Appendix C

Contamination risk assessment methodology

C1 Introduction

165 A generic quantitative assessment of the results of the contemporary phase of ground investigation is provided in the report in accordance with the current UK guidance on the assessment of contaminated land and in particular the Contaminated Land Exposure Assessment (CLEA) framework.

C1.1 Human health

C1.1.1 Generic assessment criteria

166 The UK statutory guidance suggests that generic soil quality guideline values may be used for an initial screening of soil contamination results in relation to human health risk assessment. Generic assessment criteria (GAC) provide an indication of concentrations in soil below which the long-term human health risks for various generic land-use scenarios are considered to be minimal. Concentrations above GAC do not necessarily indicate that significant contamination is present, but rather that further assessment or risk management measures may be warranted.

167 A generic residential end use has been considered in the assessment to provide an initial appraisal of the results. The generic residential end use is based on assessing risks to young female child with exposure pathways including direct soil and indoor dust ingestion, consumption of homegrown produce, consumption of soil adhering to homegrown produce, skin contact with soils and indoor dust and inhalation of indoor and outdoor dust and vapours.

168 Arup has derived GAC using CLEA 1.07 which use C4SL exposure parameters but maintain the traditional minimal risk toxicological benchmarks. Input data for the toxicological effects, physical characteristics and contaminant fate and transport parameters for the determinands have been taken from sources published by the Environment Agency and other industry sources (including LQM/CIEH and the European Food Safety Authority (EFSA). Further details of the derivation of the Arup GACs including changes made to the default user chemical database and exposure assumptions are available on request.

C1.1.2 Asbestos in soil

169 Work with asbestos in the UK is controlled by the Health and Safety Executive (HSE) and the Control of Asbestos Regulations (CAR) 2012. Certain activities, such as working with asbestos insulation, coatings, and insulting board require licensing and notification to the appropriate authority before work commences. All work with asbestos materials must be initially assessed by a competent person and various requirements arise from that assessment.

170 The HSE has published a Code of Practice for CAR 2012 which does not include specific guidance regulating asbestos in soils. In March 2014 CIRIA published C733 Asbestos in Soil and Made Ground: A guide to understanding and managing risks.

171 In order for asbestos found within soil to pose a risk to health, it has to be present in a form that can release fibres to air for inhalation (or may do after it has been disturbed). The potential for fibre release is likely to be relatively lower when asbestos is present in soil in the form of cements or other ‘bonded’ materials and higher when friable forms or unconsolidated forms such as ‘free fibres’ are present. However, even cemented and bonded ACM may eventually degrade and release fibres and can be disturbed and broken during construction for instance.

172 The release of fibres from the soil into the air can occur via wind-blown disturbance or physical disturbance either during site development (e.g. construction, remediation or earthworks) or during site use after development. The concentration of airborne fibres released is influenced by many factors including asbestos type, ACM type and condition/state, depth, distribution and concentration in soil, soil type, and soil moisture content. There is limited data on the release of airborne fibres from soils in real world environments, but soil moisture content has a particularly significant impact. In laboratory studies, the addition of 5% moisture to a dry soil reduced airborne fibre release by 80-95% and no airborne fibre were detected when the soil moisture content was greater than 15%.

173 There are currently no generic assessment criteria for asbestos in soils and C733 makes it clear that such criteria are unlikely in the near future due to uncertainties on the mechanisms for fibre release, calculating the likely exposure and the risk of harm at low levels of exposure. Instead the report recommends site specific assessment based on multiple lines of evidence.

174 In 2016 a guide was published by CL:AIRE referred to as 'Interpretation for managing and working with asbestos in soils CAR-SOILTM', which is currently the most authoritative guide on the topic and should be followed. CAR-SOILTM confirms that all work with asbestos in soil should be carried out under a 'plan of work' and defines the contents of that plan.

175 Analysis has been performed to the lowest possible accredited detection limit routinely reported by laboratories (0.001%) and a robust strategy to sever plausible pollutant linkages will be adopted in the remediation strategy, to reduce exposure as low as reasonably practicable during development and prevent exposure after development.

C1.2 Controlled waters

176 The framework within which the Environment Agency can work with others to manage and protect groundwater is set out within 'Groundwater protection: Principal and practice (GP3), 2013. Groundwater and leachability results have been screened against Water Quality Standards (WQS), initially by comparison with the environmental quality standards (EQS) for inland surface water, or where unavailable freshwater EQS. Where EQS screening criteria are not available, the following guidelines and standards have been referred to in this hierarchy:

- UK Drinking Water Standards (DWS);
- Surface Water Abstraction Directive (SWAD); and
- The World Health Organisation (WHO) Guidelines for Drinking Water.

177 No criteria are available at all for certain other PAH and for TPH. In the absence of criteria for TPH the withdrawn DWS of 0.01mg/kg has been considered as an initial assessment.

C1.3 Ground gas

178 The following published guidance on the assessment of ground gas has been used in the assessment:

- CIRIA 2007 Report C665 Assessing risks posed by hazardous ground gases to buildings;
- BS 8485 (2015) Code of practice for the characterisation and remediation from ground gas in affected developments; and
- Card, Wilson and Haines (2009) Ground gas handbook.

179 The Ground gas handbook describes a process of deriving gas screening values (GSV) for hazardous ground gases (it summarises the guidance presented in reference 14 and 15 above). The method uses both gas concentrations and borehole flow rates to define a range of characteristic situations (CS1 to

CS6) based on limiting borehole gas volume flow for methane and carbon dioxide. The GSV is calculated by multiplying the borehole flow rate (litres per hour) by the gas concentration.

C1.4 Waste assessment methodology

C1.4.1 Framework

180 There are three types of permitted landfill (inert, non-hazardous and hazardous) and four principal types of waste, as outlined below:

- Inert; generally uncontaminated natural soils and certain clean construction materials such as crushed concrete. The material may be disposed of to an inert landfill without testing. If the natural soils are suspected as contaminated then it may be classed as inert if it satisfies the inert waste acceptance criteria (WAC). Made Ground would typically be required to be tested and pass the WAC in order to be classed as inert. Inert materials may also be used as a construction material in other sites given appropriate waste management permitting;
- Hazardous; defined by the analysis of 'total' chemical parameters to assess the hazard properties. The classified waste may only be disposed of to a hazardous landfill (following treatment) if in addition it satisfies the TOC and leachability WAC;
- Stable non-reactive hazardous waste; defined in a similar manner to hazardous waste (i.e. classed as hazardous) but then satisfying a stricter set of WAC. Following treatment, it may be disposed of in specifically designed separate cells in non-hazardous landfills (if the operator has obtained a permit to operate these cells); and
- Non-hazardous waste; if the waste is not classified as inert or hazardous then it is non-hazardous. There is no WAC for non-hazardous waste.

C1.4.2 Hazardous waste classification

181 The following documents were used to carry out the initial waste classification and disposal assessment of Made Ground and natural soil arisings generated by the development:

- Environment Agency (2009), Hazardous Waste – August 2009 Update;
- Environment Agency (2015), Hazardous Waste, Technical guidance WM3;
- The Hazardous Waste (England and Wales) Regulations; and
- Table 3.2 of Annex VI to Regulation (EC) No. 1272/2008.

182 Metals may be classified as hazardous based on a number of potential hazardous properties including carcinogenic (H7 lowest threshold 1,000mg/kg), ecotoxic (H14 lowest threshold 2,500mg/kg), toxic for reproduction (H10 lowest threshold 5,000mg/kg), harmful (H5 lowest threshold 250,000mg/kg) and toxic (H6 lowest threshold 30,000mg/kg). With the exception of H7, the other classifications are additive i.e. the concentrations are converted to the worst case (for harm) compound and added together before comparison with the thresholds.

183 Hydrocarbons in contaminated soils are generally categorised against the hazardous properties carcinogenic (H7) and ecotoxic (H14). For H7, waste would be defined as hazardous if category 1 or 2 carcinogenic compounds (e.g. benzene) exceeded 0.1% (1,000mg/kg), or category 3 compounds (e.g. diesel) exceeded 1% (10,000mg/kg). TPH is an aggregate parameter that includes a range of category 1, 2 and 3 compounds, along with other elements not classified as carcinogenic. In most circumstances TPH contaminated soil and stones should be assessed as 'unknown oil' (unless there is

a specific documented record or a consistent hydrocarbon profile to indicate diesel or weathered diesel being the contaminating oil) and a worst case should be assumed.

184 For an unknown oil if the concentration of TPH is ≥ 0.1% the waste will be H7 Carcinogenic and H11 Mutagenic unless the concentration of benzo[a]pyrene is <0.01% of the TPH concentration. Substance specific thresholds have been set for specific PAHs.

185 The hazardous waste threshold for asbestos is 0.1% w/w. It is noted that the quantification weight percentage of asbestos is difficult to achieve as asbestos can be present in a wide range of forms. While it is likely that ACM, such as cemented asbestos, board or lagging, will exceed such a threshold, the quantity of ACM in a bulk sample will often be below this level. WM3 states that where a waste contains identifiable pieces of ACM (that can be identified as potentially being asbestos by a competent person if examined by the naked eye) then these pieces must be assessed separately. If the ACM cannot be segregated the waste is regarded as hazardous if the concentration of asbestos in the ACM pieces alone is greater than 0.1.

Appendix D

Groundwise desktop utility search

Can be provided upon request (file size greatly exceeds 10Mb file size limit)

Appendix E

Stage 1 basement design drawings and perimeter sections

A1

FCI basement outline

Site Boundary - basement wall layout adjacent to the FC institute to be developed.

ARP-STR-C-01
Existing Utilities

ARP-STR-C-004
Existing basement / foundation structures

300thk. RC CR2 demise line wall

1500 RC Raft Slab
SSL +10.000 m

Step in underside raft

1000x1000 RC column (Typical)

ARP-STR-C-02
Buried Obstructions

500x500 RC column (Typical)

1500 RC Raft Slab
SSL +11.200 m

1500 RC Raft Slab
SSL +11.500 m

Step in underside raft

All RC walls 300thk UNO. Openings in walls to be coordinated and developed. Lift pits levels and set downs to be coordinated. Raft slab to be stepped down under pits, raft min. 2m deep under cores.

CR2 tunnel exclusion zone

2000 RC Raft Slab
SSL +11.500 m

600 x 1250 RC Columns

400 RC Flat Slab
SSL +11.500 m

For Details of structure in CR2 demise, refer to sketches SK-0023

300 Thk. RC wall

2000 RC Raft Slab
SSL +8.745 m

2000 RC Raft Slab
SSL +11.500 m

Line of assumed infrastructure exclusion zone . To be confirmed and agreed with relevant utility owners

Assumed Existing infrastructure corridor to be confirmed by survey. Refer to Utilities drawings for details

ARP-STR-C-01
Existing Utilities

Outline of exisiting Thameslink Station Box

ARP-STR-C-002
Piling above LUL tunnels

800 RC Raft Slab
SSL +11.500 m

300x300 RC column

For details of retaining wall construction refer to SK-0011

450 thick insitu retaining wall formed in open cut against existing structure.

Indicative Outline of proposed CR2 Ticket hall. Allowance to be made for partial construction of CR2 Ticket Hall structure by SMBL to facilitate BL loading bay operation during CR2 main construction works. Extent and scope to be determind

CR2 tunnel exclusion zone

Existing LUL tunnels

ARP-STR-C-004
Existing basement / foundation structures

Refer to sketches SK-0014 and SK-0017 for BLCC structural proposals

ARP-STR-C-004
Existing basement / foundation structures

C
S-500003

B
S-500003

Outline of Existing British Library basement retaining wall

Existing services corridor retained SSL = +12.429 AOD - Levels and constrruction to be verified by survey.

450 thick RC retaining wall constructed against existing - allow 50mm gap for soft joint.

References denote items in combined hazard elimination & mitigation register. Refer to BL-ARUP-ZZ-XX-HS-V-000001 for full details of risks highlighted.

Do not scale

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15:15:17

Notes:
All dimensions are in millimetres U.N.O.
All levels are mOD U.N.O

Steel grade:
All steelwork S355 (subgrades tbc)
Corrosion protection to NSSS.

All steelwork to achieve minimum 2hr fire resistance U.N.O. Allow for intumescant paint to all members at this stage.

Concrete grades:
Columns C50/60
Beams and slabs C40/50
Core walls C40/50
Retaining walls C40/50
Piles C30/38
Blinding Gen 1

Rebar Estimates for Costing Excl. Crossrail 2 areas.

Columns		400kg/m³
LG Slab (incl. BLCC)		110kg/m³
L02 Slabs		100kg/m³
L02 Transfer Beams (PT)		100kg/m³
Raft Slab		140kg/m³
Retaining Walls		190kg/m³
Capping Beam		150kg/m³
Core Walls		300kg/m³
250 PT Slabs	50kg/m³	Reinforcement + 50kg/m³ tendons.
300 PT Slabs	40kg/m³	Reinforcement + 40kg/m³ tendons.

Core capping slabs and lift over-runs 125kg/m³

Refer to referenced sketches for Stage 1 costing information for all other elements.

Allowance to be made for sleeving of piles through the made ground strata, with min. 1m embedment in to London Clay.

Refer to geotechnical desk study report study (BL-ARUP-ZZ-XX-RP-CG-00000
1) for assumed ground conditions based on available existing ground investigation data. Detailed geotechnical ground investigation to be carried out at subsequent design stage.-

Allowance to be made for grubbing out buried historic masonry footings across site, demolition of existing of BLCC pile foundations and Tank farm service corridor as part of excavation works. Refer to geotechnical desk study for details of currently known buried obstructions.

Allow for bonded waterproof membrane to underside of raft slab - GCP Preprufe O.E.A. and min. 75mm of blinding concrete below slab. Requirements for drainage layer/heave board to be developed. Hydrophillic water stops to be provided at all raft slab construction joints.

Refer to SK-0011 for details of retaining wall waterproofing details.

Allowance to be made for temporary works to excavations during basement construction. Allow for minimum one level of temporary propping to all retaining walls. Retaining wall propping sequences to be developed a future design stages.

Allowance for raft thickenings for temporary tower crane foundations to be made. To be developed at subsequent design stages.

Rev	Date	By	Chkd	Appd
P02	19/03/21	JR	CM/GS	AC
Stage 1 Design Freeze				
P01	23/02/21	JR	CM/GS	AC
Issued For Coordination - Sheet Renumbered				
C01	05/07/18	JN	AC	AC
For Information				

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www.arup.com

Client
SMBL Developments Ltd

Project Title
British Library

Drawing Title
General Arrangement
Level B1

Scale at A1
1 : 250

Role
Structural

Suitability
S2 - For Information

Arup Job No
249622

Rev
P02

Name
BL-ARUP-ZZ-B1-DR-S-200080

A1

FCI basement outline

Site Boundary - basement wall layout adjacent to the FC institute to be developed.

ARP-STR-C-01
Existing Utilities

ARP-STR-C-004
Existing basement / foundation structures

Openings for CR2 vent outlets. Slab edges & set out to be developed

Main building RC columns to be cast with architecturally expressed permanent steel formwork from LG to L02

500 RC Slab
SSL +17.250 m

Indicates external stair over, suspended from upper levels.

ARP-STR-C-015
Hung structure. Temporary propping

RC stability cores, 300thk walls typ. Openings in walls to be coordinated and developed.

500 RC Slab
SSL +17.250 m

RC stability cores, 300thk walls typ. Openings in walls to be coordinated and developed.

500 RC Slab
SSL +16.750 m

Line of assumed infrastructure exclusion zone . To be confirmed and agreed with relevant utility owners

Indicates external stair over, suspended from upper levels.

ARP-STR-C-01
Existing Utilities

Assumed Existing infrastructure corridor to be confirmed by survey. Refer to Utilities drawings for details

300 Thk. RC wall

CR2 tunnel exclusion zone

RC stability cores, 300thk walls typ. Openings in walls to be coordinated and developed.

Indicates external stair over, suspended from upper levels.

RC stability cores, 300thk walls typ. Openings in walls to be coordinated and developed.

For Details of structure in CR2 demise, refer to sketches SK-0023

Indicates external stair over, suspended from upper levels.

300 RC Flat Slab
SSL +16.750 m

For capping beam details refer to sketch SK-0011

500 RC Slab
SSL +16.750 m

Outline of exisiting Thameslink Station Box

ARP-STR-C-002
Piling above LUL tunnels

Foundations to new columns adjacent existing BL columns/footings. Refer to sketch SK-0009 for details.

CR2 tunnel exclusion zone

Indicative Outline of proposed CR2 Ticket hall. Allowance to be made for partial construction of CR2 Ticket Hall structure by SMBL to facilitate BL loading bay operation during CR2 main construction works. Extent and scope to be determind

Existing LUL tunnels

ARP-STR-C-004
Existing basement / foundation structures

Refer to sketches SK-0014 and SK-0017 for BLCC structural proposals

BLCC

C
S-500003

Outline of Existing British Library

682 4043 4618 4932 3518 2968 1815

ARP-STR-C-004
Existing basement / foundation structures

B
S-500002

To align with existing BL columns

ARP-STR-C-004
Existing basement / foundation structures

Existing services corridor retained SSL = +12.429 AOD - Levels and constrruction to be verified by survey.

References denote items in combined hazard elimination & mitigation register. Refer to BL-ARUP-ZZ-XX-HS-V-000001 for full details of risks highlighted.

Notes:
All dimensions are in millimetres U.N.O.
All levels are mOD U.N.O

Steel grade:
All steelwork S355 (subgrades tbc)
Corrosion protection to NSSS.

All steelwork to achieve minimum 2hr fire resistance U.N.O. Allow for intumescant paint to all members at this stage.

Concrete grades:
Columns C50/60
Beams and slabs C40/50
Core walls C40/50
Retaining walls C40/50
Piles C30/38
Blinding Gen 1

Rebar Estimates for Costing Excl. Crossrail 2 areas.

Columns		400kg/m³
LG Slab (incl. BLCC)		110kg/m³
L02 Slabs		100kg/m³
L02 Transfer Beams (PT)		100kg/m³
Raft Slab		140kg/m³
Retaining Walls		190kg/m³
Capping Beam		150kg/m³
Core Walls		300kg/m³
250 PT Slabs	50kg/m³	Reinforcement + 50kg/m³ tendons.
300 PT Slabs	40kg/m³	Reinforcement + 40kg/m³ tendons.

Core capping slabs and lift over-runs 125kg/m³

Refer to referenced sketches for Stage 1 costing information for all other elements.

Column schedule:

South building

Cols	Int Ø	perim Ø	corner Ø
LG, UG, L01	1000	800	800
L02	800	700	600
L03	750	650	600
L04	700	650	550
L05	650	600	500
L06	600	550	450
L07	550	500	450
L08	500	450	450
L09	500	450	450
L10	500	450	450

North building

Cols	Int Ø	perim Ø	corner Ø
LG, UG, L01	n/a	800	800
L02	700	650	550
L03	650	600	500
L04	600	550	450
L05	550	500	450
L06	500	450	450
L07	500	450	450
L08	500	450	450
L09	500	450	450

Architecturally expressed structure:
RC and steel structure are typically architecturally exposed between LG and L02. Allow for high quality finish to be agreed with the Architect.
Other specific elements noted on sketches.

Refer to sketch SK-0011 for proposed LG slab waterproofing details in landscaped areas.
Hydrophillic water stops to be provided at all LG slab construction joints in landscaped areas.

Rev	Date	By	Chkd	Appd
P02	19/03/21	JR	CM/GS	AC
Stage 1 Design Freeze				
P01	23/02/21	JR	CM/GS	AC
Issued For Coordination - Sheet Renumbered				
C01	05/07/18	JN	AC	AC
For Information				

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Client
SMBL Developments Ltd

Project Title
British Library

Drawing Title
General Arrangement
Lower Ground

Scale at A1 1 : 250

Role Structural

Suitability S2 - For Information

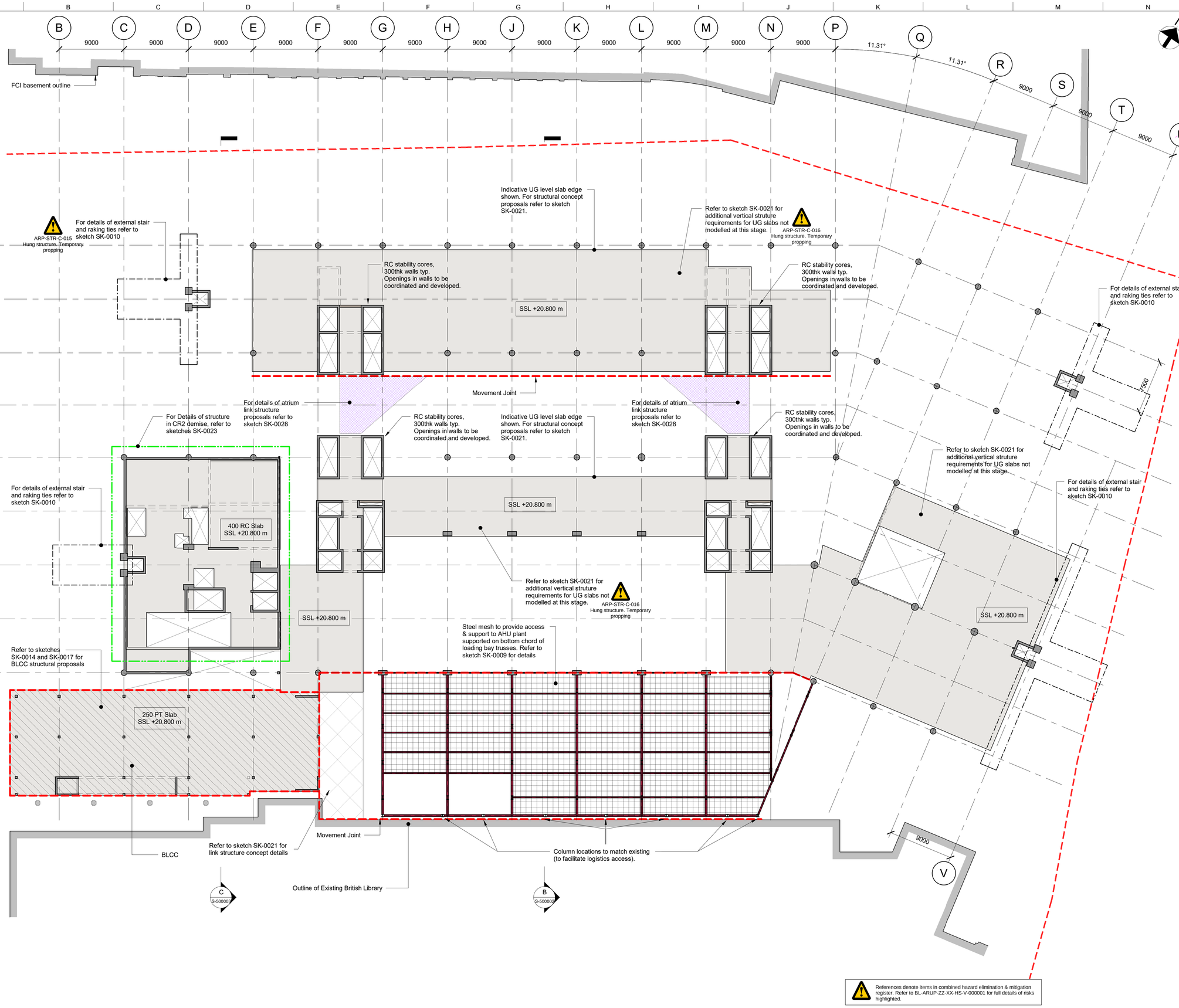
Arup Job No 249622

Rev P02

Name BL-ARUP-ZZ-LG-DR-S-200090

22/03/2021 15:15:12

Do not scale



22/03/2021 15:15:13

Notes:
All dimensions are in millimetres U.N.O.
All levels are mOD U.N.O

Steel grade:
All steelwork S355 (subgrades tbc)
Corrosion protection to NSSS.

All steelwork to achieve minimum 2hr fire resistance U.N.O. Allow for intumescant paint to all members at this stage.

Concrete grades:
Columns C50/60
Beams and slabs C40/50
Core walls C40/50
Retaining walls C40/50
Piles C30/38
Blinding Gen 1

Rebar Estimates for Costing Excl. Crossrail 2 areas.

Columns	400kg/m³
LG Slab (incl. BLCC)	110kg/m³
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L02 Transfer Beams (PT)	100kg/m³
Raft Slab	140kg/m³
Retaining Walls	190kg/m³
Capping Beam	150kg/m³
Core Walls	300kg/m³
250 PT Slabs	50kg/m³ Reinforcement + 50kg/m³ tendons.
300 PT Slabs	40kg/m³ Reinforcement + 40kg/m³ tendons.

Core capping slabs and lift over-runs 125kg/m³

Refer to referenced sketches for Stage 1 costing information for all other elements.

Column schedule:

South building

Cols	Int Ø	perim Ø	corner Ø
LG, UG, L01	1000	800	800
L02	800	700	600
L03	750	650	600
L04	700	650	550
L05	650	600	500
L06	600	550	450
L07	550	500	450
L08	500	450	450
L09	500	450	450
L10	500	450	450

North building

Cols	Int Ø	perim Ø	corner Ø
LG, UG, L01	n/a	800	800
L02	700	650	550
L03	650	600	500
L04	600	550	450
L05	550	500	450
L06	500	450	450
L07	500	450	450
L08	500	450	450
L09	500	450	450

Architecturally expressed structure:
RC and steel structure are typically architecturally exposed between LG and L02. Allow for high quality finish to be agreed with the Architect.
Other specific elements noted on sketches.

Rev	Date	By	Chkd	Appd
P02	19/03/21	JR	CM/GS	AC
Stage 1 Design Freeze				
P01	23/02/21	JR	CM/GS	AC
Issued For Coordination - Sheet Renumbered				
C01	05/07/18	JN	AC	AC
For Information				

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Client
SMBL Developments Ltd

Project Title
British Library

Drawing Title
General Arrangement
Upper Ground

Scale at A1 1 : 250

Role Structural

Suitability S2 - For Information

Arup Job No 249622

Rev P02

Name BL-ARUP-ZZ-UG-DR-S-200100

Do not scale

A1

Drawing List			
Drawing No.	Drawing Title	Revision	Issue Date
BL-ARUP-ZZ-ZZ-DR-S-000002	Drawing List & Isometric	P02	22/03/21
BL-ARUP-ZZ-B1-DR-S-200080	General Arrangement - Level B1	P02	22/03/21
BL-ARUP-ZZ-LG-DR-S-200090	General Arrangement - Lower Ground Level	P02	22/03/21
BL-ARUP-ZZ-UG-DR-S-200100	General Arrangement - Upper Ground Level	P02	22/03/21
BL-ARUP-ZZ-01-DR-S-200110	General Arrangement - Level 01	P02	22/03/21
BL-ARUP-ZZ-02-DR-S-200120	General Arrangement - Level 02	P02	22/03/21
BL-ARUP-ZZ-03-DR-S-200130	General Arrangement - Level 03	P02	22/03/21
BL-ARUP-ZZ-03-DR-S-200131	General Arrangement - Level 03 - Typical Lab Floor Plan	P02	22/03/21
BL-ARUP-ZZ-04-DR-S-200140	General Arrangement - Level 04	P02	22/03/21
BL-ARUP-ZZ-05-DR-S-200150	General Arrangement - Level 05	P02	22/03/21
BL-ARUP-ZZ-06-DR-S-200160	General Arrangement - Level 06	P02	22/03/21
BL-ARUP-ZZ-07-DR-S-200170	General Arrangement - Level 07	P02	22/03/21
BL-ARUP-ZZ-08-DR-S-200180	General Arrangement - Level 08	P02	22/03/21
BL-ARUP-ZZ-09-DR-S-200190	General Arrangement - Level 09	P02	22/03/21
BL-ARUP-ZZ-10-DR-S-200200	General Arrangement - Level 10	P02	22/03/21
BL-ARUP-ZZ-11-DR-S-200210	General Arrangement - Level 11 (Roof)	P02	22/03/21

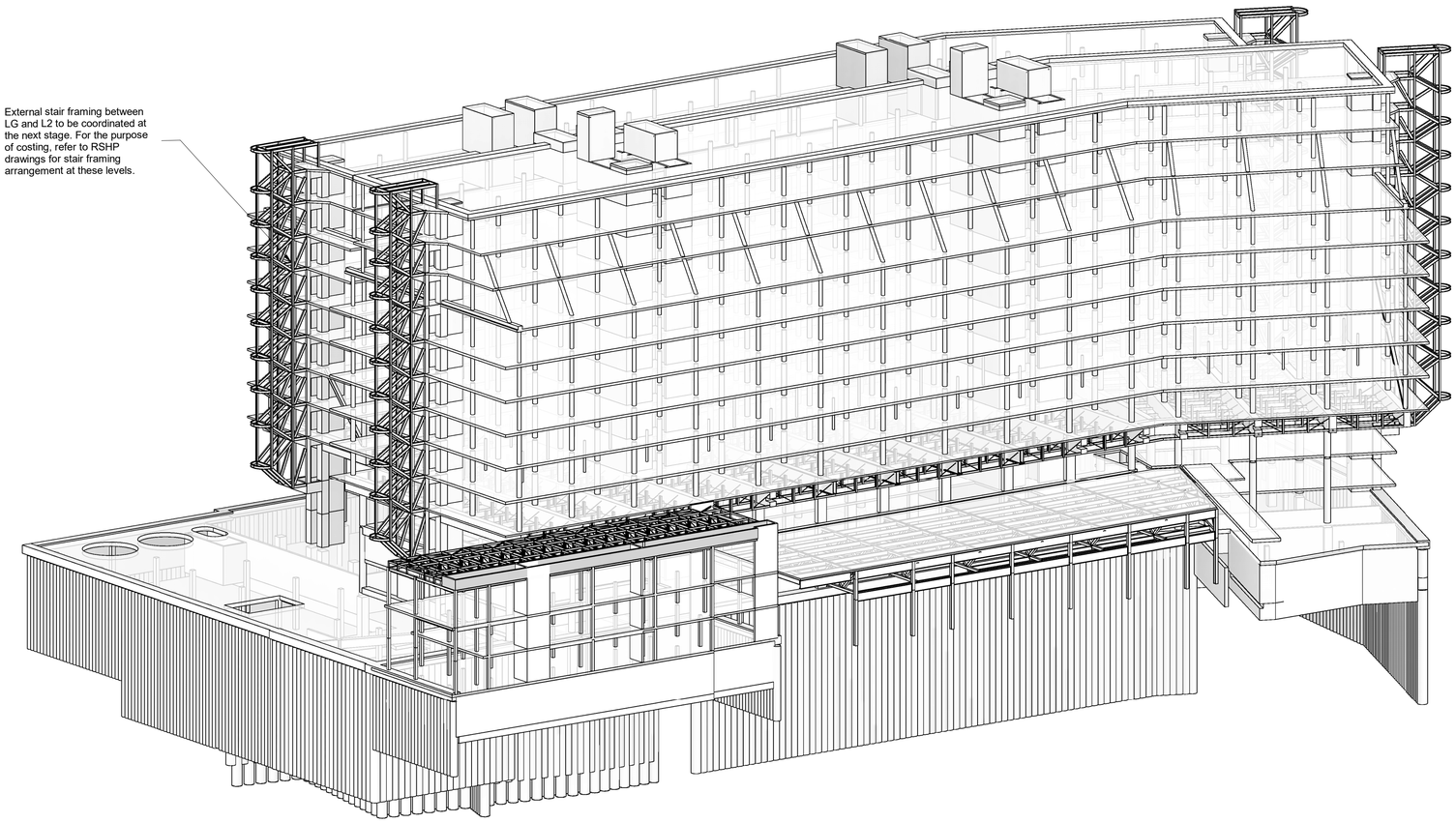
Drawing Naming Key

BL	ARUP	XX	XX	DR	S	X	X	X	X	X
PROJECT	ORIGINATOR	VOLUME	LEVEL	TYPE	ROLE	CODE	NUMBER			

Drawing Code Key	
0	Notes/Schedules
1	Overall/Model view
2	Layouts
3	Enlarged Plans/Core Elevations
4	Elevations
5	Overall Sections
6	Sections and Details
7	Loading Plans
8	Force Schedules
9	RC Detailing

Drawing Level Key	
ZZ	Multiple Levels
XX	Not Applicable
B7	Level B7
B6	Level B6
B5	Level B5
B4	Level B4
B3	Level B3
B2	Level B2
B1	Level B1
LG	Lower Ground Floor
UG	Upper Ground Floor
01	Level 01
02	Level 02
03	Level 03
04	Level 04
05	Level 05
06	Level 06
07	Level 07
08	Level 08
09	Level 09
10	Level 10
11	Level 11 (Roof Level)

External stair framing between LG and L2 to be coordinated at the next stage. For the purpose of costing, refer to RSHP drawings for stair framing arrangement at these levels.



Notes:
All dimensions are in millimetres U.N.O.
All levels are mOD U.N.O

Steel grade:
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Corrosion protection to NSSS.

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Core walls C40/50
Retaining walls C40/50
Piles C30/38
Blinding Gen 1

Rebar Estimates for Costing Excl. Crossrail 2 areas.

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L02 Transfer Beams (PT)		100kg/m³
Raft Slab		140kg/m³
Retaining Walls		190kg/m³
Capping Beam		150kg/m³
Core Walls		300kg/m³
250 PT Slabs	50kg/m³	Reinforcement +
	50kg/m³	tendons.
300 PT Slabs	40kg/m³	Reinforcement +
	40kg/m³	tendons.

Core capping slabs and lift over-runs 125kg/m³

Refer to referenced sketches for Stage 1 costing information for all other elements.

22/03/2021
15:16:12

Rev	Date	By	Chkd	Appd
P02	19/03/21	JR	CM/GS	AC
Stage 1 Design Freeze				
P01	23/02/21	JR	CM/GS	AC
Issued For Coordination - Sheet Renumbered				

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Client
SMBL Developments Ltd

Project Title
British Library

Drawing Title
Drawing List & Isometric

Scale at A1
1 : 100

Role
Structural

Suitability
S2 - For Information

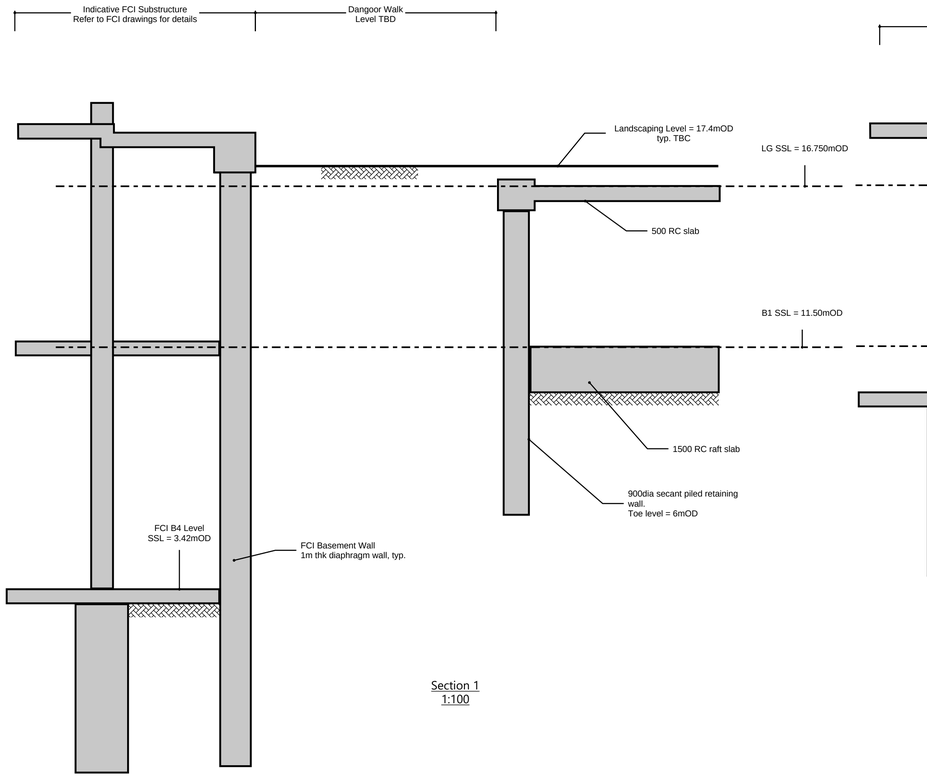
Arup Job No
249622

Rev
P02

Name
BL-ARUP-ZZ-ZZ-DR-S-000002

Do not scale

A1



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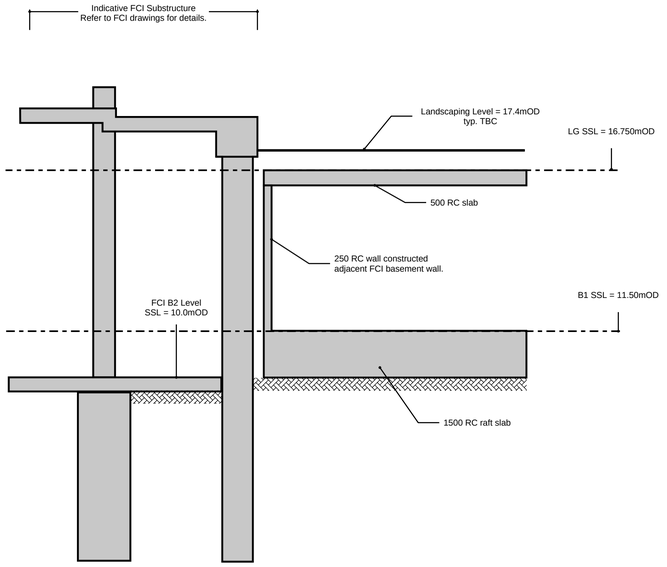

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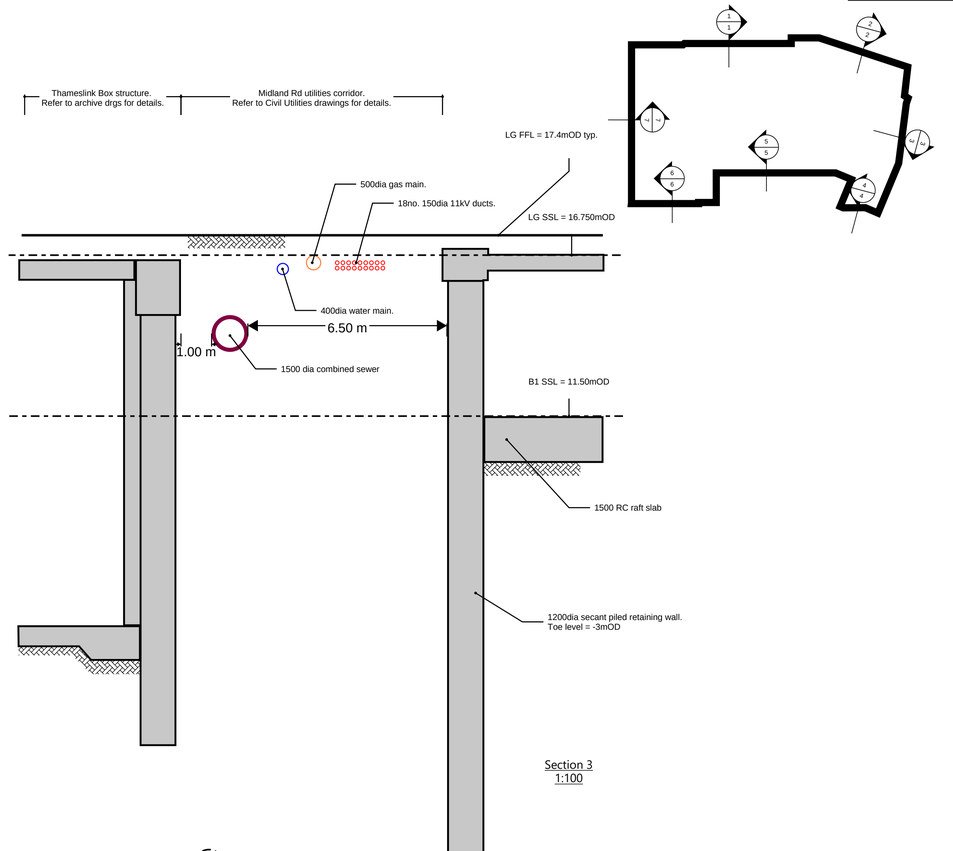

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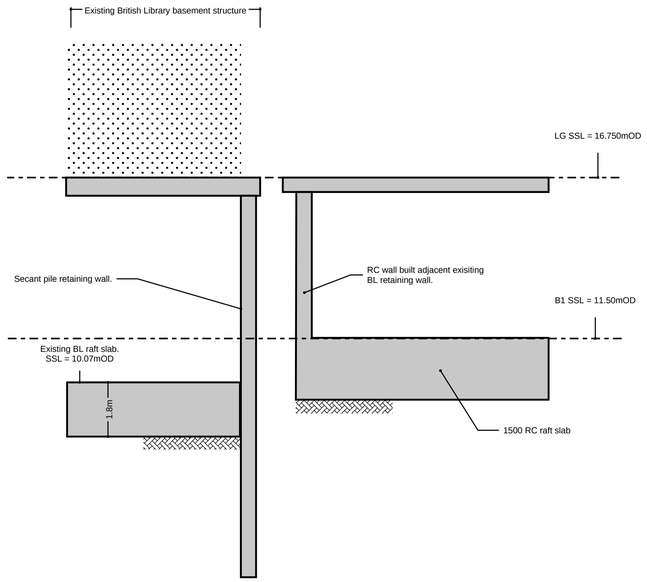

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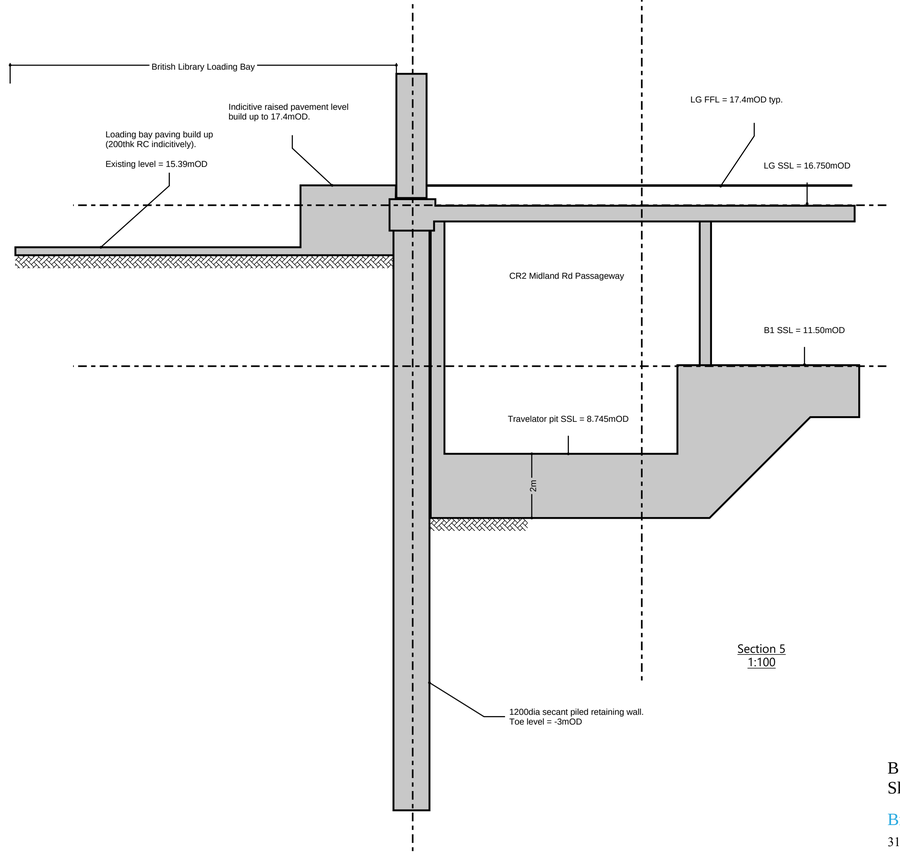

Section 5
1:100

B1 Retaining Wall
Sketch Sections - 1:100 @A1

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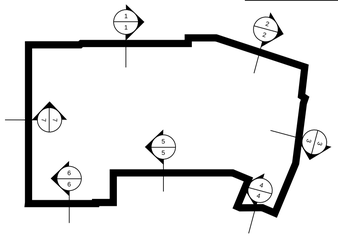
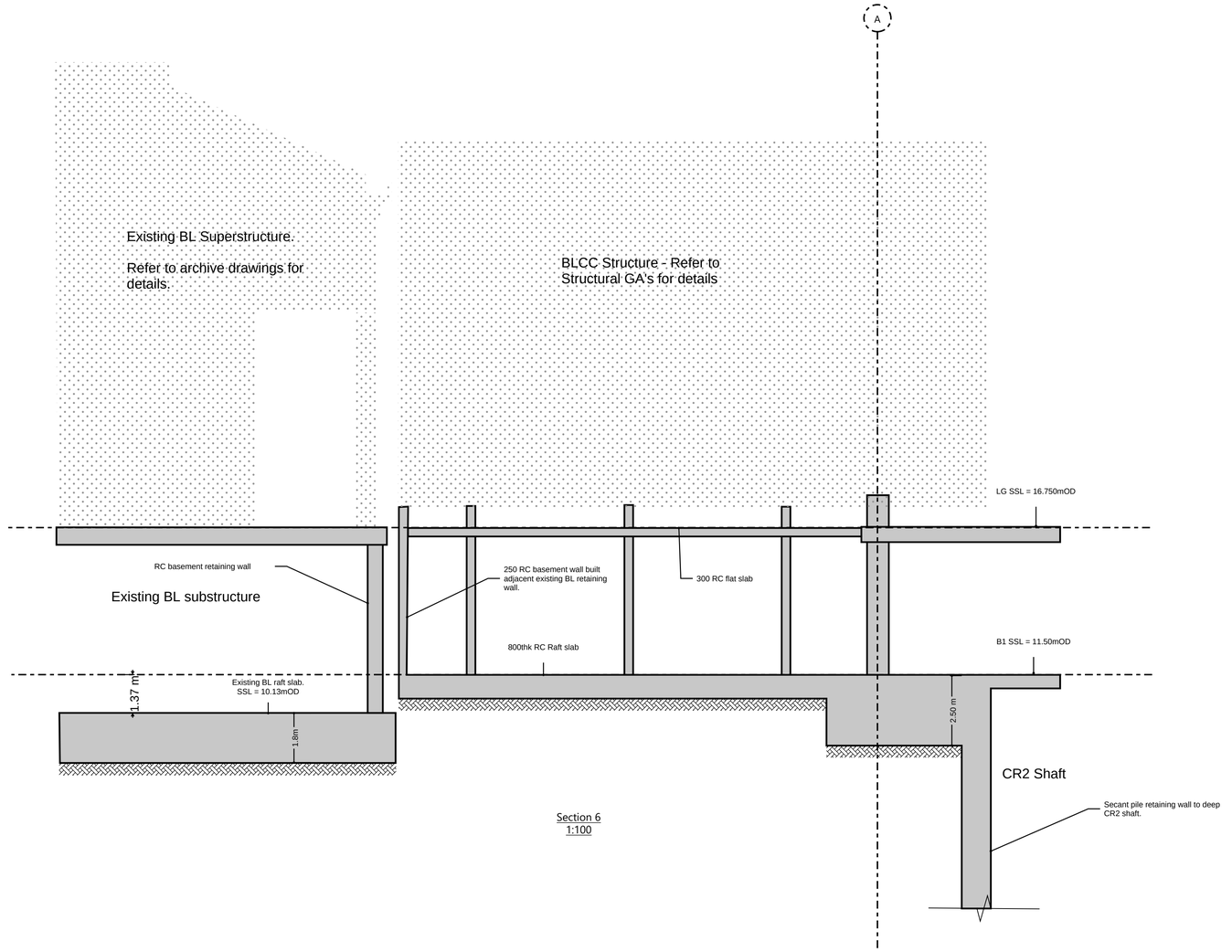
A1





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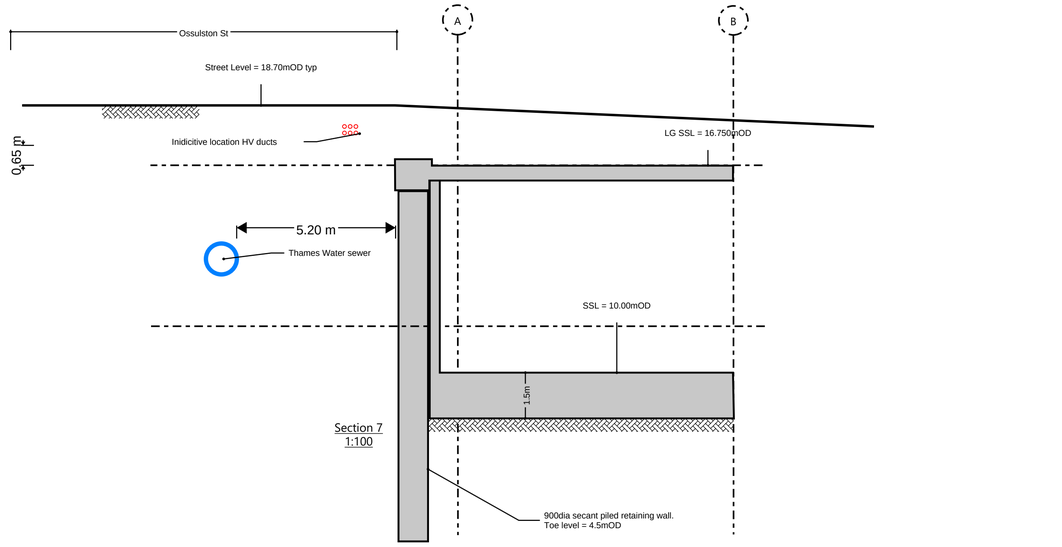

Section 7
1:100

B1 Retaining Wall
Sketch Sections - 1:100@A1

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