



MARSHALL DAY  
Acoustics 

COMPANY PROFILE  
EDUCATION

## WHO WE ARE

Marshall Day Acoustics is one of the world's leading firms of acoustic consultants, providing the highest standard of architectural and environmental acoustic consulting to our clients.

For over 30 years, we have been providing innovative acoustic designs on major projects in over 15 countries and employ over 85 professional staff in offices in Australia, New Zealand, China, Hong Kong, and France.

As one of the largest acoustic engineering firms worldwide, we are able to provide our clients with the greatest range and depth of experience and expertise available.

Our strength in acoustic design comes from the diversity of our team members who have been drawn from engineering, architectural, musical and academic backgrounds, with one common focus; to provide innovative acoustic designs of the highest standard.

From concert halls to wind farms and everything in between, we have experts in every field of acoustics who have the specialist knowledge required to deliver quality project outcomes.



*"I regard the acoustic designs of Marshall Day Acoustics to be amongst the finest and probably the most innovative in the world"*

Dr Anders Gade, Associate Professor Technical University of Denmark

## A COLLABORATIVE APPROACH

We have a collaborative approach to design and work as part of an integrated team with the client, architect and other consultants. We do not specify acoustic performance that “must” be achieved but instead we work with the project team to develop acoustic criteria and treatment that meets the desired project outcomes, whatever they may be. Recognising commercial realities and achieving an appropriate balance between quality and cost objectives is something we take very seriously.

## QUALITY ASSURANCE

Marshall Day Acoustics is certified in accordance with ISO 9001:2015.

The certifying body is SAI Global and the certificate number is QEC 23174.

Additional information about the system can be provided upon request.

*“Marshall Day Acoustics brought imagination and resourcefulness to the task... Their work has set a new standard.”*

Donald L. Bates, Project Director,  
Federation Square, Melbourne –  
Lab Architecture Studio



## TECHNICAL AND DESIGN CAPABILITIES

Marshall Day Acoustics is at the cutting edge of development in the acoustic industry. We are committed to being at the forefront of research and development in our field and have employed significant time, energy and resources into ongoing development of our in-house and commercially available tools across a range of sectors including concert halls, theatre design, building acoustics, environmental noise modelling, intelligent noise loggers, underwater acoustics and more.

We provide a unique combination of design skills, research knowledge and predictive techniques to ensure the client's requirements are achieved.

Our range of acoustic design tools including the facility to carry out computer modelling and also scale model testing on physical models as small as 1:50. This allows the accurate prediction of the objective acoustic properties and simulation of subjective qualities before they are constructed.

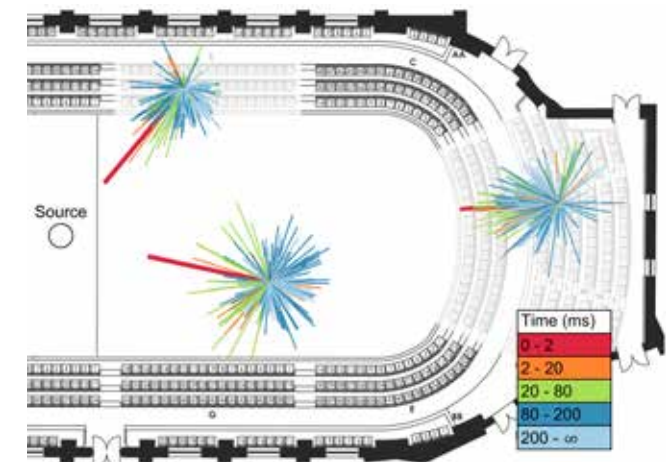
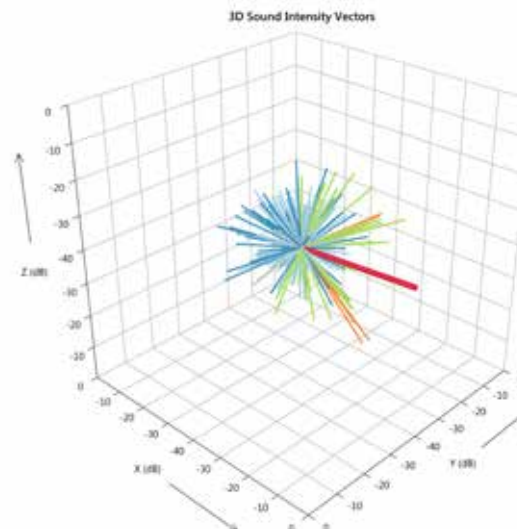
We are a world leader in the development of commercially available sound insulation predictive tools for consultants and engineers. Our proprietary software has sold more than 1,900 licences in 22 countries.

All of our offices are linked via a company intranet which indexes the collective experience of our consultants, providing access to solutions developed over many years of consulting projects.

We are committed to improving our delivery of quality and to enhancing our reputation as suppliers of quality acoustic consulting services in all of our markets.

*“MDA has developed a unique collaborative process involving 3-dimensional technologies to deliver proficient, yet original design accomplishments. The internationally recognised success in the acoustic designs of the Guangzhou Opera House is a reflection of this testament.”*

Woody K.T. Yao, Associate Director, Zaha Hadid Architects



## CONSULTANCY SERVICES - WHAT WE DO

### ARCHITECTURAL ACOUSTICS

Design or corrective work to make the acoustical environment effective and comfortable. Sound insulation, acoustic quality, speech privacy and the total acoustic design of projects such as music teaching facilities, offices, hotels, reception centres, broadcast facilities and apartments.

### AUDITORIUM ACOUSTICS

Complete acoustic consultancy for all communication and performing arts spaces, including theatres, churches, conference rooms, multi-purpose halls and concert halls. Design techniques include state-of-the-art computer and scale modelling.

### ELECTRO-ACOUSTIC SYSTEMS

Specialist consulting services for the design and commissioning of sound reinforcement and communication systems for performing arts applications, churches and convention facilities.

### ENVIRONMENTAL NOISE AND VIBRATION

Assessment of noise and vibration impact of development proposals, including new roads, railways, air transportation developments and industrial projects. Site noise and vibration surveys, sound and vibration propagation predictions. Recommendations for the enforcement of environmental standards. Presentation of expert evidence for prosecutions or planning hearings. Assistance with development of noise and vibration control policy.

*“Marshall Day Acoustics participated fully in the development of insightful, responsive and appropriate designs for the acoustic and vibration issues across the entire project”*

Donald L. Bates, Project Director, Federation Square, Melbourne – Lab Architecture StudioDenmark

### MECHANICAL SERVICES NOISE AND VIBRATION CONTROL

Design, specification, supervision and commissioning of noise and vibration control systems for mechanical plant. Control of all duct, pipe and structure-borne noise.

### INDUSTRIAL NOISE CONTROL

Occupational noise surveys, noise abatement, factory planning, design of specialist silencers, screening and industrial enclosures.

Building vibration and structural dynamics estimation of vibration propagation factors in buildings and other structures. Estimate of re-radiated structure-borne noise. Recommendations for vibration control measures. Empirical, theoretical and numerical modelling.

### SOFTWARE DEVELOPMENT

Development of acoustics and vibration software, including software for the estimation of sound insulation properties, sound absorption coefficients and environmental noise propagation. Developer of INSUL, Zorba, dBSea and IRIS, and agent for SoundPLAN.

### COURSES AND SEMINARS

Provision of courses and seminars in the areas of building acoustics, mechanical services noise control, sound system design, town planning acoustics and SoundPLAN training.



## EDUCATION

Clear and intelligible speech communication is essential to the learning process. Excessive background noise and high levels of reverberation make speech difficult to hear and understand.

In education environments, poor acoustics can be a source of low student achievement, off-task behaviour and teacher voice strain. Poor acoustics are especially detrimental to students with hearing, learning or language difficulties.

Acoustic conditions in classrooms must support the wide variety of teaching methods used today. Educationalists place a high value on group work and “incidental learning” – what students learn from each other through gathering information casually. Students learning in small groups need to be able to communicate with each other, and not disturb neighbouring groups.

Additionally, new learning and teaching spaces, which often emphasise flexibility, can push the boundaries of accepted levels of sound insulation, noise control and speech intelligibility. With careful acoustic design, these new flexible spaces can be extremely effective learning spaces but without careful research-based acoustic input during planning and design, these spaces can become unusable.

Our services on educational projects include:

- Baseline noise and vibration measurements to assist site selection
- Sound insulation design of building façades to protect from external noise sources
- Control of internal sound transfer
- Mechanical services noise and vibration control
- Acoustic design of specialist areas such as lecture theatres and performance spaces.



## SELECTED PROJECTS

### LEARNING AND TEACHING BUILDING, MONASH UNIVERSITY, MELBOURNE

Architect: John Wardle Architects  
Budget: AUD \$180 m  
Completion Date: 2018

Monash University's new four storey 28,000 m<sup>2</sup> Learning and Teaching Building, situated at Clayton campus and including a new transport interchange, will provide a new front door experience for all visitors. The building will showcase and reinforce Monash University's commitment to innovative teaching and learning practises. The layout of the new facility has been designed to reflect recent pedagogical changes, which have seen unstructured or informal learning spaces becoming increasingly important.

#### Key Objectives

- To create a significant building and gateway to the Clayton campus, reinforcing the Monash University brand and vision
- To deliver an exemplary building for multi-faculty teaching and learning, that applies the concept of 'long life, loose fit'
- Deliver a building that exemplifies best practice student-centred teaching and learning, aligned with the University's 'Better Teaching Better Learning Agenda'
- To provide a world class, multi-modal, integrated Monash Transport Interchange
- To deliver best practice in sustainable design

#### Our Brief

Marshall Day Acoustics is providing design input into all acoustic aspects of the project, from the acoustic design of the theatre in the round, to bus noise via the facade. A key challenge will be working the wider design team in the analysis of the external environment, whilst considering the complex interaction with ESD and services engineers to develop the best design solutions.

*A gateway to the Clayton campus which will showcase and reinforce Monash University's commitment to innovative teaching and learning practises*



## INNOVATIVE LEARNING ENVIRONMENTS RESEARCH

Architect: Australian Research Council  
Location: Australia & New Zealand  
Completion: 2019

The University of Melbourne has been awarded funding from the Federal Government for research into Innovative Learning Environments and Teacher Change. Marshall Day Acoustics is proud to be part of the research team, which also includes Ecophon and Hayball architects.

The project will collect evidence of the link between quality teaching and the effective use of innovative learning environments and then produce a strategy to examine how teachers use them most effectively. It will develop a mechanism for implementing this strategy across as wide a range of educational sites as possible in Australia and New Zealand. It will create evidence to verify this impact and guide future teaching approaches, infrastructure and design of facilities.

The new understanding gained through the project is expected to guide developments in pedagogy, policy and design and to produce strategies to improve learning in schools across Australia and New Zealand.

Marshall Day has gained a lot of critical experience through the design and commission of first generation Building Education Revolution schools, and has a clear understanding of how the spaces can best be utilized from an acoustic standpoint. Amanda Robinson, our education specialist, will provide consulting engineering services with other members of the Marshall Day team as required, to help teaching staff understand and best utilise their teaching environment.





## TARONGA ZOO, INSTITUTE OF SCIENCE AND LEARNING

Client: Taylor Construction Group

Completion Date: 2018

Budget: \$31 m

The Institute of Science and Learning at Taronga Zoo comprises part of the Zoo's \$150 m Centenary Revitalisation Plan which provides a world-class teaching and research facility and place of national significance. The facility was opened in October 2018 by the Duke and Duchess of Sussex.

The project aims at inspiring and educating the next generation of conservation scientists, from early learning right through to tertiary and beyond, and its design involved the delicate integration of newly built facilities with existing administration spaces.

The centre includes several specialised immersive teaching spaces which allow direct observation and interaction with animals. Additionally, there are research and teaching laboratories, administrative offices and multimedia meeting rooms and a 300 seat lecture theatre. The co-location of teaching facilities and state-of-the-art research labs aims to create tangible links between theory and practice and encourage the integration of STEM education with industry level research.

Marshall Day Acoustics was engaged as part of the Design & Construct contract to provide an overall acoustic design commensurate with the 5 Star Greenstar design standard, across all facility spaces. These included the lecture theatre, laboratories, cryogenic facilities, teaching laboratories, meeting rooms, and office spaces.

The acoustic design comprises internal separation, isolation from external noise, rain noise control, room acoustics and mechanical services acoustic design.

Challenges included:

- Control of reverberation within large open office and activated atria spaces with significant levels of glazing
- Balancing the acoustic amenity of quiet focussed research spaces adjacent to learning facilities
- Effective control of complex mechanical services noise within small ceiling voids
- Designing affordable and effective room acoustic solutions in keeping with the Architect's timber focused design intent.



## THE STABLES, VICTORIAN COLLEGE OF THE ARTS

Client: Kerstin Thompson Architects

Completion Date: 2018

The former Victoria Police Mounted Branch stables, which date from 1912, ('The Stables') have been transformed into world-class teaching and learning facilities for students of the University of Melbourne's Faculty of Fine Arts and Music following an \$18 m make-over. The Stables feature a new visual arts wing with 170 studios and flexible exhibition spaces, while the former riding school has been converted into a 260-seat multipurpose arts wing for theatre, dance, music theatre and music performances.

### Scope

- Marshall Day was engaged as a core design team member to provide:
- Building Acoustics for the entire refurbishment
- Room Acoustics for the performing arts space
- Theatre Design of the multi-purpose, highly flexible performing arts space

### Flexibility

#### Building services design

The services design responded to the constraints of a unique layout for the offices and stables areas, while maintaining the performance requirements of the brief. Our understanding of acoustic issues gained from a multitude of educational projects and our work on historic buildings was utilised in a close working relationship with the architect and services engineers to develop practical and effective acoustic solutions for the development.

#### Performance space

Providing flexibility in venue sound ambiance within the Performance Space was critical to maintaining the brief for a multi-use space. The provision of fully-retractable heavy drapes which extend around the entire space creates a black-box. This allows control over the acoustics to provide conditions suited to a range of performance styles. Once retracted, the space is flooded with natural light to create a truly versatile environment.

### Awards

- Victorian AIA Awards 2018 - Heritage Architecture
- Victorian AIA Awards 2018 - Educational Architecture
- Victorian AIA Awards 2018 - Interior Architecture Commendation



## UTS DR CHAU CHAK WING, FACULTY OF BUSINESS

Principal Architect: Gehry Partners LLP  
Executive Architect: Daryl Jackson Robin Dyke Architects  
Client: University of Technology Sydney  
Completion Date: 2015

Australian-Chinese businessman and philanthropist Dr Chau Chak Wing is the namesake of the new Faculty of Business at UTS. The state of the art building forms a key component in the UTS City Campus Master Plan.

The Dr Chau Chak Wing Faculty of Business will provide lecture theatres, seminar rooms, collaborative teaching spaces, laboratories, group work areas, and academic research and staff office spaces for the UTS Business School. Located in the heart of Ultimo, the new building will also benefit the wider business community with spaces for conferencing, meetings, executive education and lectures available to the public.

Marshall Day worked closely with UTS, Gehry Partners and Daryl Jackson Robin Dyke to determine the functional acoustic requirements for the building while developing the design to meet the intent of the clients brief and architects vision.

The building facade design is a composite of brick and glass sheets, a reference to Sydney heritage and mirror to the surrounding area. In an area with high traffic noise, the facade sound insulation was an important part of the building's design.

One of the key areas of our involvement included the internal sound insulation design to achieve speech privacy between offices. A mock-up of the proposed office construction was built to test the construction materials and methodology to assist in determining the most cost effective way of achieving the brief.

*"This building is a symbol of everything UTS stands for – it epitomises our vision to be a world leading university of technology where creativity and innovation intersect."*

Vicki Sara, UTS Chancellor Professor



**IONA COLLEGE NEW LEARNING CENTRE, WA**

Client: EIW Architects

Multi-story learning centre with central meeting spaces for both students and staff. The new centre features a multitude of new learning art and fashion spaces, design studios, food technology workshops, innovative maker spaces and STEM studios. MDA provided full acoustic design services for the project.



**METHODIST LADIES COLLEGE JUNIOR YEARS, WA**

Client: CODA Studio

New junior school including classrooms, drama, dance and music rehearsal spaces, and staff areas. Acoustic challenges included separation of drama and music spaces from adjacent classrooms and room acoustic design for flexible, open plan teaching areas.



**SOUTH MELBOURNE PRIMARY SCHOOL, VIC**

Client: Hayball

New multi-storey inner-city primary school adjacent to rail lines and busy traffic area. Scope included both architectural acoustic consulting services and environmental noise and vibration study for this open-plan and flexible learning environment.



**ADELAIDE HIGH SCHOOL, SA**

Architect: JPE Design Studio

New wing and upgrades with additional classrooms to Building 4. The new wing incorporates: Lower Ground - underground carpark, HPE teaching room, drama workshop and offices; Ground Level – Resource Centre, study spaces, flexible teaching spaces, offices, meeting room ICT help desk and recording booth; First Floor – science teaching rooms, GLA's open areas and offices; Roof Top – deck.



**MELVILLE SENIOR HIGH SCHOOL, PERTH, WA**

Client: Cox Architecture

New high school theatre featuring a flexible flat floor auditorium with 300 retractable seats and acoustic operable wall allowing the space to be divided into separate drama and dance teaching spaces. The building also includes a green room, foyer and gallery.



**ST LEONARD'S COLLEGE SENIOR SCHOOL DEVELOPMENT, VIC**

Client: ARM Architecture

Substantial senior school development, including a new 2,300sqm performing arts centre and a new 2,100sqm three storey building including teaching spaces, cafeteria and an extension to the existing underground car park.



**RICHMOND HIGH SCHOOL, VIC**

Client: Hayball

Marshall Day provided full acoustic design services for the new four-storey vertical school. The school caters for 650 students and is split into two precincts, one academic and the other sports. The state-of-the-art facilities include flexible learning spaces, competition-standard netball courts, a performing arts space, rooftop garden, terrace balconies and an open atrium.



**BALLINA HIGH SCHOOL, NSW**

Client: NSW Dept. of Education

\$40m new consolidated vertical high school opened in 2019. The development focused on flexible, highly functional spaces incorporating open learning community areas, performance theatre, music rooms and assembly areas.



**LUTHER COLLEGE MIDDLE SCHOOL, VIC**

Client: Cox Architecture

Refurbishment of an existing Annex space to provide a clean, light, acoustically supportive space, with acoustic treatment provided in key areas to support the learning functions.



**GEELONG GRAMMAR SCHOOL OF PERFORMING ARTS AND CREATIVE EDUCATION, VIC**

Client: Peter Elliot Architecture

Full acoustic design services for this technologically innovative performing arts centre. Key spaces included a 1,000-seat multi-functional hall, a 270-seat studio, classrooms, and an interactive foyer featuring an impressive suite of video walls and touch learning pods.



**INTERNATIONAL SCHOOL HO CHI MINH CITY, VIETNAM**

Architect: Cognita Asia

Marshall Day provided theatre, AV, sound system and acoustic consulting services for the performing arts centre project. The project included a 350-seat black box theatre with shared foyer areas, change rooms and all the usual spaces associated with a theatre in a school environment.



**SACRED HEART PERFORMING ARTS CENTRE, AUCKLAND, NZ**

Client: Jasmax

State-of-the-art 1,500-person capacity, 2,500sqm multi-purpose performing arts auditorium. With a wide range of proposed activities, the acoustic design was critical to ensure a functional space.



**UNIVERSITY OF TASMANIA MARINE AND ANTARCTIC STUDIES CENTRE**

Architect: John Wardle Architects

New research facility in Tasmania located on the waterfront. Marshall Day completed the acoustic design for this project and worked closely with John Wardle Architects to deliver an award winning building.



**UNIVERSITY OF TASMANIA SMALL ANIMALS FACILITY**

Architect: Hames Sharley

Benchmarking of existing facilities and provision of acoustic design advice pertaining to external and internal sound insulation. In addition, mechanical services noise control recommendations were provided for the purpose built animal research facility.



**UTS THOMAS STREET BUILDING, NSW**

Architect: BVN + DBJ

Provision of acoustic design and construction advice for the new Faculty of Science and Graduate School of Health. The Thomas St Building includes superlabs, practice and consultant rooms, lecture theatre, seminar spaces and research areas.



**MONASH SCIENCE TECHNOLOGY RESEARCH AND INNOVATION PRECINCT STAGE 2 AND 3, VIC**

Architect: DesignInc

The Monash STRIP Stage 2 & 3 project is an extension to the existing STRIP 1 facility. Extensive ESD elements are incorporated into the design including exposed slabs, chilled beams and displacement air-conditioning systems. Marshall Day provided full acoustic design consultancy on the project.



**PETER DOHERTY INSTITUTE, PARKVILLE**

Client: University of Melbourne

The Doherty Institute is a world-class institute combining research, teaching, public health and reference laboratory services, diagnostic services and clinical care into infectious diseases and immunity in one building. Marshall Day was responsible for the design of acoustic treatment and vibration control.



**LATROBE UNIVERSITY LIBRARY, BUNDOORA, VIC**

Architect: John Wardle

5,000 m<sup>2</sup> library development at Latrobe University's Bundoora campus.



## MELBOURNE BRAIN CENTRE

Client: Florey Institute/University of Melbourne

The Melbourne Brain Centre is home to Australia's largest brain research collaboration. Marshall Day provided services for acoustic design and vibration control. Key challenges at the University of Melbourne's Parkville site included the location of highly sensitive laboratory floors with stringent vibration specifications, in close proximity to vibration sources.



## UNSW FACULTY OF LAW BUILDING, NSW

Architect: Lyons Architects

Acoustic design of the new Law Faculty building incorporating a 350 seat auditorium, teaching spaces, a new library and office accommodation.



## ANU CANBERRA SCHOOL OF MUSIC, STAGE 2, ACT

Architect: MGT Canberra

Acoustic design of Stage 2 of the Canberra School of Music, including a recital room, jazz and classical music practice rooms and rehearsal spaces.



## MONASH UNIVERSITY, BERWICK STAGE 2, VIC

Architect: Woods Bagot

Marshall Day provided the room acoustics, sound insulation and noise control design of the extension to the Berwick campus at Monash University.



## DEAKIN UNIVERSITY CENTRAL PRECINCT, VIC

Architect: H2O

New university precinct with gymnasium, lecture theatre, classrooms and office accommodation.



## VICTORIA UNIVERSITY LEARNING COMMONS AND EXERCISE SCIENCE PRECINCT, VIC

Client: John Wardle Architects

New purpose built sports facility including sleep assessment areas, VO2 measure, laboratories, teaching spaces. Used by Western Bulldogs as a training facility.





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