

Site Analytical Services Ltd.

Site 28 CANFIELD GARDENS,LONDON,NW6 3LA	Borehole Number BH1
Client MARTIN REDSTON	Job Number 1625536
Engineer	Sheet 1/1

Installation Type Single Installation	Dimensions Internal Diameter of Tube [A] = 50 mm Diameter of Filter Zone = 100 mm
Location TQ260845	Ground Level (mOD)

Legend	Water	Instr (A)	Level (mOD)	Depth (m)	Description	Groundwater Strikes During Drilling														
						Date	Time	Depth Struck (m)	Casing Depth (m)	Inflow Rate	Readings				Depth Sealed (m)					
				1.00	Bentonite Seal															
Groundwater Observations During Drilling																				
				8.00	Slotted Standpipe	Date	Start of Shift				End of Shift									
							Time	Depth Hole (m)	Casing Depth (m)	Water Depth (m)	Water Level (mOD)	Time	Depth Hole (m)	Casing Depth (m)	Water Depth (m)	Water Level (mOD)				
Instrument Groundwater Observations																				
Inst. [A] Type : Slotted Standpipe																				
				9.00	Bentonite Seal	Date	Instrument [A]			Remarks										
							Time	Depth (m)	Level (mOD)											
				15.00	General Backfill															

Remarks
Lockable cover set in cement

Site Analytical Services Ltd.

Site 28 CANFIELD GARDENS,LONDON,NW6 3LA	Borehole Number BH2
Client MARTIN REDSTON	Job Number 1625536
Engineer	Sheet 1/1

Installation Type Single Installation	Dimensions Internal Diameter of Tube [A] = 50 mm Diameter of Filter Zone = 100 mm
Location TQ260845	Ground Level (mOD)

Legend	Water	Instr (A)	Level (mOD)	Depth (m)	Description	Groundwater Strikes During Drilling														
						Date	Time	Depth Struck (m)	Casing Depth (m)	Inflow Rate	Readings				Depth Sealed (m)					
				1.00	Bentonite Seal															
Groundwater Observations During Drilling																				
					Slotted Standpipe	Date		Start of Shift				End of Shift								
						Time	Depth Hole (m)	Casing Depth (m)	Water Depth (m)	Water Level (mOD)	Time	Depth Hole (m)	Casing Depth (m)	Water Depth (m)	Water Level (mOD)					
Instrument Groundwater Observations																				
Inst. [A] Type : Slotted Standpipe																				
				8.50	Bentonite Seal	Date			Instrument [A]			Remarks								
				9.50	General Backfill	Time	Depth (m)	Level (mOD)												
				10.00																

Remarks
Lockable cover set in cement



**PLASTICITY INDEX &
MOISTURE CONTENT
DETERMINATIONS**

LOCATION 28 Canfield Gardens, London, NW6 3LA

BH/TP No.	Depth m	Natural Moisture %	Liquid Limit %	Plastic Limit %	Plasticity Index %	Passing 425 µm %	Class
BH1	3.50	30	65	24	41	100	CH
	4.00	31	64	22	42	100	CH
BH2	4.00	32	69	26	43	100	CH

Table 2

Appendix C – Martin Redston Associate Engineers Load Drawing

Martin Redston Associates

Consulting Civil & Structural Engineers

3 Edward Square, London N1 0SP
Tel: 020 7837 5377 Fax: 020 7837 3211

6 Hale Lane, London NW7 3NX
Tel: 020 8959 1666 Fax: 020 8906 8503

Email: martin@redston.org



Date 17/10/16,

Eng. PS

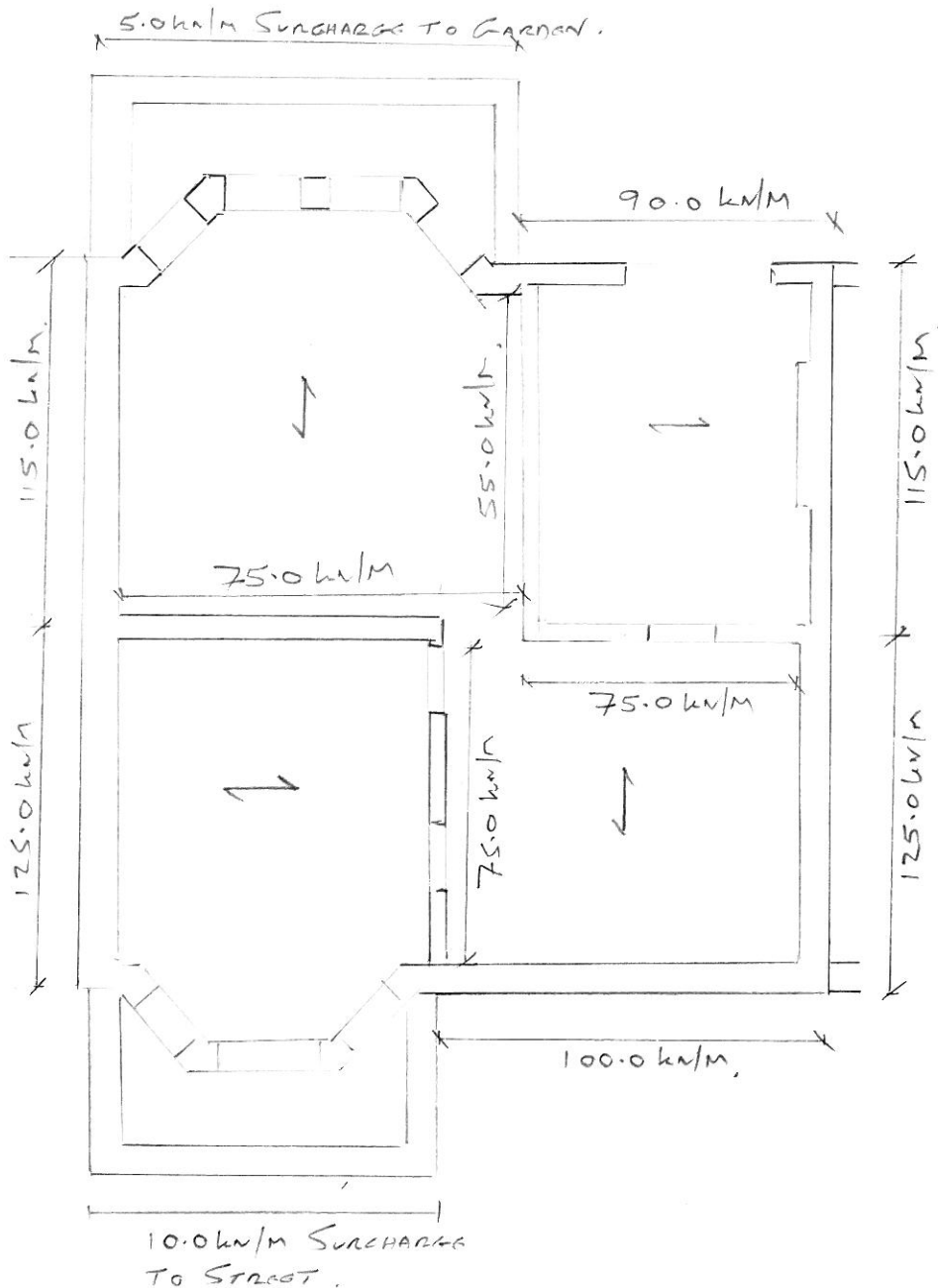
Job No. 16.440

Sheet No.

TL-01

28 CANFIELD GARDENS
NW6.

TEMPORARY CONDITION LINE LOADS



(FRONT, CANFIELD GDN)

PERMANENT CONDITION

WALL LOADS SPREAD INTO BASE SLAB TO GIVE AN AVERAGE LOAD OF APPROXIMATELY 95.0 kN/m^2 . (UNFACTORED)

Appendix D - Stage 1 – PDISP Undrained unloading heave movements

Job No.	Sheet No.	Rev.
117401		
Drg. Ref.		
Made by	Date	Checked
OC		

Analysis Options

Analysis: Boussinesq
Global Poisson's ratio: 0.50
Maximum allowable ratio between values of E: 1.5
Horizontal rigid boundary level: -15.00 [m OD]
Displacements at area centroids calculated.

Soil Profiles Soil Profile 1

Layer	Level at top	Number of intermediate displacement levels	Youngs Modulus	Poissons ratio	Non-linear curve
	[mOD]		Top [kN/m ²]	Btm [kN/m ²]	
1	0.0	6	5000.	5000.	0.5000 None
2	-2.400	10	23000.	43000.	0.5000 None
3	-7.400	16	43000.	43000.	0.5000 None

Soil Zones

Zone	Name	X coordinates min	X coordinates max	Y coordinates min	Y coordinates max	Profile
		[m]	[m]	[m]	[m]	
1	Soil Zone #	-4.897	20.01	-5.038	24.93	Soil Profile 1

Non-linear Curve Coordinates - Non-linear Curve 1

Point Strain Factor [%]

Load Data

Load ref.	Name	Shape	Orientation of Plane	Centre of load (Global)			Load position			Polygon Coordinates	Rectangle tolerance	Number of rectangles	Load value		
				X [m]	Y [m]	Z (level) [m]	Angle of local x from [Degrees]	Width x or Radius [m]	Length y [m]				Normal (local z) [kN/m ²]	Tangential (local x) [kN/m ²]	(local y) [kN/m ²]
1	Basement	Polygonal	Horizontal	N/A	N/A	-3.390	N/A	N/A	N/A	(3.07,12.5) (3.43,12.5) (4.36,13.8) (7.28,13.8) (8.22,12.5) (8.57,12.5) (8.57,2.7) (7.1,2.7) (6.3,1.6) (4.3,1.6) (3.43,2.7) (3.07,2.7)	10.00	5	-33.00	N/A	N/A
2	Front Lightwell	Polygonal	Horizontal	N/A	N/A	-3.390	N/A	N/A	N/A	(3.07,2.7) (3.43,2.7) (4.3,1.6) (6.3,1.6) (7.1,2.7) (7.57,2.7) (7.57,0.17) (3.07,0.17) (3.07,2.7)	10.00	7	-58.00	N/A	N/A
3	Rear Lightwell	Polygonal	Horizontal	N/A	N/A	-3.390	N/A	N/A	N/A	(3.07,15.2) (8.57,15.2) (8.57,12.5) (8.22,12.5) (7.28,13.8) (4.36,13.8) (3.43,12.5) (3.07,12.5) (3.07,15.2)	10.00	7	-58.00	N/A	N/A
4	Lower Ground	Polygonal	Horizontal	N/A	N/A	-2.480	N/A	N/A	N/A	(8.57,12.5) (12.5,12.5) (12.5,2.7) (8.57,2.7) (8.57,12.5)	10.00	1	-15.00	N/A	N/A

Polygonal Loads' Rectangles

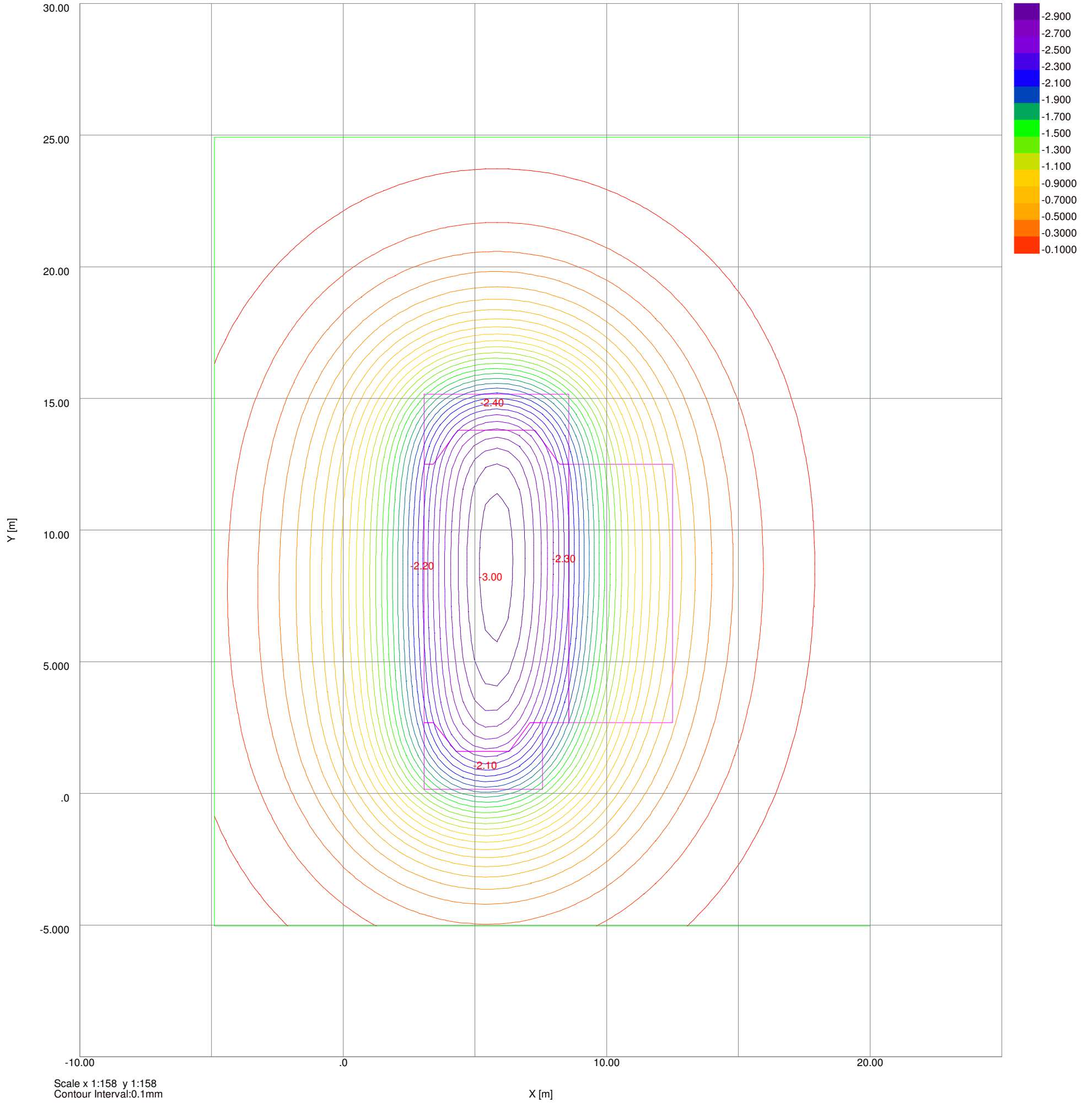
No.	Centre of load X	Centre of load Y	Angle of local x from global X [Degrees]	Width x [m]	Depth y [m]
Load 1 : Basement (Edge 2 optimal)					
1	5.820	7.600	-90.00	9.800	5.500
2	5.274	2.425	-90.00	0.5500	3.253
3	5.291	1.875	-90.00	0.5500	2.418
4	5.821	13.48	-90.00	0.6500	3.388
5	5.824	12.82	-90.00	0.6500	4.323
Load 2 : Front Lightwell (Edge 2 optimal)					
1	3.322	2.517	-90.00	0.3667	0.5050
2	3.467	2.150	-90.00	0.3667	0.7950
3	3.612	1.783	-90.00	0.3667	1.085
4	5.320	0.8850	-90.00	1.430	4.500
5	7.268	2.517	-90.00	0.3667	0.6033
6	7.135	2.150	-90.00	0.3667	0.8700
7	7.002	1.783	-90.00	0.3667	1.137
Load 3 : Rear Lightwell (Edge 2 optimal)					
1	5.820	14.48	-90.00	1.360	5.500
2	3.638	13.58	-90.00	0.4333	1.135
3	3.483	13.15	-90.00	0.4333	0.8250
4	3.328	12.72	-90.00	0.4333	0.5150
5	8.003	13.58	-90.00	0.4333	1.133
6	8.160	13.15	-90.00	0.4333	0.8200
7	8.317	12.72	-90.00	0.4333	0.5067
Load 4 : Lower Ground (Edge 2 optimal)					
1	10.53	7.600	-90.00	9.800	3.930

Displacement Data

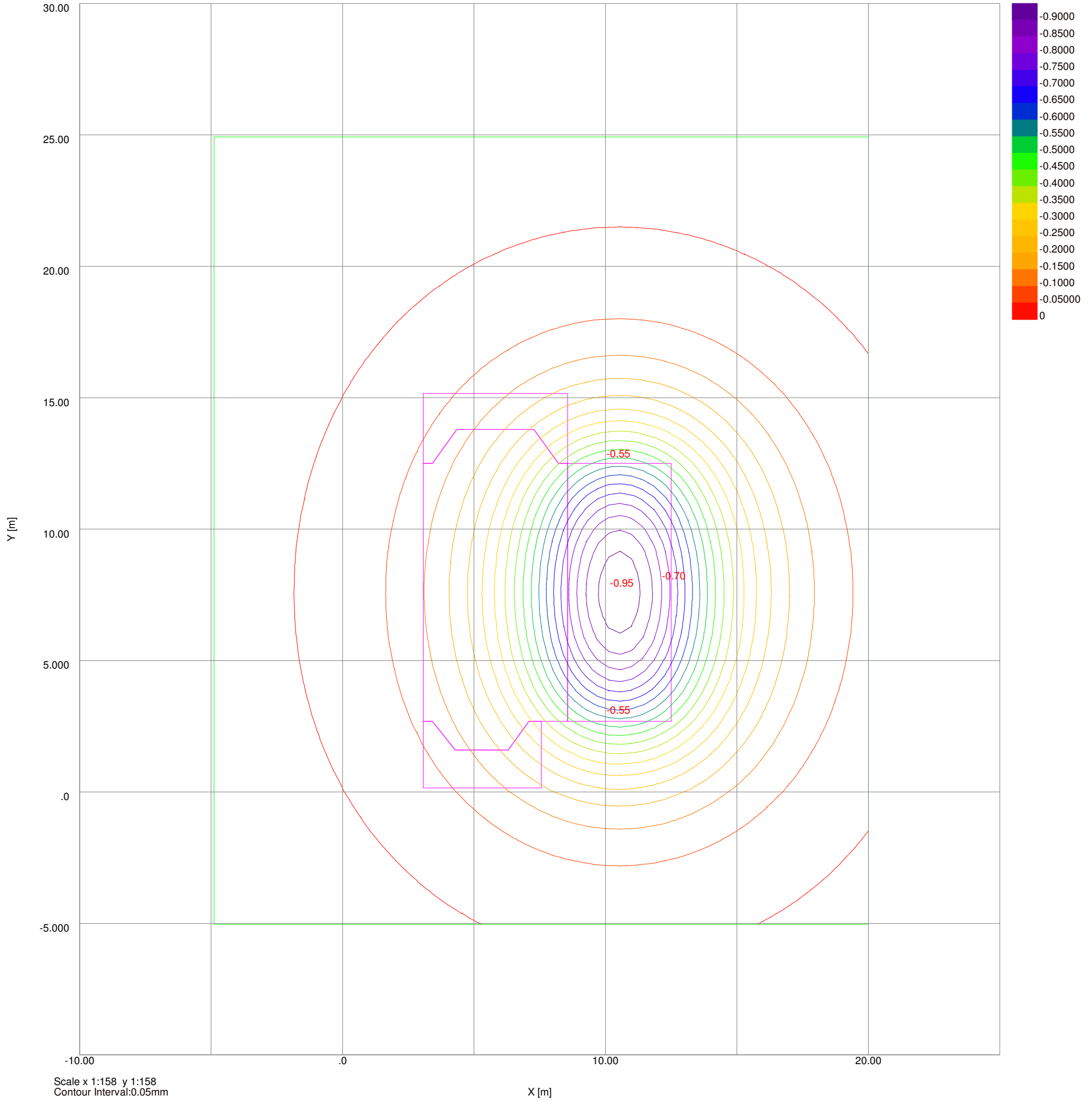
Ref.	Type	Name	Direction of Extrusion	Line/Line for extrusion			No. of intrvl across		Extrusion Depth [m]	No. of intrvl along extrusion	Calculate	Show Detailed results		
				First point X [m]	First point Y [m]	Z (level) [m]	Second point X [m]	Second point Y [m]					Z (level) [m]	extrusion/line
1	Grid	Basement	Global Y	-4.897	-5.038	-3.390	20.01	N/A	-3.390	58	29.97	74	Yes	No
2	Grid	Lower GF	Global Y	-4.897	-5.038	-2.480	20.01	N/A	-2.480	58	29.97	74	Yes	No

Job No.	Sheet No.	Rev.
117401		
Drg. Ref.		
Made by OC	Date	Checked

Settlement Contours : Grid 1 at -3.3900m



Settlement Contours : Grid 1 at -3.3900m



Appendix E- Stage 2 – PDISP Undrained reloading heave movements

Analysis Options

Analysis: Boussinesq
Global Poisson's ratio: 0.50
Maximum allowable ratio between values of E: 1.5
Horizontal rigid boundary level: -15.00 [m OD]
Displacements at area centroids calculated.

Soil Profiles Soil Profile 1

Layer	Level at top	Number of intermediate displacement levels	Youngs Modulus	Poissons ratio	Non-linear curve
			Top [kN/m ²]	Btm [kN/m ²]	
1	0.0	6	5000.	5000.	0.5000 None
2	-2.400	10	23000.	43000.	0.5000 None
3	-7.400	16	43000.	43000.	0.5000 None

Soil Zones

Zone	Name	X coordinates min	X coordinates max	Y coordinates min	Y coordinates max	Profile
1	Soil Zone #	-4.897	20.01	-5.038	24.93	Soil Profile 1

Non-linear Curve Coordinates - Non-linear Curve 1

Point Strain Factor [%]

Load Data

Load ref.	Name	Shape	Orientation of Plane	Centre of load (Global)		Z (level) [m]	Load position Angle of local x from	Width x or Radius [m]	Length y [m]	Polygon Coordinates [m]	Rectangle tolerance	Number of rectangles	Load value		
				X [m]	Y [m]								Normal (local z) [kN/m ²]	Tangential (local x) [kN/m ²]	(local y) [kN/m ²]
1	Basement	Polygonal	Horizontal	N/A	N/A	-3.390	N/A	N/A	N/A	(3.07,12.5) (3.43,12.5) (4.36,13.8) (7.28,13.8) (8.22,12.5) (8.57,12.5) (8.57,2.7) (7.1,2.7) (6.3,1.6) (4.3,1.6) (3.43,2.7) (3.07,2.7) (3.07,12.5)	10.00	5	-33.00	N/A	N/A
2	Front Lightwell	Polygonal	Horizontal	N/A	N/A	-3.390	N/A	N/A	N/A	(3.07,2.7) (3.43,2.7) (4.3,1.6) (6.3,1.6) (7.1,2.7) (7.57,2.7) (7.57,0.17) (3.07,0.17) (3.07,2.7)	10.00	7	-58.00	N/A	N/A
3	Rear Lighwell	Polygonal	Horizontal	N/A	N/A	-3.390	N/A	N/A	N/A	(3.07,15.2) (8.57,15.2) (8.57,12.5) (8.22,12.5) (7.28,13.8) (4.36,13.8) (3.43,12.5) (3.07,12.5) (3.07,15.2)	10.00	7	-58.00	N/A	N/A
4	Lower Ground	Polygonal	Horizontal	N/A	N/A	-2.480	N/A	N/A	N/A	(8.57,12.5) (12.5,12.5) (12.5,2.7) (8.57,2.7) (8.57,12.5)	10.00	1	-15.00	N/A	N/A
5	Basement	Polygonal	Horizontal	N/A	N/A	-3.390	N/A	N/A	N/A	(3.07,12.5) (3.43,12.5) (4.36,13.8) (7.28,13.8) (8.22,12.5) (8.57,12.5) (8.57,2.7) (7.1,2.7) (6.3,1.6) (4.3,1.6) (3.43,2.7) (3.07,2.7) (3.07,12.5)	10.00	5	95.00	N/A	N/A
6	Lower Ground	Polygonal	Horizontal	N/A	N/A	-2.480	N/A	N/A	N/A	(8.57,12.5) (12.5,12.5) (12.5,2.7) (8.57,2.7) (8.57,12.5)	10.00	1	95.00	N/A	N/A

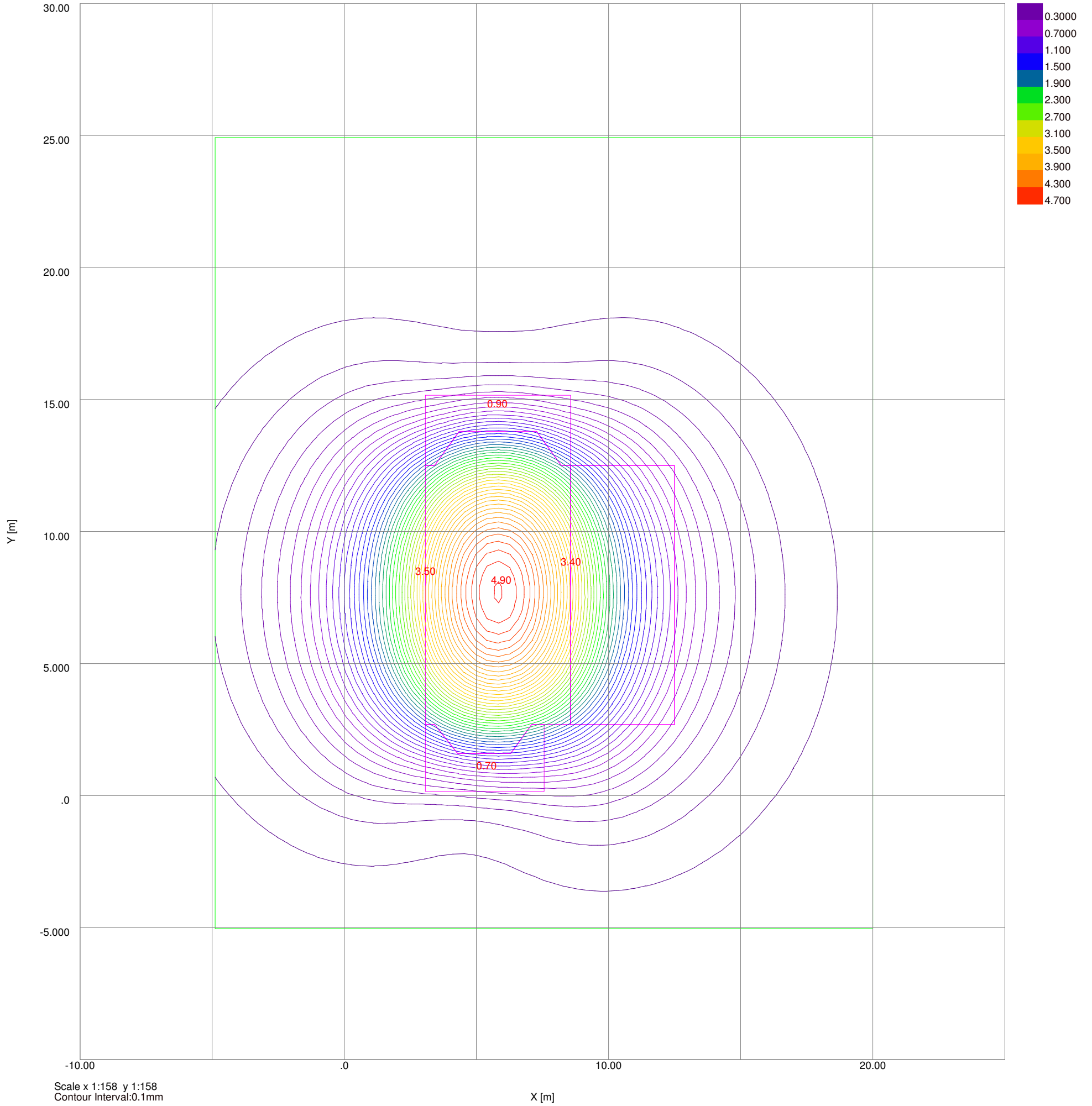
Polygonal Loads' Rectangles

No.	Centre of load X	Y	Angle of local x from global X [Degrees]	Width x [m]	Depth y [m]
Load 1 : Basement (Edge 2 optimal)					
1	5.820	7.600	-90.00	9.800	5.500
2	5.274	2.425	-90.00	0.5500	3.253
3	5.291	1.875	-90.00	0.5500	2.418
4	5.821	13.48	-90.00	0.6500	3.388
5	5.824	12.82	-90.00	0.6500	4.323
Load 2 : Front Lightwell (Edge 2 optimal)					
1	3.322	2.517	-90.00	0.3667	0.5050
2	3.467	2.150	-90.00	0.3667	0.7950
3	3.612	1.783	-90.00	0.3667	1.085
4	5.320	0.8850	-90.00	1.430	4.500
5	7.268	2.517	-90.00	0.3667	0.6033
6	7.135	2.150	-90.00	0.3667	0.8700
7	7.002	1.783	-90.00	0.3667	1.137
Load 3 : Rear Lighwell (Edge 2 optimal)					
1	5.820	14.48	-90.00	1.360	5.500
2	3.638	13.58	-90.00	0.4333	1.135
3	3.483	13.15	-90.00	0.4333	0.8250
4	3.328	12.72	-90.00	0.4333	0.5150
5	8.003	13.58	-90.00	0.4333	1.133
6	8.160	13.15	-90.00	0.4333	0.8200
7	8.317	12.72	-90.00	0.4333	0.5067
Load 4 : Lower Ground (Edge 2 optimal)					
1	10.53	7.600	-90.00	9.800	3.930
Load 5 : Basement (Edge 2 optimal)					
1	5.820	7.600	-90.00	9.800	5.500
2	5.274	2.425	-90.00	0.5500	3.253
3	5.291	1.875	-90.00	0.5500	2.418
4	5.821	13.48	-90.00	0.6500	3.388
5	5.824	12.82	-90.00	0.6500	4.323
Load 6 : Lower Ground (Edge 2 optimal)					
1	10.53	7.600	-90.00	9.800	3.930

Displacement Data

Ref.	Type	Name	Direction of Extrusion	First point X [m]	Y [m]	Z (level) [m]	Line/Line for extrusion Second point X [m]	Y [m]	Z (level) [m]	No. of intrvl across extrusion/line	Extrusion Depth [m]	No. of intrvl along extrusion	Calculate	Show Detailed results
1	Grid	Basement	Global Y	-4.897	-5.038	-3.390	20.01	N/A	-3.390	58	29.97	74	Yes	No
2	Grid	Lower GF	Global Y	-4.897	-5.038	-2.480	20.01	N/A	-2.480	58	29.97	74	Yes	No

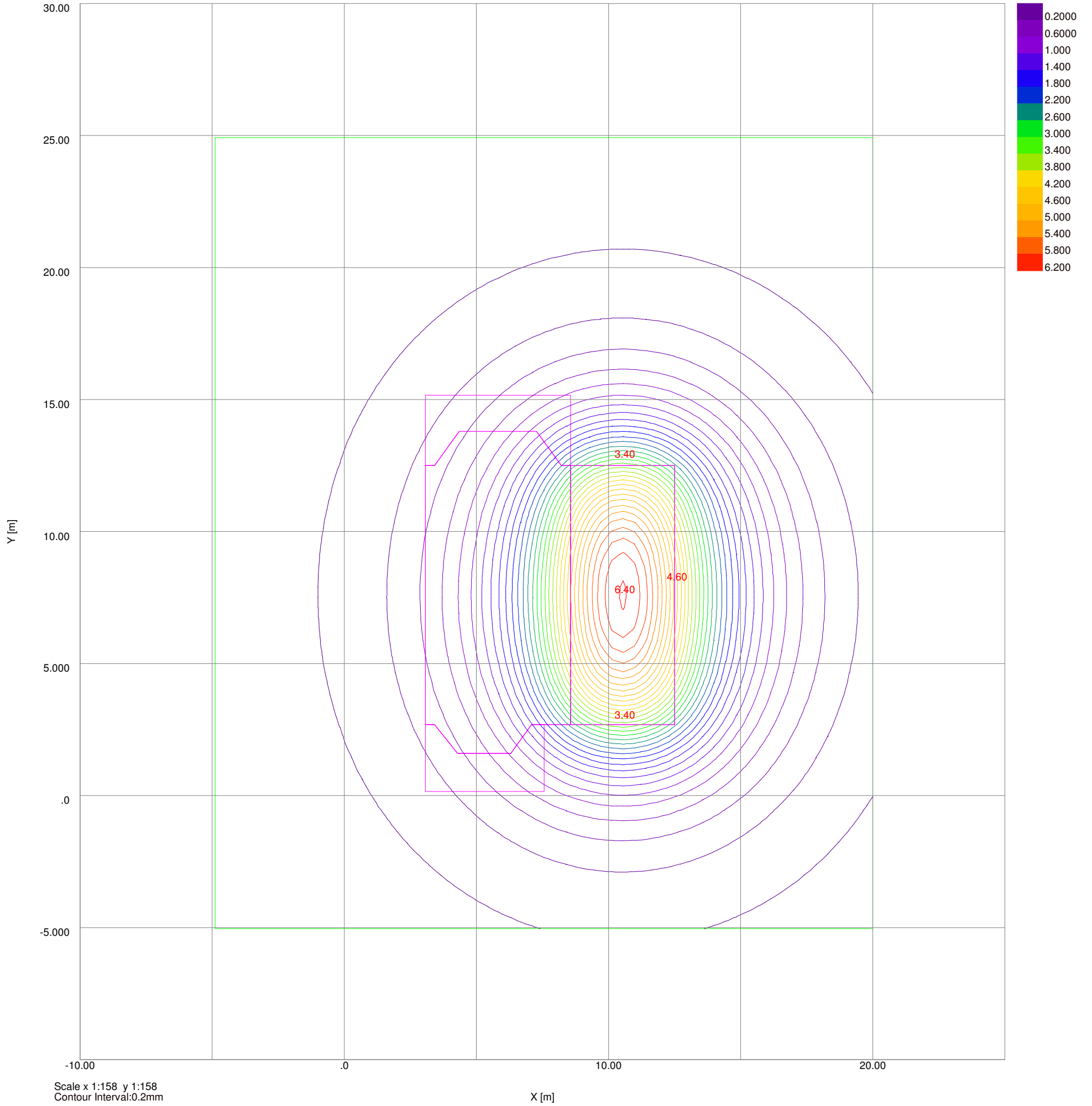
Settlement Contours : Grid 1 at -3.3900m



Scale x 1:158 y 1:158
Contour Interval:0.1mm

Job No.	Sheet No.	Rev.
117401		
Drg. Ref.		
Made by OC	Date	Checked

Settlement Contours : Grid 2 at -2.4800m



Appendix F - Stage 3 – PDISP Drained reloading heave movements

Analysis Options

Analysis: Boussinesq
Global Poisson's ratio: 0.50
Maximum allowable ratio between values of E: 1.5
Horizontal rigid boundary level: -15.00 [m OD]
Displacements at area centroids calculated.

Soil Profiles Soil Profile 1

Layer	Level at top	Number of intermediate displacement levels	Youngs Modulus	Poissons ratio	Non-linear curve
			Top [kN/m ²]	Btm [kN/m ²]	
1	0.0	6	2500.	2500.	0.2000
2	-2.400	10	13000.	26000.	0.2000
3	-7.400	16	26000.	26000.	0.5000

Soil Zones

Zone	Name	X coordinates min	X coordinates max	Y coordinates min	Y coordinates max	Profile
1	Soil Zone #	-4.897	20.01	-5.038	24.93	Soil Profile 1

Non-linear Curve Coordinates - Non-linear Curve 1

Point Strain Factor [%]

Load Data

Load ref.	Name	Shape	Orientation of Plane	Centre of load (Global)		Z (level) [m]	Load position Angle of local x from	Width x or Radius [m]	Length y [m]	Polygon Coordinates [m]	Rectangle tolerance	Number of rectangles	Load value		
				X [m]	Y [m]								Normal (local z) [kN/m ²]	Tangential (local x) [kN/m ²]	(local y) [kN/m ²]
1	Basement	Polygonal	Horizontal	N/A	N/A	-3.390	N/A	N/A	N/A	(3.07,12.5) (3.43,12.5) (4.36,13.8) (7.28,13.8) (8.22,12.5) (8.57,12.5) (8.57,2.7) (7.1,2.7) (6.3,1.6) (4.3,1.6) (3.43,2.7) (3.07,2.7) (3.07,12.5)	10.00	5	-33.00	N/A	N/A
2	Front Lightwell	Polygonal	Horizontal	N/A	N/A	-3.390	N/A	N/A	N/A	(3.07,0.17) (3.07,2.7) (4.3,1.6) (6.3,1.6) (7.1,2.7) (7.57,2.7) (7.57,0.17) (8.57,12.5) (8.22,12.5) (8.57,2.7) (3.07,12.5)	10.00	7	-58.00	N/A	N/A
3	Rear Lightwell	Polygonal	Horizontal	N/A	N/A	-3.390	N/A	N/A	N/A	(3.07,15.2) (8.57,15.2) (7.28,13.8) (4.36,13.8) (3.43,12.5) (3.07,12.5) (3.07,15.2)	10.00	7	-58.00	N/A	N/A
4	Lower Ground	Polygonal	Horizontal	N/A	N/A	-2.480	N/A	N/A	N/A	(8.57,12.5) (12.5,12.5) (12.5,2.7) (8.57,2.7) (8.57,12.5)	10.00	1	-15.00	N/A	N/A
5	Basement	Polygonal	Horizontal	N/A	N/A	-3.390	N/A	N/A	N/A	(3.07,12.5) (3.43,12.5) (4.36,13.8) (7.28,13.8) (8.22,12.5) (8.57,12.5) (8.57,2.7) (7.1,2.7) (6.3,1.6) (4.3,1.6) (3.43,2.7) (3.07,2.7) (3.07,12.5)	10.00	5	95.00	N/A	N/A
6	Lower Ground	Polygonal	Horizontal	N/A	N/A	-2.480	N/A	N/A	N/A	(8.57,12.5) (12.5,12.5) (12.5,2.7) (8.57,2.7) (8.57,12.5)	10.00	1	95.00	N/A	N/A

Polygonal Loads' Rectangles

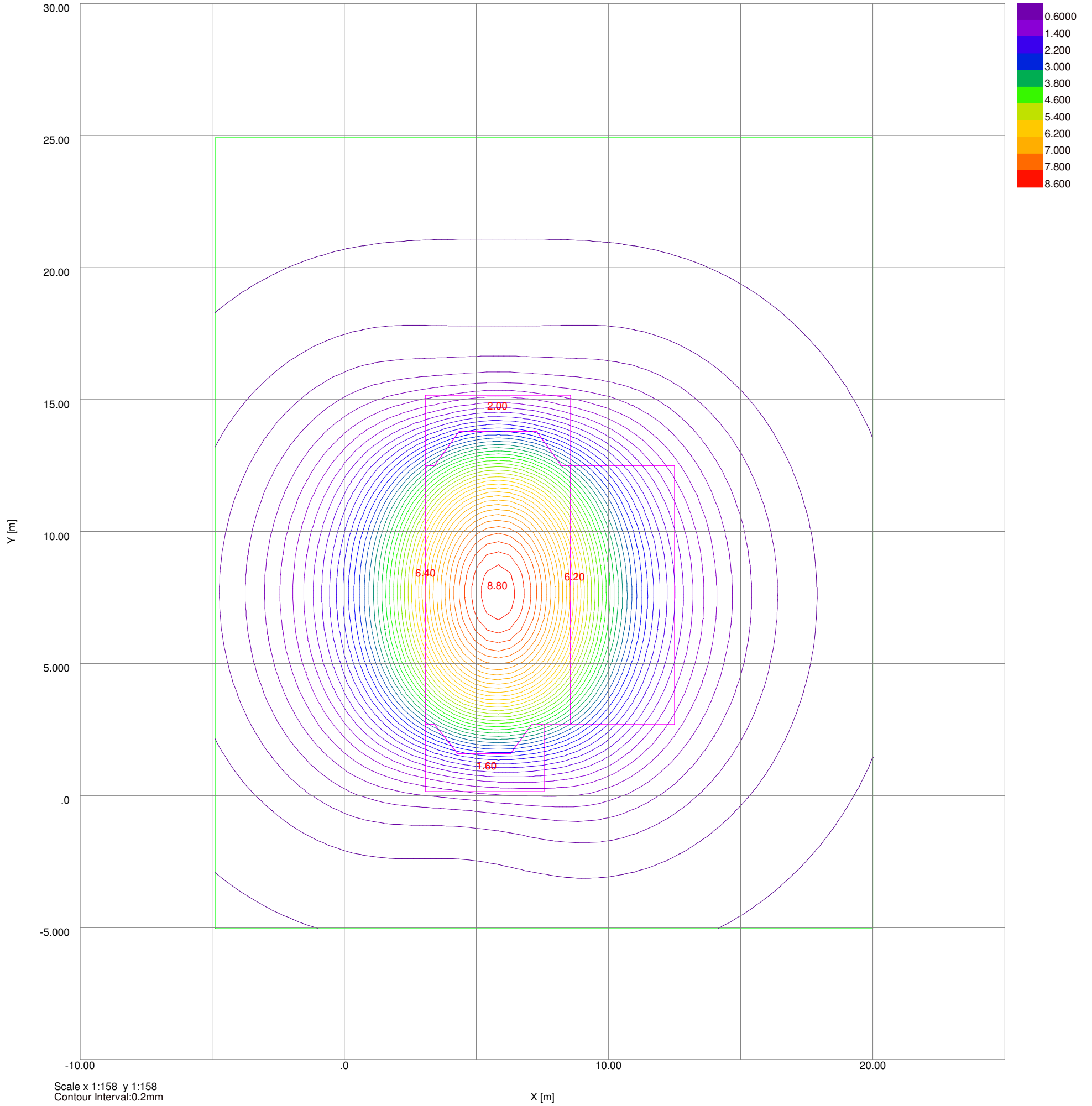
No.	Centre of load X	Y	Angle of local x from global X [Degrees]	Width x [m]	Depth y [m]
Load 1 : Basement (Edge 2 optimal)					
1	5.820	7.600	-90.00	9.800	5.500
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Load 2 : Front Lightwell (Edge 2 optimal)					
1	3.322	2.517	-90.00	0.3667	0.5050
2	3.467	2.150	-90.00	0.3667	0.7950
3	3.612	1.783	-90.00	0.3667	1.085
4	5.320	0.8850	-90.00	1.430	4.500
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6	8.160	13.15	-90.00	0.4333	0.8200
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Load 4 : Lower Ground (Edge 2 optimal)					
1	10.53	7.600	-90.00	9.800	3.930
Load 5 : Basement (Edge 2 optimal)					
1	5.820	7.600	-90.00	9.800	5.500
2	5.274	2.425	-90.00	0.5500	3.253
3	5.291	1.875	-90.00	0.5500	2.418
4	5.821	13.48	-90.00	0.6500	3.388
5	5.824	12.82	-90.00	0.6500	4.323
Load 6 : Lower Ground (Edge 2 optimal)					
1	10.53	7.600	-90.00	9.800	3.930

Displacement Data

Ref.	Type	Name	Direction of Extrusion	First point X [m]	Y [m]	Z (level) [m]	Line/Line for extrusion Second point X [m]	Y [m]	Z (level) [m]	No. of intrvl across extrusion/line	Extrusion Depth [m]	No. of intrvl along extrusion	Calculate	Show Detailed results
1	Grid	Basement	Global Y	-4.897	-5.038	-3.390	20.01	N/A	-3.390	58	29.97	74	Yes	No
2	Grid	Lower GF	Global Y	-4.897	-5.038	-2.480	20.01	N/A	-2.480	58	29.97	74	Yes	No

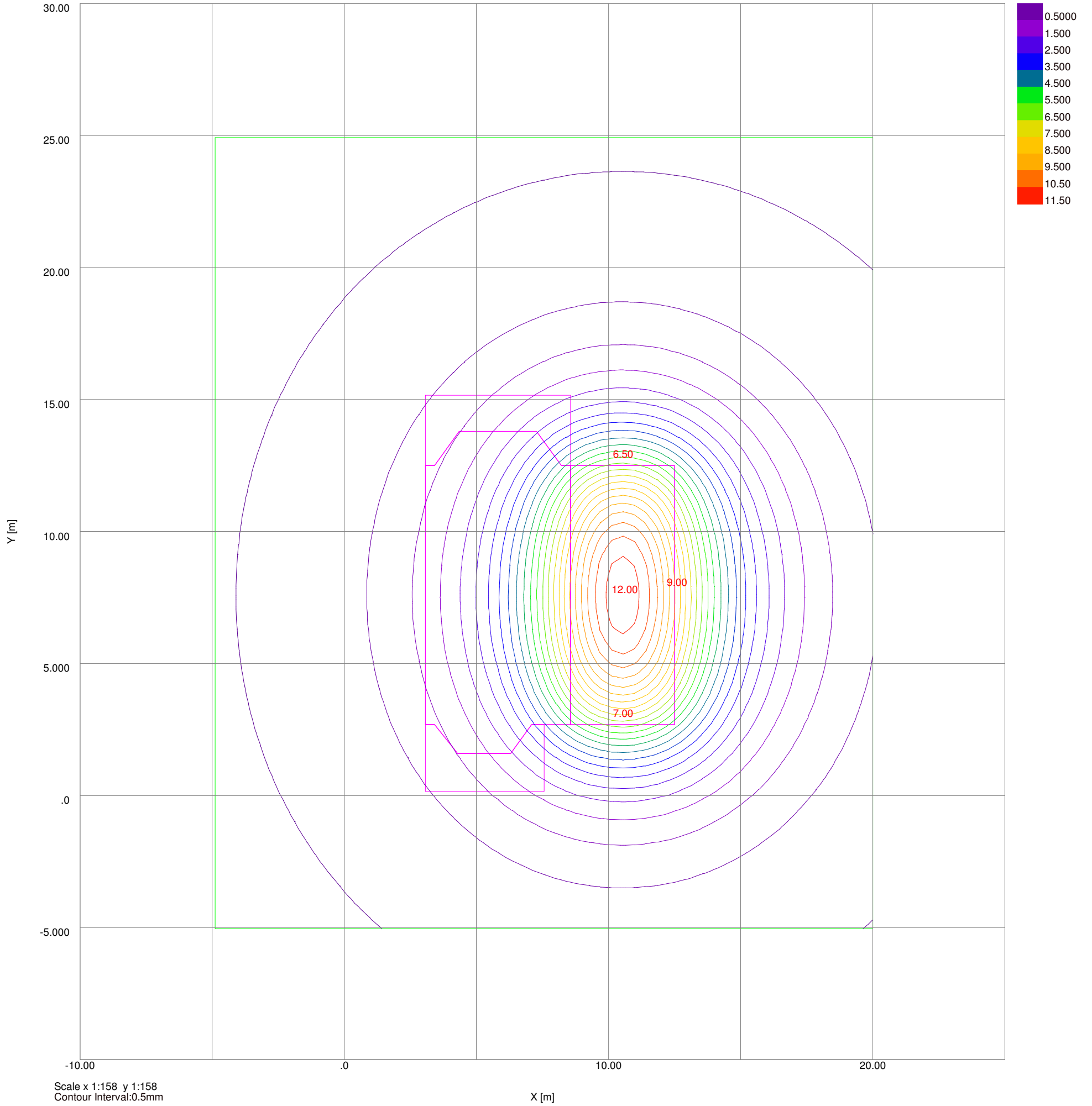
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Settlement Contours : Grid 1 at -3.3900m



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Made by OC	Date	Checked

Settlement Contours : Grid 2 at -2.4800m



Appendix G - XDISP Analysis

Problem Type

Problem Type : Tunnelling and Embedded Wall Excavations

Vertical Ground Movement Curves

Curve Name: Installation of planar diaphragm wall in stiff clay (CIRIA 580 Fig. 2.9(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][0.050,0.000,0.047][0.100,0.000,0.043][0.150,0.000,0.040]
 [0.200,0.000,0.037][0.250,0.000,0.034][0.300,0.000,0.031][0.350,0.000,0.028]
 [0.400,0.000,0.025][0.450,0.000,0.022][0.500,0.000,0.020][0.550,0.000,0.018]
 [0.600,0.000,0.016][0.650,0.000,0.014][0.700,0.000,0.012][0.750,0.000,0.010]
 [0.800,0.000,0.008][0.850,0.000,0.007][0.900,0.000,0.006][0.950,0.000,0.005]
 [1.000,0.000,0.004][1.050,0.000,0.003][1.100,0.000,0.003][1.150,0.000,0.002]
 [1.200,0.000,0.002][1.250,0.000,0.001][1.300,0.000,0.001][1.350,0.000,0.001]
 [1.400,0.000,0.001][1.450,0.000,0.000][1.500,0.000,0.000]
Curve Fitting: Polynomial
Method:
 x Order: 4
 y Order: 0
 Polynomial: $z = -1.2355E-2x^4 + 3.4814E-2x^3 - 2.8885E-3x^2 - 6.5618E-2x + 4.9987E-2$
 Coeff. of 1.0000
Determination:

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: Polynomial
Method:
 x Order: 4
 y Order: 0
 Polynomial: $z = -2.6455E-3x^4 + 2.8495E-2x^3 - 1.0051E-1x^2 + 1.0569E-1x + 3.8990E-2$
 Coeff. of 9.9991E-1
Determination:

Horizontal Ground Movement Curves

Curve Name: Installation of planar diaphragm wall in stiff clay (CIRIA 580 Fig. 2.9(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) (%)]
 [0.000,0.000,0.050][1.500,0.000,0.000]
Curve Fitting: Polynomial
Method:
 x Order: 1
 y Order: 0
 Polynomial: $z = -3.33E-2x + 5.00E-2$
 Coeff. of 1.00
Determination:

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: Polynomial
Method:
 x Order: 1
 y Order: 0
 Polynomial: $z = -3.75E-2x + 1.50E-1$
 Coeff. of 1.00
Determination:

Polygonal Excavations

Excavation Name: Basement wall installation
Surface level [m]: 0.0
Contribution: Positive
Enabled: Yes

Corner	x	y	Base Level	Stiffened	Previous Side	Next Side
	[m]	[m]	[m]		d p1 p2*	d p1 p2*
					[m] [%] [%]	[m] [%] [%]
1	3.0700	15.160	-3.3900	Yes	0.0 67.000 25.000	0.0 67.000 25.000
2	8.5700	15.160	-3.3900	No	-	-
3	12.500	12.700	-3.3900	Yes	0.0 67.000 25.000	0.0 67.000 25.000
4	12.500	2.7000	-3.3900	Yes	0.0 67.000 25.000	0.0 67.000 25.000
5	7.5700	0.17000	-3.3900	No	-	-
6	3.0700	0.17000	-3.3900	Yes	0.0 67.000 25.000	0.0 67.000 25.000

Side	Corner 1		Corner 2		Vertical			Ground Movement Curve		
	x	y	x	y	d	p1	p2*	d	p1	p2*
	[m]	[m]	[m]	[m]	[m]	[%]	[%]	[m]	[%]	[%]
1	3.0700	15.160	8.5700	15.160	Installation of planar diaphragm wall in stiff clay (CIRIA 580 Fig. 2.9(b))			Installation of planar diaphragm wall in stiff clay (CIRIA 580 Fig. 2.9(a))		
2	8.5700	15.160	12.500	12.700	Installation of planar diaphragm wall in stiff clay (CIRIA 580 Fig. 2.9(b))			Installation of planar diaphragm wall in stiff clay (CIRIA 580 Fig. 2.9(a))		
3	12.500	12.700	12.500	2.7000	Installation of planar diaphragm wall in stiff clay (CIRIA 580 Fig. 2.9(b))			Installation of planar diaphragm wall in stiff clay (CIRIA 580 Fig. 2.9(a))		
4	12.500	2.7000	7.5700	0.17000	Installation of planar diaphragm wall in stiff clay (CIRIA 580 Fig. 2.9(b))			Installation of planar diaphragm wall in stiff clay (CIRIA 580 Fig. 2.9(a))		
5	7.5700	0.17000	3.0700	0.17000	Installation of planar diaphragm wall in stiff clay (CIRIA 580 Fig. 2.9(b))			Installation of planar diaphragm wall in stiff clay (CIRIA 580 Fig. 2.9(a))		
6	3.0700	0.17000	3.0700	15.160	Installation of planar diaphragm wall in stiff clay (CIRIA 580 Fig. 2.9(b))			Installation of planar diaphragm wall in stiff clay (CIRIA 580 Fig. 2.9(a))		

Excavation Name: Basement wall deflection
Surface level [m]: 0.0
Contribution: Positive
Enabled: Yes

Corner	x	y	Base Level	Stiffened	Previous Side	Next Side
	[m]	[m]	[m]		d p1 p2*	d p1 p2*
					[m] [%] [%]	[m] [%] [%]
1	3.0700	15.160	-3.3900	Yes	0.0 67.000 25.000	0.0 67.000 25.000
2	8.5700	15.160	-3.3900	No	-	-
3	12.500	12.700	-3.3900	Yes	0.0 67.000 25.000	0.0 67.000 25.000
4	12.500	2.7000	-3.3900	Yes	0.0 67.000 25.000	0.0 67.000 25.000
5	7.5700	0.17000	-3.3900	No	-	-
6	3.0700	0.17000	-3.3900	Yes	0.0 67.000 25.000	0.0 67.000 25.000

Side	Corner 1	Corner 2	Ground Movement Curve
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	x [m]	y [m]	x [m]	y [m]	Vertical	Horizontal
1	3.0700	15.160	8.5700	15.160	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	8.5700	15.160	12.500	12.700	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	12.500	12.700	12.500	2.7000	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	12.500	2.7000	7.5700	0.17000	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	7.5700	0.17000	3.0700	0.17000	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	3.0700	0.17000	3.0700	15.160	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

Structure Name	Sub-Structure Name	Displacement Line	Start Distance Along Line [m]	End Distance Along Line [m]	Vertical Offsets from Line for Vertical Movement Calculations [m]	Vertical Displacement Limit [mm]	Damage Category	Strains	Poisson's Ratio	E/G
No. 30 Canfield Gardens	wall 1	Line 1	0.00	9.33	0.0	0.10	Burland Strain Limits	0.20000	2.6000	
No. 30 Canfield Gardens	wall 2	Line 2	0.00	9.33	0.0	0.10	Burland Strain Limits	0.20000	2.6000	
No. 30 Canfield Gardens	wall 3	Line 3	0.00	9.33	0.0	0.10	Burland Strain Limits	0.20000	2.6000	
No. 30 Canfield Gardens	wall 4	Line 4	0.00	9.80	0.0	0.10	Burland Strain Limits	0.20000	2.6000	
No. 26 Canfield Gardens	wall 5	Line 5	0.00	9.30	0.0	0.10	Burland Strain Limits	0.20000	2.6000	
No. 26 Canfield Gardens	wall 6	Line 6	0.00	9.30	0.0	0.10	Burland Strain Limits	0.20000	2.6000	
No. 26 Canfield Gardens	wall 7	Line 7	0.00	9.30	0.0	0.10	Burland Strain Limits	0.20000	2.6000	
No. 26 Canfield Gardens	wall 8	Line 8	0.00	9.80	0.0	0.10	Burland Strain Limits	0.20000	2.6000	

Specific Structures - Bending Parameters

Structure Name	Sub-Structure Name	Height [m]	Default Properties	Hogging			Sagging		
				2nd Moment of Area (per unit width) [m ³]	Distance of Bending from N.A. [m]	Distance of N.A. from Edge of Beam in Tension [m]	2nd Moment of Area (per unit width) [m ³]	Distance of Bending from N.A. [m]	Distance of N.A. from Edge of Beam in Tension [m]
No. 30 Canfield Gardens	wall 1	9.1200	Yes	252.85	9.1200	9.1200	63.213	4.5600	4.5600
No. 30 Canfield Gardens	wall 2	9.1200	Yes	252.85	9.1200	9.1200	63.213	4.5600	4.5600
No. 30 Canfield Gardens	wall 3	9.1200	Yes	252.85	9.1200	9.1200	63.213	4.5600	4.5600
No. 30 Canfield Gardens	wall 4	9.1200	Yes	252.85	9.1200	9.1200	63.213	4.5600	4.5600
No. 26 Canfield Gardens	wall 5	9.1200	Yes	252.85	9.1200	9.1200	63.213	4.5600	4.5600
No. 26 Canfield Gardens	wall 6	9.1200	Yes	252.85	9.1200	9.1200	63.213	4.5600	4.5600
No. 26 Canfield Gardens	wall 7	9.1200	Yes	252.85	9.1200	9.1200	63.213	4.5600	4.5600
No. 26 Canfield Gardens	wall 8	9.1200	Yes	252.85	9.1200	9.1200	63.213	4.5600	4.5600

Building Segment Combinations

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

Warnings

- Multiple excavations have been specified. The displacements resulting from these excavations are calculated by summing 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).

Specific Building Damage Results - Horizontal Displacements

Structure: No. 30 Canfield Gardens | Sub-structure: wall 1

Dist.	Coordinates			Displacements		
	x	y	z	x	y	Horizontal displacement along the Line
[m]	[m]	[m]	[m]	[mm]	[mm]	[mm]
0.0	2.90	12.50	0.00	6.6596	0.0	0.0
1.0367	1.86	12.50	0.00	5.9253	0.0	0.0
2.0733	0.83	12.50	0.00	5.1910	0.0	0.0
3.1100	-0.21	12.50	0.00	4.4567	0.0	0.0
4.1467	-1.25	12.50	0.00	3.7224	0.0	0.0
5.1833	-2.28	12.50	0.00	3.0775	0.0	0.0
6.2200	-3.32	12.50	0.00	2.6887	0.0	0.0
7.2567	-4.36	12.50	0.00	2.3000	0.0	0.0
8.2933	-5.39	12.50	0.00	1.9113	0.0	0.0
9.3300	-6.43	12.50	0.00	1.5225	0.0	0.0

Structure: No. 30 Canfield Gardens | Sub-structure: wall 2

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

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[m]	[m]	[m]	[m]	[mm]	[mm]	[mm]	[mm]
0.0	2.90	7.60	0.00	6.6596	0.0	-6.6596	0.0
1.0367	1.86	7.60	0.00	5.9253	0.0	-5.9253	0.0
2.0733	0.83	7.60	0.00	5.1910	0.0	-5.1910	0.0
3.1100	-0.21	7.60	0.00	4.4567	0.0	-4.4567	0.0
4.1467	-1.25	7.60	0.00	3.7224	0.0	-3.7224	0.0
5.1833	-2.28	7.60	0.00	3.0775	0.0	-3.0775	0.0
6.2200	-3.32	7.60	0.00	2.6887	0.0	-2.6887	0.0
7.2567	-4.36	7.60	0.00	2.3000	0.0	-2.3000	0.0
8.2933	-5.39	7.60	0.00	1.9113	0.0	-1.9113	0.0
9.3300	-6.43	7.60	0.00	1.5225	0.0	-1.5225	0.0

Structure: No. 30 Canfield Gardens | Sub-structure: wall 3

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]
0.0	2.90	7.60	0.00	6.6596	0.0	-6.6596	0.0
1.0367	1.86	7.60	0.00	5.9253	0.0	-5.9253	0.0
2.0733	0.83	7.60	0.00	5.1910	0.0	-5.1910	0.0
3.1100	-0.21	7.60	0.00	4.4567	0.0	-4.4567	0.0
4.1467	-1.25	7.60	0.00	3.7224	0.0	-3.7224	0.0
5.1833	-2.28	7.60	0.00	3.0775	0.0	-3.0775	0.0
6.2200	-3.32	7.60	0.00	2.6887	0.0	-2.6887	0.0
7.2567	-4.36	7.60	0.00	2.3000	0.0	-2.3000	0.0
8.2933	-5.39	7.60	0.00	1.9113	0.0	-1.9113	0.0
9.3300	-6.43	7.60	0.00	1.5225	0.0	-1.5225	0.0

Structure: No. 30 Canfield Gardens | Sub-structure: wall 4

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]
0.0	2.90	12.50	0.00	6.6596	0.0	0.0	6.6596
1.0889	2.90	11.41	0.00	6.6596	0.0	0.0	6.6596
2.1778	2.90	10.32	0.00	6.6596	0.0	0.0	6.6596
3.2667	2.90	9.23	0.00	6.6596	0.0	0.0	6.6596
4.3556	2.90	8.14	0.00	6.6596	0.0	0.0	6.6596
5.4444	2.90	7.06	0.00	6.6596	0.0	0.0	6.6596
6.5333	2.90	5.97	0.00	6.6596	0.0	0.0	6.6596
7.6222	2.90	4.88	0.00	6.6596	0.0	0.0	6.6596
8.7111	2.90	3.79	0.00	6.6596	0.0	0.0	6.6596
9.8000	2.90	2.70	0.00	6.6596	0.0	0.0	6.6596

Structure: No. 26 Canfield Gardens | Sub-structure: wall 5

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]
0.0	12.70	12.50	0.00	-6.6383	0.0	-6.6383	0.0
1.0333	13.73	12.50	0.00	-5.9064	0.0	-5.9064	0.0
2.0667	14.77	12.50	0.00	-5.1744	0.0	-5.1744	0.0
3.1000	15.80	12.50	0.00	-4.4425	0.0	-4.4425	0.0
4.1333	16.83	12.50	0.00	-3.7106	0.0	-3.7106	0.0
5.1667	17.87	12.50	0.00	-3.0725	0.0	-3.0725	0.0
6.2000	18.90	12.50	0.00	-2.6850	0.0	-2.6850	0.0
7.2333	19.93	12.50	0.00	-2.2975	0.0	-2.2975	0.0
8.2667	20.97	12.50	0.00	-1.9100	0.0	-1.9100	0.0
9.3000	22.00	12.50	0.00	-1.5225	0.0	-1.5225	0.0

Structure: No. 26 Canfield Gardens | Sub-structure: wall 6

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]
0.0	12.70	7.60	0.00	-6.6383	0.0	-6.6383	0.0
1.0333	13.73	7.60	0.00	-5.9064	0.0	-5.9064	0.0
2.0667	14.77	7.60	0.00	-5.1744	0.0	-5.1744	0.0
3.1000	15.80	7.60	0.00	-4.4425	0.0	-4.4425	0.0
4.1333	16.83	7.60	0.00	-3.7106	0.0	-3.7106	0.0
5.1667	17.87	7.60	0.00	-3.0725	0.0	-3.0725	0.0
6.2000	18.90	7.60	0.00	-2.6850	0.0	-2.6850	0.0
7.2333	19.93	7.60	0.00	-2.2975	0.0	-2.2975	0.0
8.2667	20.97	7.60	0.00	-1.9100	0.0	-1.9100	0.0
9.3000	22.00	7.60	0.00	-1.5225	0.0	-1.5225	0.0

Structure: No. 26 Canfield Gardens | Sub-structure: wall 7

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]
0.0	12.70	2.70	0.00	-5.1089	0.0	-5.1089	0.0
1.0333	13.73	2.70	0.00	-4.5456	0.0	-4.5456	0.0
2.0667	14.77	2.70	0.00	-3.9823	0.0	-3.9823	0.0
3.1000	15.80	2.70	0.00	-3.4190	0.0	-3.4190	0.0
4.1333	16.83	2.70	0.00	-2.8557	0.0	-2.8557	0.0
5.1667	17.87	2.70	0.00	-2.3646	0.0	-2.3646	0.0
6.2000	18.90	2.70	0.00	-2.0664	0.0	-2.0664	0.0
7.2333	19.93	2.70	0.00	-1.7682	0.0	-1.7682	0.0
8.2667	20.97	2.70	0.00	-1.4700	0.0	-1.4700	0.0
9.3000	22.00	2.70	0.00	-1.1717	0.0	-1.1717	0.0

Structure: No. 26 Canfield Gardens | Sub-structure: wall 8

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]
0.0	12.70	12.50	0.00	-6.6383	0.0	-6.6383	0.0
1.0889	12.70	11.41	0.00	-6.6383	0.0	0.0	-6.6383
2.1778	12.70	10.32	0.00	-6.6383	0.0	0.0	-6.6383
3.2667	12.70	9.23	0.00	-6.6383	0.0	0.0	-6.6383
4.3556	12.70	8.14	0.00	-6.6383	0.0	0.0	-6.6383
5.4444	12.70	7.06	0.00	-6.6383	0.0	0.0	-6.6383
6.5333	12.70	5.97	0.00	-6.6383	0.0	0.0	-6.6383
7.6222	12.70	4.88	0.00	-6.6383	0.0	0.0	-6.6383
8.7111	12.70	3.79	0.00	-6.6383	0.0	0.0	-6.6383
9.8000	12.70	2.70	0.00	-5.1089	0.0	0.0	-5.1089

Specific Building Damage Results - Vertical Displacements

Structure: No. 30 Canfield Gardens | Sub-structure: wall 1

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Ground Movement Assessment
Damage Assessment

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

Vertical Offset 1
 0.0 2.90 12.50 0.00 3.0759
 1.0367 1.86 12.50 0.00 3.1444
 2.0733 0.83 12.50 0.00 2.9048
 3.1100 -0.21 12.50 0.00 2.5477
 4.1467 -1.25 12.50 0.00 2.1571
 5.1833 -2.28 12.50 0.00 1.7296
 6.2200 -3.32 12.50 0.00 1.3070
 7.2567 -4.36 12.50 0.00 0.90963
 8.2933 -5.39 12.50 0.00 0.57785
 9.3300 -6.43 12.50 0.00 0.33313

Structure: No. 30 Canfield Gardens | Sub-structure: wall 2

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

Vertical Offset 1
 0.0 2.90 7.60 0.00 3.0759
 1.0367 1.86 7.60 0.00 3.1444
 2.0733 0.83 7.60 0.00 2.9048
 3.1100 -0.21 7.60 0.00 2.5477
 4.1467 -1.25 7.60 0.00 2.1571
 5.1833 -2.28 7.60 0.00 1.7296
 6.2200 -3.32 7.60 0.00 1.3070
 7.2567 -4.36 7.60 0.00 0.90963
 8.2933 -5.39 7.60 0.00 0.57785
 9.3300 -6.43 7.60 0.00 0.33313

Structure: No. 30 Canfield Gardens | Sub-structure: wall 3

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

Vertical Offset 1
 0.0 2.90 2.70 0.00 3.0759
 1.0367 1.86 2.70 0.00 3.1444
 2.0733 0.83 2.70 0.00 2.9048
 3.1100 -0.21 2.70 0.00 2.5477
 4.1467 -1.25 2.70 0.00 2.1571
 5.1833 -2.28 2.70 0.00 1.7296
 6.2200 -3.32 2.70 0.00 1.3070
 7.2567 -4.36 2.70 0.00 0.90963
 8.2933 -5.39 2.70 0.00 0.57785
 9.3300 -6.43 2.70 0.00 0.33313

Structure: No. 30 Canfield Gardens | Sub-structure: wall 4

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

Vertical Offset 1
 0.0 2.90 12.50 0.00 3.0759
 1.0889 2.90 11.41 0.00 3.0759
 2.1778 2.90 10.32 0.00 3.0759
 3.2667 2.90 9.23 0.00 3.0759
 4.3556 2.90 8.14 0.00 3.0759
 5.4444 2.90 7.06 0.00 3.0759
 6.5333 2.90 5.97 0.00 3.0759
 7.6222 2.90 4.88 0.00 3.0759
 8.7111 2.90 3.79 0.00 3.0759
 9.8000 2.90 2.70 0.00 3.0759

Structure: No. 26 Canfield Gardens | Sub-structure: wall 5

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

Vertical Offset 1
 0.0 12.70 12.50 0.00 3.0847
 1.0333 13.73 12.50 0.00 3.1411
 2.0667 14.77 12.50 0.00 2.8976
 3.1000 15.80 12.50 0.00 2.5404
 4.1333 16.83 12.50 0.00 2.1506
 5.1667 17.87 12.50 0.00 1.7242
 6.2000 18.90 12.50 0.00 1.3029
 7.2333 19.93 12.50 0.00 0.90726
 8.2667 20.97 12.50 0.00 0.57692
 9.3000 22.00 12.50 0.00 0.33313

Structure: No. 26 Canfield Gardens | Sub-structure: wall 6

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

Vertical Offset 1
 0.0 12.70 7.60 0.00 3.0847
 1.0333 13.73 7.60 0.00 3.1411
 2.0667 14.77 7.60 0.00 2.8976
 3.1000 15.80 7.60 0.00 2.5404
 4.1333 16.83 7.60 0.00 2.1506
 5.1667 17.87 7.60 0.00 1.7242
 6.2000 18.90 7.60 0.00 1.3029
 7.2333 19.93 7.60 0.00 0.90726
 8.2667 20.97 7.60 0.00 0.57692
 9.3000 22.00 7.60 0.00 0.33313

Structure: No. 26 Canfield Gardens | Sub-structure: wall 7

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

Vertical Offset 1
 0.0 12.70 2.70 0.00 2.3740
 1.0333 13.73 2.70 0.00 2.4174
 2.0667 14.77 2.70 0.00 2.2300
 3.1000 15.80 2.70 0.00 1.9551
 4.1333 16.83 2.70 0.00 1.6551
 5.1667 17.87 2.70 0.00 1.3270
 6.2000 18.90 2.70 0.00 1.0028
 7.2333 19.93 2.70 0.00 0.69823
 8.2667 20.97 2.70 0.00 0.44400
 9.3000 22.00 2.70 0.00 0.25638

Structure: No. 26 Canfield Gardens | Sub-structure: wall 8

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

Vertical Offset 1
 0.0 12.70 12.50 0.00 3.0847

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

1.0889	12.70	11.41	0.00	3.0847
2.1778	12.70	10.32	0.00	3.0847
3.2667	12.70	9.23	0.00	3.0847
4.3556	12.70	8.14	0.00	3.0847
5.4444	12.70	7.06	0.00	3.0847
6.5333	12.70	5.97	0.00	3.0847
7.6222	12.70	4.88	0.00	3.0847
8.7111	12.70	3.79	0.00	3.0847
9.8000	12.70	2.70	0.00	2.3740

Specific Building Damage Results - All Segments

Structure: No. 30 Canfield Gardens | Sub-structure: wall 1

Vertical Offset from Line for Vertical Movement Calculations	Segment	Start	Length	Curvature	Deflection Ratio	Average Horizontal Strain	Max. Tensile Strain	Maximum Gradient of Horizontal Displacement Curve	Maximum Gradient of Vertical Displacement Curve	Min. Radius of Curvature	Damage Category
[m] 0.0	1	[m] 0.0	[m] 5.2002	Sagging	[%] 0.0070665	[%] 0.069005	[%] 0.074727	-707.83E-6	412.18E-6	[m] 3024.9	1 (Very Slight)
	2	5.2002	4.1288	Hogging	0.0029199	0.037500	0.038504	-374.86E-6	407.50E-6	11629.	0 (Negligible)

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

Structure: No. 30 Canfield Gardens | Sub-structure: wall 2

Vertical Offset from Line for Vertical Movement Calculations	Segment	Start	Length	Curvature	Deflection Ratio	Average Horizontal Strain	Max. Tensile Strain	Maximum Gradient of Horizontal Displacement Curve	Maximum Gradient of Vertical Displacement Curve	Min. Radius of Curvature	Damage Category
[m] 0.0	1	[m] 0.0	[m] 5.2002	Sagging	[%] 0.0070665	[%] 0.069005	[%] 0.074727	-707.83E-6	412.18E-6	[m] 3024.9	1 (Very Slight)
	2	5.2002	4.1288	Hogging	0.0029199	0.037500	0.038504	-374.86E-6	407.50E-6	11629.	0 (Negligible)

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

Structure: No. 30 Canfield Gardens | Sub-structure: wall 3

Vertical Offset from Line for Vertical Movement Calculations	Segment	Start	Length	Curvature	Deflection Ratio	Average Horizontal Strain	Max. Tensile Strain	Maximum Gradient of Horizontal Displacement Curve	Maximum Gradient of Vertical Displacement Curve	Min. Radius of Curvature	Damage Category
[m] 0.0	1	[m] 0.0	[m] 5.2002	Sagging	[%] 0.0070665	[%] 0.069005	[%] 0.074727	-707.83E-6	412.18E-6	[m] 3024.9	1 (Very Slight)
	2	5.2002	4.1288	Hogging	0.0029199	0.037500	0.038504	-374.86E-6	407.50E-6	11629.	0 (Negligible)

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

Structure: No. 30 Canfield Gardens | Sub-structure: wall 4

Vertical Offset from Line for Vertical Movement Calculations	Segment	Start	Length	Curvature	Deflection Ratio	Average Horizontal Strain	Max. Tensile Strain	Maximum Gradient of Horizontal Displacement Curve	Maximum Gradient of Vertical Displacement Curve	Min. Radius of Curvature	Damage Category
[m] 0.0	1	[m] 0.0	[m] 6.5333	None	[%] 0.0	[%] 0.0	[%] 0.0	0.0	0.0	[m] -	0 (Negligible)
	2	6.5333	3.2657	None	0.0	0.0	0.0	0.0	0.0	2.1844E+18	0 (Negligible)

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

Structure: No. 26 Canfield Gardens | Sub-structure: wall 5

Vertical Offset from Line for Vertical Movement Calculations	Segment	Start	Length	Curvature	Deflection Ratio	Average Horizontal Strain	Max. Tensile Strain	Maximum Gradient of Horizontal Displacement Curve	Maximum Gradient of Vertical Displacement Curve	Min. Radius of Curvature	Damage Category
[m] 0.0	1	[m] 0.0	[m] 5.1747	Sagging	[%] 0.0068891	[%] 0.068967	[%] 0.074522	-707.83E-6	412.38E-6	[m] 3086.5	1 (Very Slight)
	2	5.1747	4.1243	Hogging	0.0029248	0.037500	0.038504	-374.86E-6	407.53E-6	11628.	0 (Negligible)

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

Structure: No. 26 Canfield Gardens | Sub-structure: wall 6

Vertical Offset from Line for Vertical Movement Calculations	Segment	Start	Length	Curvature	Deflection Ratio	Average Horizontal Strain	Max. Tensile Strain	Maximum Gradient of Horizontal Displacement Curve	Maximum Gradient of Vertical Displacement Curve	Min. Radius of Curvature	Damage Category
[m] 0.0	1	[m] 0.0	[m] 5.1747	Sagging	[%] 0.0068891	[%] 0.068967	[%] 0.074522	-707.83E-6	412.38E-6	[m] 3086.5	1 (Very Slight)
	2	5.1747	4.1243	Hogging	0.0029248	0.037500	0.038504	-374.86E-6	407.53E-6	11628.	0 (Negligible)

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

Structure: No. 26 Canfield Gardens | Sub-structure: wall 7

Vertical Offset from Line for Vertical Movement Calculations	Segment	Start	Length	Curvature	Deflection Ratio	Average Horizontal Strain	Max. Tensile Strain	Maximum Gradient of Horizontal Displacement Curve	Maximum Gradient of Vertical Displacement Curve	Min. Radius of Curvature	Damage Category
[m] 0.0	1	[m] 0.0	[m] 5.1743	Sagging	[%] 0.0053027	[%] 0.053080	[%] 0.057355	-544.84E-6	317.42E-6	[m] 4009.1	1 (Very Slight)
	2	5.1743	4.1247	Hogging	0.0022513	0.028860	0.029633	-288.52E-6	313.66E-6	15107.	0 (Negligible)

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

Structure: No. 26 Canfield Gardens | Sub-structure: wall 8

Vertical Offset from Line for Vertical Movement Calculations	Segment	Start	Length	Curvature	Deflection Ratio	Average Horizontal Strain	Max. Tensile Strain	Maximum Gradient of Horizontal Displacement Curve	Maximum Gradient of Vertical Displacement Curve	Min. Radius of Curvature	Damage Category
[m] 0.0	1	[m] 0.0	[m] 6.5333	None	[%] 0.0	[%] 0.0	[%] 0.0	0.0	0.0	[m] -	0 (Negligible)
	2	6.5333	3.2657	Sagging	0.014495	0.0	0.014034	0.0	652.67E-6	1334.2	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

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Vertical Offset from Line for Vertical Movement	Segment	Start	Length	Curvature	Deflection Ratio	Average Horizontal Strain	Max. Tensile Strain	Maximum Gradient of Horizontal Displacement	Maximum Gradient of Vertical Displacement	Min. Radius of Curvature	Damage Category
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Structure: No. 30 Canfield Gardens | Sub-structure: wall 1

Vertical Offset from Line for Vertical Movement	Deflection Ratio	Average Horizontal Strain	Maximum Slope	Maximum Settlement	Max. Tensile Strain	Maximum Gradient of Horizontal Displacement	Maximum Gradient of Vertical Displacement	Min. Radius of Curvature (Hogging)	Min. Radius of Curvature (Sagging)	Damage Category
Calculations	[%]	[%]	[mm]	[mm]	[%]	[mm]	[mm]	[m]	[m]	
0.0	0.0070665	0.069005	412.18E-6	3.1419	0.074727	-707.83E-6	412.18E-6	11629.	3024.9	1 (Very Slight)

Structure: No. 30 Canfield Gardens | Sub-structure: wall 2

Vertical Offset from Line for Vertical Movement	Deflection Ratio	Average Horizontal Strain	Maximum Slope	Maximum Settlement	Max. Tensile Strain	Maximum Gradient of Horizontal Displacement	Maximum Gradient of Vertical Displacement	Min. Radius of Curvature (Hogging)	Min. Radius of Curvature (Sagging)	Damage Category
Calculations	[%]	[%]	[mm]	[mm]	[%]	[mm]	[mm]	[m]	[m]	
0.0	0.0070665	0.069005	412.18E-6	3.1419	0.074727	-707.83E-6	412.18E-6	11629.	3024.9	1 (Very Slight)

Structure: No. 30 Canfield Gardens | Sub-structure: wall 3

Vertical Offset from Line for Vertical Movement	Deflection Ratio	Average Horizontal Strain	Maximum Slope	Maximum Settlement	Max. Tensile Strain	Maximum Gradient of Horizontal Displacement	Maximum Gradient of Vertical Displacement	Min. Radius of Curvature (Hogging)	Min. Radius of Curvature (Sagging)	Damage Category
Calculations	[%]	[%]	[mm]	[mm]	[%]	[mm]	[mm]	[m]	[m]	
0.0	0.0070665	0.069005	412.18E-6	3.1419	0.074727	-707.83E-6	412.18E-6	11629.	3024.9	1 (Very Slight)

Structure: No. 30 Canfield Gardens | Sub-structure: wall 4

Vertical Offset from Line for Vertical Movement	Deflection Ratio	Average Horizontal Strain	Maximum Slope	Maximum Settlement	Max. Tensile Strain	Maximum Gradient of Horizontal Displacement	Maximum Gradient of Vertical Displacement	Min. Radius of Curvature (Hogging)	Min. Radius of Curvature (Sagging)	Damage Category
Calculations	[%]	[%]	[mm]	[mm]	[%]	[mm]	[mm]	[m]	[m]	
0.0	0.0	0.0	0.0	3.0759	0.0	0.0	0.0	-	-	0 (Negligible)

Structure: No. 26 Canfield Gardens | Sub-structure: wall 5

Vertical Offset from Line for Vertical Movement	Deflection Ratio	Average Horizontal Strain	Maximum Slope	Maximum Settlement	Max. Tensile Strain	Maximum Gradient of Horizontal Displacement	Maximum Gradient of Vertical Displacement	Min. Radius of Curvature (Hogging)	Min. Radius of Curvature (Sagging)	Damage Category
Calculations	[%]	[%]	[mm]	[mm]	[%]	[mm]	[mm]	[m]	[m]	
0.0	0.0068891	0.068967	412.38E-6	3.1389	0.074522	-707.83E-6	412.38E-6	11628.	3086.5	1 (Very Slight)

Structure: No. 26 Canfield Gardens | Sub-structure: wall 6

Vertical Offset from Line for Vertical Movement	Deflection Ratio	Average Horizontal Strain	Maximum Slope	Maximum Settlement	Max. Tensile Strain	Maximum Gradient of Horizontal Displacement	Maximum Gradient of Vertical Displacement	Min. Radius of Curvature (Hogging)	Min. Radius of Curvature (Sagging)	Damage Category
Calculations	[%]	[%]	[mm]	[mm]	[%]	[mm]	[mm]	[m]	[m]	
0.0	0.0068891	0.068967	412.38E-6	3.1389	0.074522	-707.83E-6	412.38E-6	11628.	3086.5	1 (Very Slight)

Structure: No. 26 Canfield Gardens | Sub-structure: wall 7

Vertical Offset from Line for Vertical Movement	Deflection Ratio	Average Horizontal Strain	Maximum Slope	Maximum Settlement	Max. Tensile Strain	Maximum Gradient of Horizontal Displacement	Maximum Gradient of Vertical Displacement	Min. Radius of Curvature (Hogging)	Min. Radius of Curvature (Sagging)	Damage Category
Calculations	[%]	[%]	[mm]	[mm]	[%]	[mm]	[mm]	[m]	[m]	
0.0	0.0053027	0.053080	317.42E-6	2.4157	0.057355	-544.84E-6	317.42E-6	15107.	4009.1	1 (Very Slight)

Structure: No. 26 Canfield Gardens | Sub-structure: wall 8

Vertical Offset from Line for Vertical Movement	Deflection Ratio	Average Horizontal Strain	Maximum Slope	Maximum Settlement	Max. Tensile Strain	Maximum Gradient of Horizontal Displacement	Maximum Gradient of Vertical Displacement	Min. Radius of Curvature (Hogging)	Min. Radius of Curvature (Sagging)	Damage Category
Calculations	[%]	[%]	[mm]	[mm]	[%]	[mm]	[mm]	[m]	[m]	
0.0	0.014495	0.0	652.67E-6	3.0847	0.014034	0.0	652.67E-6	-	1334.2	0 (Negligible)

Specific Building Damage Results - Critical Segments within Each Structure

Structure Name	Parameter	Critical Sub-Structure	Critical Segment	Start	End	Curvature	Maximum Slope	Maximum Settlement	Max. Tensile Strain	Min. Radius of Curvature (Hogging)	Min. Radius of Curvature (Sagging)	Damage Category
No. 30 Canfield Gardens	Maximum Slope	wall 1	1	[m]	0.0	5.2002	Sagging	412.18E-6	3.1419	0.074727	3024.9	1 (Very Slight)
	Maximum Settlement	wall 1	1	0.0	5.2002	Sagging	412.18E-6	3.1419	0.074727	-	3024.9	1 (Very Slight)
	Max. Tensile Strain	wall 1	1	0.0	5.2002	Sagging	412.18E-6	3.1419	0.074727	-	3024.9	1 (Very Slight)
	Min. Radius of Curvature (Hogging)	wall 1	2	5.2002	9.3290	Hogging	407.50E-6	1.7227	0.038504	11629.	-	0 (Negligible)
	Min. Radius of Curvature (Sagging)	wall 1	1	0.0	5.2002	Sagging	412.18E-6	3.1419	0.074727	-	3024.9	1 (Very Slight)
No. 26 Canfield Gardens	Maximum Slope	wall 8	2	6.5333	9.7990	Sagging	652.67E-6	3.0847	0.014034	-	1334.2	0 (Negligible)
	Maximum Settlement	wall 5	1	0.0	5.1747	Sagging	412.38E-6	3.1389	0.074522	-	3086.5	1 (Very Slight)
	Max. Tensile Strain	wall 5	1	0.0	5.1747	Sagging	412.38E-6	3.1389	0.074522	-	3086.5	1 (Very Slight)
	Min. Radius of Curvature (Hogging)	wall 5	2	5.1747	9.2990	Hogging	407.53E-6	1.7209	0.038504	11628.	-	0 (Negligible)
	Min. Radius of Curvature (Sagging)	wall 8	2	6.5333	9.7990	Sagging	652.67E-6	3.0847	0.014034	-	1334.2	0 (Negligible)

Specific Building Damage Results - All Combined Segments

Structure: No. 30 Canfield Gardens | Sub-structure: wall 1

Vertical	Combined	Start	Length	Curvature	Deflection	Average	Max.	Damage Category
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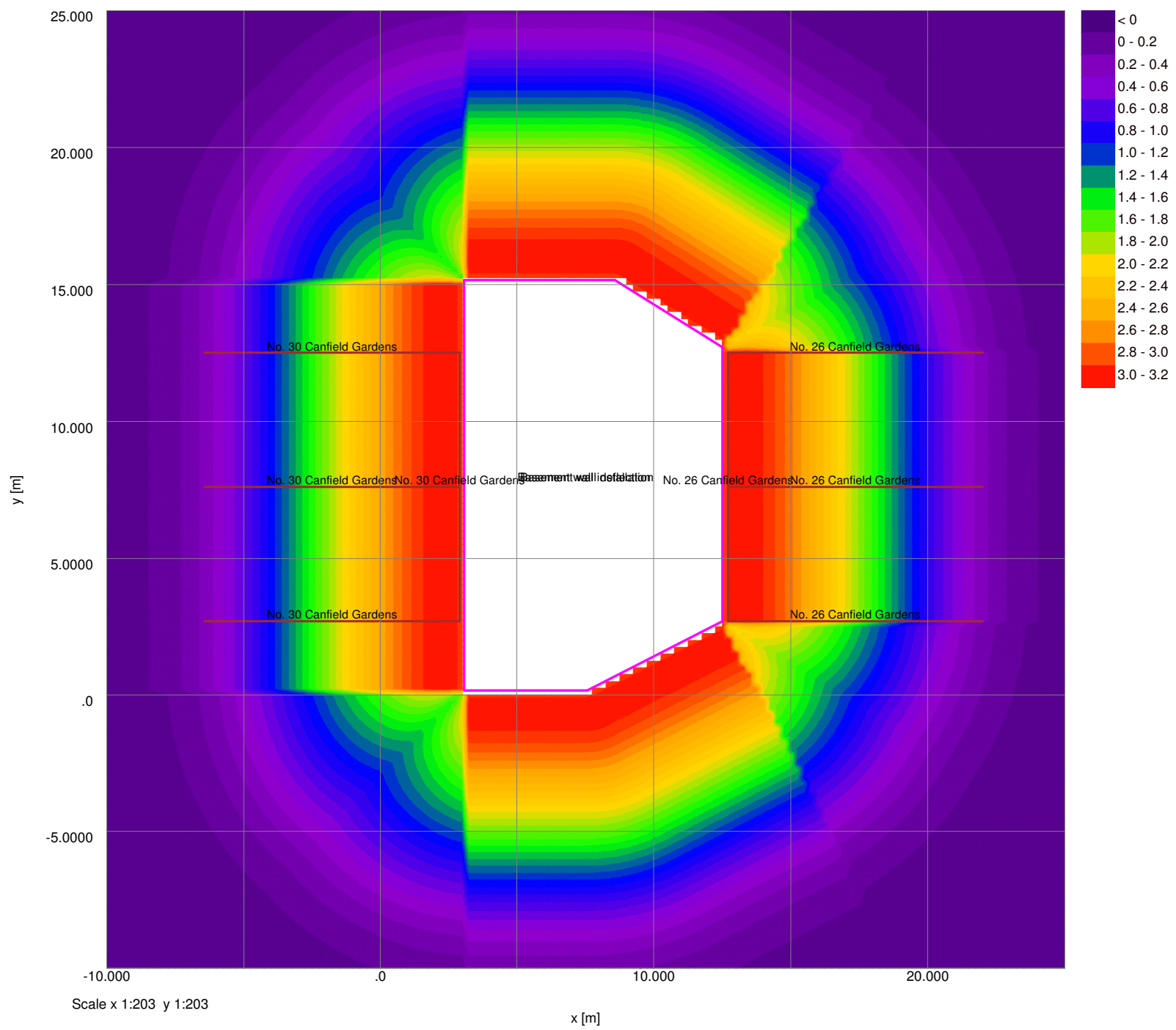
28 Canfield Gardens
Ground Movement Assessment
Damage Assessment

Job No.	Sheet No.	Rev.
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Offset from Line for Vertical Movement Calculations	Segment	Ratio	Horizontal Strain	Tensile Strain			
[m]	[m]	[m]	[%]	[%]	[%]		
No structures have segments combined.							
Structure: No. 30 Canfield Gardens Sub-structure: wall 2							
Vertical Offset from Line for Vertical Movement Calculations	Combined Segment	Start Length	Curvature	Deflection Ratio	Average Horizontal Strain	Max. Tensile Strain	Damage Category
[m]	[m]	[m]		[%]	[%]	[%]	
No structures have segments combined.							
Structure: No. 30 Canfield Gardens Sub-structure: wall 3							
Vertical Offset from Line for Vertical Movement Calculations	Combined Segment	Start Length	Curvature	Deflection Ratio	Average Horizontal Strain	Max. Tensile Strain	Damage Category
[m]	[m]	[m]		[%]	[%]	[%]	
No structures have segments combined.							
Structure: No. 30 Canfield Gardens Sub-structure: wall 4							
Vertical Offset from Line for Vertical Movement Calculations	Combined Segment	Start Length	Curvature	Deflection Ratio	Average Horizontal Strain	Max. Tensile Strain	Damage Category
[m]	[m]	[m]		[%]	[%]	[%]	
No structures have segments combined.							
Structure: No. 26 Canfield Gardens Sub-structure: wall 5							
Vertical Offset from Line for Vertical Movement Calculations	Combined Segment	Start Length	Curvature	Deflection Ratio	Average Horizontal Strain	Max. Tensile Strain	Damage Category
[m]	[m]	[m]		[%]	[%]	[%]	
No structures have segments combined.							
Structure: No. 26 Canfield Gardens Sub-structure: wall 6							
Vertical Offset from Line for Vertical Movement Calculations	Combined Segment	Start Length	Curvature	Deflection Ratio	Average Horizontal Strain	Max. Tensile Strain	Damage Category
[m]	[m]	[m]		[%]	[%]	[%]	
No structures have segments combined.							
Structure: No. 26 Canfield Gardens Sub-structure: wall 7							
Vertical Offset from Line for Vertical Movement Calculations	Combined Segment	Start Length	Curvature	Deflection Ratio	Average Horizontal Strain	Max. Tensile Strain	Damage Category
[m]	[m]	[m]		[%]	[%]	[%]	
No structures have segments combined.							
Structure: No. 26 Canfield Gardens Sub-structure: wall 8							
Vertical Offset from Line for Vertical Movement Calculations	Combined Segment	Start Length	Curvature	Deflection Ratio	Average Horizontal Strain	Max. Tensile Strain	Damage Category
[m]	[m]	[m]		[%]	[%]	[%]	
No structures have segments combined.							

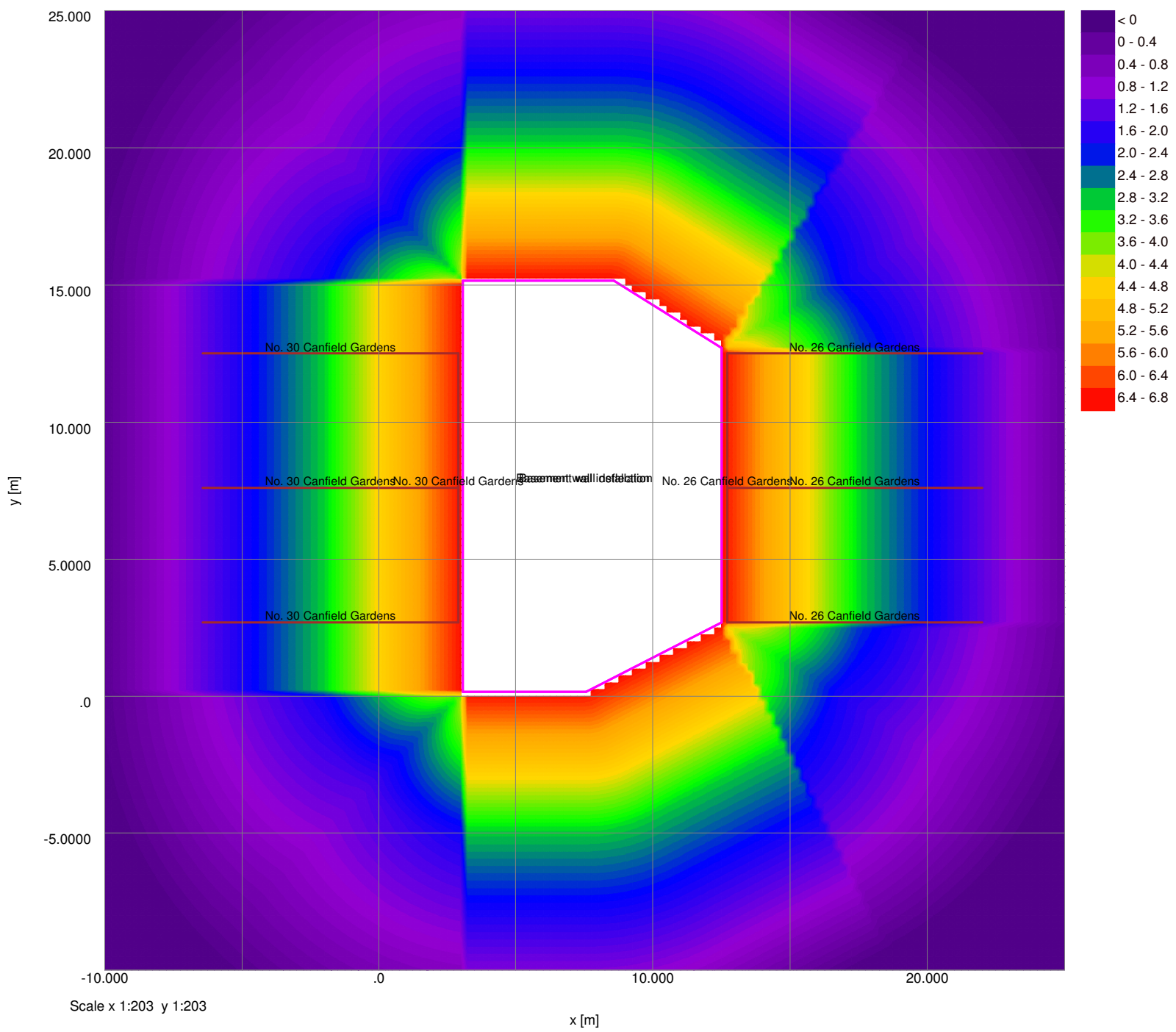
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Vertical Settlement Contours: Grid 1 (level 0.000m) (Interval 0.1mm)



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Made by OC	Date 29-Nov-2016	Checked

Horizontal Displacement Contours: Grid 1 (level 0.000m) Interval 0.1mm



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