

# **GEOSYSTEMS LTD.**

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**MR. JOHN COWLAND**

**SPECIALTY/SKILLS:**

Independent Geotechnical and Geosynthetics  
Engineering Consultant

**GEOGRAPHIC BASE:** Hong Kong, China

**TYPE OF COMPANY:** Sole Proprietor

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## **RESUMÉ**

### **MR. JOHN COWLAND**

**EDUCATION**

B.Sc. Civil Engineering, University of Salford, England  
M.Sc. Soil Mechanics, Imperial College, London  
DIC. Soil Mechanics, Imperial College, London

**KEY EXPERIENCE  
AND ABILITIES**

John Cowland is an Independent Geotechnical and Geosynthetics Engineering Consultant based in Hong Kong, China, with 40 years experience. He has provided advice to numerous government and private sector clients throughout the Asia Pacific region on geotechnical, environmental and geosynthetic projects. These have included solid waste landfills, water supplies, dams, tunnels, mining projects, coastal reclamations, deep excavations, soil slopes, rock slopes, soft ground and foundations. John has also provided advice on project management; especially for environmental and water supply projects.

**PROFESSIONAL  
QUALIFICATIONS  
AND SOCIETIES**

Registered Professional Engineer (Geotechnical), Hong Kong  
Chartered Engineer, United Kingdom  
Member, Hong Kong Institution of Engineers  
Member, Hong Kong Geotechnical Engineering Society  
Member, Institution of Civil Engineers, United Kingdom  
Elected Council Member, International Geosynthetics Society  
Elected Chairman, Hong Kong Association of Geotechnical and  
Geoenvironmental Specialists  
Fellow, Geological Society  
Member, Society of Construction Law

Member, American Society for Testing and Materials  
Member, Hong Kong Waste Management Association  
Associate Member, Australian National Committee on Large Dams  
Associate Member, Academy of Experts

**PRINCIPAL  
PROFESSIONAL  
DISTINCTIONS**

Elected Council Member of the International Geosynthetics Society (IGS) from 2000 to now, and Treasurer 2006 to 2011.  
Invited Member of the Environmental Geotechnics Committee TC 215 of the International Society of Soil Mechanics and Geotechnical Engineering.  
Elected Chairman of the Hong Kong Association of Geotechnical and Geoenvironmental Specialists.  
Invited Speaker on Solid Waste Landfill Design and Landfill Liners at International Conferences and Seminars in Australia, Canada, China, France, Hong Kong, India, Indonesia, Italy, Korea, Malaysia, New Zealand, Philippines, Singapore, Thailand, USA and Vietnam.  
Chairman of International Conference Sessions on Landfill Liners in Atlanta, Kuala Lumpur, Nice, Seoul, Singapore and Yokohama.  
Published 48 papers on Geotechnical Engineering and Geosynthetics.

**PROFESSIONAL  
EXPERIENCE AND  
BACKGROUND**

**INDEPENDENT GEOTECHNICAL ENGINEERING CONSULTANT  
2000-PRESENT**

Provided advice to over 60 clients in the Asia Pacific region on geotechnical, environmental and geosynthetic aspects of infrastructure projects. Assignments have included providing independent design reviews, expert reports, expert technical assistance on site and independent advice on project management. Technical projects have included assessments of the causes of failures, guidance on solutions and advice on litigation.

***Geosynthetics Engineering Projects:***

- Expert advice to the Government of Western Australia on measures to avoid geomembrane liner failures in water supply projects.
- Expert advice to a private client in Eastern Australia on measures to avoid geomembrane liner failures in water retention projects.
- Expert advice on a geomembrane liner failure in Hong Kong.
- Reviewed the leachate drainage provisions for the Marsden Park Landfill in NSW, Australia, designed a new system, and gained approval from the NSW EPA.
- Reviewed the leachate drainage system for the Brandown Landfill in NSW, Australia, and gained approval from the NSW EPA.
- Reviewed geomembrane liner construction on quarried rock faces for the Tirohia Landfill in New Zealand and designed changes, which were approved by the NZ Environment Agency.
- Geotechnical and geosynthetics engineering advice for an Environmental Review of the Urban and Tseung Kwan O Landfills for the Environmental Protection Department (EPD), Hong Kong.
- Advice for a specialist geomembrane liner for a leaking dam in Tasmania.
- Advice for a specialist geomembrane liner for a leaking dam in Thailand.
- Advice for a specialist geomembrane liner for a leaking HEP canal in New Zealand.
- Advice to Vale Inco on geomembrane liners for the containment of liquid chemicals for a nickel mining project in New Caledonia.

- Advice to Rio Tinto Aluminium on geomembrane liners for the containment of liquid chemicals for mining in Australia.
- Advice to Orica Australia on geomembrane liners for the containment of liquid chemicals for mining.
- Provided advice on the construction of two leachate containment ponds within reinforced earth structures for the WENT Landfill, Hong Kong.
- Reviewed the design and construction of the landfill cap for the Xing Feng Landfill, Guangzhou, China.
- Reviewed the liner design for Buttonderry Landfill NSW, Australia.
- Reviewed the liner design for Summerhill Landfill NSW, Australia.
- Reviewed the liner design for Singleton Landfill, NSW, Australia.
- Reviewed the liner design for Red Hill Landfill, Western Australia.
- Reviewed the liner design for a landfill in Seoul, South Korea.
- Reviewed the liner design for a landfill in the Cook Islands, Pacific Ocean.
- Reviewed liner construction for the Diego Garcia Landfill, Indian Ocean.
- Advice on geosynthetic clay liners for the WENT Landfill in Hong Kong.
- Advice on geosynthetic clay liners for the NENT Landfill in Hong Kong.
- Reviewed the use of geogrid reinforcement in the NENT Landfill lining system.
- Reviewed the use of geogrid reinforcement in the WENT Landfill lining system.
- Advice on methods to apply vegetation to steep slopes in Hong Kong utilising geosynthetics.
- Reviewed specialist testing of geosynthetics for a client in the USA.
- Factory quality assurance inspections of geosynthetics in China, Thailand and Taiwan for various clients.

### ***Geotechnical Engineering Projects:***

- Design review of the Shatin to Central Mass Transit Railway (MTR) line for the Hong Kong SAR Government (34 km of tunnels and 9 stations - estimated project value US\$ 8 billion).
- Advice on tunnelling to the Contractor, Maeda/CREC/SELI, for the Tsuen Wan Drainage Tunnel, Hong Kong, including contractual interpretation of the Geotechnical Baseline Report and planning for the use of a tunnel boring machine (TBM).
- Advice on deep excavation design and construction for a Mass Transit Railway (MTR) station (43 m deep beneath two existing stations and four high rise buildings) in Hong Kong.
- Design checking for a MTR station (28 m deep beneath three road bridges and one railway bridge) in Kowloon.
- Expert advice on a retaining wall remedial work failure due to grouting problems in Hong Kong.
- Extensive advice on soft ground and instrumentation to the contractor, Hyundai, for the Container Terminal 9 Project, Tsing Yi, Hong Kong.
- Advice on dewatering to the contractor for a 1.2 km long excavation in an area of sensitive buildings in Hong Kong.
- A safety review of tunnel strengthening works for an old water supply tunnel in Hong Kong.
- Investigations of slope failures in Hong Kong, and design of remedial works.
- Supervision of remedial works for a number of slopes, Hong Kong.
- Supervision of the construction of rock slopes, Hong Kong.

- Advice on slope works for building re-development, Hong Kong.
- Reviewed excessive settlement of a building on bored piles founded on alluvial deposits in Hong Kong (short pile case).
- Reviewed pile founding problems on weathered rocks, Tsuen Wan, Hong Kong.
- Reviewed bored pile design in cavernous marble area, Yuen Long, Hong Kong.
- Reviewed a ground investigation scheme for pile foundations for a number of buildings in the New Territories, Hong Kong.
- Provided advice on building damage due to movement of adjacent excavation, Kowloon, Hong Kong.
- Advice on construction methods for a marine reclamation, Hong Kong.
- Provided advice on settlement due to tunnelling, Tseung Kwan O, Hong Kong.
- Reviewed the soft ground site formation design for the Lao Gang Landfill, Shanghai, China.
- Reviewed blasting methods for rock faces in the Tirohia Landfill, New Zealand.
- Reviewed earth reinforcement construction methods and projects in Asia for clients in Germany, Hong Kong, Italy, Malaysia, the Netherlands and the USA.
- Provided advice on the construction of one of the world's largest reinforced earth structures, to contain waste for the NENT Landfill, Hong Kong.

***Environmental Projects:***

- Studied a failure of a containment method for contaminated marine mud, and made recommendations for its eventual successful use, for a Malaysian client.
- Advice on contaminated mud to the contractor, Hyundai, for Container Terminal 9, Hong Kong.
- Advice on a silt curtain for the Central Reclamation, Hong Kong.
- Advice on a silt curtain for a coal loading facility remediation, Australia.
- Studied potential seabed damage, and obtained EPD approval, for the first reverse osmosis plant constructed by the private sector in Hong Kong.
- Advice to the Hong Kong Cricket Association on the Feasibility of building an International Cricket Ground on the Gin Drinkers Bay Solid Waste Landfill.
- Reviewed methods for environmental laboratory testing in Hong Kong.

***Project Management Assignments:***

- Advice on dredging and filling operations, and preparation of claims, for the Container Terminal 9 reclamation project, Tsing Yi, Hong Kong (project value US\$ 600 million).
- Project manager for the installation of a reverse osmosis water supply system in Hong Kong.
- Project manager for the reconstruction of a golf course in Hong Kong.

**GEOTECHNICAL ENGINEERING OFFICE, HONG KONG GOVERNMENT  
*Senior Geotechnical Engineer, 1981 – 2000***

Experience in this period included:

***Advisory Division (1986-2000)***

- Led a team that provided an advisory service to other government departments giving specialist advice for their geotechnical problems. Gave advice on tunnels, soil and rock slopes, retaining walls, reclamations, embankments on soft soils, instrumentation, explosives, solid waste landfills and geosynthetics.

### ***Solid Waste Landfills***

- Provided design input to all 16 of Hong Kong's landfills in various stages of planning, design, operation and restoration. Carried out liner and cap design, construction specification, and research into the geotechnical properties of waste and the durability of liner materials. Also involved in environmental studies for the landfills. Three of these landfills are amongst the largest in the world, with expected waste intakes of over 50 million tonnes.
- Responsible for assessing the stability of these landfills, which led to an extensive review of the strength of various geosynthetic components of the lining and capping systems.
- Responsible for the designs of large seaward extensions of two coastal landfills founded on soft marine soils. These were particularly challenging projects as one of the landfills had previously suffered a large stability failure.

### ***Slopes***

- Designed about 100 soil and rock slopes, up to 80 metres high, and investigated numerous slope failures. These cut and fill slopes were distributed throughout the various geological conditions of Hong Kong. Designed and interpreted ground investigations, carried out stability analyses, carried out designs for new slopes and retaining walls, and designs for remedial works to existing slopes.

### ***Embankments on Soft Soils***

- Provided advice on the design and construction of 40 kilometres of embankments on soft ground, for various road and flood protection projects in the northern New Territories, including the Shen Zhen river widening. Designed and interpreted ground investigations, designed ground improvement works, and designed and interpreted ground instrumentation schemes to determine the allowable filling rate and residual settlement.

### ***Reinforced Earth***

- Chairman of the Government Panel responsible for recommending long term allowable design strengths for certification of steel and geosynthetic reinforcing products.

### ***Reclamations***

- Provided advice on the design and construction of 15 major coastal reclamation projects. This included design of surcharging and rates of loading, design and interpretation of instrumentation, design of ground improvement schemes, assessment of excessive settlements and the design of remedial works.

### ***Tunnels and Deep Excavations***

- Carried out a preliminary design for a 2 kilometre long railway tunnel. Made an on site assessment of difficulties during construction of a 60 metre deep shaft in a fault zone, and suggested remedial action.

### ***Explosives***

- Carried out a study to assess the safe use of explosives for rock excavation in urban areas.

### *Alternative Designs*

- Frequently gave advice on contractor's alternative designs.

### *Special Projects Division (1984-1986)*

- Managed 10 staff engaged on research ranging from shear strength of soils and ground instrumentation to measurement of fill compaction and the properties of geotextiles. Operated the GEO rain gauge system and gave advice on land slip warnings. Set up the Geotechnical Information Unit (GIU). Also wrote the first draft of Geoguide 3 on tropical soil and rock description.

### *Mass Transit Railway Section (1981-1984)*

- Section leader (5 staff) dealing with the geotechnical aspects of all the tunnels and excavations for the MTR Island Line. Construction for the underground railway included 15 km of hard rock tunnelling, 10 km of soft ground tunnelling, extensive use of grouting, S.E. Asia's largest underground rock cavern, and ten 20 – 40 m deep excavations for the stations.
- Investigated and prepared reports on three major underground failures, a deep excavation failure, and damage to adjacent buildings. Assessed the feasibility, and approved, soft ground tunnelling beneath multi-storey buildings with the removal of some of their foundation piles.

### **GEOTECHNICAL CONTROL OFFICE, HONG KONG GOVERNMENT *Geotechnical Engineer, 1979-1981***

Checked hundreds of slope stability and retaining wall designs. Carried out a detailed study of rock slope stability, including the measurement and assessment of groundwater pressures.

### **W.S. ATKINS & PARTNERS, BRITAIN, GEOTECHNICAL ENGINEER, 1977-1979**

Site Investigation, Retaining Wall and Diaphragm Wall Design.

### **GKN KELLER FOUNDATIONS, BRITAIN, GEOTECHNICAL ENGINEER, 1975-1977**

Site Investigation, Piling and Ground Improvement

### **KING WILKINSON BV, THE NETHERLANDS, 1974**

Design of Structural Steelwork

### **INDUSTRIAL DEVELOPMENT CONSULTANTS, BRITAIN, 1972-1973**

Design of Reinforced Concrete Buildings  
Site Engineer for Earthworks and Piling

### **PUBLICATIONS**

48 publications.