


TECHNICAL NOTES
CN
THE BASIC DESIGN STUDY
CN
THE PROJECT FOR IMPROVEMENT OF WATER SUPPLY FACILITIES
AT
DARKHAN CITY
IN
MONGOLIA

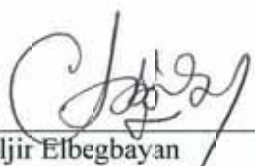
Based on the Minutes of Discussions (hereinafter referred to as "M/D") on the Basic Design Study on the Project for Improvement of Water Supply Facilities at Darkhan City in Mongolia (hereinafter referred to as "the Project") signed on May 28, 2008 between the Basic Design Study Team (hereinafter referred to as "the Team") of Japan International Cooperation Agency (hereinafter referred to as "JICA") and Ministry of Construction and Urban Development (hereinafter referred to as "MCUD"), of the Government of Mongolia, the consultant members of the Team (hereinafter referred to as "TEC") had a series of discussions and conducted field surveys from May 29 to June 19, 2008.

As a result of the discussions and the surveys, both sides confirmed the technical conditions described as per the attached.

Darkhan, June 19, 2008



Soichiro Yamoto
Chief Consultant,
JICA Basic Design Study Team for
the Project for Improvement of Water
Supply Facilities at Darkhan City
in Mongolia



Sodnombaljir Elbegbayan
Director,
Water Supply and Sewerage System Co. of
Darkhan City,
Mongolia

ATTACHMENT

Both parties agreed upon and confirmed the following items.

1. Population Frame and Water Demand

Population frame of the Darkhan city is set as tabulated below based on the forecast prepared by the Water Supply and Sewerage System Co. of Darkhan City (hereinafter referred to as "WSSSCD").

Table 1 Population Frame of Darkhan City (2007 - 2015)

Year	2007	2008	2009	2010	2011	2012	2013	2014	2015
Apartment Area	49,867	51,739	54,547	62,336	64,725	66,287	69,830	72,535	73,709
Ger Area	24,659	24,828	25,084	25,461	26,135	26,615	27,156	28,534	29,402
Total Population	74,526	76,568	79,631	87,798	90,860	92,902	96,986	101,070	103,111

The water demand of 2011 is set as stated below, and the average daily demand and the maximum daily demand for the Darkhan city are calculated to be 21,194 m³/day and 36,030 m³/day, respectively.

a. Total Population:	90,860
Apartment Area:	64,725
Ger Area:	26,135
b. Unit Consumption	
Apartment Area (l/day/capita):	170
Ger Area (l/day/capita):	25
c. Annual Consumption (1,000m ³):	4,255
Apartment Area (1,000m ³):	4,016
Ger Area (1,000m ³):	238
d. Daily Consumption (m ³):	21,194
e. Unaccounted Water (%):	45
f. Daily Demand (m ³ /day):	21,194
g. Max. Daily Demand (m ³ /day):	36,030
h. Industrial Water Demand (m ³ /day):	2,877
i. Total Demand (m ³ /day):	24,071

2. Control and Monitoring Systems of the 1st and 2nd Stations

The minimum level of control and monitoring system consisting of the essential functions required for the proper operation of the pumping units in the 1st and 2nd Stations shall be applied as illustrated in Fig. 1 and Fig. 2.

3. Facilities to be Replaced in the 1st Station

The number of pump unit to be replaced shall be determined in the study in Japan, and the replaced parts of pumping system shall be as indicated in Fig. 3 and Fig. 4. The fittings of each system shall be furnished with the electric heating ware to prevent from freezing during the winter season. The WSSSCD requested to apply the pumping units with the type and capacity same as those being used at present considering the easiness in operation and maintenance by

the WSSSCD staff. The transformer and the control panel shall also be replaced.

Since the electric supply line from No. 7 and No. 8 of 6,000V was found to be unusable, WSSSCD shall fix it before the commencement of the project implementation.

The following items shall be considered in the renovation plan of the existing pump house.

- a. Entrance door
- b. Window and window frame
- c. Pipe insulator and heater
- d. Room heater
- e. Internal lighting fixture

4. Facilities to be Replaced in the 2nd Station

The WSSSCD requested that three (3) pumping units would be replaced under the Project in order to allocate one (1) bay reserved for the further increase of pumping capacity of the station in future as indicated in Fig. 5. As for the electric supply facilities, only the parts necessary for the replacement of the pumping units shall be considered. The pump panels for three (3) pumping units to be replaced shall be newly installed in the room used as a meeting room at present. The present operation room shall be used as it is, and the operation and monitoring panels shall be installed in the same room.

The new chlorination equipment shall be installed in the chlorination room of the house beside the pump house. The room behind the chlorine room shall be used for the storage of chlorine cylinders. The injection shall be made into the regulation reservoirs located behind the pump house.

5. Use of Storage House in the 2nd Station

The water hammer effect shall be analyzed in the course of the study in Japan, and if any countermeasures are required as a result, the storage house which is not used at present shall be utilized for installing the surge tank to prevent mal effect of the water hammer to occur at the sudden stop of pumping equipment.

6. Water Kiosks and Distribution Networks in Ger Areas

The locations of water kiosks are tentatively determined as indicated in Fig. 6 and Fig. 7 as the result of a series of discussions with chief of bags and leaders of beneficiaries as well as the staff of WSSSCD. The routes of the distribution pipelines are tentatively determined as shown in the figure with the alternative route. The distribution network analysis shall be carried out in the course of the study in Japan, and the pipeline routes and the kiosk locations shall be definitely determined. The house of the existing No. 32 water kiosk which was constructed about two (2) years ago shall be used though the other kiosk houses shall be newly constructed.

As for the kiosk which is located in the elevated hill in the No. 6 bag, it is found to be difficult to convey the water from the main distribution pipe with its pressure. The WSSSCD strongly requests to apply a booster pump for conveying the water to the said kiosk. The applicability of



this pump, therefore, shall be studied in the course of the study in Japan. The automatic operation system of booster pump shall not be applied, and only a simple method with manual operation shall be considered for the easiness in operation by the present kiosk staff.

7. Water Flow Meters to be Installed for Monitoring

Five (5) flow meters shall be installed; three (3) meters at the outlet from the reservoirs on the three (3) distribution mains, and two (2) meters at the beginning of the raw water transmission.

8. Water Meters to be Procured

The WSSSCD requested to increase the number of water meters to be procured to meet the number of meter planned to be installed in 2011 and 2012, and the TEC will convey this request to JICA.

Table 2 Installation Plan of House Water Meter

Year (20**)	05	06	07	08	09	10	11	12	13	14	15
No. of Meter to be Installed	16	79	505	800	1,200	1,400	1,500	1,600	1,800	2,000	2,200
Comm. No. of Meter	16	95	600	1,400	2,600	4,000	5,500	7,100	8,900	10,900	13,100

9. Water Quality Analysis Equipment to be Procured

The following items of equipment shall be procured as the water quality analysis equipment.

- a. Drying oven 1 no.
- b. Incubator 1 no.
- c. Absorption spectrophotometer 1 no.

10. Track Crane and Mobile Welding Machine

Since 1978 the track crane has been used for about 30 years, and various troubles occur due to oldness. The crane is considered an essential equipment in the operation and maintenance works of the pumping units of the 1st station as well as those of the distribution networks. The welding machine has also used long time, and the remarkable deterioration was found. Therefore, those operation and maintenance equipment is also required to be replaced as soon as possible.

11. Technical Assistance

Though the operation and monitoring system shall be planned on the basis of minimum level to meet to the present manners of operation of the 2nd station considering the skills and technical know-how of the present operation staff, it is requested by WSSSCD to provide some extent of technical assistance for the operation of the 2nd station. In addition, it is requested provide technical assistance for the operation of booster pump in the elevated kiosk also. A short training course consisting of lectures and on-the-job training shall be proposed.

- Operation of 1st Station**
1. Manual Operation from 1st Station Pump Panel or
 2. Manual Operation from 2nd Station Monitoring Panel
- Operation of 2nd Station**
1. Manual Operation from 2nd Station Monitoring Panel

- Level Monitoring**
1. No. 1 Regulation Reservoir Level
 2. No. 2 Regulation Reservoir Level
 3. No. 1 2000m³ Reservoir Level
 4. No. 2 2000m³ Reservoir Level
 5. No. 1 6000m³ Reservoir Level
 6. No. 2 6000m³ Reservoir Level
- Flow Monitoring**
1. No. 1 Raw Water Flow
 2. No. 2 Raw Water Flow
 3. No. 3 Raw Water Flow
 4. No. 1 Supplied Water Flow
 5. No. 2 Supplied Water Flow
 6. No. 1 Distribution Water Flow
 7. No. 2 Distribution Water Flow
 8. No. 3 Distribution Water Flow

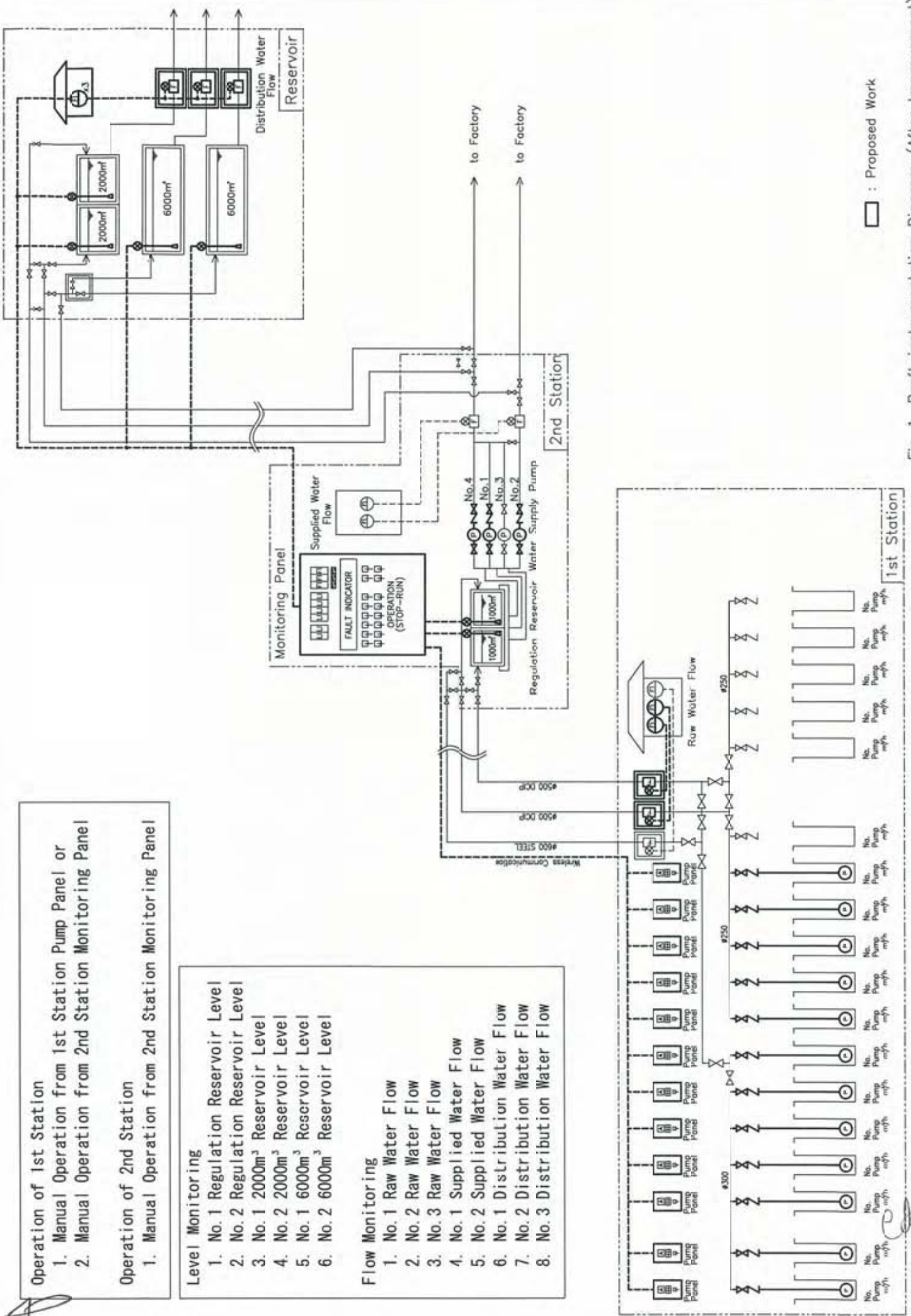
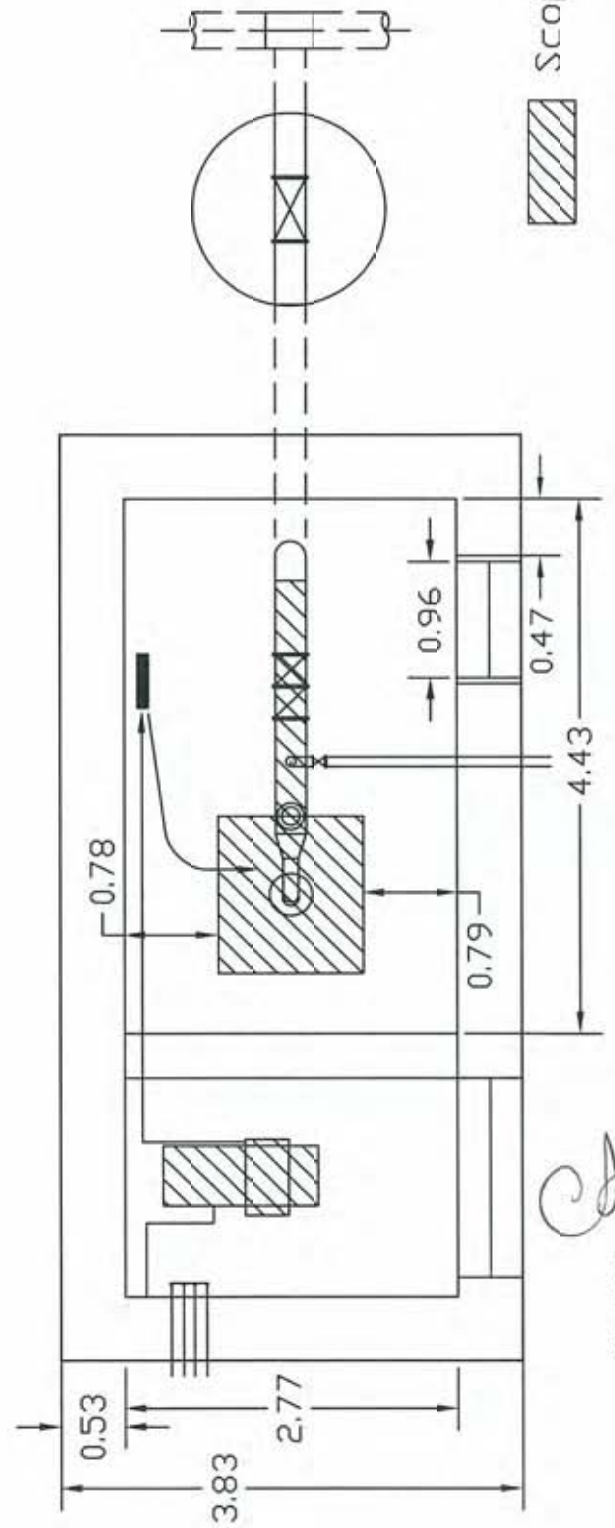
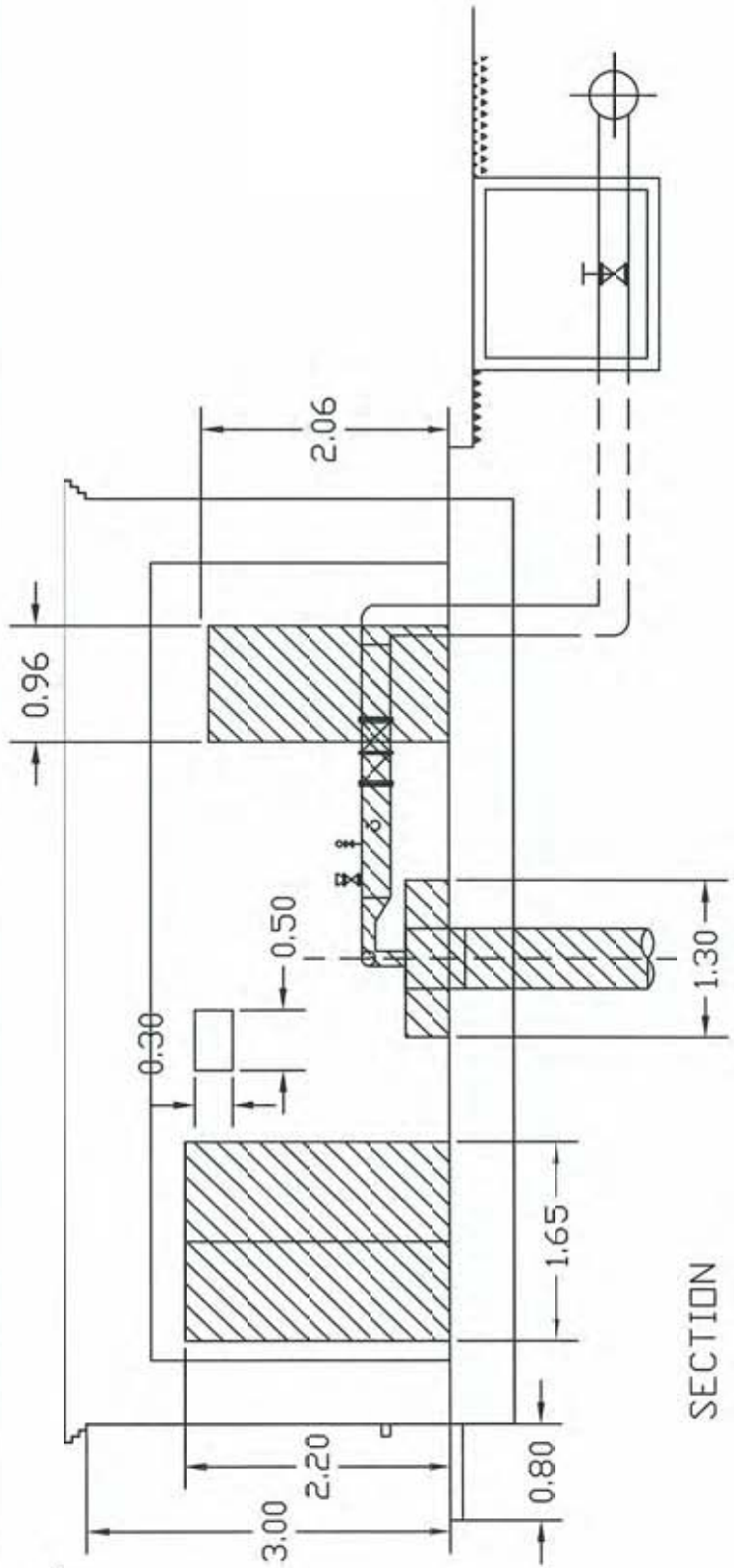


Fig 1. Draft instrumentation Diagram (After Improvement)

No.1 Well ON	No.2 Well ON	No.3 Well ON	No.4 Well ON	No.5 Well ON	No.6 Well ON	No.7 Well ON	No.8 Well ON	No.9 Well ON	No.10 Well ON	No.11 Well ON	No.12 Well ON	Spare	Spare	Spare	Spare	Spare	Spare
No.1 Well OFF	No.2 Well OFF	No.3 Well OFF	No.4 Well OFF	No.5 Well OFF	No.6 Well OFF	No.7 Well OFF	No.8 Well OFF	No.9 Well OFF	No.10 Well OFF	No.11 Well OFF	No.12 Well OFF	Spare	Spare	Spare	Spare	Spare	Spare
No.1 Well FAULT	No.2 Well FAULT	No.3 Well FAULT	No.4 Well FAULT	No.5 Well FAULT	No.6 Well FAULT	No.7 Well FAULT	No.8 Well FAULT	No.9 Well FAULT	No.10 Well FAULT	No.11 Well FAULT	No.12 Well FAULT	Spare	Spare	Spare	Spare	Spare	Spare
No.1 Wireless Communication Equipment FAULT	No.2 Wireless Communication Equipment FAULT	No.3 Wireless Communication Equipment FAULT	No.4 Wireless Communication Equipment FAULT	No.5 Wireless Communication Equipment FAULT	No.6 Wireless Communication Equipment FAULT	No.7 Wireless Communication Equipment FAULT	No.8 Wireless Communication Equipment FAULT	No.9 Wireless Communication Equipment FAULT	No.10 Wireless Communication Equipment FAULT	No.11 Wireless Communication Equipment FAULT	No.12 Wireless Communication Equipment FAULT	Spare	Spare	Spare	Spare	Spare	Spare

No.1 Water Supply Pump ON	No.2 Water Supply Pump ON	No.3 Water Supply Pump ON	No.4 Water Supply Pump ON	No.1 Outlet Valve OPEN	No.2 Outlet Valve OPEN	No.3 Outlet Valve OPEN	No.4 Outlet Valve OPEN	Chlorination Equipment ON	No.1 2000m ³ Reservoir HH	No.2 2000m ³ Reservoir HH	No.1 6000m ³ Reservoir HH	No.2 6000m ³ Reservoir HH
No.1 Water Supply Pump OFF	No.2 Water Supply Pump OFF	No.3 Water Supply Pump OFF	No.4 Water Supply Pump OFF	No.1 Outlet Valve CLOSE	No.2 Outlet Valve CLOSE	No.3 Outlet Valve CLOSE	No.4 Outlet Valve CLOSE	Chlorination Equipment OFF	No.1 2000m ³ Reservoir LL	No.2 2000m ³ Reservoir LL	No.1 6000m ³ Reservoir LL	No.2 6000m ³ Reservoir LL
No.1 Water Supply Pump FAULT	No.2 Water Supply Pump FAULT	No.3 Water Supply Pump FAULT	No.4 Water Supply Pump FAULT	No.1 Outlet Valve FAULT	No.2 Outlet Valve FAULT	No.3 Outlet Valve FAULT	No.4 Outlet Valve FAULT	Chlorination Equipment FAULT	No.1 Regulation Reservoir HH	No.2 Regulation Reservoir HH	Spare	Spare
Spare	Spare	Spare	Spare	Spare	Spare	Spare	Spare	Spare	No.1 Regulation Reservoir LL	No.2 Regulation Reservoir LL	Spare	Spare

Fig 2. Detail of Fault Indicator (Draft)




 Scope of Replacement Work

Fig 3. Pump House No1-11

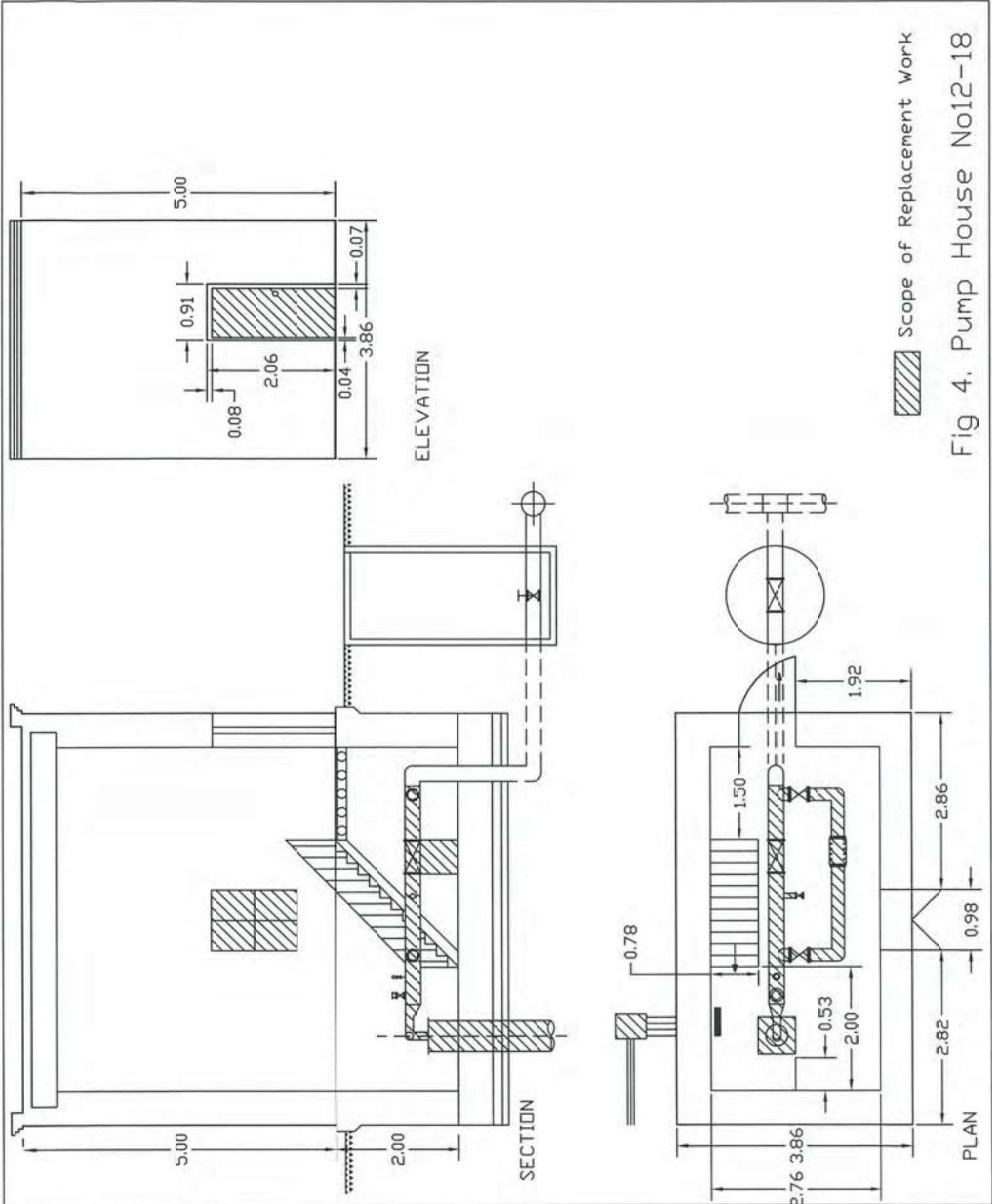
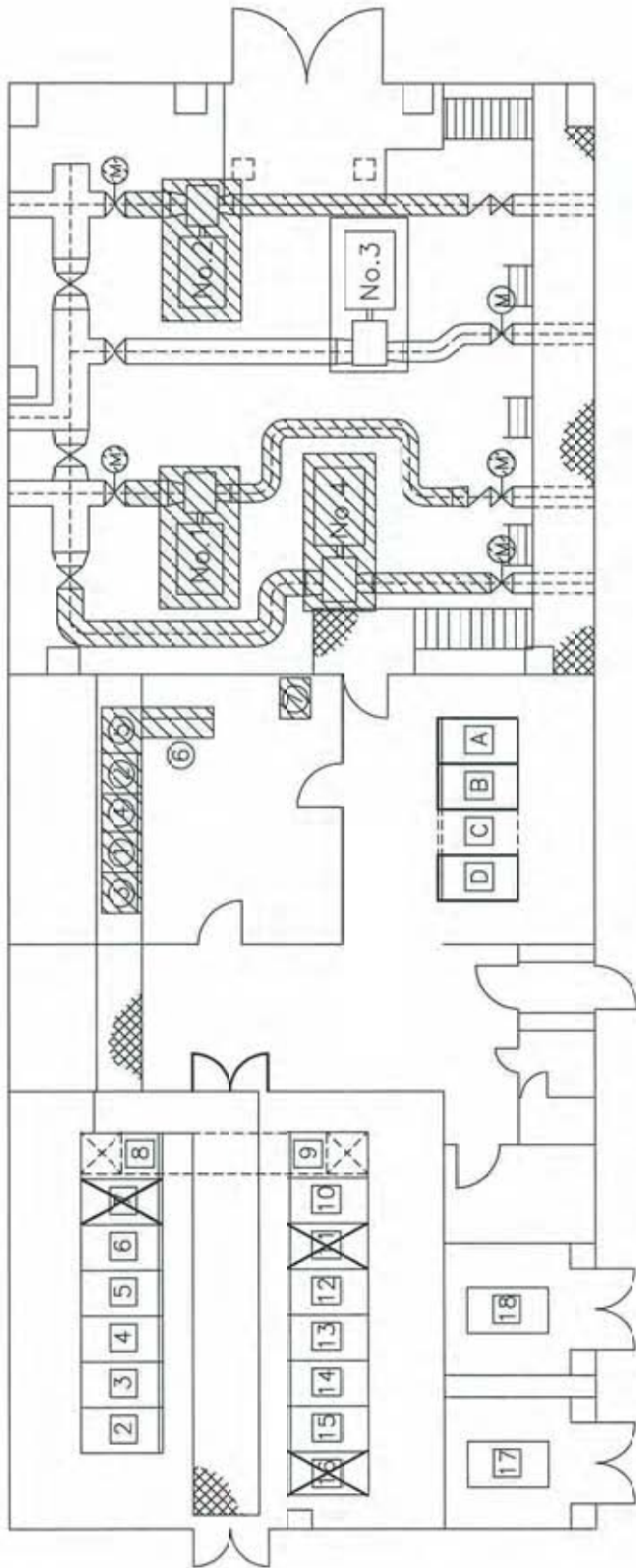


Fig 4. Pump House No12-18




A

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AS



Note: No.3 Pumping unit will be moved to either side of the room.

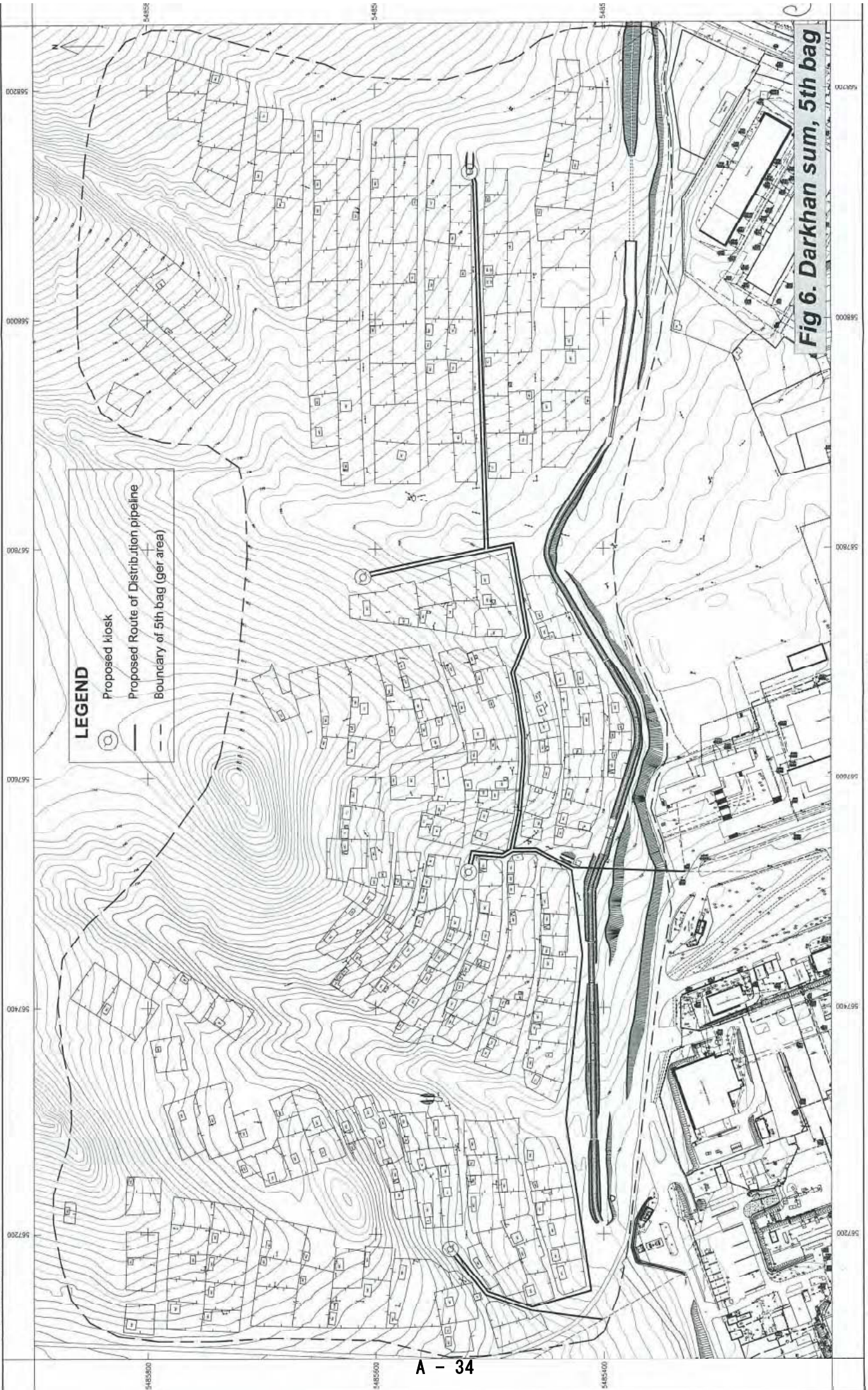
- : Scope of Replacement Work
- : Scope of Installation Work
- : Operation Stop

Panel List

No.	Name	No.	Name	No.	Name	No.	Name
2	No.1 6.6kV Receiving Panel	1	No.2 Pump Panel	1	No.1 Auxiliary Panel	A	No.1 Pump Panel
3	No.1 TR Feeder Panel	2	No.2 LA Panel	2	No.2 Auxiliary Panel	B	No.2 Pump Panel
4	No.1 1st Station Feeder Panel	3	No.1 2nd Station Feeder Panel	3	No.3 Auxiliary Panel	C	No.3 Pump Panel (future)
5	No.1 LA Panel	4	No.2 TR Feeder Panel	4	No.4 Auxiliary Panel	D	No.4 Pump Panel
6	No.3 Pump Panel	5	No.2 5.6kV Receiving Panel	5	Instruments Panel		
7	No.1 Pump Panel	6	No.4 Pump Panel	6	Remote Control Panel		
8	No.1 EVT Panel	7	No.1 Transformer	7	Instruments Panel		
9	Bus Tie Panel	8	No.2 Transformer				
10	No.2 EVT Panel						

Fig 5. Draft improvement Plan of 2nd Station Pump House



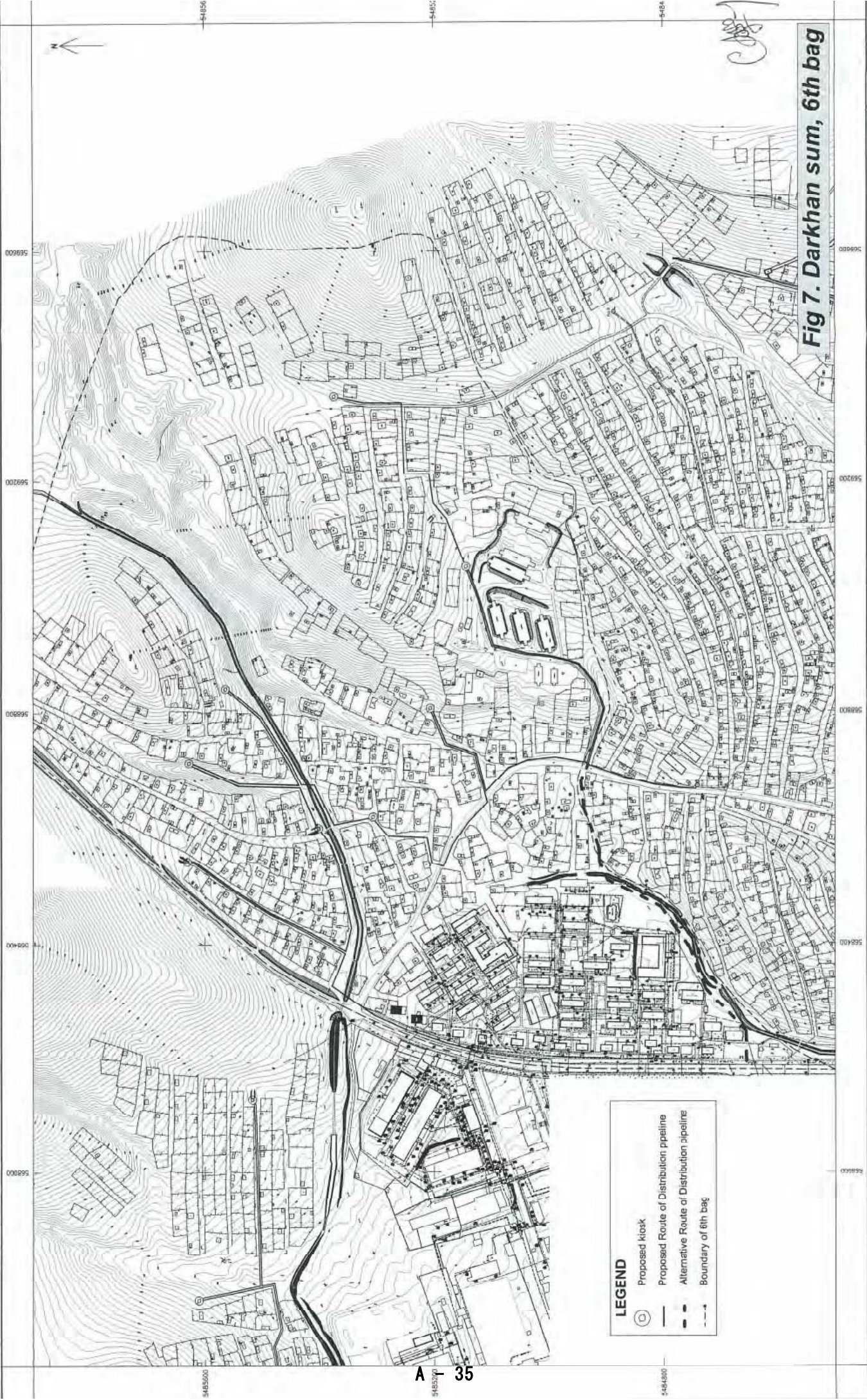


LEGEND

- Proposed kiosk
- Proposed Route of Distribution pipeline
- - - Boundary of 5th bag (ger area)

Fig 6. Darkhan sum, 5th bag

SCALE 1 : 3000
 1 centimeter equals 30 meters
 Height interval: 1 m
 Height system: Baltic Sea



LEGEND

- Proposed kiosk
- Proposed Route of Distribution pipeline
- - - Alternative Route of Distribution pipeline
- - - Boundary of 6th bag

Fig 7. Darkhan sum, 6th bag



SCALE 1 : 6000
 1 centimeter equals 60 meters
 Height interval 1 m
 Height system: Baltic Sea

Prepared by MontMap Engineering Co., Ltd
 For Tokyo Engineering Consultants Co., Ltd
 June, 2008

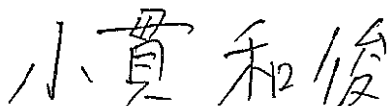
MINUTES OF DISCUSSIONS
ON THE BASIC DESIGN STUDY
ON THE PROJECT FOR IMPROVEMENT OF WATER SUPPLY FACILITIES
AT DARKHAN CITY IN MONGOLIA
(EXPLANATION ON DRAFT REPORT)

In May 2008, the Japan International Cooperation Agency (hereinafter referred to as "JICA") dispatched the Basic Design Study Team on the Project for Improvement of Water Supply Facilities at Darkhan City in Mongolia (hereinafter referred to as "the Project") to Mongolia and through discussion, field survey, and technical examination of the results in Japan, JICA prepared a draft report of the study.

In order to explain and to consult with the Government of Mongolia on the components of the draft report, JICA sent to Mongolia the Draft Report Explanation Team (hereinafter referred to as "the Team"), which is headed by Mr. Kazutoshi ONUKI, Deputy Resident Representative, JICA Mongolia Office, from September 19th to 28th, 2008.

As a result of discussions, both parties confirmed the main items described on the attached sheets.

Ulaanbaatar, 26th September 2008



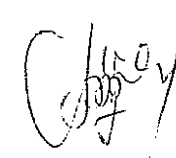
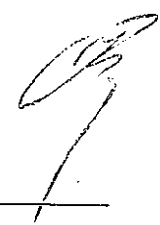
Mr. Kazutoshi ONUKI
Leader,
Deputy Resident Representative
Mongolia office
Japan International Cooperation Agency
Mongolia

Mr. Jadamba BAT-ERDENE
State Secretary,
Ministry of Roads, Transport, Construction and
Urban Development
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(witness)

Mr. Baavgai KHURENBAATAR
Director General,
Department of Policy and Coordination
for Loans and Aid
Ministry of Finance
Mongolia

Mr. Sodnombaljir ELBEGBAYAN
Director,
Water Supply and Sewerage System Co.
of Darkhan City
Mongolia



ATTACHMENT

1. Components of the Draft Report

The Government of Mongolia agreed and accepted in principle the components of the Draft Basic Design Study Report explained by the Team. The components of the project are shown in Annex-1.

2. Japan's Grant Aid scheme

The Mongolian side understands the Japan's Grant Aid Scheme and the necessary measures to be taken by the Government of Mongolia as explained by the Team and described in Annex-4 and Annex-5 of the Minutes of Discussions signed by both parties on May 28th 2008.

3. Schedule of the Study

JICA will complete the final report in accordance with the confirmed item and send it to the Government of Mongolia by January 2009.

4. Other relevant issues

4-1. Undertakings of the Mongolian side

The Team requested to the Government of Mongolia to abide the following undertakings of the Mongolian side in addition to major undertakings described in Annex-4 and Annex-5 of the Minutes of Discussions signed by both parties on 28th May 2008. The Mongolian side agreed to it.

The provisions shown in Annex-2 (2) of the human resources and the expenses for the engineers and technical staff, and the lands and spaces belonging to the Water Supply and Sewerage System Co. of Darkhan city (hereinafter referred to as WSSSC-Darkhan) .

4-2. Project Cost estimation

The team explained to the Mongolian side the Project cost estimation as described in Annex-2. The team and the Mongolian side agreed that the Project cost estimation should never be duplicated or released to any outside parties before signing of all the Contract(s) for the Project.

The government of Mongolia understood that the Project cost estimation attached as Annex-2 is not final and is subject to change.

ANNEX-1 : Components of the project

ANNEX-2 : Project Cost Estimation

ANNEX-1 : Components of the project

(1) Contents of the Facilities and Equipment

components		number of items
1st station	Replacement of Intake Pump (160 m ³ /hr)	10nos
	Operation Control System (Manual Remote Control)	1set
	Portable Water Level Gauge	2nos
	Discharge Meter	2nos
2nd station	Replacement of Transmission Pump (640 m ³ / hr)	3nos
	Automatic Operation Control System (Manual Remote Control)	1set
	Discharge Meter	3nos
Chlorination System		1set
Water Supply System for Ger Area	Kiosk House	12nos
	Distribution Pipeline	φ150 x 7,326 m
Operation and Maintenance Equipment	Truck Crane	1no
	Welding Machine (Truck mounted type)	1no
	Water Quality Analysis Equipment (Spectrophotometer, Incubator, Dryer)	1set
	Water Meter	1,500nos

(2) Technical Assistance (Soft Component)

Activity item	Contents
Intake and Transmission Pumps	Compiling operation manual (Mongolian)
	Seminar/Workshop : Basic operation conforming to the manual, Demand responsive operation on water quantity
	Operation OJT : Confirmation of check-up points and operation procedures, Operation practice, Daily operation record / management report , Efficient operation optimizing electric utility rate
Chlorination Facilities	Seminar/Workshop : Basics of chlorine disinfection, Basic operation, Injection rate control, Safety control
	Operation OJT : Operation practice, Emergency response for accident/troubles, Daily operation record with injection data
Relay Pump in Kiosk	Seminar/Workshop : Knowledge of pumping works, Basic pump operation
	Operation OJT : Precaution/Notices on pump operation, Operation practice with proper procedures, Daily operation record / management report

ANNEX-2 : Project Cost Estimation

(1) Japan's Grand Aid

Item			Cost (Million JPY)	
Construction and Installation of Facilities	Construction of Water Supply Facilities	Construction of the water supply facilities in the Ger areas of the 5th. and the 6th. Bags	817.0	849.1
	Replacement of Existing Water Supply Facilities	Replacement of Intake Pump of 1st. Station, Transmission Pump, Chlorination System of 2nd. Station, and repair of auxiliary equipment		
Procurement of Equipment	Operation and Maintenance Equipment	Truck Crane, Mobile Welding Machine	32.1	
	Water Quality Analysis Devices	Water quality analysis devices (a spectral photometer, a dry oven and an incubator)		
	Water Meter	Water meter for households of 1,500 nos.		
D/D, S/V and Technical Assistance			131.1	
Total			980.2	

The cost estimate is provisional and will be further examined by the Government of Japan for the approval of the Grant.

According to the Mongolian tax system, equipment and materials procured by grant aid are exempted from tax on value added (VAT) and import customs, etc.

(2) Undertakings by the Government of Mongolia

(Unit: Million MNT)

Items	Costs	Remarks
(1) Provision of temporary yard (Workshop space behind the WSSSC building and vacant space in the 2nd. Station)	-	The spaces belong to WSSSC, and they will be free of charge.
(2) Secure the lands for the project facilities including temporary yards for construction and access roads.	-	The land acquisition will be necessary only for the construction of water supply facilities for Ger areas, but all the facilities are planned to be constructed in the public lands. It is not difficult to acquire such lands.
(3) Provision of information on the buried facilities and joint inspection on the trench excavation for the Ger areas of the 5th. and the 6th. Bags.	-	The engineers and technical staff will be dispatched.
(4) Cooperation at the time of connection of the existing and the replaced facilities (Joint inspection of the construction and information on water stop)	-	The engineers and technical staff will be dispatched.
(5) Provision of the water for pressure test for distribution pipelines to be constructed, and for performance test of the equipment.	-	The water of WSSSC will be used.
(6) Provision of the electric power line to the pump houses of the 1st Station (400 V)	-	The connection of the power lines was completed for the existing facilities, and these facilities are planned to be used.
(7) Provision of the electric power line to the incoming panel of the 2nd. Station. (6,000 V)	-	
(8) Provision of the electric power lines to each water kiosk in the 5th. and the 6th. Bags (230 V)	13.2	It is necessary to take the power line for lighting of kiosks as well as operation of relay pump. Since there are power supply lines for consumers near the kiosks along the road, the WSSSC has to get the approval of the power supply company to connect the line as well as payment of necessary charges.
(9) Security of lands and facilities where the equipment are installed.	-	These lands and facilities will be possibly secured.
(10) Personnel Assignment for Project Implementation	14.5	Calculation on staff increase (6 persons) based on WSSSC salary scale
(11) Provision of necessary data and materials for this project	-	Data and materials are for the Detailed Design and the project implementation
Total	27.7	-

添付資料- 5 事業事前計画表(基本設計時)

1. 案件名
モンゴル国 ダルハン市給水施設改善計画基本設計調査
2. 要請の背景(協力の必要性・位置付け)
<p>モンゴル国では、持続的経済成長による貧困の削減を目標として、「政府行動計画」が2000年に定められた。その中の地域・地方開発計画で全国を5つのブロックに分け、各々のブロックの中核都市を定め、それらの都市を中心とする地域開発の促進を目指している。ダルハン市は中央地域の中核都市として位置付けられており、今後、ウランバートルに次ぐ工業都市としての成長が期待されている。また、「政府行動計画」を実施するための具体的計画として、「経済成長と貧困削減計画(Economic Growth Support and Poverty Reduction Strategy Paper: EGSPRS)」が世界銀行の支援を受けて策定された。この戦略の5つの柱の一つとして、地方との格差是正を目的とする持続可能な地域・地方開発があげられている。</p> <p>ダルハン市は首都ウランバートルから219kmに位置する人口74,526人の地域の中核都市である。近くに鉄鉱石の鉱山があることから旧ソ連時代から製鉄業を初めとする工業都市として位置付けられ、近年は製鉄所の拡張、石油精製プラント等の建設やその他多くの中小工場の進出が予定され、また、モンゴル国の定住化政策のもとで多くの人々が流入してきている。</p> <p>しかしながら、同市の給水システムは旧ソ連時代に建設されたものの、ソ連崩壊後は資機材の供給と技術指導が途絶え施設の老朽化が著しい。これまで事業者が独自に修復等を行ってきたものの、年々生産水量が減少し、基幹施設の更新はモンゴル国の予算が不足している等のため未だ実施されないままに運営されている。人口が増加しているゲル地区等への給水施設整備が追いついておらず、今後予定されている工場の労働者やその家族の移入による人口増加にも対応できない状況である。</p> <p>本プロジェクトは、ダルハン市住民の衛生環境の改善に資することを目標として、同市給水施設の老朽化による給水量の減少を改善し、長期間広範囲にわたる断水のリスクを解消し、さらに、今後予定される工業化による同市の人口増加に対応した安定的な給水量を確保することを目的とする。</p>
3. プロジェクトの全体計画概要
<p>(1) プロジェクト全体計画の目標</p> <p>ダルハン市民に安全で十分な水が供給される。</p> <p>裨益対象の範囲及び規模：モンゴル国ダルハン市民約75,000人(2007年)</p> <p>(2) プロジェクト全体計画の成果</p> <p>ア <u>ダルハン市の給水施設が改善される。</u></p> <p>イ <u>ダルハン市上下水道公社の維持管理能力が改善される。</u></p> <p>ウ <u>水道メーターが調達される。</u></p>

エ 水道メーターが設置される。

(3) プロジェクト全体計画の主要活動

ア 基幹給水施設の更新・改修・建設

イ 維持管理機材の調達

ウ 維持管理技術の指導

(4) 投入(インプット)

ア 日本側：無償資金協力 9.83 億円

(実施設計 0.43 億円、本体建設・調達 9.40 億円)

イ モンゴル国側：

ア) 本無償資金協力案件実施に係わる負担額：0.02 億円

イ) 本無償資金協力案件対象施設建設後の維持管理費：年 0.82 億円

(5) 実施体制

主管官庁：道路運輸建設都市開発省

実施機関：ダルハン市上下水道公社

4 . 無償資金協力案件の内容

(1) サイト

モンゴル国ダルハン市

(2) 概要

第 1 ステーション(水源井戸群)及び第 2 ステーション(送水ポンプ場)の機器更新及び上屋の改修、塩素消毒設備の更新と塩素棟の改修、ゲル地区給水施設(給水キオスク、配水管路)の建設、及び維持管理用機材(トラッククレーン、移動溶接機、水質分析器、水道メーター)の調達。

施設・機材の運転操作員を対象とするポンプ機器及び塩素消毒設備の運転操作にかかるソフトコンポーネントの実施。

(3) 相手国側負担事項

用地の確保

地下埋設物情報の提供、掘削時立会い

既設施設と更新施設の接続工事の立会い

洗浄及び試験用水の提供

完成時消毒の作業協力

電力線の引き込み

(4) 概算事業費

概算事業費 9.85 億円 (日本側負担 9.83 億円、モンゴル国側負担 0.02 億円)

(5) 工期

入札期間を含め 22 ヶ月。

(6) 貧困、ジェンダー、環境及び社会面の配慮

5 . 外部要因リスク (プロジェクト全体計画の目標達成に関して)		
なし		
6 . 過去の類似案件からの教訓の活用		
特になし。		
7 . プロジェクト全体計画の事後評価に係る提案		
(1) プロジェクト全体計画の目標達成を示す成果指標		
成果指標	現状(2007年)	計画値(2011年)
生産水量	日平均生産水量:13,575m ³ /日	日平均生産水量:21,800m ³ /日
塩素消毒	塩素消毒を実施していない。	塩素消毒が実施可能になる。
(2) その他の成果指標		
特になし。		
(3) 評価のタイミング		
2011年以降。(協力対象施設の竣工後)		

