

COST EFFECTIVE DESIGN FOR A MUSIC REHEARSAL STUDIO

Redevelopment of Victoria Police Bands' Green Street Studios

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The Victoria Police Bands perform at formal police events, official State functions, in schools, for charities, and at community events throughout Victoria. From their permanent base – in an almost forgotten corner of Melbourne's inner northern suburbs – the bands often host school groups, provide music education workshops, conduct master classes, and even record and produce their own CD releases for sale. This month the band moves into a dedicated new rehearsal facility, recently completed on their existing site. This brief note summarises the vision and constraints driving the project, and traces the broader design process behind the acoustic design.

BACKGROUND

The Victoria Police Bands are comprised of three distinct musical ensembles, and perform a wide-range of musical styles and repertoire. Together, the bands are made up of nearly 50 musicians and include a 25-piece Showband, a 16-piece traditional Scottish bagpipe band and a 5-piece rock/pop band. The bands have a long history, dating back to 1891. The original band has evolved over time with various permutations as brass band, concert band, through to its current form as a Showband.

A Pipe Band was first formed in 1936 to complement the concert band of the time, and has since represented Victoria Police both nationally and internationally. The Pipe Band has performed at prestigious international events, including the Edinburgh Military Tattoo. In international competition events, their highest achievement has been winning the title of World Pipe Band Champions, in 1998 in Glasgow.

PREVIOUS FACILITIES

All groups share the same rehearsal complex, consisting of a ramshackle former drill hall and a collection of small out-buildings. The buildings had never been designed or retrofitted for musical purposes. The main band room, located in the drill hall, was not capable of accommodating all members of the three bands together, much less with any degree of acoustic comfort. The room had a floor area of barely 90 m² and a ceiling height of just 3.6 m. Ventilation in the space relied on natural airflow through a pair of louvre windows in one wall. Token acoustic treatment was limited to thin, perforated wood fibre panels direct-fixed to the upper walls. Poor ensemble conditions and oppressive loudness were unsurprising complaints about the space.

Rooms being used for individual and small ensemble practice had no pretence of acoustic isolation. Any internal acoustic treatment was limited to off cuts of carpet hung to cover the basic fibro partitions. As well as the assortment of rooms within the drill hall and out-buildings, a number of

disused shipping containers on the site were frequently used for individual practice. The acoustically untreated buildings were also affected by noise of trains passing by on the suburban railway line every few minutes.



Figure 1: Previous band room.

PROJECT BRIEF

The bands' requirements could be summarised into a relatively succinct list of design priorities, forming the essence

of a project brief:

- create a more usable space for the musicians;
- introduce acoustic separation between spaces;
- improve internal acoustic quality;
- provide for flexible use of spaces;
- adhere strictly to the modest budget available.

DESIGN CONCEPT

Despite the existing drill hall's many shortcomings, it did offer one concession towards redesign for music – a large central space, which was being used for general storage, vehicle parking and home to the band's music library and historical records.

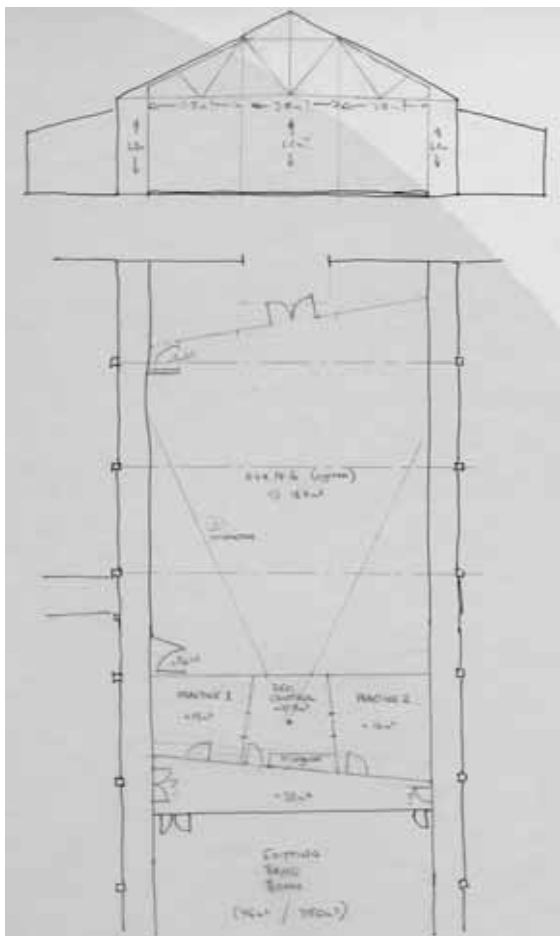


Figure 2: An early concept sketch.

The architectural direction immediately moved towards exploiting the existing space with the insertion of a new, freestanding rehearsal studio within the drill hall. As the concept developed, a conscious decision was made to retain the exterior of the drill hall without significant modification, and to avoid any obvious exterior clues as to the significant changes being proposed underneath the unassuming facade. This design concept has since been described by band members as creating a precious acoustic gem, encapsulated within the raw materials of the old drill hall. There was also a strong desire from the bands for their new rehearsal studio to be adjoined by quality individual practice rooms and if possible for the whole facility to double as a satisfactory recording studio.

THE PROCESS

A collaborative approach evolved during design of the studios, underpinned by a design mantra of *'refining the best possible design - within the available budget'*. Three distinct options representing defined cost points were maintained throughout design development. This allowed the client to understand and contribute to key decisions around budget costs, always being aware of not only the projected project cost, but the associate design limitations and outcomes for any given cost ceiling. The designs were tested, tweaked and costed, then tested again, tweaked again and re-costed. This approach inevitably required ongoing engagement between architect, acoustician, quantity surveyor and other engineering consultants. However the payoff was clear, with immediate control of projected costs possible from very early on in the design process.



Figure 3: Studios under construction.

DESIGN DETAILS

The main studio is designed as a freestanding structure, supported by a steel portal frame hidden entirely within new wall and ceiling cavities. An existing tongue and groove hardwood floor over original concrete slab was retained throughout the main rehearsal space, with individual practice rooms receiving a new carpet floor finish where the existing timber flooring could not be salvaged. A dedicated new air conditioning system serves the new studio spaces. Designed

as a top-down system, air is supplied into the main studio at ceiling level via a duct that is tucked into a convenient void under the apex of the roof. Associated machinery is located in a new enclosure, at grade and outside of the drill hall. The system is designed to achieve NR 20; sufficiently quiet to enable periodic recording sessions without needing to isolate the air conditioning (although isolation is possible).

In order to maximise internal room volume, the new studio ceiling follows the form of the drill hall roof, without penetrating or altering the external roofline. Construction of the new ceiling as a double-skin system provides control of rain noise, mitigates external noise (e.g. from train movements), and maintains acoustic isolation between the new studio and surrounding rooms.

New wall partitions are detailed as lightweight, multi-layer constructions to maximise acoustic isolation whilst also minimising material and construction costs. Design of the partitions was critical due to the high sound levels produced by many of the instruments being designed for (especially bagpipes and snare drums), and the substantial cost implications of adding any unnecessary partition layers. Numerous partition designs were assessed for predicted transmission loss and also costed in detail, in order to arrive at an optimal balance of cost and acoustic performance.

Isolated glazing details are used to create visual connections between the main studio and an individual practice room designed to double as a recording control room.

The internal acoustic treatment scheme adopted throughout makes extensive use of custom fabricated, modular panels. This approach provides a well controlled room acoustic solution, and also allowed significant economies during design optimisation, as well as control of fabrication and installation costs. The acoustic panels themselves are relatively simple broadband panel absorbers, consisting of perforated front facings over an air cavity containing glass wool insulation. The panels were designed with an angled front face to enable a single panel type, when installed in different orientations, to produce variations in face angle and depth between adjacent panels. This surface variation not only provides visual interest, but also creates the necessary acoustic diffusion within each room.

The broadband panel design, used for the majority of panels, is supplemented by a proportion of tuned low frequency panels. The low frequency panels use a similar construction method as the broadband panels and incorporate the same angled front face; however a different perforation pattern is used to assist tuning.

Together, these two panel types form the basis of the room acoustic treatment for both the main studio, and the new individual practice rooms. The predictable acoustic properties of the panels contributed to straightforward and reliable room acoustic predictions, with minimal impact on the acoustic design when panel layouts required inevitable adjustment to co-ordinate with alterations in room geometry or the location of services.

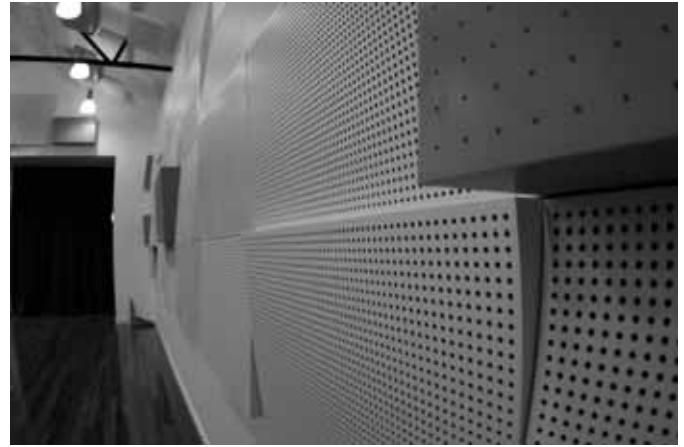


Figure 4: Close-up of modular acoustic panels.

BUILT RESULT

The result is a dedicated rehearsal studio, spacious enough to accommodate any of the bands in proper formation, or even accommodate all three police bands together in relative comfort. Loudness is managed in the main studio without compromising ensemble playing conditions or tonal balance.

In addition to the main studio, band musicians now also have three new individual practice rooms – including one which doubles as a quality recording control room including direct visual connection into the main rehearsal studio. The individual rooms provide neutral acoustic conditions for instrumental practice, and sufficient control of loudness to enable extended practice sessions. Audio and data tie lines connect all the new spaces together, enabling recording in any room; or in any combination of rooms together.



Figure 5: An individual practice room.

The bands are currently moving into their new rehearsal complex and have already tried out each of the new rooms. Initial feedback has already been very positive on the appearance, quality and acoustic design of the new spaces.

PROJECT CREDITS

Client: Victoria Police
 Acoustic Designer: AECOM
 Architect: BVN Architecture, Michael McKenna architects
 Services Engineer: PCE
 Quantity Surveyor: Currie Brown
 Builder: Devco



Figure 6: Main studio nearing completion.

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