

ACT CHAPTER: REGISTER OF NOTABLE BUILDINGS

Date: 5 October 2026

NAME OF PLACE		GIO Stadium and the AIS Arena Precinct	
Other/Former Names		Bruce Stadium and the National Indoor Stadium Originally the National Athletics Stadium & National Indoor Sports & Training Centre	
Address/Location		30 Battye Street and 26 Leverrier Street, Bruce, ACT 2617 Block 26, Section 8, Bruce	
Listing Status	Registered	Other Heritage Listings	Not included on a statutory list/register
		Level of Significance	National
Date of Listing	2003	Category	Public – Sporting
Citation	2	Style	Late 20 th Century Structuralist
Date of Design	1974 (GIO Stadium) 1979 (AIS Arena)	Designer/Architect	Architects - Philip Cox & Partners Engineers – Bond James Laron Murtagh
Construction Period	1976-77 (GIO Stadium) 1980-81 (AIS Arena)	Client/Owner	Owned by Commonwealth Government (Australian Sports Commission). Leased by ACT Government (GIO Stadium)
Date of Additions	1996 (AIS Arena) 1997 (GIO Stadium)	Builder	Leighton Holdings (GIO Stadium) John Holland (AIS Arena)
STATEMENT OF SIGNIFICANCE¹			
The original parts of GIO Stadium (1977) and the AIS Arena (1981) form a precinct of nationally significant architecture designed by architects Philip Cox & Partners with Bond James Laron Murtagh as structural engineers. Together, the two buildings formed the earliest facilities to be utilised by the national Australian Institute of Sport (AIS) which became the most important factor in the resurgence of Australian sport on the world stage following a decline during the late 1970s. The two buildings are excellent examples of the Late Twentieth-Century Structuralist Style and are important for the technical achievements of their complex structural system. Philip Cox was a key proponent of the style and both buildings are notable examples of his design work. The precinct is the only one in Australia which includes two related buildings with differing tensile suspension systems, the original stadium grandstand with its roof hung from steel cables and the Indoor Stadium with its roof supported on long span cables. Philip Cox is one of Australia's most important architects of the late twentieth century. The two buildings are important in his career in terms of their early date, size, prestige and the clear expression of the principles in which his architecture is based. Both buildings demonstrate Cox's belief that there is no division between architecture and structural engineering.			
BACKGROUND/HISTORY			
The two buildings were designed by the Sydney firm of Philip Cox & Partners for the National Capital Development Commission. The original part of GIO Stadium was designed in 1974 as the National Athletics Stadium whilst the AIS Arena was designed three years later in 1977 as the National Indoor			

Sports & Training Centre.ⁱ The construction of the stadium was completed in 1977 and the training centre in 1981.ⁱⁱ



Sport and recreation – venues with Bruce Stadium in the foreground (1990)
(Source: National Archives of Australia, A6135, K18/4/90/72)

The National Athletics Stadium was constructed to hold the 1977 Pacific Conference Games in Canberra prior to the establishment of the Australian Institute of Sport.ⁱⁱⁱ The National Capital Development Commission (NCDC) selected a relatively flat area west and north of the O'Connor Ridge for the facility.



Sport and recreation – Pacific Games inside Bruce Stadium (1977) and exterior of grandstand (1981)
(Source: National Archives of Australia, A6135, K14/12/77/37 and K20/2/81/14)

The Whitlam Labor Government commissioned a report in 1973 titled 'The Role, Scope and Development of Recreation in Australia' which suggested that the Federal Government establish a National Institute of Sport similar to many others in European Countries. In September 1975, a study group was appointed by the government and reported in November 1975 that it recommended the Institute of Sport be established. The same month however, the incumbent Whitlam Government was dismissed. The new Government did not believe in spending government money on sport.^{iv}

The following year, at the 1976 Monreal Olympic Games, Australia did not win a gold medal and 'found themselves amateurs in a world of professionals – possessing a sporting past but not a future'. Four years later, the Fraser Government attempted to prevent Australian athletes from participating in the 1980 Moscow Olympic Games due to the USSR intervention in Afghanistan. Some athletes withdrew and others competed, though were prevented from participating under the nation's flag or receiving Federal funding. Possibly as recompense, the Fraser Government announced in January 1980 that an Australian Sports Institute would be established. There was much debate about whether it should utilise

existing state facilities or whether new facilities should be provided in one location. In September of the same year, the Federal Government announced that it would be located in Canberra.^v

It was determined that the existing National Athletics Stadium should be utilised as the track and field, and soccer facility, and that a new indoor arena be built for the opening ceremony to house 4,000 spectators, administration offices and be the home base for Australia's elite basketball, netball, gymnastics and weightlifting teams. The Prime Minister Malcolm Fraser opened the new indoor arena in January 1981, just four months after the announcement to locate the facility in Canberra. The decision to proceed with the building had however been made in December 1979^{vi} Whilst designs had yet to be finalised, an order for hi tensile wire was made to Shinko Wire Works in Japan (also used at GIO Stadium) prior to Christmas in order to risk chances of delay.

A limited construction period was forced on the design team of the Indoor Sports & Training Centre, with the time taken from commencement of the final engineering design to completion of the building being just 14 months. The structural system devised allowed the roof to be constructed prior to, or at the same time, as the construction of the base building. This structural system also met the fundamental requirement of providing a clear span, allowing clear sight lines to all spectators owing to the lack of columns. The design also had to accommodate potential for a two-bay extension at a later date, necessitating the use of a one-way structural system. A cable system stabilised against uplift by the dead load of the concrete roof panels was selected for both reasons of economy and on aesthetic grounds.

Considerable refinement was undertaken during the design phase to achieve a structure that avoided unacceptable levels of vibration or deflection.^{vii} The steel truss gantry, aided by the use of outriggers, enabled the roof to be constructed independently of any walls and was kept inside the building to facilitate the moving of heavy loads. The arena also originally had a ventilating and air circulating mechanical system that was assisted by the recessing of the building into the ground and maintained a relative constant temperature except during extreme weather conditions.



Sport and recreation – exterior of National Indoor Sport Centre (1981)
(Source: National Archives of Australia, A6135, K13/2/81/8)

It became obvious within a year of the completion of the arena that additional facilities would be required due to the number of sports using the facility combined with commercial entertainment activities which resulted in training schedules not being fulfilled. A gymnasium, tennis halls, swimming pools, basketball courts etc. were constructed over the following years to alleviate these problems.

The World Cup in Athletics was held at the stadium in October 1985 and while this was well attended, the overall use of the stadium as a spectator facility was limited. In 1988, a decision was made to relocate the Canberra Rugby League Team, The Canberra Raiders, from Queanbeyan to the National Athletics Stadium. This required the removal of the athletics track and adjustments to the perimeter seating. Some minor changes to the grandstand had previously been undertaken, including glazing in the gap between the upper-level seating and the roof in 1979. Track and field training was relocated to the nearby warm up track with enhanced facilities.

Prior to the Sydney 2000 Olympic games, the football stadium underwent considerable upgrades with a new grandstand built on the east side, the playing field relocated closer to the original grandstand at a lower level to increase capacity, and the installation of new perimeter seating. Corporate boxes replaced the original stadium's lower seating, though the roof and upper seating have been retained.

In about 1996, the addition to the AIS Arena was constructed to provide visitor services.^{viii}

Late twentieth century Structuralist Style

Architects who designed buildings in the Late twentieth-Century Structuralist Style were seeking an alternative to the heavier concrete architecture of the post-war period and were often designing for specialised functions that required very large column-free structures. These structures were also claimed to be less expensive to construct since the material, usually steel, was used in tension minimising the required volume of material. The steel cables however, were made of more costly high tensile steel and the connections were more labour intensive. This meant economies related to cost were not always achieved.

The use of metal cables in long span tensile structure was first achieved in England during the mid-19th century in bridges such as the Clifton Suspension Bridge, which spans 214 metres over the River Avon. It would appear that the use of tensile steel suspension systems for buildings was first explored at a small scale by Buckminster Fuller in the late 1920s with his design for the 'Dymaxion' house project which was built in 1945. The radially planned house had a central vertical core with tension cables extending out from the top of the core to the perimeter supporting roof and elevated door.^{ix}

The use of high tensile suspension systems was an important post-World War II development in construction, but was rarely used in Australia.^x The earliest examples of tensile structures in Australia include the Olympic Swimming Stadium (Borland, McIntyre, John and Phyllis Murphy, 1952-56), the Sidney Myer Music Bowl (Yuncken, Freeman Borthers, Griffin and Simpson, 1956-59), both located in Melbourne with Bill Irwin as the structural engineer. At a domestic scale, Robin Boyd's second house (constructed for himself, 1957 in South Yarra) also incorporated a tensile structure.

Later examples include the Sydney Football Stadium (using struts rather than cables) and the Darling Harbour Exhibition Building, 1988, both by the same architects as the AIS buildings. Both Sydney structures have been demolished.

Internationally, notable major steel tensile systems include the two Tokyo Olympic Indoor Arenas by Kenzo Tange (1964), the West German Pavilion at the Montreal Expo (1967), and the Munich Olympic stadium and pool roof structures (1972), all by the engineer Frei Otto.

Other examples of tensile structures in the ACT include Callam Offices (John Andrews International, 1977-81), Stage 88 in Commonwealth Park (also by Cox), the Canberra International Motor Inn, Dickson (1981), and Rydges Capital Hill Hotel (formerly the Pavilion Hotel), Forrest, the latter two by Brian Dowling. All except for Callam Offices vary from the AIS buildings in that they are tensile membrane structures.

Philip Cox

Philip Cox graduated from Sydney University in 1962 and the following year joined with Ian McKay. Together they designed the Tocal Agricultural Collage, Patterson, NSW (1964) which is an important early example of the Late Twentieth Century Regional Style. In 1967, he founded his own practice Philip Cox and Associates.

Philip Cox believes that 'the architecture which emerged [from his early work] was the basis for all future works, that is, architecture which pays respect for its immediate environment, essential horizontal punctuated by simple massing'. Additionally, he believes that 'we are dealing with fundamental issues and basic concepts of architecture such as mass, form, colour and textures, whilst recognizing social, political and economic values'.^{xi}

He is one of Australia's important twentieth century architects and is recognised and worked internationally. Philip Cox's firm has expanded considerably over the last 40 years. Cox believes Australian landscape painting has influenced his architecture.^{xii} In the majority of his work, he has attempted to relate buildings to their settings, a task relatively easily achieved with his earlier Sydney Regional Style projects but more challenging in his later structuralist work. In his shift from a heavy 'crafted' regional aesthetic to the light industrial international aesthetic, his work has not lost its relationship with the site, as is clearly evident in the two buildings at the AIS.

Cox believes that 'the Sports Stadium and Indoor Facilities in Canberra (Bruce) are expressions of the philosophy that there is no division between architecture and structural engineering'. 'They are light skeleton forms [and] they are buildings which pay homage to the landscape in which they are placed'.^{xiii}

Philip Cox's firms have completed a substantial body of work much of which is exemplary. In 1984, he was awarded the RAIA Gold Medal and was made a member of the Order of Australia in 1988.

Some of the firms' other important works include housing at Woolloomooloo (1979), the Yulara Tourist Repost (1983) at Uluru, the National Tennis Centre in association with Peddle Thorp and Learmonth (1988) and the Brisbane Convention and Exhibition Centre. Other works in Canberra include Jerilderie Court, Reid (1975), the Embassy of Ireland (1975), the Family Court and ACT Juvenile Court (1976), Kambah Health Centre (1977), National Council of Independent Schools Headquarter (1982) and Radford College (1983).^{xiv}

DESCRIPTION

GIO Stadium and the AIS Arena are located on the southern part of the Australian Institute of Sport (AIS) campus at Bruce and are set within undulating terrain with a mix of grassland and native tree plantings. The buildings are located within 150 metres of each other and are both visible from the east end of Battye Street.

The original parts of both the stadium and arena are examples of the Late Twentieth-Century Structuralist Style (1960-2000). They were designed by architect Philip Cox and Partners with the structural design developed by Bond James Laron Murtagh. Both structures feature slender roofs supported on suspension structures consisting primarily of steel cables and prominent tapered steel masts. The concrete roofs to both buildings have a lightweight appearance that contrasts with the more robust forms of masonry used for seating, access and necessary building amenities/services.

The original part of GIO Stadium and the AIS Arena are linked both aesthetically, with the use of similar materials and structural tensile systems, and physically via the connecting manmade landscaped lawns and plantings. The GIO Stadium roof is hung from steel cables whilst the AIS Arena roof is supported on long span cables. They are both good examples of large structures integrated with the landscape.

The key architectural elements characteristic of the Late Twentieth-Century Structuralist Style (1960-) displayed by these buildings are their compression masts and cable stays (both buildings), GIO Stadium's reinforced concrete supporting structure, and the AIS Arena's triangular steel supports to the roof.^{xv}

GIO Stadium

The original, boldly designed grandstand is located on the western side of GIO Stadium and has roof supported by a lightweight tensile suspension structure that projects over the tiered concrete base. The structural system of pre-stressed, high-tensile steel cables was chosen to both minimise the use of materials as well as to make an architectural statement.

The roof suspension structure consists of the following elements:

- Five tapered steel uprights (masts) which are hollow and are a prominent feature of the design. These uprights extend down to ground level adjacent to the rear of the grandstand and are secured at ground level with pin-joints.
- Nine suspension cables supported from each of the uprights which support the steel roof beams (there are three cables per beam).
- A pair of larger cables that extend from the top of each upright down to ground level. The cables are anchored to concrete blocks using substantial U-bolts.
- Steel-framed roof deck with a concrete 'over-deck' that adds weight to prevent uplift. The roof tilts 12 degrees down toward the playing field and forms a robust curved element in the landscape.^{xvi}
- Steel beams that tie the uprights to the concrete seating structure.
- A group of circular steel members at each end of the roof that extend from the concrete seating structure to provide lateral stability to the roof.

The lower concrete part of the original grandstand is curved in both plan and elevation, incorporating a substantial curved edge beam that projects beyond the end of the roof, acting as buttresses for the roof structure. The grandstand has a relatively steep seating arrangement which was designed for optimum sightlines.



Western grandstand, GIO Stadium (2025)

The structural design of the concrete base is expressed when viewed from the forecourt, with the tapered blade columns, raked beams and precast seating slabs all visible. The exposed nature of the structure, combined with the expressed format of the projecting masonry circulation zones, are akin to the 'Constructivism' of the 1920s.

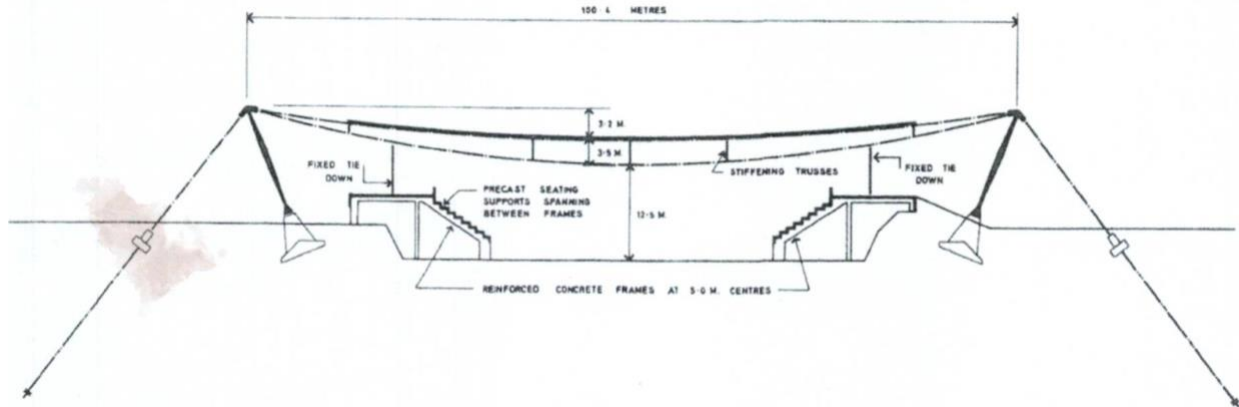
The concrete seating structure is now partially obscured by later additions to the rear (forecourt) side. Dark coloured glazing has also been introduced between the roof and the concrete seating structure to provide additional protection from the wind. Viewed from the playing area, the grandstand originally consisted almost entirely of tiered seating. The lower parts of the original seating were replaced with commentary facilities and corporate boxes. Below these, the seating was extended when the level of the playing field was lowered.

The original upper-level seating that projected either side of the main grandstand remains. These elements have external walls finished in random coursed stone. The earth berms that continued beyond the original concrete seating have been substantially removed. The form of these grassed banks was considered an important design theme that enabled the seating structures to gently curve around the northern and southern perimeter evolving into grass seating.^{xvii} Prior to the replacement of these elements, the form of the stadium blended in with the undulating landform. All of the remaining original concrete seating has been fitted with fixed individual seats.

Tiered seating now extends around the full perimeter of the ground and there is a second grandstand (the eastern grandstand) on the west side. Below the original grandstand seating are change rooms, administration offices and equipment stores.

AIS Arena

The AIS Arena is partially buried below ground level, with the full height of the structure exposed on the west side. The original building is rectangular in plan and features a catenary roof supported by cables slung between prominent tapered steel masts which are constructed of box sections. The catenary form of the roof is clearly evident at the north and south ends of the building.



Section through building

(Source: Analysis and Design of Long Span Singly-Curved Cable Roof, KA Bond and R Hough in Civil Engineering Transactions, 1983, pp13-20)

There are six masts to both the east and west sides (a total of twelve) that support the 100 metre long tensile cable system. The prestressed high-tensile steel cables consist of thinner cables that are located at the upper level of the roof, and multi-strand thicker cables at a lower level, which are located well below the roof. These larger cables have a bigger sag and support internal steel roof struts and three main bracing roof truss members. These trusses are oriented perpendicular to the cable structure and provide lateral support.



East side of AIS Arena (2025)

Each steel mast is connected to the ground by a pin-joint and supports four upper cables and two lower cables. Short length trussed 'spreader' members are used to align the cables at the perimeter of the roof. Each mast is anchored with a pair of cables that extend from the tops of the masts to ground level, over 20 metres from the edge of the building.

The walls of the building are set back a considerable distance from the eaves, making the roof structure the most prominent feature and emphasising the independent nature of the roof. The lower cables are tied down to the concourse structure in line with the walls to minimise uplift and prevent movement between the roof and the glazing. The eaves are supported by steel struts at the north and south ends of the building which extend between the upper and lower cables.

The roof itself consists of 50mm thick 6 x 3 metre precast concrete panels.^{xviii} Substantial cone-shaped concrete structures are located centrally at the north and south ends of the building to collect the rainwater from the roof. Water is directed into these via two substantial horizontal pipes at each end.



South end of AIS Arena (2025)

The walls are constructed of contrasting materials in different planes. This includes projecting curved forms constructed of concrete blockwork (similar in size to bricks) which contain a variety of services (such as toilets) and soften the otherwise cubic form of the elevations. The robustness of these elements contrast with the slenderness of the roof tensile structure. Between the brick elements are horizontal strips of aluminium framed glazing, including doors. Above these, are horizontal banks of projecting glazing supported on a steel space frame. Each of the different façade treatments create a dynamic composition with contrasting positive (projecting) and negative (recessed) forms.

Originally, spectators entered the stadium from the upper level, via stairs on the west side or directly from ground level on the east side. A sizable addition has been constructed to north end to act as an entry and provide visitor centre facilities. This addition is constructed at an angle to the original building and provides a more substantial lobby and cafeteria space. The addition has a contemporary style and allows the form of the original building to continue to be interpreted. It was designed by Daryl Jackson Alastair Swayn Architects.

Internally, the stadium has a relatively steep perimeter seating arrangement that was designed for optimum sight lines and is accessed from the upper concourse that extends around all four sides. This concourse provides the main circulation route and incorporates food and beverage outlets as well as toilets.

The stepped concrete structure on which the seating is installed extends around all four sides of the playing surface and can accommodate 5,200 spectators. Retractable seating is provided at the lower level, providing a more flexible venue (this is a replacement of the original). Under the seating at floor level are change rooms, a function room to the north, as well as plant and storage areas. The playing area is primarily based on a basketball court, though allows for many sporting activities as well as concerts and functions.

The lightweight roof structure is by its very nature minimalist, with the three large bracing trusses being the more dominant structural form internally. The non-structural, truss-framed service gantry spans the width of the space with tracks located along the concourse. This is used to access roof services and was an integral part of the original construction process. The soffits of the precast panel roof are lined with rippled metal sheet panels.

The sculpture to the western forecourt 'The Gymnast' is by John Robinson.^{xix}

CONDITION

Both buildings are maintained and actively used. Progressive upgrades have been undertaken since their construction and future upgrades will be required to support their ongoing use.

GIO Stadium is now a higher capacity facility when compared with the original National Athletics Stadium. The structural design of the original grandstand remains intact, albeit changes have been made to the original concrete base, including replacement of the lower seating with new structures to accommodate corporate boxes and other facilities.

Whilst upgrade works have been undertaken to the AIS Arena, such as new mechanical systems, amenities upgrades and the construction of a substantial entry addition, key features of the building including its structural system and external elevations remain substantially intact.

VALUES WHICH MEET ACT HERITAGE ACT 2004 CRITERIA

a) *Importance to the course or pattern of the ACT's cultural or natural history;*

The original parts of GIO Stadium and the AIS Arena are historically significant to both the ACT and Australia. Together the two buildings formed the earliest facilities to be utilised by the national Australian Institute of Sport (AIS). The AIS became the most important factor in the resurgence of Australian sport on the world stage following a decline during the late 1970s.

Both facilities were developed for the National Capital Development Commission and were key facilities in the establishment of the Nation's premier sporting institution. The National Athletics Stadium (now part of GIO Stadium) was constructed as the venue to hold the 1977 Pacific Conference Games in Canberra prior to the establishment of the Australian Institute of Sport. Once the AIS was formed, it was then specifically used as the track and field, and soccer training facility for the elite of Australia's athletes. It is currently the home ground for two of the ACT's football codes (Rugby League and Rugby Union).

The AIS Arena, whilst constructed after the stadium, was constructed as the AIS's first purpose-built facility and its premier indoor facility. It is still used for national sporting events.

The GIO Stadium and AIS Arena Precinct meet this criterion.

b) *Has uncommon, rare or endangered aspects of the ACT's cultural or natural history;*

Structuralist style buildings were most commonly large public buildings that required substantial column free spaces, including sporting facilities such as stadiums. Whilst there are other buildings of this style in the ACT, the precinct is the only one in Australia which includes two related buildings with differing tensile suspension systems. These are the GIO Stadium's west grandstand with its roof hung from steel cables and the AIS Arena with its roof supported on long span cables.

The GIO Stadium and AIS Arena Precinct meet this criterion.

c) *Potential to yield important information that will contribute to an understanding of the ACT's cultural or natural history;*

Whilst the design of GIO Stadium and the AIS Arena provide a valuable educational resource for designers, this information could also be yielded from other sources.

d) *Importance in demonstrating the principal characteristics of a class of cultural or natural places or objects;*

The original part of GIO Stadium and the AIS Arena are excellent examples of the Late Twentieth-Century Structuralist Style in Australia and were designed by Philip Cox with Bond James Laron Murtagh. Philip Cox was a key proponent of the style and both buildings are notable examples of his design work. The buildings exhibit key architectural elements of the style with their compression masts and cable stays, together with the reinforced concrete supporting structure and cantilevered concrete beams to the stadium, and the triangular steel supports to the roof of the arena.

Together, the two buildings exhibit the two main tensile suspension systems, the original stadium grandstand with its roof hung from steel cables and the arena with its roof supported on long span cables. Examples of this style are becoming rarer as public facilities (convention centres, stadiums) are demolished to allow for the construction of contemporary structures for the same use. The AIS Arena has a strong architectural expression, due to the catenary roof, supported by a cable system strung from dominant steel masts.

The original buildings and their relationship to the landscape, the masonry forms and contrasting lightweight materials (such as glazing to the arena) are important to both the buildings and precinct as a whole. Whilst alterations and upgrades have been undertaken to both buildings, their main elements are substantially intact.

The GIO Stadium and AIS Arena Precinct meet this criterion.

e) Important in exhibiting particular aesthetic characteristics valued by the ACT community or a cultural group in the ACT;

It is not known if there are particular aesthetic characteristics valued by the ACT community or a cultural group.

f) Importance in demonstrating a high degree of creative or technical achievement for a particular period;

The GIO Stadium and AIS Arenan are significant for their technically complex structural systems. Both structures feature slender roofs supported on suspension structures consisting primarily of steel cables and prominent tapered steel masts.

The original, boldly designed grandstand (western grandstand) of GIO Stadium has a roof supported by a lightweight tensile suspension structure that projects over the tiered concrete base. The structural system of pre-stressed, high-tensile steel cables was chosen to both minimise the use of materials as well as to make an architectural statement.

The AIS Arena has a centenary roof, supported by a 100 metre long tensile cable systems strung from tapered steel masts. The centenary form of the roof is clearly evident at the north and south ends of the building. The structural system devised allowed the roof to be constructed prior to, or at the same time, as the construction of the base building. The steel truss gantry, aided by the use of outriggers, enabled the roof to be constructed independently of any walls.

The GIO Stadium and AIS Arena Precinct meet this criterion.

g) Has a strong or special association with the ACT community, or a cultural group in the ACT for social, cultural or spiritual reasons;

It is not known if the place has a strong or special association with the ACT community or a cultural group in the ACT.

h) Has a special association with the life or work of a person, or people, important to the history of the ACT.

Philip Cox played a significant role in Australia's cultural history and is widely recognised as a significant architect in Australia. He is one of Australia's important architects of the late twentieth century and was awarded the RAIA Gold Medal in 1984 as well as a member of the Order of Australia in 1988.

Both the stadium and the arena were important buildings in his career in terms of their early date, size, prestige and because they express clearly the principles on which his architecture is based. Both buildings demonstrate Cox's belief that there is no division between architecture and structural engineering. Amongst the many buildings designed by Cox in the ACT, the facilities at the AIS arguably have the strongest association with Cox.

The GIO Stadium and AIS Arena Precinct meet this criterion.

REFERENCES

ⁱ *Australian Architects, Philip Cox*, RAIA 1984

ⁱⁱ Taylor, *op. cit.*

ⁱⁱⁱ John A Daly, *Quest for excellence: the Australian Institute of Sport in Canberra*, Australian Government Publishing Service, 1991

^{iv} *Ibid*

^v *Ibid*

^{vi} *Ibid*. Clearly the design for the Indoor Stadium was begun some time before the announcement to locate the AIS in Canberra. Ken Murtagh notes that the a decision to commence the project was made in December 1979 to make the facility available for an international tennis tournament in 14 months time.

^{vii} Analysis and Design of Long Span Singly-Curved Cable Roof, KA Bond and R Hough in *Civil Engineering Transactions*, 1983, pp13-20

^{viii} A fit for purpose Australian Institute of Sport: An independent review, January 2020⁴

^{ix} Reyner Banham. *Theory and Design in the First Machine Age*. The Architectural Press, London, 1977.

^x ACT Heritage Register entry, Callam Offices, 22 August 2008

^{xi} *Australian Architects, Philip Cox, op. cit.*

^{xii} Graham Jahn, *Sydney Architecture*, The Watermark Press, Sydney, 1977

^{xiii} *Australian Architects, Philip Cox, op. cit.*

^{xiv} *Canberra: An Architectural Guide to Australia's Capital, op. cit.*

^{xv} Richard Apperly, Robert Urvig, Peter Reynolds, *Identifying Australian Architecture Styles and Terms from 1788 to the Present*, Angus & Robertson, 1989

^{xvi} Jennifer Taylor, *Australian Architecture Since 1960*, RAI 1990. *Canberra: An Architectural Guide to Australia's Capital*, RAI 1982

^{xvii} Taylor, *op. cit.*

^{xviii} *Ibid.*

^{xix} *Canberra: An Architectural Guide to Australia's Capital, op. cit.*