CampbellReith
consulting engineers

# 26-27 Kirby Street
# London EC1N8TE

## Basement Impact Assessment
## Audit

For

London Borough of Camden

Project Number: 12066-89
Revision: D1

January 2016

Campbell Reith Hill LLP
Friars Bridge Court
41-45 Blackfriars Road
London
SE1 8NZ

T:+44 (0)20 7340 1700
F:+44 (0)20 7340 1777
E:london@campbellreith.com
W:www.campbellreith.com

## Document History and Status

| Revision | Date | Purpose/Status | File Ref | Author | Check | Review |
|---|---|---|---|---|---|---|
| D1 | 22/01/16 | Draft | JHCajm-12066-89-220116-26-27 Kirby Street-D1.doc | JHC | AJM | AJM |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |



## Document Details

| | |
|---|---|
| Last saved | 22/01/2016 14:35 |
| Path | JHCajm-12066-89-220116-26-27 Kirby Street-D1.doc |
| Author | J Chastney, BSc FGS |
| Project Partner | E M Brown, BSc MSc CGeol FGS |
| Project Number | 12066-89 |
| Project Name | 26-27 Kirby Street |
| Planning Reference | 2015/4840/P |

## 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 submitted as part of the Planning Submission documentation for Antwerp house, 26-27 Kirby Street (planning reference 2015/4840/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 (BIA) 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 check list.

1.4. The BIA has been carried out by a well-known firm of engineering consultants, Clarkebond Ltd. The reviewer is a structural engineer but no proof of expertise in engineering geology has been provided as required by CPG4.

1.5. The BIA has stated that the proposed basement will be founded within the Hackney Gravel Member. The Structural Overview Statement contradicts this and suggests that the basement will be founded within the London Clay. This contradiction should be corrected and the founding stratum should be consistent across all reports.

1.6. The BIA discusses underpinning as a basement construction proposal with shallow strip foundations to support the proposed 5 storey (plus single storey basement) development.

1.7. The development proposals provided as a part of the planning application contradict the loading assessment provided within the Structural Overview Statement. The load breakdown provided within the Structural Overview statement should be consistent with development proposals as this is likely to have substantial design implications.

1.8. No detailed Construction Method Statement (CMS) has been provided. A detailed CMS is required to fully assess potential ground movements associated with the proposed development and should identify, as a minimum, the underpinning layout alongside a more detailed load assessment on existing and proposed walls. The load assessment should consider surcharging from adjacent structures and highways.

1.9. The BIA has stated that perched ground waters may be encountered at the proposed development. Ground water monitoring has identified the ground water level at 0.86m below basement level assuming basement construction is as described within the BIA at 3.00m bgl. If

the basement is constructed to a greater depth then the possibility of encountering groundwater should be reviewed.

1.10. It is recommended that investigation of neighbouring foundations is carried out. Due to the limited extent of the current investigation it would be prudent to allow for further investigation of below ground soils and groundwater monitoring allowing a decision to be taken on construction methodology and to confirm design assumptions.

1.11. An analysis has been undertaken of horizontal and vertical ground movements which have stated damage to adjacent properties will be Burland Category 2 or less. Mitigation proposals should be proposed to limit potential damage to adjacent properties to Burland Category 1. Once a CMS has been produced and a decision on construction methodology is finalised a detailed ground movement assessment should be undertaken.

1.12. Proposals are provided for movement monitoring strategy during excavation and construction. This should be finalised within the CMS to allow confirmation of a viable construction methodology. The BIA recommends that mitigating measures are to include; pre and post condition surveys of adjacent properties, definition of threshold displacement values, formulation of remedial actions if these thresholds are reached and the installation of monitoring stations to assess land stability and groundwater levels.

1.13. An assessment should be provided of appropriate mitigation measures to prevent excavation collapse and 'running sand' conditions and to overcome associated potentially significant ground movements.

1.14. Estimates of foundation settlement should be undertaken which either utilise information from additional ground investigation or assumed 'worst case' ground conditions.

1.15. It is accepted that the surrounding slopes to the development site are stable.

1.16. Evidence of consultation with adjacent neighbours has not been provided.

1.17. Evidence of consultations with utilities providers has not been provided. This should be undertaken to ensure that the proposed development causes no damage to services.

1.18. Consultations with Thames Water should be undertaken to clarify if existing water infrastructure will be able to accommodate the needs of the proposed development.

1.19. It is accepted that the development will likely not impact on the wider hydrogeology of the area and is not in an area subject to flooding.

1.20. Queries and requests for clarification or further information are summarised in Appendix 2.

## 2.0 INTRODUCTION

2.1. CampbellReith was instructed by London Borough of Camden (LBC) on 13/11/15 to carry out a Category B Audit on the Basement Impact Assessment (BIA) submitted as part of the Planning Submission documentation for 26-27 Kirby Street, EC1 N8TE.

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) 4: Basements and Lightwells.
- Camden Development Policy (DP) 27: Basements and Lightwells.
- Camden Development Policy (DP) 23: Water.

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; and,

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 *"Refurbishment of lower floors and a basement extension to provide retail and associated office use and conversion of one floor to provide 1 x 2-bed flat with addition of three storeys to provide 1 x 2-bed flats and 1 x 3-bed duplex flat".*

The Audit Instruction also confirmed 26-27 Kirby Street was not a listed building, or was a neighbour to, listed buildings.

2.6. CampbellReith accessed LBC's Planning Portal on 12/01/16 and gained access to the following relevant documents for audit purposes:

- Basement Impact Assessment Report (BIA)
- Structural Overview Statement
- Planning Application Drawings consisting of

  Location Plan

  Existing Plans

  Proposed Plans
- Design & Access Statement

## 3.0 BASEMENT IMPACT ASSESSMENT AUDIT CHECK LIST

| Item | Yes/No/NA | Comment |
|---|---|---|
| Are BIA Author(s) credentials satisfactory? | No | CEng sign off for Land Stability and Surface Flow / Flooding. No CGeol sign off for Subterranean Flow. |
| Is data required by Cl.233 of the GSD presented? | Yes | |
| Does the description of the proposed development include all aspects of temporary and permanent works which might impact upon geology, hydrogeology and hydrology? | No | No detailed CMS provided. |
| Are suitable plan/maps included? | Yes | |
| Do the plans/maps show the whole of the relevant area of study and do they show it in sufficient detail? | No | Sections D-D, E-E and F-F as indicated on existing plans not provided. |
| Land Stability Screening:<br>Have appropriate data sources been consulted?<br>Is justification provided for 'No' answers? | Yes | BIA Section 2.5. |
| Hydrogeology Screening:<br>Have appropriate data sources been consulted?<br>Is justification provided for 'No' answers? | Yes | BIA Section 2.5. |
| Hydrology Screening:<br>Have appropriate data sources been consulted?<br>Is justification provided for 'No' answers? | Yes | BIA Section 2.5. |
| Is a conceptual model presented? | Yes | BIA Sections 2.3 and 2.4. |
| Land Stability Scoping Provided?<br>Is scoping consistent with screening outcome? | Yes | BIA Section 3. |

| Item | Yes/No/NA | Comment |
|---|---|---|
| Hydrogeology Scoping Provided?<br>Is scoping consistent with screening outcome? | Yea | BIA Section 3. |
| Hydrology Scoping Provided?<br>Is scoping consistent with screening outcome? | Yes | BIA Section 3. |
| Is factual ground investigation data provided? | Yes | Limited to 1 hand held window sample borehole extending approximately 1.00m below proposed basement finished floor level. |
| Is monitoring data presented? | Yes | Groundwater monitoring presented within section 4.2. |
| Is the ground investigation informed by a desk study? | Yes | Desk study type assessment contained within Section 2.0 of BIA. Structural Overview Statement (desk study type report) undertaken prior to intrusive investigation. |
| Has a site walkover been undertaken? | Yes | Contained within Structural Overview Statement. |
| Is the presence/absence of adjacent or nearby basements confirmed? | Yes | BIA Section 2.2. |
| Is a geotechnical interpretation presented? | Yes | BIA Section 5.0. |
| Does the geotechnical interpretation include information on retaining wall design? | Yes | Material parameters for retaining wall design provided within BIA Section 5.2.10. |
| Are reports on other investigations required by screening and scoping presented? | No | No mention of consultations with adjacent property owners as stated required within BIA Section 3.0. |
| Are baseline conditions described, based on the GSD? | Yes | |
| Do the base line conditions consider adjacent or nearby basements? | Yes | BIA Section 5.2.5 and Section 5.2.6 (however no direct mention of adjacent basements, only adjacent properties). |

| Item | Yes/No/NA | Comment |
|---|---|---|
| Is an Impact Assessment provided? | Yes | BIA Section 5. |
| Are estimates of ground movement and structural impact presented? | Yes | BIA Section 5.2.4 and 5.2.5. However no co consideration given to surcharge from adjacent properties and adjacent roads. |
| Is the Impact Assessment appropriate to the matters identified by screen and scoping? | Yes | |
| Has the need for mitigation been considered and are appropriate mitigation methods incorporated in the scheme? | Yes | Mitigation measures considered, however, further consideration should be given to preventing 'running sand' conditions which if occur will likely have a significant impact on adjacent properties. No consideration given to potential requirement for underpinning adjacent properties. BIA states requirement for further consideration during detailed design. |
| Has the need for monitoring during construction been considered? | Yes | BIA Section 5.2.6. |
| Have the residual (after mitigation) impacts been clearly identified? | Yes | BIA Section 5.2.6 and Section 5.3. |
| Has the scheme demonstrated that the structural stability of the building and neighbouring properties and infrastructure will be maintained? | No | |
| Has the scheme avoided adversely affecting drainage and run-off or causing other damage to the water environment? | Yes | No increase in area of hardstanding. |
| Has the scheme avoided cumulative impacts upon structural stability or the water environment in the local area? | Yes | However little mention of number of basements in the surrounding area. |
| Does report state that damage to surrounding buildings will be no worse than Burland Category 2? | Yes | Not explicitly stated, however damage presented within BIA Section 5.2.5 to surrounding properties will be classified as equivalent to Burland Category 2. Ground movement assessment does not take into account construction method. |

| Item | Yes/No/NA | Comment |
|---|---|---|
| Are non-technical summaries provided? | No | |

## 4.0 DISCUSSION

4.1. The Basement Impact Assessment (BIA) has been carried out by a well-known firm of engineering consultants, Clarkebond Ltd. The reviewer is a structural engineer but no proof of expertise in engineering geology has been provided as required by CPG4.

4.2. No Construction Method Statement (CMS) or similar alternative has been prepared. It should be noted that this document is key to assessing potential ground movements and potential impact on adjacent properties.

4.3. The LBC Instruction to proceed with the audit confirmed 26-27 Kirby Street was not a listed building, or was a neighbour to, listed buildings. The Design & Access Statement identified that 26-27 Kirby Street is located in the Hatton Garden Conservation Area, however the only listed building in the immediate vicinity is Wren House, refurbished for office accommodation in 1999.

4.4. The proposed basement extension consists of lowering the existing basement by 0.50m and further lateral extension of the basement to the west such that the overall proposed basement will extend over the entire building footprint. The proposal description states the proposed development will comprise '*Refurbishment of lower floors and a basement extension to provide retail and associated office use and conversion of one floor to provide 1 x 2-bed flat with addition of three storey to provide 1 x 2-bed flats and 1 x 3-bed duplex flat*'.

4.5. The proposal description contradicts the loading assessment provided within the Structural Overview Statement. The Structural Overview Statement assumes both floors currently used as office space will be converted to residential usage which will offset loads imposed by the addition of additional storeys. The load breakdown provided within the Structural Overview statement should be consistent with development proposals as this is likely to have design implications.

4.6. It should be noted that development plans and drawings submitted do not include cross sections D-D, E-E and F-F.

4.7. The BIA contains ground investigation data in the form of one hand held window sample borehole log. This has identified that the area of the lateral basement extension is underlain by Made Ground to a depth of 2.40 metres below ground floor level, below which lies the Hackney Gravel Member which has been proven to a depth of 4.00m below ground floor level (approximately 1.00m below proposed basement level). It is anticipated that the London Clay will underlie this formation; however this was unproven by ground investigation. Groundwater was not recorded during excavation of the borehole, however was recorded on 1 out of 3 subsequent monitoring visits at a depth of 3.86m below ground floor level (approximately 0.86m below proposed basement level).

4.8. The BIA briefly discusses proposed basement construction methodology. The method stated is to utilise conventional underpinning techniques to form the perimeter walls with temporary propping installed prior to installation of permanent basement and ground floor slabs. Ground bearing floor are considered suitable, however, the likely requirement for void formers to protect against ground heave is stated. It should be noted that a detailed underpinning layout will be required to adequately assess damage to adjacent properties.

4.9. Shallow strip foundations bearing onto the Hackney Gravel Member are proposed within the BIA to accommodate loads from the proposed 5 storey (plus basement) building. This contradicts the Structural Overview Statement which states the basement extension will be founded in the London Clay.

4.10. No mention of proven or anticipated foundations of adjacent properties, or mention of adjacent highways, has been made within the BIA or associated documents. It is stated that the property to the south of the proposed development contains a single storey basement. Surcharge loading implied from adjacent foundations affects the form of both temporary and permanent works.

4.11. Section 5.2.2 of the BIA states that '*The stability of excavations through Made Ground and Hackney Gravel are unlikely to remain stable even during the short periods required for construction. The stability of excavations will rapidly deteriorate in the presence of water. The site investigation has not indicated the presence of groundwater within the construction depth, and further the works lying within the internal area of the building will be protected from surface water. Due to the limited extent of the site investigation, it is not possible to completely discount the potential for perched groundwater pockets. It remains likely that if present such bodies will be of limited extent and as such may drain rapidly as the excavation proceeds. However, water bearing granular deposits will not remain stable and even if supported, there is a risk of soil running into the excavation if perched groundwater pockets are encountered.*' Particle Size Distribution undertaken within the Hackney Gravel Formation show that the material contains a low clay/silt component of between 6% and 7% which suggests that the strata is highly permeable and implies that the material will exhibit little cohesion. This further highlights susceptibility to collapse in excavations.

4.12. Without proper mitigation measures implied to prevent excavation collapse and 'running sand' conditions significant ground movements may occur which may cause significant damage to surrounding properties. Discussions for mitigation measures to prevent excavation collapse and 'running sand' conditions have not been discussed as a part of the BIA and recommendations have not been provided to investigate the matter as a part of future works.

4.13. Estimates of ground movements due to installation of the proposed basements have been provided within the BIA which state that the maximum horizontal and vertical ground

movements will be 4.5mm and 3.0mm respectively which equate to Burland Category 2 Damage. Ground movements affecting the adjacent highway (within 5m of the basement excavation) have not been considered. CPG4 requires that mitigation measures are proposed where there any risk of damage in excess of Burland Category 1. Irrespective of the adoption of construction methodology presented within the BIA, no specific CMS been produced, and consequently no indication of potential damage to adjoining properties can be reviewed in detail.

4.14. Consideration to an alternative foundation solution to that proposed within the BIA may be required due to potential issues of excessive settlements due to loadings from the 6 storey (including single storey basement) structure and an unknown depth to the London Clay. Estimates of foundation settlement should be undertaken utilising either information from additional ground investigation or assumed 'worst case' ground conditions.

4.15. Ground investigation including groundwater monitoring at the site was limited. Further groundwater monitoring and a review of a basements within the localised area would allow a more detailed assessment to be made within the BIA of the impact of the proposed basement on the local hydrogeology. The BIA has stated that *"the intrusive investigation has revealed that the groundwater level lies at sufficient depth below that impacted by the proposed basement that this development will neither impact on the existing groundwater flow, nor be impacted by the presence of groundwater within the basement depth. Both of these potential impacts are therefore adequately negated by based on the data retrieved from the investigation"*. This statement cannot be verified on the basis of information provided to date.

4.16. Appropriate geotechnical parameters have been included within the BIA for retaining wall design. Surcharge loading from the adjacent foundations and highways requires consideration prior to detailed design for the permanent and temporary works. These geotechnical parameters should be used in conjunction with the findings of any further pre-construction intrusive investigation undertaken.

4.17. Recommendations are provided within the BIA for a movement monitoring strategy during excavation and construction. The monitoring plan is to include for measurements of vertical and horizontal ground movements against pre-defined trigger levels and is to include contingency measures to be implemented should the trigger levels be exceeded. An outline scope is suggested within the BIA which highlights the requirement for excavations and associated ground movements to be tightly controlled. The monitoring regime, plus pre and post-condition surveys of adjacent properties, will be required to be undertaken to comply with the Party Wall Act.

4.18. The proposed development does not impact on current rainwater discharges to the below ground surface water drainage system as there is no increase in area of hardstanding. No consultation with Thames Water is provided.

4.19. The BIA has shown that although the development is close to the "lost" River Fleet, it will not impact on the wider hydrogeology of the area, any other watercourses, springs or the Hampstead Heath Pond chain catchment area.

4.20. No significant slopes in excess of 7 degrees are present surrounding the site and it is accepted that there are no slope stability concerns regarding the proposed development and it is not in an area prone to flooding.

## 5.0 CONCLUSIONS

5.1. The Basement Impact Assessment (BIA) has been carried out by a well-known firm of engineering consultants, Clarkebond Ltd. The reviewer is a structural engineer but no proof of expertise in engineering geology has been provided as required by CPG4.

5.2. The BIA has confirmed that the proposed basement will be founded within the Hackney Gravel Member. The Structural Overview Statement contradicts this and suggests that the basement will be founded within the London Clay. This contradiction should be corrected and the founding strata should be consistent across all reports.

5.3. The BIA discusses underpinning as a basement construction proposal with shallow strip foundation to support the proposed 5 storey (plus single storey basement) development.

5.4. The development proposals provided as a part of the planning application contradict the loading assessment provided within the Structural Overview Statement. The load breakdown provided within the Structural Overview statement should be consistent with development proposals as this is likely to have substantial design implications.

5.5. No detailed Construction Method Statement (CMS) has been provided. A detailed CMS is required to fully assess potential ground movements associated with the proposed development and should identify, as a minimum, the underpinning layout alongside a more detailed load assessment on existing and proposed walls. The load assessment should consider surcharging from adjacent structures and highways.

5.6. The BIA has stated that perched ground waters may be encountered at the proposed development. Ground water monitoring has identified the ground water level at 0.86m below basement level assuming basement construction is as described within the BIA at 3.00m bgl. If the basement is constructed to a greater depth then the possibility of encountering groundwater should be reviewed.

5.7. It is recommended that investigation of neighbouring foundations is carried out. Due to the limited extent of the current investigation it would be prudent to allow for further investigation of below ground soils and groundwater monitoring allowing a decision to be taken on construction methodology. Intrusive investigation should assess the depth to the London Clay to calculate potential settlement of foundations and to confirm the allowable bearing capacity provided within the BIA. The further soils investigation may be tailored to allow further consideration of likelihood of groundwater flow and direction affecting the local hydrogeology. Further ground investigation should be undertaken prior to construction but is not required as a part of the BIA.

5.8. Estimates of foundation settlement should be undertaken utilising either information from additional ground investigation or assumed 'worst case' ground conditions.

5.9. An analysis has been undertaken of horizontal and vertical ground movements which have stated damage to adjacent properties will be Burland Category 2 or less. Mitigation proposals should be proposed to limit damage to adjacent properties to Burland Category 1. Once a CMS has been produced and a decision on construction methodology is finalised a detailed ground movement assessment should be undertaken.

5.10. Proposals are provided for movement monitoring strategy during excavation and construction. This should be finalised within the CMS to allow confirmation of a viable construction methodology. The BIA recommends that mitigating measures are introduced as a part of the party wall act which are suggested to include; pre and post condition surveys of adjacent properties, definition of threshold displacement values, formulation of remedial actions if these thresholds are reached and the installation of monitoring stations to assess land stability and groundwater levels.

5.11. An assessment should be provided of mitigation measures to prevent excavation collapse and 'running sand' conditions and to overcome associated potentially significant ground movements.

5.12. It is accepted minor surrounding slopes to the development site are stable.

5.13. Evidence of consultation with adjacent neighbours has not been provided.

5.14. Evidence of consultations with utilities providers has not been provided. This should be undertaken to ensure that the proposed development causes no damage to services. Furthermore consultations with Thames Water should be undertaken to clarify if existing water infrastructure will not be able to accommodate the needs of the proposed development.

5.15. It is accepted that the development will likely not impact on the wider hydrogeology of the area and is not in an area subject to flooding.

5.16. It is recommended that the queries and discrepancies identified are closed out in an updated BIA. Additional information required should cover the following:

- Detailed construction methodology (to be included as a part of a construction method statement and to including underpinning layout).
- Predicted ground movements to be confirmed for actual construction sequence, basement configuration and nature and condition of surrounding structures and infrastructure.
- Mitigation proposals to limit potential damage to adjacent properties to Burland Category 1.

- Detailed design of retaining walls (permanent and temporary works) with soil, groundwater and adjacent foundation layout assumptions clearly stated. This may require further ground investigation.
- Evidence of consultation with Thames Water and utilities providers to seek their approval for the works.
- Evidence of consultation regarding condition surveys and monitoring with surrounding building and asset owners.

# Appendix 1: Residents' Consultation Comments

None

# Appendix 2: Audit Query Tracker

CampbellReith
consulting engineers

Audit Query Tracker

| Query No | Subject | Query | Status | Date closed out |
|---|---|---|---|---|
| 1 | Stability | Construction Method Statement to be undertaken. | Open | |
| 2 | Stability | Mitigation measures to avoid the potential for excavation collapse / running sand conditions within Made Ground and Hackney Gravel Member. | Open | |
| 3 | Stability | Monitoring and condition surveys to be agreed and completed as required by the party wall act and in conjunction with requirements following consultations with local utilities providers and adjacent properties. | Open | |
| 4 | Stability | Layout of adjacent foundations to be provided. | Open | |
| 5 | Stability | Settlement estimates of proposed strip foundations to be provided. This should take into account proven depth to London Clay or an assumed 'worst case' situation. | Open | |
| 6 | BIA author qualifications | Evidence of authors' experience in engineering geology. | Open | |
| 7 | Neighbour amenity | No evidence of consultations with neighbours provided. | Open | |
| 8 | Stability | No evidence of consultations with utilities asset owners provided. | Open | |

| | | | | |
|---|---|---|---|---|
| 9 | Information | Sections D,E and F not provided as per existing plans (S001 and P001). | Open | |
| 10 | Stability | Updated load breakdown consistent with planning proposals | Open | |
| 11 | Stability | Provision of mitigation proposals to limit potential damage to adjacent properties to Burland Category 1. | Open | |

# Appendix 3: Supplementary Supporting Documents

None

## 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