添　付　資　料　A

添付資料A－1

調査団員リスト・調査日程・面談者リスト

1. 基本設計調査団員

(1) 調査団員氏名 (現地調査)

担当業務	団員氏名	所 属
総括／水道計画	鎌田 晟雄	横須賀市水道局業務部計画調査課長
計画管理	石岡 秀敏	ＪＩＣＡ無償資金協力調査部 基本設計調査第一課
給水計画	堀 健二	日本上下水道設計株式会社
配水施設設計	宮沢 忠雄	日本上下水道設計株式会社
浄水施設設計	藤原 政男	日本上下水道設計株式会社
機械設備	長岡 建治	日本上下水道設計株式会社
電気設備	小泉 英雄	日本上下水道設計株式会社
運営・維持管理	佐野 廣一	日本上下水道設計株式会社

(2) 調査日程

No	月 日	日	行 程	調 査 内 容
1	4／ 9	木	TG641 成田 11:00-ﾊﾞﾝｺｯｸ 15:30移動	（コンサル団員）
2	4／10	金	TG321 ﾊﾞﾝｺｯｸ 11:30-ﾀﾞｯｶ 12:50 移動	事務所打合せ
3	4／11	土	ダッカ	大蔵省海外資金局、地方自治体開発省 ダッカＷＡＳＡ本部表敬・打合せ
4	4／12	日	ダッカ	ナラヤンガンジ浄水場視察 ダッカＷＡＳＡ打合せ
5	4／13	月	ダッカ	世銀表敬・打合せ ダッカＷＡＳＡゾーンⅡ事務所打合せ
6	4／14	火	ダッカ	祭日
7	4／15	水	ダッカ	ダッカＷＡＳＡ本部打合せ、現場調査
8	4／16	木	ダッカ	ミニッツにかかる協議 ミニッツ署名 事務所・大使館報告
9	4／17	金	TG322 ﾀﾞｯｶ 14:00-ﾊﾞﾝｺｯｸ 17:00 ﾊﾞﾝｺｯｸ 22:00-JL718	移動（官ベース団員） コンサル団員継続調査 電気設備担当団員到着
10	4／18	土	成田 06:05 帰国	
11 〜 18	4／19 4／26		ダッカ	コンサル団員継続調査 浄水場改修及び配管整備ルート試掘、配水管網状況、先方実施体制等調査
19 20	4／27 4／28		ﾀﾞｯｶ - ﾊﾞﾝｺｯｸ ﾊﾞﾝｺｯｸ - 成田	運営・維持管理計画担当団員帰国
21 〜 28	4／29 5／ 6		ダッカ	コンサル団員継続調査 浄水場改修及び配管整備ルート試掘、配水管網状況調査等
29 30	5／ 7 5／ 8		ﾀﾞｯｶ - ﾊﾞﾝｺｯｸ ﾊﾞﾝｺｯｸ - 成田	浄水施設設計、機械設備、担当団員帰国
31 〜 35	5／ 9 5／13		ダッカ	コンサル団員継続調査 配管整備ルート試掘、配水管網状況調査等
36 37	5／14 5／16		ﾀﾞｯｶ - ﾊﾞﾝｺｯｸ ﾊﾞﾝｺｯｸ - 成田	電気設備担当団員帰国
38 〜 58	5／17 6／ 5		ダッカ	コンサル団員継続調査 ダッカＷＡＳＡ打合せ 配水管網状況調査
59 60	6／ 6 6／ 7		ﾀﾞｯｶ - ﾊﾞﾝｺｯｸ ﾊﾞﾝｺｯｸ - 成田	給水計画／運営・維持管理計画、配水施設設計担当団員帰国

(3) 調査団員氏名（ドラフト・レポート協議）

担当業務	団員氏名	所　属
総括／水道計画	鎌田　晟雄	横須賀市水道局業務部 計画調査課長
無償資金協力	野口　浩司	外務省無償資金協力課
計画管理	石岡　秀敏	JICA無償資金協力調査部 基本設計調査第一課
給水計画	堀　　健二	日本上下水道設計株式会社
配水施設設計	宮沢　忠雄	日本上下水道設計株式会社
浄水施設設計	藤原　敏夫	日本上下水道設計株式会社

(4) 調査日程（ドラフト・レポート協議）

No.	月　日	日	行　　程	調査日程
1	10／24	土	JAL 717 成田12:55 - バンコク17:10 移動	
2	10／25	日	JG 321 バンコク11:30 - ダッカ12:50 移動	JICA事務所、大使館表敬
3	10／26	月	ダッカ	大蔵省海外資金局表敬 ダッカWASA打合せ 計画地区視察
4	10／27	火	ダッカ	ダッカWASA打合せ 大蔵省海外資金局、地方自治体開発省、ダッカWASA、大使館、JICA事務所合同打合せ
5	10／28	水	ダッカ	ミニッツにかかる協議 ダッカWASA打合せ 先方実施管理体制等確認 下水処理施設視察
6	10／29	木	ダッカ	ミニッツ署名 JICA事務所打合せ
7	10／30	金	TG 322 ダッカ14:00 - バンコク17:10 移動 バンコク23:45 TG 42 ↓	
8	10／31	土	成田07:30	帰国

2. 面接者リスト

(1) バングラデシュ国側関係者

1) Economic Relations Division, Ministry of Finance (ERD)

Dr. A.M.M. Shawkat Ali	Additional Secretary
Mr. Ahmed Shahriar Chowdhury	Dy. Secretary
Mr. Rafiqul Islam	Asst. Chief

2) Ministry of Local Government, Rural Development and Cooperatives (LGRD)

Mr. B. R. Chowdhury	Jt. Secretary
Mr. Mossaraf Hossain	Jt. Secretary
Mr. Khairul Alam	Dy. Chief

3) Dhaka Water Supply and Sewerage Authority (DWASA)

Capt. (R'td) Nurul Islam	Chairman
Mr. Abdur Rouf Chowdhury	Secretary
Mr. Abdul Muqueet	Member Finance
Mr. Habibur Rahman Jamaly	Chief Engineer & Member Engineer
Mr. Mohd. Sanaullah	SE (MODS)
Mr. Mohd. Mesbahuddin	SE (RPE & M)
Mr. M. Mohsen Ali	SE (C & D)
Mr. Abdul Kader Chowdhury	SE (Drainage)
Mr. Kazi M. Sheesh	SE (P & D)
Mr. Shamsul Alm	EE, W (P & D)
Mr. Iqbal Hossain Bhuiyan	EE (F & M)
Mr. S. D. M. Quamrul Chowdhury	EE (Zone II)
Mr. A. K. M. Quamrul Chowdhury	EE, W (C & D)
Mr. R. J. M. Rabiul Kaiser	Asst. E (P & D)
Mr. Sahidur Rahman Pardhan	P. D (Crash. P)
Mr. Abdul Matin Akhand	Dy. Chief of Planning
Mr. M. A. Jalil	Asst. Chief of Planning

(2) 日本国関係者

1) 在バングラデシュ日本大使館

斉木　俊男	駐バングラデシュ特命全権大使
市橋　康吉	駐バングラデシュ参事官
馬場　仁志	一等書記官
井上　圭三	二等書記官

2) JICAバングラデシュ事務所

今津　　武	所長
内藤　治男	次長
成瀬　　猛	所員

添付資料A－2

ミニッツ（基本設計調査）

MINUTES OF DISCUSSIONS
OF
BASIC DESIGN STUDY ON THE PROJECT FOR BALANCING, MODERNIZING, REHABILITATION & EXPANSION OF CHANDNIGHAT WATER TREATMENT PLANT IN THE PEOPLE'S REPUBLIC OF BANGLADESH

Based on the results of the Preliminary study, the Japan International Cooperation Agency (JICA) decided to conduct a Basic Design Study on the Project for Balancing, Modernizing, Rehabilitation & Expansion of Chandnighat Water Treatment Plant (hereinafter referred to as "the Project") and entrusted the study to JICA. JICA sent to Bangladesh a study team, which is headed by Mr Seiyu Kamata, Head of Planning Research Section, Yokosuka City Waterworks Bureau and is scheduled to study in the country from April 11 to June 5, 1992.

The team held discussions with the officials concerned of the Government of Bangladesh and conducted a field survey at study area.

In the course of discussions and field survey, both parties have confirmed the main items described on the attached sheets and agreed to recommend to their respective governments and the authorities concerned to examine those towards the implementation of the project. The team will proceed to further works and prepare the Basic Design Study Report.

Dhaka, April 16, 1992

Mr. Seiyu Kamata
Leader
Basic Design Study Team, JICA

Mr. Nurul Islam
Chairman, Dhaka Water Supply and Sewerage Authority

ATTACHMENT

1. Objective

The objective of the Project is to rehabilitate the water supply systems in Old Dhaka, specially in MODS (Maintenance, Operation, Distribution and Service) Zone II of Dhaka Water Supply and Sewerage Authority (DWASA) as shown in Annex I and thus contributing to the improvement of water supply situation in that area.

2. Project Area

The Project area is MODS Zone II of DWASA.

3. Executing Agency

Dhaka Water Supply and Sewerage Authority is responsible for the implementation and administration of the Project.

4. Main components of the project requested from DWASA through the Government of Bangladesh.

1) Rehabilitation of water intake facilities of Chandnighat Water Treatment Plant. Expansion of intake capacity shall be considered, if necessary.

2) Rehabilitation and expansion of treatment capacity of water treatment facilities of Chandnighat Water Treatment Plant up to approximately 50,000m3/day.

3) Improvement of existing main pipes for the water distribution network in the Project area to ensure smooth supply of water after increase of distribution water by rehabilitated Chandnighat Water Treatment Plant. The total length of main pipes to be improved shall be approximately 5,000m.

However, the final components of the Project may differ from the above items, if it is found necessary after further studies in Japan.

5. Cooperation from people in the Project Area

DWASA has understood the importance of cooperation of people in the Project area for smooth implementation of the Project, and agreed that DWASA will take necessary action for getting cooperation from people in the Project area during the project implementation period as Executing Agency of the Project.

S. K

6. Japan's Grand Aid System and Undertakings by the Government of Bangladesh

1) The Government of Bangladesh has understood the system of Japan's Grant Aid explained by the Study Team.

2) The Government of Bangladesh will take the necessary measures, described in Annex-II, for smooth implementation of the Project on condition that the Japan's Grant Aid is extended to the project.

7. Further Schedule

1) The consultants will proceed to further studies in Bangladesh until June 5, 1992.

2) JICA will prepare the draft report in English and dispatch a mission in order to explain its contents around September 1992.

3) In case that the contents of the report is accepted in principle by the Bangladesh side, JICA will complete the final report and send it to the Government of Bangladesh around October 1992.

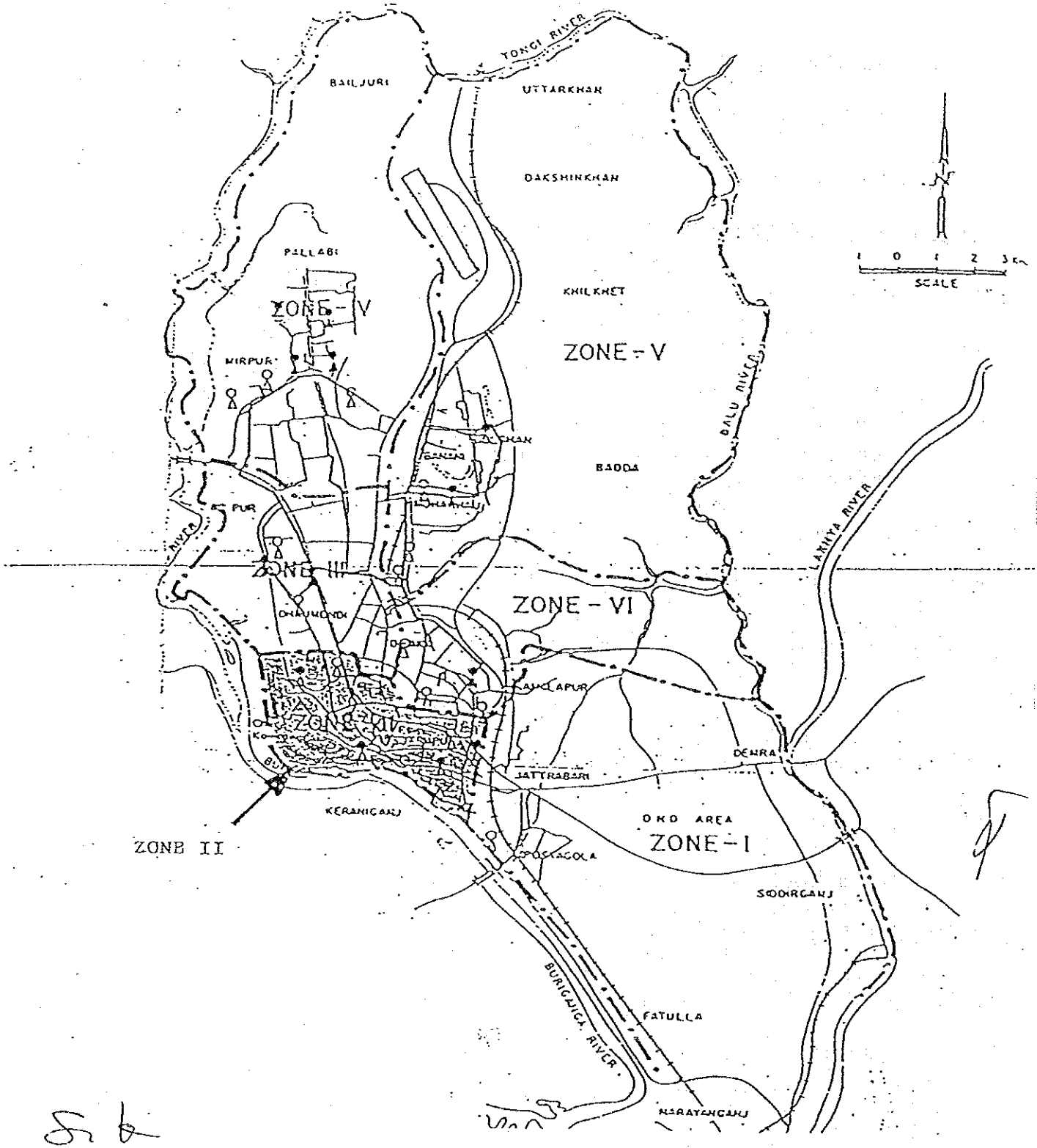
8. Technical Cooperation

On condition that Japan's Grant Aid is extended to the project the Government of the Bangladesh also showed their hope to improve their technical and management capacity with Japan in the future.

Annex-I

Map of the Project Area

MODS ZONES



ANNEX-II

Following arrangements will be requested to be taken by the Government of the People's Republic of Bangladesh.

1. To provide data and information necessary for the project implementation, Basic Design and Detailed Design, and to assign exclusive counterpart personnel.

2. To ensure speedy unloading, tax exemption (providing CDST payment) and custom clearance at the port of disembarkation of products purchased for the Project.

3. To accord Japanese nationals whose services may be required in connection with the supply of the products and the services under the verified contracts such facilities as may be necessary for their entry into the Bangladesh and stay therein for the performance of their work.

4. To exempt Japanese national involved in the project from customs duties, internal taxes and other fiscal levies which may be imposed in Bangladesh with respect to the supply of equipment/machineries and services under the verified contracts.

5. To bear commissions to the Japanese foreign exchange bank for the banking services based upon the Banking Arrangement.

6. To bear all expenses, other than those to be borne by the Grant Aid necessary for the execution of the project.

7. To take necessary measures for getting permission for construction works under the Project from the authorities concerned, if necessary.

8. To maintain and use properly and effectively the facilities constructed and equipment purchased under the Grant.

添付資料A－3

ＤＷＡＳＡと地域住民との協議議事録

A MINUTES OF DISCUSSION FOR BALANCING, MODERNIZING REHABILITATION AND EXPANSION OF CHANDNIGHAT WATER TREATMENT PLANT.

1. In pursuance of Article 6 of Minutes of discussion of preliminary study of the project signed on December 12, 1991 between DWASA and the preliminary Study Team, JICA, a joint meeting was held on March 04, 1992 at 6.30 P.M. in the project area. The meeting was held between the WASA represented by Chairman, Chief Engineer and other the representatives of the people in the Project area headed by the Member parliament Lt. General (Retd) Mir. Shawkat Ali. A large number of local people attended the meeting. A list of some of the persons attended in the meeting is enclosed herewith.

2. At the outset of the meeting the Chairman Dhaka WASA opened the discussion welcoming the Member Parliament and local resident and representatives of the Government of Japan and the participants. He said that Chandnighat water Treatment Plant is most important for water supply in old Dhaka City. Its population is more than 1 million. Water demand in this area has increased drastically because of higher concentration of population in this area. DWASA cannot increase water supply as per demand through this small surface water treatment plant unless the production capacity of this plant is enhanced. As such in response to the request from the Govt. of the people's Republic of Bangladesh, the Government of Japan has kindly come forward and decided to give all sorts of co-operation to implement the project. He also said that for the smooth implementation of the project some old rusty & leakage existing main iron pipes for the water distribution network need

to be rehabilitated. During improvement and rehabilitation of required main pipes some roads of the project area need to be stopped for vehicles temporarily and as such normal communication of that roads may be disrrupted for some days. He further added that: in order to get the greater benefit of the project there is no alternative but to take some trouble in this regard for the time being. Moreover, local people would have to give the assurance to DWASA & the representative of the govt. of Japan that during implementation of project they would give all sorts of co-operation for the smooth implementation of the project, and then only Japan Government would come forward and provide their technical and financial assistance to the project.

3. The Member of Parliment agreed and gave full assurance. to DWASA for smooth implementation of the project and also confirmation of the same.

4. Some of the local leaders expressed the necessity of implementation of the project very soon to mitigate their sufferings caused by water shortage. They said that they were ready to give if required voluntary services to motivate the local inhabitants. They also gave assurance that during implementation of the project they would co-operate with DWASA and the Japanese Construction Firm for thegreater interest of the local people.

5. Finally, onbehalf of the local people, the honorable member of the parliament of the area assured the representatives of the Government of Japan that he would extend his all sorts of co-operation for implementation of the project.

6. At last Mr. Ota, first secretary, the Embassy of Japan in Bangladesh, on behelf the Govt. of Japan told in the meeting that the Government of Japan had already conducted a preliminary study of the project. He further told that he was fascinated to see the inspiration and verbal assurance for co-operation of the local, people for implementation of the project very soon. He also told that the Japan Government would despatch a delegation to conduct the Basic Design Study of the project in April 1992 as a part of implementation of the project.

7. After discussion in the meeting it was decided that :

a. The local people would extend all sorts of co-operation to DWASA and the Japanases firms for smooth and timely implementation of the project.

b. The representatives of govt. of Japan present in the meeting would try for despatch of a delegation in April,'92 to conduct the Basic Design Study of the project.

c. DWASA would give an assurance to the govt of Japan that DWASA would take its best efforts for smooth and timely implementation of the project.

Then the meeting ended with a vote of thanks to the participants.

(Group Captain (Retd.) Nurul Islam)
Chairman
Dhaka WASA.

List of Participants

1.	Lt. General (Retd) Mir Shawkat Ali	MP
2.	Mr. Nazir Hossain	Ex-Ward Commission
3.	Mr. Meshab uddin sabu	Local Elite
4.	Mr. Saifuuddin Ahmed Milon	General Secretary (Lalbagh Thana)
5.	Mr. Atiquallah	President Word No. 29
6.	Mr. Md. Rulul Amin	Reporter (Newspaper)
7.	Mr. Farooq Ahmed	Local Industrialist
8.	Mr. Abdul Hai	Social Worker
9.	Mr. Aziz ullah	President Word No.-30
10.	Mr. Khatibur Rahman Khokan	General Secy.
11.	Mr. Abdul Azuim	President Jubadal (Lalbagh Thana)
12.	Mr. Sharif	Vice President, Lalbagh Thana
13.	Mr. Abdul Matin	President, Word No-28
14.	Mr. Saleh Ahmed	Secretary, Word No-29
15.	Mr. Kabir Uddin Sikder	Local Elite
16.	Mr. Nasir uddin Ahmed	Local Elite
17.	Mr. Afzal Hossain	Local Elite
18.	Mr. Md. Khokan	Local Elite
19.	Mr. Nasiruddin Pintu	President, Lalbagh Thana Chatradal Vice President, Lalbagh Thana

DWASA Personnel

1. Chairman
2. Chief Engineer
3. Secretary
4. Superintending Engineer, MODS Circle
5. Superintending Engineer, P&D Circle
6. Deputy Chief Planning
7. Assistant Chief,(Planning)
8. Executive Engineer MODS Zone-2

添付資料A－4

ＤＷＡＳＡ・基本設計調査団技術協議議事録

MEMORANDUM OF DISCUSSION
ON
BMRE PROJECT FOR CHANDNIGHAT W.T.P.

A meeting was held on May 25, 1992 at the Board Room of DWASA, between the Senior Engineers from Dhaka WASA and Basic Design Study Team to discuss the comments prepared by the Study Team on DWASA's report on rehabilitation & expansion of the Chandnighat Water Treatment Plant as requested by the Chairman,DWASA.

The said discussion is made in order to compare and concentrate on the basic concept of the rehabilitation works for the project.

Mohd. Sanaullah,SE (MODS),DWASA presided over the meeting and the following officials from Dhaka WASA together with the Study Team member attended the discussion ;

1. Mr. Mesbah Uddin, SE(RPE&M)Circle.
2. Mr. Kazi Md. Sheesh, SE(P&D)Circle.
3. Mr. Mohsen Ali, SE (C&D)Circle.
4. Mr. Shamsul Alam, EE(P&D)Water.
5. Mr. A.K.M. Jafarullah, EE W(C&D)
6. Mr. Jahidul Arif, EE (SOC)
7. Mr. Iqbal Hossain Bhuiyan, EE(FM)Division.
8. Mr. Quamrul Alam Chowdhury, EE(MODS ZONE II)
9. Mr. Kenji Hori, Member, JICA Study Team

The Study Team's comment on DWASA's report is attached herewith.

The following is the outcome of the discussion :

PART 1. *Treatment Capacity and Production Capacity*

1) Water Treatment Capacity in WASA report shall be read as 9.6MGD /10.08MGD taking into consideration the existing water intake pump capacity and water loss of 5%, which is wasted as backwash of filter and sludge drains etc.

2) Actual production capacity of 8.4MGD is expected for 21hrs. operation a day after rehabilitation planned, in WASA report taking into consideration capacity of clear water reservoir.

3) While the water treatment capacity proposed by the Study Team is 8.6MGD and actual production capacity is planned for 8.6MGD taking into consideration construction of clear water reservoir as large as possible.

4) The reason why the treatment capacity of 11MGD couldnot be recommended are summarized as below;

i) Limitation of Space

-Employing of high-rate settler module in the old sedimentation tanks cannot be recommended from technical, operational and maintenance point of view. Therefore, new construction of sedimentation tank instead of employment of the high-rate settler module in the existing Sedimentation Tank is needed in order to meet the increase of treatment capacity of 11MGD. The limited space for construction of additional sedimentation tank besides the proposed filter and clear water reservoir is to be considered as the main problem for this project site.

-In order to save the land space, the question of constructing high rate filter with high rate settler module were . . being discussed.
The high-rate settler module will be employed for new construction of sedimentation tank with consideration in the design taking account of operation and maintenance,which is mentioned later at item PART 2.6

As for filter, employment of high-rate filter system, is not recommended because coal anthracite is not available in Bangladesh and careless operation cannot allowed for backwashing under this system.

ii) Cost up for Rehabilitation

To increase the treatment capacity upto 11MGD, the replacement of all water intake pumps, its operational panels,transmission pipe lines,distribution pumps and its operational panels also some other facilities concerned are to be replaced by bigger capacity ones.Such replacement works doesnot include in DWASA's original request and as such said works cannot be executed by the allocated projected budget by the Government of Japan, as explained in the previous meeting by the Study Team.

PART 2. *Contents and Basic Concept of Rehabilitation for the Water Treatment Facility.*

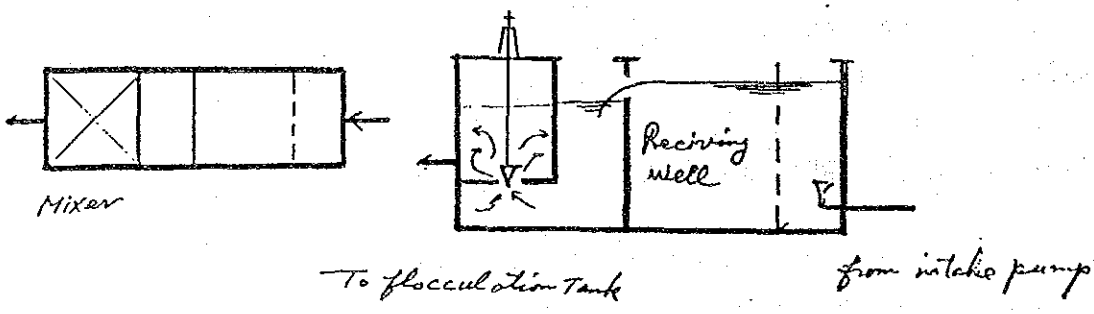
1) Water Intake Pumps Facilities
Three(3)pumps of No.1(old)pump station with vacuum pump and sump pump shall be replaced. Electrical sub-station for No.1 and No.2 pump station is used as it is.

2) Transmission Pipe
Transmission pipe for No.1 pump station line from the station upto the water treatment plant shall be installed under this project. and ~~its~~ intake point to be extended upto the main streams of the river and in case of necessity of permission from any agency DWASA will do it. DWASA pointed out this issue in discussion.

3) Receiving Well & Mixing

i) Receiving well shall be newly constructed with a weir for measurment of influent flow.

ii) Mixing tank shall also be constructed, which will be designed employing hydraulic mixing method as shown below:



4) Flocculation Tank

i) Since modifying the existing flocculation tank into vertically baffled channel type flocculator is required water head-loss of 30cm to 60cm ,mechanical flocculator will be employed in this rehabilitation project. However, whether and how many numbers of flocculator are necessary or not, is a matter of further study.

ii) Re-construction of a baffled channel type flocculator as proposed by DWASA shall also be considered for further study.

5) Water Channel to Sedimentation Tank

Water channel to sedimentation tank shall be modified to meet standard velocity and to lead gentle distribution towards the sedimentation basin.

6) Sedimentation Tank

i) Modification shall be done to the existing sedimentation tank so as to Width and Length (W/L) ratio stands 1:3 to 8.
ii) An additional sedimentation tank shall be constructed to meet the projected water treatment capacity together with the existing one.
iii) It is also to be considered that new sedimentation tank shall take sludge drainage by pump.

7) Filter

i) Filter having a capacity of the projected treatment capacity shall be newly constructed in this project.
ii) Type of the filter shall be employed rapid sand filter with non-valve type.
iii) Implementation plan shall be made taking into account that the existing filters should be used until the completion of construction of the new filters without disturbing normal water supply.

8) Clear Water Reservoir

Clear water reservoir shall be designed to be bigger as much as possible in order to reserve the treated water produced at night time, so that actual production capacity could be increased as much as possible.

9) Distribution Pump Facility

Three (3)pumps of No.2(new)pump station shall be replaced. Electrical operational panels of No.1 and No.2 pump station are to be used as it is.

10) Electrical Sub-station Facility

i) Existing capacity of 800KVA sub-station inside the water works is to be reconfirmed by DWASA.

ii) There is an emergency cable line for operation of water intake pumps from sub-station in Chandnighat Plant. The line will be used in case of emergency for the purpose. Power consumption for intake pump operation is not necessary to be included in the calculation of total connected load of the Water Treatment Plant.

iii) Existing electrical facilities of intake and W.T.P. installation should be used. If additional sub-station and generator is needed that will be supplied from DWASA after repair. Only the construction of sub-station and generator room may be considered in this project along with installation.

11) Water Quality Management

For improvement of the treated water quality.chemical feeding equipment shall be considered in order to feed the chemical in suitable volume in this project.
For such purpose, required laboratory facilities shall be included with Jar-Tester.

MD. SANAULLAH
Superintending Engineer
MODS Circle
Dhaka WASA

Member, JICA Study Team.

ミニッツ（ドラフト・レポートの協議）

付・日本側提言に対するDWASAの実施計画書

MINUTES OF DISCUSSIONS
OF
BASIC DESIGN STUDY ON THE PROJECT FOR
BALANCING, MODERNIZING, REHABILITATION & EXPANSION
OF
CHANDNIGHAT WATER TREATMENT PLANT
IN
THE PEOPLE'S REPUBLIC OF BANGLADESH
(CONSULTATION ON DRAFT REPORT)

In April, 1992 the Japan International Cooperation Agency (JICA) dispatched a basic design study team on the Project for Balancing, Modernizing, Rehabilitation & Expansion of Chandnighat Water Treatment Plant (hereinafter referred to as "the Project") to The People's Republic of Bangladesh and through discussions field survey and technical examination on the results in Japan has prepared a draft report of the study.

In order to explain and consult with Bangladesh side on the contents of the report. JICA sent a team to Bangladesh which was headed by Mr. Seiyo Kamata, Head of Planning Research Section, Yokosuka City Waterworks Bureau and scheduled to stay in the country from October 25 to 30, 1992.

As a result of discussions, both parties confirmed the main items as described on the attached sheets and subject to the final approval of the respective governments.

Dhaka. October 28, 1992

Mr. Seiyu Kamata
Leader
Draft Report Explanation Team
JICA

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ATTACHMENT

1. Components for Draft Report

The Government of Bangladesh has agreed and accepted the components of the Draft Report proposed by the team. Amendments if require will be done through mutual consultation.

2. Japan's Grant Aid System

(1) The Government of Bangladesh has understood the system of Japanese Grant Aid explained by the team.

(2) The Government of Bangladesh will take the necessary measures, describe in ANNEX I, for smooth implementation of the project on condition that the Grant Aid assistance 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 send it to the Government of Bangladesh by beginning of December, 1992.

4. Administrative Proceedings for Project Implementation.

(1) The Bangladesh side will prepare the Project Concept Paper as soon as possible for early project approval by the Government of Bangladesh.

(2) Considering the emergent nature of the Project and aiming at earlier commencement of the construction works, the Government of Bangladesh will examine possible arrangement to expedite the implementation.

5. Arrangement for Project Implementation

The Government of Bangladesh will take the necessary measures for execution of the confirmed items, described in Annex II, for smooth and fruitful implementation of the Project on condition that the Grant Aid assistance by the Government of Japan is extended to the Project.

ANNEX - I

Following necessary measures should be taken by the Government of Bangladesh in case the Project is executed under Japanese Grant Aid.

1) To provide data and imformation necessary for the Detail Design and Project implementation, and to assign exclusive counterpart personnel for execution of the Project.

2) To clear and level the site prior to commencement of construction, if necessary.

3) To bear commissions to the Japanese foreign exchange bank of the banking services based upon the Banking Agreement.

4) To ensure necessary taxes and to take necessary measures for customs clearance of materials and equipment brought for the Project at the port of disembarkation.

5) To exempt Japanese nationals engaged in the Project from customs duties, internal taxes and other fiscal levies which may be imposed in Bangladesh with respect to the supply of the products and the services under the verified contracts.
However, the cost of duties, internal taxes and other fiscal levies to be imposed under the Bangladesh Regulations shall be borne by the relevant Ministry/Agency concerned with the project for which necessary budget provision shall be made by them.

6) To accord Japanese nationals whose services may be required in connection with the supply of the products and the services under the verified contracts such facilities as may be necessary for their entry into Bangladesh and stay therein for the performance of their work.

7) To take necessary measures for getting permission for construction works under the Project from the authorities concerned, if necessary.

8) To bear all the expenses other than those to be borne by the Grant.

ANNEX - II

1. To improve the management system of DWASA as described in Appendix.

2. To promote the leakage detection control programme in the project area as described in Appendix.

3. To reinforce water quality management for conservation of the water quality of raw water for the Chandnighat water Treatment plant as described in Appendix.

4. To provide the operation and maintenance expense so as to maintain and use properly and effectively the rehabilitated plant under the Grant.

Action plan as per recommendation of the JICA study team for the Implementation of BMRE project for Chandnighat W.T.P.

Recommendation proposed by the study team.	Action to be taken/already taken.
1. Improvement of management system of Dhaka WASA for two fold desk in planning and monitoring cell.	The overall responsibility of the Planning and Monitoring Division is to plan for new projects and during execution of its evaluation and monitoring. After completion of necessary approval it is implemented under direct supervision of a Project Director from outside of Planning Division.
(a) Planning desk for new project.	A new set-up showing two fold desks one is for planning of new projects and other is for monitoring is expected to be approved by the GOB soon. It may be mentioned that there are one Deputy Chief, One Asstt. Chief, Two Planning Officers, Two Research Officers and 4 Research Asstt. are working now.
(b) Management desk for planning and implementing the project.	
2. In charge of counter part Engineer.	Mr. S.D.M. Quamrul Alam Chowdhury, Executive Engineer, MODS Zone-II has been assigned as in-charge of counter part Engineer with the designation of Project Director for Chandnighat project. He will look after the project till completion of the same.

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3. Provision for operation and maintenance expenses.	After completion of the project in question, necessary budget provision for operation and maintenance to the project will be kept in DWASA Annual Revenue Budget.
4. Promotion of leak detection control programme.	Number and location of Faucets/Street Hydrent (Without stop valve) has already been indentified. Rehabilitation programme has already been started and expected to be completed by June 1993.
(a) FAUCETS (Without stop valve)	
(b) Pitcher Pump.	A consumer survey has already been started in MODS Zone-II area to detect illegal pitcher pump/hand pump along with other information. At the end of this survey, warning letter or notices will be issued to remove the same. In this regard a campaign programme for public motivation has been started through different mass media like news paper T.V. etc.
	It is noted that pitcher pump is mainly used due to shortage of water. After improvement of water supply, pitcher pump automatically will go off.

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(c)	Leak detection and control programme.	DWASA is continuously giving effort to detect the leakage in the distribution system and to control them. as a part of this effort DWASA has already rehabilitated 15 Km. water line in MODS Zone-II area. 7 Km. water line will be rehabilitated within June'93 also and this process of changing old pipe by new ones if necessary will be continued in future. Furthermore WASA personnel are given training to utilise leak detection equipments for prompt detection of leakages and remedial measure of the same.
5.	Reinforcement of water quality control system.	DWASA has its own water quality control laboratory for analysing water quality as a routin work. A chemical Engineer, two micro biologists have already been appointed. On requirement Dhaka WASA will obtain the help from the Department of Environment (DOE), Atomic Energy Commission, BUET, Dhaka University etc. for ensuring the quality of water effectively.
6.	To take necessary measures to obtain permission from DCC for construction work.	A general Permission for the Project work concerning Road repair, Road restoration etc. will be obtained from DCC by Dhaka WASA and submit to JICA, Bangladesh office before start of the work. Contractor will submit work schedule to DWASA. DWASA will submit work schedule to DCC to get Permission to work on the DCC Road.

ABDUL MUQUEET
Member Engineer (Incharge)
and
Chief Engineer
DWASA.

OFFICE OF THE EXECUTIVE ENGINEER
MODS ZONE-II, DHAKA WASA, DHAKA .

LIST OF STREET HYDRANT WITH LARATION

Sl.No.	Holding No.	Nos of tap	Remarkes
1.	199, Banshal Road, Dhaka.	1(One)No.	
2.	177, -do-	1(One) no.	
3.	161, -do-	1(One) "	
4.	104, -do-	1)One) "	
5.	28/6, -do-	1(One) "	
6.	24, -do-	1(One) "	
7.	86, Ahi Ullah Road, Dhaka.	1(One) "	
8.	13, -do-	1(One) "	
9.	89, K.P.Gosh street RoadcDhaka.	1(One) "	
10.	28, -do-	1(One) "	
11.	35, -do-	1(One) "	
12.	51, -do-	1(One) "	
13.	24/1, -do-	1(One) "	
14.	24, -do-	1(One) "	
15.	65, -do-	1(One) "	
16.	6, -do-	1(One) "	
17.	38/1, -do-	1(One)"	
18.	5, -do-	1(One) "	
19.	3, Kashgytu;i Road, Dhaka.	1(One) "	
20.	25, -do-	1(One) "	
21.	9, -do-	1 (One) "	
22.	3, Kazim Uddin lane, Dhaka	1(One) "	
23.	17, Baggdasha lane, Dhala.	1(One) "	
24.	47/1, -do-	1(One) "	
25.	57, -do-	1(One) "	
26.	11, -do-	1(One) "	
27.	Sromzibi Hoshpiliel front(Neya Bazar)	1(One) "	
28.	Nowbad Yusuf Market	1(One) "	
29.	13, Samshabad, Dhaka.	1(One) "	
30.	25, -do-	1(One) "	
31.	37, Abdulla Sarkar lane, Dhaka	1(One) "	
32.	33, Freance Road, Dhaka	1(One) "	
33.	1/1, Abul Hasnath Road, Dhaka	1(One) "	

Sl.No.	Holding No.	Nos of tap	Remarks Remerkes.
34.	118,Abul Hasnath Road,Dhaka.	1(One) No.	
35.	121, -do-	1(One) "	
36.	7/2,Keder Nath dy lane,Dhaka	1 (One) "	
37.	7/1, Golam Mostafa lane,Dhaka.	1 (One) "	
38.	22/2,K,M.Azam lane,Dhaka.	1 (One)"	
39.	18, Noor Box lane,Dhaka	1(One) "	
40.	2,Nabalque Miah lane,Dhaka	1(One) "	
41.	18,Hafiz Ullah Road,Dhaka	1(One) "	
42.	2,Molavi Bazar Road,Dhaka	1 (One) "	
43.	13, Becharam Dewri,Dhaka	1 (One) "	
44.	37, -do-	1(One) "	
45.	35, -do-	1 (One) "	
46.	16, -do-	1 (One) "	
47.	13/1,Ali Hossain Khan Road,Dhaka.	1 (One) "	
48.	Abul Khayrat Road,Dhaka	1 (One) "	
49.	6/1,Agha Nowab Dewri,Dhaka.	1(One) "	
50.	12, B.K.Ray lane,Dhaka	1 (One) "	
51.	3/1, D.C.Ray Road,Dhaka	1 (One)"	
52.	35,Nitfot Road,Dhaka.	1(One) "	
53.	26, -do-	1(One) "	
54.	Armanitula Mat	1 (One) "	
55.	21/B,Armoniyam Street,Dhaka.	1 (One) "	
56.	17/1,Syed Hashan Ali lae,Dhaka	1 (one) "	
57.	8, -do-	1(One) "	
58.	37/4,Jindabahar Ist lane,Dhaka	1 (One) "	
59.	32, -do-	1(One) "	
60.	4/3, -do-	1(One) "	
61.	28, -do-	1(One)"	
62.	22/3, -do-	1(One) "	
63.	13,Jindabahar 3rd.lane,Dhaka	1(One) "	
64.	4, -do-	1(One) "	
65.	33,Proshann Poddar Lane,Dhaka	1(One) "	
66.	29, -do-	1(One) "	

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Sl.No.	Holding No.	Nos of tap	Remerkes.
67.	50,Proshann Podder lane,Dhaka	1 (One) No.	
68.	51,Enligh Road,Dhaka.	1(One) "	
69.	74, Tati Bazar Road,Dhaka.	1(One) "	
70.	61/1,Radoka Mohan Bashak lane,Dhaka	1(One) "	
71.	6, -do-	1(One) "	
72.	27, -do-	1(One) "	
73.	9/1, Julan Bari lane, Dhaka.	1(One) "	
74.	31,Razar Deweri ,Dhaka.	1(One) "	
75.	71, Ghoyal Nagor Road,Dhaka.	1(One) "	
76.	25, -do-	1(One) "	
77.	87, -do-	1(One) "	
78.	25,Khot House street,Dhaka	1(One) "	
79.	7, -do-	1(One) "	
80.	8/1, -do-	1(One) "	
81.	4,Ahshan Ullah Road,Dhaka	1(ONe) "	
82.	9, -do-	1(One) "	
83.	26, -do-	1(One) "	
84.	19, -do-	1(One) "	
85.	25/3, -do-	1(One) "	
86.	13, -do-	1(One) "	
87.	27,Khumartu,i Road,Dhaka	1(One) "	
88.	9, -do-	1(One) "	
89.	66/1,Shakari Bazar Road,Dhaka.	1(One) "	
90.	74, -do-	1(One) "	
91.	32/2,Panitula lane,Dhaka	1(One) "	
92.	17,Bashabari lane,Dhaka	1(One) "	
93.	11/1,Hayabut Nagar lane,Dhaka	1(one) "	
94.	1/1,Kazi Riyaz Uddin Road,Dhaka	1(One) "	
95.	22,Shahazada Miah lane,Dhaka	1(One) "	
96.	9,Shadrghat Road,Dhaka	1(One) "	
97.	2,Shimsan Road,Dhaka	1(One) "	
98.	10,Ptuyatuli lane	1(One) "	
99.	45,Akamal Khan Road(Babu bazar)	1(One) "	
100.	16,Shalgola Road,Dhaka	1(One) "	

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Sl.No.	Holding No.	Nos of tap	Remarkes
101.	14,U Podder lane,Dhaka.	1 (One) No.	
102.	90,Dhaka Water Works Road,Dhaka	1 (One) "	
103.	144, -do-	1 (One) "	
104.	28, -do-	1 (One) "	
105.	38, -do-	1 (One) "	
106.	2,Rahmotgong Road,Dhaka	1(One) "	
107.	25. -do-	1 (One) "	
108.	46, -do-	1 (One) "	
109.	30,Haji Ballu Road,Dhaka	1 (One) "	
110.	31/5/A, -do-	1 (One) "	
111.	21, -do-	1 (One) "	
112.	44, Debi Dhasgath Road,Dhaka	1 (One) "	
113.	9, -do-	1 (One) "	
114.	17, -do-	1 (One) "	
115.	30,Bar Katara Road,Dhaka	1 (One) "	
116.	27, -do-	1 (One) "	
11 7.	14,Showari Ghat Road,Dhaka	1(One) "	
118.	31, -do-	1 (One) "	
119.	5/A,Chempatuli lane,Dhaka	1 (One) "	
120.	1, -do-	1 (One) "	
121.	7, -do-	1 (One) "	
122.	72, Khaze Dewayan Ist.lane,Dhaka	1 (One) "	
123.	94,Hornath Ghos Road,Dhaka	1(One) "	
124.	17, Joynagha Road,Dhaka	1(One) "	
125.	11/2, -do-	1 (One) "	
126.	28, Uddu Road,Dhaka	1 (One) "	
127.	16,Kaml Dhah Road,Dhaka	1(One) "	
128.	10,Umesh Detta Road,Dhaka	1 (One) "	
129.	28, -do-	1 (One) "	
130.	16,Bachshi Bazar lane,Dhaka	1 (One) "	
131.	55, -do-	1 (One) "	
132.	26, -do-	1 (One) "	

Condt.....P/5.

Sl.No.	Holding No.	Nos of tap	Remarkes
133.	31,Hosheni Dalan Road,Dhaka	1 (One) No.	
134.	64/1, -do-	1 (One) "	
135.	91/2, -do-	1 (One) "	
136.	73, -do-	1 (One) "	
137.	82, -do-	1 (One) "	
138.	87, -do-	1 (One) "	
139.	92/2,Nazim Uddin Road,Dhaka.	1 (One) "	
140.	9,Hekim Habbur Rahman Road,Dhaka	1 (One) "	
141.	10, -do-	1 (One) "	
142.	14, -do-	1 (One) "	
143.	33, -do-	1 (One) "	
144.	9,Mohi Uddin lane,Dhaka	1 (One) "	
145.	48,Nandkumar Dett Road,Dhaka.	1 (One) "	
146.	31, Hornath Ghash Road,Dhaka	1 (One) "	
147.	28, Haji Rahim box lane,Dhaka	1 (One) "	
148.	Sayestakhan Callayadantera Center.	1 (One) "	
149.	25, -do-	1 (One) "	
150.	29,Nurfta lane,Dhaka	1 (One) "	
151.	23, -do-	1 (One) "	
152.	Dhakeswari Fire Office	1 (One) "	
153.	Azimpur Road,Dhaka	1 (One) "	
154.	40,Khajedewan 2nd.lane,Dhaka	1 (One) "	
155.	28, -do-	1 (One) "	
156.	88, -do-	1 (One) "	
157.	26, -do- Ist lane	1 (One) "	
158.	15, Kaji Kiyaz Uddin Road,Dhaka	1 (One) "	
159.	27, -do-	1 (One) "	
160.	30, -do-	1 (One) "	
161.	42, -do-	1 (One) "	
162.	5/7,Kaznarayan Dhar Road,Dhaka	1 (One) "	
163.	30/3, -do-	1 (One) "	
164.	45, -do-	1 (One) "	
165.	51/1, -do-	1 (One) "	
166.	53, -do-	1 (One) "	

Contd.....P/6.

Sl.No.	Holding No.	Nos of tap	Remarkes.
167.	Raznarayan Dhar Road(Water Pump)	1 (One) No.	
168.	28, Shahid Naghar, Dhaka	1 (One) "	
1 69.	30/3, -do-	1 (One) "	
170.	2/1, J.N. Shaha Road, Dhaka	1 (One) "	
171.	4/2, -do-	1 (One) "	
172.	19, -do-	1 (One) "	
173.	20, -do-	1 (One) "	
174.	204, -do-	1 (One) "	
175.	29/2, Azghar lane, Dhaka	1 (One) "	
176.	6, -do-	1 (One) "	
177.	71, Chakk Circulaer Road, Dhaka	1 (One) "	
17 8.	78, Mawlabi Bazar, Dhaka	1 (One) "	
179.	210/1, J.N. Shaha Road, Dhaka	1 (One) "	
180.	220, -do-	1 (One) "	
181.	224/1, -do-	1 (One) "	
182.	232, -do-	1 (One) "	
183.	236, -do-	1(One) "	
184.	236/1/1, -do-	1 (One) "	
185.	299, -do-	1 (One) "	
186.	305, -do-	1 (One) "	
187.	178, -do-	1 (One) "	
188.	116, -do-	1 (One) "	
1 89.	Haji Ballu Ghat lane, Dhaka	1 (One) "	
190.	85, -do-	1 (One) "	
1 91.	32, Lalbagh Road, Dhaka	1 (One) "	
192.	324, -do-	1 (One) "	
193.	Khan Mohad Mosque	1 One) "	
194.	133, Lalbagh Road, Dhaka	1 (One) "	
195.	244, -do-	1 (One) "	
196.	132, -do-	1 (One) "	
197.	38/5, -do-	1 (One) "	
198.	185, -do-	1 (One) "	
199.	210, -do-	1 (One) "	
200.	209/A, -do-	1 (One) "	
201.	201/Eh -do-	1 (One)"	

Condt.....P/7.

Sl.No.	Holding No.	Nos of tap	Remarkes.
202.	204/1,Lalbagh Road,Dhaka	1 (One) No.	
203.	226, -do-	1 (One) "	
204.	212/4, -do-	1 (One) "	
205.	234, -do-	1 (One) "	
206.	236, -do-	1 (One) "	
207.	155, -do-	1 (One) "	
208.	Azimpur Communitte Center.	1 (One) "	
209.	8/1, Azimpur Road,Dhaka.	1 (One) "	
210.	15, -do-	1 (One) "	
211.	24/3, -do-	1 (One) "	
212.	39, -do-	1 (One) "	
213.	39/5, -do-	1 (One) "	
214.	36, -do-	1 (One) "	
215.	38, -do-	1 (One) "	
216.	11, -do-	1 (One) "	
217.	10,Kaz Shree Nath street,Dhaka	1 (One) "	
218.	6,Gongaram Bazar lane,Dhaka	1 (One) "	
219.	14, -do-	1 (One) "	
220.	23, -do-	1 (One) "	
221.	34, -do-	1 (One) "	
222.	5/6,Shubal Dhas Road,Dhaka	1 (One) "	
223.	14, -do-	1 (One) "	
224.	22, -do-	1 (One) "	
225.	37, -do-	1 (One) "	
226.	42, -do-	1 (One) "	
227.	45, -do-	1 (One) "	
228.	85, -do-	1 (One) "	
229.	14,Kasmiretola lane,Dhaka	1 (One) "	
230.	19, -do-	1 (One) "	
231.	10,Duri Angu, lane,Dhaka	1 (One) "	
232.	26, -do-	1 (One) "	
233.	38, -do-	1 (One) "	
234.	42, -do-	1 (One) "	

Contd.....P/8.

Sl.No.	Holding No.	Nos of tap	Remarkes.
235.	Abdul Aziz lane,Dhaka.	1 (One) No.	
236.	59, -do-	1 (One) "	
237.	51, -do-	1 (One) "	
238.	44, -do-	1 (One) "	
239.	42, -do-	1 (one) "	
240.	13,Lalit Mohan Dhas lane	1 (One) "	
241.	13/1, -do-	1 (One) "	
242.	14, -do-	1 (One) "	
243.	9, -do-	1 (One) "	
244.	28, -do-	1 (One) "	
245.	33, -do-	1 (One) "	
246.	25, -do-	1 (One) "	
247.	13, M.C.Ray lane,Dhaka	1 (One) "	
248.	27, -do-	1 (One) "	
249.	28, -do-	1 (One) "	
250.	36, -do-	1 (One) "	
251.	38, -do-	1 (One) "	
252.	42, -do-	1 (One) "	
253.	39,Nowbabgong Road,Dhaka	1 (One) "	
254.	21, -do-	1 (One) "	
255.	Nowbabbgong Citi Publick Toylet.	1 (One) "	
256.	-do- (Fornt of Park)	1 (One) "	
257.	-do-	1 (One) "	
258.	Nowbabgong Big Mosque	1 (One) "	
259.	3,Hossin Udding Khen Ist lane,Dhaka	1 (One) "	
260.	22, -do-	1 (One) "	
261.	29, -do-	1 (One) "	
262.	9, -do- 2nd.	1 (One) "	
263.	7, -do-	1 (One) "	
264.	30, -fo-	1(One) "	
265.	42, -do-	1 (One) "	
266.	43, -do-	1 (One) "	
267.	3,Naghur Beltli lane,Dhaka	1 (One) "	
268.	15, -do-	1 (One) "	
269.	21, -do-	1 (One) "	
270.	Nowbabgong Polis	1 One) "	

Contd....P/9.

Sl.No.	Holding No.	Mons of tap	Remarkes
271.	6/2,Ghanctuli Road,Dhaka	1 (One) No.	
272.	15/3, -do-	1 (One) "	
273.	20, -do-	1 (One) "	
274.	40, -do-	1 (One) "	
275.	Ghanctuli jame Mosque	1 (One) "	
276.	Ghanctuli Sewer Calloni Mandir	1(One) "	
277.	50,Badda ghar lane,Dhaka.	1 (One) "	
278.	7, -do-	1 (One) "	
279.	48/3, -do-	1 (One) "	
280.	2,Nilbamar shaha Road,Dhaka	1 (One) "	
281.	6, -do-	1 (One) "	
282.	12, -do-	1 (One) "	
283.	10, -do-	1 (One) "	
284.	28, -do-	1 (One) "	
285.	31, -do-	1 (One) "	
286.	51, -do-	1 (One) "	
287.	53,Anayetgong Road,Dhaka	1 (One) "	
288.	73,Nilbamar shaha Road,Dhaka	1 (One) "	
289.	4,Vaghaptur Road,Dhaka	1 (One) "	
290.	7, -do-	1(One) "	
291.	12, -do-	1 (One) "	
292.	21, -do-	1 (One) "	
293.	48, -do-	1 (One) "	
294.	90, -do-	1 (One) "	
295.	117, -do-	1 (One) "	
296.	6,Moneswar Road,Dhaka	1 (One) "	
297.	38, -do-	1 (One) "	
2 98.	48/2, -do-	1 (One) "	
299.	58, -do-	1 (One) "	
300.	26/2, -do-	1 (One) "	
301.	1,Hazaribagh Road,Dhaka	1 (One) "	
302.	6/1, -do-	1 (One) "	
303.	8, -do-	1 (One) "	
304.	11, -do-	1(One)"	
305.	23/2, -do-	1 (One) "	
306.	25, -do-	1 (One) "	
307.	28, -do-	1 (One) "	
308.	33, -do-	1(One) "	
309.	Hazaribagh Sattolar Mazar	1(One) "	
310.	56/4, -do-	1 (One) "	

Contd....P/10.

Sl.No.	Holding No.	Nos of tap	Remarkds
311.	118,Hazaribagh Road,Dhaka.	1 (One) No.	
312.	127, -do-	1 (One) "	
313.	119, -do-	1 (One) "	
314.	Hazaribagh Parkk	1 (One) "	
315.	29/1,Hazaribagh lane,Dhaka	1 (One) "	
316.	137, -do-	1 (One) "	
317.	146, -do-	1 (One) "	
318.	60,Moneswar Road,Dhaka.	1(One) "	
319.	Hazaribagh (5 No.Pump).	1 (One) "	
320.	Khalil Sardar Mosque	1 (One) "	
321.	10,Colan mxk mhal,Dhaka	1 (One) "	
322.	16, -do-	1 (One) "	
323.	12, Nabipur, Dhaka	1 (One) "	
324.	27, -do-	1 (One) "	
325.	37, -do-	1 (One) "	
326.	40, -do-	1 (One) "	
327.	42, -do-	1 (One) "	
328.	7/6,Ghaz Mhal,Dhaka	1 (One) "	
329.	10, -do-	1 (One) "	
330.	21, -do-	1 (One) "	
331.	82, -do-	1 (One) "	
332.	90, -do-	1 (One) "	
333.	121, -do-	1 (One) "	
334.	123, -do-	1 (One) "	
335.	156, -do-	1 (One) "	
336.	Hazaribagh Dhaka Tranari,Dhaka	1 (One) "	
337.	59,Bgdda ZXX Naghar lane,Dhaka	1 (One) "	
338.	18, Moneswar Ist lane,Dhaka.	1 (One) "	
339.	20, Abdul Hadilane,Dhaka	1 (One) "	
340.	32, -do-	1 (One) "	
341.	23, -do-	1 (One) "	
342.	37,Sikkatoli lane,Dhaka	1 (One) "	
343.	6, -do-	1 (One) "	
344.	72, -do-	1(One) "	

Contd.....P/11.

Sl.No.	Holding no.	Nos of tap	Remarkes.
345.	14,Shikkatoli lane,Dhaka	1 (One) No.	
346.	51/A, -do-	1 (One) "	
347.	49, -do-	1 (One) "	
348.	13,Malitola lane,Dhaka	1(One) "	
349.	78, -do-	1 (One) "	
350.	99/1,Haji Osman Ghani Road,Dhaka	1 (One) "	
351.	38, -do-	1 (One) "	
352	5/2,Abdul Hadi lane,Dhaka	1(One) "	
353.	128, Siddique Bazar,Dhaka	1 (One) "	
354.	85, -do-	1 (One) "	
355.	48/1, -do-	1 (One) "	
356.	133, -do-	1 (One) "	
357.	77,Nowbabkatra Road,Dhaka	1 (One) "	
358.	3,Haji Ala Uddin Road ,Dhaka	1 (One) "	
359.	12, -do-	1 (One) "	
360.	28/A,Haji Osman Ghani Road,Dhaka	1 (One) "	
361.	135,Agha Shadeque Road,Dhaka	1 (One) "	
362.	32, Abul Hasnat Road,Dhaka	1 (One) "	
363.	132, -do-	1 (One) "	
364.	118, -do-	1 (One) "	
365.	101, -do-	1 (One) "	
366.	141, -do-	1 (One) "	
367.	17/18,Jhuri Oyala Ghali	1 (One) "	
368.	62, -do-	1 (One)"	
369.	142,Bangladesh Ghat Pump	1 (One) "	
370.	3,Tequer Hat,Dhaka	1 (One) "	
371.	58, Lutfar Rahman lane,Dhaka	1 (One) "	
372.	135, -do-	1 (One) "	
373.	120, -do-	1 (One) "	
374.	90/93, -do-	1 (One) "	
375.	118, -do-	1 (One) "	
376.	91/1, -do-	1 (One)"	
377.	62,Gholque Pal lane,Dhaka	1 (One) "	
378.	99, Malitola,Dhaka.	1 (One)"	

Contd.....P/12.

T.T.

Sl.No.	Holding No.	Nos of tap	Remarkes
378.	66, Malitola, Dhaka.	1 (One) No.	
380.	24, -do-	1 (One) "	
381.	15, -do-	1 (One) "	
382.	29/2, -do-	1 (One) "	
383.	27, -do-	1 (One) "	
384.	267, Banshal Road, Dhaka	1 (One) "	
385.	167, -do-	1 (One) "	
386.	32, Abul Hasnath Road, Dhaka	1 (One) "	
387.	101, -do-	1 (One) "	
388.	132, -do-	1 (One) "	
389.	118, -do-	1 (One) "	
390.	141, -do-	1 (One) "	
391.	83, -do-	1(One) "	
392.	88, -do-	1 (One) "	
393.	77, Siddique Bazar, Dhaka	1 (One) "	
394.	19/20, -do-	1 (One) "	
395.	20/25, -do-	1 (One) "	
396.	40/41, -do-	1 (One) "	
397.	173, -do-	1 (One) "	
398.	150, -do-	1 (One) "	
399.	49, -do-	1 (One) "	
400.	76, -do-	1 (One) "	
401.	86, -do-	1 (One) "	
402.	102/1, -do-	1 (One) "	
403.	105, -do-	1 (One) "	
404.	66/1, -do-	1 (One) "	
405.	62, -do-	1 (One) "	
406.	83 -do-	1 (One) "	
407.	96, -do-	1 (One) "	
408.	42, Haji Osman Ghani Road, Dhaka	1 (One) "	
409.	128, Siddique Bazar, Dhaka	1 (One) "	
410.	2, Nowbabkatra, Dhaka.	1 (One) "	
411.	51/1, -do-	1 (One) "	

Condt.....P/12.

Sl.No.	Holding No.	Nos of tap.	Remarkes.
412.	54 ,Nowbabkatra,Dhaka	1 (One) No.	
413.	49, -do-	1 (One) "	
414.	57/1, -do-	1 (One) "	
415.	15, -do-	1 (One) "	
416.	62,Agha Shadeque Road,Dhaka	1 (One) "	
417.	91, -do-	1 (One) "	
418.	98, -do-	1 (One) "	
419.	135, -do-	1 (One) "	
420.	77, -do-	1 (One) "	
421.	46, -do-	1 (One) "	
422.	16/17, -do-	1 (One) "	
423.	52, -do-	1 (One) "	
424.	83, -do-	1 (One) "	
425.	3,Kazi Alla Uddin Road,Dhaka	1(One) "	
426.	12, -do-	1 (One) "	
427.	16, -do-	1 (One) "	
428.	28, -do-	1 (One) "	
429.	92,Agha Shadeque Road,Dhaka	1 (One) "	
430.	43,Aghamashi lane,Dhaka	1 (One) "	
431.	16/17, -do-	1 (One) "	
432.	83, -do-	1 (One) "	
433.	481,Shikkatoli Road,D haka	1 (One) "	
434.	4, Abdul Hadi; lane,Dhaka	1 (One) "	
435.	18, -do-	1 (One) "	
436.	32,Alinequei dewri lane,Dhaka	1 (One) "	
437.	55, Nowbabkatra Road,Dhaka	1 (One) "	
438.	39, -do-	1 (One) "	
439.	7, -do-	1 (One) "	
440.	16, Kazi Alla Uddinc Road,Dhaka	1 (One) "	
441.	34, -do-	1 (One) "	
442.	144/2, -do-	1 (One) "	
443.	138, Aghashadeque lane,Dhaka	1 (One) "	
444.	62, -do-	1 (One) "	
445.	77, -do-	1 (One) "	
		1 (One) "	

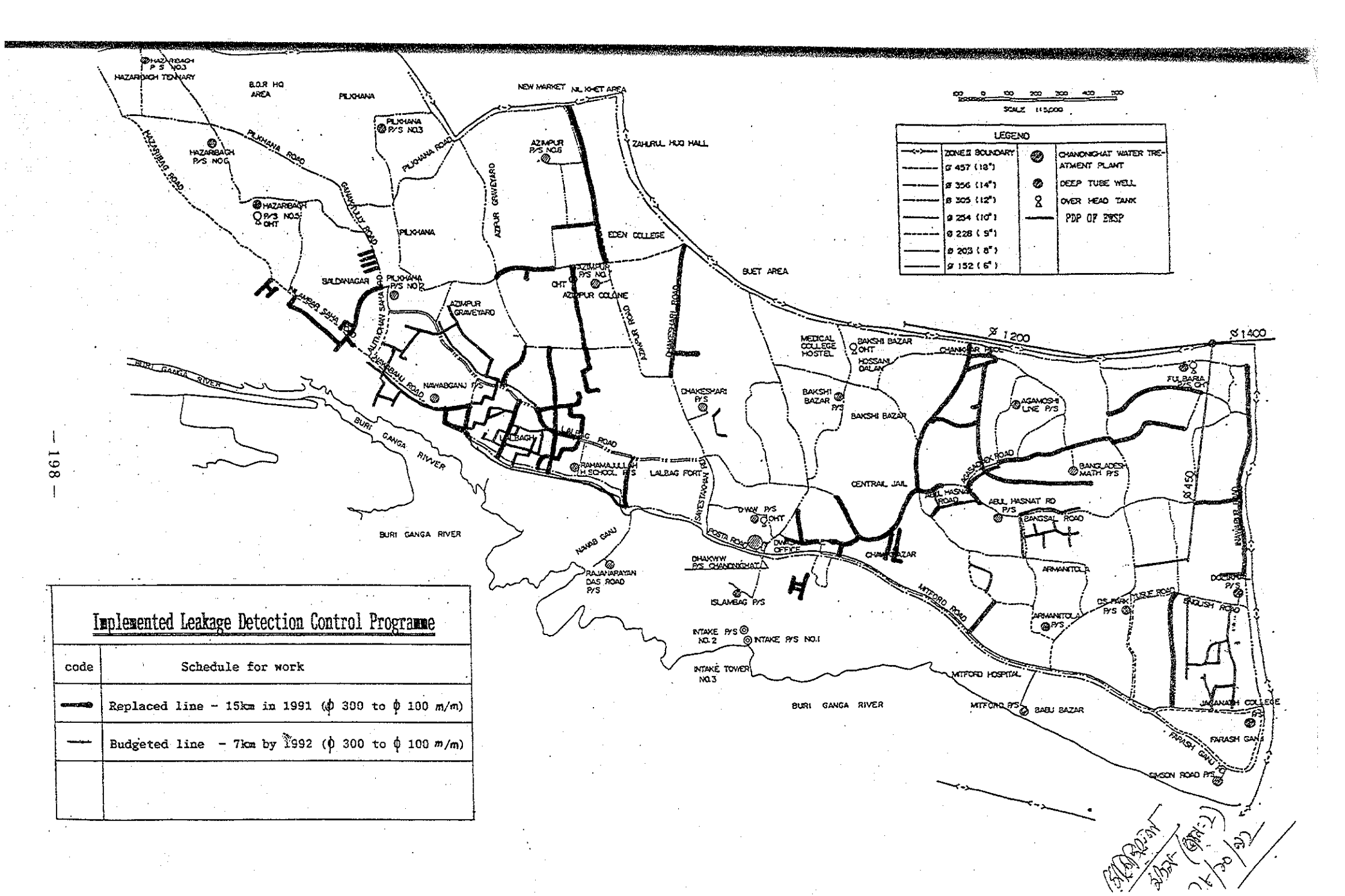
Contd... .....P/13.

Sl.No.	Holding No.	Nos of tap	Remarkes
446.	105/3, Hazi Osman Ghoni Road, Dhaka	1 (One) No.	
447.	38, -do-	1 (One) "	
448.	23, Nazima Bazar, Dhaka .	1 (One) "	
449.	21, -do-	1 (One) "	

OVERALL SCHEDULE FOR MAINTENANCE OF STREET HYDRANT IN ZONE-II AREA

Item of works	1992			1 9 9 3													
	Oct	Nov	Dec	Jan	Feb	Mar	Apr	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
List up location of Hydrants	XXX																
Prepare for bidding		XXX	XXXX														
Start repair work				XXX	XXXX	XXXX (for	XXXX 390	XXXX units)	XXXX	XXXX	XXXX						
Maintenance												XXX	XXXX	XXXX	XXXX	XXXX	XXXX*

* to be continued,
if necessary.



Implemented Leakage Detection Control Programme

code	Schedule for work
▬▬	Replaced line - 15km in 1991 (ϕ 300 to ϕ 100 m/m)
——	Budgeted line - 7km by 1992 (ϕ 300 to ϕ 100 m/m)

ドラフト・レポートに対するＤＷＡＳＡのコメント及び同確認書

Comments of DWASA on the :-

"Basic Draft Design Study Report on the Project for Balancing, Modernizing, Rehabilitation and Expansion of Chandnighat Water Treatment Plant.

A. 1. WASA personnels should be associated from the Planning stage of this project upto the completion. This integration is necessary for conceptual understanding of the philosophy as well as techniques of the project. The consultant may furnish a set-up for WASA personnel in this regard.

B. 1. During the implementation of this BMRE Project, the existing water supply facilities should be kept uninterupted.

2. A more extensive raw water quality test, specially in dry season may be performed by the consultant to detect presence of heavy metal, excessive NH_4-N and other harmful materials, if any.

3. Generally during dry months, there are problems of excessive algal growth in raw water near the intake point. This is to be taken into consideration during process design.

4. The intake point is to be extended further down to the river as per earlier proposal. Problems of necessary permission, if any, will be resolved by DWASA.

5. The intake water pipe starting from the intake point in the river upto the intake pump house number 1 is to be refixed/ rehabilitated as required.

Contd.....P/2.

6. The structural stability and longevity of flocculation and sedimentation basins may be checked during designing stage provision for renovation of these structures, if possible, may be kept in this project.

7. Detail of alignment & sizes of transmission pipe from intake to receiving well may be furnished.

8. Prechlorination point may be indicated in the treatment flow chart.

9. Safe disposal of the sludge should be ensured in order to avoid environmental hazards and recirculation through intake.

10. Originally a 600 mm dia pipe size was discussed for treated water distribution system. In the basic design draft study report, it is proposed to be 500 mm. This may be rechecked.

11. Provision for pressure drop valve in the distribution system may be kept for structural safety of existing secondary water system.

12. Construction of distribution main from the plant to the secondary water main to be included in the scope of work.

13. Renovation of both intake and distribution pump houses to be included in this project.

14. Provision for security arrangement such as boundary wall etc. is to be kept in the scope of work.

Contd.....P/3.

15. Complete installation of Mechanical and Electrical Equipment for the treatment plant is to be included in the scope of work.

16. For operational necessity priming facility of intake pumps may be kept in the system.

17. Installation of a new 1000 KVA transformer & repair of the existing H.T. Switch gear should be kept in the scope of work. All electrical cables to be installed underground.

18. Specification of intake pumps to be defined more clearly. All pumps may be self primed type.

19. The Rising pump for filter may be provided with Turbine pump. Provision of standby pumps may be kept.

20. The condition of the existing pumps which will not be changed during this project is to be checked and comments may be furnished regarding their performance.

21. Existing intake & distribution pumps, electrical sub-station renovations, alterations, if necessary, may be included in the scope of work.

22. Provision for well equipped water testing laboratory to be kept in the scope of work.

23. The scope of work from GOB side should be described elaborately to avoid any future uncertainity.

Contd.....P/4.

24. If possible, the construction period may be reduced.

25. The existing DTW is to be kept operational in view of meeting local water demand.

26. At the end of construction of this project, the consultant is requested to furnish an operation & maintenance manual and proposal for a required set-up of personnel for operation and maintenance of the rehabilitated WTP.

27. Road repairment cost is to be included in the scope of work.

C. 1. The concept of staff house is not clear enough. More elaborate description on the same is necessary.

2. Provision for further vertical extension of the proposed office building may be kept.

3. Provisions for official & residential accommodation for water works maintenance staff to be kept in the project.

4. Probable cost estimate, for consultancy service, construction cost of the project including foreign currency involvement & GOB contribution including CDST to be stated for preparation of necessary documents in Bangladesh.

5. Authority & Responsibility of DWASA personnel involved in the project to be properly out lined.

Contd.....P/5.

6. Provision for extensive training of concerned WASA personnel for effective management of operation and maintenance of the plant is requested.

7. There is no indication of maintenace period of the working contractor. DWASA will prefer one year maintenance period.

8. Location of site office of the project may be shown well ahead of commencement of the project.

9. Provision of utility vehicles (Jeep/Pick-up) for supervision of project, operation & maintenance of the plant needs be kept.

10. The organization plan for the plant can be modified and shown shift-wise with job specification of individual staff.

11. In page 168, the comments on over all quality of water in general is not correct. Only iron (Fe.) is excessive according to table 3-5 page 52 of the Basic Design Study Report. This may be taken care of at the time of process design.

26/10/92

ABDUL MUQUEET
Member Eegineer (Incharge)
and
Chief Engineer
DHAKA WASA.

CONFIRMATION TO THE COMMENTS, FURNISHED BY DWASA ON THE BASIC DESIGN STUDY REPORT FOR CHANDNIGHAT WTP, FROM THE CONSULTANT.

A1. It is agreeable that before commencement of the Detail Design Work the consultant will submit a set-up for WASA personnel those will be associated with the project from its planing stage upto the completion.(ref.page No.42,170)

B1. The same has been considered and recommended in the Basic Design Study Report (Page No.92,109,165).

B2. The same is not agreeable, as because;

a) The matter is entirely in the scope of DWASA's side operation.

b) DWASA's having its own laboratory, must be doing such testings throughout all seasons, involvement of consultant in above work is not necessary.

c) At present the quality of water is upto the mark, which has been incorporated in page No.52

B3. Preservation of the enviromental conditions and to ensure the quality of raw water to be drawn from the river (at intake point) is the overall resposibility of the WTP Management at Chandnighat. However, the consultant aims to assist DWASA to take necessary action on above respect during detail design and supervisory service stage for the project,if it is required.

B4. Recommendation on this point has been made in the Basic Design Study Report (Page No.73,173).Moreover, at present quality of water at existing intake point is allright. In future if needed intake point may be extended upto the main river by a separate project.

B5. The same will be considered to refix as required.

B6. The same is agreeable, considerable amount of renovation works for these structures has already been suggested in the Basic Design Study report. (ref.page No.72)

B7. The same has already been considered in the Basic Design Study Report, for Pump stations No.1 and No.2 (ref.page No.151).

B8. The same has been indicated in the Basic Design Study Report,. (ref.page No.150)

B9. As the material of the sludge contents is the same as that of raw water contents (suspended solid material)therefore, recirculation of the same will not effect to river water quality. However, the discharge point for recirculation into river will be considered. in order to prevent environmental hazards.

B10. The 600mm dia pipe,in question, was decided for 11MGD capacity, but this project decided design for 8.6MGD for which 500mm dia pipe deemed to be sufficient.

B11. The same is not necesary because distribution pressure is max. 3.5 kg/m which is not too high pressure for distribution main. Also, the pressure control can be done by the control valve.

B12. Said connection works are included in this project,but the number of connection points are limited and will be considered from the technical point of view. It will be included in scope of work.

B13. Already considered in the Basic Design Study Report for minor repair works, painting, finishing ect. for the buildings only.

B14. Only the portion of wall demolished at the time of construction will be re-constructed again,as it was, and finishing work will be done for only the part in relation to demolished wall.

B15. Already considered for in the Basic Design Study Report. In scope of works installation for all E/M equipment will be included. (ref. page No.162)

16. Priming facility for the pump will be considered at detail design stage after confirmation of critical water level between river water and the pump installations.

B17. Existing 800KVA transformer is available to maintain running, therefore, question of installation and repair is out of scope. Refer to Appendices A-4, Memorandum of Discussion, Part 2,10).

B18. Already considered for and incorporated in the Basic Design Study Report,Page-116.

B19. There is no space for the installation of horizontal Turbine Pump and therefore Submersible Pump has been selected. The subject in question will be clarified during Detail Design Study period. The rough cost for both kinds of pump is almost same. Standby Pump has already considered in the Report,- Page No.124.

B20. Consultant will furnish comments on Intake pumps, as requested.

B21. The same has already been incorporated in the Basic Design Study Report,- Page No.162.

B22. Since DWASA has its own laboratory,general water quality analysis should be done there. To decide of the chemical dosing rate some testing equipment will be provided in the Chandighat water works, under this project, besides PH, turbidity, colour, temparature testing instrument and equipment. Provision of Lab. facilities will be included in scope of works.

B23. The same has already been incorporated in the Basic Design Study Report,- Page No.92.164.

B24. The same has already been incorporated in the Basic Design Study Report,- Page No.109,160,161.

B25. The same has been considered and will be indicated on the general plan (Page No.133) of the Basic Design Study Report.

"26. The same has already been incorporated in the Basic Design Study Report(Page No.96),as for Operation & Maintenance Manual will be presented by the contractor, as was done for USCR Project.

B27. The same has already been included in the project cost.

C1. The same has been considered as a resting place for on duty staff specially during night works

C2. The same has been considered for further build up extension for 2nd floor, for future.

C3. The same is considered as out of scope for this project.

C4. The consultant agrees to provide the same.

C5. As agreed earlier, during Detail Design work the consultant will provide a set-up for DWASA personnel attached to this project,it will also clarify their authority and responsibilities. Please refer to Page No.43 for implementation organisation proposed.

C6. Training for DWASA staff on operation and maintenance of the WTP is inclusive of the scope of works for the project.Same way it was done for USCR Project.

C7. The same will be incorporated in the tender conditions, same as the USCR PROJECT.

C8. The same has already been incorporated in the Basic Design Study Report, Page No.97.

C9. The same is considered as out of scope for this project.

C10. The same has already been incorporated in terms of shift-wise with job specification by means of the existing shift organisation in the Basic Design Study Report,page No.96.

C11. The same will be followed to your comment.

-4-

N.B.1 Communication system shall be provided by walky-talky set.

KENJI HORI
Consultant,
NIPPON JOGESUIDO SEKKEI CO.LTD.
Tokyo-Japan.

Confirmed except the content in SL B-4
August
17/11/92

DATED : Oct. 29, 1992.

添　付　資　料　B

B－1　将来水需要予測関連資料

B－2　インタビュー調査結果

(1)　インタビュー調査住所表

(2)　インタビュー調査実施位置図

(3)　インタビュー調査集計表

(4)　インタビューによる給水時間グラフ

B－3　過去の原水水質に関する資料

B－4　チャンドニガット浄水場現況電気単線結線図

B－5　直接給水／高架タンク給水操作スケジュール図

B－6　MODS　ZONEⅡ
配水コントロール時間給水区分図

B－7　一次配水管ルート試掘調査結果

B－8　チャンドニガット浄水場内土質試験結果

将来水需要予測関連資料

Under the following conditions water demand in MODS Zone II is estimated:

1) Population in 1991 is based on the report from National Population Census (1991).

2) Population in 1995 and 2000 is estimated based on the calculation of population growth rate shown in DWASA's report on EWSP.

3) Population of non-permanent resident of the Project area is estimated based on number of floating people. The said population in 1991 is assumed five(5) times of number of floating people in National Census of 1981. Average growth rate of population in Dhaka city of 3.8% is used for estimation of the same for the year 1995 and 2000.

4) Daily water demand per capita is qouted from DWASA's report on EWSP, which is 158 litters in 1991 and 159 in 1995 and 2000 for LALAḆGH AREA and 145 litters in 1991, 146 in 1995 and 147 in 2000 for KOTWALI AREA.

5) Daily water demand per capita for non-permanent resident is assumed to be 80 litters till the year 2000.

6) Ratio of water supply physical loss is referred as 35%, 31% and 28% for the years 1991, 1995 and 2000, respectively which are derived from DWASA's report on EWSP. On the other hand, the present physical loss of 25% is indicated in DWASA's report of LDWPR as the result of the survey undertaken for system losses in the pilot areas. However, the ratio is likely to be little small for this particular Project area, because the said ratio is used for estimation of the system losses of whole of Dhaka City. The report sugests that the water pressure in the main pipe and the service connection in the survey is as 5 to 8 meter and lower than 2 m to 3 m, respectively. Which shows likely a little low pressure for the Project area.

In the report, therefore, water supply physical loss is assumed to be the same with the ratio shown in EWSP report.

Water demand in MODS Zone II is summed up by the outcome of the demand in Lalbagh area and Kotwali area, because the daily water demand between Lalbagh and Kotwali area is different.

Table 2- Estimation of Water Demand in Lalbagh Thana

Particulars	Year		
	1991	1995	2000
1. Population (in million)	405,024	433,254	464,448
2. Daily Water consumption per capita (lt/c.d.)	158	159	159
3. Water Consumption above (MGD)	14.06	15.14	16.23
4. No. of Non-permanent Residents (Persons)	49,900	57,900	69,800
5. Daily Water Consumption per capita above (lt/c.d.)	80	80	80
6. Water Consumption above (MGD)	0.88	1.02	1.22
7. Total Water Consumption (MGD)	14.94	16.16	17.45
8. Total Supply Loss (%)	35	31	28
9. Water Demand (MGD)	22.98	23.42	24.24

Table 2- Estimation of Water Deman in Kotwali Thana

Particulars	Year		
	1991	1995	2000
1. Population (in million)	192,424	202,622	213,969
2. Daily Water consumption per capita (lt/c.d.)	145	146	147
3. Water Consumption above (MGD)	6.13	6.50	6.91
4. No. of Non-permanent Residents (Persons)	81,300	94,500	113,800
5. Daily Water Consumption per capita above (lt/c.d.)	80	80	80
6. Water Consumption above (MGD)	1.42	1.66	2.00
7. Total Water Consumption (MGD)	7.55	8.16	87.91
8. Total Supply Loss (%)	35	31	28
9. Water Demand (MGD)	11.62	11.83	12.38

インタビュー調査結果

(1) インタビュー調査住所表

(2) インタビュー調査実施位置図

(3) インタビュー調査集計表

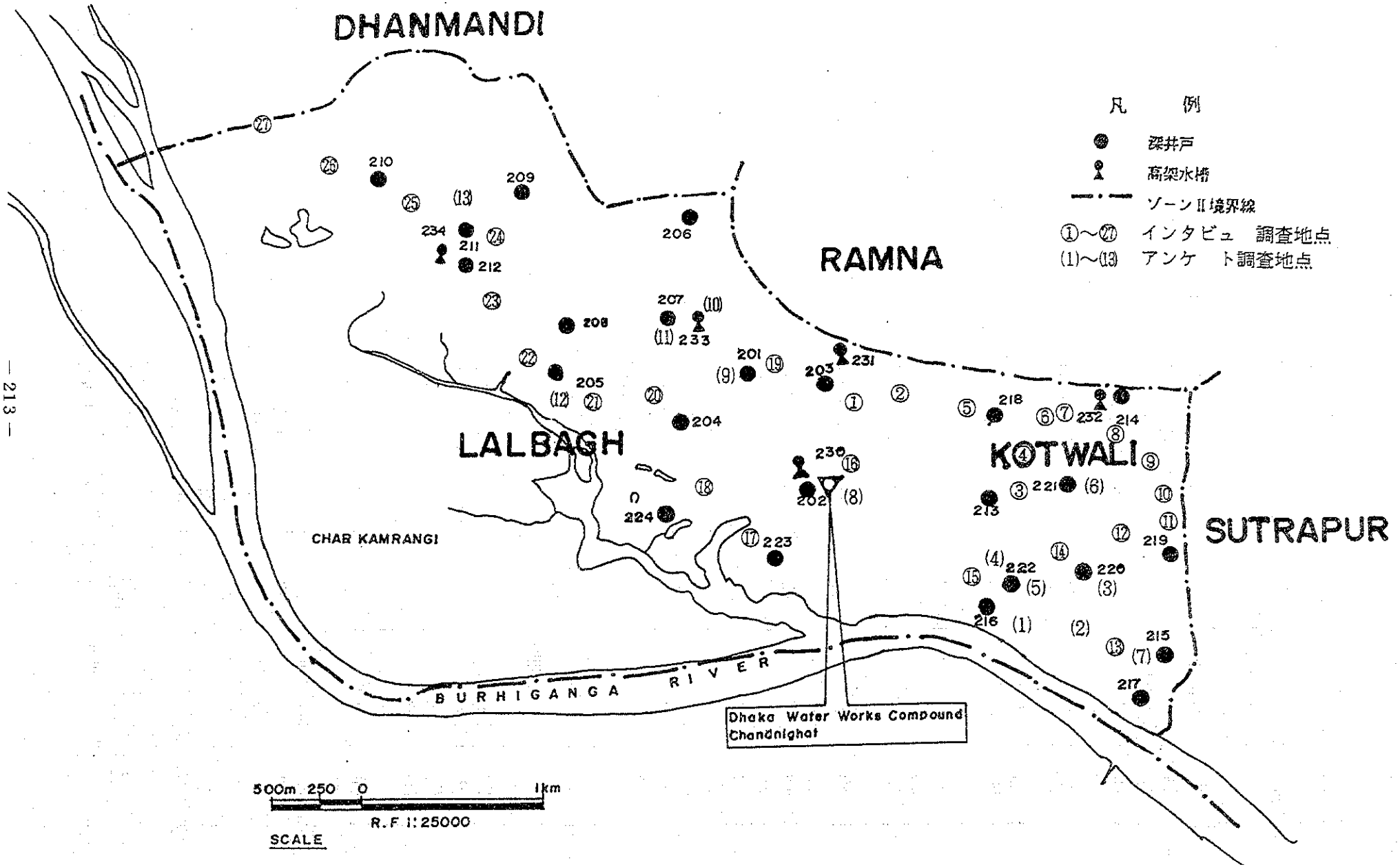
(4) インタビューによる給水時間グラフ

(1) インタビュー（アンケート）調査住所表

No.	RESIDENCE ADDRESS			Remarks
	THANA	WARD	ADDRESS	
①	LALBAGH		26 BAKSHI BAZAR	
②	〃		48/2 BAKSHI BAZAR	
③	KOTWALI	32	120/6 BANGSHAL ROAD	
④	〃	32	34 ABUL HASANAT ROAD	
⑤	〃	32	29 B.K.GANGULY LANE	
⑥	〃	32	35 NOWAB KATRA	
⑦	〃	32	25 NOWAB KATRA	
⑧	〃	33	146/6 SIDDEQUE BAZAR	
⑨	〃	33	154 SIDDEQUE BAZAR	
⑩	〃	33	244 NOWABPUR ROAD	LOCALE HOTEL
⑪	〃	33	263 NOWABPUR ROAD	
⑫	〃	34	50 MALITOLA	
⑬	〃	34	124 SHANKARI BAZAR	
⑭	〃	31	21 HAZI ABDUR RASHID LANE	TINPLATE SHOP
⑮	〃	31	218 MITFORD ROAD	PERFUME SHOP
⑯	LALBAGH	27	30/2 CHANDNIGHAT	
⑰	〃	28	35 ISLAMBAG	
⑱	〃	29	259 JAGONNATH SHAHA ROAD	
⑲	〃	27	6/1/ ORPHANAGE ROAD	
⑳	〃	22	5 NOWABGANJ	
㉑	〃	22	26/ NOWABGANJ	
㉒	〃	21	30/4 MONESHOR ROAD	
㉓	〃	21	40/ /A MONESHOR ROAD	
㉔	〃	21	35 HAZARIBAG ROAD	
㉕	〃	21	26/8/A MONESHOR ROAD	
㉖	〃	24	15 MONESHOR ROAD	
㉗	DHANMONDY		40 SHEKARITOLA	
(1)	KOTWALI		13/2 BABU BAZAR	
(2)	〃		ASHBK JAN OLD O.H.T COMP	
(3)	〃	34	S.D.PARK P/S COMPOUND	
(4)	〃		10 NO M.C.RAY ROAD	
(5)	〃	29	17/D P.K.GHOSH STREET	
(6)	〃	32	34 SHIKATULI LANE	
(7)	〃	33	82 NO SHAKARI BAZAR	
(8)	LALBAGH		CHANDNIGHAT W/T/P COMP	
(9)	〃	28	DHAKESWARI WASA STAFF QUA	
(10)	〃		AZIMPUR 3 WASA STAFF QUA	
(11)	〃	28	4 NO AZIMPUR OFFICERS RUARTER	
(12)	〃		60 DURIANGUAL LANE	
(13)	〃		10/1 BADDANPARA LANE	

注１）　①～㉗は、直接家庭を訪問して、インタビュー方式でアンケートを纏めたもの
〃２）　(1)～(13)は、WASAの職員にアンケート調査用紙を渡して記入してもらったもの

(2) インタビュー調査実施位置図

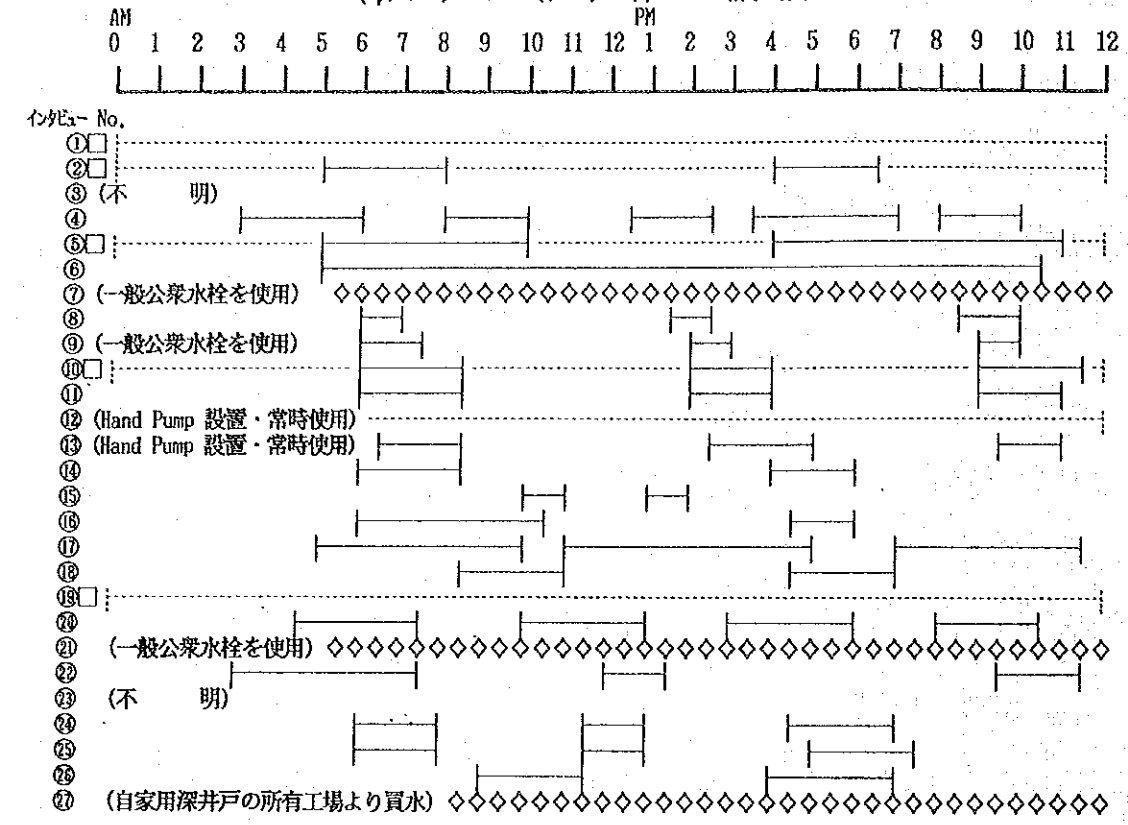


(3) インタビュー（アンケート）調査集計表

質　　問	回答 ①②③④⑤⑥⑦⑧⑨⑩⑪⑫⑬⑭⑮⑯⑰⑱⑲⑳㉑㉒㉓㉔㉕㉖㉗ (1)(2)(3)(4)(5)(6)(7)(8)(9)(10)(11)(12)(13)
① 給水栓の種別	
i) ハウスコネクション（メーター付）	
ii) 〃 （メーター無）	
iii) 共用ハウスコネクション（メーター付	
iv) 〃 （メーター無）	
v) 一般公衆水栓	
vi) ハンドポンプ	
vii) その他	
② 水の使用量と料金	
i) 1日の使用量（バケツに何杯）	
a) 20杯以下	
b) 21杯～50杯	
c) 51杯～100 杯	
d) 101杯以上	
ii) 1月の使用量（ ㎥／月）	
a) 50㎥以下	
b) 51㎥～100 ㎥	
c) 101㎥～200 ㎥	
d) 201㎥以上	
iii) 料金（TK／月）	
a) 100TK以下	
b) 101TK～200 TK	
c) 201TK～300 TK	
d) 301TK 400 TK	
e) 401TK以上	
③ WASAに対するクレームと不満	
i) なし	
ii) あり	
a) 絶対量の不足	
b) 低水圧	
c) 給水の時間制限	
d) その他	
④ その他	
i) 家の中の水栓の数（ ケ）	
a) なし	
b) 1ケ	
c) 2ケ	
d) 3ケ	
e) 4ケ	
f) 5ケ以上	
ii) 家族の員数（ 人）	
a) 5人以下	
b) 6人～10人	
c) 11人～20人	
d) 21人以上	
iii) 寝室の部屋数（ 部屋）	
a) 1部屋	
b) 2部屋	
c) 3部屋	
d) 4部屋	
e) 5部屋	
f) 6部屋以上	
iv) 収入（TK／月）	
a) 2,000TK以下	
b) 2,000TK～ 5,000TK	
c) 5,000TK～10,000TK	
d) 10,000TK～20,000TK	
e) 20,000TK以上	

注－1 ⑰の①－vii) 欄の○は買水
〃－2 ⑮の③－ii) － d) 欄の○は水道の蛇口から時々汚い水が出ると言うクレーム
〃－3 ⑳の③－ii) － d) 欄の○はWASAの資金でハウスコネクションをして欲しいと言う要望

(4) インタビュー（アンケート）による給水時間グラフ



凡例) ┆┈┆ : 常時水使用可能

├─┤ : 時間給水

◇ : 回答なし

注) □ 貯水槽を設置している家庭。

①. ⑲ : 自家用貯水槽を設置しているので、常時蛇口から水は出るが、貯水槽に水が溜まる時間は不明

②. ⑤. ⑩. ⑬ : 自家用貯水槽を設置しているので、常時蛇口から水は出るが、貯水槽に水が溜まる時間は、実線区間（├─┤）のみである。

(9). (10). (11) : 集合住宅用の貯水槽が設置されているので、常時蛇口から水は出るが、貯水槽に水が溜まる時間は不明

TABLE

DEEP TUBEWELL IN ZONE-II

Well No.	LOCATION	WELL SPECIFICATION				REMARKS
		Construction year	Depth (m)	ϕ (Tube) m/m	Screen length(m)	
201	DHAKESWARI	1961	118.0	150	45.7	UNDER RE-CONSTRUCTION
202	DHAKA WATER WORKS	1971	129.2	200	40.0	
203	BAKSHEBAZAR	1982	137.3	200	54.9	
204	RAHAMATULLAH	1977	132.9	200	51.8	
205	NAWABGANJ	1973	134.8	200	45.7	
206	AZIMPUR(No.6)	1975	126.2	200	45.6	
207	AZIMPUR(No.7)	1990	140.2	200	44.2	
208	PEELKHANA(No.2)	1970	121.9	200	52.0	
209	PEELKHANA(No.3)	1989	136.6	200	50.1	
210	HAZARIBAG(No:3)	1980	142.5	200	54.9	
211	HAZARIBAG(No.6)	1991	124.3	200	50.1	
212	HAZARIBAG(No.5)	1976	148.5	200	51.8	
213	ABUL HASNAT RD.	1973	86.9	200	33.4	
214	FULBARIA	1989	154.5	200	48.9	
215	JAGANNATH COLLEGE	1989	168.6	200	53.0	
216	MITFORD HOSPITAL	1987	150.0	200	54.9	
217	SIMSON ROAD	1989	158.5	200	54.9	
219	DHOLAI KHAL (NOWABPUR)	1976	135.7	200	51.2	
220	S. D. PARK	1978	142.5	200	51.8	
221	BANGLADESH MATH	1977	135.7	200	51.9	
222	ARMANITOLA	1977	135.7	200	51.9	
223	ISLAMBAGH	1989	143.3	200	50.1	
224	RAJNARAYAN DAS RD	1990	131.7	200	47.2	
	TOTAL (AVERAGE) -	<1980.6>	<131.1>	<200>	<49.1>	

WATER QUALITY OF DEEP TUBE-WELL IN ZONE 2

WELL NO	WELL NAME	E.C	ALKALINITY	CHLORIDE	CALCIUM	HARDNESS	COLIFORMS	NOTE
		uS/cm	(as CaCO3)	mg/l	mg/l	mg/l		
201	DHAKESWARI	-	-	-	-	-	-	UPPER:APRIL 1989
		-	-	-	-	-	-	UNDER:NOVEMBER 1989
202	DHAKA WATER WORKS	-	-	-	-	-	-	
		1,000	155	192	76.15	220	27	
203	BAKSIBAZAR	-	-	-	-	-	-	
		800	110	83	54.50	240	37	
204	RAHMATULLAH	-	-	-	-	-	-	
		460	120	73	48.09	194	-	
205	NAWABGANJ	-	-	-	-	-	-	
		500	105	110	52.10	238	48	
206	AZIMPUR NO 6	600	90	101	48.09	180	-	
		-	-	-	-	-	-	
207	AZIMPUR NO 7	650	90	132	60.92	198	-	
		-	-	-	-	-	-	
208	PEEL KHANA NO 2	-	-	-	-	-	-	
		640	95	36	28.05	148	14	
209	PEEL KHANA NO 3	-	-	-	-	-	-	
		470	110	80	55.31	180	2	
210	HAZARIBAGH NO 4	-	-	-	-	-	-	
		500	155	80	36.07	100	12	
211	HAZARIBAGH NO 3	-	-	-	-	-	-	
		600	95	98	36.87	132	-	
212	HAZARIBAGH NO 5	-	-	-	-	-	-	
		500	150	80	44.08	120	-	
213	ABUL HASNAT ROAD	-	-	-	-	-	-	
		700	140	199	30.46	100	90	
214	PULBARIA	-	-	-	-	-	-	
		700	110	125	60.92	236	20	
215	JAGANNATH COLLEGE	-	-	-	-	-	-	
		700	155	95	28.05	236	-	
216	MITFORD HOSPITAL	-	-	-	-	-	-	
		250	110	82	50.50	183	31	
217	SIMSON ROAD	-	-	-	-	-	-	
		390	100	42	48.09	136	35	
218	AGAMACHI LANE	-	-	-	-	-	-	
		-	-	-	-	-	-	
219	DHOLAIKHAL	-	-	-	-	-	-	
		825	115	195	64.93	254	4	
220	S.O.PARK	-	-	-	-	-	-	
		625	130	65	50.50	250	-	
221	BANGLADESH MATH	-	-	-	-	-	-	
		700	135	68	45.69	446	0	
222	ARMANITOLA MATH	-	-	-	-	-	-	
		450	85	80	55.30	64	6	
223	ISLAMBAGH	-	-	-	-	-	-	
		-	-	-	-	-	-	
224	RAJNARAYANDAS ROAD	-	-	-	-	-	-	
		-	-	-	-	-	-	

過去の原水水質に関する資料

ANNEX-VI WATER QUALITY ANALYSIS GIVEN BY DWASA

WATER ANALYSIS

The following table shows the water quality of the raw water from the Buriganga river, which is intake place for the project.The water quality tests are done by WASA personnel at the WASA laboratory. Compared with the WHO recommendation for the drinking water, it is confirmed that water of the Buriganga river is acceptable for intake water.

		Buriganga River	WHO
1.	Turbidity	10 NTU	5
2.	Total hardness (mg/l as $Caco_3$)	80 mg/l	500
3.	Calcium(mg/l as $caco_3$)	23.25 mg/l	-
4.	Chloride(mg/l as cl)	80 mg/l	250
5.	PH value	7.18	6.5-8.5
6.	Total Alkalinity(mg/l as $caco_3$)	95 mg/l	-
7.	Conductivity(Micro mho/cm)	260	500
8.	Total dissolved solids	156mg/l	1000 mg/l
9.	Nitrate nitrogen(mg/l as No_3)	1.18 mg/l	10 mg/l
10.	Nitrite nitrogen(mg/l as No_2)	0.00 mg/l	0.1 mg/l

Date		7-4-87	7-4-87	6-6-89	19-6-89	3-7-89	1-8-89
Hour		–	–	3:00pm	3:35pm	2:45pm	1:45pm
Sampling point		12	13	Bur	Bur	Bur	Bur
Temperature	°C	31	32	30.5	30.2	29.5	28.5
pH		7.7	7.7	9.10	8.90	7.30	8.00
Resistivity	μs/cm						
Conductivity	μMho-cm	360	440				
Colour	Hatch			140	190	120	180
Turbidity	NTU	6	8	31.0	35.0	15.0	37.0
Turbidity	Hatch			30	40	22	38
Total solids	mg/l	230	238	330	27	66	112
Tot.sol.after filtr.	mg/l			318	20	21	102
Suspended solids	mg/l	10	7	12.0	7.0	45.0	10.0
COD (KMnO4)	mg/l						
Dissolved oxygen	mg/l	4.2	4.8				
BOD	mg/l	3.6	6.6	1.50	1.90	1.50	2.90
CO2	mg/l						
Total hardness	mg/l			60	40	52	44
Total alkalinity	mg/l	170	192	50	35	50	50
Ammonia (NH3)	mg/l	ND	ND	1.098	0.854	0.915	1.464
Ammonium (NH4+)	mg/l			1.161	0.903	0.968	1.548
Chloride	mg/l	14	26				
Fluoride	mg/l	0.21	0.4				
Nitrate	mg/l	0.7	0.8		0.24	0.12	
Nitrite	mg/l	ND	1.4				
Phosphate	mg/l	8	9	0.88	0.06	0.00	0.00
Sulfate	mg/l	4	4				
Chlorophyl	mg/l						
Arsenic	mg/l						
Chromium	mg/l						
Mercury	mg/l						
Cadmium	mg/l						
Magnesium	mg/l						
Manganese	mg/l	ND	ND				
Iron	mg/l	0.02	ND				
Copper	mg/l	0.1	0.12				
Lead	mg/l						
Zinc	mg/l						
Coliforms	n/100ml						
Faecal coliforms	n/100ml			194	120	80	100

Sources of analyses : University of Dhaka (Department of Chemistry)
WASA Laboratory
Institute of Public Health Mohakhali
Department of Environment
Atomic Energy Center
CDM-Mac Donald

ブリガンガ河　水質分析表　（フランスレポート）

ANNEX Water Analysis Results

1	Sample	Raw Water			Raw Water	Treated Water	Raw Water			Filtered Water			Raw Water		Treated Water
2	Sampling place	※1	※2	※3	※4	※5	※6	※7	※8	※9	※10	※11	※12	※13	※14
3	Date / Time	← Sep.29 →			← Oct. 2 →		← Oct. 3 →						← Oct. 4 →		
		AM 11:30	AM 11:00	AM 10:00	←PM3:00 to 4:00→		← AM 10:00 to 12:00 →						PM 4:30	PM 4:00	PM 5:30
4	Weather / Temp.	← Fine →			← Rain →		← Cloudy →						← Rain →		
							30℃								
5	Quality														
	Water Temp. (℃)	—	—	—	—	—	27	—	—	—	—	—	—	—	—
	Turbidity (degree)	120	120	100	—	5	—	—	—	5	>5	>5	100	60	3
	Color (degree)	15	15	15	—	—	—	—	—	10	>10	>10	15	15	4
	pH (—)	7.34	7.09	7.01	7.0	7.0	7.5	7.0	7.0	—	—	—	7.41	7.07	6.89
	Ammonia nitrogen (as N mg/ℓ)	0.8	0.59	0.64	0.4	<0.4	0.4	0.4	0.4	<0.4	<0.4	<0.4	0.6	—	0.75
	Nitrite nitrogen (as N mg/ℓ)	<0.01	<0.01	<0.01	0.03	<0.01	—	—	—	—	—	—	<0.01	<0.01	<0.01
	Chloride ion (mg/ℓ)	1.2	3.6	4.3									1.3	—	1.6
	Potassium permanganate consumption(mg/ℓ)	4.0	4.0	3.6									4.3	6.1	2.7
	Cyanide ion (mg/ℓ)	<0.01	<0.01	<0.01		—							<0.01	<0.01	<0.01
	Mercury (mg/ℓ)	<0.0005	<0.0005	<0.0005									<0.0005	<0.0005	<0.0005
	Cadmium (mg/ℓ)	<0.005	<0.005	<0.005									<0.005	<0.005	<0.005
	Arsenic (mg/ℓ)	<0.005	<0.005	<0.005									<0.005	<0.005	<0.005
	Lead (mg/ℓ)	<0.02	<0.02	<0.02									<0.02	<0.02	<0.02
	Iron (mg/ℓ)	—	—	3.3									—	3.4	0.16
	Manganese (mg/ℓ)	—	—	0.05									—	0.06	<0.01
	Fluoride (mg/ℓ)	—	—	—									—	0.14	—
	Hexavalent chromium (mg/ℓ)	—	—	<0.02									—	—	—
	Calcium hardness (as CaCo, mg/ℓ)	—	—	37									—	—	46
	Magnesium hardness (as CaCo, mg/ℓ)	—	—	15									—	—	21
	Residual chlorine (mg/ℓ)	—	—	—	—	0.2	—	—	—	Not detected	—	—	—	—	—

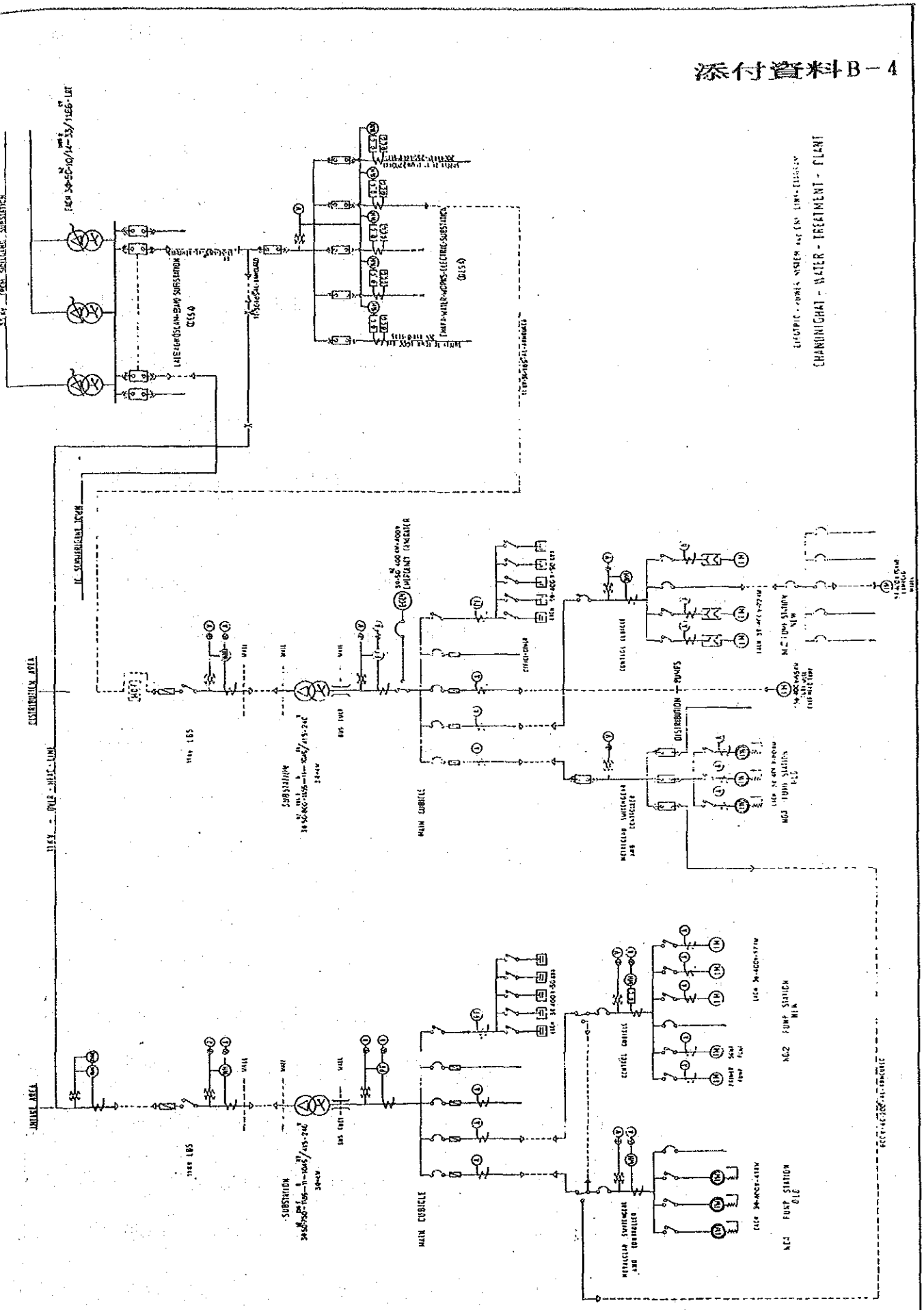
Remarks :

1. Sampling place is as follows :

-※1 : Main stream of river, approx. 1 Km upstream from the water intake towers
-※2 : Sub-stream of river, approx. 2 Km upstream from the water intake towers
-※3 : Water intake tower(New)
-※4 : Mixing well
-※5 : Outlet of clear water reservoir
-※6 : Mixing well
-※7 : Outlet of coagulation/sedimentation basin
-※8 : Outlet of sedimentation basin
-※9 : Outlet of Jewel filter
-※10 : Outlet of Paterson filter(small)
-※11 : Outlet of Paterson filter(large)
-※12 : Main stream of river, approx. 1 Km upstream from the water intake towers
-※13 : Water intake tower(Old)
-※14 : Outlet of clear water reservoir

添付資料B－4

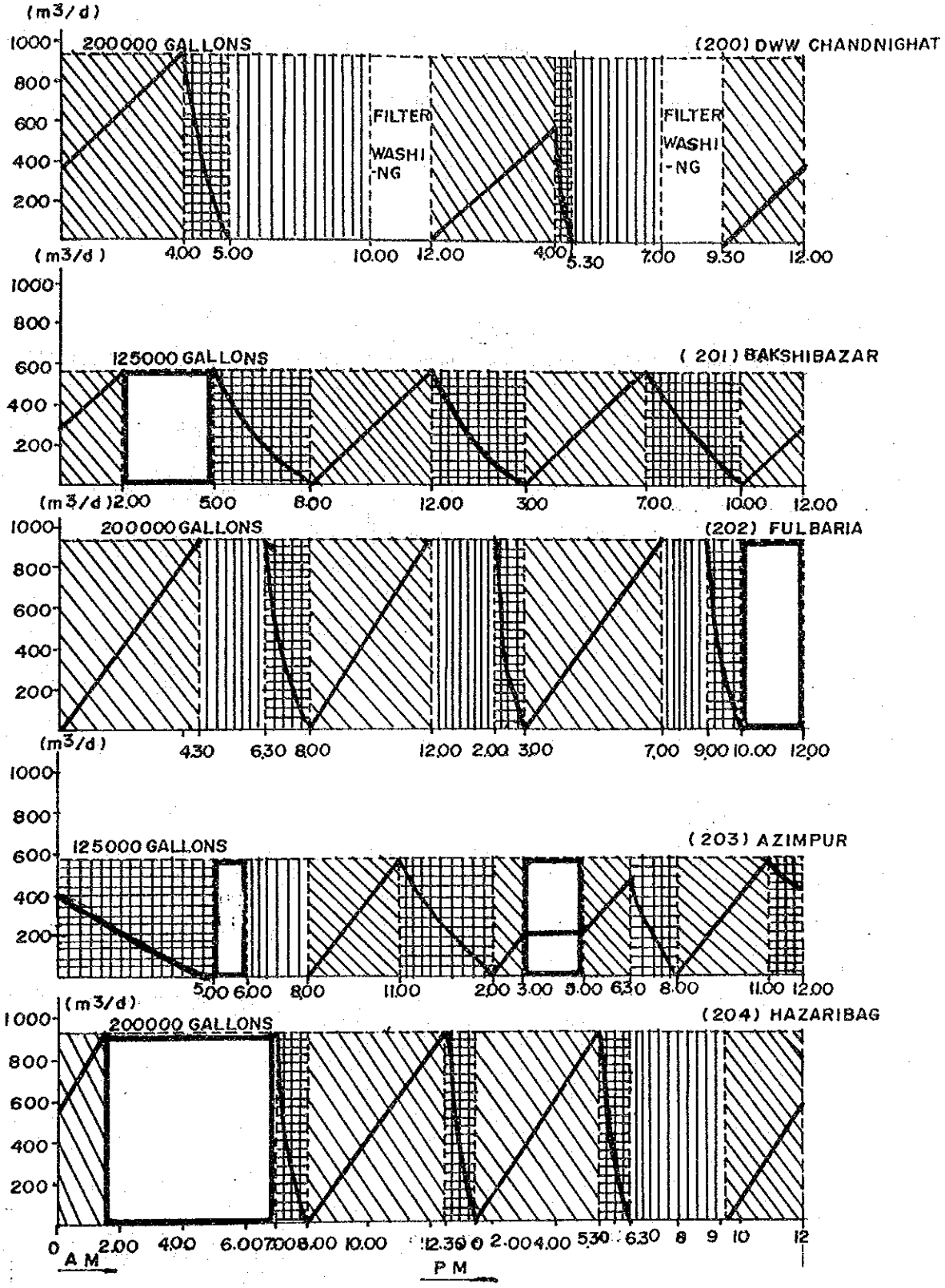
チャンドニガット浄水場現況電気単線結線図



添付資料B－5

直接給水／高架タンク給水操作スケジュール図

FIG. OPERATION OF OVERHEAD TANK

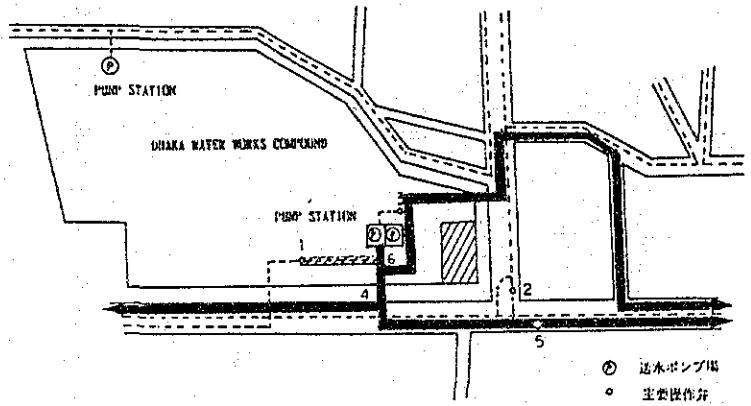


LEGEND	
TANK CHARGE	TANK SUPPLY & PUMP DIRECT SUPPLY
PUMP DIRECT SUPPLY	PUMP STOP

ＭＯＤＳ　ＺＯＮＥⅡ
配水コントロール時間給水区分図

タイプ	給水系統図	時間別バルブ操作区分

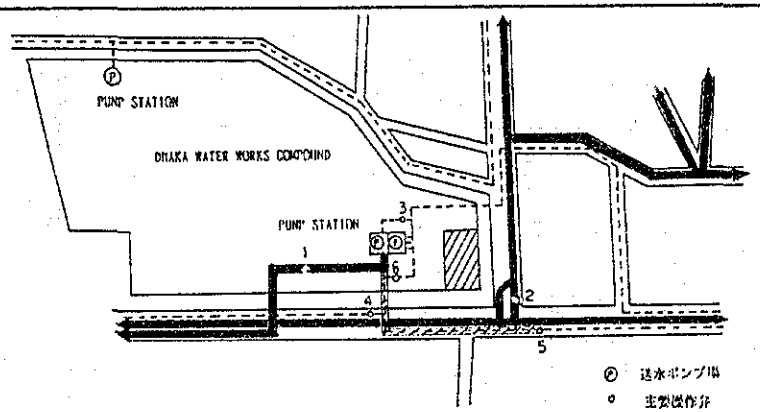
Ⅰ



操作時間	バルブ開閉状況 ①	②	③	④	⑤	⑥	給水区域
AM11.00～ PM 2.00 PM 7.00～ PM 1.30	⊗	⊗	○	○	○	○	ライズイングサプライ管により東部西部へ給水

(○：バルブ全開、⊗：バルブ全閉)

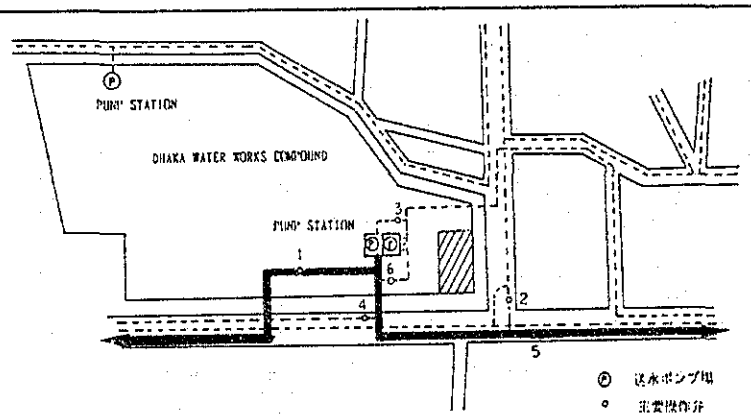
Ⅱ



操作時間	バルブ開閉状況 ①	②	③	④	⑤	⑥	給水区域
AM 4.00～ AM 9.30 PM 2.00～ PM 7.00	◒	○	⊗	⊗	⊗	⊗	タウンサプライ管により東部、西部北部へ給水

(○：バルブ全開、◒：バルブ半開、バルブ全閉)

Ⅲ

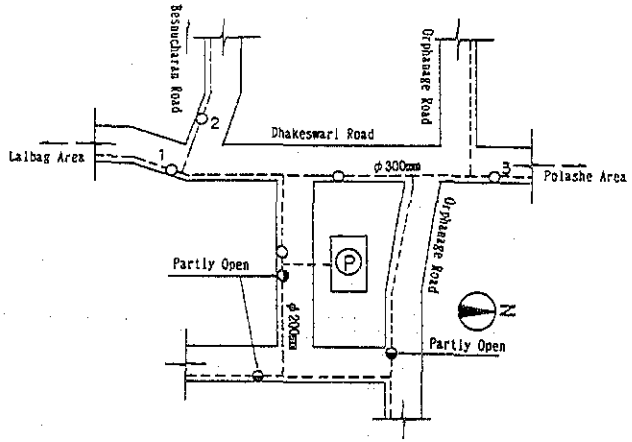


操作時間	バルブ開閉状況 ①	②	③	④	⑤	⑥	給水区域
AM 9.30～ AM11.00	◒	⊗	⊗	⊗	○	⊗	ライズイングサプライ管により東部へ、タウンサプライ管により西部へ給水

(○：バルブ全開、◒：バルブ半開、バルブ全閉)

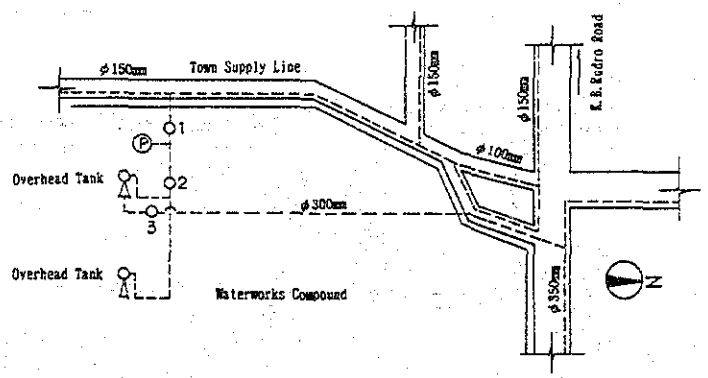
水源	給水系統図	時間別バルブ操作区分

ダッカスワリ P/S



操作時間	バルブ開閉状況 ①	②	③	④	⑤	給水区域
① AM 5.00～ 9.00	○	○	⊗			ラルバーグ、ベスナチャラン道路
② 9.00～ 12.00	⊗	⊗	⊗			アジンプール
③ 12.00～ PM 2.00	⊗	⊗	○			ポラシエ地区
④ PM 2.00～ 6.00	○	○	⊗			①に同じ
⑤ 6.00～ 8.00	⊗	⊗	○			③に同じ
⑥ 8.00～ 10.00	⊗	⊗	⊗			ポンプ停止
⑦ 10.00～ AM 5.00	⊗	⊗	⊗			②に同じ

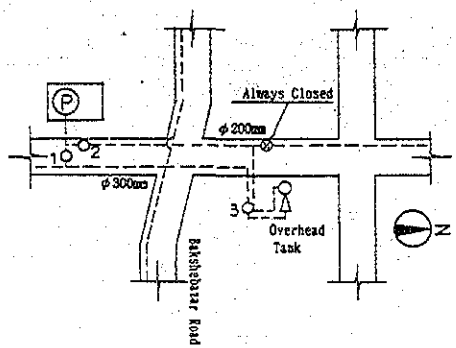
チャンドニガット浄水場内井戸



操作時間	バルブ開閉状況 ①	②	③	④	⑤	給水区域
① AM 4.00～ 10.00	○	⊗	○			浄水場の北、東地域一帯（ポンプ直送及び高架水槽からの給水
② 10.00～ 12.00	⊗	○	⊗			浄水場の逆洗タンクへ送水
③ 12.00～ PM 4.00	○	⊗	○			高架水槽へ送水
④ PM 4.00～ 7.00	⊗	○	⊗			①に同じ
⑤ 7.00～ 9.00	⊗	⊗	○			②に同じ
⑥ 9.00～ AM 4.00	⊗	⊗	⊗			③に同じ

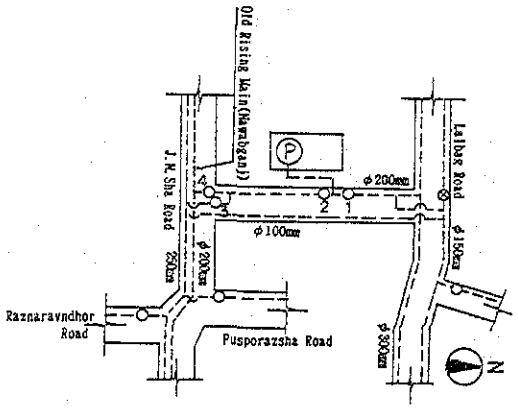
水　源	給　水　系　統　図	時　間　別　バ　ル　ブ　操　作　区　分

ボクシバザール P／S 3

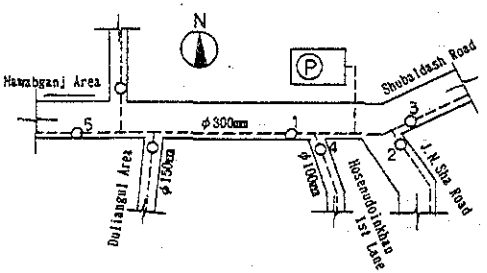
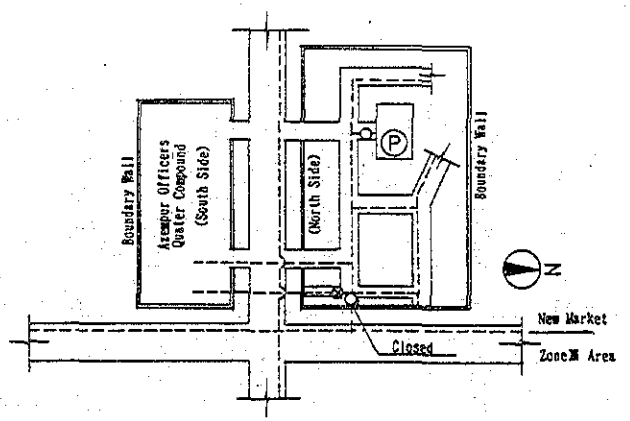


操　作　時　間	バルブ開閉状況 ①	②	③	④	⑤	給　水　区　域
① AM 4.00～ 6.00	⊗	○	⊗			高架水槽へ送水
② 6.00～ 8.00	⊗	○	⊗			東、南、西地域一帯
③ 8.00～ 12.00	⊗	○	⊗			①に同じ
④ 12.00～ PM 3.00	⊗	○	⊗			②に同じ
⑤ PM 3.00～ 7.00	⊗	○	⊗			①に同じ
⑥ 7.00～ 10.00	⊗	○	⊗			②に同じ
⑦ 10.00～ 12.00	⊗	○	⊗			①に同じ
⑧ 12.00～ AM 4.00	—	—	—			ポンプ停止

ラハマテウーラ P／S 4



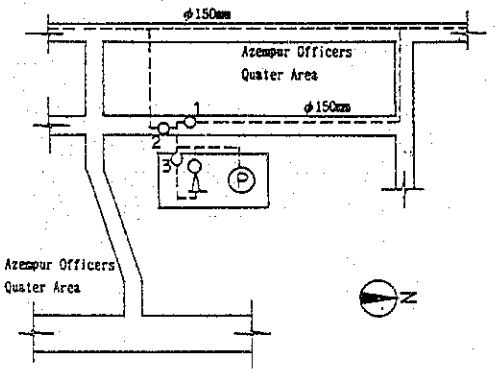
操　作　時　間	バルブ開閉状況 ①	②	③	④	⑤	給　水　区　域
① AM 4.00～ 9.00	○	⊗	⊗	⊗		ラルバーグ道路
② 9.00～ 11.00	⊗	○	⊗	⊗		ジ・エヌ・シャ道路(250m/m)
③ 11.00～ PM 1.00	⊗	○	⊗	⊗		ジ・エヌ・シャ道路(200m/m)
④ PM 1.00～ 5.00	⊗	○	⊗	⊗		①に同じ
⑤ 5.00～ 8.00	⊗	○	⊗	⊗		②に同じ
⑥ 8.00～ 12.00	⊗	○	⊗	○		③に同じ
⑦ 12.00～ AM 4.00	—	—	—	—		ポンプ停止

水　源	給　水　系　統　図	時　間　別　バ　ル　ブ　操　作　区　分
ナワブガンジ P／S 5		下表参照
アジンプール NO. 6 P／S 6		バルブによる時間給水操作は行っていない （アジンプール公務員住宅の貯水槽へ給水）

操作時間	バルブ開閉状況 ①	②	③	④	⑤	給水区域
① AM 4.00～ 8.00	○	○	○	○	○	全域
② 8.00～ 10.00	⊗	○	⊗	⊗	⊗	ハセヌデン、ジ・エヌ・シャ道路
③ 10.00～ 12.00	○	⊗	⊗	○	○	ドライアンガル、ナワブガンジ道路
④ 12.00～ PM 1.00	⊗	⊗	○	⊗	⊗	シャワブダシ道路
⑤ PM 1.00～ 3.00	⊗	○	⊗	⊗	⊗	②に同じ
⑥ 3.00～ 6.00	○	○	⊗	○	○	ドライアンガル、シャワブダシ道路
⑦ 6.00～ 7.00	⊗	⊗	⊗	⊗	⊗	②に同じ
⑧ 7.00～ 9.00	○	⊗	⊗	⊗	⊗	③に同じ
⑨ 9.00～ 10.00	⊗	⊗	⊗	⊗	⊗	②に同じ
⑩ 10.00～ 11.00	⊗	⊗	○	⊗	⊗	④に同じ
⑪ 11.00～ AM 4.00	—	—	—	—	—	ポンプ停止

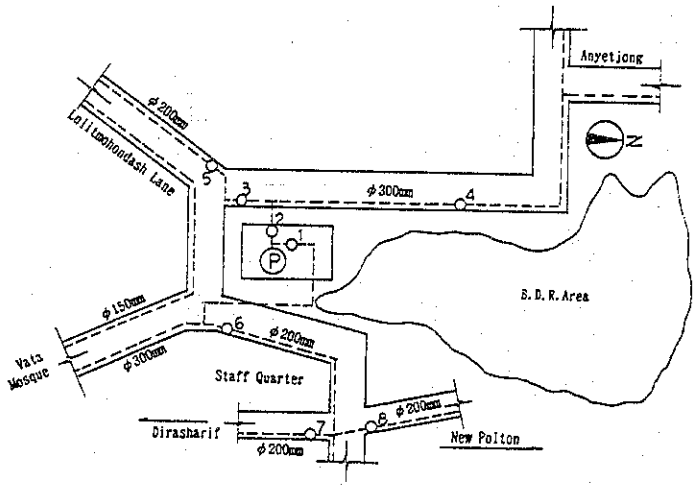
水　源	給　水　系　統　図	時間別バルブ操作区分

アジンプール NO. 7 P/S 7

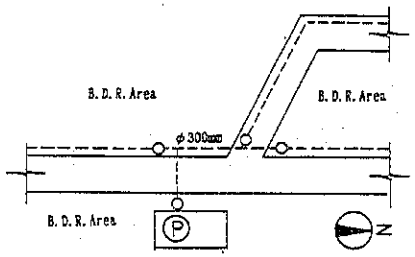
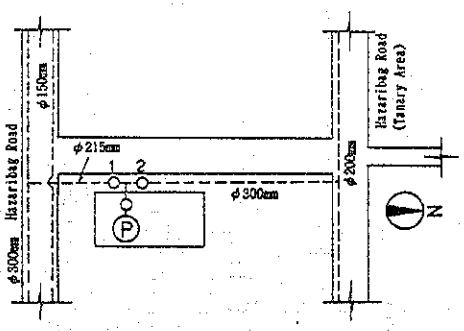


操作時間	バルブ開閉状況 ①	②	③	④	⑤	給水区域
① AM 5.00～ 6.00	−	−	−			ポンプ停止
② 6.00～ 8.00	○	○	○			ポンプ直送と高架水槽からの給水
③ 8.00～ 11.00	⊗	⊗	⊗			高架水槽へ送水
④ 11.00～ PM 2.00	○	○	○			②に同じ
⑤ PM 2.00～ 3.00	⊗	⊗	⊗			③に同じ
⑥ 3.00～ 5.00	−	−	−			ポンプ停止
⑦ 5.00～ 6.30	⊗	⊗	⊗			③に同じ
⑧ 6.30～ 8.00	○	○	○			②に同じ
⑨ 8.00～ 11.00	⊗	⊗	⊗			③に同じ
⑩ 11.00～ AM 5.00	○	○	○			②に同じ

ビルクハンナ NO. 2 P/S 8

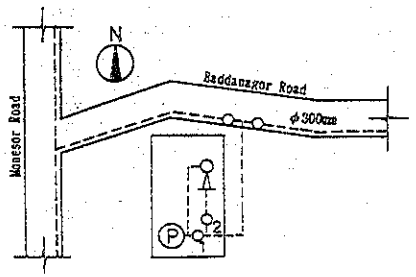


操作時間	バルブ開閉状況 ①	②	③	④	⑤	⑥	⑦	⑧	給水区域
① AM 5.00～ 7.00	○	⊗	⊗	⊗	⊗	○	○	⊗	クオーター、ダイアラシャリフバットモスク
② 7.00～ 8.30	○	⊗	⊗	⊗	⊗	⊗	⊗	○	ニューポルトン地区
③ 8.30～ 11.00	⊗	○	⊗	○	⊗	⊗	⊗	⊗	アンセットジョング地区
④ 11.00～ 12.00	⊗	○	○	⊗	○	⊗	○	⊗	ロリトモロホン地区
⑤ 12.00～ PM 1.30	○	⊗	⊗	○	⊗	○	⊗	⊗	ダイアラシャリフ地区
⑥ PM 1.30～ 3.00	⊗	○	○	⊗	○	⊗	○	⊗	④に同じ
⑦ 3.00～ 5.00	⊗	○	⊗	○	⊗	○	⊗	⊗	③に同じ
⑧ 5.00～ 6.00	⊗	○	⊗	⊗	○	⊗	○	⊗	④に同じ
⑨ 6.00～ 8.00	⊗	○	⊗	⊗	⊗	○	⊗	⊗	⑤に同じ
⑩ 8.00～ 10.00	⊗	○	⊗	⊗	○	⊗	⊗	⊗	③に同じ
⑪ 10.00～ AM 5.00	⊗	○	○	⊗	○	⊗	⊗	⊗	④に同じ

水　源	給　水　系　統　図	時　間　別　バ　ル　ブ　操　作　区　分
ピルクハンナ NO. 4P／S 9		バルブによる時間給水操作は行っていない （全量をバングラデシュ軍へ供給）　　PM 8.00～ AM 1.00　ポンプ停止
ハザリバーグ NO. 3P／S 10		操作時間 / バルブ開閉状況 ①②③④⑤ / 給水区域 ① AM 5.00～ 8.00　⊗ ○　タナリー地区 ② 8.00～ 9.00　○ ⊗　ハザリバーグ地区 ③ 9.00～ 12.00　⊗ ○　①に同じ ④ 12.00～ PM 2.00　○ ⊗　②に同じ ⑤ PM 2.00～ 4.00　⊗ ○　①に同じ ⑥ 4.00～ 8.00　○ ⊗　②に同じ

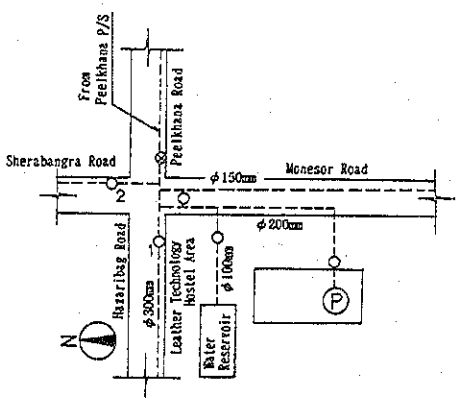
水　源	給　水　系　統　図	時　間　別　バ　ル　ブ　操　作　区　分

ハザリバーグ NO. 5 P/S 11



操作時間	バルブ開閉状況 ①	②	③	④	⑤	給水区域
① AM 5.00～ 8.00	○	○				ポンプ直送と高架水槽からの給水
② 8.00～ 12.00	⊗	⊗				高架水槽へ揚水
③ 12.00～ PM 1.00	○	○				①に同じ
④ PM 1.00～ 5.00	⊗	⊗				②に同じ
⑤ 5.00～ 7.00	○	○				①に同じ
⑥ 7.00～ 12.00	⊗	⊗				②に同じ
⑦ 12.00～ AM 5.00	—	—				ポンプ停止

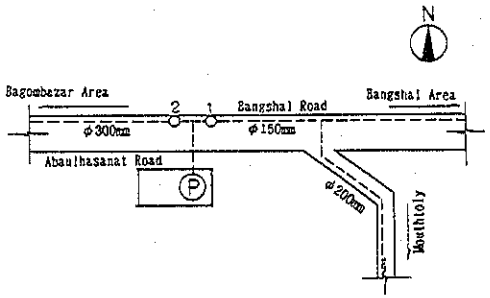
ハザリバーグ NO. 6 P/S 12



操作時間	バルブ開閉状況 ①	②	③	④	⑤	給水区域
① AM 5.00～ 9.00	⊗	○				シェラバングラ道路
② 9.00～ 12.00	○	○				ハザリバーグ道路
③ 12.00～ PM 2.00	⊗	⊗				①に同じ
④ PM 2.00～ 4.00	○	○				②に同じ
⑤ 4.00～ 8.00	⊗	⊗				①に同じ
⑥ 8.00～ AM 5.00	○	⊗				②に同じ

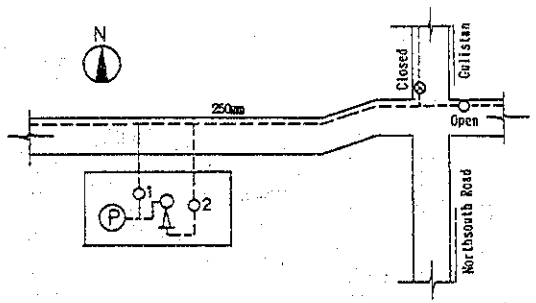
水　源	給　水　系　統　図	時　間　別　バ　ル　ブ　操　作　区　分

アブルハスナット P/S 13

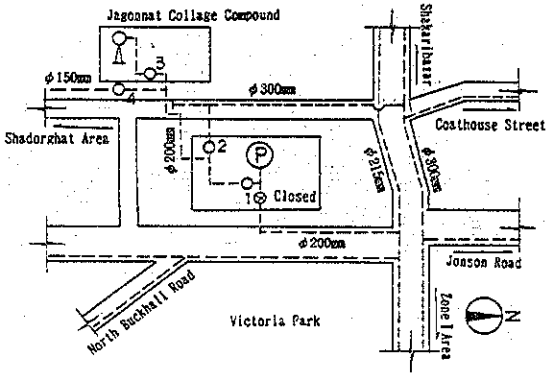
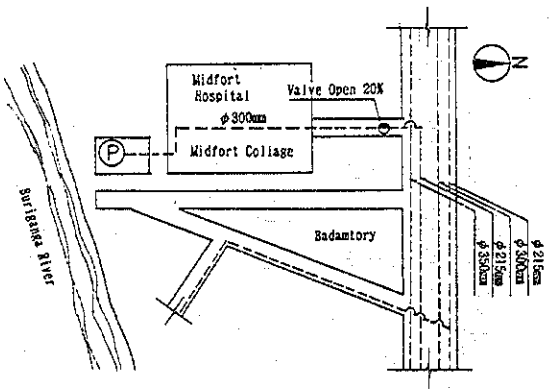


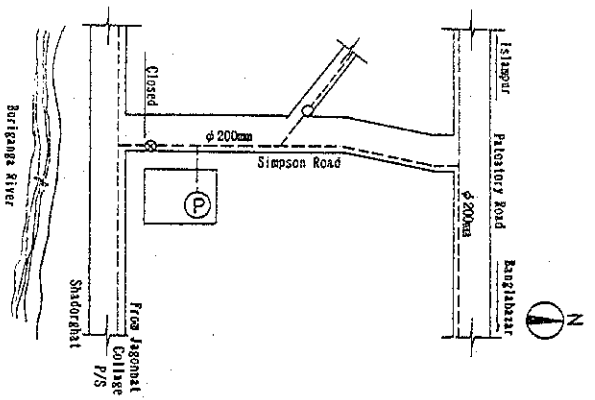
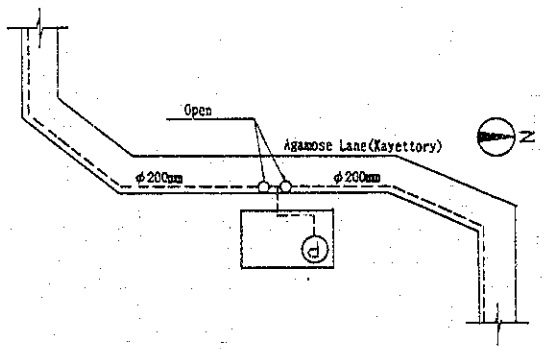
操作時間	バルブ開閉状況 ①	②	③	④	⑤	給水区域
① AM 3.00～ 6.00	○	⊗				バングシャール地区
② 6.00～ 8.00	⊗	○	⊗			バゴンバザール地区
③ 8.00～ 10.00	⊗	⊗	○			①に同じ
④ 10.00～ 12.00	⊗	⊗	⊗			②に同じ
⑤ 12.00～ PM 2.00	○	⊗	⊗			①に同じ
⑥ PM 2.00～ 4.00	⊗	○	⊗			②に同じ
⑦ 4.00～ 6.00	○	⊗	○			①に同じ
⑧ 6.00～ 8.00	⊗	○	⊗			②に同じ
⑨ 8.00～ 10.00	○	⊗	○			①に同じ
⑩ 10.00～ 12.00	⊗	○	⊗			②に同じ
⑪ 12.00～ AM 3.00	－	－				ポンプ停止

フルバリア P/S 14



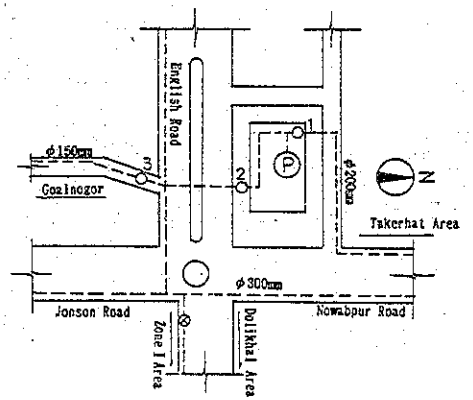
操作時間	バルブ開閉状況 ①	②	③	④	⑤	給水区域
① AM 4.30～ 6.00	○	○				ポンプ直送（シャダクバザール、カザアラウデン道路、ナワブール道路
② 6.00～ 8.00	⊗	⊗				ポンプ直送と高架水槽からの給水
③ 8.00～ 12.00	○	○	⊗			高架水槽へ揚水
④ 12.00～ PM 2.00	○	○	○			①に同じ
⑤ PM 2.00～ 3.00	⊗	○	⊗			②に同じ
⑥ 3.00～ 7.00	○	○	○			③に同じ
⑦ 7.00～ 9.00	○	○	⊗			①に同じ
⑧ 9.00～ 10.00	⊗	○	－			②に同じ
⑨ 10.00～ 12.00	○	⊗				ポンプ停止
⑩ 12.00～ 4.30	○	⊗				③に同じ

水　源	給　水　系　統　図	時　間　別　バ　ル　ブ　操　作　区　分
ジャガナスカレッジ　P／S 15		操作時間 / バルブ開閉状況 ①②③④⑤ / 給水区域 ① AM 4.00～6.00　○○⊗○　コートハウス道路、シャダルガット ② 6.00～7.00　○⊗○○　ジャガナス大学の高架水槽へ揚水 ③ 7.00～9.00　○○⊗○　コートハウス道路 ④ 9.00～11.00　○○⊗○　①に同じ ⑤ 11.00～12.00　○⊗○○　②に同じ ⑥ 12.00～PM 3.00　○⊗⊗○　①に同じ ⑦ 3.00～5.00　○⊗○○　シャダルガット地区へ給水 ⑧ 5.00～6.00　○⊗○○　②に同じ ⑨ 6.00～9.00　○○⊗⊗　③に同じ ⑩⑪ 9.00～12.00　○○⊗○　①に同じ ⑪ 12.00～AM 4.00　－－－－　ポンプ停止
ミトホードホスピタル　P／S 16		バルブによる時間給水操作は行っていない

水　源	給　水　系　統　図	時　間　別　バ　ル　ブ　操　作　区　分
シムソンロード P／S 17		バルブによる時間給水操作は行っていない
アガモシュウレーン P／S 18		バルブによる時間給水操作は行っていない

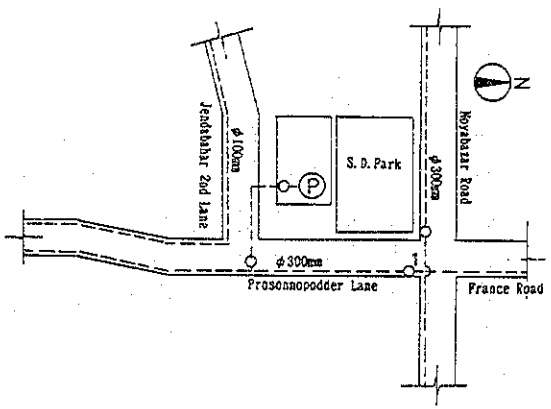
水　源	給　水　系　統　図	時　間　別　バ　ル　ブ　操　作　区　分

ドライカール P／S 10

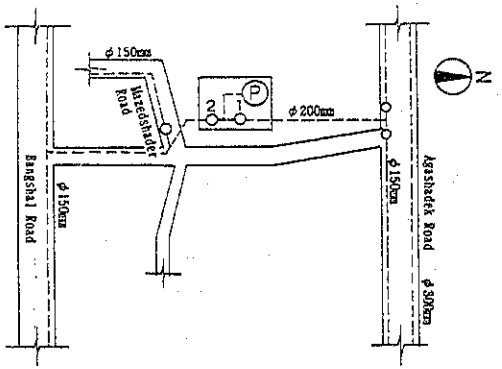
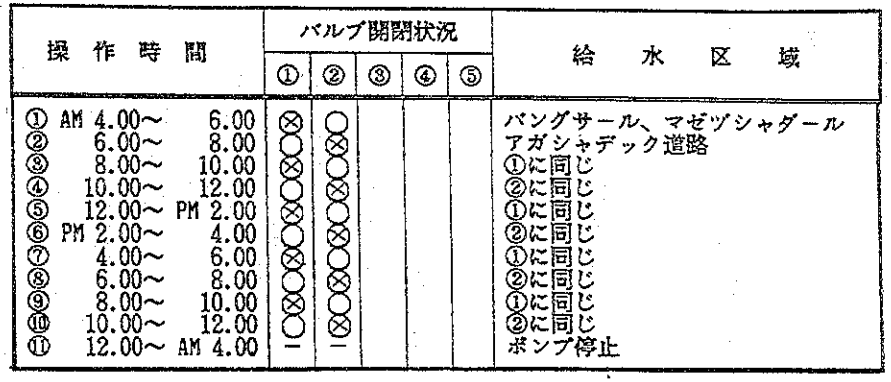
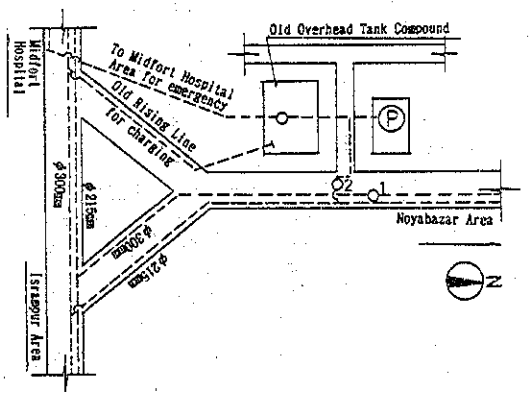
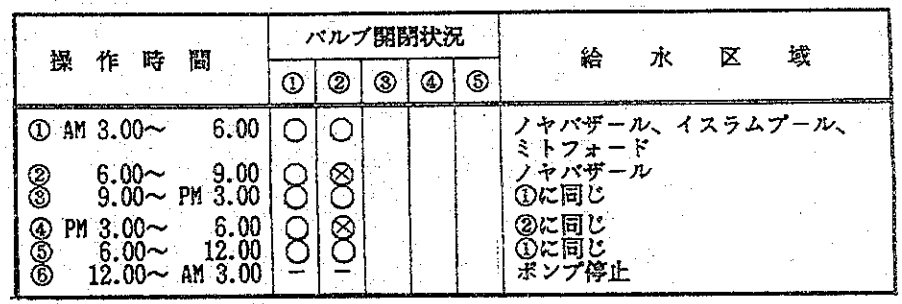


操作時間	バルブ開閉状況 ①	②	③	④	⑤	給水区域
① AM 2.00～ 4.00	○	○	○			タカハッタ地区とゴルナゴール地区
② 4.00～ 6.30	○	⊗	○			タカハッタ地区へ給水
③ 6.30～ 10.30	○	○	○			ゴルナゴール地区
④ 10.30～ 12.00	○	⊗	⊗			②に同じ
⑤ 12.00～ PM 1.00	○	○	○			①に同じ
⑥ PM 1.00～ 2.30	⊗	○	○			③に同じ
⑦ 2.30～ 5.00	○	⊗	⊗			②に同じ
⑧ 5.00～ 7.00	○	○	⊗			①に同じ
⑨ 7.00～ 9.00	○	⊗	○			③に同じ
⑩ 9.00～ 11.00	○	○	⊗			②に同じ
⑪ 11.00～ 12.00	⊗	○	○			③に同じ
⑫ 12.00～ AM 2.00	－	－	－			ポンプ停止

S. D. パーク P／S 20

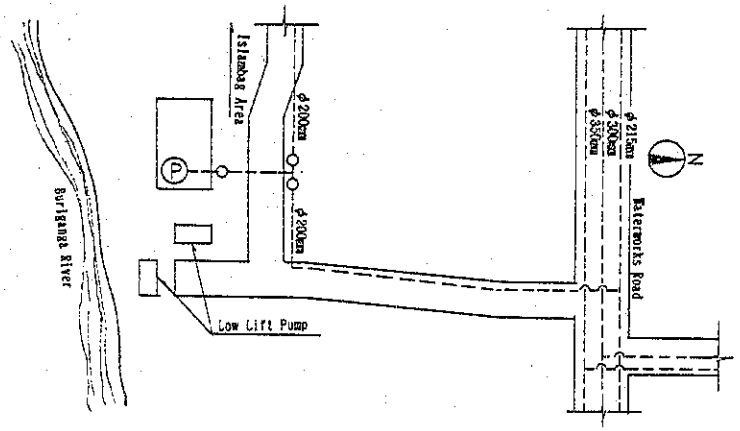
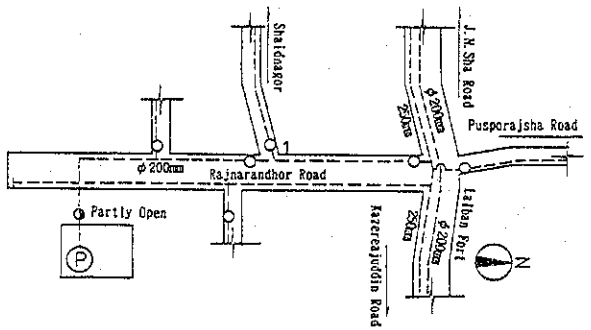
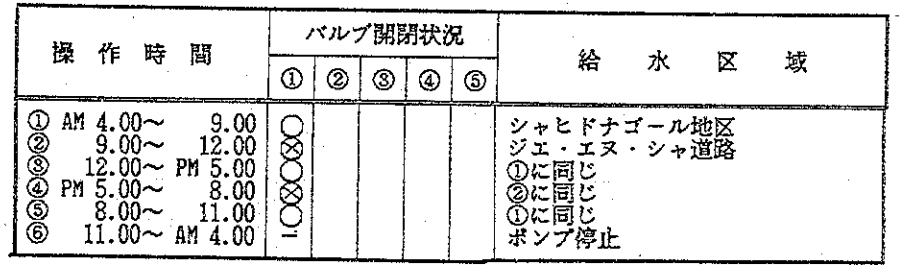


操作時間	バルブ開閉状況－ ①	②	③	④	⑤	給水区域
① AM 4.00～ 6.00	◓					フレンチ道路　バングサール イスラムプー
② 6.00～ 9.00	○	⊗	◓			フレンチ道路　バングサール イスラムプール
③ 9.00～ 11.00	○	⊗	⊗			①に同じ
④ 11.00～ PM 3.00	◓	⊗	○			③に同じ
⑤ PM 3.00～ 6.00	⊗	○	○			②に同じ
⑥ 6.00～ 9.00	○	⊗	○			③に同じ
⑦ 9.00～ 12.00	⊗	○	○			ポンプ停止
⑧ 12.00～ AM 4.00	－					

水　源	給　水　系　統　図	時間別バルブ操作区分
バングラデシュ マス　P／S 21		
アルマニトラ P／S 22		

操作時間	バルブ開閉状況 ①	②	③	④	⑤	給水区域
① AM 4.00～ 6.00	⊗	○				バングサール、マゼヅシャダール
② 6.00～ 8.00	⊗	⊗				アガシャデック道路
③ 8.00～ 10.00	○	⊗				①に同じ
④ 10.00～ 12.00	⊗	⊗				②に同じ
⑤ 12.00～ PM 2.00	⊗	○				①に同じ
⑥ PM 2.00～ 4.00	⊗	⊗				②に同じ
⑦ 4.00～ 6.00	⊗	○				①に同じ
⑧ 6.00～ 8.00	⊗	⊗				②に同じ
⑨ 8.00～ 10.00	⊗	○				①に同じ
⑩ 10.00～ 12.00	○	⊗				②に同じ
⑪ 12.00～ AM 4.00	－	－				ポンプ停止

操作時間	バルブ開閉状況 ①	②	③	④	⑤	給水区域
① AM 3.00～ 6.00	○	○				ノヤバザール、イスラムプール、ミトフォード
② 6.00～ 9.00	○	⊗				ノヤバザール
③ 9.00～ PM 3.00	○	○				①に同じ
④ PM 3.00～ 6.00	○	⊗				②に同じ
⑤ 6.00～ 12.00	○	○				①に同じ
⑥ 12.00～ AM 3.00	－	－				ポンプ停止

水　源	給　水　系　統　図	時　間　別　バ　ル　ブ　操　作　区　分
イスラムバーグ P/S 23		バルブによる時間給水操作は行っていない
ラジャナランドール P/S 24		

操　作　時　間	バルブ開閉状況 ①	②	③	④	⑤	給　水　区　域
① AM 4.00～ 9.00	○					シャヒドナゴール地区
② 9.00～ 12.00	⊗					ジエ・エヌ・シャ道路
③ 12.00～ PM 5.00	○					①に同じ
④ PM 5.00～ 8.00	⊗					②に同じ
⑤ 8.00～ 11.00	○					①に同じ
⑥ 11.00～ AM 4.00	一					ポンプ停止

添付資料B－7

一次配水管ルート試掘調査結果

EXCAVATION RESULT

WATER WORKS PLANT SITE

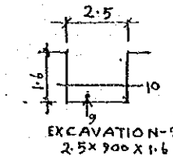
TO VICTORIA PARK.

NOTE:

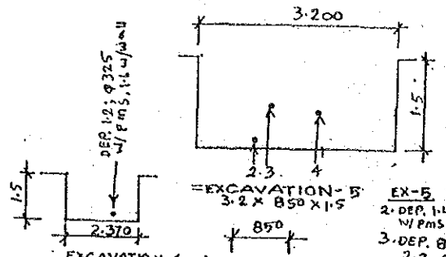
DISTANCE OF EXCAVATION FROM WATER WORKS

EX-2

1. DEP. 500, Φ 35 T/C. N/wall 600
2. DEP. 550, Φ 75 ELEC. Cable - 6 Nos. 800 N/wall
3. DEP. 1·275, Φ 250 W/P ms, 1·1 N/wall
4. DEP. 1·050, Φ 325 W/P. ms, 1·6 N/wall
5. DEP. 975, Φ 350, W/P ms, 5·4 N/wall
6. DEP. 800, Φ 100, G/P 6·2 N/wall
7. DEP. 1·100, Φ 67 4·3 N/wall
8. DEP. 1·150, Φ 67, 6·500 N/wall
9. DEP. 1·5, Φ 250 W/P ms, 6·2 N/wall, 1·250 E/wall
10. DEP. 1·050, Φ 25, T/C. 4·8 N/wall



EXCAVATION-2
2·5 × 900 × 1·6



EXCAVATION-5
3·2 × 850 × 1·5

EXCAVATION-4
2·37 × 850 × 1·5

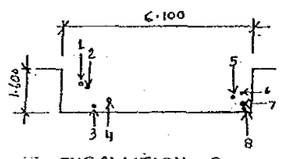
EXCAVATION-5
2·000 × 850 × 1·5

EX-5

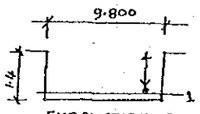
2. DEP. 1·450, Φ 200 W/P ms. 2·550 E/wall
3. DEP. 800, Φ 25, W/P ms, 2·3 E/wall
4. DEP. 850, Φ 37, W/P ms 1·2 E/wall

EX-4

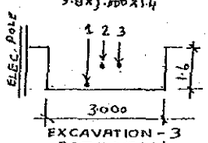
1. DEP. 1·2, Φ 325 W/P ms, 1·6 W/wall
5. DEP. 1·2, Φ 325, W/P ms 1·3 N/wall



EXCAVATION - 2



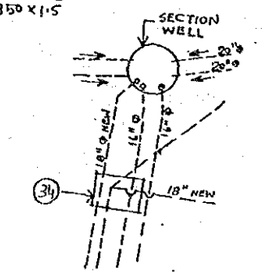
EXCAVATION - 3
9·8 × 1·000 × 1·4



EXCAVATION - 3
3·000 × 900 × 1·6

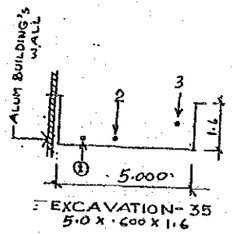
EX-3

1. DEP. 1·350, Φ 325 W/P ms, 1·9 T/Pole
2. DEP. 600, cable 2·5 T/Pole
3. DEP. 600, Φ 37 W/P., 3·0 T/Pole
4. DEP. 1·350, Φ 325 W/P. ms, 9·5 S/wall

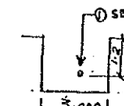


EX-35

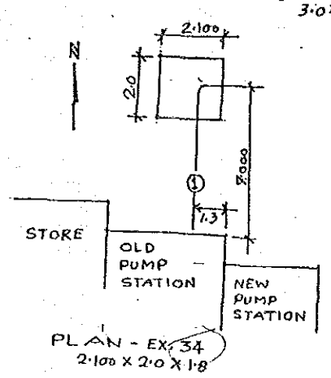
1. DEP. 1·550, Φ 450 A.C intake pipe 800 Alum Bldg. wall
2. DEP. 1·550, Φ 450, A.C. intake pipe 1·7 Alum Bldg. wall
3. DEP. 750, Φ 350, W/P, ms, 4·100 Alum Bldg wall



EXCAVATION-35
5·0 × ·600 × 1·6



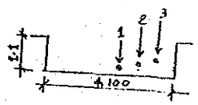
(SEC) EXCAVATION-34
3·0 × 2·0 × 1·8



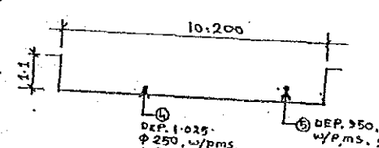
PLAN - EX-34
2·100 × 2·0 × 1·8

EX-9

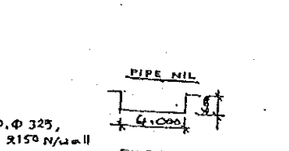
1. DEP. 300, Φ 250 W/P. ms, 4·080 W/wall
2. DEP. 850, Φ 150, W/P (C.I) 4·580 W/wall
3. DEP. 650, Φ 150 (Damaged Kw) C.I, 5·3 W/wall



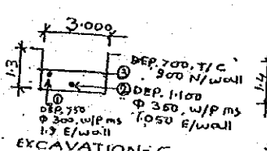
EXCAVATION - 9
4·1 × ·900 × 1·1



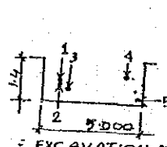
EXCAVATION-9
10·2 × 1·2 × 1·1



EXCAVATION - 10
4·0 × ·800 × ·600



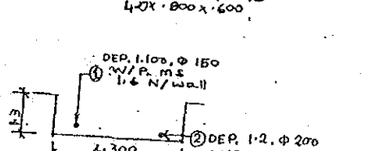
EXCAVATION-6
3·0 × 900 × 1·3



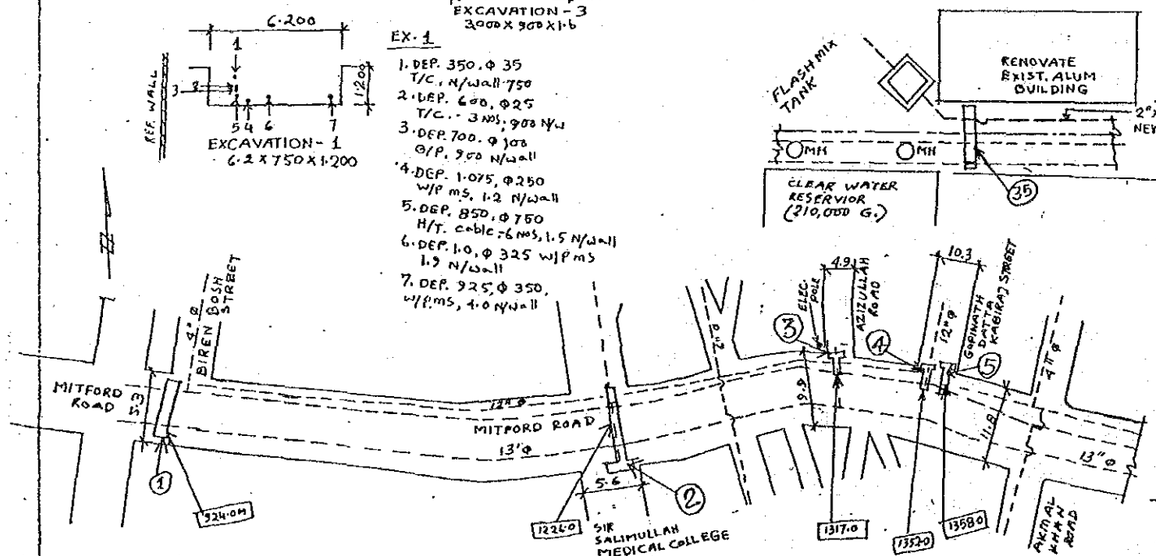
EXCAVATION-7
5·0 × 900 × 1·4

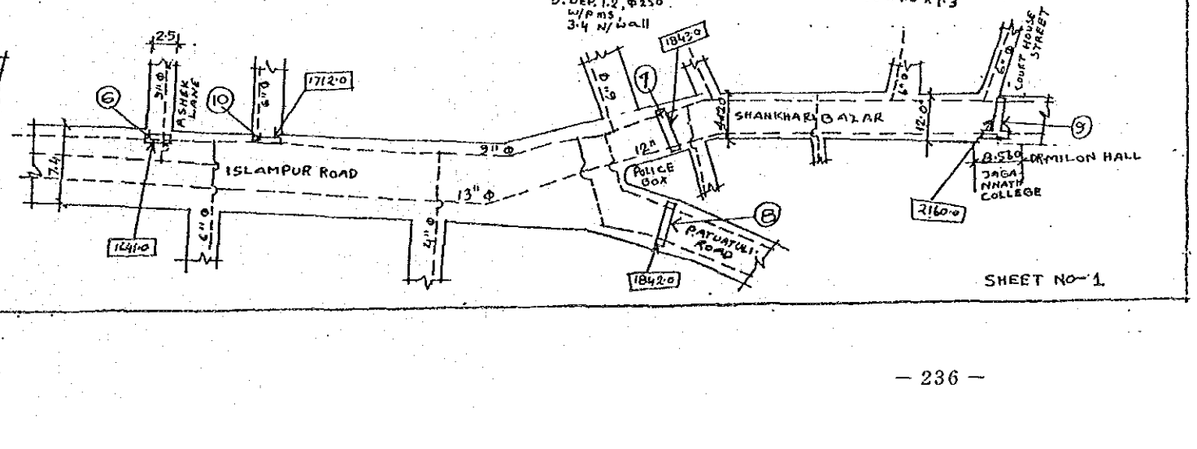
EX-7

1. DEP. 700, T/C, 600 N/wall
2. DEP. 750, Φ 75 S/P. 600 N/wall
3. DEP. 950, Φ 325 W/P ms, 850 N/wall
4. DEP. 600, Φ 100 PVC Soil line, 100 N/wall
5. DEP. 1·2, Φ 250 W/P ms 3·4 N/wall

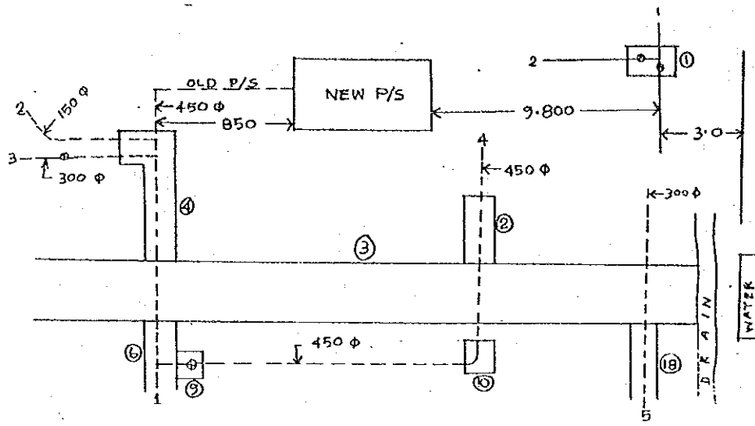


EXCAVATION - 8
4·3 × 1·0 × 1·3

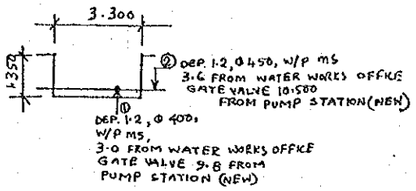




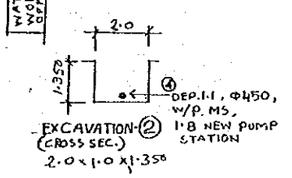
SHEET NO-1



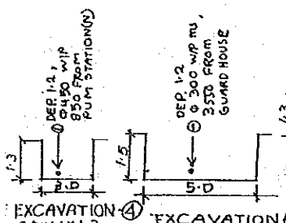
EXCAVATION 2, 4, 6, 9, 10 & 18



EXCAVATION - ① 3·3 X 2·3 X 1·350

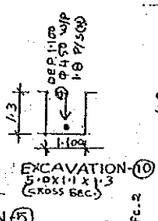


EXCAVATION-② (CROSS SEC.) 2·0 x 1·0 x 1·350

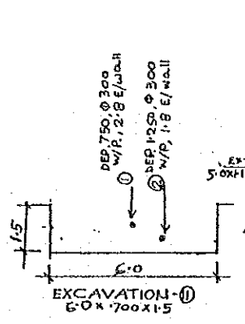


EXCAVATION-④ 3·0 x 1·1 x 1·3

EXCAVATION-⑤ 5·0 x 1·0 x 1·5



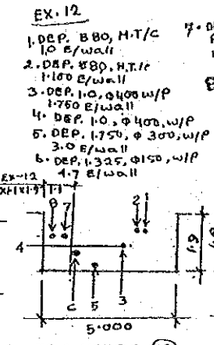
EXCAVATION-⑩ 5·0 x 1·1 x 1·3 (CROSS SEC.)



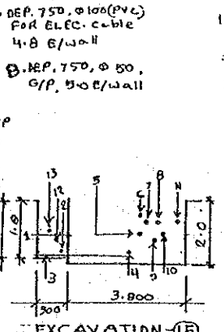
EXCAVATION-① 6·0 x ·700 x 1·5

EX-12

1. DEP. 880, H.T/C 1·0 E/wall
2. DEP. 880, H.T.1C 1·100 E/wall
3. DEP. 1·0, Φ400 W/P 1·760 E/wall
4. DEP. 1·0, Φ 400, W/P
5. DEP. 1·750, Φ 300, W/P 3·0 E/wall
6. DEP. 1·325, Φ150, W/P 4·7 E/wall
7. DEP. 750, Φ 100 (PVC) FOR ELEC. cable 4·8 E/wall
8. DEP. 750, Φ 50, G/P, 3·0 E/wall



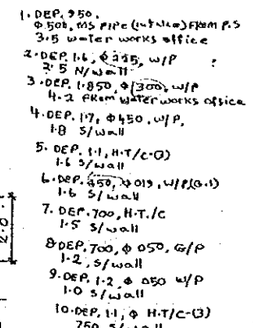
EXCAVATION-⑫ 5·0 x 1·1 x 1·9



EXCAVATION-⑮ (2·5 x 300 x 1·8) 3·8 x 900 x 2·0

EX-15

1. DEP. 950, Φ 508, MS PIPE (outside) FROM P.S 3·6 water works office
2. DEP. 1·6, Φ 325, W/P 3·5 N/wall
3. DEP. 1·850, Φ 300, W/P 4·2 FROM WATER WORKS OFFICE
4. DEP. 1·7, Φ450, W/P, 1·8 S/wall
5. DEP. 1·1, H·T/C·(1) 1·6 S/wall
6. DEP. 850, Φ 019, W/P (0·1) 1·6 S/wall
7. DEP. 700, H·T./C 1·5 S/wall
8. DEP. 700, Φ 050, G/P 1·2 S/wall
9. DEP. 1·2, Φ 050 W/P 1·0 S/wall
10. DEP. 1·1, Φ H·T/C·(3) 750 S/wall
11. DEP. 700, Φ50, PVC soil/P 450 S/wall
12. DEP. 1·250, Φ100, G/P, 2·250 N/wall
13. DEP. 900, Φ25, T/C 2·1 N/wall

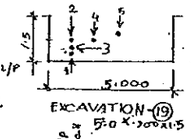


EXCAVATION-⑯A 5·1 x 1·0 x 2·0

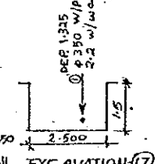
EXCAVATION-⑯ 3·8 x 900 x 2·0

EX-19

1. DEP. 1·325, Φ 350 W/P, 2·2 w/wall
2. DEP. 825, Φ50 G/P, 2·2 S/wall
3. DEP. 1·100, Φ 350 W/P, 2·1 S/wall
4. DEP. 825, H.T./C(4) 1·9 S/wall
5. DEP. 800, Φ 20, T/C, 1·7 S/wall



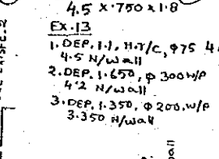
EXCAVATION-⑲ 5·0 x ·700 x 1·5



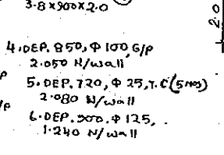
EXCAVATION-⑰ 2·5 x 1·0 x 1·5

Ex·13

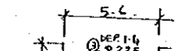
1. DEP. 1·1, H·T/C, Φ75 4·5 N/wall
2. DEP. 1·650, Φ 300 W/P 4·2 N/wall
3. DEP. 1·350, Φ 200, W/P 3·350 N/wall
4. DEP. 850, Φ 100 G/P 2·050 N/wall
5. DEP. 720, Φ 25, T·C (5 ms) 2·080 N/wall
6. DEP. 300, Φ 125, 1·240 N/wall



EXCAVATION-⑬ 4.5 x ·750 x 1·8

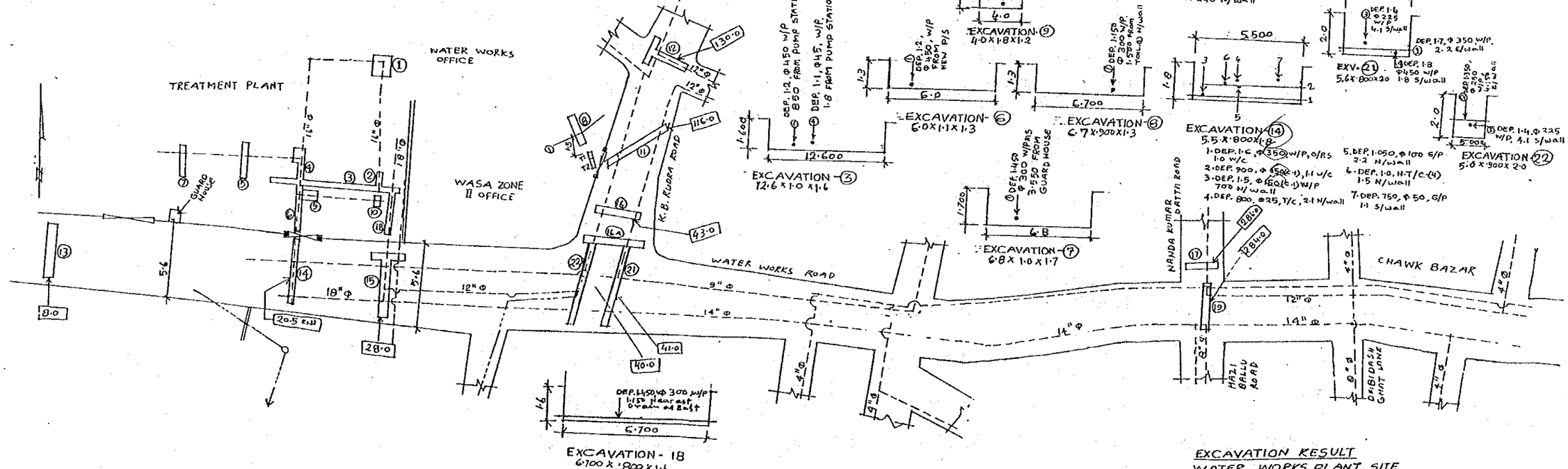


EXCAVATION-⑯ 3·8 x 900 x 2·0



EXCAVATION-㉑ 5.6 x ·800 x 2·0

EXCAVATION-㉒ 5·0 x ·900 x 2·0



EXCAVATION-③ 12·6 x 1·0 x 1·6

EXCAVATION-④ 6·0 x 1·1 x 1·3

EXCAVATION-⑤ 6·0 x 1·0 x 1·3

EXCAVATION-⑧ 6·7 x ·900 x 1·3

EXCAVATION-⑨ 4·0 x 1·8 x 1·2

EXCAVATION-⑦ 6·8 x 1·0 x 1·7

EXCAVATION-⑭ 5.5 x ·800 x 1·8

EXCAVATION-⑱ 6·700 x ·800 x 1·6

1. DEP. 1·C, Φ 350 W/P, O/RS 1·0 w/c
2. DEP. 900, Φ 450 (1), 1·1 w/c
3. DEP. 1·5, Φ 600 (1) W/P 700 N/wall
4. DEP. 800, Φ25, T/C, 2·1 N/wall
5. DEP. 1·050, Φ 100 G/P 2·2 N/wall
6. DEP. 1·0, H·T/C·(4) 1·5 N/wall
7. DEP. 750, Φ 50, G/P 1·1 S/wall

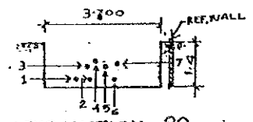
NOTE: DISTANCE OF EXCAVATION FROM WATER WORKS

EXCAVATION RESULT
WATER WORKS PLANT SITE
TO CHAWK BAZAR.

SHEET NO. - 2

E-20

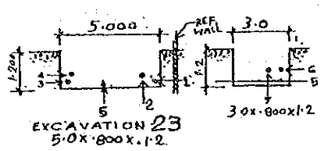
1. DEP. 1·2, Φ 100, G/P
   2·7 FROM E/WALL
2. DEP. 1·2, Φ 300, W/P MS
   2·3 FROM E/WALL
3. DEP. ·750, Φ 150, PVC W/P
   2·1 E/W
4. DEP. ·650, Φ 16, T/C
   2·1 E/WALL
5. DEP. ·925, Φ 200, R.C.C SOIL-P
   1·9 E/WALL
6. DEP. ·780, Φ ·075, PVC-P (E/C)
   1·5 E/WALL
7. DEP. ·950, Φ ·050, M.S LINE
   1·350 E/WALL



EXCAVATION - 20
3·7 X ·800 X 1·400

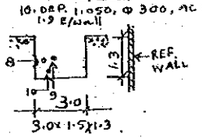
EX-23

1. DEP. 1·020, Φ 200, W/P MS
   ·800 S/WALL, ·600 W/WALL
2. DEP. ·750, Φ 25, T/C (3 NOS.)
   ·500 S/WALL
3. DEP. 1·050, Φ 125 W/P
   4·150 S/WALL
4. DEP. ·800, Φ 50, G/P
   4.350 S/WALL
5. DEP. 1·1, Φ 250, W/P (A·C LINE)
   2·850 S/WALL
6. DEP. 650, Φ 25, T/C (5 NOS)
   6·1 E/WALL
7. DEP. 650, Φ 75, E.T. CABLE LINE; 7·3 E/WALL
8.



EXCAVATION 23
5·0 X ·800 X 1·2

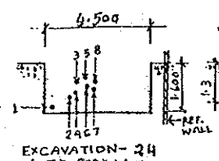
8. DEP. 800, Φ 100, G/P 2·50 E/WALL
9. DEP. 775, Φ 150, PVC W/P.
   2·00 E/WALL
10. DEP. 1·050, Φ 300, AC LINE,
    1·9 E/WALL



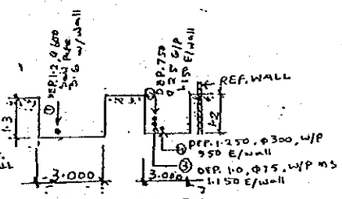
3·0 X 1·5 X 1·3

EX-24

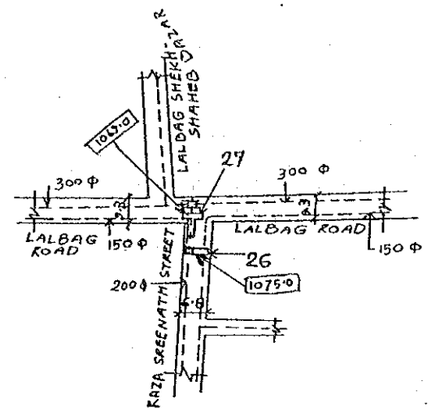
1. DEP. 1·500, Φ 300, W/P (ASBESTOS CEMENT)
   3·6 S/WALL
2. DEP. 1·25, Φ 150, W/P MS, 2·65 S/WALL
3. DEP. 600, Φ 75, G.I, 2·500 S/WALL
4. DEP. 900, H.T. CABLE, 2·500 S/WALL
5. DEP. 500, T/C, 2·2 S/WALL
6. DEP. 800, Φ 150, W/P (C.I)
   2·1 S/WALL
7. DEP. 870, ELE. CABLE,
   1·350 S/WALL
8. DEP. 600, Φ 20, G/P,
   1·8 S/WALL

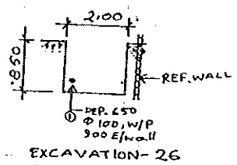


EXCAVATION - 24
4·5 X ·800 X 1·600

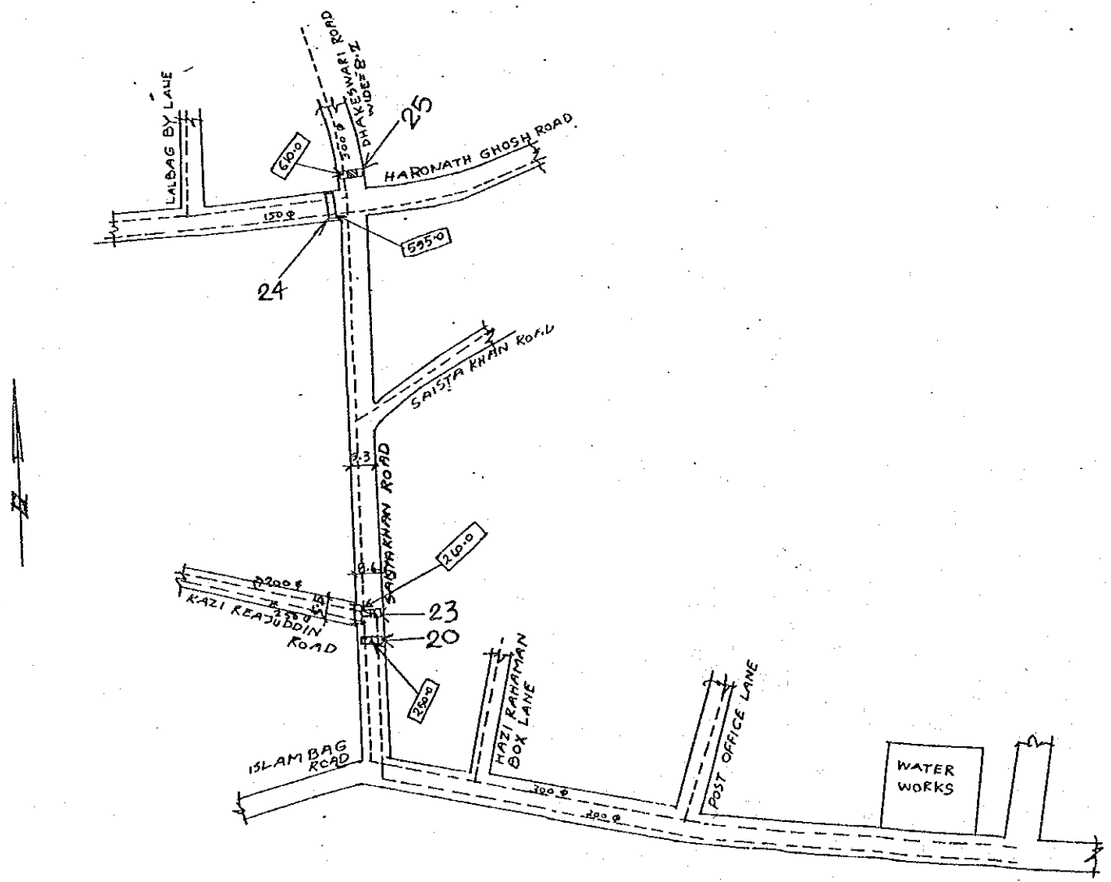


EXCAVATION - 25
(3·0 X ·800 X 1·3) (3·0 X ·800 X 1·2)

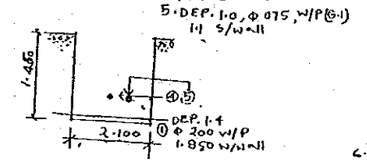




EXCAVATION - 26
2·0 X 650 X ·850

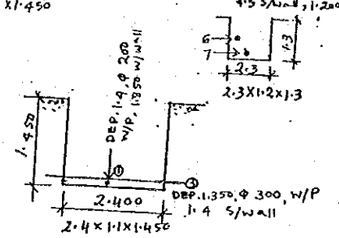


1. DEP. 1·0, Φ 100
   G/P, 1·3 SOUTH WALL
5. DEP. 1·0, Φ 075, W/P (C·I)
   1·1 S/WALL



EXCAVATION - 27
2·1 : X 1·250 X 1·450

6. DEP. 700, Φ 50, G/P
   4·9 S/WALL
7. DEP. 1·2, Φ 150, W/P
   4·5 S/WALL ; 1·200 N/WALL



2·3 X 1·2 X 1·3

2·4 X 1·1 X 1·455

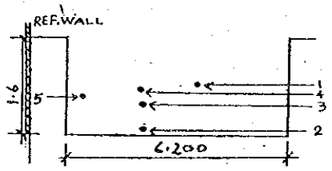
EXCAVATION RESULT
WATER WORKS PLANT SITE
TO PILKHANA.

NOTE:
DISTANCE OF EXCAVATION FROM WATER WORKS

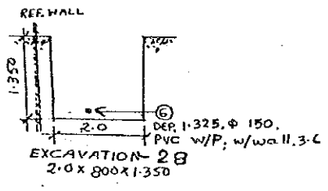
SHEET NO.- 3

EX. 29

1. DEP. 700, ϕ 25
   T/C, 1·4 N/wall
2. DEP. 1·5, ϕ 300, W/P,
   2·3 N/wall
3. DEP. 1·075, ϕ 150, W/P MS
   2·3 N/wall
4. DEP. 800, ϕ 40, L.T. cable line
   2·3 N/wall
5. DEP. 1·0, ϕ 100, G/P
   4·300 N/wall



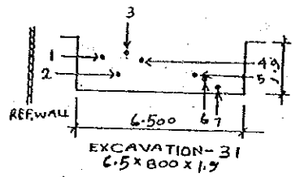
EXCAVATION – 29
6·2 X 750 X 1·600



EXCAVATION – 28
2·0 x 800 x 1·350

EX. – 31

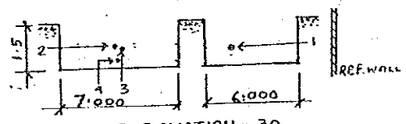
1. DEP. 650, L.T. cable
   300 w/wall
2. DEP. 1·2, ϕ 200, G/P
   1·4 w/wall
3. DEP. 500, ϕ 19, T/C
   1·7 w/wall
4. DEP. 700, L.T. cable, 2·1 w/wall
5. DEP. 1·025, ϕ 50, G/P, 1·450 E/wall
6. DEP. 1·1, ϕ 100, G/P, 1·350 E/wall
7. DEP. 1·5, ϕ 300, W/P, 950 E/wall



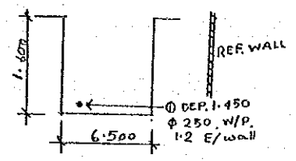
EXCAVATION – 31
6·5 x 800 x 1·9

EX. – 30

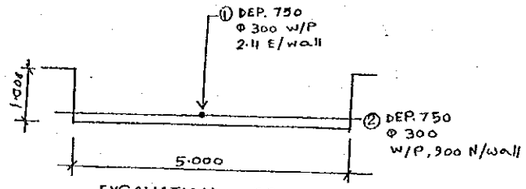
1. DEP. 950, ϕ 75, G/P, 3·2 S/wall
2. DEP. 800, ϕ 25, W/P (G·I), 1·8 N/wall
3. DEP. 900, ϕ 50, G/P, 1·9 N/wall
4. DEP. 1·300, ϕ 250
   W/P. (MS), 3·9 N/wall



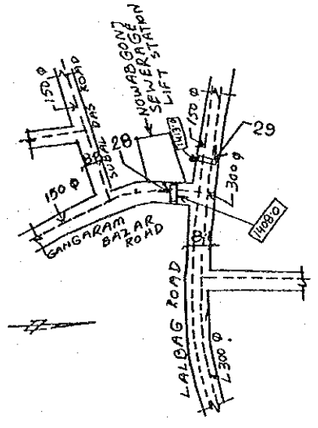
EXCAVATION – 30
(7·0 X ϕ·08 X 1·5) (6·0 x 8·0 x 1·5)

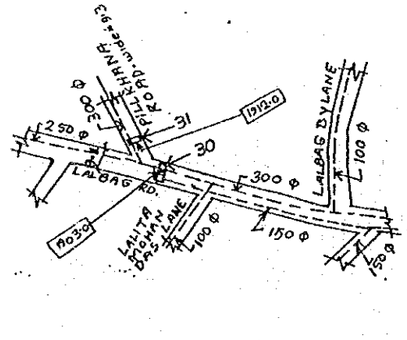


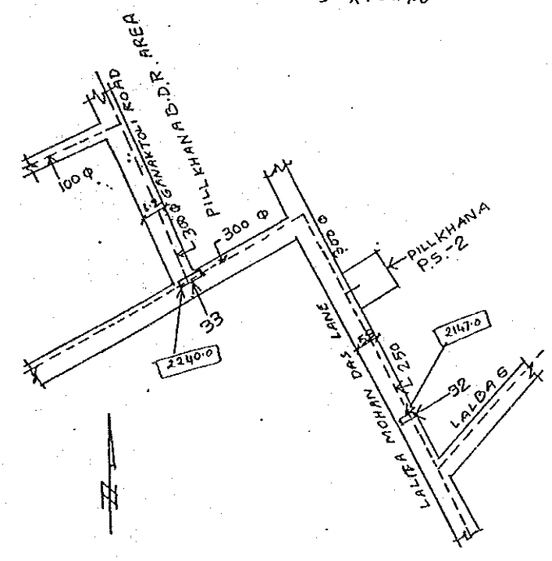
EXCAVATION – 32
6·5 x 800 x 1·6



EXCAVATION – 33
5·0 X 1·0 X 1·0



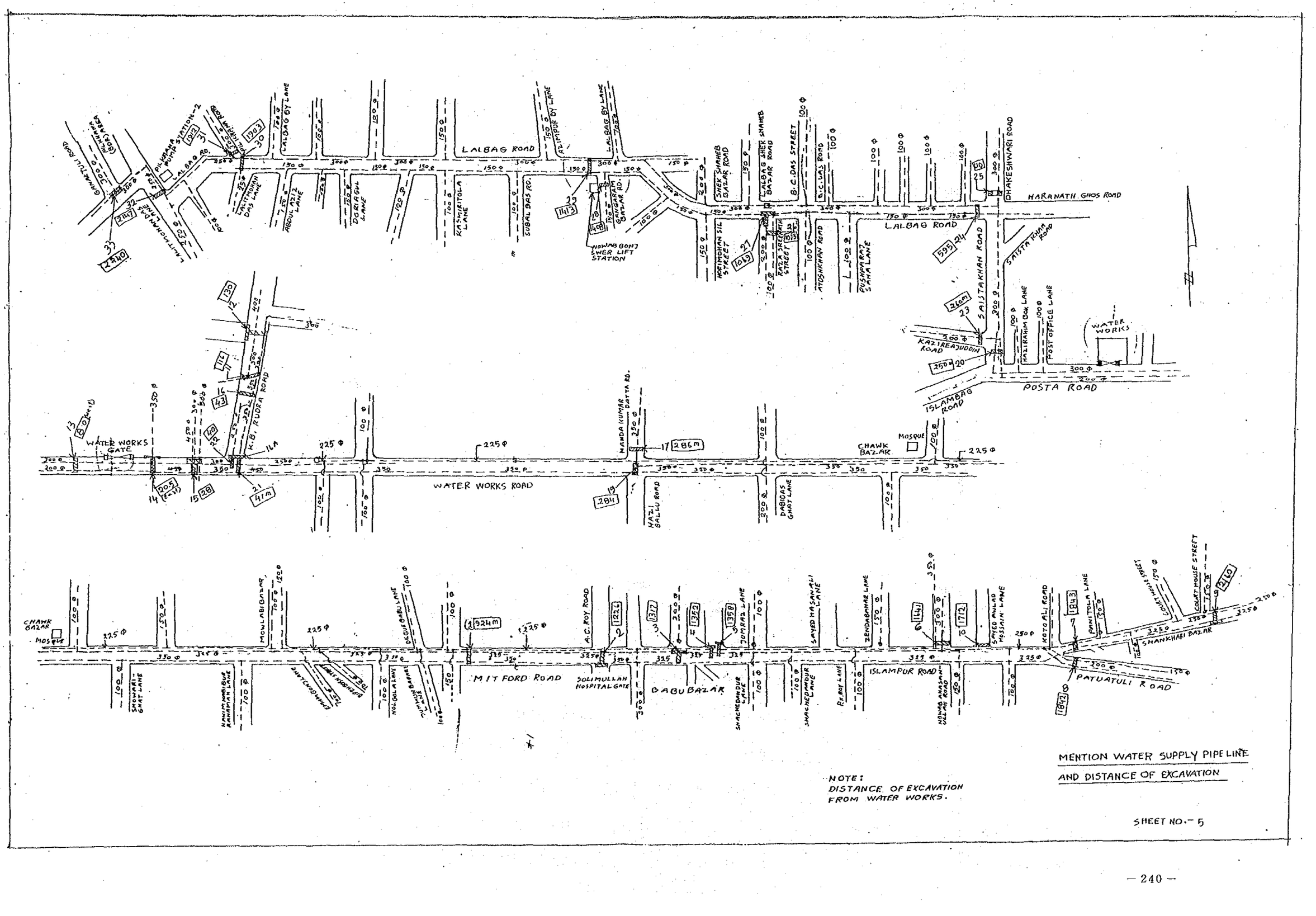




EXCAVATION RESULT
WATER PLANT SITE
TO PILKHANA.

NOTE: DISTANCE OF EXCAVATION FROM WATER WORKS

SHEET NO – 4



NOTE:
DISTANCE OF EXCAVATION FROM WATER WORKS.

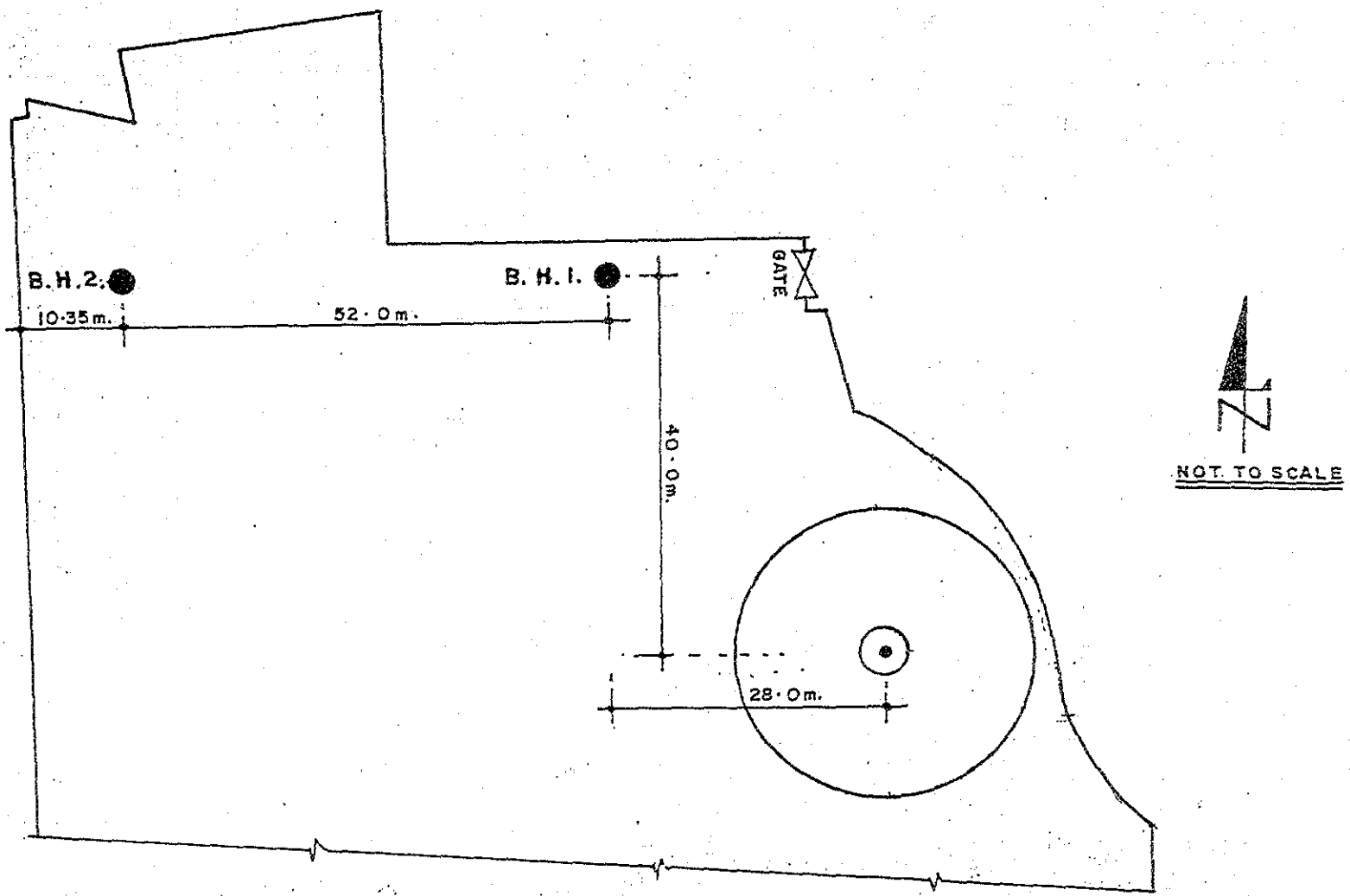
MENTION WATER SUPPLY PIPE LINE AND DISTANCE OF EXCAVATION

SHEET NO.- 5

添付資料B－8

チャンドニガット浄水場内土質試験結果

SUBSOIL ENGINEERING & CONSTRUCTION CO. LTD. DHAKA.	PLAN SHOWING LOCATION OF BORE HOLE POINTS	CLIENT: WASA DHAKA SITE : WATER TREATMENT PLANT, CHANDNIGHAT, DHAKA.



SUBSOIL ENGINEERING & CONSTRUCTION CO. LTD. DRN. A. HASHEM DATE: 29 · 4 · 92 PLAN NO. 2220

SUB SOIL ENGINEERING & CONSTRUCTION CO. LTD.
DHAKA

Client:- WASA, DHAKA.

Site:- WATER TREATMENT PLANT CHANDNIGHAT DHAKA.

Bore chart of Boring No. B. H. I.

Φ900 l=14.5' (AV) Rc=40 t/unit

R.L.= 32·47' (9·899 m.)

G.W.T.= 17·50' (5·335 m.)

DATE	REDUCED ELEVATION	DEPTH IN FEET	THICKNESS	STRATA ENCOUNTERED	LOG	DIA. OF BORING	STANDARD PENETRATION TESTS Blows/ft. 10 20 30 40 50 60 70 80 90	REMARKS (G.W.T. SOIL SAMPLES) VANE SHEAR TESTS Lbs./sq in.
25·4·92		5'-0"	5'-0"	Reddish brown medium stiff silty CLAY, trace brick chips(F)		101'-6", 5" Φ Percussion method	6, 10	3'-0" 6'-0" 9'-0" 12'-0" 15'-0"
		11'-0"	6'-0"	BRICK CHIPS with clay, trace fine sand (Filling soil)			8, 6	20'-0" 25'-0"
		14'-0"	3'-0"	Light brown medium stiff silty CLAY ▽+5.629			15, 19, 16	30'-0" 35'-0"
		28'-0"	14'-0"	Reddish brown very stiff silty CLAY, trace fine sand C-1 ▽+1.369			4, 4	40'-0" 45'-0"
		38'-0"	10'-0"	Reddish brown loose fine sandy SILT, trace clay C-2 ▽-1.681			17, 18, 33	50'-0" 55'-0"
				S-1 ▽-2.000			31, 29, 26, 30, 27	60'-0" 65'-0" 70'-0" 75'-0"
		77'-0"	39'-0"	Brown medium dense to dense silty fine SAND			35, 37, 40, 43, 47	80'-0" 85'-0" 90'-0" 95'-0" 100'-0"
		101'-6"	24'-6"	Light brown to brown dense fine to medium SAND with silt				

DISTURBED SAMPLE.... ▨ UNDISTURBED SAMPLE.... ■

DRN:- MAMOON DATE:- 27 · 4 · 92 SCALE:- 1"=16'-0" PLAN No. 2221

SUBSOIL ENGINEERING & CONSTRUCTION CO. LTD.
DHAKA

Client:- WASA, DHAKA.

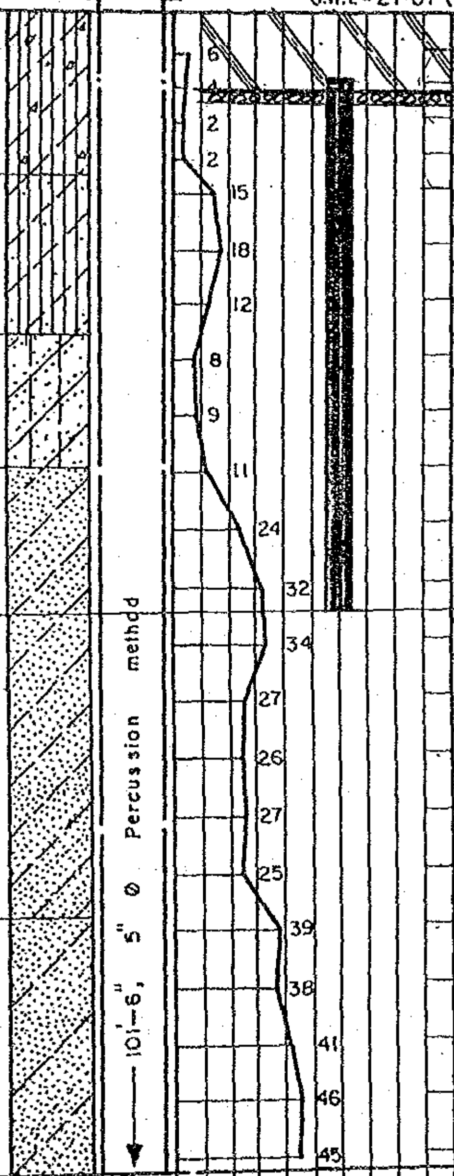
Site:- WATER TREATMENT PLANT CHANDNIGHAT DHAKA.

Bore chart of Boring No. B. H. 2.

φ400, l=14.0m (AV) Ra = 40t/unit

R.L. = 30.85' (9.406 m.) G.W.T. = 21.01' (6.406 m.)

DATE	REDUCED ELEVATION	DEPTH IN FEET	THICKNESS	STRATA ENCOUNTERED	DIA. OF BORING
21.4.92		14'-0"	14'-0"	Bc-1 Dark grey medium stiff to soft silty CLAY with brick chips (Filling soil) ▽+5.103	101'-6", 5" φ Percussion method
		28'-0"	14'-0"	C-1 Reddish brown very stiff to stiff silty CLAY, trace fine sand ▽+0.876	
		40'-0"	12'-0"	C-2 Reddish brown loose fine sandy SILT, trace clay ▽-2.284	
to				S-1 ▽-7.000	
23.4.92		79'-0"	39'-0"	Brown medium dense to dense silty fine SAND	
		101'-6"	22'-0"	Light brown to brown dense fine SAND with silt	



REMARKS (G.W.T. SOIL SAMPLES)	STANDARD PENETRATION TESTS Blows/ft.
3'-0"	6
6'-0"	4
9'-0"	2
12'-0"	2
15'-0"	15
20'-0"	18
25'-0"	12
30'-0"	8
35'-0"	9
40'-0"	11
45'-0"	24
50'-0"	32
55'-0"	34
60'-0"	27
65'-0"	26
70'-0"	27
75'-0"	25
80'-0"	39
85'-0"	38
90'-0"	41
95'-0"	46
100'-0"	45

VANE SHEAR TESTS Lbs./sq in.

DISTURBED SAMPLE.... ▨ UNDISTURBED SAMPLE.... ■

DRN:- A. RAZZAK DATE:- 24.4.92 SCALE:- 1" = 16'-0" PLAN No. 2222