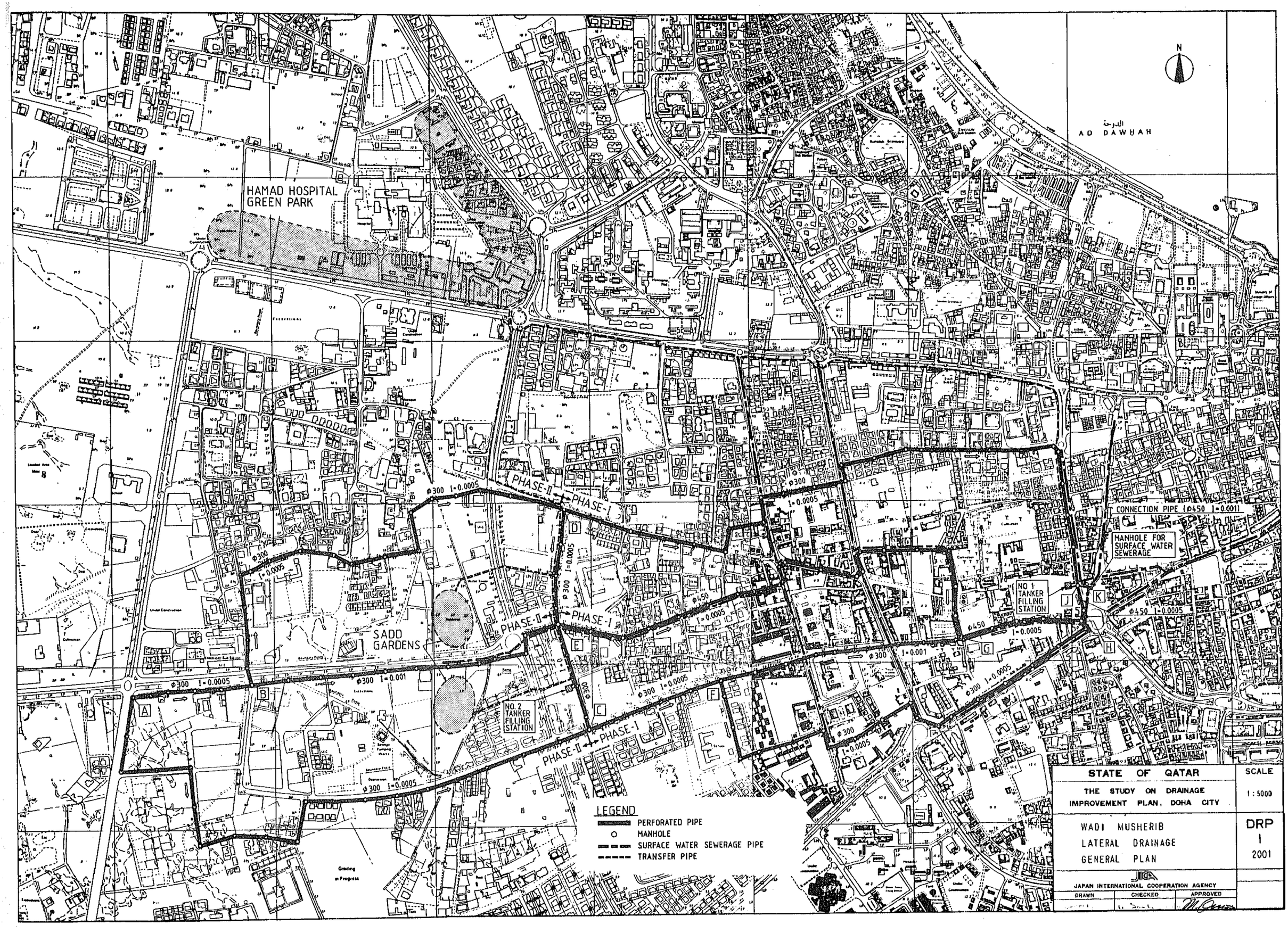
DRAWINGS

DRAWING LIST

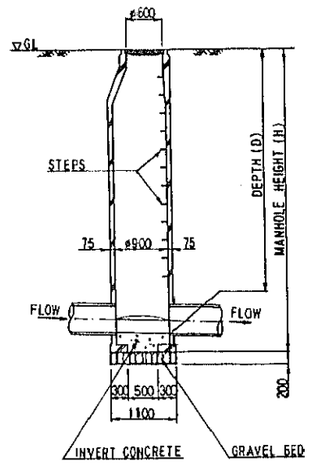
DWG. NO.	TITLE
DRP-1001	DRAINAGE IMPROVEMENT PLAN
DRP-2001	WADI MUSHERIB LATERAL DRAINAGE-GENERAL PLAN
DRP-2009	WADI MUSHERIB MANHOLE AND TYPICAL SECTION OF LATERAL DRAIN
DRP-2010	TANKER FILLING STATION AND CONNECTION TO SURFACE WATER SEWERAGE
DRP-2011	TANKER FILLING STATION DETAILS
DRP-3001	OLD RAYYAN LATERAL DRAINAGE-GENERAL PLAN
DRP-3002	OLD RAYYAN LATERAL DRAINAGE TRANSVERSAL AND LONGITUDINAL SECTIONS (1/3)
DRP-3005	OLD RAYYAN MANHOLE AND TYPICAL SECTION OF LATERAL DRAIN
DRP-4001	DISCHARGE PIPE LINE GENERAL PLAN AND LONGITUDINAL SECTION
DRP-4002	DISCHARGE PUMP STATION (1/2)
DRP-4003	DISCHARGE PUMP STATION (2/2)
DRP-4004	DISCHARGE PIPE LINE DETAILS (1/2)
DRP-4005	DISCHARGE PIPE LINE DETAILES (2/2)
DRP-4006	MANGROVE AFFORESTATION PLAN

Note: More detailed drawings i.e. transversal and longitudinal sections, and detailed plans on 1/2000 maps are included in Supporting Report "F" and "G" for Wadi Musherib and Rayyan drainage schemes respectively.

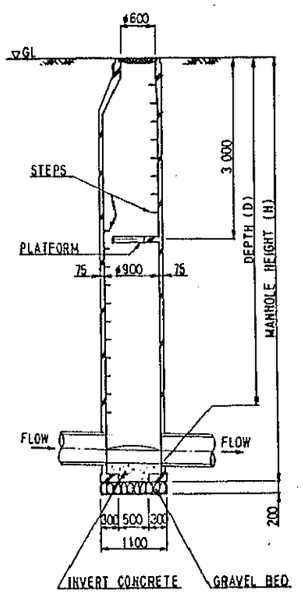

HAMAD HOSPITAL
GREEN PARK
SADD
GARDENS
AD DAWHAH
الدوحة
N
PHASE-I
PHASE-II
NO.1
TANKER
FILLING
STATION
NO.2
TANKER
FILLING
STATION
MANHOLE FOR
SURFACE WATER
SEWERAGE
CONNECTION PIPE (φ450 I=0.001)
LEGEND
PERFORATED PIPE
MANHOLE
SURFACE WATER SEWERAGE PIPE
TRANSFER PIPE
STATE OF QATAR
THE STUDY ON DRAINAGE
IMPROVEMENT PLAN, DOHA CITY
SCALE
1:5000
WADI MUSHERIB
LATERAL DRAINAGE
GENERAL PLAN
DRP
1
2001
JICA
JAPAN INTERNATIONAL COOPERATION AGENCY
DRAWN
CHECKED
APPROVED

MANHOLE LIST

MANHOLE NO.	LOCATION	DEPTH (D) (m)	TYPE	MANHOLE HEIGHT (H) (m)
1	EK+2180 DJ+2215	4.577	A	4.880
2	EK+2100	5.154	B	5.460
3	EK+2065 CH+2002	5.119	B	5.420
4	EK+1945	4.858	A	5.160
5	EK+1885	4.628	A	4.930
6	EK+1860	4.516	A	4.820
7	EK+1780	4.976	A	5.320
8	EK+1680 FG+ 772	5.326	B	5.670
9	EK+1610	5.091	B	5.440
10	EK+1520	4.346	A	4.690
11	EK+1405	3.988	A	4.330
12	EK+1305	3.838	A	4.180
13	EK+1205	3.688	A	4.030
14	EK+1130	4.153	A	4.500
15	EK+1115	4.643	A	4.990
16	EK+1065	4.418	A	4.760
17	EK+1040	4.406	A	4.750
18	EK+ 925	4.248	A	4.590
19	EK+ 810	4.991	A	5.340
20	EK+ 785	4.978	A	5.320
21	EK+ 740	4.956	A	5.300
22	EK+ 725	4.948	A	5.290
23	EK+ 645	5.108	B	5.450
24	EK+ 595	4.783	A	5.130
25	EK+ 495	4.933	A	5.280
26	EK+ 395	4.783	A	5.130
27	EK+ 295	5.033	B	5.380
28	EK+ 210	5.491	B	5.840
29	EK+ 110	5.941	B	6.290
30	EK+ 000 AD+2278 AC+2398 BE+1030	5.886	B	6.230
31	DJ+2095	4.047	A	4.390
32	DJ+1995	4.397	A	4.740
33	DJ+1895	4.347	A	4.690
34	DJ+1785	5.792	B	6.140
35	DJ+1765	5.782	B	
36	DJ+1665	6.232	B	6.580
37	DJ+1565	5.882	B	6.230
38	DJ+1455	4.527	A	4.870
39	DJ+1355	5.477	B	5.820
40	DJ+1305	5.452	B	5.800
41	DJ+1205	5.102	B	5.450
42	DJ+1100	5.450	B	5.790
43	DJ+1050	4.725	A	5.070
44	DJ+ 950	5.075	B	5.420
45	DJ+ 850	5.025	B	5.370
46	DJ+ 780	4.990	A	5.330
47	DJ+ 705	4.752	A	5.100
48	DJ+ 595	5.197	B	5.540
49	DJ+ 520	5.560	B	5.900
50	DJ+ 420	6.010	B	6.350
51	DJ+ 320	6.460	B	6.800
52	DJ+ 220	6.710	B	7.050
53	DJ+ 120	6.160	B	6.500
54	DJ+ 000 AD+1930	6.112	B	6.460
55	CH+1975	5.287	B	5.630
56	CH+1875	4.937	A	5.280
57	CH+1775	4.687	A	5.030
58	CH+1675	5.137	B	5.480
59	CH+1575	5.487	B	5.830
60	CH+1475	6.137	B	6.480
61	CH+1425	6.412	B	6.760
62	CH+1355	6.377	B	6.720
63	CH+1305	5.652	B	6.000
64	CH+1205	5.102	B	5.450
65	CH+1100	6.750	B	7.090
66	CH+1015	6.807	B	7.150
67	CH+ 960	6.980	B	7.320
68	CH+ 860	5.730	B	6.070
69	CH+ 750	5.475	B	5.820
70	CH+ 690	5.445	B	5.790
71	CH+ 590	5.295	B	5.640
72	CH+ 490	5.045	B	5.390
73	CH+ 440 FG+ 000	4.920	A	5.260
74	CH+ 340	5.470	B	5.810
75	CH+ 240	5.420	B	5.760
76	CH+ 120	5.460	B	5.800
77	CH+ 000 AC+2059	5.216	B	5.560
78	FG+ 752	5.252	B	5.600
79	FG+ 652	4.492	A	4.840
80	FG+ 572	3.872	A	4.220
81	FG+ 472	4.372	A	4.720
82	FG+ 372	4.972	A	5.320
83	FG+ 312	4.112	A	4.460
84	FG+ 212	4.512	A	4.860
85	FG+ 112	4.612	A	4.960
86	AD+2230	6.162	B	6.510
87	AD+2130	6.312	B	6.660
88	AD+2030	6.562	B	6.910
89	AD+1850	6.372	B	6.720
90	AD+1755	5.722	B	6.070
91	AD+1660	6.677	B	7.020
92	AD+1580	6.637	B	6.980
93	AD+1500	6.497	B	6.840
94	AD+1420	6.657	B	7.000
95	AD+1300	6.697	B	7.040
96	AD+1190	6.142	B	6.490
97	AD+1085	6.289	B	6.630
98	AD+1025	6.459	B	6.800
99	AD+ 920	6.507	B	6.850
100	AD+ 820	6.532	B	6.880
101	AD+ 750	6.327	B	6.670
102	AD+ 715	6.904	B	7.250
103	AD+ 615	6.854	B	7.200
104	AD+ 515	6.004	B	6.350
105	AD+ 425	6.359	B	6.700
106	AD+ 370 BE+ 000	6.832	B	7.180
107	AD+ 275	6.384	B	6.730
108	AD+ 195	6.444	B	6.790
109	AD+ 115	5.804	B	6.150
110	AD+ 060	5.477	B	5.820
111	AD+ 000 AC+ 000	5.447	B	5.790
112	AC+2298	5.686	B	6.030
113	AC+2198	5.686	B	6.030
114	AC+2098	5.336	B	5.680
115	AC+1958	5.666	B	6.010
116	AC+1837	5.905	B	6.250
117	AC+1715	5.944	B	6.290
118	AC+1615	5.994	B	6.340
119	AC+1515	5.744	B	6.090
120	AC+1415	5.494	B	5.840
121	AC+1315	5.344	B	5.690
122	AC+1215	5.294	B	5.640
123	AC+1130	5.152	B	5.500
124	AC+1005	5.489	B	5.830
125	AC+ 905	5.639	B	5.980
126	AC+ 805	5.489	B	5.880
127	AC+ 695	5.434	B	5.780
128	AC+ 575	4.974	A	5.320
129	AC+ 455	4.614	A	4.960
130	AC+ 350	5.562	B	5.910
131	AC+ 240	5.407	B	5.750
132	AC+ 120	5.247	B	5.590
133	BE+ 920	5.720	B	6.060
134	BE+ 865	5.665	B	6.010
135	BE+ 765	5.565	B	5.910
136	BE+ 715	3.815	A	4.160
137	BE+ 615	4.115	A	4.460
138	BE+ 515	5.915	B	6.260
139	BE+ 415	6.015	B	6.360
140	BE+ 315	6.415	B	6.760
141	BE+ 215	4.815	A	5.160
142	BE+ 115	5.115	B	5.460

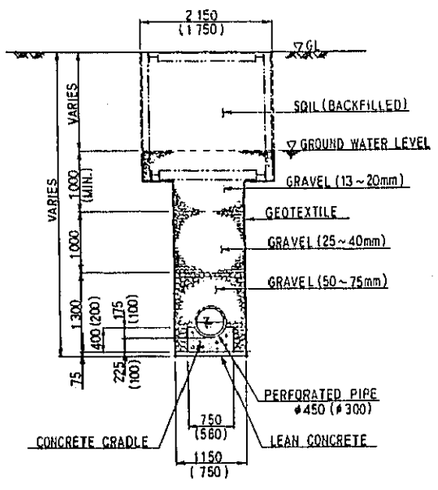


D < 5.0M

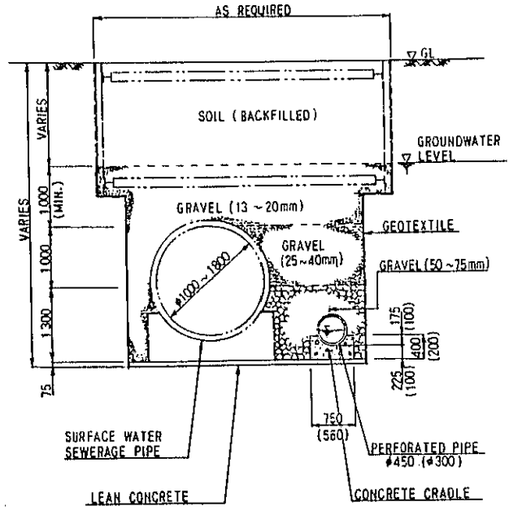


D ≧ 5.0M

TYPICAL SECTION OF MANHOLE (S=1:50)



TYPICAL SECTION OF LATERAL DRAIN (S=1:50)



MODIFICATION OF SURFACE WATER SEWERAGE FOR LAND DRAINAGE TYPICAL SECTION (S=1:50)

NOTES

1 FOR GENERAL PLAN OF LATERAL DRAINAGE, SEE DWG NO DRP-2001

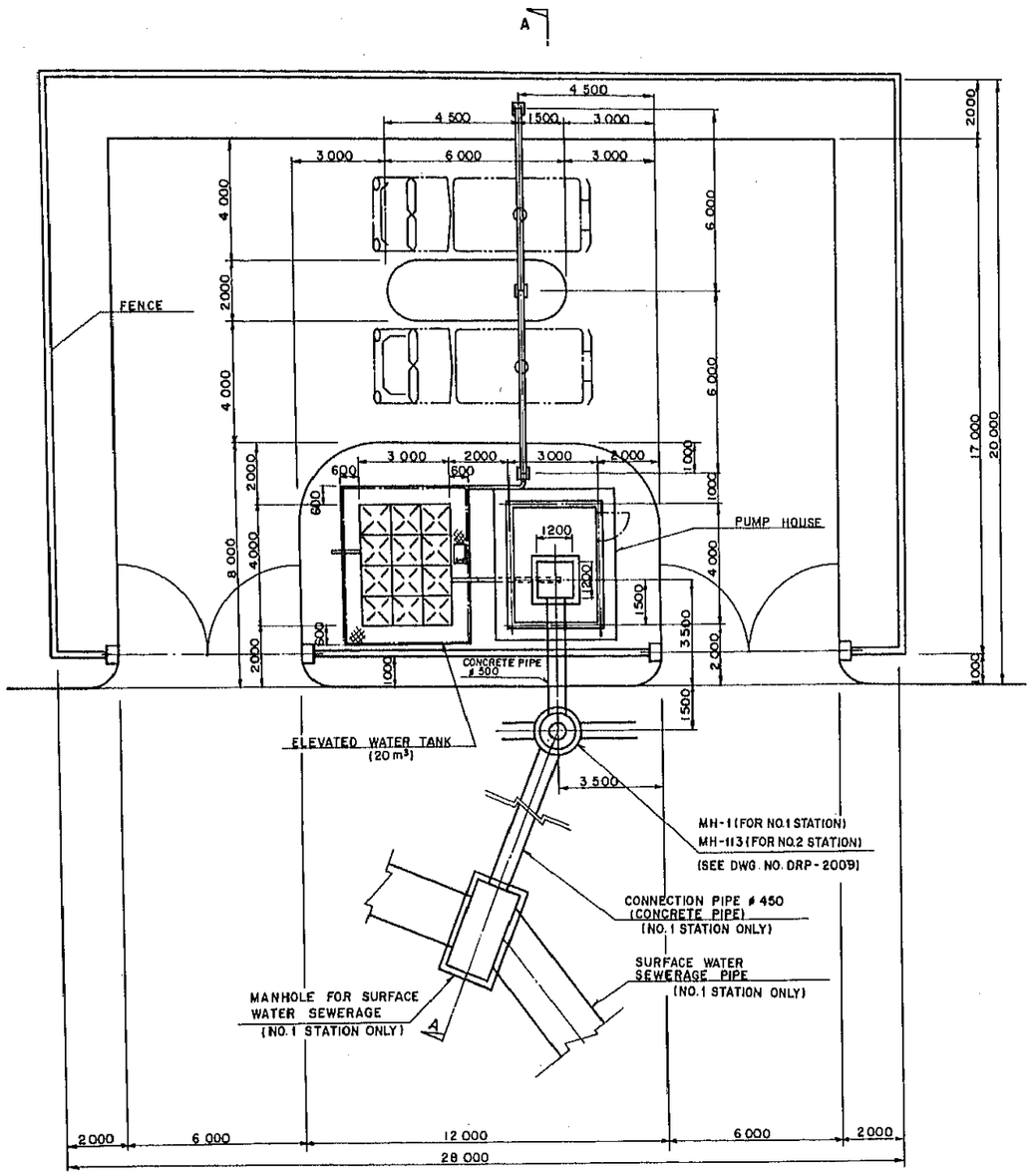
2 FOR TRANSVERSAL AND LONGITUDINAL SECTIONS, ON WHICH THE LOCATIONS OF MANHOLES ARE INDICATED, SEE DWG. NOS DRP-2002 THRU 2008

3 GEOTEXTILE SHALL BE PROVIDED ON THE EXCAVATED SURFACE FROM THE TRENCH BOTTOM TO THE GROUND WATER LEVEL AT THE SITE.

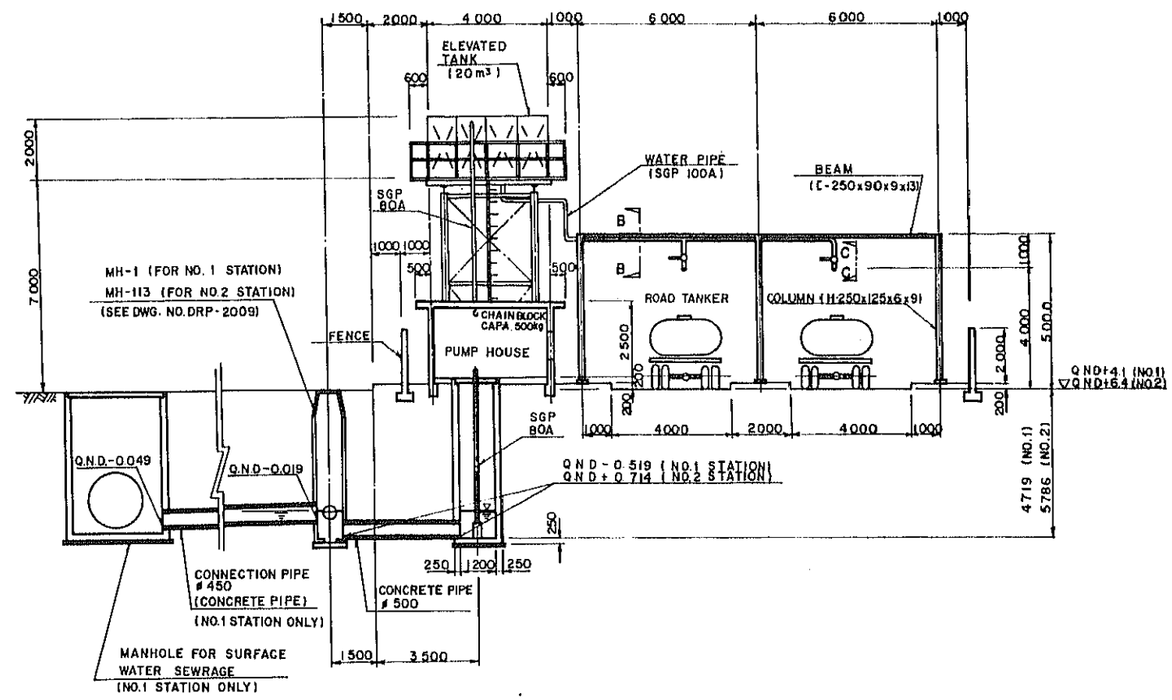
4 GRAVEL (13-20mm) SHALL BE PROVIDED ABOVE THE GROUND WATER LEVEL AND THE THICKNESS SHALL NOT BE LESS THAN 1.0 METER

5 MANHOLES SHOWN ABOVE ARE OF PRECAST CONCRETE AND STANDARD TYPE WIDELY USED IN JAPAN SO THAT INDICATED DIMENSIONS (DIAMETER AND THICKNESS) ARE SUBJECT TO CHANGE.

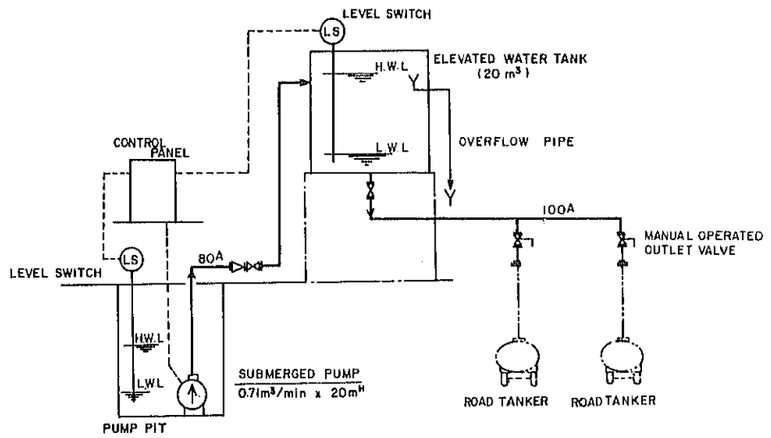
STATE OF QATAR THE STUDY ON DRAINAGE IMPROVEMENT PLAN, DOHA CITY	SCALE 1 : 50
WADI MUSHERIB MANHOLE AND TYPICAL SECTION OF LATERAL DRAIN	DRP I 2009
JICA JAPAN INTERNATIONAL COOPERATION AGENCY	
DRAWN / CHECKED / APPROVED	



PLAN 1:100



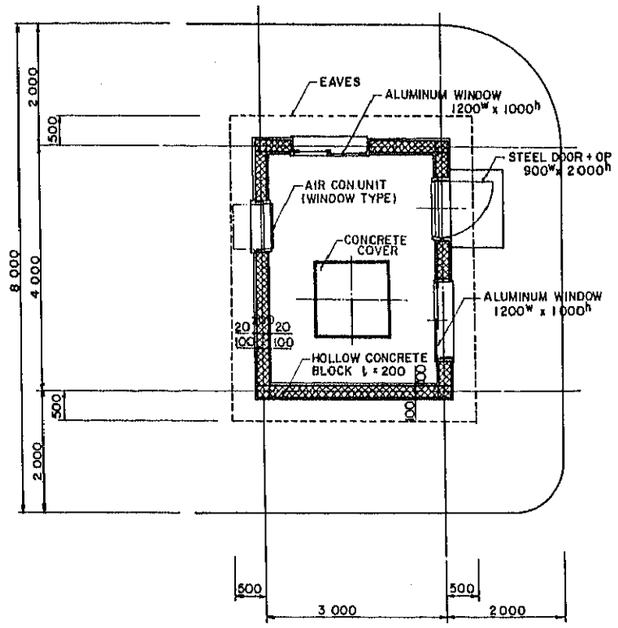
SECTION A-A 1:100



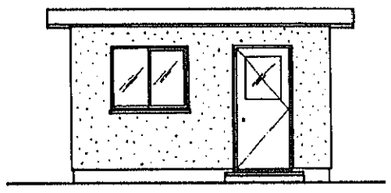
FLOW DIAGRAM

STATE OF QATAR	SCALE
THE STUDY ON DRAINAGE IMPROVEMENT PLAN, DOHA CITY	1:100
TANKER FILLING STATION & CONNECTION TO SURFACE WATER SEWERAGE	DRP I 2010
JICA JAPAN INTERNATIONAL COOPERATION AGENCY	
DRAWN / CHECKED / APPROVED	

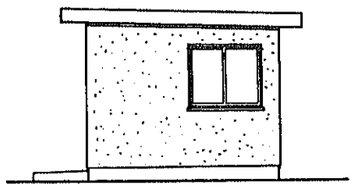
PUMP HOUSE



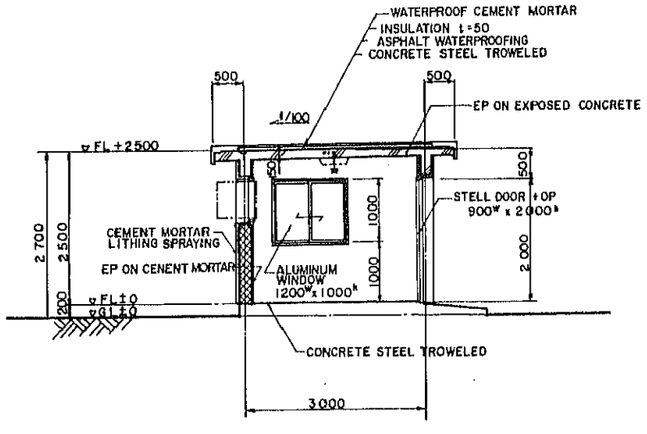
PLAN 1:50



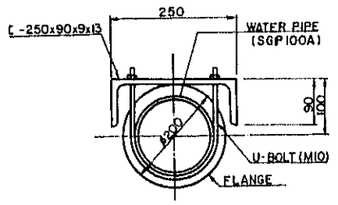
FRONT ELEVATION 1:50



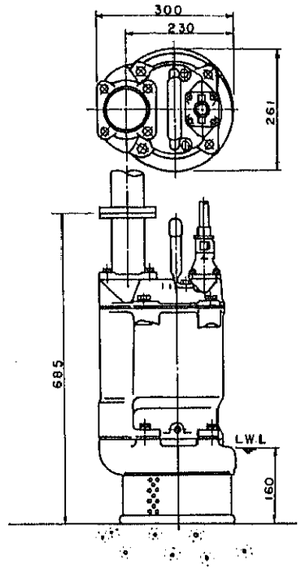
SIDE ELEVATION 1:50



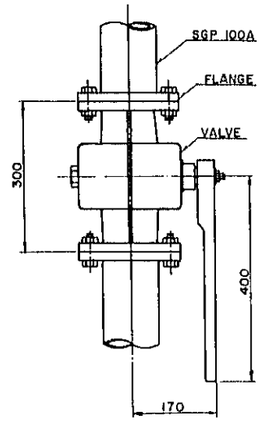
SECTIONAL DETAIL 1:50



SECTION B-B 1:6
(SEE DWG. NO. DRP-2010)

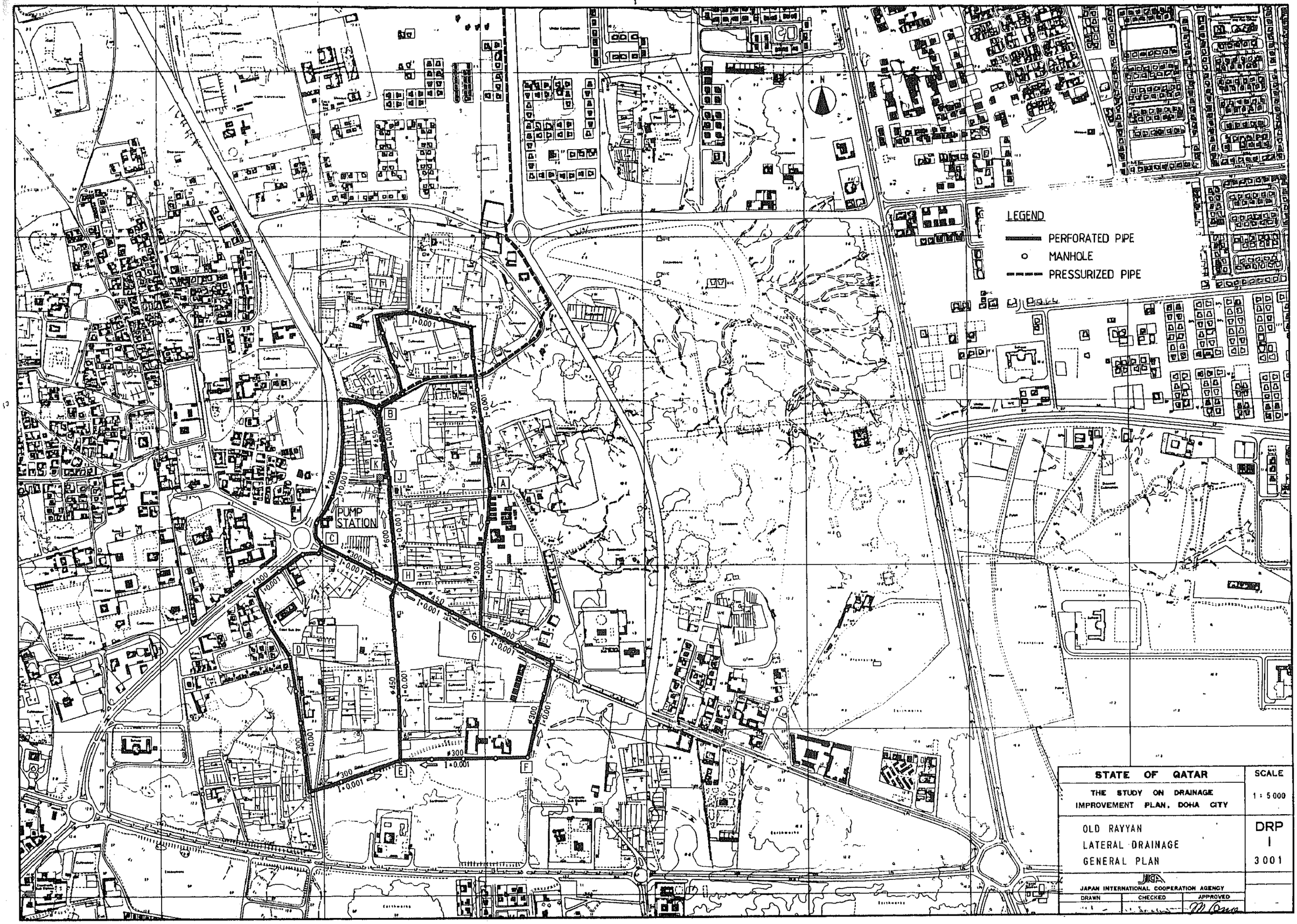


OUTLINE OF SUBMERGED PUMP
(NOT TO SCALE)



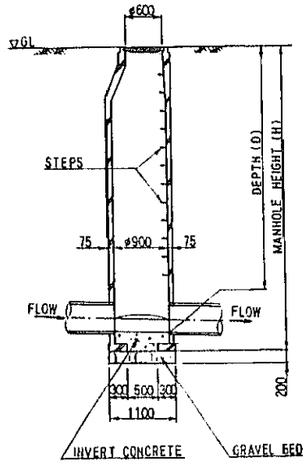
MANUAL OPERATED OUTLET VALVE 1:6
(VIEW C-C, SEE DWG. NO. DRP-2010)

STATE OF QATAR THE STUDY ON DRAINAGE IMPROVEMENT PLAN, DOHA CITY	SCALE 1:6 1:50
TANKER FILLING STATION DETAILS	DRP I 2011
JICA JAPAN INTERNATIONAL COOPERATION AGENCY DRAWN / CHECKED / APPROVED	

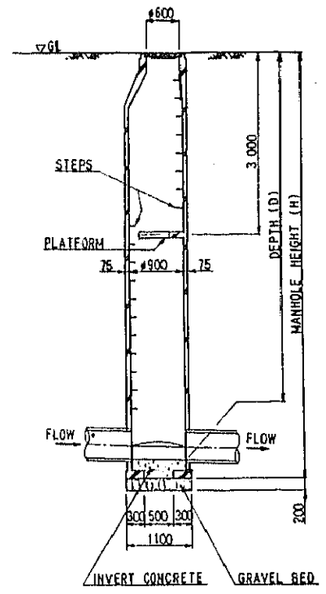

N
LEGEND
PERFORATED PIPE
MANHOLE
PRESSURIZED PIPE
PUMP STATION
A
B
C
D
E
F
G
H
J
K
STATE OF QATAR
THE STUDY ON DRAINAGE IMPROVEMENT PLAN, DOHA CITY
SCALE
1 : 5 000
OLD RAYYAN
LATERAL DRAINAGE
GENERAL PLAN
DRP
I
3001
JICA
JAPAN INTERNATIONAL COOPERATION AGENCY
DRAWN
CHECKED
APPROVED

MANHOLE LIST

MANHOLE NO.	LOCATION	DEPTH (D) (m)	TYPE	MANHOLE HEIGHT (H) (m)
1	AK+ 000 AG+ 000	4.800	A	5.100
2	AK+ 103	4.403	A	4.710
3	AK+ 203	4.403	A	4.710
4	AK+ 303	5.203	B	5.510
5	AK+ 403	5.403	B	5.710
6	AK+ 503	4.503	A	4.810
7	AK+ 603	4.303	A	4.610
8	AK+ 703	4.203	A	4.510
9	AK+ 801	5.301	B	5.610
10	AK+ 856	4.656	A	4.960
11	AK+ 954	5.754	B	6.060
12	AK+1055	5.345	B	5.650
13	AK+1125 CB+ 606	5.325	B	5.630
14	CB+ 534	5.534	B	5.840
15	CB+ 471	6.471	B	6.780
16	CB+ 366	4.266	A	4.570
17	CB+ 266	3.766	A	4.070
18	CB+ 169	3.869	A	4.170
19	CB+ 073	5.473	B	5.780
20	CB+ 000 DH+ 489	5.689	B	5.990
21	DH+ 464	5.864	B	6.170
22	DH+ 419	5.919	B	6.220
23	DH+ 324	6.324	B	6.630
24	DH+ 234	6.934	B	7.240
25	DH+ 118	7.218	B	7.520
26	DH+ 000 DJ+ 000	6.800	B	7.100
27	DJ+ 103	4.503	A	4.810
28	DJ+ 203	5.603	B	5.910
29	DJ+ 303	5.303	B	5.610
30	DJ+ 411	5.011	B	5.320
31	DJ+ 513	4.813	A	5.120
32	DJ+ 613	4.813	A	5.120
33	DJ+ 688 FE+ 395	4.998	A	5.300
34	DJ+ 796	4.496	A	4.800
35	DJ+ 894	4.594	A	4.900
36	DJ+ 994	4.594	A	4.900
37	DJ+1094	5.094	B	5.400
38	DJ+1194	4.694	A	5.000
39	FE+ 000 FH+ 000	7.500	B	7.800
40	FE+ 095	5.795	B	6.100
41	FE+ 195	5.295	B	5.600
42	FE+ 295	5.495	B	5.800
43	FH+ 100	5.600	B	5.900
44	FH+ 200	5.900	B	6.200
45	FH+ 303	7.803	B	8.110
46	FH+ 424	7.624	B	7.930
47	FH+ 548 AG+ 418	5.748	B	6.080
48	FH+ 650	4.350	A	4.650
49	FH+ 744	4.344	A	4.650
50	DH+ 569	4.169	A	4.470
51	DH+ 650	3.950	A	4.250
52	AG+ 100	5.900	B	6.200
53	AG+ 200	4.500	A	4.800
54	AG+ 306	4.406	A	4.710
55	DJ+1241 DH+ 742 FH+ 844	5.677	B	5.980
56	DJ+1364	4.500	A	4.800
57	DJ+1464	4.800	A	5.100
58	AK+1210	5.110	B	5.410
59	AK+1328 DJ+1371	4.975	A	5.280

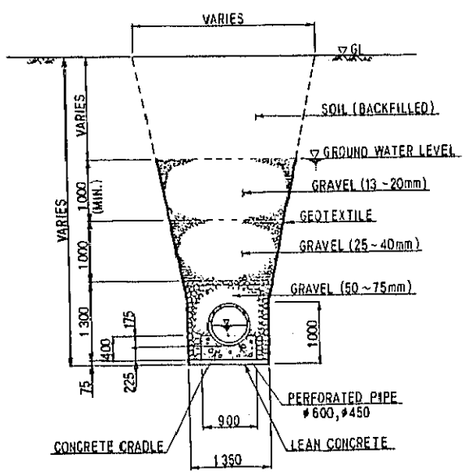


D < 5.0 M

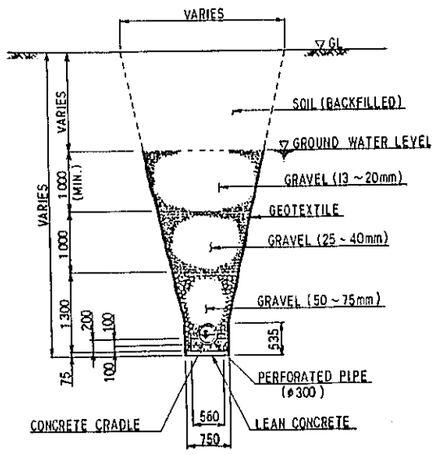


D ≧ 5.0 M

TYPICAL SECTION OF MANHOLE (S=1:50)



PERFORATED PIPE ϕ600 & ϕ450



PERFORATED PIPE ϕ300

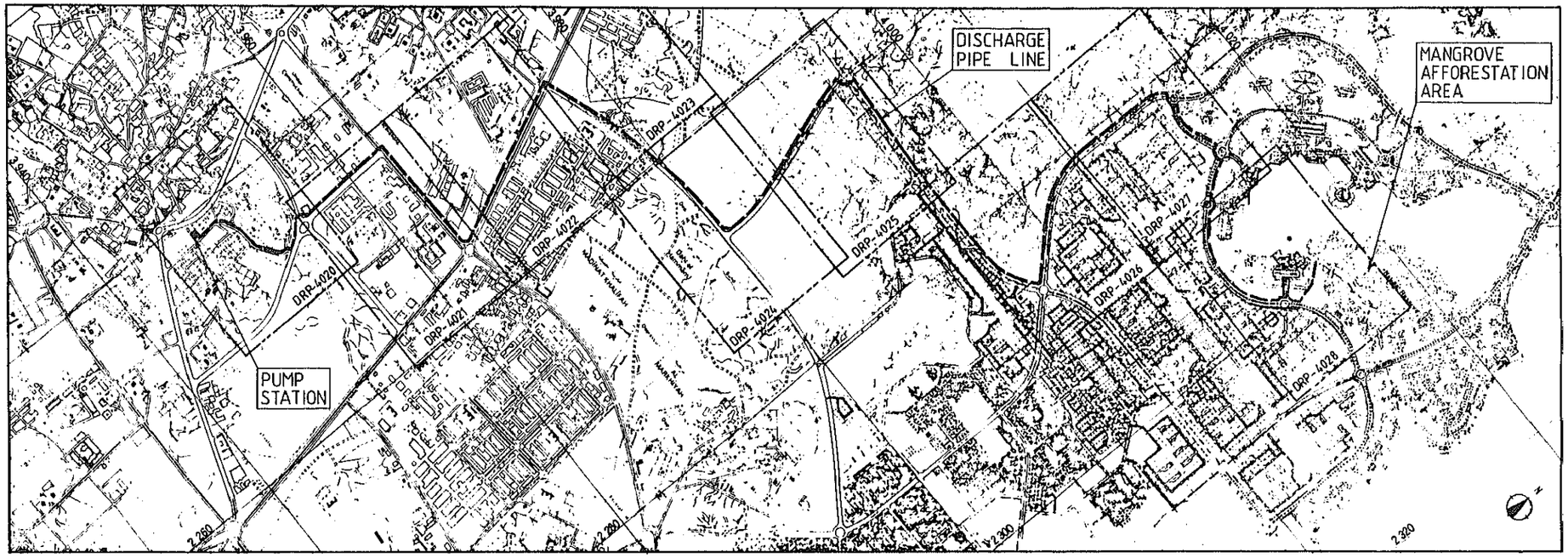
TYPICAL SECTION OF LATERAL DRAIN (S=1:50)

NOTES

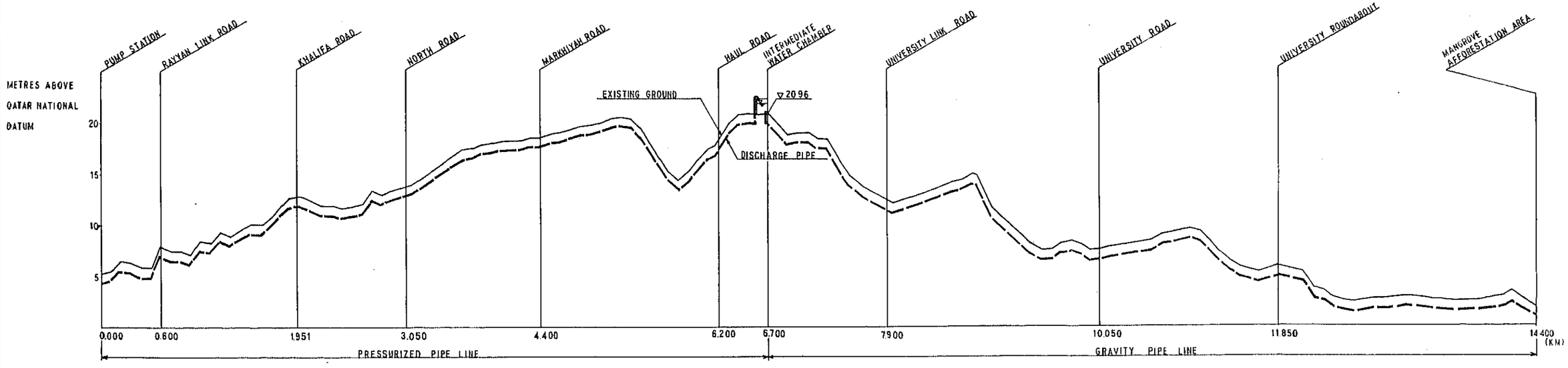
1. FOR GENERAL PLAN OF LATERAL DRAINAGE, SEE DWG. NO. DRP-3001.
2. FOR TRANSVERSAL AND LONGITUDINAL SECTIONS, ON WHICH THE LOCATIONS OF MANHOLES ARE INDICATED, SEE DWG. NOS. DRP-3002 THRU 3004.
3. GEOTEXTILE SHALL BE PROVIDED ON THE EXCAVATED SURFACE FROM THE TRENCH BOTTOM TO THE GROUND WATER LEVEL AT THE SITE.
4. GRAVEL (13~20mm) SHALL BE PROVIDED ABOVE THE GROUND WATER LEVEL AND THE THICKNESS SHALL NOT BE LESS THAN 1.0 METER.

STATE OF QATAR	SCALE
THE STUDY ON DRAINAGE IMPROVEMENT PLAN, DOHA CITY	1 : 50
OLD RAYYAN MANHOLE AND TYPICAL SECTION OF LATERAL DRAIN	DRP I 3005
JICA JAPAN INTERNATIONAL COOPERATION AGENCY	
DRAWN / CHECKED / APPROVED	

RAYYAN DISCHARGE PIPE LINE

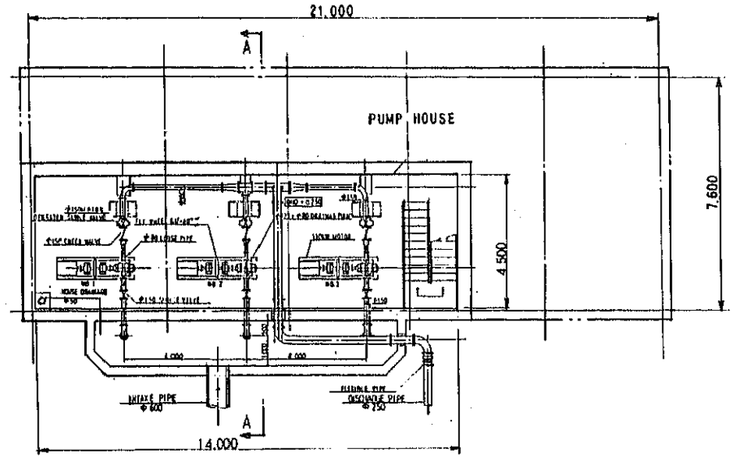


PLAN (SCALE 1 : 20000)

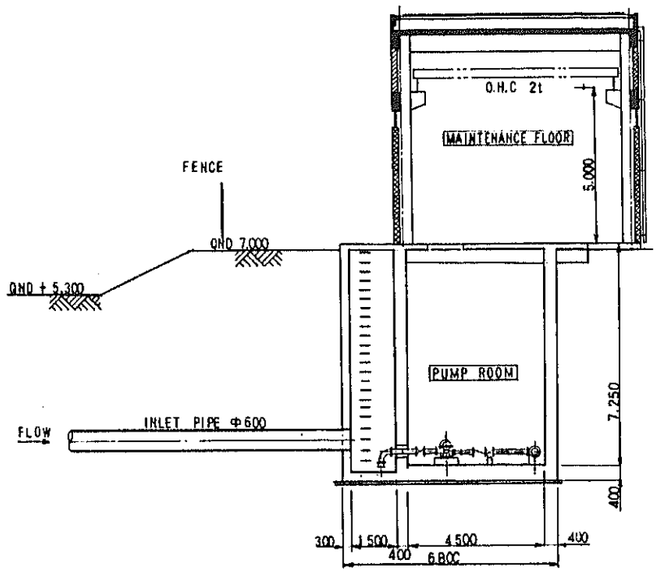


LONGITUDINAL SECTION (SCALE VER. 1:200, HOR. 1: 20.000)

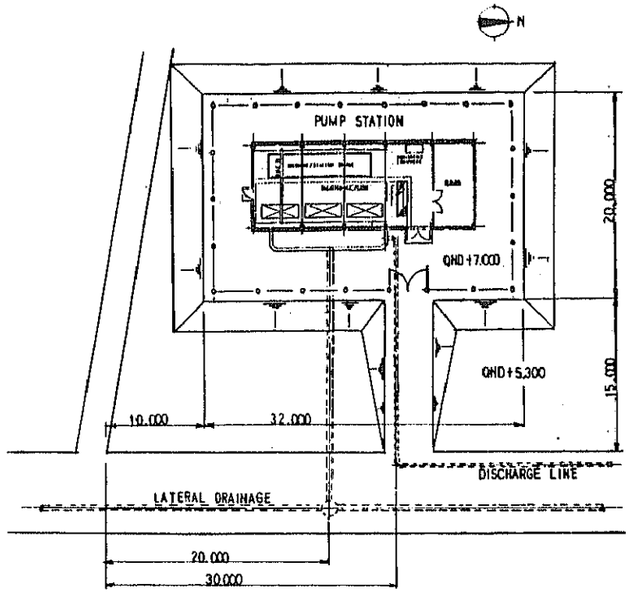
STATE OF QATAR THE STUDY ON DRAINAGE IMPROVEMENT PLAN, DOHA CITY	SCALE 1 : 200 1 : 20 000
DISCHARGE PIPE LINE GENERAL PLAN AND LONGITUDINAL SECTION	DRP I 4001
JICA JAPAN INTERNATIONAL COOPERATION AGENCY DRAWN / CHECKED / APPROVED	



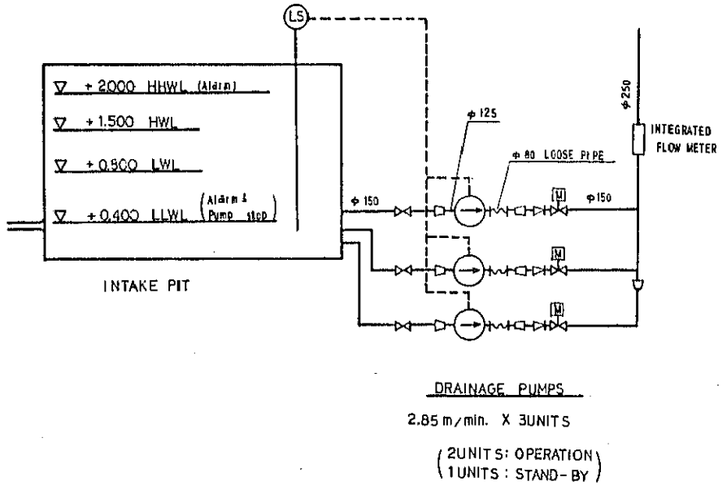
PUMP ARRANGEMENT S=1:100



SECTION A - A S=1:100



LATOUT OF PUMP STATION S=1:300

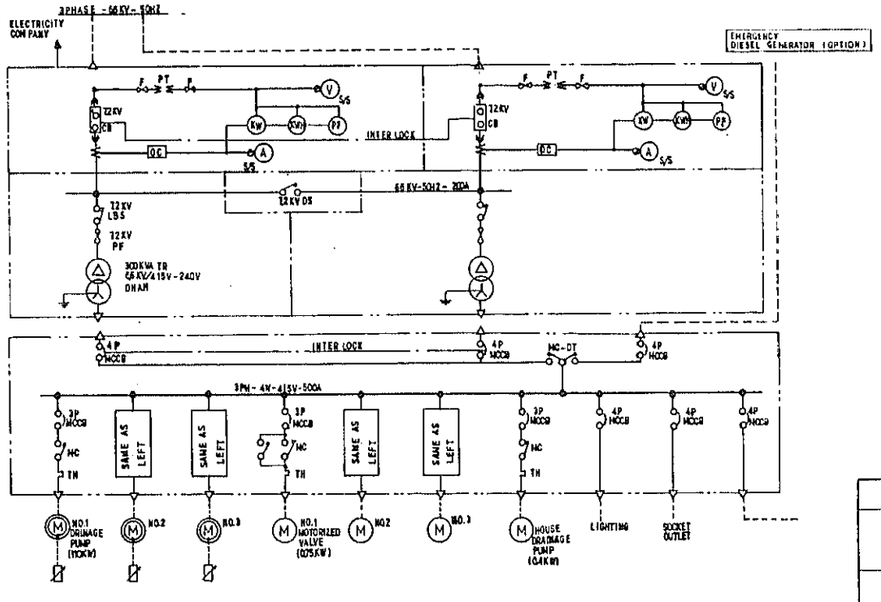


DRAINAGE PUMPS

2.85 m/min. X 3UNITS

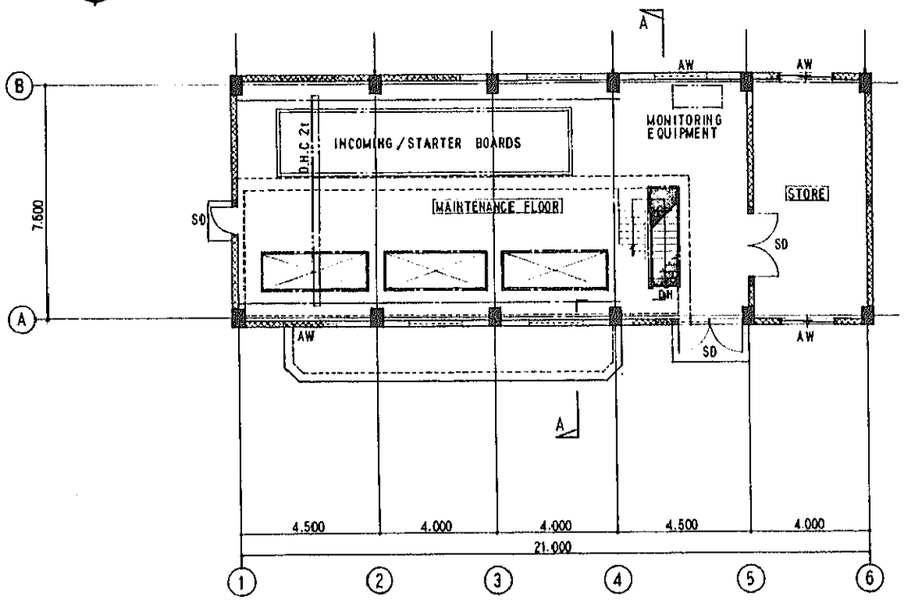
(2UNITS: OPERATION
1UNITS : STAND-BY)

FLOW DIAGRAM

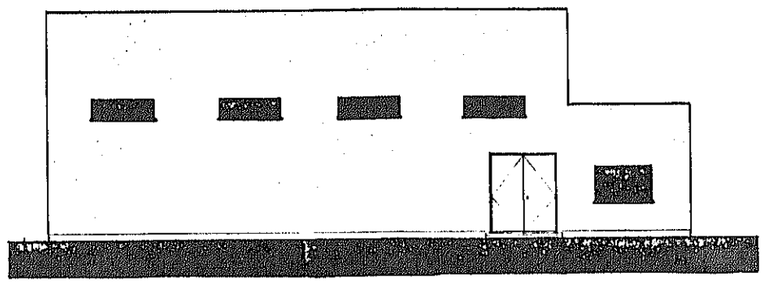


ELECTRICAL ONE LINE DIAGRAM

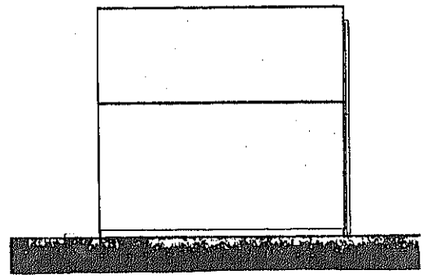
STATE OF QATAR		SCALE
THE STUDY ON DRAINAGE IMPROVEMENT PLAN, DOHA CITY		1:100 1:300
DISCHARGE PUMP STATION (1/2)		DRP I 4002
JICA JAPAN INTERNATIONAL COOPERATION AGENCY		
DRAWN	CHECKED	APPROVED



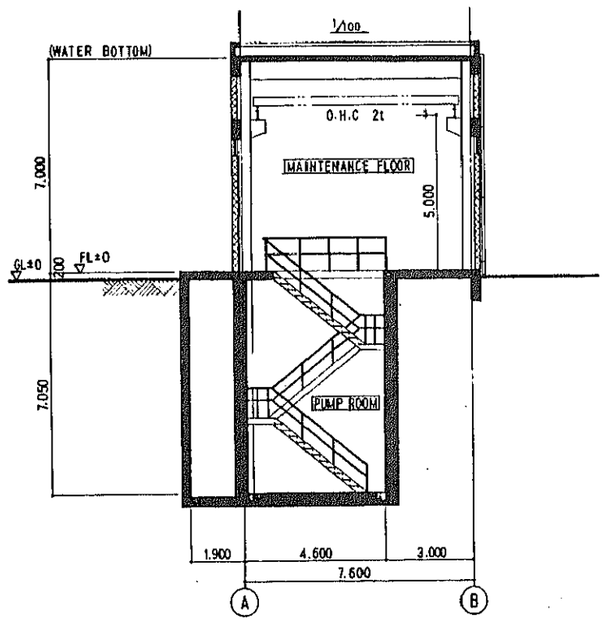
PLAN S=1:100



EAST ELEVATION S=1:100



NORTH ELEVATION S=1:100



A - A SECTION S=1:100

STRUCTURE	
FOUNDATION , COLUMN AND BEAM	: R.C
WALL	: HOLLOW CONCRETE BLOCK t=200

R.C	: REINFORCED CONCRETE
OP	: OIL PAINT
EP	: EMULSION PAINT
SD	: STEEL DOOR
AW	: ALUMINUM WINDOW

EXTERIOR FINISH SCHEDULE	
ROOF	: WATERPROOF CEMENT MORTAR + INSULATION + ASPHALT WATERPROOFING
WALL	: CEMENT MORTAR LITHING SPRAYING
BASEBOARD	: EXPOSED CONCRETE
PORCH	: CONCRETE STEEL TROWELED
DOOR & WINDOW	: STEEL DOOR & ALUMINUM WINDOW SD- 900W x 2,000H, 2,200W x 2,500H; AW- 1,800W x 1,000H, 1,800W x 600H
DOUNPIPE	: PVC ϕ100

INTERIOR FINISH SCHEDULE

ROOM \ MATERIAL	FLOOR	BASEBOARD	WALL	CEILING	REMARKS
MAINTENANCE FLOOR	CONCRETE STEEL TROWELED		EP ON CONCRETE MORTAR	EP ON EXPOSED CONCRETE	
STORE	CONCRETE STEEL TROWELED		EP ON CONCRETE MORTAR	EP ON EXPOSED CONCRETE	
PUMP ROOM	CONCRETE STEEL TROWELED		EXPOSED CONCRETE	EXPOSED CONCRETE	
STAIR	OP ON CH.2-4.5				OP ON HANDRAIL

STATE OF QATAR

THE STUDY ON DRAINAGE IMPROVEMENT PLAN, DOHA CITY

DISCHARGE PUMP STATION (2/2)

SCALE 1 : 100

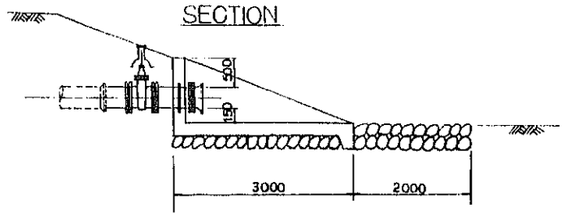
DRP I 4003

JICA JAPAN INTERNATIONAL COOPERATION AGENCY

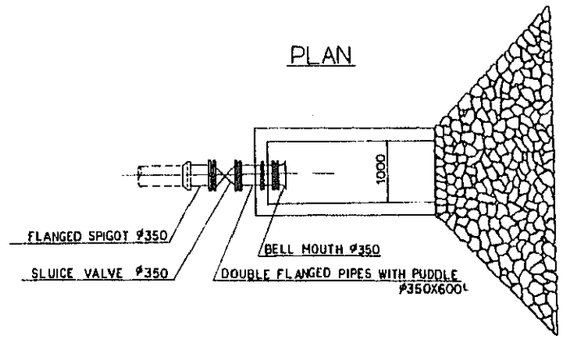
DRAWN	CHECKED	APPROVED

TEMPORARY OUTFALL 1:50

SECTION

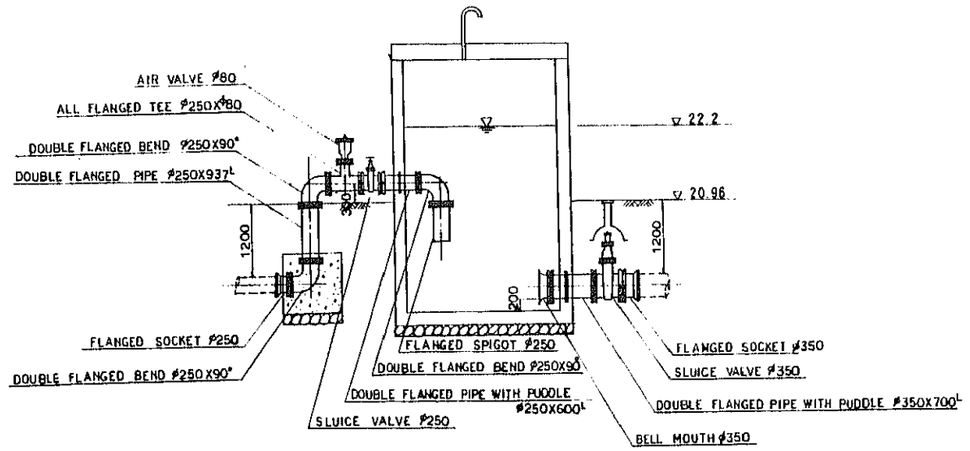


PLAN

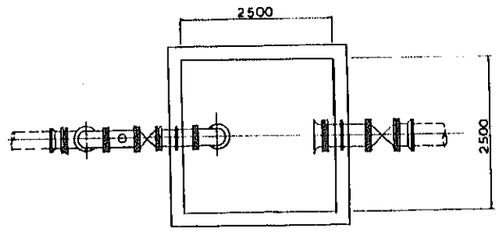


INTERMEDIATE WATER CHAMBER 1:50

SECTION

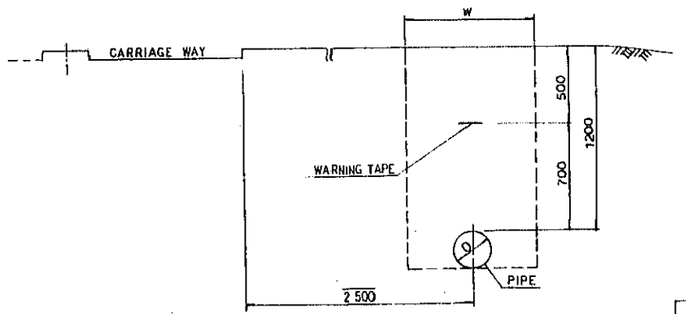


PLAN

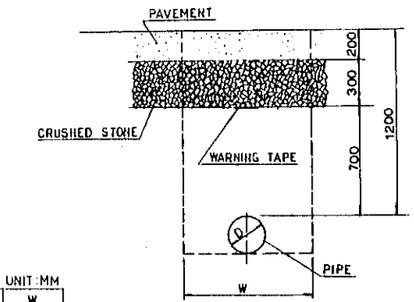


TYPICAL SECTION 1:20

SHOULDER OF ROAD



UNDER ROAD



UNIT:MM

D	W
250	850
350	950

LEGEND

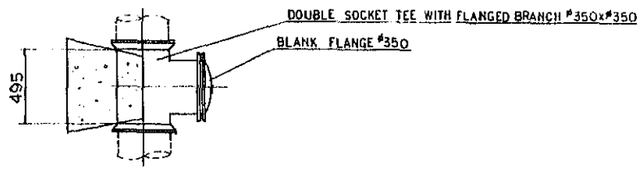
PUSH-ON JOINT

FLANGE JOINT

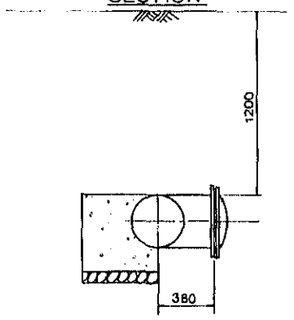
STATE OF QATAR THE STUDY ON DRAINAGE IMPROVEMENT PLAN, DOHA CITY	SCALE 1 : 20 1 : 50
DISCHARGE PIPE LINE DETAILS (1/2)	DRP I 4 004
JICA JAPAN INTERNATIONAL COOPERATION AGENCY	
DRAWN / CHECKED / APPROVED	

BRANCH 1:20

PLAN

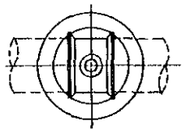


SECTION

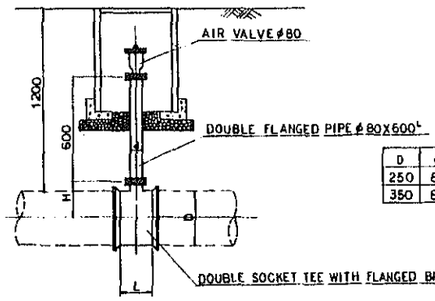


AIR VALVE BOX 1:20

PLAN



SECTION

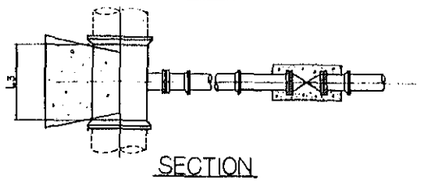


UNIT:MM

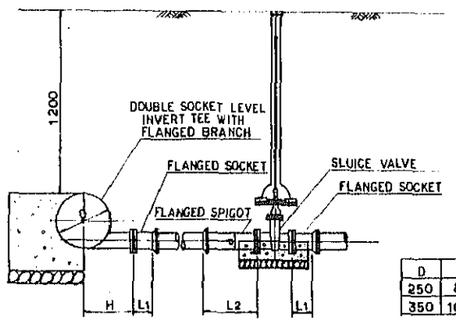
D	d	L	H
250	80	200	270
350	80	205	330

DRAINAGE 1:20

PLAN



SECTION

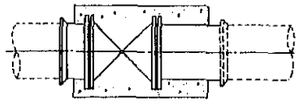


UNIT:MM

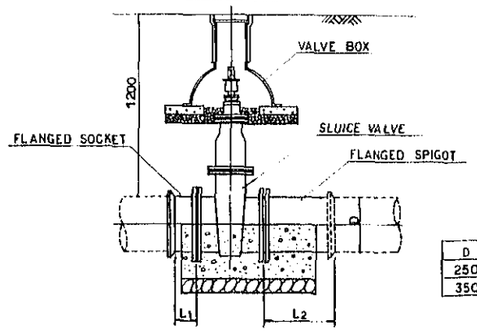
D	d	H	L1	L2	L3
250	80	275	130	350	250
350	100	325	130	360	280

SLUICE VALVE BOX 1:20

PLAN



SECTION

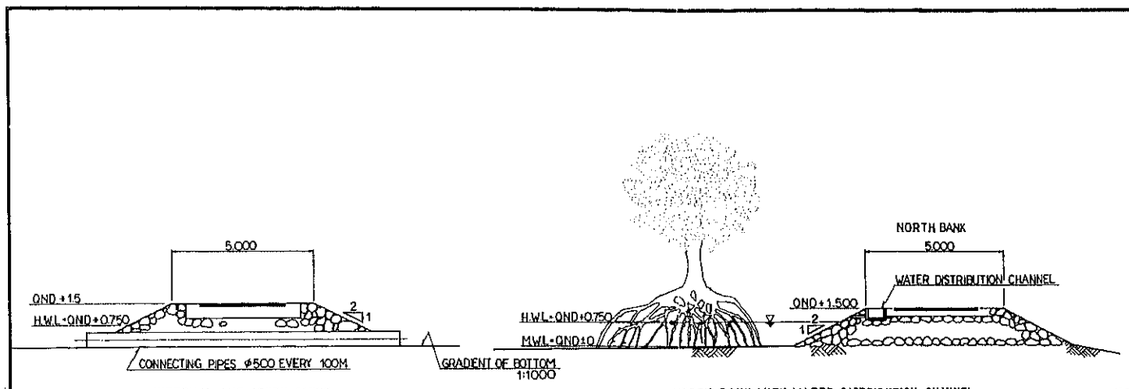


UNIT:MM

D	L1	L2
250	145	420
350	155	460

LEGEND

STATE OF QATAR	SCALE
THE STUDY ON DRAINAGE IMPROVEMENT PLAN, DOHA CITY	1:20
DISCHARGE PIPE LINE DETAILS (2/2)	DRP I 4005
JICA JAPAN INTERNATIONAL COOPERATION AGENCY	
DRAWN / CHECKED / APPROVED	



MANGROVE AFFORESTATION PLAN

WATER DISTRIBUTION CHANNEL

MANGROVE FOREST

DATE PALM TREES

NEW DISTRICT REGIONAL PARK PROJECT

WEIR

GROUND WATER DISCHARGE PIPE LINE FROM RAYYAN

STATE OF QATAR	SCALE
THE STUDY ON DRAINAGE IMPROVEMENT PLAN, DOHA CITY	1 : 100 1 : 5 000
MANGROVE AFFORESTATION PLAN	DRP I 4006
JICA JAPAN INTERNATIONAL COOPERATION AGENCY	
DRAWN / CHECKED / APPROVED