

Bracknell Gate, Frogna Lane, London, NW3

Structural Engineer's Inspection Report

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 Job Number: **25433**

Date	Version	Notes / Amendments / Issue Purpose
28.07.2016	1	For Information

## 1 Introduction

Price and Myers were instructed by Route One Consult to carry out a visual inspection of existing metalwork balconies at the Bracknell Gate Estate, off Froggnal Lane, London, NW3. The inspection took place on 6<sup>th</sup> July 2016.

The purpose of the inspection was to establish the condition and any potential defects to the existing balconies, one serving each of the three upper floors of the three Blocks on the Estate and give recommendations for repairs or replacement to the balconies and for future use.

The inspection was limited to the visible and accessible exteriors only and no opening-up works were carried out. Access was granted via an external scaffold. No access was gained onto the balconies themselves or within the buildings.

This report had been prepared for Route One Consult on behalf of Bracknell Gate Properties Ltd and should not be used or relied upon by any Third Party.

## 2 Discussion

The Bracknell Gate Estate, in the Hampstead area of London, comprises three detached, four-storey Blocks of apartments. The Blocks appear to date from around the 1920-30's and the balconies appear to have been part of the original layout. The Blocks are labelled A, B and C and arranged as the plan opposite. Each of the upper floors (1<sup>st</sup> to 3<sup>rd</sup> floors) to each of the Blocks is served by a balcony, typically at the rear of the flat and overlooking a concealed central courtyard between the Blocks.

The balconies to Blocks A and C are of similar construction, with an 8x4" rolled steel joist (RSJ) across the front of the balcony together with spaced rolled angles supporting a metalwork plate forming the balcony floor. These balconies are a regular rectangle on plan and divided by the angles into 10 segments (refer to the drawings at the end of this report). The centre segment at the front of the balcony is left open at all levels and would originally have benefitted from the use of an external hoist from ground level. The hoist is no longer in use, but has been left 'parked' at each Block.

The balconies to Block B are smaller than those to Blocks A or C, and more square on plan. These are formed with rolled steel channels (RSC) and rolled angles supporting a metalwork plate, and to divide the balcony into 5 segments (refer to the drawings at the end of this report). Again, the centre segment at the front of the balcony is left open at all levels for an external hoist from ground level, which is no longer in use.

All balconies have a metalwork balustrade to the front and around the hoist opening, formed typically of metal bars with a handrail. The front balustrade is supported of the front RSJ or RSC. In some instances, a metal kick plate has been added to the foot of the balustrade.

All balconies appeared to be in use by the residents.



Location Plan of Blocks on the Bracknell Gate Estate



Typical Hoist, now redundant.



Example of renewed fixings to balcony

At all levels of all Blocks, previous remedial works are evident; most notably renewed balustrade fixings to some balconies and the addition of new steel angles to support areas of the metalwork plate around the hoist openings. These works appear to be fairly recent and have probably taken place at different times judging from the types of materials and methods used.

During the inspection, a number of recurring defects were noted. These are scheduled on the drawings at the end of this report and recommendations for repair and replacement follow. The defects are mostly typical of water exposure and the resulting corrosion of the metalwork, particularly where water can be trapped between the metalwork plates and supporting members, or where the flanged member can harbour water. Some cracking was also noted in the pavers on some of the balconies, these appear to correspond with the angles supporting the metalwork plates and are as a consequence of the corrosion to the angles.

The major item of note for future use of the balconies is the front RSJ on Blocks A and C has lost its top flange from continued water exposure – possibly accelerated from window boxes and plants on the balconies. When the remaining, reduced section of the RSJ is considered, including the loading from the balustrades, the RSJ section is considered inadequate. This section requires replacing with a like for like section.

### 3 Recommendations

A schedule of observations, defects and repairs are noted on the drawings at the end of this report.

In summary;

- The metalwork plates generally appear in fair condition, although at their supports they need to be cleaned off to assess any loss of material and then be retreated/ restored as required.
- Corroded or missing/ lost bolts and fasteners require replacing, after having cleaned off the areas affected in preparation and then retreat as required.
- The front RSJ on Blocks A and C has lost its top flange, and when considered with the loading from the balustrades, the reduced section is considered inadequate. The section should be removed and replaced with a like-for-like section OR preferably with an RHS section of the same size. The RHS would not have any open flanges and would therefore not harbour water in the same way.
- Cracking noted to the bearings at Block B, level 3, should be opened, cleaned and restored.

Outline Specifications for the Works noted;

#### General Notes

- Temporarily works, including scaffold access and propping, shall be the responsibility of the Contractor.
- All general steel sections and plate to be grade S275(43A) to BS EN 10025-2, hollow sections to be S355 to BS EN 10210-1:2006.
- Details of all products (cleaning agents, solvents, paints etc) to be submitted by the Contractor for review.

#### Repair Specification for corroded metalwork

- By hand, using wire brush or abrasive paper or chipping hammer or chisel or similar, clean off visible corrosion (rust and rust scale) to determine extent of lost material behind. If loss is more than 1mm refer back to Engineer for assessment. If loss is less than 1mm, continue as follows.
- Again by hand, remove any burrs, sharp edges, old or loose paint. Clean area with an appropriate solution/ solvent, applied by brush and treat affected area.
- Before retreating, if necessary remove loose matter from cleaning and ensure remaining paint has no residual gloss and remaining sound paint has been feathered back.
- Dry the affected area by vacuum cleaning or by dry compressed air.
- Apply a suitable paint system, a 2-part surface tolerant epoxy paint would be recommended, and apply in accordance with the Manufacturer's instructions. The minimum dry film thickness should be 150 microns.

#### Replacement bolts and fasteners

- Remove loose, corroded or damaged bolts and fasteners.
- By hand, using wire brush or abrasive paper or chipping hammer or chisel or similar, clean off visible corrosion (rust and rust scale) around the fixing holes and follow the steps above.
- Install new bolts and fasteners before applying new paint.
- Use a further stripe coat of the paint system after the bolts or fasteners are installed.

#### Replacement of front RSJ

- Temporarily prop front of balcony and balustrades.
- Cut off/ unfix balustrades and angles connected to RSJ
- Remove existing RSJ in its entirety and follow instructions above for cleaning and repainting edges of floorplate and angles.
- Introduce new 200x100x10 RHS section to be painted with a two part zinc phosphate epoxy primer/ high build MIO to a total (minimum) of 180 microns. Splices will not be accepted in beams.
- Reconnect existing floorplates, angles and balustrades and follow the steps above including stripe coat for replacing bolts and fasteners.

#### WELDING ON SITE

- No welding is permitted to cast or wrought iron elements within the approval of the Structural Engineer.
- Painted steel, or any other contaminate including rust, on the surfaces to be welded must be thoroughly cleaned by local grinding prior to welding.
- After cleaning, surfaces must be dry immediately prior to welding.
- Do not weld when surfaces are wet or when the ambient temperature is below 0 °C.
- Carefully dress welds to remove slag on each run and prior to further runs being laid. Do not deform surface of weld.
- Upon completion, all site welds shall be tested in accordance with NSSS (latest edition) and results submitted to the Engineer.
- Where welds fail to acceptable standards, the Contractor shall submit proposals for repair.
- When welds have been tested and accepted, paint with a stripe coat of the primer specified above.

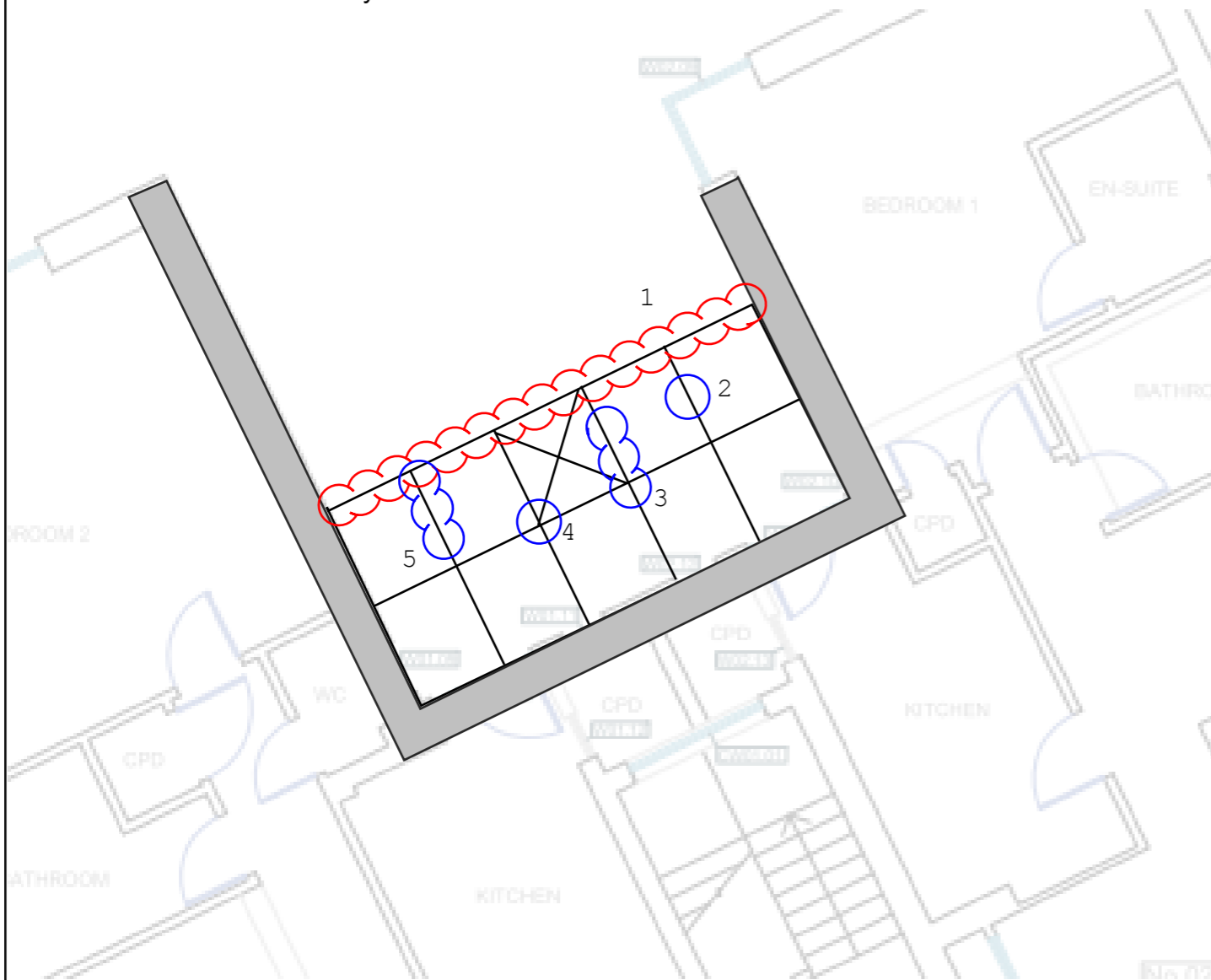
#### Renew bearings






- Temporarily prop front of balcony.
- Expose end bearing and clean off corroded section as steps above for corroded metalwork.

#### 4 Drawings and Schedules

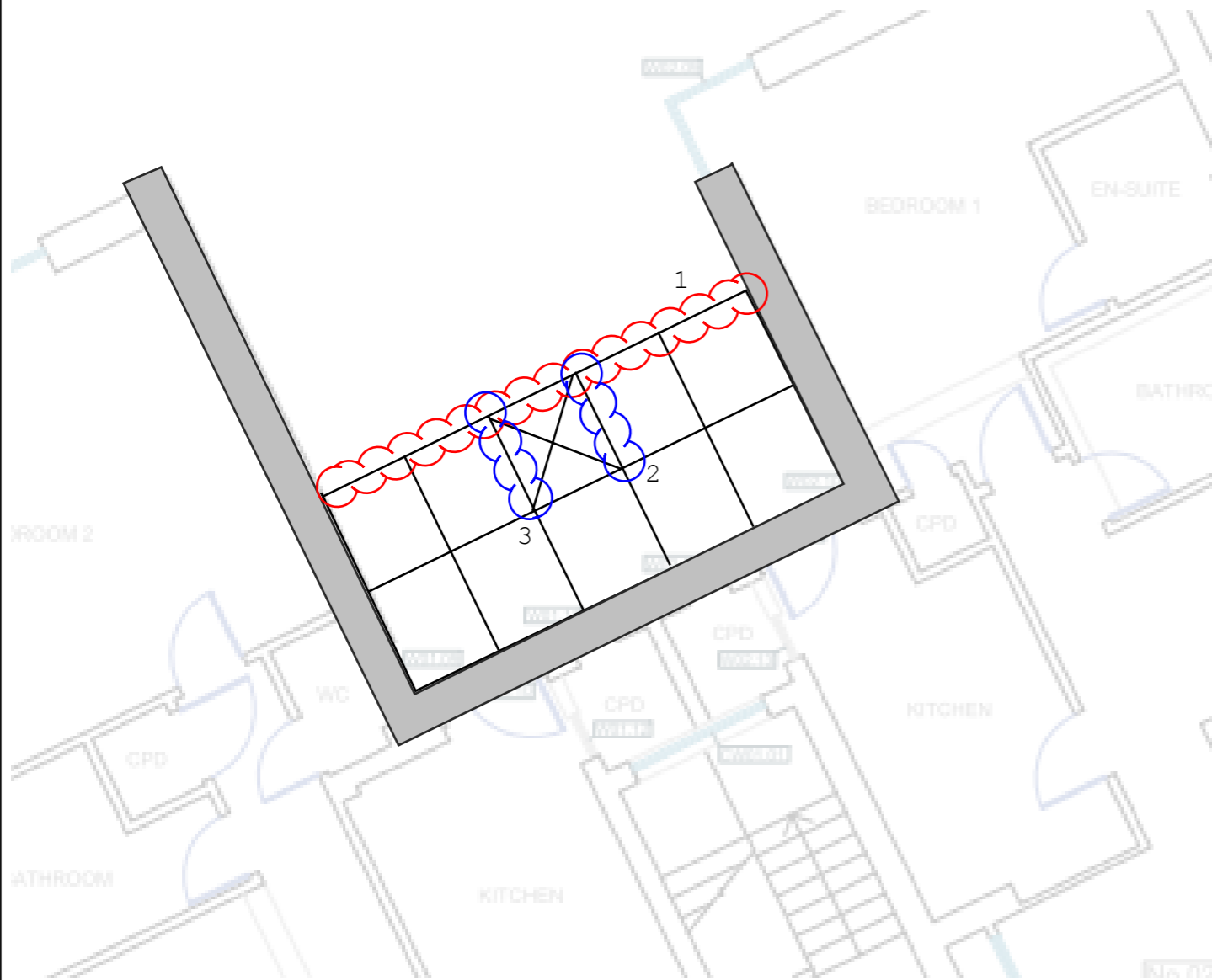
Block A – 1 <sup>st</sup> Floor	25433/A/1
Block A – 2 <sup>nd</sup> Floor	25433/A/2
Block A – 3 <sup>rd</sup> Floor	25433/A/3
Block B – 1 <sup>st</sup> Floor	25433/B/1
Block B – 2 <sup>nd</sup> Floor	25433/B/2
Block B – 3 <sup>rd</sup> Floor	25433/B/3
Block C – 1 <sup>st</sup> Floor	25433/C/1
Block C – 2 <sup>nd</sup> Floor	25433/C/2
Block C – 3 <sup>rd</sup> Floor	25433/C/3

BLOCK A - 1st Floor Balcony



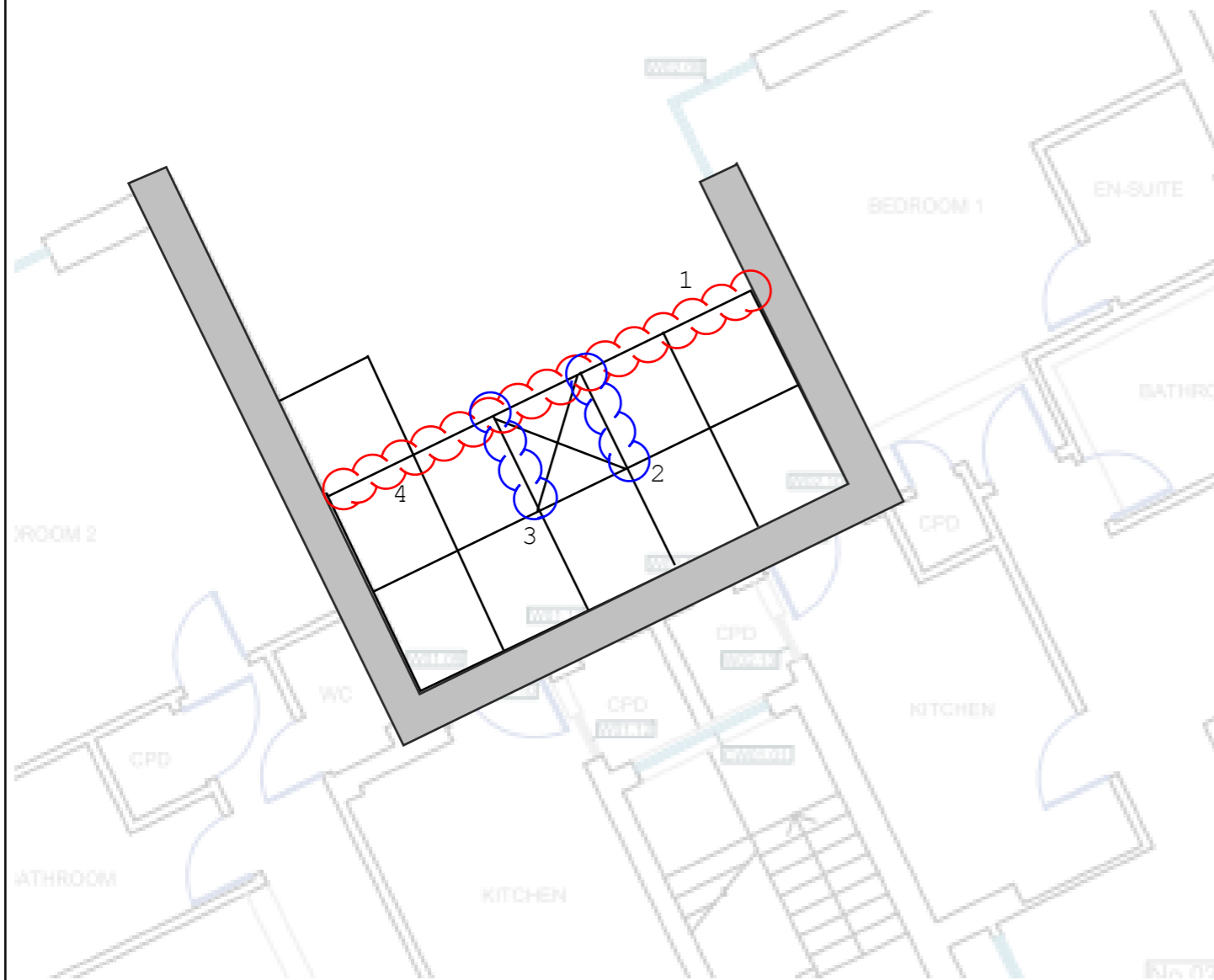
BLOCK	LEVEL	REF	DESCRIPTION	IMAGE	REPAIR
A	1	1	Rusty, loss of material/section		Replace Beam
		2	Rusty		Clean and Repair as specified
		3	Rusty, loss of material/section, missing or corroded bolts		Remove and Replace bolts. Clean and Repair as specified.
		4	Rusty, loss of material/section, missing or corroded bolts		Remove and Replace bolts. Clean and Repair as specified.
		5	Rusty, loss of material/section		Clean and Repair as specified.




BLOCK A - 2nd Floor Balcony



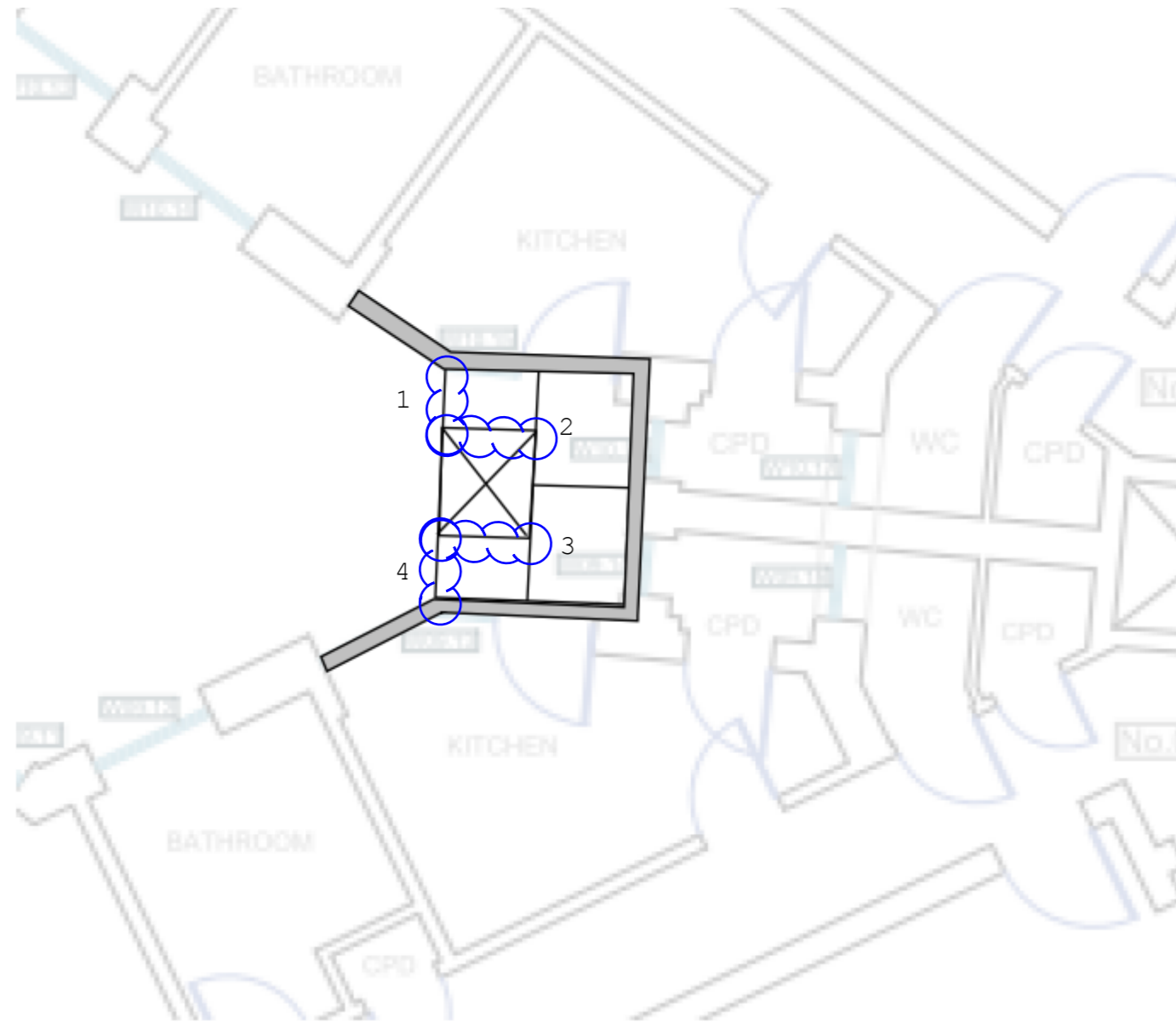
BLOCK	LEVEL	REF	DESCRIPTION	IMAGE	REPAIR
A	2	1	Rusty, loss of material/section		Replace Beam
		2	Rusty, loss of material/section		Clean and Repair as specified
		3	Rusty, loss of material/section		Clean and Repair as specified

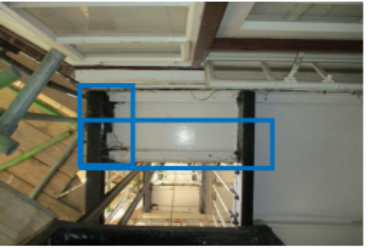

BLOCK A - 3rd Floor Balcony



BLOCK	LEVEL	REF	DESCRIPTION	IMAGE	REPAIR
A	3	1	Rusty, loss of material/section		Replace Beam
		2	Rusty, loss of material/section		Clean and Repair as specified
		3	Rusty, loss of material/section		Clean and Repair as specified

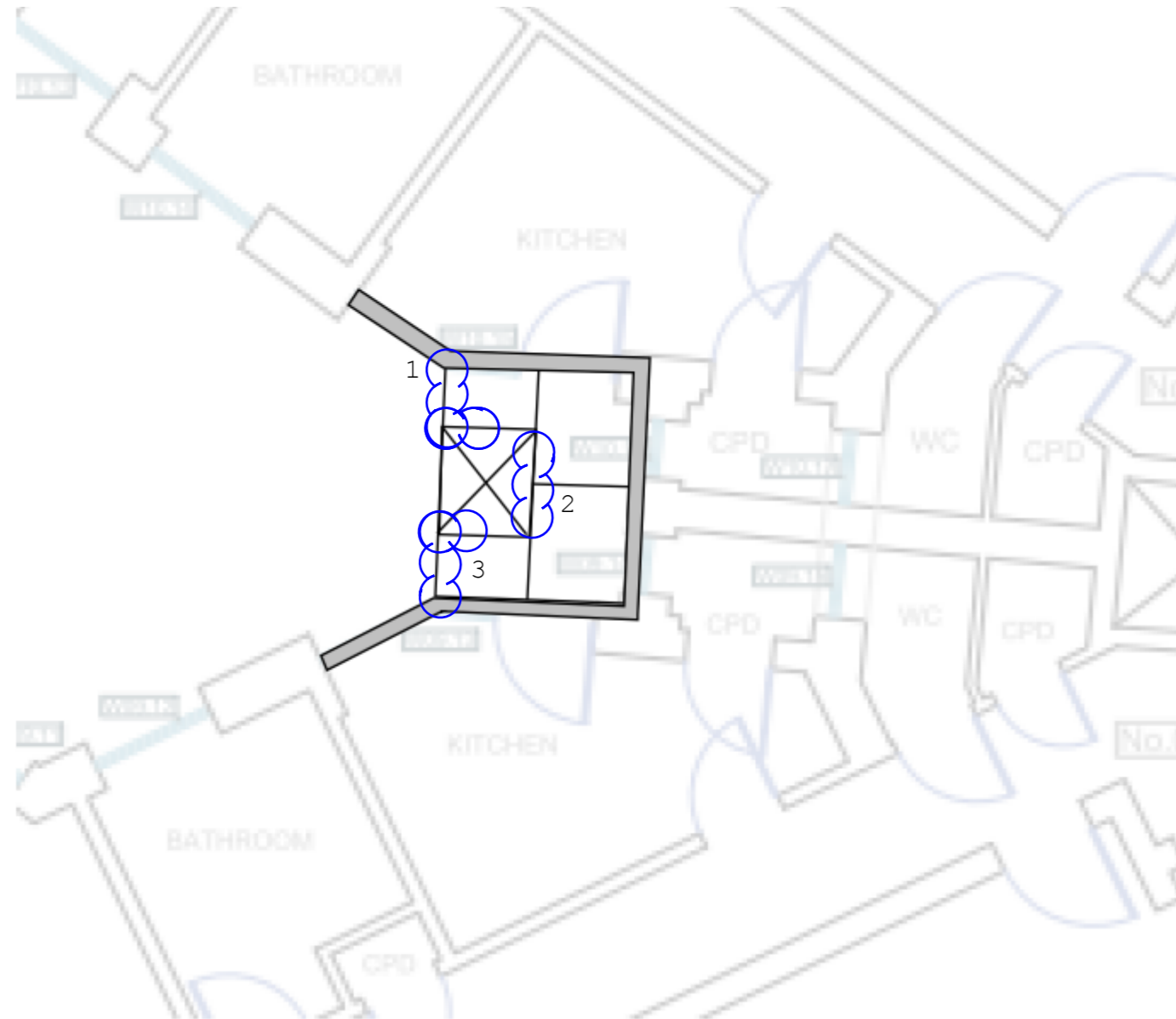
BLOCK B - 1ST Floor Balcony

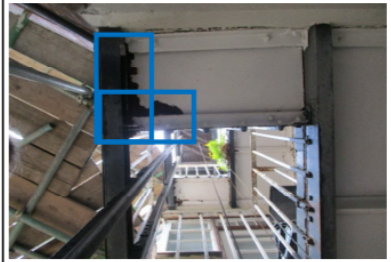




BLOCK	LEVEL	REF	DESCRIPTION	IMAGE	REPAIR
B		1, 2	Rusty, loss of material/section		Clean and Repair as specified
		3, 4	Rusty, loss of material/section		Clean and Repair as specified

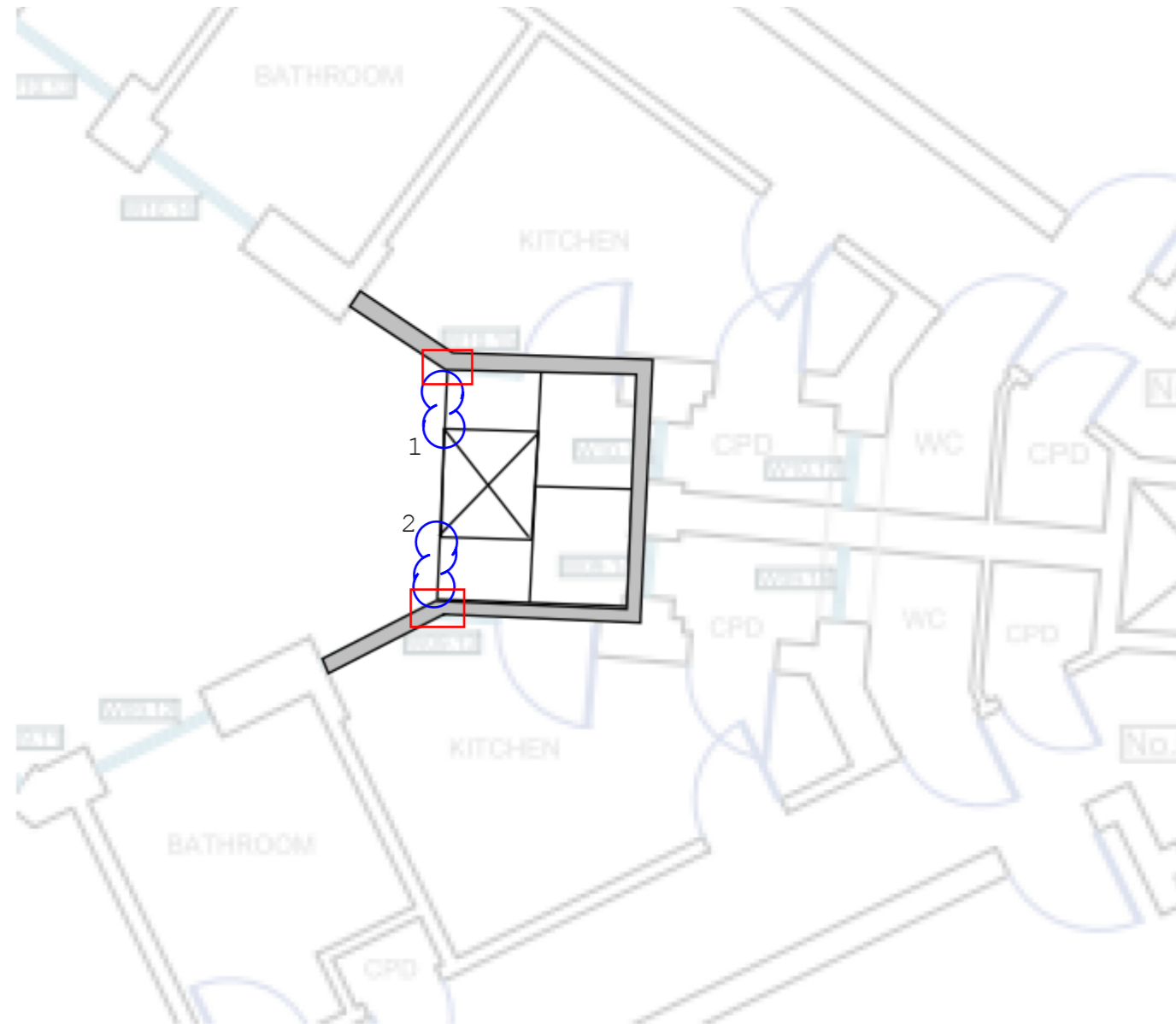






BLOCK B - 2nd Floor Balcony



BLOCK	LEVEL	REF	DESCRIPTION	IMAGE	REPAIR
B	2	1	Rusty, loss of material/section		Clean and Repair as specified
		2	Rusty		Clean and Repair as specified
		3	Rusty		Clean and Repair as specified





BLOCK B - 3RD Floor Balcony



BLOCK	LEVEL	REF	DESCRIPTION	IMAGE	REPAIR
B	3	1	Rusty, loss of material/section		Clean and Repair as specified
		2	Rusty, loss of material/section		Clean and Repair as specified
			Cracking below bearing		Expose bearing to check for corrosion. Clean and Repair as specified
			Cracking below bearing		Expose bearing to check for corrosion. Clean and Repair as specified

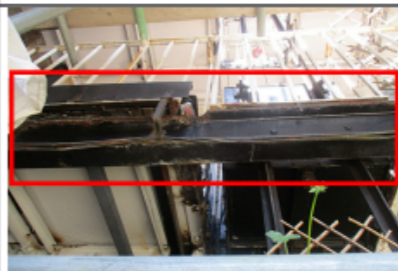

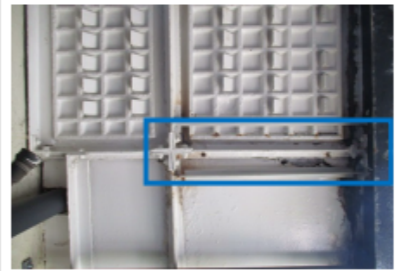
BLOCK C - 1st Floor Balcony



BLOCK	LEVEL	REF	DESCRIPTION	IMAGE	REPAIR
C	1	1	Rusty,		Clean and Repair as specified
		2	Rusty, loss of material/section		Replace Beam
		3	Rusty, loss of material/section		Clean and Repair as specified
		4	Rusty, loss of material/section		Clean and Repair as specified




BLOCK C - 2nd Floor Balcony



BLOCK	LEVEL	REF	DESCRIPTION	IMAGE	REPAIR
C	2	1	Rusty, loss of material/section		Replace Beam
		2	Rusty, loss of material/section		Clean and Repair as specified
		3	Rusty, loss of material/section		Clean and Repair as specified
		4	Rusty		Clean and Repair as specified

BLOCK C - 3rd Floor Balcony



BLOCK	LEVEL	REF	DESCRIPTION	IMAGE	REPAIR
C	3	1	Rusty, loss of material/section		Replace Beam
		2	Rusty, loss of material/section		Clean and Repair as specified
		3	Rusty, loss of material/section		Clean and Repair as specified



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