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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  
MILLE

(Volume IV-II)

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FEBRUARY, 1996

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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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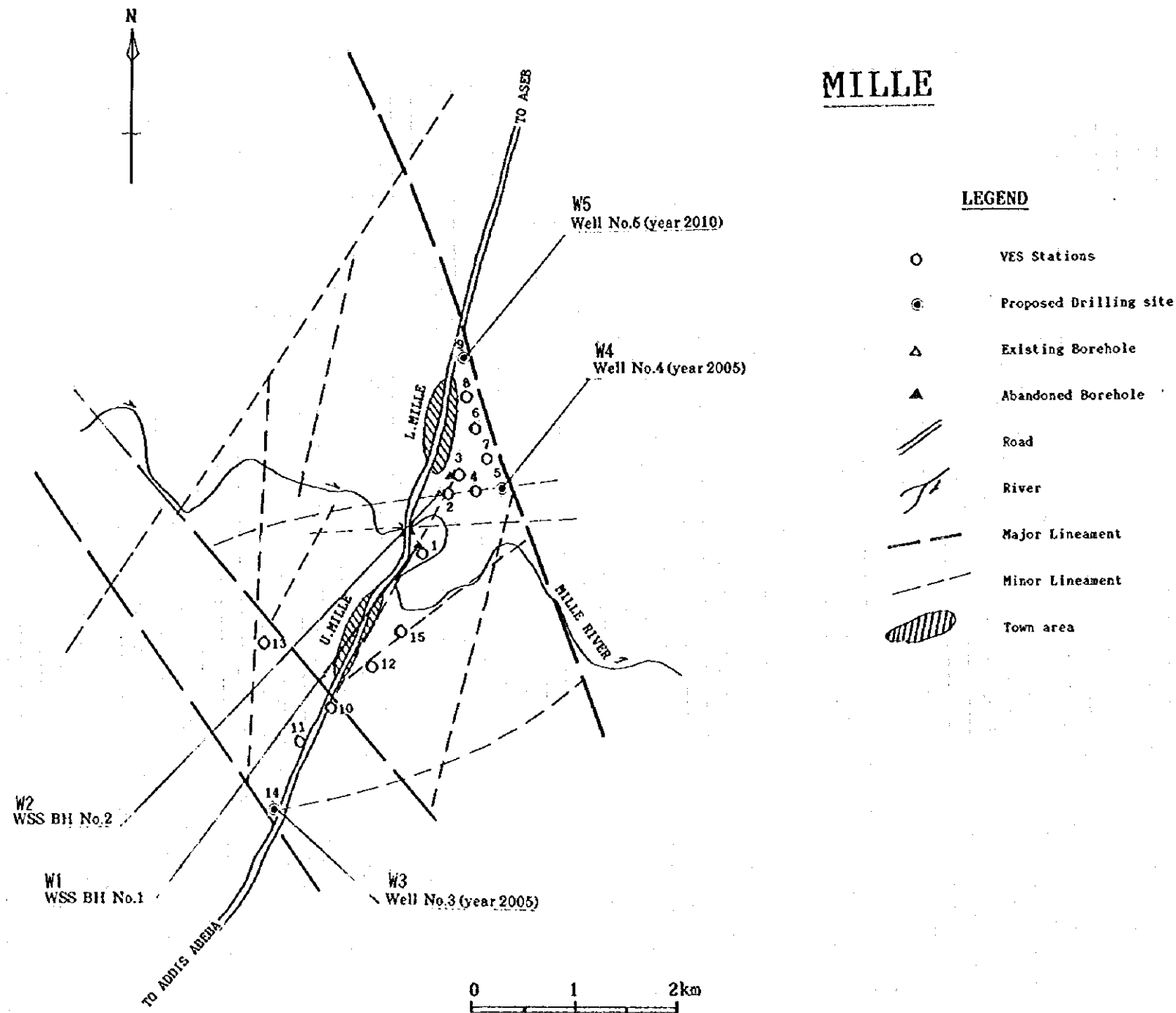
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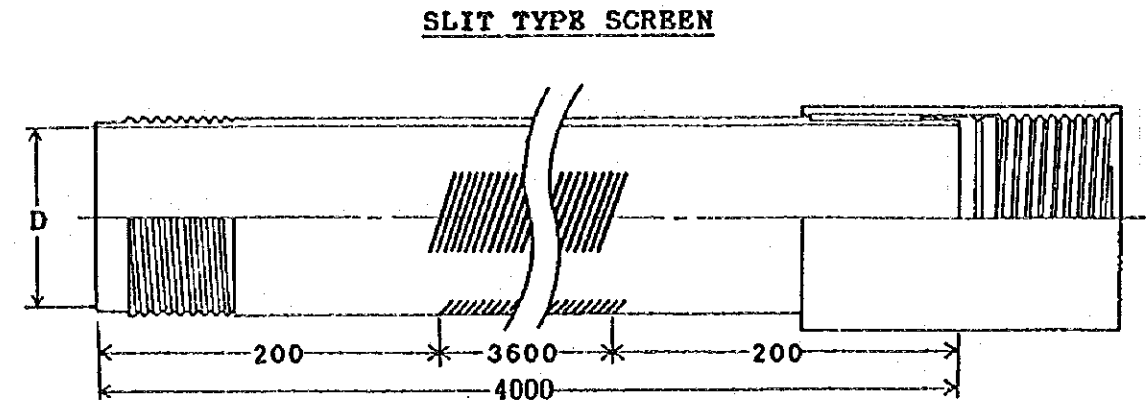
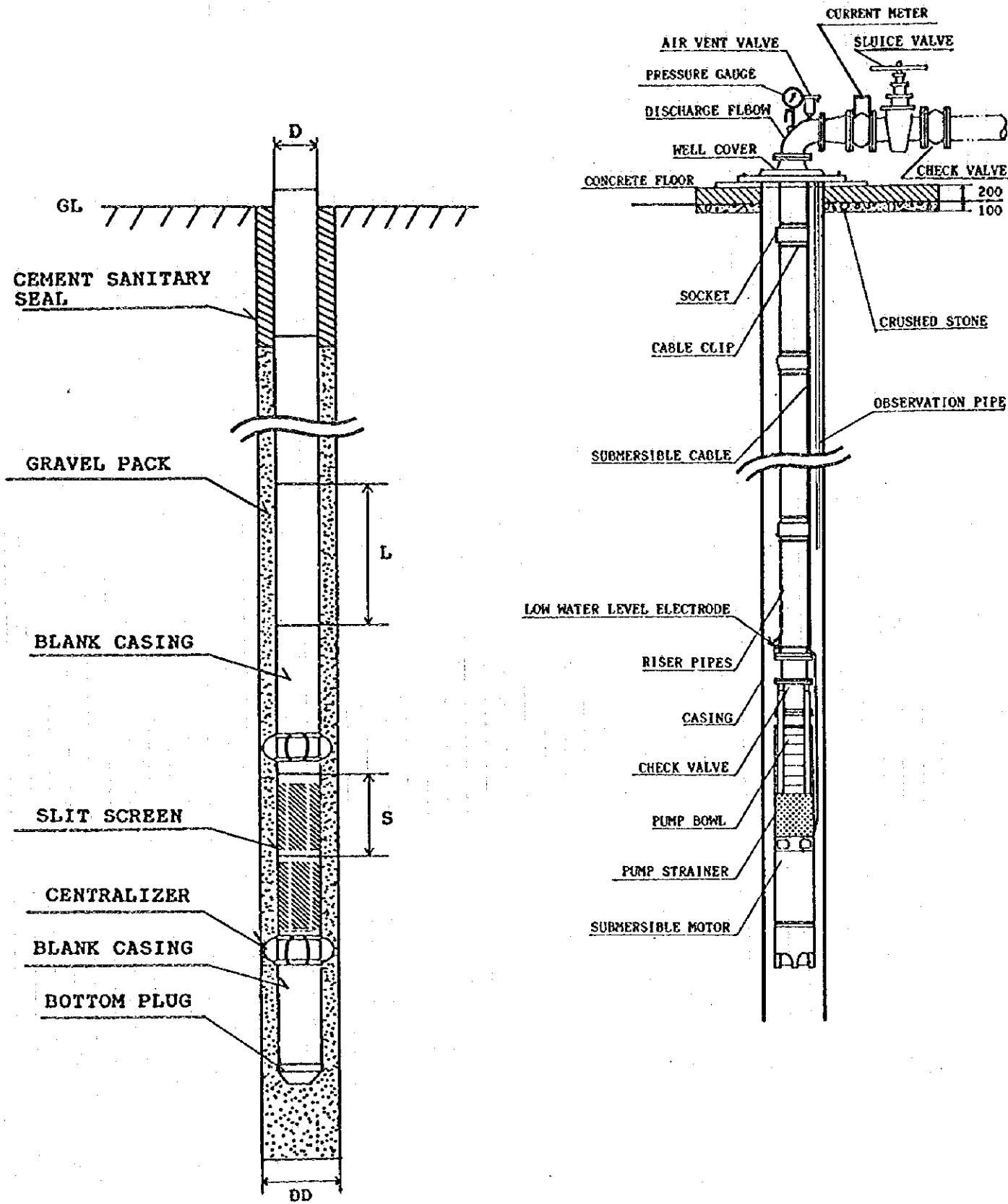




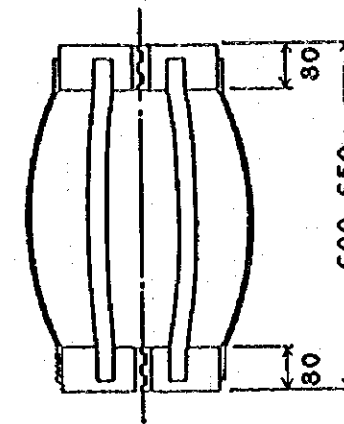




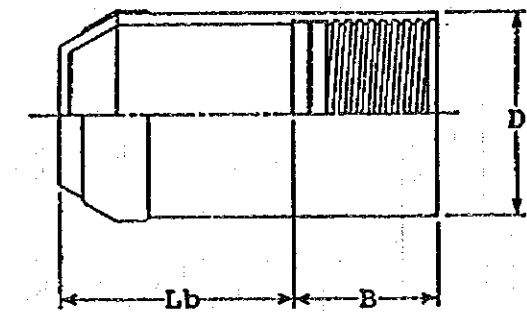
**Drawing 5. Layout of Proposed Deep Well**



**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**

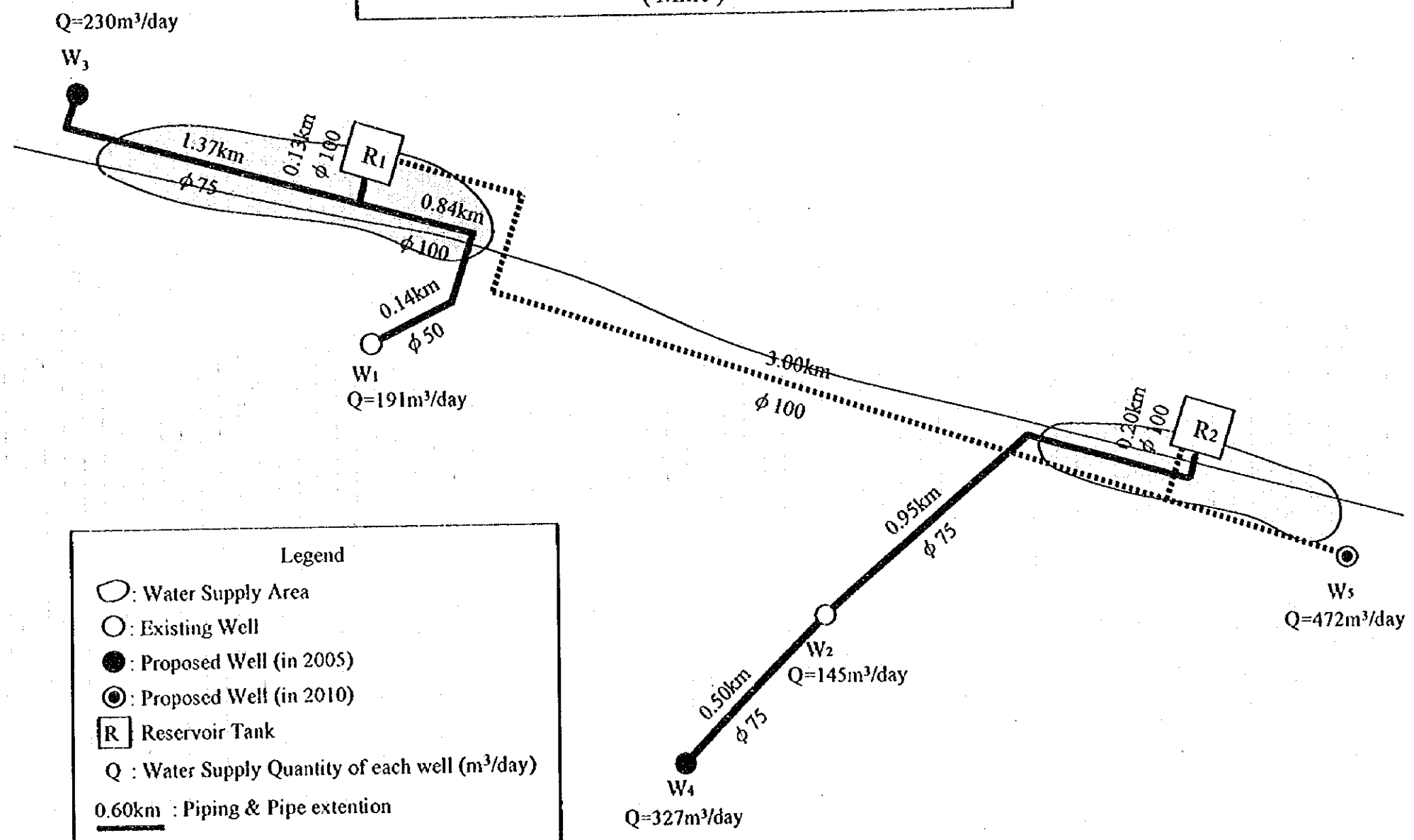
BLANK PIPE : FRP  
 SCREEN : FRP  
 BOTTOM PLUG : FRP

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

|              | 1995*      | 2000       | 2005       | 2010       |
|--------------|------------|------------|------------|------------|
| Domestic     | 68         | 162        | 286        | 519        |
| Non Domestic | 28         | 79         | 129        | 206        |
| Losses       | 34         | 27         | 57         | 128        |
| <b>Total</b> | <b>130</b> | <b>268</b> | <b>472</b> | <b>853</b> |

\*Actual consumption

**General View of Wells & Water Conveyance Facility Plan  
(Mille)**

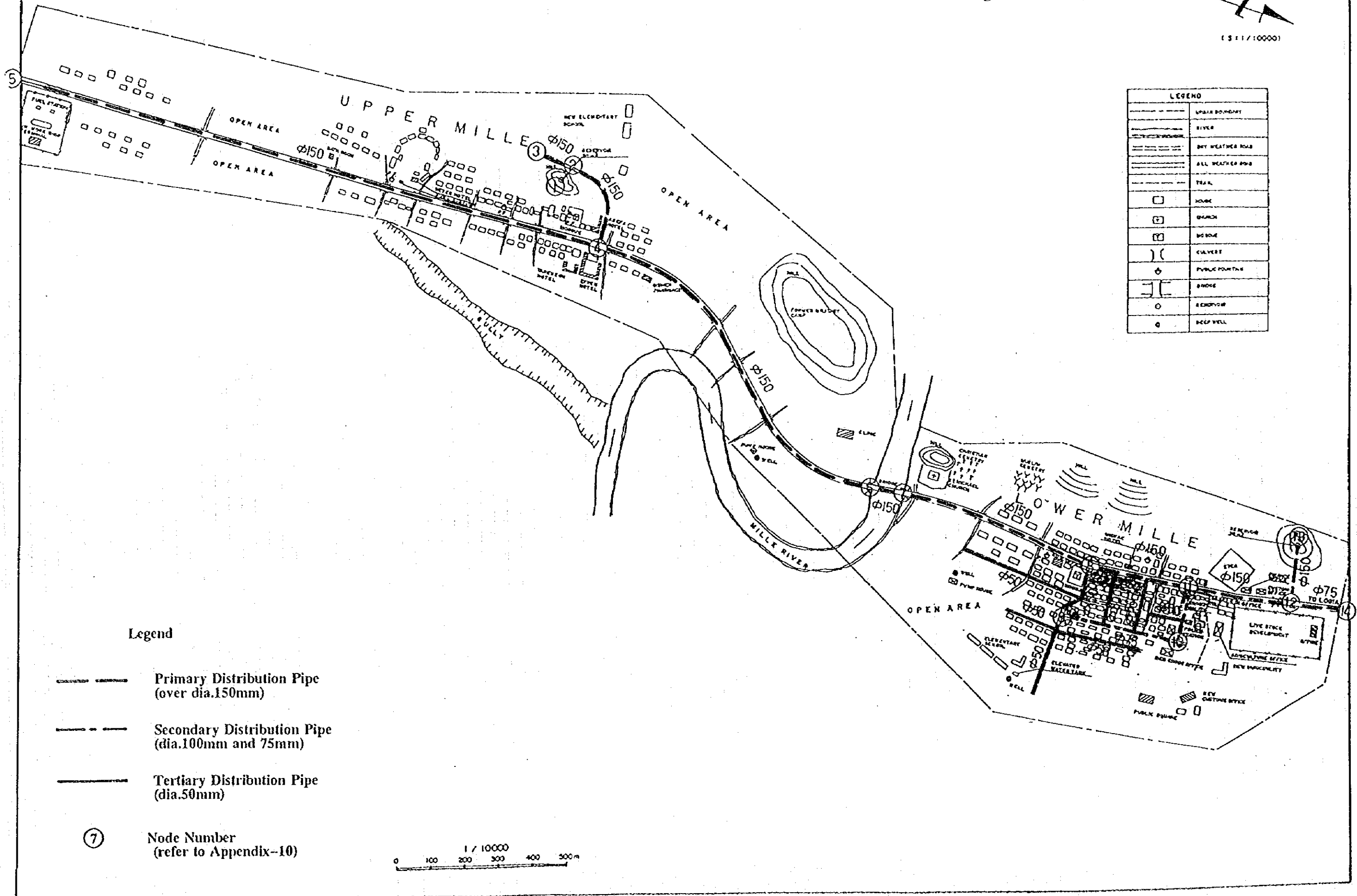
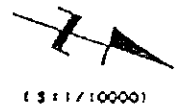


**Legend**

- : Water Supply Area
- : Existing Well
- : Proposed Well (in 2005)
- ⊙ : Proposed Well (in 2010)
- : Reservoir Tank
- Q : Water Supply Quantity of each well (m<sup>3</sup>/day)
- 0.60km : Piping & Pipe extension

**Drawing 7. Layout of Water Distribution Pipelines**

( Target Year 2005 )

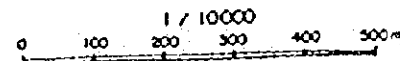


| LEGEND |                   |
|--------|-------------------|
| ---    | URBAN BOUNDARY    |
| ---    | RIVER             |
| ---    | INT. WEATHER ROAD |
| ---    | ALL WEATHER ROAD  |
| ---    | TRAIL             |
| □      | HOUSE             |
| ⊠      | CHURCH            |
| ⊞      | BOYSCOUT          |
| ))     | CULVERT           |
| ⊕      | PUBLIC FOUNTAIN   |
| ⊞      | BRIDGE            |
| ○      | RECEPTOR          |
| ⊙      | DEEP WELL         |

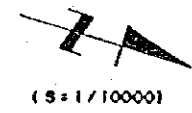
**Legend**

- Primary Distribution Pipe (over dia.150mm)
- - - Secondary Distribution Pipe (dia.100mm and 75mm)
- Tertiary Distribution Pipe (dia.50mm)

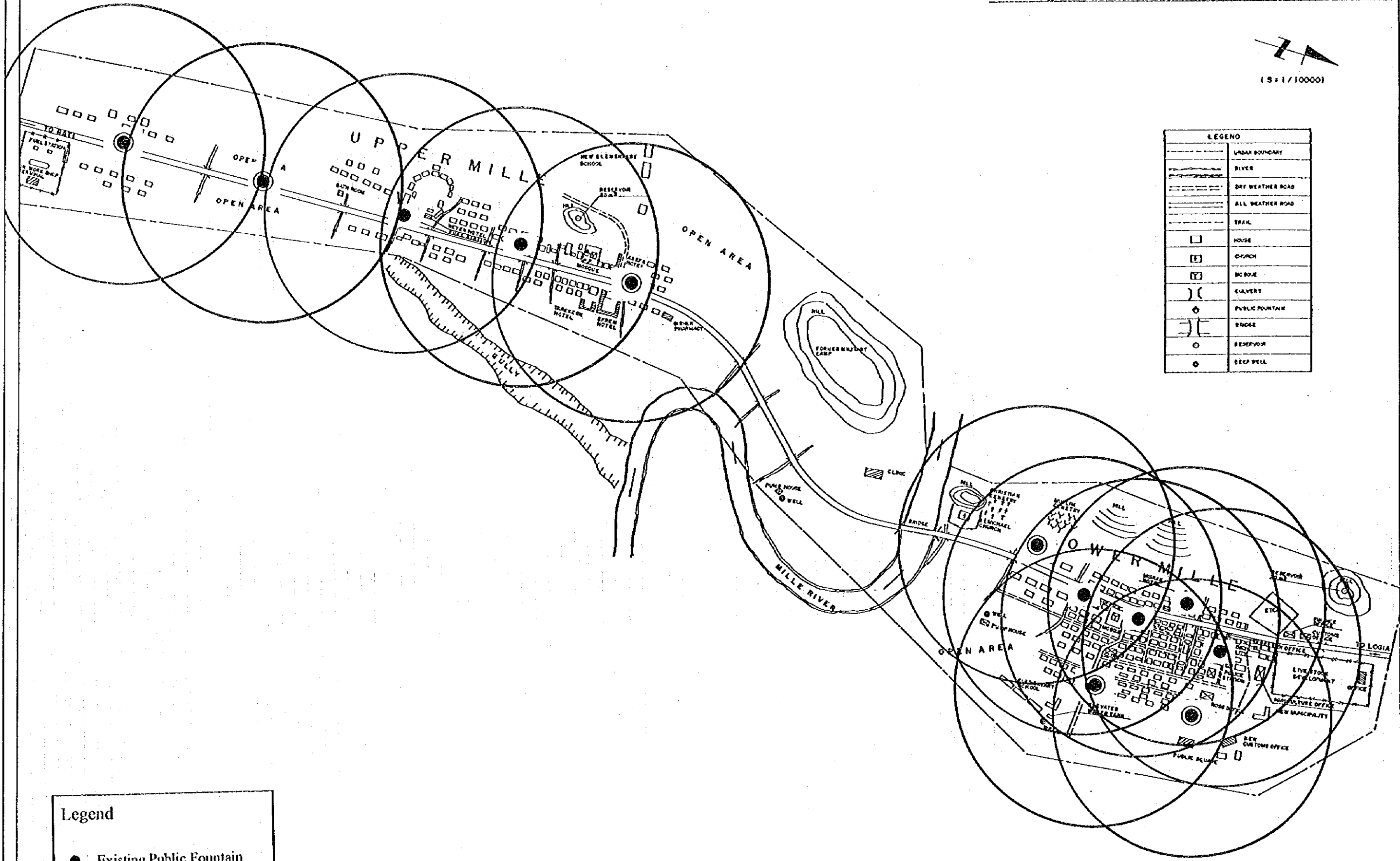
⑦ Node Number (refer to Appendix-10)



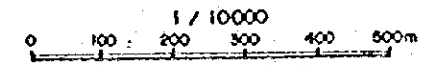
Drawing 8. Location of Proposed Public Fountains

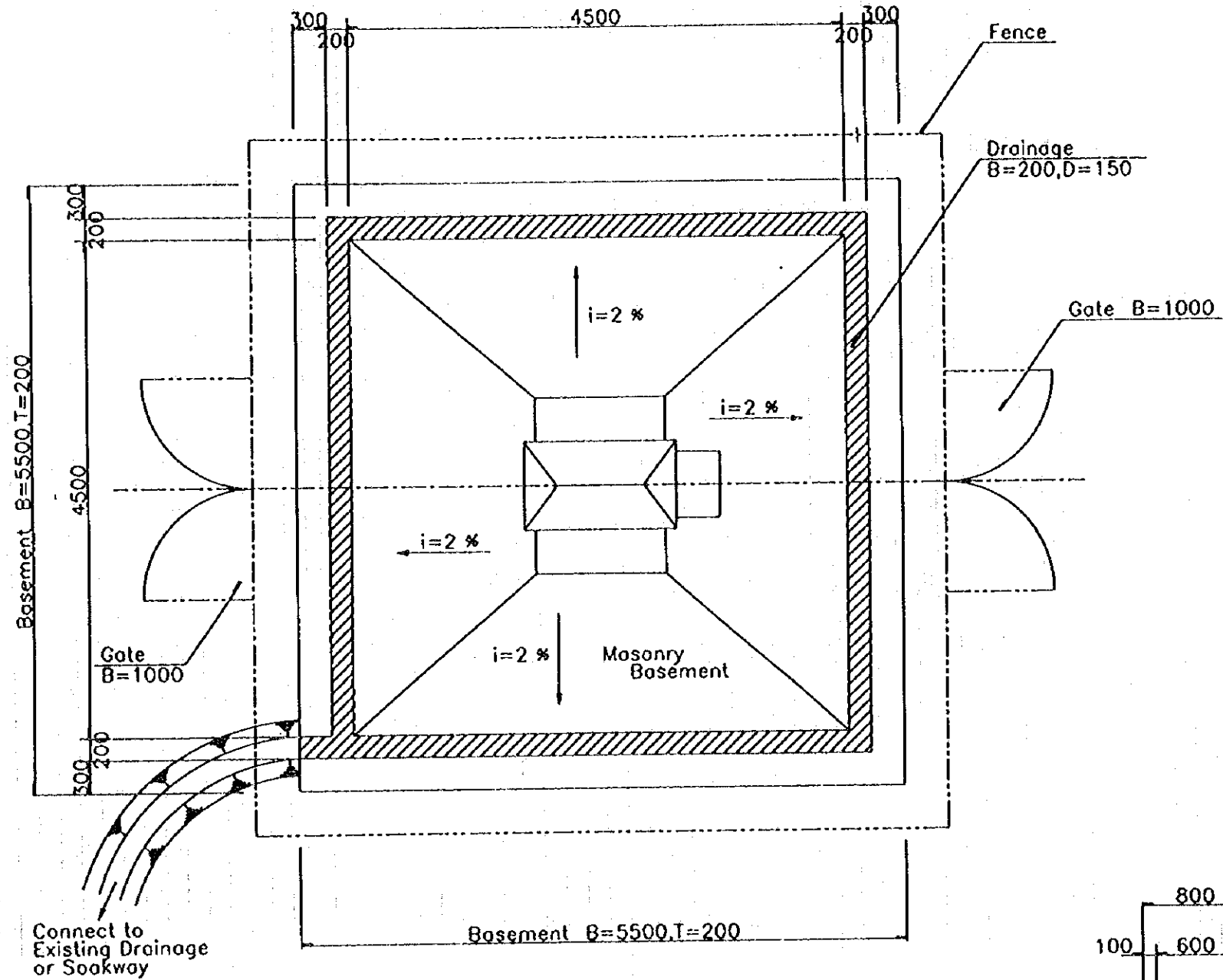


| LEGEND    |                  |
|-----------|------------------|
| ---       | URBAN BOUNDARY   |
| ~~~~~     | RIVER            |
| - - - - - | DRY WEATHER ROAD |
| =====     | ALL WEATHER ROAD |
| - . - . - | TRAIL            |
| □         | HOUSE            |
| ⊞         | CHURCH           |
| ⊞         | MOSQUE           |
| ))        | CULVERT          |
| ⊙         | PUBLIC FOUNTAIN  |
| ⊞         | BRIDGE           |
| ○         | RESERVOIR        |
| ⊙         | DEEP WELL        |



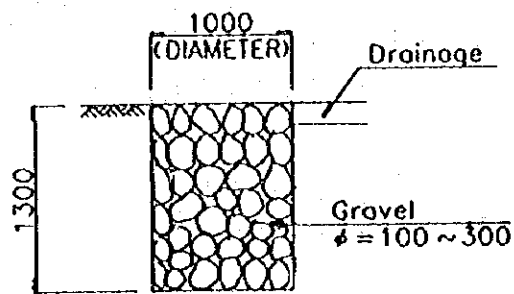
| Legend |                          |
|--------|--------------------------|
| ●      | Existing Public Fountain |
| ⊙      | Proposed Public Fountain |



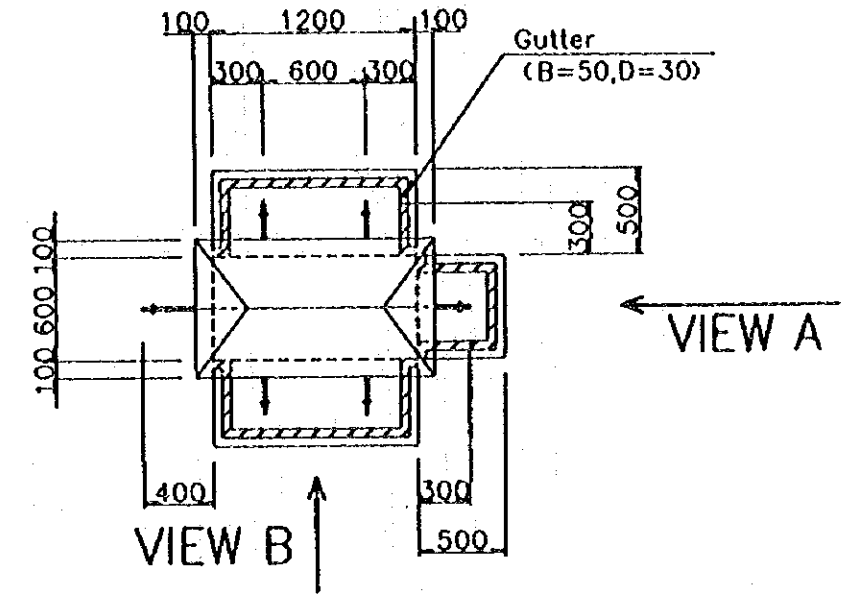


GENERAL PLAN

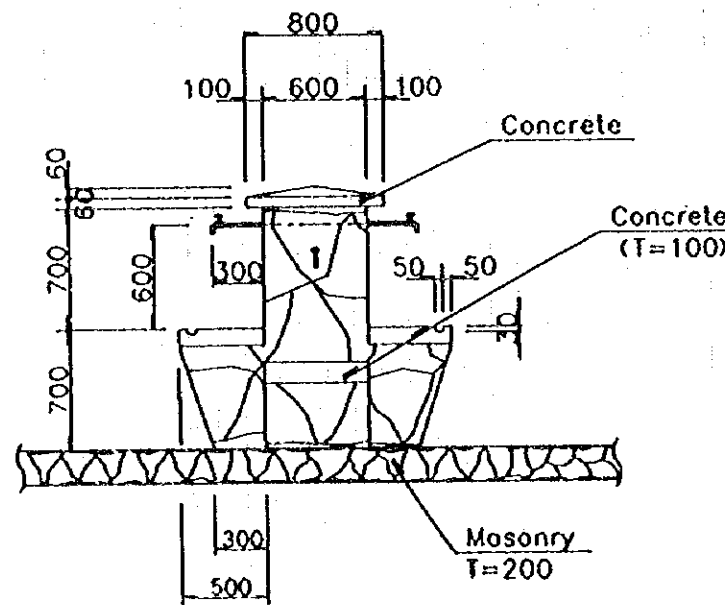
- Quantity:
- Concrete : 0.25 m<sup>3</sup>
  - Form-work : 0.66 m<sup>2</sup>
  - Masonry : 7.08 m<sup>3</sup>
  - Fence : 2 m X 20.4 m
  - Pipe : 6 m
  - Tap : 6 NOS
  - Meter : 1 NOS
  - Valve : 1 NOS
  - Excavation : 13 m<sup>3</sup>
  - Gravel : 1 m<sup>3</sup>



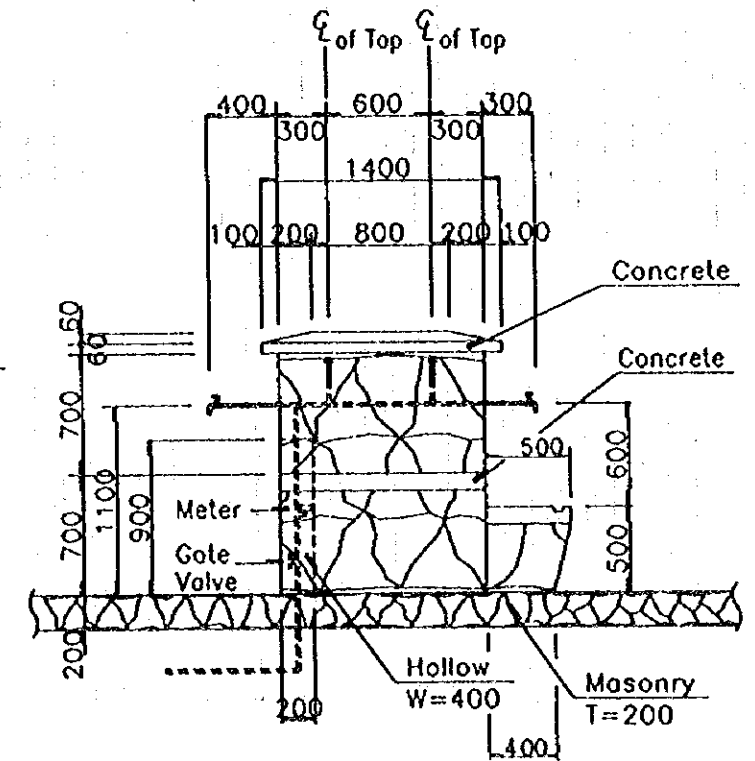
SOAKWAY



PLAN OF PUBLIC FOUNTAIN



VIEW A

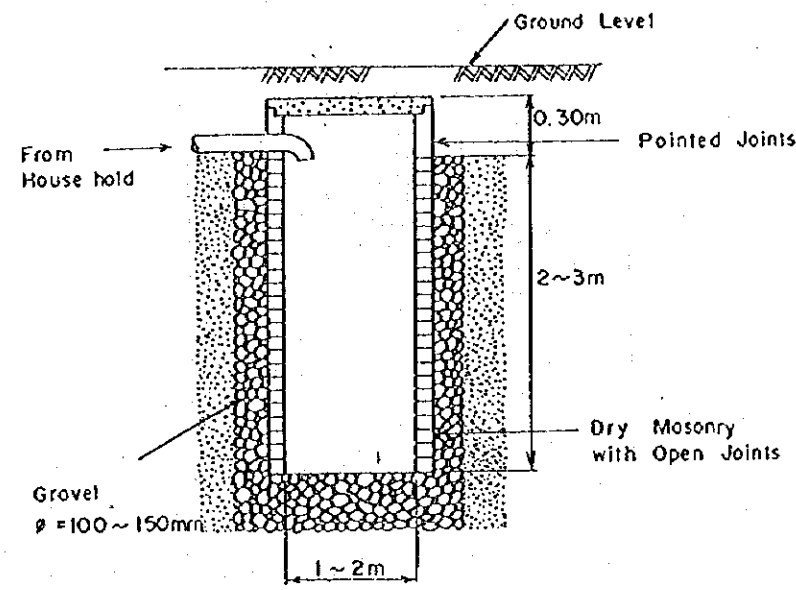


VIEW B

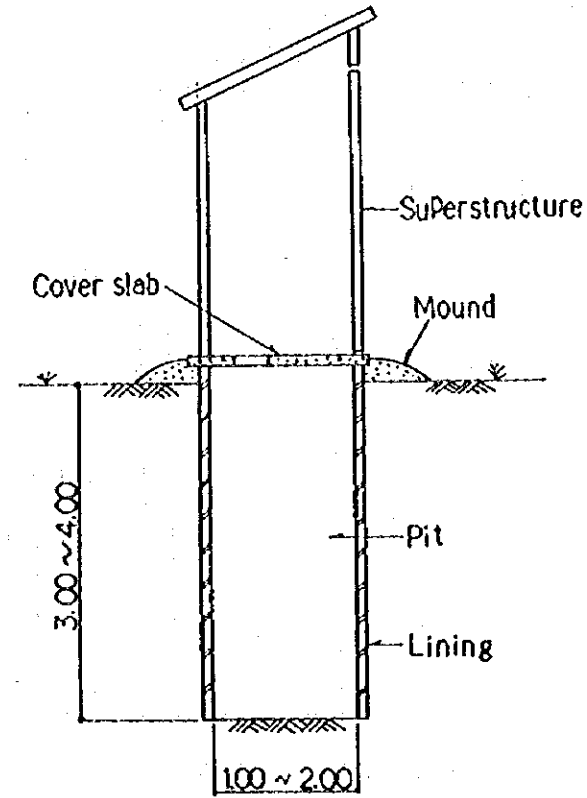
NOTE:  
1. All dimensions are shown in millimeter.



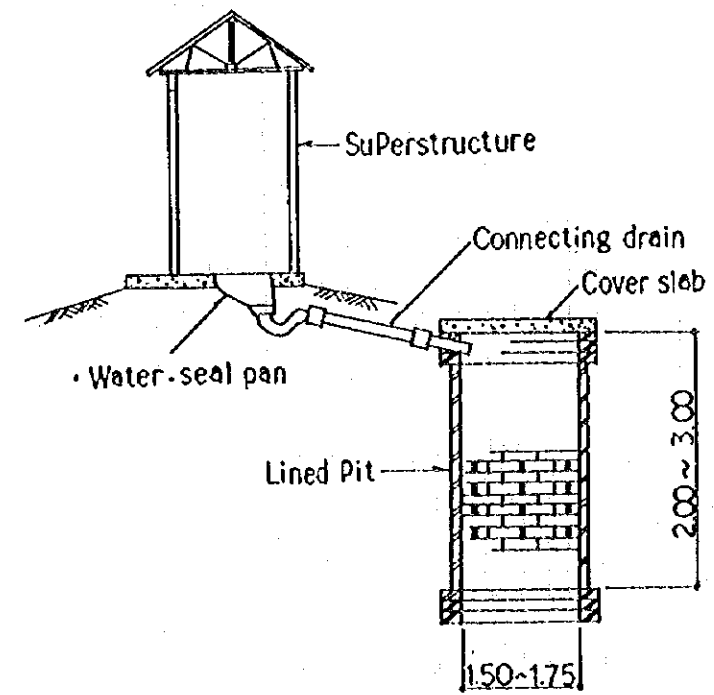
**Drawing 10. Layout of Household Waste Water Disposal Pit & Toilet**



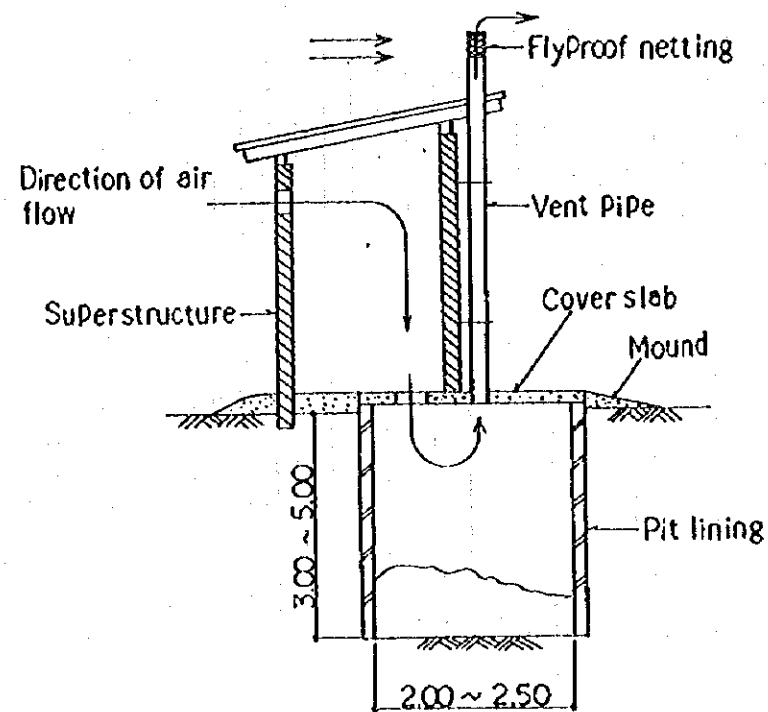
**Waste Water Disposal Pit**



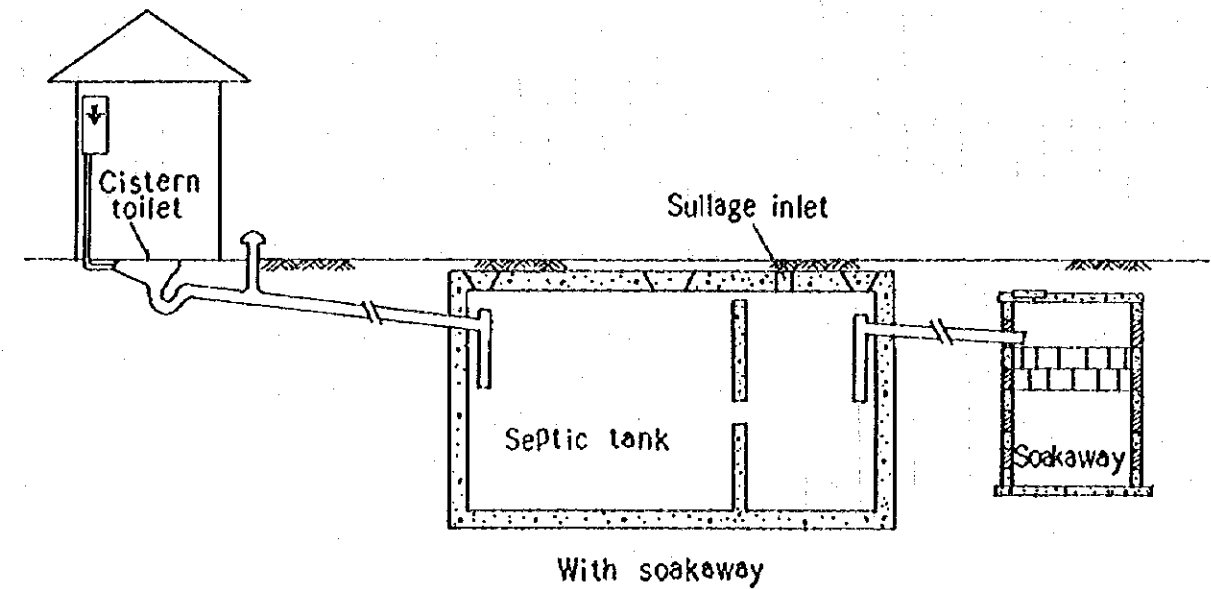
**Improved Traditional Pit Latrine**



**Pour-flush latrine and Soakaway Pit**

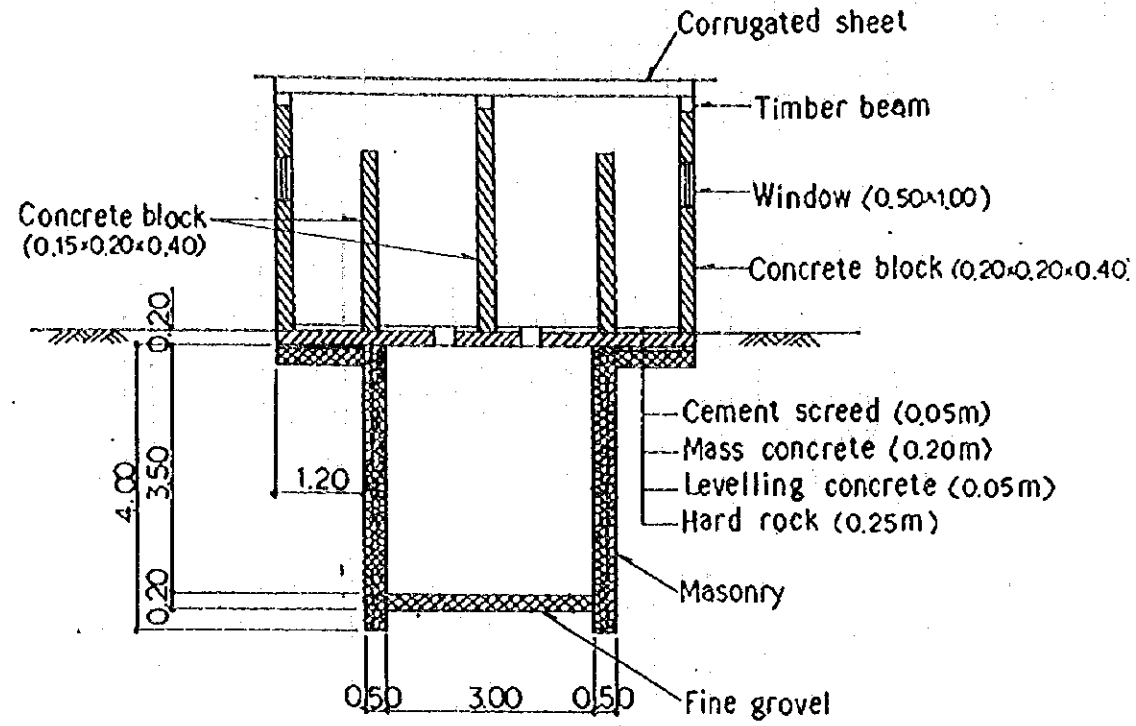


**VIP Latrine**

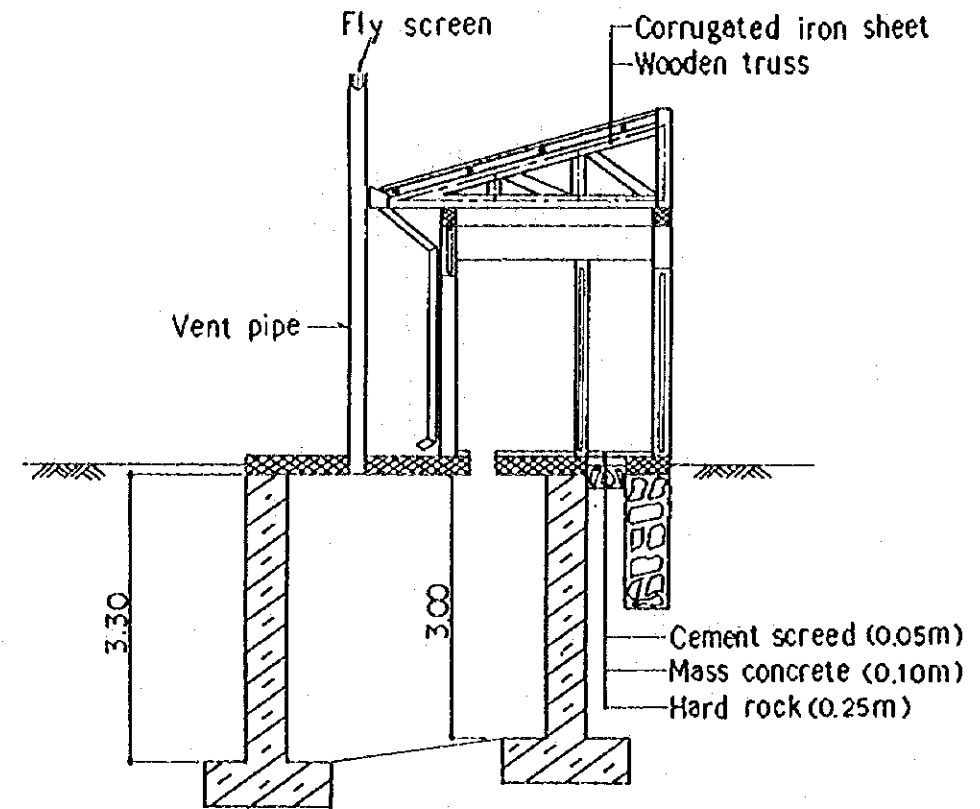


**Cistern-flush Toilet and Septic Tank**

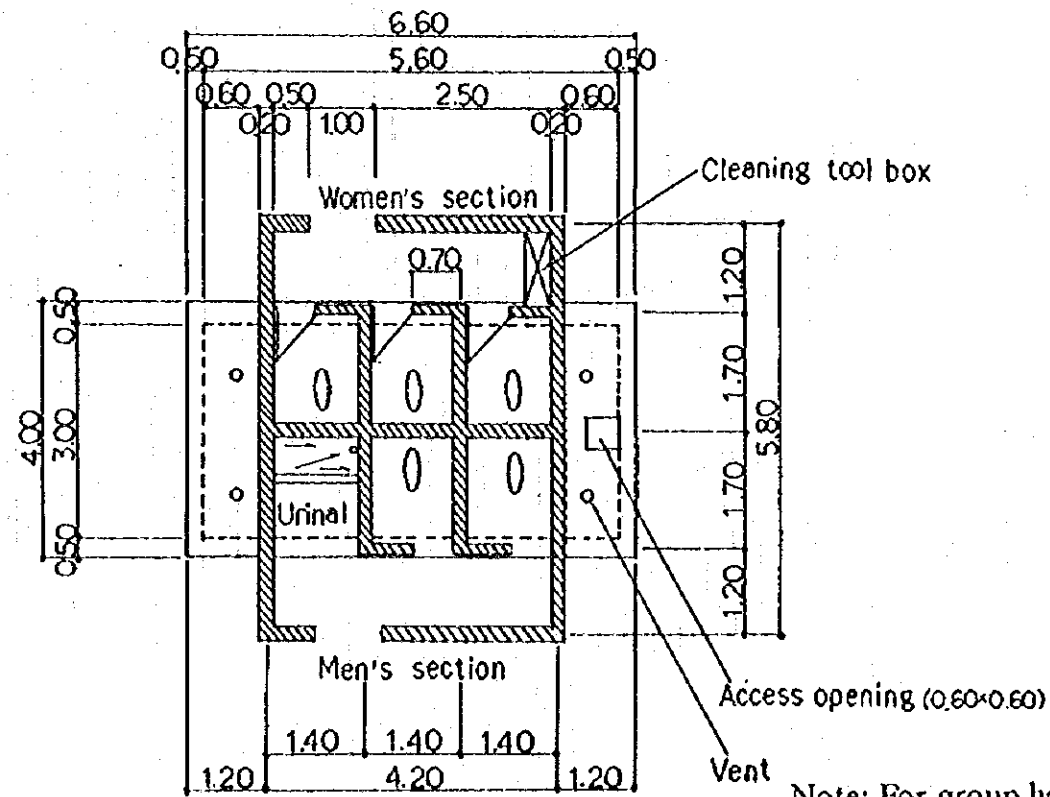
**Drawing 11. Layout of Community Type Toilet and VIP Public Type Toilet**



**Typical Section**

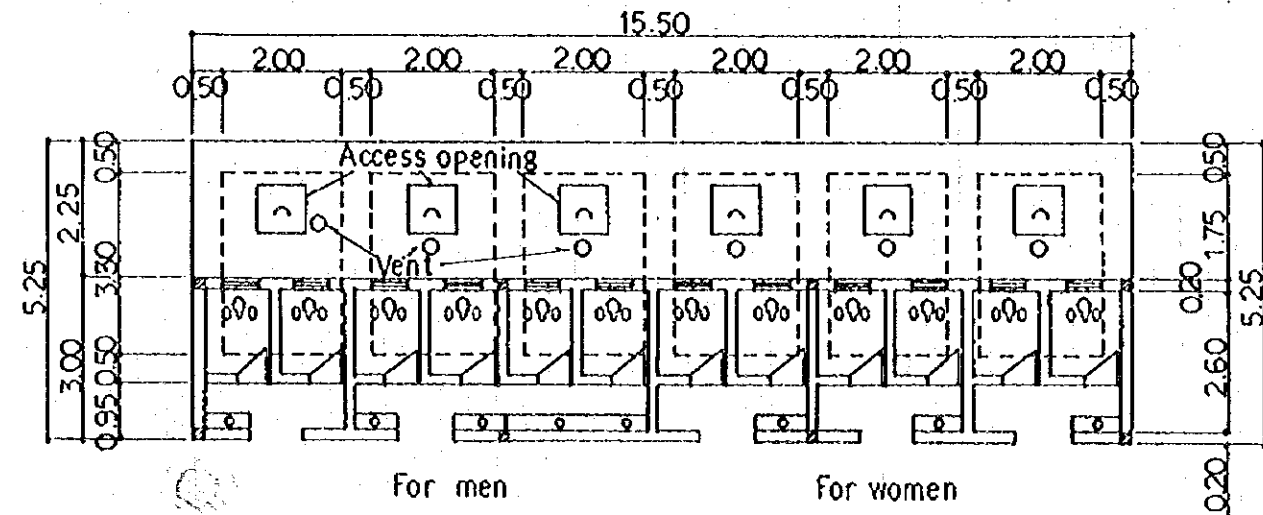


**Typical Section**



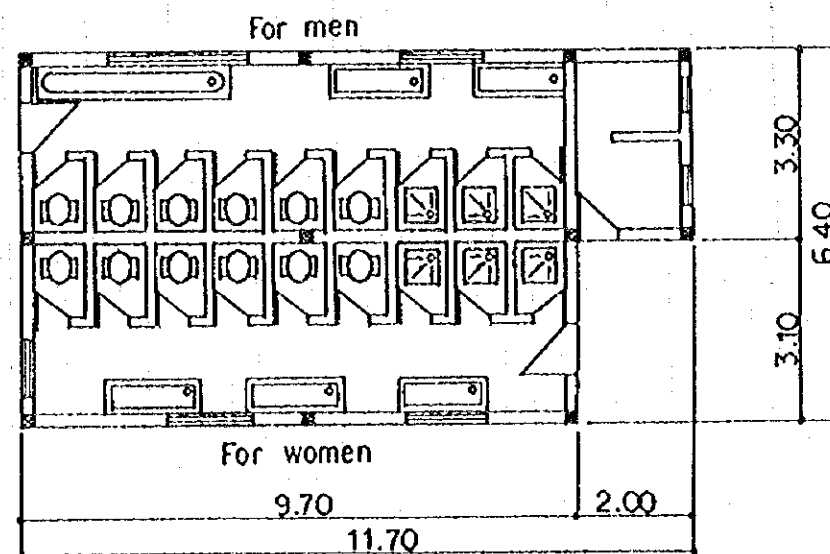
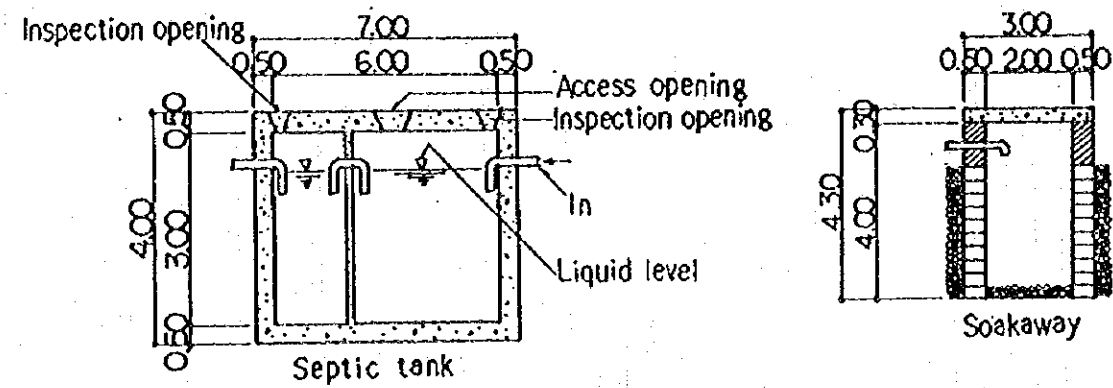
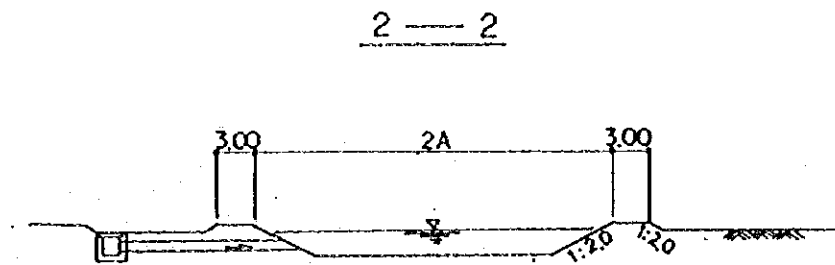
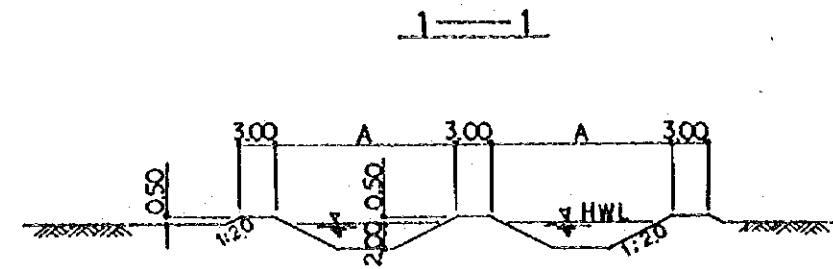
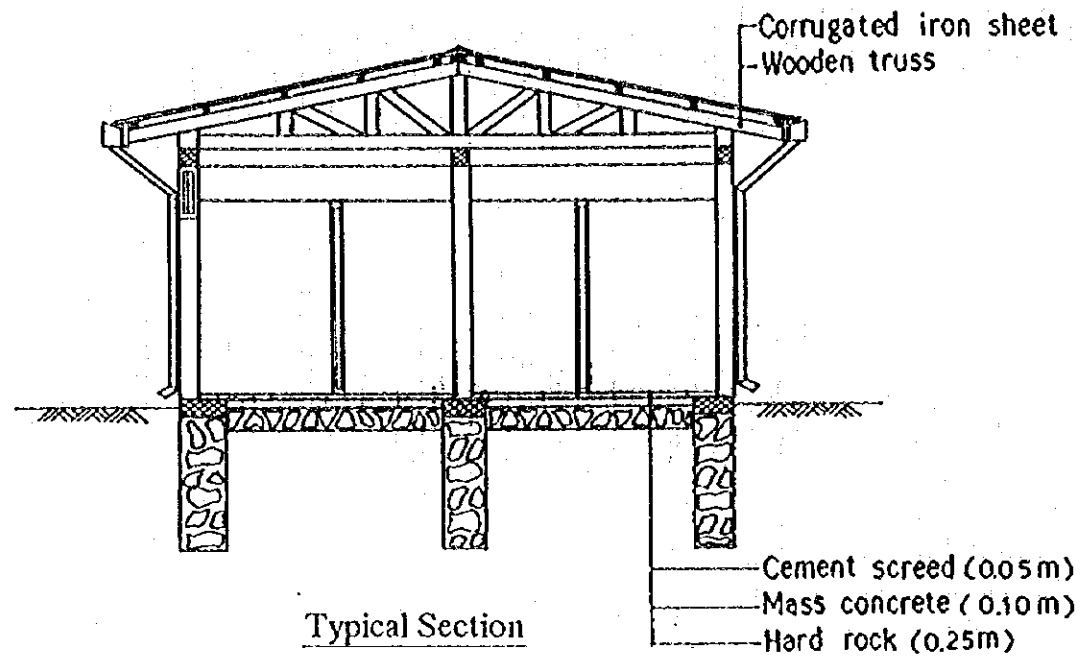
**VIP Latrine (Community Type)**

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

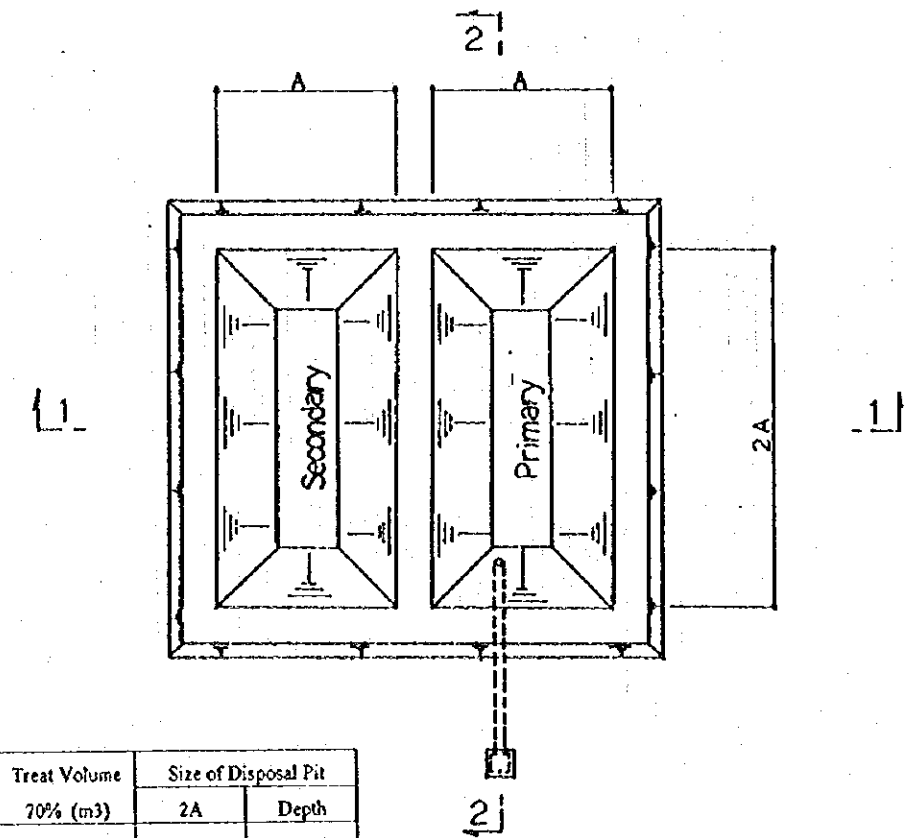


**VIP Latrine (Public Type)**

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



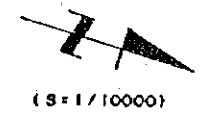
**Pour-flush Latrine with Shower (Public Type)**



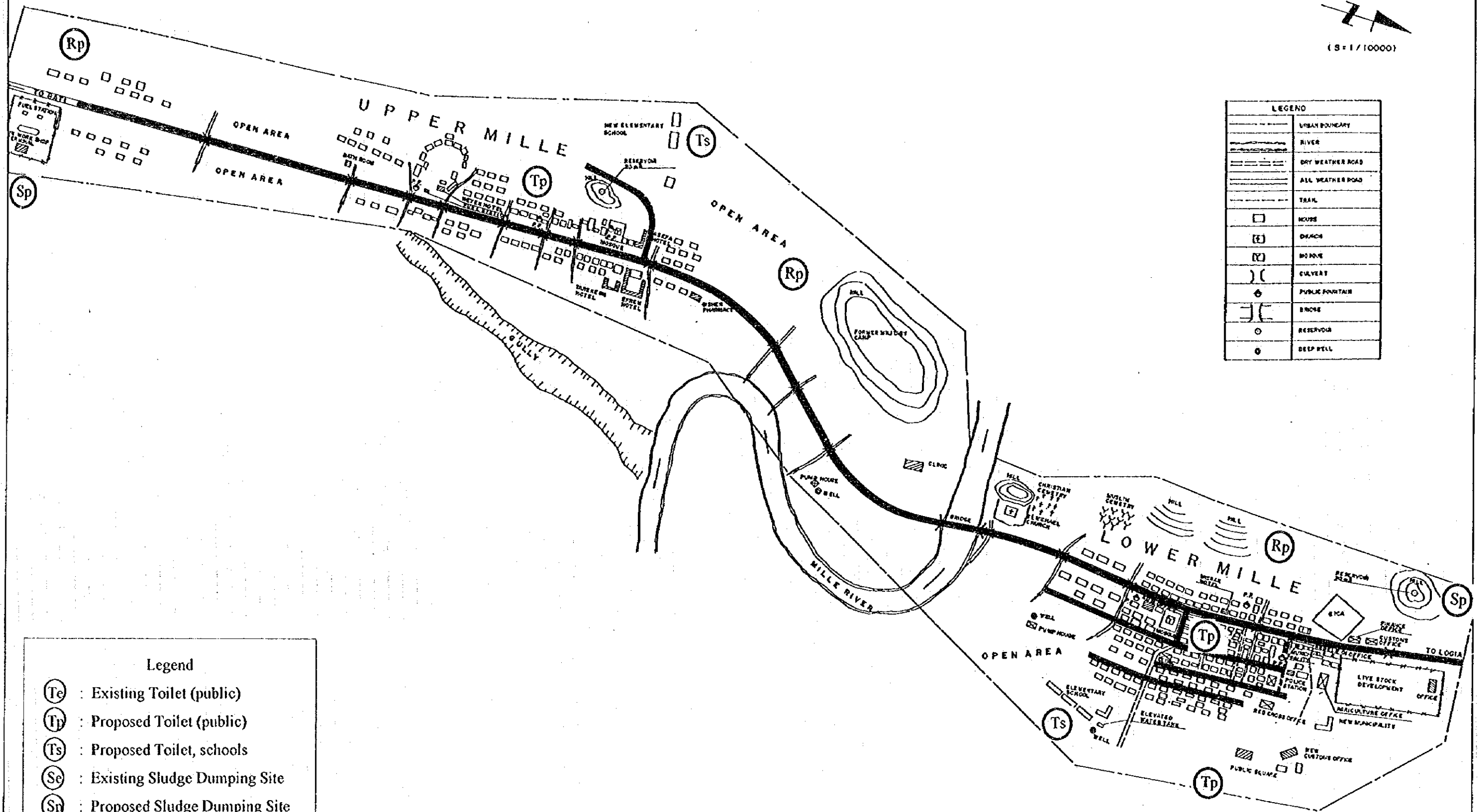
| Urban Center | Population | Sludge Volume               | Treat Volume          | Size of Disposal Pit |       |
|--------------|------------|-----------------------------|-----------------------|----------------------|-------|
|              |            |                             |                       | 2A                   | Depth |
| Mille        | 8,200      | 0.2m <sup>3</sup> /Man/Year | 70% (m <sup>3</sup> ) | 24m                  | 2m    |

**Sullage Disposal Pit**

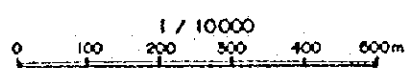
Drawing 13. Location of Sanitary Facilities



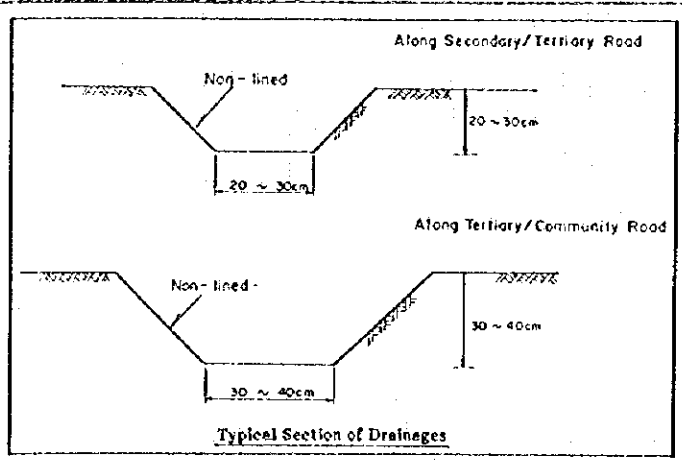
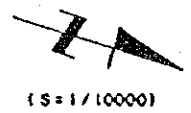
| LEGEND |                  |
|--------|------------------|
|        | URBAN BOUNDARY   |
|        | RIVER            |
|        | DRY WEATHER ROAD |
|        | ALL WEATHER ROAD |
|        | TRAIL            |
|        | HOUSE            |
|        | DEWASH           |
|        | MOBILE           |
|        | CULVERT          |
|        | PUBLIC FOUNTAIN  |
|        | BENCH            |
|        | RESERVOIR        |
|        | DEEP WELL        |



| Legend |                                 |
|--------|---------------------------------|
|        | : Existing Toilet (public)      |
|        | : Proposed Toilet (public)      |
|        | : Proposed Toilet, schools      |
|        | : Existing Sludge Dumping Site  |
|        | : Proposed Sludge Dumping Site  |
|        | : Existing Refuse Dumping Site  |
|        | : Proposed Refuse Dumping Site  |
|        | : Experiment Toilet             |
|        | : Ds (Proposed Drainage System) |



Drawing 14. Current Drainage Condition and Improvement Plan

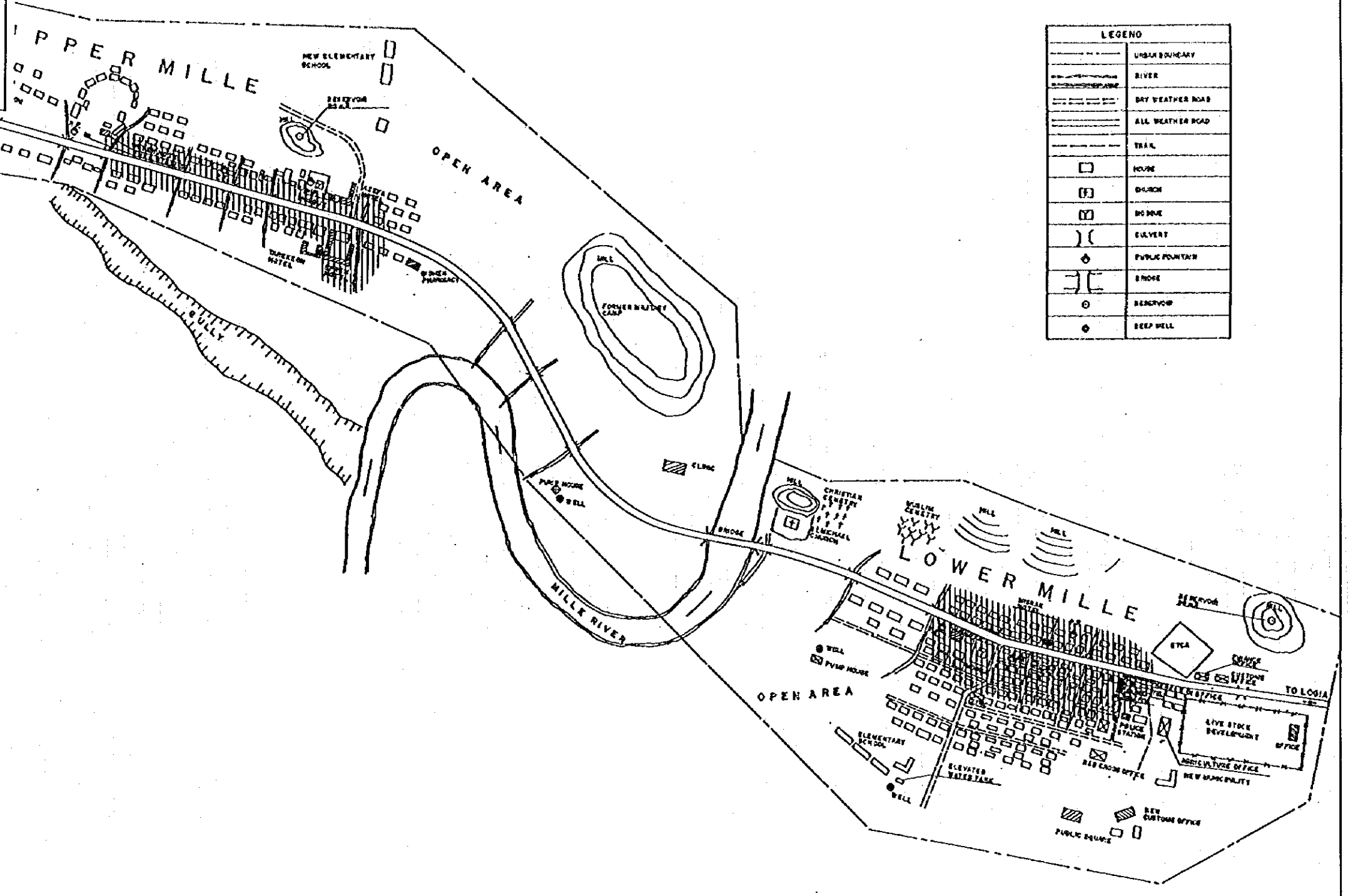
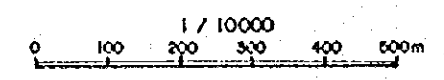


| LEGEND  |                  |
|---------|------------------|
| [---]   | URBAN BOUNDARY   |
| [~~~~~] | RIVER            |
| [=====] | DAY WEATHER ROAD |
| [=====] | ALL WEATHER ROAD |
| [-----] | TRAIL            |
| [□]     | HOUSE            |
| [⊞]     | CHURCH           |
| [⊞]     | BO HOME          |
| [)]     | CULVERT          |
| [⊕]     | PUBLIC FOUNTAIN  |
| [=]     | BRIDGE           |
| [○]     | WATERPUMP        |
| [⊙]     | DEEP WELL        |

Drainage Situation. Proposed Pubic Toilet MILLE

Explanatory Notes:

- [Cross-hatched box] Very Poor
- [Vertical lines box] Fairly Poor
- [Horizontal lines box] Poor











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