

The elevations have full length window panels at each floor level with a metal clad panel below. The panels are supported on timber frames which are attached to the concrete up-stand wall behind. The cavity between metal cladding and concrete frame is filled with fibrous insulation.

- Treves House:- The concrete elements were generally in a fair condition although the coating to the exposed concrete elements had extensive deterioration. Carbonation was found to be 15-30mm in depth with mean cover to the reinforcement of 18-28mm. Chloride test results showed a low to moderate risk reading. The carbonation has reached the reinforcement in some areas causing the spalling to exposed faces.
- Brickwork panels on the gable elevations are as follows :-

Full height brickwork panels are of solid bonded brickwork construction. The panels appeared generally free from defects. It was noted that areas of the gables have been repointed.

- The Front & Rear elevations are as follows :-

The front and rear elevations are divided in their length by the concrete access stair. On the front elevation the windows with a metal clad panel below are at first and third floor levels. The second floor has the access walkway enclosed by metal hand rails with glazed panels. On the rear elevation the glazing and metal clad panels are at all three floor levels. The panels are supported on timber frames which are attached to the concrete up-stand wall behind. The cavity between metal cladding and concrete frame is filled with fibrous insulation.

CONCLUSIONS

- Note in many instances where the concrete has been tested or removed there was a skim render coat, generally 2-4mm thick which will need to be made good.
- The concrete elements are generally sound but requiring some remedial works in the form of local patch repairs and in some areas the application of a migrating corrosion inhibitor (Ferrogard 903 or similar will be required to provide protection against chlorides and advancing carbonation. All exposed concrete surfaces should have anti carbonation coatings applied. Generally those areas covered by the new EWI will need to be sound and durable to receive the insulation fixings.
- The main brickwork panels are not adequate in their current form to support the proposed EW1 system. Currently the outer brick face is not tied back to the inner blockwork skin and remedial wall ties will need to be installed across the panels before the EW1 is applied.
- Remedial wall ties will need to be installed on a grid pattern approximately 900mm across x 450mm vertical and in the center of the bricks. There is a possibility with this amount of ties that some internal damage may occur in the flats due to drill breakout. (see sketch 11135/100 for layout)
- When attaching the insulation to the walls the specialist contractor will need to map out the layout of bed joints and perpend to ensure that the panel fixings are located in the brick and not in the joints where pull out values are zero. We would suggest a trial area to confirm adequacy of this system.
- The use of a rain screen type insulation system should also be considered. The concrete structure is sound and would support the metal frame that carries the insulation. The extra cost of this system would be offset by the need for remedial wall ties, the EWI fixings and possible internal damage.

- Refer to the Martech report for section details through the existing cladding and windows. The condition of the up-stand walls may vary considerably and will only be known once the cladding is removed. Allow for skim render coat to all external up-stand walls at this stage.



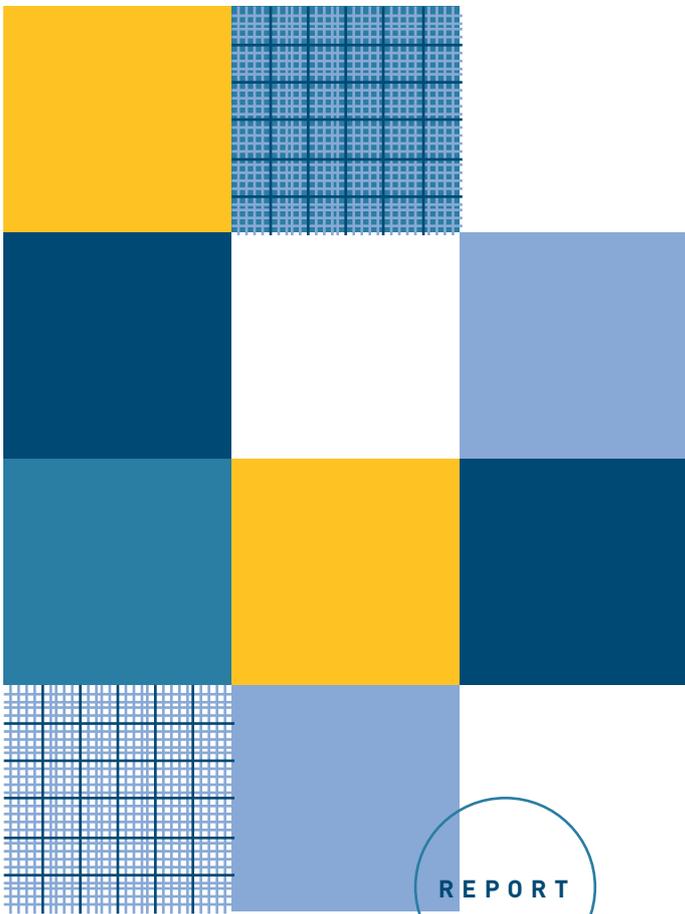
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REPORT

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PROJECT DETAILS

TEST REPORT

This entire document, as detailed on the home or front page, comprises Martech Report reference 14093, dated 31st July 2014. This interpretative report is on concrete, brickwork and cladding investigation and testing.

SIGNATURE

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STRUCTURE

The structures are two housing blocks adjacent to each other. Lister House is a 9 storey block of flats with some exposed brickwork panels and concrete frame elements as well as over cladding and glazing. The roof is of flat roof construction.

Treves House is a long 4 storey block of maisonettes with a flat roof. This also has exposed concrete frame elements as well as brickwork panels/walls and over cladding.

The following photographs illustrate the structures:



Photograph 1: General view of Lister House, main east elevation and north gable end.



Photograph 2: General view of the central (stair/lift/bin chute) section to the east elevation, with exposed floor beams at alternate floors and an access walkway at 6th floor. The rest of the elevation is clad.



Photograph 3: General view of Lister House, main west elevation and south gable. Note the exposed concrete frame to the gable as well as brickwork wall panels.



Photograph 4: General view of main north elevation to Treves House, with an access walkway at 2nd floor.



Photograph 5: General view of the east gable.



Photograph 6: General view of the rear south elevation.



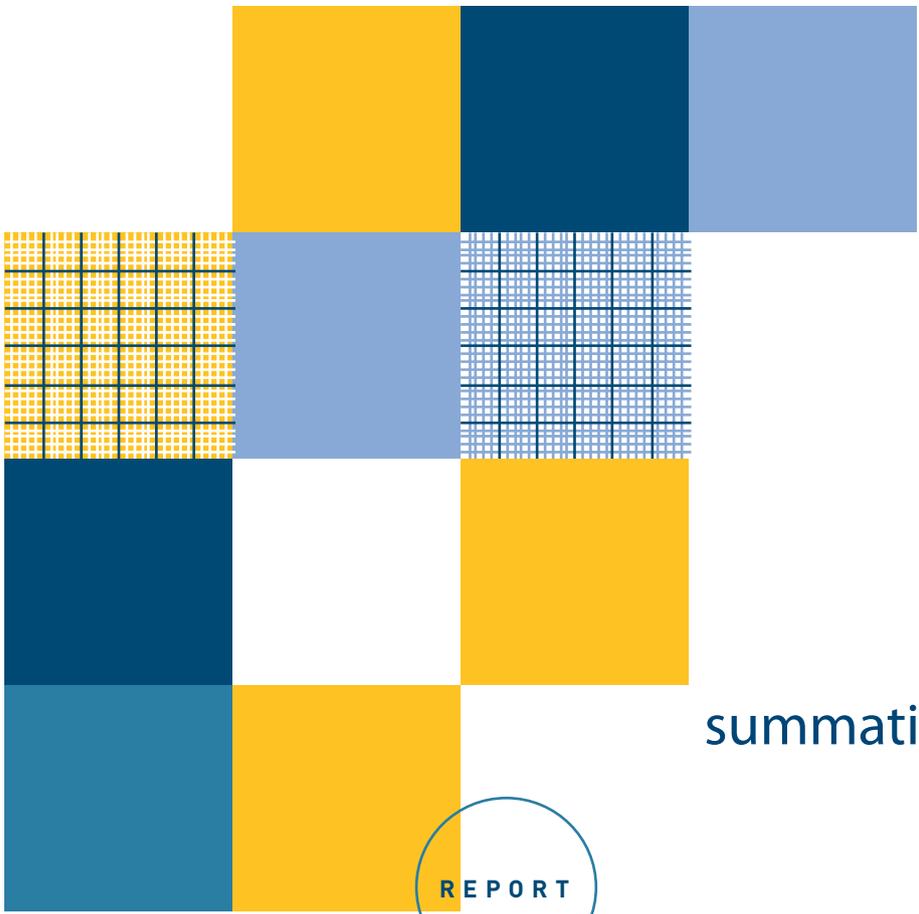
Photograph 7: General view of the west gable end.



Photograph 8: General view of the stair area to Treves House, as seen from the front.

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summation

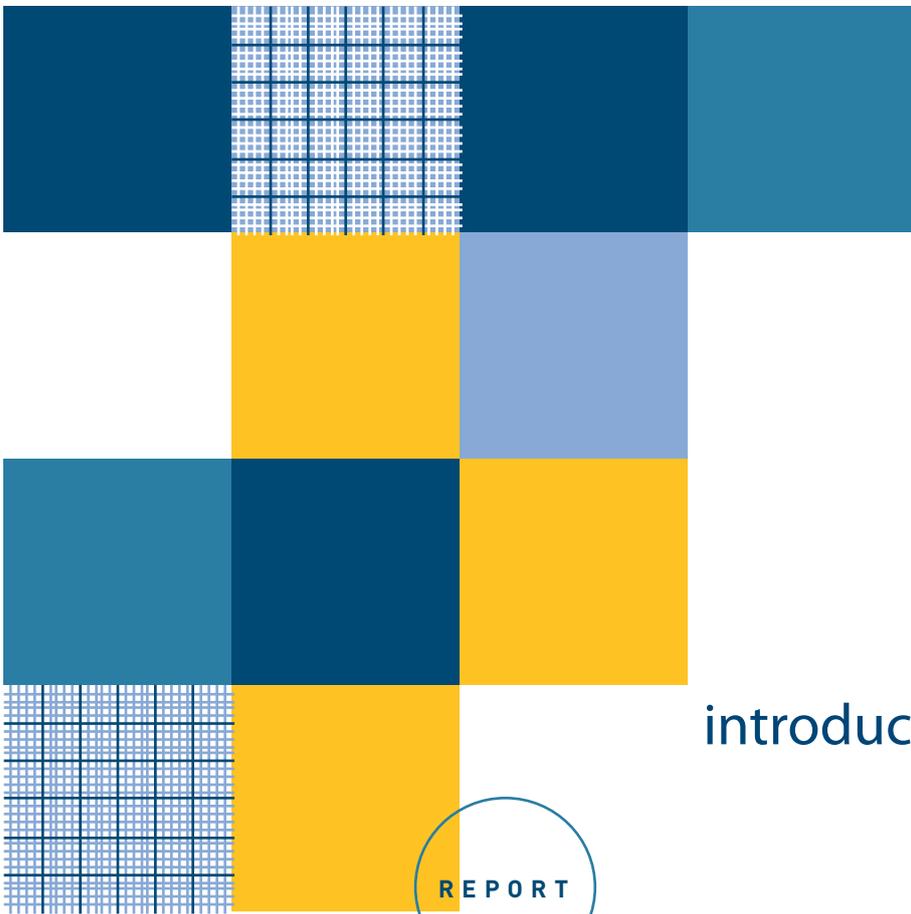
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SUMMATION

Key words:	concrete, brickwork, cladding, reinforcement corrosion, assessment, testing, cover, carbonation, chlorides, samples, laboratory testing, alkalinity, cracking, spalling, European Standard EN 1504, concrete repair, corrosion control, wall ties, cavity insulation.
Objectives:	Lister and Treves Houses were assessed and tested in order to gain knowledge on the construction detailing as well as the causes of any deterioration and reinforcement corrosion present.
Findings:	<p>Lister House</p> <p>The structure was found to be suffering from low cover in areas with the advancing carbonation having reached the reinforcement in places, and hence a reinforcement corrosion problem. In addition there is a significant latent damage issue due to high risk levels of chlorides found present which ranged from <i>low to extremely high</i> risk. The surface coatings are deteriorated.</p> <p>The brickwork walls to the gable ends were confirmed as being of cavity wall construction with a retro installed ball insulation. Ties were found to each side of the panels inspected being galvanised straps from the concrete columns into the mortar joints at regular intervals vertically.</p> <p>The cladding was found to be a metal sheet cladding attached to a timber frame which in turn is attached to the original structure, with insulation between.</p> <p>Treves House</p> <p>The structure was found to be suffering from low cover in areas with the advancing carbonation having reached the reinforcement in places, and hence a reinforcement corrosion problem. The chlorides found present which ranged from <i>low to moderate</i> risk. As on Lister the surface coatings are deteriorated.</p> <p>The brickwork walls to the gable ends were confirmed as being of solid brickwork construction.</p> <p>The cladding was found to be as on Lister House with a metal sheet cladding attached to a timber frame which in turn is attached to the original structure, with insulation between.</p>
Dateline:	It is clear that the deterioration observed has been caused by a combination of factors. This has resulted in the readily visible effects of the seen on the structures, plus the latent, or hidden, damage identified. The information contained within the report is only valid as presented in its entirety. As deterioration is clearly ongoing in the structure, the contents of the report are only valid for a period of 12 months from the date of issue.



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INTRODUCTION

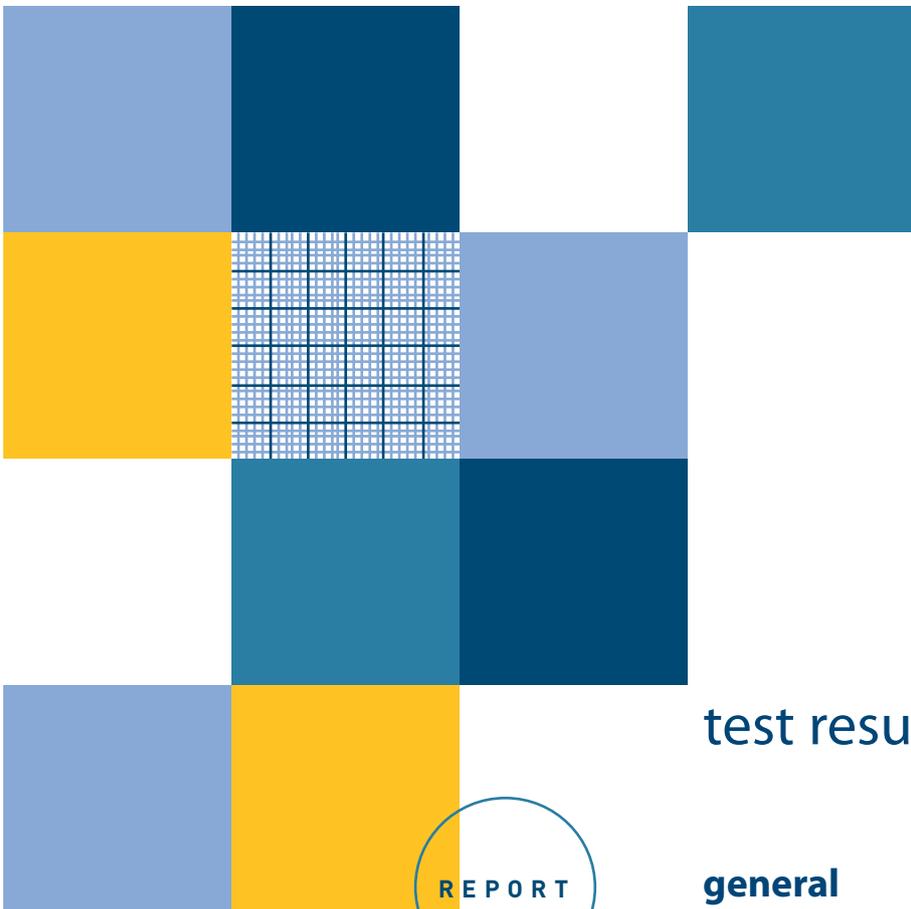
THE WORKS

Martech Technical Services Ltd were requested by Mr Jim Rhind of EDA to carry out concrete and brickwork condition testing on Lister & Treves Houses, London E1, in accordance with their email of instruction dated 23rd June 2014.

The works were carried out in accordance with our proposals in our quotation QJ11814 and QJ11914 dated 20th May 2014.

In addition to the concrete and brickwork testing cladding panel investigations were also undertaken.

Our Engineers carried out the site work in the week commencing 7th July 2014 and their findings are the subject of this interpretative report.



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TEST RESULTS

GENERAL

Although a brief overall visual assessment was made, detailed testing work was only carried out in selected test areas.

The test area positions were selected on the basis of the visual assessment, in such a manner as to endeavour to sample the full range of concrete and reinforcement conditions present, and thus to maximise the information obtainable.

The following Test Results sub-sections of the report contain photographs illustrating various parts of the text. It is recommended that these be studied, with their explanatory captions, in conjunction with the accompanying text.

The most important test results are summarised, in a logical tabular form, in the Summary Tables section of this report.

The findings are recorded on survey sheets, to be found in the Images section of this report.

The Background section of this report contains more information on the test procedures under Testing.

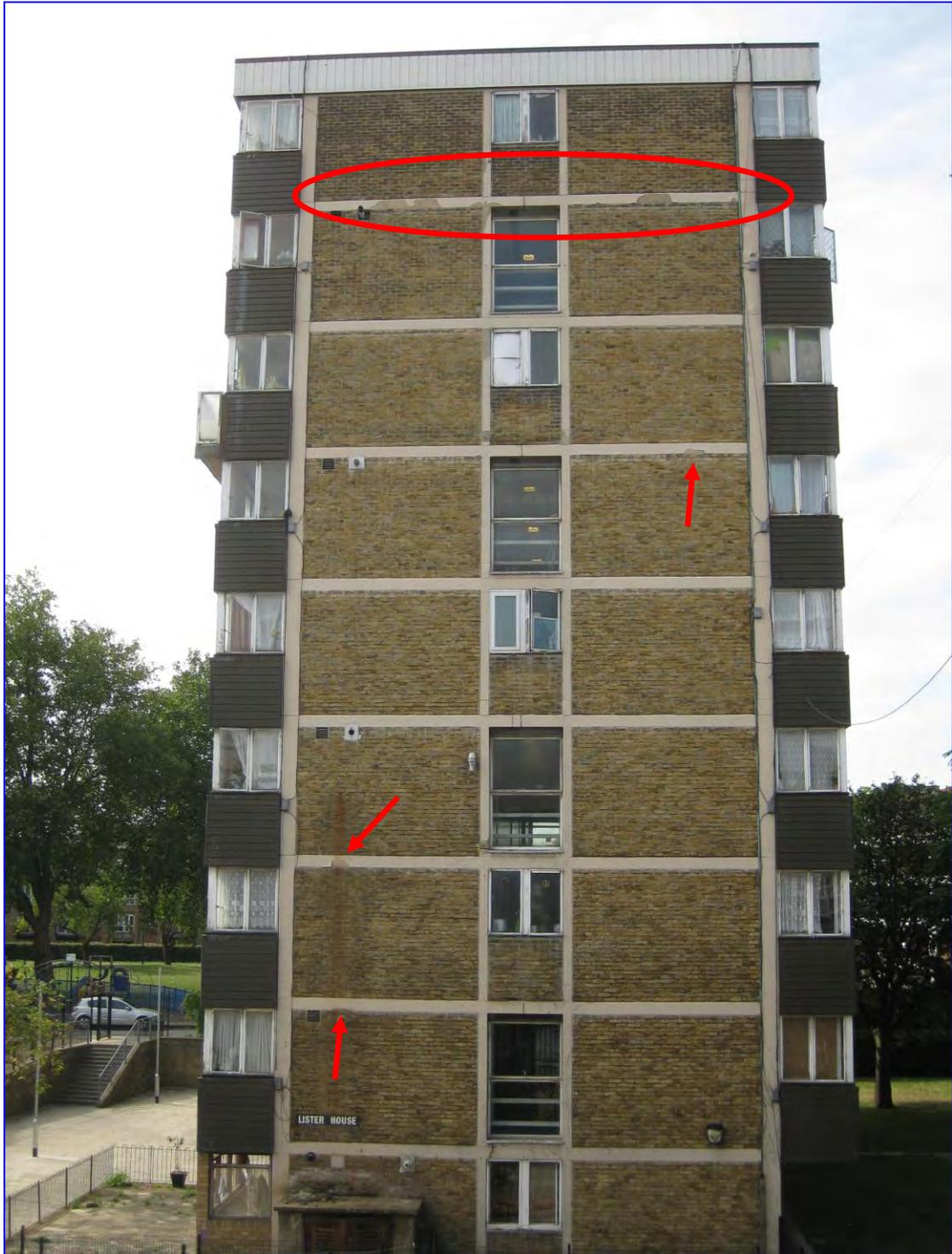
Assessment and testing was carried out employing the following techniques:

VISUAL

Please note that our visual observations are based upon one of our Engineers carrying out a brief walk around survey of accessible areas, perhaps supplemented by areas accessed during the course of the detailed testing.

Lister House was noted to have various external defects. These included occasional spalling concrete (most concrete is covered by cladding), deteriorated paint coatings and timberwork as well as some broken window panels and missing ventilation grills. The most apparent spalling was over the main entrance.

The following photographs illustrate some of the defects noted to Lister House:



Photograph 9: General view of the north gable end of Lister House. Note the peeling paint to the concrete frame indicated.



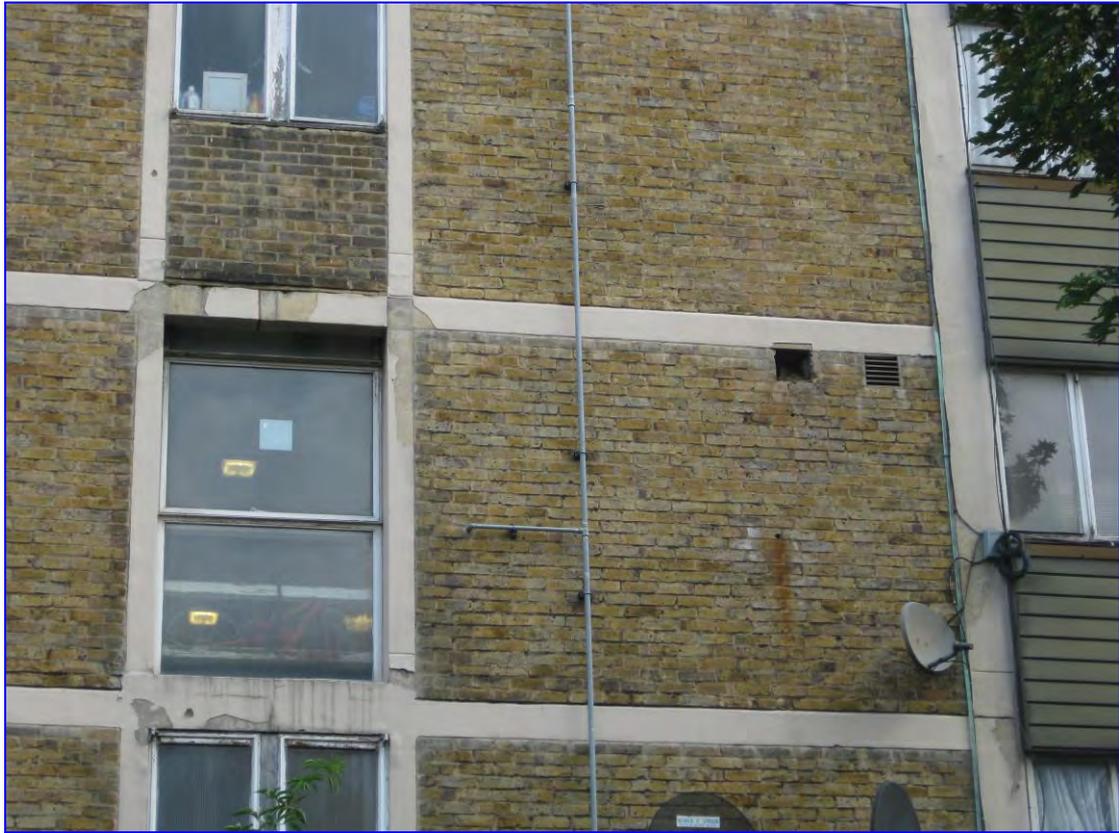
Photograph 10: General view at the main entrance to Lister House with spalling/cracked concrete indicated.



Photograph 11: Closer view of the first floor cracked slab edge, Lister House.



Photograph 12: Closer view of the 3rd floor slab edge over the entrance with spall to the left apparent as well as deteriorated coatings. Note also broken glazing and poor condition timberwork.



Photograph 13: View of part of the south gable end to Lister with further deteriorated coatings evident.

Treves House was noted to have some deterioration to external elements which again included poor coatings to the concrete (and handrails), occasional spalling but also a section of re-pointing to the top of the east gable end brickwork. There was also plant growth in the central access section.

The following photographs illustrate some of the defects seen to Treves House:



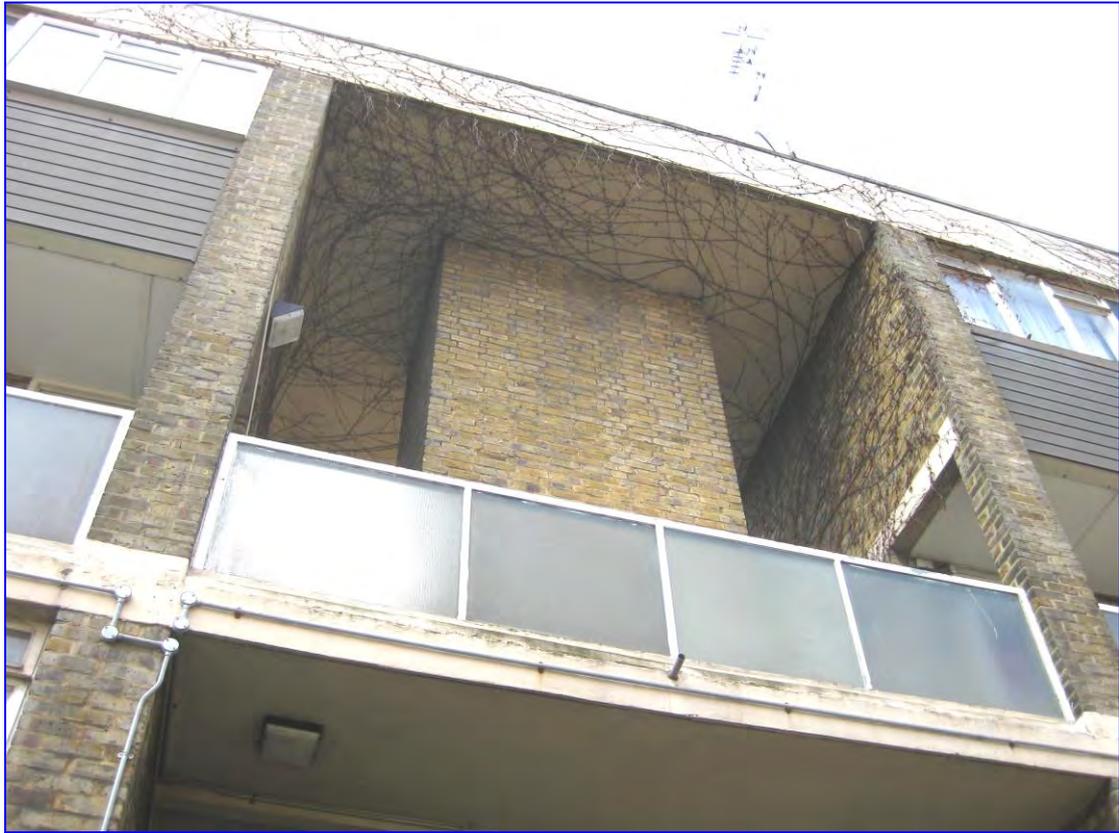
Photograph 14: General view of east gable to Treves with repointed top section of brickwork apparent.



Photograph 15: Example of deteriorated coatings and a spall to concrete in access stairs.



Photograph 16: Example of further deteriorated coatings to a flying beam in the access area. Note also plant growth.



Photograph 17: General view of the top of the access area with abundant plant growth apparent.