Alexandra Road Estate
Heating Infrastructure

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Levitt Bernstein People.Design

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1.0 Introduction

1.0 Introduction

This report has been produced by Levitt Bernstein, on behalf of Butler and Young Associates, to put forward proposals for the Alexandra Road and Rowley Way heating infrastructure.

The quality and importance of the Alexandra Road Estate has been widely recognised both in England and abroad. It is a powerful icon of the optimism and idealism that underpinned post-war public sector architecture.

The Alexandra Road Estate is a residential estate of 520 dwellings in Camden, NW9. The majority of the estate was listed Grade II* in 1993, the remainder now falling within the Alexandra Road Conservation Area, designated in 1996. The Estate is considered among the most ambitious social housing schemes of this time, one of a series of low rise, high density schemes.

The Team

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Site History

Designed in 1968 and built between 1972 and 1978 by the London Borough of Camden Architects Department, Alexandra Road Estate is one of the most ambitious examples of the innovative new social housing emerging from the Department at this time, and of new housing in Britain. Its architect was Neave Brown.

Camden was formed in 1965 from the London Boroughs of Hampstead, Holborn and St Pancras and was one of the largest, wealthiest and most ambitious of the new London Boroughs. The architect's department under the leadership of Sidney Cook was, like all local authorities, under great pressure to build large amounts of housing. Camden developed low rise, high density schemes to meet this demand rather than the system built high rise schemes adopted by many other local authorities. The Estate was seen as an opportunity to improve a whole area by the inclusion of a public park and the provision of social buildings such as the community centre, shops and special needs school.

The street is the dominant element in the design and seen as a modern translation of the traditional London Street, where the sum of the whole exceeds the individual parts in creating a meaningful urban space. All dwellings are entered directly from the streets, which are freed of traffic by the parking garage provided at low level.

The estate can be seen as one of the most successful examples of the segregation of traffic and the pedestrian, and it remains a successful social space.

The linear stepped section was influenced by work developed by Leslie Martin - an idea also developed by Denys Lasdun at the University of East Anglia (1962-68) and by Patrick Hodgkinson at the Brunswick Centre in Bloomsbury (1967-72). At Alexandra Road the stepped section enabled all dwellings to have a sunny outdoor space and was further utilised to shield the estate from the noise of the railway line to the north. Alexandra Road Estate also represents a development of Neave Brown's earlier work for housing societies, undertaken while he was in private practice, at Winscombe Street and Fleet Road. Though on a much smaller scale, these too were essays in high-density developments of stacked dwellings and the considered sequencing of spaces moving from public and semi-public to private and semi-private.

The construction of the Estate is of white board marked concrete with areas of self-coloured render. The predominant materials are light in colour with contrasting joinery, inside and out. Concrete forms the large, complex section, and the areas of self-coloured render is a reference to the Regency terrace. At Alexandra Road the quality and detailing of the materials is high. The care devoted to the internal fittings was perhaps unique amongst local authority departments at this time.

The quality and importance of the estate has been widely recognised both in England and abroad. It is a powerful icon of the optimism and idealism that underpinned post-war public sector architecture. It continues to be regularly visited by architectural students and practitioners.

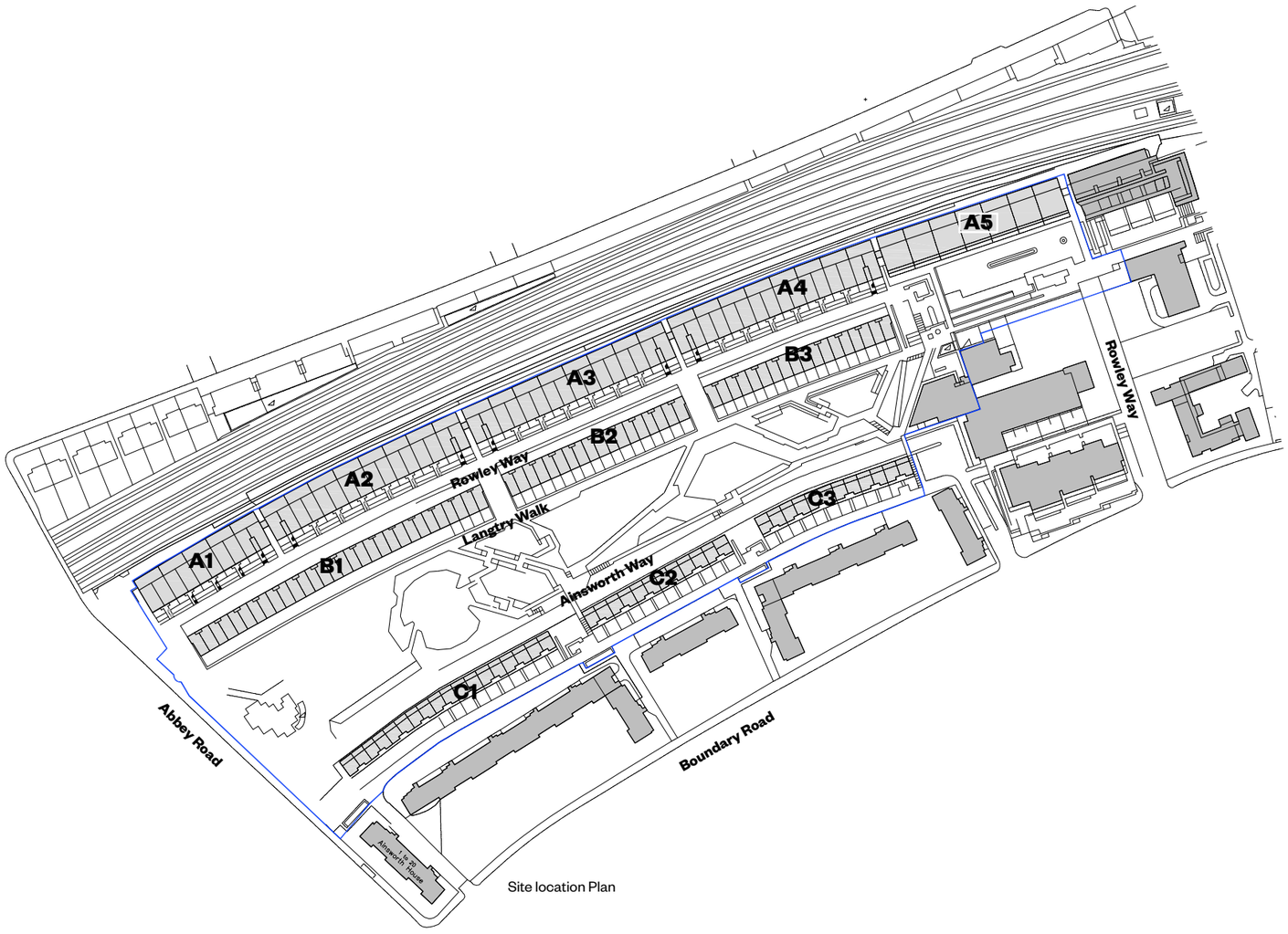
2.0 Location, context and existing site

The Alexandra Road Estate is bounded by, Loudoun Road on the east, on the south by Boundary Road, Abbey Road on the west, and by the West Coast Main Line to the north. Block A follows the geometry of the tracks and is organised in the form of a ziggurat, stepping down in height towards the central pedestrian street, Rowley Way. Block B, a lower, 4-storey block runs along the other side of a Rowley Way. Block C runs east-west along the southern edge of the site, sitting parallel to another public walkway.

Block B, the lower 4-storey building along Rowley Way contains maisonettes with shared access, terraces, and gardens over-looking the park at the rear. Maisonettes also occupy the top two levels of Block A opposite, with entrance from a walkway on the 7th floor that runs the entire length of the structure. Dwellings in the lower floor in this block are entered from open stairs serving two dwellings per floor. The flat roofs of the stepped elevation provide private outdoor areas for every home.

There are a number of different dwelling types, all sharing a similar approach and a number of key features. The high density of the estate led to tight interior layouts, mitigated by open plan elements. Sliding doors and glazed partitions allow flexible arrangements, with the potential for views and light to pass through each dwelling.

The proximate relationship of public and private is eased by porches, decks and planting. Finishes are restrained, white paint contrasting with stained timber and brown tiling. Internally, simple joinery shelves and cupboards are formed from plywood, while the stairs are a more developed piece of joinery work. In the kitchens, concrete worktops form a striking, almost sculptural element. These are tiled, as are the walls, forming a very deliberate composition.

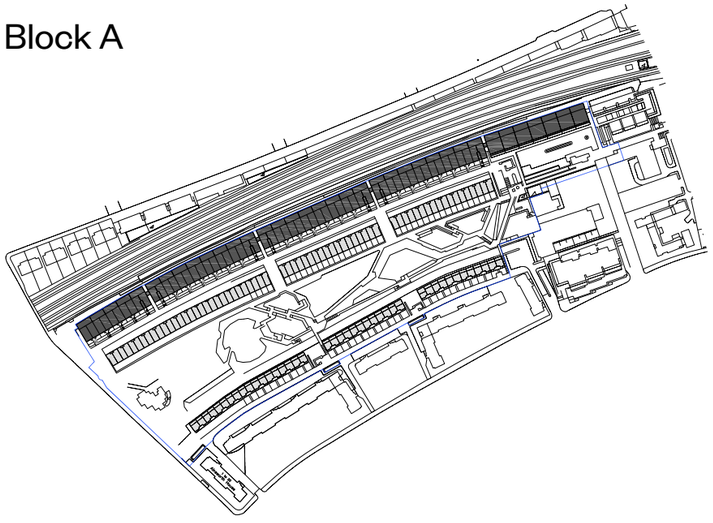


Site location Plan


Site photos

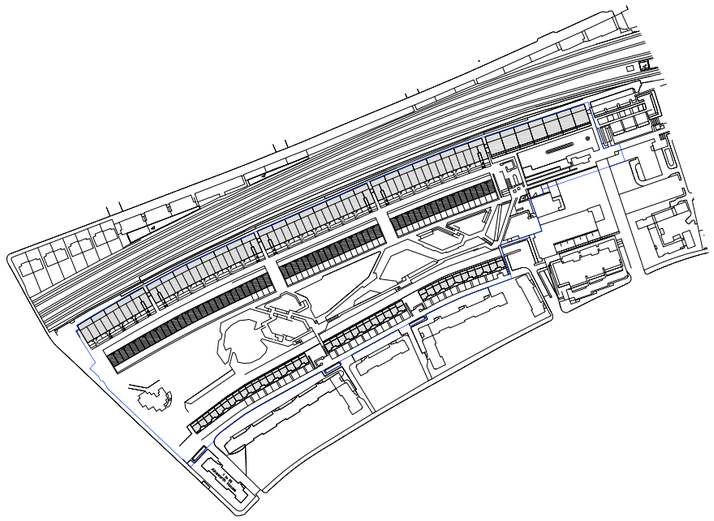
Existing site

Block A



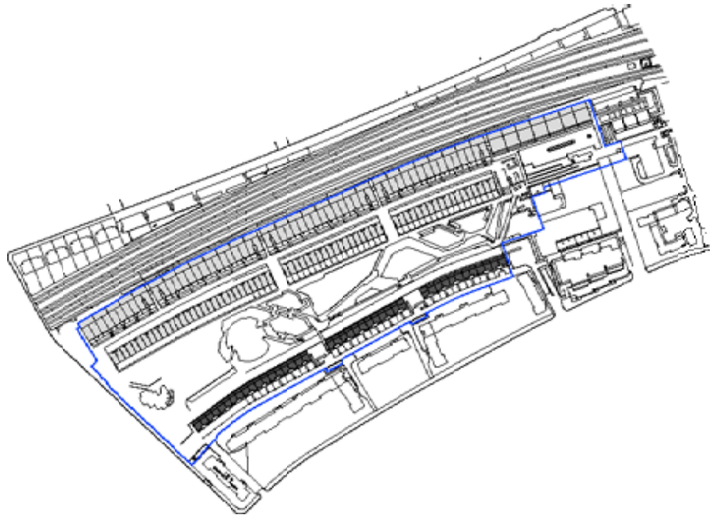
Block A is the tallest (7-storeys plus basement parking) and backs on to the railway to the north of the Estate, presenting a mostly solid elevation with relatively small double-glazed aluminium windows. The south facing aspect is more open and steps down to Rowley Way, which is paved with red brick and lined with trees. The curved sweep of Block A is punctuated by the recessed glazed lift enclosures. which restricts access for maintenance and repair. Pipework will run via a set of sub-plant rooms to each of the three blocks, where heat exchanger units in the kitchens will provide both heating and hot water to the flats.

Block B



Block B on the opposite side of Rowley Way is lower (4-storeys) but also stepped in a manner similar to Block A. Each flat or maisonette is provided with its own terrace/garden area with integral in-situ concrete planters. Both Blocks A and B sit on a concrete deck. A parking garage is placed beneath Block A and Rowley Way as a response to requirement of the original brief to provide sufficient parking spaces for residents of the new estate and the existing Ainsworth Estate. The south elevation of Block B is of plain render and is not stepped. A broad band of landscaped lawns, enclosed play areas and integral seating, stretches two-thirds of the length of the site from Abbey Road in the west to the Tenants' Hall in the east and separates Blocks B and C.

Block C



Block C is a lower, modified form of Block B, and consists of three-storeys. Parking is provided in basements reached by one of the estate roads entered from Boundary Road. The gardens of Block C face south but are rather overshadowed by the neighbouring blocks of the earlier Ainsworth Estate.

3.0 Project brief

The Alexandra Road Estate was built with an innovative heating system that utilised heating coils buried in the concrete frame. This is now nearing the end of its working life, so Butler and Young have been engaged to design replacement heating infrastructure. This application covers the following areas:

- Proposals to rationalise the existing boiler room
- New sub-plant rooms for Block A and Block B
- Associated pipework distribution routes
- Installation of Heat Interface Units (HIUs) to dwellings

The expectation is to 'double up' the systems, to avoid extensive 'down time' in the Estate's heating and hot water services. The proposals will therefore, temporarily, exist in parallel to the current system.

In light of the potential complexity of working with the listed Estate buildings, BYA and LB have met with Historic England and LB Camden's Conservation Officer. The draft proposals were well received, with comments as noted in the following sections.

The Estate is heated on a communal basis from a centralised boiler house, via heating pipes buried in the reinforced concrete walls. With the original heating system now nearing the end of its working life, a new system is required. This will replace not only the heating, but the hot water service to taps.

The system must be installed alongside the existing so that the transfer and inevitable temporary loss of service (which will affect hundreds of dwellings) is as fast as possible. This is particularly important as pipes serve multiple flats, so any fault affects more than one dwelling. New pipework will run on the outside of the building to aid maintenance. Currently routes are within individual dwellings, which restricts access for maintenance and repair.

Extract from Architect's Journal: 8th September 1976

4.0 Mechanical & Electrical Overview

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Re: LB of Camden, Alexandra Road Estate, Rowley Way, London NW8 0SF –
494-off Dwelling Conversion To Individual Heat Interface Units (HIU's) From Estate Central Heating Plant and Installation of Replacement Domestic Water Services

Butler & Young Associates are Engineering Consultants representing the technical interests of the London Borough of Camden (Housing Department), at pre-site install stage, as part of an integrated Project Design Team

It is the intention to install heat interface units (HIU's) to serve 494-off individual dwellings all year round with heating and domestic hot water services and a partial replacement domestic water service to Blocks A1-A5 (incl)

All works will be carried out in full accordance with Water Regulations, British Standards, Building Regulation requirements, industry standards and codes of practice

Background and History

The Alexandra Road Estate, Rowley Way (Blocks A1-A5, B1-B3 & C1-C3 incl.) and associated central heating system that provides heating and hot water services to all affected dwellings is approximately 40 years old bringing increased maintenance burdens, costs and the risk of a catastrophic system failure. Temperature and scheduled time-clock control of heating and hot water services is basic or missing altogether from the dwellings

Camden Council have taken the decision to replace the existing heating and hot water services to the estate, including all associated distribution infrastructure by installing replacement heating and hot water services in parallel with the existing system so that essential services can be maintained over the entire Project programme (estimated at 2 years)

The works will be phased with progressive de-commissioning of the existing system/s as the new systems get commissioned and come "on-line." As existing systems reduce in capacity associated plant performance (existing primary and secondary pump sets) shall be de-regulated and reduced in pump performance capacity until such time the plant becomes redundant.

The London Borough of Camden proposed heating refurbishment scheme is anticipated to bring the following benefits;

- Reduced maintenance burden both within central Plant Room and dwellings
- Reduction in carbon emissions thru' more energy efficient heat generation, distribution and temperature control
- Individual dwelling temperature control and metering of heating and hot water systems

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Works will include but not be limited to the following: -

- Partial removal and total replacement of the entire secondary LTHW heating system to the estate dwellings (Blocks A1-A5, B1-B3 & C1-C3 incl)
- Existing central plant will be retained
- Supply and installation of new above ground and exposed 2 x pipe distribution mains (combined heating F&R and primary HWS) and new mains cold water services to Blocks A1-A5 only

The Estate Blocks are designated as follows;

The 494-off dwellings comprise of a mix of flats and maisonettes

Block A1

- 8 No 3-Bed
- 10 No 2-Bed
- 32 No 1-Bed

Blocks A2, A3 & A4 (each)

- 12 No 3-Bed
- 16 No 2-Bed
- 52 No 1-Bed

Block A5

- Nil No 3-Bed
- 14 No 2-Bed
- 42 No 1-Bed

Block B1

- 30 No 3-Bed
- 30 No 2-Bed

Block B2 & B3 (each)

- 18 No 3-Bed
- 18 No 2-Bed

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Block C1

- 18 No 4-Bed

Block C2

- 12 No 4-Bed

Block C3

- 12 No 4-Bed

Constraints Associated With Re-use of Existing Piped Services & Associated Service Risers

- Limited or no access to existing pipe service risers both internal and external of dwellings will give rise to increased project costs due to additional intrusive works to expose pipework at all levels of each block and within individual dwellings to assess suitability of use and/or available riser space

- Risk of losing heating and DHWS services for extended periods during the replacement works will be greatly increased due to not paralleling up the existing heating and domestic systems but instead attempting to re-use the existing distribution pipework

- No installing Contractor will give an installation warranty on the re-use of existing heating pipework even if pressure tested locally due to the pipework age, internal condition and limited or no future maintenance access once the pipework is concealed again within risers for the next 30 years

- Existing steel heating pipework is sized for a 20 deg C dT and new pipework will be sized for a 30 C deg dT giving rise to an operating system compromise

- With the unlikely possibility that the existing heating pipework could be re-used this still does not resolve the issue of installing replacement MCWS pipework which also forms part of the refurbishment "scope of works"

- LBC would need to evaluate fire compartmentation and fire integrity performance issues between each dwelling and pipe service riser if "opened up" for inspection, installation and maintenance of piped services

Design Scheme Proposals

Accompanying Planning Submission Drawings;

(i) Rowley Way Proposed Replacement Heating & Domestic Water Services Pipe Routes To External Elevations of Blocks A1-A5 (1:100)
Drg No: 2777-RW-M-20 (Sheet 1of2)

(ii) Rowley Way Proposed Replacement Heating & Domestic Water Services Pipe Routes To External Elevations of Blocks A1-A5 (1:100)
Drg No: 2777-RW-M-020 (Sheet 2of2)

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(iii) Rowley Way Proposed Replacement Heating Services Pipe Routes To External Elevations of Blocks B1-B3 (1:100)
Drg No: 2777-RW-M-021 (Sheet 1of2)

(iv) Rowley Way Proposed Replacement Heating Services Pipe Routes To External Elevations of Blocks B1-B3 (1:100)
Drg No: 2777-RW-M-021 (Sheet 2of2)

(v) Rowley Way Proposed Replacement Heating Services Pipe Routes To External Elevations of Blocks C1-C3 (1:100)
Drg No: 2777-RW-M-022 (Sheet 1of2)

(vi) Rowley Way Proposed Replacement Heating Services Pipe Routes To External Elevations of Blocks C1-C3 (1:100)
Drg No: 2777-RW-M-022 (Sheet 2of2)

Estate Plant Room

Replacement heating and domestic water services pipework will exit the Estate Plant Room at high level and branch in three directions;

- North toward Sub-Plant Room A via underside of raised walkway within pipe concealment system before rising up the end flank wall of Block A4, horizontally distributing at Roof Level to Blocks A1-A5 incl and dropping on alternate structural spines before horizontally entering each dwelling via the external wall

- West toward Sub-plant Room B via Main Plant Room before dropping to Service Road Level and horizontally distributing on soffit level of B1-B3 Garages. Service distribution pipework will enter Lower Dwellings via existing plant service voids following similar pipe routes to existing. Upper Dwellings associated with Blocks B1-B3 will be served via heating pipework rising on each “flank wall” and distributing horizontally at Roof Level before dropping to dwellings below via existing roof service riser under cold water tank location

- South toward Blocks C1-C3 via Main Plant Room and Community Centre before dropping to Service Road Level and horizontally distributing on soffit of C1-C3 Garages. Service distribution pipework will enter Dwellings via existing vertical plant service risers located at Garage Level following similar pipe routes to existing. Due to the physical “gaps” between Blocks C1, C2 and C3 interconnecting heating pipework will need to exit the end flank wall of each block before dropping into the external ground and rising back up at the next block and entering within the existing Bin Area

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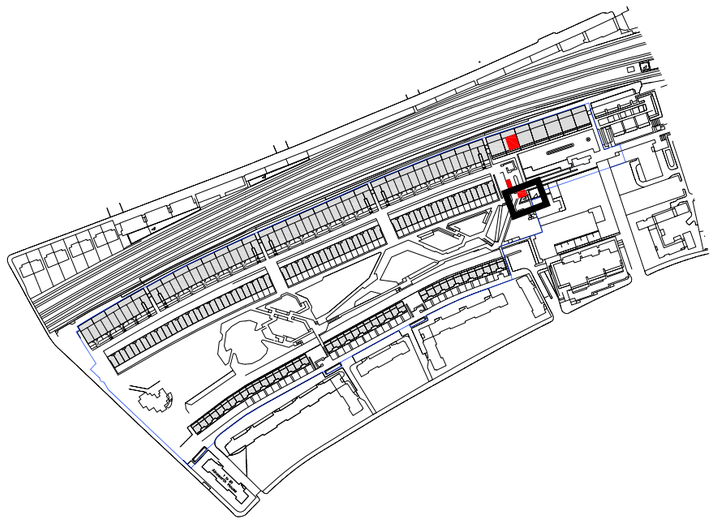
The mitigation for new services pipework to exit the existing Plant Room at high level is that the pipework will follow the same routes as existing pipework. All existing services are to remain “live” and available until such time that new services render them redundant or a “catastrophic failure” occurs

All new horizontal and vertical visible service pipework will be installed exposed with suitable insulation finish to suit existing adjacent building fabric. Where pipework is installed lower than 2500mm AFFL it shall be mechanically protected from accidental damage or the risk of vandalism within fully ventilated, purpose constructed and suitable finish pipe concealment casing (Pendock Casing or similar)

5.0 Proposed Design

Existing boiler room - Enclosure



Recent changes have required the installation of two plate heat exchangers, mounted outside the original plant area and concealed by temporary hoarding. Conservation advisors would both like to see this temporary hoarding line pushed back, and the hoarding itself replaced by a good quality permanent solution.

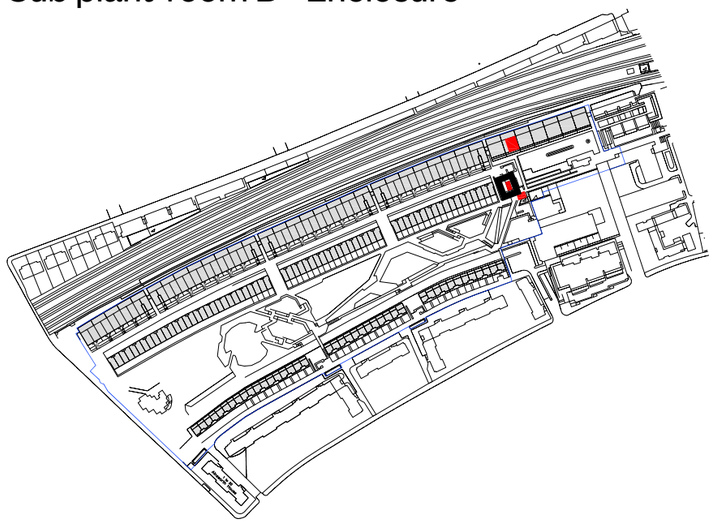
Permanent enclosure including louvres and access takes into account of existing structure (circular columns, circular stair opening in slab above, etc). Access to the plate heat exchangers and other equipment must also be maintained. It may be that the new wall is made of hinged or lift-off panels. This would allow the walls to be brought closer to the equipment, solving clash issues with the stairs.

It is proposed that any unnecessary or redundant hoarding will be removed. It was confirmed that the temporary timber ramp is not necessary (the existing steps remain beneath) and so the hoarding line around this is to be straightened out in line with the existing wall.

Boiler Room - Existing Photos

Visualisation of existing sub-plant room - Proposed

Sub plant-room B - Enclosure



A new plant room is proposed below existing external access stairs, adjacent to the boiler room and at the end of block B. Through consultation with Camden Conservation Officers, it was agreed that this area posed security issues, and so closing it off might be considered beneficial. Conservation advisors have accepted this visible change in principal, but requested that physical changes be minimal and reversible.

In order to provide sufficient height within the new enclosure of sub plant-room B, it will be necessary to remove the existing steps, also creating a new level base for the required plant

Through consultation with Camden Conservation officers, we were also advised that the cladding should be set back from the face of the stair balustrade, so that it is clearly a secondary material.

Sub plant-room B - existing photos

Visualisation of Sub Plant Room B (to right) - Existing

Visualisation of Sub Plant Room B (to right) - Proposed

Block B - Distribution of Services

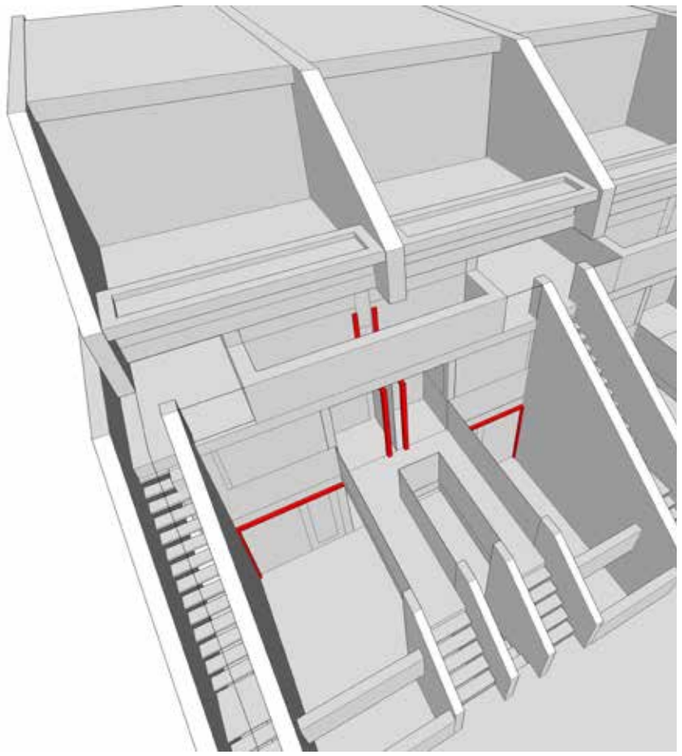
Design Options 1 & 2

A number of options were explored as part of the design proposals for serving the upper maisonettes of Block B. These are as follows:

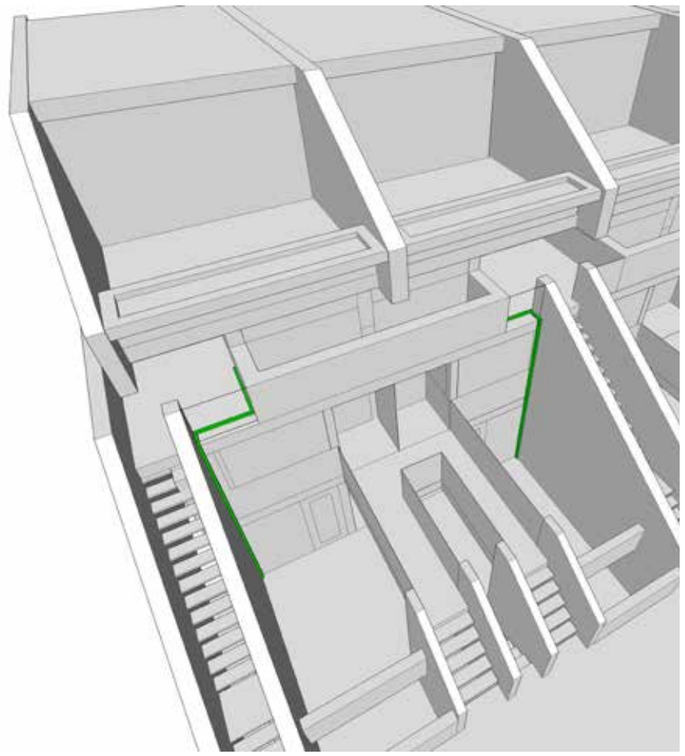
Option 1: (Shown in red) proposed to take services from the plant rooms beneath the stair, over the head of windows, up through the deck slab and over the soffiit, through the underside of the planters of the upper maisonettes, and enter the kitchen at worktop level.

Option 2: (Shown in green) proposed route went from the plant rooms beneath the stair, up to deck level of the upper maisonette, through the screen, along the base of the planter and into the kitchen at lower level.

Both options were considered too invasive to the existing fabric of the building, and would result in compromises in a number of locations; the windows to the lower maisonette would be partly blocked, multiple slab penetrations would be required, there would be a lot of disruption during construction and there would possibly be ongoing disruption during maintenance



Design Option 1



Design Option 2

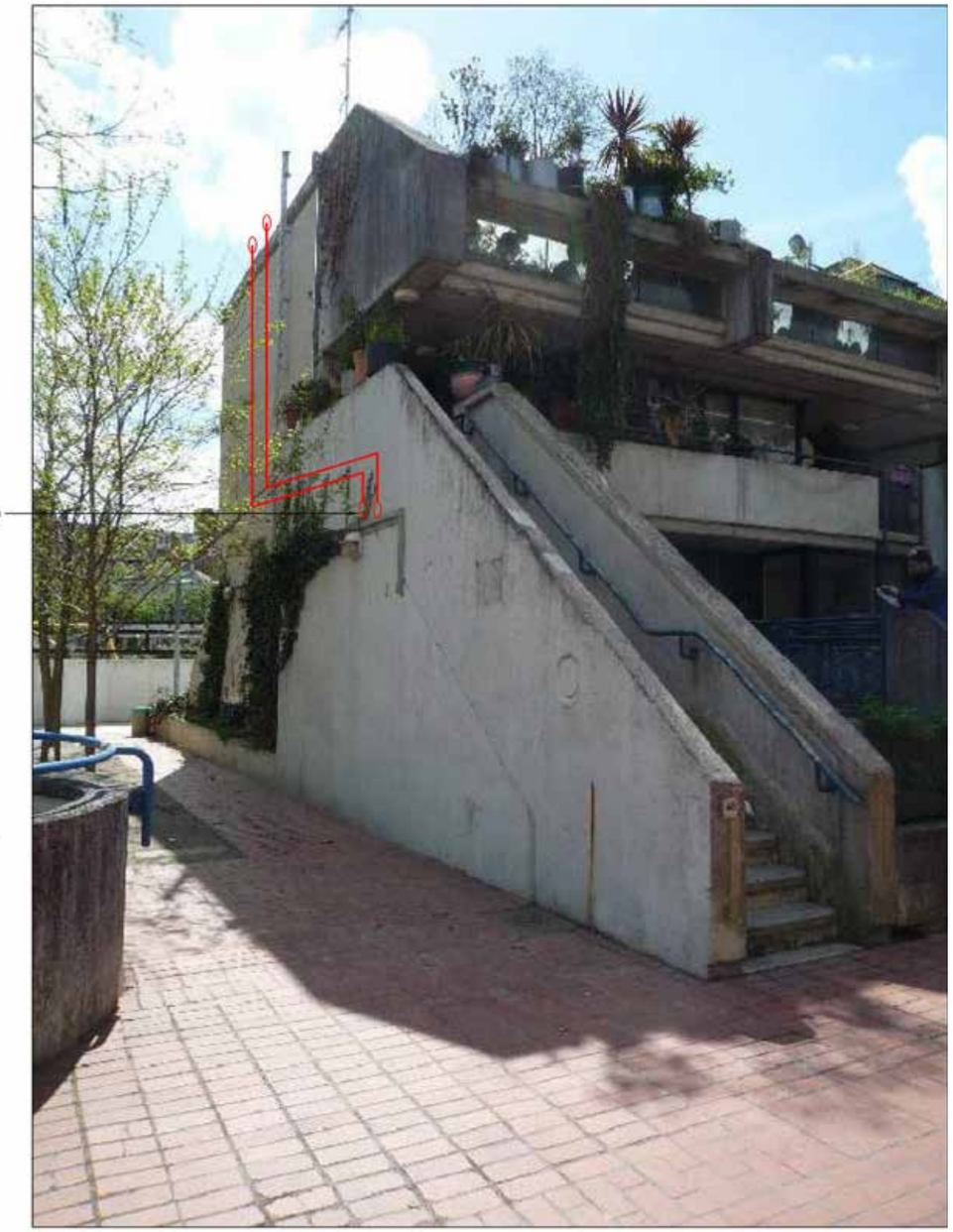
Existing photos - looking toward Block B along Rowley Way

Flank wall of Block B

Design Option 3 - Proposed Option

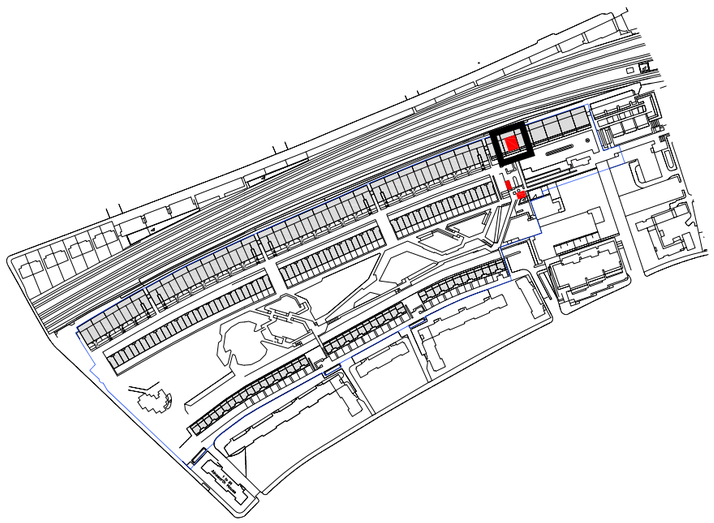
Option 3 proposes a more direct route into the upper maisonettes; taking the pipework along the flank wall at the end of each block B1-B3, and up on to the roof. Pipework can then run at roof level and drop directly down into the maisonette they are serving, without entering the dwelling below.

PROPOSED HTG PIPE DISTRIBUTION TO SERVE UPPER AND LOWER MAISONETTES OF BLOCKS B1, B2 & B3 (TYPICAL)



PROPOSED HTG PIPE DISTRIBUTION TO SERVE UPPER AND LOWER MAISONETTES OF BLOCKS B1, B2 & B3 (TYPICAL)

Sub plant-room A - Enclosure



The new enclosure for sub plant room A is currently used for informal parking. Earlier proposals located the enclosure adjacent to the roller shutter (shown to the right), but through consultation we found that it is used for access on a regular basis.

The proposed louvred enclosure goes up to the soffit of the slab above, creating a simple, rational screen to house the required equipment in this area.

Existing photos of proposed sub plant room A

Visualisation of Sub Plant Room A - Existing

Visualisation of Sub Plant Room A - Proposed

Block A - Distribution of Services

It is hoped that pipework can run to block A through the existing, galvanised boxing suspended from the walkway underside. If not, the boxing may have to be reconfigured. It was noted that at least some of the boxing is non-original. On the rear of block A, the pipes will turn and run briefly at high level before turning up onto the side of a fin and rising to roof level

Temporary isolators will be used so that the four existing horizontal pipes can be removed and the new pipework installed in their place. This is to avoid a strange gap above the new pipework. It was preferred that the horizontal pipework run slightly below soffit level, so that it can be straight (rather than stepping below beams

For all pipework on the rear of A block, conservation advisors preferred that the pipes be run individually (rather than grouped in boxing) and clad in weatherproof wrapping that is visually as similar to the concrete as possible. Pipes should as much as possible have similar diameters, concealed fixings, minimise number of controls etc, and be set out consistently and symmetrically.

Heating pipework will then drop in smaller pipes to stacks of individual dwellings, on the rear face of every other fin. Mains water will rise on the same fins. Horizontal pipework will then connect these routes to each flat, stepping out round the gas pipes already installed. The gas installation should not be altered unless this is unavoidable.

The penetrations through to the existing flats must be considered carefully, both in structural terms and also in coordination with the internal layouts.
It was accepted that the new vertical pipework must run on the rear of the fins, not the sides, as in some cases the fins do not project enough.
It was accepted that some protection may be needed to the pipework close to ground level (say first 2-3m)
Conservation advisors asked that installation be 'mocked up' on a single fin, for review.

Existing lighting has been installed at irregular spacings, and may be reconfigured so that it is more evenly spaced, to avoid clashes with pipework. Either the lights could be on the fins which do not have pipes, or the lights could be mounted on the low level boxing.

Visualisation of Block C pipework distribution - Proposed

PROPOSED HTG PIPE DISTRIBUTION TO SERVE BLOCKS C1 - C2 (TYPICAL)

PROPOSED HTG PIPE DISTRIBUTION TO SERVE BLOCKS C1 - C2 (TYPICAL)

PROPOSED HTG PIPE DISTRIBUTION TO SERVE BLOCKS C1 - C2 (TYPICAL)

Block C - Distribution of Services

Previous design options included the provision of a dedicated plant room to serve Block C within the timber enclosure in front of the Community Centre. Due to the loss of light to the area behind, the Design Team worked to design a space within the existing boiler room enclosure; this also resulted in fewer alternations to the external fabric of the estate.

The proposed services route is described in BYA's drawings (extracts below); coming through the existing opening at high level, continuing at high level to the underside of the bridge-link, and then dropping down into a vacant garage at lower ground level.

Because the services are running at high level for majority of the route, it is proposed that they are not boxed in, but clad locally to a colour of the same tone as the surrounding concrete. This would also assist in lessening the visual impact.

Heating Interface Units Overview

The estate contains a number of different dwelling types, all sharing a similar approach and a number of key features. The high density of the estate led to tight interior layouts, mitigated by open plan elements. Sliding doors and glazed partitions allow flexible arrangements, with the potential for views and light to pass through each dwelling.

The Estate is heated on a communal basis from a centralised boiler house, via heating pipes buried in the reinforced concrete walls. With the original heating system now nearing the end of its working life, a new system is required. This will replace not only the heating, but the hot water service to taps. The system must be installed alongside the existing so that the transfer and inevitable temporary loss of service (which will affect hundreds of dwellings) is as fast as possible. This is particularly important as pipes serve multiple flats, so any fault affects more than one dwelling.

Inside each dwelling will be a plate heat exchanger. The expectation is that these will be in the location of the existing hot water cylinders, meaning that the interior flat layout need not change.

The current heating and hot water services in A-Blocks, fed from a central boiler room, distribute across the roof to the flats through heating elements buried in the party walls. This internal heating system of the dwellings has neither provision for temperature control adjustment between dwellings, nor any provision for temperature control adjustment from room to room. The constant temperature inside each of the dwellings is generally considered to be too high for comfort most of the time. As the services are all buried within the party walls it means servicing and maintaining them is a difficult task and many services are in a state of disrepair and are failing. The need to replace them has become a matter of urgency to be able to continue providing heating and electrical services to the residents.

Demonstration Flats

In order to agree an approach to services installation, it has been discussed that we could demonstrate our approach by carrying out the installation to a void flat, thereby giving residents and Conservation Officers a real sense of what can be acheived.

6.0 Material Treatment

Plant Room Screen- Proposed Materials

Proposed materials

Perforated metal balustrades

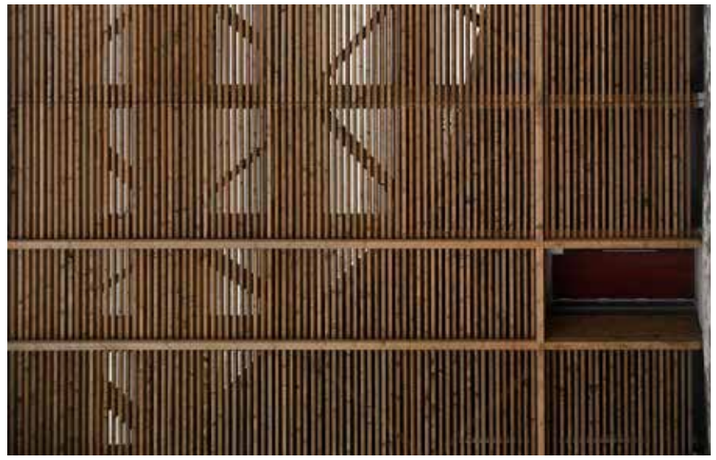
Timber Frames

A palette of carefully considered materials has been discussed with the planners and it was agreed that the colour of the new cladding should be neutral: Either a grey/galvanised/metallic finish (to tone in with the concrete structure), or black (to match existing timber window frames and cladding panels). It was accepted that the panels may be louvred or perforated, to allow ventilation. Glass planks or blocks, to match the existing stair enclosures, were also discussed but rejected as they offer no ventilation to the enclosures

Thought has been given to the extent of removal of existing services pipework (including pipe casing containment, insulation etc) that is exposed and visible to the residents and visitors; what will be left behind when services are removed and what is final services appearance when replaced by new heating distribution.

Precedents

Ventilated Louvre Panels



Hit and miss timber cladding

7.0 Supporting Information

This Design and Access Statement is to be read in conjunction with the following drawings:

BYA Drawings:

2777-RW-M-020-Sht 1of2-Planning (29-05-18)	Rev/
2777-RW-M-020-Sht 2of2-Planning (29-05-18)	Rev/
2777-RW-M-021-Sht 1of2-Planning (29-05-18)	Rev/
2777-RW-M-021-Sht 2of2-Planning (29-05-18)	Rev/
2777-RW-M-022-Sht 1of2-Planning (29-05-18)	Rev/
2777-RW-M-022-Sht 2of2-Planning (29-05-18)	Rev/
2777-RW-M-100 PLANNING	Rev/
2777-RW-SCH-010 PLANNING	Rev/

Levitt Bernstein Drawings

3467_SY_100	Rev P2
3467_SY_120	Rev P2
3467_L_120	Rev P2
3467_A_600	Rev P2
3467_A_601	Rev P2
3467_A_605	Rev P3
3467_A_610	Rev P4
3467_A_611	Rev P3

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