NOS 2 - 4 CUMBERLAND PLACE
REGENTS PARK, LONDON NW1

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PJR/0050/7A

To be read in accordance with drawings provided with the Planning and Listed Building Consent Applications.

1 INTRODUCTION

This Report is to be read in conjunction with the Planning and Listed Building Consent Applications.

The proposal is to return the three buildings, which are currently interlinked, back into individual houses. Although Grade I listed, the properties were substantially altered in the late 1950's to create a number of lateral flats and one maisonette. During the conversion works, there was extensive loss of original detail as well as alterations to doors and windows.

The proposed works intend to restore detail where indication of the original exists, eg restoration of original fenestration patterns to the elevations and to put forward appropriate details where no evidence exists. The external symmetry of the building will be retained and its historic setting enhanced through a more structured and considered landscaping scheme.

An initial programme of investigative works was carried out, with the approval of London Borough of Camden and English Heritage, which assisted us in the preparation of the detailed design. The works confirmed that extensive alterations were carried out, particularly to the structure. Proposals for repair have been based upon these investigations and the recommendations of the Professional Team.

Contact has been made with the relevant Statutory Authorities and a site visit held with Camden Council and English Heritage. The reinstatement of the buildings as three houses has been welcomed and their initial, informal comments have been incorporated into the proposals.

PSX00 0 5047

a) LOCATION

The buildings are situated on the east side of the Outer Circle of Regents Park. They comprise what were originally three of the four houses which constituted Cumberland Place. Entrance doors are to the elevation facing east towards Cumberland Terrace, with a service entrance gate in the balustrade.

There is a private terraced garden to the north which belongs to house No 4. Nos 2 and 3 do not have private gardens, but the houses access onto the garden communal to all three properties and have basement areas accessible from street level.

To the east, there is a metal railing with lamp posts set in a heavily repaired stone curb, with low pillars to either end. These, and the pavement, are in the management of the Crown Estate Paving Commissioners, (CEPC) who are a separate body from the Crown Estate. They will be refurbished as part of the redevelopment.

There are vaults beneath this pavement and the communal gardens which are included within the premises, although the communal garden and pavements are in the management of the CEPC.

b) BRIEF DESCRIPTION

The houses are of brick construction with stuccoed walls and decoration to the north, west and part east elevations lined to imitate ashlar. The central windows to the west elevation between nos 2 and 3 are blind to hide the junction between houses. The main roof is flat, with a pitched, slate covered mansard with dormers and parapet gutters. All have been heavily repaired, often altering the original levels to the detriment of the drainage.

The private garden to No 4 is paved, with planting beds and trees of varying age and condition. The basement areas generally have stucco or brick walls, which have been partly replaced to the west elevation by glass slip bricks. The floors are paved, with extensive repairs.

The properties were originally three of the four houses comprising Cumberland Place. No 1 is excluded from the proposals as it has already been the subject of a recent refurbishment.

The properties appear to have been little changed until after the War, when they were altered, around 1960, from the original layout to create flats.

The layout of No 2 remains, in principle, as originally intended to the ground, first and second floors. At third and fourth floors, individual flats to each floor span the full length of the three properties. At ground, first and second, the flats span across houses Nos 3 and 4, with a small flat, and storage and service areas to the basement.

This extensive remodelling has largely swept away most of the original internal detail to the property, and resulted in considerable structural alteration. This extent of work is not evident in the exterior, which remains largely as originally intended.

2 HISTORIC REPORT

a) HISTORIC DETAILS AND LISTING
(Prepared by Harvey W Van Sickle for the Crown Estate).

i) Introduction

Erected in 1826-28 as a block of four speculatively-built houses, Cumberland Place has been largely passed over by most histories of Regency architecture and treated as something of a footnote in terms of the history of Regents Park. This is undoubtedly due to a lack of historically notable residents, although Mrs Gaskell is said to have lived here in the late 1850s, as well as the buildings' architectural overshadowing by the more spectacular terraces of the park.

The building is nonetheless an excellent illustration of the essence of speculative building in Regents Park. The four houses, described by Summerson in 1949 as 'very small and thin with miserable staircases', were designed to appear as a single large and rather grand palazzo; this catered directly for that illusion of respectability which was perhaps the parks' greatest appeal for the aspiring and successful professional/merchant class at which it was aimed. Interestingly, the buildings social and physical settings are identical: it is positioned somewhere between the lesser terrace houses and the prime villa sites found in the centre of the park.

Analysis of the development of Cumberland Place has been hampered by the almost complete destruction of the Crown Estate leasing files prior to the mid-1960s. (This is not as surprising as it may seem at first: given the absence of notable residents, and the lack of interest in the building by conventional architectural historians, it is unfortunately to be expected that conventional records assessment found little of merit to preserve). All that remains at the present time are Branch files dating back some 20 to 30 years, and Surveyors files dating to c.1940 Nothing is held at the PRO other than the original leasing information of the 1820s.

This report relies on a leasing/occupancy history as well as existing plans and photographs dating from the late 1930s to establish probably and documented building changes.

ii) Construction

Cumberland Place was an addition, essentially a use of surplus land, to W. M. Nurse's development of Cumberland Terrace. The initial leases ran for 99 years from 5 July 1826, and were fully granted in May 1828; Nos 1 and 4 were leased by George Stephen Butler, while the internal houses were taken by Miss Joanna Sturch. In both cases, the houses were clearly taken along with others in Cumberland Place as investments for further sub-letting.

The four houses, arranged to appear as a single large mansion, were apparently designed for Nurse by James Thomson, the architect of Cumberland Terrace (John Summerson notes that a plan of 1828 was signed by F G Greene, but the signature on the plan is possibly that of a draughtsman and, in any event, the plan is a garden design rather than a building design plan). The facade design was presumably specified in the usual manner by John Nash.

The reputation of the houses in architectural circles has always been divided between the individual houses and the collective composition. John Summerson, for example, follows his comment on the thin-ness and miserable staircases with the note that the bloc, as a whole, is impressive and turns a brave Corinthian front towards the Park.. It is presumably this overall effect to which Ann Saunders was referring some 20 years later (in 1969) when she described the block as a group of pretty well proportioned houses.

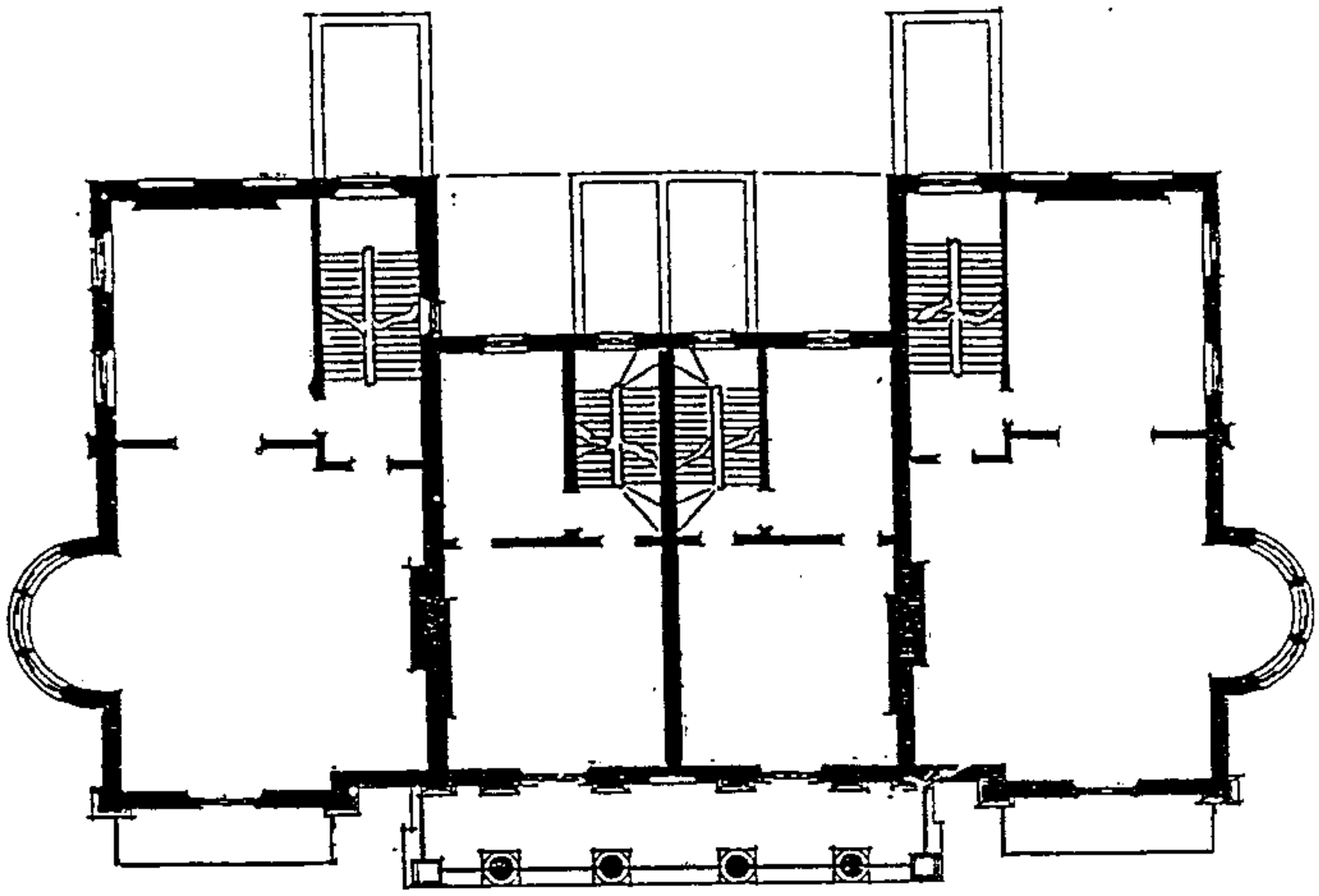
iii) Illustrations

Plan from Survey of London 1938.

Photographs (undated) from HBMC archive.

Listing Entry.

CUMBERLAND PLACE



Between Cumberland and Chester terraces is another group of four houses illustrated in plate 97, and by the plan above. They are numbered 1–4 Cumberland Place. To the Park they show a central projecting portico of four columns of the Corinthian order rather widely spaced extending through two storeys above the ground floor. Flanking this at either end are slight projections treated with pairs of double pilasters of the same order. To the north and south are well-designed semi-circular bays rising to the main cornice, while above the main block is an attic storey.

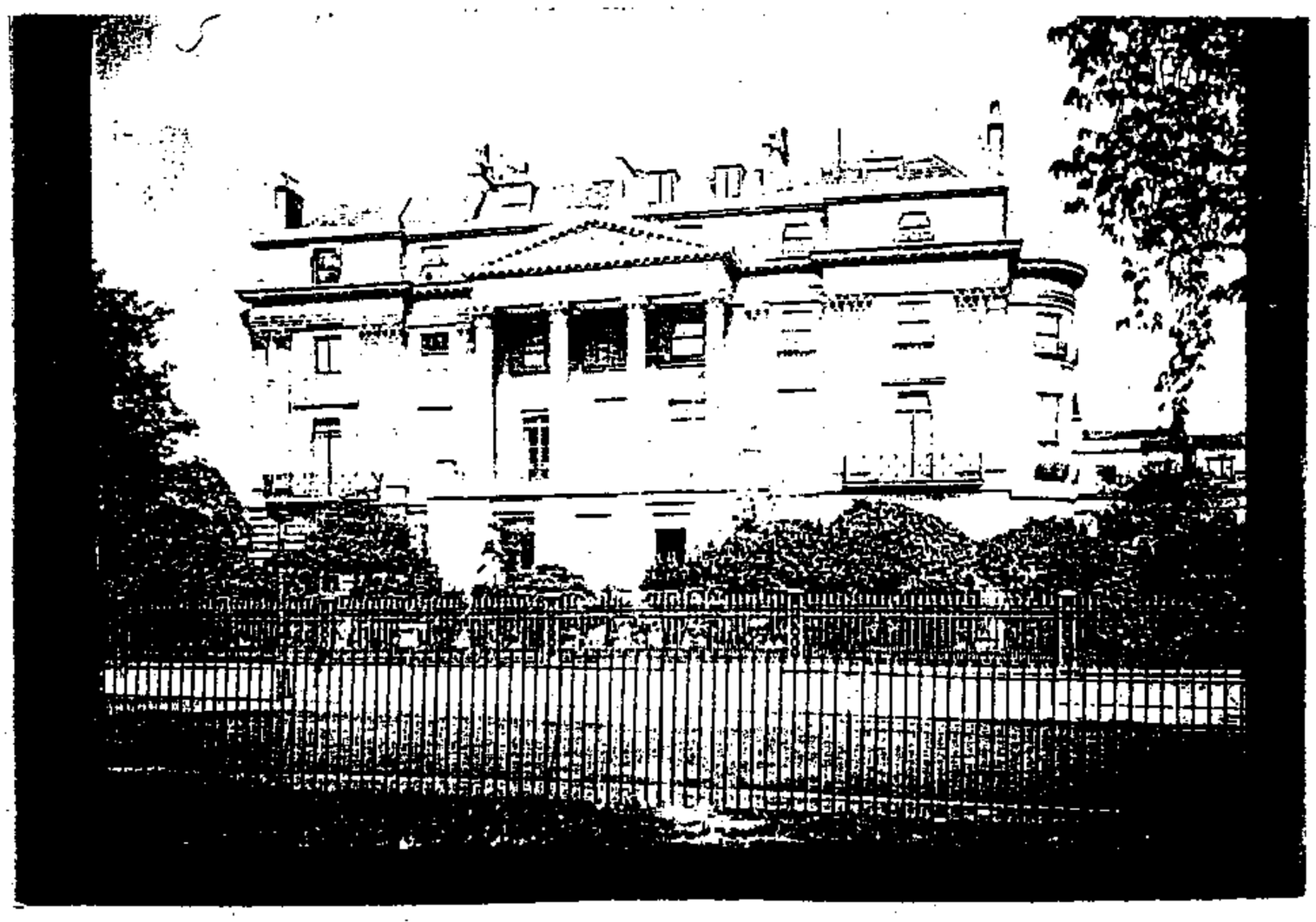
Survey of London, 1938.

PHOTOGRAPHIC RECORD

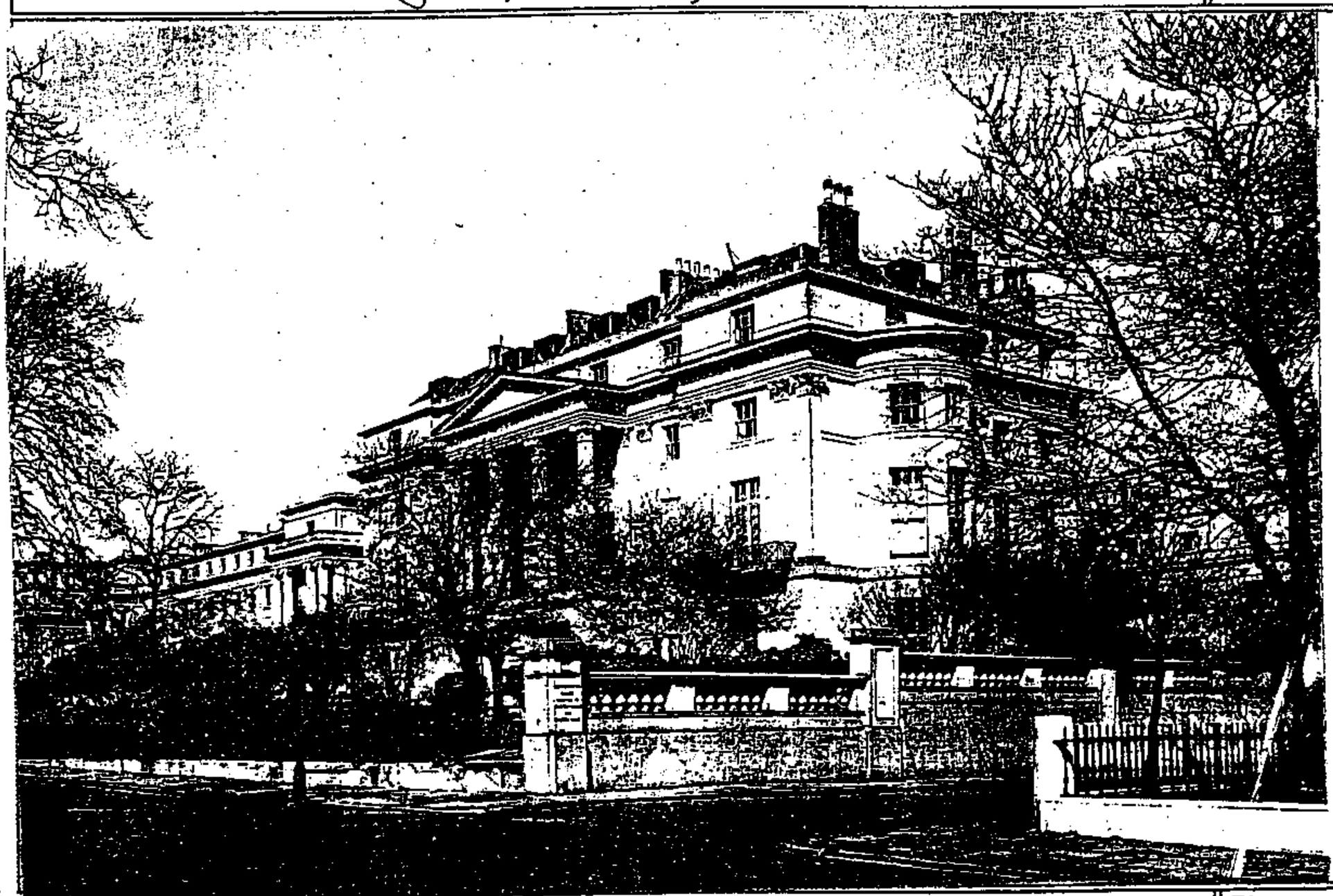
Gibberd

Project Title: Nos. 2–4 Cumberland Place, Regents Park Report no: — Sheet no: 1

Job no: C1023 Date: Historic



West Elevation (facing Regents Park) c. 1948 HBMC | Photo no: H1



South West Elevation (from Outer Circle) c. 1955. HBMC | Photo no: H2

Form F13/5/QMS/iss3/Jan'99

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Wording of Listing Entry, provided by London Borough of Camden July 1999
The building is Grade I listed

TQ2882NE
798-1/87/288
14/05/74

CAMDEN
CUMBERLAND PLACE
(East side)
Nos.1-4 (Consecutive)
and attached balustrades & railings
(Formerly Listed as:
CUMBERLAND PLACE
Nos. 1-4 (Consecutive))
(Formerly Listed as:
CUMBERLAND PLACE
Railings to garden forecourt of
Nos.1-4 (consec))

GV

I

Block of 4 houses giving impression of 1 large house. C1828.
By John Nash and possible J Thomson. Stucco with brick rear elevation. Slated mansard roof with dormers.
EXTERIOR: symmetrical block with main elevation to Regents Park but entrances on rear to Cumberland Place. 4 storeys, attics and basements. 7 window range. Returns with 3 windows and projecting semicircular bays rising to main cornice. Main elevation with projecting end bays and central projecting tetrastyle pedimented Corinthian portico, columns rising through 1st and 2nd floor, ground floor forming a podium. Corinthian pilasters to other bays, paired at projecting bays, supporting the main entablature with projecting cornice at 3rd floor level.. Recessed sashes to ground, 2nd and 3rd floors. 1st floor with casements and cast-iron balconies. Cornice and blocking course above 3rd floor. Rear elevation with projecting end bays of 3 windows each, mostly blind. Entrances in projecting stucco porticoes with pilasters carrying entablature and blocking course; fanlights and panelled doors. Nos 2 & 3 with attached cast-iron railings to areas and steps flanking entrances.
INTERIORS; not inspected.
SUBSIDIARY FEATURES; attached stone balustrades and plain wrought-iron geometrical railings on low wall to garden forecourt.
(Survey of London: vol. IX, Old St Pancras and Kentish Town (St Pancras II): London: -1938: 118).

3 BRIEF REPORT UPON PRESENT CONDITION AND PROPOSALS

To be read in accordance with application drawings.

a) EXTERIOR

General

The exterior has been relatively little altered from the original. It is however, proposed to carry out a full schedule of repair, and to reinstate details which have been lost or obscured.

i) Roofs and Gutters

Main Roof

The flat roofs are asphalted and the pitched roofs clad in slate. Dormer windows are set out from the main plane of the roof. The slates are varying sizes and condition, with inadequate repairs. Investigative works have exposed a roof structure which indicates extensive work to alter the layout below, and charring most likely caused by bomb damage. It is proposed to replace the present composite mixture of timber/steel with a timber structure within the original envelope, with west and north dormers inset to match no 1, so maintaining the symmetry of the overall building.

The roof gutters, particularly to the west elevation to No 4, appear to have been altered extensively, in that a new gutter level is significantly higher than the original. This is likely to be due to the failure of the original gutter, with a new one fixed over the old, rather than carrying out a correct repair. Stucco to the gutter parapets is failing. It is proposed to renew all roof coverings. Materials will be lead to flat areas, gutters, dormers, slate to pitches, and new stucco and pointing to the gutters.

Access to the roofs is at present by either climbing over water tanks, out through a window into a parapet, or via a ladder through a rooflight over the staircase to No 4. Neither comply with current Health and Safety Recommendations. New rooflights (also necessary for smoke dispersal) will allow access, with eye bolts at roof level for harness connections. A larger rooflight, similar in detail to that at No 1, is proposed to No 4.

The chimney stacks to the party walls have been removed and the parapets are capped. One stack remains to the N.E corner, together with the upper level of the lift housing. The stacks will be reconstructed with pots to match those at no 1. The lift housing will be incorporated within the roof slope.

Lower Roofs

All of these roof finishes are in inappropriate materials and heavily repaired. A large extract protrudes through the roof to entrance no 3 which will be removed. The floor to the portico balcony is tiled. All flat roofs will be finished in lead, with decking or other protection where they will receive foot traffic in excess of normal maintenance.

External Downpipes

The falls to the gutters are unlikely to comply with current requirements. It would appear that some outlets have been omitted during repairs, additional pipes incorporated on an ad-hoc basis and that some rainwater downpipes are now blocked. This has caused extensive water ingress during recent heavy rain at fourth floor level from the main roof, and at first and second floor level from the north bay balcony roof. All gutters will be replaced with lead, to correct falls. Plastic pipes will be removed, old lead or cast iron will be overhauled and repaired, or replaced, with like for like. New pipes are sited in discreet locations, and match existing.

ii) Elevations

West Elevation - Ground to Fourth Floor

The elevation facing the communal garden is stucco. It has recently been redecorated and there are some particularly rough areas of stucco to no 4, and visible cracks above ground floor level. Blind windows cover the party wall junction, behind the portico. Unnecessary air grilles will be removed, made good, stucco repaired and replaced where necessary.

Windows to the main elevation are generally double hung, six pane sashes, except for the French doors to the first floor balconies and the first floor window to no 4. Some alterations have taken place to facilitate bathrooms and window openings. The original form of the windows will be reinstated. A tall sash window opens onto steps out into the communal gardens from house 2, 3 and 4.

North Elevation - Ground to Fourth Floor (House 4)

The stucco work is in similar condition to the west elevation, and will be treated in a similar manner.

The bay balcony has been extended in height, which results in a loss of symmetry to the building and loss of view. It will be reduced to the height of that at no 1, subject to the structural engineers advice upon investigative works in this area. The stucco work to the interior face of the wall will be replaced.

The exit from the ground floor central bay has a chequerplate metal ramp. It leads to a sash, not French doors, and may have been used as a means of escape. A new door onto the terrace will be included, from the window to the proposed dining room, with steps and railings to match existing, and the escape ramp and railings removed.

There is a window which has been filled in, at third floor and will be re-opened with window sashes to match existing.

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East Elevation

This is stock brick above ground floor, which is stucco, with pilaster decoration to either side of the doors. There are some large cracks, and rough areas where unsuitable materials may have been used. Cracks will be filled and rough areas smoothed or replaced if necessary. There are 2 air grilles to house no 2 which will be removed. The brickwork is unevenly dirty. Pointing is uneven in areas, particularly over second floor windows over the portico to No 2. Brickwork will be washed, and not overcleaned with chemicals. Repointing will be carried out where necessary, to match existing.

Windows are of the double six pane sash design, except for house No 4, where some have been bricked in to facilitate insertion of the lift. These will be re-opened. It is thought that those to the north of the lift are early, if not original, blind windows and will remain closed. The central blind window above the cornice is half opened, the one to its left has an extract. These will be filled with brickwork to match existing.

The entrance door to No 4 has kicking plate, glazed top panel, with wrought iron protective screens. The top panels will be filled with solid timber, and new stone steps will replace concrete.

The entrance doors to No 2 and 3 are similar except for different ironmongery and light fittings over the doors. Original stone entrance steps to each house have been heavily repaired in concrete, which will be replaced in stone.

To all doors, appropriate ironmongery will be fitted, together with a small entrance video/intercom panel to the door reveals.

West, North and East Elevations - Basement area, including railings

The cast iron railings to the West and North Elevations are of a matching design, but their condition is poor in areas with layers of paint and loose connections. The railings to the east elevation (houses 2 and 3) match, with the exception of the basement steps having been replaced by a ladder to No 3. No 2 has boot scrapers, with a single boot scraper to the basement entrance. Basement steps to no 2 are heavily repaired.

All railings will be fully overhauled, and new stone steps will be constructed to No 3, those at No 2 will be overhauled with new stone treads.

The basement retaining walls to the west basement area have been partly covered with glazed brickwork and the remaining stucco is extensively blown and cracked. The interiors to the vaults are in similar poor condition, with areas of stucco being lost completely in some places. The pointing to the brickwork where exposed, is loose or missing, and salts are appearing. Walls will be re-stuccoed, and all stucco removed to the vaults and repairs carried out. Part of the north basement area is glazed over.

The floor to the basement area is a mixture of uneven paving, and extensive repair, with a central drainage run to the north. Drainage appears not to be effective. The full length of the basement area will be repaired in stone, reusing any existing stone, with new to match. The drainage channel will be re-located outside of the glazed area.

All basement doors and windows will be overhauled to a more appropriate design, with vault doors to service areas to be louvred.

iii) Terrace to No 4

The structure of the terrace to No 4 and its retaining walls are now in very poor condition. The walls show signs of movement, and the surface to the terrace is very uneven and hazardous to walk on. The balustrade is in very poor condition, being cracked and broken. The gate is damaged. The terrace will be rebuilt and relaid with York stone. The gate and balustrade overhauled, and will be painted to match no 1.

The condition of the planting is much overgrown, and is suspected by the Structural Engineer to be a source of damage to the terrace. Previous attempts to halt the deteriorating condition of the retaining walls and terrace are losing their efficiency, and significant work is now necessary. Please refer to Appendix C Landscape Architects Report, and Appendix A Structural Engineers Report, for proposals to these areas.

b) **INTERIOR**

General

The interior has been extensively altered as previously described. The proposals carry out a full schedule of repair, and reinstate the 3 houses originally intended.

i) General Items

Chimney Pieces and Flues

The extent of alterations to the houses includes removal of all roof level chimneys and the amount of false work adjacent to fire places, makes tracing the flues very difficult. Chimney stacks will be reinstated to party walls, with pots to match no 1. It is hoped that flues can be traced and repaired or reinstated to allow fireplaces with gas fires to ground and first floors in principal rooms. Any "spare" flues will be used to take services to roof level eg ventilation or extracts. Proposals for new chimney pieces will be provided in due course.

Doors and Windows

Existing windows will be restored to their original fenetration pattern, and be reglazed in Crown Glass. This will be toughened, in accordance with Building Control requirements, to doors. With the exception of the door to the basement in house no 4 no original doors have been found, although modern flush panels are being removed from doors to see if any originals exist. New doors and architraves will be based upon the 'typical' details, which are based upon the original doors found during the restoration to house no 1. Window panelling is to be reinstated to principal rooms to ground, first and second floor level, but shutters cannot be reinstated because of the structure now incorporated in their place. Ironmongery will be of appropriate design, sample to be provided in due course.

Cornices and Ceiling Boxes

No original cornices exist. Proposals are based upon historic precedent in the area, bearing in mind the proportion of the rooms (some ceilings are very low). Typical details are provided.

Picture Rails and Dado Rails

These will generally be used in principal rooms and entrance halls to ground and first floors, and the typical details indicate the mouldings proposed.

Staircases

The original staircases to all houses are retained between ground and second floors. Some loss of detail has occurred but this will be reinstated. The steps and balustrade will be fully overhauled. New traditional 'back –stairs' between 2nd and 4th floors are proposed to house no 4. In houses no 2 and 3, the main stair is continued, with detail to match existing, to third floor and a 'back stair' runs between 3rd and 4th floor.

Plasterwork

All plaster found so far is recent, and it is assumed that all plasterwork will be new.

Radiator Casings

New casings to an appropriate design will be detailed in due course.

Services

These will be fully renewed, visible fixings eg sockets etc to be of suitable design, samples to be provided. See Appendix B, Mechanical and Electrical Engineers Report. The lift, which does not comply with current standards will be replaced.

Bathrooms

Waterproofing to bathroom floors, including beneath all shower trays will be by Elastomeric dpc on ply, to the specified thickness fixings and detail. Floor finishes are marble or ceramic.

Timber decay

Initial surveys have not, as yet, uncovered rotten timber, but some beetle has been located, which may be live. A full programme of investigation will be carried out when the works commence, and proposals made based on what is found.

ii) House No 4

The restoration of this is broadly based upon the layout found at No 1. Extensive remodelling works at no 1, thought to have been carried out in the 1860's and include an extension to the S E corner, mean that it does not provide an entirely accurate model for no 4, but the general principles are followed. This house provides one of the largest of the Regents Park terraces, with details appropriate to its scale and location.

At fourth floor, the reconstruction of the roof omits the arbitrary downstand beams which are a feature of the present construction, and the correct construction standards are met. The dormers retain the views across the park, but are inset to be less visually dominant. A traditional pitched rooflight mirrors that at No 1 and allows natural light into this previous attic space (most likely used for servant accommodation). A smaller flat rooflight over the stairs allows smoke ventilation, light and access. The layout of a larger studio to the west, and bathroom to the east, separated by the stair, follows the original basic layout. Detail at this level is appropriately simple.

The priority in considering the third floor has been to omit the various downstand beams, and to create two bedrooms and bathrooms. At the third floor balcony, new double doors detailed to match adjacent original windows are fixed into the existing opening.

The second floor becomes a master bedroom suite, with bathroom and changing areas. At second and third floor levels, detail is more elaborate, but reflects the low ceiling height at 3rd floor.

A typical "back " stair links second to fourth floor.

The ground and first floors provide principal reception rooms, based upon the original plan. Double doors link the rooms, with bi-fold doors at ground level, to match those found at no 1. A dumb waiter links the dining room to basement kitchen, and a cupboard balances its effect on the room. Detail reflects the status and scale of these rooms, without being over-ostentatious.

The original stair runs from ground to second floor, and is fully repaired, including reinstatement of the incised plaster skirting. The original stair string detail, viewed across the long window in the south elevations is reinstated, rather than the inelegant thickened string/balustrade which has been added. A new lift runs from basement to third floor, in the location of the old lift, but does not protrude at roof level. The window adjacent to the lift to the east elevation is re-opened, to allow natural light to the landing.

The basement becomes kitchen, service and staff accommodation, and the original stair between ground and basement is overhauled. The under-terrace area, and new retaining walls, are used as a family room. This is not obvious when viewed at ground level. The basement will benefit from the installation of dpm and dpcs. The rebuilding of the terrace facilitates a new landscaping scheme, which is fully described in Appendix C and associated drawings.

iii) Houses 2 and 3

These are handed and being considerably smaller than no 4, are designed in a slightly less elaborate manner, appropriate to their status.

The fourth floors provide bed/bathroom accommodation, the reconstruction of the roof allows for the removal of the downstand beams, but retaining the dormer, albeit inset.

Similarly, the third floors provide bed and bathroom which benefit from storage areas within the upper portico.

A "back" stair connects third and fourth floors.

The second floor becomes a master bedroom suite, with bedroom and bathroom. First and ground floors are restored as principal entertaining rooms, with a kitchen at ground floor level, which links via a dumb waiter to the first floor. Double doors link the principal rooms. The first floor west facing rooms benefit from access to the balcony within the portico.

The existing stairs between ground and second floors is extended, copying existing detail, to the third floor. New basement stairs are constructed.

The basement becomes staff/service accommodation, with new dpm/dpcs. Detailing throughout follows the hierarchy of the levels.

2-4 Cumberland Place, Regents Park, NW1 for Octagon Developments

1.00 INTRODUCTION

1.01 2-4 Cumberland Place is part of a row of four terraced houses constructed in 1826. The houses are grade 1 listed buildings comprising timber floors on brick or timber stud loadbearing construction with stuccoed walls to the external elevations. The main roof is flat, with a pitched, slate covered mansard including dormers and parapet gutters. There is a private garden to No. 4, which is paved, with planting beds and trees of varying age and condition.

1.02 The properties were altered around 1960, from their original layout to create flats. The layout of No. 2 remains in principle as originally intended to the ground, first and second floors, except for the inclusion of bathrooms. At third and fourth floors, individual flats to each floor span the full length of the three properties. At ground, first and second, the flats span across house No's 3 and 4, with a small flat, and storage and service areas to the basement.

1.03 The alterations over the years have largely removed and replaced much of the original structure members particularly at roof level. Currently steel beams support much of the principal timber construction, which at roof level has resulted in an unsatisfactory layout of downstands in a low storey height.

2.00 PROPOSED WORKS

2.01 The main objective of the proposed scheme is to convert the three properties back to their original design, as three individual houses. This will involve extensive repairs to the structure; including strengthening of timber floors, the removal and replacement of the long span steel beams to all three properties which currently span from party wall to party wall. In No 4 it is intended to take the floor loads back to the original load bearing wall line adjacent to the stone staircase. The supports to the current roof construction and their relationship with the fourth floor structural supports require that the roof should be replaced with new timber construction. This has enabled the design and detailing of a new support system, which allows the removal of all inappropriate downstands at both levels. Elsewhere all downstand members will be replaced with beams installed within the depth of the floor zone, thus providing a flush ceiling line. Repairs will include the removal of all bond timbers to all external and internal walls, and repairing or replacing any internal, external door and window lintels that are not to current standards.

2.02 In order to carry out the essential structural repairs, suitable temporary works will be provided to protect the historical fabric of the building.

2.03 The proposals will involve underpinning the north wall and partial underpinning of the west wall. This is to prevent further movement of the buildings, which are founded on highly shrinkable London clay, with a large number of trees in close proximity. Tree roots will extract moisture from the clay, which results in clay shrinkage and subsequent foundation movement. Cracking indicative of the problem is evident in the north wall. It is intended to take the underpinning down to a depth of 2.4 metres below existing basement level. The trees adjacent to the existing terrace have a future potential growth, which will in time be detrimental to the foundations beyond the area currently scheduled for underpinning. It is therefore important that the proposed landscaping includes for removal of the larger trees.

2.04 We understand that a new tree planting scheme is intended for the area between the terrace and the road and that a species of tree will be selected with limited potential for root growth that might affect nearby foundations.

2.05 A basement room is to be constructed under the existing private garden to No 4; this will be a concrete water resisting structure. A reinforced concrete contiguous piled wall will be constructed incorporating 150mm thick reinforced concrete wall around the external perimeter of the new basement room to act as a retaining wall and to cope with clay heave.

2.06 In support of the above proposals investigation and opening up works have been carried out, subject to the agreement of the Local Authority, and the results shown on the submitted drawings.

1.0 INTRODUCTION

Refurbishment of this property is planned, which will also involve an extension of the basement on the north side. There are some cracks in the walls on this north side. We have therefore carried out an investigation of the ground conditions.

This report presents the findings of our exploratory work and then discusses foundation aspects.

2.0 EXPLORATORY WORK

These properties lie on the eastern side of Regent's Park and are substantial 4 to 5-storey buildings with a basement over the whole area. Along the northern and the western side of the building, the external ground surface is also at basement level. The external walls are surfaced with rendering. This building was constructed in 1826 to 1828. The 1870 map shows the same outline as present.

The frontage (west elevation) abuts a lawn and within the north west corner there is a mature Plane tree. The northern side is paved and semi-mature trees, marked as Locust and Cherry on the survey plan are present along the boundary. These trees have since been re-identified as Ailanthus (Tree of Heaven), Ash and Cherry. This is also a small Weeping Almond tree on the west side of the house.

A series of 10 No Trial Pits were excavated at basement level by a Contractor to expose the foundations. Several of these pits were extended with a borehole constructed by a dynamic sampler. The virtually continuous core obtained was examined by our geotechnical engineer, who also measured the strength using a pocket penetrometer. Numerous soil samples were also taken for laboratory soil classification tests. Roots were seen in some of these pits and root samples were sent to be botanically identified.

Two boreholes were constructed within the paved area on the northern side. The soil samples were returned to our Laboratory and the shear strength, moisture content and plasticity measured.

The location of our boreholes is shown on the Ground Floor Plan (Fig 9) and the Trial Pits are marked on the Basement Plan (Fig 10).

3.0 GROUND CONDITIONS

The Geological Survey map shows that London Clay outcrops at the surface and extends to a depth of about 30m. Our two boreholes, constructed from ground level adjacent to the basement, encountered made up ground comprising clay fill, to depths of about 3m. Natural London Clay was then met which initially is of a brown colour, becomes grey-brown and then typically grey. All of the clays are of high plasticity with a measured Plasticity Index generally over 50%.

The Trial Pits, at basement level, also met London Clay. However in two of the pits (No 1 and No 3), a thin layer of made up ground was found between the underside of the footing and the natural undisturbed clay. The footings comprise corbelled brickwork resting directly on the soil. The depth and width of these footings varied as shown on the enclosed records, and are generally at a relatively shallow depth of the order of 500mm. Tree roots were noted in these pits within the clay at and below the foundations. In TP1, the root is from a Tree of Heaven species. A large root was found in TP3, located in an open basement area on the east side. Another large root was seen in TP8, positioned in the corridor nearby. These roots are of Plane species. There are presently no trees on this side of the property.

Along the northern side of the house, these roots are from Tree of Heaven species.

In TP 4, 5 and 7 alongside the west wall, Plane tree roots were found. There is a large and mature Plane tree some 19m to the west within the garden. Some desiccation is evident within the clay soils at and below the foundation level.

The clay soil beneath the floor in TP10 was markedly dried out, no doubt due to the two large hot water storage tanks within this Boiler Room.

Our laboratory tests reveal that the clay soils have been affected by tree roots. Thus the moisture content is depressed and the strength of the clay is spuriously high. These effects are clearly shown on the enclosed moisture content v depth profile Fig 1 and 1A, and the shear strength v depth graph Fig 2 derived from our detailed tests on the borehole samples.

The depth of desiccation is assessed as almost 5m below garden level. The magnitude of desiccation is severe, being highest in Borehole No 1 located close to the north-west corner of the house. Desiccation is also significant in the second borehole, although the moisture deficit is slightly less.

The magnitude of desiccation within the trial pits at basement level is much less, no doubt due to the lower elevation in relation to the base of the trees. The moisture deficits are illustrated on the enclosed graphs Fig 3 to 6.

4.0 RECOMMENDATIONS FOR REMEDIAL FOUNDATION WORK

The proposed refurbishment work will obviously include repairs to the cracks within the brickwork walls. These cracks are evident in the walls at basement level in the north west corner. Some minor cracks are also present in the basement walls along the western side. It was noted that the basement does not appear to have been re-decorated for many years, whereas the ground and upper floors are in reasonably good decorative condition. The foundations of these walls are at a relatively shallow depth by modern standards, although the immediately surrounding external ground (at basement level) is protected with concrete

surfacing. Nevertheless, tree roots are present which have passed under the footing and encroached inside the building. The influence of these roots, at each location has been assessed as varying from slight to moderate.

4.1 Existing North Walls

The western part of the foundations of the north wall have been subjected to some subsidence due to clay shrinkage caused by the roots of trees. Our main boreholes were necessarily set back from the wall and measured desiccation to depths of 4m to 5m below ground level, i.e. 1.25m to 2.25m below existing basement level. The TP1 against the wall shows desiccation extending down to about 1.9m depth below the basement floor. In TP2, further to the east, desiccation was measured to extend to about 1.3m depth. These tree roots will be severed by the construction of the proposed basement. There will then be a high risk of heave since the desiccated clay beneath the foundation will tend to slowly try to regain this moisture deficit of 5% to 6%.

We therefore recommend that this main wall is underpinned in order to remove this affected clay and thus transfer the structural load onto stable and unaffected soil. The new founding level should be 2.0m below existing basement level along the western half of this north wall, reducing from the east side of the Bow to a depth of about 1.2m to the eastern corner.

The faces of the underpin foundation must be lined with a compressible material in order to cater for possible lateral swelling forces. The ground floor slab in this part of the building, if in contact with the soil, should be replaced by a suspended floor incorporating a void or compressible material.

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4.2 West Wall

The northern end of this west wall will also need underpinning, to the same 2.0m depth as the north wall at the corner. A short section can then be carried out to a depth of say 1.25m, in order to avoid a marked change in founding levels.

We have carefully considered the situation along the remaining section of this wall to the south. Trial Pit 4 and 5 located on the inside of the wall, both revealed the presence of roots at and below the existing foundations. Our soil tests show that the clay may be slightly desiccated below the foundation. These roots have been botanically identified as Plane species, and there is a large Plane tree in the garden and to the west. Continuing growth of this tree would cause further moisture loss and clay shrinkage.

We therefore recommend that precautionary measures are taken to protect the existing foundations. The simplest method would be to sever the roots by installing a root barrier outside the property and alongside the wall foundation. This barrier could be located within the present external walkway at basement level, and should be extended down to a depth of about 1.5m.

Since the magnitude of moisture deficiency is not large at present, any future swelling of the clay which is underneath the existing footing is unlikely to be significant.

On the eastern side, TP3 encountered a Plane tree root and this foundation was resting on some made-up ground. In the nearby TP8, a large plane tree root was also discovered. In view of the lack of cracking and isolated nature of this situation, foundation work may not be necessary.

5.0 DISCUSSION OF NEW BASEMENT

The existing open basement area on the north side of the property is to be enlarged and then covered over at garden level. This new basement will be joined to the existing house basement but at a slightly lower elevation in order to provide the required headroom.

The design and construction of this new basement needs to consider the presence of desiccated clay which will be present around the outside of the new walls and also below the new floor. This desiccation extends to depths of up to 5m below ground level and thus below the new basement floor. The presence of the existing trees and their roots also requires to be taken into account. A Tree Survey and report has been prepared by Peter Bridgeman & Associates (June 2000).

We have considered the future behaviour of the clay soil and the alternative methods of construction of the basement in relation to geotechnical aspects.

5.1 Conventional Construction

New foundations must be placed at sufficient depth to rest on natural clay soil which has not been, and will not be affected by tree roots.

Ground level (garden) – at approx 36.0m OD

Along the north wall of the house:

West end - founding level to be @ 30.5m OD

East end - founding level to be @ 32.0m OD

Along the proposed new north wall:

West end - founding level to be @ 30.5m OD

East end - founding level to be @ 31.5m OD

Along the West flank wall – founding level to be @ 30.5m OD

Along the East flank wall – founding level to be @ 32.0m OD

At these proposed founding levels, unaffected stiff grey-brown or brown clay should be present, which is capable of supporting a high bearing pressure. For design purposes, we recommend a safe bearing pressure of 180 kN/m². Both sides of the section of footing in contact with desiccated clay must be protected from heave forces by installing a layer of compressible material between the clay and the concrete. The lower section of the footing is within unaffected clay and thus should not be affected by heave forces.

Allowing for a reasonable thickness of basement floor slab, it is evident that mass excavation to a depth of 3.5m below ground level will be required. Local excavations for strip footings would then extend a further up to 2.0m depth. Since the soils to be excavated are cohesive, a vertical cut for the mass excavation is feasible, but safety and stability need to be considered. There is insufficient room to grade the excavations to a batter and hence some form of temporary support will be required for safety purposes. It may be necessary to consider excavating and constructing the basement wall in short sections.

The long term design detailing for this below ground structure must incorporate anti-heave measures to accommodate horizontal swelling forces. A void former e.g. Clayboard, must be placed against the excavated clay face and abutting the basement wall. This facility should be provided on the outside of the three walls, see Fig 7.

5.2 Pile Construction

The adoption of a row of piles around the perimeter of the proposed basement would provide a method of achieving temporary and permanent support. These piles can be designed to resist potential vertical heave forces, by the installation of appropriate steel reinforcement. However, these perimeter piles would also be subjected to lateral forces resulting from the presently desiccated clay regaining moisture and thereby swelling. The magnitude of swelling forces can be considerable and develop over a period of time.

The current proposal is to install a permanent watering system for the trees. In this situation, abundant supply of water would be available to re-hydrate the clay and hence very large swelling movement and/or forces will be generated. If the outside of the pile remains in contact with the clay, we suggest that the pile steel reinforcement is designed to cater for a vertical adhesion of 65 kN/m² on the side of the pile in the desiccated zone. This value would be applied to one side of the pile over the 5m upper section of shaft. A load factor of 1.2 is suggested to allow for variations and unknown factors.

We estimate that the horizontal swelling pressure at basement floor level could be 200 to 250 kN/m² if the structure is very rigid. If some movements can take place then some of this pressure may dissipate. Even so, we consider it is unlikely that a normal sized piled wall could be made sufficiently rigid to resist this magnitude of force and also to not undergo any lateral movement.

The installation of a truly compressible layer or a void between the row of piles and the retained clay may be technically feasible. This work could involve constructing a second row of pile bores, or a deep slit trench, which would then be filled with foam or a collapsible material. The depth of this anti-heave measure will need to be about 5m along the northern wall and reducing in depth elsewhere. At the same time, these precautions should also be designed to avoid excessive settlement of the ground surface on the outside of the wall.

For the design of vertical load capacity of bored and/or augered piles, we recommend the following parameters which are deduced from our measured clay strengths.

Ultimate Shaft Adhesion

Ground Level to 5m - ignore in load capacity

At 5m, 0.45 x 100 kN/m², increasing at the rate of 12 kN/m² per metre depth

Ultimate End Bearing

At 12m depth 9 x 184 kN/m², increasing linearly to:

At 18m depth 9 x 255 kN/m²

A factor of safety of 2.5 should be acceptable for this site, since a detailed soils investigation has been carried out. Examples of load capacity are given on the enclosed sheet, but do not incorporate the allowance for uplift forces on the pile shaft.

The piles must include sufficient steel reinforcement to resist potential heave forces. We understand that the scheme envisages a watering system to ensure that the boundary trees do not get dry. This water may well permit the presently desiccated clay to rapidly regain moisture and thereby swell.

5.3 Hybrid Solution

In view of the problems associated with temporary support of an open excavation, and of counteracting swelling forces on the side of a piled wall, a hybrid solution has merit. This proposal involves:

a) installing piles at intervals along a line just outside of the proposed basement walls. These piles would be reinforced to resist bending when acting as cantilevers during the temporary construction period.

b) mass excavation of the clay soil down to the required formation level.

c) local excavation for the deeper wall foundations.

d) construction of a conventional reinforced concrete retaining wall, which incorporates a void former against the retained clay. Again, the void former should only be sufficient to reduce/mitigate soil swelling pressure, in order to avoid excessive ground settlement.

In this manner, the piles provide safe support for the excavation work, and the new structure is isolated from the effect of swelling forces, see Fig 8.

5.4 Basement Floor Slab

The new basement floor should be designed to be fully suspended and incorporate a void or a compressible material to accommodated potential heave from the zone of desiccated clay which will remain beneath this floor. The use of modern manufactured Clayboard should be acceptable since decomposition of this new material does not generate gas.

5.5 Effects of Sulphates

The clay soils contain some soluble sulphate and thus new foundation concrete should be designed for Class 2 conditions. Reference to BRE Digest 363:1996 should be made to ensure that a concrete mix resistant to attack is specified.

5.6 Ground Contamination

Selected samples of the soil, which is likely to be excavated, have been analysed to check for the presence of harmful contaminants. The only significant high concentration of chemical was the presence of Lead. In Borehole No 1 at a depth of 1.0m, the concentration of 660 mg/kg is above the threshold value for domestic gardens.

However, all of this soil is to be removed to create the basement. Some inevitable mixing of the spoil is likely and thus the clay fill maybe given an overall classification as Non Hazardous Industrial Waste. The underlying natural clay can be regarded as "Inert", for waste disposal purposes. However, the Waste Regulatory authorities should be consulted to determine the final classification.

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