HS2

1CP01

PROTECTION OF HERITAGE COLUMNS AT ROYAL COLLEGE OF GENERAL PRACTITIONERS (RCGP) (EXTRACT FROM PAYE REPAIR STRATEGY)

Document no: 1CP01-MDS-EN-REP-SS08_SL20-000010
Work Package Ref: Tranche 8

Revision	Author	Reviewed by	Approved by	Date	Revision Details
C02	Djamal Renard	Ramraj Shetti	David Henry	14-03-2021	Revised following comments

STAKEHOLDER REVIEW REQUIRED (SRR)
☐COUNTY/DISTRICT/LONDON BOROUGH COUNCIL
☐LOV
☐LUL
☐NRL
☐TFL

PURPOSE OF SRR
☐ACCEPTANCE
☐APPROVAL
☐NO OBJECTION
☐CONSENT

CONTENTS

1 Executive Summary

1.1.1 This document is an extract of 1CP01-MDS_PRL-EN-REP-SS08_SL20-000001 (C01) Royal College of General Practitioners (RCGP) – Repair Strategy and Methodology which addresses general repairs to heritage features at the RCGP.

1.1.2 This extract deals specifically with the interior clad columns to the upper floors of RCGP which have been identified as being at risk of damage from the adjacent HS2 works.

2 Mitigation measures to interior clad columns (upper floors)

2.1.1 The interior clad columns are typical load-bearing terracotta block construction restrained back to the structural steel column with steel restraining ties. A common cracking pattern is observed to the top terracotta unit in the same plane as the down stand beam. This suggests that load transfer / movement from the steel frame has induced cracking to the top unit. One unit on the second floor has sustained significantly more damage than the others and has been historically wrapped (summarised from Byrne Looby Report 1CP01-MDS_BLY-EN-REP-SS08_SL20-000004)

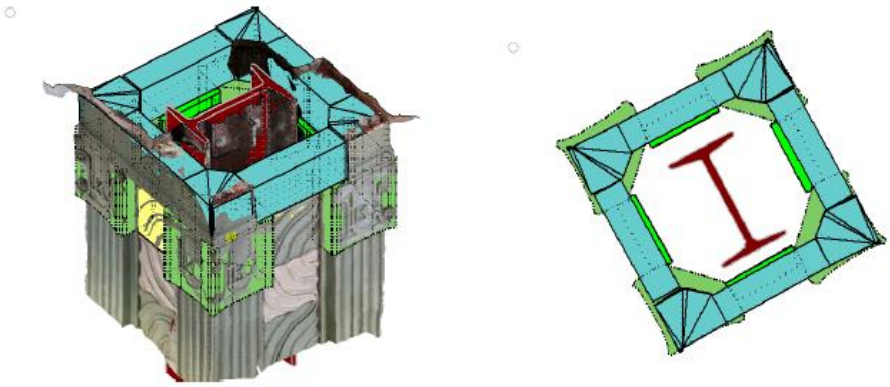

Figure 1 Photogrammetric Survey of a Typical Column

2.1.2 The predicted settlement of the beams could cause further damage to the terracotta at the down stand beam. Therefore, mitigation measures should be implemented to the 12no. columns where the down stand beam bears onto the top of the terracotta units.

2.1.3 The 12no. columns should be temporarily restrained and encapsulated due to the potential risk of displaced units fracturing and falling to floor. The restraint method will involve Cambuckle straps and an encapsulation hoarding from the cushion course up.

2.1.4 The top two courses to the column should be strapped and secured in place with Cambuckle strap as detailed in the image shown below. This method also allows periodic inspection as it can be removed and reinstated by the surveyor. It has the

added benefit of not requiring fixings into the building fabric. The below sketch indicates a potential solution.

2.1.5 Single sided adhesive foam tape will be stuck to the inside of the strap before fixing. This will manage the higher pressure expected at the corners and help ensure that a positive connection is maintained along the full length of the strap. The cambuckle straps will be hand-tightened by a single operative to provide restraint to column cladding. Care will be taken not to over-tighten the straps. This will provide restraint to any units inclined to fall and allow for periodic inspection to be undertaken.

Figure 2 Indicative sketch of the top two courses strapped

Figure 1 Cambuckle straps

2.1.6 An encapsulation hoarding will be installed around the column body from the cushion course up. The hoarding will restrain any cracked terracotta and prevent any large broken pieces from falling.

2.1.7 A temporary works design will be produced for the encapsulation hoarding. The building overall fire risk assessment and strategy is the responsibility of the building owner and should be updated to accommodate the timber hoarding additions.

2.1.8 It will not be possible to inspect (for defects) any of the terracotta columns behind the encapsulation hoarding once it has been installed. See 2.1.13-17 for visual inspection regime.

2.1.9 Two 2x2 timber collars (top and bottom) will be fixed around the column. 10mm foam will be installed to the inside face of the timber collars to provide protection to the column face. The bottom timber collar will be held in position by friction of the foamed face bearing against the column and will sit just above the pilaster lip (to prevent

sliding). The top timber collar will be held in position by friction of the foam bearing against the column and the plywood sheet. 12mm plywood will span between the two collars and sit onto the cushion course. Temporary 2x2 timber posts may be required to temporarily restrain the top collar until the plywood has been installed.

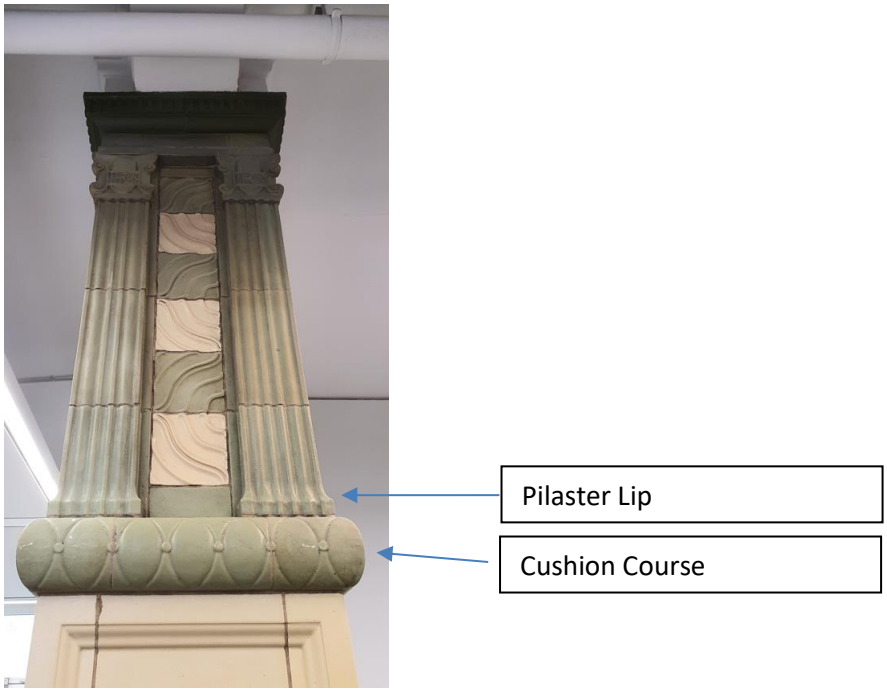

Figure 3 Typical column

2.1.10 Timber packers will be fixed to the inside face to make up the step change build up. The timber fixings will be at the corners – timber to timber. There will be no fixing into the column. All timber will be pre-measured and pre-cut off site.

2.1.11 Two Cambuckle straps will be installed behind the encapsulation hoarding to resist any potential lateral forces induced on the column. 50mm thick insulation board - restrained by the Cambuckle straps – will be cut to size and fitted in the recessed area between the two timber collars to protect the terracotta block face and hold any cracked terracotta in place.

2.1.12 To the collars we will install 1.1m high 12mm thick plywood to all four sides. The timber plywood will sit on the cushion course and will stop two courses down from the down stand beam to allow for periodic inspection of the top two courses. A die-bond finish (of a photo of a typical existing column) will be installed to all faces to give a high-quality finish. Die bond skirting will be used to trim the corners.

Figure 4 - encapsulation hoarding to the column

2.1.13 During the tunnelling and piling phases, the top two courses to the columns will be monitored during regular visual inspections. The encapsulation hoarding will prevent monitoring of the remaining column. The existing fracture pattern and load path indicate that the top courses will be the first to experience cracking. These will therefore be used as the action threshold. A baseline survey to all columns will define the exiting condition.

2.1.14 During visual inspections if the cracking to the top two courses worsens an additional mitigation measure will be implemented. The down stand beam will be divorced from the terracotta block by stitch drilling out the concrete cover to the down stand beam.

2.1.15 Drilling perpendicular to the beam the down stand beam will be separated from the terracotta column. A 500mm long diamond tipped drill bit will be used to "stitch" drill a series of holes to divorce the down stand beam from the terracotta block (shown in fig. 5 below). Diameter of the drill holes will be 12-24mm (maximum 24mm will not be exceeded)

2.1.16 Damage to the terracotta block from drilling will be mitigated by; visually inspecting the columns before drilling, GPR surveys undertaken to confirm the concrete or plaster depth, and a purpose made stainless steel jig bracket.

2.1.17 Visual inspections will be undertaken to the terracotta joints to confirm the minimum offset for the stitch drill holes. Only the plaster or concrete cover to the down stand beam is to be stitch drilled. A GPR survey will confirm the cover to the steel beam. A

trial hole will be undertaken along the underside of the beam away from the terracotta blocks to confirm the concrete / plaster cover indicated by the surveys.

2.1.18 At no point should the terracotta block be drilled into. A stainless-steel jig bracket will be used as a drill guide to prevent the drill damaging the terracotta block. The jig can be adapted on site with the introduction of shims to raise the stitch drill line offset from the terracotta block. A stitch drill trial will be undertaken to one column to confirm the methodology and controls are suitable before stitch drilling the remaining columns.

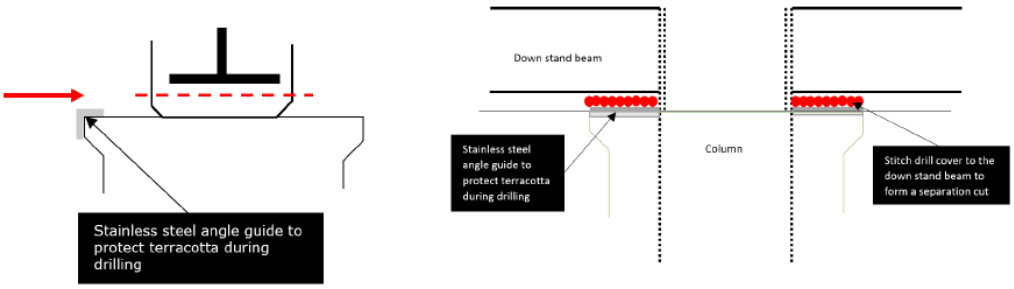

Figure 5 indicative sketch sowing the don-stand beam divorce from the terracotta column

2.1.19 Upon completion of the tunnelling and piling works and once ground movement has ceased, the encapsulation hoarding and straps should be carefully removed. The reverse sequence of the install should be followed when removing hoarding – i.e., carefully remove 12mm plywood (if movement is noted stop work), carefully remove Cambuckle straps and insulation packing to the recessed area (if movement is noted stop work), remove the timber collars (if movement is noted stop work).

2.1.20 Following removal of the encapsulation hoarding, the columns will be inspected for any damage sustained during the works, and if required, proposals for repairs will be submitted to the relevant consenting bodies for approval.

Appendix A: Column Location Plan

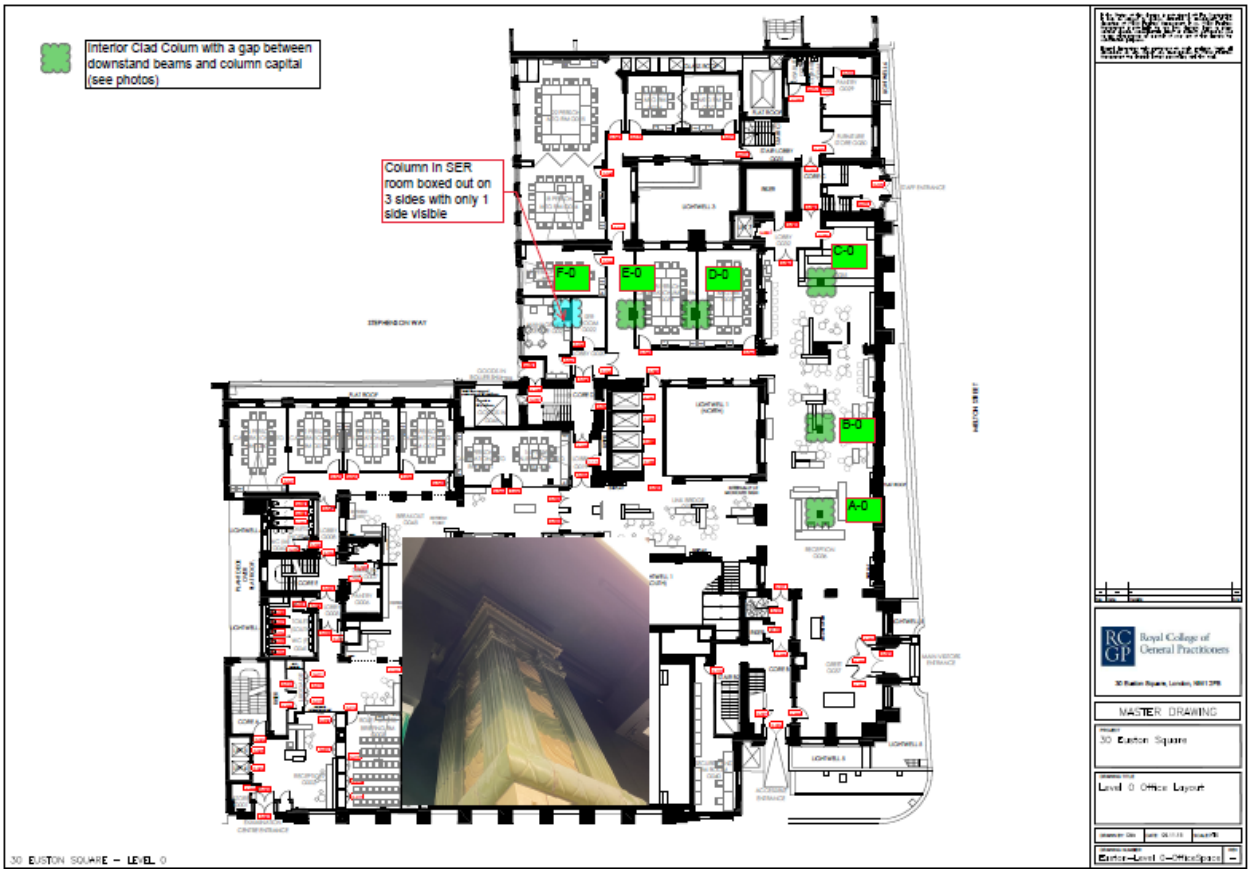

Figure 6: Ground Floor

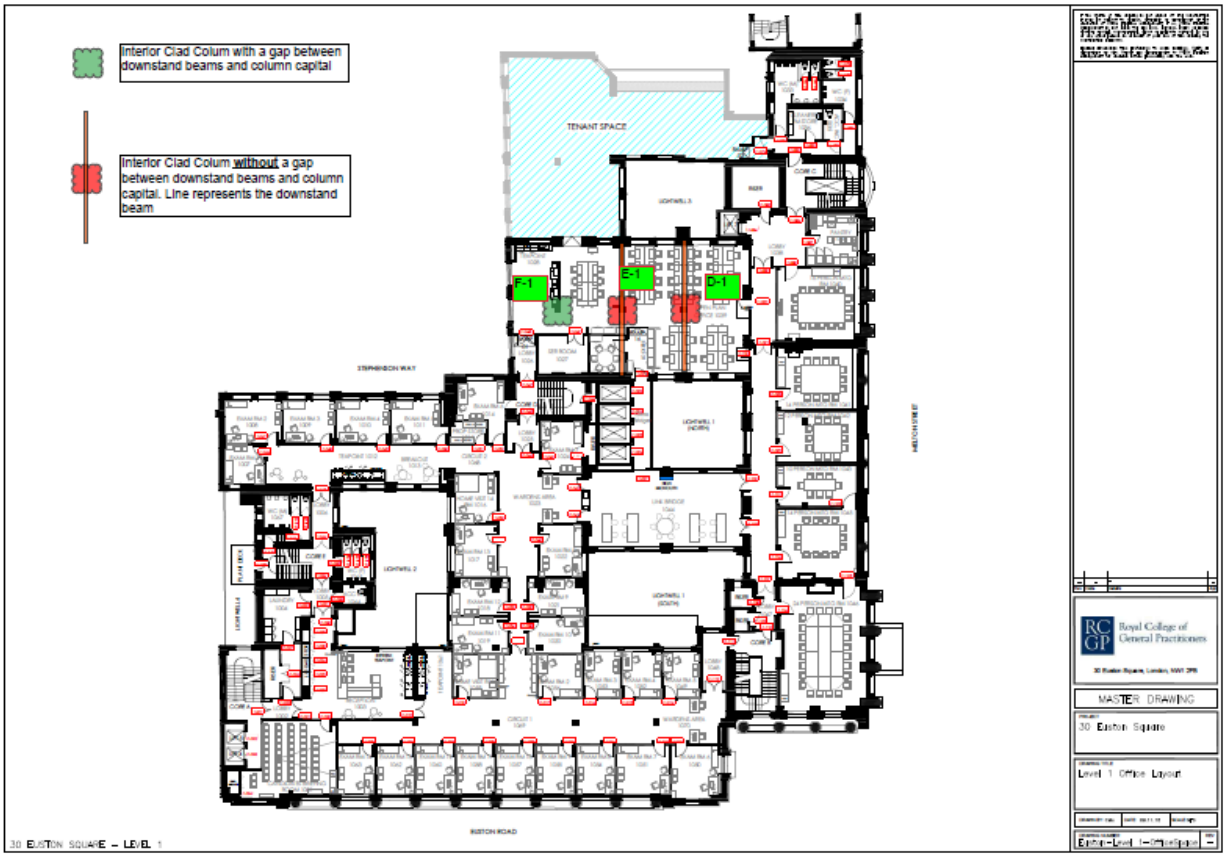

Figure 7: Level 1 (not to scale)

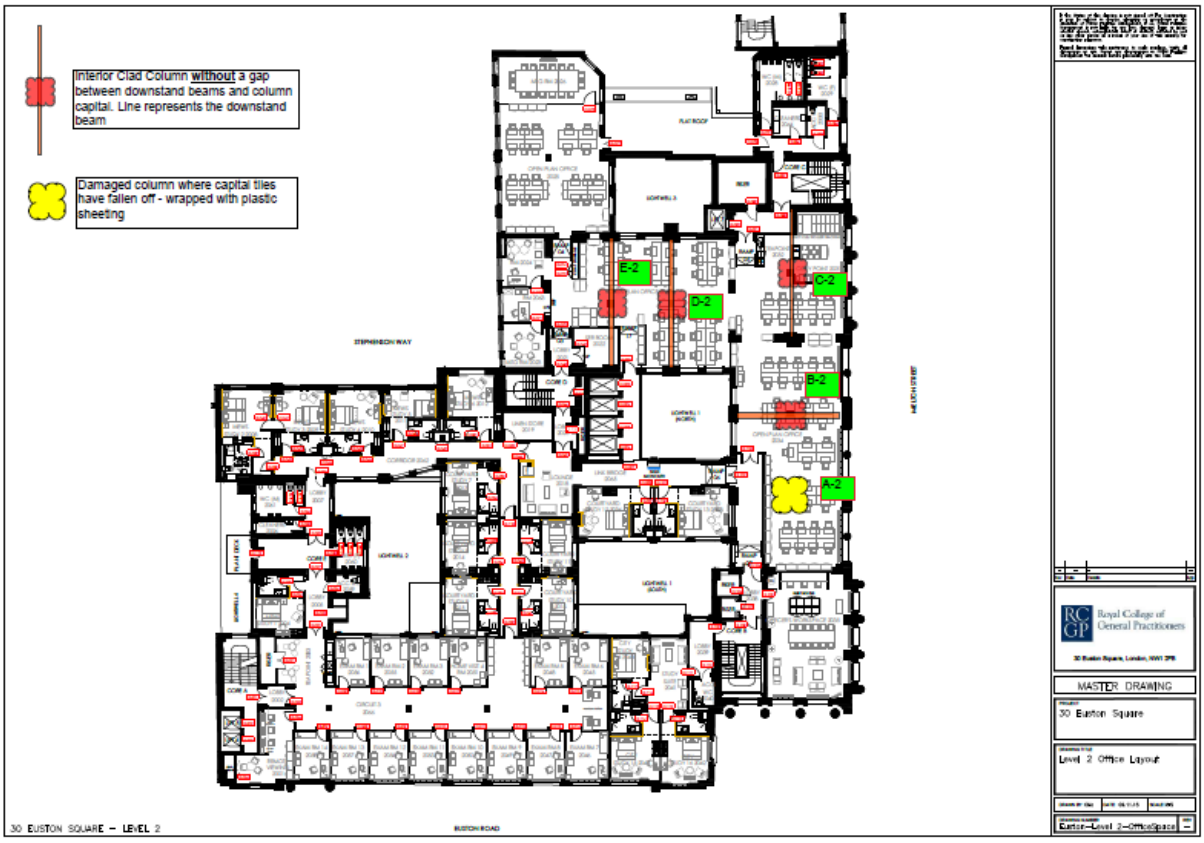

Figure 8: Level 2 (not to scale)

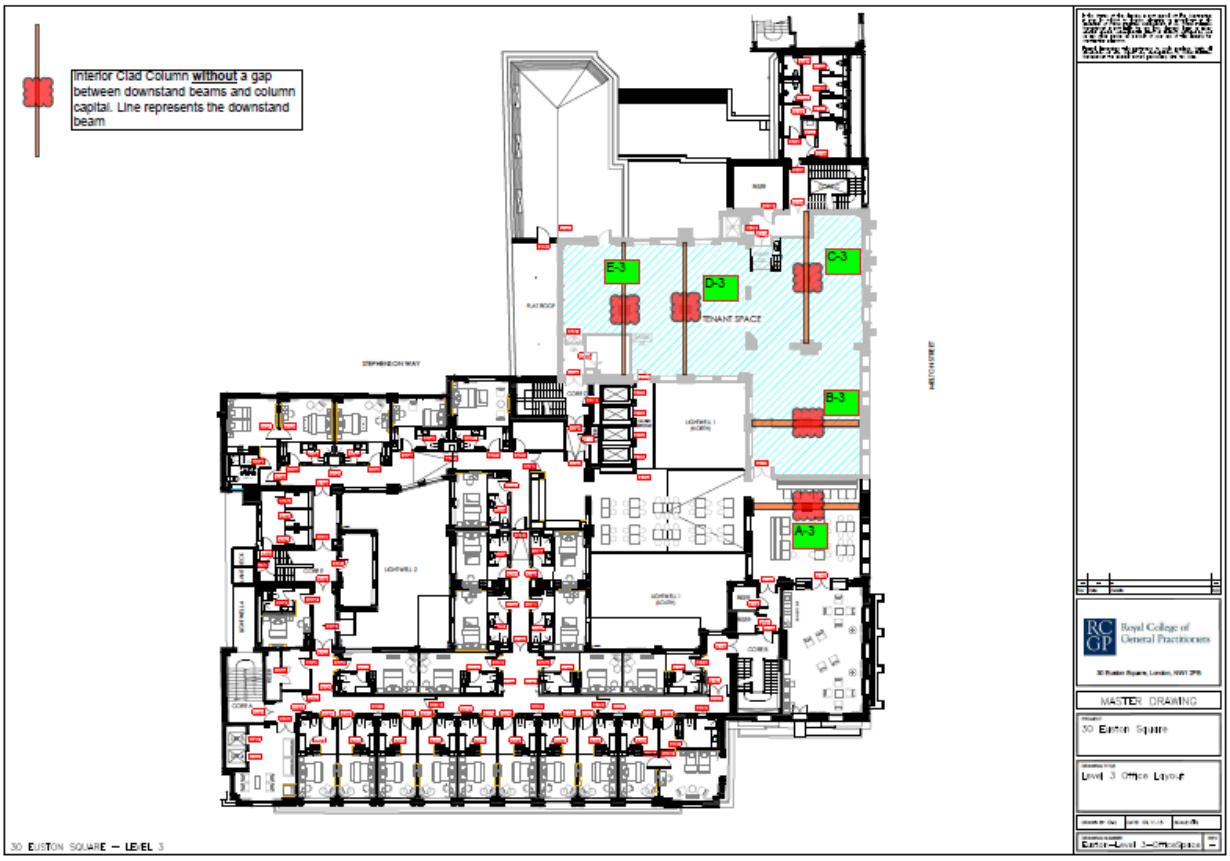

Figure 9: Level 3 (not to scale)