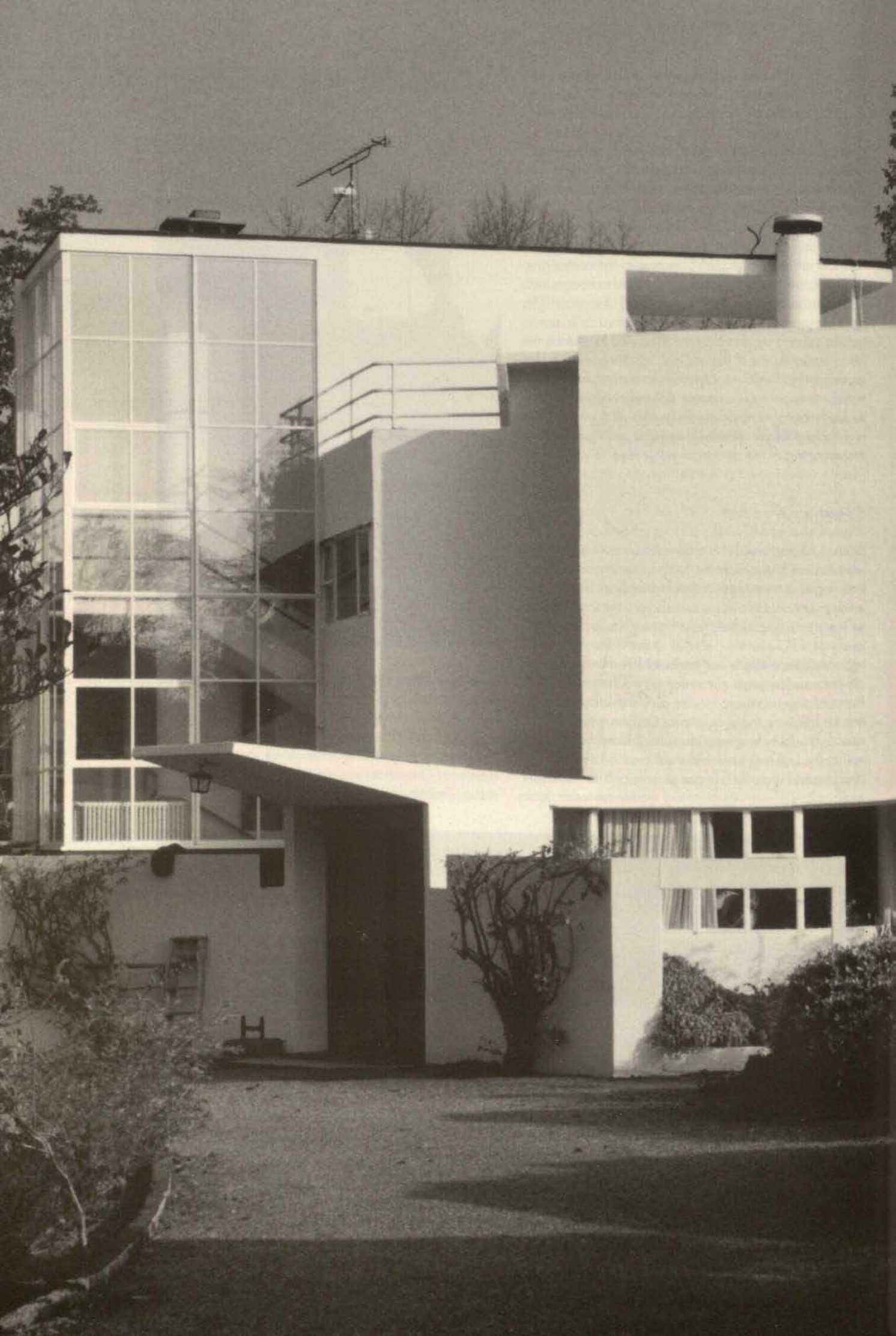


John Allan

Conservation of Modern Buildings in England

The Modern Movement in architecture arrived in England later than in most European countries. Whereas 1930 is often cited as the moment when the movement in Europe had completed and codified its prolific first phase, nothing but a couple of experimental houses had been built in England by this time. Our Modern Movement was largely imported from the Continent either through published images and examples, or through the immigration of influential foreign practitioners – Mendelsohn, Lubetkin, Goldfinger, Breuer, Moholy-Nagy, and of course Gropius – who produced groundbreaking new buildings that became exemplars for the oncoming generation of native British architects. Some of these major figures stayed, some passed through. But their cumulative impact was enormous, and should always remind us that the Modern Movement was a universal tradition and its achievements are a shared inheritance.

Unlike Europe, where the new architecture was widely adopted by corporate and municipal institutions, modernism in England was largely a product of private patronage, much of it in the form of single houses built in the face of considerable local resistance. Not until after the war was modern architecture universally adopted as the only viable solution to the vast problems of national reconstruction. Although modern architecture has always been a subject of controversy in Britain, most recently as a result of our future king's public outbursts, many of the best pioneer buildings and indeed an increasing number of more recent works are now protected by statutory listing.

However, the experimental nature of the early works and the uneven original quality and subsequent maintenance of much post-war construction pose considerable challenges for modern conservationists. It is some of these conservation projects in which I and my practice Avanti Architects have been involved that I should like to present to you now.

I will not give detailed narrative accounts of these as individual jobs, although I will say more about Finsbury Health Centre than the others as it involves a wider range of technical aspects. I intend rather to select features from each of them to illustrate certain themes which seem to me to have wider implications for the subject of this conference.

The main issue I want to highlight is that of design intervention in conservation work. This is often approached only from the conservationist's viewpoint or as if it was simply a theoretical problem, but I have to say that as a practising architect it is generally from the starting point of our client's brief that we approach the conservation issue. And in my experience it is very rare indeed that conservation as such is the only – or even the main – objective for the client. Motives may be biased towards social, economic or cultural factors or any combination of the three. In extreme cases a project may only result from statutory enforcement. Out of 77 of Avanti Architects' "conservation" projects to date – including many involving listed buildings – I have checked that there is not a single one which has not required some sort of "intervention" in the fabric, even if there were one or two that have not required listed building consent.

Dealing with such interventions is always more difficult than "pure archaeological repair" if indeed there is such a thing – but is correspondingly more interesting because it calls for architectural judgement. In other words conservation is ultimately about priorities. And this is why, when confronted by the quest for universal principles of conservation, I have found the only answer that is always correct: "It depends".

Ill. 1
The White House (detail on the left), Surrey, 1932 by Amyas Connell. Not a modernist house just built, but a 60-year old building just repaired in 1991 by Avanti Architects

This brings me to my first project – the *Penguin Pool*, designed by Lubetkin & Tecton in 1934, restored 1987 by Avanti Architects in collaboration with Lubetkin. I only want to consider two aspects of this job which still seem relevant to our discussion (though it is nearly ten years now since we did this).

The first concerns this problem of design intervention. An important aim of the rehabilitation project was the reinstatement of the deep diving tank at the top of the south ramp which had fallen into disuse. We were told by the Zoo that if this facility was to be of any use for the animals, it must be made larger.

So, having recalled Lubetkin's original intentions 50 years previously – the idea of an elipse cut on the diagonal –

Lubetkin and I set about exploring the possible ways the enlargement might be achieved. The illustration shows a few of the options we considered. Obviously the alteration would require Listed Building Consent (the pool is Grade I) as there was clearly no way of enlarging the tank within the existing envelope.

I remember vividly the meeting that took place between Westminster City Council (the municipality responsible for giving consent), English Heritage (the official conservation advisory body), Lubetkin and myself when Lubetkin's preferred proposal was rejected by the Heritage officer as "not being in the spirit of the original design!" But the point I want to make is that I think the Heritage officer was right.

Ill. 2
The Penguin Pool, London Zoo, 1934 by Lubetkin & Tecton, restored by Avanti Architects, 1987

It was suggested that Lubetkin's solution had slight 1950's overtones that seemed foreign to the classic lines of the original pool – though it could well be argued that what the Heritage officer read as a 50's motif (the canted cheeks of a projecting tank) was only what Lubetkin himself had invented in the 1930's at Finsbury Health Centre. I think the eventual solution was better for being less assertive and adopting the purer geometry of the original. The moral being that even when the original designer is available for guidance the best adaptation *may* be derived from the original design rather than its author.

The second point has to do with restoration vis-a-vis conservation. "Restoration" – meaning the reinstatement of the structure in its actual or conjectural original appearance – has a bad reputation in the context of traditional conservation where minimal repair and retention of visible effects of ageing are regarded as the only correct response.

The received wisdom of defending and retaining the "culturally significant fabric" is as good a starting point as any – given that it leaves wide open the interpretation of what *is* culturally significant. But what, if the culturally significant fabric is no longer visible? i. e. as in the case of the Penguin Pool, obliterated by 13 subsequent overcoats of paint, bituminous compound, render, more paint and other miscellaneous formless coverings.

It soon became clear to us in rescuing the Penguin Pool that we were not repairing the "authentic architectural fabric" so much as restoring the "culturally significant design" i. e. the concept. Only by using specialised proprietary products could the original concept – in which I include the key attribute of *thinness* – be maintained at the same time as effecting a repair of reasonable quality.

The concrete repair of the Penguin Pool involved removal of all the umpteen inauthentic coatings down to a sound substrate and reestablishing an alkaline rich surface with no appreciable thickening of wall sections, in a way which – as far as we could tell – resembled the high state of finish of the original.

I readily admit that what has been restored is the concept – an ideal proposition – an affirmation of the deeply

unfashionable precept that man dominates nature, and reason dominates man. In other words there are circumstances in modern conservation where the traditional creed may not help us. Having said which, I repeat my opening caveat, it all depends. And to demonstrate this I turn to my second case study.

The *White House*, designed by Amyas Connell in 1932 and restored by Avanti Architects in 1991; this problem of authenticity in modern surfaces reappeared at the White House, or New Farm, by the architect Amyas Connell where we undertook a similar rescue operation. The process involved the typical procedures of traditional concrete repair. Like the Penguin Pool this still involved removal of defective subsequent coatings, which in this instance were also contributing to the fabric decay by retaining interstitial moisture within the structure.

But here the original finish was much more primitive than the Penguin Pool, so apart from using a brush applied 1 mm fairing mortar coat to close blow holes in the concrete we decided against including levelling renders between the repaired substrate and the protective coatings. This had the effect of leaving a more clearly discernable record of the irregular character of the original building. The appearance we sought was not that of a modernist house that had just been built, but that of a 60 year old building that had just been repaired.

The other main item of work involved replacement of the staircase window. This raises the issue of improving performance in conservaton work. The original window was literally on its last legs and neither I nor Crittalls – the installers – who I asked to report on the feasibility of repair – considered there was any economical prospect of saving the original screen (which was ungalvanised painted mild steel). Moreover the owner was anxious to address the considerable problems of heat loss and solar gain.

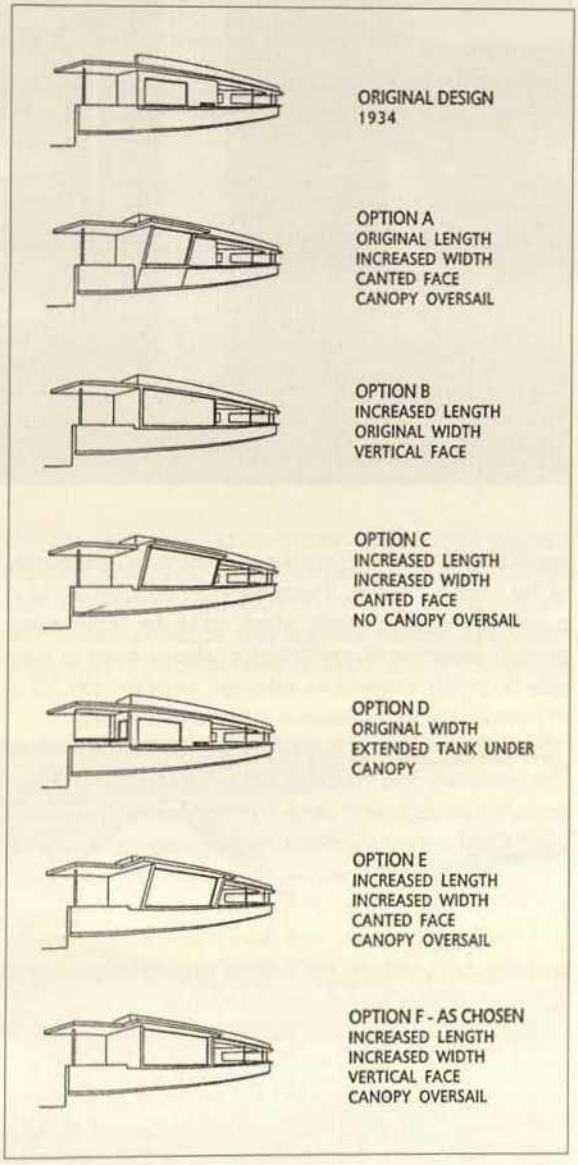
The replacement in galvanised powder coated W20 section maintained all the fenetration details and almost all the profile characteristics of the original while incorporating 14 mm double glazed low emissivity units, reducing the U value from 5.4 to 2.6. I know this departs from the original but is it ethically reprehensible? I would still contend that it was a discreet and therefore legitimate reconciliation of the client's desire for improved performance and the conservation requirement for a sympathetic response.

Finsbury Health Centre was designed by Lubetkin & Tecton in 1935-38 and restored by Avanti Architects in 1994; the issue of "legitimite intervention" – or seeking to reconcile conservation criteria with the desire for improved performance – runs all through my next case study, the first phase of the refurbishment of Finsbury Health Centre. It was designed by Berthold Lubetkin and Tecton and opened in 1938. Since then it has continuously provided primary health care facilities for the local community. It is internationally recognised as a pioneering example of social architecture and a masterpiece of 20th century modern design.

In 1988 Avanti Architects prepared a report on the scope of works required for the restoration of the outside of the building. Funds were allocated by the Camden & Islington NHS Trust and Family Health Service Authority in the autumn of 1993 for the first phase of the exterior restoration, which comprised a wide range of works – the principal elements being as follows:

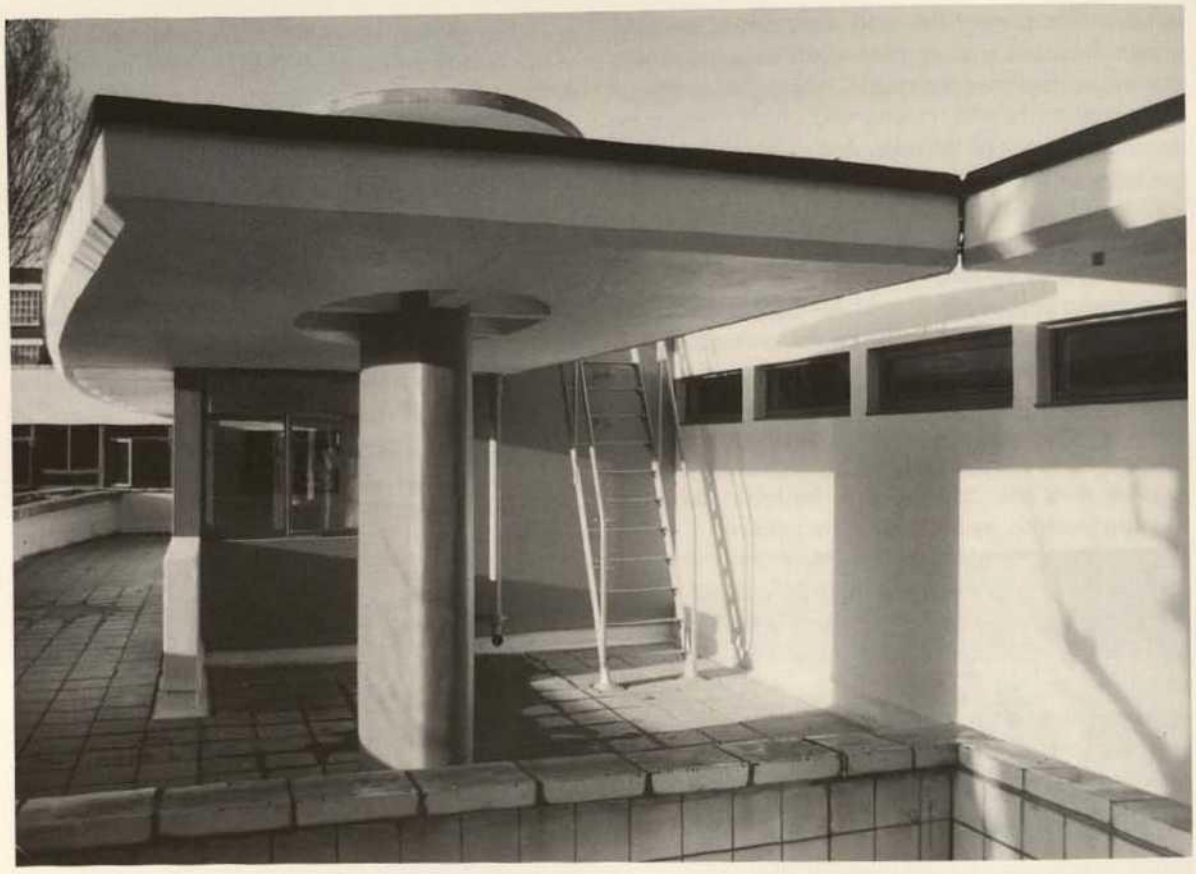
Re-Roofing Works
The original roof finish was rock asphalt – a naturally occurring material no longer commercially available. This was generally laid over screed on 25 mm cork slab insulation. On the curved barrel roof the build-up was 25 mm rock asphalt on e.m.l. on a further layer of 25 mm rock asphalt on 25 mm cork slab on concrete. In the central area of the building the rock asphalt, was also dressed over verges and projecting copes and was therefore an integral feature of the building's appearance. The original membranes had passed their viable service life.

Research into alternative roofing systems, particularly so-called high performance single ply membranes, found no



Ill. 3
The Penguin Pool, London: Alternative options considered for adaptation of the diving tank: original design, top; chosen solution, option F

Ill. 4
View of concrete repair areas with restoration of original colours



material that could achieve the jointless monolithic quality of the original asphalt. It was therefore decided to use a polymer modified asphalt, which unlike the conventional product maintains its performance when subject to naturally occurring temperature extremes, together with 50 or 70 mm cork slab insulation in a warm roof system.

This approach had the advantage of giving an improved performance but using known procedures *and* maintaining the authentic appearance. Cork insulation, as well as replicating an original element of the specification, is also a CFC and HCFC-free renewable resource. The barrel roof insulation was lined with three layers of 6 mm ply, felt and e.m.l. to reduce the surface temperature variation within the asphalt on the inclined surface.

Concrete and Render Repairs

Extensive concrete repairs were required and initially were carried out using traditional techniques. Following further tests the decision was taken to proceed using the recently developed technique of re-alkalisation. Flat tanks of saline solution are clamped to the concrete surface and an electrical charge established between the reinforcement and the electrolyte. This induces alkalinity into the concrete by ionisation and the risk of further corrosion to steel reinforcement and consequent concrete damage is arrested.

Re-alkalisation offered two advantages – as a less invasive and therefore quieter process caused less disruption to building users (who remained on site throughout the contract); as a pre-quantifiable process the contractor was able to offer a fixed price quotation, and thus avoid the cost uncertainty of traditional "open-ended" repairs.

One other point to note concerns the re-establishment of the original colour scheme. All render and concrete surfaces above basement level had been overpainted white during subsequent maintenance. By studying contemporary black and white photographs and removing later applications of paint and render it was possible to retrieve a picture of the original surface tones and colours. An authentic Tecton palette of colours was discovered: intense red-brown applied to selected surfaces on the terrace including the elliptical vent ducts; pale blue to the reveals of the glass block entrance screen, terrace canopy soffit and lecture theatre block, a dark "French navy-grey" to basement and undercroft areas, and a honey colour elsewhere – reminding us that the early MoMo buildings were not all as black-and-white as the period photographs suggest.

Steel Windows and Curtain Walling

The curtain walling on the face of the wings, the most innovative feature of the building, had been damaged in the war and marred by subsequent modifications which themselves were in an advanced state of decay. The whole assembly needs to be rebuilt to its original appearance though Phase 1 funds only allowed the south-east facing entrance wing to be tackled.

Perhaps ironically, perhaps not, the most traditional component of the curtain wall – the teak frame – was the best preserved of all, and only required cleaning and some minor local repair. However, its mild steel fixings to the

concrete structure had largely corroded, and were all replaced in stainless steel.

The replication of the original window details was governed by the range of W20 steel sections currently available and the decision to introduce double glazing. Paint scrapes revealed that the windows were originally painted in an olive grey colour. New steelwork is galvanized and polyester powder coated. The original silver bronze lever handles and distinctive friction pivot levers have been salvaged and re-used on the replacement windwos.

One of the biggest challenges of the whole restoration project has been the treatment of the spandrel panels. These were access panels for the external service ducts running along the face of the building – and originally comprised Thermolux – two sheets of clear glass with a coloured spun glass silk interlayer. Although we discovered that "Thermolux" was still made in Germany, it is now only available in white.

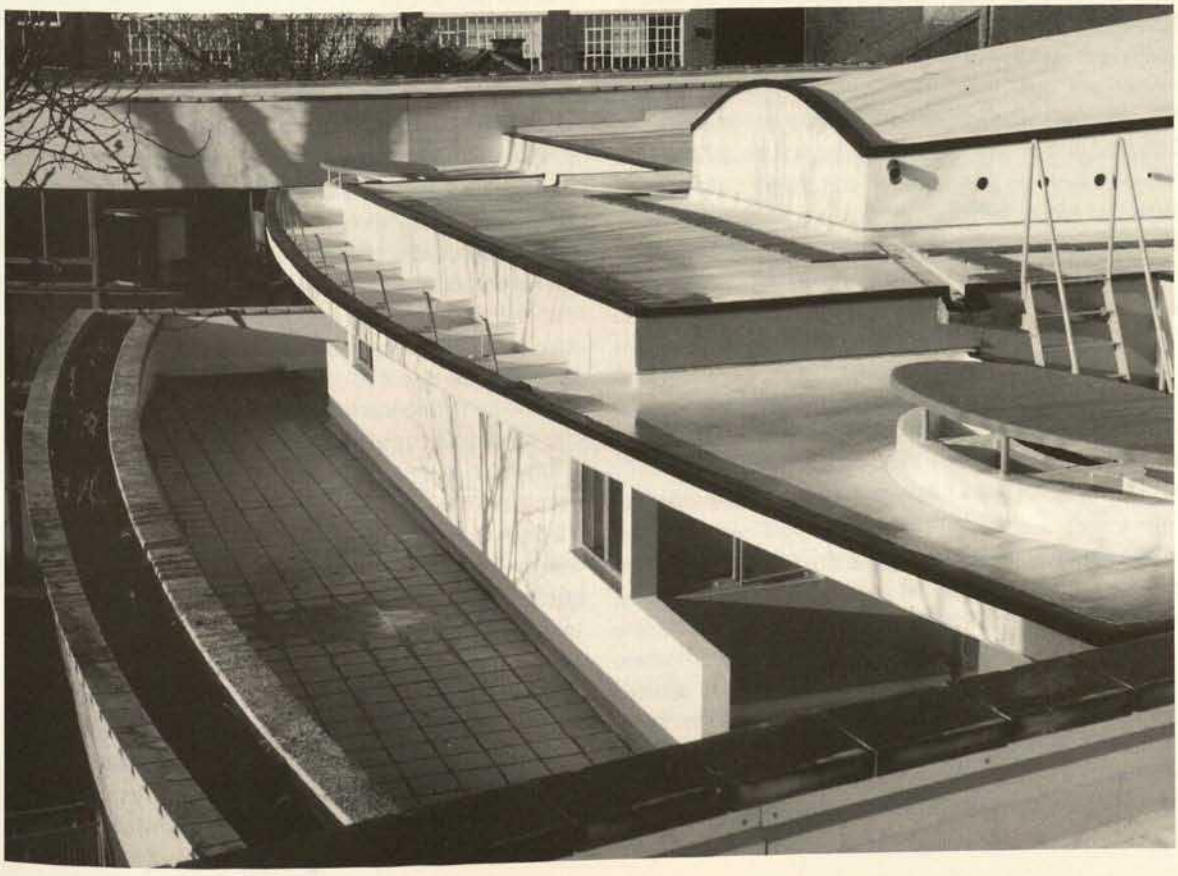
None of the original panels survived to give an indication of colour. Miraculously, a few time fragments of the original panels were discovered at the base of the ducts. These were sent to a materials laboratory for forensic analysis and colour matching. The eventual solution for the replacement replicates the original coloration of the curtain walling with a laminated glass panel, comprising tinted glass and a clear interlayer, and retrieves the original textured reflective character by placing plain white Thermolux behind it. This solution has the additional benefits of protecting the Thermolux, improving insulation values and providing a more durable outer skin by virtue of the BS 6206 class A lamination standard.

Ceramic Tiles and Faience Copings

The main façade areas of the original building were finished with cream coloured ceramic tiles manufactured using a dust-pressed (as opposed to extruded) process. This allowed greater dimensional accuracy and resulted in the narrow joints (0-2 mm) characteristic of the building. Unfortunately, the original tiles were not fully vitrified and therefore not reliably frost-resistant. In addition there was no effective provision of movement joints. No British manufacturer was prepared to produce the close glaze match and range of specials required in a vitrified dust-pressed tile. So the raw tile base was procured from various sources and glazed in a factory in Northern France.

A number of technical issues still had to be resolved: the original tile, not being vitrified, absorbed more of the glaze, giving an appearance of greater depth and translucence than modern tiles which have a more refined body. Also, current glazes tend to be more uniform than the original – with the attendant risk that the final effect would lose the pleasing original variegation and look too mechanical. Thus the biscuit, which was brown, had to be coated with white slip or engobe prior to glazing to achieve the correct colour and surface quality.

The tiles were bonded to a new unreinforced polymer modified render coat with a 3-6 mm thin/thick bed adhesive. Movement joints were introduced in accordance with current standards and fall into several categories: wider joints at inconspicuous locations such as changes of



Ill. 5
Finsbury Health Centre, 1938 by Lubetkin & Tecton, restored by Avanti Architects, 1994. View of roofing repair, showing use of polymer modified asphalt covering and edging.

profile or at the abutments of the tiled surface with steel flashing strips, etc; and narrow joints at critical visual points on the façade, achieved by means of a bridging detail with a narrow tile joint over a wider render joint.

Prospects for Completion of the Exterior Restoration
These works were completed in early 1995, but the greater part of this key building of English Modernism remains to be rescued. The building owners are seeking further funding for the completion of the exterior restoration and upgrading of the interior.

Finsbury's problem is the fact that as a working unit in the public sector capital estate it has endured over half a century of inadequate maintenance. This again underlines the way in which the type of client is bound to influence one's approach to conservation. In Finsbury's case, the owners are primarily concerned to provide healthcare services, not to protect architectural masterpieces. So one seeks to spend the scarce capital funding in ways that will save or avoid future maintenance and therefore minimise dependence on insufficient resources. But I say again – it all depends. So by way of contrast I turn to my last case study.

2 Willow Road, Hampstead, designed by Erno Goldfinger in 1936-38 and restored by Avanti Architects in 1995. Unlike Finsbury, at Willow Road, where we have recently completed a contract for the National Trust, we have a conservation client with a whole philosophy and tradition of expertise in the repair, restoration, preservation, management and maintenance of architecturally or historically significant buildings and their contents. Willow Road has been acquired by the Trust to be exhibited for its own architectural and historic interest to paying visitors, and the Trust's remit to maintain the house and provide public access to it *for ever.*

This alters the whole basis for conservation. Secure in the knowledge that any future problems will be tackled conscientiously when they arise we can do the minimum necessary to secure the fabric against progressive defects.
A badly corroded window frame, for example, which might otherwise have been a case for replacement has been repaired as well as reasonably possible in situ to avoid the risk of damaging the glass during removal. This means it may have to be repaired again, but this is built into the whole philosophy of the Trust's quinquennial review procedures and endowment schemes.

Some displaced areas of parapet wall, which in other circumstances and for another client might certainly have had to be rebuilt, have been secured by resin injection techniques. This will leave a visible defect on the façade, but arguably avoids introducing an even more visible remedy, i.e. by risking a patch of rebuilt brickwork where (because the original mortar was so strong) it seemed unlikely we would be able to salvage unbroken bricks for re-use in a matching repair.

Where we have intervened is in acting to arrest and correct the causes of the original fault – that is the defective inner leaf of the parapet and the cavity (or rather lack of same) between it and the outer skin. This inner leaf of poor quality brick which was saturated and had actually perished through frost action had transmitted movement pressures to the façade. We have therefore rebuilt it entirely in engineering brick, creating the necesssary cavity and clearing weepholes, removing, cleaning and replacing the coping stones in the process.

I emphasise the significance of working for a "conservation client" because it enables a more moderate approach to be taken in dealing with various problems. Because the National Trust has a well-established regime of quinquennial reviews it is possible to leave some things that do not need urgent attention in the knowledge that they can be considered and reappraised next time round. It demonstrates again how effective conservation relies not only on appropriate repair techniques but on the whole management culture in which they occur.

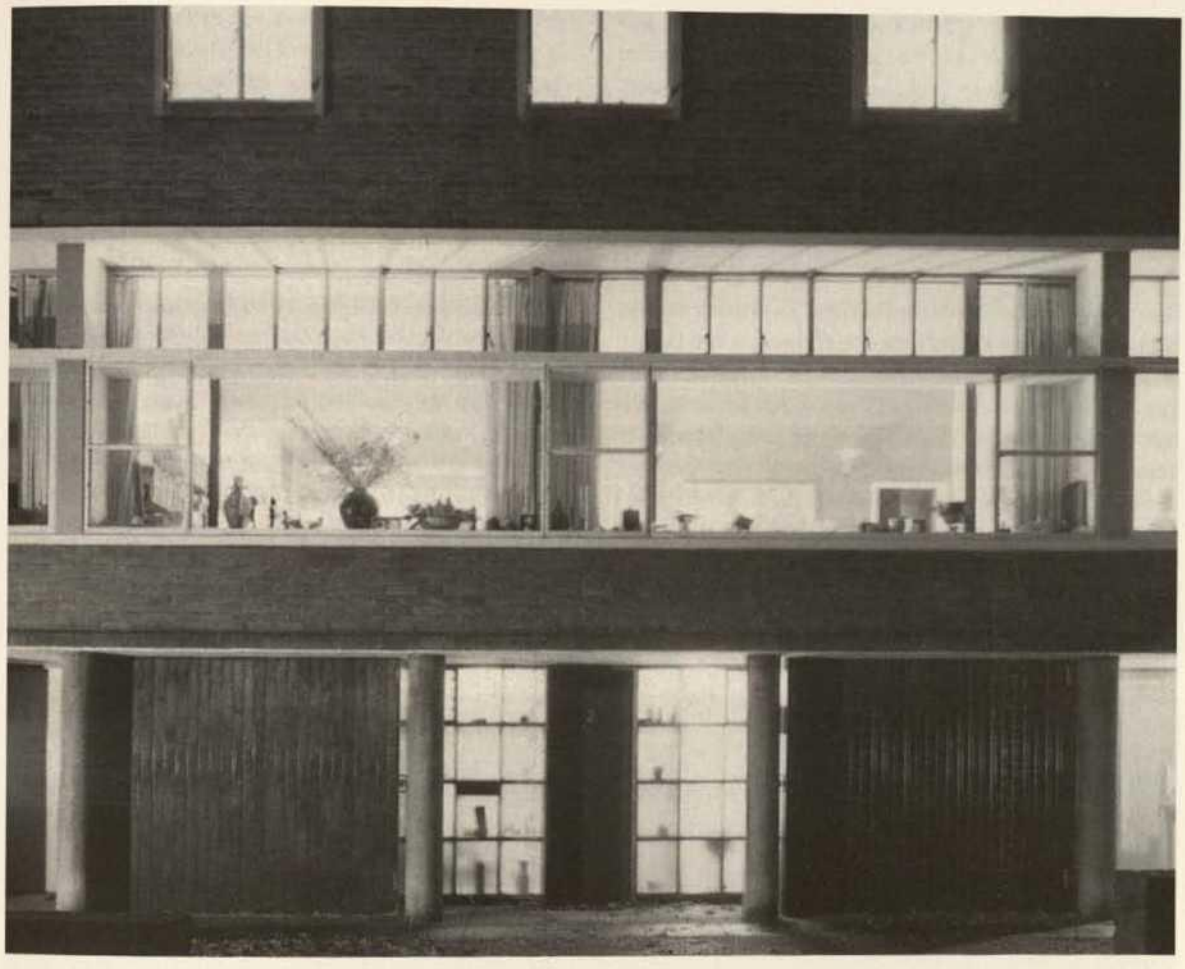
But there is a small paradox even in the exemplary activity of the National Trust. The very act of isolating, conserving and than presenting a building as a fragment of architectural and social culture imposes the need for certain interventions which would not otherwise apply.

Saving Willow Road for the nation has involved a use reclassification from private residence to public museum. This certainly avoids some of the pressure for improved performance that occurs in a building in occupation – increased insulation for example like the White House we looked at earlier. But the very fact that the house is not in occupation has entailed the introduction of various installations to satisfy the need for security, health and safety and fire precautions.

Obviously one tries to do this as discreetly as possible but there are performance related requirements in the size, visibility and location of such things as passive infra-red scanners, alarm sounders, smoke detectors and break glass points that make them virtually impossible to camouflage – especially as a modern interior has none of the ornamental details of a traditional one to hide things in. The lesson of these last two projects is, I think, that the opportunities for moderate conservation are vastly increased if it takes place within a culture of responsible maintenance.

Conclusions

I began by suggesting that conservation was ultimately about defining priorities, and that this inevitably calls for architectural judgment. I also mentioned my misgivings about the usefulness of universal principles, and that the only consistent precept was "It all depends". However, I would not like this to be interpreted as implying that there are no guidelines worth following at all. Total expediency would be just as absurd as dogmatic adherence to a catechism of rules regardless of circumstances. In the light of my own experience, as briefly illustrated above, I therefore offer the following conclusions, which I stress are



Ill. 6
2 Willow Road, London, 1938 by Erno Goldfinger; restored 1995 by Avanti Architects

not suggested as universal principles but might be useful as ten pointers towards a provisional methodology:

1. Before embarking on any conservation project one must always research as fully as reasonably possible the building's original design, construction, materials, components, appearance and setting.
2. One must also try to understand – as distinct from judge – the building's original cultural context, the circumstances of its commissioning and the intentions of its designers. Evidence of the designer's errors can be just as interesting as evidence of his wisdom.
3. It is also important to discover the building's subsequent history of use and maintenance.
4. The project must seek to establish a sustainable and architecturally compatible future use. It is a truism that the best way of conserving a building is to use it effectively, and in this regard it is always better to allow the original design to suggest and govern potential new uses, rather than impose a new use on a resistant design.
5. One must try to identify the essence of the building's significance – architectural, technical, social and cultural – in order to determine the interface between authentic repair and legitimate intervention.
6. Having done all the above preparatory work, one should formulate an overall strategy, clearly defining the objectives and documenting the project before, during and after the implementation of any work. Such a strategy must also take account of the likely maintenance regime after the work is completed.
7. When work starts insist that the contractor always asks permission before removing anything from site. The building itself is your most valuable archive and may continue to yield vital evidence after the work has commenced.
8. If holding works are necessary it is always wise to consider the design of the eventual permanent works before deciding the temporary ones. The first priority is always to get the structure dry. There is no point in retouching interior details if the roof leaks.
9. If unexpected situations occur during the progress of the job, always search for options before making a choice, even if there seems initially to be only one solution to the problem at hand. And don't forget the option to do nothing.
10. If you cannot finish the whole job, what is done should either be limited and exemplary or should secure enough of the significant material for a future conservation project.

Finally, despite the proverb that "art is long and life is short", my experience is that in any battle between the two life invariably wins. This being so, it seems to me that the only lasting successes in conservation are likely to be those that are achieved through persuasion rather than conquest.