Palace Road Estate
Structural Inspection Report

Prepared by

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6th June 2018

Summary

1. The external visual inspections carried out on the three-storey block of flats on Coburg Crescent, Chalner House, the two block of maisonettes and the two-storey block flats on Bushell close appeared to show that they are in good structural conditions commensurate with the age and type of the buildings.

2. Some of the flats lack routine maintenance works such as renewal of paint work to timber cladding to front and rear elevations, minor brick crack repairs and replacement of damaged windows and glass panels to railings.

3. Structural distresses were observed in the exposed reinforced concrete elements such as communal balconies, leading edges to slabs and lintel-beams over the windows in Despard, Ponton Baly and Ducavel Houses. The defects are mainly cracking and spalling of concrete due to corrosion of reinforcements caused by low cover and carbonation of concrete over the life of the structures.

4. The exposed and corroded reinforcements observed in the lintel-beams to high level windows and leading edges to the floor slabs to the three-storey flats and the ground & second floor maisonettes in several locations are evidences that the concrete had been detached and fallen from heights from these structural elements. Hence these defects could be considered as a **health & Safety risks** to the residents and visitors to the buildings.

5. Except the structural defects mentioned above all the buildings appeared to be in good structural condition. **None of the defects mentioned above is considered as impairing the structural stability and integrity of the buildings at present. However early remedial action to rectify the above structural defects is necessary to prevent further deterioration of these defects.**

6. The service ducts fixed on to the soffits of the communal balcony slabs to the three-storey flats and the mild steel gas pipe fixed onto the soffits and leading edges of the second floor maisonette's slabs will make the concrete repair works very difficult. Diversion of the services pipes will be costly and disruptive to residents. Hence a suitable method of concrete repairs must be engineered and agreed with the residents prior to commencement of any concrete repair works

7. Cost for access scaffolding to carry out the concrete repair works to the five blocks of flats and maisonettes forms high proportion of the total cost. Hence utilising the same access scaffolding platforms to carry out other major works such as replacement windows, flat roofs renewal and other refurbishment works etc. could reduce the overall cost of the projects.

	Lambeth Housing

Report

23rd May2018

To	Housing Management
Attn	Su Gomer
Your Ref	
From	Kris Rajendran
Our Ref	MW/KR/IDB1566
Tel	X 65240

Re: Palace Road Estate, London SW2 – Structural Inspection

I refer to your request dated the 5th May 2018 for a structural inspection of the estate buildings and to provide a report on their structural conditions. Attention was drawn to investigate the structural condition and integrity of the buildings and their effects on the health & safety of the residents.

I would like to advise that I carried out a visual inspection of the external elevations of the buildings on 31st May and 1st June 2018 in the presence of Simon Mahari, Assistant Structural Engineer. No internal inspections of the building's roofs and the underground car parks were carried out; hence no comments can be made on those parts or aspects of the buildings which remained covered or inaccessible.

General description

Palace Rd Estate is situated approximately between North East of Christ Church Rd, and South West of Palace Rd, London SW2 and consist of a mix of eight, two to three-storey block of flats, ground and first floor maisonettes as follows:

Block 1(a) – 12-23 Coburg Crescent
Block 1(b) – 10-11 & 24-60 Coburg Crescent
Block 1(c) – 61-79 Coburg Crescent
Block 1(d) – 80- 110Coburg Crescent
Block 1(e) – 12-23 Coburg Crescent
Block 1(f) - 130-139 Coburg Crescent

2.0 Former Community Hall

3.0 Ducavel House

4.0 Baly House

5.0 Ponton House

6.0 Chalner House

7.0 Bushell House

8.0 Despard House

See Photograph -1

Photograph - 1

Estate Map

The buildings are believed to be built around the 1970s.

No structural drawings or construction details are available at the time of inspection. According to the bore-hole investigation carried out at the rear garden of 42 Bushell Close for subsidence damage in 2006 the soil underlying the foundation is London Clay.

My observations, comments and recommendation are set out below:

Observations

1. **Coburg Crescent (a-f)**

a) The buildings 1(a) to 1(e) at Coburg Crescent are three-storey blocks of flats that are constructed generally with external loadbearing cavity walls, suspended timber floors and flat roofs. Some of the flats have garages whilst the remaining flats have living

accommodation on the ground floors. The only concrete element found in each flat was the lintel over the ground floor window or the garage door. The lintels have exposed aggregate finishes and appeared to be in good condition (see photographs 2 & 3).

b) The rear elevations of the flats were clad with close-board timbers between large rectangular windows. The close-board timber cladding to all block flats appeared to be in good condition except some of them exhibited peeling and flaking paintwork (see photographs - 4).

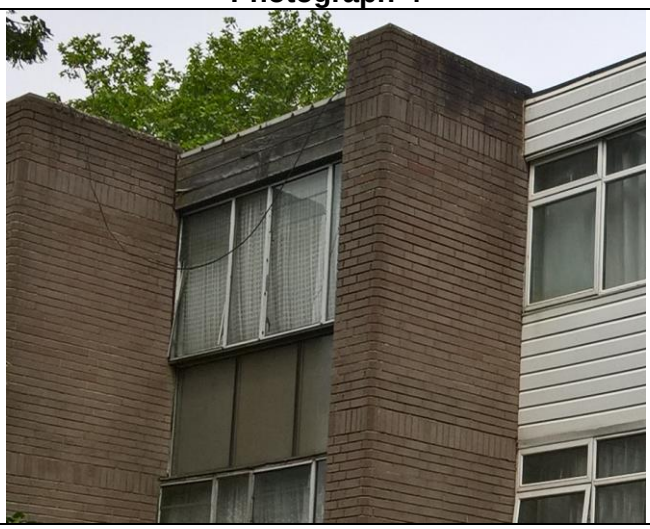
Photograph -2

Coburg Crescent – front elevation

Photograph-3

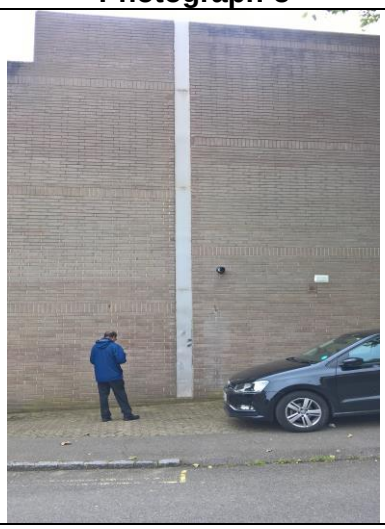
Coburg Crescent –rear elevation

Photograph-4



Peeling & Flaking paintwork to timber cladding (flat-22)

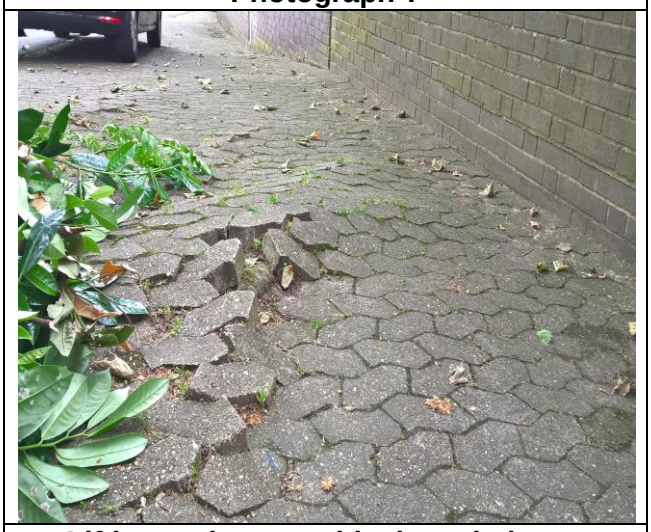
Photograph-5



Boarded up window in flank wall –Flat-12

c) The narrow and full height double glazed windows on the flank wall elevation of flat no.12 had been boarded up. The reason is not known (see photograph-5).

d) There are mature London Plane trees at the rear of No.20 and in front of No.10. Lifting and uneven paving blocks were observed in front of No.10 due to expanding root system (see photographs 6 & 7).

Photograph-6	Photograph-7
	
Mature London Plane tree – in front of Flat NO.10	**Lifting and uneven block work due to expanding root system**

e) The ground floor Flat 131 in block 1(f) was investigated in January 2010 for subsidence damage due to tree root activity. Tree management and repairing of cracks were recommended at the time. Minor horizontal cracks to the soffit of the 1st floor communal balcony and peeling and flaking paintwork to the communal balcony railings were observed during this inspection (see photographs -8 & 9).

Photograph-8	Photograph-9
	
Coburg Crescent 130-139	**Coburg Crescent 130 -139–Front Elevation**

2. <u>Former Community Hall</u>

This building had been demolished and the area had been boarded up. The display sign indicates that this area had been designated for future development as a learning centre for people with learning disabilities.

3. **Ducavel House**
4. **Baly House**
5. **Ponton House**
8. **Despard House**

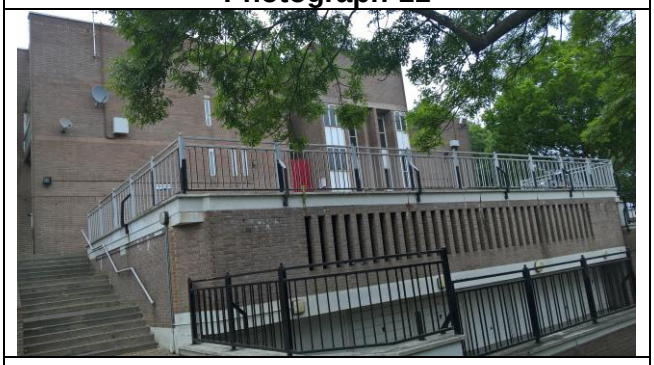
General Description

The above four buildings are structurally identical and each block consists of a three-storey block of flats and a ground and 2nd floor maisonettes. Both blocks are linked to a central staircase. Access to both flats and maisonettes is via a flight of concrete steps at ground floor level on Palace Rd leading to a rectangular podium, central staircase and communal balconies at each floor level on the front elevations. An underground car park is located below the podium slab to each building (see photograph-10 &11).

Photograph-10

Front elevation of Flats and Maisonettes

Photograph-11



Access stairs to podium & underground garages

Observations
Three-storey Flats

The three-storey block of flats and the four-storey maisonettes are constructed generally with cavity external and internal cross walls, concrete floors and flat roofs. The communal and private balconies appear to be formed in cast in-situ reinforced concrete. The facing bricks used generally on the external elevations are a non-standard size, being nominally 290mm long and 90mm wide, compared with a standard brick of nominal size 215 to 225mm long and 105mm wide. This brick has been used typically throughout the estate. Private balconies are provided at each floor level to flats and at 2nd floor level to maisonettes.

Photograph-12

Rear elevation of flats

Photograph -13

Rear elevation of maisonettes

The railings to the communal and private balconies consist of a continuous steel frame with 75mm deep x 45mm wide x 1080mm high rectangular hollow section (RHS) standards spaced at 2200mm centres, and a 135mm x 45mm RHS hand rail welded together. These steel standards are bolt fixed onto the leading edges of communal and private balcony slabs with the end plates. The spaces between the steel standards are in filled with translucent glass panels that are retained within the recesses of the top and bottom timber transoms (40mm wide x 230mm deep). These timber transoms are in turn fixed onto the steel standards by bolts (see photograph 14 & 15).

Photograph-14

Typical railings to communal balcony (Flats)

Photograph-15

Typical Railings to Private balcony (Maisonettes)

Horizontal cracks (approx. 2mm wide) were observed in places on the soffits of the 1st and 2nd floor communal balconies. These cracks were covered with white salt deposits due to water ingress. A rectangular service duct (approx. 680mm wide) is fixed onto each communal balcony soffit (see photograph 16 &17).

Photograph-16

Exposed service pipes serving flats.

Photograph-17

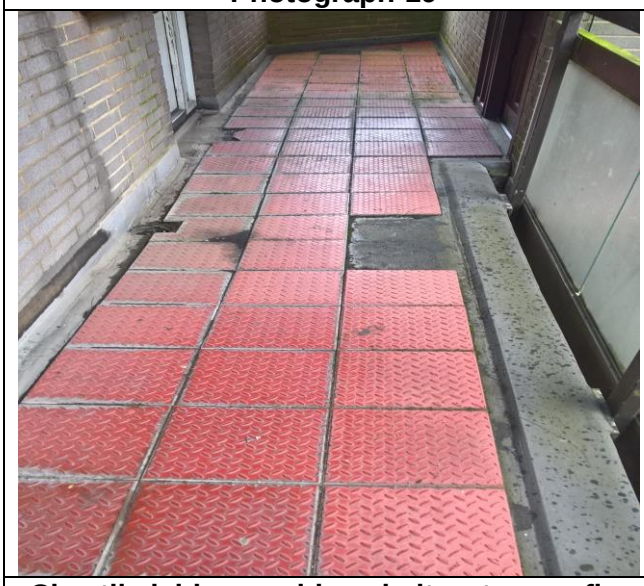
Service duct fixed to the full length of the soffit

Square clay tiles (approx. 300mm x 300mm) were laid over the old asphalt waterproofing layers to both communal balconies in Despard House (see photograph 19). The other three blocks have exposed asphalt finishes.

Photograph-18

Cracks on communal balcony soffit and service duct to full length.

Photograph-19



Clay tile laid over old asphalt waterproofing (Despard House Flats & Maisonettes)

Severe cracking, spalling and detached concrete and exposed corroded reinforcements were observed on all leading edges of the cantilever slabs to the 2nd floor flats. (see photographs 20 & 21).

Photograph-20

Cracked concrete to lintel-beam

Photograph-21

Corroded and exposed reinforcements to lintel-beam due to detached concrete

Peeling and flaking paintwork were observed on the steel and timber elements of the railings to the communal and private balconies (See photographs 22 & 23).

Photograph-22	Photograph-23
	
Peeling & flaking paintwork to railings timbers	**Peeling & flaking paintwork to railings steelwork**

Observations

Ground & 2nd floor maisonettes

The maisonette block has a distinct architectural feature where by approx. half the length of the floor slab at 1st and 2nd floor levels are staggered and overhang the entrances to the maisonettes below forming protected porch type structures. The remaining section has a straight cantilever slab over the entrances below. The leading edges to the staggered and cantilever slab have exposed needle-gunned type finishes (see photograph -24)

Photograph-24	Photograph-25
	
Maisonette – Typical Front Elevation	**Maisonette – Typical Rear Elevation**

The brickwork and pointing to all external elevations appeared to be in good condition.

Clay tiles had been laid over the asphalt waterproofing layer on the communal balcony (see photograph 26) in Despard House. The other three blocks have exposed asphalt finishes.

Horizontal cracks and water stains were observed on the soffit to the communal balcony slab in several places (see photograph 27).

Detached concrete and exposed corroded reinforcement were also observed on the leading edges to the staggered and cantilever slabs (see photograph 28 & 29).

Photograph -26

Clay tiles laid over asphalt waterproofing layer

Photograph-27

Horizontal cracks & water stains in the soffit

Photograph-28

Detached concrete to leading edge of slab

Photograph-29

Exposed corroded reinforcement in leading edge

Flaking and peeling paintwork to timber cladding was observed in a few maisonettes (see photograph -30).

Photograph-30	Photograph -31
	
Flaking & Peeling paintwork to timber cladding to maisonette	**Mild steel gas pipe fixed on to the soffit & face of maisonette beam.**

Mild Steel gas pipe approx. 75mm dia.) is fixed on to the soffits and leading edges of the 2nd floor maisonette beams (See Photograph-31)

6. <u>Chalner House</u>

This is a single three-storey block of flats similar to other three-storey block of flats in the estate (see photographs-30 & 32).

Photograph-30	Photograph-32
	
Chalner House –Front Elevation	**Chalner House –Rear Elevation**

A "stepped crack"(approx. 3mm wide) was observed on the front elevation brickwork to the ground floor flat-2. A mature Oak and an Ash trees were observed in close proximity to flat-2 and the staircase respectively (see photographs- 33)

Photograph-33

Mature Oak in front of flat-2

Photograph-34

Ash tree in front of staircase

The leading edges of the cantilever slabs over the windows and the communal balcony slabs appeared to be in good condition except exposed and corroded steel reinforcements were seen in a few places.

7. Bushell Close

1-26 Bushell Close

a) This is a ground and 2nd floor single block of maisonette structurally similar to other maisonettes in the estate (see photograph -35 &36). The brickwork and the leading edges of the floor slab over the windows on all elevations appeared to be in good condition.

Photograph-35

Part front elevation

Photograph-36

Part front elevation

The communal and private balconies at the rear and its railing also appeared to be in good condition.

27-38 Bushell Close

a) This is a ground and 2nd floor single block of maisonette structurally similar to other maisonettes in the estate (see photograph -37). The brickwork on all elevations appeared to be in good condition.

b) Three minor horizontal cracks were observed on the soffit to the communal balcony slab (see photograph -38).

Photograph-37	Photograph-38
	
Front Elevation	Cracks in communal balcony slab

39-52 Bushell Close

a) This is a two-storey "L" shaped block of flats of loadbearing masonry walls, solid concrete floors and flat roof construction. Access to the ground floor flats is via the main entrance doors located on the rear elevation whilst access to the first-floor flats is via the main entrance door on the front elevation and internal access stairs leading to the concrete communal balcony on the rear elevation. Private balconies to the first-floor flats are located on the first-floor front elevation.

b) The external brickwork on all elevations appeared to be in good condition.

c) Horizontal cracks (approx. 2-3mm wide) were observed on the soffit of the communal balcony slab.

d) Detached concrete (approx. 400mm long x 100mm wide x 75mm deep) corroded and exposed reinforcements were observed on lintel over window to 1st floor flat no.45.

e) The ground floor flat no.43 was investigated for subsidence damage in November 2006. The mature trees in the rear garden of the private property was implicated. Tree management measures and crack repairs were recommended at that time.

f) Four young Ash trees were observed in the front garden.

Comments

1. The external visual inspections carried out on the three-storey block of flats on Coburg Crescent, Chalner House, the two block of maisonettes and the two-storey block flats on Bushell close appeared to show that they are in good structural conditions commensurate with the age and type of the buildings. Some of the ground floor flats on Bushell Close and in Chalner House have been affected by subsidence damage due to "root action" of the mature trees in close proximity to the buildings.

2. A system of tree management should be set up and put In place to manage the trees in the estate in consultation with Lambeth's Trees Section

3. Structural distresses were observed in the exposed reinforced concrete elements such as communal balconies, leading edges to slabs and lintel-beams over the windows in Despard, Ponton Baly and Ducavel Houses. The defects are mainly cracking and spalling of concrete due to corrosion of reinforcements caused by low cover and carbonation of concrete over the life of the structures.

4. The cracking, spalling of concrete, corroded and exposed reinforcements observed in the lintel-beams over the windows to the three-storey blocks of flats are severe compared to the maisonette blocks. Early remedial action will prevent further deterioration of these defects.

5. The exposed and corroded reinforcements observed in the lintel-beams to high level windows and leading edges to the floor slabs to the three-storey flats and the ground & second floor maisonettes in several locations are evidences that the concrete had been detached and fallen from heights from these structural elements. **Hence these defects could be considered as a health& Safety risks to the residents and visitors to the buildings.**

6. The horizontal cracks and the water stains observed on the soffits of the communal balconies are an indication that the asphalt waterproofing to the communal balconies are defective. These asphalt waterproofing layers appeared be worn thin and nearing the end of their service life.

7. The railings to the communal and private balconies and the timber cladding to the front and rear elevations to the flats and maisonettes in the estate lack routine maintenance.

8. Except the structural defects mentioned above all the buildings appeared to be in good structural condition. None of the defects mentioned above is considered as detrimental to the structural stability and integrity of the buildings at present. However early remedial action to rectify the above structural defects is necessary to prevent further deterioration of the defects.

9. The service ducts fixed on to the soffits of the communal balcony slabs to the three-storey flats and the mild steel gas pipe fixed onto the soffits and leading edges of the second floor maisonette’s slabs will make the concrete repair works very difficult. Diversion of the services pipes will be costly and disruptive to residents. Hence a suitable method of concrete repairs must be engineered and agreed with the residents prior to commencement of any concrete repair works.

Recommendations

1. Proper concrete repairs based on Structural Engineers specification should be carried out in order to prevent further deterioration. The pproposed remedial works involve the following:

(a) Erection of safe access scaffolding platform on all elevations of the buildings.

(b) Hammer testing of concrete to communal and private balcony slab soffit surfaces and leading edges to identify and mark up defective areas.

(c) Cutting out of cracked concrete areas, exposing and treating corroded steel reinforcements.

(d) Crack repairs and anti-carbonation coating to soffits and leading edges.

(e) Renewing asphalt waterproofing to communal and private balcony slabs.

(f) Protective coating to communal and private balcony soffits, leading edges and railings.

(g) The cost for access scaffolding to carry out the concrete repair works to the communal and private balconies forms high proportion of the total cost. Hence utilising the same access scaffolding platforms to carry out other major works such as replacement windows, renewal of flat roofs and refurbishment works etc. could reduce the overall cost of the projects.

2. Carry out routine maintenance works to estate buildings to ensure they are in good structural condition.

3. Carry out periodic maintenance of the mature trees in the estate to mitigate the structural damage to buildings. Consult the Council's Arboriculturist for further advice

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