# Basement Impact Assessment

18-23 Hand Court High Holborn Estate SRG Holborn Ltd.

26th September 2018



1508 - High Holborn Estate - 18-21 Hand Court | Basement Impact Assessment



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Status: Basement Impact Assessment 26/09/2018 Date: Revision: А 1508 Job no: **Prepared by:** Gordon Armstrong-Payne Approved by: Elliott Furminger

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## 1. Introduction

Heyne Tillett Steel has been appointed by SRG Holborn Limited as consulting structural engineers for the proposed development at 18-21 Hand Court within the London Borough of Camden (LBC). The site is located within the High Holborn Estate to the north of High Holborn, along the pedestrian thoroughfare Hand Court. The proposed mixed-use development includes the construction of a single storey basement across the full site footprint, with 5 storeys above ground.

This Basement Impact Assessment (BIA) has been prepared by Heyne Tillett Steel in conjunction with RSK and in line with:

- Camden Planning Guidance CPG4 Basement and Lightwells
- Section DP27 Basement and Lightwells of Camden's Development Policies 2015
- Supplementary reference documentation within these documents.

This report provides specific details of each stage of the basement impact process as well as information on excavation, temporary works and construction techniques. The report includes details of the potential impact of the subterranean development on the existing and neighbouring structures, based on the specific site characteristics, geology and hydrogeology. In support of the BIA, a Geotechnical Report has been prepared by RSK. This is contained within the appendices. The RSK report considers the geotechnical, hydrological and hydrogeological aspects of the structural scheme. It also summarises the 5 stages required for any BIA within Camden; these being Screening, Scoping, Site Investigation and Study, Basement Impact Assessment and Review and Decision Making. An assessment of the expected ground movements is also included within their report.

This structural engineering and geotechnical report has been organised to address the Camden BIA stages and the other structural matters relevant to the project. A summary of each Camden BIA stage is given below including a corresponding reference location within this report.

This report covers the work undertaken from instruction through to the completion of RIBA Stage 2. It has been prepared in collaboration with Buckley Gray Yeoman Architects (BGY) and GDM Partnership Building Services Engineers (GDMP). Site investigations have been completed where appropriate to inform the stage 2 design. The following archive sources have been contacted and visited to increase our understanding of the existing structure, however limited information was found.

- British Geological Survey (BGS)
- · London Metropolitan Archives (LMA)
- · London Borough of Camden Archives



Prespective view of proposed structure

Camden CPG4 Stage	Refere
1.0 Screening	
<ul> <li>1.1 Subterranean Screening Assessment</li> <li>1.2 Surface Flow and Flooding Screening Assessment</li> <li>1.3 Stability Screening Assessment</li> </ul>	RSK Re RSK Re RSK Re
2.0 Scoping	
<ul> <li>2.1 Subterranean Screening Assessment</li> <li>2.2 Surface Flow and Flooding Screening Assessment</li> <li>2.3 Stability Screening Assessment</li> </ul>	RSK Re RSK Re RSK Re
3.0 Site Investigation and Study	RSK R Investi <sub></sub>
4.0 Impact Assessment	RSK Re
5.0 Review and Decision Making	Audit R
amden CPG4 stages	



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eport Section 4.0, Table 4 eport Section 4.0, Table 5

eport Section 4.0, Table 6

eport Section 5.1 eport Section 5.2

eport Section 5.3

eport Section 6 and RSK Appendix C (Site gation Report)

eport Section 7.0

Review Undertaken by LB Camden



# 2. The Site

#### 2.1 General

The site is rectangular on plan, measuring approximately 27m x 16m and is situated on Hand Court, a pedestrianised thoroughfare which has been in use since the early 19<sup>th</sup> century. Hand Court is located to the north of High Holborn, in the London Borough of Camden. This provides pedestrian access between Sandland Street and High Holborn.

The existing building adjoins three separate properties, each of which is owned by the developing client. Caroline House to the south, High Holborn House to the east and 22-23 Hand Court to the north. Each of these properties have a single storey basement which extends to the site boundary.

To the west of the site is Mid City Place; a 7-storey building over a single storey basement, which along with the surrounding buildings are predominantly commercial use.





The site is located within an ancient area of London dating back to the 17<sup>th</sup> Century. The area was a major focus for publishing along with many local taverns. Throughout the 19<sup>th</sup> and 20<sup>th</sup> century, Hand Court was predominantly a commercial and light industrial thoroughfare. Historic maps indicate that a bakery, veterans club and an engraver were all situated along Hand Court. The site was heavily bombed in WWII, however was reconstructed in the late 20<sup>th</sup> Century. A number of instances of reconfiguring properties is evident across the site. To the North of the site sits an early 18<sup>th</sup> Century Georgian terrace which is now Grade 2 listed.



886 sketch of Hand Court



View south along Hand Court

#### 2.3 Ground Conditions

#### Site Geology

A geotechnical desktop study and a full suite of site investigations have been undertaken by RSK to inform the BIA. Refer to the RSK report in the appendices for full details. The ground investigation findings are summarised below:

0.00 - 0.25m	Existing 250thk RC slab
0.25 - 0.35m	Made ground +21.38m AOD (existing basement level)
0.35 - 4.30m	Lynch Hill Gravel +20.85m AOD
4.30 - 5.80m	London Clay +16.94m AOD
5.8 - 8.50m	Lambeth Group -5.46m AOD

Ground water was encountered at approximately 3.6m below ground level.

No contamination is considered likely beyond the made ground strata.

#### Existing Hydrology and Hydrogeology

RSK have undertaken an assessment of the existing site hydrogeology, which is summarised as follows:

The site has been classified by the EA to overlie a:

- Secondary "A" Aquifer: permeable layers capable of supporting water supplies at a local rather than strategic scale, and in some cases forming an important source of base flow to rivers
- `unproductive' strata: low permeability with negligible significance for water supply or river base flow.

The EA status report issued in 2016 'Management of the London Basin Chalk Aquifer' indicates that the potentiometric surface of the groundwater in the deep aquifer in the site area in January 2016 was at approximately -30mAOD, i.e. approximately 55m below ground level. The risk of rising groundwater levels to the proposed development would therefore appear to be low.

The flood probability and risk maps for the area, published by the EA, show that the risk of flooding has been assessed by the EA as low, and for planning purposes is in a flood zone 1 meaning a flood risk assessment is not required.





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#### 2.4 Below Ground Drainage

A below ground CCTV survey has been carried out by Spaflow which indicated that there is a single below ground drainage system on site. The system discharges by gravity into the combined sewer via a single outfall at high level basement.

A Thames Water asset location search indicates that a combined sewer is situated within Hand Court. The exact position and level of this sewer is currently unknown and this should confirmed in the next stage of design.

It is believed that the asset is within 3m of the site, and therefore a standard build over agreement will be required. Thames Water also require a ground movement assessment to determine the resultant movement of the sewer due to the new development. A pre-development enquiry has confirmed that the existing sewer along Hand Court has the capacity to accommodate the proposed foul water discharge from the development.



#### 2.5 London Underground

The Central Line of the London Underground (LUL) network runs east-west along High Holborn. LUL have issued a letter of no objection confirming that they require no further involvement with the project.

#### 2.6 Kingsway Tunnels

The deep tunnel air raid shelters known as the Kingsway Tunnels, built during World War 2, are located under High Holborn.The tunnels run near to the site, but will not be affected by the proposed works.

#### 2.7 WWII Bomb Maps

Bomb maps show the site was seriously damaged

during World War 2, but not beyond repair. During the geotechnical investigations, a detailed UXO risk assessment was carried out. This concluded that there is a medium risk of unexploded air-delivered ordnance within the site boundary. It has been recommended that UXO specialist on-site support is provided throughout any excavations and all personnel will require UXO awareness briefings prior to any excavation works.



WWII bomb map



1935 Archive drawing of 13-21 Hand Court



Kingsway tunnels

947 Ai



rial view



# 3. Existing Building

#### 3.1 General

The existing building is a 3 storey structure providing office space over a single storey basement. The existing basement only partially occupies the site within the south-west corner. Towards the north-east corner, there is no existing basement.

The existing building is rectangular in plan and believed to have been constructed in various stages throughout the 20<sup>th</sup> century. Access to the superstructure has been limited, therefore structural information has been gained from a series of visual inspections, survey drawings and knowledge of similar structures. No structural archive information has been found. Two trial pits have been completed within the existing basement of 18-21 Hand Court, along with trial pits to the boundary walls of High Holborn House and 22-23 Hand Court to ascertain the nature of the existing foundations.

#### 3.2 Superstructure

The existing structure consists of concrete slabs, either filler joist or reinforced concrete, supported on loadbearing masonry spine walls running east to west. Wall thicknesses vary throughout but generally decrease up the building. The mansard roof is assumed to be of timber construction.

The building covers the entire site footprint at ground floor, except for a small lightwell within the South-East corner of the site, and reduces in area on plan to cover only the eastern-most half at roof level.

#### 3.3 Stability

Lateral stability is assumed to be provided by the masonry spine walls in the east-west direction, and by the masonry facades in the north-south direction.

#### 3.4 Substructure

The existing single storey basement of the building does not occupy the entire site and its extents are limited to the south-west corner. Masonry retaining walls surround the basement, with masonry piers abutting the wall along Hand Court.

Typically, load bearing masonry walls were found to be supported on brick corbelled footings on mass concrete strip foundations. It was noted within trial pit 1 that the western wall appeared to have no mass concrete footings. All footings are assumed to be symmetrical, i.e. the projection of the footing from the wall into the neighbouring buildings is equal to the projection into the 18-21 Hand Court site.

The basement slab is ground bearing mass concrete and varies in thickness from 130-530mm at trial pit locations

#### 3.5 Boundary/ Party Walls

The site is constrained on three sides by adjacent buildings:

- 22-23 Hand Court to the north is understood to have an independent boundary wall
- Caroline House to the south is understood to have an independent boundary wall.
- High Holborn House to the east is separated by a party wall which provides support to the 1st floor structure of 18-21 Hand Court.

#### 3.6 Existing Design Loadings for Geotechnical Assessment

The original design loadings are unknown, however for the purposes of the geotechnical assessments the following British Standard compliant imposed loads have been assumed:

•	Office floors	2.50 kN/m <sup>2</sup> (+ 1.00 kN/m <sup>2</sup> for partitions)
	Flat roof areas	1.50 kN/m <sup>2</sup> for access and maintenance
	Sloping roofs	0.60 kN/m <sup>2</sup>





Existing perspective section



## 4. Proposed Development

#### 4.1 Demolition

All the existing structure within the site boundary is proposed to be demolished, with the exception of the retaining wall along Hand Court.

#### 4.2 Overview and Use

The proposed development is rectangular on plan and consists of a new five storey reinforced concrete structure over a single storey basement. At third floor level, the building envelope steps in to create a large external terrace. Basement is retail and plant/ancillary space, ground floor is predominately retail space with a UKPN substation and the office entrance, first floor and above is office accommodation.

#### 4.3 Substructure

The proposed single storey basement covers the full site footprint and is supported by an 800mm thick reinforced concrete raft foundation. The raft will be founded at +19.970m AOD where the allowable bearing pressure will be in the region of 200kN/m2. Local deepening to around +18.690m AOD will be required around the lift pits. Around the perimeter there will be mass concrete strip footings under the raft to match the depth of existing adjacent footings, to ensure no additional load is applied on existing foundations.



Drawing P250 section 4-4

The existing masonry wall along the Hand Court elevation is to be retained, but the masonry piers removed. A new reinforced water-resistant concrete (WRC) liner wall will be constructed against the inside face of the masonry wall and RC piers will project out to support the RC columns above.

A number of adjacent foundations to the perimeter will be underpinned to facilitate the construction of the reinforced concrete basement box. The underpins will be mass concrete.



Perspective Section of Proposed Structure



Lower ground floor plate

## 4.4 Basement Waterproofing Strategy

The basement waterproofing is an architectural item/ contractor design portion (CDP). The strategy has structural implications, so the assumed approach is clarified below to explain the current structural design. The basement will be designed to achieve a Grade 3 level of waterproofing protection.

surfaces.

The construction methodology will need to ensure no damage to existing perimeter masonry walls during casting of the WRC liner walls, due to the hydrostatic pressure of the wet concrete. This is typically done by limiting the height of the concrete pours.

The proposed five storey RC structure will extend to the full site perimeter from basement to third floor level. At fourth floor the building envelope reduces to form a large external terrace area; the building facade steps back from Hand Court and 22-23 Hand Court, creating a reduced internal fourth floor and roof area.

Due to overall height constraints a reinforced concrete building with flat slabs has been chosen as it provides the minimum depth structural zone compared to steel, timber, and RC downstand options. The flat slab is typically 250mm thick. This increases to 275mm at ground floor to accommodate for increased ground floor loads, particularly in the UKPN room, and 350mm at third floor level because this is a transfer slab.

over.

To ensure strict compliance with BS 8102:2009 two forms of basement protection have been recommended. Both Type B (integral i.e. the WRC liner wall) and Type C (cavity drain) protection will be provided to all basement

#### 4.5 Superstructure

A galvanized steel frame is to be provided at roof level to support the plant screen and a series of PV panels



#### 4.6 Ground Floor

To accommodate the change in level along Hand Court, the ground floor slab will step in three locations.

A service lift will operate between the basement and ground floor. The shaft will be formed by 200mm thick reinforced concrete walls from basement structural slab level (SSL) to the first floor slab soffit. It is understood that no lift overrun is required.

#### 4.7 Fourth Floor Transfer Slab

The step back at fourth floor requires a transfer structure to accommodate the change in column grid and avoid further internal columns at lower levels. Downstand options were rejected in preference to maintaining a consistent soffit across the floor plates.

Along the Hand Court elevation, the 350mm slab requires additional support for punching shear and this is provided with an upstand beam along the full length of the façade, which will be incorporated within the terrace floor build-up.



## 4.8 Lateral Stability

Lateral stability in the north-south direction will be provided entirely by the reinforced concrete core. In the east-west direction, lateral stability will be provided by the core in conjunction with an RC shear wall running along a portion of the northern site boundary.

Walls comprising the core perimeter are to be 250mm thick while the remaining internal lift shaft walls are to be 200mm thick. The northern shear wall will be 250mm thick. These shear walls act as vertical cantilevers. The forces at the base of the walls are resolved into the raft foundation and ultimately resisted by the ground.

#### 4.9 Disproportionate Collapse

The proposed structure will be designed for disproportionate collapse in accordance with the Building Regulations and the current material codes and standards. The structure, including the basement, is classified as Class 2B in Approved Document A (Part A3) of the Building Regulations. The building will be designed in accordance with the relevant design standards to satisfy the requirements for robustness.

#### 4.10 Below Ground Drainage

The site currently discharges to a combined 225mmØ Thames Water sewer located in Hand Court. All the existing below ground drainage within the site boundary is assumed to be redundant and will be removed during the demolition of the existing building.

The lowering of the basement slab, from the existing to the proposed scheme, renders the existing connection to the public sewer unsuitable; new connections at high level basement are proposed. The new connections will require adaptable manholes to be constructed on the line of the public sewer.

All drainage (surface and foul water) above the basement level is proposed to be drained by gravity. Foul water from the basement level will be pumped to high level basement, where is will drain to the sewers by gravity. All basement level drainage will run within the depth of the raft foundation.

The proposed surface water drainage strategy is to attenuate rainwater at roof level via blue roofs and then discharged to the neighbouring combined sewer in Hand Court, at a rate of less than 5.0 l/s for all storms of up to 1 in 100-years + 20% Climate Change.



Proposed lateral stability elements



Proposed basement section



# 5. Basement Impact Assessment

RSK's full report can be found in the appendices but is summarised below.

#### 5.1 Stage 1 – Screening

The London Borough of Camden guidance suggests that any development that includes a basement should be screened to determine whether a full Basement Impact Assessment (BIA) is required. A screening assessment toolkit is included in the ARUP document and forms the basis of section 4.0 of RSK's report

#### 5.2 Stage 2 – Scoping / Stage 3 – SI and Study

There are several scoping points used to identify the potential impacts of the proposed scheme for each matter of concern identified in the screening stage.

To assess these scoping points RSK have completed a full desk study, intrusive site investigation and monitoring programme, compliant with the data requirements as set out in appendix G of 'Camden Geological, Hydrogeological and Hydrological Study' produced for Camden by Arup in November 2010.

To summarise both stages, a table containing the potential impacts, consequences and conclusions of the site investigations is summarised below.

#### 5.3 Stage 4 - Impact Assessment

The impact assessment by RSK assessed the structural stability of adjacent structures from the proposed retaining wall installation and basement excavation. The conclusion being:

Movement analyses have been undertaken in accordance with CIRIA C760. All building structures fall into 'Category 0' (Negligible) to 'Category 1' ('Very Slight Damage'). The results fulfil the requirements of CPG4 in that they do not exceed the damage category of 'Very Slight' (Category 1) and reflect categories of cosmetic rather than structural damage.

It also assessed the structural stability of adjacent structures from heave of the basement excavation and concluded:

Numerical modelling has been undertaken to determine the conditions at key stages in the construction process, namely:

- Unloading due to demolition of the existing building and excavation for the new basement; and
- Full loading following construction of the new basement and building.

In both cases, no potentially damaging vertical movements are predicted beyond the site's boundary.

Potential impact	Consequence	Site investigation Conclusions
The basement may extend into the underlying aquifer.	The basement extension could affect the groundwater flow regime.	Given the density of existing basement developments that bound the site to the north east and south in addition to those within the local area of the site coupled with the absence of any evidence to suggest these basement excavations have resulted in an increase in surface water flooding events, it is concluded that the proposed development will have little or no impact on the existing subterranean water flows.
Basement excavation Potential Impact/Consequences	Ground movements associated with basement excavation may result in damage to the road, pavement or any underground services below these.	The stage 4 impact assessment addresses the issue.





# 6. Temporary Works and Sequence of Construction

## 6.1 Stage 1 - Initial Temporary Works and Demolition

#### Demolish existing structure to ground level



Demolition of upper floors

#### 6.2 Stage 2 - Basement Temporary Works

- · Install temporary propping to Hand Court retaining wall.
- · Locally demolish basement slab to allow thrust blocks for temporary props to be cast at proposed raft level.
- · Install wailers and A-frame props between existing masonry piers along hand court elevation.
- · Install other temporary props as required.
- Install sheet piles local to North West corner • where existing basement extent is to be increased.
- Demolish ground floor slab and masonry piers to retaining wall



Plan of Hand Court retaining wall with temporary props

#### 6.3 Stage 3 - Underpinning and Excavation

- . Demolish existing basement slab
- Carry out underpinning of adjacent foundations . (where required) in agreed sequence at a maximum width of 1m.
- Excavate to new raft foundation level .



Section A-A - Retaining wall props and thrust block support



Ground floor and basement slab demolished

#### 6.4 Stage 4 - Basement Construction

- · Cast basement RC raft around existing thrust blocks. Reinforcement continuity to be provided.
- · Cast WRC liner walls. Wall along Hand Court elevation to be poured in stages with infill strip required following removal of temporary works.
- · Cast WRC liner walls. Wall along Hand Court elevation to be poured in stages with infill strip required following removal of temporary works.



New RC Raft and liner walls cast

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6.5 - Stage 5 Construction of Ground Floor and Superstructure

- Cast ground floor slab
- Remove propping to retaining walls
- Construct superstructure



Superstructure constructed and temporary works removed

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# Appendix A Design Criteria and Outline Specification



# **Design Criteria and Outline Specification (Eurocode)**

#### 1.1 **Design Criteria**

#### 1.1.1 Deflections

The deflections of the new structure will be designed to meet the following criteria:

Concrete Elements (in-situ and precast):-

Vertical deflection of floor slabs will be limited to:

•	Deflections	under	total	loads:
~			-	( 050

Continuous =		[span / 200]
Cantilevers =	=	[span / 125]

• Deflections under live loads:

= [span / 360]\* Internal = [span / 500]\* Perimeter = [span / 175]\* Cantilevers \*or 20mm whichever is the lesser

Differential deflection between any two floors = • +20mm

Steelwork Elements:-

Vertical deflection of beams will be limited to: Deflections under total load:

Simply supported	= [span / 250]
Cantilever	= [span / 125]

Deflections under live loads:

= [span / 360]\* Simply supported = [span / 180]\* Cantilever = [span / 500]\* Perimeter \*or 20mm whichever is the lesser

All cladding, finishes and services must be designed and detailed to accommodate the worst combination of these.

#### 1.1.2 Movements

The overall size and form of the proposed structure is such that it will not be necessary to introduce movement joints within the primary structure.

#### 1.1.3 Durability

Long term durability of the concrete structure will be achieved by providing adequate cover to reinforcement as recommended in BS EN 1991-1. Corrosion protection of the steel structure will be achieved by a suitable paint system which provides a life to first major maintenance of 10 to 15 years.

#### 1.1.4 Fire Protection

It is assumed that the fire rating for the structure will be 90 minutes, although this is subject to confirmation from the fire consultant. Fire protection to reinforced concrete structure will be achieved by providing cover to the reinforcement and minimum concrete section sizes as recommended in BS EN 1992-1. Fire protection to steelwork elements is to be determined by the architect. This may take the form of spray applied systems, fire boarding or intumescent paints.

#### 1.1.5 Tolerances

The frames will be constructed to be within the tolerances set down in the technical specifications and the recommendations of BS EN 13670:2009. All finishes, cladding, services, internal partitions are required to be detailed to accommodate the worst combination of these.

Structural Robustness 1.1.6

The structure will be designed in accordance with the Building Regulations and the current material codes and standards. The structure, including the basement, is classified as Class 2B in Approved Document A (Part A3) of the Building Regulations. The building will be designed in accordance with the relevant design standards to satisfy the requirements for robustness

#### 1.2 General

The following design elements should be in accordance with the architect's details:

- Water and damp proofing
- Setting out
- Fire protection
- Floor separation and acoustic isolation
- External works
- Finishes
- Internal partitions
- 1.2.2 Concrete

The concrete grades to be used are as follows:

- Blinding, GEN1
- Mass concrete, GEN3
- In-situ, RC40
- Foundations, FND2

All formed surfaces to be Type A (basic) finish in accordance with BS EN 13670:2009. Floor slabs to be uniformly levelled and tamped to type 1 finish, subject to agreement with flooring manufacturer.

#### 1.2.3 Steelwork

All steelwork to be Grade \$355, to BS EN 10025 and in accordance with BS5950. All hollow sections to be grade \$355 Corus Celsius.

All connections to have minimum 2no. M16 bolts, with minimum 6mm leg length continuous fillet welds, unless specifically noted.

All steelwork to be blast cleaned to SA2.5. Internal steelwork painted with 75 µm of zinc phosphate primer, 75 µm sealant. External / perimeter steelwork to be galvanised to 85 µm.

#### 1.2.5 Temporary Works

The contractor is responsible for the design, installation and maintenance of all necessary temporary works to ensure the strength and stability of the building and surrounding buildings throughout the construction process.

- **Design Parameters** 1.3
- 1.3.1 **Codes of Practice**

#### Eurocodes:

BS EN 1990 - Eurocode 0 - Basis of Structural Design BS EN 1991 - Eurocode 1 - Actions on Structures BS EN 1992 - Eurocode 2 - Design of Concrete Structures BS EN 1993 - Eurocode 3 - Design of Steel Structures BS EN 1995 - Eurocode 5 - Design of Timber Structures BS EN 1996 - Eurocode 6 - Design of Masonry Structures BS EN 1997 - Eurocode 7 - Geotechnical Design

#### Building Regulations 2010:

Approved Document A – Structure (2013 edition) Approved Document H - Drainage & Waste Disposal (2010 edition)

#### 1.3.2 Design Loadings (Eurocode)

The structural proposals are based on the following design live loadings:

Roof	Plant	7.50 kN/M <sup>2</sup>
	Access and Maintenance	1.50 kN/m <sup>2</sup>
Typical Floor	Office	4.00 kN/m <sup>2</sup> + 1.00 kN/m <sup>2</sup> partitions
	Terrace	4.00 kN/m <sup>2</sup>
Ground Floor	Retail	4.00 kN/m <sup>2</sup> + 1.00 kN/m <sup>2</sup> partitions
	UKPN	10.0 kN/m2
Basement	Retail	4.00 kN/m <sup>2</sup> + 1.00 kN/m <sup>2</sup> partitions
	Plant	7.50 kN/m2

These loadings are compliant with BS EN 1991 and BCO guidance. The office floors are designed with 4.00 kN/  $m^2$  + 1.00 kN/m<sup>2</sup> to provide future flexibility.









- This drawing is to be read in conjunction with all relevant architects, engineers and specialists drawings and specifications.
- 2 Do not scale from this drawing in either paper or digital form. Use written dimensions only. To check drawing has been printed to the intended scale the above bar should be 100mm long
- 3 All demolition drawings are to be read in conjunction with proposed plans
- 4 The foundations of the existing structure must not be undermined. Upon exposing the retained structures the contractor should identify if any proposed excavation levels are deeper than the existing founding levels and notify the engineer accordingly
- 5 Contractor to submit temporary works and sequencing proposal to the CA for review prior to commencing work. Temporary works required prior to demolition of existing ground floor slab and until new basement and ground floor structure is complete.

#### Demolition legend

	Area of floor to be demolished
	Beam demolished / removed
I	Column demolished / removed
	RC / Masonry wall demolished

P1	29.06.18	IZ	SL	STAGE 2
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P1	29.06.18	IZ	SL	STAGE 2
Re	/ Date	Ву	Eng	Amendments







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## Job Name High Holborn Estate 18-21 Hand Court

Drawing Title Demolition Floor Plates

Purpose of Issue Stage 2 Scale at A1

Drawing No 1508/HC/D006 Rev P1



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	Area of floor to be demolished		
	Beam demolished / removed		
I	Column demolished / removed		
	RC / Masonry wall demolished		

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STRUCTURAL

ENGINEERS

### High Holborn Estate 18-21 Hand Court

Demolition Perspective Sections Sheet 1



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I	Column demolished / removed	
	RC / Masonry wall demolished	









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Job Name High Holborn Estate 18-21 Hand Court

Drawing Title Demolition Perspective Sections Sheet 2

Purpose of Issue Stage 2 Scale at A1

Drawing No 1508/HC/D009 Rev P1





- 1 This drawing is to be read in conjunction with all relevant architects, engineers and specialists drawings and specifications.
- 2 Do not scale from this drawing in either paper or digital form. Use written dimensions only. To check drawing has been printed to the intended scale the above bar should be 100mm long
- 3 All demolition drawings are to be read in conjunction with proposed plans
- 4 The foundations of the existing structure must not be undermined. Upon exposing the retained structures the contractor should identify if any proposed excavation levels are deeper than the existing founding levels and exist the contract excellance. notify the engineer accordingly
- 5 Contractor to submit temporary works and sequencing proposal to the CA for review prior to commencing work. Temporary works required prior to demolition of existing ground floor slab and until new basement and ground floor structure is complete.

#### Demolition legend

	Area of floor to be demolished	
	Beam demolished / removed	
I	Column demolished / removed	
	RC / Masonry wall demolished	



Demolition Plans Lower Ground Floor

Purpose of Issue Stage 2 Scale at A1

1 : 50

Drawing No 1508/HC/D090 Rev P1



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- 3 All demolition drawings are to be read in conjunction with proposed plans
- 4 The foundations of the existing structure must not be undermined. Upon exposing the retained structures the contractor should identify if any proposed excavation levels are deeper than the existing founding levels and exist the contract excellance. notify the engineer accordingly
- 5 Contractor to submit temporary works and sequencing proposal to the CA for review prior to commencing work. Temporary works required prior to demolition of existing ground floor slab and until new basement and ground floor structure is complete.

#### Demolition legend

	Area of floor to be demolished	
	Beam demolished / removed	
I	Column demolished / removed	
	RC / Masonry wall demolished	

P1	29.06.18	IZ	SL	STAGE 2
Rev	Date	Ву	Eng	Amendments







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1 : 50

## High Holborn Estate 18-21 Hand Court

Drawing Title Demolition Plans Ground Floor

Purpose of Issue Stage 2 Scale at A1

Drawing No 1508/HC/D100 Rev P1





- 1 This drawing is to be read in conjunction with all relevant architects, engineers and specialists drawings and specifications.
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- 3 All demolition drawings are to be read in conjunction with proposed plans
- 4 The foundations of the existing structure must not be undermined. Upon exposing the retained structures the contractor should identify if any proposed excavation levels are deeper than the existing founding levels and exist the contract excellance. notify the engineer accordingly
- 5 Contractor to submit temporary works and sequencing proposal to the CA for review prior to commencing work. Temporary works required prior to demolition of existing ground floor slab and until new basement and ground floor structure is complete.

#### Demolition legend

	Area of floor to be demolished		
	Beam demolished / removed		
I	Column demolished / removed		
	RC / Masonry wall demolished		



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- 2 Do not scale from this drawing in either paper or digital form. Use written dimensions only. To check drawing has been printed to the intended scale the above bar should be 100mm long
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- 4 The foundations of the existing structure must not be undermined. Upon exposing the retained structures the contractor should identify if any proposed excavation levels are deeper than the existing founding levels and exist the contract excellance. notify the engineer accordingly
- 5 Contractor to submit temporary works and sequencing Contractor to submit temporary works and sequencing proposal to the CA for review prior to commencing work. Temporary works required prior to demolition of existing ground floor slab and until new basement and ground floor structure is complete.

#### Demolition legend

	Area of floor to be demolished		
	Beam demolished / removed		
I	Column demolished / removed		
	RC / Masonry wall demolished		



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- 2 Do not scale from this drawing in either paper or digital form. Use written dimensions only. To check drawing has been printed to the intended scale the above bar should be 100mm long
- 3 All demolition drawings are to be read in conjunction with proposed plans
- 4 The foundations of the existing structure must not be undermined. Upon exposing the retained structures the contractor should identify if any proposed excavation levels are deeper than the existing founding levels and exist the contract excellance. notify the engineer accordingly
- 5 Contractor to submit temporary works and sequencing Contractor to submit temporary works and sequencing proposal to the CA for review prior to commencing work. Temporary works required prior to demolition of existing ground floor slab and until new basement and ground floor structure is complete.

#### Demolition legend

	Area of floor to be demolished	
	Beam demolished / removed	
I	Column demolished / removed	
	RC / Masonry wall demolished	

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DWG HC/D090 1:100

DWG HC/D090 1:100

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- 3 All demolition drawings are to be read in conjunction with proposed plans
- 4 The foundations of the existing structure must not be undermined. Upon exposing the retained structures the contractor should identify if any proposed excavation levels are deeper than the existing founding levels and any it is a province according. notify the engineer accordingly
- 5 Contractor to submit temporary works and sequencing proposal to the CA for review prior to commencing work. Temporary works required prior to demolition of existing ground floor slab and until new basement and ground floor structure is complete.

The existing structural information shown on these drawings is based on visual inspection of the building, limited opening up works and relevant archive information. All details of the existing construction are subject to confirmation by the Contractor during the works on site. No materials are to be ordered until the relevant details and conditions are confirmed by the Contractor on site. Should the contractor discover any discrepancies between the assumed existing structure and what is found on site they should notify the engineer immediately, and await further instruction

#### Demolition legend

	Area of floor to be demolished		
	Beam demolished / removed		
I	Column demolished / removed		
	RC / Masonry wall demolished		



Purpose of Is	sue Stage 2	Scale at A1		1 : 100
Drawing No	1508/H	C/D200	Rev	Ρ1





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Job Name High Holborn Estate 18-21 Hand Court

Drawing Title
Existing Floor Plates

Purpose of Issue Stage 2 Scale at A1

Drawing No 1508/HC/E006 Rev P1



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Job Name High Holborn Estate 18-21 Hand Court

Drawing Title
Existing Perspective Sections Sheet 1

Purpose of Issue Stage 2 Scale at A1

Drawing No 1508/HC/E008 Rev P1



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Job Name High Holborn Estate 18-21 Hand Court

Drawing Title
Existing Perspective Sections Sheet 2

Purpose of Issue Stage 2 Scale at A1

Drawing No 1508/HC/E009 Rev P1



- This drawing is to be read in conjunction with all relevant architects, engineers and specialists drawings and specifications.
- 2 Do not scale from this drawing in either paper or digital form. Use written dimensions only. To check drawing has been printed to the intended scale the above bar should be 100mm long

NOTE: All existing details shown are based on archive drawings and limited opening up works. Assumptions have been made regarding existing construction. Materials, construction, framing and spans of existing slabs and walls to be confirmed during enabling works.

#### Existing legend

∠ <sup>E</sup> _	Existing RC floor as indicated on drawing
<u>∠e</u>	Existing timber joists, dimensions, crs and span as indicated on drawing.
	Existing structural walls
	Existing structure below
	Existing padstone, TBC on site

P1	29.06.18	IZ	SL	STAGE 2
Rev	Date	Ву	Eng	Amendments



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## Job Name High Holborn Estate 18-21 Hand Court

Drawing Title Existing Plans Lower Ground Floor

Purpose of Issue Stage 2 Scale at A1

1 : 50

Drawing No 1508/HC/E090 Rev P1



This drawing is to be read in conjunction with all relevant architects, engineers and specialists drawings and specifications.

100mm @ A1 (50mm @ A3)

2 Do not scale from this drawing in either paper or digital form. Use written dimensions only. To check drawing has been printed to the intended scale the above bar should be 100mm long

NOTE: All existing details shown are based on archive drawings and limited opening up works. Assumptions have been made regarding existing construction, Materials, construction, framing and spans of existing slabs and walls to be confirmed during enabling works.

#### Existing legend

∠ <sup>E</sup> _	Existing RC floor as indicated on drawing
<u>∠_e</u>	Existing timber joists, dimensions, crs and span as indicated on drawing.
	Existing structural walls
	Existing structure below
	Existing padstone, TBC on site

Rev Date By Eng Amendments	P1	29.06.18	IZ	SL	STAGE 2
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## <sub>Job Name</sub> High Holborn Estate 18-21 Hand Court

Drawing Title Existing Plans Ground Floor

Purpose of Issue Stage 2 Scale at A1

1 : 50

Drawing No 1508/HC/E100 Rev P1



- This drawing is to be read in conjunction with all relevant architects, engineers and specialists drawings and specifications.
- 2 Do not scale from this drawing in either paper or digital form. Use written dimensions only. To check drawing has been printed to the intended scale the above bar should be 100mm long

NOTE: All existing details shown are based on archive drawings and limited opening up works. Assumptions have been made regarding existing construction, Materials, construction, framing and spans of existing slabs and walls to be confirmed during enabling works.

#### Existing legend

∠ <sup>E</sup> _	Existing RC floor as indicated on drawing
<u>∠_e</u>	Existing timber joists, dimensions, crs and span as indicated on drawing.
	Existing structural walls
	Existing structure below
	Existing padstone, TBC on site

Rev Date By	Eng	Amendments





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1 : 50

Job Name High Holborn Estate 18-21 Hand Court

Drawing Title Existing Plans First Floor

Purpose of Issue Stage 2 Scale at A1

Drawing No 1508/HC/E110 Rev P1





- This drawing is to be read in conjunction with all relevant architects, engineers and specialists drawings and specifications.
- 2 Do not scale from this drawing in either paper or digital form. Use written dimensions only. To check drawing has been printed to the intended scale the above bar should be 100mm long

NOTE: All existing details shown are based on archive drawings and limited opening up works. Assumptions have been made regarding existing construction, Materials, construction, framing and spans of existing slabs and walls to be confirmed during enabling works.

#### Existing legend

∠ <sup>E</sup> ¬	Existing RC floor as indicated on drawing
<u>∠_e_</u>	Existing timber joists, dimensions, crs and span as indicated on drawing.
	Existing structural walls
	Existing structure below
	Existing padstone, TBC on site







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1 : 50

<sub>Job Name</sub> High Holborn Estate 18-21 Hand Court

Drawing Title
Existing Plans Second Floor

Purpose of Issue Stage 2 Scale at A1

Drawing No 1508/HC/E120 Rev P1



1	This drawing is to be read in conjunction with all
	relevant architects, engineers and specialists
	drawings and specifications.

100mm @ A1 (50mm @ A3)

2 Do not scale from this drawing in either paper or digital form. Use written dimensions only. To check drawing has been printed to the intended scale the above bar should be 100mm long

NOTE: All existing details shown are based on archive drawings and limited opening up works. Assumptions have been made regarding existing construction. Materials, construction, framing and spans of existing slabs and walls to be confirmed during enabling works.

#### Existing legend

∠ <sup>E</sup> _	Existing RC floor as indicated on drawing
<u>∠e</u>	Existing timber joists, dimensions, crs and span as indicated on drawing.
	Existing structural walls
	Existing structure below
	Existing padstone, TBC on site

P1	29.06.18	IZ	SL	STAGE 2
Rev	Date	Ву	Eng	Amendments





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## Job Name High Holborn Estate 18-21 Hand Court

Drawing Title Existing Plans Roof

Purpose of Issue Stage 2 Scale at A1

Drawing No 1508/HC/E130 Rev P1



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# Drawing Title Proposed Floor Plates

Purpose of Issue Stage 2 Scale at A1

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100mm @ A1 (50mm @ A3)

Drawing No 1508/HC/P006 Rev P1

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Drawing No 1508 / HC/P090 Rev P1





Drawing No 1508 / HC/P110 Rev P1







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#### Column Schedule

C1	152x152x23 UC		CC3	400 x 400 RC
CC1	600 x 400 RC		CC4	550 Ø RC
CC2	1000 x 200 RC		CC5	500 x 500 RC

#### Beam Schedule

B1	203x102x23 UB
BR1	150 x 10 MS plate cross-brace
CB1	400d x 150w RC
CB2	395d x 490w RC
CB3	600d x 600w RC upstand
EA1	100x100x8 EA

#### Floor Schedule

Profiled deck		Timber Floor	RC slab		
1	800 thk WRC raft foundation				
2	350 thk RC slab				
3	275 thk RC slab				
4	250 thk RC slab				
5	Beam and block infill				

#### Legend

	Proposed RC structure
19 + 10 + + 1 + 10 + 10	Proposed WRC structure
	Proposed Steel Framing

precast concrete or steel stair tbc

Core wall arrangement adjusted to avoid clash with party wall. Location subject to partry wall investigation

P1	29.06.18	IZ	SL	STAGE 2
Rev	Date	Ву	Eng	Amendments





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## <sub>Job Name</sub> High Holborn Estate 18-21 Hand Court

Drawing Title Proposed Plans Fourth Floor

Purpose of Issue Stage 2 Scale at A1

1 : 50

Drawing No 1508/HC/P140 Rev P1



- This drawing is to be read in conjunction with all relevant architects, engineers and specialists drawings and specifications.
- 2 Do not scale from this drawing in either paper or digital form. Use written dimensions only. To check drawing has been printed to the intended scale the above bar should be 100mm

#### Column Schedule

C1	C1 152x152x23 UC		CC3	400 x 400 RC
CC1	600 x 400 RC		CC4	550 Ø RC
CC2	1000 x 200 RC		CC5	500 x 500 RC

#### Beam Schedule

B1	203x102x23 UB				
BR1	150 x 10 MS plate cross-brace				
CB1	400d x 150w RC				
CB2	395d x 490w RC				
CB3	600d x 600w RC upstand				
EA1	100x100x8 EA				

#### Floor Schedule

Profiled deck		Timber Floor	RC slab		
1	800 thk WRC raft foundation				
2	350 thk RC slab				
3	275 thk RC slab				
4	250 thk RC slab				
5	Beam and block infill				

#### Legend

	Proposed RC structure
15 + 18 + + 1 + 10 + 1 +	Proposed WRC structure
	Proposed Steel Framing

P1	29.06.18	IZ	SL	STAGE 2
Rev	Date	Ву	Eng	Amendments









1 : 50

Job Name High Holborn Estate 18-21 Hand Court

Drawing Title Proposed Plans Roof

Purpose of Issue Stage 2 Scale at A1

Drawing No 1508/HC/P150 Rev P1





- This drawing is to be read in conjunction with all relevant architects, engineers and specialists drawings and specifications.
- 2 Do not scale from this drawing in either paper or digital form. Use written dimensions only. To check drawing has been printed to the intended scale the above bar should be 100mm

#### Column Schedule

C1	1 152x152x23 UC		CC3	400 x 400 RC
CC1	600 x 400 RC	(	CC4	550 Ø RC
CC2	1000 x 200 RC	(	CC5	500 x 500 RC

#### Beam Schedule

B1	203x102x23 UB
BR1	150 x 10 MS plate cross-brace
CB1	400d x 150w RC
CB2	395d x 490w RC
CB3	600d x 600w RC upstand
EA1	100x100x8 EA

#### Floor Schedule

Profiled d	eck	Timber Floor	RC slab	
1	800 thk WRC raft foundation			
2	350 thk RC slab			
3	275 thk RC slab			
4	250 thk RC slab			
5	Beam and block infill			

#### Legend

	Proposed RC structure
<u>*+_</u> #++	Proposed WRC structure
	Proposed Steel Framing

P1	29.06.18	IZ	SL	STAGE 2
Rev	Date	Ву	Eng	Amendments





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Job Name High Holborn Estate 18-21 Hand Court

Drawing Title Proposed Plans Roof Plant and Lift Overrun

Purpose of Issue Stage 2 Scale at A1 1 : 50

Drawing No 1508/HC/P160 Rev P1