Adaptable floorspace – a new city fabric?

Buildings that convert easily between uses provide a sustainable fabric. Alex Lifschutz with Arup has designed a system which does not discriminate between classes of use.

Alex Lifschutz is founder partner in Lifschutz Davidson Sandilands architects.

The moon programme was perhaps the most impressive feat of engineering of the post war period; the first landing was accomplished in 1969 within the nine year deadline set by Kennedy. This, among other technological achievements of the 20th century, gave credence to the utopian vision that, properly directed, big ideas could be made to work at a national or even international level to solve the problems of the age.

Just as the moon programme was completed in 1972, a development of 3000 dwellings in St. Louis, Missouri, called Pruitt Igoe, designed by Minoru Yamasake (whose World Trade Centre met its tragic fate in 2001), was being dynamited. Whether because of poor design, inadequate management or social change, the showpiece scheme had lasted only 20 years. So complete was the blight caused by the building foundations remaining after demolition that, even today, the land has not been redeveloped and lies fallow.

Closer to home, we see evidence of the continuing impact of post war utopian regeneration projects. Only in 2005 was it decided to demolish The Aylesbury Estate in Southwark (built in 1963) following years of uncertainty about how to progress the regeneration of the area. The failings of the Heygate Estate (built in 1970-1974) nearby, is a primary reason for a comprehensive redevelopment of the Elephant and Castle, still in planning. Its shopping centre

Pruitt Igoe goes down

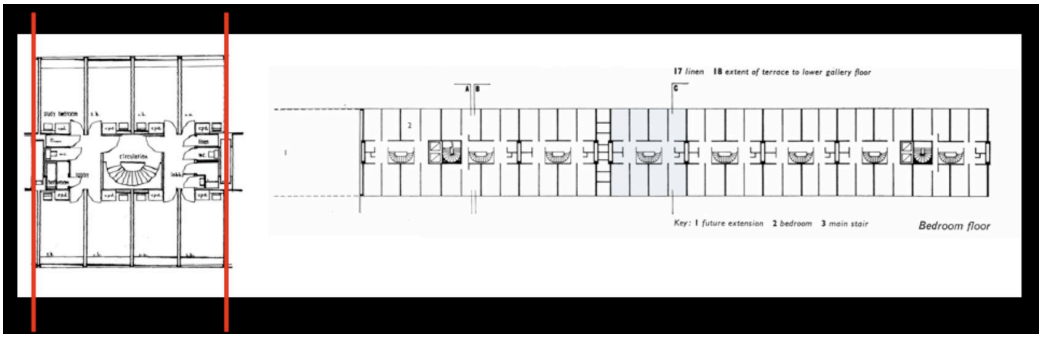
was described by Time Out readers as "the biggest eyesore in London". Only now is the Elephant and Castle moving to the stage where a development team is being chosen. Again, past failings leave a highly problematic residue that we are still grappling with today.

Instrinsic to these projects is their 'top down' approach to urban renewal and this was rounded on by Jane Jacobs in her book the Death and Life of Great American Cities published in 1961 at the beginning of the moon programme. "But look at what we have built....low income projects that have become worse centres of delinquency, vandalism and general social hopelessness than the slums they were supposed to replace; middle income housing projects which are truly marvels of dullness and regimentation, sealed against any buoyancy or vitality of city life....cultural centres that are unable to support a good bookstore...This is not the rebuilding of cities. This is the sacking of cities"

Perhaps we have moved on and, while we are gradually clearing the backlog from the cock-ups of the 60's and 70's, new development has learned from past mistakes. But are we sure that in the districts of undifferentiated apartment blocks springing up in the Thames corridor, in the mono-cultural housing schemes of the south east and the business parks of the Thames Valley, we are not building new versions of old failures? And what can we do to these buildings if they are not fit for their intended purpose other than to wait a generation, as at Elephant and Castle, for another round of renewal?

In 2003 we (together with engineers Adams Kara Taylor) were asked by Imperial College in London to review the opportunities for upgrading a comparatively new building on their campus, the Southside student halls of residence in Princes Gardens. This celebrated and Grade II listed concrete structure designed by Sheppard Robson in the 1960's, was suffering from various fabric failures. Of greater concern, the accommodation did not meet modern standards especially DDA compliance; the lack of en suite bathrooms was also a turn off for prospective students. The original design had assigned two shared wc's, a bath and shower plus a single

Imperial College plan



escape stair to 8 study bedrooms in a clustered arrangement. The structure and escape system was highly tuned to this arrangement, with the main walls around each cluster in load bearing concrete. Largely because of this structural rigidity, we concluded that the building could not be reused and Westminster City Council gave permission for it to be demolished in 2004 to make way for a new building by architects KPF.

In the 30 years since the student housing at Princes Gardens was completed, the pendulum had swung from Imperial College being able to attract the students of its choice – to a situation where students expected relatively luxurious facilities that the building could not accommodate.

The design of the Southside halls of residence celebrated the established Modern Movement tradition of form following function; hence the expression of the 'streets in the air' circulation system in its elevation, also in the highly specific plan with its restrictive concrete tunnel forms surrounding stairs and rooms. The idea of expressing function in this way had first been suggested by Louis Sullivan in the late 19th century and continued to be attractive throughout the 20th century, being used by all the great modernists as a method of generating and justifying the idiosyncratic and specific forms of their buildings and their own architectural identity. Each design, being the resolution of a specific brief, was a perfect object that should not (indeed, as we often find, could not) be improved or altered. The architect was to have the last word.

Many designers – le Corbusier, for example – argued that the formal expression was based on their version of universal truths; so, for instance, the need for buildings to introduce air and light to counteract disease (the 1920's version of sustainability), or the need to prepare buildings for Taylorisation (the 1920's version of off site prefabrication or Modern Methods of Construction) to improve quality and house the poor.

The attraction of form based architecture is stronger today than ever with all major cities hosting buildings by the great modernists of our day. Many extraordinary, excellent designs follow the tradition of an ideal and specific form that solves a particular brief. Increasingly, though, the form and the brief are based on unapologetically personal rather than universal truths. So parts of our cities are becoming 'zoos' for exotic and delightful buildings; the more remarkable and varied the species contained, the more, somehow, each zoo comes to resemble other zoos and therefore comes to lose any sense of place.

The modernist conception of city that underpins this approach is a highly regulated and zoned vision. Le Corbusier's Ville Radieuse, for instance, provided a platform for highly specific buildings with housing, offices and civic buildings differentiated in both their plan and location: "Business district at the top, with circular station directly beneath. Residential superblocks flank a central commercial and civic axis, while industrial complexes are sited below".

Villa Savoie: Corb's last word

(Le Corbusier; the Machine and the Grand Design by Norma Evenson.)

The great modernist mind could of course figure out the ideal city plan and put it on paper.

Contrast this with the 'traditional' city that dealt with environmental, economic and social needs by means of an evolving local vernacular. Looking at a plan of this kind of city (Colin Rowe and Fred Koetter used Parma as an example in their sometimes impenetrable book, Collage City 1973), with the exception of obviously specific public buildings at the centre (the church, town hall etc.), there is no apparent distinction between all the other buildings (the 'ground') that make up the fabric of the town in their plan or location; and that fabric sustains living, working and entertainment with equal ease. "The very great versatility of the supporting texture or ground...this is not under any great pressure for self-completion or overt expression of function; and, given the stabilising effects of public façade, it remains relatively free to act according to local impulse or the requirements of immediate necessity".

Corb's Saint-Dié. *Bottom:* Parma, a traditional city *(images from Collage City)*

So there we have it – the modernist approach to cities and buildings is generally deterministic, with highly specific city zones and, within them, specific building forms developed from functional needs (or increasingly personal rationales). The alternative approach, originally espoused by Jacobs, Bernard Rudofsky and now by a new brand of 'emergence' theorists is that the opposite is the case. Cities and buildings need to be made of much more general, simple ingredients. Bottom up rather than top down.

"An ant colony behaves with an intelligence no particular ant possesses; a brain is conscious although no particular brain cell is; a city develops districts and neighbourhoods no planner could impose. In each case, complex problems are solved by a profusion of relatively simple elements."
(Steven Johnson, Emergence)

In this emergent view, not only are cities made of simple buildings but these buildings are constantly being adapted or altered by the citizens who inhabit them in a continuous process of evolution. Stewart Brand documented this pattern of change in his 1994 book How Buildings Learn – what happens to them after they're built. His cover illustration is of two identical Greek Revival buildings of the 1850's and the typical changes that occurred – " Both buildings grew; they diverged; their skins changed markedly. Both had a rapid turnover of tenants; brick construction helped them last; window openings stayed the same".

In the 1960's the containerisation of cargo forced a significant change to many industrialised cities. Their ports moved downstream to cope with the new logistical system and this left large areas of wharves, warehouses and industrial buildings vacant, often in the heart of town. These were framed, generally non specific and robust structures. Although many were initially demolished often for no good reason, those that remained turned out to be extraordinarily useful and their waterfront context added huge value.

Oxo Tower Wharf was one such building on London's South Bank dating from the late 19th century when it was constructed as a power generating station for the Post Office. The building was subsequently extended and altered to become a meat warehouse and in the 1920's the iconic Oxo tower was added to advertise the meat cube product – overt signs being prohibited on the river. Later the building became a meat processing plant and a factory for endless eggs, a sausage shaped product inserted into meat pies to give an appropriate amount of yolk and egg in each slice.

When in 1990 our office was given the task of converting the building it was in a state of dereliction. We removed redundant structure, inserted a light well in the centre of the building and re-cored it simply with a central lift and stair and escapes at either end. The building structure was an early concrete frame robust enough (with some repair) to take a cocktail of uses including ground floor shops, workshops on first and second floors, five storeys of coop flats and a spectacular 400 cover rooftop restaurant for Harvey Nichols. These new uses are not likely to be the last inhabiting the structure which, given the simplicity of plan and core could be refitted many times in the future. When Londoners tire of the roof top restaurant, it could be converted into apartments, offices or a museum. Ours is one intervention in this building's long life.

Our conversion of the Piper Building (1999) followed a similar path – this office and industrial building, originally belonging to British

Gas, converted relatively easily into a mix of loft flats, offices and a warehouse for the fashion company Joseph. Again, a relatively simple, robust, framed structure facilitated new life.

Property consultants Savills estimate that approximately 13m square feet of offices like the Piper Building were converted into apartments in the recession of the 1990's. The attributes of post war offices built up to that time – 12/18m wall to wall dimensions, significant load capacity and cores with ample lifts and stairs; made them ideal for conversion. Many were not particularly generous in floor to ceiling height as offices but nevertheless adequate for residential occupation.

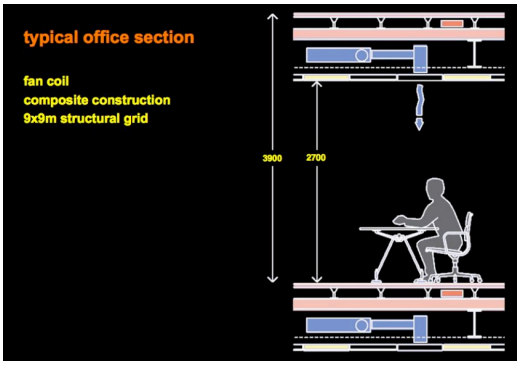
Buildings that convert easily between uses (office, residential including hotel and apartments, retail and restaurant etc) provide a very sustainable fabric especially in parts of the city that have not become established economically or where there is likely to be rapid social change. However this approach requires not only relatively non specific structures which accommodate the common features of all uses (structure, environment, dimensional constraints), but also an acceptance in planning zoning that such change should be anticipated and perhaps even, given our increasingly overlapping lifestyles, encouraged. The benefits are obvious – unlike 60's and 70's housing projects that could not be reused because of their inflexibility and specificity and which still blight

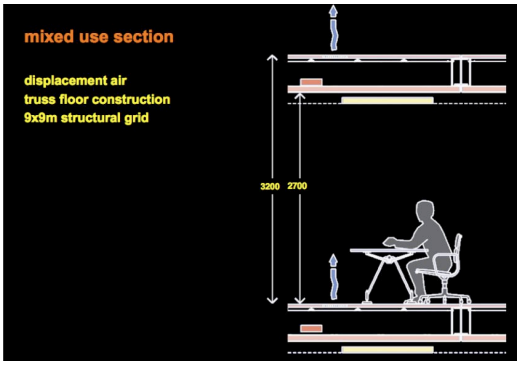
areas of our towns, the surplus office and warehouse buildings of the 90's have been beneficially absorbed.

Unfortunately, modern tendencies in both residential and office buildings are moving away from this possibility. Offices have the storey height (3.6-4m), strength, lifts and escape stairs to support many different uses but are becoming increasingly deep in plan as developers strive to increase efficiency. Wall to wall dimensions of 45m are the norm with small atria of 6-9 m inserted in the centre to give adequate daylight for office staff but not for conversion into apartments. Such deep buildings are also having a profound effect on the grain of our cities, making them less permeable and less responsive to human scale at street level.

Residential buildings are becoming increasingly more specific with minimum lift capacity suitable only for light use; ungenerous floor to floor dimensions (2.85-3.1m) and risers are insufficient to accommodate anything other than residential uses. The structural capacity (1.5KN per m) of a block of flats is generally less than half that of a lightly loaded office (2.5KN +1KN per m for partitions) and most such buildings are stabilised with concrete cross walls on party wall lines between flats; a system that deters alteration. Are we to imagine that the recent formation of many millions of new small households (around two thirds of UK dwellings are now occupied by one or two people) is unalterable? How will such purpose designed apartments deal with an ageing population, with trends towards an overlap in work, entertainment and home?

Our conceptual masterplan for Silvertown Dock proposed an urban fabric around the reconstituted finger docks made up of 15-18m deep blocks – 'urban warehouses' that could accommodate an extensive range of uses now and in the future.





Their non-specificity did not reduce their architectural impact which in this scheme was created by expressed external cores and slabs cantilevered over the water. This scheme proposes a method for large urban renewals, which often last 10 years or more, to proceed through the vagaries of economic and social change; this because there is no need to take on development risk in predicting the value of housing, offices, hotels and shops years ahead of time. Buildings can be planned and constructed as fabric but only fitted out to the specific use appropriate at the time of completion; changes of use can occur even during the course of the development.

Our office has been carrying out research, with engineers ARUP, to develop a system that can provide sustainable, adaptable structures like those in the Silvertown scheme that will last the test of time. The recently prototyped system has an efficient storey height (say 3.2m) that is only slightly taller than that normal for residential buildings but well inside standard office dimensions. This generates a 2.7m floor to ceiling height accommodating, offices shops, restaurants and generous residential units of all types (hotel, student housing, affordable, market and loft flats). The system can support the highest loads for offices and therefore easily cope with housing of all kinds. The floor is fully accessible for services and deep enough to permit offices above apartments and vice versa so that uses can be exchanged within and between buildings. Most importantly, the structure uses a minimum amount of material, can be recycled and encourages a green environmental system that utilises free night cooling.

We should be honest about our lack of success in regenerating and extending our cities over the last century. Our over reliance on schemes that are too specific to their initial use and subsequently unable to respond to change has led us to spectacular failures, and ones that continue to haunt us. In excluding the opportunity for citizens to affect small scale improvements, to colonise and alter their environment, our top down approach to city planning and design is not only risky but often undemocratic. In the UK we still celebrate the Georgian/Victorian terraced house for its adaptability – even though it is not particularly versatile – it is time now to develop a new city fabric that meets the dynamic needs of the 21st century city.