GRIMSHAW/ UCL CANCER INSTITUTE

1. Rooftop view from the institute towards UCH's Euston Road Tower

THE BUILDING OPENS UP AN OFTEN OPAQUE AND PRIVATE AREA OF STUDY

By Kenneth Powell. Photography by Anthony Coleman

The estate of University College London (UCL) – the founding college of the University of London – is extensive and remarkably diverse, sprawling over much of central Bloomsbury. There is everything from converted Georgian houses to Short and Associates' recent, extraordinary School of Slavonic Studies. It is, however, the enclosed quadrangle fronting on to Gower Street, with William Wilkins' imposing decastyle portico of the 1820s, that provides the college with an impressive public image.

Facing the quadrangle on the western side of the street is Alfred Waterhouse's University College Hospital (UCH), completed in 1906, recently superseded by Llewellyn Davies' massive PFI-funded tower (2005) on Euston Road and converted into teaching space for the college. The spectacular terracotta-faced cruciform hospital building was completed by Waterhouse's son Paul, who went on to build the premises of the UCL medical school with his son, Michael, who in turn went on to work on further hospital buildings in the inter-war years.

The development of the new hospital provided the opportunity for a radical reassessment of UCH's property holdings. The demolition of Michael Waterhouse's nurses' home on Huntley Street, described by Pevsner as 'dour and reticent', provided the site for Grimshaw's UCL Cancer Institute, named the Paul O'Gorman Building in memory of a child who died of leukaemia. The £35 million project was won by Grimshaw after competitive interviews in 2000. The building is currently being brought into use by the college, part of a development programme intended to attract top researchers and maintain UCL's position as one of the leading UK centres of medical research. It houses 350 scientists and contains 4,500m² of laboratory space on five floors.

Although the site, backing on to Chenies Mews, falls within the Bloomsbury Conservation Area, the demolition of the unlisted nurses' home was refreshingly uncontroversial. Part of the brief was the refurbishment and integration into the project of an adjacent Grade II-listed block by Paul Waterhouse on the corner of University Street. The budget for this part of the scheme was very modest, allowing for only a superficial makeover of the building. As Simon Moore, the Grimshaw associate running the project explains, Camden planners and English Heritage were keen to achieve a sympathetic conjunction between the listed building and the new insertion.

The entrance to the new building has been located at the point where it adjoins the reinstated flank wall of the listed building, the gap being filled with a sheer glazed wall which reveals the strikingly engineered staircase – a typical Grimshaw tour de force which is, in visual terms, the focal point of the building. Flanked by lifts, the stair is a highly economical structure with cast-steel treads cantilevered from a structural spine of precast concrete. Part of the return cornice of the listed building, torn off when the nurses' home was built, has been faithfully reinstated. One of the client's key aims was to procure a building with a sense of transparency and accessibility. As the Cancer Institute's director Professor Chris Boshoff explains, 'the building does something exciting by opening up an often opaque and private area of study.' Cancer, he insists, already kills more than one in four of the population and is a matter of intense public concern: he and his team want the public to be informed about their work.

2. The building's raison d'être is research: this is a 'write-up' area

Maximum transparency for the glazed link is obtained by flat-laminated (not toughened) glass, secured with a system of clamps (rather than planar fixings) which, Moore admits, was inspired by the remarkable glazed facade on the low-rise wing of Seifert's Centre Point – a pioneering piece of glazing design in its day. Beyond the entrance area is a top-lit atrium, covered by an ETFE cushion roof, formed in the lightwell of the listed building. This serves as an interactive social space for those working in both buildings.

The raison d'être of the building is, however, research. In line with current thinking on laboratory design, the actual laboratory spaces, enclosed and highly serviced, with mandatory full air-conditioning, are separated from the 'write-up' areas, where the findings of research are analysed, discussed and recorded by researchers (who include senior figures in the field as well as postgraduate students). The laboratories are located in the central core of the building, with the write-up spaces facing west onto Huntley Street. The use of opaque fritting on the glass partitions dividing the two areas allows natural light to penetrate the laboratories. The write-up areas have timber floors, further underlining the division in function, and the use of timber acoustic panelling provides another element of warmth and texture. Service areas are set along the eastern elevation, facing Chenies Mews.

A bank of offices for senior academics forms a 'bookend' at the southern end of the block, spanning the Huntley Street entrance to the mews, with views from the upper floors over much of the West End (tinted glazing is used on this elevation). The theme of openness extends to the provision of light and views for those working within the building – a contrast to the introspective character of many scientific research buildings.

If the element of demolition involved in the scheme was relatively uncontentious, there was a desire to secure a building with some regard for context – Huntley Street contains, along with some grim hospital blocks (still in use but meriting replacement), a run of listed houses. The fixed terracotta louvres, which form a shading device on the street facade with its floor-to-ceiling glazing, clearly help to link the building visually to the listed Paul Waterhouse block and the old hospital building beyond, and give it a richly layered look.

Terracotta was, for Alfred Waterhouse, 'a new and exciting modern material'. It has once more become a fashionable material in recent years, popularised perhaps by its use in the work of Renzo Piano. Grimshaw uses it in a novel way: the louvre blades (permanently fixed in position on the basis of sunlight studies and creating a wave-like effect on the street facade) being threaded onto vertical stainless-steel tubes with rubber joints that allow the blades – each made up of seven separate sections – to flex under

3.

4.

3, 4 & 5. The entrance to the institute is next to a listed building by Paul Waterhouse, which has been retained as part of the scheme

load without damage. The effect of the suspended louvre bank is to provide controlled daylight inside the building while still allowing views out. Individual control of fabric blinds gives users the ability to exclude the sun when necessary.

The plan of the building is highly repetitive on the first to fourth floors, providing a clear diagram for servicing the vertical stack of laboratories. Write-up areas are pushed out beyond the grid line of the structural steel frame using coffered precast-concrete slabs – the architect compares the arrangement to sliding drawers. The ground floor steps back to respect the street line. On the fifth floor of the building, the long office area on the western elevation is replaced by an open terrace, which provides a break-out space.

Given the complex technology demanded by its function, the building's services are neatly contained within a minimum of rooftop extrusions – a contrast to the unsightly clutter that sits on top of many of the older UCL and hospital buildings in the vicinity. Each stack of laboratories is serviced by its own air-handling unit at sixth-floor level.

Grimshaw claims that elements of the building have been consciously generated by the imagery of biomedical research: 'Images of cells, wave patterns and the chromosome permeate the forms of the building.' The terracotta louvres have 'a rhythm that can be read as a vertical "bar code" configuration or genetic sequence image, but also reflect the waveform that is so significant to modern science'. Exposed concrete soffits are 'reflective of the mechanisms and cellular structures of biology; they are literally scooped out where the material serves no structural purpose'. Talk of this kind may please the client, but is superfluous to a critical analysis of a building which does not depend on a concealed referential language to achieve success.

Medical research can have an inherent drama, even a romance. The public awaits new discoveries that will prolong lives and reduce human suffering. That drama was expressed long ago in Louis Kahn's Richards Building in Philadelphia, with its strongly modelled composition of laboratories and service towers.

In comparison, Grimshaw's Cancer Institute is a highly controlled and rational building, almost industrial in its ordered geometry and response to the Georgian street grid of Bloomsbury. With its clear expression of structure and careful integration of services, it is a building in the best Grimshaw tradition, and one where Grimshaw's concern for detail does not obscure the clarity of the diagram. In this it vividly suggests that medical research is not always dramatic – that it's more often a matter of exhaustive analysis and experiment than sudden flashes of inspiration.

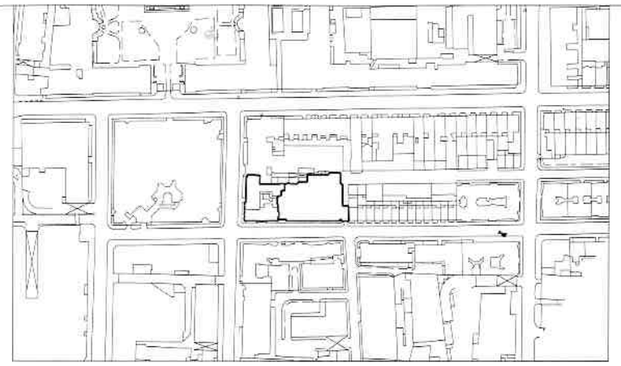
5.

6. Terracotta louvres link the new building visually to the Paul Waterhouse block and the original hospital beyond

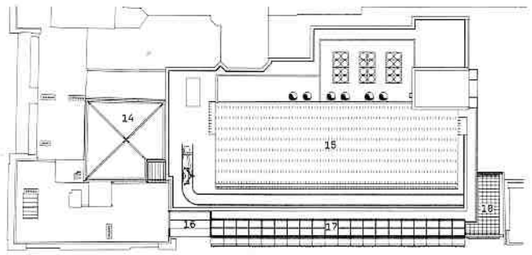
STRUCTURAL ENGINEER'S REPORT

The design called for the extensive use of visually exposed precast-concrete soffits and stair elements for the front-of-house areas. Construction took place above an operational sub-basement plant room which served the adjacent hospital within the congested central London site. The two existing buildings which were demolished to make way for the new building had similar height and load characteristics to the new build. This enabled the reuse of some existing piled foundations. The difference in plan dimension required new piled foundations to supplement the existing ones. To align the load paths between the new and old grids, storey-height steel transfer trusses spanning over heavily serviced areas of the sub-basement were used. This solution allowed the differences in geometry to be easily overcome while maintaining the existing ground and basement slab levels. This minimised the development works below basement level, allowing the sub-basement to remain operational at all times. The structural challenge of keeping within the building height limits and minimising on-site operations led to the adoption of a shallow precast-plank, steel-frame system that best met the aspects of the brief. Steel beams located within the planks provide support, and give a flat soffit to maximise the flexibility of partition layouts and horizontal service distribution. The key architectural challenge was the entrance and front-of-house areas, where the aesthetics of the 'white' acid-etched precast concrete were paramount, as was the need to minimise the impact of the structural depth as seen through the full-height glazed facade. These concrete elements were detailed without downstands or support projections. The use of 'hidden' cast-steel plates within densely reinforced concrete nibs was employed. This was achieved by working carefully with the precast subcontractor to develop 3D einforcement details which allowed the architectural intent to be maintained at critical connection points between column, beams and infill floor elements.

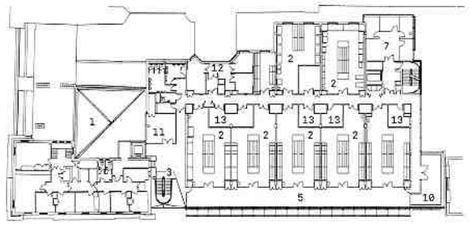
Malachy McNamara, Buro Happold



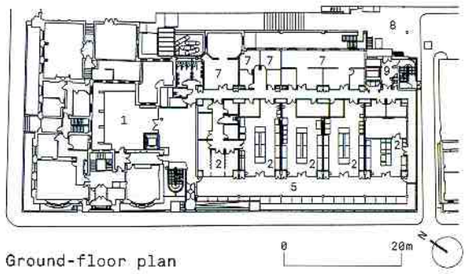
Site plan



Roof plan

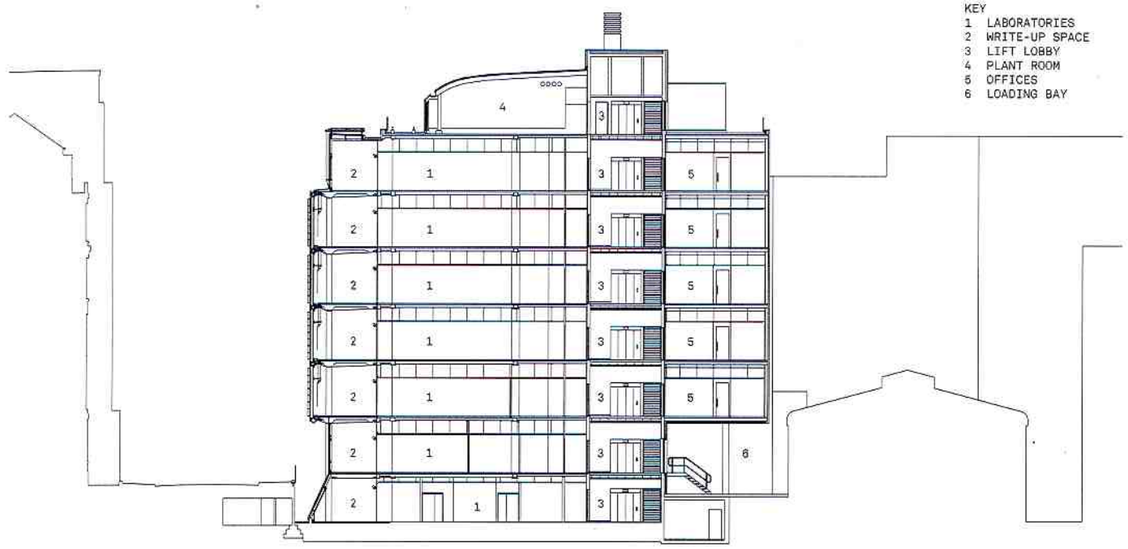


Fifth-floor plan

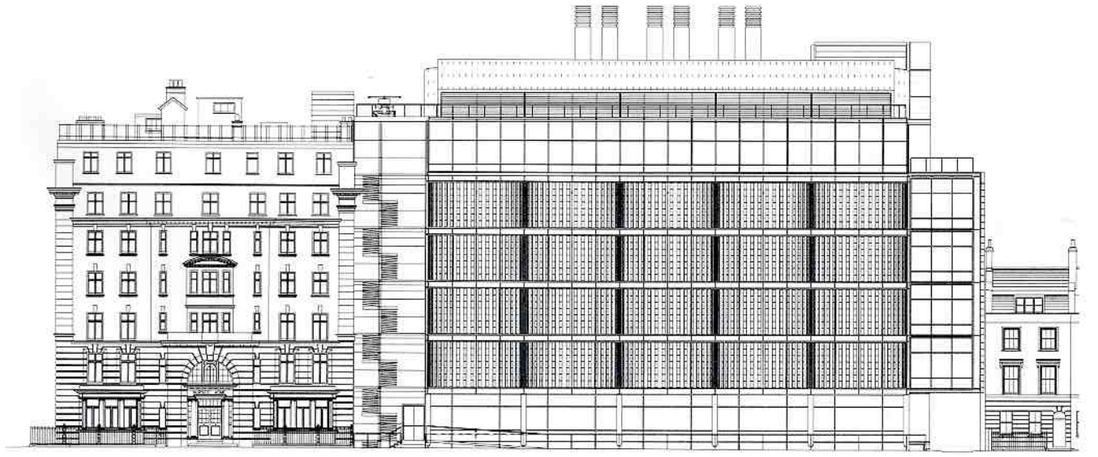


Ground-floor plan

KEY
1 LIGHTWELL SEATING AREA
2 LABORATORIES
3 STAIRWELL
4 ENTRANCE LOBBY
5 WRITE-UP SPACE
6 LIFT
7 OFFICES
8 LOADING BAY
9 SERVICE LIFT LOBBY
10 ROOF TERRACE
11 MEETING ROOM
12 CATEGORY III MEDICAL LABORATORY
13 SPECIALIST LABORATORIES
14 LIGHTWELL ROOF
15 PLANT ROOM ROOF
16 GLAZED ROOF OF ENTRANCE STAIR
17 GLAZED ROOF OF WRITE-UP SPACE



SW-NE section



Huntley Street elevation

Credits

Start date
May 2000
Start on site date
July 2004
Contract duration
36 months
Gross internal floor area
8,832m²
Total cost based on tender sum
£19,673,616
Client
University College London
Architect
Grimshaw
Project team
Neven Sidor, Simon Moore, Kristina Ehlert, Jane Garrett, Christian Hönigschmid-Grossich, Nigel Raynor, Wenke Reitz, Jerry Tate, Karen Summers, Karen Turner, Malgorzata Haley, Andrew Perez
Structural engineer
Buro Happold
Services engineer
Faber Maunsell
Quantity surveyor
Gleeds
Project manager
Turner and Townsend/MACE
Main contractor
Shepherd Construction
Selected subcontractors and suppliers
Bespoke precast entrance stairs and concrete ceilings Decomo; *external cladding* GIG Fassadenbau; *architectural metalwork* Boundary Metal; *lab furniture* Waldner; *ETFE roof* Vector Special Projects; *louvres* Colt; *windows* Solaglass; *single-ply membrane* Robseal Roofing; *suspended ceilings* SCS; *glazed partitions* Optima; *internal roller blinds, manually operated window and rooflight blinds* Levolux; *X-ray screening* Wardray; *limestone flooring* Gormley

Cost summary

	Cost per m² (£)	Percentage of total
SUBSTRUCTURE	54	2.4
SUPERSTRUCTURE	343	15.4
ENVELOPE	391	17.6
INTERNAL DOORS AND PARTITIONS	167	7.5
FINISHES	101	4.5
FIXTURES, FITTINGS AND EQUIPMENT	187	8.4
SERVICES	566	25.4
EXTERNAL WORKS	15	0.7
PRELIMINARIES	345	15.5
OVERHEADS AND PROFIT	21	0.9
PROVISIONAL WORKS	29	1.3
DAYWORKS	9	0.4
AGREED CONTRACT TOTAL	2,228	100

Based on contract sum.
Cost data provided by Phil Corbett at Gleeds

7.

7. Lightwell between old and new

8. View down cul-de-sac towards the offices on the south side of the institute

8.

A PRECAST CONCRETE STAIRCASE AND A GLASS WALL

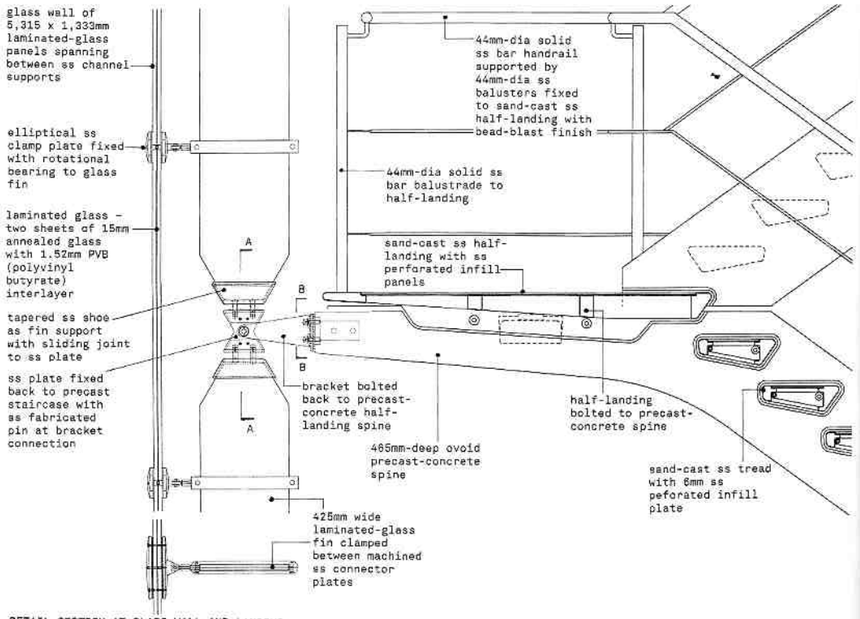
The staircase rises seven floors from the main entrance foyer; it is set behind a glass wall which spans between the wall of the original 1907 building and the new building. The staircase spine, a delicate ovoid of precast concrete, supports sand-cast stainless steel half-landing plates and treads with perforated stainless steel infill plates.

The glass wall consists of laminated glass panels of annealed glass. The 5,315mm wide by 1,333mm high glass panels span between stainless steel channel supports set in the solid adjacent walls. Horizontal joints are made with gaskets and silicone mastic. Lateral restraint (wind load) to the glass wall at mid span is provided by a vertical row of laminated glass fins; they have stainless steel connector plates clamped to them which are connected to the glass wall panels by rotational bearings and stainless steel clamp plates.

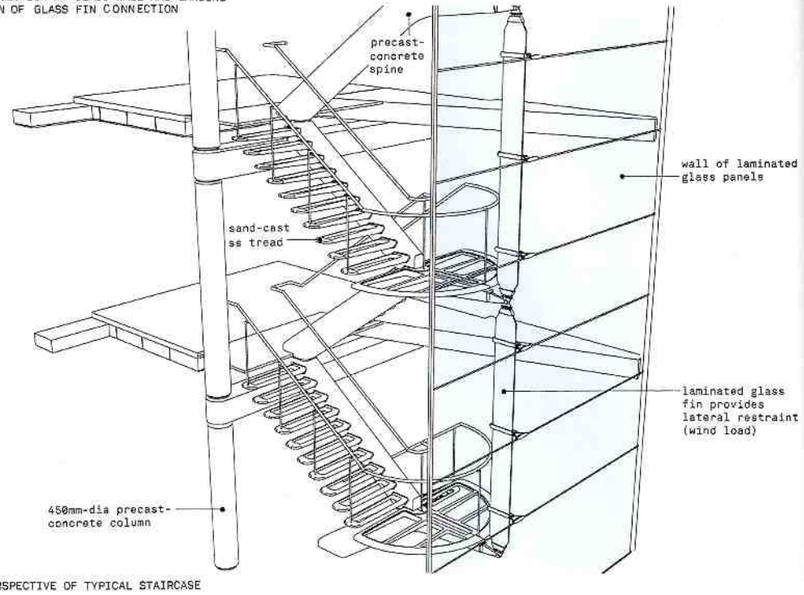
The glass fins are supported at each cantilevered precast concrete half-landing by a bracket. To accommodate vertical movement, the ends of the fins are housed in stainless steel shoes connected with sliding joints to a stainless steel plate. A pin joint at the centre of the plate allows additional movement.

The precast spine, of acid-etched white concrete with mica sand mix, was cast with threaded stainless steel inserts to which the treads are bolted.

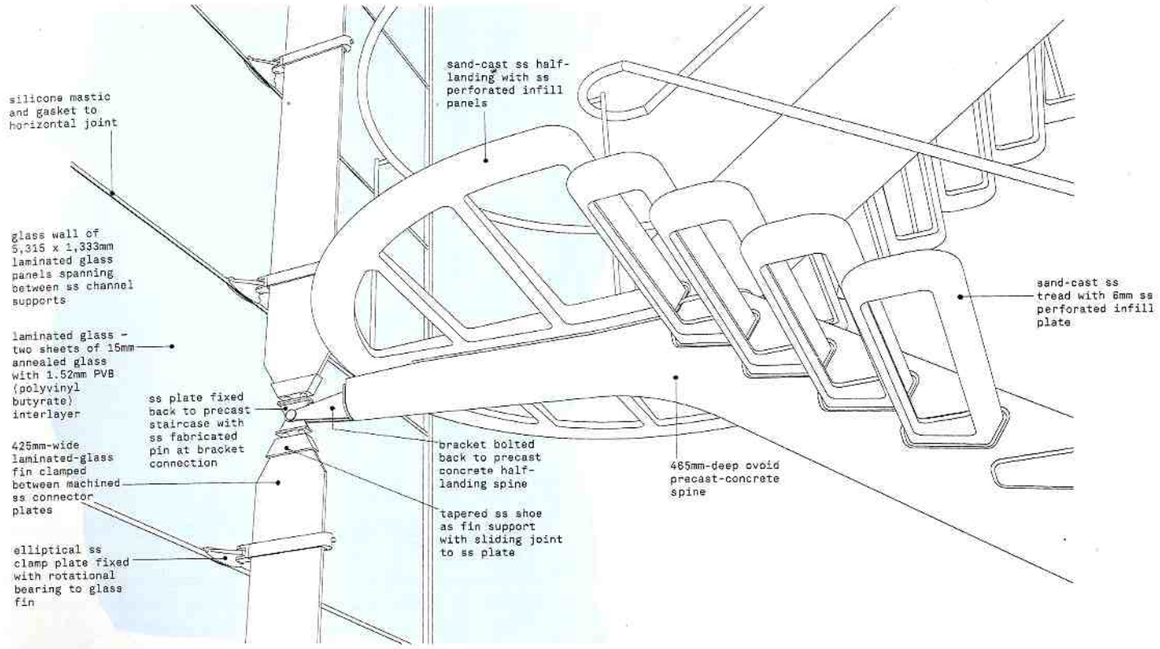
By Susan Dawson



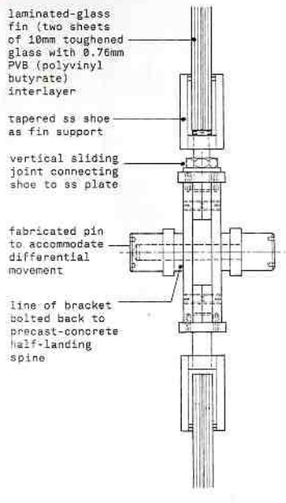
DETAIL SECTION AT GLASS WALL AND LANDING AND PLAN OF GLASS FIN CONNECTION



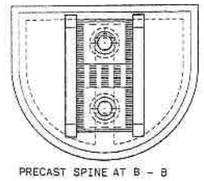
KEY PERSPECTIVE OF TYPICAL STAIRCASE



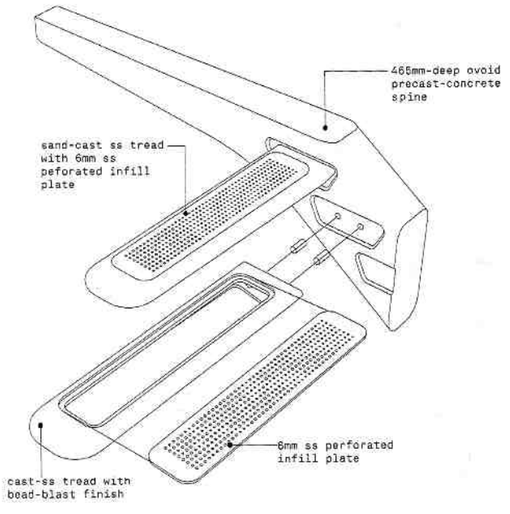
PERSPECTIVE OF GLASS WALL AND LANDING



GLASS FIN DETAIL AT A - A



PRECAST SPINE AT B - B



PERSPECTIVE VIEW OF CAST-SS TREAD