

社会開発調査部報告書

JAPAN INTERNATIONAL COOPERATION AGENCY (JICA)

FEDERAL DEMOCRATIC REPUBLIC OF ETHIOPIA

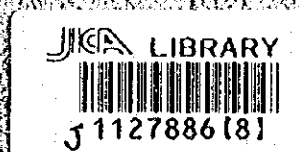
MINISTRY OF WATER RESOURCES

No. 11

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

DRAWINGS
DUPTI

(Volume IV-I)



FEBRUARY 1996

SANYU CONSULTANTS INC.
KYOWA ENGINEERING CONSULTANTS CO., LTD.

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**GOVERNMENT OF JAPAN
JAPAN INTERNATIONAL COOPERATION AGENCY(JICA)
FEDERAL DEMOCRATIC REPUBLIC OF ETHIOPIA
MINISTRY OF WATER RESOURCES**

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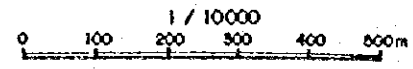
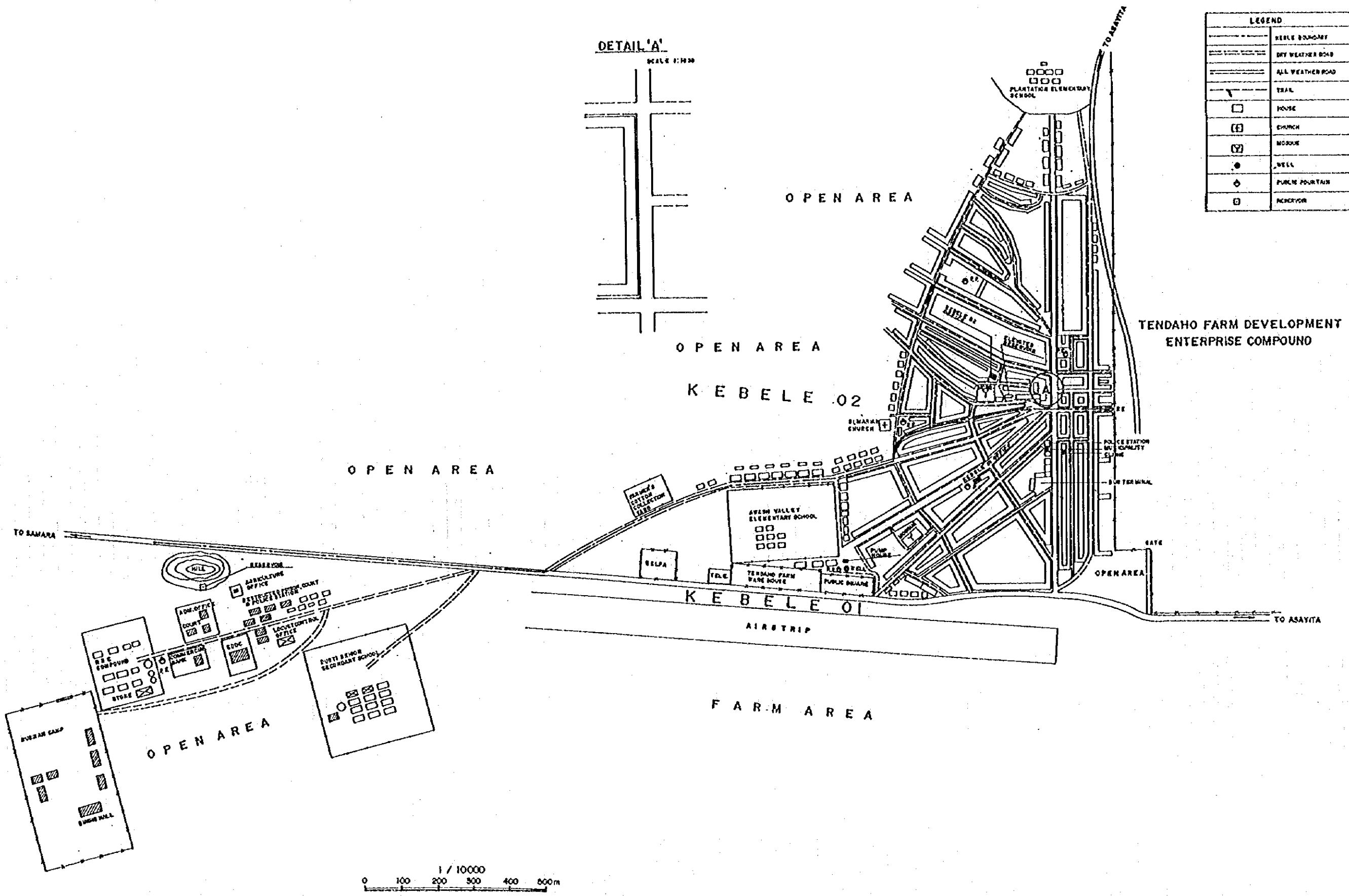
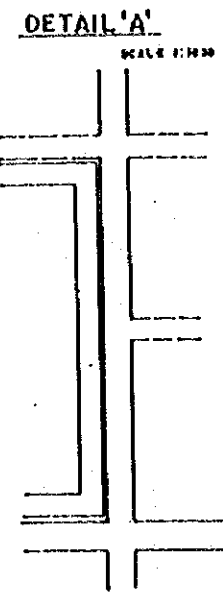
Drawing 1.	Topographic Map (Scale 1/10000)
Drawing 2.	Land Use and Bench Marks
Drawing 3.	Current Available Water Sources
Drawing 4.	Plan of Proposed Water Sources
Drawing 5.	Layout of Proposed Shallow Well
Drawing 6.	Layout Between Water Sources and Reservoir
Drawing 7.	Layout of Water Distribution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

Drawing 1. Topographic Map (Scale 1/10000)

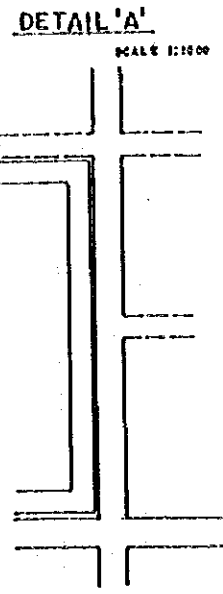
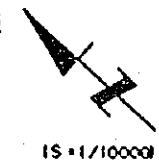


1:5 = 1/10000

LEGEND	
	KEBLE BOUNDARY
	DRY WEATHER ROAD
	ALL WEATHER ROAD
	TRAIL
	HOUSE
	CHURCH
	MOSQUE
	WELL
	PUBLIC FOUNTAIN
	INCUBATOR

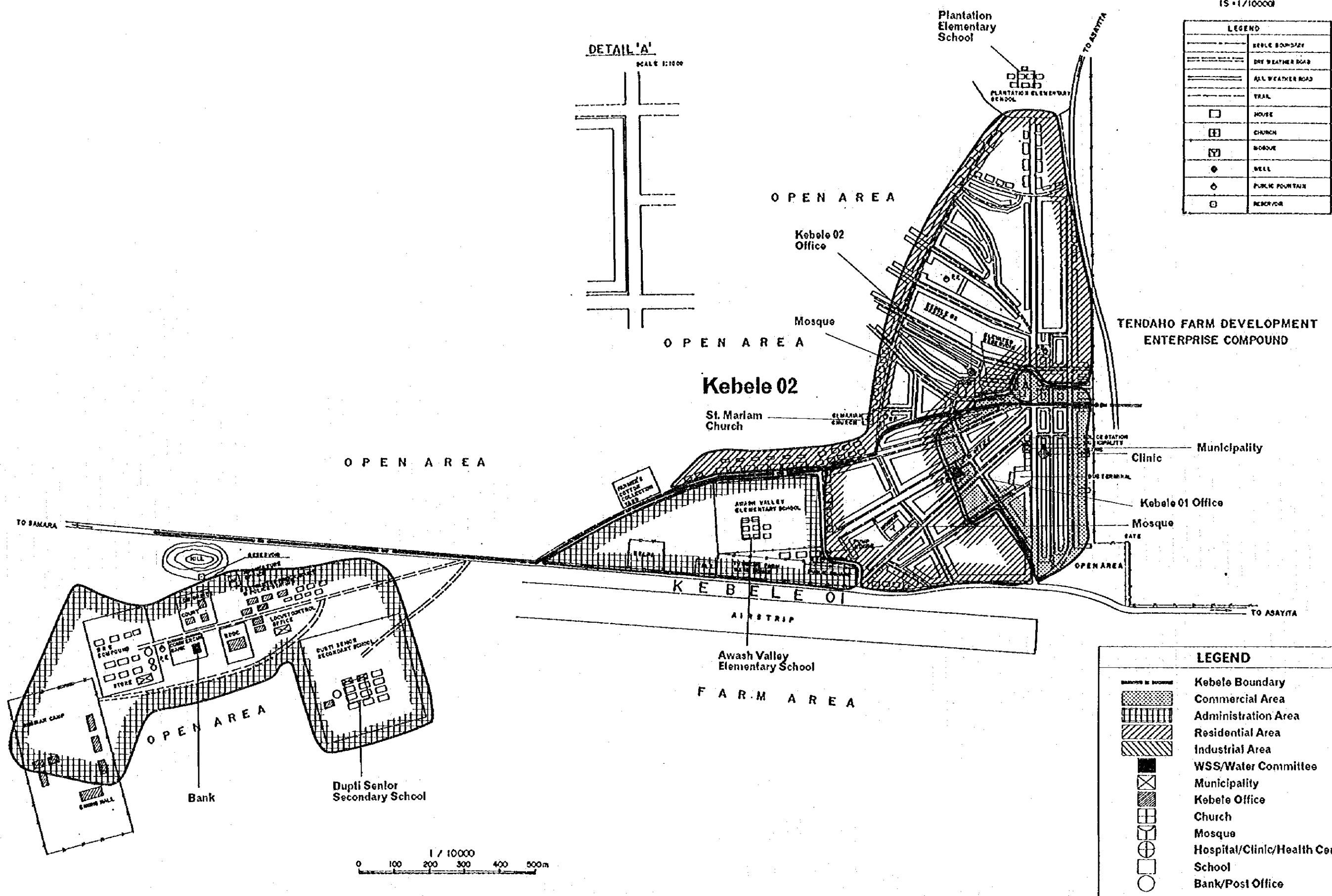


Drawing 2. Land Use and Bench Marks



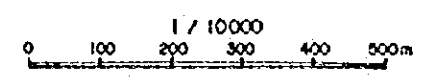
LEGEND

	KEBELE BOUNDARY
	DRY WEATHER ROAD
	ALL WEATHER ROAD
	TRAIL
	HOUSE
	CHURCH
	MOSQUE
	WELL
	PUBLIC FOUNTAIN
	MEMORIAL

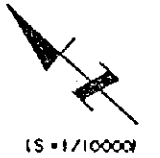


LEGEND

	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

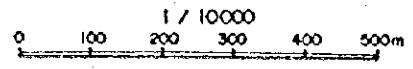
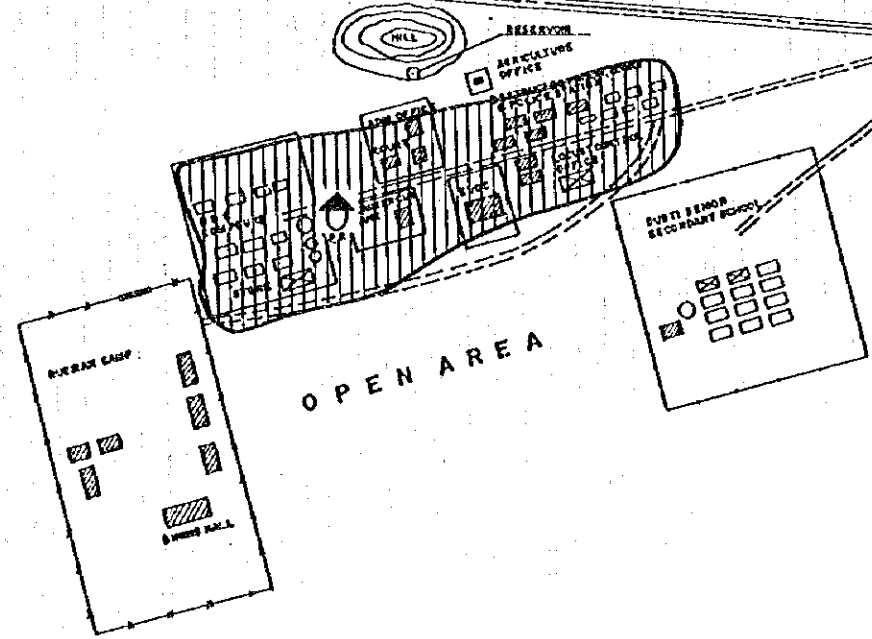
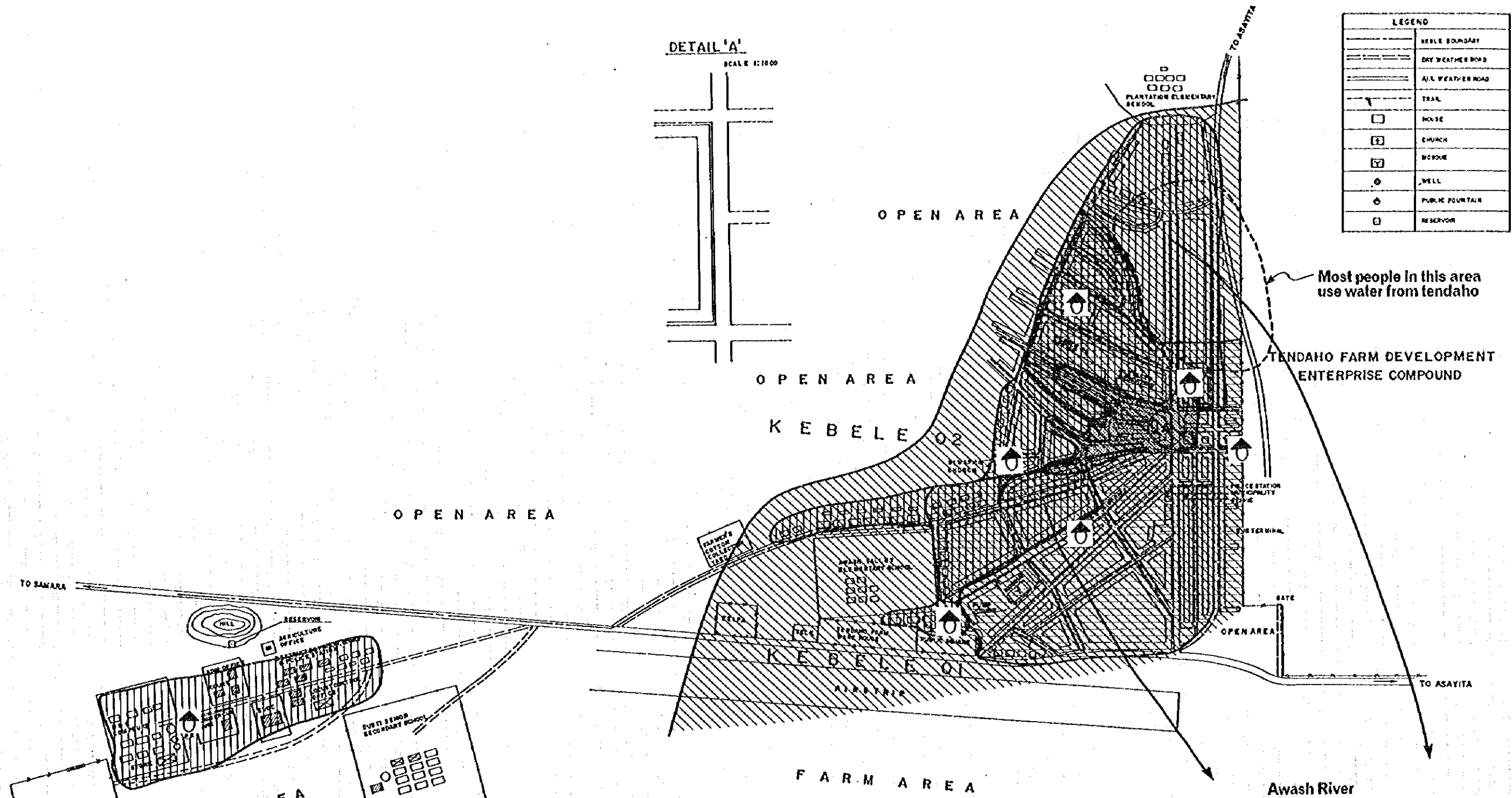
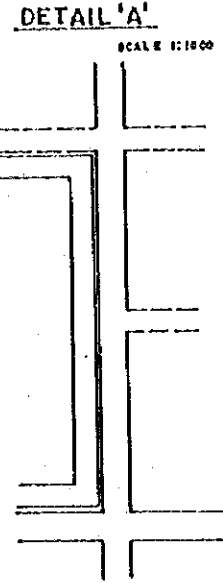


Drawing 3. Current Available Water Sources



1S = 1/10000

LEGEND	
	KEBELE BOUNDARY
	DRY WEATHER ROAD
	ALL WEATHER ROAD
	TRAIL
	HOUSE
	CHURCH
	MOPOUR
	WELL
	PUBLIC FOUNTAIN
	RESERVOIR



- 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 February 1995.
 3. All use awash river water when water systems falls.

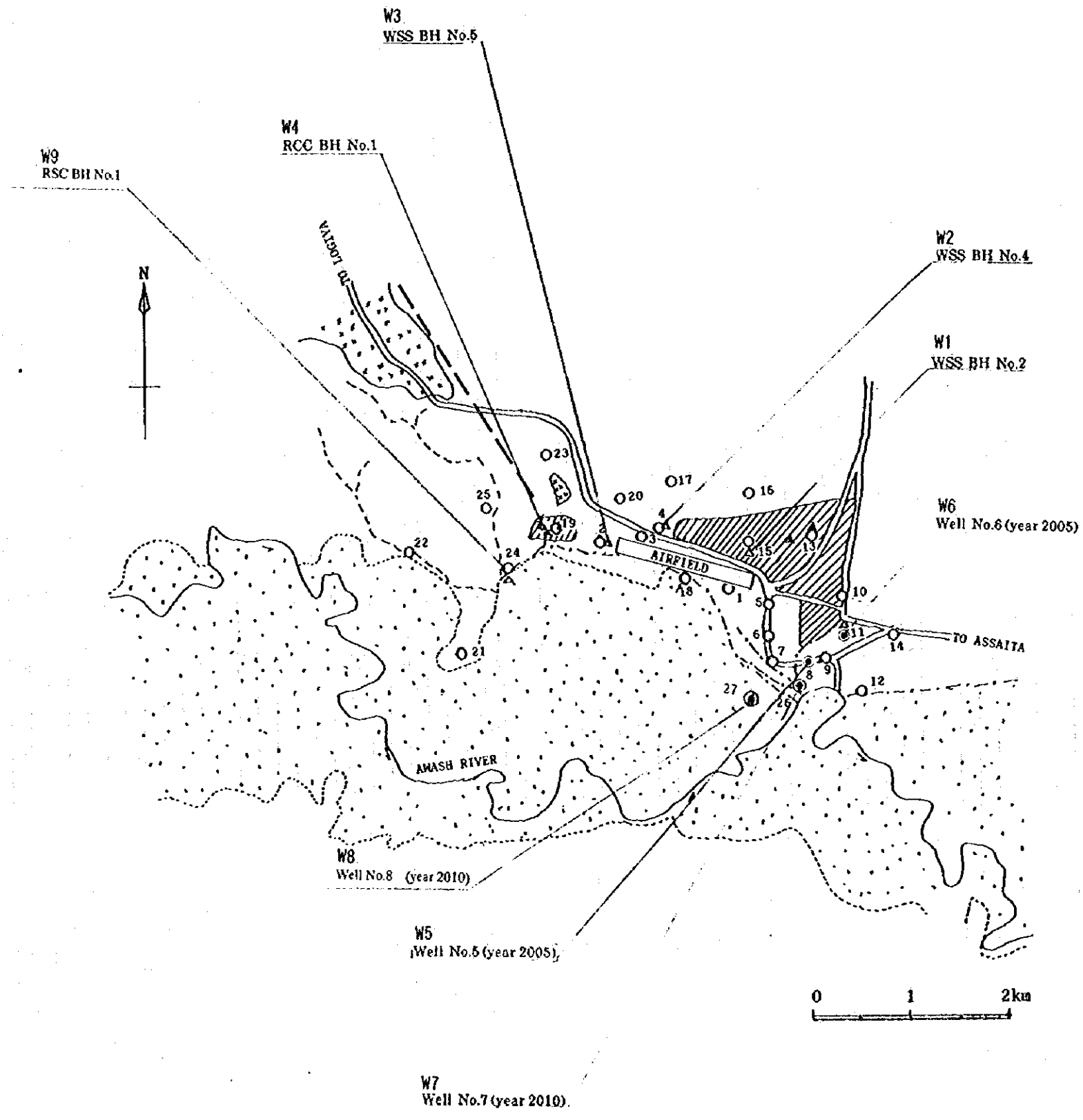
LEGEND	
	from House/Yard Connection
	from Public Fountain
	from Vendor
	from Hand Dug Well
	from Spring/River
	Spring
	WSS/Water Committee
	Existing Public Fountain

Drawing 4. Plan of Proposed Water Sources

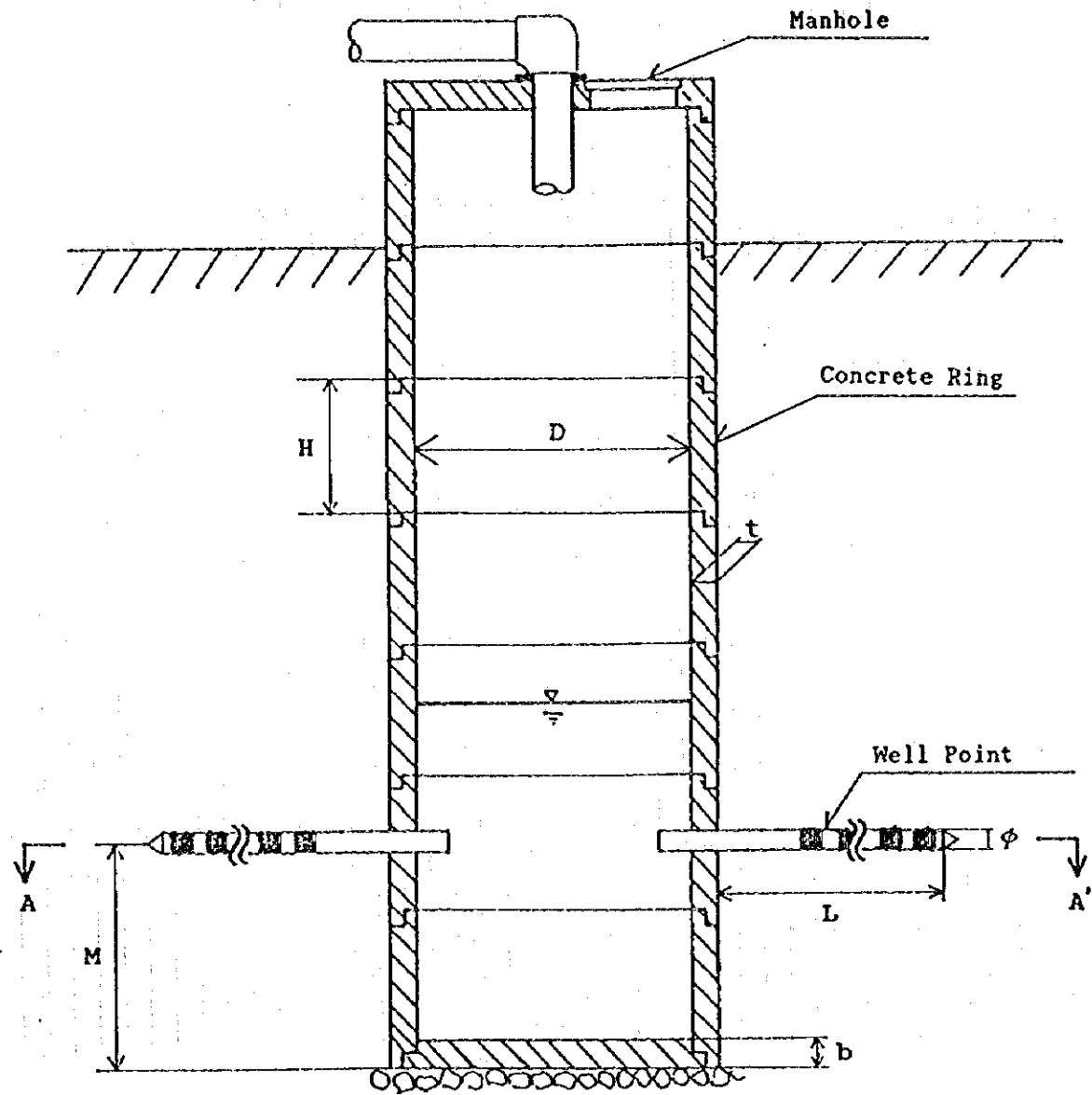
DUPTI

LEGEND

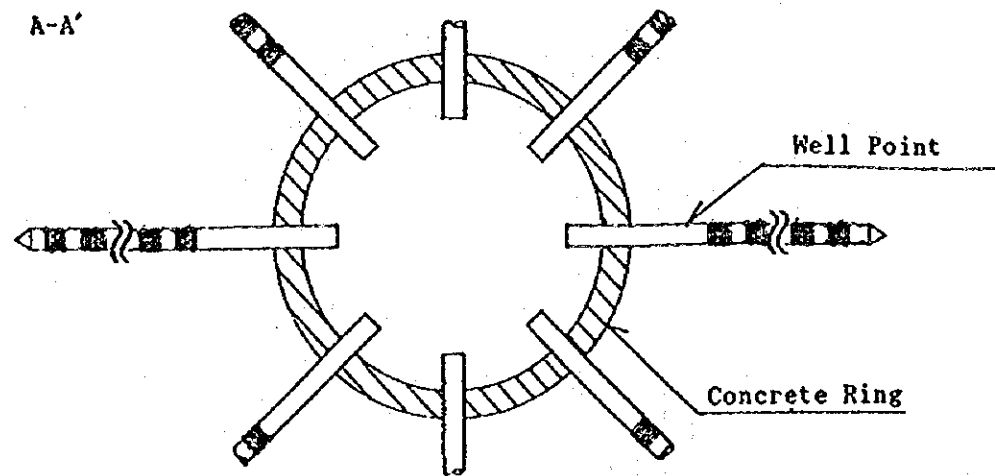
- VES Stations
- ⊙ Proposed Drilling site
- △ Existing Borehole
- ▲ Abandoned Borehole
- Road
- River
- - - Wadi
- - - Irrigation canal
- - - Lineation
- Flood plain
- ▨ Town area
- Basalt outcrop



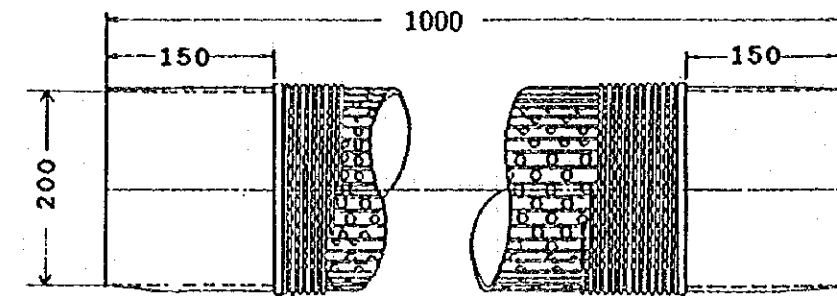
Drawing 5. Layout of Proposed Shallow Well



Section A-A'



Jhonson Type Screen for the Well Points



Dimensions

D	2 m
H	1.0 m
t	150 mm
b	0.4 m
L	12.0 m
ϕ	200 mm
M	1.5 m

Material

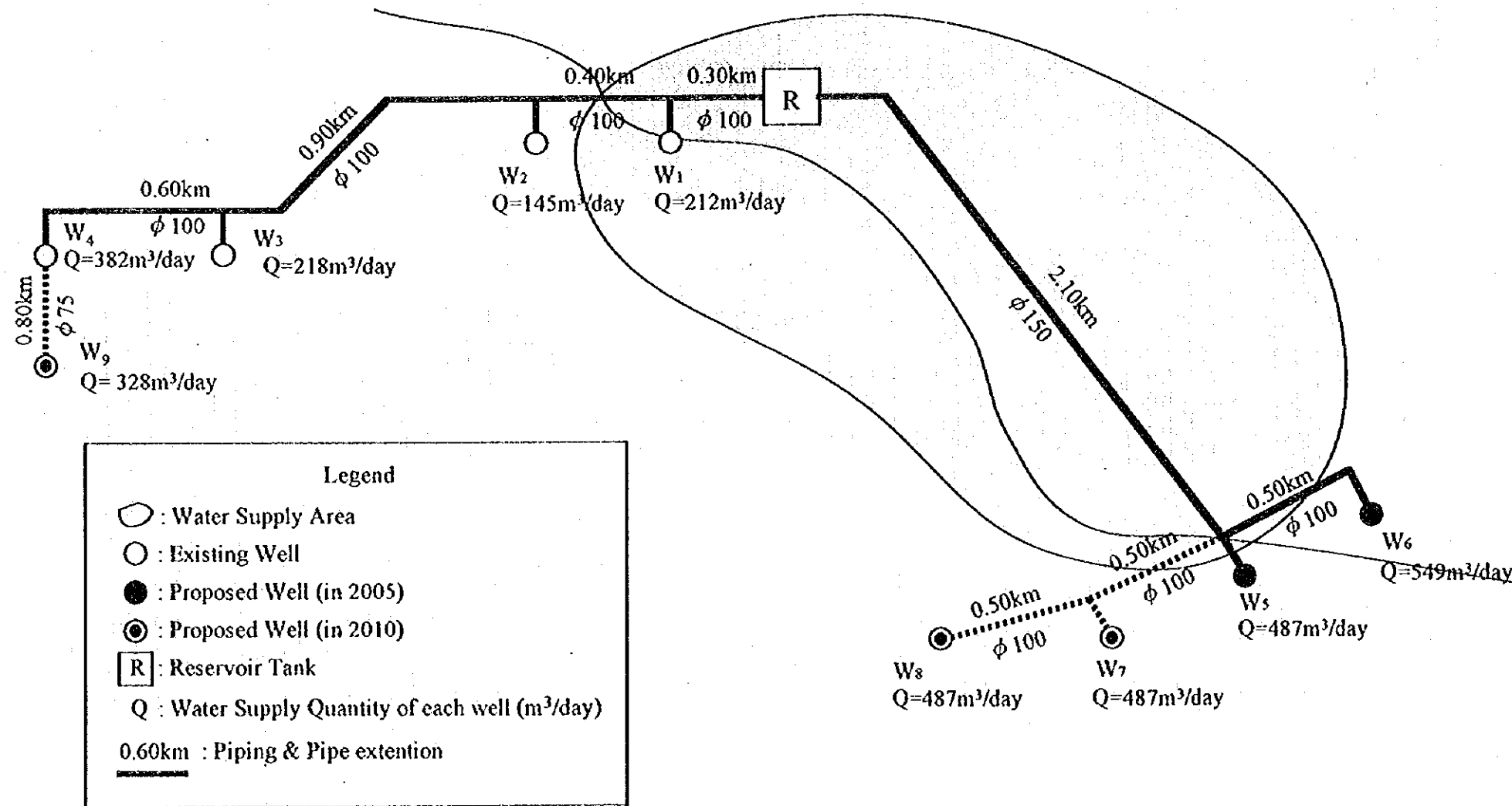
Concrete Ring: Reinforce Concrete
 Well Point: Steel
 Screen: Jhonson type

Total Water Demand in Target Years (m³/day)

	1995*	2000	2005	2010
Domestic	115	397	841	1,636
Non Domestic	21	132	184	253
Losses	56	59	140	333
Total	192	588	1,164	2,222

*Actual consumption

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







Drawing 7. Layout of Water Distribution Pipelines











(Target Year 2005)

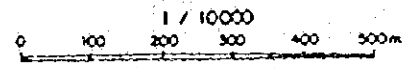
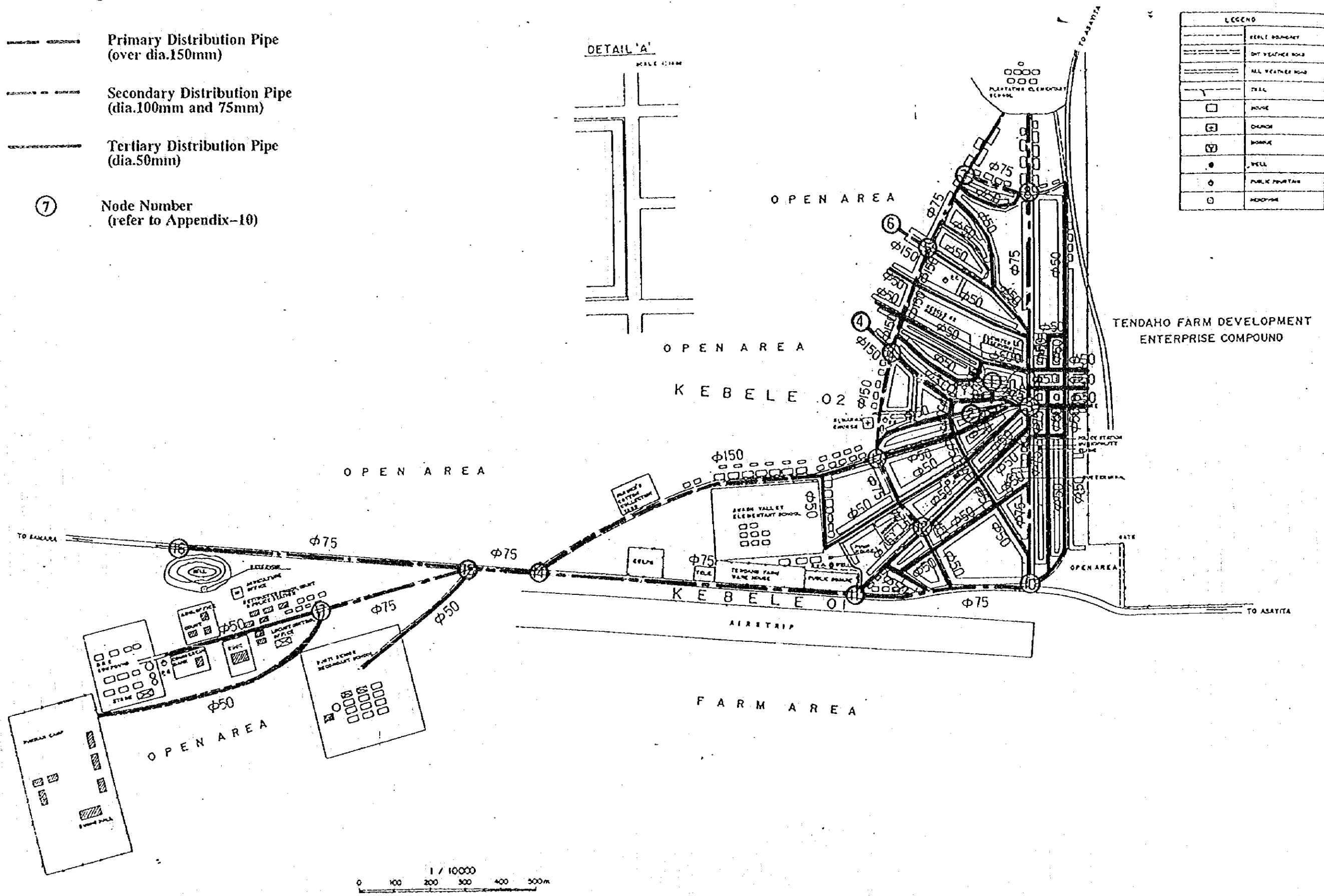
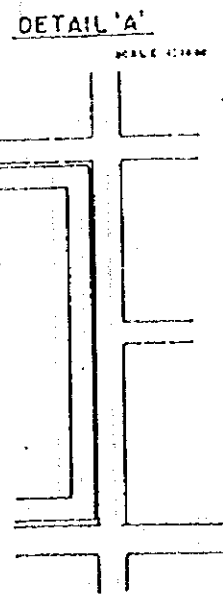


15 - 1/10000

Legend

-  Primary Distribution Pipe (over dia.150mm)
-  Secondary Distribution Pipe (dia.100mm and 75mm)
-  Tertiary Distribution Pipe (dia.50mm)
-  Node Number (refer to Appendix-10)

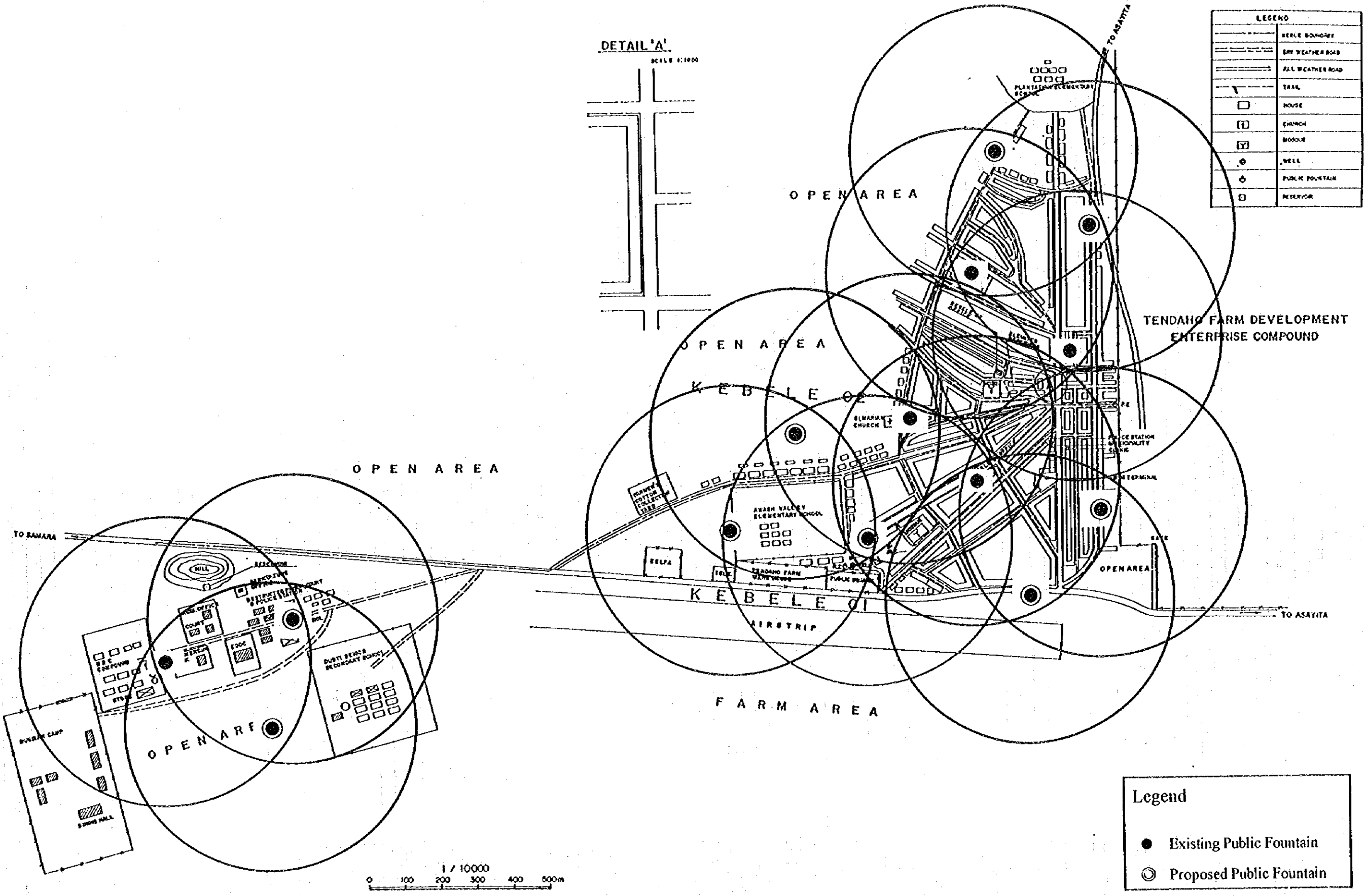
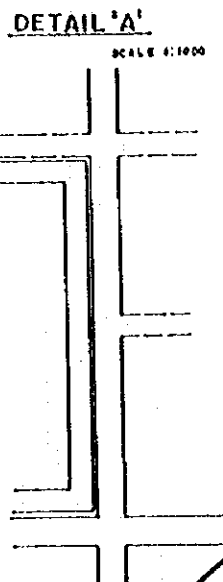
LEGEND	
	PEOPLE HOUSING
	DIRT WEATHER ROAD
	ALL WEATHER ROAD
	TREE
	HOUSE
	CHURCH
	SHOP
	WELL
	PUBLIC FOUNTAIN
	MONUMENT



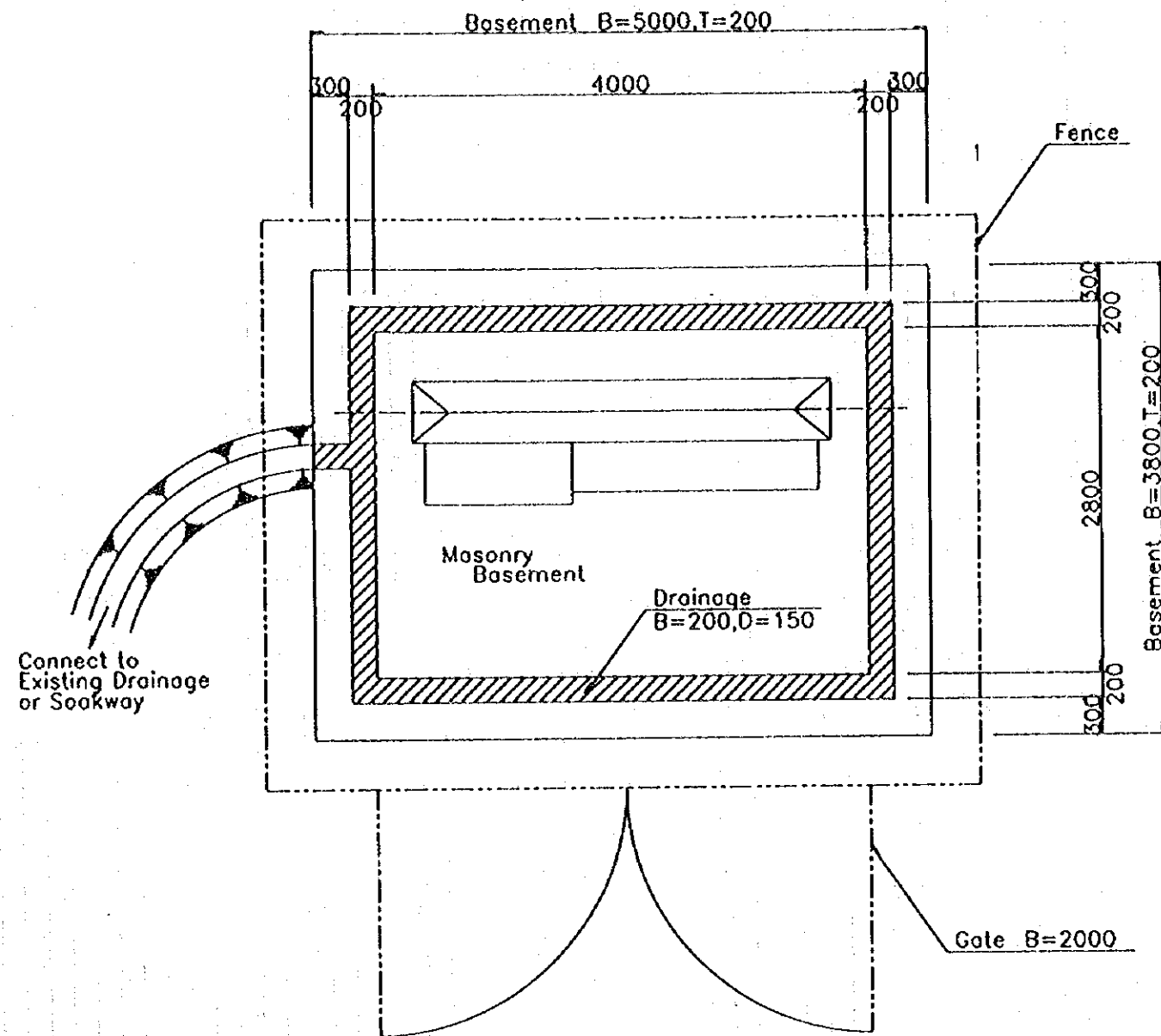
Drawing 8. Location of Proposed Public Fountains

1:5 = 1/10000

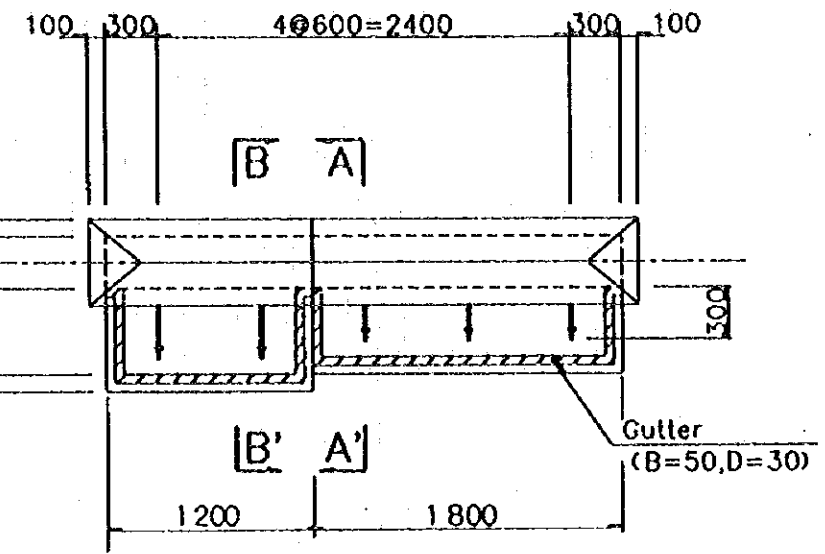
LEGEND	
	KERLE BONAFT
	DRY WEATHER ROAD
	ALL WEATHER ROAD
	TRAIL
	HOUSE
	CHURCH
	MOSQUE
	WELL
	PUBLIC FOUNTAIN
	RESERVOIR



Legend	
	Existing Public Fountain
	Proposed Public Fountain

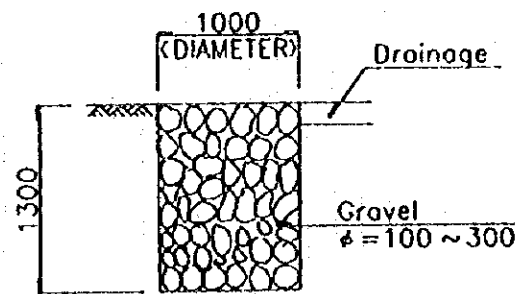


GENERAL PLAN

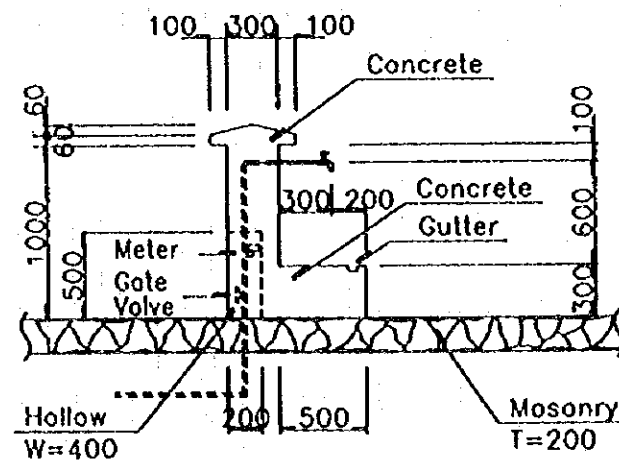


PLAN OF PUBLIC FOUNTAIN

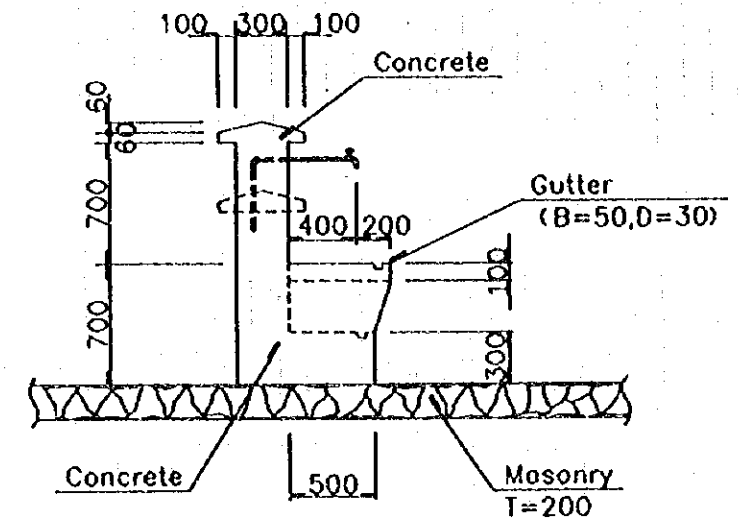
- Quantity:
- Concrete : 1.87 m³
 - Form-work : 16.67 m²
 - Masonry : 3.36 m³
 - Fence : 2 m x 16.0 m
 - Pipe : 6.6 m
 - Tap : 5 NOS
 - Meter : 1 NOS
 - Valve : 1 NOS
 - Excavation : 9 m³
 - Gravel : 1 m³



SOAKWAY

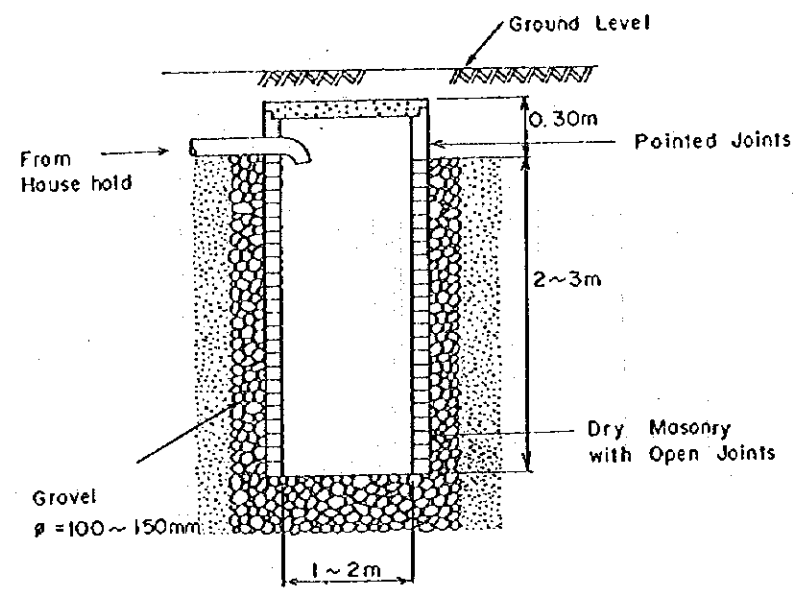


SECTION A-A'

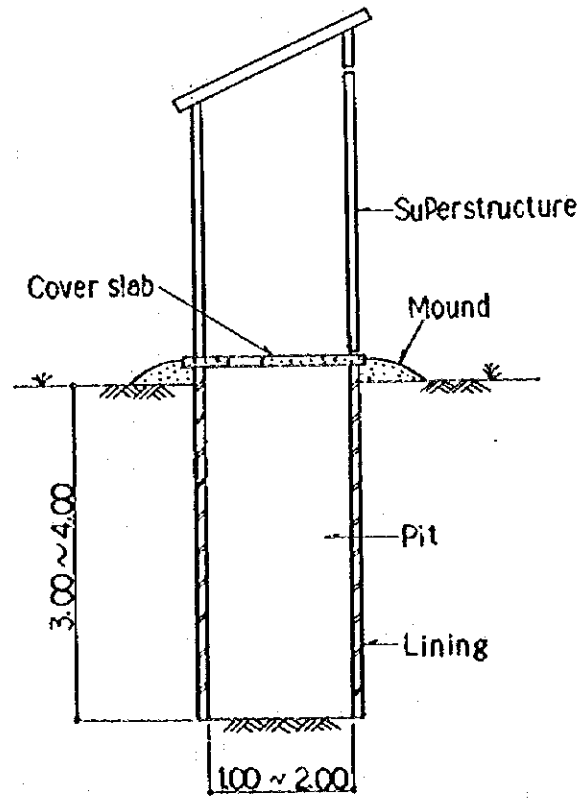


SECTION B-B'

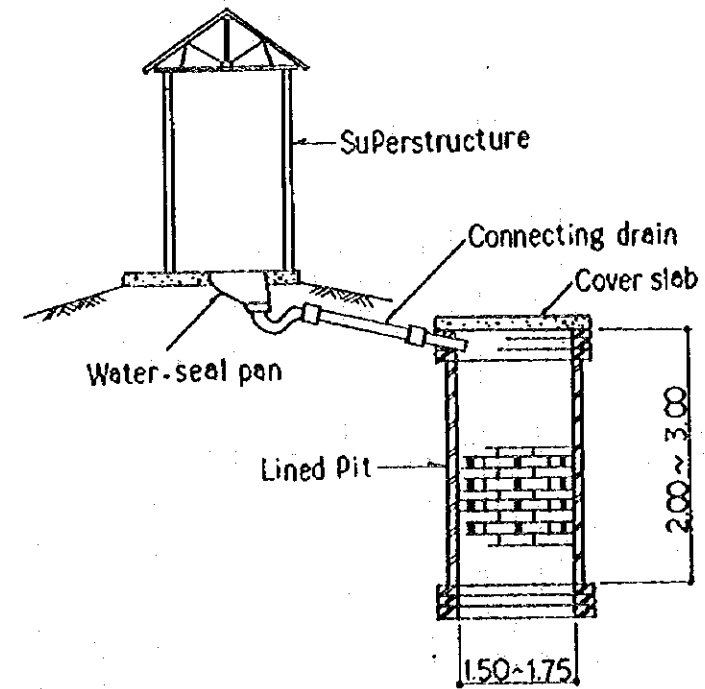
NOTE:
1. All dimensions are shown in millimeter.



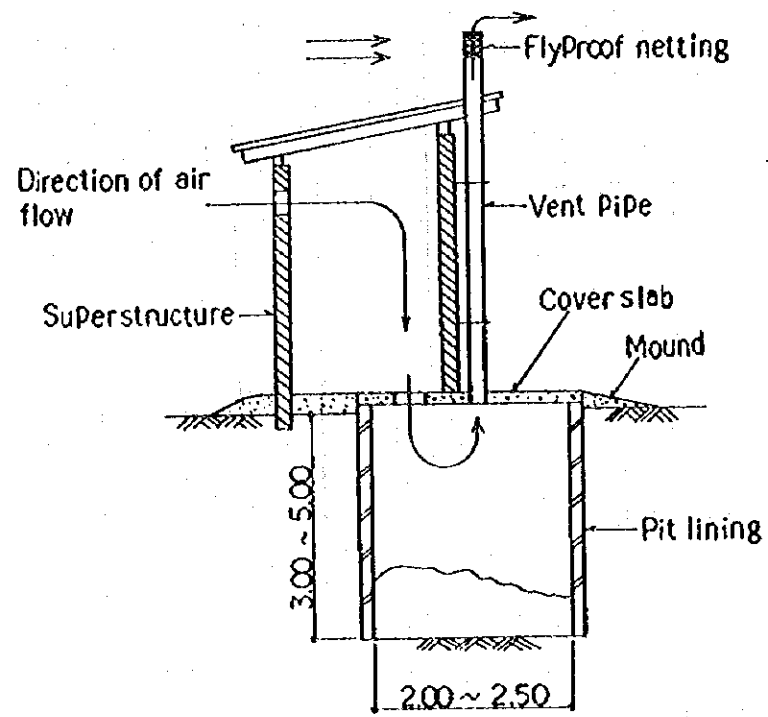
Waste Water Disposal Pit



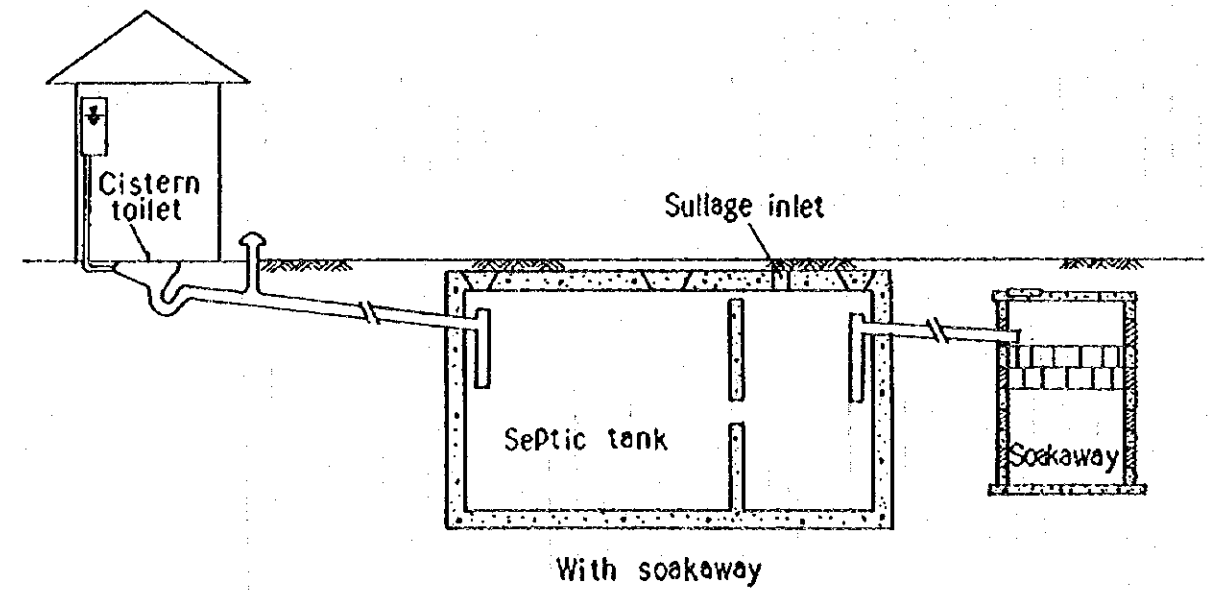
Improved Traditional Pit Latrine



Pour-flush latrine and Soakaway Pit

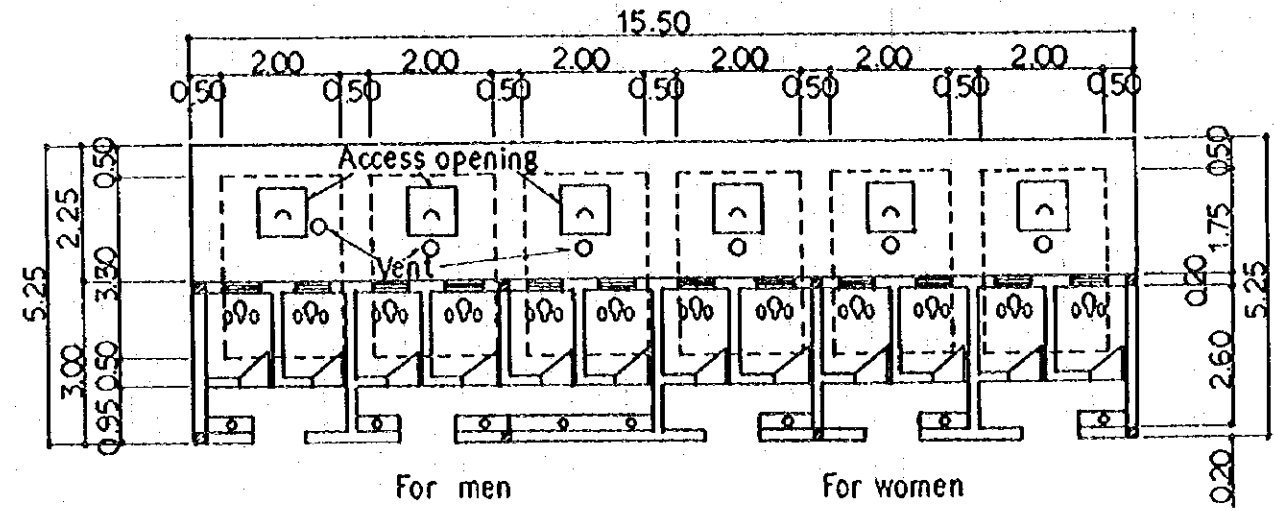
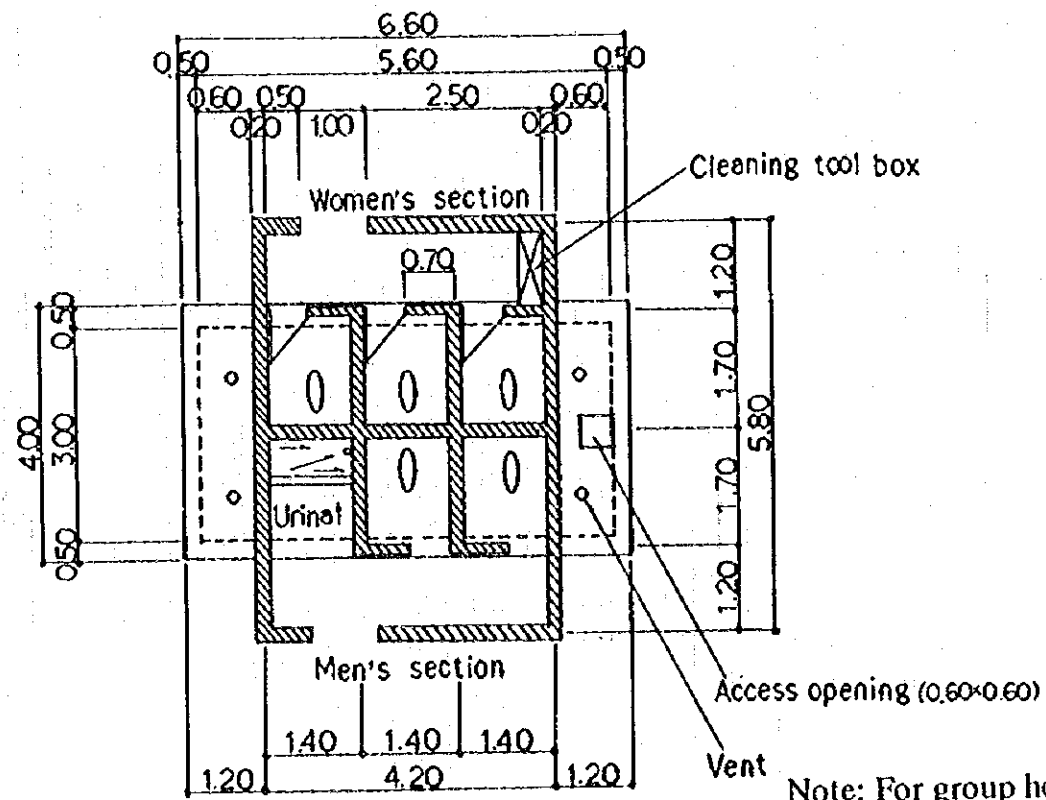
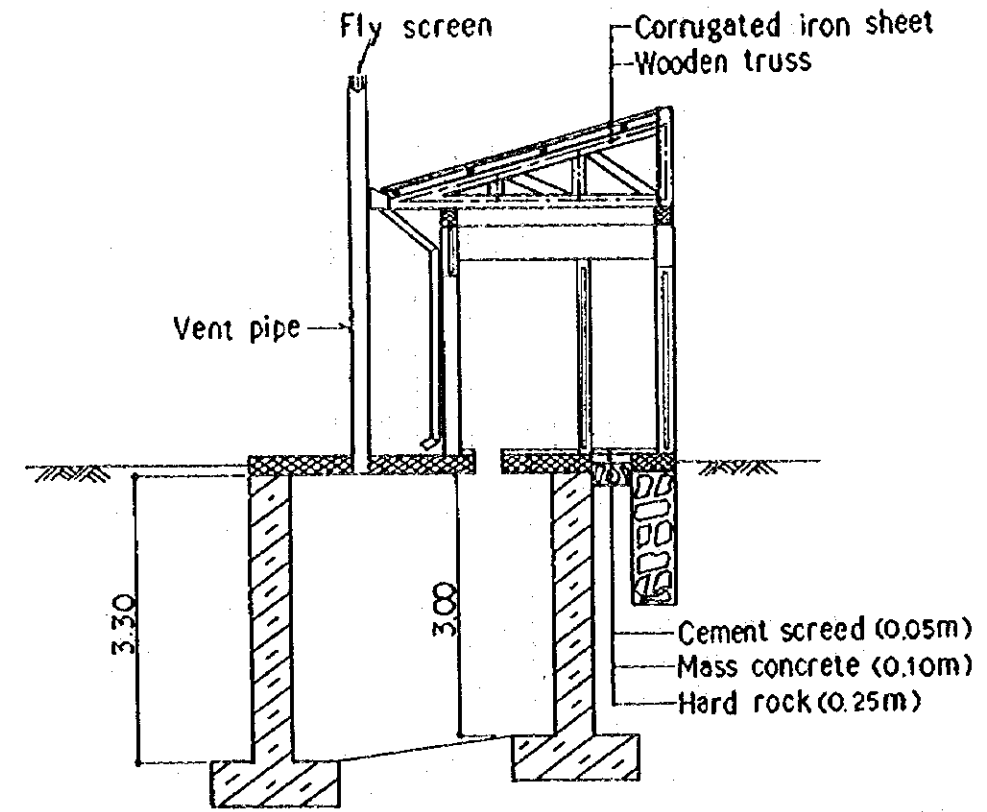
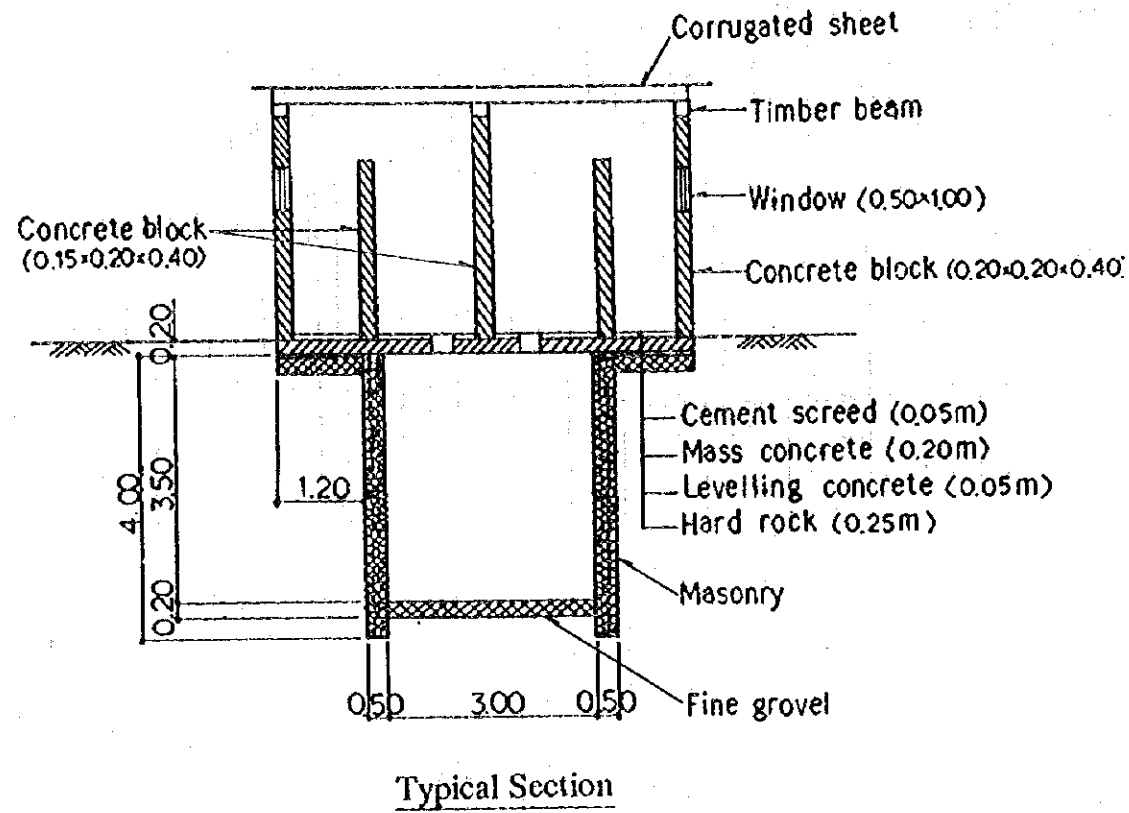


VIP Latrine



Cistern-flush Toilet and Septic Tank

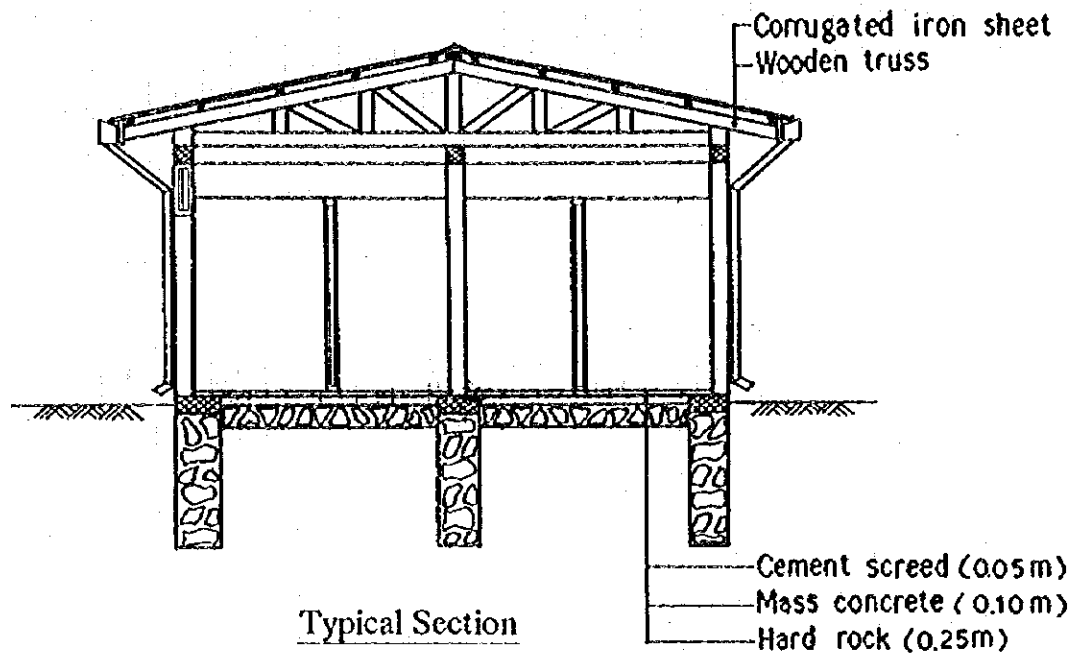
Drawing 11. Layout of Community Type Toilet and VIP Public Type Toilet



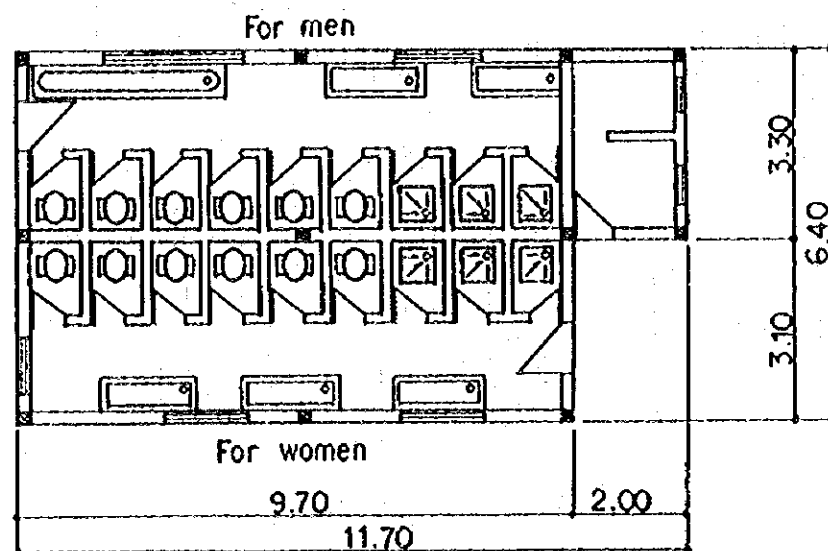
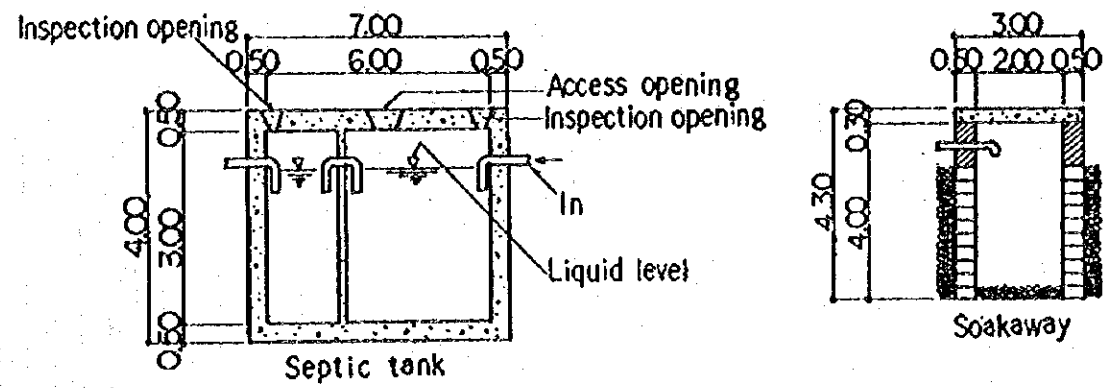
VIP Latrine (Community Type)

VIP Latrine (Public Type)

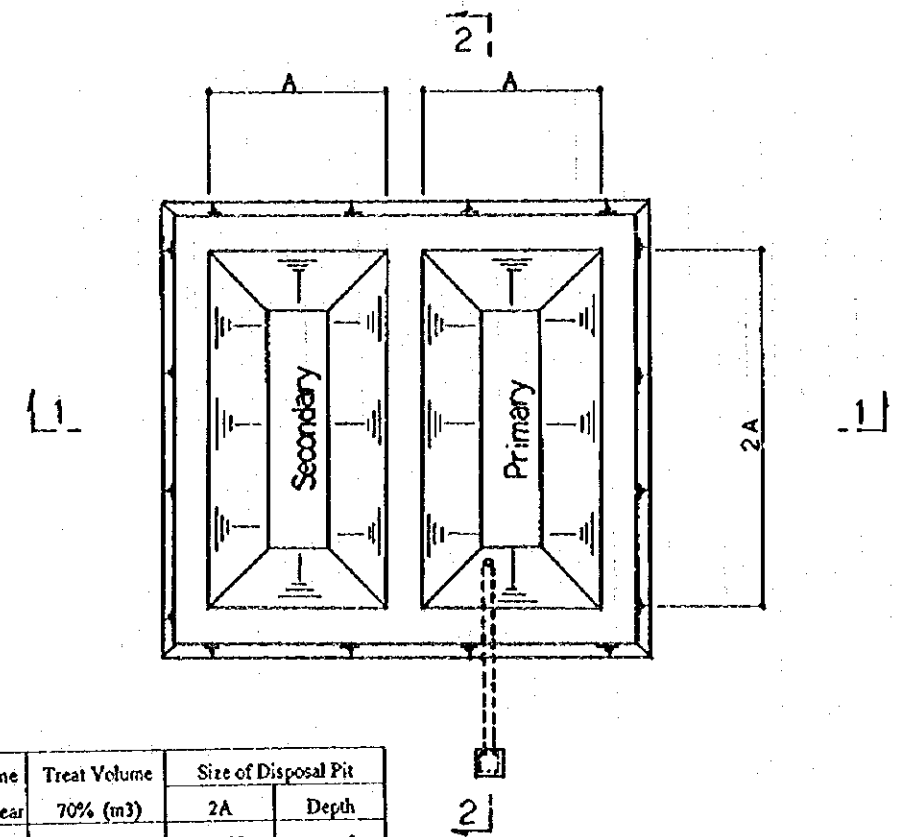
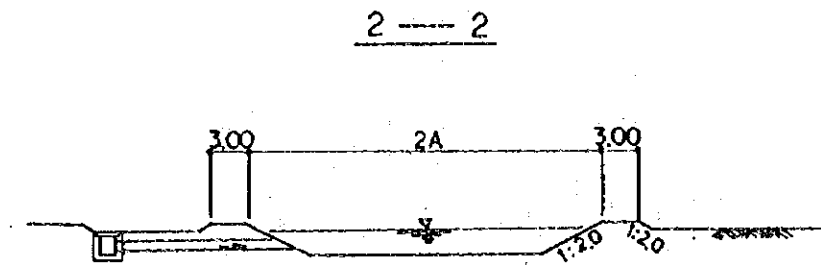
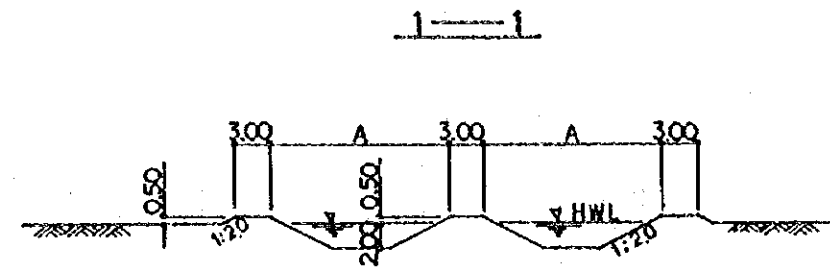
Drawing 12. Layout of Pour-flush Public Type Toilet and Sullage Disposal Pit



Typical Section



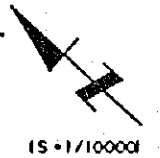
Pour-flush Latrine with Shower (Public Type)



Urban Center	Population	Sludge Volume	Treat Volume	Size of Disposal Pit	
				2A	Depth
Dubti	20,700	0.2m ³ /Man/Year 4,140	70% (m ³) 2,898	38m	2m

Sullage Disposal Pit

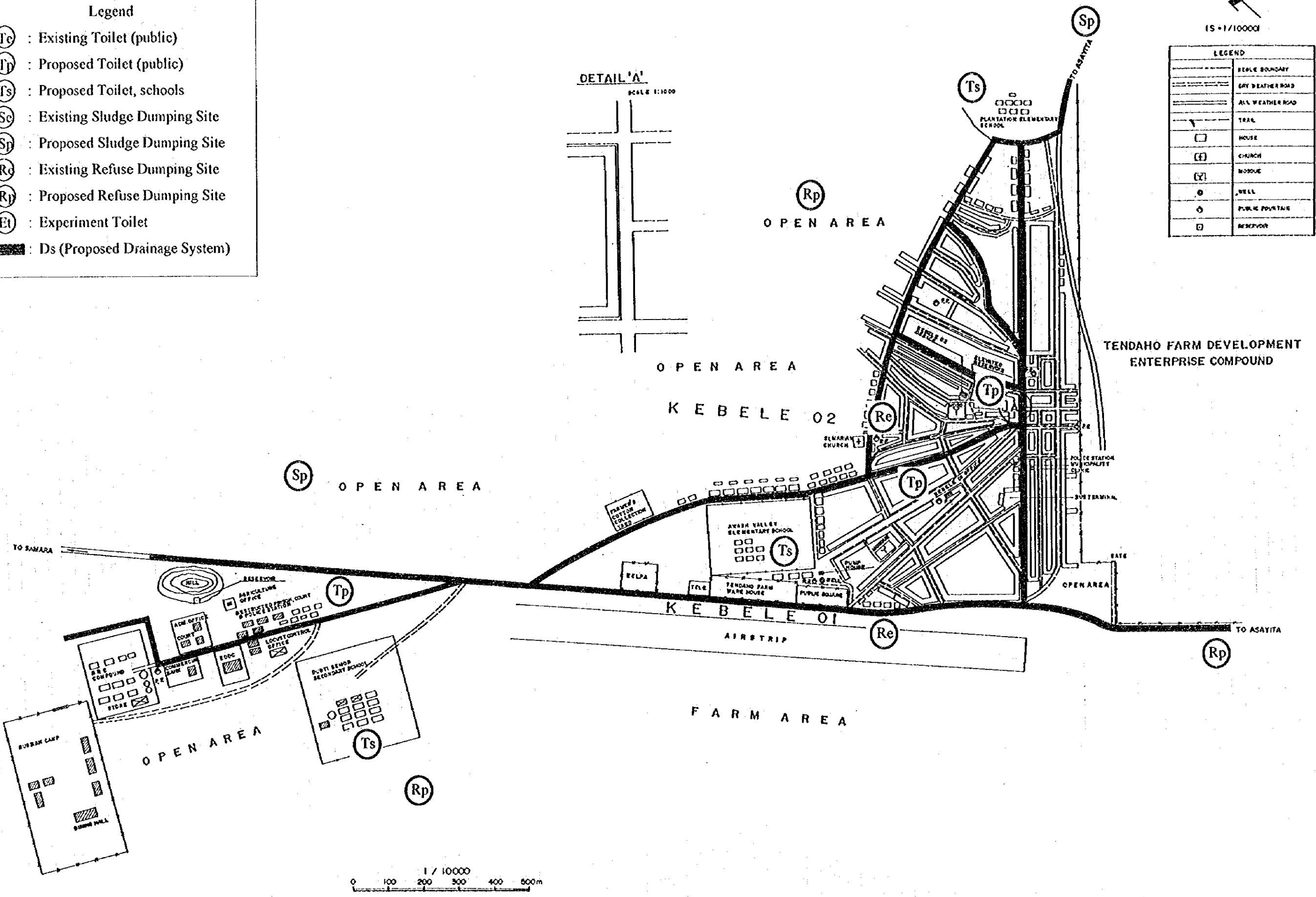
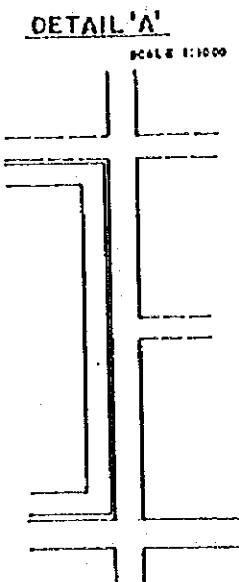
Drawing 13. Location of Sanitary Facilities



1S-1/10000

- Legend**
- (Te) : Existing Toilet (public)
 - (Tp) : Proposed Toilet (public)
 - (Ts) : Proposed Toilet, schools
 - (Sc) : Existing Sludge Dumping Site
 - (Sp) : Proposed Sludge Dumping Site
 - (Rc) : Existing Refuse Dumping Site
 - (Rp) : Proposed Refuse Dumping Site
 - (Et) : Experiment Toilet
 - ▨ : Ds (Proposed Drainage System)

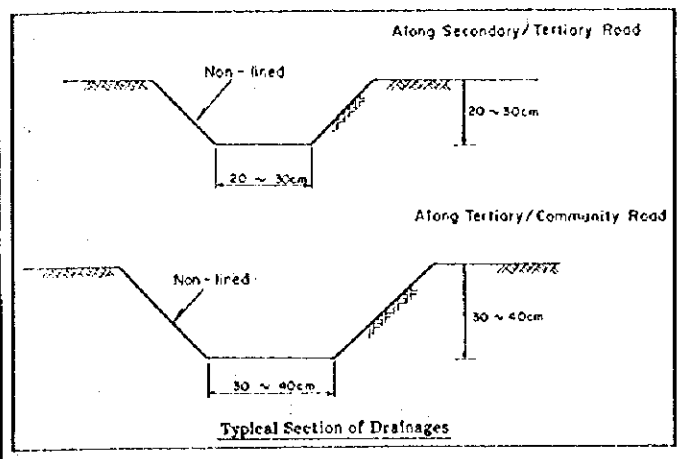
LEGEND	
---	KEBLE BOUNDARY
---	GRAV DRAINAGE ROAD
---	ALL WEATHER ROAD
---	TRAIL
□	HOUSE
⊞	CHURCH
⊞	MOSQUE
○	WELL
○	PUBLIC FOUNTAIN
□	RESERVOIR



Drawing 14. Current Drainage Condition and Improvement Plan

1:5 = 1/10000

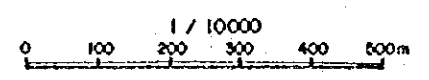
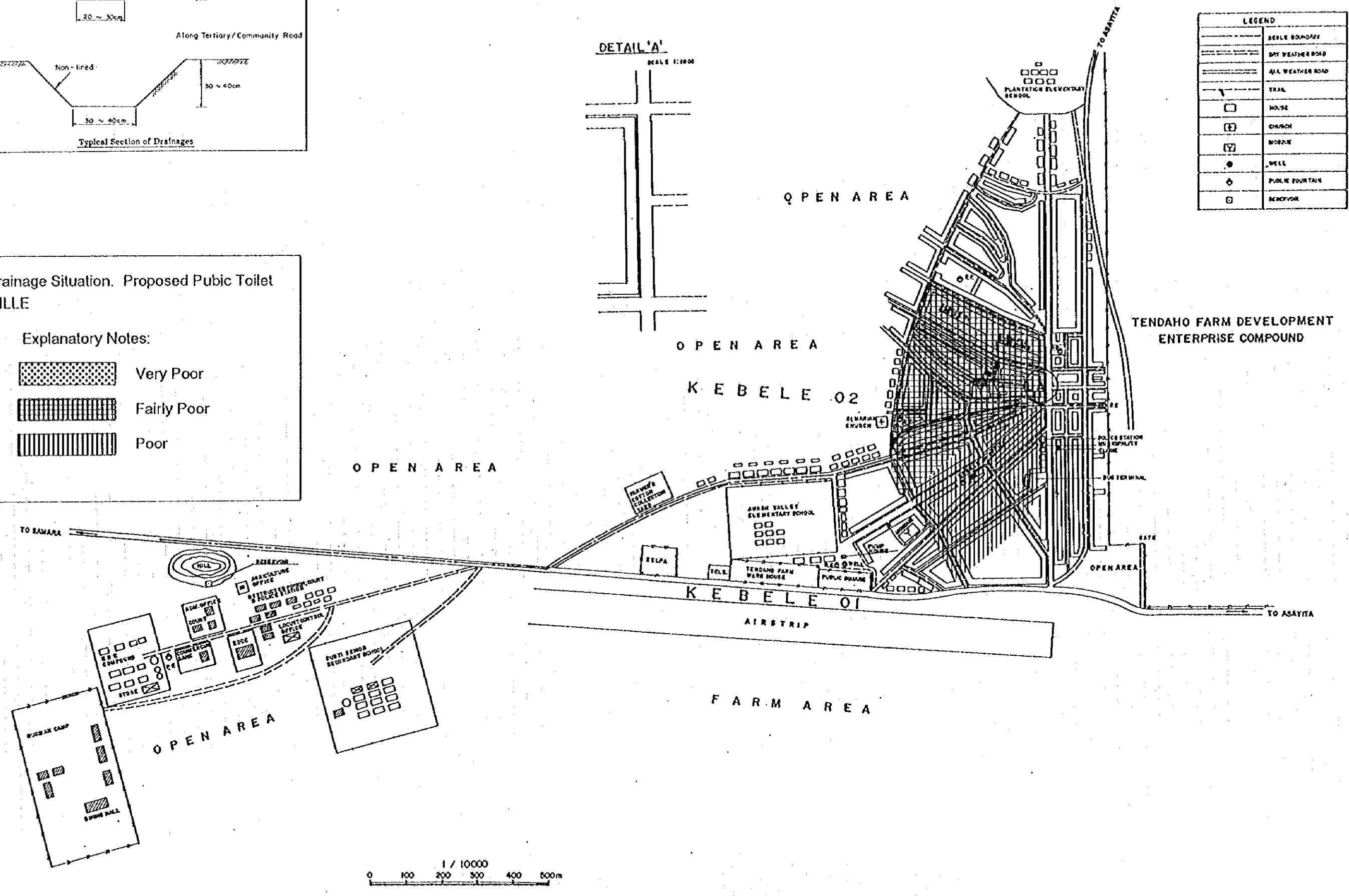
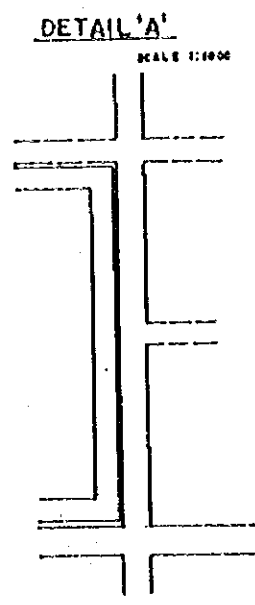
LEGEND	
	KEBLE BOUNDARY
	DRY WEATHER ROAD
	ALL WEATHER ROAD
	TRAIL
	HOUSE
	CHURCH
	MOOR
	WELL
	PUBLIC FOUNTAIN
	KENYON



Drainage Situation. Proposed Public Toilet MILLE

Explanatory Notes:

- Very Poor
- Fairly Poor
- Poor



JICA