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Research Output 2: Peabody Housing, Silvertown

Output Type: Design

Building: Low-Cost Housing for the Peabody Trust

Function: Housing

Location: Silvertown, London, UK

Client: Peabody Trust

Practical Completion: September 2004

Budget: £1.5M

Area: 988 m²

300 Word Summary

Peabody Housing project for 12 apartments (2001–2004), budget £1,600,000, Silvertown, East London resulting from winning a design competition organized by Peabody Trust.

Questions/Aims/Objectives

To translate a specific site condition– iridescence – discovered through contextual/historical research into the use of a new material – Radiant Light Film – as the key component in the façade.

Contexts/Methods

Research into the history/topography of the site revealed an extraordinary brief flowering of industry, or chemical-flare, from the Great Exhibition, 1851, to the collapse of British manufacturing in the late 1970s, including the manufacture of 'chemical sweetness, colour and light' (sugar/coloured dyes/jam/golden syrup/soda/TNT/soap/matches). A 1900 photograph showing horse-drawn petroleum carts on Knights Road suggested the previous life of iridescent material.

In collaboration with artist Martin Richman, a material – Radiant Light Film – not usually used in building construction was selected, whose dichroic properties produce iridescence. Colourless metal oxides on the film surface disrupt light reflection, producing interference patterns that appear as colour. The building's south façade is wrapped in a covering of dichroic material, held in glass frames. Light is reflected back from different layers of the construction, producing a shifting pattern, geometric, evanescent and fugitive, giving the building a dream-like quality whose image will not fix, connecting to the uncertain properties of the site.

This innovative choice of material for the façade deviated from the normative construction, producing unexpected problems, e.g. in insurance, so requiring the architects' lateral thinking and the advice of specialist glass manufacture consultants and subcontractors to assist in resolving the design detail as the core architectural concept.

Dissemination/ Esteem

Competitions: Fresh Ideas for Low Cost Housing Competition (2001).
Awards: AAIA (2005); RIBA Award (2005); RIAI Ireland Award (2005).
Publications: RIBA Journal and Detail (2006); RIAI Journal (2005); Civic Trust Award (2006).

Exhibitions: GBE, Carnegie Mellon Museum, Pittsburgh (2006); London Architecture Exhibition, Building Centre (2005).

Authorship

McLaughlin's design teaching at the Bartlett allows him to research architectural design concepts, which are developed through his practice Niall McLaughlin Architects. In this case, more general research looked at how site qualities inform design processes, and more specific aspects examined the architectural design potential offered by iridescence.



Image 1

General Description

In December 2002, NMLA won a design competition organized by the Peabody Trust, called *Fresh Ideas for Low Cost Housing*. The site was in Silvertown in East London, between Royal Victoria Dock and the River Thames.

Each living unit has two bedrooms and a shared bathroom. The kitchen, dining and living functions are accommodated within a single, large space on the south side of the building. This allows each apartment to make the most of the sun and the view. There is a little south-facing terrace outside each flat, and the ground floor units each have a back garden. Special corner windows on the upper floor flats allow the view to open out along the street towards the Millennium Dome and Canary Wharf in the distance.

NMLA concentrated on the following design issues:

- (1) A rational layout of the interior, with a large, flexible living space which has unusually high ceilings for low cost housing.
- (2) The view from the building, over the strange landscape of the London Docklands: London City Airport, Canary Wharf and the Millennium Dome.
- (3) The strange chemical history of the site.
- (4) The nature of modern industrialized construction, in which a timber-frame is wrapped in a decorative outer layer.

In this building the **research focus** is on the translation of a specific condition of the site – iridescence – discovered through contextual and historical research into the use of a new material – Radiant Light Film – not usually used in the construction of buildings – as the key component in the design of the final façade. This innovation in the choice of material for a glass façade, entailed a deviation in the normative construction detail, producing unexpected problems, for example in insurance issues, so involving the need for lateral creative thinking from the architects and the advice of specialist consultants and subcontractors in the area of glass manufacture to assist in resolving the design detail, as the core concept of the architecture. (images 1–2)



Image 2

Research Methods/Contexts

This practice usually looks carefully into the history and topography of a site. Each location has something comparable to DNA, a coded trace pointing towards the future. Everything from local myths to geology can become a starting point for architecture.

Looked at in the context of historical time, this site experienced an extraordinary flowering of industry from the time of the Great Exhibition in 1851 to the collapse of British manufacturing in the late 1970s. In 1850 the place was marshland; by 1990 it had returned to almost total dereliction. The industrial flowering, or chemical-flare, lasted for a very brief period of time. Now the area is being repopulated by a rag-bag of yuppie-houses, airports, an IBIS Hotel and a vast conference centre. It is both somewhere and nowhere.



Image 3

This kind of place has been called a post-industrial landscape. NMLA prefer to think of it in the context of emerging and dissolving landscapes. The uncertainty of its identity is the essence of the place. Its properties are fugitive.

Even the name Silvertown plays a trick on you. The glister in the name comes from Stephen Winkworth Silver who built a rubber plant on the site in 1852, manufacturing wet-weather clothing. This is the kind of material Queen Victoria might have inspected at the opening of the Great Exhibition the year before. Raw material from the Empire transformed directly into cheap consumer goods on the shore where it landed.

Looking at the map change during the next 50 years, the blooming of a remarkably consistent range of factories making sugar, coloured dyes, jam, golden syrup, gutta percha, soda, TNT, soap and matches can be seen. (image 3)

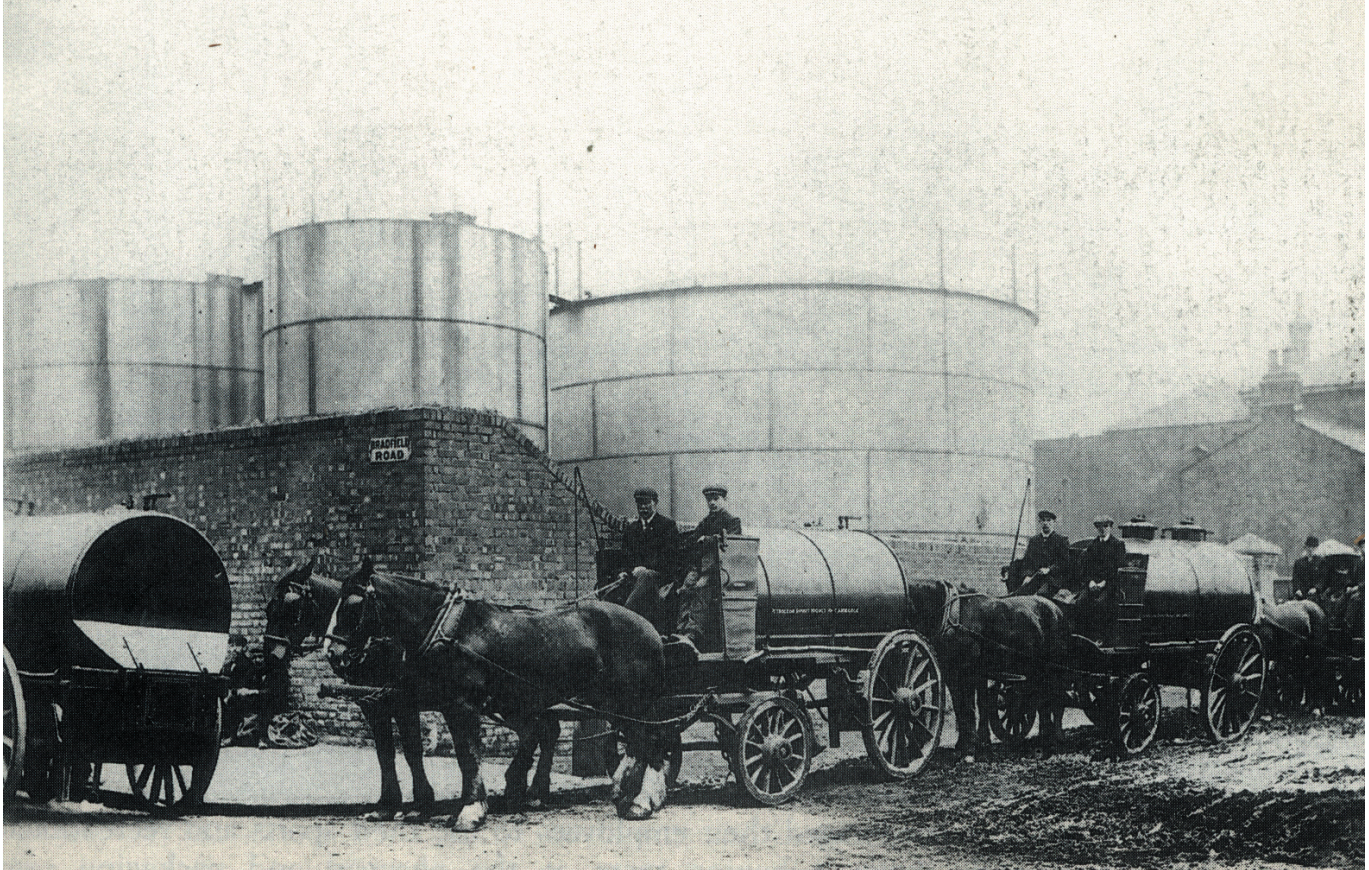


Image 4

A now surreal photograph from 1900 shows horse-drawn petroleum carts on Knights Road, reminding us of the previous life of this most iridescent of materials. (image 4) The Victorians, through chemistry and trade, learnt to make luxury cheap. These factories manufactured chemical sweetness, colour and light.

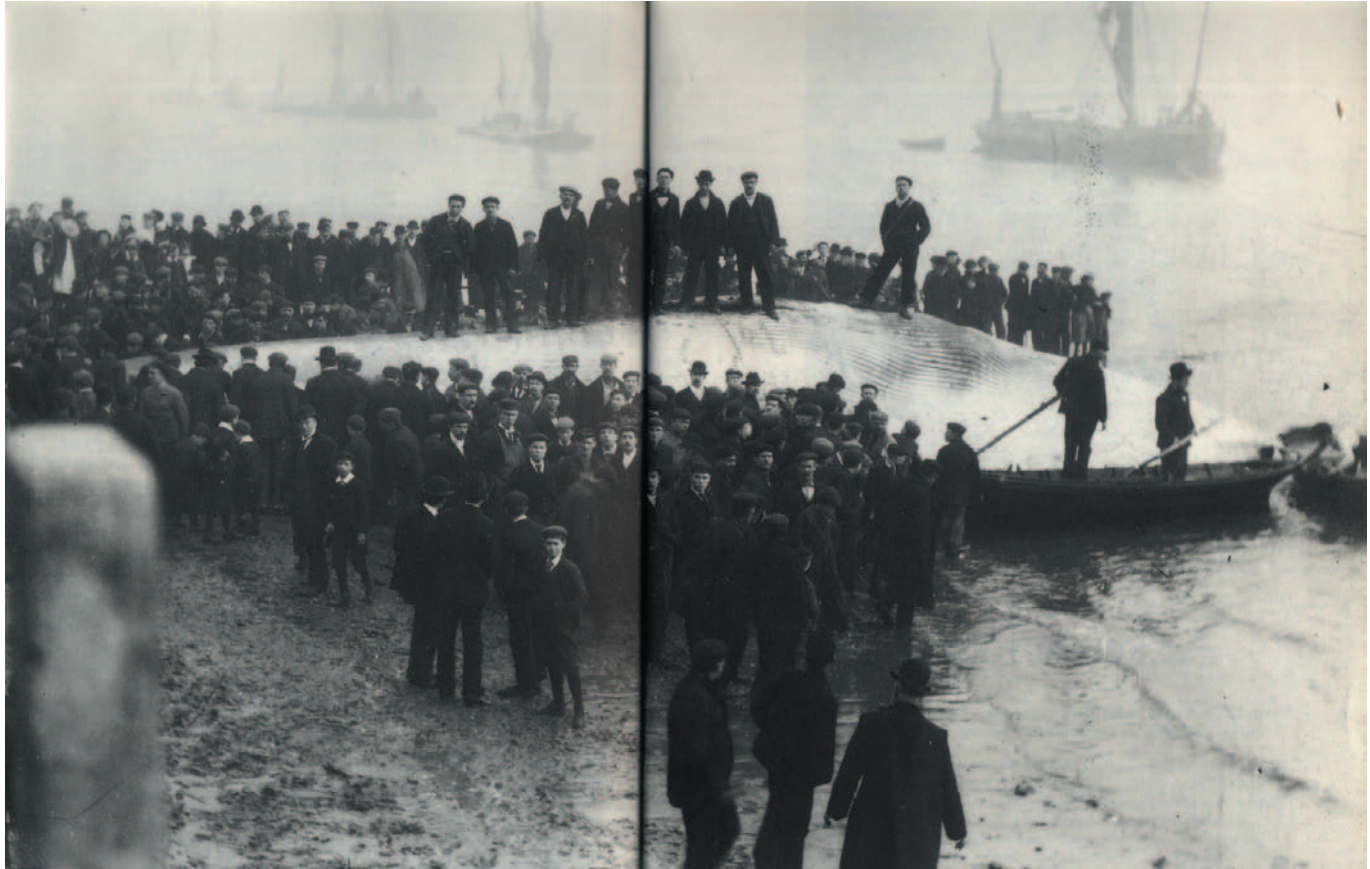


Image 5

In one bizarre incident, a whale beached herself on the North Woolwich shore in 1899. Was she lost, or was she following her nose towards John Knight's Primrose Soap Works? The factory workers ran out and stoned or bludgeoned her to death. A photograph shows them standing proudly on her 66-foot carcass. These two emblems of the sublime were clearly incompatible. (image 5)

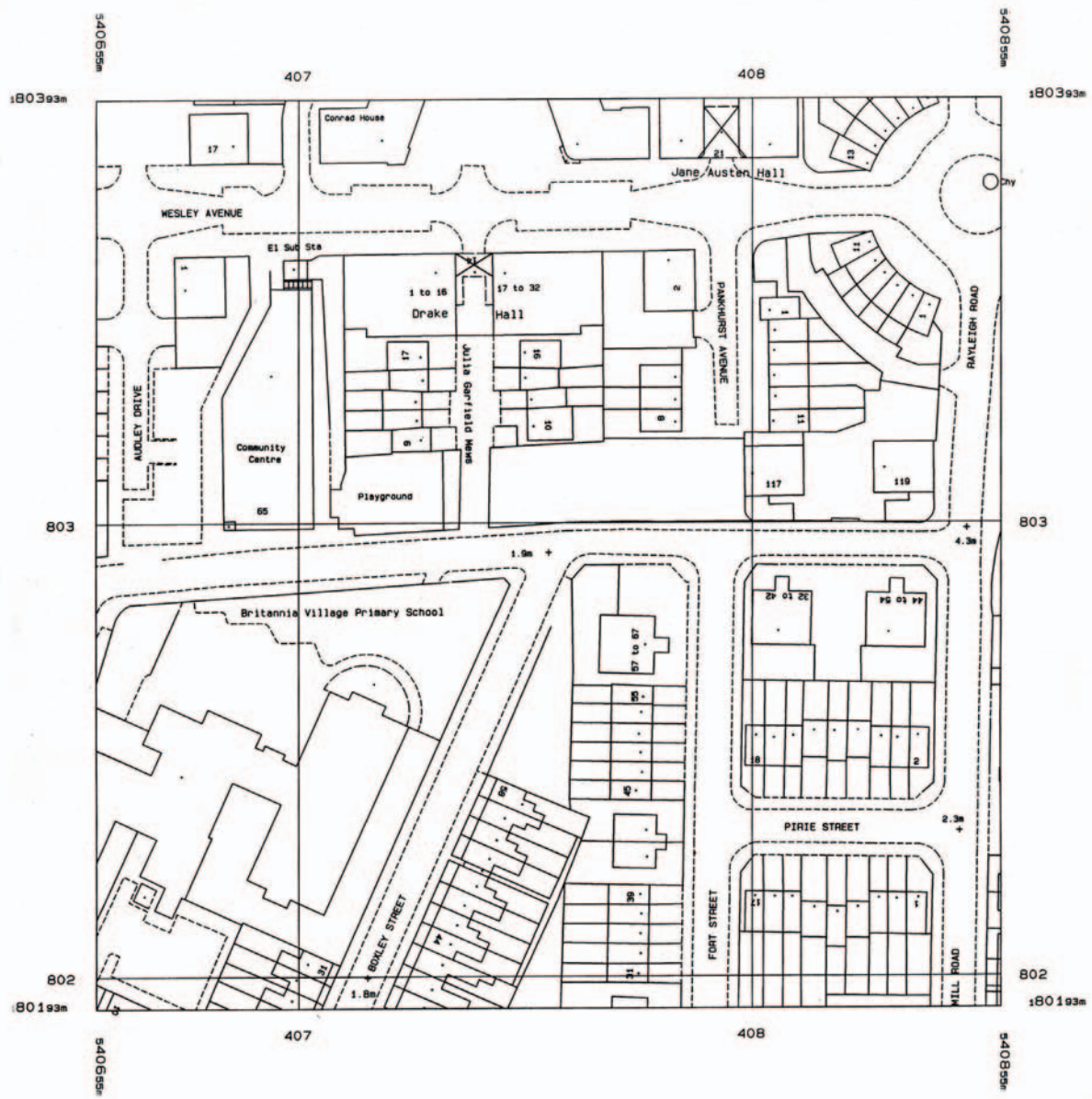


Image 6

The factories lined the river and the warehouses lined the dock. In between lay a zone of industrial workers' housing. It was low-lying, squat and regular. The site lies on the edge of Evelyn Road. Although the street is partly derelict now, it separated the houses from the warehouses. The apartments are built on the warehouse side of the street. (image 6)

Modern low cost housing construction is pre-fabricated timber frame and timber sheeting. NMLA imagined the building as a row of packing crates stacked up near the water. Once you make the timber carcass, you have to wrap it in something. This is usually a layer of brick, or wood, or tiles. The industrial product is returned to a reassuring traditional appearance.



Image 7

For this project NMLA looked at kinds of industrial wrapping that might be used as the final layer of our building. Given the site history, something bright and sweet and chemical was required. It also had to be inexpensive.

NMLA collaborated with light artist Martin Richman for this project; he suggested a material called Radiant Light Film, which is produced by 3M who make everything from dental adhesive to Post-it notes. It has dichroic properties so it produces iridescence. (image 7) Colourless metal oxides on the surface of the film disrupt the reflection of light, producing interference patterns that appear as colour. As the angle of incidence changes, the colour changes. The surface, the light source and the viewer are in an ever-changing relationship. The eighteenth-century physicist and architect Auguste Fresnel discovered this effect and explained the phenomenon of iridescence. It appears naturally in petrol and peacocks' wings.



Image 8

The south façade of the building is wrapped in a cladding of dichroic material held in glass frames. These façade units have a 200mm depth and contain two groups of offset louvers, the first centred within the depth of the case, and the second on the back wall. The louvers are fabricated from sheet acrylic, each covered in the dichroic film. Light hitting the facade is reflected back from different layers, producing a shifting pattern. Cast glass captures the light as it escapes. In time, a stand of silver birch trees will add an extra layer to the façade. (image 8) They will cast shadows onto the surface and catch reflected coloured light. At times the light effect is robustly geometric, at others is evanescent and fugitive. (images 9–10) The aim is for the building to have a dream-like quality, as though its image will not fix completely in your mind. NMLA hope that this connects to the shifting, uncertain properties of the place.



Image 9



Image 10

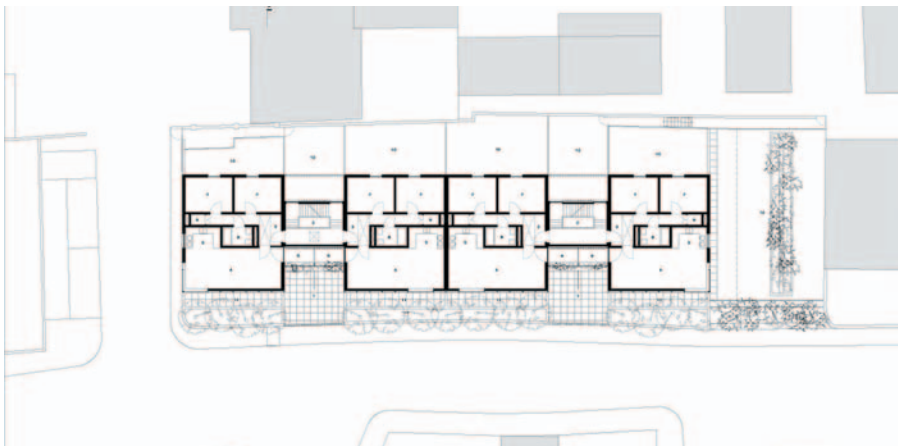
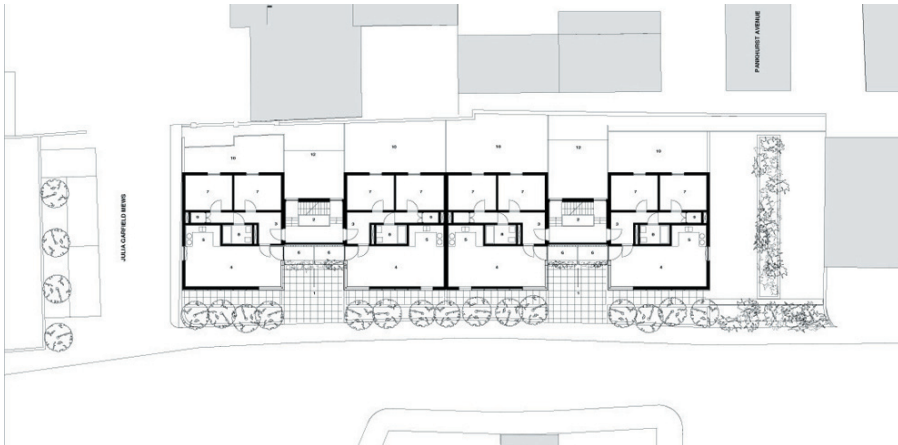
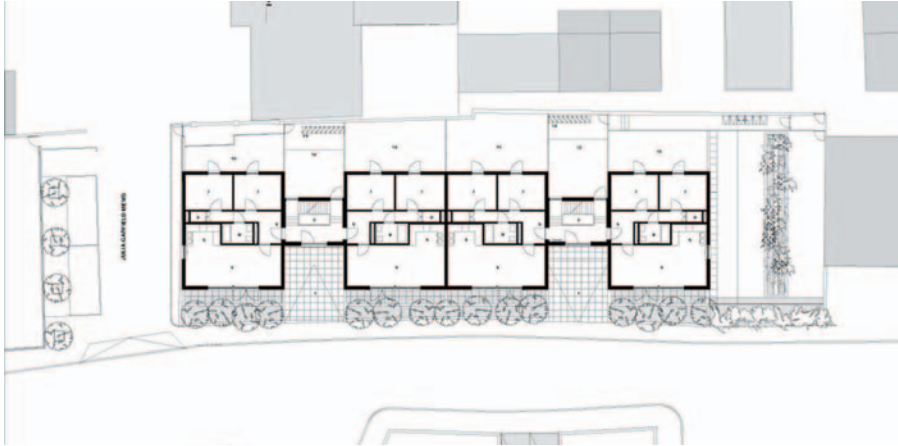


Image 11

This was a Design & Build Contract in which NMLA partnered with Sandwood Construction who worked successfully with them on the development of the design, as well as the construction of the building. Sandwood Construction gave considerable support in solving the many practical difficulties involved in taking materials that are not standard building products and incorporating them into the face of the building.

Sandwood Construction had entered into a framework agreement with the client, the Peabody Trust. NMLA too entered into the spirit of partnering on this project and had a good working relationship with the contractor. The contractors were committed to teamwork and were involved in the detail design throughout. This gave the client the confidence that ambitious details could be achieved.

A Design & Build Contract allows the architect less control over the detail as the contractor takes the opportunity to detail many aspects of the design. The responsibility for site inspections also changes; the architect's responsibilities are lessened as the contractor takes on this responsibility. It is usual for the contractor to employ the architect to continue the design development for such projects.

A typical problem faced on Design & Build Contracts is that the budget is fixed. There is no allowance for a contingency sum should unforeseen extras be inevitable. When buried ordnance, munitions and toxic waste were found during the excavations, there was no budget available for dealing with the careful removal needed. Items simply had to be omitted from the work – in this instance it was agreed that it would be the interior radiant light film and rooflights. Such omissions seem brutal for an architect with a strong design vision, but necessary under such a contract.

In order to ensure design control, the architect needs to have worked through and specified all the critical details by the end of the 'Final Proposal' stage. Under a traditional contract, many details are deferred until the 'Production Information' stage. Under a Design & Build Contract, this would be too late. The circular columns in the corner glazed windows might have been omitted if we as the architects had realised the need for them earlier on in the design process and to avoid them had ensured that the roof cantilevered at this point. Under a traditional contract, where the fixing of all details early on is not critical, this change might have been possible.

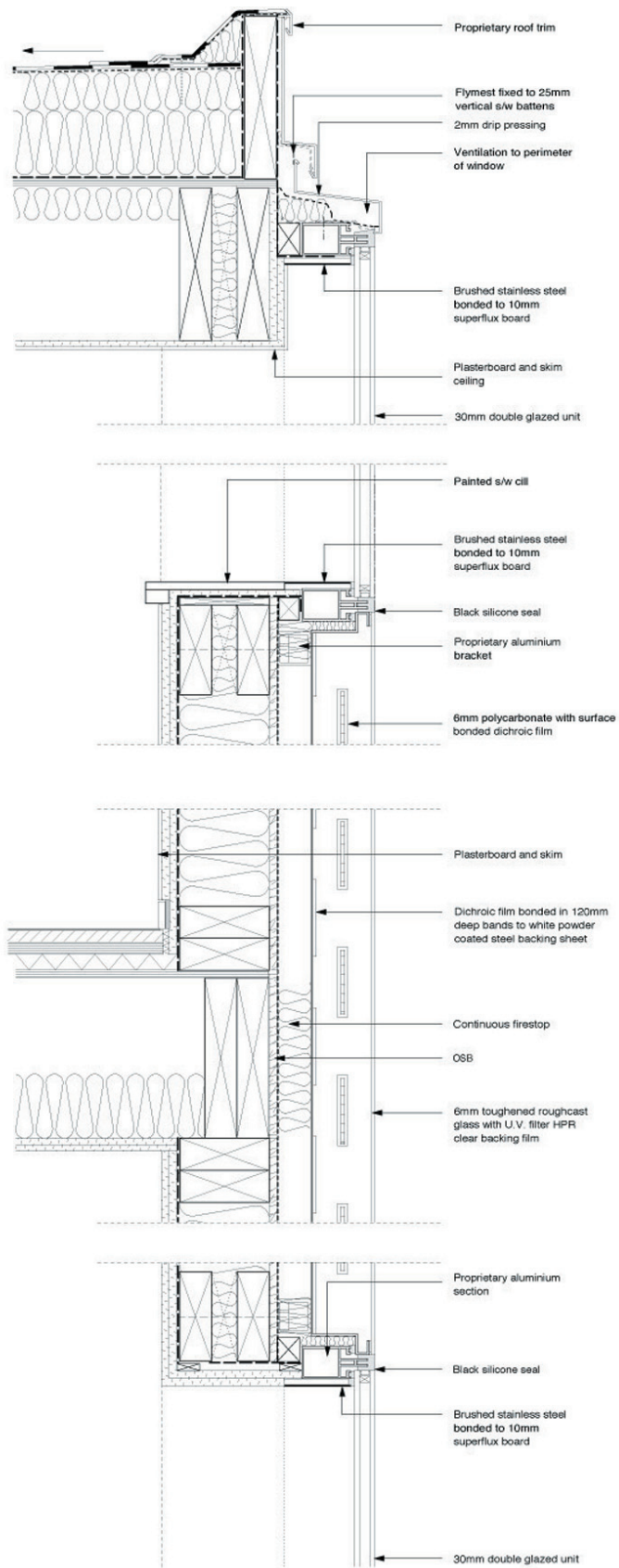


Image 12

As the use of Radiant Light Film for the façade of the building was not an approved application, the insurers who re-insure first time home-buyers were unhappy that the façade didn't have the guarantees that building products usually have. The Housing Association requires the insurers' approval. NMLA therefore approached 3M, the dichroic film manufacturers, but they were unwilling to advise on its suitability for use on a building as the quantities needed were simply too small.

We then employed Dewhurst MacFarlane, glass experts and façade designers, who produced a performance specification for the design that embodied the employer's requirements. It isolated the only potential danger, that the glue fixing the film to the louvres would become embrittled by U-V light.

Dewhurst MacFarlane advised that the glass should have a U-V filter on it to protect the glue and carried out accelerated testing on the glue to test its performance over 30 years. This process was not fast enough to be complete before work began on site so had to be carried out concurrently. The specification was then changed so that the performance of the façade panels was independent of the performance of the building. As a result, the performance of the glue would not affect the building's performance. If the glue failed, only the aesthetic appearance of the building would be altered. On this basis, the insurers agreed to provide suitable cover.

The glass panels were developed with the subcontractor. The initial design was sent to different tenderers who each provided their strategy. Firman Glass, for example, created a laminated glass panel. Architectural Aluminium in Dublin were chosen as the preferred subcontractor. They developed aluminium cases deep enough to contain the film on offset acrylic louvres. (images 11–12) The back of the case is polished aluminium and the front is cast glass with a standard double-glazed seal between. The panels, which act as a rainscreen, are clipped onto the timber frame construction behind. Air can circulate freely behind the panel.

At one stage, coloured bands were to be wrapped around the breather membrane, with battens on top and acrylic sheet over to reveal the construction. The problem with this was the potential for dust, condensation and mould to accumulate on the back of the acrylic where it was to be ventilated. This was not based on an intuitive detailed response early on in the design process.

Appendix 1: Related Articles by Niall Mc Laughlin

(1.1) Niall McLaughlin, 'A Royal Gittern at the British Museum', in Katie Lloyd Thomas (ed.) *Material Matters* (London: Routledge, 2007), pp. 29–42.

(1.2) Niall McLaughlin Architects, 'Peabody Housing, Silvertown, London, 2001–2004', in Raymund Ryan (ed.), *Gritty Brits: New London Architecture*, (Pittsburgh: Heinz Architectural Center, Carnegie Museum of Art, 20 January–3 June 2007), pp. 74–75.

Appendix 2: Critics' Reviews

- (2.1) *Building Design* (April 2003).
- (2.2) *The Times* (November 2004).
- (2.3) *Building Design Plus: 'Architect of the Year'* (December 2004).
- (2.4) *RIBA Journal* (January 2005).
- (2.5) *Architect's Journal* (February 2005).
- (2.6) *The Sunday Times* (Irish Edition) (February 2005).
- (2.7) *The Evening Standard* (March 2005).
- (2.8) *Irish Times* (April 2005).
- (2.9) *Architect's Journal* (June 2005).
- (2.10) *Architecture Ireland* (June 2005).
- (2.11) *RIBA Journal* (July 2005).
- (2.12) *Detail* (January 2006).
- (2.13) *Urban Building* (March 2007).
- (2.14) *New Irish Architecture 20: AAI Awards 2005* (Architectural Association of Ireland, 2005).
- (2.15) *RIBA London Review 2005* (London: Excel Publishing, 2005).
- (2.16) *RIBA Housing Review 2005* (London: Excel Publishing, 2005).
- (2.17) *London Architecture & Design* (Loft Publications, 2005).

