CampbellReith
consulting engineers

7 Denmark St
London, WC2H 8LS

Basement Impact Assessment
Audit

For

London Borough of Camden

Project Number: 12727-48
Revision: F1

October 2018

Document History and Status

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Author	N Simonini, Bsc MSc
Project Partner	E M Brown, BSc MSc CGeol FGS
Project Number	12727-48
Project Name	7 Denmark St
Planning Reference	2018/0049/P

Structural ◆ Civil ◆ Environmental ◆ Geotechnical ◆ Transportation

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Contents

Appendix

1.0   NON-TECHNICAL SUMMARY

1.1.   CampbellReith was instructed by London Borough of Camden, (LBC) to carry out an audit on the Basement Impact Assessment (BIA) submitted as part of the Planning Submission documentation for 7 Denmark St, (planning reference 2018/0049/P). The basement is considered to fall within Category B as defined by the Terms of Reference.

1.2.   The Audit reviewed the Basement Impact Assessment for potential impact on land stability and local ground and surface water conditions arising from basement development in accordance with LBC's policies and technical procedures.

1.3.   CampbellReith was able to access LBC's Planning Portal and gain access to the latest revision of submitted documentation and reviewed it against an agreed audit checklist.

1.4.   The existing building is a 3 storey terraced Grade 2 listed building with a single partial basement that extends below the footprint of the structure to the edge of the open yard to the rear. The proposed development includes the extension of the existing basement to the site boundary to accommodate plant and a cycle storage area for residents.

1.5.   Details of groundwater levels and monitoring regime requested in the previous audit are presented in the BIA. The potential risk for rise in groundwater due to seasonal changes or heavy rain has been considered in the BIA. The impact of settlement induced by the possibility of temporary groundwater exclusion during construction has been also assessed.

1.6.   Geotechnical parameters, including those for retaining wall design, have been updated in the GEA report to reflect the site specific ground investigation findings.

1.7.   As requested in the previous version of the audit, information with respect to the typology of temporary works and an outline construction programme are presented in the BIA.

1.8.   An updated Ground Movement Assessment (GMA) is included in the GEA report as requested in the previous version of the audit. The model estimates damages to the applicant's and neighbouring buildings to be within Category 0 of the Burland Scale. It should be noted that, as the structure is listed, it is incumbent on the owner not to cause any harm to the site itself and the temporary and permanent works design and sequencing will be key in controlling movements, as will workmanship.

1.9.   It is accepted that there are no concerns about slope stability issues regarding the basement development.

1.10.   It is accepted that there are no surface water or groundwater flow concerns regarding the basement development.

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1.11.   No trees will be felled as a part of the construction, and the site is not directly underlain by London Clay. Shrink/swell is not considered to have an impact on the site.

1.12.   It is accepted that the site is not within the catchment of the ponds on Hampstead Heath, or in vicinity of any watercourse/lost rivers/spring lines, or at risk of sea/reservoir/sewer/river flooding.

1.13.   Queries and requests for information raised during the initial audit are described in Section 4 and summarised in Appendix 2. It is accepted that the BIA, with the supplementary information provided, demonstrates that the basement proposals meet the criteria of CPG: Basements.

2.0   INTRODUCTION

2.1.   CampbellReith was instructed by London Borough of Camden (LBC) on 13/02/2018 to carry out a Category B Audit on the Basement Impact Assessment (BIA) submitted as part of the Planning Submission documentation for 7 Denmark St, London WC2H 8LS (Reference: 2018/0049/P).

2.2.   The Audit was carried out in accordance with the Terms of Reference set by LBC. It reviewed the Basement Impact Assessment for potential impact on land stability and local ground and surface water conditions arising from basement development.

2.3.   A BIA is required for all planning applications with basements in Camden in general accordance with policies and technical procedures contained within

-    Guidance for Subterranean Development (GSD). Issue 01. November 2010. Ove Arup & Partners.

-    Camden Planning Guidance (CPG): Basements.

-    Camden Development Policy (DP) 27: Basements and Lightwells.

-    Camden Development Policy (DP) 23: Water.

-    Local Plan Policy A5 Basements.

2.4.   The BIA should demonstrate that schemes:

a)   maintain the structural stability of the building and neighbouring properties;

b)   avoid adversely affecting drainage and run off or causing other damage to the water environment;

c)   avoid cumulative impacts upon structural stability or the water environment in the local area;

and evaluate the impacts of the proposed basement considering the issues of hydrology, hydrogeology and land stability via the process described by the GSD and to make recommendations for the detailed design.

2.5.   LBC's Audit Instruction described the planning proposal as "*Partial demolition of single storey rear elements; additional storey to the rear mews building to create an eating area for the existing bar (A4) use; basement extension to provide additional office (B1a) space and new residential bicycle storage (22 spaces) and associated works.*"

2.6. The Audit Instruction also confirmed that the proposal involves a listed building.

2.7. CampbellReith accessed LBC's Planning Portal on 05/03/2018 and gained access to the following relevant documents for audit purposes:

- Basement Impact Assessment (BIA) by Engenuiti Ltd dated December 2017.

- Design and Access Statement by Ian Chalk Architects, dated October 2017.

- Architects General Arrangement Plans & Sections Existing and Proposed:

– Existing Location and Site plan;

– Proposed Location and Site Plan;

– 6 No. Existing floor and basement plans, sections and elevations;

– 6 No. Proposed floor and basement plans, sections and elevations.

2.8. The following document was received in response to the queries and comments raised in the initial audit. The documents are available on the planning portal and have therefore not been included in the Appendix.

- Ground Investigation & Ground Movement Assessment Report by GEA Ltd (ref. JI8119), dated June 2018.

2.9. Further queries were raised on the construction sequence and methodology used in the ground movement analysis and additional information was provided via email in September and October 2018. The information referred to in paragraphs 2.8 and 2.9 is available on the planning portal and, with the exception of the tabular outputs, is not included in Appendix 3.

- Response to BIA Audit by Engenuiti Ltd, Rev 00 – 22 August 2018
- Basement Impact Assessment (BIA) by Engenuiti Ltd, Rev 02 – 22 August 2018.
- Ground Movement Assessment software tabular outputs:
– PDisp Inputs.pdf

– 7 Denmark XDisp Inputs and Outputs.pdf (print version 18/10/2018)

3.0   BASEMENT IMPACT ASSESSMENT AUDIT CHECK LIST

Item	Yes/No/NA	Comment
Are BIA Author(s) credentials satisfactory?	Yes	BIA authors' expertise in ground engineering has been included in the BIA as requested in the D1 version of the audit.
Is data required by Cl.233 of the GSD presented?	Yes	The BIA includes all the data required.
Does the description of the proposed development include all aspects of temporary and permanent works which might impact upon geology, hydrogeology and hydrology?	Yes	The BIA includes all these aspects.
Are suitable plan/maps included?	Yes	Plan and maps are included in the BIA.
Do the plans/maps show the whole of the relevant area of study and do they show it in sufficient detail?	Yes	
Land Stability Screening: Have appropriate data sources been consulted? Is justification provided for 'No' answers?	Yes	Appropriate data sources have been consulted. Justifications are provided for 'No' answers.
Hydrogeology Screening: Have appropriate data sources been consulted? Is justification provided for 'No' answers?	Yes	Hydrogeology screening has been reviewed in the light of the site investigation carried on site. Question Q1b has now been carried forward to the scoping process as requested in the D1 version of the audit.
Hydrology Screening: Have appropriate data sources been consulted? Is justification provided for 'No' answers?	Yes	Appropriate data sources have been consulted. Justifications are provided for 'No' answers.
Is a conceptual model presented?	Yes	Consideration for seasonal groundwater level change was required in the previous audit along with the characterization of the groundwater profile across the site. These are now presented in the BIA.
Land Stability Scoping Provided? Is scoping consistent with screening outcome?	Yes	Every positive response identified in the screening stage was carried forward to the scoping process.

Item	Yes/No/NA	Comment
Hydrogeology Scoping Provided? Is scoping consistent with screening outcome?	Yes	The scoping was considered to be inconsistent with the screening outcome in the previous audit. The BIA is now updated with an appropriate hydrogeology scoping.
Hydrology Scoping Provided? Is scoping consistent with screening outcome?	Yes	Every positive response identified in the screening stage was carried forward to the scoping process.
Is factual ground investigation data provided?	Yes	A site specific ground investigation was carried in May 2018 by GEA and is presented in the BIA.
Is monitoring data presented?	Yes	Contradictory information was noted in the previous audit. Monitoring data from the site investigation is now clearly presented in the BIA (See Paragraph 4.7.).
Is the ground investigation informed by a desk study?	Yes	Desk study information is provided in the original BIA and in the GI and GMA Report by GEA.
Has a site walkover been undertaken?	Yes	The GI and GMA report states a site walkover was undertaken by GEA at the time of the fieldwork.
Is the presence/absence of adjacent or nearby basements confirmed?	Yes	It is understood that the adjacent No. 6, 8 and 9 Denmark Street and No. 122 Charing Cross Road have a basement. This is based on some drawings provided by Engenuiti to GEA. Those drawings are now presented in the BIA (See Paragraph 4.11.).
Is a geotechnical interpretation presented?	Yes	Updated geotechnical parameters are presented in the GEA report.
Does the geotechnical interpretation include information on retaining wall design?	Yes	Geotechnical parameters for retaining wall design are shown in the BIA.
Are reports on other investigations required by screening and scoping presented?	Yes	
Are the baseline conditions described, based on the GSD?	Yes	
Do the base line conditions consider adjacent or nearby basements?	Yes	The presence of basements within neighbouring properties has been confirmed in the baseline description.

Item	Yes/No/NA	Comment
Is an Impact Assessment provided?	Yes	Impact Assessment is presented in the main report. However, further assessments are required to be submitted.
Are estimates of ground movement and structural impact presented?	Yes	Estimate of ground movements and structural impact are presented in the GEA report following a request in the initial audit report.
Is the Impact Assessment appropriate to the matters identified by screen and scoping?	Yes	The issues raised in the previous audit have been addressed and an appropriate Impact Assessment is presented in the BIA.
Has the need for mitigation been considered and are appropriate mitigation methods incorporated in the scheme?	Yes	Mitigation measures against the potential for seasonal groundwater level change that were required in the previous audit are now included in the BIA.
Has the need for monitoring during construction been considered?	Yes	The need for monitoring was not mentioned in the previous version of the BIA. This is now included in Section 10.2 of the BIA.
Have the residual (after mitigation) impacts been clearly identified?	Yes	These have been reviewed after the GMA revision.
Has the scheme demonstrated that the structural stability of the building and neighbouring properties and infrastructure will be maintained?	Yes	A GMA revision was required in the previous audit. This is now presented in the BIA and demonstrates the structural stability of the building and neighbouring properties.
Has the scheme avoided adversely affecting drainage and run-off or causing other damage to the water environment?	Yes	
Has the scheme avoided cumulative impacts upon structural stability or the water environment in the local area?	Yes	As per above.
Does report state that damage to surrounding buildings will be no worse than Burland Category 1?	Yes	
Are non-technical summaries provided?	Yes	Technical summaries are presented in Section 1 of the BIA.

4.0   DISCUSSION

4.1.   The Basement Impact Assessment (BIA) has been carried out by engineering consultants, Engenuiti Ltd and the authors have suitable qualifications. A Ground Investigation and Ground Movement Report has been presented by GEA as a response to the initial BIA audit. Confirmation of the Authors' qualifications and expertise in ground engineering has been provided.

4.2.   The existing building is a 3 storey terraced Grade 2 listed building with a single partial basement that extends below the footprint of the structure to the edge of the open yard to the rear. It is located on the south side of Denmark Street. The site is bounded by Denmark Street to the north, and has shared walls with No. 6 and 8 Denmark Street to the east and west. The south of the site is partly shared with the rear of Book Mews and No. 122 Charing Cross Road.

4.3.   The proposed development consists of partial demolition of single storey rear elements, including the existing rear mews and utilities areas at ground floor level and construction of a two-storey addition to the rear yard linked to a new single-storey restaurant with a glazed ceiling. Some of the paved yard is to be kept. It also includes the extension of the existing basement to the site boundary to accommodate plant and a cycle storage area for residents.

4.4.   It is intended to underpin the existing foundations of the building associated with a temporary propping system to support the walls and limit ground movements. As requested in the previous audits, both the new and the old basement levels (22.46 and 21.66m AOD) are specified.

4.5.   The property to the rear at Book Mews does not contain a basement according to the existing plan drawings. The presence of a basement has been confirmed for the adjacent No. 6, 8 and 9 Denmark Street and No. 122 Charing Cross Road.

4.6.   As requested in the original version of the audit, a site specific ground investigation was undertaken in May 2018. This comprised two boreholes to a depth of 5.00m bgl and identified Made Ground to 2.50m bgl overlying the Lynch Hill Gravel to a maximum depth of 6.00m bgl, which in turn overlies the London Clay to an assumed depth of -30.00m bgl. Consequently, the basement is considered to be founded within the Lynch Hill Gravel, a suitable founding stratum.

4.7.   Contradictory information was given in the previous BIA regarding the number of groundwater monitoring rounds undertaken on site and consideration for potential seasonal groundwater rise was requested in the previous audit. This has now been clarified and consistent groundwater monitoring levels (20.15 – 20.54m AOD) are shown in the BIA. The potential risk for rise in

groundwater due to seasonal changes or heavy rain has been considered in Section 5.1 of the BIA.

4.8.   Following the previous audit, it was requested that the impact of settlement induced by the possibility of temporary groundwater exclusion during construction to be assessed. This has been considered in Section 5.1 of the BIA and permeation grouting is considered to be a reasonable solution to be adopted in case of such a scenario.

4.9.   Geotechnical parameters, including those for retaining wall design have been updated in the GEA report to reflect the site specific ground investigation findings.

4.10.   Structural drawings are presented in the BIA to demonstrate the viability of the proposed construction. These include proposed development with comparison of existing and proposed building footprints and basement outlines. Clarification was required with respect to temporary and permanent construction methodology and an outline construction programme was requested in the previous audit. A basement construction sequence has been included in Section 9.5 of the BIA and sketches of construction methodology are presented in Appendix K along with an outline construction programme.

4.11.   An updated Ground Movement Assessment (GMA) is included in the GEA report as requested in the previous version of the audit. It is understood that basement levels and heights of the neighbouring properties used in the GMA are based on survey drawings provided by Engenuiti to GEA (See Appendix K of the BIA). Two different approaches are presented. In the first one, the analyses of potential horizontal ground movements associated with the excavation and new load setting have been modelled using the Oasys software X-Disp and consequently imported into an X-Disp model to complete the damage assessment. In the latter, a single X-Disp analysis was undertaken and movements from wall installation have been estimated by applying the ground movement curves for installation of diaphragm wall in stiff clay from CIRIA C760.

4.12.   Whilst the X-Disp software is intended to be applicable to piled retaining walls, it is accepted that predicted movements are reasonable for the underpinning scheme provided there is good control of workmanship. Both the models predict damage to the applicant's and neighbouring buildings to be within Category 0 of the Burland Scale. Ground movements monitoring and mitigation measures are discussed in Section 10.2 of the BIA. It should be noted that, as the structure is listed, it is incumbent on the owner not to cause any harm to the site itself and the temporary and permanent works design and sequencing will be key in controlling movements, as will workmanship.

4.13.   It is accepted that the proposed construction will not have an impact on its surrounding roads and pedestrian rights of way as the basement itself is of a small size (single storey) and located

at the back of the site. With respect to underground tunnels, the site is within the safeguarding zone for Crossrail who have commented on the planning application advising of their requirements.

4.14. The site is located on the Lynch Hill Gravel Formation which is designated as a 'secondary A' aquifer by the Environment Agency. The construction of a basement across the flow of groundwater levels potentially can increase the groundwater flow immediately upstream of the development and change the local subterranean regime. This is also reflected in the Camden designated zone of groundwater vulnerability. It is accepted that the groundwater flow is likely to be to the south and that the site is in the shadow of larger underground structures to the north, as well as the existing basement at the front of the site, resulting in the impact from this basement being less significant. It is also noted that the proposed basement does not extend below the groundwater level.

4.15. It is noted in the BIA that discrete surface flooding is possible, affecting houses or infrastructure since Denmark Street to the north of the site is shown to be locally at high risk of surface flooding. A flood risk assessment undertaken in September 2012 for an adjacent development (St Giles Circus) has confirmed that the risk of flooding for the area is low. Considering the location of the proposed basement is at the back of the property and c. 12m distant from Denmark Street, it is accepted that surface flooding does not pose a risk for the development. It is also accepted that flood risk is not increased elsewhere as a consequence of the proposed development.

4.16. It is accepted that the site is not within the catchment of the ponds on Hampstead Heath, or in vicinity of any watercourse/lost rivers/spring lines, or at risk of sea/reservoir/sewer/river flooding.

4.17. No change will be made on the area of the hard paved surfaces as the existing open yard is already paved. No SUDS is proposed, as there will be no change in the surface drainage regime.

4.18. The new basement will drain into the existing basement drainage: Thames Water has been contacted with regard to sewerage infrastructure capacity, and has no objection on the planning application. However, if any collected groundwater as a result of construction dewatering is proposed to be discharged into the public sewers, Thames Water's permission is required.

4.19. It is acknowledged that the site and its surroundings are 'gently' sloping towards the south: there is no concern about slope stability issues with this regard.

4.20. No trees will be felled as a part of the construction, and the site is not directly underlain by London Clay. Shrink/swell is not considered as an impact on the site.

4.21. Queries and requests for information are described in Section 4 and summarised in Appendix 2.

5.0   CONCLUSIONS

5.1.   The Basement Impact Assessment (BIA) has been carried out by Engenuiti Ltd. The authors' qualifications follow the CPG4 requirements. A Ground Investigation and Ground Movement Report has been presented by GEA as a BIA queries response. Authors' qualification and expertise in ground engineering have been provided.

5.2.   The site is occupied by a three storey terraced Grade 2 listed property. It is intended to deepen an existing basement and to extend the basement to cover the entire building footprint.

5.3.   Details for groundwater levels and monitoring regime requested in the previous audit are presented in the BIA. The potential risk for rise in groundwater due to seasonal changes or heavy rain has been considered in the BIA. The impact of settlement induced by the possibility of temporary groundwater exclusion during construction has been also assessed.

5.4.   Geotechnical parameters, including those for retaining wall design have been updated in the GEA report to reflect the site specific ground investigation findings.

5.5.   As requested in the previous version of the audit, information with respect to the typology of temporary work and an outline construction programme are presented in the BIA.

5.6.   An updated Ground Movement Assessment (GMA) is included in the GEA report as requested in the previous version of the audit. The model estimates damages to the applicant's and neighbouring buildings to be within Category 0 of the Burland Scale. It should be noted that, as the structure is listed, it is incumbent on the owner not to cause any harm to the site itself and the temporary and permanent works design and sequencing will be key in controlling movements, as will workmanship.

5.7.   It is accepted that there are no concern about slope stability issues regarding the basement development.

5.8.   It is accepted that there are no surface water and groundwater flow concerns regarding the basement development.

5.9.   No trees will be felled as a part of the construction, and the site is not directly underlain by London Clay. Shrink/swell is not considered to have an impact on the site.

5.10.   It is accepted that the site is not within the catchment of the ponds on Hampstead Heath, or in vicinity of any watercourse/lost rivers/spring lines, or at risk of sea/reservoir/sewer/river flooding.

5.11.   No change will be made on the area of the hard paved surfaces as the existing open yard is already paved. No SUDS is proposed as there will be no change in the surface drainage regime.

5.12.   It is accepted that the BIA and supplementary information referred to in Section 2 demonstrate that the scheme complies with the requirements of CPG: Basements.

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Appendix 1: Residents' Consultation Comments

Residents' Consultation Comments

Surname	Address	Date	Issue raised	Response
Whitten, on behalf of the Covent Garden Community Association	42 Earlham Street WC2H 9LA	1 Feb 2018	Stability concerns	See Audit paragraph 4.11. to 4.14.

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Appendix 2: Audit Query Tracker

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Audit Query Tracker

Query No	Subject	Query	Status	Date closed out
1	BIA	Proof of expertise in ground engineering to be presented.	Closed	09/07/18
2	BIA	Residual (after mitigation) impacts should be clearly identified and non-technical summaries should be presented the BIA.	Closed – Non technical summaries are included in Section 1 of the BIA. Residual impacts are considered in Section 10.2.	12/10/2018
3	BIA	An outline construction programme should be presented in the BIA.	Closed - A construction programme is presented in the BIA.	12/10/2018
4	Stability and hydrogeology	Assumptions with respect to ground and groundwater conditions are based on information from adjacent sites. The depth to a suitable foundation stratum and the groundwater level should be confirmed undertaking a site specific ground investigation. The BIA should then be updated.	Closed – A site specific ground investigation is presented in the BIA (Appendix Q) and the assumptions on groundwater have updated consequently.	12/10/2018
5	Stability and hydrogeology	A definitive excavation level should be decided after the determination of ground conditions that should be informed by a site specific ground investigation.	Closed - A maximum excavation level is now stated in the BIA (See Paragraph 4.4 of this audit).	12/10/2018
6	Stability	A Ground Movement Assessment should be presented in the BIA. Consequent mitigation measures should be mentioned in the BIA.	Closed - The GMA presented in the GEA report has been reviewed (Paragraph 4.11) and mitigation measures presented. (Section 10.1 of the BIA.	18/10/2018
7	Stability	Clarification required with respect to temporary and permanent construction methodology following a site specific ground investigation.	Closed - Permanent and temporary construction methodology is presented in Section 9.5 of the BIA.	12/10/2018
8	Stability	The impact of settlement induced by the possibility of temporary groundwater exclusion during construction should be assessed in the BIA.	Closed – Potential settlement induced by the possibility of temporary groundwater exclusion has been assessed in the BIA (See Paragraph 4.8 of this audit).	12/10/2018

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Appendix 3: Supplementary Supporting Documents

Oasys

GEOTECHNICAL AND ENVIRONMENTAL ASSOCIATES LTD *J18119*

7 Denmark Street, London WC2H 8LZ
Drained total movement

Job No.		Sheet No.		Rev.

Drg. Ref.		

Made by	Date	Checked
ML		

Titles

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Job No.:                J18119
Job Title:              7 Denmark Street, London WC2H 8LZ
Sub-title:              Drained total movement
Calculation Heading:
Initials:               ML
Checker:
Date Saved:
Date Checked:
Notes:
File Name:              Total (19.4).pdd
File Path:              C:\Users\Matt Legg\Desktop\PDisp workings\7 Denmark St
```

History

Date	Time	By	Notes
12-Jun-2018	17:11	Matt Legg	
12-Jun-2018	17:38	Matt Legg	
13-Jun-2018	01:10	Matt Legg	
13-Jun-2018	15:25	Matt Legg	
02-Oct-2018	13:32	Matt Legg	

Analysis Options

General
Global Poisson's ratio: 0.20
Maximum allowable ratio between values of E: 1.5
Horizontal rigid boundary level: -30.00 [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 Profiles Short-term

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	Layer 1	0.0	2	5000.0	10000.	0.50000	None
2	Layer 2	-2.5000	2	60000.	60000.	0.50000	None
3	Layer 3	-4.0000	2	48000.	48000.	0.50000	None
4	Layer 4	-6.0000	1	40000.	42500.	0.50000	None
5	Layer 5	-7.0000	1	42500.	45000.	0.50000	None
6	Layer 6	-8.0000	2	45000.	55000.	0.50000	None
7	Layer 7	-10.000	2	55000.	60000.	0.50000	None
8	Layer 8	-12.000	3	60000.	70000.	0.50000	None
9	Layer 9	-15.000	3	70000.	85000.	0.50000	None
10	Layer 10	-18.000	7	85000.	105000.	0.50000	None
11	Layer 11	-25.000	5	105000.	120000.	0.50000	None

Soil Profiles Total

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	Layer 1	0.0	2	3000.0	6000.0	0.20000	None
2	Layer 2	-2.5000	2	60000.	60000.	0.20000	None
3	Layer 3	-4.0000	2	48000.	48000.	0.20000	None
4	Layer 4	-6.0000	1	24000.	25500.	0.20000	None
5	Layer 5	-7.0000	1	25500.	27000.	0.20000	None
6	Layer 6	-8.0000	2	27000.	33000.	0.20000	None
7	Layer 7	-10.000	2	33000.	36000.	0.20000	None
8	Layer 8	-12.000	3	36000.	42000.	0.20000	None
9	Layer 9	-15.000	3	42000.	51000.	0.20000	None
10	Layer 10	-18.000	7	51000.	63000.	0.20000	None
11	Layer 11	-25.000	5	63000.	72000.	0.20000	None

Soil Zones

Zone	Name	X min [m]	X max [m]	Y min [m]	Y max [m]	Profile
1	Zone 1	15.000	55.000	0.0	50.000	Total

Polygonal Load Data

Load ref.	Name	Position : Level [m]	Position : Polygon : Coords. [m]	Position : Polygon Rect. tolerance [%]	No. of Rectangles	Value : Normal (local z) [kN/m²]
1	Basement Unloading	-3.50000	(34,22.6) (38.5,17.7) (43.1,21.1) (39.1,26.1) (34,22.6)	10.000	11	-50.000
2	6 Denmark St	-3.50000	(38.3,25.6) (39.1,26.1) (43.1,21.1) (42.1,20.6) (38.3,25.6)	10.000	6	62.200
3	7 Denmark St	-3.50000	(34,22.6) (38.3,25.6) (38.8,25) (34.6,22) (34,22.6)	10.000	4	26.900
4	8 Denmark St	-3.50000	(34.6,22) (35.3,22.5) (39.2,18.3) (38.5,17.7) (34.6,22)	10.000	2	0.0
5	122 Charing Cross Rd	-3.50000	(39.2,18.3) (42.1,20.6) (41.7,21.2) (38.8,18.9) (39.2,18.3)	10.000	3	0.0

Polygonal Loads' Rectangles

No.	Centre : x [m]	Centre : y [m]	Angle of local x from global X [Degrees]	Width x [m]	Depth y [m]
Load 1 : Basement Unloading					
(Edge 1 optimal)					
1	34.28448	22.74289	-47.437	0.17436	0.61237
2	34.85345	23.02868	-47.437	0.17436	1.8371
3	35.42242	23.31447	-47.437	0.17436	3.0619

Oasys
GEOTECHNICAL AND ENVIRONMENTAL ASSOCIATES LTD

7 Denmark Street, London WC2H 8LZ

Drained total movement

Job No. J18119	Sheet No.	Rev.

Drg. Ref.

Made by ML	Date	Checked

No.	Centre : x	Centre : y	Angle of local x from global X	Width x	Depth y
4	35.99139	23.60026	-47.437	0.17436	4.2866
5	36.56036	23.88605	-47.437	0.17436	5.5113
6	38.72737	21.83329	-47.437	5.7810	5.9265
7	40.85889	19.78388	-47.437	0.12145	5.1563
8	41.35692	20.07635	-47.437	0.12145	4.0105
9	41.85494	20.36882	-47.437	0.12145	2.8646
10	42.35296	20.66129	-47.437	0.12145	1.7188
11	42.85099	20.95376	-47.437	0.12145	0.57293

Load 2 : 6 Denmark St
(Edge 3 optimal)

1	42.60591	20.95199	-52.765	0.051751	0.95686
2	42.74708	20.99428	-52.765	0.051751	0.68347
3	42.88825	21.03657	-52.765	0.051751	0.41008
4	43.02942	21.07886	-52.765	0.051751	0.13669
5	38.51301	25.70789	-52.765	0.085986	0.46974
6	40.63067	23.37331	-52.765	6.1941	1.0165

Load 3 : 7 Denmark St
(Edge 2 optimal)

1	36.44178	23.81151	35.538	5.1033	0.80715
2	38.66318	25.14155	35.538	0.058124	0.38943
3	34.08930	22.53498	35.538	0.069749	0.20886
4	34.26790	22.40493	35.538	0.069749	0.62658

Load 4 : 8 Denmark St
(Edge 3 optimal)

1	34.79178	22.10650	-47.793	0.099911	0.42721
2	36.91238	20.11123	-47.793	5.7053	0.88785

Load 5 : 122 Charing Cross Rd
(Edge 1 optimal)

1	39.11164	18.45923	38.418	0.059438	0.35933
2	40.45000	19.75000	38.418	3.6419	0.71866
3	41.78836	21.04077	38.418	0.059438	0.35933

Displacement Lines

Name	X1 [m]	Y1 [m]	Z1 [m]	X2 [m]	Y2 [m]	Z2 [m]	Intervals [No.]	Calculate	Detailed Results
No7 A	25.70000	33.20000	-2.50000	34.00000	22.60000	-2.50000	7	Yes	No
No7 B	34.00000	22.60000	-2.50000	39.10000	26.10000	-2.50000	6	Yes	No
No7 C	39.10000	26.10000	-2.50000	30.80000	37.20000	-2.50000	7	Yes	No
No7 D	30.80000	37.20000	-2.50000	25.70000	33.20000	-2.50000	6	Yes	No
No6 A	30.80000	37.20000	-2.50000	40.30000	25.00000	-2.50000	8	Yes	No
No6 B	40.30000	25.00000	-0.70000	43.10000	21.10000	-0.70000	6	Yes	No
No6 C	43.10000	21.10000	-0.70000	47.90000	24.70000	-0.70000	4	Yes	No
No6 D	47.90000	24.70000	-0.70000	45.20000	28.40000	-0.70000	8	Yes	No
No7 E	45.20000	28.40000	-2.50000	35.70000	41.10000	-2.50000	6	Yes	No
No8 F	35.70000	41.10000	-2.50000	30.80000	37.20000	-2.50000	6	Yes	No
No9 A	20.60000	29.40000	-2.50000	28.40000	19.40000	-2.50000	7	Yes	No
No9 B	28.40000	19.40000	-2.50000	33.10000	13.40000	-2.50000	7	Yes	No
122A	29.30000	10.20000	-3.50000	41.20000	19.20000	-3.50000	7	Yes	No
122B	41.20000	19.20000	-3.50000	48.20000	10.40000	-3.50000	9	Yes	No
No8 A	25.70000	33.20000	-1.00000	20.60000	29.40000	-1.00000	6	Yes	No

Displacement Grids

Name	Extrusion: Direction	X1 [m]	Y1 [m]	Z1 [m]	X2 [m]	Y2 [m]	Z2 [m]	Intervals Along Line [No.]	Extrusion: Distance [m]	Extrusion: Intervals Along [No.]	Calculate	Detailed Results
Grid 1	Global X	15.00000	0.00000	-3.50000	–	50.00000	-3.50000	25	40.00000	20	Yes	No

Warnings

(1) The load at (38.635, 21.897, -3.500)m lies wide of all soil zones. Displacements at its centre have been requested. The first soil profile will be used.

Oasys

GEOTECHNICAL AND ENVIRONMENTAL ASSOCIATES LTD J18119

7 Denmark Street, London WC2H 8LZ
Combined lateral and horizontal movements

Job No.	Sheet No.	Rev.

Drg. Ref.		

Made by ML	Date 02-Oct-2018	Checked

Problem Type

Problem Type : Tunnelling and Embedded Wall Excavations

Displacement Data

Type	Name	Direction of extrusion	First point X [m]	First point Y [m]	First point Z(level) [m]	Second point X [m]	Second point Y [m]	Second point Z(level) [m]	No. of intervals across extrusion/line	Extrusion depth [m]	No. of intervals along extrusion	Calculate	Surface type for tunnels
Grid	Grid 1	Global X	15.00000	0.00000	0.00000	–	50.00000	0.00000	25	40.00000	20	Yes	Surface
Line	No7 A	–	25.70000	33.20000	-2.50000	34.00000	22.60000	-2.50000	7	–	–	Yes	Surface
Line	No7 B	–	34.00000	22.60000	-2.50000	39.10000	26.10000	-2.50000	6	–	–	Yes	Surface
Line	No7 C	–	39.10000	26.10000	-2.50000	30.80000	37.20000	-2.50000	7	–	–	Yes	Surface
Line	No7 D	–	30.80000	37.20000	-2.50000	25.70000	33.20000	-2.50000	6	–	–	Yes	Surface
Line	No6 A	–	30.80000	37.20000	-2.50000	40.30000	25.00000	-2.50000	8	–	–	Yes	Surface
Line	No6 B	–	40.30000	25.00000	-0.70000	43.10000	21.10000	-0.70000	6	–	–	Yes	Surface
Line	No6 C	–	43.10000	21.10000	-0.70000	47.90000	24.70000	-0.70000	4	–	–	Yes	Surface
Line	No6 D	–	47.90000	24.70000	-0.70000	45.20000	28.40000	-0.70000	8	–	–	Yes	Surface
Line	No7 E	–	45.20000	28.40000	-2.50000	35.70000	41.10000	-2.50000	6	–	–	Yes	Surface
Line	No8 F	–	35.70000	41.10000	-3.50000	30.80000	37.20000	-3.50000	6	–	–	Yes	Surface
Line	No9 A	–	20.60000	29.40000	-3.50000	28.40000	19.40000	-3.50000	7	–	–	Yes	Surface
Line	No9 B	–	28.40000	19.40000	-3.50000	33.10000	13.40000	-3.50000	7	–	–	Yes	Surface
Line	122A	–	29.30000	10.20000	-3.50000	41.20000	19.20000	-3.50000	7	–	–	Yes	Surface
Line	122B	–	41.20000	19.20000	-3.50000	48.20000	10.40000	-3.50000	9	–	–	Yes	Surface
Grid	Grid 2	Global X	15.00000	0.00000	-3.50000	–	50.00000	0.00000	25	40.00000	20	Yes	Surface
Line	No8 A	–	25.70000	33.20000	-3.50000	20.60000	29.40000	-3.50000	6	–	–	Yes	Surface

Imported Displacements

The following data points and displacements were found in the import file .

Ref.	Coordinates x [m]	y [m]	z [m]	Displacements x [mm]	y [mm]	z [mm]	
1	38.63548	21.89672	-3.50000	0.00000	0.00000	-6.86319	
2	40.70155	23.28605	-3.50000	0.00000	0.00000	-3.05279	
3	36.39905	23.78286	-3.50000	0.00000	0.00000	-4.29956	
4	36.92396	20.09740	-3.50000	0.00000	0.00000	-5.70035	
5	40.45000	19.75000	-3.50000	0.00000	0.00000	-5.31207	
6	25.70000	33.20000	-2.50000	0.00000	0.00000	-0.09641	1,2,6
7	26.88571	31.68571	-2.50000	0.00000	0.00000	-0.13851	1,2,6
8	28.07143	30.17143	-2.50000	0.00000	0.00000	-0.20175	1,2,6
9	29.25714	28.65714	-2.50000	0.00000	0.00000	-0.29997	1,2,6
10	30.44286	27.14286	-2.50000	0.00000	0.00000	-0.45983	1,2,6
11	31.62857	25.62857	-2.50000	0.00000	0.00000	-0.73827	1,2,6
12	32.81429	24.11429	-2.50000	0.00000	0.00000	-1.27153	1,2,6
13	34.00000	22.60000	-2.50000	0.00000	0.00000	-2.48607	1,2,6
14	34.00000	22.60000	-2.50000	0.00000	0.00000	-2.48607	1,2,6
15	34.85000	23.18333	-2.50000	0.00000	0.00000	-3.17759	1,2,6
16	35.70000	23.76667	-2.50000	0.00000	0.00000	-3.48930	1,2,6
17	36.55000	24.35000	-2.50000	0.00000	0.00000	-3.54232	1,2,6
18	37.40000	24.93333	-2.50000	0.00000	0.00000	-3.25202	1,2,6
19	38.25000	25.51667	-2.50000	0.00000	0.00000	-2.42828	1,2,6
20	39.10000	26.10000	-2.50000	0.00000	0.00000	-1.40058	1,2,6
21	39.10000	26.10000	-2.50000	0.00000	0.00000	-1.40058	1,2,6
22	37.91429	27.68571	-2.50000	0.00000	0.00000	-1.06329	1,2,6
23	36.72857	29.27143	-2.50000	0.00000	0.00000	-0.66625	1,2,6
24	35.54286	30.85714	-2.50000	0.00000	0.00000	-0.42796	1,2,6
25	34.35714	32.44286	-2.50000	0.00000	0.00000	-0.28276	1,2,6
26	33.17143	34.02857	-2.50000	0.00000	0.00000	-0.19100	1,2,6
27	31.98571	35.61429	-2.50000	0.00000	0.00000	-0.13110	1,2,6
28	30.80000	37.20000	-2.50000	0.00000	0.00000	-0.09099	1,2,6
29	30.80000	37.20000	-2.50000	0.00000	0.00000	-0.09099	1,2,6
30	29.95000	36.53333	-2.50000	0.00000	0.00000	-0.09484	1,2,6
31	29.10000	35.86667	-2.50000	0.00000	0.00000	-0.09765	1,2,6
32	28.25000	35.20000	-2.50000	0.00000	0.00000	-0.09926	1,2,6
33	27.40000	34.53333	-2.50000	0.00000	0.00000	-0.09960	1,2,6
34	26.55000	33.86667	-2.50000	0.00000	0.00000	-0.09863	1,2,6
35	25.70000	33.20000	-2.50000	0.00000	0.00000	-0.09641	1,2,6
36	30.80000	37.20000	-2.50000	0.00000	0.00000	-0.09099	1,2,6
37	31.98750	35.67500	-2.50000	0.00000	0.00000	-0.12971	1,2,6
38	33.17500	34.15000	-2.50000	0.00000	0.00000	-0.18673	1,2,6
39	34.36250	32.62500	-2.50000	0.00000	0.00000	-0.27255	1,2,6
40	35.55000	31.10000	-2.50000	0.00000	0.00000	-0.40522	1,2,6
41	36.73750	29.57500	-2.50000	0.00000	0.00000	-0.61601	1,2,6
42	37.92500	28.05000	-2.50000	0.00000	0.00000	-0.95219	1,2,6
43	39.11250	26.52500	-2.50000	0.00000	0.00000	-1.38187	1,2,6
44	40.30000	25.00000	-2.50000	0.00000	0.00000	-1.87110	1,2,6
45	40.30000	25.00000	-0.70000	0.00000	0.00000	-1.87110	1,2,6
46	40.76667	24.35000	-0.70000	0.00000	0.00000	-2.13804	1,2,6
47	41.23333	23.70000	-0.70000	0.00000	0.00000	-2.35653	1,2,6
48	41.70000	23.05000	-0.70000	0.00000	0.00000	-2.51900	1,2,6
49	42.16667	22.40000	-0.70000	0.00000	0.00000	-2.58982	1,2,6
50	42.63333	21.75000	-0.70000	0.00000	0.00000	-2.45947	1,2,6
51	43.10000	21.10000	-0.70000	0.00000	0.00000	-1.96770	1,2,6
52	43.10000	21.10000	-0.70000	0.00000	0.00000	-1.96770	1,2,6
53	44.30000	22.00000	-0.70000	0.00000	0.00000	-1.22442	1,2,6
54	45.50000	22.90000	-0.70000	0.00000	0.00000	-0.80501	1,2,6
55	46.70000	23.80000	-0.70000	0.00000	0.00000	-0.55355	1,2,6
56	47.90000	24.70000	-0.70000	0.00000	0.00000	-0.39289	1,2,6
57	47.90000	24.70000	-0.70000	0.00000	0.00000	-0.39289	1,2,6
58	47.56250	25.16250	-0.70000	0.00000	0.00000	-0.40470	1,2,6
59	47.22500	25.62500	-0.70000	0.00000	0.00000	-0.41394	1,2,6
60	46.88750	26.08750	-0.70000	0.00000	0.00000	-0.42034	1,2,6
61	46.55000	26.55000	-0.70000	0.00000	0.00000	-0.42369	1,2,6
62	46.21250	27.01250	-0.70000	0.00000	0.00000	-0.42394	1,2,6
63	45.87500	27.47500	-0.70000	0.00000	0.00000	-0.42112	1,2,6
64	45.53750	27.93750	-0.70000	0.00000	0.00000	-0.41537	1,2,6
65	45.20000	28.40000	-0.70000	0.00000	0.00000	-0.40691	1,2,6
66	45.20000	28.40000	-2.50000	0.00000	0.00000	-0.40691	1,2,6
67	43.61667	30.51667	-2.50000	0.00000	0.00000	-0.34446	1,2,6
68	42.03333	32.63333	-2.50000	0.00000	0.00000	-0.26332	1,2,6
69	40.45000	34.75000	-2.50000	0.00000	0.00000	-0.18831	1,2,6
70	38.86667	36.86667	-2.50000	0.00000	0.00000	-0.12949	1,2,6
71	37.28333	38.98333	-2.50000	0.00000	0.00000	-0.08709	1,2,6
72	35.70000	41.10000	-2.50000	0.00000	0.00000	-0.05776	1,2,6
73	35.70000	41.10000	-2.50000	0.00000	0.00000	-0.05776	1,2,6
74	34.88333	40.45000	-2.50000	0.00000	0.00000	-0.06362	
75	34.06667	39.80000	-2.50000	0.00000	0.00000	-0.06955	
76	33.25000	39.15000	-2.50000	0.00000	0.00000	-0.07543	
77	32.43333	38.50000	-2.50000	0.00000	0.00000	-0.08108	
78	31.61667	37.85000	-2.50000	0.00000	0.00000	-0.08633	
79	30.80000	37.20000	-2.50000	0.00000	0.00000	-0.09099	1,2,6
80	20.60000	29.40000	-2.50000	0.00000	0.00000	-0.06490	
81	21.71429	27.97143	-2.50000	0.00000	0.00000	-0.08696	

Oasys

GEOTECHNICAL AND ENVIRONMENTAL ASSOCIATES LTD J18119

7 Denmark Street, London WC2H 8LZ
Combined lateral and horizontal movements

Job No.	Sheet No.	Rev.
J18119		

Drg. Ref.		
Made by ML	**Date** 02-Oct-2018	**Checked**

Ref.	Coordinates			Displacements			
	x [m]	y [m]	z [m]	x [mm]	y [mm]	z [mm]	
82	22.82857	26.54286	-2.50000	0.00000	0.00000	-0.11610	
83	23.94286	25.11429	-2.50000	0.00000	0.00000	-0.15424	
84	25.05714	23.68571	-2.50000	0.00000	0.00000	-0.20331	
85	26.17143	22.25714	-2.50000	0.00000	0.00000	-0.26438	
86	27.28571	20.82857	-2.50000	0.00000	0.00000	-0.33588	
87	28.40000	19.40000	-2.50000	0.00000	0.00000	-0.41081	
88	28.40000	19.40000	-2.50000	0.00000	0.00000	-0.41081	
89	29.07143	18.54286	-2.50000	0.00000	0.00000	-0.45209	
90	29.74286	17.68571	-2.50000	0.00000	0.00000	-0.48574	
91	30.41429	16.82857	-2.50000	0.00000	0.00000	-0.50805	
92	31.08571	15.97143	-2.50000	0.00000	0.00000	-0.51638	
93	31.75714	15.11429	-2.50000	0.00000	0.00000	-0.50981	
94	32.42857	14.25714	-2.50000	0.00000	0.00000	-0.48931	
95	33.10000	13.40000	-2.50000	0.00000	0.00000	-0.45744	
96	29.30000	10.20000	-3.50000	0.00000	0.00000	-0.16452	1,2,6
97	31.00000	11.48571	-3.50000	0.00000	0.00000	-0.24889	1,2,6
98	32.70000	12.77143	-3.50000	0.00000	0.00000	-0.38558	1,2,6
99	34.40000	14.05714	-3.50000	0.00000	0.00000	-0.61841	1,2,6
100	36.10000	15.34286	-3.50000	0.00000	0.00000	-1.04280	1,2,6
101	37.80000	16.62857	-3.50000	0.00000	0.00000	-1.87503	1,2,6
102	39.50000	17.91429	-3.50000	0.00000	0.00000	-3.19173	1,2,6
103	41.20000	19.20000	-3.50000	0.00000	0.00000	-3.35392	1,2,6
104	41.20000	19.20000	-3.50000	0.00000	0.00000	-3.35392	1,2,6
105	41.97778	18.22222	-3.50000	0.00000	0.00000	-1.97643	1,2,6
106	42.75556	17.24444	-3.50000	0.00000	0.00000	-1.27292	1,2,6
107	43.53333	16.26667	-3.50000	0.00000	0.00000	-0.86891	1,2,6
108	44.31111	15.28889	-3.50000	0.00000	0.00000	-0.61876	1,2,6
109	45.08889	14.31111	-3.50000	0.00000	0.00000	-0.45422	1,2,6
110	45.86667	13.33333	-3.50000	0.00000	0.00000	-0.34088	1,2,6
111	46.64444	12.35556	-3.50000	0.00000	0.00000	-0.26004	1,2,6
112	47.42222	11.37778	-3.50000	0.00000	0.00000	-0.20083	1,2,6
113	48.20000	10.40000	-3.50000	0.00000	0.00000	-0.15657	1,2,6
114	15.00000	0.00000	-3.50000	0.00000	0.00000	-0.00631	I
115	17.00000	0.00000	-3.50000	0.00000	0.00000	-0.00856	I
116	19.00000	0.00000	-3.50000	0.00000	0.00000	-0.01128	I
117	21.00000	0.00000	-3.50000	0.00000	0.00000	-0.01449	I
118	23.00000	0.00000	-3.50000	0.00000	0.00000	-0.01821	I
119	25.00000	0.00000	-3.50000	0.00000	0.00000	-0.02237	I
120	27.00000	0.00000	-3.50000	0.00000	0.00000	-0.02686	I
121	29.00000	0.00000	-3.50000	0.00000	0.00000	-0.03148	I
122	31.00000	0.00000	-3.50000	0.00000	0.00000	-0.03594	I
123	33.00000	0.00000	-3.50000	0.00000	0.00000	-0.03987	I
124	35.00000	0.00000	-3.50000	0.00000	0.00000	-0.04291	I
125	37.00000	0.00000	-3.50000	0.00000	0.00000	-0.04471	I
126	39.00000	0.00000	-3.50000	0.00000	0.00000	-0.04504	I
127	41.00000	0.00000	-3.50000	0.00000	0.00000	-0.04388	I
128	43.00000	0.00000	-3.50000	0.00000	0.00000	-0.04134	I
129	45.00000	0.00000	-3.50000	0.00000	0.00000	-0.03773	I
130	47.00000	0.00000	-3.50000	0.00000	0.00000	-0.03343	I
131	49.00000	0.00000	-3.50000	0.00000	0.00000	-0.02881	I
132	51.00000	0.00000	-3.50000	0.00000	0.00000	-0.02420	I
133	53.00000	0.00000	-3.50000	0.00000	0.00000	-0.01985	I
134	55.00000	0.00000	-3.50000	0.00000	0.00000	-0.01591	I
135	15.00000	2.00000	-3.50000	0.00000	0.00000	-0.00834	I
136	17.00000	2.00000	-3.50000	0.00000	0.00000	-0.01129	I
137	19.00000	2.00000	-3.50000	0.00000	0.00000	-0.01492	I
138	21.00000	2.00000	-3.50000	0.00000	0.00000	-0.01929	I
139	23.00000	2.00000	-3.50000	0.00000	0.00000	-0.02445	I
140	25.00000	2.00000	-3.50000	0.00000	0.00000	-0.03035	I
141	27.00000	2.00000	-3.50000	0.00000	0.00000	-0.03687	I
142	29.00000	2.00000	-3.50000	0.00000	0.00000	-0.04373	I
143	31.00000	2.00000	-3.50000	0.00000	0.00000	-0.05049	I
144	33.00000	2.00000	-3.50000	0.00000	0.00000	-0.05659	I
145	35.00000	2.00000	-3.50000	0.00000	0.00000	-0.06137	I
146	37.00000	2.00000	-3.50000	0.00000	0.00000	-0.06424	I
147	39.00000	2.00000	-3.50000	0.00000	0.00000	-0.06478	I
148	41.00000	2.00000	-3.50000	0.00000	0.00000	-0.06293	I
149	43.00000	2.00000	-3.50000	0.00000	0.00000	-0.05892	I
150	45.00000	2.00000	-3.50000	0.00000	0.00000	-0.05329	I
151	47.00000	2.00000	-3.50000	0.00000	0.00000	-0.04669	I
152	49.00000	2.00000	-3.50000	0.00000	0.00000	-0.03975	I
153	51.00000	2.00000	-3.50000	0.00000	0.00000	-0.03299	I
154	53.00000	2.00000	-3.50000	0.00000	0.00000	-0.02675	I
155	55.00000	2.00000	-3.50000	0.00000	0.00000	-0.02124	I
156	15.00000	4.00000	-3.50000	0.00000	0.00000	-0.01072	I
157	17.00000	4.00000	-3.50000	0.00000	0.00000	-0.01454	I
158	19.00000	4.00000	-3.50000	0.00000	0.00000	-0.01932	I
159	21.00000	4.00000	-3.50000	0.00000	0.00000	-0.02522	I
160	23.00000	4.00000	-3.50000	0.00000	0.00000	-0.03233	I
161	25.00000	4.00000	-3.50000	0.00000	0.00000	-0.04068	I
162	27.00000	4.00000	-3.50000	0.00000	0.00000	-0.05015	I
163	29.00000	4.00000	-3.50000	0.00000	0.00000	-0.06038	I
164	31.00000	4.00000	-3.50000	0.00000	0.00000	-0.07076	I
165	33.00000	4.00000	-3.50000	0.00000	0.00000	-0.08036	I
166	35.00000	4.00000	-3.50000	0.00000	0.00000	-0.08806	I
167	37.00000	4.00000	-3.50000	0.00000	0.00000	-0.09275	I
168	39.00000	4.00000	-3.50000	0.00000	0.00000	-0.09367	I
169	41.00000	4.00000	-3.50000	0.00000	0.00000	-0.09065	I
170	43.00000	4.00000	-3.50000	0.00000	0.00000	-0.08416	I
171	45.00000	4.00000	-3.50000	0.00000	0.00000	-0.07520	I
172	47.00000	4.00000	-3.50000	0.00000	0.00000	-0.06493	I
173	49.00000	4.00000	-3.50000	0.00000	0.00000	-0.05443	I
174	51.00000	4.00000	-3.50000	0.00000	0.00000	-0.04447	I
175	53.00000	4.00000	-3.50000	0.00000	0.00000	-0.03555	I
176	55.00000	4.00000	-3.50000	0.00000	0.00000	-0.02786	I
177	15.00000	6.00000	-3.50000	0.00000	0.00000	-0.01341	I
178	17.00000	6.00000	-3.50000	0.00000	0.00000	-0.01829	I
179	19.00000	6.00000	-3.50000	0.00000	0.00000	-0.02453	I
180	21.00000	6.00000	-3.50000	0.00000	0.00000	-0.03238	I
181	23.00000	6.00000	-3.50000	0.00000	0.00000	-0.04211	I
182	25.00000	6.00000	-3.50000	0.00000	0.00000	-0.05386	I
183	27.00000	6.00000	-3.50000	0.00000	0.00000	-0.06760	I
184	29.00000	6.00000	-3.50000	0.00000	0.00000	-0.08296	I
185	31.00000	6.00000	-3.50000	0.00000	0.00000	-0.09908	I
186	33.00000	6.00000	-3.50000	0.00000	0.00000	-0.11449	I
187	35.00000	6.00000	-3.50000	0.00000	0.00000	-0.12722	I
188	37.00000	6.00000	-3.50000	0.00000	0.00000	-0.13517	I
189	39.00000	6.00000	-3.50000	0.00000	0.00000	-0.13679	I
190	41.00000	6.00000	-3.50000	0.00000	0.00000	-0.13169	I
191	43.00000	6.00000	-3.50000	0.00000	0.00000	-0.12086	I
192	45.00000	6.00000	-3.50000	0.00000	0.00000	-0.10625	I
193	47.00000	6.00000	-3.50000	0.00000	0.00000	-0.09003	I
194	49.00000	6.00000	-3.50000	0.00000	0.00000	-0.07399	I
195	51.00000	6.00000	-3.50000	0.00000	0.00000	-0.05930	I
196	53.00000	6.00000	-3.50000	0.00000	0.00000	-0.04656	I
197	55.00000	6.00000	-3.50000	0.00000	0.00000	-0.03593	I
198	15.00000	8.00000	-3.50000	0.00000	0.00000	-0.01639	I
199	17.00000	8.00000	-3.50000	0.00000	0.00000	-0.02251	I
200	19.00000	8.00000	-3.50000	0.00000	0.00000	-0.03050	I
201	21.00000	8.00000	-3.50000	0.00000	0.00000	-0.04083	I

Oasys

GEOTECHNICAL AND ENVIRONMENTAL ASSOCIATES LTD **J18119**

7 Denmark Street, London WC2H 8LZ
Combined lateral and horizontal movements

Job No.	Sheet No.	Rev.
J18119		

Drg. Ref.		

Made by	Date	Checked
ML	**02-Oct-2018**	

Ref.	Coordinates x [m]	y [m]	z [m]	Displacements x [mm]	y [mm]	z [mm]	
202	23.00000	8.00000	-3.50000	0.00000	0.00000	-0.05396	I
203	25.00000	8.00000	-3.50000	0.00000	0.00000	-0.07035	I
204	27.00000	8.00000	-3.50000	0.00000	0.00000	-0.09023	I
205	29.00000	8.00000	-3.50000	0.00000	0.00000	-0.11337	I
206	31.00000	8.00000	-3.50000	0.00000	0.00000	-0.13872	I
207	33.00000	8.00000	-3.50000	0.00000	0.00000	-0.16404	I
208	35.00000	8.00000	-3.50000	0.00000	0.00000	-0.18583	I
209	37.00000	8.00000	-3.50000	0.00000	0.00000	-0.19991	I
210	39.00000	8.00000	-3.50000	0.00000	0.00000	-0.20290	I
211	41.00000	8.00000	-3.50000	0.00000	0.00000	-0.19391	I
212	43.00000	8.00000	-3.50000	0.00000	0.00000	-0.17512	I
213	45.00000	8.00000	-3.50000	0.00000	0.00000	-0.15059	I
214	47.00000	8.00000	-3.50000	0.00000	0.00000	-0.12446	I
215	49.00000	8.00000	-3.50000	0.00000	0.00000	-0.09975	I
216	51.00000	8.00000	-3.50000	0.00000	0.00000	-0.07810	I
217	53.00000	8.00000	-3.50000	0.00000	0.00000	-0.06005	I
218	55.00000	8.00000	-3.50000	0.00000	0.00000	-0.04550	I
219	15.00000	10.0000	-3.50000	0.00000	0.00000	-0.01954	I
220	17.00000	10.0000	-3.50000	0.00000	0.00000	-0.02708	I
221	19.00000	10.0000	-3.50000	0.00000	0.00000	-0.03713	I
222	21.00000	10.0000	-3.50000	0.00000	0.00000	-0.05043	I
223	23.00000	10.0000	-3.50000	0.00000	0.00000	-0.06789	I
224	25.00000	10.0000	-3.50000	0.00000	0.00000	-0.09045	I
225	27.00000	10.0000	-3.50000	0.00000	0.00000	-0.11898	I
226	29.00000	10.0000	-3.50000	0.00000	0.00000	-0.15383	I
227	31.00000	10.0000	-3.50000	0.00000	0.00000	-0.19415	I
228	33.00000	10.0000	-3.50000	0.00000	0.00000	-0.23686	I
229	35.00000	10.0000	-3.50000	0.00000	0.00000	-0.27583	I
230	37.00000	10.0000	-3.50000	0.00000	0.00000	-0.30233	I
231	39.00000	10.0000	-3.50000	0.00000	0.00000	-0.30831	I
232	41.00000	10.0000	-3.50000	0.00000	0.00000	-0.29145	I
233	43.00000	10.0000	-3.50000	0.00000	0.00000	-0.25703	I
234	45.00000	10.0000	-3.50000	0.00000	0.00000	-0.21427	I
235	47.00000	10.0000	-3.50000	0.00000	0.00000	-0.17133	I
236	49.00000	10.0000	-3.50000	0.00000	0.00000	-0.13306	I
237	51.00000	10.0000	-3.50000	0.00000	0.00000	-0.10128	I
238	53.00000	10.0000	-3.50000	0.00000	0.00000	-0.07602	I
239	55.00000	10.0000	-3.50000	0.00000	0.00000	-0.05645	I
240	15.00000	12.0000	-3.50000	0.00000	0.00000	-0.02274	I
241	17.00000	12.0000	-3.50000	0.00000	0.00000	-0.03179	I
242	19.00000	12.0000	-3.50000	0.00000	0.00000	-0.04412	I
243	21.00000	12.0000	-3.50000	0.00000	0.00000	-0.06087	I
244	23.00000	12.0000	-3.50000	0.00000	0.00000	-0.08353	I
245	25.00000	12.0000	-3.50000	0.00000	0.00000	-0.11397	I
246	27.00000	12.0000	-3.50000	0.00000	0.00000	-0.15430	I
247	29.00000	12.0000	-3.50000	0.00000	0.00000	-0.20646	I
248	31.00000	12.0000	-3.50000	0.00000	0.00000	-0.27108	I
249	33.00000	12.0000	-3.50000	0.00000	0.00000	-0.34516	I
250	35.00000	12.0000	-3.50000	0.00000	0.00000	-0.41878	I
251	37.00000	12.0000	-3.50000	0.00000	0.00000	-0.47307	I
252	39.00000	12.0000	-3.50000	0.00000	0.00000	-0.48650	I
253	41.00000	12.0000	-3.50000	0.00000	0.00000	-0.45179	I
254	43.00000	12.0000	-3.50000	0.00000	0.00000	-0.38390	I
255	45.00000	12.0000	-3.50000	0.00000	0.00000	-0.30592	I
256	47.00000	12.0000	-3.50000	0.00000	0.00000	-0.23402	I
257	49.00000	12.0000	-3.50000	0.00000	0.00000	-0.17476	I
258	51.00000	12.0000	-3.50000	0.00000	0.00000	-0.12873	I
259	53.00000	12.0000	-3.50000	0.00000	0.00000	-0.09407	I
260	55.00000	12.0000	-3.50000	0.00000	0.00000	-0.06837	I
261	15.00000	14.0000	-3.50000	0.00000	0.00000	-0.02578	I
262	17.00000	14.0000	-3.50000	0.00000	0.00000	-0.03636	I
263	19.00000	14.0000	-3.50000	0.00000	0.00000	-0.05106	I
264	21.00000	14.0000	-3.50000	0.00000	0.00000	-0.07152	I
265	23.00000	14.0000	-3.50000	0.00000	0.00000	-0.10006	I
266	25.00000	14.0000	-3.50000	0.00000	0.00000	-0.13993	I
267	27.00000	14.0000	-3.50000	0.00000	0.00000	-0.19550	I
268	29.00000	14.0000	-3.50000	0.00000	0.00000	-0.27221	I
269	31.00000	14.0000	-3.50000	0.00000	0.00000	-0.37551	I
270	33.00000	14.0000	-3.50000	0.00000	0.00000	-0.50701	I
271	35.00000	14.0000	-3.50000	0.00000	0.00000	-0.65524	I
272	37.00000	14.0000	-3.50000	0.00000	0.00000	-0.78076	I
273	39.00000	14.0000	-3.50000	0.00000	0.00000	-0.81671	I
274	41.00000	14.0000	-3.50000	0.00000	0.00000	-0.73398	I
275	43.00000	14.0000	-3.50000	0.00000	0.00000	-0.58586	I
276	45.00000	14.0000	-3.50000	0.00000	0.00000	-0.43643	I
277	47.00000	14.0000	-3.50000	0.00000	0.00000	-0.31469	I
278	49.00000	14.0000	-3.50000	0.00000	0.00000	-0.22416	I
279	51.00000	14.0000	-3.50000	0.00000	0.00000	-0.15921	I
280	53.00000	14.0000	-3.50000	0.00000	0.00000	-0.11313	I
281	55.00000	14.0000	-3.50000	0.00000	0.00000	-0.08047	I
282	15.00000	16.0000	-3.50000	0.00000	0.00000	-0.02843	I
283	17.00000	16.0000	-3.50000	0.00000	0.00000	-0.04042	I
284	19.00000	16.0000	-3.50000	0.00000	0.00000	-0.05736	I
285	21.00000	16.0000	-3.50000	0.00000	0.00000	-0.08144	I
286	23.00000	16.0000	-3.50000	0.00000	0.00000	-0.11600	I
287	25.00000	16.0000	-3.50000	0.00000	0.00000	-0.16612	I
288	27.00000	16.0000	-3.50000	0.00000	0.00000	-0.23965	I
289	29.00000	16.0000	-3.50000	0.00000	0.00000	-0.34856	I
290	31.00000	16.0000	-3.50000	0.00000	0.00000	-0.51013	I
291	33.00000	16.0000	-3.50000	0.00000	0.00000	-0.74477	I
292	35.00000	16.0000	-3.50000	0.00000	0.00000	-1.06067	I
293	37.00000	16.0000	-3.50000	0.00000	0.00000	-1.40075	I
294	39.00000	16.0000	-3.50000	0.00000	0.00000	-1.52862	I
295	41.00000	16.0000	-3.50000	0.00000	0.00000	-1.27738	I
296	43.00000	16.0000	-3.50000	0.00000	0.00000	-0.91163	I
297	45.00000	16.0000	-3.50000	0.00000	0.00000	-0.61396	I
298	47.00000	16.0000	-3.50000	0.00000	0.00000	-0.41047	I
299	49.00000	16.0000	-3.50000	0.00000	0.00000	-0.27727	I
300	51.00000	16.0000	-3.50000	0.00000	0.00000	-0.18974	I
301	53.00000	16.0000	-3.50000	0.00000	0.00000	-0.13129	I
302	55.00000	16.0000	-3.50000	0.00000	0.00000	-0.09159	I
303	15.00000	18.0000	-3.50000	0.00000	0.00000	-0.03046	I
304	17.00000	18.0000	-3.50000	0.00000	0.00000	-0.04358	I
305	19.00000	18.0000	-3.50000	0.00000	0.00000	-0.06233	I
306	21.00000	18.0000	-3.50000	0.00000	0.00000	-0.08947	I
307	23.00000	18.0000	-3.50000	0.00000	0.00000	-0.12931	I
308	25.00000	18.0000	-3.50000	0.00000	0.00000	-0.18898	I
309	27.00000	18.0000	-3.50000	0.00000	0.00000	-0.28064	I
310	29.00000	18.0000	-3.50000	0.00000	0.00000	-0.42602	I
311	31.00000	18.0000	-3.50000	0.00000	0.00000	-0.66528	I
312	33.00000	18.0000	-3.50000	0.00000	0.00000	-1.07032	I
313	35.00000	18.0000	-3.50000	0.00000	0.00000	-1.74705	I
314	37.00000	18.0000	-3.50000	0.00000	0.00000	-2.78200	I
315	39.00000	18.0000	-3.50000	0.00000	0.00000	-3.70698	I
316	41.00000	18.0000	-3.50000	0.00000	0.00000	-2.39580	I
317	43.00000	18.0000	-3.50000	0.00000	0.00000	-1.41003	I
318	45.00000	18.0000	-3.50000	0.00000	0.00000	-0.82453	I
319	47.00000	18.0000	-3.50000	0.00000	0.00000	-0.50628	I

Oasys

GEOTECHNICAL AND ENVIRONMENTAL ASSOCIATES LTD

7 Denmark Street, London WC2H 8LZ
Combined lateral and horizontal movements

Job No.	Sheet No.	Rev.
J18119		

Drg. Ref.		

Made by ML	Date 02-Oct-2018	Checked

Ref.	Coordinates			Displacements		
	x [m]	y [m]	z [m]	x [mm]	y [mm]	z [mm]
320	49.00000	18.00000	-3.50000	0.00000	0.00000	-0.32507
321	51.00000	18.00000	-3.50000	0.00000	0.00000	-0.21544
322	53.00000	18.00000	-3.50000	0.00000	0.00000	-0.14591
323	55.00000	18.00000	-3.50000	0.00000	0.00000	-0.10027
324	15.00000	20.00000	-3.50000	0.00000	0.00000	-0.03167
325	17.00000	20.00000	-3.50000	0.00000	0.00000	-0.04547
326	19.00000	20.00000	-3.50000	0.00000	0.00000	-0.06536
327	21.00000	20.00000	-3.50000	0.00000	0.00000	-0.09445
328	23.00000	20.00000	-3.50000	0.00000	0.00000	-0.13780
329	25.00000	20.00000	-3.50000	0.00000	0.00000	-0.20411
330	27.00000	20.00000	-3.50000	0.00000	0.00000	-0.30937
331	29.00000	20.00000	-3.50000	0.00000	0.00000	-0.48555
332	31.00000	20.00000	-3.50000	0.00000	0.00000	-0.80391
333	33.00000	20.00000	-3.50000	0.00000	0.00000	-1.43881
334	35.00000	20.00000	-3.50000	0.00000	0.00000	-2.78818
335	37.00000	20.00000	-3.50000	0.00000	0.00000	-5.68063
336	39.00000	20.00000	-3.50000	0.00000	0.00000	-6.47502
337	41.00000	20.00000	-3.50000	0.00000	0.00000	-4.86482
338	43.00000	20.00000	-3.50000	0.00000	0.00000	-1.97073
339	45.00000	20.00000	-3.50000	0.00000	0.00000	-0.98998
340	47.00000	20.00000	-3.50000	0.00000	0.00000	-0.57026
341	49.00000	20.00000	-3.50000	0.00000	0.00000	-0.35449
342	51.00000	20.00000	-3.50000	0.00000	0.00000	-0.23057
343	53.00000	20.00000	-3.50000	0.00000	0.00000	-0.15429
344	55.00000	20.00000	-3.50000	0.00000	0.00000	-0.10516
345	15.00000	22.00000	-3.50000	0.00000	0.00000	-0.03192
346	17.00000	22.00000	-3.50000	0.00000	0.00000	-0.04587
347	19.00000	22.00000	-3.50000	0.00000	0.00000	-0.06601
348	21.00000	22.00000	-3.50000	0.00000	0.00000	-0.09555
349	23.00000	22.00000	-3.50000	0.00000	0.00000	-0.13974
350	25.00000	22.00000	-3.50000	0.00000	0.00000	-0.20777
351	27.00000	22.00000	-3.50000	0.00000	0.00000	-0.31690
352	29.00000	22.00000	-3.50000	0.00000	0.00000	-0.50322
353	31.00000	22.00000	-3.50000	0.00000	0.00000	-0.85480
354	33.00000	22.00000	-3.50000	0.00000	0.00000	-1.64108
355	35.00000	22.00000	-3.50000	0.00000	0.00000	-4.27557
356	37.00000	22.00000	-3.50000	0.00000	0.00000	-6.51965
357	39.00000	22.00000	-3.50000	0.00000	0.00000	-6.70047
358	41.00000	22.00000	-3.50000	0.00000	0.00000	-4.28754
359	43.00000	22.00000	-3.50000	0.00000	0.00000	-1.95026
360	45.00000	22.00000	-3.50000	0.00000	0.00000	-0.98528
361	47.00000	22.00000	-3.50000	0.00000	0.00000	-0.57024
362	49.00000	22.00000	-3.50000	0.00000	0.00000	-0.35505
363	51.00000	22.00000	-3.50000	0.00000	0.00000	-0.23105
364	53.00000	22.00000	-3.50000	0.00000	0.00000	-0.15464
365	55.00000	22.00000	-3.50000	0.00000	0.00000	-0.10539
366	15.00000	24.00000	-3.50000	0.00000	0.00000	-0.03118
367	17.00000	24.00000	-3.50000	0.00000	0.00000	-0.04471
368	19.00000	24.00000	-3.50000	0.00000	0.00000	-0.06417
369	21.00000	24.00000	-3.50000	0.00000	0.00000	-0.09254
370	23.00000	24.00000	-3.50000	0.00000	0.00000	-0.13466
371	25.00000	24.00000	-3.50000	0.00000	0.00000	-0.19880
372	27.00000	24.00000	-3.50000	0.00000	0.00000	-0.29999
373	29.00000	24.00000	-3.50000	0.00000	0.00000	-0.46816
374	31.00000	24.00000	-3.50000	0.00000	0.00000	-0.76995
375	33.00000	24.00000	-3.50000	0.00000	0.00000	-1.36988
376	35.00000	24.00000	-3.50000	0.00000	0.00000	-2.58958
377	37.00000	24.00000	-3.50000	0.00000	0.00000	-4.50890
378	39.00000	24.00000	-3.50000	0.00000	0.00000	-4.75150
379	41.00000	24.00000	-3.50000	0.00000	0.00000	-2.26942
380	43.00000	24.00000	-3.50000	0.00000	0.00000	-1.38015
381	45.00000	24.00000	-3.50000	0.00000	0.00000	-0.82094
382	47.00000	24.00000	-3.50000	0.00000	0.00000	-0.50783
383	49.00000	24.00000	-3.50000	0.00000	0.00000	-0.32698
384	51.00000	24.00000	-3.50000	0.00000	0.00000	-0.21691
385	53.00000	24.00000	-3.50000	0.00000	0.00000	-0.14693
386	55.00000	24.00000	-3.50000	0.00000	0.00000	-0.10096
387	15.00000	26.00000	-3.50000	0.00000	0.00000	-0.02952
388	17.00000	26.00000	-3.50000	0.00000	0.00000	-0.04213
389	19.00000	26.00000	-3.50000	0.00000	0.00000	-0.06009
390	21.00000	26.00000	-3.50000	0.00000	0.00000	-0.08591
391	23.00000	26.00000	-3.50000	0.00000	0.00000	-0.12356
392	25.00000	26.00000	-3.50000	0.00000	0.00000	-0.17938
393	27.00000	26.00000	-3.50000	0.00000	0.00000	-0.26404
394	29.00000	26.00000	-3.50000	0.00000	0.00000	-0.39594
395	31.00000	26.00000	-3.50000	0.00000	0.00000	-0.60702
396	33.00000	26.00000	-3.50000	0.00000	0.00000	-0.94480
397	35.00000	26.00000	-3.50000	0.00000	0.00000	-1.43007
398	37.00000	26.00000	-3.50000	0.00000	0.00000	-1.89791
399	39.00000	26.00000	-3.50000	0.00000	0.00000	-1.45612
400	41.00000	26.00000	-3.50000	0.00000	0.00000	-1.29189
401	43.00000	26.00000	-3.50000	0.00000	0.00000	-0.91816
402	45.00000	26.00000	-3.50000	0.00000	0.00000	-0.61983
403	47.00000	26.00000	-3.50000	0.00000	0.00000	-0.41532
404	49.00000	26.00000	-3.50000	0.00000	0.00000	-0.28080
405	51.00000	26.00000	-3.50000	0.00000	0.00000	-0.19216
406	53.00000	26.00000	-3.50000	0.00000	0.00000	-0.13291
407	55.00000	26.00000	-3.50000	0.00000	0.00000	-0.09267
408	15.00000	28.00000	-3.50000	0.00000	0.00000	-0.02713
409	17.00000	28.00000	-3.50000	0.00000	0.00000	-0.03845
410	19.00000	28.00000	-3.50000	0.00000	0.00000	-0.05432
411	21.00000	28.00000	-3.50000	0.00000	0.00000	-0.07671
412	23.00000	28.00000	-3.50000	0.00000	0.00000	-0.10848
413	25.00000	28.00000	-3.50000	0.00000	0.00000	-0.15391
414	27.00000	28.00000	-3.50000	0.00000	0.00000	-0.21924
415	29.00000	28.00000	-3.50000	0.00000	0.00000	-0.31325
416	31.00000	28.00000	-3.50000	0.00000	0.00000	-0.44634
417	33.00000	28.00000	-3.50000	0.00000	0.00000	-0.62352
418	35.00000	28.00000	-3.50000	0.00000	0.00000	-0.82236
419	37.00000	28.00000	-3.50000	0.00000	0.00000	-0.95901
420	39.00000	28.00000	-3.50000	0.00000	0.00000	-0.92569
421	41.00000	28.00000	-3.50000	0.00000	0.00000	-0.78034
422	43.00000	28.00000	-3.50000	0.00000	0.00000	-0.60807
423	45.00000	28.00000	-3.50000	0.00000	0.00000	-0.44877
424	47.00000	28.00000	-3.50000	0.00000	0.00000	-0.32226
425	49.00000	28.00000	-3.50000	0.00000	0.00000	-0.22901
426	51.00000	28.00000	-3.50000	0.00000	0.00000	-0.16238
427	53.00000	28.00000	-3.50000	0.00000	0.00000	-0.11522
428	55.00000	28.00000	-3.50000	0.00000	0.00000	-0.08186
429	15.00000	30.00000	-3.50000	0.00000	0.00000	-0.02423
430	17.00000	30.00000	-3.50000	0.00000	0.00000	-0.03405
431	19.00000	30.00000	-3.50000	0.00000	0.00000	-0.04755
432	21.00000	30.00000	-3.50000	0.00000	0.00000	-0.06615
433	23.00000	30.00000	-3.50000	0.00000	0.00000	-0.09174
434	25.00000	30.00000	-3.50000	0.00000	0.00000	-0.12683
435	27.00000	30.00000	-3.50000	0.00000	0.00000	-0.17454
436	29.00000	30.00000	-3.50000	0.00000	0.00000	-0.23806
437	31.00000	30.00000	-3.50000	0.00000	0.00000	-0.31897

Oasys	GEOTECHNICAL AND ENVIRONMENTALASSOCIATES LTD	Job No. J18119	Sheet No.	Rev.
7 Denmark Street, London WC2H 8LZ	Drg. Ref.			
Combined lateral and horizontal movements				
	Made by ML	Date 02-Oct-2018	Checked	

```
Ref.      Coordinates              Displacements
        x       y       z       x       y       z
       [m]     [m]     [m]     [mm]    [mm]    [mm]

 438 33.00000 30.00000 -3.50000 0.00000 0.00000 -0.41288                    I
 439 35.00000 30.00000 -3.50000 0.00000 0.00000 -0.50281                    I
 440 37.00000 30.00000 -3.50000 0.00000 0.00000 -0.55737                    I
 441 39.00000 30.00000 -3.50000 0.00000 0.00000 -0.55077                    I
 442 41.00000 30.00000 -3.50000 0.00000 0.00000 -0.49161                    I
 443 43.00000 30.00000 -3.50000 0.00000 0.00000 -0.40718                    I
 444 45.00000 30.00000 -3.50000 0.00000 0.00000 -0.31979                    I
 445 47.00000 30.00000 -3.50000 0.00000 0.00000 -0.24259                    I
 446 49.00000 30.00000 -3.50000 0.00000 0.00000 -0.18023                    I
 447 51.00000 30.00000 -3.50000 0.00000 0.00000 -0.13230                    I
 448 53.00000 30.00000 -3.50000 0.00000 0.00000 -0.09643                    I
 449 55.00000 30.00000 -3.50000 0.00000 0.00000 -0.06994                    I
 450 15.00000 32.00000 -3.50000 0.00000 0.00000 -0.02106                    I
 451 17.00000 32.00000 -3.50000 0.00000 0.00000 -0.02931                    I
 452 19.00000 32.00000 -3.50000 0.00000 0.00000 -0.04044                    I
 453 21.00000 32.00000 -3.50000 0.00000 0.00000 -0.05536                    I
 454 23.00000 32.00000 -3.50000 0.00000 0.00000 -0.07522                    I
 455 25.00000 32.00000 -3.50000 0.00000 0.00000 -0.10135                    I
 456 27.00000 32.00000 -3.50000 0.00000 0.00000 -0.13502                    I
 457 29.00000 32.00000 -3.50000 0.00000 0.00000 -0.17691                    I
 458 31.00000 32.00000 -3.50000 0.00000 0.00000 -0.22596                    I
 459 33.00000 32.00000 -3.50000 0.00000 0.00000 -0.27768                    I
 460 35.00000 32.00000 -3.50000 0.00000 0.00000 -0.32274                    I
 461 37.00000 32.00000 -3.50000 0.00000 0.00000 -0.34875                    I
 462 39.00000 32.00000 -3.50000 0.00000 0.00000 -0.34719                    I
 463 41.00000 32.00000 -3.50000 0.00000 0.00000 -0.31979                    I
 464 43.00000 32.00000 -3.50000 0.00000 0.00000 -0.27613                    I
 465 45.00000 32.00000 -3.50000 0.00000 0.00000 -0.22677                    I
 466 47.00000 32.00000 -3.50000 0.00000 0.00000 -0.17951                    I
 467 49.00000 32.00000 -3.50000 0.00000 0.00000 -0.13846                    I
 468 51.00000 32.00000 -3.50000 0.00000 0.00000 -0.10488                    I
 469 53.00000 32.00000 -3.50000 0.00000 0.00000 -0.07843                    I
 470 55.00000 32.00000 -3.50000 0.00000 0.00000 -0.05809                    I
 471 15.00000 34.00000 -3.50000 0.00000 0.00000 -0.01783                    I
 472 17.00000 34.00000 -3.50000 0.00000 0.00000 -0.02460                    I
 473 19.00000 34.00000 -3.50000 0.00000 0.00000 -0.03352                    I
 474 21.00000 34.00000 -3.50000 0.00000 0.00000 -0.04516                    I
 475 23.00000 34.00000 -3.50000 0.00000 0.00000 -0.06016                    I
 476 25.00000 34.00000 -3.50000 0.00000 0.00000 -0.07914                    I
 477 27.00000 34.00000 -3.50000 0.00000 0.00000 -0.10245                    I
 478 29.00000 34.00000 -3.50000 0.00000 0.00000 -0.12986                    I
 479 31.00000 34.00000 -3.50000 0.00000 0.00000 -0.15996                    I
 480 33.00000 34.00000 -3.50000 0.00000 0.00000 -0.18965                    I
 481 35.00000 34.00000 -3.50000 0.00000 0.00000 -0.21405                    I
 482 37.00000 34.00000 -3.50000 0.00000 0.00000 -0.22777                    I
 483 39.00000 34.00000 -3.50000 0.00000 0.00000 -0.22740                    I
 484 41.00000 34.00000 -3.50000 0.00000 0.00000 -0.21339                    I
 485 43.00000 34.00000 -3.50000 0.00000 0.00000 -0.18951                    I
 486 45.00000 34.00000 -3.50000 0.00000 0.00000 -0.16078                    I
 487 47.00000 34.00000 -3.50000 0.00000 0.00000 -0.13153                    I
 488 49.00000 34.00000 -3.50000 0.00000 0.00000 -0.10462                    I
 489 51.00000 34.00000 -3.50000 0.00000 0.00000 -0.08144                    I
 490 53.00000 34.00000 -3.50000 0.00000 0.00000 -0.06235                    I
 491 55.00000 34.00000 -3.50000 0.00000 0.00000 -0.04709                    I
 492 15.00000 36.00000 -3.50000 0.00000 0.00000 -0.01474                    I
 493 17.00000 36.00000 -3.50000 0.00000 0.00000 -0.02016                    I
 494 19.00000 36.00000 -3.50000 0.00000 0.00000 -0.02715                    I
 495 21.00000 36.00000 -3.50000 0.00000 0.00000 -0.03604                    I
 496 23.00000 36.00000 -3.50000 0.00000 0.00000 -0.04715                    I
 497 25.00000 36.00000 -3.50000 0.00000 0.00000 -0.06071                    I
 498 27.00000 36.00000 -3.50000 0.00000 0.00000 -0.07670                    I
 499 29.00000 36.00000 -3.50000 0.00000 0.00000 -0.09466                    I
 500 31.00000 36.00000 -3.50000 0.00000 0.00000 -0.11344                    I
 501 33.00000 36.00000 -3.50000 0.00000 0.00000 -0.13111                    I
 502 35.00000 36.00000 -3.50000 0.00000 0.00000 -0.14508                    I
 503 37.00000 36.00000 -3.50000 0.00000 0.00000 -0.15282                    I
 504 39.00000 36.00000 -3.50000 0.00000 0.00000 -0.15277                    I
 505 41.00000 36.00000 -3.50000 0.00000 0.00000 -0.14506                    I
 506 43.00000 36.00000 -3.50000 0.00000 0.00000 -0.13137                    I
 507 45.00000 36.00000 -3.50000 0.00000 0.00000 -0.11416                    I
 508 47.00000 36.00000 -3.50000 0.00000 0.00000 -0.09580                    I
 509 49.00000 36.00000 -3.50000 0.00000 0.00000 -0.07813                    I
 510 51.00000 36.00000 -3.50000 0.00000 0.00000 -0.06225                    I
 511 53.00000 36.00000 -3.50000 0.00000 0.00000 -0.04865                    I
 512 55.00000 36.00000 -3.50000 0.00000 0.00000 -0.03740                    I
 513 15.00000 38.00000 -3.50000 0.00000 0.00000 -0.01188                    I
 514 17.00000 38.00000 -3.50000 0.00000 0.00000 -0.01615                    I
 515 19.00000 38.00000 -3.50000 0.00000 0.00000 -0.02153                    I
 516 21.00000 38.00000 -3.50000 0.00000 0.00000 -0.02821                    I
 517 23.00000 38.00000 -3.50000 0.00000 0.00000 -0.03632                    I
 518 25.00000 38.00000 -3.50000 0.00000 0.00000 -0.04592                    I
 519 27.00000 38.00000 -3.50000 0.00000 0.00000 -0.05685                    I
 520 29.00000 38.00000 -3.50000 0.00000 0.00000 -0.06868                    I
 521 31.00000 38.00000 -3.50000 0.00000 0.00000 -0.08060                    I
 522 33.00000 38.00000 -3.50000 0.00000 0.00000 -0.09143                    I
 523 35.00000 38.00000 -3.50000 0.00000 0.00000 -0.09977                    I
 524 37.00000 38.00000 -3.50000 0.00000 0.00000 -0.10433                    I
 525 39.00000 38.00000 -3.50000 0.00000 0.00000 -0.10436                    I
 526 41.00000 38.00000 -3.50000 0.00000 0.00000 -0.09990                    I
 527 43.00000 38.00000 -3.50000 0.00000 0.00000 -0.09175                    I
 528 45.00000 38.00000 -3.50000 0.00000 0.00000 -0.08116                    I
 529 47.00000 38.00000 -3.50000 0.00000 0.00000 -0.06948                    I
 530 49.00000 38.00000 -3.50000 0.00000 0.00000 -0.05781                    I
 531 51.00000 38.00000 -3.50000 0.00000 0.00000 -0.04696                    I
 532 53.00000 38.00000 -3.50000 0.00000 0.00000 -0.03735                    I
 533 55.00000 38.00000 -3.50000 0.00000 0.00000 -0.02917                    I
 534 15.00000 40.00000 -3.50000 0.00000 0.00000 -0.00934                    I
 535 17.00000 40.00000 -3.50000 0.00000 0.00000 -0.01265                    I
 536 19.00000 40.00000 -3.50000 0.00000 0.00000 -0.01673                    I
 537 21.00000 40.00000 -3.50000 0.00000 0.00000 -0.02168                    I
 538 23.00000 40.00000 -3.50000 0.00000 0.00000 -0.02756                    I
 539 25.00000 40.00000 -3.50000 0.00000 0.00000 -0.03431                    I
 540 27.00000 40.00000 -3.50000 0.00000 0.00000 -0.04178                    I
 541 29.00000 40.00000 -3.50000 0.00000 0.00000 -0.04963                    I
 542 31.00000 40.00000 -3.50000 0.00000 0.00000 -0.05731                    I
 543 33.00000 40.00000 -3.50000 0.00000 0.00000 -0.06411                    I
 544 35.00000 40.00000 -3.50000 0.00000 0.00000 -0.06924                    I
 545 37.00000 40.00000 -3.50000 0.00000 0.00000 -0.07203                    I
 546 39.00000 40.00000 -3.50000 0.00000 0.00000 -0.07208                    I
 547 41.00000 40.00000 -3.50000 0.00000 0.00000 -0.06939                    I
 548 43.00000 40.00000 -3.50000 0.00000 0.00000 -0.06439                    I
 549 45.00000 40.00000 -3.50000 0.00000 0.00000 -0.05774                    I
 550 47.00000 40.00000 -3.50000 0.00000 0.00000 -0.05019                    I
 551 49.00000 40.00000 -3.50000 0.00000 0.00000 -0.04244                    I
 552 51.00000 40.00000 -3.50000 0.00000 0.00000 -0.03502                    I
 553 53.00000 40.00000 -3.50000 0.00000 0.00000 -0.02827                    I
 554 55.00000 40.00000 -3.50000 0.00000 0.00000 -0.02236                    I
 555 15.00000 42.00000 -3.50000 0.00000 0.00000 -0.00715                    I
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Oasys

GEOTECHNICAL AND ENVIRONMENTAL ASSOCIATES LTD

7 Denmark Street, London WC2H 8LZ
Combined lateral and horizontal movements

Job No.	Sheet No.	Rev.
J18119		

Drg. Ref.		

Made by ML	Date 02-Oct-2018	Checked

Ref.	Coordinates			Displacements		
	x [m]	y [m]	z [m]	x [mm]	y [mm]	z [mm]
556	17.00000	42.00000	-3.50000	0.00000	0.00000	-0.00967
557	19.00000	42.00000	-3.50000	0.00000	0.00000	-0.01273
558	21.00000	42.00000	-3.50000	0.00000	0.00000	-0.01637
559	23.00000	42.00000	-3.50000	0.00000	0.00000	-0.02060
560	25.00000	42.00000	-3.50000	0.00000	0.00000	-0.02534
561	27.00000	42.00000	-3.50000	0.00000	0.00000	-0.03046
562	29.00000	42.00000	-3.50000	0.00000	0.00000	-0.03570
563	31.00000	42.00000	-3.50000	0.00000	0.00000	-0.04071
564	33.00000	42.00000	-3.50000	0.00000	0.00000	-0.04507
565	35.00000	42.00000	-3.50000	0.00000	0.00000	-0.04830
566	37.00000	42.00000	-3.50000	0.00000	0.00000	-0.05005
567	39.00000	42.00000	-3.50000	0.00000	0.00000	-0.05009
568	41.00000	42.00000	-3.50000	0.00000	0.00000	-0.04843
569	43.00000	42.00000	-3.50000	0.00000	0.00000	-0.04528
570	45.00000	42.00000	-3.50000	0.00000	0.00000	-0.04102
571	47.00000	42.00000	-3.50000	0.00000	0.00000	-0.03609
572	49.00000	42.00000	-3.50000	0.00000	0.00000	-0.03091
573	51.00000	42.00000	-3.50000	0.00000	0.00000	-0.02583
574	53.00000	42.00000	-3.50000	0.00000	0.00000	-0.02109
575	55.00000	42.00000	-3.50000	0.00000	0.00000	-0.01685
576	15.00000	44.00000	-3.50000	0.00000	0.00000	-0.00529
577	17.00000	44.00000	-3.50000	0.00000	0.00000	-0.00720
578	19.00000	44.00000	-3.50000	0.00000	0.00000	-0.00947
579	21.00000	44.00000	-3.50000	0.00000	0.00000	-0.01213
580	23.00000	44.00000	-3.50000	0.00000	0.00000	-0.01515
581	25.00000	44.00000	-3.50000	0.00000	0.00000	-0.01847
582	27.00000	44.00000	-3.50000	0.00000	0.00000	-0.02199
583	29.00000	44.00000	-3.50000	0.00000	0.00000	-0.02552
584	31.00000	44.00000	-3.50000	0.00000	0.00000	-0.02883
585	33.00000	44.00000	-3.50000	0.00000	0.00000	-0.03166
586	35.00000	44.00000	-3.50000	0.00000	0.00000	-0.03374
587	37.00000	44.00000	-3.50000	0.00000	0.00000	-0.03486
588	39.00000	44.00000	-3.50000	0.00000	0.00000	-0.03489
589	41.00000	44.00000	-3.50000	0.00000	0.00000	-0.03384
590	43.00000	44.00000	-3.50000	0.00000	0.00000	-0.03182
591	45.00000	44.00000	-3.50000	0.00000	0.00000	-0.02905
592	47.00000	44.00000	-3.50000	0.00000	0.00000	-0.02580
593	49.00000	44.00000	-3.50000	0.00000	0.00000	-0.02231
594	51.00000	44.00000	-3.50000	0.00000	0.00000	-0.01882
595	53.00000	44.00000	-3.50000	0.00000	0.00000	-0.01550
596	55.00000	44.00000	-3.50000	0.00000	0.00000	-0.01247
597	15.00000	46.00000	-3.50000	0.00000	0.00000	-0.00375
598	17.00000	46.00000	-3.50000	0.00000	0.00000	-0.00518
599	19.00000	46.00000	-3.50000	0.00000	0.00000	-0.00685
600	21.00000	46.00000	-3.50000	0.00000	0.00000	-0.00878
601	23.00000	46.00000	-3.50000	0.00000	0.00000	-0.01094
602	25.00000	46.00000	-3.50000	0.00000	0.00000	-0.01327
603	27.00000	46.00000	-3.50000	0.00000	0.00000	-0.01569
604	29.00000	46.00000	-3.50000	0.00000	0.00000	-0.01808
605	31.00000	46.00000	-3.50000	0.00000	0.00000	-0.02029
606	33.00000	46.00000	-3.50000	0.00000	0.00000	-0.02215
607	35.00000	46.00000	-3.50000	0.00000	0.00000	-0.02351
608	37.00000	46.00000	-3.50000	0.00000	0.00000	-0.02424
609	39.00000	46.00000	-3.50000	0.00000	0.00000	-0.02426
610	41.00000	46.00000	-3.50000	0.00000	0.00000	-0.02358
611	43.00000	46.00000	-3.50000	0.00000	0.00000	-0.02227
612	45.00000	46.00000	-3.50000	0.00000	0.00000	-0.02045
613	47.00000	46.00000	-3.50000	0.00000	0.00000	-0.01827
614	49.00000	46.00000	-3.50000	0.00000	0.00000	-0.01591
615	51.00000	46.00000	-3.50000	0.00000	0.00000	-0.01351
616	53.00000	46.00000	-3.50000	0.00000	0.00000	-0.01118
617	55.00000	46.00000	-3.50000	0.00000	0.00000	-0.00902
618	15.00000	48.00000	-3.50000	0.00000	0.00000	-0.00249
619	17.00000	48.00000	-3.50000	0.00000	0.00000	-0.00355
620	19.00000	48.00000	-3.50000	0.00000	0.00000	-0.00478
621	21.00000	48.00000	-3.50000	0.00000	0.00000	-0.00617
622	23.00000	48.00000	-3.50000	0.00000	0.00000	-0.00771
623	25.00000	48.00000	-3.50000	0.00000	0.00000	-0.00934
624	27.00000	48.00000	-3.50000	0.00000	0.00000	-0.01101
625	29.00000	48.00000	-3.50000	0.00000	0.00000	-0.01264
626	31.00000	48.00000	-3.50000	0.00000	0.00000	-0.01412
627	33.00000	48.00000	-3.50000	0.00000	0.00000	-0.01536
628	35.00000	48.00000	-3.50000	0.00000	0.00000	-0.01626
629	37.00000	48.00000	-3.50000	0.00000	0.00000	-0.01674
630	39.00000	48.00000	-3.50000	0.00000	0.00000	-0.01676
631	41.00000	48.00000	-3.50000	0.00000	0.00000	-0.01631
632	43.00000	48.00000	-3.50000	0.00000	0.00000	-0.01545
633	45.00000	48.00000	-3.50000	0.00000	0.00000	-0.01424
634	47.00000	48.00000	-3.50000	0.00000	0.00000	-0.01278
635	49.00000	48.00000	-3.50000	0.00000	0.00000	-0.01117
636	51.00000	48.00000	-3.50000	0.00000	0.00000	-0.00951
637	53.00000	48.00000	-3.50000	0.00000	0.00000	-0.00788
638	55.00000	48.00000	-3.50000	0.00000	0.00000	-0.00634
639	15.00000	50.00000	-3.50000	0.00000	0.00000	-0.00149
640	17.00000	50.00000	-3.50000	0.00000	0.00000	-0.00227
641	19.00000	50.00000	-3.50000	0.00000	0.00000	-0.00316
642	21.00000	50.00000	-3.50000	0.00000	0.00000	-0.00416
643	23.00000	50.00000	-3.50000	0.00000	0.00000	-0.00525
644	25.00000	50.00000	-3.50000	0.00000	0.00000	-0.00639
645	27.00000	50.00000	-3.50000	0.00000	0.00000	-0.00755
646	29.00000	50.00000	-3.50000	0.00000	0.00000	-0.00866
647	31.00000	50.00000	-3.50000	0.00000	0.00000	-0.00967
648	33.00000	50.00000	-3.50000	0.00000	0.00000	-0.01050
649	35.00000	50.00000	-3.50000	0.00000	0.00000	-0.01110
650	37.00000	50.00000	-3.50000	0.00000	0.00000	-0.01142
651	39.00000	50.00000	-3.50000	0.00000	0.00000	-0.01143
652	41.00000	50.00000	-3.50000	0.00000	0.00000	-0.01114
653	43.00000	50.00000	-3.50000	0.00000	0.00000	-0.01056
654	45.00000	50.00000	-3.50000	0.00000	0.00000	-0.00975
655	47.00000	50.00000	-3.50000	0.00000	0.00000	-0.00876
656	49.00000	50.00000	-3.50000	0.00000	0.00000	-0.00766
657	51.00000	50.00000	-3.50000	0.00000	0.00000	-0.00651
658	53.00000	50.00000	-3.50000	0.00000	0.00000	-0.00537
659	55.00000	50.00000	-3.50000	0.00000	0.00000	-0.00428
660	25.70000	33.20000	-1.00000	0.00000	0.00000	-0.09641
661	24.85000	32.56667	-1.00000	0.00000	0.00000	-0.09268
662	24.00000	31.93333	-1.00000	0.00000	0.00000	-0.08807
663	23.15000	31.30000	-1.00000	0.00000	0.00000	-0.08279
664	22.30000	30.66667	-1.00000	0.00000	0.00000	-0.07704
665	21.45000	30.03333	-1.00000	0.00000	0.00000	-0.07102
666	20.60000	29.40000	-1.00000	0.00000	0.00000	-0.06490

1 - Data point coincident with displacement data. Its displacement has been added to those calculated by Xdisp.
2 - Data point coincident with horizontal movement calculation point for a specific building. Its displacement has been added before performing building damage calculations.
6 - Data point coincident with vertical movement calculation point for a specific building. Its displacement has been added before performing building damage calculations.

Vertical Ground Movement Curves (Excavations)

Curve Name: No vertical ground movement

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GEOTECHNICAL AND ENVIRONMENTAL ASSOCIATES LTD J18119

7 Denmark Street, London WC2H 8LZ
Combined lateral and horizontal movements

Job No.	Sheet No.	Rev.

Drg. Ref.		

Made by ML	Date 02-Oct-2018	Checked

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

Coordinates: [Distance from wall / wall depth or max. excavation depth (x), Depth / wall depth or max. excavation depth (y), Settlement / wall depth or max. excavation depth (z)(%)]
[0.000,0.000,0.000][1.000,0.000,0.000][0.000,1.000,0.000][1.000,1.000,0.000]

Curve Fitting Method: Polynomial
x Order: 1
y Order: 0
Polynomial: z = 0.0x + 0.0
Coeff. of Determination: -2147483648.E+2147483647

Horizontal Ground Movement Curves (Excavations)

Curve Name: Installation of underpins
Coordinates: [Distance from wall / wall depth or max. excavation depth (x), Depth / wall depth or max. excavation depth (y), Horizontal movement / wall depth or max. excavation depth (z)(%)]
[0.000,0.000,0.150][1.500,0.000,0.000]

Curve Fitting Method: Polynomial
x Order: 1
y Order: 0
Polynomial: z = -10.0E-2x + 1.50E-1
Coeff. of Determination: 1.00

Polygonal Excavations

Excavation Name: Basement Excavation
Surface level [m]: 0.0
Contribution: Positive
Enabled: Yes
Surface movement curves which are selected are applied between surface and [m]: -3.5000

Corner	x	y	Base Level	Stiffened	Previous Side			Next Side		
					d	p1	p2*	d	p1	p2*
	[m]	[m]	[m]		[m]	[%]	[%]	[m]	[%]	[%]
1	34.000	22.600	-3.5000	Yes	0.0	67.000	25.000	0.0	67.000	25.000
2	38.500	17.700	-3.5000	Yes	0.0	67.000	25.000	0.0	67.000	25.000
3	43.100	21.100	-1.1900	Yes	0.0	67.000	25.000	0.0	67.000	25.000
4	39.100	26.100	-3.5000	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	34.000	22.600	38.500	17.700	No vertical ground movement	Installation of underpins
2	38.500	17.700	43.100	21.100	No vertical ground movement	Installation of underpins
3	43.100	21.100	39.100	26.100	No vertical ground movement	Installation of underpins
4	39.100	26.100	34.000	22.600	No vertical ground movement	Installation of underpins

Damage Category Strains

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

Specific Structures - Geometry

Structure Name	Sub-Structure Name	Displacement Line	Start Distance Along Line	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]	[mm]			
No 6 Denmark Street	No6 A	No6 A	0.00000	15.46000	0.0	0.10000	Burland Strain Limits	0.20000	2.6000
No 6 Denmark Street	No6 B	No6 B	0.00000	4.80000	0.0	0.10000	Burland Strain Limits	0.20000	2.6000
No 6 Denmark Street	No6 C	No6 C	0.00000	5.99000	0.0	0.10000	Burland Strain Limits	0.20000	2.6000
No 6 Denmark Street	No6 D	No6 D	0.00000	4.58000	0.0	0.10000	Burland Strain Limits	0.20000	2.6000
No 6 Denmark Street	No6 E	No7 E	0.00000	15.86000	0.0	0.10000	Burland Strain Limits	0.20000	2.6000
No 6 Denmark Street	No6 F	No8 F	0.00000	6.26000	0.0	0.10000	Burland Strain Limits	0.20000	2.6000
No 9 Denmark Street	No9 A	No9 A	0.00000	12.68000	0.0	0.10000	Burland Strain Limits	0.20000	2.6000
No 9 Denmark Street	No9 B	No9 B	0.00000	7.62000	0.0	0.10000	Burland Strain Limits	0.20000	2.6000
No 8 Denmark Street	No8 A	No8 A	0.00000	6.36000	0.0	0.10000	Burland Strain Limits	0.20000	2.6000
122 Charing Cross Rd	122A	122A	0.00000	14.92000	0.0	0.10000	Burland Strain Limits	0.20000	2.6000
122 Charing Cross Rd	122B	122B	0.00000	11.24000	0.0	0.10000	Burland Strain Limits	0.20000	2.6000
No 7 Retained	No7 A	No7 A	0.00000	13.46000	0.0	0.10000	Burland Strain Limits	0.20000	2.6000
No 7 Retained	No7 B	No7 B	0.00000	6.10000	0.0	0.10000	Burland Strain Limits	0.20000	2.6000
No 7 Retained	No7 C	No7 C	0.00000	13.86000	0.0	0.10000	Burland Strain Limits	0.20000	2.6000
No 7 Retained	No7 D	No7 D	0.00000	6.48000	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]		[m³]	[m]	[m]	[m³]	[m]	[m]
No 6 Denmark Street	No6 A	15.000	Yes	1125.0	15.000	15.000	281.25	7.5000	7.5000
No 6 Denmark Street	No6 B	9.0000	Yes	243.00	9.0000	9.0000	60.750	4.5000	4.5000
No 6 Denmark Street	No6 C	9.0000	Yes	243.00	9.0000	9.0000	60.750	4.5000	4.5000
No 6 Denmark Street	No6 D	9.0000	Yes	243.00	9.0000	9.0000	60.750	4.5000	4.5000
No 6 Denmark Street	No6 E	15.000	Yes	1125.0	15.000	15.000	281.25	7.5000	7.5000
No 6 Denmark Street	No6 F	15.000	Yes	1125.0	15.000	15.000	281.25	7.5000	7.5000
No 9 Denmark Street	No9 A	18.000	Yes	1944.0	18.000	18.000	486.00	9.0000	9.0000
No 9 Denmark Street	No9 B	18.000	Yes	1944.0	18.000	18.000	486.00	9.0000	9.0000
No 8 Denmark Street	No8 A	18.000	Yes	1944.0	18.000	18.000	486.00	9.0000	9.0000

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7 Denmark Street, London WC2H 8LZ
Combined lateral and horizontal movements

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Structure Name	Sub-Structure Name	Height	Default Properties	Hogging 2nd Moment of Area	Hogging Distance of Bending	Hogging Distance of N.A.	Sagging 2nd Moment of Area	Sagging Distance of Bending	Sagging Distance of N.A.
Street									
122 Charing Cross Rd	122A	18.000	Yes	1944.0	18.000	18.000	486.00	9.0000	9.0000
122 Charing Cross Rd	122B	18.000	Yes	1944.0	18.000	18.000	486.00	9.0000	9.0000
No 7 Retained	No7 A	15.000	Yes	1125.0	15.000	15.000	281.25	7.5000	7.5000
No 7 Retained	No7 B	15.000	Yes	1125.0	15.000	15.000	281.25	7.5000	7.5000
No 7 Retained	No7 C	15.000	Yes	1125.0	15.000	15.000	281.25	7.5000	7.5000
No 7 Retained	No7 D	15.000	Yes	1125.0	15.000	15.000	281.25	7.5000	7.5000

Building Segment Combinations

Structure Name	Sub-Structure Name	Vertical Offset from Line for Vertical Movement Calculations [m]	Segment Start [m]	Length [m]	Curvature	Combined Segment

No structures have segments combined.

Utility Strain Calculation Options

Neglect beneficial contribution of axial strains : No

Displacement and Strain Results

Type/No. Name	Dist. [m]	Coordinates x [m]	Coordinates y [m]	Coordinates z [m]	Displacements x [mm]	Displacements y [mm]	Displacements z [mm]	Horizontal displacement along Line [mm]	Horizontal displacement perpendicular to Line [mm]	Angle of Line to x Axis [°]
Grid 1 Grid 1	15.00000	0.00000	0.00000	0.0	0.0	0.0	-	-	-	
	17.00000	0.00000	0.00000	0.0	0.0	0.0	-	-	-	
	19.00000	0.00000	0.00000	0.0	0.0	0.0	-	-	-	
	21.00000	0.00000	0.00000	0.0	0.0	0.0	-	-	-	
	23.00000	0.00000	0.00000	0.0	0.0	0.0	-	-	-	
	25.00000	0.00000	0.00000	0.0	0.0	0.0	-	-	-	
	27.00000	0.00000	0.00000	0.0	0.0	0.0	-	-	-	
	29.00000	0.00000	0.00000	0.0	0.0	0.0	-	-	-	
	31.00000	0.00000	0.00000	0.0	0.0	0.0	-	-	-	
	33.00000	0.00000	0.00000	0.0	0.0	0.0	-	-	-	
	35.00000	0.00000	0.00000	0.0	0.0	0.0	-	-	-	
	37.00000	0.00000	0.00000	0.0	0.0	0.0	-	-	-	
	39.00000	0.00000	0.00000	0.0	0.0	0.0	-	-	-	
	41.00000	0.00000	0.00000	0.0	0.0	0.0	-	-	-	
	43.00000	0.00000	0.00000	0.0	0.0	0.0	-	-	-	
	45.00000	0.00000	0.00000	0.0	0.0	0.0	-	-	-	
	47.00000	0.00000	0.00000	0.0	0.0	0.0	-	-	-	
	49.00000	0.00000	0.00000	0.0	0.0	0.0	-	-	-	
	51.00000	0.00000	0.00000	0.0	0.0	0.0	-	-	-	
	53.00000	0.00000	0.00000	0.0	0.0	0.0	-	-	-	
	55.00000	0.00000	0.00000	0.0	0.0	0.0	-	-	-	
	15.00000	2.00000	0.00000	0.0	0.0	0.0	-	-	-	
	17.00000	2.00000	0.00000	0.0	0.0	0.0	-	-	-	
	19.00000	2.00000	0.00000	0.0	0.0	0.0	-	-	-	
	21.00000	2.00000	0.00000	0.0	0.0	0.0	-	-	-	
	23.00000	2.00000	0.00000	0.0	0.0	0.0	-	-	-	
	25.00000	2.00000	0.00000	0.0	0.0	0.0	-	-	-	
	27.00000	2.00000	0.00000	0.0	0.0	0.0	-	-	-	
	29.00000	2.00000	0.00000	0.0	0.0	0.0	-	-	-	
	31.00000	2.00000	0.00000	0.0	0.0	0.0	-	-	-	
	33.00000	2.00000	0.00000	0.0	0.0	0.0	-	-	-	
	35.00000	2.00000	0.00000	0.0	0.0	0.0	-	-	-	
	37.00000	2.00000	0.00000	0.0	0.0	0.0	-	-	-	
	39.00000	2.00000	0.00000	0.0	0.0	0.0	-	-	-	
	41.00000	2.00000	0.00000	0.0	0.0	0.0	-	-	-	
	43.00000	2.00000	0.00000	0.0	0.0	0.0	-	-	-	
	45.00000	2.00000	0.00000	0.0	0.0	0.0	-	-	-	
	47.00000	2.00000	0.00000	0.0	0.0	0.0	-	-	-	
	49.00000	2.00000	0.00000	0.0	0.0	0.0	-	-	-	
	51.00000	2.00000	0.00000	0.0	0.0	0.0	-	-	-	
	53.00000	2.00000	0.00000	0.0	0.0	0.0	-	-	-	
	55.00000	2.00000	0.00000	0.0	0.0	0.0	-	-	-	
	15.00000	4.00000	0.00000	0.0	0.0	0.0	-	-	-	
	17.00000	4.00000	0.00000	0.0	0.0	0.0	-	-	-	
	19.00000	4.00000	0.00000	0.0	0.0	0.0	-	-	-	
	21.00000	4.00000	0.00000	0.0	0.0	0.0	-	-	-	
	23.00000	4.00000	0.00000	0.0	0.0	0.0	-	-	-	
	25.00000	4.00000	0.00000	0.0	0.0	0.0	-	-	-	
	27.00000	4.00000	0.00000	0.0	0.0	0.0	-	-	-	
	29.00000	4.00000	0.00000	0.0	0.0	0.0	-	-	-	
	31.00000	4.00000	0.00000	0.0	0.0	0.0	-	-	-	
	33.00000	4.00000	0.00000	0.0	0.0	0.0	-	-	-	
	35.00000	4.00000	0.00000	0.0	0.0	0.0	-	-	-	
	37.00000	4.00000	0.00000	0.0	0.0	0.0	-	-	-	
	39.00000	4.00000	0.00000	0.0	0.0	0.0	-	-	-	
	41.00000	4.00000	0.00000	0.0	0.0	0.0	-	-	-	
	43.00000	4.00000	0.00000	0.0	0.0	0.0	-	-	-	
	45.00000	4.00000	0.00000	0.0	0.0	0.0	-	-	-	
	47.00000	4.00000	0.00000	0.0	0.0	0.0	-	-	-	
	49.00000	4.00000	0.00000	0.0	0.0	0.0	-	-	-	
	51.00000	4.00000	0.00000	0.0	0.0	0.0	-	-	-	
	53.00000	4.00000	0.00000	0.0	0.0	0.0	-	-	-	
	55.00000	4.00000	0.00000	0.0	0.0	0.0	-	-	-	
	15.00000	6.00000	0.00000	0.0	0.0	0.0	-	-	-	
	17.00000	6.00000	0.00000	0.0	0.0	0.0	-	-	-	
	19.00000	6.00000	0.00000	0.0	0.0	0.0	-	-	-	
	21.00000	6.00000	0.00000	0.0	0.0	0.0	-	-	-	
	23.00000	6.00000	0.00000	0.0	0.0	0.0	-	-	-	
	25.00000	6.00000	0.00000	0.0	0.0	0.0	-	-	-	
	27.00000	6.00000	0.00000	0.0	0.0	0.0	-	-	-	
	29.00000	6.00000	0.00000	0.0	0.0	0.0	-	-	-	
	31.00000	6.00000	0.00000	0.0	0.0	0.0	-	-	-	
	33.00000	6.00000	0.00000	0.0	0.0	0.0	-	-	-	
	35.00000	6.00000	0.00000	0.0	0.0	0.0	-	-	-	
	37.00000	6.00000	0.00000	0.0	0.0	0.0	-	-	-	
	39.00000	6.00000	0.00000	0.0	0.0	0.0	-	-	-	
	41.00000	6.00000	0.00000	0.0	0.0	0.0	-	-	-	
	43.00000	6.00000	0.00000	0.0	0.0	0.0	-	-	-	
	45.00000	6.00000	0.00000	0.0	0.0	0.0	-	-	-	
	47.00000	6.00000	0.00000	0.0	0.0	0.0	-	-	-	
	49.00000	6.00000	0.00000	0.0	0.0	0.0	-	-	-	
	51.00000	6.00000	0.00000	0.0	0.0	0.0	-	-	-	
	53.00000	6.00000	0.00000	0.0	0.0	0.0	-	-	-	
	55.00000	6.00000	0.00000	0.0	0.0	0.0	-	-	-	
	15.00000	8.00000	0.00000	0.0	0.0	0.0	-	-	-	
	17.00000	8.00000	0.00000	0.0	0.0	0.0	-	-	-	
	19.00000	8.00000	0.00000	0.0	0.0	0.0	-	-	-	
	21.00000	8.00000	0.00000	0.0	0.0	0.0	-	-	-	
	23.00000	8.00000	0.00000	0.0	0.0	0.0	-	-	-	
	25.00000	8.00000	0.00000	0.0	0.0	0.0	-	-	-	
	27.00000	8.00000	0.00000	0.0	0.0	0.0	-	-	-	
	29.00000	8.00000	0.00000	0.0	0.0	0.0	-	-	-	

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Made by	Date	Checked
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Type/No.		Coordinates			Displacements			Horizontal displacement	Horizontal displacement	Angle of Line to x Axis
Name	Dist.	x	y	z	x	y	z			
		31.00000	8.00000	0.00000	0.0	0.0	0.0	–	–	–
		33.00000	8.00000	0.00000	0.0	0.0	0.0	–	–	–
		35.00000	8.00000	0.00000	0.0	0.0	0.0	–	–	–
		37.00000	8.00000	0.00000	0.0	0.0	0.0	–	–	–
		39.00000	8.00000	0.00000	0.0	0.0	0.0	–	–	–
		41.00000	8.00000	0.00000	0.0	0.0	0.0	–	–	–
		43.00000	8.00000	0.00000	0.0	0.0	0.0	–	–	–
		45.00000	8.00000	0.00000	0.0	0.0	0.0	–	–	–
		47.00000	8.00000	0.00000	0.0	0.0	0.0	–	–	–
		49.00000	8.00000	0.00000	0.0	0.0	0.0	–	–	–
		51.00000	8.00000	0.00000	0.0	0.0	0.0	–	–	–
		53.00000	8.00000	0.00000	0.0	0.0	0.0	–	–	–
		55.00000	8.00000	0.00000	0.0	0.0	0.0	–	–	–
		15.00000	10.00000	0.00000	0.0	0.0	0.0	–	–	–
		17.00000	10.00000	0.00000	0.0	0.0	0.0	–	–	–
		19.00000	10.00000	0.00000	0.0	0.0	0.0	–	–	–
		21.00000	10.00000	0.00000	0.0	0.0	0.0	–	–	–
		23.00000	10.00000	0.00000	0.0	0.0	0.0	–	–	–
		25.00000	10.00000	0.00000	0.0	0.0	0.0	–	–	–
		27.00000	10.00000	0.00000	0.0	0.0	0.0	–	–	–
		29.00000	10.00000	0.00000	0.0	0.0	0.0	–	–	–
		31.00000	10.00000	0.00000	0.0	0.0	0.0	–	–	–
		33.00000	10.00000	0.00000	0.0	0.0	0.0	–	–	–
		35.00000	10.00000	0.00000	0.0	0.0	0.0	–	–	–
		37.00000	10.00000	0.00000	0.0	0.0	0.0	–	–	–
		39.00000	10.00000	0.00000	0.0	0.0	0.0	–	–	–
		41.00000	10.00000	0.00000	0.0	0.0	0.0	–	–	–
		43.00000	10.00000	0.00000	0.0	0.0	0.0	–	–	–
		45.00000	10.00000	0.00000	0.0	0.0	0.0	–	–	–
		47.00000	10.00000	0.00000	0.0	0.0	0.0	–	–	–
		49.00000	10.00000	0.00000	0.0	0.0	0.0	–	–	–
		51.00000	10.00000	0.00000	0.0	0.0	0.0	–	–	–
		53.00000	10.00000	0.00000	0.0	0.0	0.0	–	–	–
		55.00000	10.00000	0.00000	0.0	0.0	0.0	–	–	–
		15.00000	12.00000	0.00000	0.0	0.0	0.0	–	–	–
		17.00000	12.00000	0.00000	0.0	0.0	0.0	–	–	–
		19.00000	12.00000	0.00000	0.0	0.0	0.0	–	–	–
		21.00000	12.00000	0.00000	0.0	0.0	0.0	–	–	–
		23.00000	12.00000	0.00000	0.0	0.0	0.0	–	–	–
		25.00000	12.00000	0.00000	0.0	0.0	0.0	–	–	–
		27.00000	12.00000	0.00000	0.0	0.0	0.0	–	–	–
		29.00000	12.00000	0.00000	0.0	0.0	0.0	–	–	–
		31.00000	12.00000	0.00000	0.0	0.0	0.0	–	–	–
		33.00000	12.00000	0.00000	0.0	0.0	0.0	–	–	–
		35.00000	12.00000	0.00000	0.0	0.0	0.0	–	–	–
		37.00000	12.00000	0.00000	0.0	0.0	0.0	–	–	–
		39.00000	12.00000	0.00000	0.0	0.0	0.0	–	–	–
		41.00000	12.00000	0.00000	0.0	0.0	0.0	–	–	–
		43.00000	12.00000	0.00000	0.0	0.0	0.0	–	–	–
		45.00000	12.00000	0.00000	0.0	0.0	0.0	–	–	–
		47.00000	12.00000	0.00000	0.0	0.0	0.0	–	–	–
		49.00000	12.00000	0.00000	0.0	0.0	0.0	–	–	–
		51.00000	12.00000	0.00000	0.0	0.0	0.0	–	–	–
		53.00000	12.00000	0.00000	0.0	0.0	0.0	–	–	–
		55.00000	12.00000	0.00000	0.0	0.0	0.0	–	–	–
		15.00000	14.00000	0.00000	0.0	0.0	0.0	–	–	–
		17.00000	14.00000	0.00000	0.0	0.0	0.0	–	–	–
		19.00000	14.00000	0.00000	0.0	0.0	0.0	–	–	–
		21.00000	14.00000	0.00000	0.0	0.0	0.0	–	–	–
		23.00000	14.00000	0.00000	0.0	0.0	0.0	–	–	–
		25.00000	14.00000	0.00000	0.0	0.0	0.0	–	–	–
		27.00000	14.00000	0.00000	0.0	0.0	0.0	–	–	–
		29.00000	14.00000	0.00000	0.0	0.0	0.0	–	–	–
		31.00000	14.00000	0.00000	0.0	0.0	0.0	–	–	–
		33.00000	14.00000	0.00000	0.0	0.0	0.0	–	–	–
		35.00000	14.00000	0.00000	0.072883	0.072361	0.0	–	–	–
		37.00000	14.00000	0.00000	0.28234	0.53331	0.0	–	–	–
		39.00000	14.00000	0.00000	−0.15658	0.67624	0.0	–	–	–
		41.00000	14.00000	0.00000	−0.30250	0.42951	0.0	–	–	–
		43.00000	14.00000	0.00000	0.0	0.0	0.0	–	–	–
		45.00000	14.00000	0.00000	0.0	0.0	0.0	–	–	–
		47.00000	14.00000	0.00000	0.0	0.0	0.0	–	–	–
		49.00000	14.00000	0.00000	0.0	0.0	0.0	–	–	–
		51.00000	14.00000	0.00000	0.0	0.0	0.0	–	–	–
		53.00000	14.00000	0.00000	0.0	0.0	0.0	–	–	–
		55.00000	14.00000	0.00000	0.0	0.0	0.0	–	–	–
		15.00000	16.00000	0.00000	0.0	0.0	0.0	–	–	–
		17.00000	16.00000	0.00000	0.0	0.0	0.0	–	–	–
		19.00000	16.00000	0.00000	0.0	0.0	0.0	–	–	–
		21.00000	16.00000	0.00000	0.0	0.0	0.0	–	–	–
		23.00000	16.00000	0.00000	0.0	0.0	0.0	–	–	–
		25.00000	16.00000	0.00000	0.0	0.0	0.0	–	–	–
		27.00000	16.00000	0.00000	0.0	0.0	0.0	–	–	–
		29.00000	16.00000	0.00000	0.0	0.0	0.0	–	–	–
		31.00000	16.00000	0.00000	0.0	0.0	0.0	–	–	–
		33.00000	16.00000	0.00000	0.036235	0.033277	0.0	–	–	–
		35.00000	16.00000	0.00000	1.1212	1.0297	0.0	–	–	–
		37.00000	16.00000	0.00000	1.3193	1.3656	0.0	–	–	–
		39.00000	16.00000	0.00000	−0.68308	1.6675	0.0	–	–	–
		41.00000	16.00000	0.00000	−1.0647	1.4404	0.0	–	–	–
		43.00000	16.00000	0.00000	0.0	0.0	0.0	–	–	–
		45.00000	16.00000	0.00000	0.0	0.0	0.0	–	–	–
		47.00000	16.00000	0.00000	0.0	0.0	0.0	–	–	–
		49.00000	16.00000	0.00000	0.0	0.0	0.0	–	–	–
		51.00000	16.00000	0.00000	0.0	0.0	0.0	–	–	–
		53.00000	16.00000	0.00000	0.0	0.0	0.0	–	–	–
		55.00000	16.00000	0.00000	0.0	0.0	0.0	–	–	–
		15.00000	18.00000	0.00000	0.0	0.0	0.0	–	–	–
		17.00000	18.00000	0.00000	0.0	0.0	0.0	–	–	–
		19.00000	18.00000	0.00000	0.0	0.0	0.0	–	–	–
		21.00000	18.00000	0.00000	0.0	0.0	0.0	–	–	–
		23.00000	18.00000	0.00000	0.0	0.0	0.0	–	–	–
		25.00000	18.00000	0.00000	0.0	0.0	0.0	–	–	–
		27.00000	18.00000	0.00000	0.0	0.0	0.0	–	–	–
		29.00000	18.00000	0.00000	0.0	0.0	0.0	–	–	–
		31.00000	18.00000	0.00000	0.0	0.0	0.0	–	–	–
		33.00000	18.00000	0.00000	1.0326	0.94832	0.0	–	–	–
		35.00000	18.00000	0.00000	2.1176	1.9447	0.0	–	–	–
		37.00000	18.00000	0.00000	3.2025	2.9411	0.0	–	–	–
		39.00000	18.00000	0.00000	−2.8783	3.8942	0.0	–	–	–
		41.00000	18.00000	0.00000	−1.5926	2.1547	0.0	–	–	–
		43.00000	18.00000	0.00000	−0.30693	0.41526	0.0	–	–	–
		45.00000	18.00000	0.00000	0.0	0.0	0.0	–	–	–
		47.00000	18.00000	0.00000	0.0	0.0	0.0	–	–	–
		49.00000	18.00000	0.00000	0.0	0.0	0.0	–	–	–
		51.00000	18.00000	0.00000	0.0	0.0	0.0	–	–	–
		53.00000	18.00000	0.00000	0.0	0.0	0.0	–	–	–
		55.00000	18.00000	0.00000	0.0	0.0	0.0	–	–	–
		15.00000	20.00000	0.00000	0.0	0.0	0.0	–	–	–
		17.00000	20.00000	0.00000	0.0	0.0	0.0	–	–	–
		19.00000	20.00000	0.00000	0.0	0.0	0.0	–	–	–
		21.00000	20.00000	0.00000	0.0	0.0	0.0	–	–	–
		23.00000	20.00000	0.00000	0.0	0.0	0.0	–	–	–
		25.00000	20.00000	0.00000	0.0	0.0	0.0	–	–	–
		27.00000	20.00000	0.00000	0.0	0.0	0.0	–	–	–
		29.00000	20.00000	0.00000	0.0	0.0	0.0	–	–	–
		31.00000	20.00000	0.00000	0.56826	0.50871	0.0	–	–	–
		33.00000	20.00000	0.00000	2.0290	1.8634	0.0	–	–	–
		35.00000	20.00000	0.00000	3.1140	2.8598	0.0	–	–	–
		37.00000	20.00000	0.00000	Point lies within an excavation.					

Oasys

GEOTECHNICAL AND ENVIRONMENTAL ASSOCIATES LTD J18119

7 Denmark Street, London WC2H 8LZ
Combined lateral and horizontal movements

Job No.	Sheet No.	Rev.

Drg. Ref.

Made by	Date	Checked
ML	02-Oct-2018	

Type/No.		Coordinates			Displacements					Angle of Line
Name	Dist.	x	y	z	x	y	z	Horizontal displacement	Horizontal displacement	to x Axis
		39.00000	20.00000	0.00000		Point lies within an excavation.				
		41.00000	20.00000	0.00000		Point lies within an excavation.				
		43.00000	20.00000	0.00000	-0.83489	1.1296	0.0	-	-	-
		45.00000	20.00000	0.00000	0.0	0.0	0.0	-	-	-
		47.00000	20.00000	0.00000	0.0	0.0	0.0	-	-	-
		49.00000	20.00000	0.00000	0.0	0.0	0.0	-	-	-
		51.00000	20.00000	0.00000	0.0	0.0	0.0	-	-	-
		53.00000	20.00000	0.00000	0.0	0.0	0.0	-	-	-
		55.00000	20.00000	0.00000	0.0	0.0	0.0	-	-	-
		15.00000	22.00000	0.00000	0.0	0.0	0.0	-	-	-
		17.00000	22.00000	0.00000	0.0	0.0	0.0	-	-	-
		19.00000	22.00000	0.00000	0.0	0.0	0.0	-	-	-
		21.00000	22.00000	0.00000	0.0	0.0	0.0	-	-	-
		23.00000	22.00000	0.00000	0.0	0.0	0.0	-	-	-
		25.00000	22.00000	0.00000	0.0	0.0	0.0	-	-	-
		27.00000	22.00000	0.00000	0.0	0.0	0.0	-	-	-
		29.00000	22.00000	0.00000	0.072332	0.018745	0.0	-	-	-
		31.00000	22.00000	0.00000	0.77045	0.28076	0.0	-	-	-
		33.00000	22.00000	0.00000	1.6863	1.2533	0.0	-	-	-
		35.00000	22.00000	0.00000		Point lies within an excavation.				
		37.00000	22.00000	0.00000		Point lies within an excavation.				
		39.00000	22.00000	0.00000		Point lies within an excavation.				
		41.00000	22.00000	0.00000		Point lies within an excavation.				
		43.00000	22.00000	0.00000	-1.3392	-1.0713	0.0	-	-	-
		45.00000	22.00000	0.00000	0.0	0.0	0.0	-	-	-
		47.00000	22.00000	0.00000	0.0	0.0	0.0	-	-	-
		49.00000	22.00000	0.00000	0.0	0.0	0.0	-	-	-
		51.00000	22.00000	0.00000	0.0	0.0	0.0	-	-	-
		53.00000	22.00000	0.00000	0.0	0.0	0.0	-	-	-
		55.00000	22.00000	0.00000	0.0	0.0	0.0	-	-	-
		15.00000	24.00000	0.00000	0.0	0.0	0.0	-	-	-
		17.00000	24.00000	0.00000	0.0	0.0	0.0	-	-	-
		19.00000	24.00000	0.00000	0.0	0.0	0.0	-	-	-
		21.00000	24.00000	0.00000	0.0	0.0	0.0	-	-	-
		23.00000	24.00000	0.00000	0.0	0.0	0.0	-	-	-
		25.00000	24.00000	0.00000	0.0	0.0	0.0	-	-	-
		27.00000	24.00000	0.00000	0.0	0.0	0.0	-	-	-
		29.00000	24.00000	0.00000	0.017619	-0.0069942	0.0	-	-	-
		31.00000	24.00000	0.00000	0.61029	-0.40894	0.0	-	-	-
		33.00000	24.00000	0.00000	1.2139	-1.7379	0.0	-	-	-
		35.00000	24.00000	0.00000	2.6377	-3.8435	0.0	-	-	-
		37.00000	24.00000	0.00000		Point lies within an excavation.				
		39.00000	24.00000	0.00000		Point lies within an excavation.				
		41.00000	24.00000	0.00000	-2.7709	-2.2168	0.0	-	-	-
		43.00000	24.00000	0.00000	-1.0235	-0.81879	0.0	-	-	-
		45.00000	24.00000	0.00000	0.0	0.0	0.0	-	-	-
		47.00000	24.00000	0.00000	0.0	0.0	0.0	-	-	-
		49.00000	24.00000	0.00000	0.0	0.0	0.0	-	-	-
		51.00000	24.00000	0.00000	0.0	0.0	0.0	-	-	-
		53.00000	24.00000	0.00000	0.0	0.0	0.0	-	-	-
		55.00000	24.00000	0.00000	0.0	0.0	0.0	-	-	-
		15.00000	26.00000	0.00000	0.0	0.0	0.0	-	-	-
		17.00000	26.00000	0.00000	0.0	0.0	0.0	-	-	-
		19.00000	26.00000	0.00000	0.0	0.0	0.0	-	-	-
		21.00000	26.00000	0.00000	0.0	0.0	0.0	-	-	-
		23.00000	26.00000	0.00000	0.0	0.0	0.0	-	-	-
		25.00000	26.00000	0.00000	0.0	0.0	0.0	-	-	-
		27.00000	26.00000	0.00000	0.0	0.0	0.0	-	-	-
		29.00000	26.00000	0.00000	0.0	0.0	0.0	-	-	-
		31.00000	26.00000	0.00000	0.24195	-0.31212	0.0	-	-	-
		33.00000	26.00000	0.00000	1.0642	-1.5508	0.0	-	-	-
		35.00000	26.00000	0.00000	1.7046	-2.4838	0.0	-	-	-
		37.00000	26.00000	0.00000	2.3450	-3.4169	0.0	-	-	-
		39.00000	26.00000	0.00000		Point lies within an excavation.				
		41.00000	26.00000	0.00000	-2.4553	-1.9642	0.0	-	-	-
		43.00000	26.00000	0.00000	-0.70781	-0.56625	0.0	-	-	-
		45.00000	26.00000	0.00000	0.0	0.0	0.0	-	-	-
		47.00000	26.00000	0.00000	0.0	0.0	0.0	-	-	-
		49.00000	26.00000	0.00000	0.0	0.0	0.0	-	-	-
		51.00000	26.00000	0.00000	0.0	0.0	0.0	-	-	-
		53.00000	26.00000	0.00000	0.0	0.0	0.0	-	-	-
		55.00000	26.00000	0.00000	0.0	0.0	0.0	-	-	-
		15.00000	28.00000	0.00000	0.0	0.0	0.0	-	-	-
		17.00000	28.00000	0.00000	0.0	0.0	0.0	-	-	-
		19.00000	28.00000	0.00000	0.0	0.0	0.0	-	-	-
		21.00000	28.00000	0.00000	0.0	0.0	0.0	-	-	-
		23.00000	28.00000	0.00000	0.0	0.0	0.0	-	-	-
		25.00000	28.00000	0.00000	0.0	0.0	0.0	-	-	-
		27.00000	28.00000	0.00000	0.0	0.0	0.0	-	-	-
		29.00000	28.00000	0.00000	0.0	0.0	0.0	-	-	-
		31.00000	28.00000	0.00000	0.0	0.0	0.0	-	-	-
		33.00000	28.00000	0.00000	0.13115	-0.19111	0.0	-	-	-
		35.00000	28.00000	0.00000	0.77151	-1.1242	0.0	-	-	-
		37.00000	28.00000	0.00000	1.4119	-2.0573	0.0	-	-	-
		39.00000	28.00000	0.00000	0.20850	-1.4355	0.0	-	-	-
		41.00000	28.00000	0.00000	-1.1903	-1.0788	0.0	-	-	-
		43.00000	28.00000	0.00000	-0.39213	-0.31370	0.0	-	-	-
		45.00000	28.00000	0.00000	0.0	0.0	0.0	-	-	-
		47.00000	28.00000	0.00000	0.0	0.0	0.0	-	-	-
		49.00000	28.00000	0.00000	0.0	0.0	0.0	-	-	-
		51.00000	28.00000	0.00000	0.0	0.0	0.0	-	-	-
		53.00000	28.00000	0.00000	0.0	0.0	0.0	-	-	-
		55.00000	28.00000	0.00000	0.0	0.0	0.0	-	-	-
		15.00000	30.00000	0.00000	0.0	0.0	0.0	-	-	-
		17.00000	30.00000	0.00000	0.0	0.0	0.0	-	-	-
		19.00000	30.00000	0.00000	0.0	0.0	0.0	-	-	-
		21.00000	30.00000	0.00000	0.0	0.0	0.0	-	-	-
		23.00000	30.00000	0.00000	0.0	0.0	0.0	-	-	-
		25.00000	30.00000	0.00000	0.0	0.0	0.0	-	-	-
		27.00000	30.00000	0.00000	0.0	0.0	0.0	-	-	-
		29.00000	30.00000	0.00000	0.0	0.0	0.0	-	-	-
		31.00000	30.00000	0.00000	0.0	0.0	0.0	-	-	-
		33.00000	30.00000	0.00000	0.0	0.0	0.0	-	-	-
		35.00000	30.00000	0.00000	0.0	0.0	0.0	-	-	-
		37.00000	30.00000	0.00000	0.26591	-0.44180	0.0	-	-	-
		39.00000	30.00000	0.00000	0.062452	-0.56935	0.0	-	-	-
		41.00000	30.00000	0.00000	-0.22979	-0.36400	0.0	-	-	-
		43.00000	30.00000	0.00000	0.0	0.0	0.0	-	-	-
		45.00000	30.00000	0.00000	0.0	0.0	0.0	-	-	-
		47.00000	30.00000	0.00000	0.0	0.0	0.0	-	-	-
		49.00000	30.00000	0.00000	0.0	0.0	0.0	-	-	-
		51.00000	30.00000	0.00000	0.0	0.0	0.0	-	-	-
		53.00000	30.00000	0.00000	0.0	0.0	0.0	-	-	-
		55.00000	30.00000	0.00000	0.0	0.0	0.0	-	-	-
		15.00000	32.00000	0.00000	0.0	0.0	0.0	-	-	-
		17.00000	32.00000	0.00000	0.0	0.0	0.0	-	-	-
		19.00000	32.00000	0.00000	0.0	0.0	0.0	-	-	-
		21.00000	32.00000	0.00000	0.0	0.0	0.0	-	-	-
		23.00000	32.00000	0.00000	0.0	0.0	0.0	-	-	-
		25.00000	32.00000	0.00000	0.0	0.0	0.0	-	-	-
		27.00000	32.00000	0.00000	0.0	0.0	0.0	-	-	-
		29.00000	32.00000	0.00000	0.0	0.0	0.0	-	-	-
		31.00000	32.00000	0.00000	0.0	0.0	0.0	-	-	-
		33.00000	32.00000	0.00000	0.0	0.0	0.0	-	-	-
		35.00000	32.00000	0.00000	0.0	0.0	0.0	-	-	-
		37.00000	32.00000	0.00000	0.0	0.0	0.0	-	-	-
		39.00000	32.00000	0.00000	0.0	0.0	0.0	-	-	-
		41.00000	32.00000	0.00000	0.0	0.0	0.0	-	-	-
		43.00000	32.00000	0.00000	0.0	0.0	0.0	-	-	-
		45.00000	32.00000	0.00000	0.0	0.0	0.0	-	-	-

Oasys

GEOTECHNICAL AND ENVIRONMENTAL ASSOCIATES LTD *J18119*

7 Denmark Street, London WC2H 8LZ
Combined lateral and horizontal movements

Job No.	Sheet No.	Rev.

Drg. Ref.

Made by **ML**   Date **02-Oct-2018**   Checked

Type/No.		Coordinates			Displacements					Angle of Line to x Axis
Name	Dist.	x	y	z	x	y	z	Horizontal displacement	Horizontal displacement	
		47.00000	32.00000	0.00000	0.0	0.0	0.0	-	-	-
		49.00000	32.00000	0.00000	0.0	0.0	0.0	-	-	-
		51.00000	32.00000	0.00000	0.0	0.0	0.0	-	-	-
		53.00000	32.00000	0.00000	0.0	0.0	0.0	-	-	-
		55.00000	32.00000	0.00000	0.0	0.0	0.0	-	-	-
		15.00000	34.00000	0.00000	0.0	0.0	0.0	-	-	-
		17.00000	34.00000	0.00000	0.0	0.0	0.0	-	-	-
		19.00000	34.00000	0.00000	0.0	0.0	0.0	-	-	-
		21.00000	34.00000	0.00000	0.0	0.0	0.0	-	-	-
		23.00000	34.00000	0.00000	0.0	0.0	0.0	-	-	-
		25.00000	34.00000	0.00000	0.0	0.0	0.0	-	-	-
		27.00000	34.00000	0.00000	0.0	0.0	0.0	-	-	-
		29.00000	34.00000	0.00000	0.0	0.0	0.0	-	-	-
		31.00000	34.00000	0.00000	0.0	0.0	0.0	-	-	-
		33.00000	34.00000	0.00000	0.0	0.0	0.0	-	-	-
		35.00000	34.00000	0.00000	0.0	0.0	0.0	-	-	-
		37.00000	34.00000	0.00000	0.0	0.0	0.0	-	-	-
		39.00000	34.00000	0.00000	0.0	0.0	0.0	-	-	-
		41.00000	34.00000	0.00000	0.0	0.0	0.0	-	-	-
		43.00000	34.00000	0.00000	0.0	0.0	0.0	-	-	-
		45.00000	34.00000	0.00000	0.0	0.0	0.0	-	-	-
		47.00000	34.00000	0.00000	0.0	0.0	0.0	-	-	-
		49.00000	34.00000	0.00000	0.0	0.0	0.0	-	-	-
		51.00000	34.00000	0.00000	0.0	0.0	0.0	-	-	-
		53.00000	34.00000	0.00000	0.0	0.0	0.0	-	-	-
		55.00000	34.00000	0.00000	0.0	0.0	0.0	-	-	-
		15.00000	36.00000	0.00000	0.0	0.0	0.0	-	-	-
		17.00000	36.00000	0.00000	0.0	0.0	0.0	-	-	-
		19.00000	36.00000	0.00000	0.0	0.0	0.0	-	-	-
		21.00000	36.00000	0.00000	0.0	0.0	0.0	-	-	-
		23.00000	36.00000	0.00000	0.0	0.0	0.0	-	-	-
		25.00000	36.00000	0.00000	0.0	0.0	0.0	-	-	-
		27.00000	36.00000	0.00000	0.0	0.0	0.0	-	-	-
		29.00000	36.00000	0.00000	0.0	0.0	0.0	-	-	-
		31.00000	36.00000	0.00000	0.0	0.0	0.0	-	-	-
		33.00000	36.00000	0.00000	0.0	0.0	0.0	-	-	-
		35.00000	36.00000	0.00000	0.0	0.0	0.0	-	-	-
		37.00000	36.00000	0.00000	0.0	0.0	0.0	-	-	-
		39.00000	36.00000	0.00000	0.0	0.0	0.0	-	-	-
		41.00000	36.00000	0.00000	0.0	0.0	0.0	-	-	-
		43.00000	36.00000	0.00000	0.0	0.0	0.0	-	-	-
		45.00000	36.00000	0.00000	0.0	0.0	0.0	-	-	-
		47.00000	36.00000	0.00000	0.0	0.0	0.0	-	-	-
		49.00000	36.00000	0.00000	0.0	0.0	0.0	-	-	-
		51.00000	36.00000	0.00000	0.0	0.0	0.0	-	-	-
		53.00000	36.00000	0.00000	0.0	0.0	0.0	-	-	-
		55.00000	36.00000	0.00000	0.0	0.0	0.0	-	-	-
		15.00000	38.00000	0.00000	0.0	0.0	0.0	-	-	-
		17.00000	38.00000	0.00000	0.0	0.0	0.0	-	-	-
		19.00000	38.00000	0.00000	0.0	0.0	0.0	-	-	-
		21.00000	38.00000	0.00000	0.0	0.0	0.0	-	-	-
		23.00000	38.00000	0.00000	0.0	0.0	0.0	-	-	-
		25.00000	38.00000	0.00000	0.0	0.0	0.0	-	-	-
		27.00000	38.00000	0.00000	0.0	0.0	0.0	-	-	-
		29.00000	38.00000	0.00000	0.0	0.0	0.0	-	-	-
		31.00000	38.00000	0.00000	0.0	0.0	0.0	-	-	-
		33.00000	38.00000	0.00000	0.0	0.0	0.0	-	-	-
		35.00000	38.00000	0.00000	0.0	0.0	0.0	-	-	-
		37.00000	38.00000	0.00000	0.0	0.0	0.0	-	-	-
		39.00000	38.00000	0.00000	0.0	0.0	0.0	-	-	-
		41.00000	38.00000	0.00000	0.0	0.0	0.0	-	-	-
		43.00000	38.00000	0.00000	0.0	0.0	0.0	-	-	-
		45.00000	38.00000	0.00000	0.0	0.0	0.0	-	-	-
		47.00000	38.00000	0.00000	0.0	0.0	0.0	-	-	-
		49.00000	38.00000	0.00000	0.0	0.0	0.0	-	-	-
		51.00000	38.00000	0.00000	0.0	0.0	0.0	-	-	-
		53.00000	38.00000	0.00000	0.0	0.0	0.0	-	-	-
		55.00000	38.00000	0.00000	0.0	0.0	0.0	-	-	-
		15.00000	40.00000	0.00000	0.0	0.0	0.0	-	-	-
		17.00000	40.00000	0.00000	0.0	0.0	0.0	-	-	-
		19.00000	40.00000	0.00000	0.0	0.0	0.0	-	-	-
		21.00000	40.00000	0.00000	0.0	0.0	0.0	-	-	-
		23.00000	40.00000	0.00000	0.0	0.0	0.0	-	-	-
		25.00000	40.00000	0.00000	0.0	0.0	0.0	-	-	-
		27.00000	40.00000	0.00000	0.0	0.0	0.0	-	-	-
		29.00000	40.00000	0.00000	0.0	0.0	0.0	-	-	-
		31.00000	40.00000	0.00000	0.0	0.0	0.0	-	-	-
		33.00000	40.00000	0.00000	0.0	0.0	0.0	-	-	-
		35.00000	40.00000	0.00000	0.0	0.0	0.0	-	-	-
		37.00000	40.00000	0.00000	0.0	0.0	0.0	-	-	-
		39.00000	40.00000	0.00000	0.0	0.0	0.0	-	-	-
		41.00000	40.00000	0.00000	0.0	0.0	0.0	-	-	-
		43.00000	40.00000	0.00000	0.0	0.0	0.0	-	-	-
		45.00000	40.00000	0.00000	0.0	0.0	0.0	-	-	-
		47.00000	40.00000	0.00000	0.0	0.0	0.0	-	-	-
		49.00000	40.00000	0.00000	0.0	0.0	0.0	-	-	-
		51.00000	40.00000	0.00000	0.0	0.0	0.0	-	-	-
		53.00000	40.00000	0.00000	0.0	0.0	0.0	-	-	-
		55.00000	40.00000	0.00000	0.0	0.0	0.0	-	-	-
		15.00000	42.00000	0.00000	0.0	0.0	0.0	-	-	-
		17.00000	42.00000	0.00000	0.0	0.0	0.0	-	-	-
		19.00000	42.00000	0.00000	0.0	0.0	0.0	-	-	-
		21.00000	42.00000	0.00000	0.0	0.0	0.0	-	-	-
		23.00000	42.00000	0.00000	0.0	0.0	0.0	-	-	-
		25.00000	42.00000	0.00000	0.0	0.0	0.0	-	-	-
		27.00000	42.00000	0.00000	0.0	0.0	0.0	-	-	-
		29.00000	42.00000	0.00000	0.0	0.0	0.0	-	-	-
		31.00000	42.00000	0.00000	0.0	0.0	0.0	-	-	-
		33.00000	42.00000	0.00000	0.0	0.0	0.0	-	-	-
		35.00000	42.00000	0.00000	0.0	0.0	0.0	-	-	-
		37.00000	42.00000	0.00000	0.0	0.0	0.0	-	-	-
		39.00000	42.00000	0.00000	0.0	0.0	0.0	-	-	-
		41.00000	42.00000	0.00000	0.0	0.0	0.0	-	-	-
		43.00000	42.00000	0.00000	0.0	0.0	0.0	-	-	-
		45.00000	42.00000	0.00000	0.0	0.0	0.0	-	-	-
		47.00000	42.00000	0.00000	0.0	0.0	0.0	-	-	-
		49.00000	42.00000	0.00000	0.0	0.0	0.0	-	-	-
		51.00000	42.00000	0.00000	0.0	0.0	0.0	-	-	-
		53.00000	42.00000	0.00000	0.0	0.0	0.0	-	-	-
		55.00000	42.00000	0.00000	0.0	0.0	0.0	-	-	-
		15.00000	44.00000	0.00000	0.0	0.0	0.0	-	-	-
		17.00000	44.00000	0.00000	0.0	0.0	0.0	-	-	-
		19.00000	44.00000	0.00000	0.0	0.0	0.0	-	-	-
		21.00000	44.00000	0.00000	0.0	0.0	0.0	-	-	-
		23.00000	44.00000	0.00000	0.0	0.0	0.0	-	-	-
		25.00000	44.00000	0.00000	0.0	0.0	0.0	-	-	-
		27.00000	44.00000	0.00000	0.0	0.0	0.0	-	-	-
		29.00000	44.00000	0.00000	0.0	0.0	0.0	-	-	-
		31.00000	44.00000	0.00000	0.0	0.0	0.0	-	-	-
		33.00000	44.00000	0.00000	0.0	0.0	0.0	-	-	-
		35.00000	44.00000	0.00000	0.0	0.0	0.0	-	-	-
		37.00000	44.00000	0.00000	0.0	0.0	0.0	-	-	-
		39.00000	44.00000	0.00000	0.0	0.0	0.0	-	-	-
		41.00000	44.00000	0.00000	0.0	0.0	0.0	-	-	-
		43.00000	44.00000	0.00000	0.0	0.0	0.0	-	-	-
		45.00000	44.00000	0.00000	0.0	0.0	0.0	-	-	-
		47.00000	44.00000	0.00000	0.0	0.0	0.0	-	-	-
		49.00000	44.00000	0.00000	0.0	0.0	0.0	-	-	-
		51.00000	44.00000	0.00000	0.0	0.0	0.0	-	-	-
		53.00000	44.00000	0.00000	0.0	0.0	0.0	-	-	-

Oasys

GEOTECHNICAL AND ENVIRONMENTAL ASSOCIATES LTD J18119

7 Denmark Street, London WC2H 8LZ
Combined lateral and horizontal movements

Job No.	Sheet No.	Rev.

Drg. Ref.

Made by ML | Date 02-Oct-2018 | Checked

Type/No. Name	Dist.	Coordinates x	y	z	Displacements x	y	z	Horizontal displacement	Horizontal displacement	Angle of Line to x Axis
		55.00000	44.00000	0.00000	0.0	0.0	0.0	–	–	–
		15.00000	46.00000	0.00000	0.0	0.0	0.0	–	–	–
		17.00000	46.00000	0.00000	0.0	0.0	0.0	–	–	–
		19.00000	46.00000	0.00000	0.0	0.0	0.0	–	–	–
		21.00000	46.00000	0.00000	0.0	0.0	0.0	–	–	–
		23.00000	46.00000	0.00000	0.0	0.0	0.0	–	–	–
		25.00000	46.00000	0.00000	0.0	0.0	0.0	–	–	–
		27.00000	46.00000	0.00000	0.0	0.0	0.0	–	–	–
		29.00000	46.00000	0.00000	0.0	0.0	0.0	–	–	–
		31.00000	46.00000	0.00000	0.0	0.0	0.0	–	–	–
		33.00000	46.00000	0.00000	0.0	0.0	0.0	–	–	–
		35.00000	46.00000	0.00000	0.0	0.0	0.0	–	–	–
		37.00000	46.00000	0.00000	0.0	0.0	0.0	–	–	–
		39.00000	46.00000	0.00000	0.0	0.0	0.0	–	–	–
		41.00000	46.00000	0.00000	0.0	0.0	0.0	–	–	–
		43.00000	46.00000	0.00000	0.0	0.0	0.0	–	–	–
		45.00000	46.00000	0.00000	0.0	0.0	0.0	–	–	–
		47.00000	46.00000	0.00000	0.0	0.0	0.0	–	–	–
		49.00000	46.00000	0.00000	0.0	0.0	0.0	–	–	–
		51.00000	46.00000	0.00000	0.0	0.0	0.0	–	–	–
		53.00000	46.00000	0.00000	0.0	0.0	0.0	–	–	–
		55.00000	46.00000	0.00000	0.0	0.0	0.0	–	–	–
		15.00000	48.00000	0.00000	0.0	0.0	0.0	–	–	–
		17.00000	48.00000	0.00000	0.0	0.0	0.0	–	–	–
		19.00000	48.00000	0.00000	0.0	0.0	0.0	–	–	–
		21.00000	48.00000	0.00000	0.0	0.0	0.0	–	–	–
		23.00000	48.00000	0.00000	0.0	0.0	0.0	–	–	–
		25.00000	48.00000	0.00000	0.0	0.0	0.0	–	–	–
		27.00000	48.00000	0.00000	0.0	0.0	0.0	–	–	–
		29.00000	48.00000	0.00000	0.0	0.0	0.0	–	–	–
		31.00000	48.00000	0.00000	0.0	0.0	0.0	–	–	–
		33.00000	48.00000	0.00000	0.0	0.0	0.0	–	–	–
		35.00000	48.00000	0.00000	0.0	0.0	0.0	–	–	–
		37.00000	48.00000	0.00000	0.0	0.0	0.0	–	–	–
		39.00000	48.00000	0.00000	0.0	0.0	0.0	–	–	–
		41.00000	48.00000	0.00000	0.0	0.0	0.0	–	–	–
		43.00000	48.00000	0.00000	0.0	0.0	0.0	–	–	–
		45.00000	48.00000	0.00000	0.0	0.0	0.0	–	–	–
		47.00000	48.00000	0.00000	0.0	0.0	0.0	–	–	–
		49.00000	48.00000	0.00000	0.0	0.0	0.0	–	–	–
		51.00000	48.00000	0.00000	0.0	0.0	0.0	–	–	–
		53.00000	48.00000	0.00000	0.0	0.0	0.0	–	–	–
		55.00000	48.00000	0.00000	0.0	0.0	0.0	–	–	–
		15.00000	50.00000	0.00000	0.0	0.0	0.0	–	–	–
		17.00000	50.00000	0.00000	0.0	0.0	0.0	–	–	–
		19.00000	50.00000	0.00000	0.0	0.0	0.0	–	–	–
		21.00000	50.00000	0.00000	0.0	0.0	0.0	–	–	–
		23.00000	50.00000	0.00000	0.0	0.0	0.0	–	–	–
		25.00000	50.00000	0.00000	0.0	0.0	0.0	–	–	–
		27.00000	50.00000	0.00000	0.0	0.0	0.0	–	–	–
		29.00000	50.00000	0.00000	0.0	0.0	0.0	–	–	–
		31.00000	50.00000	0.00000	0.0	0.0	0.0	–	–	–
		33.00000	50.00000	0.00000	0.0	0.0	0.0	–	–	–
		35.00000	50.00000	0.00000	0.0	0.0	0.0	–	–	–
		37.00000	50.00000	0.00000	0.0	0.0	0.0	–	–	–
		39.00000	50.00000	0.00000	0.0	0.0	0.0	–	–	–
		41.00000	50.00000	0.00000	0.0	0.0	0.0	–	–	–
		43.00000	50.00000	0.00000	0.0	0.0	0.0	–	–	–
		45.00000	50.00000	0.00000	0.0	0.0	0.0	–	–	–
		47.00000	50.00000	0.00000	0.0	0.0	0.0	–	–	–
		49.00000	50.00000	0.00000	0.0	0.0	0.0	–	–	–
		51.00000	50.00000	0.00000	0.0	0.0	0.0	–	–	–
		53.00000	50.00000	0.00000	0.0	0.0	0.0	–	–	–
		55.00000	50.00000	0.00000	0.0	0.0	0.0	–	–	–
No7 A	Line 1	25.70000	33.20000	-2.50000	0.0	0.0	-0.19281	0.0	0.0	308.06 *
	1.9233	26.88571	31.68571	-2.50000	0.0	0.0	-0.13851	0.0	0.0	308.06 *
	3.8465	28.07143	30.17143	-2.50000	0.0	0.0	-0.20175	0.0	0.0	308.06 *
	5.7698	29.25714	28.65714	-2.50000	0.0	0.0	-0.29997	0.0	0.0	308.06 *
	7.6931	30.44286	27.14286	-2.50000	0.0	0.0	-0.45983	0.0	0.0	308.06 *
	9.6164	31.62857	25.62857	-2.50000	0.47915	-0.65718	-0.73827	0.81283	-0.027901	308.06 *
	11.540	32.81429	24.11429	-2.50000	1.1358	-1.5578	-1.2715	1.9267	-0.066136	308.06 *
	13.463	34.00000	22.60000	-2.50000	2.6641	-1.0818	-4.9721	2.4942	1.4306	308.06 *
No7 B	Line 2	34.00000	22.60000	-2.50000	2.6641	-1.0818	-4.9721	1.5844	-2.3994	34.461 *
	1.0309	34.85000	23.18333	-2.50000	0.0	0.0	-3.1776	0.0	0.0	34.461 *
	2.0618	35.70000	23.76667	-2.50000	0.0	0.0	-3.4893	0.0	0.0	34.461 *
	3.0927	36.55000	24.35000	-2.50000	2.9707	-4.3287	-3.5423	0.0	-5.2500	34.461 *
	4.1236	37.40000	24.93333	-2.50000	2.9707	-4.3287	-3.2520	0.0	-5.2500	34.461 *
	5.1546	38.25000	25.51667	-2.50000	2.9707	-4.3287	-2.4283	0.0	-5.2500	34.461 *
	6.1855	39.10000	26.10000	-2.50000	-0.38687	-2.6074	-2.8012	-1.7943	-1.9309	34.461 *
No7 C	Line 3	39.10000	26.10000	-2.50000	-0.38687	-2.6074	-2.8012	-1.8565	1.8712	126.79 *
	1.9800	37.91429	27.68571	-2.50000	1.8512	-2.6975	-1.0633	-3.2689	0.13280	126.79 *
	3.9600	36.72857	29.27143	-2.50000	0.73178	-1.0663	-0.66625	-1.2922	0.052496	126.79 *
	5.9400	35.54286	30.85714	-2.50000	0.0	0.0	-0.42796	0.0	0.0	126.79 *
	7.9200	34.35714	32.44286	-2.50000	0.0	0.0	-0.28276	0.0	0.0	126.79 *
	9.9000	33.17143	34.02857	-2.50000	0.0	0.0	-0.19100	0.0	0.0	126.79 *
	11.880	31.98571	35.61429	-2.50000	0.0	0.0	-0.13110	0.0	0.0	126.79 *
	13.860	30.80000	37.20000	-2.50000	0.0	0.0	-0.36396	0.0	0.0	126.79 *
No7 D	Line 4	30.80000	37.20000	-2.50000	0.0	0.0	-0.36396	0.0	0.0	218.11 *
	1.0803	29.95000	36.53333	-2.50000	0.0	0.0	-0.094844	0.0	0.0	218.11 *
	2.1605	29.10000	35.86667	-2.50000	0.0	0.0	-0.097651	0.0	0.0	218.11 *
	3.2408	28.25000	35.20000	-2.50000	0.0	0.0	-0.099264	0.0	0.0	218.11 *
	4.3210	27.40000	34.53333	-2.50000	0.0	0.0	-0.099597	0.0	0.0	218.11 *
	5.4013	26.55000	33.86667	-2.50000	0.0	0.0	-0.098627	0.0	0.0	218.11 *
	6.4815	25.70000	33.20000	-2.50000	0.0	0.0	-0.19281	0.0	0.0	218.11 *
No6 A	Line 5	30.80000	37.20000	-2.50000	0.0	0.0	-0.36396	0.0	0.0	307.91 *
	1.9328	31.98750	35.67500	-2.50000	0.0	0.0	-0.12971	0.0	0.0	307.91 *
	3.8656	33.17500	34.15000	-2.50000	0.0	0.0	-0.18673	0.0	0.0	307.91 *
	5.7985	34.36250	32.62500	-2.50000	0.0	0.0	-0.27255	0.0	0.0	307.91 *
	7.7313	35.55000	31.10000	-2.50000	0.0	0.0	-0.40522	0.0	0.0	307.91 *
	9.6641	36.73750	29.57500	-2.50000	0.40371	-0.59109	-0.61601	0.71441	-0.044629	307.91 *
	11.597	37.92500	28.05000	-2.50000	1.0488	-1.6366	-0.95219	1.9357	-0.17799	307.91 *
	13.530	39.11250	26.52500	-2.50000	0.065911	-1.9708	-1.3819	1.5955	-1.1589	307.91 *
	15.463	40.30000	25.00000	-2.50000	-3.2247	-2.5798	-1.8711	0.054223	-4.1293	307.91 *
No6 B	Line 6	40.30000	25.00000	-0.70000	-3.2247	-2.5798	-1.8711	0.21493	-4.1240	305.68 *
	0.80017	40.76667	24.35000	-0.70000	-2.9196	-2.3357	-2.1380	0.19460	-3.7338	305.68 *
	1.6003	41.23333	23.70000	-0.70000	-2.6144	-2.0915	-2.3565	0.17426	-3.3436	305.68 *
	2.4005	41.70000	23.05000	-0.70000	-2.3093	-1.8474	-2.5190	0.15392	-2.9533	305.68 *
	3.2007	42.16667	22.40000	-0.70000	-2.0041	-1.6033	-2.5898	0.13358	-2.5631	305.68 *
	4.0009	42.63333	21.75000	-0.70000	-1.6990	-1.3592	-2.4595	0.11324	-2.1728	305.68 *
	4.8010	43.10000	21.10000	-0.70000	-0.45557	-0.36446	-3.9354	0.030365	-0.58263	305.68 *
No6 C	Line 7	43.10000	21.10000	-0.70000	-0.45557	-0.36446	-3.9354	-0.58314	-0.018223	36.870 *
	1.5000	44.30000	22.00000	-0.70000	-0.14354	-0.11138	-1.2244	-0.18166	-0.0029782	36.870 *
	3.0000	45.50000	22.90000	-0.70000	0.0	0.0	-0.80501	0.0	0.0	36.870 *
	4.5000	46.70000	23.80000	-0.70000	0.0	0.0	-0.55355	0.0	0.0	36.870 *
	6.0000	47.90000	24.70000	-0.70000	0.0	0.0	-0.78577	0.0	0.0	36.870 *
No6 D	Line 8	47.90000	24.70000	-0.70000	0.0	0.0	-0.78577	0.0	0.0	126.12 *
	0.57255	47.56250	25.16250	-0.70000	0.0	0.0	-0.40470	0.0	0.0	126.12 *
	1.1451	47.22500	25.62500	-0.70000	0.0	0.0	-0.41394	0.0	0.0	126.12 *
	1.7176	46.88750	26.08750	-0.70000	0.0	0.0	-0.42034	0.0	0.0	126.12 *
	2.2902	46.55000	26.55000	-0.70000	0.0	0.0	-0.42369	0.0	0.0	126.12 *
	2.8627	46.21250	27.01250	-0.70000	0.0	0.0	-0.42394	0.0	0.0	126.12 *
	3.4353	45.87500	27.47500	-0.70000	0.0	0.0	-0.42112	0.0	0.0	126.12 *
	4.0078	45.53750	27.93750	-0.70000	0.0	0.0	-0.41537	0.0	0.0	126.12 *
	4.5804	45.20000	28.40000	-0.70000	0.0	0.0	-0.40691	0.0	0.0	126.12 *
No7 E	Line 9	45.20000	28.40000	-2.50000	0.0	0.0	-0.40691	0.0	0.0	126.80 *
	2.6433	43.61667	30.51667	-2.50000	0.0	0.0	-0.34446	0.0	0.0	126.80 *
	5.2867	42.03333	32.63333	-2.50000	0.0	0.0	-0.26332	0.0	0.0	126.80 *
	7.9300	40.45000	34.75000	-2.50000	0.0	0.0	-0.18831	0.0	0.0	126.80 *
	10.573	38.86667	36.86667	-2.50000	0.0	0.0	-0.12949	0.0	0.0	126.80 *
	13.217	37.28333	38.98333	-2.50000	0.0	0.0	-0.087091	0.0	0.0	126.80 *

Oasys

GEOTECHNICAL AND ENVIRONMENTAL ASSOCIATES LTD *J18119*

7 Denmark Street, London WC2H 8LZ
Combined lateral and horizontal movements

Job No.	Sheet No.	Rev.

Drg. Ref.

Made by ML	Date 02-Oct-2018	Checked

Type/No.		Coordinates			Displacements					Angle of Line
Name	Dist.	x	y	z	x	y	z	Horizontal displacement	Horizontal displacement	to x Axis
	15.860	35.70000	41.10000	-2.50000	0.0	0.0	-0.11552	0.0	0.0	126.80 *
No8 F	Line 10	35.70000	41.10000	-3.50000	0.0	0.0	0.0	0.0	0.0	218.52
	1.0438	34.88333	40.45000	-3.50000	0.0	0.0	0.0	0.0	0.0	218.52
	2.0875	34.06667	39.80000	-3.50000	0.0	0.0	0.0	0.0	0.0	218.52
	3.1313	33.25000	39.15000	-3.50000	0.0	0.0	0.0	0.0	0.0	218.52
	4.1751	32.43333	38.50000	-3.50000	0.0	0.0	0.0	0.0	0.0	218.52
	5.2188	31.61667	37.85000	-3.50000	0.0	0.0	0.0	0.0	0.0	218.52
	6.2626	30.80000	37.20000	-3.50000	0.0	0.0	0.0	0.0	0.0	218.52
No9 A	Line 11	20.60000	29.40000	-3.50000	0.0	0.0	0.0	0.0	0.0	307.95
	1.8118	21.71429	27.97143	-3.50000	0.0	0.0	0.0	0.0	0.0	307.95
	3.6235	22.82857	26.54286	-3.50000	0.0	0.0	0.0	0.0	0.0	307.95
	5.4353	23.94286	25.11429	-3.50000	0.0	0.0	0.0	0.0	0.0	307.95
	7.2470	25.05714	23.68571	-3.50000	0.0	0.0	0.0	0.0	0.0	307.95
	9.0588	26.17143	22.25714	-3.50000	0.0	0.0	0.0	0.0	0.0	307.95
	10.871	27.28571	20.82857	-3.50000	0.0	0.0	0.0	0.0	0.0	307.95
	12.682	28.40000	19.40000	-3.50000	0.0	0.0	0.0	0.0	0.0	307.95
No9 B	Line 12	28.40000	19.40000	-3.50000	0.0	0.0	0.0	0.0	0.0	308.07
	1.0888	29.07143	18.54286	-3.50000	0.0	0.0	0.0	0.0	0.0	308.07
	2.1776	29.74286	17.68571	-3.50000	0.0	0.0	0.0	0.0	0.0	308.07
	3.2664	30.41429	16.82857	-3.50000	0.0	0.0	0.0	0.0	0.0	308.07
	4.3552	31.08571	15.97143	-3.50000	0.0	0.0	0.0	0.0	0.0	308.07
	5.4441	31.75714	15.11429	-3.50000	0.0	0.0	0.0	0.0	0.0	308.07
	6.5329	32.42857	14.25714	-3.50000	0.0	0.0	0.0	0.0	0.0	308.07
	7.6217	33.10000	13.40000	-3.50000	0.0	0.0	0.0	0.0	0.0	308.07
122A	Line 13	29.30000	10.20000	-3.50000	0.0	0.0	-0.16452	0.0	0.0	37.100 *
	2.1314	31.00000	11.48571	-3.50000	0.0	0.0	-0.24889	0.0	0.0	37.100 *
	4.2629	32.70000	12.77143	-3.50000	0.0	0.0	-0.38558	0.0	0.0	37.100 *
	6.3943	34.40000	14.05714	-3.50000	0.0	0.0	-0.61841	0.0	0.0	37.100 *
	8.5258	36.10000	15.34286	-3.50000	0.0	0.0	-1.0428	0.0	0.0	37.100 *
	10.657	37.80000	16.62857	-3.50000	0.0	0.0	-1.8750	0.0	0.0	37.100 *
	12.789	39.50000	17.91429	-3.50000	0.0	0.0	-3.1917	0.0	0.0	37.100 *
	14.920	41.20000	19.20000	-3.50000	0.0	0.0	-6.7078	0.0	0.0	37.100 *
122B	Line 14	41.20000	19.20000	-3.50000	0.0	0.0	-6.7078	0.0	0.0	308.50 *
	1.2494	41.97778	18.22222	-3.50000	0.0	0.0	-1.9764	0.0	0.0	308.50 *
	2.4988	42.75556	17.24444	-3.50000	0.0	0.0	-1.2729	0.0	0.0	308.50 *
	3.7482	43.53333	16.26667	-3.50000	0.0	0.0	-0.86891	0.0	0.0	308.50 *
	4.9976	44.31111	15.28889	-3.50000	0.0	0.0	-0.61876	0.0	0.0	308.50 *
	6.2470	45.08889	14.31111	-3.50000	0.0	0.0	-0.45422	0.0	0.0	308.50 *
	7.4964	45.86667	13.33333	-3.50000	0.0	0.0	-0.34088	0.0	0.0	308.50 *
	8.7458	46.64444	12.35556	-3.50000	0.0	0.0	-0.26004	0.0	0.0	308.50 *
	9.9952	47.42222	11.37778	-3.50000	0.0	0.0	-0.20083	0.0	0.0	308.50 *
	11.245	48.20000	10.40000	-3.50000	0.0	0.0	-0.15657	0.0	0.0	308.50 *
Grid 2	Grid 2	15.00000	0.00000	-3.50000	0.0	0.0	-0.0063082	-	-	-
		17.00000	0.00000	-3.50000	0.0	0.0	-0.0085587	-	-	- *
		19.00000	0.00000	-3.50000	0.0	0.0	-0.011277	-	-	- *
		21.00000	0.00000	-3.50000	0.0	0.0	-0.014494	-	-	- *
		23.00000	0.00000	-3.50000	0.0	0.0	-0.018209	-	-	- *
		25.00000	0.00000	-3.50000	0.0	0.0	-0.022373	-	-	- *
		27.00000	0.00000	-3.50000	0.0	0.0	-0.026864	-	-	- *
		29.00000	0.00000	-3.50000	0.0	0.0	-0.031483	-	-	- *
		31.00000	0.00000	-3.50000	0.0	0.0	-0.035939	-	-	- *
		33.00000	0.00000	-3.50000	0.0	0.0	-0.039875	-	-	- *
		35.00000	0.00000	-3.50000	0.0	0.0	-0.042910	-	-	- *
		37.00000	0.00000	-3.50000	0.0	0.0	-0.044707	-	-	- *
		39.00000	0.00000	-3.50000	0.0	0.0	-0.045044	-	-	- *
		41.00000	0.00000	-3.50000	0.0	0.0	-0.043875	-	-	- *
		43.00000	0.00000	-3.50000	0.0	0.0	-0.041341	-	-	- *
		45.00000	0.00000	-3.50000	0.0	0.0	-0.037734	-	-	- *
		47.00000	0.00000	-3.50000	0.0	0.0	-0.033429	-	-	- *
		49.00000	0.00000	-3.50000	0.0	0.0	-0.028807	-	-	- *
		51.00000	0.00000	-3.50000	0.0	0.0	-0.024198	-	-	- *
		53.00000	0.00000	-3.50000	0.0	0.0	-0.019848	-	-	- *
		55.00000	0.00000	-3.50000	0.0	0.0	-0.015913	-	-	- *
		15.00000	2.00000	-3.50000	0.0	0.0	-0.0083428	-	-	- *
		17.00000	2.00000	-3.50000	0.0	0.0	-0.011293	-	-	- *
		19.00000	2.00000	-3.50000	0.0	0.0	-0.014919	-	-	- *
		21.00000	2.00000	-3.50000	0.0	0.0	-0.019292	-	-	- *
		23.00000	2.00000	-3.50000	0.0	0.0	-0.024448	-	-	- *
		25.00000	2.00000	-3.50000	0.0	0.0	-0.030353	-	-	- *
		27.00000	2.00000	-3.50000	0.0	0.0	-0.036871	-	-	- *
		29.00000	2.00000	-3.50000	0.0	0.0	-0.043727	-	-	- *
		31.00000	2.00000	-3.50000	0.0	0.0	-0.050490	-	-	- *
		33.00000	2.00000	-3.50000	0.0	0.0	-0.056587	-	-	- *
		35.00000	2.00000	-3.50000	0.0	0.0	-0.061369	-	-	- *
		37.00000	2.00000	-3.50000	0.0	0.0	-0.064235	-	-	- *
		39.00000	2.00000	-3.50000	0.0	0.0	-0.064784	-	-	- *
		41.00000	2.00000	-3.50000	0.0	0.0	-0.062927	-	-	- *
		43.00000	2.00000	-3.50000	0.0	0.0	-0.058920	-	-	- *
		45.00000	2.00000	-3.50000	0.0	0.0	-0.053289	-	-	- *
		47.00000	2.00000	-3.50000	0.0	0.0	-0.046687	-	-	- *
		49.00000	2.00000	-3.50000	0.0	0.0	-0.039749	-	-	- *
		51.00000	2.00000	-3.50000	0.0	0.0	-0.032986	-	-	- *
		53.00000	2.00000	-3.50000	0.0	0.0	-0.026751	-	-	- *
		55.00000	2.00000	-3.50000	0.0	0.0	-0.021239	-	-	- *
		15.00000	4.00000	-3.50000	0.0	0.0	-0.010715	-	-	- *
		17.00000	4.00000	-3.50000	0.0	0.0	-0.014536	-	-	- *
		19.00000	4.00000	-3.50000	0.0	0.0	-0.019322	-	-	- *
		21.00000	4.00000	-3.50000	0.0	0.0	-0.025216	-	-	- *
		23.00000	4.00000	-3.50000	0.0	0.0	-0.032327	-	-	- *
		25.00000	4.00000	-3.50000	0.0	0.0	-0.040679	-	-	- *
		27.00000	4.00000	-3.50000	0.0	0.0	-0.050145	-	-	- *
		29.00000	4.00000	-3.50000	0.0	0.0	-0.060382	-	-	- *
		31.00000	4.00000	-3.50000	0.0	0.0	-0.070760	-	-	- *
		33.00000	4.00000	-3.50000	0.0	0.0	-0.080359	-	-	- *
		35.00000	4.00000	-3.50000	0.0	0.0	-0.088056	-	-	- *
		37.00000	4.00000	-3.50000	0.0	0.0	-0.092751	-	-	- *
		39.00000	4.00000	-3.50000	0.0	0.0	-0.093673	-	-	- *
		41.00000	4.00000	-3.50000	0.0	0.0	-0.090646	-	-	- *
		43.00000	4.00000	-3.50000	0.0	0.0	-0.084159	-	-	- *
		45.00000	4.00000	-3.50000	0.0	0.0	-0.075197	-	-	- *
		47.00000	4.00000	-3.50000	0.0	0.0	-0.064933	-	-	- *
		49.00000	4.00000	-3.50000	0.0	0.0	-0.054428	-	-	- *
		51.00000	4.00000	-3.50000	0.0	0.0	-0.044473	-	-	- *
		53.00000	4.00000	-3.50000	0.0	0.0	-0.035546	-	-	- *
		55.00000	4.00000	-3.50000	0.0	0.0	-0.027861	-	-	- *
		15.00000	6.00000	-3.50000	0.0	0.0	-0.013412	-	-	- *
		17.00000	6.00000	-3.50000	0.0	0.0	-0.018292	-	-	- *
		19.00000	6.00000	-3.50000	0.0	0.0	-0.024526	-	-	- *
		21.00000	6.00000	-3.50000	0.0	0.0	-0.032382	-	-	- *
		23.00000	6.00000	-3.50000	0.0	0.0	-0.042106	-	-	- *
		25.00000	6.00000	-3.50000	0.0	0.0	-0.053856	-	-	- *
		27.00000	6.00000	-3.50000	0.0	0.0	-0.067598	-	-	- *
		29.00000	6.00000	-3.50000	0.0	0.0	-0.082961	-	-	- *
		31.00000	6.00000	-3.50000	0.0	0.0	-0.099078	-	-	- *
		33.00000	6.00000	-3.50000	0.0	0.0	-0.11449	-	-	- *
		35.00000	6.00000	-3.50000	0.0	0.0	-0.12722	-	-	- *
		37.00000	6.00000	-3.50000	0.0	0.0	-0.13517	-	-	- *
		39.00000	6.00000	-3.50000	0.0	0.0	-0.13679	-	-	- *
		41.00000	6.00000	-3.50000	0.0	0.0	-0.13169	-	-	- *
		43.00000	6.00000	-3.50000	0.0	0.0	-0.12086	-	-	- *
		45.00000	6.00000	-3.50000	0.0	0.0	-0.10625	-	-	- *
		47.00000	6.00000	-3.50000	0.0	0.0	-0.090030	-	-	- *
		49.00000	6.00000	-3.50000	0.0	0.0	-0.073985	-	-	- *
		51.00000	6.00000	-3.50000	0.0	0.0	-0.059300	-	-	- *
		53.00000	6.00000	-3.50000	0.0	0.0	-0.046562	-	-	- *
		55.00000	6.00000	-3.50000	0.0	0.0	-0.035929	-	-	- *
		15.00000	8.00000	-3.50000	0.0	0.0	-0.016385	-	-	- *
		17.00000	8.00000	-3.50000	0.0	0.0	-0.022511	-	-	- *
		19.00000	8.00000	-3.50000	0.0	0.0	-0.030504	-	-	- *
		21.00000	8.00000	-3.50000	0.0	0.0	-0.040825	-	-	- *

Oasys

GEOTECHNICAL AND ENVIRONMENTAL ASSOCIATES LTD *J18119*

7 Denmark Street, London WC2H 8LZ
Combined lateral and horizontal movements

Job No.		Sheet No.		Rev.
J18119				
Drg. Ref.				
Made by ML	**Date** 02-Oct-2018		**Checked**	

Type/No.		Coordinates			Displacements			Horizontal	Horizontal	Angle of Line	
Name	Dist.	x	y	z	x	y	z	displacement	displacement	to x Axis	
		23.00000	8.00000	-3.50000	0.0	0.0	-0.053962	-	-	-	*
		25.00000	8.00000	-3.50000	0.0	0.0	-0.070354	-	-	-	*
		27.00000	8.00000	-3.50000	0.0	0.0	-0.090234	-	-	-	*
		29.00000	8.00000	-3.50000	0.0	0.0	-0.11337	-	-	-	*
		31.00000	8.00000	-3.50000	0.0	0.0	-0.13872	-	-	-	*
		33.00000	8.00000	-3.50000	0.0	0.0	-0.16404	-	-	-	*
		35.00000	8.00000	-3.50000	0.0	0.0	-0.18583	-	-	-	*
		37.00000	8.00000	-3.50000	0.0	0.0	-0.19991	-	-	-	*
		39.00000	8.00000	-3.50000	0.0	0.0	-0.20290	-	-	-	*
		41.00000	8.00000	-3.50000	0.0	0.0	-0.19391	-	-	-	*
		43.00000	8.00000	-3.50000	0.0	0.0	-0.17512	-	-	-	*
		45.00000	8.00000	-3.50000	0.0	0.0	-0.15059	-	-	-	*
		47.00000	8.00000	-3.50000	0.0	0.0	-0.12446	-	-	-	*
		49.00000	8.00000	-3.50000	0.0	0.0	-0.099752	-	-	-	*
		51.00000	8.00000	-3.50000	0.0	0.0	-0.078096	-	-	-	*
		53.00000	8.00000	-3.50000	0.0	0.0	-0.060045	-	-	-	*
		55.00000	8.00000	-3.50000	0.0	0.0	-0.045500	-	-	-	*
		15.00000	10.00000	-3.50000	0.0	0.0	-0.019541	-	-	-	*
		17.00000	10.00000	-3.50000	0.0	0.0	-0.027080	-	-	-	*
		19.00000	10.00000	-3.50000	0.0	0.0	-0.037128	-	-	-	*
		21.00000	10.00000	-3.50000	0.0	0.0	-0.050433	-	-	-	*
		23.00000	10.00000	-3.50000	0.0	0.0	-0.067886	-	-	-	*
		25.00000	10.00000	-3.50000	0.0	0.0	-0.0904050	-	-	-	*
		27.00000	10.00000	-3.50000	0.0	0.0	-0.11898	-	-	-	*
		29.00000	10.00000	-3.50000	0.0	0.0	-0.15383	-	-	-	*
		31.00000	10.00000	-3.50000	0.0	0.0	-0.19415	-	-	-	*
		33.00000	10.00000	-3.50000	0.0	0.0	-0.23686	-	-	-	*
		35.00000	10.00000	-3.50000	0.0	0.0	-0.27583	-	-	-	*
		37.00000	10.00000	-3.50000	0.0	0.0	-0.30233	-	-	-	*
		39.00000	10.00000	-3.50000	0.0	0.0	-0.30831	-	-	-	*
		41.00000	10.00000	-3.50000	0.0	0.0	-0.29145	-	-	-	*
		43.00000	10.00000	-3.50000	0.0	0.0	-0.25703	-	-	-	*
		45.00000	10.00000	-3.50000	0.0	0.0	-0.21427	-	-	-	*
		47.00000	10.00000	-3.50000	0.0	0.0	-0.17133	-	-	-	*
		49.00000	10.00000	-3.50000	0.0	0.0	-0.13306	-	-	-	*
		51.00000	10.00000	-3.50000	0.0	0.0	-0.10128	-	-	-	*
		53.00000	10.00000	-3.50000	0.0	0.0	-0.076015	-	-	-	*
		55.00000	10.00000	-3.50000	0.0	0.0	-0.056448	-	-	-	*
		15.00000	12.00000	-3.50000	0.0	0.0	-0.022736	-	-	-	*
		17.00000	12.00000	-3.50000	0.0	0.0	-0.031795	-	-	-	*
		19.00000	12.00000	-3.50000	0.0	0.0	-0.044125	-	-	-	*
		21.00000	12.00000	-3.50000	0.0	0.0	-0.060873	-	-	-	*
		23.00000	12.00000	-3.50000	0.0	0.0	-0.083534	-	-	-	*
		25.00000	12.00000	-3.50000	0.0	0.0	-0.11397	-	-	-	*
		27.00000	12.00000	-3.50000	0.0	0.0	-0.15430	-	-	-	*
		29.00000	12.00000	-3.50000	0.0	0.0	-0.20646	-	-	-	*
		31.00000	12.00000	-3.50000	0.0	0.0	-0.27108	-	-	-	*
		33.00000	12.00000	-3.50000	0.0	0.0	-0.34516	-	-	-	*
		35.00000	12.00000	-3.50000	0.0	0.0	-0.41878	-	-	-	*
		37.00000	12.00000	-3.50000	0.0	0.0	-0.47307	-	-	-	*
		39.00000	12.00000	-3.50000	0.0	0.0	-0.48650	-	-	-	*
		41.00000	12.00000	-3.50000	0.0	0.0	-0.45179	-	-	-	*
		43.00000	12.00000	-3.50000	0.0	0.0	-0.38390	-	-	-	*
		45.00000	12.00000	-3.50000	0.0	0.0	-0.30592	-	-	-	*
		47.00000	12.00000	-3.50000	0.0	0.0	-0.23402	-	-	-	*
		49.00000	12.00000	-3.50000	0.0	0.0	-0.17476	-	-	-	*
		51.00000	12.00000	-3.50000	0.0	0.0	-0.12873	-	-	-	*
		53.00000	12.00000	-3.50000	0.0	0.0	-0.094068	-	-	-	*
		55.00000	12.00000	-3.50000	0.0	0.0	-0.068367	-	-	-	*
		15.00000	14.00000	-3.50000	0.0	0.0	-0.025775	-	-	-	*
		17.00000	14.00000	-3.50000	0.0	0.0	-0.036365	-	-	-	*
		19.00000	14.00000	-3.50000	0.0	0.0	-0.051063	-	-	-	*
		21.00000	14.00000	-3.50000	0.0	0.0	-0.071519	-	-	-	*
		23.00000	14.00000	-3.50000	0.0	0.0	-0.10006	-	-	-	*
		25.00000	14.00000	-3.50000	0.0	0.0	-0.13993	-	-	-	*
		27.00000	14.00000	-3.50000	0.0	0.0	-0.19550	-	-	-	*
		29.00000	14.00000	-3.50000	0.0	0.0	-0.27221	-	-	-	*
		31.00000	14.00000	-3.50000	0.0	0.0	-0.37551	-	-	-	*
		33.00000	14.00000	-3.50000	0.0	0.0	-0.50701	-	-	-	*
		35.00000	14.00000	-3.50000	0.0	0.0	-0.65524	-	-	-	*
		37.00000	14.00000	-3.50000	0.0	0.0	-0.78076	-	-	-	*
		39.00000	14.00000	-3.50000	0.0	0.0	-0.81671	-	-	-	*
		41.00000	14.00000	-3.50000	0.0	0.0	-0.73398	-	-	-	*
		43.00000	14.00000	-3.50000	0.0	0.0	-0.58586	-	-	-	*
		45.00000	14.00000	-3.50000	0.0	0.0	-0.43643	-	-	-	*
		47.00000	14.00000	-3.50000	0.0	0.0	-0.31469	-	-	-	*
		49.00000	14.00000	-3.50000	0.0	0.0	-0.22416	-	-	-	*
		51.00000	14.00000	-3.50000	0.0	0.0	-0.15921	-	-	-	*
		53.00000	14.00000	-3.50000	0.0	0.0	-0.11313	-	-	-	*
		55.00000	14.00000	-3.50000	0.0	0.0	-0.080474	-	-	-	*
		15.00000	16.00000	-3.50000	0.0	0.0	-0.028430	-	-	-	*
		17.00000	16.00000	-3.50000	0.0	0.0	-0.040424	-	-	-	*
		19.00000	16.00000	-3.50000	0.0	0.0	-0.057356	-	-	-	*
		21.00000	16.00000	-3.50000	0.0	0.0	-0.081436	-	-	-	*
		23.00000	16.00000	-3.50000	0.0	0.0	-0.11600	-	-	-	*
		25.00000	16.00000	-3.50000	0.0	0.0	-0.16612	-	-	-	*
		27.00000	16.00000	-3.50000	0.0	0.0	-0.23965	-	-	-	*
		29.00000	16.00000	-3.50000	0.0	0.0	-0.34856	-	-	-	*
		31.00000	16.00000	-3.50000	0.0	0.0	-0.51013	-	-	-	*
		33.00000	16.00000	-3.50000	0.0	0.0	-0.74477	-	-	-	*
		35.00000	16.00000	-3.50000	0.0	0.0	-1.0607	-	-	-	*
		37.00000	16.00000	-3.50000	0.0	0.0	-1.4007	-	-	-	*
		39.00000	16.00000	-3.50000	0.0	0.0	-1.5286	-	-	-	*
		41.00000	16.00000	-3.50000	0.0	0.0	-1.2774	-	-	-	*
		43.00000	16.00000	-3.50000	0.0	0.0	-0.911163	-	-	-	*
		45.00000	16.00000	-3.50000	0.0	0.0	-0.61396	-	-	-	*
		47.00000	16.00000	-3.50000	0.0	0.0	-0.41047	-	-	-	*
		49.00000	16.00000	-3.50000	0.0	0.0	-0.27727	-	-	-	*
		51.00000	16.00000	-3.50000	0.0	0.0	-0.18974	-	-	-	*
		53.00000	16.00000	-3.50000	0.0	0.0	-0.13129	-	-	-	*
		55.00000	16.00000	-3.50000	0.0	0.0	-0.091588	-	-	-	*
		15.00000	18.00000	-3.50000	0.0	0.0	-0.030463	-	-	-	*
		17.00000	18.00000	-3.50000	0.0	0.0	-0.043578	-	-	-	*
		19.00000	18.00000	-3.50000	0.0	0.0	-0.062333	-	-	-	*
		21.00000	18.00000	-3.50000	0.0	0.0	-0.089467	-	-	-	*
		23.00000	18.00000	-3.50000	0.0	0.0	-0.12931	-	-	-	*
		25.00000	18.00000	-3.50000	0.0	0.0	-0.18898	-	-	-	*
		27.00000	18.00000	-3.50000	0.0	0.0	-0.28064	-	-	-	*
		29.00000	18.00000	-3.50000	0.0	0.0	-0.42602	-	-	-	*
		31.00000	18.00000	-3.50000	0.0	0.0	-0.66528	-	-	-	*
		33.00000	18.00000	-3.50000	0.0	0.0	-1.0703	-	-	-	*
		35.00000	18.00000	-3.50000	0.0	0.0	-1.7471	-	-	-	*
		37.00000	18.00000	-3.50000	0.0	0.0	-2.7820	-	-	-	*
		39.00000	18.00000	-3.50000	0.0	0.0	-3.7070	-	-	-	*
		41.00000	18.00000	-3.50000	0.0	0.0	-2.3958	-	-	-	*
		43.00000	18.00000	-3.50000	0.0	0.0	-1.4100	-	-	-	*
		45.00000	18.00000	-3.50000	0.0	0.0	-0.824453	-	-	-	*
		47.00000	18.00000	-3.50000	0.0	0.0	-0.50628	-	-	-	*
		49.00000	18.00000	-3.50000	0.0	0.0	-0.32507	-	-	-	*
		51.00000	18.00000	-3.50000	0.0	0.0	-0.21544	-	-	-	*
		53.00000	18.00000	-3.50000	0.0	0.0	-0.14591	-	-	-	*
		55.00000	18.00000	-3.50000	0.0	0.0	-0.10027	-	-	-	*
		15.00000	20.00000	-3.50000	0.0	0.0	-0.031671	-	-	-	*
		17.00000	20.00000	-3.50000	0.0	0.0	-0.045470	-	-	-	*
		19.00000	20.00000	-3.50000	0.0	0.0	-0.065363	-	-	-	*
		21.00000	20.00000	-3.50000	0.0	0.0	-0.094450	-	-	-	*
		23.00000	20.00000	-3.50000	0.0	0.0	-0.13780	-	-	-	*
		25.00000	20.00000	-3.50000	0.0	0.0	-0.20411	-	-	-	*
		27.00000	20.00000	-3.50000	0.0	0.0	-0.30937	-	-	-	*
		29.00000	20.00000	-3.50000	0.0	0.0	-0.48555	-	-	-	*

Oasys

GEOTECHNICAL AND ENVIRONMENTALASSOCIATES LTD *J18119*

7 Denmark Street, London WC2H 8LZ
Combined lateral and horizontal movements

Job No.	Sheet No.	Rev.

Drg. Ref.

Made by **ML** | Date **02-Oct-2018** | Checked

Type/No.		Coordinates			Displacements			Horizontal displacement	Horizontal displacement	Angle of Line to x Axis	
Name	Dist.	x	y	z	x	y	z				
		31.00000	20.00000	-3.50000	0.0	0.0	-0.80391	-	-	-	*
		33.00000	20.00000	-3.50000	0.0	0.0	-1.4388	-	-	-	*
		35.00000	20.00000	-3.50000	0.0	0.0	-2.7882	-	-	-	*
		37.00000	20.00000	-3.50000	0.0	0.0	-5.6806	-	-	-	*
		39.00000	20.00000	-3.50000	0.0	0.0	-6.4750	-	-	-	*
		41.00000	20.00000	-3.50000	0.0	0.0	-4.8648	-	-	-	*
		43.00000	20.00000	-3.50000	0.0	0.0	-1.9707	-	-	-	*
		45.00000	20.00000	-3.50000	0.0	0.0	-0.98998	-	-	-	*
		47.00000	20.00000	-3.50000	0.0	0.0	-0.57026	-	-	-	*
		49.00000	20.00000	-3.50000	0.0	0.0	-0.35449	-	-	-	*
		51.00000	20.00000	-3.50000	0.0	0.0	-0.23057	-	-	-	*
		53.00000	20.00000	-3.50000	0.0	0.0	-0.15429	-	-	-	*
		55.00000	20.00000	-3.50000	0.0	0.0	-0.10516	-	-	-	*
		15.00000	22.00000	-3.50000	0.0	0.0	-0.031918	-	-	-	*
		17.00000	22.00000	-3.50000	0.0	0.0	-0.045865	-	-	-	*
		19.00000	22.00000	-3.50000	0.0	0.0	-0.066010	-	-	-	*
		21.00000	22.00000	-3.50000	0.0	0.0	-0.095546	-	-	-	*
		23.00000	22.00000	-3.50000	0.0	0.0	-0.13974	-	-	-	*
		25.00000	22.00000	-3.50000	0.0	0.0	-0.20777	-	-	-	*
		27.00000	22.00000	-3.50000	0.0	0.0	-0.31690	-	-	-	*
		29.00000	22.00000	-3.50000	0.0	0.0	-0.50322	-	-	-	*
		31.00000	22.00000	-3.50000	0.0	0.0	-0.85480	-	-	-	*
		33.00000	22.00000	-3.50000	0.0	0.0	-1.6411	-	-	-	*
		35.00000	22.00000	-3.50000	0.0	0.0	-4.2756	-	-	-	*
		37.00000	22.00000	-3.50000	0.0	0.0	-6.5197	-	-	-	*
		39.00000	22.00000	-3.50000	0.0	0.0	-6.7005	-	-	-	*
		41.00000	22.00000	-3.50000	0.0	0.0	-4.2875	-	-	-	*
		43.00000	22.00000	-3.50000	0.0	0.0	-1.9503	-	-	-	*
		45.00000	22.00000	-3.50000	0.0	0.0	-0.98528	-	-	-	*
		47.00000	22.00000	-3.50000	0.0	0.0	-0.57024	-	-	-	*
		49.00000	22.00000	-3.50000	0.0	0.0	-0.35505	-	-	-	*
		51.00000	22.00000	-3.50000	0.0	0.0	-0.23105	-	-	-	*
		53.00000	22.00000	-3.50000	0.0	0.0	-0.15464	-	-	-	*
		55.00000	22.00000	-3.50000	0.0	0.0	-0.10539	-	-	-	*
		15.00000	24.00000	-3.50000	0.0	0.0	-0.031175	-	-	-	*
		17.00000	24.00000	-3.50000	0.0	0.0	-0.044707	-	-	-	*
		19.00000	24.00000	-3.50000	0.0	0.0	-0.064167	-	-	-	*
		21.00000	24.00000	-3.50000	0.0	0.0	-0.092537	-	-	-	*
		23.00000	24.00000	-3.50000	0.0	0.0	-0.13466	-	-	-	*
		25.00000	24.00000	-3.50000	0.0	0.0	-0.19880	-	-	-	*
		27.00000	24.00000	-3.50000	0.0	0.0	-0.29999	-	-	-	*
		29.00000	24.00000	-3.50000	0.0	0.0	-0.46816	-	-	-	*
		31.00000	24.00000	-3.50000	0.0	0.0	-0.76995	-	-	-	*
		33.00000	24.00000	-3.50000	0.0	0.0	-1.3699	-	-	-	*
		35.00000	24.00000	-3.50000	0.0	0.0	-2.5896	-	-	-	*
		37.00000	24.00000	-3.50000	0.0	0.0	-4.5089	-	-	-	*
		39.00000	24.00000	-3.50000	0.0	0.0	-4.7515	-	-	-	*
		41.00000	24.00000	-3.50000	0.0	0.0	-2.2694	-	-	-	*
		43.00000	24.00000	-3.50000	0.0	0.0	-1.3802	-	-	-	*
		45.00000	24.00000	-3.50000	0.0	0.0	-0.82094	-	-	-	*
		47.00000	24.00000	-3.50000	0.0	0.0	-0.50783	-	-	-	*
		49.00000	24.00000	-3.50000	0.0	0.0	-0.32698	-	-	-	*
		51.00000	24.00000	-3.50000	0.0	0.0	-0.21691	-	-	-	*
		53.00000	24.00000	-3.50000	0.0	0.0	-0.14693	-	-	-	*
		55.00000	24.00000	-3.50000	0.0	0.0	-0.10096	-	-	-	*
		15.00000	26.00000	-3.50000	0.0	0.0	-0.029522	-	-	-	*
		17.00000	26.00000	-3.50000	0.0	0.0	-0.042135	-	-	-	*
		19.00000	26.00000	-3.50000	0.0	0.0	-0.060089	-	-	-	*
		21.00000	26.00000	-3.50000	0.0	0.0	-0.085913	-	-	-	*
		23.00000	26.00000	-3.50000	0.0	0.0	-0.12356	-	-	-	*
		25.00000	26.00000	-3.50000	0.0	0.0	-0.17938	-	-	-	*
		27.00000	26.00000	-3.50000	0.0	0.0	-0.26404	-	-	-	*
		29.00000	26.00000	-3.50000	0.0	0.0	-0.39594	-	-	-	*
		31.00000	26.00000	-3.50000	0.0	0.0	-0.60702	-	-	-	*
		33.00000	26.00000	-3.50000	0.0	0.0	-0.94480	-	-	-	*
		35.00000	26.00000	-3.50000	0.0	0.0	-1.4301	-	-	-	*
		37.00000	26.00000	-3.50000	0.0	0.0	-1.8979	-	-	-	*
		39.00000	26.00000	-3.50000	0.0	0.0	-1.4561	-	-	-	*
		41.00000	26.00000	-3.50000	0.0	0.0	-1.2919	-	-	-	*
		43.00000	26.00000	-3.50000	0.0	0.0	-0.91816	-	-	-	*
		45.00000	26.00000	-3.50000	0.0	0.0	-0.61983	-	-	-	*
		47.00000	26.00000	-3.50000	0.0	0.0	-0.41532	-	-	-	*
		49.00000	26.00000	-3.50000	0.0	0.0	-0.28080	-	-	-	*
		51.00000	26.00000	-3.50000	0.0	0.0	-0.19216	-	-	-	*
		53.00000	26.00000	-3.50000	0.0	0.0	-0.13291	-	-	-	*
		55.00000	26.00000	-3.50000	0.0	0.0	-0.092672	-	-	-	*
		15.00000	28.00000	-3.50000	0.0	0.0	-0.027130	-	-	-	*
		17.00000	28.00000	-3.50000	0.0	0.0	-0.038451	-	-	-	*
		19.00000	28.00000	-3.50000	0.0	0.0	-0.054323	-	-	-	*
		21.00000	28.00000	-3.50000	0.0	0.0	-0.076706	-	-	-	*
		23.00000	28.00000	-3.50000	0.0	0.0	-0.10848	-	-	-	*
		25.00000	28.00000	-3.50000	0.0	0.0	-0.15391	-	-	-	*
		27.00000	28.00000	-3.50000	0.0	0.0	-0.21924	-	-	-	*
		29.00000	28.00000	-3.50000	0.0	0.0	-0.31325	-	-	-	*
		31.00000	28.00000	-3.50000	0.0	0.0	-0.44634	-	-	-	*
		33.00000	28.00000	-3.50000	0.0	0.0	-0.62352	-	-	-	*
		35.00000	28.00000	-3.50000	0.0	0.0	-0.82236	-	-	-	*
		37.00000	28.00000	-3.50000	0.0	0.0	-0.95901	-	-	-	*
		39.00000	28.00000	-3.50000	0.0	0.0	-0.92569	-	-	-	*
		41.00000	28.00000	-3.50000	0.0	0.0	-0.78034	-	-	-	*
		43.00000	28.00000	-3.50000	0.0	0.0	-0.60807	-	-	-	*
		45.00000	28.00000	-3.50000	0.0	0.0	-0.44877	-	-	-	*
		47.00000	28.00000	-3.50000	0.0	0.0	-0.32226	-	-	-	*
		49.00000	28.00000	-3.50000	0.0	0.0	-0.22901	-	-	-	*
		51.00000	28.00000	-3.50000	0.0	0.0	-0.16238	-	-	-	*
		53.00000	28.00000	-3.50000	0.0	0.0	-0.11522	-	-	-	*
		55.00000	28.00000	-3.50000	0.0	0.0	-0.081862	-	-	-	*
		15.00000	30.00000	-3.50000	0.0	0.0	-0.024227	-	-	-	*
		17.00000	30.00000	-3.50000	0.0	0.0	-0.034045	-	-	-	*
		19.00000	30.00000	-3.50000	0.0	0.0	-0.047553	-	-	-	*
		21.00000	30.00000	-3.50000	0.0	0.0	-0.066149	-	-	-	*
		23.00000	30.00000	-3.50000	0.0	0.0	-0.091737	-	-	-	*
		25.00000	30.00000	-3.50000	0.0	0.0	-0.12683	-	-	-	*
		27.00000	30.00000	-3.50000	0.0	0.0	-0.17454	-	-	-	*
		29.00000	30.00000	-3.50000	0.0	0.0	-0.23806	-	-	-	*
		31.00000	30.00000	-3.50000	0.0	0.0	-0.31897	-	-	-	*
		33.00000	30.00000	-3.50000	0.0	0.0	-0.41288	-	-	-	*
		35.00000	30.00000	-3.50000	0.0	0.0	-0.50281	-	-	-	*
		37.00000	30.00000	-3.50000	0.0	0.0	-0.55737	-	-	-	*
		39.00000	30.00000	-3.50000	0.0	0.0	-0.55077	-	-	-	*
		41.00000	30.00000	-3.50000	0.0	0.0	-0.49161	-	-	-	*
		43.00000	30.00000	-3.50000	0.0	0.0	-0.40718	-	-	-	*
		45.00000	30.00000	-3.50000	0.0	0.0	-0.31979	-	-	-	*
		47.00000	30.00000	-3.50000	0.0	0.0	-0.24259	-	-	-	*
		49.00000	30.00000	-3.50000	0.0	0.0	-0.18023	-	-	-	*
		51.00000	30.00000	-3.50000	0.0	0.0	-0.13230	-	-	-	*
		53.00000	30.00000	-3.50000	0.0	0.0	-0.096425	-	-	-	*
		55.00000	30.00000	-3.50000	0.0	0.0	-0.069942	-	-	-	*
		15.00000	32.00000	-3.50000	0.0	0.0	-0.021056	-	-	-	*
		17.00000	32.00000	-3.50000	0.0	0.0	-0.029315	-	-	-	*
		19.00000	32.00000	-3.50000	0.0	0.0	-0.040440	-	-	-	*
		21.00000	32.00000	-3.50000	0.0	0.0	-0.055360	-	-	-	*
		23.00000	32.00000	-3.50000	0.0	0.0	-0.075224	-	-	-	*
		25.00000	32.00000	-3.50000	0.0	0.0	-0.10135	-	-	-	*
		27.00000	32.00000	-3.50000	0.0	0.0	-0.13502	-	-	-	*
		29.00000	32.00000	-3.50000	0.0	0.0	-0.17691	-	-	-	*
		31.00000	32.00000	-3.50000	0.0	0.0	-0.22596	-	-	-	*
		33.00000	32.00000	-3.50000	0.0	0.0	-0.27768	-	-	-	*
		35.00000	32.00000	-3.50000	0.0	0.0	-0.32274	-	-	-	*
		37.00000	32.00000	-3.50000	0.0	0.0	-0.34875	-	-	-	*

Oasys

GEOTECHNICAL AND ENVIRONMENTAL ASSOCIATES LTD *J18119*

7 Denmark Street, London WC2H 8LZ
Combined lateral and horizontal movements

Job No.	Sheet No.	Rev.

Drg. Ref.

Made by ML | **Date** 02-Oct-2018 | **Checked**

Type/No.		Coordinates			Displacements				Angle of Line	
Name	Dist.	x	y	z	x	y	z	Horizontal displacement	Horizontal displacement	to x Axis	
		39.00000	32.00000	-3.50000	0.0	0.0	-0.34719	-	-	-	*
		41.00000	32.00000	-3.50000	0.0	0.0	-0.31979	-	-	-	*
		43.00000	32.00000	-3.50000	0.0	0.0	-0.27613	-	-	-	*
		45.00000	32.00000	-3.50000	0.0	0.0	-0.22677	-	-	-	*
		47.00000	32.00000	-3.50000	0.0	0.0	-0.17951	-	-	-	*
		49.00000	32.00000	-3.50000	0.0	0.0	-0.13846	-	-	-	*
		51.00000	32.00000	-3.50000	0.0	0.0	-0.10488	-	-	-	*
		53.00000	32.00000	-3.50000	0.0	0.0	-0.078433	-	-	-	*
		55.00000	32.00000	-3.50000	0.0	0.0	-0.058086	-	-	-	*
		15.00000	34.00000	-3.50000	0.0	0.0	-0.017835	-	-	-	*
		17.00000	34.00000	-3.50000	0.0	0.0	-0.024601	-	-	-	*
		19.00000	34.00000	-3.50000	0.0	0.0	-0.033517	-	-	-	*
		21.00000	34.00000	-3.50000	0.0	0.0	-0.045159	-	-	-	*
		23.00000	34.00000	-3.50000	0.0	0.0	-0.060165	-	-	-	*
		25.00000	34.00000	-3.50000	0.0	0.0	-0.079139	-	-	-	*
		27.00000	34.00000	-3.50000	0.0	0.0	-0.10245	-	-	-	*
		29.00000	34.00000	-3.50000	0.0	0.0	-0.12986	-	-	-	*
		31.00000	34.00000	-3.50000	0.0	0.0	-0.15996	-	-	-	*
		33.00000	34.00000	-3.50000	0.0	0.0	-0.18965	-	-	-	*
		35.00000	34.00000	-3.50000	0.0	0.0	-0.21405	-	-	-	*
		37.00000	34.00000	-3.50000	0.0	0.0	-0.22777	-	-	-	*
		39.00000	34.00000	-3.50000	0.0	0.0	-0.22740	-	-	-	*
		41.00000	34.00000	-3.50000	0.0	0.0	-0.21339	-	-	-	*
		43.00000	34.00000	-3.50000	0.0	0.0	-0.18951	-	-	-	*
		45.00000	34.00000	-3.50000	0.0	0.0	-0.16078	-	-	-	*
		47.00000	34.00000	-3.50000	0.0	0.0	-0.13153	-	-	-	*
		49.00000	34.00000	-3.50000	0.0	0.0	-0.10462	-	-	-	*
		51.00000	34.00000	-3.50000	0.0	0.0	-0.081444	-	-	-	*
		53.00000	34.00000	-3.50000	0.0	0.0	-0.062352	-	-	-	*
		55.00000	34.00000	-3.50000	0.0	0.0	-0.047094	-	-	-	*
		15.00000	36.00000	-3.50000	0.0	0.0	-0.014738	-	-	-	*
		17.00000	36.00000	-3.50000	0.0	0.0	-0.020159	-	-	-	*
		19.00000	36.00000	-3.50000	0.0	0.0	-0.027147	-	-	-	*
		21.00000	36.00000	-3.50000	0.0	0.0	-0.036037	-	-	-	*
		23.00000	36.00000	-3.50000	0.0	0.0	-0.047151	-	-	-	*
		25.00000	36.00000	-3.50000	0.0	0.0	-0.060711	-	-	-	*
		27.00000	36.00000	-3.50000	0.0	0.0	-0.076701	-	-	-	*
		29.00000	36.00000	-3.50000	0.0	0.0	-0.094659	-	-	-	*
		31.00000	36.00000	-3.50000	0.0	0.0	-0.11344	-	-	-	*
		33.00000	36.00000	-3.50000	0.0	0.0	-0.13111	-	-	-	*
		35.00000	36.00000	-3.50000	0.0	0.0	-0.14508	-	-	-	*
		37.00000	36.00000	-3.50000	0.0	0.0	-0.15282	-	-	-	*
		39.00000	36.00000	-3.50000	0.0	0.0	-0.15277	-	-	-	*
		41.00000	36.00000	-3.50000	0.0	0.0	-0.14506	-	-	-	*
		43.00000	36.00000	-3.50000	0.0	0.0	-0.13137	-	-	-	*
		45.00000	36.00000	-3.50000	0.0	0.0	-0.114416	-	-	-	*
		47.00000	36.00000	-3.50000	0.0	0.0	-0.095800	-	-	-	*
		49.00000	36.00000	-3.50000	0.0	0.0	-0.078128	-	-	-	*
		51.00000	36.00000	-3.50000	0.0	0.0	-0.062246	-	-	-	*
		53.00000	36.00000	-3.50000	0.0	0.0	-0.048648	-	-	-	*
		55.00000	36.00000	-3.50000	0.0	0.0	-0.037402	-	-	-	*
		15.00000	38.00000	-3.50000	0.0	0.0	-0.011884	-	-	-	*
		17.00000	38.00000	-3.50000	0.0	0.0	-0.016148	-	-	-	*
		19.00000	38.00000	-3.50000	0.0	0.0	-0.021528	-	-	-	*
		21.00000	38.00000	-3.50000	0.0	0.0	-0.028206	-	-	-	*
		23.00000	38.00000	-3.50000	0.0	0.0	-0.036324	-	-	-	*
		25.00000	38.00000	-3.50000	0.0	0.0	-0.045922	-	-	-	*
		27.00000	38.00000	-3.50000	0.0	0.0	-0.056852	-	-	-	*
		29.00000	38.00000	-3.50000	0.0	0.0	-0.068681	-	-	-	*
		31.00000	38.00000	-3.50000	0.0	0.0	-0.080601	-	-	-	*
		33.00000	38.00000	-3.50000	0.0	0.0	-0.091431	-	-	-	*
		35.00000	38.00000	-3.50000	0.0	0.0	-0.099769	-	-	-	*
		37.00000	38.00000	-3.50000	0.0	0.0	-0.10433	-	-	-	*
		39.00000	38.00000	-3.50000	0.0	0.0	-0.10436	-	-	-	*
		41.00000	38.00000	-3.50000	0.0	0.0	-0.099904	-	-	-	*
		43.00000	38.00000	-3.50000	0.0	0.0	-0.091752	-	-	-	*
		45.00000	38.00000	-3.50000	0.0	0.0	-0.081165	-	-	-	*
		47.00000	38.00000	-3.50000	0.0	0.0	-0.069477	-	-	-	*
		49.00000	38.00000	-3.50000	0.0	0.0	-0.057814	-	-	-	*
		51.00000	38.00000	-3.50000	0.0	0.0	-0.046959	-	-	-	*
		53.00000	38.00000	-3.50000	0.0	0.0	-0.037354	-	-	-	*
		55.00000	38.00000	-3.50000	0.0	0.0	-0.029167	-	-	-	*
		15.00000	40.00000	-3.50000	0.0	0.0	-0.0093450	-	-	-	*
		17.00000	40.00000	-3.50000	0.0	0.0	-0.012646	-	-	-	*
		19.00000	40.00000	-3.50000	0.0	0.0	-0.016728	-	-	-	*
		21.00000	40.00000	-3.50000	0.0	0.0	-0.021683	-	-	-	*
		23.00000	40.00000	-3.50000	0.0	0.0	-0.027556	-	-	-	*
		25.00000	40.00000	-3.50000	0.0	0.0	-0.034312	-	-	-	*
		27.00000	40.00000	-3.50000	0.0	0.0	-0.041785	-	-	-	*
		29.00000	40.00000	-3.50000	0.0	0.0	-0.049632	-	-	-	*
		31.00000	40.00000	-3.50000	0.0	0.0	-0.057312	-	-	-	*
		33.00000	40.00000	-3.50000	0.0	0.0	-0.064111	-	-	-	*
		35.00000	40.00000	-3.50000	0.0	0.0	-0.069244	-	-	-	*
		37.00000	40.00000	-3.50000	0.0	0.0	-0.072031	-	-	-	*
		39.00000	40.00000	-3.50000	0.0	0.0	-0.072077	-	-	-	*
		41.00000	40.00000	-3.50000	0.0	0.0	-0.069394	-	-	-	*
		43.00000	40.00000	-3.50000	0.0	0.0	-0.064389	-	-	-	*
		45.00000	40.00000	-3.50000	0.0	0.0	-0.057736	-	-	-	*
		47.00000	40.00000	-3.50000	0.0	0.0	-0.050191	-	-	-	*
		49.00000	40.00000	-3.50000	0.0	0.0	-0.042444	-	-	-	*
		51.00000	40.00000	-3.50000	0.0	0.0	-0.035023	-	-	-	*
		53.00000	40.00000	-3.50000	0.0	0.0	-0.028270	-	-	-	*
		55.00000	40.00000	-3.50000	0.0	0.0	-0.022361	-	-	-	*
		15.00000	42.00000	-3.50000	0.0	0.0	-0.0071472	-	-	-	*
		17.00000	42.00000	-3.50000	0.0	0.0	-0.0096702	-	-	-	*
		19.00000	42.00000	-3.50000	0.0	0.0	-0.012733	-	-	-	*
		21.00000	42.00000	-3.50000	0.0	0.0	-0.016374	-	-	-	*
		23.00000	42.00000	-3.50000	0.0	0.0	-0.020595	-	-	-	*
		25.00000	42.00000	-3.50000	0.0	0.0	-0.025338	-	-	-	*
		27.00000	42.00000	-3.50000	0.0	0.0	-0.030455	-	-	-	*
		29.00000	42.00000	-3.50000	0.0	0.0	-0.035699	-	-	-	*
		31.00000	42.00000	-3.50000	0.0	0.0	-0.040714	-	-	-	*
		33.00000	42.00000	-3.50000	0.0	0.0	-0.045066	-	-	-	*
		35.00000	42.00000	-3.50000	0.0	0.0	-0.048304	-	-	-	*
		37.00000	42.00000	-3.50000	0.0	0.0	-0.050050	-	-	-	*
		39.00000	42.00000	-3.50000	0.0	0.0	-0.050091	-	-	-	*
		41.00000	42.00000	-3.50000	0.0	0.0	-0.048429	-	-	-	*
		43.00000	42.00000	-3.50000	0.0	0.0	-0.045283	-	-	-	*
		45.00000	42.00000	-3.50000	0.0	0.0	-0.041024	-	-	-	*
		47.00000	42.00000	-3.50000	0.0	0.0	-0.036093	-	-	-	*
		49.00000	42.00000	-3.50000	0.0	0.0	-0.030912	-	-	-	*
		51.00000	42.00000	-3.50000	0.0	0.0	-0.025830	-	-	-	*
		53.00000	42.00000	-3.50000	0.0	0.0	-0.021093	-	-	-	*
		55.00000	42.00000	-3.50000	0.0	0.0	-0.016852	-	-	-	*
		15.00000	44.00000	-3.50000	0.0	0.0	-0.0052891	-	-	-	*
		17.00000	44.00000	-3.50000	0.0	0.0	-0.0071961	-	-	-	*
		19.00000	44.00000	-3.50000	0.0	0.0	-0.0094721	-	-	-	*
		21.00000	44.00000	-3.50000	0.0	0.0	-0.0121293	-	-	-	*
		23.00000	44.00000	-3.50000	0.0	0.0	-0.015150	-	-	-	*
		25.00000	44.00000	-3.50000	0.0	0.0	-0.018474	-	-	-	*
		27.00000	44.00000	-3.50000	0.0	0.0	-0.021989	-	-	-	*
		29.00000	44.00000	-3.50000	0.0	0.0	-0.025518	-	-	-	*
		31.00000	44.00000	-3.50000	0.0	0.0	-0.028830	-	-	-	*
		33.00000	44.00000	-3.50000	0.0	0.0	-0.031660	-	-	-	*
		35.00000	44.00000	-3.50000	0.0	0.0	-0.033741	-	-	-	*
		37.00000	44.00000	-3.50000	0.0	0.0	-0.034858	-	-	-	*
		39.00000	44.00000	-3.50000	0.0	0.0	-0.034890	-	-	-	*
		41.00000	44.00000	-3.50000	0.0	0.0	-0.033837	-	-	-	*
		43.00000	44.00000	-3.50000	0.0	0.0	-0.031821	-	-	-	*
		45.00000	44.00000	-3.50000	0.0	0.0	-0.029053	-	-	-	*

Oasys

GEOTECHNICAL AND ENVIRONMENTAL ASSOCIATES LTD *J18119*

7 Denmark Street, London WC2H 8LZ
Combined lateral and horizontal movements

Job No.	Sheet No.	Rev.

Drg. Ref.		

Made by ML	Date 02-Oct-2018	Checked

Type/No. Name	Dist.	Coordinates x	y	z	Displacements x	y	z	Horizontal displacement	Horizontal displacement	Angle of Line to x Axis	
		47.00000	44.00000	-3.50000	0.0	0.0	-0.025795	–	–	–	*
		49.00000	44.00000	-3.50000	0.0	0.0	-0.022307	–	–	–	*
		51.00000	44.00000	-3.50000	0.0	0.0	-0.018817	–	–	–	*
		53.00000	44.00000	-3.50000	0.0	0.0	-0.015498	–	–	–	*
		55.00000	44.00000	-3.50000	0.0	0.0	-0.012467	–	–	–	*
		15.00000	46.00000	-3.50000	0.0	0.0	-0.0037491	–	–	–	*
		17.00000	46.00000	-3.50000	0.0	0.0	-0.0051766	–	–	–	*
		19.00000	46.00000	-3.50000	0.0	0.0	-0.0068549	–	–	–	*
		21.00000	46.00000	-3.50000	0.0	0.0	-0.0087827	–	–	–	*
		23.00000	46.00000	-3.50000	0.0	0.0	-0.010937	–	–	–	*
		25.00000	46.00000	-3.50000	0.0	0.0	-0.013267	–	–	–	*
		27.00000	46.00000	-3.50000	0.0	0.0	-0.015687	–	–	–	*
		29.00000	46.00000	-3.50000	0.0	0.0	-0.018077	–	–	–	*
		31.00000	46.00000	-3.50000	0.0	0.0	-0.020287	–	–	–	*
		33.00000	46.00000	-3.50000	0.0	0.0	-0.022151	–	–	–	*
		35.00000	46.00000	-3.50000	0.0	0.0	-0.023509	–	–	–	*
		37.00000	46.00000	-3.50000	0.0	0.0	-0.024235	–	–	–	*
		39.00000	46.00000	-3.50000	0.0	0.0	-0.024259	–	–	–	*
		41.00000	46.00000	-3.50000	0.0	0.0	-0.023579	–	–	–	*
		43.00000	46.00000	-3.50000	0.0	0.0	-0.022267	–	–	–	*
		45.00000	46.00000	-3.50000	0.0	0.0	-0.020445	–	–	–	*
		47.00000	46.00000	-3.50000	0.0	0.0	-0.018272	–	–	–	*
		49.00000	46.00000	-3.50000	0.0	0.0	-0.015910	–	–	–	*
		51.00000	46.00000	-3.50000	0.0	0.0	-0.013506	–	–	–	*
		53.00000	46.00000	-3.50000	0.0	0.0	-0.011181	–	–	–	*
		55.00000	46.00000	-3.50000	0.0	0.0	-0.0090216	–	–	–	*
		15.00000	48.00000	-3.50000	0.0	0.0	-0.0024947	–	–	–	*
		17.00000	48.00000	-3.50000	0.0	0.0	-0.0035539	–	–	–	*
		19.00000	48.00000	-3.50000	0.0	0.0	-0.0047829	–	–	–	*
		21.00000	48.00000	-3.50000	0.0	0.0	-0.0061746	–	–	–	*
		23.00000	48.00000	-3.50000	0.0	0.0	-0.0077072	–	–	–	*
		25.00000	48.00000	-3.50000	0.0	0.0	-0.0093398	–	–	–	*
		27.00000	48.00000	-3.50000	0.0	0.0	-0.011011	–	–	–	*
		29.00000	48.00000	-3.50000	0.0	0.0	-0.012638	–	–	–	*
		31.00000	48.00000	-3.50000	0.0	0.0	-0.014124	–	–	–	*
		33.00000	48.00000	-3.50000	0.0	0.0	-0.015365	–	–	–	*
		35.00000	48.00000	-3.50000	0.0	0.0	-0.016262	–	–	–	*
		37.00000	48.00000	-3.50000	0.0	0.0	-0.016741	–	–	–	*
		39.00000	48.00000	-3.50000	0.0	0.0	-0.016758	–	–	–	*
		41.00000	48.00000	-3.50000	0.0	0.0	-0.016313	–	–	–	*
		43.00000	48.00000	-3.50000	0.0	0.0	-0.015448	–	–	–	*
		45.00000	48.00000	-3.50000	0.0	0.0	-0.014236	–	–	–	*
		47.00000	48.00000	-3.50000	0.0	0.0	-0.012775	–	–	–	*
		49.00000	48.00000	-3.50000	0.0	0.0	-0.011166	–	–	–	*
		51.00000	48.00000	-3.50000	0.0	0.0	-0.0095070	–	–	–	*
		53.00000	48.00000	-3.50000	0.0	0.0	-0.0078785	–	–	–	*
		55.00000	48.00000	-3.50000	0.0	0.0	-0.0063431	–	–	–	*
		15.00000	50.00000	-3.50000	0.0	0.0	-0.0014888	–	–	–	*
		17.00000	50.00000	-3.50000	0.0	0.0	-0.0022681	–	–	–	*
		19.00000	50.00000	-3.50000	0.0	0.0	-0.0031620	–	–	–	*
		21.00000	50.00000	-3.50000	0.0	0.0	-0.0041621	–	–	–	*
		23.00000	50.00000	-3.50000	0.0	0.0	-0.0052495	–	–	–	*
		25.00000	50.00000	-3.50000	0.0	0.0	-0.0063932	–	–	–	*
		27.00000	50.00000	-3.50000	0.0	0.0	-0.0075494	–	–	–	*
		29.00000	50.00000	-3.50000	0.0	0.0	-0.0086624	–	–	–	*
		31.00000	50.00000	-3.50000	0.0	0.0	-0.0096683	–	–	–	*
		33.00000	50.00000	-3.50000	0.0	0.0	-0.010501	–	–	–	*
		35.00000	50.00000	-3.50000	0.0	0.0	-0.011100	–	–	–	*
		37.00000	50.00000	-3.50000	0.0	0.0	-0.011418	–	–	–	*
		39.00000	50.00000	-3.50000	0.0	0.0	-0.011430	–	–	–	*
		41.00000	50.00000	-3.50000	0.0	0.0	-0.011135	–	–	–	*
		43.00000	50.00000	-3.50000	0.0	0.0	-0.010559	–	–	–	*
		45.00000	50.00000	-3.50000	0.0	0.0	-0.0097469	–	–	–	*
		47.00000	50.00000	-3.50000	0.0	0.0	-0.0087581	–	–	–	*
		49.00000	50.00000	-3.50000	0.0	0.0	-0.0076580	–	–	–	*
		51.00000	50.00000	-3.50000	0.0	0.0	-0.0065099	–	–	–	*
		53.00000	50.00000	-3.50000	0.0	0.0	-0.0053694	–	–	–	*
		55.00000	50.00000	-3.50000	0.0	0.0	-0.0042805	–	–	–	*
No8 A	Line 15	25.70000	33.20000	-3.50000	0.0	0.0	0.0	0.0	0.0	216.69	
	1.0600	24.85000	32.56667	-3.50000	0.0	0.0	0.0	0.0	0.0	216.69	
	2.1200	24.00000	31.93333	-3.50000	0.0	0.0	0.0	0.0	0.0	216.69	
	3.1800	23.15000	31.30000	-3.50000	0.0	0.0	0.0	0.0	0.0	216.69	
	4.2400	22.30000	30.66667	-3.50000	0.0	0.0	0.0	0.0	0.0	216.69	
	5.3000	21.45000	30.03333	-3.50000	0.0	0.0	0.0	0.0	0.0	216.69	
	6.3600	20.60000	29.40000	-3.50000	0.0	0.0	0.0	0.0	0.0	216.69	

* Result includes imported displacement(s).

Specific Building Damage Results - Horizontal Displacements

Structure: No 6 Denmark Street | Sub-structure: No6 A

Dist.	Coordinates x	y	z	Displacements x	y	Horizontal displacement along the Line	Horizontal displacement perpendicular to Line	
[m]	[m]	[m]	[m]	[mm]	[mm]	[mm]	[mm]	
0.0	30.80000	37.20000	-2.50000	0.0	0.0	0.0	0.0	d
1.9328	31.98750	35.67500	-2.50000	0.0	0.0	0.0	0.0	d
3.8656	33.17500	34.15000	-2.50000	0.0	0.0	0.0	0.0	d
5.7985	34.36250	32.62500	-2.50000	0.0	0.0	0.0	0.0	d
7.7313	35.55000	31.10000	-2.50000	0.0	0.0	0.0	0.0	d
9.6641	36.73750	29.57500	-2.50000	0.040371	-0.59109	0.71441	-0.044629	d
11.597	37.92500	28.05000	-2.50000	1.0488	-1.6366	1.9357	-0.17799	d
13.530	39.11250	26.52500	-2.50000	0.065911	-1.9708	1.5955	-1.1589	d
15.463	40.30000	25.00000	-2.50000	-3.2247	-2.5798	0.054223	-4.1293	d

d – Displacements include imported displacements.

Structure: No 6 Denmark Street | Sub-structure: No6 B

Dist.	Coordinates x	y	z	Displacements x	y	Horizontal displacement along the Line	Horizontal displacement perpendicular to Line	
[m]	[m]	[m]	[m]	[mm]	[mm]	[mm]	[mm]	
0.0	40.30000	25.00000	-0.70000	-3.2247	-2.5798	0.21493	-4.1240	d
0.80017	40.76667	24.35000	-0.70000	-2.9196	-2.3357	0.19460	-3.7338	d
1.6003	41.23333	23.70000	-0.70000	-2.6144	-2.0915	0.17426	-3.3436	d
2.4005	41.70000	23.05000	-0.70000	-2.3093	-1.8474	0.15392	-2.9533	d
3.2007	42.16667	22.40000	-0.70000	-2.0041	-1.6033	0.13358	-2.5631	d
4.0009	42.63333	21.75000	-0.70000	-1.6990	-1.3592	0.11324	-2.1728	d
4.8010	43.10000	21.10000	-0.70000	-0.45557	-0.36446	0.030365	-0.58263	d

d – Displacements include imported displacements.

Structure: No 6 Denmark Street | Sub-structure: No6 C

Dist.	Coordinates x	y	z	Displacements x	y	Horizontal displacement along the Line	Horizontal displacement perpendicular to Line	
[m]	[m]	[m]	[m]	[mm]	[mm]	[mm]	[mm]	
0.0	43.10000	21.10000	-0.70000	-0.45557	-0.36446	-0.58314	-0.018223	d
1.5000	44.30000	22.00000	-0.70000	-0.14354	-0.11138	-0.18166	-0.0029782	d

Oasys

GEOTECHNICAL AND ENVIRONMENTAL ASSOCIATES LTD *J18119*

7 Denmark Street, London WC2H 8LZ
Combined lateral and horizontal movements

Job No.	Sheet No.	Rev.

Drg. Ref.		
Made by ML	**Date** 02-Oct-2018	**Checked**

```
Dist.      Coordinates                      Displacements
           x        y        z        x      y      Horizontal    Horizontal
                                                     displacement  displacement
                                                     along the     perpendicular

3.0000 45.50000 22.90000 -0.70000      0.0    0.0         0.0          0.0 d
4.5000 46.70000 23.80000 -0.70000      0.0    0.0         0.0          0.0 d
6.0000 47.90000 24.70000 -0.70000      0.0    0.0         0.0          0.0 d
d - Displacements include imported displacements.


Structure: No 6 Denmark Street | Sub-structure: No6 D

Dist.      Coordinates                      Displacements
           x        y        z        x      y      Horizontal    Horizontal
                                                     displacement  displacement
                                                     along the     perpendicular
                                                     Line          to Line
  [m]     [m]      [m]      [m]      [mm]  [mm]      [mm]          [mm]
   0.0 47.90000 24.70000 -0.70000   0.0   0.0        0.0           0.0 d
0.57255 47.56250 25.16250 -0.70000  0.0   0.0        0.0           0.0 d
1.1451 47.22500 25.62500 -0.70000   0.0   0.0        0.0           0.0 d
1.7176 46.88750 26.08750 -0.70000   0.0   0.0        0.0           0.0 d
2.2902 46.55000 26.55000 -0.70000   0.0   0.0        0.0           0.0 d
2.8627 46.21250 27.01250 -0.70000   0.0   0.0        0.0           0.0 d
3.4353 45.87500 27.47500 -0.70000   0.0   0.0        0.0           0.0 d
4.0078 45.53750 27.93750 -0.70000   0.0   0.0        0.0           0.0 d
4.5804 45.20000 28.40000 -0.70000   0.0   0.0        0.0           0.0 d
d - Displacements include imported displacements.


Structure: No 6 Denmark Street | Sub-structure: No6 E

Dist.      Coordinates                      Displacements
           x        y        z        x      y      Horizontal    Horizontal
                                                     displacement  displacement
                                                     along the     perpendicular
                                                     Line          to Line
  [m]     [m]      [m]      [m]      [mm]  [mm]      [mm]          [mm]
   0.0 45.20000 28.40000 -2.50000   0.0   0.0        0.0           0.0 d
2.6433 43.61667 30.51667 -2.50000   0.0   0.0        0.0           0.0 d
5.2867 42.03333 32.63333 -2.50000   0.0   0.0        0.0           0.0 d
7.9300 40.45000 34.75000 -2.50000   0.0   0.0        0.0           0.0 d
10.573 38.86667 36.86667 -2.50000   0.0   0.0        0.0           0.0 d
13.217 37.28333 38.98333 -2.50000   0.0   0.0        0.0           0.0 d
15.860 35.70000 41.10000 -2.50000   0.0   0.0        0.0           0.0 d
d - Displacements include imported displacements.


Structure: No 6 Denmark Street | Sub-structure: No6 F

Dist.      Coordinates                      Displacements
           x        y        z        x      y      Horizontal    Horizontal
                                                     displacement  displacement
                                                     along the     perpendicular
                                                     Line          to Line
  [m]     [m]      [m]      [m]      [mm]  [mm]      [mm]          [mm]
   0.0 35.70000 41.10000 -3.50000   0.0   0.0        0.0           0.0
1.0438 34.88333 40.45000 -3.50000   0.0   0.0        0.0           0.0
2.0875 34.06667 39.80000 -3.50000   0.0   0.0        0.0           0.0
3.1313 33.25000 39.15000 -3.50000   0.0   0.0        0.0           0.0
4.1751 32.43333 38.50000 -3.50000   0.0   0.0        0.0           0.0
5.2188 31.61667 37.85000 -3.50000   0.0   0.0        0.0           0.0
6.2626 30.80000 37.20000 -3.50000   0.0   0.0        0.0           0.0


Structure: No 9 Denmark Street | Sub-structure: No9 A

Dist.      Coordinates                      Displacements
           x        y        z        x      y      Horizontal    Horizontal
                                                     displacement  displacement
                                                     along the     perpendicular
                                                     Line          to Line
  [m]     [m]      [m]      [m]      [mm]  [mm]      [mm]          [mm]
   0.0 20.60000 29.40000 -3.50000   0.0   0.0        0.0           0.0
1.8118 21.71429 27.97143 -3.50000   0.0   0.0        0.0           0.0
3.6235 22.82857 26.54286 -3.50000   0.0   0.0        0.0           0.0
5.4353 23.94286 25.11429 -3.50000   0.0   0.0        0.0           0.0
7.2470 25.05714 23.68571 -3.50000   0.0   0.0        0.0           0.0
9.0588 26.17143 22.25714 -3.50000   0.0   0.0        0.0           0.0
10.871 27.28571 20.82857 -3.50000   0.0   0.0        0.0           0.0
12.682 28.40000 19.40000 -3.50000   0.0   0.0        0.0           0.0


Structure: No 9 Denmark Street | Sub-structure: No9 B

Dist.      Coordinates                      Displacements
           x        y        z        x      y      Horizontal    Horizontal
                                                     displacement  displacement
                                                     along the     perpendicular
                                                     Line          to Line
  [m]     [m]      [m]      [m]      [mm]  [mm]      [mm]          [mm]
   0.0 28.40000 19.40000 -3.50000   0.0   0.0        0.0           0.0
1.0888 29.07143 18.54286 -3.50000   0.0   0.0        0.0           0.0
2.1776 29.74286 17.68571 -3.50000   0.0   0.0        0.0           0.0
3.2664 30.41429 16.82857 -3.50000   0.0   0.0        0.0           0.0
4.3552 31.08571 15.97143 -3.50000   0.0   0.0        0.0           0.0
5.4441 31.75714 15.11429 -3.50000   0.0   0.0        0.0           0.0
6.5329 32.42857 14.25714 -3.50000   0.0   0.0        0.0           0.0
7.6217 33.10000 13.40000 -3.50000   0.0   0.0        0.0           0.0


Structure: No 8 Denmark Street | Sub-structure: No8 A

Dist.      Coordinates                      Displacements
           x        y        z        x      y      Horizontal    Horizontal
                                                     displacement  displacement
                                                     along the     perpendicular
                                                     Line          to Line
  [m]     [m]      [m]      [m]      [mm]  [mm]      [mm]          [mm]
   0.0 25.70000 33.20000 -3.50000   0.0   0.0        0.0           0.0
1.0600 24.85000 32.56667 -3.50000   0.0   0.0        0.0           0.0
2.1200 24.00000 31.93333 -3.50000   0.0   0.0        0.0           0.0
3.1800 23.15000 31.30000 -3.50000   0.0   0.0        0.0           0.0
4.2400 22.30000 30.66667 -3.50000   0.0   0.0        0.0           0.0
5.3000 21.45000 30.03333 -3.50000   0.0   0.0        0.0           0.0
6.3600 20.60000 29.40000 -3.50000   0.0   0.0        0.0           0.0


Structure: 122 Charing Cross Rd | Sub-structure: 122A

Dist.      Coordinates                      Displacements
           x        y        z        x      y      Horizontal    Horizontal
                                                     displacement  displacement
                                                     along the     perpendicular
                                                     Line          to Line
  [m]     [m]      [m]      [m]      [mm]  [mm]      [mm]          [mm]
   0.0 29.30000 10.20000 -3.50000   0.0   0.0        0.0           0.0 d
2.1314 31.00000 11.48571 -3.50000   0.0   0.0        0.0           0.0 d
4.2629 32.70000 12.77143 -3.50000   0.0   0.0        0.0           0.0 d
6.3943 34.40000 14.05714 -3.50000   0.0   0.0        0.0           0.0 d
8.5258 36.10000 15.34286 -3.50000   0.0   0.0        0.0           0.0 d
10.657 37.80000 16.62857 -3.50000   0.0   0.0        0.0           0.0 d
```

Oasys

GEOTECHNICAL AND ENVIRONMENTAL ASSOCIATES LTD J18119

7 Denmark Street, London WC2H 8LZ
Combined lateral and horizontal movements

Job No.	Sheet No.	Rev.

Drg. Ref.		

Made by ML	Date 02-Oct-2018	Checked

```
Dist.       Coordinates                     Displacements
       x         y         z        x      y    Horizontal   Horizontal
                                                displacement  displacement
                                                along the    perpendicular
12.789 39.50000 17.91429 -3.50000  0.0    0.0      0.0           0.0 d
14.920 41.20000 19.20000 -3.50000  0.0    0.0      0.0           0.0 d
d - Displacements include imported displacements.
```

Structure: 122 Charing Cross Rd | Sub-structure: 122B

```
Dist.       Coordinates                     Displacements
       x         y         z        x      y    Horizontal   Horizontal
                                                displacement  displacement
                                                along the    perpendicular
                                                Line         to Line
  [m]    [m]      [m]      [m]     [mm]  [mm]    [mm]         [mm]
  0.0  41.20000 19.20000 -3.50000  0.0   0.0      0.0           0.0 d
1.2494 41.97778 18.22222 -3.50000  0.0   0.0      0.0           0.0 d
2.4988 42.75556 17.24444 -3.50000  0.0   0.0      0.0           0.0 d
3.7482 43.53333 16.26667 -3.50000  0.0   0.0      0.0           0.0 d
4.9976 44.31111 15.28889 -3.50000  0.0   0.0      0.0           0.0 d
6.2470 45.08889 14.31111 -3.50000  0.0   0.0      0.0           0.0 d
7.4964 45.86667 13.33333 -3.50000  0.0   0.0      0.0           0.0 d
8.7458 46.64444 12.35556 -3.50000  0.0   0.0      0.0           0.0 d
9.9952 47.42222 11.37778 -3.50000  0.0   0.0      0.0           0.0 d
11.245 48.20000 10.40000 -3.50000  0.0   0.0      0.0           0.0 d
d - Displacements include imported displacements.
```

Structure: No 7 Retained | Sub-structure: No7 A

```
Dist.       Coordinates                     Displacements
       x         y         z        x       y     Horizontal    Horizontal
                                                  displacement   displacement
                                                  along the     perpendicular
                                                  Line          to Line
  [m]    [m]      [m]      [m]      [mm]    [mm]    [mm]          [mm]
  0.0  25.70000 33.20000 -2.50000   0.0     0.0      0.0            0.0 d
1.9233 26.88571 31.68571 -2.50000   0.0     0.0      0.0            0.0 d
3.8465 28.07143 30.17143 -2.50000   0.0     0.0      0.0            0.0 d
5.7698 29.25714 28.65714 -2.50000   0.0     0.0      0.0            0.0 d
7.6931 30.44286 27.14286 -2.50000   0.0     0.0      0.0            0.0 d
9.6164 31.62857 25.62857 -2.50000  0.47915 -0.65718  0.81283       -0.027901 d
11.540 32.81429 24.11429 -2.50000  1.1358  -1.5578   1.9267        -0.066136 d
13.463 34.00000 22.60000 -2.50000  2.6641  -1.0818   2.4942         1.4306 d
d - Displacements include imported displacements.
```

Structure: No 7 Retained | Sub-structure: No7 B

```
Dist.       Coordinates                     Displacements
       x         y         z        x       y     Horizontal    Horizontal
                                                  displacement  displacement
                                                  along the     perpendicular
                                                  Line          to Line
  [m]    [m]      [m]      [m]      [mm]    [mm]    [mm]          [mm]
  0.0  34.00000 22.60000 -2.50000  2.6641  -1.0818   1.5844        -2.3994 d
1.0309 34.85000 23.18333 -2.50000   0.0     0.0      0.0            0.0 d
2.0618 35.70000 23.76667 -2.50000   0.0     0.0      0.0            0.0 d
3.0927 36.55000 24.35000 -2.50000  2.9707  -4.3287   0.0           -5.2500 d
4.1236 37.40000 24.93333 -2.50000  2.9707  -4.3287   0.0           -5.2500 d
5.1546 38.25000 25.51667 -2.50000  2.9707  -4.3287   0.0           -5.2500 d
6.1855 39.10000 26.10000 -2.50000 -0.38687 -2.6074  -1.7943        -1.9309 d
d - Displacements include imported displacements.
```

Structure: No 7 Retained | Sub-structure: No7 C

```
Dist.       Coordinates                     Displacements
       x         y         z        x       y     Horizontal    Horizontal
                                                  displacement  displacement
                                                  along the     perpendicular
                                                  Line          to Line
  [m]    [m]      [m]      [m]      [mm]    [mm]    [mm]          [mm]
  0.0  39.10000 26.10000 -2.50000 -0.38687 -2.6074  -1.8565         1.8712 d
1.9800 37.91429 27.68571 -2.50000  1.8512  -2.6975  -3.2689         0.13280 d
3.9600 36.72857 29.27143 -2.50000  0.73178 -1.0663  -1.2922         0.052496 d
5.9400 35.54286 30.85714 -2.50000   0.0     0.0      0.0            0.0 d
7.9200 34.35714 32.44286 -2.50000   0.0     0.0      0.0            0.0 d
9.9000 33.17143 34.02857 -2.50000   0.0     0.0      0.0            0.0 d
11.880 31.98571 35.61429 -2.50000   0.0     0.0      0.0            0.0 d
13.860 30.80000 37.20000 -2.50000   0.0     0.0      0.0            0.0 d
d - Displacements include imported displacements.
```

Structure: No 7 Retained | Sub-structure: No7 D

```
Dist.       Coordinates                     Displacements
       x         y         z        x      y    Horizontal    Horizontal
                                                displacement  displacement
                                                along the     perpendicular
                                                Line          to Line
  [m]    [m]      [m]      [m]     [mm] [mm]    [mm]          [mm]
  0.0  30.80000 37.20000 -2.50000  0.0   0.0      0.0            0.0 d
1.0803 29.95000 36.53333 -2.50000  0.0   0.0      0.0            0.0 d
2.1605 29.10000 35.86667 -2.50000  0.0   0.0      0.0            0.0 d
3.2408 28.25000 35.20000 -2.50000  0.0   0.0      0.0            0.0 d
4.3210 27.40000 34.53333 -2.50000  0.0   0.0      0.0            0.0 d
5.4013 26.55000 33.86667 -2.50000  0.0   0.0      0.0            0.0 d
6.4815 25.70000 33.20000 -2.50000  0.0   0.0      0.0            0.0 d
d - Displacements include imported displacements.
```

Specific Building Damage Results - Vertical Displacements

Structure: No 6 Denmark Street | Sub-structure: No6 A

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

Vertical Offset 1
  0.0  30.80000 37.20000 -2.50000 -0.36396 d
1.9328 31.98750 35.67500 -2.50000 -0.12971 d
3.8656 33.17500 34.15000 -2.50000 -0.18673 d
5.7985 34.36250 32.62500 -2.50000 -0.27255 d
7.7313 35.55000 31.10000 -2.50000 -0.40522 d
9.6641 36.73750 29.57500 -2.50000 -0.61601 d
11.597 37.92500 28.05000 -2.50000 -0.95219 d
13.530 39.11250 26.52500 -2.50000 -1.3819 d
15.463 40.30000 25.00000 -2.50000 -1.8711 d
d - Displacements include imported displacements.
```

Structure: No 6 Denmark Street | Sub-structure: No6 B

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

Oasys

GEOTECHNICAL AND ENVIRONMENTAL ASSOCIATES LTD J18119

7 Denmark Street, London WC2H 8LZ
Combined lateral and horizontal movements

Job No. J18119	Sheet No.	Rev.
Drg. Ref.		
Made by ML	Date 02-Oct-2018	Checked

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

Vertical Offset 1

0.0	40.30000	25.00000	-0.70000	-1.8711	d
0.80017	40.76667	24.35000	-0.70000	-2.1380	d
1.6003	41.23333	23.70000	-0.70000	-2.3565	d
2.4005	41.70000	23.05000	-0.70000	-2.5190	d
3.2007	42.16667	22.40000	-0.70000	-2.5898	d
4.0009	42.63333	21.75000	-0.70000	-2.4595	d
4.8010	43.10000	21.10000	-0.70000	-3.9354	d

d – Displacements include imported displacements.

Structure: No 6 Denmark Street | Sub-structure: No6 C

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

Vertical Offset 1

0.0	43.10000	21.10000	-0.70000	-3.9354	d
1.5000	44.30000	22.00000	-0.70000	-1.2244	d
3.0000	45.50000	22.90000	-0.70000	-0.80501	d
4.5000	46.70000	23.80000	-0.70000	-0.55355	d
6.0000	47.90000	24.70000	-0.70000	-0.78577	d

d – Displacements include imported displacements.

Structure: No 6 Denmark Street | Sub-structure: No6 D

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

Vertical Offset 1

0.0	47.90000	24.70000	-0.70000	-0.78577	d
0.57255	47.56250	25.16250	-0.70000	-0.40470	d
1.1451	47.22500	25.62500	-0.70000	-0.41394	d
1.7176	46.88750	26.08750	-0.70000	-0.42034	d
2.2902	46.55000	26.55000	-0.70000	-0.42369	d
2.8627	46.21250	27.01250	-0.70000	-0.42394	d
3.4353	45.87500	27.47500	-0.70000	-0.42112	d
4.0078	45.53750	27.93750	-0.70000	-0.41537	d
4.5804	45.20000	28.40000	-0.70000	-0.40691	d

d – Displacements include imported displacements.

Structure: No 6 Denmark Street | Sub-structure: No6 E

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

Vertical Offset 1

0.0	45.20000	28.40000	-2.50000	-0.40691	d
2.6433	43.61667	30.51667	-2.50000	-0.34446	d
5.2867	42.03333	32.63333	-2.50000	-0.26332	d
7.9300	40.45000	34.75000	-2.50000	-0.18831	d
10.573	38.86667	36.86667	-2.50000	-0.12949	d
13.217	37.28333	38.98333	-2.50000	-0.087091	d
15.860	35.70000	41.10000	-2.50000	-0.11552	d

d – Displacements include imported displacements.

Structure: No 6 Denmark Street | Sub-structure: No6 F

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

Vertical Offset 1

0.0	35.70000	41.10000	-3.50000	0.0	
1.0438	34.88333	40.45000	-3.50000	0.0	
2.0875	34.06667	39.80000	-3.50000	0.0	
3.1313	33.25000	39.15000	-3.50000	0.0	
4.1751	32.43333	38.50000	-3.50000	0.0	
5.2188	31.61667	37.85000	-3.50000	0.0	
6.2626	30.80000	37.20000	-3.50000	0.0	

Structure: No 9 Denmark Street | Sub-structure: No9 A

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

Vertical Offset 1

0.0	20.60000	29.40000	-3.50000	0.0	
1.8118	21.71429	27.97143	-3.50000	0.0	
3.6235	22.82857	26.54286	-3.50000	0.0	
5.4353	23.94286	25.11429	-3.50000	0.0	
7.2470	25.05714	23.68571	-3.50000	0.0	
9.0588	26.17143	22.25714	-3.50000	0.0	
10.871	27.28571	20.82857	-3.50000	0.0	
12.682	28.40000	19.40000	-3.50000	0.0	

Structure: No 9 Denmark Street | Sub-structure: No9 B

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

Vertical Offset 1

0.0	28.40000	19.40000	-3.50000	0.0	
1.0888	29.07143	18.54286	-3.50000	0.0	
2.1776	29.74286	17.68571	-3.50000	0.0	
3.2664	30.41429	16.82857	-3.50000	0.0	
4.3552	31.08571	15.97143	-3.50000	0.0	
5.4441	31.75714	15.11429	-3.50000	0.0	
6.5329	32.42857	14.25714	-3.50000	0.0	
7.6217	33.10000	13.40000	-3.50000	0.0	

Structure: No 8 Denmark Street | Sub-structure: No8 A

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

Vertical Offset 1

0.0	25.70000	33.20000	-3.50000	0.0	
1.0600	24.85000	32.56667	-3.50000	0.0	
2.1200	24.00000	31.93333	-3.50000	0.0	
3.1800	23.15000	31.30000	-3.50000	0.0	
4.2400	22.30000	30.66667	-3.50000	0.0	
5.3000	21.45000	30.03333	-3.50000	0.0	
6.3600	20.60000	29.40000	-3.50000	0.0	

Structure: 122 Charing Cross Rd | Sub-structure: 122A

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GEOTECHNICAL AND ENVIRONMENTALASSOCIATES LTD *J18119*

7 Denmark Street, London WC2H 8LZ
Combined lateral and horizontal movements

Job No.	Sheet No.	Rev.

Drg. Ref.		

Made by ML	Date 02-Oct-2018	Checked

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


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

Vertical Offset 1
   0.0 29.30000 10.20000 -3.50000 -0.16452 d
2.1314 31.00000 11.48571 -3.50000 -0.24889 d
4.2629 32.70000 12.77143 -3.50000 -0.38558 d
6.3943 34.40000 14.05714 -3.50000 -0.61841 d
8.5258 36.10000 15.34286 -3.50000  -1.0428 d
10.657 37.80000 16.62857 -3.50000  -1.8750 d
12.789 39.50000 17.91429 -3.50000  -3.1917 d
14.920 41.20000 19.20000 -3.50000  -6.7078 d
d - Displacements include imported displacements.


Structure: 122 Charing Cross Rd | Sub-structure: 122B

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

Vertical Offset 1
   0.0 41.20000 19.20000 -3.50000  -6.7078 d
1.2494 41.97778 18.22222 -3.50000  -1.9764 d
2.4988 42.75556 17.24444 -3.50000  -1.2729 d
3.7482 43.53333 16.26667 -3.50000 -0.86891 d
4.9976 44.31111 15.28889 -3.50000 -0.61876 d
6.2470 45.08889 14.31111 -3.50000 -0.45422 d
7.4964 45.86667 13.33333 -3.50000 -0.34088 d
8.7458 46.64444 12.35556 -3.50000 -0.26004 d
9.9952 47.42222 11.37778 -3.50000 -0.20083 d
11.245 48.20000 10.40000 -3.50000 -0.15657 d
d - Displacements include imported displacements.


Structure: No 7 Retained | Sub-structure: No7 A

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

Vertical Offset 1
   0.0 25.70000 33.20000 -2.50000 -0.19281 d
1.9233 26.88571 31.68571 -2.50000 -0.13851 d
3.8465 28.07143 30.17143 -2.50000 -0.20175 d
5.7698 29.25714 28.65714 -2.50000 -0.29997 d
7.6931 30.44286 27.14286 -2.50000 -0.45983 d
9.6164 31.62857 25.62857 -2.50000 -0.73827 d
11.540 32.81429 24.11429 -2.50000  -1.2715 d
13.463 34.00000 22.60000 -2.50000  -4.9721 d
d - Displacements include imported displacements.


Structure: No 7 Retained | Sub-structure: No7 B

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

Vertical Offset 1
   0.0 34.00000 22.60000 -2.50000  -4.9721 d
1.0309 34.85000 23.18333 -2.50000  -3.1776 d
2.0618 35.70000 23.76667 -2.50000  -3.4893 d
3.0927 36.55000 24.35000 -2.50000  -3.5423 d
4.1236 37.40000 24.93333 -2.50000  -3.2520 d
5.1546 38.25000 25.51667 -2.50000  -2.4283 d
6.1855 39.10000 26.10000 -2.50000  -2.8012 d
d - Displacements include imported displacements.


Structure: No 7 Retained | Sub-structure: No7 C

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

Vertical Offset 1
   0.0 39.10000 26.10000 -2.50000  -2.8012 d
1.9800 37.91429 27.68571 -2.50000  -1.0633 d
3.9600 36.72857 29.27143 -2.50000 -0.66625 d
5.9400 35.54286 30.85714 -2.50000 -0.42796 d
7.9200 34.35714 32.44286 -2.50000 -0.28276 d
9.9000 33.17143 34.02857 -2.50000 -0.19100 d
11.880 31.98571 35.61429 -2.50000 -0.13110 d
13.860 30.80000 37.20000 -2.50000 -0.36396 d
d - Displacements include imported displacements.


Structure: No 7 Retained | Sub-structure: No7 D

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

Vertical Offset 1
   0.0 30.80000 37.20000 -2.50000 -0.36396 d
1.0803 29.95000 36.53333 -2.50000 -0.094844 d
2.1605 29.10000 35.86667 -2.50000 -0.097651 d
3.2408 28.25000 35.20000 -2.50000 -0.099264 d
4.3210 27.40000 34.53333 -2.50000 -0.099597 d
5.4013 26.55000 33.86667 -2.50000 -0.098627 d
6.4815 25.70000 33.20000 -2.50000 -0.19281 d
d - Displacements include imported displacements.
```

Specific Building Damage Results - All Segments

```
Structure: No 6 Denmark Street | Sub-structure: No6 A
```

Vertical Offset from Line for Vertical Movement Calculations [m]	Segment	Start [m]	Length [m]	Curvature	Deflection Ratio [%]	Average Horizontal Strain [%]	Max Tensile Strain [%]	Max Gradient of Horizontal Displacement Curve	Max Gradient of Vertical Displacement Curve	Min Radius of Curvature [m]	Damage Category
0.0	1	0.0	15.460	Sagging	0.0046004	363.81E-6	0.0060968	798.06E-6	253.32E-6	10468.	0 (Negligible)

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


Structure: No 6 Denmark Street | Sub-structure: No6 B
```

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

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GEOTECHNICAL AND ENVIRONMENTAL ASSOCIATES LTD

7 Denmark Street, London WC2H 8LZ
Combined lateral and horizontal movements

Job No. J18119	Sheet No.	Rev.
Drg. Ref.		
Made by ML	Date 02-Oct-2018	Checked

	Movement Calculations									Displacement Curve	Curve	
[m]		[m]	[m]		[%]	[%]	[%]			[m]		
0.0	1	0.0	2.6273	Hogging	0.0029844	−0.0025418	0.0023203	25.418E-6	333.62E-6	5851.7		0
												(Negligible)
	2	2.6273	2.1727	Sagging	0.043762	−0.0054164	0.041074	103.58E-6	0.0018447	310.90		0
												(Negligible)

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

Structure: No 6 Denmark Street | Sub-structure: No6 C

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	5.9900	Sagging	0.032028	0.0097352	0.039185	−267.58E-6	−0.0018068	797.55	0
											(Negligible)

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

Structure: No 6 Denmark Street | Sub-structure: No6 D

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	1.7001	Sagging	0.015018	0.0	0.014881	0.0	−665.57E-6	670.91	0
											(Negligible)
	2	1.7001	2.8799	Hogging	317.28E-6	0.0	315.18E-6	0.0	−14.760E-6	106420.	0
											(Negligible)

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

Structure: No 6 Denmark Street | Sub-structure: No6 E

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	4.8542	Hogging	174.83E-6	0.0	173.63E-6	0.0	−30.692E-6	280980.	0
											(Negligible)
	2	4.8542	11.006	Sagging	609.50E-6	0.0	604.57E-6	0.0	−30.692E-6	82751.	0
											(Negligible)

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

Structure: No 6 Denmark Street | Sub-structure: No6 F

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		All settlements are less than the Settlement Trough Limit Sensitivity.									

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

Structure: No 9 Denmark Street | Sub-structure: No9 A

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		All settlements are less than the Settlement Trough Limit Sensitivity.									

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

Structure: No 9 Denmark Street | Sub-structure: No9 B

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		All settlements are less than the Settlement Trough Limit Sensitivity.									

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

Structure: No 8 Denmark Street | Sub-structure: No8 A

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		All settlements are less than the Settlement Trough Limit Sensitivity.									

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

Structure: 122 Charing Cross Rd | Sub-structure: 122A

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	14.920	Sagging	0.019826	0.0	0.021495	0.0	0.0016496	1728.6	0
											(Negligible)

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

Structure: 122 Charing Cross Rd | Sub-structure: 122B

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	11.240	Sagging	0.035601	0.0	0.032365	0.0	−0.0037870	314.72	0
											(Negligible)

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

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GEOTECHNICAL AND ENVIRONMENTALASSOCIATES LTD *J18119*

7 Denmark Street, London WC2H 8LZ
Combined lateral and horizontal movements

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Structure: No 7 Retained | Sub-structure: No7 A

Vertical Offset from Line for Vertical Movement Calculations [m]	Segment	Start [m]	Length [m]	Curvature	Deflection Ratio [%]	Average Horizontal Strain [%]	Max Tensile Strain [%]	Max Gradient of Horizontal Displacement Curve	Max Gradient of Vertical Displacement Curve	Min Radius of Curvature [m]	Damage Category
0.0	1	0.0	13.460	Sagging	0.022319	0.018524	0.044063	−578.83E-6	0.0019236	949.63	0 (Negligible)

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

Structure: No 7 Retained | Sub-structure: No7 B

Vertical Offset from Line for Vertical Movement Calculations [m]	Segment	Start [m]	Length [m]	Curvature	Deflection Ratio [%]	Average Horizontal Strain [%]	Max Tensile Strain [%]	Max Gradient of Horizontal Displacement Curve	Max Gradient of Vertical Displacement Curve	Min Radius of Curvature [m]	Damage Category
0.0	1	0.0	2.5340	Sagging	0.047171	−0.062526	0.034992	0.0015393	−0.0017434	393.25	0 (Negligible)
	2	2.5340	1.6374	Hogging	0.0079791	0.0	0.0079731	0.0	−799.04E-6	2883.8	0 (Negligible)
	3	4.1714	1.9286	Sagging	0.028729	−0.085325	0.024516	0.0017436	−799.04E-6	634.01	0 (Negligible)

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

Structure: No 7 Retained | Sub-structure: No7 C

Vertical Offset from Line for Vertical Movement Calculations [m]	Segment	Start [m]	Length [m]	Curvature	Deflection Ratio [%]	Average Horizontal Strain [%]	Max Tensile Strain [%]	Max Gradient of Horizontal Displacement Curve	Max Gradient of Vertical Displacement Curve	Min Radius of Curvature [m]	Damage Category
0.0	1	0.0	13.860	Sagging	0.010371	0.013394	0.025489	−997.36E-6	−878.33E-6	2393.4	0 (Negligible)

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

Structure: No 7 Retained | Sub-structure: No7 D

Vertical Offset from Line for Vertical Movement Calculations [m]	Segment	Start [m]	Length [m]	Curvature	Deflection Ratio [%]	Average Horizontal Strain [%]	Max Tensile Strain [%]	Max Gradient of Horizontal Displacement Curve	Max Gradient of Vertical Displacement Curve	Min Radius of Curvature [m]	Damage Category
0.0	1	0.0	3.2208	Sagging	0.0055644	0.0	0.0054994	0.0	−249.13E-6	3430.1	0 (Negligible)
	2	3.2208	0.076665	Hogging	22.806E-6	0.0	22.781E-6	0.0	1.4939E-6	925330.	0 (Negligible)
	3	3.2974	3.1826	Sagging	0.0019470	0.0	0.0019248	0.0	87.190E-6	9778.6	0 (Negligible)

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

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

Structure: No 6 Denmark Street | Sub-structure: No6 A

Vertical Offset from Line for Vertical Movement Calculations [m]	Deflection Ratio [%]	Average Horizontal Strain [%]	Max Slope	Max Settlement [mm]	Max Tensile Strain [%]	Max Gradient of Horizontal Displacement Curve	Max Gradient of Vertical Displacement Curve	Min Radius of Curvature (Hogging) [m]	Min Radius of Curvature (Sagging) [m]	Damage Category
0.0	0.0046004	363.81E-6	253.32E-6	1.8705	0.0060968	798.06E-6	253.32E-6	−	10468.	0 (Negligible)

Structure: No 6 Denmark Street | Sub-structure: No6 B

Vertical Offset from Line for Vertical Movement Calculations [m]	Deflection Ratio [%]	Average Horizontal Strain [%]	Max Slope	Max Settlement [mm]	Max Tensile Strain [%]	Max Gradient of Horizontal Displacement Curve	Max Gradient of Vertical Displacement Curve	Min Radius of Curvature (Hogging) [m]	Min Radius of Curvature (Sagging) [m]	Damage Category
0.0	0.043762	−0.0054164	0.0018447	3.9335	0.041074	103.58E-6	0.0018447	5851.7	310.90	0 (Negligible)

Structure: No 6 Denmark Street | Sub-structure: No6 C

Vertical Offset from Line for Vertical Movement Calculations [m]	Deflection Ratio [%]	Average Horizontal Strain [%]	Max Slope	Max Settlement [mm]	Max Tensile Strain [%]	Max Gradient of Horizontal Displacement Curve	Max Gradient of Vertical Displacement Curve	Min Radius of Curvature (Hogging) [m]	Min Radius of Curvature (Sagging) [m]	Damage Category
0.0	0.032028	0.0097352	−0.0018068	3.9354	0.039185	−267.58E-6	−0.0018068	−	797.55	0 (Negligible)

Structure: No 6 Denmark Street | Sub-structure: No6 D

Vertical Offset from Line for Vertical Movement Calculations [m]	Deflection Ratio [%]	Average Horizontal Strain [%]	Max Slope	Max Settlement [mm]	Max Tensile Strain [%]	Max Gradient of Horizontal Displacement Curve	Max Gradient of Vertical Displacement Curve	Min Radius of Curvature (Hogging) [m]	Min Radius of Curvature (Sagging) [m]	Damage Category
0.0	0.015018	0.0	−665.57E-6	0.78577	0.014881	0.0	−665.57E-6	106420.	670.91	0 (Negligible)

Structure: No 6 Denmark Street | Sub-structure: No6 E

Vertical Offset from Line for Vertical Movement Calculations [m]	Deflection Ratio [%]	Average Horizontal Strain [%]	Max Slope	Max Settlement [mm]	Max Tensile Strain [%]	Max Gradient of Horizontal Displacement Curve	Max Gradient of Vertical Displacement Curve	Min Radius of Curvature (Hogging) [m]	Min Radius of Curvature (Sagging) [m]	Damage Category
0.0	609.50E-6	0.0	−30.692E-6	0.40691	604.57E-6	0.0	−30.692E-6	280980.	82751.	0 (Negligible)

Structure: No 6 Denmark Street | Sub-structure: No6 F

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GEOTECHNICAL AND ENVIRONMENTAL ASSOCIATES LTD *J18119*

7 Denmark Street, London WC2H 8LZ

Combined lateral and horizontal movements

Job No.	Sheet No.	Rev.
J18119		

Drg. Ref.		
Made by ML	**Date** 02-Oct-2018	**Checked**

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

Structure: No 9 Denmark Street | Sub-structure: No9 A

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

Structure: No 9 Denmark Street | Sub-structure: No9 B

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

Structure: No 8 Denmark Street | Sub-structure: No8 A

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

Structure: 122 Charing Cross Rd | Sub-structure: 122A

Vertical Offset from Line for Vertical Movement Calculations [m]	Deflection Ratio [%]	Average Horizontal Strain [%]	Max Slope	Max Settlement [mm]	Max Tensile Strain [%]	Max Gradient of Horizontal Displacement Curve	Max Gradient of Vertical Displacement Curve	Min Radius of Curvature (Hogging) [m]	Min Radius of Curvature (Sagging) [m]	Damage Category
0.0	0.019826		0.0	0.0016496	6.7076	0.021495	0.0	0.0016496	– 1728.6	0 (Negligible)

Structure: 122 Charing Cross Rd | Sub-structure: 122B

Vertical Offset from Line for Vertical Movement Calculations [m]	Deflection Ratio [%]	Average Horizontal Strain [%]	Max Slope	Max Settlement [mm]	Max Tensile Strain [%]	Max Gradient of Horizontal Displacement Curve	Max Gradient of Vertical Displacement Curve	Min Radius of Curvature (Hogging) [m]	Min Radius of Curvature (Sagging) [m]	Damage Category
0.0	0.035601		0.0	-0.0037870	6.7078	0.032365	0.0	-0.0037870	– 314.72	0 (Negligible)

Structure: No 7 Retained | Sub-structure: No7 A

Vertical Offset from Line for Vertical Movement Calculations [m]	Deflection Ratio [%]	Average Horizontal Strain [%]	Max Slope	Max Settlement [mm]	Max Tensile Strain [%]	Max Gradient of Horizontal Displacement Curve	Max Gradient of Vertical Displacement Curve	Min Radius of Curvature (Hogging) [m]	Min Radius of Curvature (Sagging) [m]	Damage Category
0.0	0.022319	0.018524	0.0019236		4.9665	0.044063	-578.83E-6	0.0019236	– 949.63	0 (Negligible)

Structure: No 7 Retained | Sub-structure: No7 B

Vertical Offset from Line for Vertical Movement Calculations [m]	Deflection Ratio [%]	Average Horizontal Strain [%]	Max Slope	Max Settlement [mm]	Max Tensile Strain [%]	Max Gradient of Horizontal Displacement Curve	Max Gradient of Vertical Displacement Curve	Min Radius of Curvature (Hogging) [m]	Min Radius of Curvature (Sagging) [m]	Damage Category
0.0	0.047171	-0.085325	-0.0017434		4.9721	0.034992	0.0017436	-0.0017434	2883.8 393.25	0 (Negligible)

Structure: No 7 Retained | Sub-structure: No7 C

Vertical Offset from Line for Vertical Movement Calculations [m]	Deflection Ratio [%]	Average Horizontal Strain [%]	Max Slope	Max Settlement [mm]	Max Tensile Strain [%]	Max Gradient of Horizontal Displacement Curve	Max Gradient of Vertical Displacement Curve	Min Radius of Curvature (Hogging) [m]	Min Radius of Curvature (Sagging) [m]	Damage Category
0.0	0.010371	0.013394	-878.33E-6		2.8012	0.025489	-997.36E-6	-878.33E-6	– 2393.4	0 (Negligible)

Structure: No 7 Retained | Sub-structure: No7 D

Vertical Offset from Line for Vertical Movement Calculations [m]	Deflection Ratio [%]	Average Horizontal Strain [%]	Max Slope	Max Settlement [mm]	Max Tensile Strain [%]	Max Gradient of Horizontal Displacement Curve	Max Gradient of Vertical Displacement Curve	Min Radius of Curvature (Hogging) [m]	Min Radius of Curvature (Sagging) [m]	Damage Category
0.0	0.0055644		0.0	-249.13E-6	0.36396	0.0054994	0.0	-249.13E-6	925330. 3430.1	0 (Negligible)

Specific Building Damage Results - Critical Segments within Each Structure

Structure Name	Parameter	Critical Sub-Structure	Critical Segment	Start [m]	End [m]	Curvature	Max Slope	Max Settlement [mm]	Max Tensile Strain [%]	Min Radius of Curvature (Hogging) [m]	Min Radius of Curvature (Sagging) [m]	Damage Category
No 6 Denmark Street	Max Slope	No6 B	2	2.6273	4.8000	Sagging	**0.0018447**	3.9335	0.041074	–	310.90	0 (Negligible)
	Max Settlement	No6 C	1	0.0	5.9900	Sagging	0.0018068	**3.9354**	0.039185	–	797.55	0 (Negligible)
	Max Tensile	No6 B	2	2.6273	4.8000	Sagging	0.0018447	3.9335	**0.041074**	–	310.90	0 (Negligible)

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GEOTECHNICAL AND ENVIRONMENTAL ASSOCIATES LTD *J18119*

7 Denmark Street, London WC2H 8LZ
Combined lateral and horizontal movements

Job No.	Sheet No.	Rev.

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Made by ML	Date 02-Oct-2018	Checked

Structure Name	Parameter	Critical Sub-Structure	Critical Segment	Start	End	Curvature	Max Slope	Max Settlement	Max Tensile Strain	Min Radius of Curvature (Hogging)	Min Radius of Curvature (Sagging)	Damage Category
	Strain											
	Min Radius of Curvature (Hogging)	No6 B	1	0.0	2.6273	Hogging	333.62E-6		2.5391	0.0023203	5851.7	–	0 (Negligible)
	Min Radius of Curvature (Sagging)	No6 B	2	2.6273	4.8000	Sagging	0.0018447		3.9335	0.041074	–	310.90	0 (Negligible)
No 9 Denmark Street	All settlements are less than the Settlement Trough Limit Sensitivity.											
	All settlements are less than the Settlement Trough Limit Sensitivity.											
	All settlements are less than the Settlement Trough Limit Sensitivity.											
	All settlements are less than the Settlement Trough Limit Sensitivity.											
	All settlements are less than the Settlement Trough Limit Sensitivity.											
No 8 Denmark Street	All settlements are less than the Settlement Trough Limit Sensitivity.											
	All settlements are less than the Settlement Trough Limit Sensitivity.											
	All settlements are less than the Settlement Trough Limit Sensitivity.											
	All settlements are less than the Settlement Trough Limit Sensitivity.											
	All settlements are less than the Settlement Trough Limit Sensitivity.											
122 Charing Cross Rd	Max Slope	122B	1	0.0	11.240	Sagging	0.0037870		6.7078	0.032365	–	314.72	0 (Negligible)
	Max Settlement	122B	1	0.0	11.240	Sagging	0.0037870	6.7078	0.032365	–	314.72	0 (Negligible)
	Max Tensile Strain	122B	1	0.0	11.240	Sagging	0.0037870	6.7078	0.032365	–	314.72	0 (Negligible)
	Min Radius of Curvature (Hogging)		–		–	–	–	–		–	–	–	
	Min Radius of Curvature (Sagging)	122B	1	0.0	11.240	Sagging	0.0037870		6.7078	0.032365	–	314.72	0 (Negligible)
No 7 Retained	Max Slope	No7 A	1	0.0	13.460	Sagging	0.0019236		4.9665	0.044063	–	949.63	0 (Negligible)
	Max Settlement	No7 B	1	0.0	2.5340	Sagging	0.0017434	4.9721	0.034992	–	393.25	0 (Negligible)
	Max Tensile Strain	No7 A	1	0.0	13.460	Sagging	0.0019236	4.9665	0.044063	–	949.63	0 (Negligible)
	Min Radius of Curvature (Hogging)	No7 B	2	2.5340	4.1714	Hogging	799.04E-6		3.5417	0.0079731	2883.8	–	0 (Negligible)
	Min Radius of Curvature (Sagging)	No7 B	1	0.0	2.5340	Sagging	0.0017434		4.9721	0.034992	–	393.25	0 (Negligible)

London

Friars Bridge Court
41- 45 Blackfriars Road
London, SE1 8NZ

T: +44 (0)20 7340 1700
E: london@campbellreith.com

Birmingham

Chantry House
High Street, Coleshill
Birmingham B46 3BP

T: +44 (0)1675 467 484
E: birmingham@campbellreith.com

Surrey

Raven House
29 Linkfield Lane, Redhill
Surrey RH1 1SS

T: +44 (0)1737 784 500
E: surrey@campbellreith.com

Manchester

No. 1 Marsden Street
Manchester
M2 1HW

T: +44 (0)161 819 3060
E: manchester@campbellreith.com

Bristol

Wessex House
Pixash Lane, Keynsham
Bristol BS31 1TP

T: +44 (0)117 916 1066
E: bristol@campbellreith.com

UAE

Office 705, Warsan Building
Hessa Street (East)
PO Box 28064, Dubai, UAE

T: +971 4 453 4735
E: uae@campbellreith.com