

**Appendix 3.7 Calculation of Emission from Portals and Ventilation Buildings (Construction Phase)**

**Emission Rate Calculation**

Description	Length (m)	Road Link ID	Vent Bldg. ID	Percentage from Vent Bldg. <sup>1</sup>	Portal ID	% from Portal <sup>1</sup>	No. of Volume Source (Portal)	Hour	Q (veh/hr)	Total E.F. (portal + VB)			Total emission rate (portal + VB)			Emission rate (from Vent Bldg.)			Emission rate (from portal within 500m Study Area)				
										TSP E.F.	RSP E.F.	FSP E.F.	TSP	RSP	FSP	TSP	RSP	FSP	TSP	RSP	FSP		
										(g/mile-veh)	(g/mile-veh)	(g/mile-veh)	(g/s)	(g/s)	(g/s)	(g/s)	(g/s)	(g/s)	(g/s)	(g/s)	(g/s)		
Lion Rock Tunnel (Sha Tin Bound)	1415	23b	ELRTSTVB1	50%	ELRTSTP1-ELRTSTP12	50%	12	1	755	1.812E-02	1.802E-02	1.660E-02	3.342E-03	3.323E-03	3.061E-03	1.671E-03	1.661E-03	1.530E-03	1.671E-03	1.661E-03	1.530E-03		
	1415	23b		50%		2		520	1.910E-02	1.899E-02	1.749E-02	2.425E-03	2.412E-03	2.221E-03	1.212E-03	1.206E-03	1.111E-03	1.212E-03	1.206E-03	1.111E-03	1.212E-03	1.206E-03	1.111E-03
	1415	23b		50%		3		369	2.007E-02	1.997E-02	1.838E-02	1.807E-03	1.798E-03	1.656E-03	9.036E-04	8.990E-04	8.278E-04	9.036E-04	8.990E-04	8.278E-04	9.036E-04	8.990E-04	8.278E-04
	1415	23b		50%		4		292	2.104E-02	2.094E-02	1.928E-02	1.500E-03	1.492E-03	1.374E-03	7.498E-04	7.462E-04	6.870E-04	7.498E-04	7.462E-04	6.870E-04	7.498E-04	7.462E-04	6.870E-04
	1415	23b		50%		5		283	2.201E-02	2.191E-02	2.017E-02	1.519E-03	1.512E-03	1.392E-03	7.594E-04	7.560E-04	6.959E-04	7.594E-04	7.560E-04	6.959E-04	7.594E-04	7.560E-04	6.959E-04
	1415	23b		50%		6		354	2.299E-02	2.289E-02	2.107E-02	1.987E-03	1.978E-03	1.821E-03	9.935E-04	9.892E-04	9.105E-04	9.935E-04	9.892E-04	9.105E-04	9.935E-04	9.892E-04	9.105E-04
	1415	23b		50%		7		896	2.400E-02	2.389E-02	2.199E-02	5.250E-03	5.226E-03	4.810E-03	2.625E-03	2.613E-03	2.405E-03	2.625E-03	2.613E-03	2.405E-03	2.625E-03	2.613E-03	2.405E-03
	1415	23b		50%		8		2328	2.521E-02	2.511E-02	2.311E-02	1.433E-02	1.428E-02	1.314E-02	7.166E-03	7.138E-03	6.571E-03	7.166E-03	7.138E-03	6.571E-03	7.166E-03	7.138E-03	6.571E-03
	1415	23b		50%		9		2747	2.412E-02	2.401E-02	2.212E-02	1.618E-02	1.611E-02	1.484E-02	8.090E-03	8.054E-03	7.421E-03	8.090E-03	8.054E-03	7.421E-03	8.090E-03	8.054E-03	7.421E-03
	1415	23b		50%		10		2334	2.672E-02	2.663E-02	2.453E-02	1.523E-02	1.518E-02	1.398E-02	7.616E-03	7.591E-03	6.991E-03	7.616E-03	7.591E-03	6.991E-03	7.616E-03	7.591E-03	6.991E-03
	1415	23b		50%		11		1976	2.854E-02	2.853E-02	2.625E-02	1.377E-02	1.377E-02	1.267E-02	6.886E-03	6.883E-03	6.334E-03	6.886E-03	6.883E-03	6.334E-03	6.886E-03	6.883E-03	6.334E-03
	1415	23b		50%		12		1845	2.846E-02	2.845E-02	2.618E-02	1.282E-02	1.282E-02	1.180E-02	6.410E-03	6.408E-03	5.898E-03	6.410E-03	6.408E-03	5.898E-03	6.410E-03	6.408E-03	5.898E-03
	1415	23b		50%		13		2316	3.400E-02	3.399E-02	3.124E-02	1.923E-02	1.923E-02	1.767E-02	9.617E-03	9.615E-03	8.837E-03	9.617E-03	9.615E-03	8.837E-03	9.617E-03	9.615E-03	8.837E-03
	1415	23b		50%		14		2367	3.465E-02	3.458E-02	3.184E-02	2.004E-02	2.000E-02	1.841E-02	1.002E-02	9.999E-03	9.207E-03	1.002E-02	9.999E-03	9.207E-03	1.002E-02	9.999E-03	9.207E-03
	1415	23b		50%		15		2523	3.675E-02	3.675E-02	3.377E-02	2.265E-02	2.264E-02	2.081E-02	1.132E-02	1.132E-02	1.040E-02	1.132E-02	1.132E-02	1.040E-02	1.132E-02	1.132E-02	1.040E-02
	1415	23b		50%		16		2645	3.314E-02	3.306E-02	3.045E-02	2.141E-02	2.136E-02	1.967E-02	1.071E-02	1.068E-02	9.836E-03	1.071E-02	1.068E-02	9.836E-03	1.071E-02	1.068E-02	9.836E-03
	1415	23b		50%		17		2739	3.215E-02	3.214E-02	2.955E-02	2.151E-02	2.150E-02	1.976E-02	1.075E-02	1.075E-02	9.882E-03	1.075E-02	1.075E-02	9.882E-03	1.075E-02	1.075E-02	9.882E-03
	1415	23b		50%		18		3004	3.182E-02	3.173E-02	2.913E-02	2.335E-02	2.328E-02	2.137E-02	1.167E-02	1.164E-02	1.069E-02	1.167E-02	1.164E-02	1.069E-02	1.167E-02	1.164E-02	1.069E-02
	1415	23b		50%		19		3212	2.637E-02	2.625E-02	2.410E-02	2.069E-02	2.060E-02	1.891E-02	1.034E-02	1.030E-02	9.455E-03	1.034E-02	1.030E-02	9.455E-03	1.034E-02	1.030E-02	9.455E-03
	1415	23b		50%		20		2580	2.251E-02	2.240E-02	2.065E-02	1.419E-02	1.412E-02	1.301E-02	7.093E-03	7.058E-03	6.506E-03	7.093E-03	7.058E-03	6.506E-03	7.093E-03	7.058E-03	6.506E-03
	1415	23b		50%		21		1942	2.625E-02	2.624E-02	2.417E-02	1.245E-02	1.244E-02	1.146E-02	6.225E-03	6.222E-03	5.731E-03	6.225E-03	6.222E-03	5.731E-03	6.225E-03	6.222E-03	5.731E-03
	1415	23b		50%		22		1866	2.444E-02	2.443E-02	2.251E-02	1.114E-02	1.114E-02	1.026E-02	5.570E-03	5.568E-03	5.129E-03	5.570E-03	5.568E-03	5.129E-03	5.570E-03	5.568E-03	5.129E-03
	1415	23b		50%		23		1827	2.136E-02	2.135E-02	1.958E-02	9.529E-03	9.525E-03	8.733E-03	4.764E-03	4.762E-03	4.366E-03	4.764E-03	4.762E-03	4.366E-03	4.764E-03	4.762E-03	4.366E-03
	1415	23b		50%		24		1430	2.238E-02	2.237E-02	2.051E-02	7.816E-03	7.813E-03	7.164E-03	3.908E-03	3.907E-03	3.582E-03	3.908E-03	3.907E-03	3.582E-03	3.908E-03	3.907E-03	3.582E-03
								<b>Daily</b>	-	-	-	-	2.942E-01	2.935E-01	2.700E-01	1.471E-01	1.468E-01	1.350E-01	1.471E-01	1.468E-01	1.350E-01		
Lion Rock Tunnel (Kowloon Bound)	1425	24b	ELRTKLVB1	50%	ELRTKLP1-ELRTKLP12	50%	12	1	974	2.372E-02	2.361E-02	2.174E-02	5.685E-03	5.659E-03	5.211E-03	2.842E-03	2.830E-03	2.606E-03	2.842E-03	2.830E-03	2.606E-03		
	1425	24b		50%		2		672	2.459E-02	2.449E-02	2.255E-02	4.062E-03	4.046E-03	3.725E-03	2.031E-03	2.023E-03	1.863E-03	2.031E-03	2.023E-03	1.863E-03	2.031E-03	2.023E-03	1.863E-03
	1425	24b		50%		3		477	2.548E-02	2.538E-02	2.337E-02	2.988E-03	2.976E-03	2.740E-03	1.494E-03	1.488E-03	1.370E-03	1.494E-03	1.488E-03	1.370E-03	1.494E-03	1.488E-03	1.370E-03
	1425	24b		50%		4		378	2.637E-02	2.627E-02	2.419E-02	2.450E-03	2.440E-03	2.247E-03	1.225E-03	1.220E-03	1.123E-03	1.225E-03	1.220E-03	1.123E-03	1.225E-03	1.220E-03	1.123E-03
	1425	24b		50%		5		366	2.726E-02	2.717E-02	2.500E-02	2.453E-03	2.445E-03	2.250E-03	1.227E-03	1.222E-03	1.125E-03	1.227E-03	1.222E-03	1.125E-03	1.227E-03	1.222E-03	1.125E-03
	1425	24b		50%		6		459	2.815E-02	2.806E-02	2.582E-02	3.177E-03	3.166E-03	2.913E-03	1.588E-03	1.583E-03	1.457E-03	1.588E-03	1.583E-03	1.457E-03	1.588E-03	1.583E-03	1.457E-03
	1425	24b		50%		7		1162	2.908E-02	2.897E-02	2.667E-02	8.310E-03	8.280E-03	7.620E-03	4.155E-03	4.140E-03	3.810E-03	4.155E-03	4.140E-03	3.810E-03	4.155E-03	4.140E-03	3.810E-03
	1425	24b		50%		8		3022	3.221E-02	3.219E-02	2.958E-02	2.394E-02	2.393E-02	2.199E-02	1.197E-02	1.196E-02	1.100E-02	1.197E-02	1.196E-02	1.100E-02	1.197E-02	1.196E-02	1.100E-02
	1425	24b		50%		9		3561	3.782E-02	3.770E-02	3.472E-02	3.312E-02	3.301E-02	3.041E-02	1.656E-02	1.651E-02	1.521E-02	1.656E-02	1.651E-02	1.521E-02	1.656E-02	1.651E-02	1.521E-02
	1425	24b		50%		10		3050	3.520E-02	3.519E-02	3.236E-02	2.641E-02	2.639E-02	2.427E-02	1.320E-02	1.320E-02	1.214E-02	1.320E-02	1.320E-02	1.214E-02	1.320E-02	1.320E-02	1.214E-02
	1425	24b		50%		11		2593	3.400E-02	3.399E-02	3.122E-02	2.169E-02	2.168E-02	1.991E-02	1.084E-02	1.084E-02	9.957E-03	1.084E-02	1.084E-02	9.957E-03	1.084E-02	1.084E-02	9.957E-03
	1425	24b		50%		12		2418	3.349E-02	3.348E-02	3.076E-02	1.992E-02	1.991E-02	1.830E-02	9.959E-03	9.956E-03	9.149E-03	9.959E-03	9.956E-03	9.149E-03	9.959E-03	9.956E-03	9.149E-03
	1425	24b		50%		13		2060	2.826E-02	2.825E-02	2.601E-02	1.432E-02	1.431E-02	1.318E-02	7.160E-03	7.157E-03	6.588E-03	7.160E-03	7.157E-03	6.588E-03	7.160E-03	7.157E-03	6.588E-03
	1425	24b		50%		14		2085	2.893E-02	2.892E-02	2.662E-02	1.483E-02	1.483E-02	1.365E-02	7.417E-03	7.415E-03	6.826E-03	7.417E-03	7.415E-03	6.826E-03	7.417E-03	7.415E-03	6.826E-03
	1425	24b		50%		15		2201	3.089E-02	3.080E-02	2.837E-02	1.672E-02	1.668E-02	1.536E-02	8.360E-03	8.338E-03	7.679E-03	8.360E-03	8.338E-03	7.679E-03	8.360E-03	8.338E-03	7.679E-03
	1425	24b		50%		16		2350	2.729E-02	2.721E-02	2.506E-02	1.578E-02	1.573E-02	1.449E-02	7.888E-03	7.864E-03	7.243E-03	7.888E-03	7.864E-03	7.243E-03	7.888E-03	7.864E-03	7.243E-03
	1425	24b		50%		17		2448	2.631E-02	2.622E-02	2.415E-02	1.584E-02	1.579E-02	1.454E-02	7.919E-03	7.893E-03	7.270E-03	7.919E-03	7.893E-03	7.270E-03	7.919E-03	7.893E-03	7.270E-03
	1425	24b		50%		18		2762	2.472E-02	2.461E-02	2.268E-02	1.679E-02	1.672E-02	1.541E-02	8.397E-03	8.359E-03	7.705E-03	8.397E-03	8.3				

**Appendix 3.7 Calculation of Emission from Portals and Ventilation Buildings (Construction Phase)**

Emission Inventory of Portal Sources

Road Name	Height (m) <sup>1</sup>	Width (m) <sup>1</sup>	Source ID	Source Type	X	Y	Daily Emission Rate (QS) (g/s) <sup>2</sup>			Base Elevation (m)	Release Height (HS) (mAG)	Lateral Dimension (SY) (m)	Vertical Dimension (SZ) (m)	Total Emission Rate (QS) (g/s)			
							TSP	RSP	FSP					TSP	RSP	FSP	
Lion Rock Tunnel (Sha Tin Bound)	6.7	9.2	ELRTSTP1	VOLUME	835860.87	824136.94	1.634E-02	1.631E-02	1.500E-02	97.5	3.35	4.28	3.12				
			ELRTSTP2	VOLUME	835855.40	824144.34	1.634E-02	1.631E-02	1.500E-02	97.5	3.35	4.28	3.12				
			ELRTSTP3	VOLUME	835849.93	824151.73	1.634E-02	1.631E-02	1.500E-02	97.5	3.35	4.28	3.12				
			ELRTSTP4	VOLUME	835844.46	824159.13	1.634E-02	1.631E-02	1.500E-02	97.5	3.35	4.28	3.12				
			ELRTSTP5	VOLUME	835838.99	824166.53	1.634E-02	1.631E-02	1.500E-02	97.5	3.35	4.28	3.12				
			ELRTSTP6	VOLUME	835833.52	824173.92	1.634E-02	1.631E-02	1.500E-02	97.5	3.35	4.28	3.12				
			ELRTSTP7	VOLUME	835828.05	824181.32	8.171E-03	8.153E-03	7.500E-03	97.5	3.35	4.28	3.12				
			ELRTSTP8	VOLUME	835822.58	824188.72	8.171E-03	8.153E-03	7.500E-03	97.5	3.35	4.28	3.12				
			ELRTSTP9	VOLUME	835817.11	824196.11	8.171E-03	8.153E-03	7.500E-03	97.5	3.35	4.28	3.12				
			ELRTSTP10	VOLUME	835811.63	824203.51	8.171E-03	8.153E-03	7.500E-03	97.5	3.35	4.28	3.12				
			ELRTSTP11	VOLUME	835806.16	824210.91	8.171E-03	8.153E-03	7.500E-03	97.5	3.35	4.28	3.12				
			ELRTSTP12	VOLUME	835800.69	824218.30	8.171E-03	8.153E-03	7.500E-03	97.5	3.35	4.28	3.12				
Lion Rock Tunnel (Kowloon Bound)	6.7	9.2	ELRTKLP1	VOLUME	836741.38	823035.03	1.708E-02	1.704E-02	1.568E-02	96.0	3.35	4.28	3.12				
			ELRTKLP2	VOLUME	836744.06	823026.23	1.708E-02	1.704E-02	1.568E-02	96.0	3.35	4.28	3.12				
			ELRTKLP3	VOLUME	836746.75	823017.43	1.708E-02	1.704E-02	1.568E-02	96.0	3.35	4.28	3.12				
			ELRTKLP4	VOLUME	836749.43	823008.63	1.708E-02	1.704E-02	1.568E-02	96.0	3.35	4.28	3.12				
			ELRTKLP5	VOLUME	836752.12	822999.83	1.708E-02	1.704E-02	1.568E-02	96.0	3.35	4.28	3.12				
			ELRTKLP6	VOLUME	836754.80	822991.03	1.708E-02	1.704E-02	1.568E-02	96.0	3.35	4.28	3.12				
			ELRTKLP7	VOLUME	836757.48	822982.23	8.542E-03	8.522E-03	7.842E-03	96.0	3.35	4.28	3.12				
			ELRTKLP8	VOLUME	836760.17	822973.43	8.542E-03	8.522E-03	7.842E-03	96.0	3.35	4.28	3.12				
			ELRTKLP9	VOLUME	836762.85	822964.63	8.542E-03	8.522E-03	7.842E-03	96.0	3.35	4.28	3.12				
			ELRTKLP10	VOLUME	836765.54	822955.83	8.542E-03	8.522E-03	7.842E-03	96.0	3.35	4.28	3.12				
			ELRTKLP11	VOLUME	836768.22	822947.03	8.542E-03	8.522E-03	7.842E-03	96.0	3.35	4.28	3.12				
			ELRTKLP12	VOLUME	836770.90	822938.23	8.542E-03	8.522E-03	7.842E-03	96.0	3.35	4.28	3.12				

Remarks:

1. The dimension of the Lion Rock Tunnel is based on existing engineering design.
2. 2/3 of the total emission from the portal is distributed to the sources at the first half and 1/3 of the total emission is distributed to the sources at the second half.

**Appendix 3.7 Calculation of Emission from Portals and Ventilation Buildings (Construction Phase)**

**Hourly Profile for Portal**

Hour	Lion Rock Tunnel (Sha Tin Bound)		
	TSP	RSP	FSP
Hour 1	0.0114	0.0113	0.0113
Hour 2	0.0082	0.0082	0.0082
Hour 3	0.0061	0.0061	0.0061
Hour 4	0.0051	0.0051	0.0051
Hour 5	0.0052	0.0052	0.0052
Hour 6	0.0068	0.0067	0.0067
Hour 7	0.0179	0.0178	0.0178
Hour 8	0.0487	0.0486	0.0487
Hour 9	0.0550	0.0549	0.0550
Hour 10	0.0518	0.0517	0.0518
Hour 11	0.0468	0.0469	0.0469
Hour 12	0.0436	0.0437	0.0437
Hour 13	0.0654	0.0655	0.0655
Hour 14	0.0681	0.0681	0.0682
Hour 15	0.0770	0.0771	0.0771
Hour 16	0.0728	0.0728	0.0729
Hour 17	0.0731	0.0733	0.0732
Hour 18	0.0794	0.0793	0.0792
Hour 19	0.0703	0.0702	0.0700
Hour 20	0.0482	0.0481	0.0482
Hour 21	0.0423	0.0424	0.0425
Hour 22	0.0379	0.0379	0.0380
Hour 23	0.0324	0.0325	0.0323
Hour 24	0.0266	0.0266	0.0265
Total	1.0000	1.0000	1.0000

Hour	Lion Rock Tunnel (Kowloon Bound)		
	TSP	RSP	FSP
Hour 1	0.0185	0.0184	0.0185
Hour 2	0.0132	0.0132	0.0132
Hour 3	0.0097	0.0097	0.0097
Hour 4	0.0080	0.0080	0.0080
Hour 5	0.0080	0.0080	0.0080
Hour 6	0.0103	0.0103	0.0103
Hour 7	0.0270	0.0270	0.0270
Hour 8	0.0779	0.0780	0.0779
Hour 9	0.1077	0.1076	0.1077
Hour 10	0.0859	0.0860	0.0860
Hour 11	0.0705	0.0707	0.0705
Hour 12	0.0648	0.0649	0.0648
Hour 13	0.0466	0.0467	0.0467
Hour 14	0.0482	0.0483	0.0484
Hour 15	0.0544	0.0544	0.0544
Hour 16	0.0513	0.0513	0.0513
Hour 17	0.0515	0.0515	0.0515
Hour 18	0.0546	0.0545	0.0546
Hour 19	0.0503	0.0500	0.0501
Hour 20	0.0369	0.0367	0.0368
Hour 21	0.0318	0.0318	0.0319
Hour 22	0.0285	0.0285	0.0284
Hour 23	0.0245	0.0245	0.0244
Hour 24	0.0201	0.0201	0.0200
Total	1.0000	1.0000	1.0000

**Appendix 3.7 Calculation of Emission from Portals and Ventilation Buildings (Construction Phase)**

**Emission Inventory of Ventilation Building Sources**

Ventilation Building	Exhaust Direction	Source ID	Type	X	Y	Exit Temperature (K) <sup>1</sup>	Exit Velocity (m/s) <sup>2</sup>	Stack Diameter (m) <sup>2</sup>	Base Elevation (m)	Release Height (mAG) <sup>2</sup>	Daily Emission Factor (QS) (g/s)		
											TSP	RSP	FSP
Ventilation Building (at Sha Tin for Shatin Bound Tunnel)	Horizontal	ELRTSTVB1	POINTHOR	835836.79	824142.51	0.00	13.06	3.95	97.50	9.50	1.471E-01	1.468E-01	1.350E-01
Ventilation Building (at Kowloon for Kowloon Bound Tunnel)	Horizontal	ELRTKLB1	POINTHOR	836759.71	823024.20	0.00	13.06	3.95	96.00	9.50	1.537E-01	1.534E-01	1.412E-01

Remark:

1. Exit temperature at ambient temperature is set as 0 K in the model
2. The stack parameters are based on existing engineering design.

**Hourly Profile for Ventilation Buildings**

Hour	Ventilation Building (Shatin Portal)		
	TSP	RSP	FSP
Hour 1	0.0114	0.0113	0.0113
Hour 2	0.0082	0.0082	0.0082
Hour 3	0.0061	0.0061	0.0061
Hour 4	0.0051	0.0051	0.0051
Hour 5	0.0052	0.0052	0.0052
Hour 6	0.0068	0.0067	0.0067
Hour 7	0.0179	0.0178	0.0178
Hour 8	0.0487	0.0486	0.0487
Hour 9	0.0550	0.0549	0.0550
Hour 10	0.0518	0.0517	0.0518
Hour 11	0.0468	0.0469	0.0469
Hour 12	0.0436	0.0437	0.0437
Hour 13	0.0654	0.0655	0.0655
Hour 14	0.0681	0.0681	0.0682
Hour 15	0.0770	0.0771	0.0771
Hour 16	0.0728	0.0728	0.0729
Hour 17	0.0731	0.0733	0.0732
Hour 18	0.0794	0.0793	0.0792
Hour 19	0.0703	0.0702	0.0700
Hour 20	0.0482	0.0481	0.0482
Hour 21	0.0423	0.0424	0.0425
Hour 22	0.0379	0.0379	0.0380
Hour 23	0.0324	0.0325	0.0323
Hour 24	0.0266	0.0266	0.0265
Total	1.0000	1.0000	1.0000

Hour	Ventilation Building (Kowloon Portal)		
	TSP	RSP	FSP
Hour 1	0.0185	0.0184	0.0185
Hour 2	0.0132	0.0132	0.0132
Hour 3	0.0097	0.0097	0.0097
Hour 4	0.0080	0.0080	0.0080
Hour 5	0.0080	0.0080	0.0080
Hour 6	0.0103	0.0103	0.0103
Hour 7	0.0270	0.0270	0.0270
Hour 8	0.0779	0.0780	0.0779
Hour 9	0.1077	0.1076	0.1077
Hour 10	0.0859	0.0860	0.0860
Hour 11	0.0705	0.0707	0.0705
Hour 12	0.0648	0.0649	0.0648
Hour 13	0.0466	0.0467	0.0467
Hour 14	0.0482	0.0483	0.0484
Hour 15	0.0544	0.0544	0.0544
Hour 16	0.0513	0.0513	0.0513
Hour 17	0.0515	0.0515	0.0515
Hour 18	0.0546	0.0545	0.0546
Hour 19	0.0503	0.0500	0.0501
Hour 20	0.0369	0.0367	0.0368
Hour 21	0.0318	0.0318	0.0319
Hour 22	0.0285	0.0285	0.0284
Hour 23	0.0245	0.0245	0.0244
Hour 24	0.0201	0.0201	0.0200
Total	1.0000	1.0000	1.0000

**Appendix 3.7 Calculation of Emission from Portals and Ventilation Buildings (Construction Phase)**

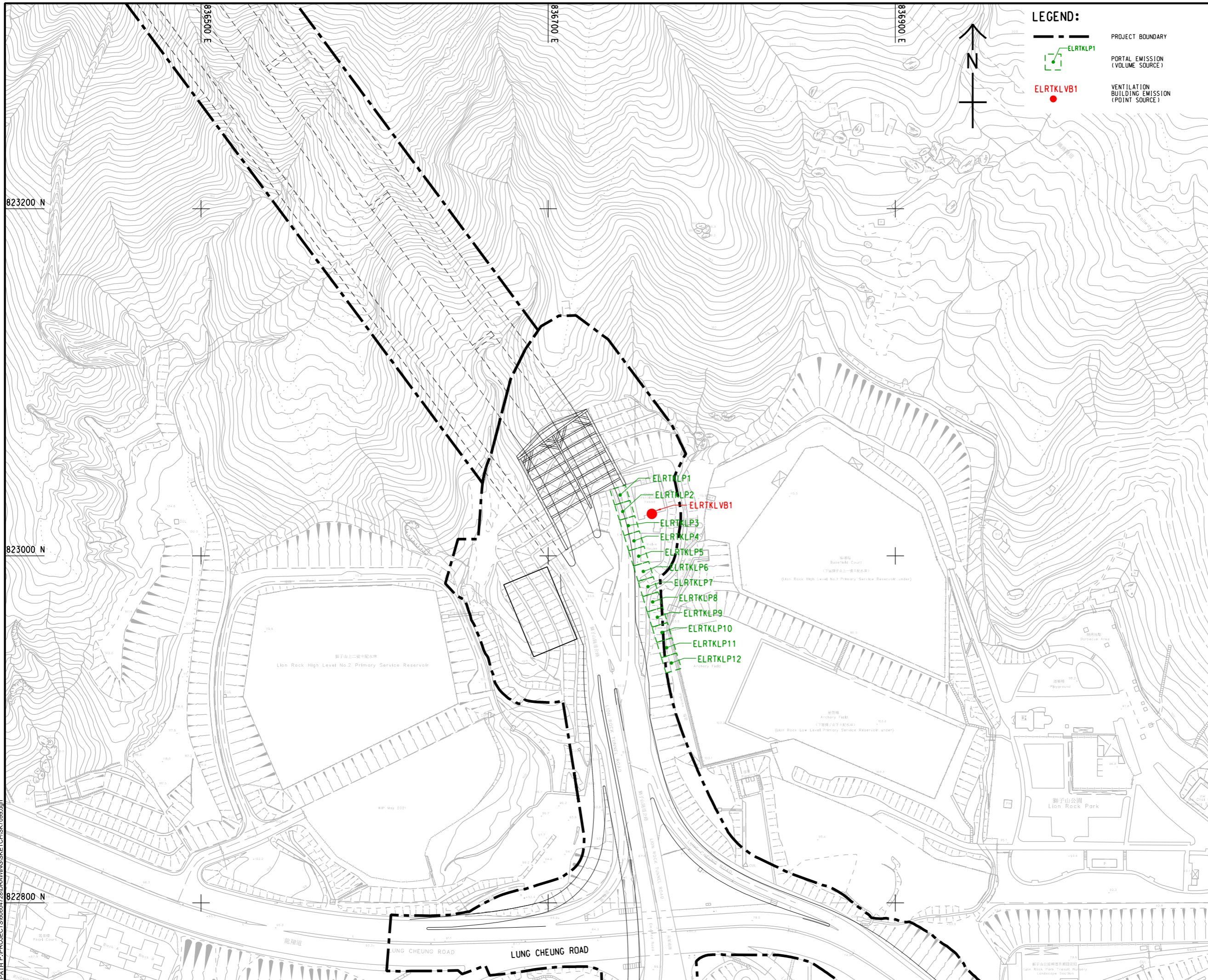
**Emission Sources Listing in Aermod**

Description	Source ID	Type	Flow Direction	X	Y	Base Elevation (m)	Release Height (mAG)	Exit Temp. (K)	Exit velocity (m/s)	Stack Diameter (m)	Syinit	Szinit	TSP Emission Rate <sup>1</sup>	RSP Emission Rate <sup>1</sup>	FSP Emission Rate <sup>1</sup>
Ventilation Building (at Sha Tin for Shatin Bound Tunnel)	ELRTSTVB1	POINTHOR	Horizontal	835836.79	824142.51	97.5	9.50	0.0	13.06	3.95	-	-	1.471E-01	1.468E-01	1.350E-01
Ventilation Building (at Kowloon for Kowloon Bound Tunnel)	ELRTKLVB1	POINTHOR	Horizontal	836759.71	823024.20	96.0	9.50	0.0	13.06	3.95	-	-	1.537E-01	1.534E-01	1.412E-01
Lion Rock Tunnel (Sha Tin Bound)	ELRTSTP1	VOLUME	-	835860.87	824136.94	97.5	3.35	-	-	-	4.28	3.12	1.634E-02	1.631E-02	1.500E-02
	ELRTSTP2	VOLUME	-	835855.40	824144.34	97.5	3.35	-	-	-	4.28	3.12	1.634E-02	1.631E-02	1.500E-02
	ELRTSTP3	VOLUME	-	835849.93	824151.73	97.5	3.35	-	-	-	4.28	3.12	1.634E-02	1.631E-02	1.500E-02
	ELRTSTP4	VOLUME	-	835844.46	824159.13	97.5	3.35	-	-	-	4.28	3.12	1.634E-02	1.631E-02	1.500E-02
	ELRTSTP5	VOLUME	-	835838.99	824166.53	97.5	3.35	-	-	-	4.28	3.12	1.634E-02	1.631E-02	1.500E-02
	ELRTSTP6	VOLUME	-	835833.52	824173.92	97.5	3.35	-	-	-	4.28	3.12	1.634E-02	1.631E-02	1.500E-02
	ELRTSTP7	VOLUME	-	835828.05	824181.32	97.5	3.35	-	-	-	4.28	3.12	8.171E-03	8.153E-03	7.500E-03
	ELRTSTP8	VOLUME	-	835822.58	824188.72	97.5	3.35	-	-	-	4.28	3.12	8.171E-03	8.153E-03	7.500E-03
	ELRTSTP9	VOLUME	-	835817.11	824196.11	97.5	3.35	-	-	-	4.28	3.12	8.171E-03	8.153E-03	7.500E-03
	ELRTSTP10	VOLUME	-	835811.63	824203.51	97.5	3.35	-	-	-	4.28	3.12	8.171E-03	8.153E-03	7.500E-03
	ELRTSTP11	VOLUME	-	835806.16	824210.91	97.5	3.35	-	-	-	4.28	3.12	8.171E-03	8.153E-03	7.500E-03
	ELRTSTP12	VOLUME	-	835800.69	824218.30	97.5	3.35	-	-	-	4.28	3.12	8.171E-03	8.153E-03	7.500E-03
Lion Rock Tunnel (Kowloon Bound)	ELRTKLP1	VOLUME	-	836741.38	823035.03	96.0	3.35	-	-	-	4.28	3.12	1.708E-02	1.704E-02	1.568E-02
	ELRTKLP2	VOLUME	-	836744.06	823026.23	96.0	3.35	-	-	-	4.28	3.12	1.708E-02	1.704E-02	1.568E-02
	ELRTKLP3	VOLUME	-	836746.75	823017.43	96.0	3.35	-	-	-	4.28	3.12	1.708E-02	1.704E-02	1.568E-02
	ELRTKLP4	VOLUME	-	836749.43	823008.63	96.0	3.35	-	-	-	4.28	3.12	1.708E-02	1.704E-02	1.568E-02
	ELRTKLP5	VOLUME	-	836752.12	822999.83	96.0	3.35	-	-	-	4.28	3.12	1.708E-02	1.704E-02	1.568E-02
	ELRTKLP6	VOLUME	-	836754.80	822991.03	96.0	3.35	-	-	-	4.28	3.12	1.708E-02	1.704E-02	1.568E-02
	ELRTKLP7	VOLUME	-	836757.48	822982.23	96.0	3.35	-	-	-	4.28	3.12	8.542E-03	8.522E-03	7.842E-03
	ELRTKLP8	VOLUME	-	836760.17	822973.43	96.0	3.35	-	-	-	4.28	3.12	8.542E-03	8.522E-03	7.842E-03
	ELRTKLP9	VOLUME	-	836762.85	822964.63	96.0	3.35	-	-	-	4.28	3.12	8.542E-03	8.522E-03	7.842E-03
	ELRTKLP10	VOLUME	-	836765.54	822955.83	96.0	3.35	-	-	-	4.28	3.12	8.542E-03	8.522E-03	7.842E-03
	ELRTKLP11	VOLUME	-	836768.22	822947.03	96.0	3.35	-	-	-	4.28	3.12	8.542E-03	8.522E-03	7.842E-03
	ELRTKLP12	VOLUME	-	836770.90	822938.23	96.0	3.35	-	-	-	4.28	3.12	8.542E-03	8.522E-03	7.842E-03

Remarks:

1. Emission rate of POINTHOR and VOLUME sources are in gram per second (g/s)

ISO A1 594mm x 841mm  
 Approved:  
 Checked:  
 Designer:  
 Project Management Initials:  
 2022/2/11  
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 Plot File by: ZHILZ



**LEGEND:**

- PROJECT BOUNDARY
- ELRTKLP1  
PORTAL EMISSION (VOLUME SOURCE)
- ELRTKLB1  
VENTILATION BUILDING EMISSION (POINT SOURCE)



**AECOM**

PROJECT  
**IMPROVEMENT OF LION ROCK TUNNEL - INVESTIGATION**

CLIENT  
 路政署  
**HIGHWAYS DEPARTMENT**

CONSULTANT  
 AECOM Asia Company Ltd.  
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SUB-CONSULTANTS  
 分列工程顧問公司

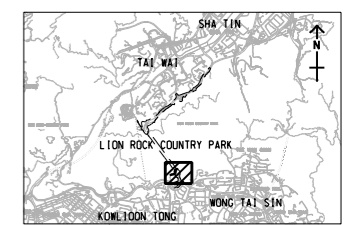
**ISSUE/REVISION**

IR	DATE	DESCRIPTION	CHK.

**STATUS**

**SCALE**  
 A3 1 : 2000

**DIMENSION UNIT**  
 METRES



**PROJECT NO.**  
 60604728

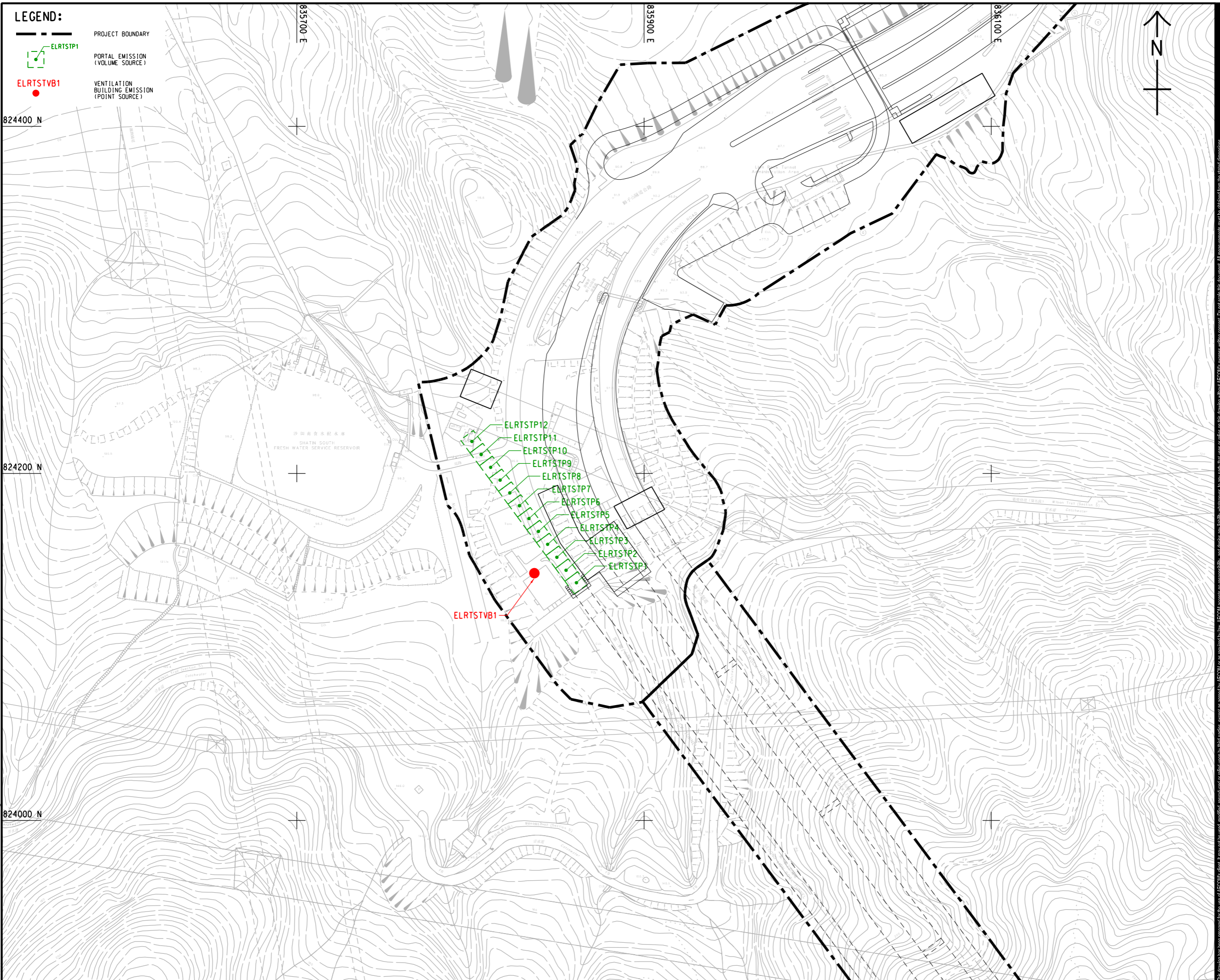
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 CE 48/2018(HY)

**SHEET TITLE**  
 LOCATIONS OF PORTAL EMISSION AND VENTILATION BUILDING IN YEAR 2027 (KOWLOON SIDE)

**SHEET NUMBER**  
 60604728/SK7099

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ISO A1 594mm x 841mm  
Approved:  
Checked:  
Designer:  
Project Management Initials:



**LEGEND:**

- PROJECT BOUNDARY
- PORTAL EMISSION (VOLUME SOURCE)
- VENTILATION BUILDING EMISSION (POINT SOURCE)



**PROJECT**  
IMPROVEMENT OF LION ROCK TUNNEL - INVESTIGATION

**CLIENT**  
路政署  
**HIGHWAYS DEPARTMENT**

**CONSULTANT**  
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**SUB-CONSULTANTS**  
分判工程顧問公司

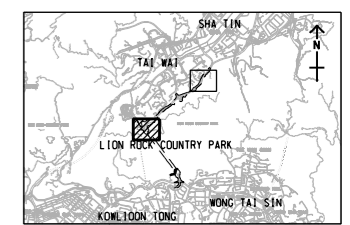
**ISSUE/REVISION**

IR	DATE	DESCRIPTION	CHK.

**STATUS**

**SCALE**      **DIMENSION UNIT**  
A3 1 : 2000      METRES

**KEY PLAN**      A3 1 : 200000



**PROJECT NO.**      **AGREEMENT NO.**  
60604728      CE 48/2018(HY)

**SHEET TITLE**  
LOCATIONS OF PORTAL EMISSION AND VENTILATION BUILDING IN YEAR 2027 (SHATIN SIDE)

**SHEET NUMBER**  
60604728/SK7100

2022/2/11  
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Plot File by: ZHILZ

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