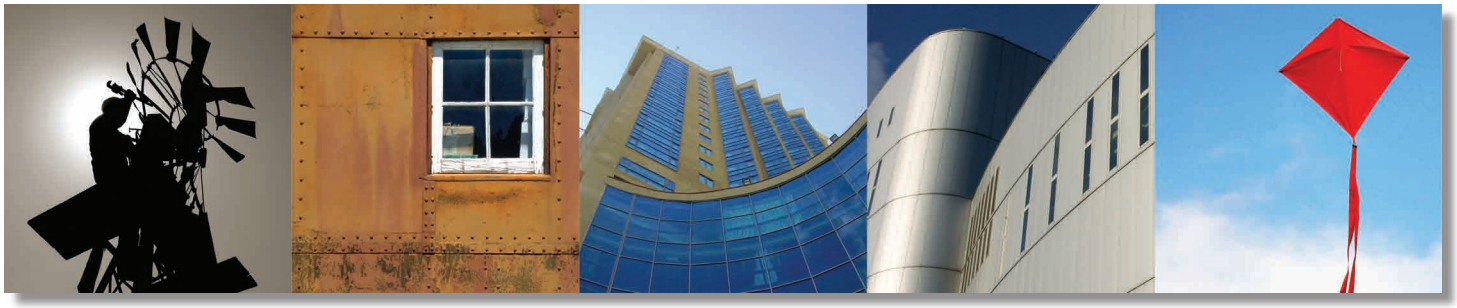
HEGGIES SLR
global environmental solutions

BUILDING

Company Background - Overall Service Capabilities

SLR Heggies is a progressive firm of consulting engineers and scientists providing services in a range of specialist engineering and environmental fields.

- Engineering Sciences – Acoustics – Vibration – Structural Dynamics
  - Acoustics – Noise and Vibration Assessment and Control
  - Structural Dynamics – Experimental Modal Analysis – Strain Gauging – Dynamic FEA
  - Structural Condition Monitoring
  - Wind Engineering – Meteorology – CFD – Natural Ventilation
  - Specialist Building Technologies – Energy – ESD – Reflectivity – Lighting – Solar Ingress
- Environmental Sciences – Odour and Air Quality – Soil and Water Quality
  - Environmental and Quality Management Systems
  - Environmental Monitoring Websites – Public Education and Training Videos
  - Acoustics and Vibration Design for Transportation, Industrial, Building and Construction Projects
  - Odour and Ambient Air Quality – CO, CO_2, NO_x, SO_x, PAHs, VOCs, Airborne Microbial
  - Hazardous Materials – Asbestos – Heavy Metals – TPH/BTEX PAH etc
  - Contaminated Sites – Fuels Solvents Pesticides – Groundwater Quality
- OHS and Risk Management Services - Media Services – R & D
  - Occupational Hygiene – Respirable Dust – SMF – Fumes
  - Confined Spaces – Heat Stress – OHS Management
  - NATA Laboratory – Research and Development Services



Our consultants apply advanced technologies and innovation to manage risks, optimise opportunities and enhance the cost effectiveness of project solutions. Guidance is provided from planning and design through to compliance assessment and the ongoing operational stages of transportation, architectural, construction, industrial, minerals extraction and infrastructure development projects.

Since the company was incorporated in 1978, services have grown to embrace acoustics, vibration, air quality, noise and vibration control, blast design and monitoring, modal analysis, structural dynamics, wind engineering, solar and energy/ESD studies. The company achieved a significant milestone in 2004 with the acquisition of New Environment Management and Technology, augmenting the company's environmental, hazardous materials and OHS services.

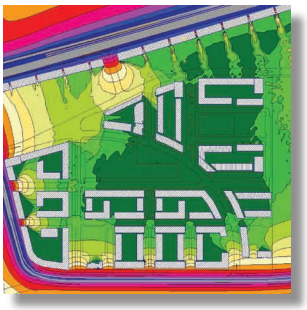
SLR Heggies operates operates under a Quality Management System fully certified to AS/NZS ISO 9001:2000 (SAI Global Licence No. 3236) and has NATA-accreditation for its laboratory (to ISO 17025) and for air volume measurement and asbestos fibre counting.

With approximately 140 staff and offices in Sydney, Brisbane, Newcastle, Wollongong, Canberra, Melbourne, Perth, Townsville and Singapore, SLR Heggies is able to provide specialist resources for both large and small projects in all states of Australia, New Zealand, Papua New Guinea and South East Asia. Whether the project is large or small, our consultants pride themselves on providing a high standard of service and technical expertise.

SLR Heggies Building Group Services

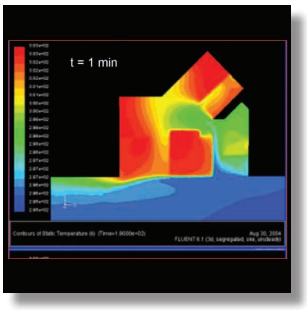
Acoustics

- **Architectural Acoustics**
  - Residential Buildings
  - Office Buildings
  - Retail Developments
- **Mechanical Services**
  - Assessment and Control
  - Vibration Isolation
- **Special Spaces**
  - Auditoria, Theatres
  - Recording Studios
  - Places of Worship
  - Public Building
  - Sport and Recreation



Vibration

- **Monitoring and Predictions**
  - Building Vibrations
  - Bridge Vibrations
  - Ground Vibrations
- **Vibration Mitigation**
  - Vibration Isolation
  - Buildings and Bridges
  - Tuned Mass Dampers

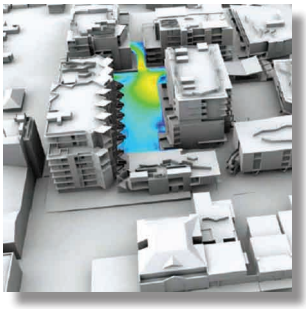


Energy

- **ESD and Sustainability**
  - Assessments
  - Recommendations
- **Energy Ratings / Efficiency**
  - NatHERS, BASIX, BERS, First Rate, ABGRS,Greenstar

Construction

- **Planning**
  - Construction Emissions
  - Predictions
  - Environmental Management Plans
- **Monitoring**
  - Noise and Vibration
  - Air Quality, Dust
  - Erosion and Sedimentation
  - Water Quality

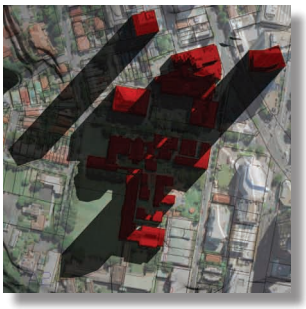


Site Contamination

- **Remediation**
  - Surveys and Remediation
  - Action Plans
  - Validation Surveys
- **Hazardous Materials**
  - Asbestos, Lead, PCBs Surveys, NATA Labs

Wind Engineering

- **Wind Loads**
  - Pressure Cladding Tests
  - Structural Tests
  - Tuned Mass Dampers
- **CFD (Fluent)**
  - Ventilation Flow Simulations
- **Environmental Winds**
  - Wind Effects Statement
  - Natural Ventilation



Planning

- **New Development**
  - Approvals
  - Master-Planning
  - Studies

SLR Heggies Building Group Services

Building Acoustics

Control of reverberation, reinforcement of sound projection, reduction of outdoor noise and control of privacy and noise transfer and between spaces are the key elements of acoustic design. It is important to consider the implications of the mechanical plant early in the design phase, as constraints imposed by internal and external criteria will be reflected in control measures.

Frequently the need to address problems retrospectively can necessitate extensive controls resulting in relatively high cost. SLR Heggies has considerable experience in the specification, design and control of mechanical services noise and vibration.

Environmental Acoustics and Noise Control

Land use planning provides for the orderly development of transporation corridors and industrial zones and adjacent noise-sensitive areas. Such planning minimises the community's exposure to excessive noise and vibration and other potential pollutants.

Early consideration of acoustical issues in the planning of new developments also leads to cost-effective solutions. Site layout and internal building space allocations can be optimised to reduce the need for specialist noise control measures.

Energy/ESD

SLR Heggies is committed to the advancement of Ecological Sustainable Development (ESD) and the application of innovative and cost-effective "green" building designs. SLR Heggies provides ESD advice for multi-storey residential buildings, retail buildings, educational facilities, industrial facilities, healthcare facilities and office fit-outs. With 30 years of professional consulting experience, SLR Heggies understands the constraint when integrating ESD applications to a built environment, thereby allowing us to achieve a balance between cost and "green" benefits for a building development.

SLR Heggies ESD services:

- BASIX Assessment and NatHERS & AccuRate Modelling
- Green Star Assessment
- ABGR Commitment Agreement design
- BCA Section J Energy Efficiency Assessment
- Qualitative ESD assessment of building developments
- Detailed ESD advice on sustainable materials selections
- Detailed ESD advice on building fabric and systems
- Embodied energy assessment of materials
- Waste management plans for construction and building operations
- Daylight and illumination modelling of internal spaces
- Natural ventilation – detailed modelling studies

Indoor Air Quality

The air within homes and workplaces can be, without us realising it, highly polluted and can represent a significant health risk, causing problems such as headache, fatigue, coughing, sneezing, dizziness, and eye, nose, throat and skin irritation. SLR Heggies regularly consult on this issue, in particular:

- Sick Buildings and Legionella
- Internal Building Air Movement Studies
- Indoor Air Quality Surveys
- Natural Ventilation Studies
- Mould Fungus and Bacteria Issues

Wind Engineering

Wind effects influence the design of buildings, towers and bridges as well as the public spaces around building developments used by pedestrians and building occupants (eg outdoor eating and relaxation areas). Wind tunnel testing of scale models is often used to provide confident predictions of such wind effects as a basis for structural and architectural design.

For taller buildings, towers, bridges and lightweight structures, wind-induced loads usually provide limiting load conditions for strength and displacement considerations. Acceleration effects for the occupants of high-rise buildings - especially residential towers - often become governing criteria for taller buildings.

Such building responses (forces including torsional loads, displacement and acceleration) are generally poorly predicted by wind codes. This is especially the case for buildings with unusual aerodynamic cross-sections or buildings in close proximity to other similar height towers where complex interaction effects can take place.

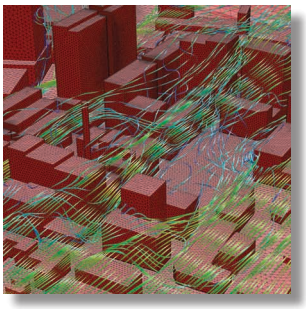
Computational Fluid Dynamics

SLR Heggies uses numerical analysis incorporating Computational Fluid Dynamic (CFD) to overcome some of the limitations in wind tunnel testing such as bounded air movement through internal building spaces or for the purposes of flow visualisation. This technique allows for detailed airflow studies of internal naturally ventilated spaces.

Solar Studies - Glare, Shading, Lighting, Solar Ingress

SLR Heggies services include:

- Reflective glare assessments for curtain wall facades
- Overshadowing studies using detailed 3-D modelling
- Daytime and night-time Illumination studies, internal lux levels



BUILDING

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ENVIRONMENTAL SERVICES

ACOUSTICAL DESIGN	• REF, EES, EIA, EIS Studies - Road, Rail, Aircraft, Industry, Mining • Building Acoustics, BCA compliance • Mechanical Services Noise / Vibration • Construction Noise and Vibration • Environmental Management Plans	• Blast and Explosion Assessment / Control • Silencers, Attenuators, Enclosures, etc • Resilient Mounts, Vibration Isolation Mats, Tuned Mass Dampers • Community Liaison, Expert Testimony, Regulatory Authority Meetings
AIR QUALITY	• Outdoor & Indoor REF, EES, EIA, EIS Studies - Industries, Transportation and other sectors • Atmospheric Dispersion Modelling for All Airborne Pollutants and Odour • Monitoring All Major Air Pollutants / Odours	• Design/Operation of ambient Air Quality Monitoring Networks • Indoor Air Quality, Natural Ventilation • AUSPLUME, TAPM, CALPUFF, ISC3, ADMS3 CALINE4, AERMOD, FLUENT (CFD)
WATER QUALITY	• Water Quality Monitoring	• Ground Water Sampling
HAZARDOUS MATERIALS	• Asbestos: Identification, Monitoring, Fibre Counting, Management, Training	• Contaminated Site Investigations & Surveys; Due Diligence Surveys
SITE CONTAMINATION	• Monitoring for Lead, PCBs, Silica, SMFs – All Major Contaminants	• Remediation Action Plans, Remediation Management, Validation Surveys
METEOROLOGY and CLIMATE	• Monitoring for a Wide Range of Meteorological Parameters	• Wind Climate Analysis, Extreme Climate Risk Assessments

ENGINEERING SCIENCE SERVICES

WIND ENGINEERING and CFD	• Wind Tunnel Testing and Expert Opinion • Full-Scale Testing of Buildings, Bridges	• CFD Simulations Using FLUENT • Natural Ventilation, Indoor Air Quality
SOLAR – ESD ENERGY STUDIES	• Energy Efficiency, Energy Audits • ESD, Sustainability Studies • Shadows, Solar Ingress, Reflectivity • Natural Lighting / Lux Level Simulations	• Energy Ratings – NatHERS, BERS, FirstRate, BASIX, AccuRate (Residential Buildings) • ABGR / GreenStar (Commercial Buildings) • BCA Section J Assessments
STRUCTURAL DYNAMICS and MECHANICAL DESIGN	• Experimental Modal Analysis • Dynamic Finite Element Analysis • Machine Vibration Surveys • Turbine Dynamics and Monitoring • Vibration Isolation Systems	• Pipe / Pulsation Analysis (PULS) • Pipeline / Valve Acoustic Induced Vibration • Fatigue / Fracture / Stress Analysis • Mechanical Systems Design • ProEngineer, NASTRAN, FLUENT
ADVANCED SYSTEMS	• UAV and Aeronautical Studies • Safety MIL-STD 882 and Risk Engineering • Communications • AEO & AMO Certification Systems	• GIS Management/Assessments • Blast Systems & Modelling • Harsh Environments – MIL-STD 810 • EMC Mil-Std 461

OTHER SERVICES

OHS and OCCUPATIONAL HYGIENE PROJECT and RISK MANAGEMENT	• (Certified) OHS Surveys, Audits • Technical Due Diligence Surveys • Ergonomic and Workplace Assessments • Project Management Services	• OHS Management Systems and Training • RF Accumulation & Testing • Risk Studies to AS / NZS 4360 and SAFETY • Health and Toxicology Studies
LABORATORY and R&D SERVICES	• NATA-Accredited to ISO 17025 – Air Volume Sampling, Asbestos Fibre Counting, Asbestos Identification • Research and Development	• Laboratory and Field Testing for Air and Water Quality, Acoustics, Vibration • Harsh Environment – MIL-STD 810, DEF(AUST) 5168, DEF(AUST) 5681
WEBSITE and MEDIA SERVICES	• Web-based Real-time Data Management and Monitoring Interfaces	• Professional Videos for Training, Expert Testimony, Media Presentations