RIDGE

58-108A REGINA ROAD
CROYDON LONDON SE25 4TT

STRUCTURAL ENGINEERING VISUAL INSPECTION OF TOWER BLOCK

24th September 2021

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Prepared for

Saheed Ullah
Head of Capital Delivery for Homes and Schools
Place Department
Homes & Social Investment
3rd floor, Zone D
Bernard Weatherill House
8 Mint Walk
Croydon
CR0 1EA

Prepared by

Ridge and Partners LLP
3 Valentine Place
London
SE1 8QH
Tel: 020 7593 3400

Contact

Martin Edwards
Associate
Martinedwards@ridge.co.uk

VERSION CONTROL

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1. INTRODUCTION AND BRIEF

Following instructions from Saheed Ullah, Head of Capital Delivery for Homes and Schools Place Department, Ridge structural engineers carried out a visual inspection of the tower block at 58-108A Regina Road, Croydon SE25 4TT.

The scope for the inspection was to be limited to a visual inspection of the exterior, interior common areas and a sample number of voided flats.

This report follows a previous inspection and report undertaken for a similar tower block at 1-87 Regina Road, Croydon SE25 4TW and at 2-56A Regina Road (inspected same day as 58-108A).

In addition to the inspection, we carried out a review of record drawings for the buildings provided by LB Croydon, and specialist reports on its method of construction. Our findings were to be summarised in a brief report with recommendations for any further action that we considered to be appropriate.

The survey was conducted by Martin Edwards, a Chartered Structural Engineer and Associate with Ridge, who was accompanied by other Ridge representatives; Clive Roberts, Partner of Building Services Engineering and Bukola Adetola, Senior Chartered Building Surveyor.

The inspection was made on Monday 20th September 2021.

Fig 1 View of South elevation of 58-108A

2. GENERAL DESCRIPTION

The tower is a purpose built 11-storey high tower block, understood to have been constructed using a precast reinforced concrete large panel system (LPS) and constructed by Wates. The tower is thought to date from the mid-1960s.

The tower has subsequently been overclad, so the original cladding material could not be seen (refer Fig 1). The record drawings provided by LB Croydon (by Harley Curtain Walling) are for the over cladding works at 2-56A Regina Road and Regina Road Blocks, which are identical in layout and appearance. The drawings are dated July- September 2002 (refer example in Fig 2).

The building contains four flats per level, arranged symmetrically about a central stair and lift core.

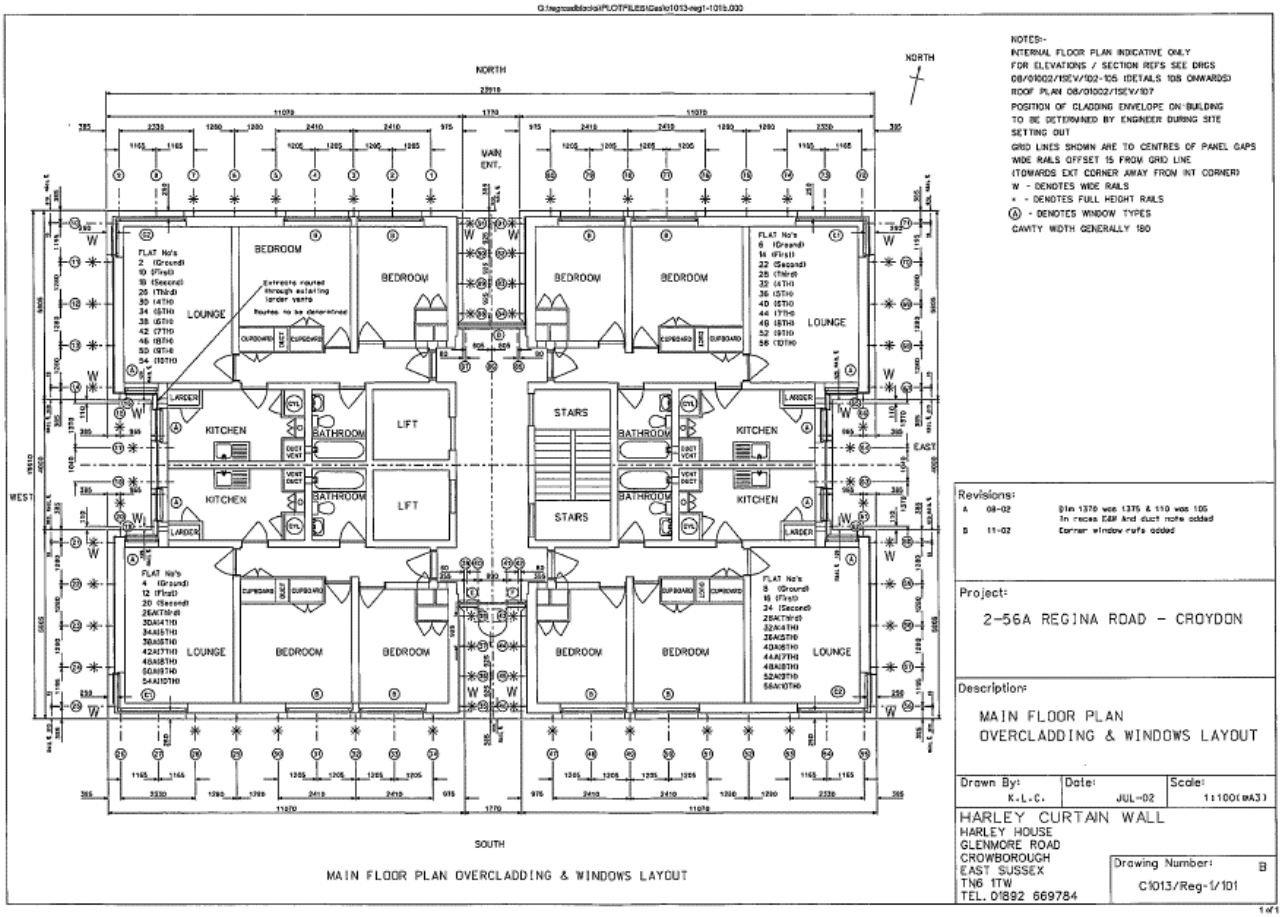

Fig 2 Overcladding record drawings Main Floor Plan 2-56A dated July 2002 showing typical flat layout

Projecting waste chutes are visible to the rear of the tower, located in a recess adjacent the central core. It appears from the record drawings that the original chutes were broken out and new added during the over cladding works (refer Fig 3).

There is what appears to be lift motor/plant room and possibly a tank room on the flat roof of the blocks, which was not accessible during the inspection.

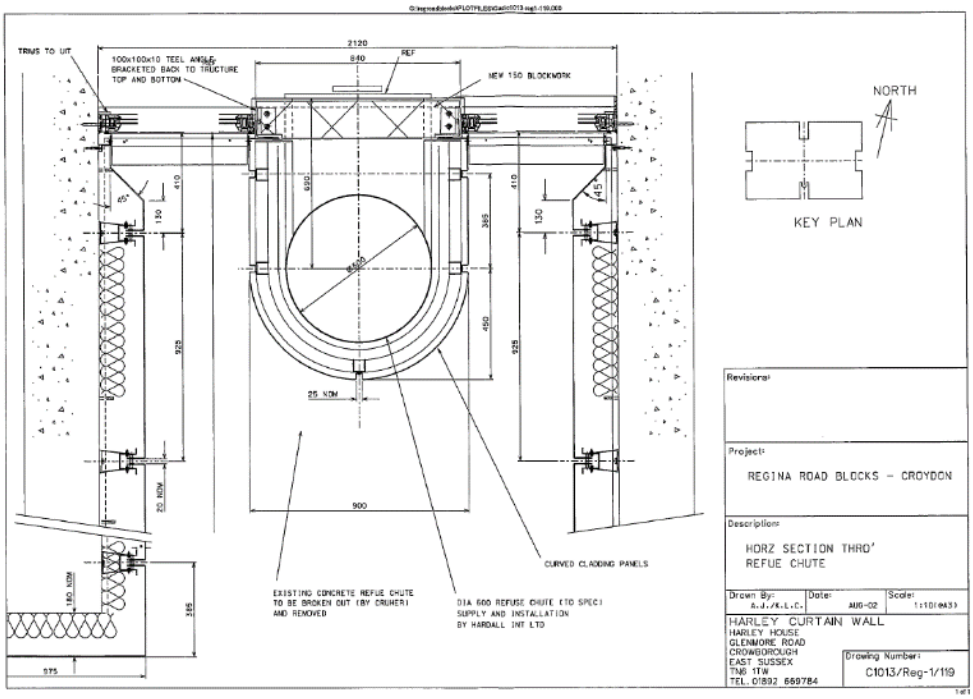

Fig 3 Over cladding record drawings for 'Regina Road Blocks' dated Aug. 2002 showing proposed refuse chute

The record drawings show the cladding system comprised brackets fixed to the concrete structure supporting a system of vertical rails to which aluminium cladding panels have been fixed. This had been applied from first floor level up to roof (refer Fig 4).

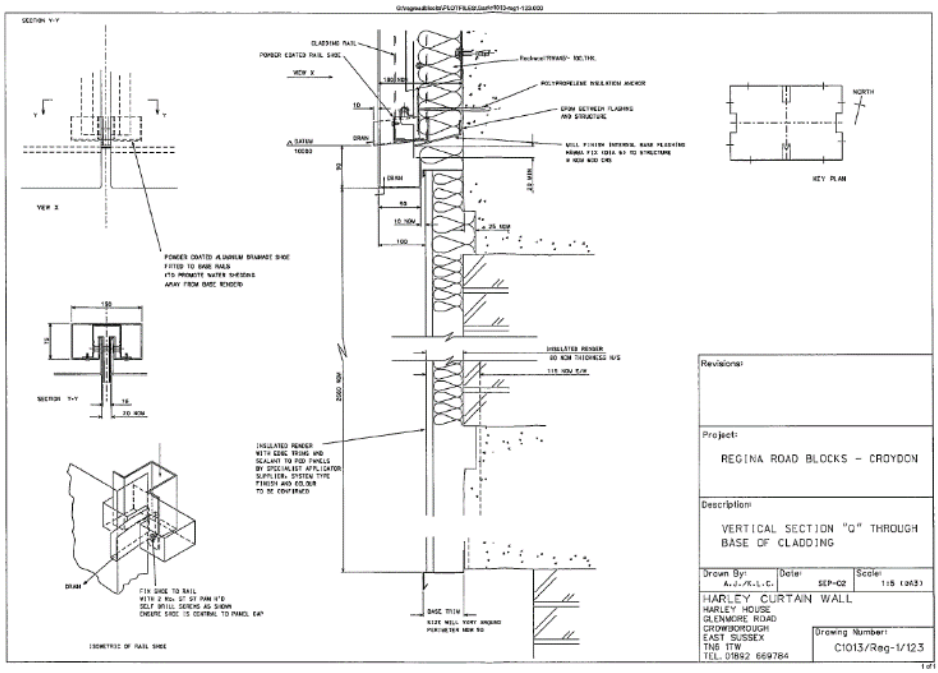

Fig 4 Over cladding record drawings for 'Regina Road Blocks' dated Sept. 2002 showing detail at ground floor

The ground floor level had been clad in render and insulation. The render had an exposed aggregate finish and was inset from the line of the aluminium cladding above.

Fig 5 Western elevation 58-108A showing render finish to ground floor to over-cladding and aluminium panels used for remainder of block

Fig 6 View of Northern elevation 58-108A showing refuse chute

Fig 7 Eastern elevation 58-108A Showing render finish to ground floor to concrete and brick substructure

Fig 8 Eastern elevation 58-108A

3. SURVEY

The building was subjected to a visual inspection both externally and internally.

The internal inspection was restricted to examination of the common areas i.e., the main staircase and lift lobby at each level and a single inhabited unit (Flat 90A). External examination was from the perimeter of the building at ground level.

Since the building has been overclad, the external primary structure is hidden from view. Nevertheless, it was possible to see the brickwork and concrete supporting the towers and enclosing the space below ground floor level, which remains exposed. This appeared to be in a generally satisfactory condition (refer Fig 5-8).

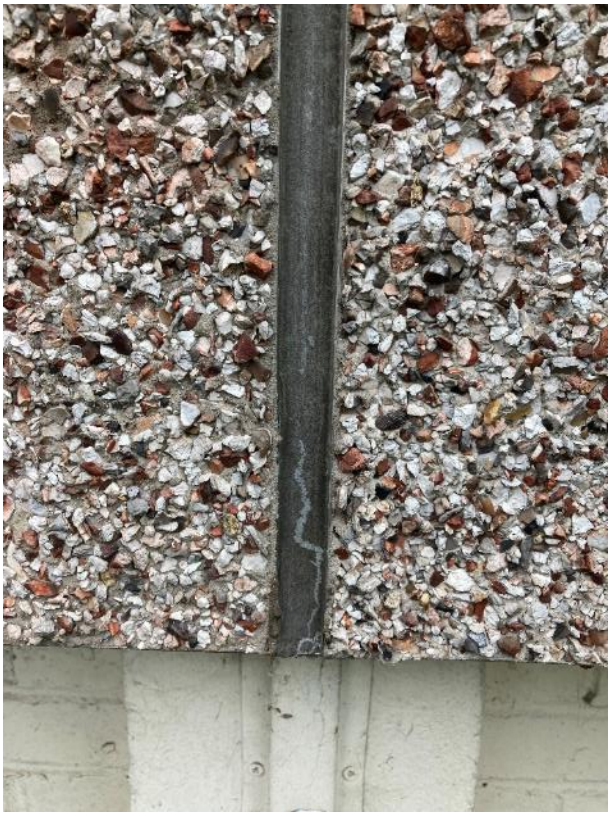

Fig 9 Close up of vertical joint between panels

Fig 10 Underside of rendered concrete panel at ground floor level

An external joint in the rendered panel was also examined from ground level. This looked in good order with the infill material remaining flexible and fully filling the joint (refer Fig 9).

The underside of an external panel was also inspected. This shows the render on a layer of insulation as indicated on the record drawings which is fixed onto the concrete panel (refer Fig 10). The underside of the panel looked sound with no cracks, spalling or exposed reinforcement.

Internally the walls in the common areas had a plastered finish. There were various where the plaster had been damaged, but this was due to impact and abrasion rather than because of any underlying structural issues.

Within the inhabited flat that was examined, the internal partition walls were also plaster finished and therefore the structure was concealed.

It is assumed that this block is similar to those previously inspected, where finishes had been removed i.e.:

- Internal partitions were constructed in blockwork
- Main structural walls appeared to be of reinforced concrete large panels. This included the walls between the bedroom and bathroom and lounge and hall lobby.

Despite the presence of finishes, there was no visible evidence of any significant structural issues within the flats or common areas inspected.

There was no evidence internally of gaps appearing between wall and floor units, the floors did not appear to have suffered from long-term creep deflection. No longitudinal joints between adjacent units were visible and there was no evidence of general cracking, exposed reinforcement, or spalling concrete.

4. RECORD REVIEW

Whilst the record drawings provided for 2-56A were useful for the over cladding aspect of the towers, they did not reveal any useful information concerning the construction of the original building.

However, it is understood that the building was constructed using the Wates LPS system. Reference to BRE publications indicates that the Wates system was generally not widely used compared with other LPS systems. It apparently comprises precast floors supported on solid precast internal walls, with precast sandwich panels forming the outer envelope. The inner leaf of the sandwich panels supports the floors at the loadbearing peripheral walls of the building.

A common problem with LPS systems is the detailing and workmanship at the panel joints. At least three Wates blocks have subject to opening up by the BRE to examine these joints. Typical of the issues encountered on Wates blocks were:

1. The in-situ concrete surrounding the levelling bolt was in place and complete but was friable in nature.
2. No bedding mortar had been used at one location, resulting in the upper panel bearing unevenly on high spots at the top of the lower panel.
3. Vertical cracking between panels occurred frequently at the higher levels in the building but less often with reducing height. No cracks were present below fourth-floor level.
4. A strengthening bar exposed was not properly embedded in the concrete and was considered to be ineffective.
5. Chloride contents in all samples were in the low.
6. Inadequate concrete cover to the reinforcement leading to carbonation and spalling of the concrete cover.
7. Water penetration at some joints
8. Chloride contents in the panels were in the low category but where repairs had been made, chloride contents in the repair materials were often high.
9. Poor-quality concrete in the cladding panels due to an excessive amount of sand in the mix resulting in a poorly graded porous concrete, with excessive shrinkage leading to cracking in the panels.

5. CONCLUSIONS

From the observations made on site, there was little visible evidence of any structural distress in the building.

However, it must be borne in mind that the external structure of the building was hidden behind the cladding material, and so the condition of the external wall panels could not be observed.

In addition, experience gained by the BRE in examining other LPS structures in general and the Wates system in particular has highlighted potential detailing and workmanship issues that may exist.

Most blocks of this age and form of construction will have been subjected to structural engineering appraisal following the Ronan point collapse. However, many of these appraisals were undertaken in the form of desktop studies, and the conclusions regarding such matters as quality of workmanship, adequacy of detailing, robustness and resistance to disproportionate collapse will not necessarily have been examined by physical examination.

In order to evaluate whether any of the risks highlighted in the previous section are present in the building, it is recommended that some limited scope opening up is carried out to enable examination by a Chartered engineer.

Whilst this only enables a limited assessment to be made, it will provide an indication of the likelihood of the construction being of an acceptable standard or otherwise, in which case furthermore detailed examination might be necessary.

6. RECOMMENDATIONS

Taking the foregoing points into account, it is recommended that some sample areas are opened up in voided units to allow visual examination of the joint details by a Chartered Engineer.

This will enable an assessment to be made of whether the construction detailing and workmanship is likely to be of a satisfactory standard, sufficient to provide the degree of robustness required to resist disproportionate collapse.

Whilst such a limited scope investigation will only allow a very small sample to be considered, it will provide an indicator as to the standard of construction employed on the remainder of the building, and hence enable an informed decision to be made on whether further detailed investigation might ultimately be necessary.

This further detailed investigation could also include materials testing to ascertain the ongoing design life of the structure.

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