1.2 DESCRIPTION OF THE WORKS AND DESIGN CRITERIA

1.2.1 Building Structure and Fabric

Information provided by Corstorphine & Wright Architects, the Architects

The typical external wall build up is made up of a Stofix ventilated rainscreen brick slip cladding system, with pre-fixed & pre-mortared kiln-fired brick slips mounted on 0.7mm or greater galvanised steel sheets; supported on a proprietary helping hand support brackets & horizontal rail. 150mm Rockwool Duoslab rainscreen mineral wool insulation mechanically fixed with washered wall ties with a Wraptite vapour permeable & airtight self-adhesive 'breather membrane' beneath. 12.5mm Secolite cement board exterior sheathing board fixed at regular intervals to 150mm EOS infill walling steel framing system (SFS) at typically 600mm centres; fully filled with Rockwool RWA45 mineral wool insulation & closed off with Tyvek A2 rated internal vapour control layer (VCL) and one layer of 15mm British Gypsum Fireline plasterboard with an approximate 2mm Thistle skim finish. Any pattress in the external façade shall be made of an equal A1 or A2 rated material such as Fermacell gypsum fibreboard.

Information provided by CWA, the Civil and Structural Engineers

In evaluating suitable structural solutions CWA considered potential solutions against several design criteria including.

- Satisfying geometrical constraints including grid setting out and structural zones.
- Servicing strategy and integration (resulting floor to floor height).
- Flexibility for change in use or servicing strategy.
- Aesthetics, where exposed or featured.
- Speed of construction.
- Cost of materials.
- Sustainability including embodied carbon, thermal mass and BREEAM targets.

It should be noted that at this stage, only blocks C&D have been designed. Blocks A&B will be designed and constructed at a later date due to the phasing of the project. This basis of design report shall be updated once the scheme for blocks A&B has been sufficiently developed.

The structure is proposed to be of insitu reinforced concrete construction using blade columns and walls supporting insitu reinforced concrete flat slabs. A 3.6m x 3.6m grid was agreed with the Architect at the concept stage. This lends itself to a structural grid of 7.2m x 7.2m to suit ground floor parking and typical apartment layouts. However, due to the irregular shape of the building and the proposed internal layouts, a regular grid has not been maintained. Where possible, columns have been positioned to be outside of the internal space of the apartments, to be concealed within corridor and party walls. Spans have typically been limited to 7.2m where possible.

Columns sizes are typically rectangular in plan, either 250x1000mm or 300x1200mm.

Reinforced concrete walls are typically 250mm thick and all floor and roof slabs are 250mm thick.

Cladding consists of Stofix reconstituted stone panels supported by a carrier system attached to an inner leaf of SFS framing, both elements of which will be designed by a specialist sub-contractor.

Lateral Stability

Lateral stability shall be provided to the building by utilising reinforced concrete shear walls located within the lift and stair cores and elsewhere within the structure as required. Lateral forces applied to the structure, such as wind, shall be distributed to the walls by diaphragm action of the floor and roof slabs. Due to the height of the structure, blade columns have been utilised to provide frame action with the floor slabs in their stronger axis to further limit horizontal deflections. The use of moment transfer between columns and slabs is required to limit SLS deflections only. Shear walls shall be designed assuming there is no contribution from the column and slab interaction. Columns and slabs shall be designed for both ULS and SLS design forces from the moment transfer.

Transfer Structures

The use of transfer structures has been limited where possible by coordinating layouts between floors. However, due to the change in use from residential accommodation to car parking below upper ground level, some transfer structures are required. The main hall to the girl guides space in block D is also required to be column free which requires additional transfer structures to support columns and walls above. At transfer locations, the column layouts have been developed to align columns in at least one direction to facilitate the use of reinforced insitu-concrete downstand beams.

Permanent Loads

Permanent loads shall be calculated for each individual element. The material weights used for calculation of permanent loads are outlined in the table below.

Table 1 – Standard Weights of Materials

Material	Density (kN/m^3)
Steel	78.5
Reinforced concrete including normal percentage of reinforcing and pre-stressing steel	25
Blockwork	16
Brickwork	22
Glass	25

Super-Imposed Permanent Loads

The structure shall be designed for the following superimposed loads

Table 2 - Lower Ground Floor (Girl Guides)

Material	Load (kN/m^2)
Finishes	1.00
Screed	2.40
Total	**3.40**

Table 3 – Mezzanine (Apartment)

Material	Load (kN/m^2)
Finishes	0.20
Services	0.10
Suspended ceiling	0.25
Total	**0.55**

Table 4 - Mezzanine (WC & Showers)

Material	Load (kN/m^2)
Finishes	1.00
Services	0.10
Suspended ceiling	0.25
Total	**1.35**

Table 5 – Upper Ground (Courtyard)

Material	Load (kN/m^2)
Block paving (100mm)	2.40

Pedestals	0.50
Waterproofing	0.50
Services	0.10
Total	**3.50**

Table 6 - Upper Ground (Amenity)

Material	**Load (kN/m^2)**
Finishes	1.00
Services	0.10
Suspended ceiling	0.25
Total	**1.35**

Table 7 - Upper Ground (Apartments)

Material	**Load (kN/m^2)**
Finishes	0.20
Services	0.10
Suspended ceiling	0.25
Total	**0.55**

Table 8 – 1st to 13th (Apartments)

Material	**Load (kN/m^2)**
Finishes	0.20
Services	0.10
Suspended ceiling	0.25
Total	**0.55**

Table 9 – Brown Roof

Material	Load (kN/m²)
Brown roof 100mm thick	1.80
Roof filter fleece	0.01
Roof drainage and 40mm Storage Board	0.05
100mm deep attenuation cell	1.00
Waterproofing and insulation	0.15
Green roof cap sheet	0.10
2no underlayers	0.10
Services	0.10
Suspended ceiling	0.25
Total	**3.56**

Table 10 – Roof Terrace

Material	Load (kN/m²)
Paving or gravel	2.20
Waterproofing	0.50
Insulation	0.10
Services	0.10
Suspended ceiling	0.25
Total	**3.21**

Table 11 – Windows/Glazing

Material	Load (kN/m²)
Glazing	1.00

Table 12 – Brickwork Cladding

Material	Load (kN/m^2)
Brick slips (25mm)	0.55
Backing board (20mm CP)	0.15
SFS	0.20
Insulation	0.05
Plaster + skim	0.40
Total	**1.35**

Table 13 – Rainscreen Cladding

Material	Load (kN/m^2)
Rainscreen	0.20
SFS	0.20
Insulation	0.05
Plaster + skim	0.40
Total	**0.85**

Imposed Loads

The following imposed loads shall be allowed for in accordance with BS 6399-1 and BS 6399-3.

Table 14 – Imposed Load Requirements

Use	BS Category	Distributed Load (kN/m^2)	Partition Allowance (kN/m^2)	Point Load (kN)
Apartments	A	1.5	1.0	1.4
Offices for general use	B	2.5	1.0	2.7
Corridors, hallways, stairs, landings	C3	3.0	-	4.5
Girl Guide Main Hall	C4	5.0	-	3.6

Girl Guide Shop	D	4.0	1.0	3.6
Girl Guide Activity Rooms	C1	3.0	1.0	2.7
Girl Guide WC	A	2.0	1.0	1.8
Car park	F	2.5	-	9.0
Communal working	B	2.5	1.0	2.7
External Courtyard	C3	3.0	-	4.5
External Courtyard subject to vehicle access	G	10.0	-	35.0
Refuse store	E	5.0	-	4.5
Sprinkler tank room	E	20.0*	-	10.0*
Plant rooms	E	7.5	-	4.5
General Storage	E	5.0	-	4.5
Roof with access	-	1.5	-	1.8
Communal roof terrace	-	3.0	-	4.5

*Sprinkler tank loadings TBC by MEP Engineer

Wind Loads

Wind loads shall be calculated in accordance with BS 6399-2.

Table 15 - Site wind loading parameters

Parameter	Value	Units
Site Altitude	140.0	m
Basic wind speed	22.0	m/s
Seasonal factor	1.0	-
Probability factor	1.0	-

Snow Loads

Snow loads shall be calculated in accordance with BS 6399-3.

Table 16 - Site snow loading parameters

Parameter	Value	Units
Site Altitude	140.0	m
Basic snow load	0.55	kN/m^2
Site snow load	0.61	kN/m^2

Accidental Loads

Columns and walls located within the car park shall be designed to resist impact loads from vehicle collision in accordance with BS 6399-1.

Table 17 – Accidental loading parameters

Parameter	Value	Units	Comments
Vehicle collision	150	kN	Applied 375mm above FFL
Key elements	34	kN/m^2	Limited to maximum area of 6m square

Retaining Wall Surcharge Loads

The contiguous pile wall around the perimeter of the site has been designed with a surcharge load of 10kN/m^2. Retaining walls within the building have been designed for a 10kN/m^2 surcharge at slab formation level, reducing to the imposed loads given in Table 16 at slab level.

Load Combinations

The following load combinations shall be considered in the design in accordance with BS 8110. A breakdown of all combinations considered shall be provided in the relevant calculations.

Table 18 – Load combinations to BS 8110

Load Combination	Load Type					
	Dead		Imposed		Wind	Accidental
	Adverse	Beneficial	Adverse	Beneficial		
Dead and Imposed	1.4	1.0	1.6	0	-	-
Dead and wind	1.4	1.0	-	-	1.4	-

Dead and imposed and wind	1.2	1.2	1.2	1.2	1.2	-
Dead and imposed and accidental loads	1.0	1.0	0.35	0	-	1.05

1.2.2 Building Services

Information provided by CWA, the Civil and Structural Engineers

A utilities survey was undertaken at the site and was carried out by Midland Survey Ltd in November 2017 with updates in August 2020. The footpath and highway surrounding the site are heavily congested with existing services including electric, gas, water, comms and a combined sewer. Within the site boundary, the North site is still operational and as such there are a number of buried services serving the buildings and car park. It is understood the site will be cleared including capping and removal of all services. The south site is understood to have already been cleared. Refer to topographical and utilities survey drawing 30360 for details.

1.2.2 Building Services

Information provided by TNA, the Mechanical Designers

Holloway Head development consists of 4No. blocks, Block A and B the North site and Blocks C and D the south site. Below each site is an underground car park and main services, plant room and refuse.

Within Block D there is amenity space including concierge, lounge, co working, dining and TV lounge areas. Within the back of house areas, there is a lettings office, management office, office and parcel room.

The Girl Guides new HQ including activity rooms, offices, reception, kitchen, showers and toilets are located within Block D. A Girl Guides apartment is also located in Block C.

The metered boosted cold water has been provided to the Girl Guides Headquarters from the landlords site wide central storage system for boosted distribution. The water authority meter for the Girl Guides Headquarters is located within the plant area.

The boosted cold water supply distributes throughout the unit to each appliance through the utility meter. From the unit meter the cold water distributes to each outlet, which includes the showers, WCs, wash hand basins, sinks, washing machines, drinking outlets and dishwashers.

Thermostatic mixing valve arrangements (TMV3) have been installed to each sanitary ware outlet such as basins and showers.

All pipework, systems and components have been pressure tested and disinfected at completion.

The domestic hot water for sinks, wash hand basins, bath, shower and washing machine is provided via an indirectly heated cylinder. The cylinder is heated by a primary LTHW coil served by the gas boiler. The cylinder has been installed adjacent to the boiler in the allocated plant area. The stored hot water is controlled by a 7-day 24-hour digital programmer.

Ballofix type valves have been fitted to all hot and cold outlets within the unit.

The hot and cold water installations have been pressure tested and disinfected at completion.

Heating to the units is provided by LTHW fed radiators and fan convectors. Room temperature controls have been installed to each space as appropriate via TRV'S or room thermostats where fan convectors are installed.

To ensure occupant safety all emitters are Low Surface Temperature (LST) compliant.

Wired central controls are linked to specific area control valves. All sensors, interfaces, contactors and electrical wiring have been provided to ensure that the central controller can link to and operate the heating system and provide the appropriate zone control. A night setback and optimisation facility has been incorporated into the control system.

Heat Recovery Units (HRU's) have been installed within the unit to comply with Building Regulations.

The kitchen areas benefit from a commercial type over cooker, with high level extraction hood incorporating mechanical fan controls and safety interlock.

Mechanical extract ventilation from the shower rooms is provided by ceiling mounted grilles connected to the mechanical HRU system. PIR, boost and trickle ventilation controls have been applied to the systems installed.

Mechanical supply air is distributed throughout the unit to provide internal occupancy comfort and make up air for the extract system. Ventilation ductwork is routed within the ceiling void of the unit. The fresh air and exhaust ducts connect to individual plenums formed on the louvred section in the external walls. Rapid ventilation has been made available to occupants via opening windows. The ductwork is thermally insulated.

All ventilation units have been made accessible for further service and maintenance purposes.

All system installations comply with DW144, DW154, Approved Document F, DW172. All necessary fire dampers and collars have been incorporated within the ductwork systems to suit the fire strategy layout and fire engineers' recommendations. Make up air passage between areas is provided via undercut doors/natural leakage.

Where possible the above ground drainage system is gravity fed. Services connections are on the floor level of the equipment it serves. WC's, showers and remotely located sanitaryware have been appropriately located draining stacks for direct connection.

An SVP has been installed adjacent to any appliance, equipment or unit that requires drainage for safety, pressure relief or overflow requirements. WC's, showers and remotely located sanitaryware have appropriately located draining stacks for direct connection.

Internal and external pipework has been insulated to comply with correct standards and design guidelines with regards to acoustic and thermal performance.

All system installations comply with BSEN 12056 and Approved Document H.

A separate misting system has been installed within the Girl Guides headquarters building and shop.

The Girl Guides apartment has been connected to the building main domestic sprinkler system, as per the other apartments in the Block.

The design of the Mechanical Engineering Services installation has been based on the following design criteria:

- British Standards, Codes of Practice and Building Regulations
- CIBSE Guides and Technical Memoranda
- Local and Statutory Authority Requirements
- Supply Authority Regulations
- Non-Domestic Compliance guide 2013
- Part L Building Regulations

Information provided by TNA, the Electrical Designers

Holloway Head development consists of 4No. blocks, Block A and B the North site and Blocks C and D the south site. Below each site is an underground car park and main services, plant room and refuse.

Within Block D there is amenity space including concierge, lounge, co working, dining and TV lounge areas. Within the back of house areas, there is a lettings office, management office, office and parcel room.

The Girl Guides new HQ including activity rooms, offices, reception, kitchen, showers and toilets are located within Block D. A Girl Guides apartment is also located in Block C.

The Girl Guides Headquarters has been installed with a designated three phase incoming electrical service to the switchroom which is fed directly from the local LV network.

Distribution boards have been installed for the main headquarters and the shop, the boards are split-load metered for general lighting and power.

Power supplies have been installed for lighting, door entry, fire alarm, mechanical plant, AV system, lifts and sockets.

Small power accessories have been installed including, twin socket outlets, fused connection units, single socket outlets and isolators.

LED lighting has been installed throughout the Girl Guides unit. Recessed LED circular downlights have been installed in the corridors, reception lobbies and the shop. Corridors and receptions are controlled using PIR’s. The shop utilises manual dimming switches to control dimmable downlights.

IP65 rated LED downlights have been installed to WC’s and shower rooms, with control via PIR’s.

Linear, dimmable, LED surface fittings have been installed in the activity rooms and dimmable LED recessed fittings have been fitted in the main hall. Fittings are suitably impact resistant accounting for the mixed-use nature of the spaces. Multi-gang, manual dimmer switching is provided within these spaces so as to allow greater flexibility of the areas.

IP65 LED surface linear fittings have been installed in the kitchen with manual on/off control.

Emergency lighting has been installed throughout the unit, utilising integral 3hour battery packs within fittings where possible, supplemented with illuminated exit signage as necessary.

Emergency key tests units have been positioned discretely within each zone.

An Ultrafast Fibre Optic has been provided to the Girl Guides Headquarters. The telephone distribution network throughout gives the occupants the option of connecting to an ISDN, ADSL and a basic telephone service.

Each of the offices and the shop space incorporate separate telephone lines which may be used simultaneously for external telephone and broadband purposes.

Data points for wireless access devices have been installed in the corridor of each floor level.

Telephone wiring internally has been installed using Cat6 cabling. Outlets are standard RJ45 with loose telephone adapters.

The unit has its own designated fire alarm system protecting all areas with a BS5839 L1 automatic detection system. The system has a main addressable alarm panel at the entrance lobby, automatic detection throughout (heat in kitchen and plant rooms), visual and audio alerts and manual break glasses at exits and level changes.

Interfaces are provided to the necessary systems such as access controlled doors, plant, lift etc.

The system is also interfaced with the Landlords fire alarm system covering the apartment above and shared communal areas, such as the car park, bin stores and lobbies. Systems are configured so as to alert the opposing main panel in the event of full alarm.

A standalone intruder alarm system has been utilised, with the main keypad located at the main entrance lobby.

PIR surface fixed detection is applied throughout all rooms with external entry points (doors and windows). Flashing sounder beacons are mounted externally of the front façade and above the Girl Guides 3 bed apartment.

The car park barrier, front and rear courtyard access doors and the main shop door are provided with electronic key-pad entry systems.

The car park barrier, front and rear courtyard door keypads have a speaker ring button to allow anyone at the door to speak to a secretary in both the ground and upper ground floor secretaries' rooms and the Commissioner's office, who will be able to remotely unlock to allow access. The shop keypad does not link to remote offices.

The car park barrier has been installed under the Landlords main building contract, only the access control link is included under the Girl Guides installation.

The door access control systems are standalone systems and do not link to any Landlords access control systems outside of the Girl Guides demise. These doors are connected to the fire alarm system to 'fail safe' in the event of alarm, as well as having push-to-exit buttons and emergency break glasses internally.

Each activity room and the main hall have been installed with a recessed motorised projector unit with built in speakers. Suitable speaker/coaxial cabling has been installed to the ceiling mounted speakers.

Disabled WC alarm systems have been installed to accessible WC's and showers, with remote alert flashing sounder within a manned Office.

An induction loop system has been installed to operate in both halves of the main hall, the activity rooms, and the common room; with a suitable connection in each room to link with a plug-in portable sound amplification unit.

The installation and design of the electrical engineering services installation will be based on the following design criteria:

- British Standards, Codes of Practice and Building Regulations
- CIBSE Guides and Technical memoranda
- 18th Edition IET, BS7671: Requirements for Electrical Installations
- Local and Statutory Authority Requirements
- Supply Authority Regulations
- Building Regulations Approved Document Part 2013 'L2'
- BS EN 12101 smoke and heat control systems
- BS 9999 and BS 5839-1 2017

1.2.3 Site Works and Infrastructure

Information provided by Corstorphine & Wright Architects, the Architects

Landscape / Civils designs to provide

- Items to include:

  - Landscaping

  - Soft and hard landscaping

Information provided by CWA the Civil and Structural Engineers

Foundation Strategy

Continuous Flight Auger (CFA) bearing piles taken into the Helsby Sandstone Formation are proposed throughout. A combination of 450mm and 600mm diameter piles are used with 450mm piles typically used at column locations and 600mm piles typically used at shear wall locations. The proposed pile lengths vary from 7m – 14m dependent on location and loading. Reinforced concrete pile caps are used to transfer loads from columns and walls to the piles. Pile caps are typically 1500mm deep.

Basement Strategy

A contiguous piled wall is proposed to form the basement around the perimeter of the site on 3 elevations. The piles are proposed to be 600mm in diameter and vary in length from 6m – 12m. The wall shall be designed to support the adjacent footpath and highway with a maximum retained height in its permanent condition of 4m. The wall will also be used to provide support to the footpath and highway in the temporary condition, during construction of the lower ground foundations and floor slabs. A reinforced concrete capping beam is proposed to tie the tops of the piles and provide support for the external walls.

In order to waterproof the basement, a concrete lining wall is proposed to the inside face of the piles. The degree of waterproofing to the basement varies dependent on the environmental grading of the internal space in accordance with BS 8102:2009. The waterproofing strategy shall be developed by the Architect and the waterproofing consultant/specialist. It is understood that a combination of waterproof concrete (type B) and waterproof membrane (type A) are proposed.

Ground Floor Slabs

Ground bearing slabs have been proposed for all lower level floors. No ground gas protection measures are necessary and the water table is sufficiently low enough that no significant hydrostatic pressures shall be imposed upon the floor slabs.

Drainage

Both foul and storm water drainage relies upon a gravity system to remove flows from the building. Storm water is attenuated with a storage tank located in the mezzanine car park.

Anticipated construction sequence

The construction sequence shall be developed and agreed by the designer and the contractor during stage 5. A brief summary of the anticipated construction sequence is shown below based upon the design information to date.

1. Construct piling platforms and install contiguous piled retaining walls. Where required, install bearing piles from high level. Excavate down to pile cut off level to crop contig piles to required level, install waterproofing measures and construct reinforced concrete capping beam.
2. Excavate down to reduced levels in the basement. Install piling platforms for lower levels and install remainder of bearing piles. Excavate down to pile cut off level to crop piles to required level and install any waterproofing measures.
3. Construct reinforced concrete pile caps, ground beams and retaining walls. Install any waterproofing measures and backfill any excavations with agreement from the permanent and/or temporary works designer.
4. Install foul and surface water drainage manholes, pipes and attenuation tanks.
5. Construct reinforced concrete lift shaft and stair cores for block C and block D using slipform construction from foundation level up to roof level.
6. Construct all columns and walls from foundation level up to mezzanine level.
7. Construct lower ground level ground floor slabs.
8. Construct suspended flat slab at mezzanine level over lower ground level in Block C. Formwork to be propped from lower ground level (subject to temporary works design).
9. Construct all columns and walls from mezzanine level up to upper ground level.
10. Construct mezzanine level ground floor slabs.
11. Construct reinforced concrete downstand transfer beams at upper ground level. All transfer beams shall be suitably propped until the concrete has reached its full 28-day strength as a minimum, or as required for the construction of the upper floor slabs.
12. Construct suspended upper ground level slab in its entirety before proceeding to levels above. Formwork to be propped from mezzanine/lower ground level (subject to temporary works design) and back propped to lower ground level in block C.
13. Construct the remainder of the superstructure working sequentially level by level. It is anticipated that the slabs will need to be back propped by at least 3 levels (subject to temporary works design).