CLIENTS | PEOPLE | PERFORMANCE

AIRCRAFT PAVEMENT ENGINEERING

INFRASTRUCTURE | MINING & INDUSTRY | DEFENCE | PROPERTY & BUILDINGS | ENVIRONMENT

GHD IS AN INTERNATIONAL PROFESSIONAL SERVICES COMPANY. OUR PEOPLE DELIVER INNOVATIVE SOLUTIONS BY COMBINING TECHNICAL SKILL AND EXPERIENCE WITH AN UNDERSTANDING OF OUR CLIENTS' OBJECTIVES AND ASPIRATIONS.

YOUR NEEDS

GHD focuses on creating wealth and opportunity for our clients and their customers by delivering projects that meet or exceed objectives. We do this from the outset by building teams with a shared understanding and focus on clients, which creates a successful project foundation, and reinforces our commitment to financial certainty and on-time delivery.

Our aircraft pavement engineering specialists have practical experience in working on a wide range of international, regional and remote airfields. We can help you with aspects of your project or provide total project delivery.

OUR SERVICES

PLANNING AND CONCEPT DESIGN

- Geometric layout and design
- Concept pavement designs
- Whole of life costing options
- Material investigations

DETAILED DESIGN AND DOCUMENTATION

- New pavements or extensions
- Asphalt overlays
- Reconstruction and other rehabilitation

CONDITION AND STRENGTH EVALUATION

- Periodic and routine pavement inspections
- Distress and failure investigations
- PCN analysis and review
- Non Destructive Testing methods
- Pavement strength modelling using computer based modelling tools

MAINTENANCE SPECIFICATION AND MANAGEMENT

- Design and specification of routine, periodic and major maintenance
- Technical supervision of maintenance activities
- Maintenance program development and management

AIRCRAFT PAVEMENT ENGINEERING

The single most valuable asset at an airport is arguably the aircraft pavement system. GHD understands that aircraft pavements are subjected to static and dynamic aircraft loads as well as exposure to the elements, so only sound engineering judgement, made by experienced and qualified staff, can provide cost-effective and appropriate solutions to aircraft pavement engineering challenges.

GHD also acknowledges the interaction between aircraft pavements, airfield lighting and airport masterplanning. That is why GHD's specialist aircraft pavement team works constantly with our airport planning and airfield lighting specialists to develop comprehensive and integrated solutions.

Rolling a bitumen emulsion sand seal, Lockhart River Airport

Lockhart River Airport geotechnical investigation

Proof rolling pavement in Ha'apai, Tonga

OUR SOLUTIONS

GHD has amassed a significant amount of aircraft pavement engineering experience over the years in Australia, as well as internationally through projects in Norfolk Island, Papua New Guinea, Indonesia and the Pacific Islands.

RAAF BASE TOWNSVILLE NEW AIRCRAFT PAVEMENTS

As part of the redevelopment of RAAF Base Townsville, the Department of Defence constructed new fighter and bomber aircraft parking and loading areas. GHD designed and documented these facilities, including the aircraft pavements. The aircraft pavement design centred on 14 concrete aprons for various design aircraft as well as several kilometres of flexible taxiway pavement. The design included both rigid and flexible aircraft pavements and took into consideration the issues associated with the construction of new aircraft pavements abutting existing runways on an active airfield.

ROCKHAMPTON AIRPORT RUNWAY EXTENSION AND OVERLAY

As the design consultants for the 650-metre extension of the Rockhampton Airport runway, GHD was responsible for the design of the aircraft pavements and the provision of a creek crossing near the existing runway end. GHD analysed the proposed operations from the Rockhampton airport in order to determine the runway extension length required, and provided detailed design for pavements, drainage and airfield lighting. Aircraft pavement thickness design was undertaken using the aircraft pavement specific mechanistic design tool Aircraft Pavement Structural Design System (APSDS).

NORFOLK ISLAND AIRPORT OVERLAY

When the Administration of Norfolk Island elected to overlay the main runway at their international airport, GHD was engaged to provide design and documentation support as well as project management and provision of construction phase services. GHD's design team assessed the use of locally available materials or importation of material for the production of asphalt, as well as viable sites for crushing and asphalt batching operations

NEWCASTLE AIRPORT APRON UPGRADE

GHD was initially engaged to manage a geotechnical investigation to confirm the existing pavement structures for the older apron pavements and determine upgrade requirements for a range of aircraft usage scenarios including B737, B757, B767 and A320 jet aircraft as well as various turbo prop transports. The upgrade options addressed both the geometry and strength of the pavements. Following the selection of the preferred upgrade option by Newcastle Airport, GHD prepared detailed design of upgrade works for an asphalt overlay and pavement widening, including a master grading plan and contract documentation.

GOVE AIRPORT RUNWAY EXTENSION

As the design consultant, GHD's responsibilities included the inspection and evaluation of the existing aircraft pavements, design of a 900-metre extension to the runway as well as a material sourcing and evaluation investigation. GHD delivered both the geometric and pavement designs, and included the use of locally available materials for pavement construction. The design of a three coat seal to provide a pavement surface free of loose materials was also included.

Joint resealing at HMAS Albatross

Applying SEST at HMAS Albatross

HMAS Albatross after SEST application

DEFENCE AIR-TO-AIR REFUELLING STUDIES

GHD investigated the aircraft pavement requirements for the operation of the new Air-to-Air Refuelling aircraft out of RAAF Base Amberley. As part of this commission, GHD undertook geotechnical investigations (including Heavy Falling Weight Deflectometer) as well as both geometric and preliminary thickness design of the new rigid and flexible aircraft pavements. This investigation also identified the requirements for strength upgrades of the existing main runway and taxiway pavements. GHD later conducted similar assessments of ten other Defence airfields across Australia.

LOCKHART RIVER AIRPORT STRENGTH REVIEW AND RESEAL

GHD managed a geotechnical investigation, evaluated the existing pavement strength and reviewed the Pavement Classification Number (PCN) for Lockhart River Airport. When the airport elected to reseal the runway, taxiway and apron, GHD designed and specified the seal, and provided technical supervision of the work. GHD's design team conducted a cost-benefit analysis of the use of marginal local materials and imported quarry product, to provide the most reliable but still economical resurfacing.

HMAS ALBATROSS PAVEMENT MAINTENANCE

GHD initially inspected the aircraft pavements at HMAS Albatross and reported on the required maintenance and relative priorities. The major maintenance requirement was the application of a cutback bitumen Surface Enrichment Spray Treatment (SEST) to the older flexible aircraft pavements and the reinstatement of joint sealant in the rigid pavements. Following the preparation of specifications for the rigid and flexible work packages, GHD developed the Method of Working Plan (MOWP) and provided full-time supervision of the key tasks.

RAAF BASE AMBERLEY PAVEMENT STRENGTH INVESTIGATIONS

With the planned introduction of new, heavier aircraft to RAAF Base Amberley, and the existing aircraft pavement distress caused by F111 aircraft, GHD conducted insitu pavement strength evaluations of both flexible and rigid pavements. These evaluations were supported by a combination of destructive (cores and boreholes) and non-destructive (Heavy Falling Weight Deflectometer) geotechnical investigations. Flexible pavements were modelled under their intended design traffic using the aircraft pavement design tool Aircraft Pavement Structural Design System (APSDS).

ABOUT GHD

GHD is an international professional services company. Our people deliver innovative solutions by combining technical skill and experience with an understanding of our clients' objectives and aspirations.

With more than 6000 people in a network of 100-plus offices throughout Australia, New Zealand, Asia, the Middle East, the Americas and Europe, we serve clients in the global market sectors of infrastructure, mining and industry, defence, property and buildings and the environment.

Central to our clients' prosperity and GHD's success are forward-thinking engineers, architects, planners, scientists, drafters, project managers, economists and supporting staff. Our people embrace the core values that have sustained the company since inception – **Teamwork, Respect and Integrity**.

Established in 1928, GHD is ranked as one of the world's leading engineering, architecture and consultancy firms. We are dedicated to our clients and their stakeholders, to being a responsible corporate citizen and to improving the quality of life around the world.

We contribute to the goals of sustainable development and are committed to managing the social, economic and environmental impacts of our operations and assisting our clients to manage theirs in the provision of our technical consulting services. We recognise innovation as the key to realising this objective.

As a member of the World Business Council for Sustainable Development (WBCSD), GHD actively participates in the public debate on the role business has to play in managing climate change, energy, development and ecosystems.

GHD operates under a Practice Quality Management System that is certified to AS/NZS ISO 9001:2000 and our Environmental Management System (EMS) is accredited to international standard ISO 14001 by NATA Certification Services International (NCSI).

For more information, visit **www.ghd.com.au**

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