

社会開発調査部報告書

JAPAN INTERNATIONAL COOPERATION AGENCY (JICA)

FEDERAL DEMOCRATIC REPUBLIC OF ETHIOPIA

MINISTRY OF WATER RESOURCES

No. 11

THE STUDY  
ON  
ELEVEN CENTERS WATER SUPPLY AND SANITATION  
IN  
FEDERAL DEMOCRATIC REPUBLIC OF ETHIOPIA

DRAWINGS  
AYKEL

(Volume IV-V)



FEBRUARY, 1996

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KYOWA ENGINEERING CONSULTANTS CO., LTD.

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GOVERNMENT OF JAPAN  
JAPAN INTERNATIONAL COOPERATION AGENCY(JICA)  
FEDERAL DEMOCRATIC REPUBLIC OF ETHIOPIA  
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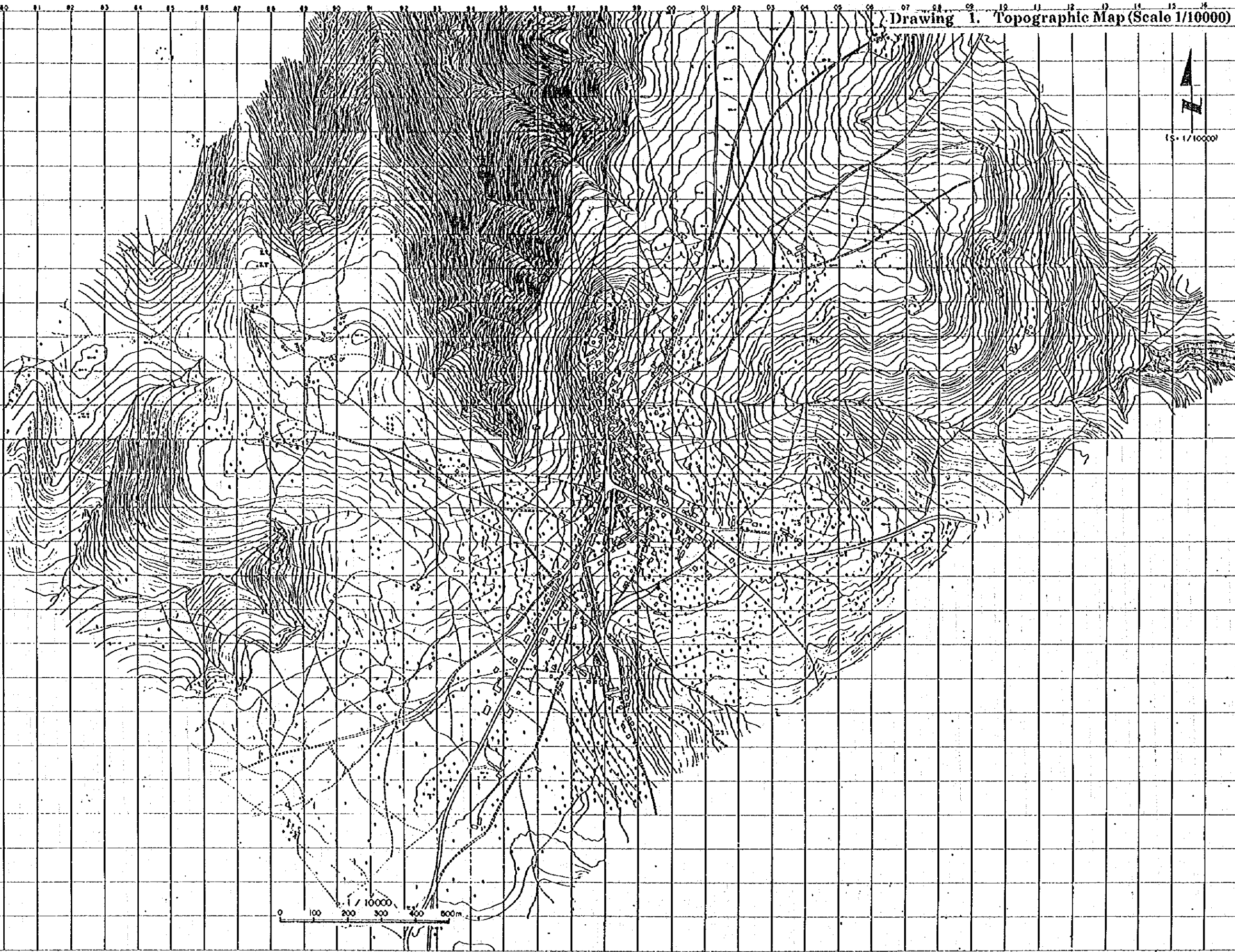
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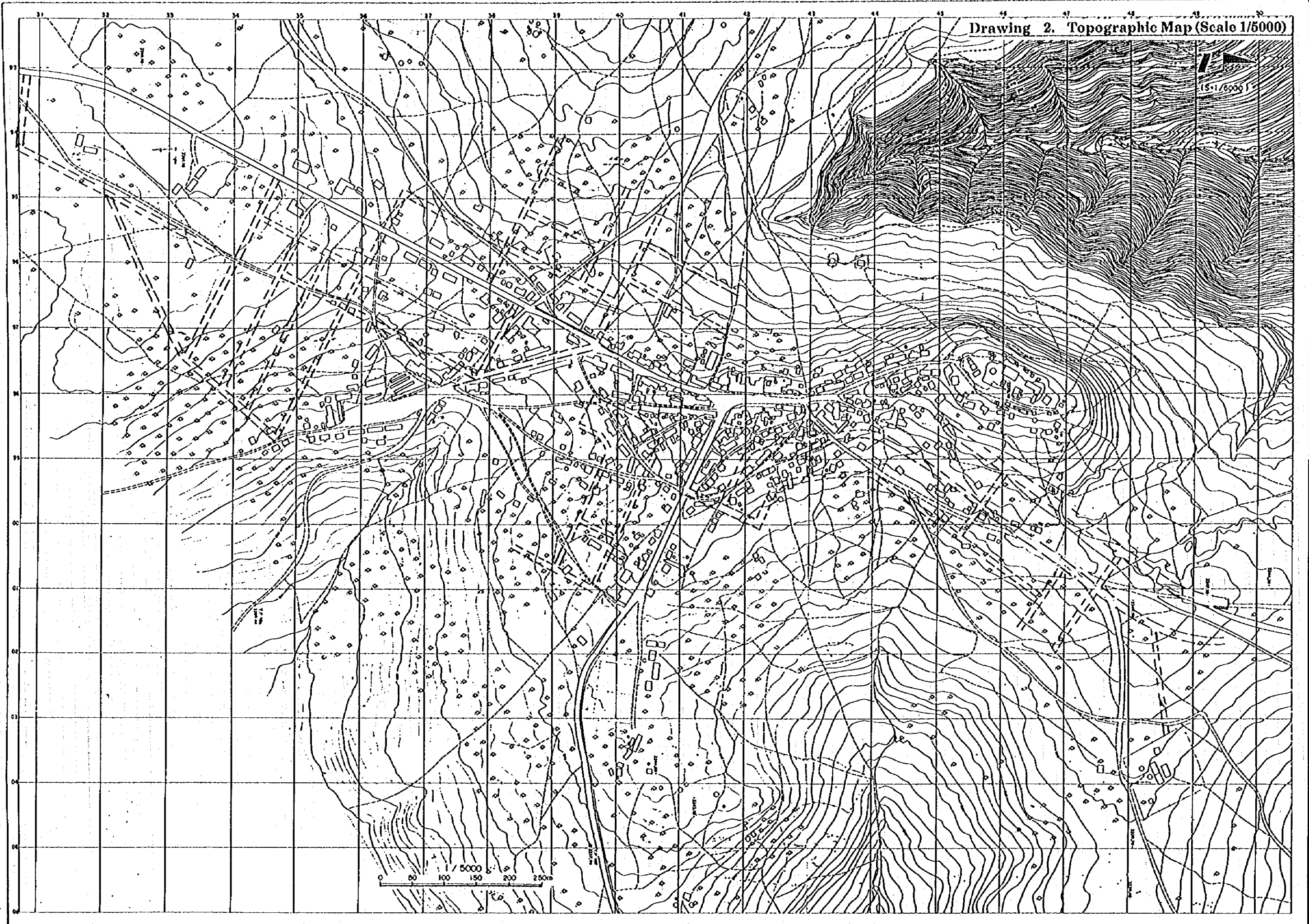
## **Table of Contents**

<b>Drawing 1.</b>	<b>Topographic Map (Scale 1/10000)</b>
<b>Drawing 2.</b>	<b>Topographic Map (Scale 1/5000)</b>
<b>Drawing 3.</b>	<b>Land Use and Bench Marks</b>
<b>Drawing 4.</b>	<b>Current Available Water Sources</b>
<b>Drawing 5.</b>	<b>Plan of Proposed Water Sources</b>
<b>Drawing 6.</b>	<b>Layout of Proposed Deep Well</b>
<b>Drawing 7.</b>	<b>Layout Between Water Sources and Reservoir</b>
<b>Drawing 8.</b>	<b>Layout of Water Distribution Pipelines</b>
<b>Drawing 9.</b>	<b>Location of Proposed Public Fountains</b>
<b>Drawing 10.</b>	<b>Layout of Proposed Public Fountain</b>
<b>Drawing 11.</b>	<b>Layout of Boosting Chamber</b>
<b>Drawing 12.</b>	<b>Layout of Household Waste Water Disposal Pit &amp; Toilet</b>
<b>Drawing 13.</b>	<b>Layout of Community Type Toilet and VIP Public Type Toilet</b>
<b>Drawing 14.</b>	<b>Layout of Pour-flush Public Type Toilet and Sullage Disposal Pit</b>
<b>Drawing 15.</b>	<b>Location of Sanitary Facilities</b>
<b>Drawing 16.</b>	<b>Current Drainage Condition and Improvement Plan</b>

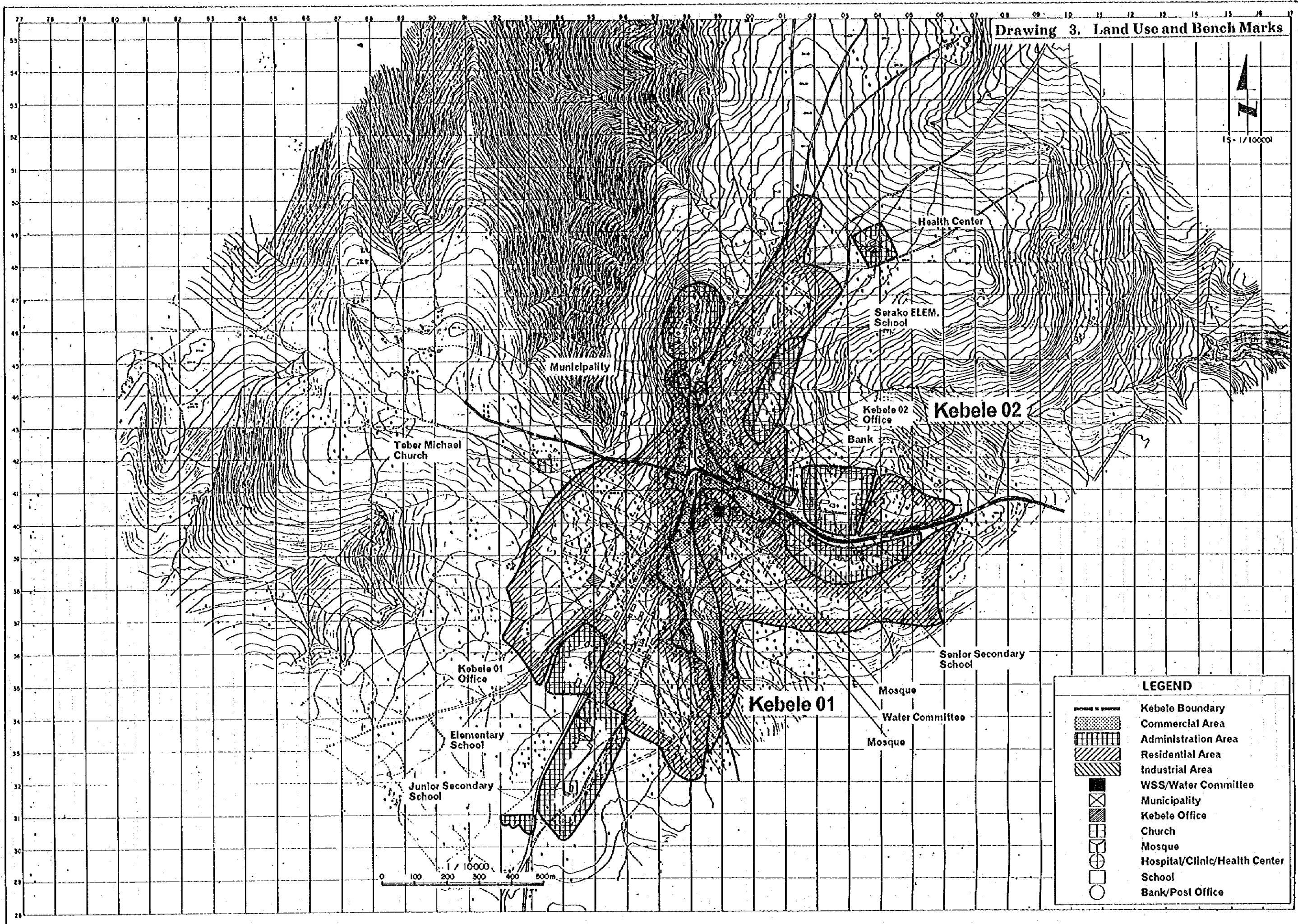




Drawing 2. Topographic Map (Scale 1/5000)

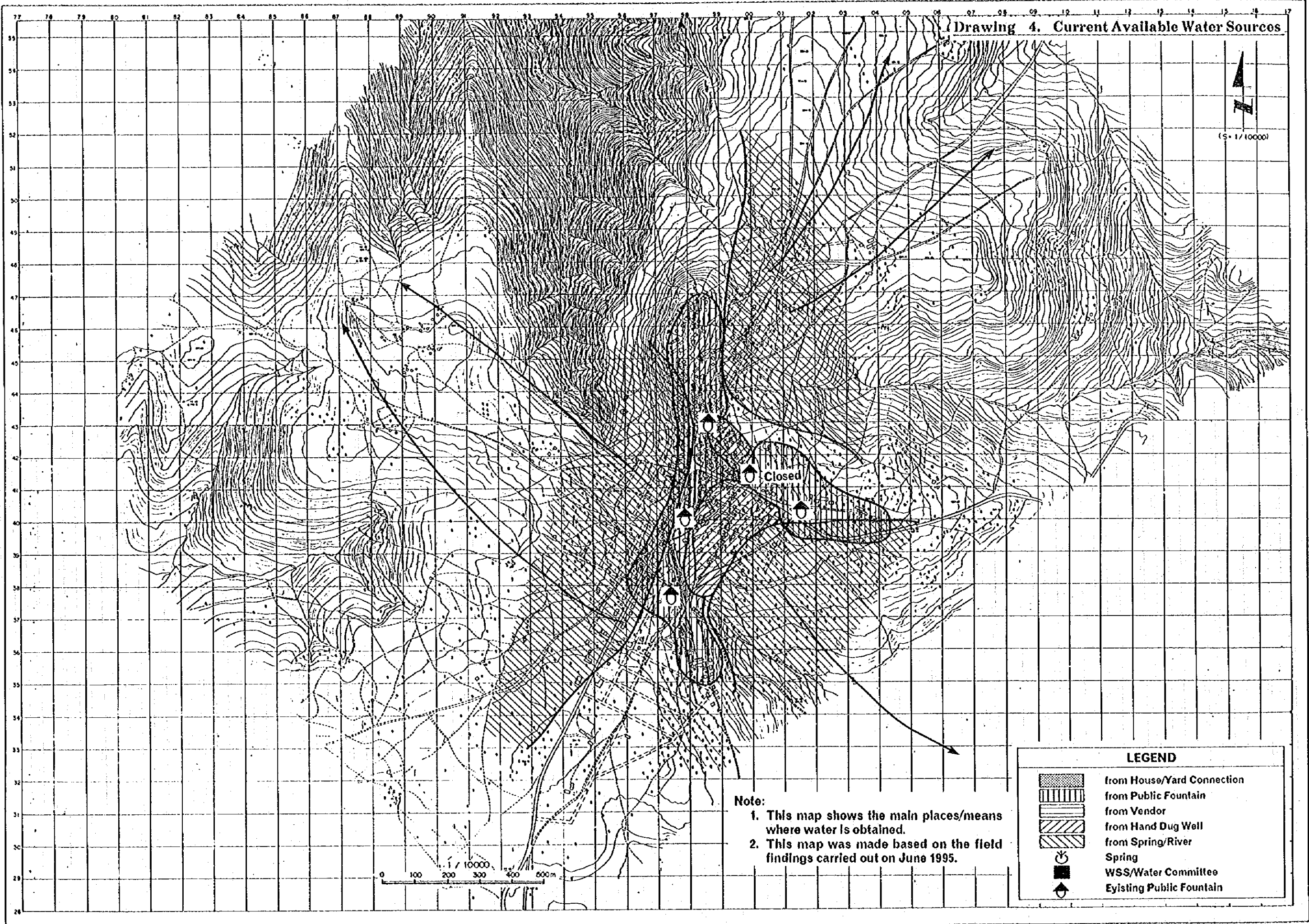


Drawing 3. Land Use and Bench Marks



LEGEND	
	Kebele Boundary
	Commercial Area
	Administration Area
	Residential Area
	Industrial Area
	WSS/Water Committee
	Municipality
	Kebele Office
	Church
	Mosque
	Hospital/Clinic/Health Center
	School
	Bank/Post Office

Drawing 4. Current Available Water Sources

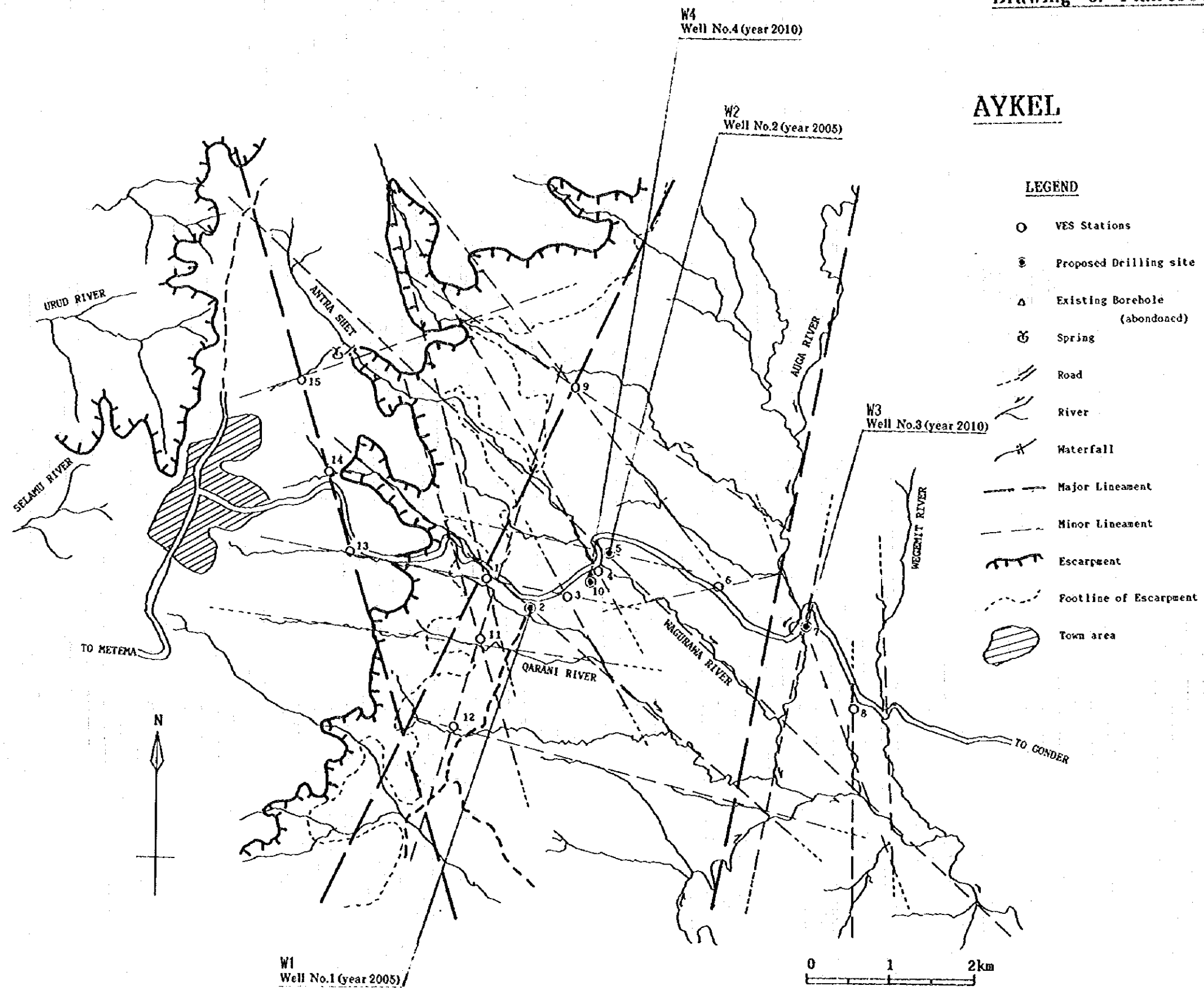


**Note:**  
 1. This map shows the main places/means where water is obtained.  
 2. This map was made based on the field findings carried out on June 1995.

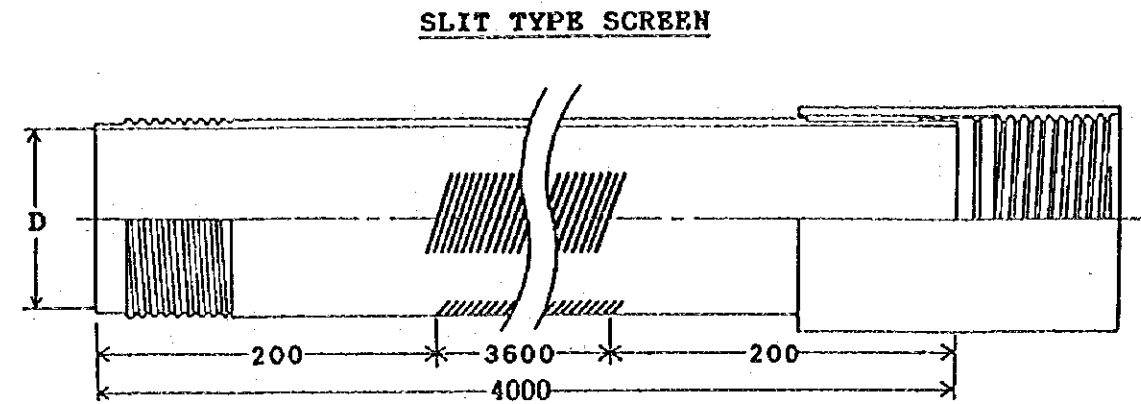
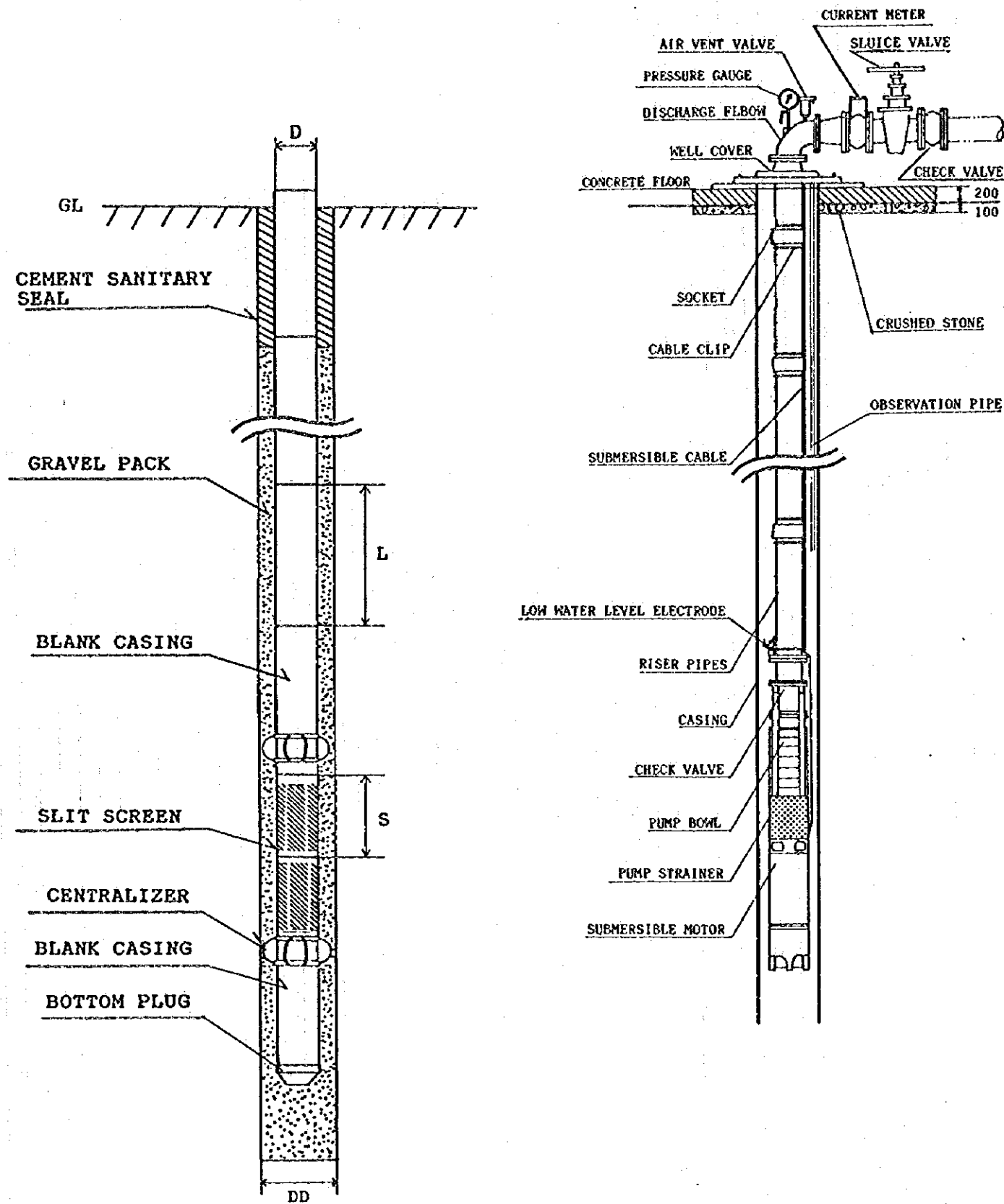
**LEGEND**

	from House/Yard Connection
	from Public Fountain
	from Vendor
	from Hand Dug Well
	from Spring/River
	Spring
	WSS/Water Committee
	Existing Public Fountain

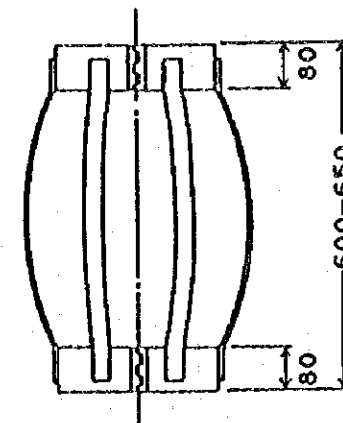
Drawing 5. Plan of Proposed Water Sources



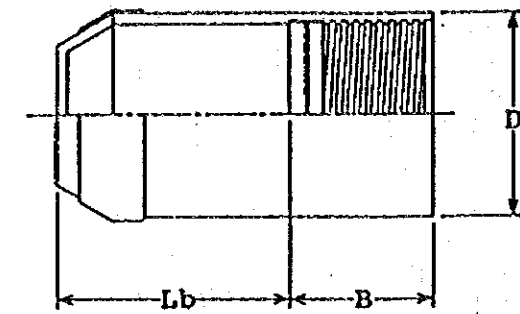
Drawing 6. Layout of Proposed Deep Well



CENTRALIZER



BOTTOM PLUG



Dimension

(Unit: mm)

Inner Diameter	Drilling Diameter	Blank Pipe	Diagonal Slit Screen	Bottom Plug	
				Lb	B
D	DD	L	S		
150	250	6,000	4,000	Approx 160	110
200	300				

Material

BLANK PIPE : FRP  
 SCREEN : FRP  
 BOTTOM PLUG : FRP

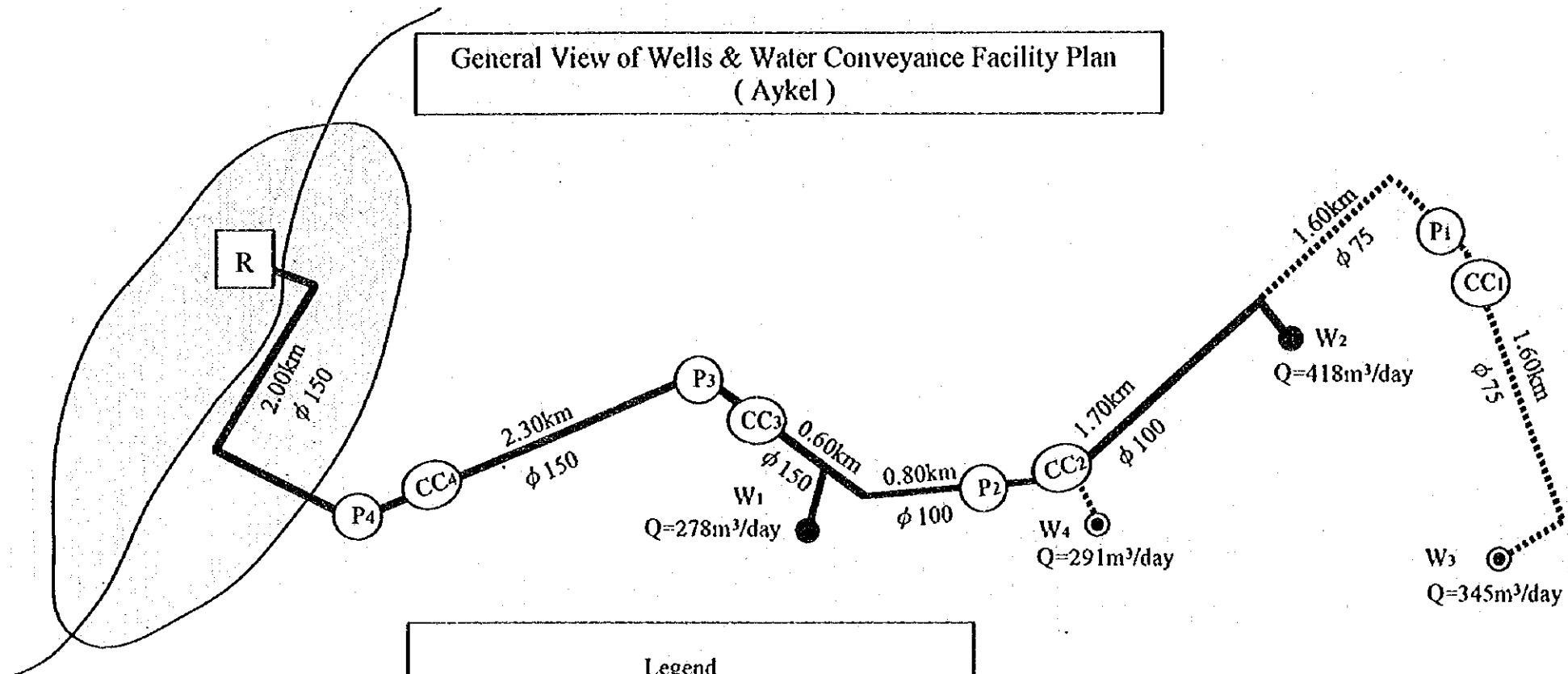
Total Water Demand in Target Years (m<sup>3</sup>/day)

	1995*	2000	2005	2010
Domestic	19	193	350	630
Non Domestic	3	68	95	129
Losses	9	29	61	134
Total	31	290	505	893

\*Actual consumption

Drawing 7. Layout Between Water Sources and Reservoir

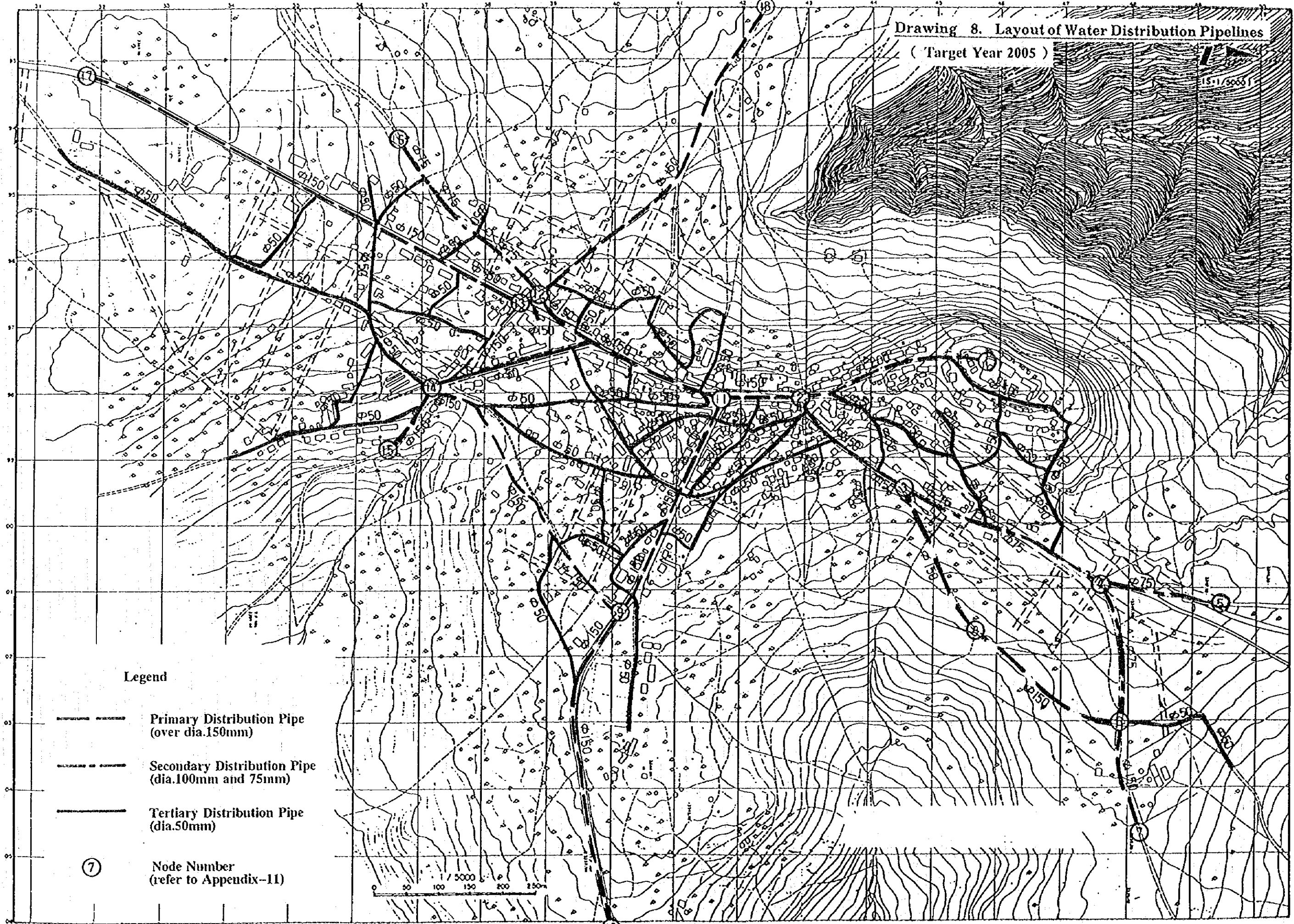
General View of Wells & Water Conveyance Facility Plan (Aykel)







Drawing 8. Layout of Water Distribution Pipelines

( Target Year 2005 )

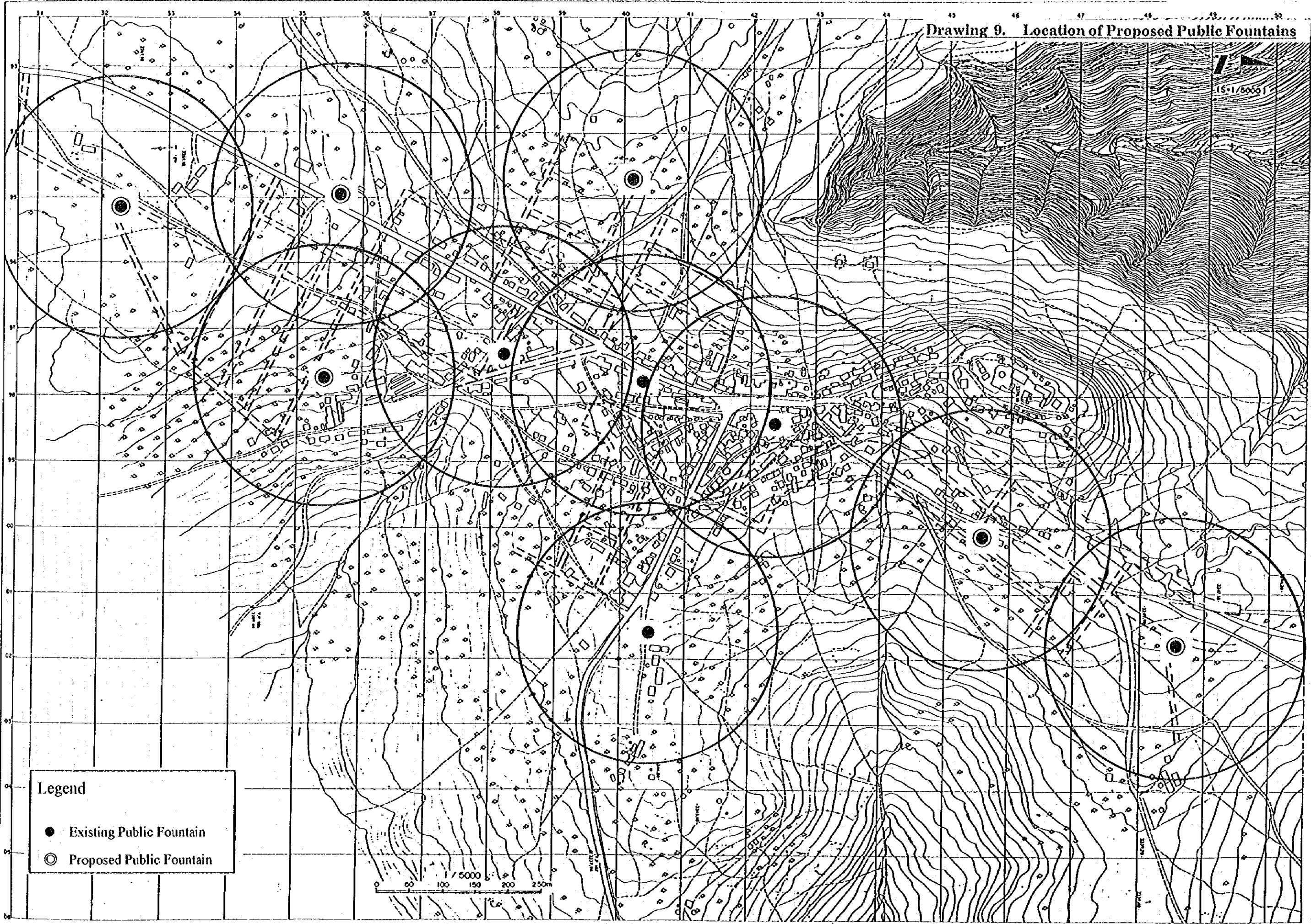
1:50000



Legend

-  Primary Distribution Pipe (over dia.150mm)
-  Secondary Distribution Pipe (dia.100mm and 75mm)
-  Tertiary Distribution Pipe (dia.50mm)
-  Node Number (refer to Appendix-11)

Drawing 9. Location of Proposed Public Fountains

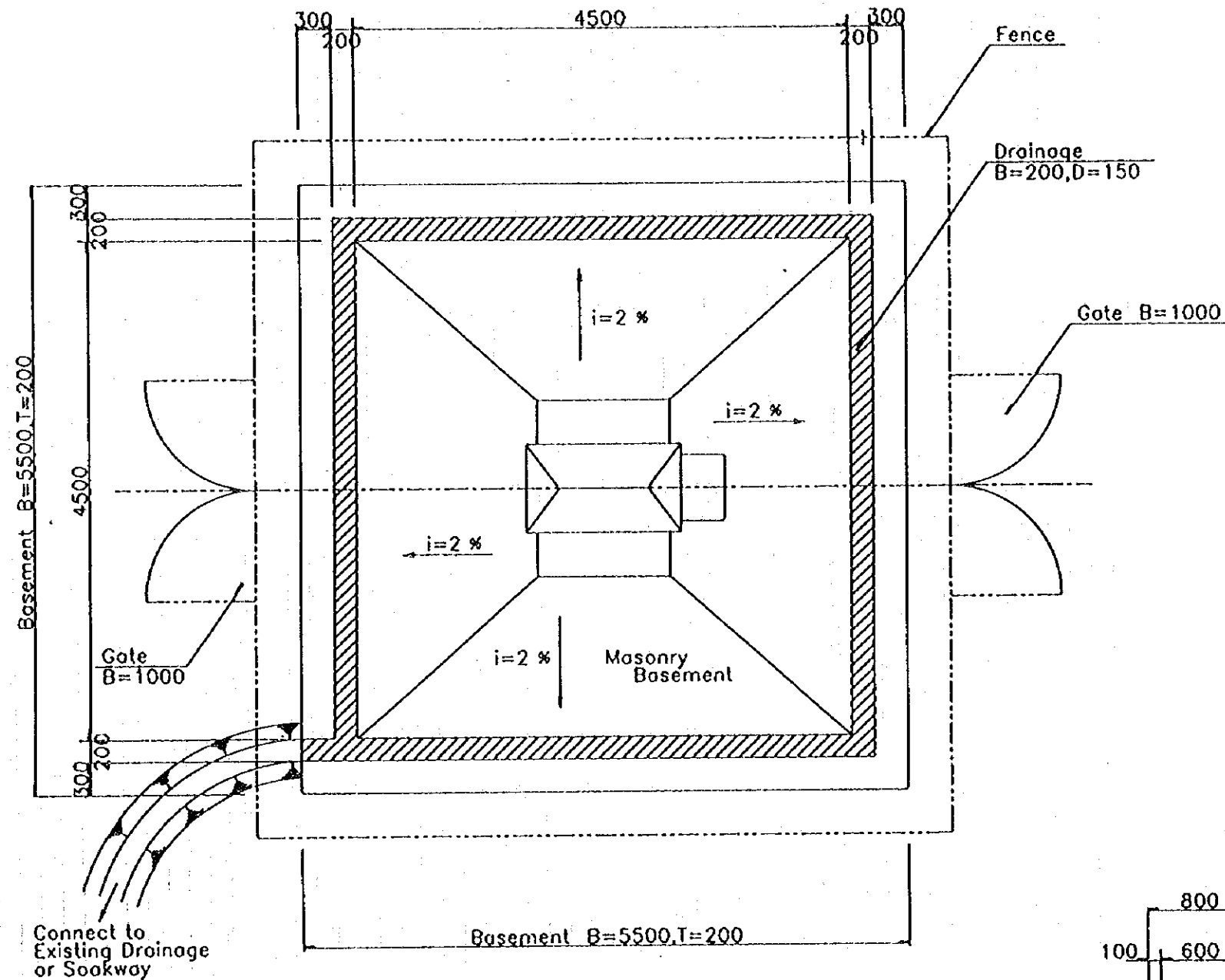


Legend

- Existing Public Fountain
- ⊙ Proposed Public Fountain

1 / 5000  
0 50 100 150 200 250m

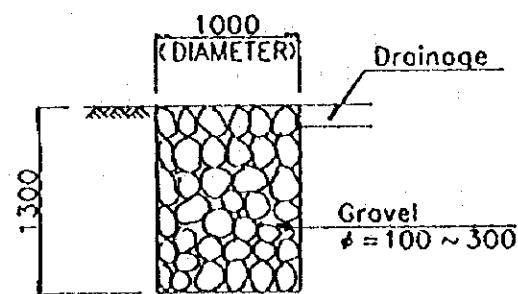




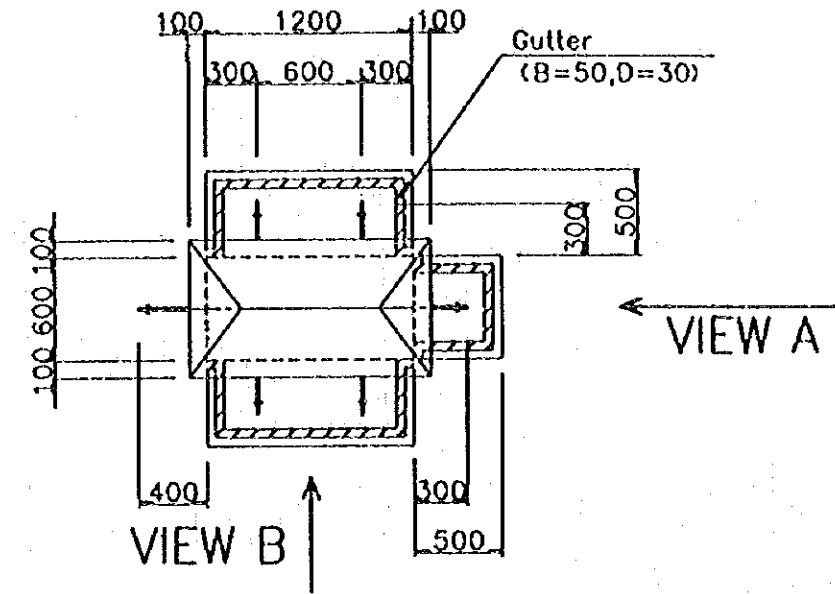
GENERAL PLAN

Quantity:

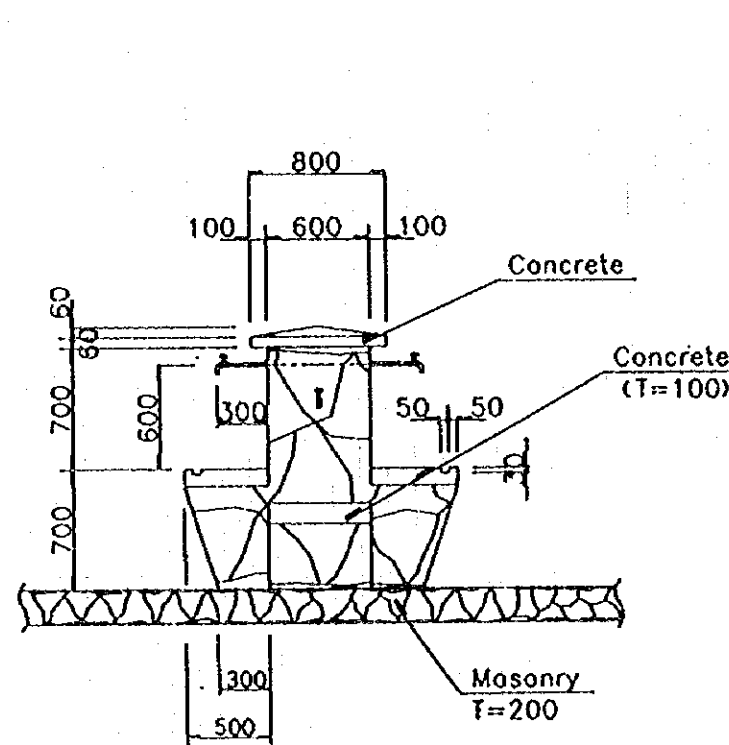
Concrete	: 0.25 m <sup>3</sup>
Form-work	: 0.66 m <sup>2</sup>
Masonry	: 7.08 m <sup>3</sup>
Fence	: 2 m X 20.4 m
Pipe	: 6 m
Tap	: 6 NOS
Meter	: 1 NOS
Valve	: 1 NOS
Excavation	: 13 m <sup>3</sup>
Gravel	: 1 m <sup>3</sup>



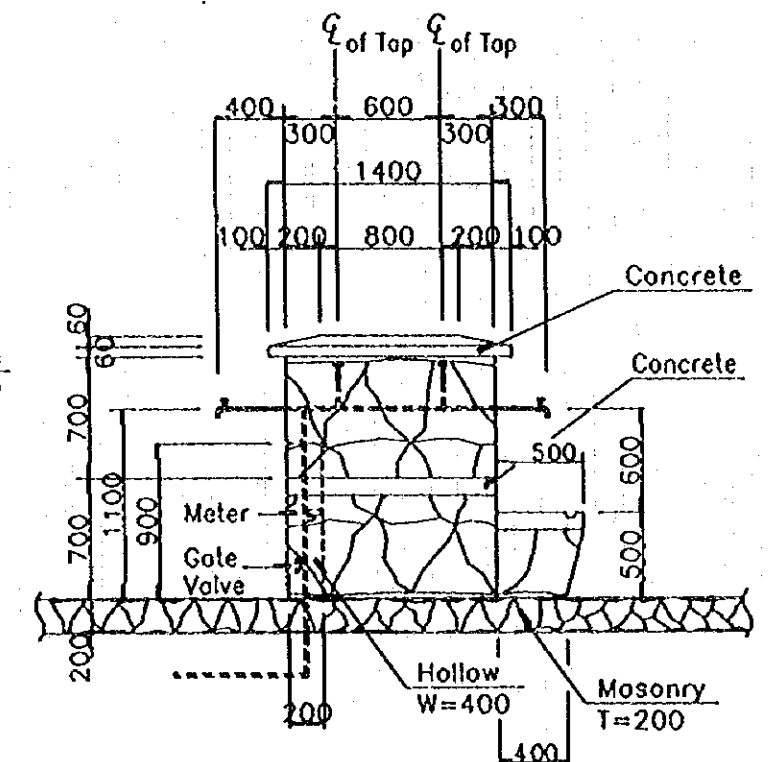
SOAKWAY



PLAN OF PUBLIC FOUNTAIN

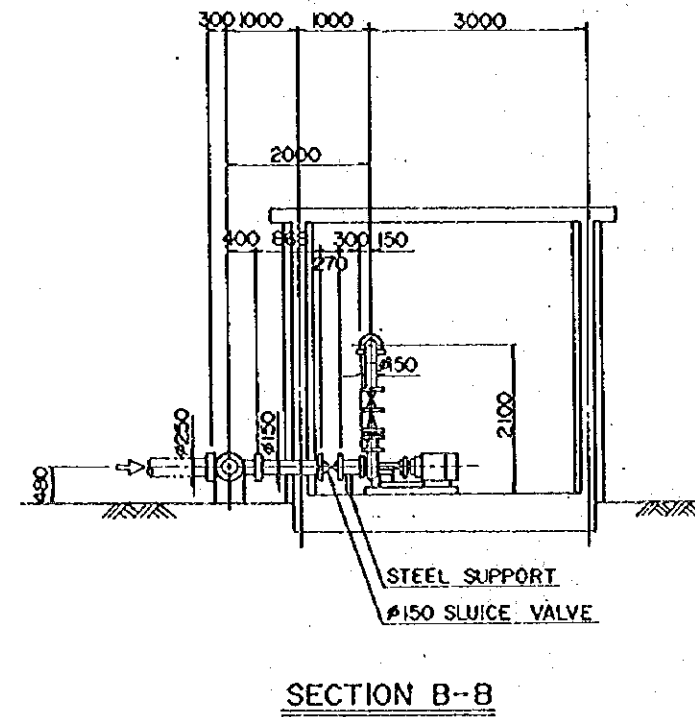
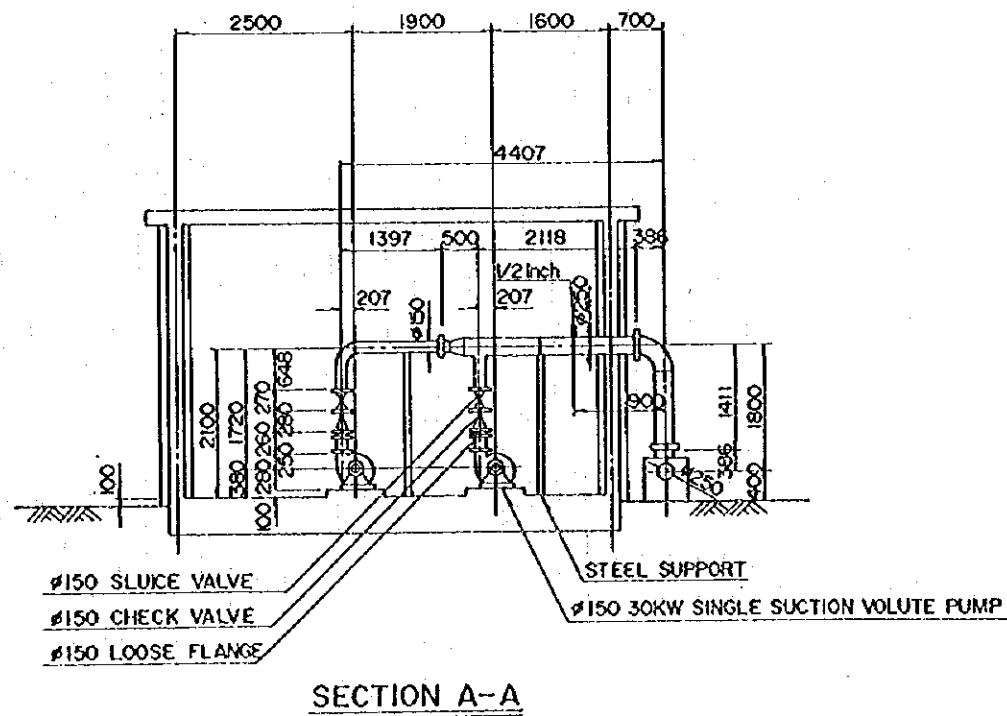
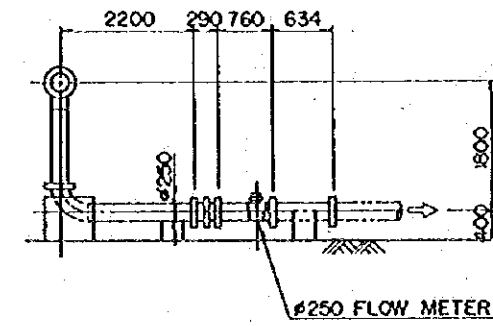
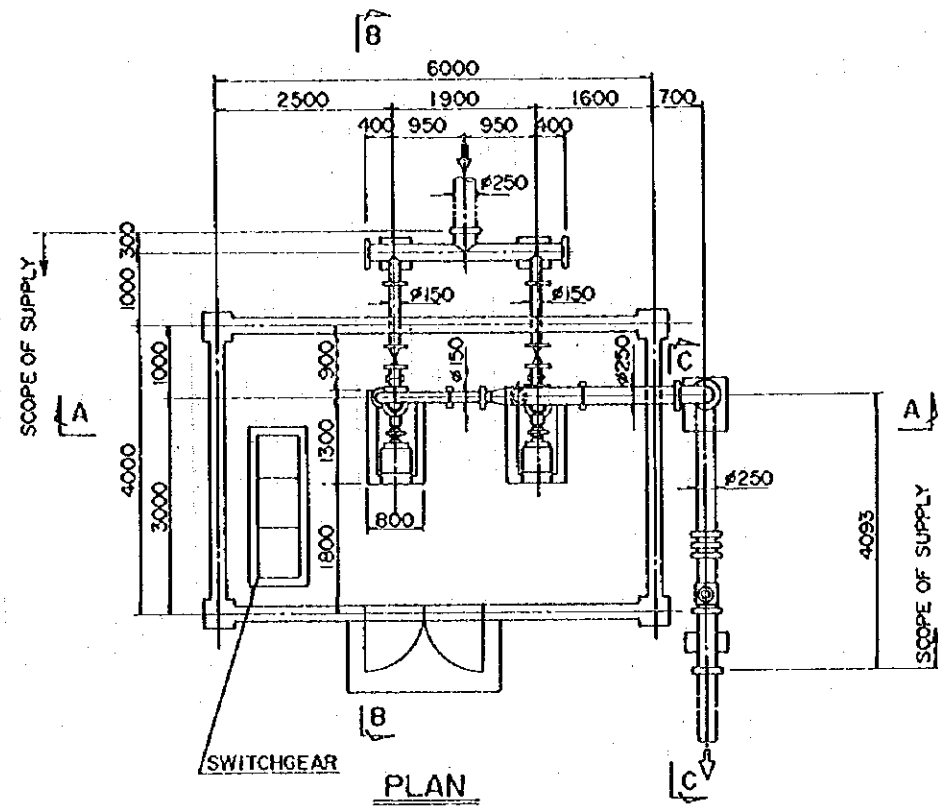


VIEW A



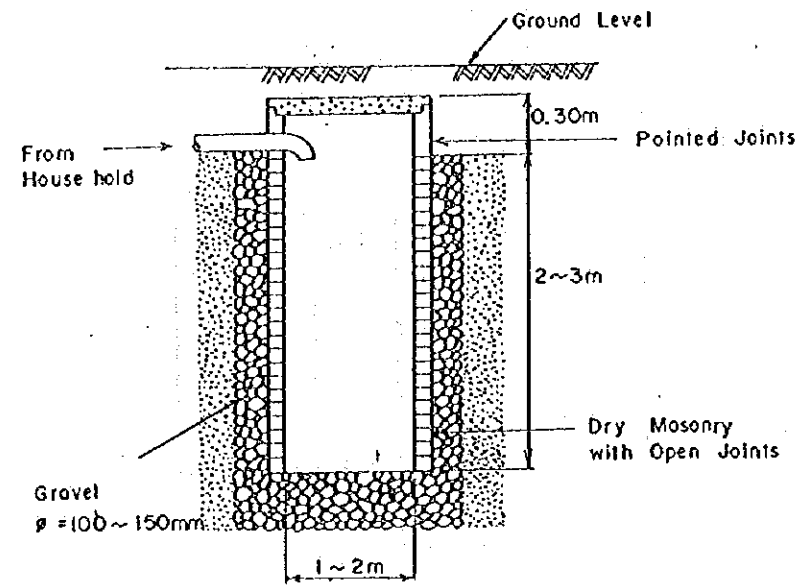
VIEW B

NOTE:  
1. All dimensions are shown in millimeter.

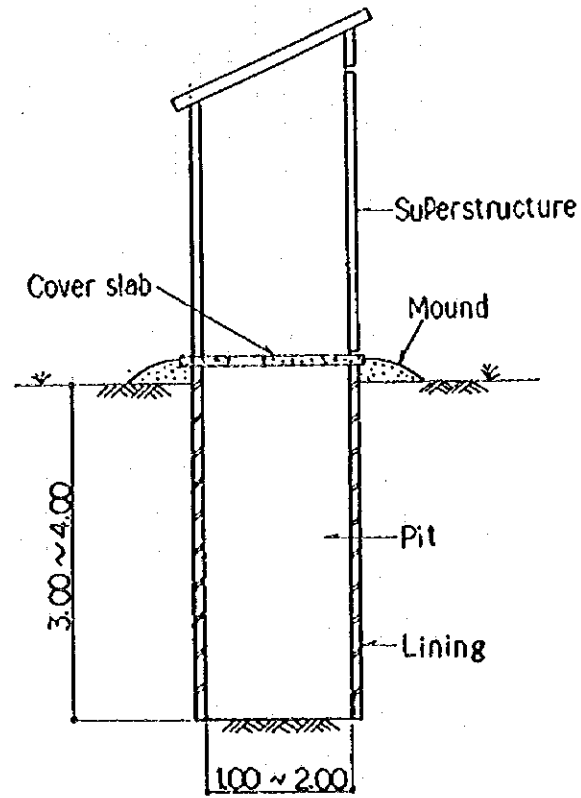


NOTE : unit is millimeter unless otherwise specified.

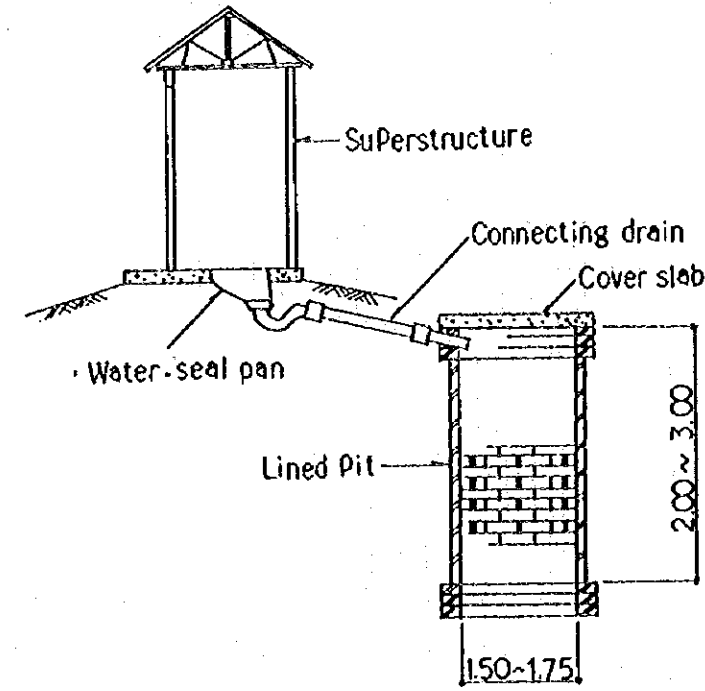
**Drawing 12. Layout of Household Waste Water Disposal Pit & Toilet**



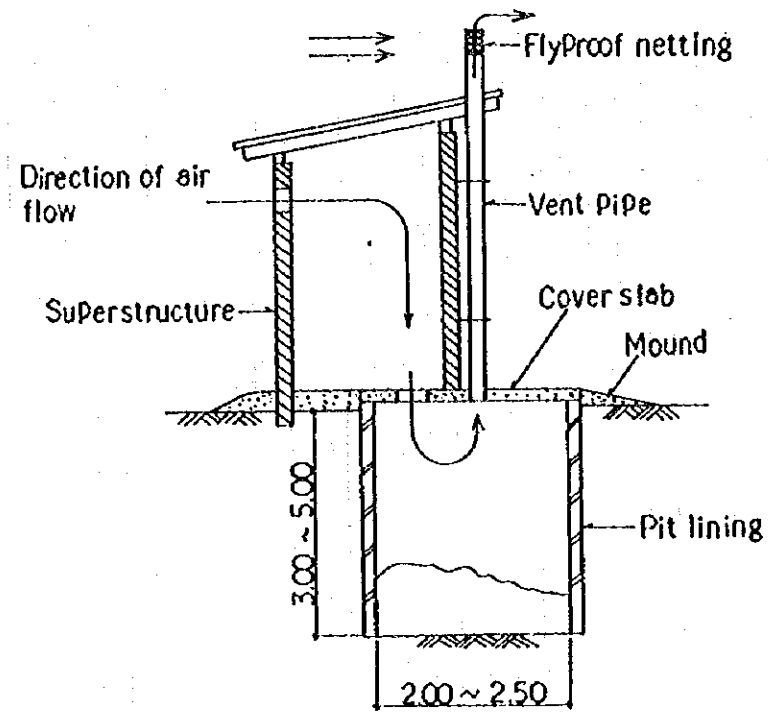
Waste Water Disposal Pit



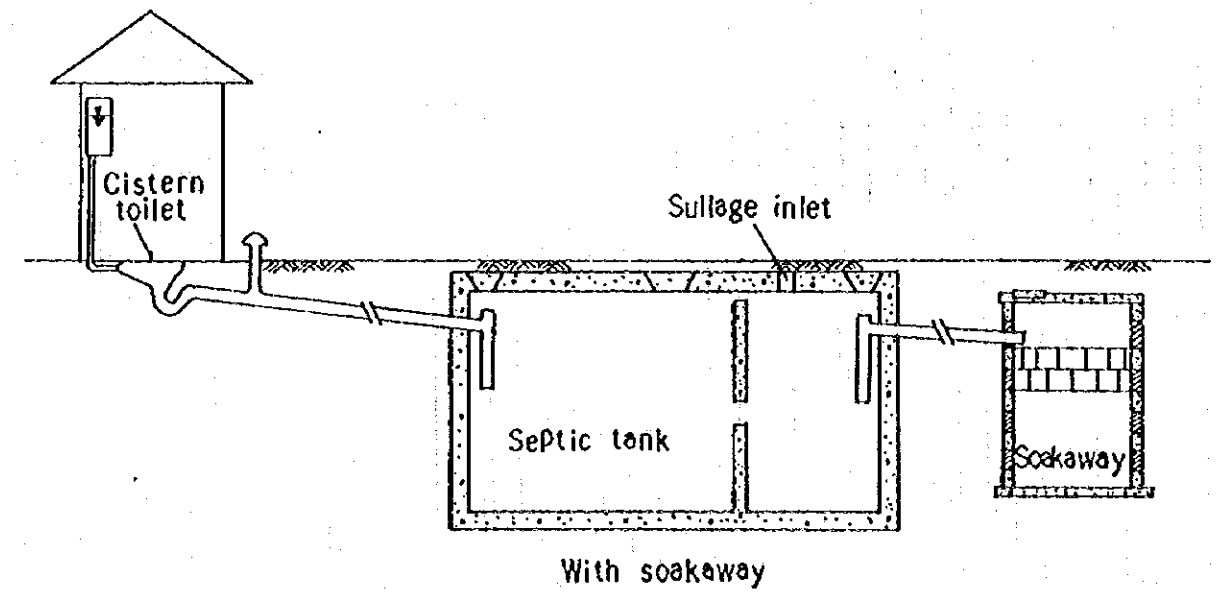
Improved Traditional Pit Latrine



Pour-flush latrine and Soakaway Pit

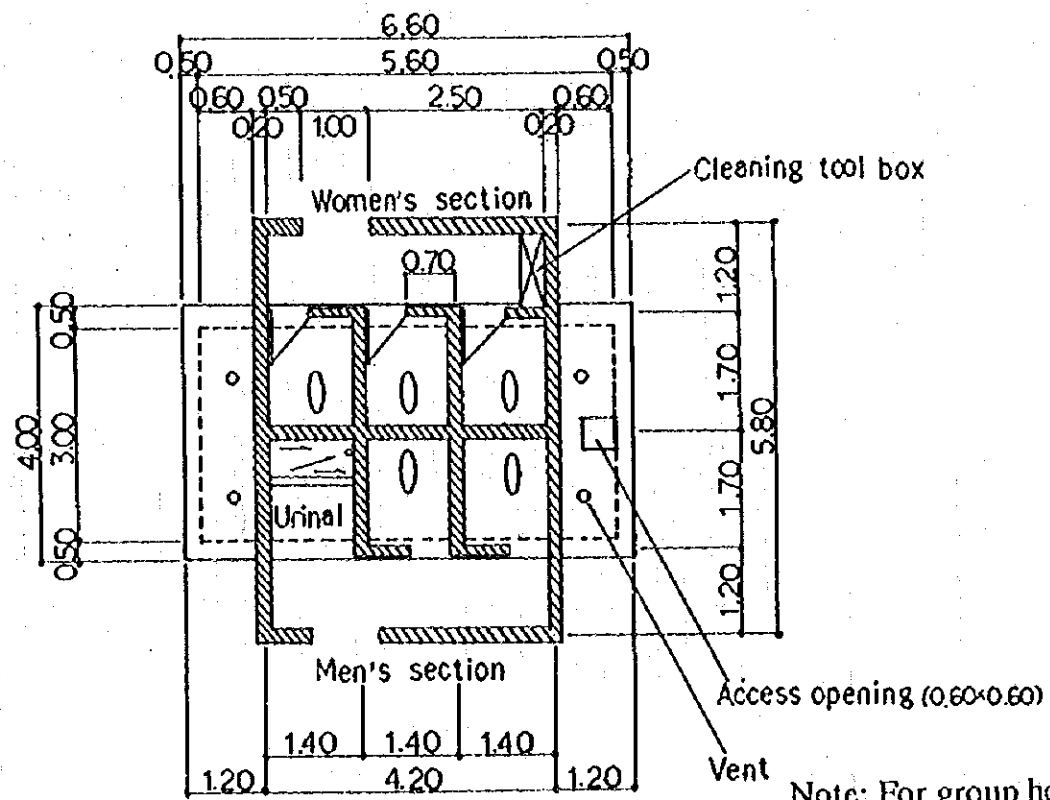
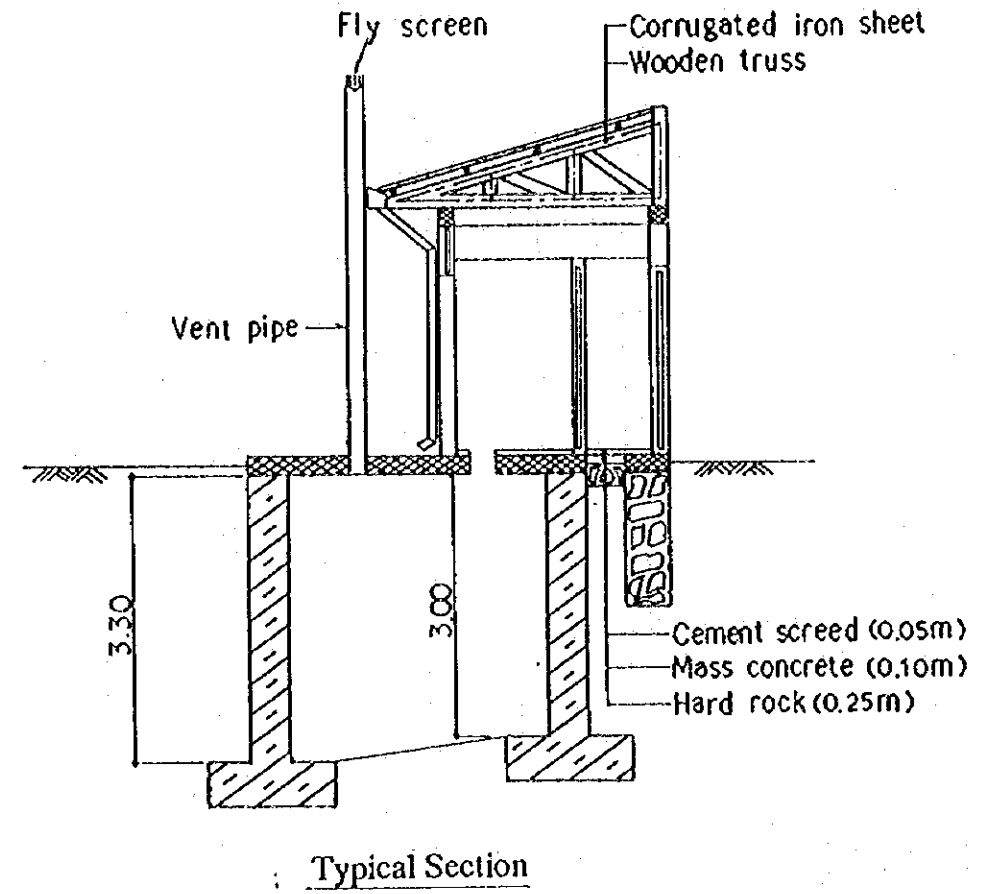
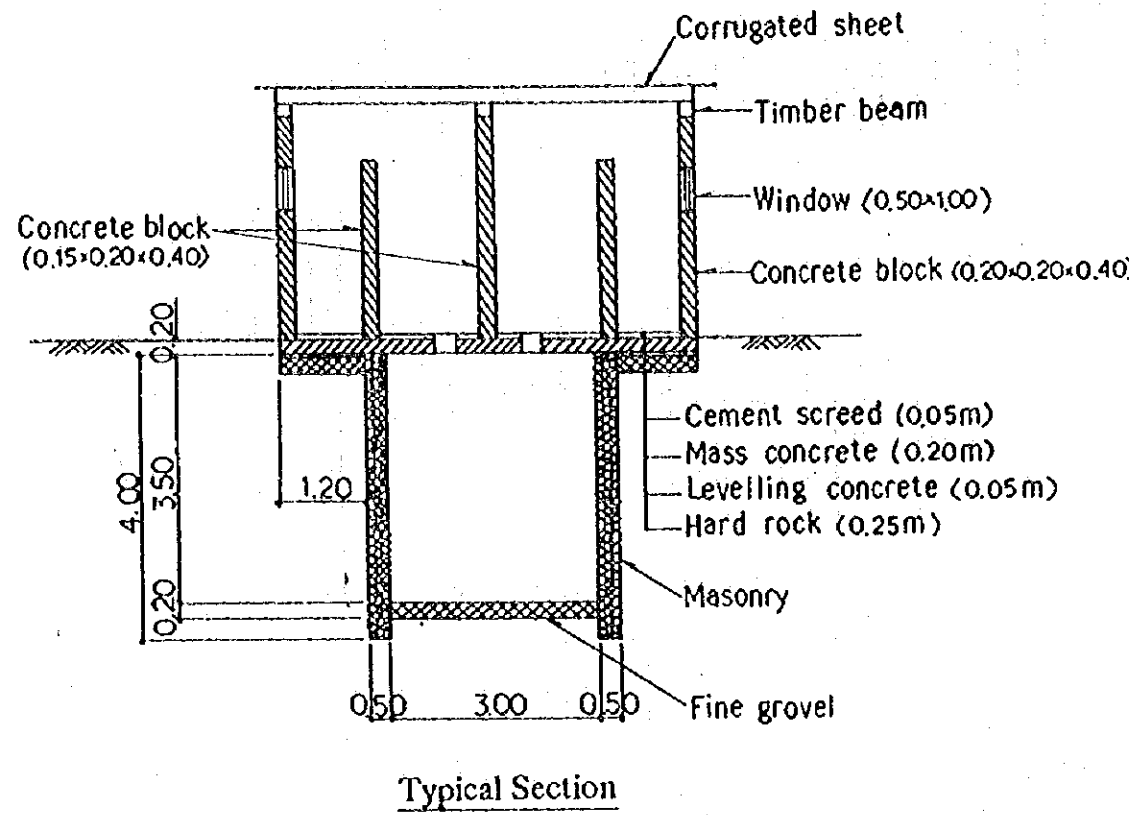


VIP Latrine

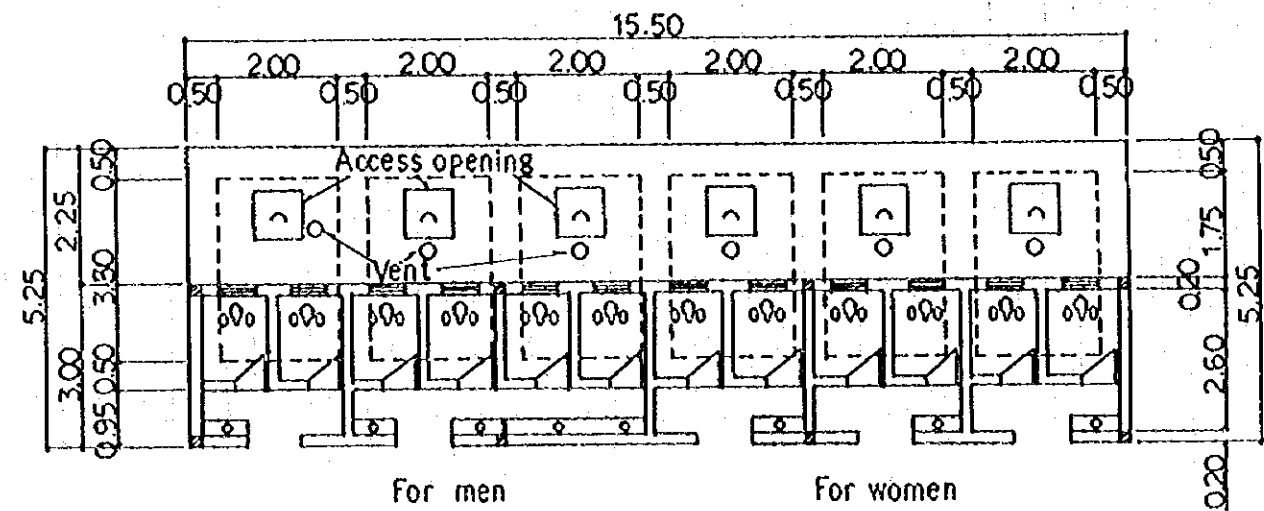


Cistern-flush Toilet and Septic Tank

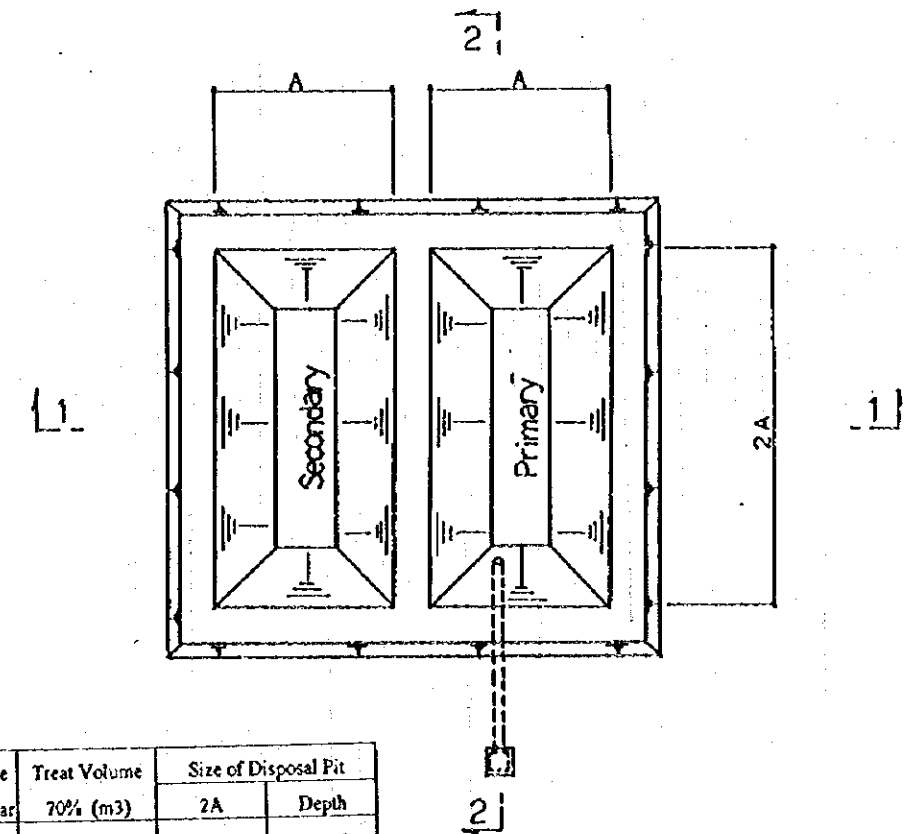
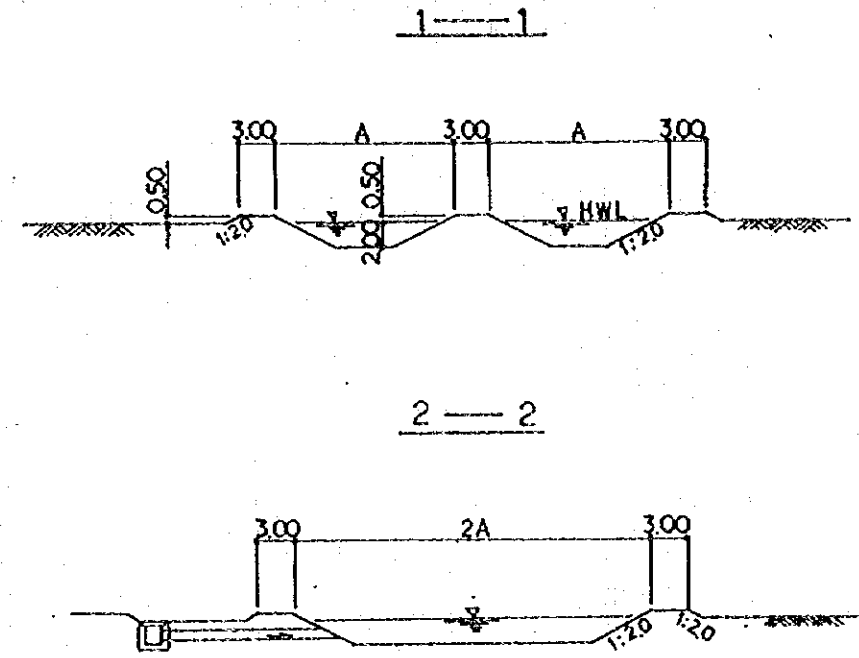
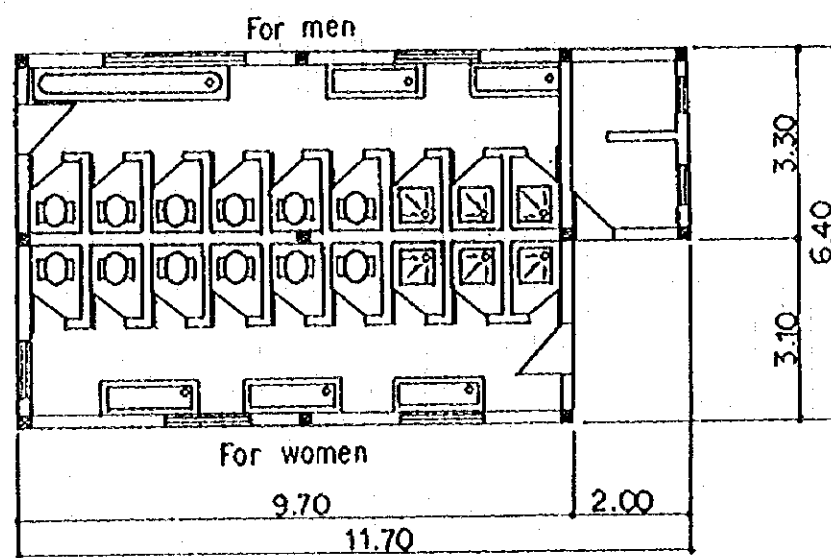
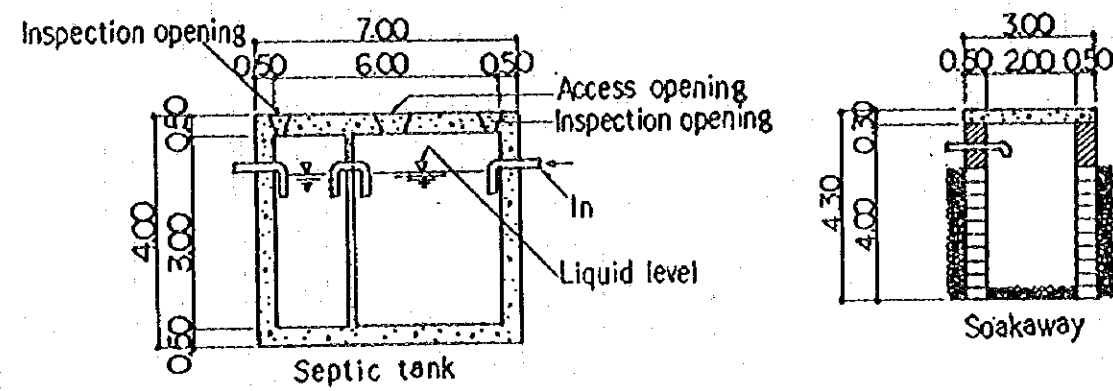
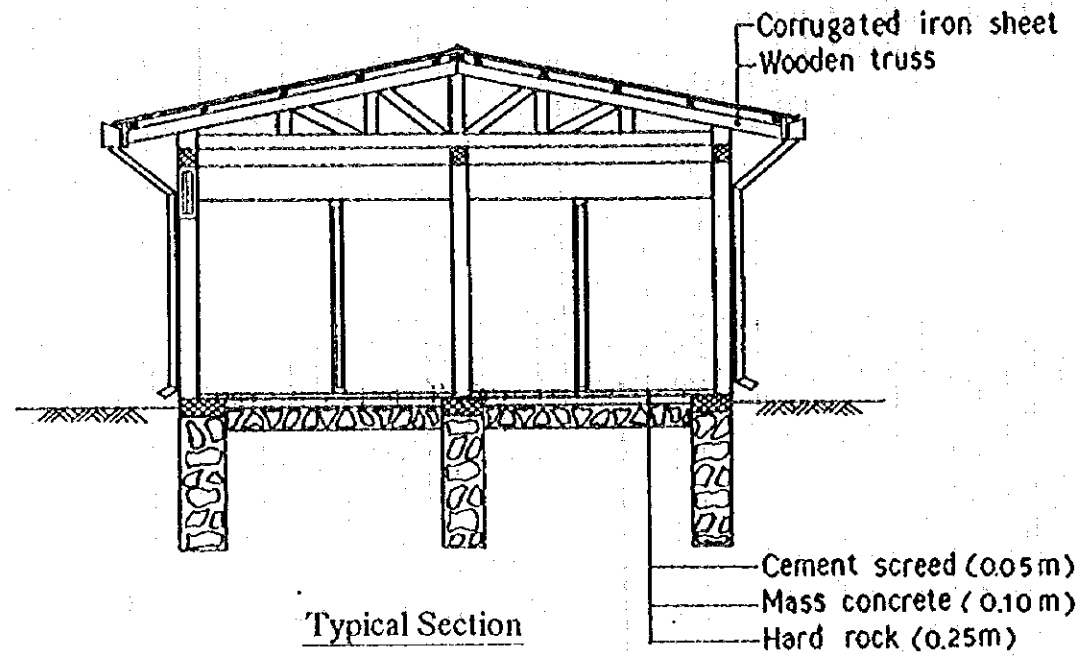
**Drawing 13. Layout of Community Type Toilet and VIP Public Type Toilet**



Note: For group household use, urinal is changed to 6th cubicle.



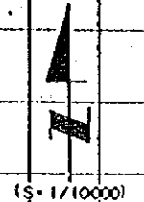
Drawing 14. Layout of Pour-flush Public Type Toilet and Sullage Disposal Pit



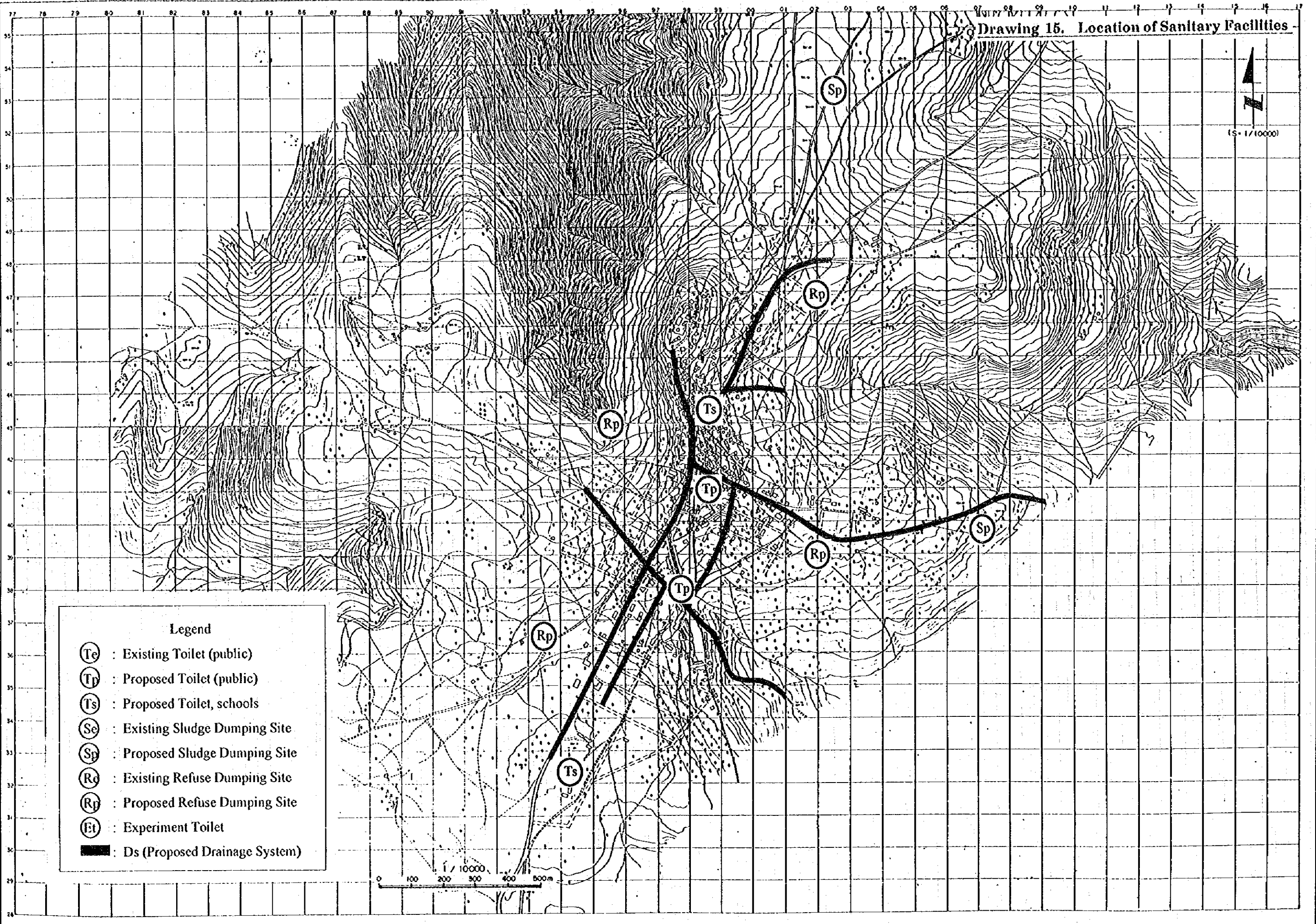
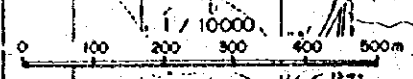
Urban Center	Population	Sludge Volume 0.2m <sup>3</sup> /Man/Year	Treat Volume 70% (m <sup>3</sup> )	Size of Disposal Pit	
				2A	Depth
D/fabor	15,900	3,180	2,226	33m	2m

Sullage Disposal Pit

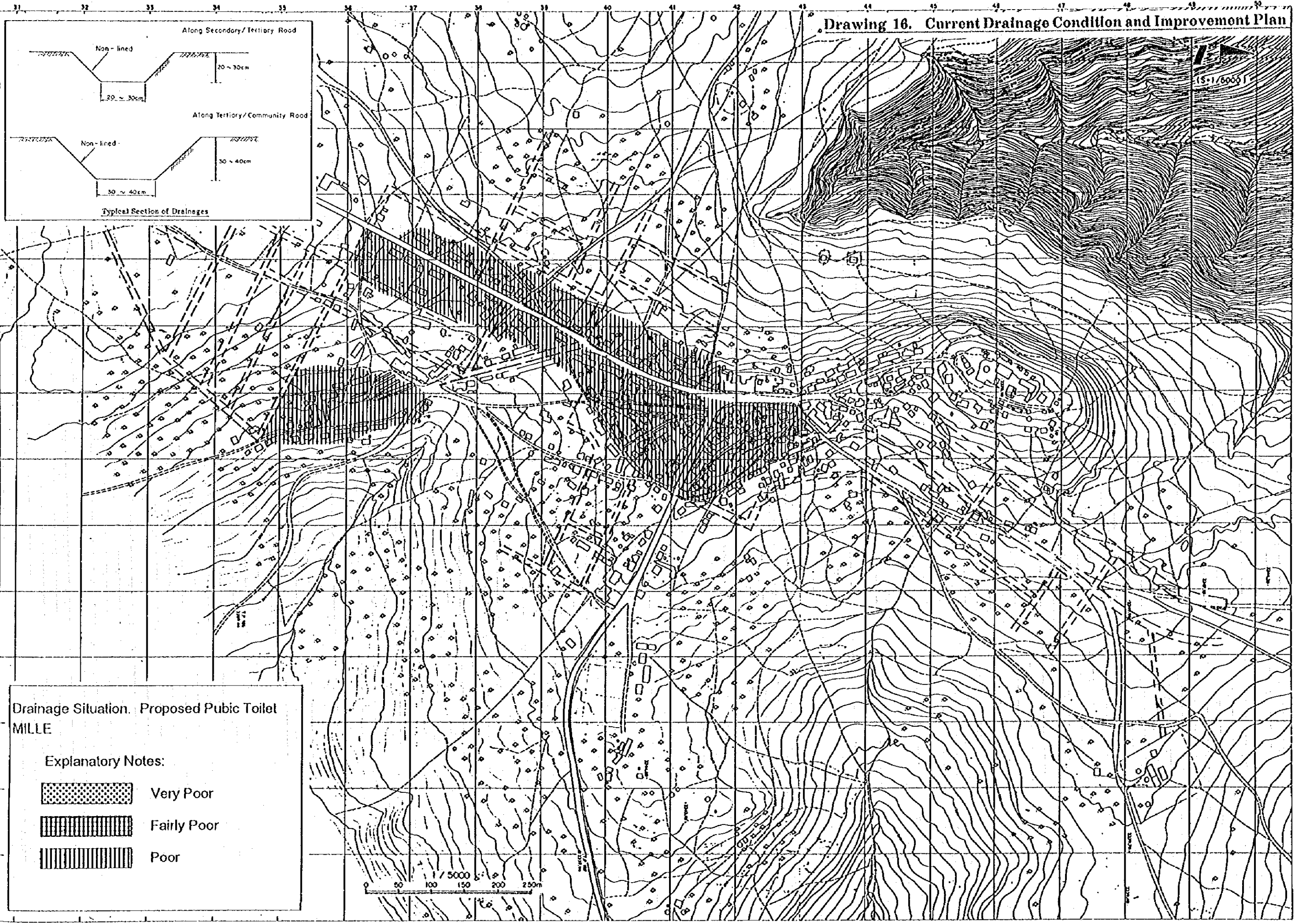
Drawing 15. Location of Sanitary Facilities



- Legend
- ⊙<sub>Te</sub> : Existing Toilet (public)
  - ⊙<sub>Tp</sub> : Proposed Toilet (public)
  - ⊙<sub>Ts</sub> : Proposed Toilet, schools
  - ⊙<sub>Se</sub> : Existing Sludge Dumping Site
  - ⊙<sub>Sp</sub> : Proposed Sludge Dumping Site
  - ⊙<sub>Re</sub> : Existing Refuse Dumping Site
  - ⊙<sub>Rp</sub> : Proposed Refuse Dumping Site
  - ⊙<sub>Et</sub> : Experiment Toilet
  - ▬ : Ds (Proposed Drainage System)


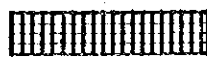



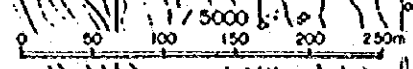
Drawing 16. Current Drainage Condition and Improvement Plan



Drainage Situation. Proposed Public Toilet  
MILLE

Explanatory Notes:

-  Very Poor
-  Fairly Poor
-  Poor











JICA