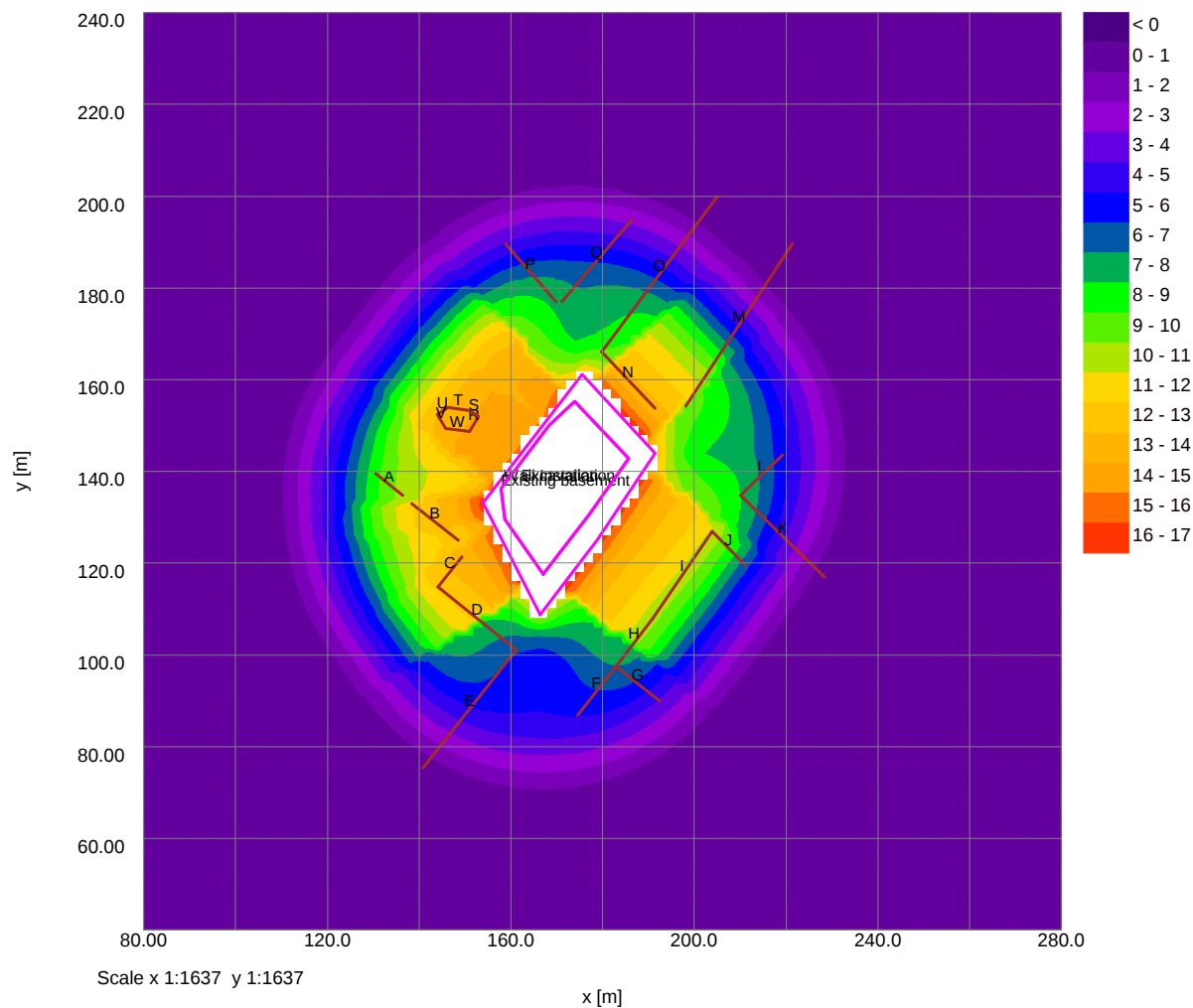


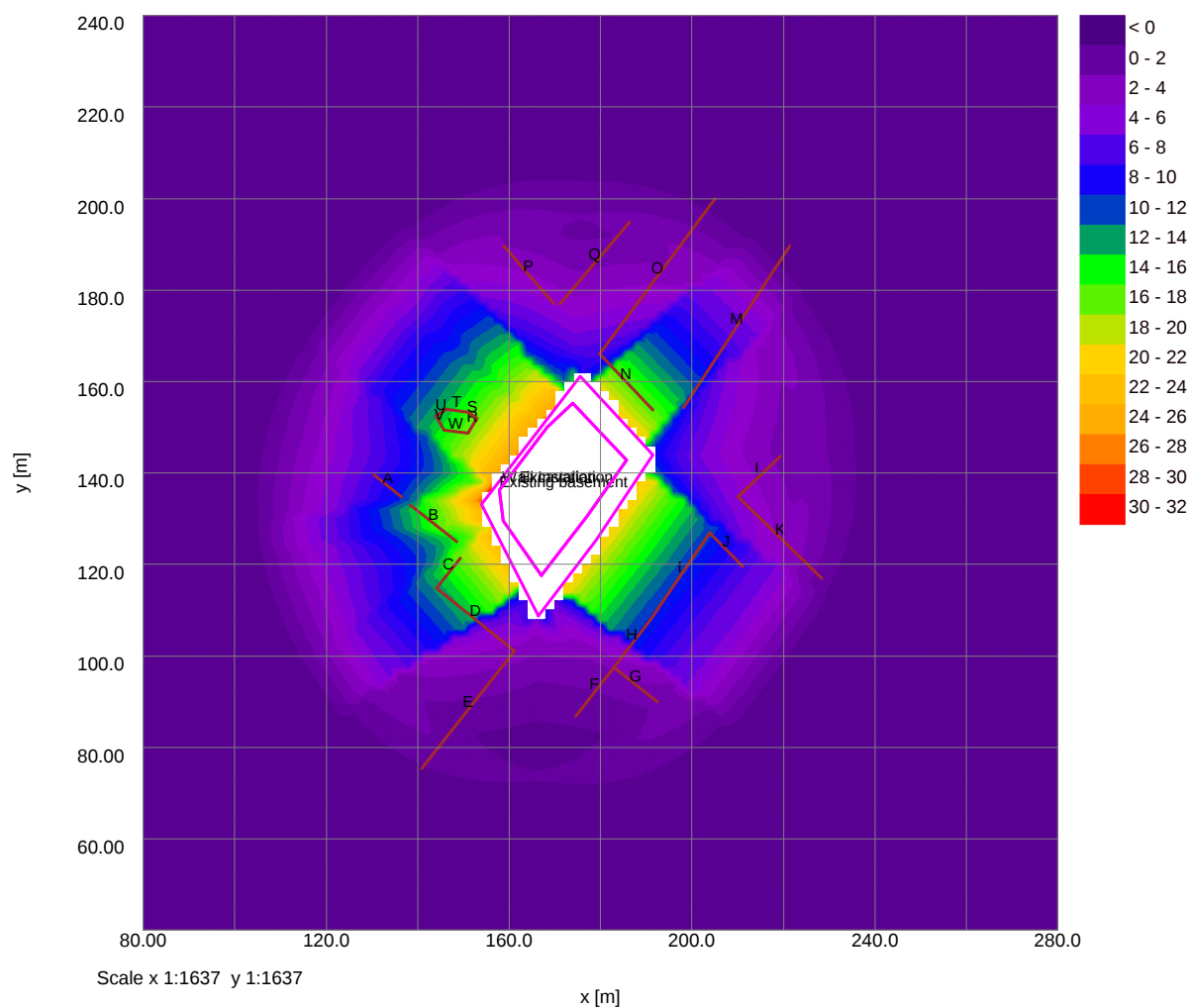
Job No.	Sheet No.	Rev.
J17183		
Drg. Ref.		
Made by	Date	Checked
	12-Dec-2017	

Vertical Settlement Contours: Grid 1 (level 0.000m) (Interval 1mm)



Job No.	Sheet No.	Rev.
J17183		
Drg. Ref.		
Made by	Date	Checked
	12-Dec-2017	

Horizontal Displacement Contours: Grid 1 (level 0.000m) Interval 1mm





GEA LIMITED (GEOTECHNICAL & ENV ASSOC)

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Wall installation and excavation combined

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Problem Type

Problem Type : Tunnelling and Embedded Wall Excavations

Displacement Data

Type	Name	Direction of extrusion	Point/Line/Line for extrusion						No. of intervals across extrusion/line	Extrusion depth	No. of intervals along extrusion	Calculate	Surface type for tunnels
			First point			Second point							
			X [m]	Y [m]	Z(level) [m]	X [m]	Y [m]	Z(level) [m]					
Grid	Grid 1	Global X	0.00000	0.00000	0.00000	-	400.00000	0.00000	200	400.00000	200	Yes	Surface
Line	A	-	130.60000	139.50000	-0.50000	136.40000	134.80000	-0.50000	8	-	-	Yes	Surface
Line	B	-	138.40000	133.00000	-0.50000	148.60000	124.90000	-0.50000	7	-	-	Yes	Surface
Line	C	-	149.30000	121.40000	-0.50000	144.10000	114.80000	-0.50000	9	-	-	Yes	Surface
Line	D	-	144.10000	114.80000	-0.50000	161.20000	101.10000	-0.50000	11	-	-	Yes	Surface
Line	E	-	161.20000	101.10000	-0.50000	140.80000	75.40000	-0.50000	17	-	-	Yes	Surface
Line	F	-	174.60000	86.80000	-0.50000	182.90000	97.50000	-0.50000	7	-	-	Yes	Surface
Line	G	-	182.90000	97.50000	-0.50000	192.40000	90.00000	-0.50000	7	-	-	Yes	Surface
Line	H	-	182.90000	97.50000	-0.50000	190.90000	108.00000	-0.50000	7	-	-	Yes	Surface
Line	I	-	190.90000	108.00000	-0.50000	203.90000	126.90000	-0.50000	12	-	-	Yes	Surface
Line	J	-	203.90000	126.90000	-0.50000	211.00000	119.60000	-0.50000	6	-	-	Yes	Surface
Line	K	-	228.40000	116.90000	-0.50000	210.10000	134.80000	-0.50000	13	-	-	Yes	Surface
Line	L	-	210.10000	134.80000	-0.50000	219.30000	143.70000	-0.50000	7	-	-	Yes	Surface
Line	M	-	221.40000	189.60000	-0.50000	198.10000	154.30000	-0.50000	22	-	-	Yes	Surface
Line	N	-	191.40000	153.80000	-0.50000	179.80000	166.00000	-0.50000	9	-	-	Yes	Surface
Line	O	-	179.80000	166.00000	-0.50000	205.00000	199.90000	-0.50000	22	-	-	Yes	Surface
Line	P	-	158.80000	189.60000	-0.50000	169.90000	177.10000	-0.50000	9	-	-	Yes	Surface
Line	Q	-	171.10000	177.10000	-0.50000	186.30000	194.90000	-0.50000	12	-	-	Yes	Surface
Line	R	-	151.00000	148.70000	-0.50000	153.00000	151.90000	-0.50000	4	-	-	Yes	Surface
Line	S	-	153.00000	151.90000	-0.50000	151.00000	153.30000	-0.50000	3	-	-	Yes	Surface
Line	T	-	151.00000	153.30000	-0.50000	146.20000	153.90000	-0.50000	5	-	-	Yes	Surface
Line	U	-	146.20000	153.90000	-0.50000	143.90000	152.50000	-0.50000	3	-	-	Yes	Surface
Line	V	-	143.90000	152.50000	-0.50000	145.80000	149.40000	-0.50000	4	-	-	Yes	Surface
Line	W	-	145.80000	149.40000	-0.50000	151.00000	148.70000	-0.50000	6	-	-	Yes	Surface

Vertical Ground Movement Curves (Excavations)

Curve Name: Installation of secant bored pile wall in stiff clay (CIRIA 580 Fig. 2.8(b))
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)(%)]
[0.000,0.000,0.050][2.000,0.000,0.000]
Curve Fitting Method: Polynomial
x Order: 1
y Order: 0
Polynomial: z = -2.5E-2x + 5.0E-2
Coeff. of Determination: 1.0

Curve Name: Excavation in front of high stiffness wall in stiff clay (CIRIA 580 Fig. 2.11(b))
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)(%)]
[0.000,0.000,0.039][0.100,0.000,0.049][0.200,0.000,0.056][0.300,0.000,0.062]
[0.400,0.000,0.067][0.500,0.000,0.070][0.600,0.000,0.072][0.700,0.000,0.073]
[0.800,0.000,0.073][0.900,0.000,0.072][1.000,0.000,0.070][1.100,0.000,0.068]
[1.200,0.000,0.065][1.300,0.000,0.061][1.400,0.000,0.058][1.500,0.000,0.054]
[1.600,0.000,0.050][1.700,0.000,0.046][1.800,0.000,0.042][1.900,0.000,0.038]
[2.000,0.000,0.034][2.100,0.000,0.030][2.200,0.000,0.027][2.300,0.000,0.023]
[2.400,0.000,0.020][2.500,0.000,0.017][2.600,0.000,0.014][2.700,0.000,0.012]
[2.800,0.000,0.010][2.900,0.000,0.008][3.000,0.000,0.007][3.100,0.000,0.005]
[3.200,0.000,0.004][3.300,0.000,0.004][3.400,0.000,0.003][3.500,0.000,0.002]
[3.600,0.000,0.002][3.700,0.000,0.002][3.800,0.000,0.001][3.900,0.000,0.001]
[4.000,0.000,0.000]
Curve Fitting Method: Polynomial
x Order: 4
y Order: 0
Polynomial: z = -2.6455E-3x⁴ + 2.8495E-2x³ - 1.0051E-1x² + 1.0569E-1x + 3.8990E-2
Coeff. of Determination: 9.9991E-1

Horizontal Ground Movement Curves (Excavations)

Curve Name: Installation of secant bored pile wall in stiff clay (CIRIA 580 Fig. 2.8(a))
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)(%)]
[0.000,0.000,0.081][0.050,0.000,0.076][0.100,0.000,0.072][0.150,0.000,0.067]
[0.200,0.000,0.063][0.250,0.000,0.059][0.300,0.000,0.056][0.350,0.000,0.052]
[0.400,0.000,0.049][0.450,0.000,0.045][0.500,0.000,0.043][0.550,0.000,0.040]
[0.600,0.000,0.037][0.650,0.000,0.034][0.700,0.000,0.032][0.750,0.000,0.029]
[0.800,0.000,0.027][0.850,0.000,0.024][0.900,0.000,0.022][0.950,0.000,0.020]
[1.000,0.000,0.018][1.050,0.000,0.016][1.100,0.000,0.014][1.150,0.000,0.012]
[1.200,0.000,0.011][1.250,0.000,0.009][1.300,0.000,0.007][1.350,0.000,0.005]
[1.400,0.000,0.004][1.450,0.000,0.002][1.500,0.000,0.000]
Curve Fitting Method: Polynomial
x Order: 3
y Order: 0
Polynomial: z = -1.0610E-2x³ + 4.4203E-2x² - 9.6358E-2x + 8.0901E-2
Coeff. of Determination: 1.0000

Curve Name: Excavation in front of high stiffness wall in stiff clay (CIRIA 580 Fig. 2.11(a))
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)(%)]
[0.000,0.000,0.150][4.000,0.000,0.000]
Curve Fitting Method: Polynomial
x Order: 1
y Order: 0
Polynomial: z = -3.75E-2x + 1.50E-1
Coeff. of Determination: 1.00

Polygonal Excavations

Excavation Name: Existing basement
Surface level [m]: 0.0
Contribution: Negative
Enabled: Yes
Surface movement curves which are selected are applied between surface and [m]: -8.7000



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Corner	x	y	Base Level	Stiffened	Previous Side			Next Side		
	[m]	[m]	[m]		d	p1	p2*	d	p1	p2*
1	166.40	108.80	-8.7000	No	-	-	-	-	-	-
2	179.00	125.30	-8.7000	No	-	-	-	-	-	-
3	191.40	143.90	-8.7000	No	-	-	-	-	-	-
4	175.50	161.10	-8.7000	No	-	-	-	-	-	-
5	153.90	133.20	-8.7000	No	-	-	-	-	-	-

Side	Corner 1		Corner 2		Ground Movement Curve	
	x	y	x	y	Vertical	Horizontal
	[m]	[m]	[m]	[m]		
1	166.40	108.80	179.00	125.30	Excavation in front of high stiffness wall in stiff clay (CIRIA 580 Fig. 2.11(b))	Excavation in front of high stiffness wall in stiff clay (CIRIA 580 Fig. 2.11(a))
2	179.00	125.30	191.40	143.90	Excavation in front of high stiffness wall in stiff clay (CIRIA 580 Fig. 2.11(b))	Excavation in front of high stiffness wall in stiff clay (CIRIA 580 Fig. 2.11(a))
3	191.40	143.90	175.50	161.10	Excavation in front of high stiffness wall in stiff clay (CIRIA 580 Fig. 2.11(b))	Excavation in front of high stiffness wall in stiff clay (CIRIA 580 Fig. 2.11(a))
4	175.50	161.10	153.90	133.20	Excavation in front of high stiffness wall in stiff clay (CIRIA 580 Fig. 2.11(b))	Excavation in front of high stiffness wall in stiff clay (CIRIA 580 Fig. 2.11(a))
5	153.90	133.20	166.40	108.80	Excavation in front of high stiffness wall in stiff clay (CIRIA 580 Fig. 2.11(b))	Excavation in front of high stiffness wall in stiff clay (CIRIA 580 Fig. 2.11(a))

Excavation Name: Wall Installation
Surface level [m]: 0.0
Contribution: Positive
Enabled: Yes
Surface movement curves which are selected are applied between surface and [m]: -25.000

Corner	x	y	Base Level	Stiffened	Previous Side			Next Side		
	[m]	[m]	[m]		d	p1	p2*	d	p1	p2*
1	167.00	117.60	-25.000	No	-	-	-	-	-	-
2	177.10	130.60	-25.000	No	-	-	-	-	-	-
3	185.70	142.80	-25.000	No	-	-	-	-	-	-
4	173.90	155.20	-25.000	No	-	-	-	-	-	-
5	168.30	150.00	-25.000	No	-	-	-	-	-	-
6	157.80	136.30	-25.000	No	-	-	-	-	-	-
7	158.70	129.60	-25.000	No	-	-	-	-	-	-

Side	Corner 1		Corner 2		Ground Movement Curve	
	x	y	x	y	Vertical	Horizontal
	[m]	[m]	[m]	[m]		
1	167.00	117.60	177.10	130.60	Installation of secant bored pile wall in stiff clay (CIRIA 580 Fig. 2.8(b))	Installation of secant bored pile wall in stiff clay (CIRIA 580 Fig. 2.8(a))
2	177.10	130.60	185.70	142.80	Installation of secant bored pile wall in stiff clay (CIRIA 580 Fig. 2.8(b))	Installation of secant bored pile wall in stiff clay (CIRIA 580 Fig. 2.8(a))
3	185.70	142.80	173.90	155.20	Installation of secant bored pile wall in stiff clay (CIRIA 580 Fig. 2.8(b))	Installation of secant bored pile wall in stiff clay (CIRIA 580 Fig. 2.8(a))
4	173.90	155.20	168.30	150.00	Installation of secant bored pile wall in stiff clay (CIRIA 580 Fig. 2.8(b))	Installation of secant bored pile wall in stiff clay (CIRIA 580 Fig. 2.8(a))
5	168.30	150.00	157.80	136.30	Installation of secant bored pile wall in stiff clay (CIRIA 580 Fig. 2.8(b))	Installation of secant bored pile wall in stiff clay (CIRIA 580 Fig. 2.8(a))
6	157.80	136.30	158.70	129.60	Installation of secant bored pile wall in stiff clay (CIRIA 580 Fig. 2.8(b))	Installation of secant bored pile wall in stiff clay (CIRIA 580 Fig. 2.8(a))
7	158.70	129.60	167.00	117.60	Installation of secant bored pile wall in stiff clay (CIRIA 580 Fig. 2.8(b))	Installation of secant bored pile wall in stiff clay (CIRIA 580 Fig. 2.8(a))

Excavation Name: Excavation
Surface level [m]: 0.0
Contribution: Positive
Enabled: Yes
Surface movement curves which are selected are applied between surface and [m]: -14.000

Corner	x	y	Base Level	Stiffened	Previous Side			Next Side		
	[m]	[m]	[m]		d	p1	p2*	d	p1	p2*
1	167.00	117.60	-14.000	Yes	0.0	67.000	25.000	0.0	67.000	25.000
2	177.10	130.60	-14.000	Yes	0.0	67.000	25.000	0.0	67.000	25.000
3	185.70	142.80	-14.000	Yes	0.0	67.000	25.000	0.0	67.000	25.000
4	173.90	155.20	-14.000	Yes	0.0	67.000	25.000	0.0	67.000	25.000
5	168.30	150.00	-14.000	Yes	0.0	67.000	25.000	0.0	67.000	25.000
6	157.80	136.30	-14.000	Yes	0.0	67.000	25.000	0.0	67.000	25.000
7	158.70	129.60	-14.000	Yes	0.0	67.000	25.000	0.0	67.000	25.000

Side	Corner 1		Corner 2		Ground Movement Curve	
	x	y	x	y	Vertical	Horizontal
	[m]	[m]	[m]	[m]		
1	167.00	117.60	177.10	130.60	Excavation in front of high stiffness wall in stiff clay (CIRIA 580 Fig. 2.11(b))	Excavation in front of high stiffness wall in stiff clay (CIRIA 580 Fig. 2.11(a))
2	177.10	130.60	185.70	142.80	Excavation in front of high stiffness wall in stiff clay (CIRIA 580 Fig. 2.11(b))	Excavation in front of high stiffness wall in stiff clay (CIRIA 580 Fig. 2.11(a))
3	185.70	142.80	173.90	155.20	Excavation in front of high stiffness wall in stiff clay (CIRIA 580 Fig. 2.11(b))	Excavation in front of high stiffness wall in stiff clay (CIRIA 580 Fig. 2.11(a))
4	173.90	155.20	168.30	150.00	Excavation in front of high stiffness wall in stiff clay (CIRIA 580 Fig. 2.11(b))	Excavation in front of high stiffness wall in stiff clay (CIRIA 580 Fig. 2.11(a))
5	168.30	150.00	157.80	136.30	Excavation in front of high stiffness wall in stiff clay (CIRIA 580 Fig. 2.11(b))	Excavation in front of high stiffness wall in stiff clay (CIRIA 580 Fig. 2.11(a))
6	157.80	136.30	158.70	129.60	Excavation in front of high stiffness wall in stiff clay (CIRIA 580 Fig. 2.11(b))	Excavation in front of high stiffness wall in stiff clay (CIRIA 580 Fig. 2.11(a))
7	158.70	129.60	167.00	117.60	Excavation in front of high stiffness wall in stiff clay (CIRIA 580 Fig. 2.11(b))	Excavation in front of high stiffness wall in stiff clay (CIRIA 580 Fig. 2.11(a))

Damage Category Strains

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

Specific Structures - Geometry



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Structure Name	Sub-Structure Name	Displacement Line	Start Distance Along Line	End Distance Along Line	Vertical Offsets from Line for Vertical Movement Calculations	Vertical Displacement Limit	Damage Category	Strains	Poisson's Ratio	E/G
			[m]	[m]	[m]	[mm]				
A	A		0.00000	7.46500	0.0	0.10000	Burland Strain Limits		0.20000	2.6000
B	B		0.00000	13.02400	0.0	0.10000	Burland Strain Limits		0.20000	2.6000
C	C		0.00000	8.40200	0.0	0.10000	Burland Strain Limits		0.20000	2.6000
D	D		0.00000	21.91100	0.0	0.10000	Burland Strain Limits		0.20000	2.6000
E	E		0.00000	32.81200	0.0	0.10000	Burland Strain Limits		0.20000	2.6000
F	F		0.00000	13.54100	0.0	0.10000	Burland Strain Limits		0.20000	2.6000
G	G		0.00000	12.10300	0.0	0.10000	Burland Strain Limits		0.20000	2.6000
H	H		0.00000	13.20000	0.0	0.10000	Burland Strain Limits		0.20000	2.6000
I	I		0.00000	22.93900	0.0	0.10000	Burland Strain Limits		0.20000	2.6000
J	J		0.00000	10.18300	0.0	0.10000	Burland Strain Limits		0.20000	2.6000
K	K		0.00000	25.59800	0.0	0.10000	Burland Strain Limits		0.20000	2.6000
L	L		0.00000	12.80000	0.0	0.10000	Burland Strain Limits		0.20000	2.6000
M	M		0.00000	42.29600	0.0	0.10000	Burland Strain Limits		0.20000	2.6000
N	N		0.00000	16.83400	0.0	0.10000	Burland Strain Limits		0.20000	2.6000
O	O		0.00000	42.24000	0.0	0.10000	Burland Strain Limits		0.20000	2.6000
P	P		0.00000	16.71700	0.0	0.10000	Burland Strain Limits		0.20000	2.6000
Q	Q		0.00000	23.40600	0.0	0.10000	Burland Strain Limits		0.20000	2.6000
R	R		0.00000	3.77300	0.0	0.10000	Burland Strain Limits		0.20000	2.6000
S	S		0.00000	2.44100	0.0	0.10000	Burland Strain Limits		0.20000	2.6000
T	T		0.00000	4.83700	0.0	0.10000	Burland Strain Limits		0.20000	2.6000
U	U		0.00000	6.60200	0.0	0.10000	Burland Strain Limits		0.20000	2.6000
V	V		0.00000	3.63500	0.0	0.10000	Burland Strain Limits		0.20000	2.6000
W	W		0.00000	5.24600	0.0	0.10000	Burland Strain Limits		0.20000	2.6000

Specific Structures - Bending Parameters

Structure Name	Sub-Structure Name	Height	Default Properties	Hogging			Sagging		
				2nd Moment of Area (per unit width)	Distance of Bending Strain from N.A.	Distance of N.A. from Edge of Beam in Tension	2nd Moment of Area (per unit width)	Distance of Bending Strain from N.A.	Distance of N.A. from Edge of Beam in Tension
		[m]		[m ³]	[m]	[m]	[m ³]	[m]	[m]
A		21.500	Yes	3312.8	21.500	21.500	828.20	10.750	10.750
B		21.500	Yes	3312.8	21.500	21.500	828.20	10.750	10.750
C		21.500	Yes	3312.8	21.500	21.500	828.20	10.750	10.750
D		21.500	Yes	3312.8	21.500	21.500	828.20	10.750	10.750
E		21.500	Yes	3312.8	21.500	21.500	828.20	10.750	10.750
F		12.500	Yes	651.04	12.500	12.500	162.76	6.2500	6.2500
G		12.500	Yes	651.04	12.500	12.500	162.76	6.2500	6.2500
H		12.500	Yes	651.04	12.500	12.500	162.76	6.2500	6.2500
I		12.500	Yes	651.04	12.500	12.500	162.76	6.2500	6.2500
J		12.500	Yes	651.04	12.500	12.500	162.76	6.2500	6.2500
K		12.500	Yes	651.04	12.500	12.500	162.76	6.2500	6.2500
L		12.500	Yes	651.04	12.500	12.500	162.76	6.2500	6.2500
M		24.500	Yes	4902.0	24.500	24.500	1225.5	12.250	12.250
N		15.500	Yes	1241.3	15.500	15.500	310.32	7.7500	7.7500
O		15.500	Yes	1241.3	15.500	15.500	310.32	7.7500	7.7500
P		15.500	Yes	1241.3	15.500	15.500	310.32	7.7500	7.7500
Q		15.500	Yes	1241.3	15.500	15.500	310.32	7.7500	7.7500
R		5.0000	Yes	41.667	5.0000	5.0000	10.417	2.5000	2.5000
S		5.0000	Yes	41.667	5.0000	5.0000	10.417	2.5000	2.5000
T		5.0000	Yes	41.667	5.0000	5.0000	10.417	2.5000	2.5000
U		5.0000	Yes	41.667	5.0000	5.0000	10.417	2.5000	2.5000
V		5.0000	Yes	41.667	5.0000	5.0000	10.417	2.5000	2.5000
W		5.0000	Yes	41.667	5.0000	5.0000	10.417	2.5000	2.5000

Building Segment Combinations

Structure Name	Sub-Structure Name	Vertical Offset from Line for Vertical Movement Calculations	Segment Start	Length	Curvature	Combined Segment
		[m]		[m]		
No structures have segments combined.						

Utility Strain Calculation Options

Neglect beneficial contribution of axial strains : No

Warnings

- Multiple excavations have been specified. The displacements resulting from these excavations are calculated assuming the displacements resulting from each individual excavation. No account has been taken of the interactions between excavations (e.g. overlapping zones of influence or 'shielding' of one excavation by another).

Errors

None

Displacement and Strain Results

Type/No.		Coordinates			Displacements					Angle of Line
Name	Dist.	x	y	z	x	y	z	Horizontal displacement along Line	Horizontal displacement perpendicular to Line	to x Axis
		[m]	[m]	[m]	[mm]	[mm]	[mm]	[mm]	[mm]	[°]
A	Line 1	130.60000	139.50000	-0.50000	7.8438	-0.19523	8.6506	6.2170	4.7866	320.98
	0.93316	131.32500	139.91250	-0.50000	8.1662	-0.016211	8.9305	6.3548	5.1287	320.98
	1.8663	132.05000	138.32500	-0.50000	8.5012	0.17976	9.1893	6.4917	5.4919	320.98
	2.7995	132.77500	137.73750	-0.50000	8.8497	0.39377	9.4270	6.6277	5.8776	320.98
	3.7326	133.50000	137.15000	-0.50000	9.2125	0.62689	9.6437	6.7628	6.2871	320.98
	4.6658	134.22500	136.56250	-0.50000	9.5902	0.88023	9.8404	6.8968	6.7217	320.98
	5.5989	134.95000	135.97500	-0.50000	9.9838	1.1548	10.018	7.0297	7.1828	320.98
	6.5321	135.67500	135.38750	-0.50000	10.394	1.4515	10.180	7.1614	7.6715	320.98
	7.4653	136.40000	134.80000	-0.50000	10.821	1.7711	10.326	7.2919	8.1886	320.98
	Line 2	138.40000	133.00000	-0.50000	14.117	2.5667	11.958	9.4587	10.789	321.55
B	1.8607	139.85714	131.84286	-0.50000	14.703	2.0907	12.177	10.214	10.781	321.55
	3.7214	141.31429	130.68571	-0.50000	15.336	1.4090	12.421	11.133	10.640	321.55
	5.5821	142.77143	129.52857	-0.50000	16.025	0.48896	12.708	12.246	10.349	321.55
	7.4428	144.22857	128.37143	-0.50000	16.789	-0.68410	13.043	13.573	9.9050	321.55
	9.3036	145.68571	127.21429	-0.50000	15.573	0.074110	12.291	12.150	9.7429	321.55
	11.164	147.14286	126.05714	-0.50000	14.911	2.7431	12.260	9.9713	11.421	321.55
	13.025	148.60000	124.90000	-0.50000	14.159	6.2534	12.386	7.1909	13.702	321.55
	Line 3	149.30000	121.40000	-0.50000	13.775	11.044	13.558	-17.200	3.9854	231.77
	0.93360	148.72222	120.66667	-0.50000	13.347	10.697	13.438	-16.663	3.8640	231.77



GEA LIMITED (GEOTECHNICAL & ENV ASSOC)

135 Shaftsbury Avenue, London WC2H 8AH
Wall installation and excavation combined

Job No.	Sheet No.	Rev.
J17183		
Drg. Ref.		
Made by	Date 12-Dec-2017	Checked

Type/No.	Coordinates				Displacements				Angle of Line		
Name	Dist.	x	y	z	x	y	z	Horizontal displacement	Horizontal displacement	to x Axis	
								displacement	displacement		
D	Line 4	1.8672	148.14444	119.93333	-0.50000	12.934	10.361	13.316	-16.143	3.7477	231.77
		2.8008	147.56667	119.20000	-0.50000	12.535	10.033	13.187	-15.639	3.6364	231.77
		3.7344	146.98889	118.46667	-0.50000	12.148	9.7154	13.049	-15.149	3.5297	231.77
		4.6680	146.41111	117.73333	-0.50000	11.774	9.4059	12.899	-14.675	3.4274	231.77
		5.6016	145.83333	117.00000	-0.50000	11.412	9.1047	12.734	-14.214	3.3295	231.77
		6.5352	145.25556	116.26667	-0.50000	11.061	8.8114	12.552	-13.767	3.2356	231.77
		7.4688	144.67778	115.53333	-0.50000	10.721	8.5254	12.351	-13.332	3.1455	231.77
		8.4024	144.10000	114.80000	-0.50000	10.392	8.2465	12.130	-12.909	3.0590	231.77
		9.3360	143.52222	114.06667	-0.50000	10.063	7.9676	11.909	-12.480	2.9730	231.77
		1.9919	145.65455	113.55455	-0.50000	10.510	8.3771	12.163	2.9644	13.109	321.30
		3.9839	147.20909	112.30909	-0.50000	10.632	8.5105	12.185	2.9764	13.290	321.30
		5.9758	148.76364	111.06364	-0.50000	10.759	8.6468	12.199	2.9899	13.475	321.30
		7.9677	150.31818	109.81818	-0.50000	10.890	8.7862	12.209	3.0049	13.666	321.30
		9.9596	151.87273	108.57273	-0.50000	11.025	8.9287	12.218	3.0214	13.861	321.30
		11.952	153.42727	107.32727	-0.50000	5.8322	5.2626	8.6282	0.67430	7.2067	321.30
		13.943	154.98182	106.08182	-0.50000	3.3412	5.1126	7.7265	-0.58905	6.0791	321.30
		15.935	156.53636	104.83636	-0.50000	0.7559	4.3242	5.9522	-2.1492	4.7481	321.30
		17.927	158.09091	103.59091	-0.50000	0.13560	4.5841	6.9241	-2.7604	3.6623	321.30
		19.919	159.64545	102.34545	-0.50000	-0.12533	4.1217	6.5161	-2.6749	3.1383	321.30
E	Line 5	21.911	161.20000	101.10000	-0.50000	-0.075907	3.6429	6.1388	-2.3369	2.7955	321.30
		1.9301	160.00000	99.58824	-0.50000	-0.075907	3.6429	6.1388	-2.8960	-2.3243	231.56
		3.8603	158.80000	98.07647	-0.50000	0.42579	3.0443	5.9635	-2.6491	-1.5592	231.56
		5.7904	157.60000	96.56471	-0.50000	0.57590	2.7681	5.9575	-2.5261	-1.2699	231.56
		7.7206	156.40000	95.05294	-0.50000	0.67879	2.5972	5.9343	-2.3857	-1.0271	231.56
		9.6507	155.20000	93.54118	-0.50000	0.74451	2.2599	5.9550	-2.1337	-0.7194	231.56
		11.581	154.00000	92.02941	-0.50000	0.78183	2.0238	5.6923	-2.0712	-0.64588	231.56
		13.511	152.80000	90.51765	-0.50000	0.79444	1.7962	5.4305	-1.9008	-0.49450	231.56
		15.441	151.60000	89.00588	-0.50000	0.78589	1.5738	5.0661	-1.7213	-0.36295	231.56
		17.371	150.40000	87.49412	-0.50000	0.75785	1.3533	4.6970	-1.5312	-0.24781	231.56
		19.301	149.20000	85.98235	-0.50000	0.71089	1.1304	4.3279	-1.2982	-0.14682	231.56
		21.232	148.00000	84.47059	-0.50000	0.75116	1.0436	3.4957	-1.2844	-0.060508	231.56
		23.162	146.80000	82.95882	-0.50000	0.97280	1.2047	2.9186	-1.5484	0.012946	231.56
		25.092	145.60000	81.44706	-0.50000	1.1896	1.3644	2.3969	-1.8083	0.083426	231.56
		27.022	144.40000	79.93529	-0.50000	1.1125	1.2491	1.8494	-1.6760	0.094819	231.56
		28.952	143.20000	78.42353	-0.50000	0.94580	1.0526	1.2903	-1.4125	0.080457	231.56
		30.882	142.00000	76.91176	-0.50000	0.77481	0.85526	0.75371	-1.1516	0.075136	231.56
		32.812	140.80000	75.40000	-0.50000	0.59983	0.65724	0.23256	-0.88771	0.061195	231.56
		F	Line 6	1.9345	175.78571	88.32857	-0.50000	-0.12935	1.2275	5.0267	0.89065
3.8691	176.97143			87.07143	-0.50000	-0.28321	1.5956	5.5905	1.0951	1.2078	52.199
5.8036	178.15714			91.38571	-0.50000	-0.40348	1.8086	5.8151	1.1817	1.4273	52.199
7.7382	179.34286			92.91429	-0.50000	-0.56662	2.0218	6.0818	1.2502	1.6869	52.199
9.6727	180.52857			94.44286	-0.50000	-0.78504	2.2448	6.3613	1.2926	1.9962	52.199
11.607	181.71429			95.97143	-0.50000	-1.0709	2.4766	6.6554	1.3005	2.3041	52.199
13.542	182.90000			97.50000	-0.50000	-1.6657	2.7300	6.9526	1.3005	2.5994	52.199
1.7291	182.90000			97.50000	-0.50000	-1.6657	2.7300	6.9526	-2.9990	1.1106	321.71
3.4582	185.61429			95.35714	-0.50000	-1.7228	2.5524	6.7310	-2.9338	0.93577	321.71
5.1873	186.97143			94.28571	-0.50000	-1.7540	2.3819	6.4198	-2.8526	0.78267	321.71
6.9164	188.32857			93.21429	-0.50000	-1.7632	2.2167	6.0216	-2.7575	0.64728	321.71
8.6455	189.68571			92.14286	-0.50000	-1.7529	2.0545	5.6462	-2.6489	0.51429	321.71
10.375	191.04286			91.07143	-0.50000	-1.7241	1.8930	5.0111	-2.5262	0.41747	321.71
12.104	192.40000			90.00000	-0.50000	-1.6770	1.7296	4.4412	-2.3880	0.31840	321.71
13.858	194.04286			88.92857	-0.50000	-1.6111	1.5617	3.8691	-2.2322	0.22746	321.71
15.605	195.40000			87.85714	-0.50000	-1.6657	1.3902	3.2967	-2.1620	0.14620	52.696
17.352	196.75714			86.78571	-0.50000	-2.4612	2.9624	7.1969	0.86197	2.9752	52.696
19.100	198.11429			85.71429	-0.50000	-3.2597	3.1512	7.3832	0.53098	4.5026	52.696
20.848	199.47143			84.64286	-0.50000	-4.0183	3.2918	7.5068	0.18310	5.1913	52.696
22.596	200.82857	83.57143	-0.50000	-4.4508	3.6244	7.6310	0.14769	10.737	52.696		
24.344	202.18571	82.50000	-0.50000	-4.4611	6.6324	10.322	0.14782	10.750	52.696		
26.092	203.54286	81.42857	-0.50000	-4.4719	6.404	10.333	0.14795	10.763	52.696		
27.840	204.90000	80.35714	-0.50000	-4.4816	6.1684	10.344	0.14807	10.776	52.696		
29.588	206.25714	79.28571	-0.50000	-4.4913	5.9320	10.355	0.14782	10.750	52.696		
31.336	207.61429	78.21429	-0.50000	-4.5010	5.6956	10.366	0.14782	10.750	52.696		
33.084	208.97143	77.14286	-0.50000	-4.5107	5.4592	10.377	0.14782	10.750	52.696		
34.832	210.32857	76.07143	-0.50000	-4.5204	5.2228	10.388	0.14782	10.750	52.696		
36.580	211.68571	75.00000	-0.50000	-4.5301	4.9864	10.399	0.14782	10.750	52.696		
38.328	213.04286	73.92857	-0.50000	-4.5398	4.7490	10.410	0.14782	10.750	52.696		
40.076	214.40000	72.85714	-0.50000	-4.5495	4.5116	10.421	0.14782	10.750	52.696		
41.824	215.75714	71.78571	-0.50000	-4.5592	4.2742	10.432	0.14782	10.750	52.696		
43.572	217.11429	70.71429	-0.50000	-4.5689	4.0368	10.443	0.14782	10.750	52.696		
45.320	218.47143	69.64286	-0.50000	-4.5786	3.7994	10.454	0.14782	10.750	52.696		
47.068	219.82857	68.57143	-0.50000	-4.5883	3.5620	10.465	0.14782	10.750	52.696		
48.816	221.18571	67.50000	-0.50000	-4.5980	3.3246	10.476	0.14782	10.750	52.696		
50.564	222.54286	66.42857	-0.50000	-4.6077	3.0872	10.487	0.14782	10.750	52.696		
52.312	223.90000	65.35714	-0.50000	-4.6174	2.8498	10.498	0.14782	10.750	52.696		
54.060	225.25714	64.28571	-0.50000	-4.6271	2.6124	10.509	0.14782	10.750	52.696		
55.808	226.61429	63.21429	-0.50000	-4.6368	2.3750	10.520	0.14782	10.750	52.696		
57.556	227.97143	62.14286	-0.50000	-4.6465	2.1376	10.531	0.14782	10.750	52.696		
59.304	229.32857	61.07143	-0.50000	-4.6562	1.9002	10.542	0.14782	10.750	52.696		
61.052	230.68571	60.00000	-0.50000	-4.6659	1.6628	10.553	0.14782	10.750	52.696		
62.800	232.04286	58.92857	-0.50000	-4.6756	1.4254	10.564	0.14782	10.750	52.696		
64.548	233.40000	57.85714	-0.50000	-4.6853	1.1880	10.575	0.14782	10.750	52.696		
66.296	234.75714	56.78571	-0.50000	-4.6950	0.9506	10.586	0.14782	10.750	52.696		
68.044	236.11429	55.71429	-0.50000	-4.7047	0.7132	10.597	0.14782	10.750	52.696		
69.792	237.47143	54.64286	-0.50000	-4.7144	0.4758	10.608	0.14782	10.750	52.696		
71.540	238.82857	53.57143	-0.50000	-4.7241	0.2384	10.619	0.14782	10.750	52.696		
73.288	240.18571	52.50000	-0.50000	-4.7338	0.0010	10.630	0.14782	10.750	52.696		
75.036	241.54286	51.42857	-0.50000	-4.7435	-0.2364	10.641	0.14782	10.750	52.696		
76.784	242.90000	50.35714	-0.50000	-4.7532	-0.4738	10.652	0.14782	10.750	52.696		
78.532	244.25714	49.28571	-0.50000	-4.7629	-0.7112	10.663	0.14782	10.750	52.696		
80.280	245.61429	48.21429	-0.50000	-4.7726	-0.9486	10.674	0.14782	10.750	52.696		
82.028	246.97143	47.14286	-0.50000	-4.7823	-1.1860	10.685	0.14782	10.750	52.696		
83.776	248.32857	46.07143	-0.50000	-4.7920	-1.4234	10.696	0.14782	10.750	52.696		
85.524	249.68571	45.00000	-0.50000	-4.8017	-1.6608	10.707	0.14782	10.750	52.696		
87.272	251.04286	43.92857	-0.50000	-4.8114	-1.8982	10.718	0.14782	10.750	52.696		
89.020	252.40000	42.85714	-0.50000	-4.8211	-2.1356	10.729	0.14782	10.750	52.696		
90.768	253.75714	41.78571	-0.50000	-4.8308	-2.3730	10.740	0.14782	10.750	52.696		
92.516	255.11429	40.71429	-0.50000	-4.8405	-2.6104	10.751	0.14782	10.750	52.696		
94.264	256.47143	39.64286	-0.50000	-4.8502	-2.8478	10.762	0.14782	10.750	52.696		
96.012	257.82857	38.57143	-0.50000	-4.8599	-3.0852	10.773	0.14782	10.750	52.696		
97.760	259.18571	37.50000	-0.50000	-4.8696	-3.3226	10.784	0.14782	10.750	52.696		
99.508	260.54286</										



Job No.	Sheet No.	Rev.
J17183		
Drg. Ref.		
Made by	Date	Checked
	12-Dec-2017	

Structure: A | Sub-structure:

Structure: B | Sub-structure:

Structure: C | Sub-structure:



GEA LIMITED (GEOTECHNICAL & ENV ASSOC)

135 Shaftsbury Avenue, London WC2H 8AH
Wall installation and excavation combined

Job No.	Sheet No.	Rev.
J17183		
Drg. Ref.		
Made by	Date 12-Dec-2017	Checked

Dist.	Coordinates			Displacements		
	x	y	z	x	y	Horizontal displacement along the Line
	[m]	[m]	[m]	[mm]	[mm]	Horizontal displacement perpendicular to Line
	0.0	149.30900	121.40900	-0.50000	13.775	11.044
0.93360	148.72222	120.66667	-0.50000	13.347	10.697	-16.663
1.8672	148.14444	119.93333	-0.50000	12.934	10.361	-16.143
2.8008	147.56667	119.20000	-0.50000	12.535	10.033	-15.639
3.7344	146.98889	118.46667	-0.50000	12.148	9.7154	-15.149
4.6680	146.41111	117.73333	-0.50000	11.774	9.4059	-14.675
5.6016	145.83333	117.00000	-0.50000	11.412	9.1047	-14.214
6.5352	145.25556	116.26667	-0.50000	11.061	8.8114	-13.767
7.4688	144.67778	115.53333	-0.50000	10.721	8.5254	-13.332
8.4024	144.10000	114.80000	-0.50000	10.392	8.2465	-12.909

Structure: D | Sub-structure:

Dist.	Coordinates			Displacements		
	x	y	z	x	y	Horizontal displacement along the Line
	[m]	[m]	[m]	[mm]	[mm]	Horizontal displacement perpendicular to Line
	0.0	144.10000	114.80000	-0.50000	10.392	8.2465
1.9919	145.65455	113.55455	-0.50000	10.510	8.3771	2.9644
3.9839	147.20909	112.30909	-0.50000	10.632	8.5105	2.9764
5.9758	148.76364	111.06364	-0.50000	10.759	8.6468	2.9899
7.9677	150.31818	109.81818	-0.50000	10.890	8.7862	3.0049
9.9596	151.87273	108.57273	-0.50000	11.025	8.9287	3.0214
11.952	153.42727	107.32727	-0.50000	5.0322	5.2026	0.67439
13.943	154.98182	106.08182	-0.50000	3.3412	5.1126	-0.58905
15.935	156.53636	104.83636	-0.50000	1.4475	4.9243	-1.9492
17.927	158.09091	103.59091	-0.50000	0.13560	4.5841	-2.7604
19.919	159.64545	102.34545	-0.50000	-0.12533	4.1217	-2.6749
21.911	161.20000	101.10000	-0.50000	-0.075907	3.6429	-2.3369

Structure: E | Sub-structure:

Dist.	Coordinates			Displacements		
	x	y	z	x	y	Horizontal displacement along the Line
	[m]	[m]	[m]	[mm]	[mm]	Horizontal displacement perpendicular to Line
	0.0	161.20000	101.10000	-0.50000	0.075907	3.6429
1.9301	160.00000	99.58824	-0.50000	0.21433	3.3363	-2.7464
3.8603	158.00000	98.07647	-0.50000	0.42579	3.0443	-2.6491
5.7904	157.00000	96.56471	-0.50000	0.57590	2.7681	-2.5261
7.7206	156.00000	95.05294	-0.50000	0.67879	2.5072	-2.3857
9.6507	155.20000	93.54118	-0.50000	0.74495	2.2589	-2.2332
11.581	154.00000	92.02941	-0.50000	0.78183	2.0238	-2.0712
13.511	152.80000	90.51765	-0.50000	0.79444	1.7962	-1.9008
15.441	151.60000	89.00588	-0.50000	0.78589	1.5738	-1.7213
17.371	150.40000	87.49412	-0.50000	0.75785	1.3533	-1.5312
19.301	149.20000	85.98235	-0.50000	0.71089	1.1311	-1.3279
21.232	148.00000	84.47059	-0.50000	0.75116	1.0436	-1.2844
23.162	146.80000	82.95882	-0.50000	0.97280	1.2047	-1.5484
25.092	145.60000	81.44706	-0.50000	1.1896	1.3644	-1.8083
27.022	144.40000	79.93529	-0.50000	1.1125	1.2491	-1.6790
28.952	143.20000	78.42353	-0.50000	0.94588	1.0526	-1.4125
30.882	142.00000	76.91176	-0.50000	0.77481	0.8526	-1.1516
32.812	140.80000	75.40000	-0.50000	0.59983	0.65724	-0.88771

Structure: F | Sub-structure:

Dist.	Coordinates			Displacements		
	x	y	z	x	y	Horizontal displacement along the Line
	[m]	[m]	[m]	[mm]	[mm]	Horizontal displacement perpendicular to Line
	0.0	174.60000	86.80000	-0.50000	-0.12935	1.2275
1.9345	175.78571	88.32857	-0.50000	-0.19477	1.4122	0.89065
3.8691	176.97143	89.85714	-0.50000	-0.28320	1.6056	0.99649
5.8036	178.15714	91.38571	-0.50000	-0.40348	1.8006	1.0951
7.7382	179.34286	92.91429	-0.50000	-0.56652	2.0218	1.1817
9.6727	180.52857	94.44286	-0.50000	-0.78504	2.2448	1.2502
11.607	181.71429	95.97143	-0.50000	-1.0709	2.4766	1.2926
13.542	182.90000	97.50000	-0.50000	-1.6657	2.7300	1.3005
						1.1362

Structure: G | Sub-structure:

Dist.	Coordinates			Displacements		
	x	y	z	x	y	Horizontal displacement along the Line
	[m]	[m]	[m]	[mm]	[mm]	Horizontal displacement perpendicular to Line
	0.0	182.90000	97.50000	-0.50000	-1.6657	2.7300
1.7291	184.25714	98.42857	-0.50000	-1.7228	2.5524	-2.9990
3.4582	185.61429	99.35714	-0.50000	-1.7540	2.3819	1.1106
5.1873	186.97143	94.28571	-0.50000	-1.7632	2.2167	-2.9338
6.9164	188.32857	93.21429	-0.50000	-1.7529	2.0545	0.93577
8.6455	189.68571	92.14286	-0.50000	-1.7241	1.8930	-2.8526
10.375	191.04286	91.07143	-0.50000	-1.6770	1.7296	-2.7575
12.104	192.40000	90.00000	-0.50000	-1.6111	1.5617	-2.6489
						-2.5262
						-2.3880
						-2.2322

Structure: H | Sub-structure:

Dist.	Coordinates			Displacements		
	x	y	z	x	y	Horizontal displacement along the Line
	[m]	[m]	[m]	[mm]	[mm]	Horizontal displacement perpendicular to Line
	0.0	182.90000	97.50000	-0.50000	-1.6657	2.7300
1.8858	184.04286	99.00000	-0.50000	-2.4673	2.9624	1.1620
3.7715	185.18571	100.50000	-0.50000	-3.2597	3.1512	0.86107
5.6573	186.32857	102.00000	-0.50000	-4.0183	3.2918	0.53098
7.5431	187.47143	103.50000	-0.50000	-4.8508	6.6244	0.18310
9.4288	188.61429	105.00000	-0.50000	-8.4611	6.6324	0.14769
11.315	189.75714	106.50000	-0.50000	-8.4714	6.6404	0.14759
13.200	190.90000	108.00000	-0.50000	-8.4816	6.6484	0.14807

Structure: I | Sub-structure:

Dist.	Coordinates			Displacements		
	x	y	z	x	y	Horizontal displacement along the Line
	[m]	[m]	[m]	[mm]	[mm]	Horizontal displacement perpendicular to Line



GEA LIMITED (GEOTECHNICAL & ENV ASSOC)

135 Shaftsbury Avenue, London WC2H 8AH
Wall installation and excavation combined

Job No.	Sheet No.	Rev.
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Made by	Date 12-Dec-2017	Checked

[m]	[m]	[m]	[m]	[mm]	[mm]	Line [mm]	to Line [mm]
0.0	190.90000	108.00000	-0.50000	-8.4816	6.6484	0.67102	10.756
1.9116	191.98333	109.57500	-0.50000	-8.5212	6.6795	0.67423	10.806
3.8232	193.06667	111.15000	-0.50000	-8.5609	6.7107	0.67746	10.857
5.7348	194.15000	112.72500	-0.50000	-8.6007	6.7428	0.68069	10.907
7.6464	195.23333	114.30000	-0.50000	-8.4626	7.0430	1.0070	10.964
9.5580	196.31667	115.87500	-0.50000	-8.4745	6.9653	0.93619	10.930
11.470	197.40000	117.45000	-0.50000	-9.0129	6.5340	0.27573	11.129
13.381	198.48333	119.02500	-0.50000	-9.0356	6.5497	0.27578	11.156
15.293	199.56667	120.60000	-0.50000	-9.0584	6.5654	0.27582	11.184
17.204	200.65000	122.17500	-0.50000	-9.0811	6.5811	0.27587	11.212
19.116	201.73333	123.75000	-0.50000	-9.1038	6.5967	0.27592	11.239
21.028	202.81667	125.32500	-0.50000	-9.1265	6.6124	0.27596	11.267
22.939	203.90000	126.90000	-0.50000	-9.1492	6.6281	0.27601	11.294

Structure: J | Sub-structure:

Dist.	Coordinates			Displacements			Horizontal displacement along the Line	Horizontal displacement perpendicular to Line
	x	y	z	x	y			
[m]	[m]	[m]	[m]	[mm]	[mm]	[mm]	[mm]	[mm]
0.0	203.90000	126.90000	-0.50000	-9.1492	6.6281	-11.130	-1.9375	
1.6972	205.08333	125.63333	-0.50000	-8.6114	6.2282	-10.469	-1.8308	
3.3944	206.26667	124.46667	-0.50000	-8.0944	5.8450	-9.8336	-1.7273	
5.0917	207.45000	123.25000	-0.50000	-7.5945	5.4727	-9.2182	-1.6285	
6.7889	208.63333	122.03333	-0.50000	-7.1077	5.1098	-8.6186	-1.5326	
8.4861	209.81667	120.81667	-0.50000	-6.6302	4.7534	-8.0302	-1.4388	
10.183	211.00000	119.60000	-0.50000	-6.1561	4.4008	-7.4483	-1.3462	

Structure: K | Sub-structure:

Dist.	Coordinates			Displacements			Horizontal displacement along the Line	Horizontal displacement perpendicular to Line
	x	y	z	x	y			
[m]	[m]	[m]	[m]	[mm]	[mm]	[mm]	[mm]	[mm]
0.0	220.40000	116.90000	-0.50000	-1.2872	0.83063	1.5010	0.30628	
1.9691	226.99231	118.27692	-0.50000	-1.6882	1.0753	1.9588	0.41172	
3.9383	225.58462	119.65385	-0.50000	-2.0847	1.3090	2.4056	0.52194	
5.9074	224.17692	121.03077	-0.50000	-2.4762	1.5303	2.8402	0.63754	
7.8766	222.76923	120.40769	-0.50000	-2.8621	1.7375	3.2610	0.75923	
9.8457	221.36154	123.78422	-0.50000	-3.2415	1.9287	3.6659	0.88783	
11.815	219.95385	125.16154	-0.50000	-3.4119	1.9688	3.8158	0.97831	
13.784	218.54615	126.53846	-0.50000	-3.4186	1.8661	3.7487	1.0564	
15.753	217.13846	127.91538	-0.50000	-3.7011	1.8955	3.9713	1.2330	
17.722	215.73077	129.29231	-0.50000	-3.9706	1.8939	4.1628	1.4225	
19.691	214.32309	130.66923	-0.50000	-4.2301	1.8595	4.3242	1.6286	
21.661	212.91538	132.04615	-0.50000	-4.4819	1.7893	4.4552	1.8549	
23.630	211.50769	133.42308	-0.50000	-4.7277	1.6789	4.5537	2.1057	
25.599	210.10000	134.80000	-0.50000	-4.9677	1.5221	4.6156	2.3856	

Structure: L | Sub-structure:

Dist.	Coordinates			Displacements			Horizontal displacement along the Line	Horizontal displacement perpendicular to Line
	x	y	z	x	y			
[m]	[m]	[m]	[m]	[mm]	[mm]	[mm]	[mm]	[mm]
0.0	210.10000	134.80000	-0.50000	-4.9677	1.5221	-2.5121	4.5480	
1.8286	211.41429	136.07143	-0.50000	-4.5969	1.1724	-2.4888	4.0388	
3.6573	212.72857	137.34286	-0.50000	-4.2438	0.87194	-2.4439	3.5774	
5.4859	214.04286	138.61429	-0.50000	-3.9090	0.61452	-2.3923	3.1596	
7.3145	215.35714	139.88571	-0.50000	-3.5925	0.39463	-2.3077	2.7815	
9.1431	216.67143	141.15714	-0.50000	-3.2932	0.20773	-2.2225	2.4391	
10.972	217.98571	142.42857	-0.50000	-3.0095	0.050159	-2.1282	2.1285	
12.800	219.30000	143.70000	-0.50000	-2.7393	-0.080932	-2.0251	1.8464	

Structure: M | Sub-structure:

Dist.	Coordinates			Displacements			Horizontal displacement along the Line	Horizontal displacement perpendicular to Line
	x	y	z	x	y			
[m]	[m]	[m]	[m]	[mm]	[mm]	[mm]	[mm]	[mm]
0.0	221.40000	189.60000	-0.50000	0.0	0.0	0.0	0.0	
1.9226	220.34091	187.99545	-0.50000	0.0	0.0	0.0	0.0	
3.8451	219.28182	186.39091	-0.50000	-0.44085	-0.41952	0.59298	-0.13683	
5.7677	218.22273	184.78636	-0.50000	-0.94975	-0.90380	1.2775	-0.29477	
7.6902	217.16364	183.18182	-0.50000	-1.4587	-1.3881	1.9620	-0.45272	
9.6128	216.10455	181.57727	-0.50000	-1.9676	-1.8724	2.6465	-0.61087	
11.535	215.04545	179.97273	-0.50000	-2.4765	-2.3566	3.3310	-0.76861	
13.458	213.98636	178.36818	-0.50000	-2.9854	-2.8409	4.0156	-0.92656	
15.380	212.92727	176.76364	-0.50000	-3.4943	-3.3252	4.7001	-1.0845	
17.303	211.86818	175.15909	-0.50000	-4.0032	-3.8095	5.3846	-1.2425	
19.226	210.80909	173.55455	-0.50000	-4.5070	-4.1874	5.9170	-1.3630	
21.148	209.75000	171.95000	-0.50000	-4.9918	-4.1964	5.9217	-1.3537	
23.071	208.69091	170.34545	-0.50000	-4.8618	-4.6576	6.5654	-1.4918	
24.993	207.63182	168.74091	-0.50000	-5.3314	-5.1185	7.2088	-1.6299	
26.916	206.57273	167.13636	-0.50000	-5.8035	-5.5817	7.8554	-1.7687	
28.838	205.51364	165.53182	-0.50000	-6.2829	-6.0519	8.5119	-1.9098	
30.761	204.45455	163.92727	-0.50000	-6.7744	-6.5336	9.1847	-2.0546	
32.684	203.39545	162.32273	-0.50000	-7.2829	-7.0315	9.8804	-2.2048	
34.606	202.33636	160.71818	-0.50000	-7.8133	-7.5502	10.606	-2.3617	
36.529	201.27727	159.11364	-0.50000	-8.3704	-8.0944	11.367	-2.5269	
38.451	200.21818	157.50909	-0.50000	-8.9591	-8.6685	12.170	-2.7019	
40.374	199.15909	155.90455	-0.50000	-9.5842	-9.2773	13.022	-2.8882	
42.296	198.10000	154.30000	-0.50000	-7.1678	-6.7842	9.6106	-2.2449	

Structure: N | Sub-structure:

Dist.	Coordinates			Displacements			Horizontal displacement along the Line	Horizontal displacement perpendicular to Line
	x	y	z	x	y			
[m]	[m]	[m]	[m]	[mm]	[mm]	[mm]	[mm]	[mm]
0.0	191.40000	153.80000	-0.50000	-12.334	-11.948	-0.15948	17.171	
1.8705	190.11111	155.15556	-0.50000	-12.327	-11.941	-0.15961	17.161	
3.7410	188.82222	156.51111	-0.50000	-12.319	-11.933	-0.15975	17.150	
5.6115	187.53333	157.86667	-0.50000	-12.311	-11.926	-0.15989	17.140	
7.4820	186.24444	159.22222	-0.50000	-12.303	-11.919	-0.16003	17.129	
9.3525	184.95556	160.57778	-0.50000	-12.295	-11.912	-0.16017	17.118	
11.223	183.66667	161.93333	-0.50000	-12.288	-11.904	-0.16030	17.108	
13.093	182.37778	163.28889	-0.50000	-8.3143	-8.1464	-0.17463	11.639	
14.964	181.08889	164.64444	-0.50000	-5.0431	-7.7433	-2.1366	8.9904	
16.834	179.80000	166.00000	-0.50000	-2.8344	-7.2418	-3.2951	7.0441	

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J17183		
Drg. Ref.		
Made by	Date 12-Dec-2017	Checked

Dist.

Coordinates

x

y

z

Displacements

Horizontal displacement along the

Horizontal displacement perpendicular

Structure: O | Sub-structure:

Dist.

Coordinates

x

y

z

Displacements

Horizontal displacement along the

Horizontal displacement perpendicular

[m]

[m]

[m]

[m]

[mm]

[mm]

[mm]

[mm]

0.0

179.80000

166.00000

-0.50000

-2.8344

-7.2418

-7.5029

-2.0457

1.9200

180.94545

167.54091

-0.50000

-3.0906

-6.6904

-7.2132

-1.5111

3.8400

182.09091

169.08182

-0.50000

-3.1750

-6.1764

-6.8511

-1.1367

5.7601

183.23636

170.62273

-0.50000

-3.1643

-5.7005

-6.4627

-0.86136

7.6801

184.38182

172.16364

-0.50000

-3.0984

-5.2608

-6.0705

-0.65188

9.6001

185.52727

173.70455

-0.50000

-3.0000

-4.8543

-5.6856

-0.40839

11.520

186.67273

175.24545

-0.50000

-2.8821

-4.4775

-5.3129

-0.35818

13.440

187.81818

176.78636

-0.50000

-2.7523

-4.1262

-4.9535

-0.25277

15.360

188.96364

178.32727

-0.50000

-2.6147

-3.7961

-4.6065

-0.16628

17.280

190.10909

179.86818

-0.50000

-2.4711

-3.4827

-4.2693

-0.094551

19.200

191.25455

181.40909

-0.50000

-2.3218

-3.1813

-3.9383

0.034554

21.120

192.40000

182.95000

-0.50000

-2.1661

-2.8872

-3.6094

0.015929

23.040

193.54545

184.49091

-0.50000

-2.0025

-2.5957

-3.2778

0.058545

24.960

194.69091

186.03182

-0.50000

-1.8288

-2.3018

-2.9383

0.094524

26.880

195.83636

187.57273

-0.50000

-1.6447

-2.3962

-3.0033

0.13119

28.800

196.98182

189.11364

-0.50000

-1.4426

-2.4426

-3.1575

0.153398

30.720

198.12727

190.65455

-0.50000

-1.2533

-2.1309

-2.7574

0.13747

32.640

199.27273

192.19545

-0.50000

-1.5018

-1.8188

-2.3556

0.12019

34.560

200.41818

193.73636

-0.50000

-1.2464

-1.5063

-1.9525

0.10170

36.480

201.56364

195.27727

-0.50000

-0.9847

-1.1934

-1.5480

0.082153

38.400

202.70909

196.81818

-0.50000

-0.73110

-0.88014

-1.1425

0.061665

40.320

203.85455

198.35909

-0.50000

-0.47147

-0.56663

-0.73602

0.040341

42.240

205.00000

199.90000

-0.50000

-0.21072

-0.25285

-0.32864

0.018267

Structure: P | Sub-structure:

Dist.

Coordinates

x

y

z

Displacements

Horizontal displacement along the

Horizontal displacement perpendicular

[m]

[m]

[m]

[m]

[mm]

[mm]

[mm]

[mm]

0.0

158.00000

189.60000

-0.50000

1.4698

-2.5916

2.9137

-0.62181

1.8575

160.03333

188.21111

-0.50000

1.4879

-2.0633

3.1289

-0.78867

3.7149

161.26667

186.82222

-0.50000

1.4874

-3.1373

3.3335

-0.97101

5.5724

162.50000

185.43333

-0.50000

1.4590

-3.4009

3.5118

-1.1672

7.4298

163.73333

184.04444

-0.50000

1.4008

-3.6558

3.6637

-1.3800

9.2873

164.96667

182.65556

-0.50000

1.3096

-3.9033

3.7882

-1.6126

11.145

166.20000

181.26667

-0.50000

1.1811

-4.1439

3.8828

-1.8684

13.002

167.43333

179.87778

-0.50000

1.0191

-4.3769

3.9434

-2.1518

14.860

168.66667

178.48889

-0.50000

0.79013

-4.6004

3.9646

-2.4638

16.717

169.90000

177.10000

-0.50000

0.51442

-4.8110

3.9390

-2.8098

Structure: Q | Sub-structure:

Dist.

Coordinates

x

y

z

Displacements

Horizontal displacement along the

Horizontal displacement perpendicular

[m]

[m]

[m]

[m]

[mm]

[mm]

[mm]

[mm]

0.0

171.10000

177.10000

-0.50000

0.22082

-4.6660

-3.4049

-3.1979

1.9506

172.36667

178.58333

-0.50000

-0.021940

-4.1778

-3.1913

-2.6963

3.9011

173.63333

180.06667

-0.50000

0.21440

-3.7357

-2.9801

-2.2628

5.8517

174.90000

181.55000

-0.50000

-0.36800

-3.3599

-2.7941

-1.9020

7.8023

176.16667

183.03333

-0.50000

-0.49261

-3.1370

-2.7055

-1.6625

9.7528

177.43333

184.51667

-0.50000

-0.58852

-2.9166

-2.6002

-1.4464

11.703

178.70000

186.00000

-0.50000

-0.65920

-2.6972

-2.4792

-1.2502

13.654

179.96667

187.48333

-0.50000

-0.70700

-2.4768

-2.3427

-1.0708

15.605

181.23333

188.96667

-0.50000

-0.73349

-2.2532

-2.1898

-0.90540

17.555

182.50000

190.45000

-0.50000

-0.73951

-2.0233

-2.0188

-0.75150

19.506

183.76667

191.93333

-0.50000

-0.76835

-1.9154

-1.9555

-0.65953

21.456

185.03333

193.41667

-0.50000

-0.89573

-2.1102

-2.1864

-0.68918

23.407

186.30000

194.90000

-0.50000

-0.95728

-2.1345

-2.2449

-0.65816

Structure: R | Sub-structure:

Dist.

Coordinates

x

y

z

Displacements

Horizontal displacement along the

Horizontal displacement perpendicular

[m]

[m]

[m]

[m]

[mm]

[mm]

[mm]

[mm]

0.0

151.00000

148.70000

-0.50000

14.205

-10.834

-1.6586

-17.788

0.94340

151.50000

149.50000

-0.50000

14.164

-10.803

-1.6539

-17.737

1.8868

152.00000

150.30000

-0.50000

14.124

-10.772

-1.6492

-17.686

2.8302

152.50000

151.10000

-0.50000

14.083

-10.741

-1.6445

-17.635

3.7736

153.00000

151.90000

-0.50000

14.043

-10.710

-1.6398

-17.585

Structure: S | Sub-structure:

Dist.

Coordinates

x

y

z

Displacements

Horizontal displacement along the

Horizontal displacement perpendicular

[m]

[m]

[m]

[m]

[mm]

[mm]

[mm]

[mm]

0.0

153.00000

151.90000

-0.50000

14.043

-10.710

-17.646

0.72141

0.81377

152.33333

152.36667

-0.50000

13.671

-10.427

-17.179

0.70272

1.6275

151.66667

152.83333

-0.50000

13.310

-10.153

-16.726

0.68462

2.4413

151.00000

153.30000

-0.50000

12.960

-9.8863

-16.287

0.66710

Structure: T | Sub-structure:

Dist.

Coordinates

x

y

z

Displacements

Horizontal displacement along the

Horizontal displacement perpendicular

[m]

[m]

[m]

[m]

[mm]

[mm]

[mm]

[mm]

0.0

151.00000

153.30000

-0.50000

12.960

-9.8863

-14.086

8.2025

0.96747

150.04000

153.42000

-0.50000

12.610

-9.6202

-13.706

7.9019

1.9349

149.08000

153.54000

-0.50000

12.271

-9.3619

-13.337

7.7676

2.9024

148.12000

153.66000

-0.50000

11.941

-9.1111

-12.979

7.5597

3.8699

147.16000

153.78000

-0.50000

11.621

-8.8675

-12.631

7.3576

4.8374

146.20000

153.90000

-0.50000

11.309

-8.6305

-12.292

7.1612

Structure: U | Sub-structure:

Dist.

Coordinates

x

y

z

Displacements

Horizontal displacement along the

Horizontal displacement perpendicular

[m]

[m]

[m]

[m]

[mm]

[mm]

[mm]

[mm]

0.0

151.00000

153.30000

-0.50000

12.960

-9.8863

-14.086

8.2025

0.96747

150.04000

153.42000

-0.50000

12.610

-9.6202

-13.706

7.9019

1.9349

149.08000

153.54000

-0.50000

12.271

-9.3619

-13.337

7.7676

2.9024

148.12000

153.66000

-0.50000

11.941

-9.1111

-12.979

7.5597

3.8699

147.16000

153.78000

-0.50000

11.621

-8.8675

-12.631

7.3576

4.8374

146.20000

153.90000

-0.50000

11.309

-8.6305

-12.292

7.1612

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[m]	[m]	[m]	[m]	[mm]	[mm]	[mm]	[mm]
0.0	146.20000	153.90000	-0.50000	11.309	-8.6305	-5.1727	13.252
0.89753	145.43333	153.43333	-0.50000	11.189	-8.5394	-5.1177	13.112
1.7951	144.66667	152.96667	-0.50000	11.071	-8.4493	-5.0633	12.974
2.6926	143.90000	152.50000	-0.50000	10.953	-8.3601	-5.0094	12.836

Structure: V | Sub-structure:

Dist.	Coordinates			Displacements			
	x	y	z	x	y	Horizontal displacement along the Line	Horizontal displacement perpendicular to Line
	[m]	[m]	[m]	[mm]	[mm]	[mm]	[mm]
0.0	143.90000	152.50000	-0.50000	10.953	-8.3601	12.852	4.9701
0.90898	144.37500	151.72500	-0.50000	11.259	-8.5924	13.209	5.1093
1.8180	144.85000	150.95000	-0.50000	11.573	-8.8313	13.577	5.2524
2.7269	145.32500	150.17500	-0.50000	11.896	-9.0771	13.956	5.3996
3.6359	145.80000	149.40000	-0.50000	12.229	-9.3302	14.346	5.5511

Structure: W | Sub-structure:

Dist.	Coordinates			Displacements			
	x	y	z	x	y	Horizontal displacement along the Line	Horizontal displacement perpendicular to Line
	[m]	[m]	[m]	[mm]	[mm]	[mm]	[mm]
0.0	145.80000	149.40000	-0.50000	12.229	-9.3302	13.365	-7.6153
0.87448	146.66667	149.28333	-0.50000	12.536	-9.5639	13.790	-7.8059
1.7490	147.53333	149.16667	-0.50000	12.852	-9.8040	14.045	-8.0018
2.6235	148.40000	149.05000	-0.50000	13.176	-10.051	14.399	-8.2031
3.4979	149.26667	148.93333	-0.50000	13.510	-10.305	14.764	-8.4101
4.3724	150.13333	148.81667	-0.50000	13.852	-10.566	15.138	-8.6230
5.2469	151.00000	148.70000	-0.50000	14.205	-10.834	15.523	-8.8421

Specific Building Damage Results - Vertical Displacements

Structure: A | Sub-structure:

Dist.	Coordinates			Displacements
	x	y	z	z
	[m]	[m]	[m]	[mm]

Vertical Offset 1				
0.0	130.60000	139.50000	-0.50000	8.6506
0.93316	131.32500	138.91250	-0.50000	8.9305
1.8663	132.05000	138.32500	-0.50000	9.1893
2.7995	132.77500	137.73750	-0.50000	9.4270
3.7326	133.50000	137.15000	-0.50000	9.6437
4.6658	134.22500	136.56250	-0.50000	9.8404
5.5989	134.95000	135.97500	-0.50000	10.018
6.5321	135.67500	135.38750	-0.50000	10.180
7.4653	136.40000	134.80000	-0.50000	10.326

Structure: B | Sub-structure:

Dist.	Coordinates			Displacements
	x	y	z	z
	[m]	[m]	[m]	[mm]

Vertical Offset 1				
0.0	138.40000	133.00000	-0.50000	11.958
1.8607	139.85714	131.84286	-0.50000	12.177
3.7214	141.31429	130.68571	-0.50000	12.421
5.5821	142.77143	129.52857	-0.50000	12.708
7.4428	144.22857	128.37143	-0.50000	13.043
9.3036	145.68571	127.21429	-0.50000	12.291
11.164	147.14286	126.05714	-0.50000	12.260
13.025	148.60000	124.90000	-0.50000	12.386

Structure: C | Sub-structure:

Dist.	Coordinates			Displacements
	x	y	z	z
	[m]	[m]	[m]	[mm]

Vertical Offset 1				
0.0	149.30000	121.40000	-0.50000	13.558
0.93360	148.72222	120.66667	-0.50000	13.438
1.8672	148.14444	119.93333	-0.50000	13.316
2.8008	147.56667	119.20000	-0.50000	13.187
3.7344	146.98889	118.46667	-0.50000	13.049
4.6680	146.41111	117.73333	-0.50000	12.899
5.6016	145.83333	117.00000	-0.50000	12.734
6.5352	145.25556	116.26667	-0.50000	12.562
7.4688	144.67778	115.53333	-0.50000	12.351
8.4024	144.10000	114.80000	-0.50000	12.130

Structure: D | Sub-structure:

Dist.	Coordinates			Displacements
	x	y	z	z
	[m]	[m]	[m]	[mm]

Vertical Offset 1				
0.0	144.10000	114.80000	-0.50000	12.130
1.9919	145.65455	113.55455	-0.50000	12.163
3.9839	147.20909	112.30909	-0.50000	12.185
5.9758	148.76364	111.06364	-0.50000	12.199
7.9677	150.31818	109.81818	-0.50000	12.209
9.9596	151.87273	108.57273	-0.50000	12.218
11.952	153.42727	107.32727	-0.50000	8.0202
13.943	154.98182	106.08182	-0.50000	7.7265
15.935	156.53636	104.83636	-0.50000	7.3532
17.927	158.09091	103.59091	-0.50000	6.9241
19.919	159.64545	102.34545	-0.50000	6.5161
21.911	161.20000	101.10000	-0.50000	6.1388

Structure: E | Sub-structure:

Dist.	Coordinates			Displacements
	x	y	z	z
	[m]	[m]	[m]	[mm]

Vertical Offset 1				
0.0	161.20000	101.10000	-0.50000	6.1388
1.9301	160.00000	99.58824	-0.50000	6.0031
3.8603	158.00000	98.07647	-0.50000	5.9635
5.7904	157.60000	96.56471	-0.50000	5.9575
7.7206	156.40000	95.05294	-0.50000	5.9343

135 Shaftsbury Avenue, London WC2H 8AH
Wall installation and excavation combined

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Dist.	Coordinates		Displacements	
	x	y	z	z
[m]	[m]	[m]	[m]	[mm]
9.6507	155.20000	93.54118	-0.50000	5.8550
11.581	154.00000	92.02941	-0.50000	5.6923
13.511	152.80000	90.51765	-0.50000	5.4305
15.441	151.60000	89.00588	-0.50000	5.0661
17.371	150.40000	87.49412	-0.50000	4.6070
19.301	149.20000	85.98235	-0.50000	4.0730
21.232	148.00000	84.47059	-0.50000	3.4957
23.162	146.80000	82.95882	-0.50000	2.9186
25.092	145.60000	81.44706	-0.50000	2.3969
27.022	144.40000	79.93529	-0.50000	1.8494
28.952	143.20000	78.42353	-0.50000	1.2903
30.882	142.00000	76.91176	-0.50000	0.75371
32.812	140.80000	75.40000	-0.50000	0.23256

Structure: F | Sub-structure:

Dist.	Coordinates		Displacements	
	x	y	z	z
[m]	[m]	[m]	[m]	[mm]

Vertical Offset 1				
0.0	174.60000	86.80000	-0.50000	5.0267
1.9345	175.78571	88.32857	-0.50000	5.2964
3.8691	176.97143	89.85714	-0.50000	5.5560
5.8036	178.15714	91.38571	-0.50000	5.8151
7.7382	179.34286	92.91429	-0.50000	6.0818
9.6727	180.52857	94.44286	-0.50000	6.3613
11.607	181.71429	95.97143	-0.50000	6.6554
13.542	182.90000	97.50000	-0.50000	6.9526

Structure: G | Sub-structure:

Dist.	Coordinates		Displacements	
	x	y	z	z
[m]	[m]	[m]	[m]	[mm]

Vertical Offset 1				
0.0	182.90000	97.50000	-0.50000	6.9526
1.7291	184.25714	96.42857	-0.50000	6.7310
3.4582	185.61429	95.35714	-0.50000	6.4198
5.1873	186.97143	94.28571	-0.50000	6.0216
6.9164	188.32857	93.21429	-0.50000	5.5462
8.6455	189.68571	92.14286	-0.50000	5.0111
10.375	191.04286	91.07143	-0.50000	4.4412
12.104	192.40000	90.00000	-0.50000	3.8691

Structure: H | Sub-structure:

Dist.	Coordinates		Displacements	
	x	y	z	z
[m]	[m]	[m]	[m]	[mm]

Vertical Offset 1				
0.0	182.90000	97.50000	-0.50000	6.9526
1.8858	184.04286	99.00000	-0.50000	7.1969
3.7715	185.18571	100.50000	-0.50000	7.3832
5.6573	186.32857	102.00000	-0.50000	7.5068
7.5431	187.47143	103.50000	-0.50000	10.311
9.4288	188.61429	105.00000	-0.50000	10.322
11.315	189.75714	106.50000	-0.50000	10.333
13.200	190.90000	108.00000	-0.50000	10.344

Structure: I | Sub-structure:

Dist.	Coordinates		Displacements	
	x	y	z	z
[m]	[m]	[m]	[m]	[mm]

Vertical Offset 1				
0.0	190.90000	108.00000	-0.50000	10.344
1.9116	191.98333	109.57500	-0.50000	10.386
3.8232	193.06667	111.15000	-0.50000	10.427
5.7348	194.15000	112.72500	-0.50000	10.468
7.6464	195.23333	114.30000	-0.50000	10.519
9.5580	196.31667	115.87500	-0.50000	10.531
11.470	197.40000	117.45000	-0.50000	10.638
13.381	198.48333	119.02500	-0.50000	10.662
15.293	199.56667	120.60000	-0.50000	10.686
17.204	200.65000	122.17500	-0.50000	10.710
19.116	201.73333	123.75000	-0.50000	10.734
21.028	202.81667	125.32500	-0.50000	10.758
22.939	203.90000	126.90000	-0.50000	10.781

Structure: J | Sub-structure:

Dist.	Coordinates		Displacements	
	x	y	z	z
[m]	[m]	[m]	[m]	[mm]

Vertical Offset 1				
0.0	203.90000	126.90000	-0.50000	10.781
1.6972	205.08333	125.68333	-0.50000	10.201
3.3944	206.26667	124.46667	-0.50000	9.5447
5.0917	207.45000	123.25000	-0.50000	8.8205
6.7889	208.63333	122.03333	-0.50000	8.0409
8.4861	209.81667	120.81667	-0.50000	7.2239
10.183	211.00000	119.60000	-0.50000	6.3932

Structure: K | Sub-structure:

Dist.	Coordinates		Displacements	
	x	y	z	z
[m]	[m]	[m]	[m]	[mm]

Vertical Offset 1				
0.0	228.40000	116.90000	-0.50000	0.22566
1.9691	226.99231	118.27692	-0.50000	0.76268
3.9383	225.58462	119.65385	-0.50000	1.3194
5.9074	224.17692	121.03077	-0.50000	1.9055
7.8766	222.76923	122.40769	-0.50000	2.5233
9.8457	221.36154	123.78462	-0.50000	3.1926
11.815	219.95385	125.16154	-0.50000	3.8479
13.784	218.54615	126.53846	-0.50000	4.5085
15.753	217.13846	127.91538	-0.50000	5.2253
17.722	215.73077	129.29231	-0.50000	5.9593
19.691	214.32308	130.66923	-0.50000	6.6937
21.661	212.91538	132.04615	-0.50000	7.1831
23.630	211.50769	133.42308	-0.50000	7.6538
25.599	210.10000	134.80000	-0.50000	8.0036

Structure: L | Sub-structure:

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Dist.	Coordinates			Displacements
	x	y	z	z
[m]	[m]	[m]	[m]	[mm]

Vertical Offset 1

0.0	210.10000	134.80000	-0.50000	8.0036
1.8286	211.41429	136.07143	-0.50000	7.6788
3.6573	212.72857	137.34286	-0.50000	7.3443
5.4859	214.04286	138.61429	-0.50000	6.9934
7.3145	215.35714	139.88571	-0.50000	6.6194
9.1431	216.67143	141.15714	-0.50000	6.2166
10.972	217.98571	142.42857	-0.50000	5.7819
12.800	219.30000	143.70000	-0.50000	5.3158

Structure: M | Sub-structure:

Dist.	Coordinates			Displacements
	x	y	z	z
[m]	[m]	[m]	[m]	[mm]

Vertical Offset 1

0.0	221.40000	189.60000	-0.50000	0.0
1.9226	220.34091	187.99545	-0.50000	0.0
3.8451	219.28182	186.39091	-0.50000	0.11876
5.7677	218.22273	184.78636	-0.50000	0.20579
7.6902	217.16364	183.18182	-0.50000	0.27656
9.6128	216.10455	181.57727	-0.50000	0.66314
11.535	215.04545	179.97273	-0.50000	1.2306
13.458	213.98636	178.36818	-0.50000	1.8367
15.380	212.92727	176.76364	-0.50000	2.4940
17.303	211.86818	175.15909	-0.50000	3.2123
19.226	210.80909	173.55455	-0.50000	3.9603
21.148	209.75000	171.95000	-0.50000	4.7236
23.071	208.69091	170.34545	-0.50000	5.5827
24.993	207.63182	168.74091	-0.50000	6.4846
26.916	206.57273	167.13636	-0.50000	7.3855
28.839	205.51364	165.53182	-0.50000	8.2901
30.761	204.45455	163.92727	-0.50000	9.0521
32.684	203.39545	162.32273	-0.50000	9.7743
34.606	202.33636	160.71818	-0.50000	10.408
36.529	201.27727	159.11364	-0.50000	10.953
38.451	200.21818	157.50909	-0.50000	11.420
40.374	199.15909	155.90455	-0.50000	11.826
42.296	198.10000	154.30000	-0.50000	9.5594

Structure: N | Sub-structure:

Dist.	Coordinates			Displacements
	x	y	z	z
[m]	[m]	[m]	[m]	[mm]

Vertical Offset 1

0.0	191.40000	153.80000	-0.50000	13.378
1.8705	190.11111	155.15556	-0.50000	13.377
3.7410	188.82222	156.51111	-0.50000	13.375
5.6115	187.53333	157.86667	-0.50000	13.374
7.4820	186.24444	159.22222	-0.50000	13.374
9.3525	184.95556	160.57778	-0.50000	13.373
11.223	183.66667	161.93333	-0.50000	13.372
13.093	182.37778	163.28889	-0.50000	10.047
14.964	181.08889	164.64444	-0.50000	9.0523
16.834	179.80000	166.00000	-0.50000	9.1839

Structure: O | Sub-structure:

Dist.	Coordinates			Displacements
	x	y	z	z
[m]	[m]	[m]	[m]	[mm]

Vertical Offset 1

0.0	179.80000	166.00000	-0.50000	9.1839
1.9200	180.94545	167.54091	-0.50000	8.7519
3.8400	182.09091	169.08182	-0.50000	8.4870
5.7601	183.23636	170.62273	-0.50000	8.3192
7.6801	184.38182	172.16364	-0.50000	8.1885
9.6001	185.52727	173.70455	-0.50000	8.0456
11.520	186.67273	175.24545	-0.50000	7.8521
13.440	187.81818	176.78636	-0.50000	7.5805
15.360	188.96364	178.32727	-0.50000	7.2143
17.280	190.10909	179.86818	-0.50000	6.7483
19.200	191.25455	181.40909	-0.50000	6.1880
21.120	192.40000	182.95000	-0.50000	5.5593
23.040	193.54545	184.49091	-0.50000	4.8628
24.960	194.69091	186.03182	-0.50000	4.1647
26.880	195.83636	187.57273	-0.50000	3.5058
28.800	196.98182	189.11364	-0.50000	2.9115
30.720	198.12727	190.65455	-0.50000	2.2670
32.640	199.27273	192.19545	-0.50000	1.6629
34.560	200.41818	193.73636	-0.50000	1.0928
36.480	201.56364	195.27727	-0.50000	0.54859
38.400	202.70909	196.81818	-0.50000	0.17408
40.320	203.85455	198.35909	-0.50000	0.12849
42.240	205.00000	199.90000	-0.50000	0.071983

Structure: P | Sub-structure:

Dist.	Coordinates			Displacements
	x	y	z	z
[m]	[m]	[m]	[m]	[mm]

Vertical Offset 1

0.0	158.80000	189.60000	-0.50000	4.0314
1.8575	160.03333	188.21111	-0.50000	4.6530
3.7149	161.26667	186.82222	-0.50000	5.2908
5.5724	162.50000	185.43333	-0.50000	5.9007
7.4298	163.73333	184.04444	-0.50000	6.4481
9.2873	164.96667	182.65556	-0.50000	6.9080
11.145	166.20000	181.26667	-0.50000	7.2646
13.002	167.43333	179.87778	-0.50000	7.5114
14.860	168.66667	178.48889	-0.50000	7.6507
16.717	169.90000	177.10000	-0.50000	7.6937

Structure: Q | Sub-structure:

Dist.	Coordinates			Displacements
	x	y	z	z
[m]	[m]	[m]	[m]	[mm]

Vertical Offset 1

0.0	171.10000	177.10000	-0.50000	7.5547
1.9500	172.36667	178.58333	-0.50000	7.2913
3.9011	173.63333	180.06667	-0.50000	7.0341
5.8517	174.90000	181.55000	-0.50000	6.7789
7.8023	176.16667	183.03333	-0.50000	6.5614

Oasys

GEA LIMITED

(GEOTECHNICAL & ENV ASSOC)

135 Shaftsbury Avenue, London WC2H 8AH

Wall installation and excavation combined

Job No.

Sheet No.

Rev.

J17183

Drg. Ref.

Made by

Date

Checked

12-Dec-2017

Dist.

Coordinates

Displacements

[m]

x

[m]

y

[m]

z

[m]

z

[mm]

9.7528 177.43333 184.51667 -0.50000 6.2636

11.703 178.70000 186.00000 -0.50000 5.8820

13.654 179.96667 187.48333 -0.50000 5.4207

15.605 181.23333 188.96667 -0.50000 4.8925

17.555 182.50000 190.45000 -0.50000 4.3195

19.506 183.76667 191.93333 -0.50000 3.7339

21.456 185.03333 193.41667 -0.50000 3.1786

23.407 186.30000 194.90000 -0.50000 2.6535

Structure: R | Sub-structure:

Dist.

Coordinates

Displacements

[m]

x

[m]

y

[m]

z

[m]

z

[mm]

Vertical Offset 1

0.0 151.00000 148.70000 -0.50000 14.068

0.94340 151.50000 149.50000 -0.50000 14.065

1.8868 152.00000 150.30000 -0.50000 14.063

2.8302 152.50000 151.10000 -0.50000 14.060

3.7736 153.00000 151.90000 -0.50000 14.057

Structure: S | Sub-structure:

Dist.

Coordinates

Displacements

[m]

x

[m]

y

[m]

z

[m]

z

[mm]

Vertical Offset 1

0.0 153.00000 151.90000 -0.50000 14.057

0.81377 152.33333 152.36667 -0.50000 14.009

1.6275 151.66667 152.83333 -0.50000 13.945

2.4413 151.00000 153.30000 -0.50000 13.862

Structure: T | Sub-structure:

Dist.

Coordinates

Displacements

[m]

x

[m]

y

[m]

z

[m]

z

[mm]

Vertical Offset 1

0.0 151.00000 153.30000 -0.50000 13.862

0.96747 150.04000 153.42000 -0.50000 13.755

1.9349 149.08000 153.54000 -0.50000 13.625

2.9024 148.12000 153.66000 -0.50000 13.470

3.8699 147.16000 153.78000 -0.50000 13.289

4.8374 146.20000 153.90000 -0.50000 13.081

Structure: U | Sub-structure:

Dist.

Coordinates

Displacements

[m]

x

[m]

y

[m]

z

[m]

z

[mm]

Vertical Offset 1

0.0 146.20000 153.90000 -0.50000 13.081

0.89753 145.43333 153.43333 -0.50000 12.992

1.7951 144.66667 152.96667 -0.50000 12.899

2.6926 143.90000 152.50000 -0.50000 12.802

Structure: V | Sub-structure:

Dist.

Coordinates

Displacements

[m]

x

[m]

y

[m]

z

[m]

z

[mm]

Vertical Offset 1

0.0 143.90000 152.50000 -0.50000 12.802

0.90890 144.37500 151.72500 -0.50000 13.043

1.8180 144.85000 150.95000 -0.50000 13.256

2.7269 145.32500 150.17500 -0.50000 13.441

3.6359 145.80000 149.40000 -0.50000 13.600

Structure: W | Sub-structure:

Dist.

Coordinates

Displacements

[m]

x

[m]

y

[m]

z

[m]

z

[mm]

Vertical Offset 1

0.0 145.80000 149.40000 -0.50000 13.600

0.87448 146.66667 149.28333 -0.50000 13.722

1.7490 147.53333 149.16667 -0.50000 13.824

2.6235 148.40000 149.05000 -0.50000 13.908

3.4979 149.26667 148.93333 -0.50000 13.975

4.3724 150.13333 148.81667 -0.50000 14.028

5.2469 151.00000 148.70000 -0.50000 14.068

Specific Building Damage Results - All Segments

Structure: A | Sub-structure:

Vertical Offset from Line for Vertical Movement Calculations

Segment

Start

Length

Curvature

Deflection Ratio

Average Horizontal Strain

Max Tensile Strain

Max Gradient of Horizontal Displacement Curve

Max Gradient of Vertical Displacement Curve

Min Radius of Curvature

Damage Category

[m]

0.0

1

[m]

0.0

[m]

7.4650

Sagging

[%]

0.0020781

[%]

0.014398

[%]

0.015475

-147.65E-6

-299.88E-6

[m]

41306.

0

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

Structure: B | Sub-structure:

Vertical Offset from Line for Vertical Movement Calculations

Segment

Start

Length

Curvature

Deflection Ratio

Average Horizontal Strain

Max Tensile Strain

Max Gradient of Horizontal Displacement Curve

Max Gradient of Vertical Displacement Curve

Min Radius of Curvature

Damage Category

[m]

0.0

1

[m]

0.0

[m]

3.9889

Hogging

[%]

407.28E-6

[%]

0.045989

[%]

0.046047

-597.44E-6

-153.96E-6

[m]

87160.

0

[m]

0.0

2

[m]

3.9889

[m]

4.8153

Sagging

[%]

0.011606

[%]

0.025719

[%]

0.029668

765.53E-6

404.89E-6

[m]

9864.0

0

[m]

0.0

3

[m]

8.8042

[m]

4.2198

Hogging

[%]

0.0044911

[%]

-0.12634

[%]

0.025400

0.0014922

404.89E-6

[m]

11675.

0

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

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Printed 13-Dec-2017

Time 13:47



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Vertical Offset from Line for Vertical Movement	Segment	Start	Length	Curvature	Deflection Ratio	Average Horizontal Strain	Max Tensile Strain	Max Gradient of Horizontal Displacement	Max Gradient of Vertical Displacement	Min Radius of Curvature	Damage Category
Structure: C Sub-structure:											
Vertical Offset from Line for Vertical Movement Calculations	Segment	Start	Length	Curvature	Deflection Ratio	Average Horizontal Strain	Max Tensile Strain	Max Gradient of Horizontal Displacement	Max Gradient of Vertical Displacement	Min Radius of Curvature	Damage Category
[m] 0.0		[m] 0.0	[m] 8.4620	Sagging	[%] 0.0016009	[%] 0.051071	[%] 0.051997	-574.64E-6	236.56E-6	[m] 42630.1	1 (Very Slight)
Tensile horizontal strains are +ve, compressive horizontal strains are -ve.											
Structure: D Sub-structure:											
Vertical Offset from Line for Vertical Movement Calculations	Segment	Start	Length	Curvature	Deflection Ratio	Average Horizontal Strain	Max Tensile Strain	Max Gradient of Horizontal Displacement	Max Gradient of Vertical Displacement	Min Radius of Curvature	Damage Category
[m] 0.0		[m] 0.0	[m] 11.078	Sagging	[%] 0.019202	[%] -0.011280	[%] 0.014698	0.0011797	0.0021099	[m] 3515.8	0 (Negligible)
	2	11.078	4.7703	Hogging	0.028854	-0.075333	0.023443	0.0011797	0.0021099	4295.1	0 (Negligible)
	3	15.848	1.8938	Sagging	122.66E-6	-0.041996	0.0083994	683.32E-6	215.50E-6	93813.	0 (Negligible)
	4	17.742	4.1694	Hogging	405.42E-6	0.0083418	0.0084021	407.38E-6	215.50E-6	119710.	0 (Negligible)
Tensile horizontal strains are +ve, compressive horizontal strains are -ve.											
Structure: E Sub-structure:											
Vertical Offset from Line for Vertical Movement Calculations	Segment	Start	Length	Curvature	Deflection Ratio	Average Horizontal Strain	Max Tensile Strain	Max Gradient of Horizontal Displacement	Max Gradient of Vertical Displacement	Min Radius of Curvature	Damage Category
[m] 0.0		[m] 0.0	[m] 5.2503	Hogging	[%] 0.0013170	[%] 0.0046759	[%] 0.0049676	-63.719E-6	70.259E-6	[m] 33399.	0 (Negligible)
	2	5.2503	15.846	Sagging	0.0046242	0.0080342	0.012636	-105.30E-6	299.06E-6	37417.	0 (Negligible)
	3	21.096	3.8408	Hogging	709.50E-6	-0.013016	0.0026353	136.78E-6	299.06E-6	175870.	0 (Negligible)
	4	24.937	2.7594	Sagging	127.19E-6	0.0075151	0.0075401	134.66E-6	289.58E-6	573550.	0 (Negligible)
	5	27.696	5.1158	Hogging	295.68E-6	0.013532	0.013586	-136.70E-6	289.58E-6	216940.	0 (Negligible)
Tensile horizontal strains are +ve, compressive horizontal strains are -ve.											
Structure: F Sub-structure:											
Vertical Offset from Line for Vertical Movement Calculations	Segment	Start	Length	Curvature	Deflection Ratio	Average Horizontal Strain	Max Tensile Strain	Max Gradient of Horizontal Displacement	Max Gradient of Vertical Displacement	Min Radius of Curvature	Damage Category
[m] 0.0		[m] 0.0	[m] 4.0869	Sagging	[%] 131.30E-6	[%] 0.0052401	[%] 0.0053044	-54.708E-6	-139.43E-6	[m] 297260.	0 (Negligible)
	2	4.0869	9.4541	Hogging	335.16E-6	332.31E-6	520.38E-6	84.953E-6	-153.63E-6	313260.	0 (Negligible)
Tensile horizontal strains are +ve, compressive horizontal strains are -ve.											
Structure: G Sub-structure:											
Vertical Offset from Line for Vertical Movement Calculations	Segment	Start	Length	Curvature	Deflection Ratio	Average Horizontal Strain	Max Tensile Strain	Max Gradient of Horizontal Displacement	Max Gradient of Vertical Displacement	Min Radius of Curvature	Damage Category
[m] 0.0		[m] 0.0	[m] 11.480	Sagging	[%] 0.0032074	[%] 0.0061900	[%] 0.0099161	-90.107E-6	330.85E-6	[m] 33185.	0 (Negligible)
	2	11.480	0.62259	None	0.0	0.0090116	0.0090115	-90.107E-6	330.85E-6	511400.	0 (Negligible)
Tensile horizontal strains are +ve, compressive horizontal strains are -ve.											
Structure: H Sub-structure:											
Vertical Offset from Line for Vertical Movement Calculations	Segment	Start	Length	Curvature	Deflection Ratio	Average Horizontal Strain	Max Tensile Strain	Max Gradient of Horizontal Displacement	Max Gradient of Vertical Displacement	Min Radius of Curvature	Damage Category
[m] 0.0		[m] 0.0	[m] 2.0492	Sagging	[%] 225.68E-6	[%] -0.016083	[%] 0.0032193	175.07E-6	-129.58E-6	[m] 60036.	0 (Negligible)
	2	2.0492	4.4815	Hogging	0.021852	-0.014856	0.017492	184.51E-6	-0.0014872	5675.6	0 (Negligible)
	3	6.5306	4.7840	Sagging	0.024700	-392.03E-6	0.023650	18.779E-6	-0.0014872	4895.5	0 (Negligible)
	4	11.315	1.8854	Hogging	0.0	6.8520E-6	6.8307E-6	0.0	-5.8502E-6	9.5567E+9	0 (Negligible)
Tensile horizontal strains are +ve, compressive horizontal strains are -ve.											
Structure: I Sub-structure:											
Vertical Offset from Line for Vertical Movement Calculations	Segment	Start	Length	Curvature	Deflection Ratio	Average Horizontal Strain	Max Tensile Strain	Max Gradient of Horizontal Displacement	Max Gradient of Vertical Displacement	Min Radius of Curvature	Damage Category
[m] 0.0		[m] 0.0	[m] 2.0770	Sagging	[%] 0.0	[%] 168.29E-6	[%] 168.48E-6	-1.6864E-6	-21.638E-6	[m] 15.684E+6	0 (Negligible)
	2	2.0770	2.3983	Sagging	2.4192E-6	168.74E-6	169.48E-6	-1.6902E-6	-21.516E-6	1.4876E+6	0 (Negligible)
	3	4.4753	2.0583	Hogging	129.68E-6	0.0067275	0.0067439	-170.66E-6	-26.907E-6	776680.	0 (Negligible)
	4	6.5336	3.9617	Hogging	754.06E-6	-0.0051662	0.0011225	345.62E-6	-56.070E-6	216100.	0 (Negligible)
	5	10.495	12.444	Sagging	313.40E-6	-0.0027030	559.72E-6	345.62E-6	-56.070E-6	175980.	0 (Negligible)
Tensile horizontal strains are +ve, compressive horizontal strains are -ve.											
Structure: J Sub-structure:											
Vertical Offset from Line for Vertical Movement Calculations	Segment	Start	Length	Curvature	Deflection Ratio	Average Horizontal Strain	Max Tensile Strain	Max Gradient of Horizontal Displacement	Max Gradient of Vertical Displacement	Min Radius of Curvature	Damage Category
[m] 0.0		[m] 0.0	[m] 2.0770	Sagging	[%] 0.0	[%] 168.29E-6	[%] 168.48E-6	-1.6864E-6	-21.638E-6	[m] 15.684E+6	0 (Negligible)
	2	2.0770	2.3983	Sagging	2.4192E-6	168.74E-6	169.48E-6	-1.6902E-6	-21.516E-6	1.4876E+6	0 (Negligible)
	3	4.4753	2.0583	Hogging	129.68E-6	0.0067275	0.0067439	-170.66E-6	-26.907E-6	776680.	0 (Negligible)
	4	6.5336	3.9617	Hogging	754.06E-6	-0.0051662	0.0011225	345.62E-6	-56.070E-6	216100.	0 (Negligible)
	5	10.495	12.444	Sagging	313.40E-6	-0.0027030	559.72E-6	345.62E-6	-56.070E-6	175980.	0 (Negligible)
Tensile horizontal strains are +ve, compressive horizontal strains are -ve.											



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Job No.	Sheet No.	Rev.
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	12-Dec-2017	

Movement Calculations						Displacement Curve	Curve		
[m] 0.0	1	[m] 0.0	[m] 10.183	Sagging	[%] 0.0022873	[%] 0.036159	[%] 0.038608	-389.29E-6	489.27E-6
								[m] 37428.	0 (Negligible)

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

Structure: K | Sub-structure:

Vertical Offset from Line for Vertical Movement Calculations	Segment	Start	Length	Curvature	Deflection Ratio	Average Horizontal Strain	Max Tensile Strain	Max Gradient of Horizontal Displacement Curve	Max Gradient of Vertical Displacement Curve	Min Radius of Curvature	Damage Category
[m] 0.0	1	[m] 0.0	[m] 15.764	Hogging	[%] 0.0012525	[%] 0.015677	[%] 0.016780	-232.41E-6	-363.95E-6	[m] 107680.	0 (Negligible)
	2	15.764	9.8343	Sagging	0.0029479	0.0065418	0.0096211	-97.245E-6	-362.59E-6	31292.	0 (Negligible)

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

Structure: L | Sub-structure:

Vertical Offset from Line for Vertical Movement Calculations	Segment	Start	Length	Curvature	Deflection Ratio	Average Horizontal Strain	Max Tensile Strain	Max Gradient of Horizontal Displacement Curve	Max Gradient of Vertical Displacement Curve	Min Radius of Curvature	Damage Category
[m] 0.0	1	[m] 0.0	[m] 12.800	Sagging	[%] 0.0011815	[%] 0.0038051	[%] 0.0052719	-56.373E-6	254.88E-6	[m] 106060.	0 (Negligible)

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

Structure: M | Sub-structure:

Vertical Offset from Line for Vertical Movement Calculations	Segment	Start	Length	Curvature	Deflection Ratio	Average Horizontal Strain	Max Tensile Strain	Max Gradient of Horizontal Displacement Curve	Max Gradient of Vertical Displacement Curve	Min Radius of Curvature	Damage Category
[m] 0.0	1	[m] 3.8451	[m] 21.209	Hogging	[%] 0.0056869	[%] 0.031290	[%] 0.034903	-355.92E-6	-468.98E-6	[m] 18592.	0 (Negligible)
	2	25.054	17.242	Sagging	0.015083	0.013815	0.028306	0.0017778	0.0011808	1109.7	0 (Negligible)

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

Structure: N | Sub-structure:

Vertical Offset from Line for Vertical Movement Calculations	Segment	Start	Length	Curvature	Deflection Ratio	Average Horizontal Strain	Max Tensile Strain	Max Gradient of Horizontal Displacement Curve	Max Gradient of Vertical Displacement Curve	Min Radius of Curvature	Damage Category
[m] 0.0	1	[m] 0.0	[m] 7.4822	Hogging	[%] 1.8703E-6	[%] -7.3849E-6	[%] 1.8239E-6	0.0	0.0	[m] 49.351E+6	0 (Negligible)
	2	7.4822	4.8652	Sagging	0.031528	-182.64E-6	0.030678	7.6573E-6	0.0017776	3766.5	0 (Negligible)
	3	12.347	3.4600	Hogging	0.026077	-0.071966	0.021614	0.0010500	0.0017776	5170.6	0 (Negligible)
	4	15.807	1.0267	None	0.0	-0.061938	0.012388	619.76E-6	250.58E-6	4241.1	0 (Negligible)

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

Structure: O | Sub-structure:

Vertical Offset from Line for Vertical Movement Calculations	Segment	Start	Length	Curvature	Deflection Ratio	Average Horizontal Strain	Max Tensile Strain	Max Gradient of Horizontal Displacement Curve	Max Gradient of Vertical Displacement Curve	Min Radius of Curvature	Damage Category
[m] 0.0	1	[m] 0.0	[m] 7.3103	Hogging	[%] 0.0025607	[%] 0.018561	[%] 0.019477	-204.21E-6	224.97E-6	[m] 19963.	0 (Negligible)
	2	7.3103	16.104	Sagging	0.0046043	0.018221	0.023985	-204.21E-6	363.56E-6	38047.	0 (Negligible)
	3	23.414	16.906	Hogging	0.0036870	0.014643	0.017518	-212.13E-6	363.56E-6	18248.	0 (Negligible)

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

Structure: P | Sub-structure:

Vertical Offset from Line for Vertical Movement Calculations	Segment	Start	Length	Curvature	Deflection Ratio	Average Horizontal Strain	Max Tensile Strain	Max Gradient of Horizontal Displacement Curve	Max Gradient of Vertical Displacement Curve	Min Radius of Curvature	Damage Category
[m] 0.0	1	[m] 0.0	[m] 2.1709	Hogging	[%] 106.82E-6	[%] 0.011503	[%] 0.011514	-115.84E-6	-343.33E-6	[m] 126800.	0 (Negligible)
	2	2.1709	14.546	Sagging	0.0048918	0.0053313	0.011093	-110.11E-6	-343.33E-6	32084.	0 (Negligible)

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

Structure: Q | Sub-structure:

Vertical Offset from Line for Vertical Movement Calculations	Segment	Start	Length	Curvature	Deflection Ratio	Average Horizontal Strain	Max Tensile Strain	Max Gradient of Horizontal Displacement Curve	Max Gradient of Vertical Displacement Curve	Min Radius of Curvature	Damage Category
[m] 0.0	1	[m] 0.0	[m] 5.7407	Hogging	[%] 82.937E-6	[%] 0.010456	[%] 0.010479	-109.49E-6	135.06E-6	[m] 318710.	0 (Negligible)
	2	5.7407	12.473	Sagging	0.0029262	0.0064715	0.0095783	-95.346E-6	300.17E-6	46481.	0 (Negligible)
	3	18.213	5.1925	Hogging	506.07E-6	-0.0047642	996.67E-6	118.38E-6	300.17E-6	125670.	0 (Negligible)

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

Structure: R | Sub-structure:

Vertical Offset from Line for Vertical Movement Calculations	Segment	Start	Length	Curvature	Deflection Ratio	Average Horizontal Strain	Max Tensile Strain	Max Gradient of Horizontal Displacement Curve	Max Gradient of Vertical Displacement Curve	Min Radius of Curvature	Damage Category
[m] 0.0	1	[m] 0.0	[m] 3.7730	Sagging	[%] 6.8901E-6	[%] 496.58E-6	[%] 503.58E-6	-4.9927E-6	2.9149E-6	[m] 6.4904E+6	0



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Vertical Offset from Line for Vertical Movement	Segment	Start Length	Curvature	Deflection Ratio	Average Horizontal Strain	Max Tensile Strain	Max Gradient of Horizontal Displacement	Max Gradient of Vertical Displacement Curve	Min Radius of Curvature	Damage Category
Tensile horizontal strains are +ve, compressive horizontal strains are -ve.										(Negligible)
Structure: S Sub-structure:										
Vertical Offset from Line for Vertical Movement Calculations	Segment	Start Length	Curvature	Deflection Ratio	Average Horizontal Strain	Max Tensile Strain	Max Gradient of Horizontal Displacement Curve	Max Gradient of Vertical Displacement Curve	Min Radius of Curvature	Damage Category
[m] 0.0	1	[m] 0.0	[m] 2.4410	Sagging	[%] 721.67E-6	[%] 0.055689	[%] 0.056200	-573.37E-6	101.53E-6	[m] 34913.1 (Very Slight)
Tensile horizontal strains are +ve, compressive horizontal strains are -ve.										
Structure: T Sub-structure:										
Vertical Offset from Line for Vertical Movement Calculations	Segment	Start Length	Curvature	Deflection Ratio	Average Horizontal Strain	Max Tensile Strain	Max Gradient of Horizontal Displacement Curve	Max Gradient of Vertical Displacement Curve	Min Radius of Curvature	Damage Category
[m] 0.0	1	[m] 0.0	[m] 4.8370	Sagging	[%] 0.0015707	[%] 0.037086	[%] 0.038971	-392.63E-6	214.38E-6	[m] 35031.0 (Negligible)
Tensile horizontal strains are +ve, compressive horizontal strains are -ve.										
Structure: U Sub-structure:										
Vertical Offset from Line for Vertical Movement Calculations	Segment	Start Length	Curvature	Deflection Ratio	Average Horizontal Strain	Max Tensile Strain	Max Gradient of Horizontal Displacement Curve	Max Gradient of Vertical Displacement Curve	Min Radius of Curvature	Damage Category
[m] 0.0	1	[m] 0.0	[m] 2.6920	Sagging	[%] 149.63E-6	[%] 0.0060640	[%] 0.0061793	-61.257E-6	100.19E-6	[m] 199850.0 (Negligible)
Tensile horizontal strains are +ve, compressive horizontal strains are -ve.										
Structure: V Sub-structure:										
Vertical Offset from Line for Vertical Movement Calculations	Segment	Start Length	Curvature	Deflection Ratio	Average Horizontal Strain	Max Tensile Strain	Max Gradient of Horizontal Displacement Curve	Max Gradient of Vertical Displacement Curve	Min Radius of Curvature	Damage Category
[m] 0.0	1	[m] 0.0	[m] 3.6350	Sagging	[%] 0.0015019	[%] 0.041088	[%] 0.042567	-428.55E-6	-264.90E-6	[m] 29484.0 (Negligible)
Tensile horizontal strains are +ve, compressive horizontal strains are -ve.										
Structure: W Sub-structure:										
Vertical Offset from Line for Vertical Movement Calculations	Segment	Start Length	Curvature	Deflection Ratio	Average Horizontal Strain	Max Tensile Strain	Max Gradient of Horizontal Displacement Curve	Max Gradient of Vertical Displacement Curve	Min Radius of Curvature	Damage Category
[m] 0.0	1	[m] 0.0	[m] 5.2460	Sagging	[%] 0.0014051	[%] 0.041142	[%] 0.042911	-440.35E-6	-138.97E-6	[m] 38802.0 (Negligible)
Tensile horizontal strains are +ve, compressive horizontal strains are -ve.										
Specific Building Damage Results - Critical Values for All Segments within Each Sub-Structure										
Structure: A Sub-structure:										
Vertical Offset from Line for Vertical Movement Calculations	Deflection Ratio	Average Horizontal Strain	Max Slope	Max Settlement	Max Tensile Strain	Max Gradient of Horizontal Displacement Curve	Max Gradient of Vertical Displacement Curve	Min Radius of Curvature (Hogging)	Min Radius of Curvature (Sagging)	Damage Category
[m] 0.0	[%] 0.0020781	[%] 0.014398	-299.88E-6	[mm] 10.326	[%] 0.015475	-147.65E-6	-299.88E-6	[m] -	[m] 41306.0	0 (Negligible)
Structure: B Sub-structure:										
Vertical Offset from Line for Vertical Movement Calculations	Deflection Ratio	Average Horizontal Strain	Max Slope	Max Settlement	Max Tensile Strain	Max Gradient of Horizontal Displacement Curve	Max Gradient of Vertical Displacement Curve	Min Radius of Curvature (Hogging)	Min Radius of Curvature (Sagging)	Damage Category
[m] 0.0	[%] 0.011606	[%] -0.12634	404.89E-6	[mm] 13.043	[%] 0.046047	0.0014922	404.89E-6	[m] 11675.	[m] 9864.0	0 (Negligible)
Structure: C Sub-structure:										
Vertical Offset from Line for Vertical Movement Calculations	Deflection Ratio	Average Horizontal Strain	Max Slope	Max Settlement	Max Tensile Strain	Max Gradient of Horizontal Displacement Curve	Max Gradient of Vertical Displacement Curve	Min Radius of Curvature (Hogging)	Min Radius of Curvature (Sagging)	Damage Category
[m] 0.0	[%] 0.0016009	[%] 0.051071	236.56E-6	[mm] 13.558	[%] 0.051997	-574.64E-6	236.56E-6	[m] -	[m] 42630.1	1 (Very Slight)
Structure: D Sub-structure:										
Vertical Offset from Line for Vertical Movement Calculations	Deflection Ratio	Average Horizontal Strain	Max Slope	Max Settlement	Max Tensile Strain	Max Gradient of Horizontal Displacement Curve	Max Gradient of Vertical Displacement Curve	Min Radius of Curvature (Hogging)	Min Radius of Curvature (Sagging)	Damage Category
[m] 0.0	[%] 0.028854	[%] -0.075333	0.0021099	[mm] 12.218	[%] 0.023443	0.0011797	0.0021099	[m] 4295.1	[m] 3515.8	0 (Negligible)
Structure: E Sub-structure:										
Vertical Offset from Line for Vertical Movement Calculations	Deflection Ratio	Average Horizontal Strain	Max Slope	Max Settlement	Max Tensile Strain	Max Gradient of Horizontal Displacement Curve	Max Gradient of Vertical Displacement Curve	Min Radius of Curvature (Hogging)	Min Radius of Curvature (Sagging)	Damage Category



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Movement Calculations					Curve															
[m]	[%]	[%]		[mm]	[%]						[m]	[m]								
0.0	0.0046242	0.013532	299.06E-6	6.1388	0.013586	136.78E-6	299.06E-6	33399.	37417.	0 (Negligible)										
Structure: F Sub-structure:																				
Vertical Offset from Line for Vertical Movement Calculations	Deflection Ratio	Average Horizontal Strain	Max Slope	Max Settlement	Max Tensile Strain	Max Gradient of Horizontal Displacement Curve	Max Gradient of Vertical Displacement Curve	Min Radius of Curvature (Hogging)	Min Radius of Curvature (Sagging)	Damage Category										
[m]	[%]	[%]		[mm]	[%]			[m]	[m]											
0.0	335.16E-6	0.0052401	-153.63E-6	6.9525	0.0053044	84.953E-6	-153.63E-6	313260.	297260.	0 (Negligible)										
Structure: G Sub-structure:																				
Vertical Offset from Line for Vertical Movement Calculations	Deflection Ratio	Average Horizontal Strain	Max Slope	Max Settlement	Max Tensile Strain	Max Gradient of Horizontal Displacement Curve	Max Gradient of Vertical Displacement Curve	Min Radius of Curvature (Hogging)	Min Radius of Curvature (Sagging)	Damage Category										
[m]	[%]	[%]		[mm]	[%]			[m]	[m]											
0.0	0.0032074	0.0090116	330.85E-6	6.9526	0.0099161	-90.107E-6	330.85E-6	-	33185.	0 (Negligible)										
Structure: H Sub-structure:																				
Vertical Offset from Line for Vertical Movement Calculations	Deflection Ratio	Average Horizontal Strain	Max Slope	Max Settlement	Max Tensile Strain	Max Gradient of Horizontal Displacement Curve	Max Gradient of Vertical Displacement Curve	Min Radius of Curvature (Hogging)	Min Radius of Curvature (Sagging)	Damage Category										
[m]	[%]	[%]		[mm]	[%]			[m]	[m]											
0.0	0.024700	-0.016083	-0.0014872	10.344	0.023650	184.51E-6	-0.0014872	5675.6	4895.5	0 (Negligible)										
Structure: I Sub-structure:																				
Vertical Offset from Line for Vertical Movement Calculations	Deflection Ratio	Average Horizontal Strain	Max Slope	Max Settlement	Max Tensile Strain	Max Gradient of Horizontal Displacement Curve	Max Gradient of Vertical Displacement Curve	Min Radius of Curvature (Hogging)	Min Radius of Curvature (Sagging)	Damage Category										
[m]	[%]	[%]		[mm]	[%]			[m]	[m]											
0.0	754.06E-6	0.0067275	-56.070E-6	10.781	0.0067439	345.62E-6	-56.070E-6	216100.	175980.	0 (Negligible)										
Structure: J Sub-structure:																				
Vertical Offset from Line for Vertical Movement Calculations	Deflection Ratio	Average Horizontal Strain	Max Slope	Max Settlement	Max Tensile Strain	Max Gradient of Horizontal Displacement Curve	Max Gradient of Vertical Displacement Curve	Min Radius of Curvature (Hogging)	Min Radius of Curvature (Sagging)	Damage Category										
[m]	[%]	[%]		[mm]	[%]			[m]	[m]											
0.0	0.0022873	0.036159	489.27E-6	10.781	0.038608	-389.29E-6	489.27E-6	-	37428.	0 (Negligible)										
Structure: K Sub-structure:																				
Vertical Offset from Line for Vertical Movement Calculations	Deflection Ratio	Average Horizontal Strain	Max Slope	Max Settlement	Max Tensile Strain	Max Gradient of Horizontal Displacement Curve	Max Gradient of Vertical Displacement Curve	Min Radius of Curvature (Hogging)	Min Radius of Curvature (Sagging)	Damage Category										
[m]	[%]	[%]		[mm]	[%]			[m]	[m]											
0.0	0.0029479	0.015677	-363.95E-6	8.0035	0.016780	-232.41E-6	-363.95E-6	107680.	31292.	0 (Negligible)										
Structure: L Sub-structure:																				
Vertical Offset from Line for Vertical Movement Calculations	Deflection Ratio	Average Horizontal Strain	Max Slope	Max Settlement	Max Tensile Strain	Max Gradient of Horizontal Displacement Curve	Max Gradient of Vertical Displacement Curve	Min Radius of Curvature (Hogging)	Min Radius of Curvature (Sagging)	Damage Category										
[m]	[%]	[%]		[mm]	[%]			[m]	[m]											
0.0	0.0011815	0.0038051	254.88E-6	8.0036	0.0052719	-56.373E-6	254.88E-6	-	106060.	0 (Negligible)										
Structure: M Sub-structure:																				
Vertical Offset from Line for Vertical Movement Calculations	Deflection Ratio	Average Horizontal Strain	Max Slope	Max Settlement	Max Tensile Strain	Max Gradient of Horizontal Displacement Curve	Max Gradient of Vertical Displacement Curve	Min Radius of Curvature (Hogging)	Min Radius of Curvature (Sagging)	Damage Category										
[m]	[%]	[%]		[mm]	[%]			[m]	[m]											
0.0	0.015083	0.031290	0.0011808	11.822	0.034903	0.0017778	0.0011808	18592.	1109.7	0 (Negligible)										
Structure: N Sub-structure:																				
Vertical Offset from Line for Vertical Movement Calculations	Deflection Ratio	Average Horizontal Strain	Max Slope	Max Settlement	Max Tensile Strain	Max Gradient of Horizontal Displacement Curve	Max Gradient of Vertical Displacement Curve	Min Radius of Curvature (Hogging)	Min Radius of Curvature (Sagging)	Damage Category										
[m]	[%]	[%]		[mm]	[%]			[m]	[m]											
0.0	0.031528	-0.071966	0.0017776	13.378	0.030678	0.0010500	0.0017776	5170.6	3766.5	0 (Negligible)										
Structure: O Sub-structure:																				
Vertical Offset from Line for Vertical Movement Calculations	Deflection Ratio	Average Horizontal Strain	Max Slope	Max Settlement	Max Tensile Strain	Max Gradient of Horizontal Displacement Curve	Max Gradient of Vertical Displacement Curve	Min Radius of Curvature (Hogging)	Min Radius of Curvature (Sagging)	Damage Category										
[m]	[%]	[%]		[mm]	[%]			[m]	[m]											
0.0	0.0046043	0.018561	363.56E-6	9.1839	0.023985	-212.13E-6	363.56E-6	18248.	38047.	0 (Negligible)										



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Vertical Offset from Line for Vertical Movement Calculations	Deflection Ratio	Average Horizontal Strain	Max Slope	Max Settlement	Max Tensile Strain	Max Gradient of Horizontal Displacement	Max Gradient of Vertical Displacement Curve	Min Radius of Curvature (Hogging)	Min Radius of Curvature (Sagging)	Damage Category
Structure: P Sub-structure:										
[m] 0.0	[%] 0.0048918	[%] 0.011503	-343.33E-6	[mm] 7.6937	[%] 0.011514	-115.84E-6	-343.33E-6	[m] 126800.	[m] 32084.	0 (Negligible)
Structure: Q Sub-structure:										
[m] 0.0	[%] 0.0029262	[%] 0.010456	300.17E-6	[mm] 7.5547	[%] 0.010479	118.38E-6	300.17E-6	[m] 125670.	[m] 46481.	0 (Negligible)
Structure: R Sub-structure:										
[m] 0.0	[%] 6.8901E-6	[%] 496.58E-6	2.9149E-6	[mm] 14.068	[%] 503.58E-6	-4.9927E-6	2.9149E-6	[m] -	[m] 6.4904E+6	0 (Negligible)
Structure: S Sub-structure:										
[m] 0.0	[%] 721.67E-6	[%] 0.055689	101.53E-6	[mm] 14.057	[%] 0.056200	-573.37E-6	101.53E-6	[m] -	[m] 34913.	1 (Very Slight)
Structure: T Sub-structure:										
[m] 0.0	[%] 0.0015707	[%] 0.037086	214.38E-6	[mm] 13.862	[%] 0.038971	-392.63E-6	214.38E-6	[m] -	[m] 35031.	0 (Negligible)
Structure: U Sub-structure:										
[m] 0.0	[%] 149.63E-6	[%] 0.0060640	100.19E-6	[mm] 13.081	[%] 0.0061793	-61.257E-6	100.19E-6	[m] -	[m] 199850.	0 (Negligible)
Structure: V Sub-structure:										
[m] 0.0	[%] 0.0015019	[%] 0.041088	-264.90E-6	[mm] 13.600	[%] 0.042567	-428.55E-6	-264.90E-6	[m] -	[m] 29484.	0 (Negligible)
Structure: W Sub-structure:										
[m] 0.0	[%] 0.0014061	[%] 0.041142	-138.97E-6	[mm] 14.068	[%] 0.042911	-440.35E-6	-138.97E-6	[m] -	[m] 38802.	0 (Negligible)

Specific Building Damage Results - Critical Segments within Each Structure

Structure Name	Parameter	Critical Sub-Structure	Critical Segment	Start	End	Curvature	Max Slope	Max Settlement	Max Tensile Strain	Min Radius of Curvature (Hogging)	Min Radius of Curvature (Sagging)	Damage Category
A				[m]	[m]			[mm]	[%]	[m]	[m]	
	Max Slope		1	0.0	7.4650	Sagging	299.88E-6	10.326	0.015475	-	41306.0	0 (Negligible)
	Max Settlement		1	0.0	7.4650	Sagging	299.88E-6	10.326	0.015475	-	41306.0	0 (Negligible)
	Max Tensile Strain		1	0.0	7.4650	Sagging	299.88E-6	10.326	0.015475	-	41306.0	0 (Negligible)
	Min Radius of Curvature (Hogging)		-	-	-	-	-	-	-	-	-	-
B	Min Radius of Curvature (Sagging)		1	0.0	7.4650	Sagging	299.88E-6	10.326	0.015475	-	41306.0	0 (Negligible)
	Max Slope		2	3.9889	8.8042	Sagging	404.89E-6	13.043	0.029668	-	9864.0	0 (Negligible)
	Max Settlement		2	3.9889	8.8042	Sagging	404.89E-6	13.043	0.029668	-	9864.0	0 (Negligible)
	Max Tensile Strain		1	0.0	3.9889	Hogging	153.96E-6	12.462	0.046047	87160.	-	0 (Negligible)
	Min Radius of Curvature (Hogging)		3	8.8042	13.024	Hogging	404.89E-6	12.493	0.025400	11675.	-	0 (Negligible)
C	Min Radius of Curvature (Sagging)		2	3.9889	8.8042	Sagging	404.89E-6	13.043	0.029668	-	9864.0	0 (Negligible)
	Max Slope		1	0.0	8.4020	Sagging	236.56E-6	13.558	0.051997	-	42630.1	1 (Very Slight)
	Max Settlement		1	0.0	8.4020	Sagging	236.56E-6	13.558	0.051997	-	42630.1	1 (Very Slight)
	Max Tensile Strain		1	0.0	8.4020	Sagging	236.56E-6	13.558	0.051997	-	42630.1	1 (Very Slight)



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Structure Name	Parameter	Critical Sub-Structure	Critical Segment	Start	End	Curvature	Max Slope	Max Settlement	Max Tensile Strain	Min Radius of Curvature (Hogging)	Min Radius of Curvature (Sagging)	Damage Category
	Strain			-	-	-	-	-	-	-	-	
	Min Radius of Curvature (Hogging)			-	-	-	-	-	-	-	-	
	Min Radius of Curvature (Sagging)			1	0.0	8.4020	Sagging	236.56E-6	13.558	0.051997	-	42630.1 (Very Slight)
D	Max Slope			1	0.0	11.078	Sagging	0.0021099	12.218	0.014698	-	3515.8 0 (Negligible)
	Max Settlement			1	0.0	11.078	Sagging	0.0021099	12.218	0.014698	-	3515.8 0 (Negligible)
	Max Tensile Strain			2	11.078	15.848	Hogging	0.0021099	9.8621	0.023443	4295.1	- 0 (Negligible)
	Min Radius of Curvature (Hogging)			2	11.078	15.848	Hogging	0.0021099	9.8621	0.023443	4295.1	- 0 (Negligible)
	Min Radius of Curvature (Sagging)			1	0.0	11.078	Sagging	0.0021099	12.218	0.014698	-	3515.8 0 (Negligible)
E	Max Slope			2	5.2503	21.096	Sagging	299.06E-6	5.9592	0.012636	-	37417.0 0 (Negligible)
	Max Settlement			1	0.0	5.2503	Hogging	70.259E-6	6.1388	0.0049676	33399.	- 0 (Negligible)
	Max Tensile Strain			5	27.696	32.812	Hogging	289.58E-6	1.6541	0.013586	216940.	- 0 (Negligible)
	Min Radius of Curvature (Hogging)			1	0.0	5.2503	Hogging	70.259E-6	6.1388	0.0049676	33399.	- 0 (Negligible)
	Min Radius of Curvature (Sagging)			2	5.2503	21.096	Sagging	299.06E-6	5.9592	0.012636	-	37417.0 0 (Negligible)
F	Max Slope			2	4.0869	13.541	Hogging	153.63E-6	6.9525	520.38E-6	313260.	- 0 (Negligible)
	Max Settlement			2	4.0869	13.541	Hogging	153.63E-6	6.9525	520.38E-6	313260.	- 0 (Negligible)
	Max Tensile Strain			1	0.0	4.0869	Sagging	139.43E-6	5.5851	0.0053044	-	297260.0 0 (Negligible)
	Min Radius of Curvature (Hogging)			2	4.0869	13.541	Hogging	153.63E-6	6.9525	520.38E-6	313260.	- 0 (Negligible)
	Min Radius of Curvature (Sagging)			1	0.0	4.0869	Sagging	139.43E-6	5.5851	0.0053044	-	297260.0 0 (Negligible)
G	Max Slope			1	0.0	11.480	Sagging	330.85E-6	6.9526	0.0099161	-	33185.0 0 (Negligible)
	Max Settlement			1	0.0	11.480	Sagging	330.85E-6	6.9526	0.0099161	-	33185.0 0 (Negligible)
	Max Tensile Strain			1	0.0	11.480	Sagging	330.85E-6	6.9526	0.0099161	-	33185.0 0 (Negligible)
	Min Radius of Curvature (Hogging)			-	-	-	-	-	-	-	-	-
	Min Radius of Curvature (Sagging)			1	0.0	11.480	Sagging	330.85E-6	6.9526	0.0099161	-	33185.0 0 (Negligible)
H	Max Slope			2	2.0492	6.5306	Hogging	0.0014872	8.8055	0.017492	5675.6	- 0 (Negligible)
	Max Settlement			4	11.315	13.200	Hogging	5.8582E-6	10.344	6.8307E-6	9.5567E+9	- 0 (Negligible)
	Max Tensile Strain			3	6.5306	11.315	Sagging	0.0014872	10.333	0.023650	-	4895.5 0 (Negligible)
	Min Radius of Curvature (Hogging)			2	2.0492	6.5306	Hogging	0.0014872	8.8055	0.017492	5675.6	- 0 (Negligible)
	Min Radius of Curvature (Sagging)			3	6.5306	11.315	Sagging	0.0014872	10.333	0.023650	-	4895.5 0 (Negligible)
I	Max Slope			4	6.5336	10.495	Hogging	56.070E-6	10.583	0.0011225	216100.	- 0 (Negligible)
	Max Settlement			5	10.495	22.939	Sagging	56.070E-6	10.781	559.72E-6	-	175980.0 0 (Negligible)
	Max Tensile Strain			3	4.4753	6.5336	Hogging	26.907E-6	10.489	0.0067439	776680.	- 0 (Negligible)
	Min Radius of Curvature (Hogging)			4	6.5336	10.495	Hogging	56.070E-6	10.583	0.0011225	216100.	- 0 (Negligible)
	Min Radius of Curvature (Sagging)			5	10.495	22.939	Sagging	56.070E-6	10.781	559.72E-6	-	175980.0 0 (Negligible)
J	Max Slope			1	0.0	10.183	Sagging	489.27E-6	10.781	0.038608	-	37428.0 0 (Negligible)
	Max Settlement			1	0.0	10.183	Sagging	489.27E-6	10.781	0.038608	-	37428.0 0 (Negligible)
	Max Tensile Strain			1	0.0	10.183	Sagging	489.27E-6	10.781	0.038608	-	37428.0 0 (Negligible)
	Min Radius of Curvature (Hogging)			-	-	-	-	-	-	-	-	-
	Min Radius of Curvature (Sagging)			1	0.0	10.183	Sagging	489.27E-6	10.781	0.038608	-	37428.0 0 (Negligible)
K	Max Slope			1	0.0	15.764	Hogging	363.95E-6	5.2291	0.016780	107680.	- 0 (Negligible)
	Max Settlement			2	15.764	25.598	Sagging	362.59E-6	8.0035	0.0096211	-	31292.0 0 (Negligible)
	Max Tensile Strain			1	0.0	15.764	Hogging	363.95E-6	5.2291	0.016780	107680.	- 0 (Negligible)
	Min Radius of Curvature (Hogging)			1	0.0	15.764	Hogging	363.95E-6	5.2291	0.016780	107680.	- 0 (Negligible)
	Min Radius of Curvature (Sagging)			2	15.764	25.598	Sagging	362.59E-6	8.0035	0.0096211	-	31292.0 0 (Negligible)
L	Max Slope			1	0.0	12.800	Sagging	254.88E-6	8.0036	0.0052719	-	106060.0 0 (Negligible)
	Max Settlement			1	0.0	12.800	Sagging	254.88E-6	8.0036	0.0052719	-	106060.0 0 (Negligible)
	Max Tensile Strain			1	0.0	12.800	Sagging	254.88E-6	8.0036	0.0052719	-	106060.0 0 (Negligible)
	Min Radius of Curvature (Hogging)			-	-	-	-	-	-	-	-	-
	Min Radius of Curvature (Sagging)			1	0.0	12.800	Sagging	254.88E-6	8.0036	0.0052719	-	106060.0 0 (Negligible)
M	Max Slope			2	25.054	42.296	Sagging	0.0011808	11.822	0.028306	-	1109.7 0 (Negligible)
	Max Settlement			2	25.054	42.296	Sagging	0.0011808	11.822	0.028306	-	1109.7 0 (Negligible)
	Max Tensile Strain			1	3.8451	25.054	Hogging	468.98E-6	6.5130	0.034903	18592.	- 0 (Negligible)
	Min Radius of Curvature (Hogging)			1	3.8451	25.054	Hogging	468.98E-6	6.5130	0.034903	18592.	- 0 (Negligible)
	Min Radius of Curvature (Sagging)			2	25.054	42.296	Sagging	0.0011808	11.822	0.028306	-	1109.7 0 (Negligible)
N	Max Slope			2	7.4822	12.347	Sagging	0.0017776	13.374	0.030678	-	3766.5 0 (Negligible)
	Max Settlement			1	0.0	7.4822	Hogging	0.0	13.378	1.8239E-6	49.351E+6	- 0 (Negligible)
	Max Tensile Strain			2	7.4822	12.347	Sagging	0.0017776	13.374	0.030678	-	3766.5 0 (Negligible)
	Min Radius of Curvature (Hogging)			3	12.347	15.807	Hogging	0.0017776	11.373	0.021614	5170.6	- 0 (Negligible)
	Min Radius of Curvature (Sagging)			2	7.4822	12.347	Sagging	0.0017776	13.374	0.030678	-	3766.5 0 (Negligible)
O	Max Slope			2	7.3103	23.414	Sagging	363.56E-6	8.2137	0.023995	-	38047.0 0 (Negligible)
	Max Settlement			1	0.0	7.3103	Hogging	224.97E-6	9.1839	0.019477	19963.	- 0 (Negligible)
	Max Tensile Strain			2	7.3103	23.414	Sagging	363.56E-6	8.2137	0.023995	-	38047.0 0 (Negligible)
	Min Radius of Curvature (Hogging)			3	23.414	40.320	Hogging	363.56E-6	4.7268	0.017518	18248.	- 0 (Negligible)
	Min Radius of Curvature (Sagging)			2	7.3103	23.414	Sagging	363.56E-6	8.2137	0.023995	-	38047.0 0 (Negligible)



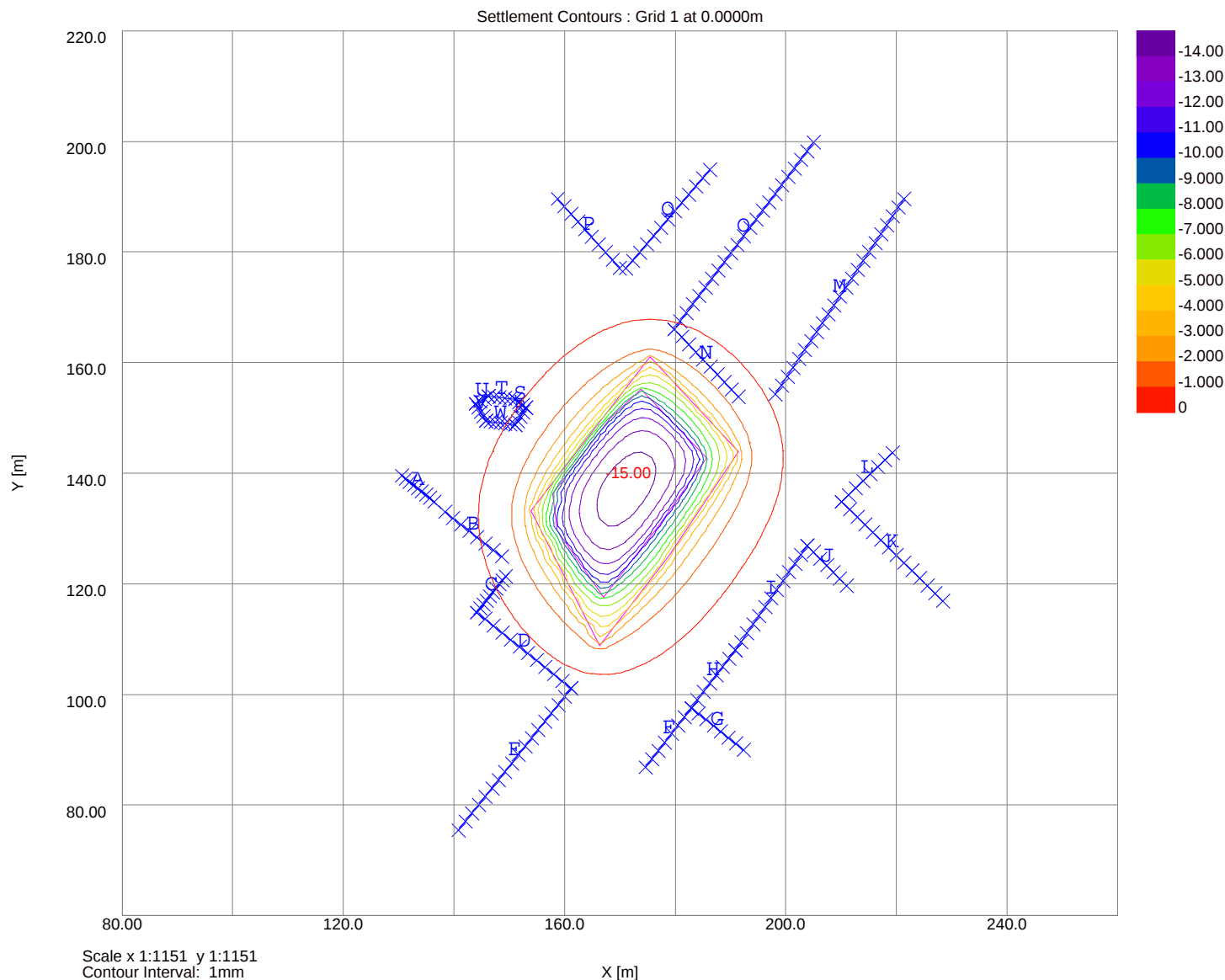
GEA LIMITED
(GEOTECHNICAL & ENV ASSOC)

135 Shaftsbury Avenue, London WC2H 8AH
Wall installation and excavation combined

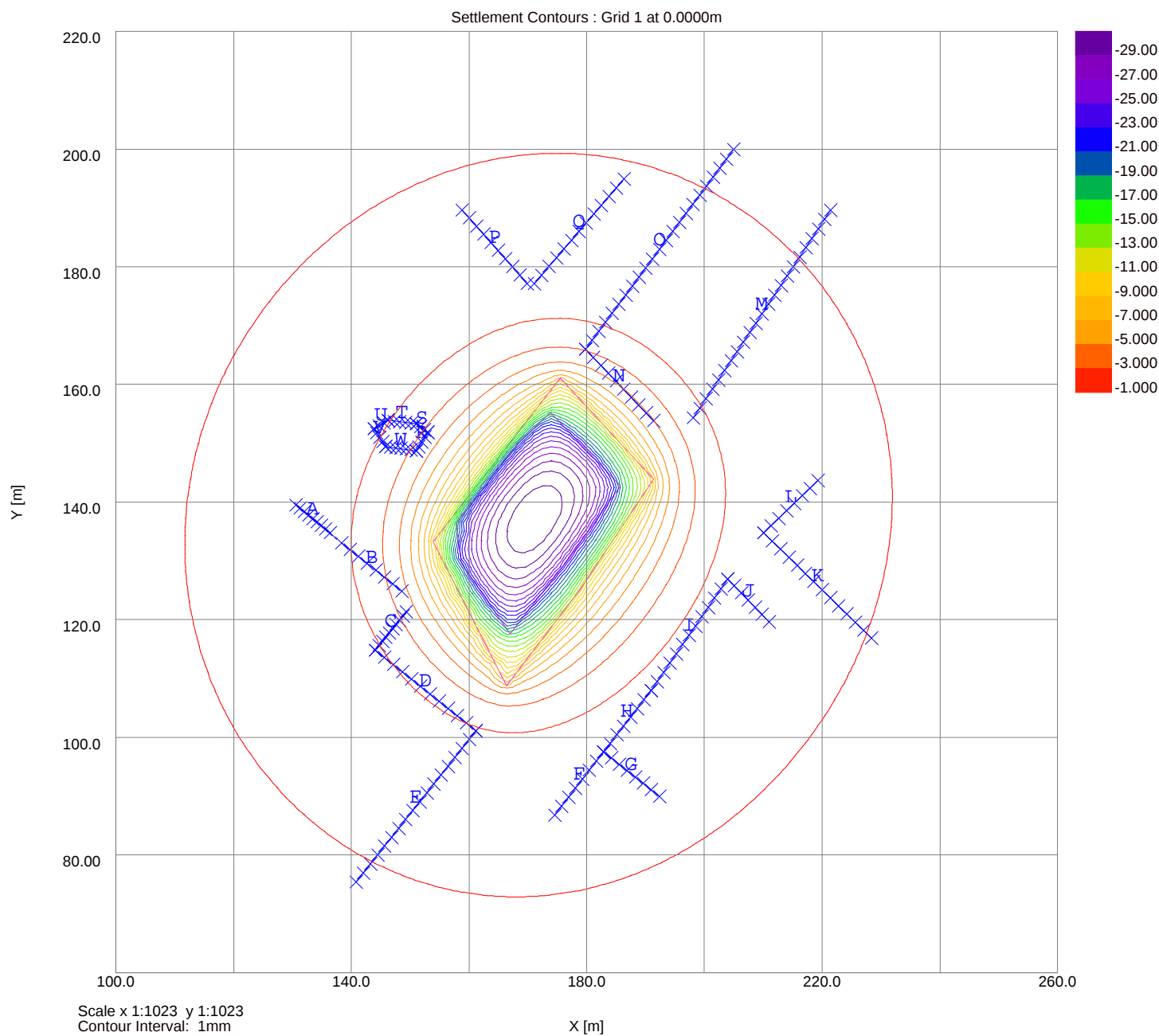
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Structure Name	Parameter	Critical Sub-Structure	Critical Segment	Start	End	Curvature	Max Slope	Max Settlement	Max Tensile Strain	Min Radius of Curvature (Hogging)	Min Radius of Curvature (Sagging)	Damage Category
P	Max Slope		1	0.0	2.1709	Hogging	343.33E-6	4.7607	0.011514	126800.	- 0 (Negligible)	
	Max Settlement		2	2.1709	16.717	Sagging	343.33E-6	7.6937	0.011093	-	32084. 0 (Negligible)	
	Max Tensile Strain		1	0.0	2.1709	Hogging	343.33E-6	4.7607	0.011514	126800.	- 0 (Negligible)	
	Min Radius of Curvature (Hogging)		1	0.0	2.1709	Hogging	343.33E-6	4.7607	0.011514	126800.	- 0 (Negligible)	
	Min Radius of Curvature (Sagging)		2	2.1709	16.717	Sagging	343.33E-6	7.6937	0.011093	-	32084. 0 (Negligible)	
Q	Max Slope		2	5.7407	18.213	Sagging	300.17E-6	6.7934	0.0095783	-	46481. 0 (Negligible)	
	Max Settlement		1	0.0	5.7407	Hogging	135.06E-6	7.5547	0.010479	318710.	- 0 (Negligible)	
	Max Tensile Strain		1	0.0	5.7407	Hogging	135.06E-6	7.5547	0.010479	318710.	- 0 (Negligible)	
	Min Radius of Curvature (Hogging)		3	18.213	23.406	Hogging	300.17E-6	4.1218	996.67E-6	125670.	- 0 (Negligible)	
	Min Radius of Curvature (Sagging)		2	5.7407	18.213	Sagging	300.17E-6	6.7934	0.0095783	-	46481. 0 (Negligible)	
R	Max Slope		1	0.0	3.7730	Sagging	2.9149E-6	14.068	503.58E-6	-	6.4904E+6 0 (Negligible)	
	Max Settlement		1	0.0	3.7730	Sagging	2.9149E-6	14.068	503.58E-6	-	6.4904E+6 0 (Negligible)	
	Max Tensile Strain		1	0.0	3.7730	Sagging	2.9149E-6	14.068	503.58E-6	-	6.4904E+6 0 (Negligible)	
	Min Radius of Curvature (Hogging)		-	-	-	-	-	-	-	-	-	
	Min Radius of Curvature (Sagging)		1	0.0	3.7730	Sagging	2.9149E-6	14.068	503.58E-6	-	6.4904E+6 0 (Negligible)	
S	Max Slope		1	0.0	2.4410	Sagging	101.53E-6	14.057	0.056200	-	34913. 1 (Very Slight)	
	Max Settlement		1	0.0	2.4410	Sagging	101.53E-6	14.057	0.056200	-	34913. 1 (Very Slight)	
	Max Tensile Strain		1	0.0	2.4410	Sagging	101.53E-6	14.057	0.056200	-	34913. 1 (Very Slight)	
	Min Radius of Curvature (Hogging)		-	-	-	-	-	-	-	-	-	
	Min Radius of Curvature (Sagging)		1	0.0	2.4410	Sagging	101.53E-6	14.057	0.056200	-	34913. 1 (Very Slight)	
T	Max Slope		1	0.0	4.8370	Sagging	214.38E-6	13.862	0.038971	-	35031. 0 (Negligible)	
	Max Settlement		1	0.0	4.8370	Sagging	214.38E-6	13.862	0.038971	-	35031. 0 (Negligible)	
	Max Tensile Strain		1	0.0	4.8370	Sagging	214.38E-6	13.862	0.038971	-	35031. 0 (Negligible)	
	Min Radius of Curvature (Hogging)		-	-	-	-	-	-	-	-	-	
	Min Radius of Curvature (Sagging)		1	0.0	4.8370	Sagging	214.38E-6	13.862	0.038971	-	35031. 0 (Negligible)	
U	Max Slope		1	0.0	2.6920	Sagging	108.19E-6	13.081	0.0061793	-	199850. 0 (Negligible)	
	Max Settlement		1	0.0	2.6920	Sagging	108.19E-6	13.081	0.0061793	-	199850. 0 (Negligible)	
	Max Tensile Strain		1	0.0	2.6920	Sagging	108.19E-6	13.081	0.0061793	-	199850. 0 (Negligible)	
	Min Radius of Curvature (Hogging)		-	-	-	-	-	-	-	-	-	
	Min Radius of Curvature (Sagging)		1	0.0	2.6920	Sagging	108.19E-6	13.081	0.0061793	-	199850. 0 (Negligible)	
V	Max Slope		1	0.0	3.6350	Sagging	264.90E-6	13.600	0.042567	-	29484. 0 (Negligible)	
	Max Settlement		1	0.0	3.6350	Sagging	264.90E-6	13.600	0.042567	-	29484. 0 (Negligible)	
	Max Tensile Strain		1	0.0	3.6350	Sagging	264.90E-6	13.600	0.042567	-	29484. 0 (Negligible)	
	Min Radius of Curvature (Hogging)		-	-	-	-	-	-	-	-	-	
	Min Radius of Curvature (Sagging)		1	0.0	3.6350	Sagging	264.90E-6	13.600	0.042567	-	29484. 0 (Negligible)	
W	Max Slope		1	0.0	5.2460	Sagging	138.97E-6	14.068	0.042911	-	38802. 0 (Negligible)	
	Max Settlement		1	0.0	5.2460	Sagging	138.97E-6	14.068	0.042911	-	38802. 0 (Negligible)	
	Max Tensile Strain		1	0.0	5.2460	Sagging	138.97E-6	14.068	0.042911	-	38802. 0 (Negligible)	
	Min Radius of Curvature (Hogging)		-	-	-	-	-	-	-	-	-	
	Min Radius of Curvature (Sagging)		1	0.0	5.2460	Sagging	138.97E-6	14.068	0.042911	-	38802. 0 (Negligible)	

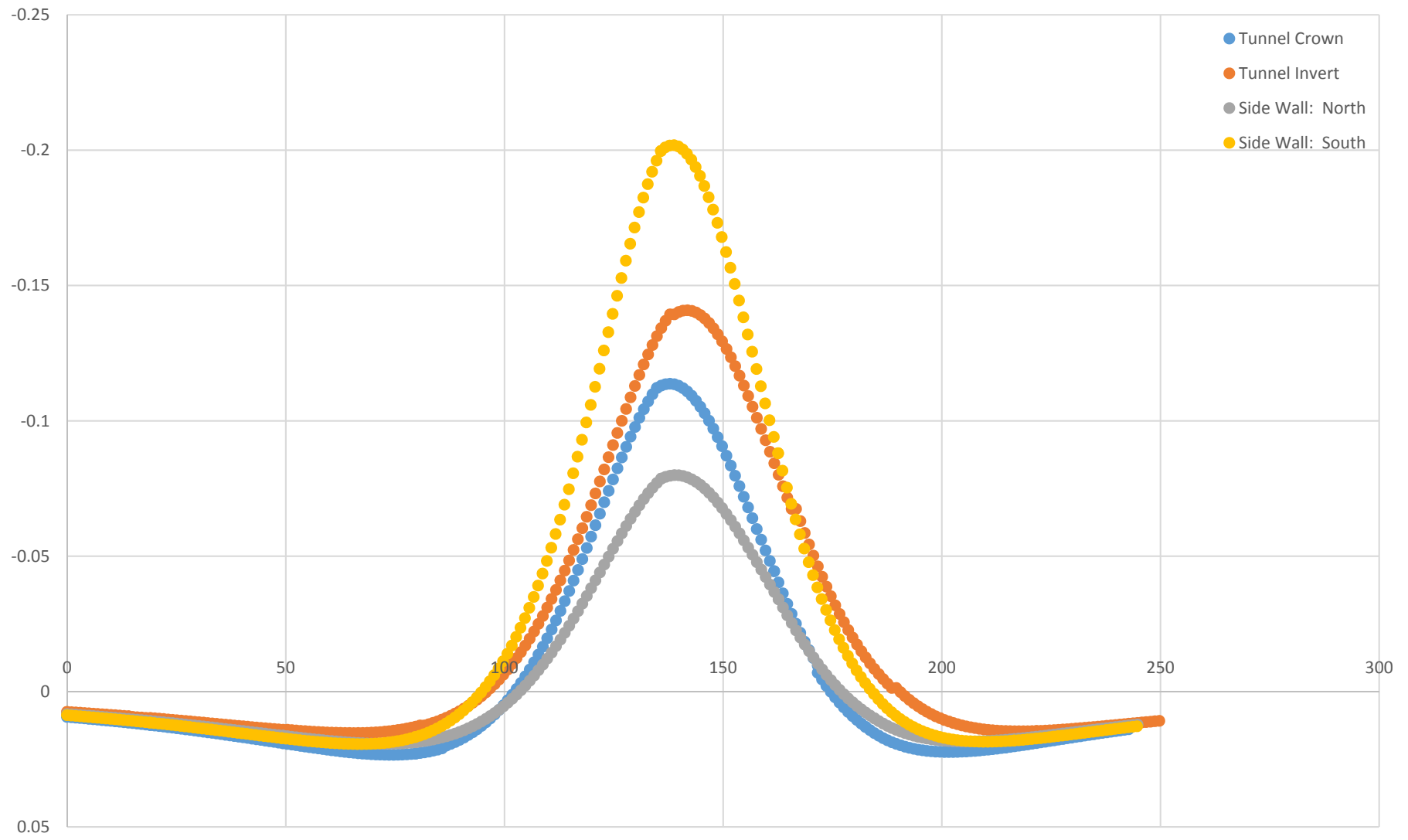
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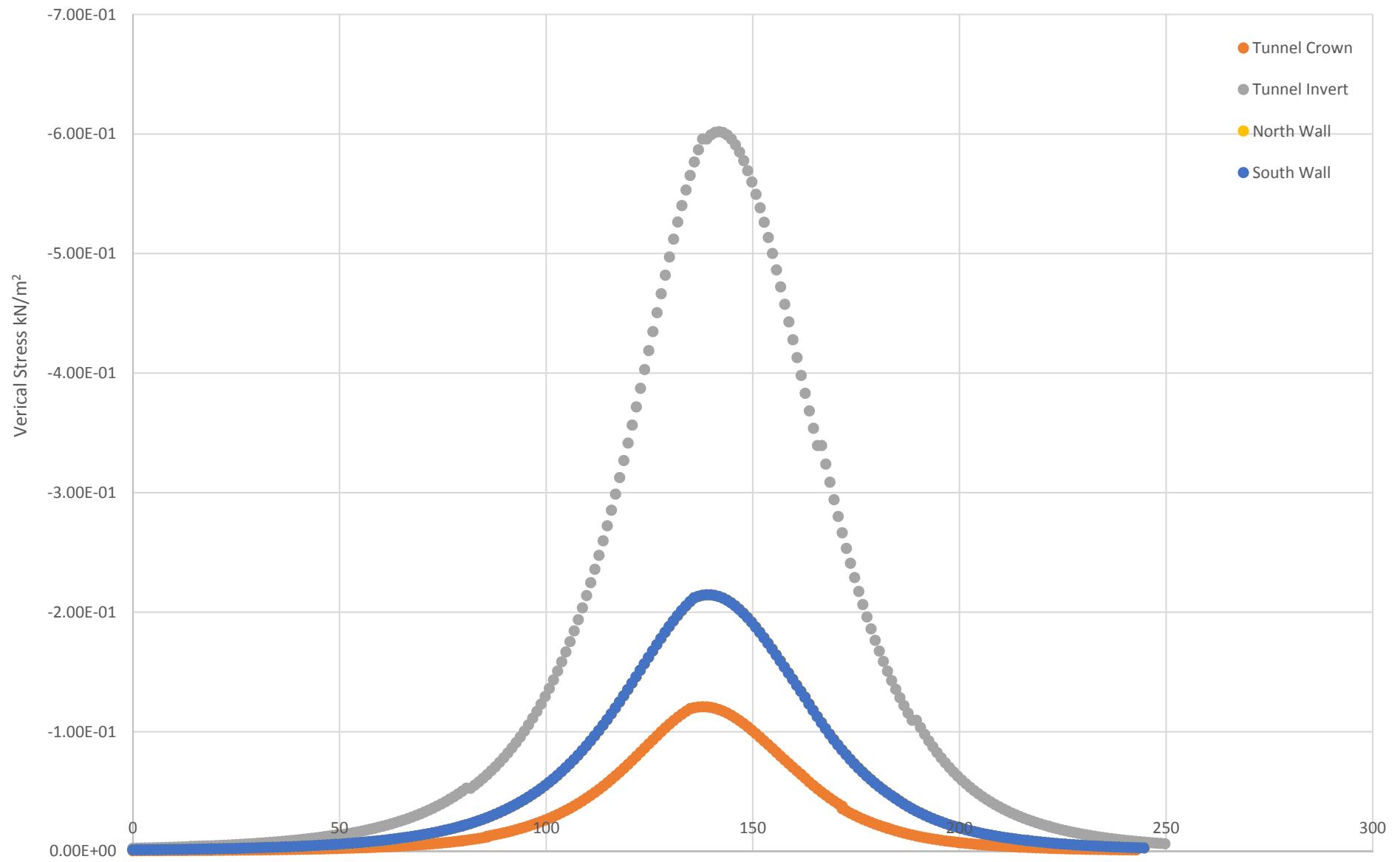
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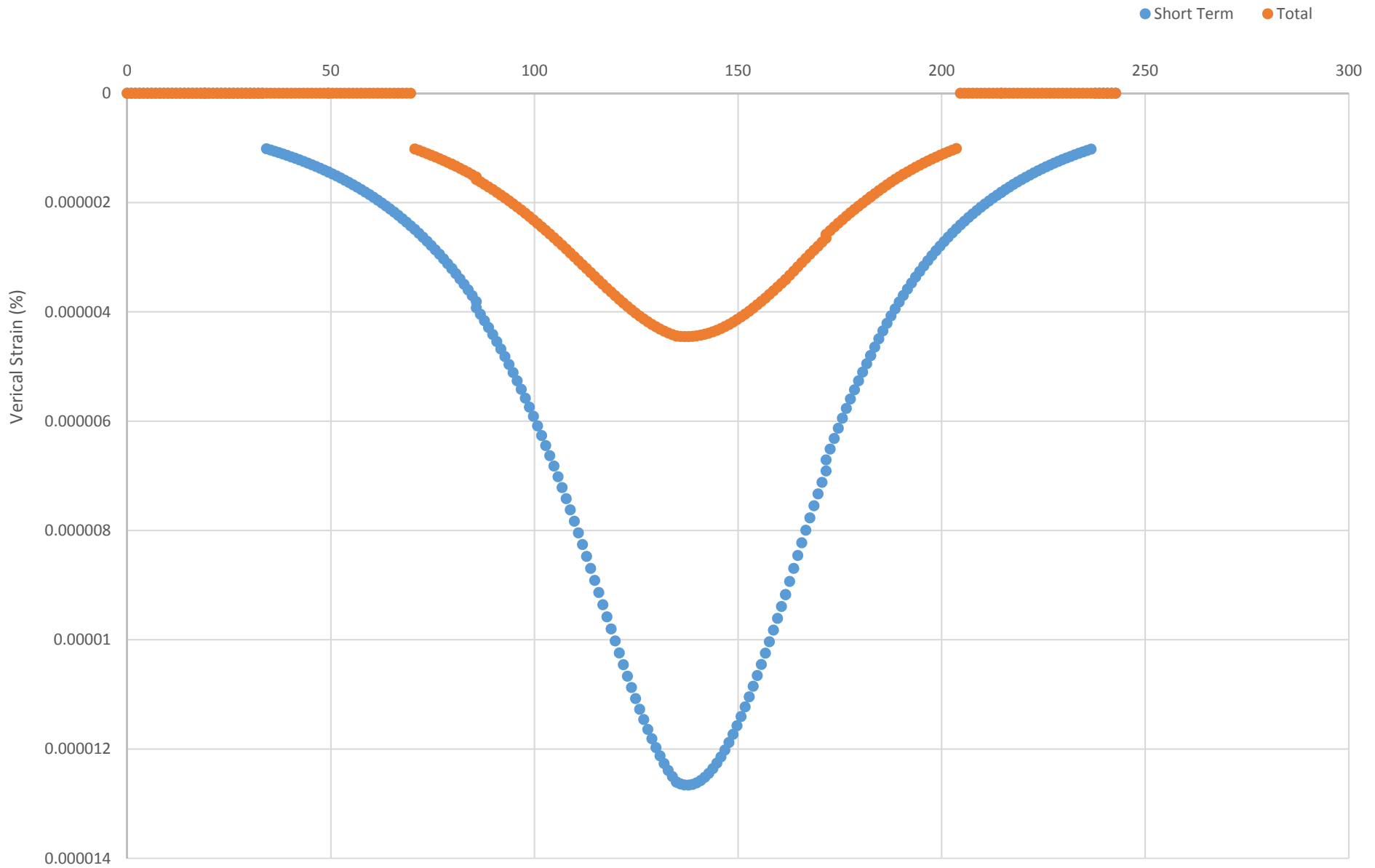
Displacement across tunnel



Vertical Stress



Vertical Strain at tunnel crown



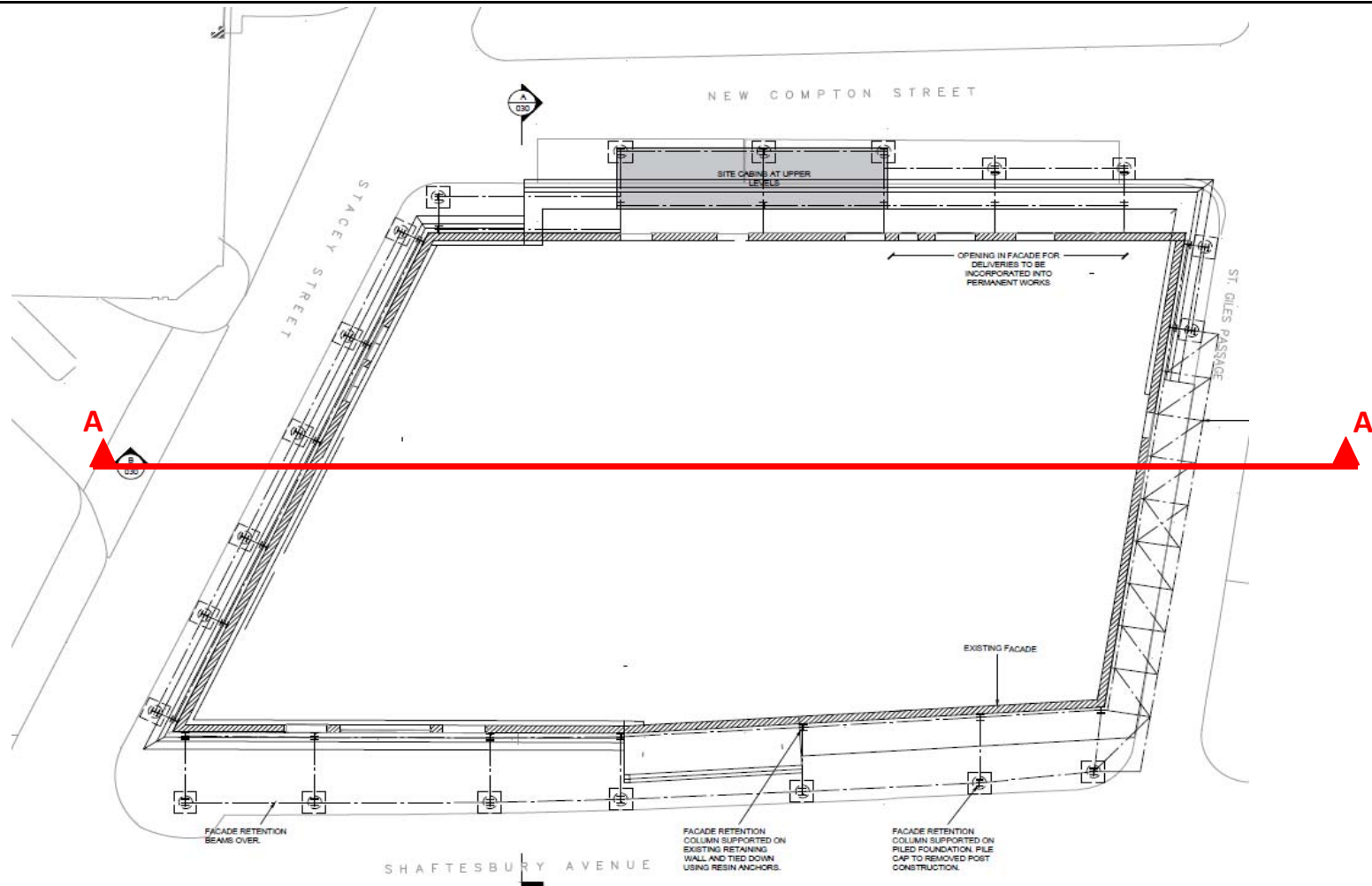
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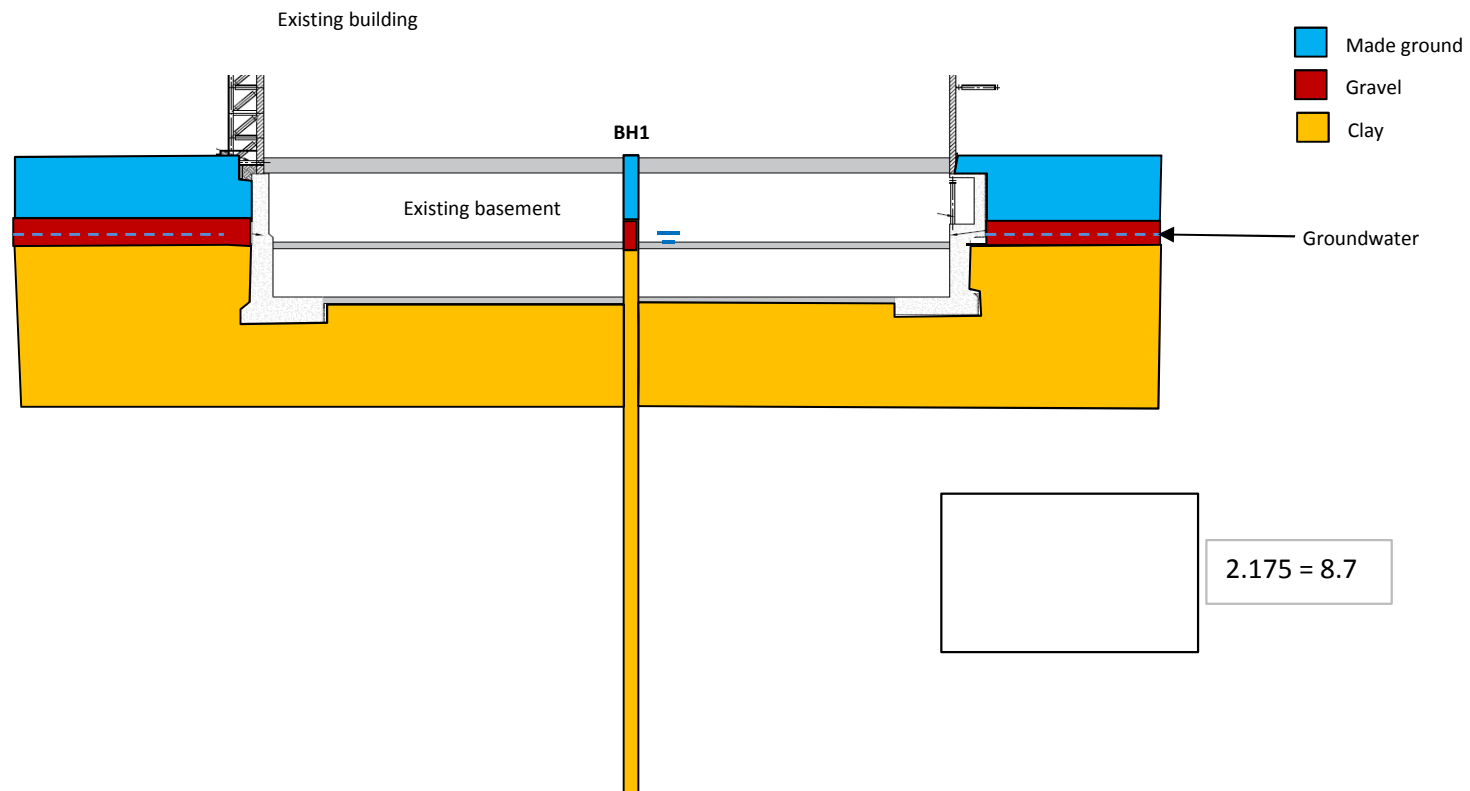
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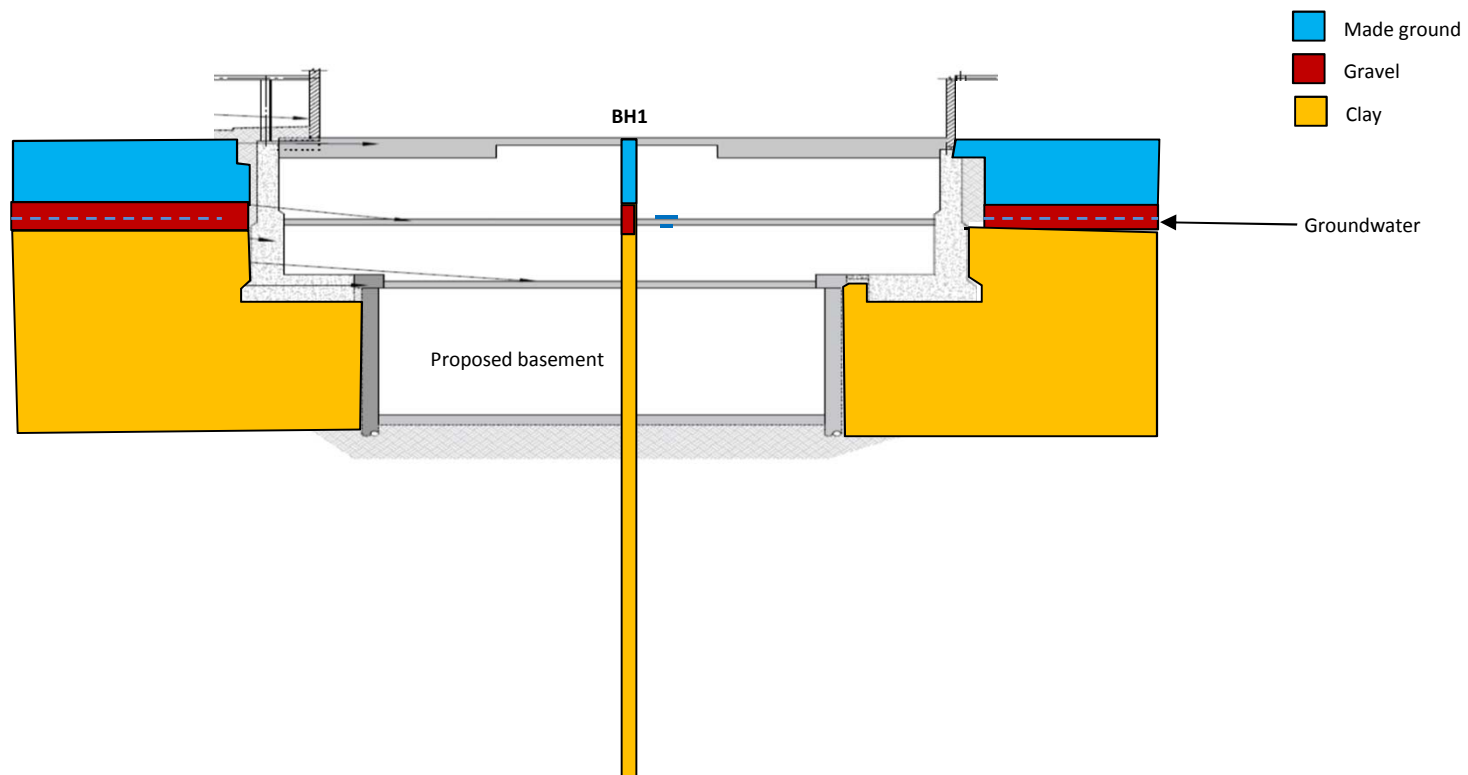
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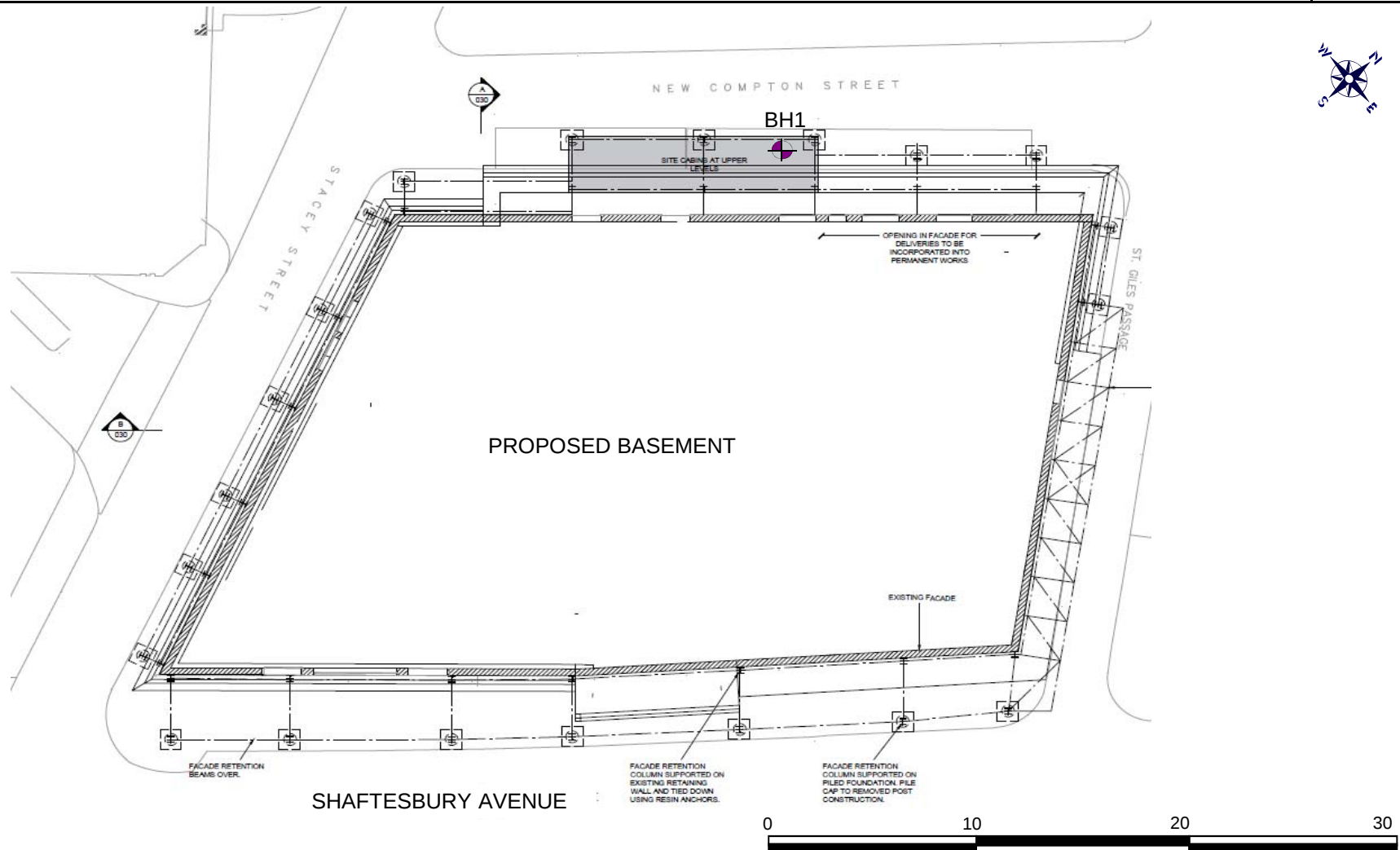
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Geotechnical & Environmental Associates
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