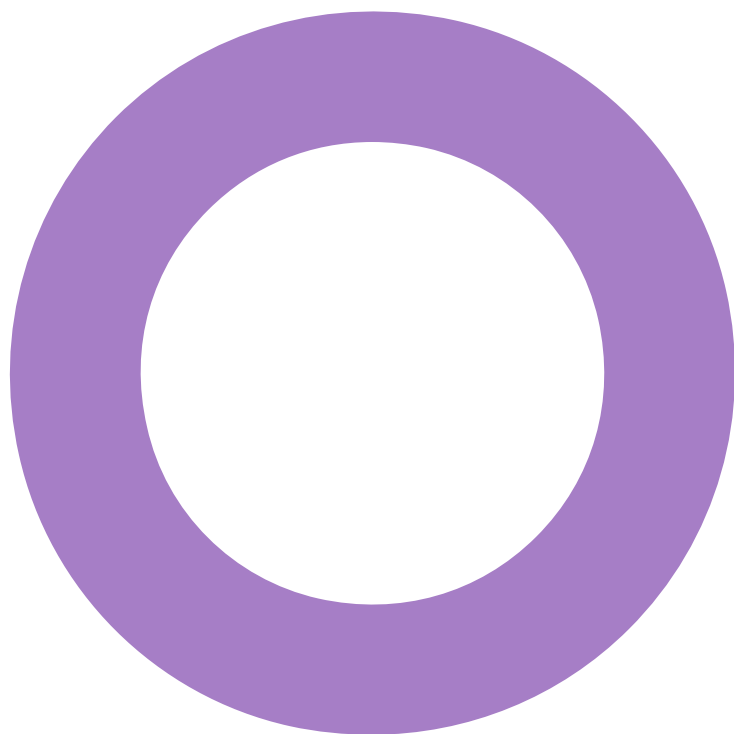


**Station Hill.
Reading.
Lincoln MGT.**

FAÇADE ACCESS
PLANNING SUBMISSION

REVISION 02 – 31 MAY 2019



Audit sheet.

Rev.	Date	Description of change / purpose of issue	Prepared	Reviewed	Authorised
02	2019-05-31	Planning submission	AS	TR	PK

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Executive summary.

The contents of this report are to outline the proposed façade access strategy for the cleaning and maintenance to Station Hill, Blocks E and F.

The objective of the strategy is to provide the most appropriate and robust methods of safe access to the entirety of the building facades for all cleaning and maintenance tasks expected to occur over the life of the building.

In line with regulatory guidance, Hoare Lea advise that the façade access strategy should aim to avoid the need to work at height where reasonably practicable and then prioritise collective protection measures over personal protection.

Following consideration of various façade access strategy options, the following approaches are preferred:

1. Rope access for cleaning
2. Internal glass replacement

The proposed strategy therefore prioritises the use of internal cleaning access where practicable, to glazing within projecting balconies and to terrace and ground level glazing. Regular cleaning access and light duty maintenance to the façade surfaces not accessible from balconies or terraces is to be achieved via industrial rope access techniques.

An anchor rail system and safety wire are proposed as the primary anchorage at the top of each elevation and a safe landing zone is required at the bottom (both recommended to be a minimum 1500mm).

Glass replacement can be reasonably expected to occur on average once every ten years. The architect has indicated a preference for an internal glass replacement approach, transporting the glass panel through the building via the lifts and through the corridors and doorframes, as opposed to exterior replacement with hoisting achieved via davits installed at roof.

1. Introduction.

This report provides an initial appraisal for the feasibility of accessing the facades of the proposed Blocks E and F Station Hill, Reading for the purposes of cleaning, maintenance and replacing glass. The Blocks range in height from approximately 20m to 40m in height from effective ground floor level.



Figure 1: Station Hill Blocks E & F isometric view from south-east

1.1 Strategy Objective.

The primary objective of the agreed strategy must be to grant suitable access to the entirety of the building façades. Good practice solutions consider all the tasks to be undertaken over the life-cycle of the building so as to achieve a holistic solution and minimise risk to maintenance contractors. The primary tasks are summarised as follows:

- Routine cleaning of the building fabric externally
- Long term inspection & maintenance of the façade such as the replacement of cladding panels

Key considerations in the evaluation of the scheme have been;

- scheme constraints
- compliance with all legislation and codes or practice
- minimising the cost of cleaning the façade

Other items which should be considered as the design progresses are:

- building and structural requirements
- physical contact with the building fabric and associated wear and tear

The strategy has been benchmarked against the following standards:

- BS 8560 Code of practice for the design of buildings incorporating safe work at height
- BN EN 1808 Safety requirements for suspended access equipment
- BS EN 795 Personal fall protection equipment
- BS 7985 Code of practice for Rope Access
- BS 7883 Code of practice for the design, selection, installation, use and maintenance of anchor devices

1.2 Designing for the Safety of Operatives Working at Height.

The design of the proposed buildings, do not make it possible to propose strategies which completely avoid the need to work at height.

The access strategies therefore prioritise safety by selecting methods of work that reduce the risk of a fall or personal injury to an acceptable level.

BS 8560, The Work at Height Regulations, The Construction (Design and Management) Regulations and the Health & Safety Executive advise that work at height risk is addressed in accordance with the points below and the control measures presented in Table 1.

- 1. Avoidance: where possible the design should avoid the need to work at height.
- 2. Prevention: where avoidance is impractical, the design should incorporate measures that prevent falls or that prevent operatives accessing a position from which a fall could occur. The design should prioritise:
 - a. permanent measures ahead of temporary measures
 - b. collective measures that protect all from falling ahead of personal measures that only protect an individual

It is important to recognize that passive measures (measures requiring no action on the part of those protected) may offer greater safety benefits than active measures (measures which require specific action on the part of the user to be effective).

Control Measures	Example Control Measures	Desirability
Avoid the need to work at height	Ground/ floor based maintenance	Most
Prevent falls; collective	Building Maintenance Unit, Temporary Suspended Platforms, Davit, Mobile Elevating Work Platforms, Scaffold	
Prevent falls; personal	Rope access techniques, anchors and anchor lines for work restraint	Least

Table 1: Work at Height control measures

For all work at height, the most intrinsically safe means of access should always be the first consideration.

Hoare Lea has previously discussed the topic of health and safety for persons involved in the maintenance of buildings with The Health and Safety Executive and a large number of CDM coordinators. The information below further sets out the pertinent points frequently raised.

- Cleaning and maintenance of the building glazing and façade must address the safety of operatives carrying out the work
- In deciding on a cleaning and maintenance regime the pros and cons of any options should be considered and assessed
- Where it can be demonstrated that no collective method or system is practicable and personal protection measures are identified as necessary, their use must be minimised across the site by employing other suitable solutions which may have implications for cost and design
- In the spirit of CDM any decision should aim to produce a health and safety benefit

Numerous factors may well provide input into the decision-making process but in the opinion of health and safety guidance, cost and design considerations should not ignore or take precedence over health and safety considerations.

2. Strategy Overview.



Figure 2: Rope access anchorage strategy overview

3. Cleaning Strategy

3.1 Rope access via anchor rails.

Hoare Lea propose the use of anchor rails as the primary method of anchorage system minimising impact on the roof space compared to other anchorage methods and allowing the rail upstands to be fixed over sedum green roofs. 1500mm clear space from the inside edge of the parapet is required for abseiling using the anchor rail. Anchor rail upstands are to be fixed every 3000mm. It is recommended that only one operator is to abseil between two upstands at a time.

For elevations with 975mm parapet (Figure 3), an anchor rail and safety wire system is designed to provide fall protection. The anchor rail is to be positioned at least 750mm from the inside edge of the parapet to allow operator movement and to create a safe condition for rope rigging. The anticipated imposed load on the parapet is 28kN.

For elevations where there are no parapets (Figure 4), an anchor rail and safety wire system is designed to provide fall protection. We would recommend a minimum of 1000mm clear zone is to be provided from the roof edge to the anchor rail. The anticipated imposed load on the parapet is 21kN.

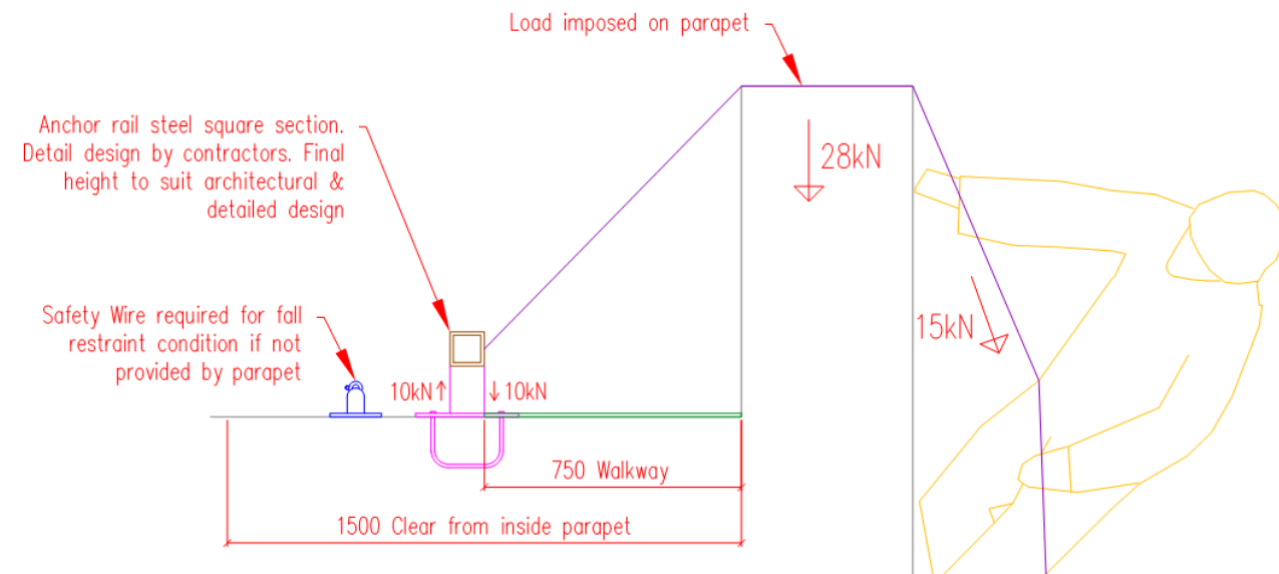


Figure 3: Rope anchor rail for 975mm high parapet

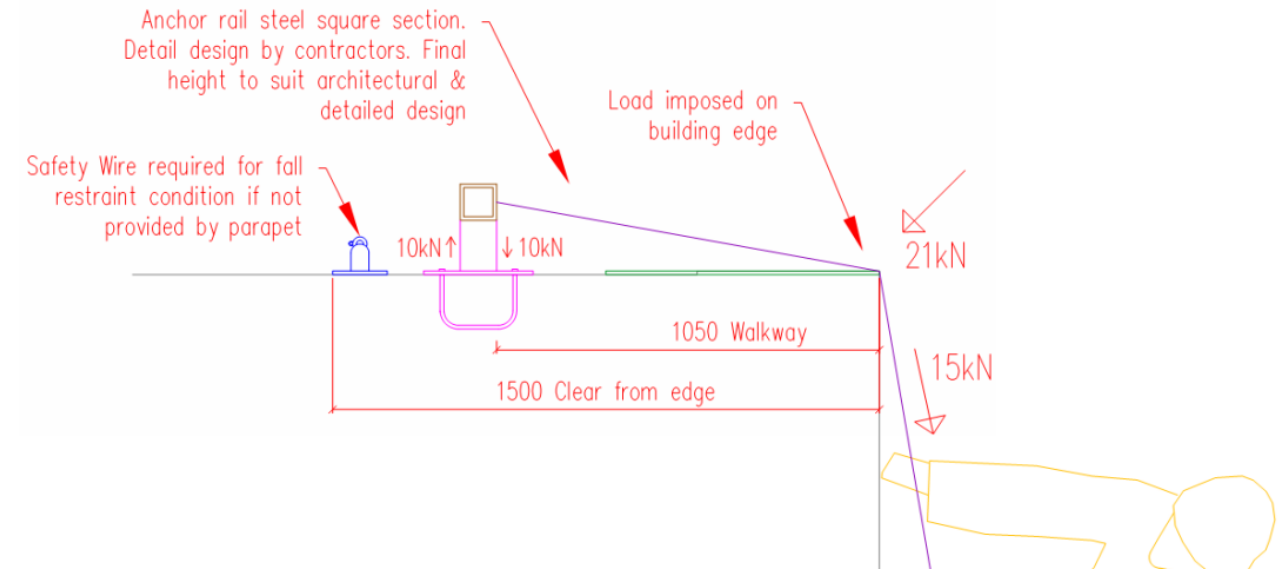


Figure 4: Rope anchor and safety wire for unprotected edge

A 1500mm clear landing zone on ground level is required for safe descent in the case of an emergency.

3.2 Rope access via Recessed davits.

As an alternative anchorage solution recessed davit anchors may be utilised in the amenity spaces (marked in red on Figure 2). 1500mm clear space from the inside of the parapet/balustrade is required for installing and operating the davits. Anchors are proposed to be positioned every 1500mm for an operator to reach a radius of 750mm to either side from each descent point.

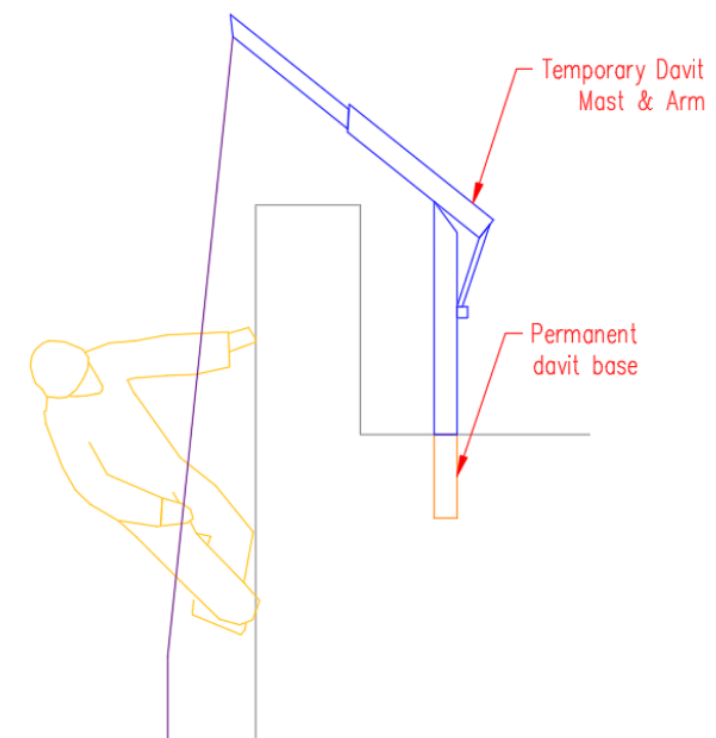


Figure 5: Rope davit with recessed anchor

3.3 Secondary anchors / monorails.

Windows on the balconies are proposed to be cleaned from the balcony.

Regular cleaning access to the façade areas beneath the balconies requires a secondary anchorage/monorail system integrated into the underside of the balcony above, to allow for rope re-anchoring and operative positioning close to the façade.

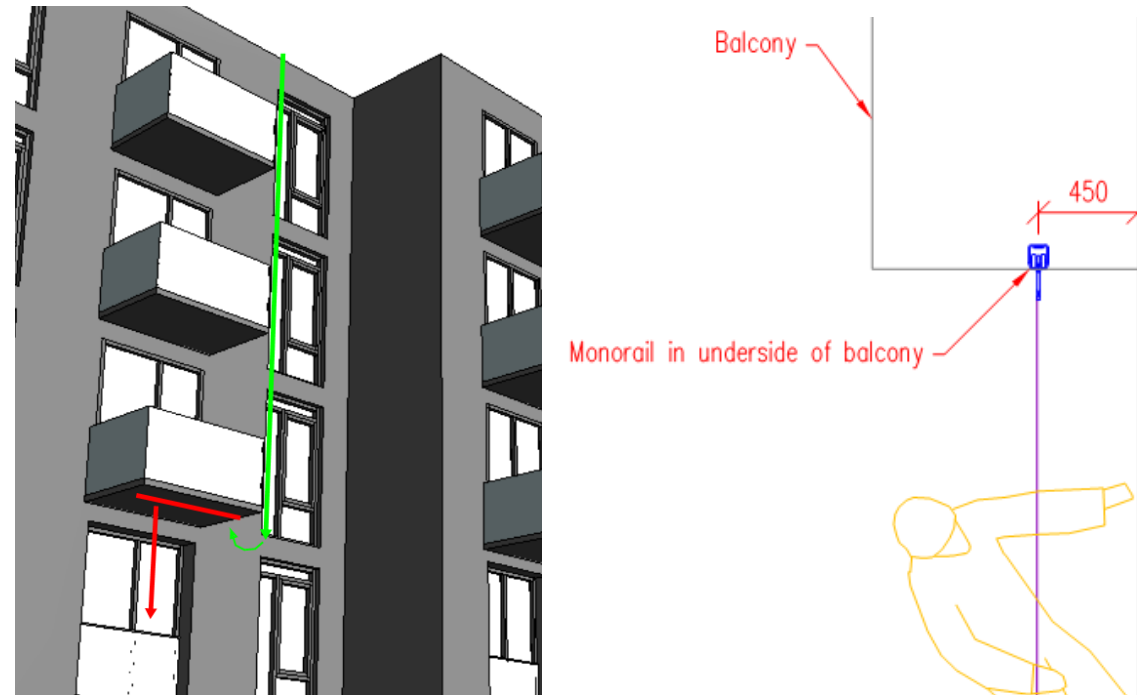


Figure 6: Monorail to be installed below the lowest projected balcony

Monorails are preferred to a series of anchor points as they spread the suspended load across multiple mounting points and reduce the amount of re-anchoring required. Re-anchoring can be a time-consuming process which consequently increases the overall cleaning time, the operative's suspension time and the time it may take to perform an emergency rescue procedure.

4. Maintenance and Glass Replacement Strategy.

During the design development of the façade, due consideration should be made to the repair and / or replacement of the façade panels and panes of glazing. Whilst this is likely to be carried out on an infrequent basis, the principle will be considered and provision made.

Glass panels are to be replaced via internal methods. The glass panels are to be internally beaded and suitably sized to transport via the lifts and through the internal building layout. In order to achieve this, it is important to make sure all panels are sized to pass through the lift door and fit inside the lift car.

It is recommended that the internal areas are designed to accommodate the maximum glass panel size being transported through the building on a suitable glass trolley similar to the equipment shown in Figure 7.

Reasonable space should be provided adjacent to the interior surface of each glass panel to allow for an appropriate working zone which can accommodate maintenance operatives, replacement glass panels and associated maintenance equipment.

This strategy is to be further co-ordinated with the design team in stage 4.

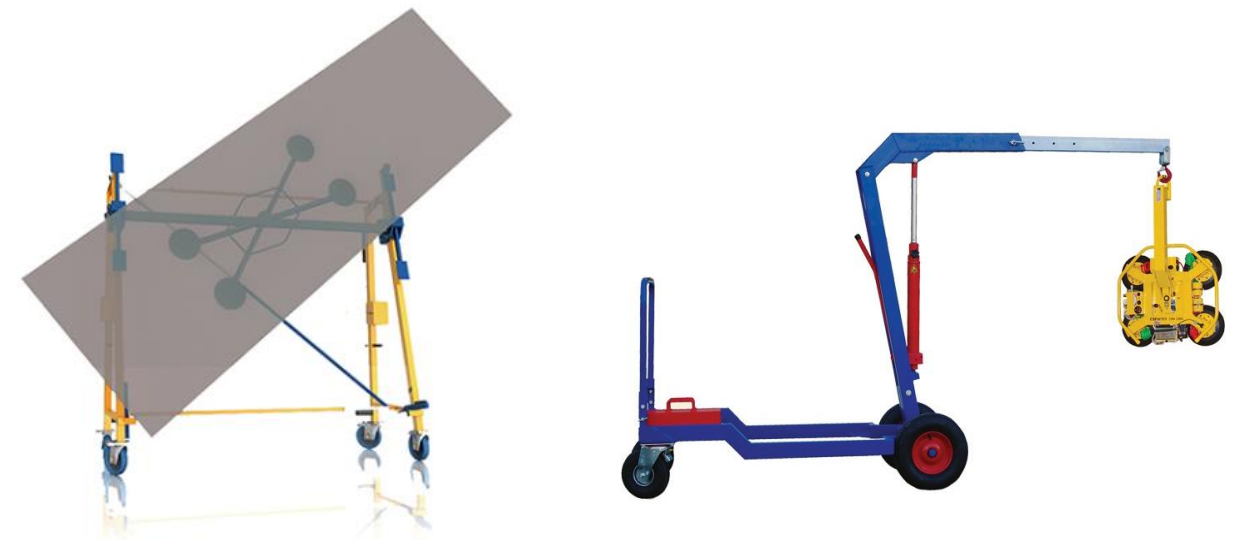


Figure 7: Indicative internal glass replacement equipment

Maintenance works to non-glazed elements are expected to occur on an extremely infrequent basis. In general, temporary scaffold towers are to be erected where and when required.

5. Safety considerations.

5.1 Safe working methods

Site specific method statements and risk assessments should be provided to help identify and mitigate operational risks during works. Permits to work should be provided to authorise operative access to the necessary work areas.

5.2 Aptitude and experience

The specialist industrial rope access operatives will have appropriate training, knowledge or experience in safe rope access methods. They will ensure that rope access works are properly planned, appropriately supervised and carried out in a safe manner. The Industrial Rope Access Trade Association (IRATA) is one of the most recognised associations in the rope access industry.

5.3 Personal Protective Equipment

Operatives are to have suitable personal protective equipment in accordance with the Personal Protective Equipment at Work Regulations (PUWER).

5.4 Exclusion zones

A minimum 1.5m clear, safe landing zone perpendicular to the façade and projected down to the foot of the elevation is proposed for safe emergency descent and to protect against unauthorised persons entering the work area. A wider exclusion zone to protect others against falling objects from above should be the maximum appropriate to the work situation, ideally at least equal to the height of the work position.

A minimum 1.5m anchor area exclusion zone should be cordoned off at anchor level with suitable barriers and signs during operation to provide safe access to the anchor points and to the working edge.

5.5 Safe emergency rescue

Even though great care and attention is given to designing safe working systems and practices, incidents can still happen. The survival of an injured or otherwise immobile person often depends on the speed of rescue and the care given to the casualty during and after rescue. Consequently, great importance should be attached to assessing all possible emergency scenarios and to plan how any resulting rescues would be carried out. Provisions should be made to ensure that help is provided promptly to any operative who needs it or who is unable to communicate and might be in danger, for example from suspension intolerance.

6. Work restraint systems.

Work restraint systems compliant with BS EN 795 which utilise harness-lanyard-anchor arrangements to restrict operative travel are proposed for height safety when accessing roof areas with unprotected edges.

The system is designed to allow operatives to maintain their work position without difficulty so that cleaning and maintenance or connection to/from the rope access systems can be completed safely.



Figure 8: Work restraint safety wire system

7. Working edge design.

Where the method of rope anchorage does not divert rope loads over the parapet (i.e. the working edges adjacent to the anchor rails), the parapet structure will need to be designed to accommodate the imposed rope loads, and hazardous features such as sharp edges or abrasive or hot surfaces should be avoided.

If the anchorage method requires operatives to climb over the parapet/balustrade, the parapet/balustrade should be appropriately designed to support the weight of one or multiple operatives and to avoid sharp, hot or abrasive hazards.

8. System storage.

All equipment for use in rope access should be stored in a cool, dry, dark place in a chemically neutral environment away from excessive heat or heat sources, high humidity, sharp edges, corrosives or other possible causes of damage. Equipment should not be stored wet.

9. Cleaning frequency.

To retain the aesthetic appearance of the façade, cleaning is proposed to take place on a regular basis. If the façade is not cleaned regularly the different surfaces of the façade will show signs of dirt build-up. Dirt will concentrate in corners and on protruding parts that are not naturally washed by rain.

All elements of the façade should be cleaned on a regular basis to keep the facade in good condition. Careful consideration should be given to the cleaning cycle of the cladding. In our opinion and based on previous experience residential buildings are typically cleaned every three to six months to ensure the glazing maintains a high-quality appearance. Guttering is typically cleaned annually and any precast elements approximately once every five years.

Ground level glass is proposed to be cleaned as frequently as once per 6 weeks to maintain a high-quality finish to these publicly visible façade areas.

The above frequencies are indicative only and we expect the cleaning and maintenance frequency to be judged and determined by a specialist cleaning company in consideration of the period indicated by the cladding contractor warranties and the expectations of the client and the residents.