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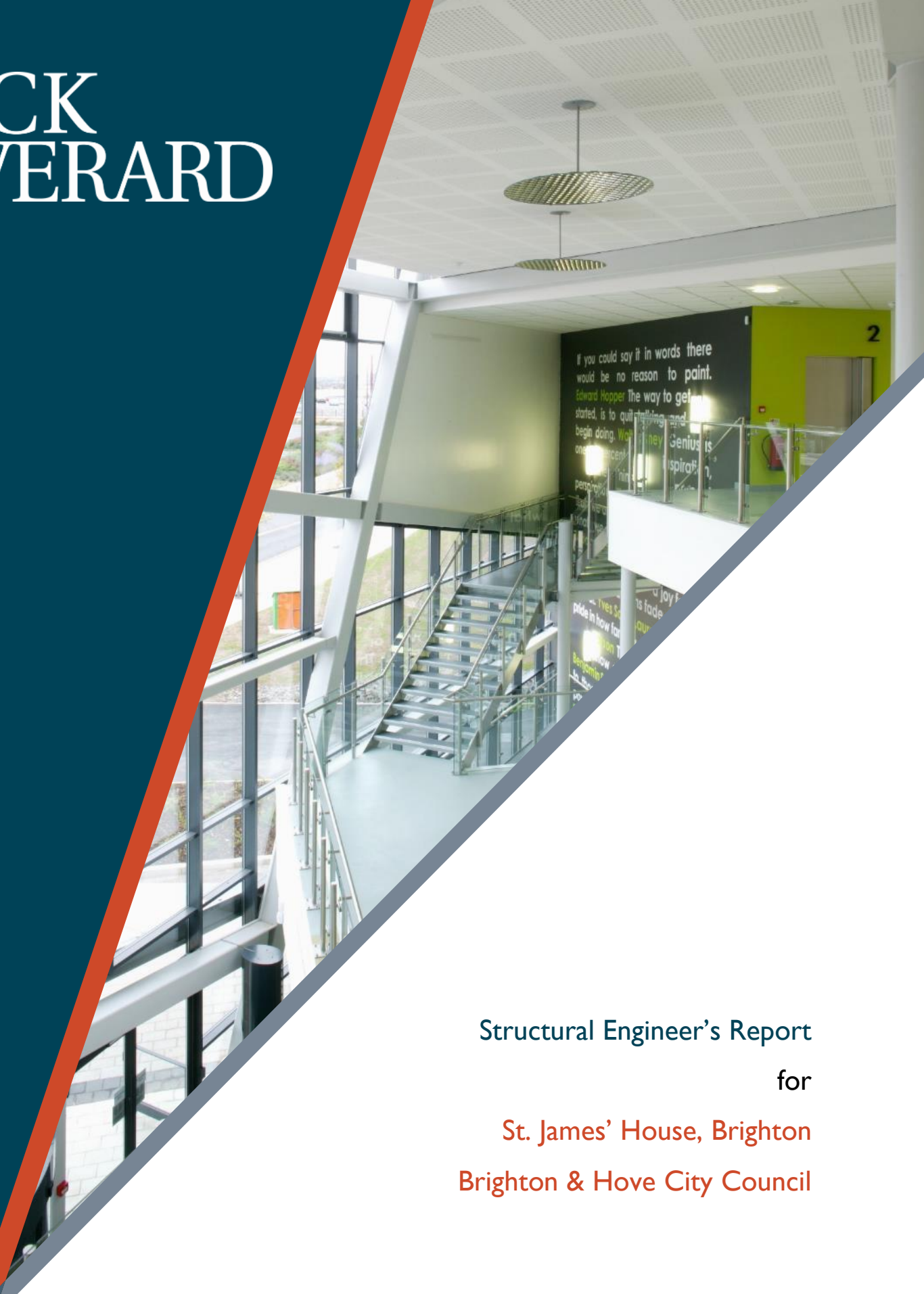


Structural Engineer's Report

for

St. James' House, Brighton

Brighton & Hove City Council

Issue Number 01
11 July 2019

Document History

Issue	Date	Comment	Author	Chk'd
01	11.07.19	First Issue	IAA	IPR

Contents

1.0 Reference and Instruction

1.1	PE Report Reference	:	STR/IPR/IPG/190215/17-2/R006 – Issue 01
1.2	Client	:	Brighton & Hove City Council
1.2.1	Address	:	Housing Centre Unit 1 Fairway Trading Estate Eastergate Road Moulsecoomb Brighton BN2 4QL
1.2.2	Telephone Number	:	[redacted]
1.3	Inspected Property	:	St. James' House High Street Brighton BN2 1RW
1.4	Occupier	:	Various tenants and leaseholders
1.5	Inspecting Engineer/Surveyor	:	[redacted]
1.6	Instruction		
1.6.1	Mode	:	Purchase Order
1.6.2	Reference	:	BHC0608879/0
1.6.3	Instructed by	:	Geof Gage
1.6.4	On behalf of	:	Brighton & Hove City Council

1.7 Brief

Site Inspection and Investigation Works

- To carry out a visual, non-intrusive inspection of the tower block superstructure, externally from ground level with the use of binoculars, and internally to accessible communal areas and to void flats or flats where residents had requested or agreed an internal inspection.
- To particularly focus on inspection of exposed surfaces at panel connection locations, to inform decisions regarding any further investigations, to establish hidden connection details and condition, not included in this brief (the brief did not require opening up and inspection at typical connection details at this time).
- To carry out carbonation testing and High Alumina Cement (HAC) testing to a sample of concrete from each elevation of the block at ground floor level only.
- To identify any obvious Fire or H&S risks associated with the structural observations (not a full Fire or H&S assessment of the building)

Reporting

- Following the site inspection and investigation works, to provide a report with comment on findings, the nature and cause of any damage; and recommendations on such further investigations as might be necessary to ascertain the cause of the damage and/or the type and scope of possible remedial measures.

2.0 Scope of Investigations and Report

In accordance with the aforesaid instructions, the following investigations have been undertaken:-

(a) A visual inspection of the superstructure
(b) On site carbonation testing of concrete samples from each elevation at ground floor level, using Phenolphthalein Solution on freshly broken concrete samples.
(c) Laboratory HAC testing of concrete samples taken from site.
(d) In addition, a desktop review of the following documents was undertaken:
   a. Feasibility Report for Additional Lift Shaft door openings from 2013, by Frankham Structural Engineers, provided by the Council.
   b. Online Geological maps

The investigations and this report are confined to technical assessment of the load bearing elements of the structure, the identification of damage in these elements at the time of our inspection, the cause of damage and the type and scope of measures necessary to repair that damage. Whilst every endeavour will be made to provide a positive and helpful report we are unable to predict the future behaviour of the structure or its components. Guarantee cannot therefore be given that the property will be free from future damage or that existing defects will not suffer from further deterioration or lead to damage.

This report is not to be used for any other purpose or by any third party and is not to be taken as a specification for remedial action or works. However, if the recommendations included within this report are to be subsequently taken forward to detailed design / scheduling and / or construction; before any work can commence, there is a duty on designers, within the definition of the Construction (Design and Management) Regulations 2015, to ensure that Clients are aware of the specific duties they are required to carry out under the provisions set out in the CDM Regulations. HSE's Client Guidance document INDG 411 which can be found on www.hse.gov.uk sets out clear and concise guidance as to the role the Client plays in a project, and also what is expected of other disciplines involved in the project.

The visual inspection of the superstructure was made on 25, 26 and 30 April 2019 and detailed notes are retained on file. The weather was fine and dry on all days.

Other than samples taken for carbonation and HAC testing, no breaking out or opening up of the building fabric was undertaken at the time of our inspection and no part of the property which was not readily accessible, or which was covered or otherwise concealed, was inspected.

Internally, communal areas and the following Flats were able to be accessed and inspected:

- Flat [redacted] – 26 April 2019. This was reported by the client as a void (empty) flat. However, a resident was in occupation but agreed to provide access.
- Flat [redacted] – 30 April 2019. The resident saw us carrying out our inspections on site and requested for us to inspect inside their flat.
- Flat [redacted] – 26 April 2019. This was reported by the client as a void (empty) flat. However, a resident was in occupation but agreed to provide access.

Flats [redacted], [redacted], [redacted] and [redacted] were also reported by the client to be void flats. However, the void key did not open the doors, and there was no response from residents when we knocked on the doors. Flat [redacted] was also reported as a void flat, however, there was a resident in occupation who refused us entry.

Access was not possible to the following communal areas, generally due to none of the keys provided operating the locks:

- Former Incinerator Rooms within the central core at the following floor levels:
    - Floors 1, 2, 3, 14 and 15
- Store Room to the South of the lift shaft on Floor 7
- Lift Shafts
- Ground floor Bike Store at the North West corner of the building.
- An area at ground floor level to the South of the Lift Shaft which was observed to have a blocked up doorway within the adjacent Lobby.
- Lower Ground Floor/basement areas due to construction works taking place.

Absence of report on areas not accessed is not to be taken that it is free from defect. Such areas and unexposed parts of the building may contain problems and special arrangements would need to be made for these areas to be investigated (where practicably possible) if confirmation were to be required about their condition.

Drains were not inspected or tested. Foundations were not uncovered. Woodwork was not inspected other than for present functional structural adequacy.

Enquiries with local or statutory authorities have not been carried out. Whilst attention may be drawn to any apparent breaches of statutory requirements relative to the buildings or site, the absence of any such comment does not imply compliance with such requirements. The building and associated structures have not therefore been assessed for compliance with the Building Regulations, for example, Approved Document B – Fire Safety.

Whilst attention may be drawn to the suspected presence of asbestos in the building, this report is to be taken specifically to exclude any advice or recommendation in respect of the identification, handling, management or disposal of asbestos. Advice should be sought from other specialists, as and where appropriate.

We have not carried out any inspections to external structures that are not part of the tower blocks, including the car park structures and retaining walls around the site. Access was not possible to the lower ground floor structure and areas below the building due to construction works taking place.

We have not carried out any inspections for invasive plant species such as Japanese Knotweed. Whilst attention may be drawn to the suspected presence of invasive plant species this report is to be taken specifically to exclude any advice or recommendation in respect of the identification, handling, management or disposal of such plants. If required advice should be sought from a qualified ecological or landscape consultant as and where appropriate.

2.1 Classification of Visible Damage to Walls and Ceilings

For the purposes of this report, the width of cracks is used as a basis for the classification of visible damage, broadly in compliance with the damage classifications defined by Building Research Establishment Digest 251, revision of 1991 (although updated in 1995 to provide greater description) :-

Description	Approximate crack width	BRE Category of Damage
Hairline cracks	Barely visible, less than 0.1mm wide	0
Very slight cracks	Up to 1mm wide	1
Slight cracks	1mm to 5mm wide	2
Moderate cracks	5mm to 15mm wide	3
Severe cracks	15mm to 25mm wide	4
Very severe cracks	Greater than 25mm wide	5

2.2 Orientation

Compass point orientation has been used to describe the location of various elements of the building. RIGHT-HAND and LEFT-HAND in relation to individual walls or components are taken when facing that wall or component.

3.0 The Property – General Details & History

3.1 Construction Details Observed

St. James' House is a residential tower block located on High Street in the centre of Brighton. The archive general arrangement floor plans provided by the client of these blocks, which includes a typical ground floor plan, typical upper floor plan, and typical roof plan; appear to be the original design drawings and are dated August 1964, which suggests that the buildings were likely constructed c1965 and are of a Wates 'Large Panel System' (LPS) design.

St. James' House has a lower ground level/underground car park, a ground floor level and fifteen upper floor levels. It appears that the underground car park and ground floor level loadbearing structure is likely of in-situ reinforced concrete columns and beams, supporting pre-cast floor panels at first floor level, which appears to be the start of the main pre-cast wall and floor panel construction continuing upwards. The lower ground floor car park is surrounded by in-situ reinforced concrete walls which retain the adjacent roads. The internal dividing walls at ground floor level and the lift shafts also appear to be pre-cast concrete units. Brick and block cavity construction walls at ground floor level appear to be non-loadbearing.

The original external pre-cast concrete wall panels to the North and South elevations have been clad externally with an insulated rainscreen cladding system, and original windows replaced with UPVC framed double glazed windows. Ventilation grilles were noted at the bottom of the new cladding. Given the presence of the cladding installation, none of the original pre-cast concrete wall panels to the North and South elevation is visible.

However, original concrete wall panel external faces are visible within the central 'alcoves' adjacent to the lifts and communal areas, except the majority of the West facing part of the alcove of the western side of the building, which is also clad with a newer insulated rainscreen cladding system.

Internally, the pre-cast concrete panels in the communal areas are generally visible, with a painted finish.

Online geological maps suggest that the building is founded on the Newhaven Chalk Formation, likely utilising piled foundations, although this would have to be investigated further if confirmation was required.

The building is set on a slight slope running up from South to North.

Although not able to be accessed during our April inspection due to construction works in the lower car park/basement, it is understood from the client that the gas boiler for the block is housed in a room within the lower ground floor basement, directly beneath the tower block.

3.2 Brief Background and History of Large Panel System Buildings

The majority of high rise tower blocks utilising 'Large Panel Systems' were designed and constructed in the 1950/1960s. They typically comprise pre-cast reinforced concrete floor and roof components spanning onto storey-height structural precast concrete wall panels. The pre-cast components are connected by various forms of joint made on site; typically dowels and hoops cast into the walls and floors are connected, with the gaps then infilled with a dry pack mortar on site to complete the structural construction. There are

however differences in the individual forms of LPS, which were propriety products produced by the various manufacturers of the day.

As noted above, the system used for St. James' House is understood to be a Wates System.

Concerns regarding the general structural form of LPS construction for high rise buildings were brought into focus in 1968 at the time of the Ronan Point disaster where a gas explosion in a flat caused a progressive collapse to one side of the building. The Ronan Point building was a Taylor Woodrow-Anglian (TWA) LPS dwelling block.

In subsequent years to the Ronan Point disaster, various structural investigations and appraisals have been undertaken on various manufacturer's systems, by the Building Research Establishment (BRE) and others, with reports readily available. These reports have led to recommendations on requirements for appraisals and assessment of these buildings from the BRE and the Ministry of Housing and Local Governments (MHLG) (as once was).

Particularly after the Ronan Point disaster there were immediate recommendations, amongst others, for strengthening works to the joints between the pre-cast panels.

Various localised defects have been found to different types of LPS system buildings over the years during previous BRE and other investigations, which although raise concern about potential build quality of the systems, does not necessarily mean that all LPS buildings were constructed poorly.

However, the BRE Report in 1987 (The Structural Adequacy and Durability of LPS dwellings) made recommendations that a full structural assessment of a complete LPS dwelling block should be undertaken every 20 years; with supporting visual inspections of the external envelope of the building at intervals of about 5 years, together with intrusive investigations every 10 years to check upon the condition of the reinforcement within in-situ joints which might experience rain penetration.

The most recent guidance document regarding LPS buildings is the BRE Handbook for the Structural Assessment of LPS Dwelling Blocks for Accidental Loading of 2012, which reiterates the above inspection regime of the 1987 report and provides 3 criteria against which LPS dwelling blocks should be evaluated.

3.3 Review of Previous Reports on the Building

The client was largely unable to readily locate any historic records for structural appraisals or remedial works undertaken to the building since its construction, although did report that the Council's archiving system was in the progress of being digitised, which means that there may be historic records available which are not currently readily accessible.

Apart from the typical archive general arrangement floor plans provided, the client was only able to locate one other previous report which refers to the building structure, which was the 2013 Feasibility Report on Additional Lift Shaft Door Openings, by Frankham Structural Engineers.

This report indicates that the lift shafts within St. James' House were inspected as part of this feasibility study to form new door openings in the shafts (to allow new lifts to stop at every floor rather than every other floor).

Although there was no reference to any obvious visible defects observed in the lift shaft structures at St. James' House, it can be seen from photograph 2 within the report, that at

least 1 no. of the levelling jack positions at the horizontal joint between panels has not been filled with a dry mix, as the jack is visible and there is a view through to the other lift shaft.

It was also reported by the client that the piped gas supply had been removed from the tower block, presumably at some point following the Ronan Point disaster. The gas supply is now only to the lower ground floor feeding the gas boilers, which heat water that is fed up to the tower block.

From the limited records currently available, there is no documentary evidence at present to suggest that BRE or MHLG recommended inspection or remedial works have been carried out over the years since the Ronan Point disaster.

4.0 Visual Inspection – Observations and Principal Present Damage

Within the majority of the building, there was no obvious significant structural damage observed to the areas that we were able to inspect and the building generally appeared to be in good structural condition. The hairline to very slight cracking at joints in the concrete panels is considered to be due to slight thermal expansions and contractions between the panels.

However, there were some localised areas of concern in regards to what appears to be concrete end capping sections fixed to the main pre-cast concrete walls, at the corners of balconies. These were observed to be distorted in a few locations. (Typical example shown in photos 257-262)

As noted in Section 3.1 above, external inspection of much of the original concrete panels was generally not possible and the internal inspection was limited to communal areas. There were no obvious significant deformations in the external cladding panels which might otherwise give cause for immediate structural concern.

There was no obvious evidence of internal patch repairs to floor/wall junctions within the areas inspected, which might otherwise suggest that strengthening works at joints may have been carried out following the Ronan Point disaster. However, evidence of such strengthening works may now be hidden behind decorative finishes.

Regarding specific areas of damage observed during our on-site inspections, we have itemised these into the table on the Section 4.1, with a recommendation for further investigation or repair, and a recommendation for when such works should be carried out. Photographs can be found in Appendix B. Although most of these are not of structural concern at present, they have been recorded to allow for future visual monitoring.

The localised repairs recommended for the year 2020 and beyond (amber and green highlights) are subject to the findings of the wider further recommendations provided in Section 6.0 of this report, such that, if further investigations yield any significant further concerns, the necessity for localised repairs may be superseded. However, if further investigations are not undertaken as recommended in Section 6.0, then localised repairs should be undertaken as recommended.

4.1 Visual Inspection – Observations and Principal Present Damage

Location	Building Element	Element Description	Condition / Defect	Recommended Works	Photo Number	Rec Year Of Work
Flat [redacted] Bathroom	Ceiling	Painted artex soffit of precast reinforced concrete plank	Hairline crack to ceiling at slab joint.	Visually monitor as part of future routine inspections.	84	**2024**
Flat [redacted] Lounge	Ceiling	Painted artex soffit of precast reinforced concrete plank	Hairline crack to ceiling at slab joint.	Visually monitor as part of future routine inspections.	85	**2024**
Flat [redacted] Kitchen	Ceiling	Painted artex soffit of precast reinforced concrete plank	Hairline crack to ceiling at slab joint.	Visually monitor as part of future routine inspections.	86	**2024**
Flat [redacted] Balcony Both ends	Wall	Precast concrete wall and end capping	It was observed that there is no sealant to the compressible fill material at what appears to be the joint between the main wall panel and a decorative 'capping' to the end face of the wall.	This appears likely to be a detail repeated at all balcony locations. It would be prudent to seal these joints, subject to the findings of further investigations into the end capping detail and condition of fixings.	87 / 89	**2020**

4.1 Visual Inspection – Observations and Principal Present Damage

Location	Building Element	Element Description	Condition / Defect	Recommended Works	Photo Number	Rec Year Of Work
Flat [redacted] Balcony North end	Wall	Precast concrete end capping	Hairline cracking and possible spalling of previous concrete repair to end 'capping' to North side of balcony.	Break out loose concrete and inspect underlying reinforcement for corrosion. Clean any corroded steel reinforcement back to bright metal and apply zinc rich paint followed by proprietary concrete repair in accordance with manufacturer's specification.	88	**2020**
Internal Central Corridor	Internal wall	Precast concrete wall	Typical hairline to very slight cracks at joints between external wall panels and internal walls of the former Incinerator rooms at each floor level. Extent of visible cracking varies at different floor levels. Some damp damage to plaster as well, likely caused by condensation at the cold bridge adjacent to the external wall.	It would be prudent to make good the cracks by filling with a proprietary concrete repair and make good decorations.	115	**2020**
Internal staircase walls	Internal wall	Precast concrete wall	Typical hairline vertical crack at joint to internal walls visible. To all staircase levels up the tower.	Visually monitor as part of future routine inspections.	116	**2024**
Internal staircase windows	Windows	Timber framed internally, double glazed units.	Typical rotting timber to window frame at all floor levels.	Although the damage to the window frame is not a structural concern, water penetration has affected the structure causing corrosion to reinforcement and spalling concrete to the pre-cast stair sections. Therefore it would be prudent to replace the windows to ensure no water ingress into the structure.	118 / 119 / 141	**2020**

4.1 Visual Inspection – Observations and Principal Present Damage

Location	Building Element	Element Description	Condition / Defect	Recommended Works	Photo Number	Rec Year Of Work
Internal Corridor walls	Internal wall	Precast concrete wall	Typical hairline vertical cracks at joints to internal walls visible. To all areas of the building. The damage is considered to be due to slight thermal expansions and contractions between the wall sections. This damage is not considered structurally significant.	Visually monitor as part of future routine inspections.	123	**2024**
Internal Central Corridor adjacent to the North West windows. Floors 3, 8, 9, 11, 12	Internal ceiling	Precast reinforced concrete slab	Spalling concrete, corrosion staining and spalled concrete and exposed reinforcement to soffit of concrete slab soffit adjacent to the North West windows at various floor levels.	Break out loose concrete and inspect underlying reinforcement for corrosion. Clean any corroded steel reinforcement back to bright metal and apply zinc rich paint followed by proprietary concrete repair in accordance with manufacturer's specification.	125 / 142 / 145	**2020**
Internal Upper Floor Stores to South East of Lift Shaft	Internal wall	Precast concrete wall	Typical hairline to very slight cracks at joints between external wall panels and internal walls of the Store. Extent of visible cracking varies at different floor levels. Some damp damage to plaster as well, likely caused by condensation at the cold bridge adjacent to the external wall.	It would be prudent to make good the cracks by filling with a proprietary concrete repair and make good decorations.	128	**2020**

4.1 Visual Inspection – Observations and Principal Present Damage

Location	Building Element	Element Description	Condition / Defect	Recommended Works	Photo Number	Rec Year Of Work
External central walls, various floor levels	Wall	Precast concrete wall	Typical previous concrete patch repairs to external wall panels. Most appear to be in sound condition, but some appear to be de-bonding, as noted in specific items below.	Repairs that currently appear to be in a sound condition should be visually monitored as part of future routine inspections.	130	**2024**
South end staircase landing between floors 13-14	Floor	Precast reinforced concrete slab	Spalling to top of slab and exposed corroding reinforcement.	Break out surrounding concrete and inspect underlying reinforcement for corrosion. Clean any corroded steel reinforcement back to bright metal and apply zinc rich paint followed by proprietary concrete repair in accordance with manufacturer's specification.	141	**2020**
Internal Central Corridor adjacent to the North West windows. Floor 11	Wall	Precast concrete wall	Corrosion staining at joint between external wall and internal wall of the former Incinerator room.	Break out surrounding concrete and inspect underlying reinforcement for corrosion. Clean any corroded steel reinforcement back to bright metal and apply zinc rich paint followed by proprietary concrete repair in accordance with manufacturer's specification.	146	**2020**

4.1 Visual Inspection – Observations and Principal Present Damage

Location	Building Element	Element Description	Condition / Defect	Recommended Works	Photo Number	Rec Year Of Work
External, West Elevation, south facing wall of Alcove, adjacent to Central Corridor, Floor 10	Wall	Precast concrete wall	Spalling of previous concrete repair.	It would be prudent to address this area as soon as possible to prevent the spalling concrete from de-bonding and falling from the building. This will also allow inspection of the underlying reinforcement condition. Break out surrounding concrete and inspect underlying reinforcement for corrosion. Clean any corroded steel reinforcement back to bright metal and apply zinc rich paint followed by proprietary concrete repair in accordance with manufacturer's specification.	153	**2019**
External North Elevation, left end	Beam	In-situ concrete beam	Localised corrosion staining spot to rendered finish, possibly due to localised corroding reinforcement at shallow depth.	Visually monitor as part of future routine inspections.	170	**2024**
External North Elevation, left end	Beam	In-situ concrete beam	2 no. hairline horizontal cracks in render.	Visually monitor as part of future routine inspections.	171 / 172	**2024**
External North Elevation, left end	Column	In-situ concrete column	Very slight vertical/diagonal crack in render.	It would be prudent to break off the render at this location to establish if there is any cracking in the underlying concrete structure.	173	**2020**

4.1 Visual Inspection – Observations and Principal Present Damage

Location	Building Element	Element Description	Condition / Defect	Recommended Works	Photo Number	Rec Year Of Work
External East Elevation	Wall	Precast concrete walls	Typical previous concrete patch repairs to external wall panels. Most appear to be in sound condition, but some appear to be de-bonding, as noted in specific items below.	Repairs that currently appear to be in a sound condition should be visually monitored as part of future routine inspections.	180	**2024**
East External Elevation Balcony Slab soffit, [redacted]	Floor	Precast Reinforced concrete	Typical localised corrosion staining and possible spalling concrete. Difficult to see from ground level and through balcony netting to some balconies.	Inspect more closely from balconies of Flats. Potentially repair may involve breaking out surrounding concrete. Clean any corroded steel reinforcement back to bright metal and apply zinc rich paint followed by proprietary concrete repair in accordance with manufacturer's specification.	229	**2020**
East External Elevation [redacted]	Wall to balcony	Precast concrete wall	End capping to wall appears to be slightly distorted.	It would be prudent to investigate the typical original details of the end capping and how this is fixed to the main concrete wall – it may be utilising dowelled connections. The fixings at this particular location should be investigated to confirm their condition. Following this, appropriate repairs can be specified in regards to any further restraint detail that may be considered necessary.	235	**2019**

4.1 Visual Inspection – Observations and Principal Present Damage

Location	Building Element	Element Description	Condition / Defect	Recommended Works	Photo Number	Rec Year Of Work
External East Elevation [redacted] (Flat [redacted] inspected on the [redacted])	Wall	Precast concrete wall	Spalling of previous concrete repairs.	It would be prudent to address these areas as soon as possible to prevent the spalling concrete from de-bonding and falling from the building. This will also allow inspection of the underlying reinforcement condition. Break out surrounding concrete and inspect underlying reinforcement for corrosion. Clean any corroded steel reinforcement back to bright metal and apply zinc rich paint followed by proprietary concrete repair in accordance with manufacturer's specification.	236 / 243 / 244 / 247 / 253	**2019**
External East Elevation, [redacted] Balcony	Precast concrete end capping	Additional steel restraint straps fixed between walls and floor slabs and the concrete end capping	Steel restraint straps and fixings are corroded. It is assumed that these restraint straps are to provide additional support to the concrete end capping detail at first and second floor levels, presumably following concerns that the end capping may not be fully secure.	It would be prudent to investigate the typical original details of the end capping and how this is fixed to the main concrete wall – it may be utilising dowelled connections. The fixings at this particular location should be investigated to confirm their condition. Following this, appropriate repairs can be specified in regards to any further restraint detail that may be considered necessary to replace the current corroding fixings.	180 / 181	**2020**

4.1 Visual Inspection – Observations and Principal Present Damage

Location	Building Element	Element Description	Condition / Defect	Recommended Works	Photo Number	Rec Year Of Work
External East Elevation [redacted]	Wall	Precast concrete walls	Localised spalling at base of wall.	Break out surrounding concrete. Clean any corroded steel reinforcement back to bright metal and apply zinc rich paint followed by proprietary concrete repair in accordance with manufacturer's specification.	182	**2019**
External East Elevation [redacted]	Steel Fixing	Steel Bolts	Slight surface corrosion to 2 no. bolts, possibly redundant service fixings.	Visually monitor as part of future routine inspections.	184	**2024**
External East Elevation [redacted], [redacted]	Beam	In-situ concrete beam	Slight vertical crack at end of beam in render.	It would be prudent to break off the render at this location to establish if there is any cracking in the underlying concrete structure.	185	**2020**
External South East corner, bottom of first floor level	External wall cladding	Cavity insulated wall cladding	Appears that trim at base of cladding has been removed to tie scaffold to building structure.	Make good once scaffold removed	189	**2020**

4.1 Visual Inspection – Observations and Principal Present Damage

Location	Building Element	Element Description	Condition / Defect	Recommended Works	Photo Number	Rec Year Of Work
External South Elevation, ground floor	Wall	Precast concrete wall	Hairline horizontal crack in render finish at joint between beam and infill wall panel below. The damage is considered to be due to slight thermal expansions and contractions between the wall sections. This damage is not considered structurally significant.	Visually monitor as part of future routine inspections.	191	**2024**
External South Elevation	Wall	Rendered plinth at bottom of wall	Various hairline cracks in render finish which appear to be caused by shrinkage or thermal movements.	Visually monitor as part of future routine inspections.	192	**2024**
External South-East corner	Column	In-situ concrete column	Hairline diagonal crack in render finish which appears to be caused by shrinkage or thermal movements.	Visually monitor as part of future routine inspections.	193	**2024**
External South Elevation South-West corner	Wall	In-situ, reinforced concrete retaining wall	Slight diagonal crack in render finish which appears to be caused by shrinkage or thermal movements. It also appears that there is a roughly formed joint between the retaining wall of the car park ramp, with gaps at the joint not sealed.	It would be prudent to make good the joint at this location to prevent water ingress into this area of the structure.	194	**2020**

4.1 Visual Inspection – Observations and Principal Present Damage

Location	Building Element	Element Description	Condition / Defect	Recommended Works	Photo Number	Rec Year Of Work
External South Wall of Western Car Park Ramp	Wall	In-situ, reinforced concrete retaining / freestanding wall	Slight vertical crack in southern wall of western car park ramp. Spalling and exposed corroded reinforcement bar on the north side of the wall. Wall is retaining approx. 1m height of pavement and appears plumb. It appears that the damage is longstanding and due to thermal movements.	Whereas forming a full movement joint may be the more robust solution, the crack has in effect formed a joint in the wall. It could therefore be attempted to remove and loose concrete and saw cut a 20mm wide joint along the line of the crack, 20mm deep each side of the wall and seal with a polyurethane sealant. Followed by making good of any exposed reinforcement by cleaning and application of a zinc rich paint, followed by proprietary concrete repair in accordance with manufacturer's specification. This should be visually monitored as part of future routine inspections. If further damage were to occur, a full movement joint may need to be designed and formed.	195 / 196	**2020**
External South Wall of Western Car Park Ramp	Wall	In-situ concrete	Very slight vertical and diagonal cracking in concrete and render repairs.	Visually monitor as part of future routine inspections.	197	**2024**
External West Elevation [redacted]	Beam	In-situ concrete	Localised corrosion staining spot to rendered finish, possibly due to localised corroding reinforcement at shallow depth.	Visually monitor as part of future routine inspections.	198	**2024**

4.1 Visual Inspection – Observations and Principal Present Damage

Location	Building Element	Element Description	Condition / Defect	Recommended Works	Photo Number	Rec Year Of Work
External West Elevation [redacted]	Wall	Render finish to masonry wall	Very slight diagonal crack in render finish. This appears likely to be caused by thermal movements.	Visually monitor as part of future routine inspections.	199	**2024**
External West Elevation [redacted]	Floor	Precast reinforced concrete slab	Localised corrosion staining spot to underside of balcony slab	Visually monitor as part of future routine inspections.	200	**2024**
External West Elevation cantilevered beam ends at ground floor level: [redacted]	Beam	In-situ concrete beam	Slight vertical cracking at ends of beams in render and/or corrosion staining.	It would be prudent to break off the render at these locations to establish if there is any cracking/spalling and corroded reinforcement in the underlying concrete structure which may require repair.	201 / 202 / 203 / 268 / 273	**2020**

4.1 Visual Inspection – Observations and Principal Present Damage

Location	Building Element	Element Description	Condition / Defect	Recommended Works	Photo Number	Rec Year Of Work
External West Elevation Alcove South Facing Wall, ground floor	Wall	Precast concrete wall	In-situ concrete joint filling and repair works to the underside of the pre-cast wall units is cracking and spalling at 2 no. locations.	Break out loose concrete. Clean any corroded steel reinforcement back to bright metal and apply zinc rich paint followed by proprietary concrete repair in accordance with manufacturer's specification.	204 / 205	**2020**
External West Elevation Alcove West Facing Wall, ground floor	Beam	In-situ concrete beam	Spalling concrete repair.	Break out loose concrete. Clean any corroded steel reinforcement back to bright metal and apply zinc rich paint followed by proprietary concrete repair in accordance with manufacturer's specification.	206	**2020**
External West Elevation Alcove West Facing Wall, ground floor	Beam	In-situ concrete beam	Hairline vertical crack in render finish which appears to be caused by shrinkage or thermal movements.	Visually monitor as part of future routine inspections.	207	**2024**
External West Elevation Alcove West Facing Wall, ground floor	Wall	Appears to be in-situ concrete wall	Spalling concrete and exposed corroding reinforcement.	Break out loose concrete. Clean any corroded steel reinforcement back to bright metal and apply zinc rich paint followed by proprietary concrete repair in accordance with manufacturer's specification.	208	**2020**

4.1 Visual Inspection – Observations and Principal Present Damage

Location	Building Element	Element Description	Condition / Defect	Recommended Works	Photo Number	Rec Year Of Work
West External Elevation Balcony Slab soffit, [redacted]	Floor	Precast Reinforced concrete	Typical localised corrosion staining and possible spalling concrete. Difficult to see from ground level and through balcony netting to some balconies.	Inspect more closely from balconies of Flats. Potentially repair may involve breaking out surrounding concrete. Clean any corroded steel reinforcement back to bright metal and apply zinc rich paint followed by proprietary concrete repair in accordance with manufacturer's specification.	214	**2020**
Generally to West External Elevation	Walls	Precast concrete wall	Typical previous concrete patch repairs to external wall panels. Most appear to be in sound condition, but some appear to be de-bonding, as noted in specific items below.	Repairs that currently appear to be in a sound condition should be visually monitored as part of future routine inspections.	216	**2024**
Generally to West External Elevation	Walls	Precast concrete wall	Localised corrosion staining to some wall panels.	Visually monitor as part of future routine inspections.	217	**2024**
Generally to West External Elevation	Walls	Precast concrete wall above windows	Typical pattern of what appears to be 4 no. repaired/filled holes in concrete above window.	Visually monitor as part of future routine inspections.	222	**2024**

4.1 Visual Inspection – Observations and Principal Present Damage

Location	Building Element	Element Description	Condition / Defect	Recommended Works	Photo Number	Rec Year Of Work
West External Elevation Balcony Slab soffit, [redacted]	Floor	Precast Reinforced concrete	Typical localised corrosion staining and possible spalling concrete. Difficult to see from ground level and through balcony netting to some balconies.	Inspect more closely from balconies of Flats. Potentially repair may involve breaking out surrounding concrete. Clean any corroded steel reinforcement back to bright metal and apply zinc rich paint followed by proprietary concrete repair in accordance with manufacturer's specification.	227	**2020**
West External Elevation [redacted]	Walls	Precast concrete wall	Appears that original end capping concrete is displaced, with cracks/gaps present in the sealant and localised spalling/cracking in the main wall panels at their ends, at 3rd and 4th floor levels. It appears likely that reinforcing bar, possibly a doweled connection is corroding and expanding, causing the distortion and cracking.	It would be prudent to fence off a 5m perimeter around this area immediately as some loose parts of the concrete may fall from the building. We then recommend that investigation works are carried out to the end capping to confirm how this is fixed to the main concrete wall. The fixings at this particular location should be investigated to confirm their condition. Following this, appropriate repairs can be specified in regards to any further restraint detail that may be considered necessary.	257-262	**2019**

4.1 Visual Inspection – Observations and Principal Present Damage

Location	Building Element	Element Description	Condition / Defect	Recommended Works	Photo Number	Rec Year Of Work
West External Elevation [redacted] south end of balcony	Wall	Precast concrete wall	Spalling of previous concrete repairs.	It would be prudent to address these areas as soon as possible to prevent the spalling concrete from de-bonding and falling from the building. This will also allow inspection of the underlying reinforcement condition. Break out surrounding concrete and inspect underlying reinforcement for corrosion. Clean any corroded steel reinforcement back to bright metal and apply zinc rich paint followed by proprietary concrete repair in accordance with manufacturer's specification.	266	**2019**
Lift Motor Room	Ceiling	Precast reinforced concrete slab	Spalling concrete around previous lifting eye fixed into roof soffit.	Break out surrounding concrete and inspect underlying reinforcement for corrosion. Clean any corroded steel reinforcement back to bright metal and apply zinc rich paint followed by proprietary concrete repair in accordance with manufacturer's specification.	ROOF-173	**2020**
Lift Motor Room	Wall	Precast Concrete Wall	Typical hairline to very slight cracks at joints between wall panels. The damage is considered to be due to slight thermal expansions and contractions between the wall sections. This damage is not considered structurally significant.	Visually monitor as part of future routine inspections.	ROOF-175	**2024**

4.1 Visual Inspection – Observations and Principal Present Damage

Location	Building Element	Element Description	Condition / Defect	Recommended Works	Photo Number	Rec Year Of Work
Lift Motor Room	Ceiling	Precast reinforced concrete slab	Previous concrete soffit patch repairs	Appear to be good condition, visually monitor as part of future routine inspections.	ROOF-181	**2024**
Roof parapet wall	Wall	Precast reinforced concrete slab	Appears to be typical patch repairs to internal face of pre-cast concrete parapet wall, staggered vertically and horizontally.	Visually monitor as part of future routine inspections.	ROOF-186	**2024**

5.0 Carbonation and HAC Testing of Concrete

5.1 Samples were taken for on-site carbonation testing and laboratory HAC testing at the following locations as shown in the Floor Layout Plans in Appendix A:

North Elevation:	In-situ concrete column
East Elevation:	Pre-cast concrete wall panel
South Elevation:	In-situ concrete column
West Elevation:	Pre-cast concrete wall panel

5.2 Carbonation testing was carried out on site using phenolphthalein solution sprayed onto the freshly broken off samples of concrete. The concrete surface turns pink in the presence of a high pH value above 9.0, indicating that the concrete has not been subject to the carbonation process whereby its pH has been reduced and thus its potential passive protection to the reinforcement steel may be less effective.

Depth of carbonation recorded for samples taken on site are as follows:

North Elevation:	Approximately 3mm of carbonation.
East Elevation:	Approximately 2mm of carbonation.
South Elevation:	Approximately 5mm of carbonation.
West Elevation:	Approximately 3mm of carbonation.

5.3 HAC testing results, which are shown in Appendix C, returned negative results for all samples, although it should be noted that on this block only two samples of pre-cast concrete could be tested.

6.0 Assessment of Findings & Recommendations

6.1 Within the majority of the building, there was no obvious significant structural damage observed to the areas we were able to inspect and the building generally appeared to be in good structural condition. The hairline to very slight cracking at joints in the concrete panels is considered to be due to slight thermal expansions and contractions between the panels.

6.2 However, there were some localised areas of concern in regards to what appears to be concrete end capping sections fixed to the main pre-cast concrete walls, at the corners of balconies. These were observed to be distorted in a few locations. We recommend that these areas are investigated further by metal detector scanning to attempt to locate any connecting dowels and then opening these up locally to inspect the detail and condition. Depth of cover to the reinforcement and carbonation testing should also be undertaken, given the potential for shallower cover at these locations. It was observed that scaffold had been erected at the South East corner of the building ([redacted]) up to the [redacted], due to localised concrete spalling in these areas, where concrete has previously fallen to the ground. This scaffold will provide access to carry out further investigations in this area, although it should be confirmed by the scaffold company that it is robust enough for such tasks. In addition it would be prudent to specifically investigate similar details at the North East corner ([redacted] of the building and on the West elevation to [redacted] Repairs to all such areas identified in Section 4.1 can then be recommended and carried out.

6.3 If carbonation depths to all concrete elements are similar to the areas tested during our inspections, then it appears that the concrete will still be providing good protection to steel reinforcement, assuming that the concrete cover is at typical depths of say 30-40mm. However, areas where localised corrosion staining have been observed and the distorted end capping sections are likely to be localised areas where reinforcement cover is relatively shallow.

6.4 However, as noted in Section 3.1, external inspection of most of the original concrete walls was not possible and the internal inspection was limited to communal areas. There were no obvious significant deformations in the external cladding panels which might otherwise give cause for immediate structural concern.

6.5 Depending on the design and installation of the ventilation detail behind the new cladding to allow air flow, there may be potential for condensation to build up behind the cladding panels.

6.6 As noted in Section 3.3 of this report, we are not aware of any records that structural strengthening has been carried out, and there was no obvious evidence from our observations on site, that such work has been undertaken following the Ronan Point collapse.

6.7 Although there was no indication of structurally significant movement in the building at present; given the apparent lack of records and the age and construction type of the building, we consider that it would be prudent to follow the BRE guidance in relation to undertaking a full structural assessment of the block, which will require intrusive investigations to check the condition of the reinforcement within typical in-situ external and internal joints and confirm the condition of typical external walls which are currently hidden by the newer cladding.

6.8 However, in the first instance, we consider that it would be prudent to review the feasibility of carrying out a thermal imaging survey of the exterior façades, as this may be a cost effective way to provide an initial indication of any damp patches or structural

anomalies (cracking/spalling) that may be occurring behind the external cladding. This may allow targeted intrusive investigations to be undertaken of the structure behind the cladding.

6.9 At the time of intrusive investigations, it would also be prudent to carry out the following further testing:

1. Compressive strength testing of pre-cast concrete wall and floor samples and of some typical in-situ concrete samples.
2. Further carbonation testing of pre-cast concrete wall panels
3. Chloride testing, given the proximity of the building to the sea and that the concrete was exposed to the elements before the current cladding system was installed.
4. Testing of the below ground structures for chlorides/sulphates, given the possibility that sea-dredged aggregates may have been used in the in-situ concrete foundation construction.

6.10 It would also be prudent as part of intrusive investigations, to assess whether the newer over cladding design and installation has taken into account the conclusions within the BRE Report of 1986 'Overcladding external walls of large panel system dwellings'

6.11 Following the findings of the intrusive investigations, it would be prudent to carry out a full structural assessment of the original concrete structure of the block in line with the guidance in the BRE Handbook for the Structural Assessment of LPS Dwelling Blocks for Accidental Loading, including assessment against the 3 criteria which LPS dwelling blocks should be evaluated.

6.12 One of the main hazard sources to the building; internal gas explosion, has not been fully removed from the building, as it is understood that there are gas boilers in the lower ground level/basement. As stated in BRE – Handbook for the Structural Assessment of LPS Dwelling Blocks 2012 this is considered an aggravating factor when considering explosion risk. Basements are typically enclosed environments where risk of build-up of gas from an external source is considered high and if ignited could cause an explosion. The presence of the gas boilers in the basement are therefore an additional risk that should be considered when carrying out a full structural assessment. It would be prudent to consider moving the gas boilers away from the main tower block, as has been completed at the other LPS buildings in the city.

6.13 Localised repairs recommended in Section 4.1 should be undertaken, but those recommended in the year 2020 and beyond (amber and green highlights) will be subject to the findings of the wider further investigations recommendations above and should be reviewed again following the further investigations and appraisal. For example, if further investigations yield any significant further concerns, the necessity for localised repairs may be superseded by larger scale remedial works. However, if further investigations are not undertaken as recommended above, localised repairs should be undertaken as recommended.

6.14 With regard to future long term inspections, appraisals and investigations, the BRE recommendations from their 1987 report (The Structural Adequacy and Durability of LPS dwellings) should be followed:

- A full structural assessment of a complete LPS dwelling block should be undertaken every 20 years
- Supporting visual inspections of the external envelope of the building at intervals of 5 years
- Intrusive investigations every 10 years to check upon the condition of the reinforcement within in-situ joints which might experience rain penetration.

7.0 Status of Report

This report does not provide a warranty or guarantee as regards the structural adequacy and condition of the building. It provides a considered professional opinion based on a limited visual inspection and no liability shall attach to us except to the extent that we have failed to exercise reasonable skill, care and diligence in the provision of our services.

Pick Everard

Pick Everard
Consulting Civil and Structural Engineers
Halford House
Charles Street
Leicester
LE1 1HA

Appendix A

Typical Floor Layout Plans

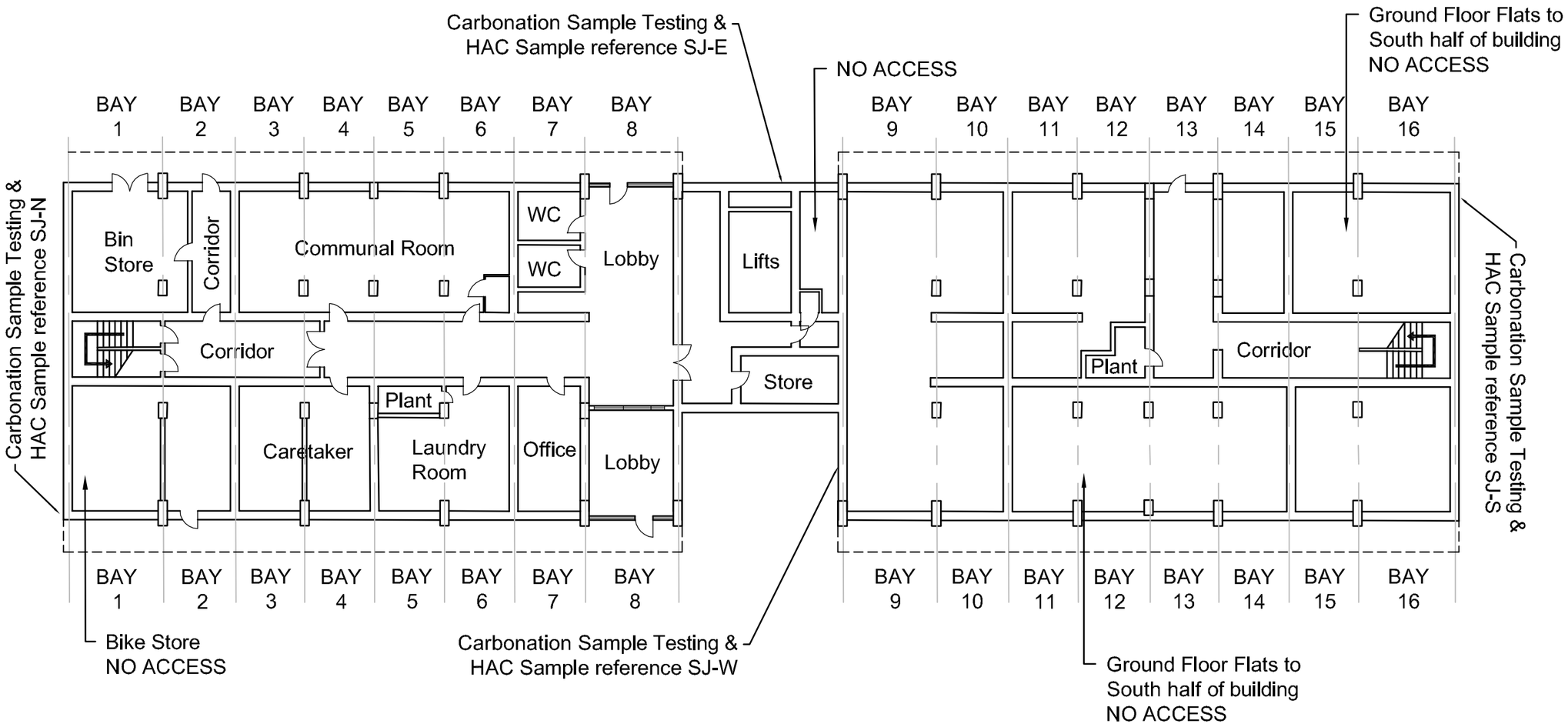
Drawing No. 190215-PEV-06-00-DR-S-0601	-	Ground Floor Layout Plan
Drawing No. 190215-PEV-06-01-DR-S-0602	-	Floors 1-15 Typical Floor Layout Plan
Drawing No. 190215-PEV-06-02-DR-S-0603	-	Roof Layout Plan

NO DIMENSIONS TO BE SCALED FROM THIS DRAWING

Note:

To be read in conjunction with Pick Everard Report reference STR/IPR/IPG/190215/17-2/R006

Plan based on archive plans provided by the client



Revision		Date	Drn	Chk
P01	Report Issue	04.07.19	IAA	IPG

Client
Brighton and Hove City Council

Project
Large Panel System Tower Block Inspection

Drawing Title
St James Lodge
Ground Floor Layout

Suitability Status
S2 - Suitable for Information

Job No.	Scale	Size	Rev
190215	NTS	@ A3	P01

Drawing Number
190215-PEV-06-00-DR-S-0601
Project Code - Originator - Zone - Level - Type - Role - Number

PICK EVERARD

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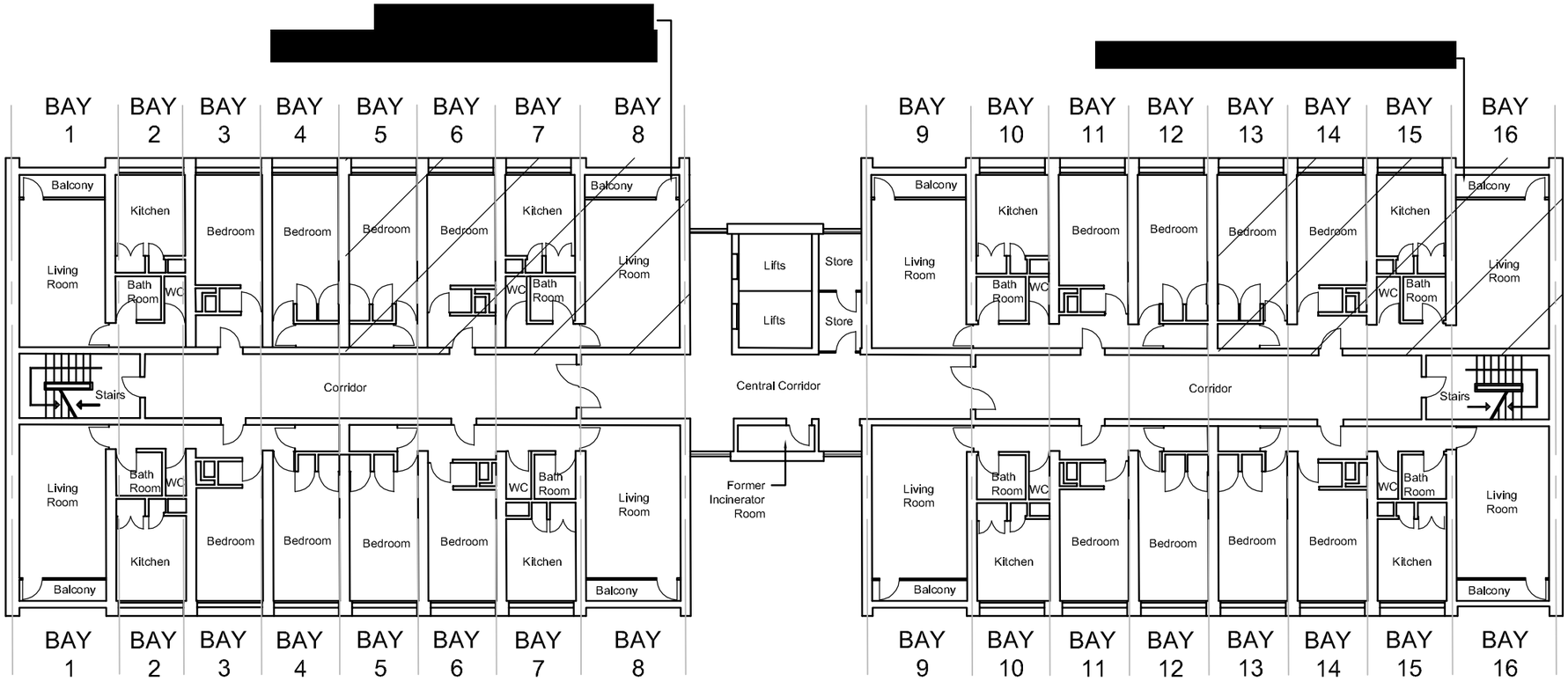
NO DIMENSIONS TO BE SCALED FROM THIS DRAWING



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To be read in conjunction with Pick Everard Report reference STR/IPR/IPG/190215/17-2/R006

Plan based on archive plans provided by the client

Revision		Date	Drn	Chk
P01	Report Issue	04.07.19	IAA	IPG

Client
Brighton and Hove City Council

Project
Large Panel System Tower Block Inspection

Drawing Title
St James Lodge
Floors 1 - 15 Typical Floor Layout

Suitability Status
S2 - Suitable for Information

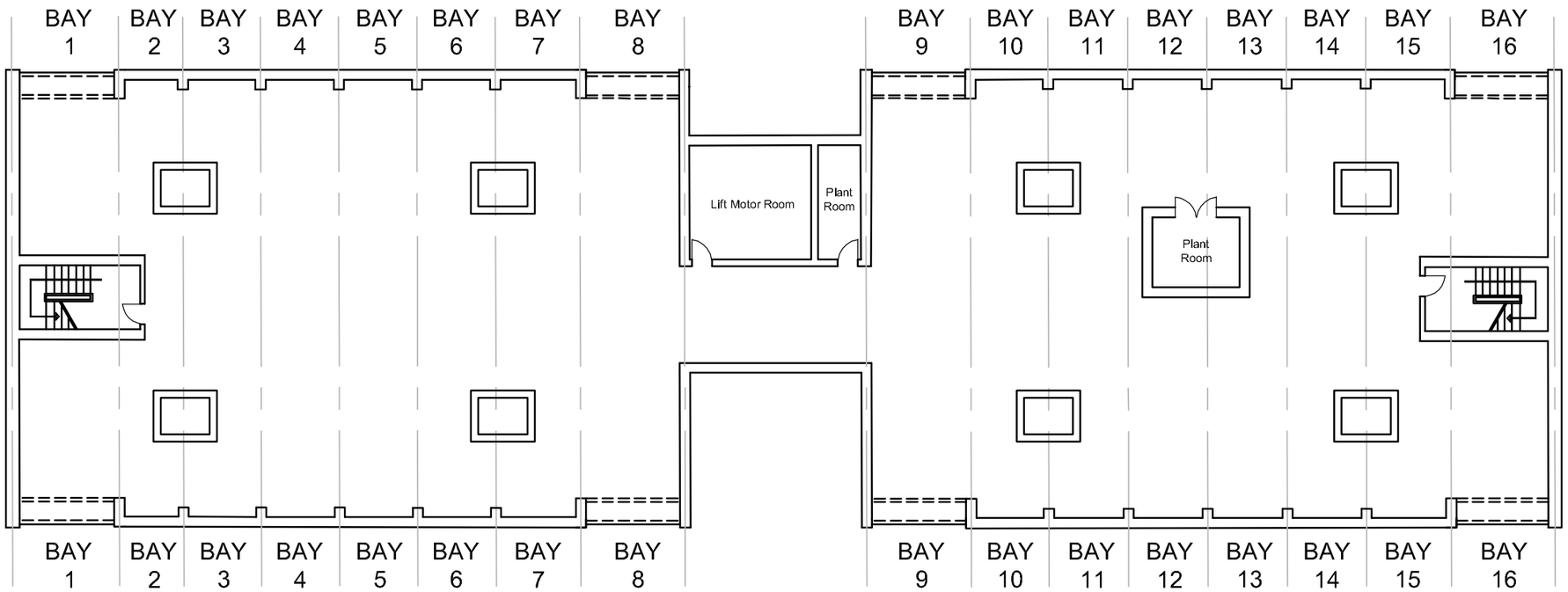
Job No.	Scale	Size	Rev
190215	NTS	@ A3	P01

Drawing Number
190215-PEV-06-01-DR-S-0602
Project Code - Originator - Zone - Level - Type - Role - Number

PICK EVERARD

T 0345 045 0050 www.pickeeverard.co.uk

NO DIMENSIONS TO BE SCALED FROM THIS DRAWING



Note:

To be read in conjunction with Pick Everard Report reference STR/IPR/IPG/190215/17-2/R006

Plan based on archive plans provided by the client

Revision		Date	Drn	Chk
P01	Report Issue	04.07.19	IAA	IPG

Client
Brighton and Hove City Council

Project
Large Panel System Tower Block Inspection

Drawing Title
St James Lodge
Roof Layout

Suitability Status
S2 - Suitable for Information

Job No.	Scale	Size	Rev
190215	NTS	@ A3	P01

Drawing Number
190215-PEV-06-02-DR-S-0603
Project Code - Originator - Zone - Level - Type - Role - Number

PICK EVERARD

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Appendix B

Photographs

Photo No. 84

Photo No. 85

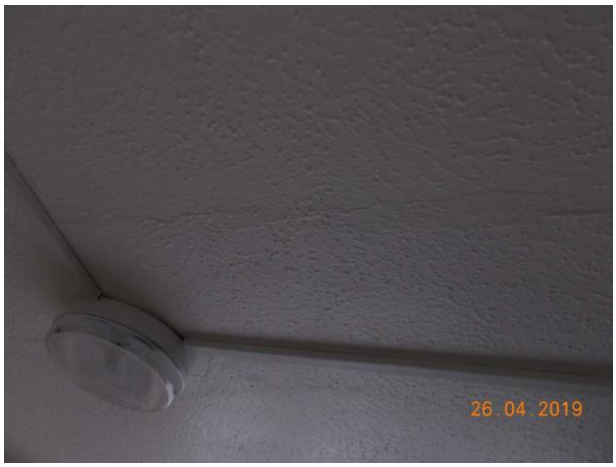

Photo No. 86

Photo No. 87

Photo No. 88

Photo No. 89

Photo No. 115

Photo No. 116

Photo No. 118

Photo No. 119

Photo No. 123

Photo No. 125

Photo No. 128

Photo No. 130

Photo No. 141

Photo No. 142

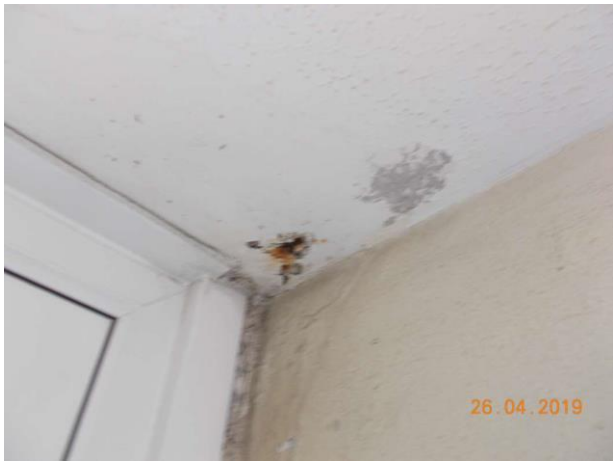

Photo No. 145

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Photo No. 153

Photo No. 170

Photo No. 171

Photo No. 172

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Photo No. 180

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Photo No. 208

Photo No. 214

Photo No. 216

Photo No. 217

Photo No. 222

Photo No. 227

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Photo No. 244

Photo No. 247

Photo No. 253

Photo No. 257

Photo No. 258

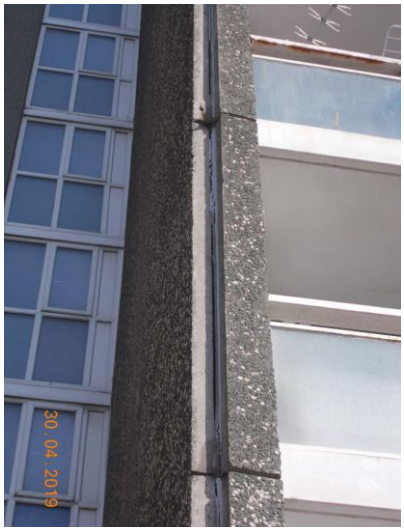

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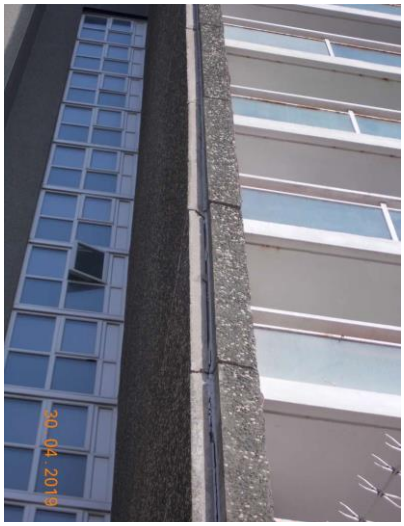
Photo No. 260



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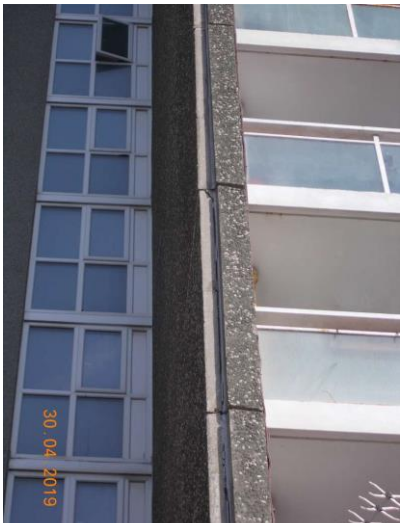

Photo No. 262

Photo No. 266

Photo No. 268

Photo No. 273

Photo No. ROOF-173

Photo No. ROOF-175

Photo No. ROOF-181

Photo No. ROOF-186

Appendix C

HAC Testing Results

Nicholls Colton Group
7 - 11 Harding Street
Leicester
LE1 4DH

Pick Everard
Halford House
Charles Street
Leicester
LE1 1HA

Analytical Test Report: L19/1274/PIC/001

Your Project Reference:	**Brighton & Hove Tower Blocks**	Samples Received on:	20/05/2019
Your Order Number:	71569	Testing Instruction Received:	20/05/2019
Report Issue Number:	1	Sample Tested:	20/05 to 30/05/2019
Samples Analysed:	32 concrete samples	Report issued:	30/05/2019

Signed

James Gane
Group Data Manager
Nicholls Colton Group

Notes:

General

Please refer to Methodologies tab for details pertaining to the analytical methods undertaken.

Samples will be retained for 14 days after issue of this report unless otherwise requested.

Samples were supplied by customer, results are representative of the material provided

Accreditation Key

UKAS = UKAS Accreditation, u = Unaccredited

Date of Issue 24.01.2017
Owned by Emily Blissett - Customer Services Supervisor
Authorised by James Gane - Commercial Manager
J:\Public\Projects\2019\L19\PIC - Pick Everard\L19-1274-PIC\[L19-1274-PIC-001.xlsx]Cover Sheet

Nicholls Colton Group
7 - 11 Harding Street
Leicester
LE1 4DH

L19/1274/PIC/001

Project Reference - Brighton & Hove Tower Blocks

Analytical Test Results - Concrete

NC Reference		37527	37528	37529	37530
Client Sample Reference		SJ/N	SJ/E	SJ/S	SJ/W
Location		St James Tower	St James Tower	St James Tower	St James Tower
Location		St James North Elevation	St James East Elevation	St James South Elevation	St James West Elevation
Sample Description		Concrete dust and lumps	Concrete dust and lumps	Concrete dust and lumps	Concrete dust and lumps
BRE DETECTION OF HIGH ALUMINA CEMENT	**Accreditation**				
Presence Of High-Alumina Cement (HAC)	UKAS	No	No	No	No

Nicholls Colton Group
7 - 11 Harding Street
Leicester
LE1 4DH

L19/1274/PIC/001

Project Reference - Brighton & Hove Tower Blocks

Analysis Methodologies and Notes

Determinant	Test method and notes
BRE Detection of High Alumina Cement	1. Testing was in accordance with BRE Information Sheet IS 15/74. 2. Contaminated samples may give a false result. 3. Samples taken from extensively carbonated concrete containing Portland Cement may give a false positive result. 4. If conclusive identification of the presence of High Alumina Cement is required this result should be confirmed by a more definitive test.