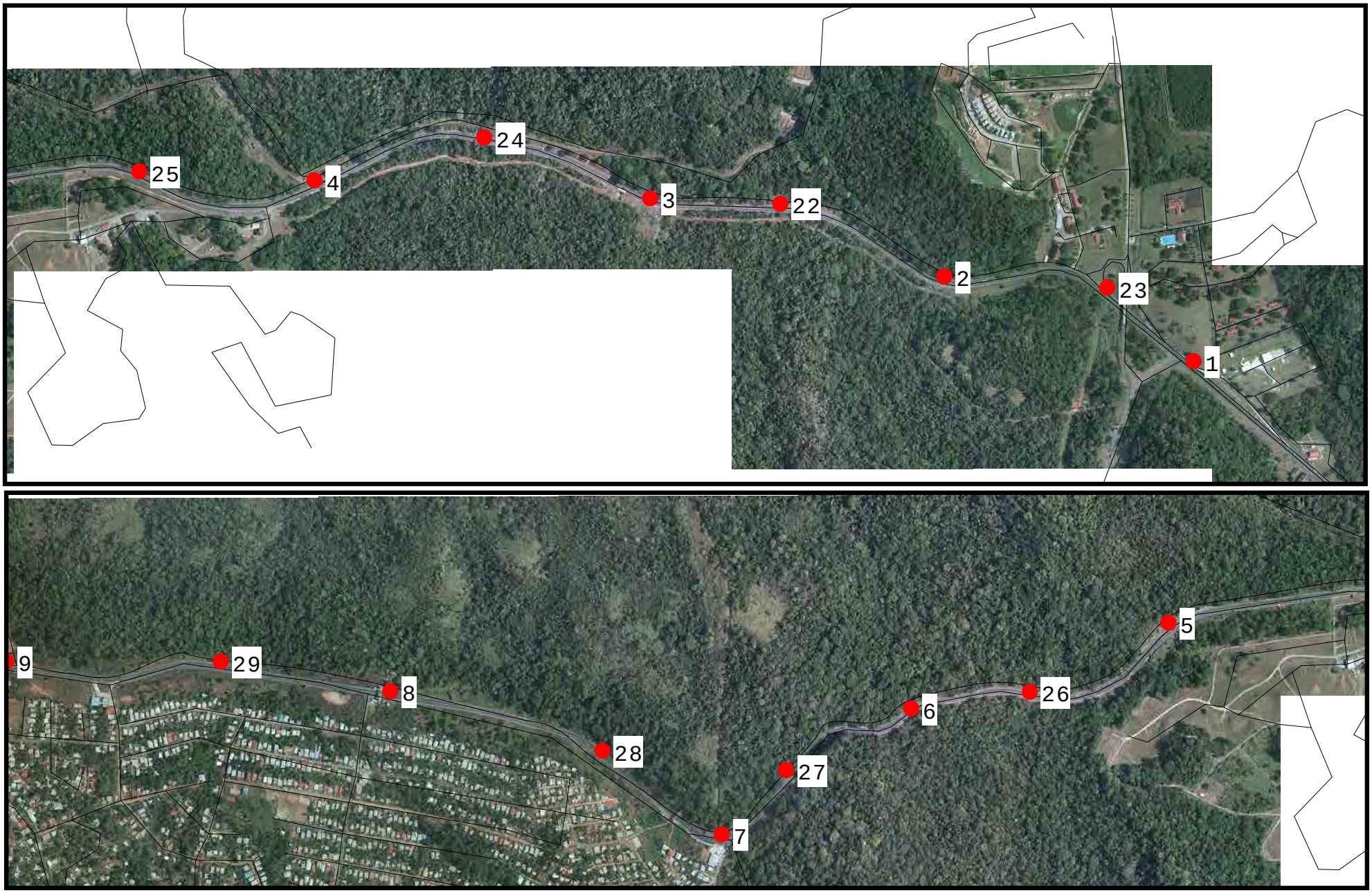
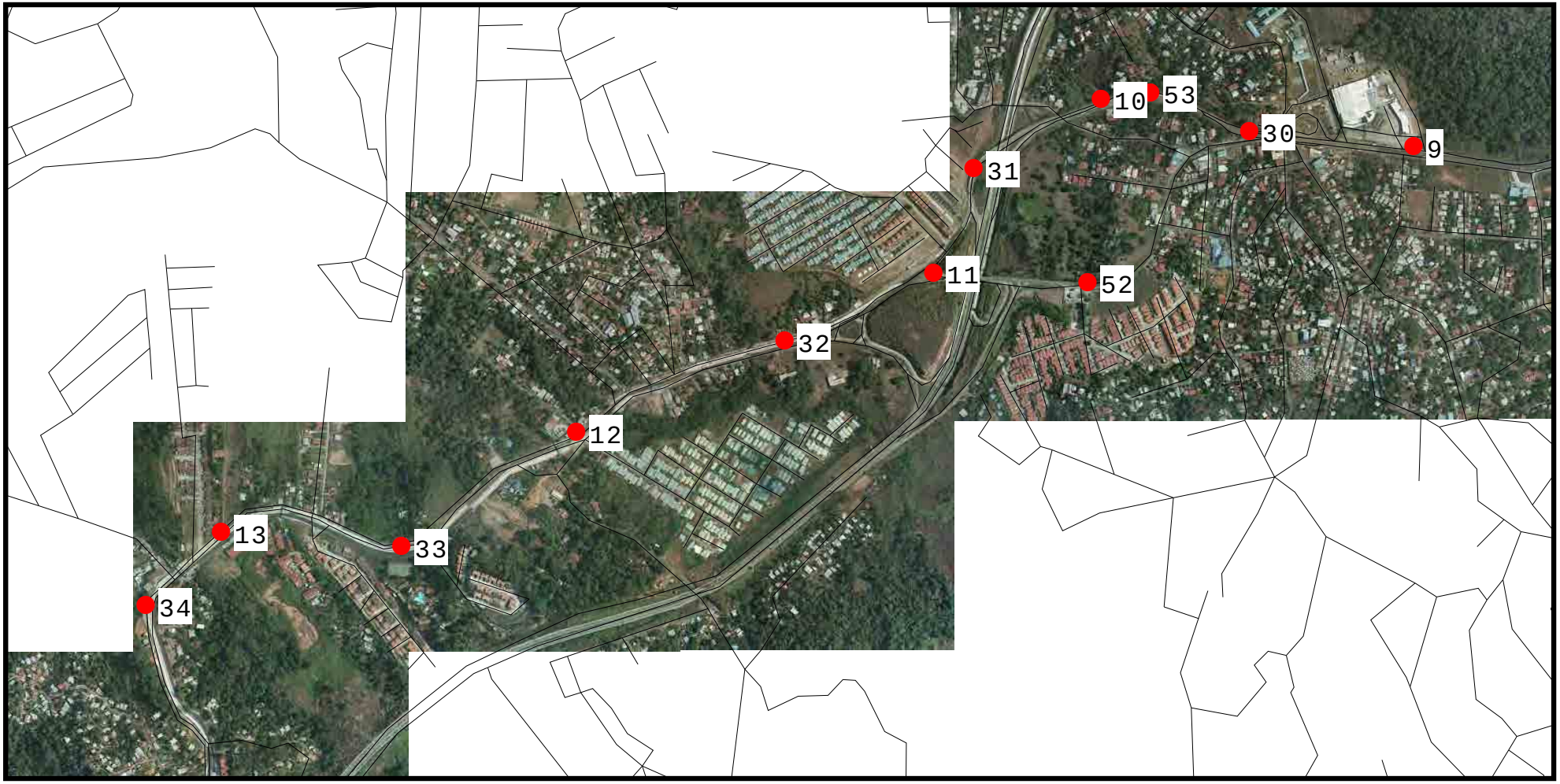
Appendix 3：Geographic Survey (Boring Log)

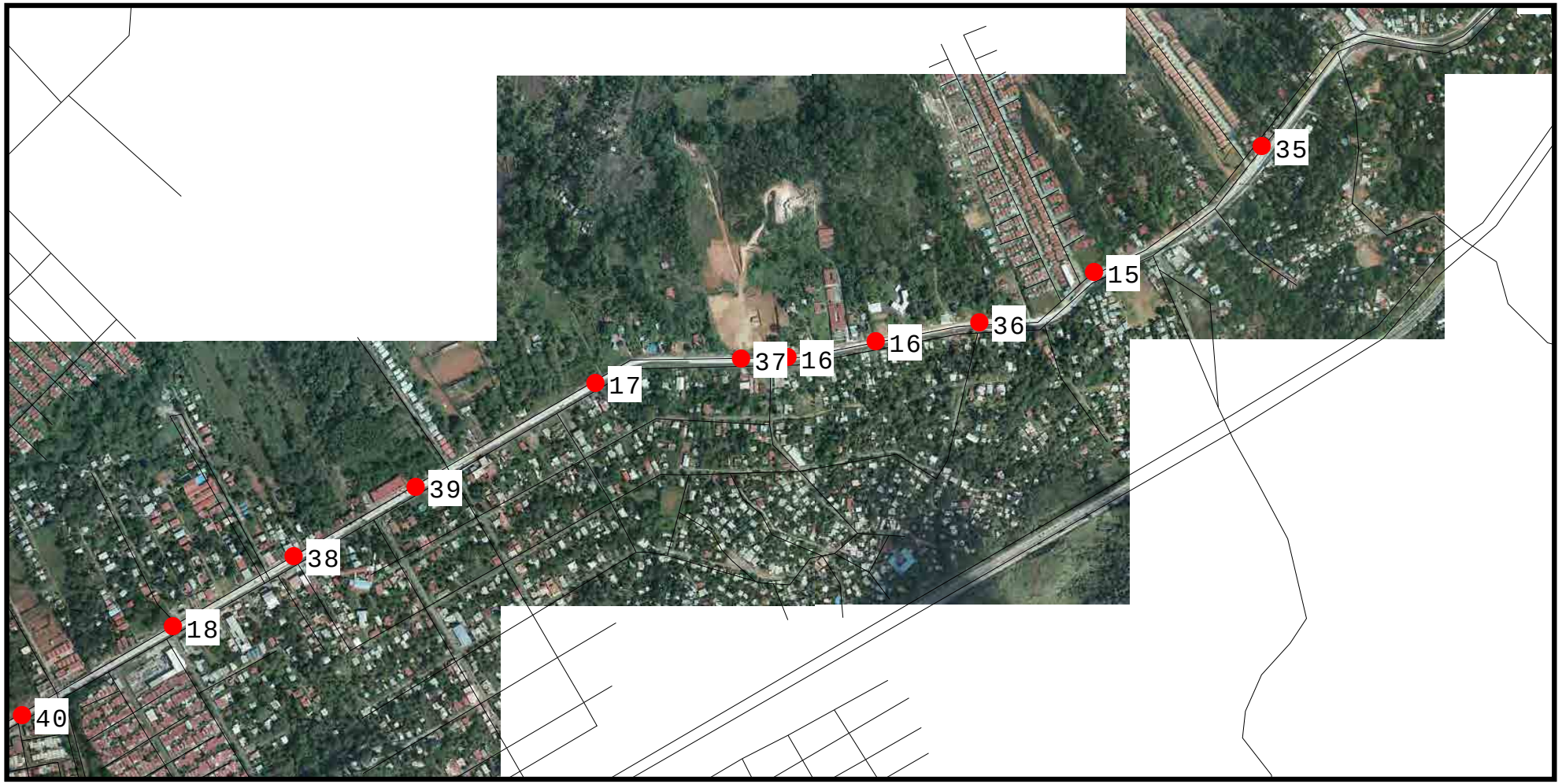
Boring Location Map (1)



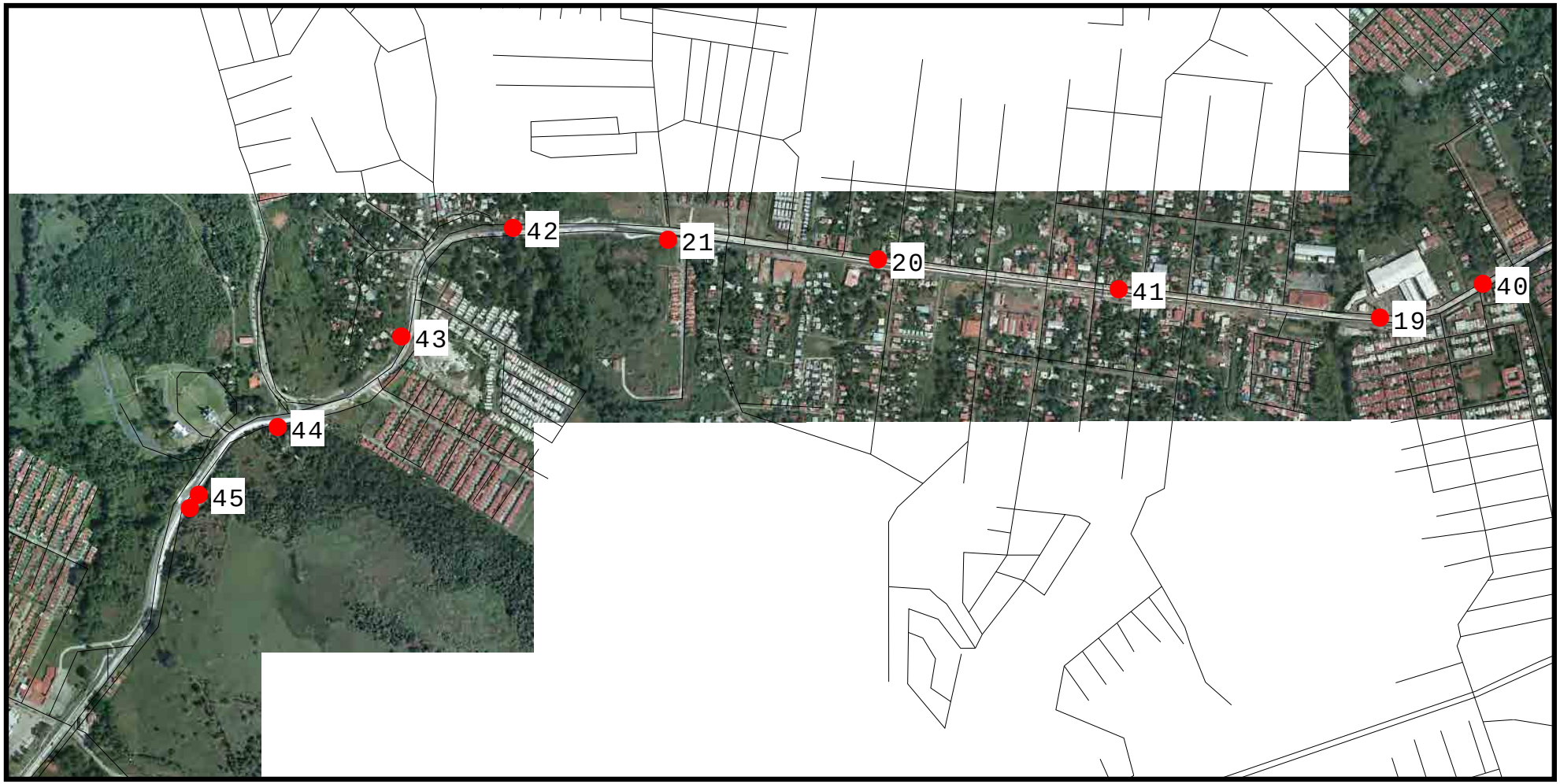
Boring Location Map (2)



Boring Location Map (3)



Boring Location Map (4)



LCC INGENIERIA

2. BORING GRAPHIC REPRESENTATION

WORK: C/010/001/049 LINE 3 RAILWAY
CUSTOMER: NIPPON KOEI

Sample N°: 343
Equipment: ROLATEC 48

Analyst: Ismael Arroyo

BORING : SR 47
DATE: 14/12/2013

Depth	Boring	Recovered (%) 20 40 60 80 100	WT	Geological Section	SAMPLE DESCRIPTION	UNDISTURBED SAMPLE	SPT	N Blows	P cms	N Field	ATTERBERG LIMITS LL	PL	PI	% SIEVING N° 4	N° 40	N° 200	Density and Moisture Wet grs/cm³	Dry grs/cm³	ω %	Compression qu (Kg/cm²)	Da (g/cm³)	NOTE
0.0	86 mm (W. type B)			0.60	Asphalt and soil																	
1.0				1.80	Marl clayey brown																	
2.0					Marl green sandy silty																	
3.0				3.60			3.00	1 0 1	15 15 15	1												
4.0					Clayey sludges																	
5.0																						
6.0							6.60	0 0 0	15 15 15	0	83	18	65	100	90.10	83.63	1.41	1.29	30.90			
7.0																						
8.0																						
9.0							9.60	1 0 1	15 15 15	1												
10.0																						
11.0																						
12.0							12.00	0 1 0	15 15 15	1												
13.0																						
14.0				14.20																		
15.0				15.45	Silty Sand yellow		15.00	19 28 50	15 15 15	79												
16.0					Very consolidated sands and silts																	
17.0																						
18.0				18.00			18.00	50	R	R	ROCK			ROCK			2.36	2.15	9.80			
19.0																						
20.0	86 mm (D. type T)																					
21.0					Conglomerate Rock		21.60	50	R	R												
22.0																						
23.0																						
24.0				24.63			24.60	50	R	R												

BORING END 24.63 m

LCC INGENIERIA

2. BORING GRAPHIC REPRESENTATION

WORK: C/010/001/039 LINE 3 RAILWAY | Sample N°: 308 | Analyst: Ismael Arroyo | **BORING : SR 50**
CUSTOMER: NIPPON KOEI | Equipment: ROLATEC 400 | **DATE: 04/12/2013**

Depth	Boring	Recovered (%)	WT	Geological Section	SAMPLE DESCRIPTION	UNDISTURBED SAMPLE	SPT	N Blows	P cms	N Field	ATTERBERG LIMITS LL	PL	PI	% SIEVING N° 4	N° 40	N° 200	Density and Moisture Wet grs/cm³	Dry grs/cm³	ω %	Compression qu (Kg/cm²)	Da (g/cm³)	NOTE
0.0	86 mm (W. type B)				Filling with gravel and rounded edges																	
1.0																						
2.0																						
3.00																						
3.0					Clay silty		3.00	2 2 2	15 15 15	4												
3.60																						
4.0					Marl with rounded edges																	
5.0																						
6.0							6.40	10 15 20	15 15 15	35	15	6	9	92.96	79.18	73.6	1.29	1.09	23.13			
6.40					Gravel mixed with stones																	
7.0																						
8.0																						
9.0							9.40	1 0 1	15 15 15	1												
9.40					Clay black with sediment																	
10.0																						
11.0																						
12.0							12.00	0 0 0	15 15 15	0												
13.0																						
14.0																						
15.0																						
16.0																						
17.00																						
17.0							17.00	5 5 5	15 15 15	10												
18.0					Marl clayey brown																	
19.0											26	15	11	100	93.04	89.25	1.07	0.78	31.98			
20.00																						
20.0							20.00	55	R	R												
21.0					Loam Rocky brown																	
21.20																						
22.0	86 mm (D. type T)				Rock		22.00	50	1	R												
23.0																						
24.0																						
25.0																						
25.40																						

BORING END 25.40 m

LCC INGENIERIA

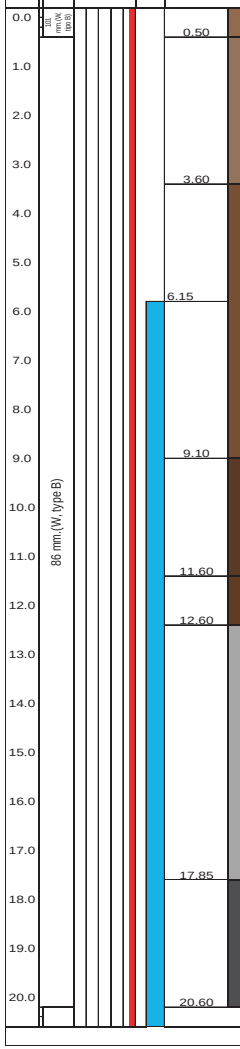
2. BORING GRAPHIC REPRESENTATION

WORK: C/010/001/001 LINE 3 RAILWAY
CUSTOMER: NIPPON KOEI

Sample N°: 135
Equipment: Rolatec 400

Analyst: Ismael Arroyo

BORING : SR 1
SAMPLE DATE: 5/10/2013



Geological Section	SAMPLE DESCRIPTION	UNDISTURBED SAMPLE	SPT	N Blows	P cms	N Field	ATTERBERG LIMITS LL	PL	PI	% SIEVING N° 4	N° 40	N° 200	Density and Moisture Wet grs/cm³	Dry grs/cm³	ω %	Compression qu (Kg/cm²)	Da (g/cm³)	NOTE
0.50	Vegetable Soil																	
	Reddish Clay Marly		3.00	5 4 4	15 15 15	8												
3.60							63	34	29	64.16	34.10	31.23	1.87	1.20	91.99			
6.15	Marl and Soft Rock		6.00	4 8 11	15 15 15	19												
9.10	Marl Consolidated		9.00	50	10 R	R												
11.60	Marl more consolidated		11.60	20 50	15 15 R	R												
12.60	Soft Rock Marly		14.70	50	15 R	R	48	28	20	12.94	4.48	3.97	GRAVEL					
17.85	Hard rock, Meteorized		18.00	50	7 R	R												
20.60			20.30	50	10 R	R												

BORING END A 20.60 m

Galera 8B, Ofidepósitos Tocumen II, Calle Nuevo Belén, Tocumen
Teléfono (507) 292-5282; 292-9083

LCC INGENIERIA

2. BORING GRAPHIC REPRESENTATION

WORK: C/010/001/42 LINE 3 RAILWAY
CUSTOMER: NIPPON KOEI

Sample N°: 314
Equipment: ROLATEC 400

Analyst: Ismael Arroyo

BORING : SR 23
DATE: 5/12/2013

Depth	Boring	Recovered (%)	WT	Geological Section	SAMPLE DESCRIPTION	UNDISTURBED SAMPLE	SPT	N Blows	P cms	N Field	ATTERBERG LIMITS LL	PL	PI	% SIEVING N° 4	N° 40	N° 200	Density and Moisture Wet grs/cm³	Dry grs/cm³	ω %	Compression qu (Kg/cm²)	Da (g/cm³)	NOTE
0.0																						
1.0																						
2.0					Gravel fill																	
3.0							3.00	50 / R	17	R												
4.0																						
5.0											NON PLASTIC MATERIAL			94.98	65.73	58.12	1.92	1.80	6.43			
6.0				6.00	Marl Consolidated brown with boulders																	
7.0				7.30			7.00	50 / R	29	R												
8.0																						
9.0	86 mm.(W. type B)						9.10	32 38 40	15 15 15	78												
10.0					Marl clayey with boulders dark brown																	
11.0																						
12.0							12.10	17 40 50	15 15 15	90												
13.0																						
14.0																						
15.0							15.10	23 27 50	15 15 15	77	51	16	35	94.56	84.48	82.71	1.45	1.01	27.81			
16.0																						
16.90																						
17.0					Rock fractured																	
18.0				18.10			18.10	50 / R	1	R												
19.0	86 mm.(D. type T)				Rock																	
20.0																						
				21.00			18.10	50 / R	1	R												

BORING END 21.02 m

LCC INGENIERIA

2. BORING GRAPHIC REPRESENTATION

WORK: C/010/001/009 LINE 3 RAILWAY Sample N°: 144 Analyst: Ismael Arroyo **BORING : SR 2**

CUSTOMER: NIPPON KOEI Equipment: Rolatec 400 **SAMPLE DATE: 12/10/2013**

Depth	Boring	Recovered (%) 20 40 60 80 100	WT	Geological Section	SAMPLE DESCRIPTION	UNDISTURBED SAMPLE	SPT N Blows	P cms	N Field	ATTERBERG LIMITS LL	PL	PI	% SIEVING N° 4	N° 40	N° 200	Density and Moisture Wet grs/cm³	Dry grs/cm³	ω %	Compression qu (Kg/cm²)	Da (g/cm³)	NOTE
0.0	101 mm.(W, type B)			0.60	Vegetable ground																
1.0				1.50	Brown Clayey loam with yellow inside																
2.0	86 mm.(W, type B)				Brown Clayey loam with yellow inside, with rocky sections					52	28	24	100	64.4	62.58	1.71	1.09	36.3			
3.0				3.10			3.00	50	10	50											
4.0	86 mm.(D, type T)				Fractured Rock																
5.0				5.40						Sample No Plastic			68.49	64.64	64.26	ROCK		7.15			
6.0					Fractured Rock		6.00	50	5	50											
7.0				7.00																	

BORING END A 7.00 m

LCC INGENIERIA

2. BORING GRAPHIC REPRESENTATION

WORK: C/010/001/013 LINE 3 RAILWAY
CUSTOMER: NIPPON KOEI

Sample N°: 177
Equipment: Rolatec 400

Analyst Ismael Arroyo

BORING : SR 22
DATE: 18/10/2013

Depth	Boring	Recovered (%) 20 40 60 80 100	WT	Geological Section	SAMPLE DESCRIPTION	UNDISTURBED SAMPLE	SPT	N Blows	P cms	N Field	ATTERBERG LIMITS LL	PL	PI	% SIEVING N° 4	N° 40	N° 200	Density and Moisture Wet grs/cm³	Dry grs/cm³	ω %	Compression qu (Kg/cm²)	Da (g/cm³)	NOTE
0.0					Vegetable ground																	
0.90																						
1.0					Loam clayey with boulders																	
2.0																						
3.0							3.30	3 5 7	15 15 15	12												
3.30																						
4.0					Clay loamy Brown																	
4.37											61	29	32	99.12	96.46	92.29	1.83	1.33	27.63			
5.0																						
5.10																						
6.0					Clay soft		6.30	2 2 3	15 15 15	5												
7.0																						
8.0																						
8.70																						
9.0					Loam consolidated with rocky levels		9.00	12 15 36	15 15 15	51												
10.0																						
11.0																						
12.0							12.60	50 R	5	R												
13.0																						
14.0											50	30	20	67.44	28.84	23.01	1.77	1.45	18.06			
14.90																						
15.0					Highly fractured rock		15.00	50 R	3	R												
16.0																						
17.00																						
17.0					Hard rock, with blacks tones																	
18.00							18.00	50 R	3	R												

86 mm.(W. type B)
86 mm.(D. type T)

BORING END 18.00 m

Galera 8B, Ofidepósitos Tocumen II, Calle Nuevo Belén, Tocumen
Teléfono (507) 292-5282; 292-9083

LCC INGENIERIA

2. BORING GRAPHIC REPRESENTATION

WORK: C/010/001/050 LINE 3 RAILWAY
CUSTOMER: NIPPON KOEI

Sample N°: 344
Equipment: RL-48

Analyst: Juan Francisco Fernandez

BORING : SR 3
DATE: 16/12/2013

Depth	Boring	Recovered (%)	WT	Geological Section	SAMPLE DESCRIPTION	UNDISTURBED SAMPLE	SPT	N Blows	P cms	N Field	ATTERBERG LIMITS LL	PL	PI	% SIEVING N° 4	N° 40	N° 200	Density and Moisture Wet grs/cm³	Dry grs/cm³	ω %	Compression qu (Kg/cm²)	Da (g/cm³)	NOTE
0.0				0.60	Soil																	
1.0				1.50	Clay																	
2.0	86 mm.(W. type B)				Silts altered																	
3.0							3.10	8 29 50	15 15 10	R												
4.0				4.50							55	21	34	96.24	85.23	77.81	1.35	1.17	29.56			
5.0					Rock fractured																	
6.0							6.00	50	5	R												
7.0																						
8.0																						
9.0							9.00	50	5	R												
10.0																						
11.0	86 mm.(D. type T)																					
12.0				12.00			12.00	50	1	R	ROCK			ROCK			2.14	2.11	1.10			
13.0					Rock																	
14.0																						
15.0							15.00	50	1	R												
16.0				16.70																		

BORING END 16.70 m

Galera 8B, Ofidepósitos Tocumen II, Calle Nuevo Belén, Tocumen
Teléfono (507) 292-5282; 292-9083

LCC INGENIERIA

2. BORING GRAPHIC REPRESENTATION

WORK: C/010/001/040 LINE 3 RAILWAY Sample N°: 309 Analyst: Juan Franciso Fernandez **BORING : SR 24**

CUSTOMER: NIPPON KOEI Equipment: RL-48 **DATE: 04/12/2013**

Depth	Boring	Recovered (%) 20 40 60 80 100	WT	Geological Section	SAMPLE DESCRIPTION	UNDISTURBED SAMPLE	SPT	N Blows	P cms	N Field	ATTERBERG LIMITS LL	PL	PI	% SIEVING N° 4	N° 40	N° 200	Density and Moisture Wet grs/cm³	Dry grs/cm³	ω %	Compression qu (Kg/cm²)	Da (g/cm³)	NOTE
0.0	86 mm.(W, type B)				Gravel fill																	
1.0				1.10																		
2.0					Clay with silts alterated						30	19	11	100	95.01	91.37	1.14	0.98	26.71			
3.0				3.00			3.00	7 8 10	15 15 15	18												
4.0					Silts alterated																	
5.0				4.00	Rock																	
6.0	86 mm.(D, type T)			5.20																		
7.0				6.00	Silty clay with rocky sections		6.00	50 R	1	R												
8.0					Rock						ROCK			ROCK			1.97	1.94	3.59			
9.0							9.00	50 R	1	R												
10.0				10.70																		

BORING END 10.70 m

Galera 8B, Ofidepósitos Tocumen II, Calle Nuevo Belén, Tocumen
Teléfono (507) 292-5282; 292-9083

LCC INGENIERIA

2. BORING GRAPHIC REPRESENTATION

WORK: C/010/001/003 LINE 3 RAILWAY Sample N°: 137 Analyst: Ismael Arroyo **BORING : SR 4**
CUSTOMER: NIPPON KOEI Equipment: Rolatec 400 **SAMPLE DATE: 6/10/2013**

Depth	Boring	Recovered (%)	WT	Geological Section	SAMPLE DESCRIPTION	UNDISTURBED SAMPLE	SPT	N Blows	P cms	N Field	ATTERBERG LIMITS LL	PL	PI	% SIEVING N° 4	N° 40	N° 200	Density and Moisture Wet grs/cm³	Dry grs/cm³	ω %	Compression qu (Kg/cm²)	Da (g/cm³)	NOTE
0.0	101 mm.(W, type B)			0.40	Asphalt with gravel																	
1.0				1.20	Vegetable layer																	
2.0				2.20	Brown clay loam with two color veins																	
3.0							3.20	4 5 5	15 15 15	10										0	2.48	
3.60					Light brown clay loam with veins bicolor						71	37	34	100	99.67	98.17	1.59	0.85	46.85			
4.0				4.20																		
5.0	86 mm.(D, type T)																					
6.0					Dark brown clay loam with veins bicolor		6.20	31 50	15 15 R	R												
7.0																						
8.0																						
9.0				9.25			9.20	50	5 R	R												
10.0																						
11.0					Consolidated loam, dark color and varies						Rock			Rock			Rock		4.01			
12.0	86 mm.(W, type B)			12.20			12.20	50	4 R	R												
13.0					Fractured rock black color, with white veins																	
14.0																						
15.0				15.03			15.00	50	3 R	R												

BORING END A 15.03 m

Galera 8B, Ofidepósitos Tocumen II, Calle Nuevo Belén, Tocumen
Teléfono (507) 292-5282; 292-9083

LCC INGENIERIA

2. BORING GRAPHIC REPRESENTATION

WORK: C/010/001/041 LINE 3 RAILWAY
CUSTOMER: NIPPON KOEI

Sample N°: 310
Equipment: ROLATEC 400

Analyst: Juan Francisco Fernandez

BORING : SR 51
DATE :5/12/2013

Depth	Boring	Recovered (%)	WT	Geological Section	SAMPLE DESCRIPTION	UNDISTURBED SAMPLE	SPT	N Blows	P cms	N Field	ATTERBERG LIMITS LL	PL	PI	% SIEVING N° 4	N° 40	N° 200	Density and Moisture Wet grs/cm³	Dry grs/cm³	ω %	Compression qu (Kg/cm²)	Da (g/cm³)	NOTE
0.0	86 mm.(W, type B)																					
1.0				1.60	Gravel fill																	
2.0					Clays compacted brown			3 6 3	15 15 15	9												
3.0				3.70			3.10															
4.0					Sandy silt with small boulders						53	39	14	97.44	81.70	78.73	1.18	0.92	31.31			
5.0																						
6.0				6.40			5.80	7 10 13	15 15 15	23												
7.0					Sandy silt																	
8.0																						
9.0				9.90			9.30	13 15 29	15 15 15	44												
10.0					Silts and silts clayey																	
11.0																						
12.0				12.10			12.00	50 R	10	R	83	50	33	97.44	81.70	78.73	1.02	0.61	36.99			
13.0	86 mm.(D, type T)			13.30	Rock fracturated																	
14.0					Rock																	
15.0				15.90																		

BORING END 15.90 m

Galera 8B, Ofidepósitos Tocumen II, Calle Nuevo Belén, Tocumen
Teléfono (507) 292-5282; 292-9083

LCC INGENIERIA

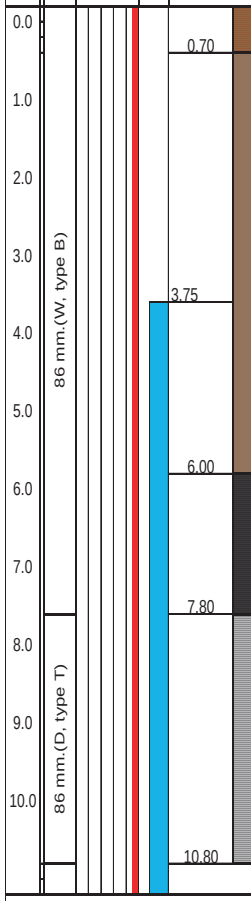
2. BORING GRAPHIC REPRESENTATION

WORK: C/010/001/011 LINE 3 RAILWAY
CUSTOMER: NIPPON KOEI

Sample N°: 171
Equipment: RL-48

Analyst: Juan Antonio

BORING : SR 25
SAMPLE DATE: 16/10/2013



Depth	Boring	Recovered (%)	WT	Geological Section	SAMPLE DESCRIPTION	UNDISTURBED SAMPLE	SPT	N Blows	P cms	N Field	ATTERBERG LIMITS LL	PL	PI	% SIEVING N° 4	N° 40	N° 200	Density and Moisture Wet grs/cm³	Dry grs/cm³	ω %	Compression qu (Kg/cm²)	Da (g/cm³)	NOTE
0.0	86 mm.(W, type B)			0.70	Filling Material																	
3.0				3.75	Silts clayey brown soft		3.00	3 4 4	15 15 15	8	63	30	33	100	99.34	95.07	1.5	0.83	44.61			
6.0				6.00	Silts soft grayish arcillos		6.00	4 5 5	15 15 15	10												
9.0	86 mm.(D, type T)			7.80	Grayish Rock		9.00	50 R	2	R										256.4	2.44	
10.0				10.80																		

BORING END A 10.80 m

Galera 8B, Ofidepósitos Tocumen II, Calle Nuevo Belén, Tocumen
Teléfono (507) 292-5282; 292-9083

LCC INGENIERIA

2. BORING GRAPHIC REPRESENTATION

WORK: C/010/001/002 LINE 3 RAILWAY
CUSTOMER: NIPPON KOEI

Sample N°: 136
Equipment: Rolatec 400

Analyst: Ismael Arroyo

BORING : SR 5
SAMPLE DATE: 10/10/2013

Depth	Boring	Recovered (%)	WT	Geological Section	SAMPLE DESCRIPTION	UNDISTURBED SAMPLE	SPT	N Blows	P cms	N Field	ATTERBERG LIMITS LL	PL	PI	% SIEVING N° 4	N° 40	N° 200	Density and Moisture Wet grs/cm³	Dry grs/cm³	ω %	Compression qu (Kg/cm²)	Da (g/cm³)	NOTE
0.0	86 .mm.(W. tipo B)	20 40 60 80 100			Gravel Fill																	
1.0				1.40																		
2.0					Brown loam with internal yellow tones																	
3.0				3.60			3.00	3 4 4	15 15 15	8												
4.0				4.60							51	32	19	100	96.03	89.98	1.57	0.78	50.26			
5.0					Marga tricolor light brown with oxides																	
6.0							6.40	5 5 6	15 15 15	11												
7.0				7.00																		
8.0					Brown sandy loam softer																	
9.0				9.00			9.00	9 18 21	15 15 15	39												
10.0					More consolidated greenish Marga																	
11.0				12.00																		
12.0					Greenish Marga more consolidated, with rocky sections		12.00	9 21 36	15 15 15	57	41	29	12	99.9	82.88	54.2	1.80	1.26	29.73			
13.0				13.80																		
14.0					Roca soft grayish with white veins																	
15.0							15.00	50 R	4	R												
16.0				16.50																		

BORING END A 16.50 m

Galera 8B, Ofidepósitos Tocumen II, Calle Nuevo Belén, Tocumen
Teléfono (507) 292-5282; 292-9083

LCC INGENIERIA

2. BORING GRAPHIC REPRESENTATION

WORK: C/010/001/012 LINE 3 RAILWAY
CUSTOMER: NIPPON KOEI

Sample N°: 172
Equipment: Rolatec 400

Analyst: Ismael Arroyo

BORING : SR 26
SAMPLE DATE: 16/10/2013

Depth	Boring	Recovered (%) 20 40 60 80 100	WT	Geological Section	SAMPLE DESCRIPTION	UNDISTURBED SAMPLE	SPT	N Blows	P cms	N Field	ATTERBERG LIMITS LL	PL	PI	% SIEVING N° 4	N° 40	N° 200	Density and Moisture Wet grs/cm³	Dry grs/cm³	ω %	Compression qu (Kg/cm²)	Da (g/cm³)	NOTE
0.0	86 mm.(W. type B)			0.50	Vegetable ground																	
0.70																						
1.0					Loam clayey Light brown																	
2.0																						
3.0							3.00	5 5 10	15 15 15	16												
3.60					Loam clayey light brown, consolidated						83	35	48	100	96.19	94.69	1.72	1.08	37.43			
4.0				4.20																		
5.0					Loam soft brown, average consolidated																	
6.0							6.00	3 4 5	15 15 15	9												
7.0				7.60																		
8.0					Loam soft brown with green veins and oxides																	
9.0							9.00	5 20 50	15 15 15	70												
9.45																						
10.0					Loam consolidated (Semi rock)																	
10.80																						
11.0	86 mm.(D. type T)				Rock with blacks tones																	
12.0				12.13			12.10	50 R	3	R												
13.0					Rock																	
14.0				14.72			14.70	50 R	2	R												

BORING END A 14.70 m

LCC INGENIERIA

2. BORING GRAPHIC REPRESENTATION

WORK: C/010/001/051 LINE 3 RAILWAY
CUSTOMER: NIPPON KOEI

Sample N°: 345
Equipment: RL-48

Analyst: Juan Francisco Fernandez

BORING : SR 6
DATE: 20/12/2013

Depth	Boring	Recovered (%) 20 40 60 80 100	WT	Geological Section	SAMPLE DESCRIPTION	UNDISTURBED SAMPLE	SPT	N Blows	P cms	N Field	ATTERBERG LIMITS LL	PL	PI	% SIEVING N° 4	N° 40	N° 200	Density and Moisture Wet grs/cm³	Dry grs/cm³	ω %	Compression qu (Kg/cm²)	Da (g/cm³)	NOTE
0.0	86 mm.(W. type B)			0.80	Asphalt																	
1.0					Base layer																	
2.0																						
3.0				3.60			3.00	5 7 7	15 15 10	14	58	11	47	100	96.02	91.26	1.32	1.14	26.71			
4.0					Clayey silt and sandy loams																	
5.0																						
6.0	86 mm.(D. type T)			6.60			6.00	5 7 7	15 15 10	14												
7.0					Silts altered																	
8.0																						
9.0							9.20	8 9 9	15 15 10	18												
10.0																						
11.0				11.00	Rock																	
12.0							12.20	50	1	R	ROCK			ROCK			1.98	1.95	3.56			
13.0																						
14.0				14.82																		

BORING END 14.82 m

LCC INGENIERIA

2. BORING GRAPHIC REPRESENTATION

WORK: C/010/001/014 LINE 3 RAILWAY Sample N°: 178 Analyst: Juan Antonio Cortez **BORING : SR 27**

CUSTOMER: NIPPON KOEI Equipment: RL-48 **DATE: 18/10/2013**

Depth	Boring	Recovered (%) 20 40 60 80 100	WT	Geological Section	SAMPLE DESCRIPTION	UNDISTURBED SAMPLE	SPT N Blows	P cms	N Field	ATTERBERG LIMITS LL	PL	PI	% SIEVING N° 4	N° 40	N° 200	Density and Moisture Wet grs/cm³	Dry grs/cm³	ω %	Compression qu (Kg/cm²)	Da (g/cm³)	NOTE
0.0	101 mm.(W, type B)				Silty clay brown with gravel																
1.0				1.32						41	27	14	95.04	86.75	80.28	1.86	1.28	31.09			
2.0				2.10																	
3.0	86 mm.(D, type T)				Grayish Rock		3.00	50 R	2 R												
4.0																			134.9	2.9	
5.0				5.42			5.40	50 R	2 R												
					BORING END A 5.42 m																

LCC INGENIERIA

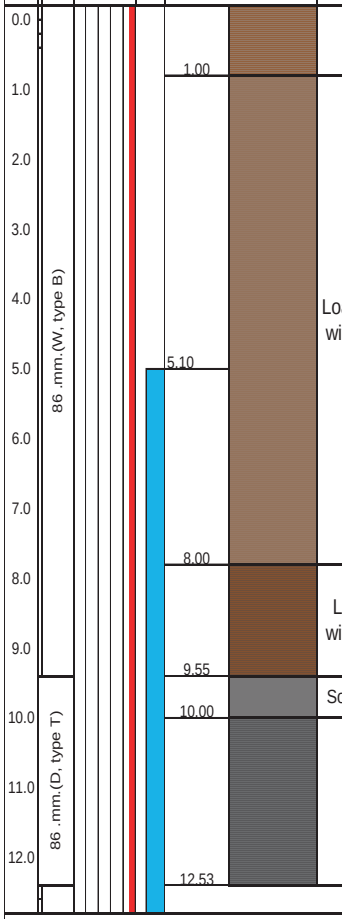
2. BORING GRAPHIC REPRESENTATION

WORK: C/010/001/004 LINE 3 RAILWAY
CUSTOMER: NIPPON KOEI

Sample N°: 139
Equipment: Rolatec 400

Analyst: Ismael Arroyo

BORING : SR 7
SAMPLE DATE: 8/10/2013



SAMPLE DESCRIPTION	UNDISTURBED SAMPLE	SPT	N Blows	P cms	N Field	ATTERBERG LIMITS LL	PL	PI	% SIEVING N° 4	N° 40	N° 200	Density and Moisture Wet grs/cm³	Dry grs/cm³	ω %	Compression qu (Kg/cm²)	Da (g/cm³)	NOTE
Vegetable layer																	
Loam tricolor, medium consolidated with brown tones, yellow and white		3.20	4 5 6	15 15 15	11	56	32	24	100	92.96	82	1.57	0.88	44.04			
		6.20	12 15 15 22	15 15 15 15	37												
Loam tricolor, More consolidated with brown tones, yellow and white		9.50	50 R	5 R	R	46	18	28	95.4	50.1	38.52	2.07	1.81	12.14			
Soft Rock with brown and yellow tones																	
Rock Black with white veins		12.50	50 R	3 R	R												
BORING END A 12.53 m																	

Galera 8B, Ofidepósitos Tocumen II, Calle Nuevo Belén, Tocumen
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LCC INGENIERIA

2. BORING GRAPHIC REPRESENTATION

WORK: C/010/001/010 LINE 3 RAILWAY Sample N°: 156 Analyst: Juan Antonio Cortez **BORING : SR 28**

CUSTOMER: NIPPON KOEI Equipment: RL-48 **SAMPLE DATE: 12/10/2013**

Depth	Boring	Recovered (%) 20 40 60 80 100	WT	Geological Section	SAMPLE DESCRIPTION	UNDISTURBED SAMPLE	SPT	N Blows	P cms	N Field	ATTERBERG LIMITS LL	PL	PI	% SIEVING N° 4	N° 40	N° 200	Density and Moisture Wet grs/cm³	Dry grs/cm³	ω %	Compression qu (Kg/cm²)	Da (g/cm³)	NOTE
0.0	86 mm.(W, type B)				Marly clays with many gravel and boulders																	
2.40																						
	86 mm.(W, type T)				Marl with many boulders																	
3.03																						
3.0							3.00	50	3	R	Sample No Plastic			3.73	2.2	2.1	ROCK		1.2			
					Clayey silt with gravel and boulders																	
4.50																						
5.0																						
6.0							6.00	28	15	76												
								34	15													
								42	15													
7.0	86 mm.(W, type B)				Lithified brown loams																	
8.0																						
9.0							9.00	31	15	R	79	24	55	98.42	86.38	78.91	1.95	1.59	18.37			
								9	15													
9.60								R														
10.0					Meteorized Rock																	
11.0																						
12.0	86 mm.(D, type T)						11.60	50	2	R												
12.60								R														

BORING END A 12.60 m

Galera 8B, Ofidepósitos Tocumen II, Calle Nuevo Belén, Tocumen
Teléfono (507) 292-5282; 292-9083

LCC INGENIERIA

2. BORING GRAPHIC REPRESENTATION

WORK: C/010/001/044 LINE 3 RAILWAY
CUSTOMER: NIPPON KOEI

Sample N°: 316
Equipment: RL-48

Analyst: Juan Francisco Fernandez

BORING : SR 46
DATE: 06/12/2013

Depth	Boring	Recovered (%) 20 40 60 80 100	WT	Geological Section	SAMPLE DESCRIPTION	UNDISTURBED SAMPLE	SPT	N Blows	P cms	N Field	ATTERBERG LIMITS LL	PL	PI	% SIEVING N° 4	N° 40	N° 200	Density and Moisture Wet grs/cm³	Dry grs/cm³	ω %	Compression qu (Kg/cm²)	Da (g/cm³)	NOTE
0.0	86 mm (W. type B)				Filled Material																	
1.0																						
2.0																						
3.0																						
4.0				4.20			4.20	9 9 9	15 15 15	18	67	34	33	26.40	7.77	6.65	1.88	1.23	33.21			
5.0					Clay mixed with gravel and rocks																	
6.0				6.60																		
7.0					Rock fractured		7.20	50	5	R												
8.0																						
9.0																						
10.0							10.20	50	3	R												
11.0																						
12.0	86 mm (D. type T)																					
13.0							13.20	50	2	R	ROCK			ROCK			ROCK					
14.0				14.50																		
15.0					Rock																	
16.0																						
				17.02			13.20	50	1	R												

BORING END A 17.02 m

Galera 8B, Ofidepósitos Tocumen II, Calle Nuevo Belén, Tocumen
Teléfono (507) 292-5282; 292-9083

LCC INGENIERIA

2. BORING GRAPHIC REPRESENTATION

WORK: C/010/001/005 LINE 3 RAILWAY
CUSTOMER: NIPPON KOEI

Sample N°: 140
Equipment: Rolatec 400

Analyst: Ismael Arroyo

BORING : SR 8
SAMPLE DATE: 9/10/2013

Depth	Boring	Recovered (%)	WT	Geological Section	SAMPLE DESCRIPTION	UNDISTURBED SAMPLE	SPT	N Blows	P cms	N Field	ATTERBERG LIMITS LL	PL	PI	% SIEVING N° 4	N° 40	N° 200	Density and Moisture Wet grs/cm³	Dry grs/cm³	ω %	Compression qu (Kg/cm²)	Da (g/cm³)	NOTE
0.0																						
1.0					Filler gravel																	
1.40																						
2.0					Consolidated Clayey loam																	
3.0							3.20	6 9 11	15 15 15	20												
3.80																						
4.0											83	39	44	92.94	92.11	89.78	1.72	0.92	46.58			
5.0																						
6.0	86 .mm.(W, type B)				Consolidated Clayey loam, softer, with gray, black and reddish veins		6.40	4 4 4	15 15 15	8												
6.47																						
7.0																						
8.0																						
8.50																						
9.0					Silty loam with very soft water and oxides		9.40	5 6 6	15 15 15	12												
8.50																						
10.0																						
11.0					Silty loam with grayish black color and white and yellow tones inside																	
12.0							12.40	11 37 50 R	15 15 15	R												
12.85											43	27	16	99.78	78.14	67.15	1.28	25.89	46.58			
13.0																						
14.0	86 .mm.(D, type T)				Fractured rock, black rock oxides																	
15.0							15.10	50 R	4	R												
16.00																						

BORING END A 16.50 m

Galera 8B, Ofidepósitos Tocumen II, Calle Nuevo Belén, Tocumen
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LCC INGENIERIA

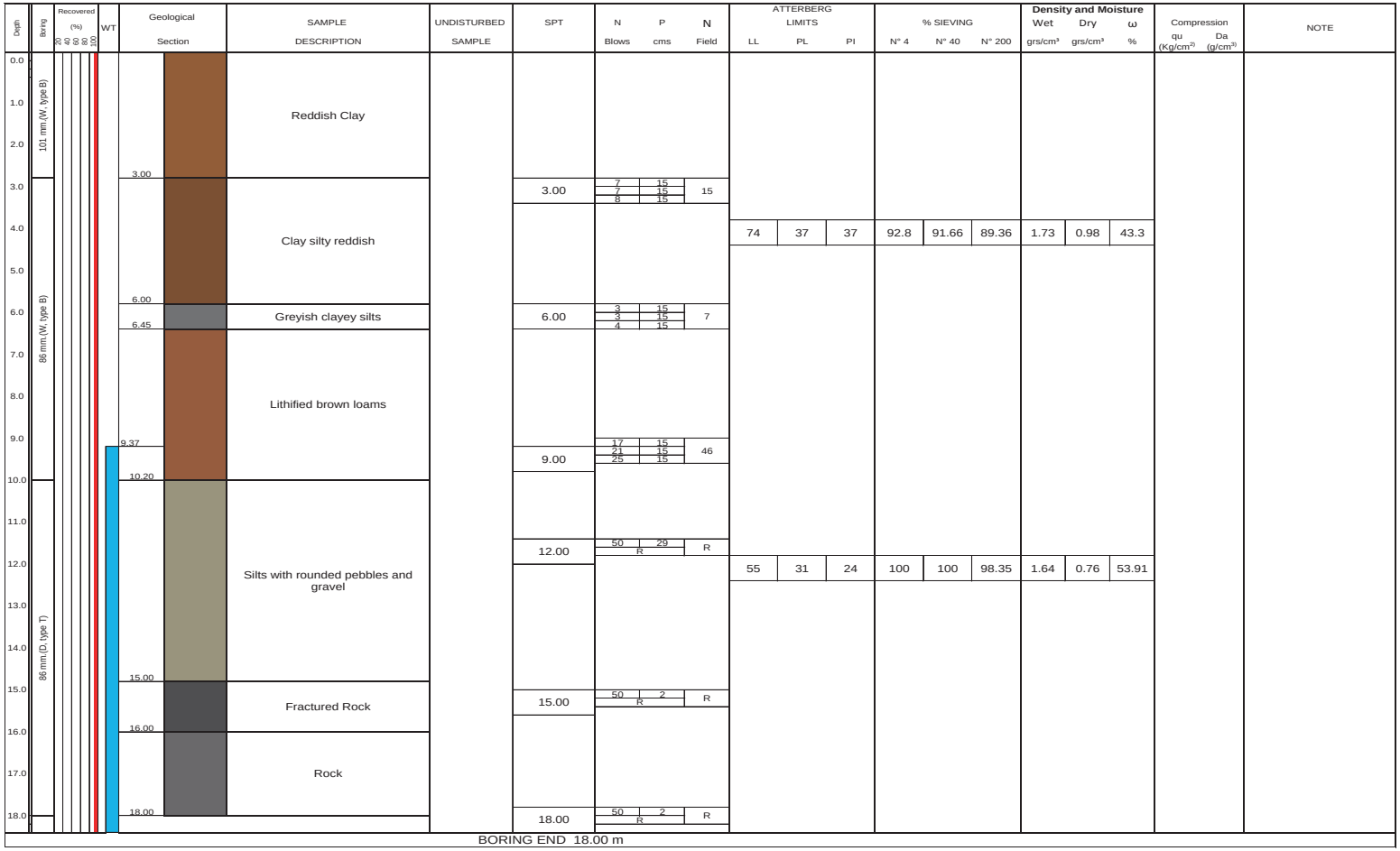
2.

WORK: C/010/001/021 LINE 3 RAILWAY
CUSTOMER: NIPPON KOEI

Sample N°: 212
Equipment: RL-48

Analyst: Juan Antonio

BORING : SR 29
DATE: 23/10/2013



BORING GRAPHIC REPRESENTATION

LCC INGENIERIA

2. BORING GRAPHIC REPRESENTATION

WORK: C/010/001/006 LINE 3 RAILWAY
CUSTOMER: NIPPON KOEI

Sample N°: 141
Equipment: RL-48

Analyst: Juan Antonio Cortez

BORING : SR 9
SAMPLE DATE: 09/10/2013

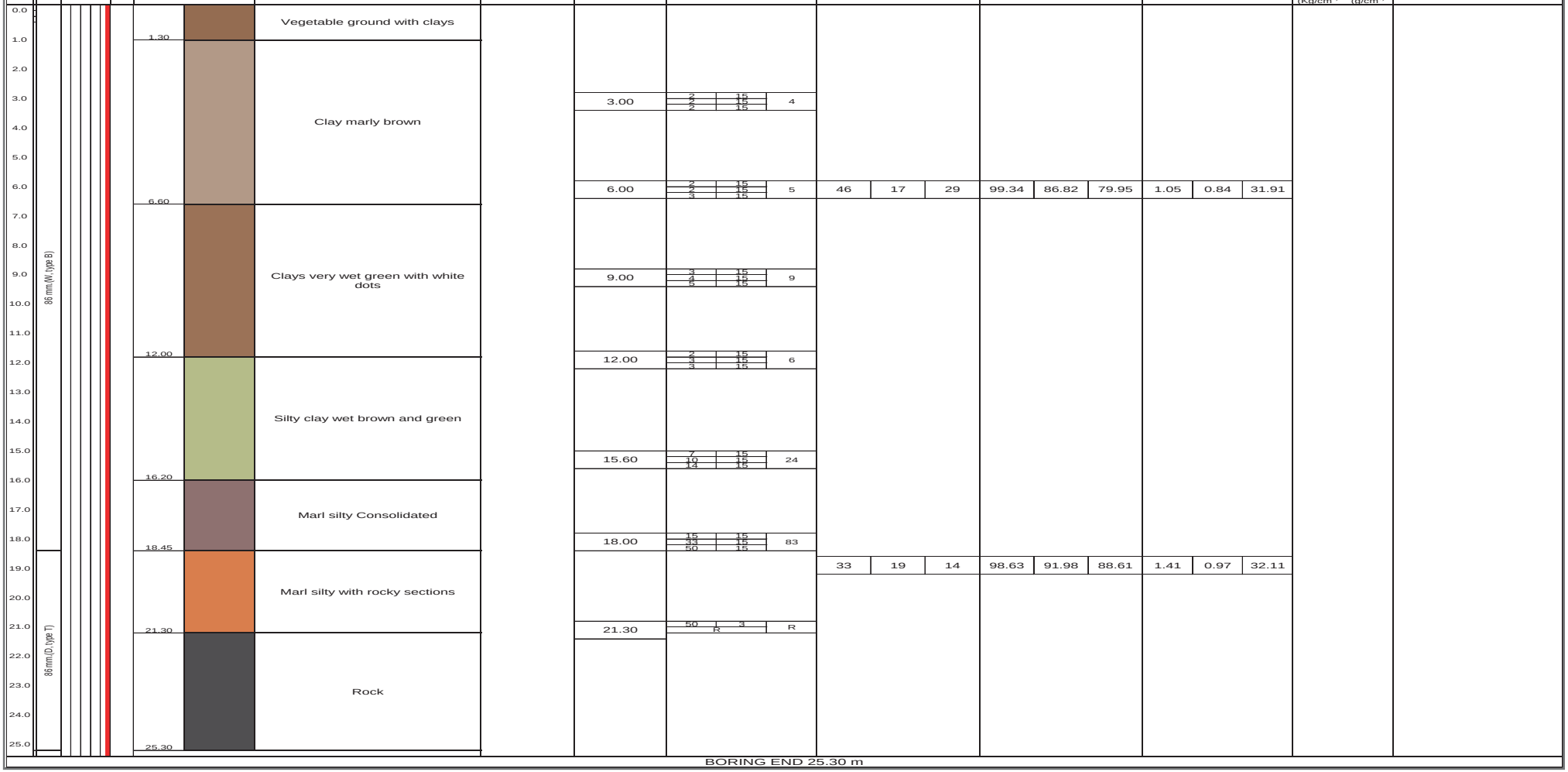
Depth	Boring	Recovered (%)	WT	Geological Section	SAMPLE DESCRIPTION	UNDISTURBED SAMPLE	SPT	N Blows	P cms	N Field	ATTERBERG LIMITS LL	PL	PI	% SIEVING N° 4	N° 40	N° 200	Density and Moisture Wet grs/cm³	Dry grs/cm³	ω %	Compression qu (Kg/cm²)	Da (g/cm³)	NOTE
0.0	86 mm.(W. type B)	20 40 60 80 100		0.25	Concrete																	
1.0					Reddish marl																	
2.0																						
3.0							3.00	8 8 9	15 15 15	17												
4.0											61	35	26	100	97.73	92.05	1.71	0.99	42.07			
5.0				5.40																		
				5.80	Clayey silt Color reddish																	
6.0							6.00	6 8 8	15 15 15	14												
7.0				7.80																		
8.0					Grayish clayey silts																	
9.0							9.00	4 5 6	15 15 15	11												
10.0				10.80																		
11.0					Clayey silts, Brown																	
12.0				12.45			11.60	10 18 28	15 15 15	46												
13.0					Sandy loams, Brown						37	30	7	100	91.9	80.71	2.54	1.82	28.18			
13.70							13.80	50	4	50												
14.0					Grayish Fractured Rock																	
15.0	86 mm.(W. type T)																					
16.0																						
17.0				17.10			17.10	50	3	50												

BORING END A 17.10 m

LCC INGENIERIA

2. BORING GRAPHIC REPRESENTATION

WORK: C/010/001/037 LINE 3 RAILWAY | Sample N°: 306 | Analyst: Ismael Arroyo | **BORING : SR 30**
CUSTOMER: NIPPON KOEI | Equipment: ROLATEC 400 | **DATE: 30/11/2013**



LCC INGENIERIA

2. BORING GRAPHIC REPRESENTATION

WORK: C/010/001/048 LINE 3 RAILWAY
CUSTOMER: NIPPON KOEI

Sample N°: 335
Equipment: RL-48

Analyst: Ismael Arroyo

BORING : SR 52
DATE: 12/12/2013

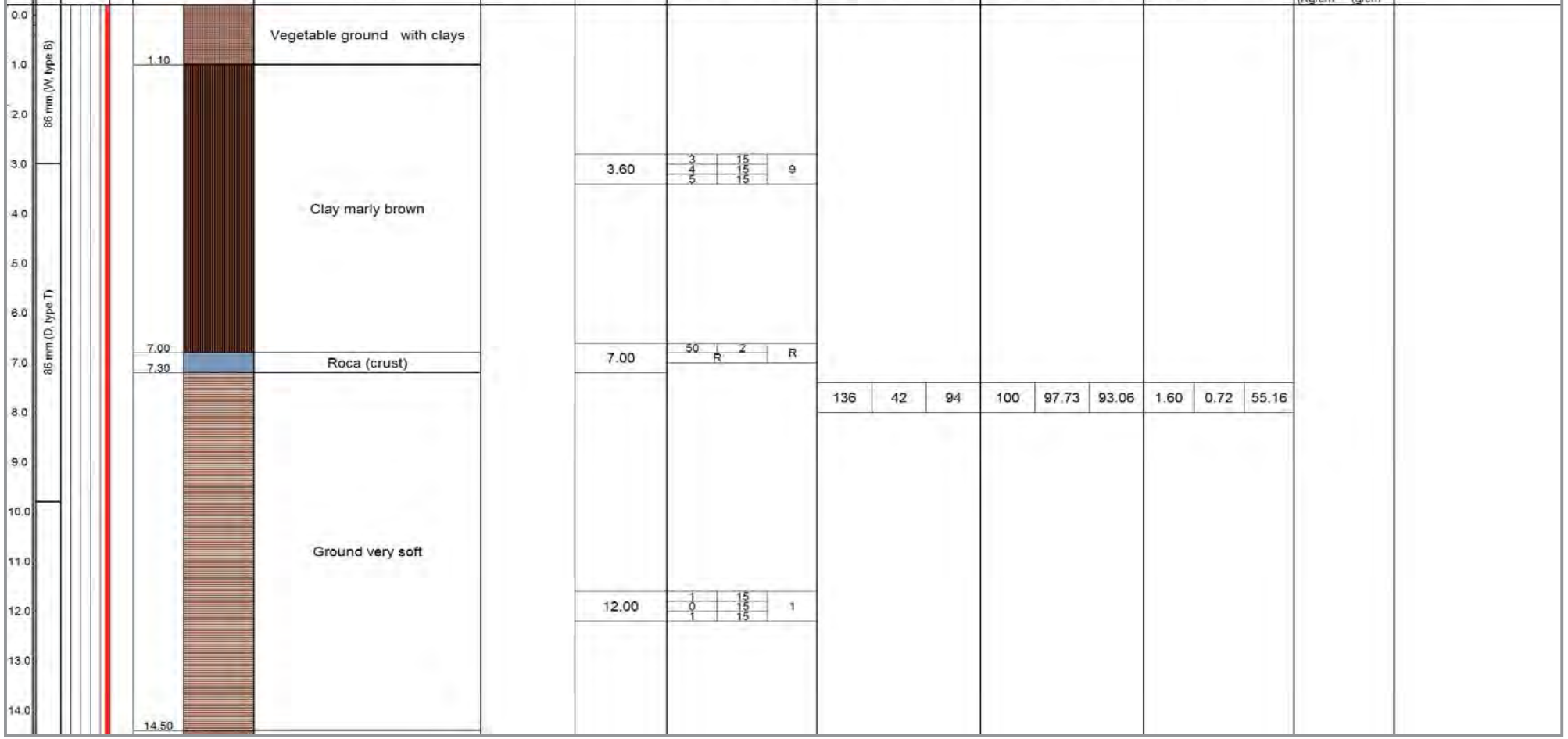
Depth	Boring	Recovered (%) 20 40 60 80 100	WT	Geological Section	SAMPLE DESCRIPTION	UNDISTURBED SAMPLE	SPT	N Blows	P cms	N Field	ATTERBERG LIMITS LL	PL	PI	% SIEVING N° 4	N° 40	N° 200	Density and Moisture Wet grs/cm³	Dry grs/cm³	ω %	Compression qu (Kg/cm²)	Da (g/cm³)	NOTE
0.0	86 mm.(W. type B)				Vegetable ground with clayey loams																	
1.0				1.80																		
2.0					brown light Marl clayey																	
3.0							3.40	2 4 5	15 15 15	9												
4.0											30	12	18	100	92.62	89.64	1.09	0.71	21.87			
5.0																						
6.0				6.60			6.00	9 10 12	15 15 15	22												
7.0					Very consolidated brown loam																	
8.0																						
9.0				9.45			9.00	22 35 50	15 15 15	85												
10.0					Green silty marl (semi rock)																	
11.0																						
12.0				12.10			12.00	50 R	10	R												
13.0					Green Rock with oxides																	
14.0											NON PLASTIC MATERIAL			34.69	16.83	11.05	1.54	1.31	17.52			
15.0				15.40			15.20	50 R	3	R												
16.0	86 mm.(D. type T)				Rock																	
17.0																						
18.0				18.52			15.20	50	R	R												

BORING END 18.52 m

LCC INGENIERIA

2. BORING GRAPHIC REPRESENTATION

WORK: C/010/001/035 LINE 3 RAILWAY | Sample N°: 296 | Analyst: Isamel Arroyo | **BORING : SR 53**
CUSTOMER: NIPPON KOEI | Equipment: ROLATEC-400 | **DATE: 29/11/2013**



Galera 8B, Ofidepósitos Tocumen II, Calle Nuevo Belén, Tocumen
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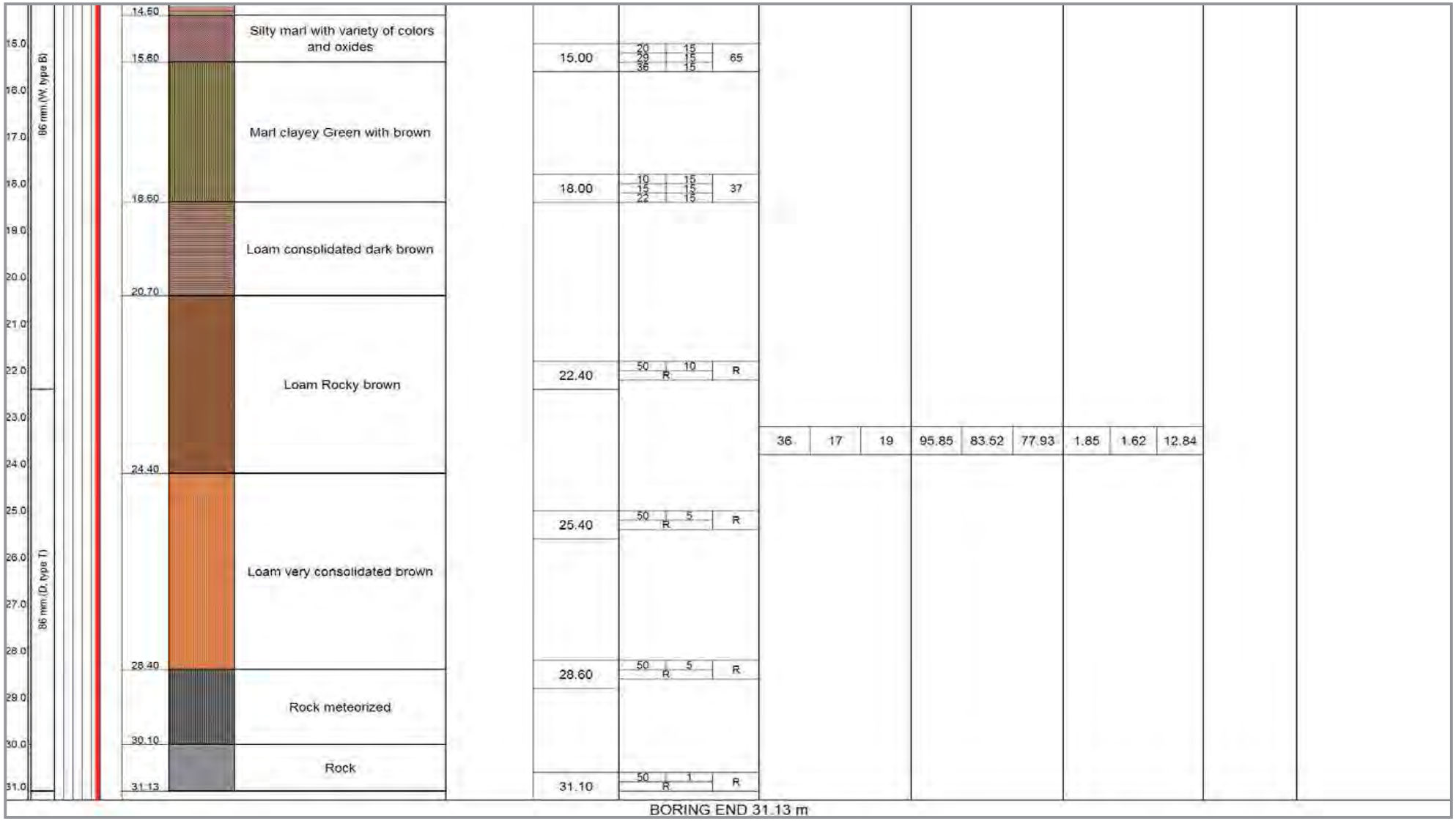

Galera 8B, Ofidepósitos Tocumen II, Calle Nuevo Belén, Tocumen
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LCC INGENIERIA

2. BORING GRAPHIC REPRESENTATION

WORK: C/010/001/007 LINE 3 RAILWAY
CUSTOMER: NIPPON KOEI

Sample N°: 142
Equipment: Rolatec 400

Analyst: Ismael Arroyo

BORING: SR 10
SAMPLE DATE: 10/10/2013

Depth	Boring	Recovered (%) 20 40 60 80 100	WT	Geological Section	SAMPLE DESCRIPTION	UNDISTURBED SAMPLE	SPT	N Blows	P cms	N Field	ATTERBERG LIMITS LL	PL	PI	% SIEVING N° 4	N° 40	N° 200	Density and Moisture Wet grs/cm³	Dry grs/cm³	ω %	Compression qu (Kg/cm²)	Da (g/cm³)	NOTE
0.0					Loam consolidated reddish tones with black interior																	
1.0																						
2.0																						
3.0							3.20	3 4 6	15 15 15	10												
4.0				4.70							70	32	38	98.77	92.9	89.3	1.79	1.08	39.77			
5.0					Very soft soil high humidity																	
6.0							6.00	1 0 1	15 15 15	1												
7.0																						
8.0																						
9.0							9.00	1 0 0	15 15 15	0												
10.0	86 mm.(W, type B)			9.60	Consolidated Clayey loam																	
11.0				10.50	Very soft soil high humidity																	
12.0							12.60	0 0 2	15 15 15	2	63	29	34	97.09	91.21	72.35	1.75	0.92	47.47			
13.0				13.20	Consolidated Clayey loam																	
14.0				14.00	Fractured rock with color variations																	
15.0	86 mm.(D, type T)						15.60	50	5 R	50												
16.0				16.50																		
17.0				16.80	Rock in black																	

BORING END A 16.80 m

Galera 8B, Ofidepósitos Tocumen II, Calle Nuevo Belén, Tocumen
Teléfono (507) 292-5282; 292-9083

LCC INGENIERIA

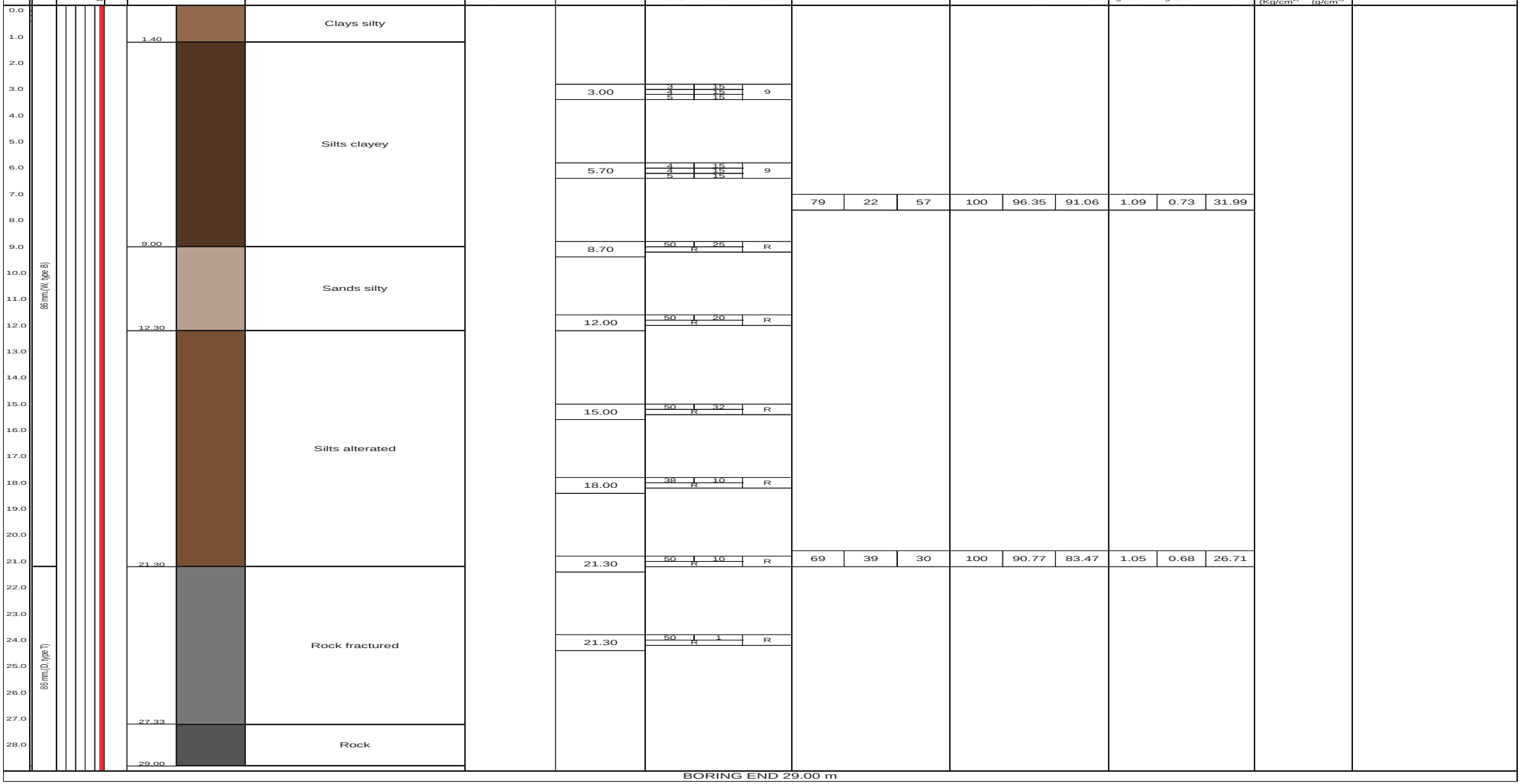
2. BORING GRAPHIC REPRESENTATION

WORK: C/010/001/045 LINE 3 RAILWAY
CUSTOMER: NIPPON KOEI

Sample N°: 317
Equipment: RL-48

Analyst: Juan Ffrancisco Fernandez

BORING: SR 31
DATE: 10/12/2013



Galera 8B, Ofidepósitos Tocumen II, Calle Nuevo Belén, Tocumen
Teléfono (507) 292-5282; 292-9083

LCC INGENIERIA

2. BORING GRAPHIC REPRESENTATION

WORK: C/010/001/008 LINE 3 RAILWAY
CUSTOMER: NIPPON KOEI

Sample N°: 143
Equipment: Rolatec 400

Analyst: Juan Antonio Cortez

BORING : SR 11
SAMPLE DATE: 10/10/2013

Depth	Boring	Recovered (%) 20 40 60 80 100	WT	Geological Section	SAMPLE DESCRIPTION	UNDISTURBED SAMPLE	SPT	N Blows	P cms	N Field	ATTERBERG LIMITS LL	PL	PI	% SIEVING N° 4	N° 40	N° 200	Density and Moisture Wet grs/cm³	Dry grs/cm³	ω %	Compression qu (Kg/cm²)	Da (g/cm³)	NOTE
0.0	86 mm.(W, type B)			0.60	Loam reddish																	
1.0				1.60	Silt brown color with some gravel and pebbles																	
2.0				2.40	Grayish rock															1040	2.76	
3.0					Loam reddish		3.00	27 34 39	15 15 15	73	Sample No Plastic			88.15	36.76	31.01	ROCK					
4.0																						
5.0				5.10																		
6.0	86 mm.(D, type T)						6.00	50 R	3	R												
7.0				6.70	Grayish meteorized rock						Sample No Plastic			ROCK			ROCK					
8.0																						
9.0				9.00			9.00	50 R	3	R												
17.0																						

BORING END A 9.00 m

Galera 8B, Ofidepósitos Tocumen II, Calle Nuevo Belén, Tocumen
Teléfono (507) 292-5282; 292-9083

LCC INGENIERIA

2. BORING GRAPHIC REPRESENTATION

WORK: C/010/001/0017 LINE 3 RAILWAY Sample N°: 198 Analyst: Ismael Arroyo **BORING : SR 32**

CUSTOMER: NIPPON KOEI Equipment: RL-48 **DATE: 28/10/2013**

Depth	Boring	Recovered (%) 20 40 60 80 100	WT	Geological Section	SAMPLE DESCRIPTION	UNDISTURBED SAMPLE	SPT	N Blows	P cms	N Field	ATTERBERG LIMITS LL	PL	PI	% SIEVING N° 4	N° 40	N° 200	Density and Moisture Wet grs/cm³	Dry grs/cm³	ω %	Compression qu (Kg/cm²)	Da (g/cm³)	NOTE
0.0	86 mm.(W, type B)			0.60	Vegetable ground																	
1.0				1.25	Dark brown Loam						31	17	14	42.54	14.61	6.18	2.04	1.67	18.19			
2.0	86 mm.(D, type B)			2.00	Rock, with a tone Blue-Black																	
3.0							3.00	50 R	5	R												
4.0											ROCK			ROCK			ROCK			1122	2.66	
5.0				5.42			5.40	50 R	2	R												

BORING END 5.42 m

LCC INGENIERIA

2. BORING GRAPHIC REPRESENTATION

WORK: C/010/001/031 LINE 3 RAILWAY
CUSTOMER: NIPPON KOEI

Sample N°: 281
Equipment: RL-48

Analyst: Juan Francisco Fernandez

BORING : SR 12
DATE: 23/11/2013

Depth	Boring	Recovered (%) 20 40 60 80 100	WT	Geological Section	SAMPLE DESCRIPTION	UNDISTURBED SAMPLE	SPT	N Blows	P cms	N Field	ATTERBERG LIMITS LL	PL	PI	% SIEVING N° 4	N° 40	N° 200	Density and Moisture Wet grs/cm³	Dry grs/cm³	ω %	Compression qu (Kg/cm²)	Da (g/cm³)	NOTE
0.0																						
				0.80	Asphalt, concrete and filling																	
1.0																						
2.0					brown clay with soft edges																	
3.0							3.00	2 3 3	15 15 15	6	62	30	32	94.29	90.10	87.92	1.77	1.03	41.58			
				3.60																		
4.0					Marly clay with green veins																	
5.0																						
6.0	86 mm (W, type B)						6.00	8 13 15	15 15 15	28												
				6.60																		
7.0					Silts																	
8.0				8.40																		
				9.15	Rock fractured			50	R	R												
9.0							9.00															
10.0											NON PLASTIC MATERIAL			ROCK			ROCK			116.2	2.39	
11.0	86 mm (D, type T)				Rock																	
12.0							12.00	50	R	R												
13.0				13.80																		

BORING END 13.80 m

LCC INGENIERIA

2. BORING GRAPHIC REPRESENTATION

WORK: C/010/001/015 LINE 3 RAILWAY
CUSTOMER: NIPPON KOEI

Sample N°: 188
Equipment: Rolatec 400

Analyst: Ismael Arroyo

BORING : SR 33
DATE: 23/10/2013

Depth	Boring	Recovered (%) 20 40 60 80 100	WT	Geological Section	SAMPLE DESCRIPTION	UNDISTURBED SAMPLE	SPT	N Blows	P cms	N Field	ATTERBERG LIMITS LL	PL	PI	% SIEVING N° 4	N° 40	N° 200	Density and Moisture Wet grs/cm³	Dry grs/cm³	ω %	Compression qu (Kg/cm²)	Da (g/cm³)	NOTE
0.0					Asphalt with gravel																	
				0.60																		
1.0	86 mm.(W, type B)				Marga greenish consolidated																	
2.0											45	24	21	100	98.51	93.53	1.99	1.43	28.23			
				1.98																		
3.0				3.05			3.00	50 / R	5	R												
4.0					Rock Black Fractured																	
				4.60																		
5.0	86 mm.(D, type T)																					
6.0					Rock Black		6.00	50 / R	2	R	ROCK			ROCK			ROCK			900.7	2.80	
7.0				7.70																		

BORING END 7.70 m

LCC INGENIERIA

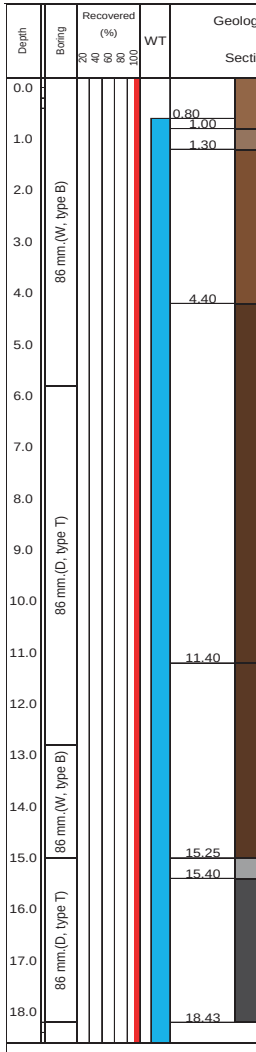
2. BORING GRAPHIC REPRESENTATION

WORK: C/010/001/0016 LINE 3 RAILWAY
CUSTOMER: NIPPON KOEI

Sample N°: 197
Equipment: Rolatec 400

Analyst: Ismael Arroyo

BORING : SR 13
DATE: 24/10/2013



SAMPLE DESCRIPTION	UNDISTURBED SAMPLE	SPT	N Blows	P cms	N Field	ATTERBERG LIMITS LL	PL	PI	% SIEVING N° 4	N° 40	N° 200	Density and Moisture Wet grs/cm³	Dry grs/cm³	ω %	Compression qu (Kg/cm²)	Da (g/cm³)	NOTE
Gravel fill																	
Level rocky purple shade																	
Loam clayey light brown with black veins		3.00	1 2 2	15 15 15	4	51	26	25	100	98.7	95.3	1.79	0.97	45.85			
Loam with rocks interiors		6.00	50 R	2	R												
		9.00	50 R	10	R												
Loam consolidated brown		12.90	20 50 R	15 15	R												
			50 R	3	R	28	15	13	76.42	35.3	16.55	1.86	1.65	10.93			
Rock Fracturad		15.20	50 R	5	R												
Rock																	

BORING END 18.43 m

Galera 8B, Ofidepósitos Tocumen II, Calle Nuevo Belén, Tocumen
Teléfono (507) 292-5282; 292-9083

LCC INGENIERIA

2. BORING GRAPHIC REPRESENTATION

WORK: C/010/001/027 LINE 3 RAILWAY
CUSTOMER: NIPPON KOEI

Sample N°: 269
Equipment: Rolatec 400

Analyst: Ismael Arroyo

BORING : SR 34
DATE: 18/11/2013

Depth	Boring	Recovered (%)	WT	Geological Section	SAMPLE DESCRIPTION	UNDISTURBED SAMPLE	SPT	N Blows	P cms	N Field	ATTERBERG LIMITS LL	PL	PI	% SIEVING N° 4	N° 40	N° 200	Density and Moisture Wet grs/cm³	Dry grs/cm³	ω %	Compression qu (Kg/cm²)	Da (g/cm³)	NOTE
0.0	101 mm.(W, type B)				Filling Material																	
1.0				1.20																		
2.0					Clay																	
3.0							3.60	6 7 9	15 15 15	16												
4.0				4.20							51	25	26	100	97.72	88.94	1.86	1.36	27.02			
5.0																						
6.0	86 mm.(W, type B)				Marl clayey brown		6.00	5 6 8	15 15 15	14												
7.0																						
8.0																						
9.0				9.45			9.00	21 33 50	15 15 R	83												
10.0					Loam very consolidated																	
11.0																						
12.0				12.45			12.00	15 22 50	15 15 R	72												
13.0					Loams interspersed with edges																	
14.0																						
15.0							15.80	50	7	R												
15.87																						
16.0					Rock bluish black						NON PLASTIC MATERIAL			3.42	3.02	2.94	ROCK	2.4	3.49			
17.0				17.40																		
18.0	86 mm.(D, type T)						18.20	50	2	R												
19.0					Rock																	
20.0																						
21.0				21.37			18.20	50	2	R												

BORING END 21.37 m

Galera 8B, Ofidepósitos Tocumen II, Calle Nuevo Belén, Tocumen
Teléfono (507) 292-5282; 292-9083

LCC INGENIERIA

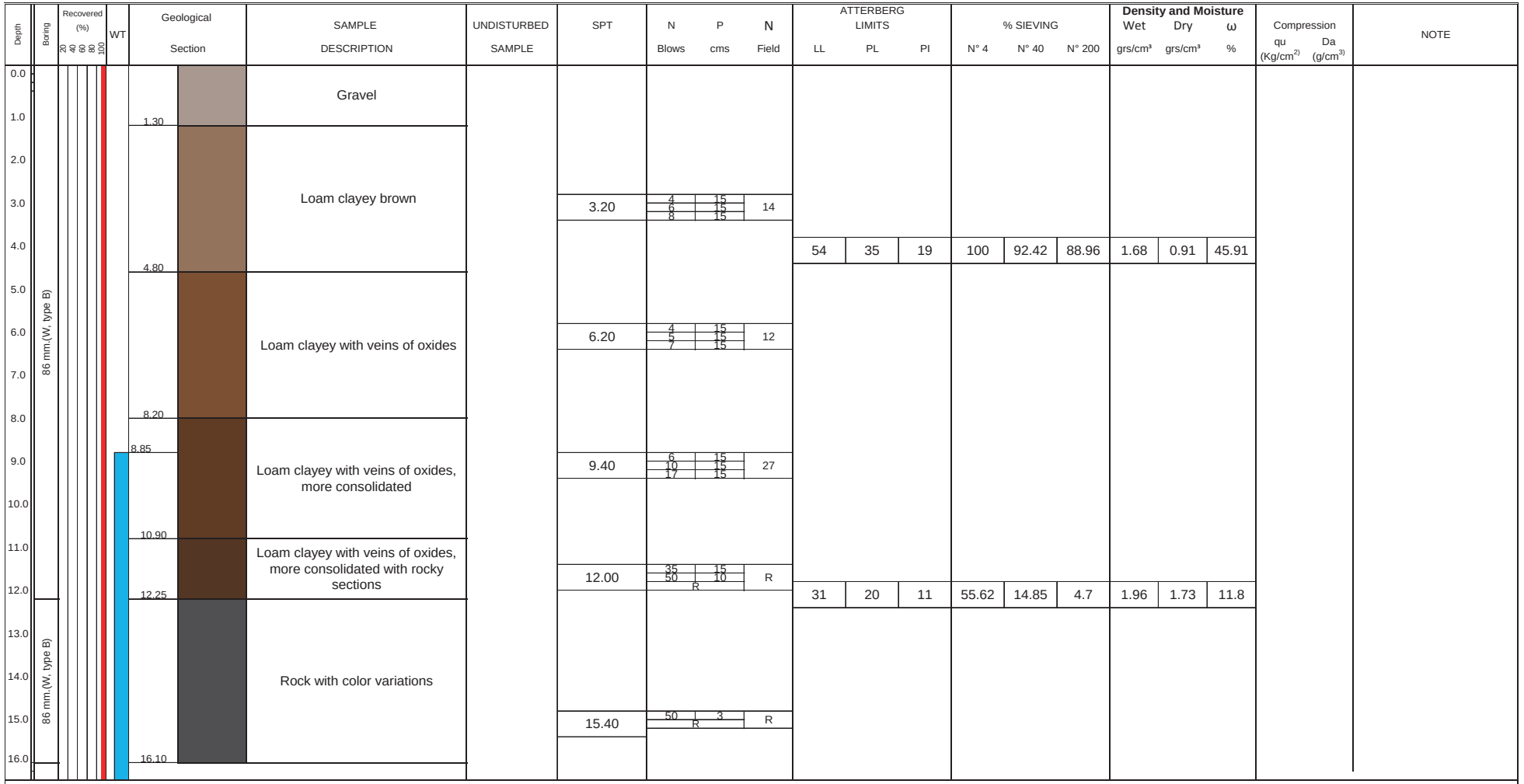
2. BORING GRAPHIC REPRESENTATION

WORK: C/010/001/0018 LINE 3 RAILWAY
CUSTOMER: NIPPON KOEI

Sample N°: 200
Equipment: Rolatec 400

Analyst: Ismael Arroyo

BORING : SR 14
DATE: 29/10/2013



BORING END 16.10 m

Galera 8B, Ofidepósitos Tocumen II, Calle Nuevo Belén, Tocumen
Teléfono (507) 292-5282; 292-9083

LCC INGENIERIA

2. BORING GRAPHIC REPRESENTATION

WORK: C/010/001/029 LINE 3 RAILWAY
CUSTOMER: NIPPON KOEI

Sample N°: 275
Equipment: RL-48

Analyst: Juan Francisco Fernandez

BORING : SR 35
DATE: 20/11/2013

Depth	Boring	Recovered (%)	WT	Geological Section	SAMPLE DESCRIPTION	UNDISTURBED SAMPLE	SPT	N Blows	P cms	N Field	ATTERBERG LIMITS LL	PL	PI	% SIEVING N° 4	N° 40	N° 200	Density and Moisture Wet grs/cm³	Dry grs/cm³	ω %	Compression qu (Kg/cm²)	Da (g/cm³)	NOTE
0.0	86 mm.(W. type B)				Filling with pebbles and clay																	
1.0				1.40																		
2.0					brown soft Clays																	
3.0				3.20			3.00	5 8 10	15 15 15	18												
4.0					Silts with some clay brown																	
5.0											42	28	14	99.65	96.69	93.89	1.18	1.13	37.12			
6.0				6.00			6.00	6 8 10	15 15 15	18												
7.0					Silts clayey very soft																	
8.0				8.30																		
9.0					Silts with rocky ridges		9.00	5 7 9	15 15 15	16												
10.0				10.90																		
11.0					Rock fractured																	
12.0							12.00	5 6 7	15 15 15	13												
13.0																						
14.0																						
15.0							15.20	4 5 7	15 15 15	12												
16.0																						
17.0																						
18.0							18.00	5 7 9	15 15 15	16	NON PLASTIC MATERIAL			99.75	99.75	99.75	ROCA MET.	2.79	2.56			
19.0																						
20.0				20.80																		
21.0							21.00	16 24 40	15 15 15	64												
22.0					Rock																	
23.0				23.80																		

BORING END 23.80 m

Galera 8B, Ofidepósitos Tocumen II, Calle Nuevo Belén, Tocumen
Teléfono (507) 292-5282; 292-9083

LCC INGENIERIA

2. BORING GRAPHIC REPRESENTATION

WORK: C/010/001/019 LINE 3 RAILWAY
CUSTOMER: NIPPON KOEI

Sample N°: 200
Equipment: Rolatec 400

Analyst: Ismael Arroyo

BORING : SR 15
DATE: 30/10/2013

Depth	Boring	Recovered (%)	WT	Geological Section	SAMPLE DESCRIPTION	UNDISTURBED SAMPLE	SPT	N Blows	P cms	N Field	ATTERBERG LIMITS LL	PL	PI	% SIEVING N° 4	N° 40	N° 200	Density and Moisture Wet grs/cm³	Dry grs/cm³	ω %	Compression qu (Kg/cm²)	Da (g/cm³)	NOTE
0.0	101 mm.(W. type B)			0.25	Concrete																	
				0.60	Gravel																	
1.0				1.50	Rock Fill																	
2.0				1.85	Loam clayey																	
3.0				3.60			3.60	2 3 4	15 15 15	7												
4.0					Loam clayey brown with veins yellow						52	35	17	100	95.39	91.43	1.58	0.73	53.65			
5.0																						
6.0	86 mm.(W. type B)			6.30			6.30	4 6 10	15 15 15	16												
7.0					Loam clayey light brown with veins interiors																	
8.0																						
9.0								7 10 14	15 15 15	24												
10.0							9.60															
11.0																						
12.0				12.16			12.10	50 R	6	R												
				12.60	Fractured rock						ROCK			ROCK			ROCK					
13.0	86 mm.(D. type T)				Rock with oxides of various colors															23.74	2.10	
14.0																						
15.0				15.33			15.30	50 R	3	R												
16.0					Rock with tones of blue																	
17.0				17.02			17.00	50 R	2	R												

BORING END 17.02 m

Galera 8B, Ofidepósitos Tocumen II, Calle Nuevo Belén, Tocumen
Teléfono (507) 292-5282; 292-9083

LCC INGENIERIA

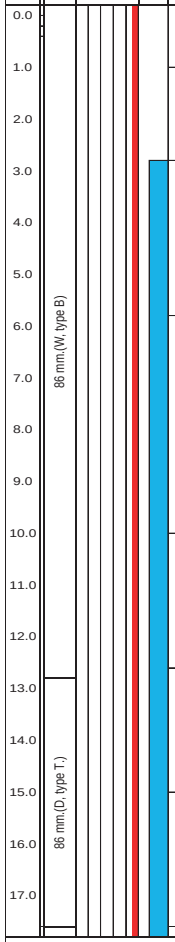
2. BORING GRAPHIC REPRESENTATION

WORK: C/010/001/032 LINE3 RAILWAY
CUSTOMER: NIPPON KOEI

Sample N°: 282
Equipment: Rolatec 400

Analyst: Ismael Arroyo

BORING: SR 36
DATE: 20/11/2013



Geological Section	SAMPLE DESCRIPTION	UNDISTURBED SAMPLE	SPT	N Blows	P cms	N Field	ATTERBERG LIMITS LL	PL	PI	% SIEVING N° 4	N° 40	N° 200	Density and Moisture Wet grs/cm³	Dry grs/cm³	ω %	Compression qu (Kg/cm²)	Da (g/cm³)	NOTE
1.10	Fill material																	
3.00	Clays																	
6.00	Clays sandy						51	25	26	100	97.35	92.04	1.81	1.15	36.54			
	Clays sandy		6.00	3 3 5	15 15 15	8												
			9.60	5 8 10	15 15 15	18												
10.20	Clay light brown																	
			12.20	12 13 14	15 15 15	27												
12.80	Altered rock with white veins						NON PLASTIC MATERIAL			ROCK METEORIZED			ROCK MET.	2.80	4.30			
15.20	Rock		15.70	50	2	R												
17.62			15.70	50	2	R												

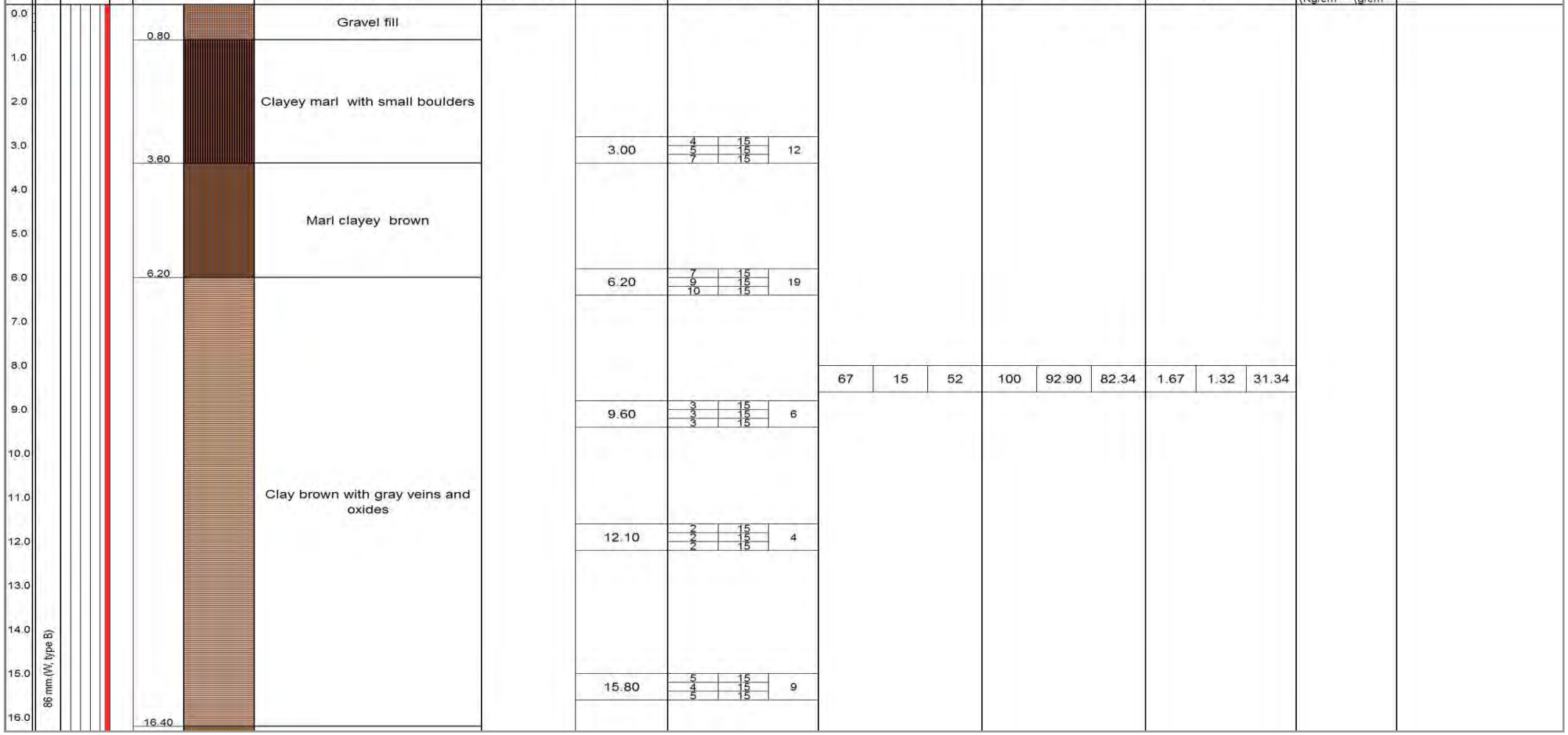
BORING END 17.62 m

Galera 8B, Ofidepósitos Tocumen II, Calle Nuevo Belén, Tocumen
Teléfono (507) 292-5282; 292-9083

LCC INGENIERIA

2. BORING GRAPHIC REPRESENTATION

WORK: C/010/001/043 LINE3 RAILWAY Sample N°: 315 Analyst: Ismael Arroyo **BORING : SR 16**
CUSTOMER: NIPPON KOEI Equipment: ROLATEC 400 **DATE: 7/12/2013**



Galera 8B, Ofidepósitos Tocumen II, Calle Nuevo Belén, Tocumen
Teléfono (507) 292-5282; 292-9083

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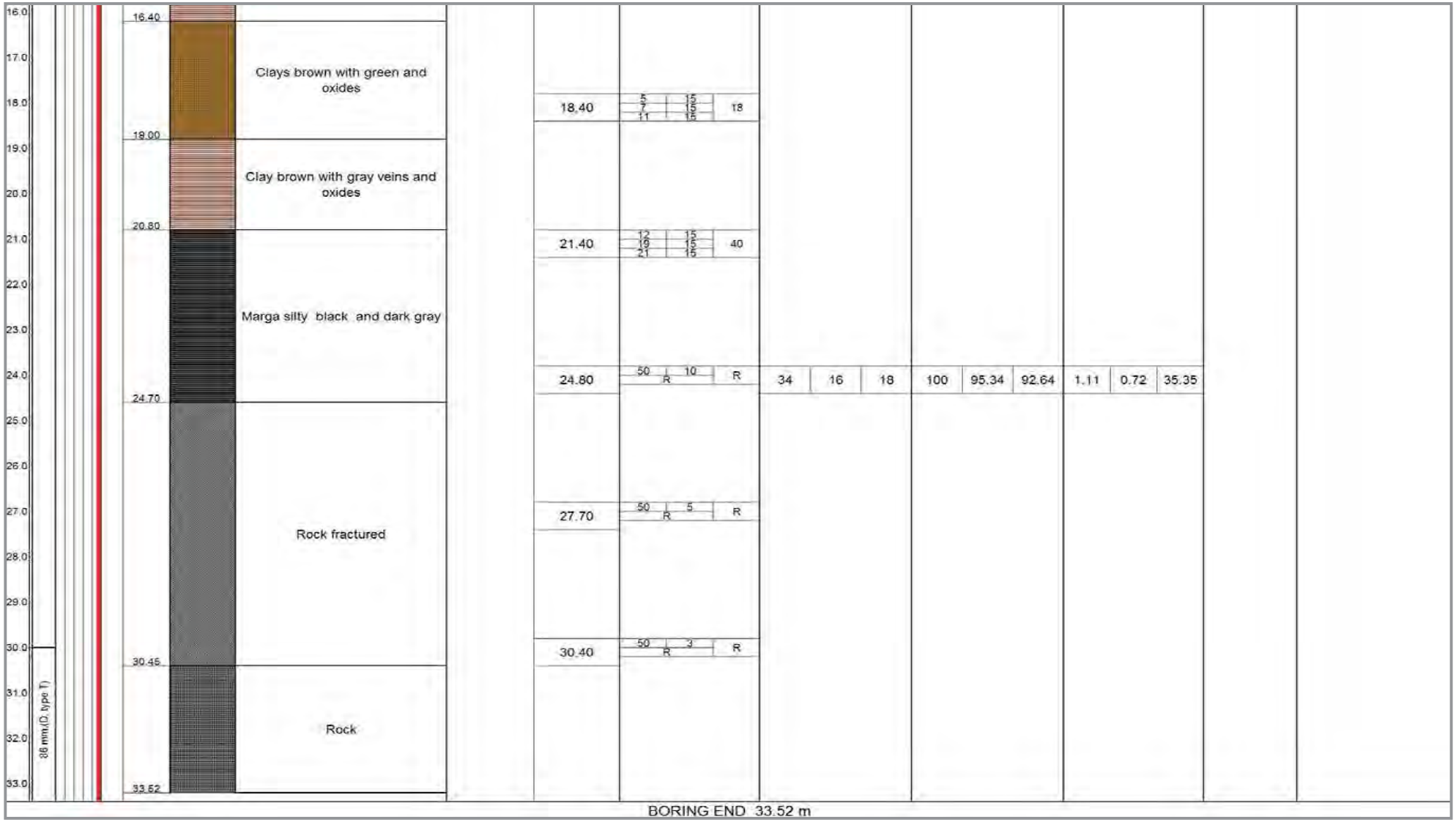

Galera 8B, Ofidepósitos Tocumen II, Calle Nuevo Belén, Tocumen
Teléfono (507) 292-5282; 292-9083

2. BORING GRAPHIC REPRESENTATION

WORK: C/010/001/047 LINE 3 RAILWAY
CUSTOMER: NIPPON KOEI

Sample N°: 332
Equipment: RL-48

Analyst: Juan Francisco Fernandez

BORING : SR 37
DATE: 12/12/2013

Depth	Boring	Recovered (%) 20 40 60 80 100	WT	Geological Section	SAMPLE DESCRIPTION	UNDISTURBED SAMPLE	SPT	N Blows	P cms	N Field	ATTERBERG LIMITS LL	PL	PI	% SIEVING N° 4	N° 40	N° 200	Density and Moisture Wet grs/cm³	Dry grs/cm³	ω %	Compression qu (Kg/cm²)	Da (g/cm³)	NOTE
0.0	86 mm.(W. type B)				Silts clayey																	
1.0				1.65																		
2.0					Clay brown																	
3.0							3.00	4 7 7	15 15 15	14												
4.0																						
5.0																						
6.0				6.60			6.00	5 8 8	15 15 15	16	83	15	68	100	94.98	91.05	1.54	1.41	36.32			
7.0					Clay brown																	
8.0																						
9.0							9.00	3 4 4	15 15 15	8												
10.0																						
11.0																						
12.0							12.00	1 2 4	15 15 15	6												
13.0																						
14.0																						
15.0				15.40			15.00	50	R	R												
16.0					Fractured and altered rock cemented silts																	
17.0																						
18.0				18.05			18.00	50	R	R	56	42	14	81.85	65.56	61.42	1.72	1.46	28.11			
19.0	86 mm.(D. type T)																					
20.0					Rock fractured																	
21.0							20.90	50	R	R												
22.0				22.20																		
23.0					Rock																	
24.0							24.30	50	R	R												
25.0				25.30																		

BORING END 25.30 m

Galera 8B, Ofidepósitos Tocumen II, Calle Nuevo Belén, Tocumen
Teléfono (507) 292-5282; 292-9083

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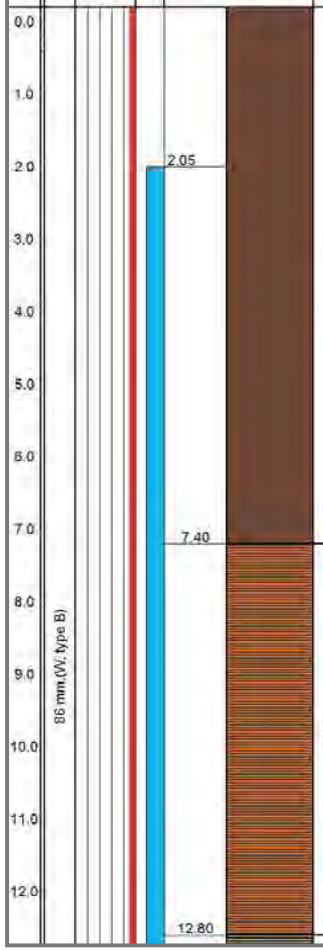
2. BORING GRAPHIC REPRESENTATION

WORK: C/010/001/020 LINE 3 RAILWAY | Sample N°: 211 | Analyst: Ismael Arroyo | **BORING : SR 17**
CUSTOMER: NIPPON KOEI | Equipment: Rolatec 400 | **DATE: 1/11/2013**



SAMPLE DESCRIPTION	UNDISTURBED SAMPLE	SPT	N Blows	P cms	N Field	ATTERBERG LIMITS LL	PL	PI	% SIEVING N° 4	N° 40	N° 200	Density and Moisture Wet grs/cm³	Dry grs/cm³	ω %	Compression qu (Kg/cm²)	Da (g/cm³)	NOTE
Loam clayey Dark brown with veins of various colors		3.40	4 7 4	15 15 15	11												
		6.20	5 7 10	15 15 15	17	56	29	27	100	99.22	95.42	1.78	1.14	35.89			
Loam sandy with veins of green tone		9.60	5 8 10	15 15 15	18												
		12.20	4 5 6	15 15 15	11												

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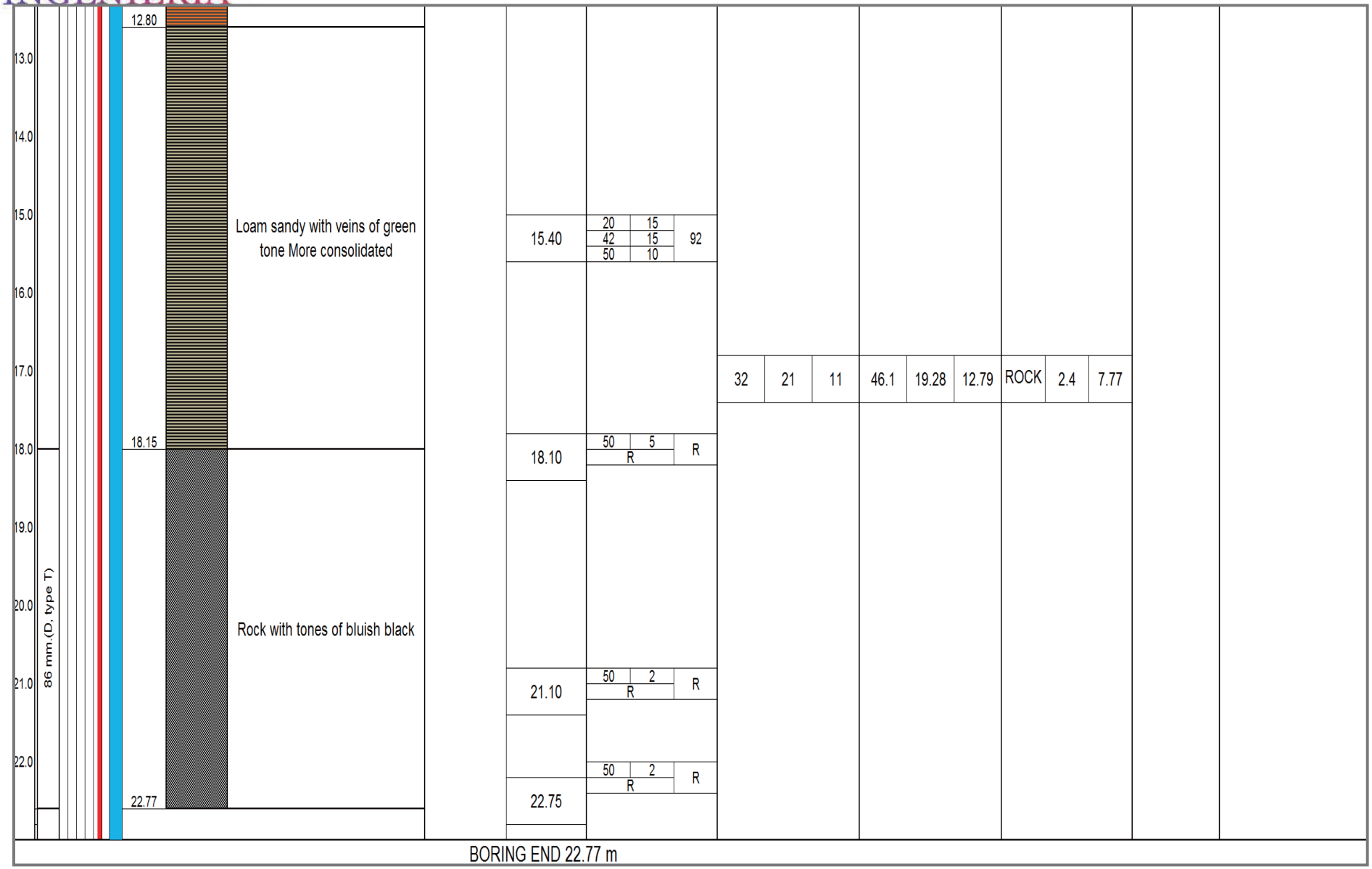


Galera 8B, Ofidepósitos Tocumen II, Calle Nuevo Belén, Tocumen
Teléfono (507) 292-5282; 292-9083

2. BORING GRAPHIC REPRESENTATION

WORK: C/010/001/028 LINE 3 RAILWAY
CUSTOMER: NIPPON KOEI

Sample N°: 274
Equipment: Rolatec 400

Analyst: Ismael Arroyo

BORING : SR 39
DATE: 20/11/2013

Depth	Boring	Recovered (%)	WT	Geological Section	SAMPLE DESCRIPTION	UNDISTURBED SAMPLE	SPT	N Blows	P cms	N Field	ATTERBERG LIMITS LL	PL	PI	% SIEVING N° 4	N° 40	N° 200	Density and Moisture Wet grs/cm³	Dry grs/cm³	ω %	Compression qu (Kg/cm²)	Da (g/cm³)	NOTE
0.0	86 mm (W. type B)			0.60	Concrete (0.20 m) with gravel fill																	
1.0					Clay brown																	
2.0																						
3.0				3.60			3.00	5 8 10	15 15 15	18												
4.0					Marly clay with green veins																	
5.0																						
6.0							6.00	6 8 10	15 15 15	18												
7.0											76	34	42	99.97	98.81	97.48	1.83	1.18	35.34			
8.0																						
9.0				9.60			9.00	5 7 9	15 15 15	16												
10.0					Clay with veins muticolor																	
11.0																						
12.0							12.00	5 6 7	15 15 15	13												
13.0																						
14.0																						
15.0							15.20	4 5 7	15 15 15	12												
16.0																						
17.0																						
18.0							18.00	5 7 9	15 15 15	16												
19.0																						
20.0				21.00																		
21.0					Loam consolidated		21.00	16 24 40	15 15 15	64												
22.0																						
23.0											42	34	8	100	97.33	89.83	1.79	1.16	35.33			
24.0				24.40			24.40	21 37 50	15 15 10	87												
25.0																						
26.0																						
27.0				27.75			27.20	50	R	0												
28.0	86 mm (D. type T)				Rock																	
29.0							27.20	50 R	5	R												
30.0				30.45				50 R	5	R												

BORING END 30.45 m

Galera 8B, Ofidepósitos Tocumen II, Calle Nuevo Belén, Tocumen
Teléfono (507) 292-5282; 292-9083

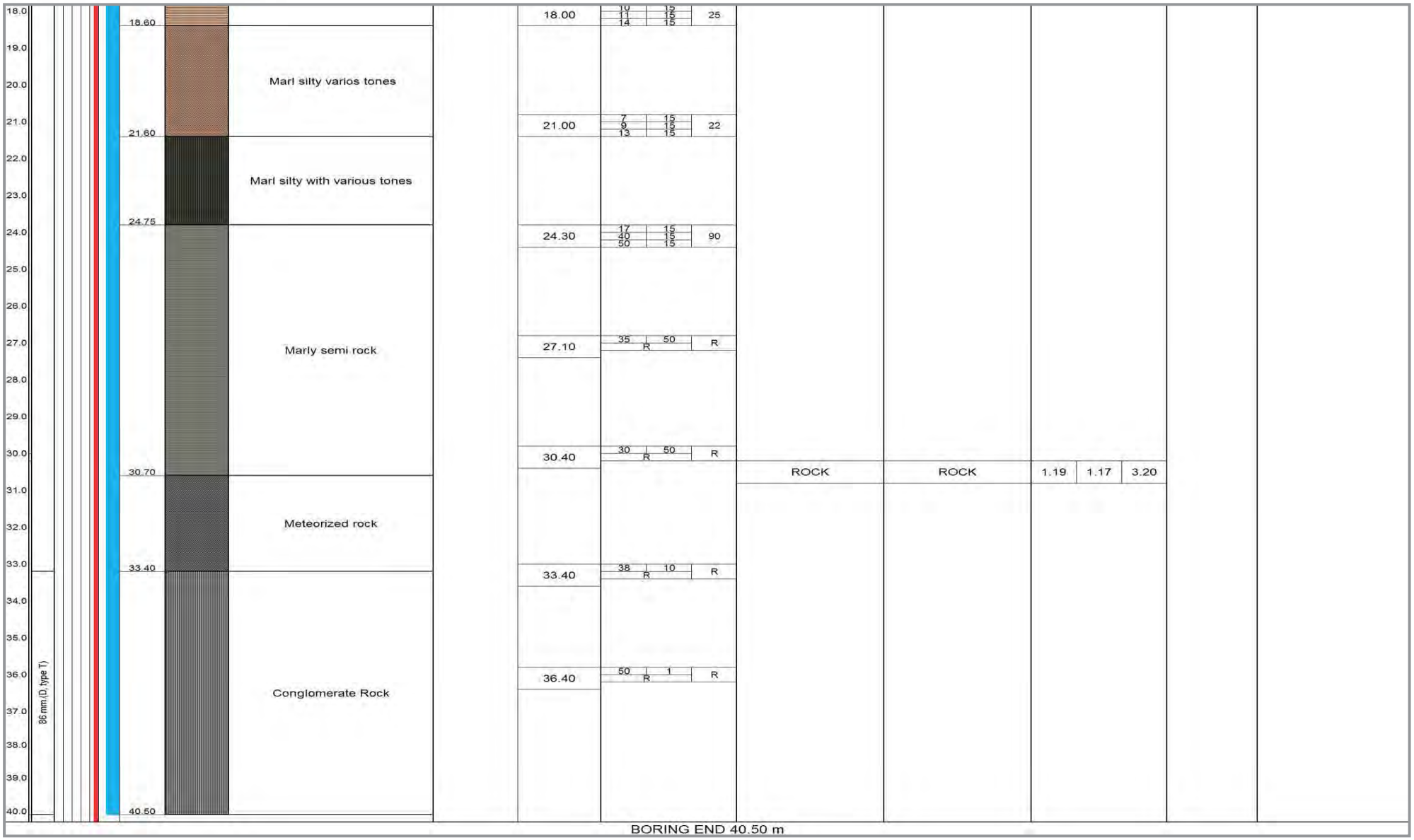
LCC INGENIERIA

2. BORING GRAPHIC REPRESENTATION

WORK: C/010/001/046 LINE 3 RAILWAY Sample N°: 328 Analyst: Ismael Arroyo **BORING : SR 38**
CUSTOMER: NIPPON KOEI Equipment: Rolatec 400 **DATE: 11/12/2013**

Depth	Boring	Recovered (%)	WT	Geological Section	SAMPLE DESCRIPTION	UNDISTURBED SAMPLE	SPT	N Blows	P cms	N Field	ATTERBERG LIMITS LL	PL	PI	% SIEVING N° 4	N° 40	N° 200	Density and Moisture Wet grs/cm³	Dry grs/cm³	ω %	Compression qu (Kg/cm²)	Da (g/cm³)	NOTE
0.0	86 mm (W. type B)				Silts clayey																	
0.90																						
1.0																						
2.0																						
3.0					Clay marly brown		3.00	5 5 6	15 cm/cm	11												
4.0																						
5.0																						
6.00																						
6.0							6.00	4 6 9	15 cm/cm	15												
7.0																						
8.0					Clay brown with water																	
9.00																						
9.0							9.00	7 10 13	15 cm/cm	23												
9.60																						
10.0											76	25	51	100	96.17	92.31	1.14	1.89	21.76			
11.0																						
12.0					Silt clayey gray with yellow		12.20	6 10 11	15 cm/cm	21												
13.0																						
14.0																						
15.0							15.00	9 10 12	15 cm/cm	22												
15.60																						
16.0																						
17.0					Marl silty brown																	
18.0							18.00	10 11 14	15 cm/cm	25												
18.60																						

LCC
INGENIERIA



Galera 8B, Ofidepósitos Tocumen II, Calle Nuevo Belén, Tocumen
Teléfono (507) 292-5282; 292-9083

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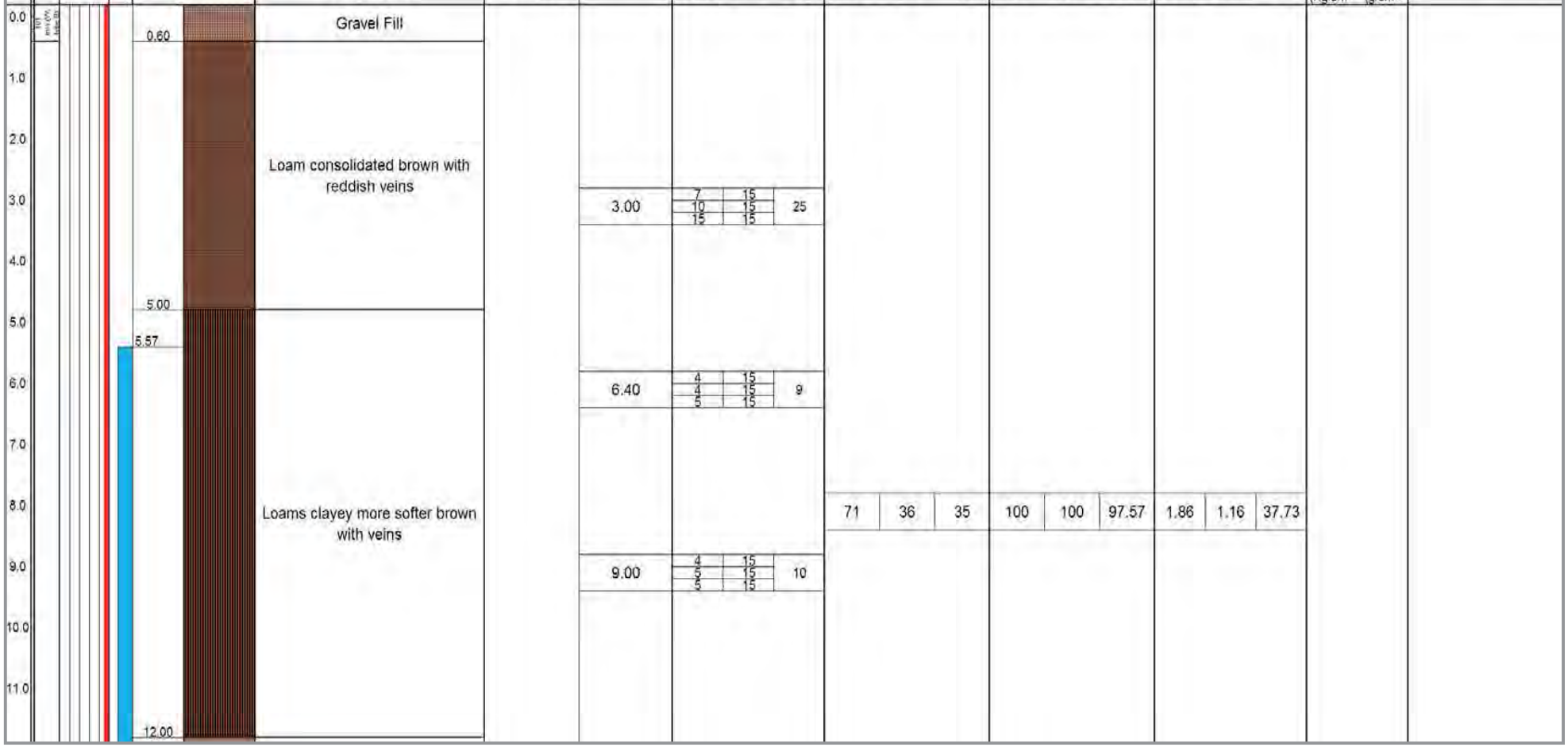
2. BORING GRAPHIC REPRESENTATION

WORK: C/010/001/023 LINE 3 RAILWAY | Sample N°: 241 | Analyst: Ismael Arroyo | **BORING : SR 18**
CUSTOMER: NIPPON KOEI | Equipment: Rolatec 400 | **DATE: 8/11/2013**



Galera 8B, Ofidepósitos Tocumen II, Calle Nuevo Belén, Tocumen
Teléfono (507) 292-5282; 292-9083

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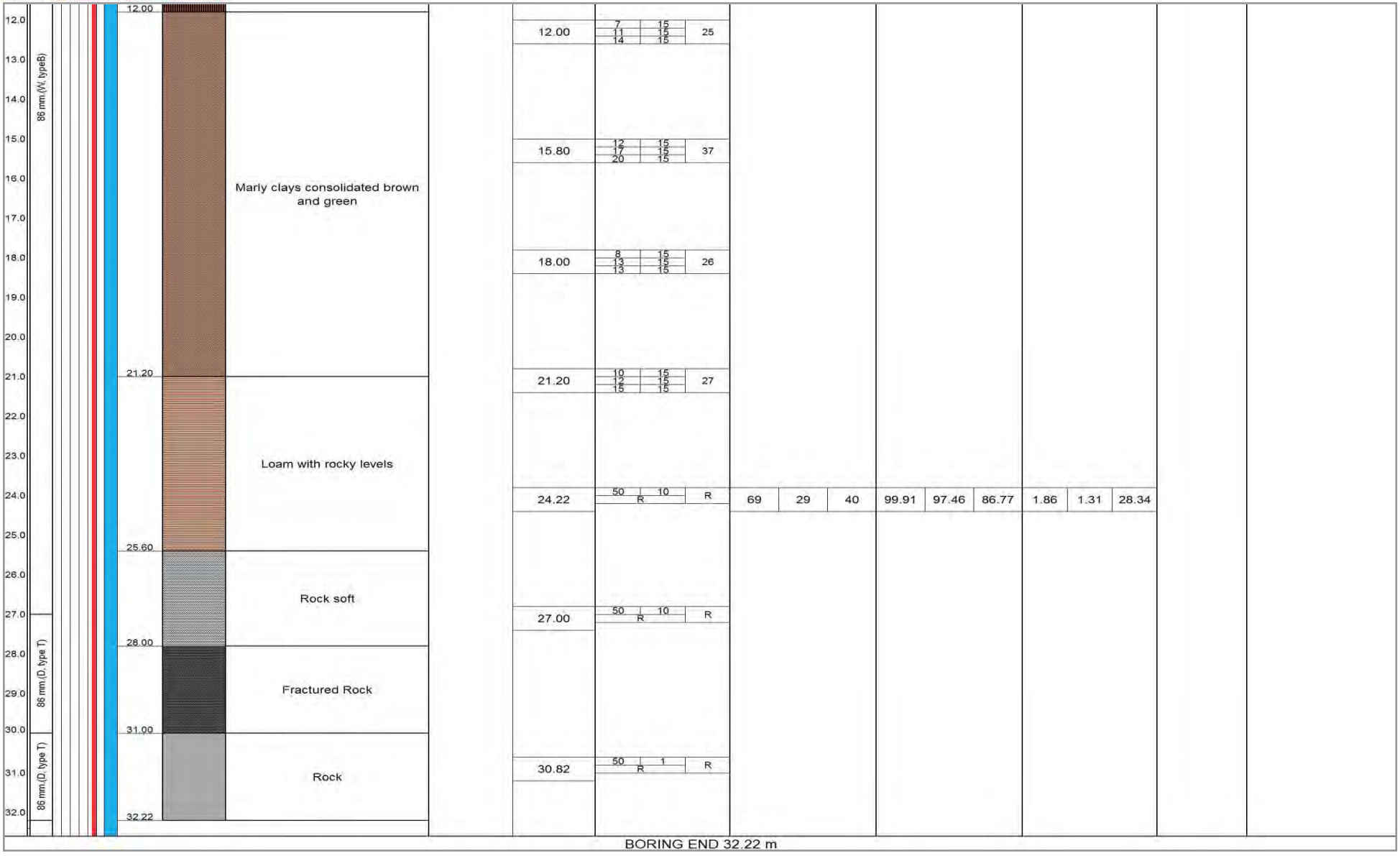

12.00	7 11 14	15 15 15	25								
15.80	12 17 20	15 15 15	37								
18.00	8 13 13	15 15 15	26								
21.20	10 12 15	15 15 15	27								
24.22	50 R	10	R	69	29	40	99.91	97.46	86.77	1.86	1.31	28.34
27.00	50 R	10	R								
30.82	50 R	1	R								

Galera 8B, Ofidepósitos Tocumen II, Calle Nuevo Belén, Tocumen
Teléfono (507) 292-5282; 292-9083

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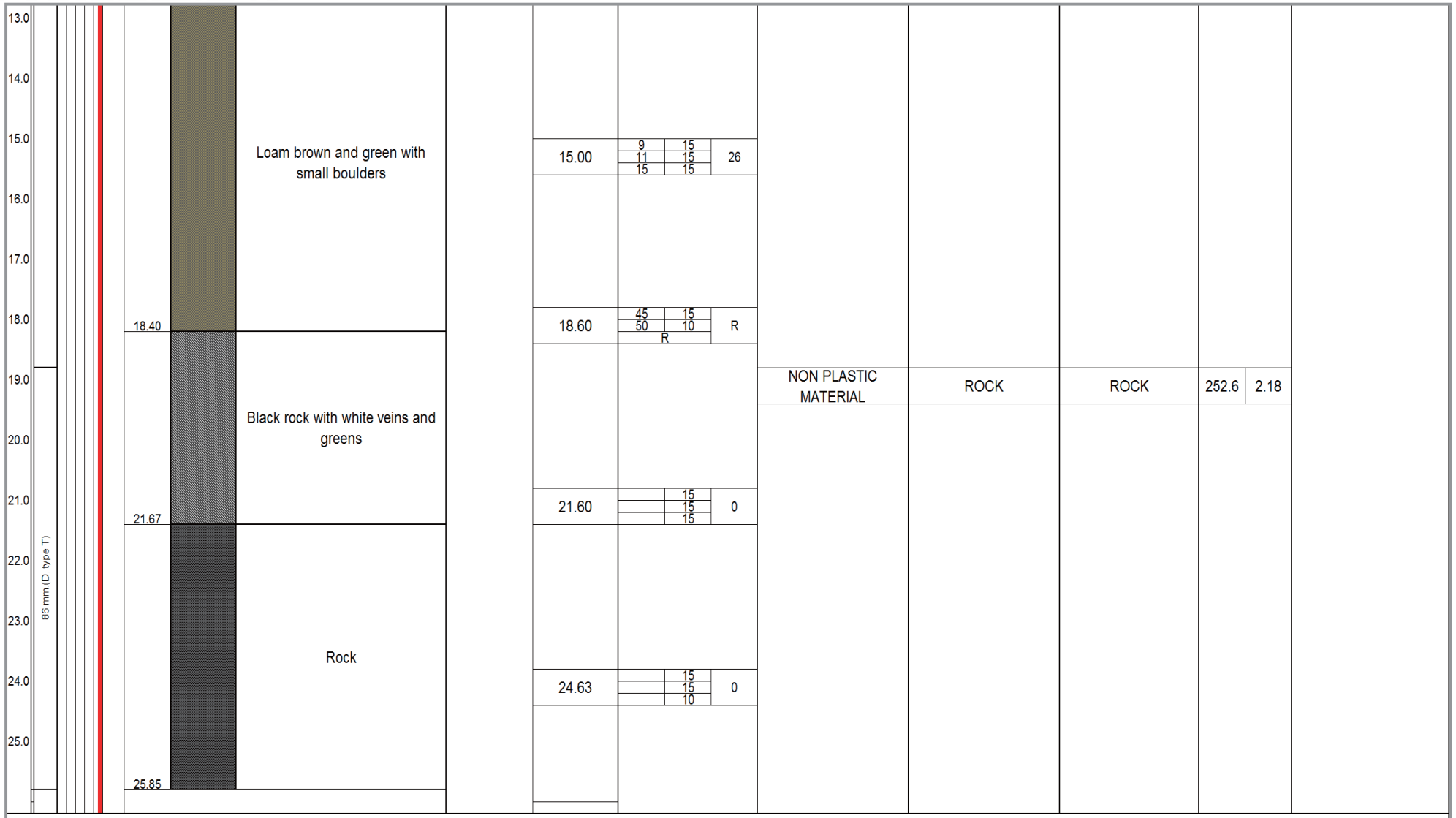
2. BORING GRAPHIC REPRESENTATION

WORK: C/010/001/030 LINE 3 RAILWAY Sample N°: 280 Analyst: Ismael Arroyo **BORING: SR 40**
CUSTOMER : NIPPON KOEI Equipment: Rolatec 400 **DATE: 23/11/2013**

Depth	Boring	Recovered (%)	WT	Geological Section	SAMPLE DESCRIPTION	UNDISTURBED SAMPLE	SPT	N Blows	P cms	N Field	ATTERBERG LIMITS LL	PL	PI	% SIEVING N° 4	N° 40	N° 200	Density and Moisture Wet grs/cm³	Dry grs/cm³	ω %	Compression qu (Kg/cm²)	Da (g/cm³)	NOTE
0.0	86 mm.(W. type B)			0.60	Gravel fill																	
1.0				1.40	Clay marly																	
2.0					Gravel																	
3.0				3.60			3.00	1 1 1	15 15 15	2												
4.0					Marly clay with green veins																	
5.0																						
6.0							6.80	4 6 6	15 15 15	11	76	28	48	99.45	94.67	93.52	1.71	0.81	52.8			
7.0				7.40																		
8.0					Clayey Loam																	
9.0				9.80			9.20	12 14 14	15 15 15	28												
10.0					Marl sandy with rounded edges																	
11.0																						
12.0				12.60			12.00	8 11 13	15 15 15	24												

LCC INGENIERIA



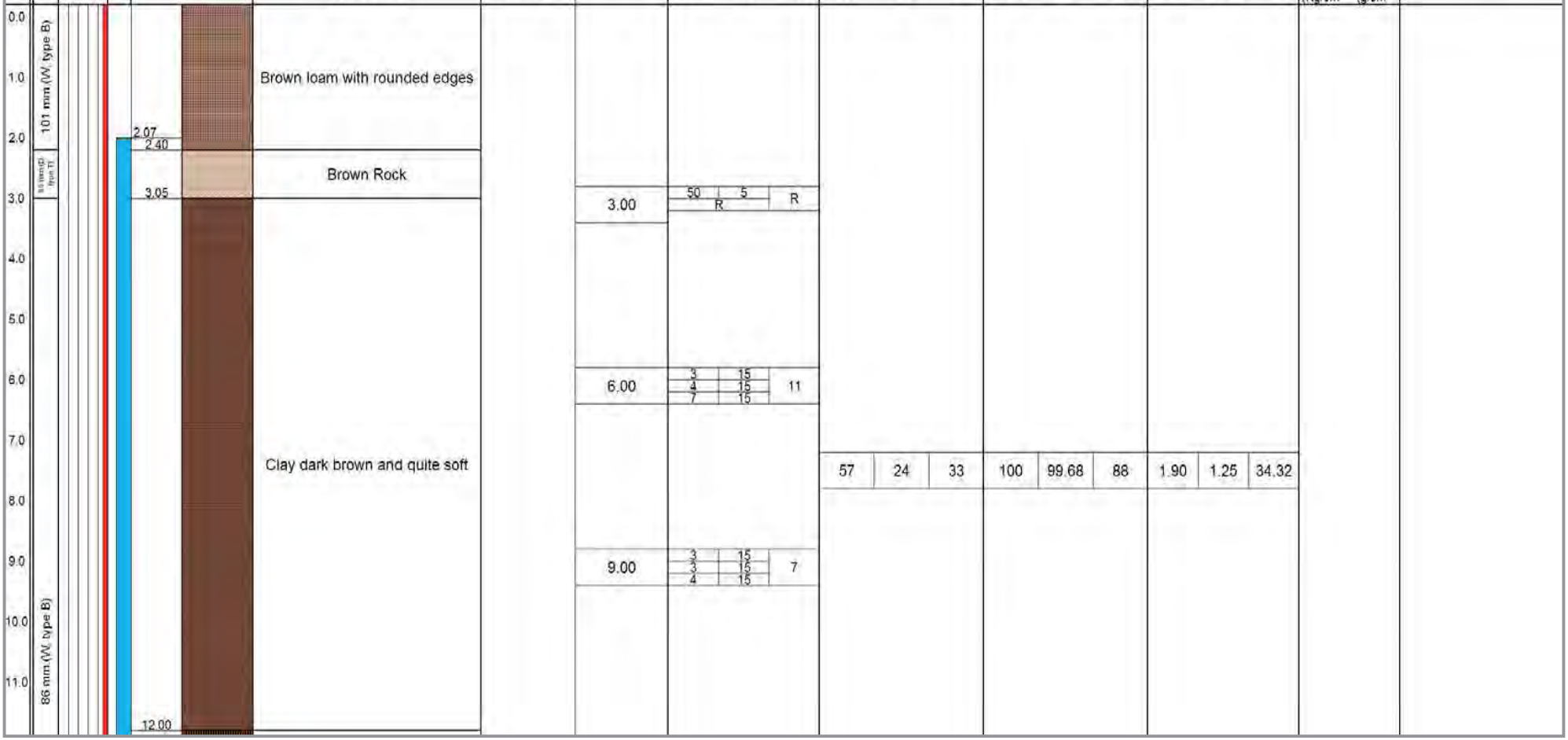
Galera 8B, Ofidepósitos Tocumen II, Calle Nuevo Belén, Tocumen
Teléfono (507) 292-5282; 292-9083

LCC INGENIERIA

2. BORING GRAPHIC REPRESENTATION

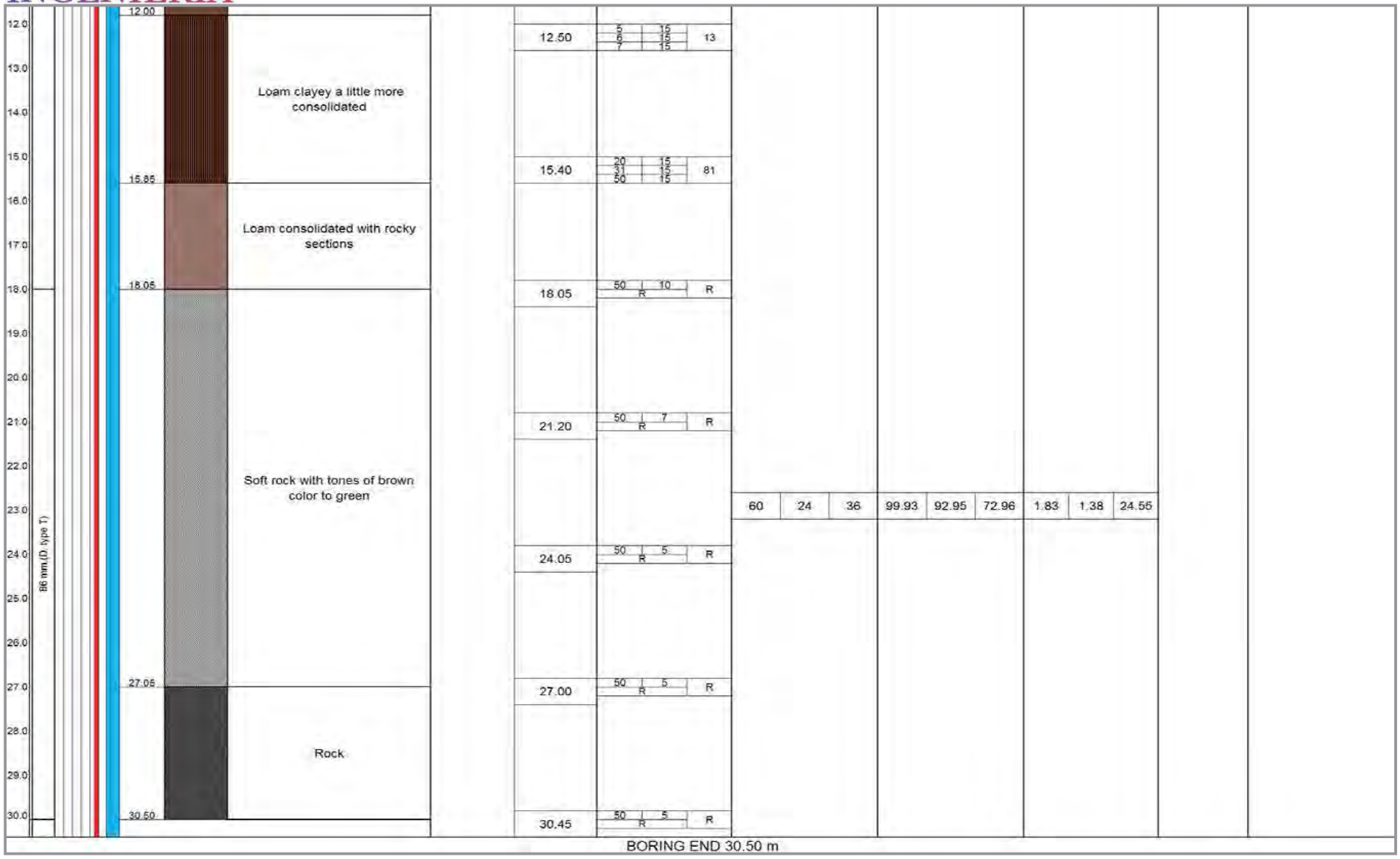
WORK: C/010/001/022 LINE 3 RAILWAY | Sample N°: 238 | Analyst: Ismael Arroyo | **BORING : SR 19**

CUSTOMER: NIPPON KOEI | Equipment: Rolatec 400 | **DATE: 6/11/2013**



Galera 8B, Ofidepósitos Tocumen II, Calle Nuevo Belén, Tocumen
Teléfono (507) 292-5282; 292-9083

LCC
INGENIERIA

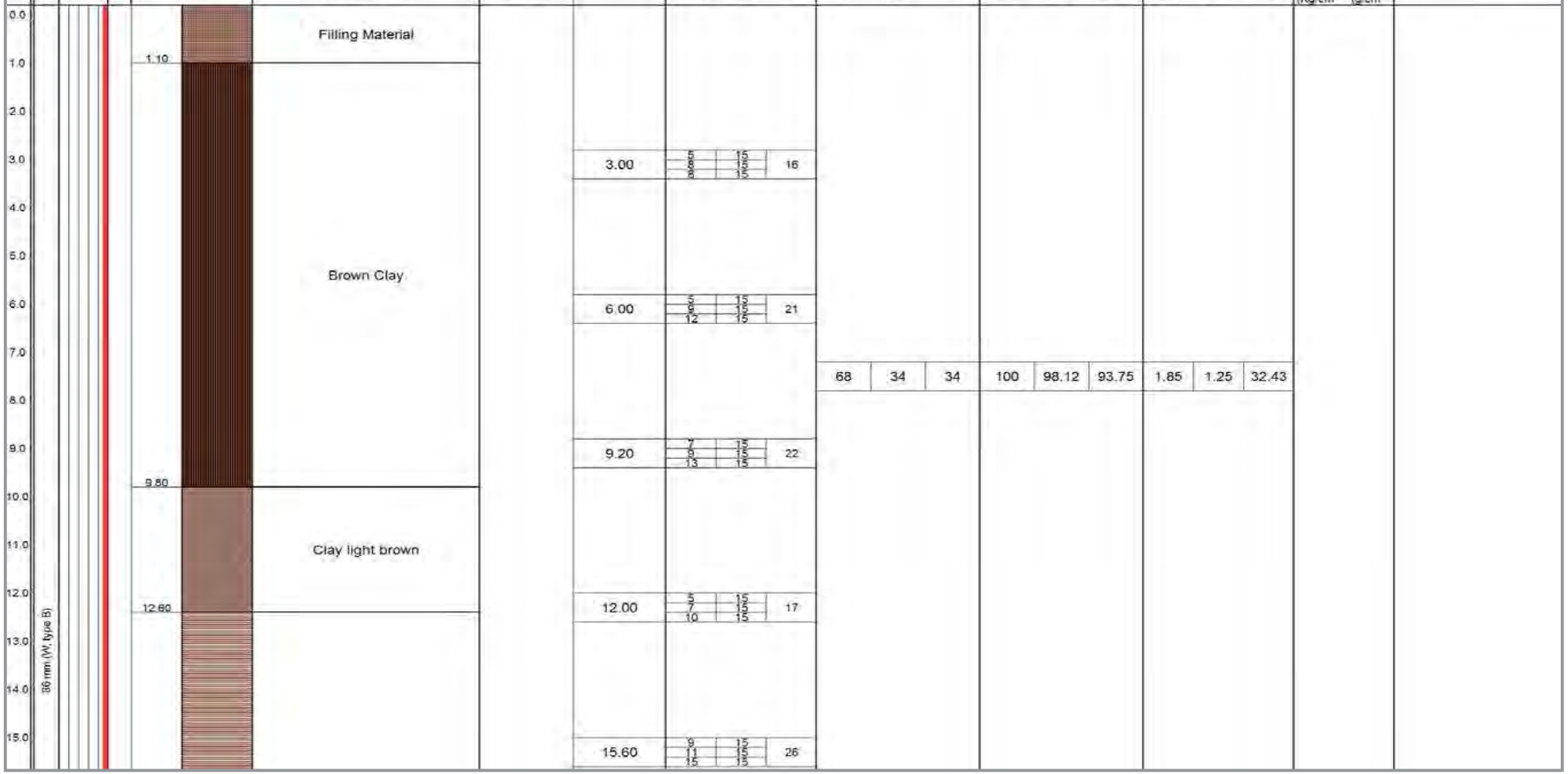


Galera 8B, Ofidepósitos Tocumen II, Calle Nuevo Belén, Tocumen
Teléfono (507) 292-5282; 292-9083

LCC
INGENIERIA

2. BORING GRAPHIC REPRESENTATION

WORK: C/010/001/026 LINE 3 RAILWAY Sample N°: 260 Analyst: Ismael Arroyo **BORING : SR 41**
CUSTOMER: NIPPON KOEI Equipment: Rolatec 400 **DATE: 15/11/2013**



Galera 8B, Ofidepósitos Tocumen II, Calle Nuevo Belén, Tocumen
Teléfono (507) 292-5282; 292-9083

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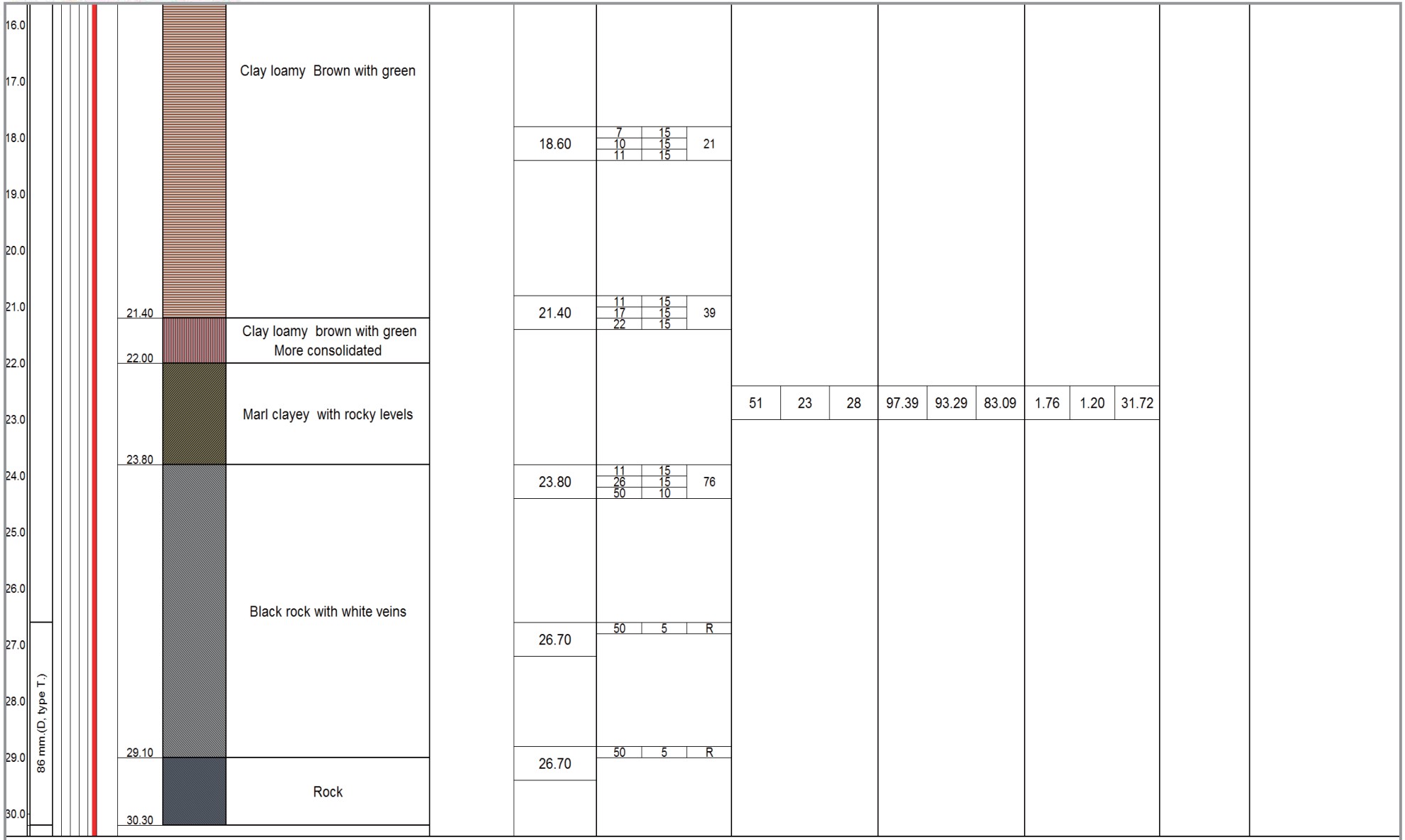
INGENIERIA



Galera 8B, Ofidepósitos Tocumen II, Calle Nuevo Belén, Tocumen
Teléfono (507) 292-5282; 292-9083

LCC INGENIERIA

2. BORING GRAPHIC REPRESENTATION

WORK: C/010/001/024 LINE 3 RAILWAY
CUSTOMER: NIPPON KOEI

Sample N°: 250
Equipment: Rolatec 400

Analyst: Ismael Arroyo

BORING : SR 20
DATE: 13/11/2013

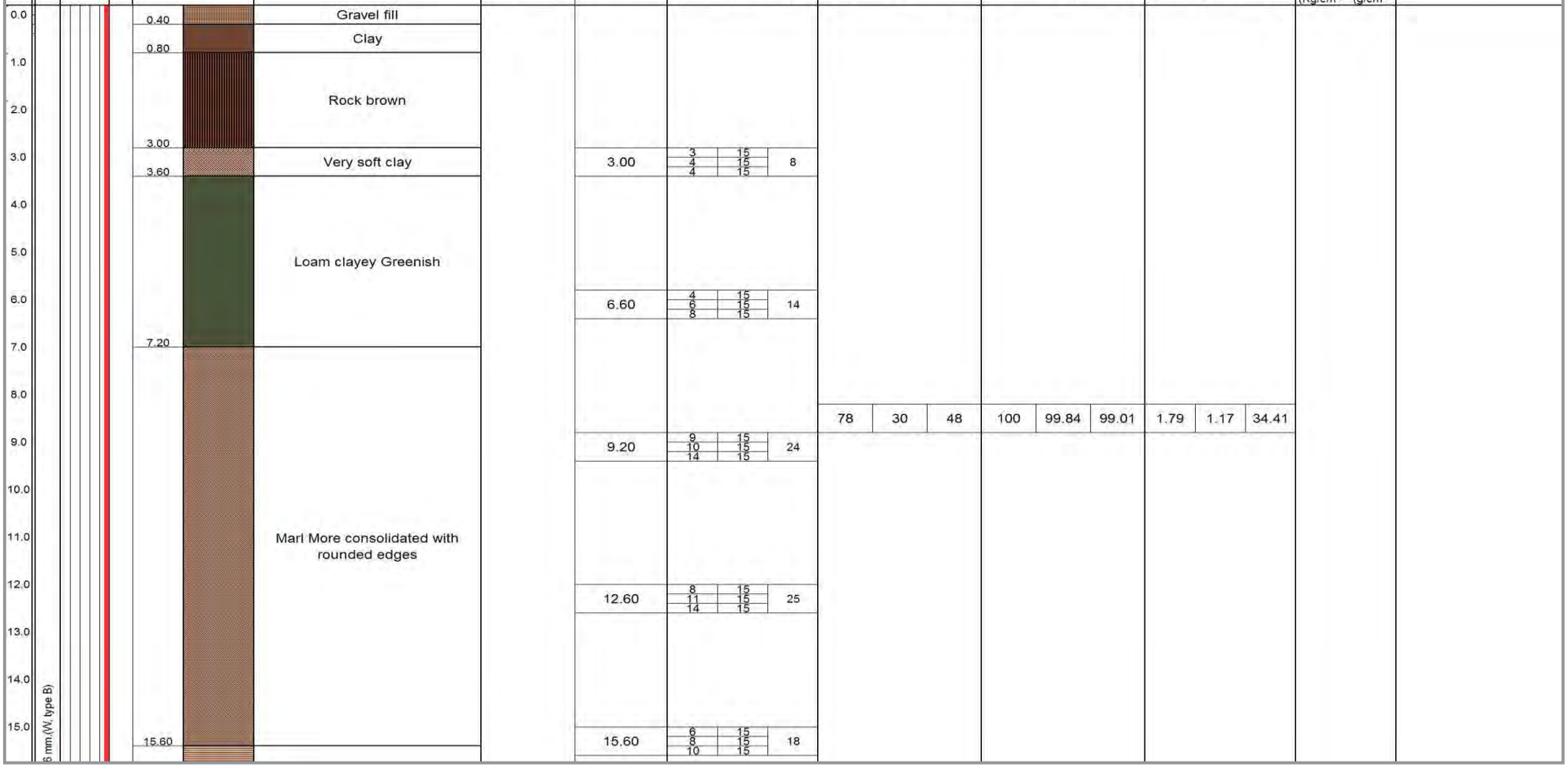
Depth	Boring	Recovered (%)	WT	Geological Section	SAMPLE DESCRIPTION	UNDISTURBED SAMPLE	SPT	N Blows	P cms	N Field	ATTERBERG LIMITS LL	PL	PI	% SIEVING N° 4	N° 40	N° 200	Density and Moisture Wet grs/cm³	Dry grs/cm³	ω %	Compression qu (Kg/cm²)	Da (g/cm³)	NOTE
0.0	101 mm.(W, type B)				Concrete and base layer																	
0.80																						
1.0																						
2.0																						
3.0	86 mm.(W, type B)				Consolidated Loam grayish color with veins		3.40	9 11 17	15 15 15	28												
3.35																						
4.0											44	31	13	100	99.67	92.24	1.81	1.13	37.46			
5.0																						
6.0							6.20	25 50 R	15 15	R												
6.50																						
7.0					Loam very consolidated																	
7.40																						
8.0					Fractured Rock																	
8.32							8.30	50 R	2	R												
9.0																						
10.0																						
11.0	86 mm.(D, type T)				Rock						ROCK			ROCK			ROCK			937.1	2.43	
12.0							8.30	50 R	3	R												
13.0																						
14.0																						
15.0																						
15.22							15.20	50 R	2	R												

BORING END 15.22 m

LCC INGENIERIA

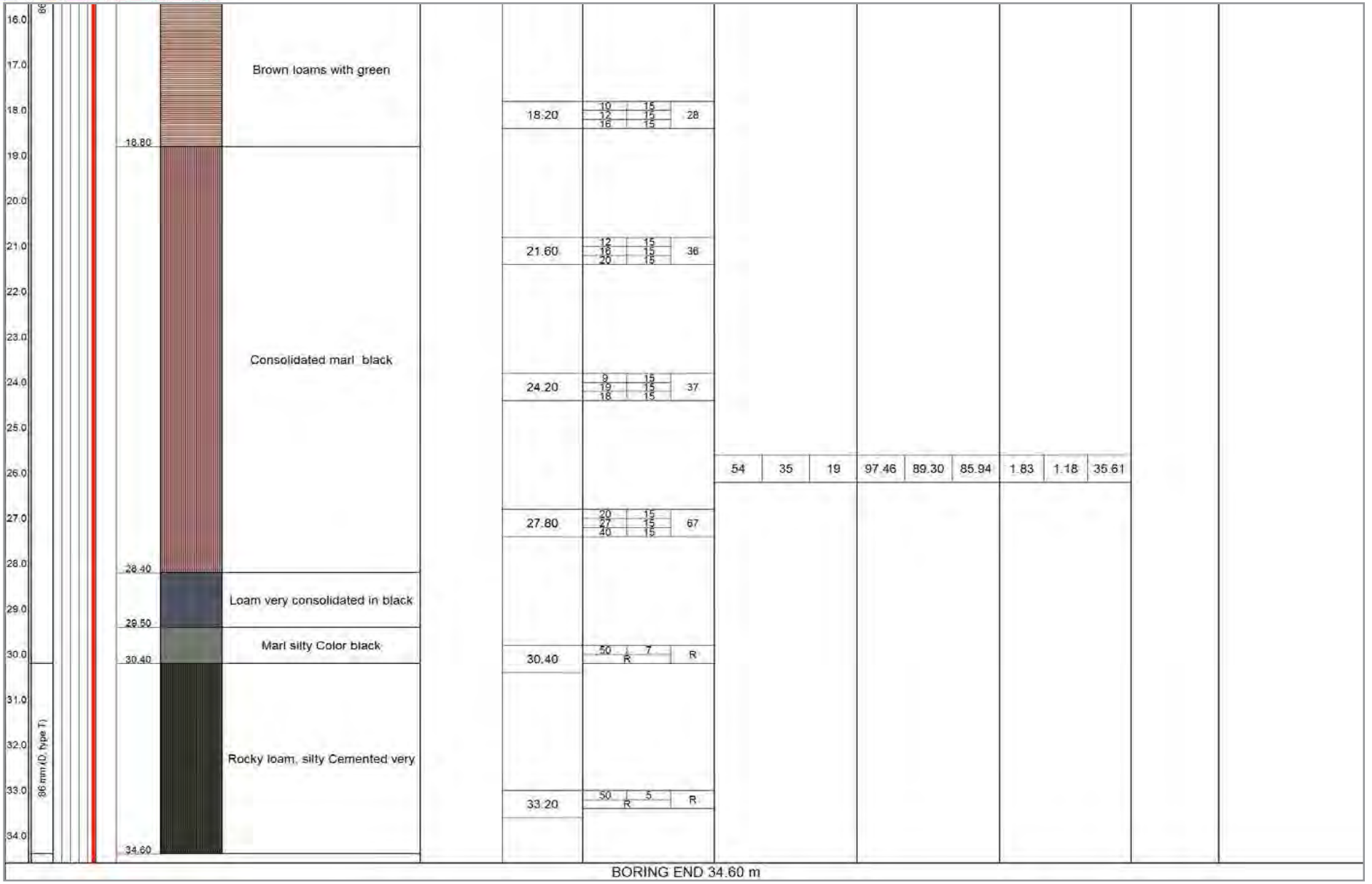
2. BORING GRAPHIC REPRESENTATION

WORK: C/010/001/025 LINE 3 RAILWAY | Sample N°: 259 | Analyst: Ismael Arroyo | **BORING : SR 21**
CUSTOMER: NIPPON KOEI | Equipment: Rolatec 400 | **DATE: 13/11/2013**



Galera 8B, Ofidepósitos Tocumen II, Calle Nuevo Belén, Tocumen
Teléfono (507) 292-5282; 292-9083

LCC
INGENIERIA



Galera 8B, Ofidepósitos Tocumen II, Calle Nuevo Belén, Tocumen
Teléfono (507) 292-5282; 292-9083

LCC INGENIERIA

2. BORING GRAPHIC REPRESENTATION

WORK: C/010/001/036 LINE 3 RAILWAY
CUSTOMER: NIPPON KOEI

Sample N°: 297
Equipment: RL-48

Analyst: Juan Francisco Fernandez

BORING : SR 42
DATE: 29/11/2013

Depth	Boring	Recovered (%)	WT	Geological Section	SAMPLE DESCRIPTION	UNDISTURBED SAMPLE	SPT	N Blows	P cms	N Field	ATTERBERG LIMITS LL	PL	PI	% SIEVING N° 4	N° 40	N° 200	Density and Moisture Wet grs/cm³	Dry grs/cm³	ω %	Compression qu (Kg/cm²)	Da (g/cm³)	NOTE
0.0	86 mm (W. type B)				Vegetable ground with clays																	
1.40																						
1.0					Clay brown																	
2.0																						
3.40																						
3.0							2.80	3 4 6	15 15 15	10												
4.0					Silts clayey light brown																	
5.0																						
6.0							6.20	4 3 2	15 15 15	5												
6.80																						
7.0					Silty clayey sand with boulders						33	22	11	98.45	84.21	72.42	1.84	1.43	24.56			
8.0																						
9.0							9.20	5 6 8	15 15 15	14												
9.80																						
10.0					Silts with some clays and altered sections																	
11.0																						
12.0							12.00	13 16 25	15 15 15	41												
13.0																						
14.0																						
15.0							15.00	50	R	R												
16.0																						
17.0																						
18.00																						
18.0					Silts altered with rocky sections		18.00	40 R	10	R												
19.0																						
20.0																						
21.0							21.00	50 R	10	R	52	19	33	100	92	84.96	1.13	0.65	36.75			
21.50																						
22.0					Loam very consolidated brown																	
23.0																						
24.0							24.10	50 R	10	R												
25.0																						
26.0																						
26.70																						
27.0	86 mm (D. type T)				Rock		27.13	50 R	2	R												
28.0																						
28.70																						

BORING END 28.70 m

Galera 8B, Ofidepósitos Tocumen II, Calle Nuevo Belén, Tocumen
Teléfono (507) 292-5282; 292-9083

LCC INGENIERIA

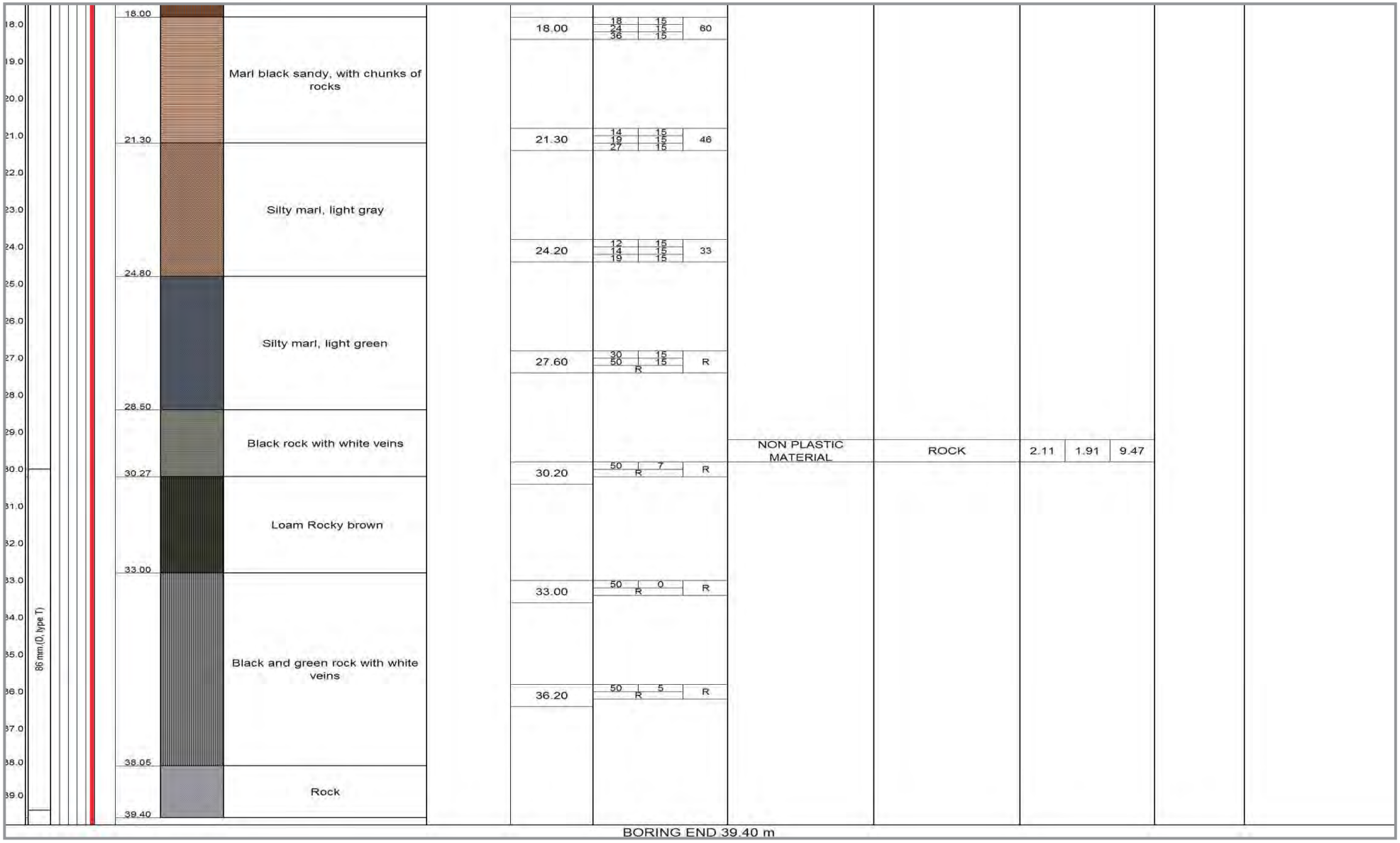
2. BORING GRAPHIC REPRESENTATION

WORK : C/010/001/033 LINE 3 RAILWAY | Sample N°: 292 | Analyst: Ismael Arroyo | **BORING : SR 43**
CUSTOMER: NIPPON KOEI | Equipment: Rolatec 400 | **DATE: 27/11/2013**

Depth	Boring	Recovered (%)	WT	Geological Section	SAMPLE DESCRIPTION	UNDISTURBED SAMPLE	SPT	N Blows	P cms	N Field	ATTERBERG LIMITS LL	PL	PI	% SIEVING N° 4	N° 40	N° 200	Density and Moisture Wet grs/cm³	Dry grs/cm³	ω %	Compression qu (Kg/cm²)	Da (g/cm³)	NOTE
0.0	86 mm (IV, type B)				Silts clayey																	
1.0				1.40																		
2.0					brown loams																	
3.0							3.00	3 4 4	15 15 15	8												
4.0																						
5.0																						
6.0				6.60			6.00	4 6 9	15 15 15	15												
7.0					Loam with oxides greenish																	
8.0																						
9.0							9.00	3 3 4	15 15 15	7												
10.0											47	27	20	100	97.69	88.46	1.49	0.53	64.35			
11.0																						
12.0				12.60			12.00	4 6 6	15 15 15	12												
13.0					Loam with oxides																	
14.0																						
15.0							15.00	6 8 10	15 15 15	18												
16.0																						
17.0																						
18.0				18.00			18.00	18 24 36	15 15 15	60												

Galera 8B, Ofidepósitos Tocumen II, Calle Nuevo Belén, Tocumen
Teléfono (507) 292-5282; 292-9083

LCC
INGENIERIA

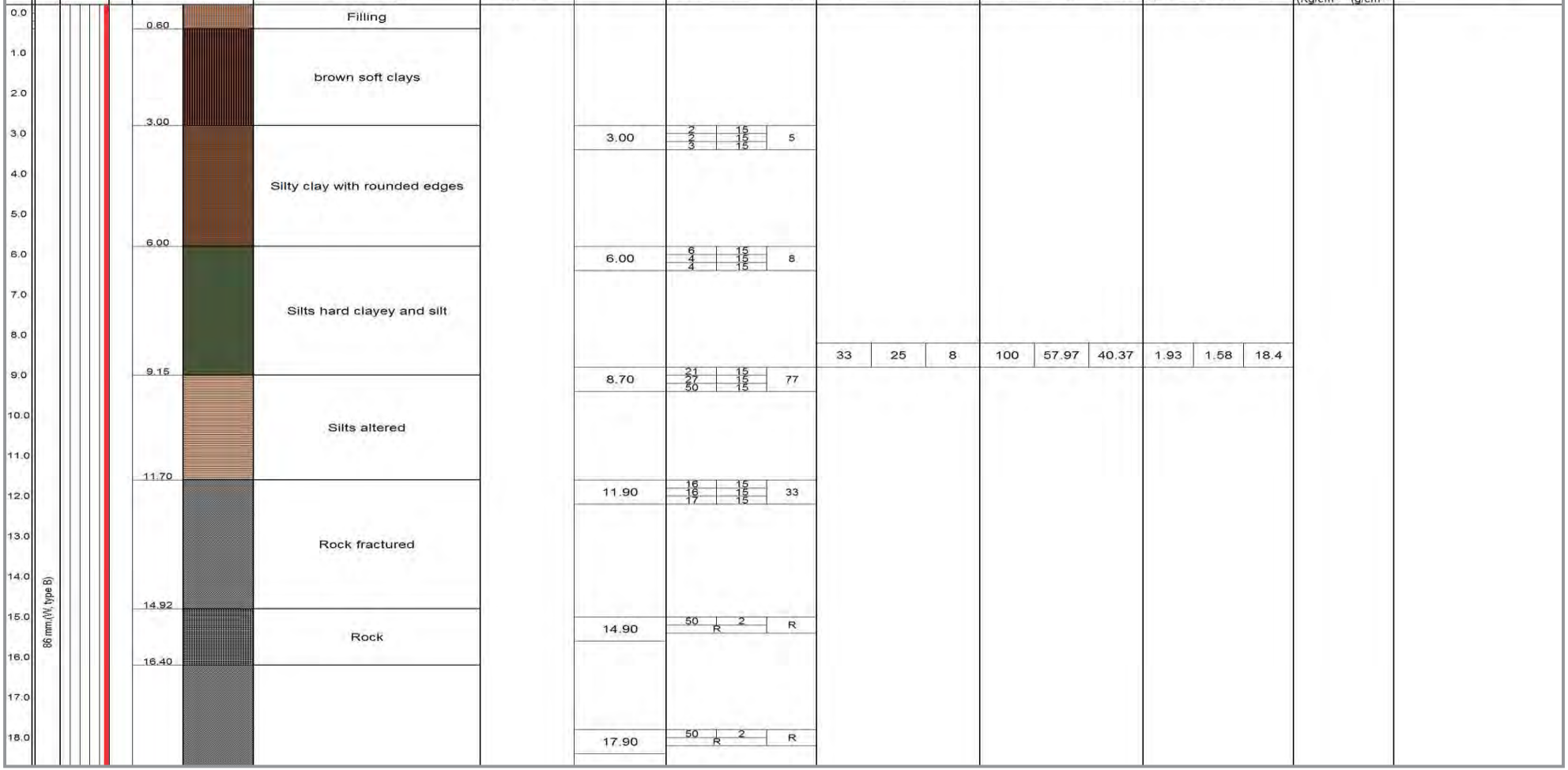


Galera 8B, Ofidepósitos Tocumen II, Calle Nuevo Belén, Tocumen
Teléfono (507) 292-5282; 292-9083

LCC INGENIERIA

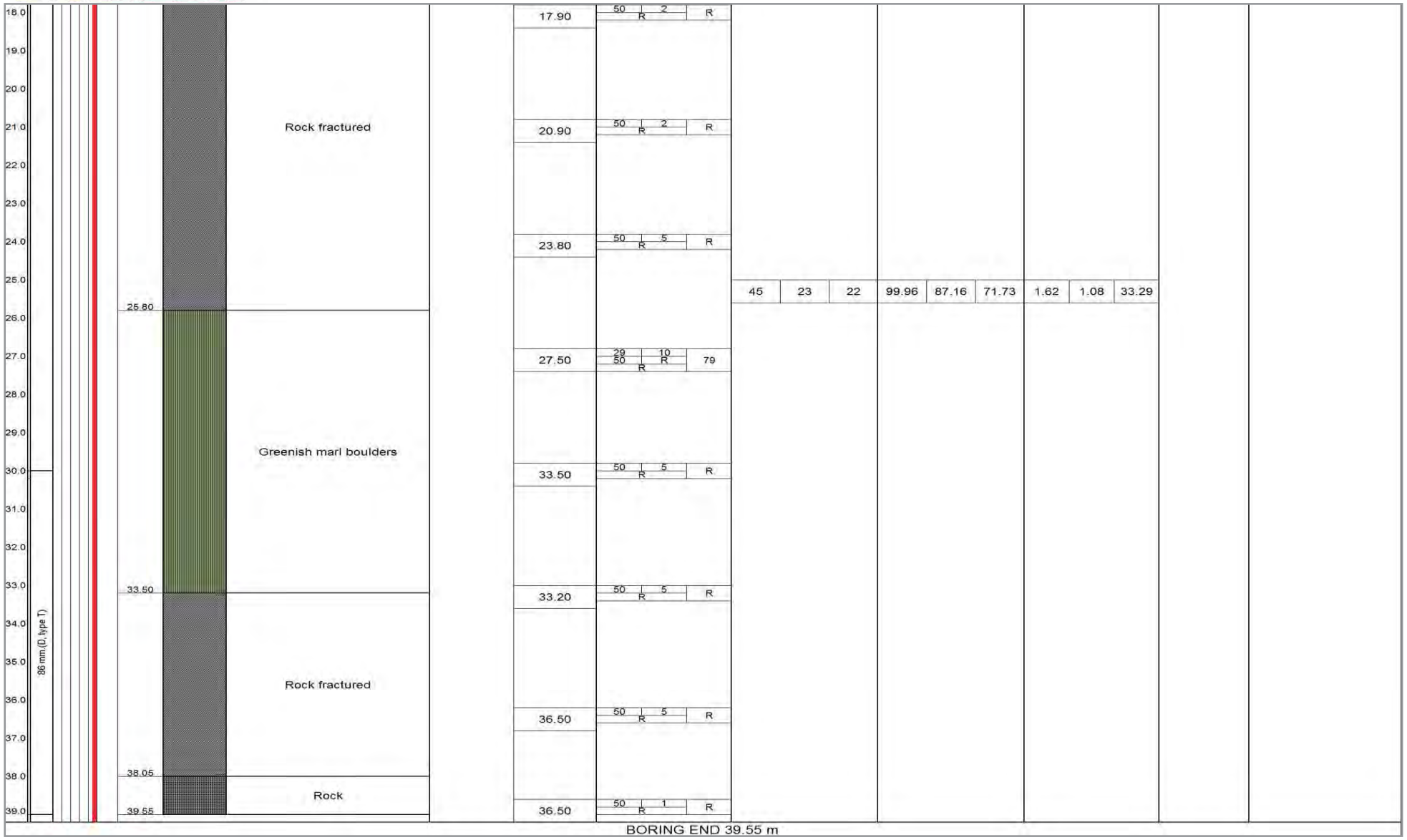
2. BORING GRAPHIC REPRESENTATION

CUSTOMER: C/010/001/034 LINE 3 RAILWAY Sample N°: 293 Analyst: Juan Francisco Fernandez **BORING : SR 44**
CUSTOMER: NIPPON KOEI Equipment: RL-48 **DATE: 25/11/2013**



Galera 8B, Ofidepósitos Tocumen II, Calle Nuevo Belén, Tocumen
Teléfono (507) 292-5282; 292-9083

LCC
INGENIERIA



Galera 8B, Ofidepósitos Tocumen II, Calle Nuevo Belén, Tocumen
Teléfono (507) 292-5282; 292-9083

LCC INGENIERIA

2. BORING GRAPHIC REPRESENTATION

WORK: C/010/001/038 LINE 3 RAILWAY
CUSTOMER: NIPPON KOEI

Sample N°: 307
Equipment: RL-48

Analyst: Juan Franciso Fernandez

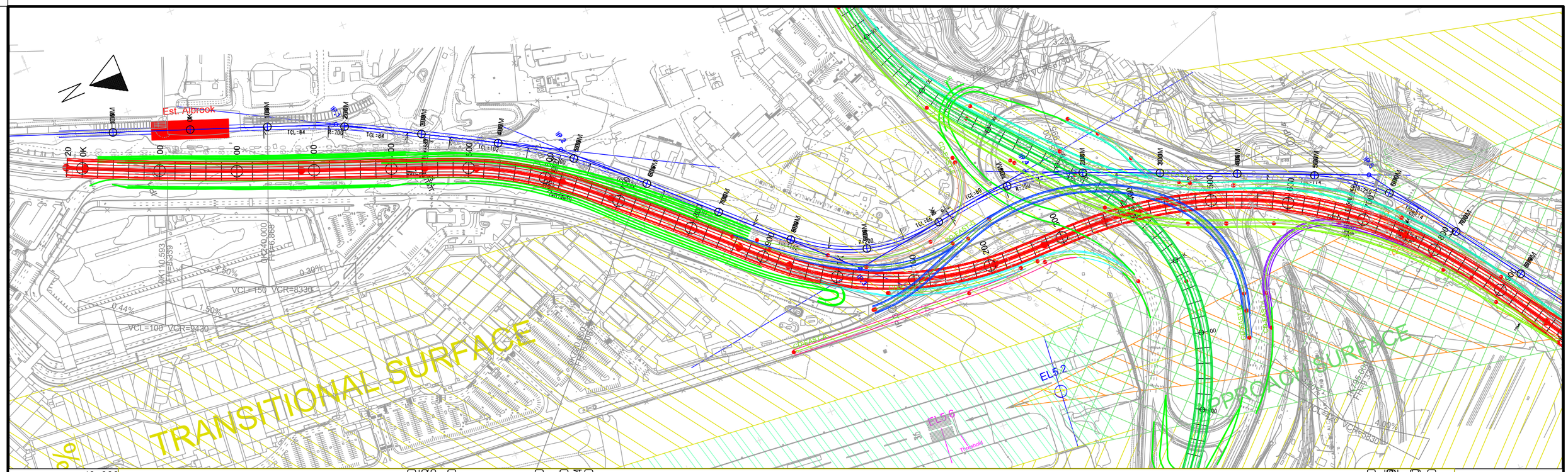
BORING : SR 45
DATE: 03/12/2013

Depth	Boring	Recovered (%) 20 40 60 80 100	WT	Geological Section	SAMPLE DESCRIPTION	UNDISTURBED SAMPLE	SPT	N Blows	P cms	N Field	ATTERBERG LIMITS LL	PL	PI	% SIEVING N° 4	N° 40	N° 200	Density and Moisture Wet grs/cm³	Dry grs/cm³	ω %	Compression qu (Kg/cm²)	Da (g/cm³)	NOTE
0.0	86 mm.(W. type B)				Filling with gravel																	
1.90																						
2.0					Clay silty																	
3.0							3.40	6 7 8	15 15 15	15	52	21	31	100	94.57	89.21	1.11	0.89	33.43			
4.0																						
5.0																						
6.00																						
6.0					Silts altered		6.00	8 14 16	15 15 15	30												
7.0																						
8.0																						
8.60																						
9.0					Rock fractured		9.00	50 R	3	R												
10.0											ROCK			6.73	1.87	1.46	1.98	1.96	3.61			
11.80																						
11.0					Rock																	
12.0							12.00	50 R	1	R												
13.0																						
13.00																						

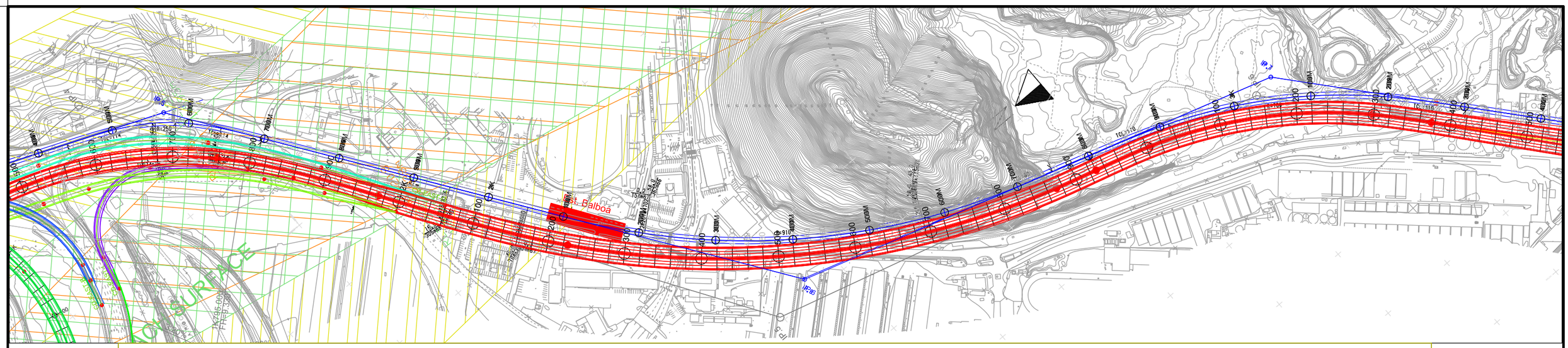
BORING END 13.00 m

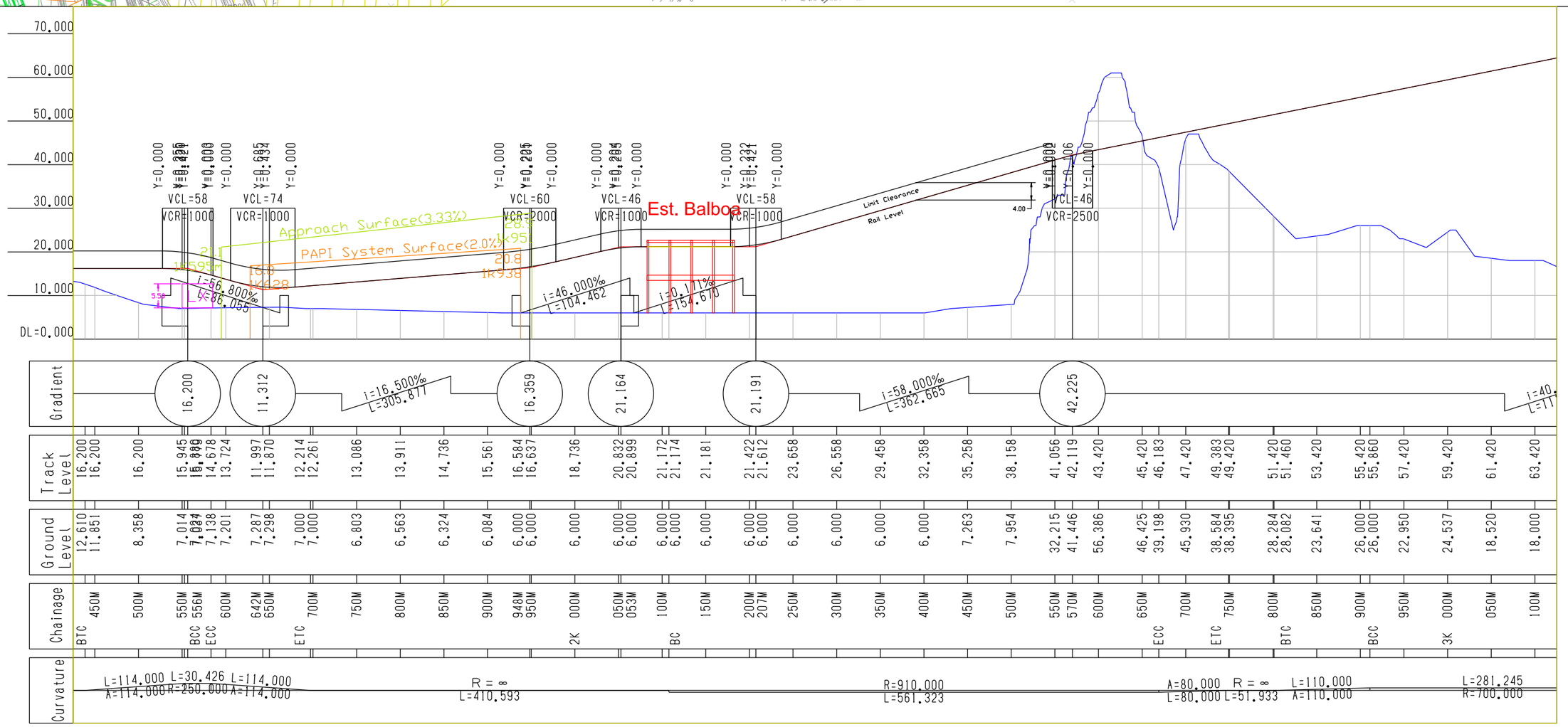
Appendix 4：Drawings (Line-3)

4-1: Plan and Profile

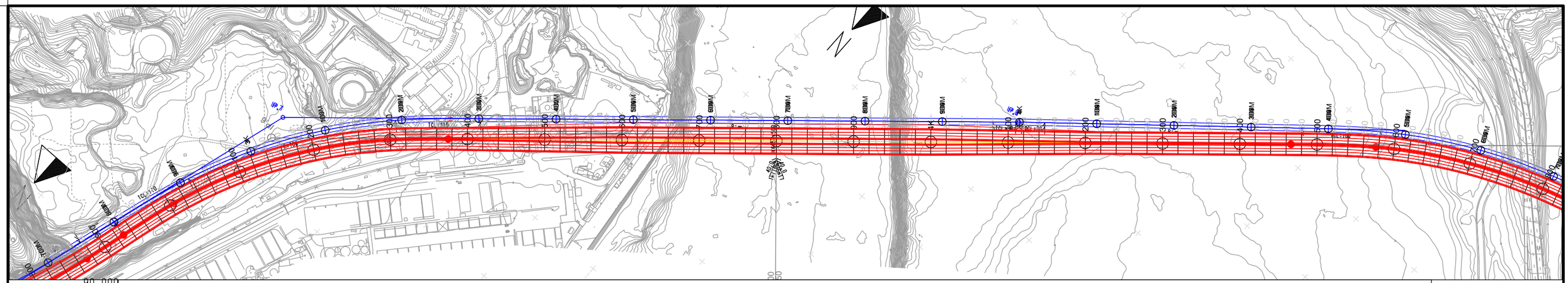


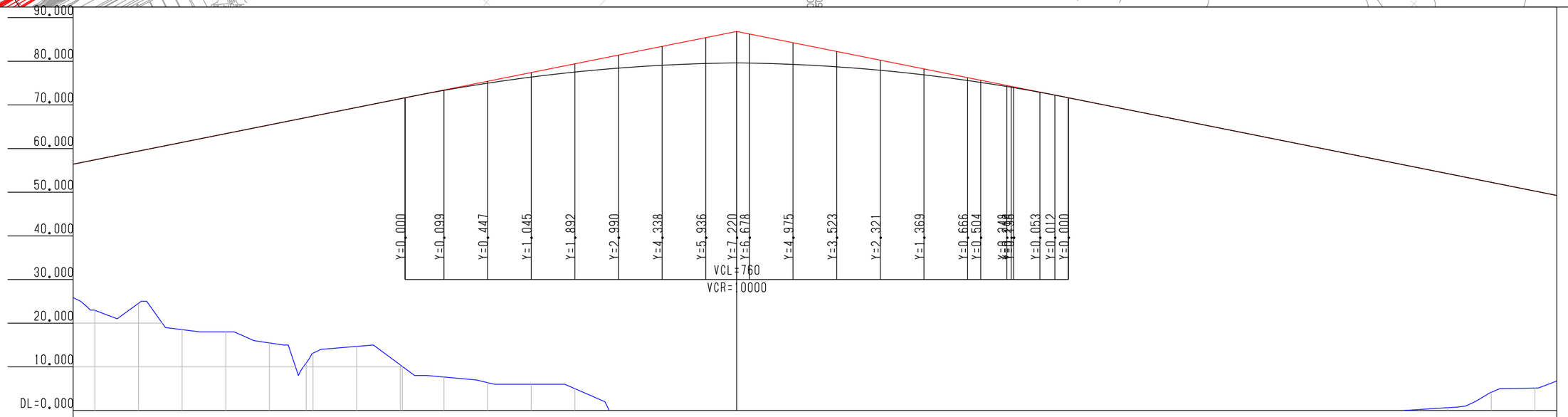
METRO DE PANAMA — SECRETARIA DEL METRO DE PANAMÁ	JICA — JAPAN INTERNATIONAL COOPERATION AGENCY	THE FEASIBILITY STUDY ON PANAMA CITY URBAN TRANSPORTATION LINE-3 PROJECT				REMARKS:
		DRAWN:	DATE: August 2014	RECEIVED BY:	SUBMITTED BY:	CHECKED BY:	PAGE: 1/18	Alignment Plan(FR) (0K000M000 ~ 1K500M000)
		DESIGNED:	SCALE(A3): Plan 1:5,000 Profile 1:5,000(X) and 1:1,000(Y)	TEAM LEADER/URBAN RAILWAY PLANNING	CIVIL AND FACILITY PLANNING	APPROVED BY:	

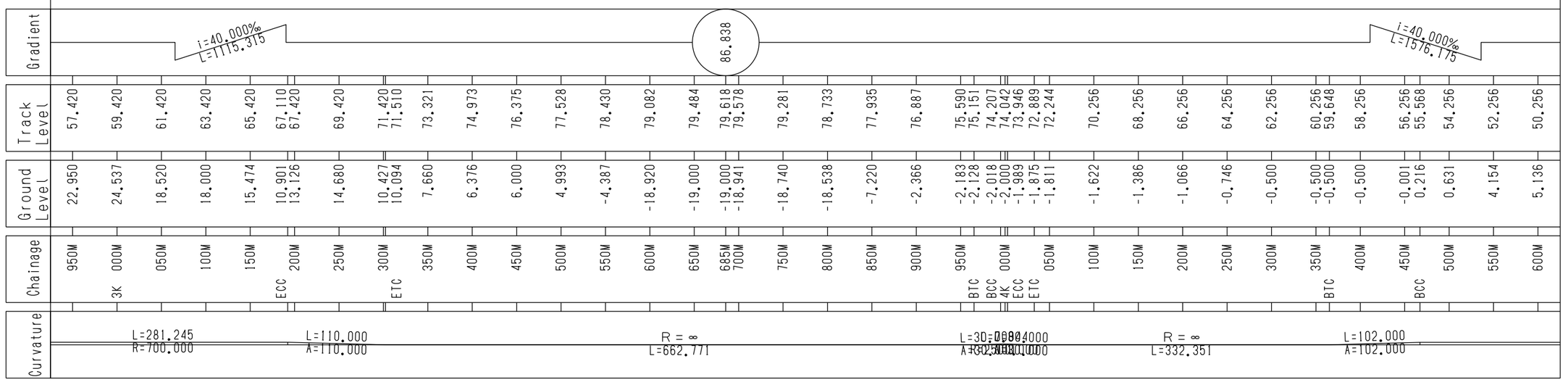




METRO DE PANAMA SECRETARIA DEL METRO DE PANAMÁ	JICA JAPAN INTERNATIONAL COOPERATION AGENCY	THE FEASIBILITY STUDY ON PANAMA CITY URBAN TRANSPORTATION LINE-3 PROJECT				REMARKS: Alignment Plan(FR) (1K500M000 ~ 3K000M000)
		DRAWN:	DATE: August 2014	RECEIVED BY:	SUBMITTED BY:	CHECKED BY:	PAGE:
		DESIGNED:	SCALE(A3): Plan 1:5,000 Profile 1:5,000(X) and 1:1,000(Y)	TEAM LEADER/URBAN RAILWAY PLANNING	CIVIL AND FACILITY PLANNING	APPROVED BY:	2 / 18

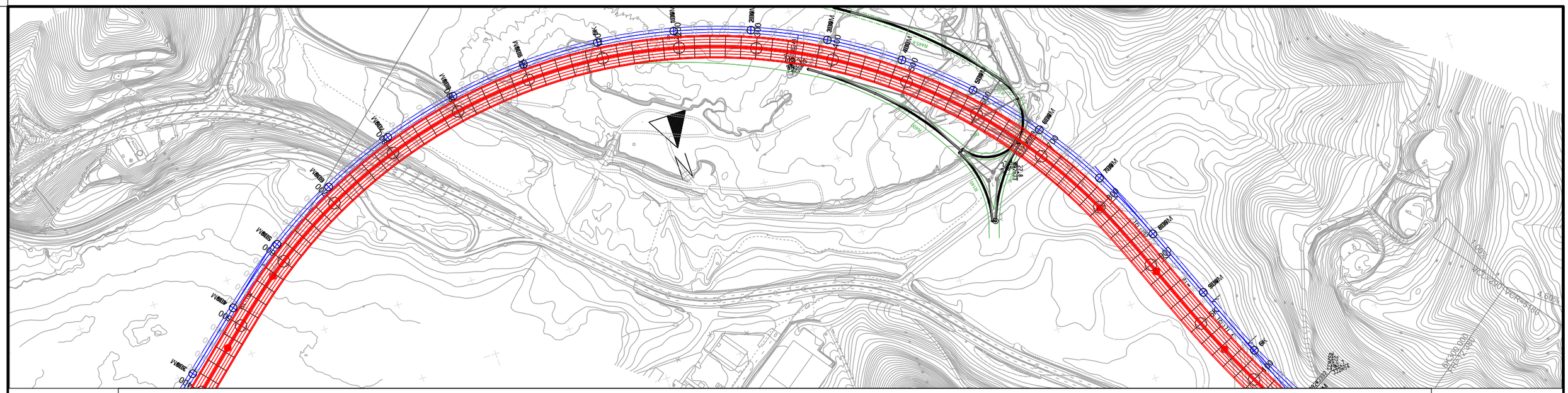


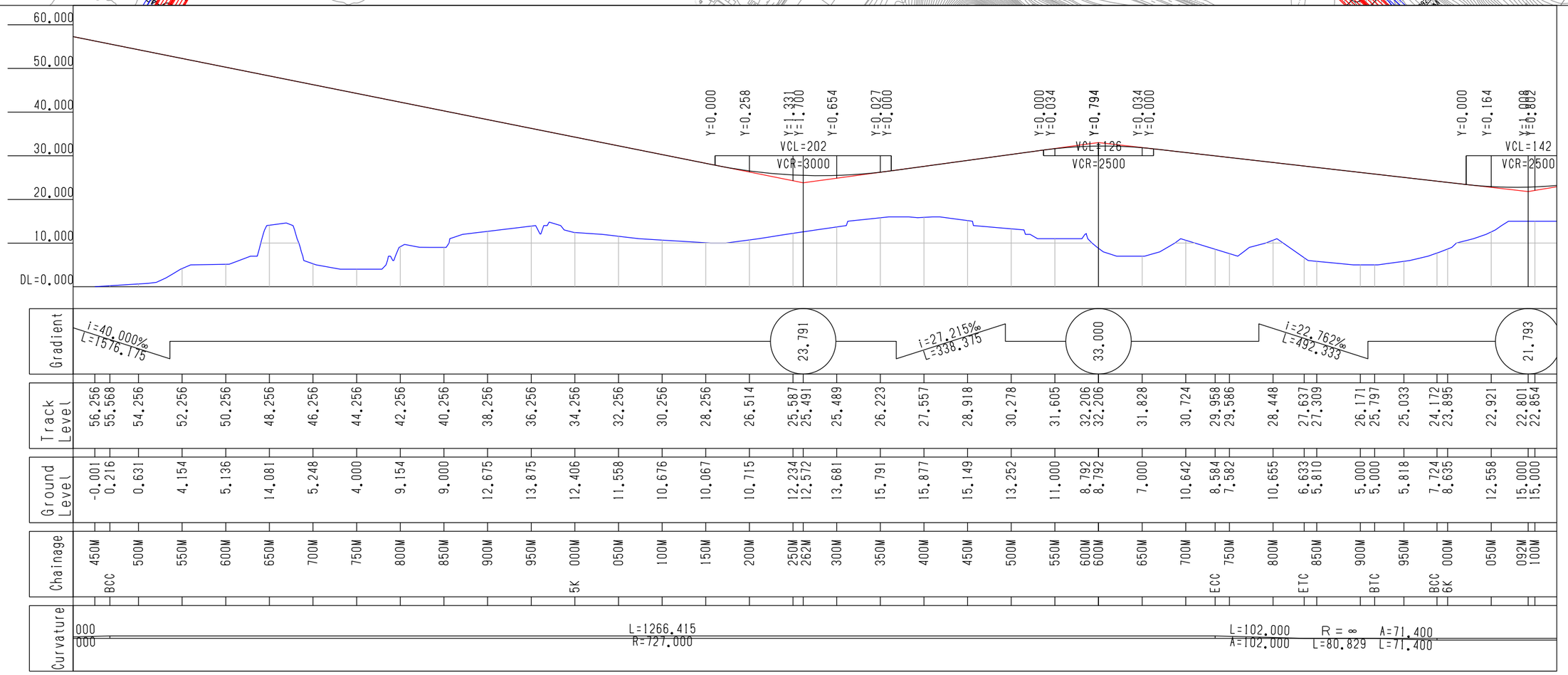




SECRETARIA DEL METRO DE PANAMÁ	JAPAN INTERNATIONAL COOPERATION AGENCY	THE FEASIBILITY STUDY ON PANAMA CITY URBAN TRANSPORTATION LINE-3 PROJECT				REMARKS:
		DRAWN:	DATE: August 2014	RECEIVED BY:	SUBMITTED BY:	CHECKED BY:	PAGE:
		DESIGNED:	SCALE(A3): Plan 1:5,000 Profile 1:5,000(X) and 1:1,000(Y)	TEAM LEADER/URBAN RAILWAY PLANNING	CIVIL AND FACILITY PLANNING	APPROVED BY:	3 / 18

Alignment Plan(FR)
(3K000M000 ~ 4K500M000)





SECRETARIA DEL METRO DE PANAMÁ

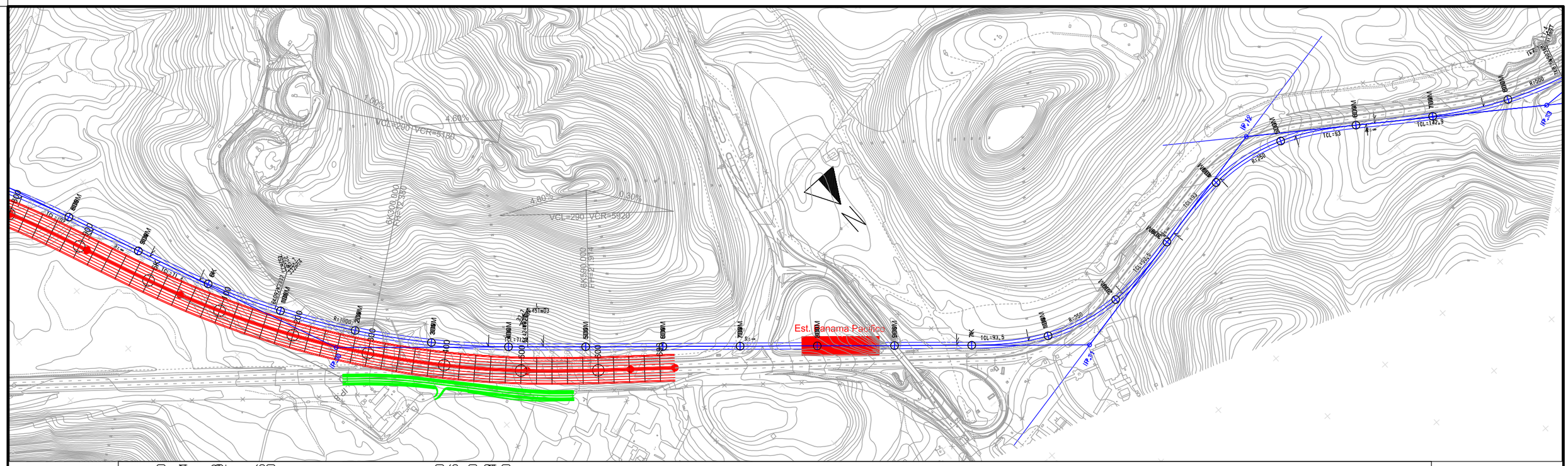
JAPAN INTERNATIONAL COOPERATION AGENCY

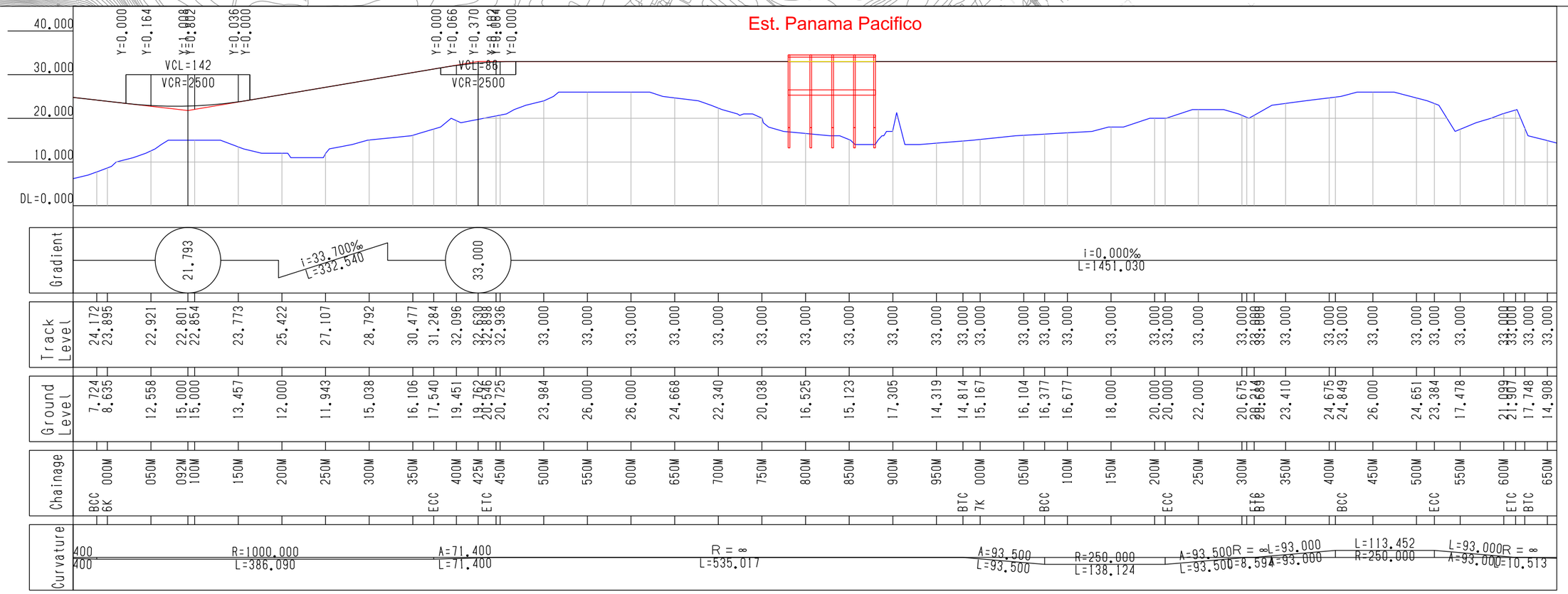
THE FEASIBILITY STUDY ON PANAMA CITY URBAN TRANSPORTATION LINE-3 PROJECT

DRAWN:	DATE: August 2014	RECEIVED BY:	SUBMITTED BY:	CHECKED BY:	PAGE: 4/18
DESIGNED:	SCALE(A3): Plan 1:5,000 Profile 1:5,000(X) and 1:1,000(Y)	TEAM LEADER/URBAN RAILWAY PLANNING	CIVIL AND FACILITY PLANNING	APPROVED BY:	

REMARKS:

Alignment Plan(FR)
(4K500M000 ~ 6K000M000)





SECRETARIA DEL METRO DE PANAMÁ

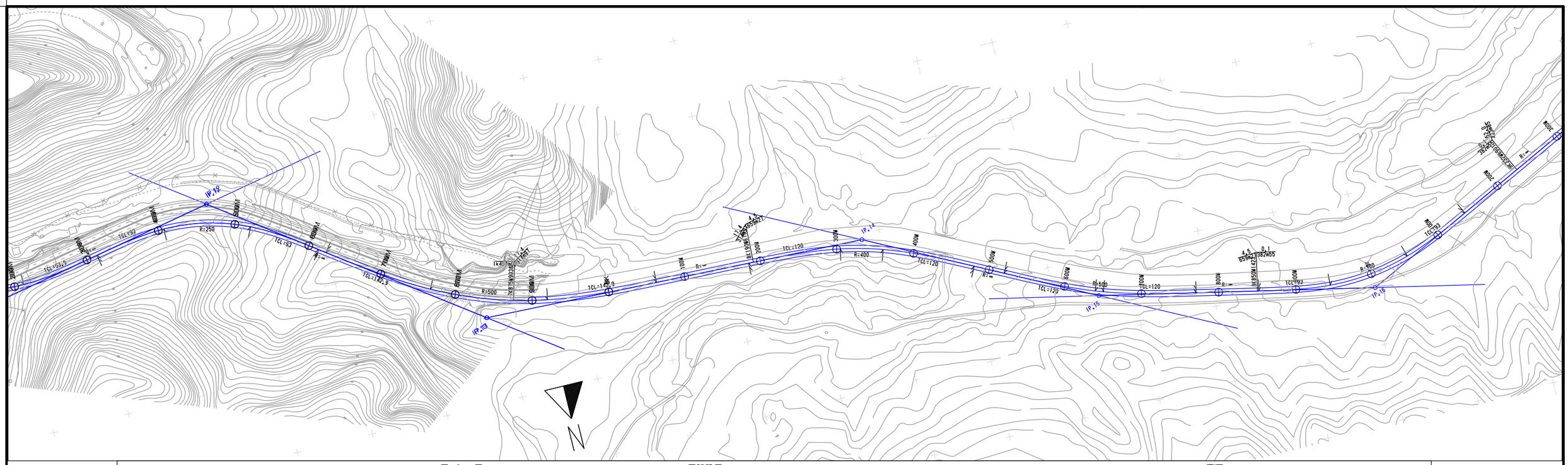
JAPAN INTERNATIONAL COOPERATION AGENCY

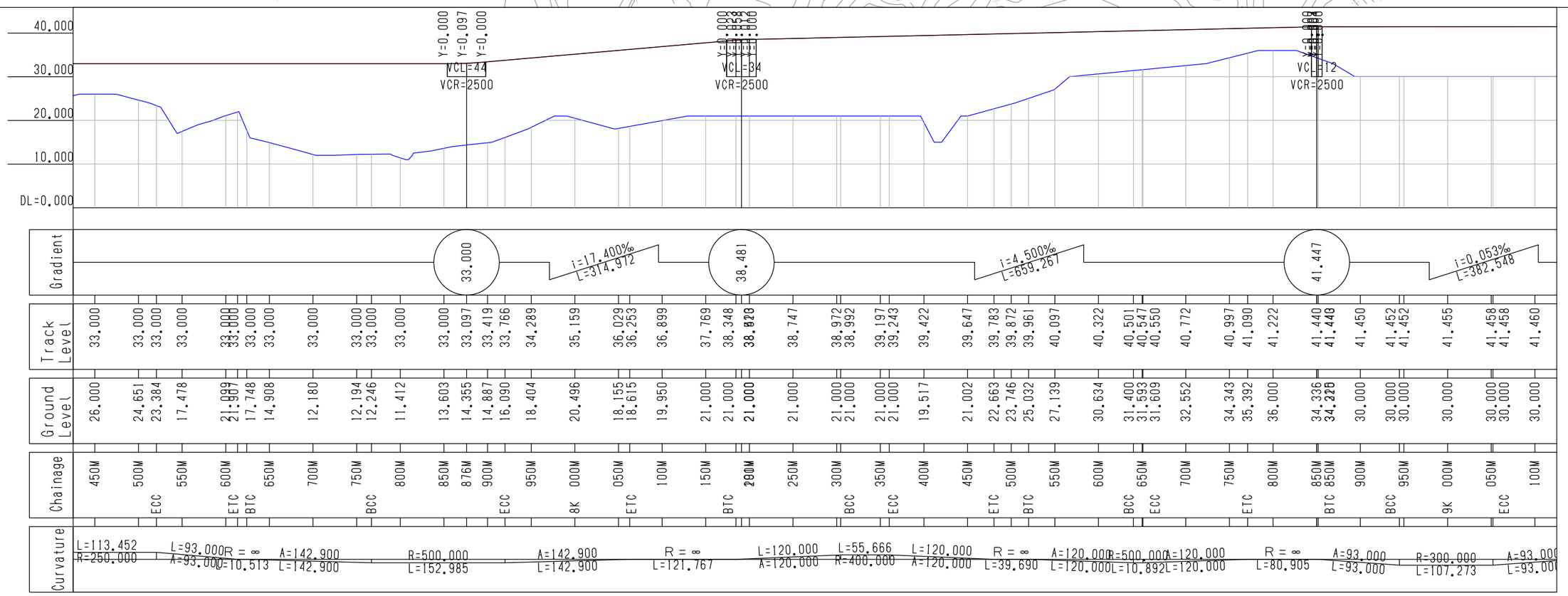
THE FEASIBILITY STUDY ON PANAMA CITY URBAN TRANSPORTATION LINE-3 PROJECT

DRAWN:	DATE: August 2014	RECEIVED BY:	SUBMITTED BY:	CHECKED BY:	PAGE:
DESIGNED:	SCALE(A3): Plan 1:5,000 Profile 1:5,000(X) and 1:1,000(Y)	TEAM LEADER/URBAN RAILWAY PLANNING	CIVIL AND FACILITY PLANNING	APPROVED BY:	5 / 18

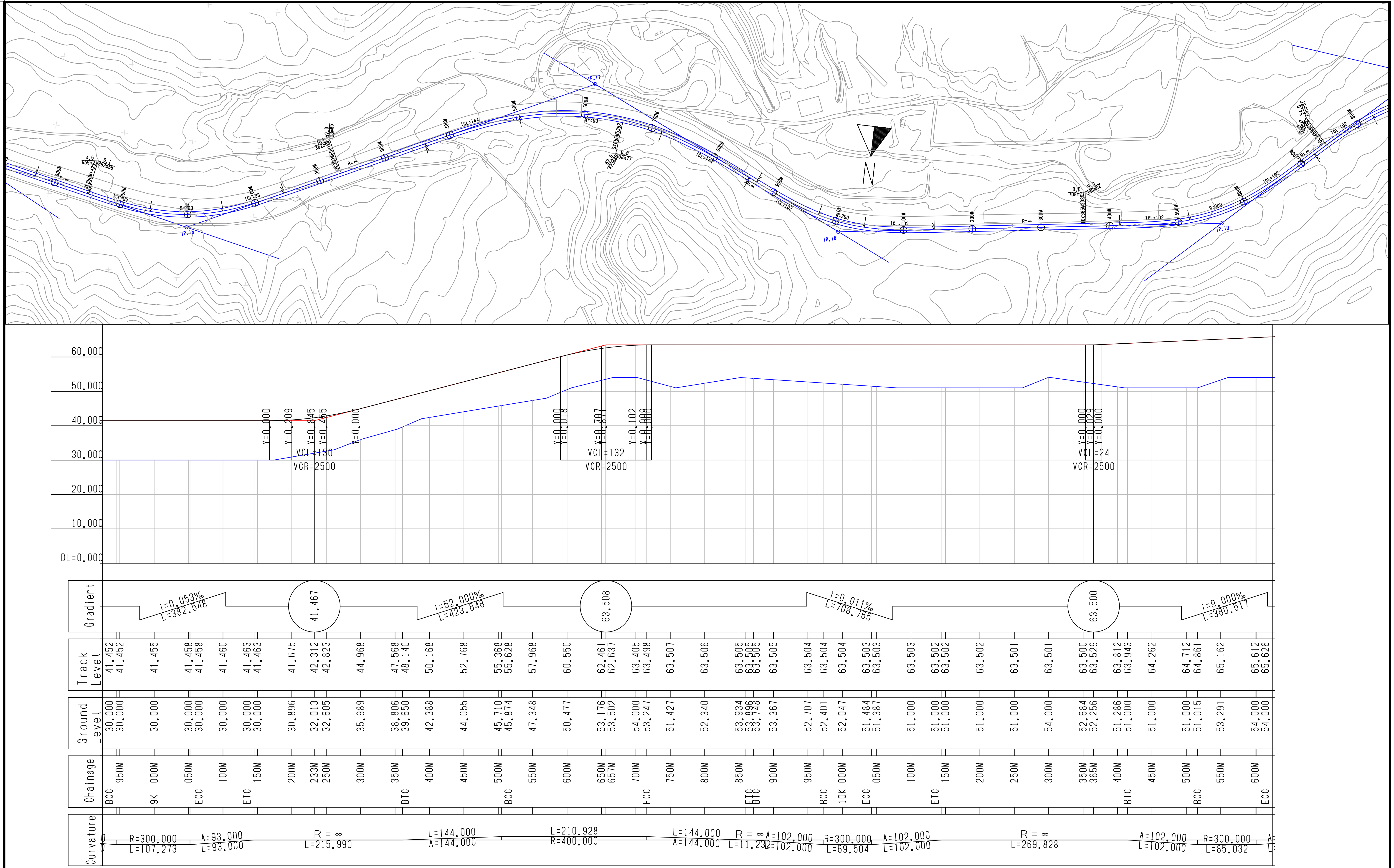
REMARKS:

Alignment Plan(FR)
(6K000M000 ~ 7K500M000)





METRO DE PANAMA / SECRETARIA DEL METRO DE PANAMÁ	JICA / JAPAN INTERNATIONAL COOPERATION AGENCY	THE FEASIBILITY STUDY ON PANAMA CITY URBAN TRANSPORTATION LINE-3 PROJECT				REMARKS: Alignment Plan(FR) (7K500M000 ~ 9K000M000)
		DRAWN:	DATE: August 2014	RECEIVED BY:	SUBMITTED BY:	CHECKED BY: / PAGE:
		DESIGNED:	SCALE(A3): Plan 1:5,000 Profile 1:5,000(X) and 1:1,000(Y)	TEAM LEADER/URBAN RAILWAY PLANNING	CIVIL AND FACILITY PLANNING	APPROVED BY: / 6/18



SECRETARIA DEL METRO DE PANAMÁ

JAPAN INTERNATIONAL COOPERATION AGENCY

THE FEASIBILITY STUDY ON PANAMA CITY URBAN TRANSPORTATION LINE-3 PROJECT

DRAWN:	DATE: August 2014	RECEIVED BY:	SUBMITTED BY:	CHECKED BY:	PAGE:	REMARKS:
DESIGNED:	SCALE(A3): Plan 1:5,000 Profile 1:5,000(X) and 1:1,000(Y)	TEAM LEADER/URBAN RAILWAY PLANNING	CIVIL AND FACILITY PLANNING	APPROVED BY:	7 / 18	

Alignment Plan(FR)
(9K000M000 ~ 10K500M000)