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Technical Note

Project title	Selkirk House, 166 High Holborn and 1 Museum Street, 10-12 Museum Street, 35-41 New Oxford Street and 16A-18 West Central Street, London, WC1A 1JR
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This note presents more details on the additional air quality modelling Arup have undertaken to inform the Mechanical, Electrical and Public Health (MEP) strategy.

The dispersion modelling was undertaken at the facades of all buildings in the development at heights to represent the windows at each floor level at each of the buildings. The same receptors have been used as presented in the 2029 analysis that informed the technical note issued on 4 October 2023.

Following the issue of previous report and consultation with LBC on 6 October 2023, a more conservative air quality assessment has been undertaken and which uses current (2022) background pollution levels and vehicle emission factors.

In headline, the results indicate that for the current modelled year (2022):

- $PM_{2.5}$ concentrations on all buildings are above the Camden air quality standard of $10\mu g/m^3$ and the national interim target of $12\mu g/m^3$ (by 2028) due to the already high background pollutant concentrations;
- NO_2 concentrations are above the Camden standard of $38\mu g/m^3$ at levels up to the 8th floor due to the already high background pollutant concentrations; and
- NO_2 concentrations are above the national standard of $40\mu g/m^3$ at buildings fronting New Oxford Street, High Holborn and Museum Street. Concentrations are within 5% of the national standard from the 2nd floor level onwards.

The headline findings for NO_2 concentrations by building are as follows:

- **Buildings fronting New Oxford Street (35-37 and 39-41)**: NO_2 concentrations are above the national air quality standard of $40\mu g/m^3$ and the Camden standard of $38\mu g/m^3$ at all levels. Concentrations are within 5% of the national air quality standard of $40\mu g/m^3$ from the 2nd floor level (8.7m height) onwards.
- **10-12 Museum Street buildings**: NO_2 concentrations are above the national air quality standard of $40\mu g/m^3$ and the Camden standard of $38\mu g/m^3$ at all levels. Concentrations are within 5% of the national air quality standard of $40\mu g/m^3$ from the 2nd floor level (8.7m height) onwards.
- **16A and 16B West Central Street buildings**: NO_2 concentrations below the national air quality standard of $40\mu g/m^3$ at all levels. However, concentrations are above the Camden air quality standard of $38\mu g/m^3$ due to high background concentrations.
- **Vine Lane building**: NO_2 concentrations below the national air quality standard of $40\mu g/m^3$ at all levels. However, concentrations are above the Camden air quality standard of $38\mu g/m^3$ due to high background concentrations.
- **High Holborn building**: NO_2 concentrations are just above (and within 5% of) the national air quality standard of $40\mu g/m^3$ of the and the Camden standard of $38\mu g/m^3$ at all levels.
- **1 Museum Street building**: NO_2 concentrations are below the national air quality standard of $40\mu g/m^3$ along Vine Lane, West Central Street and Museum Street. Concentrations are below the national air quality standard of $40\mu g/m^3$. Except for the façade along High Holborn where NO_2 concentrations are above the national standard from ground to the 5th floor level (22.5m height). Concentrations are above the Camden air quality standard of $38\mu g/m^3$ up to the 11th floor level along High Holborn, Museum Street and West Central Street. Concentrations are above the Camden air quality standard of $38\mu g/m^3$ up to the 9th floor level (35.6m height) along Vine Lane.

1. Model Results

A table is provided for each building façade on site with predicted NO_2 and $PM_{2.5}$ concentrations per floor, colour coded depending on the level against the national or local (Camden) air quality standards. Table 1 presents the key for the colour coding and Table 2 presents the relevant air quality standards.

It should be noted that the ranking of green/amber/green has been done on concentrations calculated in two decimal places, however concentrations are presented in one decimal place and explanations presented as notes at the bottom of each table where required.

Table 3 to

Table 6 present the results for the buildings in the West Central Street block, i.e. 35-37 and 39-41 New Oxford Street, 10-12 Museum Street and 16A/16B West Central Street. Table 7 and 1 Concentration in two decimal places: 12.03 to 12.05 $\mu g/m^3$

Table 8 present the results for the Vine Lane and High Holborn buildings respectively.

Table 9 to

Table 12 present the results for each façade of the 1 Museum Street building.

Table 1: Key for detailed modelling results tables

Colour/Font	Description
Green	Below national and local air quality standard
Amber	Below national and above local air quality standard
Red	Above or equal to the national and local air quality standard
Bold font	More than 5% above national air quality standard

Table 2: Air quality standards

Pollutant	Local	National	National +5%
Nitrogen dioxide (NO_2)	38.0	40.0	42.0
Fine particulate matter ($PM_{2.5}$)	10.0	12.0 [1]	12.6

[1] National interim target by 2028.

Table 3: Predicted concentrations at 35-37 New Oxford Street (West Central Street block) – Modelling point B

Floor	Height (m)	NO_2 ($\mu g/m^3$)	$PM_{2.5}$ ($\mu g/m^3$)
		B	B
3rd	11.7	41.2	12.3
2nd	8.7	41.8	12.4
1st	5.1	**43.2**	12.5
Ground	1.5	**46.1**	**12.9**

Table 4: Predicted concentrations at 39-41 New Oxford Street (West Central Street block) – Modelling point A

Floor	Height (m)	NO_2 ($\mu g/m^3$)	$PM_{2.5}$ ($\mu g/m^3$)
		A	A
3rd	11.7	41.4	12.4
2nd	8.7	41.9	12.4
1st	5.1	**43.2**	**12.6**
Ground	1.5	**45.2**	**12.8**

Table 5: Predicted concentrations at 10-12 Museum Street (West Central Street block) – Modelling points C/D

Floor	Height (m)	NO$_2$ (µg/m³)		PM$_{2.5}$ (µg/m³)	
		C	D	C	D
3rd	11.7	41.2		12.3	
2nd	8.7	41.5		12.4	
1st	5.1	**42.4**		12.5	
Ground	1.5	**43.5**	**43.4**	**12.6**	

Table 6: Predicted concentrations at 16A and 16B West Central Street (West Central Street block) – Modelling points E/F/G

Floor	Height (m)	NO$_2$ (µg/m³)			PM$_{2.5}$ (µg/m³)		
		E	F	G	E	F	G
5th	17.7		38.2	38.3		12.0 [1]	
4th	14.7	38.3			12.0 [1]		
3rd	11.7	38.3			12.0 [1]		
2nd	8.7	38.4			12.1		
1st	5.1	38.5			12.1		
Ground	1.5	38.6		38.7	12.1		

[1] Concentration in two decimal places: 12.04 to 12.05 µg/m³

Table 7: Predicted concentrations at Vine Lane building – Modelling points H/I/J

Floor	Height (m)	NO$_2$ (µg/m³)			PM$_{2.5}$ (µg/m³)		
		H	I	J	H	I	J
5th	18.7		38.1			12.0 [1]	
4th	15.4	38.3	38.1		12.0 [1]		
3rd	12.1	38.4	38.2		12.1		12.0 [1]
2nd	8.8	38.4	38.2		12.1		12.0 [1]
1st	5.5	38.5	38.2		12.1		12.0 [1]
Ground	1.5	38.6	38.3		12.1		12.0 [1]

[1] Concentration in two decimal places: 12.03 to 12.05 µg/m³

Table 8: Predicted concentrations at High Holborn building – Modelling point K

Floor	Height (m)	NO$_2$ (µg/m^3)	PM$_{2.5}$ (µg/m^3)
		K	K
5th	18.3	40.5	12.3
4th	15.1	41.1	12.3
3rd	11.9	41.4	12.4
2nd	8.7	41.8	12.4
1st	5.5	**42.2**	12.5
Ground	1.5	**42.6**	12.5

Table 9: Predicted concentrations at 1 Museum Street building (Vine Lane façade) – Modelling point L

Floor	Height (m)	NO$_2$ (µg/m^3)	PM$_{2.5}$ (µg/m^3)
		L	L
18th	68.6	37.8	12.0[3]
17th	64.8	37.8	12.0[3]
16th	61.2	37.8	12.0[3]
15th	57.6	37.9	12.0[3]
14th	54.0	37.9	12.0[3]
13th	50.4	37.9	12.0[3]
12th	46.8	37.9	12.0[3]
11th	43.2	38.0[1]	12.0[3]
10th	39.2	38.0[1]	12.0[3]
9th	35.6	38.0[1]	12.0[3]
8th	32.0	38.0[2]	12.0[3]
7th	28.4	38.0[2]	12.0[3]
6th	24.9	38.1	12.0[3]
5th	21.2	38.1	12.0[3]
4th	17.2	38.1	12.0[3]

Floor	Height (m)	NO$_2$ (µg/m^3) L	PM$_{2.5}$ (µg/m^3) L
3rd	13.6	38.1	12.0[3]
2nd	10.0	38.2	12.0[3]
1st	6.4	38.2	12.0[3]
Ground	1.5	38.3	12.0[3]

[1] Concentration in two decimal places: 37.95 to 37.99 µg/m^3
[2] Concentration in two decimal places: 38.01 to 38.03 µg/m^3
[3] Concentration in two decimal places: 12.00 to 12.04 µg/m^3

Table 10: Predicted concentrations at 1 Museum Street building (West Central Street façade) – Modelling points M/N

Floor	Height (m)	NO$_2$ (µg/m^3) M	NO$_2$ (µg/m^3) N	PM$_{2.5}$ (µg/m^3) M	PM$_{2.5}$ (µg/m^3) N
18th	68.7		37.8		12.0[2]
17th	64.9		37.8		12.0[2]
16th	61.3		37.8		12.0[2]
15th	57.7		37.9		12.0[2]
14th	54.1		37.9		12.0[2]
13th	50.5		37.9		12.0[2]
12th	46.9		37.9		12.0[2]
11th	43.3		37.9		12.0[2]
10th	39.3	38.0[1] (spanning M/N)		12.0[3] (spanning M/N)	
9th	35.7	38.1 (spanning M/N)		12.0[3] (spanning M/N)	
8th	32.1	38.1 (spanning M/N)		12.0[3] (spanning M/N)	
7th	28.5	38.1 (spanning M/N)		12.0[3] (spanning M/N)	
6th	24.9	38.1 (spanning M/N)		12.0[3] (spanning M/N)	
5th	21.3	38.3	12.0[3]	12.0[2] (spanning M/N)	
4th	17.3	38.3 (spanning M/N)		12.0[3] (spanning M/N)	
3rd	13.7	38.3 (spanning M/N)		12.0[3] (spanning M/N)	
2nd	10.1	38.4	12.0[3]	12.0[3] (spanning M/N)	

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Floor	Height (m)	NO$_2$ (µg/m³)		PM$_{2.5}$ (µg/m³)	
		M	**N**	**M**	**N**
1st	6.5	38.4		12.1	
Ground	1.5	38.7		12.1	

[1] Concentration in two decimal places: 38.02 to 38.03 µg/m³
[2] Concentration in two decimal places: 12.00 to 12.01 µg/m³
[3] Concentration in two decimal places: 12.02 to 12.05 µg/m³

Table 11: Predicted concentrations at 1 Museum Street building (Museum Street façade) – Modelling points O/P

Floor	Height (m)	NO$_2$ (µg/m³)		PM$_{2.5}$ (µg/m³)	
		O	**P**	**O**	**P**
18th	68.7	37.8		12.0[3]	
17th	64.9	37.8		12.0[3]	
16th	61.3	37.8		12.0[3]	
15th	57.7	37.9		12.0[3]	
14th	54.1	37.9		12.0[3]	
13th	50.5	37.9		12.0[3]	
12th	46.9	37.9		12.0[3]	
11th	43.3	38.0[1]		12.0[3]	
10th	39.3	38.0[2]		12.0[3]	
9th	35.7	38.0[2]		12.0[3]	
8th	32.1	38.0[2]		12.0[3]	
7th	28.5	38.0[2]		12.0[3]	
6th	24.9	38.0[2]		12.0[3]	
5th	21.3	38.1		12.0[3]	
4th	17.3	38.1		12.0[3]	
3rd	13.7	38.1		12.0[3]	
2nd	10.1	38.1	38.2	12.0[3]	
1st	6.5	38.2		12.0[3]	
Ground	1.5	38.3		12.0[3]	

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[1] Concentration in two decimal places: 37.96 to 37.98 µg/m³
[2] Concentration in two decimal places: 38.01 to 38.04 µg/m³
[2] Concentration in two decimal places: 12.00 to 12.05 µg/m³

Table 12: Predicted concentrations at 1 Museum Street building (High Holborn façade) – Modelling points Q/R

Floor	Height (m)	NO₂ (µg/m³)		PM₂.₅ (µg/m³)	
		Q	R	Q	R
18th	69.9	37.8		12.0[3]	
17th	66.1	37.8		12.0[4]	
16th	62.5	37.8		12.0[4]	
15th	58.9	37.9		12.0[4]	
14th	55.3	37.9		12.0[4]	
13th	51.7	37.9		12.0[4]	
12th	48.1	38.0[1]		12.0[4]	
11th	44.5	38.0[1]		12.0[5]	
10th	40.5	38.0[2]		12.0[5]	
9th	36.9	38.0[2]	39.1	12.0[5]	12.1
8th	33.3	38.1	39.2	12.0[5]	12.1
7th	29.7	38.1	39.3	12.0[5]	12.1
6th	26.1	38.2	39.4	12.0[5]	12.2
5th	22.5	38.4	39.8	12.0[5]	12.2
4th	18.5	38.5	40.4	12.0[5]	12.3
3rd	14.9	38.3	41.1	12.0[5]	12.3
2nd	11.3	38.2	41.5	12.0[5]	12.4
1st	7.7	38.2	41.9	12.0[5]	12.4
Ground	1.5	38.5	**42.7**	12.1	12.5

[1] Concentration in two decimal places: 37.95 to 37.99 µg/m³
[2] Concentration in two decimal places: 38.01 to 38.04 µg/m³
[3] Concentration in two decimal places: 11.99 µg/ m³
[4] Concentration in two decimal places: 12.00 to 12.01 µg/m³
[5] Concentration in two decimal places: 12.00 to 12.04 µg/m³