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WINDOW SURVEY REPORT

FOR

180 Tottenham Court Road, London

Document Reference:	**5977-CTA-ZZ-ZZ-RP-0001**
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Inspection Date:	**24 January 2025**
Report Prepared by:	**Jacob Parkinson**
Report Checked by:	**Lawrence Gray**
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SECTION 1 INTRODUCTION

1.1. Introduction

1.1.1. This report has been prepared following receipt of instructions from Lazari Investments Limited. The benefit of this report is solely for Lazari Investments Limited, and its contents must not be disclosed to any other party without the express permission of Cladtech Associates Limited and such permission must be obtained in writing.

1.1.2. If permission is sought and agreed, and the report is copied, then it must be copied in its entirety.

1.1.3. Cladtech Associates Limited shall have no duty of care beyond that owing to Lazari Investments Limited and their client.

1.1.4. The report has been prepared following a site inspection of the windows on the Friday, 24 January 2025. The weather during the inspection was generally dry with a temperature ranging between 9 and 11 degrees Celsius.

1.1.5. This survey sets out to:

1.1.5.1. Undertake a non-intrusive site inspection of the window elements from safe vantage points in and around the building and the office floor plates.

1.1.5.2. Prepare a high level commentary report. The report will provide commentary on the general condition of the windows along with any safety concerns and a high level review of options for replacement at the request of the Client.

1.1.6. For the avoidance of doubt:

1.1.6.1. Cladtech Associates Limited are not approved building inspectors and have no expertise in building regulation compliance so we cannot therefore advise whether a particular construction complies with the requirements of the Building Regulations. Any fire related matters or commentary provided within this report are for information purposes only and cannot be relied upon. Such matters must be considered by a qualified fire engineer.

1.1.6.2. We are not fire engineers and consequently cannot provide advice about the compliance with fire regulations and in particular the holistic approach described in BS9999 or about the fire risk of a particular construction.

SECTION 2 GENERAL

2.1. General

2.1.1. Building address: 180 Tottenham Court Road, London

2.1.2. Date of inspection: Friday, 24 January 2025

2.1.3. Weather conditions: dry with a temperature ranging between 9 and 11 degrees Celsius

2.1.4. Inspector: Jacob Parkinson

2.2. Inspection Access & Areas Inspected

2.2.1. The external inspections were confined to areas visible from vantage points offered by the surrounding pavement/ground level and therefore we were unable to inspect the upper floors of the façade at close quarters. No opening up works were undertaken and our inspections were visual only.

2.2.2. The internal areas were inspected from within the office floor plates on all floors and communal areas of the building, which were made available by the building management team. Note that some areas were inaccessible due to meetings, etc. However, in our view, 100% inspection of all areas does not materially change the findings of this report.

2.3. Inspection Scope

2.3.1. The following typical items were reviewed during our site attendance:

- Windows
- Glazing
- Seals
- Finishes
- Cleaning & Maintenance
- Water ingress

2.4. Building Description

2.4.1. The building is located at 180 Tottenham Court Road, London and has a façade type comprising of the following typical elements:

2.4.1.1. Crittall-styled steel windows incorporating a mix of fixed lights, outward opening side hung, top hung vents, and centre pivot vents. Infills within the windows include vision glazing and obscured glazing. These windows form the basis of this report.

2.4.1.2. The above-described windows are installed in a punched-hole arrangement within handset brickwork or rendered facades.

2.4.2. The building is located on Tottenham Court Road in the Fitzrovia area of London. Its front elevation sits directly above public realm/pavement areas, while the rear overlooks back-of-house access and storage areas and a neighbouring pub's beer garden.

2.4.3. 180 Tottenham Court Road is formed of two rectangular floor plates joined by a narrower link between them. The building shares a party wall with the adjoining buildings on either side, which are a storey taller. The ground floor incorporates the main entrance reception area and a retail unit currently occupied by Dreams; this area does not form part of the survey. Above the ground floor, there are four floors of office accommodation.

2.4.4. The building was built in 1922 and the windows are believed to have been replaced in the 1970s meaning the windows were likely around 50 years old at the time of this inspection.

2.4.5. Given the façade's age, any warranties are no longer in effect, and several components are past their typically anticipated service life.

2.4.6. We are unable to comment on fire related issues and compliance with Building Regulations and Approved Document B. Such comments would need to be provided by a Fire Engineer.

2.4.7. Photographs showing typical elevations and details can be found in SECTION 6 of this report.

2.4.8. The following figure is an aerial view of the site.

Figure 1 - Aerial image of the building (courtesy Google Earth)

2.4.9. Photographs showing examples of the issues described in this report can be found in SECTION 6 of this report.

SECTION 3 CONSTRUCTION INFORMATION

3.1. Parties Involved

3.1.1. The original parties responsible for the design and construction of the building are not known. The building is now managed by Lazari Investments Limited.

3.2. 2030 EPC

3.2.1. We are not aware of the exact U-value of the façade systems however, given the age of the façade and the typical thermal performance achieved by window systems at the time of construction, they will not provide particularly high performance when compared to current U-value legislated targets.

3.2.2. The current façade energy performance must be considered holistically within the whole building energy performance within the context of the upcoming '2030' changes in EPC rating targets for commercial buildings. In some instances, upgrades to the building M&E systems or façade may be required to achieve compliance.

3.2.3. A review of the energy performance and EPC rating is outside the scope of this report.

3.3. Operations & Maintenance Manuals

3.3.1. No O&M information relating to the windows was provided.

3.3.2. The typical façade component service life estimates listed within this report are what may be expected from good quality components, installed with good workmanship and have been subject to a diligent maintenance and cleaning regime throughout their life. If installed to a lesser degree of workmanship, poorly detailed or where proactive maintenance and cleaning have not been undertaken, the anticipated service life listed may not be achieved.

SECTION 4 Windows

4.1. Overview

4.1.1. The windows on all elevations are Crittall-style steel windows. The exact system manufacturer cannot be confirmed due to the lack of information in the O&M manuals.

4.1.2. Due to the age of the building and the hardware, profile shapes, and finishes on the windows, it is thought that they were likely manufactured and installed in the 1970s and replaced the original timber or steel windows.

4.1.3. The windows are manufactured from non-thermally broken propriety suites of rolled steel sections. The steel sections are welded together at corners and intermediate transom/mullion connections and have been painted internally and externally. In some locations, it appears that the windows have been overpainted multiple times. The lack of significant rust on the steel windows and localised areas where the paint has flaked away indicates that they were originally galvanised before painting.

4.1.4. The windows use monolithic glazing and putty type sealants installed from the inside. The monolithic glazing was measured on site using a Merlin Lazer Glass Measurement Kit as a 3-4mm float glass. Wired glass has been used on the rear elevation in the stair core.

4.1.5. The exact method of window support is unknown and would require intrusive investigations which are outside the scope of this survey. We suspect that the frames are direct screw fixed through the frame into the brickwork/concrete structure. The heads of some such fixings were evident in some locations where the windows could be opened.

4.1.6. The opening windows in the offices overlooking Tottenham Court Road include a mixture of side and top-hung outward opening vents. These opening vents are hung from externally mounted hinges and make use of cockspur handles and casement window stays, which are generally all thought to be galvanised steel with some brass fitments. All other elevations instead include centre pivot opening vents. These vents make use of a brass centre pivot fitting, steel spring ring pull laches at the head, and, in some locations, casement window stays.

4.1.7. Since there are no gaskets between the outer frame and the vent frame profiles, the expulsion of water and air is, therefore, reliant on the hardware compressing the steel frames against one another.

4.1.8. To reduce air and water migration, an internal caulk seal and an external silicone seal are included at the perimeter of the windows.

4.1.9. A proportion of these windows have also been fitted with secondary glazing, presumably as a more cost-effective way to reduce heat loss, draughts, and noise pollution than replacing them.

4.2. Operation and Maintenance Information

4.2.1. No O&M information relating to the windows was provided.

4.2.2. Maintenance and cleaning of the windows is reliant upon ‘reach and wash’ techniques and MEWP access externally. Internally, there is easy access to most widows for cleaning and maintenance. Glass replacement is completed internally. There are 3no. windows in the 1st-floor bathrooms that have been closed off by the internal finishes, these windows are no longer accessible from the inside.

4.3. Service Life

4.3.1. Most of the windows are in a poor state of repair, notably due to the widespread finish failure, seal degradation and frame and hardware deterioration. There is notable air and water ingress caused by the distortion of the framing and seal failure. These windows are considered to have exceeded their service life and are likely to be beyond any reasonable economic repair.

4.4. Survey Observations

4.4.1. **Cracked glass:** Glass panes were found to be broken in several locations, and multiple were on the elevation overlooking Tottenham Court Road. This monolithic float glass poses an increased risk to pedestrians below should it shatter and fall from the building as it will fall as shards.

It is highly recommended that this glazing be replaced as soon as possible. If subjected to harsh weather conditions or impact during cleaning and maintenance, the cracked glass could fracture further, resulting in fragments becoming dislodged and falling from the building. In the meantime, it is recommended that cracks be taped over with a suitable film and that any windows exhibiting cracked glass be set in a secure, closed position and not used.

4.4.2. **Degraded putty sealant:** The putty sealants used to retain and seal the glazing were noted to be in poor condition on most windows where visible. Where windows had been repainted, the condition of the putty could not be viewed. It is believed that in these locations, the putty has simply been painted over and not repaired prior; as such, the putty sealants are thought to be in poor condition in all windows. Since the glazing rebates are not drained, any water entering the cracks can easily leak into the building interior and expedite the continued degradation of the seal.

The only reliable method of repair is to rake out the seal completely and reapply a new seal. This is often problematic because the original seals/putty may remain firmly adhered to the glass or frame.

In multiple areas, large chunks of the glazing putty had fallen away from the window, exposing the edge of the glass. Where large areas of the putty are missing, there is an increased risk of the glass dislodging from the frame. Caution should be used when operating such windows in the lead up to them being replaced.

4.4.3. **Degraded external sealant:** Cohesive and adhesive failure of the external sealant to the perimeter of the windows was observed. Degradation of the sealant will form weak points for weather tightness, allowing the permeation of water and air through the facade.

4.4.4. **Corrosion of framing and hardware:** Where the paint has worn or is damaged, the galvanised steel has been exposed. Over time, the galvanic coating has corroded, exposing the steel substrate, which has also begun to corrode. This weakens the frames and hardware locally, compromising their structural integrity. In locations of severe corrosion, the weather tightness of the window has also been compromised, as small pathways are formed that permit the passage of air and water.

4.4.5. **Distorted frames:** Over the service life of the windows, the framing profiles have been exposed to temperature changes, repetitive use and corrosion, all of which will, in time, cause the profiles to deform slightly. Where the profiles have deformed or warped, they no longer form a tight seal when closed. As there are no gaskets to seal the opening joints and reliance if put on the hardware pulling the metal profile tightly together, there is the passage of air and water where the frames have deformed. In locations, the deformation of the frames is preventing the windows from being secured in the fully closed position, leaving them slightly ajar. Water that is able to bypass the gaps in the opening joints results in damage to the internal finishes. The slight openings also cause a whistling when the wind blows through.

Where the framing profiles have become distorted and force is required to twist them back into the securely closed potion, additional stress will be exerted onto the glazing. This will increase the risk of the glass fracturing if subjected to harsh weather conditions, impact during cleaning and maintenance or rapid temperature changes. Caution must, therefore, be taken when operating the windows and where excessive force is required to open the window, it should not be used. This will likely become worse during the summer months when the frames expand in the heat.

4.4.6. **Degradation of internal finishes:** Due to the above-mentioned failing in the windows, the cavity between the rear of the non-thermally broken window and the secondary glazing will be taking on the external temperature. The air leakage is, however, not sufficient to fully ventilate the cavity. This has increased the risk of interstitial condensation within the cavity between the glazing systems, resulting in trapped moisture condensing on the glass, frames and internal finishes, leading to water staining, deterioration and likely mould growth. The writer was also informed by the tenants on the 4th floor that the window reveals require relatively regular replastering and painting.

4.4.7. **Excessive overpainting**: The windows have been overpainted multiple times, and in some locations, this has resulted in the windows becoming sealed shut. Where the windows have been painted and closed before the paint was allowed to dry completely, the paint has split and flaked away from the steel framing when reopened. This has exposed the galvanised surface to the elements, which increases the risk of corrosion and rate of degradation.

The above-mentioned distortion of the framing profiles and over-painting have restricted window operation. Where windows can be opened, they are typically stiff, making full closure difficult.

4.4.8. **1st floor bathroom window access:** Windows in the toilets on the 1st floor have been boarded up internally, preventing access. This means there is no access for maintenance, and should the widows need to be replaced, the glass would need to be broken out and the frames removed from the outside. Replacement windows would then need to be installed externally with external beading to allow future glass replacement from the outside.

4.4.9. **Glazing films:** On the 4th floor, some windows have an internal glazing film applied that is no longer fully adhered to the glass. The reason for the film installation is unknown, as no product manufacturer markings were observed. The films could have been installed to improve the acoustic performance, reduce solar heat gains, or improve safety. The films have been poorly installed and do not extend into the putty line of the window, meaning they will not retain the glass should it fully fracture.

SECTION 5 RECOMMENDATIONS & CONCLUSION

5.1. Conclusion

5.1.1. This report follows a non-intrusive inspection of the window elements at 180 Tottenham Court Road, London in October 2024.

5.1.2. Our external inspections were confined to the pavement level. No opening up works were undertaken. The internal areas were inspected from within the office areas on all floors except for the meeting room on the 2nd floor and some locked areas on the 4th floor.

5.1.3. As discussed in the survey observation in Section 4 of this report, the steel windows are beyond their originally anticipated service life and offer (by comparison to more modern glazing) poor thermal, acoustic, and weathertightness performance. As such, we recommend that consideration is given to replacing them, which we understand is the Clients preferred option.

5.1.4. We recommend replacing the existing steel windows with a modern thermally broken metal window system that includes double-glazing units. The following should be considered when developing a replacement strategy and specification:

5.1.4.1. The local authorities may set planning constraints on the visual appearance and materials of the replacement windows, particularly the elevation overlooking Tottenham Court Road. However, multiple thermally broken systems are available in both aluminium and steel, closely matching the visual appearance and sightlines of traditional steel windows. Appendix A of this report includes datasheets for a few systems.

- Crittall T60 – thermally broken steel window
- Janson Arte 2.0 – thermally broken steel window
- Schüco AWS 75 PD.SI – thermally broken aluminium window
- AluK 58BW ST – thermally broken aluminium window

5.1.4.2. When selecting the glazing configuration for the windows, it is recommended that a glazing risk assessment be carried out. Current best practice dictates that both internal and external panes be laminated with heat-strengthened glass, which is utilised where required following structural and thermal stress assessments. Consideration must also be given to the limiting dimensions of the glazing units that can be transported through the building.

5.1.4.3. The replacement windows should meet the thermal requirements of Approved Document L (ADL). Table 4.1 of ADL Volume 2 requires windows to achieve a U-value of 1.6 W/m^2K inclusive of the framing and glass.

5.1.4.4. Consideration should also be given to reducing solar heat gain through the windows. This is achieved through the inclusion of high-performance coatings within the glazing configuration. The typical performance achieved by coatings available on the market is a G-value of 0.35 or lower.

5.1.4.5. For the windows in the offices overlooking Tottenham Court Road, acoustic interlayers in the glazing may be required to reduce noise transmittance.

5.1.4.6. The weather performance of the façade should be assessed against the project wind load and exposure to define the specific performance to be achieved by the window system. The interfaces between the windows and the adjacent solid wall areas are critical and must be appropriately designed to minimise thermal bridging and the potential for weathertightness related failure issues.

5.1.4.7. The location and rating for any fire-rated windows should be considered. This will likely require input from the fire engineer responsible for the building's fire strategy. As the windows in the rear stair core of the building currently include wired glass, they may require some level of fire resistance when replaced.

5.1.4.8. It is recommended that further intrusive investigations be undertaken to understand the existing wall buildup and ensure the new windows are installed in the most thermally efficient location within the wall's depth. This assessment should check the internal surface condensation and mould growth risk.

5.1.4.9. As the new window frames will be deeper and the location in the reveal may change, modifications to the internal linings and possibly external finishes will be required.

5.1.4.10. As there is no mechanical ventilation in the building, trickle vents may be required for background ventilation, and openable vents will be required for purge ventilation. Therefore, consideration must be given to the required free area achieved by opening windows and the ventilation rate of trickle vents to ventilate each office space adequately. Requirements are set in Approved Document F.

5.1.4.11. The operation and functionality of any opening vents must also be reviewed. The current best practice is to avoid outward-opening vents, and it is recommended that inward-opening vents be considered. This will need to be coordinated with the internal secondary glazing, should it remain in place, and any planning conditions. Opening restrictions should also be included in any opening windows, especially those which open outward.

5.1.4.12. While the works could be largely carried out from outside the building, internal access will be required for deglazing the existing widows, reglazing the new windows, and sealing. Therefore, the disruption to tenants needs to be managed. Again, coordination with the internal secondary glazing, should it remain in place, will be required to ensure glazing units can be installed and replaced.

5.1.4.13. External works in some areas could be completed from a MEWP, however, this would require partial closure of the pavement on Tottenham Court Road and potential disruption to the retail unit on the ground floor. The alternative option would be to scaffold the building externally while the works are completed. This will allow continued use of the pavement and reduce disruption on the ground floor. It will also allow work to be undertaken on a larger area of the façade at one time. Council permission will need to be sought for either option.

5.1.5. The key benefits of replacing the windows include:

5.1.5.1. Reductions in heat loss, heat gain, and air leakage which will improve the envelope's thermal efficiency, reduce energy consumption for heating, and improve the EPC.

5.1.5.2. Improved acoustic performance, reducing the transmittance of traffic and pedestrian noise from the street and beer garden below.

5.1.5.3. Improved peaceful enjoyment of the office space by the tenants.

5.1.5.4. The new windows will come with a renewed service life and warranty. Typical warranties for windows are 10-12 years, with 5 years for the hardware. When designed following good practice, installed to a good level of workmanship and regularly maintained and cleaned, the windows can provide a service life of approximately 20-25 years before significant refurbishment and replacement of components such as glazing units, finishes and seals is required. The profiles, fixings and brackets used to form the windows would typically have a service life of 50-60 years.

5.1.6. As with any building, an ongoing programme of regular monitoring and proactive (and reactive) maintenance will be required to enable early identification and replacement of any failed components and prevent issues associated with façade degradation.

SECTION 6 PHOTOGRAPHS

6.1. General Elevation

Photo 1 – Main elevation overlooking Tottenham Court Road

Photo 2 – Side elevation overlooking Queen's Yard

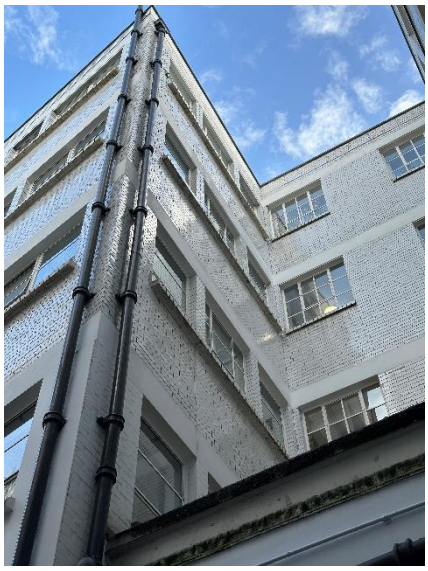

Photo 3 – Northside link recess elevations

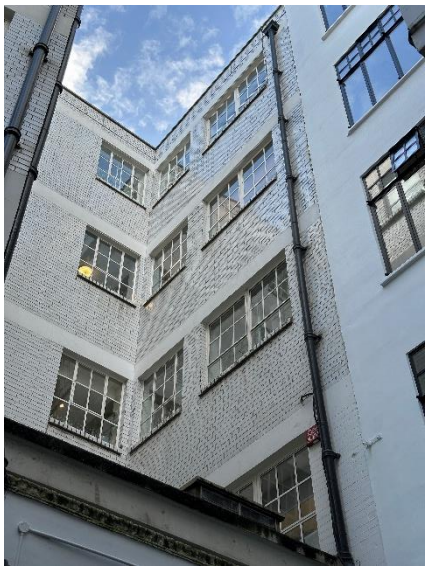

Photo 4 – Northside link recess elevations

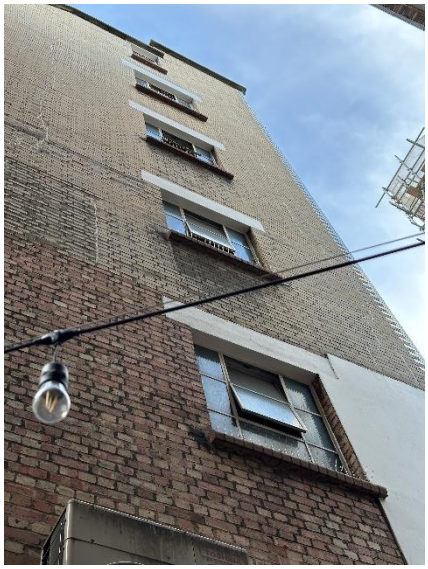

Photo 5 – Rear elevation overlooking Queen's Yard

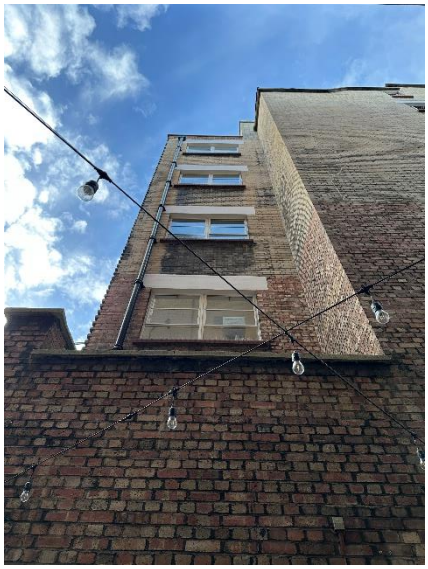

Photo 6 – Rear elevation overlooking the beer garden

6.2. Windows

Photo 7 – Typical internal view of centre pivot windows

Photo 8 – Typical external view of centre pivot windows

Photo 9 – Centre pivot window spring latch

Photo 10 – Centre pivot window mechanism

Photo 11 – Typical external view of top and side hung windows

Photo 12 – Typical external view of a side hung window

Photo 13 – Top hung window hinge

Photo 14 – Side hung window hinge

Photo 15 – Cockspur handle to a hinged window

Photo 16 – Casement stay to a hinged window

6.3. Glazing

Photo 17 – Broken glazing

Photo 18 – Broken glazing

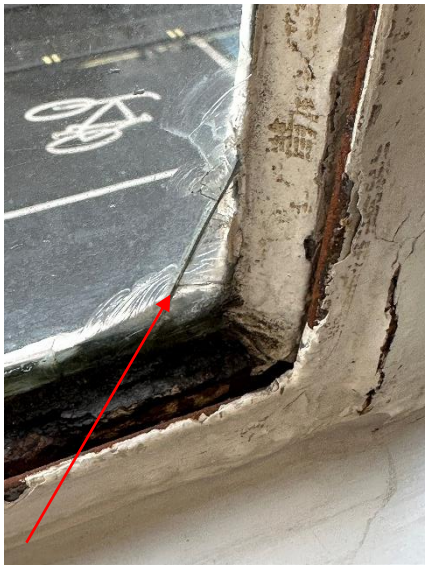

Photo 19 – Broken glazing

Photo 20 – Broken glazing

Photo 21 – Delaminated glazing film

Photo 22 – Wired glass in the stair core

6.4. Sealants

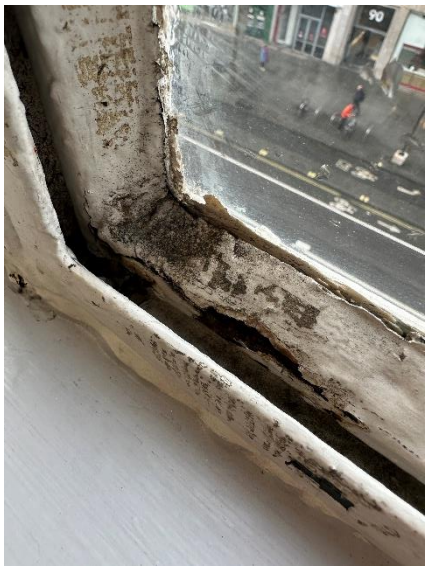

Photo 23 – Degradation of the putty sealant

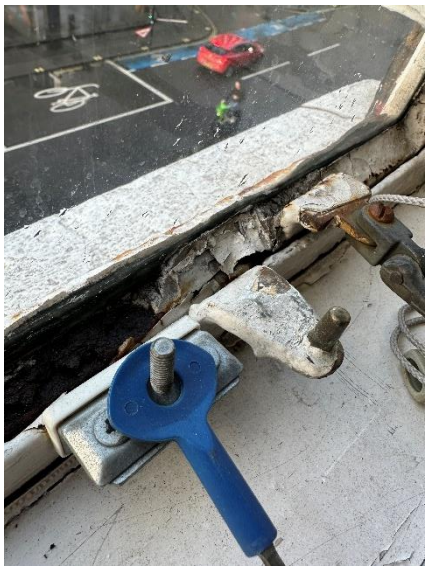

Photo 24 – Extreme degradation of the putty sealant and corrosion of the steel substrate

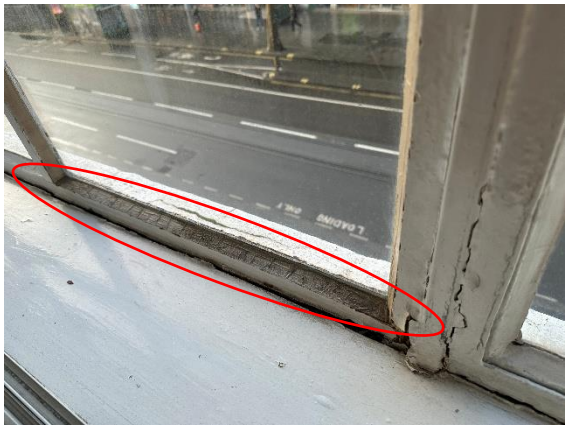

Photo 25 – Degradation of the putty sealant

Photo 26 – Extreme degradation of the putty sealant and corrosion of the steel substrate

Photo 27 – Overpainted degraded putty sealant

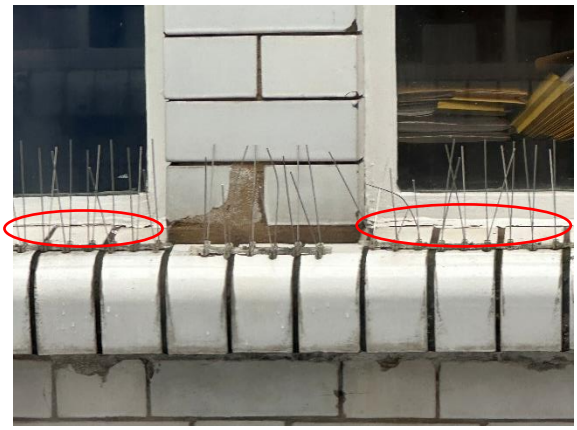

Photo 28 – External sealant degradation

6.5. Finishes

Photo 29 – Internal finishes flaked away, exposing the steel substrate

Photo 30 – Profile finish deterioration and corrosion of the steel substrate

Photo 31 – Internal finishes flaked away, exposing the steel substrate

Photo 32 – Profile finish deterioration and corrosion of the steel substrate

6.6. Water Ingress

Photo 33 – Water staining to internal finishes

Photo 34 – Deterioration of the internal finishes due to water ingress and condensation

Photo 35 – Deterioration of the internal finishes due to water ingress and condensation

Photo 36 – Deterioration of the internal finishes due to water ingress and condensation

APPENDIX A

Window system options