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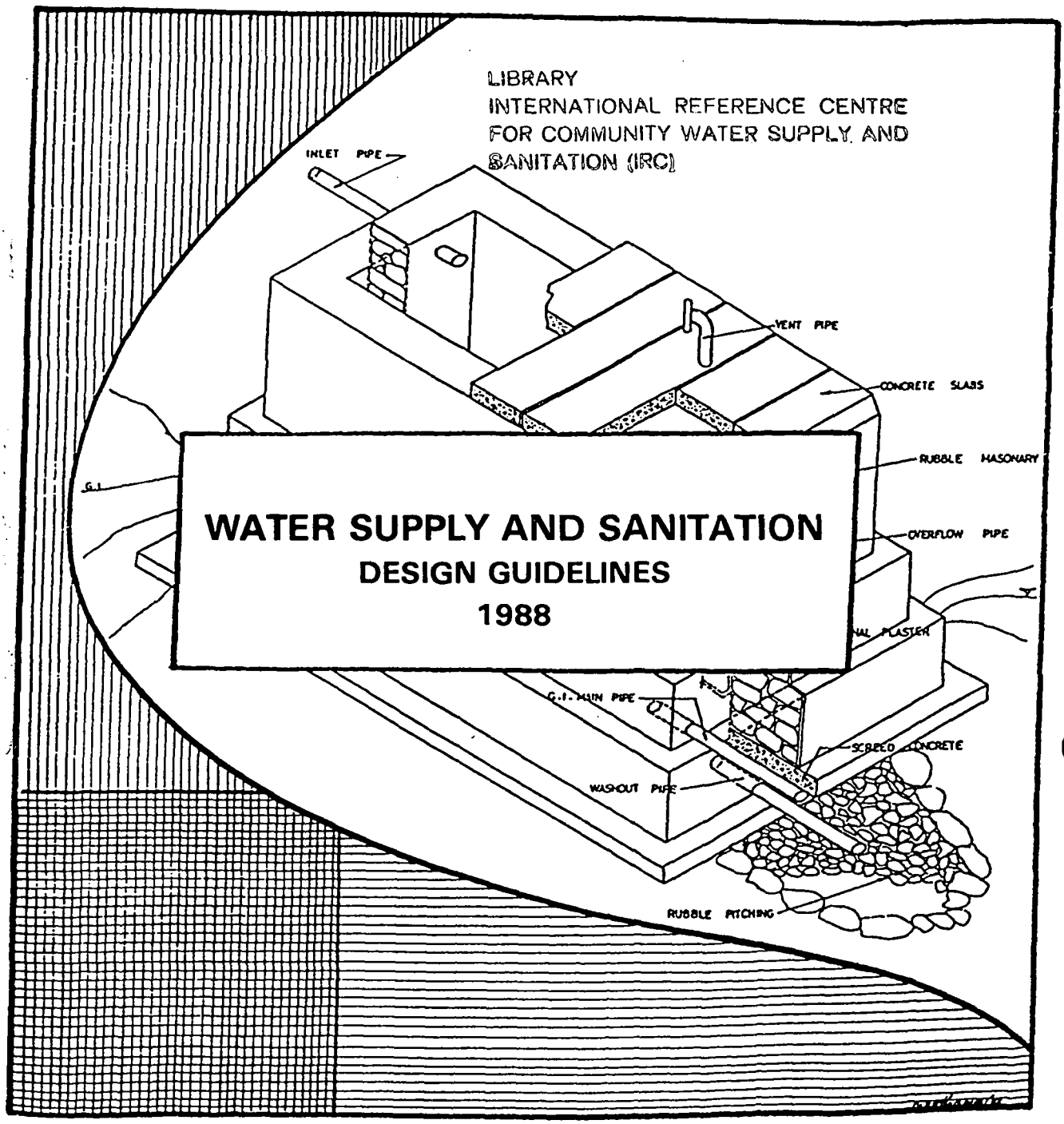
ஜனதா தோட்ட அபிவிருத்திச் சபை

JANATHA ESTATES DEVELOPMENT BOARD

SOCIAL DEVELOPMENT DIVISION, No. 320, DARLEY ROAD, COLOMBO 10.



WATER SUPPLY AND SANITATION

DESIGN GUIDELINES

1988

1988 PUBLICATION

M.T.I.P. - WATER SUPPLY & SANITATION DESIGN GUIDELINES 1988

Contents

1. CRITERIA

1.1. General

1. The unit of planning is the Division of an estate. Once the Division is selected, the full programme of water supply and sanitation is completed.
2. Provisions for opertion & maintenance in terms of budget and staff are set up in the planning stages.
3. Costs for necessary site investigations, tools and water quality analysis are considered to be part of the construction cost.
4. Beneficiary involvment in planning, construction, operation & maintenance of water and sanitation facilities is an essential requirement. This contributes to proper use of facilities, fulfilment of needs and hygine awareness.

1.2 Water Supply

5. Water is provided in the proximity of the houses by pipe and tap.
6. Quality: the water supplied is safe for drinking by the beneficiaries, while no water treatment is applied.
7. Quantity: the quantity of supply is enough for drinking, cooking and sanitation.
8. Preference is given to ground water as source of supply against surface water. Gravity fed supply is preferred to pumped supply.
9. Waste water drainage and disposal in a sanitary manner is an essential part of the water supply system.
10. The monitoring of water quality is an integral part of operation & maintenance.

1.3. Sanitation

11. Latrines are provided as private facilities (However, at back to back lines, one latrine is provided for. each 2 households.)
12. Latrines are provided only when adequate water supply is available.

2. GUIDE LINES

The following are conisidered general guidelines of water supply & sanitation. However, if it is required to deviate from the guidelines due to specific reasons, the Regional social Development officials have to be consulted.

2.1. Water Supply

1. The intake, pipe lines and reservoir safeguard the water quality of the source.
2. The area of the water intake is protected by fencing and safeguarded against the influx of surface water by a surrounding drain.
3. In the catchment area, application of agro-chemicals, disposal of grabage and excreta are eliminated.
4. At workers houses: 1 tap is provided for each 5 households within a distance of 50 m from the houses. At staff & excecutive houses, a house connection is provided. Taps for sanitation purposes are avalible at a distance not more then 20 m from each latrine.
5. Water requirements are based on 200 litres/day per workers household 750 litres/day for staff household. The latter includes water requirements for drinking, cooking and sanitation as well as bathing and washing. In the case of workers houses, requirement of bathing and washing are met separately and are not dealt with under the current M.T.I.P.
6. The source flow is adequate in dry season to meet the calculated water requirements.
7. Storage reservoirs are preferably located close to the supply area, at a minimum elevation of 6 m above the supply area. In case of overhead Reserviors, that the site to be selected to meet the supply head 6 m.
8. Generally PVC pipes in trench are used. The depth of trench to be 45 cm normally and 120 cm across the trafic roads. GI piping is applied where trenching is not feasible and for all exposed parts and connections with structures,

Pipe standards are:

— for PVC : Type 1000 as per Sri Lanka standards
— for GI : Medium Duty as British standards

9. Taps for tapstands are of a self-closing type: Heavy duty jayson Tap shall be used.

   Waste water is drained and disposed in a sanitary manner. The area around the tapstand shall not become inundated or muddy.

10. The pressure in a gravity pipeline does not exceed the equivalent of 50 m water column.

11. The overall system are desgined to suit the local condition and requirement. The elements of the are constructed as per approved typical drawings.

12. After completion of the construction, it's components are properly cleaned and disinfected. The entire Water Supply Line to be chlorinated with liquid chlorine Solution (bleaching powder) the dose to be not less then 50 ppm of available chlorin. The detention duration to be not less than 12 hours. During the process all valves and accessories to be operated than the pipe line to be thoroughly flushed with clean water after the desinfection.

13. As operation & maintenance of the water supply system, all the components as intakes pipelines, tanks, and taps etc, are regularly checked for damages and leaks. Repairs and rectification work are carried out promptly. The reservoirs are cleaned regularly giving sufficient notice to the consumers. Regular monitoring of water quality & quantity is carried out.

2.2. Sanitation

14. The latrines are sited at the back or gable sides of line houses at distances of not less than 3 m and not more than 30 m in agreement with the beneficiaries.

15. The Water-Seal Pit Latrine type is standard.

16. The latrine construction is according to approved typical drawings.

17. The latrines are cleaned daily by the users. Disinfection is carried out regularly in a proper manner.

    Wooden parts are inspected regularly for termite attacks and are attended promptly.

3. PROCEDURES

1. Estates and Divisions are selected by the Directors.
2. T.A.s visit the estates and advise the Superintendents on the technical design aspects and on the other details as required by the Construction Formats.
3. The Superintendents submit the duly perfected Design Formats to the respective Directors.
4. The Directors grant their approvals regarding the work proposed in the Design Formats.
5. The Superintendents are responsible for the implementation of the work, that are done as per JEDB regulations.
6. T.A.s visit the estates regularly to advise and monitor on progress and quality of work.
7. The works are commissioned and taken over by estates as per standard procedure.

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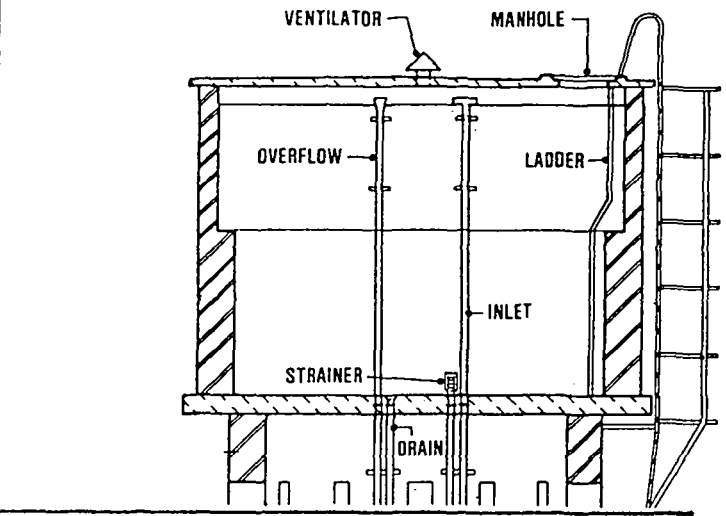
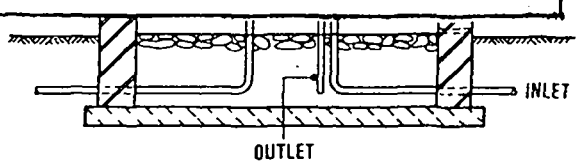
SOCIAL DEVELOPMENT DIVISION 320 DARLEY ROAD, COLOMBO – 10



WATER SUPPLY AND SANITATION

TECHNICAL SPECIFICATION

1988



1988 PUBLICATION

J. E. D. B.	REGION	ESTATE	(SUB) DIVISION	SCHEME No:	DATE

BILL OF QUANTITIES (BOQ)

1. Intake—Spring

Item	Description	Unit	Qty.	Rate	Amount
01.	Site cleating and diversion of spring flow from place of excavation.	Item			
02.	Excavation for rubble wall and foundation.	Cu.m.			
03.	Concrete base 150 mm. thick, 1:3:7 mix	Sq.m.			
04.	Construction of Rubble wall 300 mm. thick	Cu.m.			
05.	Valves and fittings	Item			
06.	Internal and external plaster 10 mm. thick 1:4 mix	Sq.m			
07.	Rubble filling, (150–200mm) rubble	Cu.m.			
08.	Sealing off top surface of rubble fill by 1:4 cement/sand mix.	Item			
09.	Fencing around intake, and drainage and landscaping etc.	Item			
	5% contingency				Rs.
	Total				Rs.

Contractor

Sign, Name, Address

J. E. D. B.	REGION	ESTATE	(SUB) DIVISION	SCHEME No:	DATE

WSA-023

BILL OF QUANTITIES (BOQ)

Stand Post - Type C

Item	Description	Unit	Qty.	Rate	Amount
1.	Excavation for foundation and Compacted fill	m3	0. 30		
2.	Compacted fill.	m3	0. 07		
3.	Rubble work in foundation in 1:5 mix	m3	0. 23		
4.	Concrete post as per drawing with 1:2:4 concrete. Shuttering and reinforcing steel to be included.	m3	0. 03		
5.	Concrete Platform of 1:2:4 mix as per drawing. Rate to include for the Granite stone and shuttering.	m3	0. 10		
6.	13 mm diameter GI Pipes and fittings (Medium duty), as per drawing.	Item	Allow		
7.	13 mm diameter Cast Iron Jason Tap.	No	01		

Cost of 01 No Standpost

Cost of.....Nos Standposts

5% contingency

Total

Contractor

Sign, Name, Address

J. E. D. B.	REGION	ESTATE	(SUB) DIVISION	SCHEME No:	DATE

BILL OF QUANTITIES (BOQ)

Tap stand – Type R

Item	Description	Unit	Qty.	Rate	Amount
01.	Site clearing & levelling	Item	Allow		
02.	Excavation of foundation and comaction	Cu.m.			
03.	Rubble foundation 1:4 mix.	Cu.m.			
04.	Platform and Post Rubble masonry 1:4 mix.	Cu.m.			
05.	Drain tap to Waste Water disposal point stone or brick work with cement plastered 1:4 mix	L.m			
06.	Valves and fittings	Item	Allow		
07.	Finished grading	Item	Allow		
	Cost of 01 No. Stand Post	Rs.			
	Cost of ... ...Nos. Stand Posts	Rs.			
	Sub Total	Rs.			
	5% contingency	Rs.			
	Total quotation for tapstand	Rs.			

Contractor

Sign, Name, Address

J. E. D. B.	REGION	ESTATE	(SUB) DIVISION	SCHEME No:	DATE

WSA-024

BILL OF QUANTITIES (BOQ)

3 Cistern Tank

Item	Description	Unit	Qty.	Rate	Amount
	1. No. Cistern Tank				
1.	Excavation	m3	3.70		
2.	Compacted fill	m3	1.85		
3.	Rubble work (1:5) in foundations and tank.	m3	7.84		
4.	75 mm thick screed concrete 1:3:6 under tank base	m2	1.10		
5.	Internal plastering, 20 mm thick with 1:3 mix.	m2	8.30		
6.	External Plastering, 13 mm. thick with 1:5 mix.	m2	14.04		
7.	Concrete roof including reinforcement	m2	3.80		
8.	50 mm thick manhole cover complete.	No	01		
9.	GI pipes and fittings as per drawing including ventilator	Item	Allow		
10	Jason taps (C. I.)	Nos	04		
11.	1:2:4 Concrete in platform. Rate to include for the, Granite stones as per drawing.	m3	1.11		
	5% contingency				
	Total				

J. E. D. B.	REGION	ESTATE	(SUB) DIVISION	SCHEME No:	DATE

WSA-020

BILL OF QUANTITIES (BOQ)

4. Ground—Reservoir

Item	Description	Unit	Qty.	Rate	Amount
01.	Site clearing	Item			
02.	Excavation of foundation and compaction	Cu.m.			
03.	Screed concrete 75 mm. thick 1:3:6 (1 1/2") concrete	Sq.m.			
04.	Reservoir beds and walls in rubble masonry, 1:4 miz.	Cu.m.			
05.	Valves and fittings	Item			
06.	Internal plastering 20 mm thick, 1:3 mix	Sq.m.			
07.	External plastering 10 mm thick, 1:5 mix	Sq.m			
08.	Construction and placing roof slab. 80 mm. thick. 1:2:4 mix. with 1/2" o MS bars at 150 mm. C/C	Cu.m.			
09.	Construction of joints in roof slab	Item			
10.	Fencing, drainage and land scaping etc.	Item			
	5% contingency	Rs.			
	Total quotation for ground reservoir	Rs.			

Contractor

Sign, Name, Address

FOR BOQ OF GROUND RESERVOIR

QUANTITIES

(in metric units)

Capacity of Reservoir Cu.m.	(Gal.)	Excavation (Cu. m)	Screed Concrete (Sq. m.)	Rubble Masonry (Cu.m.)	Internal Plaster (Sq.m.)	External Plaster (Sq.m.)	Roof Concrete (Cu. m.)
4. 5	(1000)	5.83	8.64	8.52	15.6	24.77	0.69
6. 8	(1500)	7.56	11.2	10.39	20.08	28.61	0.90
9	(2000)	9.07	13.44	12.02	24	31.97	1.08
11	(2500)	10.37	15.36	13.42	27.36	34.85	1.23
13.6	(3000)	12.31	18.24	15.52	32.4	39.17	1.46
16	(3500)	13.32	19.73	15.97	33.9	39.17	1.58
18	(4000)	14.74	21.84	17.29	37.2	41.57	1.75
20	(4500)	16.16	23.94	18.61	40.5	43.97	1.92
22	(5000)	17.58	26.04	19.92	43.8	46.37	2.08

FOR BOQ OF GROUND RESERVOIR

(4) QUANTITIES

(in imperial units)

Capacity of Reservoir (Gallons)	Excavation (Cubes)	Screed Concrete (Sqrs)	Rubble Masonry (Cubes)	Internal Plaster (Sqrs)	External Plaster (Sqrs)	Roof Concrete (Cubes)
1000	2. 1	0. 93	3. 01	1.68	2. 66	0. 24
1500	2. 7	1. 20	3. 67	2.16	3. 08	0. 32
2000	3. 2	1. 45	4. 25	2.58	3. 44	0. 38
2500	3. 7	1. 65	4. 74	2.94	3. 75	0. 43
3000	4. 3	1. 96	5. 48	3.48	4. 21	0. 52
3500	4. 7	2. 12	5. 64	3.65	4. 21	0. 56
4000	5. 2	2. 35	6. 11	4.00	4. 47	0. 62
4500	5. 7	2. 57	6. 58	4.35	4. 73	0. 68
5000	6. 2	2. 80	7. 04	4.71	4. 99	0. 73

Note :

1 Cube = 100 Cu. ft = 2.83 cu. m.
1 Sqr = 100 Sq. ft = 9.30 sq. m.

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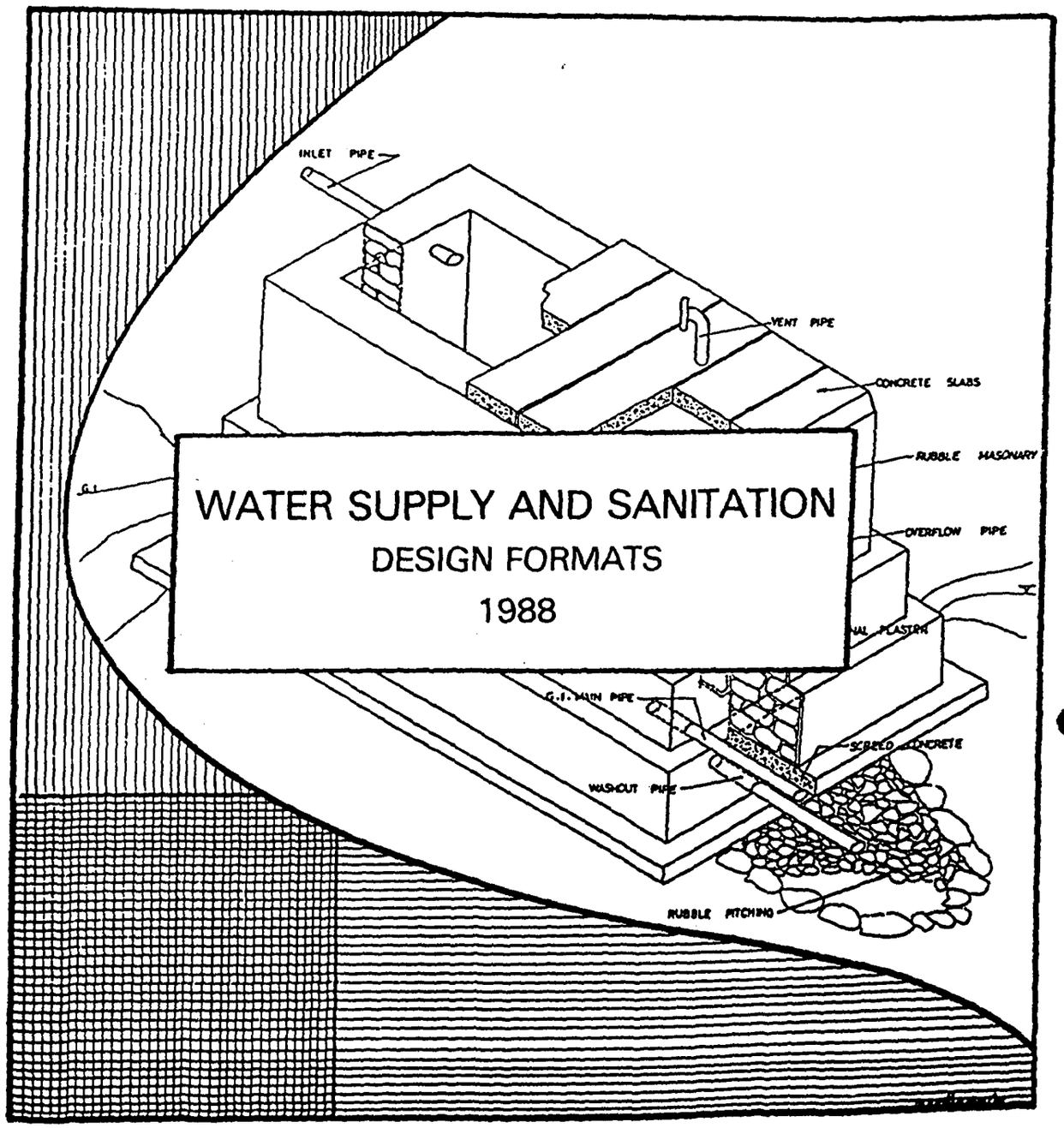
JANATHA ESTATES DEVELOPMENT BOARD

SOCIAL DEVELOPMENT DIVISION, No. 320, DARLEY ROAD, COLOMBO 10.



WATER SUPPLY AND SANITATION

DESIGN FORMATS

1988

1988 PUBLICATION

JANATHA ESTATES DEVELOPMENT BOARD

M.T.I.P. SOCIAL DEVELOPMENT COMPONENT

J.E.D.B.	REGION	ESTATE	DIVISION	SCHEME No:	DATE

DESIGN OF WATER SUPPLY & SANITATION FACILITIES
DESIGN FORMATS 1988

SUPERINTENDENT : ..... / SIGNATURE .....

DATE: .....

DIRECTOR : ..... / SIGNATURE .....

DATE: .....

J.E.D.B.	REGION	ESTATE	DIVISION	SCHEME No:	DATE

CONTENTS

PREAMBLE:

The aim of these formats is to standerdize water supply/sanitation proposals. If there are any other important details, they also should be annexed.

PART "A" — WATER SUPPPLY

J.E.D.B.	REGION	ESTATE	DIVISION	SCHEME No:	DATE

1. EXISTING SITUATION

Indicate (on both water supply and latrines)
- age and state
- drawbacks
- improvements required

Notations

- Spring Intake
- Partial Dam
- Full Dam Intake
- Dug Well Intake
- Bank Well Intake
- Infiltration Intake
- Break Pressure Tank
- Pump + Pump House
- Suspended Crossing
- Ground Reservoir
- Elevated Water Tank
- Tap Stand
- Cistern Tank
- Executive/Staff House
- Workers Houses
- Pipe Line
- Latrine
- Valve

J.E.D.B.	REGION	ESTATE	DIVISION	SCHEME No:	DATE

2. PROPOSED WATER SUPPLY LAY OUT

(1). Draw a lay-out of the proposed system.
(2). Indicate the length, diameter and type of material of each pipeline.
(3). Indicate the valves in the lay-out.

Notations Use the Notation in Page 3

J.E.D.B.	REGION	ESTATE	DIVISION	SCHEME No:	DATE

3. SOURCE DATA

Type of source(s) selected: .....

(1). SPRING INTAKE

Measured (total) flow =. litres/min.

(Date : .....)

Estimated dry season flow = ... litres/min.
= .....litres/day
(compare with page 6)

Is the source adequate to meet 150% of the daily demand? Yes/No

Is contamination of the source excluded? Yes/No

(2). WELL INTAKE*

Measured discharge = ... litres/min.

(Date : .....)

Estimated dry season discharge = ... litres/min.

Is the source adequate to meet 150% of the daily demand Yes/No

is contamination of the source excluded? Yes/No

(3). ANY OTHER DETAILS:

* The discharge of a well can be determined by:
1) emptying the well and measuring the time to fill up again to the original water level and calculating the volume in the well at that level or
2) pumping at constant water level and measuring the discharge

J.E.D.B.	REGION	ESTATE	DIVISION	SCHEME No:	DATE

4. CHEMICAL AND PHYSICAL QUALITY OF THE SOURCE WATER

Standard Analysis

Units

Chemical and Physical Quality

1. Appearance
2. Taste
3. Odour
4. Colour
5. Turbidity
6. Settleable matter
7. Floating solids
8. Total solids
9. Total hardness
10. Phenolphthalein alkalinity
11. Total alkalinity
12. Carbonate alkalinity
13. Bicarbonate alkalinity
14. Dissolved Amonia
15. Albuminoid Amonia
16. Iron
17. Chlorides
18. Nitrites
19. Nitrates
20. Sulphates
21. Electrical conductivity

Note: Guarantee the quality of the water sample by using new plastic containers that have been carefully rinsed with the same source water (see annex 2)

J.E.D.B.	REGION	ESTATE	DIVISION	SCHEME No:	DATE

5. WATER REQUIREMENT AND RESERVOIR CAPACITY

Supply Area	No of households to be served *		Water Requirement (liters/day)
	Type A Executive/Staff	Type B Workers houses	

(1). Daily Demand, litres per day = ...

(2). Reservoir capacity needed = Daily Demand = ...litres

Capacity of TYPICAL RESERVOIR selected = ...litres

* Type A : 750 litres/day per household
Type B : 200 litres/day per household

J.E.D.B.	REGION	ESTATE	DIVISION	SCHEME No:	DATE

6. PIPE DIAMETERS AND LENGHTS

Pipe (ref. lay out)	Length (m)	No. of households supplied * by the pipe Unit requirement		Flow in pipe (litres/day)	Selected pipe internal diameter (Ref. Annex 1)
		Type A Executive/Staff	Type B Workers houses		

* Unit requirements
Type A. 750 litres/day per household
Type B. 200 litres/day per household

J.E.D.B.	REGION	ESTATE	DIVISION	SCHEME No:	DATE

7. NUMBER OF TAPS

NUMBER OF HOUSEHOLDS

- In Single Linehouses :
- In Back to Back Linehouses :
- TOTAL : _____

1. TAPS *

(1). No of taps required (total) : .....

- No of standpipes : .....
- No of Cistern tanks : .....

* Minimum requirement 1 tap for 5 households. Check taps for latrines

J.E.D.B.	REGION	ESTATE	DIVISION	SCHEME No:	DATE

8. ESTIMATE OF PIPELINE

Give a complete estimate of pipeline including pipes (PVC & GI), fittings (elbows, tees, reducers, sockets, flanges, unions, end caps, solvent cement, tape etc.), valves, tools required, labour, transport etc.

(1). = Rs. .....

(2). = Rs. .....

(3). = Rs. .....

(4). = Rs. .....

(5). = Rs. .....

(6). = Rs. .....

(7). = Rs. .....

(8). = Rs. .....

(9). = Rs. .....

(10). = Rs. .....

(11). = Rs. .....

(12). = Rs. .....

(13). = Rs. .....

(14). = Rs. .....

(15). = Rs. .....

SUB TOTAL = Rs. .....

5% Contingency = Rs. .....

TOTAL = Rs. .....

J.E.D.B.	REGION	ESTATE	DIVISION	SCHEME No:	DATE

9. SUMMARY OF COST ESTIMATES *

1. Intake Structure (Type...../Nos.....) Rs. .....
2. Reservoirs (Type...../Nos.....) Rs. .....
3. Pump installation and pump house (.....Nos) Rs. .....
4. Standpipes (.....Nos) Rs. .....
5. Pipeline complete (ref. page 10) Rs. .....
6. Other items (specify.....) Rs. .....

TOTAL Rs .....

Nos, of households .....

Expenditure;

1st calendar year of construction (item .....) Rs. .....

2nd calendar year of construction (item .....) Rs. .....

Copy : to SDD

* Estimates and quotations based on BOQ shall be annexed. They shall provide for materials, transport, labour, fittings, miscellaneous items etc. and shall include a 5% contingency item in each BOQ.

OPTIONS: - force account (estate baas)
- contractor

PART "B" SANITATION

J.E.D.B.	REGION	ESTATE	DIVISION	SCHEME No:	DATE

10. NUMBER OF LATRINES

1. NUMBER OF HOUSEHOLDS

- In Single Linehouses:
- In Back to Back Linehouses :

TOTAL :

2. LATRINES *

(1). No. of latrines required (total) : .....

- No. to be upgraded : .....

- No. to be newly constructed : .....

3. Latrines (Total No .....) Rs. .....

Nos, of households .....

Expenditure :

1st calendar year of construction (items .....)Rs. .....

2nd calendar year of construction (items .....)Rs. .....

Copy : to SDD

Estimates and quotations based on BOQ shall be annexed. They shall provide for materials, transport, labour, fittings, miscellaneous items etc. and shall include a 5% contingency item in each BOQ.

*1 latrine per household for single lines/cottages
(1 latrine per two rooms for double lines)

PART "C" GENERAL

J.E.D.B.	REGION	ESTATE	DIVISION	SCHEME No:	DATE

11. WORK SCHEDULE

ACTIVITY		MONTHS											
		Jan 1	Feb 2	Mar 3	Apr 4	May 5	Jun 6	Jul 7	Aug 8	Sep 9	Oct 10	Nov 11	Dec 12
Regional Board Approval													
Supply of Materials													
CONSTRUCTION WORK	Source Intake												
	Pipe Laying												
	Reservoirs												
	Stand Pipes												
	Cistern Tanks												
	Drainage												
Latrines													

J.E.D.B.	REGION	ESTATE	DIVISION	SCHEME No:	DATE

12. OPERATION & MAINTENANCE ARRANGEMENTS

1. Budget

Have annual revenue funds for water supply/sanitation been made available? .....

If available, state the amount : Rs. .....

2. Arrangements

Have tasks and appointees (staff and volunteers) for the operation & maintenance been assessed?

If assessed, indicates in the following table:

TASKS	APPOINTEE

1. Regular inspection of :

- intake structure
- reservoirs
- tapstands
- pipelines
- drains
- pumps
- latrines
- others (specify)

2. Maintenance / Repair of :

- intake structure
- reservoirs
- tapstands
- pipelines
- drains
- pumps
- latrines
- others (specify)

J.E.D.B.	REGION	ESTATE	DIVISION	SCHEME No:	DATE

13. TA'S OBSERVATIONS

(1). Do you agree with the source selection? :

(2). Does the design confirm to the guidelines? :

(3). Price per household (water supply) : Rs. .....

If high, for what reason .....

....

(4). Any other comments:

TA's Signature .....Date :

MO'S OBSERVATIONS (If applicable)

(1) Comments on the source, susceptibility :

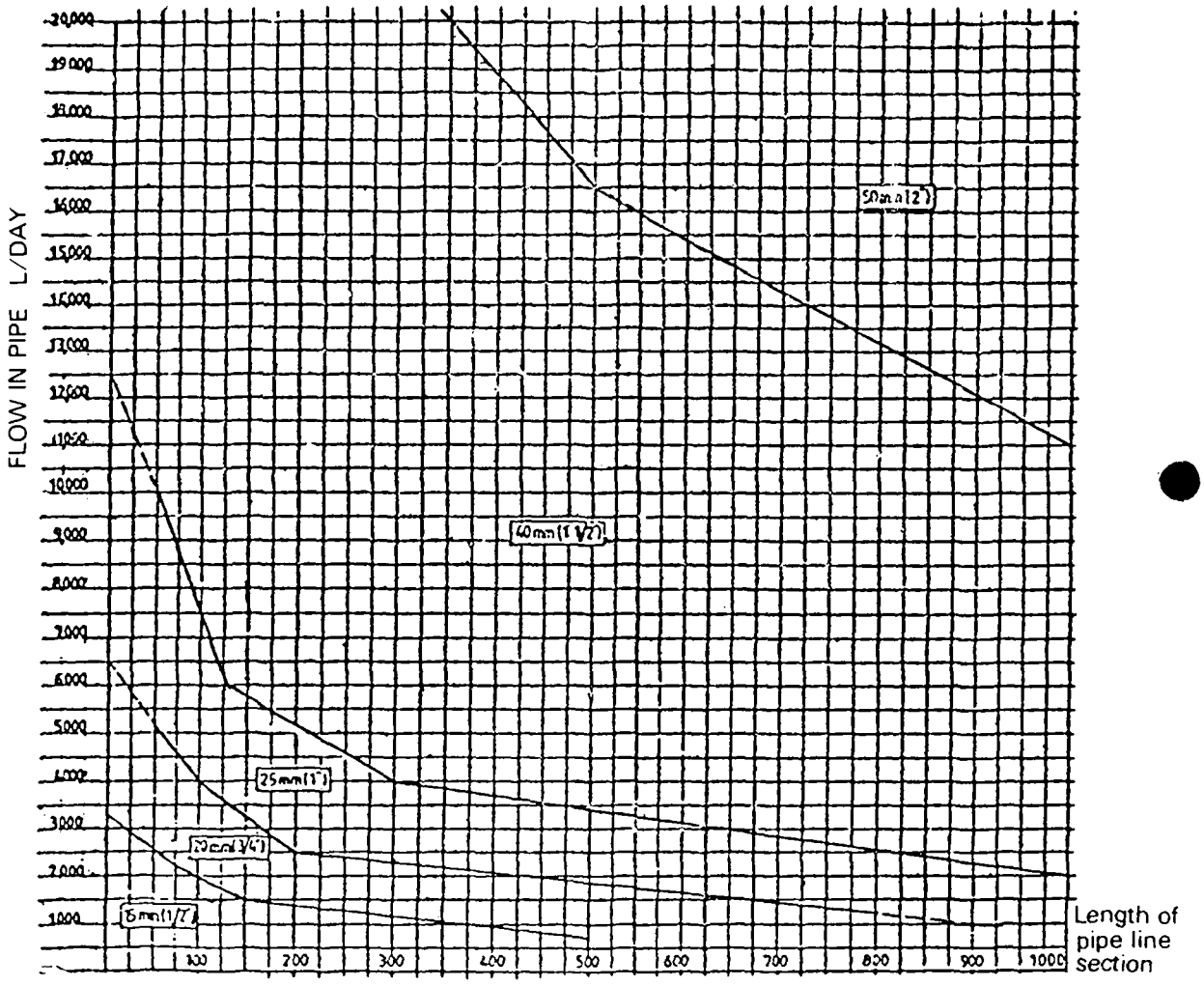
(2) Comments on water source quality :

(3) Any other comments :

MO's Signature ..... Date :

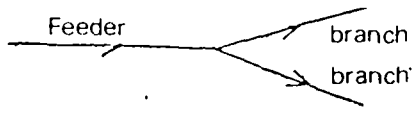
ANNEX 1

PIPE DIAMETER SELECTION



NOTES:

1. Diameters indicated may be taken as internal.
2. At any junction, the diameter of a feeder pipe should not be smaller than that of a branch pipe (ref. sketch below).



3. The upper boundaries of zones of diameters 15-25 mm and 40 mm corrospond to head losses of 1 m and 2 m respectively. (for technical ref. only.)

ANNEX 2

SAMPLING FOR WATER QUALITY ANALYSIS

CHEMICAL ANALYSIS :

Quantity required :	2 Litres (Minimum)
Container :	New plastic jerry-can, well rinsed
Labelling :	Each sample should be clearly identified and date and time of collection should be noted. Labels pasted around can tend to come out in transit. Preferred method is cardboard label tied to handle with good twine.
Collection :	Immerse jerry-can directly into source or use clean bucket.
Storage/Transport :	There is generally no requirement for cold storage. Samples should be sent in to the laboratory within one week after collection.

ANNEX 3

SELECTION OF PUMP SETS

In order to select the most suitable pumpset, the following details are required (ref, detail below) to be given when quotations are called from the suppliers.

a). Depth to standing water level of source = m

b). Depth to bottom water level of source = m

c). Vertical height from pump to discharge point = m

d). Length of delivery pipe = m

e). Diameter and pipe material (GI/PVC) =

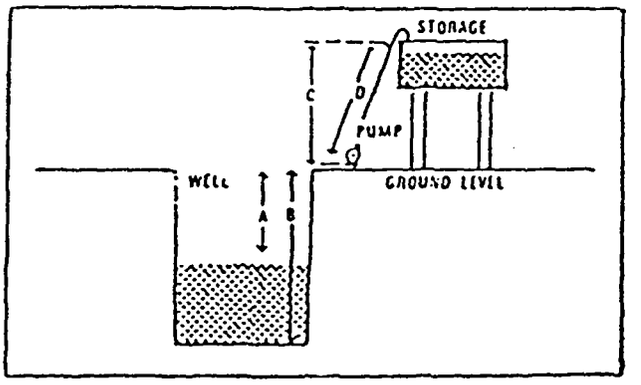
f). Engine or Electric Motor driven, specify engine/motor

If electricity is available, specify single/three phase

** (For engine driven cases. Diesel Engines are preferred. Single phase electric motors are used upto about 2 HP.)

g). Daily Demand of water (ref page 6) = litres

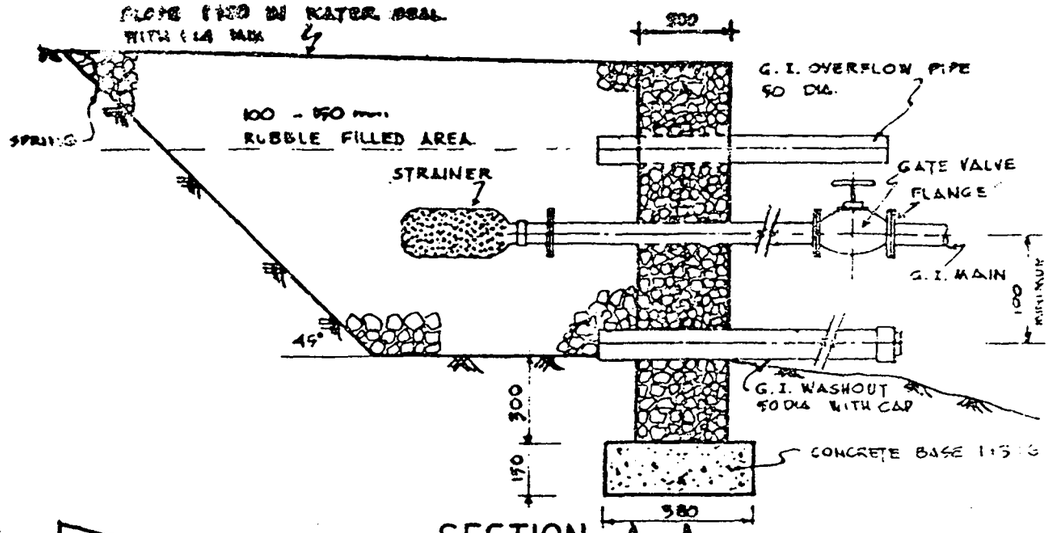
h). Hours of pumping per day (max. 8 hours) = hours.



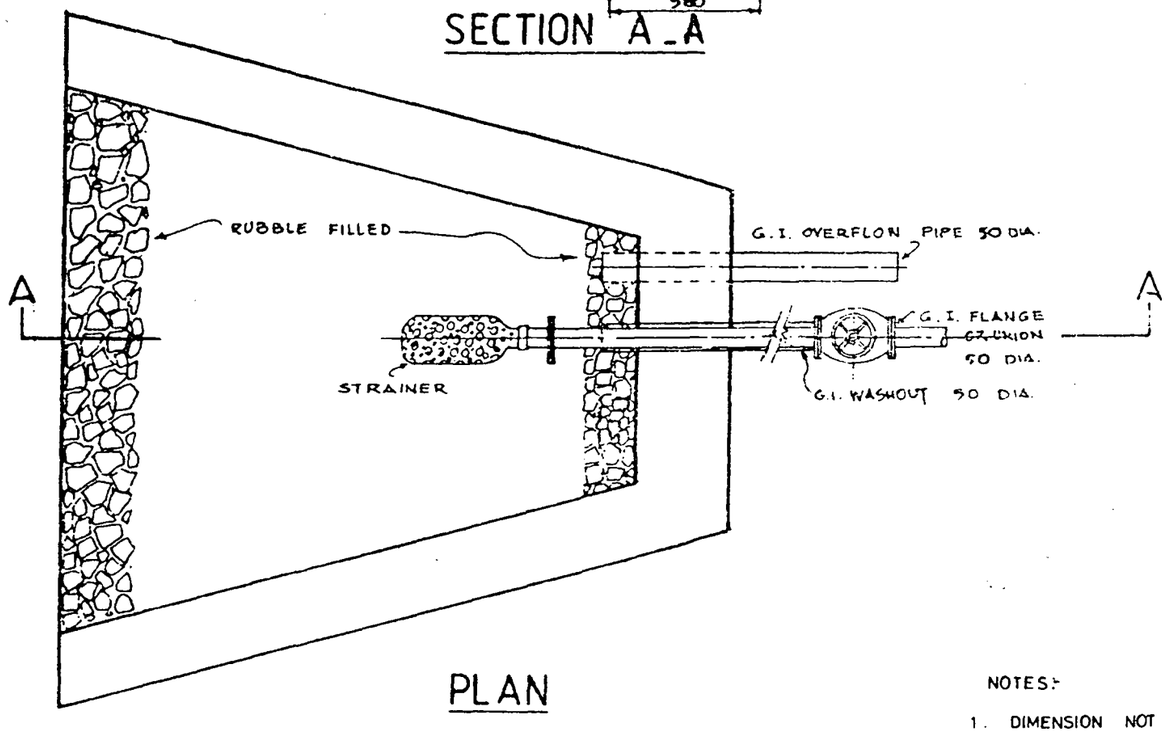
PUMP SPARES (to be completed by the Pump supplier) List and price the standard running spares recommended for two years.

1. 5.
2. 6.
3. 7.
4. 8.

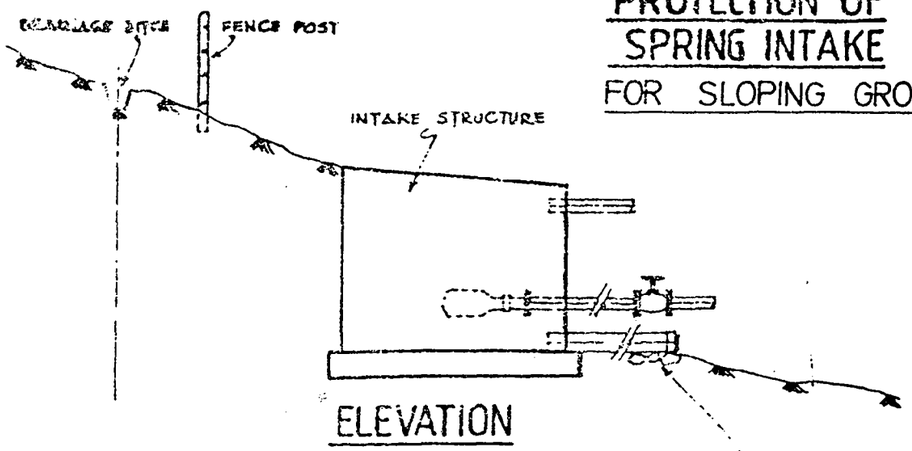
PROTECTION OF SPRING INTAKE FOR SLOPING GROUND



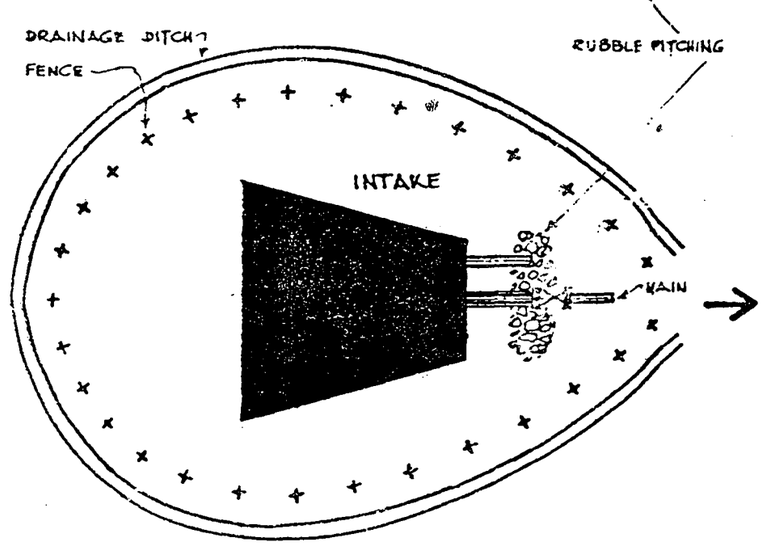
SECTION A_A



PLAN



ELEVATION



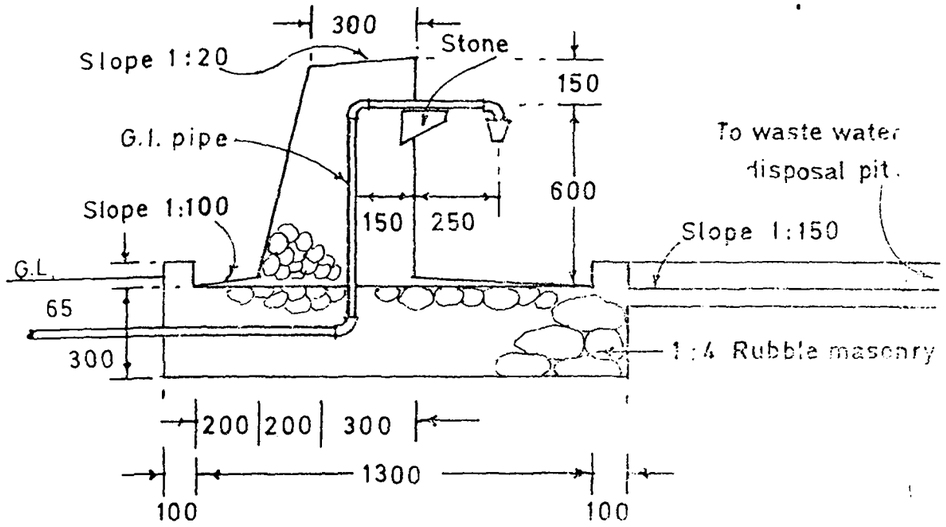
PLAN

NOTES:-

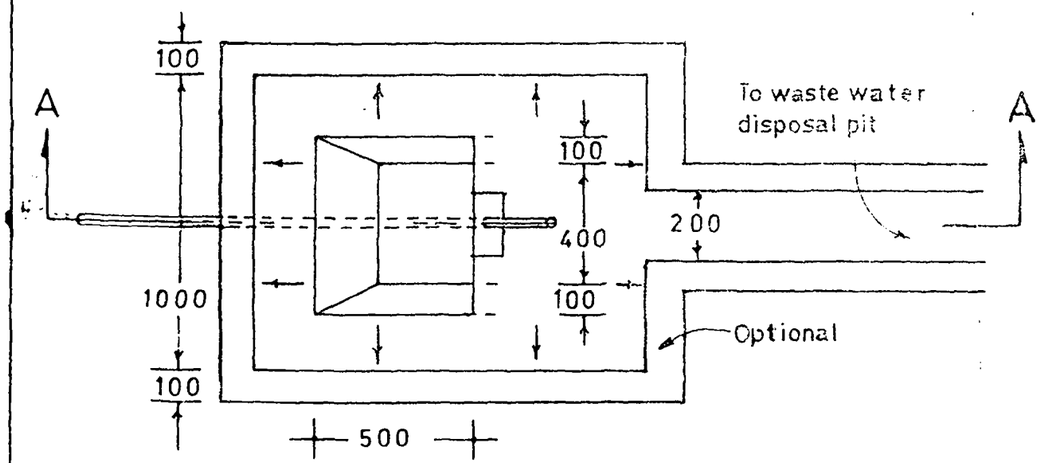
1. DIMENSION NOT SPECIFIED TO SUIT SITE CONDITIONS.
2. ADEQUATE FENCING AND DRAIAGE REQUIRED TO SUIT SITE CONDITIONS.
3. THE NUMBER OF OVERFLOW PIPES TO CORRESPOND TO EXPECTED FLOWS.
4. OVERELOW PIPES TO BE LOCATED AT A HEIGHT BELOW THE SPRING

J.E.D.B. — M.T.I.P.	
SOCIAL DEVELOPMENT DIVISION.	
WATER SUPPLY AND SANITATION.	
Drawing No:- WS & S/SD1 /85	Drawn by:- MHAR/MUM.
Type:- SPRING INTAKE.	Designed by:- ARIY.
Date:- 18.12.85.	Checked by:- P.H.S.S.
Scale:-	Approved by:-

TYPE. R.

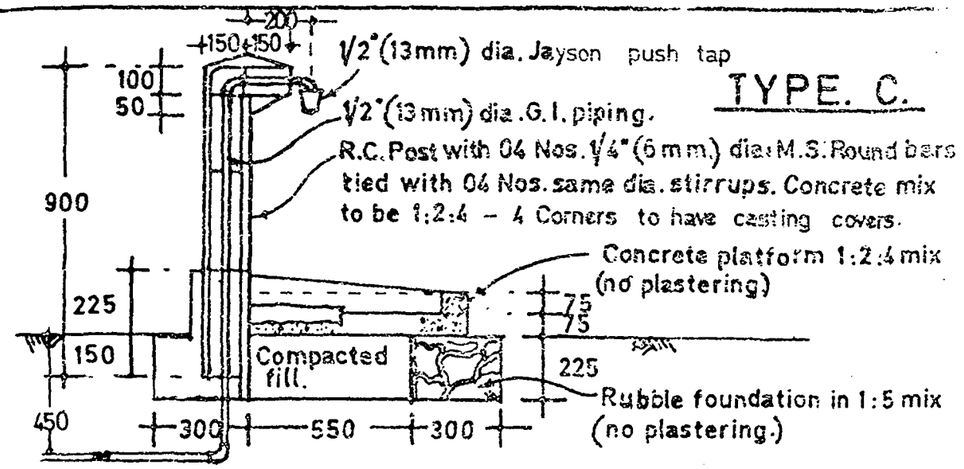


SECTION ON A.A.

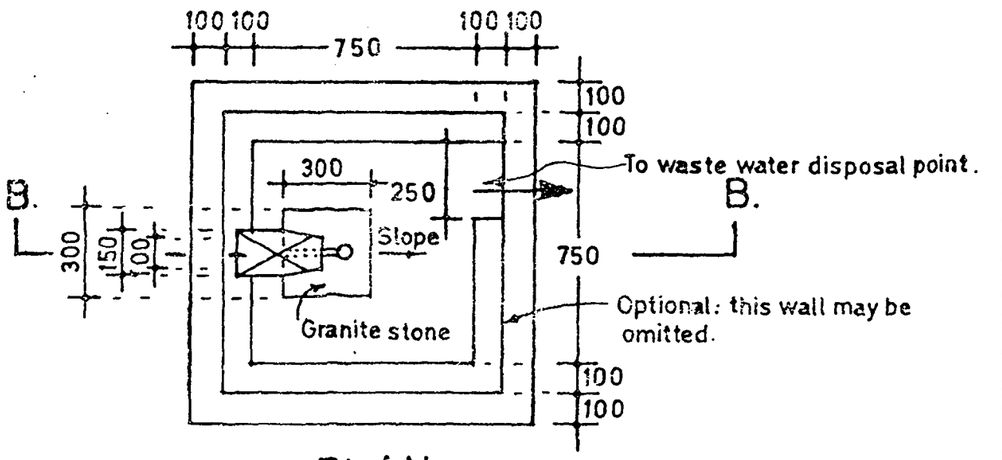


— PLAN —

TYPE. C.

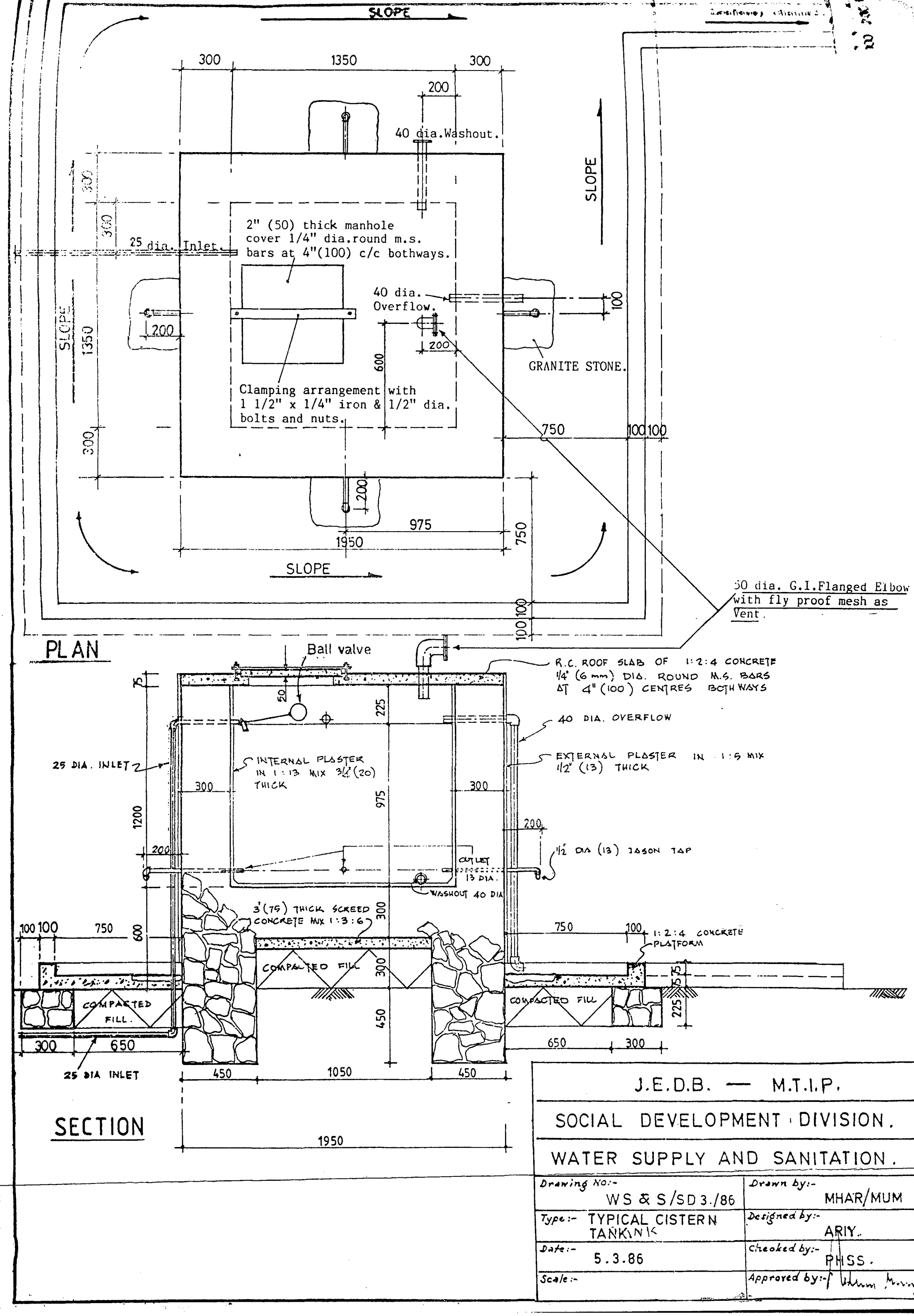


— SECTION ON B.B. —



— PLAN —

J.E.D.B. — M.T.I.P.	
SOCIAL DEVELOPMENT DIVISION	
WATER SUPPLY AND SANITATION.	
Drawing No:- WS & S/WSD3/86.	Drawn by PHSS.
Type:- R.& C. Typical Stand Posts	Designed by:- ARIY.
Date:- 27.2.1986.	Checked by PHSS
Scale:-	Approved by:-



PLAN

SECTION

J.E.D.B. — M.T.I.P.	
SOCIAL DEVELOPMENT DIVISION.	
WATER SUPPLY AND SANITATION.	
Drawing No:- WS & S/SD 3./86	Drawn by:- MHAR/MUM
Type:- TYPICAL CISTERN TANKING	Designed by:- ARIY.
Date:- 5.3.86	Checked by:- PHSS.
Scale:-	Approved by:-

J.E.D.B.	REGION	ESTATE	(SUB) DIVISION	SCHEME No.	DATE

BOQ. For Typical Dual Pit

Item	Description	Unit	Qty.	Rate	Amount
01.	Site clearing	m2			
02.	Excavation for foundation -				
	1st m. depth	m3			
	2nd m. depth	m3			
03.	Pit lining in rubble	m3			
04.	P.V.C. Sewer pipes	m			
05.	1:2:4 - Concrete slab over pit	m3			
	5% Contingency				Rs.
	Total				Rs.

Contractor's Signature:

Name & Address:

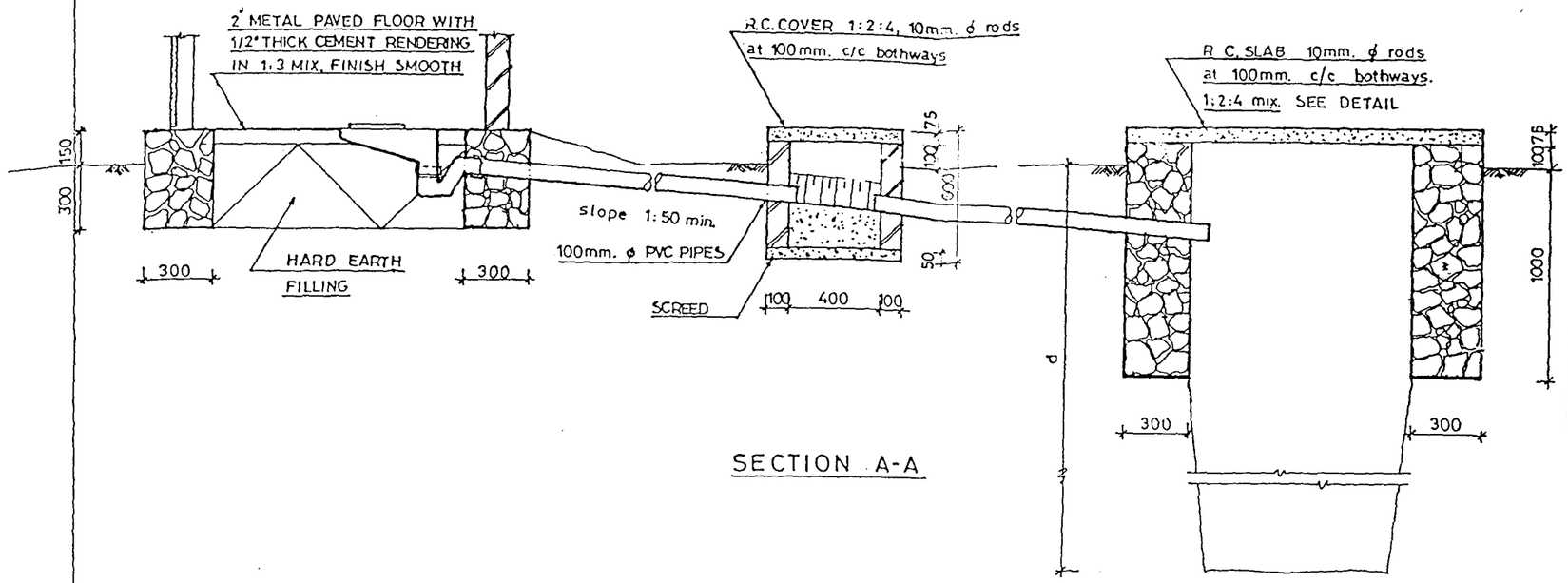
J.E.D.B.	REGION	ESTATE	(SUB) DIVISION	SCHEME No.	DATE

B.O.Q. For Inspection chamber of Typical Dual Pit.

Item	Description	Unit	Qty.	Rate	Amount
01.	Site clearing	m2			
02.	Excavation for foundation	m3			
03.	Pit lining in rubble	m3			
04.	1:2:4 Concrete bottom slab	m3			
05.	Concrete slab over pit	m3			
	5% Contingency				Rs.
	Total				Rs.

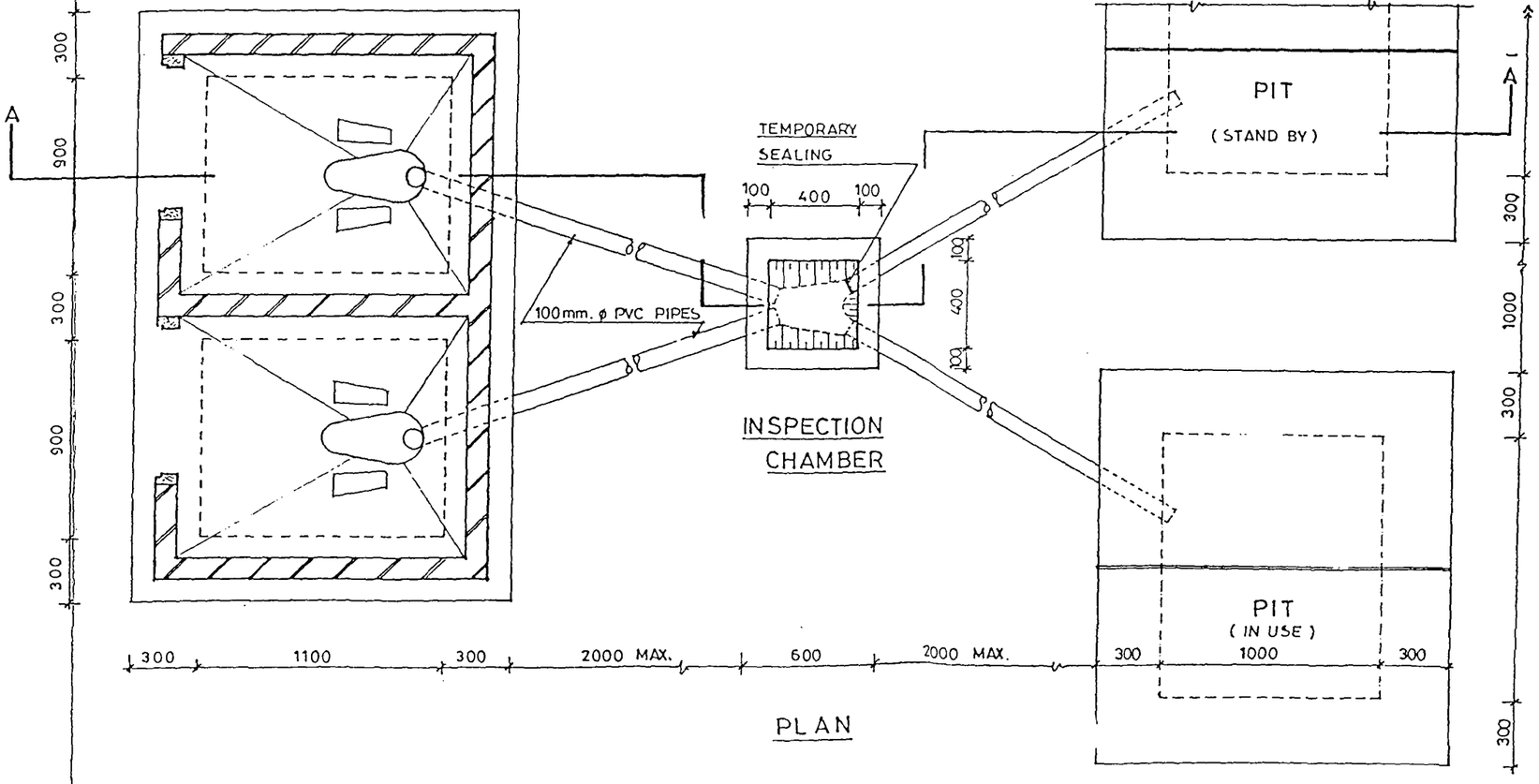
Contractor's Signature:

Name & Address:

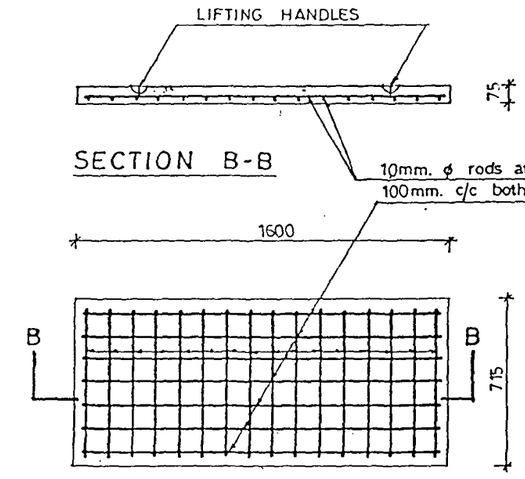


SECTION A-A

DUAL PIT			
no. of households	breadth	length	depth
1	1	1.20	1.50
2	1	1.30	2.00
3	1	1.80	2.00
4	1	2.20	2.00
5	1	2.40	2.00
6	1	3.00	2.50



PLAN



SECTION B-B

PLAN-CON. COVER SLAB

NOTE:

FOR BRICK WORK THE LENGTH OF CONCRETE SLAB IS 1250 mm.

J.E.D.B. — M.T.I.P.	
SOCIAL DEVELOPMENT. DIVISION	
WATER SUPPLY AND SANITATION	
Drawing No:- WS & S/SD 21/86	Drawn by:- M.U. Haroon.
Type:- Typical Dual Pit.	Designed by:- Ariy., TAT.
Date:- 25.11.86.	Checked by:- Geethamalee.
Scale:- 1:25	Approved by:-

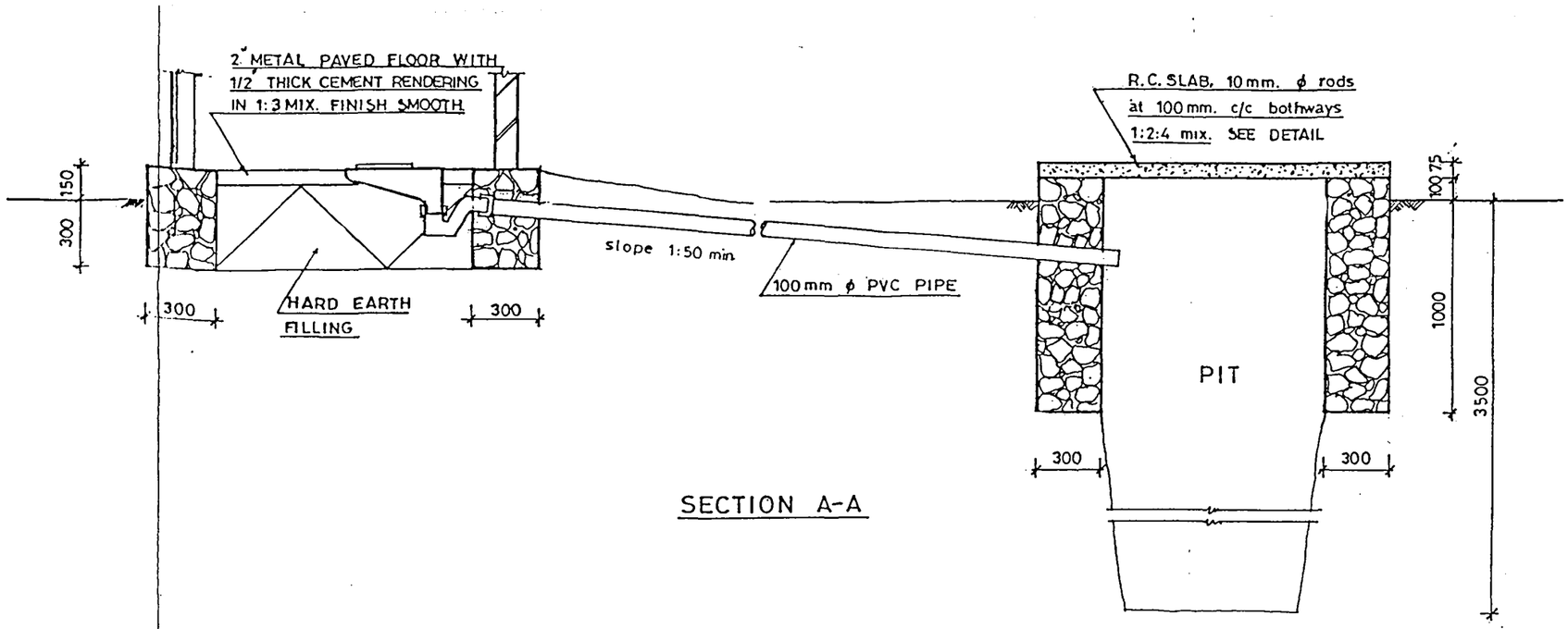
J.E.D.B.	REGION	ESTATE	(SUB) DIVISION	SCHEME NO.	DATE

B.O.Q. - For Typical Single Pit

Item	Description	Unit	Qty.	Rate	Amount
01.	Site Clearing	m2			
02.	Excavation for pit -				
	1st m.depth	m3			
	2nd m.depth	m3			
	3rd m.depth	m3			
	(4)th) 0.5m. depth	m3			
03.	Pit lining in rubble	m3			
04.	P.V.C. Sewer pipe	m			
05.	1:2:4 - Concrete slab over pit	m3			
	5% Contingency				Rs.
	Total				Rs.

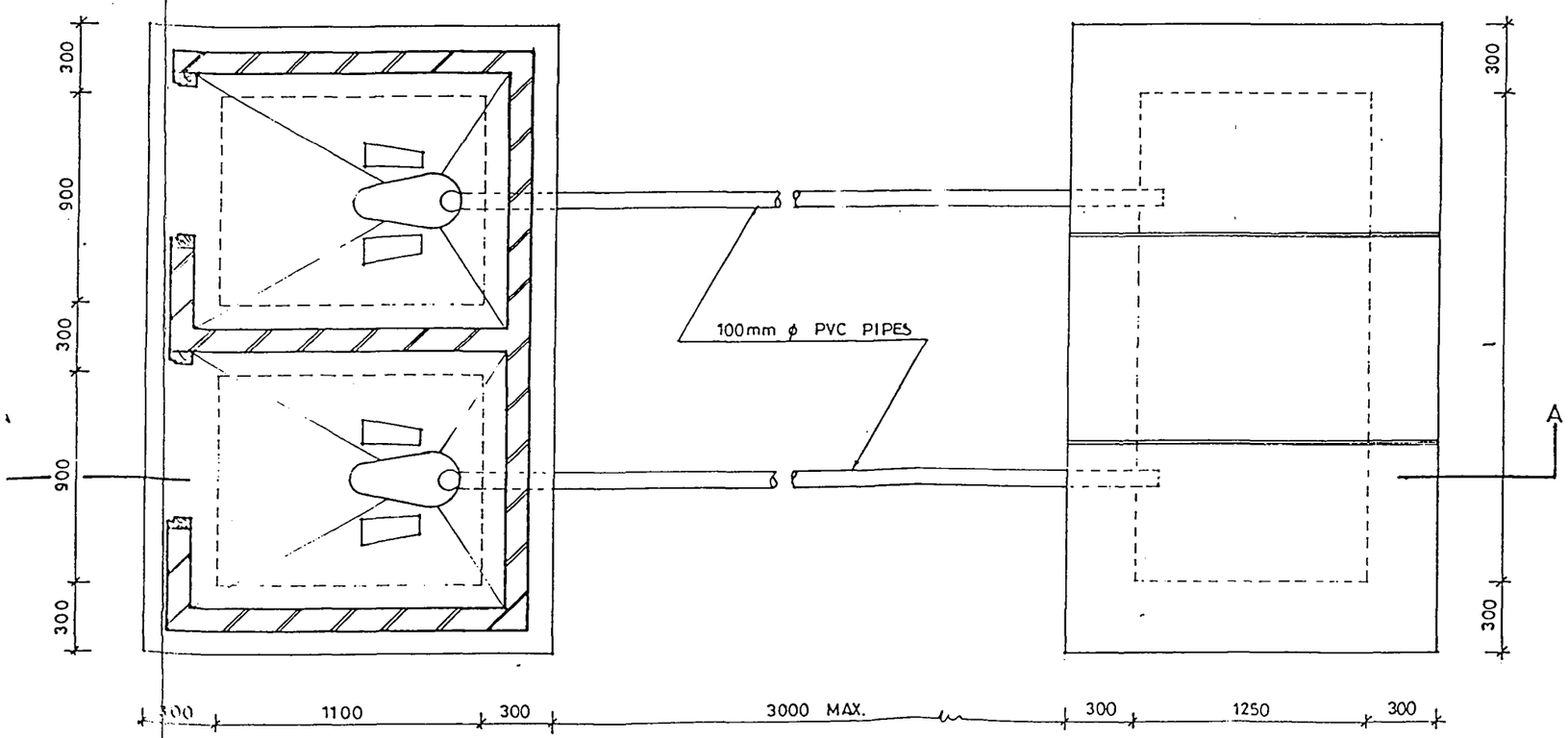
Contractor's Signature:

Name & Address :

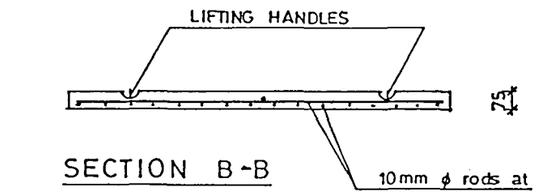


SECTION A-A

SINGLE PIT			
no. of households	breadth	length	depth
1	1.25	1.60	3.50
2	1.25	2.70	3.50
3	1:25	4.40	3.50
4	1.25	5.50	3.50
5	1.25	7.50	3.50



PLAN



SECTION B-B

PLAN-CON. COVER SLAB

NOTE:

FOR BRICK WORK THE LENGTH OF CONCRETE SLAB IS 1250mm.

J.E.D.B. — M.T.I.P.	
SOCIAL DEVELOPMENT DIVISION	
WATER SUPPLY . AND SANITATION	
Drawing No:- ws & s / SD 20/86	Drawn by:- M.U.Haroon
Type:- Typical Single Pit.	Designed by:- Ariy.,TAT.
Date:- 25.11.86	checked by:- Geethamalee..
Scale:- 1 : 25	Approved by:-

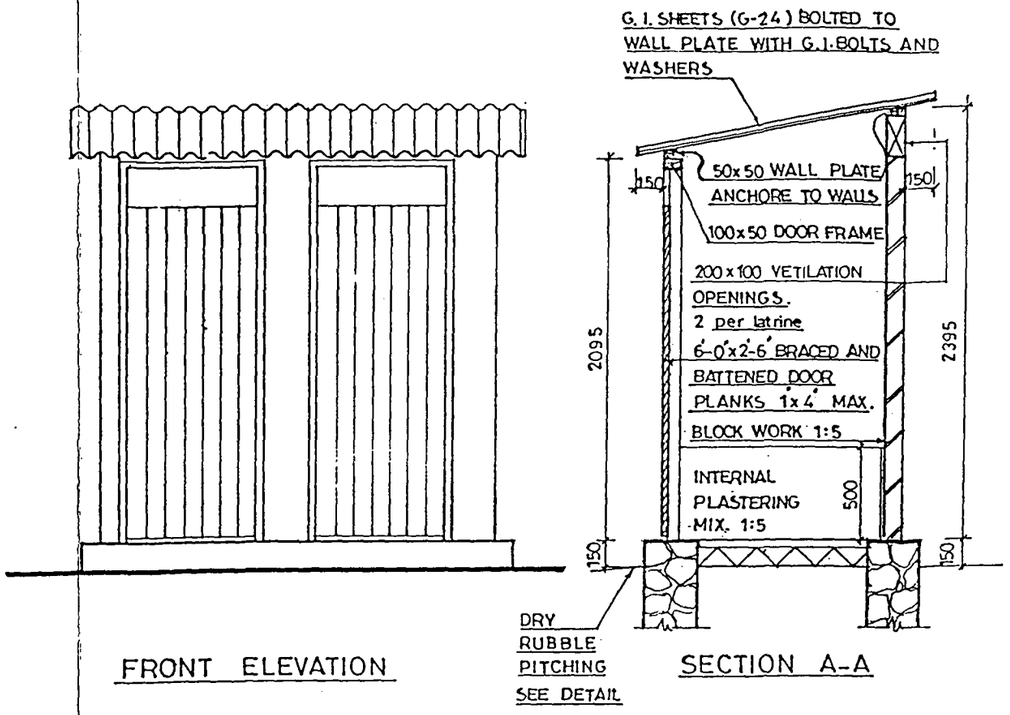
J.E.D.B.	REGION	ESTATE	(SUB) DIVISION	SCHEME NO.	DATE

BOQ - For Typical Cabin Design.

ITEM	DESCRIPTION	UNIT	QTY.	RATE	AMOUNT
01.	Site clearing	m2			
02.	Excavation for foundation	m3			
03.	Rubble foundation	m3			
04.	Hard earth filling	m3			
05.	Ceramic squatting pan & tap	Nos.			
06.	Paving of latrine floor	m2			
07.	Latrine floor rendering	m2			
08.	Cement Sand Block Wall -				
	G.I. Roofed	m2			
	Concrete Roofed	m3			
09.	Internal plastering	m2			
10.	Roofing of latrine -				
	G.I. Roofed	m2			
	Concrete Roofed	m3			
11.	Braced & Battened door	Nos.			
12.	Dry rubble pitching	m3			
13.	Locking arrangements	Nos.			
	G.I.Roofed latrine -	Rs.			
	Concrete Roofed Latrine -	Rs.			
	5% Contingency				Rs.
	Total				Rs.

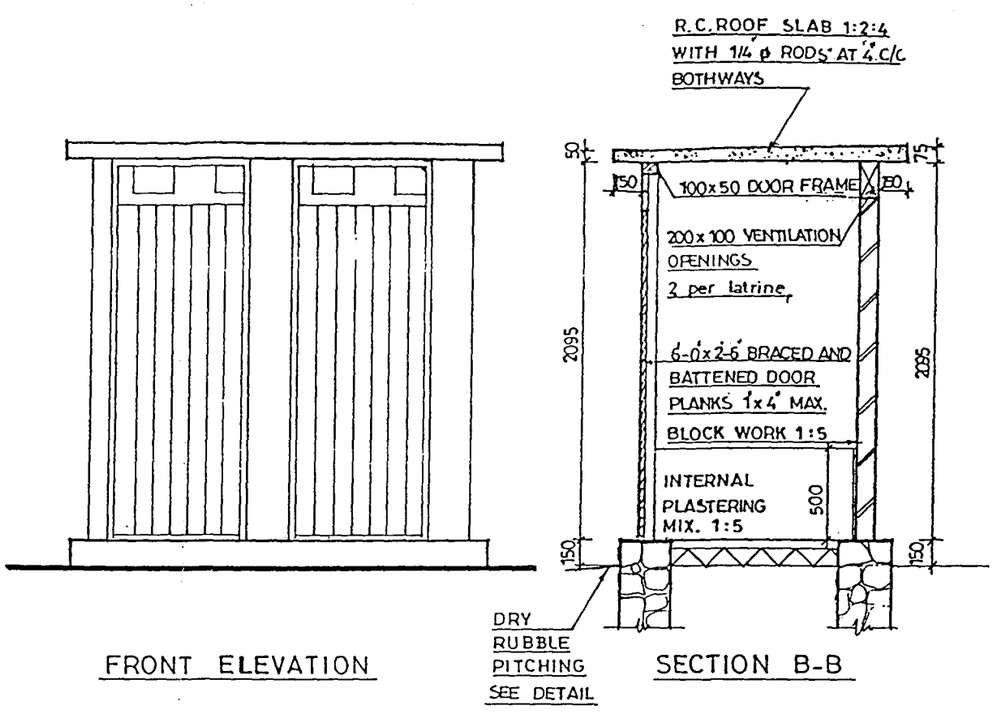
Contractor's Signature:

Name, Address:



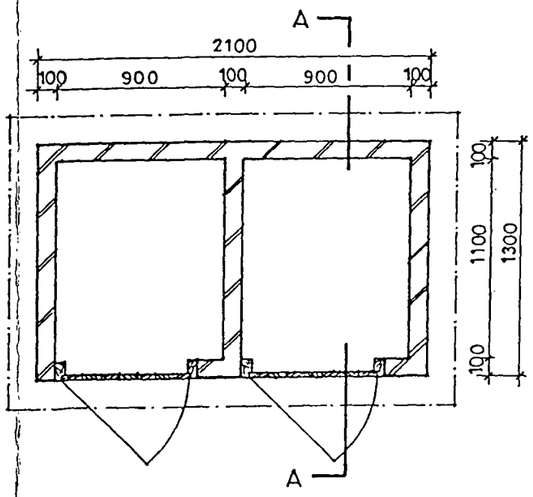
FRONT ELEVATION

SECTION A-A



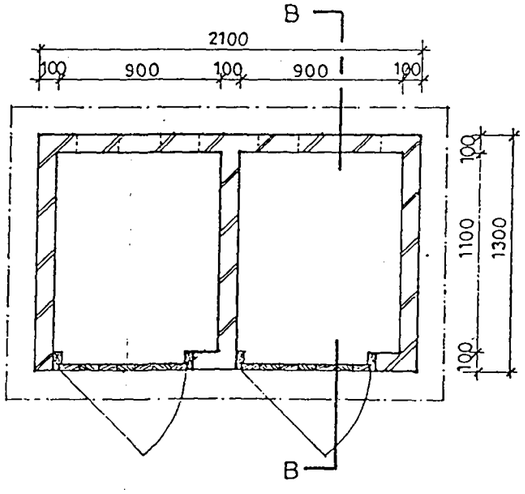
FRONT ELEVATION

SECTION B-B



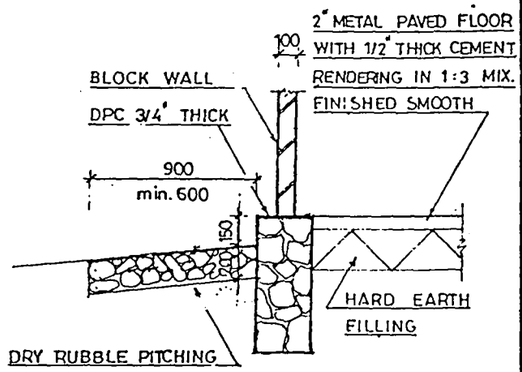
PLAN

LATRINE WITH G.I. ROOF



PLAN

LATRINE WITH R.C.ROOF



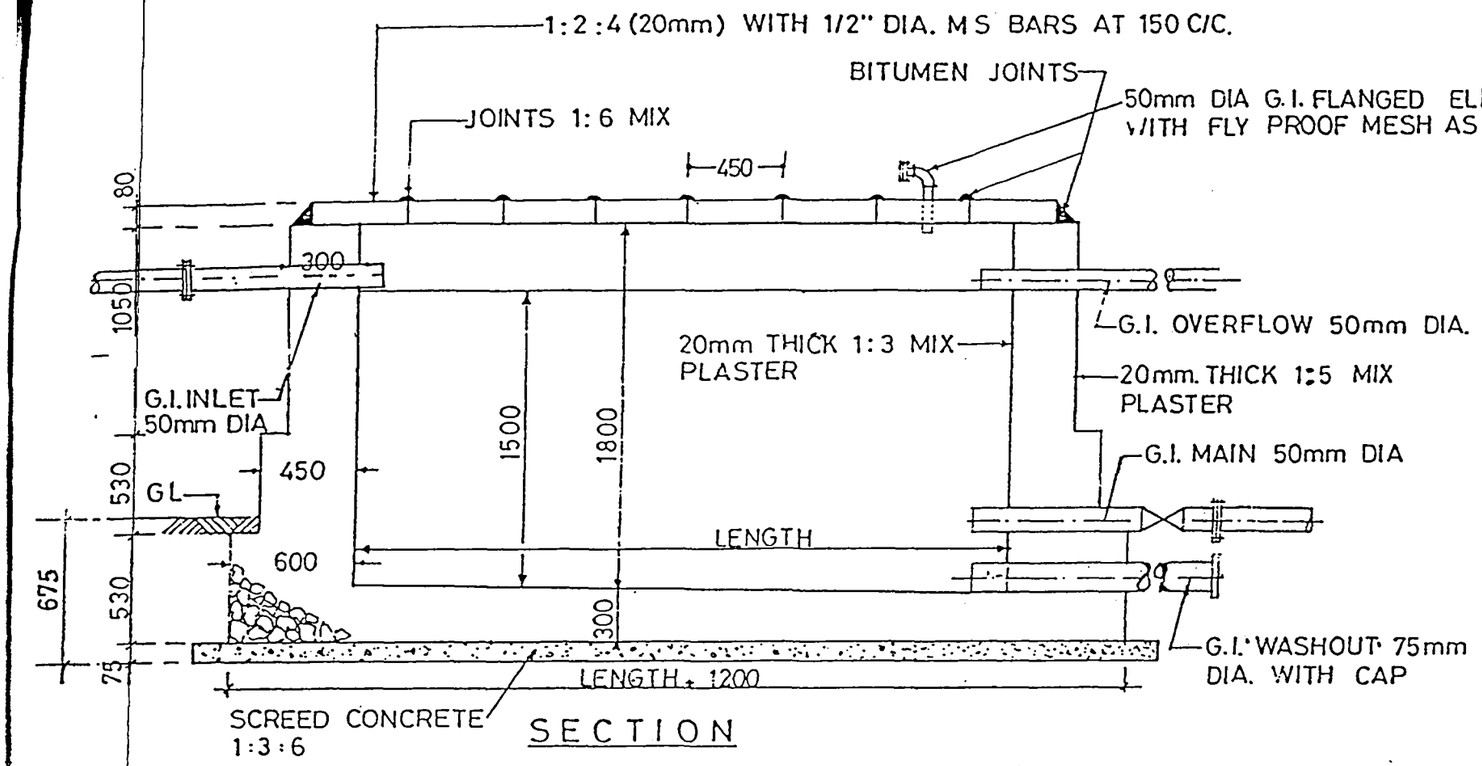
DETAIL - FOUNDATION & DRY RUBBLE PITCHING

NOTES:

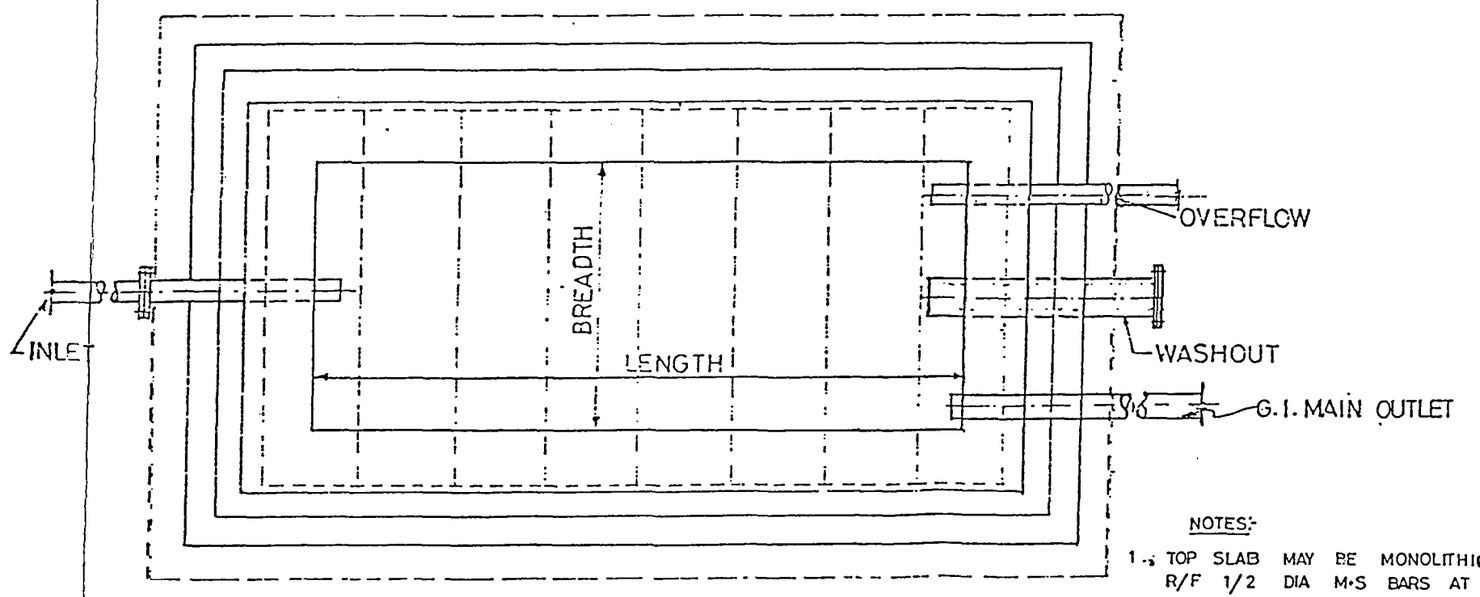
1 DRAWN FOR BLOCK WORK. IN CASE OF BRICK WORK, PROVIDE INTERNAL AND EXTERNAL PLASTERING.

2 SLOPE OF G.I. ROOF IS DRAWN TOWARDS THE ENTRANCE. IN CASE SLOPE OF ROOF IS TOWARDS REARSIDE ADDITIONAL PROVISIONS FOR DRAINAGE HAVE TO BE TAKEN.

J.E.D.B. — M.T.I.P.	
SOCIAL DEVELOPMENT DIVISION	
WATER SUPPLY AND SANITATION	
Drawing No:- WS & S / SD19 / 86	Drawn by:- M.U.Haroon
Type:- Typical Latrine Cabin Design	Designed by:- Ariy., TAT.
Date:- 25.11.86.	Checked by:- Geethamalee..
Scale:- 1:25	Approved by:-



SECTION



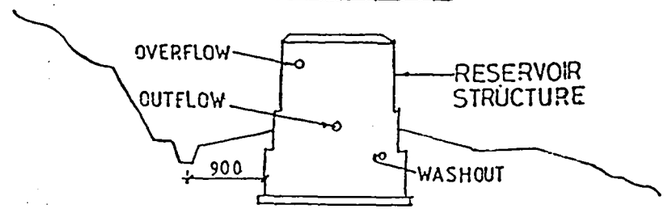
PLAN

NOTES:-

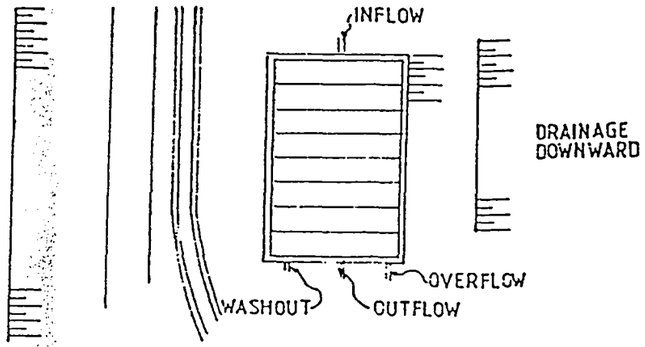
1. TOP SLAB MAY BE MONOLITHIC WITH EITHERWAY R/F 1/2 DIA M.S BARS AT 150 C/C
2. OVERFLOW & WASHOUT LENGTHS TO SUIT SITE CONDITIONS.
3. DRAINAGE TO SUIT SITE CONDITIONS.
4. ALL DIMENSIONS ARE IN MILIMETERS.

LOCATION OF RESERVOIR STRUCTURE

FOR SLOPING GROUND



ELEVATION



PLAN

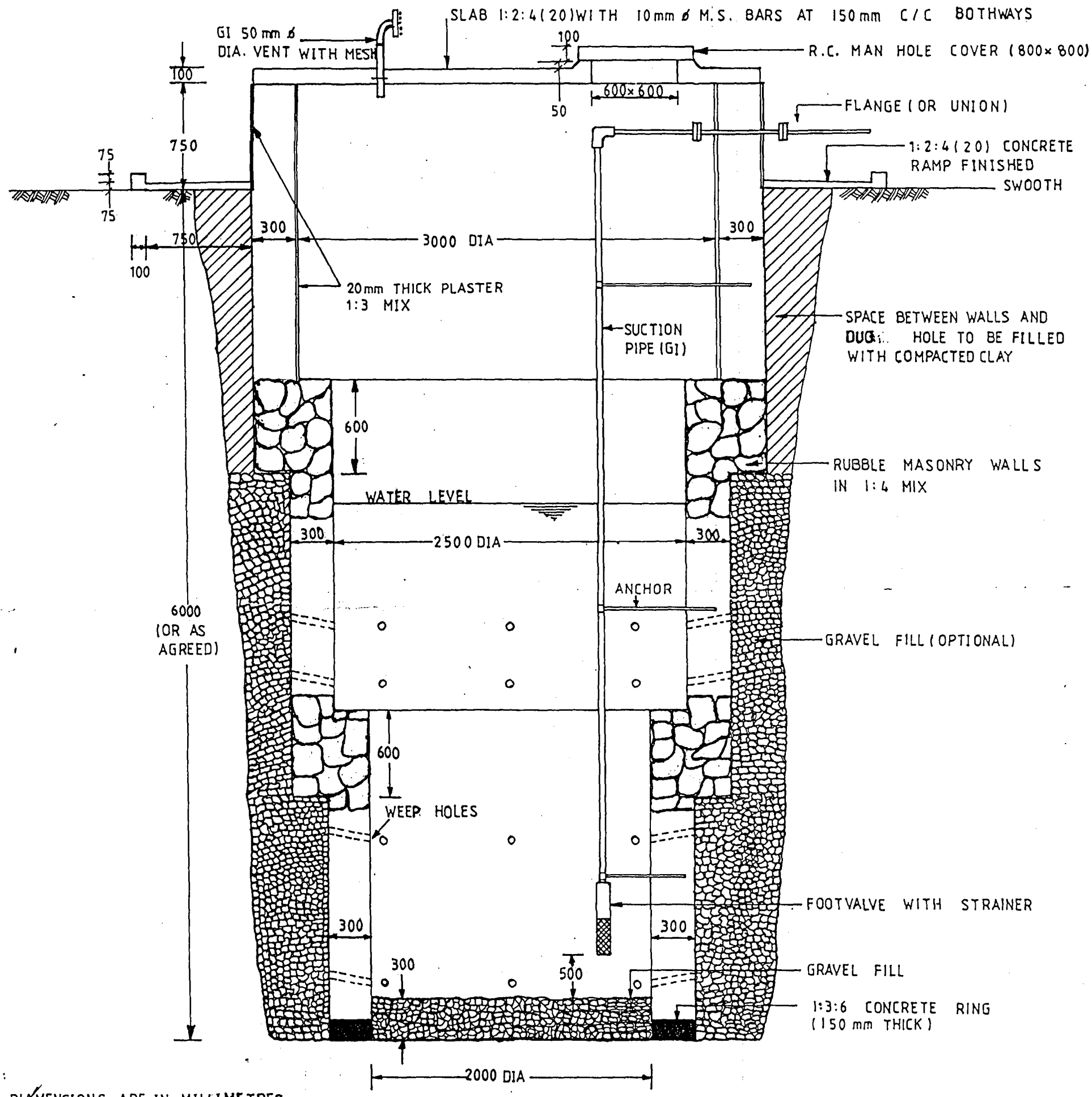
RES.CAP	(GALS)	INT. LENGTH x BREADTH x HEIGHT		
4,500	1000	1500	2000	1800
6,800	1500	2300	2000	1800
9,000	2000	3000	2000	1800
11,000	2500	3600	2000	1800
13,600	3000	4500	2000	1800
16,000	3500	3500	3000	1800
18,000	4000	4000	3000	1800
20,000	4500	4500	3000	1800
22,000	5000	5000	3000	1800

J.E.D.B. — M.T.I.P.

SOCIAL DEVELOPMENT DIVISION.

WATER SUPPLY AND SANITATION.

Drawing No:- WS & S/SD2/85	Drawn by:- ARIY
Type:- RESERVOIR TANK 1000 – 5000 GALLONS	Designed by:- ARIY
Date:- 20.12.85.	Checked by:- PHSS.
Scale:- 1:30	Approved by:-



NOTES:

1. ALL DIAMENSIONS ARE IN MILLIMETRES
2. ENSURE ADEQUACY OF WELL YIELD IN CONSULTATION WITH THE TECHNICAL ASSISTANT
3. PARTIALLY LINED WELLS MAY BE CONSTRUCTED IN HARD SOIL (SUCH AS LATERLIE) IN CONSULTATION WITH THE TECHNICAL ASSISTANT
4. IN LOCATING THE WELL, CONSIDERATION SHOULD BE GIVEN TO PUMP HOUSE SITING ALSO.

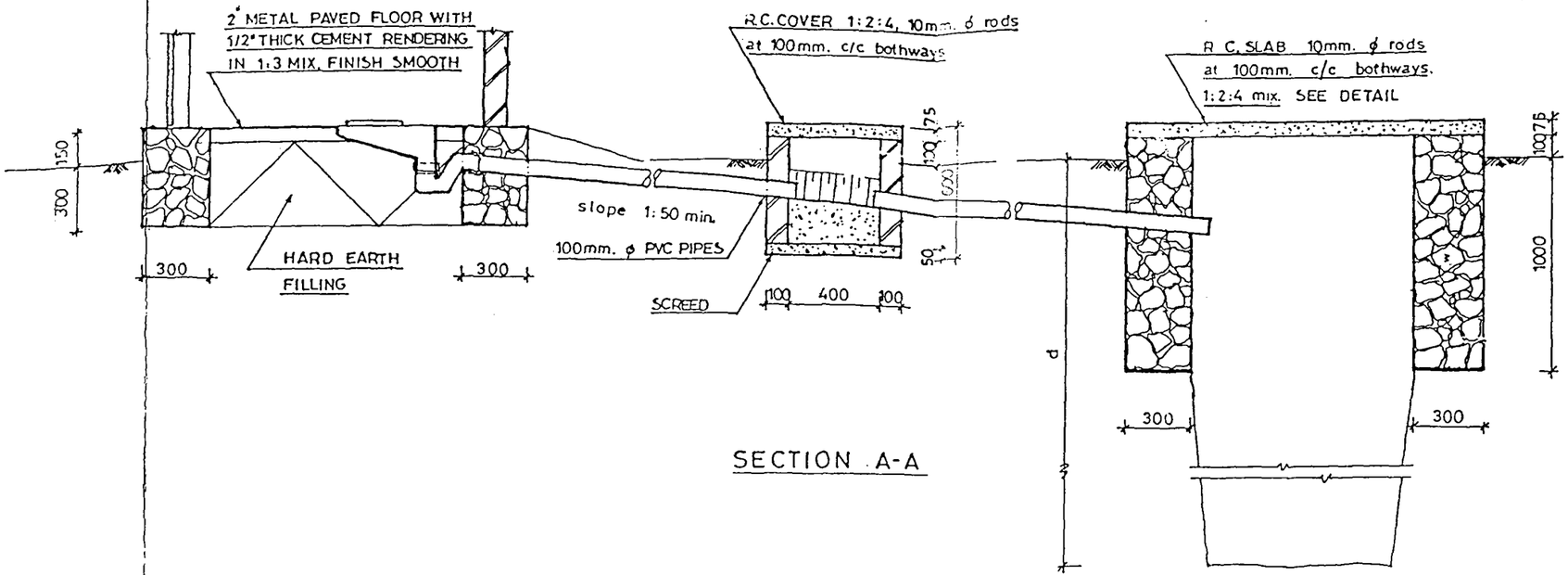
SRI LANKA STATE PLANTATIONS CORPORATION

SOCIAL DEVELOPMENT DIVISION

WATER SUPPLY AND SANITATION

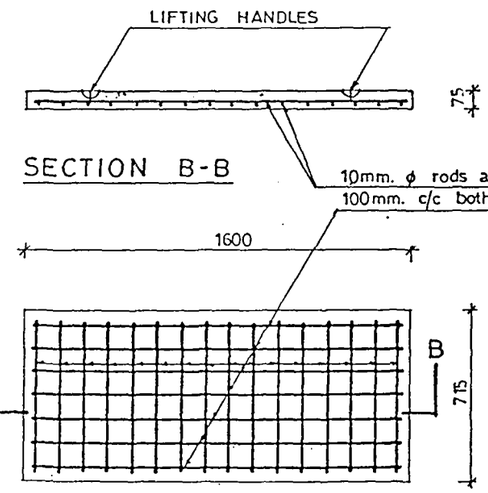
TYPICAL DUG WELL

DRAWING. SP/WS 15	REVISION.	DATE.
SCALE. N T S	B	11-3-88
DRAWN. L.S.W		
APPROVED.		
ENGINEER.		



SECTION A-A

DUAL PIT			
no. of households	breadth	length	depth
1	1	1.20	1.50
2	1	1.30	2.00
3	1	1.80	2.00
4	1	2.20	2.00
5	1	2.40	2.00
6	1	3.00	2.50

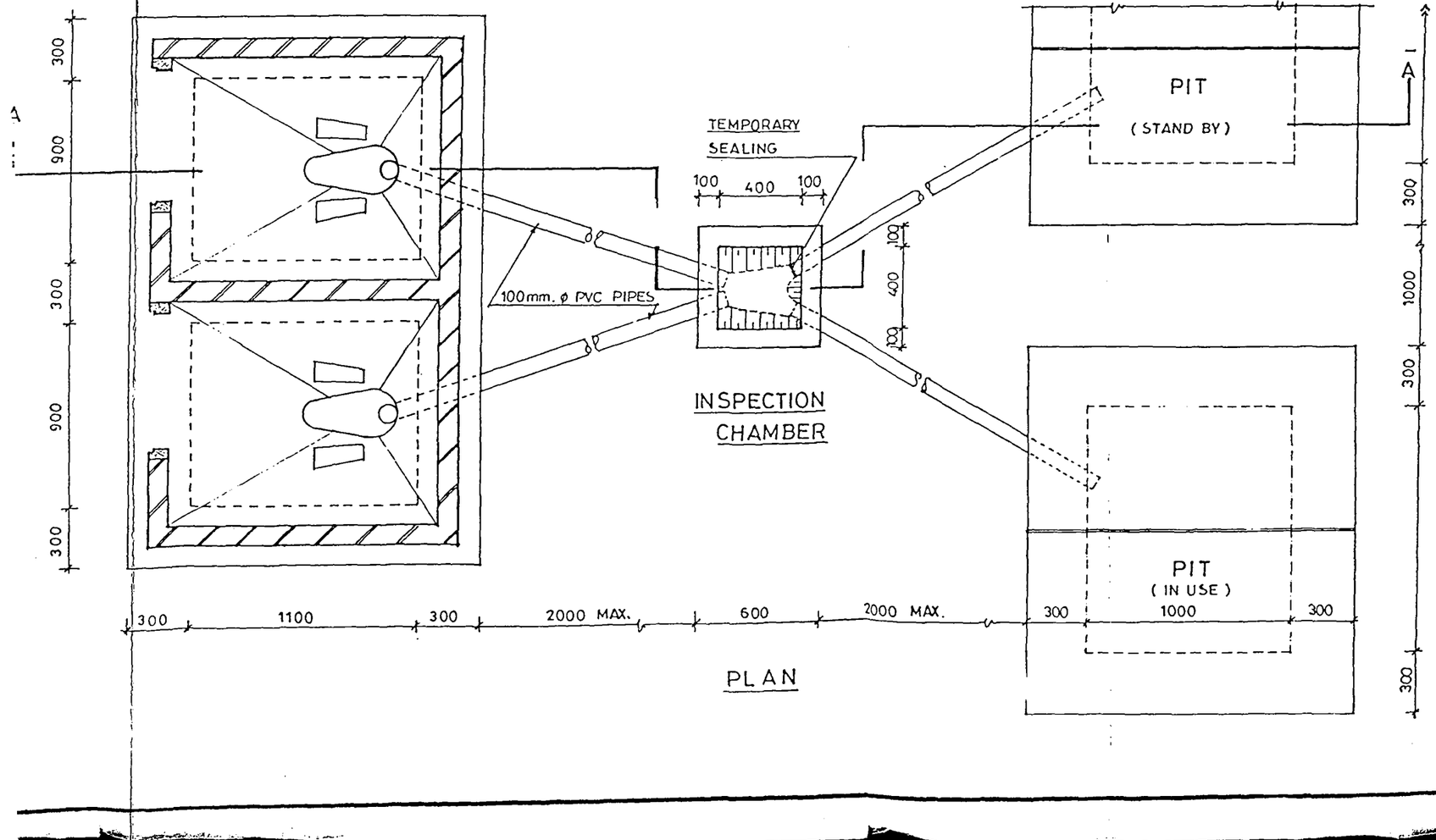


SECTION B-B

PLAN-CON. COVER SLAB

NOTE:

FOR BRICK WORK THE LENGTH OF CONCRETE SLAB IS 1250 mm.



PLAN

J.E.D.B. — M.T.I.P.	
SOCIAL DEVELOPMENT. DIVISION	
WATER SUPPLY AND SANITATION	
Drawing No:- WS & S / SD 21 / 86	Drawn by:- M.U. Haroon.
Type:- Typical Dual Pit.	Designed by:- Ariy., TAT.
Date:- 25.11.86.	Checked by:- Geethamalee.
Scale:- 1 : 25	Approved by:-