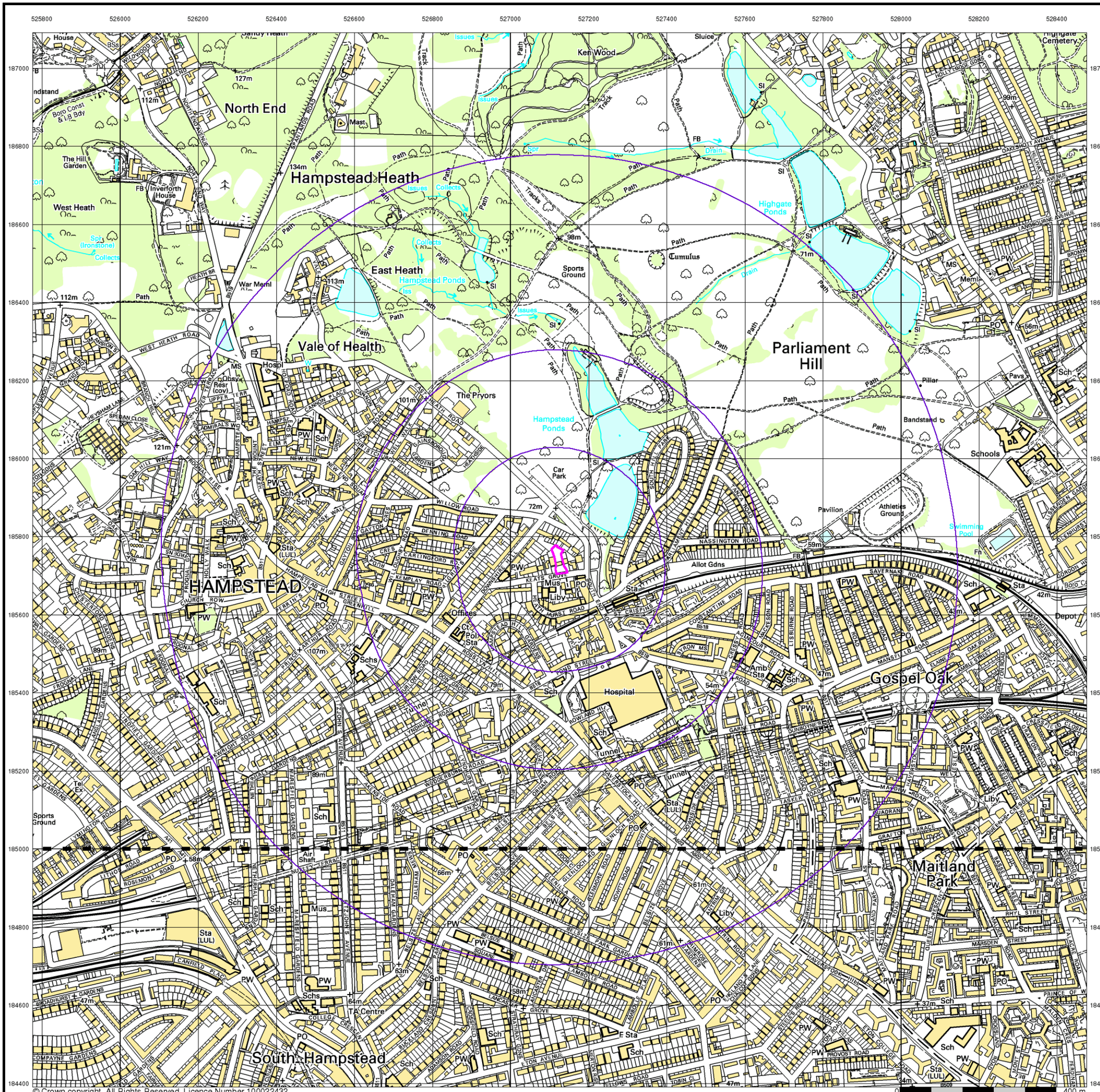


GEA

10k Raster Mapping

Published 2006

Source map scale - 1:10,000

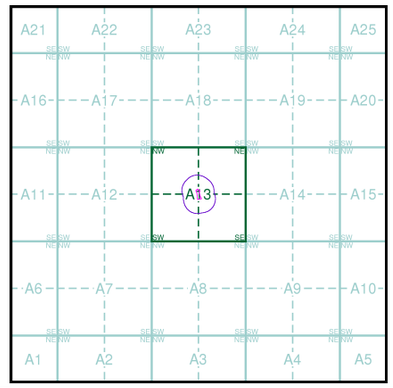
The historical maps shown were produced from the Ordnance Survey`s 1:10,000 colour raster mapping. These maps are derived from Landplan which replaced the old 1:10,000 maps originally published in 1970. The data is highly detailed showing buildings, fences and field boundaries as well as all roads, tracks and paths. Road names are also included together with the relevant road number and classification. Boundary information depiction includes county, unitary authority, district, civil parish and constituency.

Map Name(s) and Date(s)

TQ28NE
2006
1:10,000

TQ28SE
2006
1:10,000

Historical Map - Slice A



Order Details

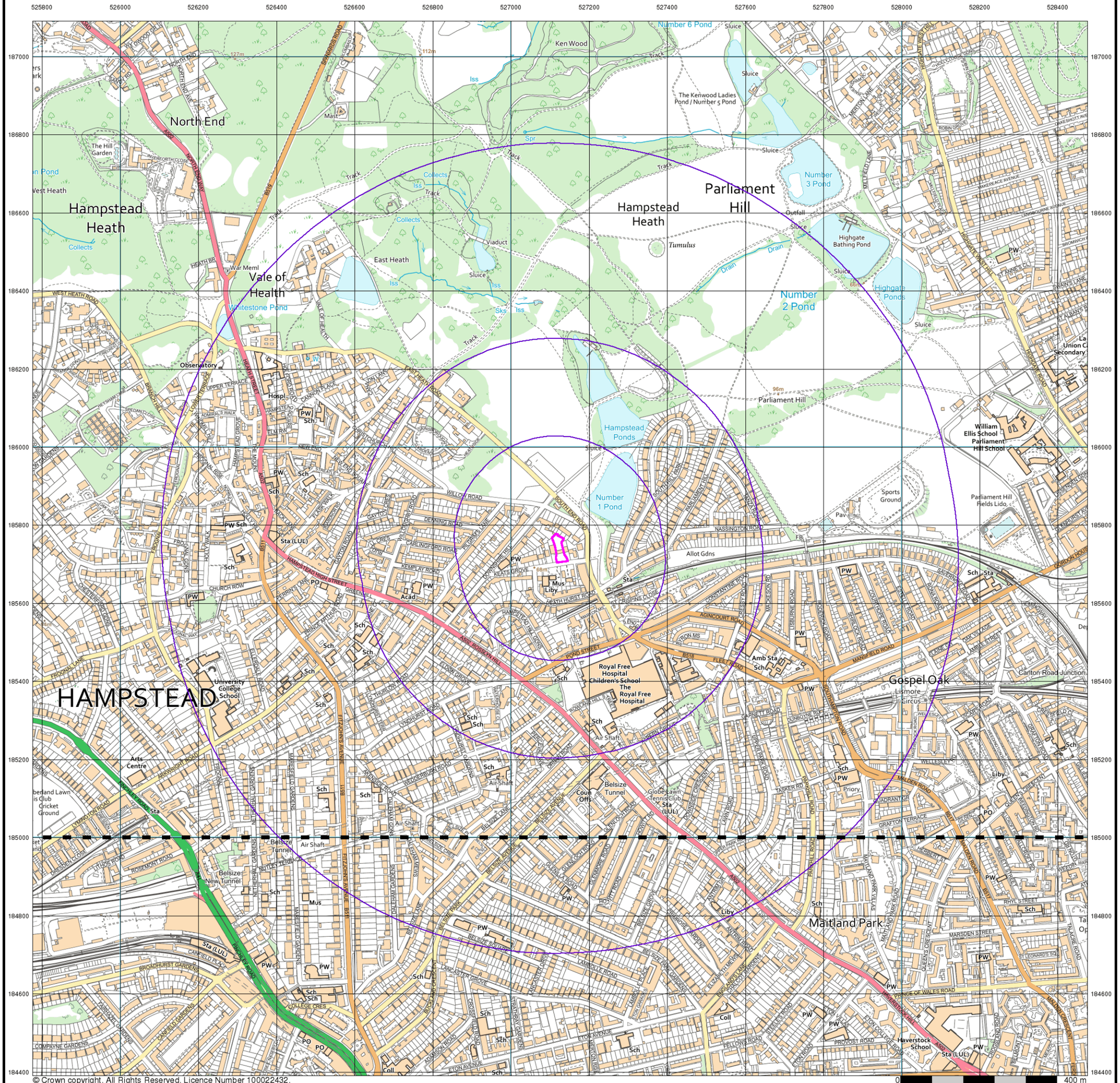
Order Number:	215322376_1_1
Customer Ref:	J19228
National Grid Reference:	527120, 185740
Slice:	A
Site Area (Ha):	0.16
Search Buffer (m):	1000

Site Details

12, Keats Grove, LONDON, NW3 2RN

Landmark INFORMATION GROUP

Tel: 0844 844 9952
Fax: 0844 844 9951
Web: www.envirocheck.co.uk



GEA

VectorMap Local

Published 2019

Source map scale - 1:10,000

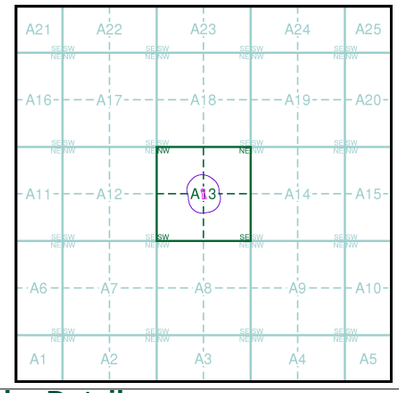
VectorMap Local (Raster) is Ordnance Survey's highest detailed 'backdrop' mapping product. These maps are produced from OS's VectorMap Local, a simple vector dataset at a nominal scale of 1:10,000, covering the whole of Great Britain, that has been designed for creating graphical mapping. OS VectorMap 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)

TQ28NE
2019
Variable

TQ28SE
2019
Variable

Historical Map - Slice A



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Company No: 7717863
VAT No: 128 8833 79

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Express Preliminary UXO Risk Assessment

Client	GEA Ltd
Project	12 Keats Grove, London
Site Address	12 Keats Grove, London, NW3 2RN
Report Reference	EP9454-00
Date	23/08/19
Originator	HAS

Assessment Objective

This preliminary risk assessment is a qualitative screening exercise to assess the likely potential of encountering unexploded ordnance (UXO) at the 12 Keats Grove 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.

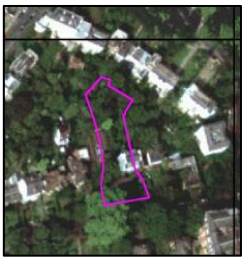
Background

This assessment uses the sources of information available in-house to 1st 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 1st 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 1st 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	The site is located within the London Borough of Camden. The area of works is situated within residential area of Hampstead. It is bordered by residential structures to the north, gardens to the east and west and Keats Grove to the south. The site comprises of a residential property and gardens. The site is approximately centred on the OS grid reference: TQ 2713285753. 
Are there any indicators of current/historical military activity on/close to the site?	At this stage, records do not indicate that the site had any former military use. The closest HAA battery was situated approximately 580m north east of the site. The conditions in which unexploded anti-aircraft ordnance may have fallen unrecorded within the proposed site are analogous to that of aerially delivered German bombs – see below for further information.
What was the pre- and post-WWII history of the site?	Pre-war OS mapping from 1915 indicates that the site comprised of open ground with one structure in the southern section of the site. The surrounding area comprised of residential properties with gardens adjacent to the site boundary. The 1934 mapping shows no obvious changes within the site boundary but there has been further development to the west of the site. Post-war mapping does not suggests that the site experienced any further changes and the surrounding area also appears to have been relatively unchanged.
Was the area subject to bombing during WWII?	According to Home Office statistics the Metropolitan Borough of Hampstead sustained a very high density bombing campaign during WWII, with an average of 166 items recorded per 1,000 acres. This included 311 high explosive (HE) bombs, 6 parachute mines, 21 oil bombs, 5 phosphorus bombs, 10 V-1 pilotless aircraft and 3 V-2 long range rocket bombs. London Bomb Census mapping does not record any bomb strikes directly on site, although, one HE bomb has been recorded adjacent to the east of the site. Additionally, Incendiary Bombing has been recorded directly on the site.
Is there any evidence of bomb damage on/close to the site?	Consulted OS mapping does not indicate that the site sustained any severe damage but the majority of the site was open ground, meaning damage is not necessarily visible. The London County Council (LCC) mapping highlights the structure on site as being 'General blast damage, not structural in nature'. One structure adjacent to the site, on South End Road, is recorded as 'damage requiring demolition'.
To what degree would the site have been subject to access?	The southern section of the site which comprised of a structure is anticipated to have been accessed regularly due to the anticipated residential nature of the site area. Although, the northern section, which comprised of open ground may not have been regularly accessed. Evidence of UXO is much more likely to go unnoticed and unrecorded in open and unfrequently accessed areas of ground.

To what degree has the site been developed post-WWII?	The site is not anticipated to have undergone significant post-war redevelopment as the structure within the site boundary was present before the war and is anticipated to still be present. The northern section of the site boundary is not anticipated to have been developed post-war.
What is the nature and extent of the intrusive works proposed?	The nature and extent of works proposed was not available at the time of writing.

Summary and Conclusions

During WWII, the site was situated within the Metropolitan Borough of Hampstead, which sustained a very high density of bombing according to Home Office statistics, with an average of 166 items recorded per 1,000 acres. Consulted London Bomb Census mapping records no incidents directly on site but one HE bomb has been recorded adjacent to the east of the boundary and incendiary bombing has been recorded on site.

The LLC damage mapping highlights that the structure on site was labelled as 'general blast damage'. One structure adjacent to the site, on South End Road, is recorded as 'damage requiring demolition'.

At this stage, it is thought likely that the strike recorded just to the east of the site actually landed to the north-east, in this area of damage. However, it is not possible to know for sure at this preliminary stage.

Further research will be required to determine the level of damage sustained on site and acquire WWII-era aerial imagery in order to assess the wartime footprint of the site.

Recommendations

In accordance with CIRIA guidelines, it is recommended that **further research** should be undertaken in the form of a **Detailed UXO Risk Assessment.**

Further research would enable the exact wartime condition of the site area to be determined, and subsequently the risk that signs of UXO could have gone unrecorded within the area of works. Further investigation would entail archive / record office visits to consult additional records of relevance, including any available high resolution WWII-era aerial imagery, relevant written records, historical maps and Goad fire insurance plans.

Prior to or in lieu of a Detailed Assessment, it is recommended that appropriate UXO Risk Mitigation Measures are provided for intrusive works proposed.

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

APPENDIX – PART 2

Ground Movement Assessment

SOIL DISPLACEMENT MODEL RESULTS

P-DISP ANALYSIS

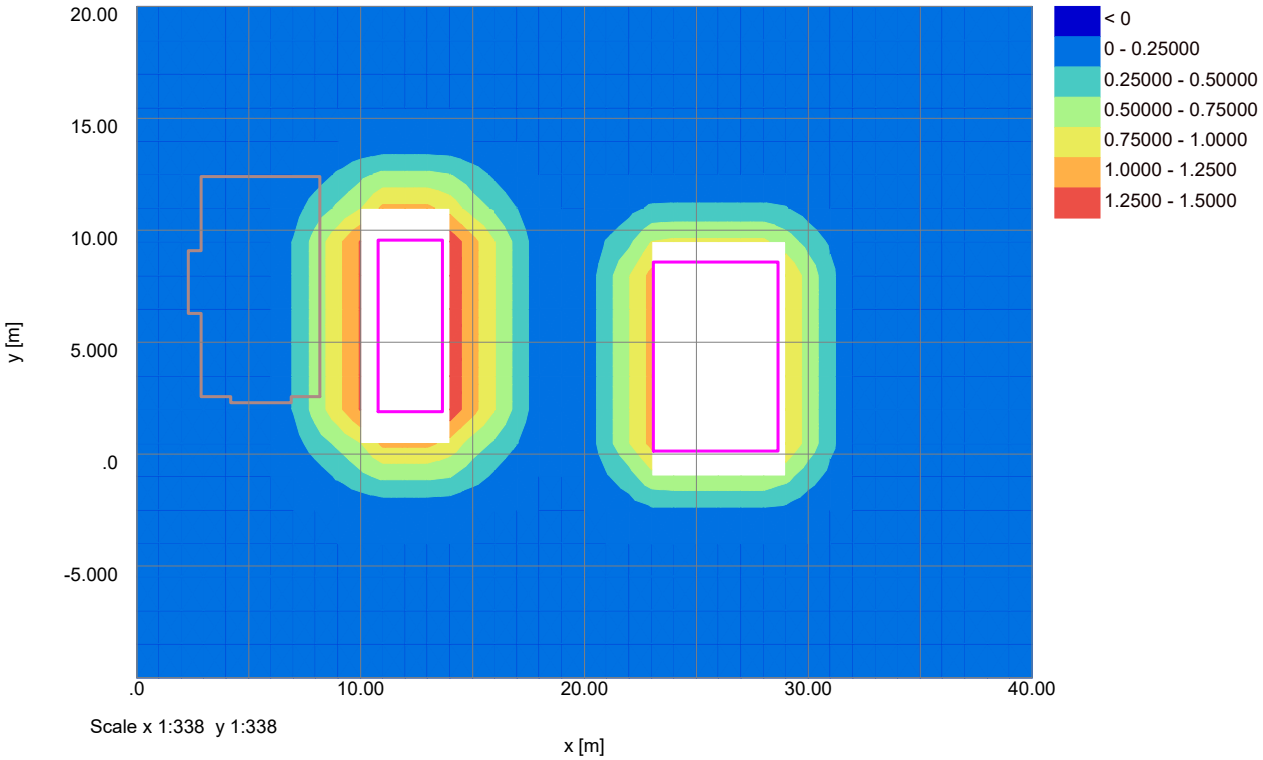
Short Term Movement
(Contour Plots and Tabular Output)

Total Movement
(Contour Plot and Tabular Output)

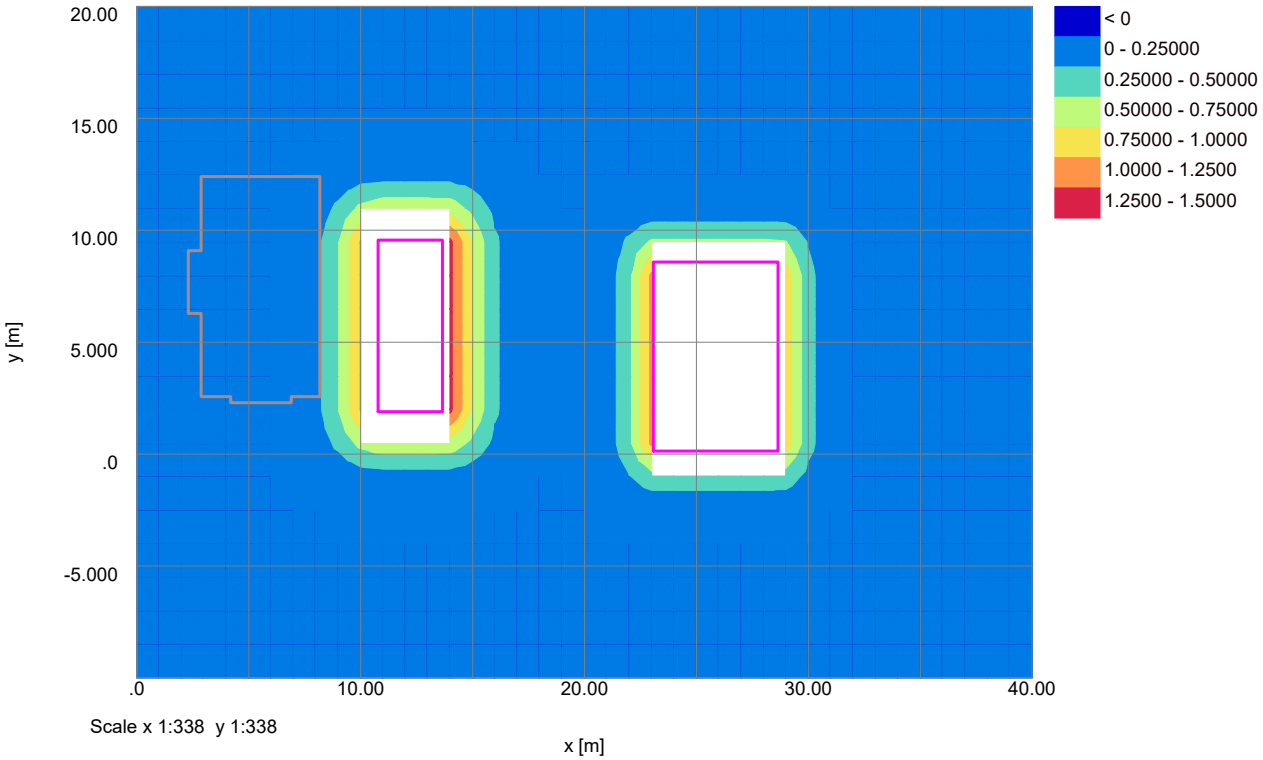
BUILDING DAMAGE ASSESSMENT (X-DISP)

Tabular Output of Results

Horizontal Displacement Contours: Grid 1 (level -1.500m) Interval 0.25mm



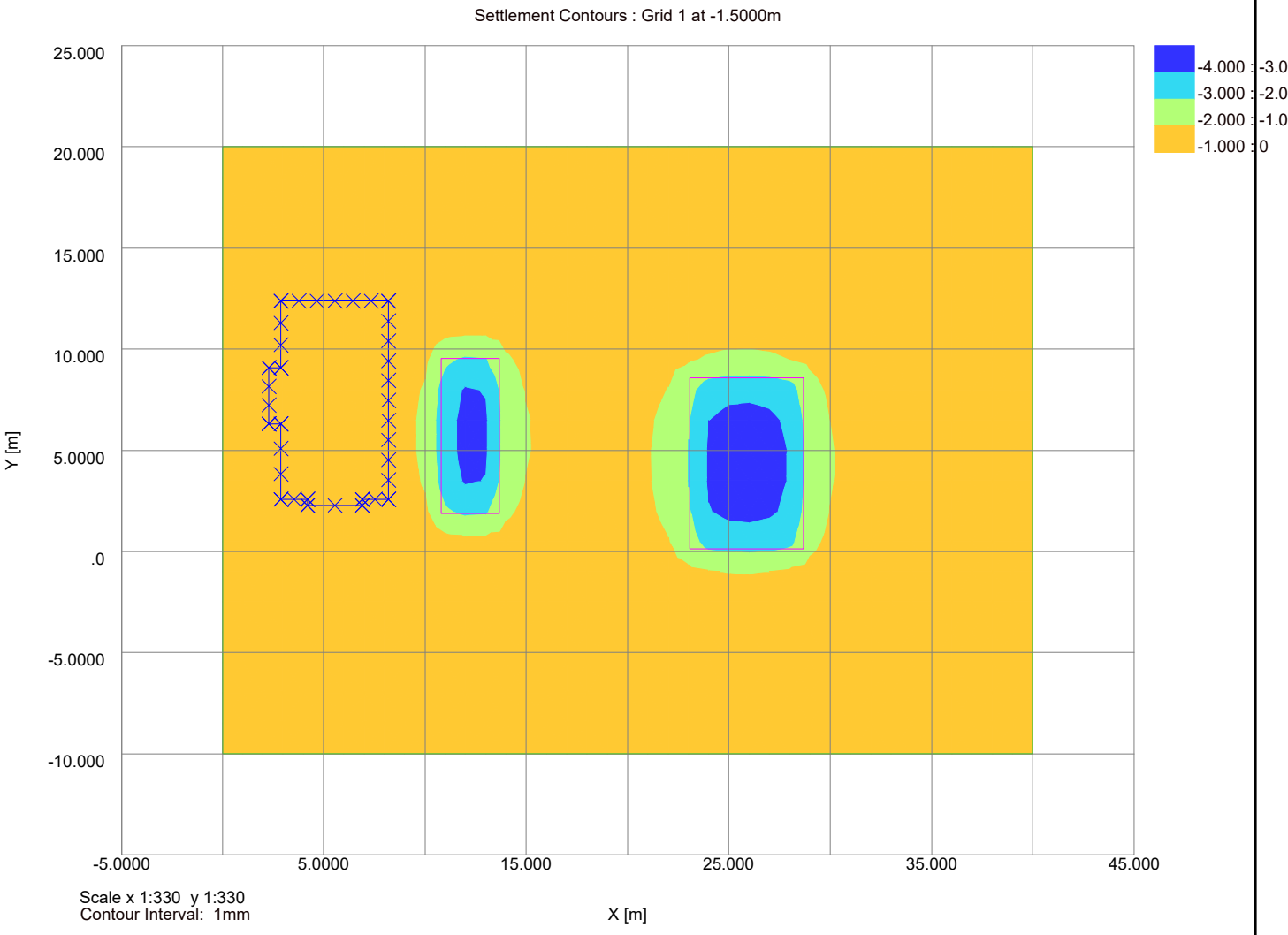
Vertical Settlement Contours: Grid 1 (level -1.500m) (Interval 0.25mm)



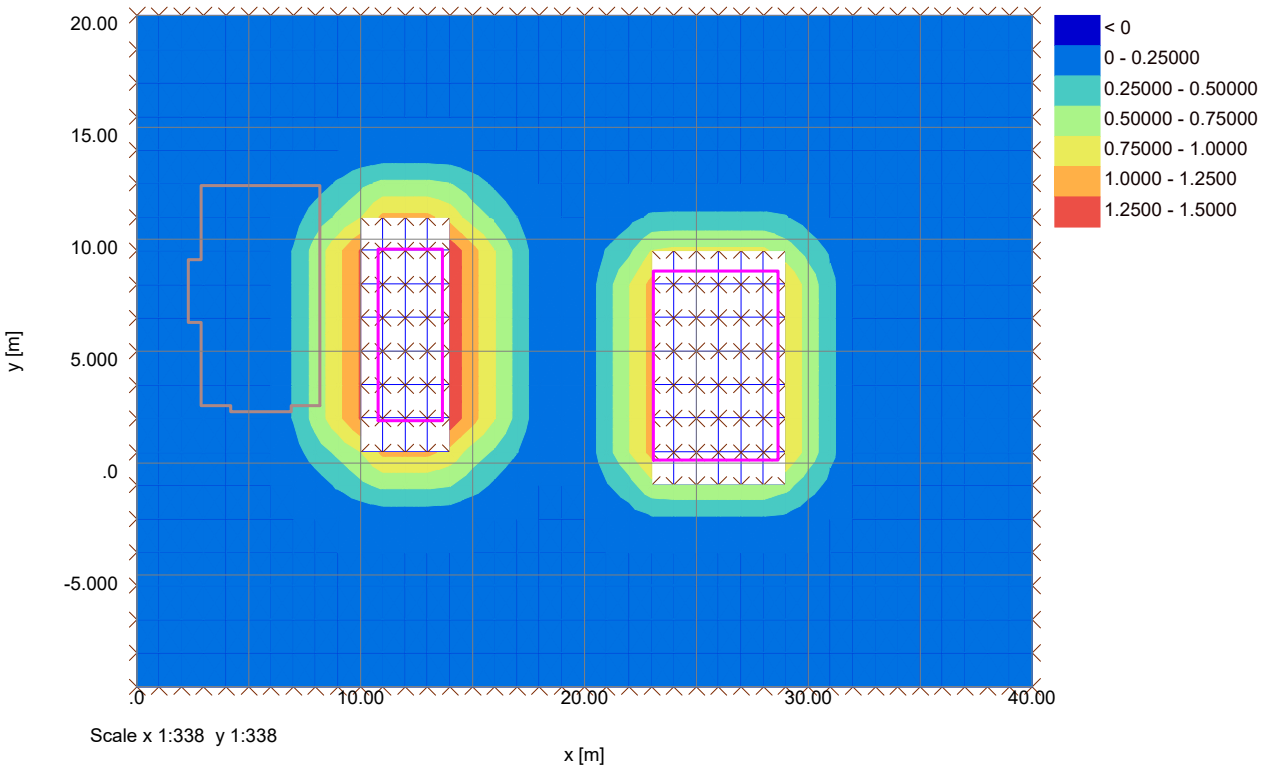
Specific Building Damage Results - Detail

Stage: Stage: Name Category Ref.	Specific Building: Ref.	Specific Building: Name	Sub-building Name	Vertical Offset from Line for Vertical Movement Calculations [m]	Segment	Start [m]	Length [m]	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 [m]	Damage
0 Base Model	1	12B Keats Grove	Wall A	0.0	1	0.0	4.9000	None	0.0	0.0	35.763E-9	0.0	0.0	-	0 (Negligible)
					2	4.9000	2.9400	Sagging	786.13E-6	-0.0043464	977.72E-6	130.41E-6	83.375E-6	33008.	0 (Negligible)
	2	12B Keats Grove	Wall B	0.0	All vertical displacements are less than the limit sensitivity.										
	3	12B Keats Grove	Wall C	0.0	All vertical displacements are less than the limit sensitivity.										
	4	12B Keats Grove	Wall D	0.0	All vertical displacements are less than the limit sensitivity.										
	5	12B Keats Grove	Wall E	0.0	All vertical displacements are less than the limit sensitivity.										
	6	12B Keats Grove	Wall F	0.0	All vertical displacements are less than the limit sensitivity.										
	7	12B Keats Grove	Wall G	0.0	All vertical displacements are less than the limit sensitivity.										
	8	12B Keats Grove	Wall H	0.0	All vertical displacements are less than the limit sensitivity.										
	9	12B Keats Grove	Wall I	0.0	All vertical displacements are less than the limit sensitivity.										
	10	12B Keats Grove	Wall J	0.0	All vertical displacements are less than the limit sensitivity.										
	11	12B Keats Grove	Wall K	0.0	All vertical displacements are less than the limit sensitivity.										
	12	12B Keats Grove	Wall L	0.0	1	1.2990	0.0	None	0.0	0.0	35.763E-9	-333.22E-6	-190.08E-6	6411.8	0 (Negligible)

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

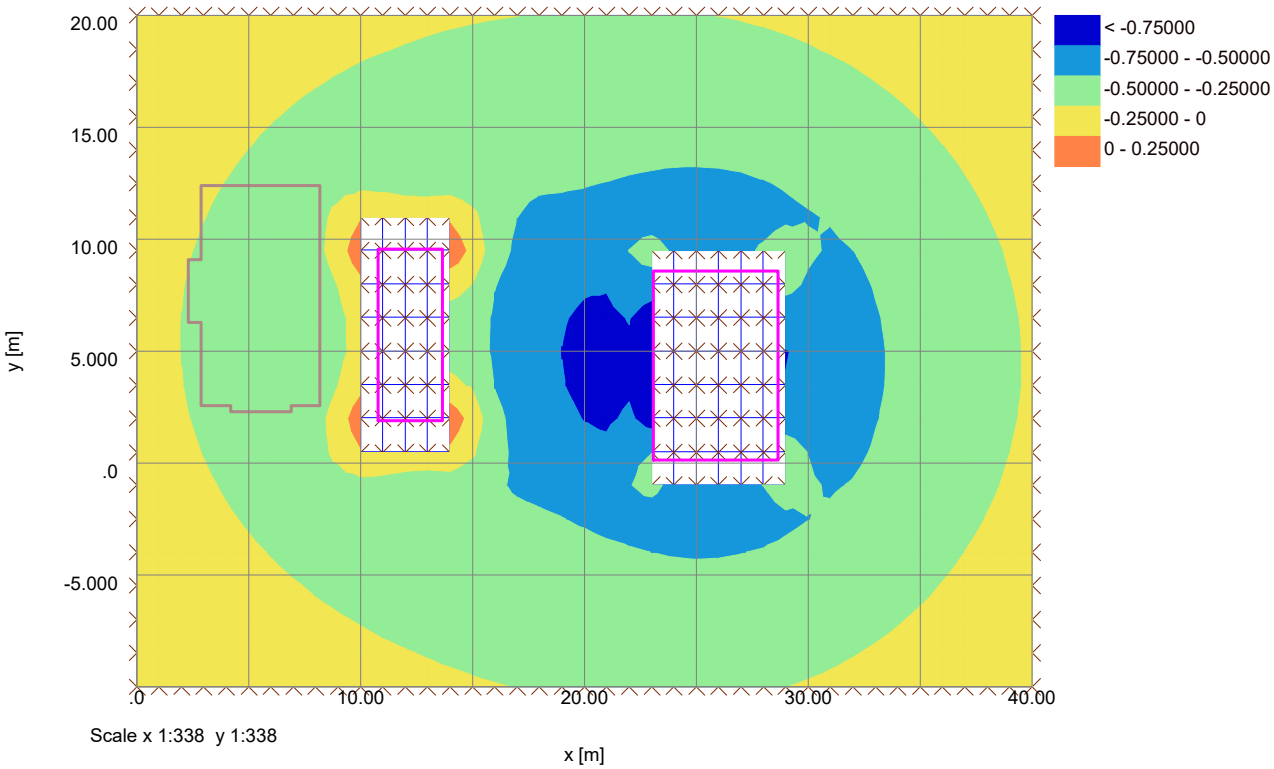

Settlement Contours : Grid 1 at -1.5000m
25.000
20.000
15.000
10.000
5.0000
.0
-5.0000
-10.000
Y [m]
-5.0000
5.0000
15.000
25.000
35.000
45.000
X [m]
-4.000 : -3.0
-3.000 : -2.0
-2.000 : -1.0
-1.000 : 0
Scale x 1:330 y 1:330
Contour Interval: 1mm

Horizontal Displacement Contours: Grid 1 (level -1.500m) Interval 0.25mm



Scale x 1:338 y 1:338

Vertical Settlement Contours: Grid 1 (level -1.500m) (Interval 0.25mm)



Scale x 1:338 y 1:338

Specific Building Damage Results - Detail

Stage: Stage: Name Category Ref.	Specific Building: Ref.	Specific Building: Name	Sub-building Name	Vertical Offset from Line for Vertical Movement Calculations [m]	Segment	Start [m]	Length [m]	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 [m]	Damage
0 Base Model	1	12B Keats Grove	Wall A	0.0	1	0.0	5.9606	Hogging	0.0012289	0.0	0.0011866	0.0	-50.033E-6	59658.	0 (Negligible)
					2	5.9606	3.8394	Sagging	0.0078086	-0.0033908	0.0062924	130.41E-6	401.83E-6	2181.2	0 (Negligible)
	2	12B Keats Grove	Wall B	0.0	1	0.0	5.2990	Sagging	0.0062652	0.0021956	0.0079345	-111.32E-6	-423.56E-6	1770.4	0 (Negligible)
	3	12B Keats Grove	Wall C	0.0	1	0.0	3.3000	Sagging	0.0076014	0.0	0.0072836	0.0	246.77E-6	4505.4	0 (Negligible)
	4	12B Keats Grove	Wall D	0.0	1	0.0	0.60000	None	0.0	0.0	35.763E-9	0.0	-49.776E-6	-	0 (Negligible)
	5	12B Keats Grove	Wall E	0.0	1	0.0	1.9614	Sagging	0.0071899	0.0	0.0070807	0.0	279.94E-6	3501.2	0 (Negligible)
					2	1.9614	0.83862	Hogging	0.0	0.0	35.763E-9	0.0	279.94E-6	1652.6	0 (Negligible)
	6	12B Keats Grove	Wall F	0.0	1	0.0	0.60000	None	0.0	0.0	35.763E-9	0.0	55.879E-6	-	0 (Negligible)
	7	12B Keats Grove	Wall G	0.0	1	0.0	3.6990	Sagging	0.0072759	0.0	0.0068977	0.0	-223.29E-6	5543.2	0 (Negligible)
	8	12B Keats Grove	Wall H	0.0	1	0.0	1.3000	Sagging	0.021893	0.0	0.021746	0.0	503.01E-6	734.74	0 (Negligible)
	9	12B Keats Grove	Wall I	0.0	1	0.0	0.30000	None	0.0	0.0	35.763E-9	0.0	-19.013E-6	-	0 (Negligible)
	10	12B Keats Grove	Wall J	0.0	1	0.0	2.7000	Sagging	0.013208	0.0085185	0.017221	-170.34E-6	348.02E-6	2529.8	0 (Negligible)
	11	12B Keats Grove	Wall K	0.0	1	0.0	0.30000	None	0.0	0.0	35.763E-9	0.0	51.423E-6	-	0 (Negligible)
	12	12B Keats Grove	Wall L	0.0	1	0.0	1.2990	Sagging	0.014781	0.033333	0.038144	-333.22E-6	-682.33E-6	1088.7	0 (Negligible)

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

Oasys

GEOTECHNICAL AND ENVIRONMENTALASSOCIATES

Job No.	Sheet No.	Rev.
IJ19228		

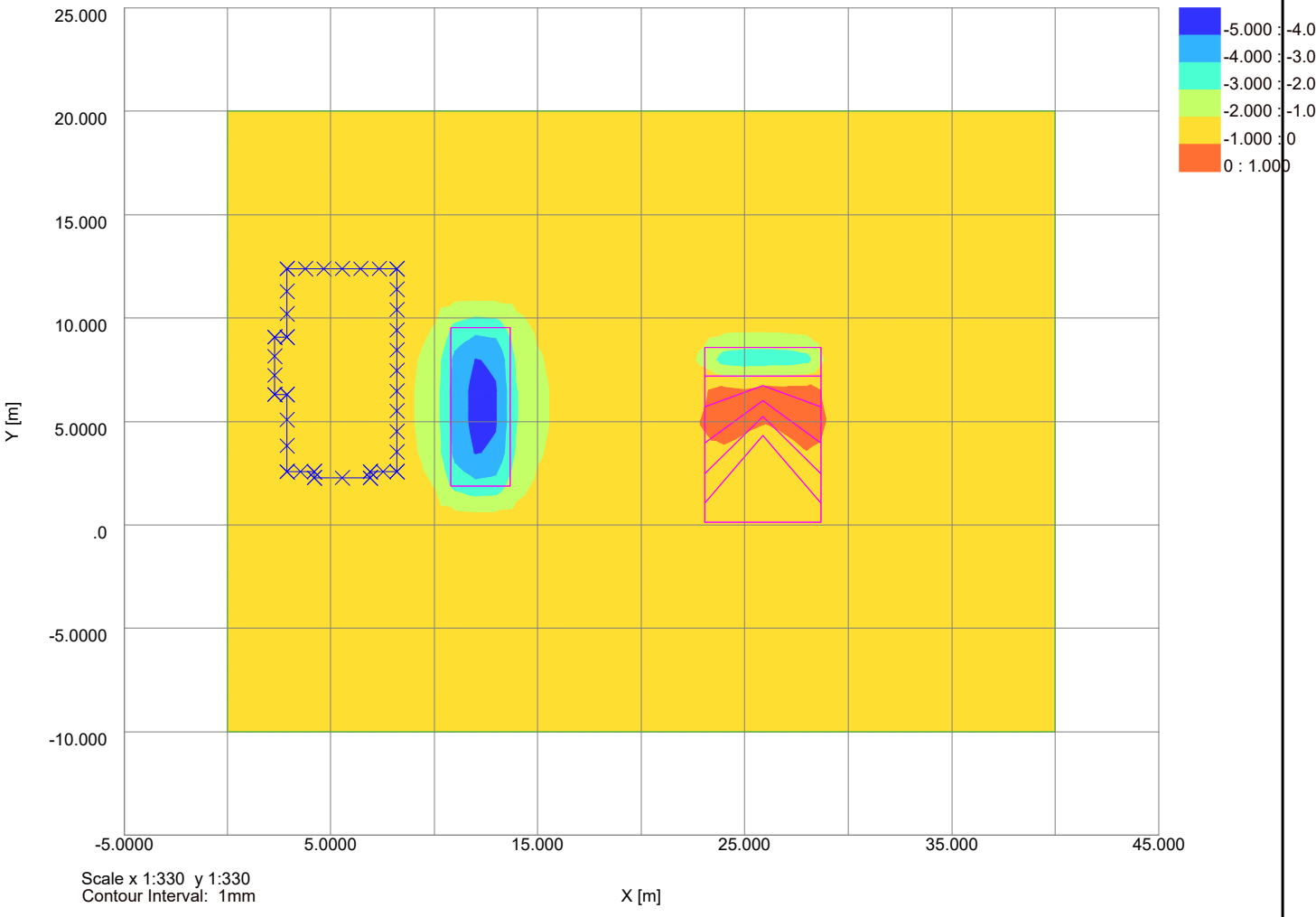
Drg. Ref.

Made by MC | Date | Checked

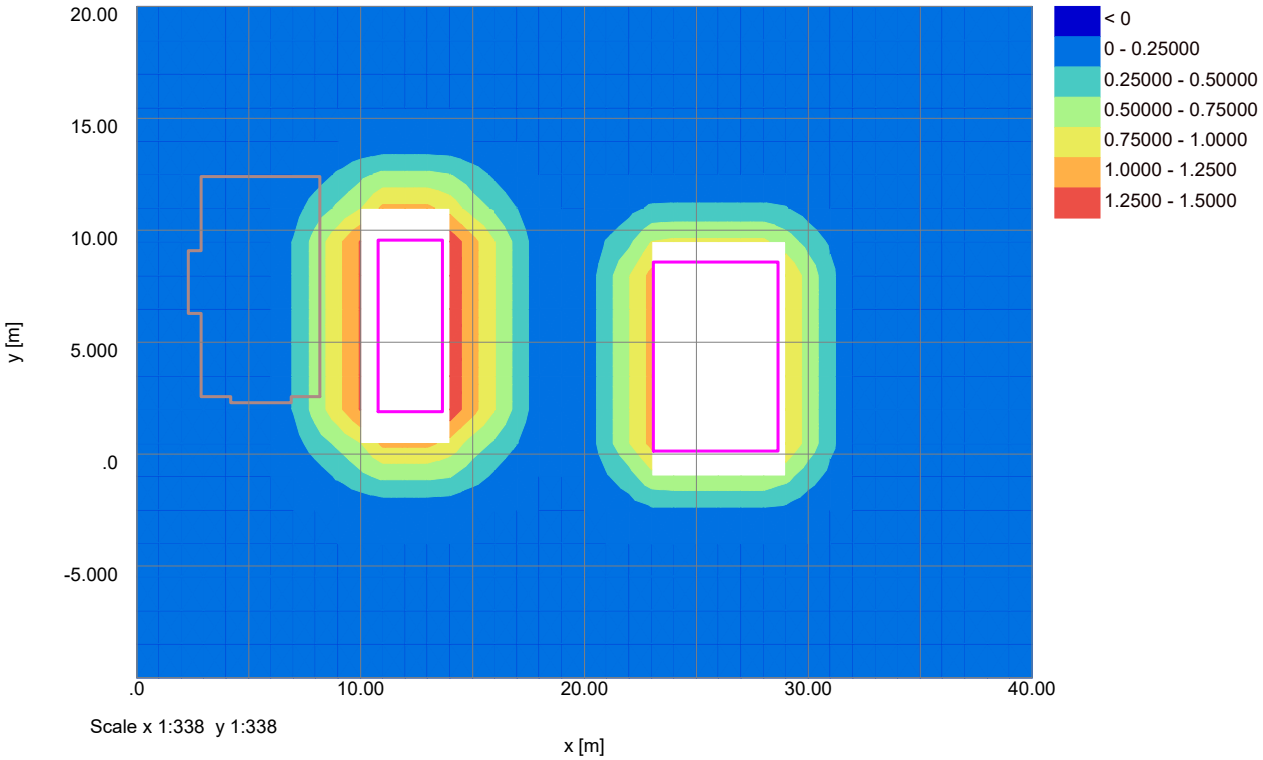
12 Keats Grove, London, NW3 2RN

Total Movements

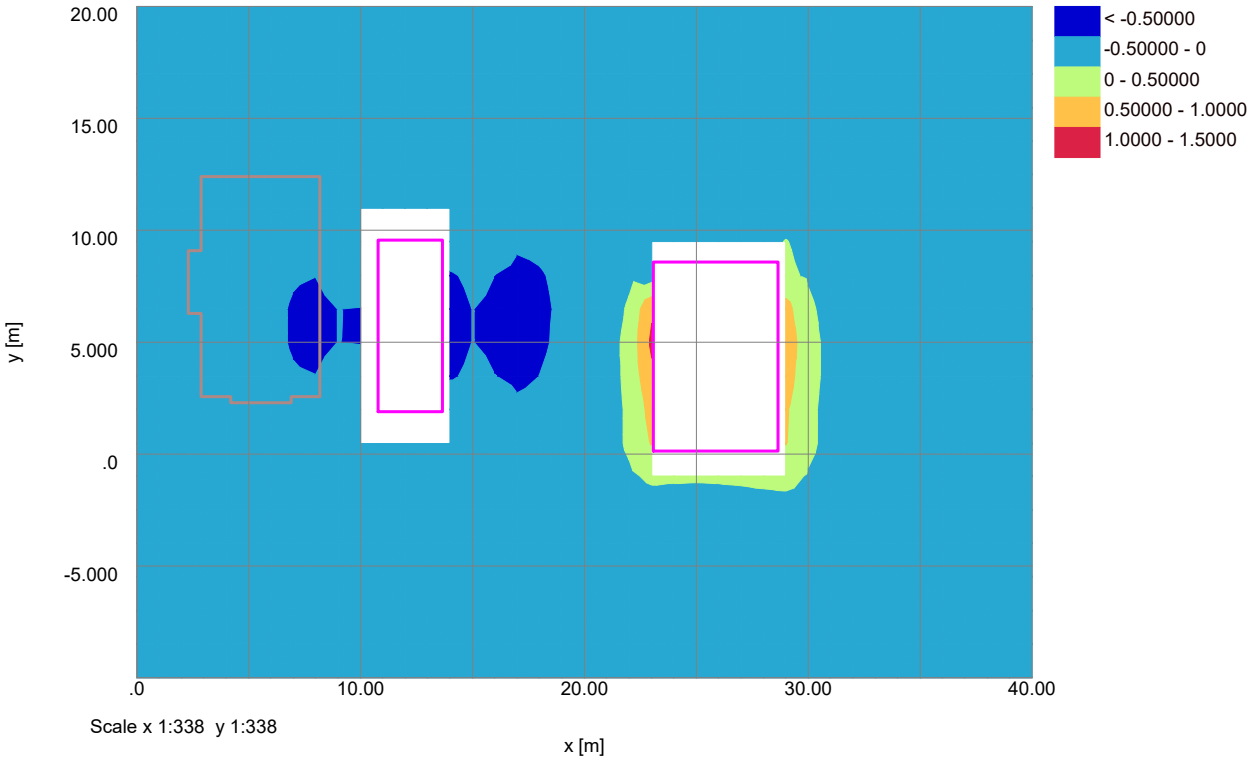
Following basement excavation and reloading



Horizontal Displacement Contours: Grid 1 (level -1.500m) Interval 0.25mm



Vertical Settlement Contours: Grid 1 (level -1.500m) (Interval 0.5mm)



Specific Building Damage Results - Detail

Stage: Stage: Name Category Ref.	Specific Building: Ref.	Specific Building: Name	Sub-building Name	Vertical Offset from Line for Vertical Movement Calculations [m]	Segment	Start [m]	Length [m]	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 [m]	Damage
0 Base Model	1	12B Keats Grove	Wall A	0.0	1	0.0	2.7955	Sagging	0.014231	0.0	0.013799	0.0	-597.66E-6	1217.2	0 (Negligible)
					2	2.7955	3.3202	Hogging	959.77E-6	0.0	949.32E-6	0.0	-72.583E-6	40058.	0 (Negligible)
					3	6.1157	3.6843	Sagging	0.0084307	-0.0035336	0.0068588	130.41E-6	402.02E-6	2054.0	0 (Negligible)
	2	12B Keats Grove	Wall B	0.0	1	0.0	5.2990	Sagging	0.0065794	0.0021956	0.0082223	-111.32E-6	-451.72E-6	1679.3	0 (Negligible)
	3	12B Keats Grove	Wall C	0.0	1	0.0	3.3000	Sagging	0.0075645	0.0	0.0072483	0.0	250.35E-6	4453.4	0 (Negligible)
	4	12B Keats Grove	Wall D	0.0	1	0.0	0.60000	None	0.0	0.0	35.763E-9	0.0	-58.322E-6	-	0 (Negligible)
	5	12B Keats Grove	Wall E	0.0	1	0.0	1.9694	Sagging	0.0072061	0.0	0.0070958	0.0	281.45E-6	3516.0	0 (Negligible)
					2	1.9694	0.83060	Hogging	0.0	0.0	35.763E-9	0.0	281.45E-6	1832.5	0 (Negligible)
	6	12B Keats Grove	Wall F	0.0	1	0.0	0.60000	None	0.0	0.0	35.763E-9	0.0	67.000E-6	-	0 (Negligible)
	7	12B Keats Grove	Wall G	0.0	1	0.0	3.6990	Sagging	0.0073169	0.0	0.0069367	0.0	-227.49E-6	5451.8	0 (Negligible)
	8	12B Keats Grove	Wall H	0.0	1	0.0	1.3000	Sagging	0.022164	0.0	0.022015	0.0	520.76E-6	725.76	0 (Negligible)
	9	12B Keats Grove	Wall I	0.0	1	0.0	0.30000	None	0.0	0.0	35.763E-9	0.0	-27.803E-6	-	0 (Negligible)
	10	12B Keats Grove	Wall J	0.0	1	0.0	2.7000	Sagging	0.014268	0.0085185	0.018182	-170.34E-6	396.50E-6	2342.0	0 (Negligible)
	11	12B Keats Grove	Wall K	0.0	1	0.0	0.30000	None	0.0	0.0	35.763E-9	0.0	77.631E-6	-	0 (Negligible)
	12	12B Keats Grove	Wall L	0.0	1	0.0	1.2990	Sagging	0.041465	0.033333	0.059119	-333.22E-6	949.21E-6	388.06	1 (Very Slight)

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

Geotechnical & Environmental Associates (GEA) is an engineer-led and client-focused independent specialist providing a complete range of geotechnical and contaminated land investigation, analytical and consultancy services to the property and construction industries.

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where information can be found
on all of the services that we offer.

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