掛けの形で一時格納した。

Ⅲ－7　作業の記録

試錐作業時間の分析，試錐成績等は次に示すTable 7，8，9，10，11，Fig. 9の通りである。

Table 7. Drilling equipment

Item	Model	Quantity	Specification	
Drilling Machine	TD-1G (Tone Boring, Co.)	2 sets	Capacity: Dimensions: Height; Length; Width; Weight:	AW Rod 150 m 1,190 mm 1,250 mm 800 mm 390 kg
	Swivel Head		Spindle speed:	135, 270, 560 r.p.m.
	Hoist		Hoisting capacity,	Max. 850 kg
	Oil Pump		Capacity: Max. pressure:	0~26 ℓ/min. 70 kg/cm^2
	NS-110C (YANMER)	2	Diesel engine Revolution: Related power:	 2,200 r.p.m. 11 PS
Drilling Pump	NAS-2 (Tone)	2	Cylinder bore dia.: Delivery volume: Max. pressure: Stroke:	63 mm 62 ℓ/min. 70 kg/cm^2 160 r.p.m.
	NS-75C (YANMER)	2	Diesel engine Revolution: Related power:	 2,200 r.p.m. 7.5 PS
Derick	Tripod (KYOEI)	2	Steel pipe Max. load capacity:	 3,000 kg
Drill Rod		80 4	AW – 3 m AW – 1.5 m	
Casing Pipe		10 4 35 4 4	73 mm – 3 m 73 mm – 1.5 m 63 mm – 3 m 63 mm – 1.5 m 63 mm – 0.5 m	
Double Core Tube	DN-AW	4	DN 65 – 1.5 m	
Double Core Tube	DN-AW	5	DN 55 – 2 m	
Single Core Tube		2	74 mm – 0.3 m	
Single Core Tube		3	74 mm – 1.5 m	

Table 8. Consumables used

	Light oil	Gasoline	Mobil oil	Grease	Cement	Bentonite
	ℓ	ℓ	ℓ	kg	bag	bag
GSJ - 1	236	44	3	1.5	3	3
GSJ - 2	308	58	2	1	3	4
GSJ - 3	308	58	7	1	5	4
GSJ - 4	254	48	1.5	1.5	3	3
GSJ - 5	236	44	6	1.5	3	2
GSJ - 6	217	41	1.5	2.0	3	3
GSJ - 7	308	58	5	1.5	10	4
GSJ - 8	290	55	5	2	3	3
GSJ - 9	293	55	1	1.5	10	4
GSJ - 10	257	48	1.5	1.5	7	8
GSJ - 11	214	40	5	2	3	4
GSJ - 12	198	37	0.5	1.5	6	4
GSJ - 13	180	34	25	2	3	3
GSJ - 14	210	39	25	2	3	4
GSJ - 15	213	40	2	1.5	3	5
GSJ - 16	272	51	5	1	10	3
GSJ - 17	236	44	7	2.5	3	2
GSJ - 18	254	48	7	2.5	4	2
Total	4,484	842	110	30	85	65

Table 9-1 Operational results of drill hole, GSJ-1

		Period			Number of Days	Actual Working Days	Day off	Total Number of Workers
Working Period	Preparation	Oct. 22, '81 ~ Oct. 23, '81			2	2		21
	Drilling	Oct. 24, '81 ~ Oct. 30, '81			7	7		73.5
	Removing	Oct. 31, '81 ~ Oct. 31, '81			1	1		8
	Total	Oct. 22, '81 ~ Oct. 31, '81			10	10		102.5
Drilling Length	Planned Length	100.00 m			Core Recovery for each 100 m section			
	Increase in Length	0.20 m	Core Length	99.80 m	Depth m	Section %		Total %
	Length Drilled	100.20 m	Core Recovery	99.6%	0 ~ 100.20	99.6		99.6
Working Time	Drilling	78°00′	46.4 %	40 %	Drilling Efficiency			
	Accompanying Works	90°00′	53.5%	46.1%	100.20/10	Total Length / Drilling Period		10.02 m/Day
	Repairing		%	%	100.20/10	Total Length / Working Days		10.02 m/Day
	Total	168°00′	100%	86.1%	100.20/7	Total Length / Net Drilling Days		14.31 m/Day
	Removing Preparation	18°00′		9.2%	73.5/100.20	Net Drilling Workers / Total Length		0.73 men/m
	Removing Moving	9°00′		4.6%	Drilled Length by Bit Size			
	Others				Bit Size	75 mm	66 mm	56 mm
	Grand Total	195°00′		100%	Drilled Length	2.00 m	31.00 m	67.20 m
Inserted Casing Pipe	Pipe Size & Inserted Length	Inserted Length / Drilling Length		Recovery of Casing Pipe	Core Length	2.00 m	31.00 m	66.80 m
	73 mm : 2.00 m	1.99 %		100 %	Remarks			
	63 mm : 33.00 m	32.93 %		90%				

Table 9-2 Operational results of drill hole, GSJ-2

		Period			Number of Days	Actual Working Days	Day off	Total Number of Workers
Working Period	Preparation	Oct. 15, '81 ~ Oct. 15, '81			1	1		13
	Drilling	Oct. 16, '81 ~ Oct. 25, '81			10	10		100
	Removing	Oct. 26, '81 ~ Oct. 26, '81			1	1		8
	Total	Oct. 15, '81 ~ Oct. 26, '81			12	12		121
Drilling Length	Planned Length	100.00 m			Core Recovery for each 100 m section			
	Increase in Length	0.60 m	Core Length	92.50 m	Depth m	Section %		Total %
	Length Drilled	100.60 m	Core Recovery	91.9%	0 ~ 100.60	91.9		91.9
Working Time	Drilling	84°00′	40 %	21 %	Drilling Efficiency			
	Accompanying Works	108°00′	51.4%	47.3%	100.60/12	Total Length / Drilling Period		8.38 m/Day
	Repairing	18°00′	8.5%	7.8%	100.60/12	Total Length / Working Days		8.38 m/Day
	Total	210°00′	100%	92.1%	100.60/10	Total Length / Net Drilling Days		10.06 m/Day
	Removing Preparation	9°00′		3.9%	100/100.60	Net Drilling Workers / Total Length		0.99 men/m
	Removing Moving	9°00′		3.9%	Drilled Length by Bit Size			
	Others				Bit Size	75 mm	66 mm	56 mm
	Grand Total	228°00′		100%	Drilled Length	6.00 m	24.00 m	70.60 m
Inserted Casing Pipe	Pipe Size & Inserted Length	Inserted Length / Drilling Length		Recovery of Casing Pipe	Core Length	5.80 m	16.10 m	70.60 m
	73 mm : 6.00 m	5.96 %		100 %	Remarks			
	63 mm : 30.00 m	29.82 %		100%				

Table 9-3 Operational results of drill hole, GSJ-3

		Period			Number of Days	Actual Working Days	Day off	Total Number of Workers
Working Period	Preparation	Oct. 4, '81 ~ Oct. 5, '81			2	2		21
	Drilling	Oct. 6, '81 ~ Oct. 13, '81			8	8		84
	Removing	Oct. 14, '81 ~ Oct. 14, '81			1	1		8
	Total	Oct. 4, '81 ~ Oct. 14, '81			11	11		113
Drilling Length	Planned Length	100.00 m			Core Recovery for each 100 m section			
	Increase in Length	0.50 m	Core Length	89.55 m	Depth m	Section %		Total %
	Length Drilled	100.50 m	Core Recovery	89.1 %	0 ~ 100.50	89.1		89.1
Working Time	Drilling	76°00′	39.5 %	34.7 %	Drilling Efficiency			
	Accompanying Works	116°00′	60.4 %	52.9 %	100.50/11	Total Length / Drilling Period		9.14 m/Day
	Repairing		%	%	100.50/11	Total Length / Working Days		9.14 m/Day
	Total	192°00′	100 %	87.6 %	100.50/8	Total Length / Net Drilling Days		12.56 m/Day
	Removing: Preparation	18°00′		8.2 %	84/100.50	Net Drilling Workers / Total Length		0.84 men/m
	Removing: Moving	9°00′		4.1 %	Drilled Length by Bit Size			
	Others				Bit Size	75 mm	66 mm	56 mm
	Grand Total	219°00′		100 %	Drilled Length	7.50 m	32.50 m	60.50 m
Inserted Casing Pipe	Pipe Size & Inserted Length	Inserted Length / Drilling Length		Recovery of Casing Pipe	Core Length	2.50 m	31.40 m	55.65 m
	73 mm : 7.50 m	7.46 %		60 %	Remarks			
	63 mm : 40.00 m	39.8 %		100 %				

Table 9-4 Operational results of drill hole, GSJ-4

		Period			Number of Days	Actual Working Days	Day off	Total Number of Workers
Working Period	Preparation	Sep. 30, '81 ~ Oct. 1, '81			2	2		16
	Drilling	Oct. 2, '81 ~ Oct. 9, '81			8	8		84
	Removing	Oct. 10, '81 ~ Oct. 10, '81			1	1		8
	Total	Sep. 30, '81 ~ Oct. 10, '81			11	11		108
Drilling Length	Planned Length	100.00 m			Core Recovery for each 100 m section			
	Increase in Length	0.20 m	Core Length	97.65 m	Depth m	Section %		Total %
	Length Drilled	100.20 m	Core Recovery	97.4 %	0 ~ 100.20	97.4		97.4
Working Time	Drilling	106°00′	55.2 %	46.2 %	Drilling Efficiency			
	Accompanying Works	86°00′	44.7 %	37.5 %	100.20/11	Total Length / Drilling Period		9.11 m/Day
	Repairing		%	%	100.20/11	Total Length / Working Days		9.11 m/Day
	Total	192°00′	100 %	83.8 %	100.20/8	Total Length / Net Drilling Days		12.55 m/Day
	Removing Preparation	18°00′		7.8 %	84/100.20	Net Drilling Workers / Total Length		0.84 men/m
	Removing Moving	9°00′		3.9	Drilled Length by Bit Size			
	Others				Bit Size	75 mm	66 mm	56 mm
	Grand Total	229		100 %	Drilled Length	2.20 m	37.40 m	60.60 m
Inserted Casing Pipe	Pipe Size & Inserted Length	Inserted Length / Drilling Length		Recovery of Casing Pipe	Core Length	2.00 m	35.05 m	60.60 m
	73 mm : 2.50 m	2.49 %		100 %	Remarks			
	63 mm : 40.00 m	39.92 %		92 %				

Table 9-5 Operational results of drill hole, GSJ-5

		Period			Number of Days	Actual Working Days	Day off	Total Number of Workers
Working Period	Preparation	Oct. 11, '81 ~ Oct. 12, '81			2	2		21
	Drilling	Oct. 13, '81 ~ Oct. 20, '81			8	8		81.5
	Removing	Oct. 21, '81 ~ Oct. 21, '81			1	1		8
	Total	Oct. 11, '81 ~ Oct. 21, '81			11	11		110.5
Drilling Length	Planned Length	100.00 m			Core Recovery for each 100 m section			
	Increase in Length	0.40 m	Core Length	95.15 m	Depth m	Section %		Total %
	Length Drilled	100.40 m	Core Recovery	94.7 %	0 ~ 100.40	94.7		94.7
Working Time	Drilling	95°00′	53.9 %	46.7 %	Drilling Efficiency			
	Accompanying Works	81°00′	46.0 %	39.9 %	100.40/11	Total Length / Drilling Period		9.13 m/Day
	Repairing		%	%	100.40/11	Total Length / Working Days		9.13 m/Day
	Total	176°00′	100 %	86.6 %	100.40/8	Total Length / Net Drilling Days		12.55 m/Day
	Removing: Preparation	18°00′		8.8 %	81.5/100.40	Net Drilling Workers / Total Length		0.81 men/m
	Removing: Moving	9°00′		4.4 %	Drilled Length by Bit Size			
	Others				Bit Size	75 mm	66 mm	56 mm
	Grand Total	203°00′		100 %	Drilled Length	2.30 m	25.20 m	72.90 m
Inserted Casing Pipe	Pipe Size & Inserted Length	Inserted Length / Drilling Length		Recovery of Casing Pipe	Core Length	2.00 m	20.60 m	72.55 m
	73 mm : 2.30 m	2.29 %		100 %	Remarks			
	63 mm : 27.50 m	27.39 %		100 %				

Table 9-6 Operational results of drill hole, GSJ-6

		Period			Number of Days	Actual Working Days	Day off	Total Number of Workers
Working Period	Preparation	Sep. 25, '81 ~ Sep. 26, '81			2	2		16
	Drilling	Sep. 27, '81 ~ Oct. 2, '81			6	6		63
	Removing	Oct. 3, '81 ~ Oct. 3, '81			1	1		8
	Total	Sep. 25, '81 ~ Oct. 3, '81			9	9		87
Drilling Length	Planned Length	100.00 m			Core Recovery for each 100 m section			
	Increase in Length	1.50 m	Core Length	98.50 m	Depth m	Section %		Total %
	Length Drilled	101.50 m	Core Recovery	97.0 %	0 ~ 101.50	97		97
Working Time	Drilling	66°00′	45.8 %	38.5 %	Drilling Efficiency			
	Accompanying Works	78°00′	54.1 %	45.6 %	101.50/9	Total Length / Drilling Period		11.28 m/Day
	Repairing		%	%	101.50/9	Total Length / Working Days		11.28 m/Day
	Total	144°00′	100 %	84.2 %	101.00/6	Total Length / Net Drilling Days		16.92 m/Day
	Removing Preparation	18°00′		10.5 %	63/101.50	Net Drilling Workers / Total Length		0.62 men/m
	Removing Moving	9°00′		5.2 %	Drilled Length by Bit Size			
	Others				Bit Size	75 mm	66 mm	56 mm
	Grand Total	171°00′		100 %	Drilled Length	3.00 m	27.00 m	71.50 m
Inserted Casing Pipe	Pipe Size & Inserted Length	Inserted Length / Drilling Length		Recovery of Casing Pipe	Core Length	1.50 m	25.70 m	71.30 m
	73 mm : 3.00 m	2.95 %		100 %	Remarks			
	63 mm : 30.00 m	29.55 %		100 %				

Table 9-7 Operational results of drill hole, GSJ-7

		Period			Number of Days	Actual Working Days	Day off	Total Number of Workers
Working Period	Preparation	Sep. 17, '81 ~ Sep. 18, '81			2	2		16
	Drilling	Sep. 19, '81 ~ Sep. 28, '81			10	10		100
	Removing	Sep. 29, '81 ~ Sep. 29, '81			1	1		8
	Total	Sep. 17, '81 ~ Sep. 29, '81			13	13		124
Drilling Length	Planned Length	100.00 m			Core Recovery for each 100 m section			
	Increase in Length	0.20 m	Core Length	91.75 m	Depth m	Section %		Total %
	Length Drilled	100.20 m	Core Recovery	91.5 %	0 ~ 100.20	91.5		91.5
Working Time	Drilling	83°00′	42.3 %	37.2 %	Drilling Efficiency			
	Accompanying Works	104°00′	53.0 %	46.6 %	100.20/13 $\frac{\text{Total Length}}{\text{Drilling Period}}$			7.71 m/Day
	Repairing	9°00′	4.5 %	4.0 %	100.20/13 $\frac{\text{Total Length}}{\text{Working Days}}$			7.71 m/Day
	Total	196°00′	100 %	87.8 %	100.20/10 $\frac{\text{Total Length}}{\text{Net Drilling Days}}$			10.02 m/Day
	Removing Preparation	18°00′		8.0 %	100/100.20 $\frac{\text{Net Drilling Workers}}{\text{Total Length}}$			1.00 men/m
	Removing Moving	9°00′		4.0 %	Drilled Length by Bit Size			
	Others				Bit Size	75 mm	66 mm	56 mm
	Grand Total	223°00′		100 %	Drilled Length	7.00 m	39.65 m	53.55 m
Inserted Casing Pipe	Pipe Size & Inserted Length	$\frac{\text{Inserted Length}}{\text{Drilling Length}}$		Recovery of Casing Pipe	Core Length	6.50 m	34.30 m	50.95 m
	73 mm : 7.00 m	6.98 %		100 %	Remarks			
	63 mm : 46.80 m	46.7 %		85 %				

Table 9-8 Operational results of drill hole, GSJ-8

		Period			Number of Days	Actual Working Days	Day off	Total Number of Workers
Working Period	Preparation	Sep. 14, '81 ~ Sep. 15, '81			2	2		21
	Drilling	Sep. 16, '81 ~ Sep. 23, '81			8	8		84
	Removing	Sep. 24, '81 ~ Sep. 24, '81			1	1		8
	Total	Sep. 14, '81 ~ Sep. 24, '81			11	11		113
Drilling Length	Planned Length	100.00 m			Core Recovery for each 100 m section			
	Increase in Length	0.30 m	Core Length	92.55 m	Depth m	Section %		Total %
	Length Drilled	100.30 m	Core Recovery	92.2 %	0 ~ 100.30	92.2		92.2
Working Time	Drilling	90°00′	46.8 %	41.0 %	Drilling Efficiency			
	Accompanying Works	102°00′	53.1 %	46.5 %	100.30/11	Total Length / Drilling Period		9.12 m/Day
	Repairing		%	%	100.30/11	Total Length / Working Days		9.12 m/Day
	Total	192°00′	100 %	83.6 %	100.30/8	Total Length / Net Drilling Days		12.54 m/Day
	Removing Preparation	18°00′		8.2 %	84/100.30	Net Drilling Workers / Total Length		0.84 men/m
	Removing Moving	9°00′		4.1 %	Drilled Length by Bit Size			
	Others				Bit Size	75 mm	66 mm	56 mm
	Grand Total	219°00′		100%	Drilled Length	2.00 m	38.00 m	60.30 m
Inserted Casing Pipe	Pipe Size & Inserted Length	Inserted Length / Drilling Length		Recovery of Casing Pipe	Core Length	2.00 m	34.20 m	56.35 m
	73 mm : 2.00 m	1.99 %		100 %	Remarks			
	63 mm : 40.00 m	39.88 %		85 %				

Table 9-9 Operational results of drill hole, GSJ-9

		Period			Number of Days	Actual Working Days	Day off	Total Number of Workers
Working Period	Preparation	Sep. 6, '81 ~ Sep. 7, '81			2	2		16
	Drilling	Sep. 8, '81 ~ Sep. 15, '81			8	8		83.5
	Removing	Sep. 16, '81 ~ Sep. 16, '81			1	1		8
	Total	Sep. 6, '81 ~ Sep. 16, '81			11	11		107.5
Drilling Length	Planned Length	100.00 m			Core Recovery for each 100 m section			
	Increase in Length	0.20 m	Core Length	94.20 m	Depth m	Section %		Total %
	Length Drilled	100.20 m	Core Recovery	94.0 %	0 ~ 100.20	94.0		94.0
Working Time	Drilling	67°30′	35.1 %	30.8 %	Drilling Efficiency			
	Accompanying Works	124°30′	64.8 %	56.8 %	100.20/11	Total Length / Drilling Period		9.11 m/Day
	Repairing		%	%	100.20/11	Total Length / Working Days		9.11 m/Day
	Total	192°00′	100 %	87.6 %	100.20/8	Total Length / Net Drilling Days		12.53 m/Day
	Removing: Preparation	18°00′		8.2 %	83.5/100.20	Net Drilling Workers / Total Length		0.83 men/m
	Removing: Moving	9°00′		4.1 %	Drilled Length by Bit Size			
	Others				Bit Size	75 mm	66 mm	56 mm
	Grand Total	219°00′		100 %	Drilled Length	6.00 m	35.85 m	58.35 m
Inserted Casing Pipe	Pipe Size & Inserted Length	Inserted Length / Drilling Length		Recovery of Casing Pipe	Core Length	1.70 m	34.25 m	58.25 m
	73 mm : 6.00 m	5.98 %		100 %	Remarks			
	63 mm : 36.00 m	35.92 %		83 %				

Table 9-10 Operational results of drill hole, GSJ-10

		Period			Number of Days	Actual Working Days	Day off	Total Number of Workers
Working Period	Preparation	Sep. 4, '81 ~ Sep. 5, '81			2	2		20
	Drilling	Sep. 6, '81 ~ Sep. 12, '81			7	7		73.5
	Removing	Sep. 13, '81 ~ Sep. 13, '81			1	1		8
	Total	Sep. 4, '81 ~ Sep. 13, '81			10	10		101.5
Drilling Length	Planned Length	100.00 m			Core Recovery for each 100 m section			
	Increase in Length	1.00 m	Core Length	84.30 m	Depth m	Section %		Total %
	Length Drilled	101.00 m	Core Recovery	83.4 %	0 ~ 101.00	83.4		83.4
Working Time	Drilling	71°00′	42.2%	36.4 %	Drilling Efficiency			
	Accompanying Works	97°00′	57.7 %	57.7 %	101.00/10	Total Length / Drilling Period		10.10 m/Day
	Repairing		%	%	101.00/10	Total Length / Working Days		10.10 m/Day
	Total	168°00′	100 %	86.1 %	101.00/7	Total Length / Net Drilling Days		14.43 m/Day
	Removing Preparation	18°00′		9.2 %	73.5/101.00	Net Drilling Workers / Total Length		0.73 men/m
	Removing Moving	9°00′		4.6 %	Drilled Length by Bit Size			
	Others				Bit Size	75 mm	66 mm	56 mm
	Grand Total	195°00′		100 %	Drilled Length	13.50 m	32.50 m	55.00 m
Inserted Casing Pipe	Pipe Size & Inserted Length	Inserted Length / Drilling Length		Recovery of Casing Pipe	Core Length	5.40 m	28.15 m	50.75 m
	73 mm : 13.50 m	13.37 %		77 %	Remarks			
	63 mm : 46.00 m	45.54 %		87 %				

Table 9-11 Operational results of drill hole, GSJ-11

		Period			Number of Days	Actual Working Days	Day off	Total Number of Workers
Working Period	Preparation	Aug. 27, '81 ~ Aug. 27, '81			1	1		8
	Drilling	Aug. 28, '81 ~ Sep. 2, '81			6	6		63
	Removing	Sep. 3, '81 ~ Sep. 3, '81			1	1		8
	Total	Aug. 27, '81 ~ Sep. 3, '81			8	8		79
Drilling Length	Planned Length	100.00 m			Core Recovery for each 100 m section			
	Increase in Length	0.05 m	Core Length	76.90 m	Depth m	Section %		Total %
	Length Drilled	100.05 m	Core Recovery	76.8 %	0 ~ 100.05	76.8		76.8
Working Time	Drilling	61°00′	42.3 %	37.6 %	Drilling Efficiency			
	Accompanying Works	83°00′	57.6 %	51.2 %	100.05/8	Total Length / Drilling Period		12.51 m/Day
	Repairing		%	%	100.05/8	Total Length / Working Days		12.51 m/Day
	Total	144°00′	100 %	88.8 %	100.05/6	Total Length / Net Drilling Days		16.75 m/Day
	Removing: Preparation	9°00′		5.5 %	63/100.05	Net Drilling Workers / Total Length		0.63 men/m
	Removing: Moving	9°00′		5.5 %	Drilled Length by Bit Size			
	Others				Bit Size	75 mm	66 mm	56 mm
	Grand Total	162°00′		100 %	Drilled Length	9.00 m	21.00 m	70.05 m
Inserted Casing Pipe	Pipe Size & Inserted Length	Inserted Length / Drilling Length		Recovery of Casing Pipe	Core Length	2.00 m	11.95 m	62.95 m
	73 mm : 9.00 m	8.99 %		66 %	Remarks			
	63 mm : 30.00 m	29.98 %		100 %				

Table 9-12 Operational results of drill hole, GSJ-12

		Period			Number of Days	Actual Working Days	Day off	Total Number of Workers
Working Period	Preparation	Aug. 19, '81 ~ Aug. 20, '81			2	2		16
	Drilling	Aug. 21, '81 ~ Aug. 25, '81			5	5		47.5
	Removing	Aug. 26, '81 ~ Aug. 26, '81			1	1		13
	Total	Aug. 19, '81 ~ Aug. 26, '81			8	8		76.5
Drilling Length	Planned Length	100.00 m			Core Recovery for each 100 m section			
	Increase in Length	0.10 m	Core Length	89.35 m	Depth m	Section %		Total %
	Length Drilled	100.10 m	Core Recovery	89.2 %	0 ~ 100.10	89.2		89.2
Working Time	Drilling	55°00′	45.8 %	37.4 %	Drilling Efficiency			
	Accompanying Works	65°00′	54.1 %	44.2 %	100.10/8	Total Length / Drilling Period		12.51 m/Day
	Repairing		%	%	100.10/8	Total Length / Working Days		12.51 m/Day
	Total	120°00′	100 %	81.6 %	100.10/5	Total Length / Net Drilling Days		20.02 m/Day
	Removing: Preparation	18°00′		12.2 %	47.5/100.10	Net Drilling Workers / Total Length		0.47 men/m
	Removing: Moving	9°00′		6.1 %	Drilled Length by Bit Size			
	Others				Bit Size	75 mm	66 mm	56 mm
	Grand Total	147°00′		100 %	Drilled Length	9.00 m	18.00 m	73.10 m
Inserted Casing Pipe	Pipe Size & Inserted Length	Inserted Length / Drilling Length		Recovery of Casing Pipe	Core Length	3.80 m	14.05 m	71.50 m
	73 mm : 9.00 m	8.99 %		100 %	Remarks			
	63 mm : 27.00 m	26.98 %		100 %				

Table 9-13 Operational results of drill hole, GSJ-13

		Period			Number of Days	Actual Working Days	Day off	Total Number of Workers
Working Period	Preparation	Aug. 5, '81 ~ Aug. 7, '81			3	3		24
	Drilling	Aug. 8, '81 ~ Aug. 15, '81			8	8		81.5
	Removing	Aug. 16, '81 ~ Aug. 16, '81			1	1		8
	Total	Aug. 5, '81 ~ Aug. 16, '81			12	12		113.5

Drilling Length	Planned Length	100.00 m			Core Recovery for each 100 m section		
	Increase in Length	0.30 m	Core Length	95.65 m	Depth m	Section %	Total %
	Length Drilled	100.30 m	Core Recovery	95.3 %	0 ~ 100.30	95.3	95.3

Working Time	Drilling	75°00′	40.3 %	33.7 %	Drilling Efficiency		
	Accompanying Works	111°00′	59.6 %	50.0 %	100.30/12	Total Length / Drilling Period	8.36 m/Day
	Repairing		%	%	100.30/12	Total Length / Working Days	8.36 m/Day
	Total	186°00′	100 %	83.7 %	100.30/8	Total Length / Net Drilling Days	12.54 m/Day
	Removing: Preparation	27°00′		12.1 %	81.5/100.30	Net Drilling Workers / Total Length	0.81 men/m
	Removing: Moving	9°00′		4.0 %	*Drilled Length by Bit Size*		
	Others				Bit Size	75 mm	66 mm	56 mm
	Grand Total	222°00′		100 %	Drilled Length	5.20 m	38.80 m	56.30 m

Inserted Casing Pipe	Pipe Size & Inserted Length	Inserted Length / Drilling Length		Recovery of Casing Pipe	Core Length	2.20 m	37.15 m	56.30 m
	73 mm : 5.50 m	5.48 %		100 %	Remarks			
	63 mm : 44.00 m	43.87 %		100 %				

Table 9-14 Operational results of drill hole, GSJ-14

		Period			Number of Days	Actual Working Days	Day off	Total Number of Workers
Working Period	Preparation	Aug. 5, '81 ~ Aug. 7, '81			3	3		18
	Drilling	Aug. 8, '81 ~ Aug. 17, '81			10	10		73
	Removing	Aug. 18, '81 ~ Aug. 18, '81			1	1		8
	Total	Aug. 5, '81 ~ Aug. 18, '81			14	14		99
Drilling Length	Planned Length	100.00 m			Core Recovery for each 100 m section			
	Increase in Length	0 m	Core Length	88.25 m	Depth m	Section %		Total %
	Length Drilled	100.00 m	Core Recovery	88.2 %	0 ~ 100.00	88.2		88.2
Working Time	Drilling	77°00′	52.0 %	42.7 %	Drilling Efficiency			
	Accompanying Works	71°00′	47.9 %	39.4 %	100.00/14	Total Length / Drilling Period		7.14 m/Day
	Repairing		%	%	100.00/14	Total Length / Working Days		7.14 m/Day
	Total	148°00′	100 %	82.2 %	100.00/10	Total Length / Net Drilling Days		10.00 m/Day
	Removing Preparation	24°00′		13.3 %	73/100.00	Net Drilling Workers / Total Length		0.73 men/m
	Removing Moving	8°00′		4.4 %	Drilled Length by Bit Size			
	Others				Bit Size	75 mm	66 mm	56 mm
	Grand Total	180°00′		100 %	Drilled Length	3.50 m	26.50 m	70.00 m
Inserted Casing Pipe	Pipe Size & Inserted Length	Inserted Length / Drilling Length		Recovery of Casing Pipe	Core Length	1.00 m	19.35 m	67.90 m
	73 mm : 3.50 m	3.50 %		100 %	Remarks			
	63 mm : 30.00 m	30.00 %		100 %				

Table 9-15 Operational results of drill hole, GSJ-15

		Period			Number of Days	Actual Working Days	Day off	Total Number of Workers
Working Period	Preparation	Aug. 17, '81 ~ Aug. 18, '81			2	2		16
	Drilling	Aug. 19, '81 ~ Aug. 24, '81			6	6		63
	Removing	Aug. 25, '81 ~ Aug. 25, '81			1	1		8
	Total	Aug. 17, '81 ~ Aug. 25, '81			9	9		87
Drilling Length	Planned Length	100.00 m			Core Recovery for each 100 m section			
	Increase in Length	0.20 m	Core Length	92.05 m	Depth m	Section %		Total %
	Length Drilled	100.20 m	Core Recovery	91.8 %	0 ~ 100.20	91.8		91.8
Working Time	Drilling	66°00′	45.8 %	38.5 %	Drilling Efficiency			
	Accompanying Works	78°00′	54.1 %	45.6 %	100.20/9	Total Length / Drilling Period		11.13 m/Day
	Repairing		%	%	100.20/9	Total Length / Working Days		11.13 m/Day
	Total	144°00′	100 %	84.2 %	100.20/6	Total Length / Net Drilling Days		16.70 m/Day
	Removing: Preparation	18°00′		10.5 %	63/100.20	Net Drilling Workers / Total Length		0.63 men/m
	Removing: Moving	9°00′		5.2 %	Drilled Length by Bit Size			
	Others				Bit Size	75 mm	66 mm	56 mm
	Grand Total	171°00′		100 %	Drilled Length	5.00 m	40.16 m	55.04 m
Inserted Casing Pipe	Pipe Size & Inserted Length	Inserted Length / Drilling Length		Recovery of Casing Pipe	Core Length	0.70 m	36.31 m	55.04 m
	73 mm : 5.00 m	4.99 %		100 %	Remarks			
	63 mm : 45.50 m	45.40 %		100 %				

Table 9-16 Operational results of drill hole, GSJ-16

		Period			Number of Days	Actual Working Days	Day off	Total Number of Workers
Working Period	Preparation	Aug. 26, '81 ~ Aug. 27, '81			2	2		16
	Drilling	Aug. 28, '81 ~ Sep. 4, '81			8	8		84
	Removing	Sep. 5, '81 ~ Sep. 5, '81			1	1		8
	Total	Aug. 26, '81 ~ Sep. 5, '81			11	11		108
Drilling Length	Planned Length	100.00 m			Core Recovery for each 100 m section			
	Increase in Length	0.20 m	Core Length	98.55 m	Depth m	Section %		Total %
	Length Drilled	100.20 m	Core Recovery	98.3 %	0 ~ 100.20	98.3		98.3
Working Time	Drilling	75°00′	39.0 %	34.2 %	Drilling Efficiency			
	Accompanying Works	117°00′	60.9 %	53.4 %	100.20/11	Total Length / Drilling Period		9.11 m/Day
	Repairing		%	%	100.20/11	Total Length / Working Days		9.11 m/Day
	Total	192°00′	100 %	87.6 %	100.20/8	Total Length / Net Drilling Days		12.55 m/Day
	Removing Preparation	18°00′		8.2 %	84/100.20	Net Drilling Workers / Total Length		0.84 men/m
	Removing Moving	9°00′		4.1 %	Drilled Length by Bit Size			
	Others				Bit Size	75 mm	66 mm	56 mm
	Grand Total	219°00′		100 %	Drilled Length	8.40 m	34.00 m	57.80 m
Inserted Casing Pipe	Pipe Size & Inserted Length	Inserted Length / Drilling Length		Recovery of Casing Pipe	Core Length	6.90 m	34.00 m	57.65 m
	73 mm : 8.50 m	8.48 %		64 %	Remarks			
	63 mm : 42.50 m	42.41 %		100 %				

Table 9-17 Operational results of drill hole, GSJ-17

		Period			Number of Days	Actual Working Days	Day off	Total Number of Workers
Working Period	Preparation	Oct. 27, '81 ~ Oct. 28, '81			2	2		21
	Drilling	Oct. 29, '81 ~ Nov. 3, '81			6	6		63
	Removing	Nov. 4, '81 ~ Nov. 4, '81			1	1		8
	Total	Oct. 27, '81 ~ Nov. 4, '81			9	9		92
Drilling Length	Planned Length	100.00 m			Core Recovery for each 100 m section			
	Increase in Length	0.80 m	Core Length	97.55 m	Depth m	Section %		Total %
	Length Drilled	100.80 m	Core Recovery	96.7 %	0 ~ 100.80	96.7		96.7
Working Time	Drilling	85°00′	59.0 %	49.7 %	Drilling Efficiency			
	Accompanying Works	59°00′	40.9 %	34.5 %	100.80/9	Total Length / Drilling Period		11.20 m/Day
	Repairing		%	%	100.80/9	Total Length / Working Days		11.20 m/Day
	Total	144°00′	100 %	84.2 %	100.80/6	Total Length / Net Drilling Days		16.8 m/Day
	Removing Preparation	18°00′		10.5 %	63/100.80	Net Drilling Workers / Total Length		0.63 men/m
	Removing Moving	9°00′		5.2 %	Drilled Length by Bit Size			
	Others				Bit Size	75 mm	66 mm	56 mm
	Grand Total	171		100 %	Drilled Length	5.50 m	26.50 m	68.80 m
Inserted Casing Pipe	Pipe Size & Inserted Length	Inserted Length / Drilling Length		Recovery of Casing Pipe	Core Length	5.50 m	23.25 m	68.80 m
	73 mm : 5.50 m	5.45 %		100 %	Remarks			
	63 mm : 32.00 m	31.74 %		100 %				

Table 9-18 Operational results of drill hole, GSJ-18

		Period			Number of Days	Actual Working Days	Day off	Total Number of Workers
Working Period	Preparation	Nov. 1, '81 ~ Nov. 1, '81			1	1		8
	Drilling	Nov. 2, '81 ~ Nov. 9, '81			8	8		84
	Removing	Nov. 10, '81 ~ Nov. 10, '81			1	1		16
	Total	Nov. 1, '81 ~ Nov. 10, '81			10	10		108
Drilling Length	Planned Length	100.00 m			Core Recovery for each 100 m section			
	Increase in Length	0.20 m	Core Length	86.70 m	Depth m	Section %		Total %
	Length Drilled	100.20 m	Core Recovery	86.5 %	0 ~ 100.20	86.5		86.5
Working Time	Drilling	69°00′	35.9 %	32.8 %	Drilling Efficiency			
	Accompanying Works	123°00′	64.0 %	58.5 %	100.20/10	Total Length / Drilling Period		10.02 m/Day
	Repairing		%	%	100.20/10	Total Length / Working Days		10.02 m/Day
	Total	192°00′	100 %	91.4 %	100.20/8	Total Length / Net Drilling Days		12.55 m/Day
	Removing Preparation	9°00′		4.2 %	84/100.20	Net Drilling Workers / Total Length		0.84 men/m
	Removing Moving	9°00′		4.2 %	Drilled Length by Bit Size			
	Others				Bit Size	75 mm	66 mm	56 mm
	Grand Total	210°00′		100 %	Drilled Length	2.00 m	29.00 m	69.20 m
Inserted Casing Pipe	Pipe Size & Inserted Length	Inserted Length / Drilling Length		Recovery of Casing Pipe	Core Length	1.80 m	20.45 m	64.45 m
	73 mm : 2.00 m	1.99 %		100 %	Remarks			
	63 mm : 31.00 m	30.93 %		70 %				

Table 10. Summary operational data of each drill hole

Drill hole No.	Drilling Period	Drilling Length	Core		No. of Drilling Shift			Drilling Speed		Remarks
			Length	Recovery	Drilling	Others	Total	*m/shift	**m/shift	
		m	m	%						
GSJ-1	Oct. 22, '81 ~ Oct. 31, '81	100.20	99.80	99.6	14	3	17	7.16	5.89	
GSJ-2	Oct. 15, '81 ~ Oct. 26, '81	100.60	92.50	91.9	16	4	20	6.29	5.03	
GSJ-3	Oct. 4, '81 ~ Oct. 14, '81	100.50	89.55	89.1	16	3	19	6.28	5.29	
GSJ-4	Sep. 30, '81 ~ Oct. 10, '81	100.20	97.65	97.4	16	3	19	6.26	5.27	
GSJ-5	Oct. 11, '81 ~ Oct. 21, '81	100.40	95.15	94.7	14	4	18	7.17	5.58	
GSJ-6	Sep. 25, '81 ~ Oct. 3, '81	101.50	98.50	97.0	12	3	15	8.46	6.77	
GSJ-7	Sep. 17, '81 ~ Sep. 29, '81	100.20	91.75	91.5	17	4	21	5.89	4.77	
GSJ-8	Sep. 14, '81 ~ Sep. 24, '81	100.30	92.55	92.2	16	3	19	6.27	5.28	
GSJ-9	Sep. 6, '81 ~ Sep. 16, '81	100.20	94.20	94.0	16	3	19	6.26	5.27	
GSJ-10	Sep. 4, '81 ~ Sep. 13, '81	101.00	84.30	83.4	14	3	17	7.21	5.94	
GSJ-11	Aug. 27, '81 ~ Sep. 3, '81	100.05	76.90	76.8	12	2	14	8.34	7.15	
GSJ-12	Aug. 19, '81 ~ Aug. 26, '81	100.10	89.35	89.2	10	3	13	10.01	7.70	
GSJ-13	Aug. 5, '81 ~ Aug. 16, '81	100.30	95.65	95.3	16	4	20	6.27	5.02	
GSJ-14	Aug. 5, '81 ~ Aug. 18, '81	100.00	88.25	88.2	17	5	22	5.88	4.55	
GSJ-15	Aug. 17, '81 ~ Aug. 25, '81	100.20	92.05	91.8	12	3	15	8.35	6.68	
GSJ-16	Aug. 26, '81 ~ Sep. 5, '81	100.20	98.55	98.3	15	4	19	6.68	5.27	
GSJ-17	Oct. 27, '81 ~ Nov. 4, '81	100.80	97.55	96.7	12	3	15	8.40	6.72	
GSJ-18	Nov. 1, '81 ~ Nov. 10, '81	100.20	86.70	86.5	16	2	18	6.26	5.57	
Total		1,806.95	1,660.95	91.9	261	59	320	6.92	5.65	

* Drilled per one shift covering net drilling operations.
** Drilled per one shift covering total works conducted.

Table 11. Consumed bits

Hole No. \ Bit Type		75 mm		66 mm		56 mm		Remarks
		Metal		Bit	Reamer	Bit	Reamer	
GSJ-1	Length Quantity	2.00 1		31.00 3	31.00 1	67.20 8.5	67.20 2	
GSJ-2	Length Quantity	6.00 0.5		24.00 2	24.00 1.5	70.60 9	70.60 2.5	
GSJ-3	Length Quantity	7.50 1		32.50 2	32.50 1	60.50 7	60.50 2	
GSJ-4	Length Quantity	2.20 1.5		37.40 3.5	37.40 1	60.60 12	60.60 2	
GSJ-5	Length Quantity	2.30 1.5		25.20 3	25.20 1	72.90 20	72.90 2	
GSJ-6	Length Quantity	3.00 1		27.00 2	27.00 1	71.50 6	71.50 1.5	
GSJ-7	Length Quantity	7.00 0.5		39.65 2.5	39.65 1	53.55 5	53.55 1	
GSJ-8	Lenght Quantity	2.00 1		38.00 2	38.00 1	60.30 4.5	60.30 2	
GSJ-9	Length Quantity	6.00 1		35.85 2	35.85 0.5	58.35 6	58.35 2	
GSJ-10	Length Quantity	13.50 1		32.50 2	32.50 1	55.00 4.5	55.00 2	
GSJ-11	Length Quantity	9.00 0.5		21.00 2	21.00 0.5	70.05 5.5	70.05 2	
GSJ-12	Length Quantity	9.00 1		18.00 3	18.00 1	73.10 6	73.10 2.5	
GSJ-13	Length Quantity	5.20 1		38.80 2	38.80 1	56.30 4.5	56.30 1.5	
GSJ-14	Length Quantity	3.50 1.50		26.50 3	26.50 1	70.00 6	70.00 1	
GSJ-15	Length Quantity	5.00 1		40.16 3	40.16 1	55.04 6	55.04 1.5	
GSJ-16	Length Quantity	8.40 1		34.00 3	34.00 1.5	57.80 6.5	57.80 1	
GSJ-17	Length Quantity	5.50 1		26.50 3	26.50 1	68.80 6	68.80 1	
GSJ-18	Length Quantity	2.00 1		29.00 2	29.00 1	69.20 17	69.20 1.5	
Total	Length Quantity	99.10 18		557.06 45	557.06 18	1150.79 130	1150.79 30	
Length/Bit		5.51		12.38	30.95	8.85	38.36	
Bits/Hole		1		2.5	1	7.2	1.67	

Fig 9 - 1

PROGRESS RECORD OF DRILLING GSJ — 1

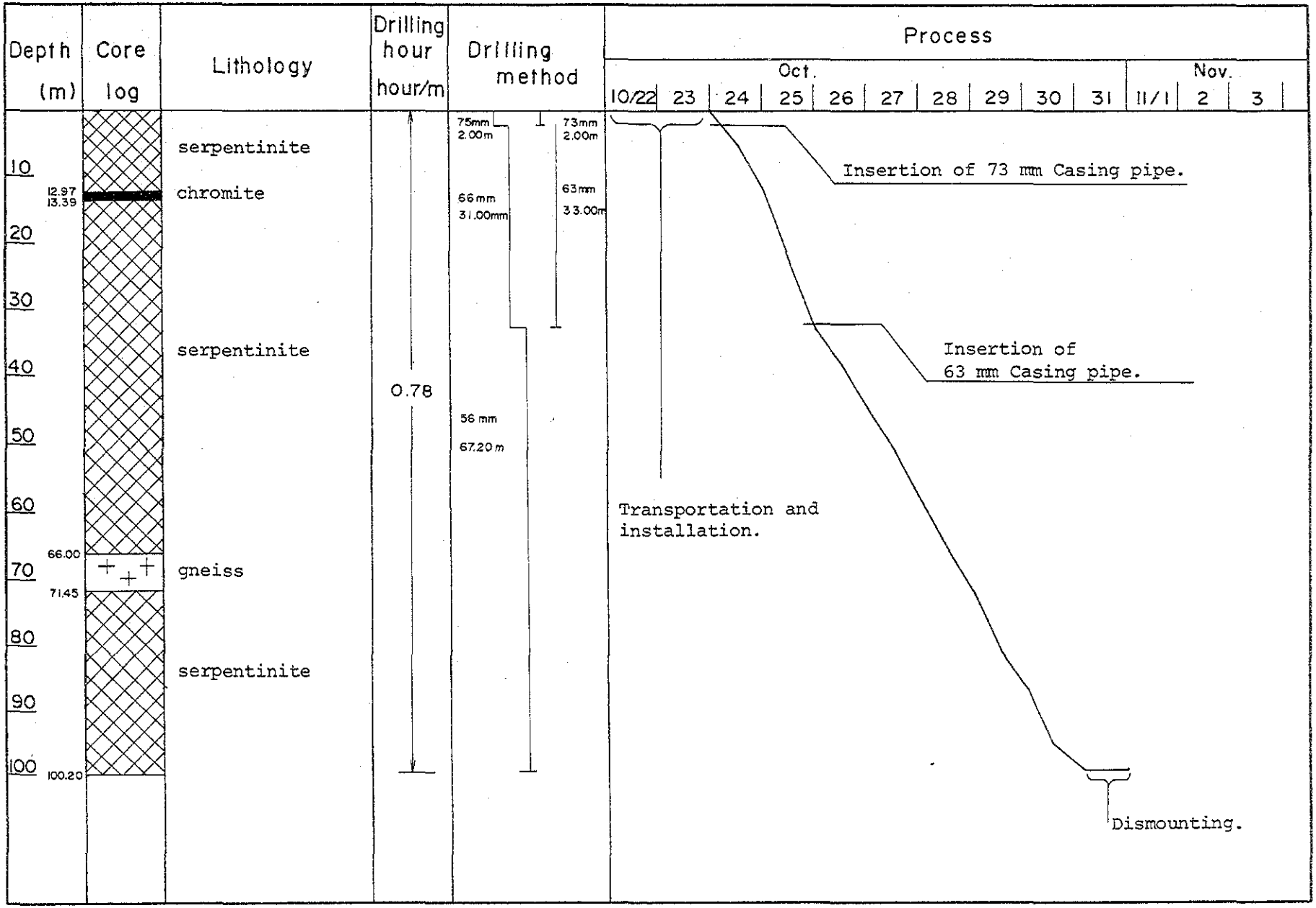


Fig 9-2

PROGRESS RECORD OF DRILLING GSJ — 2

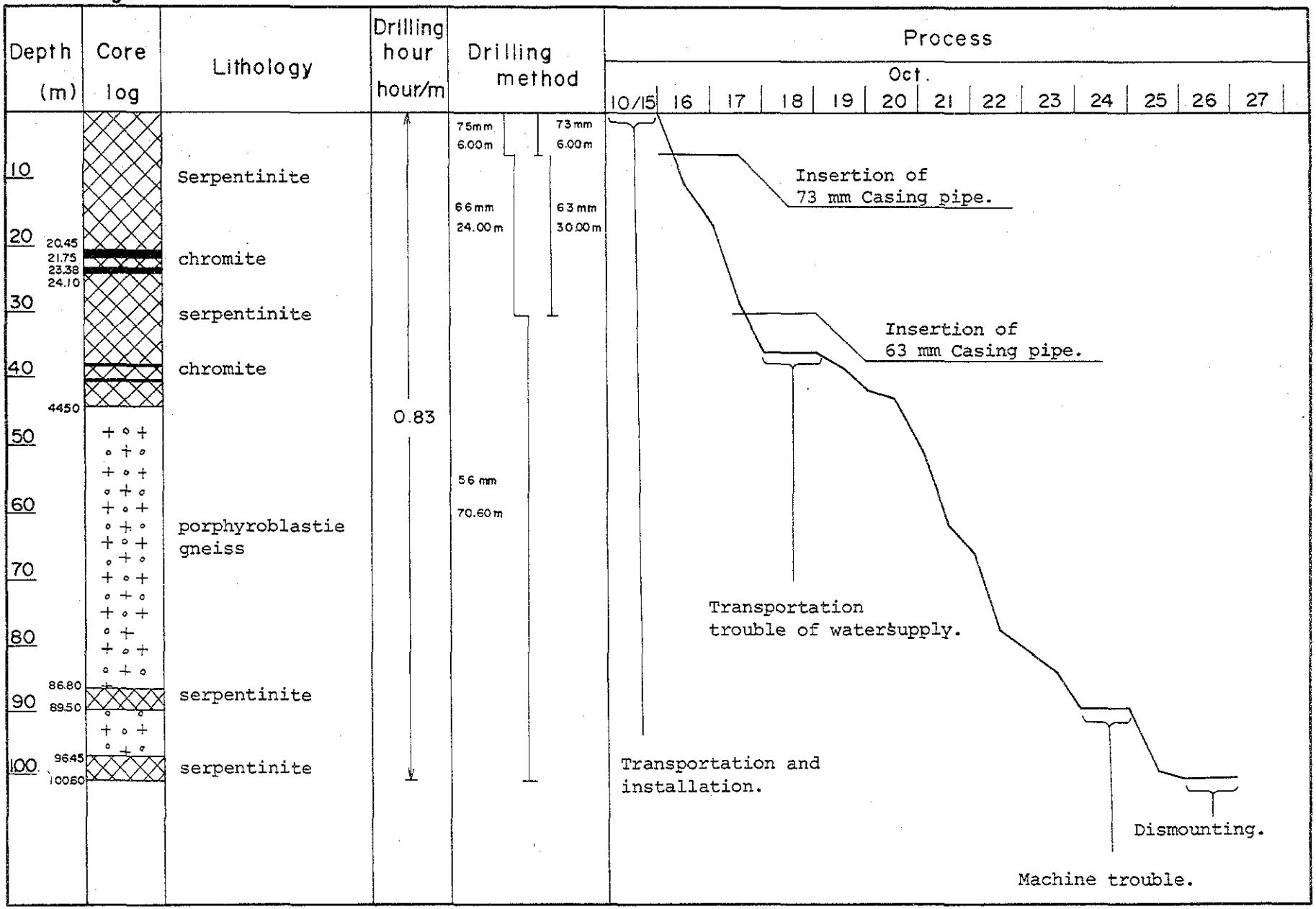


Fig 9-3

PROGRESS RECORD OF DRILLING GSJ — 3

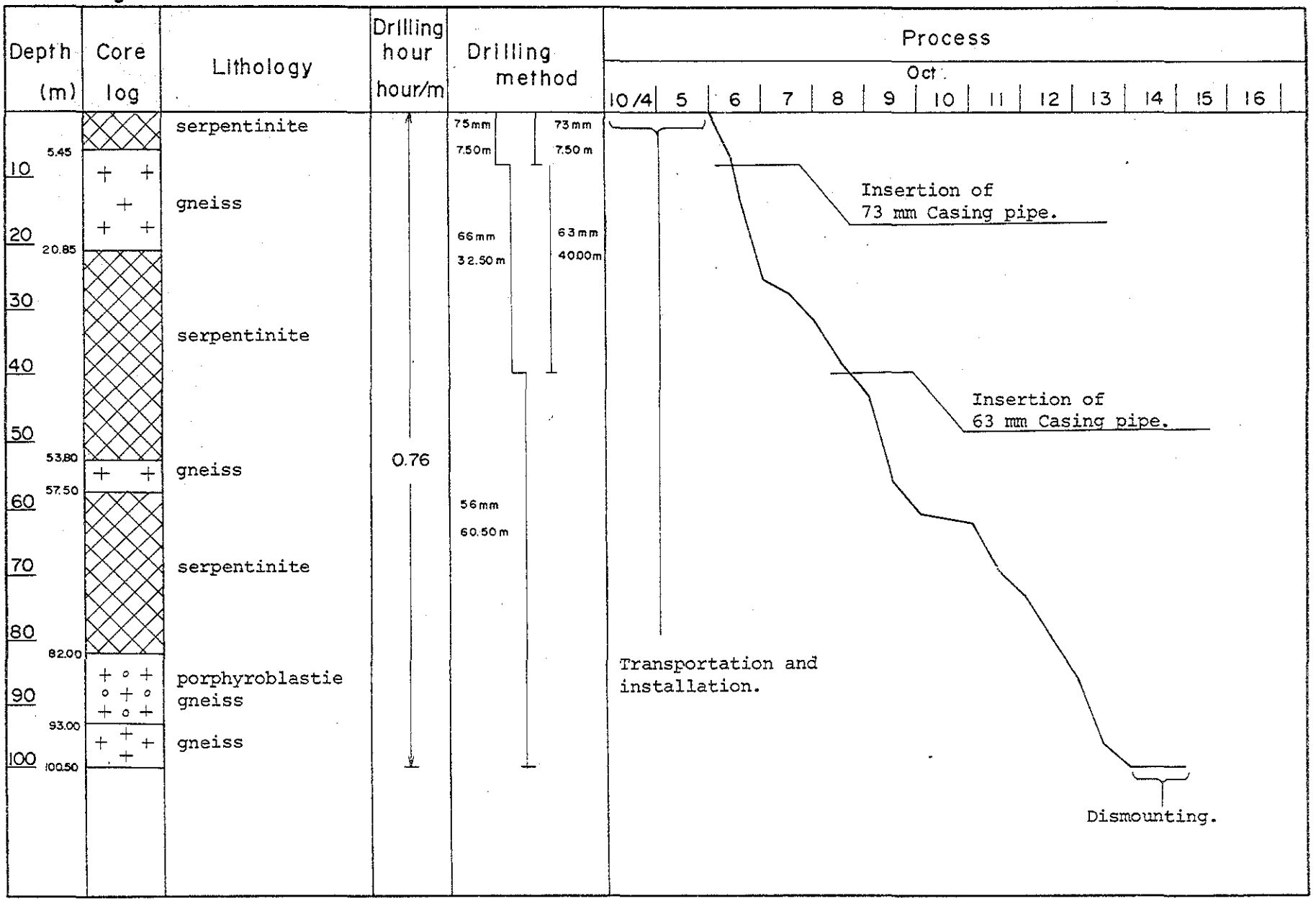


Fig9-4

PROGRESS RECORD OF DRILLING GSJ — 4

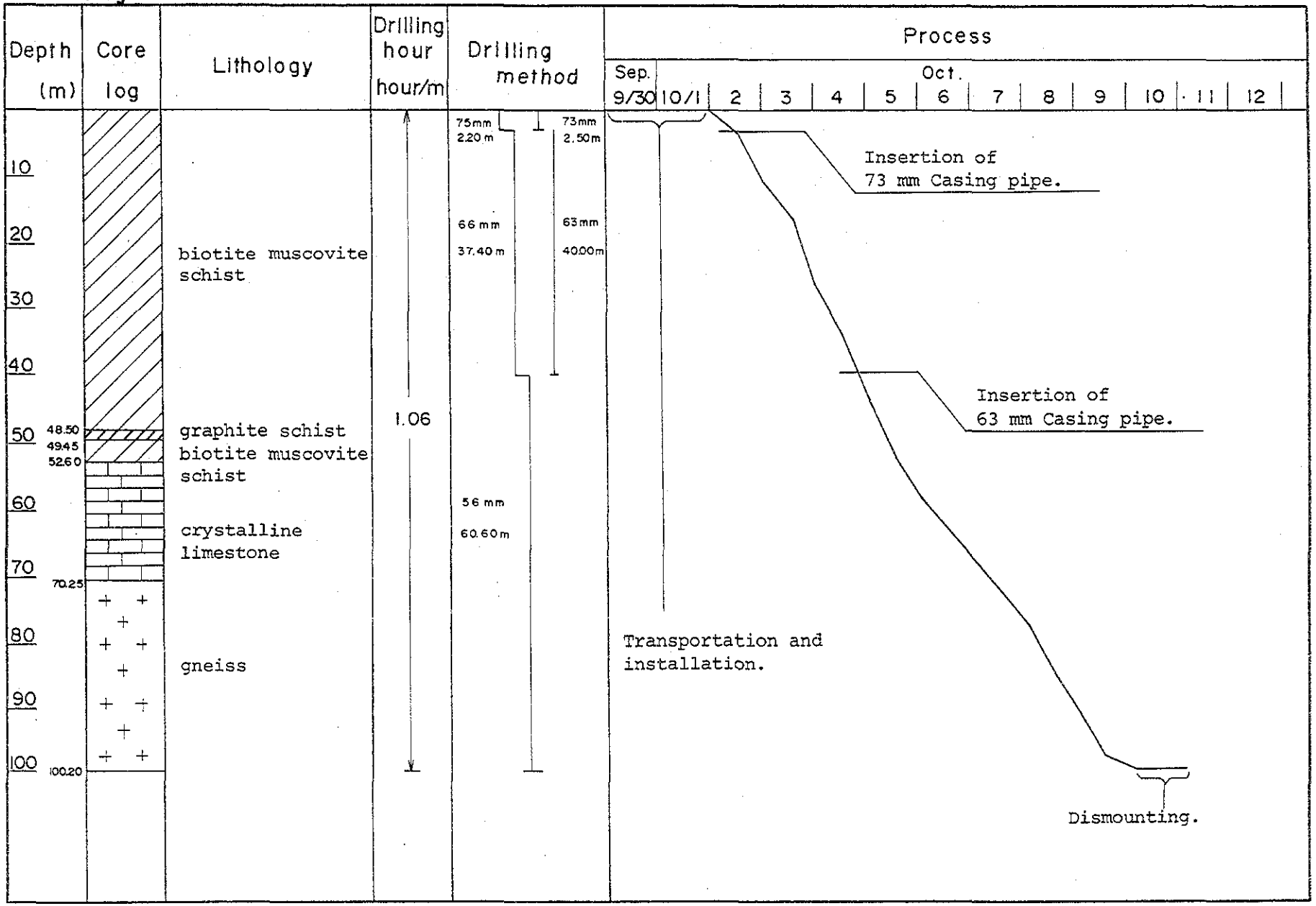


Fig 9-5

PROGRESS RECORD OF DRILLING GSJ — 5

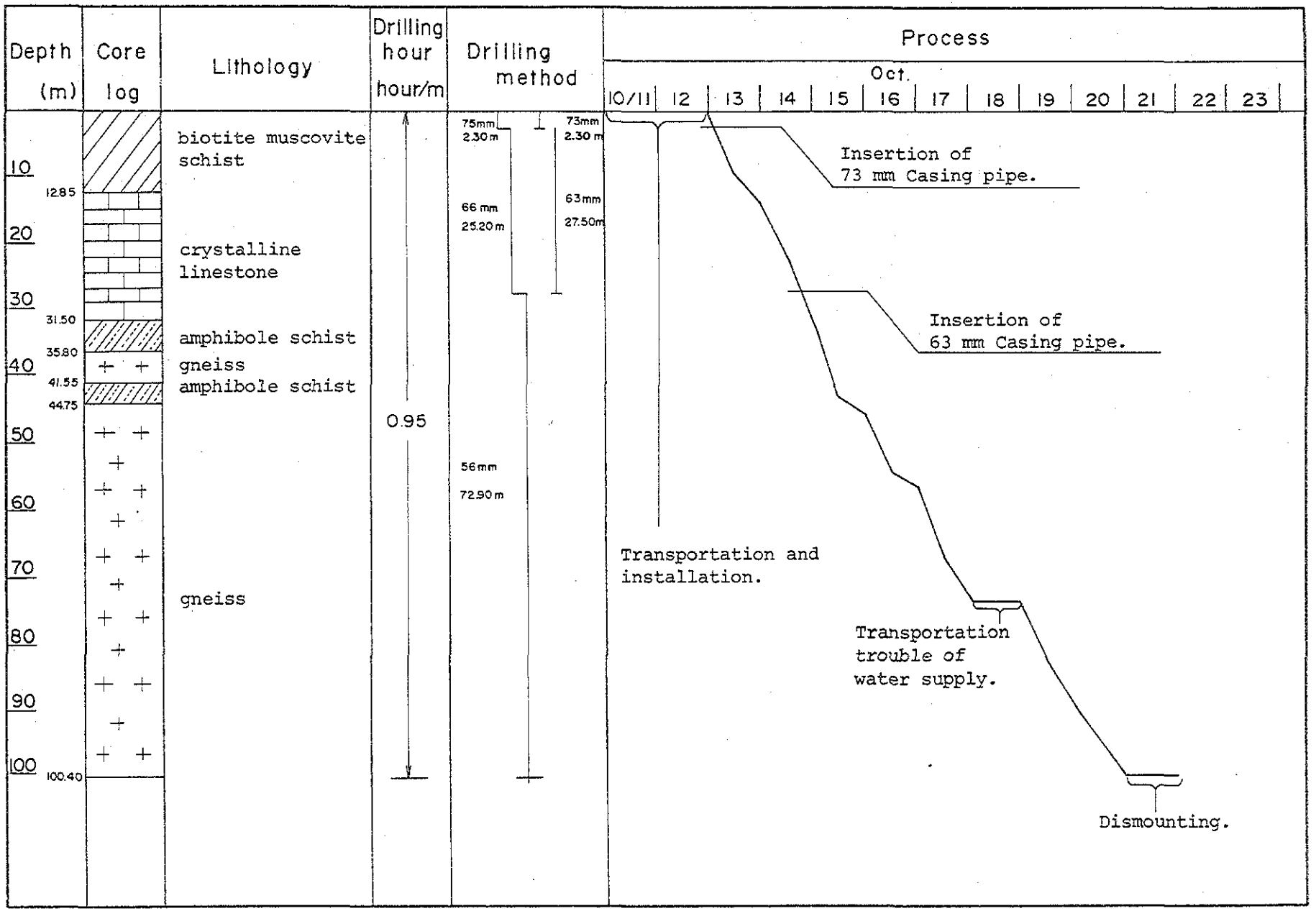


Fig 9-6

PROGRESS RECORD OF DRILLING GSJ — 6

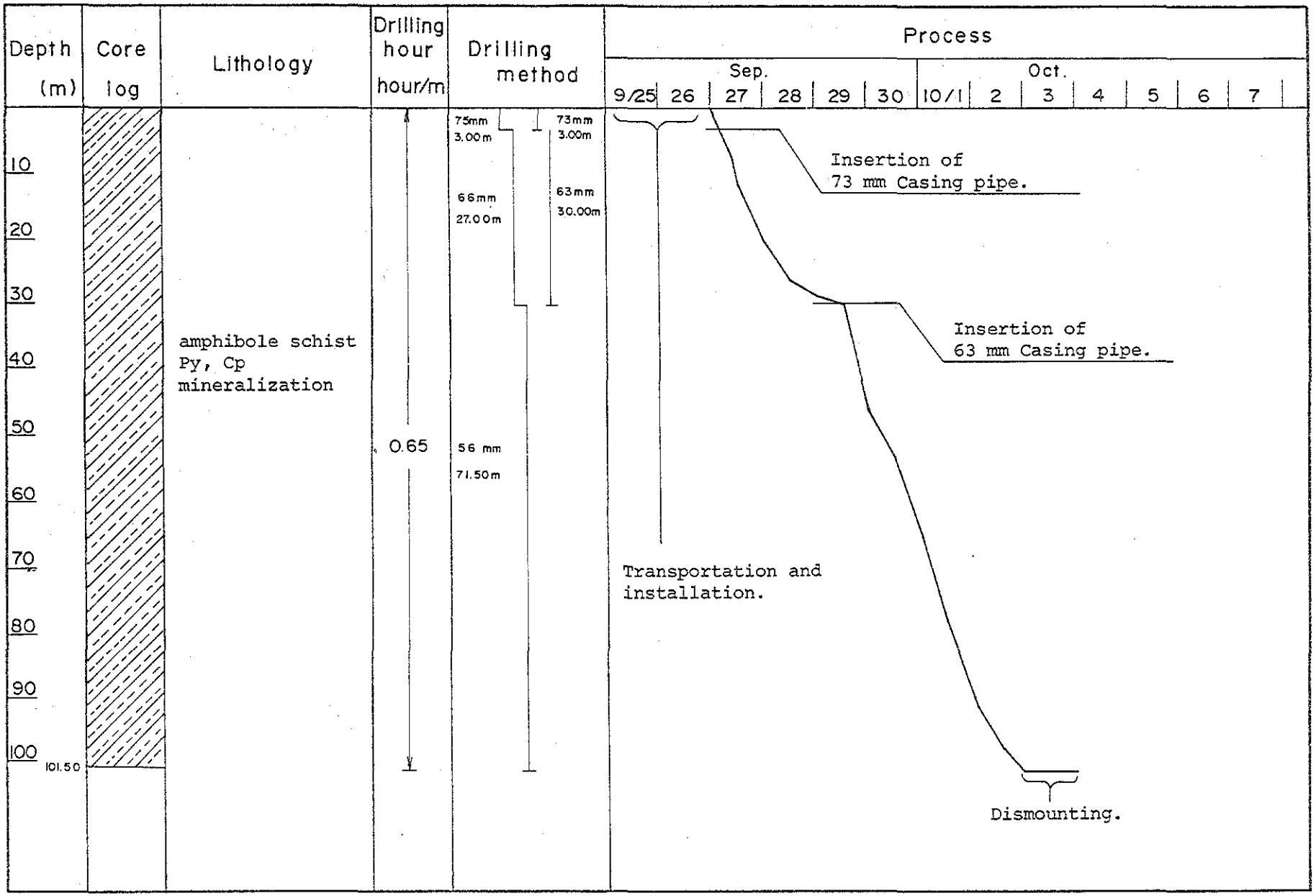


Fig 9-7

PROGRESS RECORD OF DRILLING GSJ — 7

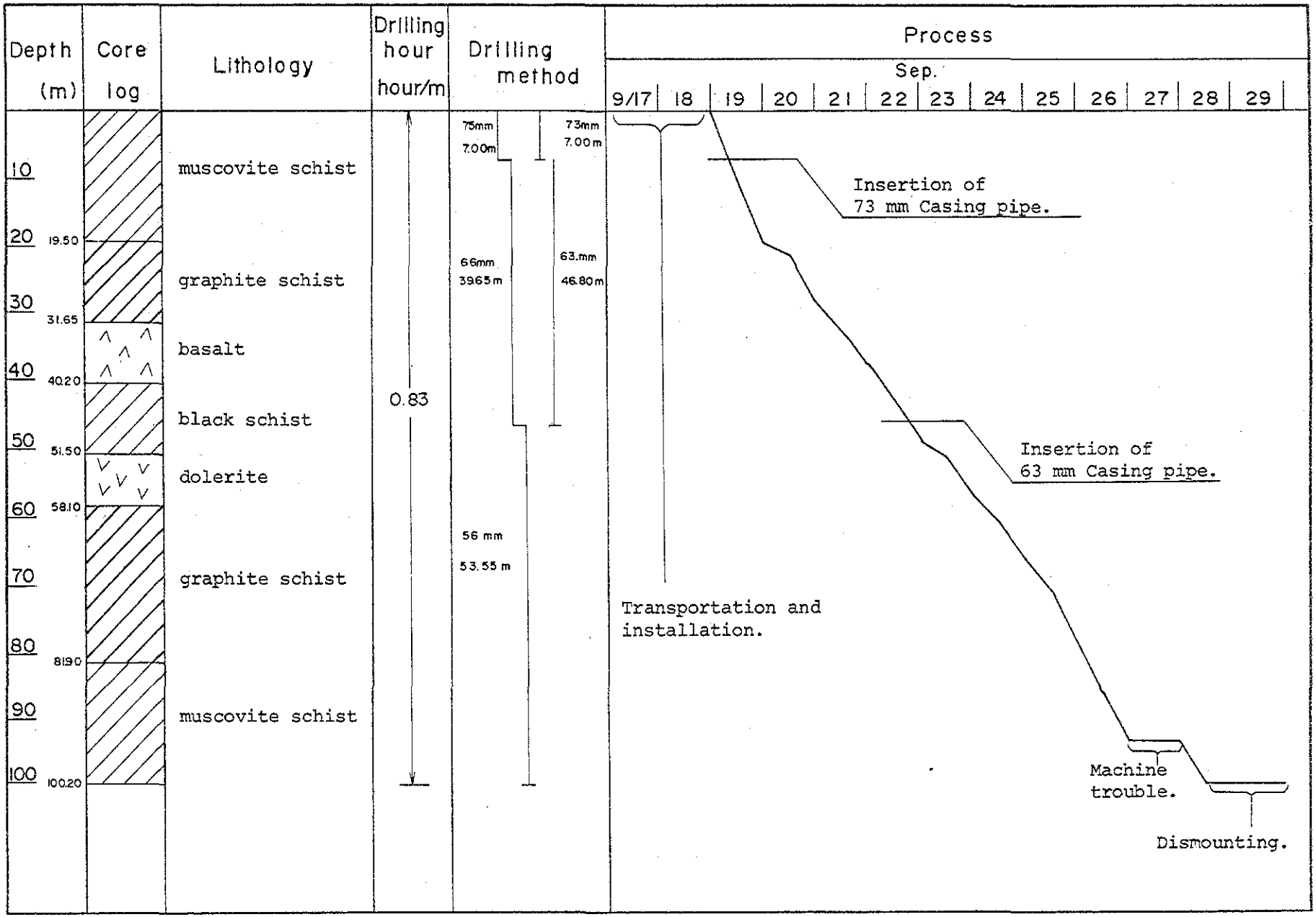


Fig 9-8

PROGRESS RECORD OF DRILLING GSJ — 8

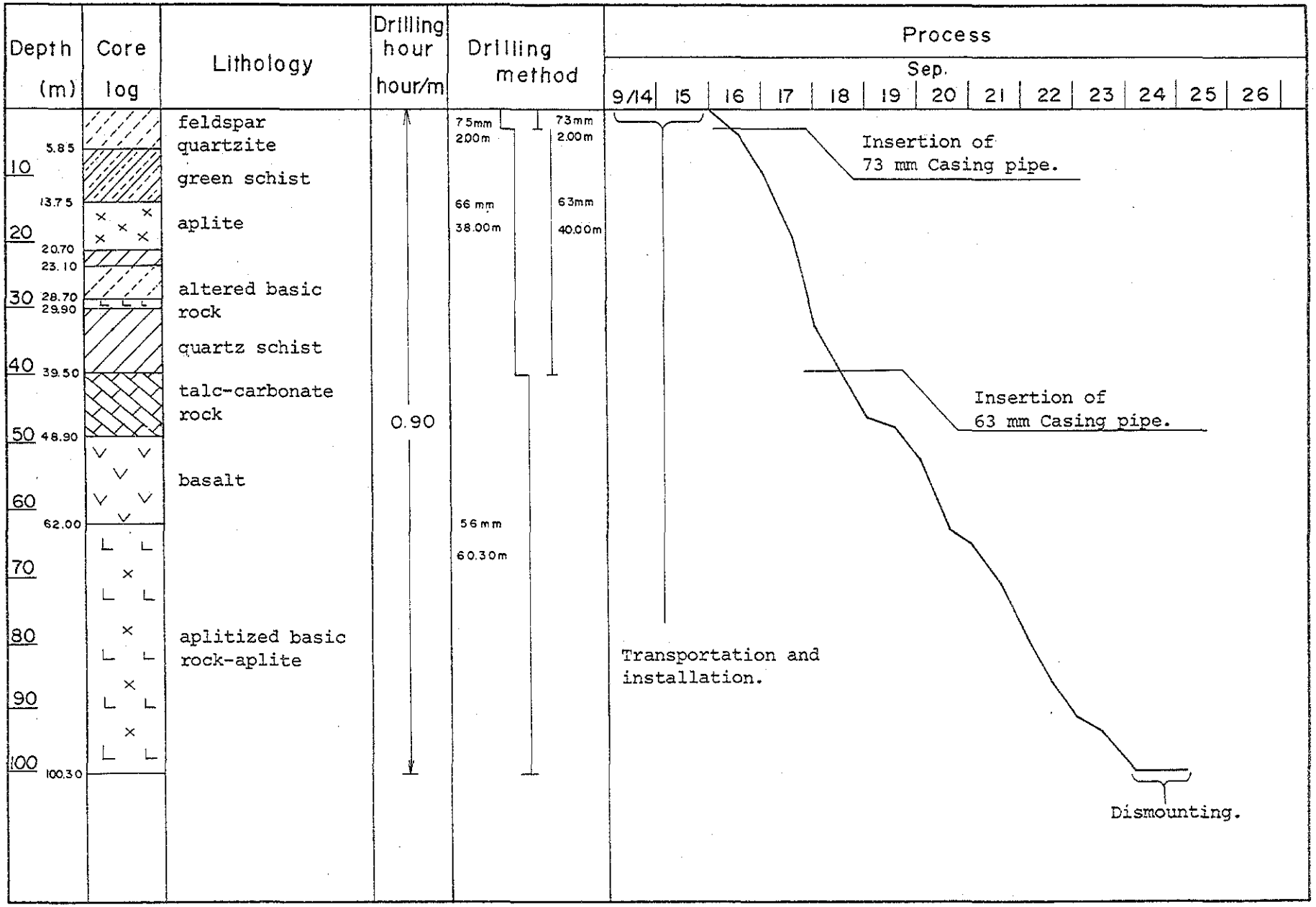


Fig 9-9

PROGRESS RECORD OF DRILLING GSJ — 9

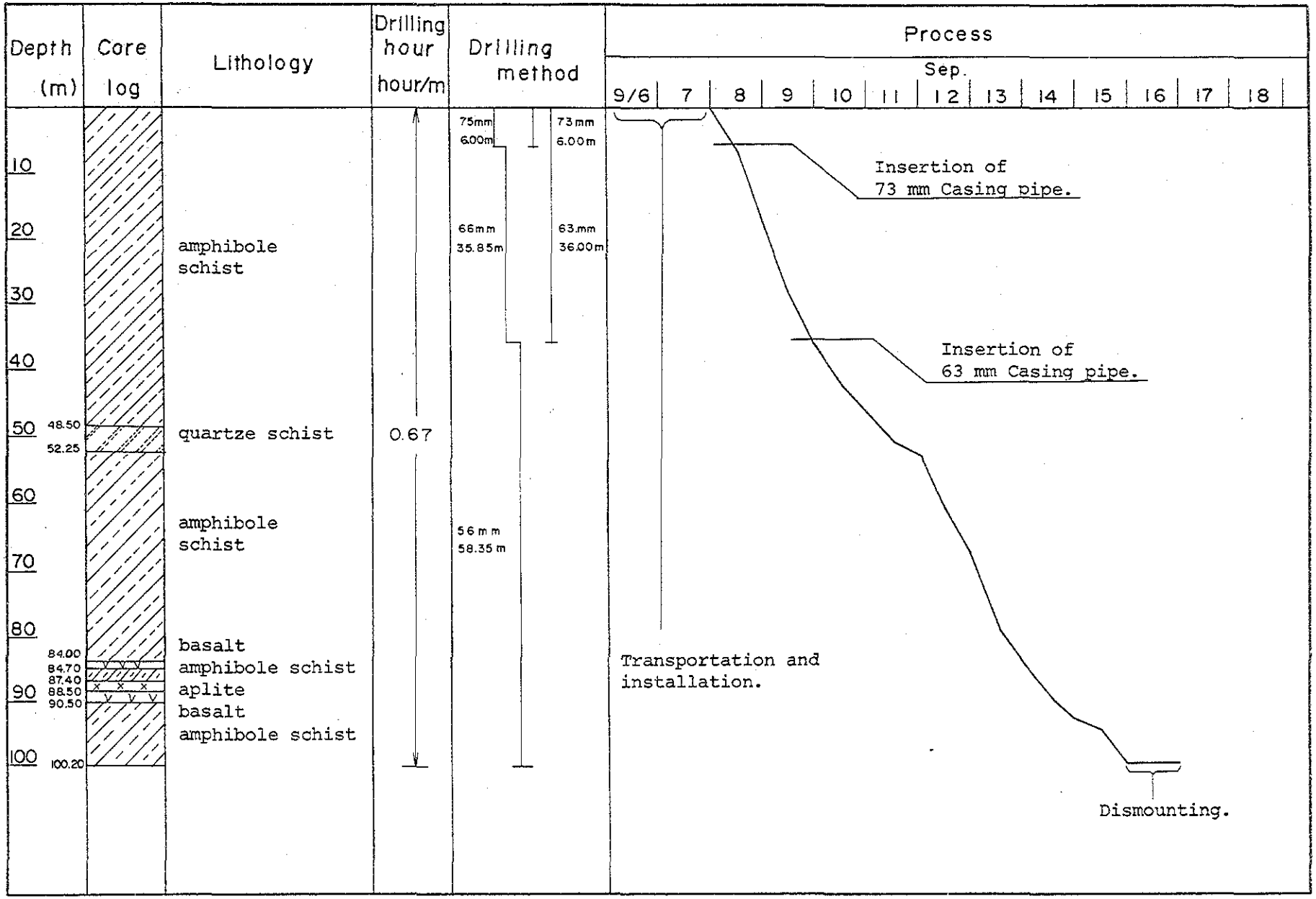


Fig 9-10

PROGRESS RECORD OF DRILLING GSJ—10

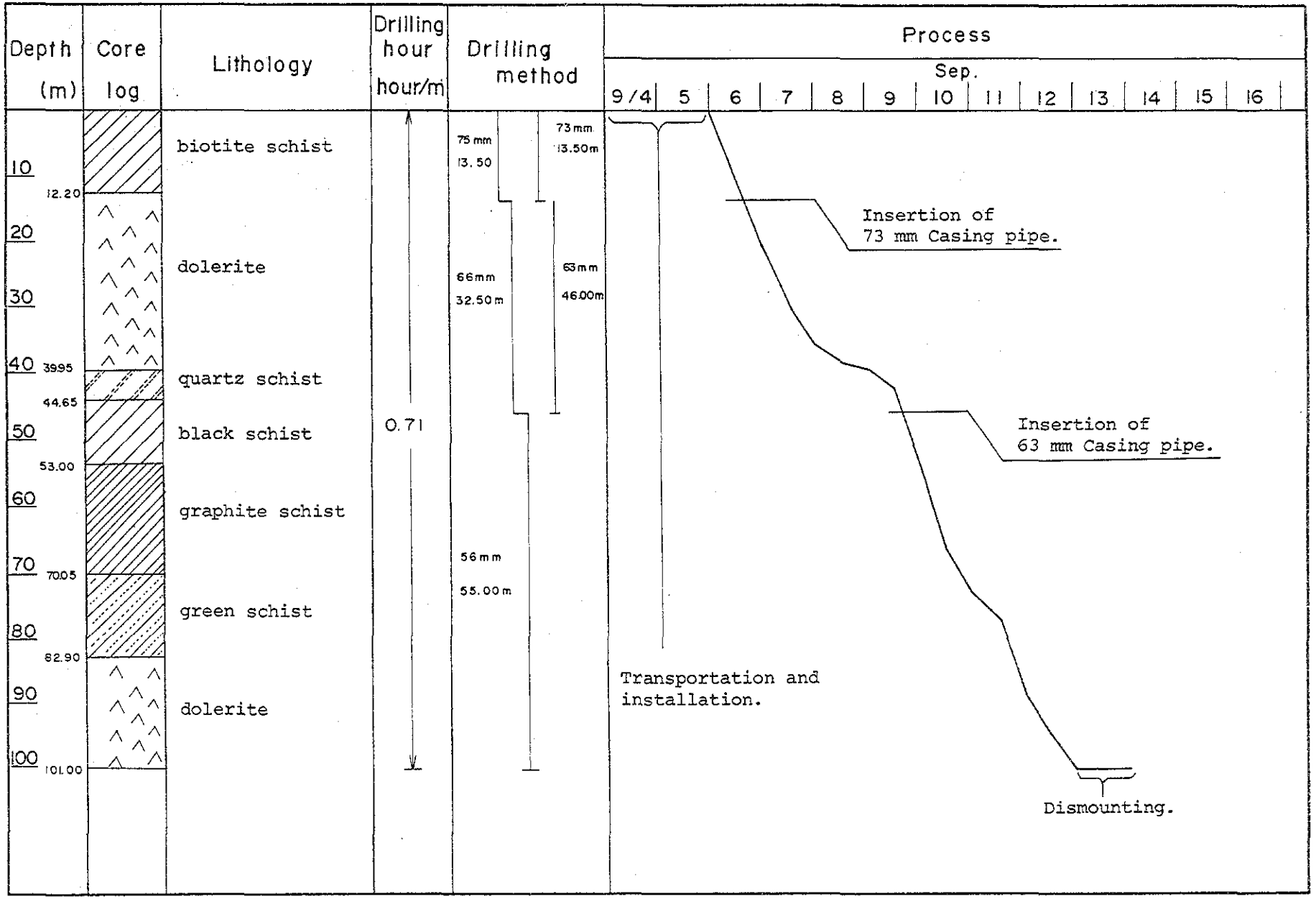


Fig 9-11

PROGRESS RECORD OF DRILLING GSJ — 11

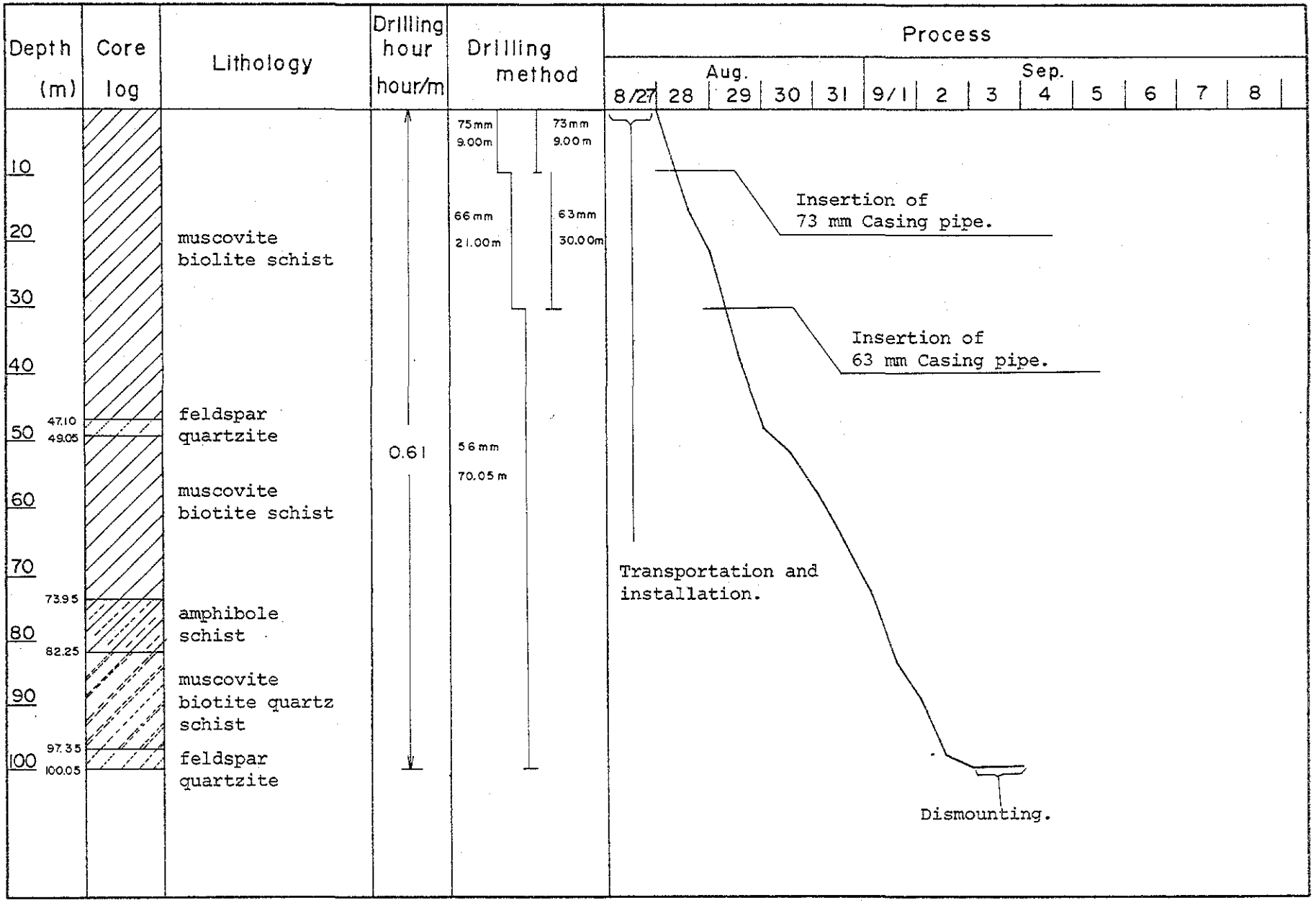


Fig 9-12

PROGRESS RECORD OF DRILLING GSJ—12

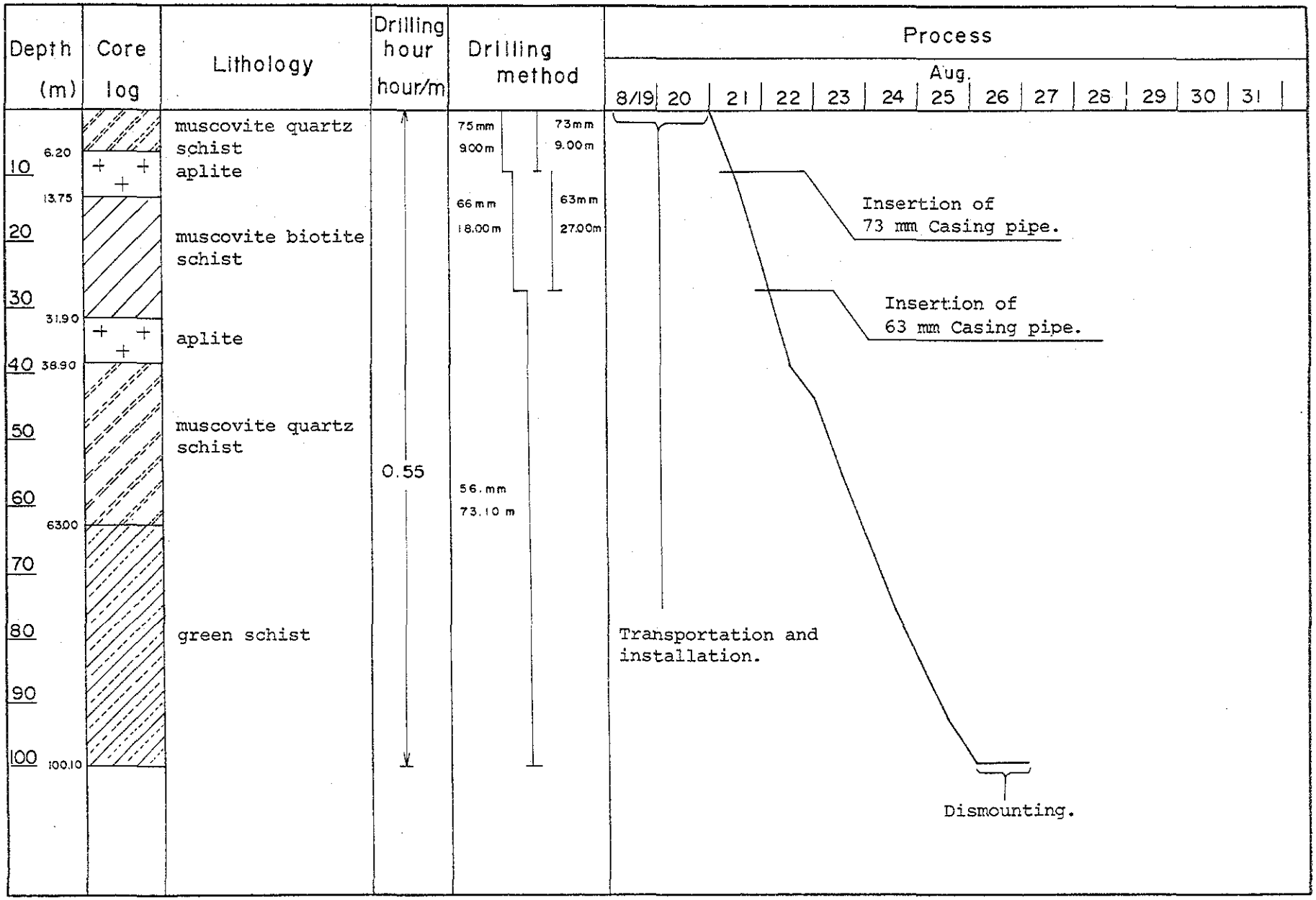


Fig9-13

PROGRESS RECORD OF DRILLING GSJ—13

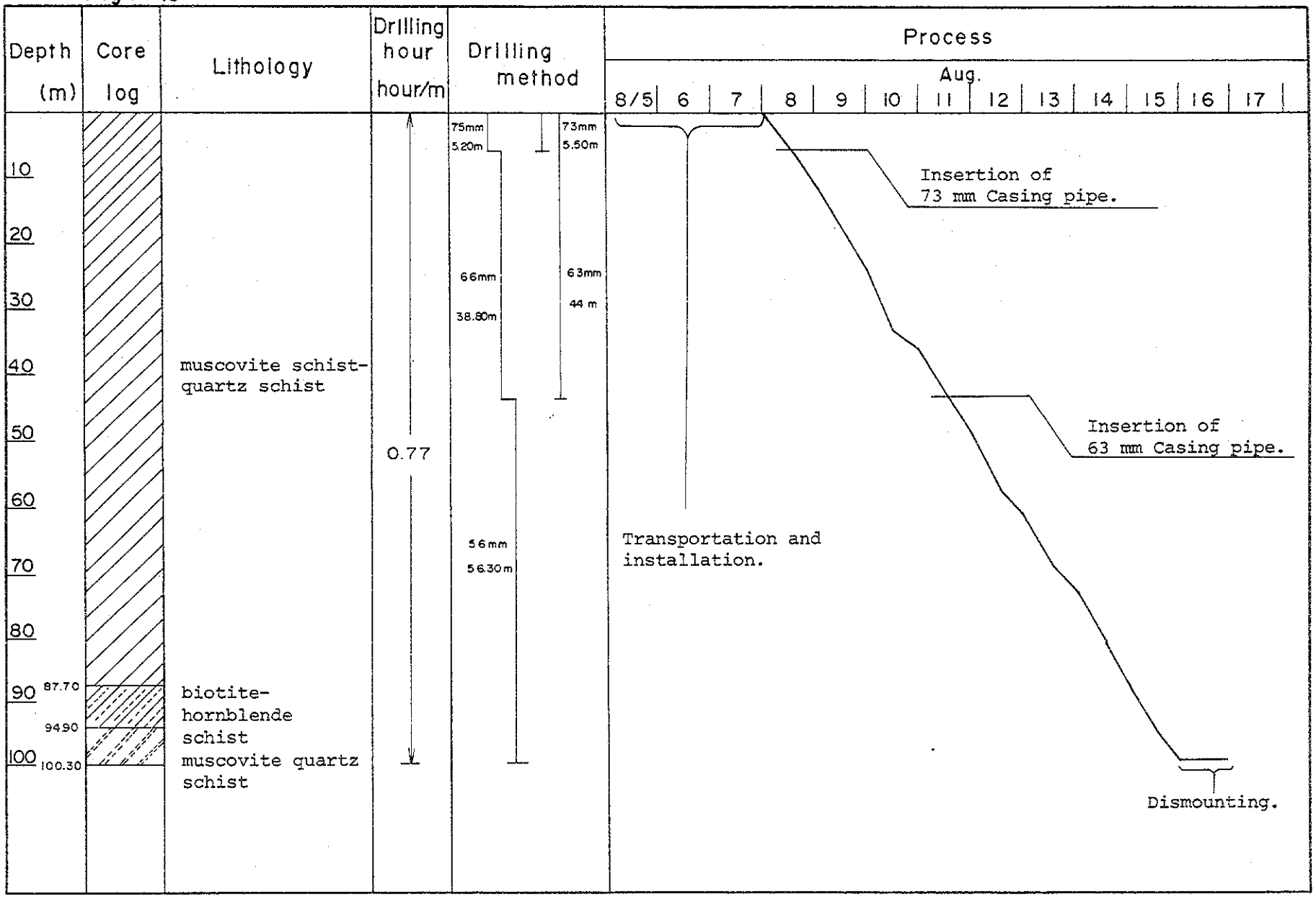


Fig 9-14

PROGRESS RECORD OF DRILLING GSJ — 14

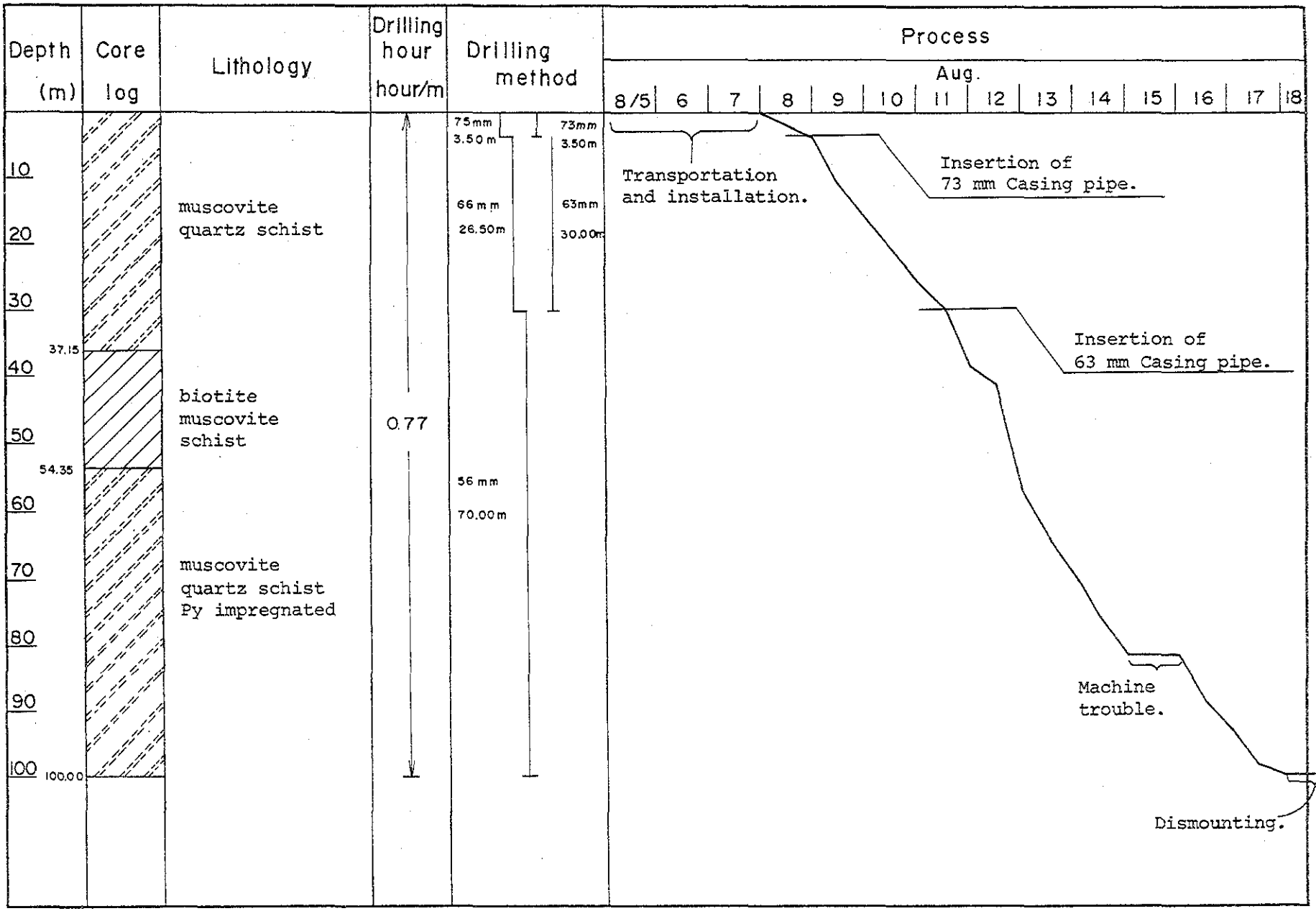


Fig 9-15 PROGRESS RECORD OF DRILLING GSJ—15

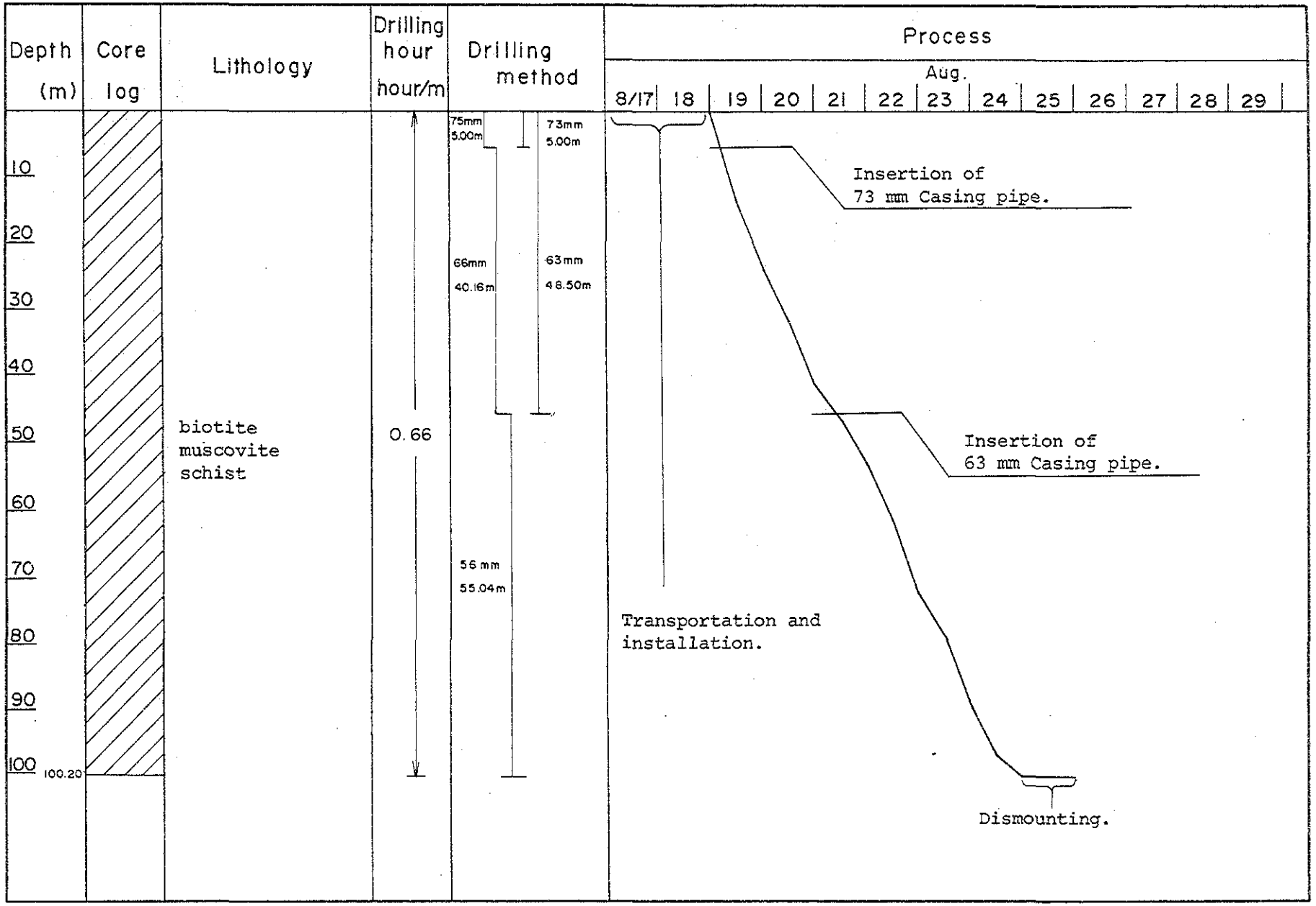


Fig 9-16

PROGRESS RECORD OF DRILLING GSJ—16

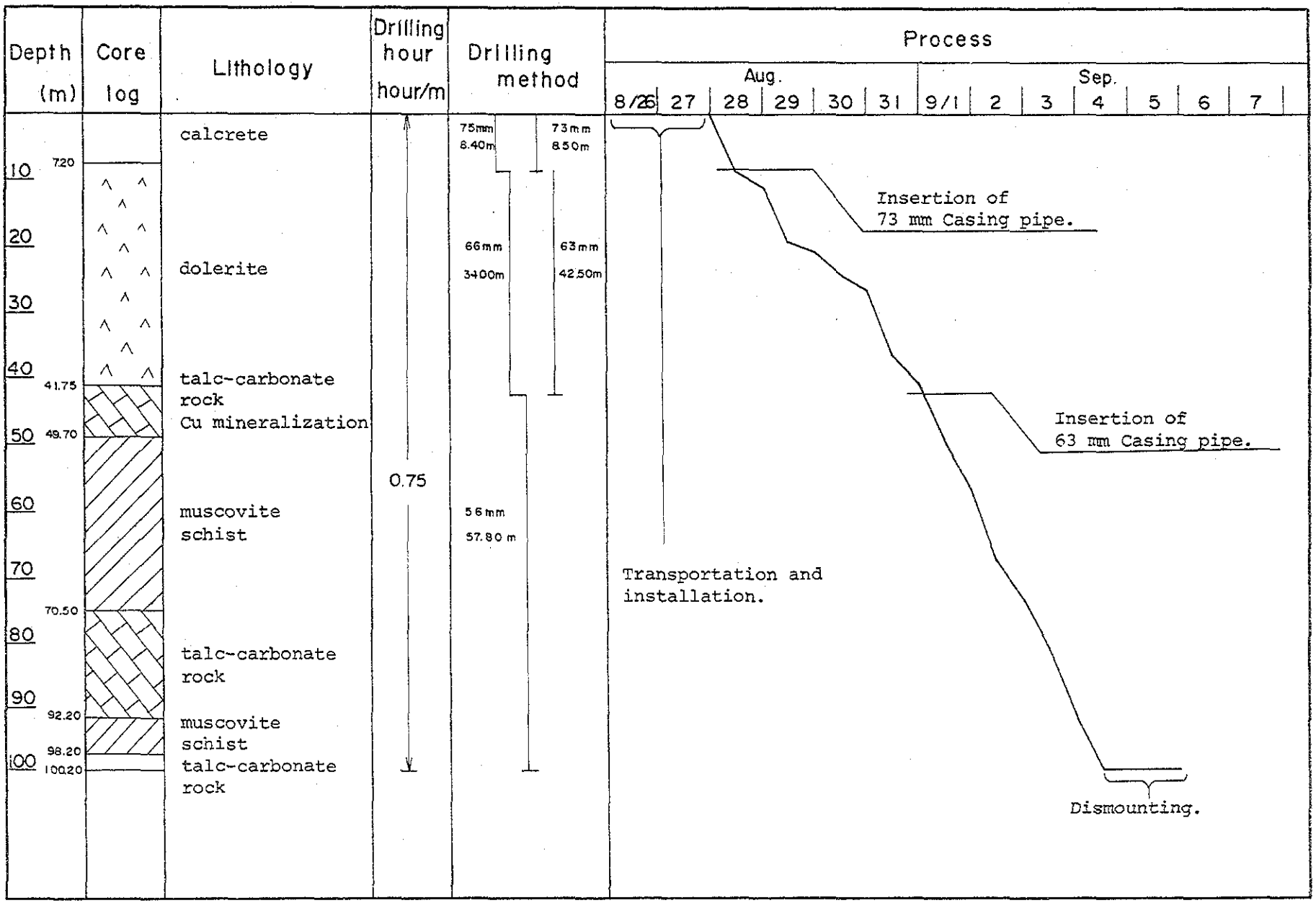


Fig 9 - 17

PROGRESS RECORD OF DRILLING GSJ — 17

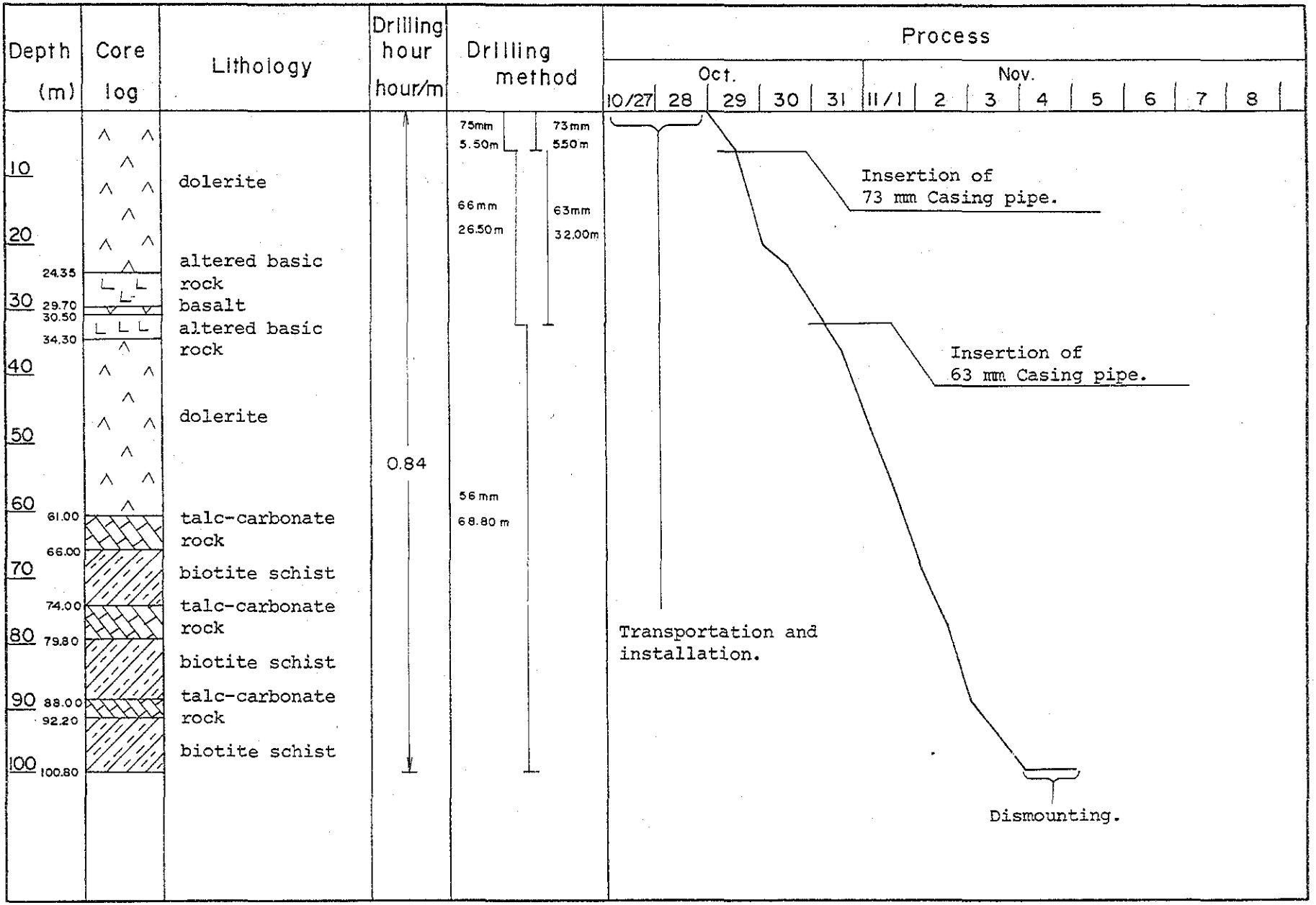
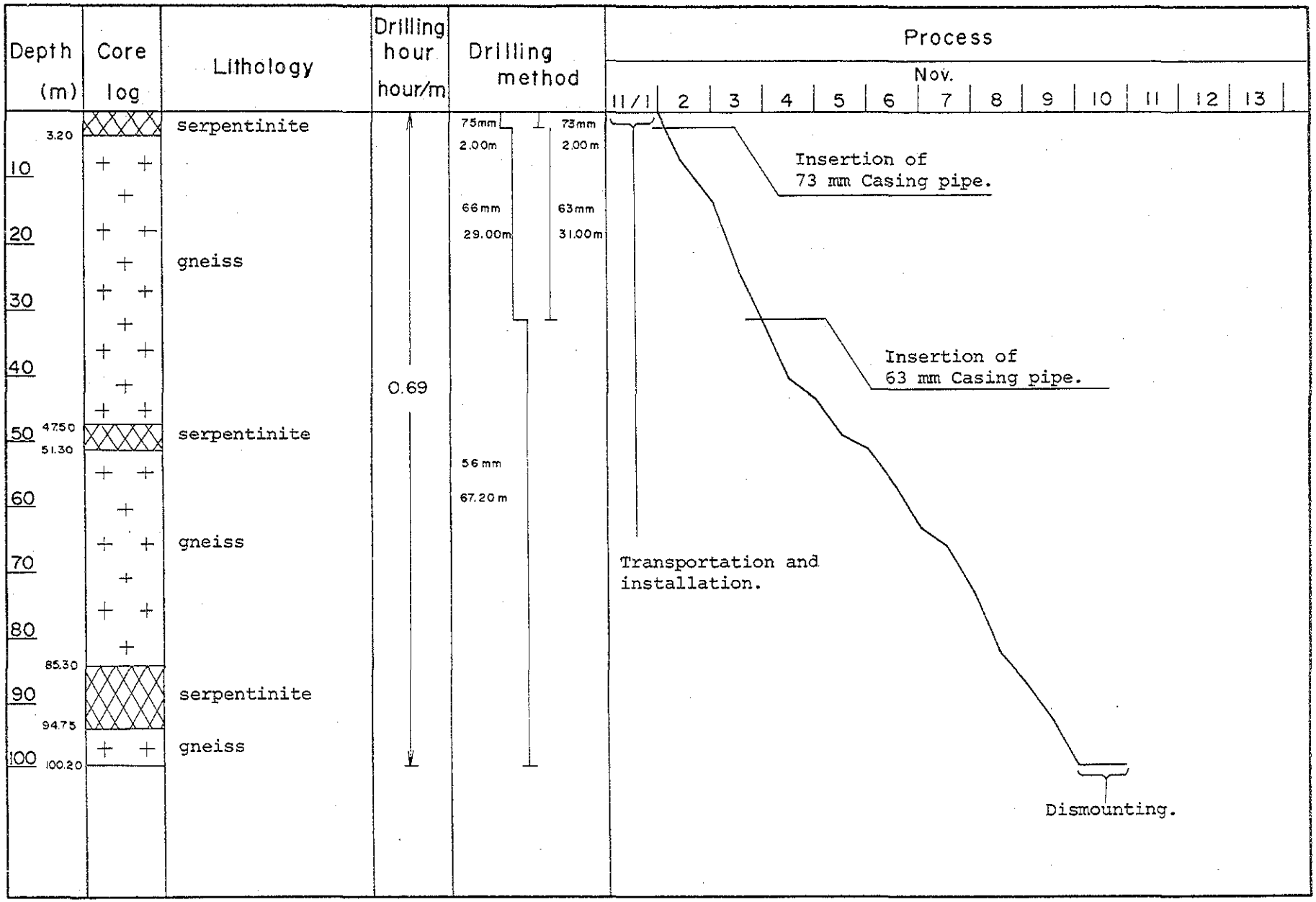


Fig9-18

PROGRESS RECORD OF DRILLING GSJ — 18



第Ⅶ部　総　合　解　析

本年度の調査対象となった銅鉱徴地区およびクロム鉱床地区のうち，銅鉱徴地区は第２年次調査，特に物理探査，地化学探査の結果から鉱床賦存の可能性の最も高い区域として選出された地域であり，一方クロム鉱床地区は第２年次までの調査から小範囲ながら露頭が確認された区域で，いずれも特定の地質層準に胚胎される。

銅鉱徴区域については本調査地域南方約５kmにあるMatsitama鉱床群の延長部として，同様の地質条件を備え且つ何らかの示徴を持つ地域を選定し，試錐を中心に調査した。

地域毎の調査結果は次の通りである。これらをまとめてTable － １２ に示した。

Area Ⅰ　地質調査，試錐の結果，鉱徴は確認できなかった。物理探査による示徴は石墨片岩(?)によるものと考えられる。

Area Ⅱ　地化学探査のＡ級異常域に対して行われた試錐の結果，黄銅鉱，黄鉄鉱の鉱染が広範囲に確認された岩質はmatsitama schist and metasedimentary 層群の角閃片岩で，Matsitama鉱床群の母岩と同層群，同岩質である。また付近に銅鉱徴が見られることなどから最も有望な地域と考えられる。

Area Ⅲ　物理探査の示徴に対して実施した試錐の結果弱い黄鉄鉱，黄銅鉱の鉱化と石墨片岩が見られ本地域は石墨を伴うBushman 型鉱床を胚胎する地質環境に近い地質状況であることが確認された。

Area Ⅳ　物理探査の異常域およびその近くの地化学探査の異常に対して実施した試錐の結果，比較的広範囲にわたる黄鉄鉱の鉱染のほかわずかながら銅の鉱徴も認められた。この試錐区域より西側には銅鉱物を含む転石が点在し，本年度追加実施した地化学探査の異常も西側へ拡大する傾向にあることから，Matsitama型鉱床賦存の期待がもたれる。

本地域東部で数少い銅の露頭が見られる旧トレンチ横での試錐では，トレンチに見られる銅鉱徴と同様の鉱徴を捕捉した。しかし，トレンチおよび試錐に見られる地質では，数回の玄武岩の貫入，それに伴う変質，さらには風化作用などが錯綜し，原岩不明の岩質となっており，はっきりしないが，この銅の鉱化作用は玄武岩に由来するもので小規模と思われる。

クロム鉱床は超塩基性岩類中に認められる。

超塩基性岩類の分布はＡ－Ｄ鉱床地区，Ｆ・Ｆ鉱床地区周辺のほかにまとまった分布を示すものはない。転石の状況より潜頭性の岩体も小規模と考えられる。

クロマイト鉱体はいずれも小規模でレンズ状，豆鞘状を呈しはっきりした方向性を示さない。これは母岩の小構造に支配されるためと考えられる。

今回鉱体の下部延長部を狙って試錐を実施したが延長部を捕捉できず，別の鉱体に着鉱した。

試錐やトレンチの結果から1単位鉱体の規模としては厚さ0.5～1m延長5～10mで落しの方向へは数mと考えられ，この様な小規模鉱体が超塩基性岩中に点在している。従って今回は主に鉱体の北側を狙って調査したが南側についても鉱体の賦存する可能性がある。

しかし鉱体が小さくはっきりした構造的特徴を示さないので，地表部の露頭から鎚押しで鉱体確認しながら探鉱範囲を拡大して行くのが適当であろう。A－D鉱床地区については小鉱体の集合として考えられればある程度まとまった鉱量は期待される。

Table 12 Result of prospecting, Phase III

Area		No. of drill hole	Phase I, II (1979, 1980)								Phase III (1981)						
			Geology	Mineralization	Geochemical anomaly Z_i score (A, B class)	Air-borne anomaly	Ground follow-up geophysical survey				Geology	Geochem. anomaly Z_i scores	Magnetic anomaly	No. of drill hole	Drilling			
							Conductor	Polarizable	Magnetic association	Probable primary source					Rock	Mineralization (m)		
																Copper	Pyrite	Chromite
Copper area	I	4	B	–	–	M-23A	Bed rock	Yes	Yes	Graphite	amp sch, calcrete, gn mica sch, ls	–	–	4	mica sch, gn, ls, graph sch, quartzite, amp sch	–	52.60-70.25 (17.65)	–
		5	B	–	–	M-23A	Bed rock	Yes	Yes	Graphite				5	mica sch, gn, ls, graph sch quartzite, amp sch	–	38.83-30.85 (0.02)	–
	II	6	A	Copper showing	A	–	–	–	–	–	amp sch, mica sch, quartzite	–	–	6	amp sch	20.00-101.50 (81.50)		–
	III	7	A	–	B	M-7A	Multiple bed rock	Yes	Yes	Graphite	amp sch, mica sch, calcrete, black turf soil covers widely	–	–	7	mica sch, graph sch, dolerite, green sch	–	–	–
		8	A	–	(B)	M-10, (M-7B)	Multiple bed rock	Yes	Yes	Sulf + Graph				8	aplitized basic rock, aplite talc-carb rock, dolerite	–	–	–
		9	A	–		M-7B	Bed rock	Yes	No	Sulf + Graph				9	amp sch, basalt, quartzite, talc-carb rock	69.60-75.00 (5.40)	69.60-82.00 (12.40)	–
		10	A	–	(B)	M-7C	Bed rock	Yes	No	Sulf + Graph				10	dolerite, graph sch, mica sch, q sch, green sch.	–	70.60-79.00 (8.40)	–
	IV-(1)	11	A	–		M-4	Bed rock	Yes	No	Sulfide	quartzite, mica sch amp sch. ls, dolerite, floats of quartzite with green copper	At the western part of Area IV-(1) A, B class of anomalies were detected	–	11	mica sch, q sch, amp sch, quartzite	79.35-81.20 (1.85)	–	–
		12	A	–	A	M-4	–	–	–	–				12	mica sch, q sch, green sch, quartzite	–	79.70-83.40 (3.70)	–
		13	A	–		M-3	Bed rock	Yes	No	Sulfide				13	mica sch. q sch hb sch.	–	55.45-87.70 (32.25) 95.10-100.30 (5.20)	–
		14	A	–		M-3	Bed rock	Yes	No	Sulfide				14	q sch, mica sch, quartzite	–	54.35-100.00 (45.65)	–
		15	A	–	A	–	–	–	–	–				15	mica sch	–	–	–
	IV-(2)	16	A	Copper occurrence	–	–	–	–	–	–	quartzite, mica sch, dolerite,	–	dolerite NW direction	16	Dolerite, talc-carb rock, mica sch, aplite, some skarn minerals	41.75-47.50 (5.75)	–	–
		17	A	Copper occurrence	–	–	–	–	–	–				17		30-50-34.80 (4.30) 64.00-66.00 (2.00)	–	–
Chrome area		1	B	Chromite occurrence	–	–	–	–	–	–	serp, gn, amp sch 5 deposits, many showings and floats of chromite were found. Each serp body is small in scale	–	Most of serp bodies are less than 30 m, in width, Dolerite dykes were catched clearly.	1	serp, gn, chromite	–	–	12.97-13.39 (
		2	B	Chromite occurrence	–	–	–	–	–	–				2	serp, chromite, gn	–	–	20.45-21.75 (23.38-24.10 (38.10-38.45 (40.10-40.33 (
		3	B	Chromite occurrence	–	–	–	–	–	–				3	serp, gn	–		–
		18	B	Chromite occurrence	–	–	–	–	–	–				18	gn, serp	–	–	–

Geology A: Matsitama schist and metasedimentary group

B: Mosetse river gneiss group

vey		Phase III (1981)														
					Drilling											
						Mineralization (m)						Assay max. %				
Probable primary source	Geology	Geochem. anomaly Z_i scores	Magnetic anomaly	No. of drill hole	Rock	Copper	Pyrite	Chromite	Graphite	Note	Cu	Cr_2O_3	Source of anomalies for Phase III	Conclusion	Priority for future exploration
Graphite	amp sch, calcrete, gn mica sch, ls	–	–	4	mica sch, gn, ls, graph sch, quartzite, amp sch	–	52.60-70.25 (17.65)	–	45.80-49.45 (3.65) 53.70-54.10 (0.40)	Graphite: only a little	–	–	sulfide (?) graphite (?)	No copper mineralization	
Graphite				5	mica sch, gn, ls, graph sch quartzite, amp sch	–	38.83-30.85 (0.02)	–	14.60-14.70 (0.10)	Graphite: only a little	–	–	?		
–	amp sch, mica sch, quartzite	–	–	6	amp sch	20.00-101.50 (81.50)		–	–	py, cp, hm: imp. or in q vein	0.228	–	sulfide	Copper mineralization is weak, but wide. Biggest potentiality for copper deposit.	1
Graphite	amp sch, mica sch, calcrete, black turf soil covers widely	–	–	7	mica sch, graph sch, dolerite, green sch	–	–	–	9.05-25.30 (6.25) 28.90-31.65 (2.75) 40.20-51.50 (11.30) 58.15-81.90 (23.75)	–	–	–	graphite	Sulfide mineralization and graphite schist was confirmed	3
Sulf + Graph				8	aplitized basic rock, aplite talc-carb rock, dolerite	–	–	–	–	strong aplitization	–	–	?		
Sulf + Graph				9	amp sch, basalt, quartzite, talc-carb rock	69.60-75.00 (5.40)	69.60-82.00 (12.40)	–	–	py.cp imp. and in q vein	0.113	–	sulfide (?)		
Sulf + Graph				10	dolerite, graph sch, mica sch, q sch, green sch.	–	70.60-79.00 (8.40)	–	49.35-70.05 (20.70)	py: weak imp	–	–	graphite		
Sulfide	quartzite, mica sch amp sch. ls, dolerite, floats of quartzite with green copper	At the western part of Area IV-(1) A, B class of anomalies were detected	–	11	mica sch, q sch, amp sch, quartzite	79.35-81.20 (1.85)	–	–	–	native copper	0.022	–	?	No copper mineralization except native copper was found, but wide pyritization are observed. Results of geological, geochemical and geophysical surveys show suitable environments for copper mineralization. Further explorations are preferable for this area	2
–				12	mica sch, q sch, green sch, quartzite	–	79.70-83.40 (3.70)	–	–	py: weak imp.	–	–	?		
Sulfide				13	mica sch. q sch hb sch.	–	55.45-87.70 (32.25) 95.10-100.30 (5.20)	–	–	py: weak imp.	–	–	?		
Sulfide				14	q sch, mica sch, quartzite	–	54.35-100.00 (45.65)	–	–	py: imp > in q vein	–	–	sulfide		
–				15	mica sch	–	–	–	–	–	–	–	?		
–	quartzite, mica sch, dolerite,	–	dolerite NW direction	16	Dolerite, talc-carb rock, mica sch, aplite, some skarn minerals	41.75-47.50 (5.75)	–	–	–	bo, cc, cp, malachite	0.172		sulfide	Copper mineralization seems to be related with leaching of basalt and it seems to be small scale.	
–				17		30-50-34.80 (4.30) 64.00-66.00 (2.00)	–	–	–	bo, cc, cp, malachite	0.620	–	sulfide		
–	serp, gn, amp sch 5 deposits, many showings and floats of chromite were found. Each serp body is small in scale	–	Most of serp bodies are less than 30 m, in width, Dolerite dykes were catched clearly.	1	serp, gn, chromite	–	–	12.97-13.39 (0.42)	–	massive chromite, with some magnetite	–	27.30	–	Surface scale of unit deposit 10 m x 1 m (max.) Chromite layers hit by drilling seem to be accessory ones, but not the main ore bodies.	4
–				2	serp, chromite, gn	–	–	20.45-21.75 (1.30) 23.38-24.10 (0.72) 38.10-38.45 (0.35) 40.10-40.33 (0.23)	–	massive chromite, with some magnetite	–	31.70	–		
–				3	serp, gn	–	–	–	–	–	–	–	–		
–				18	gn, serp	–	–	–	–	–	–	–	–		

第Ⅴ部　結論および将来への展望

本年度は第１，２年次の調査の結果に基づいて，銅鉱床賦存の可能の高い区域として選び出された地区及びクロマイトの露頭が確認され，その拡大が期待される地域についてボーリングを主体にその周辺部地質調査，簡易磁気探査，地化学探査等の調査を実施した。

本年度の調査目的は銅徴地区については物理探査，地化学探査，ボーリング等により，鉱徴を確認し，規模，品質，諸性質を明らかにすることによって本地域の総合的な評価を行い今後の探鉱指針を得ることにあった。

一方クロム鉱床については，露頭部を中心に地質調査，トレンチ，試錐，簡易磁気探査等を行い鉱況の把握することおよび周辺部の鉱徴を確認することにあった。

本年度の調査結果から得られた結論は次の通りである。

1. 調査地区内の地質は，本年度は調査地区がせまく且つ露頭が少いため，従来の見解を変更しなければならないような新事実は得られなかった。
2. 銅鉱徴地区はArea Ⅰ～Ⅳの４区域に分かれている。Area ⅠはMosetse river gneiss層群の地層の褶曲部にあたり，物理探査の示徴に対して試錐（ＧＳＪ－４，５孔）を実施した。ＧＳＪ－５孔で黄鉄鉱の薄層が見られる程度で銅の鉱徴は認められなかった。

Area Ⅱでは地化学探査の異常を狙って試錐（ＧＳＪ－６孔）を実施した。Matsitama schist and metasedimentary 層群の角閃片岩中に黄鉄鉱，黄銅鉱，赤鉄鉱の鉱化が認められた。

鉱化は弱いが広範囲にわたっており地表にも近くに銅の鉱徴が見られた。

Area Ⅲでは主として物理探査の示徴に対して試錐（ＧＳＪ－７～１０孔）を実施した。ＧＳＪ－９孔でわずかに黄銅鉱，黄鉄鉱を認めたほか，ＧＳＪ－７孔，ＧＳＪ－１０孔で石墨片岩が見られた。

これは石墨を伴うBushman 型鉱床を胚胎する地質環境に近い地質状況を示している。

Area Ⅳは中央部から西部へかけての地域における地化学探査，物理探査の異常に対して実施された試錐（ＧＳＪ－１１～１５孔）と東側の旧トレンチ横での試錐（ＧＳＪ－１６，１７孔）がある。前者では比較的広範囲に黄鉄鉱の鉱染が見られ（ＧＳＪ－１４孔）微量ながら自然銅も認められた（ＧＳＪ－１１孔）。

地化学探査は第２年次の続きとして調査地区西南端部１２㎢について実施した。その結果，Ａ級異常を含むＢ級の異常が西側へ延長していることが判明した。

地表でも数個所で銅鉱徴を確認した。

一方調査地域南東部のA.A.Cによるトレンチの鉱徴を追跡した試錐（ＧＳＪ－１６，１７孔）

の結果では，鉱徴は確認されたが，その岩石は風化岩，貫入岩，変質岩が錯綜しており地質を明確に出来ない。鉱徴の見られる変質岩の原岩は玄武岩と考えられ，これに由来する鉱化であれば小規模のものである。

3. 本年度の調査では，試錐の大部分は空中物理探査により抽出された異常域に重復して実施された地上物理探査による示徴を狙いこの実態把握を目的として実施された。

その結果ＧＳＪ－４，７，１０，１３孔では石墨が見られ，物理探査の示徴はこれに起因するものと考えられる。他についても岩脈類あるいは岩相のちがいなど地質を反映したと思われるがはっきりしない。いずれも鉱徴を認めず物理探査の示徴は地層，断層など地質単元によるものと思われる。

地化学探査の異常を狙って実施した試錐ではいずれも弱いながらも鉱徴が見られた。

4. クロム鉱は超塩基性岩中にレンズ状，豆鞘状で胚胎していると考えられる。鉱体規模は幅0.５～1.０m，延長５～１０mで品位はCr_2O_3 ３２～３６％，T.Fe １７～１９％，$A\ell_2O_3$ １１～１３％，MgO １１～１５％，SiO_2 ７～１１％ を示す。これらの小鉱体が超塩基性岩中に点在するが個々の鉱体は一定の方向性をもたず，母岩の超塩基性岩の局部的な構造に支配されていると思われる。

5. これらの調査結果から銅鉱徴地区ではArea ⅡとArea Ⅳの西部区域が有望と考えられる。

Area Ⅱでは試錐で広範囲にわたって銅鉱化が認められること，地化学探査の異常が見られること，地表にも銅鉱徴が認められること，それらがmatsitama鉱床の胚胎層準であるmatsitama schist and metasedimentary 層群中にあることなどから，今後はＧＳＪ－６孔を中心に細かなグリットでの地化学探査を実施して探鉱個所をしぼるとともに１００m程度の試錐により鉱化帯の水平的，垂直的な広がりを確認することが望まれる。

Area Ⅳでは地化学探査の結果，いくつかの異常域が抽出されること，地表でも銅の鉱徴が認められること，Matsitama sehist and metasedimentary 層群が分布することからこれらの示徴に対して鉱況確認のため１孔当り深度１００m程度の試錐による探鉱が望まれる。

6. クロム鉱床地区については鉱体の走向が一定せず，その延び先を推定しにくいため，トレンチによる鎚押探鉱で鉱体の規模，形状，品位等を確認しながら浅掘試錐を併用して探鉱範囲を拡大していくことが望まれる。

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