Intelsat: Satellites, Science and Science Fiction

Paul Walker
University of Melbourne

Abstract

In 1980, the Australian firm of John Andrews International won an international competition for the design of the Intelsat headquarters in Washington. Before the privatization of satellite communications provision, Intelsat was an intergovernmental agency which promoted international collaboration in expanding global communications networks, and ensured participation of developing as well as economically advanced nations in this rapidly evolving field.

The ceremonious spaces of the Intelsat building reflect both Intelsat's status as an organization of the international bureaucracy and the high-tech character of the industry it oversaw: an enormous entry lobby with a stainless-steel ceiling and an upper-level 'moon garden' were adorned with satellite prototypes. But while the project adopted a tech-ish look that the Andrews firm had also explored in earlier projects, it also further developed Andrews's explorations into workplace planning and environmental design. Intelsat was conceived as a series of octagonal modules of several stories, each based on an 85' square with chamfered corners, connected by space-framed atria. These atria and the planting and water features in them were integral to a complex system that managed air-movement through the building, substantially reducing energy use (per area, less than 50% of comparable Washington buildings) through computer-controlled active systems combined with passive environmental design principles. In ongoing collaboration with the mechanical engineer Don Thomas, such principles had been explored by the Andrews office since their 1973 proposal for the Callum offices in Canberra.

But while Intelsat's approach to environmental design in retrospect appears prescient, the modularization that it entailed and the artificial 'nature' of the atria that are core to its design strategy make the building inward looking, an isolated mother-ship in its otherwise rapidly intensifying Washington

neighbourhood. As much as the satellites it managed, Intelsat floats as a glittering technological object in space.

Introduction

The environmental *performance* of buildings is one of the most pressing issues that contemporary architecture faces. But judgements about buildings do not avoid how they *look*. This paper examines an architectural design of the 1980s which was the outcome of a design competition that thematised both performance and look. The design of the Intelsat headquarters building in Washington was selected through a limited competition held in 1979/1980, won by the Australian architect John Andrews. The criteria by which the winning scheme was selected were broad and inclusive, but fall into two groups: those concerned with the question of what the building would look like, and those concerned with its programmatic and environmental performance. Across both these sets of criteria, architecture's relation to science was at stake. As one of the key institutions in the rapidly evolving 'high-tech' domain of satellite communications, there was a tacit expectation that Intelsat's 'image requirements' (to use the language of the competition documents) had to be met by something that appeared technologically advanced. This was certainly one of the deciding factors in the selection of the Andrews design. Science mattered in the Intelsat design, both qualitatively and technologically; imaginatively and performatively. But in examining the Intelsat design and its reception both at the time of the competition and when the building was completed several years later, it seems that judgements about the building subordinated its technical achievements to its aesthetics.

The Intelsat Competition

Intelsat was an inter-governmental agency which had the role of promoting international collaboration in expanding global communications networks, ensuring participation of developing as well as economically advanced nations, predominantly western or non-aligned. It established international protocols and policy, managed the launch and deployment of communications satellites, and coordinated construction of a network of earth stations in member countries. Intelsat was therefore simultaneously a major bureaucracy and a technological enterprise, needing a lot of office space but also more exciting things such as a space craft control center with an adjacent public viewing area, and simulation and testing facilities. Intelsat was also an international agency which required architectural settings suited to diplomacy: a vast board room for representatives from its member nations, along with facilities for simultaneous translation; lavish offices for the organization's director and governors; reception spaces. Its ability to command a prominent site owned by the American government is a measure of the prestige it

enjoyed in the 1970s and 1980s.[1] The Intelsat headquarters building sits among tall oak trees on a sloping site on Connecticut Avenue, one of Washington's main thoroughfares, about 5km northwest of the White House. Just to its west is an enclave of embassies and chanceries known as the International Center.[2]

Given the intergovernmental nature of Intelsat as an organization, the competition to find a design for its headquarters building had to give opportunity for architects from all Intelsat's member countries. A list of potential architects from each country was gathered (the Australian suggestions forwarded by the Royal Australian Institute of Architects), and a shortlist of six firms determined by Intelsat and its advisors. The six participating firms were Arthur Erickson Architects (Canada); Raila & Reima Pietila (rendered Pietilae in the Intelsat documents) (Finland); Hentrich, Petschnigg und Partner (W Germany); Holabird and Root, and Hellmuth, Obata and Kassabaum (both US); and John Andrews International (Australia). Their design submissions were assessed in Washington in January 1980 by a panel of assessors chaired by Intelsat's then Deputy Director, Andrew Caruso, which included senior Intelsat executives and three architects: Michael Austin-Smith of the UK, Marco Zanuso of Italy, and Pietro Belluschi, also Italian but who had practiced in the United States since the early 1920s.

Belluschi was selected to serve on the Intelsat design competition assessment panel because he had a long and distinguished career, including serving as Dean of Architecture and Planning at MIT from 1952 to 1965, and most significantly serving as a key advisor to the Foreign Buildings Operation of the US State Department[3], which guided the American embassy building program of the 1950s and 1960s toward a ceremonious and somewhat monumental modernism.[4] Austin-Smith and Zanuso were not as senior in the profession as Belluschi, but both were well-regarded architects, and had held important institutional appointments, Austin-Smith as president of the Architectural Association and Vice-President of the RIBA, and Zanuso as director of the Milan Architecture and Design Triennale. Both had also designed buildings or fit-outs for 'high-tech' clients, Austin-Smith for IBM[5], and Zanuso for IBM and Olivetti.

The assessment panel provided a lengthy report on the Andrews design that considered it in relation to 'Design Considerations', 'Accommodation of INTELSAT's Use Requirements', and 'Implementation and Costs'. A note on the report indicates that the comments on the 'Design Considerations' were prepared by the 'Architect-Assessors' alone; presumably the other elements of the report reflected not only their views, but also those of the Intelsat executives on the jury for their expertise in legal, procurement and

engineering matters. There were six design considerations: ‘Distinction, excellence and quality of architectural design’; ‘Fulfilment of the space program requirements in a functional, appropriate and imaginative design’; satisfaction of ‘the image requirements and goals of Intelsat’; ‘Satisfaction of the urban design requirements of Washington, D.C.’; ‘Sensitivity to the environment and energy efficient’; and ‘Practicality of the facility, both in terms of a reasonable cost of construction as well as long term maintenance and operating costs’. The expectations that the Intelsat design had to meet, then, were wide ranging, from qualitative criteria of ‘distinction’, ‘excellence’, and ‘image’, to technical and pragmatic issues including energy efficiency and operating costs.

Sources of the Intelsat design

The Andrews project was resolved as a series of octagonal office ‘pods’, each based on an 85’ square, with chamfered corners [fig. 1]. The pods vary from four to six stories each. Between the pods are courtyards, or atria, with pools and – in most cases – extensive planting designed by Andrews’s friend and frequent collaborator, the Canadian landscape architect Richard Strong. The courtyards are enclosed by glazed roofs that ‘pop-up’ between the office pods. Strong also designed roof gardens for most of the office pods.

Figure 1. Intelsat Building, Washington, John Andrews International. Photo: Paul Walker

The glazed courtyards are traversed at upper levels by open walkways, and some feature vertical circulation cores at their centres. There are also staircases in cylindrical towers of concrete and mirrored glass blocks placed on the exterior of the building between the

office pods. At the western, ceremonious entrance to the building, the lower levels of two ‘pods’ and what would otherwise be a courtyard between them are subsumed into a sequence of public and quasi-public spaces [fig.2]. At the top level of this part of the building is a conservatory-like space called ‘the moon garden’.

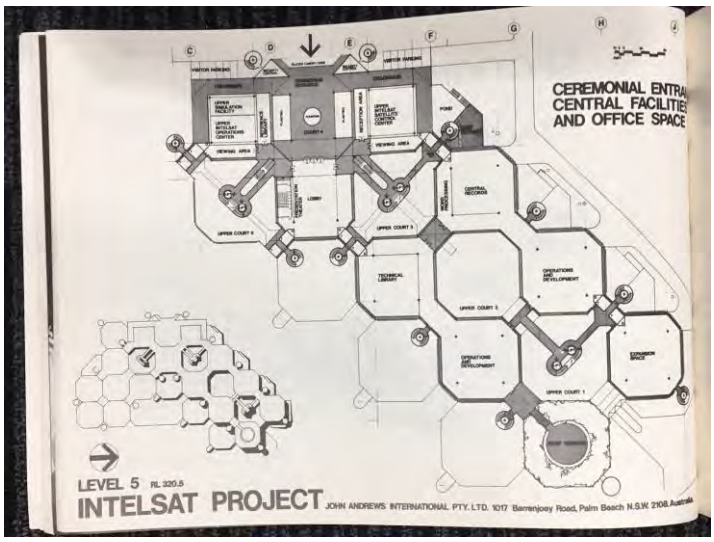

Figure 2. Page from Andrews’s Intelsat design competition report showing stage 1 design

The modular design approach facilitated the staging of Intelsat’s construction, with the first part consisting of nine office pods, three courtyards and public entrances at the west and north-east, being completed in 1986, and the second stage of another four pods and two courtyards being completed two years later. While the discovery by Andrews’s Washington office of a scheme by Intelsat executives and the second stage contractor to embezzle project funds led to Andrews being sacked from the project before stage 2 was complete[6], it was nevertheless built to the Andrews design. Reports on Intelsat in the architectural media remained oblivious to these problems. A third stage was also envisaged, which would have added more office pods at the southern end of the site. Various configurations for this were explored but it did not go ahead.

Despite its troubled delivery, the Intelsat design has an important place in Andrews’s oeuvre. Andrews and his office completed several significant projects after Intelsat, including facilities for the University of Sydney’s School of Veterinary Sciences (1990) and the Age of Fishes Museum at Canowindra, NSW (1998). There are also interesting unbuilt projects contemporaneous with Intelsat – a schematic design from 1985 for another inter-governmental satellite organisation, Arabsat, to have been built in Riyadh; an office and hotel complex for Los Angeles called Park Place; and a 50-storey office

tower for Bond Street in the Sydney CBD, to have been partly hoisted above late 19th c mercantile buildings on the site by a gigantic 15-storey pier.[7] But with the Sydney Convention Centre, completed like Intelsat in 1988, Intelsat was the last of Andrews's projects to be widely published. It was also the last project Andrews completed outside Australia, and his only North American project fully designed in the Sydney office.

Intelsat is also conceptually important as its design entailed the final point of development for several lines of inquiry that had developed across the entirety of the architect's career. Since his second-placed design for the Toronto City Hall design competition of 1957-58, Andrews had considered environmental performance as a major driver of building form. This interest was developed further in the period from 1958 to 1969 when he lived in Toronto, and confronted the challenge of designing for its cold winter climate, both while employed in the office of John B Parkin Associates until 1961, and then in his own office. From 1963, he had also investigated designs for the extreme conditions of Arctic Canada in his teaching in the architecture program at the University of Toronto.[8]

Several key Andrews buildings of the 1960s adopted a megastructure approach to respond to climate, such that circulation systems – enclosed, but at an urban scape – drive overall building form. This is clearly the case at Scarborough College (completed 1965), which was to be a celebrated example in Reyner Banham's 1976 book *Megastructure: Urban Futures of the Recent Past*.[9] This megastructural approach lingers in the design of Canberra's Cameron Offices (1968-1976). But after his return to Australia in 1969, Andrews developed a strategy for the design of large, horizontally-oriented building complexes which no longer gave primacy to circulation in determining building form. Rather, buildings were conceived of as additive systems in which building form emerged from the composition of repeated elements drawn from a kit of parts. These parts were primarily inhabitable building volumes, with landscaped voids between. This approach was developed in two Australian projects which are important precedents for the Intelsat design: the unbuilt Monarto city centre of 1975, a project for a central business area and community facilities for a new city in South Australia, and the design for the Callum Offices in the Canberra suburb of Woden of 1973. In both these cases, Andrews collaborated with the Sydney-based mechanical engineer, Don Thomas – with whom he worked first on the Cameron Offices project – to develop an environmental performance strategy that would be integral to the building design.

Figure 3. Callum Offices, Canberra, John Andrews International, 1973 proposal

Commissioned in 1973, Callum offices had been anticipated to accommodate some 6000 Australian federal government civil servants [fig. 3]. The Callum plan consisted of 24 office pods each based on a 30-metre square, with chamfered corners, virtually of the same scale and geometry as Intelsat's corresponding pods, and similarly dispersed across a regular grid and connected by circulation towers and walkways. The major difference between them is that at Intelsat, the spaces between the pavilion/towers are roofed with glazed space-frames to become a necklace of atria through the building, while at Callum spaces between pods are open and they are connected by elevated walkways suspended above the flood-plain on which the complex was to have been built. Moreover, each of the Callum pods are hung structurally from four centrally grouped columns, while the Intelsat pods have conventional steel frames.

As we have seen, the plan approach adopted by Andrews at both Intelsat and Callum is one that lends itself to incremental expansion. But it also lends itself to subtraction. As a government office project, Callum was cancelled in 1975[10], to be subsequently realized in part – three pods only – as a college of technical and further education (in Australian parlance, a TAFE).

Despite the much-diminished scale of the Woden TAFE, Thomas honed his environmental approach there:

> Three modified modules of the Woden scheme, for use as a technical college (with expected future additions for other uses), were constructed in

> 1979. In this scheme, heat is recovered from the refrigeration plant, laboratory discharges, and general space use, for storage in late water tanks adequate to accommodate all winter loading fluctuations. The tanks will also store heat form solar collectors (integral parts of the original design) once (if) they are installed.[11]

The Woden design also uses the same screening system over its glazed facades as adopted at Intelsat. A triangulated frame of stainless steel tubes supports walk-ways and transparent screens just beyond the building façade, both reducing direct solar gain and encouraging a stack effect which in summer draws warm air away from glazing. Together with the articulation of hanging structure, walkways and vertical circulation nodes, this gave Woden a high-tech look. Woden's façade screening system had first been used by Andrews on the American Express building, completed in Sydney in 1976. It perhaps owes something to the design by Louis Kahn and Ann Tyng for the Philadelphia City Hall project that had been published in *Perspecta* in 1953, the cladding of which was depicted as a triangulated space-frame.[12]

The modular plan approach found at Woden and at Intelsat is also found in Andrews's 1975 design for the Monarto town centre [fig. 4]. Monarto was planned by the South Australian government to be a new city 80km east of Adelaide. Intended for an environmentally challenging site with very high summer temperatures and low winter ones, the Andrews design addressed the expectations of environmental responsiveness with a range of design elements. Some of these were fanciful, for example an 'energy tower' that would harvest wind and solar energy in ways that were not explained. Others were more straight-forward. Andrews envisaged most of the central Monarto buildings as a sequence of three-storey bars arranged to form square courtyards between, with vertical circulation cores at the corners. In section, the buildings grouped around their courtyards would be staggered down a gentle incline, producing in profile the look of a contemporary hill-town. Pools were to be constructed within the Monarto courtyards to produce both physiological and psychological cooling.[13] Though the Monarto design remained schematic – the project was put on hold in 1976 and abandoned by the South Australian state government three years later – its pools and its picturesque profile are directly matched by those of Intelsat.

Figure 4. Monarto city centre, John Andrews International, 1975

Assessing Intelsat's environmental performance: science fact?

The overall form, plan and section arrangements of the Intelsat design were described by the architects as being the outcomes of their analysis of the organization's needs, its preferences for cellular rather than open-plan offices (the pod and atrium design maximized the number of perimeter offices), and a combination of passive energy principles and active systems. This is apparent in the report the Andrews office supplied as part of their competition entry, which set out all the measures that would achieve major energy savings, including the atria and the façade screens.[14]

As has already been mentioned, the assessment criteria for the Intelsat design competition included 'Design Considerations', 'Accommodation of INTELSAT's Use Requirements', and 'Implementation and Costs'. The competition jury produced an extensive assessment of the Andrews design in relation to these criteria.[15] The first of the six design considerations – 'distinction, excellence and quality' – emphasized the integration and coherence of the entire design, and on this point, Belluschi, Austin-Smith and Zanuso suggested that the Andrews design excelled: 'It is this test which the recommended design has met in a much more brilliant manner than any of the other entries.'[16] Of the other design criteria, three were essentially technical in nature, and two aesthetic. But even in considering the Andrews design against such technical matters as space requirements and environmental performance, the architect jurors for Intelsat consistently returned to the question of what the design would look like and how it would be experienced. They had nothing to say at all in their report on the design criterion of

construction and running costs, deferring instead to the full jury's report, which in turn deferred to Andrews's design report.

Under the design criterion of 'Fulfilment of the Space Program Requirements in a Functional, Appropriate and Imaginative Manner', the architect jurors commented that the winning design's 'checkerboard' of office modules and interior courtyards facilitated flexibility, expansion, and service requirements. The linking of courtyards at their corners was praised for creating 'a flowing pattern' of movement. While the jury touched on pragmatic issues such as entry points, car access, the disposition of services and plant rooms, and the integration of 'low energy principles', it said little on the technical detail of these matters, rather focusing on how elements used in the Andrews design to address environmental performance drove how the building looked: 'The overall appearance of the building is largely determined by the energy saving requirements.'[17]

Further on, under the consideration of 'Sensitivity to the environment and energy efficient', it is again the aesthetic outcome of the design's environmental and energy strategies that is endorsed rather than their technological resolution:

> Even the tri-dimensional screens, placed as a protection of the exterior walls, become important architectural elements when we think of the richness of effect which can be derived from the very complex casting of shadows by the elements of the screens themselves and of the light-weight structures which support them.[18]

The design's focus on energy issues is 'not expressed in reduced or punitive terms but is optimistically suggested as a development of explicit and expressive volumes, which especially at night when lighted will communicate the image of a positive technology rich in imagination, both vital and essential.'[19]

Perhaps it is not surprising that the architects serving on the Intelsat design competition jury did not undertake any technical analysis of the design. But the full jury, including Intelsat's Director of Engineering, also avoided making technical assessments, instead citing the architect's claims about technical performance of his design. This is especially apparent in the jury's analysis of the Andrews design in relation to energy use. Under the heading 'Accommodation of INTELSAT's Use Requirements' it was noted that the Andrews design involved much lower lighting costs than were usual in Washington:

> In a typical Washington office building with an annual energy consumption of 65,000 BTU's [sic] per square foot, some 30,500 BTU's are associated with lighting. In the Andrews design, by providing much exterior exposure, a photocell automatic turnoff system and the use of a space-frame to give insulation without blocking wanted light, a projected light energy budget for INTELSAT headquarters is estimated to be only 12,830 BTU's.[20]

This was transcribed directly from information supplied by the Andrews office: the figures of 65,000, 30,500, and 12,830 BTUs all appear in the Andrews's Intelsat design report, easily graspable in a clear diagram [fig. 5].[21]

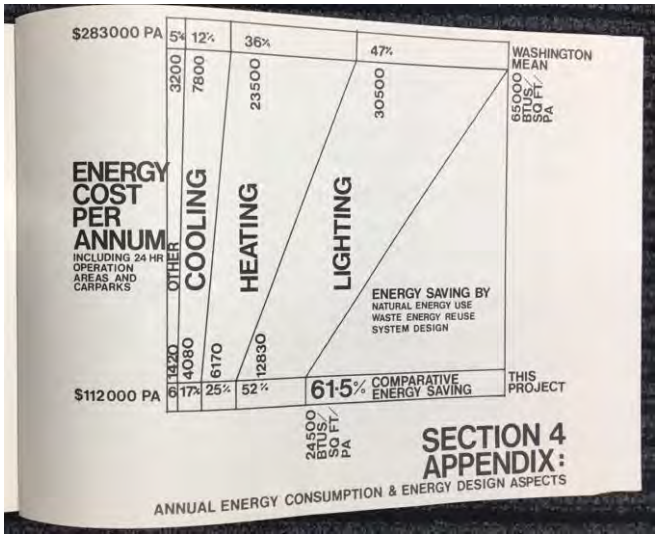

Figure 5. Diagram from Andrews's Intelsat design competition report

These numbers or close variations of them were then widely reported in the architectural media. Writing in April 1980 on the selection of the Andrews design, the *Washington Post*'s architectural critic Wolf von Eckardt noted 'While the average Washington office building consumes 65,000 Btu's [sic] (British thermal units) per square foot per year, the Intelsat building is estimated to require only 24,000 per square foot per year.'[22] After the first stage of the Intelsat was completed, while BTU consumption – both Intelsat's and the Washington norm – had apparently gone up, reports in the architectural media nevertheless continued to riff the Andrews claim of a '61.5% comparative energy saving' in the Intelsat design: *Architectural Record* suggested that Intelsat's energy use was 'less than 40 percent of the norm for comparable Washington buildings'; Peter Buchanan in *Architectural Review* noted 'energy consumption is less than 40 per cent of the norm for comparable buildings in Washington'. Reporting the same BTU figures as appeared in

Architectural Record, 'N.R.G.' in *Architecture*, at least acknowledged that such figures were estimates only.[23]

Intelsat as an image: science fiction

Of the six design considerations on which the Intelsat jury made its judgements, two were more overtly based on appearance than the others. These visual criteria were about Intelsat's 'image': the chosen design needed to 'Satisfy the image requirements and goals of INTELSAT'; and about context: 'Satisfaction of the urban design requirements of Washington, D.C.'.

Belluschi, Austin-Smith and Zanuso wrote in their assessors' report that Intelsat's 'image goals' were such that the selected design 'must reflect an optimistic view of mankind, a belief in its ability to grow in awareness, to be inspired and to create new relationships and new environments.' This the jury deemed the Andrews design to do – 'innovative in appearance, yet solidly related to the past in general character', respectful of the hillside topography and the trees 'which are such an ornament to the site'. The urban design requirement was also deemed to have been successfully addressed through the organization of the building on the site, with green space, parking, and vehicular movement all suitably handled, and linking well to Connecticut Avenue by offering an entry point there, close to the location of a new metro station, and forming a suitable landmark on a key city thoroughfare.

Technology was not relevant merely to the Intelsat headquarters building in relation to its services and environmental performance. It was also central to its look. While the particular attention paid to the shading treatment of the fenestration at Intelsat produced a glitter of stainless steel and glass, the fragmented, office-pod, stair-capsule, and space-frame look of the place took this much further than was needed merely for technical purposes, perhaps somewhat towards the HAL-9000 inhabited spaceship Discovery One from 2001: A Space Odyssey. Playing on Intelsat's 'off-planet' responsibilities, architectural critics writing on the building could not help themselves in making such sci-fi connections. On these they were ready to be inventive and speculative, fulsome in a way in which they were not on the building's energy performance. While rejecting the architect's claims that the appearance of his building was simply the outcome of the application to the design of 'common sense', the architectural critics who wrote on Intelsat entirely accepted his claims about the building's energy use. For Wolf von Eckardt, the Intelsat headquarters was precisely 'Architecture for Year 2001'.[24] Writing in *The Architectural Review* soon after the first phase of the building opened in 1986, Peter

Buchanan claimed that Intelsat's staff affectionately called the building 'Starship Enterprise'.[25] Meanwhile, under the title 'Uncommon sense' *Architectural Record*'s Margaret Gaskie wrote

> Perhaps through subliminal confusion of the building with the client, the [Intelsat] headquarters has since it first began to rise on Connecticut Avenue near Embassy Row evoked the space-city imagery of *Star Wars*, and indeed its shimmering many-faceted pavilions seem rather to float than to march up the thickly wooded hill on which they rest….[26]

And under the headline 'High-Tech Castle on a Wooded Hill', 'N.R.G.' wrote in the American Institute of Architects' journal *Architecture* that the building was a 'futuristic' '*tour de force*', suggesting that one of the atria was reminiscent of Russian Constructivism (the central stair tower), Barragán (the pools), and 'with a little Darth Vadar thrown in'.[27] Darth Vadar was as 'noir' as the sci-fi references went – no-one mentioned the contemporaneous 'Alien' or 'Bladerunner'. However, the space references were not entirely without critical allusion. This is perhaps most overt in a *Washington Post* article titled 'Intelsat: The Space-Age Stunner', by Benjamin Forgey, a *Post* staff writer and architectural critic. Forgey makes the point that many architects were disdainful of the Intelsat building because it is a 'suburban building in an urban setting'.

What is at stake in Forgey's comment is the problem of the building's relationship to its context. Visually arresting and intriguing, the Intelsat building sits on a major arterial road in a well-heeled part of Washington. But in its beautiful park, it floats at a visual and conceptual distance from its surroundings. While its immediate neighbours are the embassies to its west, the broader neighbourhood of Cleveland Park is a late nineteenth century residential district, inhabited now by professionals and politicians.[28] It was a neighbourhood that successfully organized to stop a freeway in the 1960s, and to subsequently attract one of the first trunk-lines of the Washington Metro, which started construction in 1969. The Metro station at the corner of Connecticut Avenue and Van Ness Street just north of the Intelsat site opened in 1981. The stretch of Connecticut Avenue through Cleveland Park and as far north as Van Ness is described by Forgey as 'the city's most urbane residential boulevard, lined with fine masonry apartment buildings', a pattern that was reinforced by developments that followed on from the building of the Metro. But for the most part, these buildings are banal. Commenting on the contextualism with which most Washington architecture complied at the time the Andrews Intelsat design was selected, von Eckardt, Forgey's colleague at the

Washington Post, wrote of buildings then being put up close to the Intelsat site by the University of the District of Columbia that they exemplified 'the current Washington vogue of making institutional buildings as gravely monumental, ponderous, heavy and pharaonic as possible. They are thin architectural concepts set in thick concrete, as though the architects felt their idea might otherwise too readily blow away.'[29]

Forgey, however, does not find Intelsat entirely alien:

> The issue of the building's style is not an easy one to decipher. I watched it go up with increasing fascination. It just got busier and busier, until the notion of high-tech, space-age imagery almost disappeared and I found, to my great surprise, that the building began to assume a highly romantic, somewhat 19th-century character. What building in Washington, excepting the Smithsonian Castle, has a more active, picturesque profile?

Conclusion

The Intelsat Headquarters Building could be considered a satellite building for satellites. Compared to new commercial and institutional buildings being erected at the same time in its neighbourhood – indeed, through most of Washington and much of the rest of the western world – it eschewed post-modern contextualism, as noted by von Eckardt. Instead, it adopted an approach that ostensibly foregrounded the building's energy performance on the one hand, and the physiological and psychological comfort of its inhabitants on the other. These matters focused design on the building interior. Maintaining the park-like aspect of the site, this approach therefore turned away from the signs of urban intensification that were otherwise appearing in its vicinity. It gave the building a kinship with American suburban corporate complexes, as noted by Forgey, and to the government complexes of Canberra's 1960s and 1970s expansion to which the Andrews office had already applied considerable thought.

This, however, is too simple. While the Andrews design for the Intelsat headquarters was legitimated substantially in relation to building science measures and environmental strategies, the jury which selected the design consistently subordinated the question of the design's environmental performance to the question of its appearance. Science was subordinated to science's look. For the architect members of the jury, this might not be remarkable, but it seems that the technical members also acquiesced in this move. As we have seen, this was then repeated in critiques of the Intelsat design that appeared in the *Washington Post* and in the international architectural press.

This is not to say that the Intelsat building did not perform as its designers' analyses demonstrated that it would. Rather, this aspect of the design still did not matter enough in architectural culture to be scrutinized. And Intelsat's beguiling appearance – a techy-looking complex glittering among the trees – could be reclaimed for imaginative speculation, to be construed as an updated Victorian pile or cinematic space-ship. Science fiction veiled – and prevailed over – science fact.

Endnotes

[1] On the site ownership, see Wolf von Eckardt, 'Pods and Pools', *Washington Post*, (April 19, 1980): C4.
[2] In the face of growing competition from private providers of satellite communications services – exacerbated by changes in relevant American policy and legislation – Intelsat was privatized in 2001. In 2014 it moved to an anonymous office block in Tysons Corner, an enclave of bland office buildings beyond Washington's western periphery. The Intelsat building is now occupied by tenants including embassies and the University of the District of Columbia. On the move to Tysons Corner see see https://www.washingtonpost.com/news/digger/wp/2014/07/27/intelsat-moves-into-new-tysons-office-part-of-a-wave-of-tenants-wooed-by-silver-line/?utm_term=.52baa794b06d. Accessed 26 Feb 2018.
[3] Timothy M Rohan, *The Architecture of Paul Rudolph*, New Haven & London: Yale University Press, 2014: 33-34
[4] Belluschi had coincidentally met Andrews in 1956 while travelling to Australia to speak at the RAIA convention of that year.
[5] http://www.austinsmithlord.com/story/. Accessed 26 February 2018.
[6] See 'Intelsat Suspends 2 Top Officials After Unauthorized Payments, *Washington Post* (November 25, 1986): A7; 'Ex-Intelsat Head Sentenced', *New York Times* (September 23, 1987)
[7] Paul Walker, 'No. 2 Bond Street', in *Augmented Australia: Regenerating Lost Architecture 1914-2014*, Australian Pavilion, 14th International Architecture Exhibition, La Biennale de Venezia, ed Philip Goad, Canberra: Australian Institute of Architects, 2014: 70-73
[8] 'Architect Looks North for Man's Next Home', *Globe and Mail*, Toronto (July 23, 1963)
[9] Reyner Banham, *Megastructure: Urban Futures of the Recent Past*, London: Thames and Hudson, 1976: 105, 133-35, 167.
[10] Jennifer Taylor and John Andrews, *John Andrews Architecture A Performing Art*, Melbourne: Oxford University Press, 1982: 133-135.
[11] Taylor and Andrews, *John Andrews Architecture*: 156.
[12] Paul Walker and Antony Moulis, 'Before Scarborough: John Andrews in the Office of Parkin Associates 1958-1961', in Gevork Hartoonian and John Ting, eds, *Quotation: What does history have in store for architecture today?* proceedings of the 34th annual SAHANZ conference, Canberra: SAHANZ, 2017: 778-786; Louis I Kahn, 'Toward a Plan for Midtown Philadelphia', *Perspecta* 2 (1953): 10-27.
[13] Paul Walker, Jane Grant and David Nichols, 'Monarto's Contested Landscape', *Landscape Review*, 16: 1 (2015): 20-35
[14] John Andrews International Pty. Ltd., 'Intelsat Project, Washington D.C.', report, January 1980.
[15] 'Report of the Assessment Panel for the Limited Invited Architectural Design Competition for the New INTELSAT Headquarters, 5 February 1980'. The Andrews archive collection has recently been transferred from Andrews to the State Library of New South Wales who are currently in the process of accessioning it. Access by the author was to the archive when in was still in the possession of the Andrews family.
[16] 'Report of the Assessment Panel…. Annex A to Attachment no. 6': 2
[17] 'Report of the Assessment Panel…. Annex A to Attachment no. 6': 8
[18] 'Report of the Assessment Panel…. Annex A to Attachment no. 6': 13
[19] 'Report of the Assessment Panel…. Annex A to Attachment no. 6': 13
[20] 'Report of the Assessment Panel…. Annex B to Attachment no. 6': 10

[21] John Andrews International Pty. Ltd., 'Intelsat Project, Washington D.C.', report, January 1980, 'Section 4 Appendix: Annual energy consumption & energy design aspects'.
[22] Von Eckardt, 'Pods and Pools': C4
[23] Margaret Gaskie, 'Uncommon Sense', *Architectural Record* (October 1985); Peter Buchanan, 'Intelsat Interlock', *Architectural Review*, CLXXX no 1076 (Oct 1986): 103-108; N.R.G., 'High-Tech Castle on a Wooded Hill', *Architecture*, 74: 11 (November 1985), 68-75.
[24] Von Eckardt, 'Pods and Pools': C1 & C4.
[25] Buchanan, 'Intelsat Interlock': 104
[26] Gaskie, 'Uncommon Sense'
[27] N.R.G., 'High-Tech Castle on a Wooded Hill': 72.
[28] Zachary M Schrag, *The Great Society Subway: A History of the Washington Metro*, Baltimore: Johns Hopkins University Press, 2006: 41
[29] Von Eckardt, 'Pods and Pools': C4