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DEPARTMENT OF WATER SUPPLY AND SEWERAGE

REGIONAL DIRECTORATE

COMMUNITY WATER SUPPLY AND SANITATION PROGRAMME

WESTERN REGION

STANDARDIZATION

for

RURAL WATER SUPPLY SYSTEMS

Edition 1990

Printed at:
Sudip Offset Press (P) LTD.
Mahendra Pool, Pokhara.

201-90ST-8062-2

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Notes on Estimates

In addition to the Bill of Quantities given in this standardization, the following general notes should be observed.

- Each project should receive 3m wiremesh 1mm, and 3m wiremesh 4mm for sifting of cement and sand respectively. Afterwards this wiremesh can be used for preparation of tanks, BPT, etc. and for sanitation. This wiremesh should be added to the estimate.

- Tools

  Tools listed on page No 4 of this standardization should be included in the cost estimate.

  Tools listed on page No 5 of this standardization should be provided to the WSST(s) upon submission of the "Mag-Form". After the project is completed or anytime earlier when the tools may not be needed anymore, these tools have to be returned to the RD store by the technicians.

  Tools listed on page No 6 of the standardization should be provided to the Village Maintenance Worker and should be used for the maintenance of the project only. These tools should be supplied to the VMW, at the time of the Official "Handing-Over" of the project, and not earlier. An additional estimate will have to be prepared for these tools.

- Catchment

  For the stream and spring catchment only the collection chamber has been standardized. During detailed survey a sketch of the spring, Kholsi or Khola should be made and based on this sketch, the spring or stream catchment should be designed. The files should contain the drawings of the catchment structure(s). These structures should be estimated separately and added to the estimate of the catchment.

- Sanitation

  School latrines can be built as part of the CWSS project. However latrines should be included into the estimate only when the School Management Committee has submitted a written request.

  In general, the following rules shall apply:

Primary school	2 box pit latrine
Secondary (High) school	3 box pit latrine

- HMG / UNICEF / Village Contribution

HMG Contribution is as follows:

- Transportation costs: Transport by vehicles
  Portering
- Labour wages: Skilled labourers and unskilled labourers as per the Standardization booklet.
- Store rent: Store at roadhead
  Store at site
- Materials:
  - Wood
  - Sand:. For sand collection and transportation 50 % percent of the calculated HMG rate but not exceeding Rs. 700/- per m3 can be put under HMG contribution. The balance should be put under village contribution.

UNICEF contribution is as follows:

- Materials:
  - Pipes fittings, cement, steel rods, all other construction materials except those under village or HMG Contribution
- Tools

Village contribution is as follows:

- Materials
  - Stone
  - Aggregate
  - Sand: The balance between the official HMG rate and the amount subsidized by HMG. (Subsidy 50 percent of HMG rate but not exceeding Rs. 700/- per m3).
- Labourers for
  - Pipeline trench digging
  - Pipeline trench backfilling
  - Excavation of foundation of all structures.
  - Pipe joining and laying is not estimated because this work should be done by the WSSTs with help from villagers.
- Land acquisition

- Cost Estimation

For UNICEF supplied materials a pricelist shall be provided by the CWSS Programme Coordination Unit. For local materials, labourers etc. the rates approved by the concerned district authorities should be applied.

B I L L O F Q U A N T I T I E S
and
S T A N D A R D D R A W I N G S
for
C W S S P S T R U C T U R E S

G U I D E L I N E: on issuing of Tools to CWSS-Projects

Tools provided by UNICEF and to be included in cost estimate

Description	Unit	Qty
1. Shovel	pc	2
2. Pick Axe	pc	2
3. Steel Pan	pc	5
4. Sledge Hammer 10 lbs.	pc	1
5. Sledge Hammer 1/2 lbs.	pc	5
6. Stone Cutting Hammer	pc	4
7. Stone Chisel 6"	pc	1
8. Stone Chisel 12"	pc	1
9. Stone Chisel 24"	pc	1
10. Mason String	bdl	1
11. Thermochrome Crayon	pc	2
12. Hemp	-	-
13. Putty Compound	-	-
14. Teflon Tape	roll	-
15. Hacksaw Blade	pc	5

G U I D E L I N E: on Issuing of Tools to CWSS-Project

Tools provided by UNICEF but issued on "MAG-FORM"

The following tools will be provided to the WSS-Technician upon submission of a MAG-FORM. Depending on the actual number of skilled staff employed on the construction site, the number of tools borrowed from the store may be increased accordingly. The tools provided will be sufficient for 2 to 4 skilled staff (incl WSSTs). **After the project is completed or any time earlier when the tools may not be needed anymore, these tools have to be returned to the store by the technicians.**

Description	Unit	Qty
1. Tools Box (empty)	pc	1
2. Tool Box Lock	pc	1
3. Heating Plate	pc	1
4. Teflon Cover	pc	1
5. Blow Torch	pc	1
6. Geberit Knife	pc	1
7. Pipe Wrench 18"	pc	1
8. Pipe Wrench 24"	pc	1
9. Pipe Wrench 36"	pc	1
10. Building Trowel	pc	1
11. Pointing Trowel	pc	1
12. Finishing Trowel	pc	1
13. Steel Brush	pc	2
14. Soft Brush	pc	1
15. Kerosene Jerrycan 10 ltr	pc	1
16. Kerosene	ltr	20
17. Lantern	pc	1
18. Crow Bar 4'/5'	pc	1
19. Hacksaw Frame	pc	1
20. Adjustable Spanner	pc	2
21. Plumb Bob Line	pc	1
22. Steel Scissors	pc	1
23. Rammer	pc	1
24. Wood Chisel	pc	1
25. Carpenter Saw	pc	1
26. Triangular File	pc	1
27. Combination Pliers	pc	1
28. Mason Square	pc	1
29. Nail Removing Hammer	pc	1
30. Spirit Level	pc	1

G U I D E L I N E S: on issuing of tools to the village Maintenance Worker

The following tools will be supplied to the Village Maintenance Worker for the purpose of Maintenance of the water supply project. These tools should be provided to the VMW at the time of the official Handing-Over of the project, and not earlier. For the release of these tools from the store, an additional estimate will have to be prepared.

Description	Unit	Qty
1. Tool box (empty)	pc	1
2. Tool box lock	pc	1
3. Heating plate	pc	1
4. Blow torch	pc	1
5. Teflon cover	pc	1
6. Pipe wrench 18"	pc	1
7. Pipe wrench 24"	pc	1
8. Hacksaw frame	pc	1
9. Hacksaw blade	pc	2
10. Adjustable spanner	pc	1
11. Thermochrome Crayon	pc	2

BILL OF QUANTITIES FOR: rev. 04-91

1) Standard Structure for:
   - Collection Chamber (CC)
   - Break Pressure Tank (BPT)
   - Distribution Chamber (DC)

2) Valve Chamber for:
   - Sectional Valve
   - Wash Out
   - Air Valve

3) Tapstand
4) Pipe trench

Item	Description	Unit	TYPE of STRUCTURE: CC,BPT DC	VALVE CHAMBER	TAP - STAND Type A	TAP - STAND Type B	1m of PIPE LINE
	Quantities of Different Works:						
1	Earth Work Excavation	m^3	6.09	3.67	2.00	2.00	
2	Dry Stone Soiling	m^3	0.73	0.36	0.30	0.30	
3	P.C.C. Work (1:2:4)	m^3	0.59	0.25	0.26	0.60	
4	P.C.C. for Precast Slabs	m^3	0.043	0.043			
5	R.C.C. Work (1:2:4)	m^3	0.322				
6	R.R. Masonry (1:4)	m^3	2.66				
7	R.R. Masonry (1:6)	m^3		1.45	1.88	1.54	
8	Formwork for P.C.C	m^2	3.13	1.53		2.46	
9	1/2"/12.5 mm Plaster (1:4)	m^2	6.51		5.81	5.44	
10	Barbinding R.C.C	kg	20.16				
11	Plaster (1:3) f/ Ferroslab	m^2	0.95				
12	Formwork for Precast	m^2	1.17	0.81			
13	Fencing Work	m	30.00				
14	Trench Digging	m^3					0.50
15	Trench Backfilling	m^3					0.50
	Fittings						
1	PE Pipe 63 mm (Drainage)	m		(5.00)[1]		5.00	
2	PE Pipe 90 mm (2.5 bars)	m	5.00				
3	GI Pipe 1/2"	m				4.00	
4	GI Elbow 1/2"	pc				2	
5	GI Socket 1/2"	pc				1	
6	Brass Tap 1/2"	pc				1	
7	GI Nipple 1/2"	pc				(2.)[2]	
8	GI Union 1/2"	pc				(1.)[2]	
9	Brass Union 20 mm	pc				1	
10	Stopcock 1/2"	pc				(1.)[2]	

For fittings please refer to the respective "List of Pipes and Fittings"

Note: 1) for air valve chamber only

2) for tapstand connection chamber which is used in special cases only

Tapstand type A = with masonry rim (ref. standard drawing)
B = with concrete rim (ref. standard drawing)

SUMMARY OF MATERIALS AND LABOUR FOR: rev. 04-91

1) Standard Structure for:
   - Collection Chamber (CC)
   - Break Pressure Tank (BPT)
   - Distribution Chamber (DC)

2) Valve Chamber for:
   - Sectional Valve
   - Wash Out
   - Air Valve

3) Tapstand

4) Pipe trench

Item	Description	Unit	TYPE of STRUCTURE: CC,BPT DC	VALVE CHAMBER	TAP - STAND Type A	TAP - STAND Type B	1m of PIPE LINE
	Quantities of Material:						
1	Stones (Blocks)	m^3	3.40	1.80	2.16	1.82	
2	Stones (Bond)	m^3	0.34	0.20	0.24	0.20	
3	Aggregate 5 - 10 mm	m^3	0.11	0.03	0.03	0.07	
4	Aggregate 10 - 20 mm	m^3	0.22	0.06	0.06	0.13	
5	Aggregate 20 - 40 mm	m^3	0.52	0.15	0.13	0.31	
6	Sand	m^3	2.25	1.06	1.29	1.28	
7	Cement	bags	13.00	4.00	5.33	6.50	
8	Big Slab Frame 75/75 cm	pc	1	1			
9	Rebar dia. 6 mm	m	27.00				
10	Rebar dia. 10 mm	m	27.00				
11	Binding Wire	kg	0.20				
12	Polythene Sheet (90 cm)	m	2.00	1.00			
13	Barbed Wire	kg	50				
14	Wood for Fencing	m^3	0.19				
15	Wood for Formwork	m^3	0.16	0.08		0.13	
16	U - Hooks	pc	77				
17	Nails	kg	0.80	0.40		0.62	
18	Chcken Wire Mesh (90 cm)	m	1.00				
19	Plain Wire dia. 3.5 mm	kg			0.10	0.10	
20	Labour, Skilled HMG	md	8.00	3.10	4.50	4.65	
21	Labour, Unskilled HMG	md	22.00	9.30	11.34	12.16	
22	Labour, Unskilled Village	md	9.70	5.80	3.20	3.20	1.05

Note: Tapstand type A = with masonry rim (ref. standard drawing)
B = with concrete rim (ref. standard drawing)

BILL OF QUANTITIES FOR: Ferrocement Storage Tanks

Item	Description	Unit	SIZE OF STORAGE TANKS 2.5 m³	5 m³	10 m³	20 m³
Quantities of Different Works:						
1	Earth Work Excavation	m³	13.31	18.02	27.97	45.52
2	Dry Stone Soiling	m³	1.19	1.70	2.56	3.92
3	P.C.C. Work (1:2:4)	m³	0.59	0.80	1.18	1.79
4	P.C.C. for Precast Slabs	m³	0.07	0.07	0.07	0.07
5	R.C.C. Work (1:2:4)	m³	0.14	0.14	0.14	0.14
6	R.R. Masonry (1:6)	m³	3.74	3.55	3.70	3.95
7	Dry Stone Masonry	m³	0.24	0.24	0.24	0.24
8	Formwork for P.C.C	m²	1.28	1.28	1.28	1.28
9	1/2" (12.5 mm) Plaster (1:2)	m²	19.68	28.64	45.70	71.70
10	1/2" (12.5 mm) Plaster (1:3)	m²	19.68	28.64	45.70	71.70
11	1/2" (12.5 mm) Plaster (1:4)	m²	8.35	10.14	13.76	18.90
12	Cement Punning 3 mm	m²	9.07	13.50	21.69	34.57
13	Barbinding R.C.C	kg	11.06	11.06	11.06	11.06
14	Barbinding Fe - Tank	m²	9.68	14.16	22.69	35.69
15	Formwork for Fe - Tank	m²	9.68	14.16	22.69	35.69
16	Snowcem Painting	m²	3.30	5.38	9.29	15.27
17	Fencing Work	m	18	20	26	30
18	Backfilling of Structure	m³	3.19	4.62	7.00	10.51
Fittings						
1	GI Elbow 2"	pc	7	7	7	7
2	GI Elbow 1/2"	pc	1	1	1	1
3	GI Nipple 2"	pc	5	5	5	5
4	GI Nipple 1/2"	pc	1	1	1	1
5	GI Tee, equal 1/2"	pc	1	1	1	1
6	GI Tee, equal 2"	pc	1	1	1	1
7	GI Union 2"	pc	1	1	1	1
8	GI Flange set 2"/63mm	pc	2	2	2	2
9	GI End Cap 2" (see note)	pc	(2)	(2)	(2)	(2)
10	GI Reducer 2"-1/2"	pc	1	1	1	1
11	GI Bracket 2"	pc	2	2	2	2
12	GI Bracket 1/2"	pc	1	1	1	1
13	GI Pipe 2"	m	8.45	9.05	10.15	11.55
14	GI Pipe 2" (Support)	m	1.80	1.90	2.15	2.50
15	GI Pipe 1/2"(Vent)	m	1.70	1.70	1.85	2.05
16	GI Pipe 1/2"(Brackets)	m	1.50	1.50	1.50	1.50
17	Gate Valve 2"	pc	2	2	2	2
18	PE Pipe 63 mm (Drainage)	m	10.00	10.00	10.00	10.00

Note: Item 9. GI End Caps 2" are used only during construction. They shall not be included in the material request, since End Caps from cleaning outs can be used temporary for the purpose of locking the pipes during construction of the tank.

SUMMARY OF MATERIALS AND LABOUR FOR: Ferrocement Storage Tanks

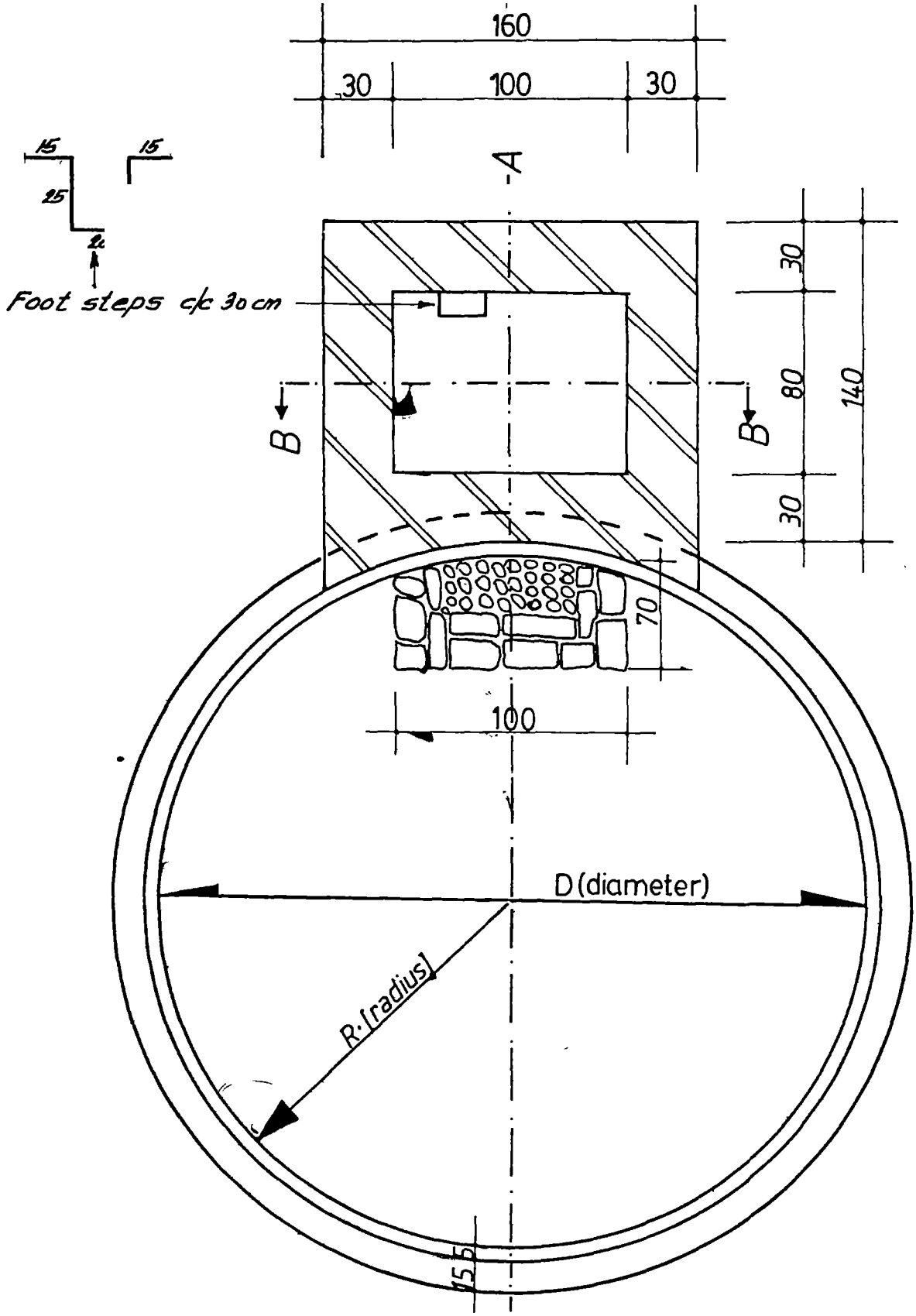
Item Description	Unit	SIZE OF STORAGE TANKS 2.5 m³	5 m³	10 m³	20 m³
Quantities of Material:					
1...Stones (Blocks)	m³	5.20	5.50	6.50	8.10
2...Stones (Bond)	m³	0.52	0.60	0.65	0.81
3...Aggregate 5 - 10 mm	m³	0.09	0.11	0.15	0.22
4...Aggregate 10 - 20 mm	m³	0.19	0.23	0.32	0.45
5...Aggregate 20 - 40 mm	m³	0.43	0.54	0.74	1.05
6...Sand	m³	3.57	4.50	5.52	7.61
7...Cement	bags	18.00	21.50	29.50	41.50
8...Small Slab Frame 55/55 cm	pc	2	2	2	2
9...Rebar dia. 6 mm	m	14	21	30	53
10...Rebar dia. 10 mm	m	55	80	114	144
11...Plain Wire dia. 3.5 mm	kg	23	30	51	80
12...Chicken Wire Mesh (90 cm)	m	22	38	55	75
13...Binding Wire	kg	5.10	5.60	7.10	8.10
14...Bamboo	pc	6	8	10	12
15...Polythene Sheet (90 cm)	m	13.40	17.60	23.60	30.10
16...Snowcem	kg	1.65	2.70	4.65	7.65
17...Barbed Wire	kg	30.00	33.50	43.50	50.00
18...Wood for Fencing	m³	0.12	0.13	0.17	0.19
19...Wood for Formwork	m³	0.07	0.07	0.07	0.07
20...U - Hooks	pc	46	51	67	77
21...Nails	kg	0.82	0.82	0.82	0.82
22...Labour, Skilled HMG	md	50.00	54.70	67.40	86.80
23...Labour, Unskilled HMG	md	43.80	50.10	64.40	86.00
24...Labour, Unskilled Village	md	23.10	21.50	48.70	78.70

LIST OF DRAWINGS

DRAWINGS

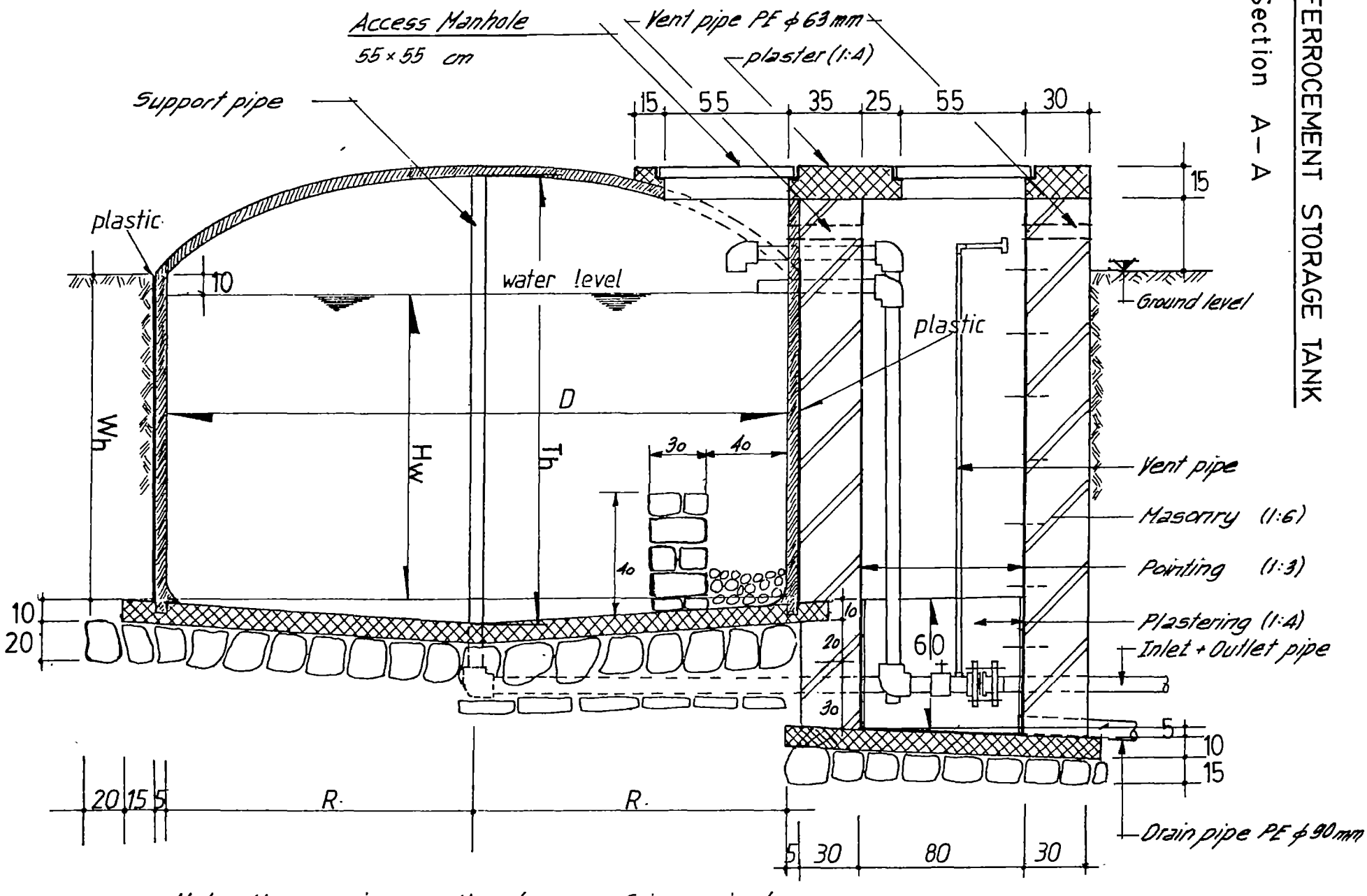
FERROCEMENT STORAGE TANK

Ground Plan



FERROCEMENT STORAGE TANK

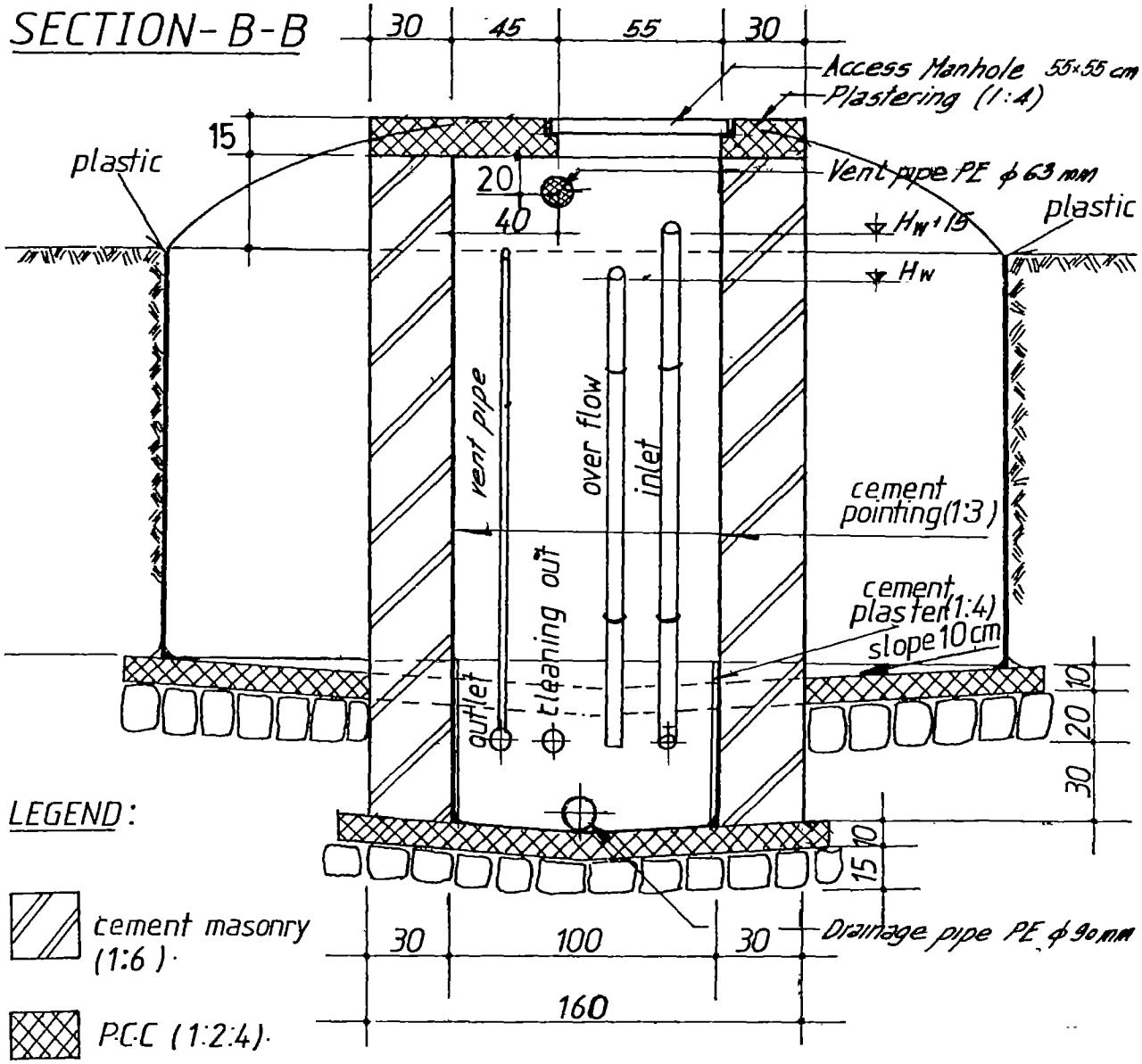
Section A–A



Note : No punning on the dome roof is required

FERROCEMENT STORAGE TANK

SECTION-B-B



LEGEND:

- cement masonry (1:6)
- P.C.C (1:2:4)
- soling.

TANK DIMENSIONS

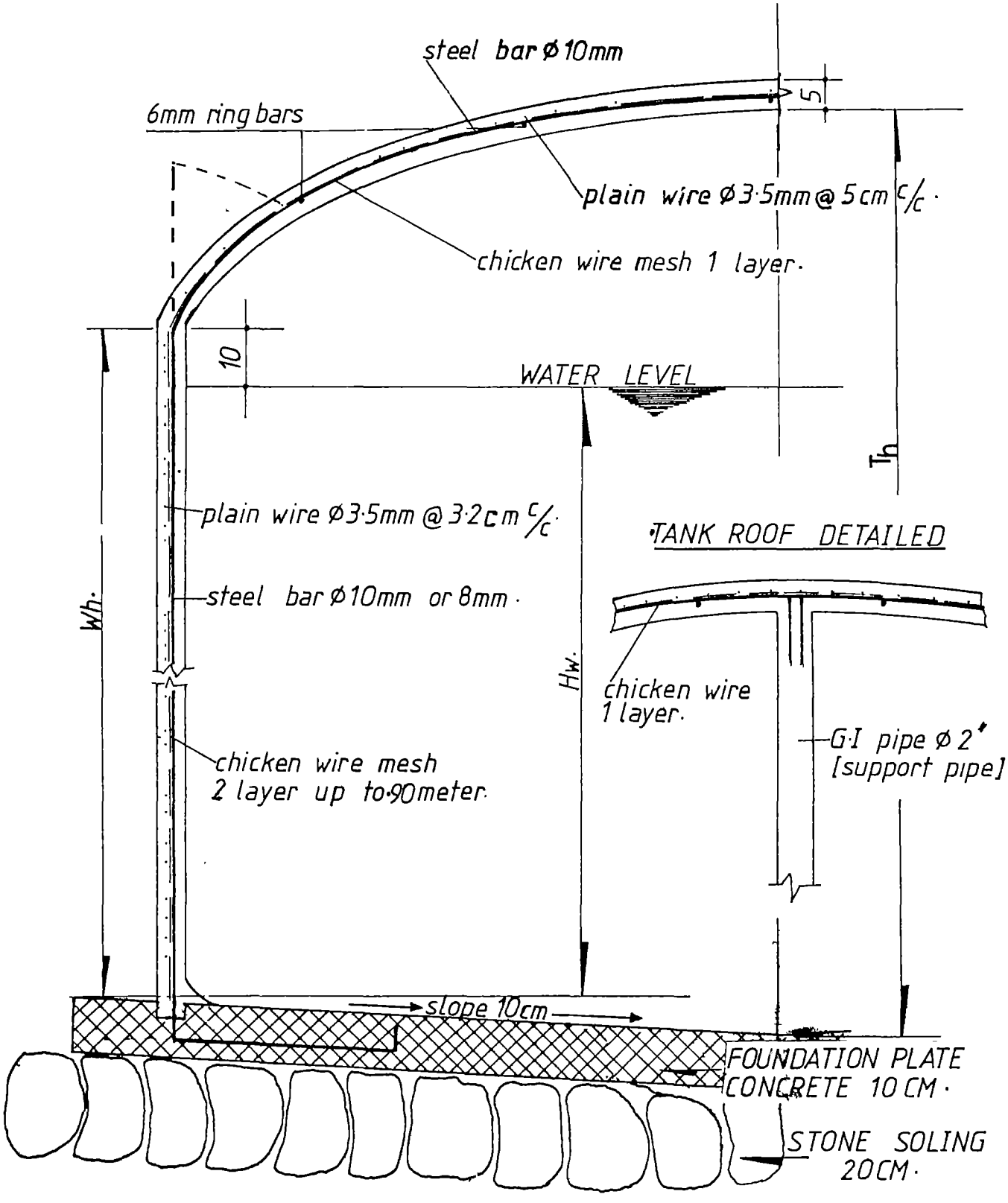
TANK CAPACITY	WATER DEPTH	WALL HEIGHT	TOTAL HEIGHT	RADIUS	DIA-METER
2.5m^3	1.30m	1.40m	1.70m	0.80m	1.60m
5 m^3	1.30m	1.40m	1.80m	1.10m	2.20m
10 m^3	1.45m	1.55m	2.05m	1.50m	3.00m
20 m^3	1.65m	1.75m	2.40m	2.00m	4.00m

FERROCEMENT STORAGE TANK

REINFORCEMENT DETAILS

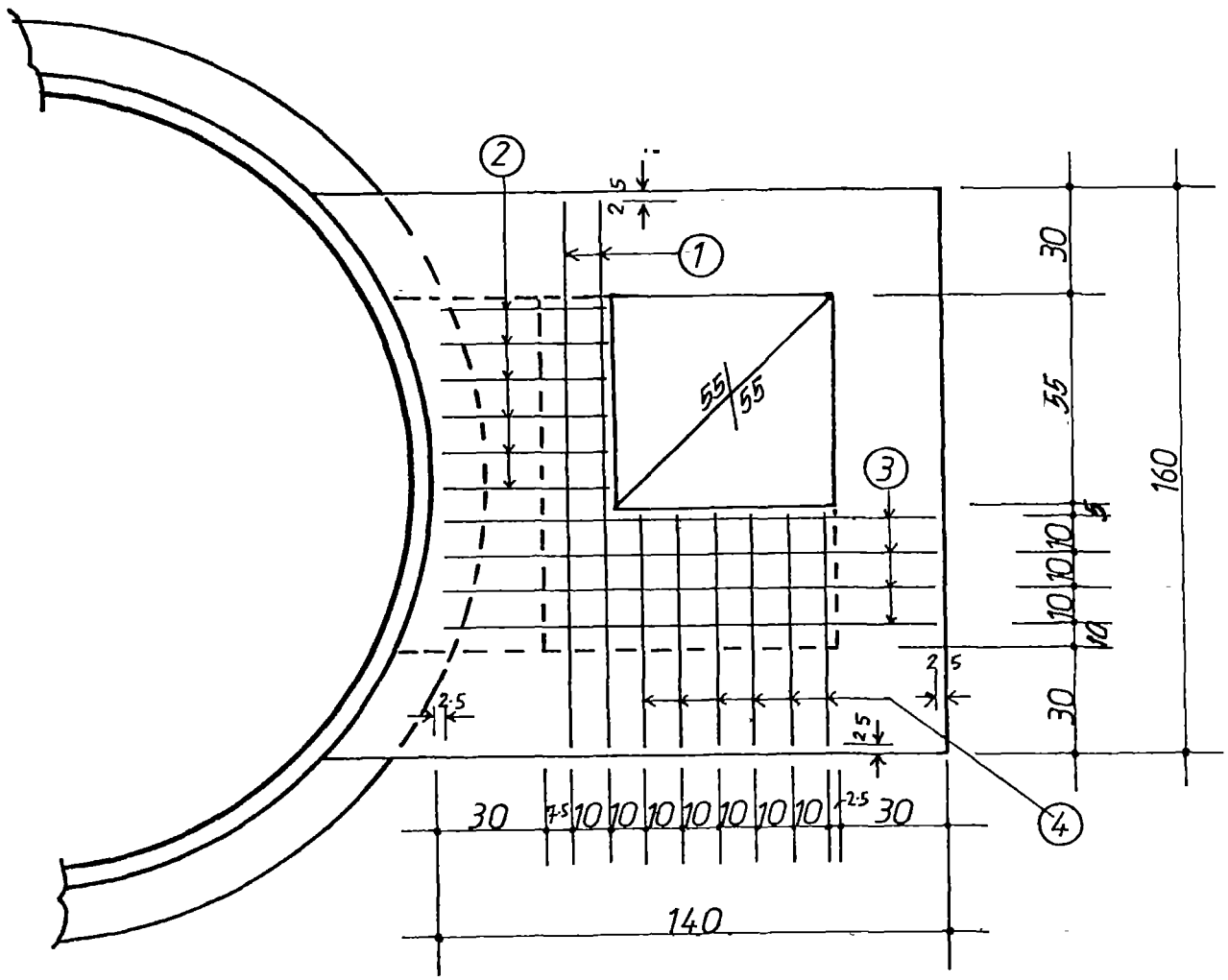
Wall reinforcement - schedule C
Roof reinforcement - schedule D
Bar bending schedule page 8

TANK — SECTION



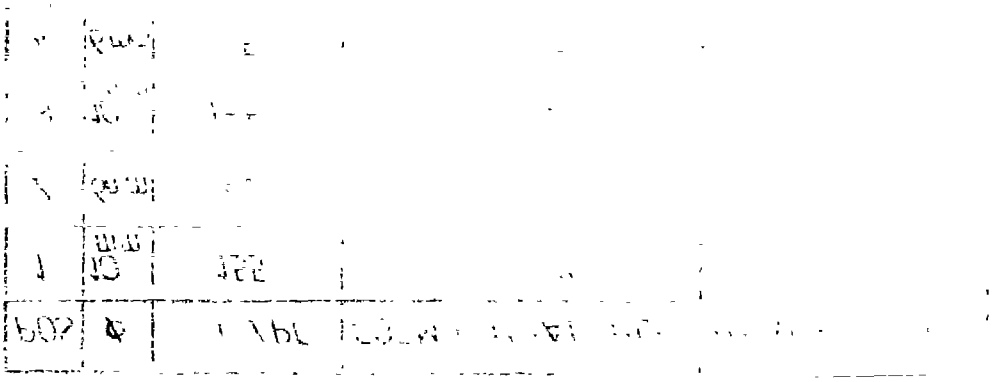
FERROCEMENT STORAGE TANK

OPERATION CHAMBER SLAB REINFORCEMENT



POS.	ø	L./PC.	FORM	TOTAL PC.	TOTAL LENGTH
1	10 mm	155	——	2	310
2	6mm	45	——	6	270
3	10 mm	135	——	4	540
4	6mm	65	——	6	390

Summary: diam 6mm L=6.60m
diam 10mm L=8.50m

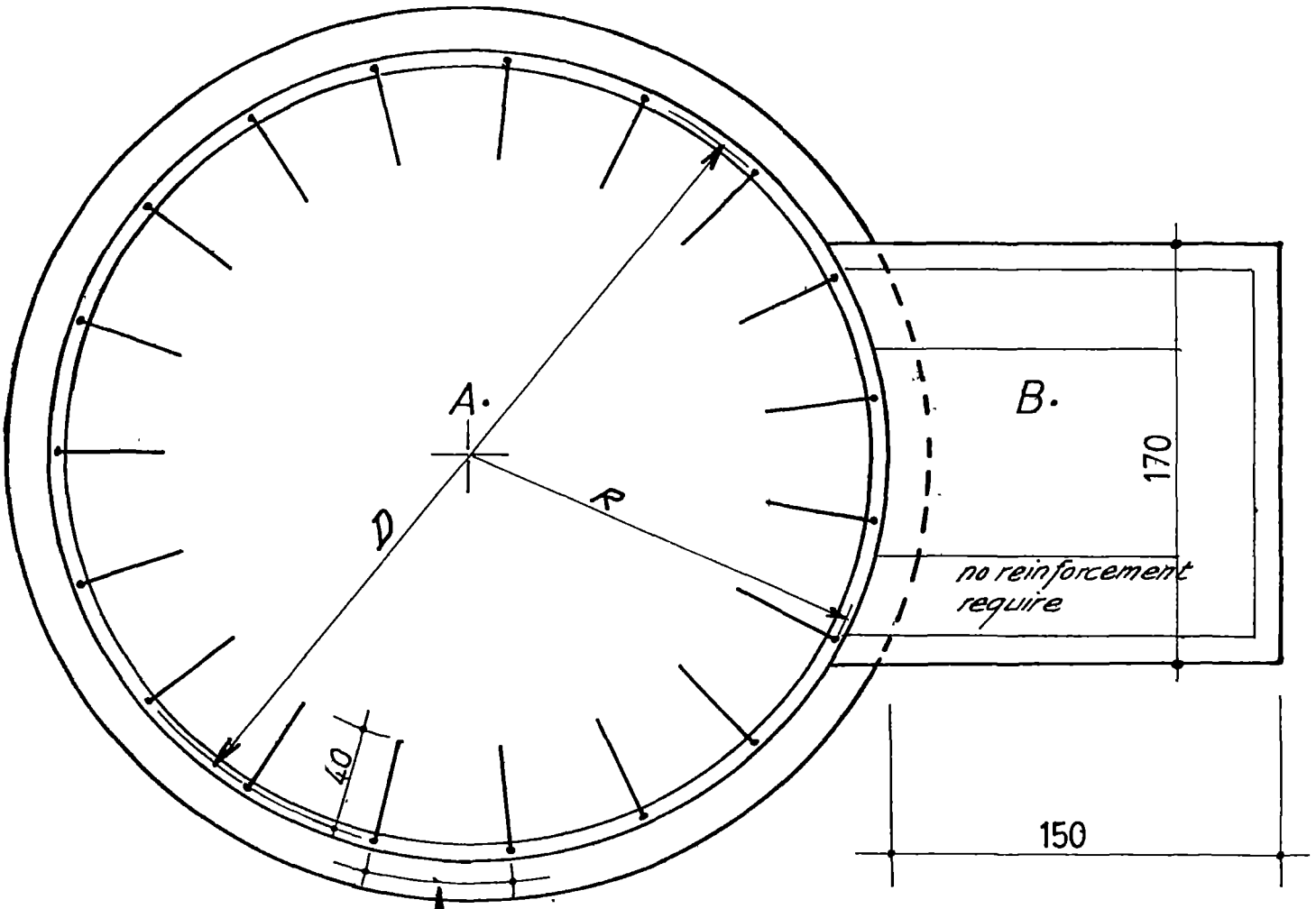


FERROCEMENT STORAGE TANK

REINFORCEMENT FOUNDATION PLAN

A. TANK

B. OPERATION CHAMBER

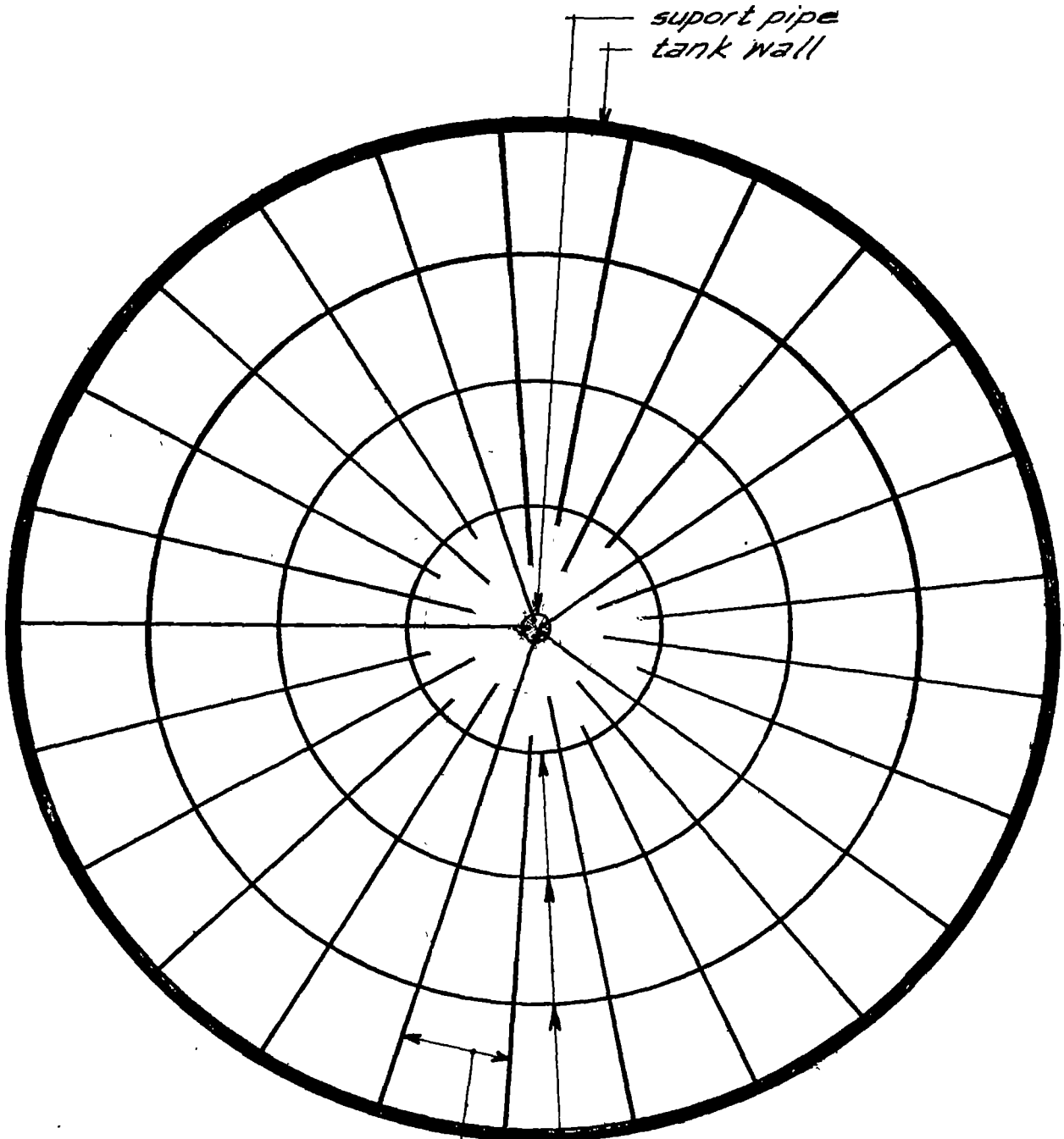


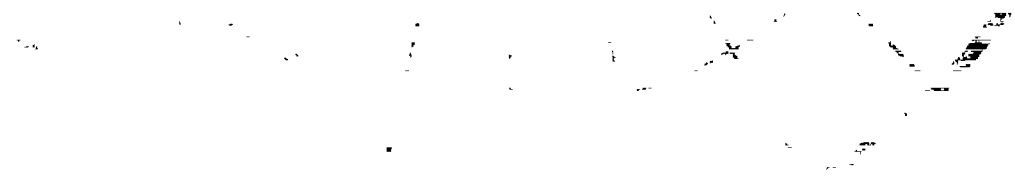
Tank size	Stirrup spacing	D	R
2.5 m^3	52 cm	165 cm	82.5 cm
5 m^3	47 cm	225 cm	112.5 cm
10 m^3	48 cm	305 cm	152.5 cm
20 m^3	51 cm	405 cm	202.5 cm

Barbending schedule page 8

FERROCEMENT STORAGE TANK

DOME ROOF REINFORCEMENT

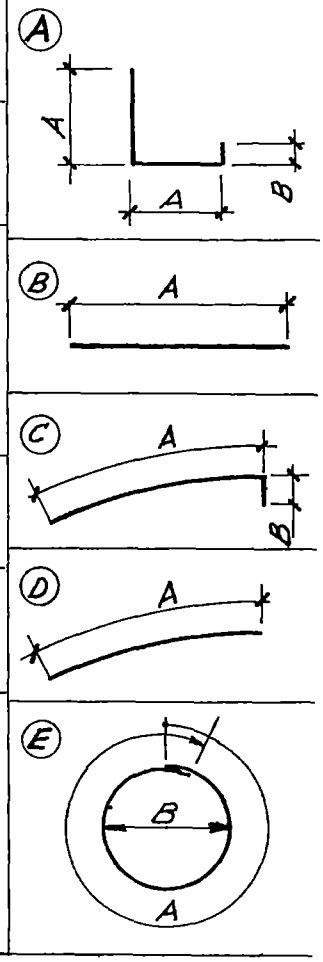




F E R R O C E M E N T S T O R A G E T A N K

B A R B E N D I N G S C H E D U L E

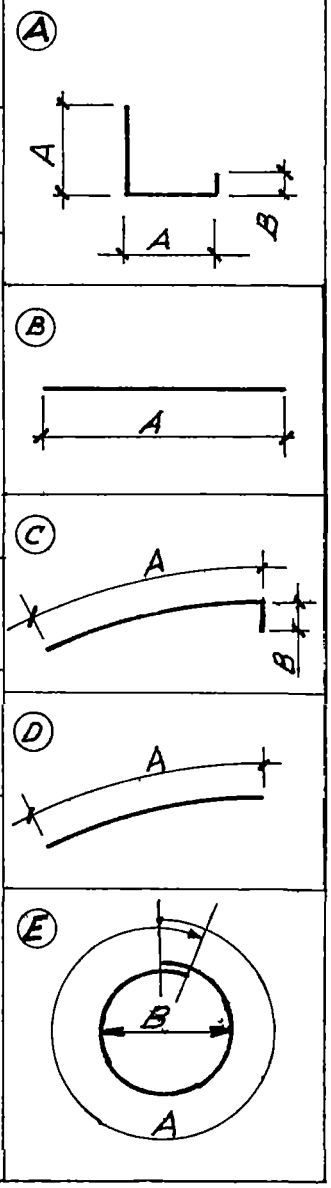
Part of Structure	Bar diam mm	Dimensions A cm	Dimensions B cm	Cut - Length cm	Total No	Shape	TOTAL Length m	TOTAL/ diam. m	Shape
	TANK CAPACITY 2.5 m3								
Fund. A	10	40	5	85	10	A	8.5		
Wall C	10	185		185	10	B	18.5		
	Plain wire diam. 3.5 mm						230.0		
	Chicken wire mesh 0.9 m width						15.0		
Roof	10	80	10	90	5	C	4.5		
	10	70		70	5	D	3.5	8.0	
	6	210	60	210	1	E	2.1		
	6	400	120	400	1	E	4.0	6.1	
	Plain wire diam. 3.5 mm						45.0		
	Chicken wire mesh 0.9 m width						5.0		
	TANK CAPACITY 5 m3								
Fund. A	10	40	5	85	15	A	12.8		
Wall C	10	185		185	15	B	27.8		
	Plain wire diam. 3.5 mm						315.0		
	Chicken wire mesh 0.9 m width						25.0		
Roof	10	110	10	120	5	C	6.0		
	10	100		100	10	D	10.0	16.0	
	6	210	60	210	1	E	2.1		
	6	400	120	400	1	E	4.0		
	6	600	180	600	1	E	6.0	12.1	
	Plain wire diam. 3.5 mm						80.0		
	Chicken wire mesh 0.9 m width						10.0		



F E R R O C E M E N T S T O R A G E T A N K

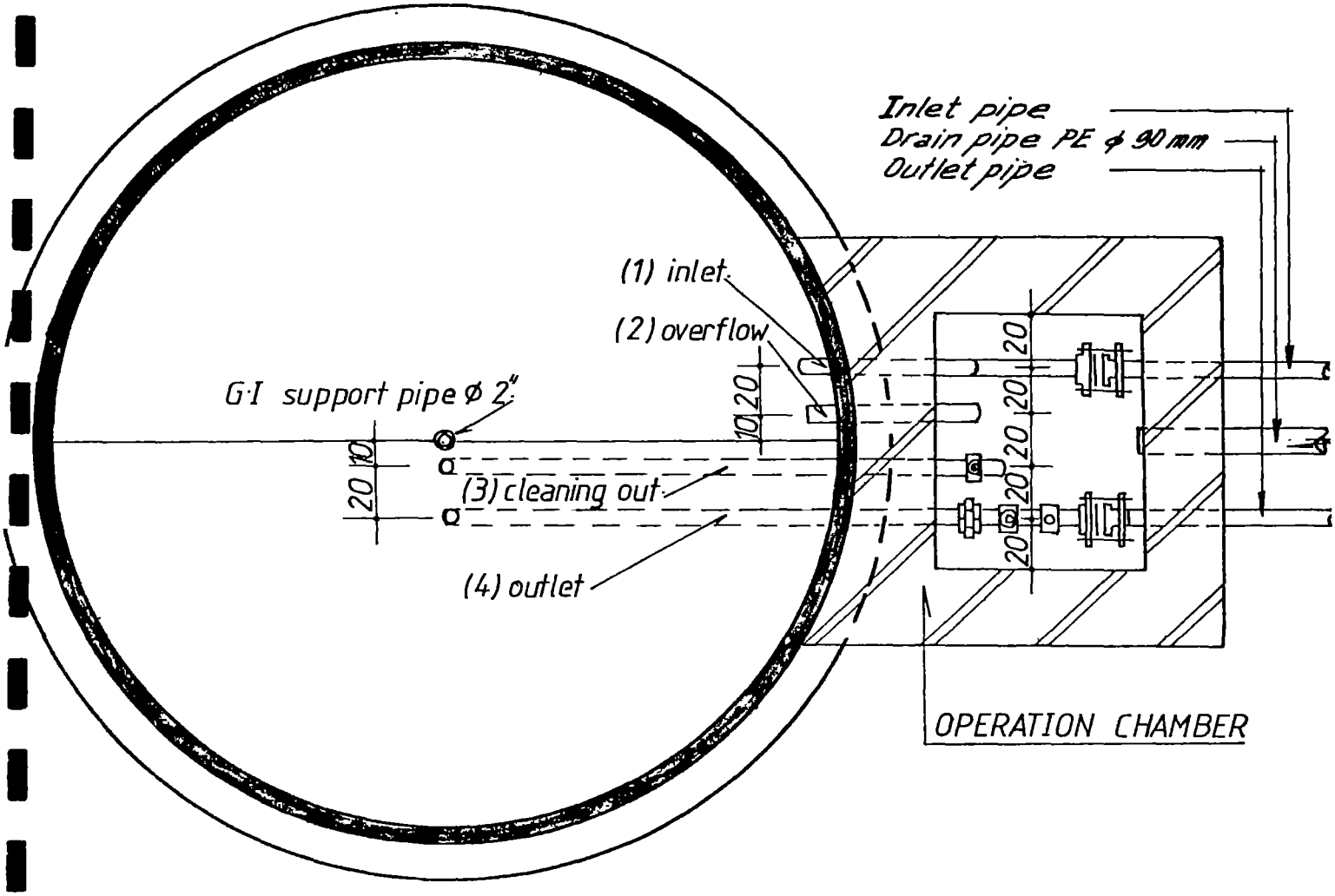
B A R B E N D I N G S C H E D U L E

Part of Structure	Bar diam mm	Dimensions A cm	Dimensions B cm	Cut - Length cm	Total No	Shape	TOTAL Length m	TOTAL/ diam. m	Shape
	TANK CAPACITY 10 m3								
Fund. A	10	40	5	85	20	A	17.0		
Wall C	10	210		210	20	B	42.0		
	Plain wire diam. 3.5 mm						470.0		
	Chicken wire mesh 0.9 m width						30.0		
Roof	10	155	10	165	5	C	8.3		
	10	145		145	5	D	7.3		
	10	130		130	10	D	13.0	28.5	
	6	210	60	210	1	E	2.1		
	6	400	120	400	1	E	4.0		
	6	600	180	600	1	E	6.0		
	6	800	240	800	1	E	8.0	20.1	
	Plain wire diam. 3.5 mm						150.0		
	Chicken wire mesh 0.9 m width						20.0		
	TANK CAPACITY 20 m3								
Fund. A	10	40	5	85	25	A	21.3		
Wall C	10	230		230	25	B	57.5		
	Plain wire diam. 3.5 mm						700.0		
	Chicken wire mesh 0.9 m width						40.0		
Roof	10	205	10	215	5	C	10.8		
	10	195		195	10	D	19.5		
	10	180		180	10	D	18.0	48.3	
	6	210	60	210	1	E	2.1		
	6	400	120	400	1	E	4.0		
	6	600	180	600	1	E	6.0		
	6	800	240	800	1	E	8.0		
	6	1000	300	1000	1	E	10.0		
	6	1200	360	1200	1	E	12.0	42.1	
	Plain wire diam. 3.5 mm						260.0		
	Chicken wire mesh 0.9 m width						30.0		



FERROCEMENT STORAGE TANK

PIPE INSTALLATION PLAN



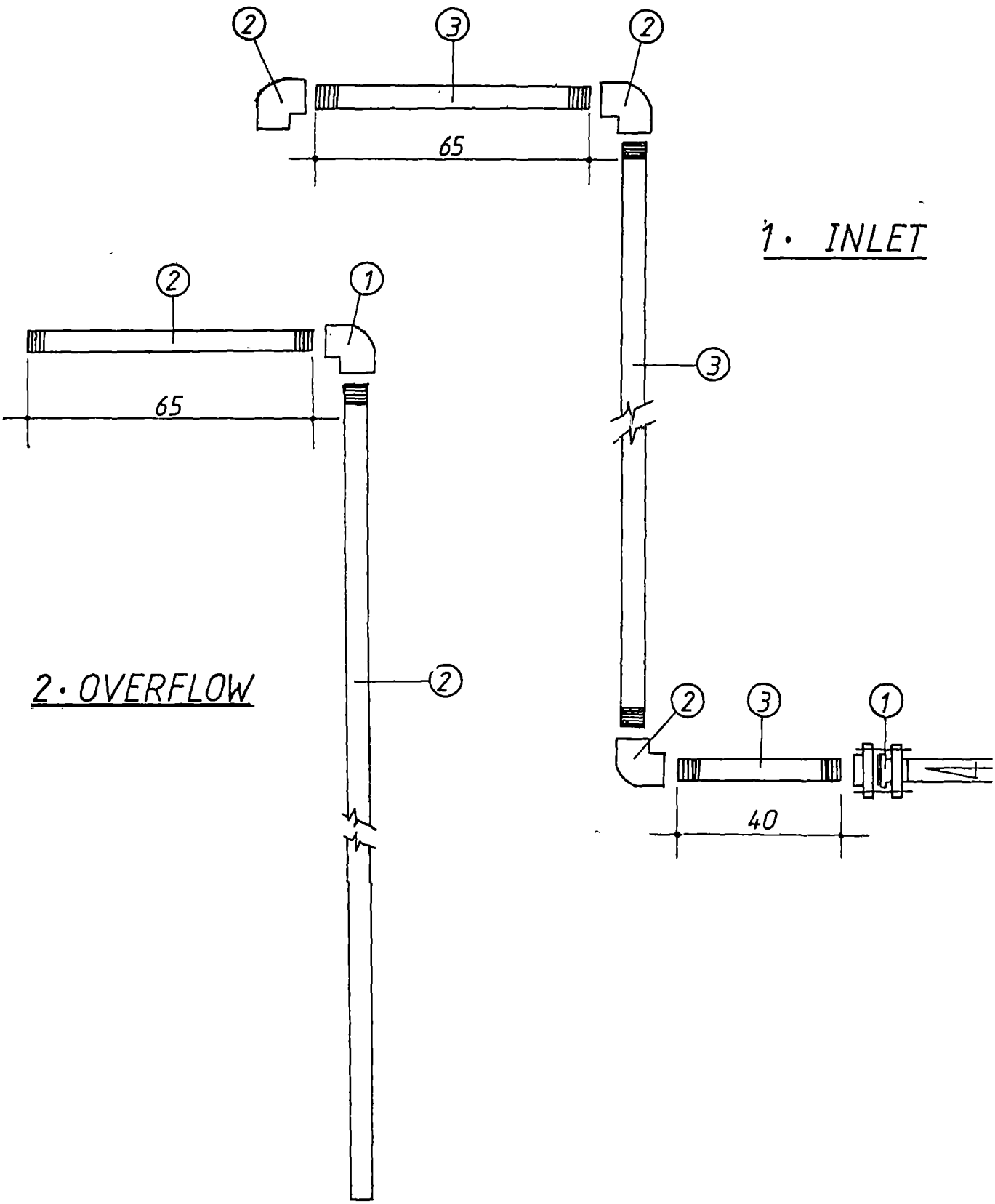
LEGEND:

cement masonry(1:6)

ferrocement wall.

FERROCEMENT STORAGE TANK

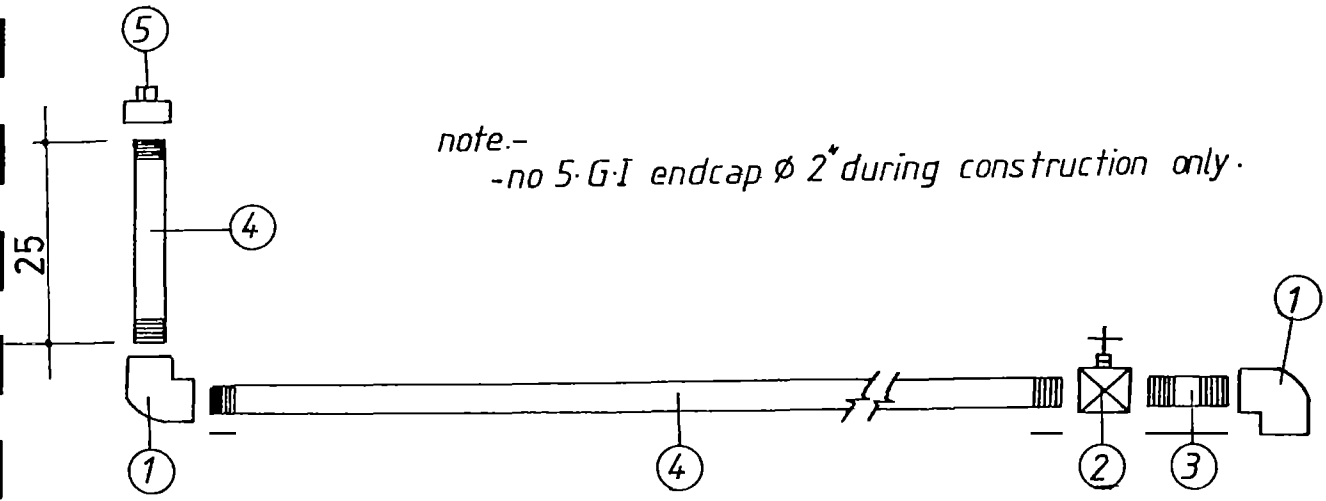
PIPE INSTALLATION DETAILS



FERROCEMENT STORAGE TANK

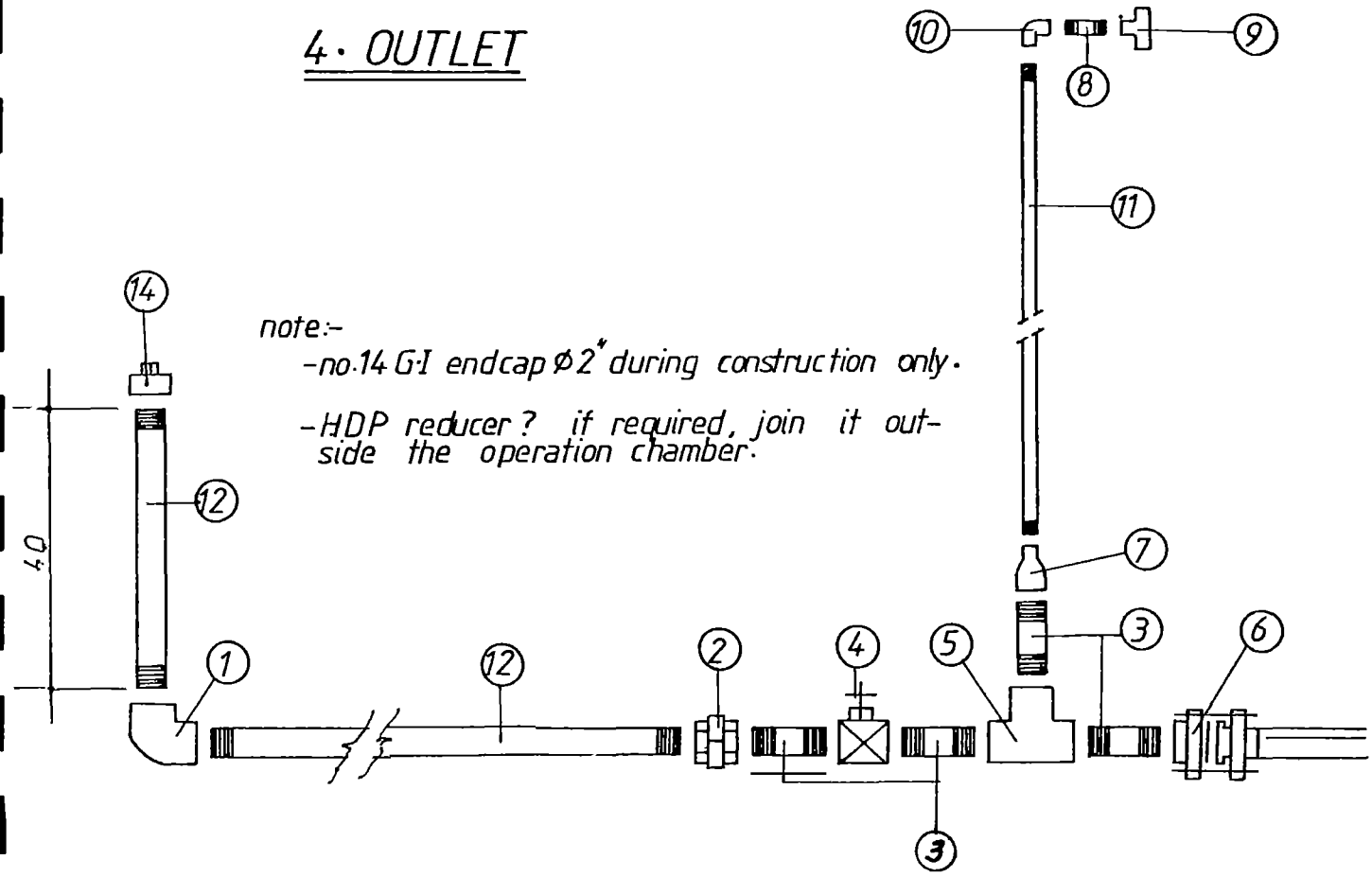
PIPE INSTALLATION DETAILS

3. CLEANING OUT



note:-
-no 5 G.I endcap ø 2" during construction only.

4. OUTLET

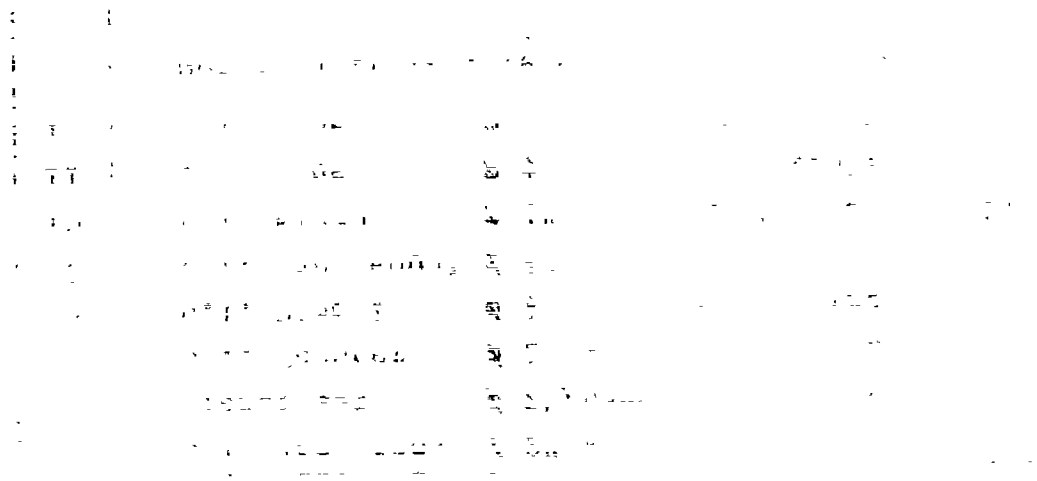


note:-
-no.14 G.I endcap ø 2" during construction only.
-HDP reducer? if required, join it outside the operation chamber.

F E R R O C E M E N T S T O R A G E T A N K

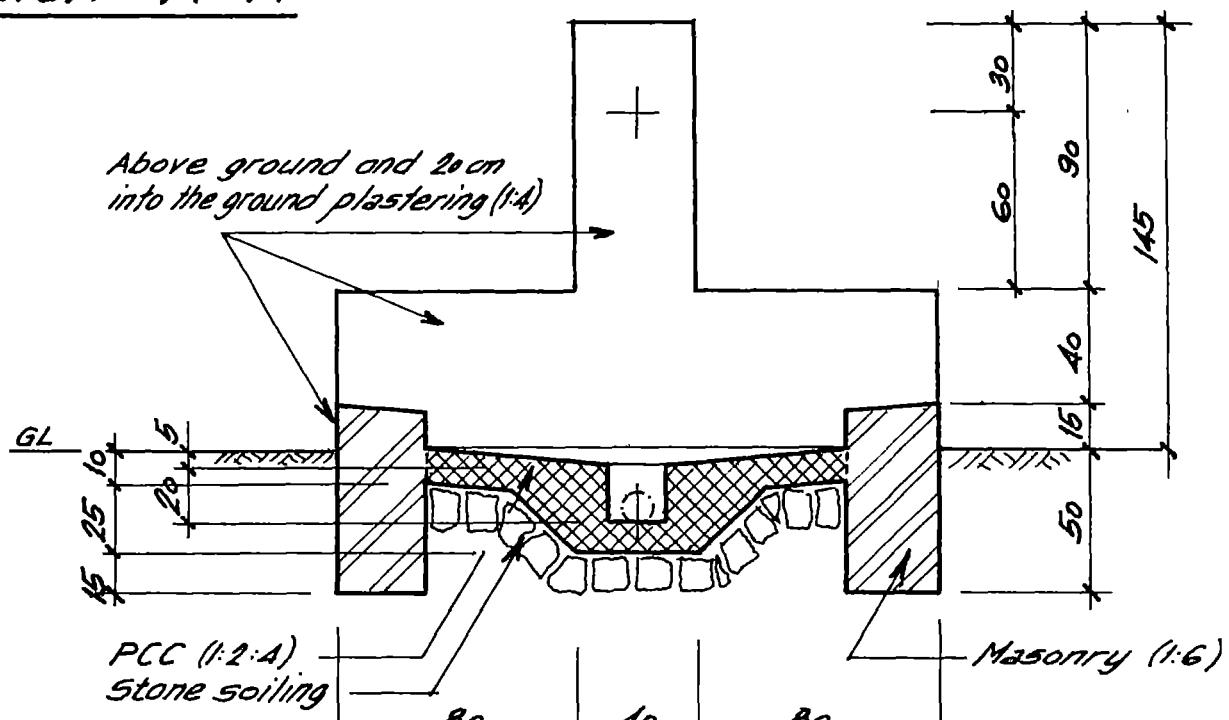
Pipe Installation List of Fittings and Pipes

Item	Description	Tank capacity 2.5m^3	5m^3	10m^3	20m^3
	1. Inlet				
1	Flange Set ø 2"/63mm	1pc	1pc	1pc	1pc
2	G.I. Elbow ø 2"	3pc	3pc	3pc	3pc
3	G.I. Pipe ø 2"	2.85m	2.85m	3.00m	3.20m
	2. Overflow				
1	G.I. Elbow ø 2"	1pc	1pc	1pc	1pc
2	G.I. Pipe ø 2"	2.30m	2.30m	2.45m	2.65m
	3. Cleaning out				
1	G.I. Elbow ø 2"	2pc	2pc	2pc	2pc
2	Gate Valve ø 2"	1pc	1pc	1pc	1pc
3	G.I. Nipple ø 2"	1pc	1pc	1pc	1pc
4	G.I. Pipe ø 2"	1.60m	1.90m	2.30m	2.80m
	4. Outlet				
1	G.I. Elbow ø 2"	1pc	1pc	1pc	1pc
2	G.I. Union ø 2"	1pc	1pc	1pc	1pc
3	G.I. Nipple ø 2"	4pc	4pc	4pc	4pc
4	Gate Valve ø 2"	1pc	1pc	1pc	1pc
5*	G.I. Tee, equal ø 2" G.I. Tee, red. ø 2" - ½"	1pc	1pc	1pc	1pc
6	Flange set ø 2"/63mm	1pc	1pc	1pc	1pc
7	G.I. Reducer ø 2" - ½"	1pc	1pc	1pc	1pc
8	G.I. Nippel ø ½"	1pc	1pc	1pc	1pc
9	G.I. Tee, equal ø ½"	1pc	1pc	1pc	1pc
10	G.I. Elbow ø ½"	1pc	1pc	1pc	1pc
11	G.I. Pipe ø ½"	1.65m	1.65m	1.80m	2.00m
12	G.I. Pipe ø 2"	1.70m	2.00m	2.40m	2.90m
	Note: *) If Tee, reducing is used,,one nipple and one reducer should be deducted.				

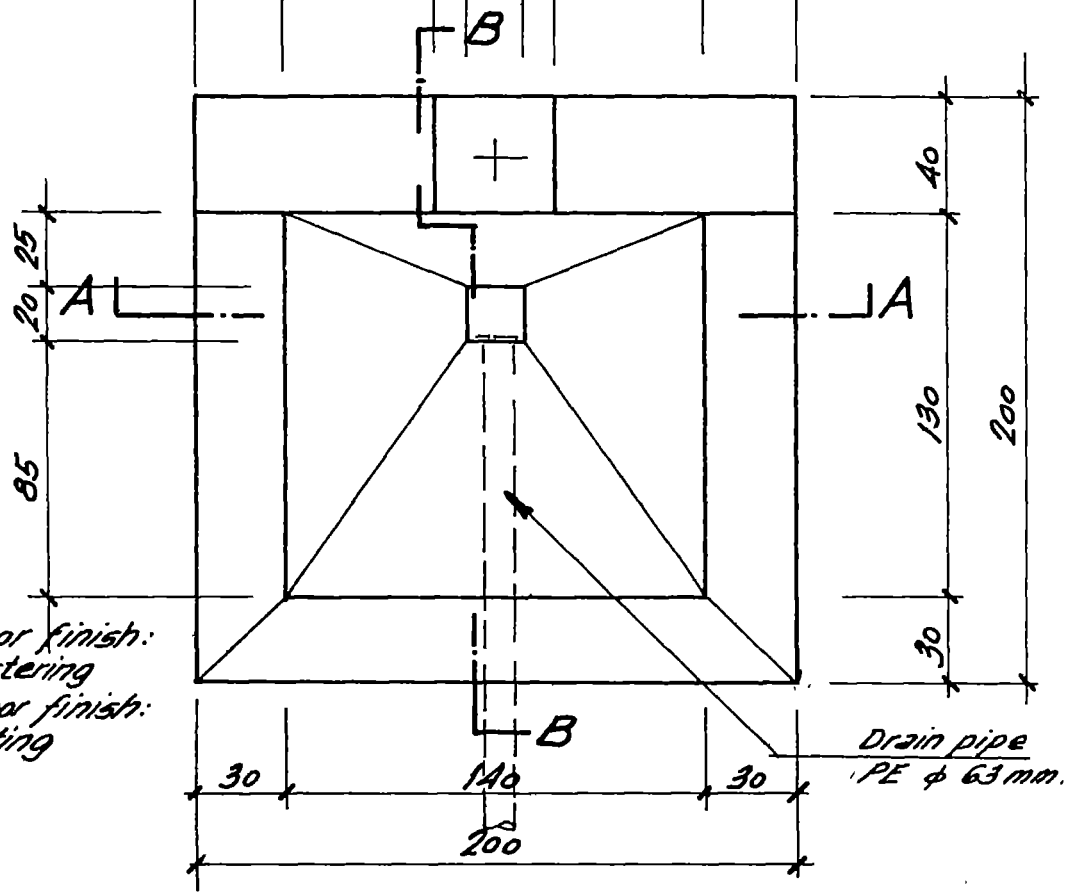


TAPSTAND

Section A-A



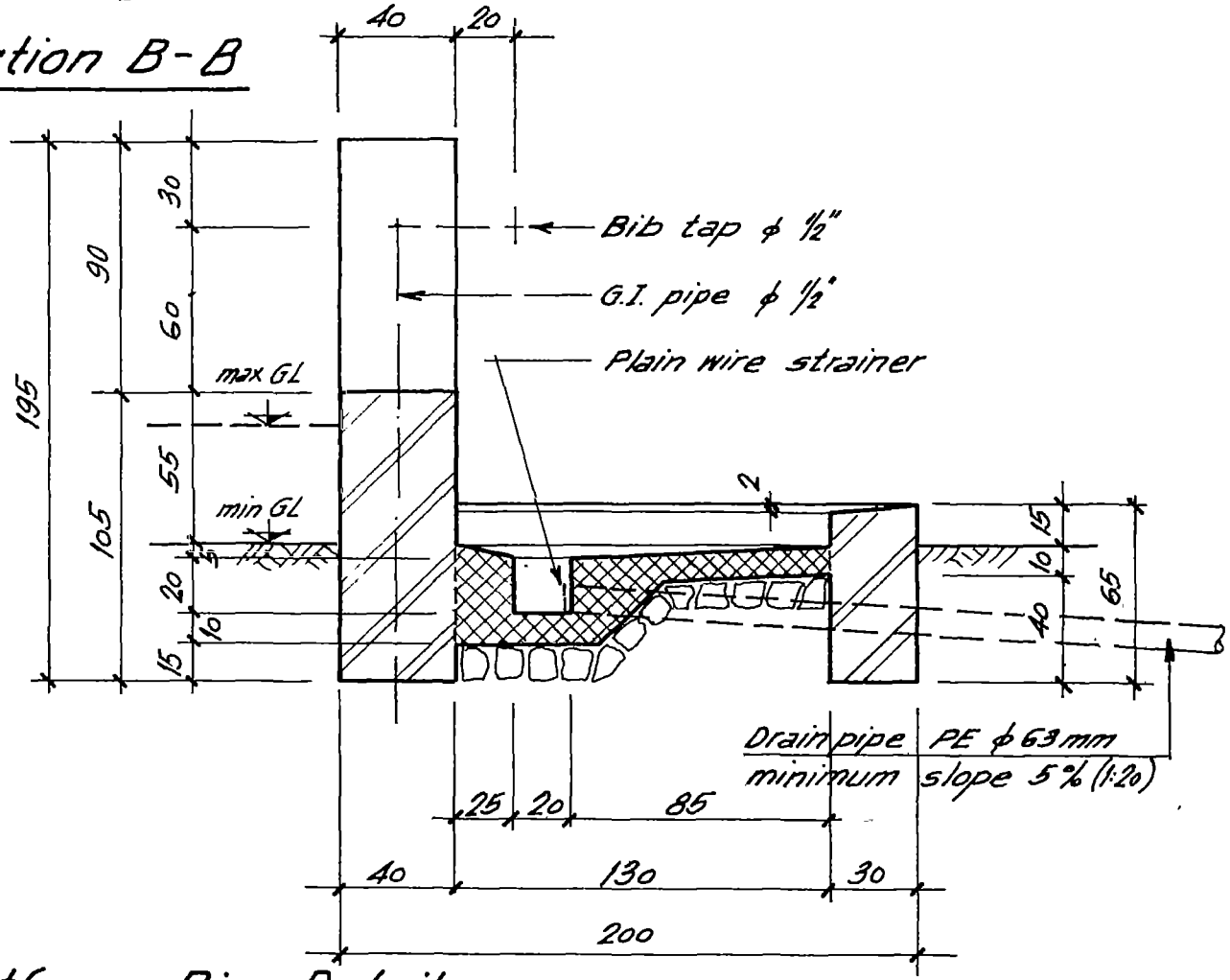
Plan



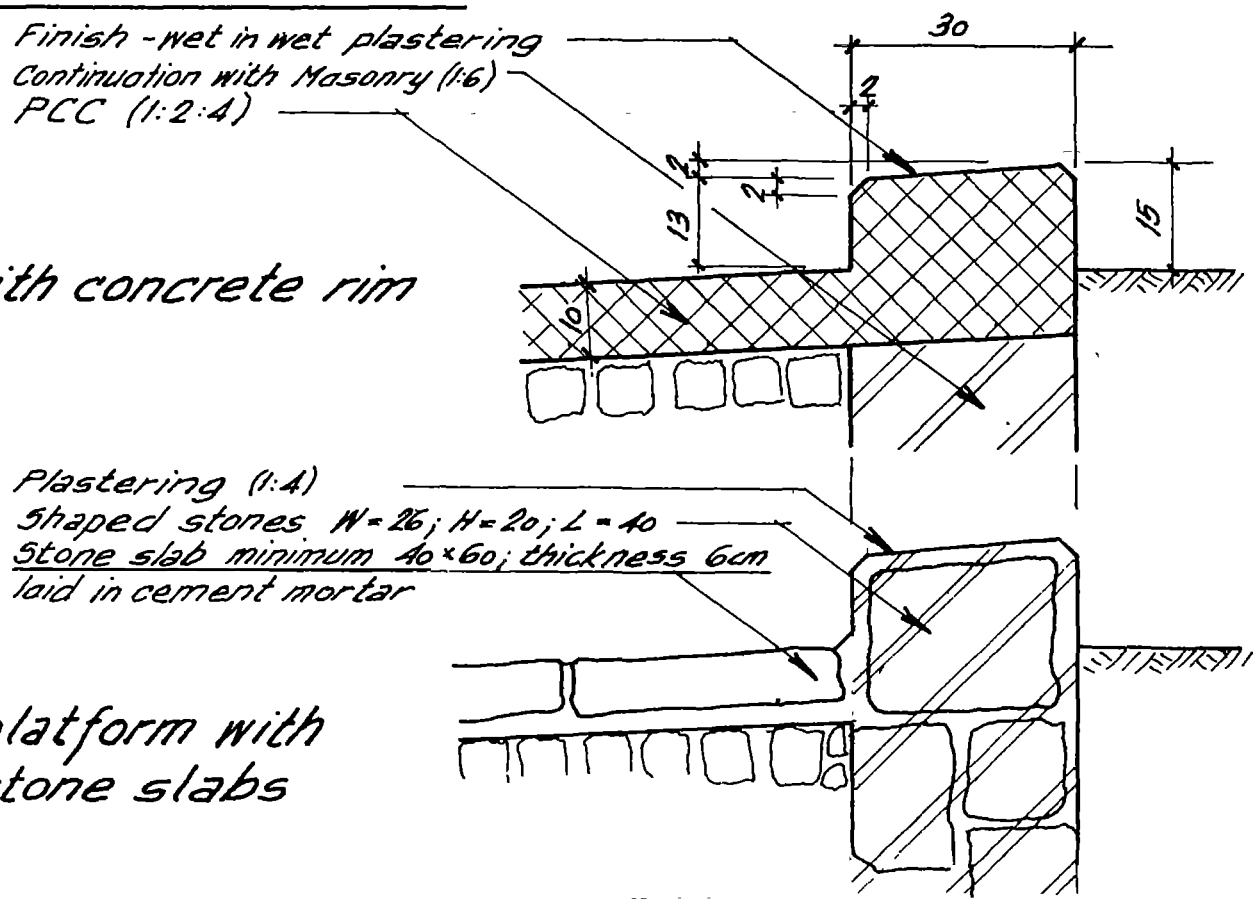
Concrete floor finish:
"wet in wet" plastering
Stone slab floor finish:
cement pointing

TAPSTAND

Section B-B

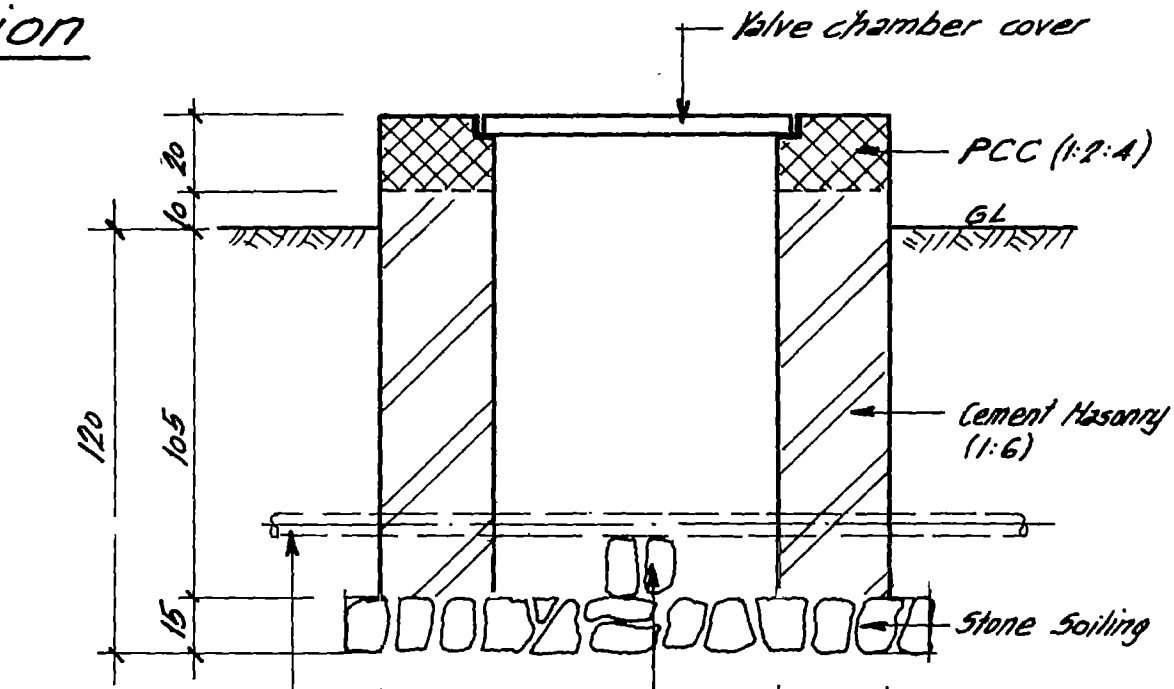


Platform - Rim Details

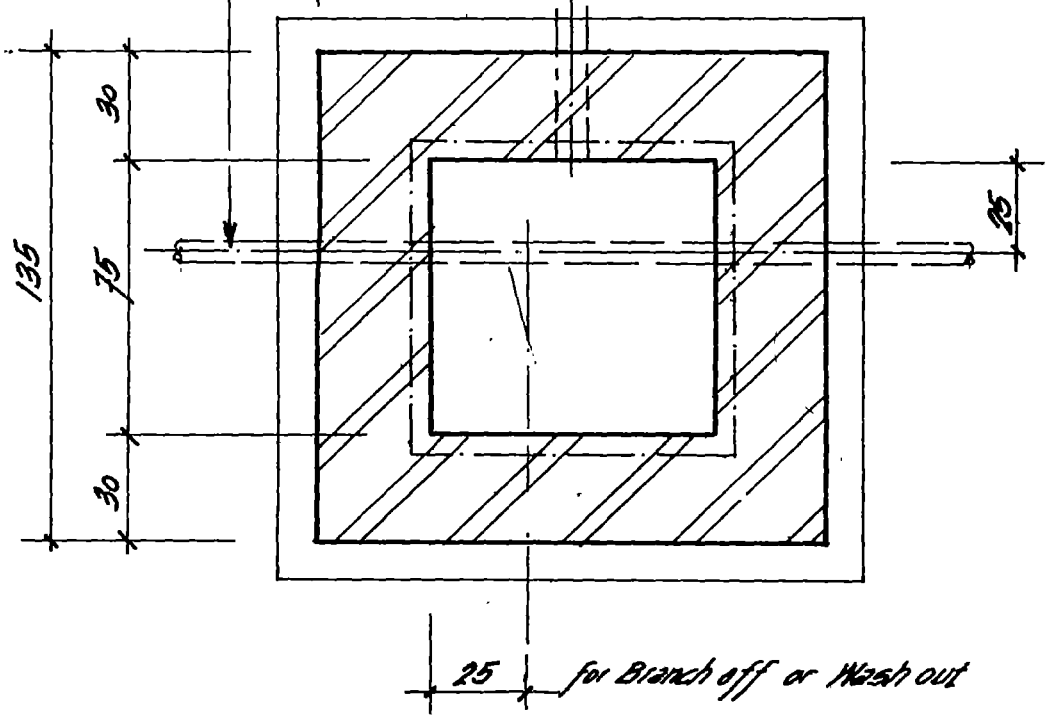


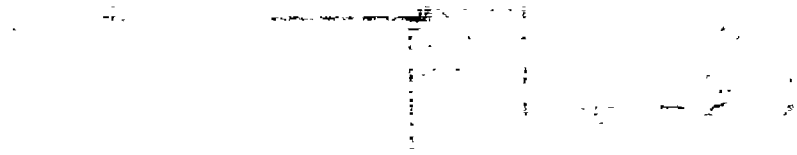
VALVE CHAMBER

Section



Plan

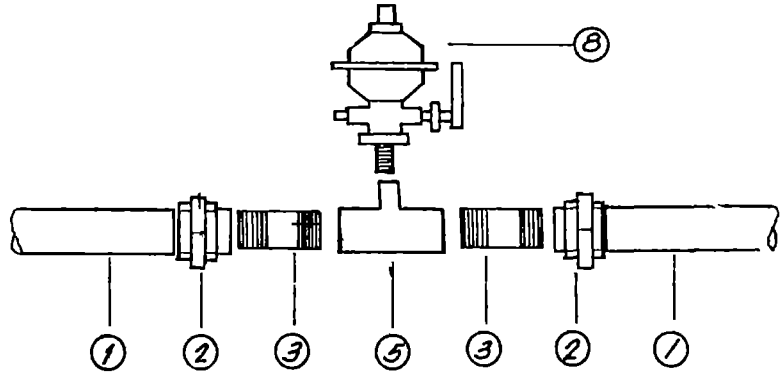




VALVE CHAMBER

PIPE INSTALLATION DETAILS

Air Release Valve



Legend:

① PE main pipe

② Adaptor
- up to pipe ø 40mm Brass Union
- above pipe ø 40mm Flange Set

③ G.I. Nipple

④ G.I. pipe, length 20cm

⑤ G.I. Tee, reducing or

G.I. Tee equal +
G.I. Nipple +
G.I. Reducer

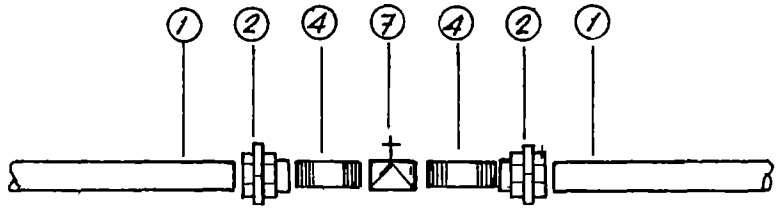
⑥ G.I. Tee, equal

⑦ Gate Valve

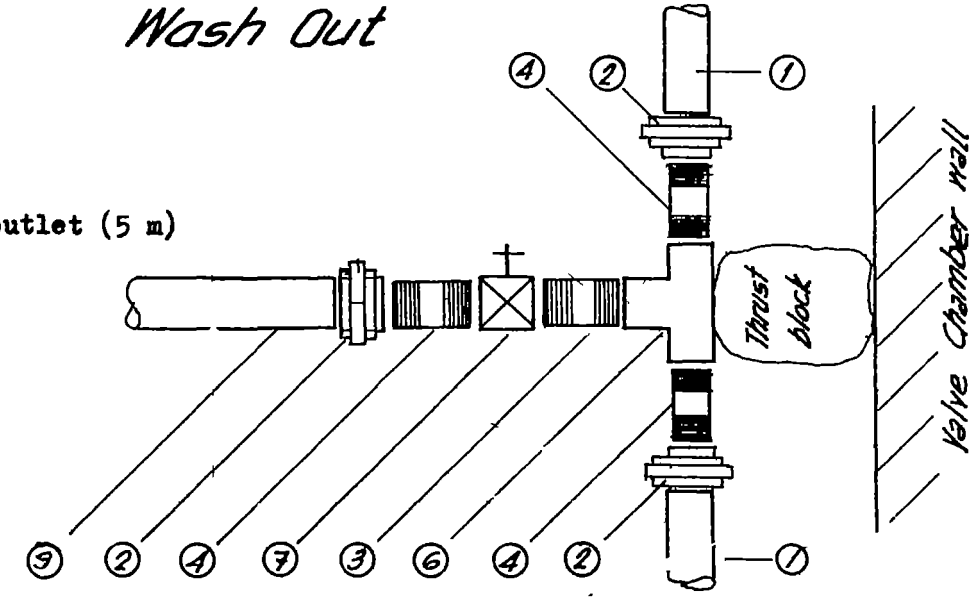
⑧ Air Release Valve

⑨ Drain pipe to free outlet (5 m)

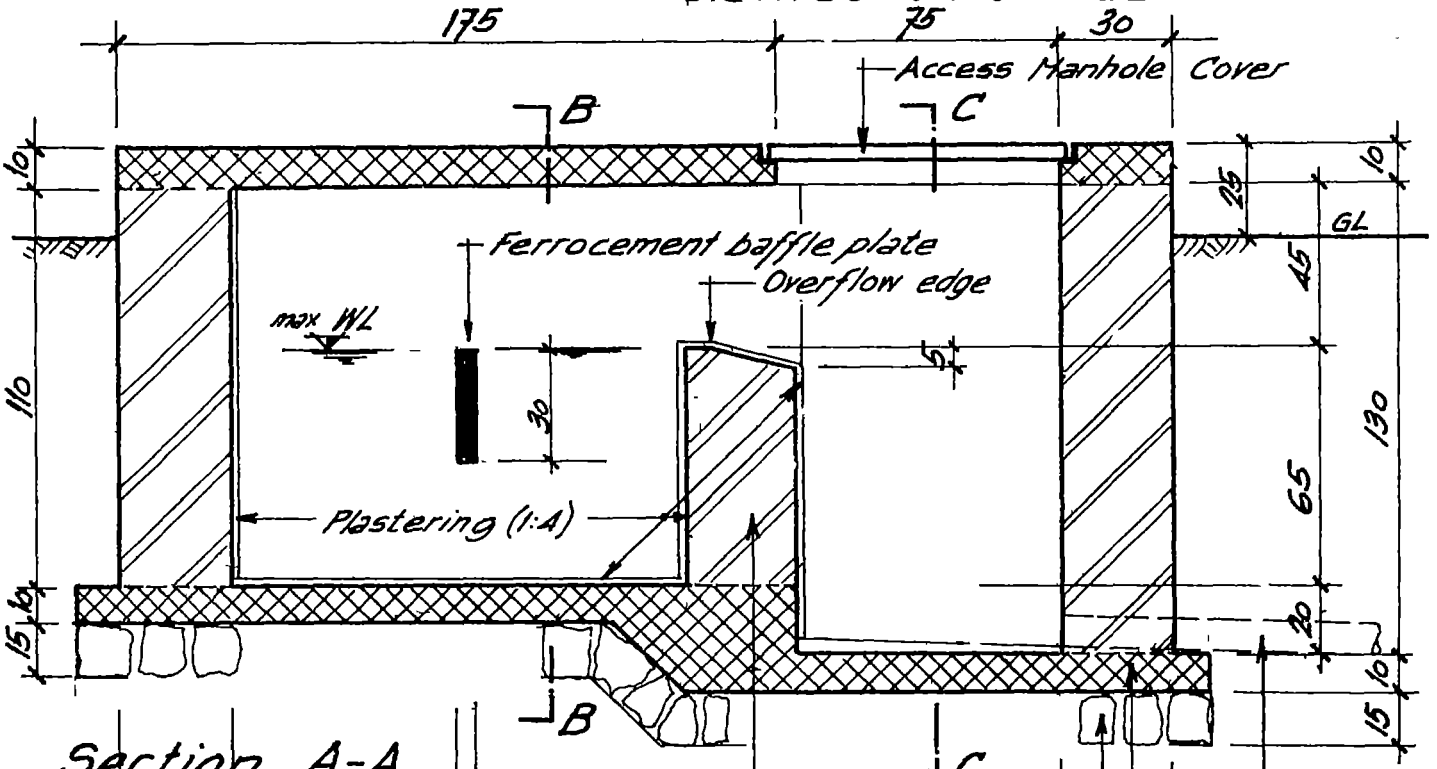
Sectional Valve



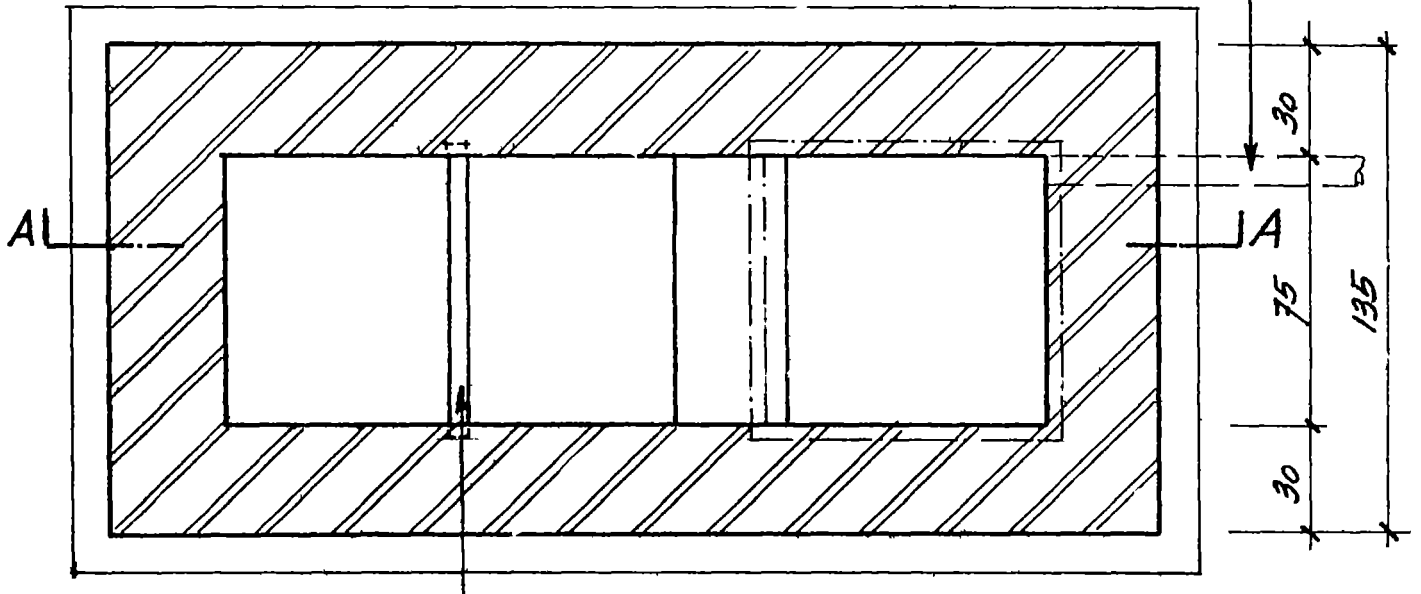
Wash Out



STRUCTURAL DETAILS for: – COLLECTION CHAMBER
– BREAK PRESSURE TANK
– DISTRIBUTION CHAMBER



Section A-A

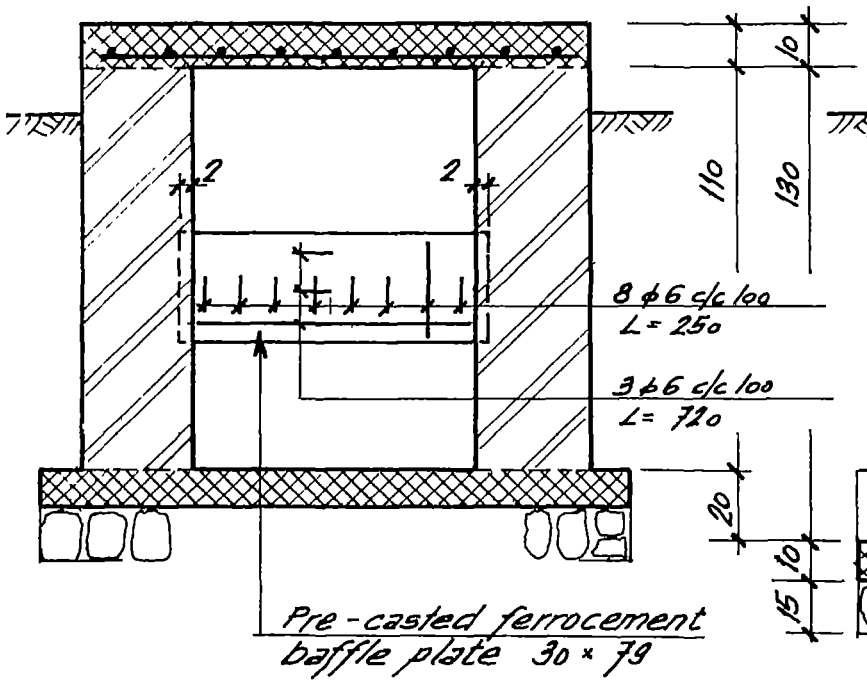


Plan

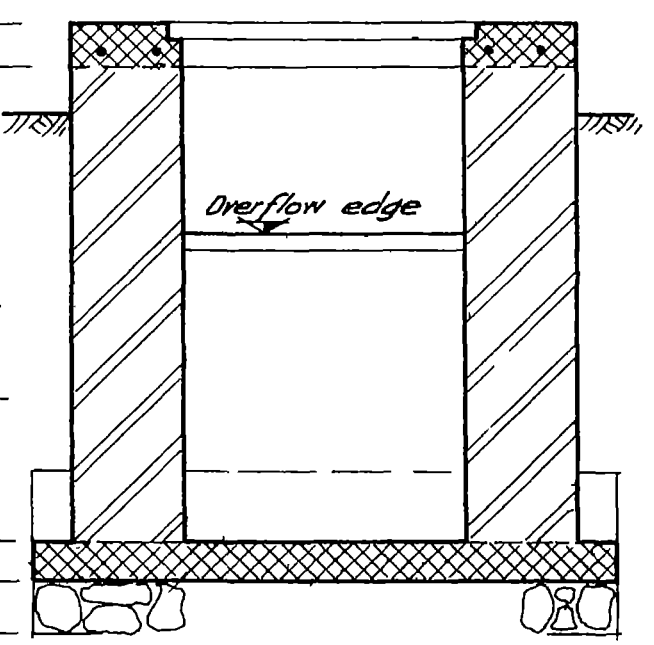
Note: Baffle plate position must be adjusted to fit floot valve used

REINFORCEMENT DETAILS for: -COLLECTION CHAMBER
-BREAK PRESSURE TANK
-DISTRIBUTION CHAMBER

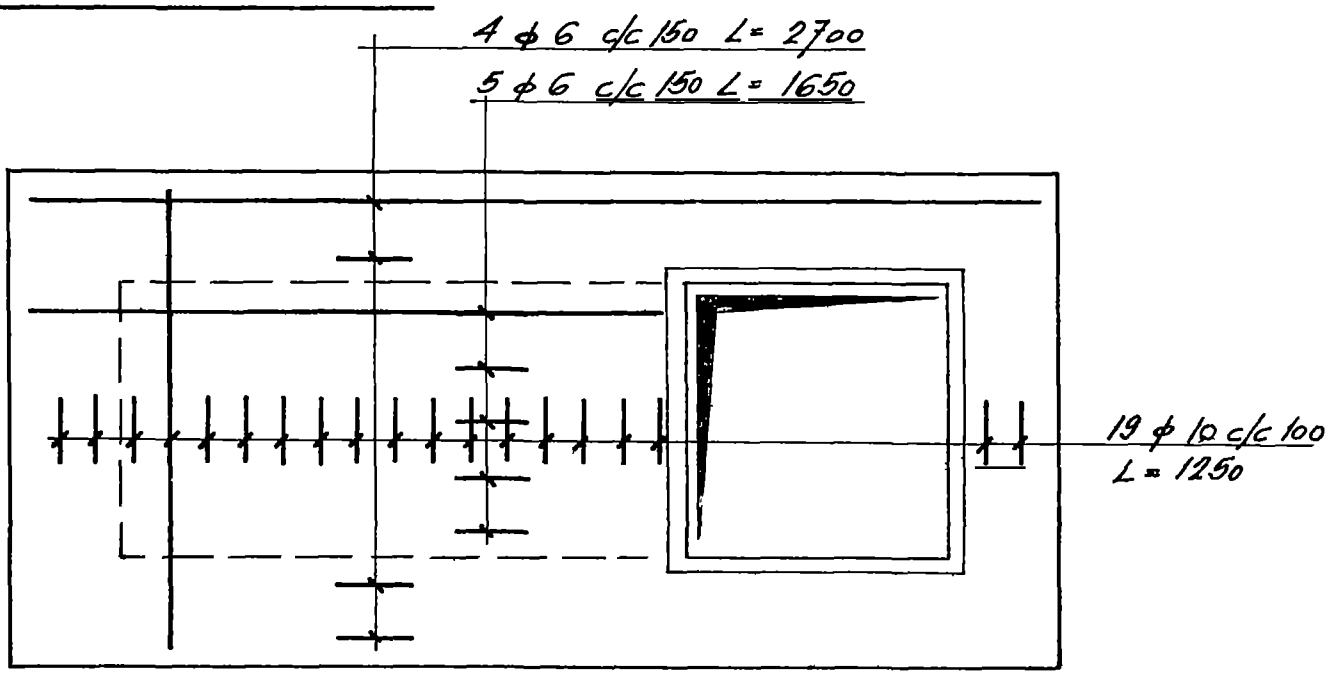
Section B - B



Section C - C



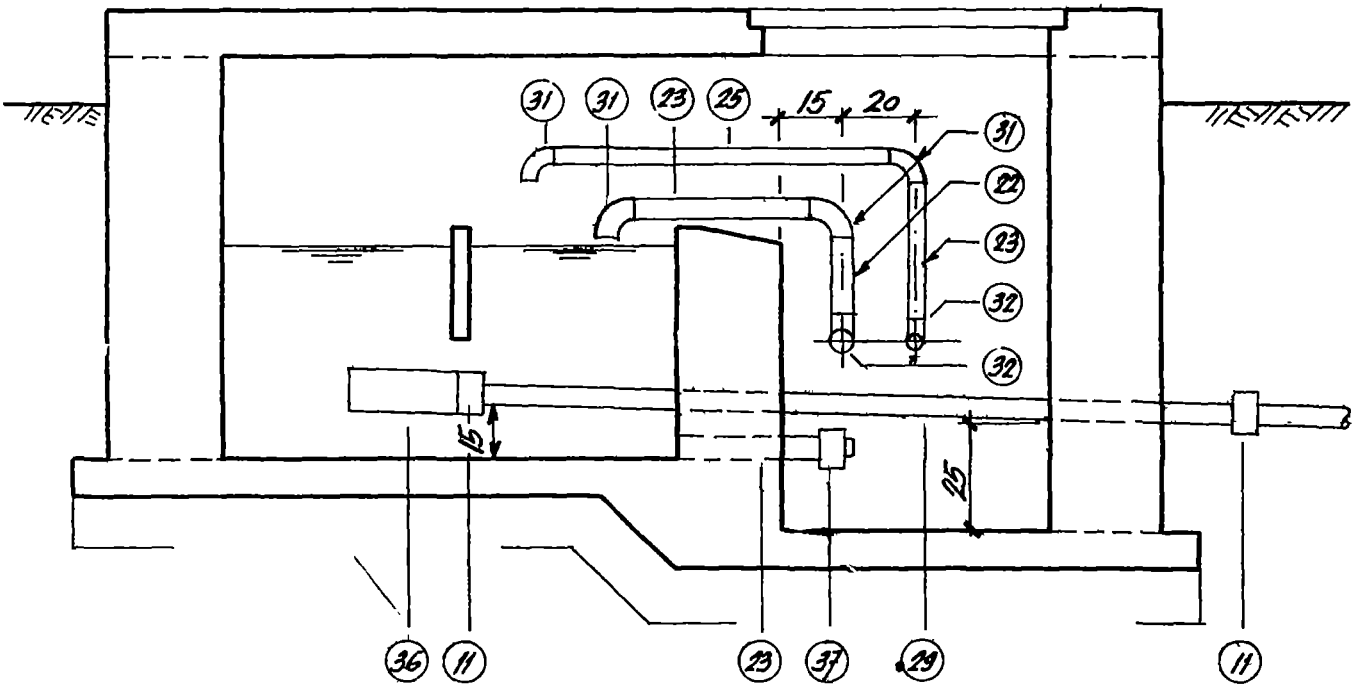
Cover Slab Plan



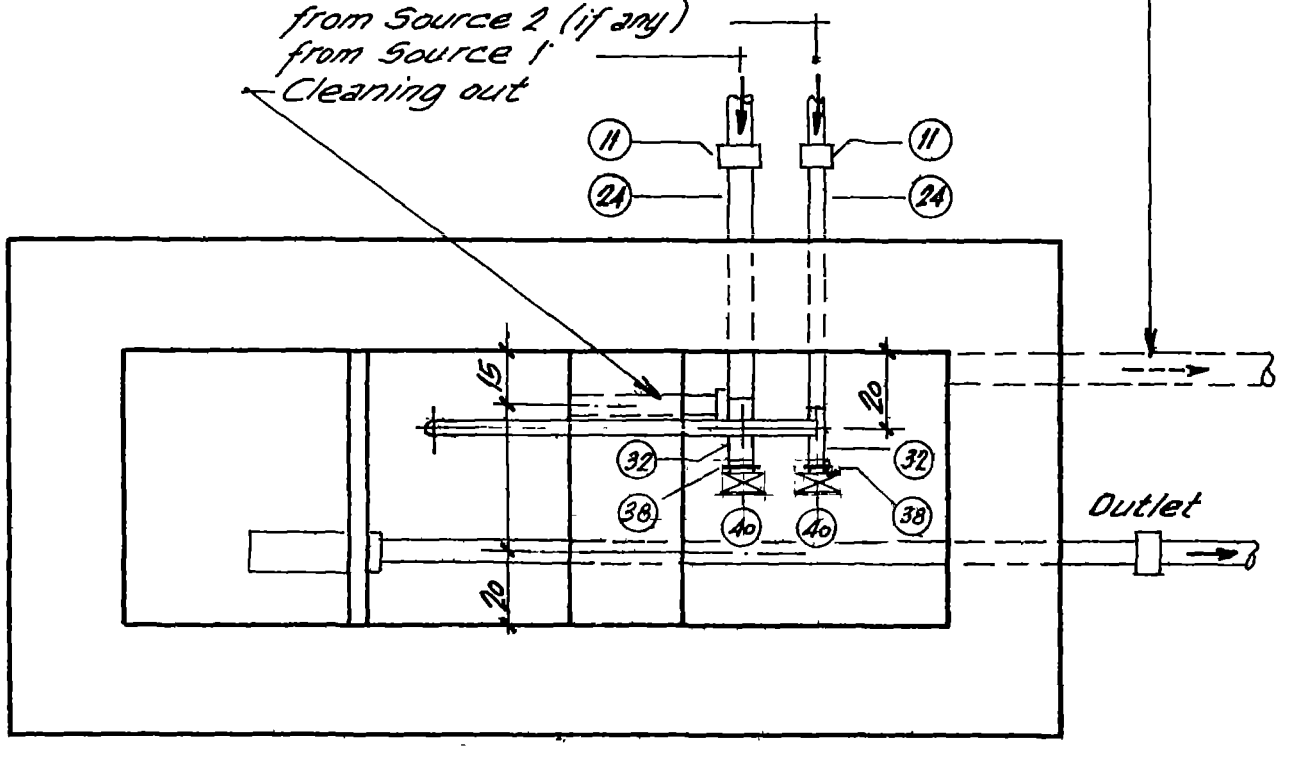
Reinforcement-measurements in mm!
-summary: diam 6mm L = 24 m
diam 10mm L = 24 m

COLLECTION CHAMBER

Pipe Installation Details

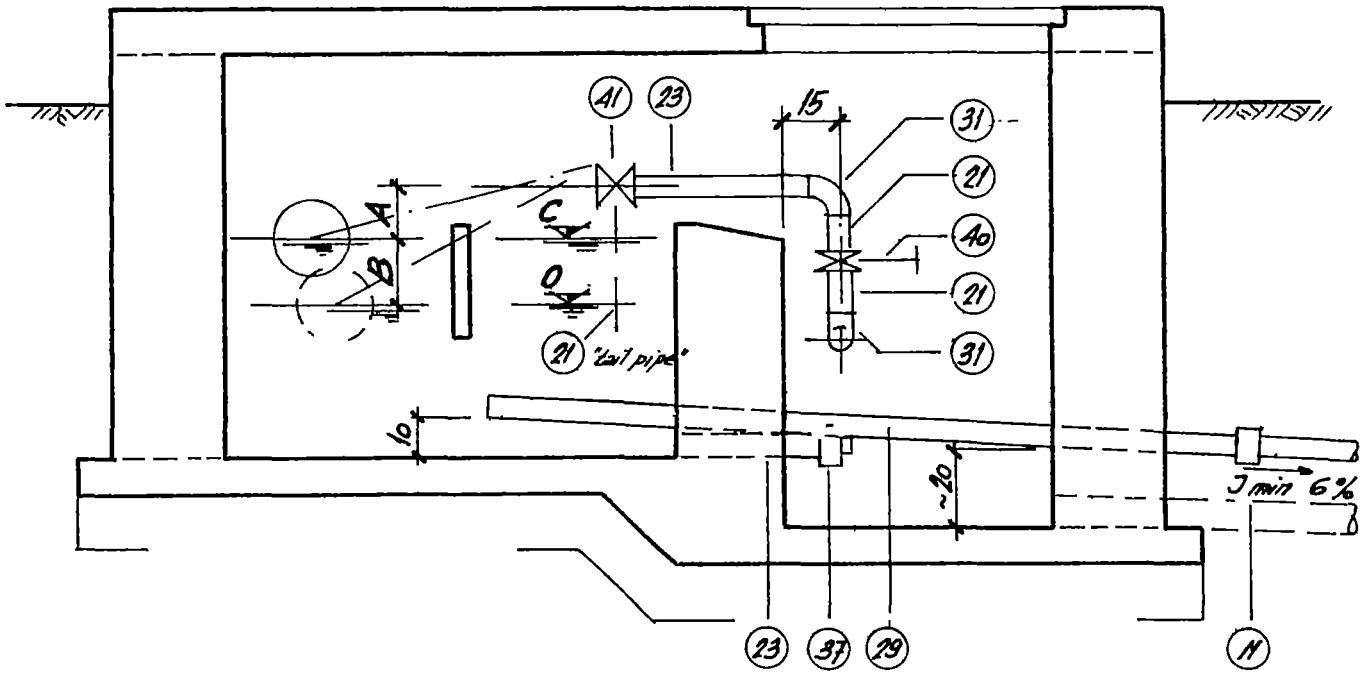


Note: Drainage pipe capacity must be greater max pipe line capacities from the source(s)

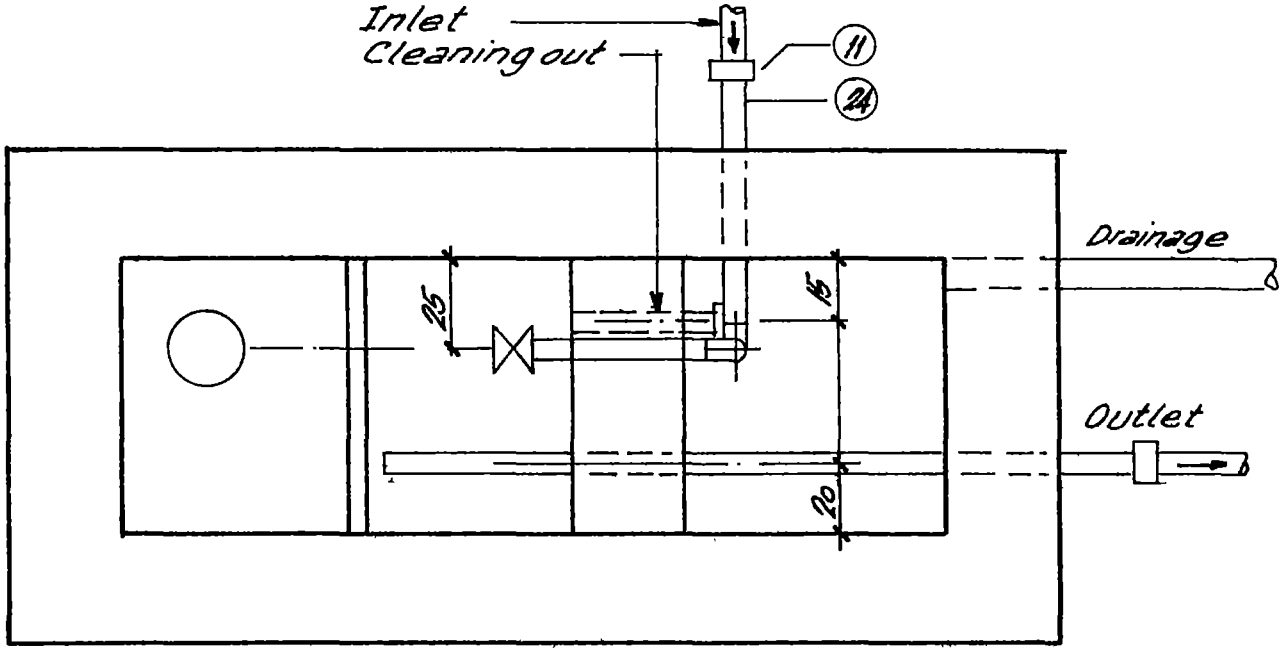


BREAK PRESSURE TANK

Pipe Installation Details

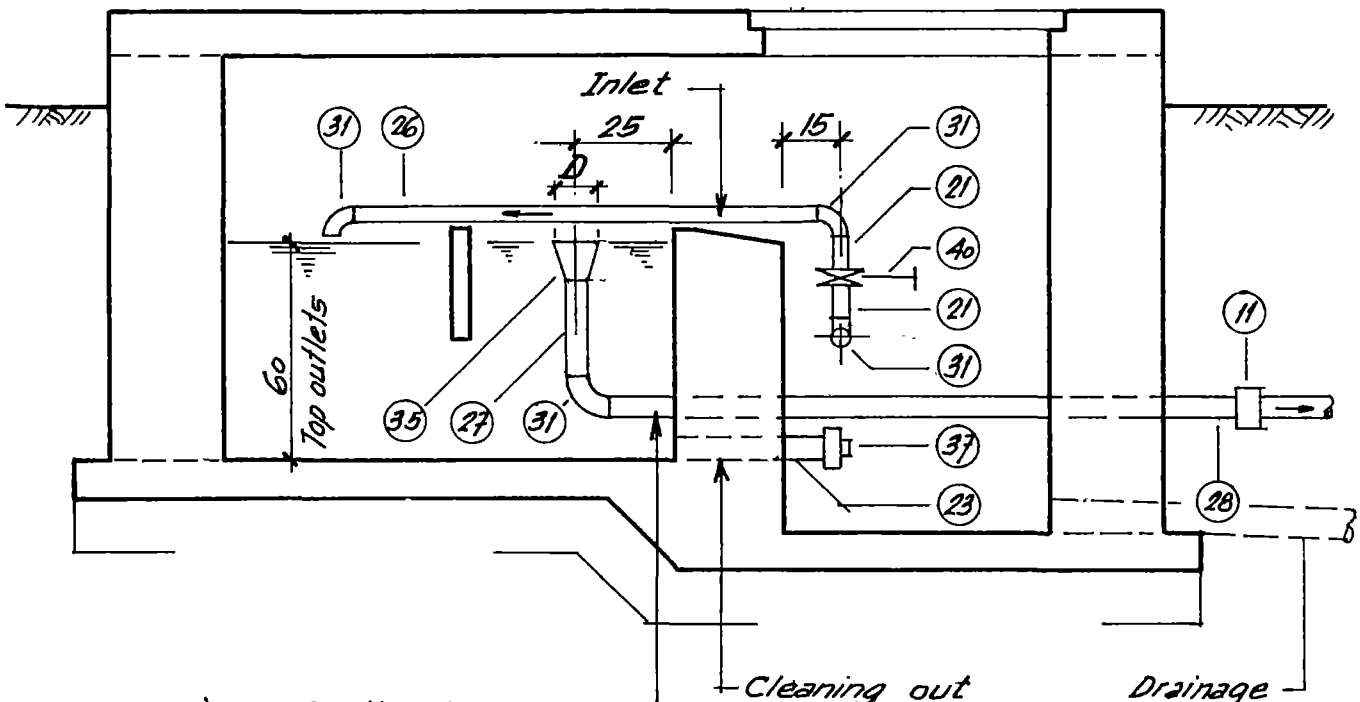


Measurements A+B depend on "make" of float valve
Water level C - float valve closed (max WL)
Water level O - float valve fully open



DISTRIBUTION CHAMBER

Pipe Installation Details

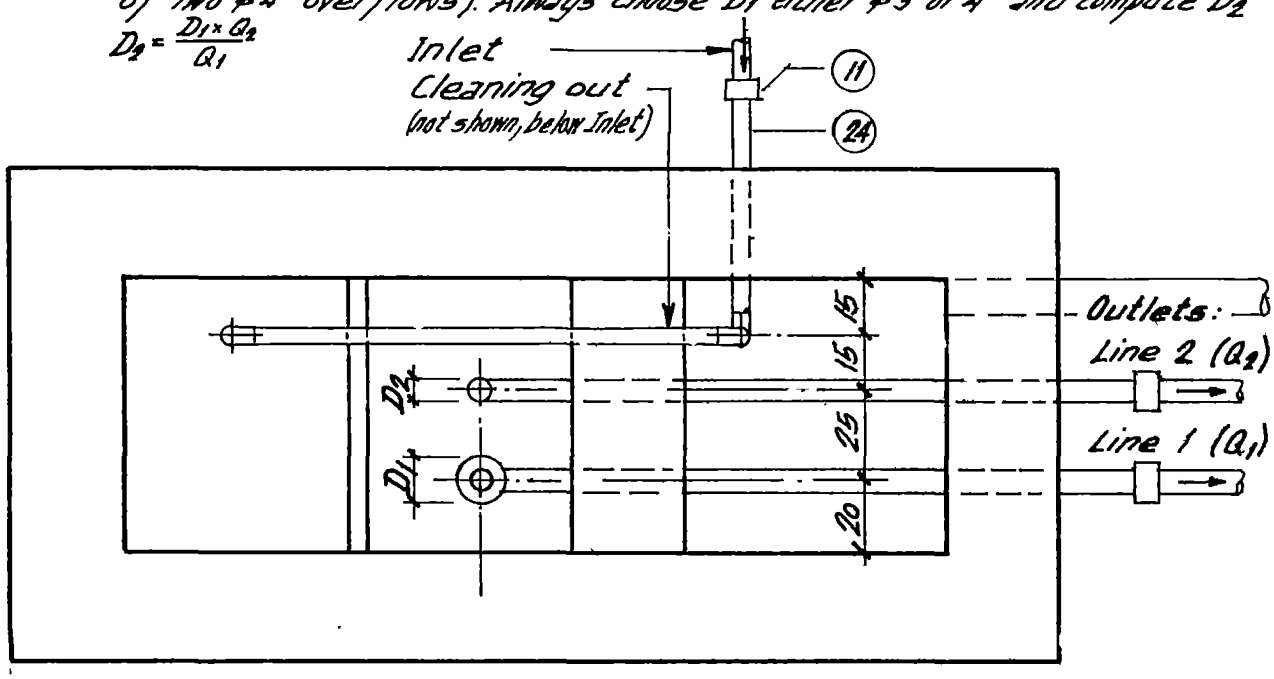


Note: 1) Top of both outlets must be exactly on the same level.

2) $Q_1 : D_2$ has the same ratio as $Q_1 : Q_2$

3) Max overflow rate = 2.5 l/s for h_o = 1.6 cm and L_o = 70 cm (circumference of two ϕ 4" overflows). Always choose D_1 either ϕ 3" or 4" and compute D_2

$$D_2 = \frac{D_1 \times Q_2}{Q_1}$$

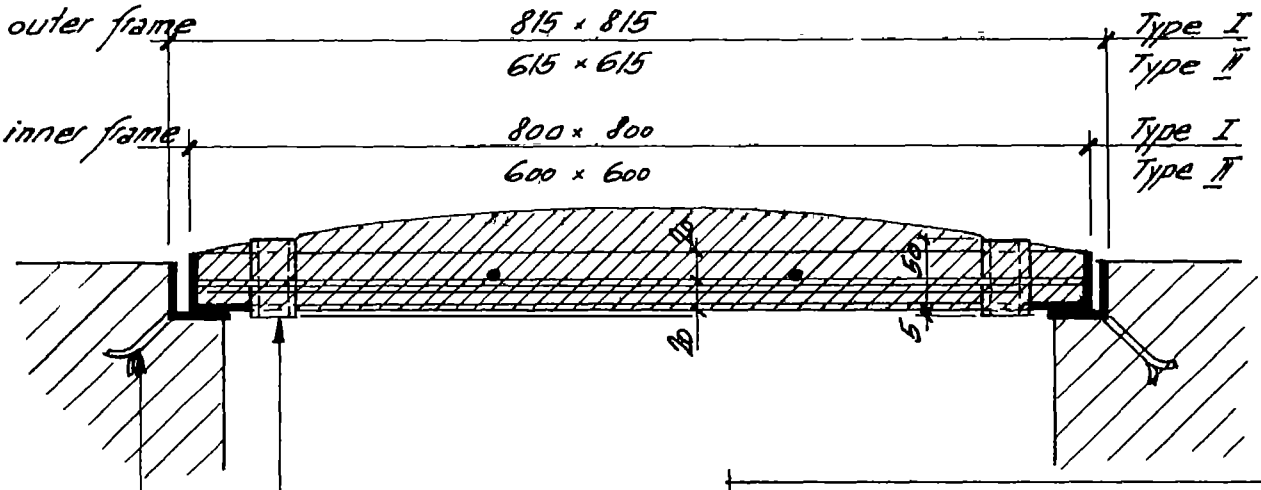


LIST OF PIPES AND FITTINGS for:
- BREAK PRESSURE TANK (BPT)
- COLLECTION CHAMBER (CC)
- DISTRIBUTION CHAMBER (DC)

Item	Description	B P T		Collection Chamber Inlet 1		Inlet 2		Distribution Chamb. Outlet 1		Outlet 2		Remarks
		diam.	No.	diam.	No.	diam.	No.	diam.	No.	diam.	No.	
	I N L E T											
11	Adaptor	....	1	....	1	....	1	....	1			
	Brass Union up to diam. 40mm											
	Flange Set above diam. 40mm											
21	G.I. Pipe length 17 cm	....	2					....	2			BPT ref. Note 1)
22	G.I. Pipe length 40 cm			....	1							
23	G.I. Pipe length 55 cm	....	1	....	1	....	1					
24	G.I. Pipe length 70 cm	....	1	....	1			....	1			
25	G.I. Pipe length 95 cm					....	1					
26	G.I. Pipe length 130 cm							....	1			
31	G.I. Elbow	....	2	....	2	....	2	....	3			
32	G.I.. Tee, equal			....	1	....	1					
33	G.I. Pipe bracket			....	1	....	1					
34	G.I. Flange	....	(1)	....	1	....	1					(.) ref. Note 2)
38	G.I. Nipple			....	1	....	1					
40	Gate Valve	....	1	....	1	....	1	....	1			
41	Float Valve	....	1									BPT ref. Note 3)
	O U T L E T											
11	Adaptor	....	1	....	2			....	1	....	1	
	Brass Union up to diam. 40mm											
	Flange Set above diam. 40mm											
27	G.I. Pipe length 37 cm							....	1	....	1	
28	G.I. Pipe length 170 cm							....	1	....	1	
29	G.I. Pipe length 200 cm	....	1	....	1							
31	G.I. Elbow							....	1	....	1	
34	G.I. Flange			....	(1)							(.) ref. Note 2)
35	G.I. Socket, reducing							....	1	....	1	CC ref. Note 4)
36	G.I. Strainer			....	1							
	C L E A N I N G O U T											
23	G.I. Pipe length 55 cm	2"	1	2"	1			2"	1			
37	G.I. End Cap	2"	1	2"	1			2"	1			

Note: 1) If float valve can be equipped with tail pipe increase quatity of item 21 by 1
2) Required only if flanged float valve or flanged strainer is utilized
3) In open systems or on gravity pipelines item 41 float valve is not required
4) Dimension of reducer depends on water splitting ratio, if no reducer is required replace it with a socket for accurate level adjustment
5) Outlet piping; max. draw off rate for pipe diameter: 1" = 0.5 l/s; 1 1/2" = 1.4 l/s; 2" = 2.5 l/s

Slab Frame Type I + II



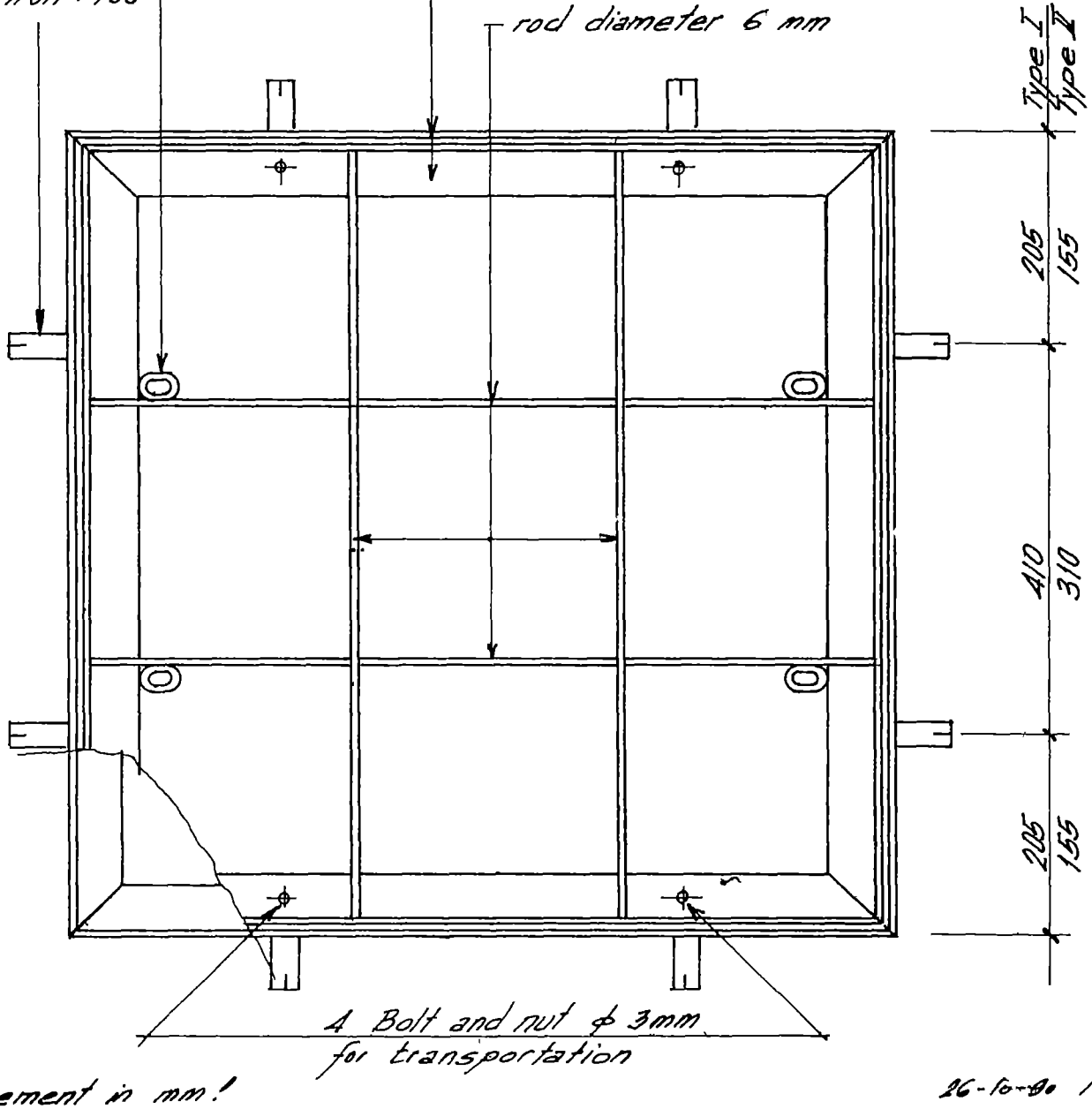
Note: The frames must be plane!
Twisted frames will not be accepted

Holdfast ϕ 20 × 32 : 80

Key hole welded to angle iron + rod

outer and inner frame L 40 × 40 × 32

rod diameter 6 mm

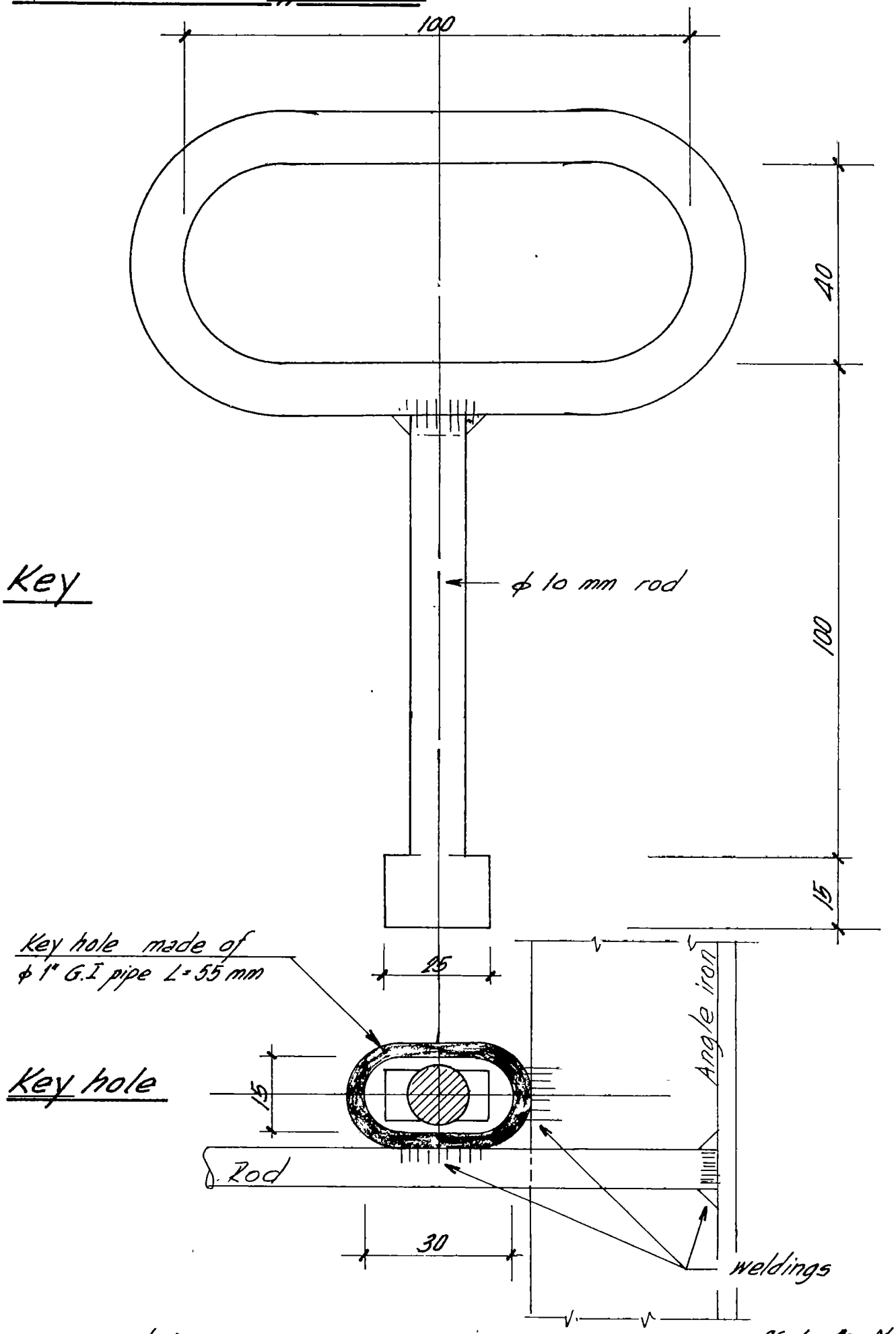


4 Bolt and nut ϕ 3mm for transportation

All measurement in mm!

26-10-80 Hü

Slab Frame Type I + II



all measurement in mm

26-10-90 MU

CWSSP WESTERN REGION — LIST OF PIPES AND FITTINGS for: BREAK PRESSURE TANK (BPT)

Project: — System No.: — Page: ...

Item	Description	B P T No. ... diam. No.	B P T No. ... diam. No.	B P T No. ... diam. No.	B P T No. ... diam. No.	B P T No. ... diam. No.	S U M M A R Y diam. No.	Remarks
	I N L E T							
11	Adaptor (Brass Union up to diam. 40mm Flange Set above diam. 40mm)	 1	 1	 1	 1	 1	....	
21	G.I. Pipe length 17 cm	 2	 2	 2	 2	 2	....	ref. Note 1)
23	G.I. Pipe length 55 cm	 1	 1	 1	 1	 1	....	
24	G.I. Pipe length 70 cm	 1	 1	 1	 1	 1	....	
31	G.I. Elbow	 2	 2	 2	 2	 2	....	
34	G.I. Flange (ref. Note 2)	 2	 2	 2	 2	 2	....	
40	Gate Valve	 1	 1	 1	 1	 1	....	
41	Float Valve (ref. Note 3)	 1	 1	 1	 1	 1	....	
	O U T L E T							
11	Adaptor (Brass Union up to diam. 40mm Flange Set above diam. 40mm)	 1	 1	 1	 1	 1	....	
29	G.I. Pipe length 200 cm	 1	 1	 1	 1	 1	....	
	C L E A N I N G O U T							
23	G.I. Pipe length 55 cm	2" 1	2" 1	2" 1	2" 1	2" 1	2"	
37	G.I. End Cap	2" 1	2" 1	2" 1	2" 1	2" 1	2"	

Note: 1) If float valve can be equipped with tail pipe increase quatity of item 21 by 1
2) Required only if flanged float valve with tail pipe is utilized
3) In open systems or on gravity pipelines item 41 (float vlave) is not required
4) Outlet piping; max. draw off rate for pipe diameter: 1" = 0.5 l/s; 1 1/2" = 1.4 l/s; 2" = 2.5 l/s

Forms\FITTINGA

CWSSP WESTERN REGION — LIST OF PIPES AND FITTINGS for: DISTRIBUTION CHAMBER (DC)

Project: — System No.: — Page: ...

Item	Description	D C No. ... Outlet 1 diam.	No.	Outlet 2 diam.	No.	D C No. ... Outlet 1 diam.	No.	Outlet 2 diam.	No.	S U M M A R Y diam.	No.	diam.	No.	Remarks
	I N L E T													
11	Adaptor (Brass Union up to diam. 40mm Flange Set above diam. 40mm)	....	1			....	1			....	....	....	....	
21	G.I. Pipe length 17 cm	....	2			....	2			....	....	....	....	
24	G.I. Pipe length 70 cm	....	1			....	1			....	....	....	....	
26	G.I. Pipe length 130 cm	....	1			....	1			....	....	....	....	
31	G.I. Elbow	....	3			....	3			....	....	....	....	
40	Gate Valve	....	1			....	1			....	....	....	....	
	O U T L E T													
11	Adaptor (Brass Union up to diam. 40mm Flange Set above diam. 40mm)	....	1	....	1	....	1	....	1	....	....	....	....	
27	G.I. Pipe length 37 cm	....	1	....	1	....	1	....	1	....	....	....	....	
28	G.I. Pipe length 170 cm	....	1	....	1	....	1	....	1	....	....	....	....	
31	G.I. Elbow	....	1	....	1	....	1	....	1	....	....	....	....	
35	G.I. Socket, reducing	....	1	....	1	....	1	....	1	....	....	....	....	ref. Note 1)
	C L E A N I N G O U T													
23	G.I. Pipe length 55 cm	2"	1			2"	1			2"	....			
37	G.I. End Cap	2"	1			2"	1			2"	....			

Note: 1) Dimension of reducer depends on water splitting ratio, if no reducer is required replace it with a socket for accurate level adjustment

2) Outlet piping; max. draw off rate for pipe diameter: 1" = 0.5 l/s; 1 1/2" = 1.4 l/s; 2" = 2.5 l/s

CWSSP WESTERN REGION
Project:

LIST OF PIPES AND FITTINGS for: COLLECTION CHAMBER (CC)
System No.:

Page: ....

Item	Description	C C No: ... Inlet 1 diam.	No.	Inlet 2 diam.	No.	C C No: ... Inlet 1 diam.	No.	Inlet 2 diam.	No.	C C No: ... Inlet 1 diam.	No.	Inlet 2 diam.	No.	S U M M A R Y diam.	No.	diam.	No.	Remarks
	I N L E T																	
11	Adaptor (Brass Union up to diam. 40mm Flange Set above diam. 40mm)	....	1	....	1	....	1	....	1	....	1	....	1	....	....	....	....	
22	G.I. Pipe length 40 cm	....	1			....	1			....	1			....	....	....	....	
23	G.I. Pipe length 55 cm	....	1	....	1	....	1	....	1	....	1	....	1	....	....	....	....	
24	G.I. Pipe length 70 cm	....	1	....	1	....	1	....	1	....	1	....	1	....	....	....	....	
25	G.I. Pipe length 95 cm			....	1			....	1			....	1	....	....	....	....	
31	G.I. Elbow	....	2	....	2	....	2	....	2	....	2	....	2	....	....	....	....	
32	G.I. Tee, equal	....	1	....	1	....	1	....	1	....	1	....	1	....	....	....	....	
33	G.I. Pipe bracket	....	1	....	1	....	1	....	1	....	1	....	1	....	....	....	....	
38	G.I. Nipple	....	1	....	1	....	1	....	1	....	1	....	1	....	....	....	....	
40	Gate Valve	....	1	....	1	....	1	....	1	....	1	....	1	....	....	....	....	
	O U T L E T																	
11	Adaptor (Brass Union up to diam. 40mm Flange Set above diam. 40mm)	....	2			....	2			....	2			....	....			
29	G.I. Pipe length 200 cm	....	1			....	1			....	1			....	....			
34	G.I. Flange (ref. Note 1)	....	1			....	1			....	1			....	....			
36	G.I. Strainer	....	1			....	1			....	1			....	....			
	C L E A N I N G O U T																	
23	G.I. Pipe length 55 cm	2"	1			2"	1			2"	1			2"	....			
37	G.I. End Cap	2"	1			2"	1			2"	1			2"	....			

Note: 1) Required only if flanged strainer is utilized
2) Outlet piping; max. draw off rate for pipe diameter: 1" = 0.5 l/s; 1 1/2" = 1.4 l/s; 2" = 2.5 l/s

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