Appendix 3.16 Calculation of Emission from Portals and Ventilation Buildings (Operation Phase)

Emission Rate Calculation (Year 2034, With Project)

Description	Length (m)	Road Link ID	Vent Bldg. ID	Percentage from Vent Bldg.[1]	Portal ID	% from Portal[1]	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)				Daily Emission Rate / Diurnal Profile (from 1st 50m for each portal source)				Daily Emission Rate / Diurnal Profile (from 2nd 50m for each portal source)				Daily Emission Rate / Diurnal Profile (from Vent Bldg.)			
										NO E.F. (g/mile-veh)	NO2 E.F. (g/mile-veh)	FSP E.F. (g/mile-veh)	RSP E.F. (g/mile-veh)	NO (g/s)	NO2 (g/s)	FSP (g/s)	RSP (g/s)	NO (g/s)	NO2 (g/s)	FSP (g/s)	RSP (g/s)	NO (g/s)	NO2 (g/s)	FSP (g/s)	RSP (g/s)	NO (g/s) / %	NO2 (g/s) / %	FSP (g/s) / %	RSP (g/s) / %	NO (g/s) / %	NO2 (g/s) / %	FSP (g/s) / %	RSP (g/s) / %	NO (g/s) / %	NO2 (g/s) / %	FSP (g/s) / %	RSP (g/s) / %
Lion Rock Tunnel (Sha Tin Bound)	1375	23b	LRTSTVB	70%	LRTSTP1-LRTSTP6	30%	6	1	750	0.2255	0.0230	0.0075	0.0081	4.01E-02	4.10E-03	1.33E-03	1.44E-03	2.81E-02	2.87E-03	9.31E-04	1.01E-03	1.20E-02	1.23E-03	3.99E-04	4.32E-04	1.43%	1.03%	1.16%	1.16%	1.43%	1.03%	1.16%	1.16%	1.43%	1.03%	1.16%	1.16%
	1375	23b		70%		30%		2	517	0.2265	0.0245	0.0078	0.0084	2.78E-02	3.01E-03	9.56E-04	1.04E-03	1.94E-02	2.10E-03	6.69E-04	7.25E-04	8.33E-03	9.02E-04	2.87E-04	3.11E-04	0.99%	0.76%	0.84%	0.83%	0.99%	0.76%	0.84%	0.83%	0.99%	0.76%	0.84%	0.83%
	1375	23b		70%		30%		3	367	0.2249	0.0256	0.0081	0.0088	1.96E-02	2.22E-03	7.03E-04	7.62E-04	1.37E-02	1.56E-03	4.92E-04	5.34E-04	5.87E-03	6.67E-04	2.11E-04	2.29E-04	0.69%	0.56%	0.62%	0.61%	0.69%	0.56%	0.62%	0.61%	0.69%	0.56%	0.62%	0.61%
	1375	23b		70%		30%		4	290	0.2258	0.0270	0.0084	0.0091	1.56E-02	1.86E-03	5.79E-04	6.27E-04	1.09E-02	1.30E-03	4.05E-04	4.39E-04	4.67E-03	5.58E-04	1.74E-04	1.88E-04	0.55%	0.47%	0.51%	0.51%	0.55%	0.47%	0.51%	0.51%	0.55%	0.47%	0.51%	0.51%
	1375	23b		70%		30%		5	281	0.2267	0.0284	0.0087	0.0094	1.51E-02	1.90E-03	5.82E-04	6.31E-04	1.06E-02	1.33E-03	4.07E-04	4.42E-04	4.54E-03	5.69E-04	1.74E-04	1.89E-04	0.54%	0.48%	0.51%	0.51%	0.54%	0.48%	0.51%	0.51%	0.54%	0.48%	0.51%	0.51%
	1375	23b		70%		30%		6	353	0.2276	0.0298	0.0090	0.0098	1.90E-02	2.50E-03	7.55E-04	8.20E-04	1.33E-02	1.75E-03	5.29E-04	5.74E-04	5.71E-03	7.49E-04	2.27E-04	2.46E-04	0.68%	0.63%	0.66%	0.66%	0.68%	0.63%	0.66%	0.66%	0.68%	0.63%	0.66%	0.66%
	1375	23b		70%		30%		7	893	0.2315	0.0318	0.0094	0.0102	4.91E-02	6.74E-03	1.99E-03	2.16E-03	3.43E-02	4.72E-03	1.39E-03	1.51E-03	1.47E-02	2.02E-03	5.98E-04	6.48E-04	1.74%	1.70%	1.74%	1.74%	1.74%	1.70%	1.74%	1.74%	1.74%	1.70%	1.74%	1.74%
	1375	23b		70%		30%		8	2322	0.2389	0.0346	0.0099	0.0107	1.32E-01	1.91E-02	5.45E-03	5.90E-03	9.22E-02	1.34E-02	3.81E-03	4.13E-03	3.95E-02	5.72E-03	1.63E-03	1.77E-03	4.68%	4.80%	4.77%	4.76%	4.68%	4.80%	4.77%	4.76%	4.68%	4.80%	4.77%	4.76%
	1375	23b		70%		30%		9	2739	0.2134	0.0320	0.0095	0.0103	1.39E-01	2.08E-02	6.15E-03	6.66E-03	9.71E-02	1.45E-02	4.31E-03	4.66E-03	4.16E-02	6.23E-03	1.85E-03	2.00E-03	4.92%	5.22%	5.38%	5.37%	4.92%	5.22%	5.38%	5.37%	4.92%	5.22%	5.38%	5.37%
	1375	23b		70%		30%		10	2336	0.2482	0.0360	0.0102	0.0110	1.38E-01	2.00E-02	5.64E-03	6.11E-03	9.63E-02	1.40E-02	3.95E-03	4.28E-03	4.13E-02	5.99E-03	1.69E-03	1.83E-03	4.89%	5.02%	4.94%	4.93%	4.89%	5.02%	4.94%	4.93%	4.89%	5.02%	4.94%	4.93%
	1375	23b		70%		30%		11	1983	0.2710	0.0396	0.0107	0.0116	1.28E-01	1.86E-02	5.04E-03	5.46E-03	8.93E-02	1.30E-02	3.53E-03	3.82E-03	3.83E-02	5.59E-03	1.51E-03	1.64E-03	4.53%	4.69%	4.41%	4.40%	4.53%	4.69%	4.41%	4.40%	4.53%	4.69%	4.41%	4.40%
	1375	23b		70%		30%		12	1850	0.2592	0.0394	0.0107	0.0116	1.14E-01	1.73E-02	4.70E-03	5.09E-03	7.97E-02	1.21E-02	3.29E-03	3.56E-03	3.42E-02	5.19E-03	1.41E-03	1.53E-03	4.04%	4.35%	4.11%	4.10%	4.04%	4.35%	4.11%	4.10%	4.04%	4.35%	4.11%	4.10%
	1375	23b		70%		30%		13	2650	0.2797	0.0451	0.0119	0.0129	1.76E-01	2.83E-02	7.50E-03	8.14E-03	1.23E-01	1.98E-02	5.25E-03	5.70E-03	5.28E-02	8.50E-03	2.25E-03	2.44E-03	6.25%	7.13%	6.57%	6.56%	6.25%	7.13%	6.57%	6.56%	6.25%	7.13%	6.57%	6.56%
	1375	23b		70%		30%		14	2705	0.2834	0.0462	0.0121	0.0131	1.82E-01	2.96E-02	7.78E-03	8.44E-03	1.27E-01	2.08E-02	5.45E-03	5.91E-03	5.46E-02	8.89E-03	2.33E-03	2.53E-03	6.46%	7.46%	6.81%	6.81%	6.46%	7.46%	6.81%	6.81%	6.46%	7.46%	6.81%	6.81%
	1375	23b		70%		30%		15	2880	0.2834	0.0484	0.0126	0.0137	1.94E-01	3.31E-02	8.62E-03	9.35E-03	1.36E-01	2.32E-02	6.03E-03	6.55E-03	5.81E-02	9.92E-03	2.59E-03	2.81E-03	6.88%	8.32%	7.54%	7.54%	6.88%	8.32%	7.54%	7.54%	6.88%	8.32%	7.54%	7.54%
	1375	23b		70%		30%		16	3027	0.2714	0.0438	0.0115	0.0125	1.95E-01	3.14E-02	8.28E-03	8.98E-03	1.37E-01	2.20E-02	5.80E-03	6.29E-03	5.85E-02	9.43E-03	2.49E-03	2.70E-03	6.93%	7.91%	7.25%	7.24%	6.93%	7.91%	7.25%	7.24%	6.93%	7.91%	7.25%	7.24%
	1375	23b		70%		30%		17	3135	0.2753	0.0411	0.0112	0.0122	2.05E-01	3.05E-02	8.37E-03	9.07E-03	1.43E-01	2.14E-02	5.86E-03	6.35E-03	6.15E-02	9.16E-03	2.51E-03	2.72E-03	7.27%	7.68%	7.32%	7.31%	7.27%	7.68%	7.32%	7.31%	7.27%	7.68%	7.32%	7.31%
	1375	23b		70%		30%		18	3450	0.2616	0.0376	0.0107	0.0117	2.14E-01	3.08E-02	8.76E-03	9.58E-03	1.50E-01	2.15E-02	6.13E-03	6.70E-03	6.43E-02	9.23E-03	2.63E-03	2.87E-03	7.61%	7.74%	7.66%	7.72%	7.61%	7.74%	7.66%	7.72%	7.61%	7.74%	7.66%	7.72%
	1375	23b		70%		30%		19	3717	0.2154	0.0289	0.0091	0.0100	1.90E-01	2.55E-02	8.02E-03	8.78E-03	1.33E-01	1.78E-02	5.62E-03	6.15E-03	5.70E-02	7.64E-03	2.41E-03	2.64E-03	6.75%	6.41%	7.02%	7.08%	6.75%	6.41%	7.02%	7.08%	6.75%	6.41%	7.02%	7.08%
	1375	23b		70%		30%		20	2990	0.2059	0.0250	0.0086	0.0093	1.46E-01	1.78E-02	6.07E-03	6.57E-03	1.02E-01	1.24E-02	4.25E-03	4.60E-03	4.38E-02	5.33E-03	1.82E-03	1.97E-03	5.19%	4.47%	5.31%	5.29%	5.19%	4.47%	5.31%	5.29%	5.19%	4.47%	5.31%	5.29%
	1375	23b		70%		30%		21	2245	0.2463	0.0300	0.0096	0.0104	1.31E-01	1.60E-02	5.10E-03	5.52E-03	9.19E-02	1.12E-02	3.57E-03	3.86E-03	3.94E-02	4.80E-03	1.53E-03	1.66E-03	4.66%	4.02%	4.46%	4.45%	4.66%	4.02%	4.46%	4.45%	4.66%	4.02%	4.46%	4.45%
	1375	23b		70%		30%		22	2160	0.2504	0.0277	0.0090	0.0098	1.28E-01	1.42E-02	4.62E-03	5.00E-03	8.99E-02	9.95E-03	3.23E-03	3.50E-03	3.85E-02	4.26E-03	1.38E-03	1.50E-03	4.56%	3.58%	4.04%	4.03%	4.56%	3.58%	4.04%	4.03%	4.56%	3.58%	4.04%	4.03%
	1375	23b		70%		30%		23	2120	0.2450	0.0243	0.0080	0.0087	1.23E-01	1.22E-02	4.04E-03	4.38E-03	8.63E-02	8.54E-03	2.83E-03	3.06E-03	3.70E-02	3.66E-03	1.21E-03	1.31E-03	4.38%	3.07%	3.54%	3.53%	4.38%	3.07%	3.54%	3.53%	4.38%	3.07%	3.54%	3.53%
	1375	23b		70%		30%		24	1658	0.2437	0.0255	0.0082	0.0090	9.59E-02	1.00E-02	3.25E-03	3.55E-03	6.71E-02	7.02E-03	2.27E-03	2.49E-03	2.88E-02	3.01E-03	9.74E-04	1.07E-03	3.41%	2.52%	2.84%	2.86%	3.41%	2.52%	2.84%	2.86%	3.41%	2.52%	2.84%	2.86%
								Daily	-	-	-	-	-	**2.82E+00**	**3.98E-01**	**1.14E-01**	**1.24E-01**	**1.97E+00**	**2.78E-01**	**8.00E-02**	**8.68E-02**	**8.45E-01**	**1.19E-01**	**3.43E-02**	**3.72E-02**	**1.877E-01**	**2.651E-02**	**7.619E-03**	**8.271E-03**	**9.387E-02**	**1.325E-02**	**3.809E-03**	**4.135E-03**	**1.971E+00**	**2.783E-01**	**8.000E-02**	**8.684E-02**
Lion Rock Tunnel (Kowloon Bound)	1375	24b	LRTKLVB1-LRTKLVB2	80%	LRTKLP1-LRTKLP6	20%	6	1	1176	0.2446	0.0253	0.0084	0.0092	6.83E-02	7.06E-03	2.36E-03	2.56E-03	5.46E-02	5.65E-03	1.89E-03	2.04E-03	1.37E-02	1.41E-03	4.72E-04	5.11E-04	2.35%	1.8%	2.0%	2.0%	2.3%	1.8%	2.0%	2.0%	2.3%	1.8%	2.0%	2.0%
	1375	24b		80%		20%		2	810	0.2452	0.0267	0.0087	0.0095	4.71E-02	5.13E-03	1.68E-03	1.82E-03	3.77E-02	4.11E-03	1.35E-03	1.46E-03	9.43E-03	1.03E-03	3.36E-04	3.65E-04	1.6%	1.3%	1.4%	1.4%	1.6%	1.3%	1.4%	1.4%	1.6%	1.3%	1.4%	1.4%
	1375	24b		80%		20%		3	575	0.2457	0.0281	0.0091	0.0098	3.35E-02	3.83E-03	1.23E-03	1.34E-03	2.68E-02	3.07E-03	9.87E-04	1.07E-03	6.70E-03	7.66E-04	2.47E-04	2.68E-04	1.2%	1.0%	1.1%	1.1%	1.2%	1.0%	1.1%	1.1%	1.2%	1.0%	1.1%	1.1%
	1375	24b		80%		20%		4	455	0.2463	0.0295	0.0094	0.0101	2.66E-02	3.18E-03	1.01E-03	1.09E-03	2.13E-02	2.55E-03	8.08E-04	8.75E-04	5.32E-03	6.37E-04	2.02E-04	2.19E-04	0.9%	0.8%	0.9%	0.9%	0.9%	0.8%	0.9%	0.9%	0.9%	0.8%	0.9%	0.9%
	1375	24b		80%		20%		5	440	0.2468	0.0309	0.0097	0.0105	2.58E-02	3.23E-03	1.01E-03	1.09E-03	2.06E-02	2.58E-03	8.07E-04	8.75E-04	5.16E-03	6.46E-04	2.02E-04	2.19E-04	0.9%	0.8%	0.9%	0.9%	0.9%	0.8%	0.9%	0.9%	0.9%	0.8%	0.9%	0.9%
	1375	24b		80%		20%		6	552	0.2474	0.0323	0.0100	0.0108	3.24E-02	4.23E-03	1.30E-03	1.41E-03	2.59E-02	3.38E-03	1.04E-03	1.13E-03	6.48E-03	8.45E-04	2.61E-04	2.83E-04	1.1%	1.1%	1.1%	1.1%	1.1%	1.1%	1.1%	1.1%	1.1%	1.1%	1.1%	1.1%
	1375	24b		80%		20%		7	1396	0.2510	0.0344	0.0103	0.0112	8.32E-02	1.14E-02	3.41E-03	3.72E-03	6.65E-02	9.12E-03	2.73E-03	2.98E-03	1.66E-02	2.28E-03	6.81E-04	7.45E-04	2.9%	2.9%	2.9%	2.9%	2.9%	2.9%	2.9%	2.9%	2.9%	2.9%	2.9%	2.9%
	1375	24b		80%		20%		8	3629	0.2619	0.0380	0.0108	0.0118	2.26E-01	3.27E-02	9.31E-03	1.02E-02	1.80E-01	2.62E-02	7.45E-03	8.14E-03	4.51E-02	6.54E-03	1.86E-03	2.04E-03	7.7%	8.3%	8.0%	8.0%	7.7%	8.3%	8.0%	8.0%	7.7%	8.3%	8.0%	8.0%
	1375	24b		80%		20%		9	4280	0.2460	0.0375	0.0107	0.0116	2.50E-01	3.80E-02	1.09E-02	1.18E-02	2.00E-01	3.04E-02	8.72E-03	9.43E-03	5.00E-02	7.61E-03	2.18E-03	2.36E-03	8.6%	9.6%	9.3%	9.3%	8.6%	9.6%	9.3%	9.3%	8.6%	9.6%	9.3%	9.3%
	1375	24b		80%		20%		10	3642	0.2714	0.0394	0.0111	0.0121	2.35E-01	3.41E-02	9.58E-03	1.05E-02	1.88E-01	2.72E-02	7.67E-03	8.38E-03	4.69E-02	6.81E-03	1.92E-03	2.09E-03	8.1%	8.6%	8.2%	8.3%	8.1%	8.6%	8.2%	8.3%	8.1%	8.6%	8.2%	8.3%
	1375	24b		80%		20%		11	3086	0.2902	0.0422	0.0116	0.0125	2.13E-01	3.09E-02	8.47E-03	9.18E-03	1.70E-01	2.47E-02	6.77E-03	7.34E-03	4.25E-02	6.18E-03	1.69E-03	1.84E-03	7.3%	7.8%	7.3%	7.2%	7.3%	7.8%	7.3%	7.2%	7.3%	7.8%	7.3%	7.2%
	1375	24b		80%		20%		12	2880	0.2776	0.0419	0.0115	0.0125	1.90E-01	2.86E-02	7.87E-03	8.53E-03	1.52E-01	2.29E-02	6.30E-03	6.83E-03	3.80E-02	5.72E-03	1.57E-03	1.71E-03	6.5%	7.2%	6.7%	6.7%	6.5%	7.2%	6.7%	6.7%	6.5%	7.2%	6.7%	6.7%
	1375	24b		80%		20%		13	2086	0.2549	0.0381	0.0107	0.0116	1.26E-01	1.89E-02	5.28E-03	5.72E-03	1.01E-01	1.51E-02	4.22E-03	4.58E-03	2.52E-02	3.78E-03	1.06E-03	1.14E-03	4.3%	4.8%	4.5%	4.5%	4.3%	4.8%	4.5%	4.5%	4.3%	4.8%	4.5%	4.5%
	1375	24b		80%		20%		14	2111	0.2582	0.0394	0.0109	0.0118	1.29E-01	1.97E-02	5.46E-03	5.92E-03	1.03E-01	1.58E-02	4.37E-03	4.73E-03	2.59E-02	3.95E-03	1.09E-03	1.18E-03	4.4%	5.0%	4.7%	4.7%	4.4%	5.0%	4.7%	4.7%	4.4%	5.0%	4.7%	4.7%
	1375	24b		80%		20%		15	2228	0.2572	0.0413	0.0114	0.0123	1.36E-01	2.18E-02	6.01E-03	6.51E-03	1.09E-01	1.74E-02	4.81E-03	5.21E-03	2.72E-02	4.36E-03	1.20E-03	1.30E-03	4.7%	5.5%	5.2%	5.1%	4.7%	5.5%	5.2%	5.1%	4.7%	5.5%	5.2%	5.1%
	1375	24b		80%		20%		16	2380	0.2461	0.0372	0.0103	0.0112	1.39E-01	2.10E-02	5.83E-03	6.32E-03	1.11E-01	1.68E-02	4.67E-03	5.05E-03	2.78E-02	4.20E-03	1.17E-03	1.26E-03	4.8%	5.3%	5.0%	5.0%	4.8%	5.3%	5.0%	5.0%	4.8%	5.3%	5.0%	5.0%
	1375	24b		80%		20%		17	2479	0.2505	0.0352	0.0101	0.0110	1.47E-01	2.07E-02	5.97E-03	6.46E-03	1.18E-01	1.65E-02	4.77E-03	5.17E-03	2.95E-02	4.14E-03	1.19E-03	1.29E-03	5.1%	5.2%	5.1%	5.1%	5.1%	5.2%	5.1%	5.1%	5.1%	5.2%	5.1%	5.1%
	1375	24b		80%		20%		18	2798	0.2365	0.0319	0.0096	0.0104	1.57E-01	2.12E-02	6.39E-03	6.92E-03	1.26E-01	1.69E-02	5.11E-03	5.54E-03	3.14E-02	4.24E-03	1.28E-03	1.38E-03	5.4%	5.4%	5.5%	5.5%	5.4%	5.4%	5.5%	5.5%	5.4%	5.4%	5.5%	5.5%
	1375	24b		80%		20%		19	3160	0.1947	0.0242	0.0081	0.0088	1.46E-01	1.81E-02	6.08E-03	6.57E-03	1.17E-01	1.45E-02	4.86E-03	5.26E-03	2.92E-02	3.62E-03	1.22E-03	1.31E-03	5.0%	4.6%	5.2%	5.2%	5.0%	4.6%	5.2%	5.2%	5.0%	4.6%	5.2%	5.2%
	1375	24b		80%		20%		20	2574	0.1874	0.0211	0.0076	0.0082	1.14E-01	1.29E-02	4.66E-03	5.03E-03	9.16E-02	1.03E-02	3.73E-03	4.03E-03	2.29E-02	2.57E-03	9.32E-04	1.01E-03	3.9%	3.3%	4.0%	4.0%	3.9%	3.3%	4.0%	4.0%	3.9%	3.3%	4.0%	4.0%
	1375	24b		80%		20%		21	1915	0.2282	0.0253	0.0083	0.0091	1.04E-01	1.15E-02	3.79E-03	4.15E-03	8.30E-02	9.19E-03	3.03E-03	3.32E-03	2.07E-02	2.30E-03	7.58E-04	8.30E-04	3.6%	2.9%	3.3%	3.3%	3.6%	2.9%	3.3%	3.3%	3.6%	2.9%	3.3%	3.3%
	1375	24b		80%		20%		22	1858	0.2339	0.0235	0.0078	0.0086	1.03E-01	1.03E-02	3.46E-03	3.79E-03	8.25E-02	8.28E-03	2.77E-03	3.03E-03	2.06E-02	2.07E-03	6.92E-04	7.58E-04	3.5%	2.6%	3.0%	3.0%	3.5%	2.6%	3.0%	3.0%	3.5%	2.6%	3.0%	3.0%
	1375	24b		80%		20%		23	1847	0.2309	0.0206	0.0070	0.0076	1.01E-01	9.04E-03	3.06E-03	3.35E-03	8.10E-02	7.23E-03	2.45E-03	2.68E-03	2.03E-02	1.81E-03	6.11E-04	6.70E-04	3.5%	2.3%	2.6%	2.6%	3.5%	2.3%	2.6%	2.6%	3.5%	2.3%	2.6%	2.6%
	1375	24b		80%		20%		24	1436	0.2316	0.0220	0.0073	0.0080	7.90E-02	7.51E-03	2.48E-03	2.72E-03	6.32E-02	6.01E-03	1.99E-03	2.18E-03	1.58E-02	1.50E-03	4.96E-04	5.44E-04	2.7%	1.9%	2.1%	2.1%	2.7%	1.9%	2.1%	2.1%	2.7%	1.9%	2.1%	2.1%
								Daily	-	-	-	-	-	**2.91E+00**	**3.95E-01**	**1.17E-01**	**1.27E-01**	**2.33E+00**	**3.16E-01**	**9.33E-02**	**1.01E-01**	**5.82E-01**	**7.90E-02**	**2.33E-02**	**2.53E-02**	**1.294E-01**	**1.756E-02**	**5.182E-03**	**5.629E-03**	**6.471E-02**	**8.778E-03**	**2.591E-03**	**2.815E-03**	**2.329E+00**	**3.160E-01**	**9.328E-02**	**1.013E-01**

Remarks:

1. The split ratio is based on engineering design.

Emission Inventory of Portal Sources (Year 2034, With Project)

Road Name	Height (m)[1]	Width (m)[1]	Base Elevation (mPD)	Source ID	Source Type	X	Y	Daily Emission Rate (QS) (g/s)[2]				Release Height	Lateral Dimension	Vertical Dimension
								NO	NO2	FSP	RSP	(HS) (mAG)	(SY) (m)	(SZ) (m)
Lion Rock Tunnel (Sha Tin Bound)	10	16.1	98.0	LRTSTP1	Volume	835869.91	824172.85	1.877E-01	2.651E-02	7.619E-03	8.271E-03	5.00	7.49	4.65
				LRTSTP2	Volume	835860.69	824186.05	1.877E-01	2.651E-02	7.619E-03	8.271E-03	5.00	7.49	4.65
				LRTSTP3	Volume	835851.48	824199.26	1.877E-01	2.651E-02	7.619E-03	8.271E-03	5.00	7.49	4.65
				LRTSTP4	Volume	835842.27	824212.46	9.387E-02	1.325E-02	3.809E-03	4.135E-03	5.00	7.49	4.65
				LRTSTP5	Volume	835833.05	824225.66	9.387E-02	1.325E-02	3.809E-03	4.135E-03	5.00	7.49	4.65
				LRTSTP6	Volume	835823.84	824238.87	9.387E-02	1.325E-02	3.809E-03	4.135E-03	5.00	7.49	4.65
Lion Rock Tunnel (Kowloon Bound)	9.4	16.3	94.0	LRTKLP1	Volume	836716.97	823069.42	1.294E-01	1.756E-02	5.182E-03	5.629E-03	4.70	7.58	4.37
				LRTKLP2	Volume	836726.45	823056.15	1.294E-01	1.756E-02	5.182E-03	5.629E-03	4.70	7.58	4.37
				LRTKLP3	Volume	836735.92	823042.89	1.294E-01	1.756E-02	5.182E-03	5.629E-03	4.70	7.58	4.37
				LRTKLP4	Volume	836745.40	823029.63	6.471E-02	8.778E-03	2.591E-03	2.815E-03	4.70	7.58	4.37
				LRTKLP5	Volume	836754.87	823016.36	6.471E-02	8.778E-03	2.591E-03	2.815E-03	4.70	7.58	4.37
				LRTKLP6	Volume	836764.35	823003.10	6.471E-02	8.778E-03	2.591E-03	2.815E-03	4.70	7.58	4.37

Remark:

1. The dimension of the Lion Rock Tunnel is based on 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.

Hourly Profile for Portal

Hour	Lion Rock Tunnel (Sha Tin Bound)			
	NO	NO2	FSP	RSP
Hour 1	0.0143	0.0103	0.0116	0.0116
Hour 2	0.0099	0.0076	0.0084	0.0084
Hour 3	0.0070	0.0056	0.0062	0.0061
Hour 4	0.0055	0.0047	0.0051	0.0051
Hour 5	0.0054	0.0048	0.0051	0.0051
Hour 6	0.0068	0.0063	0.0066	0.0066
Hour 7	0.0174	0.0170	0.0174	0.0174
Hour 8	0.0468	0.0480	0.0477	0.0476
Hour 9	0.0492	0.0523	0.0539	0.0537
Hour 10	0.0489	0.0502	0.0494	0.0493
Hour 11	0.0453	0.0469	0.0441	0.0440
Hour 12	0.0404	0.0435	0.0411	0.0410
Hour 13	0.0625	0.0713	0.0657	0.0656
Hour 14	0.0646	0.0746	0.0681	0.0681
Hour 15	0.0688	0.0832	0.0754	0.0754
Hour 16	0.0693	0.0791	0.0725	0.0724
Hour 17	0.0727	0.0768	0.0732	0.0731
Hour 18	0.0761	0.0774	0.0766	0.0772
Hour 19	0.0675	0.0641	0.0702	0.0708
Hour 20	0.0519	0.0447	0.0531	0.0529
Hour 21	0.0466	0.0402	0.0446	0.0445
Hour 22	0.0456	0.0358	0.0404	0.0403
Hour 23	0.0438	0.0307	0.0354	0.0353
Hour 24	0.0341	0.0252	0.0284	0.0286
Total	1.0000	1.0000	1.0000	1.0000

Hour	Lion Rock Tunnel (Kowloon Bound)			
	NO	NO2	FSP	RSP
Hour 1	0.0235	0.0179	0.0202	0.0202
Hour 2	0.0162	0.0130	0.0144	0.0144
Hour 3	0.0115	0.0097	0.0106	0.0106
Hour 4	0.0091	0.0081	0.0087	0.0086
Hour 5	0.0089	0.0082	0.0087	0.0086
Hour 6	0.0111	0.0107	0.0112	0.0112
Hour 7	0.0286	0.0289	0.0292	0.0294
Hour 8	0.0775	0.0828	0.0799	0.0804
Hour 9	0.0858	0.0963	0.0934	0.0931
Hour 10	0.0806	0.0862	0.0822	0.0827
Hour 11	0.0730	0.0782	0.0726	0.0725
Hour 12	0.0652	0.0725	0.0675	0.0674
Hour 13	0.0433	0.0478	0.0453	0.0452
Hour 14	0.0444	0.0499	0.0468	0.0467
Hour 15	0.0467	0.0552	0.0515	0.0514
Hour 16	0.0477	0.0531	0.0500	0.0499
Hour 17	0.0506	0.0524	0.0512	0.0510
Hour 18	0.0540	0.0536	0.0548	0.0547
Hour 19	0.0501	0.0459	0.0521	0.0519
Hour 20	0.0393	0.0326	0.0400	0.0398
Hour 21	0.0356	0.0291	0.0325	0.0328
Hour 22	0.0354	0.0262	0.0297	0.0299
Hour 23	0.0348	0.0229	0.0262	0.0265
Hour 24	0.0271	0.0190	0.0213	0.0215
Total	1.0000	1.0000	1.0000	1.0000

Appendix 3.16 Calculation of Emission from Portals and Ventilation Buildings (Operation Phase)

Emission Inventory of Ventilation Building Sources (Year 2034, With Project)

Ventilation Building	Exhaust Direction	Source ID	Type	X	Y	Exit Temperature (K) [1]	Exit Velocity (m/s) [2]	Stack Diameter (m) [2]	Base Elevation (mPD)	Release Height (m) [2]	Daily Emission Factor (QS) (g/s)			
											NO	NO2	FSP	RSP
Ventilation Building (at Sha Tin for Shatin Bound Tunnel)	Vertical	LRTSTVB	POINT	835893.42	824139.68	0.00	7.50	2.88	98.00	29	1.971E+00	2.783E-01	8.000E-02	8.684E-02
Ventilation Building (at Kowloon for Kowloon Bound Tunnel)	45°	LRTKLVB1	POINT	836686.02	822986.08	0.00	5.30	2.85	94.00	27	1.165E+00	1.580E-01	4.664E-02	5.066E-02
		LRTKLVB2	POINTHOR	836686.02	822986.08	0.00	5.30	2.85	94.00	27	1.165E+00	1.580E-01	4.664E-02	5.066E-02

Remark:

1. Exit temperature at ambient temperature is set as 0 K in the model

2. The stack parameters are based on engineering design.

Hourly Profile for Ventilation Buildings

Hour	Ventilation Building (Shatin Portal)			
	NO	NO2	FSP	RSP
Hour 1	0.0143	0.0103	0.0116	0.0116
Hour 2	0.0099	0.0076	0.0084	0.0084
Hour 3	0.0070	0.0056	0.0062	0.0061
Hour 4	0.0055	0.0047	0.0051	0.0051
Hour 5	0.0054	0.0048	0.0051	0.0051
Hour 6	0.0068	0.0063	0.0066	0.0066
Hour 7	0.0174	0.0170	0.0174	0.0174
Hour 8	0.0468	0.0480	0.0477	0.0476
Hour 9	0.0492	0.0523	0.0539	0.0537
Hour 10	0.0489	0.0502	0.0494	0.0493
Hour 11	0.0453	0.0469	0.0441	0.0440
Hour 12	0.0404	0.0435	0.0411	0.0410
Hour 13	0.0625	0.0713	0.0657	0.0656
Hour 14	0.0646	0.0746	0.0681	0.0681
Hour 15	0.0688	0.0832	0.0754	0.0754
Hour 16	0.0693	0.0791	0.0725	0.0724
Hour 17	0.0727	0.0768	0.0732	0.0731
Hour 18	0.0761	0.0774	0.0766	0.0772
Hour 19	0.0675	0.0641	0.0702	0.0708
Hour 20	0.0519	0.0447	0.0531	0.0529
Hour 21	0.0466	0.0402	0.0446	0.0445
Hour 22	0.0456	0.0358	0.0404	0.0403
Hour 23	0.0438	0.0307	0.0354	0.0353
Hour 24	0.0341	0.0252	0.0284	0.0286
Total	1.0000	1.0000	1.0000	1.0000

Hour	Ventilation Building (Kowloon Portal)			
	NO	NO2	FSP	RSP
Hour 1	0.0235	0.0179	0.0202	0.0202
Hour 2	0.0162	0.0130	0.0144	0.0144
Hour 3	0.0115	0.0097	0.0106	0.0106
Hour 4	0.0091	0.0081	0.0087	0.0086
Hour 5	0.0089	0.0082	0.0087	0.0086
Hour 6	0.0111	0.0107	0.0112	0.0112
Hour 7	0.0286	0.0289	0.0292	0.0294
Hour 8	0.0775	0.0828	0.0799	0.0804
Hour 9	0.0858	0.0963	0.0934	0.0931
Hour 10	0.0806	0.0862	0.0822	0.0827
Hour 11	0.0730	0.0782	0.0726	0.0725
Hour 12	0.0652	0.0725	0.0675	0.0674
Hour 13	0.0433	0.0478	0.0453	0.0452
Hour 14	0.0444	0.0499	0.0468	0.0467
Hour 15	0.0467	0.0552	0.0515	0.0514
Hour 16	0.0477	0.0531	0.0500	0.0499
Hour 17	0.0506	0.0524	0.0512	0.0510
Hour 18	0.0540	0.0536	0.0548	0.0547
Hour 19	0.0501	0.0459	0.0521	0.0519
Hour 20	0.0393	0.0326	0.0400	0.0398
Hour 21	0.0356	0.0291	0.0325	0.0328
Hour 22	0.0354	0.0262	0.0297	0.0299
Hour 23	0.0348	0.0229	0.0262	0.0265
Hour 24	0.0271	0.0190	0.0213	0.0215
Total	1.0000	1.0000	1.0000	1.0000

Appendix 3.16 Calculation of Emission from Portals and Ventilation Buildings (Operation Phase)

Emission Sources Listing in Aermod

Year 2034, With Project

Description	Source ID	Type	Flow Direction	X	Y	Base Elevation (mPD)	Release Height (m)	Exit Temp. (K)	Exit velocity (m/s)	Stack Diameter (m)	Syinit	Szinit	NO Emission Rate[1]	NO2 Emission Rate[1]	RSP Emission Rate[1]	FSP Emission Rate[1]
Ventilation Building (at Sha Tin for Shatin Bound Tunnel)	LRTSTVB	POINT	Vertical	835893.42	824139.68	98.0	29.0	0.0	7.50	2.88	-	-	1.971E+00	2.783E-01	8.684E-02	8.000E-02
Ventilation Building (at Kowloon for Kowloon Bound Tunnel)	LRTKLVB1	POINT	Vertical	836686.02	822986.08	94.0	27.0	0.0	5.30	2.85	-	-	1.165E+00	1.580E-01	5.066E-02	4.664E-02
Ventilation Building (at Kowloon for Kowloon Bound Tunnel)	LRTKLVB2	POINTHOR	Horizontal	836686.02	822986.08	94.0	27.0	0.0	5.30	2.85	-	-	1.165E+00	1.580E-01	5.066E-02	4.664E-02
Lion Rock Tunnel (Sha Tin Bound)	LRTSTP1	VOLUME	-	835869.91	824172.85	98	5.0	-	-	-	7.49	4.65	1.877E-01	2.651E-02	8.271E-03	7.619E-03
Lion Rock Tunnel (Sha Tin Bound)	LRTSTP2	VOLUME	-	835860.69	824186.05	98	5.0	-	-	-	7.49	4.65	1.877E-01	2.651E-02	8.271E-03	7.619E-03
Lion Rock Tunnel (Sha Tin Bound)	LRTSTP3	VOLUME	-	835851.48	824199.26	98	5.0	-	-	-	7.49	4.65	1.877E-01	2.651E-02	8.271E-03	7.619E-03
Lion Rock Tunnel (Sha Tin Bound)	LRTSTP4	VOLUME	-	835842.27	824212.46	98	5.0	-	-	-	7.49	4.65	9.387E-02	1.325E-02	4.135E-03	3.809E-03
Lion Rock Tunnel (Sha Tin Bound)	LRTSTP5	VOLUME	-	835833.05	824225.66	98	5.0	-	-	-	7.49	4.65	9.387E-02	1.325E-02	4.135E-03	3.809E-03
Lion Rock Tunnel (Sha Tin Bound)	LRTSTP6	VOLUME	-	835823.84	824238.87	98	5.0	-	-	-	7.49	4.65	9.387E-02	1.325E-02	4.135E-03	3.809E-03
Lion Rock Tunnel (Kowloon Bound)	LRTKLP1	VOLUME	-	836716.97	823069.42	94	4.7	-	-	-	7.58	4.37	1.294E-01	1.756E-02	5.629E-03	5.182E-03
Lion Rock Tunnel (Kowloon Bound)	LRTKLP2	VOLUME	-	836726.45	823056.15	94	4.7	-	-	-	7.58	4.37	1.294E-01	1.756E-02	5.629E-03	5.182E-03
Lion Rock Tunnel (Kowloon Bound)	LRTKLP3	VOLUME	-	836735.92	823042.89	94	4.7	-	-	-	7.58	4.37	1.294E-01	1.756E-02	5.629E-03	5.182E-03
Lion Rock Tunnel (Kowloon Bound)	LRTKLP4	VOLUME	-	836745.40	823029.63	94	4.7	-	-	-	7.58	4.37	6.471E-02	8.778E-03	2.815E-03	2.591E-03
Lion Rock Tunnel (Kowloon Bound)	LRTKLP5	VOLUME	-	836754.87	823016.36	94	4.7	-	-	-	7.58	4.37	6.471E-02	8.778E-03	2.815E-03	2.591E-03
Lion Rock Tunnel (Kowloon Bound)	LRTKLP6	VOLUME	-	836764.35	823003.10	94	4.7	-	-	-	7.58	4.37	6.471E-02	8.778E-03	2.815E-03	2.591E-03

Remarks:
1. Emission rate of point source and volume source is in gram per second (g/s)

ISO A1 594mm x 841mm

Approved:

Checked:

Designer:

Project Management Initials:

836500 E

836700 E

836900 E

823200 N

823000 N

822800 N

LEGEND:

PROJECT BOUNDARY

LRTKLP1

PORTAL EMISSION (VOLUME SOURCE)

LRTKLVB1

VENTILATION BUILDING (POINT SOURCE)

N

LRTKLP1

LRTKLP2

LRTKLP3

LRTKLP4

LRTKLP5

LRTKLP6

LRTKLVB1

LRTKLVB2

EXHAUST DIRECTION

Lion Rock High Level No.2 Primary Service Reservoir

Lion Rock Tunnel

LUNG CHEUNG ROAD

Lion Rock Park

Archery Field

Playground

Barbecue Area

Basketball Court

Pool Court

KWP May 2021

Relief Tunnel

2022/2111

Plot File by: ZHILZ

PATH: P:\PROJECTS\60604728\DRAWINGS\KETCH\SK7027.dgn

AECOM

PROJECT
項目

IMPROVEMENT OF LION ROCK TUNNEL - INVESTIGATION

CLIENT
業主

路政署
HIGHWAYS DEPARTMENT

CONSULTANT
工程顧問公司

AECOM Asia Company Ltd.
www.aecom.com

SUB-CONSULTANTS
分判工程顧問公司

ISSUE/REVISION
修訂

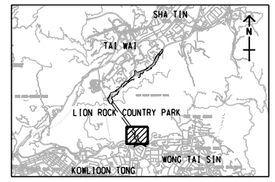
I/R 修訂	DATE 日期	DESCRIPTION 內容摘要	CHK. 核對

STATUS
階段

SCALE 比例
A3 1 : 2000

DIMENSION UNIT 尺寸單位
METRES

KEY PLAN 索引圖 A3 1 : 200000



PROJECT NO. 項目編號
60604728

AGREEMENT NO. 協議編號
CE 48/2018(HY)

SHEET TITLE
圖紙名稱

LOCATIONS OF PORTAL EMISSION AND VENTILATION BUILDING IN YEAR 2034 (WITH PROJECT) (KOWLOON SIDE)

SHEET NUMBER
圖紙編號

60604728/SK7027

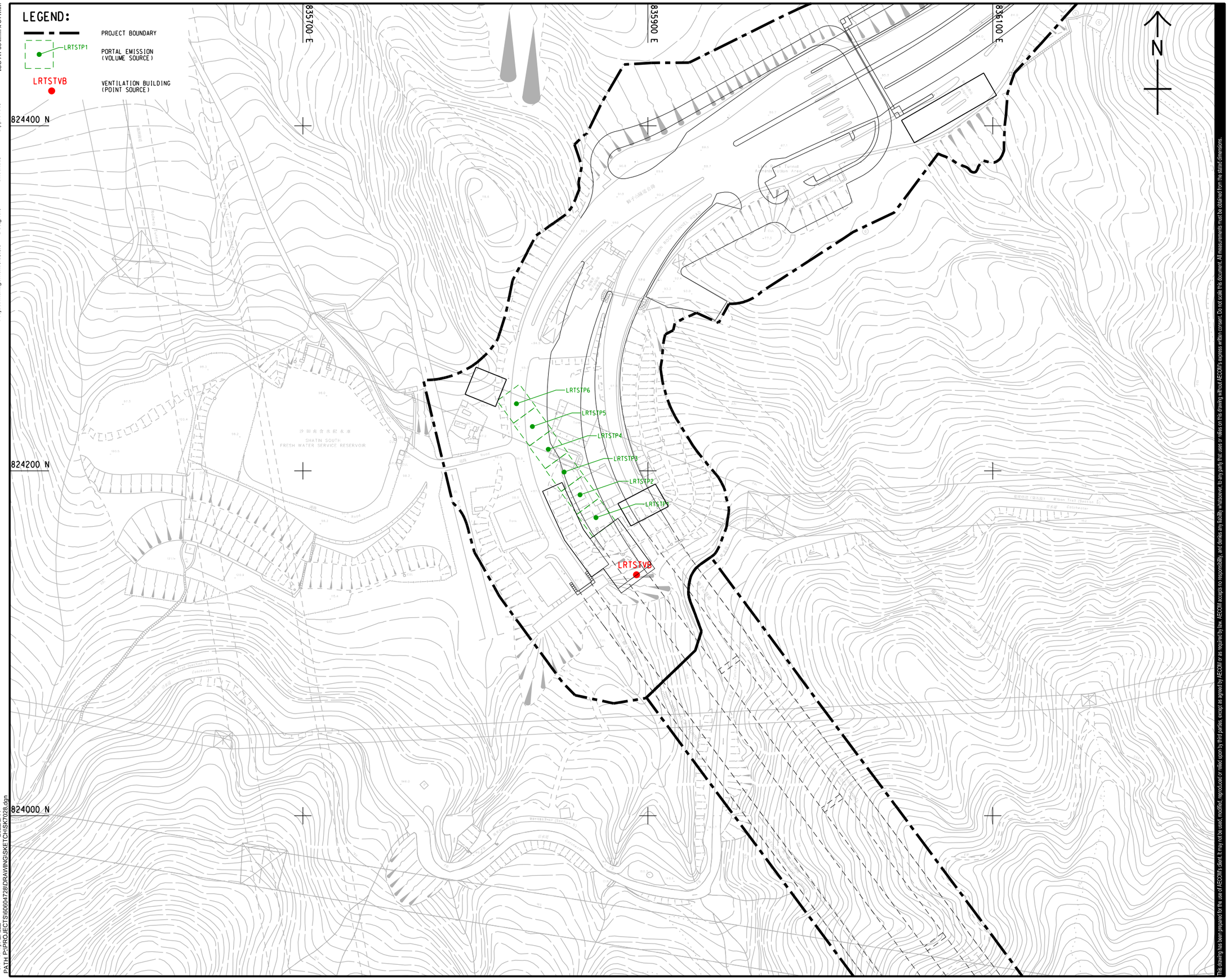
ISO A1 594mm x 841mm

Approved:

Checked:

Designer:

Project Management Initials:



Plot File by: ZHILZ
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2022/2/11

AECOM

PROJECT
項目

IMPROVEMENT OF LION ROCK TUNNEL - INVESTIGATION

CLIENT
業主

路政署
HIGHWAYS DEPARTMENT

CONSULTANT
土木顧問公司

AECOM Asia Company Ltd.
www.aecom.com

SUB-CONSULTANTS
分判土木顧問公司

ISSUE/REVISION
修訂

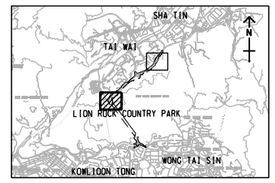
I/R 修訂	DATE 日期	DESCRIPTION 事件摘要	CHK. 校核

STATUS
狀況

SCALE 比例
A3 1 : 2000

DIMENSION UNIT 尺寸單位
METRES

KEY PLAN A3 1 : 200000
索引圖



PROJECT NO. 項目編號
60604728

AGREEMENT NO. 協議編號
CE 48/2018(HY)

SHEET TITLE
圖紙名稱

LOCATIONS OF PORTAL EMISSION AND VENTILATION BUILDING IN YEAR 2034 (WITH PROJECT) (SHATIN SIDE)

SHEET NUMBER
圖紙編號

60604728/SK7028

Emission Rate Calculation (Without Project, Year 2034)

Description	Length (m)	Road Link ID	Vent Bldg. ID	% from Vent Bldg.[1]	Portal ID	% from Portal[1]	No. of Volume Source (Portal)	Hour	Q	Total E.F. (portal + VB)				Total emission rate (portal + VB)				Emission rate (from Vent Bldg.)				Emission rate (from portal within 500m Study Area)			
										NO E.F.	NO2 E.F.	FSP E.F.	RSP E.F.	NO	NO2	FSP	RSP	NO	NO2	FSP	RSP	NO	NO2	FSP	RSP
									(veh/hr)	(g/mile-veh)	(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)	(g/s)	(g/s)	(g/s)
Lion Rock Tunnel (Sha Tin Bound)	1415	23b	WOPSTVB1	50%	WOPSTP1-WOPSTP12	50%	12	1	750	0.2255	0.0230	0.0075	0.0081	4.13E-02	4.22E-03	1.37E-03	1.48E-03	2.07E-02	2.11E-03	6.85E-04	7.41E-04	2.07E-02	2.11E-03	6.85E-04	7.41E-04
	1415	23b		50%		50%		2	517	0.2265	0.0245	0.0078	0.0084	2.86E-02	3.09E-03	9.84E-04	1.07E-03	1.43E-02	1.55E-03	4.92E-04	5.33E-04	1.43E-02	1.55E-03	4.92E-04	5.33E-04
	1415	23b		50%		50%		3	367	0.2275	0.0260	0.0081	0.0088	2.04E-02	2.33E-03	7.27E-04	7.87E-04	1.02E-02	1.16E-03	3.64E-04	3.94E-04	1.02E-02	1.16E-03	3.64E-04	3.94E-04
	1415	23b		50%		50%		4	290	0.2285	0.0274	0.0084	0.0091	1.62E-02	1.95E-03	5.99E-04	6.48E-04	8.10E-03	9.73E-04	2.99E-04	3.24E-04	8.10E-03	9.73E-04	2.99E-04	3.24E-04
	1415	23b		50%		50%		5	281	0.2295	0.0289	0.0088	0.0095	1.58E-02	1.99E-03	6.02E-04	6.52E-04	7.88E-03	9.93E-04	3.01E-04	3.26E-04	7.88E-03	9.93E-04	3.01E-04	3.26E-04
	1415	23b		50%		50%		6	353	0.2305	0.0304	0.0091	0.0098	1.99E-02	2.62E-03	7.82E-04	8.47E-04	9.93E-03	1.31E-03	3.91E-04	4.24E-04	9.93E-03	1.31E-03	3.91E-04	4.24E-04
	1415	23b		50%		50%		7	893	0.2346	0.0325	0.0094	0.0103	5.12E-02	7.08E-03	2.06E-03	2.25E-03	2.56E-02	3.54E-03	1.03E-03	1.12E-03	2.56E-02	3.54E-03	1.03E-03	1.12E-03
	1415	23b		50%		50%		8	2322	0.2458	0.0362	0.0100	0.0109	1.39E-01	2.05E-02	5.65E-03	6.18E-03	6.97E-02	1.03E-02	2.83E-03	3.09E-03	6.97E-02	1.03E-02	2.83E-03	3.09E-03
	1415	23b		50%		50%		9	2739	0.2233	0.0341	0.0097	0.0105	1.49E-01	2.28E-02	6.49E-03	7.02E-03	7.47E-02	1.14E-02	3.24E-03	3.51E-03	7.47E-02	1.14E-02	3.24E-03	3.51E-03
	1415	23b		50%		50%		10	2336	0.2561	0.0377	0.0103	0.0112	1.46E-01	2.15E-02	5.86E-03	6.41E-03	7.31E-02	1.08E-02	2.93E-03	3.20E-03	7.31E-02	1.08E-02	2.93E-03	3.20E-03
	1415	23b		50%		50%		11	1983	0.2753	0.0406	0.0108	0.0117	1.33E-01	1.97E-02	5.22E-03	5.66E-03	6.67E-02	9.83E-03	2.61E-03	2.83E-03	6.67E-02	9.83E-03	2.61E-03	2.83E-03
	1415	23b		50%		50%		12	1850	0.2634	0.0404	0.0108	0.0117	1.19E-01	1.82E-02	4.86E-03	5.27E-03	5.95E-02	9.12E-03	2.43E-03	2.64E-03	5.95E-02	9.12E-03	2.43E-03	2.64E-03
	1415	23b		50%		50%		13	2396	0.2999	0.0490	0.0125	0.0136	1.76E-01	2.87E-02	7.32E-03	7.93E-03	8.78E-02	1.43E-02	3.66E-03	3.97E-03	8.78E-02	1.43E-02	3.66E-03	3.97E-03
	1415	23b		50%		50%		14	2446	0.3039	0.0501	0.0127	0.0138	1.82E-01	2.99E-02	7.59E-03	8.22E-03	9.08E-02	1.50E-02	3.79E-03	4.11E-03	9.08E-02	1.50E-02	3.79E-03	4.11E-03
	1415	23b		50%		50%		15	2603	0.3225	0.0567	0.0135	0.0147	2.05E-01	3.61E-02	8.59E-03	9.36E-03	1.03E-01	1.80E-02	4.30E-03	4.68E-03	1.03E-01	1.80E-02	4.30E-03	4.68E-03
	1415	23b		50%		50%		16	2736	0.3146	0.0524	0.0126	0.0136	2.10E-01	3.50E-02	8.39E-03	9.11E-03	1.05E-01	1.75E-02	4.20E-03	4.55E-03	1.05E-01	1.75E-02	4.20E-03	4.55E-03
	1415	23b		50%		50%		17	2836	0.3324	0.0517	0.0126	0.0137	2.30E-01	3.58E-02	8.73E-03	9.47E-03	1.15E-01	1.79E-02	4.37E-03	4.73E-03	1.15E-01	1.79E-02	4.37E-03	4.73E-03
	1415	23b		50%		50%		18	3123	0.3464	0.0528	0.0130	0.0140	2.64E-01	4.03E-02	9.88E-03	1.07E-02	1.32E-01	2.01E-02	4.94E-03	5.34E-03	1.32E-01	2.01E-02	4.94E-03	5.34E-03
	1415	23b		50%		50%		19	3368	0.2797	0.0402	0.0112	0.0120	2.30E-01	3.31E-02	9.20E-03	9.91E-03	1.15E-01	1.65E-02	4.60E-03	4.95E-03	1.15E-01	1.65E-02	4.60E-03	4.95E-03
	1415	23b		50%		50%		20	2711	0.2179	0.0270	0.0091	0.0098	1.44E-01	1.79E-02	6.03E-03	6.52E-03	7.21E-02	8.93E-03	3.01E-03	3.26E-03	7.21E-02	8.93E-03	3.01E-03	3.26E-03
	1415	23b		50%		50%		21	2037	0.2566	0.0317	0.0100	0.0109	1.28E-01	1.58E-02	4.99E-03	5.41E-03	6.38E-02	7.90E-03	2.50E-03	2.70E-03	6.38E-02	7.90E-03	2.50E-03	2.70E-03
	1415	23b		50%		50%		22	1960	0.2607	0.0294	0.0095	0.0103	1.25E-01	1.41E-02	4.54E-03	4.92E-03	6.24E-02	7.04E-03	2.27E-03	2.46E-03	6.24E-02	7.04E-03	2.27E-03	2.46E-03
	1415	23b		50%		50%		23	1924	0.2546	0.0258	0.0085	0.0092	1.20E-01	1.21E-02	3.99E-03	4.32E-03	5.98E-02	6.06E-03	1.99E-03	2.16E-03	5.98E-02	6.06E-03	1.99E-03	2.16E-03
	1415	23b		50%		50%		24	1504	0.2533	0.0269	0.0088	0.0095	9.31E-02	9.89E-03	3.23E-03	3.49E-03	4.65E-02	4.95E-03	1.61E-03	1.75E-03	4.65E-02	4.95E-03	1.61E-03	1.75E-03
								Daily	-	-	-	-	-	**2.99E+00**	**4.35E-01**	**1.18E-01**	**1.28E-01**	**1.49E+00**	**2.17E-01**	**5.88E-02**	**6.38E-02**	**1.49E+00**	**2.17E-01**	**5.88E-02**	**6.38E-02**
Lion Rock Tunnel (Kowloon Bound)	1425	24b	WOPKLVB1	50%	WOPKLP1-WOPKLP12	50%	12	1	1000	0.2602	0.02777	0.0093	0.0101	6.40E-02	6.83E-03	2.28E-03	2.49E-03	3.20E-02	3.42E-03	1.14E-03	1.24E-03	3.20E-02	3.42E-03	1.14E-03	1.24E-03
	1425	24b		50%		50%		2	689	0.2580	0.02860	0.0095	0.0103	4.37E-02	4.85E-03	1.61E-03	1.75E-03	2.19E-02	2.42E-03	8.07E-04	8.74E-04	2.19E-02	2.42E-03	8.07E-04	8.74E-04
	1425	24b		50%		50%		3	489	0.2584	0.02997	0.0098	0.0106	3.11E-02	3.60E-03	1.18E-03	1.28E-03	1.55E-02	1.80E-03	5.90E-04	6.39E-04	1.55E-02	1.80E-03	5.90E-04	6.39E-04
	1425	24b		50%		50%		4	387	0.2588	0.03133	0.0101	0.0110	2.46E-02	2.98E-03	9.61E-04	1.04E-03	1.23E-02	1.49E-03	4.80E-04	5.21E-04	1.23E-02	1.49E-03	4.80E-04	5.21E-04
	1425	24b		50%		50%		5	374	0.2592	0.03269	0.0104	0.0113	2.39E-02	3.01E-03	9.57E-04	1.04E-03	1.19E-02	1.51E-03	4.78E-04	5.19E-04	1.19E-02	1.51E-03	4.78E-04	5.19E-04
	1425	24b		50%		50%		6	469	0.2596	0.03405	0.0107	0.0116	2.99E-02	3.93E-03	1.23E-03	1.34E-03	1.50E-02	1.96E-03	6.16E-04	6.68E-04	1.50E-02	1.96E-03	6.16E-04	6.68E-04
	1425	24b		50%		50%		7	1187	0.2630	0.03614	0.0110	0.0120	7.68E-02	1.06E-02	3.21E-03	3.51E-03	3.84E-02	5.28E-03	1.60E-03	1.75E-03	3.84E-02	5.28E-03	1.60E-03	1.75E-03
	1425	24b		50%		50%		8	3086	0.3315	0.05109	0.0130	0.0141	2.52E-01	3.88E-02	9.83E-03	1.07E-02	1.26E-01	1.94E-02	4.92E-03	5.35E-03	1.26E-01	1.94E-02	4.92E-03	5.35E-03
	1425	24b		50%		50%		9	3638	0.4041	0.06778	0.0155	0.0169	3.62E-01	6.07E-02	1.39E-02	1.51E-02	1.81E-01	3.03E-02	6.93E-03	7.54E-03	1.81E-01	3.03E-02	6.93E-03	7.54E-03
	1425	24b		50%		50%		10	3100	0.3647	0.05686	0.0137	0.0148	2.78E-01	4.34E-02	1.05E-02	1.13E-02	1.39E-01	2.17E-02	5.24E-03	5.66E-03	1.39E-01	2.17E-02	5.24E-03	5.66E-03
	1425	24b		50%		50%		11	2628	0.3268	0.04904	0.0127	0.0138	2.11E-01	3.17E-02	8.21E-03	8.90E-03	1.06E-01	1.58E-02	4.11E-03	4.45E-03	1.06E-01	1.58E-02	4.11E-03	4.45E-03
	1425	24b		50%		50%		12	2452	0.3029	0.04652	0.0124	0.0135	1.83E-01	2.81E-02	7.50E-03	8.12E-03	9.13E-02	1.40E-02	3.75E-03	4.06E-03	9.13E-02	1.40E-02	3.75E-03	4.06E-03
	1425	24b		50%		50%		13	2086	0.2588	0.03897	0.0107	0.0116	1.33E-01	2.00E-02	5.50E-03	5.96E-03	6.64E-02	1.00E-02	2.75E-03	2.98E-03	6.64E-02	1.00E-02	2.75E-03	2.98E-03
	1425	24b		50%		50%		14	2111	0.2623	0.04024	0.0110	0.0119	1.36E-01	2.09E-02	5.69E-03	6.17E-03	6.81E-02	1.04E-02	2.84E-03	3.08E-03	6.81E-02	1.04E-02	2.84E-03	3.08E-03
	1425	24b		50%		50%		15	2228	0.2658	0.04312	0.0115	0.0125	1.46E-01	2.36E-02	6.29E-03	6.87E-03	7.28E-02	1.18E-02	3.14E-03	3.43E-03	7.28E-02	1.18E-02	3.14E-03	3.43E-03
	1425	24b		50%		50%		16	2380	0.2542	0.03878	0.0104	0.0114	1.49E-01	2.27E-02	6.10E-03	6.67E-03	7.44E-02	1.13E-02	3.05E-03	3.33E-03	7.44E-02	1.13E-02	3.05E-03	3.33E-03
	1425	24b		50%		50%		17	2479	0.2624	0.03743	0.0104	0.0112	1.60E-01	2.28E-02	6.32E-03	6.84E-03	8.00E-02	1.14E-02	3.16E-03	3.42E-03	8.00E-02	1.14E-02	3.16E-03	3.42E-03
	1425	24b		50%		50%		18	2798	0.2510	0.03458	0.0099	0.0108	1.73E-01	2.38E-02	6.82E-03	7.44E-03	8.64E-02	1.19E-02	3.41E-03	3.72E-03	8.64E-02	1.19E-02	3.41E-03	3.72E-03
	1425	24b		50%		50%		19	3160	0.2110	0.02718	0.0085	0.0093	1.64E-01	2.11E-02	6.62E-03	7.24E-03	8.20E-02	1.06E-02	3.31E-03	3.62E-03	8.20E-02	1.06E-02	3.31E-03	3.62E-03
	1425	24b		50%		50%		20	2574	0.1919	0.02180	0.0077	0.0084	1.21E-01	1.38E-02	4.86E-03	5.32E-03	6.07E-02	6.90E-03	2.43E-03	2.66E-03	6.07E-02	6.90E-03	2.43E-03	2.66E-03
	1425	24b		50%		50%		21	1915	0.2334	0.02619	0.0085	0.0092	1.10E-01	1.23E-02	4.00E-03	4.33E-03	5.50E-02	6.17E-03	2.00E-03	2.17E-03	5.50E-02	6.17E-03	2.00E-03	2.17E-03
	1425	24b		50%		50%		22	1858	0.2364	0.02387	0.0080	0.0086	1.08E-01	1.09E-02	3.64E-03	3.94E-03	5.40E-02	5.45E-03	1.82E-03	1.97E-03	5.40E-02	5.45E-03	1.82E-03	1.97E-03
	1425	24b		50%		50%		23	1847	0.2333	0.02093	0.0071	0.0077	1.06E-01	9.51E-03	3.22E-03	3.48E-03	5.30E-02	4.76E-03	1.61E-03	1.74E-03	5.30E-02	4.76E-03	1.61E-03	1.74E-03
	1425	24b		50%		50%		24	1436	0.2341	0.02238	0.0074	0.0080	8.27E-02	7.91E-03	2.61E-03	2.83E-03	4.13E-02	3.95E-03	1.31E-03	1.41E-03	4.13E-02	3.95E-03	1.31E-03	1.41E-03
								Daily	-	-	-	-	-	**3.17E+00**	**4.48E-01**	**1.23E-01**	**1.34E-01**	**1.58E+00**	**2.24E-01**	**6.15E-02**	**6.68E-02**	**1.58E+00**	**2.24E-01**	**6.15E-02**	**6.68E-02**

Remarks:
1. The existing split ratio of the Lion Rock Tunnel is unavailable. Thus, a 50% to 50% split ratio is adopted based on engineering assumption.

Total Emission Rate of Portals (Without Project, Year 2034)

Road Name	Height (m)[1]	Width (m)[1]	Base Elevation (mPD)	Source ID	Source Type	X	Y	Daily Emission Rate (QS) (g/s)[2]				Release Height	Lateral Dimension	Vertical Dimension
								NO	NO2	FSP	RSP	(HS) (m)	(SY) (m)	(SZ) (m)
Lion Rock Tunnel (Sha Tin Bound)	6.7	9.2	97.5	WOPSTP1	VOLUME	835860.87	824136.94	1.659E-01	2.414E-02	6.538E-03	7.088E-03	3.35	4.28	3.12
				WOPSTP2	VOLUME	835855.40	824144.34	1.659E-01	2.414E-02	6.538E-03	7.088E-03	3.35	4.28	3.12
				WOPSTP3	VOLUME	835849.93	824151.73	1.659E-01	2.414E-02	6.538E-03	7.088E-03	3.35	4.28	3.12
				WOPSTP4	VOLUME	835844.46	824159.13	1.659E-01	2.414E-02	6.538E-03	7.088E-03	3.35	4.28	3.12
				WOPSTP5	VOLUME	835838.99	824166.53	1.659E-01	2.414E-02	6.538E-03	7.088E-03	3.35	4.28	3.12
				WOPSTP6	VOLUME	835833.52	824173.92	1.659E-01	2.414E-02	6.538E-03	7.088E-03	3.35	4.28	3.12
				WOPSTP7	VOLUME	835828.05	824181.32	8.297E-02	1.207E-02	3.269E-03	3.544E-03	3.35	4.28	3.12
				WOPSTP8	VOLUME	835822.58	824188.72	8.297E-02	1.207E-02	3.269E-03	3.544E-03	3.35	4.28	3.12
				WOPSTP9	VOLUME	835817.11	824196.11	8.297E-02	1.207E-02	3.269E-03	3.544E-03	3.35	4.28	3.12
				WOPSTP10	VOLUME	835811.63	824203.51	8.297E-02	1.207E-02	3.269E-03	3.544E-03	3.35	4.28	3.12
				WOPSTP11	VOLUME	835806.16	824210.91	8.297E-02	1.207E-02	3.269E-03	3.544E-03	3.35	4.28	3.12
				WOPSTP12	VOLUME	835800.69	824218.30	8.297E-02	1.207E-02	3.269E-03	3.544E-03	3.35	4.28	3.12
Lion Rock Tunnel (Kowloon Bound)	6.7	9.2	96.0	WOPKLP1	VOLUME	836741.38	823035.03	1.760E-01	2.487E-02	6.832E-03	7.425E-03	3.35	4.28	3.12
				WOPKLP2	VOLUME	836744.06	823026.23	1.760E-01	2.487E-02	6.832E-03	7.425E-03	3.35	4.28	3.12
				WOPKLP3	VOLUME	836746.75	823017.43	1.760E-01	2.487E-02	6.832E-03	7.425E-03	3.35	4.28	3.12
				WOPKLP4	VOLUME	836749.43	823008.63	1.760E-01	2.487E-02	6.832E-03	7.425E-03	3.35	4.28	3.12
				WOPKLP5	VOLUME	836752.12	822999.83	1.760E-01	2.487E-02	6.832E-03	7.425E-03	3.35	4.28	3.12
				WOPKLP6	VOLUME	836754.80	822991.03	1.760E-01	2.487E-02	6.832E-03	7.425E-03	3.35	4.28	3.12
				WOPKLP7	VOLUME	836757.48	822982.23	8.798E-02	1.244E-02	3.416E-03	3.712E-03	3.35	4.28	3.12
				WOPKLP8	VOLUME	836760.17	822973.43	8.798E-02	1.244E-02	3.416E-03	3.712E-03	3.35	4.28	3.12
				WOPKLP9	VOLUME	836762.85	822964.63	8.798E-02	1.244E-02	3.416E-03	3.712E-03	3.35	4.28	3.12
				WOPKLP10	VOLUME	836765.54	822955.83	8.798E-02	1.244E-02	3.416E-03	3.712E-03	3.35	4.28	3.12
				WOPKLP11	VOLUME	836768.22	822947.03	8.798E-02	1.244E-02	3.416E-03	3.712E-03	3.35	4.28	3.12
				WOPKLP12	VOLUME	836770.90	822938.23	8.798E-02	1.244E-02	3.416E-03	3.712E-03	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.

Hourly Profile for Portal

Hour	Lion Rock Tunnel (Sha Tin Bound)			
	NO	NO2	FSP	RSP
Hour 1	0.0138	0.0097	0.0116	0.0116
Hour 2	0.0096	0.0071	0.0084	0.0084
Hour 3	0.0068	0.0054	0.0062	0.0062
Hour 4	0.0054	0.0045	0.0051	0.0051
Hour 5	0.0053	0.0046	0.0051	0.0051
Hour 6	0.0067	0.0060	0.0066	0.0066
Hour 7	0.0171	0.0163	0.0175	0.0176
Hour 8	0.0467	0.0472	0.0480	0.0485
Hour 9	0.0500	0.0524	0.0552	0.0550
Hour 10	0.0489	0.0495	0.0498	0.0502
Hour 11	0.0446	0.0452	0.0443	0.0443
Hour 12	0.0399	0.0420	0.0413	0.0413
Hour 13	0.0588	0.0659	0.0622	0.0622
Hour 14	0.0608	0.0689	0.0645	0.0644
Hour 15	0.0687	0.0830	0.0730	0.0734
Hour 16	0.0704	0.0807	0.0713	0.0714
Hour 17	0.0771	0.0824	0.0742	0.0742
Hour 18	0.0885	0.0927	0.0840	0.0837
Hour 19	0.0770	0.0761	0.0782	0.0777
Hour 20	0.0483	0.0411	0.0512	0.0511
Hour 21	0.0427	0.0363	0.0424	0.0424
Hour 22	0.0418	0.0324	0.0386	0.0386
Hour 23	0.0400	0.0279	0.0339	0.0338
Hour 24	0.0312	0.0228	0.0274	0.0274
Total	1.0000	1.0000	1.0000	1.0000

Hour	Lion Rock Tunnel (Kowloon Bound)			
	NO	NO2	FSP	RSP
Hour 1	0.0202	0.0153	0.0185	0.0186
Hour 2	0.0138	0.0108	0.0131	0.0131
Hour 3	0.0098	0.0080	0.0096	0.0096
Hour 4	0.0078	0.0067	0.0078	0.0078
Hour 5	0.0075	0.0067	0.0078	0.0078
Hour 6	0.0095	0.0088	0.0100	0.0100
Hour 7	0.0243	0.0236	0.0261	0.0262
Hour 8	0.0794	0.0866	0.0800	0.0801
Hour 9	0.1142	0.1355	0.1127	0.1128
Hour 10	0.0878	0.0968	0.0852	0.0846
Hour 11	0.0667	0.0708	0.0668	0.0666
Hour 12	0.0577	0.0627	0.0610	0.0607
Hour 13	0.0419	0.0447	0.0447	0.0446
Hour 14	0.0430	0.0467	0.0463	0.0461
Hour 15	0.0460	0.0528	0.0511	0.0514
Hour 16	0.0470	0.0507	0.0496	0.0499
Hour 17	0.0505	0.0510	0.0514	0.0512
Hour 18	0.0546	0.0532	0.0554	0.0557
Hour 19	0.0518	0.0472	0.0539	0.0542
Hour 20	0.0384	0.0308	0.0395	0.0398
Hour 21	0.0347	0.0276	0.0326	0.0324
Hour 22	0.0341	0.0244	0.0296	0.0295
Hour 23	0.0335	0.0213	0.0262	0.0261
Hour 24	0.0261	0.0177	0.0213	0.0212
Total	1.0000	1.0000	1.0000	1.0000

Total Emission Rates of Ventilation Buildings

Ventilation Building	Exhaust Direction	Source ID	Type	X	Y	Exit Temperature (K) [1]	Exit Velocity (m/s)	Stack Diameter (m)	Base Elevation (mPD)	Release Height (m)	Daily Emission Factor (QS) (g/s)			
											NO	NO2	FSP	RSP
Ventilation Building (at Sha Tin for Shatin Bound Tunnel)	Horizontal	WOPSTVB	POINTHOR	835836.79	824142.51	0.00	13.06	3.95	97.50	9.50	1.493E+00	2.173E-01	5.884E-02	6.379E-02
Ventilation Building (at Kowloon for Kowloon Bound Tunnel)	Horizontal	WOPKLVB1	POINTHOR	836759.71	823024.20	0.00	13.06	3.95	96.00	9.50	1.584E+00	2.239E-01	6.148E-02	6.682E-02

Remark:

1. Exit temperature at ambient temperature is set as 0 K in the model

Hourly Profile for Ventilation Buildings

Hour	Ventilation Building (Shatin Portal)			
	NO	NO2	FSP	RSP
Hour 1	0.0138	0.0097	0.0116	0.0116
Hour 2	0.0096	0.0071	0.0084	0.0084
Hour 3	0.0068	0.0054	0.0062	0.0062
Hour 4	0.0054	0.0045	0.0051	0.0051
Hour 5	0.0053	0.0046	0.0051	0.0051
Hour 6	0.0067	0.0060	0.0066	0.0066
Hour 7	0.0171	0.0163	0.0175	0.0176
Hour 8	0.0467	0.0472	0.0480	0.0485
Hour 9	0.0500	0.0524	0.0552	0.0550
Hour 10	0.0489	0.0495	0.0498	0.0502
Hour 11	0.0446	0.0452	0.0443	0.0443
Hour 12	0.0399	0.0420	0.0413	0.0413
Hour 13	0.0588	0.0659	0.0622	0.0622
Hour 14	0.0608	0.0689	0.0645	0.0644
Hour 15	0.0687	0.0830	0.0730	0.0734
Hour 16	0.0704	0.0807	0.0713	0.0714
Hour 17	0.0771	0.0824	0.0742	0.0742
Hour 18	0.0885	0.0927	0.0840	0.0837
Hour 19	0.0770	0.0761	0.0782	0.0777
Hour 20	0.0483	0.0411	0.0512	0.0511
Hour 21	0.0427	0.0363	0.0424	0.0424
Hour 22	0.0418	0.0324	0.0386	0.0386
Hour 23	0.0400	0.0279	0.0339	0.0338
Hour 24	0.0312	0.0228	0.0274	0.0274
Total	1.0000	1.0000	1.0000	1.0000

Hour	Ventilation Building (Kowloon Portal)			
	NO	NO2	FSP	RSP
Hour 1	0.0202	0.0153	0.0185	0.0186
Hour 2	0.0138	0.0108	0.0131	0.0131
Hour 3	0.0098	0.0080	0.0096	0.0096
Hour 4	0.0078	0.0067	0.0078	0.0078
Hour 5	0.0075	0.0067	0.0078	0.0078
Hour 6	0.0095	0.0088	0.0100	0.0100
Hour 7	0.0243	0.0236	0.0261	0.0262
Hour 8	0.0794	0.0866	0.0800	0.0801
Hour 9	0.1142	0.1355	0.1127	0.1128
Hour 10	0.0878	0.0968	0.0852	0.0846
Hour 11	0.0667	0.0708	0.0668	0.0666
Hour 12	0.0577	0.0627	0.0610	0.0607
Hour 13	0.0419	0.0447	0.0447	0.0446
Hour 14	0.0430	0.0467	0.0463	0.0461
Hour 15	0.0460	0.0528	0.0511	0.0514
Hour 16	0.0470	0.0507	0.0496	0.0499
Hour 17	0.0505	0.0510	0.0514	0.0512
Hour 18	0.0546	0.0532	0.0554	0.0557
Hour 19	0.0518	0.0472	0.0539	0.0542
Hour 20	0.0384	0.0308	0.0395	0.0398
Hour 21	0.0347	0.0276	0.0326	0.0324
Hour 22	0.0341	0.0244	0.0296	0.0295
Hour 23	0.0335	0.0213	0.0262	0.0261
Hour 24	0.0261	0.0177	0.0213	0.0212
Total	1.0000	1.0000	1.0000	1.0000

Appendix 3.16 Calculation of Emission from Portals and Ventilation Buildings (Operation Phase)

Portal Emission Sources Listing in Aermod

Description	Source ID	Type	Flow Direction	X	Y	Base elevation (m)	Release Height (m)	Exit Temp. (K)	Exit velocity (m/s)	Stack Diameter (m)	Syinit	Szinit	NO Emission Rate *	NO2 Emission Rate *	RSP Emission Rate *	FSP Emission Rate *
Ventilation Building (at Sha Tin for Shatin Bound Tunnel)	WOPSTVB	POINTHOR	Horizontal	835836.79	824142.51	97.5	9.50	0.0	13.06	3.95	-	-	1.493E+00	2.173E-01	6.379E-02	5.884E-02
Ventilation Building (at Kowloon for Kowloon Bound Tunnel)	WOPKLVB1	POINTHOR	Horizontal	836759.71	823024.20	96.0	9.50	0.0	13.06	3.95	-	-	1.584E+00	2.239E-01	6.682E-02	6.148E-02
Lion Rock Tunnel (Sha Tin Bound)	WOPSTP1	VOLUME	-	835860.87	824136.94	97.5	3.35	-	-	-	4.28	3.12	1.659E-01	2.414E-02	7.088E-03	6.538E-03
Lion Rock Tunnel (Sha Tin Bound)	WOPSTP2	VOLUME	-	835855.40	824144.34	97.5	3.35	-	-	-	4.28	3.12	1.659E-01	2.414E-02	7.088E-03	6.538E-03
Lion Rock Tunnel (Sha Tin Bound)	WOPSTP3	VOLUME	-	835849.93	824151.73	97.5	3.35	-	-	-	4.28	3.12	1.659E-01	2.414E-02	7.088E-03	6.538E-03
Lion Rock Tunnel (Sha Tin Bound)	WOPSTP4	VOLUME	-	835844.46	824159.13	97.5	3.35	-	-	-	4.28	3.12	1.659E-01	2.414E-02	7.088E-03	6.538E-03
Lion Rock Tunnel (Sha Tin Bound)	WOPSTP5	VOLUME	-	835838.99	824166.53	97.5	3.35	-	-	-	4.28	3.12	1.659E-01	2.414E-02	7.088E-03	6.538E-03
Lion Rock Tunnel (Sha Tin Bound)	WOPSTP6	VOLUME	-	835833.52	824173.92	97.5	3.35	-	-	-	4.28	3.12	1.659E-01	2.414E-02	7.088E-03	6.538E-03
Lion Rock Tunnel (Sha Tin Bound)	WOPSTP7	VOLUME	-	835828.05	824181.32	97.5	3.35	-	-	-	4.28	3.12	8.297E-02	1.207E-02	3.544E-03	3.269E-03
Lion Rock Tunnel (Sha Tin Bound)	WOPSTP8	VOLUME	-	835822.58	824188.72	97.5	3.35	-	-	-	4.28	3.12	8.297E-02	1.207E-02	3.544E-03	3.269E-03
Lion Rock Tunnel (Sha Tin Bound)	WOPSTP9	VOLUME	-	835817.11	824196.11	97.5	3.35	-	-	-	4.28	3.12	8.297E-02	1.207E-02	3.544E-03	3.269E-03
Lion Rock Tunnel (Sha Tin Bound)	WOPSTP10	VOLUME	-	835811.63	824203.51	97.5	3.35	-	-	-	4.28	3.12	8.297E-02	1.207E-02	3.544E-03	3.269E-03
Lion Rock Tunnel (Sha Tin Bound)	WOPSTP11	VOLUME	-	835806.16	824210.91	97.5	3.35	-	-	-	4.28	3.12	8.297E-02	1.207E-02	3.544E-03	3.269E-03
Lion Rock Tunnel (Sha Tin Bound)	WOPSTP12	VOLUME	-	835800.69	824218.30	97.5	3.35	-	-	-	4.28	3.12	8.297E-02	1.207E-02	3.544E-03	3.269E-03
Lion Rock Tunnel (Kowloon Bound)	WOPKLP1	VOLUME	-	836741.38	823035.03	96.0	3.35	-	-	-	4.28	3.12	1.760E-01	2.487E-02	7.425E-03	6.832E-03
Lion Rock Tunnel (Kowloon Bound)	WOPKLP2	VOLUME	-	836744.06	823026.23	96.0	3.35	-	-	-	4.28	3.12	1.760E-01	2.487E-02	7.425E-03	6.832E-03
Lion Rock Tunnel (Kowloon Bound)	WOPKLP3	VOLUME	-	836746.75	823017.43	96.0	3.35	-	-	-	4.28	3.12	1.760E-01	2.487E-02	7.425E-03	6.832E-03
Lion Rock Tunnel (Kowloon Bound)	WOPKLP4	VOLUME	-	836749.43	823008.63	96.0	3.35	-	-	-	4.28	3.12	1.760E-01	2.487E-02	7.425E-03	6.832E-03
Lion Rock Tunnel (Kowloon Bound)	WOPKLP5	VOLUME	-	836752.12	822999.83	96.0	3.35	-	-	-	4.28	3.12	1.760E-01	2.487E-02	7.425E-03	6.832E-03
Lion Rock Tunnel (Kowloon Bound)	WOPKLP6	VOLUME	-	836754.80	822991.03	96.0	3.35	-	-	-	4.28	3.12	1.760E-01	2.487E-02	7.425E-03	6.832E-03
Lion Rock Tunnel (Kowloon Bound)	WOPKLP7	VOLUME	-	836757.48	822982.23	96.0	3.35	-	-	-	4.28	3.12	8.798E-02	1.244E-02	3.712E-03	3.416E-03
Lion Rock Tunnel (Kowloon Bound)	WOPKLP8	VOLUME	-	836760.17	822973.43	96.0	3.35	-	-	-	4.28	3.12	8.798E-02	1.244E-02	3.712E-03	3.416E-03
Lion Rock Tunnel (Kowloon Bound)	WOPKLP9	VOLUME	-	836762.85	822964.63	96.0	3.35	-	-	-	4.28	3.12	8.798E-02	1.244E-02	3.712E-03	3.416E-03
Lion Rock Tunnel (Kowloon Bound)	WOPKLP10	VOLUME	-	836765.54	822955.83	96.0	3.35	-	-	-	4.28	3.12	8.798E-02	1.244E-02	3.712E-03	3.416E-03
Lion Rock Tunnel (Kowloon Bound)	WOPKLP11	VOLUME	-	836768.22	822947.03	96.0	3.35	-	-	-	4.28	3.12	8.798E-02	1.244E-02	3.712E-03	3.416E-03
Lion Rock Tunnel (Kowloon Bound)	WOPKLP12	VOLUME	-	836770.90	822938.23	96.0	3.35	-	-	-	4.28	3.12	8.798E-02	1.244E-02	3.712E-03	3.416E-03

Remarks:
* - Emission rate of point source and volume is in gram per second (g/s)

ISO A1 594mm x 841mm

Approved:

Checked:

Designer:

Project Management Initials:

836500 E

836700 E

836900 E

823200 N

823000 N

822800 N

N

LEGEND:

PROJECT BOUNDARY

WOPKLP1

PORTAL EMISSION (VOLUME SOURCE)

WOPKLVB1

VENTILATION BUILDING EMISSION (POINT SOURCE)

WOPKLP1
WOPKLP2
WOPKLVB1
WOPKLP3
WOPKLP4
WOPKLP5
WOPKLP6
WOPKLP7
WOPKLP8
WOPKLP9
WOPKLP10
WOPKLP11
WOPKLP12

Lion Rock High Level No.2 Primary Service Reservoir

Lion Rock Park
獅子山公園

LUNG CHEUNG ROAD

LION ROCK TUNNEL ROAD

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2022/2/11

AECOM

PROJECT
項目

IMPROVEMENT OF LION ROCK TUNNEL - INVESTIGATION

CLIENT
業主

路政署
HIGHWAYS DEPARTMENT

CONSULTANT
工程顧問公司

AECOM Asia Company Ltd.
www.aecom.com

SUB-CONSULTANTS
分判工程顧問公司

ISSUE/REVISION
修訂

I/R 修訂	DATE 日期	DESCRIPTION 內容摘要	CHK. 核對

STATUS
階段

SCALE
比例

A3 1 : 2000

DIMENSION UNIT
尺寸單位

METRES

KEY PLAN
索引圖

PROJECT NO.
項目編號

60604728

AGREEMENT NO.
協議編號

CE 48/2018(HY)

SHEET TITLE
圖紙名稱

LOCATIONS OF PORTAL EMISSION AND VENTILATION BUILDING IN YEAR 2034 (WITHOUT PROJECT) (KOWLOON SIDE)

SHEET NUMBER
圖紙編號

60604728/SK7128

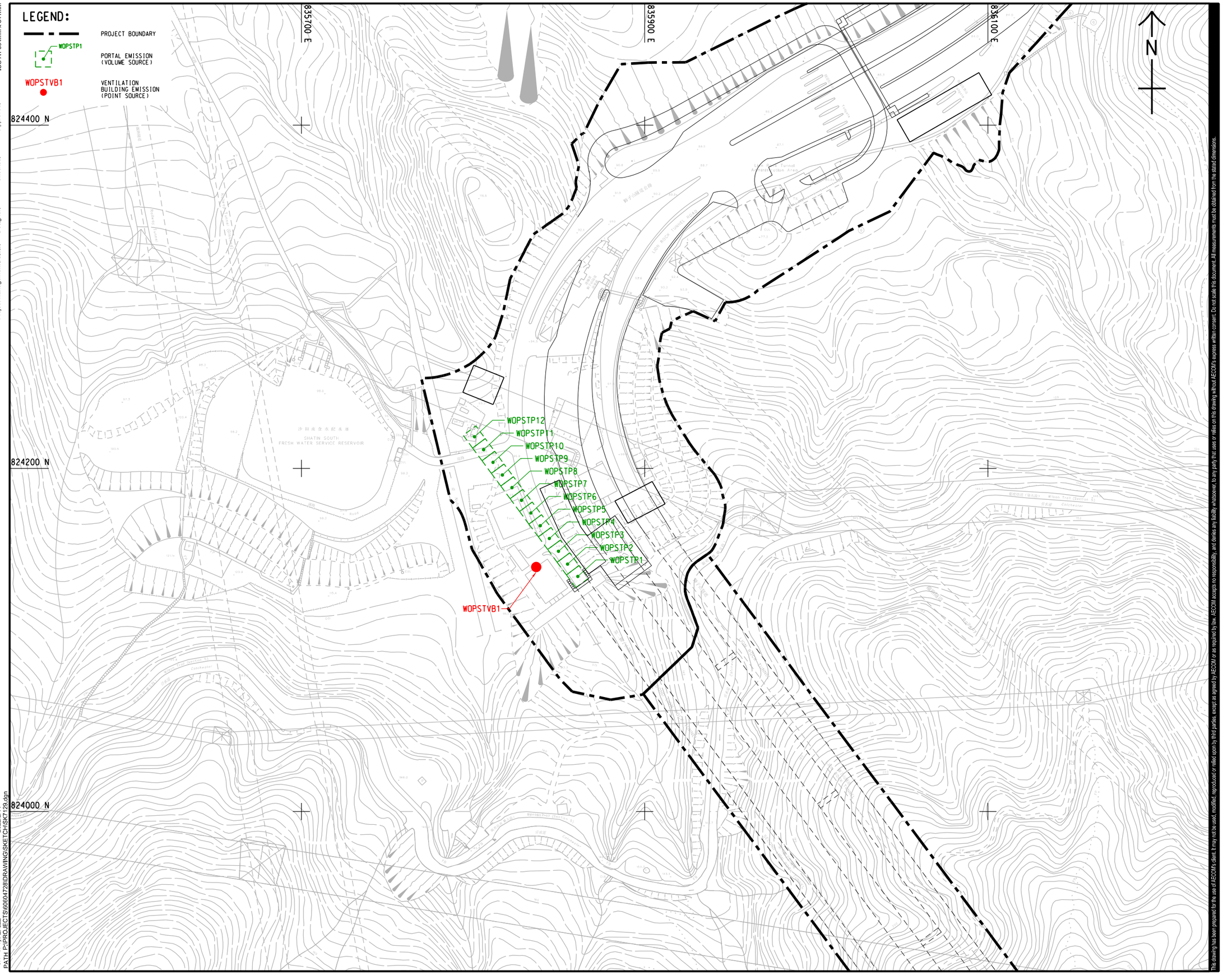
ISO A1 594mm x 841mm

Approved:

Checked:

Designer:

Project Management Initials:



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2022/2/11

AECOM

PROJECT
項目

IMPROVEMENT OF LION ROCK TUNNEL - INVESTIGATION

CLIENT
業主

路政署 HIGHWAYS DEPARTMENT

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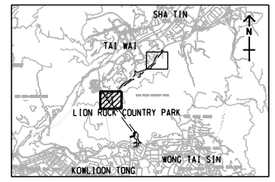
階段

SCALE 比例
A3 1 : 2000

DIMENSION UNIT 尺寸單位
METRES

KEY PLAN A3 1 : 200000
索引圖



PROJECT NO. 項目編號
60604728

AGREEMENT NO. 協議編號
CE 48/2018(HY)

SHEET TITLE
圖紙名稱

LOCATIONS OF PORTAL EMISSION AND VENTILATION BUILDING IN YEAR 2034 (WITHOUT PROJECT) (SHATIN SIDE)

SHEET NUMBER
圖紙編號

60604728/SK7129