A ROUGH DRAFT

ANDREW HURLE 2008
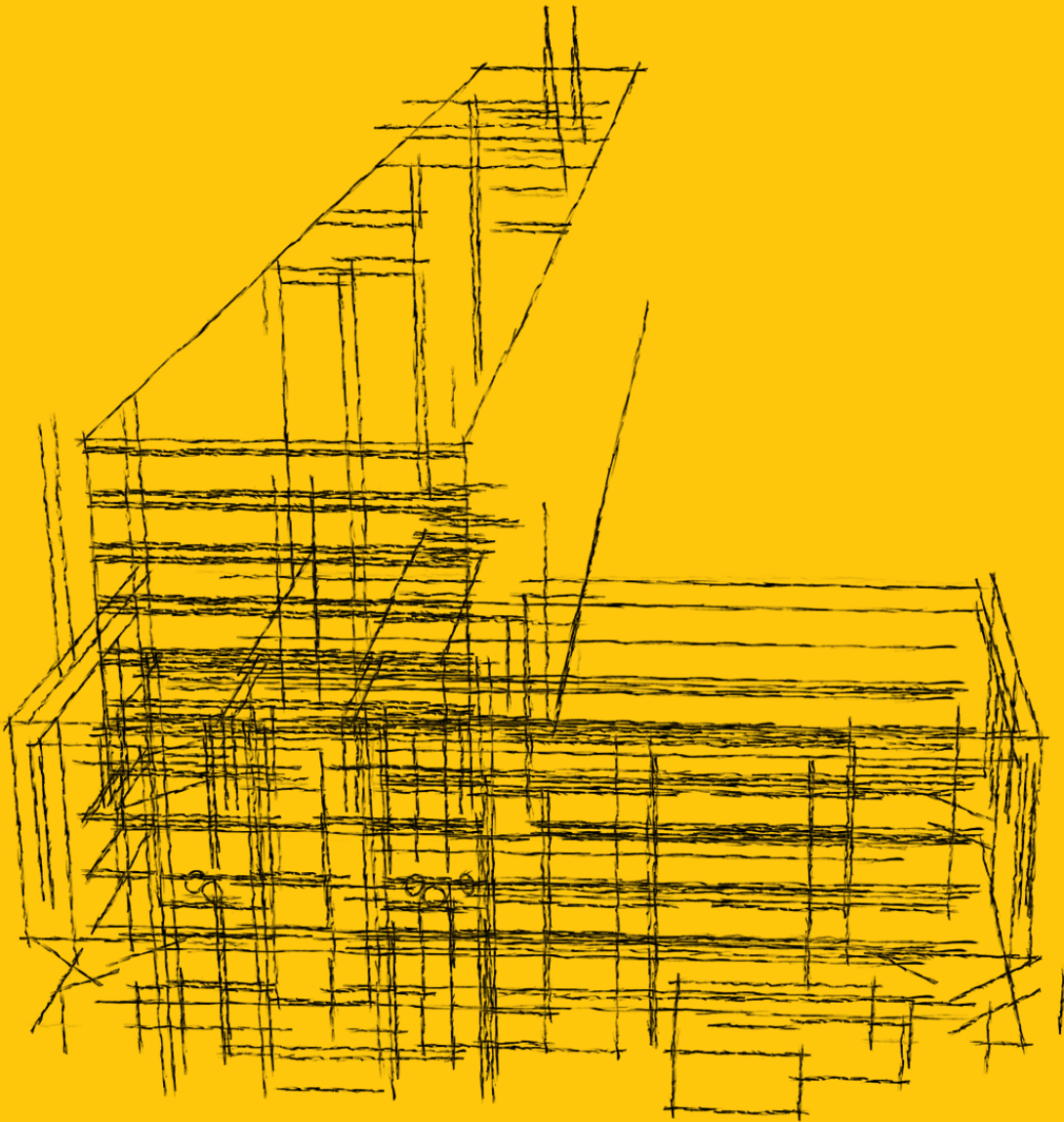
INTRODUCTION:

I had originally intended that my contribution to the Elastic Project would consist of a model of a building sitting neatly atop a virtual landscape, with a brief historical explanation and be left as simply as that. Over the course of its undertaking however, various difficulties presented themselves that resulted in there being a greater profit to be had in the account of its making (and failure) than in the completion of the product itself. This then, is what I have been able to recuperate from a project that did not go as planned.
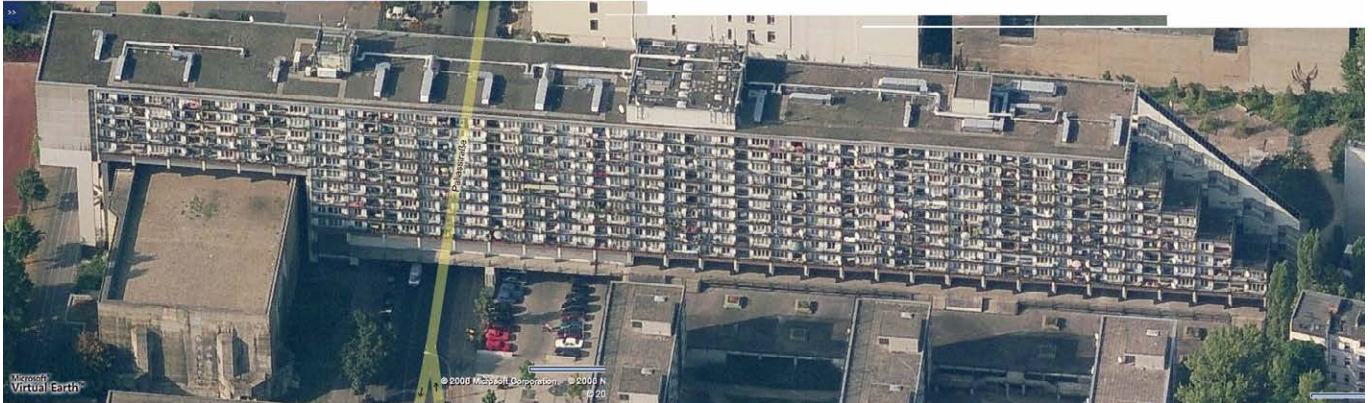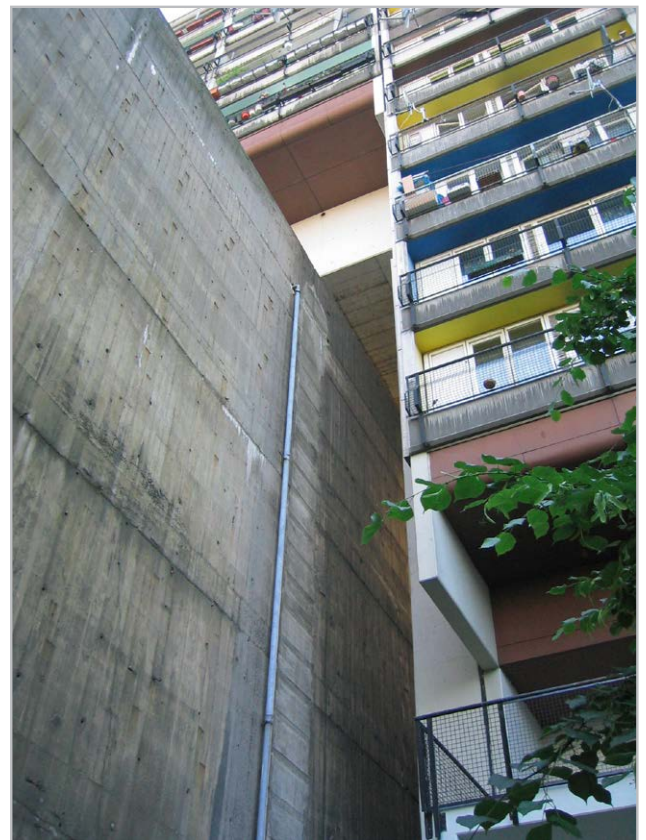

THE HOCHBUNKER:

The subject of this project can be viewed from many perspectives, but the most impressive is just west of where Yorckstraßse crosses Hauptsraße in Schöneberg. Standing there, one can see a curious configuration that might easily be overlooked at first glance due to the banality of the two forms that are distinguished only by the enormity of their scale and peculiarity of their arrangement. A long block of apartments, its balconies crowded with satellite dishes, crosses over the road and then avoids, by means of a passage built straight through its own bulk, an old, grey and featureless building which seems as devoid of life as the other is full of it. As you might see from the satellite image above, the entire configuration resembles a giant traffic accident - an obscene intercourse between a large dirty truck and a peak-hour passenger train.

The apartment block was built in 1976 and houses mostly Turkish immigrant families and older working-class German couples. The building it so carefully accommodates is a concrete bomb-shelter - technically a *Hochbunker* because it rises from the ground rather than being dug into it - which was constructed during the Second World War at a time when English bombing raids were beginning to constitute a real threat to industry and civil infrastructure in many of the larger German cities.

The workers who began construction of the Hochbunker in 1943 had been brought into Berlin from the occupied parts of the Soviet Union to work as slaves on a range of civil and military projects throughout the city. For the next two years the bunker served both as an *Arbeitslager* or labour-camp; as well as makeshift accommodation for working families of Ukrainian men, women and children. Whenever the area was bombed, local German residents took shelter in the lower floors of the emerging structure while the slave workers had to seek refuge in the hot, loud and most dangerous upper floors. By the time the Soviet Army entered the capital in 1945 and liberated the workers, the Hochbunker remained uncompleted.

The Hochbunker's position above the ground makes it a conspicuous exception to the common-sense principle that one should escape an aerial bombardment by digging underground. This seems to give the Bunker a stubborn or defiant attitude consistent with the aesthetic of other National Socialist-period buildings built in Berlin during the short term of the Third Reich.

Plans for its construction were drawn up in the urgent need for civil defence, long after the Hitler/Speer fantasy of a grandiose Germania had given way to wartime practicalities. It was intended to protect sensitive telecommunications equipment which was then (as it is still) housed in nearby Winterfeldstrasse. The Hochbunker's architecture is of a squat, muscular type favoured by the Nazis and exemplified in the robust *Flaktürme or* flack towers which were built to defend the skies above Berlin, Hamburg and Vienna. Unlike the Hochbunker, the *Flaktürme* were equipped with a formidable array of heavy cannons directed at aircraft flying over the city. Built in conjugal pairs of gun tower and radar-tower, the *Flaktürme* represent some of the most beautiful and mysterious examples of military architecture of the war. Those in Berlin were situated in four strategic locations around the city where they resembled giant and simplified mediaeval fortresses - extrapolated from Hitler's own thumbnail sketches into gigantic tombs made of steel-reinforced concrete which, in parts of the walls nearest the ground, was laid up to five metres thick.

The intense bombardment that by the war's end had made a ruin of Berlin left both the *Flaktürme* and the Hochbunker largely undamaged. Despite a huge technical effort by the occupying forces at demolishing the towers, many were still standing as late as the 1970s. Those that were eventually 'destroyed' (reduced not into dust and rubble like Berlin's apartments and factories, but rather split open, like dropped watermelons, into two or three parts) were covered up with detritus collected from the old Berlin and remained as small hills in the midst of green and verdant public parks. Fragments of the concrete structures can still be found protruding from the upper surfaces of such hills in Friedrichshain and Humboldthain.

Images are reproduced from the publication *Flaktürm* by Michael Foedrowitz 2007

The Pallasstrasse Hochbunker survived some critical years in the Western Sector of Berlin following the end of the war, largely because its proximity to an important administrative centre in neighbouring Kleistpark made it too risky to destroy the structure with dynamite. In 1964, after the focus of Western Cold War strategy had been clarified by the building of the Berlin Wall and the Cuban missile crisis, an order was issued that all military structures still standing in West Berlin should remain intact. The Hochbunker thus remained in a dormant and unfinished state until close to the end of military administration and subsequent German unification.

In 1987, two years before the collapse of the Berlin Wall, and at a cost of ten millionen Deutsche Mark, the bunker underwent a structural completion which transformed it into a fully-fledged nuclear fallout shelter - an 'Atombunker' - capable of sustaining at least 4500 Berlin citizens, through an unspecified period of inconceivable horror.

If one speaks to local people today about the Hochbunker, they tend to politely speculate on its purpose and prefer to suggest (to the foreigner at least) that it may have been preserved to provide shelter from natural disasters. Anyone familiar with the geography and history of the Brandenburg plain however should find it fairly obvious that what is considered 'natural' in that part of Europe, has for much of the late 20th century, included the possibility nuclear or biological weapon attack and that the renovated Hochbunker was intended as a resource in this event.

It is also likely that the Bunker's renovation, coming as late as it did in the Cold War would have provided a final opportunity to exhaust already-allocated funds before the Allied Control Council relinquished jurisdiction over West Berlin to a civilian government.
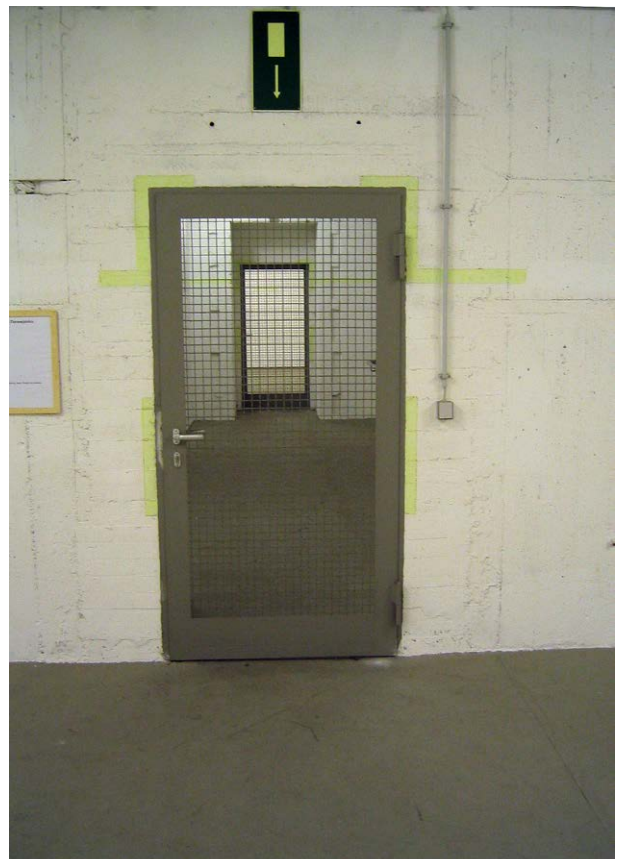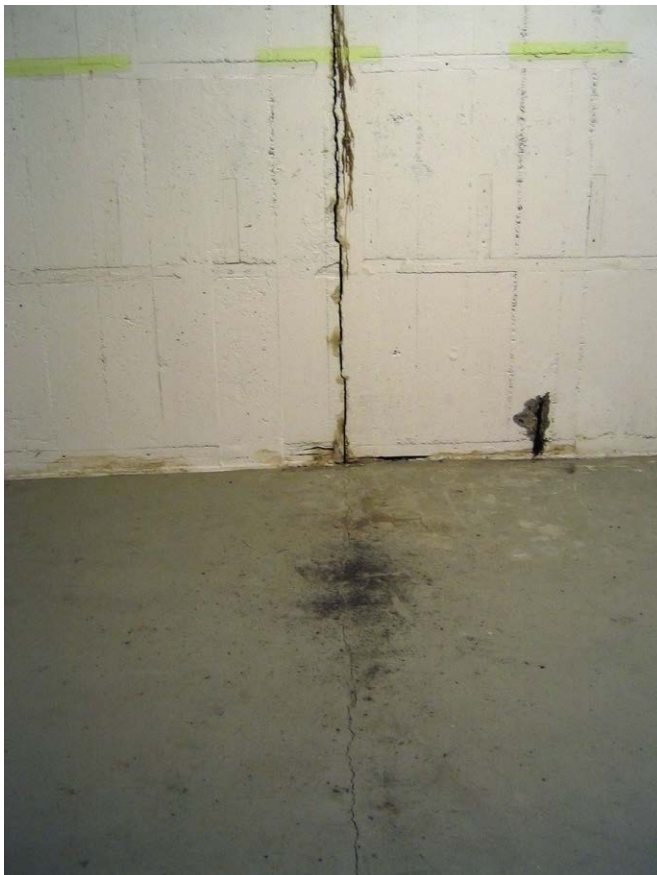
INSIDE THE HOCHBUNKER:

I had a chance, for a couple of hours of one afternoon in 2005, to get access to the interior of the Hochbunker. This was thanks to a project being hosted by the Sophie Schloss High School, on whose grounds the Hochbunker lies. The building and its history are the subject of some interest to the staff and students of the school. The school's staff include an historian and an art teacher who have made the Hochbunker the subject for various class projects including one that involved initiating contact with one of the camp's ex-workers and another for which the students constructed a sculptural memorial in the form of a low wall decorated with inscriptions running alongside the northern edge of the building. For the most part however, the barred gates leading into each of the bunker's six entrances remain locked and it was a rare occasion that they were opened for a single afternoon in June to enable the public to view a student exhibition held inside the building. For a short time I was permitted to enter the building and able to speak with some of the teachers and students - who actually did quite well to have exhibited their artwork in a space originally intended for a captive audience of nearly 5,000 people and large enough to accommodate an International Biennial or Berlin Art Fair.

I learned of the exhibition rather late and even then hadn't expected to be allowed inside the bunker. The photographs shown here were made without preparation, with camera batteries running low and in light conditions that would have benefited from a tripod to steady the view - but even so they should give some idea of the interior of the Hochbunker, complete with student artworks.

While walking around inside I was also able to make the following observations:

• There are five levels including a basement. Each level is divided into three long halls that extend almost the entire length of the building. The two outer sections have shared washbasins, toilet and an emergency (medical) room.

• All the walls are painted white and there is an extensive network of fluorescent lights and ventilation ducts attached to the ceiling of every room.

• Heavy doors and airlocks are situated at the bottom of the building leading in from the outside.

• Concrete stairwells connect all the five levels at each end of the building.

• Interior walls about one metre thick separate the three long interior chambers. These walls are broken at intervals by door-less openings.

• Dashed lines are painted in pale green luminous paint so as to outline the perimeters of the walls and the edges of the doorways. Their pencil construction lines are still visible.

• It was extremely cold in basement and ground levels. There was no evidence of how the structure would be heated but from my impression (made in late Spring) it would require a lot of energy to do so.

• Built into the southern wall was a large grid of eighty-four concrete blocks that had 'handles' made of steel reinforcing which they looked as though they could be pulled loose from the wall. Each was numbered and were apparently made to allow an emergency aperture in various sizes to be made for exit or for observation, as the circumstances permitted.

• In the middle of one of the halls there was a rather impressive crack that split the concrete from floor to ceiling.

OUTSIDE THE HOCHBUNKER:

Google Maps provides a bombardier's view of the Hochbunker rooftop from directly above the city but a more engaging view is given obliquely by the 'bird's eye' of Microsoft's *Virtual Earth*, shown here as a composite of screen-grabs*.

I suppose that anyone who has used either of these two mapping technologies will know the pleasant sense of vertigo that comes from being able to descend down from space onto any spot on earth. It's an hallucinogenic indulgence - to be cradled in a virtual hot-air balloon, floating idly and without noise, thrust or trajectory, across the surface of the earth. As far as armchair, screen-bound activities goes, this is one of the most wonderful and benign and I noticed that my first impulse was to return to locations I'd previously been - that held some sentimental or memorial significance - in preference to exploring places that I hadn't yet been. To recover or to discover territory? In any case, I remember quickly experiencing two small disappointments that reminded me that the process, as marvellous as it is, was still in relative infancy.

The first was the realisation that the view of the earth's surface doesn't actually provide a real-time surveillance image but instead displays data from undated satellite photographs. Although the scale and extent of its reach is undeniably impressive, it remains the case that the Google Map isn't strictly treating the arm-chair voyeur to a live peep-show onto the globe below, but rather onto a patchwork of snapshots which themselves are of inconsistent provenance and resolution. Some areas and cities are full of detail but others are inexplicably blurred or rough. The image's existence as a memorial sort of timelessness (updated weekly, monthly, yearly?) gives a subtle forensic edge to the experience of laptop balloon travel but the it's also a kind of anti-climax after Google's promise of omniscience. I shouldn't really complain but why can't we see everything, everywhere, at once already?

The second slight disappointment is the fact that what one observes in Maps or Virtual Earth is essentially flat-land topography. Both Google and Microsoft geo-spatial technologies use photographs to create a wallpaper surface that seems to be miraculously detailed, until one bumps against its pixel limits. The only point-of-view provided by Google Earth is that from directly above the ground, although at the time of writing, they were compensating for this spatial deficiency with a supplementary illusion using perspectival distortion and bump-map technology that molds a '3D terrain', making it seem possible to 'descend' from God's platform down to an altitude where the ground rises up around one's position and a simulated horizon comes into view. Microsoft's Virtual Earth, on the other hand, uses a database of images that have been taken at a four cardinal tangents from the horizontal-plane and which give the impression of a 'bird's eye view' although it is limited - unlike Google's recent 'Street Views' - to being a compendium of static shots rather than a dynamic and contiguous panorama.


* he Google map view can be seen at the following URL:
http://maps.google.com/?ie=UTF8&ll=52.494164,13.35916&spn=0.000931,0.002596&t=h&z=19

One significant feature of both technologies is that their maps are complemented by a secondary data layer containing 3D volumetric objects. To this end Google Earth provides users with a proprietary 3D modelling software called SketchUp, which enables enthusiastic amateurs to create and place models of their favourite buildings (finished to various degrees of detail) in their proper locations around the globe. The SketchUp models aren't really solid objects as such - but rather hollow volumes made of coplanar surfaces which have raster images mapped onto their exterior surface so as to provide the illusion of texture. Smaller details of the surface may be satisfactorily represented by the raster covering, while more prominent features must be built into the structure of the model itself.

Since 2006, an increasing quantity of these 3D models have been superimposed over the topography of Google's Earth. Predictably, most of the models that have been made for large cities end up representing buildings of touristic or historical interest, but more comprehensive efforts have been made to reconstruct entire urban precincts. Examples include Hamburg in Germany and the Irish town of Westport which was modelled by a company that specialises in 3D constructions using their own scanning technologies.

The modelling of towns and cities has limited appeal to me as a nerdy kind of obsession, but I think it represents an interesting aspect of the greater strategy of Geospatial (re)mapping made possible by digital codification. One may as well take a speculative detour around the crude, low-resolution images and objects that testify to the current limits on processing power and bandwidth, and imagine a future when every detail of every city has been mapped and modelled and made available to anyone who desires to examine or dress it with a giant's eye peering into a doll-house. The goal to create a miniature and manageable facsimile of the world seems to me to reflect a hyper-rational rather than a hobbyist urge. Its objective surely must be pragmatic - to create a profound armature, only dimly perceived now as an aesthetic and touristic device, that will eventually serve an formidable range of social, commercial and political interests. All the present shortcomings related to processing speed, image acuity and bandwidth, are of a type routinely surmounted in the development of electronic engineering. The fundamental structure of 'Google' Earth seems destined to grow to become a perfect parallel of the world accommodating multiple layers of indexed information and applications as yet unimagined.

Perhaps at some stage it will converge or intersect with something like 'Second Life', but whereas Second Life is wholly synthetic and devoted to the elaboration of fantasy, Google Earth remains anchored to both the satellite photograph and the form of the globe that together provide a referent, or literal 'ground' on which a variety of informational strata may be constructed. What is 'modelled' upward from this ground (for there are as yet no subterranean excavations into Google Earth) is a hybrid of algorithmic geometry and pixel-based bitmap information. Google Earth is a superimposition of the rasterised satellite images and their fixed point-of-view/point-in-time, with the scalable and idealised constructions of vector geometry. As far as its scalability is concerned, it is also a neat realisation of Jorge Luis Borges' fiction of a map designed to schematically reproduce the world at a scale of 1:1. The foil to Borges' map was that in order to be unfolded and visible, it should in all respects conform to, and therefore simultaneously obscure, the things it was meant to represent. Google's map represents an immaculate exercise in map-folding in this respect, extending the 'eye' of the global observer by bringing the fantasy of the naked globe into the field of vision. It looks forward to an gradual realisation of Borge's image of an idealised and infinite schema that exists in exact alignment with the muddled experience of the real and the everyday.
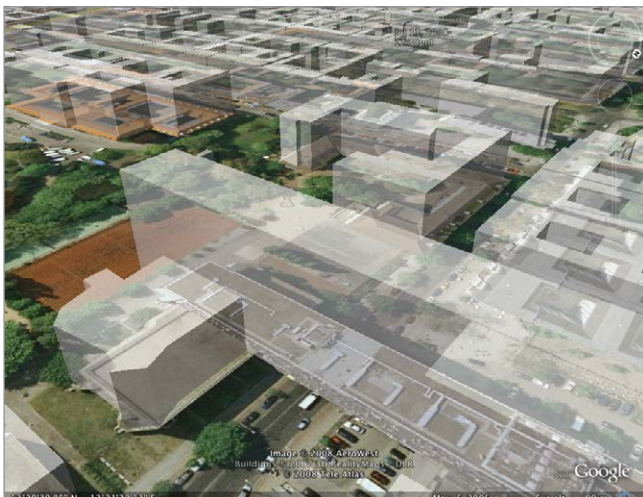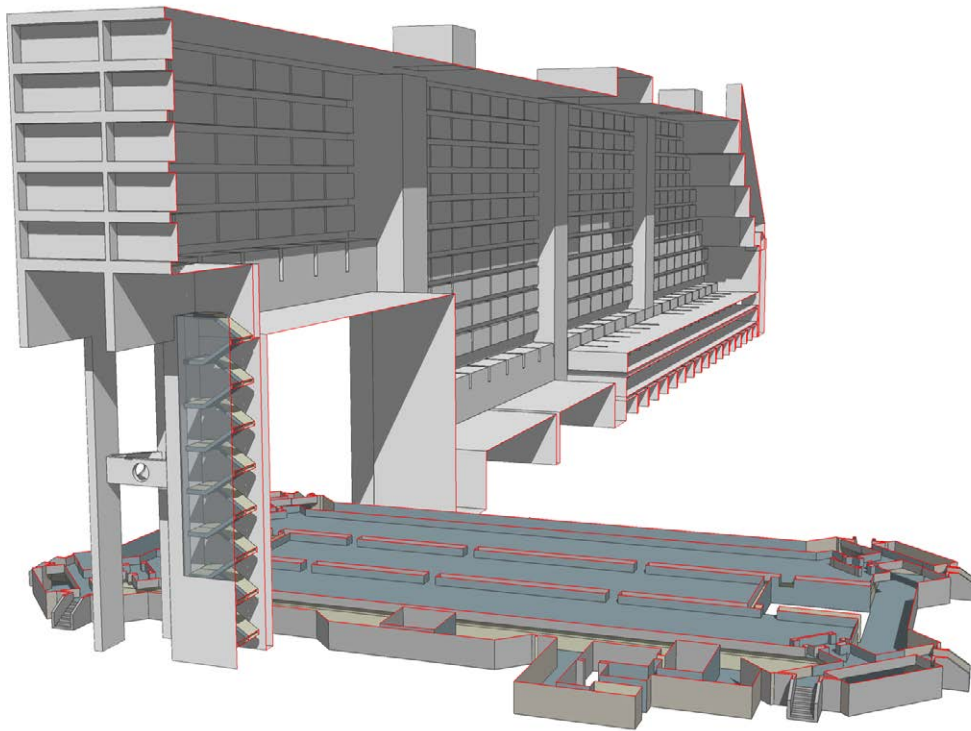
MODELLING THE HOCHBUNKER:

The rectangular forms of the Hochbunker and apartment complex suggested the possibility of recreating them as a model that could be placed in position on (or in?) Google Earth. I visited the site with a camera and a sketch pad, estimating dimensions from the details and photos I had taken. My observations were eventually aided by getting an incomplete set of plans and elevations from the archives of the Schöneberg Town Hall and from these I was able to construct a fairly accurately proportioned representation. Mine is not a particularly spectacular or complex piece of modelling compared to other Google Earth buildings, but the point was to construct this model in spite of my modelling skills, not to show them off. As things turned out, the longer I spent creating the model, the more comprehensive detail it demanded, until I found myself wishing desperately that it could be simpler.

I've used a few different brands of 3D modelling software in my practice as an artist and despite gaining a fair idea of the basic concepts, I've always had a certain quota of trouble with them - every new project suffering for my having to relearn some basics and become familiar with a new interface at the same time as bringing it to fruition. The only other building I have constructed (some years ago now) was of Albert Speer's first commission - a military academy which, like the Hochbunker, was unfinished at the end of the Second World War and eventually buried under the rubble mountain of Teufelsberg in the Grünewald. I actually ended up reconstructing this Speer's ruins as a simplified kite and a better description of can be found here:

http://www.andrewhurle.com/57/57.html

The fact that Google encourages modellers to use their proprietary software SketchUp to design for Google Earth can make things diabolically difficult for someone who is accustomed to using a standard 3D program. The difficulties with its aim to simplify things for the beginner by using what it calls an 'intuition engine' which is a predic-

tive mechanism that anticipates what the user intends to do and encourages them to take a 'near-enough-is-good-enough' kind of approach to construction. For someone without previous experience with modelling programs this might well be convenient but for a semi-experienced user it means constantly having to struggle to find an absolute and numerical foundation for actions and measurements. Advocates of SketchUp will tell you that it's possible to get CAD-like precision with the intuition engine but this is actually achieved in a very un-CADlike and thus a very unintuitive fashion.

The easiest and most sensible course would be to defer to the intuition engine and not try to override it by insisting on numerical proof of exactitude. I don't know how much time I wasted in this struggle: I estimate well over a hundred hours which, if I was a professional designer, might have represented thousands of dollars worth of unpaid work. Luckily I'm an artist and so unpaid work is the rule rather than the exception. This meant I was able to carry on until the model was in its final stages of completion before I realised how flawed it was and had to admit the entire task had defeated me.

I recognised it as defeat because before they are installed in location, a user's models must first be uploaded to a holding tank called "Google Warehouse" - a kind of purgatory server where each model is assessed by Google-appointed experts who either endorse or veto its final descent to virtual earth. Every model-maker has to undergo this testing procedure and I don't know how many indignant/bewildered letters I've seen on the Google Sketch Up forums from modellers who can't understand why their precious creation hasn't made the grade. I knew by this stage that mine wouldn't and since I've already accepted 'failure' and decided that it was, after all that, still an worthwhile project, I'll describe a few factors that would have undoubtedly prevented my model ever being accepted.

The first and most significant liability of my model is that I crippled it by building it on a microscopic scale. I can't remember exactly why this was - perhaps because I'm used to working around an A4 scale but, in spite of over fifteen years of experience with computer-imaging that should have taught me better, I convinced myself that since the model is a scalable vector object constructed of mathematically determined planes and lines rather than pixels, it should be possible to re-scale it at any stage, without effecting its proportional and structural integrity. This isn't quite the case in fact because vector software such as Adobe Illustrator and Google SketchUp always work within tolerances that limit the degree to which detail will be calculated. To give a simple and theoretical example: imagine creating a 10 cm straight line, dividing it into 3 equal parts and then rejoining those parts to make a single line again. The only way that the rejoined line will have an absolute length of 10 cm is if the decimal place of each third has been calculated to an infinite degree. If the fractions are rounded off, as they are in SketchUp, then the line will be shorter by the triplicate of whatever fraction the program can't resolve.

When I scaled my model from its diminutive 16 cm, up to its life-sized 160 metres, it was obvious than an accumulation of error had crippled it - edges didn't meet perfectly and only a few of its coplanar faces were at right-angles. In circumstances like these, which must be common for the novice, SketchUp helpfully offers to make corrections to the model but in doing so creates hundreds of interpolating planes - changing apparently simple objects into multifaceted and hopelessly complex monsters.

The practical aspect of getting models right has a profoundly psychological counterpart: it's very difficult for someone as tight-arsed as I am to accept imperfection in something that contains as many straight lines and right-angles as this model does (or should) - especially when the work-around is disguised so as to maintain a general appearance of accuracy. Quite apart from the problems of having the thing 'accepted' by the Googlers, my knowledge of being "near-enough" makes me feel like I've cheated. Ridiculous maybe, but nonetheless extant.

The second problem with my model is that it doesn't conform to what I have come to cynically regard as the principle of cheap similitude. Google Earth insists on buildings being made to appear 'realistic' by being clothed with scaled-up photographs of their real-world facades. To my mind this represents a fatal compromise - not only because basic texture-mapping can tend to make the structure look as if it belongs in a computer game - but also because it privileges one kind of visual approximation in favour of others that might have a greater relevance to the history or function of the building. I believe this was the case with both the Hochbunker and the apartment complex. The latter, for instance is cluttered with fairly nondescript details such as balcony foliage and satellite dishes that simply lose distinction as recognisable objects when superimposed in a low-resolution photograph over the geometry of the building. On the other hand, one of the building's features that I take a strange pleasure in is that each of the balconies has been painted in a single colour from a 'palette' which I suppose was chosen to distract from the uniformity and banality of the building's design. Ideally (which is what a virtual model should be all about) I would apply a clean white surface over the model and then 'paint' each indented balcony surface according to its real-life scheme, instead of wrapping the whole thing in a blocky, pixelated photograph. Perhaps the painting would give an unfair account of the building - having been abstracted or reduced down to structural essentials - but I prefer that to a reduction to the lowest common denominator of easy realism that Google's modellers seem to strive for.
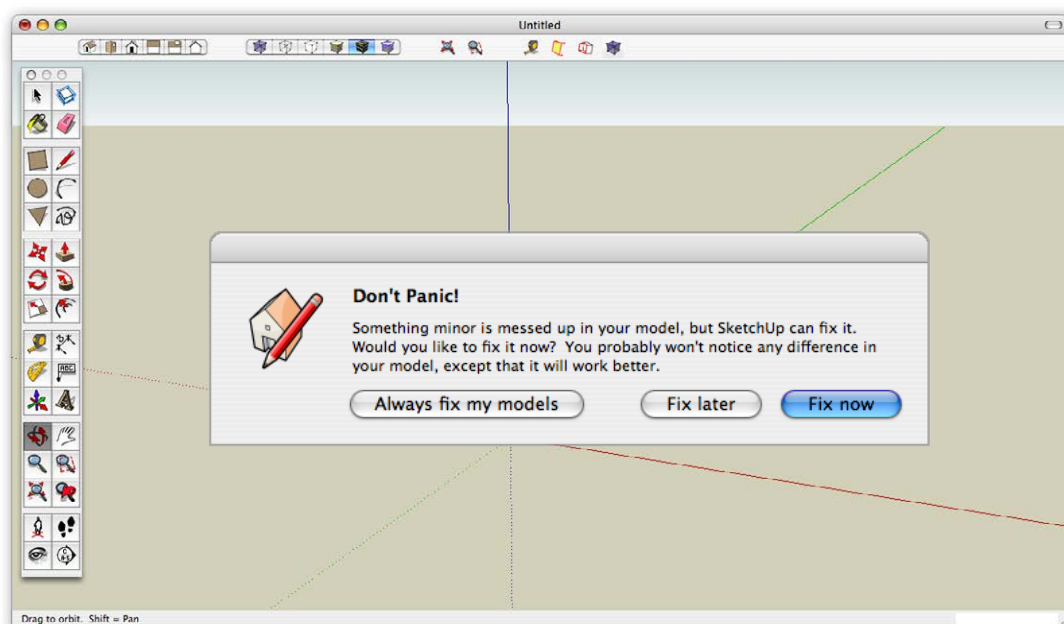
That said, the textured exterior of the Bunker communicates a sense of horror which is beyond my powers to simulate in Photoshop. Its facade is cast in a dark, weeping concrete that still holds the impressions of the crude wooden form-work used by the Ukrainian slaves sixty-four years ago to shape it. Studded with rusting hooks and spikes protruding from the surface, it looks like a torture chamber turned inside-out. It provides an uncanny contrast to the interior which has been scrubbed clean and spruced up to accommodate the worst imaginable event.

My model's third shortcoming was only resolved by compromising its design and this fact makes me unhappy. The real Hochbunker has a basement (the coldest part of the building) which I incorporated faithfully into the structure without realising that Google Earth doesn't allow for excavation or subterranean architecture. There are ways around this - it's possible to "cheat" by building up the "earth" underneath the model and then digging back into it. But the world's actual surface - as defined by Google's topography - is impenetrable and so I had to bring the floor of the Hochbunker's basement up to ground level to create a cavity so shallow that in real-life it could only be used to store large sheets of paper.

Speaking of which, another limitation to the Google Earth technology is that concerning content. Originally I had planned that sound could be included in the mapping of the Hochbunker. I imagined how one might 'open up' the building and be able to hear a noisy amalgam of sounds issuing from within as if it were a demonic music box.

At the time of writing there's no way of appending an acoustic dimension to either Google Earth's or Virtual World's maps. Before discovering this limitation, I'd had an idea to embed a sound file inside the Hochbunker that referenced the sound of exploding bombs as representing the only physical of an imagined barrage that was able to penetrate the bunker wall - the horror of acoustic 'shrapnel' that refuses to be shut out. The idea came from a sound grab that had been hanging around on my computer for years taken from the sound track to John Carpenter's 1976 film *Assault on Precinct 13* in which a street gang lays siege to a police station in Los Angeles. At one point in the assault the gang attach silencers to their semi-automatic weapons, which precipitates a charming audio sequence, lasting only for a few minutes, of the sound of bullets entering windows, hitting furniture and ricocheting around the station's offices, without the single sound of a shot being discharged.
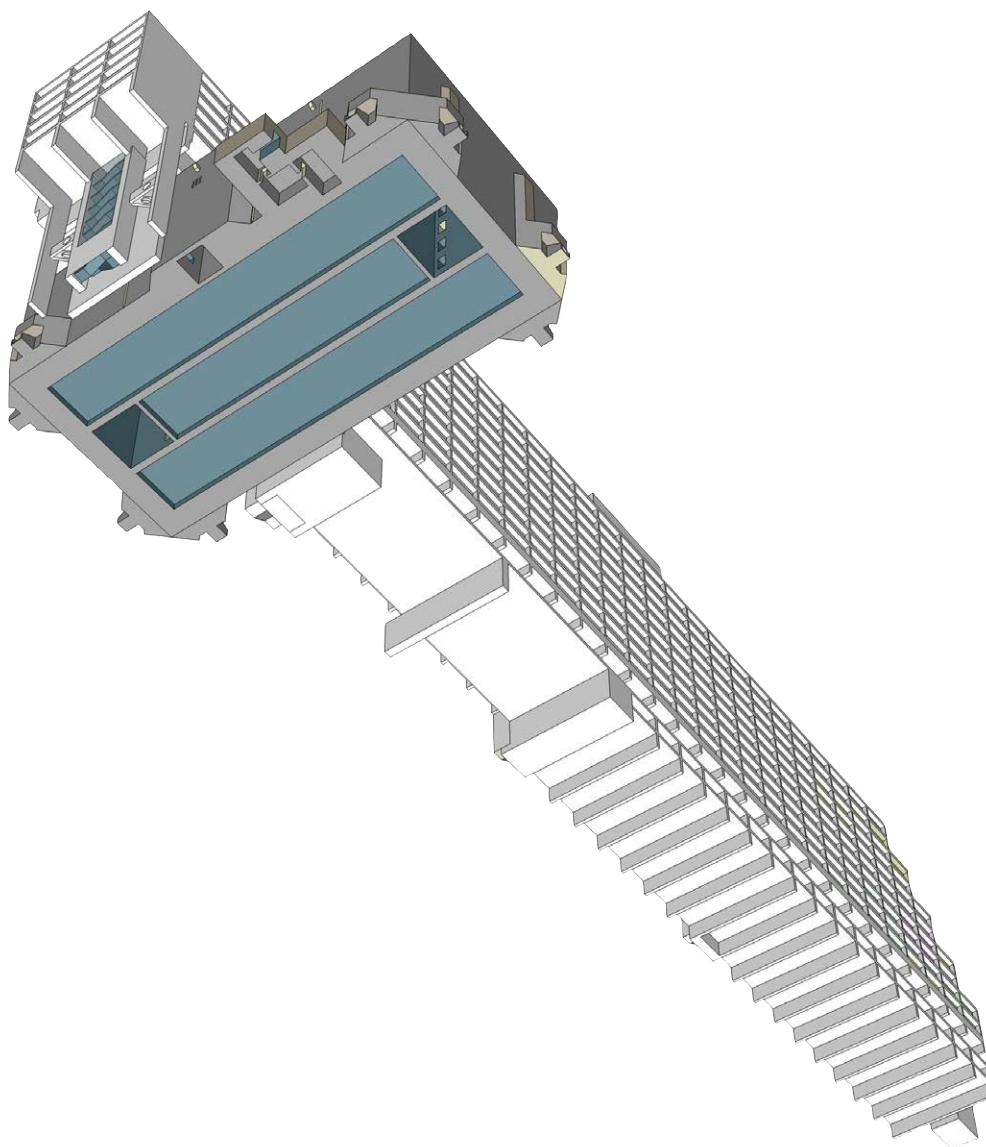
All that many months of failed work seem to have finally offered me is the opportunity to create iterations of architectural drafting images - snapshots of my crippled model posing in an endless number of positions and in various stages of undress. I've already used a few of these in the essay but I'll conclude by illustrating on this and the following page one of the refinements of SketchUp's devotion to the important details of architectural process which is incorporated into the very name of the program.

The function allows a modeller (who in most cases is likely to be not much of a draftsman) to 'reverse engineer' the construction of a building by simulating the finished model as a sketch. The program does this by applying onto the building's vector outlines, strokes borrowed from a library of rough line-work made with a variety of markers such as pencils, pens, textas etc. The results are impressive but in a perverse kind of way. Carefully and variously contrived, they counterfeit the hesitant traces of the 'creative hand' that itself has been creatively imagined and used as a trope in time-honoured forms ranging from the cafe-napkin thumbnail sketch to the drafting-board illustration. Made as they are for the pleasure of simulating the workings of a human 'intuition engine', as defined by Google, they strive for an almost-pornographic view of the moment of artistic conception that is completely in keeping with Google Earth's goal of complete and excavated visibility.