FIRNTEC
BUILDING COMPLIANCE

VISUAL STRUCTURAL APPRAISAL

Greenford House

Maria Street
West Bromwich
B70 6DX

29th November 2024

Unit 3,
Endeavour House,
Longbridge Road,
PL6 8LR

Document Issue

Revision	Date	Purpose of Issue
A	27.08.24	Issued for Review
B	29.11.24	Issued with amendments

Prepared By

Ruben Wood , Meng CEng MIStructe

Dated: 29/11/2024

Reviewed by

Firntec Project Consultant

Dated: 29/11/2024

Competency Statement

Ruben has a thorough range of experience on projects both in the UK and globally, centered on the construction industry but also in public art installations and bespoke structures. His extensive experience in a wide range of projects afford him the contacts to bring together the right team for a job. Ruben has worked on a range of projects where he has developed the ability to perform conceptual and detailed designs, analysis of complex structures and element design. He has extensive experience in structural design and construction methods and has successfully completed projects with values in excess of £10m.

Ruben has also been engaged in structural appraisals of high rise residential structures across the UK and has been assisting Principal Accountable Persons in assessing their housing stocks and compiling information to be included in the golden thread as a requirement of the Building Safety Act.

QUALIFICATIONS, MEMBERSHIPS & TRAINING

First Class MEng Civil Engineering - University College London

Chartered Engineer and Member - Institute of Structural Engineers CEng MIStructE

Knowledge of the Engineering Council's competency register for HRB's as set out in UK-SPEC for HRB

Continued professional and development through industry led courses and webinars on The Building Safety Act, fire in structural engineering and assessments of existing HRB's.

Contents

1. Executive Summary

The building survey revealed that the overall structural integrity of the property is sound. No major structural issues were identified that pose an immediate threat to the occupants or the building's stability.

Is the Building Structure Safe to Occupy?	Yes

However, some intrusive investigations are required to properly assess the building's health, condition and fire resistance. The actions for the building are:

Ref no	Observations	Risk Rating	Mitigation	Timescale
Green 001/ 2024	Concrete material tests for strength, cover depth, carbonation, presence of chlorides and HAC	Medium	Engage a qualified specialist contractor to complete the investigations	within the next 24 months
Green 002/2024	We have not been provided with accurate floorplans or any information, construction details, product specifications and warranties on the building or re-cladding.	Low / Medium	We suggest these are sourced from the original contractors and designers and kept on file by the Duty Holder as part of the Golden Thread for future reference.	Within next 24 months
Green 003/2024	Regular maintenance is crucial to preserving the property's condition and preventing future issues. The building is to be surveyed at regular 5 year intervals to inspect for signs of movement, structural decay and/or defects.	Low	Engage a qualified specialist contractor to complete the surveys	Every 5 years

2. Introduction

2.1.Brief

Firntec were appointed by Sandwell to perform a visual structural appraisal of the purpose built residential block known as Greenford House, Maria Street, B70 6DX in West Bromwich. The instruction was to identify the key structural elements of the building and is prepared to be included as part of the Building Safety Case Report for the housing block. The inspection relates to the main building only and any external fences/walls, sheds and outbuildings/garages have been excluded from our scope. An inspection of the property was undertaken by Firntec on the 24nd July 2024. The scope of the inspection included limited, visual observations of the interior and exterior of the structure. The inspection was limited to accessible areas which included the external elevations (viewed from the ground), communal areas, stair core, plant rooms and the roof.

Figure 1: Site location

2.2Limitations

This report is based upon a visual inspection of the property, as described above. This report describes the findings and draws conclusions of a general nature and is not an intrusive survey of the building and no calculations were carried out with regards to load transfer and verification of structural members.

Whilst comments are made to satisfy the requirements of the brief, the report has, of necessity, not been exhaustive and cannot therefore constitute a warranty as to the soundness or otherwise of the property in areas hidden from visual inspection or not seen during the inspection.

No internal finishes were disturbed during our inspection, and no opening up works or invasive inspections were undertaken. We were not able to observe any structural elements where hidden under finishes.

This report has been prepared for the sole use of the client Sandwell.

Disassembly or removal of any portion of the structure, mechanical equipment, plumbing equipment, or electrical equipment is beyond the scope of this inspection. There is no warranty or guarantee, either expressed or implied, regarding future performance, life, insurability, merchantability, workmanship, and/or need for repair of any item inspected. Please note that any liabilities associated with Asbestos including surveys, identification and removal have been excluded.

The components of the property included in the scope of the inspection, if present and applicable, include: structural foundations, primary load-carrying framing members, roof surface, façade structure, and miscellaneous items related to the property. The scope of the inspection is specifically in relation to structural elements and hence general building defects which are not structurally significant may not be included.

2.3 Survey Methodology

Initially a desk top study was completed through research of online records and available archive information. The desk study considers site-specific historical, geological and environmental characteristics such as the expected soils condition and if the site is within a flood zone. It also includes a review of the existing available information provided by the client. From this we are able to determine the expected construction type and materials used and plan the survey accordingly.

Once the nature of the site and surrounding areas has been recorded the more detailed inspection of the building can take place. This includes an appraisal from the inside and outside of the building. A visual appraisal is completed on every level with a more detailed assessment completed at intermittent floors, always including roof level, top floor and ground floor.

If archive drawings are unavailable the structural form of the building is determined by searching for the areas where the underlying structure is visible such as plant rooms, bin stores or service cupboards.

The integrity of the building is assessed searching for signs of structural movement, material decay and inspecting the condition of the structural elements.

Below is a list of completed actions for each area inspected:

ACTION	POINTS CONSIDERED
INSPECT ROOF AREA	• Check for signs of cracking at junctions • Check levels • Check for obvious defects
CHECK FINISHES IN FLAT/COMMUNAL AREAS	• Review each area for damages to finishes which may be caused by structural movement
SEARCH FOR CRACKS IN STRUCTURE	• Search for cracks in structure, in particular at junctions between elements • Are cracks penetrating structure • Follow the trail of the crack to assess cause
CHECK FLOOR/CEILING LEVEL	• Sagging ceiling or unlevel floors may indicate deficient design or overloaded floor plates
INSPECT CUPBOARDS	• Inside cupboards underlying structure often visible • Finishes may not have been updated and therefore provide insight into original features

ASSESS CLADDING FIXINGS	• Search for access to view cavity • Search for defects of failed wall ties such as bulging walls, cracking and separation of window reveals • Check for lifting/sagging of lintels
CHECK OPERATION OF DOORS/WINDOWS	• Search for windows and doors which are out of square, binding, cracks in the architraves
SEARCH FOR MATERIAL DEFECTS	• Identify materials used and known issues with material
INSPECT PLANT ROOMS AND SERVCE ROOMS	• Areas often without finishes revealing underlying structure • Often structural form and key elements visible
INSPECT EACH ELEVATION EXTERNALLY	• Search for cracks and/or signs of structural movement
IDENTIFY OVERHANG STRUCTURES	• Search for overhang structures • Inspect for visible defects
ASSESS STAIR CORE	• Often shear core providing stability • Stair form (precast/in-situ)
INSPECT GROUND FLOOR	• Search for vents to determine if floor is ventilated / suspended • Check levels

Table 1: Site Survey Actions

Reference shall be made to Table A of BRE Digest 292 "Cracking in Buildings" 2nd Edition (2016)

Table A: Classification of damage and repair for different crack widths

Category of damage	Description of typical damage *(Ease of repair in italics)*	Approximate crack width
0	Hairline cracks of less than about 0.1 mm width are classed as negligible.	Up to 0.1 mm
1	Perhaps isolated slight fracturing in building. Cracks rarely visible in external brickwork. *Fine cracks of up to 1 mm width can be treated easily using normal decoration.*	Up to 1 mm
2	Cracks not necessarily visible externally. Cracks can be filled easily. *Redecoration probably required. Recurrent cracks can be masked by suitable linings.* Some distortion to doors and windows, which may stick slightly. *Some external repointing may be required to ensure weathertightness.*	Up to 5 mm
3	Doors and windows sticking. Service pipes may fracture. Weathertightness often impaired. *The cracks will require some opening up and can be patched by a mason. Repointing of external brickwork and possibly a small amount of brickwork to be replaced.*	5–15 mm or several, each up to 3 mm
4	Window and door frames distorted, floor sloping noticeably*. Walls leaning or bulging noticeably*. Some loss of bearing in beams. Service pipes disrupted. *Extensive repair work involving breaking-out and replacing sections of walls, especially over doors and windows.*	15–25 mm, depending on number
5	Beams losing bearing, walls leaning badly and requiring shoring. Windows broken with distortion. Danger of instability. *This requires a major repair, involving partial or complete rebuilding.*	Usually greater than 25 mm, depending on number

* Local deviation of slope, from the horizontal or vertical, of more than 1 in 100 will normally be clearly visible. Overall deviations in excess of 1 in 150 are undesirable.

Table 2 – BRE Digest 292 Table A

2.4 Potential Material Defects

Material defects in concrete and brickwork buildings can have various causes and can affect different components of the structure. Here's a list of common material defects in concrete and brickwork buildings:

<u>Concrete Defects:</u>

1. Honeycombing: Incomplete filling of the concrete mix, leading to voids or honeycomb-like structures within the concrete.

2. Cracks: These can occur due to various factors, such as shrinkage, settlement, overloading, temperature changes, or inadequate reinforcement.

3. Spalling: Concrete surface peeling or chipping off due to freeze-thaw cycles, corrosion of embedded reinforcement, or poor quality concrete.

4. Efflorescence: White, powdery deposits on the surface caused by the migration of soluble salts to the surface and their crystallization.

5. Alkali-Aggregate Reaction (AAR): Also known as "concrete cancer," it's a chemical reaction between alkaline cement paste and certain reactive aggregates, causing cracking and deterioration.

6. Corrosion of Reinforcement: Exposure to moisture and chloride ions can lead to corrosion of the steel reinforcement, weakening the structure.

7. Shrinkage Cracks: These cracks occur as the concrete dries and shrinks, especially if curing was not adequately done.

8. Carbonation: Carbon dioxide reacts with the alkaline compounds in concrete, lowering the pH and potentially affecting the passivation of steel reinforcement.

9. Presence of High Alumina Cement(HAC): HAC was widely used in the manufacture of structural pre-cast concrete in the 1960’s as it accelerated curing. However HAC is found to be prone to a conversion process which could result in the concrete being reduced in strength.

<u>Brickwork Defects:</u>

1. Spalling: Similar to concrete, bricks can also spall or chip off due to freeze-thaw cycles, corrosion of embedded materials, or poor-quality bricks.

2. Efflorescence: As with concrete, bricks can also experience the migration of soluble salts to the surface, resulting in efflorescence.

3. Cracking: Bricks may crack due to structural movement, settling, or improper bonding.

4. Dampness: Bricks are porous, and excessive moisture penetration can lead to damp patches, staining, and deterioration.

5. Leaning or Bulging Walls: Improper construction, foundation issues, or lateral forces can cause brick walls to lean or bulge.

6. Mortar Joint Defects: Problems with the mortar used to bond bricks, such as inadequate strength, poor adhesion, or weathering.

It's important to note that these defects can vary in severity, and timely inspection, maintenance, and repairs are essential to ensure the safety and durability of concrete and brickwork buildings. As part of this survey we will inspecting for common signs of the above defects and in some cases may require further investigative works to determine their presence.

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3 Desk Top Study

3.2 Existing Information

To date we have been provided with schematic floorplans for the building and a Fire Risk Assessment dated 17th January 2024.

We have not been provided with any existing calculations for the property.

3.3 Desktop Study: Ground Conditions

Our scope of works did not include intrusive ground investigations or soil testing. In absence of such data, we have undertaken a desktop study to identify the likely founding strata of the property. The British Geological Survey (BGS) produces maps which highlight the general ground conditions around Britain.

The bedrock is the 'Alveley Member– mudstone. Superficial deposits sit on the older deposits referred to as bedrock.

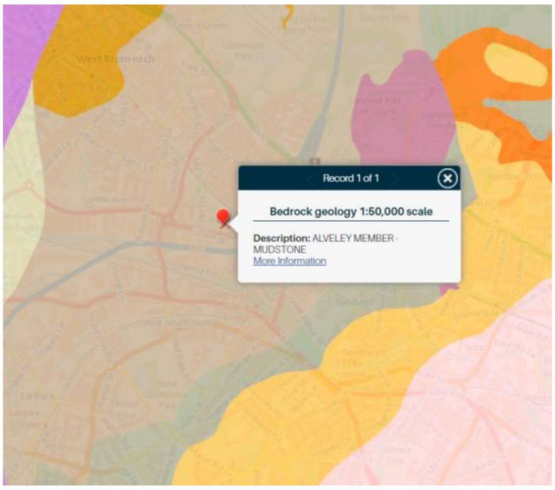

Figure 2. Bedrock Geology

For the site, the superficial deposits are an unspecified 'Till'.

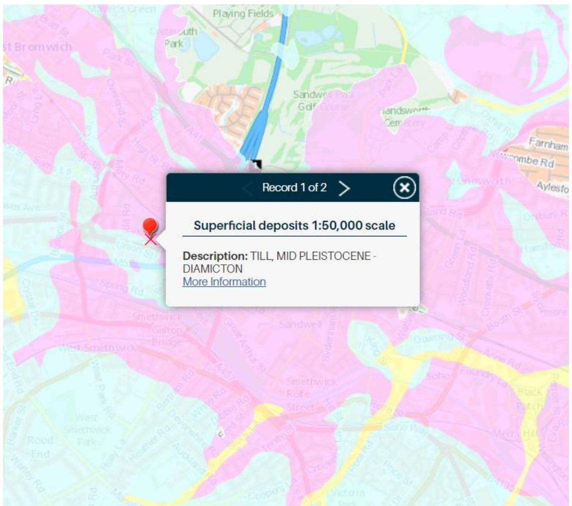

Figure 3. Superficial Geology

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3.4 Desktop Study: Flood Zone .

Flood zones have been created by the Environment Agency (EA) as a starting point in determining how likely a location is to flood.

There are 3 flood zones as defined by the EA; Flood Zone 1, 2 and 3. The flood zones are based on the likelihood of an area subject to flooding, with Flood Zone 1 areas least likely to flood and Flood Zone 3 areas more likely to flood. The property is in Flood Zone 1 i.e. less than 0.1% chance of flooding from river or sea in any year.

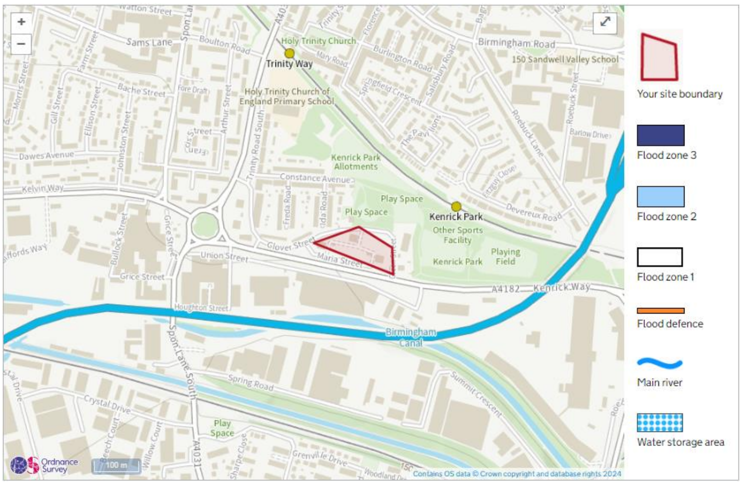

Figure 4. Flood Risk from Environmental Agency

4 Structural Form

4.1 Description of Building

The existing building is an 17 storey purpose built residential housing block containing 64 dwellings understood to be built in circa 1965 by contractor Wates for West Bromwich County Borough Council as part of the Kenrick Estate. The typical structure is constructed as a reinforced concrete frame which was cast in-situ with an RC slab supported off cast in-situ RC walls/columns which stack vertically throughout. The concrete beams and columns are at regular centres, and distributed evenly across the building.

Given the scale of the existing structure we would expect that the main foundation system is either a series of reinforced concrete pile caps and ground beams or a reinforced concrete raft foundation. Both of these systems will have reinforced concrete piles extending into the bedrock to a significant depth.

The fire resistance of the structural frame is provided by the concrete cover of the steel reinforcement elements. The cover is unknown and requires confirmation with further investigations, therefore the fire resistance can't be confirmed.

Vertically, the building is stabilised in two orthogonal directions by shear walls adjacent to the lift and stair cores. The in-situ floor slabs, which are effectively tied to the column heads, act as a diaphragm to provide horizontal stiffness.

The building has a flat concrete roof.

The typical floor plan of each storey is formed of a rectangular block with the cores placed. The staircase is in-situ reinforced concrete supported at each landing level and half landing level. The internal partition walls are unknown but presumed blockwork with masonry at ground floor.

The gable end elevations were originally clad in brickwork supported at each level on exposed concrete nibs. The balconies and side elevations are now clad in laminated panels after a refurbishment with architects BM3 in 2011 with the front and rear in rendered panels.

Figure 5. Greenford is building to the front before refurbishment

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4.2 Structural Design Type

In order to comply with the Building Safety Act 2022 the block owner will need to register the structural type with the Building Safety Regulator. As part of the registration process the building material information is required which is indicated in Table 3.

Structure design type	
Composite steel and concrete	
Concrete large panel system - 1960's	
Concrete large panel system - 1970's onwards	
Modular - concrete	
Concrete - other	X
Lightweight metal structure (aluminium)	
Masonry	
Modular - steel	
Steel frame	
Modular - other material	
Modular Timber	
Timber	
None of these	

Table 3: Structure Design Type

4.3. Structural elements

Figures 6 indicates the assumed structural layout for a typical upper floor level.

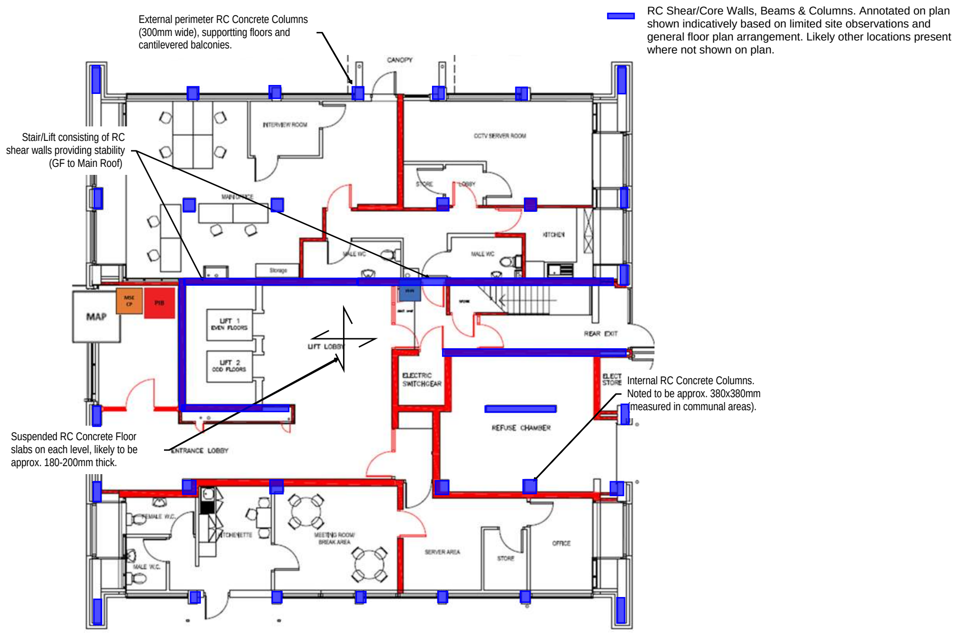

Figure 6: Diagram of typical floor plan

Table 4 Below is a summary table of the key structural elements

Item	Notes
Original and Current design intent	The building is purpose-built for residential use.
Key Materials (Are there any Precast Concrete Elements)	The main structural material is concrete, brickwork at ground floor exterior perimeter wall, internal block infill (non-load bearing walls).
Design Loading Parameters	We assume that the building was designed to the current British Standard Code of Practice of the time which was: British Standard Code of Practice 3, Chapter V 1952: Imposed Loading Residential Floors = 40lb/ sqft (equivalent to 1.92kN/sqm) Flat Roof with access = 30lb / sqft (equivalent to 1.44kN/sqm) Stairs and Landings = 60lb/sqft (equivalent to 2.88kN/sqm) British Standard Code of Practice 114 1957 The structural use of normal reinforced concrete in buildings
Have there been any refurbishments	Refurbishment works carried out in 2010 to façade/cladding.
Primary Load Bearing System (Beams, columns, wall?)	Insitu Reinforced concrete frame construciton consisting of concrete walls and columns. The foundations were not exposed for the inspection, but are presumably deep piles.
Secondary Load Bearing System (floors)	Suspended in-situ reinforced concrete floor slabs. Stair landings noted to be approx. 220mm and it is assumed for the remaining floor slabs to be of a similar thickness.
Stability System - Horizontal and Vertical	The vertical stabilty is achieved via a mixture of RC Walls and Columns transmiting loads from each level to the foundations. The horizontal stability is achieved from the shear core walls (lift/stair cores) with the concrete floors acting as a structural diaphragm.
Claddings and fixings	External masonry brick walls at ground floor perimeter, upper floors noted to be rendered and cladding noted to balconies. There appears to be a concrete panel façade external to the staircase areas.
Roof Build-Up	Roof consists of suspended insitu RC concrete slab with insulated PIR boards and roof coverings. Parapet walls to roof perimeter.
Description of any basements	N/A
Description of any cantilevered elements - Type(Juliet, cantilever, hung, stacked)	There are balconies at each floor. Canopy glass shelter to entrance.
Fixing method for cantilevered element	Balcony floors appear to be part of the in-situ concrete floor and supported via the perimeter columns. Glass shelter supported via steel beams fixed to main structure.
Cantilevered element structural and decorative materials	Balcony faces covered with cladding/façade.
Dimension Cantilevered element	Approx. 1m.
Current Structural Condition (Poor, fair, good, excellent)	Fair
Signs of structure not performing correctly (movement or failure)	None observed
Finishes in flat	No access to apartments
Structural Cracks Visible?	None observed
Floors and Wall Levels	Fairly level
Condition of Elevations	Fair

Table 4: Summary of Key Structural Elements

Figure 7 describes the load path for a RC framed building such as this. The loads distribute from the RC floor plates to the supporting load bearing RC walls/columns. The walls/columns are supported off the foundations which disperse the loads into the ground. The current foundation system is unknown but is presumed to be a reinforced concrete piled system.

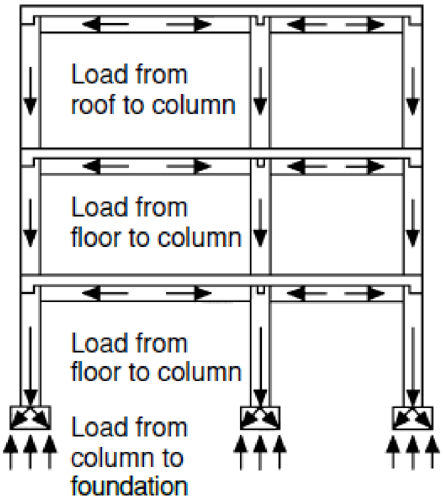

Figure 7 describes the vertical load path for the buildings

4.4 Robustness and Consequence Class

Avoiding disproportionate collapse is a critical concept for the design of new buildings and checking existing ones. It has to be accepted that explosions, usually gas, do occasionally occur and can cause severe damage to residential properties. Avoiding disproportionate collapse ensures that the structure of a building is designed or strengthened to ensure that damage is relatively limited.

The requirement was a consequence of the Ronan Point Large Panel System (LPS) building disaster of 1968. The Ronan Point enquiry produced recommendations (MHLG Circular 62/68) requiring all LPS blocks to be tied together. The initial recommendation referred to buildings with piped gas and required the structure to withstand a force of 34 kN/m^2. Another MKHG circular followed a few months later (71/68) which required a similar approach to buildings where gas was not supplied or had been removed but the pressure which the structure had to withstand was 17 kN/m^2.

The current building regulations (Part A – Structure) are regularly revised and include requirements for robustness to be included, specifically the horizontal tying requirement, to apply to all residential blocks, regardless of height. This emphasises the need when assessing existing buildings with regards to the building regulations, for judgement, research and experience to be applied. Regulation 8 of the regulations places a limit on all requirements such that they "shall not require anything to be done except for the purposes of securing a reasonable standard of health and safety for persons in and about the building".

The requirements for buildings depend on it's "consequence class" as described in Table 11 of Part A of the building regulations 2010.

Class	Building type and occupancy	Summary requirements
1	• House not exceeding 4 storeys. • Agricultural buildings. • Buildings into which people rarely go.	• No additional measures are likely to be necessary.
2A	• 5 storey single-occupancy houses. • Hotels, apartments and other residential buildings not exceeding 4 storeys. • Offices not exceeding 4 storeys. • Industrial buildings not exceeding 3 storeys. • Retailing premises not exceeding 3 storeys of less than 2000 m^2 floor area in each storey. • Single-storey educational buildings. • All buildings not exceeding 2 storeys to which members of the pubic are admitted and which contain floor areas exceeding 2000 m^2 at each storey.	• Horizontal ties, OR • Effective anchorage of floors to walls, as described in the codes of practice.
2B	• Hotels, apartments and other residential buildings exceeding 4 storeys, but not exceeding 15 storeys. • Educational buildings greater than 1 storey, but not exceeding 15 storeys. • Retail premises greater than 3 storeys but not exceeding 15 storeys. • Hospitals not exceeding 3 storeys. • Offices greater than 4 storeys but not exceeding 15 storeys. • All buildings to which members of the pubic are admitted and which contain floor areas exceeding 2000 m^2 but less than 5000 m^2 at each storey. • Car parking not exceeding 6 storeys.	• Horizontal ties and vertical ties as described in the codes of practice, OR • Show that the removal of a wall or column will cause only limited damage, OR • Design as 'key elements'.
3	• All buildings defined above as Class 2A and 2B that exceed the limits on area and/or number of storeys. • All buildings, containing hazardous substances and/or processes. • Grandstands accommodating more than 5000 spectators.	• Systematic risk assessment.
Note Basement storeys may be excluded provided they meet Class 2B criteria		

Table 5: Building Type and Consequence Class

Greenford House is classified as a Class 3 building. There are effectively three approaches to determining compliance.

1. Compliance with tying rules
2. That the removal of a wall or column will cause only limited damage
3. Showing that "key elements" and "non-removable" – i.e. can withstand the accidental loading requirements discussed above.

It is very complex to accurately model the behaviour of a building under explosive loadings but recognised techniques, combined with engineering judgment enable a reasonable assessment to be made. In this case, the form of construction predates mandated robustness requirements and relies on the tying between floors and beams which are inherent to this form of construction, however extensive intrusive investigations and a detailed analysis would be required to confirm compliance.

In addition as the building is classified as a Class 3 building, a systematic risk assessment to determine whether there are any hazard scenarios that have an unacceptable level of risk and if so to identify steps to mitigate those risks. BS EN 1991-1-7 presents a flow diagram of the overall risk analysis procedure, shown in figure 8.

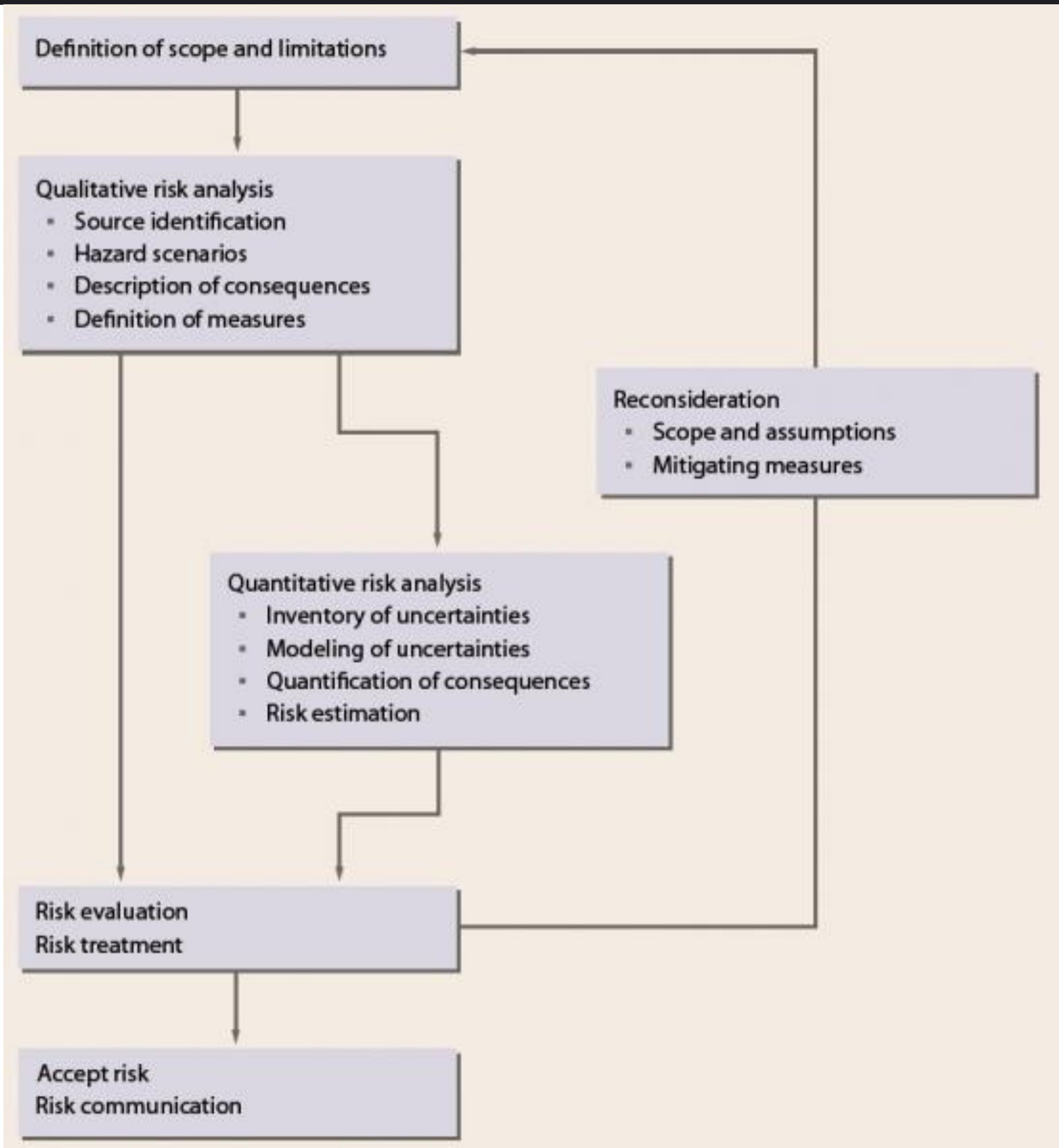

Figure 8: Systematic Risk Assessment Procedure as per BS EN 1991-1-7

5 Site Inspection

The inspection took place on 24/07/24 and the findings have been recorded in this report. The scope of the inspection included limited, visual observations of the interior and exterior of the structure and was viewed from ground level. The report contains a limited amount of photographs taken during the inspection.

5.1 External Walls Elevations

The exterior elevations were generally in ok condition and no significant structural defects were noted to the cladding panels. There were no significant cracks or tell-tale signs of any significant structural movement noted at the time of our inspection.

The external cladding system is formed of a mix of laminated panels on the balconies to the side elevations, a Wetherby Insulated Render System with 100mm mineral wool to the front and rear and full height precast panels cladding the central elevations. The ground floor is non load-bearing masonry. The contractor is understood to have been MIB Facades Limited.

The exterior panels were noted to be plumb with no signs of significant bowing, bulging or leaning noted to the panels indicating failed fixings however their presence and condition cannot be confirmed.

There are balconies at each level which have been clad in High Pressure Laminate panels.

Figure 9 and 10: Front and side Elevations

5.2 Roof

The flat roof structure is a reinforced concrete cast slab with perimeter RC parapet wall allowing safe access. There is an enclosure which partially covers the roof area comprising the lift plant. This structure is formed of solid masonry walls.

There were no tell-tale signs of any significant structural movement noted at the time of our inspection. The exterior walls were noted to be plumb with no signs of significant bowing, bulging or leaning noted to the masonry walls.

The roof has a single ply membrane finish. The exact build-up of the roof finishes were not accessible at the time of inspection. It is recommended an intrusive survey of the roof finishes is completed by a specialist surveyor to assess the condition of the roof covering.

Figure 11 and 12: Roof Level

5.3 Typical Floor Plan

The stair core and landing areas of every level were inspected with more detailed assessments made at third points over the height of the building. Refer to Appendix A for site records.

The floors in the communal landings were noted to be solid concrete floors. The floors were checked with a spirit level and were considered level and within tolerance. The doors and windows to the communal landings from the stair core all appeared to be level and opened and closed without difficulty. There were no signs of structural movement detected.

There were vertical concrete walls supporting the floor plates at every level.

The interior of the stair core walls were checked and were plumb and in line with observations made to the exterior – no significant signs of leaning or movement noted. The concrete appeared in fair condition with few BRE category 1 cracks but no structurally significant defects were noted.

The stair stringer was noted to be 130mm thick which is less than we would expect to modern standards, a cover test is required to check the resistance of the concrete section in the event of a fire.

Figure 13 and 14: Vertical RC Structure Visible

Figure 15 and 16: Staircase Stringer and clad column at ground floor

5.4 Summary Key Elements

To assist in compiling the Building Safety Case Report a summary table of the key structural elements which may be included as suggested in the Building Safety Act 2022 has been compiled with highlighted cells indicating areas of missing information which require further investigations.

ELEMENT	FINDING
PRIMARY MATERIAL OF CONSTRUCTION	• Reinforced Concrete – Intrusive investigations required
TYPE OF BUILDING	• Concrete Frame
PRIMARY LOAD BEARING SYSTEM	• Cast Concrete Floors on RC Frame
STABILITY SYSTEM	• Shear Walls
CLADDING SUPPORT SYSTEM AND FIXINGS	• Retrofit rendered panels and laminate boards
ROOFING MATERIALS	• Flat RC slab – Single ply membrane
FOUNDATIONS	• Presumed Piled System but unknown
BALCONIES	• Every level cast concrete
OTHER OVERHANG STRUCTURES	• NA
BUILDING CONSEQUENCE CLASS	• Class 3 as per Part A of Building Regulations

Table 6: Key Structural Element Summary

Refer to Appendix A for detailed photographic record of the salient structural elements recorded.

6 Conclusions and Recommendations

The findings of this report are that the existing structure is generally sound and appeared to be in a fair condition for its age. There were no tell-tale signs of any significant structural movement or cracks which fall in the BRE Category 3 or above.

We expect mechanical fixings between the external rendered panels and original façade. There are no signs the wall ties have failed.

We suggest an archive search for original design information from the original contractors Wates.

As the building is classified as a Class 3 building, a systematic risk assessment to determine whether there are any hazard scenarios that have an unacceptable level of risk and if so to identify steps to mitigate those risks. Refer to Figure 8 for the risk analysis procedure.

There are no signs of ground movement across the footprint of the building therefore although we can only assume the piled foundation type we do not deem it a pressing matter to perform the intrusive and costly trial pits which would be required to confirm their presence. These should be included in the scope at the next major structural intervention works to the building.

Due to the age of the building it is wise to perform periodical health checks to the concrete elements. This should include tests for concrete strength, cover depth, carbonation, chlorides and HAC. It would appear that these tests have never been performed to this building and therefore we recommend engaging a specialist contractor within the next 24 months who will be able to perform the tests and provide a interpretive report.

Regular maintenance is crucial to preserving the property's condition and preventing future issues. The building is to be surveyed at regular 5 year intervals to inspect for signs of movement, structural decay and/or defects.

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Appendix A – Structural Elements Survey

Unit 3,
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Greenford House

Unit 3,
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Project Details

Name: Greenford House

01752 977147 info@firntec.com www.firntec.com

Unit 3,
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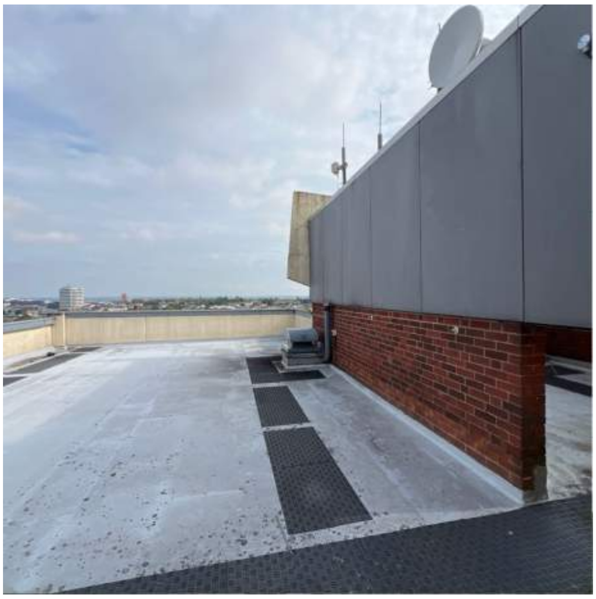
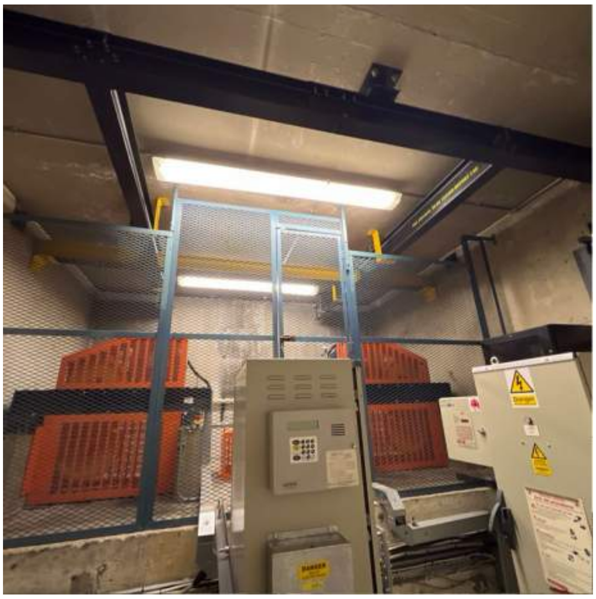
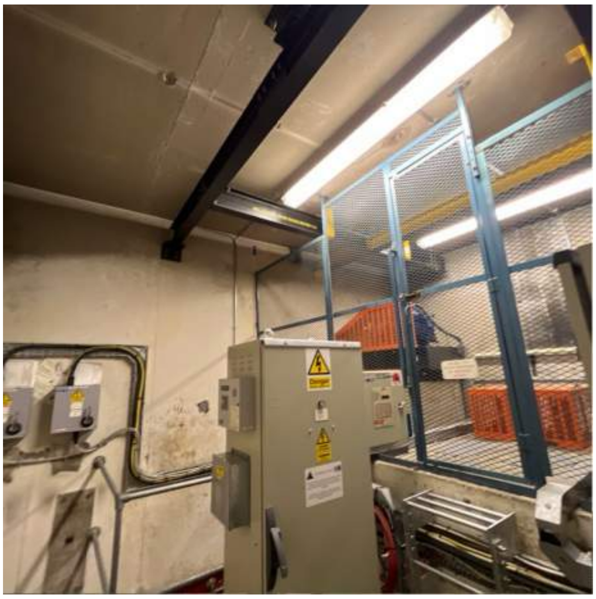
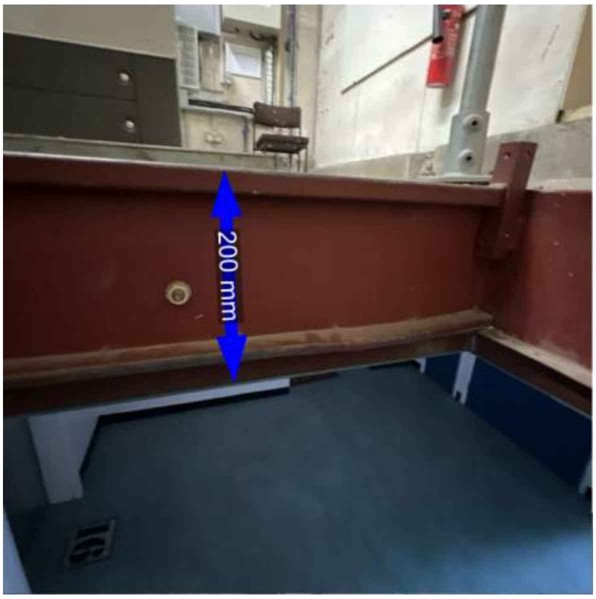
Main Roof









Comments:

Lift motor room located on roof formed of masonry walls.
Parapet walls noted to perimeter of roof.
Insitu concrete roof slab with insulated PIR Boad and roof coverings.

Unit 3,
Endeavour House,
Longbridge Road,
PL6 8LR

16th Floor Hallway

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FIRNTEC BUILDING COMPLIANCE

Unit 3,
Endeavour House,
Longbridge Road,
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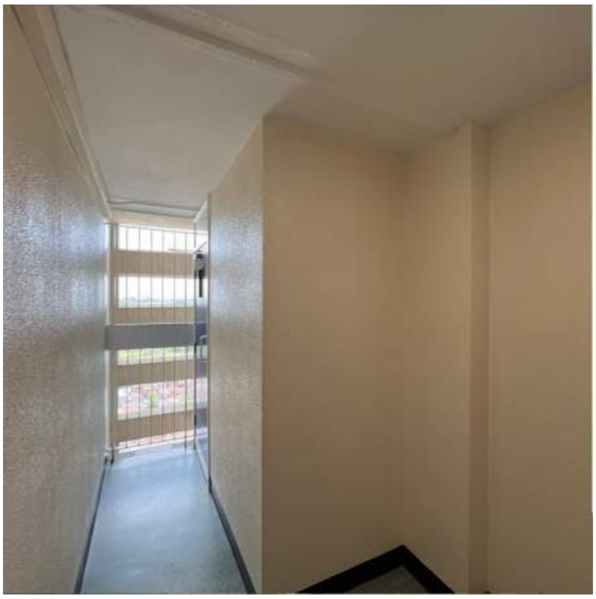

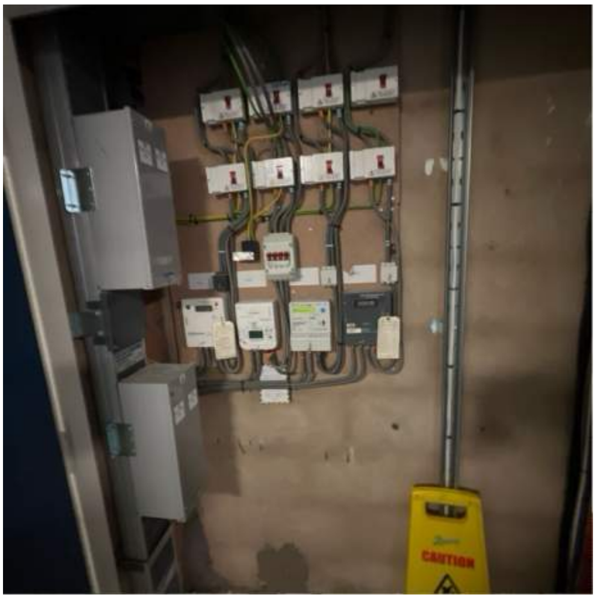

Comments: No jams or distortions noted to hallway doors to indicate any serviceability issues. Generally walls covered with finishes in hallway, likely to consist a mixture of concrete shear walls, embedded columns and block infill walls.
Electrical cabinet shows infill blockwork with render on top.
Dry riser cupboard shows some exposed concrete (likely embedded concrete column).

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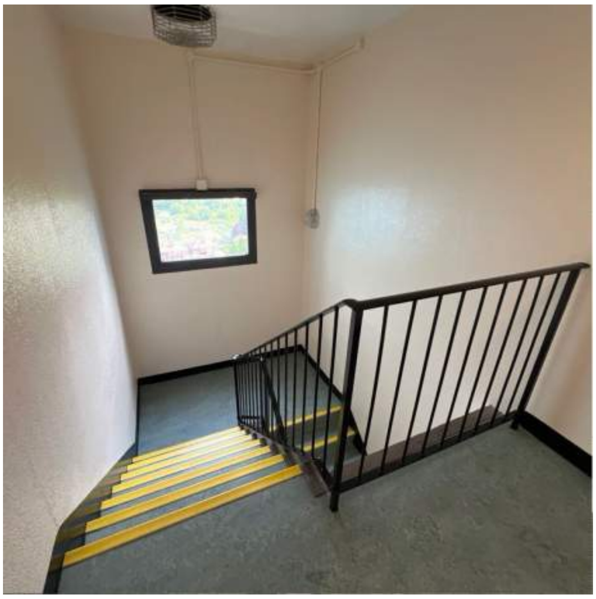
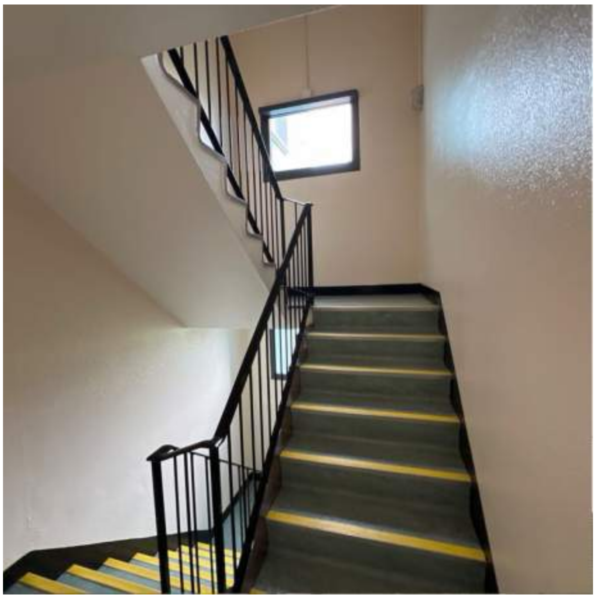
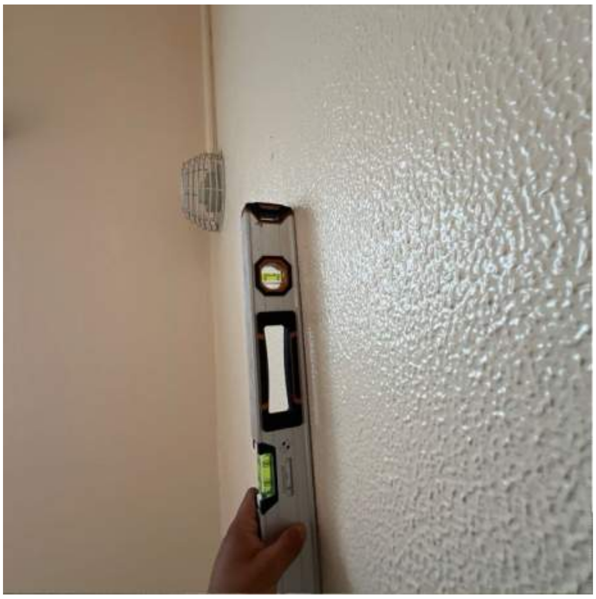
16th Floor Staircase

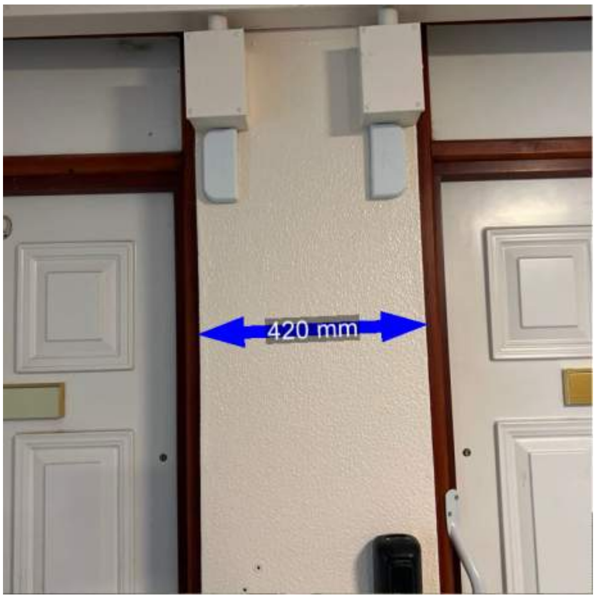


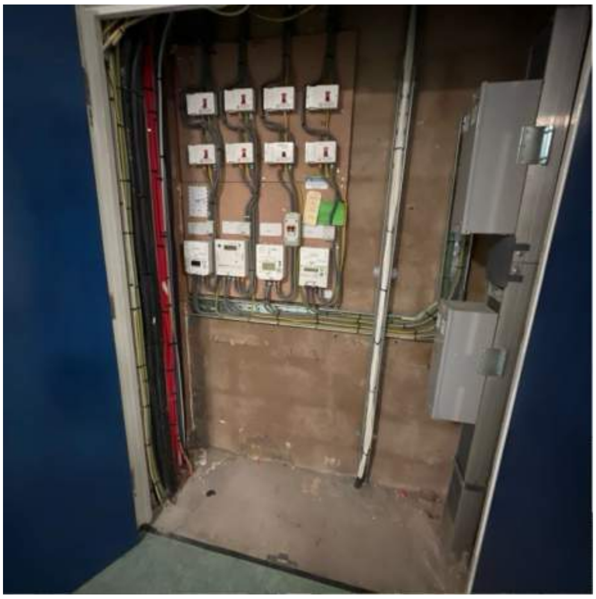



Comments:

Insitu concrete stairs with steel hand railing fixed to stairs. Walls and floors appear to be faily level.
Stair walls covered with finishes however these would likely form the main concrete shear core walls.
Floor slab measures from stair platform appears to be approx. 220mm thick.

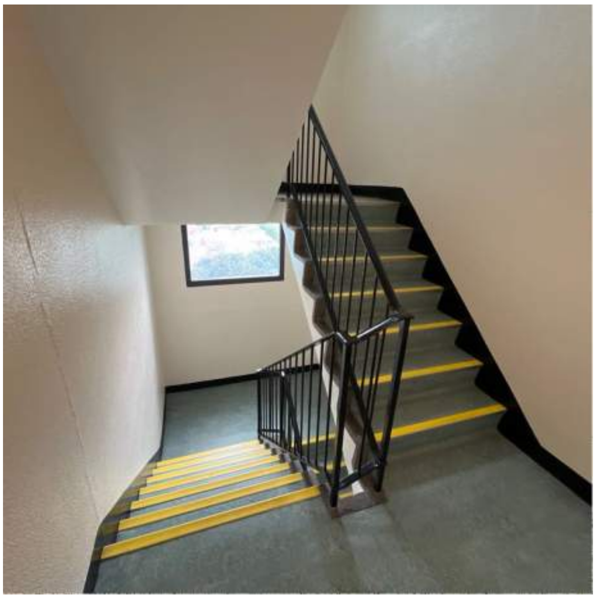
8th Floor Hallway

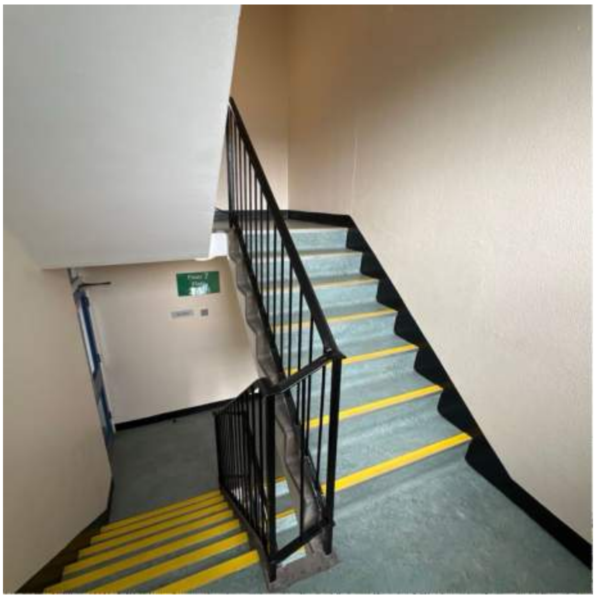


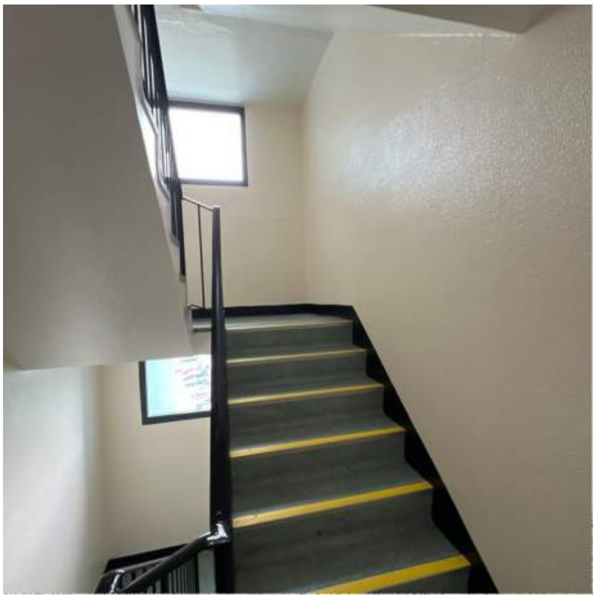


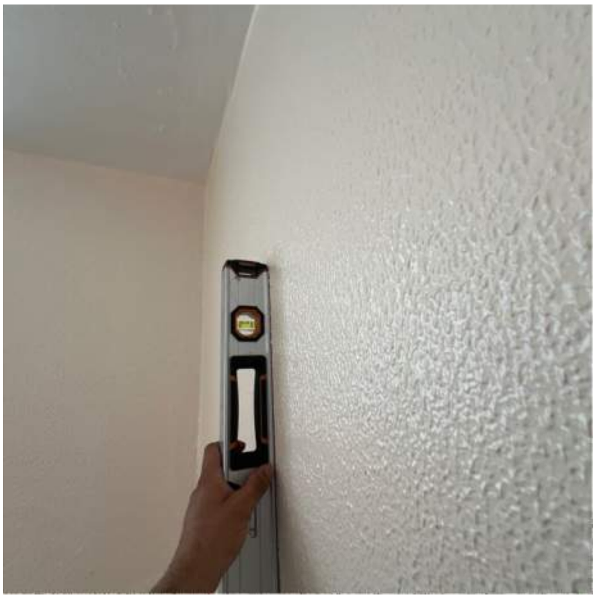
Comments: No jams or distortions noted to hallway doors to indicate any serviceability issues.
Generally walls covered with finishes in hallway, likely to consist a mixture of concrete shear walls, embedded columns and block infill walls.
Electrical cabinet shows infill blockwork with render.
Dry riser cupboard shows exposed concrete likely to form part of stair shear core wall.

8th Floor Staircase









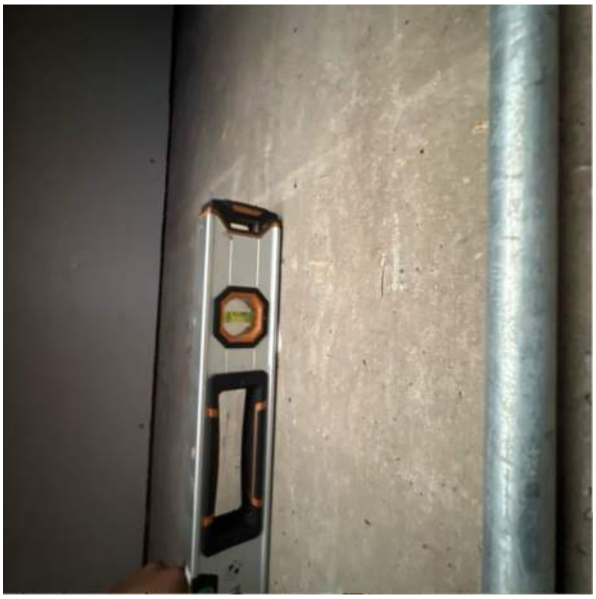
Comments:

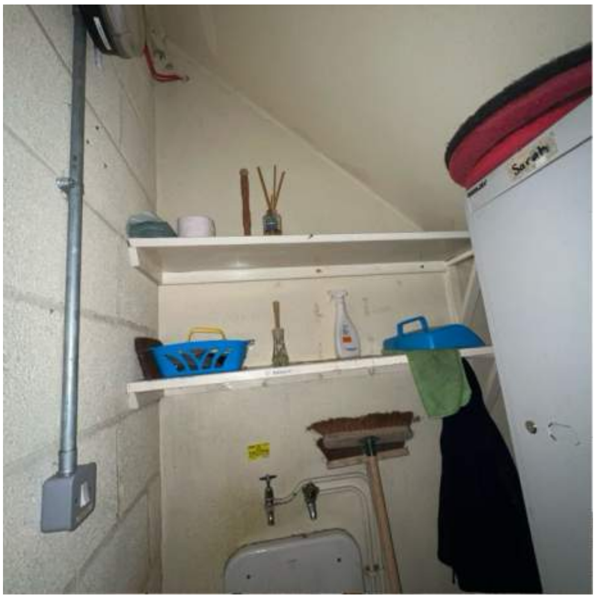
Insitu concrete stairs with steel hand railing fixed to stairs. Walls and floors appear to be faily level.
Stair walls covered with finishes however these would likely form the main concrete shear core walls.

Floor slab measured from stair platform appears to be approx. 200mm thick.

Ground Floor Hallway





Comments: No jams or distortions noted to hallway doors to indicate any serviceability issues. Generally walls covered with finishes in hallway, likely to consist a mixture of concrete shear walls, embedded columns and block infill walls.
RC Concrete Shear Core wall of lift visibly noted from riser cupboard and meterage room.
Other internal main walls noted to solid concrete walls, these are likely to be shear core walls forming partof the primary structural elements.

Bin Store

Unit 3,
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Comments:

Shear concrete walls (300mm wide including finishes) and embedded concrete columns (approx. 300mm wide) noted in bin store and storage areas. Concrete infill (non-load bearing walls) noted.

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Elevations




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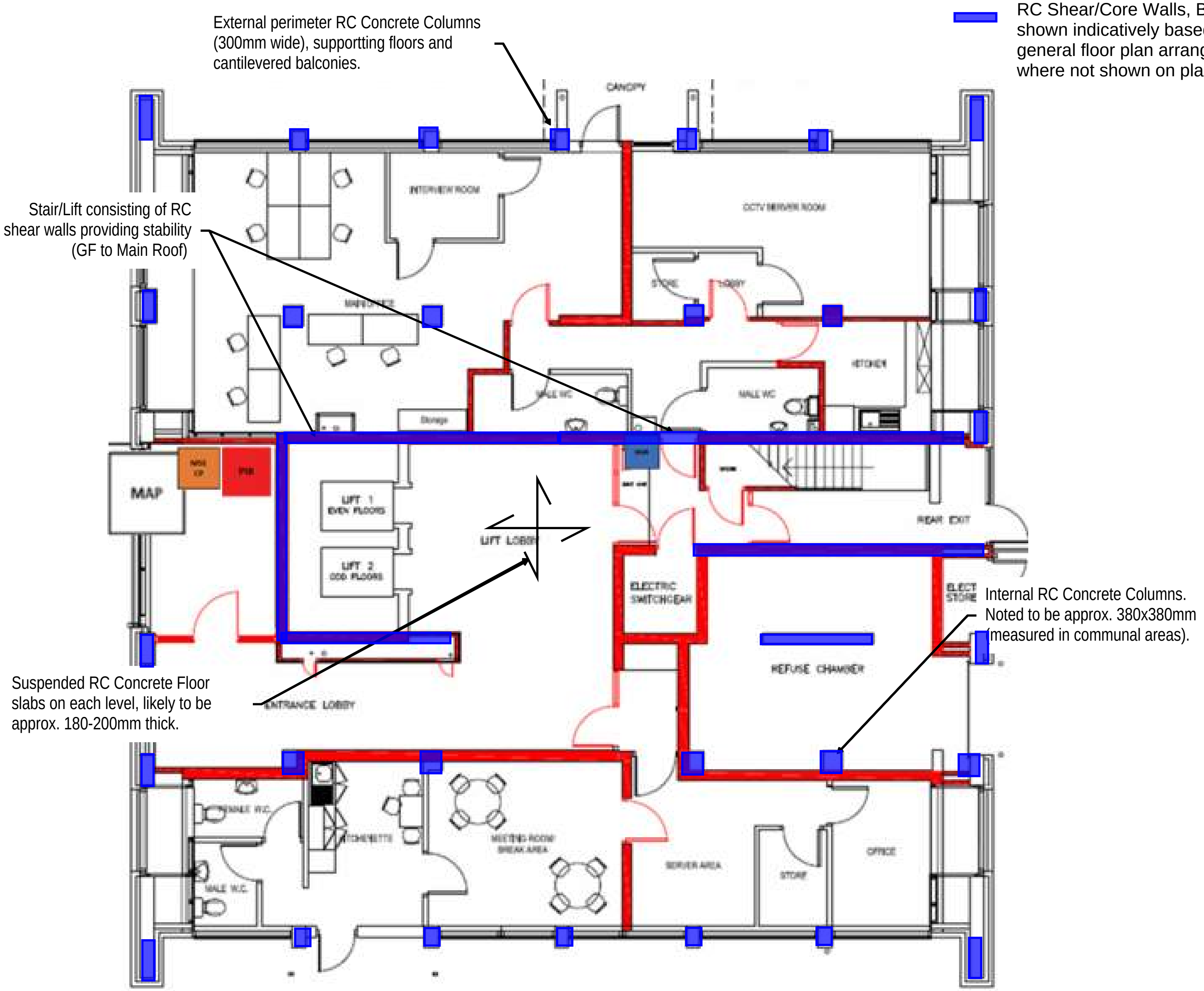
Comments:

External ground floor level consists of brick work.
Upper floors noted to have a rendered facade and cladding to balconies.
Concrete columns (300mm wide) noted to perimeter which form part of the primary structural elements of the building.
Staircase exterior appears to have a concrete panel facade feature.

RC Shear/Core Walls, Beams & Columns. Annotated on plan shown indicatively based on limited site observations and general floor plan arrangement. Likely other locations present where not shown on plan.



GREENFORD HOUSE
TYPICAL FLOOR LAYOUT

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