

32 Willoughby Road

Ground Movement Assessment
(September 2024)

Prepared for Mr Jimeet Patel

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Approved by				

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Appendix 1: XDisp Output

1 Introduction

1.1 Ground Movement Assessment

A new basement is proposed below the property at 32 Willoughby Road. The overall dimensions of the basement are 20.19m x 5.72m. The depth of the underside of the basement is 4.055m below existing ground level.

The front part of the basement will be constructed by underpinning the existing property. The rear part of the basement will be constructed in open cut with the party wall with No 30 Willoughby Road being supported with two stage underpinning and the north and eastern faces being supported with an embedded retaining wall.

Figure 1.1-1: Plan of Proposed Basement

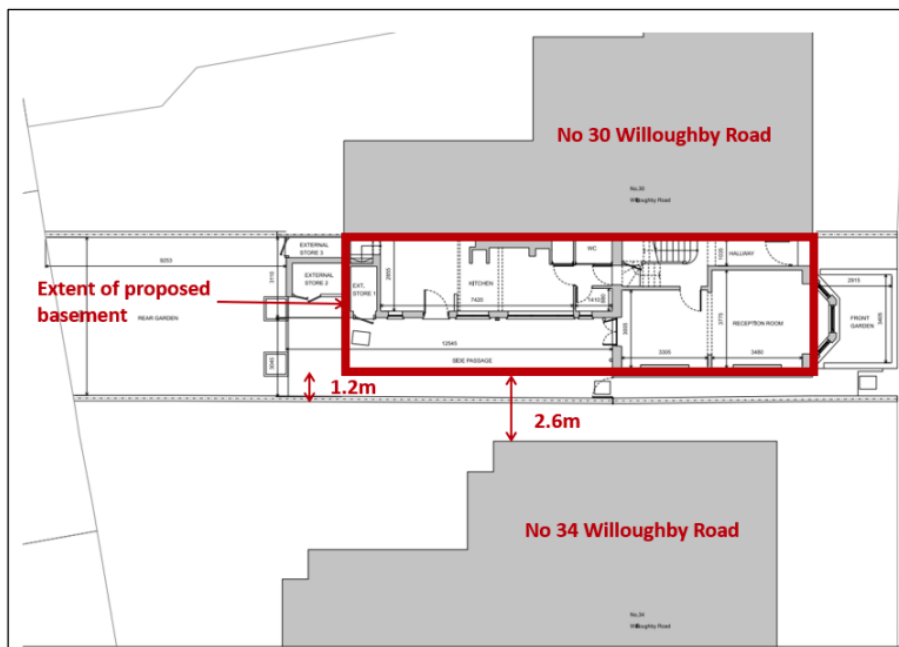
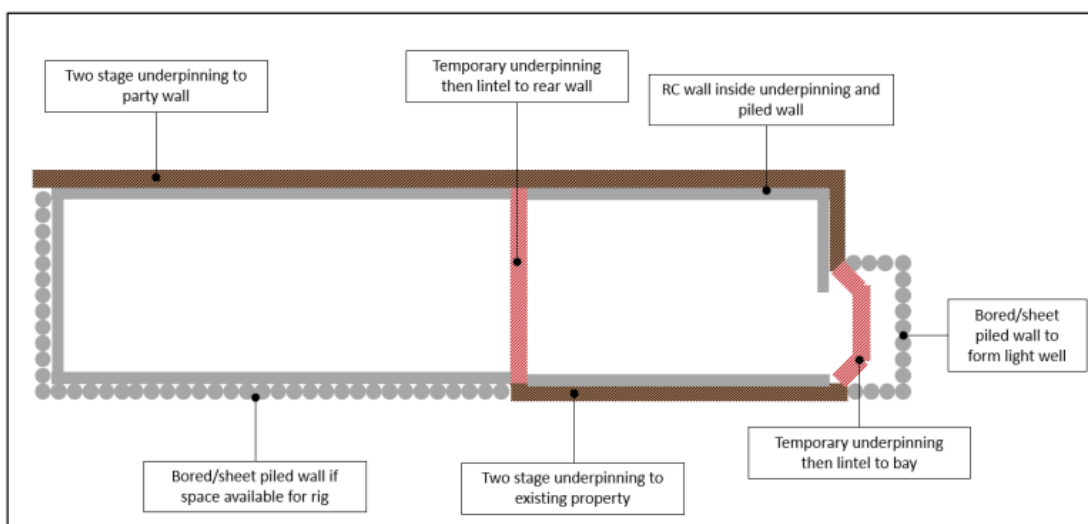


Figure 1.1-2: Plan of Proposed Retaining Walls



2 Ground Movement Assessment

2.1 Proposed Installation Sequence

Figure 2.1-1: Stage 1 – Installation of Propping at Existing Ground Floor Level

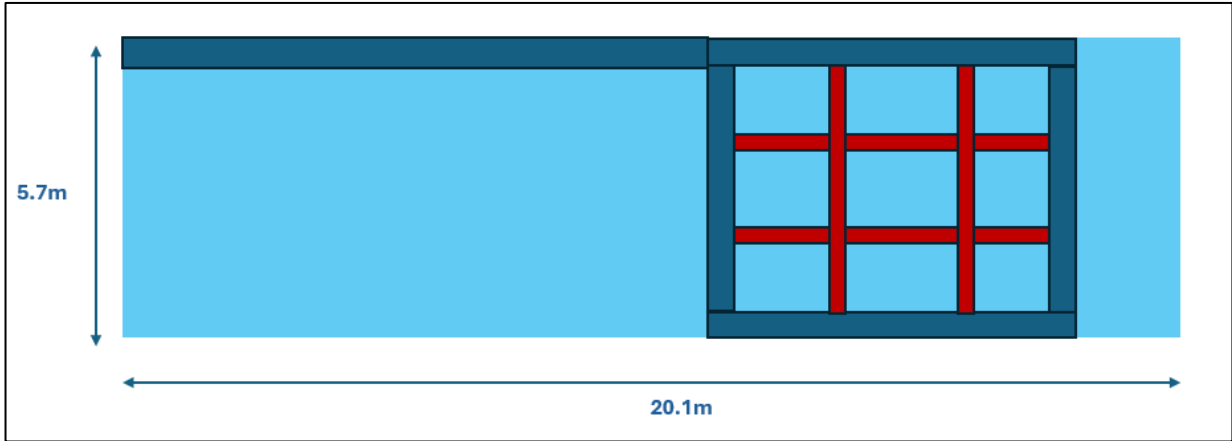


Figure 2.1-2: Stage 2 – Installation of Underpins to Existing Property

Note – upper props are omitted for clarity. Lower props installed as excavation proceeds.

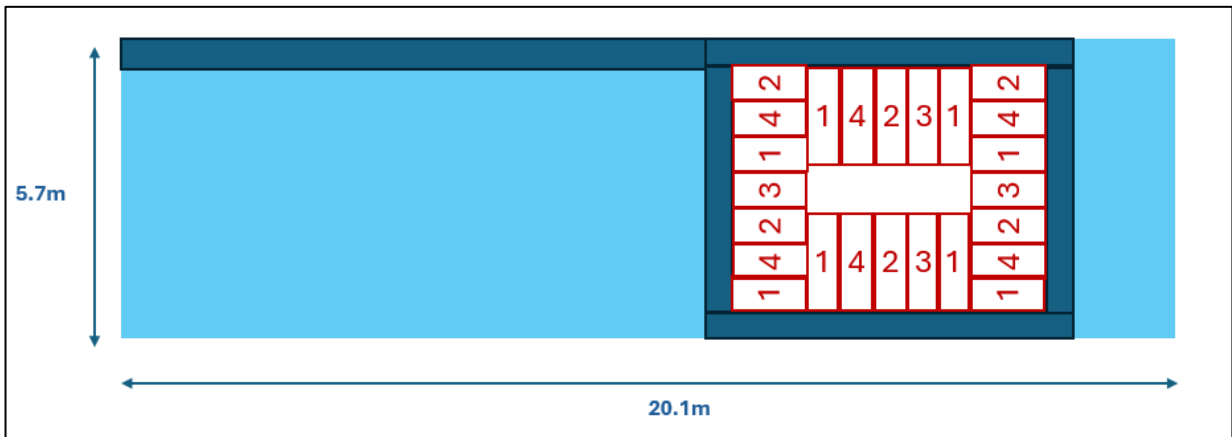


Figure 2.1-3: Stage 3 – Completion of Lower Level Propping

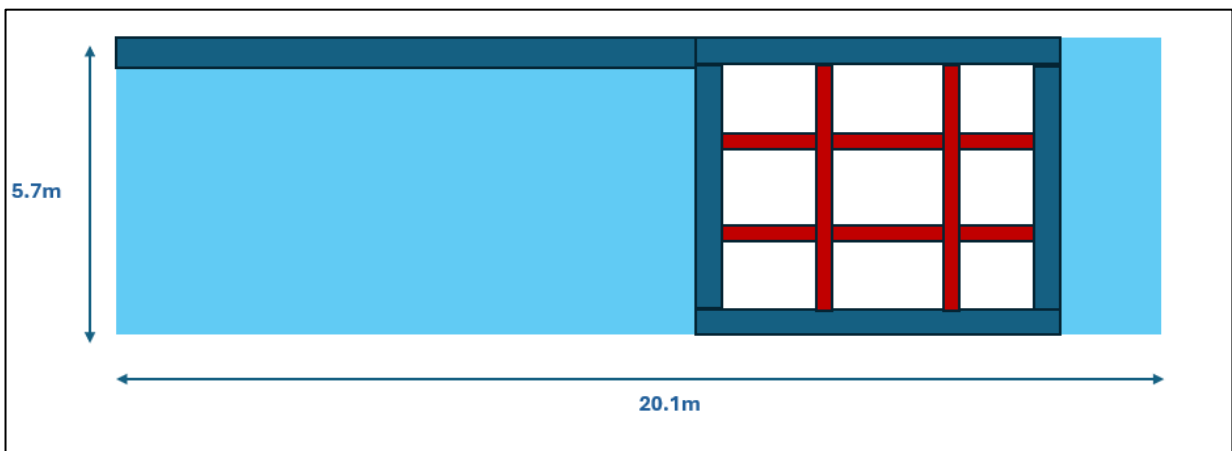


Figure 2.1-4: Stage 3 – Installation of CFA/Sheet Piling and Ground Level Propping

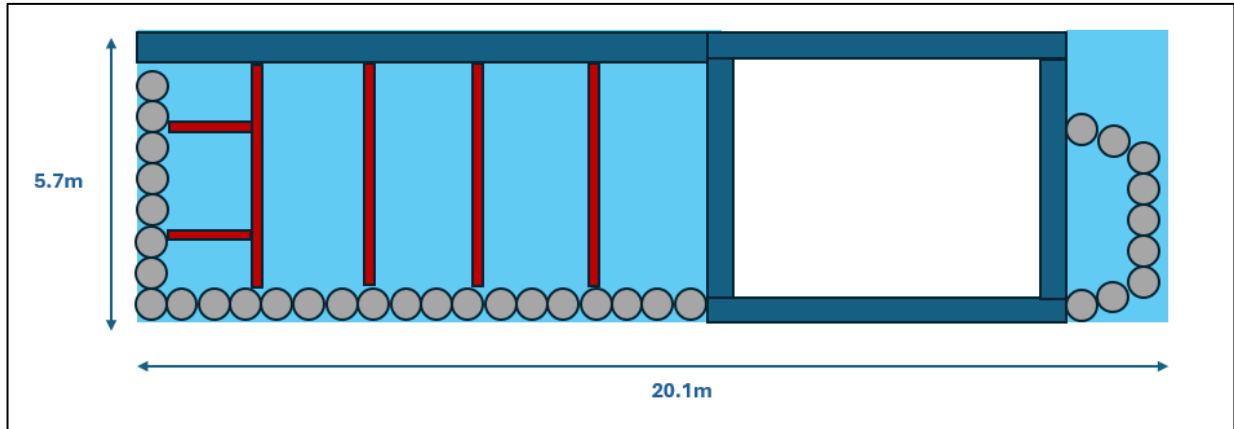


Figure 2.1-5: Stage 3 – Installation of Underpins to Rear Party Wall

Note – propping omitted for clarity.

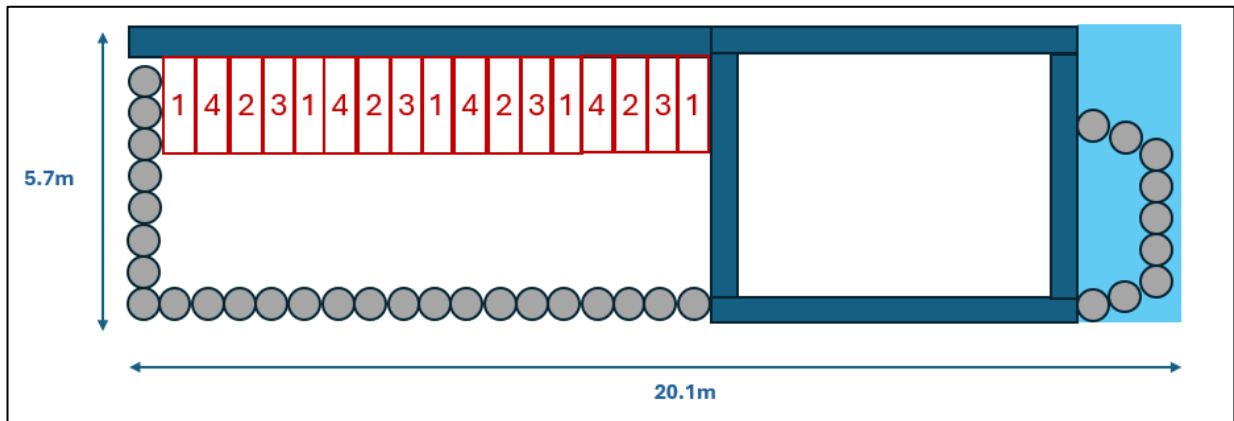
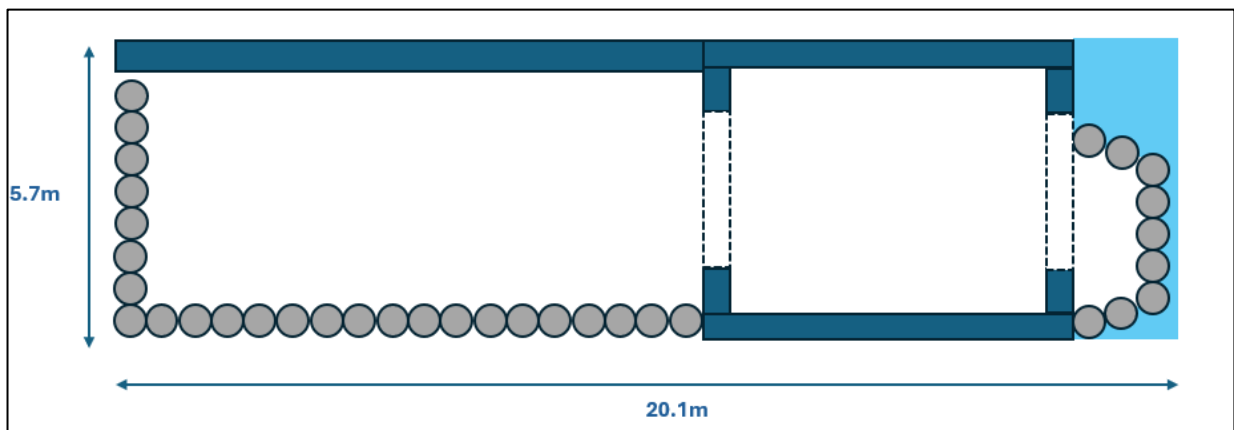


Figure 2.1-6: Stage 3 – Completion of Excavation and Installation of Lintels



2.2 Ground Movement Due to Excavation

CIRIA C760 provides displacement data collected from a range of projects. The data are used to assess the likely ground movements that could be anticipated from the excavation works. The pre-programmed displacement curves provided in PDisp are for high stiffness walls in stiff clay and low stiffness walls in stiff clay.

The movements calculated using the high stiffness wall data are considered to be too low for two stage underpinning and the movements calculated using the low stiffness wall data are considered to be too high. Therefore, a displacement curve for an intermediate stiffness wall has been developed to determine the horizontal displacement behind the wall. This is an intermediate version of the curve for ground movement as a result of excavation in front of a low stiffness wall in clay (Fig. 6.15a in C760) and ground movement as a result of excavation in front of a high stiffness wall in clay (Fig. 6.15a in C760).

Immediately behind the wall the horizontal movement is estimated to be 0.3% of the excavation depth reducing to zero at four times the maximum excavation depth.

To calculate the vertical displacement due to the excavation another intermediate curve was developed. This was again based on the curves for ground movement as a result of excavation in front of a high and low stiffness wall in clay provided in CIRIA C760 (Fig. 6.15b). The vertical displacement is assumed to be 0.26% of the wall height immediately behind the wall reducing to zero at 3.5 times the excavation depth behind the wall.

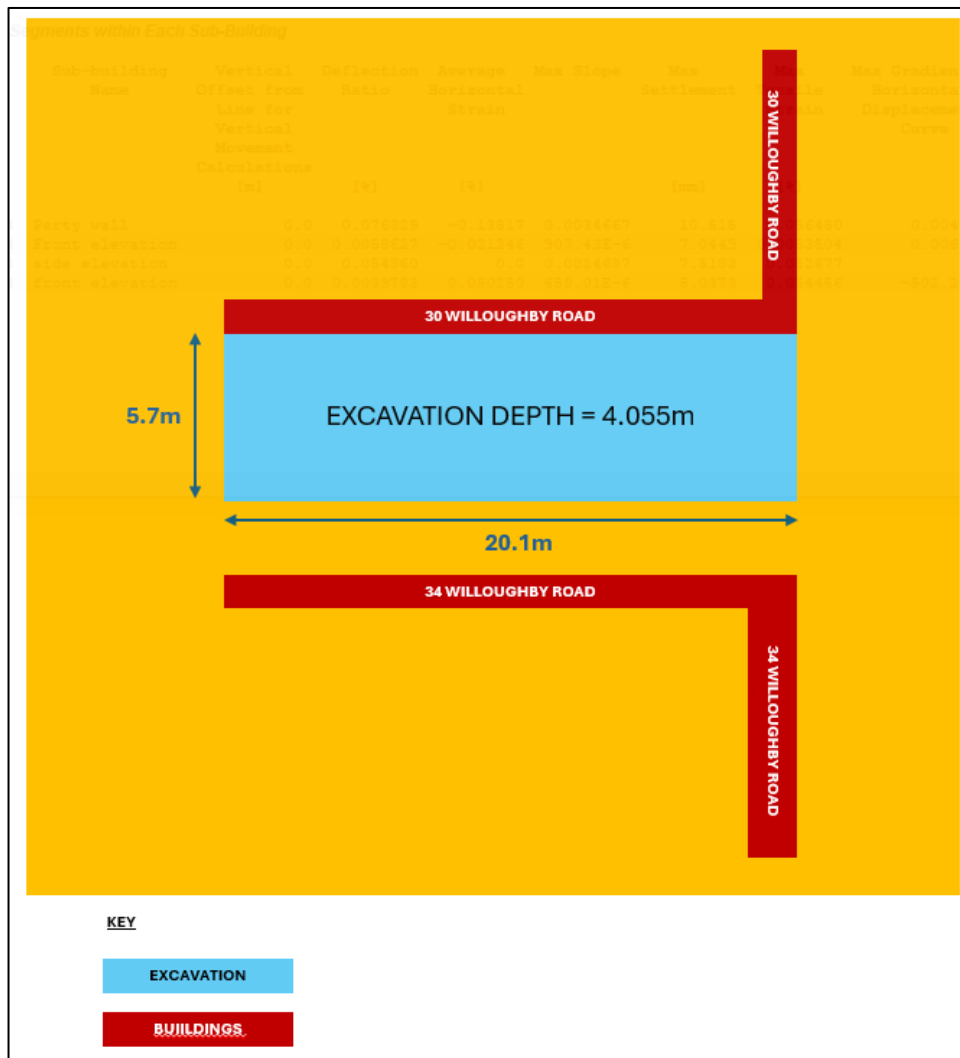
Table 2.2-1: Summary of Excavation Ground Movement Curves

Wall Type	Movement Curve	Horizontal Movement at Wall Face (H)	Max distance affected	Vertical Movement at Wall Face (V)	Max distance affected
Excavation in front of a high stiffness wall in stiff clay	CIRIA C760 Fig 6.15a, 6.15b	H/D = 0.15% (6mm)	Affected distance / D = 4 (16.22m)	V/D = 0.075% (3mm)	Affected distance / D = 4 (16.22m)
Excavation in front of a low stiffness wall in stiff clay	CIRIA C580 Fig 2.11a, 2.11b	H/D = 0.4% (16mm)	Affected distance / D = 4 (16.22m)	V/D = 0.35% (14mm)	Affected distance / D = 4 (16.22m)
Excavation in front of a low stiffness wall in stiff clay	CIRIA C760 Fig 6.15a, 6.15b	H/D = 0.4% (16mm)	Affected distance / D = 4 (16.22m)	V/D = 0.35% (14mm)	Affected distance / D = 3.5 (14.19m)
Excavation in front of an intermediate stiffness wall in stiff clay	User defined	H/D = 0.3% (12mm)	Affected distance / D = 4 (16.22m)	V/D = 0.26% (10mm)	Affected distance / D = 3.5 (14.19m)

2.3 Ground Movement Model

The following model will be used to assess the ground movement. The building positions are modelled to assess the potential damage caused by the ground movement.

Figure 2.3-1: Ground Movement Model



2.4 Corner Stiffening

The ground movement curves are considered to represent a 100% ground movement profile. However, this is not really true for retained cut excavations (for instance basement excavations), as there is increased stiffness at corners. From case studies, it has been observed that such effects result in smaller ground movements. XDisp considers such corner effects and adjusts the ground movement based on the method suggested by Fuentes and Devriendt. This method works for all corners except for re-entrant corners. Re-entrant corners of excavations are corners with internal angles greater than 180°.

2.5 Results of Ground Movement Assessment

The maximum vertical displacement calculated is approximately 10mm immediately behind the excavation. The maximum horizontal displacement calculated is approximately 12.5 mm immediately behind the excavation.

Figure 2.5-1: Horizontal Displacement Due to Excavation

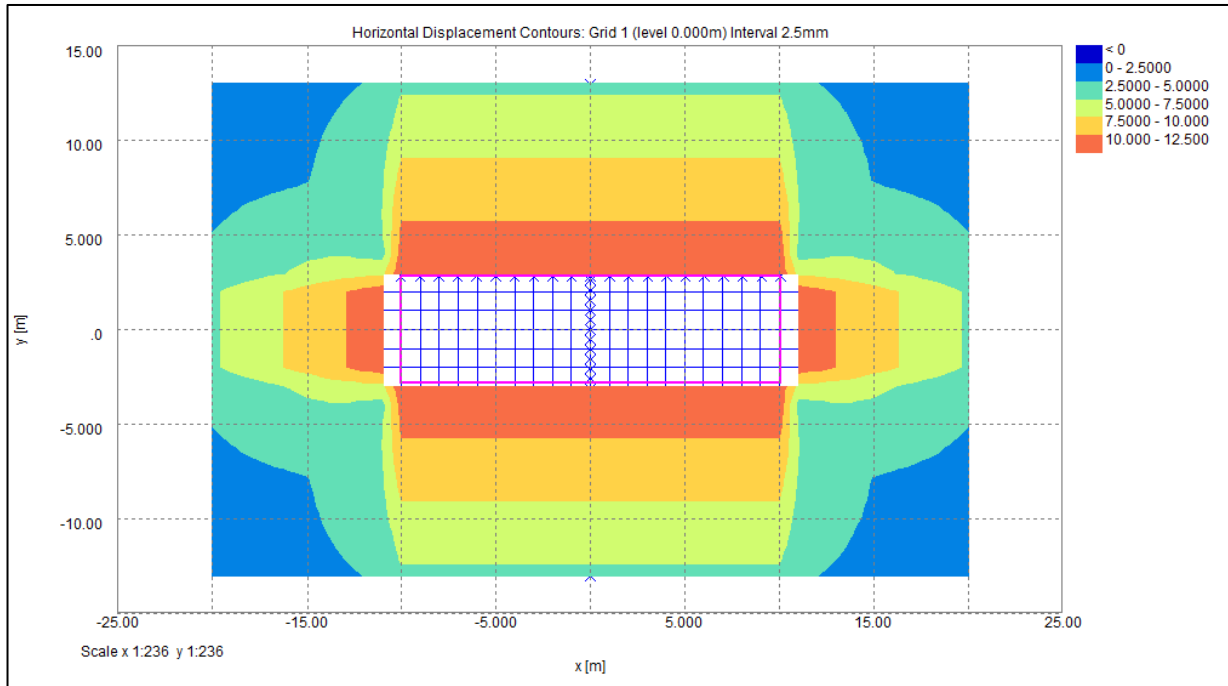
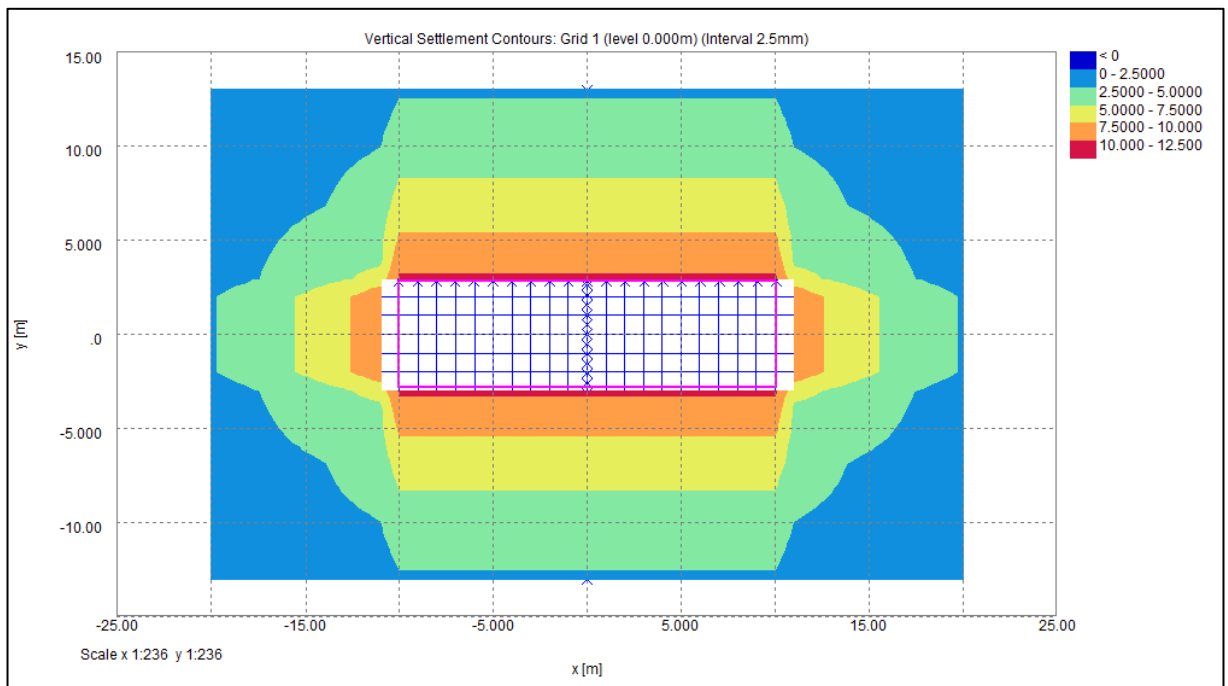


Figure 2.5-2: Vertical Displacement Due to Excavation



2.6 Ground Movement Due to Installation of Bored Piles

The vertical and horizontal ground movement around the excavation has been calculated using Oasys Xdisp 20.2. The software calculates displacements due to installation of replacement type retaining walls and excavations in the ground. It uses empirical methods to determine the magnitude of displacements.

Soil displacements are calculated using a range of pre-programmed displacement curves for the soil type and excavation support. The curves for installation of replacement type walls are shown in the table below. As highlighted, the maximum horizontal and vertical movement for a secant or bored pile replacement wall in stiff clay is 3mm at the rear of the wall. No 34 Willoughby Road is 2.6m from the excavation so any movement due to installation would be negligible.

Table 2.6-1: Summary of Installation Ground Movement Curves

Wall Type	Movement Curve	Horizontal Movement at Wall Face (H)	Max distance affected	Vertical Movement at Wall Face (V)	Max distance affected
Installation of contiguous bored piles in stiff clay	CIRIA C580 Fig 2.8a, 2.8b	H/D = 0.04% (2mm)	Affected distance / D = 1.5 (6.08m)	V/D = 0.04% (2mm)	Affected distance / D = 2 (8.11m)
Installation of contiguous bored piles in stiff clay	CIRIA C760 Fig 6.8a, 6.8b	H/D = 0.04% (2mm)	Affected distance / D = 1.5 (6.08m)	V/D = 0.04% (2mm)	Affected distance / D = 2 (8.11m)
Installation of secant bored piles in stiff clay	CIRIA C580 Fig 2.8a, 2.8b	H/D = 0.08% (3mm)	Affected distance / D = 1.5 (6.08m)	V/D = 0.05% (2mm)	Affected distance / D = 2 (8.11m)
Installation of secant bored piles in stiff clay	CIRIA C760 Fig 6.8a, 6.8b	H/D = 0.08% (3mm)	Affected distance / D = 1.5 (6.08m)	V/D = 0.05% (2mm)	Affected distance / D = 2 (8.11m)
Installation of planar diaphragm wall in stiff clay	CIRIA C580 Fig 2.9a, 2.9b	H/D = 0.05% (2mm)	Affected distance / D = 1.5 (6.08m)	V/D = 0.05% (2mm)	Affected distance / D = 1.5 (6.08m)
Installation of planar diaphragm wall in stiff clay	CIRIA C760 Fig 6.9a, 6.9b	H/D = 0.05% (2mm)	Affected distance / D = 1.5 (6.08m)	V/D = 0.05% (2mm)	Affected distance / D = 1.5 (6.08m)
Installation of counterfort diaphragm wall in stiff clay	CIRIA C580 Fig 2.9a, 2.9b	H/D = 0.10% (4mm)	Affected distance / D = 1.5 (6.08m)	V/D = 0.05% (2mm)	Affected distance / D = 1.5 (6.08m)

Installation of counterfort diaphragm wall in stiff clay	CIRIA C760 Fig 6.9a, 5.9b	H/D = 0.10% (4mm)	Affected distance / D = 1.5 (6.08m)	V/D = 0.05% (2mm)	Affected distance / D = 1.5 (6.08m)
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Figure 2.6-1: Horizontal Displacement Due to Installation of a Contiguous Bored Pile Wall

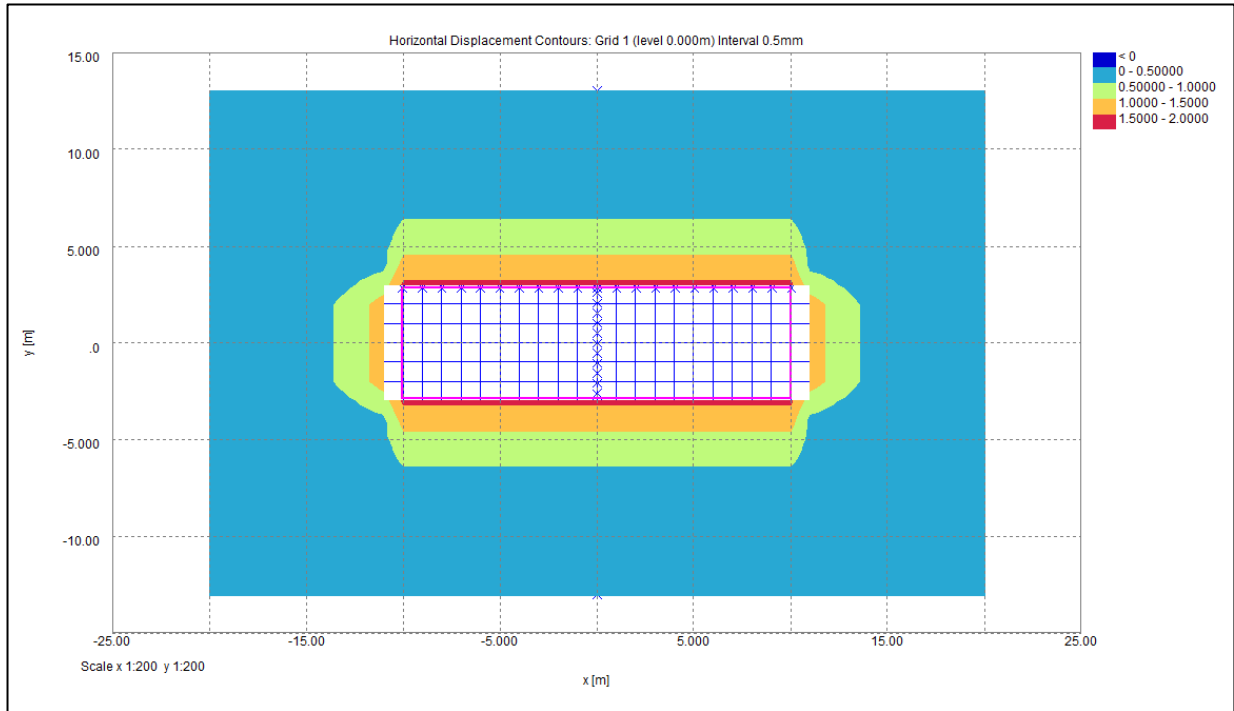
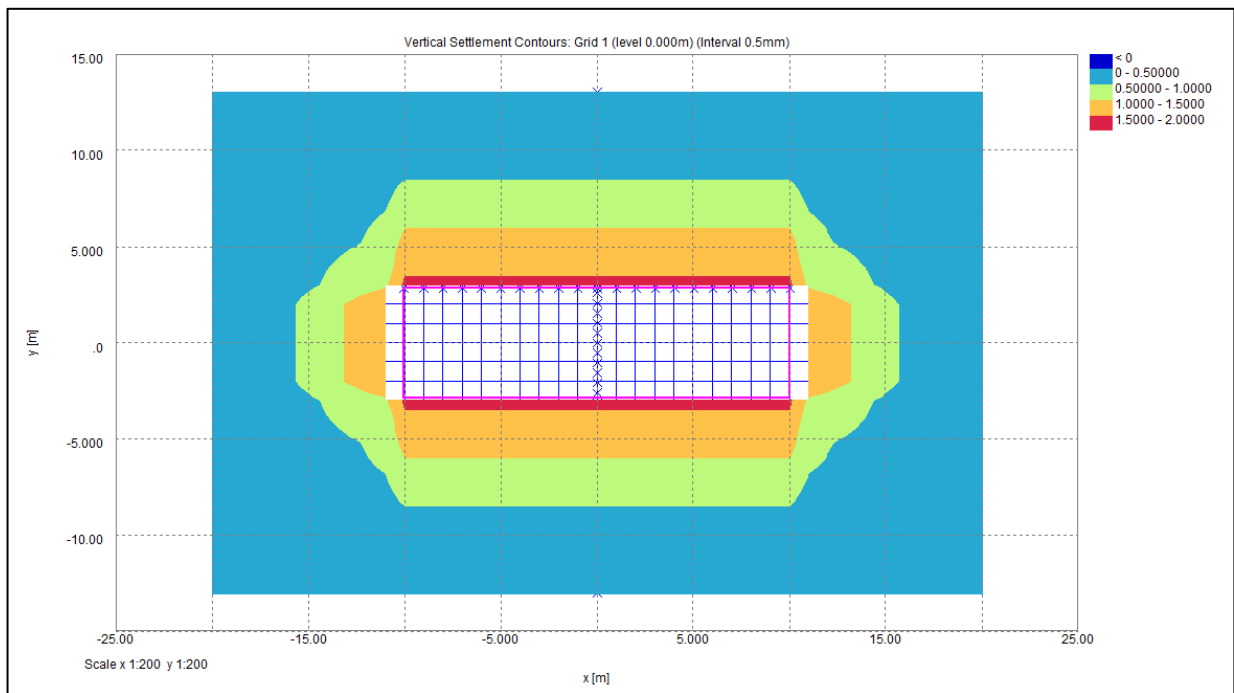


Figure 2.6-2: Vertical Displacement Due to Installation of a Contiguous Bored Pile Wall



2.7 Burland Damage Assessment

The building damage assessment has been performed using the Burland assessment method. XDisp calculates the tensile strains that will occur in specific building elevations. The tensile strains are classified into six categories from Negligible (limiting tensile strain <0.05%) to Very Severe (limiting tensile strain >0.3%).

The following inputs are provided for the structural elements:

Poisson's Ratio = 0.2 (recommended in the Xdisp user manual)

E/G = 2.6 (recommended in the Xdisp user manual for masonry)

Figure 2.7-1: Summary of Burland Damage Assessment

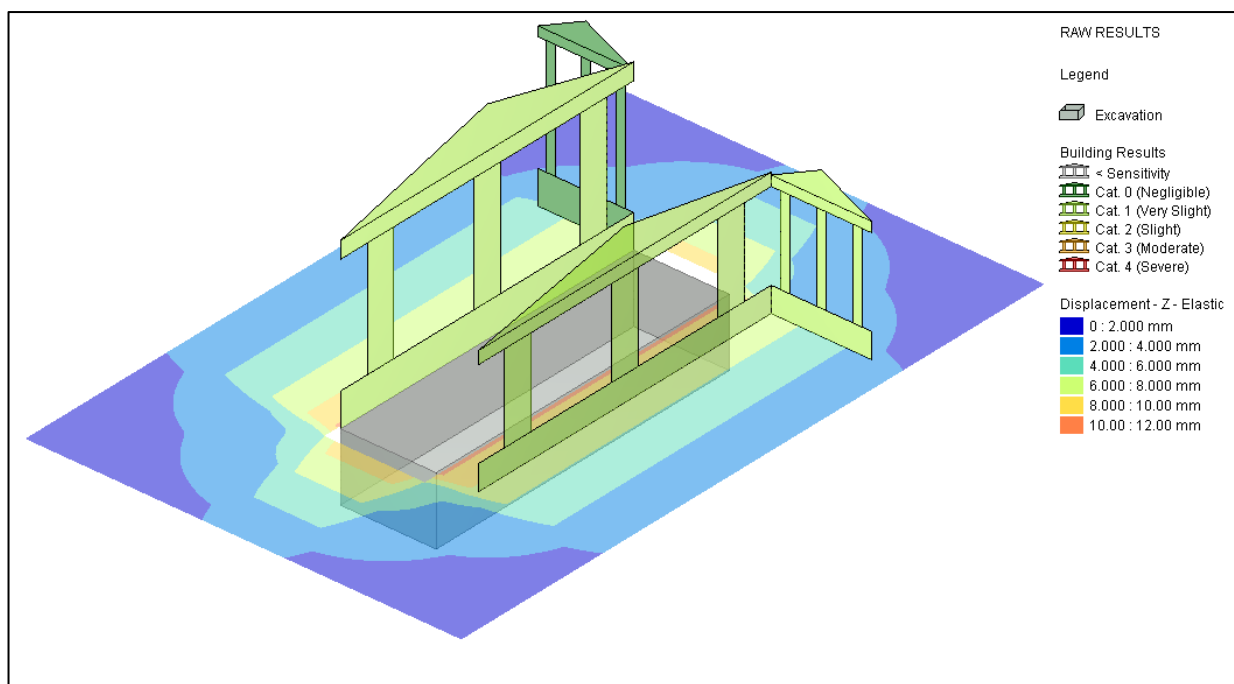


Table 2.7-1: Summary of Burland Damage Assessment

Property	Element	Maximum X Direction Movement (mm)	Maximum Y Direction Movement (mm)	Maximum Horizontal Movement (mm)	Maximum Vertical Movement (mm)	Damage Category
30 Willoughby Road	Party wall	10.05	2.85	12.17	10.52	Very slight

30 Willoughby Road	Front elevation	10.05	8.55	7.86	7.04	Negligible
34 Willoughby Road	Front elevation	10.05	11.35	6.89	5.04	Very slight
34 Willoughby Road	Side elevation	10.05	5.35	10.29	7.52	Very slight

Appendix 1: XDisp Output

Job No.	Sheet No.	Rev.
8271		
Drg. Ref.		
Made by DJH	Date 05-Sep-2024	Checked Date

Titles

Job No.: 8271
Job Title: 32 Willoughby Road
Sub-title: Basement Assessment
Calculation Heading: Excavation Movement
Initials: DJH
Checker:
Date Saved: 05-Sep-2024
Date Checked:
Notes:
File Name: XDisp1_willoughby_additional displacement 4.xdd
File Path: C:\Users\ david.halifax\Richter Associates\Richter - 8271\001
 Basement Impact Assessment\4-Calc_RA\1-Analysis

History

Date	Time	By	Notes
18-Oct-2023	10:09	david.halifax	New
18-Oct-2023	10:17	david.halifax	
18-Oct-2023	10:31	david.halifax	
18-Oct-2023	14:08	david.halifax	
18-Oct-2023	14:30	david.halifax	
24-Oct-2023	16:39	david.halifax	
24-Oct-2023	18:08	david.halifax	
25-Oct-2023	11:14	david.halifax	
08-Mar-2024	14:23	GregorisKoushiappas	
12-Aug-2024	16:16	david.halifax	
12-Aug-2024	16:41	david.halifax	
12-Aug-2024	17:25	david.halifax	
13-Aug-2024	09:57	david.halifax	
21-Aug-2024	10:49	david.halifax	
21-Aug-2024	11:04	david.halifax	
22-Aug-2024	16:24	david.halifax	
22-Aug-2024	17:16	david.halifax	
05-Sep-2024	13:51	david.halifax	
05-Sep-2024	15:23	david.halifax	

Displacement Lines

Ref.	Name	x1	y1	z1	x2	y2	z2	Intervals	Surface	type	imported
Interpolate	Calculate									for	
displacements											
		[m]	[m]	[m]	[m]	[m]	[m]	[No.]		tunnels	
1	Displacement Line 1	10.05000	2.85000	0.00000	-10.05000	2.85000	0.00000	20	Surface	Yes	Yes
2	Displacement Line 2	10.05000	2.85000	0.00000	10.05000	8.55000	0.00000	10	Surface	Yes	Yes
3	Displacement Line 3	-10.05000	-5.35000	0.00000	10.05000	-5.35000	0.00000	20	Surface	Yes	Yes
4	Displacement Line 4	10.05000	-5.35000	0.00000	10.05000	-11.35000	0.00000	10	Surface	Yes	Yes
5	Displacement Line 5	0.00000	-13.00000	0.00000	0.00000	13.00000	0.00000	50	Surface	Yes	Yes

Displacement Grids

Ref.	Name	Extrusion:	Base line	Base line	Base	Base	Base	Base	Base	Extrusion:
Extrusion:	Surface	Calculate								Distance
Intervals	type	Direction	start: X	start: Y	line	line	line	line	line:	
for			start:	end:	end: Y	end:	end:	Intervals		
			Z (level)	X	Z (level)					

Job No.	Sheet No.	Rev.
8271		
Drg. Ref.		
Made by DJH	Date 05-Sep-2024	Checked Date

tunnels

[No.]		[m]	[m]	[m]	[m]	[m]	[m]	[m]	[No.]	[m]
1	Displacement Grid 1	Global X	-20.00000	-13.00000	0.00000	-	13.00000	0.00000	26	40.00000
40	Surface	Yes								

Polygonal Excavations

Ref. 1
Excavation Name: Basement Excavation
Surface level [m]: 0.0
Contribution: Positive

Corner	x	y	Base Level	Arc Enabled	Stiffened	Prev. Side: d	Prev. Side: p1 [%]	Prev. Side: p2* [%]	Next Side: d	Next Side: p1 [%]	Next Side: p2* [%]
	[m]	[m]	[m]			[m]			[m]		
1	-10.050	-2.8500	-4.0550	Yes	Yes	0.0	67.000	25.000	0.0	67.000	25.000
2	2.0500	-2.8500	-4.0550	Yes	Yes	0.0	67.000	25.000	0.0	67.000	25.000
3	10.050	-2.8500	-4.0550	Yes	Yes	0.0	67.000	25.000	0.0	67.000	25.000
4	10.050	2.8500	-4.0550	Yes	Yes	0.0	67.000	25.000	0.0	67.000	25.000
5	-10.050	2.8500	-4.0550	Yes	Yes	0.0	67.000	25.000	0.0	67.000	25.000

Side	x1 [m]	y1 [m]	x2 [m]	y2 [m]	G.M. Curve: Vertical	G.M. Curve: Horizontal
1	-10.050	-2.8500	2.0500	-2.8500	Copy of Exc. in front of intermediate stiffness wall in stiff clay	Intermediate stiffness wall
2	2.0500	-2.8500	10.050	-2.8500	Copy of Exc. in front of intermediate stiffness wall in stiff clay	Intermediate stiffness wall
3	10.050	-2.8500	10.050	2.8500	Copy of Exc. in front of intermediate stiffness wall in stiff clay	Intermediate stiffness wall
4	10.050	2.8500	-10.050	2.8500	Copy of Exc. in front of intermediate stiffness wall in stiff clay	Intermediate stiffness wall
5	-10.050	2.8500	-10.050	-2.8500	Copy of Exc. in front of intermediate stiffness wall in stiff clay	Intermediate stiffness wall

Circular Excavations

Vertical Ground Movement Curves

Curve Name: Copy of Exc. in front of intermediate stiffness wall in stiff clay
Coordinates: [Distance from wall / wall depth or max. excavation depth (x), Depth / wall depth or max. excavation depth (y), Settlement / wall depth or max. excavation depth (z) (%)

[0.000,0.000,0.258]	[0.100,0.000,0.246]	[0.200,0.000,0.233]	[0.300,0.000,0.221]
[0.400,0.000,0.210]	[0.500,0.000,0.198]	[0.600,0.000,0.188]	[0.700,0.000,0.177]
[0.800,0.000,0.168]	[0.900,0.000,0.159]	[1.000,0.000,0.150]	[1.100,0.000,0.142]
[1.200,0.000,0.134]	[1.300,0.000,0.126]	[1.400,0.000,0.118]	[1.500,0.000,0.111]
[1.600,0.000,0.105]	[1.700,0.000,0.099]	[1.800,0.000,0.093]	[1.900,0.000,0.087]
[2.000,0.000,0.081]	[2.100,0.000,0.076]	[2.200,0.000,0.072]	[2.300,0.000,0.066]
[2.400,0.000,0.061]	[2.500,0.000,0.057]	[2.600,0.000,0.051]	[2.700,0.000,0.045]
[2.800,0.000,0.039]	[2.900,0.000,0.035]	[3.000,0.000,0.029]	[3.100,0.000,0.022]
[3.200,0.000,0.019]	[3.300,0.000,0.011]	[3.400,0.000,0.006]	[3.500,0.000,0.000]

Curve Fitting Method: Polynomial
x Order: 3
y Order: 0
Polynomial: z = -4.4633E-3x³ + 3.4221E-2x² - 1.3926E-1x + 2.5930E-1
Coeff. of Determination: 9.9988E-1

Horizontal Ground Movement Curves

Side	x1 [m]	y1 [m]	x2 [m]	y2 [m]	G.M. Curve: Vertical	G.M. Curve: Horizontal
------	-----------	-----------	-----------	-----------	----------------------	------------------------

Curve Name: Intermediate stiffness wall
Coordinates: [Distance from wall / wall depth or max. excavation depth (x), Depth / wall depth or max. excavation depth (y), Horizontal movement / wall depth or max. excavation depth (z) (%)
 [0.000,0.000,0.300][4.000,0.000,0.000]
Curve Fitting Method: Polynomial
x Order: 1
y Order: 0
Polynomial: z = -7.50000E-2x + 3.00000E-1
Coeff. of Determination: 1.00000

Damage Category Strains

Ref.	Name	0 (Negligible)	1 (Very Slight)	2 (Slight)	3 (Moderate)
		to 1 (Very Slight)	to 2 (Slight)	to 3 (Moderate)	to 4 (Severe)
1	Burland Strain Limits	0.0	500.00E-6	750.00E-6	0.0015000

Specific Buildings - Geometry

Ref.	Building Name	Sub-Building	Displacement Line	Distance		Vertical	Vertical
				Along	Along		
Damage Category	Poisson's Ratio	E/G Name		Line: Start	Line: End	Line for Vertical Movement Calculations	Limit Sensitivity
Strains	Ratio			[m]	[m]	[m]	[mm]
1	30 willoughby road	Party wall	Displacement Line 1	0.00000	20.10000	0.0	0.10000
Burland Strain Limits	0.20000	2.6000					
2	30 willoughby road	Front elevation	Displacement Line 2	0.00000	5.70000	0.0	0.10000
Burland Strain Limits	0.20000	2.6000					
3	34 willoughby road	side elevation	Displacement Line 3	0.00000	20.10000	0.0	0.10000
Burland Strain Limits	0.20000	2.6000					
4	34 willoughby road	front elevation	Displacement Line 4	0.00000	6.00000	0.0	0.10000
Burland Strain Limits	0.20000	2.6000					

Specific Buildings - Bending Parameters

Ref.	Building Name	Sub-Building	Height	Default	Hogging:	Hogging:	Hogging:	Sagging:	Sagging:
					2nd Mom.	Dist. of	Dist. of	2nd Mom.	Dist. of
Sagging:		Name			of Area	Bending	N.A. from	of Area	Bending
Dist. of					(per unit	Strain	Edge of	(per unit	Strain
N.A. from					width)	from N.A.	Beam in	width)	from N.A.
Edge of									
Beam in									
Tension									
[m]			[m]		[m³]	[m]	[m]	[m³]	[m]
1	30 willoughby road	Party wall	10.000	Yes	333.33	10.000	10.000	83.333	5.0000
5.0000									
2	30 willoughby road	Front elevation	10.000	Yes	333.33	10.000	10.000	83.333	5.0000
5.0000									
3	34 willoughby road	side elevation	7.5000	Yes	140.63	7.5000	7.5000	35.156	3.7500
3.7500									
4	34 willoughby road	front elevation	7.5000	Yes	140.63	7.5000	7.5000	35.156	3.7500
3.7500									

Warnings

None



32 Willoughby Road
Basement Assessment
Excavation Movement

Job No.	Sheet No.	Rev.
8271		
Drg. Ref.		
Made by DJH	Date 05-Sep-2024	Checked Date

Ref. Sagging:	Building Name	Sub-Building	Height Default	Hogging:	Hogging:	Hogging:	Sagging:	Sagging:
	Name			2nd Mom.	Dist. of	Dist. of	2nd Mom.	Dist. of

Errors

None

Displacement Results - Displacement Lines

Stage: δH//Ref.	Stage: δHperp. Name	Disp. Angle Ref.	Disp. Line: Name	Chainage [m]	x [m]	y [m]	z [m]	δx [mm]	δy [mm]	δz [mm]	
0	Base Model 1	180.00	Displacement Line 1	0.0	10.05000	2.85000	0.00000	-4.0753	-4.0753	7.0449	
4.0753	4.0753	180.00		1.0050	9.04500	2.85000	0.00000	0.0	-12.165	10.515	
0.0	12.165	180.00		2.0100	8.04000	2.85000	0.00000	0.0	-12.165	10.515	
0.0	12.165	180.00		3.0150	7.03500	2.85000	0.00000	0.0	-12.165	10.515	
0.0	12.165	180.00		4.0200	6.03000	2.85000	0.00000	0.0	-12.165	10.515	
0.0	12.165	180.00		5.0250	5.02500	2.85000	0.00000	0.0	-12.165	10.515	
0.0	12.165	180.00		6.0300	4.02000	2.85000	0.00000	0.0	-12.165	10.515	
0.0	12.165	180.00		7.0350	3.01500	2.85000	0.00000	0.0	-12.165	10.515	
0.0	12.165	180.00		8.0400	2.01000	2.85000	0.00000	0.0	-12.165	10.515	
0.0	12.165	180.00		9.0450	1.00500	2.85000	0.00000	0.0	-12.165	10.515	
0.0	12.165	180.00		10.050	0.00000	2.85000	0.00000	0.0	-12.165	10.515	
0.0	12.165	180.00		11.055	-1.00500	2.85000	0.00000	0.0	-12.165	10.515	
0.0	12.165	180.00		12.060	-2.01000	2.85000	0.00000	0.0	-12.165	10.515	
0.0	12.165	180.00		13.065	-3.01500	2.85000	0.00000	0.0	-12.165	10.515	
0.0	12.165	180.00		14.070	-4.02000	2.85000	0.00000	0.0	-12.165	10.515	
0.0	12.165	180.00		15.075	-5.02500	2.85000	0.00000	0.0	-12.165	10.515	
0.0	12.165	180.00		16.080	-6.03000	2.85000	0.00000	0.0	-12.165	10.515	
0.0	12.165	180.00		17.085	-7.03500	2.85000	0.00000	0.0	-12.165	10.515	
0.0	12.165	180.00		18.090	-8.04000	2.85000	0.00000	0.0	-12.165	10.515	
0.0	12.165	180.00		19.095	-9.04500	2.85000	0.00000	0.0	-12.165	10.515	
0.0	12.165	180.00		20.100	-10.05000	2.85000	0.00000	4.0753	-4.0753	7.0449	
-4.0753	4.0753	180.00									
-4.0753	4.0753	90.000	2	Displacement Line 2	0.0	10.05000	2.85000	0.00000	-4.0753	-4.0753	7.0449
-7.8641	0.0	90.000			0.57000	10.05000	3.42000	0.00000	0.0	-7.8641	6.5311
-7.5777	0.0	90.000			1.1400	10.05000	3.99000	0.00000	0.0	-7.5777	6.0520
-7.2913	0.0	90.000			1.7100	10.05000	4.56000	0.00000	0.0	-7.2913	5.6056
-7.0048	0.0	90.000			2.2800	10.05000	5.13000	0.00000	0.0	-7.0048	5.1899
-6.7184	0.0	90.000			2.8500	10.05000	5.70000	0.00000	0.0	-6.7184	4.8029
-6.4320	0.0	90.000			3.4200	10.05000	6.27000	0.00000	0.0	-6.4320	4.4425
-6.1456	0.0	90.000			3.9900	10.05000	6.84000	0.00000	0.0	-6.1456	4.1067
					4.5600	10.05000	7.41000	0.00000	0.0	-5.8591	3.7935



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Stage: $\delta H //$ Ref.	Stage: $\delta H_{perp.}$ Name	Disp. Angle Line: Ref.	Disp. Line: Name	Chainage	x	y	z	δx	δy	δz
-5.8591	0.0	90.000								
				5.1300	10.05000	7.98000	0.00000	0.0	-5.5727	3.5009
-5.5727	0.0	90.000								
				5.7000	10.05000	8.55000	0.00000	0.0	-5.2863	3.2269
-5.2863	0.0	90.000								
			3 Displacement Line 3	0.0	-10.05000	-5.35000	0.00000	0.0	6.8943	5.0373
0.0	6.8943	0.0								
				1.0050	-9.04500	-5.35000	0.00000	0.0	10.290	7.5183
0.0	10.290	0.0								
				2.0100	-8.04000	-5.35000	0.00000	0.0	10.290	7.5183
0.0	10.290	0.0								
				3.0150	-7.03500	-5.35000	0.00000	0.0	10.290	7.5183
0.0	10.290	0.0								
				4.0200	-6.03000	-5.35000	0.00000	0.0	10.290	7.5183
0.0	10.290	0.0								
				5.0250	-5.02500	-5.35000	0.00000	0.0	10.290	7.5183
0.0	10.290	0.0								
				6.0300	-4.02000	-5.35000	0.00000	0.0	10.290	7.5183
0.0	10.290	0.0								
				7.0350	-3.01500	-5.35000	0.00000	0.0	10.290	7.5183
0.0	10.290	0.0								
				8.0400	-2.01000	-5.35000	0.00000	0.0	10.290	7.5183
0.0	10.290	0.0								
				9.0450	-1.00500	-5.35000	0.00000	0.0	10.290	7.5183
0.0	10.290	0.0								
				10.050	0.00000	-5.35000	0.00000	0.0	10.290	7.5183
0.0	10.290	0.0								
				11.055	1.00500	-5.35000	0.00000	0.0	10.290	7.5183
0.0	10.290	0.0								
				12.060	2.01000	-5.35000	0.00000	0.0	10.290	7.5183
0.0	10.290	0.0								
				13.065	3.01500	-5.35000	0.00000	0.0	10.290	7.5183
0.0	10.290	0.0								
				14.070	4.02000	-5.35000	0.00000	0.0	10.290	7.5183
0.0	10.290	0.0								
				15.075	5.02500	-5.35000	0.00000	0.0	10.290	7.5183
0.0	10.290	0.0								
				16.080	6.03000	-5.35000	0.00000	0.0	10.290	7.5183
0.0	10.290	0.0								
				17.085	7.03500	-5.35000	0.00000	0.0	10.290	7.5183
0.0	10.290	0.0								
				18.090	8.04000	-5.35000	0.00000	0.0	10.290	7.5183
0.0	10.290	0.0								
				19.095	9.04500	-5.35000	0.00000	0.0	10.290	7.5183
0.0	10.290	0.0								
				20.100	10.05000	-5.35000	0.00000	0.0	6.8943	5.0373
0.0	6.8943	0.0								
			4 Displacement Line 4	0.0	10.05000	-5.35000	0.00000	0.0	6.8943	5.0373
-6.8943	0.0	270.00								
				0.60000	10.05000	-5.95000	0.00000	0.0	6.5928	4.6417
-6.5928	0.0	270.00								
				1.2000	10.05000	-6.55000	0.00000	0.0	6.2913	4.2746
-6.2913	0.0	270.00								
				1.8000	10.05000	-7.15000	0.00000	0.0	5.9898	3.9337
-5.9898	0.0	270.00								
				2.4000	10.05000	-7.75000	0.00000	0.0	5.6883	3.6166
-5.6883	0.0	270.00								
				3.0000	10.05000	-8.35000	0.00000	0.0	5.3868	3.3210
-5.3868	0.0	270.00								
				3.6000	10.05000	-8.95000	0.00000	0.0	5.0853	3.0445
-5.0853	0.0	270.00								
				4.2000	10.05000	-9.55000	0.00000	0.0	4.7838	2.7848
-4.7838	0.0	270.00								
				4.8000	10.05000	-10.15000	0.00000	0.0	4.4823	2.5394
-4.4823	0.0	270.00								
				5.4000	10.05000	-10.75000	0.00000	0.0	4.1808	2.3061
-4.1808	0.0	270.00								
				6.0000	10.05000	-11.35000	0.00000	0.0	3.8793	2.0824
-3.8793	0.0	270.00								
			5 Displacement Line 5	0.0	0.00000	-13.00000	0.00000	0.0	4.5525	2.2359
4.5525	0.0	90.000								
				0.52000	0.00000	-12.48000	0.00000	0.0	4.9425	2.5063
4.9425	0.0	90.000								
				1.0400	0.00000	-11.96000	0.00000	0.0	5.3325	2.7799
5.3325	0.0	90.000								
				1.5600	0.00000	-11.44000	0.00000	0.0	5.7225	3.0591
5.7225	0.0	90.000								



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Stage: δH // Ref.	Stage: δH perp. Name	Disp. Angle Line: Ref.	Disp. Line: Name	Chainage	x	y	z	δx	δy	δz
6.1125	0.0	90.000		2.0800	0.00000	-10.92000	0.00000	0.0	6.1125	3.3460
6.5025	0.0	90.000		2.6000	0.00000	-10.40000	0.00000	0.0	6.5025	3.6431
6.8925	0.0	90.000		3.1200	0.00000	-9.88000	0.00000	0.0	6.8925	3.9525
7.2825	0.0	90.000		3.6400	0.00000	-9.36000	0.00000	0.0	7.2825	4.2767
7.6725	0.0	90.000		4.1600	0.00000	-8.84000	0.00000	0.0	7.6725	4.6178
8.0625	0.0	90.000		4.6800	0.00000	-8.32000	0.00000	0.0	8.0625	4.9781
8.4525	0.0	90.000		5.2000	0.00000	-7.80000	0.00000	0.0	8.4525	5.3600
8.8425	0.0	90.000		5.7200	0.00000	-7.28000	0.00000	0.0	8.8425	5.7658
9.2325	0.0	90.000		6.2400	0.00000	-6.76000	0.00000	0.0	9.2325	6.1977
9.6225	0.0	90.000		6.7600	0.00000	-6.24000	0.00000	0.0	9.6225	6.6580
10.012	0.0	90.000		7.2800	0.00000	-5.72000	0.00000	0.0	10.012	7.1490
10.402	0.0	90.000		7.8000	0.00000	-5.20000	0.00000	0.0	10.402	7.6730
10.792	0.0	90.000		8.3200	0.00000	-4.68000	0.00000	0.0	10.792	8.2323
11.182	0.0	90.000		8.8400	0.00000	-4.16000	0.00000	0.0	11.182	8.8292
11.572	0.0	90.000		9.3600	0.00000	-3.64000	0.00000	0.0	11.572	9.4660
11.962	0.0	90.000		9.8800	0.00000	-3.12000	0.00000	0.0	11.962	10.145
			lies within an excavation.	10.400	0.00000	-2.60000	0.00000			Point
			lies within an excavation.	10.920	0.00000	-2.08000	0.00000			Point
			lies within an excavation.	11.440	0.00000	-1.56000	0.00000			Point
			lies within an excavation.	11.960	0.00000	-1.04000	0.00000			Point
			lies within an excavation.	12.480	0.00000	-0.52000	0.00000			Point
			lies within an excavation.	13.000	0.00000	0.00000	0.00000			Point
			lies within an excavation.	13.520	0.00000	0.52000	0.00000			Point
			lies within an excavation.	14.040	0.00000	1.04000	0.00000			Point
			lies within an excavation.	14.560	0.00000	1.56000	0.00000			Point
			lies within an excavation.	15.080	0.00000	2.08000	0.00000			Point
			lies within an excavation.	15.600	0.00000	2.60000	0.00000			Point
-11.962	0.0	90.000		16.120	0.00000	3.12000	0.00000	0.0	-11.962	10.145
-11.572	0.0	90.000		16.640	0.00000	3.64000	0.00000	0.0	-11.572	9.4660
-11.182	0.0	90.000		17.160	0.00000	4.16000	0.00000	0.0	-11.182	8.8292
-10.792	0.0	90.000		17.680	0.00000	4.68000	0.00000	0.0	-10.792	8.2323
-10.402	0.0	90.000		18.200	0.00000	5.20000	0.00000	0.0	-10.402	7.6730
-10.012	0.0	90.000		18.720	0.00000	5.72000	0.00000	0.0	-10.012	7.1490
-9.6225	0.0	90.000		19.240	0.00000	6.24000	0.00000	0.0	-9.6225	6.6580
-9.2325	0.0	90.000		19.760	0.00000	6.76000	0.00000	0.0	-9.2325	6.1977
-8.8425	0.0	90.000		20.280	0.00000	7.28000	0.00000	0.0	-8.8425	5.7658
-8.4525	0.0	90.000		20.800	0.00000	7.80000	0.00000	0.0	-8.4525	5.3600
-8.0625	0.0	90.000		21.320	0.00000	8.32000	0.00000	0.0	-8.0625	4.9781
				21.840	0.00000	8.84000	0.00000	0.0	-7.6725	4.6178



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Stage: δH// Ref.	Stage: δHperp. Name	Disp. Angle Line: Ref.	Disp. Line: Name	Chainage	x	y	z	δx	δy	δz
-7.6725	0.0	90.000								
				22.360	0.00000	9.36000	0.00000	0.0	-7.2825	4.2767
-7.2825	0.0	90.000								
				22.880	0.00000	9.88000	0.00000	0.0	-6.8925	3.9525
-6.8925	0.0	90.000								
				23.400	0.00000	10.40000	0.00000	0.0	-6.5025	3.6431
-6.5025	0.0	90.000								
				23.920	0.00000	10.92000	0.00000	0.0	-6.1125	3.3460
-6.1125	0.0	90.000								
				24.440	0.00000	11.44000	0.00000	0.0	-5.7225	3.0591
-5.7225	0.0	90.000								
				24.960	0.00000	11.96000	0.00000	0.0	-5.3325	2.7799
-5.3325	0.0	90.000								
				25.480	0.00000	12.48000	0.00000	0.0	-4.9425	2.5063
-4.9425	0.0	90.000								
				26.000	0.00000	13.00000	0.00000	0.0	-4.5525	2.2359
-4.5525	0.0	90.000								

Displacement Results - Displacement Grids

Stage: Ref.	Stage: Name	Disp. Grid: Ref.	Disp. Grid: Name	x	y	z	δx	δy	δz
				[m]	[m]	[m]	[mm]	[mm]	[mm]
0	Base Model 1		Displacement Grid 1	-20.00000	-13.00000	0.00000	0.37144	0.38422	0.0
				-19.00000	-13.00000	0.00000	0.46367	0.57157	0.20415
				-18.00000	-13.00000	0.00000	0.52777	0.78525	0.40580
				-17.00000	-13.00000	0.00000	0.56167	1.0255	0.59498
				-16.00000	-13.00000	0.00000	0.56386	1.2911	0.77269
				-15.00000	-13.00000	0.00000	0.53375	1.5793	0.93876
				-14.00000	-13.00000	0.00000	0.47211	1.8844	1.0917
				-13.00000	-13.00000	0.00000	0.38152	2.1982	1.2287
				-12.00000	-13.00000	0.00000	0.26664	2.5090	1.3457
				-11.00000	-13.00000	0.00000	0.13425	2.8023	1.4379
				-10.00000	-13.00000	0.00000	0.0	4.5525	2.2359
				-9.00000	-13.00000	0.00000	0.0	4.5525	2.2359
				-8.00000	-13.00000	0.00000	0.0	4.5525	2.2359
				-7.00000	-13.00000	0.00000	0.0	4.5525	2.2359
				-6.00000	-13.00000	0.00000	0.0	4.5525	2.2359
				-5.00000	-13.00000	0.00000	0.0	4.5525	2.2359
				-4.00000	-13.00000	0.00000	0.0	4.5525	2.2359
				-3.00000	-13.00000	0.00000	0.0	4.5525	2.2359
				-2.00000	-13.00000	0.00000	0.0	4.5525	2.2359
				-1.00000	-13.00000	0.00000	0.0	4.5525	2.2359
				0.00000	-13.00000	0.00000	0.0	4.5525	2.2359
				1.00000	-13.00000	0.00000	0.0	4.5525	2.2359
				2.00000	-13.00000	0.00000	0.0	4.5525	2.2359
				3.00000	-13.00000	0.00000	0.0	4.5525	2.2359
				4.00000	-13.00000	0.00000	0.0	4.5525	2.2359
				5.00000	-13.00000	0.00000	0.0	4.5525	2.2359
				6.00000	-13.00000	0.00000	0.0	4.5525	2.2359
				7.00000	-13.00000	0.00000	0.0	4.5525	2.2359
				8.00000	-13.00000	0.00000	0.0	4.5525	2.2359
				9.00000	-13.00000	0.00000	0.0	4.5525	2.2359
				10.00000	-13.00000	0.00000	0.0	4.5525	2.2359
				11.00000	-13.00000	0.00000	-0.13425	2.8023	1.4379
				12.00000	-13.00000	0.00000	-0.26664	2.5090	1.3457
				13.00000	-13.00000	0.00000	-0.38152	2.1982	1.2287
				14.00000	-13.00000	0.00000	-0.47211	1.8844	1.0917
				15.00000	-13.00000	0.00000	-0.53375	1.5793	0.93876
				16.00000	-13.00000	0.00000	-0.56386	1.2911	0.77269
				17.00000	-13.00000	0.00000	-0.56167	1.0255	0.59498
				18.00000	-13.00000	0.00000	-0.52777	0.78525	0.40580
				19.00000	-13.00000	0.00000	-0.46367	0.57157	0.20415
				20.00000	-13.00000	0.00000	-0.37144	0.38422	0.0
				-20.00000	-12.00000	0.00000	0.55207	0.47970	0.20687
				-19.00000	-12.00000	0.00000	0.63234	0.65652	0.41412
				-18.00000	-12.00000	0.00000	0.69996	0.88368	0.61823
				-17.00000	-12.00000	0.00000	0.73349	1.1445	0.81410
				-16.00000	-12.00000	0.00000	0.73029	1.4392	1.0029
				-15.00000	-12.00000	0.00000	0.68864	1.7661	1.1843
				-14.00000	-12.00000	0.00000	0.60843	2.1204	1.3563
				-13.00000	-12.00000	0.00000	0.49187	2.4933	1.5151
				-12.00000	-12.00000	0.00000	0.34410	2.8713	1.6552
				-11.00000	-12.00000	0.00000	0.17340	3.2366	1.7697



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Stage: Ref.	Stage: Name	Disp. Grid: Ref.	Disp. Grid: Name	x	y	z	δx	δy	δz
				[m]	[m]	[m]	[mm]	[mm]	[mm]
				-10.00000	-12.00000	0.00000	0.0	5.3025	2.7587
				-9.00000	-12.00000	0.00000	0.0	5.3025	2.7587
				-8.00000	-12.00000	0.00000	0.0	5.3025	2.7587
				-7.00000	-12.00000	0.00000	0.0	5.3025	2.7587
				-6.00000	-12.00000	0.00000	0.0	5.3025	2.7587
				-5.00000	-12.00000	0.00000	0.0	5.3025	2.7587
				-4.00000	-12.00000	0.00000	0.0	5.3025	2.7587
				-3.00000	-12.00000	0.00000	0.0	5.3025	2.7587
				-2.00000	-12.00000	0.00000	0.0	5.3025	2.7587
				-1.00000	-12.00000	0.00000	0.0	5.3025	2.7587
				0.00000	-12.00000	0.00000	0.0	5.3025	2.7587
				1.00000	-12.00000	0.00000	0.0	5.3025	2.7587
				2.00000	-12.00000	0.00000	0.0	5.3025	2.7587
				3.00000	-12.00000	0.00000	0.0	5.3025	2.7587
				4.00000	-12.00000	0.00000	0.0	5.3025	2.7587
				5.00000	-12.00000	0.00000	0.0	5.3025	2.7587
				6.00000	-12.00000	0.00000	0.0	5.3025	2.7587
				7.00000	-12.00000	0.00000	0.0	5.3025	2.7587
				8.00000	-12.00000	0.00000	0.0	5.3025	2.7587
				9.00000	-12.00000	0.00000	0.0	5.3025	2.7587
				10.00000	-12.00000	0.00000	0.0	5.3025	2.7587
				11.00000	-12.00000	0.00000	-0.17340	3.2366	1.7697
				12.00000	-12.00000	0.00000	-0.34410	2.8713	1.6552
				13.00000	-12.00000	0.00000	-0.49187	2.4933	1.5151
				14.00000	-12.00000	0.00000	-0.60843	2.1204	1.3563
				15.00000	-12.00000	0.00000	-0.68864	1.7661	1.1843
				16.00000	-12.00000	0.00000	-0.73029	1.4392	1.0029
				17.00000	-12.00000	0.00000	-0.73349	1.1445	0.81410
				18.00000	-12.00000	0.00000	-0.69996	0.88368	0.61823
				19.00000	-12.00000	0.00000	-0.63234	0.65652	0.41412
				20.00000	-12.00000	0.00000	-0.55207	0.47970	0.20687
				-20.00000	-11.00000	0.00000	0.76317	0.55020	0.41138
				-19.00000	-11.00000	0.00000	0.84877	0.72568	0.61674
				-18.00000	-11.00000	0.00000	0.89217	0.93059	0.80084
				-17.00000	-11.00000	0.00000	0.92864	1.2082	1.0060
				-16.00000	-11.00000	0.00000	0.92274	1.5297	1.2092
				-15.00000	-11.00000	0.00000	0.87102	1.8957	1.4104
				-14.00000	-11.00000	0.00000	0.77177	2.3030	1.6072
				-13.00000	-11.00000	0.00000	0.62618	2.7432	1.7946
				-12.00000	-11.00000	0.00000	0.43956	3.2011	1.9651
				-11.00000	-11.00000	0.00000	0.22203	3.6544	2.1091
				-10.00000	-11.00000	0.00000	0.0	6.0525	3.3013
				-9.00000	-11.00000	0.00000	0.0	6.0525	3.3013
				-8.00000	-11.00000	0.00000	0.0	6.0525	3.3013
				-7.00000	-11.00000	0.00000	0.0	6.0525	3.3013
				-6.00000	-11.00000	0.00000	0.0	6.0525	3.3013
				-5.00000	-11.00000	0.00000	0.0	6.0525	3.3013
				-4.00000	-11.00000	0.00000	0.0	6.0525	3.3013
				-3.00000	-11.00000	0.00000	0.0	6.0525	3.3013
				-2.00000	-11.00000	0.00000	0.0	6.0525	3.3013
				-1.00000	-11.00000	0.00000	0.0	6.0525	3.3013
				0.00000	-11.00000	0.00000	0.0	6.0525	3.3013
				1.00000	-11.00000	0.00000	0.0	6.0525	3.3013
				2.00000	-11.00000	0.00000	0.0	6.0525	3.3013
				3.00000	-11.00000	0.00000	0.0	6.0525	3.3013
				4.00000	-11.00000	0.00000	0.0	6.0525	3.3013
				5.00000	-11.00000	0.00000	0.0	6.0525	3.3013
				6.00000	-11.00000	0.00000	0.0	6.0525	3.3013
				7.00000	-11.00000	0.00000	0.0	6.0525	3.3013
				8.00000	-11.00000	0.00000	0.0	6.0525	3.3013
				9.00000	-11.00000	0.00000	0.0	6.0525	3.3013
				10.00000	-11.00000	0.00000	0.0	6.0525	3.3013
				11.00000	-11.00000	0.00000	-0.22203	3.6544	2.1091
				12.00000	-11.00000	0.00000	-0.43956	3.2011	1.9651
				13.00000	-11.00000	0.00000	-0.62618	2.7432	1.7946
				14.00000	-11.00000	0.00000	-0.77177	2.3030	1.6072
				15.00000	-11.00000	0.00000	-0.87102	1.8957	1.4104
				16.00000	-11.00000	0.00000	-0.92274	1.5297	1.2092
				17.00000	-11.00000	0.00000	-0.92864	1.2082	1.0060
				18.00000	-11.00000	0.00000	-0.89217	0.93059	0.80084
				19.00000	-11.00000	0.00000	-0.84877	0.72568	0.61674
				20.00000	-11.00000	0.00000	-0.76317	0.55020	0.41138
				-20.00000	-10.00000	0.00000	1.0022	0.59017	0.60389
				-19.00000	-10.00000	0.00000	1.1061	0.76673	0.81560
				-18.00000	-10.00000	0.00000	1.1538	0.96660	0.99984
				-17.00000	-10.00000	0.00000	1.1505	1.2072	1.1715
				-16.00000	-10.00000	0.00000	1.1463	1.5506	1.3922



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Basement Assessment
Excavation Movement

Job No.	Sheet No.	Rev.
8271		
Drg. Ref.		
Made by DJH	Date 05-Sep-2024	Checked Date

Stage: Ref.	Stage: Name	Disp. Grid: Ref.	Disp. Grid: Name	x	y	z	δx	δy	δz
				[m]	[m]	[m]	[mm]	[mm]	[mm]
				-15.00000	-10.00000	0.00000	1.0877	1.9534	1.6176
				-14.00000	-10.00000	0.00000	0.97015	2.4160	1.8454
				-13.00000	-10.00000	0.00000	0.79269	2.9322	2.0698
				-12.00000	-10.00000	0.00000	0.55992	3.4858	2.2807
				-11.00000	-10.00000	0.00000	0.28404	4.0489	2.4644
				-10.00000	-10.00000	0.00000	0.0	6.8025	3.8799
				-9.00000	-10.00000	0.00000	0.0	6.8025	3.8799
				-8.00000	-10.00000	0.00000	0.0	6.8025	3.8799
				-7.00000	-10.00000	0.00000	0.0	6.8025	3.8799
				-6.00000	-10.00000	0.00000	0.0	6.8025	3.8799
				-5.00000	-10.00000	0.00000	0.0	6.8025	3.8799
				-4.00000	-10.00000	0.00000	0.0	6.8025	3.8799
				-3.00000	-10.00000	0.00000	0.0	6.8025	3.8799
				-2.00000	-10.00000	0.00000	0.0	6.8025	3.8799
				-1.00000	-10.00000	0.00000	0.0	6.8025	3.8799
				0.00000	-10.00000	0.00000	0.0	6.8025	3.8799
				1.00000	-10.00000	0.00000	0.0	6.8025	3.8799
				2.00000	-10.00000	0.00000	0.0	6.8025	3.8799
				3.00000	-10.00000	0.00000	0.0	6.8025	3.8799
				4.00000	-10.00000	0.00000	0.0	6.8025	3.8799
				5.00000	-10.00000	0.00000	0.0	6.8025	3.8799
				6.00000	-10.00000	0.00000	0.0	6.8025	3.8799
				7.00000	-10.00000	0.00000	0.0	6.8025	3.8799
				8.00000	-10.00000	0.00000	0.0	6.8025	3.8799
				9.00000	-10.00000	0.00000	0.0	6.8025	3.8799
				10.00000	-10.00000	0.00000	0.0	6.8025	3.8799
				11.00000	-10.00000	0.00000	-0.28404	4.0489	2.4644
				12.00000	-10.00000	0.00000	-0.55992	3.4858	2.2807
				13.00000	-10.00000	0.00000	-0.79269	2.9322	2.0698
				14.00000	-10.00000	0.00000	-0.97015	2.4160	1.8454
				15.00000	-10.00000	0.00000	-1.0877	1.9534	1.6176
				16.00000	-10.00000	0.00000	-1.1463	1.5506	1.3922
				17.00000	-10.00000	0.00000	-1.1505	1.2072	1.1715
				18.00000	-10.00000	0.00000	-1.1538	0.96660	0.99984
				19.00000	-10.00000	0.00000	-1.1061	0.76673	0.81560
				20.00000	-10.00000	0.00000	-1.0022	0.59017	0.60389
				-20.00000	-9.00000	0.00000	1.2685	0.59776	0.78564
				-19.00000	-9.00000	0.00000	1.3993	0.77048	1.0082
				-18.00000	-9.00000	0.00000	1.4708	0.96967	1.2064
				-17.00000	-9.00000	0.00000	1.4709	1.2001	1.3804
				-16.00000	-9.00000	0.00000	1.4065	1.4876	1.5495
				-15.00000	-9.00000	0.00000	1.3470	1.9206	1.8028
				-14.00000	-9.00000	0.00000	1.2145	2.4373	2.0680
				-13.00000	-9.00000	0.00000	1.0036	3.0370	2.3392
				-12.00000	-9.00000	0.00000	0.71603	3.7056	2.6037
				-11.00000	-9.00000	0.00000	0.36577	4.4090	2.8420
				-10.00000	-9.00000	0.00000	0.0	7.5525	4.5109
				-9.00000	-9.00000	0.00000	0.0	7.5525	4.5109
				-8.00000	-9.00000	0.00000	0.0	7.5525	4.5109
				-7.00000	-9.00000	0.00000	0.0	7.5525	4.5109
				-6.00000	-9.00000	0.00000	0.0	7.5525	4.5109
				-5.00000	-9.00000	0.00000	0.0	7.5525	4.5109
				-4.00000	-9.00000	0.00000	0.0	7.5525	4.5109
				-3.00000	-9.00000	0.00000	0.0	7.5525	4.5109
				-2.00000	-9.00000	0.00000	0.0	7.5525	4.5109
				-1.00000	-9.00000	0.00000	0.0	7.5525	4.5109
				0.00000	-9.00000	0.00000	0.0	7.5525	4.5109
				1.00000	-9.00000	0.00000	0.0	7.5525	4.5109
				2.00000	-9.00000	0.00000	0.0	7.5525	4.5109
				3.00000	-9.00000	0.00000	0.0	7.5525	4.5109
				4.00000	-9.00000	0.00000	0.0	7.5525	4.5109
				5.00000	-9.00000	0.00000	0.0	7.5525	4.5109
				6.00000	-9.00000	0.00000	0.0	7.5525	4.5109
				7.00000	-9.00000	0.00000	0.0	7.5525	4.5109
				8.00000	-9.00000	0.00000	0.0	7.5525	4.5109
				9.00000	-9.00000	0.00000	0.0	7.5525	4.5109
				10.00000	-9.00000	0.00000	0.0	7.5525	4.5109
				11.00000	-9.00000	0.00000	-0.36577	4.4090	2.8420
				12.00000	-9.00000	0.00000	-0.71603	3.7056	2.6037
				13.00000	-9.00000	0.00000	-1.0036	3.0370	2.3392
				14.00000	-9.00000	0.00000	-1.2145	2.4373	2.0680
				15.00000	-9.00000	0.00000	-1.3470	1.9206	1.8028
				16.00000	-9.00000	0.00000	-1.4065	1.4876	1.5495
				17.00000	-9.00000	0.00000	-1.4709	1.2001	1.3804
				18.00000	-9.00000	0.00000	-1.4708	0.96967	1.2064
				19.00000	-9.00000	0.00000	-1.3993	0.77048	1.0082
				20.00000	-9.00000	0.00000	-1.2685	0.59776	0.78564



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 Basement Assessment
 Excavation Movement

Job No.	Sheet No.	Rev.
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Drg. Ref.		
Made by DJH	Date 05-Sep-2024	Checked Date

Stage: Ref.	Stage: Name	Disp. Grid: Ref.	Disp. Grid: Name	x	y	z	δx	δy	δz
				[m]	[m]	[m]	[mm]	[mm]	[mm]
				-20.00000	-8.00000	0.00000	1.5597	0.57196	0.95669
				-19.00000	-8.00000	0.00000	1.7274	0.73472	1.1946
				-18.00000	-8.00000	0.00000	1.8351	0.92598	1.4124
				-17.00000	-8.00000	0.00000	1.8677	1.1525	1.6099
				-16.00000	-8.00000	0.00000	1.8067	1.4223	1.7836
				-15.00000	-8.00000	0.00000	1.6590	1.7740	1.9586
				-14.00000	-8.00000	0.00000	1.5198	2.3359	2.2663
				-13.00000	-8.00000	0.00000	1.2772	3.0224	2.5946
				-12.00000	-8.00000	0.00000	0.92574	3.8281	2.9298
				-11.00000	-8.00000	0.00000	0.47830	4.7155	3.2450
				-10.00000	-8.00000	0.00000	0.0	8.3025	5.2104
				-9.00000	-8.00000	0.00000	0.0	8.3025	5.2104
				-8.00000	-8.00000	0.00000	0.0	8.3025	5.2104
				-7.00000	-8.00000	0.00000	0.0	8.3025	5.2104
				-6.00000	-8.00000	0.00000	0.0	8.3025	5.2104
				-5.00000	-8.00000	0.00000	0.0	8.3025	5.2104
				-4.00000	-8.00000	0.00000	0.0	8.3025	5.2104
				-3.00000	-8.00000	0.00000	0.0	8.3025	5.2104
				-2.00000	-8.00000	0.00000	0.0	8.3025	5.2104
				-1.00000	-8.00000	0.00000	0.0	8.3025	5.2104
				0.00000	-8.00000	0.00000	0.0	8.3025	5.2104
				1.00000	-8.00000	0.00000	0.0	8.3025	5.2104
				2.00000	-8.00000	0.00000	0.0	8.3025	5.2104
				3.00000	-8.00000	0.00000	0.0	8.3025	5.2104
				4.00000	-8.00000	0.00000	0.0	8.3025	5.2104
				5.00000	-8.00000	0.00000	0.0	8.3025	5.2104
				6.00000	-8.00000	0.00000	0.0	8.3025	5.2104
				7.00000	-8.00000	0.00000	0.0	8.3025	5.2104
				8.00000	-8.00000	0.00000	0.0	8.3025	5.2104
				9.00000	-8.00000	0.00000	0.0	8.3025	5.2104
				10.00000	-8.00000	0.00000	0.0	8.3025	5.2104
				11.00000	-8.00000	0.00000	-0.47830	4.7155	3.2450
				12.00000	-8.00000	0.00000	-0.92574	3.8281	2.9298
				13.00000	-8.00000	0.00000	-1.2772	3.0224	2.5946
				14.00000	-8.00000	0.00000	-1.5198	2.3359	2.2663
				15.00000	-8.00000	0.00000	-1.6590	1.7740	1.9586
				16.00000	-8.00000	0.00000	-1.8067	1.4223	1.7836
				17.00000	-8.00000	0.00000	-1.8677	1.1525	1.6099
				18.00000	-8.00000	0.00000	-1.8351	0.92598	1.4124
				19.00000	-8.00000	0.00000	-1.7274	0.73472	1.1946
				20.00000	-8.00000	0.00000	-1.5597	0.57196	0.95669
				-20.00000	-7.00000	0.00000	1.8712	0.51311	1.1157
				-19.00000	-7.00000	0.00000	2.0866	0.65867	1.3730
				-18.00000	-7.00000	0.00000	2.2448	0.83293	1.6158
				-17.00000	-7.00000	0.00000	2.3287	1.0442	1.8443
				-16.00000	-7.00000	0.00000	2.3153	1.3036	2.0544
				-15.00000	-7.00000	0.00000	2.1734	1.6258	2.2363
				-14.00000	-7.00000	0.00000	1.9052	2.0709	2.4236
				-13.00000	-7.00000	0.00000	1.6417	2.8339	2.8173
				-12.00000	-7.00000	0.00000	1.2201	3.7967	3.2437
				-11.00000	-7.00000	0.00000	0.64268	4.9315	3.6694
				-10.00000	-7.00000	0.00000	0.0	9.0525	5.9949
				-9.00000	-7.00000	0.00000	0.0	9.0525	5.9949
				-8.00000	-7.00000	0.00000	0.0	9.0525	5.9949
				-7.00000	-7.00000	0.00000	0.0	9.0525	5.9949
				-6.00000	-7.00000	0.00000	0.0	9.0525	5.9949
				-5.00000	-7.00000	0.00000	0.0	9.0525	5.9949
				-4.00000	-7.00000	0.00000	0.0	9.0525	5.9949
				-3.00000	-7.00000	0.00000	0.0	9.0525	5.9949
				-2.00000	-7.00000	0.00000	0.0	9.0525	5.9949
				-1.00000	-7.00000	0.00000	0.0	9.0525	5.9949
				0.00000	-7.00000	0.00000	0.0	9.0525	5.9949
				1.00000	-7.00000	0.00000	0.0	9.0525	5.9949
				2.00000	-7.00000	0.00000	0.0	9.0525	5.9949
				3.00000	-7.00000	0.00000	0.0	9.0525	5.9949
				4.00000	-7.00000	0.00000	0.0	9.0525	5.9949
				5.00000	-7.00000	0.00000	0.0	9.0525	5.9949
				6.00000	-7.00000	0.00000	0.0	9.0525	5.9949
				7.00000	-7.00000	0.00000	0.0	9.0525	5.9949
				8.00000	-7.00000	0.00000	0.0	9.0525	5.9949
				9.00000	-7.00000	0.00000	0.0	9.0525	5.9949
				10.00000	-7.00000	0.00000	0.0	9.0525	5.9949
				11.00000	-7.00000	0.00000	-0.64268	4.9315	3.6694
				12.00000	-7.00000	0.00000	-1.2201	3.7967	3.2437
				13.00000	-7.00000	0.00000	-1.6417	2.8339	2.8173
				14.00000	-7.00000	0.00000	-1.9052	2.0709	2.4236
				15.00000	-7.00000	0.00000	-2.1734	1.6258	2.2363



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Basement Assessment
Excavation Movement

Job No.	Sheet No.	Rev.
8271		
Drg. Ref.		
Made by DJH	Date 05-Sep-2024	Checked Date

Stage: Ref.	Stage: Name	Disp. Grid: Ref.	Disp. Grid: Name	x	y	z	δx	δy	δz
				[m]	[m]	[m]	[mm]	[mm]	[mm]
				16.00000	-7.00000	0.00000	-2.3153	1.3036	2.0544
				17.00000	-7.00000	0.00000	-2.3287	1.0442	1.8443
				18.00000	-7.00000	0.00000	-2.2448	0.83293	1.6158
				19.00000	-7.00000	0.00000	-2.0866	0.65867	1.3730
				20.00000	-7.00000	0.00000	-1.8712	0.51311	1.1157
				-20.00000	-6.00000	0.00000	2.1949	0.42331	1.2600
				-19.00000	-6.00000	0.00000	2.4691	0.54387	1.5399
				-18.00000	-6.00000	0.00000	2.6932	0.69065	1.8122
				-17.00000	-6.00000	0.00000	2.8502	0.87261	2.0783
				-16.00000	-6.00000	0.00000	2.9148	1.1028	2.3353
				-15.00000	-6.00000	0.00000	2.8491	1.4007	2.5730
				-14.00000	-6.00000	0.00000	2.5965	1.7948	2.7699
				-13.00000	-6.00000	0.00000	2.1389	2.3885	2.9708
				-12.00000	-6.00000	0.00000	1.6562	3.5066	3.5068
				-11.00000	-6.00000	0.00000	0.90416	4.9783	4.0944
				-10.00000	-6.00000	0.00000	0.0	9.8025	6.8806
				-9.00000	-6.00000	0.00000	0.0	9.8025	6.8806
				-8.00000	-6.00000	0.00000	0.0	9.8025	6.8806
				-7.00000	-6.00000	0.00000	0.0	9.8025	6.8806
				-6.00000	-6.00000	0.00000	0.0	9.8025	6.8806
				-5.00000	-6.00000	0.00000	0.0	9.8025	6.8806
				-4.00000	-6.00000	0.00000	0.0	9.8025	6.8806
				-3.00000	-6.00000	0.00000	0.0	9.8025	6.8806
				-2.00000	-6.00000	0.00000	0.0	9.8025	6.8806
				-1.00000	-6.00000	0.00000	0.0	9.8025	6.8806
				0.00000	-6.00000	0.00000	0.0	9.8025	6.8806
				1.00000	-6.00000	0.00000	0.0	9.8025	6.8806
				2.00000	-6.00000	0.00000	0.0	9.8025	6.8806
				3.00000	-6.00000	0.00000	0.0	9.8025	6.8806
				4.00000	-6.00000	0.00000	0.0	9.8025	6.8806
				5.00000	-6.00000	0.00000	0.0	9.8025	6.8806
				6.00000	-6.00000	0.00000	0.0	9.8025	6.8806
				7.00000	-6.00000	0.00000	0.0	9.8025	6.8806
				8.00000	-6.00000	0.00000	0.0	9.8025	6.8806
				9.00000	-6.00000	0.00000	0.0	9.8025	6.8806
				10.00000	-6.00000	0.00000	0.0	9.8025	6.8806
				11.00000	-6.00000	0.00000	-0.90416	4.9783	4.0944
				12.00000	-6.00000	0.00000	-1.6562	3.5066	3.5068
				13.00000	-6.00000	0.00000	-2.1389	2.3885	2.9708
				14.00000	-6.00000	0.00000	-2.5965	1.7948	2.7699
				15.00000	-6.00000	0.00000	-2.8491	1.4007	2.5730
				16.00000	-6.00000	0.00000	-2.9148	1.1028	2.3353
				17.00000	-6.00000	0.00000	-2.8502	0.87261	2.0783
				18.00000	-6.00000	0.00000	-2.6932	0.69065	1.8122
				19.00000	-6.00000	0.00000	-2.4691	0.54387	1.5399
				20.00000	-6.00000	0.00000	-2.1949	0.42331	1.2600
				-20.00000	-5.00000	0.00000	2.5197	0.30688	1.3855
				-19.00000	-5.00000	0.00000	2.8619	0.39484	1.6897
				-18.00000	-5.00000	0.00000	3.1664	0.50345	1.9939
				-17.00000	-5.00000	0.00000	3.4186	0.64067	2.3023
				-16.00000	-5.00000	0.00000	3.5956	0.81897	2.6148
				-15.00000	-5.00000	0.00000	3.6600	1.0588	2.9243
				-14.00000	-5.00000	0.00000	3.5471	1.3950	3.2107
				-13.00000	-5.00000	0.00000	3.1412	1.8899	3.4283
				-12.00000	-5.00000	0.00000	2.3421	2.7574	3.6337
				-11.00000	-5.00000	0.00000	1.3776	4.6550	4.4496
				-10.00000	-5.00000	0.00000	0.0	10.553	7.8838
				-9.00000	-5.00000	0.00000	0.0	10.553	7.8838
				-8.00000	-5.00000	0.00000	0.0	10.553	7.8838
				-7.00000	-5.00000	0.00000	0.0	10.553	7.8838
				-6.00000	-5.00000	0.00000	0.0	10.553	7.8838
				-5.00000	-5.00000	0.00000	0.0	10.553	7.8838
				-4.00000	-5.00000	0.00000	0.0	10.553	7.8838
				-3.00000	-5.00000	0.00000	0.0	10.553	7.8838
				-2.00000	-5.00000	0.00000	0.0	10.553	7.8838
				-1.00000	-5.00000	0.00000	0.0	10.553	7.8838
				0.00000	-5.00000	0.00000	0.0	10.553	7.8838
				1.00000	-5.00000	0.00000	0.0	10.553	7.8838
				2.00000	-5.00000	0.00000	0.0	10.553	7.8838
				3.00000	-5.00000	0.00000	0.0	10.553	7.8838
				4.00000	-5.00000	0.00000	0.0	10.553	7.8838
				5.00000	-5.00000	0.00000	0.0	10.553	7.8838
				6.00000	-5.00000	0.00000	0.0	10.553	7.8838
				7.00000	-5.00000	0.00000	0.0	10.553	7.8838
				8.00000	-5.00000	0.00000	0.0	10.553	7.8838
				9.00000	-5.00000	0.00000	0.0	10.553	7.8838
				10.00000	-5.00000	0.00000	0.0	10.553	7.8838



32 Willoughby Road
Basement Assessment
Excavation Movement

Job No.	Sheet No.	Rev.
8271		
Drg. Ref.		
Made by DJH	Date 05-Sep-2024	Checked Date

Stage: Ref.	Stage: Name	Disp. Grid: Ref.	Disp. Grid: Name	x	y	z	δx	δy	δz
				[m]	[m]	[m]	[mm]	[mm]	[mm]
				11.00000	-5.00000	0.00000	-1.3776	4.6550	4.4496
				12.00000	-5.00000	0.00000	-2.3421	2.7574	3.6337
				13.00000	-5.00000	0.00000	-3.1412	1.8899	3.4283
				14.00000	-5.00000	0.00000	-3.5471	1.3950	3.2107
				15.00000	-5.00000	0.00000	-3.6600	1.0588	2.9243
				16.00000	-5.00000	0.00000	-3.5956	0.81897	2.6148
				17.00000	-5.00000	0.00000	-3.4186	0.64067	2.3023
				18.00000	-5.00000	0.00000	-3.1664	0.50345	1.9939
				19.00000	-5.00000	0.00000	-2.8619	0.39484	1.6897
				20.00000	-5.00000	0.00000	-2.5197	0.30688	1.3855
				-20.00000	-4.00000	0.00000	2.8311	0.17042	1.4871
				-19.00000	-4.00000	0.00000	3.2474	0.21955	1.8152
				-18.00000	-4.00000	0.00000	3.6424	0.28079	2.1512
				-17.00000	-4.00000	0.00000	4.0072	0.35920	2.5023
				-16.00000	-4.00000	0.00000	4.3274	0.46308	2.8735
				-15.00000	-4.00000	0.00000	4.5772	0.60699	3.2650
				-14.00000	-4.00000	0.00000	4.7077	0.81879	3.6673
				-13.00000	-4.00000	0.00000	4.6134	1.1584	4.0474
				-12.00000	-4.00000	0.00000	4.0304	1.7753	4.3060
				-11.00000	-4.00000	0.00000	2.4277	3.3225	4.4852
				-10.00000	-4.00000	0.00000	0.0	11.302	9.0208
				-9.00000	-4.00000	0.00000	0.0	11.302	9.0208
				-8.00000	-4.00000	0.00000	0.0	11.302	9.0208
				-7.00000	-4.00000	0.00000	0.0	11.302	9.0208
				-6.00000	-4.00000	0.00000	0.0	11.302	9.0208
				-5.00000	-4.00000	0.00000	0.0	11.302	9.0208
				-4.00000	-4.00000	0.00000	0.0	11.302	9.0208
				-3.00000	-4.00000	0.00000	0.0	11.302	9.0208
				-2.00000	-4.00000	0.00000	0.0	11.302	9.0208
				-1.00000	-4.00000	0.00000	0.0	11.302	9.0208
				0.00000	-4.00000	0.00000	0.0	11.302	9.0208
				1.00000	-4.00000	0.00000	0.0	11.302	9.0208
				2.00000	-4.00000	0.00000	0.0	11.302	9.0208
				3.00000	-4.00000	0.00000	0.0	11.302	9.0208
				4.00000	-4.00000	0.00000	0.0	11.302	9.0208
				5.00000	-4.00000	0.00000	0.0	11.302	9.0208
				6.00000	-4.00000	0.00000	0.0	11.302	9.0208
				7.00000	-4.00000	0.00000	0.0	11.302	9.0208
				8.00000	-4.00000	0.00000	0.0	11.302	9.0208
				9.00000	-4.00000	0.00000	0.0	11.302	9.0208
				10.00000	-4.00000	0.00000	0.0	11.302	9.0208
				11.00000	-4.00000	0.00000	-2.4277	3.3225	4.4852
				12.00000	-4.00000	0.00000	-4.0304	1.7753	4.3060
				13.00000	-4.00000	0.00000	-4.6134	1.1584	4.0474
				14.00000	-4.00000	0.00000	-4.7077	0.81879	3.6673
				15.00000	-4.00000	0.00000	-4.5772	0.60699	3.2650
				16.00000	-4.00000	0.00000	-4.3274	0.46308	2.8735
				17.00000	-4.00000	0.00000	-4.0072	0.35920	2.5023
				18.00000	-4.00000	0.00000	-3.6424	0.28079	2.1512
				19.00000	-4.00000	0.00000	-3.2474	0.21955	1.8152
				20.00000	-4.00000	0.00000	-2.8311	0.17042	1.4871
				-20.00000	-3.00000	0.00000	3.1122	0.022560	1.5595
				-19.00000	-3.00000	0.00000	3.6037	0.029080	1.9088
				-18.00000	-3.00000	0.00000	4.0924	0.037240	2.2726
				-17.00000	-3.00000	0.00000	4.5771	0.047748	2.6616
				-16.00000	-3.00000	0.00000	5.0559	0.061785	3.0858
				-15.00000	-3.00000	0.00000	5.5251	0.081489	3.5549
				-14.00000	-3.00000	0.00000	5.9775	0.11116	4.0773
				-13.00000	-3.00000	0.00000	6.3959	0.16090	4.6576
				-12.00000	-3.00000	0.00000	6.7286	0.26143	5.2883
				-11.00000	-3.00000	0.00000	6.7089	0.57044	5.8846
				-10.00000	-3.00000	0.00000	0.0	12.052	10.308
				-9.00000	-3.00000	0.00000	0.0	12.052	10.308
				-8.00000	-3.00000	0.00000	0.0	12.052	10.308
				-7.00000	-3.00000	0.00000	0.0	12.052	10.308
				-6.00000	-3.00000	0.00000	0.0	12.052	10.308
				-5.00000	-3.00000	0.00000	0.0	12.052	10.308
				-4.00000	-3.00000	0.00000	0.0	12.052	10.308
				-3.00000	-3.00000	0.00000	0.0	12.052	10.308
				-2.00000	-3.00000	0.00000	0.0	12.052	10.308
				-1.00000	-3.00000	0.00000	0.0	12.052	10.308
				0.00000	-3.00000	0.00000	0.0	12.052	10.308
				1.00000	-3.00000	0.00000	0.0	12.052	10.308
				2.00000	-3.00000	0.00000	0.0	12.052	10.308
				3.00000	-3.00000	0.00000	0.0	12.052	10.308
				4.00000	-3.00000	0.00000	0.0	12.052	10.308
				5.00000	-3.00000	0.00000	0.0	12.052	10.308



32 Willoughby Road
Basement Assessment
Excavation Movement

Job No.	Sheet No.	Rev.
8271		
Drg. Ref.		
Made by DJH	Date 05-Sep-2024	Checked Date

Stage: Ref.	Stage: Name	Disp. Grid: Ref.	Disp. Grid: Name	x	y	z	δx	δy	δz
				[m]	[m]	[m]	[mm]	[mm]	[mm]
				6.00000	-3.00000	0.00000	0.0	12.052	10.308
				7.00000	-3.00000	0.00000	0.0	12.052	10.308
				8.00000	-3.00000	0.00000	0.0	12.052	10.308
				9.00000	-3.00000	0.00000	0.0	12.052	10.308
				10.00000	-3.00000	0.00000	0.0	12.052	10.308
				11.00000	-3.00000	0.00000	-6.7089	0.57044	5.8846
				12.00000	-3.00000	0.00000	-6.7286	0.26143	5.2883
				13.00000	-3.00000	0.00000	-6.3959	0.16090	4.6576
				14.00000	-3.00000	0.00000	-5.9775	0.11116	4.0773
				15.00000	-3.00000	0.00000	-5.5251	0.081489	3.5549
				16.00000	-3.00000	0.00000	-5.0559	0.061785	3.0858
				17.00000	-3.00000	0.00000	-4.5771	0.047748	2.6616
				18.00000	-3.00000	0.00000	-4.0924	0.037240	2.2726
				19.00000	-3.00000	0.00000	-3.6037	0.029080	1.9088
				20.00000	-3.00000	0.00000	-3.1122	0.022560	1.5595
				-20.00000	-2.00000	0.00000	4.7025	0.0	2.3397
				-19.00000	-2.00000	0.00000	5.4525	0.0	2.8651
				-18.00000	-2.00000	0.00000	6.2025	0.0	3.4136
				-17.00000	-2.00000	0.00000	6.9525	0.0	4.0014
				-16.00000	-2.00000	0.00000	7.7025	0.0	4.6448
				-15.00000	-2.00000	0.00000	8.4525	0.0	5.3600
				-14.00000	-2.00000	0.00000	9.2025	0.0	6.1635
				-13.00000	-2.00000	0.00000	9.9525	0.0	7.0714
				-12.00000	-2.00000	0.00000	10.702	0.0	8.1000
				-11.00000	-2.00000	0.00000	11.453	0.0	9.2656
				-10.00000	-2.00000	0.00000	Point lies within an	excavation.	
				-9.00000	-2.00000	0.00000	Point lies within an	excavation.	
				-8.00000	-2.00000	0.00000	Point lies within an	excavation.	
				-7.00000	-2.00000	0.00000	Point lies within an	excavation.	
				-6.00000	-2.00000	0.00000	Point lies within an	excavation.	
				-5.00000	-2.00000	0.00000	Point lies within an	excavation.	
				-4.00000	-2.00000	0.00000	Point lies within an	excavation.	
				-3.00000	-2.00000	0.00000	Point lies within an	excavation.	
				-2.00000	-2.00000	0.00000	Point lies within an	excavation.	
				-1.00000	-2.00000	0.00000	Point lies within an	excavation.	
				0.00000	-2.00000	0.00000	Point lies within an	excavation.	
				1.00000	-2.00000	0.00000	Point lies within an	excavation.	
				2.00000	-2.00000	0.00000	Point lies within an	excavation.	
				3.00000	-2.00000	0.00000	Point lies within an	excavation.	
				4.00000	-2.00000	0.00000	Point lies within an	excavation.	
				5.00000	-2.00000	0.00000	Point lies within an	excavation.	
				6.00000	-2.00000	0.00000	Point lies within an	excavation.	
				7.00000	-2.00000	0.00000	Point lies within an	excavation.	
				8.00000	-2.00000	0.00000	Point lies within an	excavation.	
				9.00000	-2.00000	0.00000	Point lies within an	excavation.	
				10.00000	-2.00000	0.00000	Point lies within an	excavation.	
				11.00000	-2.00000	0.00000	-11.453	0.0	9.2656
				12.00000	-2.00000	0.00000	-10.702	0.0	8.1000
				13.00000	-2.00000	0.00000	-9.9525	0.0	7.0714
				14.00000	-2.00000	0.00000	-9.2025	0.0	6.1635
				15.00000	-2.00000	0.00000	-8.4525	0.0	5.3600
				16.00000	-2.00000	0.00000	-7.7025	0.0	4.6448
				17.00000	-2.00000	0.00000	-6.9525	0.0	4.0014
				18.00000	-2.00000	0.00000	-6.2025	0.0	3.4136
				19.00000	-2.00000	0.00000	-5.4525	0.0	2.8651
				20.00000	-2.00000	0.00000	-4.7025	0.0	2.3397
				-20.00000	-1.00000	0.00000	4.7025	0.0	2.3397
				-19.00000	-1.00000	0.00000	5.4525	0.0	2.8651
				-18.00000	-1.00000	0.00000	6.2025	0.0	3.4136
				-17.00000	-1.00000	0.00000	6.9525	0.0	4.0014
				-16.00000	-1.00000	0.00000	7.7025	0.0	4.6448
				-15.00000	-1.00000	0.00000	8.4525	0.0	5.3600
				-14.00000	-1.00000	0.00000	9.2025	0.0	6.1635
				-13.00000	-1.00000	0.00000	9.9525	0.0	7.0714
				-12.00000	-1.00000	0.00000	10.702	0.0	8.1000
				-11.00000	-1.00000	0.00000	11.453	0.0	9.2656
				-10.00000	-1.00000	0.00000	Point lies within an	excavation.	
				-9.00000	-1.00000	0.00000	Point lies within an	excavation.	
				-8.00000	-1.00000	0.00000	Point lies within an	excavation.	
				-7.00000	-1.00000	0.00000	Point lies within an	excavation.	
				-6.00000	-1.00000	0.00000	Point lies within an	excavation.	
				-5.00000	-1.00000	0.00000	Point lies within an	excavation.	
				-4.00000	-1.00000	0.00000	Point lies within an	excavation.	
				-3.00000	-1.00000	0.00000	Point lies within an	excavation.	
				-2.00000	-1.00000	0.00000	Point lies within an	excavation.	
				-1.00000	-1.00000	0.00000	Point lies within an	excavation.	
				0.00000	-1.00000	0.00000	Point lies within an	excavation.	



32 Willoughby Road
Basement Assessment
Excavation Movement

Job No.	Sheet No.	Rev.
8271		
Drg. Ref.		
Made by DJH	Date 05-Sep-2024	Checked Date

Stage: Ref.	Stage: Name	Disp. Grid: Ref.	Disp. Grid: Name	x	y	z	δx	δy	δz
				[m]	[m]	[m]	[mm]	[mm]	[mm]
				1.00000	-1.00000	0.00000	Point lies within an excavation.		
				2.00000	-1.00000	0.00000	Point lies within an excavation.		
				3.00000	-1.00000	0.00000	Point lies within an excavation.		
				4.00000	-1.00000	0.00000	Point lies within an excavation.		
				5.00000	-1.00000	0.00000	Point lies within an excavation.		
				6.00000	-1.00000	0.00000	Point lies within an excavation.		
				7.00000	-1.00000	0.00000	Point lies within an excavation.		
				8.00000	-1.00000	0.00000	Point lies within an excavation.		
				9.00000	-1.00000	0.00000	Point lies within an excavation.		
				10.00000	-1.00000	0.00000	Point lies within an excavation.		
				11.00000	-1.00000	0.00000	-11.453	0.0	9.2656
				12.00000	-1.00000	0.00000	-10.702	0.0	8.1000
				13.00000	-1.00000	0.00000	-9.9525	0.0	7.0714
				14.00000	-1.00000	0.00000	-9.2025	0.0	6.1635
				15.00000	-1.00000	0.00000	-8.4525	0.0	5.3600
				16.00000	-1.00000	0.00000	-7.7025	0.0	4.6448
				17.00000	-1.00000	0.00000	-6.9525	0.0	4.0014
				18.00000	-1.00000	0.00000	-6.2025	0.0	3.4136
				19.00000	-1.00000	0.00000	-5.4525	0.0	2.8651
				20.00000	-1.00000	0.00000	-4.7025	0.0	2.3397
				-20.00000	0.00000	0.00000	4.7025	0.0	2.3397
				-19.00000	0.00000	0.00000	5.4525	0.0	2.8651
				-18.00000	0.00000	0.00000	6.2025	0.0	3.4136
				-17.00000	0.00000	0.00000	6.9525	0.0	4.0014
				-16.00000	0.00000	0.00000	7.7025	0.0	4.6448
				-15.00000	0.00000	0.00000	8.4525	0.0	5.3600
				-14.00000	0.00000	0.00000	9.2025	0.0	6.1635
				-13.00000	0.00000	0.00000	9.9525	0.0	7.0714
				-12.00000	0.00000	0.00000	10.702	0.0	8.1000
				-11.00000	0.00000	0.00000	11.453	0.0	9.2656
				-10.00000	0.00000	0.00000	Point lies within an excavation.		
				-9.00000	0.00000	0.00000	Point lies within an excavation.		
				-8.00000	0.00000	0.00000	Point lies within an excavation.		
				-7.00000	0.00000	0.00000	Point lies within an excavation.		
				-6.00000	0.00000	0.00000	Point lies within an excavation.		
				-5.00000	0.00000	0.00000	Point lies within an excavation.		
				-4.00000	0.00000	0.00000	Point lies within an excavation.		
				-3.00000	0.00000	0.00000	Point lies within an excavation.		
				-2.00000	0.00000	0.00000	Point lies within an excavation.		
				-1.00000	0.00000	0.00000	Point lies within an excavation.		
				0.00000	0.00000	0.00000	Point lies within an excavation.		
				1.00000	0.00000	0.00000	Point lies within an excavation.		
				2.00000	0.00000	0.00000	Point lies within an excavation.		
				3.00000	0.00000	0.00000	Point lies within an excavation.		
				4.00000	0.00000	0.00000	Point lies within an excavation.		
				5.00000	0.00000	0.00000	Point lies within an excavation.		
				6.00000	0.00000	0.00000	Point lies within an excavation.		
				7.00000	0.00000	0.00000	Point lies within an excavation.		
				8.00000	0.00000	0.00000	Point lies within an excavation.		
				9.00000	0.00000	0.00000	Point lies within an excavation.		
				10.00000	0.00000	0.00000	Point lies within an excavation.		
				11.00000	0.00000	0.00000	-11.453	0.0	9.2656
				12.00000	0.00000	0.00000	-10.702	0.0	8.1000
				13.00000	0.00000	0.00000	-9.9525	0.0	7.0714
				14.00000	0.00000	0.00000	-9.2025	0.0	6.1635
				15.00000	0.00000	0.00000	-8.4525	0.0	5.3600
				16.00000	0.00000	0.00000	-7.7025	0.0	4.6448
				17.00000	0.00000	0.00000	-6.9525	0.0	4.0014
				18.00000	0.00000	0.00000	-6.2025	0.0	3.4136
				19.00000	0.00000	0.00000	-5.4525	0.0	2.8651
				20.00000	0.00000	0.00000	-4.7025	0.0	2.3397
				-20.00000	1.00000	0.00000	4.7025	0.0	2.3397
				-19.00000	1.00000	0.00000	5.4525	0.0	2.8651
				-18.00000	1.00000	0.00000	6.2025	0.0	3.4136
				-17.00000	1.00000	0.00000	6.9525	0.0	4.0014
				-16.00000	1.00000	0.00000	7.7025	0.0	4.6448
				-15.00000	1.00000	0.00000	8.4525	0.0	5.3600
				-14.00000	1.00000	0.00000	9.2025	0.0	6.1635
				-13.00000	1.00000	0.00000	9.9525	0.0	7.0714
				-12.00000	1.00000	0.00000	10.702	0.0	8.1000
				-11.00000	1.00000	0.00000	11.453	0.0	9.2656
				-10.00000	1.00000	0.00000	Point lies within an excavation.		
				-9.00000	1.00000	0.00000	Point lies within an excavation.		
				-8.00000	1.00000	0.00000	Point lies within an excavation.		
				-7.00000	1.00000	0.00000	Point lies within an excavation.		
				-6.00000	1.00000	0.00000	Point lies within an excavation.		
				-5.00000	1.00000	0.00000	Point lies within an excavation.		



32 Willoughby Road
Basement Assessment
Excavation Movement

Job No.	Sheet No.	Rev.
8271		
Drg. Ref.		
Made by DJH	Date 05-Sep-2024	Checked Date

Stage: Ref.	Stage: Name	Disp. Grid: Ref.	Disp. Grid: Name	x	y	z	δx	δy	δz
				[m]	[m]	[m]	[mm]	[mm]	[mm]
				-4.00000	1.00000	0.00000	Point lies within an excavation.		
				-3.00000	1.00000	0.00000	Point lies within an excavation.		
				-2.00000	1.00000	0.00000	Point lies within an excavation.		
				-1.00000	1.00000	0.00000	Point lies within an excavation.		
				0.00000	1.00000	0.00000	Point lies within an excavation.		
				1.00000	1.00000	0.00000	Point lies within an excavation.		
				2.00000	1.00000	0.00000	Point lies within an excavation.		
				3.00000	1.00000	0.00000	Point lies within an excavation.		
				4.00000	1.00000	0.00000	Point lies within an excavation.		
				5.00000	1.00000	0.00000	Point lies within an excavation.		
				6.00000	1.00000	0.00000	Point lies within an excavation.		
				7.00000	1.00000	0.00000	Point lies within an excavation.		
				8.00000	1.00000	0.00000	Point lies within an excavation.		
				9.00000	1.00000	0.00000	Point lies within an excavation.		
				10.00000	1.00000	0.00000	Point lies within an excavation.		
				11.00000	1.00000	0.00000	-11.453	0.0	9.2656
				12.00000	1.00000	0.00000	-10.702	0.0	8.1000
				13.00000	1.00000	0.00000	-9.9525	0.0	7.0714
				14.00000	1.00000	0.00000	-9.2025	0.0	6.1635
				15.00000	1.00000	0.00000	-8.4525	0.0	5.3600
				16.00000	1.00000	0.00000	-7.7025	0.0	4.6448
				17.00000	1.00000	0.00000	-6.9525	0.0	4.0014
				18.00000	1.00000	0.00000	-6.2025	0.0	3.4136
				19.00000	1.00000	0.00000	-5.4525	0.0	2.8651
				20.00000	1.00000	0.00000	-4.7025	0.0	2.3397
				-20.00000	2.00000	0.00000	4.7025	0.0	2.3397
				-19.00000	2.00000	0.00000	5.4525	0.0	2.8651
				-18.00000	2.00000	0.00000	6.2025	0.0	3.4136
				-17.00000	2.00000	0.00000	6.9525	0.0	4.0014
				-16.00000	2.00000	0.00000	7.7025	0.0	4.6448
				-15.00000	2.00000	0.00000	8.4525	0.0	5.3600
				-14.00000	2.00000	0.00000	9.2025	0.0	6.1635
				-13.00000	2.00000	0.00000	9.9525	0.0	7.0714
				-12.00000	2.00000	0.00000	10.702	0.0	8.1000
				-11.00000	2.00000	0.00000	11.453	0.0	9.2656
				-10.00000	2.00000	0.00000	Point lies within an excavation.		
				-9.00000	2.00000	0.00000	Point lies within an excavation.		
				-8.00000	2.00000	0.00000	Point lies within an excavation.		
				-7.00000	2.00000	0.00000	Point lies within an excavation.		
				-6.00000	2.00000	0.00000	Point lies within an excavation.		
				-5.00000	2.00000	0.00000	Point lies within an excavation.		
				-4.00000	2.00000	0.00000	Point lies within an excavation.		
				-3.00000	2.00000	0.00000	Point lies within an excavation.		
				-2.00000	2.00000	0.00000	Point lies within an excavation.		
				-1.00000	2.00000	0.00000	Point lies within an excavation.		
				0.00000	2.00000	0.00000	Point lies within an excavation.		
				1.00000	2.00000	0.00000	Point lies within an excavation.		
				2.00000	2.00000	0.00000	Point lies within an excavation.		
				3.00000	2.00000	0.00000	Point lies within an excavation.		
				4.00000	2.00000	0.00000	Point lies within an excavation.		
				5.00000	2.00000	0.00000	Point lies within an excavation.		
				6.00000	2.00000	0.00000	Point lies within an excavation.		
				7.00000	2.00000	0.00000	Point lies within an excavation.		
				8.00000	2.00000	0.00000	Point lies within an excavation.		
				9.00000	2.00000	0.00000	Point lies within an excavation.		
				10.00000	2.00000	0.00000	Point lies within an excavation.		
				11.00000	2.00000	0.00000	-11.453	0.0	9.2656
				12.00000	2.00000	0.00000	-10.702	0.0	8.1000
				13.00000	2.00000	0.00000	-9.9525	0.0	7.0714
				14.00000	2.00000	0.00000	-9.2025	0.0	6.1635
				15.00000	2.00000	0.00000	-8.4525	0.0	5.3600
				16.00000	2.00000	0.00000	-7.7025	0.0	4.6448
				17.00000	2.00000	0.00000	-6.9525	0.0	4.0014
				18.00000	2.00000	0.00000	-6.2025	0.0	3.4136
				19.00000	2.00000	0.00000	-5.4525	0.0	2.8651
				20.00000	2.00000	0.00000	-4.7025	0.0	2.3397
				-20.00000	3.00000	0.00000	3.1122	-0.022560	1.5595
				-19.00000	3.00000	0.00000	3.6037	-0.029080	1.9088
				-18.00000	3.00000	0.00000	4.0924	-0.037240	2.2726
				-17.00000	3.00000	0.00000	4.5771	-0.047748	2.6616
				-16.00000	3.00000	0.00000	5.0559	-0.061785	3.0858
				-15.00000	3.00000	0.00000	5.5251	-0.081489	3.5549
				-14.00000	3.00000	0.00000	5.9775	-0.11116	4.0773
				-13.00000	3.00000	0.00000	6.3959	-0.16090	4.6576
				-12.00000	3.00000	0.00000	6.7286	-0.26143	5.2883
				-11.00000	3.00000	0.00000	6.7089	-0.57044	5.8846
				-10.00000	3.00000	0.00000	0.0	-12.052	10.308



32 Willoughby Road
 Basement Assessment
 Excavation Movement

Job No.	Sheet No.	Rev.
8271		
Drg. Ref.		
Made by DJH	Date 05-Sep-2024	Checked Date

Stage: Ref.	Stage: Name	Disp. Grid: Ref.	Disp. Grid: Name	x	y	z	δx	δy	δz
				[m]	[m]	[m]	[mm]	[mm]	[mm]
				-9.00000	3.00000	0.00000	0.0	-12.052	10.308
				-8.00000	3.00000	0.00000	0.0	-12.052	10.308
				-7.00000	3.00000	0.00000	0.0	-12.052	10.308
				-6.00000	3.00000	0.00000	0.0	-12.052	10.308
				-5.00000	3.00000	0.00000	0.0	-12.052	10.308
				-4.00000	3.00000	0.00000	0.0	-12.052	10.308
				-3.00000	3.00000	0.00000	0.0	-12.052	10.308
				-2.00000	3.00000	0.00000	0.0	-12.052	10.308
				-1.00000	3.00000	0.00000	0.0	-12.052	10.308
				0.00000	3.00000	0.00000	0.0	-12.052	10.308
				1.00000	3.00000	0.00000	0.0	-12.052	10.308
				2.00000	3.00000	0.00000	0.0	-12.052	10.308
				3.00000	3.00000	0.00000	0.0	-12.052	10.308
				4.00000	3.00000	0.00000	0.0	-12.052	10.308
				5.00000	3.00000	0.00000	0.0	-12.052	10.308
				6.00000	3.00000	0.00000	0.0	-12.052	10.308
				7.00000	3.00000	0.00000	0.0	-12.052	10.308
				8.00000	3.00000	0.00000	0.0	-12.052	10.308
				9.00000	3.00000	0.00000	0.0	-12.052	10.308
				10.00000	3.00000	0.00000	0.0	-12.052	10.308
				11.00000	3.00000	0.00000	-6.7089	-0.57044	5.8846
				12.00000	3.00000	0.00000	-6.7286	-0.26143	5.2883
				13.00000	3.00000	0.00000	-6.3959	-0.16090	4.6576
				14.00000	3.00000	0.00000	-5.9775	-0.11116	4.0773
				15.00000	3.00000	0.00000	-5.5251	-0.081489	3.5549
				16.00000	3.00000	0.00000	-5.0559	-0.061785	3.0858
				17.00000	3.00000	0.00000	-4.5771	-0.047748	2.6616
				18.00000	3.00000	0.00000	-4.0924	-0.037240	2.2726
				19.00000	3.00000	0.00000	-3.6037	-0.029080	1.9088
				20.00000	3.00000	0.00000	-3.1122	-0.022560	1.5595
				-20.00000	4.00000	0.00000	2.8311	-0.17042	1.4871
				-19.00000	4.00000	0.00000	3.2474	-0.21955	1.8152
				-18.00000	4.00000	0.00000	3.6424	-0.28079	2.1512
				-17.00000	4.00000	0.00000	4.0072	-0.35920	2.5023
				-16.00000	4.00000	0.00000	4.3274	-0.46308	2.8735
				-15.00000	4.00000	0.00000	4.5772	-0.60699	3.2650
				-14.00000	4.00000	0.00000	4.7077	-0.81879	3.6673
				-13.00000	4.00000	0.00000	4.6134	-1.1584	4.0474
				-12.00000	4.00000	0.00000	4.0304	-1.7753	4.3060
				-11.00000	4.00000	0.00000	2.4277	-3.3225	4.4852
				-10.00000	4.00000	0.00000	0.0	-11.302	9.0208
				-9.00000	4.00000	0.00000	0.0	-11.302	9.0208
				-8.00000	4.00000	0.00000	0.0	-11.302	9.0208
				-7.00000	4.00000	0.00000	0.0	-11.302	9.0208
				-6.00000	4.00000	0.00000	0.0	-11.302	9.0208
				-5.00000	4.00000	0.00000	0.0	-11.302	9.0208
				-4.00000	4.00000	0.00000	0.0	-11.302	9.0208
				-3.00000	4.00000	0.00000	0.0	-11.302	9.0208
				-2.00000	4.00000	0.00000	0.0	-11.302	9.0208
				-1.00000	4.00000	0.00000	0.0	-11.302	9.0208
				0.00000	4.00000	0.00000	0.0	-11.302	9.0208
				1.00000	4.00000	0.00000	0.0	-11.302	9.0208
				2.00000	4.00000	0.00000	0.0	-11.302	9.0208
				3.00000	4.00000	0.00000	0.0	-11.302	9.0208
				4.00000	4.00000	0.00000	0.0	-11.302	9.0208
				5.00000	4.00000	0.00000	0.0	-11.302	9.0208
				6.00000	4.00000	0.00000	0.0	-11.302	9.0208
				7.00000	4.00000	0.00000	0.0	-11.302	9.0208
				8.00000	4.00000	0.00000	0.0	-11.302	9.0208
				9.00000	4.00000	0.00000	0.0	-11.302	9.0208
				10.00000	4.00000	0.00000	0.0	-11.302	9.0208
				11.00000	4.00000	0.00000	-2.4277	-3.3225	4.4852
				12.00000	4.00000	0.00000	-4.0304	-1.7753	4.3060
				13.00000	4.00000	0.00000	-4.6134	-1.1584	4.0474
				14.00000	4.00000	0.00000	-4.7077	-0.81879	3.6673
				15.00000	4.00000	0.00000	-4.5772	-0.60699	3.2650
				16.00000	4.00000	0.00000	-4.3274	-0.46308	2.8735
				17.00000	4.00000	0.00000	-4.0072	-0.35920	2.5023
				18.00000	4.00000	0.00000	-3.6424	-0.28079	2.1512
				19.00000	4.00000	0.00000	-3.2474	-0.21955	1.8152
				20.00000	4.00000	0.00000	-2.8311	-0.17042	1.4871
				-20.00000	5.00000	0.00000	2.5197	-0.30688	1.3855
				-19.00000	5.00000	0.00000	2.8619	-0.39484	1.6897
				-18.00000	5.00000	0.00000	3.1664	-0.50345	1.9939
				-17.00000	5.00000	0.00000	3.4186	-0.64067	2.3023
				-16.00000	5.00000	0.00000	3.5956	-0.81897	2.6148
				-15.00000	5.00000	0.00000	3.6600	-1.0588	2.9243



32 Willoughby Road
Basement Assessment
Excavation Movement

Job No.	Sheet No.	Rev.
8271		
Drg. Ref.		
Made by DJH	Date 05-Sep-2024	Checked Date

Stage: Ref.	Stage: Name	Disp. Grid: Ref.	Disp. Grid: Name	x	y	z	δx	δy	δz
				[m]	[m]	[m]	[mm]	[mm]	[mm]
				-14.00000	5.00000	0.00000	3.5471	-1.3950	3.2107
				-13.00000	5.00000	0.00000	3.1412	-1.8899	3.4283
				-12.00000	5.00000	0.00000	2.3421	-2.7574	3.6337
				-11.00000	5.00000	0.00000	1.3776	-4.6550	4.4496
				-10.00000	5.00000	0.00000	0.0	-10.553	7.8838
				-9.00000	5.00000	0.00000	0.0	-10.553	7.8838
				-8.00000	5.00000	0.00000	0.0	-10.553	7.8838
				-7.00000	5.00000	0.00000	0.0	-10.553	7.8838
				-6.00000	5.00000	0.00000	0.0	-10.553	7.8838
				-5.00000	5.00000	0.00000	0.0	-10.553	7.8838
				-4.00000	5.00000	0.00000	0.0	-10.553	7.8838
				-3.00000	5.00000	0.00000	0.0	-10.553	7.8838
				-2.00000	5.00000	0.00000	0.0	-10.553	7.8838
				-1.00000	5.00000	0.00000	0.0	-10.553	7.8838
				0.00000	5.00000	0.00000	0.0	-10.553	7.8838
				1.00000	5.00000	0.00000	0.0	-10.553	7.8838
				2.00000	5.00000	0.00000	0.0	-10.553	7.8838
				3.00000	5.00000	0.00000	0.0	-10.553	7.8838
				4.00000	5.00000	0.00000	0.0	-10.553	7.8838
				5.00000	5.00000	0.00000	0.0	-10.553	7.8838
				6.00000	5.00000	0.00000	0.0	-10.553	7.8838
				7.00000	5.00000	0.00000	0.0	-10.553	7.8838
				8.00000	5.00000	0.00000	0.0	-10.553	7.8838
				9.00000	5.00000	0.00000	0.0	-10.553	7.8838
				10.00000	5.00000	0.00000	0.0	-10.553	7.8838
				11.00000	5.00000	0.00000	-1.3776	-4.6550	4.4496
				12.00000	5.00000	0.00000	-2.3421	-2.7574	3.6337
				13.00000	5.00000	0.00000	-3.1412	-1.8899	3.4283
				14.00000	5.00000	0.00000	-3.5471	-1.3950	3.2107
				15.00000	5.00000	0.00000	-3.6600	-1.0588	2.9243
				16.00000	5.00000	0.00000	-3.5956	-0.81897	2.6148
				17.00000	5.00000	0.00000	-3.4186	-0.64067	2.3023
				18.00000	5.00000	0.00000	-3.1664	-0.50345	1.9939
				19.00000	5.00000	0.00000	-2.8619	-0.39484	1.6897
				20.00000	5.00000	0.00000	-2.5197	-0.30688	1.3855
				-20.00000	6.00000	0.00000	2.1949	-0.42331	1.2600
				-19.00000	6.00000	0.00000	2.4691	-0.54387	1.5399
				-18.00000	6.00000	0.00000	2.6932	-0.69065	1.8122
				-17.00000	6.00000	0.00000	2.8502	-0.87261	2.0783
				-16.00000	6.00000	0.00000	2.9148	-1.1028	2.3353
				-15.00000	6.00000	0.00000	2.8491	-1.4007	2.5730
				-14.00000	6.00000	0.00000	2.5965	-1.7948	2.7699
				-13.00000	6.00000	0.00000	2.1389	-2.3885	2.9708
				-12.00000	6.00000	0.00000	1.6562	-3.5066	3.5068
				-11.00000	6.00000	0.00000	0.90416	-4.9783	4.0944
				-10.00000	6.00000	0.00000	0.0	-9.8025	6.8806
				-9.00000	6.00000	0.00000	0.0	-9.8025	6.8806
				-8.00000	6.00000	0.00000	0.0	-9.8025	6.8806
				-7.00000	6.00000	0.00000	0.0	-9.8025	6.8806
				-6.00000	6.00000	0.00000	0.0	-9.8025	6.8806
				-5.00000	6.00000	0.00000	0.0	-9.8025	6.8806
				-4.00000	6.00000	0.00000	0.0	-9.8025	6.8806
				-3.00000	6.00000	0.00000	0.0	-9.8025	6.8806
				-2.00000	6.00000	0.00000	0.0	-9.8025	6.8806
				-1.00000	6.00000	0.00000	0.0	-9.8025	6.8806
				0.00000	6.00000	0.00000	0.0	-9.8025	6.8806
				1.00000	6.00000	0.00000	0.0	-9.8025	6.8806
				2.00000	6.00000	0.00000	0.0	-9.8025	6.8806
				3.00000	6.00000	0.00000	0.0	-9.8025	6.8806
				4.00000	6.00000	0.00000	0.0	-9.8025	6.8806
				5.00000	6.00000	0.00000	0.0	-9.8025	6.8806
				6.00000	6.00000	0.00000	0.0	-9.8025	6.8806
				7.00000	6.00000	0.00000	0.0	-9.8025	6.8806
				8.00000	6.00000	0.00000	0.0	-9.8025	6.8806
				9.00000	6.00000	0.00000	0.0	-9.8025	6.8806
				10.00000	6.00000	0.00000	0.0	-9.8025	6.8806
				11.00000	6.00000	0.00000	-0.90416	-4.9783	4.0944
				12.00000	6.00000	0.00000	-1.6562	-3.5066	3.5068
				13.00000	6.00000	0.00000	-2.1389	-2.3885	2.9708
				14.00000	6.00000	0.00000	-2.5965	-1.7948	2.7699
				15.00000	6.00000	0.00000	-2.8491	-1.4007	2.5730
				16.00000	6.00000	0.00000	-2.9148	-1.1028	2.3353
				17.00000	6.00000	0.00000	-2.8502	-0.87261	2.0783
				18.00000	6.00000	0.00000	-2.6932	-0.69065	1.8122
				19.00000	6.00000	0.00000	-2.4691	-0.54387	1.5399
				20.00000	6.00000	0.00000	-2.1949	-0.42331	1.2600
				-20.00000	7.00000	0.00000	1.8712	-0.51311	1.1157



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Basement Assessment
Excavation Movement

Job No.	Sheet No.	Rev.
8271		
Drg. Ref.		
Made by DJH	Date 05-Sep-2024	Checked Date

Stage: Ref.	Stage: Name	Disp. Grid: Ref.	Disp. Grid: Name	x	y	z	δx	δy	δz
				[m]	[m]	[m]	[mm]	[mm]	[mm]
				-19.00000	7.00000	0.00000	2.0866	-0.65867	1.3730
				-18.00000	7.00000	0.00000	2.2448	-0.83293	1.6158
				-17.00000	7.00000	0.00000	2.3287	-1.0442	1.8443
				-16.00000	7.00000	0.00000	2.3153	-1.3036	2.0544
				-15.00000	7.00000	0.00000	2.1734	-1.6258	2.2363
				-14.00000	7.00000	0.00000	1.9052	-2.0709	2.4236
				-13.00000	7.00000	0.00000	1.6417	-2.8339	2.8173
				-12.00000	7.00000	0.00000	1.2201	-3.7967	3.2437
				-11.00000	7.00000	0.00000	0.64268	-4.9315	3.6694
				-10.00000	7.00000	0.00000	0.0	-9.0525	5.9949
				-9.00000	7.00000	0.00000	0.0	-9.0525	5.9949
				-8.00000	7.00000	0.00000	0.0	-9.0525	5.9949
				-7.00000	7.00000	0.00000	0.0	-9.0525	5.9949
				-6.00000	7.00000	0.00000	0.0	-9.0525	5.9949
				-5.00000	7.00000	0.00000	0.0	-9.0525	5.9949
				-4.00000	7.00000	0.00000	0.0	-9.0525	5.9949
				-3.00000	7.00000	0.00000	0.0	-9.0525	5.9949
				-2.00000	7.00000	0.00000	0.0	-9.0525	5.9949
				-1.00000	7.00000	0.00000	0.0	-9.0525	5.9949
				0.00000	7.00000	0.00000	0.0	-9.0525	5.9949
				1.00000	7.00000	0.00000	0.0	-9.0525	5.9949
				2.00000	7.00000	0.00000	0.0	-9.0525	5.9949
				3.00000	7.00000	0.00000	0.0	-9.0525	5.9949
				4.00000	7.00000	0.00000	0.0	-9.0525	5.9949
				5.00000	7.00000	0.00000	0.0	-9.0525	5.9949
				6.00000	7.00000	0.00000	0.0	-9.0525	5.9949
				7.00000	7.00000	0.00000	0.0	-9.0525	5.9949
				8.00000	7.00000	0.00000	0.0	-9.0525	5.9949
				9.00000	7.00000	0.00000	0.0	-9.0525	5.9949
				10.00000	7.00000	0.00000	0.0	-9.0525	5.9949
				11.00000	7.00000	0.00000	-0.64268	-4.9315	3.6694
				12.00000	7.00000	0.00000	-1.2201	-3.7967	3.2437
				13.00000	7.00000	0.00000	-1.6417	-2.8339	2.8173
				14.00000	7.00000	0.00000	-1.9052	-2.0709	2.4236
				15.00000	7.00000	0.00000	-2.1734	-1.6258	2.2363
				16.00000	7.00000	0.00000	-2.3153	-1.3036	2.0544
				17.00000	7.00000	0.00000	-2.3287	-1.0442	1.8443
				18.00000	7.00000	0.00000	-2.2448	-0.83293	1.6158
				19.00000	7.00000	0.00000	-2.0866	-0.65867	1.3730
				20.00000	7.00000	0.00000	-1.8712	-0.51311	1.1157
				-20.00000	8.00000	0.00000	1.5597	-0.57196	0.95669
				-19.00000	8.00000	0.00000	1.7274	-0.73472	1.1946
				-18.00000	8.00000	0.00000	1.8351	-0.92598	1.4124
				-17.00000	8.00000	0.00000	1.8677	-1.1525	1.6099
				-16.00000	8.00000	0.00000	1.8067	-1.4223	1.7836
				-15.00000	8.00000	0.00000	1.6590	-1.7740	1.9586
				-14.00000	8.00000	0.00000	1.5198	-2.3359	2.2663
				-13.00000	8.00000	0.00000	1.2772	-3.0224	2.5946
				-12.00000	8.00000	0.00000	0.92574	-3.8281	2.9298
				-11.00000	8.00000	0.00000	0.47830	-4.7155	3.2450
				-10.00000	8.00000	0.00000	0.0	-8.3025	5.2104
				-9.00000	8.00000	0.00000	0.0	-8.3025	5.2104
				-8.00000	8.00000	0.00000	0.0	-8.3025	5.2104
				-7.00000	8.00000	0.00000	0.0	-8.3025	5.2104
				-6.00000	8.00000	0.00000	0.0	-8.3025	5.2104
				-5.00000	8.00000	0.00000	0.0	-8.3025	5.2104
				-4.00000	8.00000	0.00000	0.0	-8.3025	5.2104
				-3.00000	8.00000	0.00000	0.0	-8.3025	5.2104
				-2.00000	8.00000	0.00000	0.0	-8.3025	5.2104
				-1.00000	8.00000	0.00000	0.0	-8.3025	5.2104
				0.00000	8.00000	0.00000	0.0	-8.3025	5.2104
				1.00000	8.00000	0.00000	0.0	-8.3025	5.2104
				2.00000	8.00000	0.00000	0.0	-8.3025	5.2104
				3.00000	8.00000	0.00000	0.0	-8.3025	5.2104
				4.00000	8.00000	0.00000	0.0	-8.3025	5.2104
				5.00000	8.00000	0.00000	0.0	-8.3025	5.2104
				6.00000	8.00000	0.00000	0.0	-8.3025	5.2104
				7.00000	8.00000	0.00000	0.0	-8.3025	5.2104
				8.00000	8.00000	0.00000	0.0	-8.3025	5.2104
				9.00000	8.00000	0.00000	0.0	-8.3025	5.2104
				10.00000	8.00000	0.00000	0.0	-8.3025	5.2104
				11.00000	8.00000	0.00000	-0.47830	-4.7155	3.2450
				12.00000	8.00000	0.00000	-0.92574	-3.8281	2.9298
				13.00000	8.00000	0.00000	-1.2772	-3.0224	2.5946
				14.00000	8.00000	0.00000	-1.5198	-2.3359	2.2663
				15.00000	8.00000	0.00000	-1.6590	-1.7740	1.9586
				16.00000	8.00000	0.00000	-1.8067	-1.4223	1.7836



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Basement Assessment
Excavation Movement

Job No.	Sheet No.	Rev.
8271		
Drg. Ref.		
Made by DJH	Date 05-Sep-2024	Checked Date

Stage: Ref.	Stage: Name	Disp. Grid: Ref.	Disp. Grid: Name	x	y	z	δx	δy	δz
				[m]	[m]	[m]	[mm]	[mm]	[mm]
				17.00000	8.00000	0.00000	-1.8677	-1.1525	1.6099
				18.00000	8.00000	0.00000	-1.8351	-0.92598	1.4124
				19.00000	8.00000	0.00000	-1.7274	-0.73472	1.1946
				20.00000	8.00000	0.00000	-1.5597	-0.57196	0.95669
				-20.00000	9.00000	0.00000	1.2685	-0.59776	0.78564
				-19.00000	9.00000	0.00000	1.3993	-0.77048	1.0082
				-18.00000	9.00000	0.00000	1.4708	-0.96967	1.2064
				-17.00000	9.00000	0.00000	1.4709	-1.2001	1.3804
				-16.00000	9.00000	0.00000	1.4065	-1.4876	1.5495
				-15.00000	9.00000	0.00000	1.3470	-1.9206	1.8028
				-14.00000	9.00000	0.00000	1.2145	-2.4373	2.0680
				-13.00000	9.00000	0.00000	1.0036	-3.0370	2.3392
				-12.00000	9.00000	0.00000	0.71603	-3.7056	2.6037
				-11.00000	9.00000	0.00000	0.36577	-4.4090	2.8420
				-10.00000	9.00000	0.00000	0.0	-7.5525	4.5109
				-9.00000	9.00000	0.00000	0.0	-7.5525	4.5109
				-8.00000	9.00000	0.00000	0.0	-7.5525	4.5109
				-7.00000	9.00000	0.00000	0.0	-7.5525	4.5109
				-6.00000	9.00000	0.00000	0.0	-7.5525	4.5109
				-5.00000	9.00000	0.00000	0.0	-7.5525	4.5109
				-4.00000	9.00000	0.00000	0.0	-7.5525	4.5109
				-3.00000	9.00000	0.00000	0.0	-7.5525	4.5109
				-2.00000	9.00000	0.00000	0.0	-7.5525	4.5109
				-1.00000	9.00000	0.00000	0.0	-7.5525	4.5109
				0.00000	9.00000	0.00000	0.0	-7.5525	4.5109
				1.00000	9.00000	0.00000	0.0	-7.5525	4.5109
				2.00000	9.00000	0.00000	0.0	-7.5525	4.5109
				3.00000	9.00000	0.00000	0.0	-7.5525	4.5109
				4.00000	9.00000	0.00000	0.0	-7.5525	4.5109
				5.00000	9.00000	0.00000	0.0	-7.5525	4.5109
				6.00000	9.00000	0.00000	0.0	-7.5525	4.5109
				7.00000	9.00000	0.00000	0.0	-7.5525	4.5109
				8.00000	9.00000	0.00000	0.0	-7.5525	4.5109
				9.00000	9.00000	0.00000	0.0	-7.5525	4.5109
				10.00000	9.00000	0.00000	0.0	-7.5525	4.5109
				11.00000	9.00000	0.00000	-0.36577	-4.4090	2.8420
				12.00000	9.00000	0.00000	-0.71603	-3.7056	2.6037
				13.00000	9.00000	0.00000	-1.0036	-3.0370	2.3392
				14.00000	9.00000	0.00000	-1.2145	-2.4373	2.0680
				15.00000	9.00000	0.00000	-1.3470	-1.9206	1.8028
				16.00000	9.00000	0.00000	-1.4065	-1.4876	1.5495
				17.00000	9.00000	0.00000	-1.4709	-1.2001	1.3804
				18.00000	9.00000	0.00000	-1.4708	-0.96967	1.2064
				19.00000	9.00000	0.00000	-1.3993	-0.77048	1.0082
				20.00000	9.00000	0.00000	-1.2685	-0.59776	0.78564
				-20.00000	10.00000	0.00000	1.0022	-0.59017	0.60389
				-19.00000	10.00000	0.00000	1.1061	-0.76673	0.81560
				-18.00000	10.00000	0.00000	1.1538	-0.96660	0.99984
				-17.00000	10.00000	0.00000	1.1505	-1.2072	1.1715
				-16.00000	10.00000	0.00000	1.1463	-1.5506	1.3922
				-15.00000	10.00000	0.00000	1.0877	-1.9534	1.6176
				-14.00000	10.00000	0.00000	0.97015	-2.4160	1.8454
				-13.00000	10.00000	0.00000	0.79269	-2.9322	2.0698
				-12.00000	10.00000	0.00000	0.55992	-3.4858	2.2807
				-11.00000	10.00000	0.00000	0.28404	-4.0489	2.4644
				-10.00000	10.00000	0.00000	0.0	-6.8025	3.8799
				-9.00000	10.00000	0.00000	0.0	-6.8025	3.8799
				-8.00000	10.00000	0.00000	0.0	-6.8025	3.8799
				-7.00000	10.00000	0.00000	0.0	-6.8025	3.8799
				-6.00000	10.00000	0.00000	0.0	-6.8025	3.8799
				-5.00000	10.00000	0.00000	0.0	-6.8025	3.8799
				-4.00000	10.00000	0.00000	0.0	-6.8025	3.8799
				-3.00000	10.00000	0.00000	0.0	-6.8025	3.8799
				-2.00000	10.00000	0.00000	0.0	-6.8025	3.8799
				-1.00000	10.00000	0.00000	0.0	-6.8025	3.8799
				0.00000	10.00000	0.00000	0.0	-6.8025	3.8799
				1.00000	10.00000	0.00000	0.0	-6.8025	3.8799
				2.00000	10.00000	0.00000	0.0	-6.8025	3.8799
				3.00000	10.00000	0.00000	0.0	-6.8025	3.8799
				4.00000	10.00000	0.00000	0.0	-6.8025	3.8799
				5.00000	10.00000	0.00000	0.0	-6.8025	3.8799
				6.00000	10.00000	0.00000	0.0	-6.8025	3.8799
				7.00000	10.00000	0.00000	0.0	-6.8025	3.8799
				8.00000	10.00000	0.00000	0.0	-6.8025	3.8799
				9.00000	10.00000	0.00000	0.0	-6.8025	3.8799
				10.00000	10.00000	0.00000	0.0	-6.8025	3.8799
				11.00000	10.00000	0.00000	-0.28404	-4.0489	2.4644



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 Basement Assessment
 Excavation Movement

Job No.	Sheet No.	Rev.
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Drg. Ref.		
Made by DJH	Date 05-Sep-2024	Checked Date

Stage: Ref.	Stage: Name	Disp. Grid: Ref.	Disp. Grid: Name	x	y	z	δx	δy	δz
				[m]	[m]	[m]	[mm]	[mm]	[mm]
				12.00000	10.00000	0.00000	-0.55992	-3.4858	2.2807
				13.00000	10.00000	0.00000	-0.79269	-2.9322	2.0698
				14.00000	10.00000	0.00000	-0.97015	-2.4160	1.8454
				15.00000	10.00000	0.00000	-1.0877	-1.9534	1.6176
				16.00000	10.00000	0.00000	-1.1463	-1.5506	1.3922
				17.00000	10.00000	0.00000	-1.1505	-1.2072	1.1715
				18.00000	10.00000	0.00000	-1.1538	-0.96660	0.99984
				19.00000	10.00000	0.00000	-1.1061	-0.76673	0.81560
				20.00000	10.00000	0.00000	-1.0022	-0.59017	0.60389
				-20.00000	11.00000	0.00000	0.76317	-0.55020	0.41138
				-19.00000	11.00000	0.00000	0.84877	-0.72568	0.61674
				-18.00000	11.00000	0.00000	0.89217	-0.93059	0.80084
				-17.00000	11.00000	0.00000	0.92864	-1.2082	1.0060
				-16.00000	11.00000	0.00000	0.92274	-1.5297	1.2092
				-15.00000	11.00000	0.00000	0.87102	-1.8957	1.4104
				-14.00000	11.00000	0.00000	0.77177	-2.3030	1.6072
				-13.00000	11.00000	0.00000	0.62618	-2.7432	1.7946
				-12.00000	11.00000	0.00000	0.43956	-3.2011	1.9651
				-11.00000	11.00000	0.00000	0.22203	-3.6544	2.1091
				-10.00000	11.00000	0.00000	0.0	-6.0525	3.3013
				-9.00000	11.00000	0.00000	0.0	-6.0525	3.3013
				-8.00000	11.00000	0.00000	0.0	-6.0525	3.3013
				-7.00000	11.00000	0.00000	0.0	-6.0525	3.3013
				-6.00000	11.00000	0.00000	0.0	-6.0525	3.3013
				-5.00000	11.00000	0.00000	0.0	-6.0525	3.3013
				-4.00000	11.00000	0.00000	0.0	-6.0525	3.3013
				-3.00000	11.00000	0.00000	0.0	-6.0525	3.3013
				-2.00000	11.00000	0.00000	0.0	-6.0525	3.3013
				-1.00000	11.00000	0.00000	0.0	-6.0525	3.3013
				0.00000	11.00000	0.00000	0.0	-6.0525	3.3013
				1.00000	11.00000	0.00000	0.0	-6.0525	3.3013
				2.00000	11.00000	0.00000	0.0	-6.0525	3.3013
				3.00000	11.00000	0.00000	0.0	-6.0525	3.3013
				4.00000	11.00000	0.00000	0.0	-6.0525	3.3013
				5.00000	11.00000	0.00000	0.0	-6.0525	3.3013
				6.00000	11.00000	0.00000	0.0	-6.0525	3.3013
				7.00000	11.00000	0.00000	0.0	-6.0525	3.3013
				8.00000	11.00000	0.00000	0.0	-6.0525	3.3013
				9.00000	11.00000	0.00000	0.0	-6.0525	3.3013
				10.00000	11.00000	0.00000	0.0	-6.0525	3.3013
				11.00000	11.00000	0.00000	-0.22203	-3.6544	2.1091
				12.00000	11.00000	0.00000	-0.43956	-3.2011	1.9651
				13.00000	11.00000	0.00000	-0.62618	-2.7432	1.7946
				14.00000	11.00000	0.00000	-0.77177	-2.3030	1.6072
				15.00000	11.00000	0.00000	-0.87102	-1.8957	1.4104
				16.00000	11.00000	0.00000	-0.92274	-1.5297	1.2092
				17.00000	11.00000	0.00000	-0.92864	-1.2082	1.0060
				18.00000	11.00000	0.00000	-0.89217	-0.93059	0.80084
				19.00000	11.00000	0.00000	-0.84877	-0.72568	0.61674
				20.00000	11.00000	0.00000	-0.76317	-0.55020	0.41138
				-20.00000	12.00000	0.00000	0.55207	-0.47970	0.20687
				-19.00000	12.00000	0.00000	0.63234	-0.65652	0.41412
				-18.00000	12.00000	0.00000	0.69996	-0.88368	0.61823
				-17.00000	12.00000	0.00000	0.73349	-1.1445	0.81410
				-16.00000	12.00000	0.00000	0.73029	-1.4392	1.0029
				-15.00000	12.00000	0.00000	0.68864	-1.7661	1.1843
				-14.00000	12.00000	0.00000	0.60843	-2.1204	1.3563
				-13.00000	12.00000	0.00000	0.49187	-2.4933	1.5151
				-12.00000	12.00000	0.00000	0.34410	-2.8713	1.6552
				-11.00000	12.00000	0.00000	0.17340	-3.2366	1.7697
				-10.00000	12.00000	0.00000	0.0	-5.3025	2.7587
				-9.00000	12.00000	0.00000	0.0	-5.3025	2.7587
				-8.00000	12.00000	0.00000	0.0	-5.3025	2.7587
				-7.00000	12.00000	0.00000	0.0	-5.3025	2.7587
				-6.00000	12.00000	0.00000	0.0	-5.3025	2.7587
				-5.00000	12.00000	0.00000	0.0	-5.3025	2.7587
				-4.00000	12.00000	0.00000	0.0	-5.3025	2.7587
				-3.00000	12.00000	0.00000	0.0	-5.3025	2.7587
				-2.00000	12.00000	0.00000	0.0	-5.3025	2.7587
				-1.00000	12.00000	0.00000	0.0	-5.3025	2.7587
				0.00000	12.00000	0.00000	0.0	-5.3025	2.7587
				1.00000	12.00000	0.00000	0.0	-5.3025	2.7587
				2.00000	12.00000	0.00000	0.0	-5.3025	2.7587
				3.00000	12.00000	0.00000	0.0	-5.3025	2.7587
				4.00000	12.00000	0.00000	0.0	-5.3025	2.7587
				5.00000	12.00000	0.00000	0.0	-5.3025	2.7587
				6.00000	12.00000	0.00000	0.0	-5.3025	2.7587



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Basement Assessment
Excavation Movement

Job No.	Sheet No.	Rev.
8271		
Drg. Ref.		
Made by DJH	Date 05-Sep-2024	Checked Date

Stage: Ref.	Stage: Name	Disp. Grid: Ref.	Disp. Grid: Name	x	y	z	δx	δy	δz
				[m]	[m]	[m]	[mm]	[mm]	[mm]
				7.00000	12.00000	0.00000	0.0	-5.3025	2.7587
				8.00000	12.00000	0.00000	0.0	-5.3025	2.7587
				9.00000	12.00000	0.00000	0.0	-5.3025	2.7587
				10.00000	12.00000	0.00000	0.0	-5.3025	2.7587
				11.00000	12.00000	0.00000	-0.17340	-3.2366	1.7697
				12.00000	12.00000	0.00000	-0.34410	-2.8713	1.6552
				13.00000	12.00000	0.00000	-0.49187	-2.4933	1.5151
				14.00000	12.00000	0.00000	-0.60843	-2.1204	1.3563
				15.00000	12.00000	0.00000	-0.68864	-1.7661	1.1843
				16.00000	12.00000	0.00000	-0.73029	-1.4392	1.0029
				17.00000	12.00000	0.00000	-0.73349	-1.1445	0.81410
				18.00000	12.00000	0.00000	-0.69996	-0.88368	0.61823
				19.00000	12.00000	0.00000	-0.63234	-0.65652	0.41412
				20.00000	12.00000	0.00000	-0.55207	-0.47970	0.20687
				-20.00000	13.00000	0.00000	0.37144	-0.38422	0.0
				-19.00000	13.00000	0.00000	0.46367	-0.57157	0.20415
				-18.00000	13.00000	0.00000	0.52777	-0.78525	0.40580
				-17.00000	13.00000	0.00000	0.56167	-1.0255	0.59498
				-16.00000	13.00000	0.00000	0.56386	-1.2911	0.77269
				-15.00000	13.00000	0.00000	0.53375	-1.5793	0.93876
				-14.00000	13.00000	0.00000	0.47211	-1.8844	1.0917
				-13.00000	13.00000	0.00000	0.38152	-2.1982	1.2287
				-12.00000	13.00000	0.00000	0.26664	-2.5090	1.3457
				-11.00000	13.00000	0.00000	0.13425	-2.8023	1.4379
				-10.00000	13.00000	0.00000	0.0	-4.5525	2.2359
				-9.00000	13.00000	0.00000	0.0	-4.5525	2.2359
				-8.00000	13.00000	0.00000	0.0	-4.5525	2.2359
				-7.00000	13.00000	0.00000	0.0	-4.5525	2.2359
				-6.00000	13.00000	0.00000	0.0	-4.5525	2.2359
				-5.00000	13.00000	0.00000	0.0	-4.5525	2.2359
				-4.00000	13.00000	0.00000	0.0	-4.5525	2.2359
				-3.00000	13.00000	0.00000	0.0	-4.5525	2.2359
				-2.00000	13.00000	0.00000	0.0	-4.5525	2.2359
				-1.00000	13.00000	0.00000	0.0	-4.5525	2.2359
				0.00000	13.00000	0.00000	0.0	-4.5525	2.2359
				1.00000	13.00000	0.00000	0.0	-4.5525	2.2359
				2.00000	13.00000	0.00000	0.0	-4.5525	2.2359
				3.00000	13.00000	0.00000	0.0	-4.5525	2.2359
				4.00000	13.00000	0.00000	0.0	-4.5525	2.2359
				5.00000	13.00000	0.00000	0.0	-4.5525	2.2359
				6.00000	13.00000	0.00000	0.0	-4.5525	2.2359
				7.00000	13.00000	0.00000	0.0	-4.5525	2.2359
				8.00000	13.00000	0.00000	0.0	-4.5525	2.2359
				9.00000	13.00000	0.00000	0.0	-4.5525	2.2359
				10.00000	13.00000	0.00000	0.0	-4.5525	2.2359
				11.00000	13.00000	0.00000	-0.13425	-2.8023	1.4379
				12.00000	13.00000	0.00000	-0.26664	-2.5090	1.3457
				13.00000	13.00000	0.00000	-0.38152	-2.1982	1.2287
				14.00000	13.00000	0.00000	-0.47211	-1.8844	1.0917
				15.00000	13.00000	0.00000	-0.53375	-1.5793	0.93876
				16.00000	13.00000	0.00000	-0.56386	-1.2911	0.77269
				17.00000	13.00000	0.00000	-0.56167	-1.0255	0.59498
				18.00000	13.00000	0.00000	-0.52777	-0.78525	0.40580
				19.00000	13.00000	0.00000	-0.46367	-0.57157	0.20415
				20.00000	13.00000	0.00000	-0.37144	-0.38422	0.0

Specific Building Damage Results - Horizontal Displacements

Stage: δy Ref.	Stage: $\delta H//$ Ref.	Name δH_{perp} Building: Ref.	Specific Building: Name Ref.	Specific Building: Name	Sub-building Name	Dist.	x	y	z	δx
[mm]	[mm]	[mm]	[mm]			[m]	[m]	[m]	[m]	[mm]
0	Base Model	1	30 willoughby road	Party wall		0.0	10.05000	2.85000	0.00000	
-4.0753	-4.0753	4.0753	4.0753			1.0050	9.04500	2.85000	0.00000	
0.0	-12.165	0.0	12.165			2.0100	8.04000	2.85000	0.00000	
0.0	-12.165	0.0	12.165			3.0150	7.03500	2.85000	0.00000	
0.0	-12.165	0.0	12.165			4.0200	6.03000	2.85000	0.00000	
0.0	-12.165	0.0	12.165			5.0250	5.02500	2.85000	0.00000	



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Stage: δy Ref.	Stage: δH // δH_{perp} Ref.	Name Building: Ref.	Specific Name	Specific Name	Building: Name	Sub-building Name	Dist.	x	y	z	δx
0.0	-12.165	0.0	12.165				6.0300	4.02000	2.85000	0.00000	
0.0	-12.165	0.0	12.165				7.0350	3.01500	2.85000	0.00000	
0.0	-12.165	0.0	12.165				8.0400	2.01000	2.85000	0.00000	
0.0	-12.165	0.0	12.165				9.0450	1.00500	2.85000	0.00000	
0.0	-12.165	0.0	12.165				10.050	0.00000	2.85000	0.00000	
0.0	-12.165	0.0	12.165				11.055	-1.00500	2.85000	0.00000	
0.0	-12.165	0.0	12.165				12.060	-2.01000	2.85000	0.00000	
0.0	-12.165	0.0	12.165				13.065	-3.01500	2.85000	0.00000	
0.0	-12.165	0.0	12.165				14.070	-4.02000	2.85000	0.00000	
0.0	-12.165	0.0	12.165				15.075	-5.02500	2.85000	0.00000	
0.0	-12.165	0.0	12.165				16.080	-6.03000	2.85000	0.00000	
0.0	-12.165	0.0	12.165				17.085	-7.03500	2.85000	0.00000	
0.0	-12.165	0.0	12.165				18.090	-8.04000	2.85000	0.00000	
0.0	-12.165	0.0	12.165				19.095	-9.04500	2.85000	0.00000	
0.0	-12.165	0.0	12.165				20.100	-10.05000	2.85000	0.00000	
4.0753	-4.0753	-4.0753	4.0753				0.0	10.05000	2.85000	0.00000	
-4.0753	-4.0753	-4.0753	4.0753			2					
						30 willoughby road					
						Front elevation					
0.0	-7.8641	-7.8641	0.0				0.57000	10.05000	3.42000	0.00000	
0.0	-7.5777	-7.5777	0.0				1.1400	10.05000	3.99000	0.00000	
0.0	-7.2913	-7.2913	0.0				1.7100	10.05000	4.56000	0.00000	
0.0	-7.0048	-7.0048	0.0				2.2800	10.05000	5.13000	0.00000	
0.0	-6.7184	-6.7184	0.0				2.8500	10.05000	5.70000	0.00000	
0.0	-6.4320	-6.4320	0.0				3.4200	10.05000	6.27000	0.00000	
0.0	-6.1456	-6.1456	0.0				3.9900	10.05000	6.84000	0.00000	
0.0	-5.8591	-5.8591	0.0				4.5600	10.05000	7.41000	0.00000	
0.0	-5.5727	-5.5727	0.0				5.1300	10.05000	7.98000	0.00000	
0.0	-5.2863	-5.2863	0.0				5.7000	10.05000	8.55000	0.00000	
0.0	6.8943	0.0	6.8943			3					
0.0	10.290	0.0	10.290			34 willoughby road					
0.0	10.290	0.0	10.290			side elevation					
0.0	10.290	0.0	10.290				0.0	-10.05000	-5.35000	0.00000	
0.0	10.290	0.0	10.290				1.0050	-9.04500	-5.35000	0.00000	
0.0	10.290	0.0	10.290				2.0100	-8.04000	-5.35000	0.00000	
0.0	10.290	0.0	10.290				3.0150	-7.03500	-5.35000	0.00000	
0.0	10.290	0.0	10.290				4.0200	-6.03000	-5.35000	0.00000	
0.0	10.290	0.0	10.290				5.0250	-5.02500	-5.35000	0.00000	
0.0	10.290	0.0	10.290				6.0300	-4.02000	-5.35000	0.00000	
0.0	10.290	0.0	10.290				7.0350	-3.01500	-5.35000	0.00000	
0.0	10.290	0.0	10.290				8.0400	-2.01000	-5.35000	0.00000	
0.0	10.290	0.0	10.290				9.0450	-1.00500	-5.35000	0.00000	
0.0	10.290	0.0	10.290				10.050	0.00000	-5.35000	0.00000	
0.0	10.290	0.0	10.290				11.055	1.00500	-5.35000	0.00000	



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Stage: δy Ref.	Stage: $\delta H//$	Name δH_{perp} Building: Ref.	Specific Building: Name	Sub-building Name	Dist.	x	y	z	δx
0.0	10.290	0.0	10.290		12.060	2.01000	-5.35000	0.00000	
0.0	10.290	0.0	10.290		13.065	3.01500	-5.35000	0.00000	
0.0	10.290	0.0	10.290		14.070	4.02000	-5.35000	0.00000	
0.0	10.290	0.0	10.290		15.075	5.02500	-5.35000	0.00000	
0.0	10.290	0.0	10.290		16.080	6.03000	-5.35000	0.00000	
0.0	10.290	0.0	10.290		17.085	7.03500	-5.35000	0.00000	
0.0	10.290	0.0	10.290		18.090	8.04000	-5.35000	0.00000	
0.0	10.290	0.0	10.290		19.095	9.04500	-5.35000	0.00000	
0.0	10.290	0.0	10.290		20.100	10.05000	-5.35000	0.00000	
0.0	6.8943	0.0	6.8943		0.0	10.05000	-5.35000	0.00000	
0.0	6.8943	-6.8943	0.0	34 willoughby road front elevation	0.0	10.05000	-5.35000	0.00000	
0.0	6.5928	-6.5928	0.0		0.60000	10.05000	-5.95000	0.00000	
0.0	6.2913	-6.2913	0.0		1.2000	10.05000	-6.55000	0.00000	
0.0	5.9898	-5.9898	0.0		1.8000	10.05000	-7.15000	0.00000	
0.0	5.6883	-5.6883	0.0		2.4000	10.05000	-7.75000	0.00000	
0.0	5.3868	-5.3868	0.0		3.0000	10.05000	-8.35000	0.00000	
0.0	5.0853	-5.0853	0.0		3.6000	10.05000	-8.95000	0.00000	
0.0	4.7838	-4.7838	0.0		4.2000	10.05000	-9.55000	0.00000	
0.0	4.4823	-4.4823	0.0		4.8000	10.05000	-10.15000	0.00000	
0.0	4.1808	-4.1808	0.0		5.4000	10.05000	-10.75000	0.00000	
0.0	3.8793	-3.8793	0.0		6.0000	10.05000	-11.35000	0.00000	

Specific Building Damage Results - Vertical Displacements

Stage: δz Ref.	Stage:	Name Ref.	Specific Building: Name	Sub-building Name	Vertical Offset	Dist.	x	y	z
[mm]					[m]	[m]	[m]	[m]	[m]
0.00000	Base Model	1	30 willoughby road	Party wall	0.0	0.0	10.05000	2.85000	
0.00000	7.0449					1.0050	9.04500	2.85000	
0.00000	10.515					2.0100	8.04000	2.85000	
0.00000	10.515					3.0150	7.03500	2.85000	
0.00000	10.515					4.0200	6.03000	2.85000	
0.00000	10.515					5.0250	5.02500	2.85000	
0.00000	10.515					6.0300	4.02000	2.85000	
0.00000	10.515					7.0350	3.01500	2.85000	
0.00000	10.515					8.0400	2.01000	2.85000	
0.00000	10.515					9.0450	1.00500	2.85000	
0.00000	10.515					10.050	0.00000	2.85000	
0.00000	10.515					11.055	-1.00500	2.85000	
0.00000	10.515					12.060	-2.01000	2.85000	



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Stage:	Stage:	Name	Specific	Specific	Building:	Sub-building	Vertical	Dist.	x	y	z
δz	Ref.	Building:	Name	Ref.	Name	Offset					
	0.00000	10.515						13.065	-3.01500	2.85000	
	0.00000	10.515						14.070	-4.02000	2.85000	
	0.00000	10.515						15.075	-5.02500	2.85000	
	0.00000	10.515						16.080	-6.03000	2.85000	
	0.00000	10.515						17.085	-7.03500	2.85000	
	0.00000	10.515						18.090	-8.04000	2.85000	
	0.00000	10.515						19.095	-9.04500	2.85000	
	0.00000	10.515						20.100	-10.05000	2.85000	
	0.00000	7.0449									
	0.00000	7.0449	2		30 willoughby road	Front elevation	0.0	0.0	10.05000	2.85000	
	0.00000	6.5311						0.57000	10.05000	3.42000	
	0.00000	6.0520						1.1400	10.05000	3.99000	
	0.00000	5.6056						1.7100	10.05000	4.56000	
	0.00000	5.1899						2.2800	10.05000	5.13000	
	0.00000	4.8029						2.8500	10.05000	5.70000	
	0.00000	4.4425						3.4200	10.05000	6.27000	
	0.00000	4.1067						3.9900	10.05000	6.84000	
	0.00000	3.7935						4.5600	10.05000	7.41000	
	0.00000	3.5009						5.1300	10.05000	7.98000	
	0.00000	3.2269						5.7000	10.05000	8.55000	
	0.00000	5.0373	3		34 willoughby road	side elevation	0.0	0.0	-10.05000	-5.35000	
	0.00000	7.5183						1.0050	-9.04500	-5.35000	
	0.00000	7.5183						2.0100	-8.04000	-5.35000	
	0.00000	7.5183						3.0150	-7.03500	-5.35000	
	0.00000	7.5183						4.0200	-6.03000	-5.35000	
	0.00000	7.5183						5.0250	-5.02500	-5.35000	
	0.00000	7.5183						6.0300	-4.02000	-5.35000	
	0.00000	7.5183						7.0350	-3.01500	-5.35000	
	0.00000	7.5183						8.0400	-2.01000	-5.35000	
	0.00000	7.5183						9.0450	-1.00500	-5.35000	
	0.00000	7.5183						10.050	0.00000	-5.35000	
	0.00000	7.5183						11.055	1.00500	-5.35000	
	0.00000	7.5183						12.060	2.01000	-5.35000	
	0.00000	7.5183						13.065	3.01500	-5.35000	
	0.00000	7.5183						14.070	4.02000	-5.35000	
	0.00000	7.5183						15.075	5.02500	-5.35000	
	0.00000	7.5183						16.080	6.03000	-5.35000	
	0.00000	7.5183						17.085	7.03500	-5.35000	
	0.00000	7.5183						18.090	8.04000	-5.35000	
	0.00000	7.5183						19.095	9.04500	-5.35000	



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Stage:	Stage:	Name Specific	Specific Building:	Sub-building	Vertical	Dist.	x	y	z
δz	Ref.	Building:	Name	Name	Offset				
	Ref.	Ref.							
0.00000	7.5183					20.100	10.05000	-5.35000	
0.00000	5.0373	4	34 willoughby road	front elevation	0.0	0.0	10.05000	-5.35000	
0.00000	5.0373					0.60000	10.05000	-5.95000	
0.00000	4.6417					1.2000	10.05000	-6.55000	
0.00000	4.2746					1.8000	10.05000	-7.15000	
0.00000	3.9337					2.4000	10.05000	-7.75000	
0.00000	3.6166					3.0000	10.05000	-8.35000	
0.00000	3.3210					3.6000	10.05000	-8.95000	
0.00000	3.0445					4.2000	10.05000	-9.55000	
0.00000	2.7848					4.8000	10.05000	-10.15000	
0.00000	2.5394					5.4000	10.05000	-10.75000	
0.00000	2.3061					6.0000	10.05000	-11.35000	
0.00000	2.0824								

Specific Building Damage Results - Detail

Stage:	Stage:	Name Specific	Specific Building:	Sub-building	Vertical	Offset	Segment	Start	Length
Curvature	Deflection	Average	Max	Max Gradient	Max Gradient	Min	Damage Category		
Ref.	Building:	Name	Name	Name	from Line for				
Ratio	Horizontal	Tensile	of	of Vertical	Radius of	Vertical			
Strain	Strain	Horizontal	Displacement	Curvature		Movement			
Displacement	Curve					Calculations			
Curve									
[%]	[%]	[%]		[m]		[m]		[m]	[m]
0	Base Model 1	30 willoughby road	Party wall		0.0	1	0.0	3.0150	3.0150
Sagging	0.076829	-0.13517	0.056450	0.0040715	-0.0034667	231.55	1 (Very Slight)		
None	0.0	0.0	35.763E-9	0.0	0.0	-	0 (Negligible)	3.0150	14.070
Sagging	0.076829	-0.13517	0.056450	0.0040715	0.0034667	231.55	1 (Very Slight)	17.085	3.0150
None	0.0058627	-0.021246	0.0053504	0.0066916	907.43E-6	8127.5	0 (Negligible)	0.0	5.7000
Sagging	0.054860	0.0	0.052677	0.0	-0.0024687	325.68	1 (Very Slight)	0.0	3.0150
None	0.0	0.0	35.763E-9	0.0	0.0	-	0 (Negligible)	3.0150	14.070
Sagging	0.054860	0.0	0.052677	0.0	0.0024687	325.68	1 (Very Slight)	17.085	3.0150
None	0.0039783	0.050250	0.054456	-502.25E-6	659.01E-6	12374.1	1 (Very Slight)	0.0	6.0000

Tensile horizontal strains are +ve, compressive horizontal strains are -ve.

Specific Building Damage Results - Critical Values for All Segments within Each Sub-Building

Stage:	Stage:	Name Specific	Specific Building:	Sub-building	Vertical	Deflection	Average	Max Slope
Max	Max	Max Gradient	of Max Gradient	of Min Radius	Min Radius	Damage Category		
Ref.	Building:	Name	Name	Name	Offset from	Ratio	Horizontal	
Settlement	Tensile	Horizontal	Vertical	of	of		Strain	
Strain	Displacement	Displacement	Curvature	Curvature	Line for			
Curve	Curve	(Hogging)	(Sagging)		Vertical			
					Movement			
					Calculations			
[mm]	[%]			[m]	[m]	[%]	[%]	

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0	Base Model	1	30 willoughby road	Party wall	0.0	0.076829	-0.13517	0.0034667
10.515	0.056450		0.0040715	0.0034667	-	231.55	1 (Very Slight)	
7.0449	0.0053504	2	30 willoughby road	Front elevation	0.0	0.0058627	-0.021246	907.43E-6
			0.0066916	907.43E-6	-	0	(Negligible)	
7.5183	0.052677	3	34 willoughby road	side elevation	0.0	0.054860	0.0	0.0024687
			0.0	0.0024687	-	325.68	1 (Very Slight)	
5.0373	0.054456	4	34 willoughby road	front elevation	0.0	0.0039783	0.050250	659.01E-6
			-502.25E-6	659.01E-6	-	-	1 (Very Slight)	

Specific Building Damage Results - Critical Segments within Each Building

Stage	Stage: Name	Specific Building:	Parameter	Critical	Critical
Start	End	Curvature Max Slope Max	Max Min	Min	Damage Category
Ref.	Building:	Name			Sub-Building
Settlement	Tensile	Radius of Radius of			Segment
Strain	Curvature	Curvature			

(Hogging) (Sagging)

[m]	[m]		[mm]	[%]	[m]	[m]		
0	Base Model	0	30 willoughby road	Max Slope			Party wall	3
17.085	20.100	Sagging	0.0034667	10.515	0.056450	-	231.55	1 (Very Slight)
							Max Settlement	Party wall
0.0	3.0150	Sagging	0.0034667	10.515	0.056450	-	231.55	1 (Very Slight)
							Max Tensile Strain	Party wall
0.0	3.0150	Sagging	0.0034667	10.515	0.056450	-	231.55	1 (Very Slight)
							Min Radius of Curvature (Hogging)	
-	-	-	-	-	-	-	-	-
							Min Radius of Curvature (Sagging)	Party wall
17.085	20.100	Sagging	0.0034667	10.515	0.056450	-	231.55	1 (Very Slight)
								side elevation
17.085	20.100	Sagging	0.0024687	7.5183	0.052677	-	325.68	1 (Very Slight)
								side elevation
0.0	3.0150	Sagging	0.0024687	7.5183	0.052677	-	325.68	1 (Very Slight)
								side elevation
0.0	6.0000	None	659.01E-6	5.0373	0.054456	-	-	1 (Very Slight)
								front elevation
								Min Radius of Curvature (Hogging)
-	-	-	-	-	-	-	-	-
								Min Radius of Curvature (Sagging)
17.085	20.100	Sagging	0.0024687	7.5183	0.052677	-	325.68	1 (Very Slight)
								side elevation