APPROVAL IN PRINCIPLE (Permanent works design)

Name / Address of Project	Agar Grove Estate, London NW1 9SU
Type of Structure	Construction Phase 2A permanent works design for 2no. multi-storey Buildings (Volumes B1 & B2) development
Structure Ref No.	Volumes B1 & B2, Phase 2A

1. HIGHWAY DETAILS

	Camley Street
1.1 Type of highway	London Local Distributor Roads networks
1.2 Permitted traffic speed	30 km/h (20 mph)
1.3 Existing restriction ** To lists whether environmental, width, weight, no parking, bollards, other barriers, double yellow lines or height restriction is present in the vicinity of the property or construction site.*	Height restrictions due to a railway line underpass at the SE corner of the site. No double Yellow Lines. No marked cycle lanes. Camley Street operates, in essence, as a cul-de-sac. On-street parking on site side of carriageway on a very small pavement. Bicycle and pedestrian way exist between the site and Campley Street at the most part of the length of the site boundary.

2. SITE DETAILS & EXISTING STRUCTURE

2.1 Description of existing structure layout/configuration: type of foundations, retaining walls, masonry arches, construction type in relation to the highway boundaries and any obstacles crossed.	The site was occupied by Council Housing Frampton building and a secondary single-storey structure on the boundary to Camley Street. These buildings are now demolished and only construction site offices and welfare exist.
2.2 Provide reasons for alteration/repairs/strengthening	Project comprises of the demolition of existing buildings (already complete) and redevelopment of the site as per approved planning consent (ref.: MMA 2022/2359/P Dec 22).

3. PROPOSED STRUCTURE

3.1 Description of structure and design working life

** To provide a general description of the proposed structure or sub-structures development or redevelopment – including the overall dimensions, - length, width and depth in relation to the highway.*

The design working life of the structure, including temporary structure, and replaceable structural parts to be given. They should be expressed as a number of years.

The development is residential and it is located to the southeast of the site and will consist of a ground and 6 upper floors block B1 plus a ground and 17 upper floors block B2, with a narrow, single-storey strip between the blocks serving as an entrance. On the Ground Floor there will be mixed use and communal areas and at First Floor there are further community space and flexible workspace.

There are no basements underneath the buildings, however, structural floor slabs at ground floor level are lowered from the external ground level to accommodate the water tanks.

Proposed superstructures will be constructed of in-situ RC concrete frame that will consist of 225mm thick RC slabs supported on blade columns. Lateral stability will be provided by the RC stair and lift core walls.

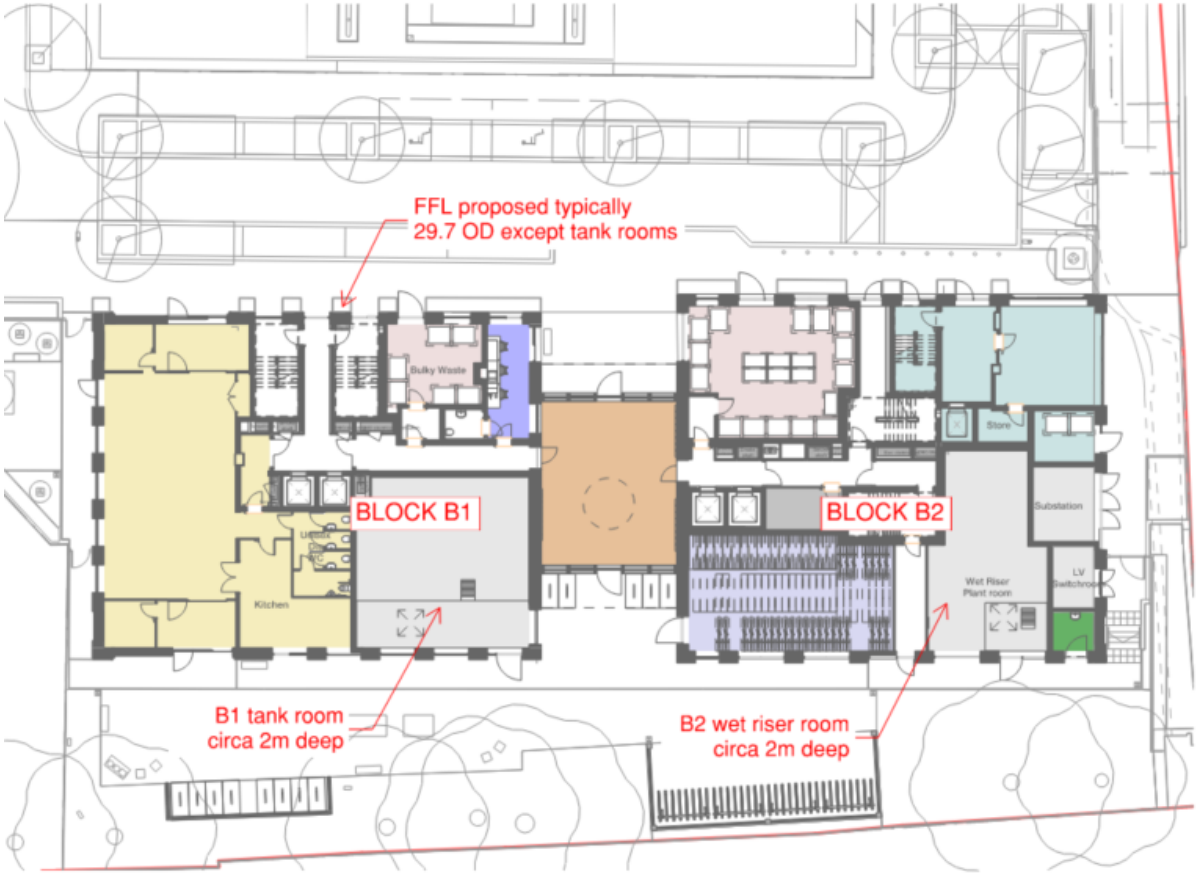
Due to the magnitude of the building loads, piled foundations will be utilized. CFA piling has been selected to mitigate the vibrations to the existing structures and infrastructure, therefore no major impact to these is expected.

Block B2 tank room retaining wall center line is approximately 7.7m from the curb line.

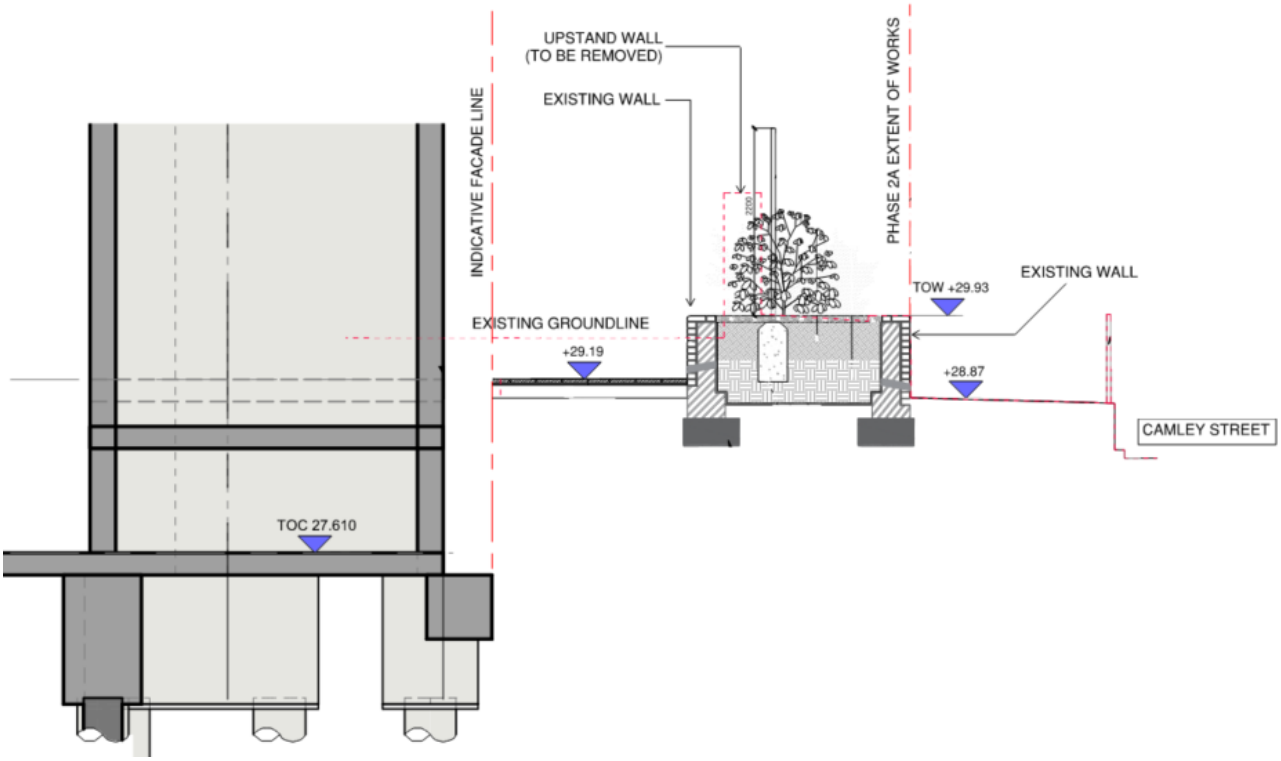
Tank rooms approx. 180m^2 (Internal Area).

Both blocks are square in plan with approximate dimensions 25(L)x20(W)m each.

The design working life for the primary structures is 50 years.



Site Plan



Typical Section

3.2 Structural type

** To provide dimensional details (thickness, height, sizes, depth of overburden above basement or vault roof slab, grades of concrete or steel) of proposed structural components. To take into consideration of the slenderness ratios of supporting elements that provides stability to the structures or sub-structures.*

450mm and 600mm dia RC piles in concrete grade C32/40, restrained with 1500mm dp pile caps min grade RC35/45. 750mm dp ground beams will be used the restrain the single-pile caps and provide a base in the perimeter of the blocks for the façade.

300mm RC retaining walls and 250mm RC raft slab for the tank rooms bgl, in C35/45. Height of retaining wall approx. 2.2m. Waterproof concrete adopted below ground level.

3.3 Foundation type

** To provide information relating to proposed foundation (including diameter of piles, or sizes for driven pile type, total length, embedment depth and the types of piles construction or raft foundation). For replacement type piles, provide information about the extent of the reinforcement.*

The ground floor slab and columns will bear onto pile caps bearing onto 450mm and 600mm dia. bearing piles. All superstructure concrete elements to have a concrete grade C40/50.

The tank room slab will be a 300mm RC suspended slab.

To cast the column pile caps below the excavation level and to form the tank rooms retaining walls, sheet piling with adequate embedment length will be installed as necessary. The sheet piles will act as free cantilevers to support the lateral pressure. Indicative sequence to be provided with the Temporary Works AIP.

3.4 Span arrangements

** To specify the span arrangements/configuration of proposed structural elements including horizontal, vertical and or inclined components*

Permanent case slab spans vary, see Ground Floor drawing appended. The tank rooms retaining wall span is approx. 2.2m.

3.5 Articulation arrangements

** To specify proposed fixities types at the supports, connections or joints (either as built-in, sliding, free, pin or restraint in one or two directions). To indicate the proposed fixity in the idealized force diagram as per section 5.2*

Slab to tank room retaining wall junctions will be designed as pinned for worst case sagging design of end bays of slab and for the design of the retaining wall. Through monolithic concrete construction these will provide nominal moment resistance.

3.6 Proposed classes/levels

3.6.1 Consequences class — CC2

** (Refer to BS EN 1990:2002+A1:2005 Table B1)*

3.6.2 Reliability class — RC1

** (Refer to BS EN 1990:2002+A1:2005 Table B2)*

3.6.3 Inspection level	IL1
** (Refer to BS EN 1990:2002+A1:2005 Table B5)*	
3.7 Road restraint systems requirements	Heras fencing and water-filled barriers or bollards to be deployed as road restraint measures, subject to confirmation from contractor, once appointed.
3.8 Proposed arrangements for future maintenance and inspection	
3.8.1 Traffic management	N/A
3.8.2 Arrangements for future maintenance and inspection of structure.	N/A
Access arrangements for structure	N/A
3.9 Environment and Sustainability issues considered. Materials and finishes	Structural elements will be designed to minimise material usage where possible. Where appropriate cement replacement materials will be utilized.
3.10 Durability – Material and finishes ** For concrete structures, give applicable exposure classes for particular structural elements. For all material strengths given, list the relevant codes/standards*	Pile caps: Exposure Class – XC2, XF1, Sulphate / Aggressive Chemical Class – AC-2s, Strength Grade - RC 32/40 (EC3) Ground Floor Slab: Exposure Class – XC1, XF1 Sulphate/ Aggressive Chemical Class – N/A Min Strength Grade - RC 35/45 (EC3) Piles: Exposure Class – XC2 Design Chemical Class – DC-2 Strength Grade – C32/40
3.11 Risks and hazards considered for design, execution, maintenance and demolition. Consultation and /or agreement from the structural Principal Designer. ** Designer to name the Principal Designer (PD) and to append an endorsed statement from PD confirming that the risks and hazards identified in the AIP permanent works design proposal are appropriate and compliance with the latest CDM Regulations 2015.*	(Groundworker / Frame Contractor / Piling Contractor to input upon appointment) See appended principal designers risk assessment (Appendix G)
3.12 Estimated cost of proposed structure together with other structural forms considered and the reasons for their	N/A

rejection including comparative whole life costs with dates of estimates

3.13 Proposed arrangements for construction

3.13.1 Construction of structure	See appended Hill Partnerships logistics plan for Phase 2A of the development. Principal contractor to input phasing plan and sequence upon appointment.
3.13.2 Traffic management	As above.
3.13.2 Service diversions	See appended Hill Partnership logistics plan for Phase 2A of the development.
3.13.3 Interface with existing structures	The existing sewer on Camley Street is passing through the footprint of the proposed development. A proposed abandonment and diversion plan can be seen in Appendix K.

4. DESIGN CRITERIA

4.1 Actions

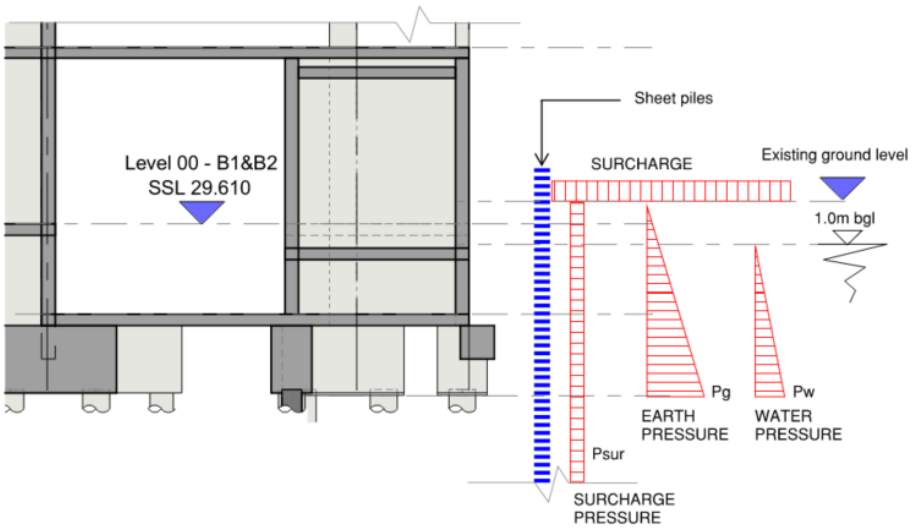
Load combinations are in accordance with BS EN1991 -2 - 2003.

IL (communal areas) = 3.0 kN/m^2
IL (residential areas) = 1.5 + 1.0 kN/m^2
IL (plant rooms) = 7.5 kN/m^2

4.1.1 Dead loading Actions (axial & lateral loadings

** To specify respective loadings, densities of materials and design safety factors @SLS*

Surcharge 10kN/m^2 (FoS = 1.5 in line with BS EN1991 – 2 – 2003). A water pressure 1.0m bgl is included as lateral loading as per the SI report recommendation.



4.1.2 Snow, wind and thermal actions	N/A to AIP. Structures will be designed accounting for snow and wind action in line with BS EN1991 -2- 2003.
4.1.3 Actions relating to normal traffic under Authorized Weight (AW) Regulations 1998 and Construction & Use (C&U) Regulations 1996	To be advised.
4.1.4 Actions relating to General Order Traffic under Special Types General Order (STGO) Regulations 2003	To be advised.
4.1.5 Footway or footbridge variable actions	N/A
4.1.6 Actions relating to Special Order Traffic, provision for exceptional abnormal indivisible loads including location of vehicle track on deck cross-section	N/A
4.1.7 Accidental actions	Key elements exist within the super-structure frame. These will be designed for the worst case of vehicle impact or area load of 34 kN/m^2.
4.1.8 Actions during construction	As per 4.1.1.
4.1.9 Any special action not covered above *(e.g. seismic action, atmospheric icing, floating debris etc)*	N/A
4.2 Heavy or high load route requirements and arrangements being made to preserve the route, including any provision for future heavier loads or future widening	N/A
4.3 Minimum headroom provided (including allowance for vertical sag compensation and maximum deflection of structures).	N/A
4.4 Authorities consulted and any special conditions required	London Borough of Camden.
4.5 Standards and documents	
4.5.1 List of relevant documents from the Technical Approval Schedule (TAS) – * *(To strike out those standards that are not relevant with the design)*	Refer to Annex B1 • Mandatory to incorporate CDM Regulations 2015 and • BD 2/12 – Technical Approval of Highway Structures

4.5.2 Additional relevant Standards and publications	Refer to Annex B1
4.6 Proposed Departures relating to departures from standards given in 4.5 **(If applicable, provide reasons or supporting documents)*	N/A
4.7 Proposed Departures relating to methods for dealing with aspects not covered by standards and documents in 4.5	N/A

5 STRUCTURAL ANALYSIS

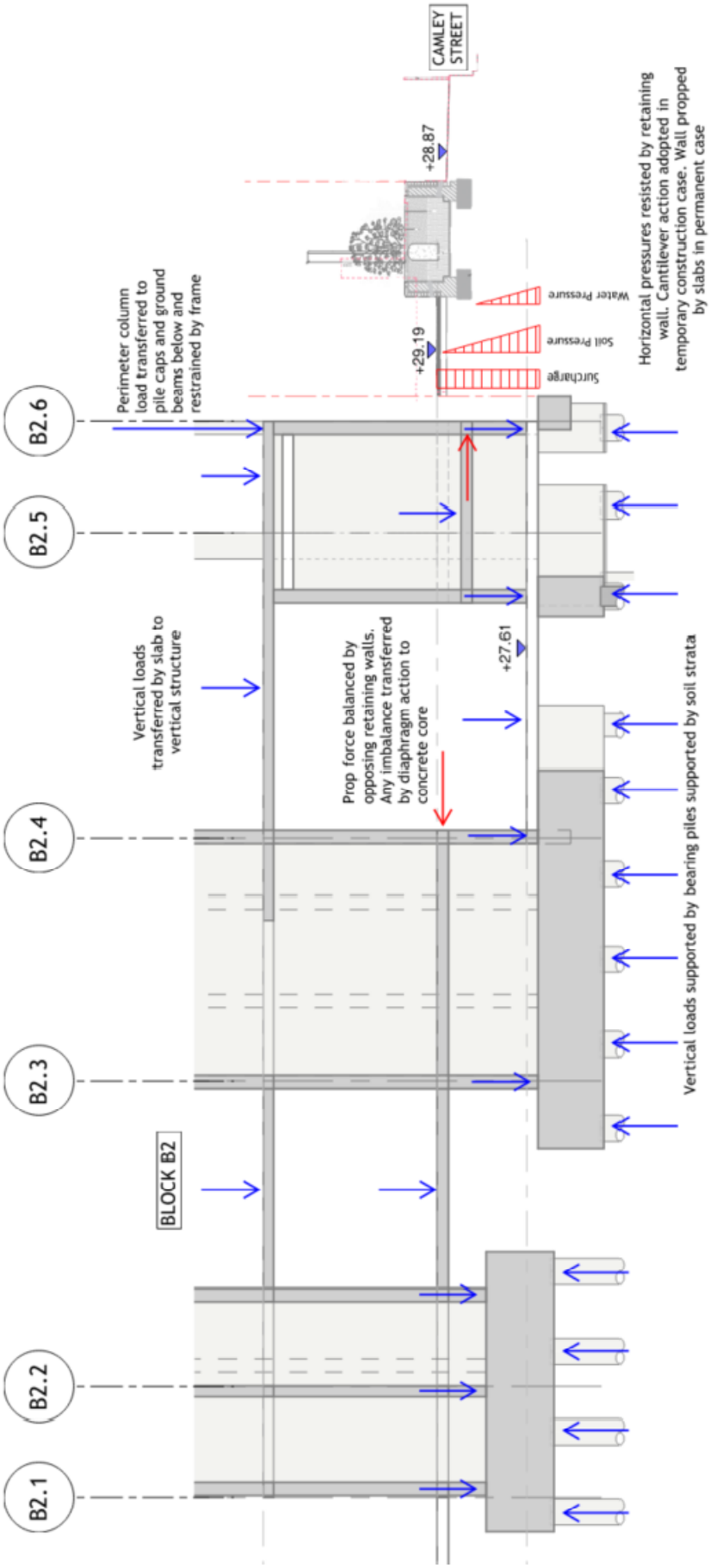
5.1 To provide design philosophy approach and methods of analysis proposed for superstructure, substructure and foundations. ** Lists the main structural elements for superstructure, substructure and foundation.* ** If the designs of the superstructure, substructure and /or foundation are to be carried out by different Design Team / Organization, the Main Designer must provide and specify all relevant conditions, constraints and external actions to be taken into account. The conditions and actions must be covered in the AIP.* ** (Notes: Detail calculations sheets are NOT required with the AIP submission)*	Structures will be designed in accordance with Eurocodes as listed within Annex B1. All levels from level 1 to level 18 will adopt flat slabs as horizontal diaphragms, bearing onto traditionally reinforced concrete columns and walls. At First-Floor level of block B1, a transfer beam requires varied vertical load paths and a downstand concrete beam transfer structure spanning between walls and columns is adopted to allow for this. Stability against lateral actions is maintained by traditionally reinforced concrete cores on both blocks. Ground floor slab adopt traditional reinforcement and spans between the pile caps of the foundation. Ground floor and tank room slabs adopt traditional reinforcement and span between pile caps and tank room retaining walls. The tank room retaining structure is provided by a traditionally reinforced retaining wall. MNP will provide unfactored reactions from the building structure to the Piling Specialist for the pile design. The Piling Specialist will define appropriate factors of safety and combinations considering lateral geotechnical and hydrostatic actions and building structure reactions. Super-structure frames will be analysed using finite element software such as Autodesk Robot Structural Analysis and Tekla Structural Designer. Various element designs will be undertaken using Tekla TEDDS and hand calculation techniques.

Pile loads will be analysed using 3D analysis software along with hand calculation techniques. Pile caps will be analysed and designed using 3D analysis software, Tekla TEDDS and hand calculation techniques.

5.2 Description and diagram of idealised structure model to be used for analysis – Force diagram should:

- Indicate nodes are fixed or pinned
- Illustrate support points and direction of restraints
- Illustrate external loading
- To provide force diagrams (point loads, triangular and rectangular shapes representing the relevant applied loadings to the sub-structural elements)
- To indicate type of restraints at the sub-structural levels.

See sketch on next page


CAMLEY STREET
+28.87
+29.19
+27.61
Water Pressure
Soil Pressure
Surcharge
Horizontal pressures resisted by retaining wall. Cantilever action adopted in temporary construction case. Wall propped by slabs in permanent case
Perimeter column load transferred to pile caps and ground beams below and restrained by frame
Vertical loads transferred by slab to vertical structure
Prop force balanced by opposing retaining walls. Any imbalance transferred by diaphragm action to concrete core
Vertical loads supported by bearing piles supported by soil strata
BLOCK B2
B2.6
B2.5
B2.4
B2.3
B2.2
B2.1

5.3 Assumptions intended for calculation of structural element stiffness

All concrete elements to assume cracked sections and reduced E (elastic modulus) defined by way of calculation.

5.4 Proposed range of soil parameter to be used in the design of earth retaining elements.

See borehole logs within appended Peter Brett Associates Ground Investigation (Appendix D) and Central Piling Pile Foundation Design (appendix G)

	Made Ground	Head Deposits	London Clay formation
Bulk Unit Weight (kN/m3)	18	20	20
Undrained Shear Strength (kPa)	-	50	50 - 190
Effective Angle of Shearing Resistance (deg)	-	-	-

6 GEOTECHNICAL CONDITIONS

6.1 Acceptance of recommendations of the Geotechnical Design Report to be used in the design and reasons for any proposed changes.

(Piling contractor to confirm acceptance of SI data upon appointment)

** Specify soil parameters for the design.*

6.2 Summary of design for highway structure in the Geotechnical Design Report.

N/A

6.3 Differential settlement and or Lateral displacement tolerance considered with the sub-structure design proposal.

Max allowable lateral displacement 10mm

* To specify the maximum differential and or lateral displacement limits with temporary works design proposal

The limiting value of distortion and deflection of structures (differential movement over a unit length) shall be 1/500 (Skempton and MacDonald)

6.4 If the Geotechnical Design Report (GDR) is not yet available, state when the results are expected and list the sources of information used to justify the preliminary choice of foundations

Refer to Appendix D.

** When the GDR becomes available, an addendum to the AIP, covering section 6, must be submitted to the TAA. The addendum must have its own sections 8, 9 and 10 to provide a list of drawings, documents and signatures.*

7 CHECKING

7.1 Proposed Category of checking and Design Supervision level	Category 2
7.2 If Category 3 is applicable, Structure Designer or Client to provide Organization name of proposed Independent Checker *(need to be approved by the LBC TAA)*	Not applicable
7.3 Erection proposals or temporary works for which Types S and P proposals will be required, listing structural parts of the permanent structure affected with reasons.	Refer to separate temporary works AIP submission by when applicable

8 DRAWINGS AND DOCUMENTS

8.1 List of drawings: *(Notes: - Calculation sheets are not required with the submission).*

- Footprint of Scheme (Plan) and Location Plan – scale 1:500 or 1:1250
- And other approvals documents accompanying the submission (like - planning consent, temporary hoarding or lane closure).
- Departures
- Relevant correspondence and documents from consultations.
- Drawing size – A3 in pdf format

Drawing No/Report Ref	Drawing Title / Planning Consent / Report	Status	Rev	Organization
Appendix A / AGC377-GRA-2A-DR-L-1001	Site wide masterplan	-	10	Grant Associates
Appendix B	Logistic Plan	-	2	Hill Partnerships
Appendix C / 18313_OGL	Topographical Survey	-	3	Greenhatch Group
Appendix D / 28732-006-R002	Ground Investigation Report	-	0	Peter Brett Associates
Appendix E / 330510718-STN-XX-XX-DR-C-100	Constraints Plan	Preliminary	P02	Stantec
Appendix F / AG2-MNP-B1-FN-DR-S-101011	Block B1 & B2 Foundation General Arrangement Plan	WIP	WIP	MNP
Appendix F / AG2-MNP-ZZ-00-DR-S-101012	Block B1 & B2 Ground Floor General Arrangement Plan	WIP	WIP	MNP
Appendix F / AG2-MNP-B1-ZZ-DR-S-102101	Block B1 Long Sections Sheet 1	WIP	WIP	MNP
Appendix F / AG2-MNP-B2-ZZ-DR-S-202101	Block B2 Long Sections Sheet 1	WIP	WIP	MNP

Appendix F / AG2-MNP-B2-ZZ-DR-S-202102	Block B2 Long Sections Sheet 2	WIP	WIP	MNP
Appendix G	Pre-Construction Information & Significant Risk Register	Stage 4	01	Hill Partnerships / AECOM
Appendix H / AGC-GRA-BZ-XX-DR-L-002001	Finished Levels Strategy – General Arrangement	For Planning	P01	Grant Associates
Appendix I / AGV-GRA-BZ-XX-DR-L-001304	Landscape Sections D-D & E-E	Preliminary	P02	Grant Associates
Appendix J / AGV-HBA-BZ-ZZ-DR-A-330120	Lower Ground Floor Slab Edge Plan	Preliminary	P1	Hawkins / Brown
Appendix K / 330510718-STN-XX-XX-DR-C-504	Sewer Abandonment and Diversion Plan	Preliminary	P02	Stantec
Appendix L / AGV-GRA-BZ-XX-DR-L-003501	Typical Boundary Details	Preliminary	P02	Grant Associates
Appendix M / 44942A1	Pile Foundations design	Preliminary	P01	Central Piling

Notes: -

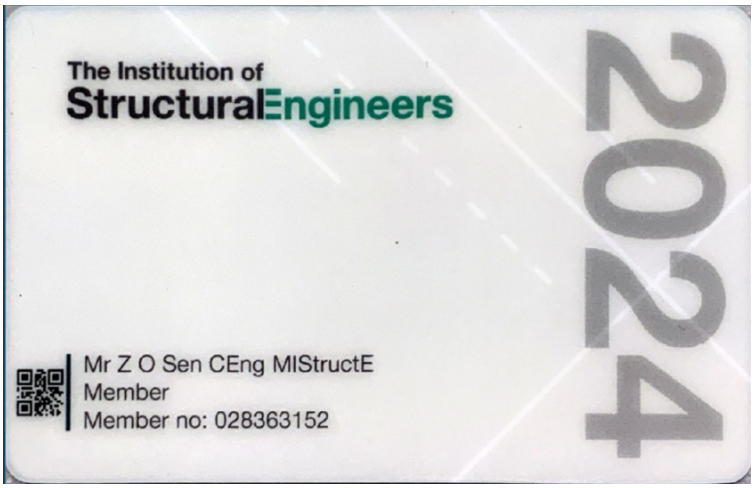
1. **To complete column 'Status' with either – 'Tender', 'Preliminary', 'For Approval' or 'Construction' or 'Info'**
2. **To append an endorsed statement from the Principal Designer with the AIP submission as per section 3.11 requirements.**

9 THE ABOVE IS SUBMITTED FOR ACCEPTANCE

We confirm that details of the permanent works design have been[#] passed to the temporary works Designer for review.

Signed	
Name	Ozgur Sen
	(Design Team Leader)
Professional Engineering Membership Qualifications [13] *(Including active membership number)*	Meng, MBA, CEng, MIStructE (IstructE Membership No. 028363152)
Name of Organization (Designer)	Mason Navarro Pledge Ltd.
Submission date	22.01.24

*(to append e-copy of latest membership card – in the blank space provided below or to append an authentication membership letter from the ICE , IStructE or IEI)



Notes:

13 *CEng MICE, CEng MIStructE , CEng MIEI , FICE or FIStructE.*

14 *AIP is valid for three years after the date of agreement by the TAA. If construction has not yet commenced within this period, the AIP shall be re-submitted to the TAA for review.*

10 The above is rejected / agreed subject to the amendments and conditions shown below

10.1 Agreed by LBC TA Service Administrator Structural Engineer

Signed _____

Name _____

Position held _____

Professional Engineering Membership Qualifications _____

Organization _____

Endorsed Date _____

10.2 Acceptance by London Borough of Camden

I have considered the submission for Approval In Principle (AIP) of the above scheme in order to be satisfied that the applicable criteria have been adequately addressed by the Designer and my comments on the submission are shown below. These comments relate principally to the elements of the structure that lie within London Borough of Camden Council Boundary

Provided these comments are adequately addressed, I hereby accept the Approval In Principle submission.

Signed _____

Name _____

Position held _____

Professional Engineering Membership Qualifications _____

TAA _____

Approval date _____

Notes:

13 CEng, MICE, MIStructE , CEng MIEI , FICE or FIStructE.

14 AIP is valid for three years after the date of agreement by the TAA. If construction has not yet commenced within this period, the AIP shall be re-submitted to the TAA for review.

Annex B1 – Technical Approval Schedule (TAS)

(Do not delete and remove the original list of standards from the template)
(Strike out those documents that are not associate with the design proposal)

Schedule of Documents Relating to Design or Assessment of Highway Bridges & Structures using National Standards (Eurocodes)

British Standards (non–conflicting with Eurocodes)

BS 449: 2005 + A2:2009	Steel for the reinforcement of concrete. Weldable reinforcing steel Bar coil and decoiled product. Specification (and Amendment No 2:2009)
BS 6031:2009 CORR: August 2010	Code of Practice for Earthworks
~~BS 8006-1:2010 CORR June 2012~~	~~Code of Practice for Strengthened/Reinforced soils and other fills~~
BS 8500-1:2015+A2:2019	Concrete – Complementary British Standard to BS EN 206-1 Part 1: Method of specifying and guidance for the Specifier.
BS 8500-2:2015+A2:2019	Concrete - Complementary British Standard to BS EN 206-1 Part 2 Specification for constituent materials and concrete.
BS 8666: 2005 (Incorporating Amendment No. 1)	Specification for scheduling, dimensioning, bending and cutting of steel reinforcement for concrete
CS454 (June 2019) (Superseded BD 37/01)	Assessment of Highway Bridges and Structures
~~BS EN 1317-1-1998 Road Restraints Systems – Part 1~~	~~Terminology and general criteria and test methods.~~
~~BS EN 1317-2-1998 Road Restraints Systems – Part 2~~	~~Performance classes, impact test acceptance criteria and test methods for safety barriers.~~
~~BS EN 1317-3-2000 Road Restraints Systems – Part 3~~	~~Performance classes, impact test acceptance criteria and test methods for crash cushions.~~
~~DD ENV 1317-4-2002 Road Restraints Systems – Part 4~~	~~Performance classes, impact test acceptance criteria and test methods for crash cushions. Terminals and transitions of Safety Barriers~~
~~BS EN 14388 – (Date)~~	~~Road traffic noise reducing devices Specifications.~~
~~BS EN 15050 – (Date)~~	~~Precast concrete products. Bridge elements~~

Eurocode 0 *Basic of structural design*

BS EN 1990 (2005)*	Eurocode - **Basis of structural design (+A1:2005)** (incorporating corrigendum December 2008 and April 2010). Establishes principles and requirements for the safety, serviceability and durability of structures, describes the basis for their design and verification.

NA to BS EN 1990 (2005)*	UK National annex for Eurocode - Basis of structural design (incorporating National amendment No. 1) Gives the nationally defined parameters (NDPs) for certain clauses where national choice is allowed. These are applicable to buildings only.

Eurocode 1 *Actions on structures*

BS EN 1991-1-1 (2002)*	Eurocode 1: Actions on structures. **General actions - Densities, self-weight, imposed loads for buildings** (incorporating corrigenda December 2004 and February 2010) Offers design guidance and actions for the structural design of buildings and civil engineering works including some geotechnical aspects for the densities of construction materials
NA to BS EN 1991-1-1 (2005)*	UK National annex to Eurocode 1 - Actions on structures General actions - Densities, self-weight, imposed loads for buildings. Gives the nationally determined parameters (NDPs) for certain sub-clauses where national choice is allowed
BS EN 1991-1-2 (2002)*	Eurocode 1: Actions on structures. **General actions - Actions on structures exposed to fire** (incorporating corrigendum March 2009) Deals with thermal and mechanical actions on structures exposed to fire - the methods given are applicable to buildings, with a fire load related to the building and its occupancy
NA to BS EN 1991-1-2 (2007)*	UK National Annex to Eurocode 1: Actions on structures. General actions - Actions on structures exposed to fire Gives the nationally determined parameters (NDPs) for certain sub-clauses where national choice is allowed
BS EN 1991-1-3 (2003)*	Eurocode 1 - Actions on structures **General actions - Snow loads** (incorporating corrigenda December 2004 and March 2009) Gives guidance for determining the values of loads due to snow which can be used in the structural design of buildings and civil engineering works
NA to BS EN 1991-1-3 (2005)*	UK National annex to Eurocode 1 - Actions on structures General actions - Snow loads (AMD Corrigendum 17172). Gives guidance for determining the values of loads due to snow which can be used in the structural design of buildings and civil engineering works
BS EN 1991-1-4 (2005) + A1:2010*	Eurocode 1: Actions on structures. **General actions - Wind actions** (+A1:2010) (incorporating corrigenda July 2009 and January 2010) Provides guidance on the determination of natural wind actions for the structural design of building and civil engineering works for each of the loaded areas under consideration
NA to BS EN 1991-1-4:2005 + A1: (2010)*	UK National Annex to Eurocode 1: Actions on structures. General actions - Wind actions (+A1:2010) (incorporating National Amendment No. 1) Gives the nationally determined parameters (NDPs) for certain sub-clauses where national choice is allowed
~~BS EN 1991-1-5 (2003)*~~	~~Eurocode 1 – Actions on structures – Part 1-5:~~ ~~**General actions – Thermal actions** (incorporating corrigenda December 2004 and February 2010)~~

	~~Details are given for the calculation rules of thermal actions on buildings, bridges and other structures including their structural elements and cladding and other appendages of buildings~~
~~NA to BS EN 1991-1-5 (2007)*~~	~~UK National Annex for Eurocode 1 – Actions on structures – Part 1-5: - General actions – Thermal actions. Gives the nationally determined parameters (NDPs) for certain sub-clauses where national choice is allowed~~
BS EN 1991-1-6 (2005)*	Eurocode 1: Actions on structures. **General actions - Actions during execution** (incorporating corrigendum February 2010 & February 2013) Provides principles and general rules for the determination of actions which should be taken into account during the execution of buildings and civil engineering works
NA to BS EN 1991-1-6 (2008)*	UK National annex to Eurocode 1: Actions on structures. General actions - Actions during execution Gives the nationally determined parameters (NDPs) for certain sub-clauses where national choice is allowed.
BS EN 1991-1-7 (2006)*	Eurocode 1: Actions on structures. **General actions - Accidental actions** (incorporating corrigendum April 2010) Provides strategies and rules for safeguarding buildings and other civil engineering works against identifiable and unidentifiable accidental actions Including IAN 124/11 Annex A additional guidance
NA to BS EN 1991-1-7 (2008)*	National annex to Eurocode 1: Actions on structures - Accidental actions. Gives the nationally determined parameters (NDPs) for certain sub-clauses where national choice is allowed
~~BS EN 1991–2 (2003)*~~	~~Eurocode 1: Actions on structures.~~ ~~**Traffic loads on bridges** (incorporating corrigenda December 2004 and April 2010)~~ ~~Defines imposed loads (models and representative values) associated with road traffic, pedestrian actions and rail traffic which include, when relevant, dynamic effects and centrifugal, braking, etc.~~
~~NA to BS EN 1991-2 (2008)*~~	~~UK National annex to Eurocode 1: Actions on structures. Traffic loads on bridges (incorporating Corrigendum No. 1)~~ ~~Gives the nationally determined parameters (NDPs) for certain sub-clauses where national choice is allowed~~

Eurocode 2 *Design of concrete structures*

BS EN 1992–1-1 (2004)*	Eurocode 2: Design of concrete structures – Part 1-1 **General rules and rules for buildings** (incorporating corrigendum June 2008 and August 2011) Applies to the design of buildings and civil engineering works in plain, reinforced and prestressed concrete
NA to BS EN 1992-1-1 (2005)*	UK National annex to Eurocode 2: Design of concrete structures. General rules and rules for buildings Part 1-1 (incorporating National amendment No. 1). Gives the UK decisions for the nationally determined parameters (NDP) for listed sub-clauses
BS EN 1992–1-2 (2004)*	Eurocode 2: Design of concrete structures – Part 1-2

	General rules - Structural fire design (incorporating corrigendum July 2008). Covers the resistance, serviceability, durability and fire resistance of concrete structures
NA to BS EN 1992-1-2 (2005)*	UK National annex to Eurocode 2: Design of concrete structures. General rules - Structural fire design. Gives the UK decisions for the Nationally determined parameters (NDP) for listed sub-clauses
~~BS EN 1992–2 (2005)*~~	~~Eurocode 2: Design of concrete structures – Part 2~~ ~~**Concrete bridges - Design and detailing rules** (incorporating corrigendum July 2008)~~ ~~Gives a basis for the design of bridges and parts of bridges in plain, reinforced and prestressed concrete made with normal and light weight aggregates~~
~~NA to BS EN 1992-2 (2007)*~~	~~UK National Annex to Eurocode 2: Design of concrete structures. Concrete bridges – Part 2. Design and detailing rules~~ ~~Gives the nationally defined parameters (NDPs) for certain clauses where national choice is allowed. These are applicable to buildings only.~~
~~BS EN 1992–3 (2006)*~~	~~Eurocode 2: Design of concrete structures – Part 3~~ ~~**Liquid retaining and containment structures**~~ ~~Covers additional rules for the design of structures constructed from plain or lightly reinforced concrete, reinforced concrete or prestressed concrete for the containment of liquids or granular solid~~
~~NA to BS EN 1992-3 (2007)*~~	~~UK National Annex to Eurocode 2: Design of concrete structures – Part 3. Liquid retaining and containment structures~~ ~~Gives the UK decisions for the Nationally determined parameters (NDP) for listed sub-clauses~~

Eurocode 3 *Design of steel structures*

BS EN 1993–1-1 (2005)*	Eurocode 3: Design of steel structures – Part 1-1 **General rules and rules for buildings** (incorporating corrigenda September 2006 and February 2010). Gives requirements for resistance, serviceability, durability and fire resistance of steel structures
NA to BS EN 1993-1-1 (2008)*	UK National Annex to Eurocode 3: Design of steel structures – Part 1-1. General rules and rules for buildings Gives the nationally determined parameters (NDPs) for certain sub-clauses where national choice is allowed
BS EN 1993–1-2 (2005)*	Eurocode 3: Design of steel structures – Part 1-2 **General rules – Structural fire design** (incorporating corrigenda December 2005, September 2006 and March 2009). Gives requirements for resistance, serviceability, durability and fire resistance of steel structures
NA to BS EN 1993-1-2 (2008)*	UK National Annex to Eurocode 3: Design of steel structures. General rules - Structural fire design. Provides the Nationally determined parameters (NDPs) for certain sub-clauses where national choice is allowed, including partial factors for the fire situation in terms of mechanical and thermal properties.
~~BS EN 1993–1-3 (2006)*~~	~~Eurocode 3: Design of steel structures – Part 1-3~~

	General rules - Supplementary rules for cold-formed members and sheeting (incorporating corrigendum November 2009) Gives design requirements for cold-formed members and sheeting, applying to cold-formed steel products made from coated or uncoated hot or cold rolled sheet or strip, that have been cold-formed
NA to BS EN 1993-1-3 (2009)*	UK National Annex to Eurocode 3: Design of steel structures. General rules - Supplementary rules for cold-formed members and sheeting. Gives the nationally determined parameters (NDPs) for certain sub-clauses where national choice is allowed
BS EN 1993–1-4 (2006)*	Eurocode 3: Design of steel structures – Part 1-4
	General rules - Supplementary rules for stainless steels. Gives supplementary provisions for the design of buildings and civil engineering works covering applications involving austenitic, austenitic-ferritic and ferritic stainless steels
NA to BS EN 1993-1-4 (2009)*	UK National Annex to Eurocode 3: Design of steel structures – Part 1-4. General rules - Supplementary rules for stainless steels Gives the nationally defined parameters (NDPs) for certain clauses where national choice is allowed.
BS EN 1993–1-5 (2006)*	Eurocode 3: Design of steel structures – Part 1-5
	Plated structural elements (incorporating corrigendum February 2010) Gives design requirements of stiffened and unstiffened plates which are subject to in-plane forces. Also covers the effects due to shear lag, in-plane load introduction and plate buckling for I-section.
NA to BS EN 1993-1-5 (2008)*	UK National annex to Eurocode 3: Design of steel structures – Part1-5. Plated structural elements Gives the nationally determined parameters (NDPs) for certain sub-clauses where national choice is allowed.
BS EN 1993–1-6 (2007)*	Eurocode 3: Design of steel structures – Part 1-6.
	Strength and stability of shell structures (incorporating corrigendum February 2010) Provides basic design rules for plated steel shell structures, in particular design against buckling, fatigue and cyclic plasticity.
BS EN 1993 1-7 (2007)*	Eurocode 3: Design of steel structures – Part 1-7.
	Plated structures subject to out of plane loading (incorporating corrigendum February 2010) For structural design of unstiffened and stiffened plates which form part of plated structures such as silos, tanks or containers. Details given for design, properties, durability, structural analysis
BS EN 1993–1-8 (2005)*	Eurocode 3: Design of steel structures – Part 1-8.
	Design of joints (incorporating corrigenda December 2005, June 2006, September 2006, July 2009, February 2010 and August 2010) Gives design methods for the design of joints subject to predominantly static loading using steel grades S235, S275, S355, S420, S450 and S460.
NA to BS EN 1993-1-8 (2008)*	UK National Annex to Eurocode 3: Design of steel structures – Part 1-8. Design of joints Provides the Nationally determined parameters (NDPs) for certain sub-clauses where national choice is allowed, including group 6 rivets, partial safety factors for joints, types of bolt class
BS EN 1993–1-9 (2005)*	Eurocode 3: Design of steel structures – Part 1-9.
	Fatigue (incorporating corrigenda December 2005, September 2006 and April 2009)

	Gives methods for the assessment of fatigue resistance of members, connections and joints subjected to fatigue loading.
NA to BS EN 1993-1-9 (2008)*	UK National annex to Eurocode 3: Design of steel structures – Part 1-9 Fatigue. Gives the nationally determined parameters (NDPs) for certain sub-clauses where national choice is allowed
BS EN 1993–1-10 (2005)*	Eurocode 3: Design of steel structures – Part 1-10. **Material toughness and through-thickness properties** (incorporating corrigenda December 2005, June 2006, September 2006 and February 2010) Contains design guidance for the selection of steel for fracture toughness and for through thickness properties of welded elements where there is a significant risk of lamellar tearing during fabrication.
NA to BS EN 1993-1-10 (2009)*	National annex (informative) to Eurocode 3 - Design of steel structures – Part 1-10 Material toughness and through thickness properties Gives the nationally determined parameters (NDPs) for certain sub-clauses where national choice is allowed.
BS EN 1993–1-11 (2006)*	Eurocode 3 - Design of steel structures – Part 1-11 **Design of structures with tension components** (incorporating corrigendum February 2010) Gives design rules for structures with tension components made of steel, which, due to their connections with the structure, are adjustable and replaceable
NA to BS EN 1993-1-11 (2008)*	UK National Annex to Eurocode 3 - Design of steel structures – Part 1-11 Design of structures with tension components
BS EN 1993–1-12 (2007)*	Eurocode 3 - Design of steel structures- Part 1-12 **Additional rules for the extension of EN 1993 up to steel grades S 700** (incorporating corrigendum April 2010).
NA to BS EN 1993-1-12 (2008)*	UK National annex to Eurocode 3: Design of steel structures – Part 1-12. Additional rules for the extension of EN 1993 up to steel grades S 700. Gives the nationally determined parameters (NDPs) for certain sub-clauses where national choice is allowed
BS EN 1993–2 (2006)*	Eurocode 3: Design of steel structures – Part 2. **Steel bridges** (incorporating corrigendum January 2010). Provides a general basis for the structural design of steel bridges, steel parts of composite bridges and also steel temporary works in bridges
NA to BS EN 1993-2 (2008)*	UK National annex to Eurocode 3: Design of steel structures – Part 2. Steel bridges (+A1:2012) Gives the nationally determined parameters (NDPs) for certain sub-clauses where national choice is allowed
BS EN 1993–3-1 (2006)*	Eurocode 3 - Design of steel structures – Part 3-1 **Towers, masts and chimneys - towers and masts** (incorporating corrigendum July 2009) Applies to the structural design of lattice towers and guyed masts, and the structural design of this type of structures supporting prismatic, cylindrical or other bluff elements
NA to BS EN 1993-3-1 (2010)*	UK National Annex to Eurocode 3: Design of steel structures – Part 3-1. Towers, masts and chimneys - towers and masts Gives the nationally defined parameters (NDPs) for certain clauses where national choice is allowed.

BS EN 1993-5 (2007)*	Eurocode 3 – Design of steel structures – Part 5: **Piling** (incorporating corrigendum August 2009)
NA to BS EN 1993-5 (date)*	UK National Annex for Eurocode 3 - Design of steel structures – Part 5: Piling (+ A1:2012)

Eurocode 4 Design of composite steel & concrete structures

BS EN 1994-1-1 (2004)*	Eurocode 4: Design of composite steel and concrete structure – Part 1-1. **General rules and rules for buildings** (incorporating corrigendum October 2009).
NA to BS EN 1994-1-1:2004	UK National Annex to Eurocode 4: Design of composite steel and concrete structures – Part 1-1. General rules and rules for buildings
BS EN 1994-2 (2005)*	Eurocode 4 – Design of composite steel and concrete structures – Part 2: **General rules and rules for bridges** (incorporating corrigendum February 2010)
NA to BS EN 1994-2 (2005)*	UK National Annex for Eurocode 4 - Design of composite steel and concrete structures – Part 2: General rules and rules for bridges

Eurocode 5 Design of timber structures

BS EN 1995-1-1 (2004)* +A1:2008	Eurocode 5 – Design of timber structures – Part 1-1: **General – Common rules and rules for buildings** (incorporating corrigendum July 2006).
NA to BS EN 1995-1-1 (2008)*	UK National Annex for Eurocode 5 - Design of timber structures – Part 1-1: General – Common rules and rules for buildings (National Amendment No.2)
BS EN 1995-2 (2004)*	Eurocode 5 – Design of timber structures – Part 2: **Bridges**
NA to BS EN 1995-2 (2004)*	UK National Annex for Eurocode 5 - Design of timber structures – Part 2- Bridges

Eurocode 6 Design of masonry structures

BS EN 1996-1-1 (2005)* + A1:2012	Eurocode 6 – Design of masonry structures – Part 1-1: **General rules for reinforced and unreinforced masonry structures** (incorporating corrigendum February 2006 and December 2009).
NA to BS EN 1996-1-1 (2005)* + A1:2012	UK National Annex for Eurocode 6 - Design of masonry structures – Part 1-1: General rules for reinforced and unreinforced masonry structures
BS EN 1996-2 (2006)*	Eurocode 6 – Design of masonry structures – Part 2:

	Design considerations, selection of materials and execution of masonry (incorporating corrigendum March 2010).
NA to BS EN 1996-2 (2006)*	UK National Annex for Eurocode 6 - Design of masonry structures – Part 2: Design considerations, selection of materials and execution of masonry (incorporating corrigendum June 2007)
BS EN 1996–3 (2006)*	Eurocode 6 – Design of masonry structures – Part 3: **Simplified calculation methods for unreinforced masonry structures** (incorporating corrigendum March 2010)
NA to BS EN 1996-3 (2006)*	UK National Annex for Eurocode 6 - Design of masonry structures – Part 3: Simplified calculation methods for unreinforced masonry structures

Eurocode 7 Geotechnical Design

BS EN 1997–1 (2004)*	Eurocode 7: Geotechnical design - Part 1. **General rules** (incorporating corrigendum February 2010) Intended to be used as a general basis for the geotechnical aspects of the design of buildings and civil engineering works.
NA to BS EN 1997-1 (2004)*	UK National annex to Eurocode 7: Geotechnical design – Part 1. General rules (incorporating Corrigendum December 2007). Gives the nationally defined parameters (NDPs) for certain clauses where national choice is allowed (incorporating corrigendum December 2007)
BS EN 1997–2 (2007)*	Eurocode 7 – Geotechnical design – Part 2: **Ground investigation and testing** (incorporating corrigendum October 2010)
NA to BS EN 1997-2 (2007)*	UK National Annex for Eurocode 7 - Geotechnical design – Part 2: Ground investigation and testing

Eurocode 8 Design of structures for earthquake resistance

BS EN 1998–1 (2004)* + A1:2013	Eurocode 8 – Design for structures for earthquake resistance – Part 1. **General rules, seismic actions and rules for buildings** (incorporating corrigendum February 2010 and January 2011)
NA to BS EN 1998-1 (2004)*	UK National Annex for Eurocode 8 - Design for structures for earthquake resistance – Part 1: General rules, seismic actions and rules for buildings
BS EN 1998–2 (2005)* + A2:2011	Eurocode 8 – Design for structures for earthquake resistance – Part 2. **Bridges** (incorporating corrigendum May 2010 and February 2012)
NA to BS EN 1998-2 (2005)*	UK National Annex for Eurocode 8 - Design for structures for earthquake resistance – Part 2: Bridges
BS EN 1998–5 (2004)*	Eurocode 8 – Design for structures for earthquake resistance – Part 5 **Foundations, retaining structures and geotechnical aspects**
NA to BS EN 1998-5 (2004)*	UK National Annex for Eurocode 8 - Design for structures for earthquake resistance – Part 5: Foundations, retaining structures and geotechnical aspects

Eurocode 9 Design of aluminium structures

BS EN 1999 – 1-1 (2007)* +A1: 2009	Eurocode 9 – Design of aluminum structures – Part 1-1: **General – common rules** (+A1 2009)
NA to BS EN 1999-1-1 (2007)* +A1:2009	UK National Annex for Eurocode 9 - Design of aluminum structures – Part 1-1: General – common rules
BS EN 1999-1-3 (2007)*	Eurocode 9 – Design of aluminum structures – Part 1-3 Additional rules for structures susceptible to fatigue (+A1:2011)
NA to BS EN 1999-1-3 (2007)* +A1:2011	UK National Annex for Eurocode 9 - Design of aluminum structures – Part 1-3: Additional rules for structures susceptible to fatigue (+ A1:2011)
BS EN 1999-1-4 (2007)* +A1:2011	Eurocode 9 – Design of aluminum structures – Part 1-4 **Cold formed structural sheeting** (+ A1:2011 and incorporating corrigendum August 2010)
NA to BS EN 1999-1-4 (2007)*	UK National Annex for Eurocode 9 - Design of aluminum structures – Part 1-4: Cold formed structural sheeting

BSI Published Documents (PD)

(For guidance only unless clauses are otherwise specified in IAN 124/11)

PD 6688-1-1 (2011)*	Recommendations for the design of structures to BS EN 1991-1-1 Gives non-contradictory complementary information to BS EN 1991-1-1 and its UK National Annex
PD 6688-1-2 (2007)*	Background paper to the UK National Annex to BS EN 1991-1.2 (AMD Corrigendum 17225) Gives complementary information to BS EN 1991-1.2 and its National Annex
PD 6688-1-4 (2009)*	Background information to the National Annex to BS EN 1991-1-4 and additional guidance (including IAN 124/11)
PD 6688-1-5 (2009)*	Background paper to the UK National Annex to BS EN 1991-1-5
PD 6688-1-7 (2009)*	Recommendations for the design of structures to BS EN 1991-1-7 Gives non-contradictory complementary information for use in the UK with BS EN 1991-1.7:2006 and its UK National Annex (including IAN 124/11 clause 2.15)
PD 6688-2 (2011)*	Recommendations for the design of structures to the UK National Annex to BS EN 1991-2 Traffic loads on bridges. Gives non-contradictory complementary information to BS EN 1991-2 and its UK National Annex
PD 6687-1 (2010)*	Background paper to the UK National Annex to BS EN 1992-1 and BS EN 1992-3 Provides background information and non-contradictory complementary information for use in the UK with BS EN 1992-1-1:2004, BS EN 1992-1-2:2004, BS EN 1992-3:2006 and their UK National Annexes.

PD 6687-2 (2008)*	Recommendations for the design of structures to BS EN 1992-2:2005. Provides background information relating to decisions for the Nationally Determined Parameters (NDPs) in the National Annex of BS EN 1992-2
PD 6694-1 (2011)*	Recommendations for the design of structures subject to traffic loading to BS EN 1997-1:2004. Gives non-contradictory complementary information, covers geotechnical aspects of bridges and other structures subject to traffic loading designed to BS EN 1997-1.
PD 6695-1-9 (2008)*	Recommendations for the design of structures to BS EN 1993-1-9 Refer to IAN 124/11 Annex B for additional guidance.
PD 6695-1-10 (2009)*	Recommendations for the design of structures to BS EN 1993-1-10 Refer to IAN 124/11 Annex B for additional guidance.
PD 6695-2 (2008)* +A1:2012	Recommendations for the design of structures to BS EN 1993 Refer to IAN 124/11 Annex B for additional guidance (incorporating corrigendum January 2010 and February 2013)
PD 6696-2 (2007)* +A1:2012	Background paper to BS EN 1994-2 and the UK National Annex to BS EN 1994-2 Refer to IAN 124/11 Annex B for additional guidance.
PD 6698 (2009)*	Recommendations for the design of structures for earthquake resistance to BS EN 1998 Refer to IAN 124/11 Annex B for additional guidance.
PD 6703 (2009)*	Structural bearings – Guidance on the use of structural bearings
PD 6705-2 (2010)* +A1:2013	Recommendations for the execution of steel bridges to BS EN 1090-2. Provides non-contradictory complementary information (NCCI) and guidance for use of BS EN 1090-2, focusing on selection of options and alternative information (Amended 30 April 2013)
PD 6705-3 (2009)*	Recommendations for the execution of steel bridges to BS EN 1090-3

Execution Standards

BS EN 1090-1:2009 + A1:2011	Execution of steel structures and aluminium structure – Part 1 Requirements for conformity assessment of structural components (Refer to IAN124/11 clause 2.19 for additional guidance)
BS EN 1090-2:2008 + A1:2011	Execution of steel structures and aluminium structure – Part2 Technical requirements for the execution of steel structures (Refer to IAN124/11 clause 2.19 for additional guidance)
BS EN 1090-3:2008	Execution of steel structures and aluminium structure – Part 3. Technical requirements for the execution of aluminium structures (Refer to IAN124/11 clause 2.19 for additional guidance)
BS EN 13670:2009	Execution of concrete structures (Refer to IAN124/11 clause 2.19 for additional guidance)

Miscellaneous

Circular Roads No 61/72 – Routes for heavy and high abnormal loads

Traffic Management Act 2004

Construction (Design and Management) Regulations 2015 **(Mandatory Requirement)**

The Manual of Contract Documents for Highway Works (MCDHW)

Volume 1: Specification for Highway Works (2008)*

Volume 2: Notes for Guidance on the Specification for Highway Works (Date)*

Volume 3: Highway Construction Details (Date)*

The Design Manual for Roads and Bridges (DMRB)

(Non-conflicting with Eurocodes)

~~*General Requirements, Standards (GD Series)*~~

~~GD 01/08 Introduction to the Design Manual for Roads and Bridges (DMRB)~~

~~GD 02/08 Quality Management System for Highway Design~~

~~GD 04/12 Standard for Safety Risk Assessment on the Strategic Road Network~~

Bridges and Structures, Advice Notes (BA Series)

~~BA 26/94 Expansion joints for use in highway bridge decks~~
~~(Refer to IAN 124/11 Annex C for additional guidance)~~

~~BA 28/92 Evaluation of Maintenance Costs in Comparing Alternative Design for Highway Structures~~

~~BA 35/90 Inspection and Repair of Concrete Highway Structures using Externally Bonded Plates~~

~~BA 36/90 The use of permanent formworks~~
~~(Refer to IAN 124/11 Annex C for additional guidance)~~

~~BA 37/92 Priority Ranking of Existing Parapets~~

~~BA 41/98 The Design and Appearance of Bridges~~

~~BA 42/96 The Design of Integral Bridges~~
~~Incorporating Amendment No.1 dated May 2003~~
~~(Refer to IAN 124/11 Annex C for additional guidance)~~

~~BA 43/03 Strengthening, Repair and Monitoring of Post-tensioned Concrete Bridge Decks~~

~~BA 47/99 Waterproofing and Surfacing of Concrete Bridge Decks~~
~~(Refer to IAN 124/11 Annex C for additional guidance)~~

~~BA 57/01 Design for Durability~~
~~(Refer to IAN 124/11 Annex C for additional guidance)~~

~~BA 59/94 Design of highway bridges for hydraulic action~~
~~(Refer to IAN 124/11 Annex C for additional guidance)~~

~~BA 67/96 Enclosure of Bridges~~
~~(Refer to IAN 124/11 Annex C for additional guidance)~~

~~BA 68/97 Crib retaining walls~~

~~BA 72/03 Maintenance of Road Tunnels~~

~~BA 80/99 Use of Rock Bolts~~

~~BA 82/00 Formation of Continuity Joints in Bridge Decks~~

~~BA 83/02 Cathodic Protection for use in Reinforced Concrete Highway Structures~~

~~BA 84/02 Use of Stainless Steel Reinforced Concrete in Highway Structures (Refer to IAN 124/11 Annex C for additional guidance)~~

~~BA/85/04 Coatings for Concrete Highway Structures & Ancillary Structures~~

~~BA 86/06 Advice Notes on the Non-destructive testing of Highway Structures~~

~~BA 92/07 The Use of Recycled Concrete Aggregates in Structural Concrete~~

Bridges and Structures, Standards (BD Series)

BD 2/12 Technical Approval of Highway Structures **(Compulsory as section 4.5.1)**

~~BD 7/01 Weathering Steel for Highway Structures (Refer to IAN 124/11 Annex C for additional guidance)~~

~~BD 10/97 Design of Highway Structures in Areas of Mining Subsidence (Refer to IAN 124/11 Annex C for additional guidance)~~

~~BD 12/01 Design of corrugated steel buried structures with spans greater than 0.9 metres and up to 8.0 metres (Refer to IAN 124/11 Annex C for additional guidance)~~

~~BD 20/92 Bridge Bearings Use of BS 5400: Part 9- 1983~~

~~BD 21/01 The Assessment of Highway Bridges and Structures~~

~~BD 27/86 Materials for the Repair of Concrete Highway Structures~~

~~BD 28/87 Early Thermal Cracking of Concrete Amendment No. 1 (August 1989)~~

~~BD 29/04 Design Criteria for Footbridges (Refer to IAN 124/11 Annex C for additional guidance)~~

~~BD 30/87 Backfilled Retaining Walls and Bridge Abutments~~

~~BD 31/01 The Design of Buried Concrete Box and Portal Frame Structures~~

~~BD 33/94 Expansion joints for use in highway bridge decks (Refer to IAN 124/11 Annex C for additional guidance)~~

~~BD 35/14 Quality Assurance Scheme for Paints and Similar Protective Coatings (Refer to IAN 124/11 Annex C for additional guidance)~~

~~BD 36/92 Evaluation of Maintenance Costs in Comparing Alternative Designs for Highway Structures~~

~~BD 42/00 Design of Embedded Retaining Walls and Bridge Abutments~~

~~BD 43/03 The Impregnation of Reinforced and Prestressed Concrete Highway Structures using Hydrophobic Pore-Lining Impregnants~~

~~BD 45/93 Identification markings of highway structures~~

~~BD 47/99 Waterproofing and Surfacing of Concrete Bridge Decks (Refer to IAN 124/11 Annex C for additional guidance)~~

~~BD 49/01 Design Rules for Aerodynamic Effects on Bridges~~

~~BD 51/14 Design Criteria for Portal and Cantilever Sign / Signal Gantries (Refer to IAN 124/11 Annex C for additional guidance)~~

~~BD 53/95 Inspection and Records for Road Tunnels~~

~~BD 54/15 Management of Post-Tensioned Concrete Bridges~~

~~BD 57/01 Design for Durability (Refer to IAN 124/11 Annex C for additional guidance)~~

~~BD 60/04 Design of Highway Bridges for Vehicle Collison Loads~~

~~BD 62/07 As-built, operational and maintenance records for highway structures (Refer to IAN 124/11 Annex C for additional guidance)~~

~~BD 63/07 Inspection of Highway Structures~~

~~BD 65/14 Design Criteria for Collison Protection Beams~~

~~BD 67/96 Enclosure of Bridges (Refer to IAN 124/11 Annex C for additional guidance)~~

~~BD 68/97 Crib retaining walls~~

~~BD 74/00 Foundations~~

~~BD 78/99 Design of Road Tunnels (Refer to IAN 124/11 Annex C for additional guidance)~~

~~BD 79/13 The Management of Sub-standard Highway Structures~~

~~BD 81/02 Use of Compressive Membrane Action in Bridge Deck~~

~~BD82/00 Design of buried rigid pipes~~

~~BD 84/02 Strengthening of Concrete Bridge Supports Vehicle Impact Using Fibre Reinforced Polymers~~

~~BD 85/08 Strengthening Highway Structures Using Externally Bonded Fibre Reinforced Polymers~~

~~BD 87/05 Maintenance Painting of Steelwork~~

~~BD 90/05 Design of FRP bridges and highway structures~~

~~BD 91/04 Unreinforced Masonry Arch Bridges~~

~~BD 94/07 Design of Minor Structures~~

~~BD 95/07 Treatment of Existing structures on highway widening schemes~~

Bridges and Structures, Technical Memoranda (BE Series)

~~BE 5/75 Rules for the Design and use of Freyssinet Concrete Hinges in Highway Structures~~

~~BE 7/04 Departmental Standard (Interim) Motorway Sign / Signal Gantries~~

~~BE 13 Fatigue Risk in Bailey Bridges~~

~~BE 23 Shear Key Decks~~
~~Amendment No. 1 (June 1971)~~

Traffic Engineering and Control, Standards (TD Series)

~~TD 9/93 Highway Link Design~~
~~Highway Link Design Amendment No. 1 (February 2002)~~

~~TD 19/06 Requirement for Road restraint Systems~~
~~Correction No. 1 (February 2008)~~

~~TD 27/05 Cross - Sections and Headroom~~

~~TD 36/93 Subways for Pedestrians and Pedal Cyclists, Layout and Dimensions~~

~~TD 49/07 Requirements for Lorry Mounted Crash Cushions~~

~~TD 89/08 Use of Passively Safe Signposts, lighting Columns & Traffic Sign Posts to BS EN 12767~~

Highways, Advice Notes (HA Series)

~~HA 59/92 Mitigation against Effects on Badgers~~

~~HA 65/94 Design Guide for Environmental Barriers~~

~~HA 66/95 Environmental Barriers – Technical Requirements (Refer to IAN 124/11 Annex C for additional guidance)~~

~~HA 80/99 Nature Conservation Advice in Relation to Bats~~

~~HA 81/99 Nature Conservation Advice in Relation to Otters~~

~~HA 84/01 Nature Conservation and Biodiversity~~

~~HA 97/01 Nature Conservation Management Advice in Relation to Dormice~~

~~HA 98/01 Nature Conservation Management Advice in Relation to Amphibians~~

Highways, Standards (HD Series)

~~HD 22/08 Managing Geotechnical Risk~~

~~HD 26/06 Pavement Design~~

~~HD 27/04 Pavement Construction Methods~~

Interim Advice Notes Standards (IAN Series)

~~IAN 41/102~~	~~European cement standards~~
~~IAN 47/02~~	~~Post tensioned grouted duct concrete bridges~~
~~IAN 48/03~~	~~Measures to minimize the risk of sulphate attack (including thaumasite) – New construction and structures under construction.~~
~~IAN 53/04~~	~~Concrete half-joint deck construction~~
~~IAN 69/05~~	~~Designing for maintenance~~
~~IAN 70/06~~	~~Implementation of new reinforcement standards (BS 4449:2005, BS 4482:2005, BS 4483:2005 and BS 8666:2005)~~
~~IAN 83/06~~	~~Principal and General Inspection of Sign/ Signal gantries and Gantries with low handrails or open mesh flooring~~
~~IAN 85/07~~	~~Design of Passively safe portal signal gantries~~
~~IAN 86/07~~	~~Amendments to the design requirements for portal and cantilever sign/signal gantries~~
~~IAN 81/07~~	~~Interim Advice on the identification of 'Particularly at Risks' Supports~~
~~IAN 95/07~~	~~Revised guidance regarding the use of BS 8500(2006) for the design and construction of structures using concrete~~
~~IAN 96/07 r 1~~	~~Guidance on implementing results of research on bridge deck waterproofing~~
~~IAN 97/07~~	~~Assessment and upgrading of existing parapets~~
~~IAN 104/07~~	~~The anchorage of reinforcement and fixings in hardened concrete~~
~~IAN 105/08~~	~~Implementation of construction (design and management) 2007 and the withdrawal of SD 10 and SD 11~~
~~IAN 116/08~~	~~Nature conservation advice in relation to bats~~
~~IAN 117/08 r 2~~	~~Certification of combined kerb and drainage products~~
~~IAN 123/10~~	~~Use of Eurocodes for the design highway structures~~
~~IAN 124/11~~	~~Eurocodes: Implementation of Eurocodes for the design of new and existing highway structures~~
~~IAN 127/10 r 1~~	~~The use of foamed concrete~~
~~IAN 130/10~~	~~Ecology and Nature Conservation Criteria for Impact Assessment~~
~~IAN 131/11~~	~~Deflection of Permanent Formwork~~
~~IAN 136/10~~	~~Structural safety reporting~~
~~IAN 149/11~~	~~Existing motorway minimum requirements~~
~~IAN 161/13~~	~~Managed motorway requirements – All lane running~~
~~IAN 168/12~~	~~Strategy for the repair/replacement of Bridge Expansion Joints~~
~~IAN 169/12 r 1~~	~~Temporary cover plates over bridge expansion joints~~

~~IAN 177/13 Introduction of the Construction Products Regulations (EU) 305/2011~~

Chief Highway Engineer Memoranda

~~CHE239/09 The Implementation of Eurocodes~~

~~CHE 227/08 The Implementation of Reinforced and Prestressed Concrete Highway Structures using Hydrophobic Pore Lining Impregnants~~

CIRIA Publications

~~C453 Bridge detailing guide~~

~~C660 Early age thermal crack control in concrete~~

~~C686 Safe access for maintenance and repair~~

***** *The compiler of the AIP should insert the current date of publication of the asterisked British Standards. MCHW and DMRB Standards and Advice Notes. This should be in the form of the year of publication for British Standards, the month and year of publication for MCHW, and the last two digits of the year of publication for DMRB Standards and Advice Notes. The dates of any Amendments should also be included.*