GEOLOGICAL SECTIONS :

NOTES :

GROUND PROFILE

1. GROUND PROFILE SHOWN IS THAT CUT ALONG THE SECTION LINE USING THE PUBLISHED TOPOGRAPHIC MAP BY HONG KONG GOVERNMENT.

BOREHOLE DETAILS

2. INDIVIDUAL BOREHOLE RECORDS SHOULD BE REFERRED TO FOR DETAILS.
3. PROJECT SPECIFIC BOREHOLES HAVE BEEN DRAWN USING THE AGS DATA.
4. INCLINED BOREHOLES SHOWN ON THE SECTIONS DO NOT TAKE INTO ACCOUNT ANY DEVIATION AWAY FROM THE SECTION LINE. HENCE CAUTION SHOULD BE ADOPTED WHEN INTERPRETING DETAILS FROM THESE BOREHOLES.

LEGEND FOR BOREHOLE LOGS

LEGEND OF LUGEON TEST RESULTS

- < 0.05 LU
- 0.05 TO 0.1 LU
- 0.1 TO 0.5 LU
- 0.5 TO 1.0 LU
- 1.0 TO 5.0 LU
- 5.0 TO 10 LU
- 10 TO 50 LU
- > 50 LU

LEGEND OF RQD

- RQD = 100
- RQD = 91 TO 99
- RQD = 76 TO 90
- RQD = 51 TO 75
- RQD = 26 TO 50
- RQD = 0 TO 25
- TIP LEVEL
- 10.15 HIGHEST MEASURED GROUNDWATER LEVEL (UP TO 01 AUG 2011)
- 9.49 LOWEST MEASURED GROUNDWATER LEVEL (UP TO 01 AUG 2011)

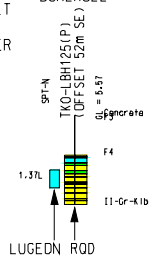
BD	BEACH DEPOSIT	1 VERY SOFT TO SOFT CLAY
MD/M	MARINE DEPOSIT	2 FIRM TO STIFF CLAY / SILT
DMD	DISTURBED MARINE DEPOSIT	3 SAND
F	FILL	4 COBBLE / GRAVEL / BOULDER
A/ALL	ALLUVIUM	
C/COLL *	COLLUVIUM	

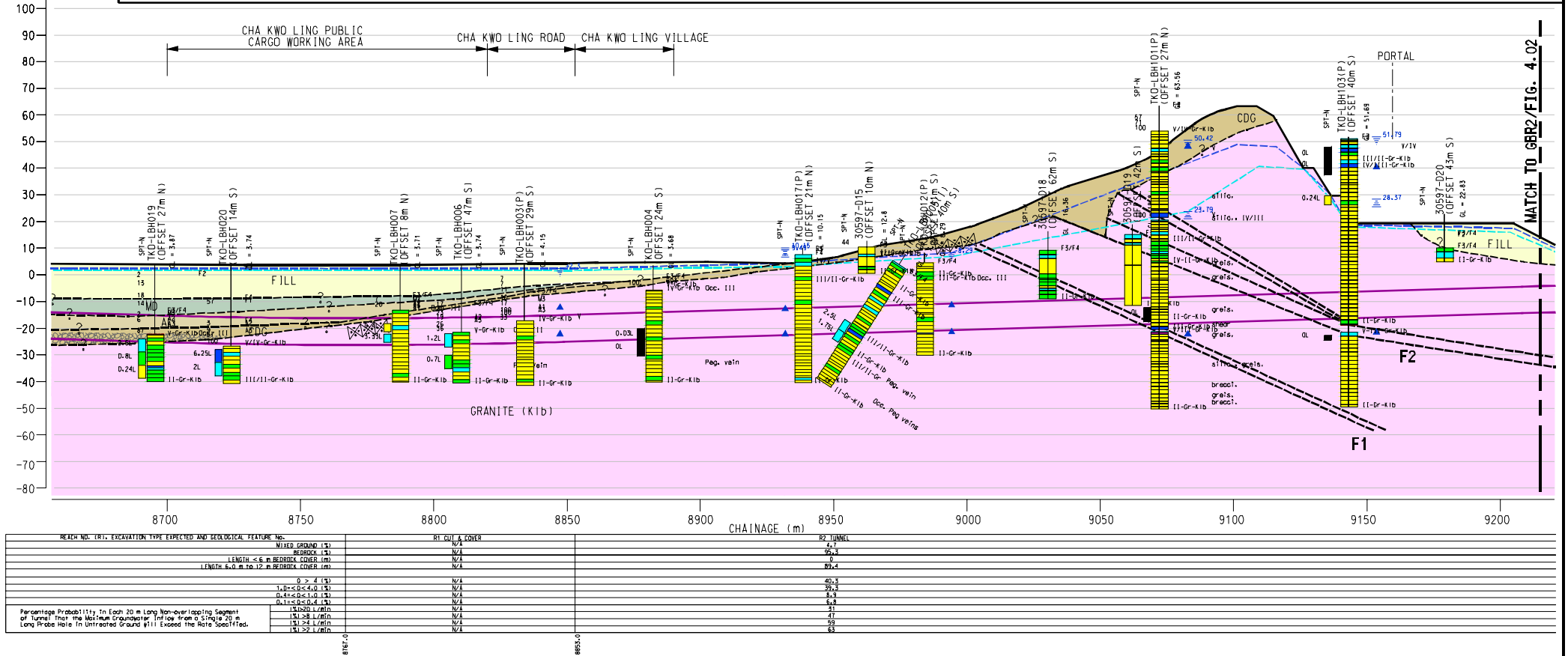
ROCK DECOMPOSITION

V	COMPLETELY DECOMPOSED
IV	HIGHLY DECOMPOSED
III	MODERATELY DECOMPOSED
II	SLIGHTLY DECOMPOSED

- INFERRED ZONE OF CORESTONE (LOCATION, SIZE AND EXTENT INDICATIVE ONLY)
- ROCKHEAD
- F1 GEOLOGICAL FEATURE
- HIGHEST GROUNDWATER LEVEL USED FOR DESIGN PURPOSES
- LOWEST PIEZOMETRIC SURFACE IN BEDROCK USED FOR DESIGN PURPOSES

ARCHIVAL AND PROJECT SPECIFIC BOREHOLE





REACH NO. (R1: EXCAVATION TYPE EXPECTED AND GEOLOGICAL FEATURE No.		R1 CUT & COVER	R2 TUNNEL
MIXED GROUND (%)		N/A	4.7
BEDROCK (%)		N/A	95.3
LENGTH < 6 m BEDROCK COVER (m)		N/A	0
LENGTH 6.0 m to 12 m BEDROCK COVER (m)		N/A	859.4
Percentage Probability in Each 20 m Long Non-overlapping Segment of Tunnel That the Maximum Groundwater Inflow from a Single 20 m Long Probe Hole in Untreated Ground will Exceed the Rate Specified.	Q > 4 (%)	N/A	40.3
	1.0<=Q<4.0 (%)	N/A	39.3
	0.4<=Q<1.0 (%)	N/A	8.9
	0.1<=Q<0.4 (%)	N/A	6.8
	I%>20 L/min	N/A	31
	I%>8 L/min	N/A	47
	I%>4 L/min	N/A	59
	I%>2 L/min	N/A	63
		8167.0	8853.0

AECOM

AGREEMENT NO. CE 42/2008 (CE)
TSEUNG KWAN O - LAM TIN TUNNEL AND ASSOCIATED WORKS - INVESTIGATION

GEOTECHNICAL PROFILE

SCALE	1 : 1500 A3	DATE	SEP 2012
CHECK	GCYN	DRAWN	ATCL
JOB No.	60097697	DRAWING No.	Appendix 4.5
		REV	-

Plotting By:5/9/2012 $USER$
PLOT SCALE: #$SCALESHORT$

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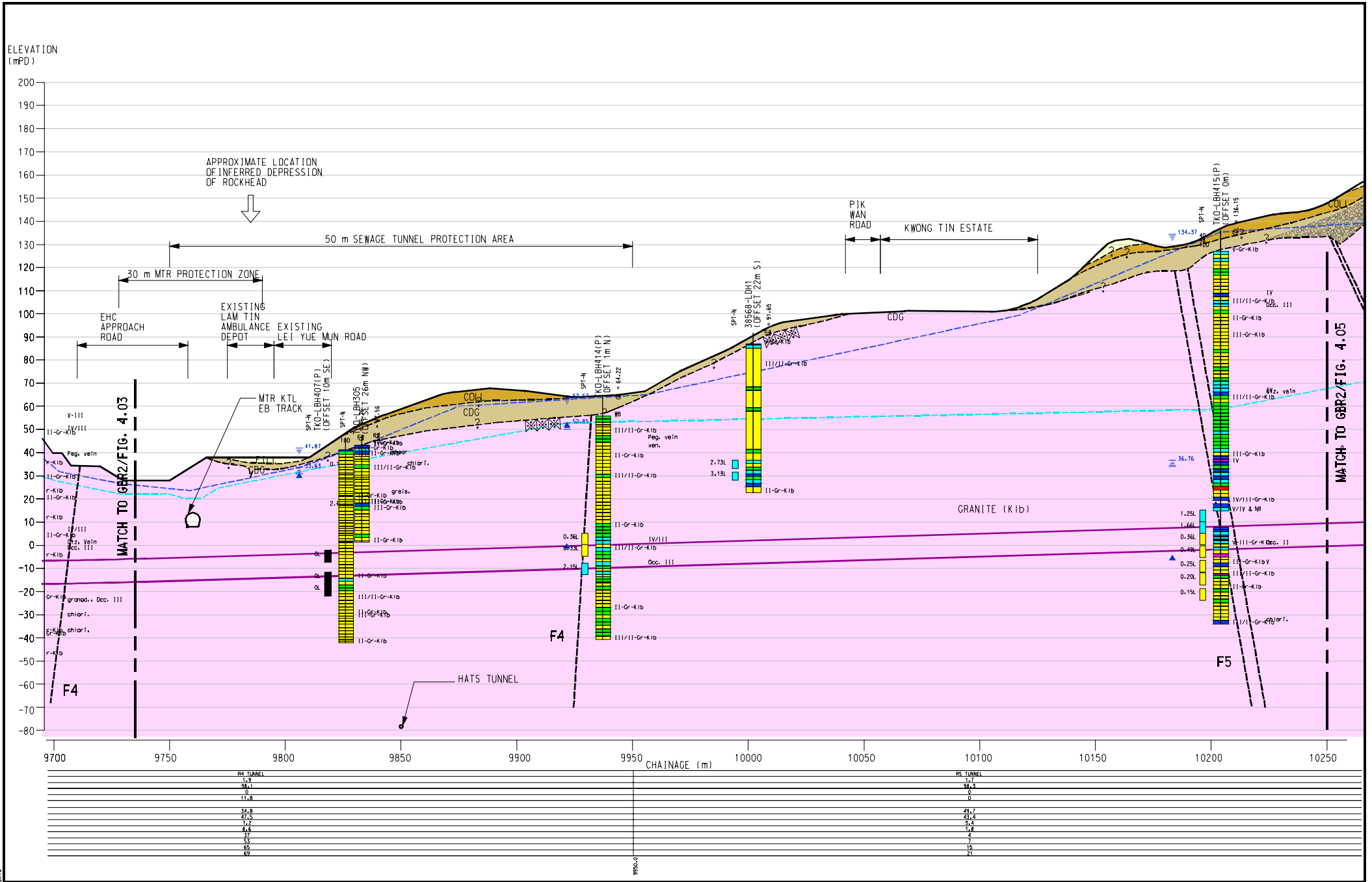

AGREEMENT NO. CE 42/2008 (CE)
TSEUNG KWAN O – LAM TIN TUNNEL AND ASSOCIATED WORKS – INVESTIGATION

GEOTECHNICAL PROFILE

SCALE	1 : 1500 A3	DATE	SEP 2012
CHECK	GCYN	DRAWN	ATCL
JOB No.	60097697	DRAWING No.	Appendix 4.5
		REV	–

Plotting By:5/9/2012 PLOT SCALE: #SCALE#SHORT#

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Detailed Calculation of Ground-borne Noise Impacts from PME

AP ID N3105
Name Cha Kwo Ling Village

PME Excavator Mounted Breaker

Item	Description								Assumption
	Octave Band Frequency	16	31.5	63	125	250	500	Hz	
	rms velocity	0.06	0.07	0.06	0.05	0.06	0.12	mm/s	Adopted from KSL EIA Appendix 7-1, Site Vibration Measurement
1	Vibration Velocity, ref 10^ -6 mm/s	95	97	96	94	96	102	dB(V)	
2	Ro	5.5	5.5	5.5	5.5	5.5	5.5	m	Site measurement of breaker operation at distance = 5.5m
	R	10	10	10	10	10	10	m	Shortest distance from the site to the NSR
	Distance Attenuation	-5	-5	-5	-5	-5	-5	dB	
3	Soil / Rock Damping	-0.7	-1.4	-2.9	-5.7	-11.4	-22.7	dB	Assume 5m clay soil from the house to the bed rock
4	Building Coupling Loss	-7	-7	-7	-7	-7	-7	dB	7 dB reduction for 1-2 storey Masonry
5	Floor to Floor Attenuation	0	0	0	0	0	0	dB	
6	Conversion from Vibration to Noise	-27	-27	-27	-27	-27	-27	dB	Adopted from KSL EIA Table 7-4
7	Conversion to A-weighted Noise	-56.7	-39.4	-26.2	-16.1	-8.6	-3.2	dB(A)	Standard acoustic principal
	Individual Groundborne Noise	-1	17	28	33	37	37	dB(A)	Standard acoustic principal
	Predicted Groundborne Noise for Hydraulic Breaker Operation						**41**	**dB(A)**	

PME Drill Rig

Using the calculated hydraulic breaker noise to correct to Rock Drill Noise	5.1	dB(A)	20log(0.536/0.298)	Site measurement in KSL EIA Appendix 7-1
Predicted groundborne noise for drill rig operation	**46**	**dB(A)**		

PME Pile Rig

Using the calculated hydraulic breaker noise to correct to pipepile noise	6.6	dB(A)	20log(0.638/0.298)	Site measurement in KSL EIA Appendix 7-1
Predicted groundborne noise for pile rig operation	**47**	**dB(A)**		

Detailed Calculation of Ground-borne Noise Impacts from PME

AP ID N3201
Name Kwong Ching House, Kwong Tin Estate

PME Excavator Mounted Breaker

Item	Description								Assumption
	Octave Band Frequency	16	31.5	63	125	250	500	Hz	
	rms velocity	0.06	0.07	0.06	0.05	0.06	0.12	mm/s	Adopted from KSL EIA Appendix 7-1, Site Vibration Measurement
1	Vibration Velocity, ref 10^ -6 mm/s	95	97	96	94	96	102	dB(V)	
2	Ro	5.5	5.5	5.5	5.5	5.5	5.5	m	Site measurement of breaker operation at distance = 5.5m
	R	95	95	95	95	95	95	m	Shortest distance from the site to the NSR
	Distance Attenuation	-25	-25	-25	-25	-25	-25	dB	
3	Soil / Rock Damping	0	-0.1	-0.1	-0.2	-0.5	-1	dB	Vibration will be transmitted from the rock breaking to the pile of the building. The whole transmission path is assumed to be rock
4	Building Coupling Loss	-7	-7	-10	-13	-14	-14	dB	Transportation Noise Reference Book, EIA Report Section 4.40
5	Floor to Floor Attenuation	-1	-1	-1	-1	-1	-1	dB	Assume -1 dB per floor and the first living level at 1/F
6	Conversion from Vibration to Noise	-27	-27	-27	-27	-27	-27	dB	Adopted from KSL EIA Table 7-4
7	Conversion to A-weighted Noise	-56.7	-39.4	-26.2	-16.1	-8.6	-3.2	dB(A)	Standard acoustic principal
	Individual Groundborne Noise	-21	-3	7	12	20	31	dB(A)	Standard acoustic principal
	Predicted Groundborne Noise for Hydraulic Breaker Operation						**31**	**dB(A)**	

PME Drill Rig

	Using the calculated hydraulic breaker noise to correct to Rock Drill Noise	5.1	dB(A)	20log(0.536/0.298)	Site measurement in KSL EIA Appendix 7-1
	Predicted groundborne noise for drill rig operation	**36**	**dB(A)**		

PME Pile Rig

	Using the calculated hydraulic breaker noise to correct to pipepile noise	6.6	dB(A)	20log(0.638/0.298)	Site measurement in KSL EIA Appendix 7-1
	Predicted groundborne noise for pile rig operation	**38**	**dB(A)**		