

than two test blocks in order to avoid influence of testing error. Three test blocks have been utilized for each of these tests.

Practically, three pairs of shearing resistance (t) and vertical stress (s), obtained from a test, are plotted on a graph with "t" for the vertical axis and "s" for the horizontal. Inclination of a straight line through those three points represents the angle of internal friction (F) and the length on the t-axis from zero to the point of crossing the straight line indicates the shear strength (T), as shown in Figures B-92 to B-95.

The results are as follows:

Adit	Geology	Shear Strength (Cohesion) T (kg/cm ²)	Angle of Internal Friction (Degree)
1	Highly weathered basalt	3.1	37
2	Highly weathered basalt	1.2	48
3	Hard clay	2.1	39
4	Slightly weathered basalt	19.0	48

From the above results of the tests, the recommendable design criteria are:

Rock	Shear Strength (Cohesion)	Angle of Internal Friction
Highly Weathered Rock and Hard Clay	2.0 kg/cm ²	35 degrees
Slightly Weathered or Fresh Rock	19.0 kg/cm ²	40 degrees

B4 Foundation Engineering

The above mentioned outcomes of the investigation lead to the following design concept:

(1) Foundation excavation

Surface soil with boulders and a superficial loose rock zone of the bedrock should be removed for the foundation of the impervious core zone and the filter zones of the rockfill dam. Thickness of the superficial loose rock zone can be judged from an extent of relatively high Lugeon unit at the top of drill holes, and from development of the uppermost low velocity layer of the seismic prospecting.

(2) Strength of the bedrock

The bedrock is strong enough to support a 80 metre high rockfill dam, even for its weakest soft rock layer. Problem lies rather in the inter-stratal diversity of strength for alternating hard rocks and soft rocks. This may cause occurrence of harmful tension in the bedrock or in the embankment due to differential deformation of the foundation. This condition is to be examined by Finite Element Method utilizing the results of the in-situ rock mechanics tests as described in Clause B3.6. The differential deformation can be prevented by concrete replacement of the weak layers to a sufficient depth, that should be determined with the result of strain distribution analysis by the Finite Element Method.

(3) Seepage cut-off

Water seepage through the dam foundation and abutment can be cut off by ordinary cement grouting. From the result of the test grouting, the grout hole arrangement at 2 metre intervals on a couple of lanes is recommended. Necessary depth of the curtain grouting will be approximately 30 metres in the river bed and 30 metres to 60 metres in the abutments.

The soft rock layers or the hard clay at boundaries of different lava flows are not more pervious than other zones. Lugeon values observed were not more than 20 in 73 percent of stages water-pressure-tested.

Blanket grouting and consolidation grouting shall be made to the depth of 5 metres or 10 metres.

(4) Lava tunnel

No sign of lava tunnel has been found through two years field geological investigations, including observation of rock outcrops, core drilling with Lugeon test, test grouting, and test aditting. Judgement is negative for existence of a lava tunnel.

The low piezometric heads found in the borehole JD-12 and other holes nearby are judged to indicate existence of local privileged water passage, but not large opening as lava tunnel because of slow draw-down of the water level in the borehole and not outstandingly high Lugeon unit. A few small cavities of about 20 centimetres have

been encountered at levels near the contemplated reservoir surface in the borehole JD-102, but not in other holes within 25 metres distance, which seems to indicate limited distribution of the cavities.

The highly pervious portions as indicated by the low groundwater level in JD-12 in the left abutment should be treated by rim curtain grouting stretching for about 400 metres from the wing of the spillway. This stretch of the grout curtain will cover all parts where the reservoir depth is more than 30 metres and can have more than 1/10 of hydraulic gradient. The rim grouting shall be made from a grouting tunnel driven at elevation 190 metres, one metre higher than the reservoir high water level, and to the depth of 60 metres through grout holes arranged at 3 metre intervals. By the split-spacing method, substantial quantity of the grout hole may be eliminated from the parts which do not require grouting, and be added where grouting is really necessary.

B 5 Geology of Quarry Site

The quarry site for rock material and concrete aggregate is located on the north-western slope of Mt.Ory, which is about 1 km north of the damsite. Mt.Ory is a part of high mountain ridge of dissected old volcano, and is composed of the old volcanic series. Around the quarry site, the old volcanic rocks of the mountain ranges crop out in the very steep mountainous slopes without thick overburden material, which are composed of talus deposits, scree deposits, weathered soil, etc.

Geological investigations consisting of the core drilling with laboratory tests on core sample are carried out for the quarry site (JQ-3), and the alternative site (JQ-1, JQ-2), which is located about 2 km north of Mt.Ory.

The obtained cores of JQ-3 shows that the older volcanic series is composed of massive, dense and hard, black glassy basalt lavas with occasional intercalation of layers of consolidated flow breccia. The talus deposits is less than 2 m in thickness, and basalt lavas have been altered by superficial weathering to the depth of 7 m. The basalt is hard, fresh and durable. The intercalated flow breccia is rather soft with high water absorption but a member of minor proportion. Hard rock can be obtained from the massive basalt lavas in general.

TABLES

Table B-1 LIST OF GEOLOGICAL INVESTIGATION (1)

Core Drilling				
Hole No.	Elevation	Depth	Angle	Location
JD-1	252.71 m	120.00 m	Vertical	Left bank
JD-2	248.23 m	120.00 m	Vertical	Left bank
JD-3	167.46 m	40.00 m	Vertical	Left bank
JD-4	186.41 m	50.00 m	20 from Vertical	Left bank
JD-5	167.55 m	50.00 m	Vertical	Left bank
JD-6	146.29 m	30.00 m	Vertical	Left bank
JD-7	124.42 m	50.00 m	40 from Vertical	Left bank
JD-8	140.57 m	70.00 m	Vertical	Right bank
JD-9	247.50 m	143.00 m	Vertical	Left bank
JD-10	251.83 m	120.00 m	Vertical	Left bank
JD-11	149.07 m	36.00 m	Vertical	Left bank
JD-12	250.17 m	120.00 m	Vertical	Left bank
JD-13	246.12 m	120.00 m	Vertical	Left bank
JD-101	252.60 m	150.00 m	Vertical	Left bank
JD-102	252.60 m	150.00 m	Vertical	Left bank
JD-103	253.60 m	150.00 m	Vertical	Left bank
Sub-total		1,519.00 m		
JTP-1	70.66 m	20.00 m	Vertical	Treatment Plant
JTP-2	68.62 m	20.00 m	Vertical	Treatment Plant
JTP-3	68.01 m	20.00 m	Vertical	Treatment Plant
JTP-4	67.94 m	20.00 m	Vertical	Treatment Plant
JTP-5	67.01 m	20.00 m	Vertical	Treatment Plant
JTP-6	67.08 m	20.00 m	Vertical	Treatment Plant
Sub-total		120.00 m		
JQ-1		15.30 m	Vertical	Quarry Site
JQ-2		15.00 m	Vertical	Quarry Site
JQ-3		30.00 m	Vertical	Quarry Site
Sub-total		60.30 m		
Total		1,699.30 m		

Table B-2 LIST OF GEOLOGICAL INVESTIGATION (2)

Test Grouting				
Hole No.	Elevation	Depth	Lugeon Test	Test Grouting
GT-1	146.24 m	60.00 m	7 Stages	7 Stages
GT-2	146.24 m	60.00 m	7 Stages	7 Stages
GT-3	146.24 m	60.00 m	7 Stages	7 Stages
GT-4	146.24 m	60.00 m	7 Stages	7 Stages
Total		240.00 m	28 Stages	28 Stages

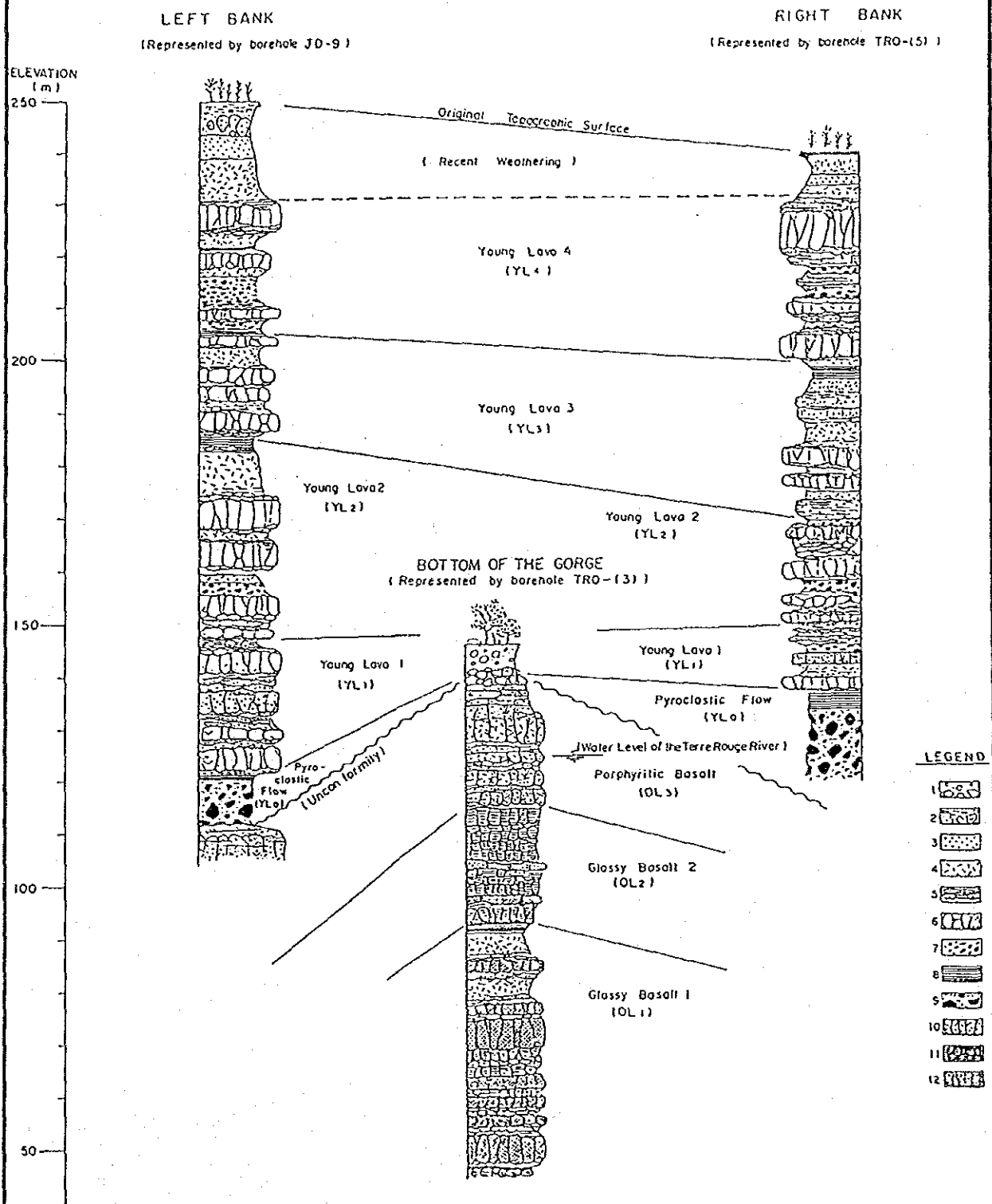
Table B-3 LIST OF GEOLOGICAL INVESTIGATION (3)

Test Adit					
Adit No.	Elevation	Length			Location
		Main Adit	Branch Adits	Total	
Adit No. 1	179.82 m	87.00 m	27.80 m	114.80 m	Left Bank
Adit No. 2	149.98 m	73.50 m	11.00 m	84.50 m	Left Bank
Adit No. 3	140.69 m	83.00 m	22.00 m	105.00 m	Right Bank
Adit No. 4	159.85 m	85.00 m	16.00 m	101.00 m	Right Bank
Total		328.50 m	76.80 m	405.30 m	

Table B-4 LIST OF GEOLOGICAL INVESTIGATION (4)

In-situ Rock Test				
Adit No.	Elevation	Block Shear Test	Plate Loading Test	Location
Adit No. 1	179.82 m	3	2	Left Bank
Adit No. 2	149.98 m	3	1	Left Bank
Adit No. 3	140.69 m	3	1	Right Bank
Adit No. 4	159.85 m	3	4	Right Bank
Total		12	8	

FIGURES



Schematic column section of the damsite showing volcano-stratigraphical sequence of basalt lavas.

GOVERNMENT OF MAURITIUS
PORT LOUIS WATER SUPPLY PROJECT

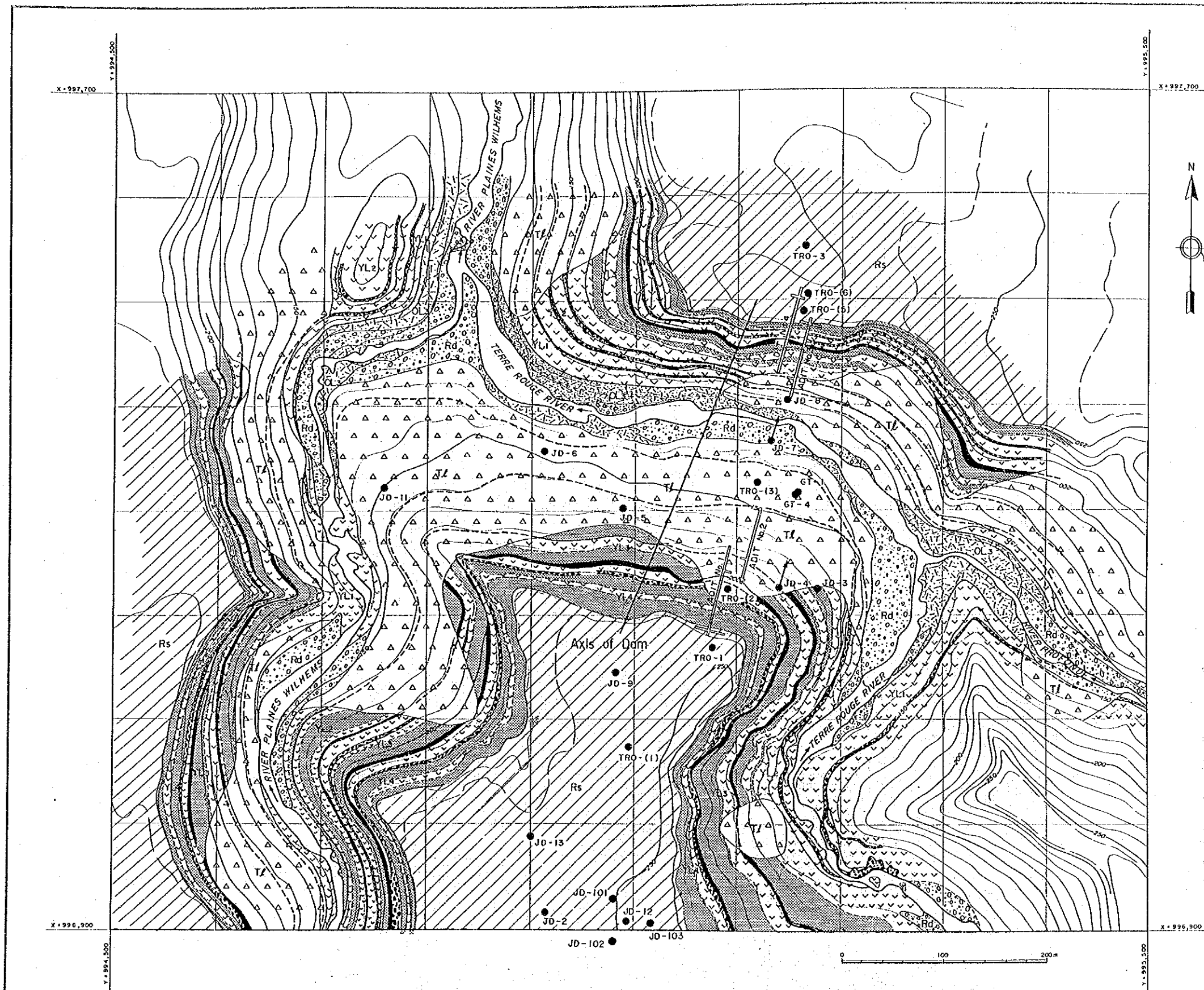
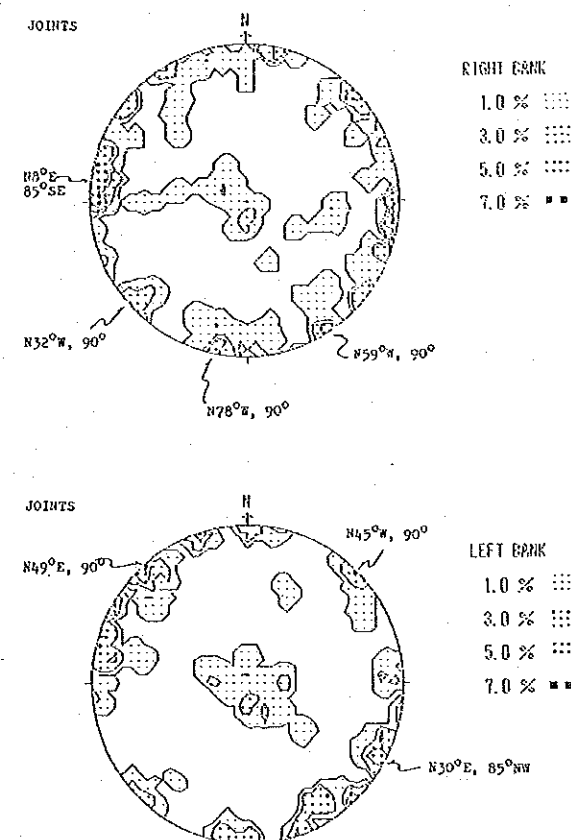
JAPAN INTERNATIONAL COOPERATION AGENCY

LEGEND

Stratigraphy		Rock Facies	
Alluvial	River Deposits (Rd)		Gravels and Sand
	Talus Deposits (Tl)		Soil with Gravels
	Residual Soil (Rs)		Lateritic Soil
Young Lava	Young Lava 4 (YL4)		Weathered basalt
	Young Lava 3 (YL3)		Basalt
	Young Lava 2 (YL2)		Flow breccia
	Young Lava 1		Hard Clay
Old Lava	Porphyritic Basalt (OL3)		Partially weathered porphyritic basalt

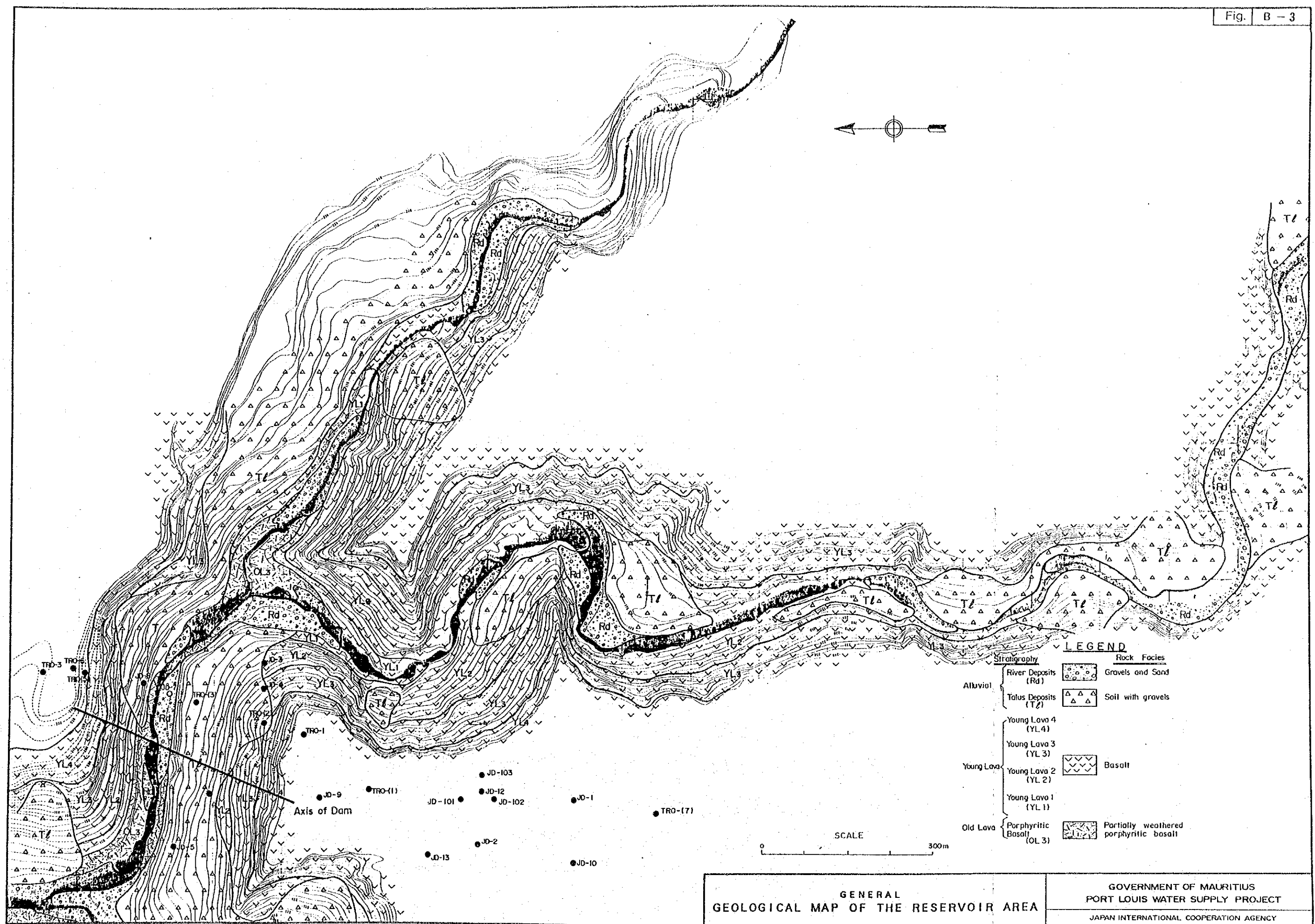
JD-2 Borehole
 ADIT No.1 Test Adit

Orientation Distribution of Joints



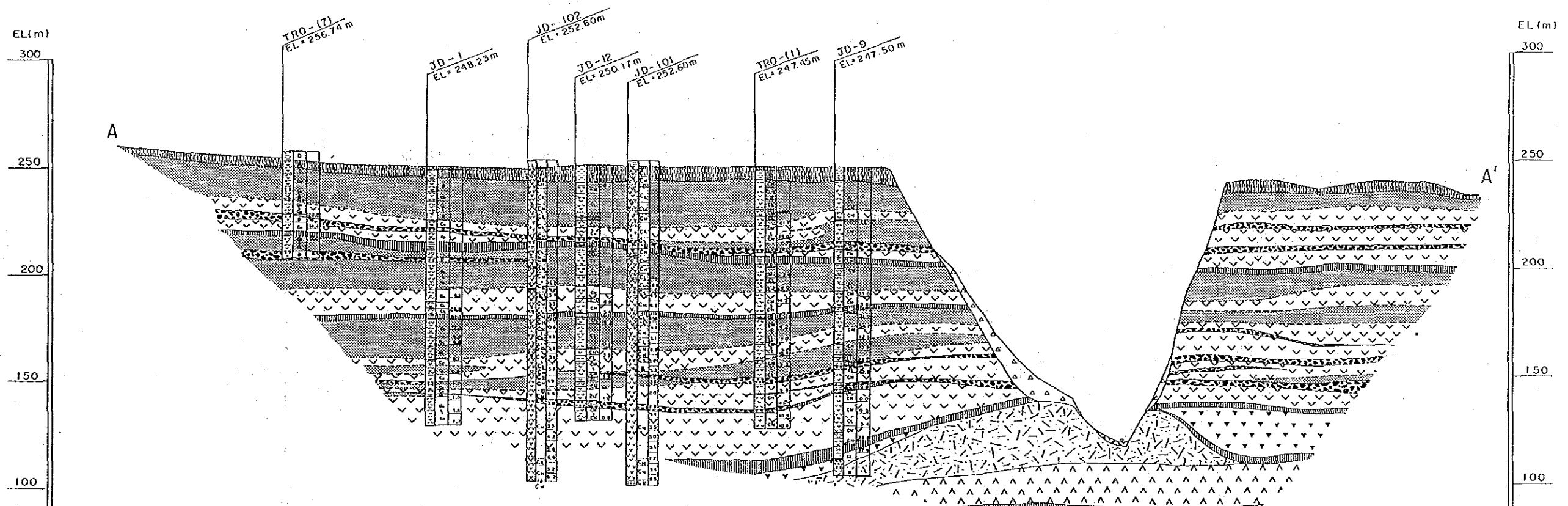
GENERAL
GEOLOGICAL MAP OF THE DAMSITE

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GENERAL
GEOLOGICAL MAP OF THE RESERVOIR AREA

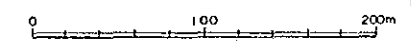
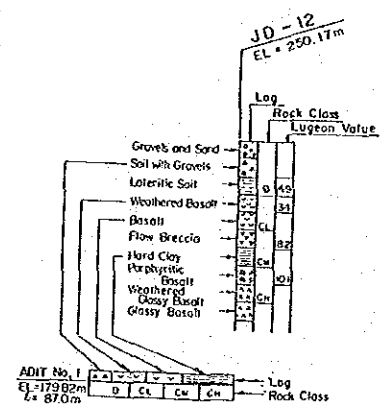
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PORT LOUIS WATER SUPPLY PROJECT
JAPAN INTERNATIONAL COOPERATION AGENCY



LEGEND

Stratigraphy		Rock Facies	
Alluvial	River Deposits (Rd)	Gravels and Sand	
	Talus Deposits (T0)	Soil with Gravels	
	Residual Soil (Rs)	Lateritic Soil	
Young Lava	Young Lava IV (YL4)	Weathered Basalt	
	Young Lava III (YL3)	Basalt	
	Young Lava II (YL2)	Flow Breccia	
	Young Lava I (YL1)	Hard Clay	
	Pyroclastic Flow (YL0)	Pyroclastic Flow	
Old Lava	Porphyritic Basalt (OL3)	Porphyritic Basalt	
	Glassy Basalt II (OL2)	Weathered Glassy Basalt	
	Glassy Basalt I (OL1)	Glassy Basalt	
		Hard Clay / Flow Breccia	

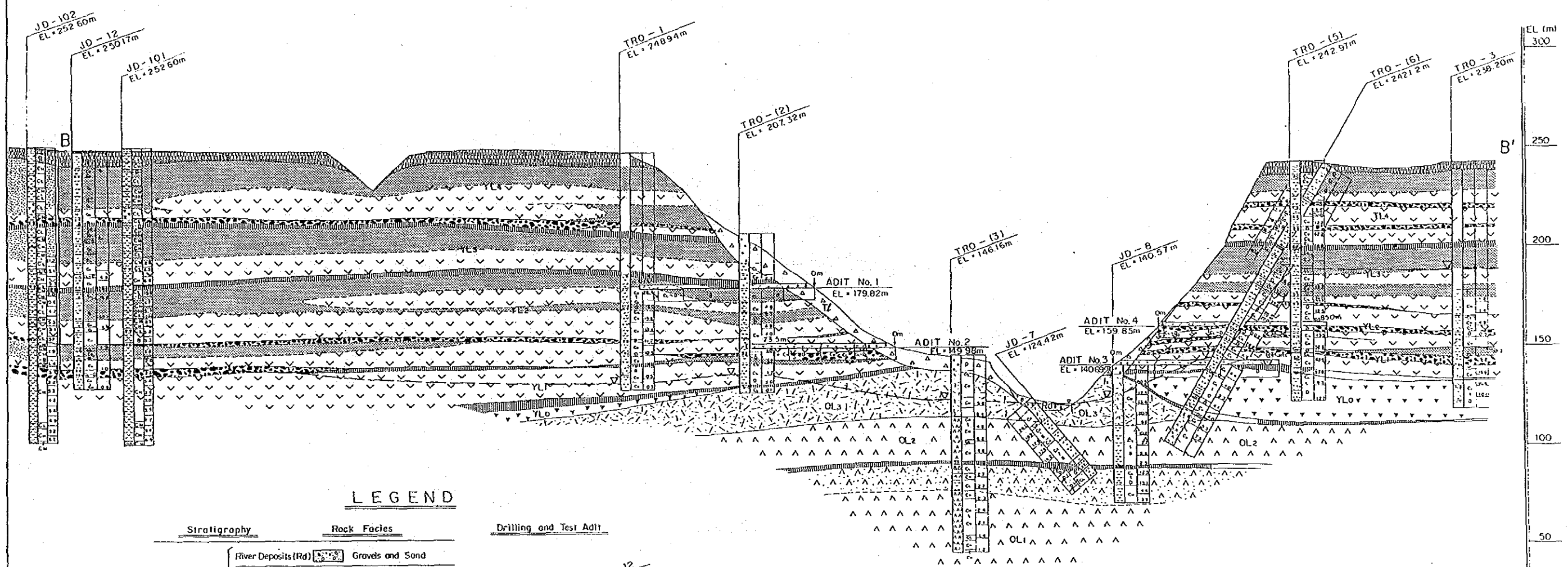
Drilling and Test Adit



Note : For location of section, see DWG.No.G-012
 DWG. NO. shown on this Figure indicates the Tender Drawing No..

**GENERAL
 GEOLOGICAL PROFILE ALONG
 THE DAM AXIS**

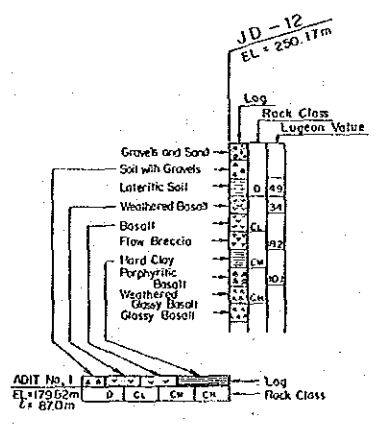
GOVERNMENT OF MAURITIUS
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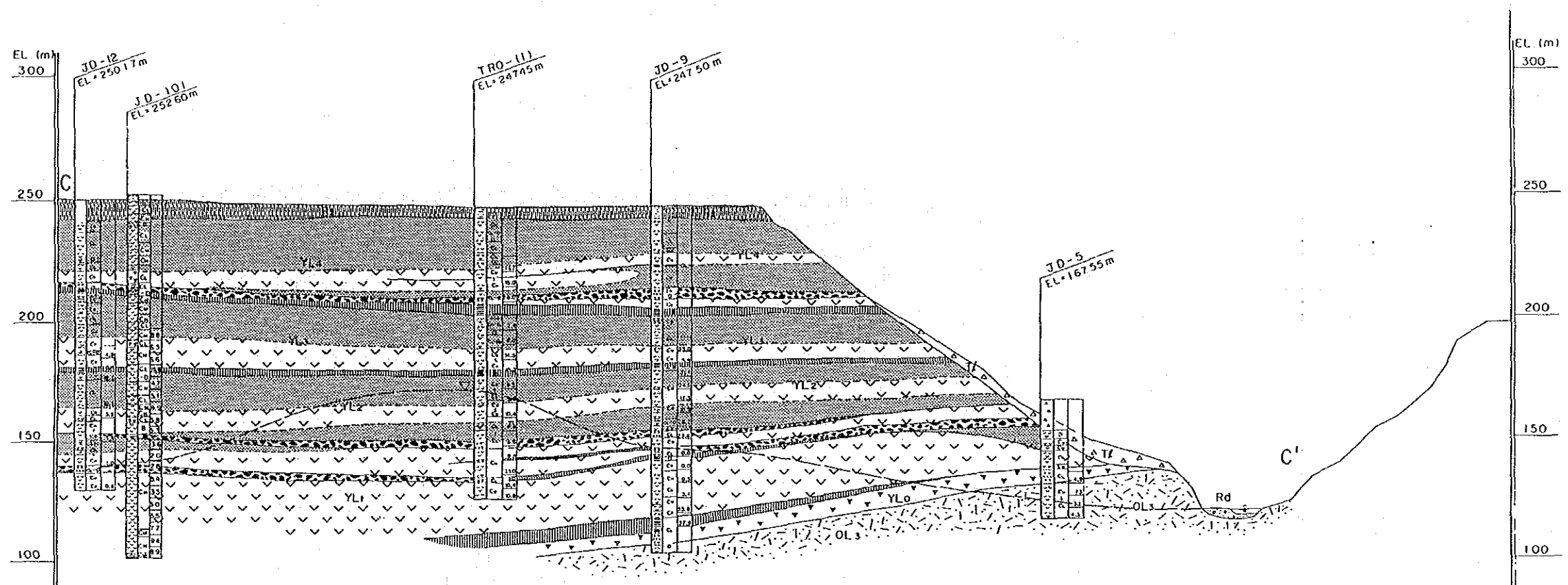
LEGEND

Stratigraphy		Rock Facies	
Alluvial	River Deposits (Rd)	Gravels and Sand	
	Talus Deposits (Tθ)	Soil with Gravels	
	Residual Soil (Rs)	Lateritic Soil	
Young Lava	Young Lava IV (YL4)	Weathered Basalt	
	Young Lava III (YL3)	Basalt	
	Young Lava II (YL2)	Flow Breccia	
		Hard Clay	
	Young Lava I (YL1)		
Pyroclastic Flow (YL0)	Pyroclastic Flow		
Old Lava	Porphyritic Basalt (OL3)	Porphyritic Basalt	
	Glassy Basalt II (OL2)	Weathered Glassy Basalt	
		Glassy Basalt	
Glassy Basalt I (OL1)	Hard Clay / Flow Breccia		

Drilling and Test Adit

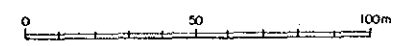
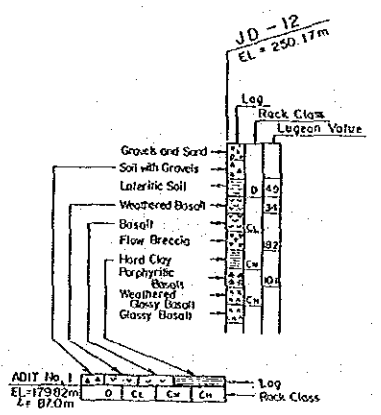


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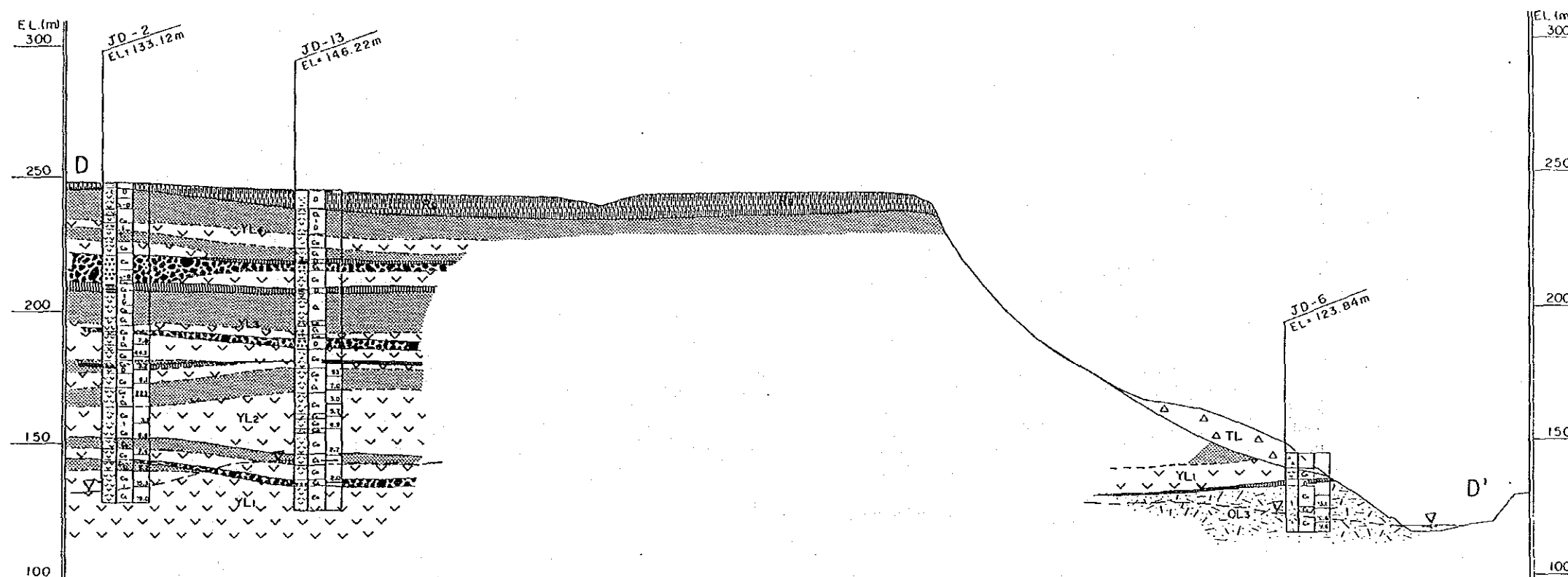
LEGEND

Stratigraphy	Rock Facies	Drilling and Test Adit
Alluvial	River Deposits (Rd) [Symbol]	Gravels and Sand
	Talus Deposits (Td) [Symbol]	Soil with Gravels
	Residual Soil (Rs) [Symbol]	Lateritic Soil
Young Lava	Young Lava IV (YL4) [Symbol]	Weathered Basalt
	Young Lava III (YL3) [Symbol]	Basalt
	Young Lava II (YL2) [Symbol]	Flow Breccia
		Hard Clay
	Young Lava I (YL1) [Symbol]	Pyroclastic Flow
Old Lava	Porphyritic Basalt (OL3) [Symbol]	Porphyritic Basalt
	Glassy Basalt II (OL2) [Symbol]	Weathered Glassy Basalt
		Glassy Basalt
	Glassy Basalt I (OL1) [Symbol]	Hard Clay / Flow Breccia



Note : For location of section, see DWG.No.G-012

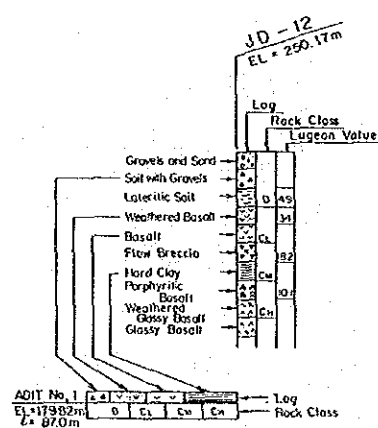
DWG. NO. shown on this Figure indicates the Tender Drawing No.



LEGEND

Stratigraphy		Rock Facies	
Alluvial	River Deposits (Rd)	Gravels and Sand	
	Talus Deposits (TB)	Soil with Gravels	
	Residual Soil (Rs)	Lateritic Soil	
Young Lava	Young Lava IV (YL4)	Weathered Basalt	
	Young Lava III (YL3)	Basalt	
	Young Lava II (YL2)	Flow Breccia	
	Young Lava I (YL1)	Hard Clay	
	Pyroclastic Flow (YL0)	Pyroclastic Flow	
Old Lava	Porphyritic Basalt (OL3)	Porphyritic Basalt	
	Glassy Basalt II (OL2)	Weathered Glassy Basalt	
	Glassy Basalt I (OL1)	Glassy Basalt	

Drilling and Test Adit

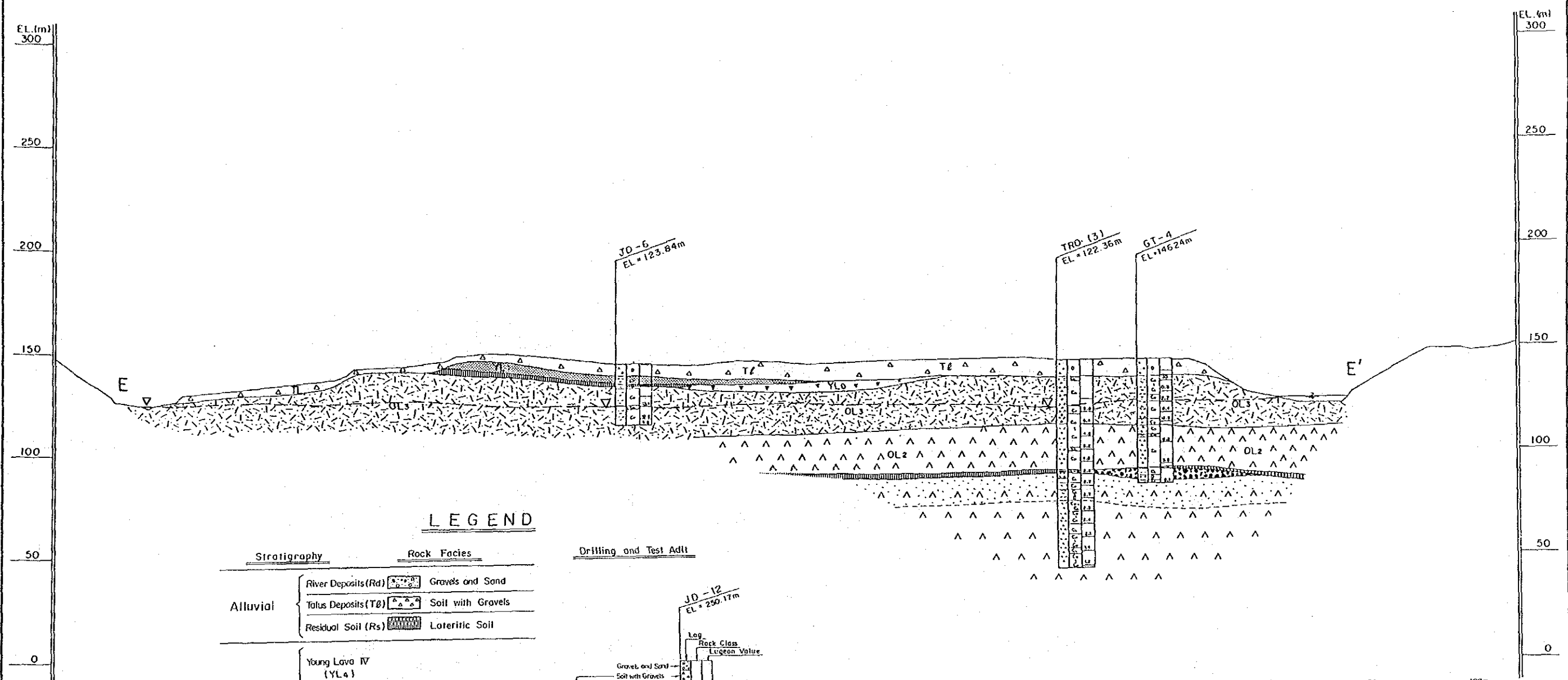


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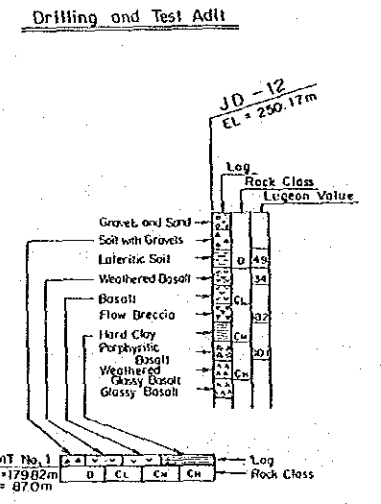
GENERAL GEOLOGICAL PROFILE OF THE DAMSITE (3)

GOVERNMENT OF MAURITIUS
PORT LOUIS WATER SUPPLY PROJECT
JAPAN INTERNATIONAL COOPERATION AGENCY

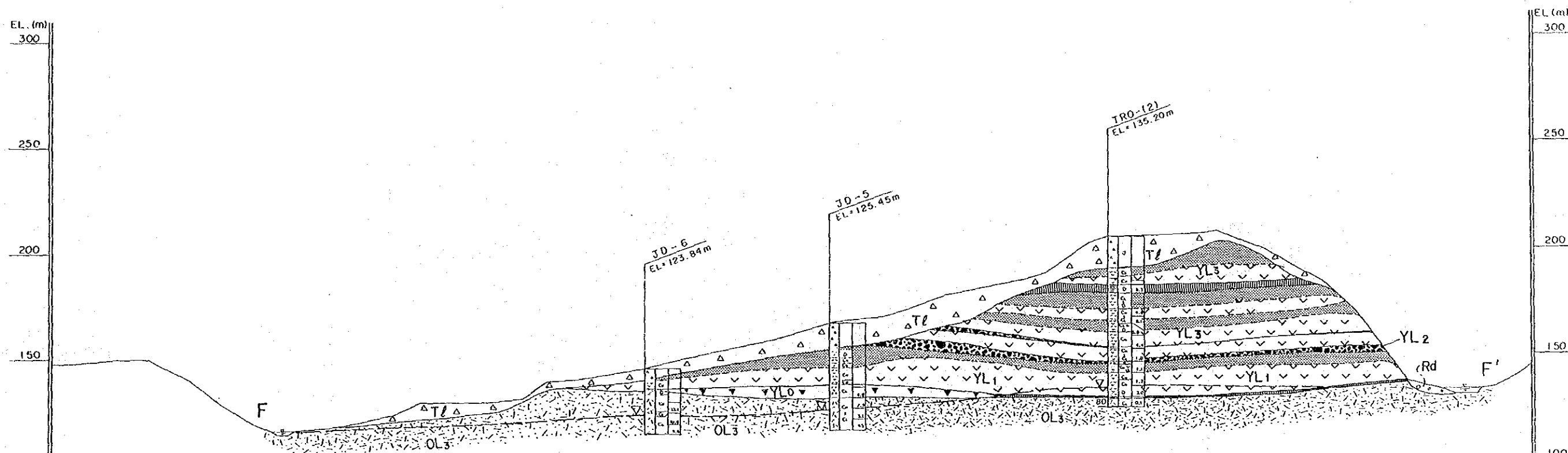


LEGEND

Stratigraphy		Rock Facies	
Alluvial	River Deposits (Rd)	Gravels and Sand	
	Talus Deposits (Tθ)	Soil with Gravels	
	Residual Soil (Rs)	Lateritic Soil	
Young Lava	Young Lava IV (YL 4)		
	Young Lava III (YL 3)	Weathered Basalt	
	Young Lava II (YL 2)	Basalt	
	Young Lava I (YL 1)	Flow Breccia	
	Young Lava I (YL 1)	Hard Clay	
Pyroclastic Flow (YL 0)	Pyroclastic Flow		
Old Lava	Porphyritic Basalt (OL 3)	Porphyritic Basalt	
	Glassy Basalt II (OL 2)	Weathered Glassy Basalt	
	Glassy Basalt I (OL 1)	Glassy Basalt	
		Hard Clay / Flow Breccia	

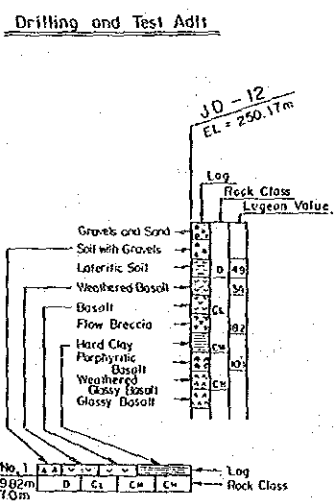


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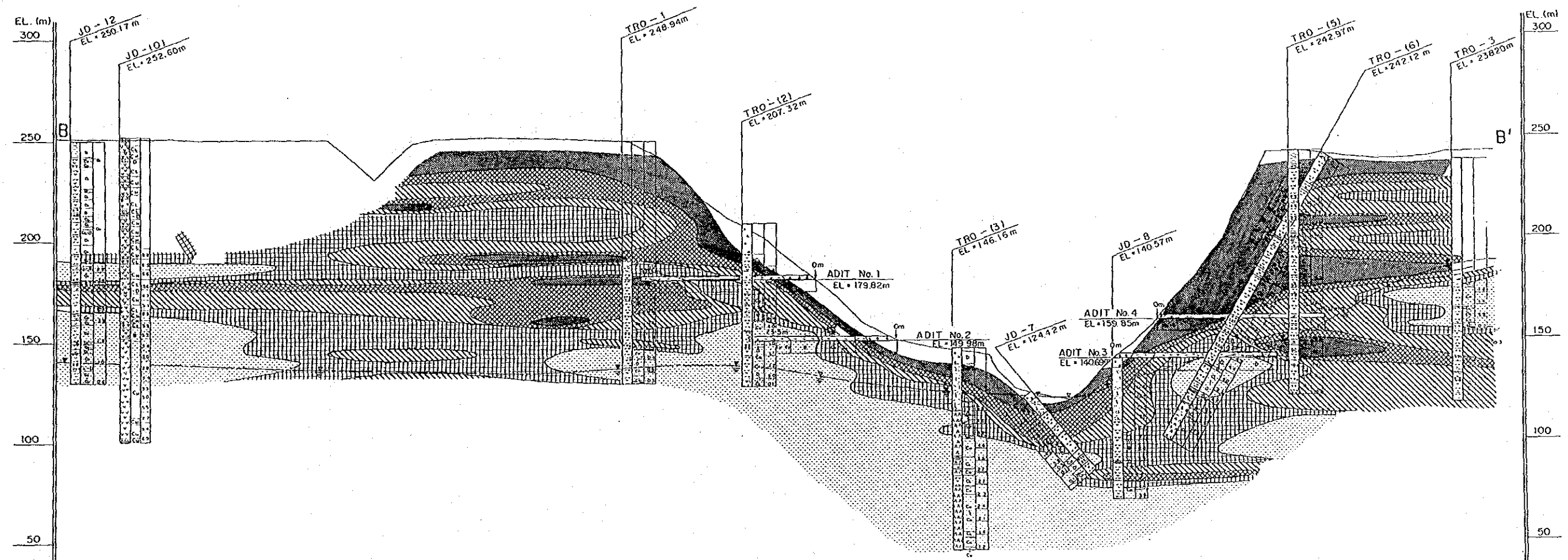


LEGEND

Stratigraphy		Rock Facies	
Alluvial	River Deposits (Rd)	Gravels and Sand	
	Talus Deposits (T δ)	Soil with Gravels	
	Residual Soil (Rs)	Lateritic Soil	
Young Lava	Young Lava IV (YL4)	Weathered Basalt	
	Young Lava III (YL3)	Basalt	
	Young Lava II (YL2)	Flow Breccia	
	Young Lava I (YL1)	Hard Clay	
	Pyroclastic Flow (YL0)	Pyroclastic Flow	
Old Lava	Porphyritic Basalt (OL3)	Porphyritic Basalt	
	Glassy Basalt II (OL2)	Weathered Glassy Basalt	
	Glassy Basalt I (OL1)	Glassy Basalt / Hard Clay / Flow Breccia	



Note : For location of section, see DWG.No.G-012
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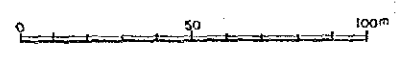
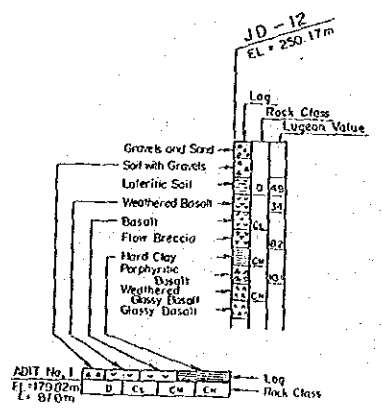


LEGEND

Lugeon Value

- 20 Lu <
- 20 - 15 Lu
- 15 - 10 Lu
- 10 - 5 Lu
- 5 Lu <

Drilling and Test Adit

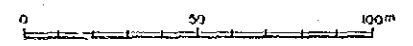
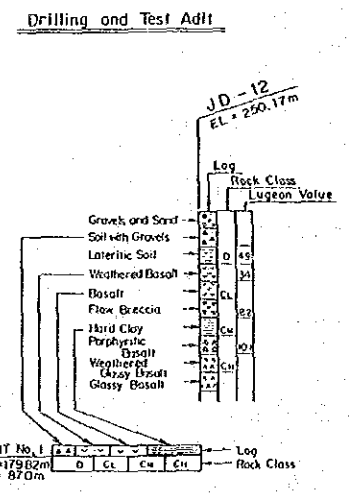
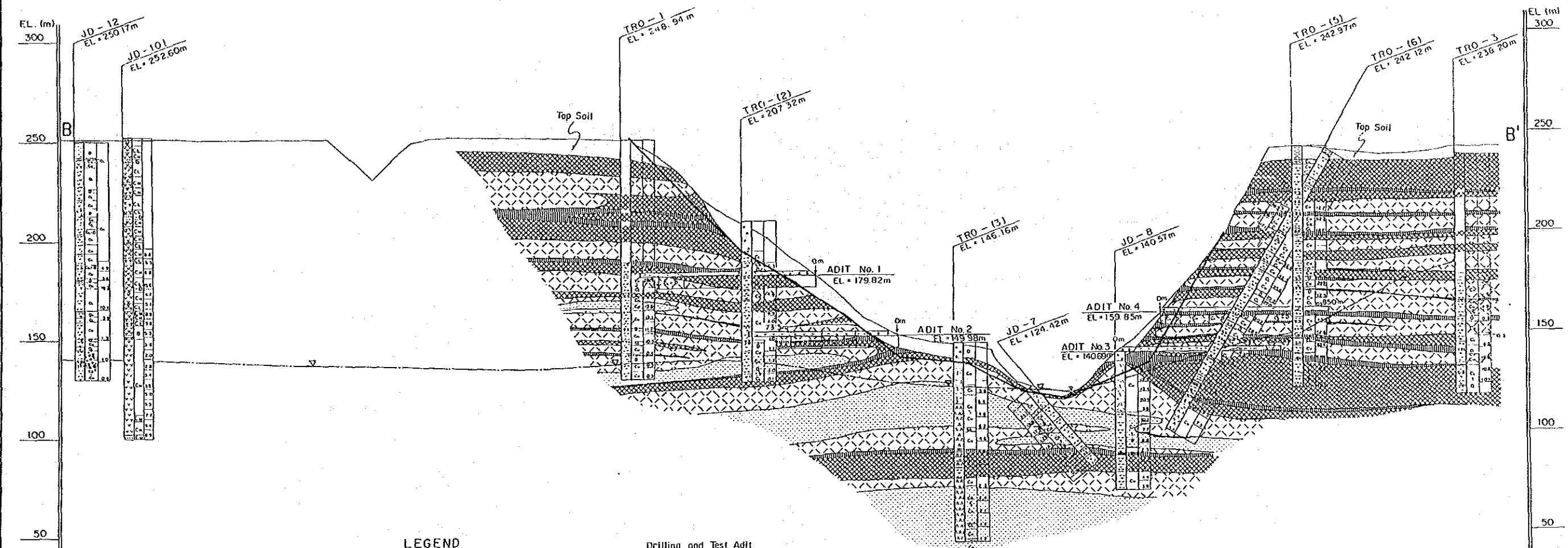


Note : For location of section, see DWG.No.G-012

DWG. NO. shown on this Figure Indicates the Tender Drawing No..

GENERAL LUGEON MAP

GOVERNMENT OF MAURITIUS
 PORT LOUIS WATER SUPPLY PROJECT
 JAPAN INTERNATIONAL COOPERATION AGENCY



Note : For location of section, see DWG.No.G-012

. DWG. NO. shown on this Figure Indicates the Tender Drawing No..

DRILL LOG

SHEET NO. 2 OF 5

SITE		TRO DAMSITE		LONGITUDE		HOLE No.		ELEVATION		DEPTH	
LATITUDE		1991/05/14 - 1991/05/31		27° 0' N 102° 5' E		JD-101		232.60m		150.00m	
DATE		1991/05/14 - 1991/05/31		27° 0' N 102° 5' E		JD-101		232.60m		150.00m	
ANGLE		180° UP DOWN		90°		HOLE No.		ELEVATION		DEPTH	
SCALE		ELEVATION		DIRECTION		SLOPE		CORE RECOVERY		WATER PRESSURE TEST	
		30.50 222.10		CI				0 50 100 0		0 10 20 30 40 50	
		31 31.00 221.60		Cm-CI				50 100 0			
		32 32.00 220.60		D				50 100 0			
		33 33.00 219.60		CI-O				50 100 0			
		34 34.00 218.60		Cm				50 100 0			
		35 35.00 217.60		D				50 100 0			
		36 36.00 216.60		CI-O				50 100 0			
		37 37.00 215.60		Cm				50 100 0			
		38 38.00 214.60		D				50 100 0			
		39 39.00 213.60		CI				50 100 0			
		40 40.00 212.60		B				50 100 0			
		41 41.00 211.60		CI				50 100 0			
		42 42.00 210.60		Ch				50 100 0			
		43 43.00 209.60		Cm				50 100 0			
		44 44.00 208.60		Ch				50 100 0			
		45 45.00 207.60		Cm				50 100 0			
		46 46.00 206.60		Ch				50 100 0			
		47 47.00 205.60		Cm				50 100 0			
		48 48.00 204.60		Ch				50 100 0			
		49 49.00 203.60		Cm				50 100 0			
		50 50.00 202.60		Ch				50 100 0			
		51 51.00 201.60		Cm				50 100 0			
		52 52.00 200.60		Ch				50 100 0			
		53 53.00 199.60		Cm				50 100 0			
		54 54.00 198.60		Ch				50 100 0			
		55 55.00 197.60		Cm				50 100 0			
		56 56.00 196.60		Ch				50 100 0			
		57 57.00 195.60		Cm				50 100 0			
		58 58.00 194.60		Ch				50 100 0			
		59 59.00 193.60		Cm				50 100 0			
		60 60.00 192.60		Ch				50 100 0			

R.O.D is Rock Quality Designation, R.O.D = (Total length of cylindrical cores longer than 10 cm) / (Total drill length) x 100%
 X-LOGON VALUE is 1/min/m under injection water pressure of 10kg/cm²
 X-DEPTH and ELEVATION are in meter
 X-DIAMETER is in millimeter

NIPPON KOEI CO., LTD.,
 CONSULTING ENGINEERS, TOKYO

DRILLING LOG OF JD-101 (2/5)

GOVERNMENT OF MAURITIUS
 PORT LOUIS WATER SUPPLY PROJECT
 JAPAN INTERNATIONAL COOPERATION AGENCY

DRILL LOG

SHEET NO.3 OF 5

SITE		TRO DAMSITE		HOLE NO.		JD-101	
LATITUDE		LONGITUDE		ELEVATION		252.50m	
DATE		1991/05/14 - 1991/05/31		DEPTH		150.00m	
ANGLE		DIRECTION		SLOPE		HORIZON	
SCALE		ROCK TYPE		DESCRIPTION		DATE	
DEPTH		ROCK CLASS		CORRECTION		WATER LEVEL	
ELEVATION		COLUMN SECTION		BIT & DIAMETER		CORE RECOVERY	
GEOLOGICAL AGE		ROCK TYPE		CORRECTION		R.O.D. x (m)	
ELEVATION		ROCK TYPE		CORRECTION		WATER PRESSURE TEST	
61	191.50	Flow Breccia	C1	Strongly tuffaceous, including basalts.	5/20	57.25	From: 60.00 To: 65.00 Lugeon Value: 5.55 k Value: 0.000050
62	190.50		B	Doleritic, with scattered pores. Hard, fresh. White calcareous stains on joint planes. Joints at about 50cm intervals.	65.00	57.25	
63	190.10						
64	189.50						
65	189.00	Basalt	Cm	Moderately weathered, with reddish brown soil in open joints.	5/21	57.25	From: 65.00 To: 70.00 Lugeon Value: 5.64 k Value: 0.000050
66	188.50		Ch	Fresh to slightly weathered, hard, with joints sparsely orange coloured clay in 69.9 to 70.0m.			
67	188.00						
68	187.50						
69	187.00						
70	186.50						
71	186.00	Weathered Basalt	D-C1	Section 69.5m - 71.0m Decomposed into sandy fine fragments. 71.0m - 75.5m Highly weathered vesicular basalt, compact. Soft and friable in 73.3m - 74.1m.	72.50	57.25	From: 70.00 To: 75.00 Lugeon Value: 15.64 k Value: 0.000050
72	185.50						
73	185.00						
74	184.50						
75	184.00						
76	183.50						
77	183.00						
78	182.50						
79	182.00						
80	181.50						
81	181.00						
82	180.50						
83	180.00						
84	179.50						
85	179.00						
86	178.50						
87	178.00						
88	177.50						
89	177.00						
90	176.50						

NIPPON KOEI CO., LTD.,
CONSULTING ENGINEERS, TOKYO

DRILLING LOG OF JD-101 (3/5)

GOVERNMENT OF MAURITIUS
PORT LOUIS WATER SUPPLY PROJECT
JAPAN INTERNATIONAL COOPERATION AGENCY

R.O.D. is Rock Quality Designation. R.O.D. = (Total length of cylindrical cores longer than 10 cm / Total drill length) x 100%
 LUIGON VALUE is 1/min/m under injection water pressure of 10kg/cm²
 DEPTH and ELEVATION are in meter
 DIAMETER is in millimeter

DRILL LOG

SHEET NO. 4 OF 5

SITE		TPO DANSSITE		LONGITUDE		HOLE No.		ELEVATION	
LATITUDE		1991/05/14 - 1991/05/31		27° 0' N 180° 0' E		JD-101		252.50m	
DATE		1991/05/14 - 1991/05/31		DATE		CORE RECOVERY		DEPTH	
ANGLE		55°		HORIZON		CORE RECOVERY % (m)		DEPTH	
SCALE		1:100		DATE		CORE RECOVERY % (m)		DEPTH	
DEPTH		ELEVATION		DESCRIPTION		CORE RECOVERY % (m)		DEPTH	
SCALE		ELEVATION		DESCRIPTION		CORE RECOVERY % (m)		DEPTH	
91	91.00	151.50	B	Moderately hard, massive. White tuffaceous material containing basalt fragments of a few cm in size.	5/24	5/24	0	0	0
92	91.73	150.87	C1	Bluish dark grey, fresh, hard. Generally non vesicular. Calcereous stains on joints.	94.00	94.00	0	0	0
93	92.00	150.50	B	Massive and compact.	5/25	5/25	0	0	0
94	93.00	149.50	C1	Fresh, hard, coarse grained. Vesicular in places. Yellow brown hard clay in 111.15m to 111.20m. Generally hard, but cracky and fractured below 110m.	103.00	103.00	0	0	0
95	93.40	149.20	B	Massive and compact.	5/26	5/26	0	0	0
96	94.00	148.50	B	Massive and compact.	110.00	110.00	0	0	0
97	95.00	147.50	B	Massive and compact.	5/27	5/27	0	0	0
98	95.00	147.50	B	Massive and compact.	110.00	110.00	0	0	0
99	95.00	147.50	B	Massive and compact.	120.00	120.00	0	0	0
100	96.00	146.50	B	Massive and compact.	5/28	5/28	0	0	0
101	96.00	146.50	B	Massive and compact.	120.00	120.00	0	0	0
102	97.00	145.50	B	Massive and compact.	120.00	120.00	0	0	0
103	97.00	145.50	B	Massive and compact.	120.00	120.00	0	0	0
104	98.00	144.50	B	Massive and compact.	120.00	120.00	0	0	0
105	98.00	144.50	B	Massive and compact.	120.00	120.00	0	0	0
106	99.00	143.50	B	Massive and compact.	120.00	120.00	0	0	0
107	99.00	143.50	B	Massive and compact.	120.00	120.00	0	0	0
108	100.00	142.50	B	Massive and compact.	120.00	120.00	0	0	0
109	100.00	142.50	B	Massive and compact.	120.00	120.00	0	0	0
110	101.00	141.50	B	Massive and compact.	120.00	120.00	0	0	0
111	101.00	141.50	B	Massive and compact.	120.00	120.00	0	0	0
112	102.00	140.50	B	Massive and compact.	120.00	120.00	0	0	0
113	102.00	140.50	B	Massive and compact.	120.00	120.00	0	0	0
114	103.00	139.50	B	Massive and compact.	120.00	120.00	0	0	0
115	103.00	139.50	B	Massive and compact.	120.00	120.00	0	0	0
116	104.00	138.50	B	Massive and compact.	120.00	120.00	0	0	0
117	104.00	138.50	B	Massive and compact.	120.00	120.00	0	0	0
118	105.00	137.50	B	Massive and compact.	120.00	120.00	0	0	0
119	105.00	137.50	B	Massive and compact.	120.00	120.00	0	0	0
120	106.00	136.50	B	Massive and compact.	120.00	120.00	0	0	0

R.O.D. is Rock Quality Designation, R.O.D.=(total length of cylindrical cores longer than 10 cm/(total drill length) x 100
 x LUGON VALUE is l/min/m under injection water pressure of 10kg/cm2
 x DEPTH and ELEVATION are in meter
 x DIAMETER is in millimeter

NIPPON KOEI CO., LTD.,
 CONSULTING ENGINEERS, TOKYO

DRILLING LOG OF JD-101 (4/5)

GOVERNMENT OF MAURITIUS
 PORT LOUIS WATER SUPPLY PROJECT
 JAPAN INTERNATIONAL COOPERATION AGENCY

DRILL LOG

SHEET NO.5 OF 5

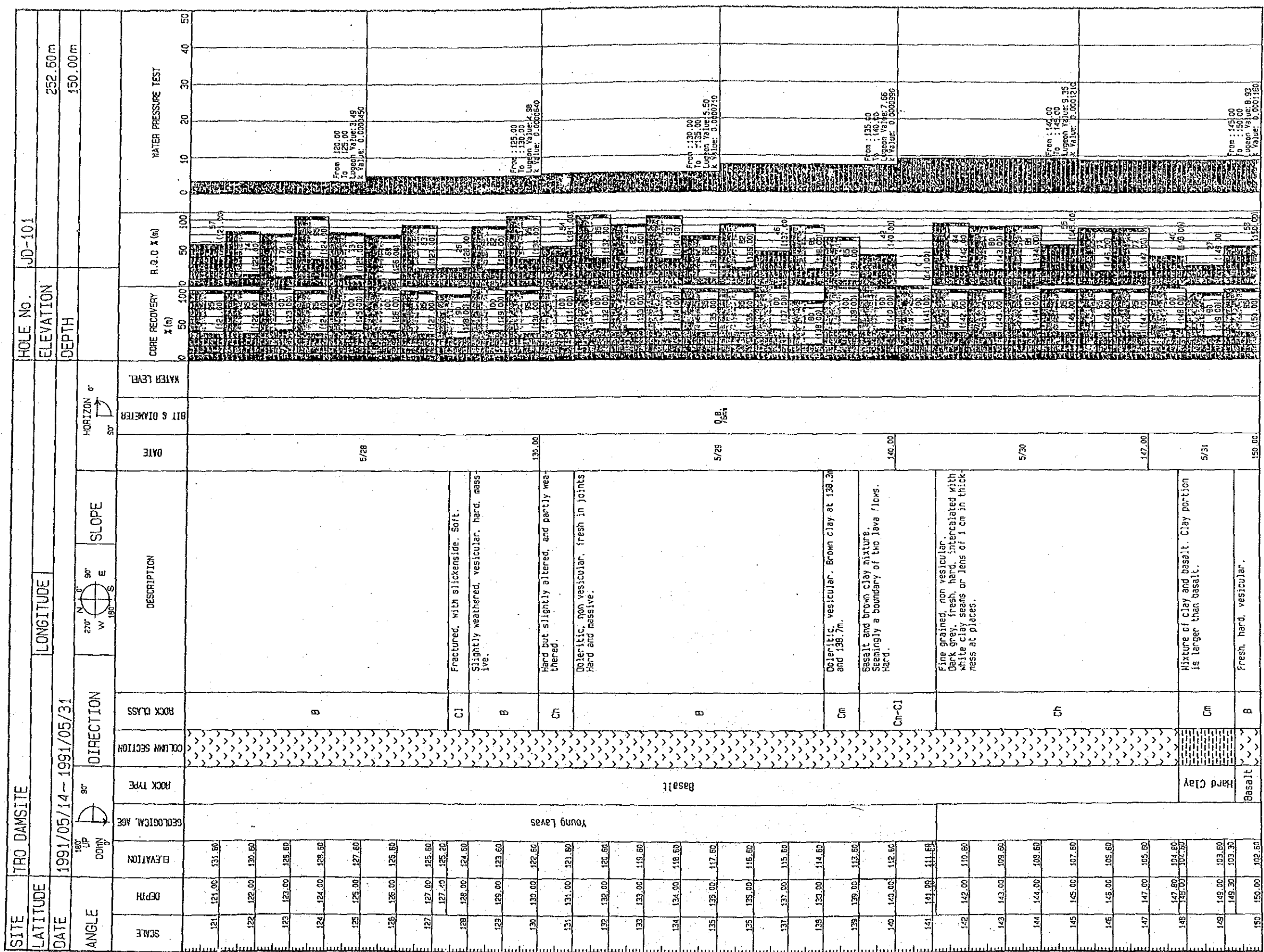
SITE		TPO DAMSITE		LONGITUDE		HOLE No.		JD-101			
LATITUDE		ELEVATION		DEPTH		CORE RECOVERY		R.O.D. % (m)		WATER PRESSURE TEST	
DATE		1991/05/14~1991/05/31		DATE		CORE RECOVERY % (m)		R.O.D. % (m)		WATER PRESSURE TEST	
SCALE	DEPTH	ELEVATION	GEOLOGICAL AGE	ROCK TYPE	COLUMN SECTION	ROCK CLASS	DESCRIPTION	DATE	BIT & DIAMETER	HORIZON & SLOPE	WATER LEVEL
	121	121.00	131.80			B		5/28			
	122	122.00	130.80			B					
	123	123.00	129.80			B					
	124	124.00	128.80			B					
	125	125.00	127.80			B					
	126	126.00	126.80			B					
	127	127.00	125.80			B					
	128	128.00	124.80			B					
	129	129.00	123.80			B					
	130	130.00	122.80			B					
	131	131.00	121.80			B					
	132	132.00	120.80			B					
	133	133.00	119.80			B					
	134	134.00	118.80			B					
	135	135.00	117.80			B					
	136	136.00	116.80			B					
	137	137.00	115.80			B					
	138	138.00	114.80			B					
	139	139.00	113.80			B					
	140	140.00	112.80			B					
	141	141.00	111.80			B					
	142	142.00	110.80			B					
	143	143.00	109.80			B					
	144	144.00	108.80			B					
	145	145.00	107.80			B					
	146	146.00	106.80			B					
	147	147.00	105.80			B					
	148	148.00	104.80			B					
	149	149.00	103.80			B					
	150	150.00	102.80			B					

NIPPON KOEI CO., LTD.,
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DRILLING LOG OF JD-101 (5/5)

GOVERNMENT OF MAURITIUS
PORT LOUIS WATER SUPPLY PROJECT
JAPAN INTERNATIONAL COOPERATION AGENCY

R.O.D is Rock Quality Designation. R.O.D = (Total length of cylindrical cores longer than 10 cm) / (Total drill length) x 100%
PLUGGON VALUE is l/min/m under injection water pressure of 10kg/cm2
DEPTH and ELEVATION are in meter
DIAMETER is in millimeter



DRILL LOG

SHEET NO. 1 OF 5

SITE		TPO DAMSITE		LONGITUDE		HOLE No.		ELEVATION	
LATITUDE		1991/05/14 ~ 1991/05/31		27° 0' 0" N 100° 0' 0" E		JD-102		252.60m	
DATE		1991/05/14 ~ 1991/05/31		DATE		CORE RECOVERY %		DEPTH	
ANGLE		180° DOWN		HORIZON 0°		0 50 100 0 50 100		0 10 20 30 40 50	
DEPTH	ELEVATION	GEOLOGICAL AGE	ROCK TYPE	ROCK CLASS	DESCRIPTION	DATE	BIT & DIAMETER	WATER LEVEL	WATER PRESSURE TEST
0.50	252.00	ALLUVIAL	Soil		Organic	5/14	76mm		
1.00	251.50		Residual Soil		Reddish brown, containing basalt blocks.				
2.00	250.50		Residual Basalt	D	Highly weathered, soft.				
3.00	249.50	YOUNG LAVA	Weathered Basalt	D	Coarse doleritic, vesicular. Partly highly weathered, but generally fresh and hard.	5/15	76mm		
4.00	248.50		Basalt	D	Highly weathered, soft, clayey.				
5.00	247.50		Clay	D	Reddish brown clayey soil.				
6.00	246.50		Weathered Basalt	C1	Highly weathered, soft, clayey. 16.3 - 16.8 18.5 - 20.05 Moderately weathered.				
7.00	245.50		Basalt	C1	Moderately weathered, with pores sparse. Moderately hard to hard.				
8.00	244.50		Basalt	C1-Cm	Bluish dark grey, slightly weathered, hard. Inclined joints at 10 to 30 cm intervals.				
9.00	243.50		Basalt	Ch	Highly weathered and friable to 31.5m. 31.5m - 33.5m Compact, with dominant lava component.				
10.00	242.50		Basalt	C1	Flow Breccia				
11.00	241.50		Basalt						
12.00	240.50		Basalt						
13.00	239.50	Basalt							
14.00	238.50	Basalt							
15.00	237.50	Basalt							
16.00	236.50	Basalt							
17.00	235.50	Basalt							
18.00	234.50	Basalt							
19.00	233.50	Basalt							
20.00	232.50	Basalt							
21.00	231.50	Basalt							
22.00	230.50	Basalt							
23.00	229.50	Basalt							
24.00	228.50	Basalt							
25.00	227.50	Basalt							
26.00	226.50	Basalt							
27.00	225.50	Basalt							
28.00	224.50	Basalt							
29.00	223.50	Basalt							
30.00	222.50	Basalt							

R.O.D is Rock Quality Designation. R.O.D=(Total length of cylindrical cores longer than 10 cm)/(total drill length) x 100%
 *LUBEON VALUE is l/min/m under injection water pressure of 10kg/cm²
 *DEPTH and ELEVATION are in meter
 *DIAMETER is in millimeter

NIPPON KOEI CO., LTD.,
 CONSULTING ENGINEERS, TOKYO

DRILL LOG

SHEET NO.2 OF 5

SITE		TRO DAMSITE		LONGITUDE		HOLE No.		ELEVATION		DEPTH				
LATITUDE		1991/05/14~1991/05/31		27° 0' 0" W 100° 0' 0" E		JD-102		252.50m		150.00m				
SCALE	DEPTH	ELEVATION	GEOLOGICAL AGE	ROCK TYPE	COLLUM SECTION	ROCK CLASS	DESCRIPTION	DATE	BIT & DIAMETER	HORIZON °	CORE RECOVERY	R.O.D. X (m)	WATER LEVEL	WATER PRESSURE TEST
31	31.00	221.50		Flow Breccia		C1	Fresh, hard, vesicular. Coarse grained.	5/17						
32	32.00	220.50		Basalt		Ch-B	Soft. Cores are fragmental.							
33	33.00	219.50												
34	34.00	219.50												
35	35.00	217.50												
36	36.00	215.50												
37	37.00	215.50												
38	38.00	213.50												
39	39.00	213.50												
40	40.00	212.50		Hard Clay			Dark brown, compact	38.00						
41	41.00	211.50												
42	42.00	210.50		Weathered Basalt		C1	Decomposed or highly weathered. Soft. Cores are fragmental in 42.0m - 42.7m. In other parts, cores are cylindrical but friable.							
43	43.00	209.50												
44	44.00	209.50												
45	45.00	207.50	YOUNG LAVA											
46	46.00	206.50												
47	47.00	205.50												
48	48.00	204.50		Basalt		B	Fresh. Hard. Joints at 0.5m intervals.							
49	49.00	203.50												
50	50.00	202.50												
51	51.00	201.50												
52	52.00	200.50												
53	53.00	199.50												
54	54.00	199.50												
55	55.00	197.50												
56	56.00	196.50												
57	57.00	195.50												
58	58.00	194.50												
59	59.00	194.10												
60	60.00	193.50												

NIPPON KOEI CO., LTD.,
CONSULTING ENGINEERS, TOKYO

R.O.D. is Rock Quality Designation, R.O.D.=(Total length of cylindrical cores longer than 10 cm)/(Total drill length) x 100%
X LOGED VALUE is 1/min/m under injection water pressure of 10kg/cm2
DEPTH and ELEVATION are in meter
DIAMETER is in millimeter

From : 55.00
To : 60.00
Logarithmic Value: 11.23
k Value: 0.000150

DRILLING LOG OF JD-102 (2/5)

GOVERNMENT OF MAURITIUS
PORT LOUIS WATER SUPPLY PROJECT
JAPAN INTERNATIONAL COOPERATION AGENCY

DRILL LOG

SHEET NO.3 OF 5

SITE		TPO DAMSITE		LONGITUDE		HOLE NO.		ELEVATION				
LATITUDE		191°05'14" - 1991/05/31		27°0' N 18°0' E		JD-102		252.60m				
DATE		1991/05/14 - 1991/05/31		27°0' W 18°0' S				150.00m				
SCALE	DEPTH	ELEVATION	GEOLOGICAL AGE	ROCK TYPE	DIRECTION	SLOPE	DATE	BIT & DIAMETER	HORIZON	CORE RECOVERY	R.O.D. x (m)	WATER PRESSURE TEST
61	61.00	191.60		Basalt	Cm	Moderately weathered, vesicular. Moderately hard, massive.	5/20	74.30	9.54	100.00		
	61.30	191.30		Basalt	C1-D	Highly weathered, friable rock. Soft silty material in 63.5m - 63.6m.	65.00			50.00		
62	62.00	190.60		Weathered Basalt	B	Fresh, hard. Generally non vesicular but partly with pores. Joints are often inclined at 60 degrees from horizontal and water-stained.				50.00		
63	63.00	189.60		Weathered Basalt	B	Friable. Cores are broken short or into fragments.	5/21			50.00		
64	64.00	188.60		Basalt	C1	Doleritic. Moderately weathered, moderately hard to soft.				50.00		
65	65.00	187.60		Basalt	Cm	Doleritic, fresh and hard. Joints at 10 to 30cm intervals, yellowish brown stained.				50.00		
66	66.00	186.60		Basalt	Ch	Top 76.3m - 77.0m highly weathered, soft. Alternation of highly weathered rock and moderately weathered rock. Cores are short and fragmentary. Deteriorated mainly on joints.	75.00			50.00		
67	67.00	185.60		Flow Breccia	C1-Cm	Fresh, hard. Joints at 20 to 50cm intervals.	5/22			50.00		
68	68.00	184.60		Basalt	B	Highly weathered, vesicular. Partly deteriorated into residual soil. (A boundary of two lava flows)				50.00		
69	69.00	183.60		Basalt	C1	Fresh, hard, coarse grained				50.00		
70	70.00	182.60		Weathered Basalt	Ch	86.5m - 88.2m Non-vesicular. White calcareous stains on joints at 20cm to 30cm intervals.	5/23			50.00		
71	71.00	181.60		Weathered Basalt	C1	Moderately to highly weathered. Soft and friable. Cores are fragmentary.				50.00		
72	72.00	180.60		Basalt	C1					50.00		
73	73.00	179.60								50.00		
74	74.00	178.60								50.00		
75	75.00	177.60								50.00		
76	76.00	176.60								50.00		
77	77.00	175.60								50.00		
78	78.00	174.60								50.00		
79	79.00	173.60								50.00		
80	80.00	172.60								50.00		
81	81.00	171.60								50.00		
82	82.00	170.60								50.00		
83	83.00	169.60								50.00		
84	84.00	168.60								50.00		
85	85.00	167.60								50.00		
86	86.00	166.60								50.00		
87	87.00	165.60								50.00		
88	88.00	164.60								50.00		
89	89.00	163.60								50.00		
90	90.00	162.60								50.00		

YOUNG LAVA

DRILLING LOG OF JD-102 (3/5)

GOVERNMENT OF MAURITIUS
PORT LOUIS WATER SUPPLY PROJECT
JAPAN INTERNATIONAL COOPERATION AGENCY

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 KLUGEON VALUE is 1/min/m under injection water pressure of 10kg/cm2.
 XDEPTH and ELEVATION are in meter
 XDIAMETER is in millimeter

NIPPON KOEI CO., LTD.,
 CONSULTING ENGINEERS, TOKYO

DRILL LOG

SHEET NO. 4 OF 5

SITE		TPO DAMSITE		LONGITUDE		HOLE No. JD-102		ELEVATION	
LATITUDE		DATE		DIRECTION		ROCK CLASS		DEPTH	
ANGLE		180° UP DOWN		90°		SLOPE		252.50m 150.00m	
SCALE		ELEVATION		ROCK TYPE		DESCRIPTION		CORE RECOVERY	
		90.00 - 152.50		Basalt		Moderately weathered, fine grained basalt vesicular, and cracky.		0 50 100.0 150.0	
		91 91.00 151.50		Cm-C1				50 100 150	
		92 92.00 150.50		C1				100 150 200	
		93 93.00 150.50		Ch				200 250 300	
		94 94.00 150.50		Cm				300 350 400	
		95 95.00 151.50		Cm				400 450 500	
		96 96.00 150.50		Cm				500 550 600	
		97 97.00 150.50		Cm				600 650 700	
		98 98.00 154.50		Cm				700 750 800	
		99 99.00 153.50		Cm				800 850 900	
		100 100.00 152.50		Cm				900 950 1000	
		101 101.00 151.50		Cm				1000 1050 1100	
		102 102.00 150.50		Cm				1100 1150 1200	
		103 103.00 149.50		Cm				1200 1250 1300	
		104 104.00 148.50		Cm				1300 1350 1400	
		105 105.00 147.50		Cm				1400 1450 1500	
		106 106.00 146.50		Cm				1500 1550 1600	
		107 107.00 145.50		Cm				1600 1650 1700	
		108 108.00 144.50		Cm				1700 1750 1800	
		109 109.00 143.50		Cm				1800 1850 1900	
		110 110.00 142.50		Cm				1900 1950 2000	
		111 111.00 141.50		Cm				2000 2050 2100	
		112 112.00 140.50		Cm				2100 2150 2200	
		113 113.00 139.50		Cm				2200 2250 2300	
		114 114.00 138.50		Cm				2300 2350 2400	
		115 115.00 137.50		Cm				2400 2450 2500	
		116 116.00 136.50		Cm				2500 2550 2600	
		117 117.00 135.50		Cm				2600 2650 2700	
		118 118.00 134.50		Cm				2700 2750 2800	
		119 119.00 133.50		Cm				2800 2850 2900	
		120 120.00 132.50		Cm				2900 2950 3000	



R.O.D is Rock Quality Designation, R.O.D = (Total length of cylindrical cores longer than 10 cm / Total drill length) x 100%
 K LUCEON VALUE is l/min/m under injection water pressure of 10kg/cm2
 X DEPTH and ELEVATION are in meter
 X DIAMETER is in millimeter

NIPPON KOEI CO., LTD.,
 CONSULTING ENGINEERS, TOKYO

DRILL LOG

SHEET NO.5 OF 5

SITE		TRO DAW SITE		LONGITUDE		HOLE No. JD-102		ELEVATION		DEPTH	
LATITUDE		1991/05/14 - 1991/05/31		27° N 180° W		90° E 90° S		252.50m		150.00m	
DATE		1991/05/14 - 1991/05/31		DIRECTION		SLOPE		CORE RECOVERY % (m)		WATER PRESSURE TEST	
ANGLE		180° UP DOWN		DIRECTION		SLOPE		CORE RECOVERY % (m)		WATER PRESSURE TEST	
SCALE		ELEVATION		ROCK TYPE		DESCRIPTION		CORE RECOVERY % (m)		WATER PRESSURE TEST	
DEPTH		ELEVATION		ROCK TYPE		DESCRIPTION		CORE RECOVERY % (m)		WATER PRESSURE TEST	
SCALE		ELEVATION		ROCK TYPE		DESCRIPTION		CORE RECOVERY % (m)		WATER PRESSURE TEST	
121	121.00	131.60		Basalt	Basalt						
122	122.00	130.60		Basalt	Basalt						
123	123.00	129.60		Basalt	Basalt						
124	124.00	128.60		Basalt	Basalt						
125	125.00	127.60		Basalt	Basalt						
126	126.00	126.60		Basalt	Basalt						
127	127.00	125.60		Basalt	Basalt						
128	128.00	124.60		Basalt	Basalt						
129	129.00	123.60		Basalt	Basalt						
130	130.00	122.60		Basalt	Basalt						
131	131.00	121.60		Basalt	Basalt						
132	132.00	120.60		Basalt	Basalt						
133	133.00	119.60		Basalt	Basalt						
134	134.00	118.60		Basalt	Basalt						
135	135.00	117.60		Basalt	Basalt						
136	136.00	116.60		Basalt	Basalt						
137	137.00	115.60		Basalt	Basalt						
138	138.00	114.60		Basalt	Basalt						
139	139.00	113.60		Basalt	Basalt						
140	140.00	112.60		Basalt	Basalt						
141	141.00	111.60		Basalt	Basalt						
142	142.00	110.60		Basalt	Basalt						
143	143.00	109.60		Basalt	Basalt						
144	144.00	108.60		Basalt	Basalt						
145	145.00	107.60		Basalt	Basalt						
146	146.00	106.60		Basalt	Basalt						
147	147.00	105.60		Basalt	Basalt						
148	148.00	104.60		Basalt	Basalt						
149	149.00	103.60		Basalt	Basalt						
150	150.00	102.60		Basalt	Basalt						

*R.Q.D is Rock Quality Designation. R.Q.D=(Total length of cylindrical cores longer than 10 cm)/(Total drill length) x 100%
 *LUBRICON VALUE is 1/min/m under injection water pressure of 10kg/cm2
 *DEPTH and ELEVATION are in meter
 *DIAMETER is in millimeter

NIPPON KOEI CO., LTD.,
 CONSULTING ENGINEERS, TOKYO

DRILLING LOG OF JD-102 (5/5)

GOVERNMENT OF MAURITIUS
 PORT LOUIS WATER SUPPLY PROJECT
 JAPAN INTERNATIONAL COOPERATION AGENCY