GOLD RAM ENGINEERING & DEVELOPMENT LTD.

HKQAA ISO 9001 : 1994 Certificate No.: CC638

DRILLHOLE RECORD

W.O. NO. *E0508/01* CONTRACT No. *E0508/98*

DATE *from 13-8-98 to 19-8-98* SHEET *1 of 6*

PROJECT *KCRC West Rail DD210 Ground Investigation Work*
Tuen Mun Section

HOLE No. *DD210/DH/043*

METHOD *IP+RC*

CO-ORDINATES *E 815721.72* *N 829836.46*

ROCK COREBIT *T2-101*

MACHINE No. *D50*

HOLE DIA. *2.00-17.00m, Px* *17.00-33.20m, Hx*

FLUSHING MEDIUM *Water*

ORIENTATION *Vertical*

GROUND-LEVEL *7.67 mPD*

Drilling Progress	Casing depth/ size	Water level/ time/ date	TCR %	SCR %	RQD %	FI	Tests	Samples	Reduced Level	Depth (m)	Legend	Grade	Description
13-08-98	Inspection Pit							1 2 3 4 5	5.67	0.00 0.50 1.00 1.50 2.00		F2	Yellowish brown, sandy SILT with occasional fine to coarse angular to subangular gravel size fragments of tuff and quartz. (FILL-EXCAVATED SOIL OF ASSORTED ORIGIN)
14-08-98	Px	DRY 08:00	95					6	3.67	3.10 4.00		F4	Loose to medium dense, greyish brown mottled dark bluish grey, slightly clayey, silty, very sandy GRAVEL. (FILL-REWORKED ALLUVIUM)
			30					T2-101	3.17	4.50		F4	COBBLES of very strong light grey slightly decomposed granite with some matrix of coarse angular to subangular gravel size fragments of granite. (FILL-CONSTRCUTION WASTE)
							3, 4, 2, 1, 2, N=8	8	2.27	4.95 5.40		F4	Loose, yellowish brown mottled greyish brown silty sandy fine to coarse angular to subrounded GRAVEL of quartz and granite. (FILL-CONSTRUCTION WASTE)
			32					T2-101				F4	COBBLES of very strong light grey slightly decomposed granite with some matrix of coarse angular to subangular gravel size fragments of granite. (FILL-CONSTRUCTION WASTE)
			68					T2-101	1.17	6.25 6.50			
			0					8 9		7.60		A3	Medium dense, dark bluish grey mottled greyish brown, slightly organic silty fine to coarse SAND with occasional fine subrounded gravel of quartz and occasional partly decomposed plant remains. (ALLUVIUM)
			100				B=42 3, 3, 4, 5, 6, N=21	10 12	-1.63	8.10 8.55 9.30			
								13		10.00		A2	Firm, light bluish grey mottled light yellowish brown, slightly gravelly sandy SILT. (ALLUVIUM)

Form No.: PRO/05/03A

LPM E0508 3-12-98

- SMALL DISTURBED SAMPLE
- S.P.T. LINER SAMPLE
- U100 UNDISTURBED SAMPLE
- U76 UNDISTURBED SAMPLE
- IMPRESSION PACKER TEST
- PACKER TEST
- PIEZOMETER TIP
- VANE SHEAR TEST
- MAZIER SAMPLE
- STANDARD PENETRATION TEST
- PISTON SAMPLE
- PERMEABILITY TEST
- PRESSUREMETER
- STANDPIPE TIP

LOGGED: *D.Lowe*
DATE: *20-08-98*
CHECKED: *P.S.Nau*
DATE *21-08-98*

REMARKS:

GOLD RAM ENGINEERING & DEVELOPMENT LTD.

HKQAA ISO 9001 : 1994 Certificate No.: CC638

DRILLHOLE RECORD

W.O. NO. *E0508/01* CONTRACT No. *E0508/98*

DATE *from 13-8-98 to 19-8-98* SHEET *2 of 6*

PROJECT *KCRC West Rail DD210 Ground Investigation Work*
Tuen Mun Section

HOLE No. *DD210/DH/043*

METHOD *IP+RC*

CO-ORDINATES *E 815721.72* *N 829836.46*

ROCK COREBIT *T2-101*

MACHINE No. *D50*

HOLE DIA. *2.00-17.00m, Px* *17.00-33.20m, Hx*

FLUSHING MEDIUM *Water*

ORIENTATION *Vertical*

GROUND-LEVEL *7.67 mPD*

Drilling Progress	Casing depth/ size	Water level/ time/ date	TCR %	SCR %	RQD %	FI	Tests	Samples	Reduced Level	Depth (m)	Legend	Grade	Description
			100				B=33	13 14		10.50			See sheet 1 of 6 for details
15-08-98		DRY 08:00							-3.58	11.25		A3	Dense, yellowish brown, slightly silty fine to coarse SAND with some fine to coarse subangular to subrounded gravel of quartz. (ALLUVIUM)
11							[4, 6, 6, 8, 10, 12) N=36	15 16		12.00 12.45			
12									-5.33	13.00		A4	Light grey, mottled yellowish brown and reddish brown, slightly sandy clayey fine to coarse angular to subangular GRAVEL with occasional cobbles of quartz and quartzite. (ALLUVIUM)
13			89				B=80	17 18	-6.08	13.50 13.75		V	Extremely weak, reddish brown mottled light grey and dark grey, completely decomposed TUFF-BRECCIA. (Slightly sandy SILT with occasional fine to medium subangular to subrounded gravel sized quartz fragments).
14										14.00			
15							[2, 3, 3, 4, 4, 5) N=16	19 20		15.50 15.95			
16										17.00			
17	Hx		100					21	-9.78	17.45			17.20 to 17.45m: 5 Relict joints are very closely to closely spaced smooth planar tight and manganese stained, dipping horizontally to 10° and 10° to 20°.
									-10.03	17.70		V	
18								22		18.10		V/IV	Extremely weak, orangish brown mottled yellowish brown and pink, completely decomposed TUFF-BRECCIA. (Silty fine to medium SAND with some fine to coarse angular gravel size rock fragments). 17.55 to 17.70m: 3 Relict joints are very closely to closely spaced smooth planar tight and manganese stained, dipping 20° to 30° and 30° to 40°.
									-10.88	18.55		V	
19							[4, 6, 6, 8, 14, 17) N=45	23 24		19.00 19.45			Extremely weak and very weak, light brownish grey, completely and highly decomposed
20													

- SMALL DISTURBED SAMPLE
- S.P.T. LINER SAMPLE
- U100 UNDISTURBED SAMPLE
- U76 UNDISTURBED SAMPLE
- IMPRESSION PACKER TEST
- PACKER TEST
- PIEZOMETER TIP
- VANE SHEAR TEST
- MAZIER SAMPLE
- STANDARD PENETRATION TEST
- PISTON SAMPLE
- PERMEABILITY TEST
- PRESSUREMETER
- STANDPIPE TIP

LOGGED: *D.Lowe*
DATE: *20-08-98*
CHECKED: *P.S.Nau*
DATE *21-08-98*

REMARKS:

GOLD RAM ENGINEERING & DEVELOPMENT LTD.

HKQAA ISO 9001 : 1994 Certificate No.: CC638

DRILLHOLE RECORD

W.O. NO. *E0508/01* CONTRACT No. *E0508/98*

DATE *from 13-8-98 to 19-8-98* SHEET *3 of 6*

PROJECT *KCRC West Rail DD210 Ground Investigation Work*
Tuen Mun Section

HOLE No. *DD210/DH/043*

METHOD *IP+RC*

CO-ORDINATES *E 815721.72* *N 829836.46*

ROCK COREBIT *T2-101*

MACHINE No. *D50*

HOLE DIA. *2.00-17.00m, Px* *17.00-33.20m, Hx*

FLUSHING MEDIUM *Water*

ORIENTATION *Vertical*

GROUND-LEVEL *7.67 mPD*

Drilling Progress	Casing depth/ size	Water level/ time/ date	TCR %	SCR %	RQD %	FI	Tests	Samples	Reduced Level	Depth (m)	Legend	Grade	Description
21			100					25		20.50			TUFF-BRECCIA with occasional cobble size moderately strong and moderately decomposed corestones. (Sandy SILT with fine to coarse angular to subangular gravel size fragments). 17.95m: 1 Relict joint is smooth planar, tight with manganese stain dipping 20° to 30°.
22								26		21.60			Extremely weak, light brownish grey completely decomposed TUFF-BRECCIA. (Very dense, very silty fine SAND with occasional fine to medium angular gravel size rock fragments).
23							10, 12, 14, 20, 28, 36) N = 98	27 28		22.50 22.95			22.85m: 1 Relict joint is smooth planar tight with manganese and iron stain dipping 50° to 60°.
									-15.83	23.50		V	Extremely weak, yellowish brown mottled light reddish brown, completely decomposed TUFF-BRECCIA. (Slightly sandy SILT with occasional fine to coarse subrounded gravel sized rock fragments).
24			100					29	-16.53	24.00 24.20		IV	Weak and moderately weak, brownish grey, highly decomposed TUFF-BRECCIA. (Coarse angular GRAVEL sized rock fragments) 6 joints are very closely spaced smooth and rough planar and undulating tight, manganese stained, dipping 10° to 20°, 30° to 40° and 50° to 60°.
									-16.93	24.60		V	
25								30	-17.18	24.85 25.10		IV	
26									-17.88	25.55		V	Extremely weak greyish brown mottled orangish brown completely decomposed TUFF-BRECCIA. (Silty fine SAND).
18-08-98		6.00m 08:00					A2, 2(0)/45mm) N = 262/125mm	31		26.00 26.12			Weak and moderately weak, grey, highly decomposed TUFF-BRECCIA. (Coarse angular GRAVEL sized rock fragments).
27										27.50			Extremely weak, greyish brown mottled dark grey and light greyish brown, completely decomposed TUFF-BRECCIA. (Very stiff, slightly sandy SILT with occasional fine to medium subangular gravel sized rock fragments).
28			95					32 33		28.60			28.30 to 28.50m: mica rich.
29										29.50 29.70			29.65m: 1 Relict joint is smooth planar, tight, manganese and iron stained, dipping 80° to
30							15, 62, 100/50mm)	34 35					

Form No.: PRO/05/03A

- SMALL DISTURBED SAMPLE
- S.P.T. LINER SAMPLE
- U100 UNDISTURBED SAMPLE
- U76 UNDISTURBED SAMPLE
- IMPRESSION PACKER TEST
- PACKER TEST
- PIEZOMETER TIP
- VANE SHEAR TEST
- MAZIER SAMPLE
- STANDARD PENETRATION TEST
- PISTON SAMPLE
- PERMEABILITY TEST
- PRESSUREMETER
- STANDPIPE TIP

LOGGED: *D.Lowe*
DATE: *20-08-98*
CHECKED: *P.S.Nau*
DATE *21-08-98*

REMARKS:

LPM E0508 3-12-98

GOLD RAM ENGINEERING & DEVELOPMENT LTD.

HKQAA ISO 9001 : 1994 Certificate No.: CC638

DRILLHOLE RECORD

W.O. NO. *E0508/01* CONTRACT No. *E0508/98*

DATE *from 13-8-98 to 19-8-98* SHEET *4 of 6*

PROJECT *KCRC West Rail DD210 Ground Investigation Work*
Tuen Mun Section

HOLE No. *DD210/DH/043*

METHOD *IP+RC*

CO-ORDINATES
E 815721.72
N 829836.46

ROCK COREBIT *T2-101*

MACHINE No. *D50*

HOLE DIA. *2.00-17.00m, Px*
17.00-33.20m, Hx

FLUSHING MEDIUM *Water*

ORIENTATION *Vertical*

GROUND-LEVEL *7.67 mPD*

Drilling Progress	Casing depth/ size	Water level/ time/ date	TCR %	SCR %	RQD %	FI	Tests	Samples	Reduced Level	Depth (m)	Legend	Grade	Description
							N = 10/15/50mm						vertically. See sheet 3 of 6 for details
31			0					36		31.00			
32			0							32.10			
33								37	-25.53	33.20			
34			100	100	100	0.5		T2-101	-26.41	34.08		II	Strong, bluish grey mottled yellowish green and light grey, slightly decomposed marble clast bearing TUFF-BRECCIA. No joints.
35			100	100	100			T2-101	-28.18	34.60 35.85		II	Strong, grey speckled yellowish green slightly decomposed lapilli TUFF. 34.65m: 1 Joint is smooth planar tight with calcite (up to 2mm) mineral growth dipping 50° to 60°. 35.07 to 35.17m: cobble size clast of quartzite.
36			100	100	100			T2-101		36.07		II	Strong, grey mottled with white slightly decomposed, marble clasts bearing TUFF-BRECCIA. No joints.
37			100	100	100			T2-101	-30.13	37.01 37.80			
38			100	100	100			T2-101	-31.53	37.97 38.80 39.20		II	Very strong, grey speckled yellowish green slightly decomposed lapilli TUFF. Locally calcareous. 37.97 to 39.20m: 1 joint is smooth stepped tight with calcite (up to 3mm) mineral growth dipping 80° to vertically. 38.15m and 38.40m: 2 joints are smooth planar tight with calcite (up to 2mm) mineral growth dipping 30° to 40°.
39			100	100	99			T2-101				II	Very strong, bluish grey mottled yellowish green and light grey, slightly decomposed marble and quartz clasts bearing TUFF-BRECCIA.
40													

- SMALL DISTURBED SAMPLE
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- STANDPIPE TIP

LOGGED: *D.Lowe*
DATE: *20-08-98*
CHECKED: *P.S.Nau*
DATE *21-08-98*

REMARKS:

GOLD RAM ENGINEERING & DEVELOPMENT LTD.

HKQAA ISO 9001 : 1994 Certificate No.: CC638

DRILLHOLE RECORD

W.O. NO. *E0508/01* CONTRACT No. *E0508/98*

DATE *from 13-8-98 to 19-8-98* SHEET *5 of 6*

PROJECT *KCRC West Rail DD210 Ground Investigation Work*
Tuen Mun Section

HOLE No. *DD210/DH/043*

METHOD *IP+RC*

CO-ORDINATES *E 815721.72* *N 829836.46*

ROCK COREBIT *T2-101*

MACHINE No. *D50*

HOLE DIA. *2.00-17.00m, Px* *17.00-33.20m, Hx*

FLUSHING MEDIUM *Water*

ORIENTATION *Vertical*

GROUND-LEVEL *7.67 mPD*

Drilling Progress	Casing depth/ size	Water level/ time/ date	TCR %	SCR %	RQD %	FI	Tests	Samples	Reduced Level	Depth (m)	Legend	Grade	Description
19-08-98		6.25m 08:00	100	100	100			T2-101		40.32			40.04 and 40.06m: 2 subparallel widely spaced joints are smooth undulating tight with slight iron staining and calcite (up to 2mm) mineral growth.
41			100	100	100			T2-101		40.68			
42			100	100	100			T2-101		41.86			42.18m: 1 Joint is smooth undulating very narrow with slight iron stain dipping horizontal to 10°.
43			100	100	100			T2-101		43.36			
44			100	100	100			T2-101		44.32			
45			100	100	100			T2-101		45.32			
46			100	100	100			T2-101		46.36			45.70-46.28m: Slightly decomposed coarse ash TUFF.
47			100	100	100			T2-101		47.85			
48			100	100	100			T2-101		49.36			
49			100	100	100			T2-101					
50													

- SMALL DISTURBED SAMPLE
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- STANDPIPE TIP

LOGGED: *D.Lowe*
DATE: *20-08-98*
CHECKED: *P.S.Nau*
DATE *21-08-98*

REMARKS:

Form No.: PRO/05/03A

LPM 130508 5-11-98

GOLD RAM ENGINEERING & DEVELOPMENT LTD.

HKQAA ISO 9001 : 1994 Certificate No.: CC638

DRILLHOLE RECORD

W.O. NO. *E0508/01* CONTRACT No. *E0508/98*

DATE *from 13-8-98 to 19-8-98* SHEET *6 of 6*

PROJECT *KCRC West Rail DD210 Ground Investigation Work*
Tuen Mun Section

HOLE No. *DD210/DH/043*

METHOD *IP+RC*

CO-ORDINATES
E 815721.72
N 829836.46

ROCK COREBIT *T2-101*

MACHINE No. *D50*

HOLE DIA. *2.00-17.00m, Px*
17.00-33.20m, Hx

FLUSHING MEDIUM *Water*

ORIENTATION *Vertical*

GROUND-LEVEL *7.67 mPD*

Drilling Progress	Casing depth/ size	Water level/ time/ date	TCR %	SCR %	RQD %	FI	Tests	Samples	Reduced Level	Depth (m)	Legend	Grade	Description
										50.09			See sheet 5 of 6 for details
									-42.83	50.50		II	Very strong, grey speckled yellowish green, slightly decomposed lapilli TUFF locally with fine gravel size marble clasts and calcareous. 50.94m: 1 joint is smooth planar extremely narrow with slight iron stain and calcite (< 1mm) mineral growth dipping horizontal to 10°. 50.97m: 1 joint is smooth planar extremely narrow with slight iron stain and calcite (< 1mm) mineral growth dipping 10° to 20°.
51			100	100	100	0.7		T2-101		51.04			
52			100	100	100			T2-101		52.06			
53			100	100	100			T2-101		52.97			
			100	100	100			T2-101	-45.88	53.55			
						0			-46.26	53.93		II	Strong, bluish grey mottled yellowish green and light grey, slightly decomposed marble and quartz clasts bearing TUFF-BRECCIA. No joints.
54													End of hole at 53.93m.
55													
56													
57													
58													
59													
60													

- SMALL DISTURBED SAMPLE
- S.P.T. LINER SAMPLE
- U100 UNDISTURBED SAMPLE
- U76 UNDISTURBED SAMPLE
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- PACKER TEST
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- STANDARD PENETRATION TEST
- PISTON SAMPLE
- PERMEABILITY TEST
- PRESSUREMETER
- STANDPIPE TIP

LOGGED: *D.Lowe*
DATE: *20-08-98*
CHECKED: *P.S.Nau*
DATE *21-08-98*

REMARKS:

KOWLOON-CANTON RAILWAY CORPORATION
WEST RAIL, TUEN MUN SECTION
DD210 SITE INVESTIGATION

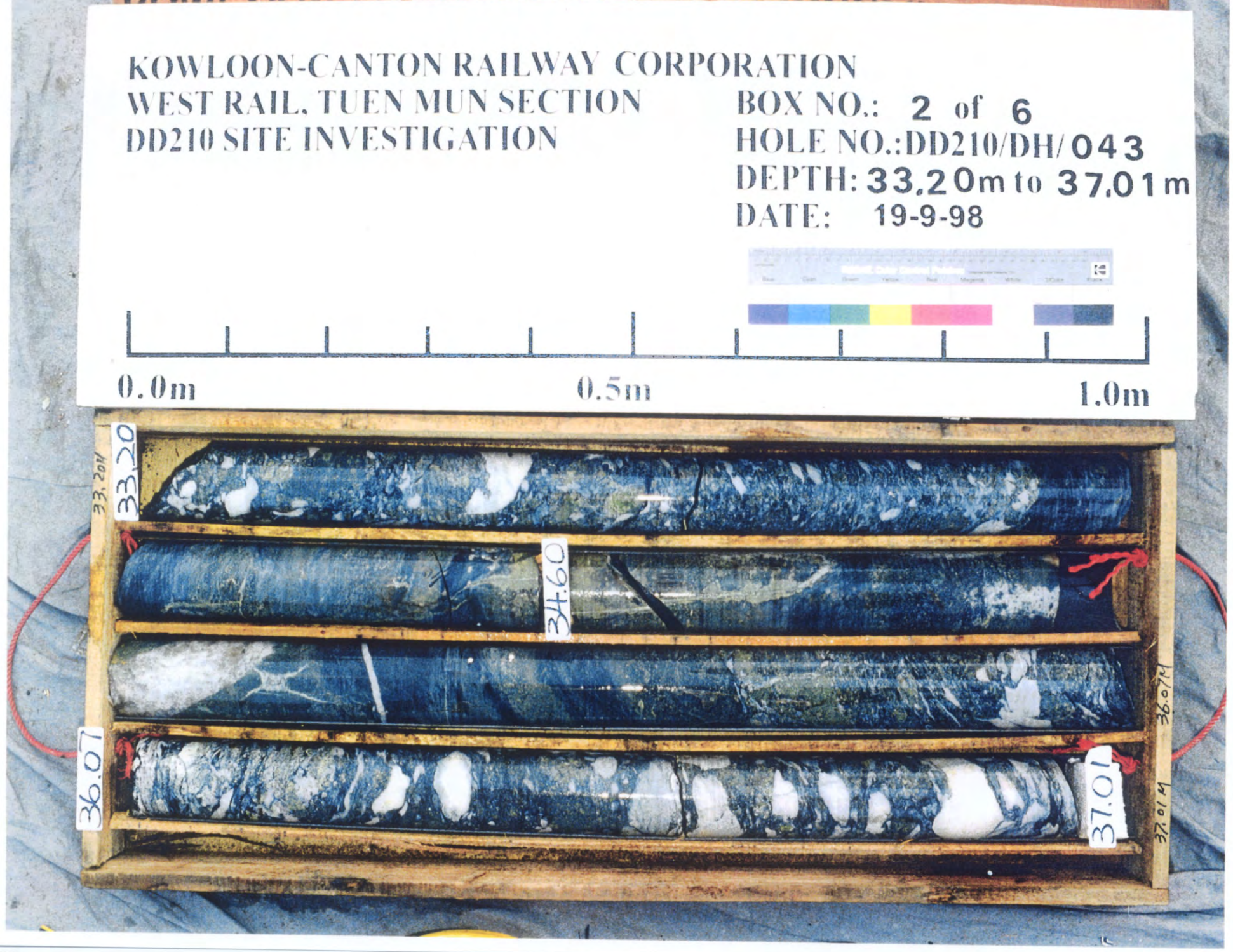
BOX NO.: 1 of 6
HOLE NO.:DD210/DH/043
DEPTH: 0.00m to 33.20m
DATE: 19-9-98



KOWLOON-CANTON RAILWAY CORPORATION
WEST RAIL, TUEN MUN SECTION
DD210 SITE INVESTIGATION

BOX NO.: 2 of 6
HOLE NO.:DD210/DH/043
DEPTH: 33.20m to 37.01m
DATE: 19-9-98

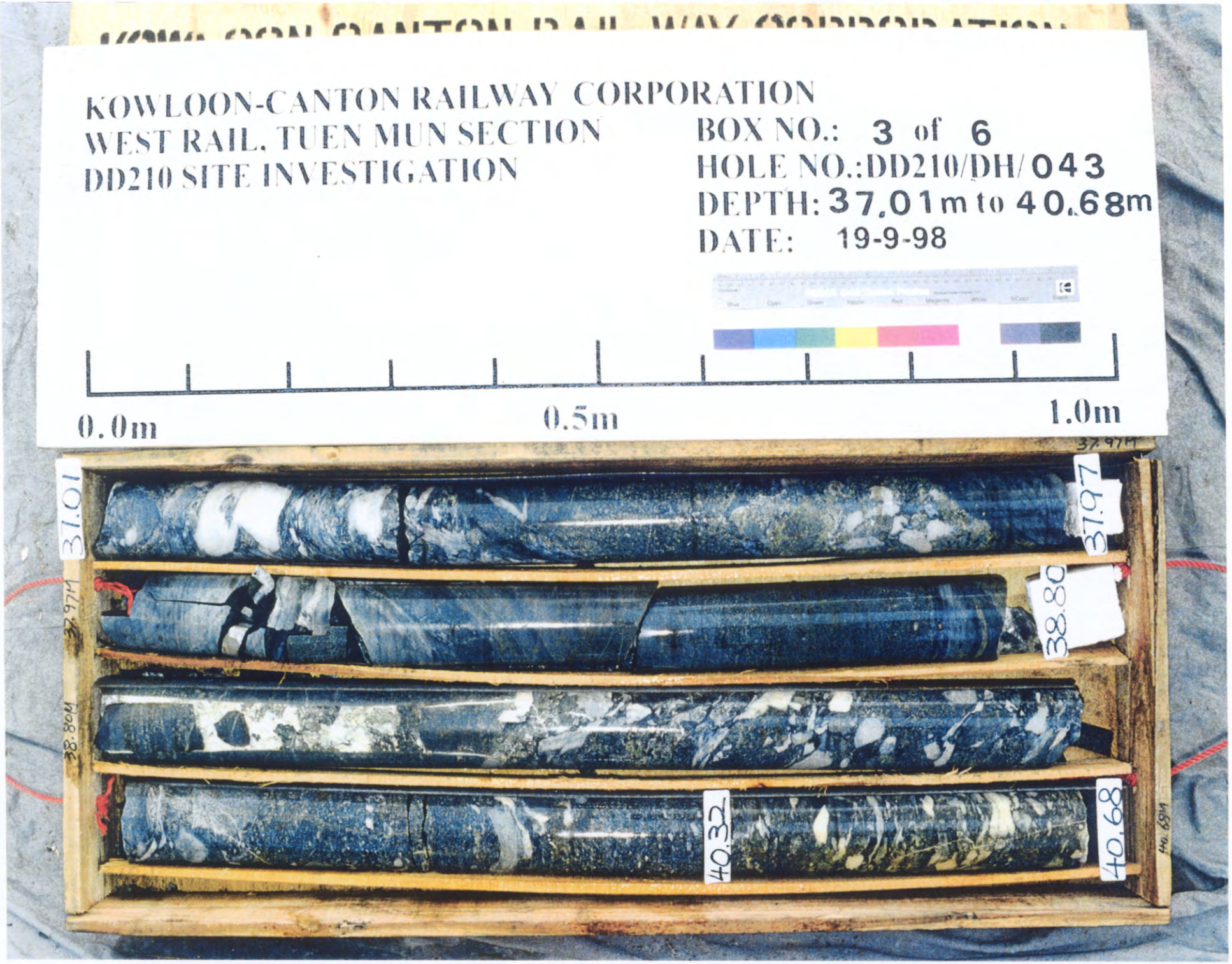
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KOWLOON-CANTON RAILWAY CORPORATION
WEST RAIL, TUEN MUN SECTION
DD210 SITE INVESTIGATION

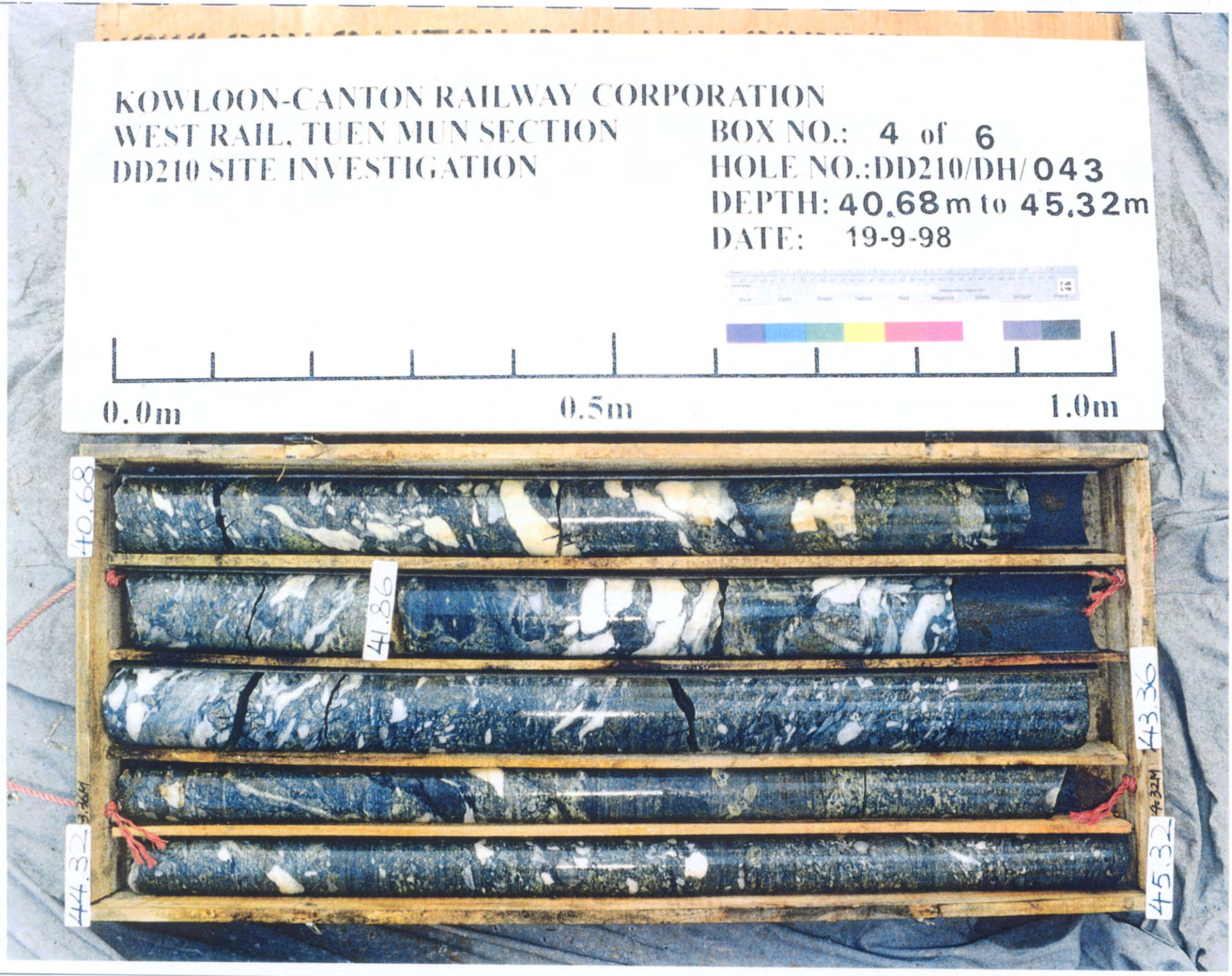
BOX NO.: 3 of 6
HOLE NO.:DD210/DH/043
DEPTH: 37.01m to 40.68m
DATE: 19-9-98

0.0m 0.5m 1.0m



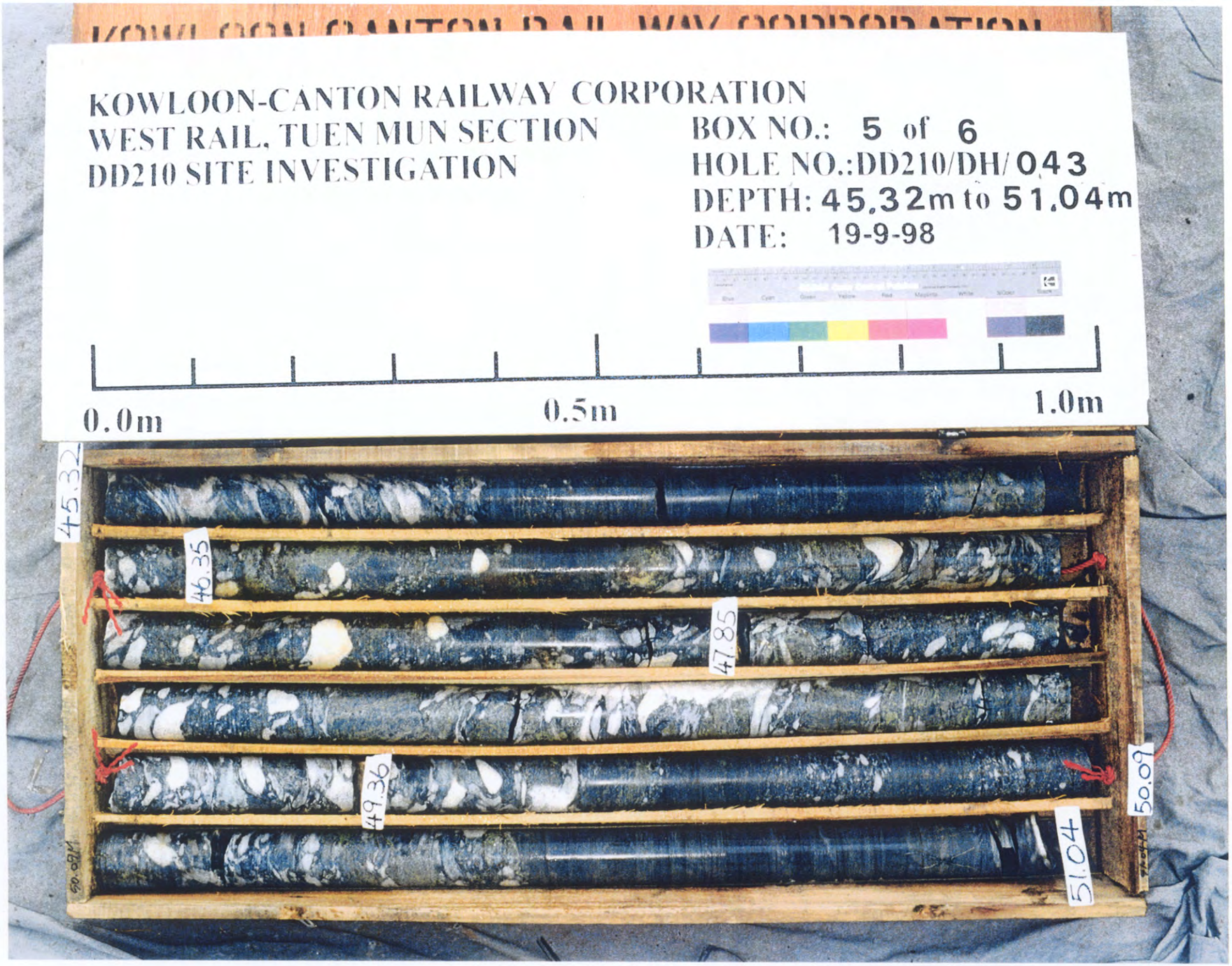
KOWLOON-CANTON RAILWAY CORPORATION
WEST RAIL, TUEN MUN SECTION
DD210 SITE INVESTIGATION

BOX NO.: 4 of 6
HOLE NO.:DD210/DH/043
DEPTH: 40.68m to 45.32m
DATE: 19-9-98



KOWLOON-CANTON RAILWAY CORPORATION
WEST RAIL, TUEN MUN SECTION
DD210 SITE INVESTIGATION

BOX NO.: 5 of 6
HOLE NO.:DD210/DH/043
DEPTH: 45.32m to 51.04m
DATE: 19-9-98



KOWLOON-CANTON RAILWAY CORPORATION
WEST RAIL, TUEN MUN SECTION
DD210 SITE INVESTIGATION

BOX NO.: 6 of 6
HOLE NO.:DD210/DH/043
DEPTH: 51.04m to 53.93m
DATE: 19-9-98

0.0m 0.5m 1.0m

