Victorian Heritage Database Report

Report generated 16/02/19

HERITAGE COUNCIL VICTORIA

ROSEBUD SOUND SHELL

Rosebud sound shell KJ November 2011

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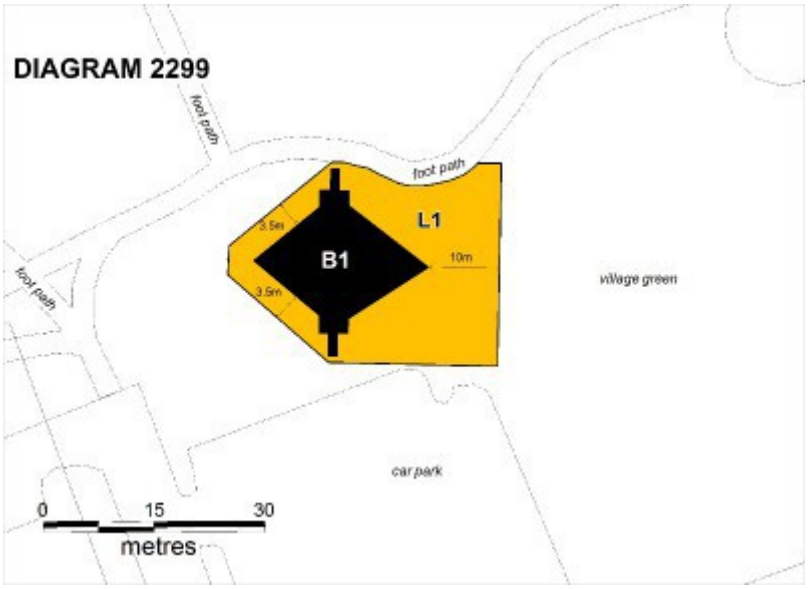
2011_Nov_29_Rosebud_sound_shell_KJ (15).JPG



rosebud sound shell.jpg

Location

988 POINT NEPEAN ROAD ROSEBUD, MORNINGTON PENINSULA SHIRE

Municipality

MORNINGTON PENINSULA SHIRE

Level of significance

Registered

Victorian Heritage Register (VHR) Number

H2299

Heritage Overlay Numbers

HO409

VHR Registration

March 8, 2012

Heritage Listing

Victorian Heritage Register

Statement of Significance

Last updated on -

The Rosebud Sound Shell, located on the Rosebud foreshore, is a reinforced concrete structure with a self-supporting hyperbolic paraboloid-shaped roof sheltering a stage and amenity rooms.

The Sound Shell was commissioned in 1967 by the Rosebud Foreshore Committee from the local architect Ronald Murcott and was completed in 1969. Rosebud had become a popular holiday camp site and recreation area, and the sound shell was part of a series of improvements made along the foreshore in the 1960s. Murcott had an interest in the unusual roof forms popular in the post-war period and their potential to span large spaces. He had already designed a church and a car park with roofs in the form of a hyperbolic paraboloid (or hypar), a special form of double-curved shell, the geometry of which is generated by straight lines, which makes it fairly easy to construct. He used the same form for the sound shell, in this case of reinforced concrete construction. Murcott was assisted in the design by the engineer Dr John Brotchie of the CSIRO Division of Building Research, an expert in the analysis of concrete shell structures, and J L van der Molen, a local pioneer in the application of computer technology to the design of concrete structures. The builder was Trevor J Luck.

The Rosebud Sound Shell has a free-standing reinforced concrete shell in the form of a hyperbolic paraboloid above a stage on one side and several enclosed rooms (formerly toilets and storage facilities) at the rear. The roof plan is roughly a diamond-shape, measuring 23 metres by 21 metres. The thickness of the shell varies from 762 mm along the central axis to 508 mm where the lower corners touch the ground. On the stage side the roof rises to a height of 8.8 metres and is slightly lower, 4.9 metres at the rear. The walls below the roof are of concrete block construction. These have now been painted with murals. Since the structure was completed barriers have been added at the lower corners to prevent access to the roof.

The Rosebud Sound Shell is of architectural, aesthetic and scientific (technical) significance to the State of

Victoria.

The Rosebud Sound Shell is of architectural significance as an outstanding example of the dynamic architectural forms which became popular in the post-World War II period. It is significant as a rare example of a hyperbolic paraboloid form, a much publicised motif in international architecture from the early 1950s to the late 1960s, and the only known example in Victoria executed in reinforced concrete. It is an innovative example of a sound shell, a building type which in the 1950s and 1960s replaced the bandstand, which had been popular in the nineteenth and early twentieth centuries for performances in public parks.

The Rosebud Sound Shell is of aesthetic significance for its highly unusual expressionist form, which is an example of the dynamic roof shapes derived from structural concepts which were developed in the post-war period. This free-standing sculptural example is a prominent foreshore landmark.

The Rosebud Sound Shell is of scientific (technical) significance as a rare example of a structure with a hyperbolic paraboloid shape, a curved surface generated by straight lines. It is significant as one of the first concrete structures in Australia to have been designed with the aid of a computer program for structural analysis, which has since become the norm.

Permit Exemptions

General Conditions: 1. All exempted alterations are to be planned and carried out in a manner which prevents damage to the fabric of the registered place or object. General Conditions: 2. Should it become apparent during further inspection or the carrying out of works that original or previously hidden or inaccessible details of the place or object are revealed which relate to the significance of the place or object, then the exemption covering such works shall cease and Heritage Victoria shall be notified as soon as possible. General Conditions: 3. If there is a conservation policy and plan all works shall be in accordance with it. Note: A Conservation Management Plan or a Heritage Action Plan provides guidance for the management of the heritage values associated with the site. It may not be necessary to obtain a heritage permit for certain works specified in the management plan. General Conditions: 4. Nothing in this determination prevents the Executive Director from amending or rescinding all or any of the permit exemptions. General Conditions: 5. Nothing in this determination exempts owners or their agents from the responsibility to seek relevant planning or building permits from the responsible authorities where applicable. Minor Works : Note: Any Minor Works that in the opinion of the Executive Director will not adversely affect the heritage significance of the place may be exempt from the permit requirements of the Heritage Act. A person proposing to undertake minor works must submit a proposal to the Executive Director. If the Executive Director is satisfied that the proposed works will not adversely affect the heritage values of the site, the applicant may be exempted from the requirement to obtain a heritage permit. If an applicant is uncertain whether a heritage permit is required, it is recommended that the permits co-ordinator be contacted.

Interior:

Works to the interiors of the amenity rooms at the rear of the stage are permit exempt.

Theme

9. Shaping cultural and creative life

Construction dates	1968,
Architect/Designer	(PWD), Murcott, Ronald,
Heritage Act Categories	Heritage place,
Hermes Number	154866
Property Number	

History

Contextual history

[The information in this report is from the National Trust nomination report, researched and written by Simon Reeves.]

Sound Shells

In the nineteenth and early twentieth centuries bandstands were located in most major public parks, but in the second half of the twentieth century sound shells began to be built instead. The celebrated Hollywood Bowl (Frank Lloyd Wright, 1929) was the inspiration for about thirty other shells built throughout the USA in the 1930s, and for one built at Napier, New Zealand, in 1931.

It was proposed that a sound shell be constructed in Melbourne as a memorial to the philanthropist Sidney Myer soon after his death in 1934, and a decade later the idea was revived as a memorial to Dame Nellie Melba, but this was not built. It was not until 1957 that the Sidney Myer Music Bowl, by architects Yuncken, Freeman Brothers, Griffiths & Simpson, was constructed in the Alexandra Gardens. Many sound shells were proposed and built throughout Australia from the early 1950s.

Hyperbolic paraboloid (hypar) roofs

According to the Penguin *Dictionary of Architecture*, 1991 [1966], a hyperbolic paraboloid (hypar for short) roof is 'A special form of double-curved shell, the geometry of which is generated by straight lines. This property makes it fairly easy to construct. The shape consists of a continuous plane developing from a parabolic arch in one direction to a similar inverted parabola in the other'.

Experiments with this form of construction were undertaken in the last decade of the nineteenth century by the Russian engineer Vladimir Shukhov and the Catalan architect Antonio Gaudi, who adopted it in 1910 for his designs for the Sagrada Familia in Barcelona. However it did not gain broader popularity until post World War II, when architects became more interested in geometric and structural innovation, and when new developments in modern building materials made them more viable.

The main advantage of hyperbolic paraboloid structures is that because they are made up entirely of tensile members, they have little weight but can span great distances. They are theoretically simple to construct from conventional steel or timber elements, and are also readily adaptable to shell concrete construction. Early modern use of the form is associated with the saddle-shaped roof of the Dorton Arena at Raleigh, North Carolina by Matthew Nowacki (designed in 1948, built 1952) and several buildings by the architect Felix Candela in Mexico in the 1950s. Many other architects around the world were experimenting with the form in the 1950s and early 1960s.

The Australian journal *Architecture & Arts* in January 1958 included an article titled 'New Structures' which illustrated the hypar amongst such other roofing innovations as the concrete shell, the folded slab, the pleated slab and the space frame. In the November 1958 *Architectural Review* Robin Boyd published a lengthy article titled 'Engineering of Excitement', in which he described the current fad for 'buildings with warps, waves, folds, droops and other unexpected shapes'. He illustrated a number of examples from around the world but made no reference to any from Australia, though the first had been unveiled in Perth two months before - a Display Pavilion for the 1958 Royal Agricultural Show, which was roofed by a series of interlocking concrete hypar shells. A hypar was used for the roof of the Methodist Church at Casino, NSW in 1960, and further examples were built near Wollongong, NSW in 1961, and in Adelaide in 1962. The Rosebud Presbyterian Church was designed with a hypar roof in 1961, but was not built until 1968. The sculptor Raymond Ewers incorporated a hypar roof into the house he designed for himself at 551 Nepean Highway, Frankston in 1965 (now demolished).

Along with many other experimental roof forms (eg the butterfly roof and the folded plate) the hyperbolic paraboloid had fallen from favour by the mid-1960s, although a number were still being built in the second half of the decade.

The Architect: Ronald Murcott

Ronald Murcott was a graduate of RMIT. In 1961, while employed by the firm Smith & Tracey Murcott, with his

fellow architect Paul Archibald he designed the Presbyterian Church in Rosebud, which had a distinctive roof in the form of a hyperbolic paraboloid. Murcott was fascinated by the quirky roof forms popular at the time and especially their potential for spanning large spaces without the need for internal supports. After a few years Murcott began work with the Department of Defence, and later with Esso, for whom he designed an ambitious scheme for a car park at Tullamarine (not built) which adapted hyperbolic paraboloid geometry for the roof.

Place History

The sound shell is located on the Rosebud Foreshore Reserve, which was reserved for public purposes in 1873 and became increasingly popular after World War II as a holiday camp site and recreation area for tourists and locals. By the mid-1960s many improvements had already been made: toilet and ablutions blocks, tennis and basketball courts, a swimming pool and youth centre. In 1967 further improvements were proposed, including a sound shell for music and theatrical performances.

The Rosebud Foreshore Committee in about 1967 engaged the architect, and local resident, Ronald Murcott to design 'a spectacular sound shell and facilities'. Murcott had already designed a church at Rosebud and car park at Tullamarine using the hyperbolic paraboloid and decided to use a similar form at Rosebud. His initial scheme was for a shell concrete structure with performance space and generous backstage areas (prop rooms, dressing rooms, etc) in a landscaped setting with a surrounding moat that would reflect sound back onto the underside of the shell. But his had to be revised when the Committee of Management were advised that dedicated performance spaces were not permitted on Crown Land, and that the new structure would have to be adapted to function primarily as a toilet block and storeroom. The sound shell was retained, but the associated backstage areas were given over to those more mundane functions and the moat was not built.

Few hyperbolic paraboloids had yet been built in Australia and Murcott approached the CSIRO Division of Building Research, which then had a policy of 'encouraging new and potentially useful structural systems, of developing and testing new techniques for analysis and design and of providing information for use in design'. The division was then under the direction of the engineer Dr John Frederick Brotchie, who while at the University of California (Berkeley) had co-authored papers on the analysis of shell concrete structures, and later published many articles on related subjects.

Brotchie brought in another engineer, J L 'Dick' van der Molen, a local pioneer in the application of computer technology to the design of concrete structures. Van der Molen had recently designed a concrete foot bridge across the Barwon River at Geelong, which is said to have been the first concrete structure in Victoria designed with the aid of a computer. Later, in 1970-71, he worked with the architects Loder & Bayly on the design of the concrete underground car park at the University of Melbourne (VHR H1004), which adapted hyperbolic paraboloid geometry to create vaulted ceilings.

The roof of the Rosebud Sound Shell was designed in reinforced shell concrete. To test its structural veracity CSIRO engineers built a twelfth-scale model, and a structural analysis was also undertaken using the new computer programme known as ICES-STRUDL.

An article in the *Southern Peninsula Gazette* (4 September 1968) reported that tenders had been accepted and contracts signed for the construction of a 'rather unusual shaped structure to be built in the area adjacent to the Village Green, and this building will comprise a toilet block and storerooms for use by the youth centre and basketball clubs'. It noted that the roof structure was in the form of a hyperbolic paraboloid shell, 'which will be a focal point of Rosebud and will attract great attention and interest'. The successful contractor was Trevor J Luck, a local builder, who experienced difficulties making and assembling the complicated timber formwork, and the concrete was not poured until February 1969. 38.2 cubic metres of concrete were poured for the shell roof, which, with the steel reinforcement, amounted to a dead weight of about 50 tons. A series of measuring instruments were incorporated into the building, so as to record changes the changes taking place as the concrete cured. After the pour the formwork was left in place for four weeks, during which time the steel reinforcement was post-stressed. There was much praise for the local builder of the unconventional structure.

Construction of the remainder of the building continued, and the first official recorded use was for the shire council's Carols by Candlelight on Christmas Eve 1969. The *Gazette* noted that 'The Paraboloid itself was ideal for the occasion and, now completed, is an undoubted acquisition to the area, justifying the vision and courage of the Foreshore Committee who conceived this unusual and attractive edifice'.

Assessment Against Criteria

a. Importance to the course, or pattern, of Victoria's cultural history

b. Possession of uncommon, rare or endangered aspects of Victoria's cultural history.

c. Potential to yield information that will contribute to an understanding of Victoria's cultural history.

d. Importance in demonstrating the principal characteristics of a class of cultural places or environments.

The Rosebud Sound Shell is an outstanding example of the dynamic architectural forms which became popular in the post-World War II period. It is significant as a rare example of a hyperbolic paraboloid 9hypar) form, a much publicised motif in international architecture from the early 1950s to the late 1960s, and is the only known example in Victoria executed in reinforced concrete. It is an innovative example of a sound shell, a building type which in the 1950s and 1960s replaced the bandstand, which had been popular in the nineteenth and early twentieth centuries for performances in public parks.

e. Importance in exhibiting particular aesthetic characteristics.

The Rosebud Sound Shell is of aesthetic significance for its highly unusual expressionist form, which is an example of the dynamic roof shapes derived from structural concepts which were developed in the post-war period. This free-standing sculptural example remains a prominent foreshore landmark.

f. Importance in demonstrating a high degree of creative or technical achievement at a particular period.

The Rosebud Sound Shell is a rare example of a structure with a hyperbolic paraboloid shape, a curved surface generated by straight lines. It is significant as one of the first concrete structures in Australia to have been designed with the aid of a computer program for structural analysis, which since become the norm.

g. Strong or special association with a particular community or cultural group for social, cultural or spiritual reasons. This includes the significance of a place to Indigenous peoples as part of their continuing and developing cultural traditions.

h. Special association with the life or works of a person, or group of persons, of importance in Victoria's history.

Plaque Citation

This reinforced concrete hypar structure, designed by Ronald Murcott and built in 1969 by Trevor Luck, demonstrates the unusual and dynamic roof forms popular at the time and was a very early example of computer-aided design.

Extent of Registration

1. All of the land marked L1 on Diagram 2299 held by the Executive Director being part of Crown Allotment 14A Parish of Wannaeue.

2. All of the building marked B1 on Diagram 2299 held by the Executive Director.