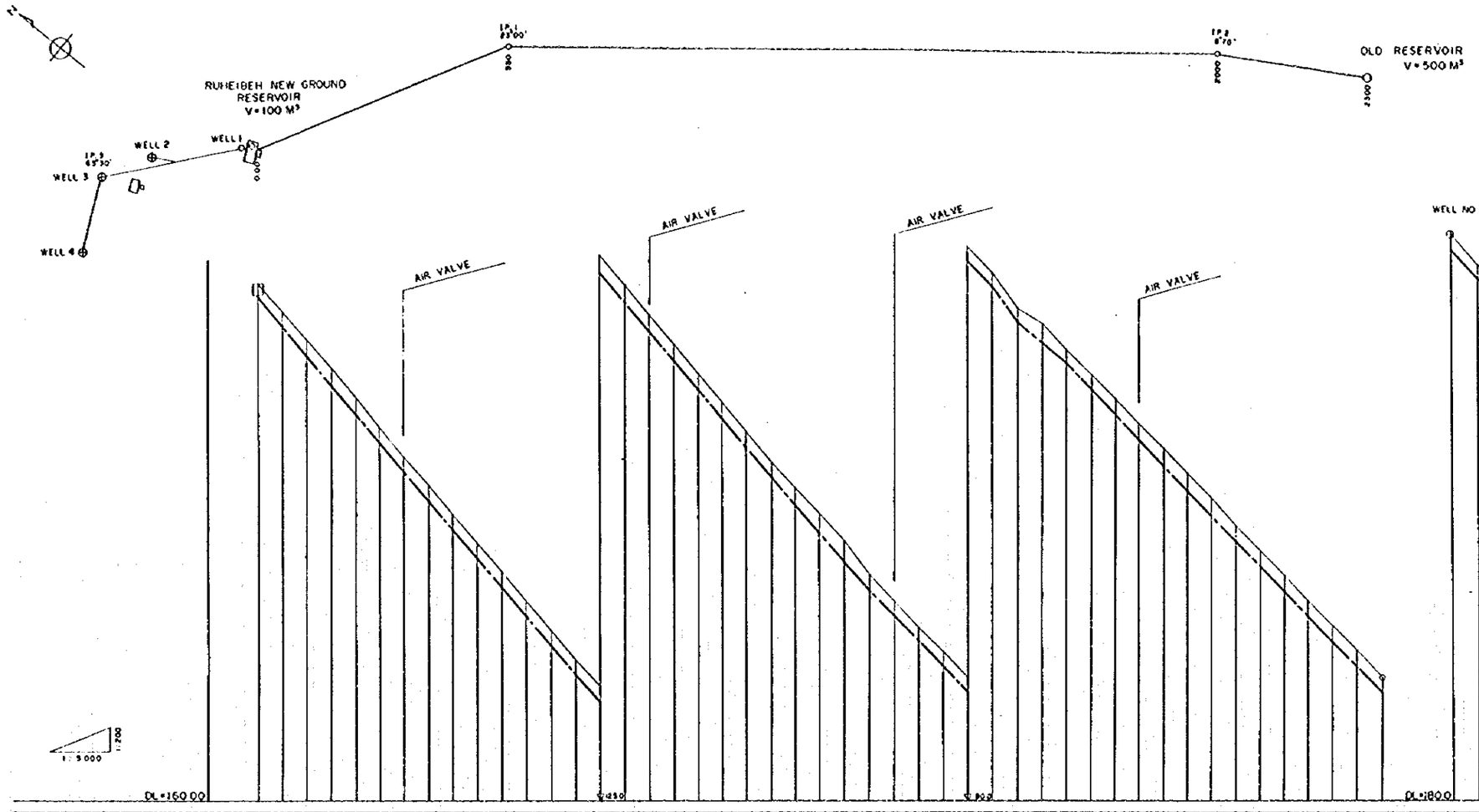
JAPAN INTERNATIONAL COOPERATION AGENCY



THE SYRIAN ARAB REPUBLIC
THE PROJECT FOR WATER SUPPLY DEVELOPMENT IN RURAL PROVINCE OF DAMASCUS

カラ地区 縦平面図 (4/4)	DRW. NO. 13

JAPAN INTERNATIONAL COOPERATION AGENCY



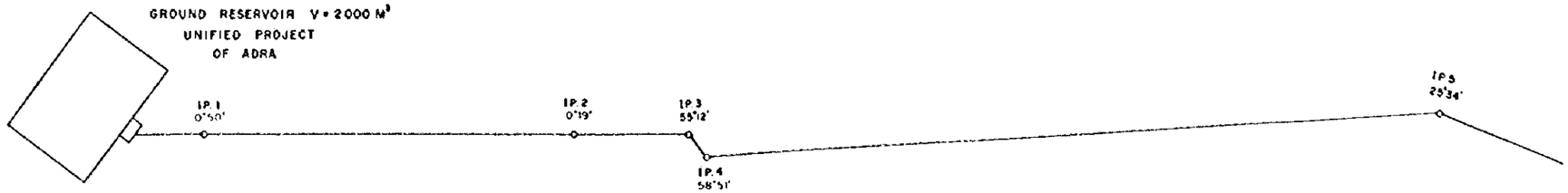
PLAN	PIPE SPECIFICATIONS	DIP φ200m K=9 / DIP φ200m K=9 / DIP φ200m K=9
	HYDRALIC ELEVATION	
	PIPE CENTER	
PRESENT CONDITION	GROUND ELEVATION	
	ACCUMULATED DISTANCE	
	DISTANCE	
	NUMBERAGE	
	ALIGNMENT	IP-1 83°00' / IP-2 87°42' / IP-3 83°30'

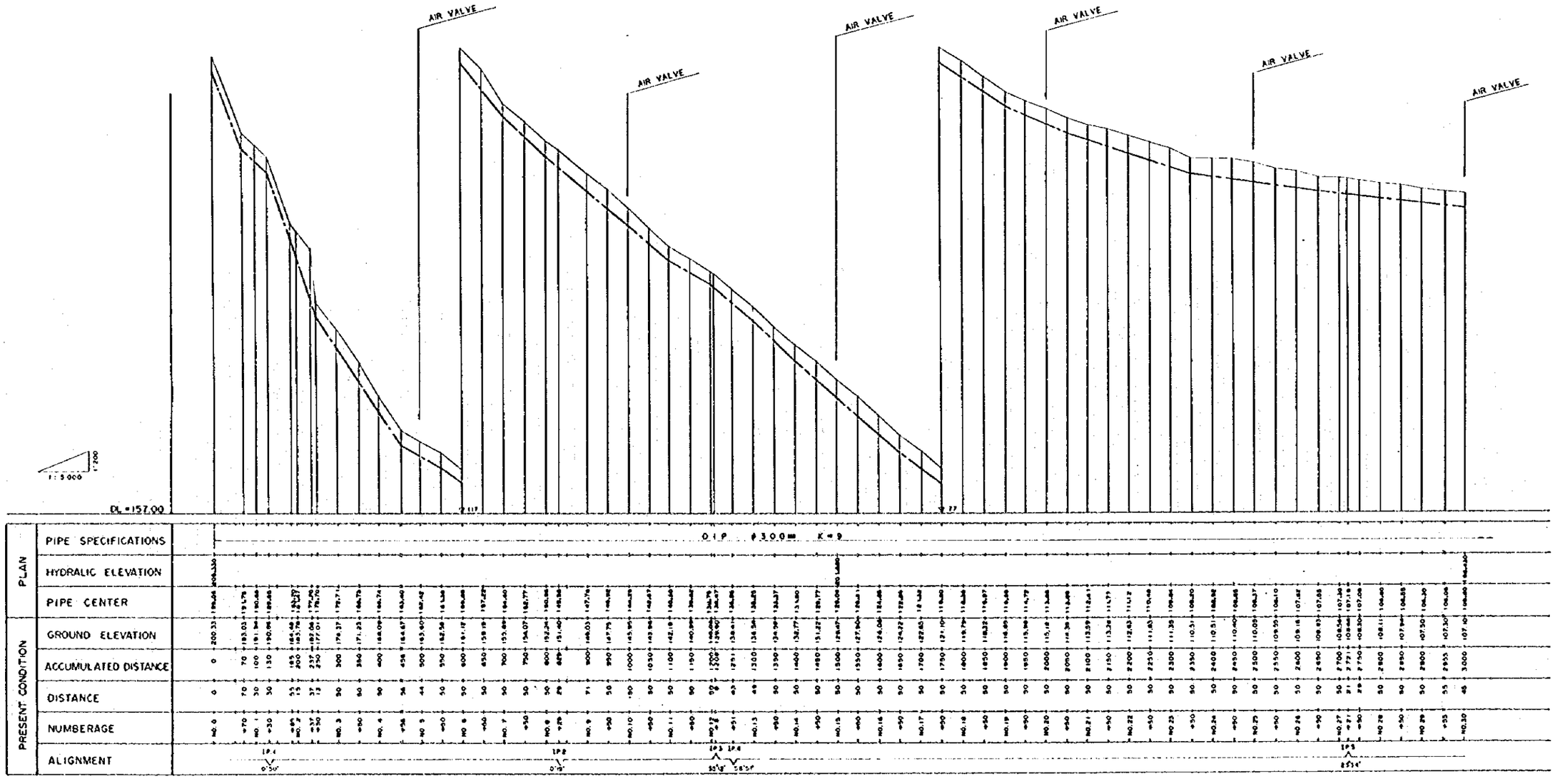
THE SYRIAN ARAB REPUBLIC
THE PROJECT FOR WATER SUPPLY DEVELOPMENT IN RURAL PROVINCE OF DAMASCUS

ルヘイバ地区
縦平面図 (1/1)

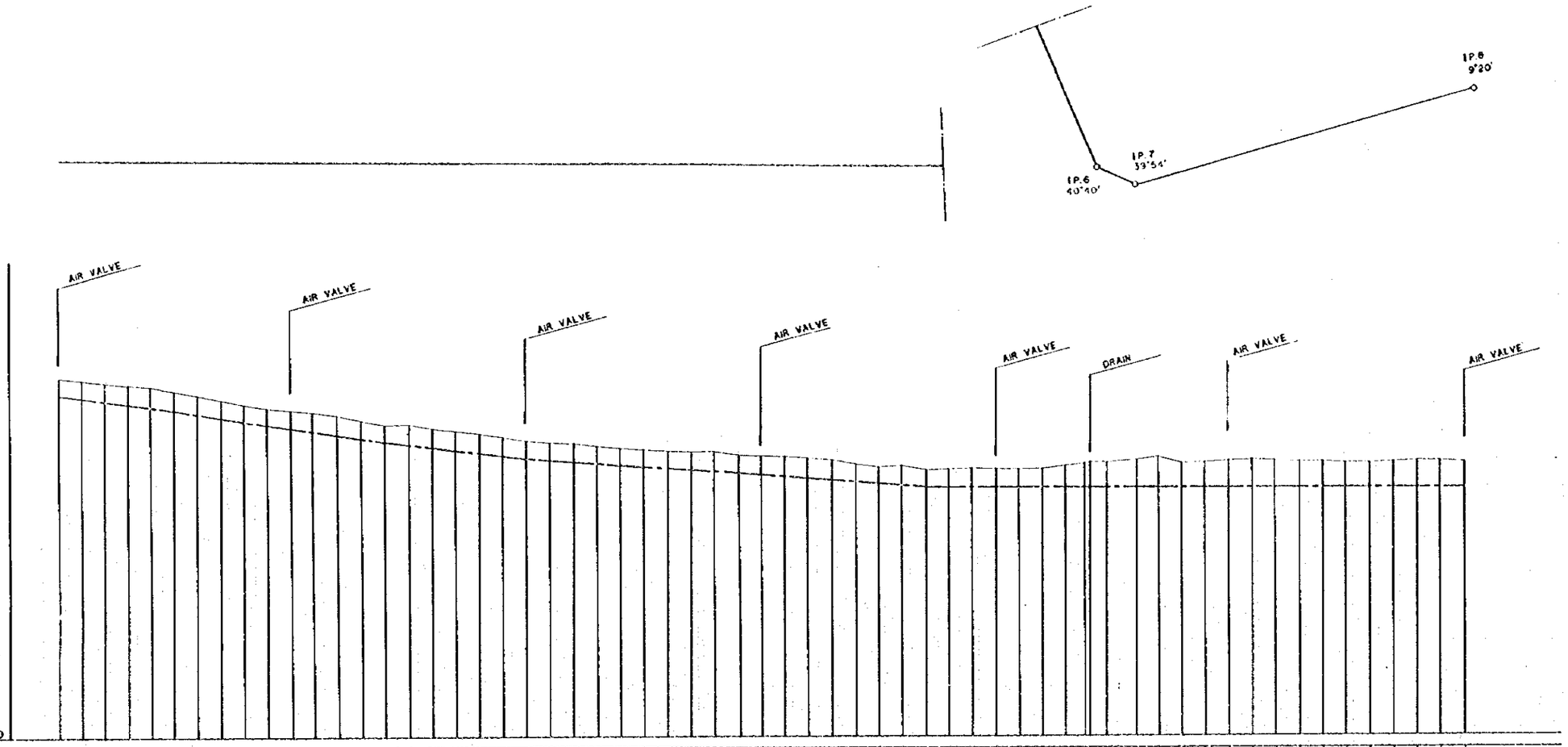
DRW. NO. 14

JAPAN INTERNATIONAL COOPERATION AGENCY



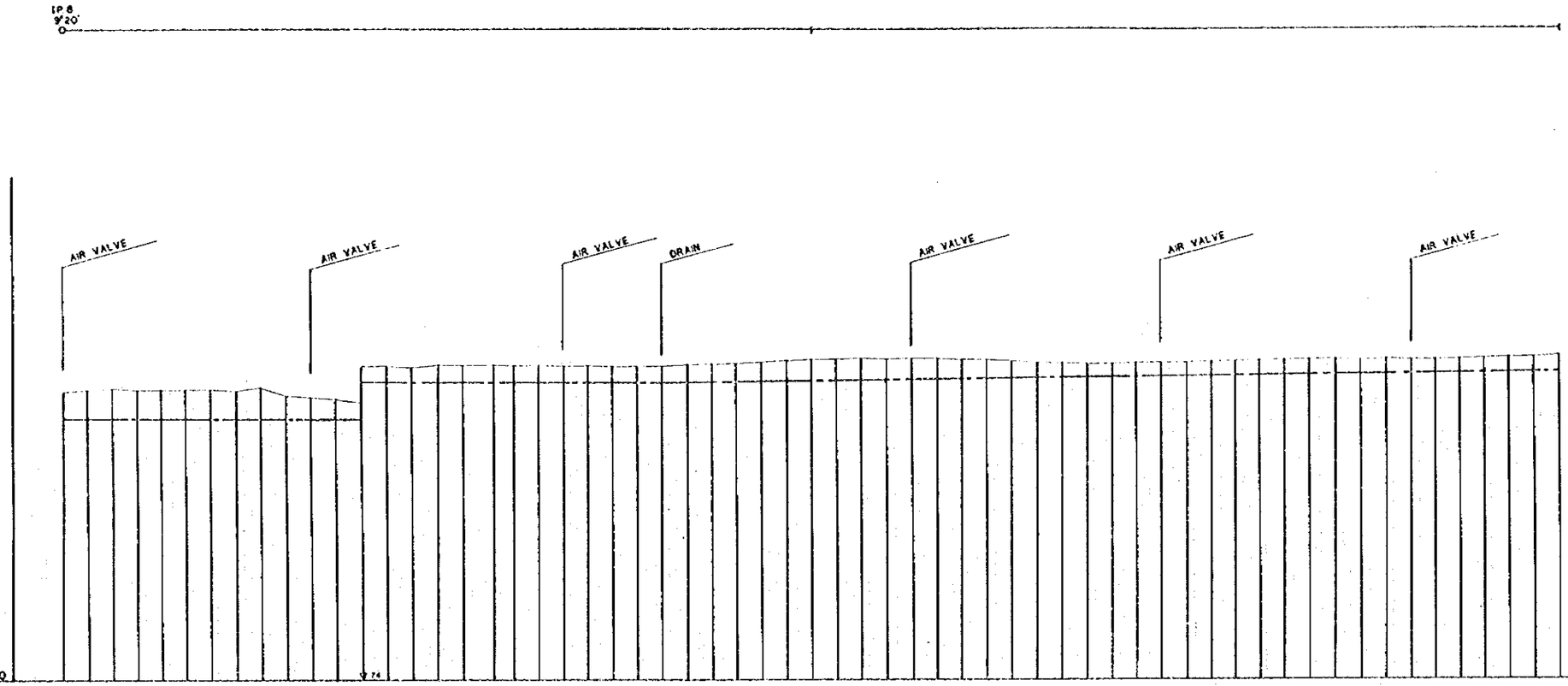


THE SYRIAN ARAB REPUBLIC THE PROJECT FOR WATER SUPPLY DEVELOPMENT IN RURAL PROVINCE OF DAMASCUS	
ドメイル地区 縦平面図 (1/8)	DRW. NO. 15
JAPAN INTERNATIONAL COOPERATION AGENCY	



PLAN	PIPE SPECIFICATIONS	DIP φ300mm K=9
	HYDRALIC ELEVATION	
	PIPE CENTER	
PRESENT CONDITION	GROUND ELEVATION	
	ACCUMULATED DISTANCE	
	DISTANCE	
	NUMBERAGE	
	ALIGNMENT	

THE SYRIAN ARAB REPUBLIC THE PROJECT FOR WATER SUPPLY DEVELOPMENT IN RURAL PROVINCE OF DAMASCUS	
ドメイル地区 縦平面図 (2/8)	DRW. NO. 16
JAPAN INTERNATIONAL COOPERATION AGENCY	



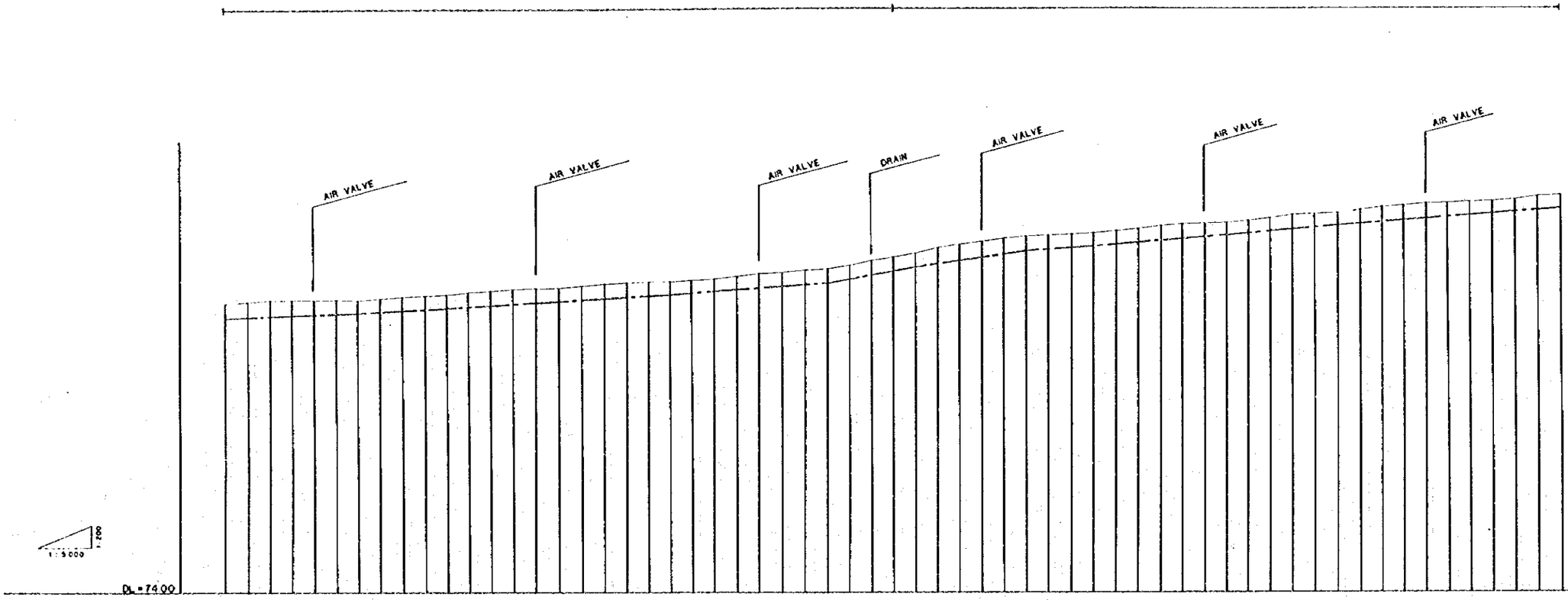
PLAN	PIPE SPECIFICATIONS	DIP φ300m K=9
	HYDRALIC ELEVATION	
	PIPE CENTER	
PRESENT CONDITION	GROUND ELEVATION	
	ACCUMULATED DISTANCE	
	DISTANCE	
	NUMBERAGE	
	ALIGNMENT	IP 8 9°20'

THE SYRIAN ARAB REPUBLIC
THE PROJECT FOR WATER SUPPLY DEVELOPMENT IN RURAL PROVINCE OF DAMASCUS

ドメイル地区
縦平面図 (3/8)

DRW. NO. 17

JAPAN INTERNATIONAL COOPERATION AGENCY



PRESENT CONDITION	PLAN	PIPE SPECIFICATIONS
		HYDRALIC ELEVATION
		PIPE CENTER
		GROUND ELEVATION
		ACCUMULATED DISTANCE
		DISTANCE
		NUMBERAGE
		ALIGNMENT

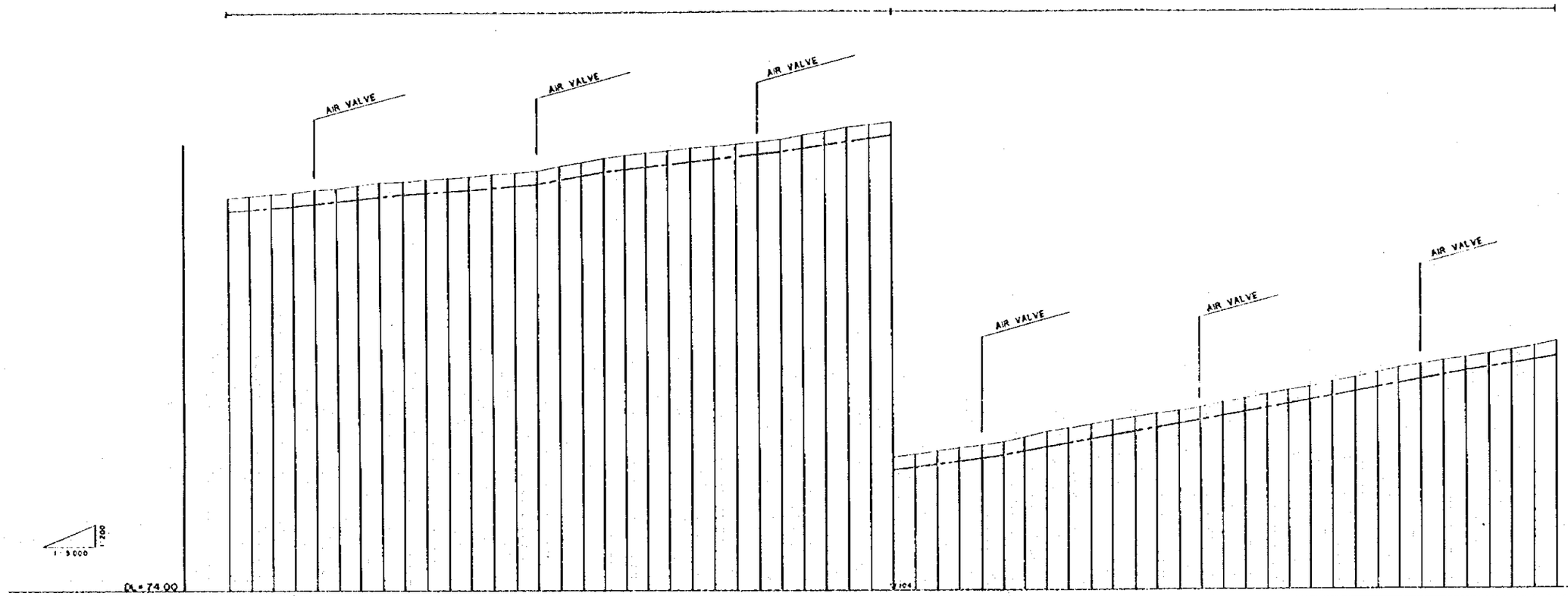
D.I.P φ300㎜ K=9

THE SYRIAN ARAB REPUBLIC
THE PROJECT FOR WATER SUPPLY DEVELOPMENT IN RURAL PROVINCE OF DAMASCUS

ドメイル地区
縦平面図 (4/8)

DRW. NO. 18

JAPAN INTERNATIONAL COOPERATION AGENCY



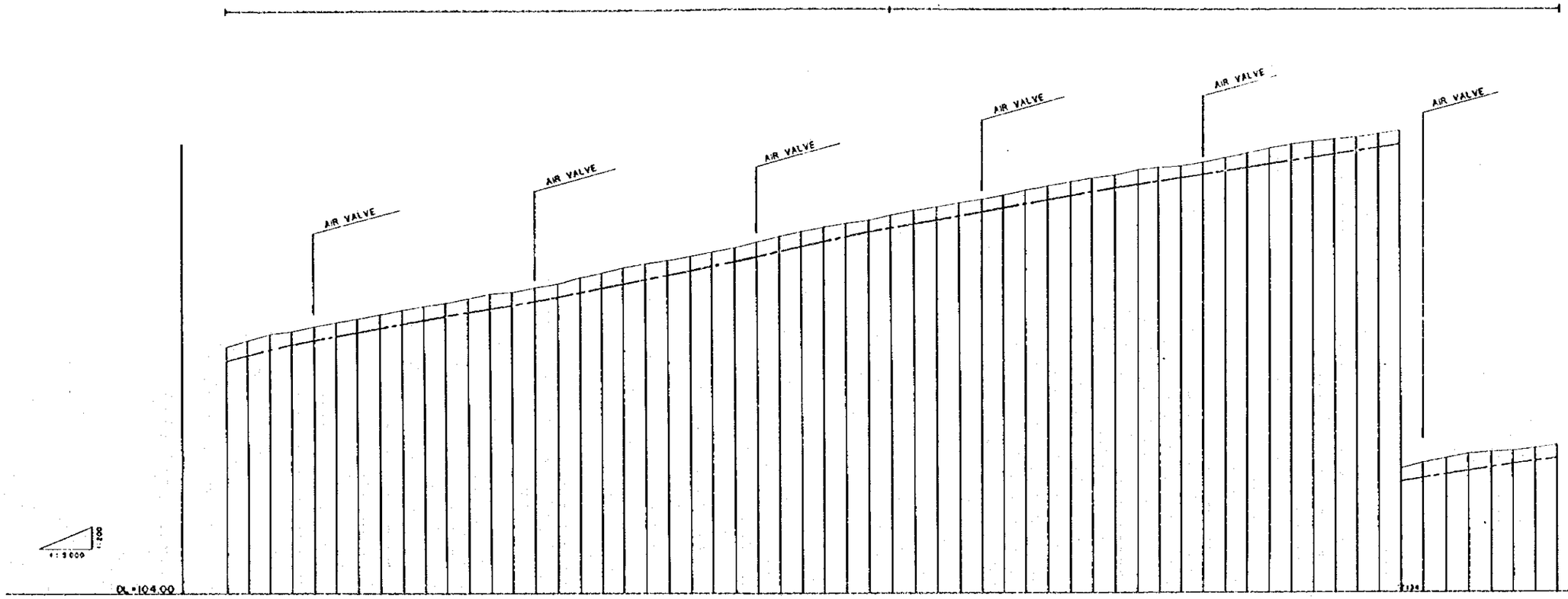
PLAN	PIPE SPECIFICATIONS	DIP ϕ300㎜ K=9
	HYDRALIC ELEVATION	
	PIPE CENTER	
PRESENT CONDITION	GROUND ELEVATION	
	ACCUMULATED DISTANCE	
	DISTANCE	
	NUMBERAGE	
	ALIGNMENT	

THE SYRIAN ARAB REPUBLIC
THE PROJECT FOR WATER SUPPLY DEVELOPMENT IN RURAL PROVINCE OF DAMASCUS

ドメイル地区
縦平面図 (5/8)

DRW. NO. 19

JAPAN INTERNATIONAL COOPERATION AGENCY



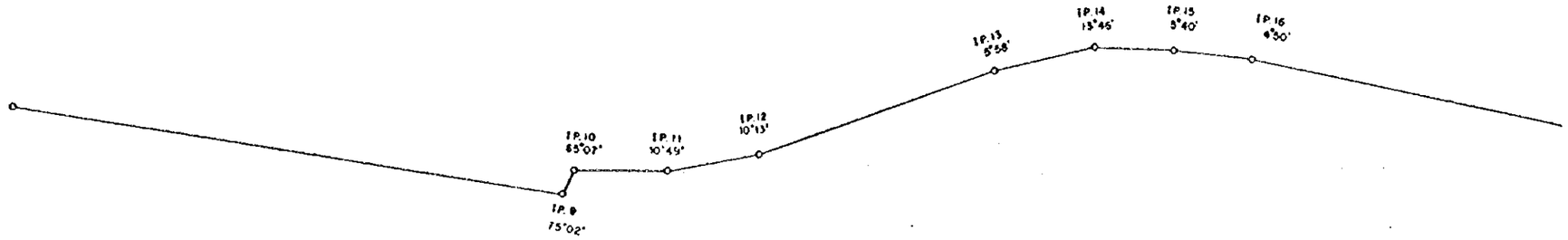
PRESENT CONDITION	PIPE SPECIFICATIONS	DIP φ300m K=9
	GROUND ELEVATION	
	ACCUMULATED DISTANCE	
	DISTANCE	
	NUMBERAGE	
	ALIGNMENT	
PLAN	HYDRALIC ELEVATION	
	PIPE CENTER	

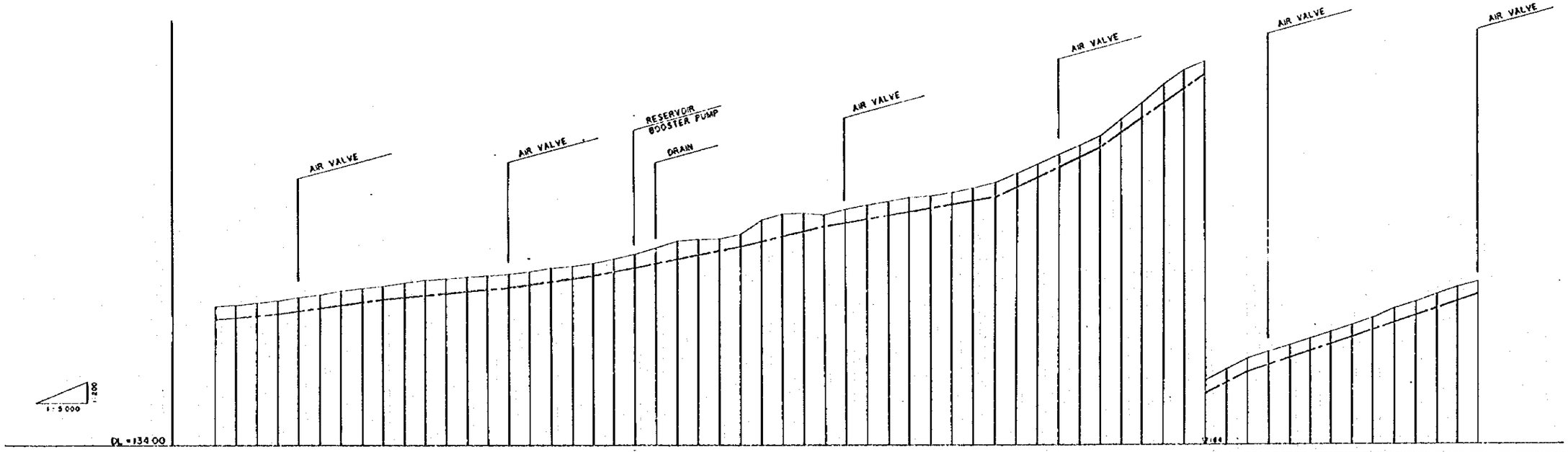
THE SYRIAN ARAB REPUBLIC
THE PROJECT FOR WATER SUPPLY DEVELOPMENT IN RURAL PROVINCE OF DAMASCUS

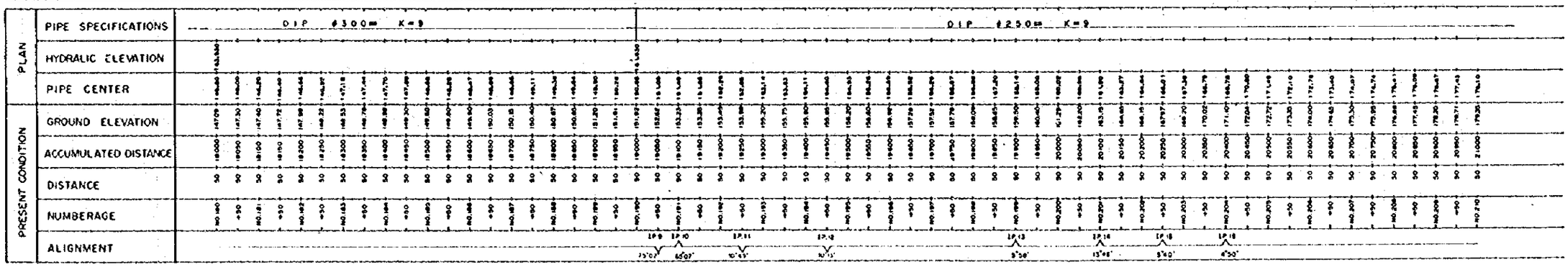
ドメイル地区
縦平面図 (6/8)

DRW. NO.
20

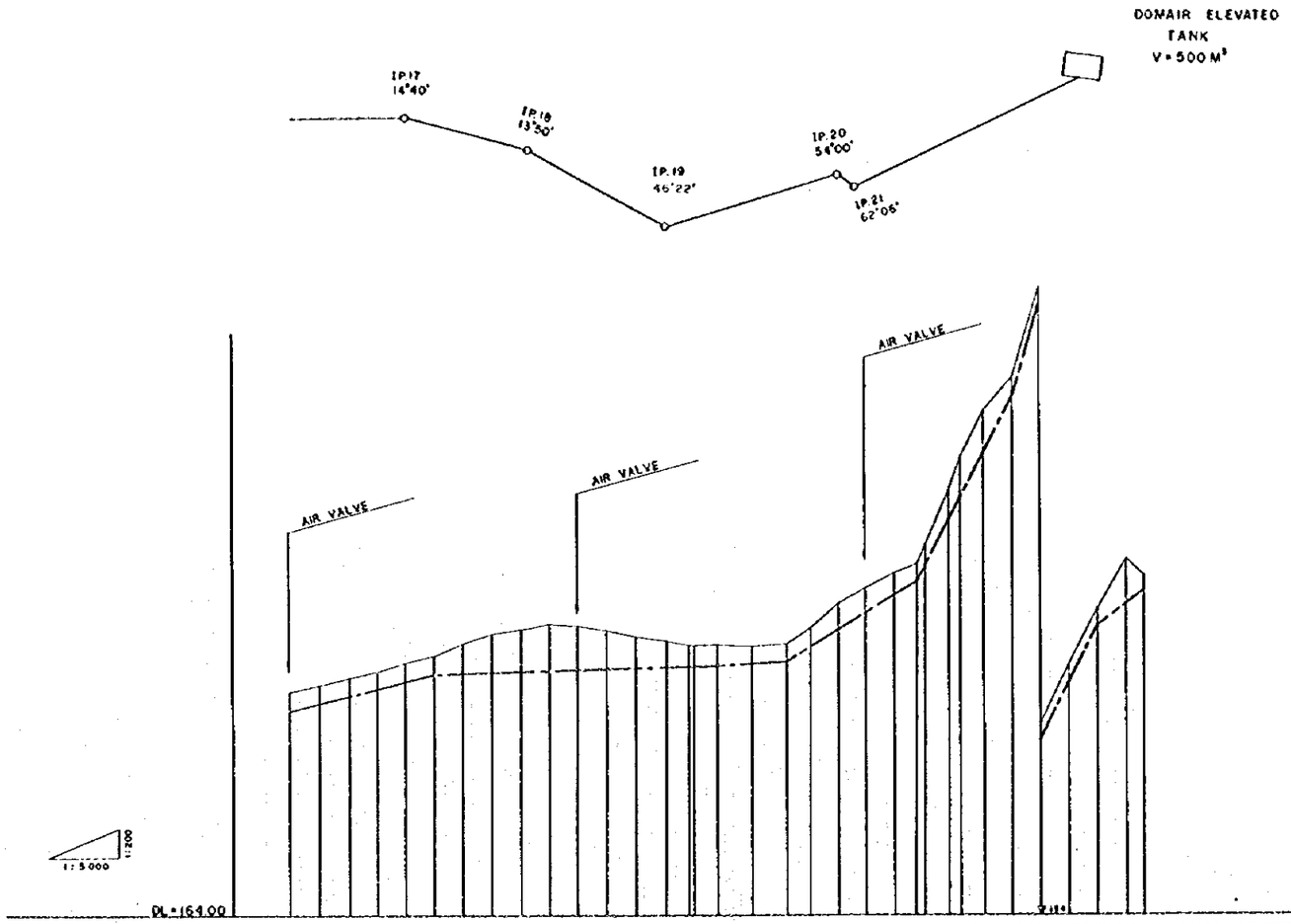
JAPAN INTERNATIONAL COOPERATION AGENCY







THE SYRIAN ARAB REPUBLIC THE PROJECT FOR WATER SUPPLY DEVELOPMENT IN RURAL PROVINCE OF DAMASCUS	
ドメイル地区 縦平面図 (7/8)	DRW. NO. 21
JAPAN INTERNATIONAL COOPERATION AGENCY	



THE SYRIAN ARAB REPUBLIC
THE PROJECT FOR WATER SUPPLY DEVELOPMENT IN RURAL PROVINCE OF DAMASCUS

ドメイル地区
縦平面図 (8/8)

DRW. NO. 22

JAPAN INTERNATIONAL COOPERATION AGENCY