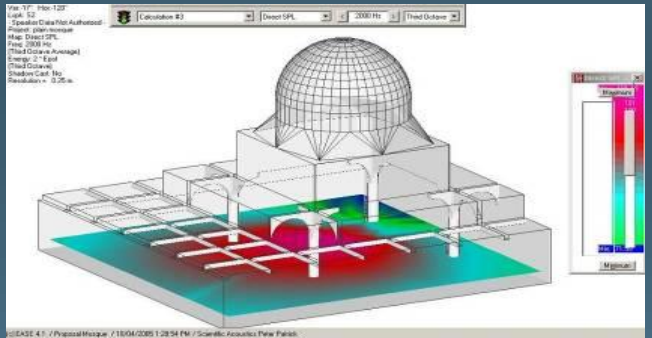


palmer acoustics

Australia Pty Ltd

CONSULTING ACOUSTIC ENGINEERS



COMPANY PROFILE



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IF IT IS NOISE - WE DO IT

Palmer Acoustics Pty Ltd

Ross Palmer established Palmer Acoustics (Australia) Pty Ltd in 1991 with the vision to position the company as the preferred supplier of acoustic services to the Australasian and South East Asian markets. Palmer Acoustics expanded rapidly and within 10 years had gained recognition from clients as a leading consultant with a reputation as a professional acoustic consulting services specializing in building and environmental projects. Palmer Acoustics is currently active in Australia, Thailand, Singapore, Doha and Vietnam, with offices in Brisbane and Bangkok.

Palmer Acoustics continues to focus on providing comprehensive and integrated acoustic consulting services, from project feasibility studies to final commissioning. At every stage this company adopts a practical engineering-based approach to acoustical problems and through intensive design and analysis achieves cost effective solutions. Using its extensive network and experience developed over 23 years, it is able to draw from a large information data base to provide practical, proven solutions to a wide range of acoustic engineering matters.

Palmer Acoustics has been commissioned on projects in Australia, New Zealand, Malaysia, Thailand, Cambodia, Vietnam, Hong Kong, China, Saudi Arabia, Papua New Guinea, Fiji, India, Sri Lanka and the United Arab Emirates.



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Our Services

Palmer Acoustics services cover every aspect of acoustic engineering across a wide range of industry sectors and project types. We engineer to provide the highest quality of acoustic environment necessary for the efficient performance of the individual spaces to achieve aural comfort and intelligibility for the users.

We provide services from inception to completion of a project with expert and experienced acoustic consultants who use the latest computer analysis and modelling software together with the latest testing, measuring and data collection equipment.

We engineer to meet the International and National Codes and Standards and also regulatory frameworks applicable to each project or commission and the individual spaces within.

An overview of the various acoustic services follows:

Architectural and Building Acoustics

- Acoustic Design of theatres, cinemas, mosques, lecture halls and specialist spaces to ensure high levels of speech intelligibility and appropriate levels of reverberation.
- Internal space acoustic planning
- Sound isolation from external noise sources
- Control of reverberant noise build-up
- Speech privacy and intelligibility modelling and testing
- Building transportation noise and vibration control
- Mechanical plant and equipment noise containment
- Building Code and Green Star compliance
- Sound Systems Design
- Fire Evacuation Alarm acoustic design
- Audio Visual Systems

Industrial Acoustics-Workplace Health & Safety

- Acoustic planning for containment of noise
- Workplace industrial noise surveys and reporting
- Machine room monitoring using real time remote monitoring systems
- Vibration monitoring and analysis

Urban Infrastructure Acoustics

- Environmental noise impact assessments for roads, rail, airports and industrial developments upon adjoining developments.
- Specification, supply and commissioning of airport noise monitoring systems
- Measurement and Assessment of noise generated from large entertainment event venues.

Our Specialties

- Building and Architectural acoustic design
- Environmental noise impact and assessments
- Acoustic Material and Systems Specifications and commissioning
- Acoustic Testing and Analysis studies
- On site Quality Assurance for implementation of acoustic systems
- Providing training programs in acoustics and noise control

Other Extended Services

Palmer Acoustics is also able to provide and manage other specialist engineering services including:

- Vibration analysis
- Building dynamic studies including computational finite element modelling
- Heat and thermal transfer analysis
- Building automation system design
- Lighting and Audio Visual System Design and Testing
- Specialist MEPF services
- Robotics

Application Of Our Services

The Palmer Acoustic Services are applied to projects such as follows and also described in the selected projects section:

Architectural and Building Acoustics

- Residential Buildings-Apartments, Hotels
- Casinos and Gaming venues
- Exhibition and Convention Centres
- Office Buildings
- Shopping Centres
- Restaurants, Hotels and public gathering places
- Large Places of Worship
- Large Auditoria
- Live Theatres, Cinemas, Concert Halls
- Large Sporting and Multi-Purpose Venues
- Universities and Schools
- Broadcasting Studios and Film Studios
- Data Centres, Call Centres
- Hospitals and Medical facilities

Industrial Acoustics

- Manufacturing facilities
- Mining sites
- Industrial Equipment, Plant and Machinery

Urban Infrastructure Acoustics

- Urban Development-Residential, Industrial
- Urban Infrastructure Plant and Equipment
- Sporting and Entertainment Venues

Our Experience

This consultancy has been in operation for 23 years and draws from a combined 100 years of professional acoustic experience.

Palmer Acoustics:

- Is a member of the Association of Australian Acoustical Consultants (AAAC).
- Offers a background of hands-on experience and a practical engineering-based approach. Through intensive design and analysis we aim to achieve cost-effective solutions to noise problems.
- Has an extensive range of specialist noise and vibration measuring equipment.
- Carries \$10m public liability insurance and \$2m professional indemnity Insurance.

Ross Palmer, Consultancy Manager and Principal has over 30 years' experience as an Acoustic Engineer and Consultant after training as an aircraft engineer.

Our Clients

Grocon Construction
Raptis Development
Juniper Construction
Sunland Construction
Multiplex Construction
Mirvac Construction
Sheraton Hotels
Hilton Hotels
Electrowat Thailand

Conrad Jupiter's
Asia Coast Development
Laing O'rourke
Western Digital Thailand
Seagate Thailand
Raffles
Jumeriah
Bovis Lend Lease
Boulderstone Construction
Redco Construction—Doha

Our Projects

The projects presented on the following pages provide a snapshot of the more significant projects where Palmer Acoustics has provided a cross section of acoustic services across various development sectors over the last 23 years.

For a more detailed list of projects and the extent of works involved, please contact our Brisbane office.



Mixed Use High Rise Developments

Q1 Residential Tower - 80 floors

Location: Surfers Paradise, Queensland, AUSTRALIA
 Client: Sunland Constructions

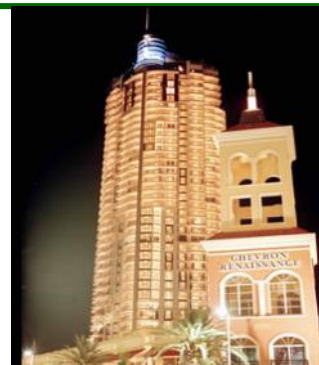
The Q1 Tower at 80 floors was classified as the world's highest residential tower at the time of construction. The Palmer Acoustics commission was to ensure the acoustics met code and occupier requirements with regard to noise levels and acoustic privacy. Of particular concern was privacy between adjacent apartments and noise from mechanical services.



Chevron Renaissance

Location: Surfers Paradise, Queensland, AUSTRALIA
 Client: Rapcivic Constructions

Palmer Acoustics was commissioned as the acoustic consultant by Rapcivic for the 3 tower, 50 level, major residential development on the Chevron Renaissance development



Aurora

Location: Brisbane, Queensland, AUSTRALIA
 Client: Bovis Lend Lease

Palmer Acoustics was commissioned to manage all acoustic issues, from concept development to commissioning in this landmark development with 69 levels and 420 residential units. The Aurora was at the time Brisbane's tallest residential building.



Southport Central Stages 1, 2 and 3

Location: Gold Coast, Queensland, AUSTRALIA
 Client: Rapcivic Construction

Southport Central is a \$700m Rapcivic Construction mixed use development on the Gold Coast. Palmer Acoustics worked with Rapcivic on all stages of the development to ensure that the acoustics amenity inside the office and residential areas met marketing expectations.



Etihad Towers

Location: Abu Dhabi, UNITED ARAB EMIRATES
 Client: Jumeirah Group

Palmer Acoustics was commissioned by DBI Architects on the prize winning prestigious Etihad Towers mixed use development in Abu Dhabi.



Mixed Use High Rise Developments

Hotel Palazzo Versace

Location: Gold Coast, Queensland, AUSTRALIA
 Client: Sunland Constructions

The Gold Coast Palazzo Versace was the first in a series of 6 star Versace hotels to be established. Acoustics were an important consideration. Palmer Acoustics was commissioned to provide full acoustic services.



Brisbane Casino & Treasury Hotel

Location: Brisbane, Queensland, AUSTRALIA
 Client: Conrad Jupiters

Palmer Acoustics was commissioned to ensure that the required levels of acoustic amenity were achieved. The conversion of a heritage listed State Government buildings into a 5 star hotel and casino posed many challenges.



Rydges Hotel

Location: Brisbane, Queensland, AUSTRALIA
 Client: Fletcher Construction

Palmer Acoustics provided a full acoustic commission on this 5 Star South Bank hotel located immediately adjacent to the South Brisbane railway line.



Novotel Hotel Brisbane

Location: Brisbane, Queensland, AUSTRALIA
 Client: Novotel

Palmer Acoustics was commissioned to ensure that all acoustic requirements of this project met the high expectations of the client. The project was conceived in the mid 80's with final construction in the late 90's. The outcome is a landmark hotel well recognized for its quality in the Central Business District.



Oracle – Twin Towers

Location: Gold Coast, Queensland, AUSTRALIA
 Client: Neicon Australia

Palmer Acoustics was commissioned as the acoustic consultant to Niecon Development for this prestigious two tower mixed use development project.



Mixed Use High Rise Developments

845 Ann Street Fortitude Valley

Location: Brisbane Queensland, AUSTRALIA
 Client: Laing O'Rourke

Palmer Acoustics provided a full acoustic commission on this mixed use Green Star office and residential development



Sukhothai Hotel

Location: Bangkok, THAILAND
 Client: Grace Ivory Hong Kong

Palmer Acoustics provided a full acoustics and Audio Visual Consultancy commission for this 5 star three tower Hotel / Condominium on Sathorn Rd Bangkok.



Ho Tram Strip Resort and Casino

Location: Ba Ria, Vung Tau, VIETNAM
 Client: Asian Coast Developments (Canada) Ltd

Palmer Acoustics were commissioned by Meinhardt Vietnam as the acoustic consultants on this 5 star \$US3.4B casino/resort development on the east coast of Vietnam 90Km from Ho Chi Minh City.



Raffles Hotel

Location: Da Nang, VIETNAM
 Client: Hill International

Palmer Acoustics was commissioned to provide full acoustic consultancy services for the design development and documentation for the proposed 150 room Raffles 5 star hotel and villa development in Da Nang Vietnam.



Saadiyat Island Resort

Location: Abu Dhabi, UNITED ARAB EMIRATES
 Client: Jumeriah

Palmer Acoustics was commissioned to assist in the development and construction of this 5 Star 150 room Jumeriah resort on Saadiyat Island off the coast from Abu Dhabi.



Mixed Use High Rise Developments

Soul Surfers Paradise

Location: Surfers Paradise, QLD
 Client: Grocon

Palmer Acoustics was commissioned to address construction and commissioning issues on this 5 star twin tower 77 level Juniper Construction development on Surfers Paradise beach.



Browns Beach Hotel Sri Lanka

Location: Browns Beach, Sri Lanka
 Client: DAS International

Palmer Acoustics was commissioned by DAS International (QLD) as the project acoustic consultants to address all acoustic matters during Design Development for this 5 Star beach resort development.



Freshwater Point

Location: Freshwater Point Gold Coast
 Client: Matthews Construction

Palmer Acoustics was commissioned to address all the acoustic issues from development approval to commissioning of this 5 star Gold Coast residential complex with 270 units and 2 levels of underground parking.



Scott Street Kangaroo Point

Location: Scott Street Kangaroo Point
 Client: Waterford Properties

Palmer Acoustics was commissioned to address all the acoustic issues from development approval to commissioning stages for this 15 level iconic residential building with 12 exclusive apartments.



Sun City Resort Gold Coast

Location: Gold Coast, Queensland, AUSTRALIA
 Client: Sunland Construction

Palmer Acoustics was commissioned to address acoustic design, construction and commissioning issues on this 4 star 39 level development in Surfers Paradise



Mixed Use High Rise Developments

Admiralty Towers 1, 2 and QUAYS

Location: Brisbane CBD , Queensland, AUSTRALIA
 Client: Seymour Group

Palmer Acoustics provided full acoustics consultancy services to the Seymour group for the construction of these high profile 4 star residential towers.



State Tennis Centre

Location: Brisbane, Queensland, AUSTRALIA
 Client: Mirvac Qld

Palmer Acoustics provide acoustic consultancy services to Mirvac Queensland for the acoustic design of the State Tennis Centre Queensland Arena and associated residential development of 3 towers.



333 Ann Street

Location: Brisbane CBD, Queensland, AUSTRALIA
 Client: Devine Construction

Palmer Acoustics was commissioned to provide a full acoustic service on this high rise, mixed-use development in the Brisbane Central Business District.



MacArthur Developments

Location: Brisbane CBD, Queensland, AUSTRALIA
 Client: Ariadne / Seymour Group

Palmer Acoustics provided consultancy services to address in particular the mechanical plant noise control and the façade acoustic isolation on this high quality commercial and retail development in the heart of the Brisbane Central Business District.



SEACON Square

Location: Bangkok, THAILAND
 Client: EEC Lincolne Scott

Palmer Acoustics provided full acoustic consultancy services for this significant 400,000m² retail development in Bangkok.



Entertainment & Auditoria

Gold Coast Convention & Exhibition Centre

Location: Gold Coast, Queensland, AUSTRALIA
Client: Jupiters Ltd

Palmer Acoustics was jointly commissioned with Gabriel's Environmental (Perth) as the acoustics consultants on this high profile convention centre development. The commission was concerned with all aspects of the acoustic design, construction and commissioning, with a particular focus on environmental noise breakout.



Conrad Jupiters Casino & Hotel

Location: Gold Coast, Queensland, AUSTRALIA
Client: Conrad Jupiter

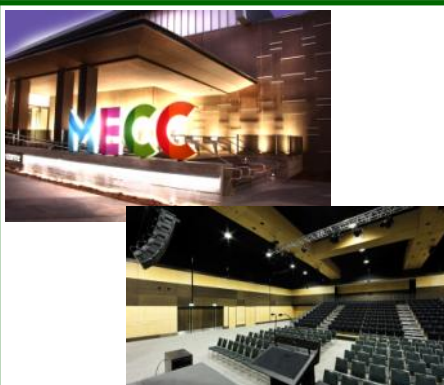
Palmer Acoustics was commissioned to assess issues of entertainment noise from the Casino affecting adjacent residential areas and also entertainment noise within the atrium affecting adjacent hotel guest rooms.



Mackay Exhibition & Convention Centre

Location: Mackay, Queensland, AUSTRALIA
Client: Mackay City Council

Palmer Acoustics was commissioned as the acoustics consultant on this high profile convention centre development. The commission was concerned with all aspects of the acoustic design, construction and commissioning, with a particular focus on environmental noise breakout.



Alor Setar Mosque

Location: Alor Setar, MALAYSIA
Client: Alor Setar Mosque

Palmer Acoustics was commissioned to redesign the room acoustic treatments to resolve the issues of speech intelligibility in the main prayer room and sports hall.



Impact Challenger Ballroom

Location: Bangkok, THAILAND
Client: Impact Challenger

Palmer Acoustics was commissioned by Impact Arena management to review the acoustics, Audio Visual and lighting of their flagship ballroom. The ballroom, 90m long x 45m wide x 15m high, was engineered to provide high quality room acoustics and lighting that was flexible and suited a range of potential uses.



Theatre, Studio and Arena Acoustic Design

State Tennis Centre—Queensland

Location: Tennyson Queensland, AUSTRALIA
Client: Mirvac Construction

Palmer Acoustics was commissioned on all aspects of the Acoustics and Audio Visual design for the State Tennis Centre 5,500 seat Arena in Brisbane.



IUB Theatre Bangladesh

Location: Dakar, BANGLADESH
Client: International University Bangladesh

Palmer Acoustics was commissioned to review the design of the proposed IUB 1,000 seat theatre and provide quality inspections on the acoustics, lighting and Audio Visual systems.



Vin Pearl Theme Park Vietnam

Location - Nah Trang, VIETNAM
Client - DAS International

Palmer Acoustics was commissioned to assess the acoustics of the 5,000 seat amphitheatre and associated park facilities within the 5 star theme park.



Griffith University Film School

Location - Brisbane, Queensland, AUSTRALIA
Client - Griffith University

Palmer Acoustics was commissioned to define the required acoustic treatments to ensure that the space within an existing heritage listed building in Southbank was able to function as a high quality recording and theatre area.



Phoenix Television Studios Hong Kong

Location - HONG KONG
Client - Phoenix Studios

Palmer Acoustics was commissioned to provide design advice and specifications for the management of noise to ensure high levels of speech intelligibility and privacy throughout the total TV broadcast and studio areas.



Theatre, Studio and Arena Acoustic Design

Sun TV India

Location: Chennai, INDIA
 Client: Primemeasure Technologies

Palmer Acoustics was commissioned to review the design and construction details of the partially constructed Sun TV facility in Chennai.



HappyLand Film Studios - Vietnam

Location: Ben Luc, Long An Province, VIETNAM
 Client: Sanderson Group HCMC

Palmer Acoustics was commissioned to provide a full acoustic services package for the design of the proposed HappyLand Film Studios at the gateway to Ho Chi Minh City.



QUT-Kelvin Grove Studios

Location: Brisbane, Queensland, AUSTRALIA
 Client: Laing O'Rourke

Palmer Acoustics was commissioned to provide a full acoustic detailed design for the proposed Queensland University of Technology music studios and dance facility.



Suncorp Stadium (Lang Park)

Location: Brisbane Queensland, AUSTRALIA
 Client: MMM Mechanical

Palmer Acoustics was commissioned to review all of the mechanical services acoustic details for this 52,000 seat sports stadium.



Kuwait Olympic Village

Location: Kuwait, City, Kuwait
 Client: Public Authority for Housing through DAS International

Palmer Acoustics was commissioned to advise with regard to building acoustics and speech intelligibility matters on this \$US 2b 7 stadium Olympics village complex.



Industrial Acoustics

ADDC Pumping Stations Condition Assessment

Location: Abu Dhabi, UNITED ARAB EMIRATES
 Client: ADDC (Government) through GH&D

Palmer Acoustics was commissioned to assess the condition of 39 district water booster pumping stations throughout Abu Dhabi. The assessments included vibration, electrical checks, alignment thermal properties and noise measurements.



Enhsam and Peak Downs Open Cut Coal Mine

Location: Emerald, Queensland, AUSTRALIA
 Client: Bucyrus

Palmer Acoustics was commissioned to assess the 1/3 octave band noise through, within and around the on-site Dragline in a range of operating conditions and locations.



Waste Water Treatment and Pumping Station - Acoustic Assessment

Location: Bangkok, THAILAND
 Client: NVPSKG Joint Venture

Palmer Acoustics was commissioned to assess and report on the noise impacts associated with 4 proposed pumping stations and a water treatment plant.



RAN Landing Craft

Location: Cairns, Queensland, AUSTRALIA
 Client: Royal Australian Navy

Palmer Acoustics was commissioned to carry out noise and vibration assessments of Royal Australian Navy landing craft to confirm compliance with military specifications.



Astral Salvor Noise Tests

Location: Brisbane River, Queensland, AUSTRALIA
 Client: Astral Salvor Brisbane

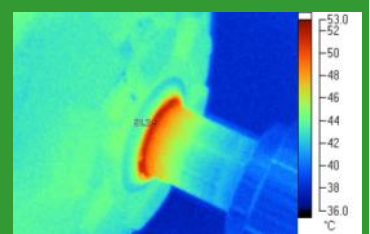
Palmer Acoustics was commissioned to make noise assessments of Brisbane river Tugboat to assess the levels of noise reduction following noise control treatments.



Other Project Images



Other Project Images



Profile-Ross Palmer CPEng RPEQ NPER 3

Principal / Director

Qualifications:

Bachelor of Engineering (Mechanical),
University of Canterbury, New Zealand, 1979
Registered Professional Engineer Queensland

Professional Memberships:

Association of Acoustical Consultants
Institution of Engineers Australia (IEAust)
Australian Institute of Refrigeration and Air Conditioning Engineers (AIRAH)
The Australian Acoustical Society (AAS)
The Acoustical Society New Zealand (ASNZ)



Personal Profile:

Ross is a practising Consulting Engineer and Principal of Palmer Acoustics (Australia) Pty . He commenced practise as an acoustics engineer in 1980 and has extensive practical, professional experience in noise control engineering and is a registered engineer capable of design solutions or certifying compliance. His experience extends over a diverse range of acoustic challenges and he is known for innovative and cost effective acoustic solutions. Ross is also well respected in the academic field and has delivered many training courses, including "Noise Control Principles & Practice", "Building Services Acoustics", "Noise in Buildings" "Advanced Noise Level Assessment" and "Noise in High Rise Buildings". Ross has presented acoustic engineering technical papers at international forums such as the 20th International Congress on Sound and Vibration, Bangkok, Thailand 2013 and the Council of Tall Buildings and Urban Habitat Conference, Dubai 2008.

Selected Project Experience Includes:

Palmer Acoustics Australia Pty Ltd

Principal consultant to Palmer Acoustics from conception in 1991, responsible for all aspects of the business including market development, project and principal engineering, and sole company Director. He has been the lead consultant on many projects throughout the UAE, SE Asia and Australasia regions.

The Treasury Casino & Hotel-Brisbane, Australia

Ross was the Principal Acoustic Consultant on the design team of this 2.5 year, \$165m, 136 guest room development. Responsibilities included assessing background noise levels, the acoustic characteristics of the Treasury and Lands Buildings and ensuring that the acoustics of the completed Casino and Hotel satisfied the requirements for a high quality development.

Rydges-South Bank Hotel –Brisbane, Australia

Ross was the Principal Acoustic Consultant to the construction company (Fletcher Construction) on this \$35m, 7 level (140 room), 3 star hotel development. A major concern was noise and vibration from the adjacent South Brisbane railway line.

Admiralty Towers 1 & 2 and Admiralty Quays - Brisbane, Australia

Acoustic Consultant on these high rise residential developments in the Brisbane CBD (approx \$35m each). Responsibilities included all acoustic services and in particular noise from mid level lift motor rooms.

Robina Dong Ah - Golf Club, Hotel & Residential Development, Gold Coast, Australia

Acoustic Consultant commissioned to investigate and report on all acoustic issues involved with this development. Particular emphasis was placed on the impact of traffic noise from the adjacent Pacific Highway onto the amenity of the residential units.

Profile-Ross Palmer CPEng RPEQ NPER 3

Crown Towers - Gold Coast, Australia

Acoustic Consultant to this \$60m Gold Coast high rise residential development to offer high class residential and serviced apartments. Particular issues were noise from the ground level cooling towers and the acoustics of the 11 storey atrium.

Morayfield Shopping Centre - Brisbane, Australia

Acoustic Consultant to the development of this major shopping centre with particular emphasis on the acoustics of the 8 cinemas.

State Government Building - Rockhampton-, Queensland, Australia

Acoustic Consultant to Statham's, responsible to ensure that the 6 storey State Government office building in Rockhampton satisfies the requirements set by the State Government for their office buildings.

Cathedral Place – Brisbane CBD, Australia

Acoustic consultant to a 400 unit residential development located adjacent to three major roads in the Brisbane CBD. The isolation of noise across the building façade was a major issue with regard to performance and cost.

Hope Island Resort Gold Club – Gold Coast, Australia

Acoustic Consultant on this project to review the services design to ensure that resultant noise levels did not compromise the quality of this 5 star Clubhouse, Ballroom and Restaurant development.

The Marriot International Hotel – Gold Coast, Australia

Responsible to check design, tender documents and construction details to ensure that the acoustics of this 28 level hotel development conformed to the expectations of a 5 star development.

Palazzo Versace Hotel Development – Gold Coast, Australia

Acoustic consultant to Sunland Corporation on this 5 star, \$60m hotel development. Responsibility included all issues of noise isolation and mechanical plant noise.

Twin Waters Resort – Sunshine Coast, Australia

Senior Mechanical and Acoustic Engineer assisting in the rectification of project problems and commissioning of this 350 room holiday resort. Acoustic tests were carried out on all the 350 accommodation air conditioning units.

Riviera Stages 1 and 2 – South Bank, Brisbane, Australia

Acoustic consultant to Watpac for this major high rise residential development located within 30m of the South East Freeway, on a bend in the Brisbane River.

Australian Embassy Apartments - Bangkok, Thailand

Acoustic Consultant to the construction company on this 3 storey apartment building being constructed to high international standards, specifically designed to control external noise through the facade and limit internal noise levels from building services.

Seacon Square - Bangkok, Thailand

Acoustic Consultant to the Project Team to ensure that the acoustics of this 430,000m² retail development satisfied the requirements of a high quality retail development. Features included 14 cinemas, extensive food courts, large conference and entertainment areas and parking for 4300 cars.

The Ho Tram Strip Resort & Casino - Ba Ria, Vung Tau, Vietnam

Acoustic Consultant to Meinhardt Vietnam for the \$3.4B resort / casino and 5 star hotel on the East Coast of Vietnam 90 Km from HCMC. Ross was involved from the detailed Design Development stage through construction, testing and commissioning. Stage 1 of the project was completed in December 2012.