

## VectorMap Local

Published 2021

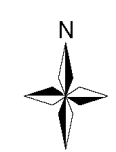
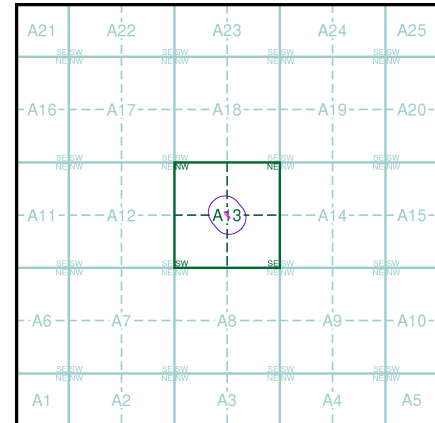
Source map scale - 1:10,000

VectorMap Local (Raster) is Ordnance Survey's highest detailed 'backdrop' mapping product. These maps are produced from OS's VectorMap Local, a simple vector dataset at a nominal scale of 1:10,000, covering the whole of Great Britain, that has been designed for creating graphical mapping. OS VectorMap Local is derived from large-scale information surveyed at 1:1250 scale (covering major towns and cities), 1:2500 scale (smaller towns, villages and developed rural areas), and 1:10 000 scale (mountain, moorland and river estuary areas).

### Map Name(s) and Date(s)

TQ28NW	TQ28NE
2021	2021
Variable	Variable
TQ28SW	TQ28SE
2021	2021
Variable	Variable

### Historical Map - Slice A



### Order Details

Order Number: 291190794\_1\_1  
Customer Ref: J22040  
National Grid Reference: 525660, 185620  
Slice: A  
Site Area (Ha): 0.05  
Search Buffer (m): 1000

### Site Details

25, Oakhill Avenue, LONDON, NW3 7RD



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# Preliminary UXO Risk Assessment

[www.1stlinedefence.co.uk](http://www.1stlinedefence.co.uk)

<b>Client</b>	GEA Ltd.
<b>Project</b>	25 Oakhill Avenue
<b>Site Address</b>	25 Oakhill Avenue, London NW3 7RD
<b>Report Reference</b>	PA15210-00
<b>Date</b>	18/02/22
<b>Originator</b>	AB

## Assessment Objective

This preliminary risk assessment is a qualitative screening exercise to assess the likely potential of encountering unexploded ordnance (UXO) at the 25 Oakhill Avenue site. The assessment involves the consideration of the basic factors that affect the potential for UXO to be present at a site as outlined in Stage One of the UXO risk management process.

## Background

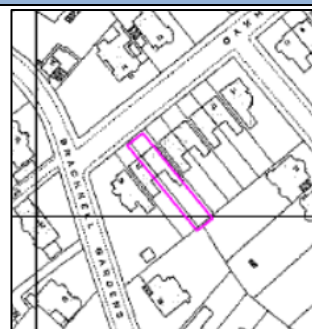
This assessment uses the sources of information available in-house to 1<sup>st</sup> Line Defence Ltd to enable the placement of a development site in context with events that may have led to the presence of German air-delivered or Allied military UXO. The report will identify any immediate necessity for risk mitigation or additional research in the form of a Detailed UXO Risk Assessment. It makes use of 1<sup>st</sup> Line Defence's extensive historical archives, library and unique geo-databases, as well as internet resources, and is researched and compiled by UXO specialists and graduate researchers.

The assessment directly follows CIRIA C681 guidelines "Unexploded Ordnance, a Guide for the Construction Industry". The document will therefore assess the following factors:

- Basic Site Data
- Previous Military Use
- Indicators of potential aerial delivered UXO threat
- Consideration of any Mitigating Factors
- Extent of Proposed Intrusive Works
- Any requirement for Further Work

It should be noted that the vast majority of construction sites in the UK will have a low or negligible risk of encountering UXO and should be able to be screened out at this preliminary stage. The report is meant as a common sense 'first step' in the UXO risk management process. The content of the report and conclusions drawn are based on basic, preliminary research using the information available to 1<sup>st</sup> Line Defence at the time this report was produced. It should be noted that the only way to entirely negate risk from UXO to a project would be to support the works proposed with appropriate UXO risk mitigation measures. It is rarely possible to state that there is absolutely 'no' risk from UXO to a project.



Risk Assessment Considerations		
Site location and description/current use	<p>The site is situated within the London Borough of Camden.</p> <p>Recent aerial photography shows the site to be occupied by a single residential structure and its associated back garden. The site is bound by Oakhill Avenue to the north, with additional residential properties and gardens situated to the east, south and west.</p> <p>The site is approximately centred on the OS grid reference: <b>TQ 25662 85621</b>.</p>	
Are there any indicators of current/historical military activity on/close to the site?	<p>At this stage, in-house records do not indicate that the site footprint had any former military use. No features such as WWII defensive positions, encampments or firing ranges are recorded to have been located at the site. In addition, no information of ordnance being stored, produced, or disposed of within the site area could be found.</p> <p>The closest Heavy Anti-Aircraft (HAA) battery was situated approximately 1.9km to the north-east of the site. The conditions in which unexploded anti-aircraft ordnance may have fallen unrecorded are analogous to that of aerial delivered German bombs – see the sections below for further information.</p>	
What was the pre- and post-WWII history of the site?	<p>Pre-WWII OS Mapping dated 1934 shows the site to be occupied by a single terraced residential structure and its associated back garden. The site is bound by Oakhill Avenue to the north, additional residential properties to the east and west, with additional gardens to the south. The wider surrounding area is of a similar composition and largely residential in nature.</p> <p>OS Mapping dated 1954 suggests that no significant change occurred on site or in the immediate surrounding area post-WWII.</p>	
Was the area subject to bombing during WWII?	<p>During WWII, the site was situated within the Metropolitan Borough of Hampstead. According to official Home Office bombing statistics, this borough sustained an overall very high density of bombing, with an average of 166 items of ordnance recorded per 1,000 acres. This included 321 high explosive (HE) bombs, six parachute mines, 31 oil bombs, five phosphorous bombs, ten V-1 flying bombs and three V2 long-range rockets; a total of 376 incidents over 2,265 acres.</p> <p>London bomb census mapping did not record any incidents within the site boundary or its immediate surrounds; the closest recorded HE bomb strike is plotted approximately 120m to the south, on Bracknell Gardens.</p>	
Is there any evidence of bomb damage on/close to the site?	<p>London County Council (LCC) bomb damage mapping does not record any damage to the structures located on site during WWII, nor to any of the neighbouring structures located within the immediate vicinity.</p> <p>This is consistent with historical OS mapping which has been found to suggest no notable changes to the site footprint post WWII. In addition, aerial photography dated from 1946, available in-house on this occasion, appears to show no visible indicators of bomb damage on site.</p>	





To what degree would the site have been subject to access?	As the site was occupied by a residential property, situated within an urbanised area of central London, it is thought that it would have been subject to a regular degree of monitor and access throughout the war. Frequent access may increase the likelihood of UXO indicators, such as entry holes and craters, being noted and reported.
To what degree has the site been developed post-WWII?	Available post war OS mapping and aerial imagery suggests that minimal post war redevelopment has occurred on the site footprint.
What is the nature and extent of the intrusive works proposed?	The proposed works are understood to comprise a number of boreholes.

### Summary and Conclusions

During WWII, the site was located within the Metropolitan Borough of Hampstead; official Home Office statistics suggest that this area sustained an overall very high density of bombing, with an average of 166 items recorded per 1000 acres. London bomb census mapping does not record any HE bombs on site; the closest recorded incident was situated approximately 120m to the south. LCC bomb damage mapping does not record any damage on site.

Likewise, no changes indicative of bomb damage, such as cleared structures or structures labelled as 'ruin', were evident when comparing pre- and post-WWII OS mapping, or visible in available aerial photography.

Given the lack of bombing and recorded damage on and surrounding the site, it is anticipated that the site would have been regularly accessed and monitored during the war, increasing the likelihood that any UXO items would have been discovered.

### Recommendations

Given the findings of this preliminary report, the risk from UXO on site is not considered to be significantly elevated above the background level for London. Whilst it would be possible to conduct a Detailed UXO Risk Assessment to analyse local bombing records, it is not thought likely that the acquisition of such records would significantly alter the findings of this report. It is therefore recommended that **no further research** be undertaken for this site.

If the client has any anecdotal or empirical evidence of UXO risk on site, please contact 1<sup>st</sup> Line Defence.

It should be noted that although the risk from unexploded ordnance on this site has been assessed as low/minimal, this does not mean there is 'no' risk of encountering UXO. This preliminary report has been undertaken with due diligence, and all reasonable care has been taken to access and analyse relevant historical information. By necessity, when dealing with historical evidence, and when making assessments of UXO risk, various assumptions have to be made which we have discussed and justified within this report. Our reports take a common-sense and practical approach to the assessment of UXO risk, and we strive to be reasonable and pragmatic in our conclusions. As referenced, it would be possible to undertake further research into this site, but based on the evidence to hand, this is not deemed strictly necessary, and no reasonably justifiable requirement for proactive on-site mitigation has been identified.

It should however be stressed that if any suspect items are encountered during the proposed works, 1<sup>st</sup> Line Defence should be contacted for advice/assistance, and to re-assess the risk as necessary. Furthermore, we would recommend that ground personnel are always made aware of the potential for encountering UXO, what to look out for and what to do in the unlikely event that a suspect item is encountered, and that a UXO Risk Management Plan is put together for the proposed works. We would be happy to provide a template and guidance for this – contact us on 01992 245020. Should the scope of works change or additional works be proposed, 1<sup>st</sup> Line Defence should be contacted to re-evaluate the risk.





## appendix d

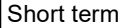
### Ground Movement Analysis

PDisp Analysis – Short term and Overall Contour Plots

PDisp Analysis – All Input Data

XDisp Analysis – Installation & Excavation Movements

XDisp Analysis – Building Damage Assessment Results

Page 1  
Time 12:38

	[m]	[m]	[m]	[m]	[%]	[kN/m <sup>2</sup> ]
1 Excavation	-3.45000	(0.6,0.6)	(9.6,0.6)	(9.6,1.7)	10.000	2 -65.000
		(13.5,1.7)	(13.5,7)	(0.6,7)		
		(0.6,0.6)				

## Polygonal Loads' Rectangles

No.	Centre : x	Centre : y	Angle of local x from global X [Degrees]	Width x [m]	Depth y [m]
-----	---------------	---------------	--	----------------	----------------

	[m]	[m]	[Degrees]	[m]	[m]
<b>Load 1 : Excavation</b>					
(Edge 1 optimal)					
1	5.10000	3.80000	0.0	9.0000	6.4000
2	11.55000	4.35000	0.0	3.9000	5.3000

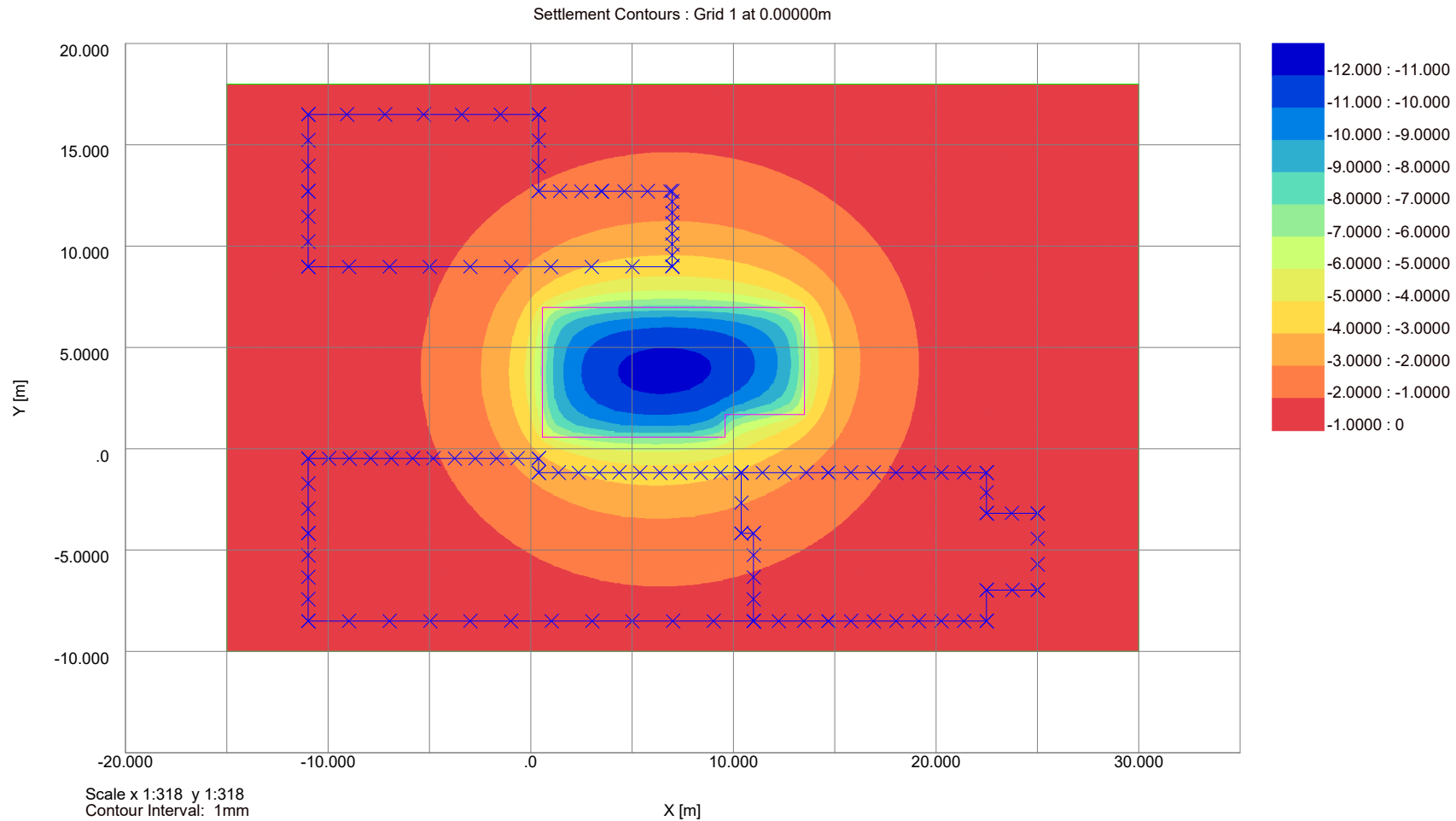
### Displacement Lines

Name	X1	Y1	Z1	X2	Y2	Z2	Intervals	Calculate	Detailed Results
	[m]	[m]	[m]	[m]	[m]	[m]	[No.]		
27A	-11.00000	-0.50000	-1.00000	0.40000	-0.50000	-1.00000	11	Yes	No
27B	-10.40000	-0.50000	-1.00000	0.40000	-1.20000	-1.00000	1	Yes	No
27C	0.40000	-1.20000	-1.00000	10.40000	-1.20000	-1.00000	10	Yes	No
27D	10.40000	-1.20000	-5.30000	14.70000	-1.20000	-5.30000	4	Yes	No
27E	14.70000	-1.20000	-5.30000	22.50000	-1.20000	-5.30000	7	Yes	No
27F	22.50000	-1.20000	-5.30000	22.50000	-3.20000	-5.30000	2	Yes	No
27G	22.50000	-3.20000	-5.30000	25.00000	-3.20000	-5.30000	7	Yes	No
27H	25.00000	-3.20000	-5.30000	22.50000	-7.00000	-5.30000	3	Yes	No
27I	25.00000	-7.00000	-5.30000	22.50000	-7.00000	-5.30000	2	Yes	No
27J	22.50000	-7.00000	-5.30000	22.50000	-8.50000	-5.30000	1	Yes	No
27K	22.50000	-8.50000	-5.30000	14.70000	-8.50000	-5.30000	7	Yes	No
27L	14.70000	-8.50000	-5.30000	11.00000	-8.50000	-5.30000	3	Yes	No
27M	11.00000	-8.50000	-5.30000	11.00000	-4.20000	-5.30000	4	Yes	No
27N	11.00000	-4.20000	-5.30000	10.40000	-4.20000	-5.30000	1	Yes	No
27O	-11.00000	-4.20000	-1.00000	10.40000	-4.20000	-1.00000	2	Yes	No
27P	11.00000	-8.50000	-1.00000	-11.00000	-5.00000	-1.00000	11	Yes	No
27Q	-11.00000	-8.50000	-1.00000	-11.00000	-4.20000	-1.00000	4	Yes	No
27R	-11.00000	-4.20000	-1.00000	-11.00000	-0.50000	-1.00000	3	Yes	No
23A	7.00000	12.70000	-1.00000	7.00000	9.01000	-1.00000	7	Yes	No
23B	-11.00000	9.00000	-1.00000	-11.00000	9.00000	-1.00000	3	Yes	No
23C	-11.00000	9.00000	-1.00000	-11.00000	12.70000	-1.00000	3	Yes	No
23D	-11.00000	12.70000	-1.00000	-11.00000	16.50000	-1.00000	3	Yes	No
23E	0.40000	12.70000	-1.00000	0.40000	16.50000	-1.00000	3	Yes	No
23F	10.40000	16.50000	-1.00000	-11.00000	16.50000	-1.00000	6	Yes	No
23G	6.90000	12.70000	-1.00000	3.50000	12.70000	-1.00000	3	Yes	No
23H	3.51000	12.70000	-1.00000	0.41000	12.70000	-1.00000	3	Yes	No

### Displacement Grids

Name	Extrusion: Direction	X1	Y1	Z1	X2	Y2	Z2	Intervals Along Line	Extrusion: Distance	Extrusion: Intervals Along	Calculate	Detailed Results
		[m]	[m]	[m]	[m]	[m]	[m]	[No.]	[m]	[No.]		
Grid 1	Global X	-15.00000	-10.00000	0.00000	-	18.00000	0.00000	80	45.00000	150	Yes	Yes

Job No.	Sheet No.	Rev.
J22040		
Drg. Ref.		
Made by GC	Date	Checked Date







### ***Titles***

## History

## Analysis Options

## Elastic : Yes

## Consolidation : No

Page 1  
Time 12:14



25 Oakhill Avenue

PDisp Excavation

Overall

Job No.	Sheet No.	Rev.
J22040		
Drg. Ref.		
Made by GC	Date	Checked Date

Load ref.	Name	Position : Level	Position : Polygon : Coords.	Position : Polygon Rectangles : Rect. tolerance	No. of Rectangles	Value : Normal (local z)
1	Excavation	-3.45000	(0.6,0.6) (9.6,0.6) (9.6,1.7) (13.5,1.7) (13.5,7) (0.6,7) (0.6,0.6)	10.000	2	-65.000

#### Polygonal Loads' Rectangles

No.	Centre : x	Centre : y	Angle of local x from global X [Degrees]	Width x [m]	Depth y [m]
Load 1 : Excavation (Edge 1 optimal)					
1	5.10000	3.80000	0.0	9.0000	6.4000
2	11.55000	4.35000	0.0	3.9000	5.3000

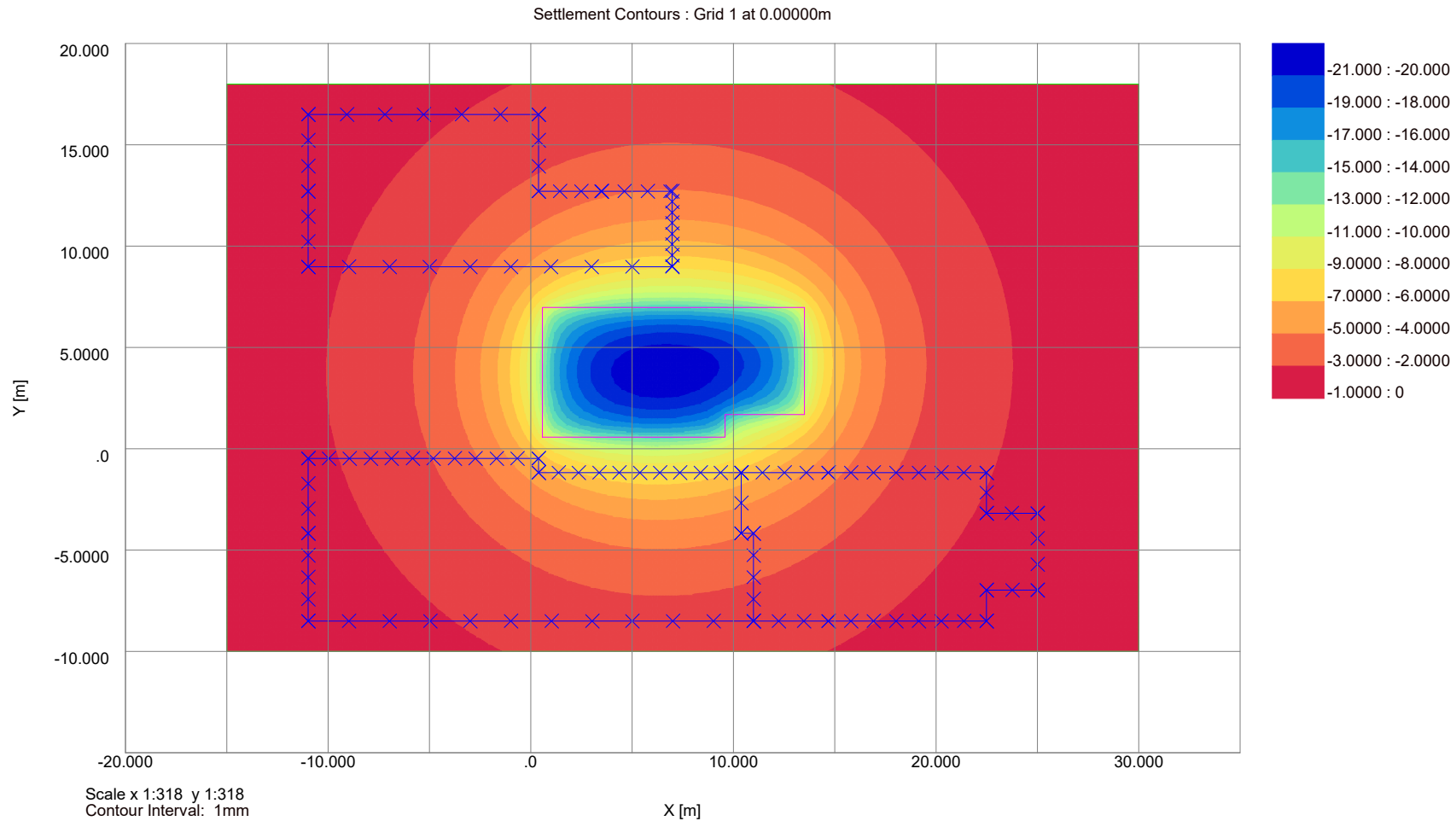
#### Displacement Lines

Name	X1	Y1	Z1	X2	Y2	Z2	Intervals	Calculate	Detailed Results
	[m]	[m]	[m]	[m]	[m]	[m]	[No.]		
27A	-11.00000	-0.50000	-1.00000	0.40000	-0.50000	-1.00000	11	Yes	No
27B	0.40000	-0.50000	-1.00000	0.40000	-1.20000	-1.00000	1	Yes	No
27C	0.40000	-1.20000	-1.00000	10.40000	-1.20000	-1.00000	10	Yes	No
27D	10.40000	-1.20000	-5.30000	14.70000	-1.20000	-5.30000	4	Yes	No
27E	14.70000	-1.20000	-5.30000	22.50000	-1.20000	-5.30000	7	Yes	No
27F	22.50000	-1.20000	-5.30000	22.50000	-3.20000	-5.30000	2	Yes	No
27G	22.50000	-3.20000	-5.30000	25.00000	-3.20000	-5.30000	2	Yes	No
27H	25.00000	-3.20000	-5.30000	25.00000	-7.00000	-5.30000	3	Yes	No
27I	25.00000	-7.00000	-5.30000	22.50000	-7.00000	-5.30000	2	Yes	No
27J	22.50000	-7.00000	-5.30000	22.50000	-8.50000	-5.30000	1	Yes	No
27K	22.50000	-8.50000	-5.30000	14.70000	-8.50000	-5.30000	7	Yes	No
27L	14.70000	-8.50000	-5.30000	11.00000	-8.50000	-5.30000	3	Yes	No
27M	11.00000	-8.50000	-5.30000	11.00000	-4.20000	-5.30000	4	Yes	No
27N	11.00000	-4.20000	-5.30000	10.40000	-4.20000	-5.30000	1	Yes	No
27O	10.40000	-4.20000	-5.30000	10.40000	-1.20000	-5.30000	2	Yes	No
27P	11.00000	-8.50000	-1.00000	-11.00000	-8.50000	-1.00000	11	Yes	No
27Q	-11.00000	-8.50000	-1.00000	-11.00000	-4.20000	-1.00000	4	Yes	No
27R	-11.00000	-4.20000	-1.00000	-11.00000	-0.50000	-1.00000	3	Yes	No
23A	7.00000	12.70000	-1.00000	7.00000	9.01000	-1.00000	7	Yes	No
23B	7.00000	9.00000	-1.00000	-11.00000	9.00000	-1.00000	9	Yes	No
23C	-11.00000	9.00000	-1.00000	-11.00000	12.70000	-1.00000	3	Yes	No
23D	-11.00000	12.70000	-1.00000	-11.00000	16.50000	-1.00000	3	Yes	No
23E	0.40000	12.70000	-1.00000	0.40000	16.50000	-1.00000	3	Yes	No
23F	0.40000	16.50000	-1.00000	-11.00000	16.50000	-1.00000	6	Yes	No
23G	6.90000	12.70000	-1.00000	3.50000	12.70000	-1.00000	3	Yes	No
23H	3.51000	12.70000	-1.00000	0.41000	12.70000	-1.00000	3	Yes	No

#### Displacement Grids

Name	Extrusion: Direction	X1	Y1	Z1	X2	Y2	Z2	Intervals Along Line [No.]	Extrusion: Distance [m]	Extrusion: Intervals Along [No.]	Calculate	Detailed Results
Grid 1	Global X	-15.00000	-10.00000	0.00000	-	18.00000	0.00000	80	45.00000	150	Yes	Yes

Job No.	Sheet No.	Rev.
J22040		
Drg. Ref.		
Made by GC	Date	Checked Date







25 Oakhill Avenue  
Installation and Excavation Movements  
Displacement Contours

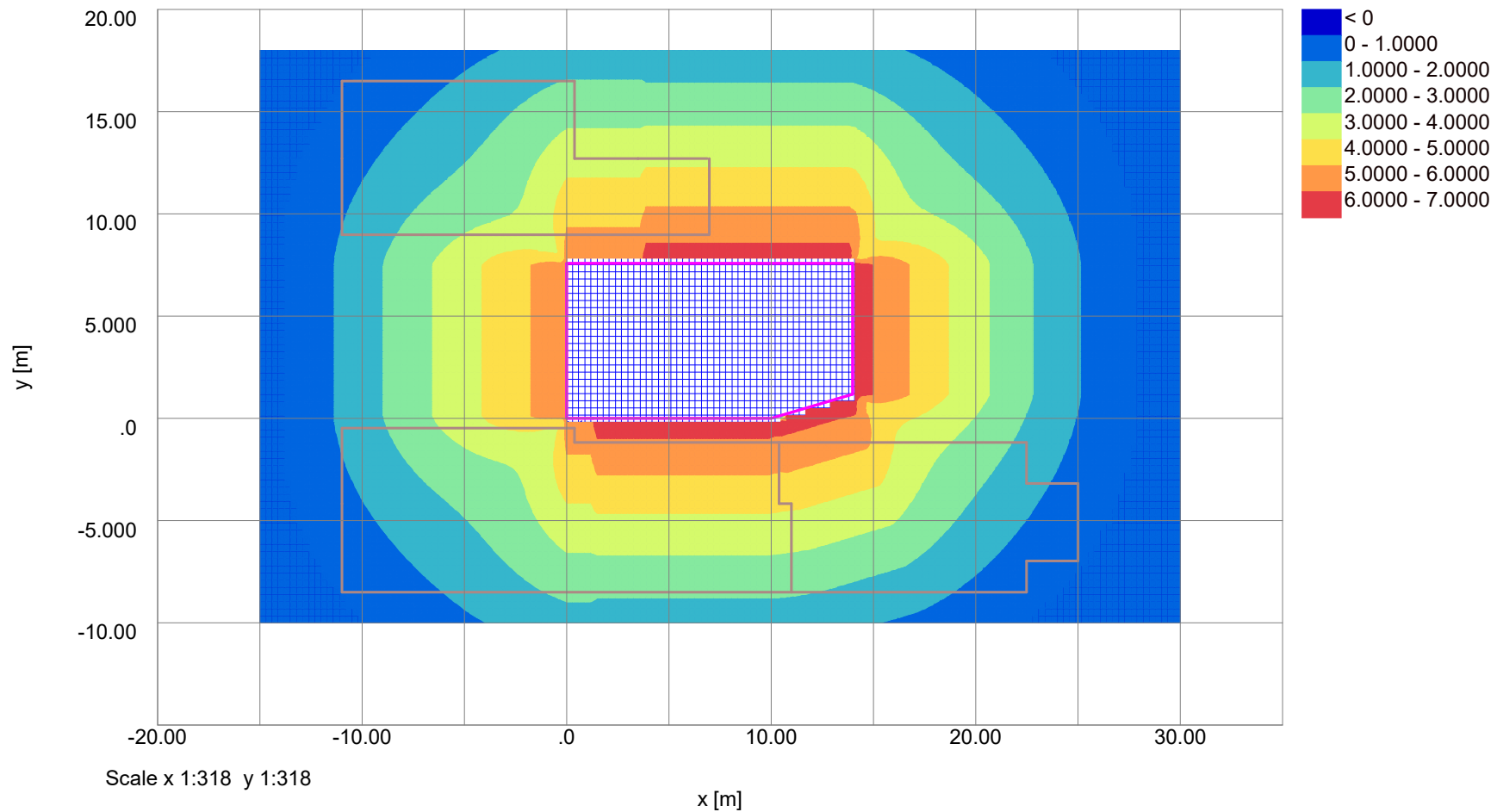
Job No.	Sheet No.	Rev.
J22040		
Drg. Ref.		
Made by GC	Date 26-Oct-2022	Checked Date

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

Stage: Ref.	Stage: Name	Specific Building: Ref.	Specific Building: Name	Sub-building Name	Vertical Offset from Line for Vertical Movement Calculations [m]	Deflection Ratio [%]	Average Horizontal Strain [%]	Max Slope	Max Settlement [mm]	Max Tensile Strain [%]	Max Gradient of Horizontal Displacement Curve	Max Gradient of Vertical Displacement Curve	Min Radius of Curvature (Hogging) [m]	Min Radius of Curvature (Sagging) [m]	Damage Category
0	Base Model	1	27 Oakhill Av	27A	0.0	0.026507	-0.25858	-916.80E-6	5.7021	0.051847	0.0030055	-916.80E-6	-	1924.1	1 (Very Slight)
		2	27 Oakhill Av	27B	0.0	0.0	0.041500	-0.0013971	5.0800	0.041500	-414.83E-6	-0.0013971	-	- 0	(Negligible)
		3	27 Oakhill Av	27C	0.0	0.034801	-0.055940	0.0015660	5.0800	0.035093	0.0016810	0.0015660	-	- 0	(Negligible)
		4	27 Oakhill Av	27D	0.0	732.75E-12	0.0015253	28.734E-6	1.2736	0.0015253	-16.028E-6	28.734E-6	-	- 0	(Negligible)
		5	27 Oakhill Av	27E	0.0	669.36E-6	0.0019527	95.701E-6	1.1500	0.0029635	124.92E-6	95.701E-6	-	- 0	(Negligible)
		6	27 Oakhill Av	27F	0.0	232.81E-6	113.04E-6	41.653E-6	0.51677	300.09E-6	-4.7091E-6	41.653E-6	-	- 0	(Negligible)
		7	27 Oakhill Av	27G	0.0	49.552E-6	0.0020017	92.041E-6	0.44287	0.0020402	-40.033E-6	92.041E-6	-	- 0	(Negligible)
		8	27 Oakhill Av	27H	0.0	0.0	0.0	49.652E-6	0.21526	35.763E-9	0.0	49.652E-6	-	- 0	(Negligible)
		9	27 Oakhill Av	27I	0.0	0.0	0.0	-78.421E-6	0.21894	35.763E-9	0.0	-78.421E-6	-	- 0	(Negligible)
		10	27 Oakhill Av	27J	0.0	0.0	0.0	72.447E-6	0.21894	35.763E-9	0.0	72.447E-6	-	- 0	(Negligible)
		11	27 Oakhill Av	27K	0.0	570.72E-6	655.50E-6	-63.317E-6	0.45079	0.0011118	-6.5549E-6	-63.317E-6	-	- 0	(Negligible)
		12	27 Oakhill Av	27L	0.0	231.77E-6	675.77E-6	-28.735E-6	0.54412	675.74E-6	13.004E-6	-28.735E-6	-	- 0	(Negligible)
		13	27 Oakhill Av	27M	0.0	22.692E-6	0.010597	-99.208E-6	0.96826	0.010615	-122.24E-6	-99.208E-6	-	- 0	(Negligible)
		14	27 Oakhill Av	27N	0.0	0.0	-0.014091	-16.403E-6	0.97808	0.0028181	140.93E-6	-16.403E-6	-	- 0	(Negligible)
		15	27 Oakhill Av	27O	0.0	40.274E-6	0.015296	-99.288E-6	1.2736	0.015319	-158.55E-6	-99.288E-6	-	- 0	(Negligible)
		16	27 Oakhill Av	27P	0.0	0.0051143	-0.0075017	203.50E-6	1.4103	0.0070592	-152.72E-6	203.50E-6	-	- 0	(Negligible)
		17	27 Oakhill Av	27Q	0.0	20.195E-6	0.0028023	-50.446E-6	0.22423	0.0028100	-64.234E-6	-50.446E-6	-	- 0	(Negligible)
		18	27 Oakhill Av	27R	0.0	433.73E-6	-0.0043706	-42.811E-6	0.34648	906.12E-6	62.068E-6	-42.811E-6	-	- 0	(Negligible)
		19	23 Oakhill Av	23A	0.0	0.0094382	0.053457	-471.53E-6	3.6705	0.066323	-563.55E-6	-471.53E-6	-	- 1	(Very Slight)
		20	23 Oakhill Av	23B	0.0	0.020375	0.033437	888.41E-6	5.5520	0.044007	990.71E-6	888.41E-6	-	4749.4	0 (Negligible)
		21	23 Oakhill Av	23C	0.0	222.35E-6	-0.0032267	42.200E-6	0.33087	656.21E-6	51.771E-6	42.200E-6	-	- 0	(Negligible)
		22	23 Oakhill Av	23D	0.0	0.0	0.0032367	53.198E-6	0.18657	0.0032367	-67.328E-6	53.198E-6	-	- 0	(Negligible)
		23	23 Oakhill Av	23E	0.0	0.0044471	0.041500	919.96E-6	4.3161	0.045712	-414.83E-6	919.96E-6	-	- 0	(Negligible)
		24	23 Oakhill Av	23F	0.0	0.0025966	-0.0093740	168.47E-6	1.1623	0.0067637	-118.64E-6	168.47E-6	-	- 0	(Negligible)
		25	23 Oakhill Av	23G	0.0	0.032140	0.0	-0.0013483	4.3161	0.038007	0.0	-0.0013483	-	- 0	(Negligible)
		26	23 Oakhill Av	23H	0.0	0.0	0.0	0.0	4.3161	35.763E-9	0.0	0.0	-	- 0	(Negligible)

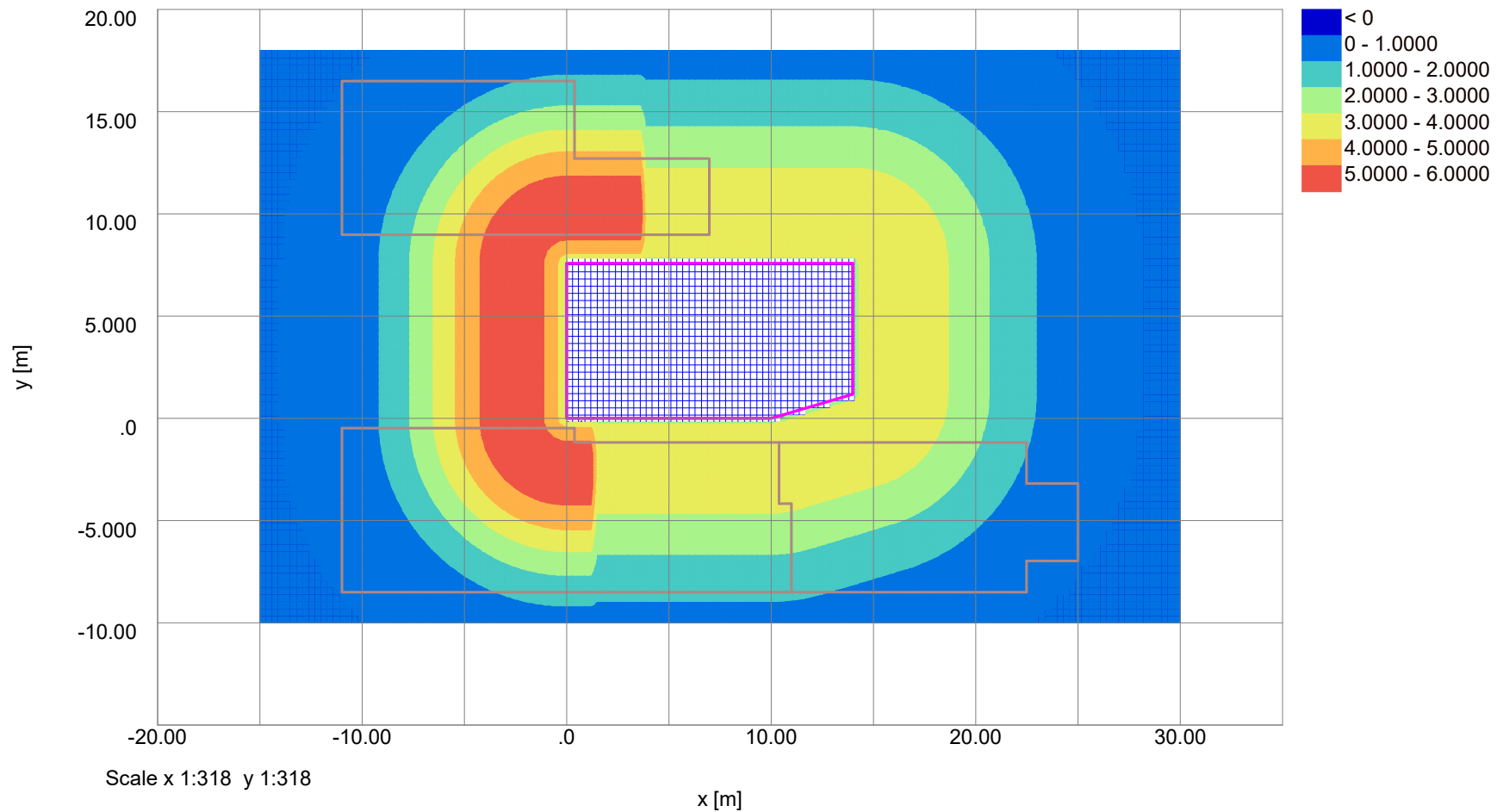
Job No.	Sheet No.	Rev.
J22040		
Drg. Ref.		
Made by GC	Date 26-Oct-2022	Checked Date

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



Job No.	Sheet No.	Rev.
J22040		
Drg. Ref.		
Made by GC	Date 26-Oct-2022	Checked Date

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







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