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DESIGN AND ACCESS STATEMENT

for

PROPOSED ALTERATIONS TO FORM AN EXTENSION TO

PALL MALL MEDICAL CENTRE

at

UNIT 1, PALL MALL COURT, KING STREET, MANCHESTER M2 4PD

08 April 2013

Revision B (08/04/2013) - Text added in item 4.3
Revision A (28/03/2013) - Noise assessment from RandTech Consulting added in Appendix C

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1.0 INTRODUCTION

This Design and Access Statement (DAS) accompanies an application for the change of use, listed building consent and conservation area consent of the existing vacant three floor levels in Unit 1 in the King Street Block at Pall Mall Court, King Street, Manchester M2 4PD into a Medical Centre (use class D1). The applicant Pall Mall Medical already occupy the Lower Ground Floor area of the Tower Block at this site. The statement has been written to meet the requirements of Article 4C of the Town and Country Planning (General Development Procedure) Order 1995 (as amended).

Unit 1 of the 5 storey King Street Block to which this planning application relates is located at the Basement, Lower Ground and Ground levels and these floors have been vacant for 10 years, the last tenant being the Abn Amro Bank.

At the onset of design work for this project, a consultation meeting was held on site with Manchester City Council's planning and conservation officers and it was clear that all parties were very keen to find a suitable tenant. The proposal for conversion of the premises into a medical centre for Pall Mall Medical was welcomed.

The design proposals include the following works:

- Change of use of the existing Basement, Lower Ground and Ground floor areas from use class B1 to D1
- Demolition and clearance of virtually all internal non-load bearing partitions, open staircase, ceilings, bank vault structure, the bullion hoist and redundant service pipes, cables & ducts.
- Addition of a new floor structure across the large void present in Ground floor structure
- internal fit out works involving the erection of new metal framed partitions, staircase, platform lift and suspended ceilings including structural alterations and a mechanical heating and ventilation system
- installation of new air-con condensers over an extended area of the existing screened roof mounted air handling plant over the 5th floor
- Installation of internally illuminated signs over the existing external wall of staircase 1 facing King Street and over replacement lower opaque glass panels in two bay windows facing Pall Mall Court

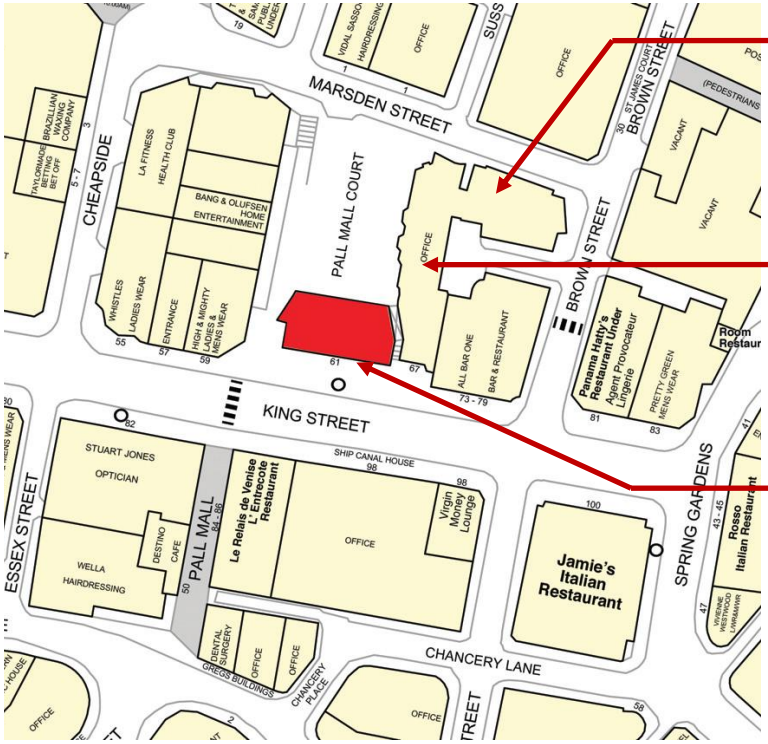
This Design and Access Statement should be read in conjunction with the Heritage Statement & Impact Assessment (prepared by K M Heritage) and all other architectural and engineering drawings and documents submitted with this planning application.

2.0 THE SITE

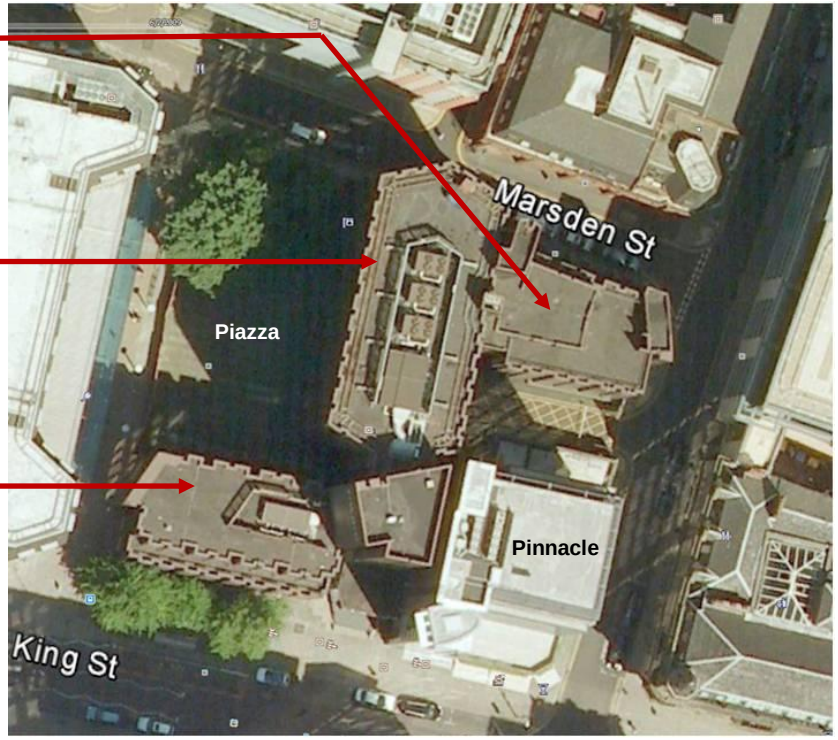
Pall Mall Court (Grade II listed) is a grouping of three buildings located in the Upper King Street Conservation Area between King Street and Marsden Street in the heart of the established business core of Manchester. The building complex comprises of three interlinked multi storey blocks laid out in a reversed figure of "2" pattern that wrap round the neighbouring "Pinnacle" building. The grouping frames a raised open public piazza, overlooked by the adjacent former Nat West Bank building to the west (now a retail & office complex) and screened by a large elevated brick planting podium to the north along Marsden Street, above the vehicular entrance to an underground car park at basement level.

The middle "Tower Block" is the tallest with 12 storeys and the two other ancillary blocks, namely the "Marsden Street Block" to the north and "King Street Block" to the south, are both 5 storeys in height. The presently vacant and disused Basement, Lower Ground Floor and Ground floor areas of the King Street Block is the subject area of this planning and listed building consent application.

Given its listed status, a more detailed description of the building, complete with photographic illustrations, follows in Section 2 of this statement.



Site location



An aerial view of Pall Mall Court

2.1 The building in context

Built in 1969, the building was designed by the architect Harry Teggin of Brett and Pollen in association with AH Brotherton & Partners and engineers Cyril Blumfield & Partners and it won the RIBA Regional Award for 1970, and was Grade II listed by English Heritage in December 2000. In a review in October 1970, the Architects' Journal said *"the building exudes quality and a sensitive mind",* while the RIBA committee admired the way it knits into the existing urban environment and its creation of a new public open space. A copy of the AJ review is contained in Appendix A.The building is a fine example of post-modern architecture in Manchester and is worthy of its listed status.

The plan form, geometry and massing of the reinforced concrete framed building is irregular and complex. Its two 5-storey ancillary wings (i.e. the Marsden St and King St Blocks) spring in opposite directions from each end of its central dominant 12 storey Tower block. All three blocks are parallel sided but their ends are strongly modelled with splayed solid opaque walls finished with bronze ceramic mosaic tiling, the tallest element being the distinct wedge shaped lift/stairs tower that links the King Street and Tower Blocks and offers a prominent frontage to the stepped approach to the King Street entrance.

The three blocks frame an open piazza which is raised to permit an underground car park, with its vehicular entrance off Marsden Street covered by a large brick built planter podium.

The glazed facades of the three blocks above ground floor level are broken up with bronze aluminium framed projecting bay windows, all separated by narrow recesses that contain vertical sliding sash windows which provide natural ventilation at low level. The repetitive pattern of the bays allow for internal subdivisions at regular intervals but they do not align with internal concrete columns. The assemblies are all single glazed with solar bronze glass, lined on the inside with a propriety clear blast resistant safety glazing film. In many areas, this safety film has peeled away and deteriorated due to the effects of ultra violet action, requiring full replacement. The glazing is highly reflective and mirrors the facades of the surrounding classical and Victorian gothic buildings. The exposed concrete edges of the floor slabs below the window assemblies are clad with bronze ceramic mosaic tiles.

In sharp contrast to the glazed facades at upper floor levels, all external plinth walls below ground floor level are in the main solid and built with Staffordshire blue engineering brickwork. These walls contain randomly spaced deep recessed vertical slot windows and a continuous narrow band of clearstory windows at high level. The undulating edges of the upper floors over these walls cantilever out towards the open framed piazza, providing covered pathways and the headroom under these cantilevered elements is very low.

The King Street and Tower blocks are linked via the central lift core but the principle staircase within only rises from the ground level and offers cover to a narrow underpass at Lower Ground floor level which was originally designed to provide a pedestrian link to the raised piazza via a stepped approach from King Street. This underpass is no longer accessible from King Street as it is blocked by the addition of an open platform lift for use by disabled visitors to the building's elevated central core area at the Ground Floor level. Accessed via secure metal gates from the piazza, this underpass is currently used for fire escape and deliveries to the building and offers a link between the lower ground levels in the King Street and Tower blocks, the latter being used by the applicant Pall Mall Medical.

The main entrance to the subject area of this planning application in the King Street block is sited at the Lower Ground Floor level in the side elevation which is overshadowed by a bronze ceramic tiled staircase tower (Staircase 1), facing the pedestrianised access to the open piazza at Pall Mall Court (see photo 3)



Photo 1
A view of the building from King Street with the King Street block in the Foreground, overshadowed by the imposing core lift tower in the background



Photo 2
A view of the main entrance to the King Street block,



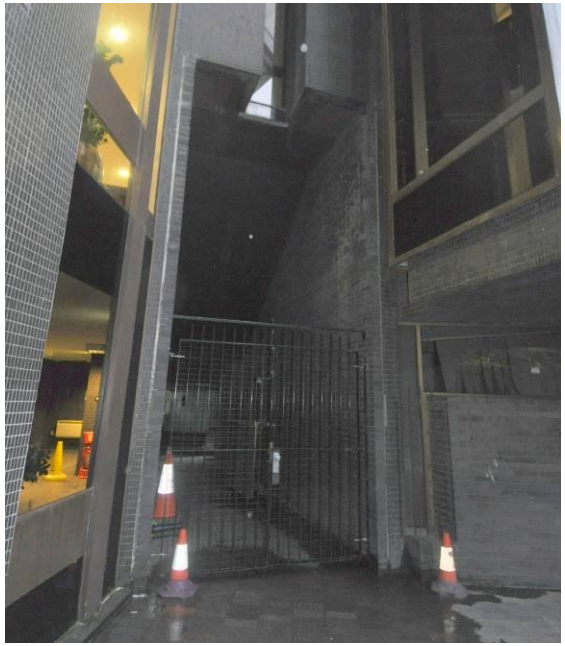
Photo 3
The existing entrance at the Lower Ground Floor of the King Street block facing a pedestrianised area that leads to the raised open public piazza at the rear.



Photo 4
A view of the raised piazza, showing the rear of the King Street block to the right



Photo 5
The entrance to the existing Pall Mall Medical centre, located at the Lower Ground floor of the Tower block and accessed off the piazza



◄Photo 6
The gated narrow underpass between the Tower and King Street blocks

Photo 7 ►
The disabled persons platform lift that now blocks the original stepped underpass between King St and the open piazza



2.2 The interior

(a) The Ground floor area

In sharp contrast to the building's exterior, the architectural quality of the interior of the Basement, Lower Ground and Ground floors in the King Street block is a disappointment. It is known from a review of the building by the Architects' Journal in 1970 (contained in Appendix A) that the lower ground and basement floors were originally intended for storage use only and hence the low headroom in these areas. However, late design changes were made by the introduction of a large void in the ground floor structure, thereby connecting the ground floor area to the lower ground floor, thereby forming a double height open banking hall environment demanded by the tenant at the time (assumed to be the Northern Commercial Trust). The consequences of this feature must have led to the addition of bulky concrete beams at high level above the ground floor, with columns suspended off these beams in a downward direction to support the cantilevered edge of the open ground floor structure.

The premises was last occupied over 10 years ago by the ABN Amro Bank and since then, the interior has remained a bare shell, stripped of all its ceilings, fixtures, fittings and finishes. The whole internal environment is currently in desperate need of refurbishment.

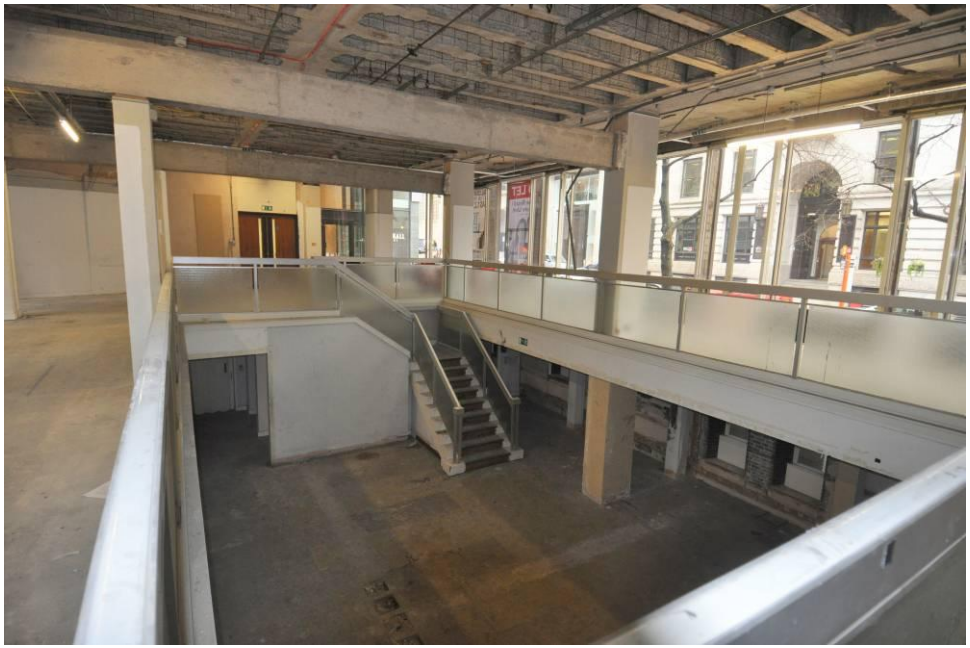


Photo 8
The large void in the ground floor structure. This feature was not part of the original design and the architectural fit-out work (assumed to have been undertaken by the first tenant, the Northern Commercial Trust) is very poor.



Photo 9
The inside faces of the mullions and transoms of the undulating profile of the bronze aluminium glazed curtain wall with projecting bay windows has a painted finish and is need of refurbishment.

(b) The Lower Ground floor area

The interior of the lower ground floor has no architectural merit as this floor was originally designed for storage use only. The available headroom to the structural soffit is only 2.4m which is too low to accommodate a modern day office environment. The areas of the floor not open to the void above are in the main sub-divided with cellular accommodation, fitted with plasterboard fixed to timber battens, leaving a ceiling void of approx. 100mm between battens. Much of this fabric has been stripped and the remainder is in very poor condition.

A bullion lift is present by the side of the open concrete stairs and serves the Basement level. It is assumed that the lift was installed by the first tenant as part of their fit-out works as this feature is not present in the original design drawing(s) retrieved from building's archives, a copies of which are contained in Appendix B of this statement. The use of such lifts is commonplace in the banking sector and a visual inspection indicates that this lift has no architectural merit and is of low historic significance.



Photo 10
The sliding folding door to the existing bullion lift at Lower Ground floor level, close to the open stairs leading to the basement level.



Photo 11
A general impression of the interior of the Lower Ground floor area, showing the inside of slot windows and clearstory windows in the blue brick plinth wall facing King Street

(c) The Basement floor area

Much like the interior of the Lower Ground floor, the Basement floor area has very low headroom and is sub-divided with cellular accommodation comprising of store rooms, a motor room for the bullion lift, sanitary facilities and a large bank vault built in reinforced concrete which is fitted with a Chubb vault door. Here again, it is assumed that the installation of the bank vault formed part of the fit-out works for the Northern Commercial Trust as this feature is not present in the original plans for the building which area contained in Appendix B of this statement.

Several water service pipes and galvanised steel ventilation ducts are suspended off the Lower Ground floor structure, above the central corridor which connects to the central lift lobby in the Tower block and basement car park (under the piazza) at one end and a fire escape stair (Staircase 1) at the other. Many of the service pipes and ducts are assumed to be redundant.



Photo 12

The sliding folding door to the existing bullion lift at Basement floor level



Photo 13

The Chubb steel door to the reinforced concrete bank vault at Basement floor level, built up to the underside of the floor structure over

3.0 THE DESIGN PROPOSALS

3.1 The applicant's brief

Pall Mall Medical is a quick-access private medical clinic which provides healthcare services to the city dwellers and clientele based in the city of Manchester. Established in 2009, Pall Mall Medical currently occupies the Lower Ground Floor area of the Tower Block and growing demands on the practice has led to a proposal to convert the existing Basement, Ground and Lower Ground floor areas of the King Street block to form an "extension" to the existing practice. The practice has already signed a tenancy agreement with the landlord, subject to obtaining planning permission and listed building consent for the proposed works.

The brief from Pall Mall Medical demands cellular accommodation in the main, which is commonplace for medical services, and is structured to meet the growing demands for medical consultations and diagnostic equipment, none of which can be accommodated within the restricted floor space at the current premises.

The applicant's brief for the development is summarised below;

(a) A new entrance along King Street (by utilising the existing), leading into an open patient waiting area, serviced by an open reception desk and toilets (including a unisex Disabled WC + baby change facility)
(b) Staircase and lift for disabled persons, connecting all three floor levels
(c) Ancillary waiting areas, reception desk and Administration room at all three floor levels. Where possible, all waiting areas are to be located close to existing windows.
(d) Staff Room, Kitchenette and Staff WC at all three floor levels
(e) A number of Consulting/Examination Rooms (min. 13). Where possible, these are to be located close to existing windows fitted with privacy blinds.
(f) 2 Treatment Rooms for minor surgeries
(g) Dirty & Clean Utility rooms
(h) Cleaners Sore
(i) A diagnostics suite of rooms comprising of the following;
- A secondary Reception/Waiting area
- Administration Room with Kitchenette & Staff WC
- A digital X-ray room + Control Room
- A Mammography Room with changing cubicle
- 2no Ultrasound rooms
- Audiology Room
- Unisex Disabled WC
- 2no dedicated Consulting/Examination Rooms

(j) Plant Room
(k) General Storage facilities

The applicant has a strong desire to locate the majority of Consulting/Examination Rooms at the ground floor level which has ample headroom and offers views out to King Street and the open piazza.

3.2 Proposed site clearance works

Pall Mall Court is a Grade II listed building (Listing date 04/12/200 - Building ID 486899) and the listing text includes the following paragraph;

Commercial offices. 1966-8 by Brett and Pollen, partner in charge Harry Teggin, in association with A H Brotherton and Partners, engineers Cyril Blumfield and Partners. Reinforced concrete frame with bronze ceramic mosaic to staircase and lift towers, blue brickwork and bronze painted aluminium curtain walling with bronze glass. `Z'-shaped plan, with five-storey block to King Street and twelve-storey range to rear, wrapped round the adjoining Norwich Union building of no merit, and with raised paved public piazza, Pall Mall Court, set with brick planter podium, over basement garage. The facade of the building was deliberately broken up with glazed bays separated by narrow recesses containing opening windows and allowing natural ventilation in sheltered conditions. The bays are of a repetitive pattern on a 6ft- 2ft-6ft-4ft grid so that they are paired. Tall projecting lift tower to right of entrance, with later revolving doors, on King Street. Interiors were open plan from the first, and have not been inspected.

The last sentence in the above paragraph clearly states that the building's interiors were not been inspected at the time of listing. The description of the building's interior in Section 2.2 of this statement and the accompanying Heritage Impact Statement will hopefully convey to the reader that the architectural quality and "heritage value" of the interior is poor and of minor significance. The following general alteration work to the interior is proposed and reasoning behind such work is provided below and an assessment of their *significance* is contained in the Heritage Impact Statement which accompanies this planning application.

(a) The proposed removal of the existing open concrete staircase
This staircase could not be retained in its present form as its layout is best suited for an open plan environment.

(b) The proposed removal of the guard rails around the open void at ground level to make way for the proposed infill of the existing void
It has been verified from a study of the architect's archived drawings that this feature was a later addition to the building and is therefore deemed to be not significant. The retention of the void in the ground floor was found to be wholly unacceptable as the loss of unusable floor space at the lower ground floor would result in a big shortfall in the applicant's development brief. Furthermore, the demands of floor space in this brief are such that the development would become unviable if the potential gain in floor space by in-filling the void area was lost. Clearly, the demands for cellular accommodation for the medical centre are not compatible with the spatial characteristics of the current double height banking hall.

(c) The proposed removal of the bank vault structure at basement level
It has been verified from a study of the architect's archived drawings that the bank vault was a later addition to the building and is deemed to be of low significance. Consultations with the planning officer at MCC have resulted in an acceptance of this clearance work but a request was made to salvage and display the vault's steel door assembly prior to undertaking the required demolition work. This request has been addressed by the architect and the vault door is proposed to be re-sited against an internal wall within the proposed waiting area at basement level (see Drawing No 12.23/PL/11 - Proposed Basement Plan)

(d) The proposed removal of the Bullion lift (including its motor room at Basement level)
It has been verified from a study of the architect's archived drawings that this feature was a later addition to the building and is deemed to be of low significance. The feature was a functional requirement of the former bank premises and is of no use to the proposed medical centre. Various sketch proposals to retain this feature were considered at the onset of design work but on each occasion, there was an unacceptable shortfall in the demand for rooms needed to form a fully functional medical diagnostic suite at this basement floor level. An example of this scenario is evident in the current scheme where, the retention of the lift and its motor room would result in the loss of Consulting/Examination Room which makes the scheme unviable as the applicant's minimum requirement for the diagnostic suite is to accommodate two Consulting/Examination rooms (each 14 sq m in size) in close proximity of the Digital X-Ray room, Mammography room and the two Ultrasound rooms. Redesign work cannot resolve these issues as the loss of floor space is too great.

3.3 The design proposals

The design proposals offer a "minimal impact" scheme to convert the affected areas of the building into a modern day medical practice, without compromising the distinct architectural quality of this prominent Grade II listed building. The alterations and development proposals are largely confined to the interior and these are described below in sufficient detail under separate headings.

3.3.1 Proposed infill of existing floor voids

(a) Void in the lower ground floor

The removal of the existing Bullion hoist that serves the Basement and Lower Ground floor areas and the resultant void in the latter is proposed to be infilled with a 150mm thick insitu reinforced concrete slab which is to be tied into the edges of the existing ribbed floor slab.

(b) Void in the ground floor

For reasons outlined earlier, the existing rectangular shaped void in the ground floor structure is proposed to be in-filled with a new floor structure that will comprise of a medium density chipboard deck fixed to timber joists supported by steel beams and small square section steel columns, all of which will form a new lightweight independently supported structure that bears onto the basement concrete floor slab via steel spreader plates. For details, refer to the appointed structural engineer's "Drawing No F4890-GA1-A - Stair + Lift Core and Floor across void in G Floor" submitted with the planning application.

During a consultation, the planning officer at Manchester City Council had asked that the outline of this rectangular void be delineated. This requirement has been acknowledged and the footprint of the void area is proposed to be identified by a row of 100mm wide black polished porcelain floor tiles, contained within the proposed surrounding cream coloured non-slip porcelain tiled floor finish.

3.3.2 Floor areas

The table below provides a summary of the existing and proposed gross internal floor areas at the three lowest floor levels of the King Street Block (all inclusive of column/wall thickness, stairwells, lifts and the bank vault area but excluding bay window recesses);

	Existing (sq m)	Proposed (sq m)	Gain / Loss (sq m)	Notes
Basement Floor level	190	184	-6	An adjustment of the interface between tenant and landlord controlled area to allow independent access to the Comms. Room has resulted in a loss of 6 sq m
Lower Ground Floor level	221	221	0	
Ground Floor level	222	280	58	The proposed flooring of the void in the ground floor area has resulted in a gain of 58 sq m
Totals	633	685	52	

3.3.3 Access and internal circulation

The principle means of access to the existing medical practice in the Tower Block is via the public piazza in Pall Mall Court and this facility is not directly connected to the three floors available to let in the King Street block, although a "link" between the two is available via the landlord controlled covered underpass and lift lobby in the Tower Block at the Lower Ground Floor level. In contrast, the existing entrance to the King Street block is more prominent and without doubt, offers a better more visible presence of the medical centre to the street scene and public at large. Early in the design stage, it was agreed in principle with the applicant that the latter King Street entrance was to be defined as the new "principle entrance" and the existing entrance was to remain in its present format, thereby offering access from both the piazza and King Street. The King Street entrance has a level threshold and is suitable for use by disabled persons.

The King Street block is wide but narrow in depth. Given the cellular nature of the accommodation required in the applicant's brief, its central axis has been used to define the horizontal circulation route through the building, connecting the two existing common staircases in the building at each end at all floor levels. The common staircase 1 located at the end of the King Street block serves all five storey's of the block and is used for fire escape only. The proposed cellular accommodation within the premises is generally located each side of the central circulation corridor at all levels.

A "link" with the existing medical centre within the Tower Block has been incorporated into the design proposals and the covered underpass below the building's central core is utilised for this purpose. The comfort value of the current windswept environment here is proposed to be improved by the addition of fully glazed double doors across the opening to the open piazza, under the staircase tower. Along the opposite side, the opening to the underside of the external disabled persons platform lift is to be screened by a pair of powder coated galvanised steel doors which would provide adequate service access to the external lift motors and platform gear for the landlord's maintenance engineers.

The applicant's brief calls for a new internal private "accommodation" staircase and lift, both of which are sited within the void area of the ground floor, thereby eliminating the need for structural alterations in the ground and lower ground floor concrete structures. The proposed platform lift will satisfy the mandatory requirements for disabled persons access, contained in Approved Document M of the Building Regulations and the current DDA Act 1995.

3.3.4 Privacy

At ground floor level, the majority of the Consulting/Examination rooms are located along the fully glazed external walls, to take advantage of views across King Street at the front and the piazza at the rear. Patient/Doctor privacy in these rooms is to be guarded by the proposed installation of electrically operated dark coloured horizontal venetian blinds across all windows, the exception being the ground floor waiting area at the corner of the building facing King Street. Within the bay window recesses, the original existing installed metal channels in the ceiling of the bays are to be retained, refurbished and reused for hanging the venetian blinds (*see the section through the bay window in the AJ review contained in Appendix A*). The glazed sides of the bay windows will be left open without any screening. Between the bay windows, the proposed blinds will be suspended off 50mm wide black stained shadow line timber battens which are to be installed to receive suspended ceiling abutments.

During daylight hours, the appearance of these blinds will be obscured by the reflective bronze solar glass which mirrors the buildings along the opposite side very effectively. However, It is accepted that during the darker hours in winter months, these blinds will become visible from the street scene but this is the case in all the existing glazed elevations at this site where a mixture of venetian, vertical and roller blinds of varying colour are being used. On this note, it is anticipated that the use of internal venetian blinds for privacy and solar shading will not be an issue.

3.3.5 Proposed internal walls and their alignment to retained elements

All new internal walls are to be non-load bearing British Gypsum's 102mm thick "Gypwall Classic" metal stud partitions, comprising of GypFrame 70-S-60 "C" studs at maximum 600mm centers and lined on both sides with British gypsum's 15mm thick "Rigidur-H" gypsum fiberboard, built up from floor slab level to the underside of the upper floor and finished with 3mm thick insitu plaster skim. On completion, all exposed plastered surfaces are to be painted with a Dulux eggshell emulsion paint system in magnolia colour. The foregoing construction will achieve 30 minutes fire resistance and 51 Rw dB sound insulation to meet the requirements of the HTM 08-01. All cavities between the metal studs area to be insulated with 50mm thick Isover APR 1200 insulation.

Where new internal wall butt the bronze aluminum curtain wall mullions in the glazed face at ground floor level, the walls are to stop short (54mm) from the face of the mullion and the gap in-filled with 50mm wide x 31mm thick "Lamaphon FIP" matt black coloured bonded composite panels obtained from Siderise Insulation Ltd. The panels are to be grip fixed into the full height of the gap to the underside of structural floor soffit, using approved 3mm thick black compressible gaskets.

Where new partitions meet existing concrete columns, such walls are to align with the centre-lines of the columns , thereby retaining their existing form.

3.3.6 Proposed suspended ceilings

With the exception of the Plant Room at the Lower Ground floor, the entire floor area at all levels is to be fitted with a propriety suspended ceiling system(s) complete with suitable 600mm square mineral fiber lay-in tiles, complete with modular fluorescent CAT 2 light fittings. At ground level, the line of the suspended ceiling will be sited below the line of the high level concrete beams but this meets the external walls, the line will rise to a higher level along an angular elevated section before it abuts to the wall above the tall aluminum glazed curtain wall. The junction of suspended ceilings to the internal perimeter of external walls will incorporate a shadow line which is to be formed using a recessed 50mm wide black painted timber batten.

3.3.7 Proposed Heating, Ventilation and Air Conditioning Services

(a) Heating/Cooling system

The proposed heating/cooling system adopted in the design proposals consists of electrically operated air conditioning units which are to be integrated into the proposed suspended ceilings at ground level. At the Lower Ground and Basement levels where sufficient headroom is not available, slim line wall mounted air-conditioning units are proposed at high level. 4no external condensers are required for these air conditioning units and these are sited over an extended area of the existing screened roof mounted air handling plant above the 5th floor of the King Street Block. The refrigeration pipes for these units will rise up from the ceiling void of the ground floor into the existing vent shaft of Staircase 2 before exiting through the sidewall of the vent shaft at roof level, at a level below the roof parapet line, before being routed horizontally to the proposed air condensing units along the inside face of the existing louvered screen wall..

(b) Ventilation system

With regard to the proposed mechanical ventilation, the containment of ventilation ducts within the restricted depths of ceiling voids at the lower two floor levels has proved to be a problem and the solution presented is to utilise the ceiling voids as a "plenum". The supply air is delivered to the spaces requiring ventilation via slim rectangular metal / upvc ducts connected to diffuser grilles in the suspended ceilings, thereby creating a pressurised environment. The ceiling voids are to be used for the air extraction side of the system with the exhaust air routed via a motorised fan into a discharge duct that is routed into the smoke vent shaft in the existing staircase 1 in the King Street block. A system similar to this has been installed in the upper storeys of the building.

(c) Hot Water supply

An electric unvented direct hot water cylinder is to be installed in the Plant Room at Lower Ground floor level which will supply hot water to all proposed wash basins and sinks via thermostatically controlled mixer valves.

3.3.8 Proposed signage

Proposals for new signage in the vicinity of the existing entrance at the Lower Ground Floor level along King Street are included in this application for planning permission and listed building consent.

Given the listed status of the building, the design challenge was to design and install appropriately sized internally illuminated signage that incorporates the established coloured logo "PMM" and the characters "PALL MALL MEDICAL", without causing irreversible harm to the building's external fabric and street scene. It is accepted that harm to the building would be inevitable if the ceramic bronze tiled walls in the vicinity were drilled to receive anchor bolts fixings to support new signage assemblies. However, ceramic bronze tiles are available to patch up holes but the adoption of the criteria to minimise the number of fixings was deemed to be a sensible approach which has influenced the proposals presented for new signage over tiled wall area(s).

The available areas for mounting the signage in the proximity of the entrance doors are restrictive and the following areas have been considered;

- The edge profile of the concrete floor slab above the entrance doors is defined by an undulating band on bronze ceramic tiles which follows the base profile of the bronze aluminum glazed bays windows at upper floors. This is a significant architectural feature of the building which repeats along the full length of the facade along King Street at all higher floor levels. Furthermore, the visible height of this band is only 400mm and its undulating profile only offers approx. 1800mm wide faces between 600mm and 1200mm recesses, all of which are not wide enough to contain the Pall Mall Medical logo and signage in a linear format in one plane. The option to fix new signage on this tiled band was therefore abandoned.

- The projecting glazed bay windows to the Ground Floor area above the main entrance doors contain cill height black glass panels at low level which conceal radiator cabinets. These glass panels are opaque, painted black at the rear and offer a visual sight line of approx. 1725mm x 560mm

The foregoing considerations has led to the proposals for new signage that are split into two separate areas of the building which area described below;

(a) Proposed signage above the entrance doors

The lower black glazed panels to the two projecting bay windows above the entrance doors are proposed to be replaced with new 1725mm x 560mm gloss black finished composite aluminium trays complete with built up brush stainless characters complete with face applied printed graphics and finished with internal LED halo illumination. These new signage panels can easily be replaced with the original black glass panels so the proposal is reversible and therefore deemed to be not harmful to the building.

(b) Proposed signage over the bronze ceramic tiled wall to Staircase 1, adjacent to the main entrance

The applicant is keen to display an illuminated sign facing King Street because their existing premises off the piazza has proved difficult to find by unfamiliar patients and visitors. The proposed facility needs to be easily discovered and the tiled staircase wall by the side of the main entrance presents an opportunity as this is set back and faces King Street. The criteria for minimal fixings into tiled walls has led to the proposal for the erection of a small 1300mm x 1200mm gloss black finished aluminium tray with 50mm returns, complete with fret cut characters pushed through opal acrylic panels which are internally illuminated via LED lighting. The "floating" assembly will stand proud of the tiled wall face by 100mm resulting in a 50mm shadow gap to facilitate a halo around the perimeter.

The lightweight assembly will be fixed using only 4no M8 stainless steel expansion bolts and cabling to the signage will be internal with the passage to the back of the signboard resulting in one additional small diameter hole through the wall. The option to mount individual characters directly onto the tiled wall without a backing panel was favoured but abandoned because of the large number of characters present in the applicant's logo, resulting in too many wall fixings.

3.3.9 Noise

The proposed medical use for the building (Use Class D1) is similar to an office use and noise from activities within will not be an issue at this site. However, there are 4no new condensers proposed over the extended area of the roof mounted air handling plant above the 5th floor. Information on the selected models and their noise levels are listed below;

(i) Mitsubishi PUHZ-RP125VKA air condensing unit - Noise (dBA) / (Heating / Cooling) = 47 to 50
(ii) Mitsubishi PURY-P800YSJM-A VRF air condensing unit - Noise (dBA) = 63.5

Manchester City Council's guidance in respect of noise generation from new development states the following;

> *Externally mounted ancillary plant, equipment and servicing should be acoustically treated in accordance with a scheme designed so as to achieve a noise level of 5dB below the existing background (LA90) in each octave band at the nearest noise sensitive location.*

In July 2008, an acoustic report prepared by Rod Lane Acoustics states that the average existing background noise levels measured on the roof are 51.2dB (LA90). Based upon the council's guidance, any noise at locally sensitive receptors would need to below 46.2dB.

A noise assessment from the appointed noise consultant Randtech Consulting is contained in Appendix C of this statement and this report concludes that noise emanating from the proposed 4no air-conditioning condensing units located behind the screened 5th floor roof plant area is unlikely to cause a nuisance to the nearest receptor, which are the occupants of the offices behind non-openable fixed glazed windows that overlook the plant location. The noise generated is predicted to be significantly below the design criterion requested of 5dB below the background levels at sensitive receptors. On this note, there will be no need for noise mitigation works to the 4no proposed condensers.

3.3.10 Proposed opening times, deliveries and waste management

The proposed opening times for the medical centre will be 7.00am to 9.00pm on weekdays, 7.00am to 7.00pm on Saturdays and 9.00am to 6.00pm on Sundays.

Deliveries and refuse collection for the existing medical centre at the Lower Ground Floor of the Tower Block is dealt with at a service yard to the rear of the building where 1100 liter wheeled waste bins for the building area stored. This area is accessed by delivery vans and waste collection vehicles via Brown Street. From the premises, the waste bins storage area is accessed via the central core area of the Tower Block. Medical waste and sharps are stored in colour coded containers and these are regularly collected from the premises by an appointed specialist waste management company.

For the proposed medical centre in the King Street Block, the management of waste will follow the same routine, and the waste storage area will be accessed via the central core of the Tower Block, via the lower ground floor area. 1 no additional 1100 litre bin is envisaged within the storage area and a fully compliant waste management strategy that follows the guidelines administered by the landlord is to be adopted.

3.3.11 Access, car parking and public transport

The site has an underground car park accessed via Marsden Street. This is facility for staff only and it is expected that a few spaces will be made available for key members of staff at the medical centre. All of Manchester's major retail and leisure facilities are within a short walk of the building, including Metrolink and bus connections at the nearby Piccadilly Gardens interchange. British Rail services are available from the refurbished Piccadilly Station and Victoria station which are equidistant from the building.

4.0 CONSULTATIONS

4.1 The landlord (UK Commercial Property Trust)

The design proposals appertaining to this application have been developed in full liaison with the landlord and all feedback received has been addressed.

4.2 Manchester City Council (Planning & Conservation departments)

Conducted by the appointed planning consultants Michele Steel and Harry Bolton of Deloitte, an early consultation meeting was held on site with the council's planning officer Mr Anthony Mitchell and conservation officer Mr John Whyard on 23 January 2013. The consultation was focused on matters concerning the status of the building's interior. Prior to the discussions, a walk through the existing medical practice at the lower ground floor in the Tower Block was conducted to give a general impression of the quality materials used in the conversion which were completed back in 2009. The meeting then moved to the subject areas of this application and key questions raised by the architect were focused on the following intended alterations;

(a) the proposal to floor the area of the large void at ground level
(b) demolish and clear the concrete bank vault at basement level
(c) demolish and clear the bullion lift that serves the lower ground and basement levels
(d) improvement of the windswept environmental conditions of the underpass at lower ground floor level

The discussions had proved fruitful and requests were made for clarification on whether the void in the ground floor, the bank vault and the bullion hoist were all original installations or later additions. Reasoning for the proposed clearance works was also demanded. The meeting was concluded by Mr Anthony Mitchell conforming the council's strong desire to bring this section of the King Street block at Pall Mall Court into long term use. Mr. Mitchell was pleased to hear that the conversion to medical use will be of "low impact" to the building and that the facility relates to the applicant's existing premises at the site.

Since this meeting and during the design stage leading up to the submission of this application, other informal consultations between Deloitte and Manchester City Council have taken place and wherever possible, we have strived to accommodate all requests made for amendments to the design proposals, the exception being the retention of the Bullion Hoist for which good reasoning has been provided in Section 3.2(d) of this statement.

4.3 English Heritage

Planning Consultants Deloitte have held informal consultations with English Heritage who have so far not requested any further detail on the proposals or a site visit. Similar proposals to those currently proposed were tabled with English Heritage at a site visit in April 2011 and the following response was obtained on 03 May 2011:

Thank you for showing me round Pall Mall Court on Wednesday 27th April and outlining your client's proposals for the re-use of this grade-II listed building.

The proposals impact on the ground and lower ground floors and proposed a new use for clinical purposes. I note that the proposal will involve the demolition of the existing staircase and part of the existing floor slab, as well as the partial sub-division of the ground floor.

As discussed, I am of the opinion that in general the proposed works will have no detrimental impact on the lower ground and ground floors. The removal of the internal fabric does not appear to be either substantial or likely to impact on significant fabric. It will be important to retain the external appearance of the building. Therefore, the method and material used to create the consulting rooms will be particularly important to maintain a feeling of open-ness within the interior and avoid substantial alteration to the existing bay windows. Similarly, the signage for the exterior should be carefully considered.

However, I can confirm that, on the basis of the submitted indicative proposals, English heritage would have no objection to these works.

5.0 CONCLUSION

The last tenant at the site was the ABN Amro Bank who vacated the premises over 10 years ago and since then, the site has remained vacant and is in desperate need for refurbishment and fit-out works to suit a new tenant. The consequences of the current financial crisis has led to an abundance of lettable office space in the city, much of which offers a better modern working environment than that offered in this listed King Street block where the internal environment not only restrictive in its form and layout, but is also plagued with low headroom problems and lack of adequate fenestration in its two lowest floor levels.

Unlike the past planning application for an A3 restaurant use that was proposed by Nando's which was refused by the council in 2009, the nature of this proposed use is one where the functional requirements of the user are insular and do not demand high levels of fenestration in external walls, thereby retaining the very elements of the building that are worthy of its listing (i.e. the building's distinct post modern architectural form, style and massing around the open piazza).

In contrast, the design proposals put forward for this application are of *"low impact"* to the heritage asset and should be welcomed the council. Planning Policy PPS5 (now superseded by the National Planning Policy Framework (NPPF), though still relevant), makes reference to the following key benefits that could weigh in favour of a proposed scheme, all of which are relevant to this application;

(a) It sustains or enhances the significance of a heritage asset and the contribution of its setting.
(b) It reduces or removes risks to a heritage asset.
(c) It secures the optimum viable use of a heritage asset in support of its long term conservation.
(d) It makes a positive contribution to economic vitality and sustainable communities.
(e) It is an appropriate design for its context and makes a positive contribution to the appearance, character, quality and local distinctiveness of the historic environment.
(f) It better reveals the significance of a heritage

Reference should be made to the accompanying Heritage Impact Statement prepared by the heritage consultant K M Heritage.

In conclusion, the development meets the general requirements of national, regional and local planning policies and the council should be supportive and grant consent for the application. The design team has adopted a flexible approach for this development and revisions will be considered, should the need arise during the course of the application.

6.0 APPENDIX A

A review of the building by the Architect's Journal, dated 28/10/1970

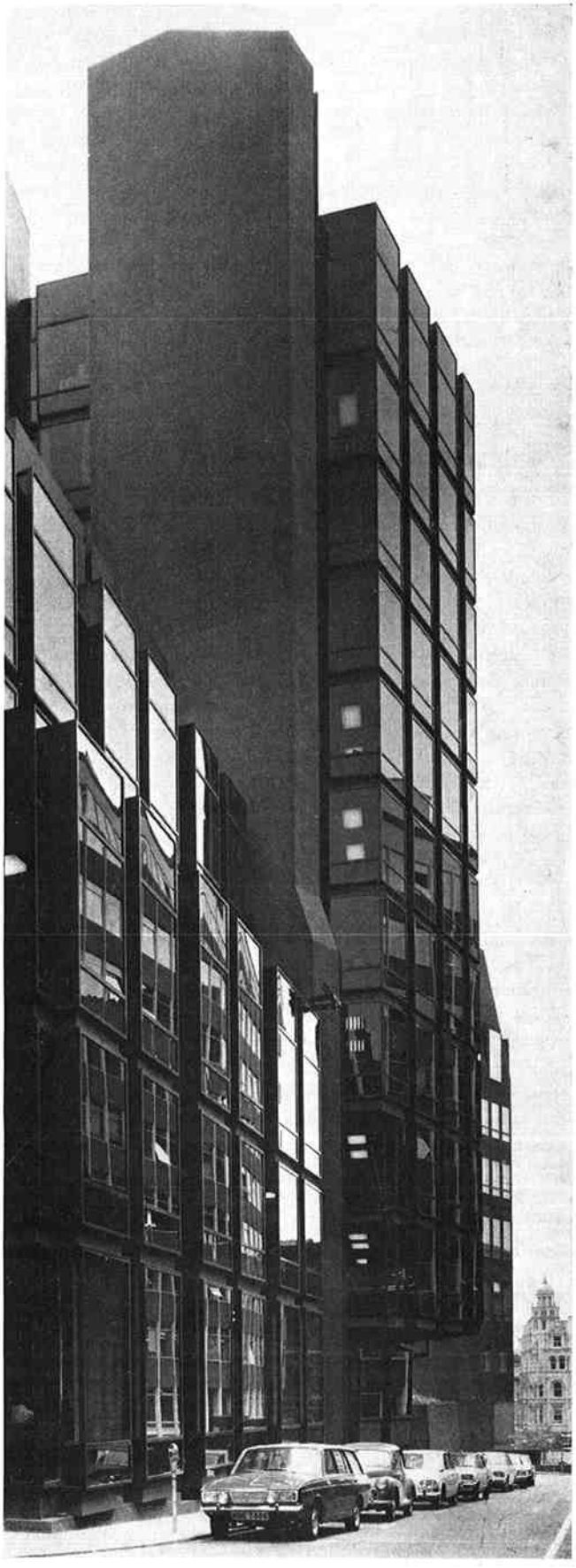
Building study

CI/SfB 32

Office block
Brett & Pollen and A. H. Brotherton & Partners

Office block

at	Pall Mall Court, King Street, Manchester
designed by	Brett & Pollen
partner in charge	Harry Teggin
in association with	A. H. Brotherton & Partners
partner in charge	Duncan Boddington
assistant architects	Chris Batty
	Austin Lonsdale
quantity surveyor	Davis, Belfield & Everest
structural engineer	Cyril Blumfield & Partners
services engineer	Donald Smith, Seymour & Rooley



Manchester is not a city whose central area has been well treated by architects since the war. Now two adjoining buildings of merit have considerably improved the scene. One is a prestige bank building. The other, the subject of this study, is an office building for an insurance company

ARCHITECT'S ACCOUNT

by Harry Teggin

The original brief for Pall Mall Court was for a prestige headquarters building for the London Assurance Group. The buildings being replaced (one of which was designed by Waterhouse) had enormous floor heights, poor internal light wells, one of the earliest hydraulic lifts ever installed, a maze of badly lit corridors and pompous staircases, and were incapable of being adapted in any way to the present day office functions of a modern insurance company.

Initial designs were started in 1962, when a series of exercises including models were made to explore the strong environmental relationships of the area. The site, on a street which had a Victorian institutional character, contained a motley selection of buildings of mixed commercial uses. The buildings to be replaced were served by two very narrow side streets, one, a tiny alley (Back Marsden Street) and the other, Pall Mall.

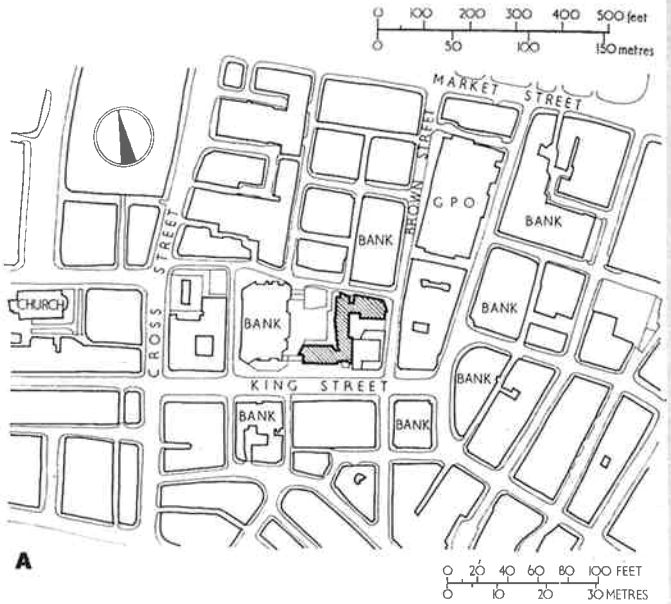
King Street, being on a slope, throws into relief the silhouettes of its buildings, many of which are of considerable architectural significance and value; the best two are the Bank of England by Sir Charles Cockerell and the Midland Bank by Sir Edwin Lutyens. At the top end of the street is a collection of Victorian banks and the Reform Club, all of which have strong silhouettes and are dominated by the large tower block of the Piccadilly Plaza.

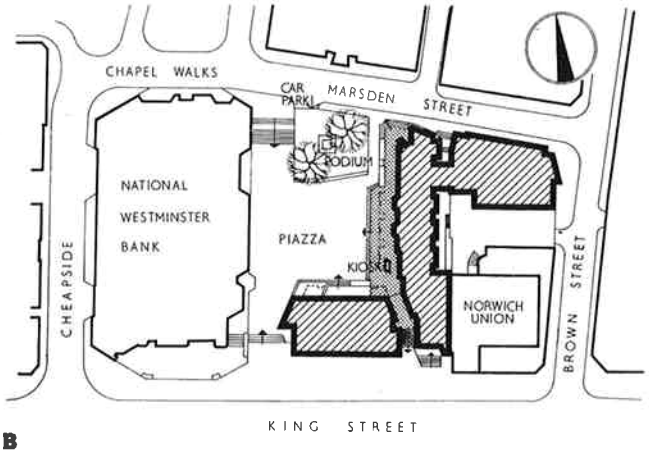
Immediately to the north of the site is the Norwich Union building by T. P. Bennett, built about 1958; partially sharing the site through the closure of Pall Mall is a new building for the District Bank (now part of the National Westminster Group) by Casson and Conder.

Pall Mall Court was designed initially as an owner occupied building for the London Assurance Group, but a merger with Sun Alliance resulted in a rationalisation of the new company's regional plans, with the consequence that only a part of the new building is occupied by the insurance group, the remainder being tenanted by banks, the Law Society, solicitors, architects and a variety of other professional firms. There was therefore a strong challenge half way through the construction period to adapt the building to contain these various functions without destroying the integrity of the original bespoke scheme.

The final design was undertaken with several assumptions and environmental improvements in mind. The big scale of King Street was to be retained and in an attempt to reflect the sort of height which would keep it pedestrian, a five-storey block was evolved, with a twelve-storey block running at right angles, forming a court facing the new District Bank. This court forms a raised piazza under which car parking provision is made and in which a tree box has been formed to contain two large plane trees (replacing the maple trees installed temporarily). Completing the development in Marsden Street to the rear is another five-storey block, again echoing the scale created by the existing buildings. A short finger of the back alley has been retained as a service entry for both the new building and the Norwich Union. The Victorian feeling of the street with its tight alleys and small canyons was exploited, with the main lift tower thrusting its silhouette beyond the bulk of the Norwich Union next door but leaving a space between flank walls.

Originally the building was to be ten feet further forward than as constructed, so creating a larger pedestrian area away from the traffic and forming a civic improvement. But objections were made to crossing in front of this existing building line, resulting in the square being rather

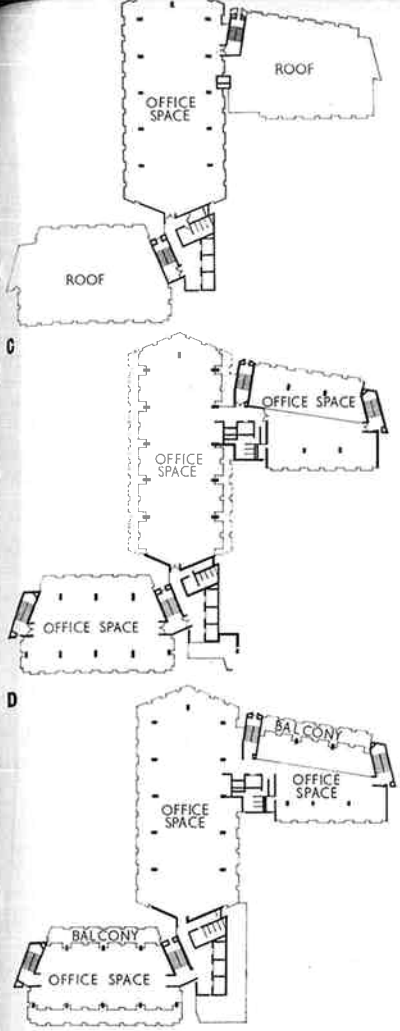




smaller and having less sun than was originally intended. The slope of the street enables the main entrance to be provided up a flight of steps and also allows pedestrians to pass under the main ground floor through into the piazza and by way of an arcade under cover into the shopping streets to the rear. Access is also available to the piazza up a flight of steps alongside the District Bank, a gap which was specifically kept open to frame the rather splendid view of Waterhouse's main tower of Manchester Town Hall.

A sense of space and feeling of ambiguity were deliberately introduced to retain the character which the site had in Victorian days, and it is essentially an attempt to introduce a sophisticated strongly modelled building, highly reflective in its main surfaces to pick up and mirror the grain and texture of the surrounding classical and Victorian gothic buildings. The building was originally conceived among the solid banking houses to have the impact of a jet stone by the use of bronze glass, sharp angles and opaque facets, though the visual illusion of mirrored surfaces has been rather lost by the street itself being cleaned and in the process losing its black millstone grit and Mancunian strength. The building was also an attempt to exploit the steep slopes of the site and produce a mass with its own strong silhouettes.

The façade of the building was deliberately broken up with glazed bays separated by narrow recesses containing opening windows and allowing natural ventilation in sheltered conditions. The bays are of a repetitive pattern of a 6ft—2ft—6ft—4ft grid (1800—600—1800—1200 mm), allowing internal subdivisions on an incremental 2ft module of 6ft upwards. The internal layout was devised to allow a



A *Location plan* (1:5000). *Piccadilly is just off map to east*
B *Site plan* ($1\frac{1}{2}$sin = 1ft). *Area tinted is walkway from King Street to Marsden Street, maintaining tradition of tiny passages through blocks of buildings*
C *Sixth to tenth floor plan* ($\frac{1}{96}$in = 1ft)
D *Third and fourth floor plan* ($\frac{1}{96}$in = 1ft)
E *First and second floor plan* ($\frac{1}{96}$in = 1ft)
F *Ground floor plan* ($\frac{1}{96}$in = 1ft). *The area designated 'offices' in the main block is tenanted by the Bank of America, and in King Street by the Northern Commercial Trust*
G *Lower ground floor plan* ($\frac{1}{96}$in = 1ft)
H *Basement plan* ($\frac{1}{96}$in = 1ft)
J *Office plan at fourth and fifth floor levels* ($\frac{1}{48}$in = 1ft)
K *Section through office tower looking north* ($\frac{1}{48}$in = 1ft)

full width of 50ft (15·24 m) in open planning on the main floors, or a subdivision on an eccentric rather than symmetrical corridor which permitted offices of 18ft or 30ft (5·49 or 9·14 m), in depth.

The main structural elements of staircases and lift shafts have been emphasised in form by being clad in ceramic mosaic specially made to have a bronze flash on a basically gun metal colour to match the Staffordshire blue bricks used in the paving of the piazza and the main entrance hall. The building has a continuity of form in all façades and a consistency of materials throughout. The basic external materials are bronze painted aluminium, bronze colour glass and mosaic and brickwork cladding in a matching blue-bronze colour.

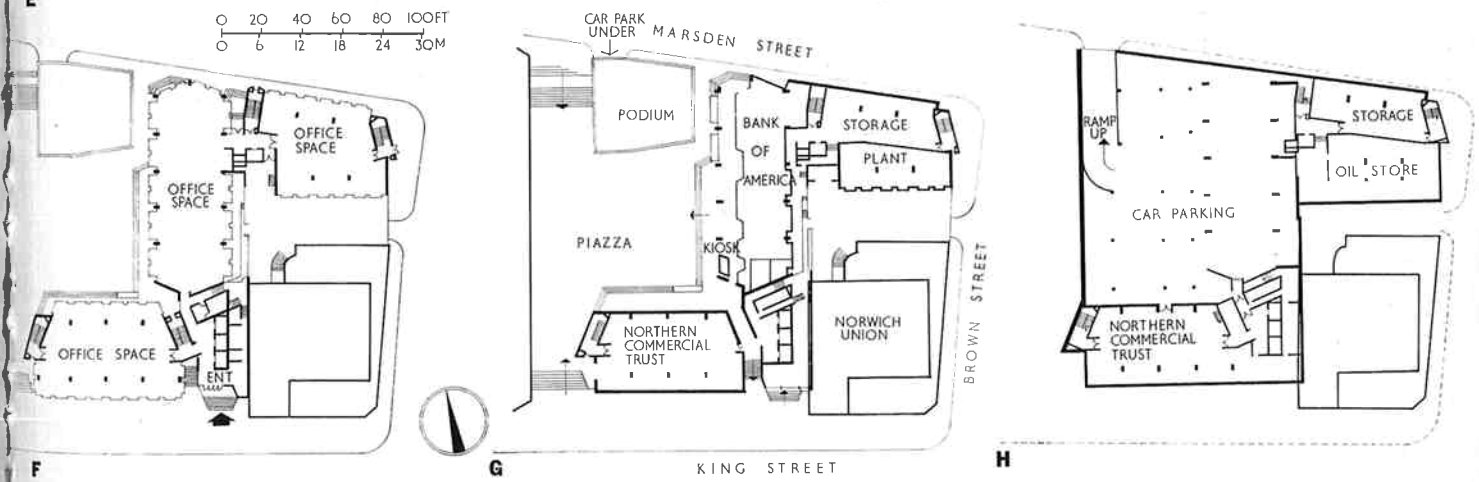
APPRAISAL

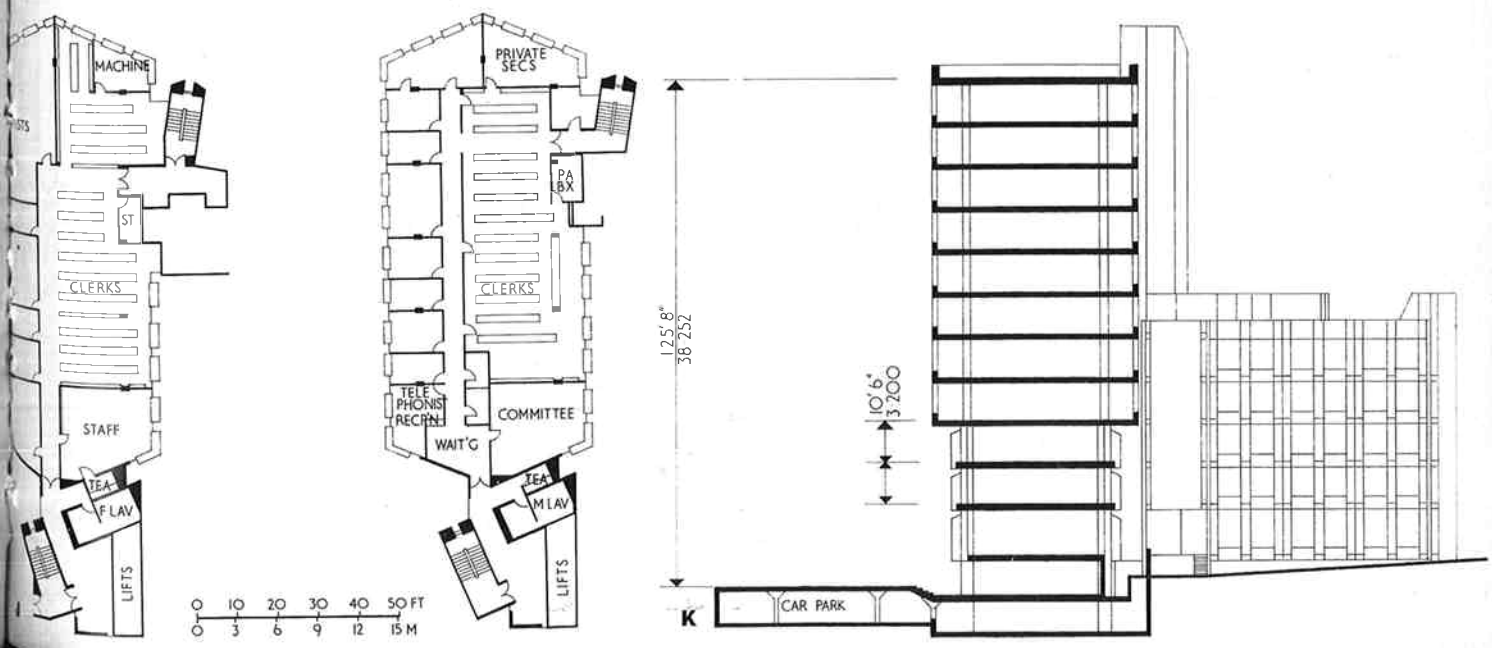
*by N. Keith Scott**

Twenty-five years after the devastation of the second world war, most people are agreed that Manchester has at last acquired two buildings of undisputed merit. True, the Co-operative Insurance tower **1** is as distinguished a skyscraper as one could find in England, and round and about this great sprawling metropolis there are some worthy and above average buildings. Nevertheless, as a northerner, familiar with its scene, one has to confess that the city has fared badly at the hands of entrepreneurs, planners and architects.

It is hardly an excuse to argue that this situation is not

*The appraiser is an architect partner of Building Design Partnership.





new to Manchester and that, almost alone of all the large cities in the British Isles, it has scarcely a single area of civic dignity and scale; certainly nothing to compare with Liverpool, Cardiff and Newcastle. The areas laid waste between 1939 and 1945 presented a great opportunity to redeem the past and we can only regret and be shamed by the chance frittered away.

Now, however, in the heart of the business district, two clients of taste and substance have commissioned architects of national repute to build headquarters for their activities and they and Manchester have been rewarded by buildings worthy of their site and purpose. The buildings, Pall Mall Court for Sun Alliance and the London Assurance Group by Brett & Pollen, and the National Westminster Bank by Casson & Conder, **1**, **3** form a close knit group half way up the northern side of King Street. This review is concerned with the former, but so heavily does each rely on the other for their impact that it would be irresponsible not to refer to their interdependence.

A happy juxtaposition of two buildings

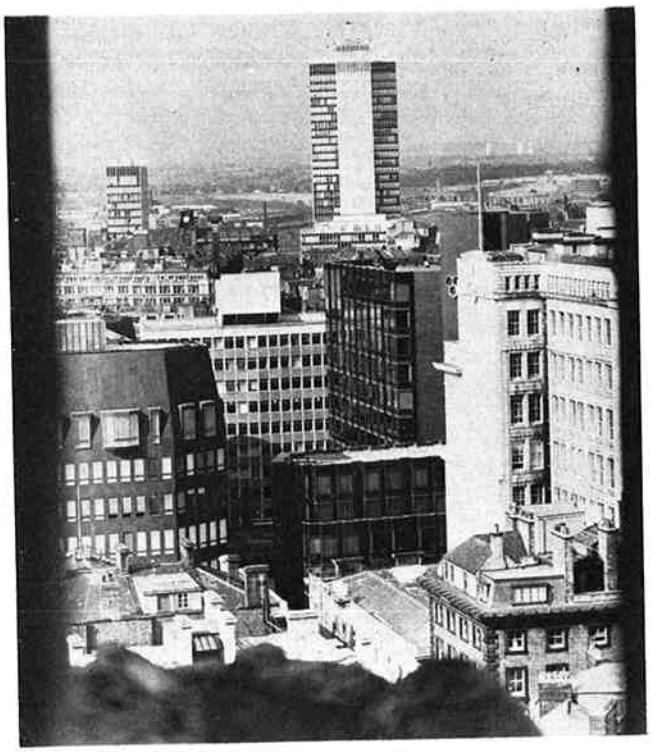
The point is made if one tries to imagine the effect on the Brett & Pollen scheme if the mundane, speculatively built Dennis house were on the Westminster Bank site, or visualize the deadening effect on Casson & Conders' design if the flaccid bulk of Norwich Union House had been where the Sun Alliance now stands. The exercise is sufficient to show the degree to which architects depend for success on their neighbour's building. It highlights also how little attention designers devote through both circumstance and inclination to buildings round about them. The present happy juxtaposition of the two buildings is really little more than chance, but the grim solidity of the granite clad bank is saved from real dullness by the mirrored grace of the Sun Alliance building.

The National Westminster Bank is too new to have been judged by any national or provincial award scheme and it remains to be seen how the public and the profession will react officially to its skin-tight detailing and highly mannered massing and profile. The Sun Alliance building, however, has been widely acclaimed and in winning a Civic Trust Award and the RIBA Regional Award has carried off every possible accolade.

The plan and the resultant massing of the building is irregular but very strong. Two lower wings spring in opposite directions from opposite ends of a tall spine block and though they are predominantly parallel sided, the ends are strongly modelled with splayed walls 22½ degrees off normal. The designers make much of their desire to see a faceted, jewel-like building echoing the scale of the Victorian streets around the site. This wish is only partially realised. The faces of a well-cut jewel are faceted with subtle inter-related angles. At Pall Mall Court only the solid walls are angled (apart from the northern prow of the main block). For the rest, right angles dominate and one cannot get splayed reflections from square bays—even if they are all glazed. It is quite wrong to talk of jewel-like faces since not only are the glazed surfaces rectangular in every way, but vigorously cut up with major recessions, projections and deeply recessed floor edges. One is not saying the design is not first class: simply that analogies to jewels are unhelpful.

Quality and sensitivity

Although some of the detailing seems fussy and is already grime laden, a firm hand has been in control throughout and, externally at least, the building exudes quality and a sensitive mind. On King Street **4** which is the most important frontage, the five-storey wing contrasts beautifully with



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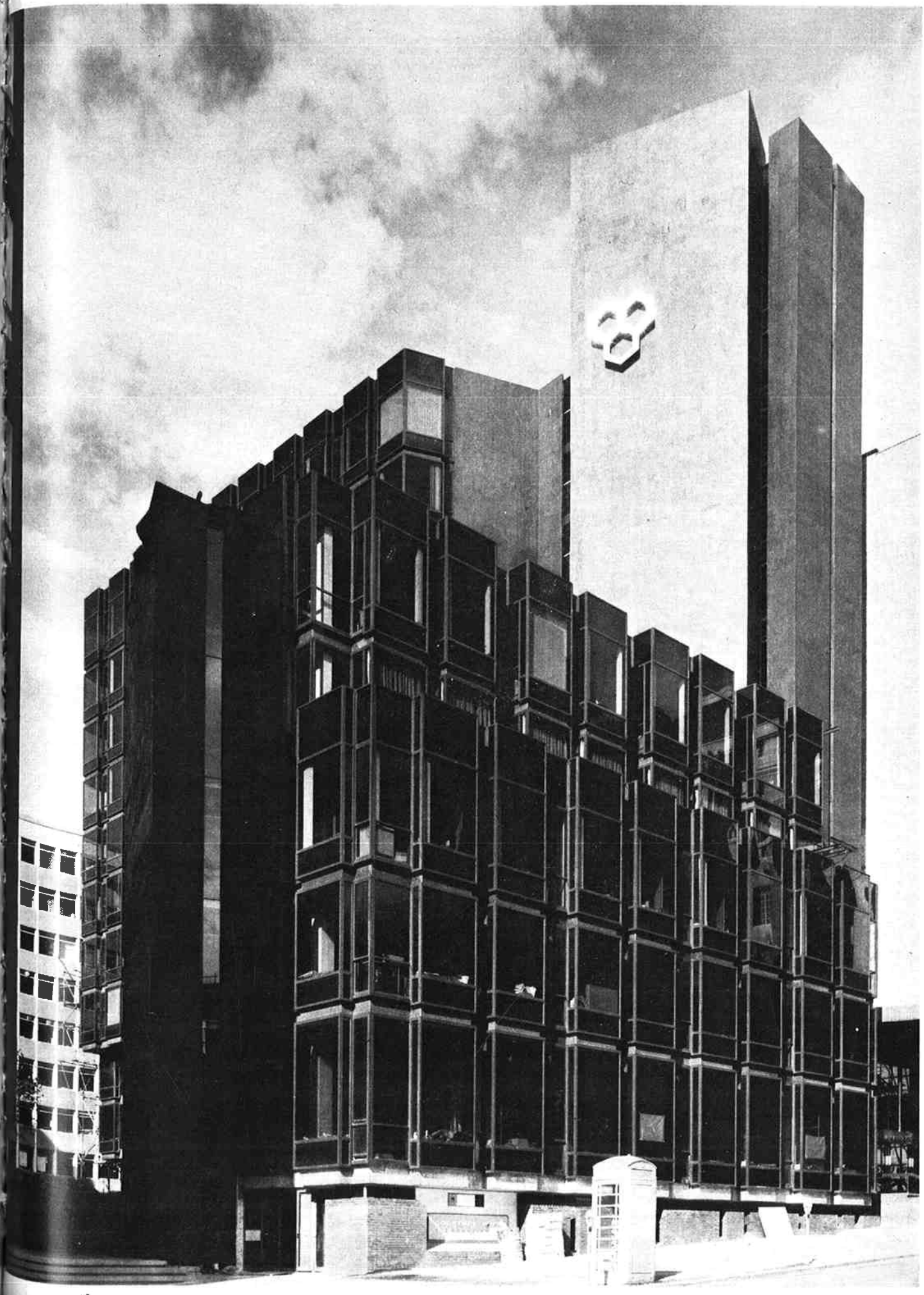
1 *View from Waterhouse's town hall over Manchester district showing Pall Mall Court and National Westminster Bank. Beyond is tower of* CIS *building—one of few postwar buildings in Manchester of real architectural merit*
2 *Looking east up King Street, showing set-back of Pall Mall Court, sheer façade of service tower, and flank wall of Norwich Union House with three small windows deliberately inserted to maintain rights of light*
3 *Late afternoon view down King Street showing how happily contrasting styles of bank and Pall Mall Court complement each other*
4 *Looking east up King Street showing character of contrast between five and twelve storey block. Interlocked hexagons symbolise merger of companies financing project. Cumbersome permanent window cleaning gear can be seen on setback at right*



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its own lift and service tower to the main twelve storey block, and with the much bigger National Westminster Bank. Of its five storeys, the top two are set back in a successful attempt to reduce the scale and impact of so much glass on a street of Victorian business buildings. The setback is mirrored on the piazza side similarly to break down the scale and to let more light into the open space. The block is thus narrowed from 50ft (15·24 m) to 30ft (9·14 m) and contrasts in every way with the granite clad bank alongside. The idea comes off and is an object lesson for young architects learning their craft, although a price has been paid in interior usefulness, which is discussed later.

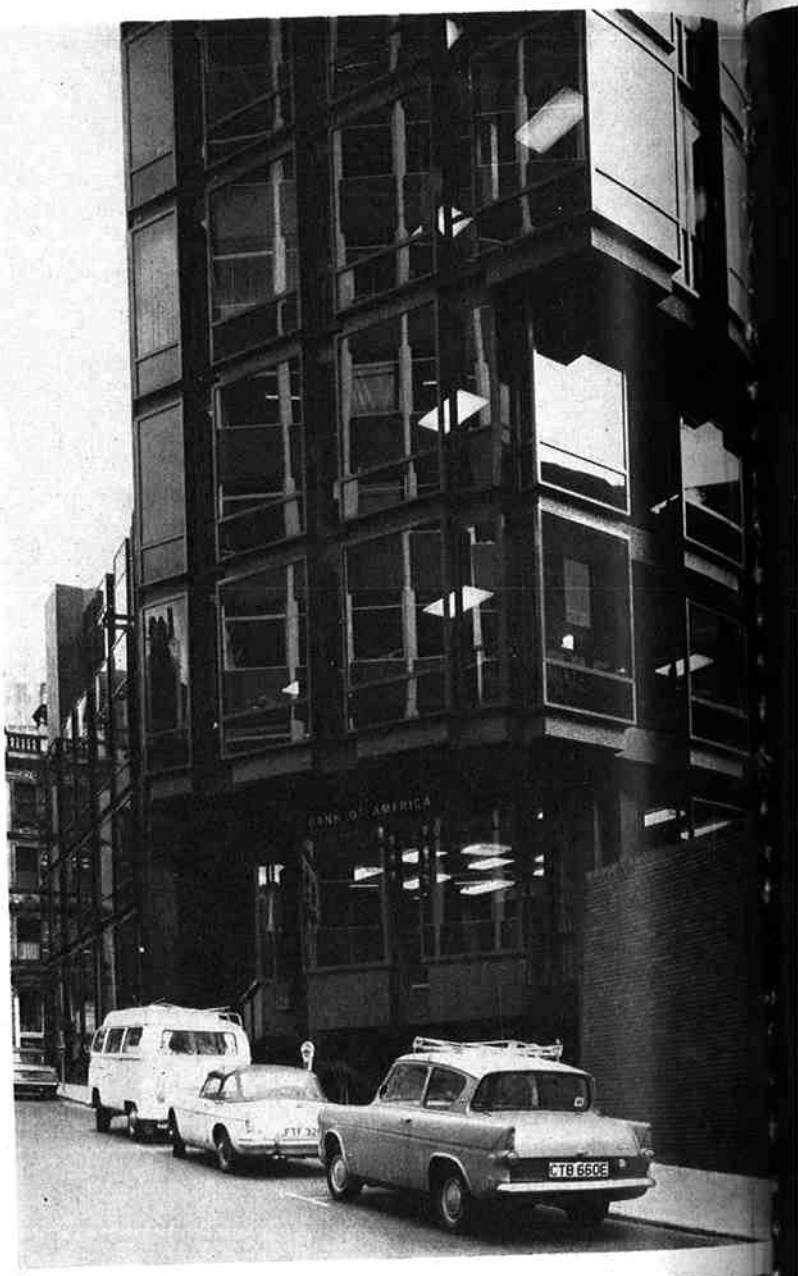
The architects were disappointed at having to keep to the original set back frontage rather than advancing 10ft (3·05 m) to the general street line. This was caused by Norwich Union's objection to the masking of their building. Criticism of this tasteless postwar building **5** would be invidious since it is not significantly worse than dozens of others in Manchester, although it would be a distinct improvement to King Street to hide the building. However, we may become reconciled and see it as a bonus to the space in the street itself. The present unfinished pavement looks bleak and over-large, but trees are envisaged, and if they are put as near to the pavement edge as practicable the benefit to King Street will be immeasurable.

The benefit to the client will also be immeasurable. No one scanning long canyons of tall buildings can really see the building he is looking for—the perspective is too acute. Try for instance to pick out the National Westminster Bank from Deansgate. A flourish of trees, however, shading the street with their distinctive form and texture, will give a unique marker to Pall Mall Court which will be the envy of commercial buildings throughout the treeless streets of the city.

The podium, a too high flower bed

In their notes the designers say the setback reduced the square in the heart of the scheme, but although this may have marginally restricted sun penetration, the real culprits in reducing the space are the architects. Principally for design reasons, they chose to emphasise the entry to the basement car park by raising a considerably larger area than strictly necessary for that purpose to create a large, high podium.

This major element with its dark brick battered walls covers nearly a third of the available space. It is built too high to see over and one expects it to contain a small auditorium like the free form of Lasdun's auditorium at the Royal College of Physicians. Admittedly, the ground cover of cotoneaster damerii and periwinkle and the two



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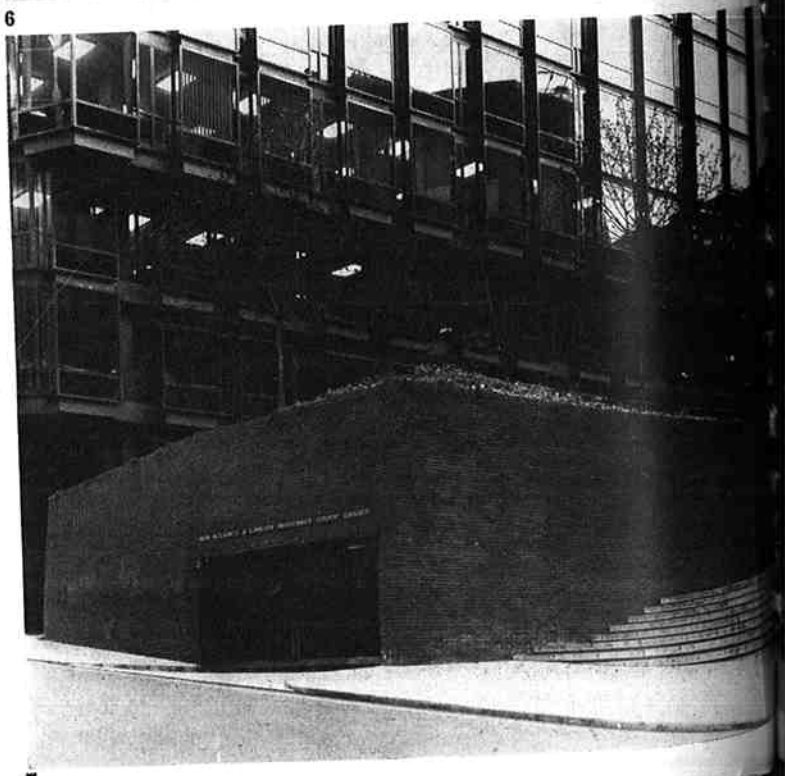

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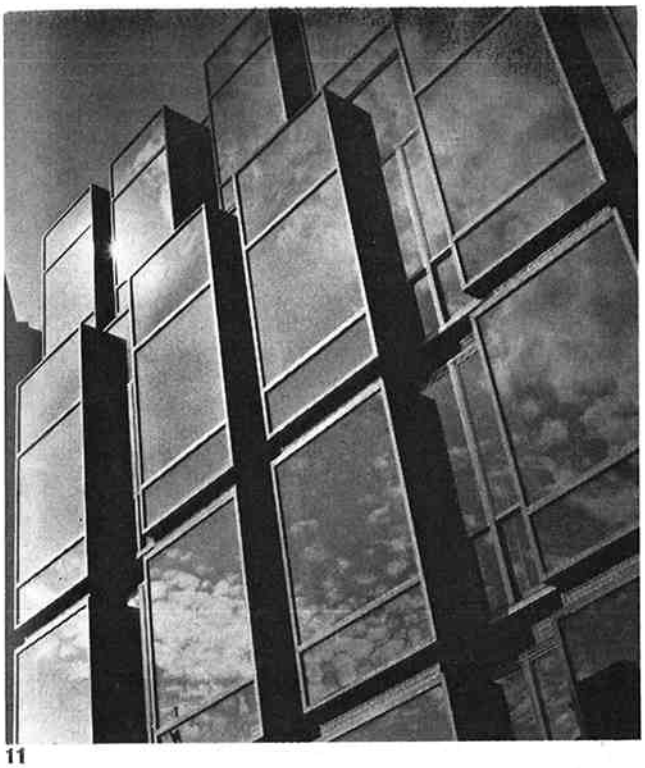
5 *Norwich Union building dwarfs Pall Mall Court alongside. Objections from Norwich Union prevented architects of Pall Mall Court advancing frontage 10ft nearer street*
6 *Main block from Marsden Street showing cantilever over street and geometric configuration of building*
7 *From Marsden Street showing tree box and car park entrance. Dominance of tree box effectively blocks wide view into court and considerably reduces useful area. Trees look remote and rather incongruous from street*
8 *From Marsden Street looking directly at the secondary entrance with its intricate modelling and dark and rather forbidding atmosphere*
9 *Looking from slit window in escape staircase at west end of wing block on King Street. Newly cleaned town hall in distance shows how carefully these various views have been contrived to make the most of Manchester scene*


BANK OF AMERICA



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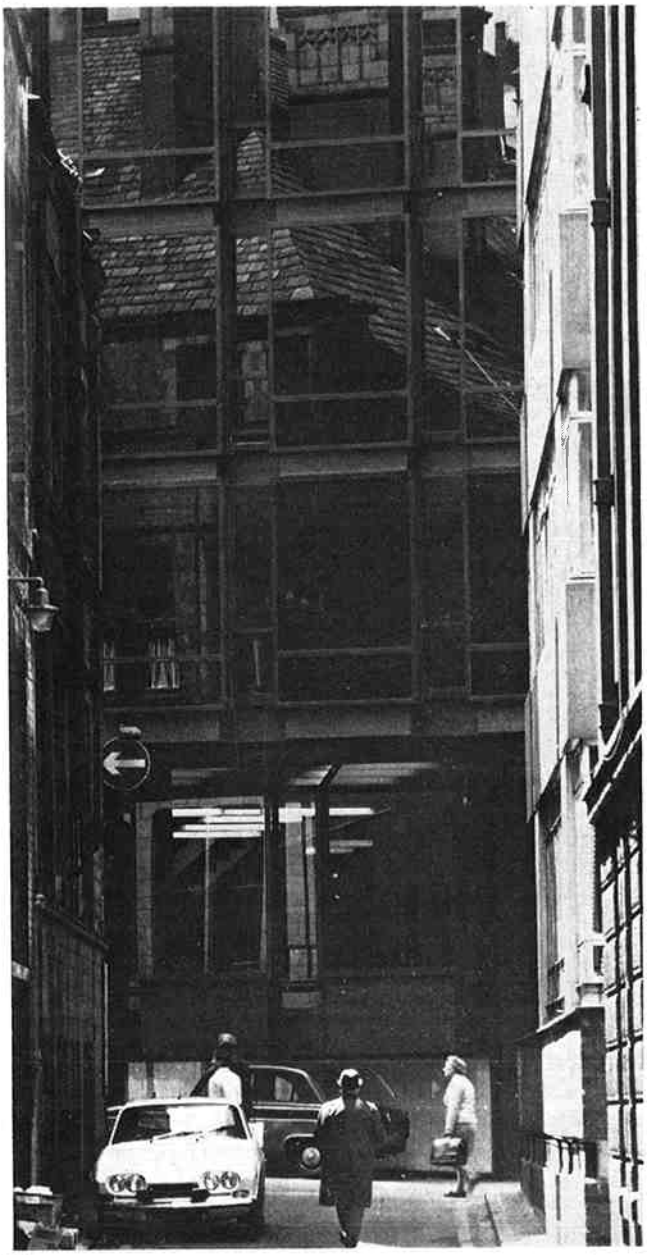

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newly planted Norway Maple trees give leave to doubt such a function, but the puzzle remains because it looks much too high to be the flower bed it in fact is.

This feature is the only major design miscalculation in the scheme. From Marsden Street the trees look incongruous, and this will increase as they grow. The bulk of the tree box is too dominant for its function and for the scale of the square, and there is little doubt that it contributes significantly to the windy vortex of the mall which always seems draughty and deserted.

The 'tree box' only comes into its own when seen from the upper floors of the main block. From there the welcome patch of green gives relief and interest to the plan form of the whole plaza. Time and final paving will test the real townscape value of this area.

Continuing the alley tradition

The steep slope of King Street has been used to give an eight-step podium to the main entrance of the building and there is just enough drop beside the podium to allow a little alley to tunnel its way under the buildings and into the plaza at a level slightly below the main area. One is then intended to thread one's way under cover of the main block and use this route as a pedestrian way between King Street and Marsden Street.

This is an excellent idea, continuing the Manchester tradition of tiny, covered passages in blocks of buildings through which bowler hatted barristers and messenger boys can scuttle in the endless drizzle without bothering to don a coat. Most of these old alleys, however, are alive with commercial incident and lined with kiosks and small specialist shops which are well known to connoisseurs.

The architect's intention was to create a similar atmosphere in the walkway through Pall Mall Court. Unfortunately, the idea was torpedoed by the Bank of America wanting to take all three lower floors of the main block, including the plaza level. The letting agents understandably (if short-sightedly for the area's benefit) grabbed an easy, lucrative letting so the potential of a lively little mall is lost and replaced by a little used and uneventful passage. Matters may improve when the mall paving is completed and a small kiosk in the south-east corner is installed, but it may prove difficult to let at an economic rent, at least until a reasonable pedestrian flow is established and business people take advantage of a new and covered short cut.

Negotiations with the city authorities resulted in the closure of Pall Mall, a small street between the two building complexes, and the National Westminster Bank was permitted to move eastwards up King Street over the former road. The Pall Mall Court building then kept clear of its former western boundary to allow access to the piazza

10 *The only truly faceted elevation. Glazed northern prow of twelve-storey block gives broken reflections and deep modelling on lower floors gives further interest—though introducing window cleaning problems*

11 *Serrated façade of King Street wing block. The floor edges were expressed at late date in design due to technical difficulties in coping with expansion problems when façade rose in a continuous membrane*

12 *View from typical Manchester alley. Highly reflective surface faithfully mirrors surrounding scene—and leads one to hope it will stay put! It would, for instance, be less interesting if windows reflected only another glass fronted Pall Mall Court*

between the buildings. This spirit of give and take between building owners, architects and the city authorities is also to be seen in Marsden Street—the only other elevation of significant interest. Here, the prow of the main block is allowed to project over the street and the complex levels have necessitated some very odd but exciting step formations.

In one or two places the design has got a little out of hand and guard rails are needed to keep people from going up or down flights with dangerously little headroom. Nevertheless, the overall result justifies small errors of judgment; a walk round the entire building reveals a constant change of scene and there is a pervading sense of adventure held together by a strict control of building materials.

The bronze painted aluminium, the bronze glass and the infill panels **10** present a continuous but highly modelled membrane to the building's surface. The original intention was to use only these few materials, but technical problems led to breaking the membrane at the floor edges, which were then covered with bronze mosaic.

The result is a much less sheer facade and a markedly different scale. The whole elevation immediately becomes more wrinkled and its true size more comprehensible. It is at this point that the juxtaposition with the National Westminster Bank becomes so satisfactory. The one grim, taut and massively scaled; the other all grace and humanly related. In an isolated and more mundane setting the expression of the floor edge would, one suspects, have been a detriment. Here one feels that technical limitations have dictated a happier solution.

A slight though perceptible worry is the clumsy provision for window cleaning on the wing blocks. The setback makes the problem more intractable, both as a projection on the low blocks and as a deep recession at the lower floors of the main block. The result is cumbersome gear permanently in view on the former **4** and a very inconvenient method of cleaning on the latter.

Subtle rhythms of the facades

The module of the main facades is subtle and adds greatly to the success of the building. Instead of simple 6ft wide bays 2ft apart, the bays are paired, with 2ft between each bay but 4ft between pairs of bays **11**. Natural ventilation is achieved by vertical sliding sashes in the 2ft and 4ft recesses where the sheltered position enables them to be opened in windy conditions. The wider spacing expresses the structural module of the block and is one of those touches that separates the men from the boys among designers. Few will stop to analyse exactly what is going on, but all, consciously or not, will get a perceptible 'lift' from the greater rhythm that this bigger module gives to the smaller scale of the bays.

Further evidence of such skill is to be seen at the bottom of the main block in the plaza. There the vertical scale is doubled by keeping the ground floor facade back from the main face and letting the columns 'read' through two floors. Similarly, the wing blocks are not permitted to come to ground in their glazed form but are stopped at main floor level, and the semi-basement is expressed with a chunky, dark brick podium, which in the original design was more simply handled and less chopped about with slit windows and clerestories resulting from the change of use from bulk store to bank.

Internal planning

Generally, the three blocks are an average of 50ft (15·2 m) wide and planned for a central corridor with standard offices and partitions or open areas **14**. It is at this point that the facade module reveals its weakness. The smallest office is 8ft (2·4 m) wide to centres of partitions and the clear space is too tight for proper furniture layout. They also look rather canyon-like being so narrow and long.

An alternative module is 10ft (3·05 m) wide, but this is over generous, and, the biggest drawback, there is no possibility of having several offices of similar size in a row. The architects point out that with the original brief with one user this would not have been so critical and that in any case the module is of no account in an open office. This may be true, but even the original brief was surely entitled to a little more flexibility. As for the open office, such plan forms are by no means commonly accepted yet and their application in such narrow widths can only give the concept a bad name.

It is generally accepted that 70ft (21·3 m) is an absolute minimum width to give true flexibility to open plan layouts and to have a hope of controlling the acoustic environment. It is interesting to note that the only tenant in the office blocks proper to try the open plan is an architect on the 30ft (9·74 m) width of the upper section of the King Street wing. Superficially, the appearance is pleasant, but there is little flexibility and a very low standard of acoustic privacy. The carpets and acoustic ceilings are no match for the highly reflectant glazed walls which on a 30ft (9·14 m) width form much too large a component of the sectional area.

Sheer walls of power and grace

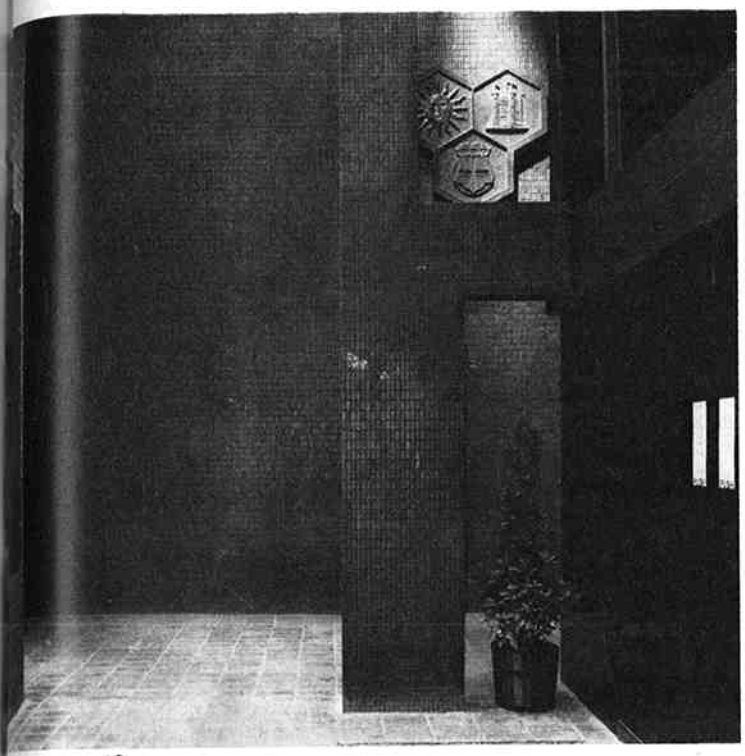
Contrasting with the highly modelled glazed membrane of the offices are the connecting lift and service cores. These are clad in a flashed bronze coloured mosaic apparently excellently and (one hopes for this material's reputation) permanently applied. The great sheer walls **15** are allowed to rise in their full height with no protrusion or glazed articulation. All windows are restricted to slits rising the full height and the result is one of sleek power and grace which forms a perfect complement to the indented glazed facades around them.

The most satisfactory tower is the main lift, stair and toilet block on King Street, which articulates the main and wing block and marks the main entrance. Vertical slits model its massive shape, and the single element interrupting the largest surface is the ingenious interlocked hexagons **4** symbolising the merger of the companies financing the project. The entrance porch itself is large scaled and imposing. The external mosaic surfaces flow through into the two storey foyer and make maximum use of the very limited, even pinched space of the foyer itself.

Articulation of spaces

The slightly irregular shape of the site has encouraged the designers to develop irregular shapes to the main blocks, and these are ingeniously resolved at the junctions and at the ends of the wings. On plan some of the spaces look inconvenient, but in fact there is no difficulty. Each major change in direction is carefully articulated with either a deep recess or one of the slit windows previously referred to. These slits give exciting views into the surrounding areas and out over the roofscape of Manchester **9**.

The main lift lobby area above ground floor level is carpeted in a rich plain gold colour which gives a touch of luxury, although tending to show each footfall. At ground floor and throughout the secondary entrance lobby and staircase system there is a brick tile floor and this is not so satisfactory. In the secondary stair and lobby the still untreated brick looks grubby and very substandard. In the main foyer **13** it has been treated with sealants, and as this



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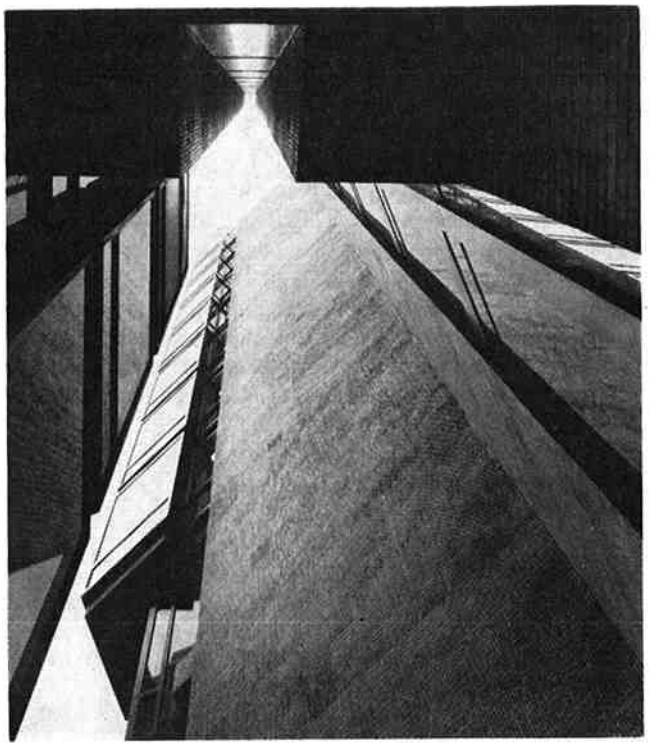


15

13 *Main entrance hall. Mosaics flow inside from exterior tower walls and cover all main surfaces. Architects designed company insignia and tenants nameplates—giving some freedom of type face*

14 *Interior of a general office in main block. Note carefully disposed lighting and metal slatted ceiling housing services and marking central corridor position*

15 *Looking up one of modelled service towers*



14

builds up it tends to destroy the character of the brick and makes one wonder why a glazed material could not have been chosen in the first place.

A further disadvantage is the necessity to cross the escape staircase landing to get from the main lift lobby into the King Street wing block. It is not a pleasant way to approach prestige offices such as these and it also makes direction finding more difficult.

Redesigning for tenants

At main floor level the offices of the Bank of America **16** are well handled and the views from the windows into the plaza and along Marsden Street are full of interest. In the King Street wing, the architects were faced with a tricky problem. The lower ground floor had been planned for storage, but at the last minute the Northern Commercial Trust rented the two bottom floors.

As a result of some quick redesigning, the interior spaces were connected with a double height banking hall, and after some negotiation, the tenants were persuaded to accept an entrance at the side, rather than directly off King Street. This works very well and preserves the unity and architectural expression of the lower levels of the block. The interior, however, designed by the company's architects, is disappointing. In so restricted a space, it is a mistake to use so many materials and complicated details. The classic and time-honoured way to handle problems like this is well demonstrated in the hall of the National Westminster Bank a few feet away across the piazza.

Money not wasted inside

In the office levels generally there is little of note. The limitations of the module have already been discussed and for the remainder the atmosphere is very much that of a typical commercial office block with vinyl tile floor finishes and plastered surfaces. A good quality movable partition, however, has been used throughout and this gives an above average sense of quality to the interiors.

Toilet accommodation seemed adequate and well up to standard even though toilets for each sex are provided on alternate floors. Money has not been wasted on demount-

able ceilings, and all surfaces and trunking above 7ft (2·15 m) has been painted matt black. The ceiling fittings have been chosen to avoid all upward spill of light and it is remarkable how little one notices the engine room atmosphere above one's head, even in so small a space.

From a user point of view the least satisfactory part of the entire scheme must be the basement car park. Its entrance is off Marsden Street and the 'tree box' in which the entrance appears has already been discussed. The planning, however, is extremely tight and big cars have great difficulty in negotiating the split level area.

Worst of all is the headroom, which is dangerously low in several places and there are places where ventilation trunking and other mechanical services come below 6ft (1·83 m) from the floor. Some modification is clearly necessary and one is again forcibly reminded of the general lack of first class integration of services into even the best of twentieth century buildings.

For architectural pilgrims

Planning problems in one basement, however, must not cloud the fact that in Pall Mall Court Manchester has acquired a building of great quality. It is the sort of thing architectural pilgrims would stop and study in any of the supposed meccas of architecture in Europe. It is of course only one bright star in a very dusty firmament, but together with its promising neighbour, one hopes that its influence will spread and that at long last this great business centre will spur more architects to their best endeavours.



16



17

16 *Bank of America employed own architect on interior of banking hall at lower ground level*
17 *Entrance lobby serving one of tenanted offices*

SUMMARY

Ground floor area: 12 360 sq ft (1148 m²).
Total floor area: 139 400 sq ft (12 950 m²).
Type of contract: RIBA (private edition) with quantities.
Tender date: October 1966.
Work began: November 1966.
Work finished: December 1968.
Tender price of foundation superstructure, installation and finishes including drainage to collecting manhole: £781 496.
Tender price of external works and ancillary buildings including drainage beyond collecting manhole: £7166.
Total: £788 662.

COST ANALYSIS

Based on tender	*Cost per sq ft* s d	*Cost per m²* £	*Per cent of total*
Preliminaries and insurances 11·48 per cent of remainder of contract.	**11 3½**	**6·08**	**10·07**
Contingencies 3·50 per cent of remainder of contract.	**3 5½**	**1·86**	**3·08**
Work below lowest floor finish Excavation over existing developed area to depths of 20ft with sheet steel piling to perimeter next to existing public roads and surrounding buildings—later replaced (except for small areas) with waterproof vibrated reinforced concrete retaining walls to basements. Pile foundations in clusters (eighty-one large diam in situ bored piles) with vibrated reinforced concrete ground beams and pile caps. 8in waterproof vibrated reinforced concrete ground floor slab with pvc waterstops, over 2in blinding layer of concrete.	**7 3**	**3·90**	**6·47**

STRUCTURAL ELEMENTS

	s d	£	%
Frame Vibrated reinforced concrete columns varying from 15in × 15in to 36in × 15in, mostly regular shapes, with some irregular at corners of blocks (beams included with upper floors).	**1 4¼**	**0·73**	**1·21**
Upper floors Coffered floor slab of vibrated reinforced concrete: 5036 sq yd, 140s 6d per sq yd (£8·40/m²). Construction, 1ft 2in tapered rib beams at 2ft centres extending across from central spine beam, to a perimeter beam. Whole area covered with 2½in reinforced concrete structural topping. Beams 3ft × 1ft 4in deep. Ribs span 15ft from spine beam to perimeter beam. 4in floor slabs: 453 sq yd, 70s 6d per sq yd (£4·22/m²). Do 6in: 2911 sq yd, 76s 8d per sq yd (£4·58/m²). Do 7in: 81 sq yd, 78s 10d per sq yd (£4·71/m²). Do 8in: 2100 sq yd, 82s 6d per sq yd (£4·93/m²). Do 9in: 18 sq yd, 84s 9d per sq yd (£5·07/m²). Do 1ft 2in: 246 sq yd, 99s 6d per sq yd (£5·94/m²). Do 1ft 6in: 12 sq yd, 141s per sq yd (£8·43/m²). Other floors reinforced concrete 6in softwood joisted: 58 sq yd, 27s per sq yd (£1·62/m²).	**8 5¼**	**4·54**	**7·52**
Roof Coffered roof slab of vibrated reinforced	**2 10**	**1·52**	**2·53**

	s	d	£	%
concrete: 594 sq yd, 241s per sq yd (£14·41/m²). 1ft 2in deep tapered rib beams at 2ft centres, extending across from central spine beam to perimeter beam. Whole covered with 2½in reinforced concrete structural topping and 2in lightweight screed, three layers asphalt membrane permanently flooded. Cast iron rainwater pipes and fittings. Vibrated concrete suspended slabs with 2in lightweight screed, three layer asphalt on a layer of sheathing felt and a topping of chippings. Sloping vibrated reinforced concrete suspended slabs to staircase wells with 2in lightweight screed, chicken wire reinforcement and three layer asphalt. Softwood joisted comprising 1in × 7in joists with 2in woodwool slabs, three layer felt covering. Softwood fascia panel and aluminium trim. Galvanised steel hollow section guard rail to parapet of main room: 454 linear ft at 28s 6d per linear ft. Staffordshire blue brick paviors pc 525s per thousand laid on asphalt roofs: 111 sq yd, 43s 6d per sq yd (£2·60/m²). 4in concrete slab: 36 sq yd, 136s per sq yd (£8·13/m²). Do 6in: 266 sq yd, 140s per sq yd (£8·36/m²). Do 8in: 188 sq yd, 147s per sq yd (£8·79/m²). Do 9in: 294 sq yd, 153s 6d per sq yd (£9·17/m²). Do 10in: 4 sq yd, 156s per sq yd (£9·33/m²). Do 10½in: 446 sq yd, 157s 3d per sq yd (£9·40/m²). 9in sloping: 66 sq yd, 163s 3d per sq yd (£9·76/m²). Do 12in: 113 sq yd, 211s per sq yd (£12·61/m²). Softwood: 100 sq yd, 64s per sq yd (£3·82/m²).				
Rooflights Three rectangular unventilated: 15 sq yd, £106 each. Two plastic prismoidal- 1 sq yd, £22 each.		0¾	0·03	0·06
Staircases	2	6¼	1·36	2·25

Staircase	*Total rise*	*Width overall tread*
In situ reinforced concrete with galvanised mild steel balusters and rails. Afrormosia handrail 1in × 6in blue-brick treads and risers		
Two main	117ft 9in	3ft 6in
One	62ft 6in	3ft 6in
One	64ft 6in	3ft 6in

External walls Vibrated reinforced concrete faced one side with Staffordshire blue brick pc 560s per thousand: 285 sq yd, 92s 10d per sq yd (£5·55/m²).	32	5¼	17·74	28·94
Vibrated reinforced concrete faced one side with black mosaic pc 100s per sq yd (£5·98/m²): 5177 sq yd, 187s 4d per sq yd (£11·20/m²). Aluminium external cladding in 'faceted' pattern on plan, glazed wholly in solar bronze glass. Asbestos fibre fire barrier between cladding and floor slabs. Full height slit windows aluminium frame and solar bronze glass: 7061 sq yd, 496s 1¼d per sq yd (£29·66/m²). Aluminium louvred ventilator extracts (designed to become part of external wall features): 39 sq yd, 400s 6d per sq yd (£18·03/m²). Cavity, one skin facing bricks pc 560s per thousand, 2in cavity, one skin common brickwork: 80 sq yd, 52s 0½d per sq yd (£3·11/m²).				
Windows Included in external walls.				
External doors Solar bronze glass to match cladding including cost of ironmongery fixed direct to glass, area of glazed screen to entrance lobbies: 947 sq ft, 82s per sq ft (£44·13/m²). Solid core flush 1¾in veneered on one face with teak; other face varies from 4in hardwood slats fixed vertically: 150 sq ft, 69s per sq ft (£37·14/m²). Do black mosaic finish to match wall. All in hardwood frames: 48 sq ft, 125s 6d per sq ft (£67·54/m²). No of single: 9. No of double: 6.		8	0·36	0·59
Internal structural walls 7in vibrated reinforced concrete: 3796 sq yd, 138s 11¼d per sq yd (£8·31/m²).	3	9	2·02	3·33
Partitions 9in common brickwork painted both sides: 118 sq yd, 60s per sq yd (£3·59/m²). 4in lightweight blocks: 1413 sq yd, 25s per sq yd (£1·49/m²). 1in blockboard to wc in steel framework including doors, butts, etc: 206 sq yd, 152s 0¾d per sq yd (£9·09/m²). Main office areas not provided with partitions.		5¾	0·26	0·43
Internal doors Solid core flush 1¾in with plywood face both sides in hardwood frames: 113 sq ft, 14s 3d per sq yd (£7·67/m²). Solid core fire resistant flush 1¾in in hardwood frames: 64 sq ft, 26s per sq ft (£13·99/m²). 1in blockboard in softwood frames: 140 sq ft, 9s per sq ft (£4·84/m²). Solid core flush 1¾in with two louvred panels 2ft × 1ft 6in in face in hardwood frames: 39 sq ft, 65s per sq ft (£34·98/m²). Solid core flush 1¾in with plywood face one side and teak veneered face other side in hardwood frames: 498 sq ft, 30s 6d per sq ft (£16·42/m²). Solid core flush 1¾in, with teak veneered faces both sides in hardwood frames: 983 sq yd, 32s 6d per sq ft (£17·49/m²).	1	5¼	0·77	1·28

	s	d	£	%
Solid core flush 1¾in with teak veneer both sides and 4in × 6ft 4in vision panel glazed in ¼in wired glass beads both sides in hardwood frames: 2189 sq ft, 44s per sq ft (£23·68/m²). Steel roller shutter and frame: 255 sq ft, 108s per sq ft (£58·13/m²). Steel fireproof doors and frames: 6 sq ft, 476s per sq ft (£256·18/m²). Softwood framed, bulkheads faced in asbestos: 2045 sq ft, 6s 10d per sq ft (£3·68/m²). No of single: 105. No of double: 69.				
Ironmongery Steel butts, laminated plastic kicking plates, 4in push plates, fixed vertically for full height of door. Overhead door closers in satin anodised aluminium. Anodised aluminium furniture. Tubular steel black nylon coated pull/push handles to full height of doors on both faces.		9	0·40	0·67
Total of structural elements	54	8¾	29·46	48·81

FINISHES AND FITTINGS

Wall finishes ½in hard plaster finish on concrete and brickwork: 5958 sq yd, 10s per sq yd (£0·59/m²). Internal black mosaic finish to circulation areas fixed with adhesive on cement rendered backing: 1656 sq yd, 145s 4d per sq yd (£8·08/m²). White glazed tiling 6in × 6in × ¼in to lavatory areas fixed with adhesive on cement rendered backing: 989 sq yd, 43s 6d per sq yd (£2·60/m²). Cement and sand render ⅜in to brickwork or concrete left to receive paint: 2069 sq yd, 10s 7d per sq yd (0·63/m²). Two and three layer vertical asphalt tanking left as finish to walls: 50 sq yd, 45s per sq yd (£2·61/m²). Aluminium channel section ½in × ⅝in × 1/16in at jambs of openings: 5074 linear ft, 2s 8d per linear ft.	2	8	1·44	2·38
Floor finishes 1½in granolithic paving on concrete: 1341 sq yd, 15s 4d per sq yd (£0·91/m²). 6in × 6in × ⅜in Staffordshire blue quarry tile pavings pointed in black cement: 366 sq yd, 42s per sq yd (£2·51/m²). 9in × 4½in × ⅜in Staffordshire blue paviors pc 569s per thousand pointed in black cement: 47 sq yd, 45s 1d per sq yd (£2·61/m²). 1⅜in cement and sand screeded bed in office areas: 9258 sq yd, 12s 3d per sq yd (£0·73/m²). Carpet in lobby areas: 672 sq yd, 94s 11d per sq yd (£5·67/m²). Three layers asphalt tanking as floor finish: 53 sq yd, 28s per sq yd (£1·67/m²). 1in × 4in softwood skirtings: 2204 linear ft, 2s 8d per linear ft. ⅝in × 4in hardwood skirtings: 3466 linear ft, 3s 11d per linear ft. 1in × 9in softwood wall strings: 779 linear ft, 6s 9d per linear ft. 1½in × 1⅝in softwood carpet battens: 1902 linear ft 1s 3d per linear ft. No floor finish provided to main office areas.	1	9	0·94	1·56
Ceiling finishes ½in render and set in hard plaster on soffits of concrete varying from 7ft 6in to 16ft high in main areas: 728 sq yd, 12s 3d per sq yd (£0·73/m²). ⅜in plasterboard and skim on softwood joists: 78 sq yd, 11s 4d per sq yd (£0·67/m²). Expanded metal suspended ceiling ⅜in lathing on 1in × 3/16in runners at 2ft centres and hangers 2ft 4in girth at 3ft centres (false ceilings above lobby/staircase areas): 606 sq yd, 30s per sq yd (£1·79/m²). Demountable suspended ceiling of aluminium strips 4in wide clipped to metal frame and hangers (along centre of main areas, and to parts of lobby and staircase wells): 244 sq yd, 70s per sq yd (£4·21/m²). ⅝in cement and sand backing externally on concrete varying from 7ft 6in to 46ft: 609 sq yd, 18s 11d per sq yd (£1·12/m²). No ceiling finish was provided in main office area.	4		0·18	0·30
Decoration Two coat emulsion paint on plaster, woodwool asbestos panels, concrete brickwork. Zinc chromate primer two undercoats and one coat hard gloss on surfaces of cladding internally and externally. Knot prime stop and two undercoats and one matt coat on woodwork internally and externally. Matt finish teak oil on hardwood internally. Prime and two undercoats and one hard gloss coat on metalwork internally and externally.	1	0	0·54	0·89
Fittings Kitchen, signboards, heater casings within faceted section of window, shelving, hat and coat rails, built-in units in caretaker's flat, cupboards for electrical distribution equipment, etc, on each floor.	2	1	1·12	1·86
Total of finishes and fittings	7	10	4·22	6·99

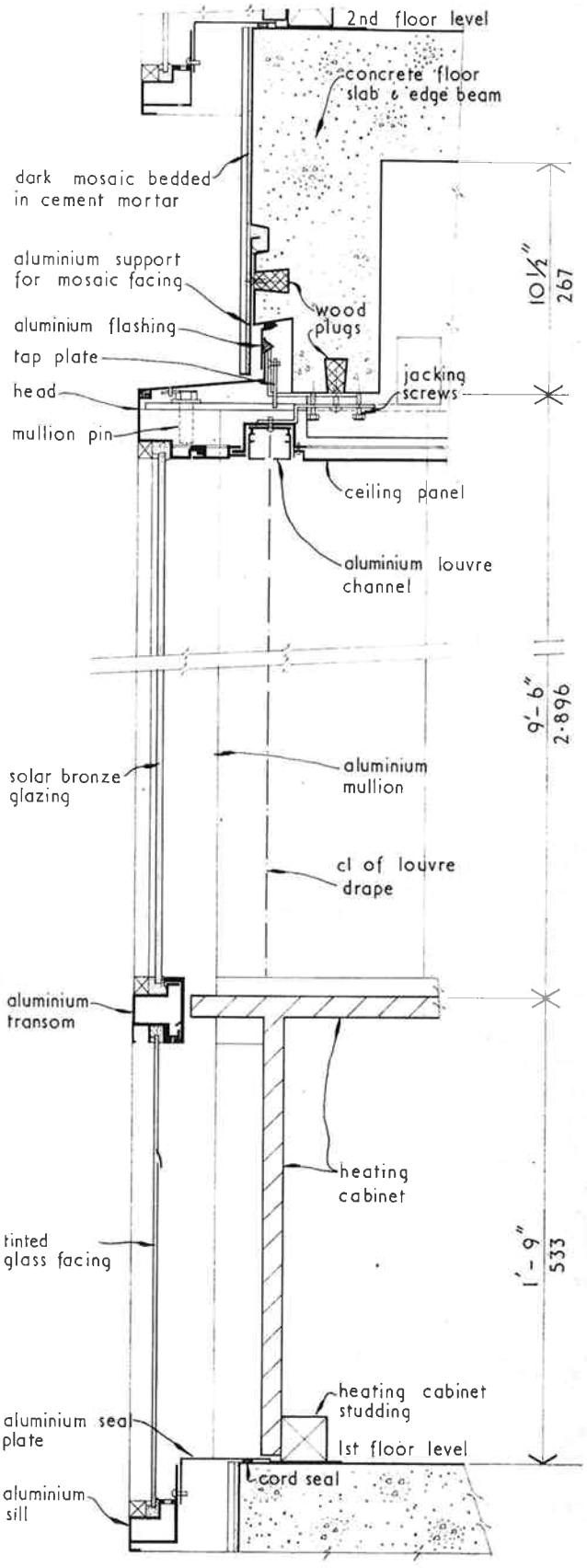
SERVICES

Sanitary appliances		6¼	0·28	0·46

Type	*No of each type*
Vitreous fireclay sinks	16
Do lavatory basins	48
Do urinal bowls in ranges with central cisterns	7
Stainless steel sinks	15
Vitreous glazed fireclay wc suite	47
Cast iron bath	1
Chromium plated towel rails	46
Do toilet roll holders	47

Waste, soil and overflow pipes Medium weight cast iron pipes. Copper		6	0·27	0·45

	s	d	£	%
wastes and overflows. Small amount of plastic waste (in caretaker's flat). Single stack system.				
Cold water services Underground quality copper mains and light gauge copper distribution pipework, chromium plated where exposed in lavatory areas with automatic water booster equipment, galvanised steel storage tanks. Storage capacity of tanks: 5020 gals. No of cold-draw off points: 125 Builder's work included in price.		8¼	0·37	0·61
Hot water services Light gauge copper distribution pipework electrically operated water heaters, draw offs terminating in ducts at each floor. No of hot-draw off points: 79. Builder's work included in price.		11	0·49	0·82
Heating services Mild steel tube with screwed joints, plastic insulation in plant rooms and sectional insulation in ducts. Two oil fired boilers of steel welded construction, each providing 2 200 000 Btu/h complete with brickwork flue and firebrick lining. Steel gantries, ladders and handrails. Two mild steel welded oil storage tanks with fusable link supply to boiler in separate compartment. Mild steel panel radiators. Foam fire fighting installation to boiler house and oil storage tanks. Steel welded expansion tank and feed capacity 200 gals. Centrifugal pump distribution on three phase electrical supply running at 1450 rpm. Two handling 280 gal/min against a head of 30ft, two handling 280 gal/min against a head of 25ft, and two handling 85 gal/min against a head of 15ft. Fan convector system working on low pressure supply producing 9960 Btu/h with a water temperature of 79·4°C. Total heat load: 4 409 960 Btu/h.	9	11	5·34	8·84
Ventilation services Galvanised steel ducted system designed to handle 1520 cu ft of air per minute at a noise level of less than 50dB and a fan speed of 945 rpm.	1	4¼	0·73	1·21
Electrical installation Arranged so each tenant can be separately metered from the supply authority's services. Main cable distribution is in paper insulated lead covered single wired armoured and served cable which supplies four rising bus-bars. Installation is by pvc cable in conduit. Lighting to staircases and exit route is supplemented by battery operated emergency lighting system. Underfloor trunking provided throughout enabling power outlets, telephone points, etc, to be positioned as tenants require. Extensive fire alarm system actuated by automatic detectors giving direct connection to fire station (price includes for electrical equipment only under this element).	5	0	2·69	4·46



Detail through King Street facade (1:8)

Breakdown of electrical services	*Cost per sq ft* s	d
Meter and switchgear	1	1
Lighting installation		8
Power installation	2	4
Light fittings		6

Builder's work: 5d.
Total no of lighting outlets: 1322.

	s	d	£	%
Total no of power outlets: 954.				
Special services Three thirteen passenger lifts operating on a 415 volt three phase electricity supply at a speed of 300 ft/min. One 1500lb service lift operating at a speed of 200 ft/min. Lightning conductors. Window cleaning gear of cradles and rails (electrical power included in Electrical services). Refuse chutes. Sprinkler system (exclusive of electrical installation to alarms). Hose reels with dry risers.	8	1	4·35	7·21
Drainage Salt glazed stoneware and cast iron pipework to combined soil and surface water system: Petrol interceptor to car park drainage. Price includes cost of last collecting chamber.		7	0·31	0·52
Total of services	27	6¾	14·83	24·58
Total per sq ft of floor area: £781 496 (net cost excluding external works)				
139 400 sq ft (measured inside external walls)	112	1½	60·35	100·00
External works Piazza area raised 8ft from ground level, blue brick paviors pc 500s per thousand and 2in reconstructed York stone paving slabs 2ft × 3ft laid in alternate bands 3ft wide, with perimeter steps of blue brick paviors. Tree box area of vibrated reinforced concrete battened walls faced with blue brickwork pc 560s per thousand and lined internally with asphalt. Galvanised steel car park gates. Galvanised steel handrails to entrances. Repairs to existing public pavement areas.				

COST COMMENT

A prestige office block always attracts attention and this scheme has some fascinating aspects, notably the overall price of 112s 0½d per sq ft obtained by competitive tender in October 1966.

As is common where a built up city site is redeveloped, the foundations posed expensive problems, resulting here in a cost of 7s 3d per sq ft of floor area. This is a price per unit area of actual foundations of 82s per sq ft, which includes for sheet piling and complex pile foundations.

In view of the proliferation of slab sizes and thicknesses, the structural frame and upper floors constructed of in situ reinforced concrete work out economically at a combined cost of 9s 9½d per sq ft. The roof element also comprises several different plans shapes according to location, with one area permanently flooded over three layers of asphalt, and other areas covered in Staffordshire blue paviors.

Most comment should be focused on the external wall and window elements, achieved at an elemental cost of 32s 5¼d per sq ft. The relatively high ratio of combined wall and window to floor of 1:0·83 contributes in part to the high proportion (29 per cent) of total expenditure attributable to this element. The window units over 56 per cent of the elevation area are most interesting, and work out at a relatively high cost with a unit rate of 55s 2d per sq ft, which includes the bronze solar glass. This has to be compared with the cost of mosaic faced concrete wall at a unit cost of 20s 9d per sq ft to approximately 40 per cent of the remaining elevation area. One immediately queries when the windows are at this cost level why it was not considered appropriate to specify bronze coloured anodised aluminium as a self-finished component instead of aluminium painted bronze colour.

After expenditure on this generous scale the internal arrangements described in the cost analysis have a Spartan look about them—though here the 'tenancy' arrangements have played an important part.

The cost analysis shows only those items which the client/landlord was obliged to provide in the communal areas, eg wall, floor and ceiling finishes to entrance halls, circulation areas and cloakroom accommodation. The remainder of the work to the tenancy areas has been provided and paid for by the tenants and does not feature in this cost analysis. The landlord items are therefore easily identified, notably the black mosaic at 145s 4d per sq yd, used to give the interior of the building a prestigious appearance and design theme. These landlord areas are, however, minor by comparison with the extremely large areas left untreated, so that the analysis figures are distorted when they show an apparent floor area cost of 7s 10d per sq ft for the finishes and fittings section.

Services totalling 27s 6¾d show comparable treatment by providing basic landlord's provision of plumbing at 2s 7½d per sq ft, heating at 9s 11d per sq ft, and electrical services at 5s per sq ft. Special services including lifts and other necessary specialist items work out at 8s 1d per sq ft.

External works provided on this restricted site are minimal. The cost was £7166 and although high quality materials were employed this represents less than one per cent of the overall expenditure.

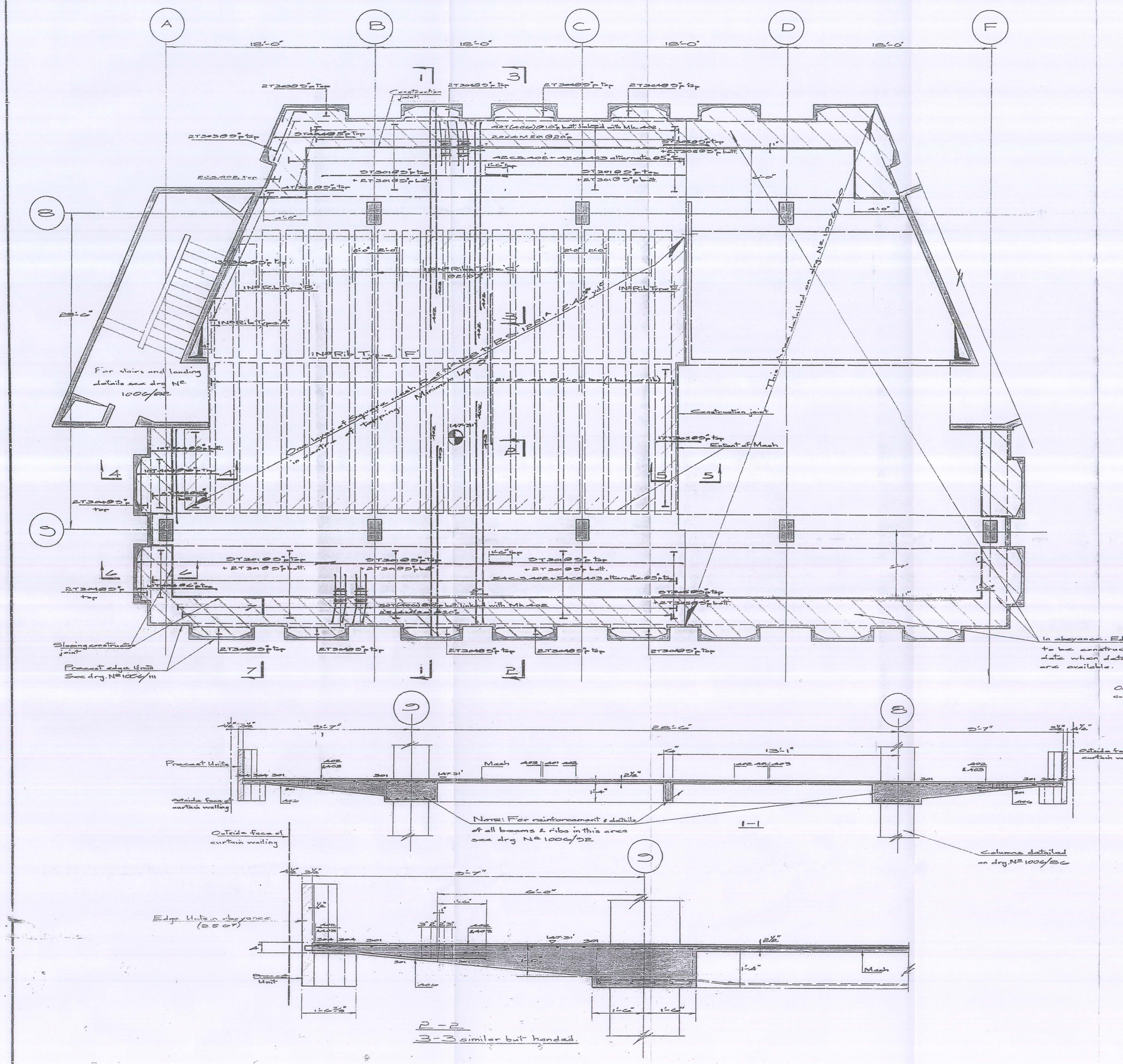
CONTRACTORS

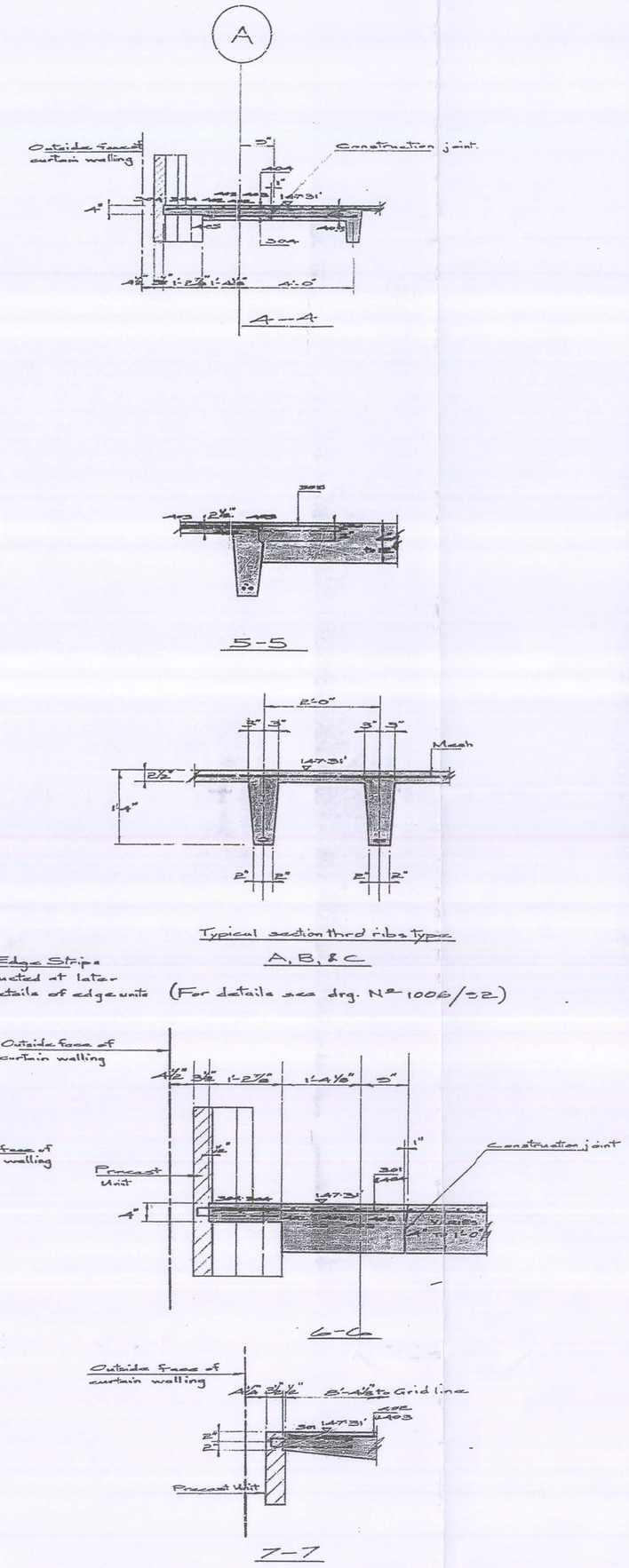
Main contractor: J. Gerrard & Sons Ltd. *Subcontractors and suppliers: Electrical installation:* Andrews-Weatherfoil Ltd. *Design, supply and erection of curtain wall, windows, and entrance glazed screens:* C-H Aluminium Ltd. *Supply and installation of solar bronze glass:* Wright & Offland Ltd. *Supply and planting of mature plane trees:* Economic Forestry Group. *Carpets:* Ellwoods (Fabrics) Ltd. *Lift system:* Express Lift Co Ltd. *Tree box planting:* Malcolm Forster. *Lightning conductor installation:* N. J. Furse & Co Ltd. *Asphalt roofs and insulating roofing screeds:* Limmer & Trinidad Co Ltd. *External signs:* Lundsigns. *Steel fire doors and sprinkler system:* Mather & Platt Ltd. *Heating, hot and cold water supply and extract ventilation:* Marris Warming Co Ltd. *Window cleaning gear:* Palmers Engineering Ltd. *Piled foundations:* Piggot Foundations Ltd. *Mosaic facings:* Proctor & Lavender Claddings Ltd. *Marking out of car park:* Norman Smith (Congleton) Ltd. *Louvre drape blinds:* Stilsound Blinds Ltd. *Suspended ceilings:* Stilsound Ceilings Ltd. *Titus grilles:* Air Distribution Ltd. *Ironmongery to flat, engraved stainless steel plates to dry riser door:* G. & S. Allgood Ltd. *Emergency light fittings in circulation space:* Atlas Lighting Ltd (British Lighting Industries Ltd). *Heater cabinet control knobs:* Samuel Buckley & Co Ltd. *Special blue floor tiles:* Hathern Ware Ltd. *Special blue facing bricks for walls, steps and external pavings:* Hawkins Tiles (Cannock) Ltd. *Ironmongery:* Laidlaw & Thompson Ltd. *Teak veneers:* William Mallinson & Sons. *Bronze plaque:* Rudolf Maochke. *Engraved nameplates:* J. D. C. Summers & Co. *Refuse chute components:* Trueflue Ltd. *Cut separate letters:* Ward & Co (Letters) Ltd.

7.0 APPENDIX B

Original floor plans for the King Street block, Pall Mall Court, King Street, Manchester

(by Cyril Blumfield & Partners)





Notes

1/ Reference drawings
a) For general arrangement see drgs. No. 1006/6.
b) This drawing must be read in conjunction with drgs No. 1006/90 & 92.

2/ Concrete
a) All concrete to have a cube strength of 4500#/□" at 28 days.

3/ Cover to reinforcement
a) ½" cover to steel in slab unless noted otherwise.

4/ Reinforcement
a) Reinforcement is designated in a system of eighths e.g. 401 denotes ½"ø
b) High tensile reinforcement prefixed 'T' e.g. T401. Lanes. 80 steel prefixed CS.
c) Refer to bending schedules No. 1006/91/1^ for reinforcement detailed on this drawing.
d) All reinforcement on this drawing is prefixed with drg. No. 91.
e) Top steel indicated dotted on plan & noted top
Bottom " " solid " " " bott.

5/ Construction
a) Position of all construction joints to be approved by structural engineers.
b) Top steel to be maintained in its specified position by the provision of an adequate number of chairs and must not be displaced during concreting operations.
c) All construction joints to be wire brushed to to expose aggregate & provide a rough joint

REF.	AMENDMENTS	DATE
A	Construction joints added to enable edge strips to be cast at a later date when details of edge units are available	8.5.67

KING STREET MANCHESTER

ARCHITECTS: A. H. BROTHERTON & PTNERS IN ASSOCIATION WITH BRETT & POLLEN

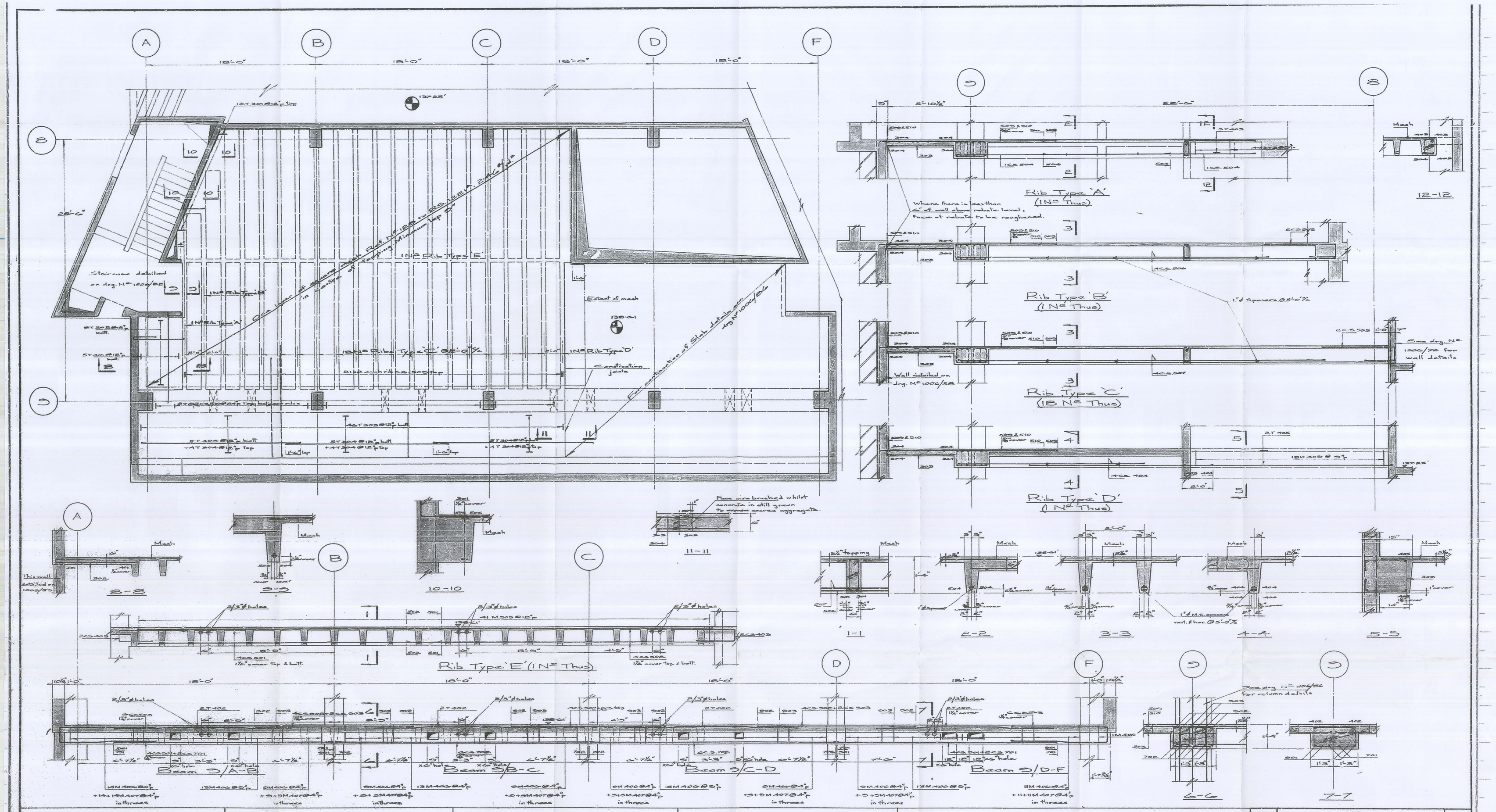
R.C. DETAILS OF GROUND FLOOR SLAB-KING STREET BLOCK (SHEET 2)

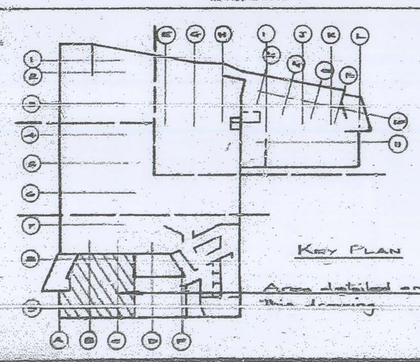
SCALE: ¼", ⅜" & ¾" TO 1'-0"

DRAWN BY: A.F.M. DATE: 14.2.67.

DRG. No. 1006/91 A

CYRIL BLUMFIELD & PARTNERS
CONSULTING, CIVIL & STRUCTURAL ENGINEERS
32, CORKRAN ROAD, SURBITON, SURREY.
128 BUCKINGHAM PALACE ROAD, WESTMINSTER, S.W.1





NOTES

1/ Reference Drawings
a) For general arrangement see drgs No 1006/19 to 24 inclusive.

2/ Concrete
a) All concrete to have a 28 day cube strength of 4500#/□".

3/ Cover to main Reinforcement.
a) ½" to steel in 6" slab.
b) As noted to steel in ribs & topping.
c) 1¼" cover to beam main steel.

4/ Reinforcement
a) Reinforcement is designated in a system of eighths e.g. 401 denotes ½"ϕ.
b) High tensile reinforcement prefixed 'T' e.g. T301 Lones 80 steel prefixed C.S. e.g. C.S. 601.
c) See bending schedules 1006/87/1 to 3 for reinf. detailed on this drg.
d) All reinforcement relative to this drawing is prefixed with drg. No 87.
e) Top steel indicated dotted on plan & noted top. Bottom " " solid " " bott.

5/ Construction
a) Position of all construction joints to be approved by structural engineers.

REF.	AMENDMENTS	DATE

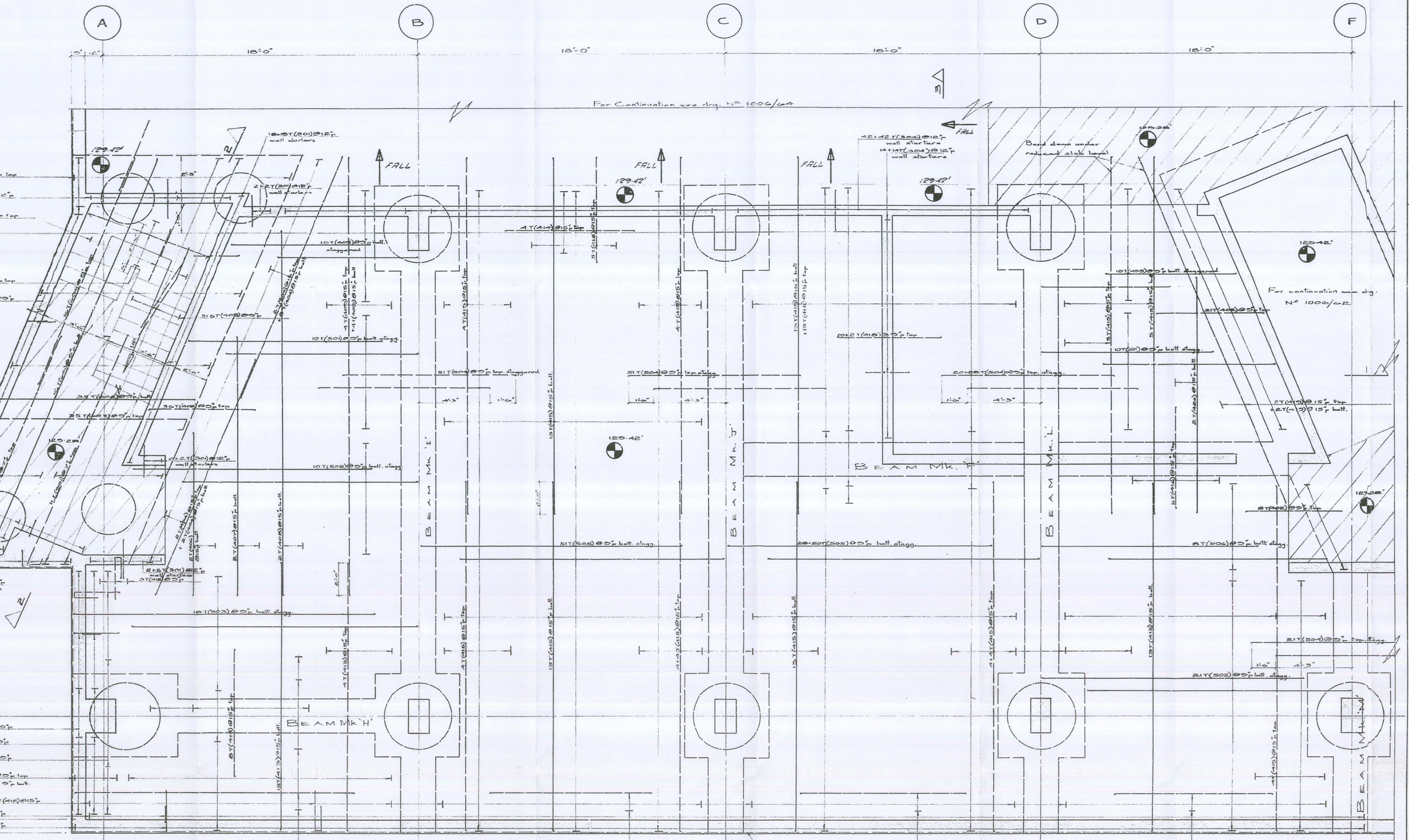
KING STREET MANCHESTER

ARCHITECTS: A.H. BROTHERTON & PTNRS IN ASSOCIATION WITH BRETT & POLLEN.

R.C. DETAILS OF LOWER GROUND FLOOR SLAB. KING. ST. BLOCK. (SHEET 2)

SCALE: ¼", ⅜" & ¾" TO 1'-0"
DRAWN BY: A.F.M.
DATE: 2.2.67.
DRG. No. 1006/87

CYRIL BLUMFIELD & PARTNERS
CONSULTING, CIVIL & STRUCTURAL ENGINEERS
37 CORKRAN ROAD, SURBITON, SURREY.
139 BUCKINGHAM PALACE ROAD, WESTMINSTER, S.W.1



Notes

1/ Reference drawings
a) For general arrangement see drgs. Nos 1006/A, 13, 18, 23.

2/ Concrete
All concrete to be mix A.W. i.e. 28 day cube strength of 4300 p.s.i. Watertight.

3/ Cover to Main reinforcement
1½" to bottom steel in slab
3/4" to top steel - unless noted otherwise.
1" side cover to 7" wall starters
1½" outside face & 1" inside face to 9" wall starters.

4/ Reinforcement
a) Reinforcement is designated in a system of eighths e.g. (40) denotes 5/8" ϕ.
b) High tensile reinforcement prefixed 'T' e.g. T(40)
c) See bending schedules 1006/A7/1 to 3. for reinf. detailed on this drawing.
d) All reinforcement relative to this drg. is prefixed with drg. No A7.
e) Top steel indicated dotted on plan thus - - - -
Bottom " " full on plan " ———

5/ Construction
a) 2" blinding layer of concrete to be placed under beams & slabs but not carried over pile heads.
b) Position of all construction joints to be approved by structural engineers.
c) Ground to be compacted sufficiently to support the beams & slab when placed.
d) References should be made to the Bill of Quantities page E4, item A, for conditions on construction procedure for watertight concrete.
e) Top steel must be maintained in its specified position by the provision of an adequate No. of chairs and must not be disturbed during concreting operations.

REF.	AMENDMENTS	DATE

KING STREET MANCHESTER

ARCHITECTS
A.H. BROTHERTON & PTNRS. IN ASSOCIATION WITH BRETT & POLLEN

R.C. DETAILS OF BASEMENT SLAB - KING ST. BLOCK

SCALE: 3/8" to 1'-0"
DRG. No. 1006/47
DRAWN BY: A.R.M. DATE: SEPT. 66

CYRIL BLUMFIELD & PARTNERS
CONSULTING, CIVIL & STRUCTURAL ENGINEERS
74, WORPLE ROAD, SURBITON, SURREY.
2, BUCKINGHAM PALACE GATE, WESTMINSTER, S.W.1

N54 172

8.0 APPENDIX C

A noise assessment of the proposed roof mounted plant by Randtech Consulting

Ref: MDR/J1459a

28th March 2013

Airology Systems ltd

The Cart Block

Chestnut Court

Jill Lane

Redditch

Warwickshire

B96 6ES

For the attention of Mr A Swift

Dear Sirs

Re: Pall Mall Medical Centre, Pall Mall Court, Manchester, Proposed roof Mounted Plant – Noise Assessment

Further to your recent instruction we are pleased to forward our noise assessment for the proposed plant to be mounted on the 5th floor roof plant compound.

The proposed plant consists of :-

- 2No. Mitsubishi PURY-P800YSJM-A heat pumps - noise rating 63.5dBA SPL @3m free-field
- 2No. Mitsubishi PUHZ-RP125VKA heat pumps - noise rating 52dBA SPL @ 3m free-field

Please see attached product information sheets.

The 4No. heat pump units are to be located in a louvred plant compound on the 5th floor roof; please see attached site plans. The nearest windows that have line of sight to the plant location are

approximately 15m, 17m, 30m & 48m distance; the windows are in offices, closed and assumed to be at least 6mm single glazed format for noise assessment purposes.

The roof mounted heat pumps will be operational during the working hours of the medical centre to provide heating and cooling, taken to be normal office hours.

The noise criteria advised by the local planning authority is that the combined plant noise should be at least 5dBA below the prevailing background noise level for any locally sensitive receptors. For the proposed plant the locally sensitive receptors would be people working in offices overlooking the roof mounted plant.

If we consider a minimum distance to an office window is 15m and assume a hemispherical free-field radiation pattern for the plant radiated noise, the total plant radiated noise at a distance of 15m would be 52.5dBA. Given that the receptors of the plant noise will be located behind closed 6mm thick glazed windows a nominal reduction for plant noise transmitted through the closed windows will need to be applied to the plant radiated noise. With reference to Planning Policy Guidance 24, a guidance document used until recently by most local planning authorities when considering external environmental noise affecting residential buildings, Table 1 in Annex 6 gives typical noise reductions in dBA for single and double glazed windows from various environmental noise sources. For closed single glazing subjected to road traffic noise the typical reduction quoted is 28dBA. If we use this as a typical reduction for the closed single glazed office windows at 15m distance from the proposed roof mounted plant the typical resultant noise level within the office room would be 24.5dBA. The typical ambient noise level within an office would be at least 40dBA and with the proposed plant noise being significantly less than 30dBA in the offices the plant operation would be inaudible.

If we consider the proposed plant noise radiated to an external location such as the pavement on King Street with line of sight to the louvred plant compound on the 5th floor roof, the distance from the plant to the pavement location would be at least 50m. The free-field radiated plant noise corrected for 50m distance would be 42.0dBA. With reference to the Rod Lane Acoustics 2008 survey, (see attached report) which gives the results of environmental noise measured at various locations in the Pall Mall Court locality, there are three measurement locations at pavement level outside Pall Mall Court, the average L_{A90} levels range from 51.2 – 55.7dB for the day and night time periods. If we assume a minimum L_{A90} background noise level for the pavement location in King Street 50m from the plant location the plant noise would be 9.2dB below the background level, significantly less than the 5dB below background that has be requested.

Ref: MDR/J1459a

Conclusion

The proposed 4No. heat pumps to be located within the louvred plant compound on the 5th floor roof will be unlikely to cause any noise nuisance to the occupants of offices with closed glazed windows overlooking the plant location and people at street pavement locations within the locality. The radiated plant noise should always be significantly below the design criterion requested of 5dB below background at the location of any noise sensitive receptors. When locating the proposed plant in the 5th floor louvred compound no noise mitigation will be required.

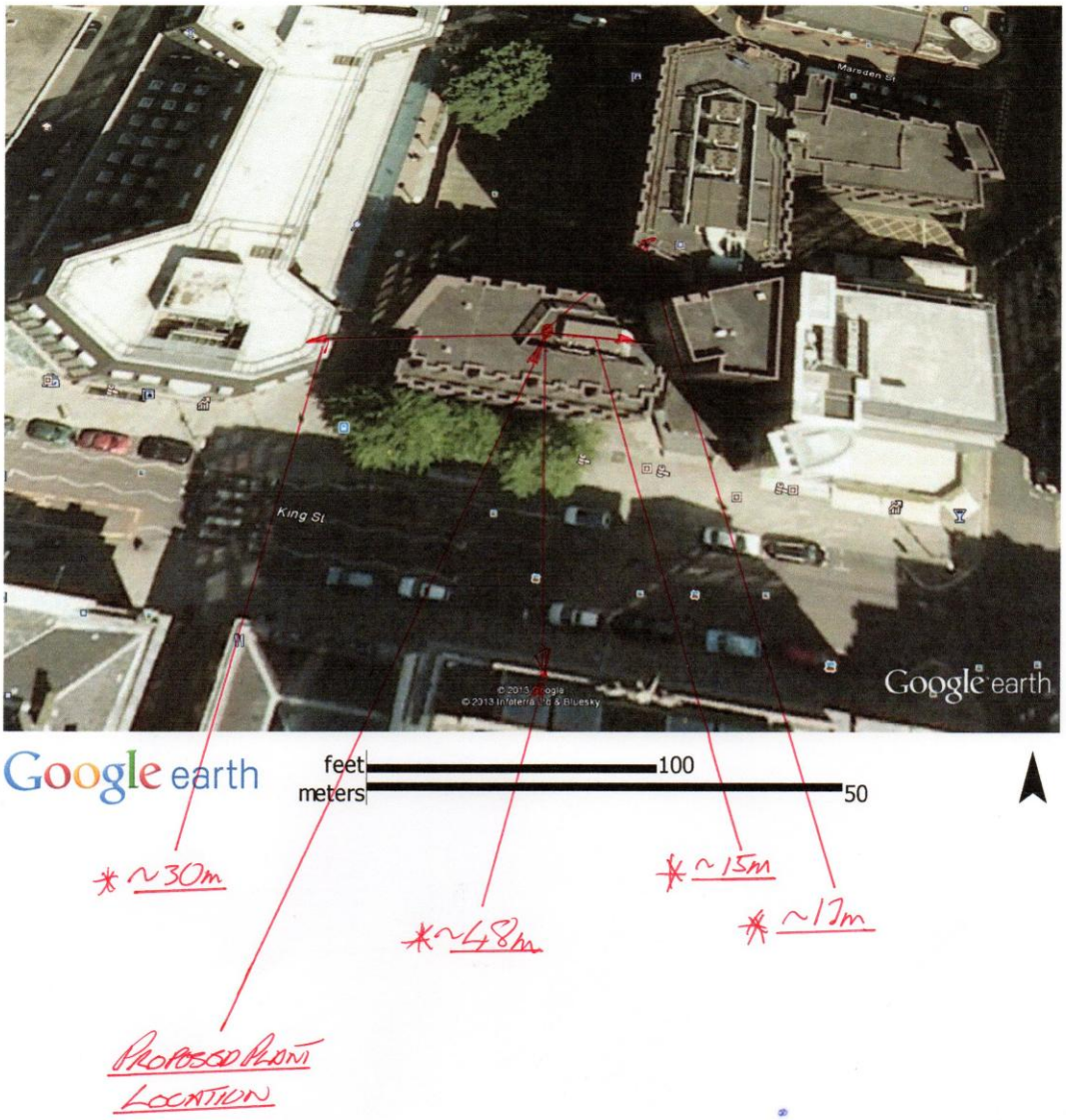
We trust the noise assessment meets with your satisfaction, however, should you have any queries please do not hesitate to contact us. Assuring you of our close co-operation at all times, we remain.

Yours faithfully



M D Randall BSc(Eng) CEng MCIBSE MIOA

RandTech Consulting 90 Park Avenue North Northampton NN3 2JD Tel 01604 451213
Fax 01604 513539 Mob 07966 913809 E-mail mdrand1@aol.com www.randtech–consulting.co.uk

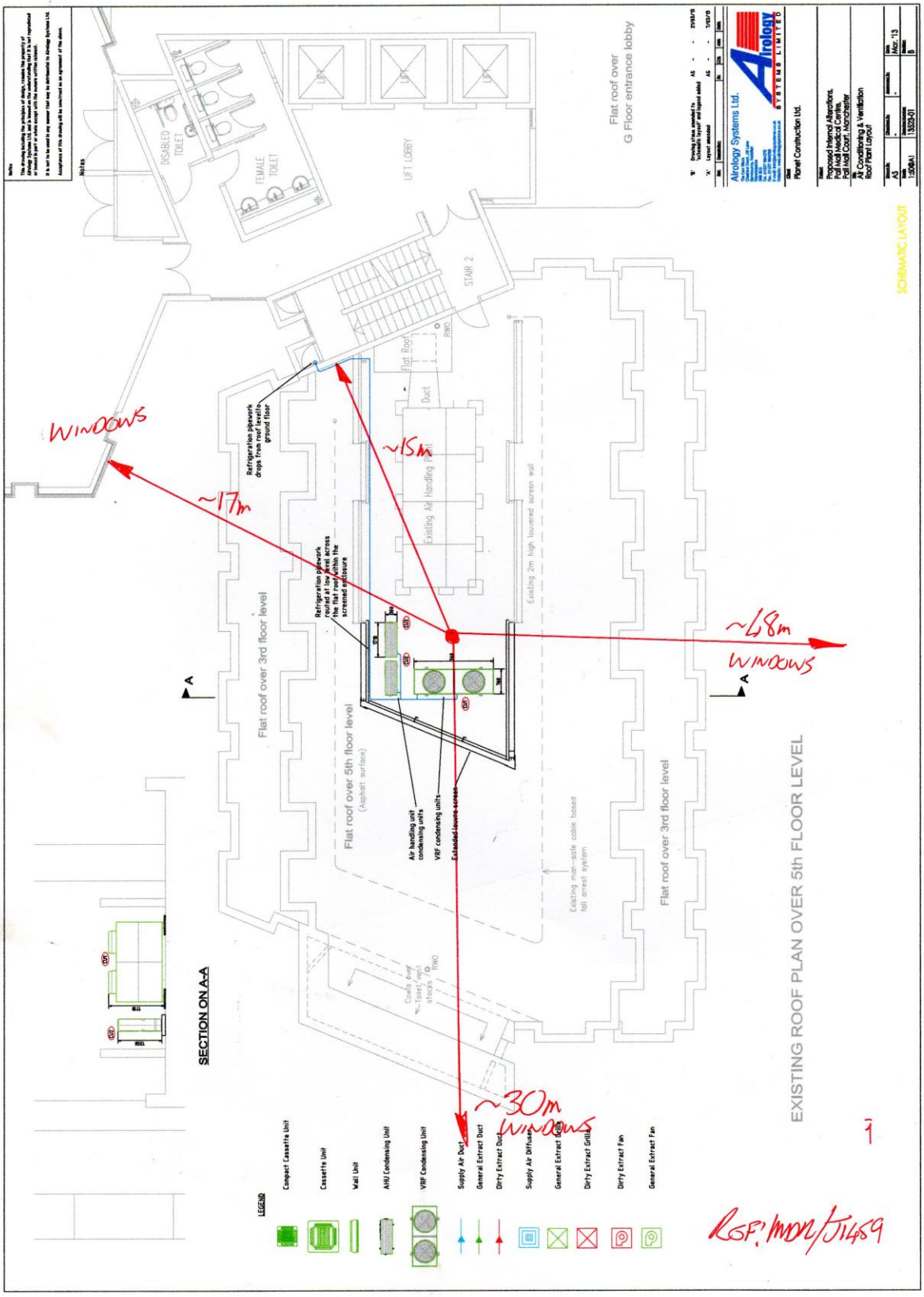


* DISTANCES TO NEAREST WINDOWS

SITE PLAN

REF: MDR/JJL59

RandTech Consulting 90 Park Avenue North Northampton NN3 2JD Tel 01604 451213
Fax 01604 513539 Mob 07966 913809 E-mail mdrand1@aol.com www.randtech–consulting.co.uk



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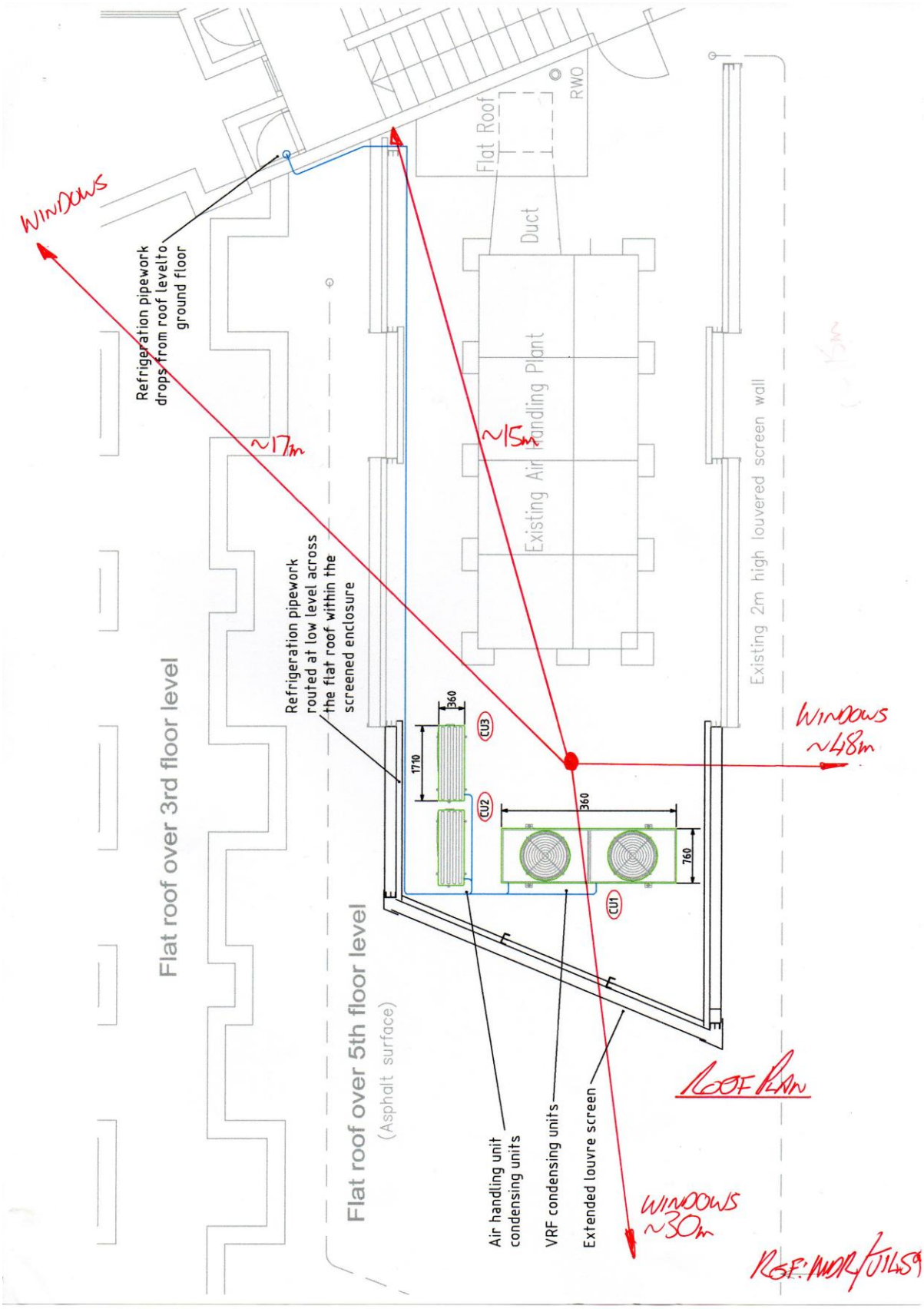
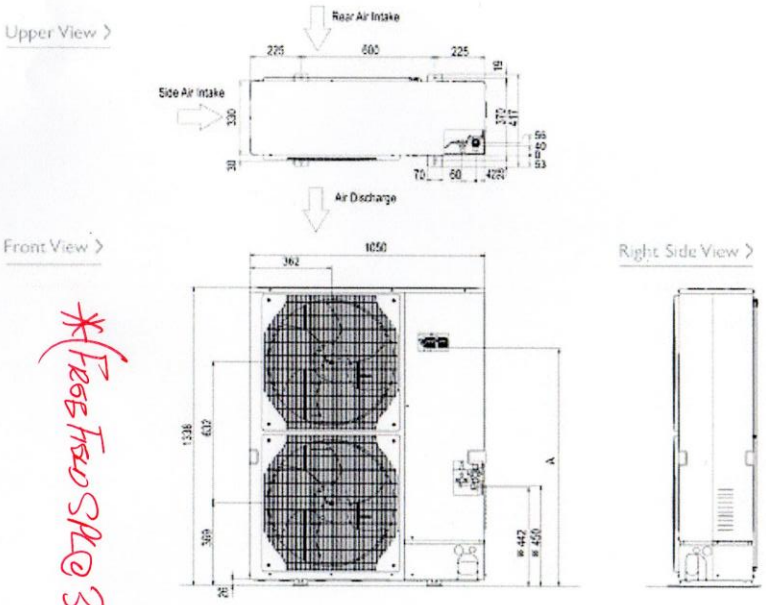
Fax 01604 513539 Mob 07966 913809 E-mail mdrand1@aol.com www.randtech–consulting.co.uk



RandTech Consulting 90 Park Avenue North Northampton NN3 2JD Tel 01604 451213
Fax 01604 513539 Mob 07966 913809 E-mail mdrand1@aol.com www.randtech–consulting.co.uk

PUHZ-RP125VKA Outdoor Unit	
Width - mm	1050
Depth - mm	330+30
Height - mm	1338
Weight - kg	116
* Noise (dBA) (Heating /Cooling) - Lo-Hi	52 /47-50 *
Electrical Supply	220-240v, 50Hz
Phase	Single
Fuse Rating (BS88) - HRC (A)	32
SystemPower Input (kW) - Heating (Nominal)	3.5
SystemPower Input (kW) - Cooling (Nominal)	3.67
SystemPower Input (kW) - Heating (UK)	3.12
SystemPower Input (kW) - Cooling (UK)	3.12
Starting Current (A)	5
SystemRunning Current (A) - Heating / Cooling	16.02 / 16.73
Mains Cable No. Cores	3
Max Pipe Length (m)	75
Max Height Difference (m)	30
Charge (kg) - 30m	5

PUHZ-RP125VKA



*(FREE FIELD SPL @ 3m)

RGF: MDR/J1459

MITSUBISHI ELECTRIC
AIR CONDITIONING SYSTEMS

Telephone: 01707 282880
Email: air.conditioning@meuk.mee.com Website: http://www.mitsubishielectric.co.uk/aircon

Mitsubishi Electric reserves the right to make any variation in technical specification to the equipment described, or to withdraw or replace products without prior notification or public announcement.

Tel:
Fax:

RandTech Consulting 90 Park Avenue North Northampton NN3 2JD Tel 01604 451213
Fax 01604 513539 Mob 07966 913809 E-mail mdrand1@aol.com www.randtech–consulting.co.uk

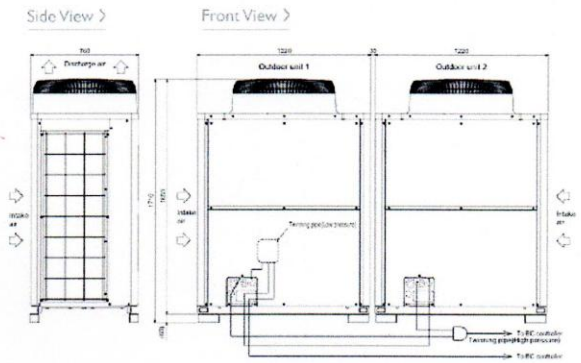
Product Details

PURY-P800YSJM-A	
Capacity (kW):	
Heating (Nominal)	95.0
Cooling (Nominal)	85.0
Heating (UK)	95.0
Cooling (UK)	78.2
Power Input (kW) Heating (Nominal)	26.04
Power Input (kW) Cooling (Nominal)	28.3
Power Input (kW) Heating (UK)	32.81
Power Input (kW) Cooling (UK)	18.25
Max No. of Connectable Indoor Units	50
Airflow(m3/min)	225 /225
Noise (dBA)	63.5
Width - mm	1220 + 1220
Depth - mm	760
Height - mm	1710
Weight - kg	270 + 270
Electrical Supply	380-415v, 50Hz
Phase	3
Mains Cable No. Cores	4 + earth
Starting Current (A)	8
Running Current (A) - Heating	40.2
Running Current (A) - Cooling	43.7

Piping Restrictions	
Total Piping Length (m)	950
Furthest Piping Length (m)	165
Between Outdoor and BC Controller - Length (m)	110
Between Indoor and Outdoor Units - Height (m)	50
Between Indoor and Indoor Units - Height (m)	15

Dimensions

PURY-P800YSJM-A



*(FREE FIELD SPL @ 3M)

MITSUBISHI ELECTRIC
AIR CONDITIONING SYSTEMS

Telephone: 01707 282880
Email: air.conditioning@meuk.mee.com Website: http://www.mitsubishielectric.co.uk/aircon

Mitsubishi Electric reserves the right to make any variation in technical specification to the equipment described, or to withdraw or replace products without prior notification or public announcement.

Tel:
Fax:

CE

REF: MDR/5459

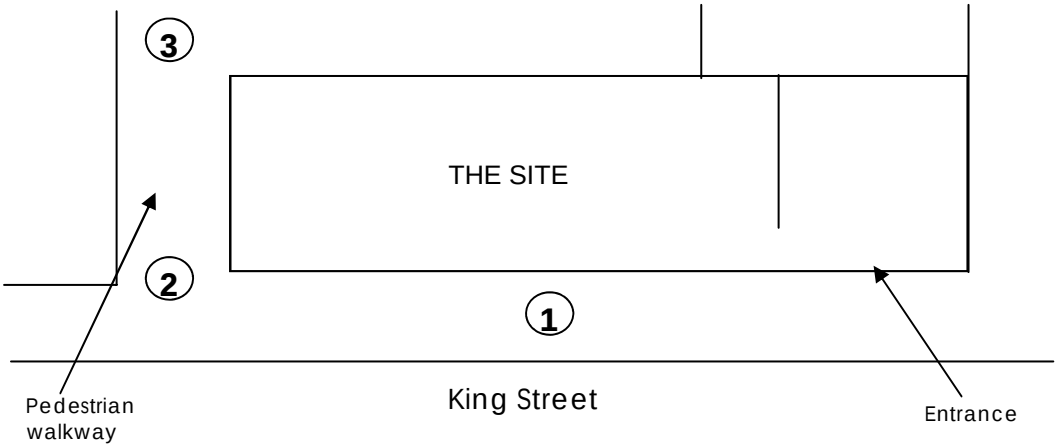
REPORT ON NOISE SURVEY
AT PALL MALL COURT,KING STREET,MANCHESTER

Survey carried out on 30th July 2008

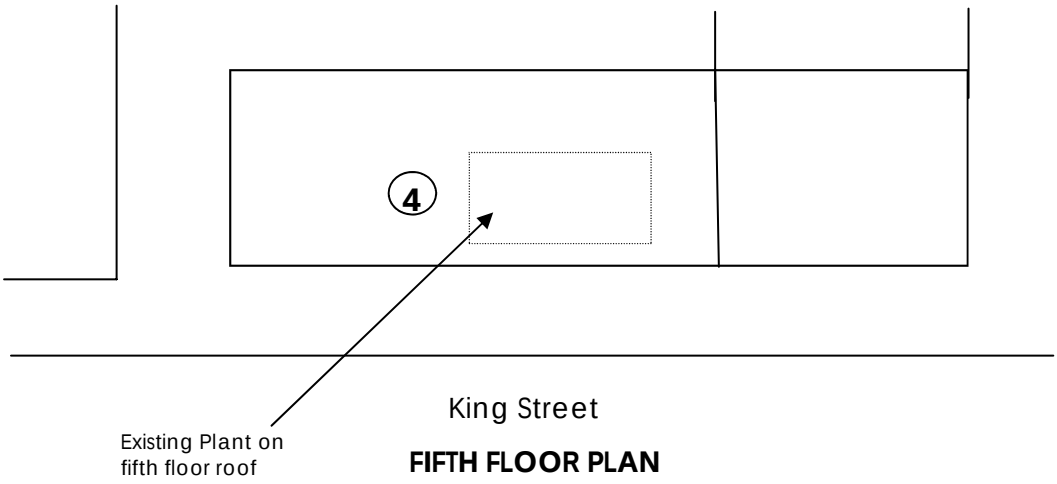
DESCRIPTION OF SITE

The building consisted of two wings forming an "L" plan form, the section running parallel to King Street being five storeys high, in which the restaurant would be located and a ten storey section at right angles to it. The building is on a sloping section of King Street, with the entrance, stairs and lift areas being located at the junction of these two wings. There is condensing plant located on the roof of the fifth floor which is "contained" within a louvred compound and the air handling plant and chillers are located on the tenth floor roof of the adjacent wing. The building is surrounded by other office / retail premises of varying heights and size which have plant located on them. A view from the tenth floor shows a number of axial flow fans located in the Market Street area which can be heard from that measuring position.

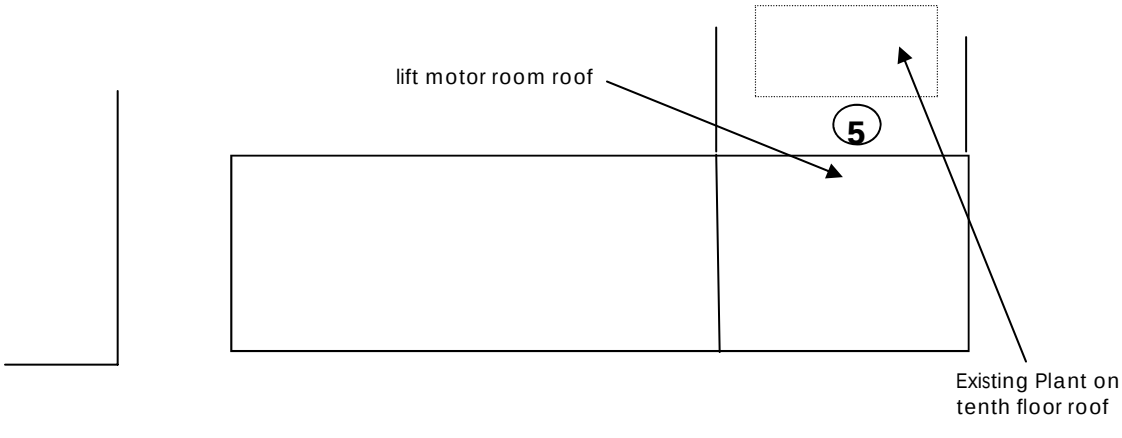
The readings were taken at various locations and are shown on the site plan below



GROUND FLOOR PLAN



FIFTH FLOOR PLAN



TENTH FLOOR PLAN

READINGS

The readings were taken with a Norsonics type Nor140 Sound Analyser and calibrated with a Norsonics type Nor 1251 electronic calibrator both at the start and the conclusion of the tests. The analyser and calibrator had returned 4 days previously from being updated / recalibrated.

The weather on site was dry for the first set of readings after which there was rain until late morning after which it remained dry. There was a breeze all day but this was felt at the various roof levels. Late at night it became humid, but still at high level, there was some breeze. There was some noise from passers by during the middle evening time, but it was at a distance.

The reading positions were as follows:

Position 1 On Kings Street 3 metres from the central face of the building.
Position 2 On the corner of the building / pedestrian walkway at 5metres.
Position 3 In the pedestrian walkway facing the building at 5metres.
Position 4 On the fifth floor roof 1 metre from existing louvred stockade.
Position 5 On the tenth floor roof 1 metre from the lift motor room wall.

The readings were stored in the analyser during the site survey to be downloaded into Excel using Norsonics NorXfer software. The complete set of readings are attached but we would be concerned with the standard “A” level statistical values which are tabulated below. The octave band frequency analysis which was also taken at the time is available for the prediction of acoustic treatment that may be required to meet the required noise criteria.

RESULTS

The average levels in each position, grouped for time of day are tabulated below:

	L_{Aeq}	L_{Amax}	L_{Amin}	L_{peak}	L_{A10}	L_{A90}	
Position 1	61.5	72.0	49.9	93.6	66.1	51.2	Night time 2300 - 0700
Position 1	64.2	75.0	51.8	90.6	67.6	55.1	Day time 0700 - 2300
Position 2	59.0	70.0	51.0	91.9	64.5	52.6	Night time 2300 - 0700
Position 2	63.3	75.4	53.9	95.0	65.8	55.4	Day time 0700 - 2300
Position 3	56.3	68.9	50.2	87.2	61.7	51.5	Night time 2300 - 0700
Position 3	60.6	72.5	53.6	93.4	63.4	54.7	Day time 0700 - 2300
Position 4	54.1	62.3	50.9	92.0	56.0	51.5	Night time 2300 - 0700
Position 4	56.6	63.8	53.7	79.0	58.6	54.3	Day time 0700 - 2300
Position 5	53.2	64.1	50.7	87.3	53.6	51.2	Night time 2300 - 0700
Position 5	55.8	63.1	53.6	82.1	57.1	54.1	Day time 0700 - 2300

Reading	Description	Time	L_{Aeq}	L_{Amax}	L_{Amin}	L_{peak}	L_{A10}	L_{A90}	31.5	63	125	250	500	1000	2000	4000	8000 Hz
1	Position 1	6.30	61.4	70.9	50.9	87.2	66.3	52.3	70.9	68.4	64.0	60.5	57.5	57.1	52.8	49.2	43.2
2	Position 2		61.1	72	51.8	92.2	65.9	52.6	67.1	66.9	64.5	61	57.2	56.3	52.8	49.2	44.6
3	Position 3		57.7	68.8	50.7	88.2	61.3	51.4	68.4	68.7	60.3	58.2	54.3	52.9	49.4	43.5	36.7
4	Position 4		57.3	63.2	54.7	82.7	59.0	55.3	66.6	67.9	62.6	58.9	54.1	52.0	48.4	41.1	30.9
5	Position 5		55.4	58.9	53.6	73.1	56.7	54.1	67.8	65.2	62.6	55.9	52.9	50.3	45.4	39.3	34.5
10	Position 1	9.00	66.5	76.3	55.8	90.7	70.1	57.5	75.3	81.8	67	64.5	61.9	61.7	58.7	55.8	51.6
11	Position 2		64.6	73.3	56.1	86.6	67.6	58	72.2	72.3	65.1	63.0	60.4	59.6	57.6	53.3	46.9
12	Position 3		61.6	69.9	54.3	89.4	65.0	55.8	68.5	70.3	63.4	60.7	57.5	56.8	53.9	49.8	43.3
13	Position 4		58.7	64.9	54.8	82.8	61.3	55.7	68.0	68.4	64.0	59.8	55.5	53.1	50.3	43.8	36.7
14	Position 5		55.2	60.8	53.6	88.7	56.2	54.1	69.0	66.4	62.0	56.5	52.0	49.8	45.7	40.7	36.1
15	Position 1	11.5	65.4	75.9	53.9	92.3	68.8	56.6	73.2	78.4	68.9	65.1	61.7	60.1	57.4	53.1	48.5
16	Position 2		62.8	72	55.3	98.0	66.5	56.8	72.2	70.4	65.8	62.2	59.1	57.9	54.8	50.7	45.8
17	Position 3		61.7	73.4	53.1	90.1	64.3	54.0	66.0	66.7	62.8	60.7	58.5	57.8	52.7	47.1	41.4
18	Position 4		57.4	64.1	55.0	78.6	58.8	55.5	66.5	67.0	62.4	59.2	53.9	51.9	48.3	43.0	36.4
19	Position 5		59.1	68.5	55.8	80.5	60.3	56.4	69.5	70.4	68.8	60.3	56.8	52.7	47.5	42.5	39.2
20	Position 1	14.55	65.2	76.3	53.6	92.8	68.5	56.1	72.0	75.8	68.0	64.9	62.2	59.9	56.8	52.4	47.2
21	Position 2		64.8	78.2	54.5	98.1	66.3	56.1	69.6	72.3	69.0	65.6	61.3	59.1	56.7	52.2	45.2
22	Position 3		62.1	71.8	55.4	86.3	65.6	56.4	68.1	69.6	63.7	62.0	59.4	57.2	53.5	49.0	43.0
23	Position 4		56.8	63.3	54.4	77.2	58.8	54.9	66.3	67.0	61.8	57.6	53.7	52.0	47.4	42.0	31.8
24	Position 5		57.6	63.6	55.5	81.2	60.0	55.7	68.0	68.0	67.6	58.8	54.5	51.9	46.9	41.3	35.7
29	Position 1	18.05	64.9	76.7	53.3	93.2	68.1	55.5	70.8	73.2	67.1	64.6	62.6	59.7	56.2	51.7	45.8
30	Position 2		66.3	81.4	53.7	107.2	69.2	55.5	71.6	72.9	68.4	67.0	63.2	61.3	56.5	54.1	53.2
31	Position 3		60.6	71.7	53.9	101.9	63.4	55.3	64.1	67.7	62.4	60.1	58.0	55.5	52.6	46.4	43.2
32	Position 4		56.4	66.7	53.1	82.9	57.8	53.7	66.5	66.7	60.3	58.1	53.4	50.8	47.5	43.2	33.3
33	Position 5		54.3	58.7	52.6	77.6	55.4	53.2	64.8	61.1	59.2	56.3	51.6	49.1	44.7	37.6	32.6
36	Position 1	21.00	59.0	70.0	42.6	83.8	62.6	49.8	67.2	69.4	61.3	59.5	55.2	53.9	50.7	46.7	41.0
37	Position 2		58.2	72.0	50.1	85.0	59.5	50.8	65.5	66.3	61.4	58.6	55.5	54.0	48.1	42.0	36.0
38	Position 3		57.2	75.8	51.5	99.1	58.5	52.0	62.2	63.7	58.1	57.5	54.0	52.5	48.6	44.4	35.0
34	Position 4		53.9	59.9	51.2	73.7	56.4	51.6	64.1	65.2	59.9	56.4	51.2	48.2	43.7	36.8	28.3
35	Position 5		52.7	63.7	50.6	82.3	53.4	51.2	61.3	58	57.9	57.0	49.0	46.4	41.7	38.4	31.2
47	Position 1	23.45	61.5	73.0	48.9	99.9	65.8	50.1	66.2	70.5	62.2	59.2	57.1	57.3	54.2	48.5	42.6
48	Position 2		56.8	66.7	45.8	97.1	61.4	47.2	67.3	68.7	59.0	55.8	53.4	52.3	48.4	43.0	36.9
49	Position 3		54.9	67.9	46.1	85.0	58.4	47.1	59.0	62.5	58.8	54.8	50.5	50.6	46.6	41.2	31.8
50	Position 4		50.8	61.4	47.0	101.2	53.0	47.6	59.4	62.2	55.3	52.7	47.6	45.5	41.7	35.8	29.9
51	Position 5		51.0	69.2	47.7	101.5	50.5	48.3	59.5	56.3	53.1	51.9	46.9	46.9	42.4	35.5	31.8

APPENDIX 2
Glossary of Acoustic Terminology 1

Decibel dB.
This is the unit used to measure sound.

Sound Pressure Level
This is the pressure created by a sound in relation to a reference value. The reference pressure is the lowest value which the human ear is able to perceive, that is, 2×10^{-5} N/m^2
The resultant value would cover such a large range and the logarithm of this term is used and when divided by ten is known as the sound pressure level dB.

Sound Power Level
This is the power generated by a sound in relation to a reference value. The reference power is the lowest value which the human ear is able to perceive, that is, 1×10^{-12} watts.
The resultant value would cover such a large range and the logarithm of this term is used and when divided by ten is known as the sound power level dB.

Octave and Third Octave bands
The human ear is sensitive to sound over a range of approximately 20Hz to 20 kHz and is generally more sensitive to medium to high frequencies. The spectrum is divided into frequency bands and the sound pressure level measured in each band, in order to define the frequency content of a sound. The most common of these is the **octave band** in which the mid frequency of each band is twice that of the preceding band. If finer analysis is required then the octave band can be further sub divided into three to form the one **third octave bands**.

Weighting
Human hearing covers a frequency range from 20Hz to 20 kHz but is most sensitive between 500Hz and 8kHz. This sensitivity range is further increased at high levels of intensity and the reaction of the ear is simulated by the frequency "weighting" of the level. The most frequently used is the "A weighting" which has the further advantage of being a single figure. Sound level meters have built in electronic filters to display this value which is known as dB (A).

Equivalent Continuous Sound level L_{eq}
This is the sound level which, when maintained for set time period, would produce the same acoustic energy as fluctuating noise over the same time period. The "A weighted" L_{eq} is widely used to measure environmental noise, especially that which fluctuates considerably with time and is denoted as $\mathbf{L_{Aeq}}$

Glossary of Acoustic Terminology 2

Statistical Level L_{90}
This is the sound pressure level that is exceeded for 90% of the measurement time period. It is indicative of the general, continuous background noise level in the absence of any higher level, short duration events occurring during the measurement period. This unit is usually measured using the "A weighting" and is consequently normally written as L_{A90}

Statistical Level L_{10}
This is the sound pressure level that is exceeded for 10% of the measurement time period. It is extensively used in the measurement road traffic noise**.** This level is therefore by definition greater than or equal to the value. This unit is usually measured using the "A weighting" and is consequently normally written as L_{A10}

Statistical Level L_{max}
This is the maximum RMS sound pressure level indicated during the measurement time period. This unit is usually measured using the "A weighting" and is consequently normally written as L_{Amax}