

**28 Canfield Gardens, London
NW6 3LA**

Ground Movement Assessment

March 2020



FAIRHURST

CONTROL SHEET

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1.0 INTRODUCTION

1.1 Background

Fairhurst has been commissioned by Site Analytical Services Limited (SASL) to complete a Ground Movement Assessment (GMA) in connection with a proposed residential development at 28 Canfield Gardens, London, NW6 3LA. The purpose of this assessment is to determine what effects the proposed basement construction at the site may have upon nearby structures.

A site specific Phase II Ground Investigation has previously been carried out by SASL in July 2016. The ground investigation was designed by SASL and the results have been used in the derivation of parameters utilised in this assessment. Fairhurst cannot be held responsible for any inaccuracy in the factual data provided.

It is understood that this report will be included as part of a planning application to be submitted to the London Borough of Camden (LBC) by the client.

1.2 Proposed Development

With reference to the proposed development plans provided by the client and presented as Appendix A, it is understood that the property owner is intending to excavate a basement under the footprint of the majority of the building including the excavation of three new proposed lightwells at the front and back of the property.

The proposed basement extension is split into three different areas with various depths of excavation:

1. An area below the north eastern section of the existing building adjacent to No. 26 Canfield Gardens which will be extended to 3.00m below ground level or 1.175m below existing basement level (circa 47.22m AOD).
2. An area below the south western section of the existing building adjacent to No. 30 Canfield Gardens which will extend to 3.00m below ground level (circa 47.22m AOD).
3. Lightwells at the front and rear of the site which are proposed to extend to depths of 1.50m bgl (48.72m AOD).

1.3 Limitations

The conclusions and recommendations made in this report are made on the basis of the site specific ground investigations undertaken by SASL undertaken in July 2016. The ground investigation was designed by SASL and the results of the work should be viewed in the context of the range of data sources consulted and the information provided, the number of locations where the ground was sampled and the number of samples tested. No liability can be accepted for inaccuracies in the factual data, information in other data sources or conditions not revealed by the sampling or testing.

In addition to this SASL have recommended the use of third party data where appropriate, it is assumed that reliance on that data used in this report has been agreed by SASL.

2.0 BASELINE CONDITIONS

2.1 Site Description

The site is located at 28 Canfield Gardens, London, NW6 3LA located in the London Borough of Camden at approximate grid reference 526099, 184507. A site location plan is presented as Figure 1. The site currently comprises the ground floor and subterranean footprint of a four storey terraced residential house with an existing basement level along with front and rear garden areas.

Information provided by the Architect (Drawing ref. 28CanfieldBasement@Camden16052016) and assuming a 0.30m thick lower ground floor slab, it is assumed that the existing basement extends to a depth of 1.825mbgl (48.395mAOD).

With reference to the proposed section plan provided by Architecture Ltd. (ref. 10 – PROPOSED SECTIONS A-A Rev 00) the ground level of the site is approximated to be 50.22mAOD. Based on this level, it is understood that ground level at the site steps down from approximately 50.22mAOD at the front of the property to approximately 49.37mAOD at lowered rear garden level.

The ground in the surrounding area generally slopes slightly to the south along Broadhurst Gardens, approximately 150m north of the site, to the intersection between Greencroft and Fairhazel Gardens 150m south of the site.

The surrounding area is generally residential. Details of the buildings located adjacent to the site are described below in Table 1 and highlighted on Figure 2.

Table 1. Summary of Structures Surrounding the Site

Structure Name	Description	Estimated Height (m)	Distance from the site
No. 30 Canfield Gardens	4 storey terraced residential dwelling with basement	10 to 14	Connected by party wall, directly south west of the property.
No. 26 Canfield Gardens	4 storey terraced residential dwelling with basement	10 to 14	Connected by party wall, directly north east of the property.
No. 28 Canfield Gardens	4 storey terraced residential dwelling with basement	10 to 14	Structure to be retained at the subject site and above the proposed basement.

2.2 Geology

The British Geological Survey (BGS) map of the area (North London, Sheet 256) indicates that the site is underlain by the London Clay Formation with no superficial deposits directly mapped at the site. However Head Deposits (Prodensity) are indicated to be present approximately 30m north-west of the site. These deposits have not been formally mapped by the BGS and have been interpreted from slope analyses and borehole data only.

Superficial Head Deposits generally comprise clays, silts, sands and gravels and were formed up to 3 million years ago in the Quaternary Period in a local environment previously dominated by subaerial slopes.

The London Clay Formation is detailed by the BGS to comprise blue clay which becomes brown when weathered with occasional bands of fine silty sand and nodular lumps of pyrite and selenite. These soils were formed approximately 34 to 56 million years ago in the Palaeogene Period in a local environment previously dominated by deep seas.

There are 7 No. historical BGS Boreholes close to the site (BGS references: TQ28SE514 to TQ28SE521) related to the construction of residential properties on Broadhurst Gardens approximately 100m to 200m north of the site in the 1950s. The boreholes indicate up to 4m thickness of Made Ground

overlying deposits typical of the London Clay Formation. Groundwater seepages are generally recorded within Made Ground at depths of between 3 and 4mbgl.

2.3 Adjacent Ground Investigations

Review of the LBC planning portal indicates that several recent planning applications have been made for basement extensions at various properties within 150m of the site. Ground investigation works were carried out as part of the associated planning applications which are summarised in Table 2 below.

Table 2. Summary of Adjacent Basement Construction and Ground investigation

Site address (distance from site)	Planning application reference	Planning application status	Ground investigation details	Scope of works
No. 44 Canfield Gardens (110m south west from site)	2010/3616/P	Granted 23-11-2010	Herts and Essex Investigation Ltd (Report Ref: MRS/9764A dated 18 th October 2010)	2 No. cable percussive boreholes to 6m maximum depth; 7 No. hand excavated trial pits to 1.4m maximum depth to expose buildings foundations.
No. 50 Canfield Gardens (150m south west from site)	2012/2812/P	Granted 04-03-2013	Land Science Ltd (Report Ref: LS048 dated from 2 nd of May 2012)	2 No window sampler boreholes to 8m maximum depth; 4 No. hand excavated trial pits to 1.5m maximum depth to expose buildings foundations.
No. 29 Compayne Gardens (140m west from site)	2016/0320/P	Granted 17-06-2016	Chelmer Site Investigation Ltd (Report Ref: FACT/6028 dated from 3 rd of November 2015)	2 No. continuous flight auger boreholes to 8m maximum depth; 4 No. hand excavated trial pits to 2.17m maximum depth to expose buildings foundations.

The section below provides a brief summary of the findings of the above ground investigations although reference should be made to the original reports for full details of the findings. Approximate ground level elevations for the investigation works have been taken from spot heights on available OS maps.

2.3.1 Ground Conditions

The exploratory holes recorded ground conditions that were generally consistent with the geological records and known history of the area with between 0.40m to 1m of Made Ground overlying deposits typical of the London Clay Formation. A summary of the ground conditions encountered is presented in Table 3 below:

Table 3. Summary of Adjacent Ground Investigation

Strata	Depth (mbgl)		Maximum Thickness (m)	Description
	Top	Bottom		
Fill/Made Ground	GL	0.4 to 1.0	1	Generally described as a dark brown, slightly sandy, silty CLAY, with occasional gravel, brick and clinker fragments
London Clay Formation	0.4 to 1.0	6 to 8	8.5*	Generally described as grey and then blue firm becoming stiff, slightly sandy, silty CLAY, with partings of brown and orange silt and fine sand and occasional selenite crystals

*Maximum thickness of London Clay Formation not proven in any of the ground investigations

Groundwater was not generally encountered as part of the Ground Investigation works and the boreholes and trial pits remained essentially dry throughout. However a slight seepage was recorded within a trial pit at 50 Canfield Road at depth of 0.75 to 1.10mbgl.

The results of groundwater monitoring carried out following drilling is summarised below:

- No post field work groundwater monitoring data is provided within the Herts and Essex Report at No. 44 Canfield Gardens;
- At 50 Canfield Gardens, a monitoring standpipe was installed by Land Science to a depth of 5.00m and subsequently monitored on 19th April 2012 recording a water depth of 0.70mbgl within the London Clay Formation;
- At 29 Compayne Gardens monitoring standpipes were installed by Chelmer to 8.0m bgl in both of the boreholes drilled at the site, and water level readings were taken on 10th and 20th November 2015. During this period of monitoring, the water level in BH1 rose from 2.60m to 1.26m bgl, whereas the water level in BH2 fell from 6.25m to 7.96m bgl.

2.3.2 In Situ and Laboratory Testing

In-situ and laboratory testing was carried out as part of the ground investigation works described above and the full results are contained in the relevant factual reports.

In summary, 28 No. samples of the London Clay formation were tested for Atterberg limits tests as part of the adjacent ground investigations. The results indicate Plasticity Index (PI) varying between 27 and 56%. The results are indicative of Class CI and CV according to the British Soil Classification System which are representative of fine grained clays of intermediate to very high plasticity and as such generally have a medium to high susceptibility to shrinkage and swelling movements with changes in moisture content, as defined by the NHBC Standards, Chapter 4.2.

Furthermore, 46 No. in-situ Hand Shear Vane (HSV) tests were undertaken within the London Clay Formation with recorded undrained shear strengths varying between 44 and 168kN/m² (generally increasing with depth), with an average of 107kN/m². The results are indicative of a medium to very high strength material at depth and are within the expected range for the London Clay Formation.

3.0 GROUND INVESTIGATION AND MONITORING

3.1 Records of Site Investigations

A site specific ground investigation was undertaken by Site Analytical Services Limited (SASL) in July 2016. The site works undertaken at the site comprised the following:

- 2 No. boreholes using hollow stem auger methods, one to 15m bgl at the front of the property (BH1) and one to 10m bgl at the rear garden of the property (BH2) with in-situ hand shear vane tests completed at regular intervals in both holes;
- Collection of disturbed soil samples for geotechnical laboratory testing;
- Installation of 2 No. 50mm internal diameter groundwater monitoring wells in BH1 and BH2 to depths of 8.00m to 8.50m bgl respectively;
- Two rounds of groundwater level monitoring following the site works on 2nd September and the 22nd of November 2016.

The factual information describing the results of the investigation dated July 2016 is presented in Appendix B.

3.2 Ground Conditions

The boreholes recorded ground conditions that were generally consistent with the geological records, known history of the area and the findings from the nearby historical ground investigations with up to 2.40m thickness of Made Ground encountered overlying the London Clay Formation to the full depths of drilling of 12.0m bgl. A summary of the ground conditions encountered is presented in Table 4 below:

Table 4. Summary of the Site Specific Ground Investigation (2016)

Strata	Depth mbgl (mAOD)		Maximum Thickness (m)	Description
	Top	Bottom		
Made Ground	GL (50.22)	0.5 to 2.4 (49.72 to 47.82)	2.4	Slate chippings over dark brown black slightly gravelly clayey SAND with fragments of brick and concrete rubble. Gravel is fine to coarse of sub-angular to sub-rounded flint. Soft to stiff brown silty sandy clay with fragments of brick and concrete rubble.
London Clay Formation	0.5 to 2.4 (49.72 to 47.82)	10 to 15 (40.22 to 35.22)	12.6*	Stiff brown sandy silty CLAY overlying stiff brown blue sandy silty CLAY.

*Maximum thickness of London Clay Formation not proven

3.3 Groundwater

Groundwater was not encountered as part of the Ground Investigation works and the boreholes remained dry. Monitoring standpipes were installed in BH1 and BH2 to 8.00 and 8.50mbgl respectively, and water level readings were taken on the 2nd of September 2016, as summarised in Table 5 overleaf.

Table 5. Monitoring Summary

Date	Borehole ID	Ground Level	Response Zone			Groundwater Level	
		m AOD	m bgl	m AOD	(Strata)	m bgl	m AOD
02/09/2016	BH1	50.22	1.00 to 8.00	49.22 – 42.22	MG/LC	DRY	DRY
	BH2	50.22	1.00m to 8.50	49.22 - 41.72	LC	1.00	49.22
22/11/2016	BH1	50.22	1.00 to 8.00	49.22 - 42.22	MG/LC	5.78	44.44
	BH2	50.22	1.00m to 8.50	49.22 – 41.72	LC	0.53	49.69

The results of the ground water monitoring carried out at the site indicate that groundwater levels are above the maximum proposed excavation depth of 3.00mbgl (47.22m AOD) in BH2 at a maximum level of 49.69m AOD.

It should be noted that the above comments on groundwater conditions are based on two monitoring visits at the site undertaken in the September 2016 and relate to observations made at that time. Changes in the groundwater level could occur due to seasonal effects and also changes in drainage conditions. It is considered prudent to continue ground water monitoring for as long as possible prior to construction.

3.4 In-Situ and Laboratory Testing

The results of the laboratory and in-situ tests are presented within the SASL factual information dated from July 2016 and presented in Appendix B.

3.4.1 Atterberg Limit Tests

Atterberg Limit tests have been conducted on 3No. selected samples of the London Clay Formation. The results indicate moisture contents varying between 30% and 32% and Plasticity Index values (PI) of between 41% and 43% indicating materials of Class CH according to the British Soil Classification System. These are representative of fine grained CLAY of high plasticity and as such generally have a high susceptibility to shrinkage and swelling movements with changes in moisture content, as defined by the NHBC Standards, Chapter 4.2 (2015).

The Atterberg limit tests results have been plotted on a Casagrande plot, and are presented on Figure 3 of the report along with the results of the historical investigations.

3.4.2 Shear Vane Testing

In the London Clay Formation, in-situ shear vane tests were undertaken at regular depth intervals to assess the undrained shear strength profile of the materials. The testing has recorded undrained shear varying from 70kPa up to 130kPa which is the limiting value of the shear vane apparatus. This correlates to cohesive materials of medium to (at least) high strength which is in keeping with the historical laboratory testing results at the adjacent sites. The results of the shear vane tests are presented on Figure 4 along with the results of the historical investigations.

4.0 PREDICTION OF GROUND MOVEMENTS

4.1 Introduction

In connection with the planning requirements of the proposed basement construction from LBC a ground movement and damage assessment has been undertaken at the site. The purpose of this assessment is to determine the effects of the proposed basement construction upon the subject (above) and neighbouring structures.

The calculations provided in this ground movement and damage assessment are specific to the proposed development and the advice herein should be reviewed if the development proposals are amended.

4.2 Adjacent Properties

The properties or structures more likely to be affected by ground movements associated with the proposed basement construction are detailed on Figure 2 and summarised below:

- No. 30 Canfield Gardens located to the south west;
- No. 26 Canfield Gardens located to the north east;
- No. 28 Canfield Gardens located at the subject site and above the proposed basement.

4.3 Ground Model

The stratigraphic sequence utilised in this assessment is based on the site specific ground investigation undertaken by SASL at the site. This comprises Made Ground to a depth of 2.40m bgl overlying the London Clay Formation.

To increase accuracy of the analyses, the in-situ and laboratory results from the nearby historical boreholes described in section 2.3 have been used in combination with the site specific investigation. It should be noted that no liability can be accepted for inaccuracies in the factual data of the nearby historical investigation and it is understood that reliance on this data has been sought by SASL.

4.3.1 Model parameters

The method of Ground Movement Analyses undertaken requires soils stiffness parameters to be used. In accordance with BS8004:2015 section 4.3.1.6 'Soil Stiffness' it is acknowledged that both the drained and undrained stiffness moduli of soils (E' , E_u) are highly strain dependent. The change in axial strain will directly influence the resultant stiffness of the soil, and in turn the stiffness of the soil will influence the strain exhibited.

Therefore in order to define a stiffness modulus applicable to the engineering problem considered, it is necessary to assess the magnitude of axial strain which the soil will be subjected to. In accordance with the recommendations made in BS8004:2015 the strain generally applicable to foundations design is in the range of 0.075 to 0.2%. The material stiffness values used for the analysis of the ground movements have been interpreted as follows.

Made Ground

The Made Ground was described in the borehole logs as clayey gravelly sand/soft to stiff brown silty sandy clay. For the purposes of this assessment, a conservative approach has been taken and the Made Ground will be treated as a soft clay. The Elastic modulus values for a soft clay typically range from 2 to 7MPa (short term, E_u) and 1 to 5MPa (long term, E') based on Table 11.7, Handbook of Geotechnical Investigation and Design Tables, Look (2007).

Poisson's ratio for soft clays are typically 0.50 (short term) and 0.40 (long term) based on Industrial Floors and Pavement Guidelines (1999).

In the absence of laboratory test results, a bulk unit weight of 16kN/m² has been adopted for design.

London Clay

Based on the maximum (i.e. most conservative) axial strain of 0.2% prescribed in BS8004:2015, the following correlation has been used to determine the Young's Modulus (E_u) of the London Clay. The

relation has been taken from ICE manual of geotechnical engineering (2012), Volume II, chapter 53.7 and matches ratio of E_u/C_u at 0.2% axial strain recommended in Tomlinson (7th, 2001) based on works by Jardine et al. (1986):

$$E_u = 330C_u \text{ (kN/m}^2\text{)}$$

The ratio of end of construction (Undrained) settlement to total settlement (fully drained) was taken as taken as 60% as specified in ICE manual of geotechnical engineering (2012), Volume II, chapter 53.6.

Therefore:

$$E_u = 200C_u \text{ (kN/m}^2\text{)}$$

Utilising a plasticity index of 43% a drained (ν') and undrained (ν) poisson's ratio of 0.40 and 0.45 respectively were utilised based on Industrial Floors and Pavement Guidelines (1999). A plot of Young's modulus versus depth is presented as Figure 5 to this report.

A summary of the stiffness values utilised in this analysis is presented in Table 6 below based on the trendline presented on Figure 5:

Table 6. Soil Stratigraphy and Stiffness Parameters Adopted

Strata	Level at top (mbgl)	Bulk Unit Weight γ (kN/m ³)	Short-term (undrained)			Long-term (drained)		
			Top	Bottom	Poisson's Ratio (ν)	Top	Bottom	Poisson's Ratio (ν')
			E_u kPa	E_u kPa		E' kPa	E' kPa	
Made Ground	GL	16	5000	5000	0.50	2500	2500	0.40
London Clay Formation	2.4	20	23000	43000	0.45	13000	26000	0.40

4.4 Basement Foundation and Load Case

With reference to development plans provided (Appendix A) and Martin Redston Associates Ltd load drawings (Appendix C), it is understood that the walls to No. 30 and No. 26 Canfield Gardens will be underpinned. The proposed lightwells to the front and back of the property will be constructed with a reinforced concrete retaining wall excavated and cast in 1m sections with a traditional hit and miss sequence.

It is understood that the retaining wall will be cast with an eccentric base section. The base will be placed against the un-excavated soil to prevent sliding and the top of the wall will be propped to resist overturning.

In the permanent condition, the loads of the structure above the newly constructed basement will be transferred to the underlying soils via a ground bearing raft foundation with an average unfactored gross Uniformly Distributed Load (UDL) of 95kN/m² being applied at the base of the foundation.

The assessment presented in Section 4.5 is specific to the construction sequence and load case described above and should be updated in accordance with any changes made to the proposed developments at the site.

4.5 Ground Movements inside the Area of the New Basement.

Following excavation of the basement area the soil at this level and along the boundary of the excavation will tend to heave upwards due to vertical stress relief. The magnitude and distribution of ground movements inside the excavated area are a function of the excavation size and shape along with the stiffness of the underlying soils.

The stress conditions and resultant settlement/heave have been assessed using the Boussinesq's method and geotechnical software PDISP. The software calculates vertical strains on the basis of the calculated stress changes and then integrated to obtain vertical movements.

Three stages of the redevelopment have been modelled as follows:

1. A first stage simulating excavation across the site with unloading due to the removal of soil. Assuming that no delays occur during the construction process, this stage has been simulated using short term soil parameters only (i.e. undrained conditions).

The proposed excavation levels are as follows (assuming existing ground level to be at 50.01 m AOD, or front garden level):

- 3.00m bgl (relative to existing external ground levels) within the main proposed basement footprint. The undrained removal of the overburden will therefore cause an unloading pressure of approximately -50.4kN/m^2 in this area;
- 1.50m below the formation level of existing lower ground floor (equal to 3.00mbgl relative to existing external ground levels) within the southern portion of the property. Unloading pressure is calculated as -26.4kN/m^2 in this area;
- 1.50mbgl within proposed lightwells. An unloading pressure is calculated as -24kN/m^2 for proposed lightwell footprints.

The PDISP analysis outputs for the basement (including main basement and southern basement) and lightwells are presented in Appendix D.

2. A second stage simulating the conditions at the end of the construction phase when the site is to be re-loaded with the pressures from the proposed structures has also been analysed.

The new loads are to be transferred via a ground bearing raft with a net load of 44.6kN/m^2 beneath the main basement and a net load of 68.6kN/m^2 beneath the basement under the existing lower ground floor (gross UDL of 95kN/m^2 minus unloading pressures). A nominal net load of -14kN/m^2 has been applied to the lightwells (nominal load of 10kN/m^2 minus unloading pressure) as these will not comprise load bearing structures. The PDISP analysis outputs at main basement and lightwells for this stage are presented in Appendix E.

3. A final third stage simulates a long term condition after construction, when the stress conditions within the soil have been allowed to equilibrate under the new pressures (i.e fully drained conditions). The PDISP analysis outputs at basement and lightwells for this stage are presented in Appendix F.

The elastic parameters for the soil have been chosen as appropriate for the short and long term conditions. Undrained parameters have been used for the short term analyses whilst fully drained parameters have been used for the long term assessments. The vertical boundary of the model has been fixed at 15 mbgl where the effective vertical stress due to foundation unloading decreases to approximately 20% of the effective overburden as required in EC7.

PDISP Results

The PDISP results were presented in Table 7 with the results detailed in Appendix C to Appendix J. Simplified construction stages have therefore been considered taking into account the net ground displacements at formation level.

Table 7: PDISP results

Load case	Maximum Settlement/Heave within footprint (mm)*	
	Basement	Lightwells
Excavation (Undrained)	-7	-5
Long Term (Drained)	<u>12</u>	<u>-2.5</u>

*Heave is denoted by -ve sign convention

The load cases in Table 7 have been modelled in isolation without consideration to the combined and/or net effects from both heave and settlement (i.e. interaction between load cases).

Along the perimeter of the proposed basement excavation, Stage 1 (heave) displacements are shown to be up to a maximum of $(-)4\text{mm}$. Stage 3 (long term settlement) displacements are shown to be in the

order of between 2 and 8mm. It should be noted that PDISP modelling has been carried out using cautious estimates of soil stiffness parameters, and that its linear elastic analysis approach tends to over predict displacements. It is therefore considered, particularly along the perimeter of the basement, that the displacements presented will likely not be fully realised in the long term.

Conclusions and recommendations

The results show that initially upon excavation and before construction the ground is expected to heave upwards by a maximum of 7mm in the basement and 5mm in the lightwells. In the long term, a maximum settlement of up to 12mm is expected in the basement, whilst results suggest ground underlying the lightwells will undergo an element of heave by up to 2.5mm.

PDISP uses individual layer properties to calculate the displacements resulting from applied stresses. Results show that heave is a possibility within lightwells, however the heave values are considered to be overestimated and are therefore conservative. It should be noted, Bowles in his text (Foundation Analysis and Design-Fifth Edition, 1995, page 542) states that "In general, where heave is involved, considerable experience and engineering judgement are necessary in estimating probable soil response, for currently there are no reliable theories for the problem".

The results of the PDISP analysis indicate movement beyond the site boundaries as shown on the output models. The modelling is based on an unrestrained excavation and is therefore unable to take account of the mitigating effect of the retaining wall supporting the excavation sides, which in reality will combine to restrict these movements within the basement excavation. The movements predicted at or just beyond the site boundaries are unlikely to be fully realised and should not therefore have a detrimental impact upon any nearby structures as long as temporary works measures and design are robust in nature.

Final designs for the basement retaining walls, basement slabs and internal load-bearing basement walls and columns should be designed to support ground movements. These movements should be taken into account particularly at party walls where additional loadings are proposed. Any proposed drainage system or pipe works within the vicinity should be designed to accommodate the predicted movements.

4.6 Ground Movements Outside the Area of the New Basement.

4.6.1 Approach and assumptions

Ground movements due to basement excavations are typically estimated based on guidance given in the CIRIA publication C580 (now updated as CIRIA C760). This is based on the behaviour of deep excavations supported by embedded walls at numerous sites in the London area.

As detailed in section 4.4 the main basement box is to be constructed using an underpin type sequence towards No. 30 and No. 26 Canfield Gardens. The proposed lightwells at the front and back of the property will be constructed with a reinforced concrete retaining wall excavated and cast in 1m sections with a traditional hit and miss sequence.

The basement excavations (including the existing lower ground floor) have been modelled together as excavations from ground level to the maximum proposed excavation depth (3.0m) below the property. Lightwells have been modelled as excavations to a proposed excavation depth of 1.5mbgl. The CIRIA C760 ground movement curves for "excavation in front of a high stiffness wall in stiff clay" along with "installation of contiguous bored pile wall in stiff clay" (to an assumed pile toe depth of 3mbgl for the basement and 1.5m bgl for lightwells respectively) have been used together in order to replicate the excavation and underpinning.

It is understood that the walls will be propped before significant excavation is undertaken, ensuring that the wall behaviour in response to excavation is stiff. Good quality workmanship and attention to the detailed design during the excavation sequence is assumed in the predictions given in this report.

4.6.2 Results

Ground movements have been analysed using XDISP and a building damage assessment has been undertaken based on the results of the predicted ground movements. Contours of vertical and horizontal

ground movement and full tabular output of the analysis are presented in Appendix G. Summary tables are provided in Section 4.7 below.

4.7 Building Damage Assessment

4.7.1 General

The building damage assessment was carried out on the subject structure and relevant adjacent structures, as detailed in Figure 6 and summarised below in Table 8.

Table 8: Summary of Structures

Structure	Structure ID (As specified on Figure 6)	Assumed structural Height (m)
No. 30 Canfield Gardens	Wall 1	10.5
	Wall 2	10.5
	Wall 3	10.5
	Wall 4	14
	Wall 5	10
No. 26 Canfield Gardens	Wall 6	10
	Wall 7	14
	Wall 8	10.5
No. 28 Canfield Gardens	Wall 9	14
	Wall 10	14
	Wall 11	10
	Wall 12	10.5

4.7.2 Results

Table 9 presents the damage assessments for the structures listed above. The table also presents the CIRIA C580 approximate crack widths corresponding to the damage categories. The full tabular output for the basement and sub-basement is presented as Appendix G.

Table 9: Ground Movement Summary

Structure ID (Figure 6)	Maximum settlement (mm)	Maximum Tensile Strain (%)	Minimum Radius of Curvature (m)	Damage Category ⁽¹⁾	Approximate Crack Width (mm) (CIRIA C580)
Wall 1	1.16	0.036	4404	Negligible	<0.1mm
Wall 2	1.68	0.024	12252	Negligible	<0.1mm
Wall 3	3.02	0.058	2818	Very Slight	<1mm
Wall 4	3.86	0.065	575	Very Slight	<1mm
Wall 5	4.00	0.057	1696	Very Slight	<1mm
Wall 6	1.81	0.025	3757	Negligible	<0.1mm
Wall 7	4.06	0.058	297	Very Slight	<1mm
Wall 8	4.60	0.048	703	Negligible	<0.1mm
Wall 9	5.45	0.074	862	Very Slight	<1mm
Wall 10	4.59	0.037	384	Negligible	<0.1mm
Wall 11	5.25	0.050	478	Very Slight	<1mm
Wall 12	3.79	0.019	878	Negligible	<0.1mm

⁽¹⁾ After Burland et al, 1977, Boscardin and Cording, 1989; and Burland, 2001

Based on these predicted ground movements, the properties surrounding the site are not expected to suffer any damage greater than CIRIA C580 Damage Category 1 (Very Slight).

It is observed that the settlements presented within structures located along the perimeter of the proposed basement excavation are typically between 4 and 6mm, therefore slightly less than those predicted within the PDISP analysis. It is considered that this is due to the general over-prediction of displacements within PDISP's linear elastic modelling approach combined with conservative soil stiffness parameters, and it is therefore anticipated that the displacements presented along the excavation perimeter within XDISP are more representative of those to be realised on site.

4.8 Summary of Ground Movement Assessment and Advice on Further Monitoring

Providing that good workmanship and construction sequences are used along with appropriate support during excavations, and groundwater management, the proposed basement construction is unlikely to cause significant damage to the surrounding structures. Based on the predicted ground movements, the adjacent and subject structures are not expected to suffer any damage greater than CIRIA C580 Damage Category 1 (Very Slight).

Despite the predicted low level of damage, it is recommended that movement monitoring of the walls to the subject and neighbouring buildings is carried out and a ground movement sensitivity monitoring plan is set out at design stage which should include a movement monitoring strategy, instrumentation and action plans. More specifically trigger levels on movements will need to be defined and this should be done by way of precise levelling or reflective survey targets being installed at the neighbouring buildings. The temporary and permanent works will need to be designed to limit eventual movement.

Open excavations and underpinning, even in cohesive materials, can result in significant ground movements when not properly retained/managed. The magnitude of movement is almost entirely a function of the standard of the workmanship which is assumed to be of sufficient quality in this analysis.

Additionally, observations made during post ground investigation ground water monitoring, indicate that the groundwater at the site is likely to be encountered at c. 0.53mbgl (41.62mAOD), perched within the Made Ground overlying the London Clay Formation which will be above the depths of excavation. The chosen contractor should have a comprehensive plan in place to deal with groundwater when encountered to ensure stability of the excavations.

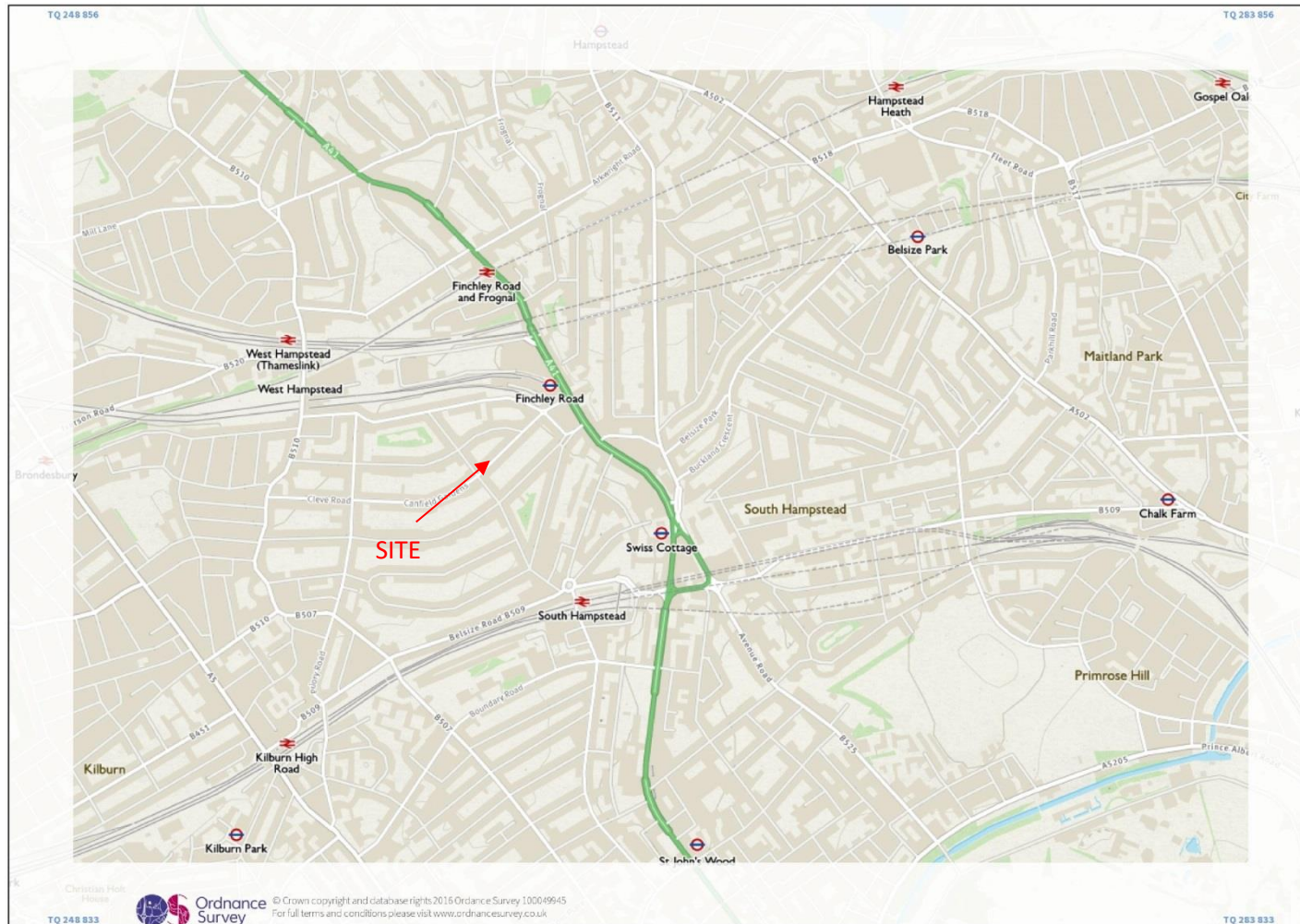
It is recommended to continue monitoring the ground water levels prior to construction works, to provide a better understanding of the ground water conditions at the site.

28 Canfield Gardens, London NW6 3LA

117401

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Figure 1 – Site Location Plan



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28 Canfield Gardens, London NW6 3LA

117401

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Figure 2 – Site Plan Showing Neighbouring Properties to the Site

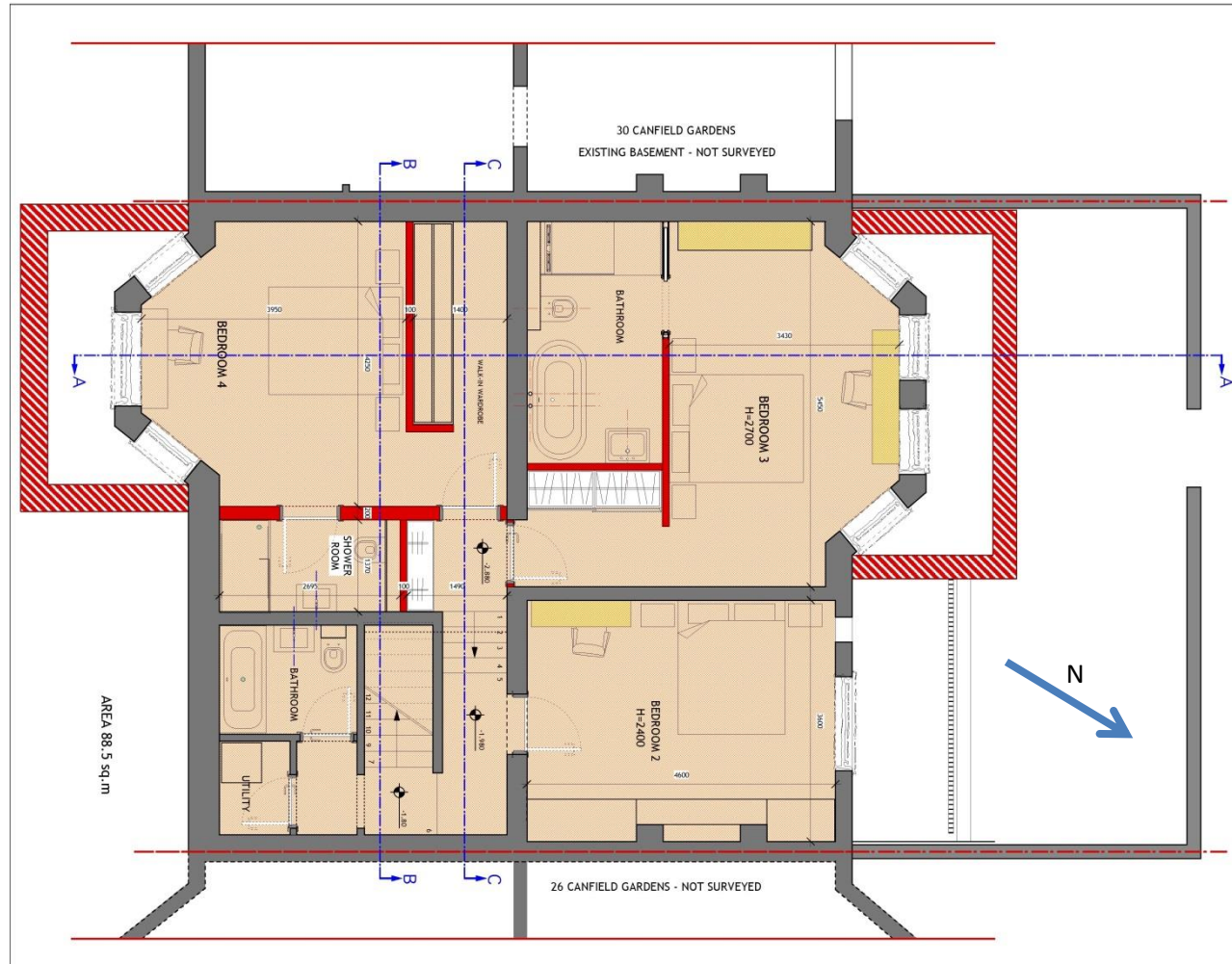
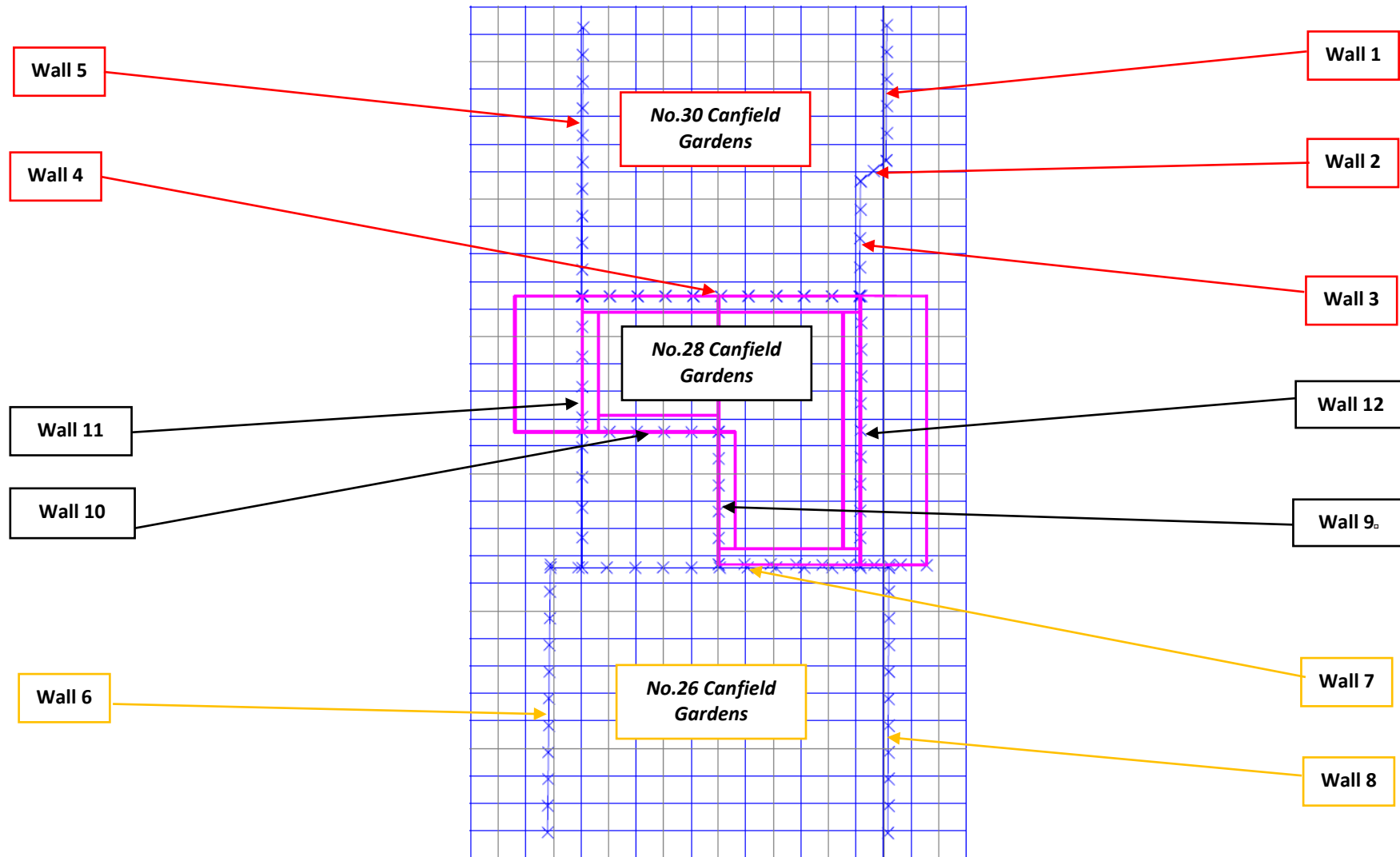


Figure 6 – Wall Plan used for XDISP Analysis



Appendix A – Architects Existing and Proposed Drawings



04 - EXISTING SECTION AA

DRAWING Ref.

28CanfieldBasement@Camden16052016

RCB

DRAWN :

1/50

SCALE :

NW63LA

PROJ No.

00

REV. No.

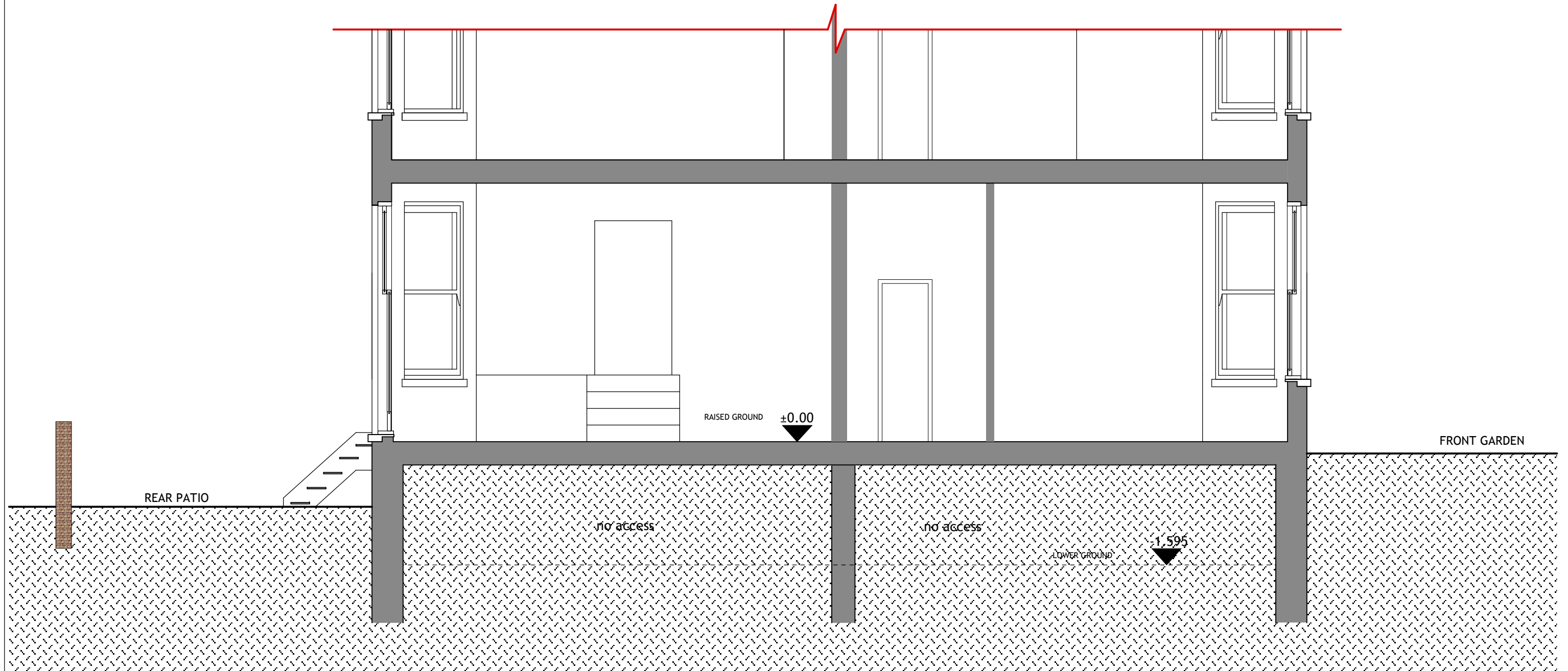
A3

SHEET :

01/06/2016

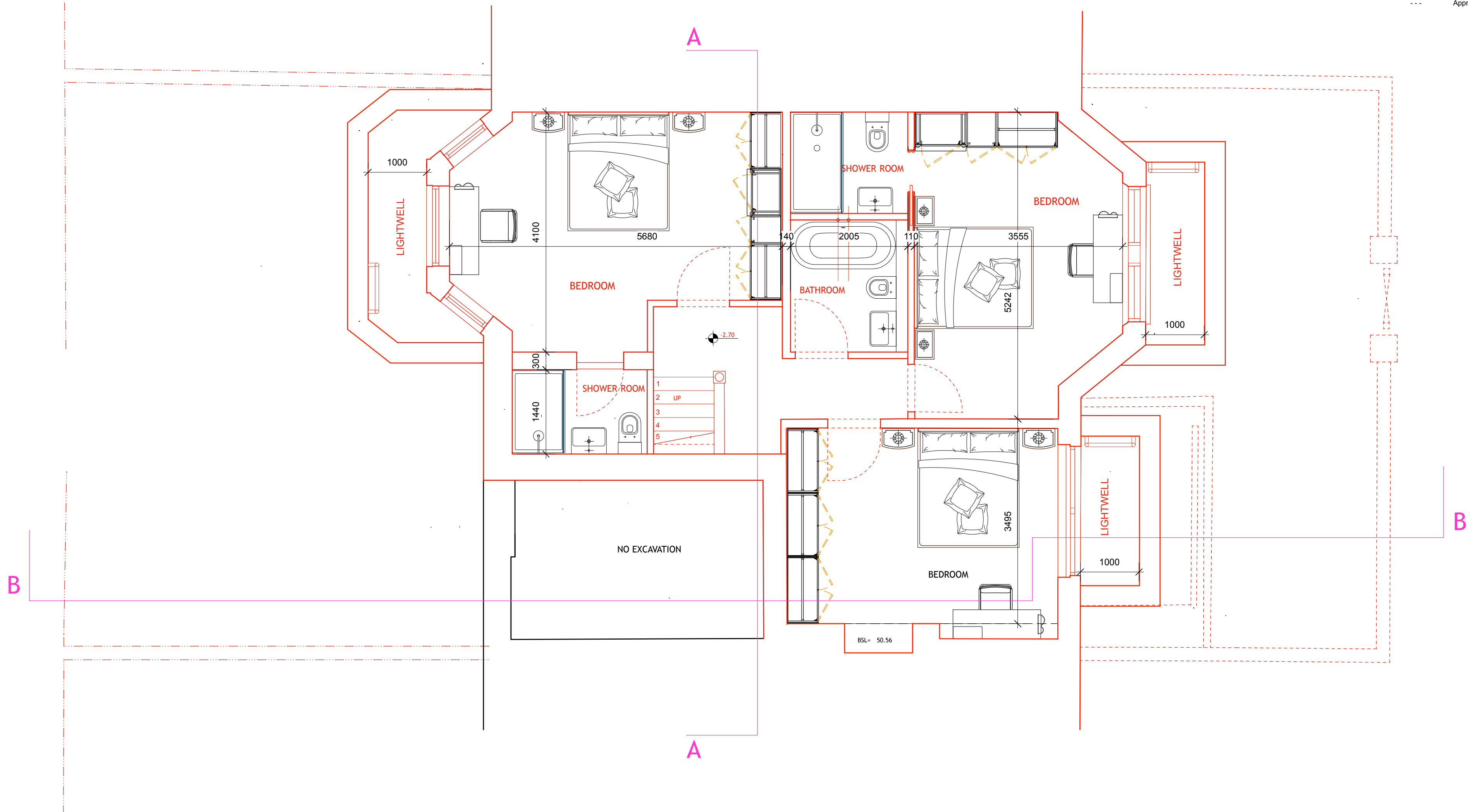
DATED :

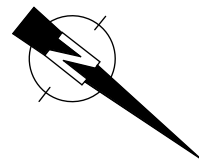
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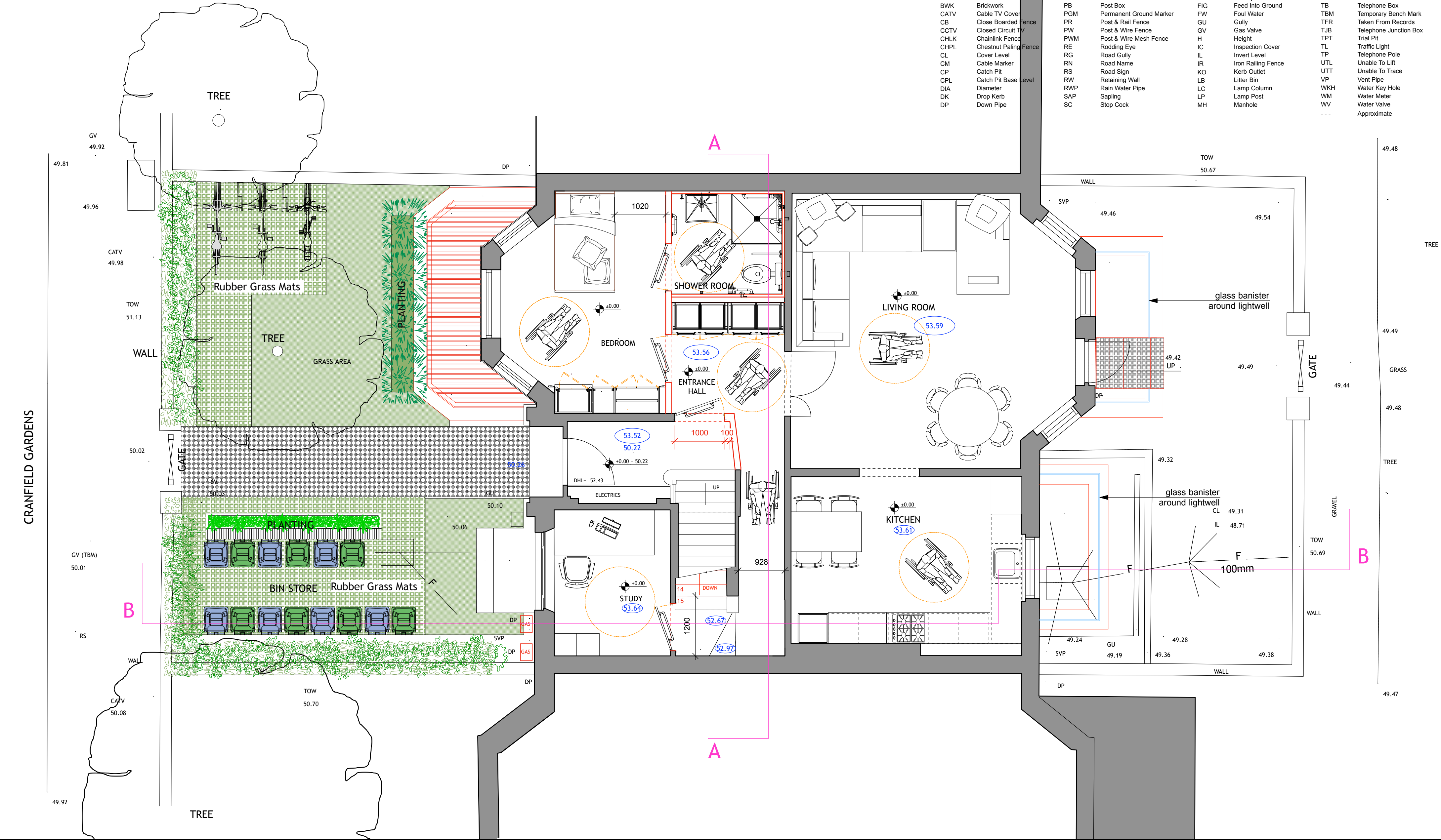


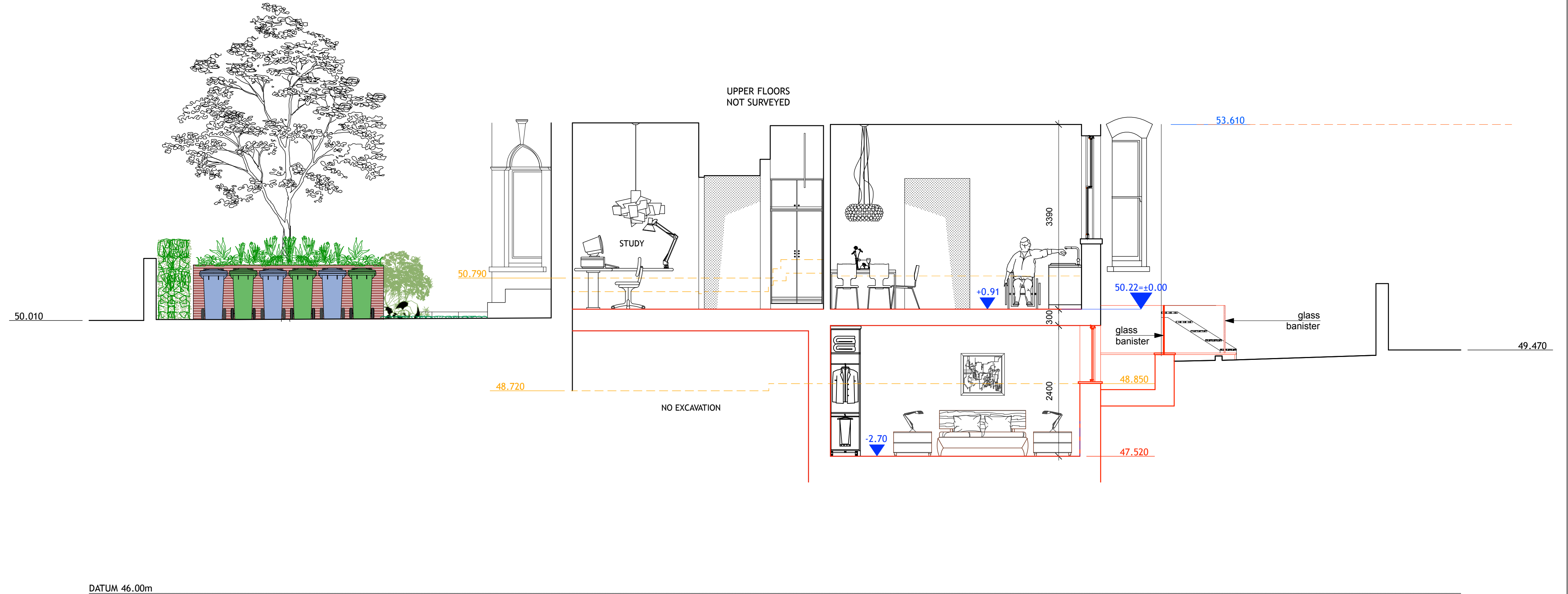


CRANFIELD GARDENS

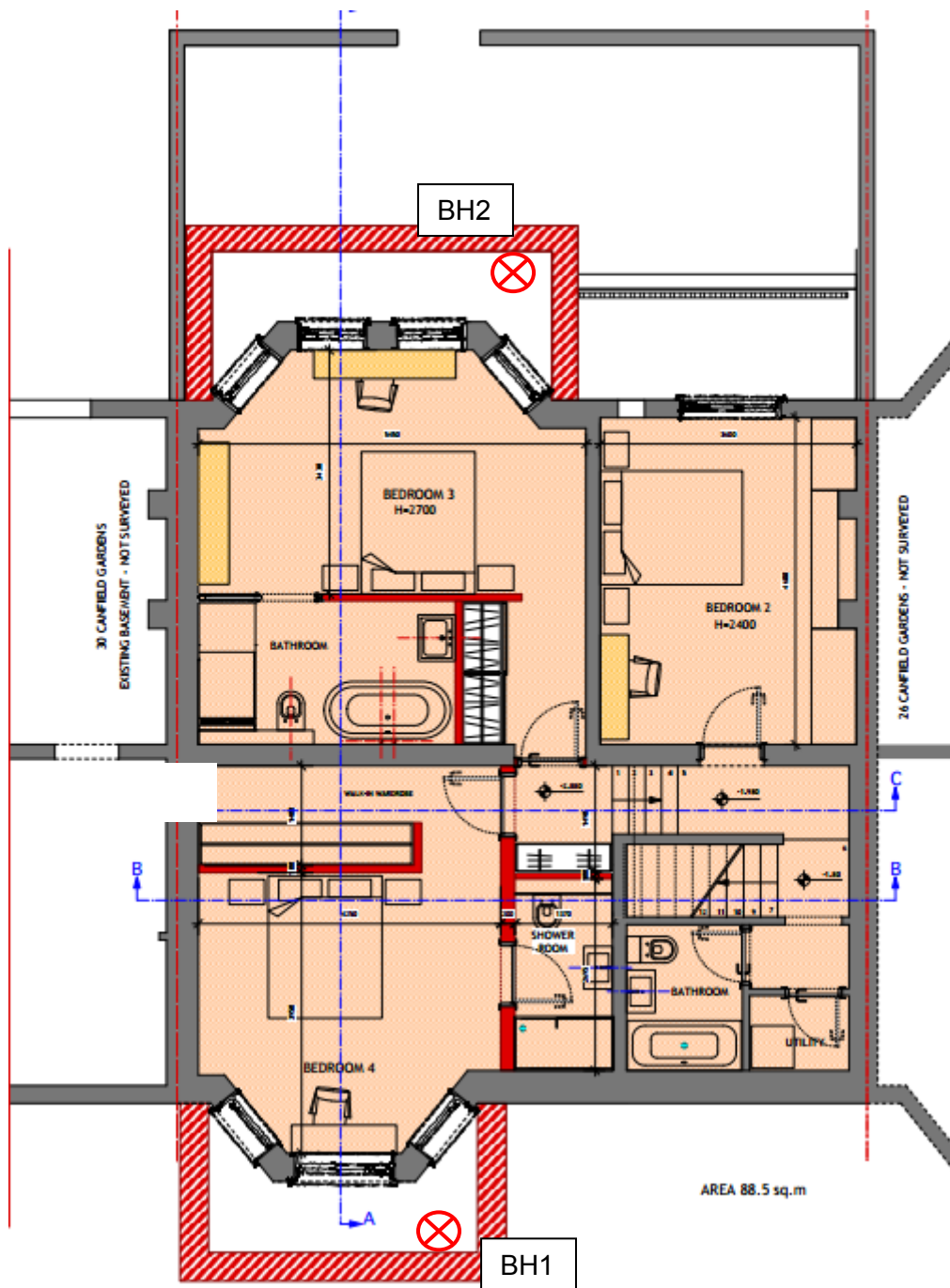
49.81
49.96
CATV 49.98
TOW 51.13
WALL
50.02
GV (TBM) 50.01
RS
WALL
CATV 50.08
TOW 50.70
49.92

49.48
49.49
GRASS
49.48
TREE
49.47

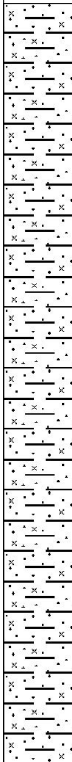




Appendix B – Site Analytical Service Limited Site Investigation Data



Site Analytical Services Ltd.							Site 28 CANFIELD GARDENS,LONDON,NW6 3LA		Borehole Number BH1	
Boring Method CONTINUOUS FLIGHT AUGER		Casing Diameter 100mm cased to 0.00m			Ground Level (mOD)		Client MARTIN REDSTON		Job Number 1625536	
		Location TQ260845			Dates 21/07/2016		Engineer		Sheet 1/2	
Depth (m)	Sample / Tests	Casing Depth (m)	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water	
0.25	D1					(0.70)	MADE GROUND: Slate chippings over dark brown black slightly gravelly clayey sand with fragments of brick and concrete rubble. Gravel is fine to coarse of sub-angular to sub-rounded flint.			
0.50	D2					0.70				
0.75	D3					(0.50)	MADE GROUND: Soft, brown silty sandy clay with fragments of brick and concrete rubble.			
1.00 1.00-1.30	D4 M1 94/300					1.20	MADE GROUND: Stiff, light brown silty sandy clay with fragments of brick and concrete rubble.			
1.50 1.50	D5 V1 95					(1.20)				
2.00 2.00	D6 V2 117					2.40				
2.50 2.50	D7 V3 130+						Stiff, brown sandy silty CLAY.			
3.00 3.00	D8 V4 130+									
3.50 3.50	D9 V5 130+									
4.00 4.00	D10 V6 130+									
4.50 4.50	D11 V7 130+					(4.80)				
5.00 5.00	D12 V8 130+									
6.00 6.00	D13 V9 130+									
7.00 7.00	D14 V10 130+					7.20				
8.00 8.00	D15 V11 130+					(2.80)	Stiff, brown blue sandy silty CLAY.			
9.00 9.00	D16 V12 130+									
Remarks D= Disturbed Sample M= Makintosh Probe - Blows/Penetration (mm) V= Vane Test - Result in kPa Groundwater was not encountered during boring/excavation Excavating from 0.00m to 1.00m for 1 hour.								Scale (approx)	Logged By	
								1:50	EW	
								Figure No. 1625536.BH!		

Site Analytical Services Ltd.							Site 28 CANFIELD GARDENS,LONDON,NW6 3LA		Borehole Number BH1	
Boring Method CONTINUOUS FLIGHT AUGER		Casing Diameter 100mm cased to 0.00m			Ground Level (mOD)		Client MARTIN REDSTON		Job Number 1625536	
		Location TQ260845			Dates 21/07/2016		Engineer		Sheet 2/2	
Depth (m)	Sample / Tests	Casing Depth (m)	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water	
10.00 10.00	D17 V13 130+					10.00	Stiff, brown blue sandy silty CLAY.			
11.00 11.00	D18 V14 130+									
12.00 12.00	D19 V15 130+					(5.00)				
13.00 13.00	D20 V16 130+									
14.00 14.00	D21 V17 130+									
15.00 15.00	D22 V18 130+					15.00	Complete at 15.00m			
Remarks D= Disturbed Sample M= Makintosh Probe - Blows/Penetration (mm) V= Vane Test - Result in kPa Groundwater was not encountered during boring/excavation								Scale (approx)	Logged By	
								1:50	EW	
								Figure No. 1625536.BH!		

Site Analytical Services Ltd.							Site 28 CANFIELD GARDENS,LONDON,NW6 3LA		Borehole Number BH2	
Boring Method CONTINUOUS FLIGHT AUGER		Casing Diameter 100mm cased to 0.00m			Ground Level (mOD)		Client MARTIN REDSTON		Job Number 1625536	
		Location TQ260845			Dates 21/07/2016		Engineer		Sheet 1/1	
Depth (m)	Sample / Tests	Casing Depth (m)	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water	
0.25	D1					0.05	MADE GROUND: Concrete slab			
						0.07 (0.43)				
0.50	D2					0.50	MADE GROUND: Thin layer of concrete			
0.75	D3					0.60				
1.00	D4					MADE GROUND: Black silty sandy clay with fragments of brick and concrete rubble.				
1.00	V1 70									
1.50	D5					MADE GROUND: Brown silty sandy clay with fragments of brick and concrete rubble.				
1.50	V2 81									
2.00	D6					Firm becoming stiff, brown sandy silty CLAY				
2.00	V3 87									
2.50	D7									
2.50	V4 93									
3.00	D8									
3.00	V5 101									
3.50	D9					(5.90)				
3.50	V6 113									
4.00	D10									
4.00	V7 122									
4.50	D11									
4.50	V8 127									
5.00	D12									
5.00	V9 130+									
6.00	D13									
6.00	V10 130+									
7.00	D14	6.50	Stiff, dark blue grey sandy silty CLAY with occasional gypsum crystals.							
7.00	V11 130+									
8.00	D15	(3.50)								
8.00	V12 130+									
9.00	D16									
9.00	V13 130+									
10.00	D17									
10.00	V14 130+									
Remarks D= Disturbed Sample M= Makintosh Probe - Blows/Penetration (mm) V= Vane Test - Result in kPa Groundwater was not encountered during boring/excavation Excavating from 0.00m to 1.00m for 1 hour.							Scale (approx) 1:50		Logged By EW	
							Figure No. 1625536.BH2			

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

Legend	Water	Instr (A)	Level (mOD)	Depth (m)	Description	Groundwater Strikes During Drilling										
				1.00	Bentonite Seal	Date	Time	Depth Struck (m)	Casing Depth (m)	Inflow Rate	Readings				Depth Sealed (m)	
											5 min	10 min	15 min	20 min		
					Groundwater Observations During Drilling											
					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											
					Date	Instrument [A]			Remarks							
Time	Depth (m)	Level (mOD)														
				8.00	Bentonite Seal											
				9.00	Bentonite Seal											
				15.00	General Backfill											

Remarks
Lockable cover set in cement

Site Analytical Services Ltd.			Site 28 CANFIELD GARDENS,LONDON,NW6 3LA	Borehole Number BH2
Installation Type Single Installation	Dimensions Internal Diameter of Tube [A] = 50 mm Diameter of Filter Zone = 100 mm		Client MARTIN REDSTON	Job Number 1625536
	Location TQ260845	Ground Level (mOD)	Engineer	Sheet 1/1

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

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

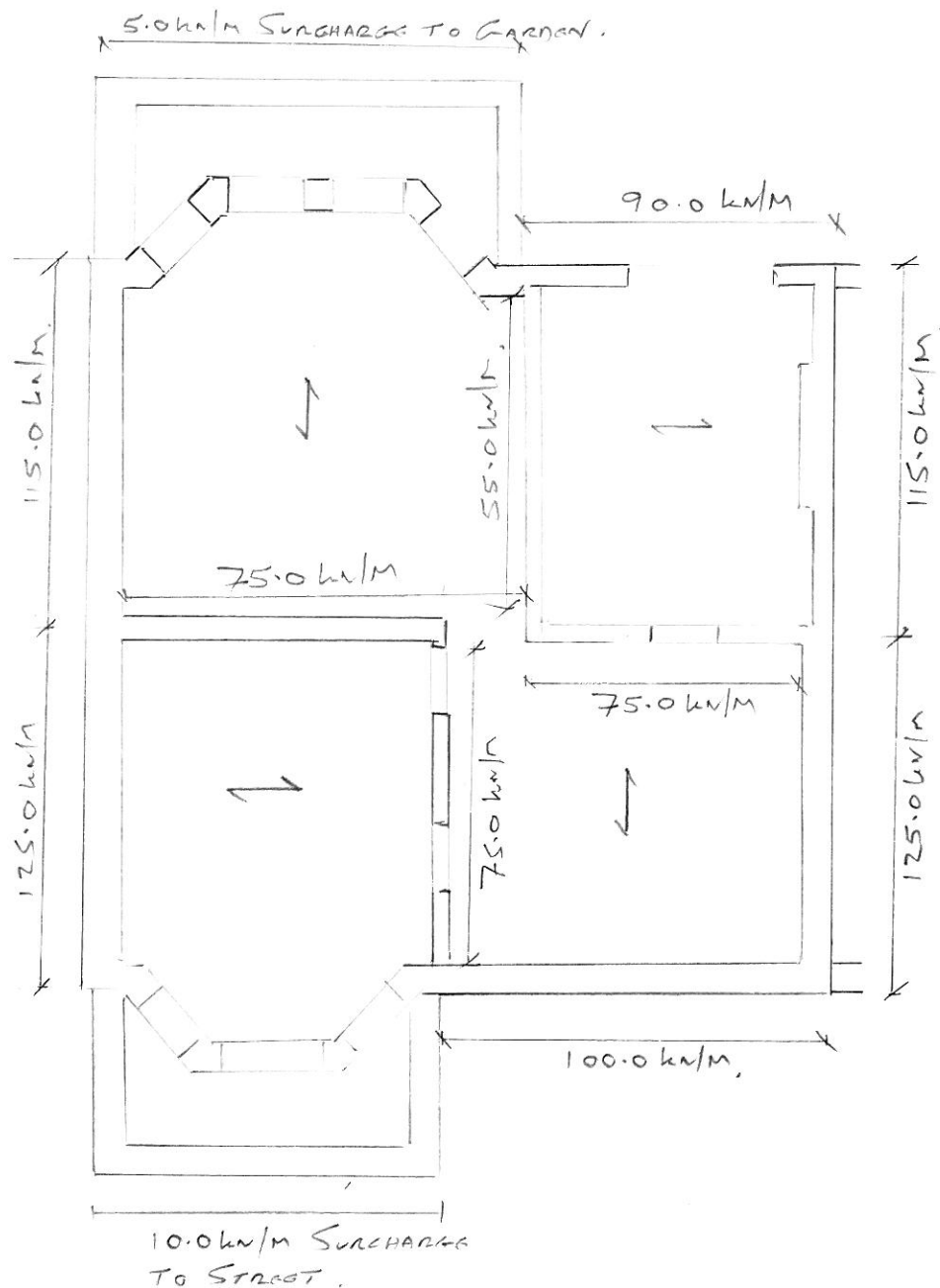
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Sheet No.

TL-01

28 CANFIELD GARDENS
NW6.

TEMPORARY CONDITION LINE LOADS



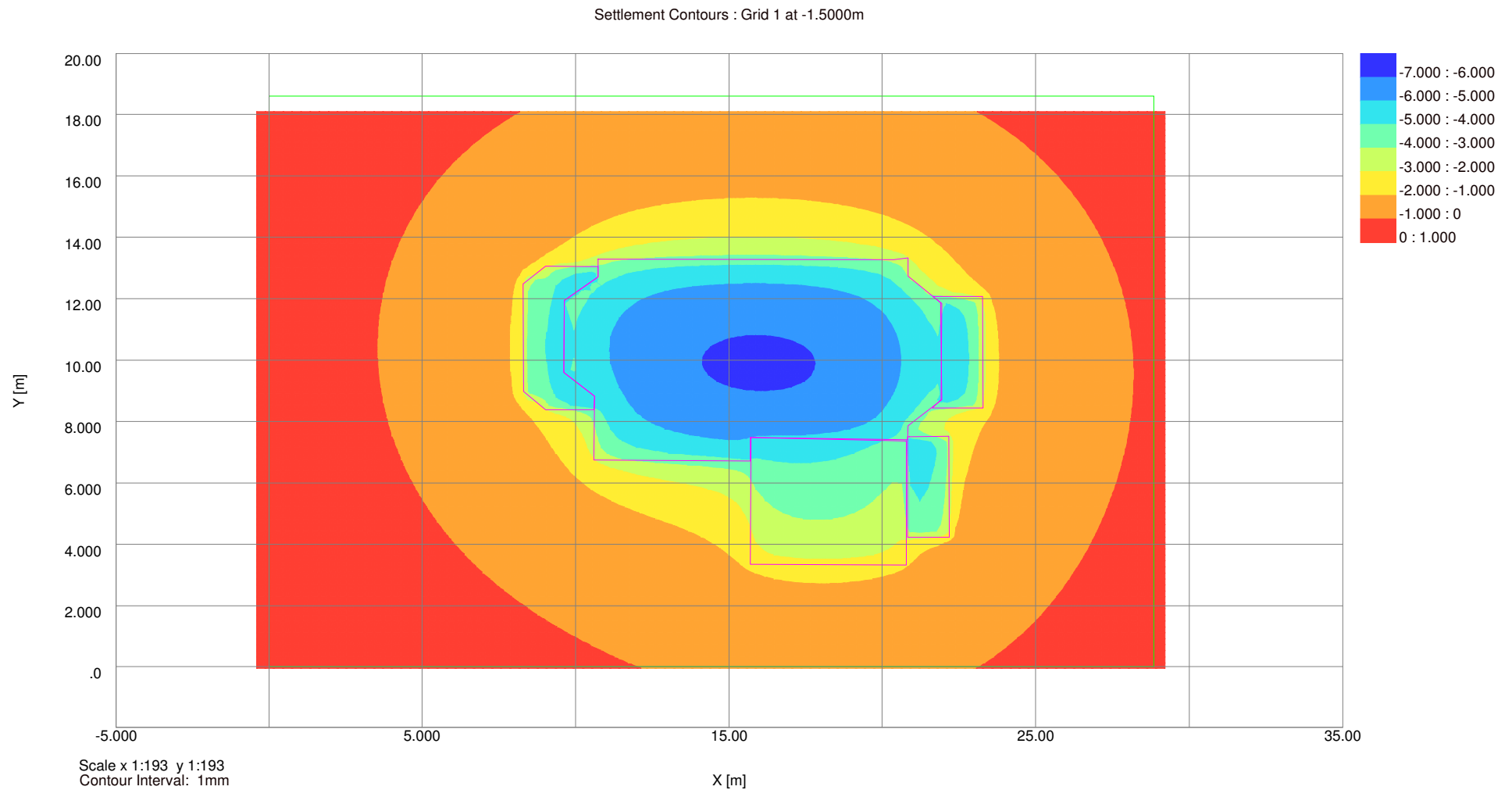
(FRONT, CANFIELD Gdns)

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 settlement movements

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





W A FAIRHURST AND PARTNERS - GLASGOW

Job No. Sheet No. Rev.

117401

Drg. Ref.

Made by Date Checked
OC

28 Canfield Gardens
Ground Movement Assessment
Heave analysis

Titles

Job No.: 117401
Job Title: 28 Canfield Gardens
Sub-title: Ground Movement Assessment
Calculation Heading: Heave analysis
Initials: OC
Checker:
Date Saved:
Date Checked:
Notes:
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29-Nov-2016	10:09	ocolas	
29-Nov-2016	12:09	ocolas	
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12-Dec-2019	15:25	hbrock	
12-Dec-2019	15:37	hbrock	
12-Dec-2019	15:50	hbrock	
18-Dec-2019	12:42	tjanusz	
18-Dec-2019	16:46	tjanusz	
20-Dec-2019	10:47	asmith	
20-Dec-2019	11:22	asmith	
03-Jan-2020	14:04	hbrock	
03-Jan-2020	14:40	hbrock	
08-Jan-2020	12:20	hbrock	
05-Mar-2020	14:31	tjanusz	
05-Mar-2020	23:32	tjanusz	
07-Mar-2020	12:06	tjanusz	

Analysis Options

General

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 load centroids: Yes
GSA piled raft data : No

Elastic

Elastic : Yes
Analysis: Boussinesq
Stiffness for horizontal displacement calculations: Weighted average
Using legacy heave correction factor: No

Consolidation

Consolidation : No

Soil ProfilesSoil Profile 1

Layer ref.	Name	Level at top [mOD]	Number of intermediate displacement levels	Youngs Modulus : Top [kN/m²]	Youngs Modulus : Btm. [kN/m²]	Poissons ratio	Non-linear curve
1	Made Ground	0.0	6	5000.0	5000.0	0.50000	None
2	London Clay Formation	-2.4000	10	23000.	43000.	0.45000	None
3	London Clay Formation (base)	-7.4000	16	43000.	43000.	0.45000	None

Non-linear Curve Coordinates - Non-linear Curve 1

Point Strain Factor
[%]

Soil Zones

Zone	Name	X min [m]	X max [m]	Y min [m]	Y max [m]	Profile
1	Soil Zone #	0.0	28.850	0.0	18.600	Soil Profile 1

Polygonal Load Data

Load ref.	Name	Position : Level	Position : Polygon : Coords. [m]	Position : Polygon : Rect. tolerance [%]	No. of Rectangles	Value : Normal (local z) [kN/m²]
1	Main Basement	-3.00000	(10.7,13.3) (20.4,13.3) (20.8,13.3) (20.8,12.7) (21.9,11.9) (21.9,8.71) (20.8,7.86) (20.8,7.41) (15.7,7.48) (15.7,6.71) (10.6,6.76) (10.6,8.82) (9.62,9.6) (9.63,11.9) (10.7,12.7)	10.000	8	-50.400
2	Lower GF Excavation	-3.00000	(15.7,7.48) (20.8,7.37) (20.8,3.33) (15.7,3.34) (15.7,7.45)	10.000	1	-26.400
3	Lightwell (Front)	-1.50000	(10.7,13) (9.01,13.1) (8.29,12.5) (8.3,8.97) (9.01,8.39) (10.6,8.39) (10.6,8.82) (9.61,9.6) (9.63,11.9) (10.7,12.7)	10.000	8	-24.000
4	Lightwell (Rear, NW)	-1.50000	(21.6,12.1) (23.3,12.1) (23.3,8.44) (21.6,8.45) (21.9,8.71) (21.9,11.8)	10.000	3	-24.000
5	Lightwell (Rear, NE)	-1.50000	(20.9,7.51) (22.2,7.51) (22.2,4.22) (20.8,4.23) (20.8,7.51)	10.000	1	-24.000

Polygonal Loads' Rectangles

No.	Centre x	Centre y	Angle of local x from global X [Degrees]	Width x [m]	Depth y [m]
Load 1 : Main Basement					
(Edge 4 optimal)					
1	10.67684	9.71616	179.94	0.11951	5.9212
2	10.37126	10.73539	179.94	0.49382	3.4516
3	9.87746	10.75387	179.94	0.49382	2.7205
4	21.63488	10.28370	179.94	0.53124	3.6079
5	21.10365	10.29091	179.94	0.53124	4.4500
6	20.60097	10.35964	179.94	0.44432	5.8921
7	18.03967	10.36502	179.94	4.6783	5.8359
8	13.21853	10.01157	179.94	4.9632	6.5531
Load 2 : Lower GF Excavation					
(Edge 2 optimal)					
1	18.24985	5.36973	-90.461	4.0413	5.0805
Load 3 : Lightwell (Front)					



W A FAIRHURST AND PARTNERS - GLASGOW

28 Canfield Gardens
Ground Movement Assessment
Heave analysis

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

No.	Centre x	Centre y	Angle of local x from global X	Width x	Depth y
(Edge 1 optimal)					
1	10.54588	12.81624	179.41	0.36200	0.45270
2	10.18255	12.68824	179.41	0.36200	0.71618
3	9.81921	12.56023	179.41	0.36200	0.97966
4	9.32785	10.72214	179.41	0.58278	4.6658
5	8.65386	10.74655	179.41	0.66936	4.0913
6	10.43653	8.67246	179.41	0.33276	0.56618
7	10.10509	8.80135	179.41	0.33276	0.82398
8	9.77364	8.93024	179.41	0.33276	1.0818
Load 4 : Lightwell (Rear, NW)					
(Edge 2 optimal)					
1	22.59820	10.27641	-90.388	3.1355	1.3486
2	22.52580	8.57703	-90.388	0.26418	1.5083
3	22.52814	11.95651	-90.388	0.22372	1.4740
Load 5 : Lightwell (Rear, NE)					
(Edge 2 optimal)					
1	21.49379	5.86991	-90.000	3.2708	1.3540

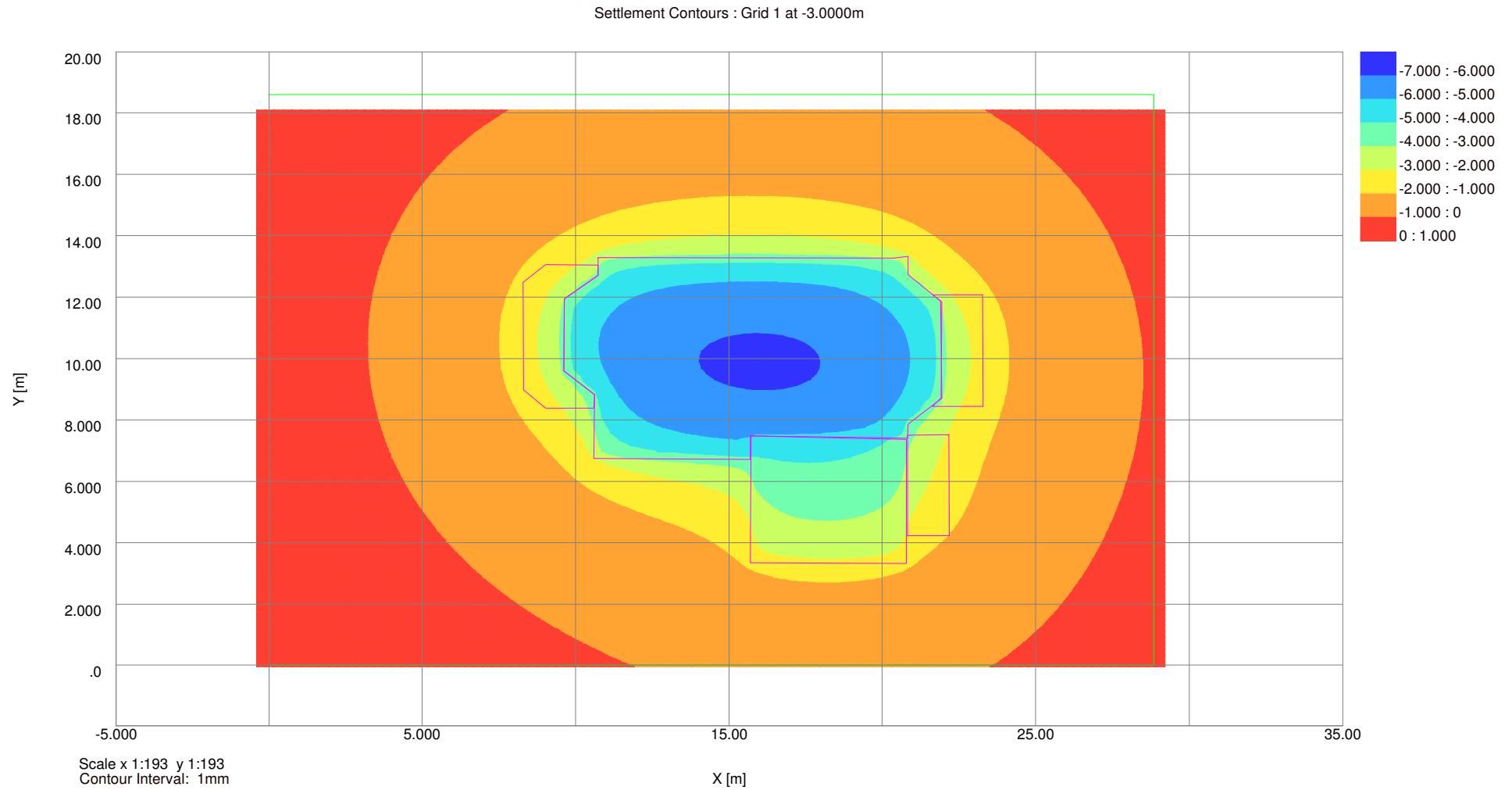
Displacement Grids

Name	Extrusion: Direction	X1	Y1	Z1	X2	Y2	Z2	Intervals Along Line [No.]	Extrusion: Distance [m]	Extrusion: Intervals Along [No.]	Calculate Detailed Results
		[m]	[m]	[m]	[m]	[m]	[m]				
Grid 1	Global Y	-0.42348	-0.65151	-1.50000	29.22009	-	-1.50000	100	19.52893	100	Yes No

Warnings

- (1)The displacement location of Grid 1 at (-0.423, -0.652, -1.500)m lies wide of all soil zones. The first soil profile will be used. There are more displacement locations for which this warning applies. Only one is detailed here.
- (2)The load at (15.706, 10.206, -3.000)m lies wide of all soil zones. Displacements at its centre have been requested. The first soil profile will be used.

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





W A FAIRHURST AND PARTNERS - GLASGOW

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

28 Canfield Gardens
Ground Movement Assessment
Heave analysis

Titles

Job No.: 117401
Job Title: 28 Canfield Gardens
Sub-title: Ground Movement Assessment
Calculation Heading: Heave analysis
Initials: OC
Checker:
Date Saved:
Date Checked:
Notes:
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File Path: C:\Users\tjanusz\Documents\01 Projects\117401 - 28 Canfield
Gardens, NW6\Geotech\Model\FDisp

History

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12-Dec-2019	15:25	hbrock	
12-Dec-2019	15:37	hbrock	
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20-Dec-2019	10:47	asmith	
20-Dec-2019	11:22	asmith	
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03-Jan-2020	14:40	hbrock	
08-Jan-2020	12:20	hbrock	
05-Mar-2020	14:31	tjanusz	
07-Mar-2020	11:55	tjanusz	

Analysis Options

General

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 load centroids: Yes
GSA piled raft data : No

Elastic

Elastic : Yes
Analysis: Boussinesq
Stiffness for horizontal displacement calculations: Weighted average
Using legacy heave correction factor: No

Consolidation

Consolidation : No

Soil ProfilesSoil Profile 1

Layer ref.	Name	Level at top	Number of intermediate displacement levels	Youngs Modulus : Top	Youngs Modulus : Btm.	Poissons ratio	Non-linear curve
		[mOD]		[kN/m²]	[kN/m²]		
1	Made Ground	0.0	6	5000.0	5000.0	0.50000	None
2	London Clay Formation	-2.4000	10	23000.	43000.	0.45000	None
3	London Clay Formation (base)	-7.4000	16	43000.	43000.	0.45000	None

Non-linear Curve Coordinates - Non-linear Curve 1

Point Strain Factor
[%]

Soil Zones

Zone	Name	X min [m]	X max [m]	Y min [m]	Y max [m]	Profile
1	Soil Zone #	0.0	28.850	0.0	18.600	Soil Profile 1

Polygonal Load Data

Load ref.	Name	Position : Level	Position : Polygon : Coords. [m]	Position : Polygon : Rect. tolerance [%]	No. of Rectangles	Value : Normal (local z) [kN/m²]
1	Main Basement	-3.00000	(10.7,13.3) (20.4,13.3) (20.8,13.3) (20.8,12.7) (21.9,11.9) (21.9,8.71) (20.8,7.86) (20.8,7.41) (15.7,7.48) (15.7,6.71) (10.6,6.76) (10.6,8.82) (9.62,9.6) (9.63,11.9) (10.7,12.7)	10.000	8	-50.400
2	Lower GF Excavation	-3.00000	(15.7,7.48) (20.8,7.37) (20.8,3.33) (15.7,3.34) (15.7,7.45)	10.000	1	-26.400
3	Lightwell (Front)	-1.50000	(10.7,13) (9.01,13.1) (8.29,12.5) (8.3,8.97) (9.01,8.39) (10.6,8.39) (10.6,8.82) (9.61,9.6) (9.63,11.9) (10.7,12.7)	10.000	8	-24.000
4	Lightwell (Rear, NW)	-1.50000	(21.6,12.1) (23.3,12.1) (23.3,8.44) (21.6,8.45) (21.9,8.71) (21.9,11.8)	10.000	3	-24.000
5	Lightwell (Rear, NE)	-1.50000	(20.9,7.51) (22.2,7.51) (22.2,4.22) (20.8,4.23) (20.8,7.51)	10.000	1	-24.000

Polygonal Loads' Rectangles

No.	Centre : x	Centre : y	Angle of local x from global X [Degrees]	Width x [m]	Depth y [m]
Load 1 : Main Basement					
(Edge 4 optimal)					
1	10.67684	9.71616	179.94	0.11951	5.9212
2	10.37126	10.73539	179.94	0.49382	3.4516
3	9.87746	10.75387	179.94	0.49382	2.7205
4	21.63488	10.28370	179.94	0.53124	3.6079
5	21.10365	10.29091	179.94	0.53124	4.4500
6	20.60097	10.35964	179.94	0.44432	5.8921
7	18.03967	10.36502	179.94	4.6783	5.8359
8	13.21853	10.01157	179.94	4.9632	6.5531
Load 2 : Lower GF Excavation					
(Edge 2 optimal)					
1	18.24985	5.36973	-90.461	4.0413	5.0805
Load 3 : Lightwell (Front)					



W A FAIRHURST AND PARTNERS - GLASGOW

28 Canfield Gardens
Ground Movement Assessment
Heave analysis

Job No.	Sheet No.	Rev.
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Made by OC	Date	Checked

No.	Centre x	Centre y	Angle of local x from global X	Width x	Depth y
(Edge 1 optimal)					
1	10.54588	12.81624	179.41	0.36200	0.45270
2	10.18255	12.68824	179.41	0.36200	0.71618
3	9.81921	12.56023	179.41	0.36200	0.97966
4	9.32785	10.72214	179.41	0.58278	4.6658
5	8.65386	10.74655	179.41	0.66936	4.0913
6	10.43653	8.67246	179.41	0.33276	0.56618
7	10.10509	8.80135	179.41	0.33276	0.82398
8	9.77364	8.93024	179.41	0.33276	1.0818
Load 4 : Lightwell (Rear, NW)					
(Edge 2 optimal)					
1	22.59820	10.27641	-90.388	3.1355	1.3486
2	22.52580	8.57703	-90.388	0.26418	1.5083
3	22.52814	11.95651	-90.388	0.22372	1.4740
Load 5 : Lightwell (Rear, NE)					
(Edge 2 optimal)					
1	21.49379	5.86991	-90.000	3.2708	1.3540

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
		[m]	[m]	[m]	[m]	[m]	[m]				
Grid 1	Global Y	-0.42348	-0.65151	-3.00000	29.22009	-	-3.00000	100	19.52893	100	Yes No

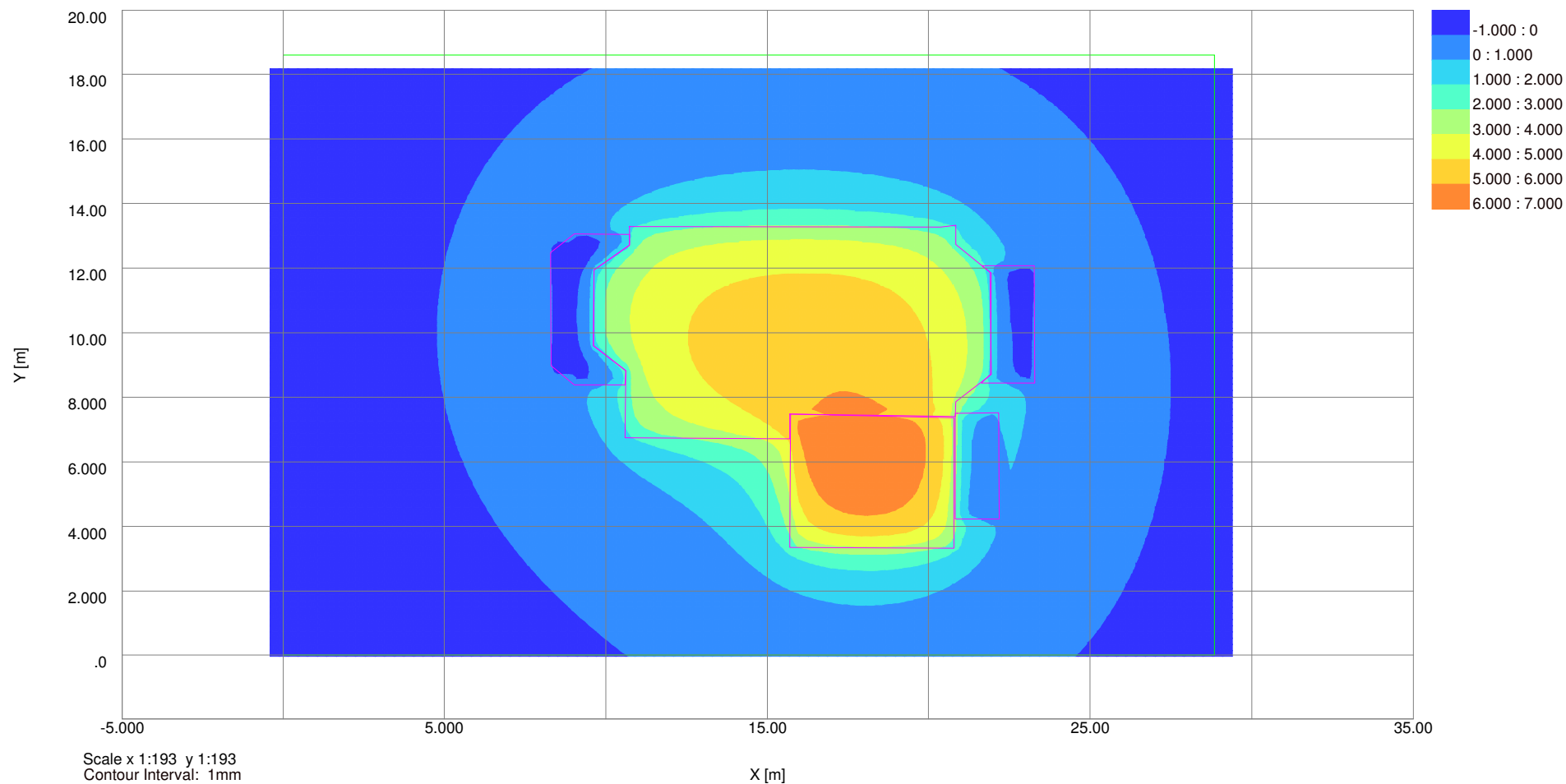
Warnings

- (1)The displacement location of Grid 1 at (-0.423, -0.652, -3.000)m lies wide of all soil zones. The first soil profile will be used. There are more displacement locations for which this warning applies. Only one is detailed here.
- (2)The load at (15.706, 10.206, -3.000)m lies wide of all soil zones. Displacements at its centre have been requested. The first soil profile will be used.

Appendix E- Stage 2 – PDISP Undrained reloading settlement movements

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

Settlement Contours : Grid 1 at -1.5000m





W A FAIRHURST AND PARTNERS - GLASGOW

Job No. Sheet No. Rev.

117401

Drg. Ref.

Made by Date Checked
HB

28 Canfield Gardens
Ground Movement Assessment
Settlement Analysis

Titles

Job No.: 117401
Job Title: 28 Canfield Gardens
Sub-title: Ground Movement Assessment
Calculation Heading: Settlement Analysis
Initials: HB
Checker:
Date Saved:
Date Checked:
Notes:
File Name: 117401 - 28 Canfield Gardens Stage 2 HB - Main Excavation 2 (LW).pdd
File Path: C:\Users\tjanusz\Documents\01 Projects\117401 - 28 Canfield Gardens, NW6\Geotech\Model1\FDisp

History

Date	Time	By	Notes
28-Nov-2016	17:03	ocolas	
28-Nov-2016	17:09	ocolas	
28-Nov-2016	17:11	ocolas	
28-Nov-2016	17:21	ocolas	
29-Nov-2016	10:09	ocolas	
29-Nov-2016	12:09	ocolas	
12-Dec-2019	15:20	hbrock	
12-Dec-2019	15:25	hbrock	
12-Dec-2019	15:37	hbrock	
12-Dec-2019	15:50	hbrock	
18-Dec-2019	12:42	tjanusz	
18-Dec-2019	16:46	tjanusz	
20-Dec-2019	10:47	asmith	
20-Dec-2019	11:22	asmith	
03-Jan-2020	14:04	hbrock	
03-Jan-2020	14:08	hbrock	
03-Jan-2020	15:43	hbrock	
08-Jan-2020	09:28	hbrock	
08-Jan-2020	09:50	hbrock	
08-Jan-2020	12:26	hbrock	
15-Jan-2020	11:41	hbrock	
05-Mar-2020	10:50	tjanusz	
05-Mar-2020	13:28	tjanusz	
05-Mar-2020	23:27	tjanusz	
05-Mar-2020	23:41	tjanusz	
07-Mar-2020	12:16	tjanusz	

Analysis Options

General

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 load centroids: Yes
GSA piled raft data : No

Elastic

Elastic : Yes
Analysis: Boussinesq
Stiffness for horizontal displacement calculations: Weighted average
Using legacy heave correction factor: No

Consolidation

Consolidation : No

Soil ProfilesSoil Profile 1

Layer ref.	Name	Level at top	Number of intermediate displacement levels	Youngs Modulus : Top	Youngs Modulus : Btm.	Poissons ratio	Non-linear curve
		[mOD]		[kN/m²]	[kN/m²]		
1	Made Ground	0.0	6	5000.0	5000.0	0.50000	None
2	London Clay Formation	-2.4000	10	23000.	43000.	0.45000	None
3	London Clay Formation (base)	-7.4000	16	43000.	43000.	0.45000	None

Non-linear Curve Coordinates - Non-linear Curve 1

Point Strain Factor
[%]

Soil Zones

Zone	Name	X min [m]	X max [m]	Y min [m]	Y max [m]	Profile
1	Soil Zone #	0.0	28.850	0.0	18.600	Soil Profile 1

Polygonal Load Data

Load ref.	Name	Position : Level	Position : Polygon : Coords.	Position : Polygon : Rect. : Rect. tolerance	No. of Rectangles	Value : Normal (local z)
		[m]	[m]	[°]		[kN/m²]
1	Main Basement	-3.00000	(10.7,13.3) (20.4,13.3) (20.8,13.3) (20.8,12.7) (21.9,11.9) (21.9,8.71) (20.8,7.86) (20.8,7.41) (15.7,7.48) (15.7,6.71) (10.6,6.76) (10.6,8.82) (9.62,9.6) (9.63,11.9) (10.7,12.7)	10.000	8	44.600
2	Lower GF Excavation	-3.00000	(15.7,7.48) (20.8,7.37) (20.8,3.33) (15.7,3.34) (15.7,7.45)	10.000	1	68.600
3	Lightwell (Front)	-1.50000	(10.7,13) (9.01,13.1) (8.29,12.5) (8.3,8.97) (9.01,8.39) (10.6,8.39) (10.6,8.82) (9.61,9.6) (9.63,11.9) (10.7,12.7)	10.000	8	-14.000
4	Lightwell (Rear, NW)	-1.50000	(21.6,12.1) (23.3,12.1) (23.3,8.44) (21.6,8.45) (21.9,8.71) (21.9,11.8)	10.000	3	-14.000
5	Lightwell (Rear, NE)	-1.50000	(20.8,7.51) (22.2,7.51) (22.2,4.22) (20.8,4.23) (20.8,7.51)	10.000	1	-14.000

Polygonal Loads' Rectangles

No.	Centre : x	Centre : y	Angle of local x from global X [Degrees]	Width x [m]	Depth y [m]
Load 1 : Main Basement (Edge 4 optimal)					
1	10.67684	9.71616	179.94	0.11951	5.9212
2	10.37126	10.73539	179.94	0.49382	3.4516
3	9.87746	10.75387	179.94	0.49382	2.7205
4	21.63488	10.28370	179.94	0.53124	3.6079
5	21.10365	10.29091	179.94	0.53124	4.4500



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28 Canfield Gardens
Ground Movement Assessment
Settlement Analysis

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Made by HB	Date	Checked

No.	Centre x	Centre y	Angle of local x from global X	Width x	Depth y
6	20.60097	10.35964	179.94	0.44432	5.8921
7	18.03967	10.36502	179.94	4.6783	5.8359
8	13.21853	10.01157	179.94	4.9632	6.5531
Load 2 : Lower GF Excavation					
(Edge 2 optimal)					
1	18.24985	5.36973	-90.461	4.0413	5.0805
Load 3 : Lightwell (Front)					
(Edge 1 optimal)					
1	10.54588	12.81624	179.41	0.36200	0.45270
2	10.18255	12.68824	179.41	0.36200	0.71618
3	9.81921	12.56023	179.41	0.36200	0.97966
4	9.32785	10.72214	179.41	0.58278	4.6658
5	8.65386	10.74655	179.41	0.66936	4.0913
6	10.43653	8.67246	179.41	0.33276	0.56618
7	10.10509	8.80135	179.41	0.33276	0.82398
8	9.77364	8.93024	179.41	0.33276	1.0818
Load 4 : Lightwell (Rear, NW)					
(Edge 2 optimal)					
1	22.59820	10.27641	-90.388	3.1355	1.3486
2	22.52580	8.57703	-90.388	0.26418	1.5083
3	22.52814	11.95651	-90.388	0.22372	1.4740
Load 5 : Lightwell (Rear, NE)					
(Edge 2 optimal)					
1	21.49379	5.86991	-90.000	3.2708	1.3540

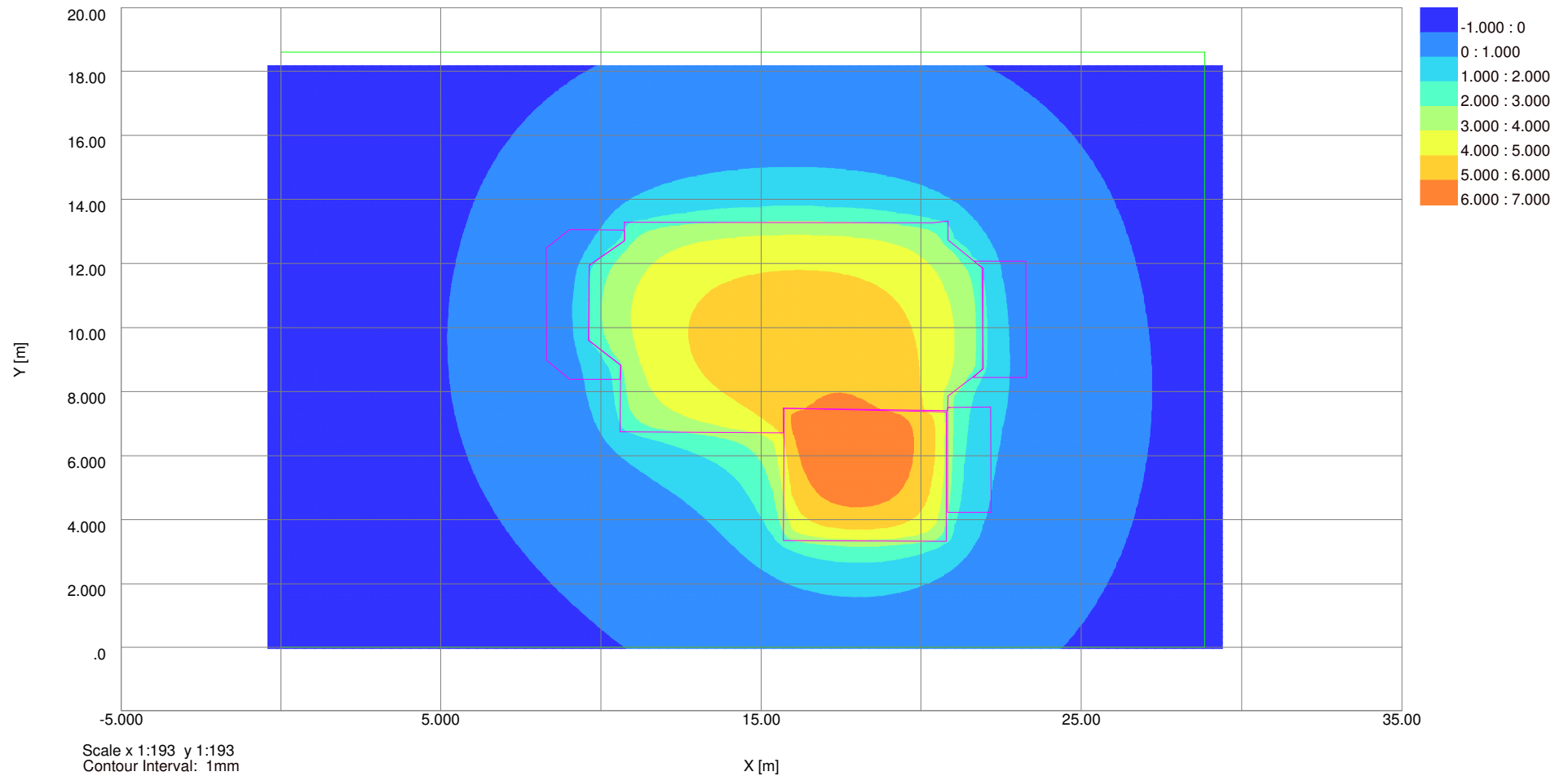
Displacement Grids

Name	Extrusion: Direction	X1	Y1	Z1	X2	Y2	Z2	Intervals Along Line [No.]	Extrusion: Distance [m]	Extrusion: Intervals Along [No.]	Calculate	Detailed Results
		[m]	[m]	[m]	[m]	[m]	[m]					
Grid 1	Global Y	-0.42348	-0.42348	-1.50000	29.39926	-	-1.50000	100	19.18688	100	Yes	No

Warnings

- (1)The displacement location of Grid 1 at (-0.423, -0.423, -1.500)m lies wide of all soil zones. The first soil profile will be used. There are more displacement locations for which this warning applies. Only one is detailed here.
- (2)The load at (15.706, 10.206, -3.000)m lies wide of all soil zones. Displacements at its centre have been requested. The first soil profile will be used.

Settlement Contours : Grid 1 at -3.0000m





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

28 Canfield Gardens
Ground Movement Assessment
Settlement Analysis

Titles

Job No.: 117401
Job Title: 28 Canfield Gardens
Sub-title: Ground Movement Assessment
Calculation Heading: Settlement Analysis
Initials: HB
Checker:
Date Saved:
Date Checked:
Notes:
File Name: 117401 - 28 Canfield Gardens Stage 2 HB - Main Excavation
2.pdd
File Path: C:\Users\tjanusz\Documents\01 Projects\117401 - 28 Canfield
Gardens, NW6\Geotech\Model\FDisp

History

Date	Time	By	Notes
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28-Nov-2016	17:09	ocolas	
28-Nov-2016	17:11	ocolas	
28-Nov-2016	17:21	ocolas	
29-Nov-2016	10:09	ocolas	
29-Nov-2016	12:09	ocolas	
12-Dec-2019	15:20	hbrock	
12-Dec-2019	15:25	hbrock	
12-Dec-2019	15:37	hbrock	
12-Dec-2019	15:50	hbrock	
18-Dec-2019	12:42	tjanusz	
18-Dec-2019	16:46	tjanusz	
20-Dec-2019	10:47	asmith	
20-Dec-2019	11:22	asmith	
03-Jan-2020	14:04	hbrock	
03-Jan-2020	14:08	hbrock	
03-Jan-2020	15:43	hbrock	
08-Jan-2020	09:28	hbrock	
08-Jan-2020	09:50	hbrock	
08-Jan-2020	12:26	hbrock	
15-Jan-2020	11:41	hbrock	
05-Mar-2020	10:50	tjanusz	
05-Mar-2020	13:28	tjanusz	
05-Mar-2020	23:27	tjanusz	
06-Mar-2020	15:08	tjanusz	
07-Mar-2020	12:10	tjanusz	

Analysis Options

General

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 load centroids: Yes
GSA piled raft data : No

Elastic

Elastic : Yes
Analysis: Boussinesq
Stiffness for horizontal displacement calculations: Weighted average
Using legacy heave correction factor: No

Consolidation

Consolidation : No

Soil ProfilesSoil Profile 1

Layer ref.	Name	Level at top	Number of intermediate displacement levels	Youngs Modulus : Top	Youngs Modulus : Btm.	Poissons ratio	Non-linear curve
		[mOD]		[kN/m²]	[kN/m²]		
1	Made Ground	0.0	6	5000.0	5000.0	0.50000	None
2	London Clay Formation	-2.4000	10	23000.	43000.	0.45000	None
3	London Clay Formation (base)	-7.4000	16	43000.	43000.	0.45000	None

Non-linear Curve Coordinates - Non-linear Curve 1

Point Strain Factor
[%]

Soil Zones

Zone	Name	X min [m]	X max [m]	Y min [m]	Y max [m]	Profile
1	Soil Zone #	0.0	28.850	0.0	18.600	Soil Profile 1

Polygonal Load Data

Load ref.	Name	Position : Level	Position : Polygon : Coords.	Position : Polygon Rectangles : Rect. tolerance	No. of Rectangles	Value : Normal (local z)
		[m]	[m]	[#]		[kN/m ²]
1	Main Basement	-3.00000	(10.7,13.3) (20.4,13.3) (20.8,13.3) (20.8,12.7) (21.9,11.9) (21.9,8.71) (20.8,7.86) (20.8,7.41) (15.7,7.48) (15.7,6.71) (10.6,6.76) (10.6,8.82) (9.62,9.6) (9.63,11.9) (10.7,12.7)	10.000	8	44.600
2	Lower GF Excavation	-3.00000	(15.7,7.48) (20.8,7.37) (20.8,3.33) (15.7,3.34) (15.7,7.45)	10.000	1	68.600
3	Lightwell (Front)	-1.50000	(10.7,13) (9.01,13.1) (8.29,12.5) (8.3,8.97) (9.01,8.39) (10.6,8.39) (10.6,8.82) (9.61,9.6) (9.63,11.9) (10.7,12.7)	10.000	8	-14.000
4	Lightwell (Rear, NW)	-1.50000	(21.6,12.1) (23.3,12.1) (23.3,8.44) (21.6,8.45) (21.9,8.71) (21.9,11.8)	10.000	3	-14.000
5	Lightwell (Rear, NE)	-1.50000	(20.8,7.51) (22.2,7.51) (22.2,4.22) (20.8,4.23) (20.8,7.51)	10.000	1	-14.000

Polygonal Loads' Rectangles

No.	Centre : x	Centre : y	Angle of local x from global X [Degrees]	Width x [m]	Depth y [m]
Load 1 : Main Basement (Edge 4 optimal)					
1	10.67684	9.71616	179.94	0.11951	5.9212
2	10.37126	10.73539	179.94	0.49382	3.4516
3	9.87746	10.75387	179.94	0.49382	2.7205
4	21.63488	10.28370	179.94	0.53124	3.6079
5	21.10365	10.29091	179.94	0.53124	4.4500



W A FAIRHURST AND PARTNERS - GLASGOW

28 Canfield Gardens
Ground Movement Assessment
Settlement Analysis

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

No.	Centre x	Centre y	Angle of local x from global X	Width x	Depth y
6	20.60097	10.35964	179.94	0.44432	5.8921
7	18.03967	10.36502	179.94	4.6783	5.8359
8	13.21853	10.01157	179.94	4.9632	6.5531
Load 2 : Lower GF Excavation					
(Edge 2 optimal)					
1	18.24985	5.36973	-90.461	4.0413	5.0805
Load 3 : Lightwell (Front)					
(Edge 1 optimal)					
1	10.54588	12.81624	179.41	0.36200	0.45270
2	10.18255	12.68824	179.41	0.36200	0.71618
3	9.81921	12.56023	179.41	0.36200	0.97966
4	9.32785	10.72214	179.41	0.58278	4.6658
5	8.65386	10.74655	179.41	0.66936	4.0913
6	10.43653	8.67246	179.41	0.33276	0.56618
7	10.10509	8.80135	179.41	0.33276	0.82398
8	9.77364	8.93024	179.41	0.33276	1.0818
Load 4 : Lightwell (Rear, NW)					
(Edge 2 optimal)					
1	22.59820	10.27641	-90.388	3.1355	1.3486
2	22.52580	8.57703	-90.388	0.26418	1.5083
3	22.52814	11.95651	-90.388	0.22372	1.4740
Load 5 : Lightwell (Rear, NE)					
(Edge 2 optimal)					
1	21.49379	5.86991	-90.000	3.2708	1.3540

Displacement Grids

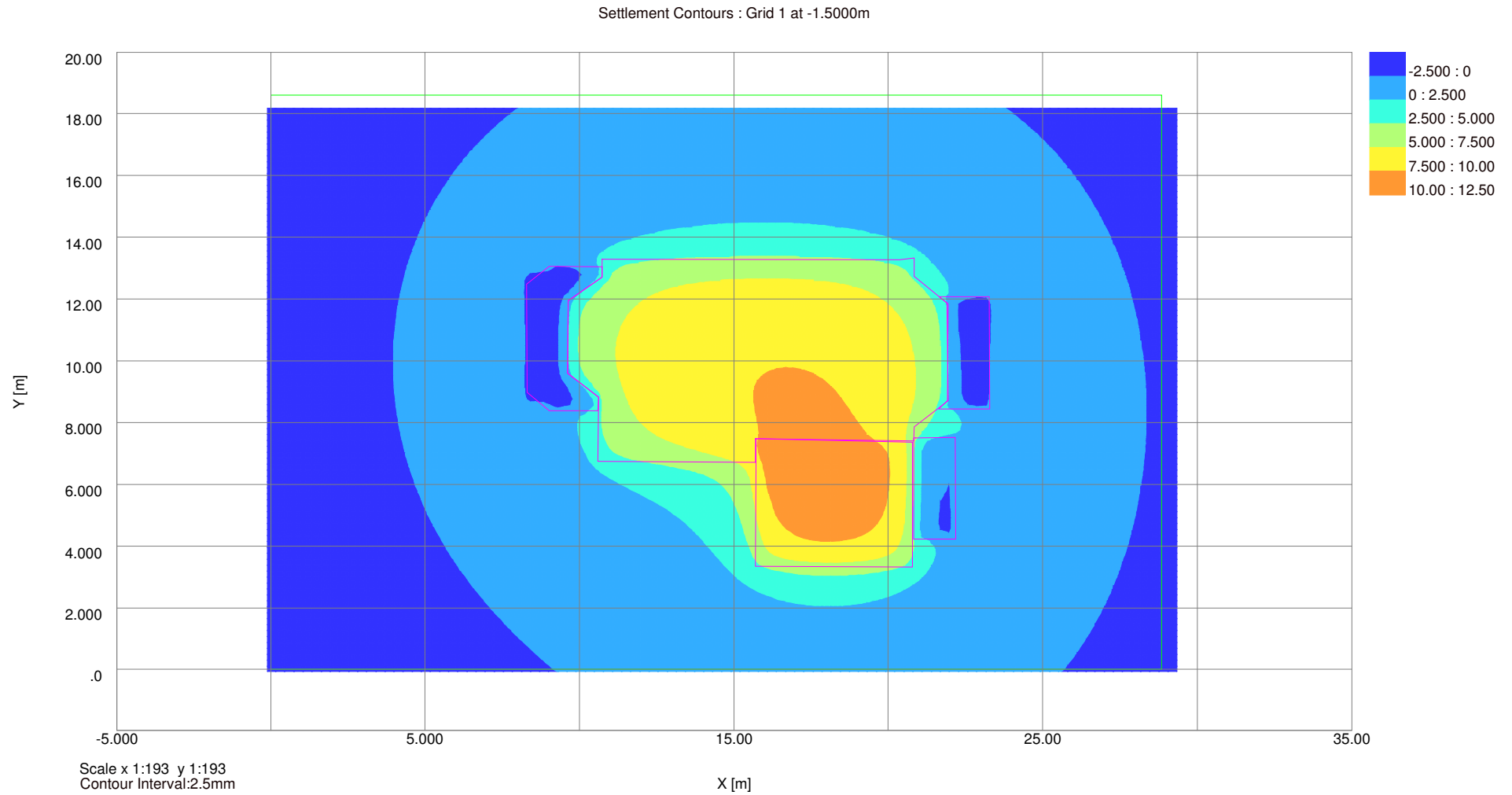
Name	Extrusion: Direction	X1	Y1	Z1	X2	Y2	Z2	Intervals Along Line [No.]	Extrusion: Distance [m]	Extrusion: Intervals Along [No.]	Calculate	Detailed Results
		[m]	[m]	[m]	[m]	[m]	[m]					
Grid 1	Global Y	-0.42348	-0.42348	-3.00000	29.39926	-	-3.00000	100	19.18688	100	Yes	No

Warnings

- (1)The displacement location of Grid 1 at (-0.423, -0.423, -3.000)m lies wide of all soil zones. The first soil profile will be used. There are more displacement locations for which this warning applies. Only one is detailed here.
- (2)The load at (15.706, 10.206, -3.000)m lies wide of all soil zones. Displacements at its centre have been requested. The first soil profile will be used.

Appendix F - Stage 3 – PDISP Drained reloading settlement movements

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





W A FAIRHURST AND PARTNERS - GLASGOW

Job No. Sheet No. Rev.

117401

Drg. Ref.

Made by Date Checked
OC

28 Canfield Gardens
Ground Movement Assessment
Heave analysis

Titles

Job No.: 117401
Job Title: 28 Canfield Gardens
Sub-title: Ground Movement Assessment
Calculation Heading: Heave analysis
Initials: OC
Checker:
Date Saved:
Date Checked:
Notes:
File Name: 117401 - 28 Canfield Gardens Stage 3 HB - Main Excavation (LW).pdd
File Path: C:\Users\tjanusz\Documents\01 Projects\117401 - 28 Canfield Gardens, NW6\Geotech\Model\FDisp

History

Date	Time	By	Notes
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28-Nov-2016	17:09	ocolas	
28-Nov-2016	17:11	ocolas	
28-Nov-2016	17:21	ocolas	
29-Nov-2016	10:09	ocolas	
29-Nov-2016	12:09	ocolas	
12-Dec-2019	15:20	hbrock	
12-Dec-2019	15:25	hbrock	
12-Dec-2019	15:37	hbrock	
12-Dec-2019	15:50	hbrock	
18-Dec-2019	12:42	tjanusz	
18-Dec-2019	16:46	tjanusz	
20-Dec-2019	10:47	asmith	
20-Dec-2019	11:22	asmith	
03-Jan-2020	14:04	hbrock	
03-Jan-2020	14:08	hbrock	
03-Jan-2020	14:09	hbrock	
03-Jan-2020	14:18	hbrock	
03-Jan-2020	15:39	hbrock	
03-Jan-2020	16:06	hbrock	
08-Jan-2020	09:56	hbrock	
08-Jan-2020	12:31	hbrock	
15-Jan-2020	11:52	hbrock	
05-Mar-2020	10:54	tjanusz	
05-Mar-2020	13:17	tjanusz	
05-Mar-2020	13:42	tjanusz	
05-Mar-2020	23:21	tjanusz	
07-Mar-2020	12:30	tjanusz	

Analysis Options

General

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 load centroids: Yes
GSA piled raft data : No

Elastic

Elastic : Yes
Analysis: Boussinesq
Stiffness for horizontal displacement calculations: Weighted average
Using legacy heave correction factor: No

Consolidation

Consolidation : No

Soil ProfilesSoil Profile 1

Layer ref.	Name	Level at top	Number of intermediate displacement levels	Youngs Modulus : Top	Youngs Modulus : Btm.	Poissons ratio	Non-linear curve
		[mOD]		[kN/m²]	[kN/m²]		
1	Made Ground	0.0	6	2500.0	2500.0	0.40000	None
2	London Clay Formation	-2.4000	10	13000.	26000.	0.40000	None
3	London Clay Formation (base)	-7.4000	16	26000.	26000.	0.40000	None

Non-linear Curve Coordinates - Non-linear Curve 1

Point Strain Factor
[%]

Soil Zones

Zone	Name	X min [m]	X max [m]	Y min [m]	Y max [m]	Profile
1	Soil Zone #	0.0	28.850	0.0	18.600	Soil Profile 1

Polygonal Load Data

Load ref.	Name	Position : Level	Position : Polygon	Coords. : Rect. tolerance	No. of Rectangles	Value : Normal (local z)
		[m]	[m]	[%]		[kN/m²]
1	Main Basement	-3.00000	(10.7,13.3) (20.4,13.3) (20.8,13.3) (20.8,12.7) (21.9,11.9) (21.9,8.71) (20.8,7.86) (20.8,7.41) (15.7,7.48) (15.7,6.71) (10.6,6.76) (10.6,8.82) (9.62,9.6) (9.63,11.9) (10.7,12.7)	10.000	8	44.600
2	Lower GF Excavation	-3.00000	(15.7,7.48) (20.8,7.37) (20.8,3.33) (15.7,3.34) (15.7,7.45)	10.000	1	68.600
3	Lightwell (Front)	-1.50000	(10.7,13) (9.01,13.1) (8.29,12.5) (8.3,8.97) (9.01,8.39) (10.6,8.39) (10.6,8.82) (9.61,9.6) (9.63,11.9) (10.7,12.7)	10.000	8	-14.000
4	Lightwell (Rear, NW)	-1.50000	(21.6,12.1) (23.3,12.1) (23.3,8.44) (21.6,8.45) (21.9,8.71) (21.9,11.8)	10.000	3	-14.000
5	Lightwell (Rear, NE)	-1.50000	(20.9,7.51) (22.2,7.51) (22.2,4.22) (20.8,4.23) (20.8,7.51)	10.000	1	-14.000

Polygonal Loads' Rectangles

No.	Centre x	Centre y	Angle of local x from global X [Degrees]	Width [m]	Depth y [m]
Load 1 : Main Basement (Edge 4 optimal)					
1	10.67684	9.71616	179.94	0.11951	5.9212
2	10.37126	10.73539	179.94	0.49382	3.4516
3	9.87746	10.75387	179.94	0.49382	2.7205



W A FAIRHURST AND PARTNERS - GLASGOW

28 Canfield Gardens
Ground Movement Assessment
Heave analysis

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No.	Centre x	Centre y	Angle of local x from global X	Width x	Depth y
4	21.63488	10.28370	179.94	0.53124	3.6079
5	21.10365	10.29091	179.94	0.53124	4.4500
6	20.60097	10.35964	179.94	0.44432	5.8921
7	18.03967	10.36502	179.94	4.6783	5.8359
8	13.21853	10.01157	179.94	4.9632	6.5531
Load 2 : Lower GF Excavation					
(Edge 2 optimal)					
1	18.24985	5.36973	-90.461	4.0413	5.0805
Load 3 : Lightwell (Front)					
(Edge 1 optimal)					
1	10.54588	12.81624	179.41	0.36200	0.45270
2	10.18255	12.68824	179.41	0.36200	0.71618
3	9.81921	12.56023	179.41	0.36200	0.97966
4	9.32785	10.72214	179.41	0.58278	4.6658
5	8.65386	10.74655	179.41	0.66936	4.0913
6	10.43653	8.67246	179.41	0.33276	0.56618
7	10.10509	8.80135	179.41	0.33276	0.82398
8	9.77364	8.93024	179.41	0.33276	1.0818
Load 4 : Lightwell (Rear, NW)					
(Edge 2 optimal)					
1	22.59820	10.27641	-90.388	3.1355	1.3486
2	22.52580	8.57703	-90.388	0.26418	1.5083
3	22.52814	11.95651	-90.388	0.22372	1.4740
Load 5 : Lightwell (Rear, NE)					
(Edge 2 optimal)					
1	21.49379	5.86991	-90.000	3.2708	1.3540

Displacement Grids

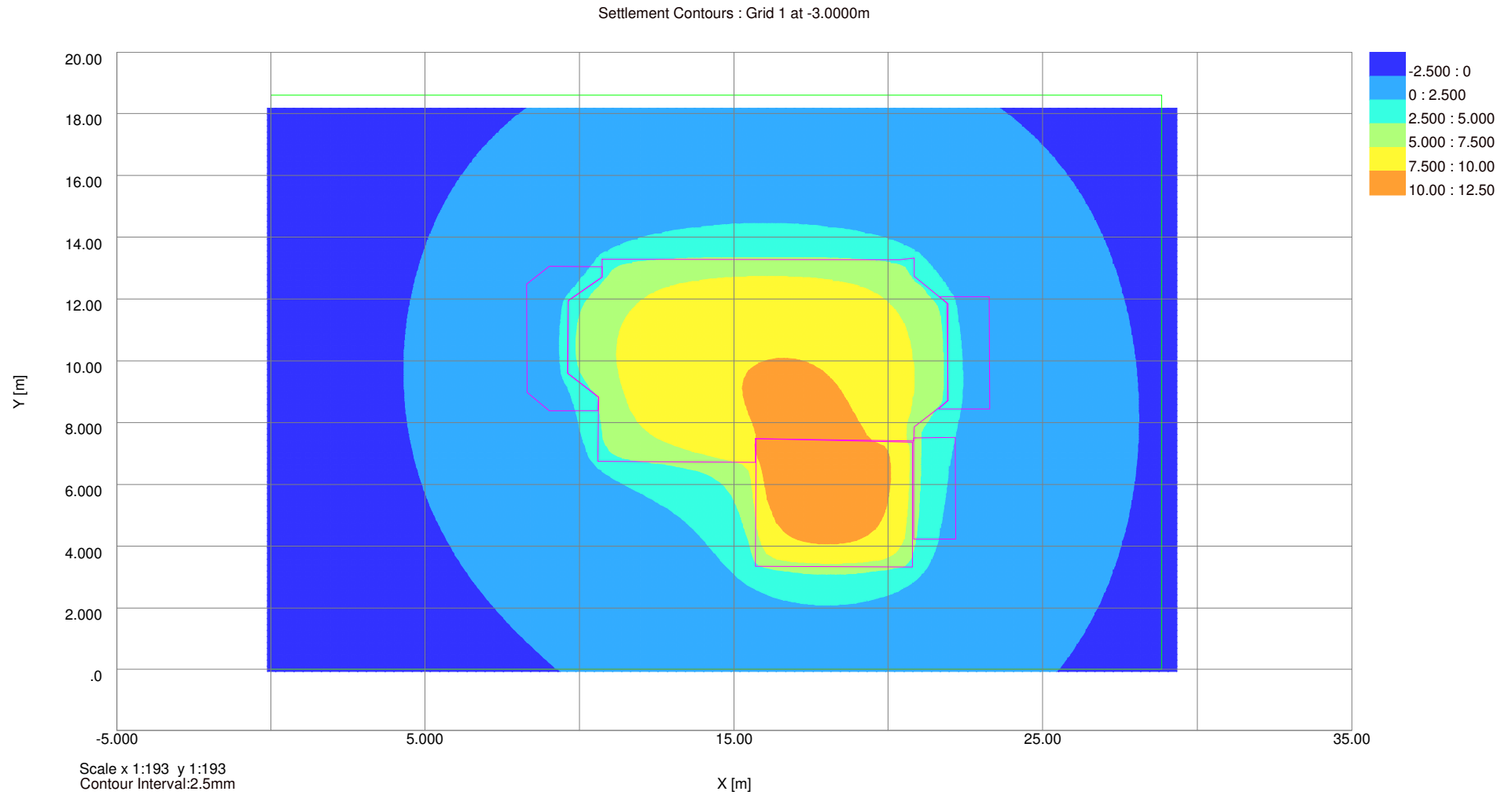
Name	Extrusion: Direction	X1	Y1	Z1	X2	Y2	Z2	Intervals Along Line [No.]	Extrusion: Distance	Extrusion: Intervals Along [No.]	Calculate	Detailed Results
		[m]	[m]	[m]	[m]	[m]	[m]		[m]			
Lightwell Grid	Global Y	-0.13030	-0.47234	-1.50000	29.35040	-	-1.50000	100	19.23575	100	Yes	No

Warnings

(1)The displacement location of Grid 1 at (-0.130, -0.472, -1.500)m lies wide of all soil zones. The first soil profile will be used. There are more displacement locations for which this warning applies. Only one is detailed here.

(2)The load at (15.706, 10.206, -3.000)m lies wide of all soil zones. Displacements at its centre have been requested. The first soil profile will be used.

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Job No. Sheet No. Rev.

117401

Drg. Ref.

Made by Date Checked
OC

28 Canfield Gardens
Ground Movement Assessment
Heave analysis

Titles

Job No.: 117401
Job Title: 28 Canfield Gardens
Sub-title: Ground Movement Assessment
Calculation Heading: Heave analysis
Initials: OC
Checker:
Date Saved:
Date Checked:
Notes:
File Name: 117401 - 28 Canfield Gardens Stage 3 HB - Main Excavation
3.pdd
File Path: C:\Users\tjanusz\Documents\01 Projects\117401 - 28 Canfield
Gardens, NW6\Geotech\Model\FDisp

History

Date	Time	By	Notes
28-Nov-2016	17:03	ocolas	
28-Nov-2016	17:09	ocolas	
28-Nov-2016	17:11	ocolas	
28-Nov-2016	17:21	ocolas	
29-Nov-2016	10:09	ocolas	
29-Nov-2016	12:09	ocolas	
12-Dec-2019	15:20	hbrock	
12-Dec-2019	15:25	hbrock	
12-Dec-2019	15:37	hbrock	
12-Dec-2019	15:50	hbrock	
18-Dec-2019	12:42	tjanusz	
18-Dec-2019	16:46	tjanusz	
20-Dec-2019	10:47	asmith	
20-Dec-2019	11:22	asmith	
03-Jan-2020	14:04	hbrock	
03-Jan-2020	14:08	hbrock	
03-Jan-2020	14:09	hbrock	
03-Jan-2020	14:18	hbrock	
03-Jan-2020	15:39	hbrock	
03-Jan-2020	16:06	hbrock	
08-Jan-2020	09:56	hbrock	
08-Jan-2020	12:31	hbrock	
15-Jan-2020	11:52	hbrock	
05-Mar-2020	10:54	tjanusz	
05-Mar-2020	13:17	tjanusz	
05-Mar-2020	13:42	tjanusz	
05-Mar-2020	23:17	tjanusz	
05-Mar-2020	23:26	tjanusz	
06-Mar-2020	17:04	tjanusz	
07-Mar-2020	12:20	tjanusz	

Analysis Options

General

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 load centroids: Yes
GSA piled raft data : No

Elastic

Elastic : Yes
Analysis: Boussinesq
Stiffness for horizontal displacement calculations: Weighted average
Using legacy heave correction factor: No

Consolidation

Consolidation : No

Soil ProfilesSoil Profile 1

Layer ref.	Name	Level at top	Number of intermediate displacement levels	Youngs Modulus : Top	Youngs Modulus : Btm.	Poissons ratio	Non-linear curve
		[mOD]		[kN/m ²]	[kN/m ²]		
1	Made Ground	0.0	6	2500.0	2500.0	0.40000	None
2	London Clay Formation	-2.4000	10	13000.	26000.	0.40000	None
3	London Clay Formation (base)	-7.4000	16	26000.	26000.	0.40000	None

Non-linear Curve Coordinates - Non-linear Curve 1

Point Strain Factor
[%]

Soil Zones

Zone	Name	X min [m]	X max [m]	Y min [m]	Y max [m]	Profile
1	Soil Zone #	0.0	28.850	0.0	18.600	Soil Profile 1

Polygonal Load Data

Load ref.	Name	Position : Level	Position : Polygon : Coords.	Position : Polygon Rectangles : Rect. tolerance	No. of Rectangles	Value : Normal (local z)
		[m]	[m]	[%]		[kN/m ²]
1	Main Basement	-3.00000	(10.7,13.3) (20.4,13.3) (20.8,13.3) (20.8,12.7) (21.9,11.9) (21.9,8.71) (20.8,7.86) (20.8,7.41) (15.7,7.48) (15.7,6.71) (10.6,6.76) (10.6,8.82) (9.62,9.6) (9.63,11.9) (10.7,12.7)	10.000	8	44.600
2	Lower GF Excavation	-3.00000	(15.7,7.48) (20.8,7.37) (20.8,3.33) (15.7,3.34) (15.7,7.45)	10.000	1	68.600
3	Lightwell (Front)	-1.50000	(10.7,13) (9.01,13.1) (8.29,12.5) (8.3,8.97) (9.01,8.39) (10.6,8.39) (10.6,8.82) (9.61,9.6) (9.63,11.9) (10.7,12.7)	10.000	8	-14.000
4	Lightwell (Rear, NW)	-1.50000	(21.6,12.1) (23.3,12.1) (23.3,8.44) (21.6,8.45) (21.9,8.71) (21.9,11.8)	10.000	3	-14.000
5	Lightwell (Rear, NE)	-1.50000	(20.9,7.51) (22.2,7.51) (22.2,4.22) (20.8,4.23) (20.8,7.51)	10.000	1	-14.000

Polygonal Loads' Rectangles

No. Centre : Centre : Angle of Width x Depth y
x y local x
from
global X
[m] [m] [Degrees] [m] [m]
Load 1 : Main Basement
(Edge 4 optimal)
1 10.67684 9.71616 179.94 0.11951 5.9212



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Ground Movement Assessment
Heave analysis

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No.	Centre x	Centre y	Angle of local x from global X	Width x	Depth y
2	10.37126	10.73539	179.94	0.49382	3.4516
3	9.87746	10.75387	179.94	0.49382	2.7205
4	21.63488	10.28370	179.94	0.53124	3.6079
5	21.10365	10.29091	179.94	0.53124	4.4500
6	20.60097	10.35964	179.94	0.44432	5.8921
7	18.03967	10.36502	179.94	4.6783	5.8359
8	13.21853	10.01157	179.94	4.9632	6.5531
Load 2 : Lower GF Excavation					
(Edge 2 optimal)					
1	18.24985	5.36973	-90.461	4.0413	5.0805
Load 3 : Lightwell (Front)					
(Edge 1 optimal)					
1	10.54588	12.81624	179.41	0.36200	0.45270
2	10.18255	12.68824	179.41	0.36200	0.71618
3	9.81921	12.56023	179.41	0.36200	0.97966
4	9.32785	10.72214	179.41	0.58278	4.6658
5	8.65386	10.74655	179.41	0.66936	4.0913
6	10.43653	8.67246	179.41	0.33276	0.56618
7	10.10509	8.80135	179.41	0.33276	0.82398
8	9.77364	8.93024	179.41	0.33276	1.0818
Load 4 : Lightwell (Rear, NW)					
(Edge 2 optimal)					
1	22.59820	10.27641	-90.388	3.1355	1.3486
2	22.52580	8.57703	-90.388	0.26418	1.5083
3	22.52814	11.95651	-90.388	0.22372	1.4740
Load 5 : Lightwell (Rear, NE)					
(Edge 2 optimal)					
1	21.49379	5.86991	-90.000	3.2708	1.3540

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
		[m]	[m]	[m]	[m]	[m]	[m]					
Basement Grid	Global Y	-0.13030	-0.47234	-3.00000	29.35040	-	-3.00000	100	19.23575	100	Yes	No
Lightwell Grid	Global Y	-0.13030	-0.47234	-1.50000	29.35040	-	-1.50000	100	19.23575	100	Yes	No

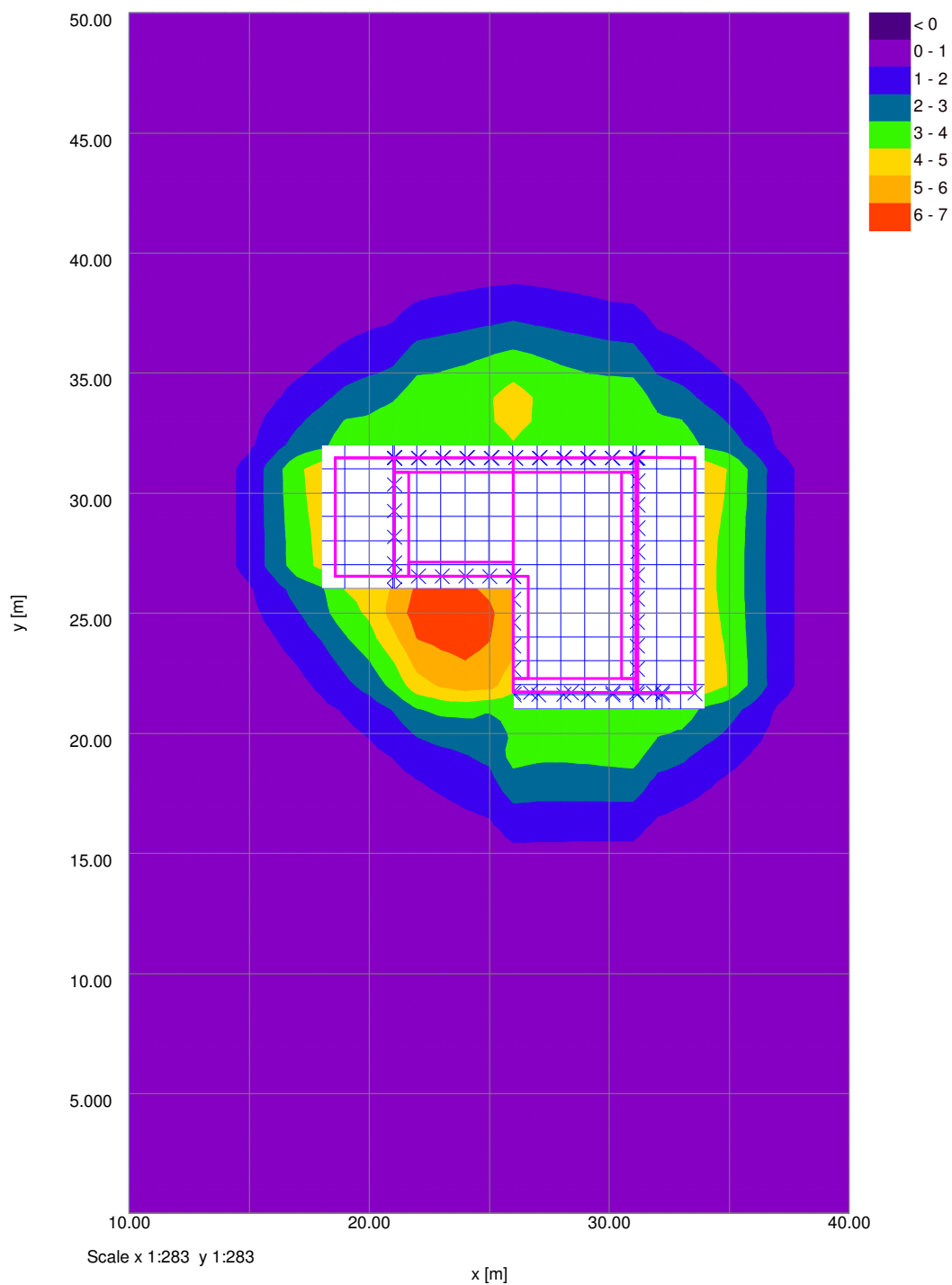
Warnings

- (1)One or more displacement grids have numbers of intervals of at least 100. Large numbers of intervals will slow the analysis.
- (2)The displacement location of Grid 1 at (-0.130, -0.472, -3.000)m lies wide of all soil zones. The first soil profile will be used. There are more displacement locations for which this warning applies. Only one is detailed here.
- (3)The load at (15.706, 10.206, -3.000)m lies wide of all soil zones. Displacements at its centre have been requested. The first soil profile will be used.

Appendix G - XDISP Analysis

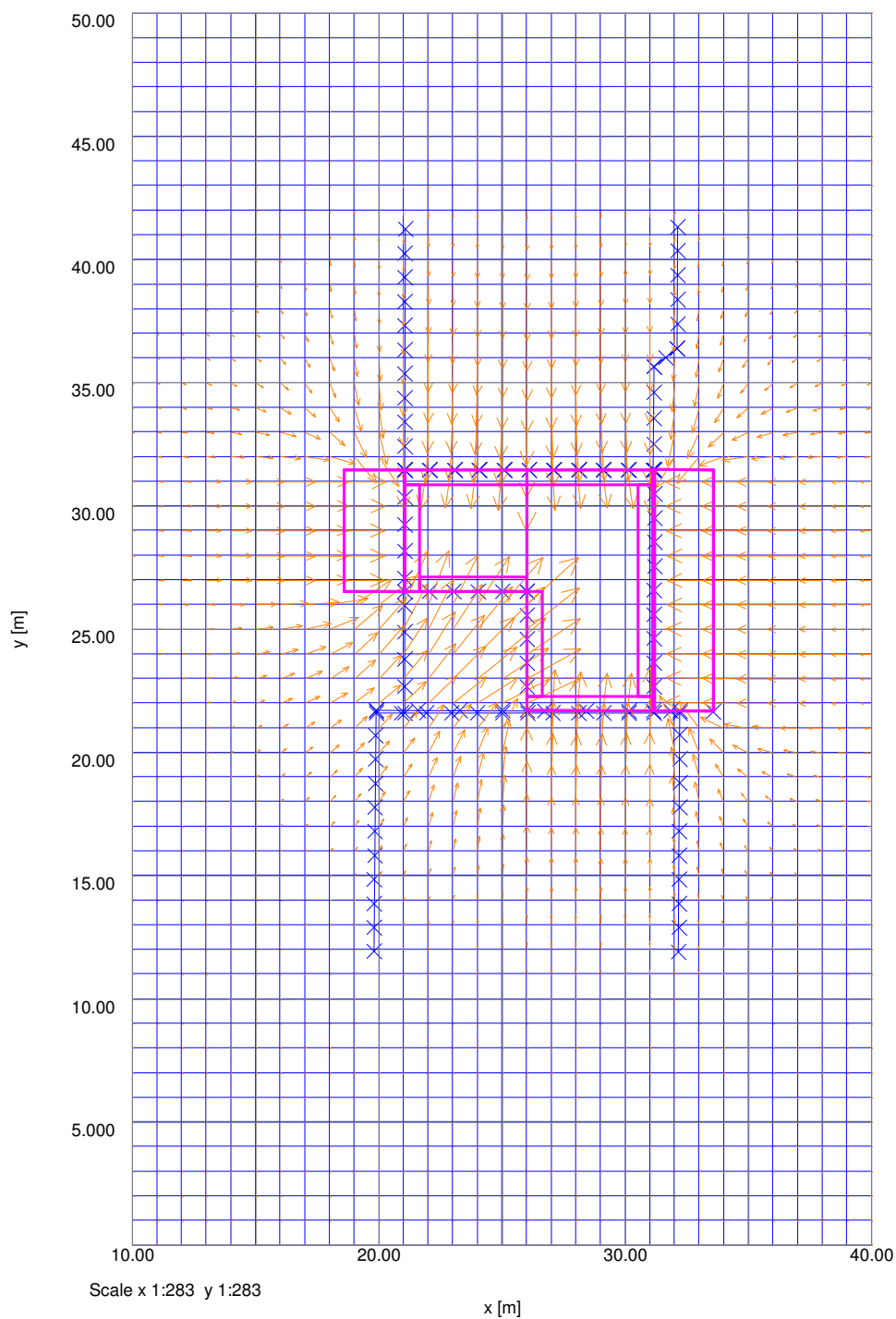
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Made by	Date	Checked
TJ	07-Mar-2020	

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



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Horizontal Displacement Vectors: Grid 1 (level 0.000m) (scale 1m to 2.73mm)





Canfield Gardens, NW6
Ground Movement Assessment
Damage Impact Assessment

Job No.	Sheet No.	Rev.
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Drg. Ref.		
Made by TJ	Date 05-Mar-2020	Checked

Problem Type

Problem Type : Tunnelling and Embedded Wall Excavations

Displacement Data

Type	Name	Direction of extrusion	Point/Line/Line for extrusion			No. of intervals across extrusion/line	Extrusion depth	No. of intervals along extrusion	Calculate	Surface type for tunnels
			First point			Second point				
			X [m]	Y [m]	Z (level) [m]	X [m]	Y [m]	Z (level) [m]		
Grid	Grid 1	Global X	10.00000	0.00000	0.00000	-	50.00000	0.00000	50	30.00000
Line	No.30_1	-	32.11050	41.32417	0.00000	32.09042	36.41190	0.00000	5	-
Line	No.30_2	-	32.09042	36.41190	0.00000	31.15768	35.66880	0.00000	2	-
Line	No.30_3	-	31.15768	35.66880	0.00000	31.11906	31.47646	0.00000	4	-
Line	No.30_4	-	31.11906	31.47646	0.00000	21.04214	31.47646	0.00000	10	-
Line	No.30_5	-	21.04214	31.47646	0.00000	21.07171	41.25273	0.00000	10	-
Line	No.26_1	-	19.79055	11.95090	0.00000	19.87833	21.70409	0.00000	10	-
Line	No.26_2	-	19.87833	21.60000	0.00000	32.19559	21.60000	0.00000	12	-
Line	No.26_3	-	32.19559	21.69694	0.00000	32.15596	11.92815	0.00000	10	-
Line	No.28_1	-	26.00500	21.71500	0.00000	26.00400	26.54200	0.00000	5	-
Line	No.28_2	-	26.00500	26.54200	0.00000	21.04214	26.54000	0.00000	5	-
Line	No.28_3	-	19.87833	21.71000	0.00000	33.56500	21.68000	0.00000	8	-
Line	No.28_4	-	21.04214	21.60000	0.00000	21.04214	31.47650	0.00000	9	-
Line	No.28_5	-	21.04200	31.47700	0.00000	31.11920	31.47700	0.00000	10	-
Line	No.28_6	-	31.17900	31.47700	0.00000	31.11900	21.70010	0.00000	10	-

Vertical Ground Movement Curves (Excavations)

Curve Name:	No vertical ground movement
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) (%)]
Curve Fitting Method:	Polynomial
x Order:	1
y Order:	0
Polynomial: z =	0.0x + 0.0
Coeff. of Determination:	-2147483648.E+2147483647
Curve Name:	Installation of contiguous bored pile wall in stiff clay (CIRIA 580 Fig. 2.8(b))
Coordinates:	[Distance from wall / wall depth or max. excavation depth (x), Depth / wall depth or max. excavation depth (y), Settlement / wall depth or max. excavation depth (z) (%)]
Curve Fitting Method:	Polynomial
x Order:	1
y Order:	0
Polynomial: z =	-2.0E-2x + 4.0E-2
Coeff. of Determination:	1.0
Curve Name:	Excavation in front of high stiffness wall in stiff clay (CIRIA 580 Fig. 2.11(b))
Coordinates:	[Distance from wall / wall depth or max. excavation depth (x), Depth / wall depth or max. excavation depth (y), Settlement / wall depth or max. excavation depth (z) (%)]
Curve Fitting Method:	Polynomial
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 Determination:	9.9991E-1

Horizontal Ground Movement Curves (Excavations)

Curve Name:	No horizontal ground movement
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) (%)]
Curve Fitting Method:	Polynomial
x Order:	0
y Order:	0
Polynomial: z =	0.0
Coeff. of Determination:	-2147483648.E+2147483647
Curve Name:	Installation of contiguous bored pile wall in stiff clay (CIRIA 580 Fig. 2.8(a))
Coordinates:	[Distance from wall / wall depth or max. excavation depth (x), Depth / wall depth or max. excavation depth (y), Horizontal movement / wall depth or max. excavation depth (z) (%)]
Curve Fitting Method:	Polynomial
x Order:	3
y Order:	0
Polynomial: z =	-4.2486E-3x ³ + 1.9096E-2x ² - 4.6221E-2x + 4.0729E-2
Coeff. of Determination:	1.0000
Curve Name:	Excavation in front of high stiffness wall in stiff clay (CIRIA 580 Fig. 2.11(a))
Coordinates:	[Distance from wall / wall depth or max. excavation depth (x), Depth / wall depth or max. excavation depth (y), Horizontal movement / wall depth or max. excavation depth (z) (%)]
Curve Fitting Method:	Polynomial
x Order:	1
y Order:	0
Polynomial: z =	-3.75E-2x + 1.50E-1
Coeff. of Determination:	1.00

Polygonal Excavations

Excavation Name:	Install #1 (Internal Underpin)
------------------	--------------------------------



FAIRHURST

Canfield Gardens, NW6 Ground Movement Assessment Damage Impact Assessment

Job No.	Sheet No.	Rev.
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Drg. Ref.		
Made by TJ	Date 05-Mar-2020	Checked

Type	Name	Direction of extrusion	Point/Line/Line for extrusion	No. of intervals across extrusion/line	Extrusion depth	No. of intervals along extrusion	Calculate	Surface type for tunnels
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	21.642	27.141	-3.0000	Yes	0.0 67.000 25.000	0.0 67.000 25.000		
2	26.005	27.144	-3.0000	Yes	0.0 67.000 25.000	0.0 67.000 25.000		
3	26.005	26.543	-3.0000	Yes	0.0 67.000 25.000	0.0 67.000 25.000		
4	21.642	26.541	-3.0000	Yes	0.0 67.000 25.000	0.0 67.000 25.000		
Side	Corner 1	Corner 2			Vertical	Ground Movement Curve		Horizontal
	x y x y							
	[m] [m] [m] [m]							
1	21.642 27.141	26.005 27.144	No vertical ground movement	No horizontal ground movement				
2	26.005 27.144	26.005 26.543	No vertical ground movement	No horizontal ground movement				
3	26.005 26.543	21.642 26.541	Installation of contiguous bored pile wall in stiff clay (CIRIA 580 Fig. 2.8(b))	Installation of contiguous bored pile wall in stiff clay (CIRIA 580 Fig. 2.8(a))				
4	21.642 26.541	21.642 27.141	No vertical ground movement	No horizontal ground movement				
Excavation Name:		Install #2 (No.30)						
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	31.117	31.476	-3.0000	Yes	0.0 67.000 25.000	0.0 67.000 25.000		
2	31.117	30.876	-3.0000	Yes	0.0 67.000 25.000	0.0 67.000 25.000		
3	21.042	30.876	-3.0000	Yes	0.0 67.000 25.000	0.0 67.000 25.000		
4	21.042	31.476	-3.0000	Yes	0.0 67.000 25.000	0.0 67.000 25.000		
Side	Corner 1	Corner 2			Vertical	Ground Movement Curve		Horizontal
	x y x y							
	[m] [m] [m] [m]							
1	31.117 31.476	31.117 30.876	Installation of contiguous bored pile wall in stiff clay (CIRIA 580 Fig. 2.8(b))	Installation of contiguous bored pile wall in stiff clay (CIRIA 580 Fig. 2.8(a))				
2	31.117 30.876	21.042 30.876	No vertical ground movement	No horizontal ground movement				
3	21.042 30.876	21.042 31.476	Installation of contiguous bored pile wall in stiff clay (CIRIA 580 Fig. 2.8(b))	Installation of contiguous bored pile wall in stiff clay (CIRIA 580 Fig. 2.8(a))				
4	21.042 31.476	31.117 31.476	Installation of contiguous bored pile wall in stiff clay (CIRIA 580 Fig. 2.8(b))	Installation of contiguous bored pile wall in stiff clay (CIRIA 580 Fig. 2.8(a))				
Excavation Name:		Install #3 (Rear Wall)]						
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	31.118	30.876	-3.0000	Yes	0.0 67.000 25.000	0.0 67.000 25.000		
2	31.118	22.295	-3.0000	Yes	0.0 67.000 25.000	0.0 67.000 25.000		
3	30.519	22.295	-3.0000	Yes	0.0 67.000 25.000	0.0 67.000 25.000		
4	30.519	30.876	-3.0000	Yes	0.0 67.000 25.000	0.0 67.000 25.000		
Side	Corner 1	Corner 2			Vertical	Ground Movement Curve		Horizontal
	x y x y							
	[m] [m] [m] [m]							
1	31.118 30.876	31.118 22.295	Installation of contiguous bored pile wall in stiff clay (CIRIA 580 Fig. 2.8(b))	Installation of contiguous bored pile wall in stiff clay (CIRIA 580 Fig. 2.8(a))				
2	31.118 22.295	30.519 22.295	No vertical ground movement	No horizontal ground movement				
3	30.519 22.295	30.519 30.876	No vertical ground movement	No horizontal ground movement				
4	30.519 30.876	31.118 30.876	No vertical ground movement	No horizontal ground movement				
Excavation Name:		Install #4 (Front Wall)						
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	21.642	30.876	-3.0000	Yes	0.0 67.000 25.000	0.0 67.000 25.000		
2	21.042	30.876	-3.0000	Yes	0.0 67.000 25.000	0.0 67.000 25.000		
3	21.042	26.541	-3.0000	Yes	0.0 67.000 25.000	0.0 67.000 25.000		
4	21.642	26.541	-3.0000	Yes	0.0 67.000 25.000	0.0 67.000 25.000		
Side	Corner 1	Corner 2			Vertical	Ground Movement Curve		Horizontal
	x y x y							
	[m] [m] [m] [m]							
1	21.642 30.876	21.042 30.876	No vertical ground movement	No horizontal ground movement				
2	21.042 30.876	21.042 26.541	Installation of contiguous bored pile wall in stiff clay (CIRIA 580 Fig. 2.8(b))	Installation of contiguous bored pile wall in stiff clay (CIRIA 580 Fig. 2.8(a))				
3	21.042 26.541	21.642 26.541	Installation of contiguous bored pile wall in stiff clay (CIRIA 580 Fig. 2.8(b))	Installation of contiguous bored pile wall in stiff clay (CIRIA 580 Fig. 2.8(a))				
4	21.642 26.541	21.642 30.876	No vertical ground movement	No horizontal ground movement				
Excavation Name:		Excavation - Front						
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	26.003	31.476	-3.0000	Yes	0.0 67.000 25.000	0.0 67.000 25.000		
2	21.042	31.476	-3.0000	Yes	0.0 67.000 25.000	0.0 67.000 25.000		
3	21.042	26.541	-3.0000	Yes	0.0 67.000 25.000	0.0 67.000 25.000		
4	26.005	26.542	-3.0000	Yes	0.0 67.000 25.000	0.0 67.000 25.000		
Side	Corner 1	Corner 2			Vertical	Ground Movement Curve		Horizontal
	x y x y							
	[m] [m] [m] [m]							
1	26.003 31.476	21.042 31.476	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	21.042 31.476	21.042 26.541	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	21.042 26.541	26.005 26.542	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	26.005 26.542	26.003 31.476	No vertical ground movement	No horizontal ground movement				
Excavation Name:		Install #5 (No.26)						
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	26.006	22.291	-3.0000	Yes	0.0 67.000 25.000	0.0 67.000 25.000		
2	31.117	22.295	-3.0000	Yes	0.0 67.000 25.000	0.0 67.000 25.000		



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Corner	x	y	Base Level	Stiffened	Previous Side	Next Side
	[m]	[m]	[m]		d p1 p2*	d p1 p2*
					[m] [%] [%]	[m] [%] [%]
3	31.117	21.693	-3.0000	Yes	0.0 67.000 25.000	0.0 67.000 25.000
4	26.006	21.715	-3.0000	Yes	0.0 67.000 25.000	0.0 67.000 25.000

Side	Corner 1	Corner 2	Vertical	Ground Movement Curve	Horizontal
	x y	x y			
	[m] [m]	[m] [m]			
1	26.006 22.291	31.117 22.295	No vertical ground movement		No horizontal ground movement
2	31.117 22.295	31.117 21.693	Installation of contiguous bored pile wall in stiff clay (CIRIA 580 Fig. 2.8(b))	Installation of contiguous bored pile wall in stiff clay (CIRIA 580 Fig. 2.8(a))	Installation of contiguous bored pile wall in stiff clay (CIRIA 580 Fig. 2.8(a))
3	31.117 21.693	26.006 21.715	Installation of contiguous bored pile wall in stiff clay (CIRIA 580 Fig. 2.8(b))	Installation of contiguous bored pile wall in stiff clay (CIRIA 580 Fig. 2.8(a))	Installation of contiguous bored pile wall in stiff clay (CIRIA 580 Fig. 2.8(a))
4	26.006 21.715	26.006 22.291	Installation of contiguous bored pile wall in stiff clay (CIRIA 580 Fig. 2.8(b))	Installation of contiguous bored pile wall in stiff clay (CIRIA 580 Fig. 2.8(a))	Installation of contiguous bored pile wall in stiff clay (CIRIA 580 Fig. 2.8(a))

Excavation Name: Install #6 (Internal Underpin)
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	26.005	26.542	-3.0000	Yes	0.0 67.000 25.000	0.0 67.000 25.000
2	26.611	26.542	-3.0000	Yes	0.0 67.000 25.000	0.0 67.000 25.000
3	26.611	22.291	-3.0000	Yes	0.0 67.000 25.000	0.0 67.000 25.000
4	26.006	22.291	-3.0000	Yes	0.0 67.000 25.000	0.0 67.000 25.000

Side	Corner 1	Corner 2	Vertical	Ground Movement Curve	Horizontal
	x y	x y			
	[m] [m]	[m] [m]			
1	26.005 26.542	26.611 26.542	No vertical ground movement		No horizontal ground movement
2	26.611 26.542	26.611 22.291	No vertical ground movement		No horizontal ground movement
3	26.611 22.291	26.006 22.291	No vertical ground movement		No horizontal ground movement
4	26.006 22.291	26.005 26.542	Installation of contiguous bored pile wall in stiff clay (CIRIA 580 Fig. 2.8(b))	Installation of contiguous bored pile wall in stiff clay (CIRIA 580 Fig. 2.8(a))	Installation of contiguous bored pile wall in stiff clay (CIRIA 580 Fig. 2.8(a))

Excavation Name: Excavation - Rear
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	31.117	31.476	-3.0000	Yes	0.0 67.000 25.000	0.0 67.000 25.000
2	26.003	31.476	-3.0000	Yes	0.0 67.000 25.000	0.0 67.000 25.000
3	26.005	26.542	-3.0000	Yes	0.0 67.000 25.000	0.0 67.000 25.000
4	26.010	21.715	-3.0000	Yes	0.0 67.000 25.000	0.0 67.000 25.000
5	31.117	21.693	-3.0000	Yes	0.0 67.000 25.000	0.0 67.000 25.000

Side	Corner 1	Corner 2	Vertical	Ground Movement Curve	Horizontal
	x y	x y			
	[m] [m]	[m] [m]			
1	31.117 31.476	26.003 31.476	Excavation in front of high stiffness wall in stiff clay (CIRIA 580 Fig. 2.11(b))	Excavation in front of high stiffness wall in stiff clay (CIRIA 580 Fig. 2.11(a))	Excavation in front of high stiffness wall in stiff clay (CIRIA 580 Fig. 2.11(a))
2	26.003 31.476	26.005 26.542	No vertical ground movement		No horizontal ground movement
3	26.005 26.542	26.010 21.715	Excavation in front of high stiffness wall in stiff clay (CIRIA 580 Fig. 2.11(b))	Excavation in front of high stiffness wall in stiff clay (CIRIA 580 Fig. 2.11(a))	Excavation in front of high stiffness wall in stiff clay (CIRIA 580 Fig. 2.11(a))
4	26.010 21.715	31.117 21.693	Excavation in front of high stiffness wall in stiff clay (CIRIA 580 Fig. 2.11(b))	Excavation in front of high stiffness wall in stiff clay (CIRIA 580 Fig. 2.11(a))	Excavation in front of high stiffness wall in stiff clay (CIRIA 580 Fig. 2.11(a))
5	31.117 21.693	31.117 31.476	Excavation in front of high stiffness wall in stiff clay (CIRIA 580 Fig. 2.11(b))	Excavation in front of high stiffness wall in stiff clay (CIRIA 580 Fig. 2.11(a))	Excavation in front of high stiffness wall in stiff clay (CIRIA 580 Fig. 2.11(a))

Excavation Name: Front Lightwell
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	18.589	31.477	-1.5000	Yes	0.0 67.000 25.000	0.0 67.000 25.000
2	21.042	31.477	-1.5000	Yes	0.0 67.000 25.000	0.0 67.000 25.000
3	21.042	26.542	-1.5000	Yes	0.0 67.000 25.000	0.0 67.000 25.000
4	18.589	26.542	-1.5000	Yes	0.0 67.000 25.000	0.0 67.000 25.000

Side	Corner 1	Corner 2	Vertical	Ground Movement Curve	Horizontal
	x y	x y			
	[m] [m]	[m] [m]			
1	18.589 31.477	21.042 31.477	Excavation in front of high stiffness wall in stiff clay (CIRIA 580 Fig. 2.11(b))	Excavation in front of high stiffness wall in stiff clay (CIRIA 580 Fig. 2.11(a))	Excavation in front of high stiffness wall in stiff clay (CIRIA 580 Fig. 2.11(a))
2	21.042 31.477	21.042 26.542	Excavation in front of high stiffness wall in stiff clay (CIRIA 580 Fig. 2.11(b))	Excavation in front of high stiffness wall in stiff clay (CIRIA 580 Fig. 2.11(a))	Excavation in front of high stiffness wall in stiff clay (CIRIA 580 Fig. 2.11(a))
3	21.042 26.542	18.589 26.542	Excavation in front of high stiffness wall in stiff clay (CIRIA 580 Fig. 2.11(b))	Excavation in front of high stiffness wall in stiff clay (CIRIA 580 Fig. 2.11(a))	Excavation in front of high stiffness wall in stiff clay (CIRIA 580 Fig. 2.11(a))
4	18.589 26.542	18.589 31.477	Excavation in front of high stiffness wall in stiff clay (CIRIA 580 Fig. 2.11(b))	Excavation in front of high stiffness wall in stiff clay (CIRIA 580 Fig. 2.11(a))	Excavation in front of high stiffness wall in stiff clay (CIRIA 580 Fig. 2.11(a))

Excavation Name: Rear Lightwells
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	33.565	31.477	-1.5000	Yes	0.0 67.000 25.000	0.0 67.000 25.000
2	33.565	21.693	-1.5000	Yes	0.0 67.000 25.000	0.0 67.000 25.000
3	31.180	21.700	-1.5000	Yes	0.0 67.000 25.000	0.0 67.000 25.000
4	31.180	31.488	-1.5000	Yes	0.0 67.000 25.000	0.0 67.000 25.000

Side	Corner 1	Corner 2	Vertical	Ground Movement Curve	Horizontal
	x y	x y			
	[m] [m]	[m] [m]			
1	33.565 31.477	33.565 21.693	Excavation in front of high stiffness wall in stiff clay (CIRIA 580 Fig. 2.11(b))	Excavation in front of high stiffness wall in stiff clay (CIRIA 580 Fig. 2.11(a))	Excavation in front of high stiffness wall in stiff clay (CIRIA 580 Fig. 2.11(a))
2	33.565 21.693	31.180 21.700	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))	Excavation in front of high stiffness wall in stiff clay (CIRIA 580 Fig. 2.11(a))
3	31.180 21.700	31.180 31.488	Excavation in front of high stiffness wall in stiff clay (CIRIA 580 Fig. 2.11(b))	Excavation in front of high stiffness wall in stiff clay (CIRIA 580 Fig. 2.11(a))	Excavation in front of high stiffness wall in stiff clay (CIRIA 580 Fig. 2.11(a))
4	31.180 31.488	33.565 31.477	Excavation in front of high stiffness wall in stiff clay (CIRIA 580 Fig. 2.11(b))	Excavation in front of high stiffness wall in stiff clay (CIRIA 580 Fig. 2.11(a))	Excavation in front of high stiffness wall in stiff clay (CIRIA 580 Fig. 2.11(a))

Excavation Name: Front Lightwell (Installation)
Surface level [m]: 0.0
Contribution: Positive
Enabled: Yes



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Corner	x	y	Base Level	Stiffened	Previous Side	Next Side
	[m]	[m]	[m]		d p1 p2*	d p1 p2*
1	18.589	31.477	-1.5000	Yes	0.0 67.000 25.000	0.0 67.000 25.000
2	21.042	31.477	-1.5000	Yes	0.0 67.000 25.000	0.0 67.000 25.000
3	21.042	26.542	-1.5000	Yes	0.0 67.000 25.000	0.0 67.000 25.000
4	18.589	26.542	-1.5000	Yes	0.0 67.000 25.000	0.0 67.000 25.000

Side	Corner 1	Corner 2	Ground Movement Curve	
	x y	x y	Vertical	Horizontal
	[m] [m]	[m] [m]		
1	18.589 31.477	21.042 31.477	Installation of contiguous bored pile wall in stiff clay (CIRIA 580 Fig. 2.8(b))	Installation of contiguous bored pile wall in stiff clay (CIRIA 580 Fig. 2.8(a))
2	21.042 31.477	21.042 26.542	Installation of contiguous bored pile wall in stiff clay (CIRIA 580 Fig. 2.8(b))	Installation of contiguous bored pile wall in stiff clay (CIRIA 580 Fig. 2.8(a))
3	21.042 26.542	18.589 26.542	Installation of contiguous bored pile wall in stiff clay (CIRIA 580 Fig. 2.8(b))	Installation of contiguous bored pile wall in stiff clay (CIRIA 580 Fig. 2.8(a))
4	18.589 26.542	18.589 31.477	Installation of contiguous bored pile wall in stiff clay (CIRIA 580 Fig. 2.8(b))	Installation of contiguous bored pile wall in stiff clay (CIRIA 580 Fig. 2.8(a))

Excavation Name: Rear Lightwells (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*
1	33.565	31.477	-1.5000	Yes	0.0 67.000 25.000	0.0 67.000 25.000
2	33.565	21.693	-1.5000	Yes	0.0 67.000 25.000	0.0 67.000 25.000
3	31.180	21.700	-1.5000	Yes	0.0 67.000 25.000	0.0 67.000 25.000
4	31.180	31.488	-1.5000	Yes	0.0 67.000 25.000	0.0 67.000 25.000

Side	Corner 1	Corner 2	Ground Movement Curve	
	x y	x y	Vertical	Horizontal
	[m] [m]	[m] [m]		
1	33.565 31.477	33.565 21.693	Installation of contiguous bored pile wall in stiff clay (CIRIA 580 Fig. 2.8(b))	Installation of contiguous bored pile wall in stiff clay (CIRIA 580 Fig. 2.8(a))
2	33.565 21.693	31.180 21.700	Installation of contiguous bored pile wall in stiff clay (CIRIA 580 Fig. 2.8(b))	Installation of contiguous bored pile wall in stiff clay (CIRIA 580 Fig. 2.8(a))
3	31.180 21.700	31.180 31.488	Installation of contiguous bored pile wall in stiff clay (CIRIA 580 Fig. 2.8(b))	Installation of contiguous bored pile wall in stiff clay (CIRIA 580 Fig. 2.8(a))
4	31.180 31.488	33.565 31.477	Installation of contiguous bored pile wall in stiff clay (CIRIA 580 Fig. 2.8(b))	Installation of contiguous bored pile wall in stiff clay (CIRIA 580 Fig. 2.8(a))

Damage Category Strains

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

Specific Structures - Geometry

Structure Name	Sub-Structure Name	Height	Default Properties	Start Distance Along Line	End Distance Along Line	Vertical Offsets from Line for Vertical Movement Calculations	Vertical Displacement Limit Sensitivity	Damage Category Strains	Poisson's Ratio	E/G
		[m]		[m]	[m]	[m]	[mm]			
No.30	1 No.30_1	0.00000	4.91200	0.0	0.10000	Burland Strain Limits	0.20000	2.6000		
No.30	2 No.30_2	0.00000	1.19200	0.0	0.10000	Burland Strain Limits	0.20000	2.6000		
No.30	3 No.30_3	0.00000	4.19200	0.0	0.10000	Burland Strain Limits	0.20000	2.6000		
No.30	4 No.30_4	0.00000	10.07600	0.0	0.10000	Burland Strain Limits	0.20000	2.6000		
No.30	5 No.30_5	0.00000	9.77600	0.0	0.10000	Burland Strain Limits	0.20000	2.6000		
No.26	1 No.26_1	0.00000	9.75300	0.0	0.10000	Burland Strain Limits	0.20000	2.6000		
No.26	2 No.26_2	0.00000	12.31700	0.0	0.10000	Burland Strain Limits	0.20000	2.6000		
No.26	3 No.26_3	0.00000	9.76800	0.0	0.10000	Burland Strain Limits	0.20000	2.6000		
No.28	1 No.28_1	0.00000	4.82700	0.0	0.10000	Burland Strain Limits	0.20000	2.6000		
No.28	2 No.28_2	0.00000	4.96200	0.0	0.10000	Burland Strain Limits	0.20000	2.6000		
No.28	4 No.28_4	0.00000	9.87600	0.0	0.10000	Burland Strain Limits	0.20000	2.6000		
No.28	6 No.28_6	0.00000	9.77600	0.0	0.10000	Burland Strain Limits	0.20000	2.6000		

Specific Structures - Bending Parameters

Structure Name	Sub-Structure Name	Height	Default Properties	Hogging			Sagging		
				2nd Moment of Area (per unit width)	Distance of Bending Strain from N.A.	Distance of N.A. from Edge of Beam in Tension	2nd Moment of Area (per unit width)	Distance of Bending Strain from N.A.	Distance of N.A. from Edge of Beam in Tension
		[m]	[m ³]	[m]	[m]	[m ³]	[m]	[m]	
No.30	1 10.500	Yes	385.88	10.500	10.500	96.469	5.2500	5.2500	
No.30	2 10.500	Yes	385.88	10.500	10.500	96.469	5.2500	5.2500	
No.30	3 10.500	Yes	385.88	10.500	10.500	96.469	5.2500	5.2500	
No.30	4 14.000	Yes	914.67	14.000	14.000	228.67	7.0000	7.0000	
No.30	5 10.000	Yes	333.33	10.000	10.000	83.333	5.0000	5.0000	
No.26	1 10.000	Yes	333.33	10.000	10.000	83.333	5.0000	5.0000	
No.26	2 14.000	Yes	914.67	14.000	14.000	228.67	7.0000	7.0000	
No.26	3 10.500	Yes	385.88	10.500	10.500	96.469	5.2500	5.2500	
No.28	1 14.000	Yes	914.67	14.000	14.000	228.67	7.0000	7.0000	
No.28	2 14.000	Yes	914.67	14.000	14.000	228.67	7.0000	7.0000	
No.28	4 10.000	Yes	333.33	10.000	10.000	83.333	5.0000	5.0000	
No.28	6 10.500	Yes	385.88	10.500	10.500	96.469	5.2500	5.2500	

Building Segment Combinations

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

Utility Strain Calculation Options

Neglect beneficial contribution of axial strains : No

Warnings

- Multiple excavations have been specified. The displacements resulting from these excavations are calculated 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).
- Embedded Wall Excavation PE1 : Install #1 (Internal Underpin) intersects PE4 : Install #4 (Front Wall), , PE5 : Excavation - Front, , PE7 : Install #6 (Internal Underpin), and PE8 : Excavation - Rear.



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Structure Name	Sub-Structure Name	Vertical Offset from Line for Vertical	Segment Start Length	Curvature Combined Segment
3	Embedded Wall Excavation PE2 : Install #2 (No.30) intersects PE3 : Install #3 (Rear Wall)), , PE4 : Install #4 (Front Wall), , PE5 : Excavation - Front, , PE8 : Excavation - Rear, , PE9 : Front Lightwell, and PE11 : Front Lightwell (Installation).			
4	Embedded Wall Excavation PE3 : Install #3 (Rear Wall)) intersects PE2 : Install #2 (No.30), , PE5 : Install #5 (No.26), and PE8 : Excavation - Rear.			
5	Embedded Wall Excavation PE4 : Install #4 (Front Wall) intersects PE1 : Install #1 (Internal Underpin), , PE2 : Install #2 (No.30), , PE5 : Excavation - Front, , PE9 : Front Lightwell, and PE11 : Front Lightwell (Installation).			
6	Embedded Wall Excavation PE5 : Excavation - Front intersects PE1 : Install #1 (Internal Underpin), , PE2 : Install #2 (No.30), , PE4 : Install #4 (Front Wall), , PE7 : Install #6 (Internal Underpin), , PE8 : Excavation - Rear, , PE9 : Front Lightwell, and PE11 : Front Lightwell (Installation).			
7	Embedded Wall Excavation PE6 : Install #5 (No.26) intersects PE3 : Install #3 (Rear Wall)), , PE7 : Install #6 (Internal Underpin), and PE8 : Excavation - Rear.			
8	Embedded Wall Excavation PE7 : Install #6 (Internal Underpin) intersects PE1 : Install #1 (Internal Underpin), , PE5 : Excavation - Front, , PE6 : Install #5 (No.26), and PE8 : Excavation - Rear.			
9	Embedded Wall Excavation PE8 : Excavation - Rear intersects PE1 : Install #1 (Internal Underpin), , PE2 : Install #2 (No.30), , PE3 : Install #3 (Rear Wall)), , PE5 : Excavation - Front, , PE6 : Install #5 (No.26), and PE7 : Install #6 (Internal Underpin).			
10	Embedded Wall Excavation PE9 : Front Lightwell intersects PE2 : Install #2 (No.30), , PE4 : Install #4 (Front Wall), and PE5 : Excavation - Front.			
11	Embedded Wall Excavation PE11 : Front Lightwell (Installation) intersects PE2 : Install #2 (No.30), , PE4 : Install #4 (Front Wall), and PE5 : Excavation - Front.			

Errors

None

Displacement and Strain Results

Type/No.		Coordinates			Displacements					Angle of Line to x Axis
Name	Dist.	x	y	z	x	y	z	Horizontal displacement along Line	Horizontal displacement perpendicular to Line	
	[m]	[m]	[m]	[m]	[mm]	[mm]	[mm]	[mm]	[mm]	[°]
Grid 1	Grid 1	10.00000	0.00000	0.00000	0.0	0.0	0.0	-	-	-
		11.00000	0.00000	0.00000	0.0	0.0	0.0	-	-	-
		12.00000	0.00000	0.00000	0.0	0.0	0.0	-	-	-
		13.00000	0.00000	0.00000	0.0	0.0	0.0	-	-	-
		14.00000	0.00000	0.00000	0.0	0.0	0.0	-	-	-
		15.00000	0.00000	0.00000	0.0	0.0	0.0	-	-	-
		16.00000	0.00000	0.00000	0.0	0.0	0.0	-	-	-
		17.00000	0.00000	0.00000	0.0	0.0	0.0	-	-	-
		18.00000	0.00000	0.00000	0.0	0.0	0.0	-	-	-
		19.00000	0.00000	0.00000	0.0	0.0	0.0	-	-	-
		20.00000	0.00000	0.00000	0.0	0.0	0.0	-	-	-
		21.00000	0.00000	0.00000	0.0	0.0	0.0	-	-	-
		22.00000	0.00000	0.00000	0.0	0.0	0.0	-	-	-
		23.00000	0.00000	0.00000	0.0	0.0	0.0	-	-	-
		24.00000	0.00000	0.00000	0.0	0.0	0.0	-	-	-
		25.00000	0.00000	0.00000	0.0	0.0	0.0	-	-	-
		26.00000	0.00000	0.00000	0.0	0.0	0.0	-	-	-
		27.00000	0.00000	0.00000	0.0	0.0	0.0	-	-	-
		28.00000	0.00000	0.00000	0.0	0.0	0.0	-	-	-
		29.00000	0.00000	0.00000	0.0	0.0	0.0	-	-	-
		30.00000	0.00000	0.00000	0.0	0.0	0.0	-	-	-
		31.00000	0.00000	0.00000	0.0	0.0	0.0	-	-	-
		32.00000	0.00000	0.00000	0.0	0.0	0.0	-	-	-
		33.00000	0.00000	0.00000	0.0	0.0	0.0	-	-	-
		34.00000	0.00000	0.00000	0.0	0.0	0.0	-	-	-
		35.00000	0.00000	0.00000	0.0	0.0	0.0	-	-	-
		36.00000	0.00000	0.00000	0.0	0.0	0.0	-	-	-
		37.00000	0.00000	0.00000	0.0	0.0	0.0	-	-	-
		38.00000	0.00000	0.00000	0.0	0.0	0.0	-	-	-
		39.00000	0.00000	0.00000	0.0	0.0	0.0	-	-	-
		40.00000	0.00000	0.00000	0.0	0.0	0.0	-	-	-
		10.00000	1.00000	0.00000	0.0	0.0	0.0	-	-	-
		11.00000	1.00000	0.00000	0.0	0.0	0.0	-	-	-
		12.00000	1.00000	0.00000	0.0	0.0	0.0	-	-	-
		13.00000	1.00000	0.00000	0.0	0.0	0.0	-	-	-
		14.00000	1.00000	0.00000	0.0	0.0	0.0	-	-	-
		15.00000	1.00000	0.00000	0.0	0.0	0.0	-	-	-
		16.00000	1.00000	0.00000	0.0	0.0	0.0	-	-	-
		17.00000	1.00000	0.00000	0.0	0.0	0.0	-	-	-
		18.00000	1.00000	0.00000	0.0	0.0	0.0	-	-	-
		19.00000	1.00000	0.00000	0.0	0.0	0.0	-	-	-
		20.00000	1.00000	0.00000	0.0	0.0	0.0	-	-	-
		21.00000	1.00000	0.00000	0.0	0.0	0.0	-	-	-
		22.00000	1.00000	0.00000	0.0	0.0	0.0	-	-	-
		23.00000	1.00000	0.00000	0.0	0.0	0.0	-	-	-
		24.00000	1.00000	0.00000	0.0	0.0	0.0	-	-	-
		25.00000	1.00000	0.00000	0.0	0.0	0.0	-	-	-
		26.00000	1.00000	0.00000	0.0	0.0	0.0	-	-	-
		27.00000	1.00000	0.00000	0.0	0.0	0.0	-	-	-
		28.00000	1.00000	0.00000	0.0	0.0	0.0	-	-	-
		29.00000	1.00000	0.00000	0.0	0.0	0.0	-	-	-
		30.00000	1.00000	0.00000	0.0	0.0	0.0	-	-	-
		31.00000	1.00000	0.00000	0.0	0.0	0.0	-	-	-
		32.00000	1.00000	0.00000	0.0	0.0	0.0	-	-	-
		33.00000	1.00000	0.00000	0.0	0.0	0.0	-	-	-
		34.00000	1.00000	0.00000	0.0	0.0	0.0	-	-	-
		35.00000	1.00000	0.00000	0.0	0.0	0.0	-	-	-
		36.00000	1.00000	0.00000	0.0	0.0	0.0	-	-	-
		37.00000	1.00000	0.00000	0.0	0.0	0.0	-	-	-
		38.00000	1.00000	0.00000	0.0	0.0	0.0	-	-	-
		39.00000	1.00000	0.00000	0.0	0.0	0.0	-	-	-
		40.00000	1.00000	0.00000	0.0	0.0	0.0	-	-	-
		10.00000	2.00000	0.00000	0.0	0.0	0.0	-	-	-
		11.00000	2.00000	0.00000	0.0	0.0	0.0	-	-	-
		12.00000	2.00000	0.00000	0.0	0.0	0.0	-	-	-
		13.00000	2.00000	0.00000	0.0	0.0	0.0	-	-	-
		14.00000	2.00000	0.00000	0.0	0.0	0.0	-	-	-
		15.00000	2.00000	0.00000	0.0	0.0	0.0	-	-	-
		16.00000	2.00000	0.00000	0.0	0.0	0.0	-	-	-
		17.00000	2.00000	0.00000	0.0	0.0	0.0	-	-	-
		18.00000	2.00000	0.00000	0.0	0.0	0.0	-	-	-
		19.00000	2.00000	0.00000	0.0	0.0	0.0	-	-	-
		20.00000	2.00000	0.00000	0.0	0.0	0.0	-	-	-
		21.00000	2.00000	0.00000	0.0	0.0	0.0	-	-	-
		22.00000	2.00000	0.00000	0.0	0.0	0.0	-	-	-
		23.00000	2.00000	0.00000	0.0	0.0	0.0	-	-	-
		24.00000	2.00000	0.00000	0.0	0.0	0.0	-	-	-
		25.00000	2.00000	0.00000	0.0	0.0	0.0	-	-	-
		26.00000	2.00000	0.00000	0.0	0.0	0.0	-	-	-
		27.00000	2.00000	0.00000	0.0	0.0	0.0	-	-	-
		28.00000	2.00000	0.00000	0.0	0.0	0.0	-	-	-
		29.00000	2.00000	0.00000	0.0	0.0	0.0	-	-	-
		30.00000	2.00000	0.00000	0.0	0.0	0.0	-	-	-
		31.00000	2.00000	0.00000	0.0	0.0	0.0	-	-	-
		32.00000	2.00000	0.00000	0.0	0.0	0.0	-	-	-
		33.00000	2.00000	0.00000	0.0	0.0	0.0	-	-	-
		34.00000	2.00000	0.00000	0.0	0.0	0.0	-	-	-
		35.00000	2.00000	0.00000	0.0	0.0	0.0	-	-	-
		36.00000	2.00000	0.00000	0.0	0.0	0.0	-	-	-
		37.00000	2.00000	0.00000	0.0	0.0	0.0	-	-	-
		38.00000	2.00000	0.00000	0.0	0.0	0.0	-	-	-
		39.00000	2.00000	0.00000	0.0	0.0	0.0	-	-	-
		40.00000	2.00000	0.00000	0.0	0.0	0.0	-	-	-
		10.00000	3.00000	0.00000	0.0	0.0	0.0	-	-	-
		11.00000	3.00000	0.00000	0.0	0.0	0.0	-	-	-
		12.00000	3.00000	0.00000	0.0	0.0	0.0	-	-	-

Canfield Gardens, NW6
Ground Movement Assessment
Damage Impact Assessment

Job No.	Sheet No.	Rev.
117401		
Drg. Ref.		
Made by TJ	Date 05-Mar-2020	Checked

Type/No.	Coordinates			Displacements			Angle of			
Name	Dist.	x	y	z	x	y	z	Horizontal displacement	Horizontal displacement	Line to x Axis
		13.00000	3.00000	0.00000	0.0	0.0	0.0	-	-	-
		14.00000	3.00000	0.00000	0.0	0.0	0.0	-	-	-
		15.00000	3.00000	0.00000	0.0	0.0	0.0	-	-	-
		16.00000	3.00000	0.00000	0.0	0.0	0.0	-	-	-
		17.00000	3.00000	0.00000	0.0	0.0	0.0	-	-	-
		18.00000	3.00000	0.00000	0.0	0.0	0.0	-	-	-
		19.00000	3.00000	0.00000	0.0	0.0	0.0	-	-	-
		20.00000	3.00000	0.00000	0.0	0.0	0.0	-	-	-
		21.00000	3.00000	0.00000	0.0	0.0	0.0	-	-	-
		22.00000	3.00000	0.00000	0.0	0.0	0.0	-	-	-
		23.00000	3.00000	0.00000	0.0	0.0	0.0	-	-	-
		24.00000	3.00000	0.00000	0.0	0.0	0.0	-	-	-
		25.00000	3.00000	0.00000	0.0	0.0	0.0	-	-	-
		26.00000	3.00000	0.00000	0.0	0.0	0.0	-	-	-
		27.00000	3.00000	0.00000	0.0	0.0	0.0	-	-	-
		28.00000	3.00000	0.00000	0.0	0.0	0.0	-	-	-
		29.00000	3.00000	0.00000	0.0	0.0	0.0	-	-	-
		30.00000	3.00000	0.00000	0.0	0.0	0.0	-	-	-
		31.00000	3.00000	0.00000	0.0	0.0	0.0	-	-	-
		32.00000	3.00000	0.00000	0.0	0.0	0.0	-	-	-
		33.00000	3.00000	0.00000	0.0	0.0	0.0	-	-	-
		34.00000	3.00000	0.00000	0.0	0.0	0.0	-	-	-
		35.00000	3.00000	0.00000	0.0	0.0	0.0	-	-	-
		36.00000	3.00000	0.00000	0.0	0.0	0.0	-	-	-
		37.00000	3.00000	0.00000	0.0	0.0	0.0	-	-	-
		38.00000	3.00000	0.00000	0.0	0.0	0.0	-	-	-
		39.00000	3.00000	0.00000	0.0	0.0	0.0	-	-	-
		40.00000	3.00000	0.00000	0.0	0.0	0.0	-	-	-
		10.00000	4.00000	0.00000	0.0	0.0	0.0	-	-	-
		11.00000	4.00000	0.00000	0.0	0.0	0.0	-	-	-
		12.00000	4.00000	0.00000	0.0	0.0	0.0	-	-	-
		13.00000	4.00000	0.00000	0.0	0.0	0.0	-	-	-
		14.00000	4.00000	0.00000	0.0	0.0	0.0	-	-	-
		15.00000	4.00000	0.00000	0.0	0.0	0.0	-	-	-
		16.00000	4.00000	0.00000	0.0	0.0	0.0	-	-	-
		17.00000	4.00000	0.00000	0.0	0.0	0.0	-	-	-
		18.00000	4.00000	0.00000	0.0	0.0	0.0	-	-	-
		19.00000	4.00000	0.00000	0.0	0.0	0.0	-	-	-
		20.00000	4.00000	0.00000	0.0	0.0	0.0	-	-	-
		21.00000	4.00000	0.00000	0.0	0.0	0.0	-	-	-
		22.00000	4.00000	0.00000	0.0	0.0	0.0	-	-	-
		23.00000	4.00000	0.00000	0.0	0.0	0.0	-	-	-
		24.00000	4.00000	0.00000	0.0	0.0	0.0	-	-	-
		25.00000	4.00000	0.00000	0.0	0.0	0.0	-	-	-
		26.00000	4.00000	0.00000	0.0	0.0	0.0	-	-	-
		27.00000	4.00000	0.00000	0.0	0.0	0.0	-	-	-
		28.00000	4.00000	0.00000	0.0	0.0	0.0	-	-	-
		29.00000	4.00000	0.00000	0.0	0.0	0.0	-	-	-
		30.00000	4.00000	0.00000	0.0	0.0	0.0	-	-	-
		31.00000	4.00000	0.00000	0.0	0.0	0.0	-	-	-
		32.00000	4.00000	0.00000	0.0	0.0	0.0	-	-	-
		33.00000	4.00000	0.00000	0.0	0.0	0.0	-	-	-
		34.00000	4.00000	0.00000	0.0	0.0	0.0	-	-	-
		35.00000	4.00000	0.00000	0.0	0.0	0.0	-	-	-
		36.00000	4.00000	0.00000	0.0	0.0	0.0	-	-	-
		37.00000	4.00000	0.00000	0.0	0.0	0.0	-	-	-
		38.00000	4.00000	0.00000	0.0	0.0	0.0	-	-	-
		39.00000	4.00000	0.00000	0.0	0.0	0.0	-	-	-
		40.00000	4.00000	0.00000	0.0	0.0	0.0	-	-	-
		10.00000	5.00000	0.00000	0.0	0.0	0.0	-	-	-
		11.00000	5.00000	0.00000	0.0	0.0	0.0	-	-	-
		12.00000	5.00000	0.00000	0.0	0.0	0.0	-	-	-
		13.00000	5.00000	0.00000						



FAIRHURST

Canfield Gardens, NW6
Ground Movement Assessment
Damage Impact Assessment

Job No.	Sheet No.	Rev.
117401		
Drg. Ref.		
Made by TJ	Date 05-Mar-2020	Checked

Type/No.	Coordinates			Displacements			Angle of Line			
Name	Dist.	x	y	z	x	y	z	Horizontal displacement	Horizontal displacement	to x Axis
		30.00000	7.00000	0.00000	0.0	0.0	0.0	-	-	-
		31.00000	7.00000	0.00000	0.0	0.0	0.0	-	-	-
		32.00000	7.00000	0.00000	0.0	0.0	0.0	-	-	-
		33.00000	7.00000	0.00000	0.0	0.0	0.0	-	-	-
		34.00000	7.00000	0.00000	0.0	0.0	0.0	-	-	-
		35.00000	7.00000	0.00000	0.0	0.0	0.0	-	-	-
		36.00000	7.00000	0.00000	0.0	0.0	0.0	-	-	-
		37.00000	7.00000	0.00000	0.0	0.0	0.0	-	-	-
		38.00000	7.00000	0.00000	0.0	0.0	0.0	-	-	-
		39.00000	7.00000	0.00000	0.0	0.0	0.0	-	-	-
		40.00000	7.00000	0.00000	0.0	0.0	0.0	-	-	-
		10.00000	8.00000	0.00000	0.0	0.0	0.0	-	-	-
		11.00000	8.00000	0.00000	0.0	0.0	0.0	-	-	-
		12.00000	8.00000	0.00000	0.0	0.0	0.0	-	-	-
		13.00000	8.00000	0.00000	0.0	0.0	0.0	-	-	-
		14.00000	8.00000	0.00000	0.0	0.0	0.0	-	-	-
		15.00000	8.00000	0.00000	0.0	0.0	0.0	-	-	-
		16.00000	8.00000	0.00000	0.0	0.0	0.0	-	-	-
		17.00000	8.00000	0.00000	0.0	0.0	0.0	-	-	-
		18.00000	8.00000	0.00000	0.0	0.0	0.0	-	-	-
		19.00000	8.00000	0.00000	0.0	0.0	0.0	-	-	-
		20.00000	8.00000	0.00000	0.0	0.0	0.0	-	-	-
		21.00000	8.00000	0.00000	0.0	0.0	0.0	-	-	-
		22.00000	8.00000	0.00000	0.0	0.0	0.0	-	-	-
		23.00000	8.00000	0.00000	0.0	0.0	0.0	-	-	-
		24.00000	8.00000	0.00000	0.0	0.0	0.0	-	-	-
		25.00000	8.00000	0.00000	0.0	0.0	0.0	-	-	-
		26.00000	8.00000	0.00000	0.0	0.0	0.0	-	-	-
		27.00000	8.00000	0.00000	0.0	0.0	0.0	-	-	-
		28.00000	8.00000	0.00000	0.0	0.0	0.0	-	-	-
		29.00000	8.00000	0.00000	0.0	0.0	0.0	-	-	-
		30.00000	8.00000	0.00000	0.0	0.0	0.0	-	-	-
		31.00000	8.00000	0.00000	0.0	0.0	0.0	-	-	-
		32.00000	8.00000	0.00000	0.0	0.0	0.0	-	-	-
		33.00000	8.00000	0.00000	0.0	0.0	0.0	-	-	-
		34.00000	8.00000	0.00000	0.0	0.0	0.0	-	-	-
		35.00000	8.00000	0.00000	0.0	0.0	0.0	-	-	-
		36.00000	8.00000	0.00000	0.0	0.0	0.0	-	-	-
		37.00000	8.00000	0.00000	0.0	0.0	0.0	-	-	-
		38.00000	8.00000	0.00000	0.0	0.0	0.0	-	-	-
		39.00000	8.00000	0.00000	0.0	0.0	0.0	-	-	-
		40.00000	8.00000	0.00000	0.0	0.0	0.0	-	-	-
		10.00000	9.00000	0.00000	0.0	0.0	0.0	-	-	-
		11.00000	9.00000	0.00000	0.0	0.0	0.0	-	-	-
		12.00000	9.00000	0.00000	0.0	0.0	0.0	-	-	-
		13.00000	9.00000	0.00000	0.0	0.0	0.0	-	-	-
		14.00000	9.00000	0.00000	0.0	0.0	0.0	-	-	-
		15.00000	9.00000	0.00000	0.0	0.0	0.0	-	-	-
		16.00000	9.00000	0.00000	0.0	0.0	0.0	-	-	-
		17.00000	9.00000	0.00000	0.0	0.0	0.0	-	-	-
		18.00000	9.00000	0.00000	0.0	0.0	0.0	-	-	-
		19.00000	9.00000	0.00000	0.0	0.0	0.0	-	-	-
		20.00000	9.00000	0.00000	0.0	0.0	0.0	-	-	-
		21.00000	9.00000	0.00000	0.0	0.0	0.0	-	-	-
		22.00000	9.00000	0.00000	0.0	0.0	0.0	-	-	-
		23.00000	9.00000	0.00000	0.0	0.0	0.0	-	-	-
		24.00000	9.00000	0.00000	0.0	0.0	0.0	-	-	-
		25.00000	9.00000	0.00000	0.0	0.0	0.0	-	-	-
		26.00000	9.00000	0.00000	0.0	0.0	0.0	-	-	-
		27.00000	9.00000	0.00000	0.0	0.0	0.0	-	-	-
		28.00000	9.00000	0.00000	0.0	0.0	0.0	-	-	-
		29.00000	9.00000	0.00000	0.0	0.0	0.0	-	-	-
		30.00000	9.00000	0.00000	0.0	0.0	0.0	-	-	-
		31.00000	9.00000	0.00000	0.0	0.0	0.0	-	-	-
		32.00000	9.00000	0.00000	0.0	0.0	0.0	-	-	-
		33.00000	9.00000	0.00000	0.0	0.0	0.0	-	-	-
		34.00000	9.00000	0.00000	0.0	0.0	0.0	-	-	-
		35.00000	9.00000	0.00000	0.0	0.0	0.0	-	-	-
		36.00000	9.00000	0.00000	0.0	0.0	0.0	-	-	-
		37.00000	9.00000	0.00000	0.0	0.0	0.0	-	-	-
		38.00000	9.00000	0.00000	0.0	0.0	0.0	-	-	-
		39.00000	9.00000	0.00000	0.0	0.0	0.0	-	-	-
		40.00000	9.00000	0.00000	0.0	0.0	0.0	-	-	-
		10.00000	10.00000	0.00000	0.0	0.0	0.0	-	-	-
		11.00000	10.00000	0.00000	0.0	0.0	0.0	-	-	-
		12.00000	10.00000	0.00000	0.0	0.0	0.0	-	-	-
		13.00000	10.00000	0.00000	0.0	0.0	0.0	-	-	-
		14.00000	10.00000	0.00000	0.0	0.0	0.0	-	-	-
		15.00000	10.00000	0.00000	0.0	0.0	0.0	-	-	-
		16.00000	10.00000	0.00000	0.0	0.0	0.0	-	-	-
		17.00000	10.00000	0.00000	0.0	0.0	0.0	-	-	-
		18.00000	10.00000	0.00000	0.0	0.0	0.0	-	-	-
		19.00000	10.00000	0.00000	0.0	0.0	0.0	-	-	-
		20.00000	10.00000	0.00000	0.0	0.0	0.0	-	-	-
		21.00000	10.00000	0.00000	0.0	0.0	0.0	-	-	-
		22.00000	10.00000	0.00000	0.0	0.0	0.0	-	-	-
		23.00000	10.00000	0.00000	0.0	0.0	0.0	-	-	-
		24.00000	10.00000	0.00000	0.0023699	0.024818	0.0069751	-	-	-
		25.00000	10.00000	0.00000	0.0026161	0.056784	0.012611	-	-	-
		26.00000	10.00000	0.00000	465.53E-6	0.10684	0.021894	-	-	-
		27.00000	10.00000	0.00000	472.65E-6	0.10847	0.022148	-	-	-
		28.00000	10.00000	0.00000	479.77E-6	0.11011	0.022400	-	-	-
		29.00000	10.00000	0.00000	486.89E-6	0.11174	0.022652	-	-	-
		30.00000	10.00000	0.00000	494.01E-6	0.11337	0.022902	-	-	-
		31.00000	10.00000	0.00000	501.13E-6	0.11501	0.023151	-	-	-
		32.00000	10.00000	0.00000	-0.0023114	0.064247	0.013829	-	-	-
		33.00000	10.00000	0.00000	-0.0028976	0.034080	0.0087902	-	-	-
		34.00000	10.00000	0.00000	0.0	0.0	0.0	-	-	-
		35.00000	10.00000	0.00000	0.0	0.0	0.0	-	-	-
		36.00000	10.00000	0.00000	0.0	0.0	0.0	-	-	-
		37.00000	10.00000	0.00000	0.0	0.0	0.0	-	-	-
		38.00000	10.00000	0.00000	0.0	0.0	0.0	-	-	-
		39.00000	10.00000	0.00000	0.0	0.0	0.0	-	-	-
		40.00000	10.00000	0.00000	0.0	0.0	0.0	-	-	-
		10.00000	11.00000	0.00000	0.0	0.0	0.0	-	-	-
		11.00000	11.00000	0.00000	0.0	0.0	0.0	-	-	-
		12.00000	11.00000	0.00000	0.0	0.0	0.0	-	-	-
		13.00000	11.00000	0.00000	0.0	0.0	0.0	-	-	-
		14.00000	11.00000	0.00000	0.0	0.0	0.0	-		



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Canfield Gardens, NW6
Ground Movement Assessment
Damage Impact Assessment

Job No.	Sheet No.	Rev.
117401		
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Made by TJ	Date 05-Mar-2020	Checked

Type/No.		Coordinates			Displacements			Angle of Line		
Name	Dist.	x	y	z	x	y	z	Horizontal displacement	Horizontal displacement	to x Axis
		16.00000	12.00000	0.00000	0.0	0.0	0.0	-	-	-
		17.00000	12.00000	0.00000	0.0	0.0	0.0	-	-	-
		18.00000	12.00000	0.00000	0.0	0.0	0.0	-	-	-
		19.00000	12.00000	0.00000	0.0014903	0.0025139	0.0022095	-	-	-
		20.00000	12.00000	0.00000	0.038417	0.081277	0.020296	-	-	-
		21.00000	12.00000	0.00000	0.061352	0.16757	0.031997	-	-	-
		22.00000	12.00000	0.00000	0.070444	0.25889	0.042739	-	-	-
		23.00000	12.00000	0.00000	0.066630	0.35138	0.054298	-	-	-
		24.00000	12.00000	0.00000	0.051809	0.43972	0.065915	-	-	-
		25.00000	12.00000	0.00000	0.028881	0.51728	0.075512	-	-	-
		26.00000	12.00000	0.00000	0.0037335	0.85682	0.12042	-	-	-
		27.00000	12.00000	0.00000	0.0037406	0.85846	0.12077	-	-	-
		28.00000	12.00000	0.00000	0.0037477	0.86009	0.12113	-	-	-
		29.00000	12.00000	0.00000	0.0037548	0.86173	0.12149	-	-	-
		30.00000	12.00000	0.00000	0.0037620	0.86336	0.12185	-	-	-
		31.00000	12.00000	0.00000	0.0037691	0.86499	0.12221	-	-	-
		32.00000	12.00000	0.00000	-0.023332	0.52495	0.077048	-	-	-
		33.00000	12.00000	0.00000	-0.047562	0.44945	0.067759	-	-	-
		34.00000	12.00000	0.00000	-0.064170	0.36244	0.056129	-	-	-
		35.00000	12.00000	0.00000	-0.070106	0.27066	0.044358	-	-	-
		36.00000	12.00000	0.00000	-0.063327	0.17958	0.033503	-	-	-
		37.00000	12.00000	0.00000	-0.042770	0.093198	0.022250	-	-	-
		38.00000	12.00000	0.00000	-0.0081944	0.014153	0.0057986	-	-	-
		39.00000	12.00000	0.00000	0.0	0.0	0.0	-	-	-
		40.00000	12.00000	0.00000	0.0	0.0	0.0	-	-	-
		10.00000	13.00000	0.00000	0.0	0.0	0.0	-	-	-
		11.00000	13.00000	0.00000	0.0	0.0	0.0	-	-	-
		12.00000	13.00000	0.00000	0.0	0.0	0.0	-	-	-
		13.00000	13.00000	0.00000	0.0	0.0	0.0	-	-	-
		14.00000	13.00000	0.00000	0.0	0.0	0.0	-	-	-
		15.00000	13.00000	0.00000	0.0	0.0	0.0	-	-	-
		16.00000	13.00000	0.00000	0.0	0.0	0.0	-	-	-
		17.00000	13.00000	0.00000	0.0	0.0	0.0	-	-	-
		18.00000	13.00000	0.00000	0.014551	0.016788	0.0073235	-	-	-
		19.00000	13.00000	0.00000	0.066378	0.094789	0.024536	-	-	-
		20.00000	13.00000	0.00000	0.10263	0.18526	0.037645	-	-	-
		21.00000	13.00000	0.00000	0.12235	0.28737	0.053897	-	-	-
		22.00000	13.00000	0.00000	0.12522	0.39894	0.075720	-	-	-
		23.00000	13.00000	0.00000	0.11190	0.51600	0.10173	-	-	-
		24.00000	13.00000	0.00000	0.084416	0.63242	0.12799	-	-	-
		25.00000	13.00000	0.00000	0.046278	0.73992	0.14944	-	-	-
		26.00000	13.00000	0.00000	0.0053675	1.2318	0.24026	-	-	-
		27.00000	13.00000	0.00000	0.0053746	1.2335	0.24097	-	-	-
		28.00000	13.00000	0.00000	0.0053817	1.2351	0.24168	-	-	-
		29.00000	13.00000	0.00000	0.0053888	1.2367	0.24239	-	-	-
		30.00000	13.00000	0.00000	0.0053959	1.2384	0.24311	-	-	-
		31.00000	13.00000	0.00000	0.0054031	1.2400	0.24383	-	-	-
		32.00000	13.00000	0.00000	-0.037627	0.74869	0.15272	-	-	-
		33.00000	13.00000	0.00000	-0.077441	0.64327	0.13206	-	-	-
		34.00000	13.00000	0.00000	-0.10718	0.52800	0.10589	-	-	-
		35.00000	13.00000	0.00000	-0.12313	0.41132	0.079337	-	-	-
		36.00000	13.00000	0.00000	-0.12304	0.29959	0.056612	-	-	-
		37.00000	13.00000	0.00000	-0.10610	0.19701	0.039552	-	-	-
		38.00000	13.00000	0.00000	-0.072519	0.10591	0.026354	-	-	-
		39.00000	13.00000	0.00000	-0.023196	0.027248	0.010542	-	-	-
		40.00000	13.00000	0.00000	0.0	0.0	0.0	-	-	-
		10.00000	14.00000	0.00000	0.0	0.0	0.0	-	-	-
		11.00000	14.00000	0.00000	0.0	0.0	0.0	-	-	-
		12.00000	14.00000	0.00000	0.0	0.0	0.0	-	-	-
		13.00000	14.00000	0.00000	0.0	0.0	0.0	-	-	-
		14.00000	14.00000	0.00000	0.0	0.0	0.0	-	-	-
		15.00000	14.00000	0.00000	0.0	0.0	0.0	-	-	-
		16.00000	14.00000	0.00000	0.0	0.0	0.0	-	-	-
		17.00000	14.00000	0.00000	0.015150	0.011756	0.0065594	-	-	-
		18.00000	14.00000	0.00000	0.086040	0.080946	0.024829	-	-	-
		19.00000	14.00000	0.00000	0.13958	0.16410	0.039255	-	-	-
		20.00000	14.00000	0.00000	0.17660	0.26505	0.060965	-	-	-
		21.00000	14.00000	0.00000	0.19409	0.38276	0.094185	-	-	-
		22.00000	14.00000	0.00000	0.19092	0.51589	0.13841	-	-	-
		23.00000	14.00000	0.00000	0.16718	0.66077	0.18909	-	-	-
		24.00000	14.00000	0.00000	0.12479	0.81056	0.23888	-	-	-
		25.00000	14.00000	0.00000	0.067962	0.95501	0.27934	-	-	-
		26.00000	14.00000	0.00000	0.0070014	1.6068	0.45064	-	-	-
		27.00000	14.00000	0.00000	0.0070086	1.6084	0.45177	-	-	-
		28.00000	14.00000	0.00000	0.0070157	1.6101	0.45290	-	-	-
		29.00000	14.00000	0.00000	0.0070228	1.6117	0.45403	-	-	-
		30.00000	14.00000	0.00000	0.0070299	1.6133	0.45516	-	-	-
		31.00000	14.00000	0.00000	0.0070370	1.6150	0.45630	-	-	-
		32.00000	14.00000	0.00000	-0.055737	0.96578	0.28491	-	-	-
		33.00000	14.00000	0.00000	-0.11478	0.82338	0.24600	-	-	-
		34.00000	14.00000	0.00000	-0.16010	0.67433	0.19667	-	-	-
		35.00000	14.00000	0.00000	-0.18714	0.52926	0.14539	-	-	-
		36.00000	14.00000	0.00000	-0.19368	0.39538	0.099740	-	-	-
		37.00000	14.00000	0.00000	-0.17944	0.27666	0.064749	-	-	-
		38.00000	14.00000	0.00000	-0.14544	0.17466	0.041548	-	-	-
		39.00000	14.00000	0.00000	-0.094552	0.090437	0.026654	-	-	-
		40.00000	14.00000	0.00000	-0.026843	0.021087	0.010164	-	-	-
		10.00000	15.00000	0.00000	0.0	0.0	0.0	-	-	-
		11.00000	15.00000	0.00000	0.0	0.0	0.0	-	-	-
		12.00000	15.00000	0.00000	0.0	0.0	0.0	-	-	-
		13.00000	15.00000	0.00000	0.0	0.0	0.0	-	-	-
		14.00000	15.00000	0.00000	0.0	0.0	0.0	-	-	-
		15.00000	15.00000	0.00000	0.0	0.0	0.0	-	-	-
		16.00000	15.00000	0.00000	0.0	0.0	0.0	-	-	-
		17.00000	15.00000	0.00000	0.094028	0.058729	0.023774	-	-	-
		18.00000	15.00000	0.00000	0.17498	0.14277	0.043812	-	-	-
		19.00000	15.00000	0.00000	0.23159	0.27097	0.074912	-	-	-
		20.00000	15.00000	0.00000	0.26643	0.41				



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Canfield Gardens, NW6
Ground Movement Assessment
Damage Impact Assessment

Job No.	Sheet No.	Rev.
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Made by TJ	Date 05-Mar-2020	Checked

Type/No.	Coordinates			Displacements			Angle of			
Name	Dist.	x	y	z	x	y	z	Horizontal displacement	Horizontal displacement	to x Axis
		33.00000	16.00000	0.00000	-0.22555	1.2311	0.63054	-	-	-
		34.00000	16.00000	0.00000	-0.31427	0.94588	0.50718	-	-	-
		35.00000	16.00000	0.00000	-0.36652	0.69164	0.38043	-	-	-
		36.00000	16.00000	0.00000	-0.37890	0.48731	0.26164	-	-	-
		37.00000	16.00000	0.00000	-0.36915	0.34810	0.17061	-	-	-
		38.00000	16.00000	0.00000	-0.34476	0.25165	0.10757	-	-	-
		39.00000	16.00000	0.00000	-0.28567	0.16900	0.063870	-	-	-
		40.00000	16.00000	0.00000	-0.19797	0.098052	0.038745	-	-	-
		10.00000	17.00000	0.00000	0.0	0.0	0.0	-	-	-
		11.00000	17.00000	0.00000	0.0	0.0	0.0	-	-	-
		12.00000	17.00000	0.00000	0.0	0.0	0.0	-	-	-
		13.00000	17.00000	0.00000	0.0	0.0	0.0	-	-	-
		14.00000	17.00000	0.00000	0.010772	0.017560	0.0068768	-	-	-
		15.00000	17.00000	0.00000	0.051521	0.098672	0.025742	-	-	-
		16.00000	17.00000	0.00000	0.22298	0.23532	0.064226	-	-	-
		17.00000	17.00000	0.00000	0.36220	0.38601	0.097152	-	-	-
		18.00000	17.00000	0.00000	0.46546	0.54896	0.14911	-	-	-
		19.00000	17.00000	0.00000	0.52865	0.72137	0.22898	-	-	-
		20.00000	17.00000	0.00000	0.54695	0.89968	0.33253	-	-	-
		21.00000	17.00000	0.00000	0.51443	1.0800	0.44568	-	-	-
		22.00000	17.00000	0.00000	0.49161	1.5655	0.62725	-	-	-
		23.00000	17.00000	0.00000	0.43764	1.8075	0.82904	-	-	-
		24.00000	17.00000	0.00000	0.33416	2.1006	1.0487	-	-	-
		25.00000	17.00000	0.00000	0.18454	2.4298	1.2280	-	-	-
		26.00000	17.00000	0.00000	0.011578	3.6534	1.9321	-	-	-
		27.00000	17.00000	0.00000	0.011714	3.2879	1.8795	-	-	-
		28.00000	17.00000	0.00000	0.034942	3.2509	1.8785	-	-	-
		29.00000	17.00000	0.00000	0.054518	3.2521	1.8779	-	-	-
		30.00000	17.00000	0.00000	0.046134	3.2565	1.8816	-	-	-
		31.00000	17.00000	0.00000	0.018306	3.2469	1.8846	-	-	-
		32.00000	17.00000	0.00000	-0.15511	2.1258	1.2017	-	-	-
		33.00000	17.00000	0.00000	-0.31137	1.7158	1.0185	-	-	-
		34.00000	17.00000	0.00000	-0.43766	1.2059	0.76888	-	-	-
		35.00000	17.00000	0.00000	-0.52334	0.86937	0.54416	-	-	-
		36.00000	17.00000	0.00000	-0.55011	0.58523	0.38976	-	-	-
		37.00000	17.00000	0.00000	-0.53254	0.38048	0.26940	-	-	-
		38.00000	17.00000	0.00000	-0.48034	0.26065	0.16706	-	-	-
		39.00000	17.00000	0.00000	-0.40463	0.18012	0.096739	-	-	-
		40.00000	17.00000	0.00000	-0.29962	0.11271	0.054531	-	-	-
		10.00000	18.00000	0.00000	0.0	0.0	0.0	-	-	-
		11.00000	18.00000	0.00000	0.0	0.0	0.0	-	-	-
		12.00000	18.00000	0.00000	0.0	0.0	0.0	-	-	-
		13.00000	18.00000	0.00000	0.024249	0.026829	0.010614	-	-	-
		14.00000	18.00000	0.00000	0.076563	0.10508	0.026594	-	-	-
		15.00000	18.00000	0.00000	0.18390	0.21135	0.056532	-	-	-
		16.00000	18.00000	0.00000	0.37126	0.35689	0.097467	-	-	-
		17.00000	18.00000	0.00000	0.52526	0.52071	0.15221	-	-	-
		18.00000	18.00000	0.00000	0.64178	0.70117	0.24076	-	-	-
		19.00000	18.00000	0.00000	0.71632	0.89521	0.36651	-	-	-
		20.00000	18.00000	0.00000	0.74332	1.0987	0.51866	-	-	-
		21.00000	18.00000	0.00000	0.71499	1.3073	0.67557	-	-	-
		22.00000	18.00000	0.00000	0.66476	1.8838	0.95923	-	-	-
		23.00000	18.00000	0.00000	0.59018	2.1310	1.2215	-	-	-
		24.00000	18.00000	0.00000	0.47206	2.5050	1.4834	-	-	-
		25.00000	18.00000	0.00000	0.27360	2.9817	1.7036	-	-	-
		26.00000	18.00000	0.00000	0.013716	4.5446	2.6360	-	-	-
		27.00000	18.00000	0.00000	0.058202	4.0620	2.5384	-	-	-
		28.00000	18.00000	0.00000	0.10928	4.0382	2.5274	-	-	-
		29.00000	18.00000	0.00000	0.12293	4.0442	2.5389	-	-	-
		30.00000	18.00000	0.00000	0.092781	4.0803	2.5712	-	-	-
		31.00000	18.00000	0.00000	0.028317	4.1220	2.5953	-	-	-
		32.00000	18.00000	0.00000	-0.23360	2.7969	1.7485	-	-	-
		33.00000	18.00000	0.00000	-0.44526	2.2225	1.5258	-	-	-
		34.00000	18.00000	0.00000	-0.60669	1.4069	1.1582	-	-	-
		35.00000	18.00000	0.00000	-0.74387	0.95836	0.83612	-	-	-
		36.00000	18.00000	0.00000	-0.82095	0.66259	0.57356	-	-	-
		37.00000	18.00000	0.00000	-0.78511	0.43242	0.39448	-	-	-
		38.00000	18.00000	0.00000	-0.66269	0.26375	0.24771	-	-	-
		39.00000	18.00000	0.00000	-0.53692	0.17135	0.13881	-	-	-
		40.00000	18.00000	0.00000	-0.40882	0.11131	0.074941	-	-	-
		10.00000	19.00000	0.00000	0.0	0.0	0.0	-	-	-
		11.00000	19.00000	0.00000	0.0	0.0	0.0	-	-	-
		12.00000	19.00000	0.00000	0.025317	0.018775	0.0095467	-	-	-
		13.00000	19.00000	0.00000	0.097751	0.087690	0.026748	-	-	-
		14.00000	19.00000	0.00000	0.15082	0.16917	0.041445	-	-	-
		15.00000	19.00000	0.00000	0.32262	0.28973	0.090361	-	-	-
		16.00000	19.00000	0.00000	0.52950	0.44150	0.15056	-	-	-
		17.00000	19.00000	0.00000	0.70229	0.61656	0.24092	-	-	-
		18.00000	19.00000	0.00000	0.83671	0.81361	0.37753	-	-	-
		19.00000	19.00000	0.00000	0.92847	1.0290	0.55878	-	-	-
		20.00000	19.00000	0.00000	0.97261	1.2570	0.76765	-	-	-
		21.00000	19.00000	0.00000	0.96154	1.4912	1.0097	-	-	-
		22.00000	19.00000	0.00000	0.94672	2.1843	1.4796	-	-	-
		23.00000	19.00000	0.00000	0.85395	2.3917	1.6885	-	-	-
		24.00000	19.00000	0.00000	0.72195	2.8119	1.9257	-	-	-
		25.00000	19.00000	0.00000	0.44428	3.4645	2.1765	-	-	-
		26.00000	19.00000	0.00000	0.040814	5.5042	3.3110	-	-	-
		27.00000	19.00000	0.00000	0.15598	4.8847	3.1240	-	-	-
		28.00000	19.00000	0.00000	0.21796	4.8202	3.1176	-	-	-
		29.00000	19.00000	0.00000	0.22231	4.8054	3.1555	-	-	-
		30.00000	19.00000	0.00000	0.16771	4.8830	3.2391	-	-	-
		31.00000	19.00000	0.00000	0.044031	5.0185	3.3337	-	-	-
		32.00000	19.00000	0.00000	-0.38636	3.3807	2.4304	-	-	-
		33.00000	19.00000	0.00000	-0.69113	2.6045	2.1698	-	-	-
		34.00000	19.00000	0.00000	-0.90119	1.5470	1.6495	-	-	-
		35.00000	19.00000	0.00000	-1.1121	0.99461	1.2959	-	-	-
		36.00000	19.00000	0.00000	-1.1694	0.629				



FAIRHURST

Canfield Gardens, NW6
Ground Movement Assessment
Damage Impact Assessment

Job No.	Sheet No.	Rev.
117401		
Drg. Ref.		
Made by TJ	Date 05-Mar-2020	Checked

Type/No.		Coordinates			Displacements			Angle of Line	
Name	Dist.	x	y	z	x	y	z	Horizontal displacement	Horizontal displacement to x Axis
	19.00000	21.00000	0.00000	1.4033	1.3320	1.0821	-	-	-
	20.00000	21.00000	0.00000	1.4976	1.6176	1.4713	-	-	-
	21.00000	21.00000	0.00000	1.5559	1.9029	2.0477	-	-	-
	22.00000	21.00000	0.00000	1.7777	2.6769	2.9212	-	-	-
	23.00000	21.00000	0.00000	2.0658	2.7145	3.2324	-	-	-
	24.00000	21.00000	0.00000	2.1936	2.8807	3.3259	-	-	-
	25.00000	21.00000	0.00000	1.7597	3.3652	3.0779	-	-	-
	26.00000	21.00000	0.00000	0.20316	5.8689	3.2088	-	-	-
	27.00000	21.00000	0.00000	0.40639	6.5660	3.6233	-	-	-
	28.00000	21.00000	0.00000	0.59284	6.3438	3.6029	-	-	-
	29.00000	21.00000	0.00000	0.72397	6.1681	3.7501	-	-	-
	30.00000	21.00000	0.00000	0.75334	6.1442	3.8312	-	-	-
	31.00000	21.00000	0.00000	0.21005	6.8874	3.8826	-	-	-
	32.00000	21.00000	0.00000	-1.6358	3.6969	3.2982	-	-	-
	33.00000	21.00000	0.00000	-2.1922	3.0561	3.5653	-	-	-
	34.00000	21.00000	0.00000	-2.5038	1.2683	2.7740	-	-	-
	35.00000	21.00000	0.00000	-2.5876	0.52202	2.3653	-	-	-
	36.00000	21.00000	0.00000	-2.2491	0.26713	1.6517	-	-	-
	37.00000	21.00000	0.00000	-1.9065	0.14364	0.88991	-	-	-
	38.00000	21.00000	0.00000	-1.5035	0.088377	0.50742	-	-	-
	39.00000	21.00000	0.00000	-1.0697	0.050386	0.27823	-	-	-
	40.00000	21.00000	0.00000	-0.72612	0.028554	0.13699	-	-	-
	10.00000	22.00000	0.00000	0.010531	0.0028338	0.0042168	-	-	-
	11.00000	22.00000	0.00000	0.16260	0.049611	0.030573	-	-	-
	12.00000	22.00000	0.00000	0.29715	0.10450	0.052625	-	-	-
	13.00000	22.00000	0.00000	0.40958	0.16955	0.093720	-	-	-
	14.00000	22.00000	0.00000	0.49382	0.24743	0.16391	-	-	-
	15.00000	22.00000	0.00000	0.93009	0.36670	0.32225	-	-	-
	16.00000	22.00000	0.00000	1.3375	0.57070	0.49361	-	-	-
	17.00000	22.00000	0.00000	1.6830	0.84315	0.74117	-	-	-
	18.00000	22.00000	0.00000	1.9784	1.1895	1.1730	-	-	-
	19.00000	22.00000	0.00000	2.2253	1.7171	1.7541	-	-	-
	20.00000	22.00000	0.00000	2.4437	2.0607	2.3590	-	-	-
	21.00000	22.00000	0.00000	2.6293	2.4088	3.2755	-	-	-
	22.00000	22.00000	0.00000	3.1044	3.0850	4.5912	-	-	-
	23.00000	22.00000	0.00000	3.7695	2.9795	5.1275	-	-	-
	24.00000	22.00000	0.00000	4.5189	2.8796	5.4413	-	-	-
	25.00000	22.00000	0.00000	5.3535	2.8015	5.3635	-	-	-
	26.00000	22.00000	0.00000	6.0293	2.8018	4.3260	-	-	-
	27.00000	22.00000	0.00000				Point lies within an excavation.	-	-
	28.00000	22.00000	0.00000				Point lies within an excavation.	-	-
	29.00000	22.00000	0.00000				Point lies within an excavation.	-	-
	30.00000	22.00000	0.00000				Point lies within an excavation.	-	-
	31.00000	22.00000	0.00000				Point lies within an excavation.	-	-
	32.00000	22.00000	0.00000				Point lies within an excavation.	-	-
	33.00000	22.00000	0.00000				Point lies within an excavation.	-	-
	34.00000	22.00000	0.00000	-6.4295	0.17307	4.5980	-	-	-
	35.00000	22.00000	0.00000	-5.0886	0.10741	3.9318	-	-	-
	36.00000	22.00000	0.00000	-4.0058	0.052029	2.6955	-	-	-
	37.00000	22.00000	0.00000	-3.2558	0.0048427	1.4554	-	-	-
	38.00000	22.00000	0.00000	-2.5057	0.0	0.80583	-	-	-
	39.00000	22.00000	0.00000	-1.7557	0.0	0.43782	-	-	-
	40.00000	22.00000	0.00000	-1.1689	0.0	0.21425	-	-	-
	10.00000	23.00000	0.00000	0.076397	0.014966	0.017156	-	-	-
	11.00000	23.00000	0.00000	0.24775	0.054684	0.039985	-	-	-
	12.00000	23.00000	0.00000	0.40380	0.10195	0.071161	-	-	-
	13.00000	23.00000	0.00000	0.53995	0.15899	0.13275	-	-	-
	14.00000	23.00000	0.00000	0.67406	0.24484	0.24018	-	-	-
	15.00000	23.00000	0.00000	1.1870	0.40546	0.44253	-	-	-
	16.00000	23.00000	0.00000	1.6183	0.62841	0.67509	-	-	-
	17.00000	23.00000	0.00000	1.9372	0.92302	1.0480	-	-	-
	18.00000	23.00000	0.00000	2.1651	1.3254	1.5570	-	-	-
	19.00000	23.00000	0.00000	2.3779	2.1147	2.2805	-	-	-
	20.00000	23.00000	0.00000	2.5436	2.6561	2.9617	-	-	-
	21.00000	23.00000	0.00000	2.6340	3.2374	3.9615	-	-	-
	22.00000	23.00000	0.00000	3.0548	3.9162	5.3568	-	-	-
	23.00000	23.00000	0.00000	3.6756	3.7025	5.7808	-	-	-
	24.00000	23.00000	0.00000	4.3782	3.5201	5.9812	-	-	-
	25.00000	23.00000	0.00000	5.1179	3.4098	5.7821	-	-	-
	26.00000	23.00000	0.00000	6.0245	3.3501	4.8910	-	-	-
	27.00000	23.00000	0.00000				Point lies within an excavation.	-	-
	28.00000	23.00000	0.00000				Point lies within an excavation.	-	-
	29.00000	23.00000	0.00000				Point lies within an excavation.	-	-
	30.00000	23.00000	0.00000				Point lies within an excavation.	-	-
	31.00000	23.00000	0.00000				Point lies within an excavation.	-	-
	32.00000	23.00000	0.00000				Point lies within an excavation.	-	-
	33.00000	23.00000	0.00000				Point lies within an excavation.	-	-
	34.00000	23.00000	0.00000	-6.3993	0.16218	4.5474	-	-	-
	35.00000	23.00000	0.00000	-5.0772	0.10454	3.9031	-	-	-
	36.00000	23.00000	0.00000	-4.0058	0.056795	2.6808	-	-	-
	37.00000	23.00000	0.00000	-3.2558	0.016694	1.4522	-	-	-
	38.00000	23.00000	0.00000	-2.5057	0.0	0.80583	-	-	-
	39.00000	23.00000	0.00000	-1.7557	0.0	0.43782	-	-	-
	40.00000	23.00000	0.00000	-1.1689	0.0	0.21425	-	-	-
	10.00000	24.00000	0.00000	0.13782	0.018064	0.025339	-	-	-
	11.00000	24.00000	0.00000	0.33081	0.048534	0.049116	-	-	-
	12.00000	24.00000	0.00000	0.51186	0.085228	0.091822	-	-	-
	13.00000	24.00000	0.00000	0.67704	0.13020	0.17489	-	-	-
	14.00000	24.00000	0.00000	0.93346	0.23201	0.32542	-	-	-
	15.00000	24.00000	0.00000	1.5100	0.37689	0.58803	-	-	-
	16.00000	24.00000	0.00000	1.9753	0.57446	0.94489	-	-	-
	17.00000	24.00000	0.00000	2.3245	0.90305	1.4656	-	-	-
	18.00000	24.00000	0.00000	2.5154	1.3894	2.0617	-	-	-
	19.00000	24.00000	0.00000	2.6274	2.4143	2.9119	-	-	-
	20.00000	24.00000	0.00000	2.7182	3.1556	3.6563	-	-	-
	21.00000	24.00000	0.00000	2.6423	4.0903	4.7466	-	-	-
	22.00000	24.00000	0.00000	2.9547	4.7424	6.0321	-	-	-
	23.00000	24.00000	0.00000	3.5061	4.3901	6.2421	-	-	-
	24.00000	24.00000	0.00000	4.1350	4.1604	6.2871	-	-	-
	25.00000	24.00000	0.00000	4.8479	4.0310	6.0373	-	-	-
	26.00000	24.00000	0.00000	5.9561	3.9564	5.3250	-	-	-
	27.00000	24.00000	0.00000				Point lies within an excavation.	-	-
	28.00000	24.00000	0.00000				Point lies within an excavation.	-	-
	29.00000	24.00000	0.00000				Point lies within an excavation.	-	-
	30.00000	24.0.							



FAIRHURST

Canfield Gardens, NW6
Ground Movement Assessment
Damage Impact Assessment

Job No.	Sheet No.	Rev.
117401		
Drg. Ref.		
Made by TJ	Date 05-Mar-2020	Checked

Type/No.		Coordinates		Displacements			Angle of	
Name	Dist.	x	y	z	x	y	z	Horizontal displacement
								Horizontal displacement
								to x Axis
		36.00000	25.00000	0.00000	-4.0058	0.034547	2.5847	-
		37.00000	25.00000	0.00000	-3.2558	0.014958	1.4423	-
		38.00000	25.00000	0.00000	-2.5057	0.0	0.80583	-
		39.00000	25.00000	0.00000	-1.7557	0.0	0.43782	-
		40.00000	25.00000	0.00000	-1.1689	0.0	0.21425	-
		10.00000	26.00000	0.00000	-2.2806	0.0055142	0.034027	-
		11.00000	26.00000	0.00000	0.46723	0.012470	0.063284	-
		12.00000	26.00000	0.00000	0.70376	0.020960	0.12469	-
		13.00000	26.00000	0.00000	1.0259	0.035998	0.25517	-
		14.00000	26.00000	0.00000	1.4784	0.064503	0.47142	-
		15.00000	26.00000	0.00000	2.2817	0.10602	0.88433	-
		16.00000	26.00000	0.00000	3.0442	0.17181	1.5764	-
		17.00000	26.00000	0.00000	3.7992	0.31069	2.3590	-
		18.00000	26.00000	0.00000	4.1882	0.74638	2.8582	-
		19.00000	26.00000	0.00000	4.1015	2.8108	4.0095	-
		20.00000	26.00000	0.00000	4.2431	3.2372	4.2676	-
		21.00000	26.00000	0.00000	2.7528	5.9602	5.1132	-
		22.00000	26.00000	0.00000	2.2682	5.9678	6.1843	-
		23.00000	26.00000	0.00000	2.8479	5.5021	6.2672	-
		24.00000	26.00000	0.00000	3.6237	5.3845	6.1481	-
		25.00000	26.00000	0.00000	4.4985	5.3333	5.8498	-
		26.00000	26.00000	0.00000	5.7906	5.3046	5.2004	-
		27.00000	26.00000	0.00000			Point lies within an excavation.	-
		28.00000	26.00000	0.00000			Point lies within an excavation.	-
		29.00000	26.00000	0.00000			Point lies within an excavation.	-
		30.00000	26.00000	0.00000			Point lies within an excavation.	-
		31.00000	26.00000	0.00000			Point lies within an excavation.	-
		32.00000	26.00000	0.00000			Point lies within an excavation.	-
		33.00000	26.00000	0.00000			Point lies within an excavation.	-
		34.00000	26.00000	0.00000	-6.2436	0.032378	4.2623	-
		35.00000	26.00000	0.00000	-5.0204	0.021593	3.5897	-
		36.00000	26.00000	0.00000	-4.0058	0.012951	2.5486	-
		37.00000	26.00000	0.00000	-3.2558	0.0058695	1.4409	-
		38.00000	26.00000	0.00000	-2.5057	0.0	0.80583	-
		39.00000	26.00000	0.00000	-1.7557	0.0	0.43782	-
		40.00000	26.00000	0.00000	-1.1689	0.0	0.21425	-
		10.00000	27.00000	0.00000	0.35925	0.0	0.052107	-
		11.00000	27.00000	0.00000	0.73425	0.0	0.097044	-
		12.00000	27.00000	0.00000	1.1092	0.0	0.19195	-
		13.00000	27.00000	0.00000	1.6385	0.0	0.39473	-
		14.00000	27.00000	0.00000	2.3885	0.0	0.73317	-
		15.00000	27.00000	0.00000	3.1385	0.0	1.3047	-
		16.00000	27.00000	0.00000	3.8885	0.0	2.3565	-
		17.00000	27.00000	0.00000	4.8426	0.0	3.5230	-
		18.00000	27.00000	0.00000	6.0396	0.0	4.2110	-
		19.00000	27.00000	0.00000			Point lies within an excavation.	-
		20.00000	27.00000	0.00000			Point lies within an excavation.	-
		21.00000	27.00000	0.00000			Point lies within an excavation.	-
		22.00000	27.00000	0.00000			Point lies within an excavation.	-
		23.00000	27.00000	0.00000			Point lies within an excavation.	-
		24.00000	27.00000	0.00000			Point lies within an excavation.	-
		25.00000	27.00000	0.00000			Point lies within an excavation.	-
		26.00000	27.00000	0.00000			Point lies within an excavation.	-
		27.00000	27.00000	0.00000			Point lies within an excavation.	-
		28.00000	27.00000	0.00000			Point lies within an excavation.	-
		29.00000	27.00000	0.00000			Point lies within an excavation.	-
		30.00000	27.00000	0.00000			Point lies within an excavation.	-
		31.00000	27.00000	0.00000			Point lies within an excavation.	-
		32.00000	27.00000	0.00000			Point lies within an excavation.	-
		33.00000	27.00000	0.00000			Point lies within an excavation.	-
		34.00000	27.00000	0.00000	-6.2436	0.0	4.2522	-
		35.00000	27.00000	0.00000	-5.0204	0.0	3.6784	-
		36.00000	27.00000	0.00000	-4.0057	0.0	2.5468	-
		37.00000	27.00000	0.00000	-3.2557	0.0	1.4401	-
		38.00000	27.00000	0.00000	-2.5057	0.0	0.80583	-
		39.00000	27.00000	0.00000	-1.7557	0.0	0.43782	-
		40.00000	27.00000	0.00000	-1.1689	0.0	0.21425	-
		10.00000	28.00000	0.00000	0.35925	0.0	0.052107	-
		11.00000	28.00000	0.00000	0.73425	0.0	0.097044	-
		12.00000	28.00000	0.00000	1.1092	0.0	0.19195	-
		13.00000	28.00000	0.00000	1.6385	0.0	0.39473	-
		14.00000	28.00000	0.00000	2.3885	0.0	0.73317	-
		15.00000	28.00000	0.00000	3.1385	0.0	1.3047	-
		16.00000	28.00000	0.00000	3.8885	0.0	2.3718	-
		17.00000	28.00000	0.00000	4.8426	0.0	3.5727	-
		18.00000	28.00000	0.00000	6.0545	0.0	4.2617	-
		19.00000	28.00000	0.00000			Point lies within an excavation.	-
		20.00000	28.00000	0.00000			Point lies within an excavation.	-
		21.00000	28.00000	0.00000			Point lies within an excavation.	-
		22.00000	28.00000	0.00000			Point lies within an excavation.	-
		23.00000	28.00000	0.00000			Point lies within an excavation.	-
		24.00000	28.00000	0.00000			Point lies within an excavation.	-
		25.00000	28.00000	0.00000			Point lies within an excavation.	-
		26.00000	28.00000	0.00000			Point lies within an excavation.	-
		27.00000	28.00000	0.00000			Point lies within an excavation.	-
		28.00000	28.00000	0.00000			Point lies within an excavation.	-
		29.00000	28.00000	0.00000			Point lies within an excavation.	-
		30.00000	28.00000	0.00000			Point lies within an excavation.	-
		31.00000	28.00000	0.00000			Point lies within an excavation.	-
		32.00000	28.00000	0.00000			Point lies within an excavation.	-
		33.00000	28.00000	0.00000			Point lies within an excavation.	-
		34.00000	28.00000	0.00000	-6.2628	0.0	4.2844	-
		35.00000	28.00000	0.00000	-5.0204	0.0	3.7295	-
		36.00000	28.00000	0.00000	-4.0057	0.0	2.5725	-
		37.00000	28.00000	0.00000	-3.2557	0.0	1.4401	-
		38.00000	28.00000	0.00000	-2.5057	0.0	0.80583	-
		39.00000	28.00000	0.00000	-1.7557	0.0	0.43782	-
		40.00000	28.00000	0.00000	-1.1689	0.0	0.21425	-
		10.00000	29.00000	0.00000	0.35925	0.0	0.052107	-
		11.00000	29.00000	0.00000	0.73425	0.0	0.097044	-
		12.00000	29.00000	0.00000	1.1092	0.0	0.19195	-
		13.00000	29.00000	0.00000	1.6385	0.0	0.39473	-
		14.00000	29.00000	0.00000	2.3885	0.0	0.73317	-
		15.00000	29.00000	0.00000	3.1385	0.0	1.3047	-
		16.00000	29.00000	0.00000	3.8885	0.0	2.4159	-
		17.00000	29.00000	0.00000	4.8463	0.0	3.6373	-
		18.00000	29.00000	0.00000	6.1023	0.0	4.3473	-
		19.00000	29.00000	0.00000			Point lies within an excavation.	-
		20.00000	29.00000	0.00000			Point lies within an excavation.	-
		21.00000	29.00000	0.00000			Point lies within an excavation.	-
		22.00000	29.00000	0.00000			Point lies within an excavation.	-
		23.00000	29.00000	0.00000			Point lies within an excavation.	-
		24.00000	29.00000	0.00000			Point lies within an excavation.	-
		25.00000	29.00000	0.00000			Point lies within an excavation.	-
		26.00000	29.00000	0.00000			Point lies within an excavation.	-
		27.00000	29.00000	0.00000			Point lies within an excavation.	-
		28.00000	29.00000	0.00000			Point lies within an excavation.	-
		29.00000	29.00000	0.00000			Point lies within an excavation.	-
		30.00000	29.00000	0.00000			Point lies within an excavation.	-
		31.00000	29.00000	0.00000			Point lies within an excavation.	-
		32.00000	29.00000	0.00000			Point lies within an excavation.	-
		33.00000	29.00000	0.00000			Point lies within an excavation.	-
		34.00000	29.00000	0.00000	-6.3134	0.0	4.3729	-
		35.00000	29.00000	0.00000	-5.0349	0.0	3.7975	-
		36.00000	29.00000	0.00000	-4.0057	0.0	2.6197	-
		37.00000	29.00000	0.00000	-3.2557	0.0	1.4401	-
		38.00000	29.00000	0.00000	-2.5057	0.0	0.80583	-
		39.00000	29.00000	0.00000	-1.7557	0.0	0.43782	-
		40.00000	29.00000	0.00000	-1.1689	0.0	0.21425	-
		10.00000	30.00000	0.00000	0.35925	0.0	0.052107	-
		11.00000	30.00000	0.00000	0.73425	0.0	0.097044	-
		12.00000	30.00000	0.00000	1.1092	0.0	0.19195	-
		13.00000	30.00000	0.00000	1.6385	0.0	0.39473	-
		14.00000	30.00000	0.00000	2.3885	0.0	0.73317	-
		15.00000	30.00000	0.00000	3.1385	0.0	1.3047	-
		16.00000	30.00000	0.00000	3.8885	0.0	2.4585	-
		17.00000	30.00000	0.00000	4.8787	0.0	3.7094	-
		18.00000	30.00000	0.00000	6.1679	0.0	4.4604	-
		19.00000	30.00000	0.00000			Point lies within an excavation.	-
		20.00000	30.00000	0.00000			Point lies within an excavation.	-
		21.00000	30.00000	0.00000			Point lies within an excavation.	-



FAIRHURST

Canfield Gardens, NW6
Ground Movement Assessment
Damage Impact Assessment

Job No.	Sheet No.	Rev.
117401		
Drg. Ref.		
Made by TJ	Date 05-Mar-2020	Checked

Type/No.		Coordinates			Displacements			Angle of Line
Name	Dist.	x	y	z	x	y	z	to x Axis
							Horizontal displacement	Horizontal displacement
22.00000	30.00000	0.00000					Point lies within an excavation.	
23.00000	30.00000	0.00000					Point lies within an excavation.	
24.00000	30.00000	0.00000					Point lies within an excavation.	
25.00000	30.00000	0.00000					Point lies within an excavation.	
26.00000	30.00000	0.00000					Point lies within an excavation.	
27.00000	30.00000	0.00000					Point lies within an excavation.	
28.00000	30.00000	0.00000					Point lies within an excavation.	
29.00000	30.00000	0.00000					Point lies within an excavation.	
30.00000	30.00000	0.00000					Point lies within an excavation.	
31.00000	30.00000	0.00000					Point lies within an excavation.	
32.00000	30.00000	0.00000					Point lies within an excavation.	
33.00000	30.00000	0.00000					Point lies within an excavation.	
34.00000	30.00000	0.00000			-6.3860	0.0	4.4937	-
35.00000	30.00000	0.00000			-5.0716	0.0	3.8753	-
36.00000	30.00000	0.00000			-4.0057	0.0	2.6663	-
37.00000	30.00000	0.00000			-3.2557	0.0	1.4462	-
38.00000	30.00000	0.00000			-2.5057	0.0	0.80583	-
39.00000	30.00000	0.00000			-1.7557	0.0	0.43782	-
40.00000	30.00000	0.00000			-1.1689	0.0	0.21425	-
10.00000	31.00000	0.00000			0.35925	0.0	0.052107	-
11.00000	31.00000	0.00000			0.73425	0.0	0.097044	-
12.00000	31.00000	0.00000			1.1092	0.0	0.19195	-
13.00000	31.00000	0.00000			1.6385	0.0	0.39473	-
14.00000	31.00000	0.00000			2.3885	0.0	0.73317	-
15.00000	31.00000	0.00000			3.1385	0.0	1.3047	-
16.00000	31.00000	0.00000			3.8885	0.0	2.4821	-
17.00000	31.00000	0.00000			4.8958	0.0	3.7579	-
18.00000	31.00000	0.00000			6.2156	0.0	4.5488	-
19.00000	31.00000	0.00000					Point lies within an excavation.	
20.00000	31.00000	0.00000					Point lies within an excavation.	
21.00000	31.00000	0.00000					Point lies within an excavation.	
22.00000	31.00000	0.00000					Point lies within an excavation.	
23.00000	31.00000	0.00000					Point lies within an excavation.	
24.00000	31.00000	0.00000					Point lies within an excavation.	
25.00000	31.00000	0.00000					Point lies within an excavation.	
26.00000	31.00000	0.00000					Point lies within an excavation.	
27.00000	31.00000	0.00000					Point lies within an excavation.	
28.00000	31.00000	0.00000					Point lies within an excavation.	
29.00000	31.00000	0.00000					Point lies within an excavation.	
30.00000	31.00000	0.00000					Point lies within an excavation.	
31.00000	31.00000	0.00000					Point lies within an excavation.	
32.00000	31.00000	0.00000					Point lies within an excavation.	
33.00000	31.00000	0.00000					Point lies within an excavation.	
34.00000	31.00000	0.00000			-6.4407	0.0	4.5908	-
35.00000	31.00000	0.00000			-5.0922	0.0	3.9288	-
36.00000	31.00000	0.00000			-4.0057	0.0	2.6932	-
37.00000	31.00000	0.00000			-3.2557	0.0	1.4552	-
38.00000	31.00000	0.00000			-2.5057	0.0	0.80583	-
39.00000	31.00000	0.00000			-1.7557	0.0	0.43782	-
40.00000	31.00000	0.00000			-1.1689	0.0	0.21425	-
10.00000	32.00000	0.00000			0.22860	-0.0053476	0.034072	-
11.00000	32.00000	0.00000			0.46821	-0.012089	0.063370	-
12.00000	32.00000	0.00000			0.70526	-0.020316	0.12488	-
13.00000	32.00000	0.00000			1.0288	-0.034895	0.25562	-
14.00000	32.00000	0.00000			1.4830	-0.062480	0.47235	-
15.00000	32.00000	0.00000			1.9158	-0.10790	0.83364	-
16.00000	32.00000	0.00000			2.3071	-0.17805	1.5735	-
17.00000	32.00000	0.00000			2.7242	-0.32085	2.3530	-
18.00000	32.00000	0.00000			2.8370	-0.75228	2.7307	-
19.00000	32.00000	0.00000			2.4206	-2.8345	3.6025	-
20.00000	32.00000	0.00000			2.1850	-3.2321	3.3940	-
21.00000	32.00000	0.00000			0.14426	-5.8653	3.3090	-
22.00000	32.00000	0.00000			-0.83495	-5.7544	3.6344	-
23.00000	32.00000	0.00000			-0.81127	-5.6122	3.5155	-
24.00000	32.00000	0.00000			-0.64751	-5.6662	3.2343	-
25.00000	32.00000	0.00000			-0.45145	-5.9559	3.1628	-
26.00000	32.00000	0.00000			-0.050059	-8.1909	3.8791	-
27.00000	32.00000	0.00000			0.40002	-5.9540	3.1309	-
28.00000	32.00000	0.00000			0.60741	-5.6568	3.1791	-
29.00000	32.00000	0.00000			0.76975	-5.5881	3.4450	-
30.00000	32.00000	0.00000			0.87888	-5.6772	3.6327	-
31.00000	32.00000	0.00000			0.25903	-6.5729	3.6527	-
32.00000	32.00000	0.00000			-2.0452	-3.3610	3.3105	-
33.00000	32.00000	0.00000			-2.4433	-2.8716	3.5992	-
34.00000	32.00000	0.00000			-2.7650	-0.94893	2.7846	-
35.00000	32.00000	0.00000			-2.7947	-0.35732	2.4513	-
36.00000	32.00000	0.00000			-2.3632	-0.19198	1.7072	-
37.00000	32.00000	0.00000			-1.9814	-0.11602	0.91739	-
38.00000	32.00000	0.00000			-1.5529	-0.067836	0.51858	-
39.00000	32.00000	0.00000			-1.1009	-0.038677	0.28353	-
40.00000	32.00000	0.00000			-0.74266	-0.021795	0.13933	-
10.00000	33.00000	0.00000			0.19095	-0.013967	0.030837	-
11.00000	33.00000	0.00000			0.40742	-0.033125	0.057510	-
12.00000	33.00000	0.00000			0.61642	-0.056400	0.11134	-
13.00000	33.00000	0.00000			0.85632	-0.091850	0.22275	-
14.00000	33.00000	0.00000			1.2177	-0.16653	0.40839	-
15.00000	33.00000	0.00000			1.5225	-0.28547	0.70116	-
16.00000	33.00000	0.00000			1.7286	-0.46009	1.2210	-
17.00000	33.00000	0.00000			1.7645	-0.74053	1.8300	-
18.00000	33.00000	0.00000			1.6985	-1.4206	2.3784	-
19.00000	33.00000	0.00000			1.3552	-2.7385	3.0508	-
20.00000	33.00000	0.00000			0.89453	-3.5104	3.1404	-
21.00000	33.00000	0.00000			0.043188	-5.0523	3.4658	-
22.00000	33.00000	0.00000			-0.29598	-5.5251	3.8674	-
23.00000	33.00000	0.00000			-0.41754	-5.3390	3.7391	-
24.00000	33.00000	0.00000			-0.41661	-5.4652	3.6741	-
25.00000	33.00000	0.00000			-0.31232	-6.0229	3.8632	-
26.00000	33.00000	0.00000			-0.038739	-7.2539	4.4572	-
27.00000	33.00000	0.00000			0.28160	-6.0164	3.8469	-
28.00000	33.00000	0.00000			0.40097	-5.4461	3.6400	-
29.00000	33.00000	0.00000			0.43263	-5.3031	3.6921	-
30.00000	33.00000	0.00000			0.33341	-5.4111	3.8061	-
31.00000	33.00000	0.00000			0.065557	-5.9098	3.9900	-
32.00000	33.00000	0.00000			-0.80240	-3.7105	3.1823	-
33.00000	33.00000	0.00000			-1.3063	-2.8056	3.0433	-
34.00000	33.00000	0.00000			-1.6523	-1.5616	2.4473	-
35.00000	33.00000	0.00000			-1.7741	-0.81419	1.9190	-
36.00000	33.00000	0.00000			-1.7483	-0.49256	1.3269	-
37.00000	33.00000	0.00000			-1.5635	-0.30630	0.75723	-
38.00000	33.00000	0.00000			-1.2703	-0.18080	0.44622	-
39.00000	33.00000	0.00000			-0.91567	-0.10216	0.24828	-
40.00000	33.00000	0.00000			-0.64880	-0.060569	0.12404	-
10.00000	34.00000	0.00000			0.13883	-0.018058	0.025457	-
11.00000	34.00000	0.						



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Canfield Gardens, NW6
Ground Movement Assessment
Damage Impact Assessment

Job No.	Sheet No.	Rev.
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Made by TJ	Date 05-Mar-2020	Checked

Type/No.		Coordinates			Displacements			Angle of Line	
Name	Dist.	x	y	z	x	y	z	Horizontal displacement	Horizontal displacement to x Axis
								displacement	displacement
39.00000	34.00000	0.00000	-0.70536	-0.13808	0.19436	-	-	-	-
40.00000	34.00000	0.00000	-0.54133	-0.091372	0.10241	-	-	-	-
10.00000	35.00000	0.00000	0.077510	-0.015096	0.017331	-	-	-	-
11.00000	35.00000	0.00000	0.24926	-0.054693	0.040150	-	-	-	-
12.00000	35.00000	0.00000	0.40573	-0.10183	0.071517	-	-	-	-
13.00000	35.00000	0.00000	0.54237	-0.15872	0.13348	-	-	-	-
14.00000	35.00000	0.00000	0.67848	-0.24525	0.24177	-	-	-	-
15.00000	35.00000	0.00000	0.82049	-0.42193	0.39454	-	-	-	-
16.00000	35.00000	0.00000	0.87723	-0.68438	0.58714	-	-	-	-
17.00000	35.00000	0.00000	0.82131	-1.0270	0.87750	-	-	-	-
18.00000	35.00000	0.00000	0.67237	-1.4870	1.2064	-	-	-	-
19.00000	35.00000	0.00000	0.50978	-2.3468	1.6336	-	-	-	-
20.00000	35.00000	0.00000	0.30285	-2.9365	1.9141	-	-	-	-
21.00000	35.00000	0.00000	0.012949	-3.5862	2.1577	-	-	-	-
22.00000	35.00000	0.00000	-0.074423	-4.3951	2.5327	-	-	-	-
23.00000	35.00000	0.00000	-0.11921	-4.4587	3.0268	-	-	-	-
24.00000	35.00000	0.00000	-0.11666	-4.6840	3.2141	-	-	-	-
25.00000	35.00000	0.00000	-0.073860	-5.0471	3.4858	-	-	-	-
26.00000	35.00000	0.00000	0.0	-5.4834	3.7813	-	-	-	-
27.00000	35.00000	0.00000	0.059873	-5.0346	3.4850	-	-	-	-
28.00000	35.00000	0.00000	0.11027	-4.6610	3.2075	-	-	-	-
29.00000	35.00000	0.00000	0.12282	-4.4253	3.0137	-	-	-	-
30.00000	35.00000	0.00000	0.087532	-4.3555	2.9197	-	-	-	-
31.00000	35.00000	0.00000	0.013666	-4.3815	2.8670	-	-	-	-
32.00000	35.00000	0.00000	-0.26530	-3.0259	1.9482	-	-	-	-
33.00000	35.00000	0.00000	-0.48746	-2.4218	1.6743	-	-	-	-
34.00000	35.00000	0.00000	-0.64699	-1.5667	1.2590	-	-	-	-
35.00000	35.00000	0.00000	-0.80168	-1.0821	0.92512	-	-	-	-
36.00000	35.00000	0.00000	-0.87747	-0.72739	0.61988	-	-	-	-
37.00000	35.00000	0.00000	-0.83558	-0.45275	0.42167	-	-	-	-
38.00000	35.00000	0.00000	-0.70655	-0.26808	0.26399	-	-	-	-
39.00000	35.00000	0.00000	-0.56187	-0.16885	0.14687	-	-	-	-
40.00000	35.00000	0.00000	-0.42892	-0.11015	0.078956	-	-	-	-
10.00000	36.00000	0.00000	0.011670	-0.0031258	0.0044976	-	-	-	-
11.00000	36.00000	0.00000	0.16408	-0.049822	0.030745	-	-	-	-
12.00000	36.00000	0.00000	0.29899	-0.10463	0.052919	-	-	-	-
13.00000	36.00000	0.00000	0.41180	-0.16960	0.094345	-	-	-	-
14.00000	36.00000	0.00000	0.49643	-0.24743	0.16504	-	-	-	-
15.00000	36.00000	0.00000	0.56293	-0.37272	0.27232	-	-	-	-
16.00000	36.00000	0.00000	0.59561	-0.62386	0.40463	-	-	-	-
17.00000	36.00000	0.00000	0.56511	-0.95134	0.56235	-	-	-	-
18.00000	36.00000	0.00000	0.48500	-1.3644	0.81892	-	-	-	-
19.00000	36.00000	0.00000	0.35617	-1.9741	1.1157	-	-	-	-
20.00000	36.00000	0.00000	0.19885	-2.4139	1.3520	-	-	-	-
21.00000	36.00000	0.00000	0.0082856	-2.8793	1.5468	-	-	-	-
22.00000	36.00000	0.00000	-0.034283	-3.7234	2.2467	-	-	-	-
23.00000	36.00000	0.00000	-0.052219	-3.8635	2.3879	-	-	-	-
24.00000	36.00000	0.00000	-0.041145	-4.0664	2.5738	-	-	-	-
25.00000	36.00000	0.00000	0.0	-4.3319	2.7808	-	-	-	-
26.00000	36.00000	0.00000	0.0	-4.6807	2.9928	-	-	-	-
27.00000	36.00000	0.00000	0.0	-4.3345	2.7825	-	-	-	-
28.00000	36.00000	0.00000	0.034931	-4.0493	2.5727	-	-	-	-
29.00000	36.00000	0.00000	0.052607	-3.8421	2.3853	-	-	-	-
30.00000	36.00000	0.00000	0.040041	-3.7019	2.2437	-	-	-	-
31.00000	36.00000	0.00000	0.0061566	-3.6242	2.1494	-	-	-	-
32.00000	36.00000	0.00000	-0.17271	-2.4740	1.3780	-	-	-	-
33.00000	36.00000	0.00000	-0.33693	-2.0283	1.1497	-	-	-	-
34.00000	36.00000	0.00000	-0.46699	-1.4245	0.86006	-	-	-	-
35.00000	36.00000	0.00000	-0.55798	-1.0048	0.59487	-	-	-	-
36.00000	36.00000	0.00000	-0.59320	-0.66087	0.42514	-	-	-	-
37.00000	36.00000	0.00000	-0.57352	-0.40237	0.29217	-	-	-	-
38.00000	36.00000	0.00000	-0.50679	-0.26120	0.17899	-	-	-	-
39.00000	36.00000	0.00000	-0.42732	-0.18104	0.10355	-	-	-	-
40.00000	36.00000	0.00000	-0.31854	-0.11422	0.057807	-	-	-	-
10.00000	37.00000	0.00000	0.0	0.0	0.0	-	-	-	-
11.00000	37.00000	0.00000	0.081090	-0.032363	0.019681	-	-	-	-
12.00000	37.00000	0.00000	0.19841	-0.091927	0.038125	-	-	-	-
13.00000	37.00000	0.00000	0.29295	-0.16119	0.063215	-	-	-	-
14.00000	37.00000	0.00000	0.35951	-0.24217	0.10763	-	-	-	-
15.00000	37.00000	0.00000	0.39180	-0.33714	0.17304	-	-	-	-
16.00000	37.00000	0.00000	0.39929	-0.49968	0.26818	-	-	-	-
17.00000	37.00000	0.00000	0.39721	-0.78590	0.40151	-	-	-	-
18.00000	37.00000	0.00000	0.34780	-1.1223	0.54533	-	-	-	-
19.00000	37.00000	0.00000	0.25831	-1.5257	0.71435	-	-	-	-
20.00000	37.00000	0.00000	0.114198	-1.8840	0.89240	-	-	-	-
21.00000	37.00000	0.00000	0.0058780	-2.2674	1.0424	-	-	-	-
22.00000	37.00000	0.00000	-0.0080774	-3.1639	1.5599	-	-	-	-
23.00000	37.00000	0.00000	-0.0056818	-3.3190	1.6786	-	-	-	-
24.00000	37.00000	0.00000	0.0	-3.5400	1.8221	-	-	-	-
25.00000	37.00000	0.00000	0.0	-3.8029	1.9783	-	-	-	-
26.00000	37.00000	0.00000	0.0	-4.0548	2.1152	-	-	-	-
27.00000	37.00000	0.00000	0.0	-3.8049	1.9795	-	-	-	-
28.00000	37.00000	0.00000	0.0	-3.5419	1.8232	-	-	-	-
29.00000	37.00000	0.00000	0.0032148	-3.3076	1.6770	-	-	-	-
30.00000	37.00000	0.00000	0.0089278	-3.1550	1.5596	-	-	-	-
31.00000	37.00000	0.00000	0.0015921	-3.0189	1.4672	-	-	-	-
32.00000	37.00000	0.00000	-0.12208	-1.9292	0.91100	-	-	-	-
33.00000	37.00000	0.00000	-0.24260	-1.5685	0.73965	-	-	-	-
34.00000	37.00000	0.00000	-0.33587	-1.1663	0.56634	-	-	-	-
35.00000	37.00000	0.00000	-0.39291	-0.82761	0.42268	-	-	-	-
36.00000	37.00000	0.00000	-0.39988	-0.52575	0.28559	-	-	-	-
37.00000	37.00000	0.00000	-0.39330	-0.35369	0.18499	-	-	-	-
38.00000	37.00000	0.00000	-0.36712	-0.25627	0.11672	-	-	-	-
39.00000	37.00000	0.00000	-0.30556	-0.17323	0.068820	-	-	-	-
40.00000	37.00000	0.00000	-0.21509	-0.10224	0.041201	-	-	-	-
10.00000	38.00000	0.00000	0.0	0.0	0.0	-	-	-	-
11.00000	38.00000	0.00000	0.0034062	-0.0017259	0.0024646	-	-	-	-
12.00000	38.00000	0.00000	0.10708	-0.063440	0.025689	-	-	-	-
13.00000	38.00000	0.00000	0.18846	-0.13					



FAIRHURST

Canfield Gardens, NW6
Ground Movement Assessment
Damage Impact Assessment

Job No.	Sheet No.	Rev.
117401		
Drg. Ref.		
Made by TJ	Date 05-Mar-2020	Checked

Type/No.		Coordinates			Displacements			Angle of	
Name	Dist.	x	y	z	x	y	z	Horizontal displacement	Horizontal displacement to x Axis
		25.00000	39.00000	0.00000	0.0	-2.6692	0.79170	-	-
		26.00000	39.00000	0.00000	0.0	-2.8028	0.83807	-	-
		27.00000	39.00000	0.00000	0.0	-2.6704	0.79213	-	-
		28.00000	39.00000	0.00000	0.0	-2.5187	0.73203	-	-
		29.00000	39.00000	0.00000	0.0	-2.3624	0.66592	-	-
		30.00000	39.00000	0.00000	0.0	-2.2124	0.61394	-	-
		31.00000	39.00000	0.00000	0.0	-2.0755	0.57087	-	-
		32.00000	39.00000	0.00000	-0.061707	-1.2847	0.35429	-	-
		33.00000	39.00000	0.00000	-0.12425	-1.0320	0.29420	-	-
		34.00000	39.00000	0.00000	-0.17223	-0.79328	0.23040	-	-
		35.00000	39.00000	0.00000	-0.20096	-0.57280	0.16544	-	-
		36.00000	39.00000	0.00000	-0.20827	-0.41159	0.11010	-	-
		37.00000	39.00000	0.00000	-0.19403	-0.28944	0.070927	-	-
		38.00000	39.00000	0.00000	-0.15947	-0.18509	0.044843	-	-
		39.00000	39.00000	0.00000	-0.10856	-0.10033	0.029034	-	-
		40.00000	39.00000	0.00000	-0.039616	-0.030119	0.013499	-	-
		10.00000	40.00000	0.00000	0.0	0.0	0.0	-	-
		11.00000	40.00000	0.00000	0.0	0.0	0.0	-	-
		12.00000	40.00000	0.00000	0.0	0.0	0.0	-	-
		13.00000	40.00000	0.00000	0.025410	-0.028026	0.010983	-	-
		14.00000	40.00000	0.00000	0.077787	-0.10644	0.026847	-	-
		15.00000	40.00000	0.00000	0.11425	-0.19805	0.040523	-	-
		16.00000	40.00000	0.00000	0.13370	-0.30222	0.058877	-	-
		17.00000	40.00000	0.00000	0.13566	-0.41695	0.083904	-	-
		18.00000	40.00000	0.00000	0.12071	-0.56919	0.11992	-	-
		19.00000	40.00000	0.00000	0.090807	-0.77005	0.15969	-	-
		20.00000	40.00000	0.00000	0.049558	-0.97611	0.19472	-	-
		21.00000	40.00000	0.00000	0.0020447	-1.1765	0.22424	-	-
		22.00000	40.00000	0.00000	0.0	-1.7252	0.33746	-	-
		23.00000	40.00000	0.00000	0.0	-1.8467	0.36727	-	-
		24.00000	40.00000	0.00000	0.0	-1.9685	0.40085	-	-
		25.00000	40.00000	0.00000	0.0	-2.0819	0.43263	-	-
		26.00000	40.00000	0.00000	0.0	-2.1767	0.45604	-	-
		27.00000	40.00000	0.00000	0.0	-2.0828	0.43286	-	-
		28.00000	40.00000	0.00000	0.0	-1.9694	0.40110	-	-
		29.00000	40.00000	0.00000	0.0	-1.8476	0.36749	-	-
		30.00000	40.00000	0.00000	0.0	-1.7260	0.33764	-	-
		31.00000	40.00000	0.00000	0.0	-1.6109	0.31480	-	-
		32.00000	40.00000	0.00000	-0.042274	-0.59347	0.19787	-	-
		33.00000	40.00000	0.00000	-0.084892	-0.78950	0.16418	-	-
		34.00000	40.00000	0.00000	-0.11688	-0.58921	0.12490	-	-
		35.00000	40.00000	0.00000	-0.13438	-0.43594	0.088416	-	-
		36.00000	40.00000	0.00000	-0.13518	-0.31983	0.062419	-	-
		37.00000	40.00000	0.00000	-0.11850	-0.21380	0.043024	-	-
		38.00000	40.00000	0.00000	-0.084683	-0.12012	0.028927	-	-
		39.00000	40.00000	0.00000	-0.034745	-0.039613	0.014093	-	-
		40.00000	40.00000	0.00000	0.0	0.0	0.0	-	-
		10.00000	41.00000	0.00000	0.0	0.0	0.0	-	-
		11.00000	41.00000	0.00000	0.0	0.0	0.0	-	-
		12.00000	41.00000	0.00000	0.0	0.0	0.0	-	-
		13.00000	41.00000	0.00000	0.0	0.0	0.0	-	-
		14.00000	41.00000	0.00000	0.011833	-0.019239	0.0073657	-	-
		15.00000	41.00000	0.00000	0.048693	-0.099485	0.023527	-	-
		16.00000	41.00000	0.00000	0.071147	-0.18803	0.035026	-	-
		17.00000	41.00000	0.00000	0.079255	-0.28247	0.046832	-	-
		18.00000	41.00000	0.00000	0.073900	-0.37896	0.060224	-	-
		19.00000	41.00000	0.00000	0.056980	-0.49427	0.079001	-	-
		20.00000	41.00000	0.00000	0.031476	-0.65782	0.10151	-	-
		21.00000	41.00000	0.00000	0.0013036	-0.81159	0.11764	-	-
		22.00000	41.00000	0.00000	0.0	-1.2148	0.17434	-	-
		23.00000	41.00000	0.00000	0.0	-1.3113	0.18826	-	-
		24.00000	41.00000	0.00000	0.0	-1.4041	0.20384	-	-
		25.00000	41.00000	0.00000	0.0	-1.4865	0.21854	-	-
		26.00000	41.00000	0.00000	0.0	-1.5506	0.22922	-	-
		27.00000	41.00000	0.00000	0.0	-1.4872	0.21865	-	-
		28.00000	41.00000	0.00000	0.0	-1.4048	0.20396	-	-
		29.00000	41.00000	0.00000	0.0	-1.3120	0.18837	-	-
		30.00000	41.00000	0.00000	0.0	-1.2155	0.17443	-	-
		31.00000	41.00000	0.00000	0.0	-1.1209	0.16315	-	-
		32.00000	41.00000	0.00000	-0.026879	-0.67012	0.10299	-	-
		33.00000	41.00000	0.00000	-0.053407	-0.50883	0.081128	-	-
		34.00000	41.00000	0.00000	-0.071918	-0.39415	0.062439	-	-
		35.00000	41.00000	0.00000	-0.079268	-0.29779	0.048864	-	-
		36.00000	41.00000	0.00000	-0.073383	-0.20274	0.036811	-	-
		37.00000	41.00000	0.00000	-0.053233	-0.11306	0.025488	-	-
		38.00000	41.00000	0.00000	-0.018641	-0.031379	0.010581	-	-
		39.00000	41.00000	0.00000	0.0	0.0	0.0	-	-
		40.00000	41.00000	0.00000	0.0	0.0	0.0	-	-
		10.00000	42.00000	0.00000	0.0	0.0	0.0	-	-
		11.00000	42.00000	0.00000	0.0	0.0	0.0	-	-
		12.00000	42.00000	0.00000	0.0	0.0	0.0	-	-
		13.00000	42.00000	0.00000	0.0	0.0	0.0	-	-
		14.00000	42.00000	0.00000	0.0	0.0	0.0	-	-
		15.00000	42.00000	0.00000	0.0	0.0	0.0	-	-
		16.00000	42.00000	0.00000	0.017651	-0.053499	0.014057	-	-
		17.00000	42.00000	0.00000	0.031819	-0.12918	0.025503	-	-
		18.00000	42.00000	0.00000	0.035121	-0.20371	0.033720	-	-
		19.00000	42.00000	0.00000	0.029287	-0.27244	0.040346	-	-
		20.00000	42.00000	0.00000	0.016788	-0.32983	0.045411	-	-
		21.00000	42.00000	0.00000	703.34E-6	-0.42616	0.059309	-	-
		22.00000	42.00000	0.00000	0.0	-0.68577	0.092990	-	-
		23.00000	42.00000	0.00000	0.0	-0.76015	0.10125	-	-
		24.00000	42.00000	0.00000	0.0	-0.82854	0.10890	-	-
		25.00000	42.00000	0.00000	0.0	-0.88535	0.11563	-	-
		26.00000	42.00000	0.00000	0.0	-0.92447	0.12053	-	-
		27.00000	42.00000	0.00000	0.0	-0.88576	0.11568	-	-
		28.00000	42.00000	0.00000	0.0	-0.82902	0.10895	-	-
		29.00000	42.00000	0.00000	0.0	-0.76067	0.10131	-	-
		30.00000	42.00000	0.00000	0.0	-0.68629	0.093050	-	-
		31.00000	42.00000	0.00000	0.0	-0.61057	0.083271	-	-
		32.00000	42.00000	0.00000	-0.014384	-0.33751	0.046034	-	-
		33.00000	42.00000	0.00000	-0.027672	-0.28248	0.041268	-	-
		34.00000	42.00000	0.00000	-0.034749	-0.21516	0.034865	-	-
		35.00000	42.00000						

Type/No.		Coordinates			Displacements			Angle of Line		
Name	Dist.	x	y	z	x	y	z	Horizontal displacement	Horizontal displacement	to x Axis
		11.00000	44.00000	0.00000	0.0	0.0	0.0	-	-	-
		12.00000	44.00000	0.00000	0.0	0.0	0.0	-	-	-
		13.00000	44.00000	0.00000	0.0	0.0	0.0	-	-	-
		14.00000	44.00000	0.00000	0.0	0.0	0.0	-	-	-
		15.00000	44.00000	0.00000	0.0	0.0	0.0	-	-	-
		16.00000	44.00000	0.00000	0.0	0.0	0.0	-	-	-
		17.00000	44.00000	0.00000	0.0	0.0	0.0	-	-	-
		18.00000	44.00000	0.00000	0.0	0.0	0.0	-	-	-
		19.00000	44.00000	0.00000	0.0	0.0	0.0	-	-	-
		20.00000	44.00000	0.00000	0.0	0.0	0.0	-	-	-
		21.00000	44.00000	0.00000	0.0	0.0	0.0	-	-	-
		22.00000	44.00000	0.00000	0.0	0.0	0.0	-	-	-
		23.00000	44.00000	0.00000	0.0	0.0	0.0	-	-	-
		24.00000	44.00000	0.00000	0.0	0.0	0.0	-	-	-
		25.00000	44.00000	0.00000	0.0	0.0	0.0	-	-	-
		26.00000	44.00000	0.00000	0.0	0.0	0.0	-	-	-
		27.00000	44.00000	0.00000	0.0	0.0	0.0	-	-	-
		28.00000	44.00000	0.00000	0.0	0.0	0.0	-	-	-
		29.00000	44.00000	0.00000	0.0	0.0	0.0	-	-	-
		30.00000	44.00000	0.00000	0.0	0.0	0.0	-	-	-
		31.00000	44.00000	0.00000	0.0	0.0	0.0	-	-	-
		32.00000	44.00000	0.00000	0.0	0.0	0.0	-	-	-
		33.00000	44.00000	0.00000	0.0	0.0	0.0	-	-	-
		34.00000	44.00000	0.00000	0.0	0.0	0.0	-	-	-
		35.00000	44.00000	0.00000	0.0	0.0	0.0	-	-	-
		36.00000	44.00000	0.00000	0.0	0.0	0.0	-	-	-
		37.00000	44.00000	0.00000	0.0	0.0	0.0	-	-	-
		38.00000	44.00000	0.00000	0.0	0.0	0.0	-	-	-
		39.00000	44.00000	0.00000	0.0	0.0	0.0	-	-	-
		40.00000	44.00000	0.00000	0.0	0.0	0.0	-	-	-
		10.00000	45.00000	0.00000	0.0	0.0	0.0	-	-	-
		11.00000	45.00000	0.00000	0.0	0.0	0.0	-	-	-
		12.00000	45.00000	0.00000	0.0	0.0	0.0	-	-	-
		13.00000	45.00000	0.00000	0.0	0.0	0.0	-	-	-
		14.00000	45.00000	0.00000	0.0	0.0	0.0	-	-	-
		15.00000	45.00000	0.00000	0.0	0.0	0.0	-	-	-
		16.00000	45.00000	0.00000	0.0	0.0	0.0	-	-	-
		17.00000	45.00000	0.00000	0.0	0.0	0.0	-	-	-
		18.00000	45.00000	0.00000	0.0	0.0	0.0	-	-	-
		19.00000	45.00000	0.00000	0.0	0.0	0.0	-	-	-
		20.00000	45.00000	0.00000	0.0	0.0	0.0	-	-	-
		21.00000	45.00000	0.00000	0.0	0.0	0.0	-	-	-
		22.00000	45.00000	0.00000	0.0	0.0	0.0	-	-	-
		23.00000	45.00000	0.00000	0.0	0.0	0.0	-	-	-
		24.00000	45.00000	0.00000	0.0	0.0	0.0	-	-	-
		25.00000	45.00000	0.00000	0.0	0.0	0.0	-	-	-
		26.00000	45.00000	0.00000	0.0	0.0	0.0	-	-	-
		27.00000	45.00000	0.00000	0.0	0.0	0.0	-	-	-
		28.00000	45.00000	0.00000	0.0	0.0	0.0	-	-	-
		29.00000	45.00000	0.00000	0.0	0.0	0.0	-	-	-
		30.00000	45.00000	0.00000	0.0	0.0	0.0	-	-	-
		31.00000	45.00000	0.00000	0.0	0.0	0.0	-	-	-
		32.00000	45.00000	0.00000	0.0	0.0	0.0	-	-	-
		33.00000	45.00000	0.00000	0.0	0.0	0.0	-	-	-
		34.00000	45.00000	0.00000	0.0	0.0	0.0	-	-	-
		35.00000	45.00000	0.00000	0.0	0.0	0.0	-	-	-
		36.00000	45.00000	0.00000	0.0	0.0	0.0	-	-	-
		37.00000	45.00000	0.00000	0.0	0.0	0.0	-	-	-
		38.00000	45.00000	0.00000	0.0	0.0	0.0	-	-	-
		39.00000	45.00000	0.00000	0.0	0.0	0.0	-	-	-
		40.00000	45.00000	0.00000	0.0	0.0	0.0	-	-	-
		10.00000	46.00000	0.00000	0.0	0.0	0.0	-		



FAIRHURST

Canfield Gardens, NW6
Ground Movement Assessment
Damage Impact Assessment

Job No.	Sheet No.	Rev.
117401		
Drg. Ref.		
Made by TJ	Date 05-Mar-2020	Checked

Type/No.		Coordinates			Displacements			Angle of Line		
Name	Dist.	x	y	z	x	y	z	Horizontal displacement	Horizontal displacement	to x Axis
		28.00000	48.00000	0.00000	0.0	0.0	0.0	-	-	-
		29.00000	48.00000	0.00000	0.0	0.0	0.0	-	-	-
		30.00000	48.00000	0.00000	0.0	0.0	0.0	-	-	0.0
		31.00000	48.00000	0.00000	0.0	0.0	0.0	-	-	0.0
		32.00000	48.00000	0.00000	0.0	0.0	0.0	-	-	-
		33.00000	48.00000	0.00000	0.0	0.0	0.0	-	-	-
		34.00000	48.00000	0.00000	0.0	0.0	0.0	-	-	-
		35.00000	48.00000	0.00000	0.0	0.0	0.0	-	-	-
		36.00000	48.00000	0.00000	0.0	0.0	0.0	-	-	0.0
		37.00000	48.00000	0.00000	0.0	0.0	0.0	-	-	-
		38.00000	48.00000	0.00000	0.0	0.0	0.0	-	-	-
		39.00000	48.00000	0.00000	0.0	0.0	0.0	-	-	-
		40.00000	48.00000	0.00000	0.0	0.0	0.0	-	-	-
		10.00000	49.00000	0.00000	0.0	0.0	0.0	-	-	0.0
		11.00000	49.00000	0.00000	0.0	0.0	0.0	-	-	-
		12.00000	49.00000	0.00000	0.0	0.0	0.0	-	-	-
		13.00000	49.00000	0.00000	0.0	0.0	0.0	-	-	-
		14.00000	49.00000	0.00000	0.0	0.0	0.0	-	-	-
		15.00000	49.00000	0.00000	0.0	0.0	0.0	-	-	0.0
		16.00000	49.00000	0.00000	0.0	0.0	0.0	-	-	-
		17.00000	49.00000	0.00000	0.0	0.0	0.0	-	-	-
		18.00000	49.00000	0.00000	0.0	0.0	0.0	-	-	-
		19.00000	49.00000	0.00000	0.0	0.0	0.0	-	-	-
		20.00000	49.00000	0.00000	0.0	0.0	0.0	-	-	0.0
		21.00000	49.00000	0.00000	0.0	0.0	0.0	-	-	-
		22.00000	49.00000	0.00000	0.0	0.0	0.0	-	-	-
		23.00000	49.00000	0.00000	0.0	0.0	0.0	-	-	-
		24.00000	49.00000	0.00000	0.0	0.0	0.0	-	-	-
		25.00000	49.00000	0.00000	0.0	0.0	0.0	-	-	-
		26.00000	49.00000	0.00000	0.0	0.0	0.0	-	-	0.0
		27.00000	49.00000	0.00000	0.0	0.0	0.0	-	-	-
		28.00000	49.00000	0.00000	0.0	0.0	0.0	-	-	-
		29.00000	49.00000	0.00000	0.0	0.0	0.0	-	-	-
		30.00000	49.00000	0.00000	0.0	0.0	0.0	-	-	-
		31.00000	49.00000	0.00000	0.0	0.0	0.0	-	-	0.0
		32.00000	49.00000	0.00000	0.0	0.0	0.0	-	-	-
		33.00000	49.00000	0.00000	0.0	0.0	0.0	-	-	-
		34.00000	49.00000	0.00000	0.0	0.0	0.0	-	-	-
		35.00000	49.00000	0.00000	0.0	0.0	0.0	-	-	-
		36.00000	49.00000	0.00000	0.0	0.0	0.0	-	-	0.0
		37.00000	49.00000	0.00000	0.0	0.0	0.0	-	-	-
		38.00000	49.00000	0.00000	0.0	0.0	0.0	-	-	-
		39.00000	49.00000	0.00000	0.0	0.0	0.0	-	-	-
		40.00000	49.00000	0.00000	0.0	0.0	0.0	-	-	-
		10.00000	50.00000	0.00000	0.0	0.0	0.0	-	-	0.0
		11.00000	50.00000	0.00000	0.0	0.0	0.0	-	-	-
		12.00000	50.00000	0.00000	0.0	0.0	0.0	-	-	-
		13.00000	50.00000	0.00000	0.0	0.0	0.0	-	-	-
		14.00000	50.00000	0.00000	0.0	0.0	0.0	-	-	-
		15.00000	50.00000	0.00000	0.0	0.0	0.0	-	-	0.0
		16.00000	50.00000	0.00000	0.0	0.0	0.0	-	-	-
		17.00000	50.00000	0.00000	0.0	0.0	0.0	-	-	-
		18.00000	50.00000	0.00000	0.0	0.0	0.0	-	-	-
		19.00000	50.00000	0.00000	0.0	0.0	0.0	-	-	-
		20.00000	50.00000	0.00000	0.0	0.0	0.0	-	-	0.0
		21.00000	50.00000	0.00000	0.0	0.0	0.0	-	-	-
		22.00000	50.00000	0.00000	0.0	0.0	0.0	-	-	-
		23.00000	50.00000	0.00000	0.0	0.0	0.0	-	-	-
		24.00000	50.00000	0.00000	0.0	0.0	0.0	-	-	-
		25.00000	50.00000	0.00000	0.0	0.0	0.0	-	-	-
		26.00000	50.00000	0.00000	0.0	0.0	0.0	-	-	0.0
		27.00000	50.00000	0.00000	0.0	0.0	0.0	-	-	-
		28.00000	50.00000	0.00000	0.0	0.0	0.0	-	-	-
		29.00000	50.00000	0.00000	0.0	0.0	0.0	-	-	-
		30.00000	50.00000	0.00000	0.0	0.0	0.0	-	-	-
		31.00000	50.00000	0.00000	0.0	0.0	0.0	-	-	0.0
		32.00000	50.00000	0.00000	0.0	0.0	0.0	-	-	-
		33.00000	50.00000	0.00000	0.0	0.0	0.0	-	-	-
		34.00000	50.00000	0.00000	0.0	0.0	0.0	-	-	-
		35.00000	50.00000	0.00000	0.0	0.0	0.0	-	-	-
		36.00000	50.00000	0.00000	0.0	0.0	0.0	-	-	0.0
		37.00000	50.00000	0.00000	0.0	0.0	0.0	-	-	-
		38.00000	50.00000	0.00000	0.0	0.0	0.0	-	-	-
		39.00000	50.00000	0.00000	0.0	0.0	0.0	-	-	-
		40.00000	50.00000	0.00000	0.0	0.0	0.0	-	-	-
No.30_1	Line 1	32.110505	41.324117	0.000000	-0.025232	-0.543500	0.079870	0.543600	-0.023009	269.77
	0.98246	32.10649	40.34172	0.00000	-0.040862	-0.86636	0.15662	0.86652	-0.037318	269.77
	1.9649	32.10247	39.35926	0.00000	-0.060211	-1.1602	0.28570	1.1604	-0.055466	269.77
	2.9474	32.09845	38.37681	0.00000	-0.084832	-1.4178	0.47630	1.4181	-0.079034	269.77
	3.9298	32.09443	37.39435	0.00000	-0.11743	-1.6672	0.72370	1.6677	-0.11061	269.77
	4.9123	32.09042	36.41190	0.00000	-0.16390	-2.2193	1.1580	2.2200	-0.15483	269.77
No.30_2	Line 2	32.09042	36.41190	0.00000	-0.16390	-2.2193	1.1580	1.5111	1.6337	218.54
	0.59628	31.62405	36.04035	0.00000	-0.10041	-2.6264	1.4318	1.7151	1.9916	218.54
	1.1926	31.15768	35.66880	0.00000	-0.0091801	-2.8715	1.6764	1.7965	2.2401	218.54
No.30_3	Line 3	31.15768	35.66880	0.00000	-0.0091801	-2.8715	1.6764	2.8714	0.017275	269.47
	1.0481	31.14803	34.62071	0.00000	-0.0098444	-3.4748	2.2454	3.4748	0.022170	269.47
	2.0963	31.13837	33.57505	0.00000	-0.0074120	-4.0722	2.8320	4.0721	0.030106	269.47
	3.1444	31.12871	32.52455	0.00000	0.011015	-4.7697	3.0211	4.7694	0.054958	269.47
	4.1925	31.11906	31.47646	0.00000	-1.0227	0.0	2.8241	0.0094218	-1.0226	269.47
No.30_4	Line 4	31.11906	31.47646	0.00000	-1.0227	0.0	2.8241	1.0227	0.0	180.00
	1.0077	30.11136	31.47646	0.00000	2.0886	-5.7219	3.8494	-2.0886	5.7219	180.00
	2.0154	29.10367	31.47646	0.00000	1.5024	-5.7219	3.4331	-1.5024	5.7219	180.00
	3.0231	28.09598	31.47646	0.00000	1.0935	-5.7219	2.8470	-1.0935	5.7219	180.00
	4.0308	27.08829	31.47646	0.00000	0.71561	-5.7219	2.5398	-0.71561	5.7219	180.00
	5.0385	26.08065	31.47646	0.00000	-0.022803	-5.7219	2.4611	0.022803	5.7219	180.00
	6.0462	25.07290	31.47646	0.00000	-0.73841	-5.7223	2.5649	0.73841	5.7223	180.00
	7.0538	24.06521	31.47646	0.00000	-1.1163	-5.7222	2.8872	1.1163	5.7222	180.00
	8.0615	23.05752	31.47646	0.00000	-1.5361	-5.7222	3.4762	1.5361	5.7	

Canfield Gardens, NW6
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Type/No.	Coordinates				Displacements				Angle of Line		
Name	Dist.	x	y	z	x	y	z	Horizontal displacement	Horizontal displacement	to x Axis	
		5.8613	32.17181	15.83566	0.00000	-0.12526	1.3473	0.66984	-1.3467	-0.13072	269.77
		6.8362	32.16785	14.85878	0.00000	-0.089876	1.1150	0.43600	-1.1147	-0.09439	269.77
		7.8132	32.16388	13.88163	0.00000	-0.063273	0.91903	0.26122	-0.91877	-0.067001	269.77
		8.7920	32.15992	12.91503	0.00000	-0.042701	0.71239	0.10129	-0.71222	-0.045591	269.77
		9.7689	32.15596	11.92815	0.00000	-0.026389	0.49825	0.072319	-0.49814	-0.028410	269.77
No.28_1	Line 9	26.00500	21.71500	0.00000	0.9838	2.7910	3.3202	2.7902		-3.9844	90.012
		0.96540	26.00480	22.68040	0.00000	0.60288	3.1710	4.7108	3.1698	-6.0294	90.012
		1.908	26.00500	23.64580	0.00000	0.59911	3.1732	5.7240	3.7359	-7.0122	90.012
		2.8962	26.00440	24.61200	0.00000	5.9085	4.3433	6.4321		-5.9094	90.012
		3.8616	26.00420	25.57660	0.00000	5.8269	4.9954	5.3740	4.9942	-5.8279	90.012
		4.8270	26.00500	26.54200	0.00000	5.7670	5.7264	4.8153	5.7252	-5.7681	90.012
No.28_2	Line 10	0.98257	26.00423	26.54200	0.00000	1.2693	2.8920	2.9092	-1.2705	-2.8915	180.02
		1.9851	24.01985	26.54120	0.00000	2.6142	4.0002	4.6145		-2.6142	180.02
		1.9851	24.01985	26.54120	0.00000	1.0315	5.7230	4.2995	-1.0338	-5.7228	180.02
		2.9777	23.02728	26.54080	0.00000	0.14507	5.7228	4.3137	-0.14738	-5.7228	180.02
		3.9703	22.03471	26.54040	0.00000	-0.64414	5.7237	4.2033	0.64183	-5.7240	180.02
		4.9629	21.04214	26.54000	0.00000	0.50305	5.7262	3.6634	-0.50610	-7.5620	180.02
No.28_3	Line 11	0.98257	21.04214	26.54000	0.00000	2.6142	4.0002	4.6145		-2.6142	180.02
		1.7108	21.58917	21.70625	0.00000	1.9053	2.9491	3.4261	1.8988	2.9532	359.87
		3.4217	23.30000	21.70250	0.00000	2.7090	2.8005	4.0703	2.7029	2.8064	359.87
		5.1325	25.01083	21.69875	0.00000	3.5698	2.7115	4.0486	3.5639	2.7193	359.87
		6.8434	26.72167	21.69500	0.00000	4.4166	7.2831	3.4512	0.39570	7.2840	359.87
		8.5542	28.43250	21.69125	0.00000	4.0437	7.7526	3.4002	0.82557	7.7534	359.87
		10.265	30.14333	21.68750	0.00000	1.4252	6.3388	3.6261	1.4113	6.3419	359.87
		11.976	31.85417	21.68375	0.00000	-3.6398	3.2331	3.4896	-3.6469	3.2251	359.87
		13.687	33.56500	21.68000	0.00000	-2.8554	2.1135	3.1365	-2.8601	2.1073	359.87
No.28_4	Line 12	0.98257	21.04214	26.54000	0.00000	2.6142	4.0002	4.6145		-2.6142	180.02
		1.0974	21.04214	26.69739	0.00000	2.6370	2.7745	3.8550		-2.6370	90.000
		2.1948	21.04214	23.79478	0.00000	2.6373	3.6568	4.6134	3.6568	-2.6373	90.000
		3.2922	21.04214	24.89217	0.00000	2.6376	4.6617	5.2509	4.6617	-2.6376	90.000
		4.3896	21.04214	25.98956	0.00000	2.6376	5.7038	5.0781	5.7038	-2.6376	90.000
		5.4869	21.04214	27.08695	0.00000	2.6376	6.7459	5.0781	6.7459	-2.6376	90.000
		6.5843	21.04214	28.18433	0.00000	-2.8609	0.0	0.12621	0.0	2.8609	90.000
		7.6817	21.04214	29.28172	0.00000	-2.8609	0.0	1.2115	0.0	2.8609	90.000
		8.7791	21.04214	30.37911	0.00000	-2.8609	0.0	1.1850	0.0	2.8609	90.000
No.28_5	Line 13	0.9675	21.04214	31.47650	0.00000	-1.9168	-5.7221	3.1638	-5.7221	1.9168	90.000
		1.0077	21.04200	32.57389	0.00000	-1.9168	-5.7221	3.1638		-5.7221	90.000
		1.0077	22.04972	31.47700	0.00000	-1.4247	-5.7222	3.3682	-1.4247	-5.7222	0.0
		2.0154	23.05744	31.47700	0.00000	-1.0290	-5.7221	3.1145	-1.0290	-5.7221	0.0
		3.0232	24.06516	31.47700	0.00000	-0.74783	-5.7222	2.7227	-0.74783	-5.7222	0.0
		4.0309	25.07288	31.47700	0.00000	-0.49469	-5.7226	2.2452	-0.49469	-5.7226	0.0
		5.0386	26.08060	31.47700	0.00000	0.096192	-5.7219	1.7309	0.096192	-5.7219	35.0
		6.0463	27.08832	31.47700	0.00000	0.71562	-5.7217	2.5403	0.71562	-5.7217	0.0
		7.0540	28.09604	31.47700	0.00000	1.0935	-5.7214	2.8474	1.0935	-5.7214	0.0
		8.0618	29.10376	31.47700	0.00000	1.5025	-5.7214	3.4336	1.5025	-5.7214	0.0
		9.0695	30.11148	31.47700	0.00000	1.9213	-5.0887	3.7214	1.9213	-5.0887	0.0
		10.077	31.11920	31.47700	0.00000	-0.29061	-0.43565	2.7014	-0.29061	-0.43565	0.0
No.28_6	Line 14	31.17900	31.47700	0.00000	-0.94379	-0.015623	2.8384	0.021414	-0.94367	-269.65	269.65
		0.97771	31.17300	30.49931	0.00000	-2.8700	0.0	3.6604	0.017613	-2.8700	269.65
		1.9554	31.16700	29.52162	0.00000	-2.8388	0.0	3.6187	0.017421	-2.8387	269.65
		2.9331	31.16100	28.54393	0.00000	-2.8431	0.0	3.5769	0.017421	-2.8431	269.65
		3.9108	31.15500	27.56624	0.00000	-2.8513	0.0	3.6102	0.017498	-2.8513	269.65
		4.8885	31.14900	26.58855	0.00000	-2.8607	0.0	3.6095	0.017555	-2.8606	269.65
		5.8663	31.14300	25.61086	0.00000	-2.8711	0.14535	3.6944	-0.12773	-2.8719	269.65
		6.8440	31.13700	24.63317	0.00000	-2.8818	0.27760	3.7609	-0.25993	-2.8834	269.65
		7.8217	31.13100	23.65548	0.00000	-2.8926	0.41073	3.8267	-0.39562	-2.8942	269.65
		8.7994	31.12500	22.67779	0.00000	-2.9077	0.43126	3.7919	-0.41341	-2.9103	269.65
		9.7771	31.11900	21.70010	0.00000	-3.8362	0.44878	3.3558	-0.42523	-3.8388	269.65

Specific Building Damage Results - Horizontal Displacements

Structure: No.30 | Sub-structure: 1

Dist.	Coordinates			Displacements		
	x	y	z	x	y	
				Horizontal displacement along the line	Horizontal displacement perpendicular to the line	
	[m]	[m]	[m]	[mm]	[mm]	
	0.0	32.11050	41.32417	0.00000	-0.02532	0.54350
						0.54360
0.98246	32.10649	40.34172	0.00000	-0.040862	0.86636	0.86652
1.9649	32.10247	39.35926	0.00000	-0.060211	-1.1602	1.1604
2.9474	32.09845	38.37681	0.00000	-0.084832	-1.4178	1.4181
3.9298	32.09443	37.39435	0.00000	-0.11743	-1.6672	1.6677
4.9123	32.09042	36.41190	0.00000	-0.16390	-2.2193	2.2200

Structure: No.30 | Sub-structure: 2

Dist.	Coordinates		z	x	y	Displacements	
	x	y				Horizontal displacement along the line	Horizontal displacement perpendicular to line
	[m]	[m]				[mm]	[mm]
0.0	32.09042	36.41190	0.00000	-0.16390	-2.193	1.5111	1.6337
0.59628	31.62405	36.04035	0.00000	-0.10041	-2.6264	1.7151	1.9916
1.1926	31.15768	35.66880	0.00000	-0.0091801	-2.8715	1.7965	2.2401

Structure: No.30 | Sub-structure: 3

Dist.	Coordinates				Displacements		
	x	y	z	y	Horizontal	Horizontal	
					displacement	displacement	
					along the	perpendicular	
				Line	to Line		
[m]			[m]	[mm]	[mm]	[mm]	
0.0	0.3175678	35.68800	0.00000	-0.0091801	-2.87518	0.017275	
1.0481	1.14803	34.62071	0.00000	-0.0098444	-3.4748	0.022170	
2.0963	1.13837	33.57263	0.00000	-0.0074120	-4.0722	0.031036	
3.1444	1.12871	32.4850	0.00000	0.011015	-4.7877	0.045968	
4.1925	1.11906	31.47646	0.00000	-0.10227	0.0	-1.0226	

Structure: No.30 | Sub-structure: 4

Dist.	Coordinates			Displacements		
	x	y	z	x	y	
				Horizontal displacement	Horizontal displacement	
				Line	perpendicular to Line	
[m]	[m]	[m]	[m]	[mm]	[mm]	
0.0	0.111906	1.47646	0.00000	-1.0227	0.0	0.0
1.0077	0.11136	1.47646	0.00000	2.0886	-5.7219	-2.0886
2.0154	0.10367	1.47646	0.00000	1.5024	-5.7219	-1.5024
3.0231	0.08958	1.47646	0.00000	1.0935	-5.7219	-1.0935
4.0308	0.078829	1.47646	0.00000	0.71561	-5.7219	-0.71561
5.0385	0.06806	1.47646	0.00000	-0.022803	-5.7219	0.022803
6.0462	0.057290	1.47646	0.00000	-0.73841	-5.7223	0.73841
7.0538	0.046521	1.47646	0.00000	-1.1163	-5.7222	1.1163
8.0615	0.035752	1.47646	0.00000	-1.5361	-5.7222	1.5361
9.0692	0.024983	1.47646	0.00000	-2.1162	-5.7222	2.1162
10.077	0.014214	1.47646	0.00000	-2.8609	-5.7221	2.8609

Structure: No.30 | Sub-structure: 5

Dist.	Coordinates				Displacements		
	x	y	z	x	y	Horizontal displacement along the Line	Horizontal displacement perpendicular to Line
[m]	[m]	[m]	[m]	[mm]	[mm]	[mm]	[mm]
0.0	21.04214	31.47646	0.00000	-2.8609	-5.7221	-5.7308	2.843
0.97763	21.04509	32.45409	0.00000	-0.0021531	-6.5560	-6.5559	-0.01768



FAIRHURST

Canfield Gardens, NW6
Ground Movement Assessment
Damage Impact Assessment

Job No.	Sheet No.	Rev.
117401		
Drg. Ref.		
Made by TJ	Date 05-Mar-2020	Checked

Dist.	Coordinates			Displacements		
	x	y	z	x	y	Horizontal displacement along the line
1.9553	21.04805	33.43172	0.00000	-0.0015452	-5.6414	-5.6414
2.9329	21.05101	34.40934	0.00000	-0.0011245	-4.8622	-4.8622
3.9105	21.05397	35.38697	0.00000	-763.22E-6	-4.1171	-4.1171
4.8882	21.05692	36.36460	0.00000	-405.21E-6	-3.4151	-3.4151
5.8658	21.05988	37.34222	0.00000	-48.852E-6	-2.8138	-2.8137
6.8494	21.06284	38.31985	0.00000	0.0	-2.3817	-2.3817
7.8210	21.06580	39.29747	0.00000	0.0	-1.9476	-1.9476
8.7987	21.06875	40.27510	0.00000	0.0	-1.4849	-1.4849
9.7763	21.07171	41.25273	0.00000	0.0	-0.99938	-0.99937

Structure: No.26 | Sub-structure: 1

Dist.	Coordinates			Displacements		
	x	y	z	x	y	Horizontal displacement along the line
[m]	[m]	[m]	[m]	[mm]	[mm]	[mm]
0.0	19.79055	11.95090	0.00000	0.028882	0.058580	0.058837
0.97536	19.79933	12.92622	0.00000	0.091593	0.15942	0.16024
1.9507	19.80811	13.90154	0.00000	0.16321	0.23794	0.23940
2.9261	19.81688	14.87685	0.00000	0.24858	0.35241	0.35463
3.9014	19.82566	15.85217	0.00000	0.36287	0.60094	0.60418
4.8768	19.83444	16.82749	0.00000	0.51688	0.83254	0.83716
5.8522	19.84322	17.80281	0.00000	0.70143	1.0310	1.0373
6.8275	19.85200	18.77813	0.00000	0.91652	1.1921	1.2003
7.8029	19.86078	19.75345	0.00000	1.1578	1.3132	1.3235
8.7782	19.86955	20.72877	0.00000	1.4152	1.4636	1.4762
9.7536	19.87833	21.70409	0.00000	1.6738	1.8695	1.8845

Structure: No.26 | Sub-structure: 2

Dist.	Coordinates			Displacements		
	x	y	z	x	y	Horizontal displacement along the line
[m]	[m]	[m]	[m]	[mm]	[mm]	[mm]
0.0	19.87833	21.60000	0.00000	1.6467	1.8285	1.6467
1.0264	20.90477	21.60000	0.00000	1.7283	2.1493	1.7283
2.0529	21.93121	21.60000	0.00000	2.0159	2.8867	2.0159
3.0793	22.95765	21.60000	0.00000	2.4700	2.8160	2.4700
4.1058	23.98409	21.60000	0.00000	2.9427	2.7612	2.9427
5.1322	25.01052	21.60000	0.00000	3.2716	2.8299	3.2716
6.1586	26.03696	21.60000	0.00000	0.23582	7.3929	0.23582
7.1851	27.06340	21.60000	0.00000	0.48818	7.0872	0.48818
8.2115	28.08984	21.60000	0.00000	0.73663	6.7815	0.73663
9.2379	29.11628	21.60000	0.00000	0.99650	6.5148	0.99650
10.264	30.14271	21.60000	0.00000	1.3279	6.3253	1.3279
11.291	31.16915	21.60000	0.00000	-0.83384	4.3675	-0.83384
12.317	32.19559	21.60000	0.00000	-3.2946	3.2419	-3.2946

Structure: No.26 | Sub-structure: 3

Dist.	Coordinates			Displacements		
	x	y	z	x	y	Horizontal displacement along the line
[m]	[m]	[m]	[m]	[mm]	[mm]	[mm]
0.0	32.19559	21.60000	0.00000	-5.1739	3.1694	-5.1739
0.97689	32.19163	20.72006	0.00000	-3.3730	3.5406	-3.5350
1.9538	32.18766	19.74318	0.00000	-0.69098	3.5046	-3.5017
2.9307	32.18370	18.76630	0.00000	-0.40483	3.1147	-3.1131
3.9076	32.17974	17.78942	0.00000	-0.25273	2.5567	-2.5556
4.8844	32.17577	16.81254	0.00000	-0.17374	1.9351	-1.9344
5.8613	32.17181	15.83566	0.00000	-0.12526	1.3473	-1.3467
6.8382	32.16785	14.85878	0.00000	-0.089876	1.1150	-1.1147
7.8151	32.16388	13.88191	0.00000	-0.063273	0.91903	-0.91877
8.7920	32.15992	12.90503	0.00000	-0.042701	0.71239	-0.71222
9.7689	32.15596	11.92815	0.00000	-0.026389	0.49825	-0.49814

Structure: No.28 | Sub-structure: 1

Dist.	Coordinates			Displacements		
	x	y	z	x	y	Horizontal displacement along the line
[m]	[m]	[m]	[m]	[mm]	[mm]	[mm]
0.0	26.00500	21.71500	0.00000	2.9838	2.7910	2.7902
0.96540	26.00480	22.54040	0.00000	0.888	3.1710	3.1698
1.9308	26.00460	23.64580	0.00000	5.9911	3.7372	3.7359
2.8962	26.00440	24.61120	0.00000	5.9085	4.3433	4.3421
3.8616	26.00420	25.57660	0.00000	5.8269	4.9954	4.9942
4.8270	26.00400	26.54200	0.00000	5.7670	5.7264	5.7252

Structure: No.28 | Sub-structure: 2

Dist.	Coordinates			Displacements		
	x	y	z	x	y	Horizontal displacement along the line
[m]	[m]	[m]	[m]	[mm]	[mm]	[mm]
0.0	26.00500	26.54200	0.00000	1.2693	2.8920	-1.2705
0.99257	25.01243	26.54160	0.00000	2.6142	5.7240	-2.6165
1.9851	24.01985	26.54120	0.00000	1.0315	5.7230	-1.0338
2.9777	23.02728	26.54080	0.00000	0.14507	5.7228	-0.14738
3.9703	22.03471	26.54040	0.00000	-0.64414	5.7237	0.64183
4.9629	21.04214	26.54000	0.00000	0.50305	7.5622	-0.50610

Structure: No.28 | Sub-structure: 4

Dist.	Coordinates			Displacements		
	x	y	z	x	y	Horizontal displacement along the line
[m]	[m]	[m]	[m]	[mm]	[mm]	[mm]
0.0	21.04214	21.60000	0.00000	1.7379	2.0591	2.0591
1.0974	21.04214	22.68739	0.00000	2.6370	2.7745	2.7745
2.1948	21.04214	23.79478	0.00000	2.6373	3.6568	3.6568
3.2922	21.04214	24.89217	0.00000	2.6376	4.6617	4.6617
4.3896	21.04214	25.98956	0.00000	2.6376	5.7038	5.7038
5.4869	21.04214	27.08694	0.00000	-2.8609	0.0	0.0
6.5843	21.04214	28.18433	0.00000	-2.8609	0.0	0.0
7.6817	21.04214	29.28172	0.00000	-2.8609	0.0	0.0
8.7791	21.04214	30.37911	0.00000	-2.8609	0.0	0.0
9.8765	21.04214	31.47650	0.00000	-1.9168	-5.7221	-5.7221

Structure: No.28 | Sub-structure: 6

Dist.	Coordinates			Displacements		
	x	y	z	x	y	Horizontal displacement along the line
[m]	[m]	[m]	[m]	[mm]	[mm]	[mm]
0.0	31.17900	31.47700	0.00000	-0.94379	-0.015623	0.021414
0.97771	31.17300	30.49931	0.00000	-2.8700	0.0	0.017613



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Dist.	Coordinates			Displacements		
	x	y	z	x	y	Horizontal displacement along the horizontal displacement perpendicular
1.9554	31.16700	29.52162	0.00000	-2.8388	0.0	0.017421
2.9331	31.16100	28.54393	0.00000	-2.8431	0.0	0.017448
3.9108	31.15500	27.56624	0.00000	-2.8513	0.0	0.017498
4.8885	31.14900	26.58855	0.00000	-2.8607	0.0	0.017555
5.8663	31.14300	25.61086	0.00000	-2.8711	0.14535	-0.12773
6.8440	31.13700	24.63317	0.00000	-2.8818	0.27760	-0.25991
7.8217	31.13100	23.65548	0.00000	-2.8930	0.37473	-0.35697
8.7994	31.12500	22.67779	0.00000	-2.9077	0.43126	-0.41341
9.7771	31.11900	21.70010	0.00000	-3.8362	0.44878	-0.42523

Specific Building Damage Results - Vertical Displacements

Structure: No.30 | Sub-structure: 1

Dist.	Coordinates			Displacements
	x	y	z	z
	[m]	[m]	[m]	[mm]
Vertical Offset 1				
0.0	32.11050	41.32417	0.00000	0.079870
0.98246	32.10649	40.34172	0.00000	0.15662
1.9649	32.10247	39.35926	0.00000	0.28570
2.9474	32.09845	38.37681	0.00000	0.47630
3.9298	32.09443	37.39435	0.00000	0.72370
4.9123	32.09042	36.41190	0.00000	1.1580

Structure: No.30 | Sub-structure: 2

Dist.	Coordinates			Displacements
	x	y	z	z
	[m]	[m]	[m]	[mm]
Vertical Offset 1				
0.0	32.09042	36.41190	0.00000	1.1580
0.59628	31.62405	36.04035	0.00000	1.4318
1.1926	31.15768	35.66880	0.00000	1.6764

Structure: No.30 | Sub-structure: 3

Dist.	Coordinates			Displacements
	x	y	z	z
	[m]	[m]	[m]	[mm]
Vertical Offset 1				
0.0	31.15768	35.66880	0.00000	1.6764
1.0481	31.14803	34.62071	0.00000	2.2454
2.0963	31.13837	33.57263	0.00000	2.8320
3.1444	31.12871	32.52455	0.00000	3.0211
4.1925	31.11906	31.47646	0.00000	2.8241

Structure: No.30 | Sub-structure: 4

Dist.	Coordinates			Displacements
	x	y	z	z
	[m]	[m]	[m]	[mm]
Vertical Offset 1				
0.0	31.11906	31.47646	0.00000	2.8241
1.0077	30.11136	31.47646	0.00000	3.8494
2.0154	29.10367	31.47646	0.00000	3.4331
3.0231	28.09598	31.47646	0.00000	2.8470
4.0308	27.08829	31.47646	0.00000	2.5398
5.0385	26.08060	31.47646	0.00000	2.4611
6.0462	25.07290	31.47646	0.00000	2.5649
7.0538	24.06521	31.47646	0.00000	2.8872
8.0615	23.05752	31.47646	0.00000	3.4762
9.0692	22.04983	31.47646	0.00000	3.8594
10.077	21.04214	31.47646	0.00000	3.5548

Structure: No.30 | Sub-structure: 5

Dist.	Coordinates			Displacements
	x	y	z	z
	[m]	[m]	[m]	[mm]
Vertical Offset 1				
0.0	21.04214	31.47646	0.00000	3.5548
0.97763	21.04509	32.45409	0.00000	4.0025
1.9553	21.04805	33.43172	0.00000	3.8981
2.9329	21.05101	34.40934	0.00000	3.2853
3.9105	21.05397	35.38697	0.00000	2.5955
4.8882	21.05692	36.36460	0.00000	1.8980
5.8658	21.05988	37.34222	0.00000	1.2427
6.8434	21.06284	38.31985	0.00000	0.80782
7.8210	21.06580	39.29747	0.00000	0.48507
8.7987	21.06875	40.27510	0.00000	0.26438
9.7763	21.07171	41.25273	0.00000	0.13888

Structure: No.26 | Sub-structure: 1

Dist.	Coordinates			Displacements
	x	y	z	z
	[m]	[m]	[m]	[mm]
Vertical Offset 1				
0.0	19.79055	11.95090	0.00000	0.016173
0.97536	19.79933	12.92622	0.00000	0.033721
1.9507	19.80811	13.90154	0.00000	0.053361
2.9261	19.81688	14.87685	0.00000	0.10028
3.9014	19.82566	15.85217	0.00000	0.17916
4.8768	19.83444	16.82749	0.00000	0.28975
5.8522	19.84322	17.80281	0.00000	0.45358
6.8275	19.85200	18.77813	0.00000	0.67774
7.8029	19.86078	19.75345	0.00000	0.95233
8.7782	19.86955	20.72877	0.00000	1.2742
9.7536	19.87833	21.70409	0.00000	1.8083

Structure: No.26 | Sub-structure: 2

Dist.	Coordinates			Displacements
	x	y	z	z
	[m]	[m]	[m]	[mm]
Vertical Offset 1				
0.0	19.87833	21.60000	0.00000	1.7509
1.0264	20.90477	21.60000	0.00000	2.4151
2.0529	21.93121	21.60000	0.00000	3.4840
3.0793	22.95765	21.60000	0.00000	3.8676
4.1058	23.98409	21.60000	0.00000	4.0587
5.1322	25.01052	21.60000	0.00000	3.8822
6.1586	26.03696	21.60000	0.00000	3.5977
7.1851	27.06340	21.60000	0.00000	3.4565
8.2115	28.08984	21.60000	0.00000	3.4119
9.2379	29.11628	21.60000	0.00000	3.5712
10.264	30.14271	21.60000	0.00000	3.6673
11.291	31.16915	21.60000	0.00000	2.3619
12.317	32.19559	21.60000	0.00000	3.6030

Structure: No.26 | Sub-structure: 3



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Dist.	Coordinates			Displacements
[m]	x [m]	y [m]	z [m]	z [mm]
Vertical Offset 1				
0.0	32.19559	21.69694	0.00000	4.5957
0.97689	32.19163	20.72006	0.00000	3.2457
1.9538	32.18766	19.74318	0.00000	2.9063
2.9307	32.18370	18.76630	0.00000	2.1969
3.9076	32.17974	17.78942	0.00000	1.5890
4.8844	32.17577	16.81254	0.00000	1.0861
5.8613	32.17181	15.83566	0.00000	0.66984
6.8382	32.16785	14.85878	0.00000	0.43600
7.8151	32.16388	13.88191	0.00000	0.26122
8.7920	32.15992	12.90503	0.00000	0.14070
9.7689	32.15596	11.92815	0.00000	0.072319

Structure: No.28 | Sub-structure: 1

Dist.	Coordinates			Displacements
[m]	x [m]	y [m]	z [m]	z [mm]
Vertical Offset 1				
0.0	26.00500	21.71500	0.00000	3.3202
0.96540	26.00480	22.68040	0.00000	4.7108
1.9308	26.00460	23.64580	0.00000	5.1923
2.8962	26.00440	24.61120	0.00000	5.4539
3.8616	26.00420	25.57660	0.00000	5.3740
4.8270	26.00400	26.54200	0.00000	4.8153

Structure: No.28 | Sub-structure: 2

Dist.	Coordinates			Displacements
[m]	x [m]	y [m]	z [m]	z [mm]
Vertical Offset 1				
0.0	26.00500	26.54200	0.00000	2.9092
0.99257	25.01243	26.54160	0.00000	4.5981
1.9851	24.01985	26.54120	0.00000	4.2995
2.9777	23.02728	26.54080	0.00000	4.3137
3.9703	22.03471	26.54040	0.00000	4.2033
4.9629	21.04214	26.54000	0.00000	3.6634

Structure: No.28 | Sub-structure: 4

Dist.	Coordinates			Displacements
[m]	x [m]	y [m]	z [m]	z [mm]
Vertical Offset 1				
0.0	21.04214	21.60000	0.00000	2.5546
1.0974	21.04214	22.69739	0.00000	3.8550
2.1948	21.04214	23.79478	0.00000	4.6134
3.2922	21.04214	24.89217	0.00000	5.2509
4.3896	21.04214	25.98956	0.00000	5.0781
5.4869	21.04214	27.08694	0.00000	1.3081
6.5843	21.04214	28.18433	0.00000	1.2621
7.6817	21.04214	29.28172	0.00000	1.2115
8.7791	21.04214	30.37911	0.00000	1.1850
9.8765	21.04214	31.47650	0.00000	3.1638

Structure: No.28 | Sub-structure: 6

Dist.	Coordinates			Displacements
[m]	x [m]	y [m]	z [m]	z [mm]
Vertical Offset 1				
0.0	31.17900	31.47700	0.00000	2.8384
0.97771	31.17300	30.49931	0.00000	3.6604
1.9554	31.16700	29.52162	0.00000	3.6187
2.9331	31.16100	28.54393	0.00000	3.6123
3.9108	31.15500	27.56624	0.00000	3.6102
4.8885	31.14900	26.58855	0.00000	3.6095
5.8663	31.14300	25.61086	0.00000	3.6944
6.8440	31.13700	24.63317	0.00000	3.7609
7.8217	31.13100	23.65548	0.00000	3.7882
8.7994	31.12500	22.67779	0.00000	3.7919
9.7771	31.11900	21.70010	0.00000	3.3558

Specific Building Damage Results - All Segments

Structure: No.30 | Sub-structure: 1

Vertical Offset from Line for Vertical Movement Calculations	Segment	Start	Length	Curvature	Deflection Ratio	Average Horizontal Strain	Max Tensile Strain	Max Gradient of Horizontal Displacement Curve	Max Gradient of Vertical Displacement Curve	Min Radius of Curvature	Damage Category	
[m]		[m]	[m]		[%]	[%]	[%]			[m]		
0.0		1	0.98246	3.9295	Hogging	0.0046767	0.034439	0.035774	-561.88E-6	-441.82E-6	4404.1 (Negligible)	0

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

Structure: No.30 | Sub-structure: 2

Vertical Offset from Line for Vertical Movement Calculations	Segment	Start	Length	Curvature	Deflection Ratio	Average Horizontal Strain	Max Tensile Strain	Max Gradient of Horizontal Displacement Curve	Max Gradient of Vertical Displacement Curve	Min Radius of Curvature	Damage Category
[m]		[m]	[m]		[%]	[%]	[%]			[m]	
0.0	1	0.0	1.1920	Sagging	0.0012048	0.023932	0.024142	-341.93E-6	-458.94E-6	12252.	0
										(Negligible)	

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

Structure: No.30 | Sub-structure: 3

Vertical Offset from Line for Vertical Movement Calculations	Segment	Start	Length	Curvature	Deflection Ratio	Average Horizontal Strain	Max Tensile Strain	Max Gradient of Horizontal Displacement Curve	Max Gradient of Vertical Displacement Curve	Min Radius of Curvature	Damage Category	
[m]		[m]	[m]		[%]	[%]	[%]			[m]		
0.0		1	0.0	0.61330	Hogging	0.0	0.057562	0.057562	-575.29E-6	-542.51E-6	9053.0	1 (Very Slight)
		2	0.61330	3.5787	Sagging	0.013522	-0.089774	0.019532	0.0045621	-559.37E-6	2817.9	(Negligible)

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

Structure: No.30 | Sub-structure: 4

Vertical Offset from Line for Vertical Movement Calculations	Segment	Start	Length	Curvature	Deflection Ratio	Average Horizontal Strain	Max Tensile Strain	Max Gradient of Horizontal Displacement Curve	Max Gradient of Vertical Displacement Curve	Min Radius of Curvature	Damage Category



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[m] 0.0	1	[m] [m] 0.0 2.7307	Sagging	[%] 0.034708	[%] -0.081841	[%] 0.027203	0.0030971	-0.0010207	[m] 575.32	0
	2	2.7307 4.7222	Hogging	0.012798	0.052829	0.056125	-732.24E-6	-584.25E-6	4443.6	1 (Very Slight)
	3	7.4529 2.6231	Sagging	0.017948	0.060145	0.065272	-727.56E-6	-584.25E-6	1257.7	1 (Very Slight)

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

Structure: No.30 | Sub-structure: 5

Vertical Offset from Line for Vertical Movement Calculations	Segment	Start	Length	Curvature	Deflection Ratio	Average Horizontal Strain	Max Tensile Strain	Max Gradient of Horizontal Displacement Curve	Max Gradient of Vertical Displacement Curve	Min Radius of Curvature	Damage Category
[m] 0.0	1	[m] [m] 0.0 4.0523	Sagging	[%] 0.020992	[%] 0.042333	[%] 0.054891		-934.57E-6	712.97E-6	[m] 1696.2	1 (Very Slight)
	2	4.0523 5.7237	Hogging	0.0093827	0.052689	0.056735	-717.55E-6	712.97E-6	6451.8	1 (Very Slight)	

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

Structure: No.26 | Sub-structure: 1

Vertical Offset from Line for Vertical Movement Calculations	Segment	Start	Length	Curvature	Deflection Ratio	Average Horizontal Strain	Max Tensile Strain	Max Gradient of Horizontal Displacement Curve	Max Gradient of Vertical Displacement Curve	Min Radius of Curvature	Damage Category
[m] 0.0	1	[m] [m] 2.9261 6.8269	Hogging	[%] 0.0058228	[%] 0.022406	[%] 0.025375		-418.42E-6	-547.32E-6	[m] 3757.3	0 (Negligible)

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

Structure: No.26 | Sub-structure: 2

Vertical Offset from Line for Vertical Movement Calculations	Segment	Start	Length	Curvature	Deflection Ratio	Average Horizontal Strain	Max Tensile Strain	Max Gradient of Horizontal Displacement Curve	Max Gradient of Vertical Displacement Curve	Min Radius of Curvature	Damage Category
[m] 0.0	1	[m] [m] 0.0 1.3481	Hogging	[%] 0.0071220	[%] 0.012738	[%] 0.015539		-280.17E-6	-0.0010410	[m] 1557.2	0 (Negligible)
	2	1.3481 4.4149	Sagging	0.016803	-0.0093423	0.013580	0.0029664	-0.0010410	2938.7	0 (Negligible)	
	3	5.7630 2.7044	Hogging	0.0043027	-0.022354	0.0051409	0.0029664	277.96E-6	7792.3	0 (Negligible)	
	4	8.4674 1.8457	Sagging	0.0035729	0.022964	0.023685	0.0021105	0.0012745	3199.5	0 (Negligible)	
	5	10.313 2.0039	Hogging	0.061731	-0.22553	0.058487	0.0024032	0.0012745	296.85	1 (Very Slight)	

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

Structure: No.26 | Sub-structure: 3

Vertical Offset from Line for Vertical Movement Calculations	Segment	Start	Length	Curvature	Deflection Ratio	Average Horizontal Strain	Max Tensile Strain	Max Gradient of Horizontal Displacement Curve	Max Gradient of Vertical Displacement Curve	Min Radius of Curvature	Damage Category
[m] 0.0	1	[m] [m] 0.0 2.7920	Hogging	[%] 0.019386	[%] -6.1377E-6	[%] 0.019296		-397.72E-6	0.0013825	[m] 703.45	0 (Negligible)
	2	2.7920 0.26998	Hogging	0.0025872	0.048192	0.048308	-570.31E-6	725.88E-6	61978.	0 (Negligible)	
	3	3.0620 5.7300	Hogging	0.0083522	0.040592	0.044032	-635.52E-6	621.96E-6	7503.6	0 (Negligible)	

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

Structure: No.28 | Sub-structure: 1

Vertical Offset from Line for Vertical Movement Calculations	Segment	Start	Length	Curvature	Deflection Ratio	Average Horizontal Strain	Max Tensile Strain	Max Gradient of Horizontal Displacement Curve	Max Gradient of Vertical Displacement Curve	Min Radius of Curvature	Damage Category
[m] 0.0	1	[m] [m] 0.0 4.8270	Sagging	[%] 0.026364	[%] 0.060804	[%] 0.074375		-756.58E-6	-0.0014399	[m] 862.45	1 (Very Slight)

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

Structure: No.28 | Sub-structure: 2

Vertical Offset from Line for Vertical Movement Calculations	Segment	Start	Length	Curvature	Deflection Ratio	Average Horizontal Strain	Max Tensile Strain	Max Gradient of Horizontal Displacement Curve	Max Gradient of Vertical Displacement Curve	Min Radius of Curvature	Damage Category
[m] 0.0	1	[m] [m] 0.0 4.9620	Sagging	[%] 0.030890	[%] 0.015426	[%] 0.037495		-0.0015920	-0.0017038	[m] 384.34	0 (Negligible)

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

Structure: No.28 | Sub-structure: 4

Vertical Offset from Line for Vertical Movement Calculations	Segment	Start	Length	Curvature	Deflection Ratio	Average Horizontal Strain	Max Tensile Strain	Max Gradient of Horizontal Displacement Curve	Max Gradient of Vertical Displacement Curve	Min Radius of Curvature	Damage Category
[m] 0.0	1	[m] [m] 0.0 4.9667	Sagging	[%] 0.046968	[%] 0.012987	[%] 0.050051		0.0052248	0.0034533	[m] 900.97	1 (Very Slight)
	2	4.9667 4.9093	Hogging	0.040015	-0.17158	0.041601	0.0052416	0.0034533	478.00	0 (Negligible)	

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

Structure: No.28 | Sub-structure: 6

Vertical Offset from Line for Vertical Movement Calculations	Segment	Start	Length	Curvature	Deflection Ratio	Average Horizontal Strain	Max Tensile Strain	Max Gradient of Horizontal Displacement Curve	Max Gradient of Vertical Displacement Curve	Min Radius of Curvature	Damage Category
[m] 0.0	1	[m] [m] 0.0 2.8800	Sagging	[%] 0.019293	[%] -137.79E-6	[%] 0.018872		3.8883E-6	-840.75E-6	[m] 878.25	0 (Negligible)
	2	2.8800 3.0575	Hogging	0.0019644	-0.0050632	0.0015867	148.62E-6	-86.935E-6	24794.	0 (Negligible)	
	3	5.9375 3.8385	Sagging	0.0090066	-0.0074991	0.0068023	135.21E-6	446.01E-6	1756.8	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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Made by

TJ

Date

05-Mar-2020

Checked

Vertical Offset from Line for Vertical Movement	Segment	Start	Length	Curvature	Deflection Ratio	Average Horizontal Strain	Max Tensile Strain	Max Gradient of Horizontal Displacement	Max Gradient of Vertical Displacement	Min Radius of Curvature (Hogging)	Min Radius of Curvature (Sagging)	Damage Category
Structure: No.30 Sub-structure: 1												
Vertical Offset from Line for Vertical Movement	Deflection Ratio	Average Horizontal Strain	Max Slope	Max Settlement	Max Tensile Strain	Max Gradient of Horizontal Displacement	Max Gradient of Vertical Displacement	Min Radius of Curvature (Hogging)	Min Radius of Curvature (Sagging)	Damage Category		
Calculations	[m]	[%]	[%]	[mm]	[%]							
0.0	0.0046767	0.034439	-441.82E-6	1.1579	0.035774	-561.88E-6	-441.82E-6	4404.1	[m]	- 0 (Negligible)		
Structure: No.30 Sub-structure: 2												
Vertical Offset from Line for Vertical Movement	Deflection Ratio	Average Horizontal Strain	Max Slope	Max Settlement	Max Tensile Strain	Max Gradient of Horizontal Displacement	Max Gradient of Vertical Displacement	Min Radius of Curvature (Hogging)	Min Radius of Curvature (Sagging)	Damage Category		
Calculations	[m]	[%]	[%]	[mm]	[%]							
0.0	0.0012048	0.023932	-458.94E-6	1.6762	0.024142	-341.93E-6	-458.94E-6	-	12252.0	0 (Negligible)		
Structure: No.30 Sub-structure: 3												
Vertical Offset from Line for Vertical Movement	Deflection Ratio	Average Horizontal Strain	Max Slope	Max Settlement	Max Tensile Strain	Max Gradient of Horizontal Displacement	Max Gradient of Vertical Displacement	Min Radius of Curvature (Hogging)	Min Radius of Curvature (Sagging)	Damage Category		
Calculations	[m]	[%]	[%]	[mm]	[%]							
0.0	0.013522	-0.089774	-559.37E-6	3.0203	0.057562	0.0045621	-559.37E-6	9053.0	2817.9	1 (Very Slight)		
Structure: No.30 Sub-structure: 4												
Vertical Offset from Line for Vertical Movement	Deflection Ratio	Average Horizontal Strain	Max Slope	Max Settlement	Max Tensile Strain	Max Gradient of Horizontal Displacement	Max Gradient of Vertical Displacement	Min Radius of Curvature (Hogging)	Min Radius of Curvature (Sagging)	Damage Category		
Calculations	[m]	[%]	[%]	[mm]	[%]							
0.0	0.034708	-0.081841	-0.0010207	3.8594	0.065272	0.0030971	-0.0010207	4443.6	575.32	1 (Very Slight)		
Structure: No.30 Sub-structure: 5												
Vertical Offset from Line for Vertical Movement	Deflection Ratio	Average Horizontal Strain	Max Slope	Max Settlement	Max Tensile Strain	Max Gradient of Horizontal Displacement	Max Gradient of Vertical Displacement	Min Radius of Curvature (Hogging)	Min Radius of Curvature (Sagging)	Damage Category		
Calculations	[m]	[%]	[%]	[mm]	[%]							
0.0	0.020992	0.052689	712.97E-6	4.0018	0.056735	-934.57E-6	712.97E-6	6451.8	1696.2	1 (Very Slight)		
Structure: No.26 Sub-structure: 1												
Vertical Offset from Line for Vertical Movement	Deflection Ratio	Average Horizontal Strain	Max Slope	Max Settlement	Max Tensile Strain	Max Gradient of Horizontal Displacement	Max Gradient of Vertical Displacement	Min Radius of Curvature (Hogging)	Min Radius of Curvature (Sagging)	Damage Category		
Calculations	[m]	[%]	[%]	[mm]	[%]							
0.0	0.0058228	0.022406	-547.32E-6	1.8079	0.025375	-418.42E-6	-547.32E-6	3757.3	[m]	- 0 (Negligible)		
Structure: No.26 Sub-structure: 2												
Vertical Offset from Line for Vertical Movement	Deflection Ratio	Average Horizontal Strain	Max Slope	Max Settlement	Max Tensile Strain	Max Gradient of Horizontal Displacement	Max Gradient of Vertical Displacement	Min Radius of Curvature (Hogging)	Min Radius of Curvature (Sagging)	Damage Category		
Calculations	[m]	[%]	[%]	[mm]	[%]							
0.0	0.061731	-0.22553	0.0012745	4.0577	0.058487	0.0029664	0.0012745	296.85	2938.7	1 (Very Slight)		
Structure: No.26 Sub-structure: 3												
Vertical Offset from Line for Vertical Movement	Deflection Ratio	Average Horizontal Strain	Max Slope	Max Settlement	Max Tensile Strain	Max Gradient of Horizontal Displacement	Max Gradient of Vertical Displacement	Min Radius of Curvature (Hogging)	Min Radius of Curvature (Sagging)	Damage Category		
Calculations	[m]	[%]	[%]	[mm]	[%]							
0.0	0.019386	0.048192	0.0013825	4.5957	0.048308	-635.52E-6	0.0013825	703.45	[m]	- 0 (Negligible)		
Structure: No.28 Sub-structure: 1												
Vertical Offset from Line for Vertical Movement	Deflection Ratio	Average Horizontal Strain	Max Slope	Max Settlement	Max Tensile Strain	Max Gradient of Horizontal Displacement	Max Gradient of Vertical Displacement	Min Radius of Curvature (Hogging)	Min Radius of Curvature (Sagging)	Damage Category		
Calculations	[m]	[%]	[%]	[mm]	[%]							
0.0	0.026364	0.060804	-0.0014399	5.4514	0.074375	-756.58E-6	-0.0014399	-	862.45	1 (Very Slight)		
Structure: No.28 Sub-structure: 2												
Vertical Offset from Line for Vertical Movement	Deflection Ratio	Average Horizontal Strain	Max Slope	Max Settlement	Max Tensile Strain	Max Gradient of Horizontal Displacement	Max Gradient of Vertical Displacement	Min Radius of Curvature (Hogging)	Min Radius of Curvature (Sagging)	Damage Category		
Calculations	[m]	[%]	[%]	[mm]	[%]							
0.0	0.030890	0.015426	-0.0017038	4.5947	0.037495	-0.0015920	-0.0017038	-	384.34	0 (Negligible)		
Structure: No.28 Sub-structure: 4												
Vertical Offset from Line for Vertical Movement	Deflection Ratio	Average Horizontal Strain	Max Slope	Max Settlement	Max Tensile Strain	Max Gradient of Horizontal Displacement	Max Gradient of Vertical Displacement	Min Radius of Curvature (Hogging)	Min Radius of Curvature (Sagging)	Damage Category		
Calculations	[m]	[%]	[%]	[mm]	[%]							
0.0	0.046968	-0.17158	0.0034533	5.2482	0.050051	0.0052416	0.0034533	478.00	900.97	1 (Very Slight)		
Structure: No.28 Sub-structure: 6												
Vertical Offset from Line for Vertical Movement	Deflection Ratio	Average Horizontal Strain	Max Slope	Max Settlement	Max Tensile Strain	Max Gradient of Horizontal Displacement	Max Gradient of Vertical Displacement	Min Radius of Curvature (Hogging)	Min Radius of Curvature (Sagging)	Damage Category		
Calculations	[m]	[%]	[%]	[mm]	[%]							
0.0	0.046968	-0.17158	0.0034533	5.2482	0.050051	0.0052416	0.0034533	478.00	900.97	1 (Very Slight)		

Job No.	Sheet No.	Rev.
117401		
Drg. Ref.		
Made by TJ	Date 05-Mar-2020	Checked

Line for Vertical Movement Calculations	Strain		Strain	Horizontal Displacement Curve	Displacement Curve	Curvature (Hogging)	Curvature (Sagging)			
[m]	[%]	[%]	[mm]	[%]		[m]	[m]			
0.0	0.019293	-0.0074991	-840.75E-6	3.7918	0.018872	148.62E-6	-840.75E-6	24794.	878.25	0 (Negligible)

Specific Building Damage Results - Critical Segments within Each Structure

Structure Name	Parameter	Critical Sub-Structure	Critical Segment	Start	End	Curvature	Max Slope	Max Settlement	Max Tensile Strain	Min Radius of Curvature (Hogging)	Min Radius of Curvature (Sagging)	Damage Category
No.30				[m]	[m]			[mm]	[%]			
	Max Slope	4	1	0.0	2.7307	Sagging	0.0010207	3.8432	0.027203	-	575.32	0 (Negligible)
	Max Settlement	5	1	0.0	4.0523	Sagging	712.97E-6	4.0018	0.054891	-	1696.2	1 (Very Slight)
	Max Tensile Strain	4	3	7.4529	10.076	Sagging	584.25E-6	3.8594	0.065272	-	1257.7	1 (Very Slight)
	Min Radius of Curvature (Hogging)	1	1	0.98246	4.9120	Hogging	441.82E-6	1.1579	0.035774	4404.1	-	0 (Negligible)
	Min Radius of Curvature (Sagging)	4	1	0.0	2.7307	Sagging	0.0010207	3.8432	0.027203	-	575.32	0 (Negligible)
No.26	Max Slope	3	1	0.0	2.7920	Hogging	0.0013825	4.5957	0.019296	703.45	-	0 (Negligible)
	Max Settlement	3	1	0.0	2.7920	Hogging	0.0013825	4.5957	0.019296	703.45	-	0 (Negligible)
	Max Tensile Strain	2	5	10.313	12.317	Hogging	0.0012745	3.6053	0.058487	296.85	-	1 (Very Slight)
	Min Radius of Curvature (Hogging)	2	5	10.313	12.317	Hogging	0.0012745	3.6053	0.058487	296.85	-	1 (Very Slight)
	Min Radius of Curvature (Sagging)	2	2	1.3481	5.7630	Sagging	0.0010410	4.0577	0.013580	-	2938.7	0 (Negligible)
	Max Slope	4	1	0.0	4.9667	Sagging	0.0034533	5.2482	0.050051	-	900.97	1 (Very Slight)
No.28	Max Settlement	1	1	0.0	4.8270	Sagging	0.0014399	5.4514	0.074375	-	862.45	1 (Very Slight)
	Max Tensile Strain	1	1	0.0	4.8270	Sagging	0.0014399	5.4514	0.074375	-	862.45	1 (Very Slight)
	Min Radius of Curvature (Hogging)	4	2	4.9667	9.8760	Hogging	0.0034533	3.1629	0.041601	478.00	-	0 (Negligible)
	Min Radius of Curvature (Sagging)	2	1	0.0	4.9620	Sagging	0.0017038	4.5947	0.037495	-	384.34	0 (Negligible)
	Max Slope	4	1	0.0	4.9667	Sagging	0.0034533	5.2482	0.050051	-	900.97	1 (Very Slight)
	Max Settlement	1	1	0.0	4.8270	Sagging	0.0014399	5.4514	0.074375	-	862.45	1 (Very Slight)

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