

Follow-up Report of Demonstration Work of AR2000 Super Recycler

Green ARM Co., Ltd.
and
Nippon Hodo Co., Ltd.

【Reference Data】

1 . Outline of Demonstration

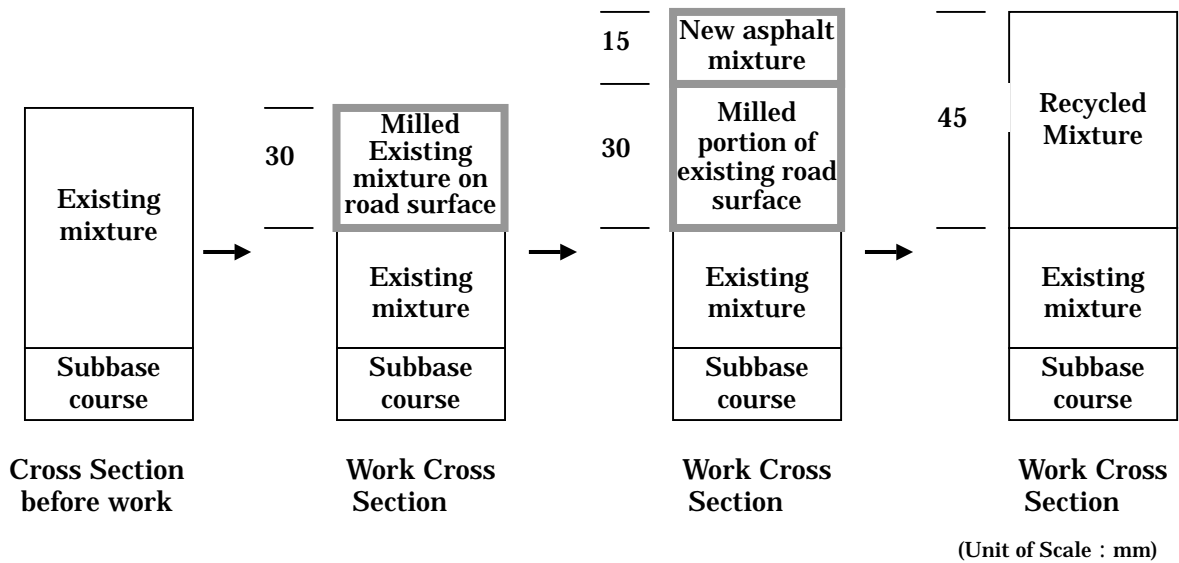
Date : November 20-21 2001

Weather Conditions

Date	Weather	Temperature ()		Wind Direction	Wind Velocity (m/s)
		Max	Min		
Nov. 20	Clear	15	10	N ~ ESE	2 ~ 3
Nov. 21	Clear	16	10	N ~ ESE	2 ~ 5

2 . Applied Method and Working Cross Section

The work method applied by the AR2000 was the so-called surface recycling in-place method (remixing system). A cross section of the performed demonstration work is shown in Figure 2.1.



- Work Cross Section Heating and milling of existing mixture
 - Work Cross Section Adding and placing of new material
 - Work Cross Section Mixing of existing mixture, new asphalt mixture and rejuvenator,
- Laydown
- Compaction

Figure-2.1 Work Cross Section (Surface Recycling in-place (remixing system))

3 . Mix Proportion Design of Utilized Materials

Prior Inspection

The design of mix proportion of the recycled materials required a prior inspection of the existing pavement. Its results are shown in Table 3-1.

Table-3-1 Quality of Existing Pavement

Item	Job Site #1	Job Site #2
Asphalt content (%)	5.19	3.92
Penetration	27	21
Softening Point	58.0	59.4

Design of mix proportion of the remixed materials

The finalized mix proportion design of the recycled materials is shown in Table 3-2

Table-3.2 Mix proportion design of the recycled materials

Item		Job Site #1	Job Site #2	Standard value
Mix proportion ratio of existing materials and newly added materials		(Existing : New) 67 : 33		-
Content of rejuvenator (relative to content of asphalt %)		12.0	17.5	-
New asphalt mixture	Content of new asphalt (%)	5.38	7.26	-
	Penetration of new asphalt (1/10mm)	50		-
Recycled mixture	Content of recycled asphalt (%)	5.5	5.3	-
	Theoretical density (g/cm ³)	2.638	2.778	-
	Bulk density (g/cm ³)	2.538	2.672	-
	Air voids ratio (%)	3.8	3.8	3 ~ 6
	Saturation degree (%)	77.9	78.2	70 ~ 85
	Marshall stability (kN)	9.58	9.10	Above 4.90
	Marshall stability (1/100cm)	36	33	20 ~ 40

4 . Operation Results

Operation Speed

Operation speed of the Asphalt Finisher (AF) over the total length of the work .is adopted to determine the operation speed. Table-4.1 shows the results.

Table-4.1 Results of operation speed

Work Section	Lane	Length of operation (m)	AF operation speed		Remarks
			Operation time (min)	Operation speed (m/min)	Road surface temperature
Job Site #1	1	448	110	4.1	13
	2	448	85	5.3	15
	3	448	90	5.0	14
Job Site #2	4	300	55	5.5	13
	5	449	85	5.3	16
	6	449	80	5.6	14
			Average	5.1	14

1. Summary

All the results of the inspection and tests conclude as follows:

- There was nearly no crack initiation, as the cracking ratios were 0.03% at the job site #1 and 0.12% at #2.
- The longitudinal roughness of 1.45mm at the job site #1, 1.5mm at #2 satisfactorily met the specified value of below 2.4mm.
- The rutting depth was measured less than 3mm, which means no defective level, whereas the larger values were measured on the aggregate scattering spots.
- The results of the specific gravity and maximum specific gravity tests concluded that the air voids ratio on the aggregate scattering spots was larger, which meant that the air voids might be one of the causes of aggregate scattering.
- The extracted grading in comparison with the mix design value was measured slightly finer at the job site #1 and coarser at #2.
- The characteristic of the recovered asphalt showed a normal deterioration progress at the both job sites and no abnormal characteristic was observed at the time of inspection. But, some slightly faster deterioration progress was found on the aggregate scattering spots.
- The MCI grade was B, and the road surface was at present in good conditions.

The characteristics of the pavement after being utilized one year were totally sound so that it can be determined that the pavement utilization during the initial period had no problem. Further follow-up inspections, however, are required on the aggregate scattering spots at the job site #2 to determine a duration of its utilization.

2. Preface

This is a summary report on the results of the follow-up inspection conducted at the site of the road, which had been reconstructed by the AR2000 Super Recycler, a hot-in-place surface recycling machinery, and has been in service for approximately one year.

3. Date and Site

Inspected Date: December 17, 2002
 Repavement Date: November, 2001 (utilized about one year)
 Inspected Road: Ohgishima Plant Road, NKK
 1-1 Ohgishima, Tsurumi-ku, Yokohama
 Inspected Sites: Job Site #1-448m, Job Site #2 -449m, Inspected Width-6m

The chart below shows the inspected sites in plain view.

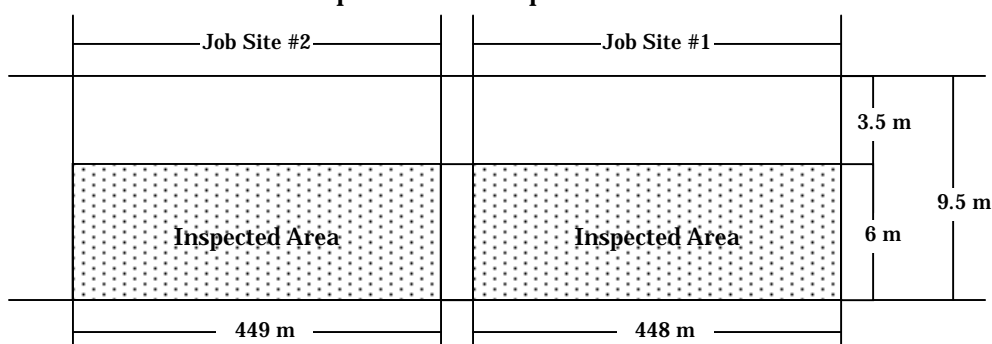


Chart 1: Inspected Sites

4. Tested Items and Methods

The tested items and applied methods with their numbers are shown in the table below.

Table-1: Inspection Methods & Numbers

Item	Method	Number
Crack Inspection	Sketching, Photo taking	$(449+448) \times 6 = 5382m^2$
Road Surface Visual Inspection	<i>Manual for Asphalt Pavement</i>	
Longitudinal Roughness	3m Profilometer, <i>Manual for Asphalt Pavement</i>	449+448m
Rutting Depth	Transverse Profilometer, <i>Manual for Asphalt Pavement</i>	44 cross sections (20m pitches)
Coring	100mm	3 cores x 2 work sections + 2 cores (aggregate scattering spots)
Core Densimetry	<i>Manual for Asphalt Pavement</i>	3 cores x 2 job sites + 2 cores (aggregate scattering spots)
Maximum Specific Gravity Test	<i>Manual for Asphalt Pavement</i> (ASTM D 2041)	1 job site x 1 piece + 1 piece (aggregate scattering spots)
Asphalt Recovery Test	<i>Manual for Asphalt Pavement</i> (ASTM D 2041)	1 job site x 1 piece + 1 piece (aggregate scattering place)
Asphalt Characteristic Test	Penetration JIS K 2007 (ASTM D D 5) Softening Point JIS K 2007(ASTM D D 36)	1 job site x 1 piece + 1 piece (aggregate scattering spots)

5. Test Results

5-1 Crack Inspection

The result is shown in the table below.

Table-2: Crack Inspection Result

Work Section	Cracking Ratio (%)
1	0.03
2	0.12

The result can determine that there was almost no crack in the both job sites.

5-2 Measurement of Longitudinal Roughness

A 3m profilometer was used for the measurement.

The result is shown in the table below.

Table-3 Measurement Result of Longitudinal Roughness

Job Site	Longitudinal Roughness (mm)	Specified Value (mm)
1	1.45	Below 2.4
2	1.15	

The both job sites satisfied the specified value of below 2.4mm.

5-3 Road Surface Visual Inspection

A few places, where the aggregate was scattered on the road surface, were found at the job site #2, but not at #1. This was caused by a machinery trouble that had occurred during the operation. (Photos-1, 2, 3)



Photo-1 Job Site #1



Photo-2 Job Site #2



Photo-3 Aggregate scattering spots

5-4 Measurement of Rutting Depth

A transverse pfilomiter was used to measure the rutting depth at 20m pitches.

The result is shown in the table below.

Table-4: Measurement Result of Rutting Depth

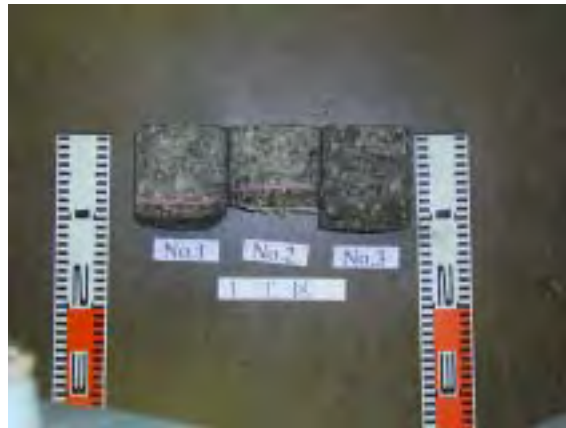
No.	Job Site #1			Job Site #2		
	D1	D2	Measured Value	D1	D2	Measured Value
1	0.0	2.5	2.5	4.0	6.0	6.0
2	1.0	0.0	1.0	3.0	0.0	3.0
3	0.0	4.0	4.0	2.0	0.0	2.0
4	0.0	0.0	1.0	13.0	3.0	13.0
5	0.0	2.0	2.0	3.0	0.0	3.0
6	2.0	0.0	0.0	2.0	8.0	8.0
7	0.0	2.0	2.0	2.0	7.0	7.0
8	1.0	0.0	0.0	2.0	1.0	2.0
9	0.0	3.0	3.0	1.5	0.0	1.5
10	2.0	3.0	3.0	5.0	2.0	5.0
11	4.0	1.0	2.0	5.0	2.5	5.0
12	1.0	2.0	4.0	2.0	2.0	2.0
13	4.0	2.0	2.0	1.5	2.0	2.0
14	1.0	1.5	4.0	2.0	2.5	2.5
15	0.0	1.0	1.0	2.0	2.0	2.0
16	1.0	0.0	0.0	3.0	2.5	3.0
17	0.0	2.0	2.0	0.0	0.0	0.0
18	0.0	2.0	2.0	0.0	0.0	0.0
19	0.0	0.0	0.0	2.0	2.0	2.0
20	0.0	2.5	2.5	2.0	3.0	3.0
21	2.0	0.0	2.0	2.0	2.0	2.0
22	2.5	2.0	2.5	0.0	4.0	4.0
Total			42.5			78.0
Average Value			1.9			3.5

There was a large spot of rutting caused by aggregate scattering, but the measured average values of 1.9mm at the job site #1 and 3.5mm at #2 can be concluded to be of no significant problem.

5-5 Coring

3 pieces of core were sampled from each job site. In addition, 2 pieces of core from the aggregate scattering spots.

1) Situation Photos



Job Site #1



Job Site #2



Aggregate scattering spots

5-6 Core Densimetry and Maximum Specific Gravity Test

The results are shown in the table below. The percentage of air voids was calculated by Formula-1 shown below. The consolidated deformation degree was determined by the magnitude relation of the air voids percentage obtained by comparing the measured density with the maximum specific gravity.

Table-5 Density and Maximum Specific Gravity Test Result

Sample No.	Item	Depth (cm)	Density (g/cm ³)	Maximum Specific Gravity (g/cm ³)	Air Voids (%)	Mix Design's Theoretical Density (g/cm ³)
Job Site #1	No.1	6.71	2.522	2.672	5.6	2.638
	No.2	8.50	2.495		6.6	
	No.3	10.08	2.563		4.1	
	Average	-	2.509		5.4	
Job Site #2	No.1	4.21	2.605	2.810	7.3	2.778
	No.2	7.51	2.611		7.1	
	No.3	4.83	2.587		7.9	
	Average	-	2.601		7.4	
Aggregate Scattering spots (Job Site #2)	No.1	6.65	2.529	2.802	9.7	2.778
	No.2	7.88	2.511		10.4	
	Average	-	2.520		10.1	

Formula-1

$$\text{Air Voids Percentage} = \left(1 - \frac{\text{Measured Density}}{\text{Maximum Specific Gravity}} \right) \times 100$$

All the values of maximum specific gravity were measured slightly higher than the theoretical density specified at the time of mix design. This was perhaps due to the mixed content of the existing material which was larger than designed.

The percentage of air voids obtained from the samples taken from the job site #2 was high, and rose higher at the aggregate scattering spots.

5-7 Asphalt Recovery and Characteristic Test

The asphalt was recovered from the cored samples and its characteristic was tested. Table-6 and Chart-2 show the results.

Table-6: Result of Asphalt Recovery and Characteristic Test

Item	Sample	Job Site #1	Job Site #2	Aggregate Scattering spots	Mix Designed	
					Job Site #1	Job Site #2
Weight of Passing Sieves (by weight %)	19.0 mm	100.0	100.0	100.0	100.0	100.0
	13.2	99.5	99.6	99.3	98.0	97.8
	4.75	66.0	55.3	41.6	62.4	62.6
	2.36	43.2	37.5	29.8	42.5	42.6
	0.6	28.2	25.1	21.5	24.6	24.3
	0.3	19.8	19.6	17.3	15.2	15.2
	0.15	11.8	11.4	10.0	11.0	10.8
	0.075	8.6	8.2	7.5	6.0	6.0
Extracted Asphalt Content (%)		5.32	5.09	4.00	-	-
Designed Asphalt Content (%)		5.50	5.30	5.30	5.50	5.30
Asphalt Characteristic	Penetration (1/10mm)	34	37	22	(45)	
	Softening Point ()	58.6	58.7	65.8	-	-
	Residual Penetration Percentage (%)	75.6	82.2	48.9	-	-

The projected penetration indicated in ().

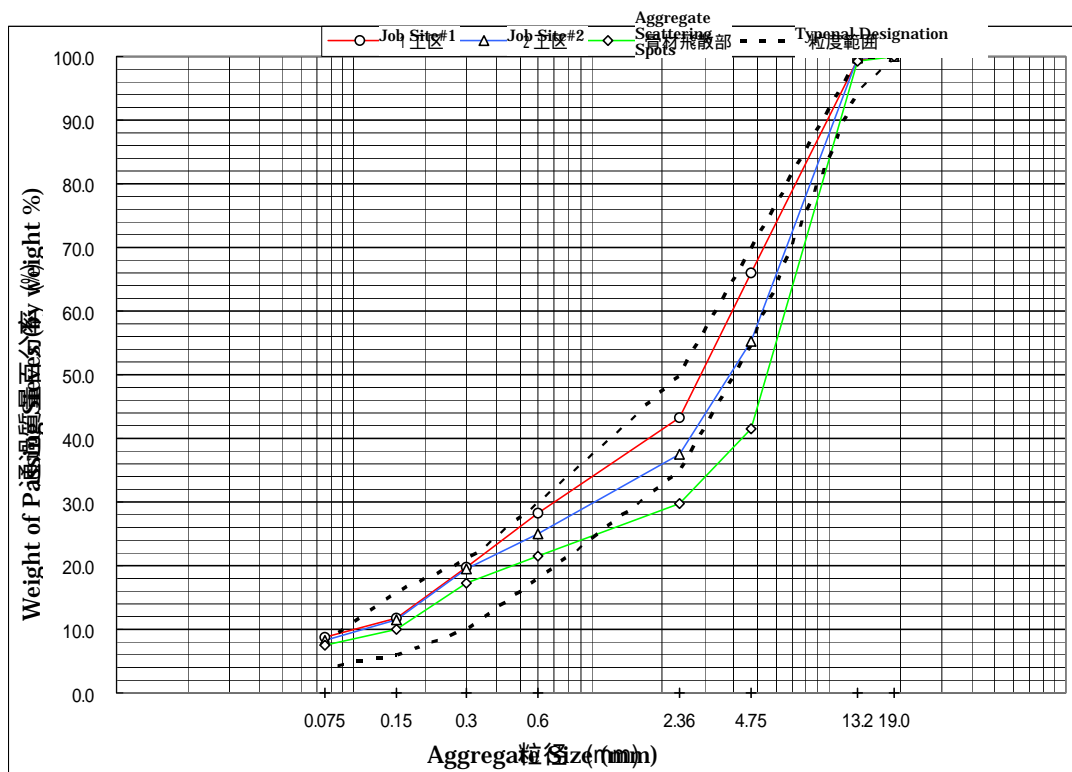


Chart-2: Grading Curves

The results of the test concluded that each extracted grade of the job site #1 and #2 was within the targeted gradation. Each grade sampled from the job site #1, however, was slightly finer since the weight percentage of the sieved fraction showed 1 to 3% larger than the mix design. As for the job site #2, the weight percentage of the fraction passing through 4.75mm and 2.36mm was 5% smaller, and the grading tended to be coarser. Furthermore, on the aggregate scattering spots of the job site #2, the grading was coarser.

The extracted asphalt contents shown in Table 6 are smaller than designed asphalt contents. Especially on the aggregate scattering spots, the asphalt content was much smaller due to the scattering.

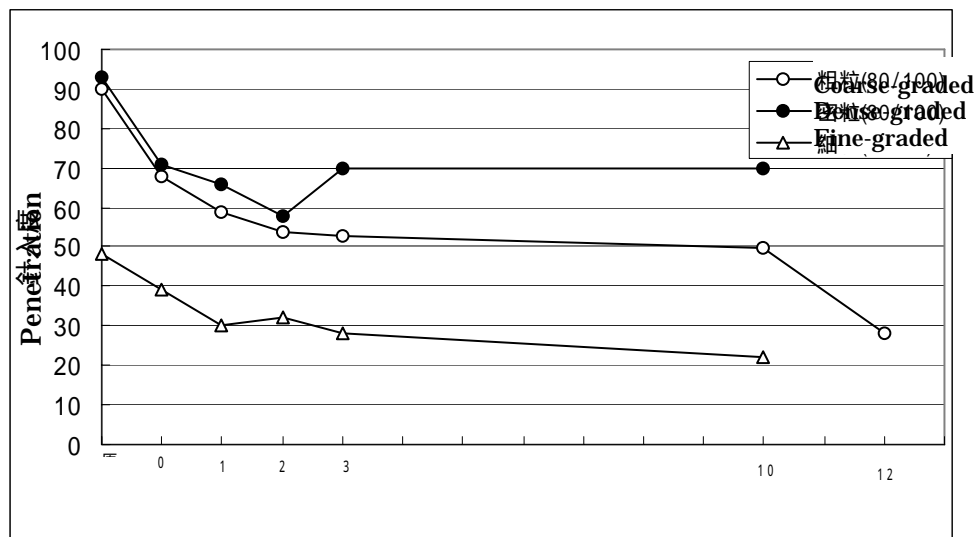


Chart-3: Penetration Curves of Utilized Mixtures

(Source: Civil Engineering Data-1985 "Asphalt Aging and Utilization Tested at Makuhari")

The characteristic test of the recovered asphalt concluded that the residual penetration at the job site #1 was 75.5% and 82.2% at #2. According to the retrospective records, asphalt deteriorates about 20% at the time of making and once utilized its deterioration reaches up to 60%. In comparison, the test concluded that the recovered asphalt had deteriorated more slowly than usual and no substantial deterioration was found.

It was, however, observed that the asphalt had deteriorated more quickly on the aggregate scattering spots at the job site #2 than the job site #1 and #2 (other parts of #2 than those aggregate scattering spots), as the residual penetration was measured 48.9%.

6. Evaluation by MCI (Maintenance Control Index)

The MCI was calculated with Formula-2 shown below, using the three parameters (cracking ratio, rutting depth and longitudinal roughness), to evaluate the conditions of the pavement.

The MCI and its evaluation are shown on Table-7 and Table-8.

$$\text{Formula-2 } MCI = 10 - 1.48 C^{0.3} - 0.29 D^{0.7} - 0.47 R^{0.2}$$

Table-7: MCI Calculation

Item	Job Site #1	Job Site #2
C : Cracking ratio (%)	0.03	0.12
D : Average of rutting depth(mm)	1.9	3.5
R : Longitudinal roughness(mm)	1.45	1.15
M C I	8.5	8.0

Table-8: MCI Evaluation Table

Grade	Point	Evaluated
A	10	Not defective at all
B	8	Very slightly defective, and in good condition
C	6	Widely defective, but no repair required
D	4	Minor repair required (patching, partial seal coating)
E	2	Major repair required (overlay, repave)

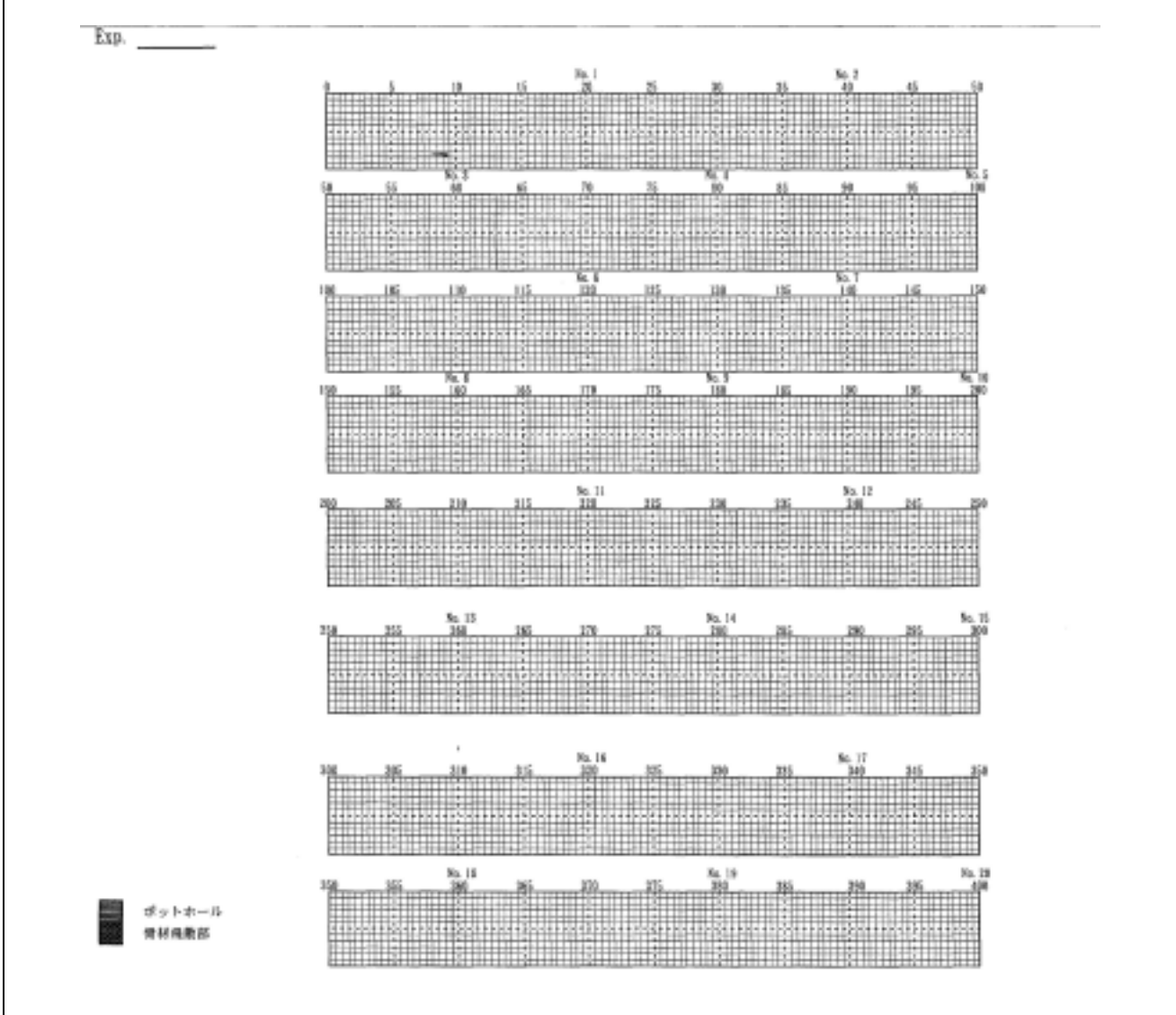
The MCI calculation referred to the above evaluation table concluded that the road surface was graded B, and very slightly defective and in good condition.

(Backup Data)

(Crack Inspection)

Road Surface Visual Inspection (Cracking Ratio)

Lane		Job Site	Work Section #1 Exp . ~ Exp .	Inspected Date	Dec.17 2001	Years in Service	1 year
Pavement Type	Dense-graded						

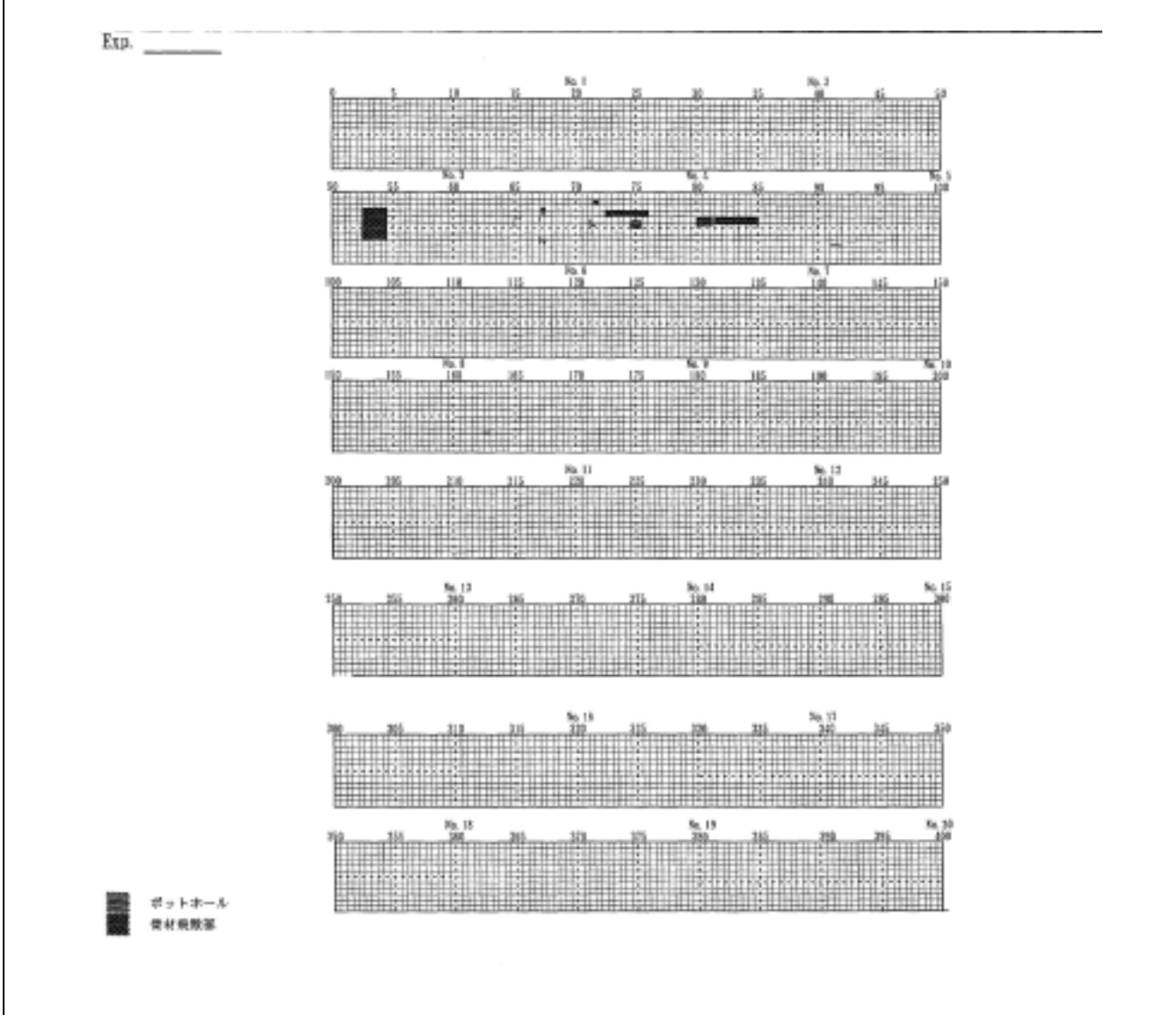


A Grid with One Linear Crack	0 Grids	0.15m ² ×	0 Grids	= 0 m ²	Total Inspected Area	2688 m ²
A Grid with Two Linear Cracks	3 Grids	0.25m ² ×	3 Grids	= 0.75 m ²	Cracked Area	0.75 m ²
A Grid of Patching of 21% up to 75%	0 Grids	0.125m ² ×	0 Grids	= 0 m ²	Cracking Ratio = Cracked Area / Total Inspected Area	0.03 %
A Grid of Patching of 75% and More	0 Grids	0.25 m ² ×	0 Grids	= 0 m ²		

Inspected Sites Ohgishima Plant Road, NKK

Road Surface Visual Inspection (Cracking Ratio)

Lane		Job Site	Work Section #2 Exp . ~ Exp .	Inspected Date	Dec.17 2001	Years in Service	1 year
Pavement Type	Dense-graded						



A Grid with One Linear Crack	10 Grids	0.15m ² ×	0 Grids	= 1.5 m ²	Total Inspected Area	2688 m ²
A Grid with Two Linear Cracks	4 Grids	0.25m ² ×	3 Grids	= 1 m ²	Cracked Area	3.25 m ²
A Grid of Patching of 21% up to 75%	0 Grids	0.125m ² ×	0 Grids	= 0 m ²	Cracking Ratio = Cracked Area / Total Inspected Area	0.12 %
A Grid of Patching of 75% and More	3 Grids	0.25 m ² ×	0 Grids	= 0.75 m ²		

Inspected Sites Ohgishima Plant Road, NKK

(Measurement of Longitudinal Roughness)

Measurement of Longitudinal Roughness

Work section #1,											
Subject <u>Ohgishima Plant Road, NKK</u>				Inspected date <u>Dec.17 2001</u>							
Measurement Starting Point _____				Inspection Item <u>3m Profilometer</u>							
Measurement Ending Point _____											
Inspected length <u>150m</u>											
Sheet Number <u>Sheet 1 of 3</u>				Inspector <u>Yoshinaka Shiga</u>							
No.	d	d2	No.	d	d2	No.	d	d2	No.	d	d2
1	7.5	56.3	26	6.0	36.0	51	7.0	49.0	76	7.5	56.3
2	7.0	49.0	27	9.0	81.0	52	6.0	36.0	77	8.0	64.0
3	8.0	64.0	28	9.0	81.0	53	9.5	90.3	78	8.0	64.0
4	8.0	64.0	29	8.0	64.0	54	6.5	42.3	79	7.5	56.3
5	7.5	56.3	30	7.5	56.3	55	8.0	64.0	80	6.0	36.0
6	8.0	64.0	31	7.0	49.0	56	7.0	49.0	81	6.0	36.0
7	8.5	72.3	32	7.0	49.0	57	7.0	49.0	82	7.0	49.0
8	7.5	56.3	33	7.0	49.0	58	9.0	81.0	83	7.0	49.0
9	7.0	49.0	34	7.0	49.0	59	8.0	64.0	84	7.5	56.3
10	9.0	81.0	35	7.0	49.0	60	8.0	64.0	85	9.0	81.0
11	7.0	49.0	36	7.5	56.3	61	9.0	81.0	86	6.0	36.0
12	7.5	56.3	37	7.0	49.0	62	6.0	36.0	87	7.0	49.0
13	6.0	36.0	38	4.5	20.3	63	8.5	72.3	88	7.5	56.3
14	6.5	42.3	39	10.0	100.0	64	6.0	36.0	89	7.0	49.0
15	7.0	49.0	40	5.5	30.3	65	6.0	36.0	90	7.0	49.0
16	9.0	81.0	41	7.0	49.0	66	7.0	49.0	91	7.0	49.0
17	7.0	49.0	42	8.0	64.0	67	7.0	49.0	92	7.5	56.3
18	8.5	72.3	43	6.5	42.3	68	7.0	49.0	93	8.0	64.0
19	8.5	72.3	44	9.0	81.0	69	6.5	42.3	94	7.5	56.3
20	7.0	49.0	45	9.5	90.3	70	9.5	90.3	95	8.5	72.3
21	6.5	42.3	46	8.0	64.0	71	4.0	16.0	96	7.0	49.0
22	7.5	56.3	47	9.5	90.3	72	7.0	49.0	97	6.5	42.3
23	6.0	36.0	48	6.5	42.3	73	6.5	42.3	98	7.0	49.0
24	7.0	49.0	49	6.0	36.0	74	5.5	30.3	99	7.0	49.0
25	6.0	36.0	50	8.0	64.0	75	6.0	36.0	100	8.0	64.0
d						d of each sheet		731.5			
d2						d2 of each sheet		5470.3			
Number of Data						Number of Data of Each Sheet		100.0			
Standard Variation						1.10					

Measurement of Longitudinal Roughness

Subject	Work section #1, Ohgishima Plant Road, NKK			Inspected date	Dec.17 2001						
Measurement Starting Point				Inspection Item	3m Profilometer						
Measurement Ending Point											
Inspected length	150m										
Sheet Number	Sheet 2 of 3			Inspector	Yoshinaka Shiga						
No.	d	d2	No.	d	d2	No.	d	d2	No.	d	d2
1	5.0	25.0	26	6.0	36.0	51	7.0	49.0	76	8.5	72.3
2	4.0	16.0	27	6.0	36.0	52	6.0	36.0	77	9.0	81.0
3	9.5	90.3	28	7.0	49.0	53	8.0	64.0	78	9.0	81.0
4	9.5	90.3	29	7.0	49.0	54	8.0	64.0	79	7.0	49.0
5	7.5	56.3	30	7.0	49.0	55	7.0	49.0	80	5.5	30.3
6	9.5	90.3	31	7.0	49.0	56	8.5	72.3	81	5.5	30.3
7	9.0	81.0	32	7.0	49.0	57	7.0	49.0	82	8.0	64.0
8	8.0	64.0	33	6.0	36.0	58	7.0	49.0	83	8.0	64.0
9	5.5	30.3	34	6.5	42.3	59	6.5	42.3	84	9.5	90.3
10	6.5	42.3	35	7.0	49.0	60	5.0	25.0	85	6.0	36.0
11	9.0	81.0	36	8.0	64.0	61	10.0	100.0	86	8.0	64.0
12	8.0	64.0	37	6.5	42.3	62	9.0	81.0	87	8.5	72.3
13	7.0	49.0	38	7.0	49.0	63	7.5	56.3	88	6.0	36.0
14	6.0	36.0	39	8.0	64.0	64	8.0	64.0	89	8.0	64.0
15	5.5	30.3	40	7.0	49.0	65	7.0	49.0	90	9.5	90.3
16	6.0	36.0	41	5.5	30.3	66	6.5	42.3	91	6.5	42.3
17	6.0	36.0	42	6.5	42.3	67	7.5	56.3	92	6.0	36.0
18	7.0	49.0	43	6.0	36.0	68	9.0	81.0	93	7.0	49.0
19	9.0	81.0	44	7.5	56.3	69	11.0	121.0	94	7.0	49.0
20	6.0	36.0	45	7.0	49.0	70	8.0	64.0	95	7.0	49.0
21	7.0	49.0	46	6.0	36.0	71	9.0	81.0	96	7.5	56.3
22	8.0	64.0	47	7.5	56.3	72	9.0	81.0	97	7.0	49.0
23	6.0	36.0	48	10.0	100.0	73	6.0	36.0	98	7.0	49.0
24	6.0	36.0	49	4.5	20.3	74	6.0	36.0	99	8.5	72.3
25	6.5	42.3	50	8.5	72.3	75	8.3	72.3	100	7.5	56.3
d					d of each sheet		728 . 0				
d2					d2 of each sheet		5475 . 0				
Number of Data					Number of Data of Each Sheet		100 . 0				
Standard Variation											

Measurement of Longitudinal Roughness

Work section #1,											
Subject Ohgishima Plant Road, NKK						Inspected date Dec.17 2001					
Measurement Starting Point						Inspection Item 3m Profilometer					
Measurement Ending Point											
Inspected length 150m											
Sheet Number Sheet 3 of 3						Inspector Yoshinaka Shiga					
No.	d	d2	No.	d	d2	No.	d	d2	No.	d	d2
1	7.0	49.0	26	6.0	36.0	51	6.0	36.0	76	8.0	64.0
2	8.0	64.0	27	9.0	81.0	52	6.5	42.3	77	10.0	100.0
3	7.0	49.0	28	8.0	64.0	53	6.0	36.0	78	9.0	81.0
4	7.0	49.0	29	7.0	49.0	54	5.0	25.0	79	3.0	9.0
5	7.0	49.0	30	6.0	36.0	55	7.0	49.0	80	7.0	49.0
6	6.5	42.3	31	6.0	36.0	56	5.0	25.0	81	8.0	64.0
7	6.0	36.0	32	6.5	42.3	57	7.0	49.0	82	9.5	90.3
8	6.0	36.0	33	7.0	49.0	58	6.0	36.0	83	4.5	20.3
9	7.5	56.3	34	5.0	25.0	59	8.0	64.0	84	5.0	25.0
10	7.5	56.3	35	6.0	36.0	60	3.0	9.0	85	8.0	64.0
11	9.5	90.3	36	10.0	100.0	61	9.0	81.0	86	8.5	72.3
12	7.0	49.0	37	6.0	36.0	62	8.5	72.3	87	7.0	49.0
13	7.0	49.0	38	4.0	16.0	63	7.0	49.0	88	7.0	49.0
14	5.5	30.3	39	7.0	49.0	64	5.5	30.3	89	6.0	36.0
15	5.0	25.0	40	7.0	49.0	65	4.5	20.3	90	6.0	36.0
16	7.0	49.0	41	6.5	42.3	66	8.0	64.0	91	7.0	49.0
17	6.0	36.0	42	6.0	36.0	67	7.5	56.3	92	7.5	56.3
18	6.0	36.0	43	8.0	64.0	68	12.0	144.0	93	5.0	25.0
19	7.0	49.0	44	6.5	42.3	69	6.0	36.0	94	5.5	30.3
20	9.0	81.0	45	7.0	49.0	70	6.0	36.0	95		0.0
21	4.5	20.3	46	7.5	56.3	71	2.0	4.0	96		0.0
22	5.0	25.0	47	5.5	30.3	72	1.0	1.0	97		0.0
23	5.5	30.3	48	7.5	56.3	73	5.0	25.0	98		0.0
24	6.0	36.0	49	7.0	49.0	74	1.5	2.3	99		0.0
25	5.5	30.3	50	6.5	42.3	75	4.5	20.3	100		0.0
d			2072.0			d of each sheet			612.5		
d2			15222.0			d2 of each sheet			4276.8		
Number of Data			294.0			Number of Data of Each Sheet			94.0		
Standard Variation			1.45						1.75		

Measurement of Longitudinal Roughness

Inspected

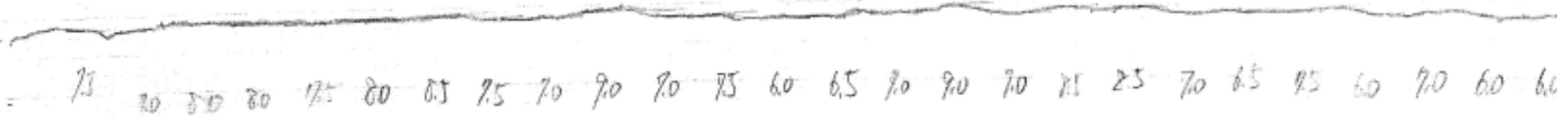
Sites Ohgishima Plant Road, NKK

Work
section

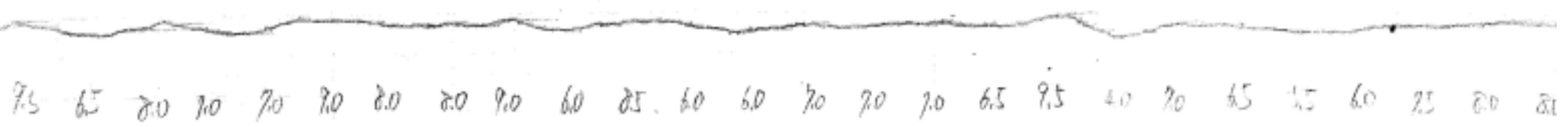
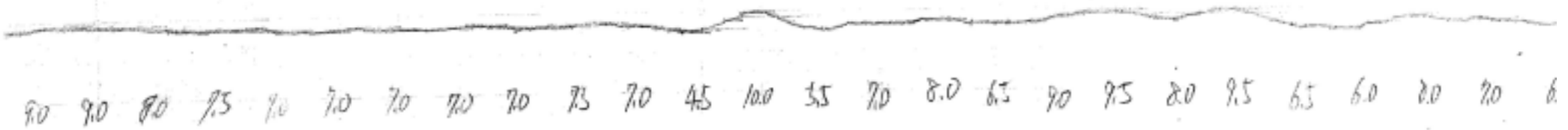
#1-1

Inspected date Dec.17 2001

Inspector Yohinaka Shiga

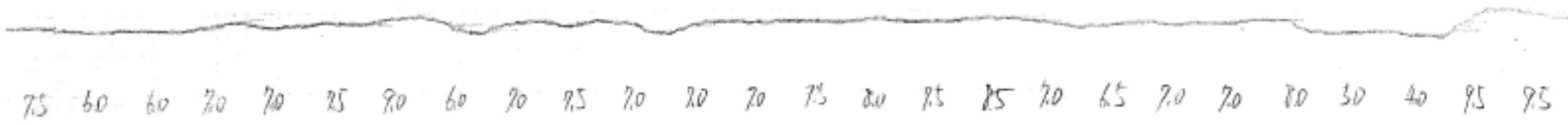


-19-

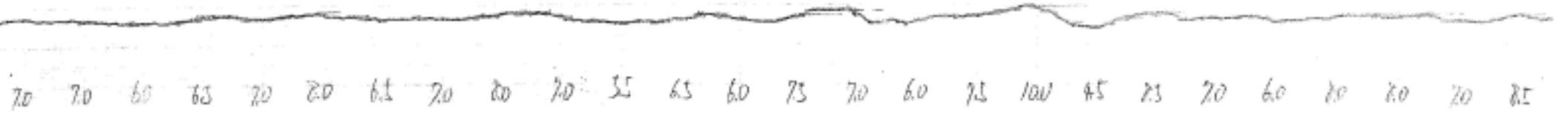
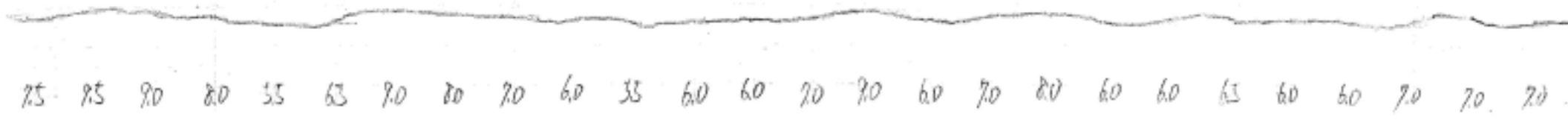


Measurement of Longitudinal Roughness

Inspected Sites Ohgishima Plant Road, NKK Work section #1-2 Inspected date Dec.17 2001 Inspector Yohinaka Shiga

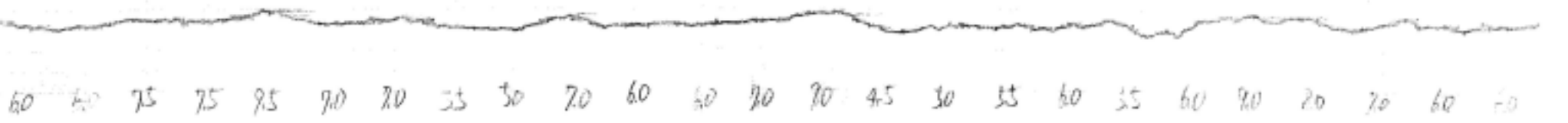
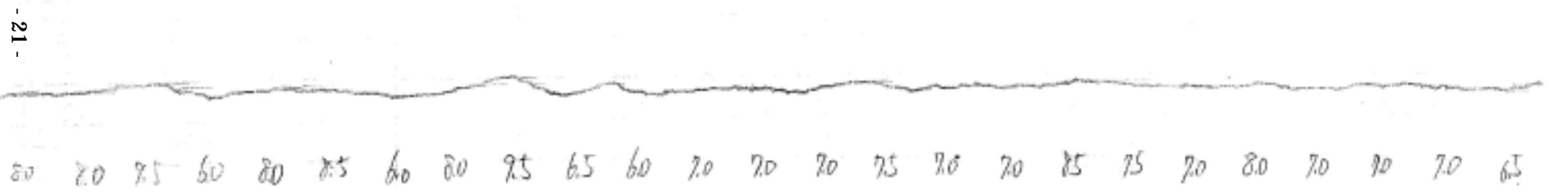
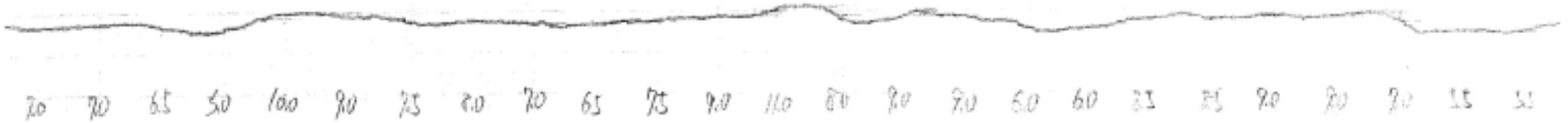


- 20 -



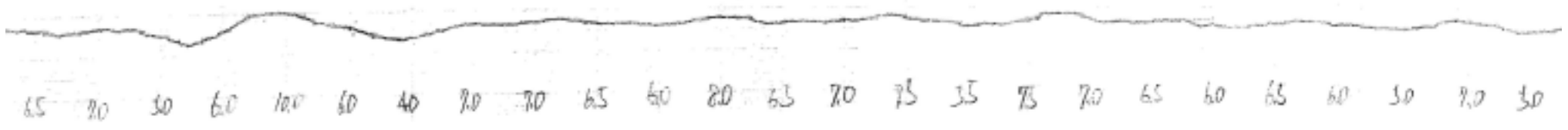
Measurement of Longitudinal Roughness

Inspected Sites Ohgishima Plant Road, NKK Work section #1-3 Inspected date Dec.17 2001 Inspector Yohinaka Shiga

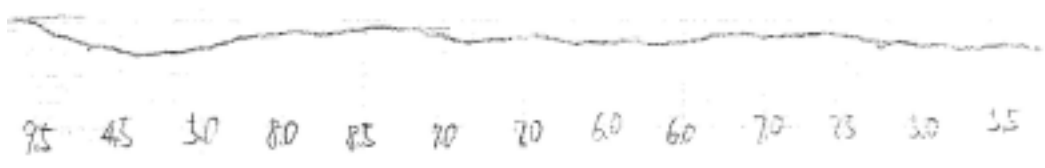
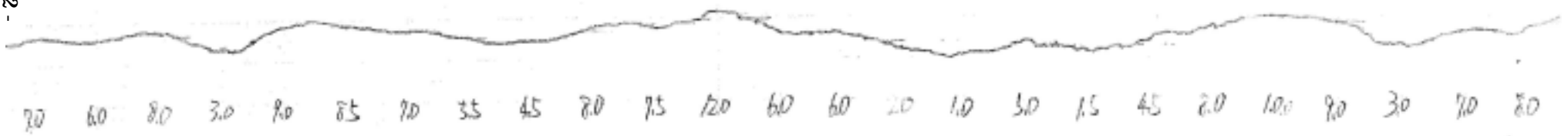


Measurement of Longitudinal Roughness

Inspected Sites Ohgishima Plant Road, NKK Work section #1-4 Inspected date Dec.17 2001 Inspector Yohinaka Shiga



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Measurement of Longitudinal Roughness

Work section #2,											
Subject <u>Ohgishima Plant Road, NKK</u>				Inspected date <u>Dec.17 2001</u>							
Measurement Starting Point _____				Inspection Item <u>3m Profilometer</u>							
Measurement Ending Point _____											
Inspected length <u>150m</u>											
Sheet Number <u>Sheet 1 of 3</u>				Inspector <u>Yoshinaka Shiga</u>							
No.	d	d2	No.	d	d2	No.	d	d2	No.	d	d2
1	1.0	1.0	26	3.0	9.0	51	1.0	1.0	76	1.0	1.0
2	0.0	0.0	27	0.0	0.0	52	3.0	9.0	77	1.5	2.3
3	1.5	2.3	28	3.5	12.3	53	1.5	2.3	78	-0.5	0.3
4	1.0	1.0	29	1.0	1.0	54	1.0	1.0	79	1.0	1.0
5	0.5	0.3	30	1.0	1.0	55	1.0	1.0	80	0.0	0.0
6	2.0	4.0	31	1.0	1.0	56	3.5	12.3	81	0.5	0.3
7	1.0	1.0	32	-2.0	4.0	57	-0.5	0.3	82	4.0	16.0
8	3.0	9.0	33	0.5	0.3	58	1.0	1.0	83	2.0	4.0
9	2.0	4.0	34	1.5	2.3	59	2.0	4.0	84	1.0	1.0
10	0.5	0.3	35	0.0	0.0	60	1.5	2.3	85	1.0	1.0
11	0.0	0.0	36	3.5	12.3	61	1.0	1.0	86	-0.5	0.3
12	1.5	2.3	37	2.0	4.0	62	3.0	9.0	87	0.0	0.0
13	1.0	1.0	38	2.0	4.0	63	0.5	0.3	88	0.0	0.0
14	0.5	0.3	39	1.5	2.3	64	1.0	1.0	89	-1.0	1.0
15	4.5	20.3	40	2.5	6.3	65	0.0	0.0	90	1.5	2.3
16	-0.5	0.3	41	-0.5	0.3	66	2.0	4.0	91	0.0	0.0
17	2.0	4.0	42	3.0	9.0	67	0.0	0.0	92	1.5	2.3
18	2.0	4.0	43	1.0	1.0	68	4.0	16.0	93	1.0	1.0
19	-0.5	0.3	44	0.5	0.3	69	2.0	4.0	94	6.0	36.0
20	2.5	6.3	45	1.0	1.0	70	-1.0	1.0	95	1.0	1.0
21	0.0	0.0	46	0.0	0.0	71	0.0	0.0	96	2.0	4.0
22	0.0	0.0	47	1.0	1.0	72	1.0	1.0	97	1.5	2.3
23	0.5	0.3	48	2.0	4.0	73	2.0	4.0	98	1.5	2.3
24	-0.5	0.3	49	0.5	0.3	74	2.0	4.0	99	0.0	0.0
25	3.0	9.0	50	1.5	2.3	75	1.5	2.3	100	0.0	0.0
d						d of each sheet		119 . 5			
d2						d2 of each sheet		309 . 8			
Number of Data						Number of Data of Each Sheet		100 . 0			
Standard Variation						1.30					

Measurement of Longitudinal Roughness

Work section #2,											
Subject <u>Ohgishima Plant Road, NKK</u>				Inspected date <u>Dec.17 2001</u>							
Measurement Starting Point _____				Inspection Item <u>3m Profilometer</u>							
Measurement Ending Point _____											
Inspected length <u>150m</u>											
Sheet Number <u>Sheet 2 of 3</u>				Inspector <u>Yoshinaka Shiga</u>							
No.	d	d2	No.	d	d2	No.	d	d2	No.	d	d2
1	2.0	4.0	26	1.0	1.0	51	1.0	1.0	76	1.0	1.0
2	0.5	0.3	27	0.5	0.3	52	2.5	6.3	77	1.0	1.0
3	0.0	0.0	28	5.0	25.0	53	-0.5	0.3	78	-0.5	0.3
4	1.5	2.3	29	-1.5	2.3	54	2.0	4.0	79	1.0	1.0
5	1.0	1.0	30	-1.0	1.0	55	1.0	1.0	80	0.0	0.0
6	1.0	1.0	31	0.0	0.0	56	1.0	1.0	81	1.5	2.3
7	1.0	1.0	32	0.5	0.3	57	0.0	0.0	82	2.0	4.0
8	2.5	6.3	33	0.5	0.3	58	-1.0	1.0	83	0.0	0.0
9	3.0	9.0	34	2.5	6.3	59	0.5	0.3	84	-0.5	0.3
10	-0.5	0.3	35	0.0	0.0	60	-0.5	0.3	85	-1.0	1.0
11	1.0	1.0	36	1.0	1.0	61	1.5	2.3	86	2.5	6.3
12	2.5	6.3	37	0.5	0.3	62	1.5	2.3	87	-1.0	1.0
13	1.0	1.0	38	-0.5	0.3	63	-0.5	0.3	88	1.5	2.3
14	1.0	1.0	39	-0.5	0.3	64	0.5	0.3	89	1.5	2.3
15	1.0	1.0	40	-0.5	0.3	65	0.0	0.0	90	1.0	1.0
16	1.0	1.0	41	1.5	2.3	66	2.5	6.3	91	2.0	4.0
17	1.0	1.0	42	1.0	1.0	67	2.0	4.0	92	1.0	1.0
18	1.0	1.0	43	1.0	1.0	68	0.0	0.0	93	1.0	1.0
19	1.0	1.0	44	1.5	2.3	69	2.0	4.0	94	1.0	1.0
20	1.0	1.0	45	0.5	0.3	70	0.5	0.3	95	0.0	0.0
21	1.0	1.0	46	0.5	0.3	71	1.0	1.0	96	0.0	0.0
22	1.0	1.0	47	-0.5	0.3	72	-0.5	0.3	97	-1.0	1.0
23	1.0	1.0	48	1.5	2.3	73	0.0	0.0	98	3.0	9.0
24	0.0	0.0	49	-1.5	2.3	74	0.5	0.3	99	1.0	1.0
25	1.0	1.0	50	1.0	1.0	75	-1.0	1.0	100	0.5	0.3
d						d of each sheet			76 . 0		
d2						d2 of each sheet			174 . 0		
Number of Data						Number of Data of Each Sheet			100 . 0		
Standard Variation						1 . 08					

Measurement of Longitudinal Roughness

Subject	Work section #2, Ohgishima Plant Road, NKK			Inspected date	Dec.17 2001		
Measurement Starting Point				Inspection Item	3m Profilometer		
Measurement Ending Point							
Inspected length	150m						
Sheet Number	Sheet 3 of 3			Inspector	Yoshinaka Shiga		

No.	d	d2	No.	d	d2	No.	d	d2	No.	d	d2
1	2.5	6.3	26	1.0	1.0	51	1.0	1.0	76	2.5	6.3
2	2.0	4.0	27	1.0	1.0	52	1.5	2.3	77	1.0	1.0
3	1.0	1.0	28	-0.5	0.3	53	1.0	1.0	78	-0.5	0.3
4	0.5	0.3	29	1.0	1.0	54	1.0	1.0	79	2.5	6.3
5	1.0	1.0	30	1.5	2.3	55	2.0	4.0	80	1.0	1.0
6	1.0	1.0	31	2.0	4.0	56	1.5	2.3	81	0.0	0.0
7	0.5	0.3	32	1.0	1.0	57	1.0	1.0	82	1.0	1.0
8	1.0	1.0	33	1.5	2.3	58	2.0	4.0	83	1.5	2.3
9	-2.0	4.0	34	1.5	2.3	59	-1.5	2.3	84	-0.5	0.3
10	0.0	0.0	35	0.0	0.0	60	-0.5	0.3	85	-2.0	4.0
11	1.0	1.0	36	1.0	1.0	61	2.5	6.3	86	0.5	0.3
12	1.5	2.3	37	1.0	1.0	62	0.0	0.0	87	2.5	6.3
13	2.0	4.0	38	0.0	0.0	63	0.5	0.3	88	2.0	4.0
14	1.0	1.0	39	0.5	0.3	64	0.5	0.3	89	1.5	2.3
15	1.0	1.0	40	0.0	0.0	65	0.0	0.0	90	-2.5	6.3
16	1.0	1.0	41	-0.5	0.3	66	0.5	0.3	91		0.0
17	1.5	2.3	42	1.0	1.0	67	0.5	0.3	92		0.0
18	1.5	2.3	43	0.0	0.0	68	0.5	0.3	93		0.0
19	1.0	1.0	44	1.0	1.0	69	1.0	1.0	94		0.0
20	0.5	0.3	45	2.0	4.0	70	2.5	6.3	95		0.0
21	1.0	1.0	46	2.0	4.0	71	1.5	2.3	96		0.0
22	0.0	0.0	47	2.0	4.0	72	0.5	0.3	97		0.0
23	2.0	4.0	48	1.0	1.0	73	1.5	2.3	98		0.0
24	-0.5	0.3	49	0.5	0.3	74	0.0	0.0	99		0.0
25	1.0	1.0	50	0.5	0.3	75	0.5	0.3	100		0.0
d				272.5	d of each sheet						77.0
d2				637.8	d2 of each sheet						154.0
Number of Data				290.0	Number of Data of Each Sheet						90.0
Standard Variation				1.15							1.00

Measurement of Longitudinal Roughness

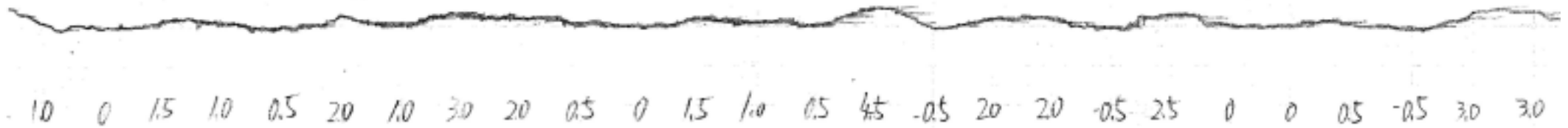
Inspected

Sites Ohgishima Plant Road, NKK

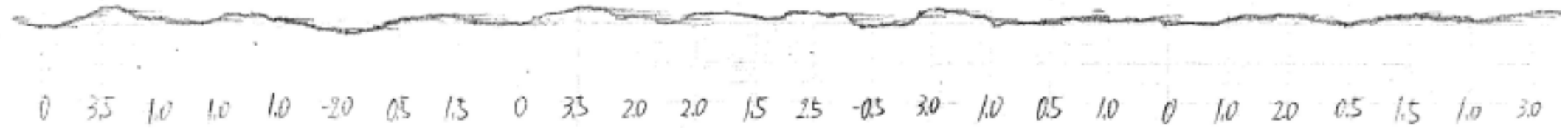
Work section #2-1

Inspected date Dec.17 2001

Inspector Yohinaka Shiga



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Measurement of Longitudinal Roughness

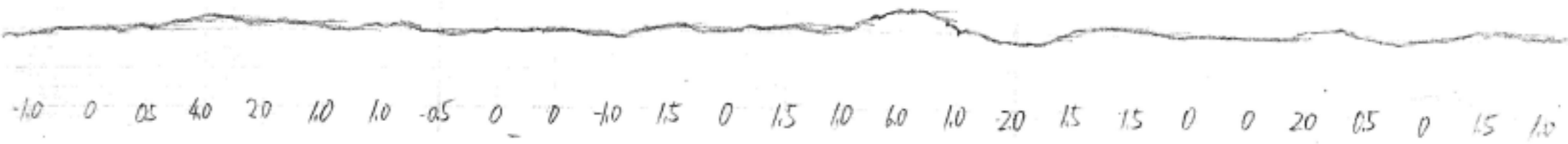
Inspected

Sites Ohgishima Plant Road, NKK

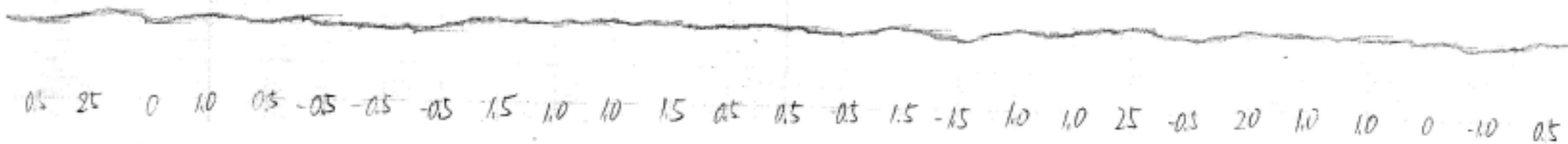
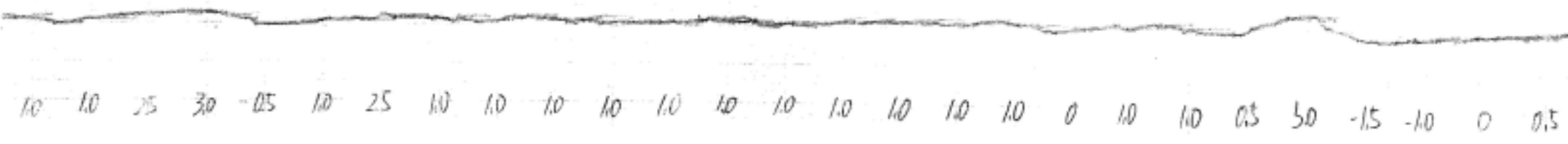
Work section #2-2

Inspected date Dec.17 2001

Inspector Yohinaka Shiga



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Measurement of Longitudinal Roughness

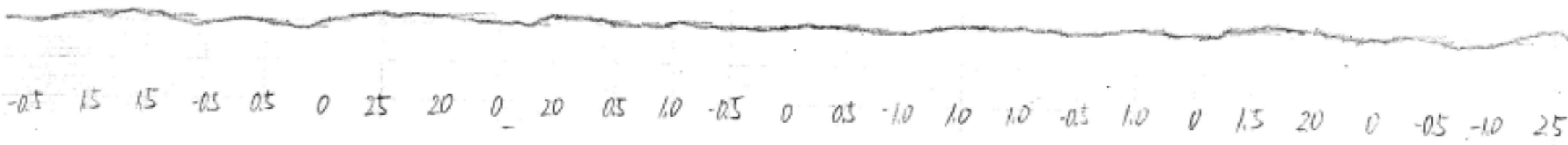
Inspected

Sites Ohgishima Plant Road, NKK

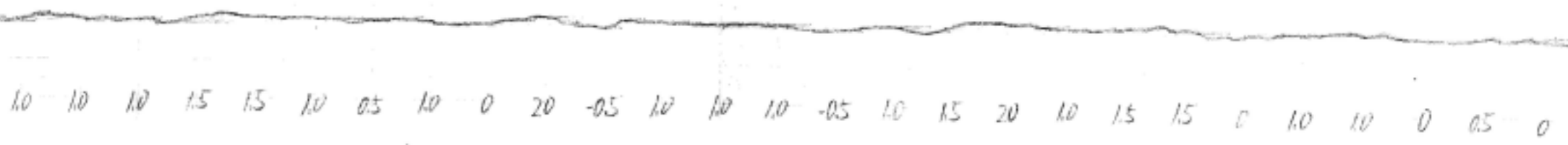
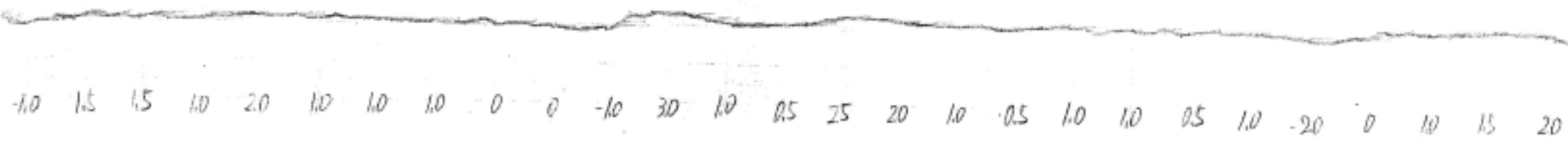
Work section #2-3

Inspected date Dec.17 2001

Inspector Yohinaka Shiga



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Measurement of Longitudinal Roughness

Inspected

Sites Ohgishima Plant Road, NKK

Work section #2-4

Inspected date Dec.17 2001

Inspector Yohinaka Shiga



-0.5 1.0 0 1.0 2.0 2.0 2.0 1.0 0.5 0.5 1.0 1.5 1.0 1.0 2.0 1.5 1.0 2.0 -1.5 -0.5 2.5 0 0.5



0.5 0 0.5 0.5 0.5 1.0 2.5 1.5 0.5 1.5 0 0.5 2.0 -0.5 0 -0.5 0.5 2.5 1.0 -0.5 2.5 1.0 0



1.0 1.5 -0.5 -2.0 0.5 2.5 2.0 1.5 -2.5

(Measurement of Rutting Depth)

Measurement of Rutting Depth

Inspected Sites	Ohgishima Plant Road, NKK	Inspected date	Dec.17 2001				
		Inspection Item	Transverse Profilometer				
Measured Sites	Work section #1						
Measurement Starting Point	No . 1						
Measurement Ending Point	No . 22	Inspector	Yoshinaka Shiga				
Road shoulder for west							
Measurement Point	D1 (mm)	D2 (mm)	Measured Value (mm)	Measurement Point	D1 (mm)	D2 (mm)	Measured Value (mm)
No . 1	0 . 0	2 . 5	2 . 5	No . 12	4 . 0	2 . 0	4 . 0
No . 2	1 . 0	0 . 0	1 . 0	No . 13	1 . 0	2 . 0	2 . 0
No . 3	0 . 0	4 . 0	4 . 0	No . 14	4 . 0	1 . 5	4 . 0
No . 4	1 . 0	0 . 0	1 . 0	No . 15	1	1	1 . 0
No . 5	0 . 0	2 . 0	2 . 0	No . 16	0	0	0 . 0
No . 6	0 . 0	0 . 0	0 . 0	No . 17	1	2	2 . 0
No . 7	2 . 0	2 . 0	2 . 0	No . 18	0	2	2 . 0
No . 8	0 . 0	0 . 0	0 . 0	No . 19	0	0	0 . 0
No . 9	1 . 0	3 . 0	3 . 0	No . 20	0	2 . 5	2 . 5
No . 10	0 . 0	3 . 0	3 . 0	No . 21	2	0	2 . 0
No . 11	2 . 0	1 . 0	2 . 0	No . 22	2 . 5	2	2 . 5
Total (mm)			20 . 5	Total (mm)			22 . 0
Average (+) / Number of Data (mm)				1 . 9			
Remarks							

Measurement of Rutting Depth

Inspected

Sites Ohgishima Plant Road, NKK

Work

section #1

Inspected date Dec.17 2001

Inspector Yohinaka Shiga

No1

路肩側

$D_1 = 0.0 \text{ mm}$

$D_2 = 23 \text{ mm}$

No2

路肩側

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$D_1 = 0.0 \text{ mm}$

$D_2 = 0.0 \text{ mm}$

No3

路肩側

$D_1 = 0.0 \text{ mm}$

$D_2 = 40 \text{ mm}$

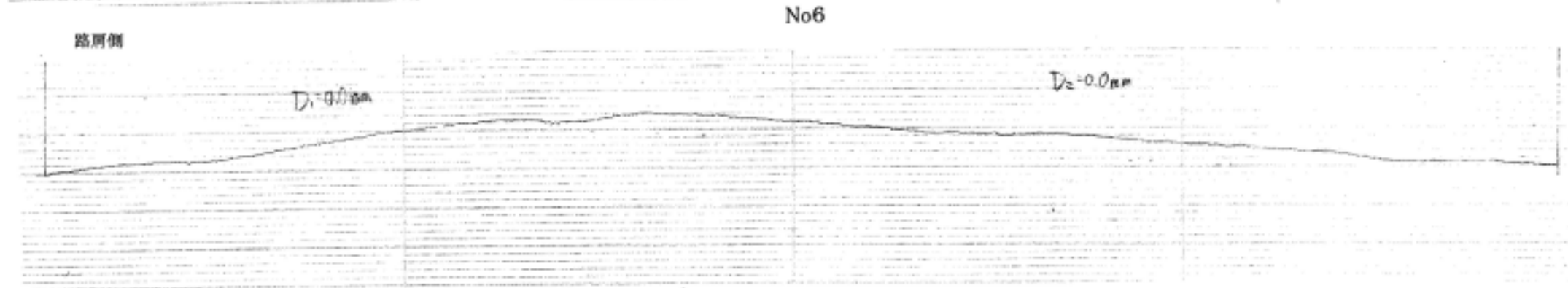
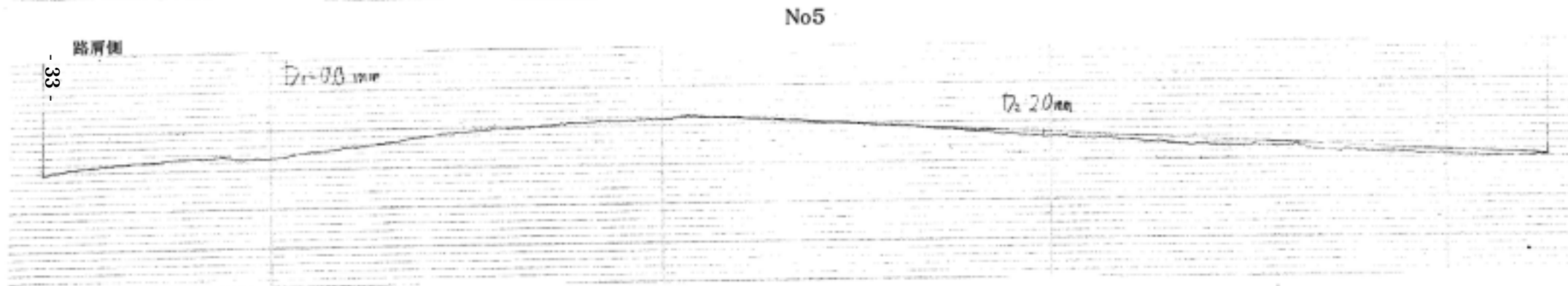
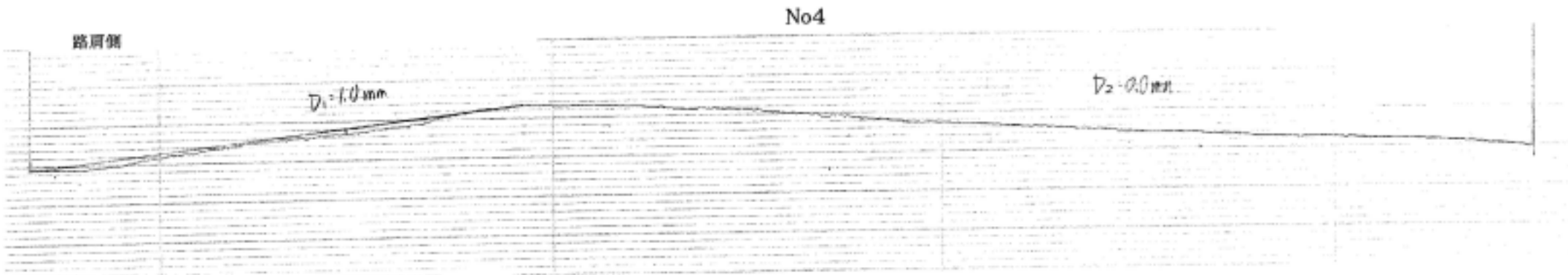
Measurement of Rutting Depth

Inspected Sites Ohgishima Plant Road, NKK

Work section #1

Inspected date Dec.17 2001

Inspector Yohinaka Shiga



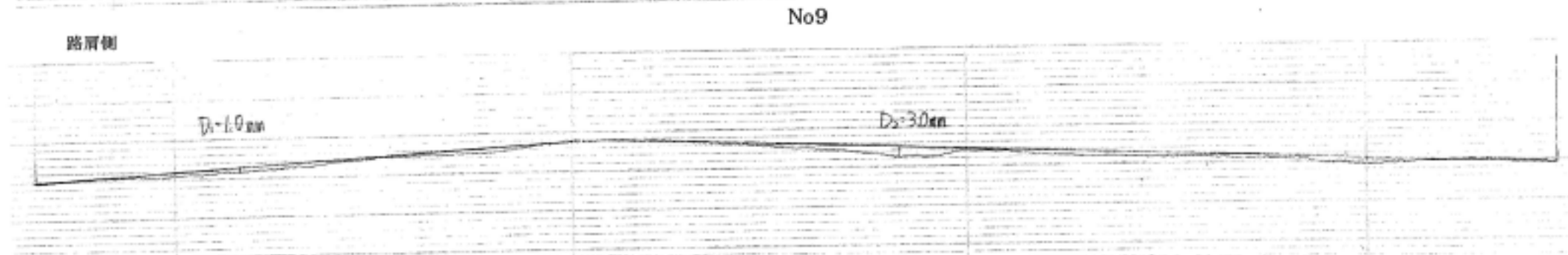
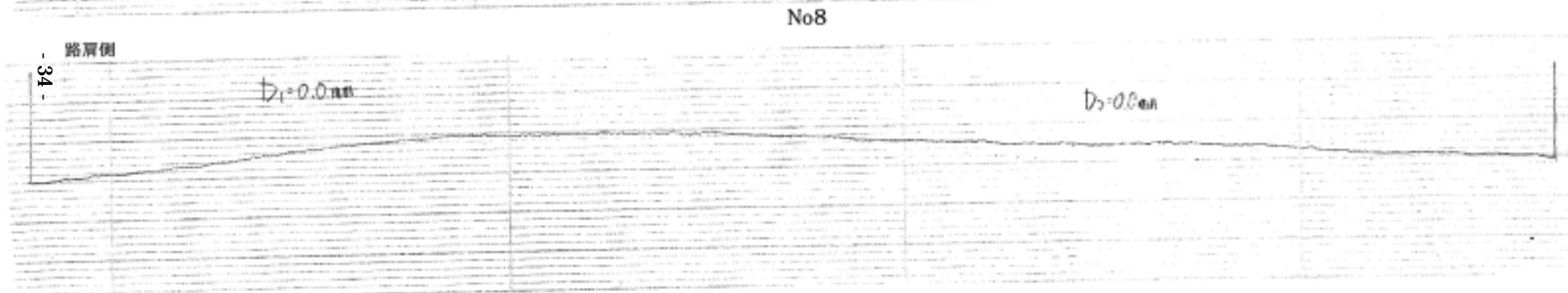
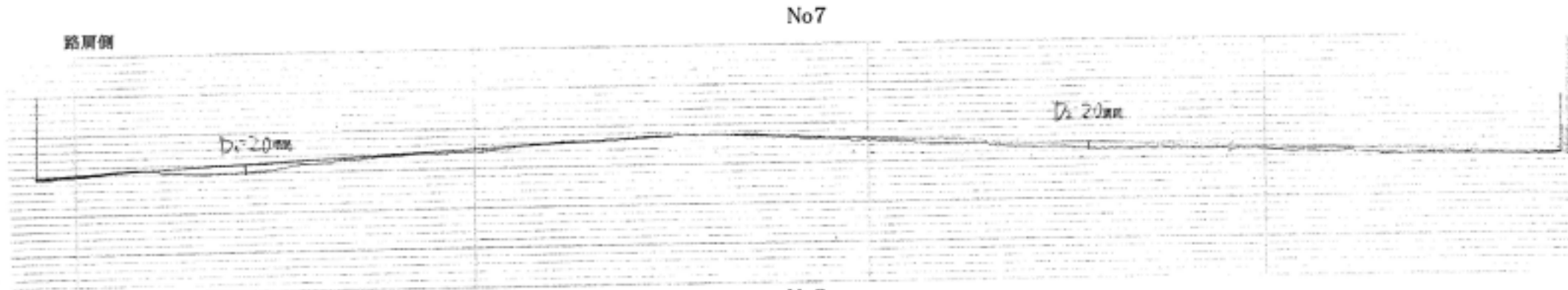
Measurement of Rutting Depth

Inspected Sites Ohgishima Plant Road, NKK

Work section #1

Inspected date Dec.17 2001

Inspector Yohinaka Shiga



Measurement of Rutting Depth

Inspected Sites Ohgishima Plant Road, NKK

Work section #1

Inspected date Dec.17 2001

Inspector Yohinaka Shiga

No10

路肩側

$D_1 = 0.0 \text{ mm}$

$D_2 = 30 \text{ mm}$

No11

路肩側

- 35 -

$D_2 = 20 \text{ mm}$

$D_2 = 10 \text{ mm}$

No12

路肩側

$D_1 = 40 \text{ mm}$

$D_2 = 20 \text{ mm}$

Measurement of Rutting Depth

Inspected Sites Ohgishima Plant Road, NKK

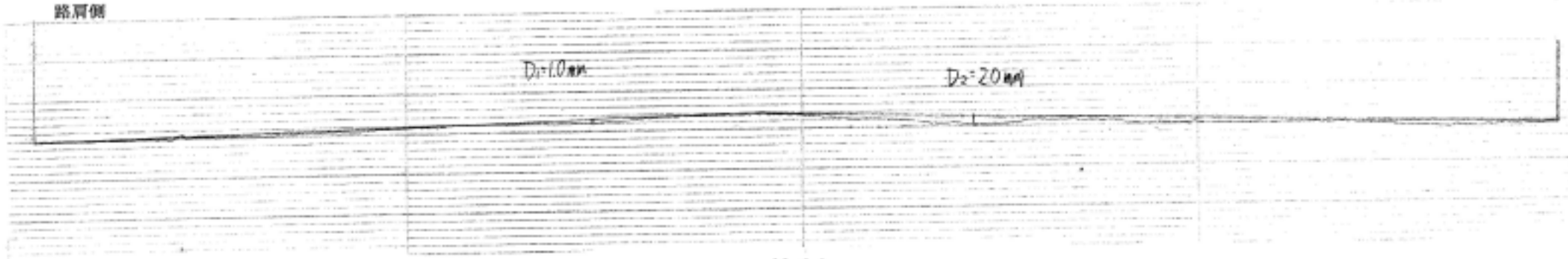
Work section #1

Inspected date Dec.17 2001

Inspector Yohinaka Shiga

No13

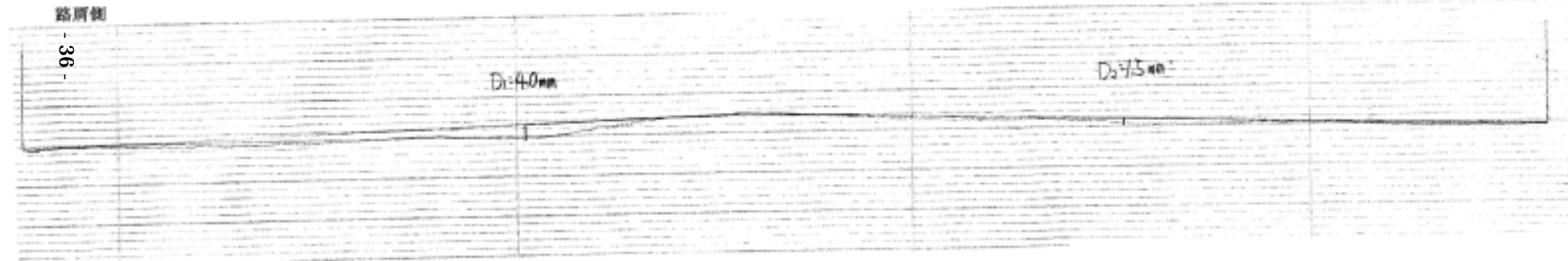
路肩側



No14

路肩側

36



No15

路肩側



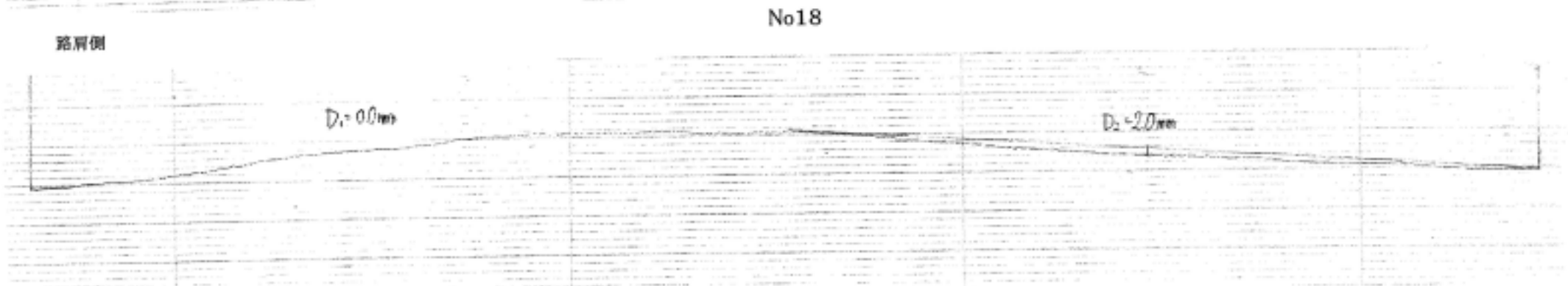
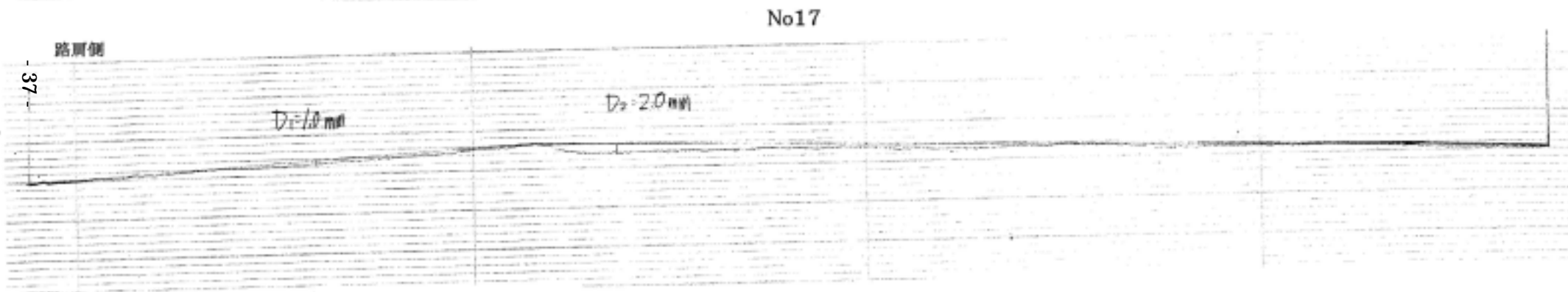
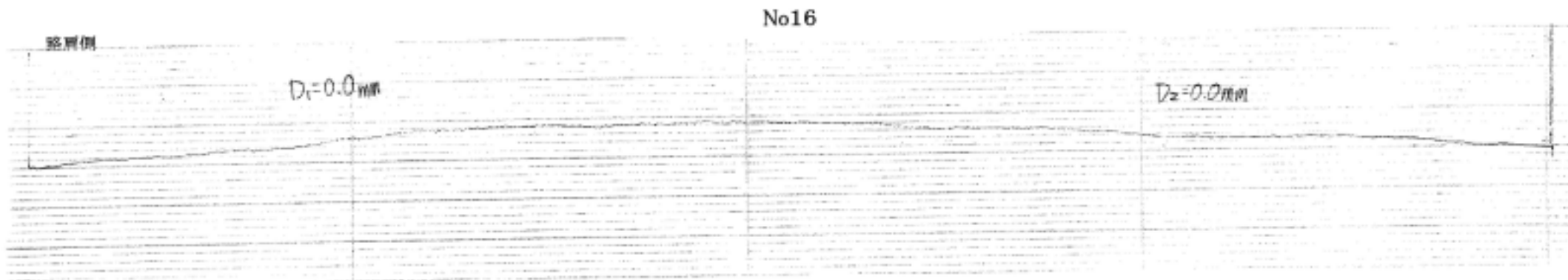
Measurement of Rutting Depth

Inspected Sites Ohgishima Plant Road, NKK

Work section #1

Inspected date Dec.17 2001

Inspector Yohinaka Shiga



Measurement of Rutting Depth

Inspected Sites Ohgishima Plant Road, NKK

Work section #1

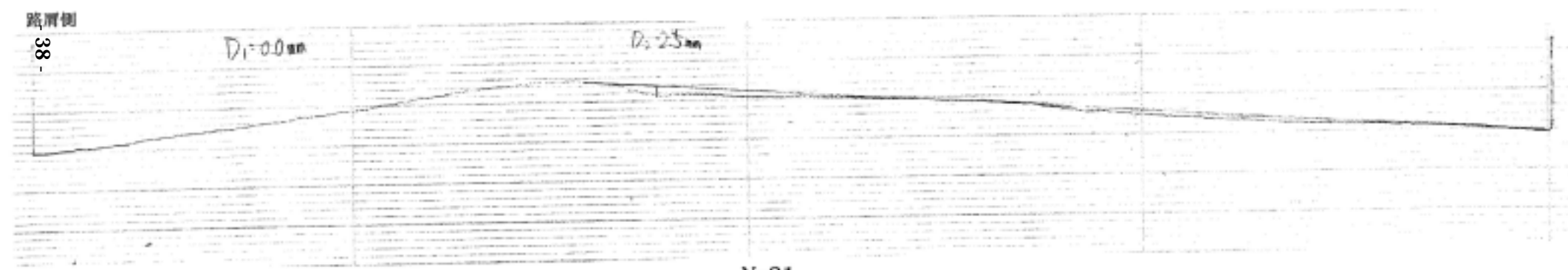
Inspected date Dec.17 2001

Inspector Yohinaka Shiga

No19



No20



No21



Measurement of Rutting Depth

Inspected

Sites Ohgishima Plant Road, NKK

Work

section #1

Inspected date Dec.17 2001

Inspector Yohinaka Shiga

No22

路肩側

D_r:25mm

D_r:20mm

Measurement of Rutting Depth

Inspected Sites	<u>Ohgishima Plant Road, NKK</u>	Inspected date	<u>Dec.17 2001</u>				
		Inspection Item	<u>Transverse Profilometer</u>				
Measured Sites	<u>Work section #2</u>						
Measurement Starting Point	<u>No . 1</u>						
Measurement Ending Point	<u>No . 22</u>	Inspector	<u>Yoshinaka Shiga</u>				
Road shoulder for west							
Measurement Point	D1 (mm)	D2 (mm)	Measured Value (mm)	Measurement Point	D1 (mm)	D2 (mm)	Measured Value (mm)
No . 1	4 . 0	6 . 0	6 . 0	No . 12	2 . 0	2 . 0	2 . 0
No . 2	3 . 0	0 . 0	3 . 0	No . 13	1 . 5	2 . 0	2 . 0
No . 3	2 . 0	0 . 0	2 . 0	No . 14	2 . 0	2 . 5	2 . 5
No . 4	13 . 0	3 . 0	13 . 0	No . 15	2	2	2 . 0
No . 5	3 . 0	0 . 0	3 . 0	No . 16	3	2 . 5	3 . 0
No . 6	2 . 0	8 . 0	8 . 0	No . 17	0	0	0 . 0
No . 7	2 . 0	7 . 0	7 . 0	No . 18	0	0	0 . 0
No . 8	2 . 0	1 . 0	2 . 0	No . 19	2	2	2 . 0
No . 9	1 . 5	0 . 0	1 . 5	No . 20	2	3	3 . 0
No . 10	5 . 0	2 . 0	5 . 0	No . 21	2	2	2 . 0
No . 11	5 . 0	2 . 5	5 . 0	No . 22	0	4	4 . 0
Total (mm)			55 . 5	Total (mm)			22 . 5
Average (+) / Number of Data (mm)				3 . 5			
Remarks							

Measurement of Rutting Depth

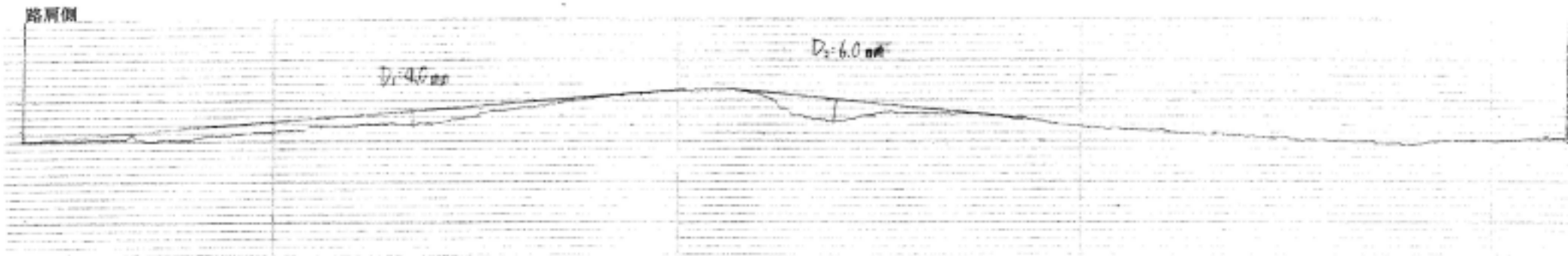
Inspected Sites Ohgishima Plant Road, NKK

Work section #2

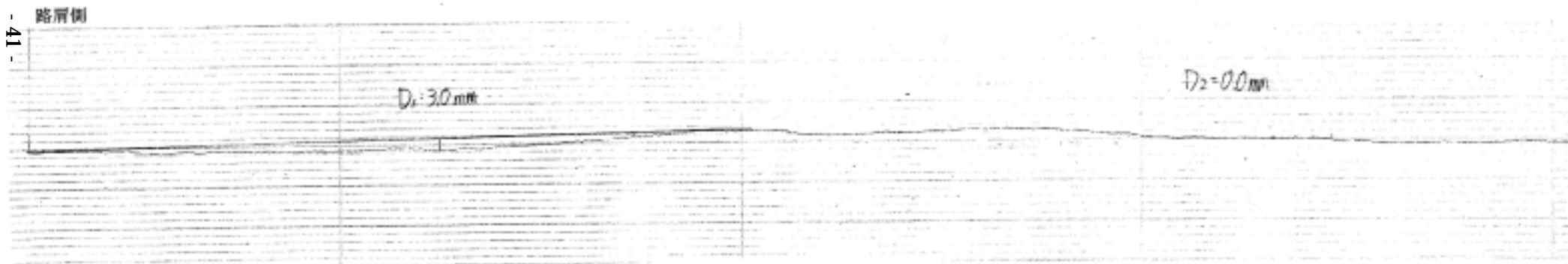
Inspected date Dec.17 2001

Inspector Yohinaka Shiga

No1



No2



No3



Measurement of Rutting Depth

Inspected

Sites Ohgishima Plant Road, NKK

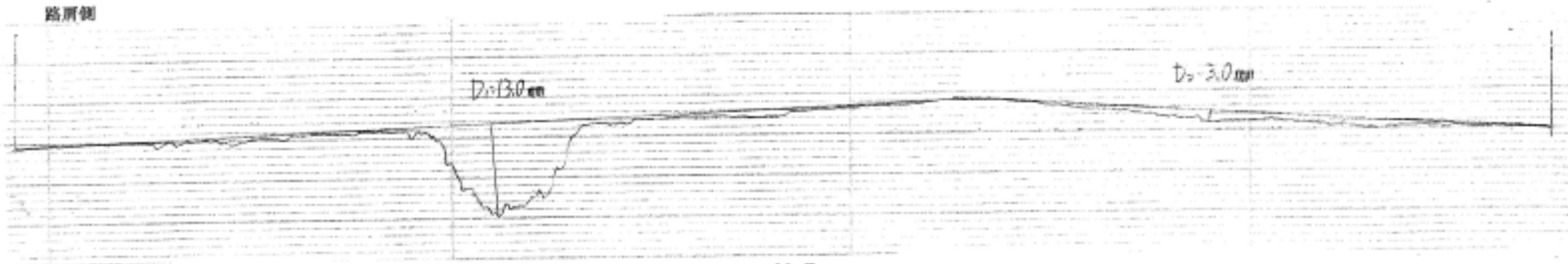
Work

section #2

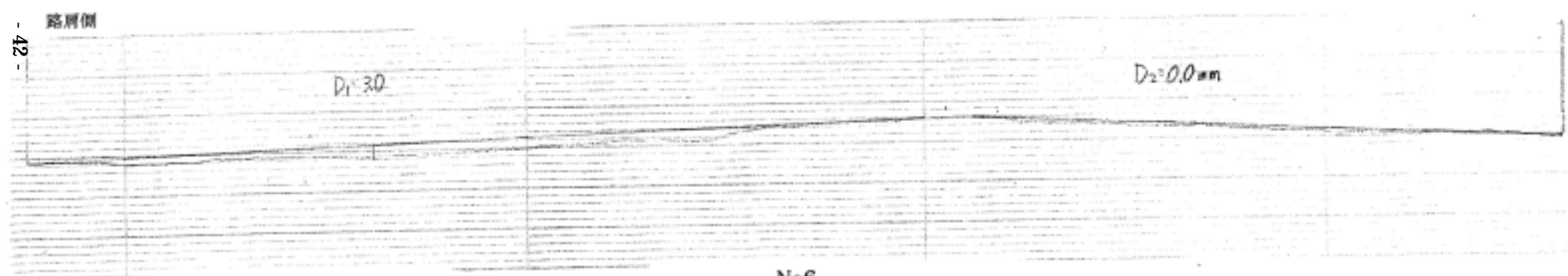
Inspected date Dec.17 2001

Inspector Yohinaka Shiga

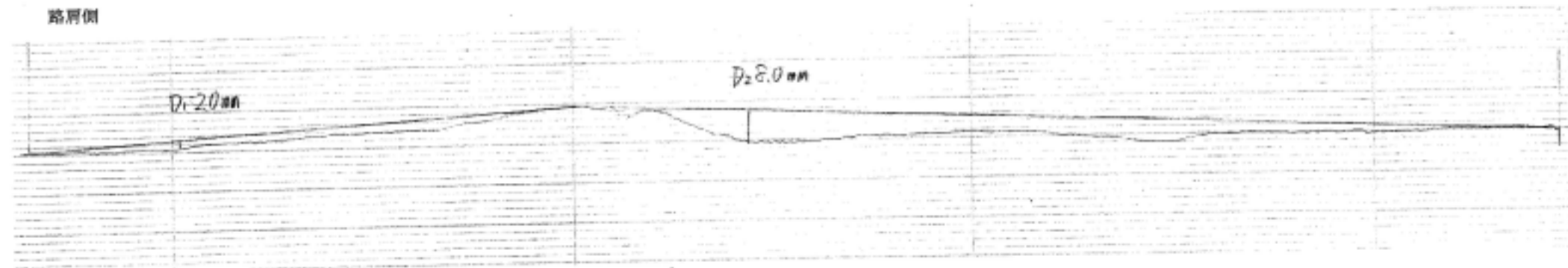
No4



No5



No6



Measurement of Rutting Depth

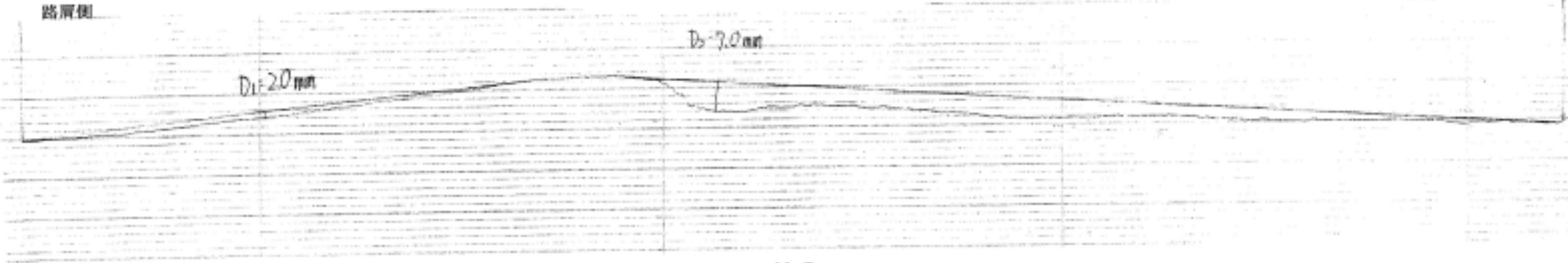
Inspected Sites Ohgishima Plant Road, NKK

Work section #2

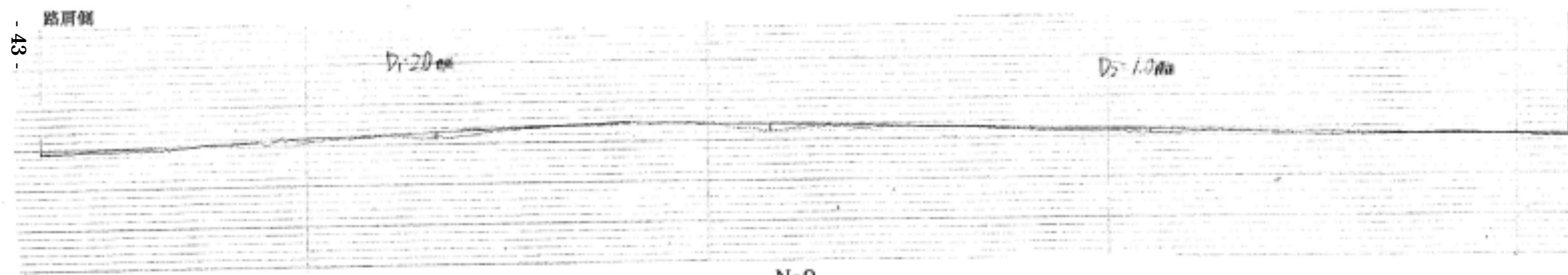
Inspected date Dec.17 2001

Inspector Yohinaka Shiga

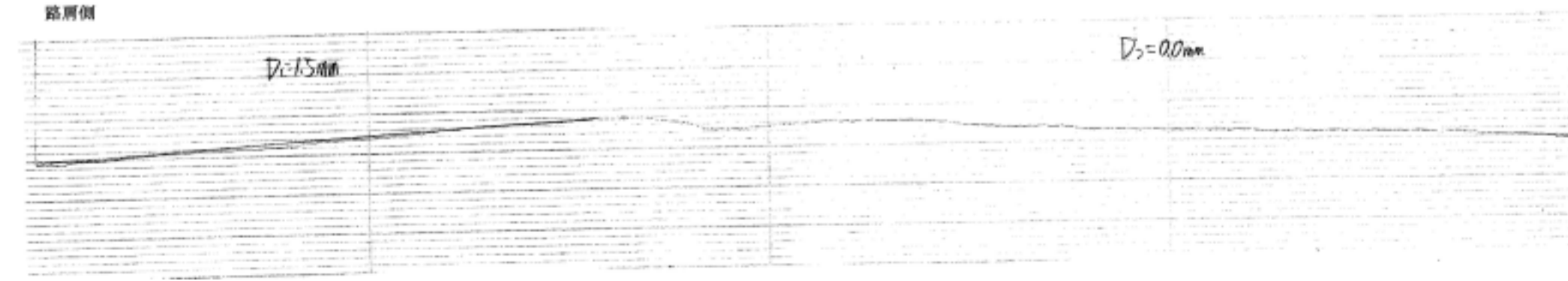
No7



No8



No9



Measurement of Rutting Depth

Inspected Sites Ohgishima Plant Road, NKK

Work section #2

Inspected date Dec.17 2001

Inspector Yohinaka Shiga

No10

路肩側

$D_1 = 50 \text{ mm}$

$D_2 = 20 \text{ mm}$

No11

路肩側

$D_1 = 50 \text{ mm}$

$D_2 = 25 \text{ mm}$

No12

路肩側

$D_1 = 20 \text{ mm}$

$D_2 = 20 \text{ mm}$

Measurement of Rutting Depth

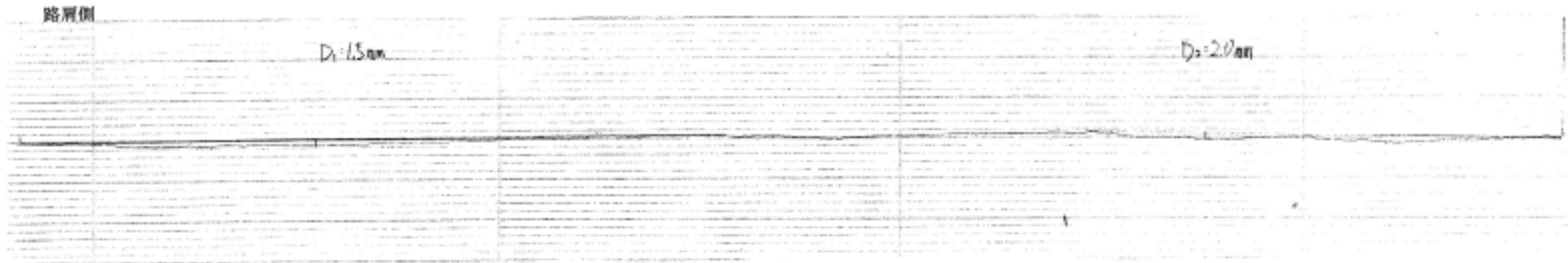
Inspected Sites Ohgishima Plant Road, NKK

Work section #2

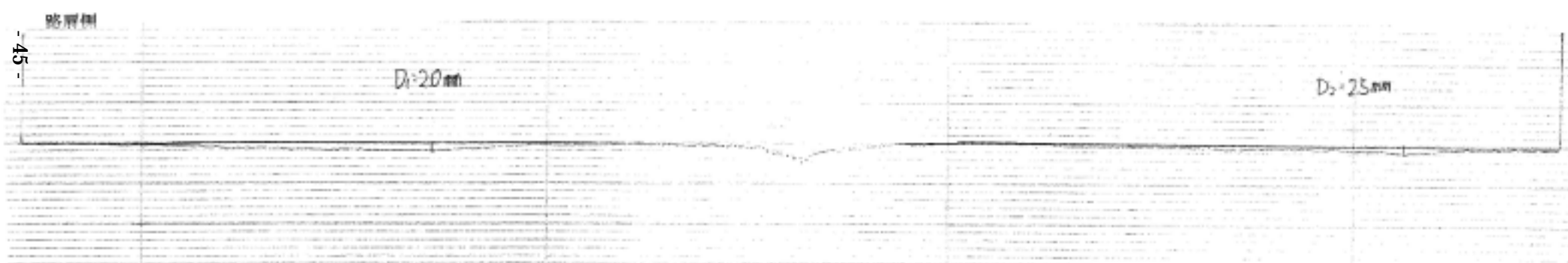
Inspected date Dec.17 2001

Inspector Yohinaka Shiga

No13



No14



No15



Measurement of Rutting Depth

Inspected

Sites Ohgishima Plant Road, NKK

Work
section #2

Inspected date Dec.17 2001

Inspector Yohinaka Shiga

No16

路肩側

$D_1 = 3.0 \text{ mm}$

$D_2 = 2.5 \text{ mm}$

No17

路肩側

$D_1 = 0.0 \text{ mm}$

$D_2 = 0.0 \text{ mm}$

No18

路肩側

$D_1 = 0.0 \text{ mm}$

$D_2 = 0.0 \text{ mm}$

Measurement of Rutting Depth

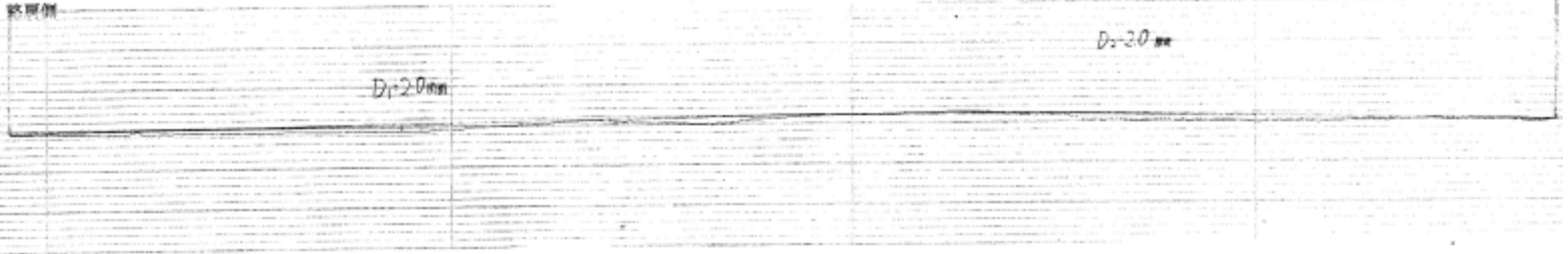
Inspected Sites Ohgishima Plant Road, NKK

Work section #2

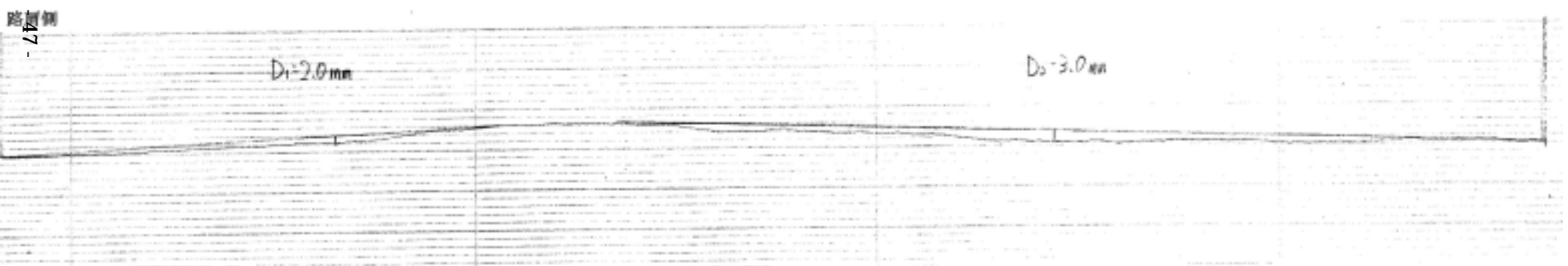
Inspected date Dec.17 2001

Inspector Yohinaka Shiga

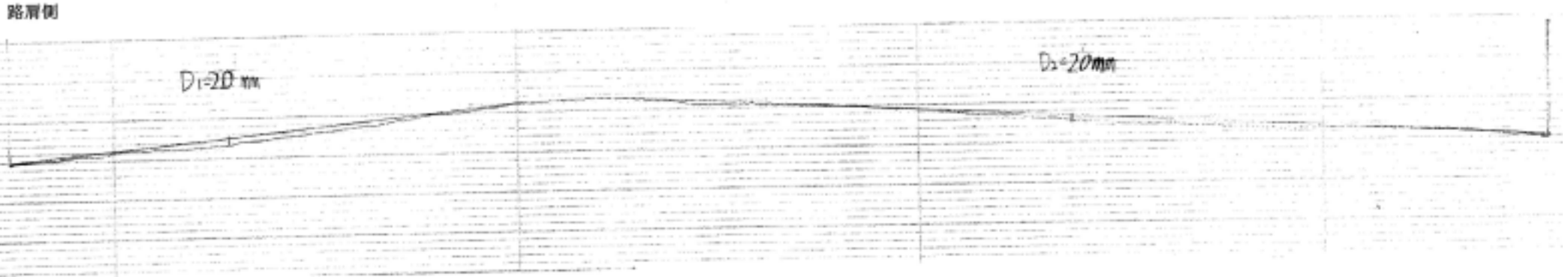
No19



No20



No21



Measurement of Rutting Depth

Inspected

Sites Ohgishima Plant Road, NKK

Work

section #2

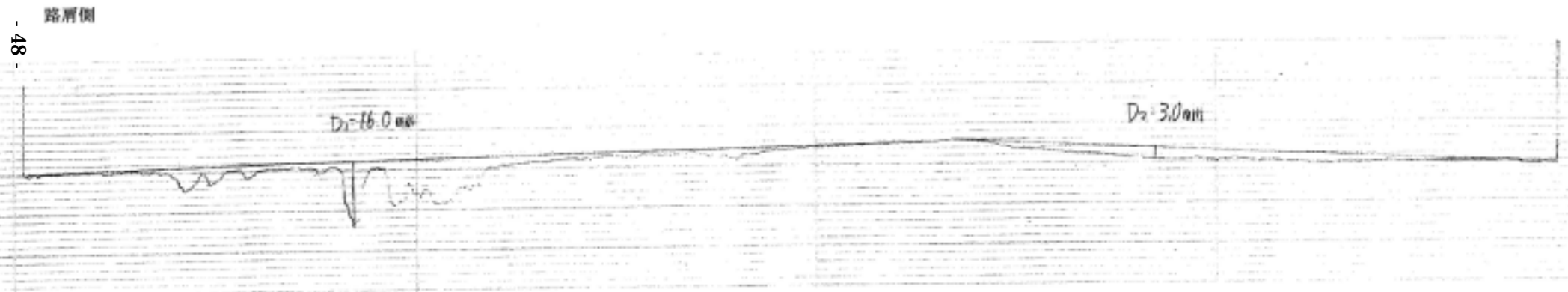
Inspected date Dec.17 2001

Inspector Yohinaka Shiga

No22



破損部



(Maximum Specific Gravity Test)

Maximum Specific Gravity Test of Mixture by Vacuum Process

Sample Name	Job Site #1
Temperature ()	25
Capacity of Flask (ml)	1630 . 5
Number of Flask	1
Weight of Sample (g)	1400 . 0
Weight of (flask + water) (g)	3630 . 5
Weight of (sample + flask + water) (g)	4506 . 5
Specific Gravity / (+ -)	2 . 672

Remarks

Maximum Specific Gravity Test of Mixture by Vacuum Process

Sample Name	Job Site #2
Temperature ()	25
Capacity of Flask (ml)	1718 . 6
Number of Flask	2
Weight of Sample (g)	1398 . 5
Weight of (flask + water) (g)	3718 . 6
Weight of (sample + flask + water) (g)	4619 . 4
Specific Gravity / (+ -)	2 . 810

Remarks

Maximum Specific Gravity Test of Mixture by Vacuum Process

Sample Name	Aggregate Scattering Spots
Temperature ()	25
Capacity of Flask (ml)	1630 . 5
Number of Flask	2
Weight of Sample (g)	1321 . 5
Weight of (flask + water) (g)	3630 . 5
Weight of (sample + flask + water) (g)	4480 . 4
Specific Gravity / (+ -)	2 . 802

Remarks

(Specific Gravity Test)

Specific Gravity Test

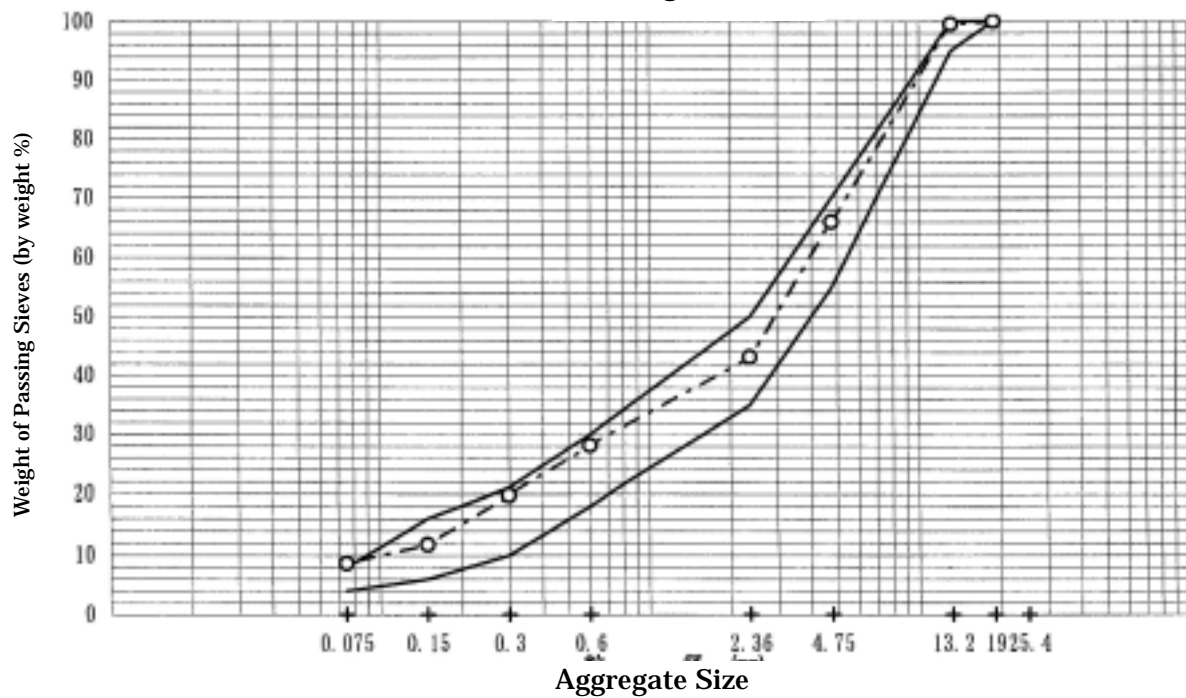
Sample No.	Average Thickness	Weight in Air (g)	Weight in Water (g)	Weight of Saturated Surface Dry Sample (g)	Volume (cm ³)	Density (g/cm ³)	Maximum Specific Gravity	Air Voids (%) <small>(1 - /) × 100</small>
					-	/		
Job site #1	No . 1	6 . 71	1741 . 0	1052 . 1	1742 . 3	690 . 2	2 . 522	5 . 6
	No . 2	8 . 50	1344 . 5	806 . 9	1345 . 7	538 . 8	2 . 495	6 . 6
	No . 3	10 . 08	2253 . 8	1380 . 0	2259 . 3	879 . 3	2 . 563	4 . 1
	Av.						2 . 509	2 . 672
Job site #1	No . 1	4 . 21	856 . 5	530 . 9	859 . 7	328 . 8	2 . 605	7 . 3
	No . 2	7 . 51	1585 . 1	979 . 2	1586 . 3	607 . 1	2 . 611	7 . 1
	No . 3	4 . 83	929 . 0	591 . 5	950 . 6	359 . 1	2 . 587	7 . 9
	Av.						2 . 601	2 . 810
Aggregate Scattering Spots	No . 1	6 . 65	1348 . 8	819 . 9	1353 . 3	533 . 4	2 . 529	9 . 7
	No . 2	7 . 88	1641 . 0	996 . 9	1650 . 4	653 . 5	2 . 511	10 . 4
	Av.						2 . 520	2 . 802

(Asphalt Recovery Characteristic Test)

Manual for Asphalt Pavement	Results of Abson Extraction Test		
Coring Spot	<u>Job Site #1, Ohgishima Plant Road, NKK</u>	Inspected date	<u>Dec.17 2001</u>
Type of Mix	<u>Dense-graded Asphalt Concrete (13)</u>	Inspector	<u>Yoshinaka Shiga</u>

Asphalt Content (%)			Sieving Analysis			
Weight of a Sample (g)	2500.0	Sieving Size	Accumulated Residual (g)	Accumulated Residual (%)	Passing (%)	
Weight of Extracted Aggregate (g)	2367.1	25 . 4mm				
Weight of Asphalt (g)	132.9	19 . 0	0	0	100	
Extracted Asphalt Content (%)	5.32	13.2	11.1	0.5	99.5	
Designed Asphalt Content (%)	5.50	4.75	805.4	34.0	66.0	
		2.36	1345.3	56.8	43.2	
		600 μ m	1700.5	71.8	28.2	
		300	1898.7	80.2	19.8	
		150	2088.6	88.2	11.8	
Characteristic of recovered Asphalt			75	2162.6	91.4	8.6
Penetration (1/10mm)	34	Total				
Softening Point ()	58.6					

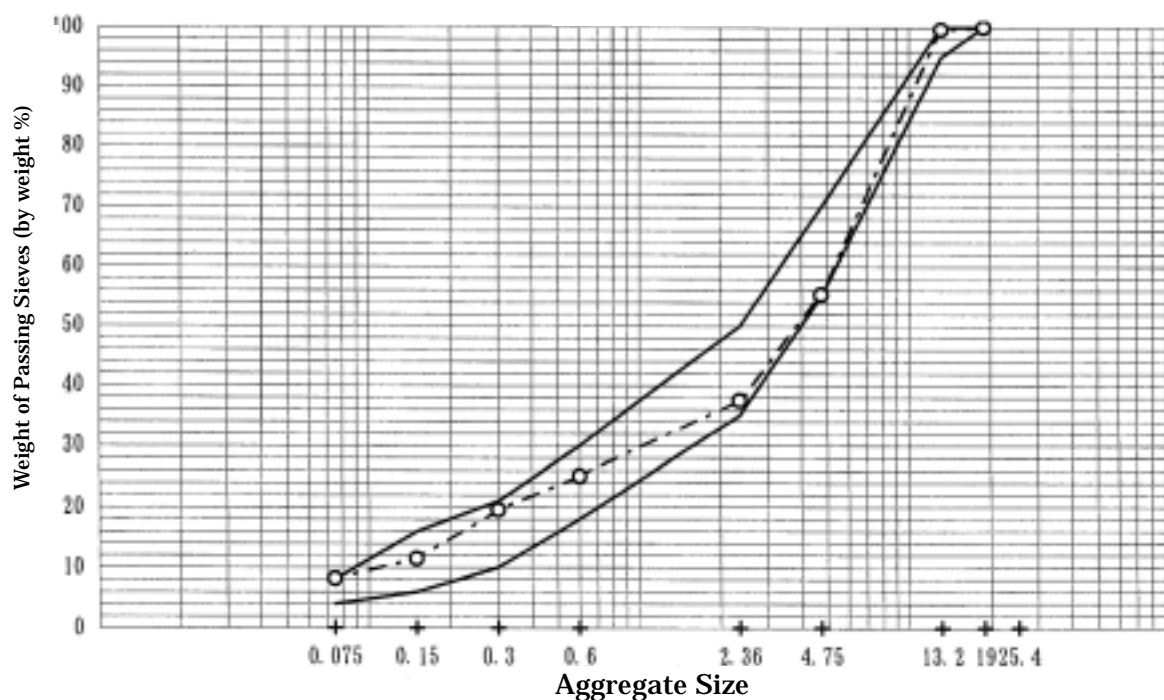
Grading Curves



Manual for Asphalt Pavement		Results of Abson Extraction Test	
Coring Spot	Job Site #2, Ohgishima Plant Road, NKK	Inspected date	Dec.17 2001
Type of Mix	Dense-graded Asphalt Concrete (13)	Inspector	Yoshinaka Shiga

Asphalt Content (%)			Sieving Analysis			
Weight of a Sample (g)	2062.5	Sieving Size	Accumulated Residual (g)	Accumulated Residual (%)	Passing (%)	
Weight of Extracted Aggregate (g)	1957.5	25 . 4mm				
Weight of Asphalt (g)	105.0	19 . 0	0	0	100	
Extracted Asphalt Content (%)	5.09	13.2	7.2	0.4	99.6	
Designed Asphalt Content (%)	5.30	4.75	874.4	44.7	55.3	
		2.36	1223.4	62.5	37.5	
		600 μ m	1466.3	74.9	25.1	
		300	1574.6	80.4	19.6	
Characteristic of recovered Asphalt			150	1733.7	88.6	11.4
Penetration (1/10mm)	37	75	1797.4	91.8	8.2	
Softening Point ()	58.7	Total				

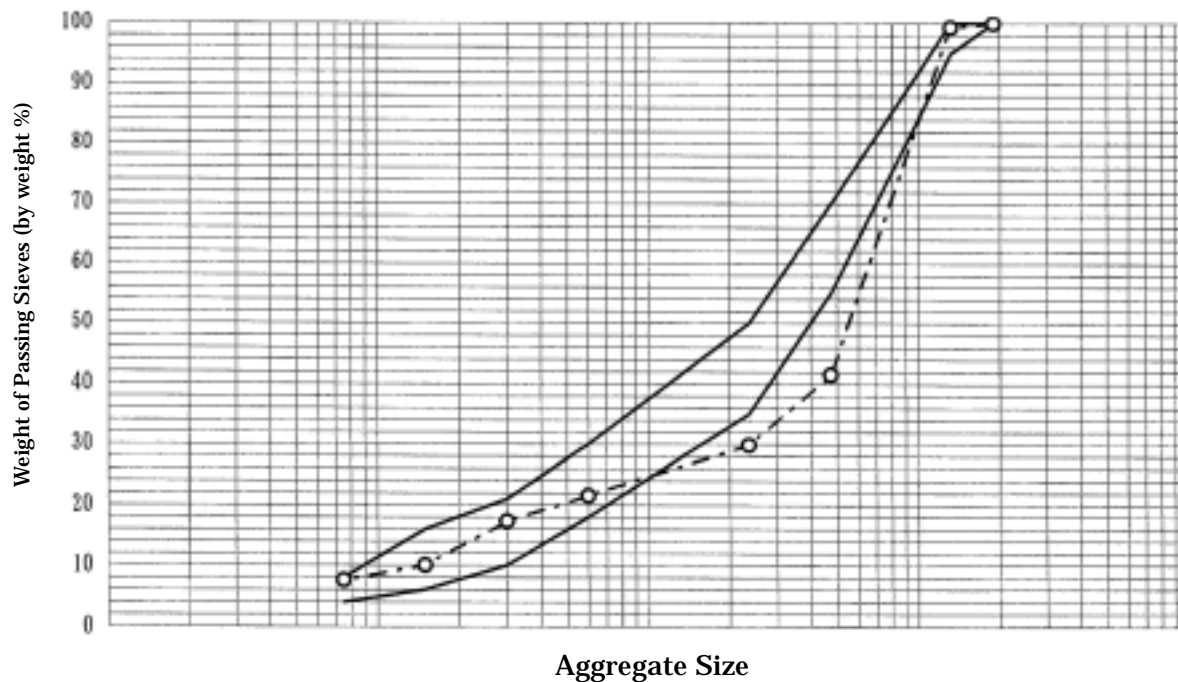
Grading Curves



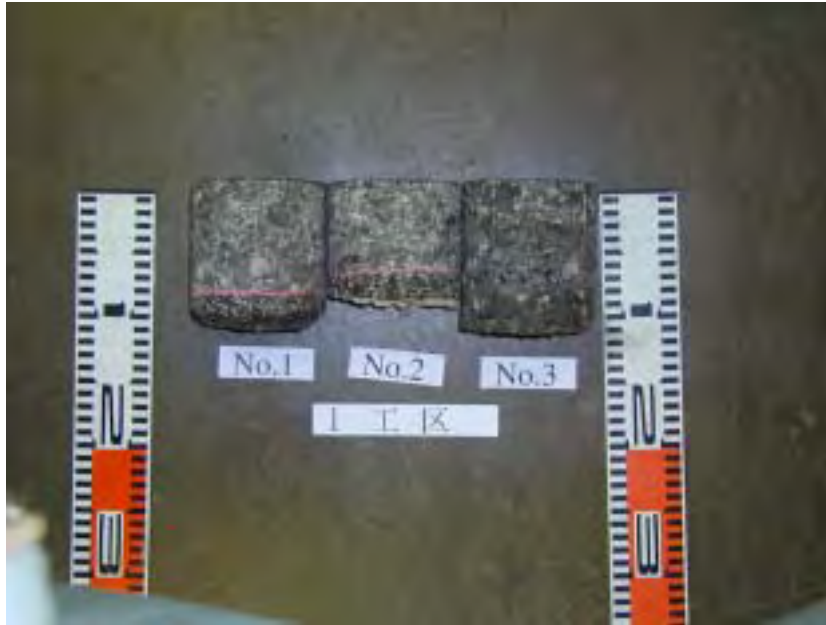
Manual for Asphalt Pavement	Results of Abson Extraction Test		
Coring Spot	Aggregate Scattering Spots, Ohgishima Plant Road, NKK	Inspected date	Dec.17 2001
Type of Mix	Dense-graded Asphalt Concrete (13)	Inspector	Yoshinaka Shiga

Asphalt Content (%)			Sieving Analysis			
Weight of a Sample (g)	2462.0	Sieving Size	Accumulated Residual (g)	Accumulated Residual (%)	Passing (%)	
Weight of Extracted Aggregate (g)	2363.5	25 . 4mm				
Weight of Asphalt (g)	98.5	19 . 0	0	0	100	
Extracted Asphalt Content (%)	4.00	13.2	16.8	0.7	99.3	
Designed Asphalt Content (%)	5.30	4.75	1381.2	58.4	41.6	
		2.36	1658.3	70.2	29.8	
		600 μ m	1854.3	78.5	21.5	
		300	1954.8	82.7	17.3	
Characteristic of recovered Asphalt			150	2127.5	90.0	10.0
Penetration (1/10mm)	22	75	2185.2	92.5	7.5	
Softening Point ()	65.8	Total				

Grading Curves



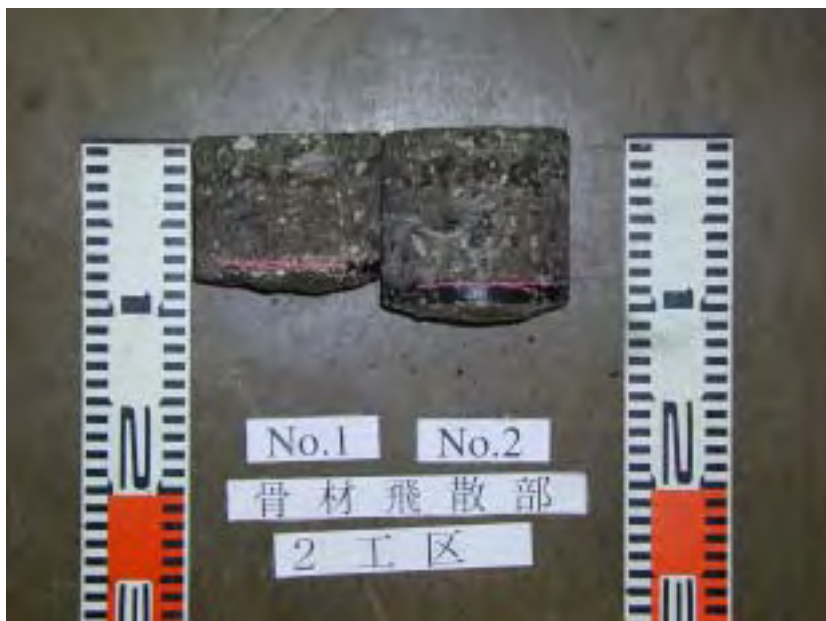
(Photos)



Cored Samples
Job site #1



Cored Samples
Job site #2



Cored Samples
Aggregate Scattering Place



Core Densimetry



Maximum Specific Gravity Test



Abson Extraction Test



Asphalt Recovery Test



Penetration Test



Softening Point Test



Measurement of
Longitudinal Roughness



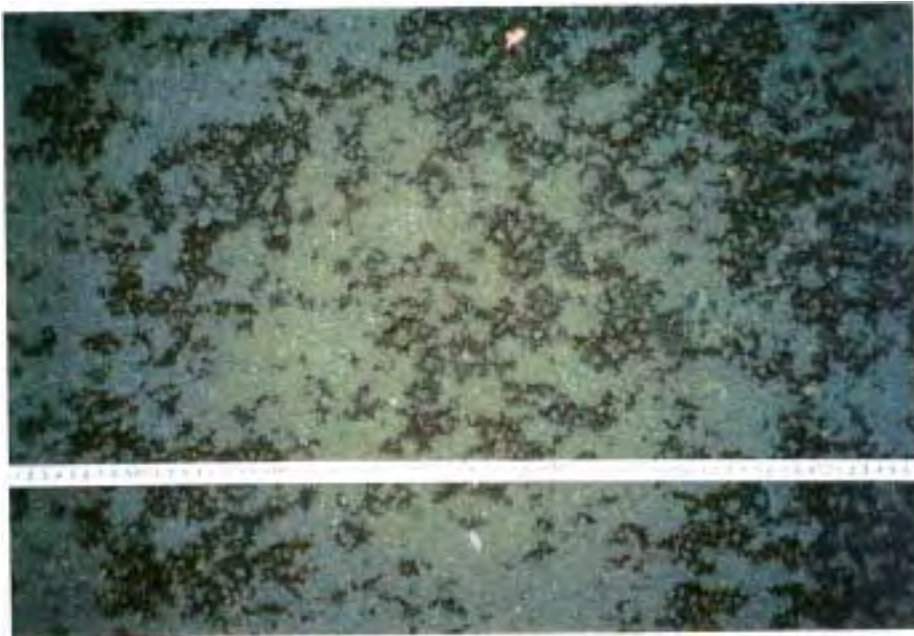
Measurement of Rutting Depth



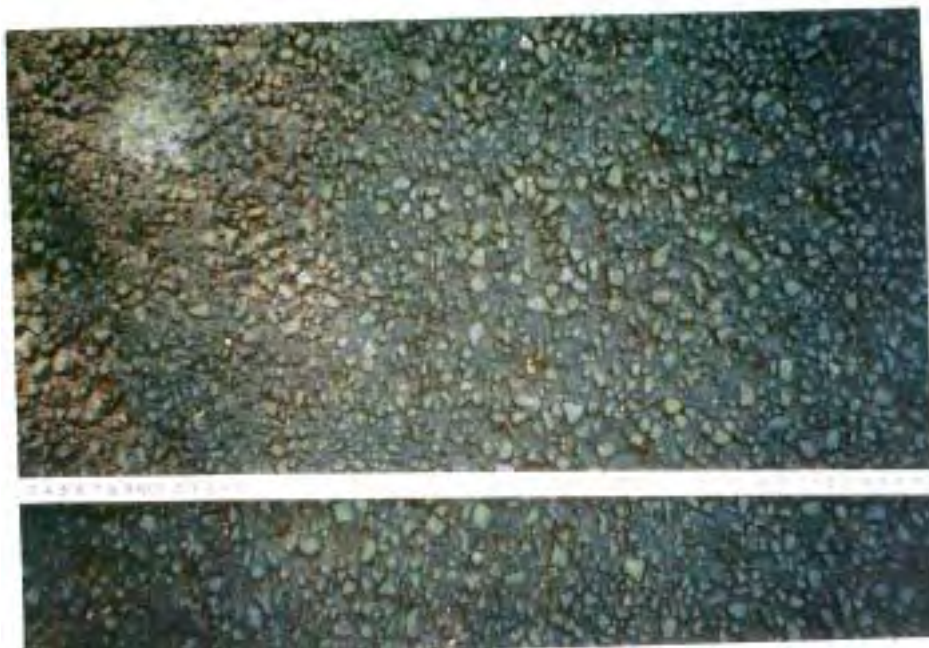
Coring



Close up of Road Surface
(Job Site #1)



Close up of Road Surface
(Job Site #1)



Close up of Road Surface
(Aggregate Scattering Spots)



Aggregate Scattering Spots



Aggregate Scattering Spots
End of Inspected
Opposite Lane