We Come in Pieces - Conservation Problems Associated with the Futuro House at the University of Canberra

John Greenwood

University of Canberra

Last March a flying saucer landed on the campus at the University of Canberra. It was not aliens but a Futuro house. The Futuro was donated to the University by the Dickson Tradies Club where it had been part of an observatory until it was damaged in a fire last year. The Futuro house is a UFO shaped house made of glass reinforced plastic and polyurethane foam. It was designed in the 1960s by Finnish architect Matti Suuronnen as a relocatable ski lodge and had a projected lifespan of 30 years. Only 96 were built, few remain and most are sad and neglected. There has been a two-year project to conserve the prototype Futuro, which is now housed in the Museum Boijmans Van Beuningen in Rotterdam. There's the rub: a plastic building in the harsh Canberra climate nearly 23 years past its prime and slightly singed – a wonderful conservation challenge. The paper considers the problems and challenges of preserving the building and adapting it for suitable use within a university and how the project can be used to teach students the challenges of conserving modern materials and contemporary art.

Introduction

On a cold, rainy day in April 2011 a sliver flying saucer appeared on the campus of the University of Canberra in Australia. This was no ordinary flying saucer that flew in from the stars; it was one of the few remaining Futuro houses, coming in pieces on the back of a trailer.

The Futuro house is a piece of iconic 1960s design, produced in a decade that represented the confidence of the "white heat of technology" (Wilson 1963), great economic growth, a strong belief in the future and the first tentative steps in space. The Futuro was designed in 1965 by the Finnish architect Matti Suuronen as a relocatable, modular ski lodge (Home 2010). His design of an ellipsoid built of glass-reinforced plastic (GRP) with insulated walls and windows, resting on a circular steel support, was innovative and effective. The first 20 buildings were produced in Finland (Home 2010) with others being produced under licence in New Zealand and elsewhere. The structures built in Finland came complete with a fitted interior, unlike the New Zealand versions, which were left empty to be fitted out by the owner.

History

The University of Canberra (UC) Futuro house was given to the University by the Dickson Tradies Club, where it was previously part of the Canberra Planetarium and Observation Association's observatory. The Futuro had been a key part of the observatory complex until a fire severely damaged the buildings in September 2010 (*Canberra Times* 28.09.2010). Prior to that it seems to have been used as a feature at a local swimming pool and as a sales office for a real estate agents[1]. Even though it is difficult to track down its full history, it appears that the Futuro has been standing exposed to the Canberra climate for more than forty years. This is at least ten years more than the manufacturers

[1] Correspondence with Geoff Driscoll Architects who gave permission for the photograph. His firm carried out the building approval for the Building Association to use the Futuro 30 years ago.

specifications which give the house an expected life of thirty years (Table 1).

Form	Ellipsoid (oblate spheroid)
Diameter	8m
Height	4m
Effective area	50m^2
Floor space	25m^2
Expected lifespan	30 years

Table 1 | Manufacturer's specifications for Futuro (Home 2010).

CONSTRUCTION

Designed for flexibility and ease of construction, the Futuro was built from 16 segmented sections, which when bolted together formed an ellipsoid four metres high and eight metres in diameter that sits on a steel ring supported on tubular steel legs. The top eight segments each have two oval windows set in. The segments are made of an inner and outer shell of 25mm glass-fibre reinforced polyester resin sandwiching a 40mm polyester-polyurethane hard foam (Bechthold 2007). The original door structure – a fold down aircraft type door (Home 2004) – has been removed and the entrance enlarged by cutting into the two Perspex® windows on the upper segment. The legs have been shortened by approximately 50mm and a set of wood and steel steps has been bolted on. The segments are bolted together through flanges formed during manufacture. The lower segments have a layer of composite board cast into the flanges as reinforcement.

When manufactured, the Futuros had fans and air circulating vents at the top and bottom where the segments met (Kuitunen 2010). These are missing on the UC Futuro, the top vent having been replaced with a tin-plated steel cover. The bottom sections are reinforced with steel sections that also support the floor. Where the steel sections meet the fan is missing, leaving a void.

The original exterior finish was an egg yellow/ochre gel coat, best described as 'baby poo' in colour. The UC Futuro has a silver metallic paint layer, which on examination covers four previous layers of paint.

Figure 1 | Futuro house as part of Canberra Planetarium and Observation Association's observatory based at Dickson Tradies Club, before the fire in 2010 (Driscoll G, 2011).

The original Finnish-manufactured Futuros had GRP interior fittings, beds and separate rooms. The models manufactured under licence in New Zealand, where the UC model is assumed to have come from, were left empty. The UC interior has a futuristic, space themed mural, which would have been painted for its use as part of the observatory. The floor is made of 16 segments of heavy duty ply emanating from a circular wooden plate, all of which are laminated with a hard, dark brown polymer finish.

THE UNIVERSITY OF CANBERRA FUTURO PROJECT

The long term use and function of the Futuro is yet to be decided. However, the University is proud to have such a design icon and every effort will be taken to preserve it. Although designed as a functional house or ski lodge the Futuro is also considered an important style icon and art object (Home 2004). It is believed that there were only 96 Futuros manufactured worldwide and of these only a few remain. Futuros have appeared in films and art installations by Andy Warhol and others. In 1970, readers of *Playboy* magazine voted the Futuro the ultimate *Playboy* bachelor pad.

Figure 2 | Futuro at the University of Canberra.

Because of its design and artistic links the Faculty of Arts and Design was asked to develop a long term care and use project with the Cultural Heritage Conservation section leading the work. The project will be a cooperative project with design, architecture and landscape inputs, and will include:

- Documentation and condition survey
- Heritage management plan, significance and possible future use
- Active and preventative conservation treatments where necessary
- Design and reinstatement of interior.

Exterior Condition

Considering the Futuro's 40-plus years exposed to the heat and cold of the Canberra climate and being at least ten years over its predicted lifespan, it appears to be in a fairly good condition.

Figure 3 | Paint cross section showing yellow paint over baby poo yellow gel coat then blue, red, yellow and silver with white undercoat between layers.

The exterior has some superficial soot and other surface contamination from the 2010 fire. There are areas of missing paint and small abrasions and some surface damage. These appear to have been caused during reassembly at UC. There are three holes 20 cm in diameter cut through the base sections, apparently for air conditioning. Other small holes have been drilled into the surface for fittings and there is a series of abrasions, nicks and surface damage to the GRP.

The UC Futuro has been repainted at least four times during its history. Following discussion with Canberra residents[2] it appears that during its time as part of the Dickson Observatory it was always silver in colour. From this we can assume the other coloured layers were subsequent to 1985. This repainting of the surface would have protected the vulnerable gel coat from excessive photo degradation. It will not be possible to thoroughly examine the surface without the removal of the overpainting.

When investigating the prototype Futuro number 013, Becholt (2007) found that exposure to the environment had caused damage to the to the gel coat. This had resulted in an increase in porosity and a powdering of the surface. Polyester resins are susceptible to breakdown and discolouration due to photo oxidation accelerated by exposure to UV (Sashoua 2008, Van Oosten 2008). Despite a long exposure to the harsh

[2] Much of the anecdotal evidence was supplied by students who visited the observatory.

Canberra environment, no significant photo degradation is apparent. This is most likely due to the protection offered by subsequent layers of paint.

Access the top of the Futuro, in order to thoroughly examine the entire surface, is limited, as it will be necessary to erect scaffolding and use access platforms. However, examination of the accessible areas has shown the visible damage to the surface to be limited.

Figure 4 | Surface abrasions and damage to the GRP caused during transit. Soot staining from the fire.

The main problem with the exterior would appear to be the alterations removing the original door and enlarging the entrance. The legs have been shortened and two of the Perspex® windows have been cut into. Comparison with contemporary photographs of the New Zealand Futuros show the original windows to be dome shaped doubled layer slumped Perspex (Home 2010). The windows on the UC model are flat and single layered indicating that they are replacements. One of the windows is missing altogether.

Interior condition

In keeping with its use in an observatory, the interior has been decorated with a space themed mural, which has been defaced by blue spray-painted graffiti. The joins between the flanges have leaked and there is substantial damage to the composite board. This has resulted in the expansion of the composite material, breakdown of the board and areas of fungal decay. The steel sections forming the floor supports have some superficial corrosion but there is little damage to the structure. There has been some water ingress due to a breakdown of the rubber window seals.

Heritage management assessment

Before any treatment can be carried out there needs to be a full heritage management assessment of the UC Futuro house. This will highlight the heritage significance of the structure and from this ideas and proposals for the future use of the Futuro can be decided.

Treatment

The conservation treatment of the Futuro is dependent on decisions about its significance and proposed use by the university, but may include the strategies described below.

Figure 5 | Graffiti damage to the interior space-themed mural.

As with all buildings or outside art installations it is important to clean any damaging dirt from the surface and make it watertight and secure (Stigter 2008). Removal of the damage caused by the fire, soot and other surface dirt is the primary concern, but it is also necessary to replace the missing window and replace the temporary wooden door with a secure and watertight replacement. Soot is composed of ultrafine particles between 10 and 2.5 microns (Tsang 2011). It is formed during combustion of hydrocarbons during a fire. These ultrafine particles can be washed into the fine interstices and cracks on the surface of the fibreglass. To achieve an efficient removal of surface soot and other particles on a large difficult-to-reach surface, the use of water with a suitable surfactant is the most effective treatment (Tsang 2011). It is important to clean the surface even if it is to be stripped of the paint layers and returned to the gel coat layer. Removal of paint layers without prior removal of the soot will increase the possibility of the ultrafine particles being forced into the interstices and cracks in the gel coat layer.

Figure 6 | Water damage resulting in swelling and breakdown of composite board on flanges.

Testing needs to be done on the method of paint removal from the GRP to ascertain the most effective treatment. Paint removal with abrasive methods would be unsuitable, causing damage to the gel coat. Horie (2010) indicates that polyester casting resins show swelling, distortion and disintegration in a wide range of organic solvents including dichloromethane, a key constituent to many paint removers. There is, however, a range of pH-neutral, environmentally-safe paint strippers with an ethylcellulose base that have been used to remove paint from GPR on military aircraft (Molecular Tech 2011: pers. corr.). Further experimentation is needed in this area.

The outer skin must be made watertight and all of the holes, nicks and other damage will need to be repaired. This will be facilitated by the removal of the paint layers and stripping back to the gel coat. Tests at the Kroller-Muller Museum in The Netherlands have shown that Araldite 20-20 epoxy adhesive and Miliput epoxy putty are the most effective materials for these repairs (Steiger 2008).

Figure 7 | Design for new access ramp from UC Architecture Club 24 design competition, September 2011 (entry by Anthony Durak, Jordan Evans-Tse, Steven Li)

The interior has problems emanating from water ingress. The composite board at the joins will need to be consolidated and re compressed. The silicone sealant between the sections has broken down and been damaged and will need replacement. The interior mural will be the subject of a heritage management assessment. The graffiti will need to be removed and this will be subject to further testing.

Preventive Conservation

Work on other Futuro houses and other large exterior GRP objects (Bechtold 2007, Stigter 2008) has highlighted the importance of a protective layer for the exterior. Exposure to UV will cause increased porosity of the surface, making it vulnerable to fine particulates and water damage. This may already be the case with the UC Futuro but until access to the top is made easier and areas of paint removed this remains unknown. Recommended surface coatings include paints and resins. Epoxy resins with nano-particles appear to be the most effective protection but are expensive. Effective surface coating needs a clean, well-prepared surface upon which to bond, and this can only be prepared following paint stripping.

The Futuro's So Bright, I Gotta Wear Shades[3]

This paper is an introduction to the University of Canberra's Futuro project. It will be an innovative and exciting project involving the conservation of contemporary materials, ethical and significance issues unique to Australia and new design for the interior. As the Futuro is examined new challenges will present which will bring in other experts from the university. Since it landed in March, the Futuro has already been the subject of a design competition for Architecture students who produced some innovative and practical ideas. The conservation team will be building on the work done on Futuro 001 (Kuitunen 2010) and Futuro 013 (Bechthold 2007) to develop a useable work building, integral to the university campus, which also is a significant work of art.

[3] Play on the title of a 1986 song by Timbuk3, *The Future's So Bright, I Gotta Wear Shades.*

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Author Biography

John graduated from the University of Wales, University College Cardiff in 1976 in Archaeology and Archaeological Conservation. He worked at the Pitt-Rivers Museum Oxford, Saint Albans Museum, Passmore-Edwards Museum in London, Sheffield Museum, South Yorkshire and ran a conservation unit at Doncaster Museum. In 1988 John started teaching conservation in what was then Lincolnshire College of Art in Lincoln UK. This then became part of De Montfort University and subsequently the University of Lincoln. John managed to escape the academic life twice on sabbatical placements: in 2000–01 to run a twelve-month UK Government-funded project developing learning programs for small and voluntary museums throughout Yorkshire; and in 2007-08 spending six months as the senior conservator on the summer program for the New Zealand Antarctic Heritage Trust. This involved long periods living and working in the field at the historic huts at Cape Royds (Ernest Shackleton) and Cape Evans (Captain Scott). In June 2009 he packed up and left the UK to come and redevelop the conservation course at the University of Canberra.