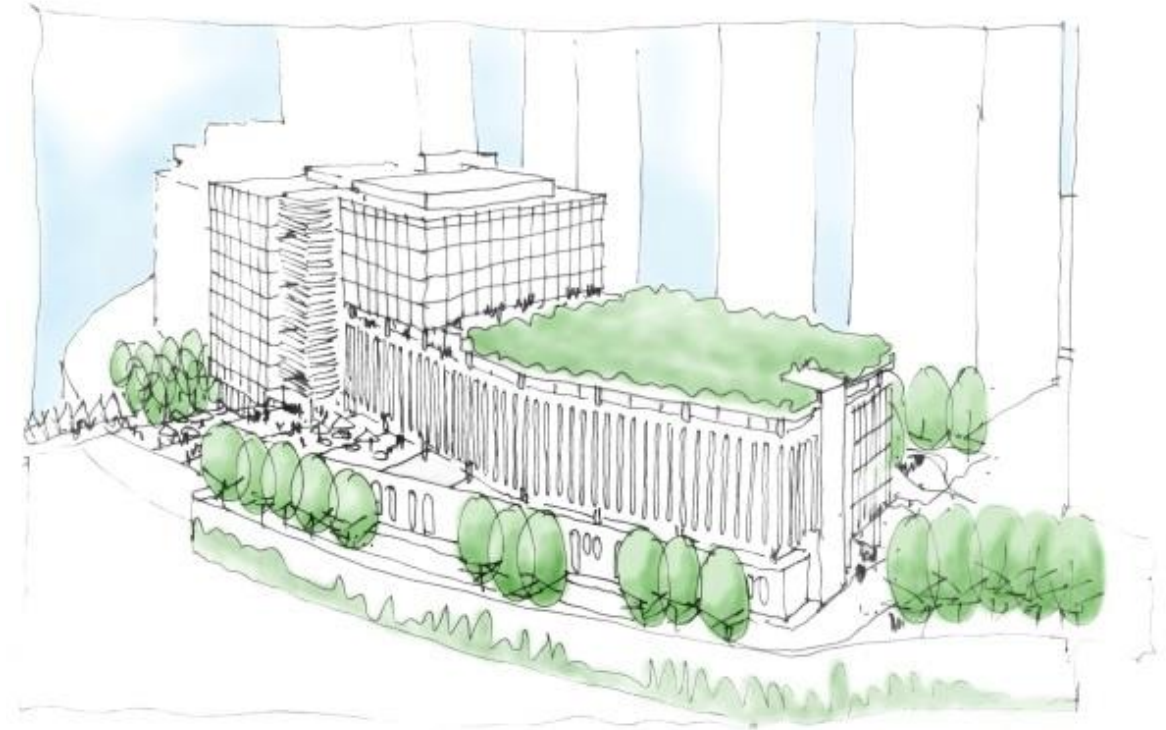


Presentation Overview

- Introduction & Brief
- Past Experience
- Summary of past experience

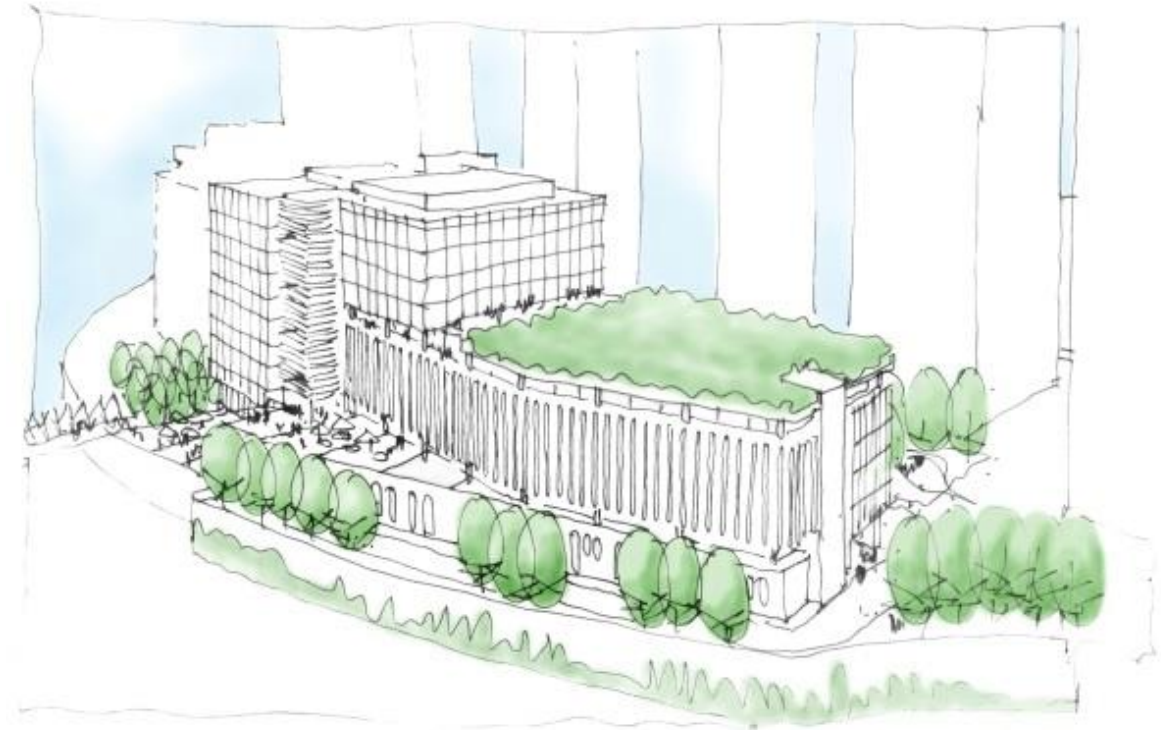


Introduction

During multiple construction activities it is required to have operatives working close to the roof edge. Roof edge protection is therefore required.

On previous projects it has been necessary to move or otherwise alter the roof edge protection during the works. This increases the risk and introduces further opportunities for accidents to occur.

It is therefore considered that the roof edge protection elements and planning should be reviewed to ensure that any potential issues are identified and that the best strategy is taken forward.



Brief

Minimise necessary alterations to the roof edge protection systems to significantly reduce the inherent risk of working at height.

Main priorities:

- Minimise operatives exposure to unprotected roof edges.
- Eliminate or reduce number of required changes to the roof edge protection.
- Increase safety with roof working

Other issues considered:

- Integration of permanent edge protection
- Construction sequencing
- Cost
- Flexibility



Edge protection sequence: S6

L10 Roof

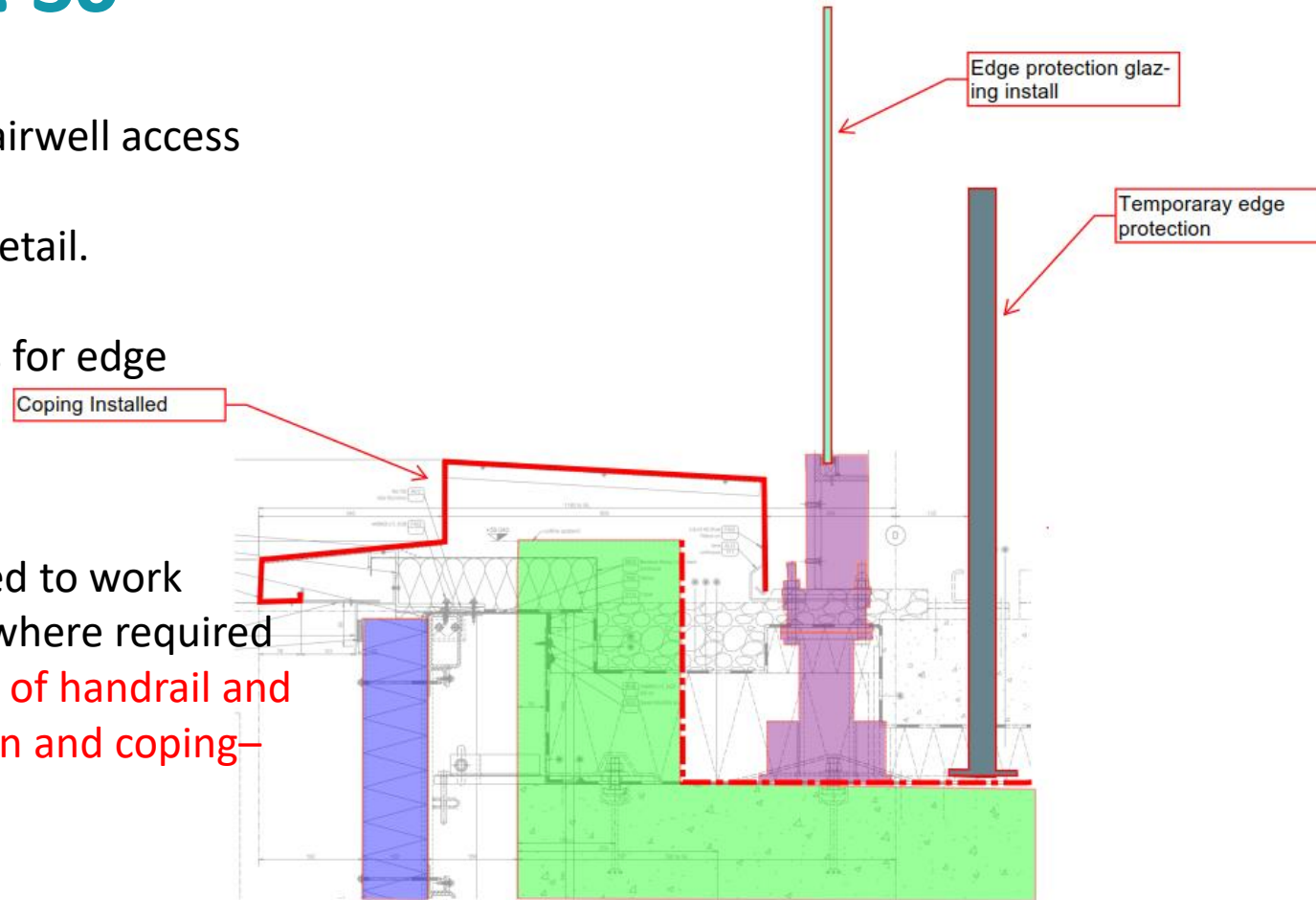
- Local upstand and handrail issue at external stairwell access location.
- Sequencing greatly improved due to upstand detail.
- Outline sequence:
 1. Roof construction using climbing screens for edge protection
 2. Careys left handrail on top of upstand.
 3. K-Guard added to HR
 4. Installation of cladding : K-Guard removed to work through handrail – lifelines can be used where required
 5. Temporary handrail installed for removal of handrail and installation of permanent edge protection and coping–lifelines can be used where required



Edge protection sequence: S6

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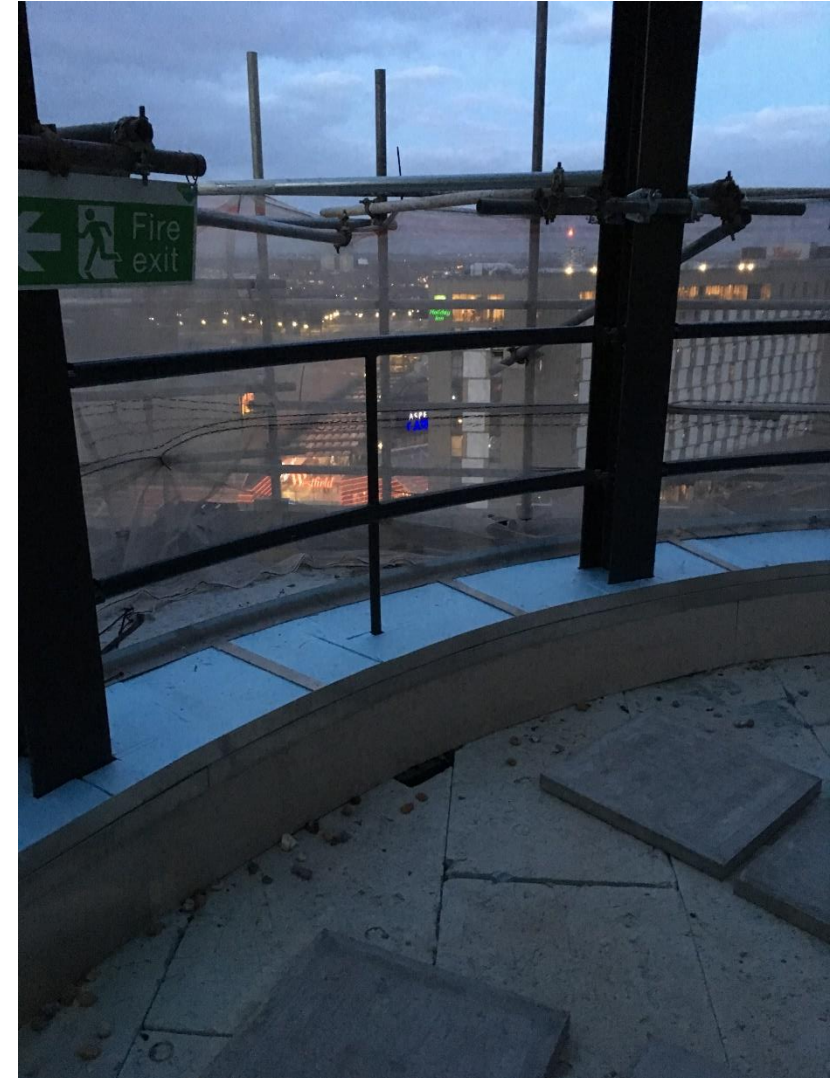
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Edge protection sequence: S6

L11 Roof

- Flat roof without upstand – more difficult
- Outline sequence:
 1. Roof construction using climbing screens for edge protection
 2. Careys left handrail around perimeter – note LLC should have advised location as its placement could have been improved.
 3. K-Guard added to HR
 4. BMU steelwork installed with permanent handrail between columns.
 5. Cantilevered scaffold with netting screen erected off of BMU steel columns to allow access to roof edge for finishes etc.
 6. Cantilevered scaffold had to be modified to allow cladding to be sealed. Note this stage could have been omitted if carried out initially
 7. Coping installed working through scaffold



Edge protection sequence: S6

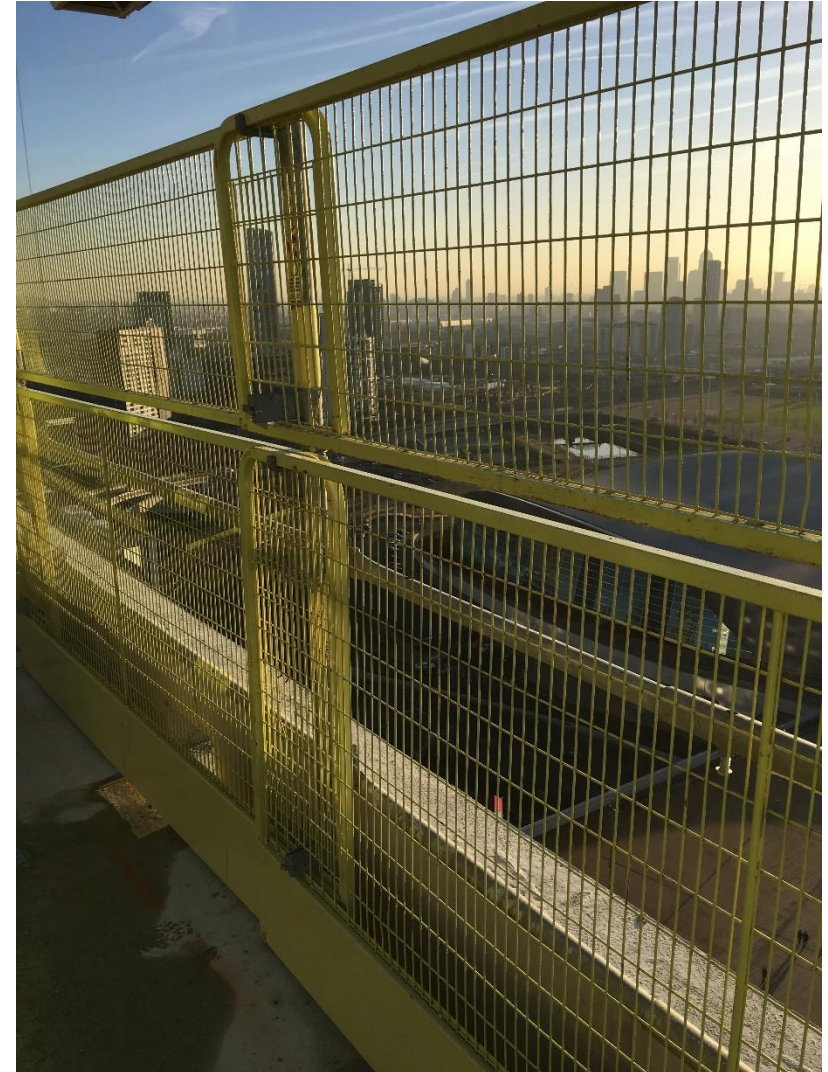
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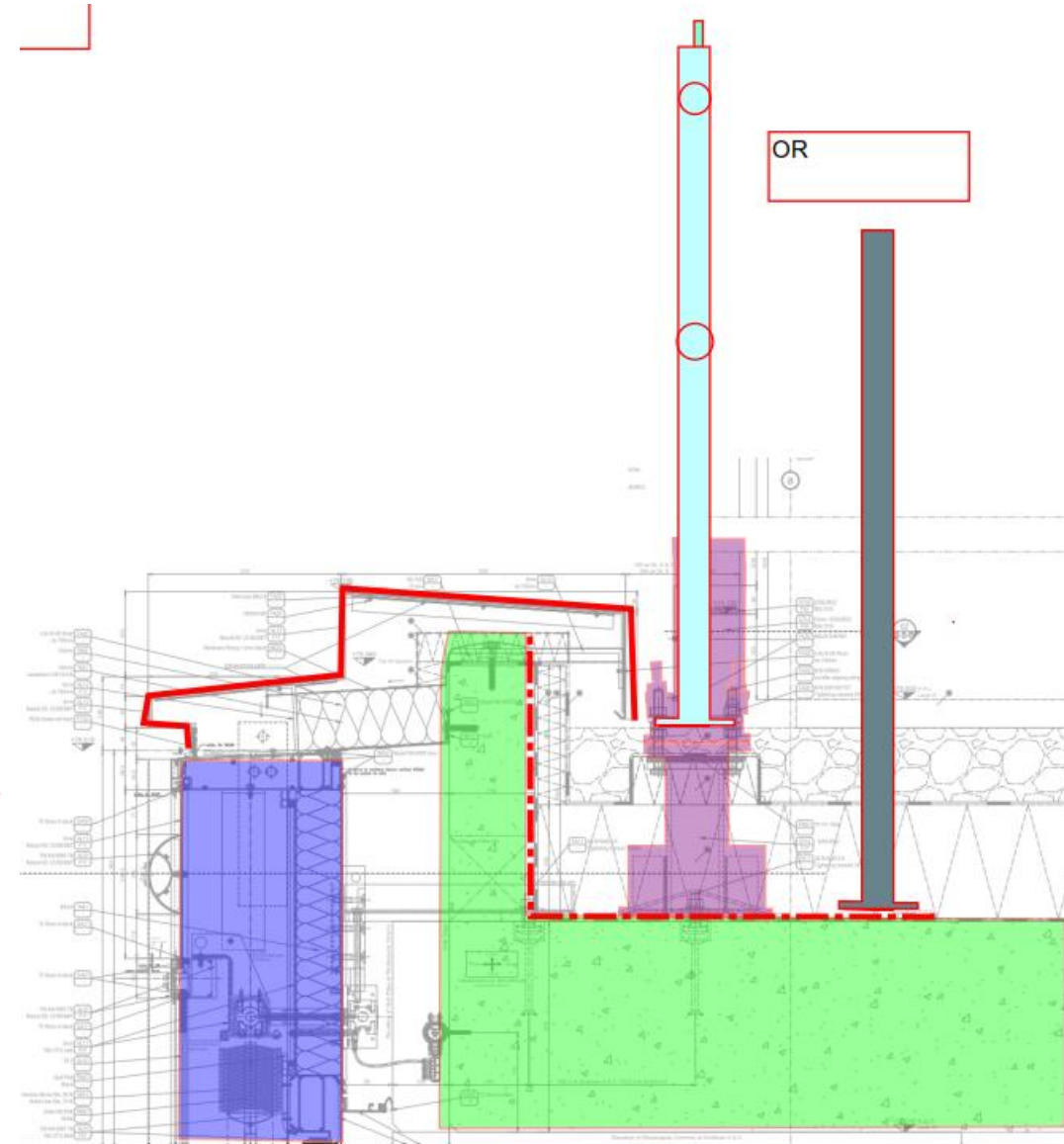
Potential edge protection sequence: S5 L15

- Narrow upstand present with HR inboard
- Double height 1.8m K-Guard used.
 1. Roof construction using climbing screens for edge protection
 2. Careys left handrail inboard of upstand.
 3. K-Guard added to HR
 4. Removing K-Guard and working through handrail for installation of cladding. Note brackets pass through upstand – lifelines to be used where required
 5. Either add temp HR to permanent glazing stanchions or install temp HR behind Line of Permanent glazing
 6. Installation of coping work through handrail – lifelines can be used where required
 7. Fit permanent glazing panels



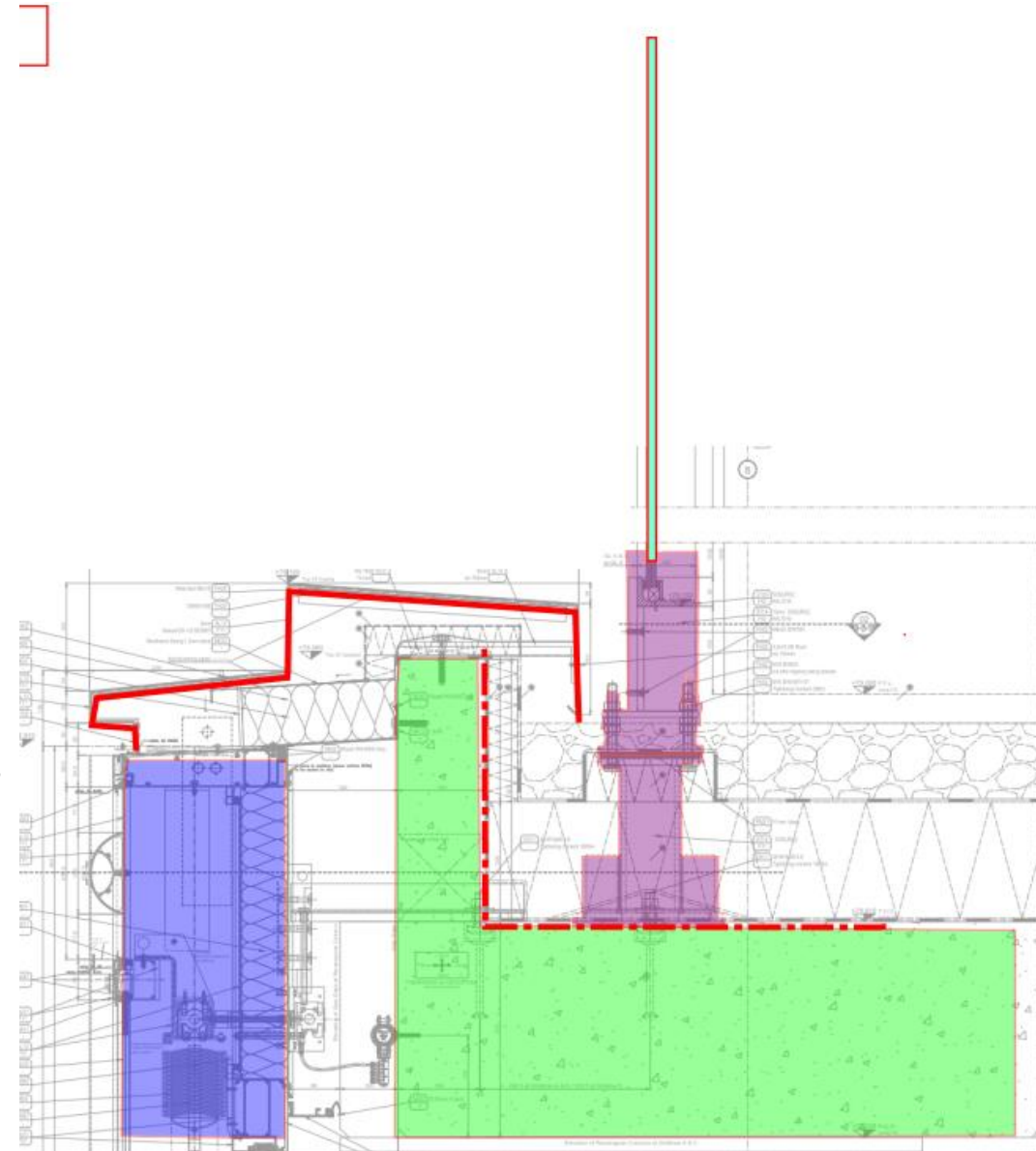
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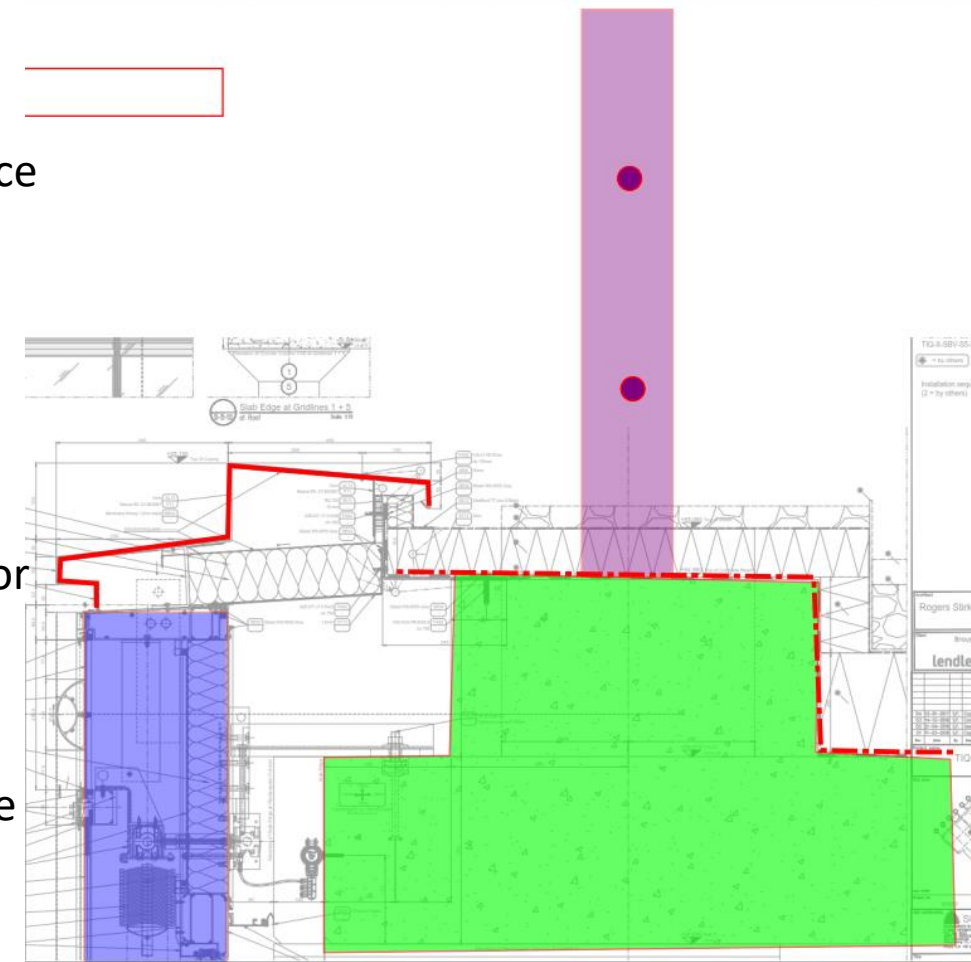
Potential edge protection sequence: S5 L19

- Uprand present but due to BMU baseplate locations insufficient space to fit handrail on upstand
- Double height 1.8m K-Guard used on north perimeter.
- Steel frame had a different system.
 1. Roof construction using climbing screens for edge protection
 2. Careys left handrail.
 3. K-Guard added to HR
 4. Construction of 2m wide scaffold fan required on level below for installation of BMU steelwork, trimming grouting ducts etc. removing K-Guard and working through handrail – lifelines can be used where required
 5. Once BMU steelwork is installed the permanent handrail can be fitted to carry out other roof finishes.
 6. Cantilevered scaffold may be required to fit cladding etc
 7. Installation of coping work through handrail – lifelines can be used where required



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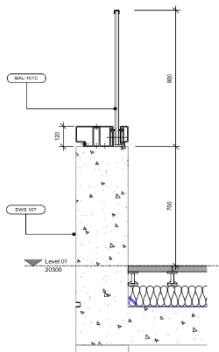


Past Experience Summary

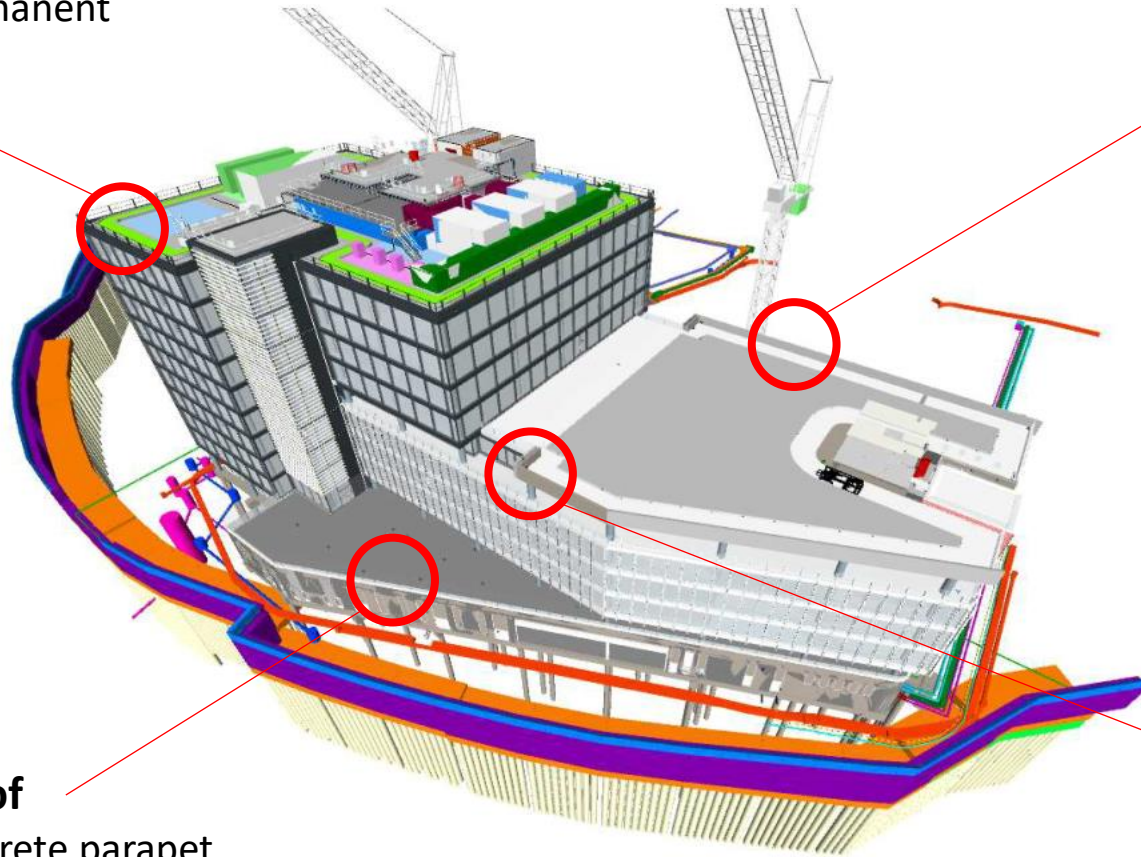
- The use of upstands allows more works to be undertaken without moving the initial edge protection
- Make sure upstand large enough to fit a handrail baseplate
- LLC should discuss with concrete frame contractor where the temporary handrail is installed
- Planning in advance can reduce the edge protection iterations required.
- It is possible to use the permanent edge protection as temporary edge protection
- Different system required for steel frame elements



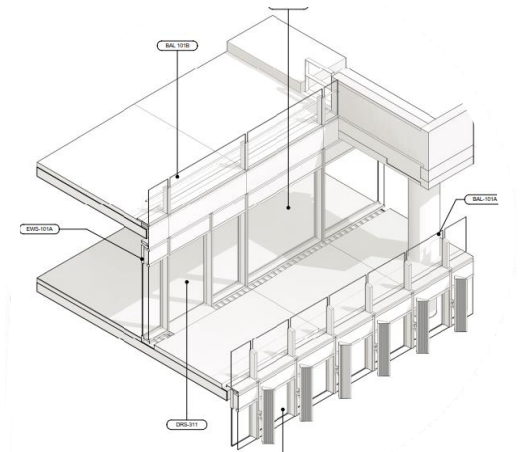
- Cladding panels include permanent handrail edge protection



- Low level concrete parapet
- Early installation of Permanent glazing edge protection to also be used as temporary edge protection



- Full height concrete parapet for permanent and temporary edge protection



- Cladding panels include permanent glazing edge protection