REGISTER OF HERITAGE PLACES - ASSESSMENT DOCUMENTATION

11. ASSESSMENT OF CULTURAL HERITAGE SIGNIFICANCE

The criteria adopted by the Heritage Council in November 1996 have been used to determine the cultural heritage significance of the place.

The documentation for this place is based on the heritage assessment completed by Wayne Moredount, Historian, and Palassis Architects, in January 2004, with amendments and/or additions by HCWA staff and the Register Committee.

PRINCIPAL AUSTRALIAN HISTORIC THEME(S)

- 8.10.5 Advancing knowledge in science and technology
- 4.3 Developing institutions

HERITAGE COUNCIL OF WESTERN AUSTRALIA THEME(S)

- 402 Education and science
- 408 Institutions

11. 1 AESTHETIC VALUE*

The Administration Building of *Perth Observatory* is a well-resolved example of the Late Twentieth-Century International style, exhibiting a distinct cubiform shape raised on a plinth, clad with local stone, and complemented by contrasting wall textures, large areas of glazing, and external metal sunshades. (Criterion 1.1)

Situated amongst thirty acres of State Forest, the landscape design of *Perth Observatory* achieves a sympathetic transition between the natural bushland and the formal setting of the Administration Building, integrating a

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* For consistency, all references to architectural style are taken from Apperly, R., Irving, R., Reynolds, P. *A Pictorial Guide to Identifying Australian Architecture. Styles and Terms from 1788 to the Present,* Angus and Roberston, North Ryde, 1989.
For consistency, all references to garden and landscape types and styles are taken from Ramsay, J. *Parks, Gardens and Special Trees: A Classification and Assessment Method for the Register of the National Estate,* Australian Government Publishing Service, Canberra, 1991, with additional reference to Richards, O. *Theoretical Framework for Designed Landscapes in WA,* unpublished report, 1997.

range of introduced exotics, formal garden beds and expanses of lawn with informal serpentine paths and a re-generated bush garden. (Criterion 1.1)

11. 2. HISTORIC VALUE

Perth Observatory is the continuation Western Australia's earliest observatory, established in West Perth in the late 19th century to foster and enhance the intellectual and cultural life of the Western Australian community. (Criterion 2.2)

As an institution, *Perth Observatory* is Australia's oldest continuously operating observatory and has continued its tradition of internationally significant astronomical research co-operation. (Criterion 2.2)

The survival of *Perth Observatory* as an institution, in the face of questions of viability raised throughout its history by the State Government and attempts to curtail its activity, has demonstrated strong community support for State sponsorship of intellectually and culturally enriching activities and institutions. (Criterion 2.2)

Parts of the collection of scientific and technical apparatus and equipment held by *Perth Observatory* have considerable historical significance as they demonstrate advances in technology from the late nineteenth century to the present (2005). (Criterion 2.4)

11. 3. SCIENTIFIC VALUE

Perth Observatory has very high scientific value, being one of the most significant scientific research and educational institutions in the State, and has a continuing role in international astronomical research. (Criterion 3.1)

The scientific significance of *Perth Observatory* is enhanced by ongoing efforts to educate, inform and enlighten the public through a variety of observational programmes, including community outreach activities. (Criterion 3.1)

Perth Observatory is significant in representing scientific and technical achievement in Western Australia, demonstrated particularly in its collection of highly sophisticated scientific equipment, some of which is also of scientific-historical importance. (Criterion 3.3)

11. 4. SOCIAL VALUE

Perth Observatory is highly valued by the Western Australian community for embodying scientific excellence, and for its use as an educational facility, as demonstrated by the popularity of its regular public tours. (Criterion 4.1)

12. DEGREE OF SIGNIFICANCE

12. 1. RARITY

Perth Observatory is Australia's oldest continuously operating observatory, having relocated in 1966 from its original site in West Perth. (Criterion 5.1)

Perth Observatory is the sole remaining State astronomical observatory still functioning in Australia. (Criterion 5.1)

Perth Observatory is a rare example of Late Twentieth Century International style building functioning as an observatory. (Criterion 5.1)

12. 2 REPRESENTATIVENESS

Perth Observatory is representative of the Late Twentieth Century International style of architecture. (Criterion 6.1)

12. 3 CONDITION

Perth Observatory is in good condition and has been well maintained. Renovations and maintenance to the place have generally been sympathetic to the original design intent.

12. 4 INTEGRITY

Perth Observatory has a high degree of integrity. Since its construction in 1964 the place has continued to be used for a range of observatory functions. The purpose-built dome buildings, constructed to house specific equipment, have continued to be used for their original purpose, while the main Administration Building continues to be used as an administrative centre and visitor reception area.

12. 5 AUTHENTICITY

Perth Observatory has a high degree of authenticity. Changes to the place have been limited to construction of the new telescope buildings throughout the grounds including the 24" Reflector Building in 1971, the Celestron Building in 1980, the Visitor's Observing Facility in 1992 and the Millennium Telescope Building in 2000. The Astrographic Building was constructed c1964 using the telescope and dome from the Old Observatory in West Perth. Changes to the fabric of the original observatory buildings have been minimal.

13. SUPPORTING EVIDENCE

The documentary evidence has been compiled by Wayne Moredoundt, Historian. The physical evidence has been compiled by Palassis Architects.

13. 1 DOCUMENTARY EVIDENCE

Perth Observatory comprises a complex of Late Twentieth Century International style buildings constructed to accommodate the equipment and functions of the former Observatory (1896) in West Perth, and includes the Administration Building (1964), the Transit/Meridian Building (1964), the Astrographic Building (1964-66), the University Dome Building (1964), the Pump House and Water Storage Tank (1965), the Caretaker's Residence (1965), the 24" Reflector Building (1971, 1982), the Celestron Building (1980), the Visitor's Observing Facility (1992), the Millennium Telescope Building (2000), and secondary facilities, the Transformer Room (1964) and Public Toilet Block (1991).

A proposal for an observatory for Perth was first introduced to the State Parliament by Premier John Forrest in 1891, but failed to obtain financial backing.[1] He persisted with the scheme, however, and funding was finally approved in 1895, along with funds for a museum and a mint.[2] Forrest sought advice from the Government Astronomer of South Australia, Sir Charles Todd, who responded with specifications for instruments and plans for buildings, based on the Adelaide Observatory. He also recommended his own Assistant Astronomer, Mr. W.E. Cooke, for the position of Government Astronomer and Meteorologist to the Perth Observatory.[3]

Early in 1896, Todd arrived in Perth to assist with selection of the best site. At the suggestion of the Government, the site of the High School playground (Reserve 2051) on Mt Eliza above the Barracks, was studied and found sufficient for the purpose. It was described in the press as: '... certainly a commanding one ... and the institution would in a short time be a conspicuous and ornamental landmark, as well as of high interest and utility'.[4]

The site was considered ideal for the location of an observatory, for both meteorological and astronomical work. The exposure to the prevailing winds, the distance from the city and the protection afforded by the large area of undeveloped bush land to the south and west (Kings Park) ensured clear skies and uninterrupted views for astronomical observations and the openness of the site allowed for consistent weather recordings. The view from the site was also magnificent and in its turn, the main building became a landmark crowning the skyline above the city. As Cooke later pointed out, this was something of a mixed blessing:

> It is in some respects unfortunate that the site is such a remarkably fine one,

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1 *Parliamentary Debates (WA)*, 1891-1892, new series, pp. 388, 450, 609-611.

2 *Western Australian Parliament, Votes and Proceedings*, 1894-1895.

3 *West Australian*, 7, 11 January 1896.

4 *West Australian*, 7, 11 January 1896.

because it causes covetous eyes to be frequently turned in its direction.[5]

During Todd's visit, the press had asked him to explain the principal benefits of a "strictly practical kind" that might be expected from the establishment of the Observatory. In reply he stated that:

> First of all you will have absolutely correct time, which will be indicated daily at a certain hour by the dropping of a time-ball. Then ships will be able to correct their chronometers. Again, meteorological observations from stations all over the colony and from the other colonies will be transmitted to the observatory, and the astronomer will from these data be able to issue weather forecasts. These are some of the practical advantages which will result from the establishment of such an institution, and, of course, there are innumerable minor benefits. Scientifically its value will be very great … An observatory is really an educational institution of the greatest importance, and although you are picking up gold and silver at present, and naturally give great attention to everything which appertains to the practical side of life, scientific considerations should not be neglected.[6]

In February 1896, William Ernest Cooke arrived in Perth to take up his appointment as the first Government Astronomer. He began his new post at temporary quarters in the Legislative Council building and started upgrading the meteorological system initiated in 1867.[7]

Meanwhile, plans for the Observatory buildings were being prepared while the site was being surveyed by the officers of the Colonial Architect's Department. The contract for the main building was let on 2 July 1896 for £6,622.19s, with a completion date of 3 March 1897. The foundation stone was subsequently laid on 29 September 1896.[8] By the time the building was completed at the end of 1897, it had cost over seven thousand pounds. In keeping with the intended use of the building, the Government Astronomer, W.E. Cooke, had prepared a design for the foundation stone that indicated the positions of the various planets in the zodiacal constellations at the time the stone was to be laid.[9] In addition, a lead casket was built into the wall behind the stone. (The foundation stone and casket were later removed from the Government Astronomer's Residence and Offices and taken to the new *Perth Observatory* when it was relocated to Bickley in the 1960s).[10]

The ceremony was celebrated as a grand civic occasion. Clearly, it was an achievement that many of the officers of the Public Works Department had contributed to and were proud of.[11] The many speeches given during the ceremony, and reported in the press, emphasized the evidence of 'progress' in the colony. According to Sir John Forrest, the building of a museum, and an observatory:

> ... showed that in the time of our prosperity we were trying to elevate and improve the public mind and to do something for the encouragement of the arts and sciences in this colony ... It was very gratifying that the Parliament of this country had been

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5 CSO File # 996/23, vol. 1, p. 560, BL Acc 752.

6 *West Australian*, 7, 11 January 1896.

7 *West Australian*, 6 February 1896.

8 *Western Australian Parliament, Votes and Proceedings*, PWD Annual Report, 1896-1897.

9 *West Australian*, 30 March 1896.

10 Oline Richards, 'Conservation Study for the Old Observatory, West Perth', prepared for the National Trust of Australia (WA), August 1991, pp. 27-28.

11 I.H. van Bremen, 'The Old Observatory Building, West Perth: Conservation Report', p. 7.

> willing to found this Observatory. It would remain for all time an evidence of a liberal-minded and enlightened people, who, while doing all that was necessary to foster the material requirements of the colony, at the same time were anxious to promote and encourage intellectual pursuits ... He thought ... Western Australians might be proud they were doing something to enlighten their people and to join hands with the scientists all over the world.[12]

By January 1897, Cooke realized that his hopes of soon getting into the main Observatory building were clearly unrealistic. The building was finally completed on 6 October 1897, some 7 months later than the contract completion date.[13] The contract for the construction of the Instrument Buildings had been let to John Shunn for 2,772 pounds, to be completed by 17th December 1897.[14] As with the earlier construction, progress on the Instrument Buildings was slow. Much depended on the arrival of the special instruments and prefabricated parts of the buildings from England. While designs for the separate Instrument Buildings had been prepared by the P.W.D. early in 1897, revisions were still being made in October 1897.[15] The press reported the return of Cooke from abroad in November 1897 and the arrival of instruments from England in December 1897.[16]

The instrument building which housed the astrograph or equatorial telescope, was a two-storey brick building, with a basement and flat concrete roof. The steel revolving dome, which surmounted the building, was also prefabricated by the instrument maker and brought to Perth with the telescopes and an experienced mechanic to install them. The first seismograph was installed in the basement of this building and from the 1920s on, the roof was used by the Weather Bureau for upper air readings. The dome and telescope were dismantled in 1963 when the building was demolished and were subsequently re-erected at the observatory at Bickley. After a century, they are still in use, with only minor adjustments made to maintain their functionality.[17]

In the first decade of the Observatory's operation, under the direction of Cooke, it achieved the principal objectives outlined by Forrest and Todd at its inception: keeping accurate time, recording and forecasting weather, and carrying out astronomical research. In regard to the first objective; Cooke developed a time service that linked the Observatory electrically to a State-wide network, providing regular time signals to shipping at Fremantle, the State railways, the post office telegraph system, and controlled public clocks in Fremantle and Perth. In 1899, a public clock was placed at the entrance gates to the grounds on Malcolm Street and, in 1901-02, a time gun (cannon) was set up on the eastern slope of the site, facing the city, and fired daily for a 1pm time signal. In addition, in 1910 Cooke published a design for a sundial for use in isolated rural areas and had one erected in

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12 *West Australian*, 29 September 1896.

13 *West Australian*, 6 October 1897.

14 *Western Australian Parliament, Votes and Proceedings*, PWD Reports, 1895-1902.

15 PROWA, PWD 5201.

16 *West Australian*, 6 November, 13 December, 1897.

17 Richards, 'Conservation Study', p. 29.

the Observatory grounds.[18]

Weather recordings were collated and published as annual Meteorological Reports in the Votes and Proceedings of Parliament. They started in 1897 from the fenced enclosure on the site, later added to by the anemometer on the tower, and were collected from recording stations around the State. Weather forecasts were also displayed in prominent places in the city and published in the press. A pair of thermometers was also added to the public clock at the entrance gates in 1900.[19]

Also in 1900, the Perth Observatory was invited to contribute to the International Star Cataloguing and Mapping Program, along with 17 other observatories, including those in Sydney and Melbourne. Under Cooke's direction, the Observatory made a notable contribution to this enterprise. Furthermore, Cooke's improvements on the methods already in use for this program gained international recognition. Later on, in 1907, a Catalogue of 420 Standard Stars was published by the Perth Observatory.[20]

In addition to these three achievements, the Observatory contributed to the knowledge and welfare of the State in a number of ways. In these years, it was closely associated with the co-ordination of the surveys and the mapping of the State. Cooke established exact latitude and longitude for the Observatory in 1899 and then at the request of the Surveyor General, for the main trig stations of the State system. He developed a new method of calculating latitude and longitude using the standard surveying theodolite and earned acclaim for the innovation. In November 1900, the centre of the Transit Circle mounting at the Observatory was connected to the State triangulation system and, in 1901, was adopted as the origin of Western Australian Surveys. Cooke also served the surveying profession by conducting classes in astronomy for cadet surveyors. Registration examinations were conducted on the site and surveyors used the standard five chain pillars near the Dome building for the regular calibration of their survey chains.[21]

Seismological readings were recorded on a Milne's Seismograph placed in the basement of the Dome building from 1899. As one of a very few such recording stations in Australia and the southern hemisphere, these records had particular significance for geophysical studies. The Observatory also provided tide tables for the north-west ports, and astronomical information, including tables of sunrise and sunset, for the general public, the press and for business. In 1902, at the request of the Colonial Government of Ceylon, a complete set of drawings of the Observatory was prepared and sent to Colombo.[22]

From its establishment, the Observatory was a place of interest to the general public. Some people were attracted by the views to be had from the verandahs or the tower, while others came to view the heavens. Public

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18 van Bremen, 'Old Observatory', p. 13.

19 van Bremen, 'Old Observatory', p. 13.

20 van Bremen, 'Old Observatory', p. 13.

21 van Bremen, 'Old Observatory', p. 13.

22 van Bremen, 'Old Observatory', pp. 13-14.

lectures in astronomy were also provided in the evening. By 1912, the visitors' evenings were so popular that a new 12 inch reflector telescope was purchased to meet the demand. This device was erected near the main entrance, off Havelock Street, and a series of regular bi-weekly receptions was instituted.[23]

In 1912, Cooke left Western Australia to take up an appointment with the Sydney Observatory. His position was not officially filled until 1920, when H.B. Curlewis was promoted to Government Astronomer. This long delay reflected the State Government's lack of support for the Institution, having already applied to the Commonwealth to take it over in 1902. While the Commonwealth did take over the meteorological work in 1908, the new Bureau had offices located in the city, with the instruments remaining at the Observatory. Because of the unsatisfactory nature of this arrangement, the Commonwealth negotiated with the State Government to acquire a site at the Observatory, on which to build its own offices and quarters. The State Government threatened to discontinue the Observatory as from December 1912, and suggested once again that the Commonwealth take it over. After strong protests against its closure were expressed by astronomers from England, and elsewhere, the Observatory was able to continue operations, pending continuing negotiations with the Commonwealth.[24]

The matter of who should ultimately control the Observatory was only decided in 1928, when the State Government, after much indecisiveness, decided to retain it. Always, in the dealings with the Commonwealth, there was a public outcry over the threat of losing the site. The records suggest that this proprietary attachment and strong anti-Federal sentiment, was the determining factor in the State Government's decision not to transfer the observatory to the Commonwealth at this time.[25]

During these later years of negotiation, the Commonwealth had proposed that the Observatory be upgraded to become a top-class scientific institution. However, this change in focus would have entailed severely restricting public access to the place. This was unacceptable to the State Government, who continued to see the place as a unique and well-loved public park.[26] In fact, public interest in the Observatory was even greater than in the early years of its operation. Curlewis, the Government Astronomer, wrote in 1929:

> The Observatory has gradually become an educative factor in the life of the State, for notes on astronomical and seismological matters appear regularly in the Press, and answers to all kinds of scientific questions are being continually posted to correspondents. To provide instruction of an interesting character, the institution is open for inspection almost everyday: and in the evening, by application only, when the moon and other celestial objects may be viewed through the big telescope. Two and three evenings a week are given up in this way, and the number of people that avail themselves of the privilege amount to over 2,000 per year.[27]

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23 van Bremen, 'Old Observatory', p. 14.

24 van Bremen, 'Old Observatory', pp. 14-15.

25 van Bremen, 'Old Observatory', p. 15.

26 van Bremen, 'Old Observatory', p. 15.

27 H.B. Curlewis, 'The Perth Observatory', *Civil Service Journal*, 20 July 1929, pp. 73-74.

In terms of its public importance, the Observatory was still the State's foremost time-keeper. Although the telephone system and radio broadcasting now contributed to the system, instructions for making Cooke's special sun-dials were still being issued for isolated areas. In addition, seismological recordings, astronomical research, and tidal calculations continued.[28] Furthermore, from 1930 to 1967 the Office of the Commonwealth Weather Bureau was officially stationed at *Perth Observatory*.[29]

During the Second World War, the Weather Bureau came under the control of the Royal Australian Air Force and meteorological officers became R.A.A.F. personnel. By 1941, the Government Astronomer's Residence and Offices housed the State Government Astronomer, H.S. Spigyl (1941-1962), and his staff, the Commonwealth Weather Bureau, State Government Botanist and staff, and the Commonwealth Radio Inspector and staff. At the end of the War, the Weather Bureau was returned to civilian control. By this time, accommodation was inadequate and the buildings run down.[30]

The Stephenson-Hepburn Plan for Metropolitan Perth was also released in 1955, identifying the Observatory site as a place where all State government offices could be located, close to Parliament House. In 1961, a national architectural competition was held for the design of government offices on the site. The winning design proposed the redevelopment of the entire site, including demolition of the Observatory buildings, major earthworks and the construction of five tower blocks.[31]

The Government Astronomer at the time expressed opposition to the proposal to move the observatory. However, it was not long before environmental conditions also dictated the need to relocate the observatory away from the interference of city lights and urban pollution. The plans for new government offices on the Observatory site went ahead, and construction of the first of the new office towers, Dumas House, was begun in 1963. The Instrument buildings were demolished at this time and the landscape of the western section of the site was radically altered to suit the new office tower and its car park.[32] The opening of Dumas House in 1966, marked the end of the Perth Observatory's long association with the site. The meteorological, seismographic and astronomical functions that had previously been conducted there were transferred to other locations. The Commonwealth Bureau of Meteorology moved its operations to Wellington Street, East Perth; seismographic recording was taken over by the Commonwealth Geophysical Observatory at Mundaring and the Perth Observatory was relocated to Bickley in the Darling Ranges.[33]

With the demolition of the Transit Circle building, the survey pillar was replaced by a new standard survey plaque on the 14th Floor of Dumas

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28 Curlewis, 'The Perth Observatory', pp. 73-74.

29 van Bremen, 'Old Observatory', p. 16.

30 van Bremen, 'Old Observatory', pp. 16-17.

31 van Bremen, 'Old Observatory', p. 17.

32 van Bremen, 'Old Observatory', p. 18.

33 Richards, 'Conservation Study', p. 31.

House. In any case, in 1966 the National Geodetic Survey was completed and Mt Gunjin became the origin point in Western Australia. The datum of the Transit Circle was then the co-ordinating point between the original State survey system and the new national system.[34]

The Government Astronomer's Residence and Offices, that remained after the rest of the site was initially cleared, was also to be demolished to allow more office towers to be built. However, these plans were not carried out, and the former Government Astronomer's Residence and Offices continued in use as offices for the Public Works Department until 1984.[35]

In May 1984, the former Government Astronomer's Residence and Offices was vested by the Government of Western Australia in the National Trust of Australia (WA) for use as its new headquarters. The keys to the building were formally handed over to the Trust on 12th December 1985. During the brief ceremony held to mark the occasion, the Minister for the Arts, the Hon. R. Davies, described the early days of the Observatory and emphasized its familiarity to the people of Perth.[36]

The Trust moved into the renovated building in April 1986. The vesting of the property was gazetted in April 1987 and a new "C" Class Reserve (No. 39892) of 0.67 hectares was created immediately around the building, a small portion of the original Observatory grounds.[37] The Trust headquarters, in the old Observatory, was officially opened on the 29th October 1988 by the Governor of Western Australia, Professor Gordon Reid.[38]

Plans for the new Perth Observatory in Bickley in the Darling Ranges were prepared by the Public Works Department of Western Australia between 1962 and 1966.[39] The buildings were to be located on one of the higher parts of the Darling Ranges at approximately 380 metres above sea level, and would be free of much of the light 'pollution' that caused increasing difficulties at the West Perth site.[40] The site, which is largely rectangular, running in a north south direction, was located due east of the Bickley town site. A triangular section of the site extends westwards in the south west corner and Walnut Road was to be extended in a south east direction, approximately 350 metres, to this corner of the site.[41]

The new building works comprised a New Observatory Building (now called the Administration Building), a Caretaker's Cottage (Caretaker's Residence), the Transformer Room, the Reflector Dome Building (University

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34 van Bremen, 'Old Observatory', p. 18.

35 van Bremen, 'Old Observatory', p. 18.

36 van Bremen, 'Old Observatory', p. 19.

37 'Trust Gets Key to the Door', *Trust News*, February 1986.

38 'The Old Observatory Officially Opened', *Trust News*, December 1988.

39 Copies of the PWDWA plans for the Perth Observatory at Bickley are held at the Perth Observatory.

40 Bickley New Observatory, Extent of Preliminary Work, Location Plan, PWDWA, Dwg No.1, March 1964.

41 Bickley New Observatory, Extent of Preliminary Work, Plan showing New Road to Site, PWDWA, Dwg No.1, March 1964.

Dome Building), the Perth Transit Building (Transit/Meridian Building), the Astrographic Building and Storage Tank.[42]

Design of the Administration Building and the three telescope buildings was guided by the aim of producing high quality scientific work. Construction began in mid-1964 and great care was taken to ensure that the telescopes had steady mountings. Excavations were carried out by drilling (rather then blasting) and the base of the Transit Circle telescope was built with aged bricks (salvaged from the demolished wall at the Claremont Mental Hospital) to minimise the likelihood of movement. Similar precautions were undertaken in the Administration Building to ensure that sensitive measuring equipment was specially screened.[43]

During 1964-66, the Administration Building,[44] the University Dome Building,[45] and the Transit/Meridian Building[46] were built, while the following year, the Caretaker's Residence,[47] and the Storage Tank and Pump House[48] were constructed. In addition the Astrographic Building[49] was constructed, using the telescope and dome from the Old Observatory in West Perth.

The new *Perth Observatory*, built at a cost of $600,000, was opened by the Premier, David Brand, on Friday 30 September 1966,[50] 70 years and one day after the original Observatory was opened by Sir John Forrest.[51]

In 1967, a group of astronomers from the Hamburg Observatory (Germany) set up their telescope in the Transit Circle Building to carry out an intensive four year programme of observations. Between 1972 and 1976, the Perth Observatory staff continued to work with the Hamburg telescope and equipment with an emphasis on increasing the recorded number and improving the positions of the Fundamental Stars in the Southern Hemisphere by observing some 75,000 star passages across the meridian.[52]

In 1971, the Lowell 61-cm reflector telescope was installed as part of the International Planetary Patrol Program, a project sponsored by NASA to obtain regular photographic surveillance of the planets. Similar telescopes were set up at six other stations around the globe, all well separated in longitude. In order to house the telescope, the Lowell Dome (the 24"

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42 Bickley New Observatory, Extent of Preliminary Work, Site Layout, PWDWA, Dwg No.1, March 1964

43 'Perth Observatory',1968.

44 Bickley New Observatory, Administration Building, PWDWA, Dwg No.2, September 1964.

45 Bickley New Observatory, Reflector Dome, PWDWA, Dwg No.1, May 1966.

46 Bickley New Observatory, Transit/Meridian Building, PWDWA, Dwg No.3, June 1964.

47 Bickley New Observatory, Caretakers Residence, PWDWA, Dwg No.1, May 1965.

48 Bickley New Observatory, Pump House, PWDWA, Dwg No.1, December 1965.

49 Bickley New Observatory, Astrographic Dome, PWDWA, Dwg No.4, April 1964.

50 'Perth Observatory',1968. A foundation stone dated 30th September 1966 is located on the southwest elevation of the Perth Observatory Administration Building at Bickley.

51 *West Australian*, 1 October 1966, p. 9.

52 *Perth Observatory*, 1976, not paginated.

Reflector Building) was constructed in 1971[53] (with alterations in 1982[54]). The Program concentrated on Jupiter and Mars, but occasionally Venus, Mercury and Saturn were observed. In 1974, observations were scaled down to only the three most successful stations, of which Perth was one. In 1976, the International Planetary Patrol was suspended, to be replaced by space probe technology.[55]

In 1977, *Perth Observatory* hosted Dr Mills from Lowell Observatory in Arizona, who had come to Perth to study the occultation of the star SAO158687 by Uranus. As Uranus approached the star, astronomers used the Perth-Lowell telescope to monitor the intensity of the starlight through a special filter. Other observations were made from space and from the Indian Ocean Rim (the only area where this phenomena was visible) in India and South Africa. These observations led to the conclusion that a series of rings existed around Uranus.[56]

In 1980, the Celestron Building was constructed to house the 35-cm Schmidt-Cassegrain Celestron telescope which was to be used mainly for public viewing.[57] In 1986, Perth Observatory played a vital role in astronomical studies of the Comet Halley apparition. The comet approached the Earth from the north, went behind the Sun, and then reappeared in the southern skies, where it was inaccessible to northern observatories. The Observatory location in the Darling Range was, however, an ideal point to study the comet. Positions of the comet taken with the Astrographic telescope were used to fine tune the positions of the flotilla of spacecraft heading for the comet. Indeed, 10% of all Earth-based positions of Comet Halley were taken from Perth. Astronomers from the United States used Perth telescopes to study the physics of the comet. The newly-published rotation period of the comet was confirmed from images taken from the Perth-Lowell 61-cm reflector, as Astronomers utilized a long period of fine weather to study the comet intensively.[58]

In 1987, the future of *Perth Observatory* was thrown into doubt when the Minister for Works and Services, Peter Dowding, asked the Bickley astronomers to 'justify' their research projects and their annual budget of $750,000. According to Dowding:

> WA was the only State that had an observatory and it was the only State which funded astronomical research. The research was particularly obscure and of no direct benefit to the State's functions … The observatory was, in some ways, a relic of a time when WA was running its own affairs.[59]

Although the points raised by Dowding would seem, to many people, sound reasons for maintaining support for *Perth Observatory*, to the Minister's mind, they constituted arguments for dismantling 91 years of world-class

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53 Bickley New Observatory, Lowell Dome, PWDWA, Dwgs Nos.A7 and A8, September/October 1970.

54 Bickley New Observatory, Lowell Dome, PWDWA, Dwgs Nos. A1 and A2, March 1982.

55 *Perth Observatory*, 1976, not paginated.

56 *Perth Observatory Centenary, 1896-1996*, 1996, not paginated.

57 Bickley New Observatory, Celestron Dome, PWDWA, Dwgs Nos. A1 and A2, February 1980.

58 *Perth Observatory Centenary, 1896-1996*, 1996, not paginated.

59 *West Australian*, 19 May 1987, p. 2.

scientific research. As had been the case with earlier attempts to withdraw funding from the Observatory, support for its work flooded in from local and interstate scientists. For example, the CSIRO's Dr Whiteoak drew attention to the likelihood of *Perth Observatory* playing an important part in a national radio telescope project to be developed the following year, while the chairman of the WA branch of the Australian Institute of Physics wrote to the Deputy Premier, Mr Bryce, pointing out the Observatory's high value to the State.[60]

To better inform the public about the valuable work that it carried out, in the late 1980s the staff of *Perth Observatory* decided to provide night visitor's tours using Observatory telescopes. Within a short time, this program battled to meet public demand. In addition, school groups and special interest groups were catered for during the day time of full moon weeks.[61]

In the 1990s, the Lowell telescope was equipped with a special camera and automated, so that its tracking of targets and camera operation was fully computer-controlled. This work was undertaken by the Perth Astronomical Research Group, which included Observatory staff, and academics from Curtin and Murdoch Universities, and the University of Western Australia. The first project using the new system involved a search for supernovae (the catastrophic explosions of massive stars at the end of their normal life). As of 1996, six Supernovae had been discovered. It was only the second automated search in the world to have found a supernova.[62]

Further building works were undertaken in the early 1990s with the construction of the Public Toilets[63] in 1991 and a Visitor's Observing Facility [64] in 1992. When established, this latter building housed a 28-cm Celestron and two Meade 20-cm LX5 telescopes. These complemented the 35-cm Schmidt-Cassegrain Celestron telescope, housed in the Celestron Building, which was also used for visitor's tours and student projects alike.[65]

It was also during this period that a museum area was established in the Administration Building to inform visitors about the history of the Observatory and to educate them in the science of astronomy. On display are instruments and artifacts from the Old Perth Observatory, astro-photographs, paintings, meteorites from the WA Museum collection, and the contents of the time capsule donated at the Observatory's founding in 1896.[66]

On 26 January 1996 *Perth Observatory* became part of the Department of Conservation and Land Management (CALM). Within CALM's Science and Information Division, the Observatory benefited from an infrastructure that

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60 *West Australian*, 21 May 1987, p. 38.

61 *Perth Observatory*, 1996, not paginated.

62 James Biggs, 'One Hundred Years of Stargazing', *Landscope Magazine*, Winter 1996.

63 Bickley New Observatory, Public Toilet Block, PWDWA, Dwgs No. Sk 1, October 1991.

64 Bickley New Observatory, Visitor's Observational Facility, PWDWA, Dwgs Nos. OB 1 and OB 2, June 1992.

65 *Perth Observatory Centenary 1896-1996*, 1996, not paginated.

66 *Our Observatory*, not paginated.

was supportive of science and research, while respecting and acknowledging the unique status of Australia's sole surviving State-funded observatory. An advantage of the move to CALM was the computer network support that would become available to the Observatory. Networking of the Observatory computers would allow remote control of telescopes, releasing staff from routine observational work to carry out more creative and demanding scientific pursuits.[67] Later, on 21 September 1996, a commemorative foundation stone was laid by the Premier, Richard Court, to celebrate 100 years of the Observatory's existence.[68]

In 2000, the Millennium Telescope Building, the newest visitor facility, construction of which was funded from visitor entry fees, was used to house the largest telescope dedicated for use by visitors, a 40-cm Schmidt-Cassegrain reflector.[69]

In 2005, *Perth Observatory* is still used for its original purpose of astronomical research and education.

13. 2 PHYSICAL EVIDENCE

Perth Observatory comprises a complex of Late Twentieth Century International style buildings constructed to accommodate the observatory equipment and functions of the former Observatory in West Perth, and includes the Administration Building (1964), the Transit/Meridian Building (1964), the Astrographic Building (1964-66), the University Dome Building (1964), the Pump House and Water Storage Tank (1965), the Caretaker's Residence (1965), the 24" Reflector Building (1971, 1982), the Celestron Building (1980), the Visitor's Observing Facility (1992), the Millennium Telescope Building (2000), and secondary facilities, the Transformer Room (1964) and Public Toilet Block (1991).

Perth Observatory is located in Bickley, twenty-five kilometres east of Perth, on a thirty-acre site surrounded by State Forest comprising mostly jarrah, marri, Swan River blackbutt, banksias, sheoaks, and snottygobble, with an understorey of balgas, zamias, grevilleas, hakeas, wattles, orchids and kangaroo paw. The site is located on the summit of Mt Gunjin, which falls away to the north to form Gunjin Gully, and to the south to form Piesse Gully. Access to the site is off Walnut Road, which runs in an east-west direction and eventually connects to Canning Road via Lawnbrook Road. *Perth Observatory* is located at the easternmost end of Walnut Road, approximately one kilometre from Hainault Vineyard and four kilometres from Lawnbrook Wines.

A narrow bituminized road forms the approach to *Perth Observatory,* flanked on either side by the State Forest. An informal gravel carpark is located on the east side of the road, before the entry gate. The entry driveway is bituminized and provides access to the Administration Building, the Caretaker's Residence, the visitor carpark and Public Toilet Block, and also

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67 Biggs, 'One Hundred Years of Stargazing'.

68 Details on Foundation Stone at the Bickley Observatory.

69 Details from plaque on the outside of the building. Conversation with Perth Observatory Technical Manager, Mr Arie Verveer, 5 December, 2003.

through-access to the Water Storage Tank and Pump House. Mature trees line both sides of the driveway and the edges of the carpark, including Cape Lilacs (*Melia azedarach*), Liquidambars (*Liquidambar sp*.), and a mature paperbark (*Melaleuca rhaphiophylla*) located directly east of the Caretaker's Residence. Three mature cypresses (probably *Chamaecyparis pisifera*) are planted in the lawn area directly in front of the Administration Building, apparently in the exact location of three former pencil pines. A large Illawarra Flame Tree (*Brachychiton acerifolius*) is planted west of the Administration Building. Formal garden beds planted with roses are located either side of the main entry stairs, with lawn areas on both sides. Lawn areas are also located to the immediate rear (east) of the Administration Building. The Transformer Room, a single-storey split-block masonry building with a flat roof, is located northwest of the Administration Building. The brick and iron Public Toilet Block is located on the southwest edge of the visitors carpark. The various telescope enclosures are located to the south of the Administration Building and are connected by a series of serpentine paths, within a bushland garden setting. The garden features a number of native species including balgas (*Xantherrhoea preissi*), zamias (*Macrozamia* sp.), hakeas (*Hakea* sp.), wattles (*Acacia* sp.), grevilleas (*Grevillea* sp.) and kangaroo paws (*Anigozanthos* sp.), and replaces a large area of native bush removed during the construction of the 24" Reflector Building in the 1970s.

Administration Building (1964)

The Administration Building comprises a single-storey split-block masonry building with a basement level clad in local stone, a flat sheet-metal roof, and a cubiform plant room projecting above the roof and clad with ribbed steel and metal grilles. The building is characterised by its cubiform shape and contrasting wall textures, including large areas of face-block walling, rectilinear steel-framed glazing and fixed metal sunshades. A flat-roofed porch cantilevers over the main entry doors, which are accessed by wide pre-cast concrete steps off the southwest (front) elevation. Three foundation stones are located on the southwest elevation – the 1896 foundation stone from the original Perth Observatory in West Perth, attended by Premier Sir John Forrest, the 1966 Foundation stone for the opening of the new Perth Observatory, attended by Premier David Brand, and a commemorative Foundation stone, dated 1996 and attended by Premier Richard Court, in celebration of the Perth Observatory's centenary. The basement level is partially revealed on all elevations and forms a plinth for the main level. External access to the basement level is from the northwest elevation, which faces the row of Cape Lilac (*Melia azedarach*) trees and has sliding glazed doors into the workshop areas. A secondary entry is also located on the northeast elevation, providing a connection to the rear grassed area.

The Administration Building has a simple rectilinear plan, accommodating a range of functions including a visitor reception area, museum, sales counter, mechanical workshop, electronics lab, plate-measuring room, photographic darkroom, lecture theatre and a reference library. The entry opens directly into the visitor reception area, which comprises an exhibition room used for temporary displays, and a sales counter and office area to

the southeast. These rooms typically feature plastered and painted masonry or timber-framed walls with feature timber paneling in some areas, carpet-tile floors, and paneled ceilings. A corridor extends in two directions from the reception area and encircles the plan, with the majority of the rooms along the outer edges, and the main staircase, plant rooms and museum in the centre. The museum is located in the former computer room, east of the reception area, and contains a collection of instruments and artefacts from the former Perth Observatory in West Perth, including the contents of the 1896 time capsule, as well as astrographs, paintings, meteorites from the WA Museum, and '*Atlas Celestias'*, a 1753 celestial atlas by John Flamsteed. The museum has tiled floors, plastered and painted walls and a paneled ceiling with banks of fluorescent lights. The library and lecture theatre are located northwest of the reception area, and comprise two large rooms, both with carpet-tile floors, plastered and painted walls and paneled ceilings. The library features fixed timber shelving and a desk area along the northwest wall. The lecture theatre features a small dais and a concertina door, which divides the space to produce the lunchroom at the northeast end. To the southeast of the lecture theatre are the toilets, followed by the photographic darkroom and plate store, and the astrographic office. More astronomers offices are located along the southeast edge of the corridor, and directly opposite these are two plate measuring rooms. Both the plate measuring rooms contain independent structural floors, and one contains a gravity station embedded in the floor.

The basement floor of the Administration Building comprises mostly workshops, laboratories and storerooms, and also includes a battery room, an electronics room and a clock room. The rooms have vinyl-tile floors or granolithic finish concrete floors, and plastered and painted walls and ceilings.

University Dome Building (1964)

The University Dome Building is located directly southeast of the Administration Building and comprises a split-block masonry building with a metal roof and aluminium dome. The building is two-storey, and has a fan-shaped plan with an apsidal end under the dome. A pier constructed of concrete supports the telescope, a 25-cm robotic telescope (known as the Mike Candy Telescope) built in the Observatory's workshop over the period 1992-1996. It is equipped with a CCD camera and is used to track faint comets and asteroids in order for their orbits to be calculated, and to monitor the brightness of stars.

Astrographic Building (1964-66)

The Astrographic Building is located directly east of the University Dome Building and comprises a split-block masonry building with a metal roof and iron dome. The building has a specific form, comprising a rectangular box with an apsidal end under the retractable dome. The iron dome (built by Sir Howard Grubb of Ireland) is originally from the Astrographic Building at the former Perth Observatory in West Perth, and features a faceted surface and a drive wheel which allows the dome to be rotated and opened to the sky.

The Astrographic Building houses the 33cm Astrographic Refractor, also originally from the former Perth Observatory, which has been operational since 1901 when it was used to photographically map the southern skies. It is now used to photograph bright comets and is an important part of the visitor programme.

Transit/Meridian Building (1964)

The Transit/Meridian Building is located northeast of the University Dome Building and comprises a single-storey barrel-vaulted shed with an external skin of fixed aluminium louvres, designed to ensure ambient temperature inside. Entry is from the east side, and opens into the single-volume space, the walls are painted black and the floors are concrete. The Transit/Meridian Building was originally used to house the telescopes brought over by astronomers from Hamburg-Bergedorf Observatory, when they came in the 1960s to carry out astrometry catalogue work. It is currently vacant.

160, 000 Gallon Water Storage Tank and Pump House (1965)

The Water Storage Tank and Pump House is located southwest of the Administration Building in an area of native bushland, accessible from the visitors carpark by a gravel road. The Water Storage Tank is constructed of off-form concrete with a corrugated iron roof supported on trusses, and has a capacity of 160, 000 gallons (720, 000 litres). Attached to the southeast side of the tank is the Pump House, a single-storey split-block masonry building with a flat reinforced concrete roof, containing the main water pump and a back-up diesel pump. An eleven-metre high platform is supported above the pump house by pre-cast concrete columns. This platform supports a 1,000 gallon concrete water tank. Galvanised pipe ladders provide access to both tanks.

Caretaker's Residence (1965)

The Caretaker's Residence is located southwest of the Administration Building and comprises a single-storey split-block masonry building with a flat sheet-metal roof, and cubiform shape. The residence features an open carport integrated into the main form, a verandah across the northeast elevation, and split-glazing to match the Administration Building. Internal access to the place is currently not available.

24" Reflector Building (1971, 1982)

The 24" Reflector Building (also known as the Lowell Dome) is located northeast of the Transit/Meridian Building and comprises a five-storey tower constructed of reinforced concrete, with a steel-framed retractable dome clad with galvanized iron and riveted. An astronomer's workshop and restroom is located on the ground floor, on the east side of the tower. The 24" Reflector Building houses the largest telescope owned by the observatory, namely the 61cm Perth-Lowell Cassegrain Reflector, used for CCD (Charge Coupled Device) imaging, photometry and photography. It is located sixteen metres above ground to avoid atmospheric turbulence. The Lowell telescope was originally owned by the Lowell Observatory in Arizona (founded 1894) and is currently the main research telescope.

Celestron Building (1980)

The Celestron Building is located directly south of the 24"Reflector Building and comprises a small polygonal-shaped steel-framed building, clad in aluminum. The outer walls are built on tracks, and with a rotating drive wheel base are able to rotate. The dome is also operated using a drive wheel. The Celestron Building houses the 35cm Schmidt-Cassegrain Celestron telescope, which is used for public viewing as well as teaching.

Visitor's Observing Facility (1992)

The Visitor's Observing Facility is located immediately west of the Celestron Building and comprises a single-storey steel-framed shed building clad with aluminium sheeting and featuring a retractable gable roof. The Visitor's Observing Facility houses the fully restored 32cm Calver Telescope, a 12.5" Reflector Telescope originally purchased for the public to view Halley's Comet in 1910, although it didn't arrive in Perth until 1911. The Calver Telescope was restored by the observatory staff for the 1996 centenary and is currently used as part of the visitors programme.

Millennium Telescope Building (2000)

The Millennium Telescope Building is located south of the Visitor's Observing Facility and comprises a split-block masonry building with a corrugated iron roof, a fibre-glass retractable dome and an attached office to the west end. The Millennium Telescope Building houses the 40cm Schmidt-Cassegrain reflector, the largest telescope dedicated for use by visitors.

13. 3 COMPARATIVE INFORMATION

Perth Observatory, comprising a complex of Late Twentieth Century International style buildings first constructed in 1964 to accommodate the equipment and functions of the former Observatory in West Perth, may be compared to other places of similar function and also architectural style.

The HCWA database lists three other observatories in Western Australia, namely P02240 Old Observatory, West Perth, P04260 Astronomical Observatory and wetland vegetation, Bunbury, and P11007 Watheroo Observatory, Watheroo. Of these places, only the Old Observatory in West Perth is entered on the State Register of Heritage Places.

The Old Observatory, West Perth, comprises the former Government Astronomer's residence and offices, a free-standing red-brick two-storey building with clay roof tile in the Federation Free Classical style, first constructed in 1896 as part of a complex of Observatory buildings. The complex also consisted of the Astrograph Dome building, which housed the main equatorial telescope and seismograph equipment, and the Transit Circle building, which was connected to the State triangulation system. These instrument buildings are no longer extant (the equipment and functions were moved to *Perth Observatory* in the 1960s), however the remaining residence and offices is similar to *Perth Observatory* in terms of condition and integrity, but has a lesser degree of authenticity. The Old

Observatory is classified by the National Trust, entered on the Register of the National Estate, and included on the City of Perth Municipal Inventory.

Perth Observatory is significant for its association with Western Australia's earliest purpose-built observatory and continues the operational functions that were once based in the Old Observatory, West Perth.

As well as the Old Observatory in West Perth, The Register of the National Estate lists three other observatories throughout Australia, namely the Old Melbourne Observatory (VIC), the Sydney Observatory (NSW) and the Mount Stromlo Observatory Precinct (ACT). The Old Melbourne Observatory (1863), with its intact complex of buildings including the Great Melbourne Telescope and The Photoheliograph Dome, is of great scientific, historical and architectural significance. So too is the Sydney Observatory, a two-storey building with domed observatories on octagonal towers and a four-storey tower containing the offices and astronomer's residence. Both the Old Melbourne Observatory and the Sydney Observatory are no longer functional, and are used as museums and educational sites. Mount Stromlo Observatory Precinct (dating from 1911) comprises an optical astronomical research complex arranged across the ridge of a mountain, including remnant structures of the telescope dome building, the administration buildings, residence, gardens, workshop, the Duffield grave and the landscape features remaining after the significant fire damage incurred during the January 2003 bushfires. Mount Stromlo was established with Commonwealth funding in the early development of the national capital and is currently run by the Australian National University (ANU).

Perth Observatory is therefore the sole remaining State astronomical observatory in Australia, and the oldest observatory in Australia to be continuously operating as a scientific research institution.

The HCWA database lists seventeen other places in the Late Twentieth Century International style, only one of which is entered on the State Register of Heritage Places, namely 3048 Western Australian Police Service Complex in East Perth. The Western Australian Police Service Complex (1965, 1975) comprises a nine-storey administrative building and an attached three-storey police station and lock-up, and is characteristic of office buildings in the 1960s with its external expression of the concrete structure, and the integration of passive sun-control devices in the design of the façade. The place may be compared to *Perth Observatory* in terms of condition, integrity and authenticity and is also classified by the National Trust.

Other International style buildings constructed in the 1960s, but identified as Post-War International style may also be compared to *Perth Observatory*, particularly 03363 Port of Fremantle Passenger Terminal, Victoria Quay, Fremantle. The Port of Fremantle Passenger Terminal (1961, 1962) comprises a steel-framed two-storey structure located in a prominent position on Victoria quay, and designed and built for the dual purpose of handling both passengers and general cargo. The terminal has a similar design aesthetic to *Perth Observatory*, featuring pre-cast concrete panel wall cladding with an exposed aggregate finish, and large areas of glazing

and vertically ribbed steel cladding to some walls. It may be compared in terms of condition, but has lesser degrees of integrity and authenticity. Port of Fremantle Passenger Terminal is classified by the National Trust and is included on the City of Fremantle Municipal Inventory.

Perth Observatory is representative of the Late Twentieth Century International style of architecture, and is a rare example of this style of building used as an observatory.

13. 4 KEY REFERENCES

No key references.

13. 5 FURTHER RESEARCH

14.0 TECHNICAL EQUIPMENT OF HISTORICAL OR SOCIAL SIGNIFICANCE

Staff at *Perth Observatory* provided the following list of the main items of historical or social significance included in the contents of the place.

- The Flamsteed Book
- Grubb Astrographic Telescope and dome
- Troughton & Simms Transit Circle Telescope
- Kullberg Pendulum clocks
- Shortt Free Pendulum clocks
- Cooke Sunclock
- William Wilson Orrery
- Five-inch Transit Theodolite
- Various Chronometers
- Sundial
- Troughton and Simms Plate Measuring Machine
- Barnacle Telescope
- Sextant (1908)
- Terestial Globe (1900)
- 18 inch Celestial Globe (1879)
- Markowitz Moon Camera (attached to Astrographic Telescope)
- Calver 12.5” Telescope (1910)
- 16” Telescope (made from parts of the Catts Telescope, 1940)
- 61-cm Perth-Lowell reflector
- Observatory library collection (some items predate 1896)
- Astrographic Plate (glass backed photographs) collection
- Time capsule contents (1896)

- Sundry items of wooden furniture from former Observatory site