Education

Doctor of Technical Science Geotechnical Engineering, School of Civil Engineering, Asian Institute of Technology, Bangkok Thailand, 1994

MSc Geotechnical Engineering, School of Civil Engineering, Asian Institute of Technology, Bangkok Thailand, 1990

BSc (Hons), University of Peradeniya, Sri Lanka, 1979

Melbourne

Senior Geotechnical Engineer

Nimal is qualified with Masters and Doctoral Degrees in the field of Geotechnical Engineering and related disciplines, and possesses more than 25 years of work experience mainly in geotechnical designs, supervisions, and investigations related to major civil construction projects in South and Southeast Asia, the Middle East, Australia and New Zealand.

His experience includes numerical modelling and analysis in geotechnical engineering using 2D and 3D finite element methods, design of foundations for high-rise buildings founded on piled rafts, retaining structures for deep excavations, underground excavations and ground support technology, soft ground stabilisation, slope stability, and pavement design.

Before joining Golder, he has worked in Parson Brinckerhoff as a Principal Geotechnical Engineer and Coffey Geotechnics in the capacity of Associate/Senior Geotechnical Engineer.

Employment History

Golder Associates Pty Ltd – Melbourne

Senior Geotechnical Engineer (2015 to Present)

Geotechnical analysis and design of underground excavations, foundations for high-rise buildings founded on piled rafts, retaining structures for deep excavations including sheet pile walls, diaphragm walls and secant pile walls using 2D and 3D-Finite Element Analysis.

Golder Associates Pty Ltd – Christchurch

Senior Geotechnical Engineer (2014 to 2015)

Geotechnical analysis of ground conditions for earthquake and soil liquefaction, design of ground stabilisation measures, analysis of deep and shallow foundations for static and dynamic loading conditions, numerical modelling and analysis of piled foundations, ground treatments, retaining structures, deep excavations and underground openings using 3D and 2D geotechnical software.

MacDonald Sheet Piling Pty Ltd – Yatala, QLD

Principal Geotechnical Engineer (2013 to 2014)

Worked as a Principal Geotechnical Engineer and the Design Manager of a in-house design section of a ground support and deep foundation contractor/manufacturer. Responsible for geotechnical design, design management and design optimisation of ground support systems for deep excavations, deep foundations and underpinning.

Golder Associates Pty Ltd – Melbourne

Principal Geotechnical Engineer (2012 to 2013)

Geotechnical analysis and design of soft ground treatments for rail and road embankments, foundations for high-rise buildings founded on piled rafts using 3D-Finite Element Analysis. Geotechnical analysis and design of retaining structures for deep excavations including sheet pile walls, diaphragm walls and

secant pile walls for deep excavations.

Parsons Brinckerhoff – Melbourne
Principal Geotechnical Engineer (2010 to 2012)

Worked as the lead Geotechnical Design Engineer in Glenfield Junction Alliance and Sewerfix Wet Weather Alliance Projects in Sydney. Conducted concept to detail geotechnical designs of soft ground stabilisations, retaining structures for deep excavations, shallow and deep foundation designs. Peer reviewed the detailed geotechnical design for Kempsey Bypass Project, NSW.

Golder Associates Pty Ltd – Melbourne
Senior Geotechnical Engineer (2008 to 2010)

Geotechnical analysis and design of foundations for high-rise buildings founded on piled rafts using 3D-Finite Element Analysis. Geotechnical analysis and design of retaining structures including sheet pile walls, diaphragm walls and secant pile walls for deep excavations. Pavement analysis and design.

Coffey Geotechnics Pty. Ltd. – Melbourne
Senior Geotechnical Engineer/ Associate Geotechnical Engineer (2003 to 2007)

Responsible for carrying out geotechnical investigations, analyses and design for civil and infrastructure development projects ranging from minor to mega scale in Victoria, Queensland and South Australia. The work included geotechnical design of foundations, slopes, earth retaining structures, ground improvements and pavements based on numerical analysis/modelling.

Terratech Consultants (M), Sdn. Bhd. – Kuala Lumpur, Malaysia
Senior Geotechnical Engineer (1999 to 2003)

Involved in major road development project in Malaysia. Conducted geotechnical terrain evaluation and hazard/risk analysis for road alignment selections; geotechnical and geophysical investigations and engineering geological mapping; geotechnical design management and geotechnical design of soil and rock slopes, earth retaining structures, foundations for bridges, culverts, and buildings; pavements; and optimisation of cut and fill volumes.

Terratech Consultants (M), Sdn. Bhd. – Kuala Lumpur, Malaysia
Geotechnical Engineer/ Engineering Geologist (1995 to 1999)

Involved in geotechnical design of foundations, earth structures, slopes, pavements; design of ground support including rock bolts, soil nails, and related composite structures for slopes and underground openings; design of subsoil drainage facilities such as horizontal drains, subsoil drains, and interface drainage blankets for cut and fill slopes and pavement; and design of slope surface protective measures using vegetative and mechanical means.

Asian Institute of Technology (AIT) – Bangkok, Thailand
Research Engineer (1994 to 1995)

Conducted research and development projects on soft ground stabilisation with pre-fabricated vertical drains and biotechnical slope protection; editing of geotechnical publications related to geotechnical engineering, engineering

geology, land use planning, and natural hazards. Conducted practical and tutorial classes for master degree students in the Geotchnical Engineering Program. Organised geotechnical conferences/ seminars/ workshops sponsored by Southeast Asian Geotechnical Society and School of Civil Engineering, AIT.

Asian Institute of Technology (AIT) – Bangkok, Thailand
Research Associate (1990 to 1994)

Carried out geotechnical research projects on determination of mineralogical and engineering properties of fly-ash; engineering characteristics of lateritic soils; physico-chemical and mineralogical behaviours of dispersive soils, and seismic relations for rockbursting phenomena. Instructed Pre-masters Bridging Program students in mathematics, statistics, and computer skills required to pursue the master degree courses in School of Civil Engineering.

National Water Supply & Drainage Board – Sri Lanka
Hydrogeologist / Manager, Hydrogeological Data Bank (1983 to 1988)

Involved in groundwater exploration projects for urban and rural water supply schemes in Sri Lanka. Carried out water balance studies in specific drainage basins using meteorological, hydrological and hydrogeological techniques along with isotope studies and geochemistry of groundwater. Maintained a groundwater data bank for tube wells constructed throughout the country.

Geotech Ltd. – Colombo, Sri Lanka
Engineering Geologist (1980 to 1983)

Worked in major geotechnical investigation projects related to large rock fill and concrete dams, hydropower tunnels, underground powerhouses and multi-storied buildings.

University of Peradeniya – Sri Lanka
Assistant Lecturer (1979 to 1980)

Conducted lectures, practical, and field classes for undergraduate geology students.

PROJECT EXPERIENCE – FOUNDATION

Bupa Cashmere Apartments Christchurch, New Zealand	Geotechnical analysis and design of piled foundation using helical piles. Pile groups were analysed for seismic loading conditions.
32 Oxford Terrace Christchurch, New Zealand	Geotechnical analysis and design of large capacity helical piles to resist seismic loadings from a buckling restrained brace (BRB) system.
280 - 290 Little Lonsdale Street Melbourne CBD, Victoria	Geotechnical analysis and design of raft foundation system for two towers with 38 levels and 5 basements on weathered siltstone formation using PLAXIS 2D and 3D programs.
Storage Tank - Northern Beaches Storage Project, Brookvale NSW, Australia	Geotechnical analysis of shallow and deep foundation options and foundation design for a large capacity storage tank using Plaxis 3D Foundation.
Nakheel Tower Dubai, UAE	Numerical modelling and analysis of barrette raft foundation for over 1300 m tall tower with a 100 m diameter footprint area using PLAXIS 3D Foundation. Several groups of large barrettes with a maximum penetration depth up to about 60 m below the raft slab were used to analyze the geotechnical effects of over two-million-tonne dead load and various live load and wind load combinations from the proposed structure to the foundation.
Riverside Residential & Commercial Complex Hanoi, Vietnam	Analysis of static pile load test results, assessment of footing conditions and analysis of the proposed piled foundations for two high rise (30 floors) buildings on 45m deep soft clay area. The pile response for critical load combinations was analysed using finite element programs.
Craigieburn Rail Craigieburn, Victoria	Assessment of footing conditions and analysis of the proposed piled foundations for the extensions of Craigieburn and Roxburgh Park Rail Stations. The pile response for critical load combinations was analysed using finite element programs.
Deer Park Bypass Victoria	Assessment of footing conditions and analysis of the proposed foundations for 11 bridges. Piled foundations were used for vertical bridge abutment with reinforced soil structures and some piers located on deep soil profiles whereas shallow footings were used for piers located on shallow bedrock areas. The pile response for critical load combinations was analysed using finite element programs.
Dynon Port Rail Link Melbourne, Victoria	Assessment of footing conditions and advice on bearing capacity and pile down drag for proposed piled footings of four bridges.
Brisbane Airport Northern Access - Tender Brisbane, Queensland	Assessment of footing conditions and analysis of the proposed piled foundations for 5 bridges on 25-30m deep soft soil area. The pile response for critical load combinations was analysed using finite element programs.

MTD Office Complex Kuala Lumpur, Malaysia	Assessment of footing conditions and advice on bearing capacity for 5-storey building complex on karstic limestone terrain.
Bukit Tinggi Housing Scheme Kelang, Malaysia	Assessment of footing conditions and analysis of shallow footings for 2-3-storey residential structures.
East Coast Expressway Pahang, Malaysia	Assessment of footing conditions and advice on pile depths and socket length of proposed micro-pile footings for various bridges a 165km long 4 lane dual carriageway.
Craigieburn Bypass Victoria	Proof engineering of the designs of various bridge footings.

PROJECT EXPERIENCE – RERAINING STRUCTURES

280 - 290 Little Lonsdale Street Melbourne CBD, Vic	Geotechnical analysis and design of deep excavation/retention system for 5 basements and lift pit. A soldier pile wall system with ground anchors at five levels were modelled and analysed using PLAXIS 3D.
Petrosea Offshore Supply Base, Balikpapan Kalimantan, Indonesia	Analysis and design of tieback sheet pile walls and steel tube pile walls for the extension of an in-service jetty and berthing areas up to 20 m water depth in Makassar Strait off the east coast of south Kalimantan. Design of tieback sheet pile wall system for an extension of jetty and harbour dredging
Bogong Powerhouse Bogong, Victoria	Geotechnical design of retaining walls as a temporary support system to an 18m excavation for the underground powerhouse. The design included secant pile walls comprising 800mm diameter piles with ground anchors and was analysed using finite element program PLAXIS and finite difference program FLAC.
Horseshoe Bend Rail Embankment Bacchus Marsh, Bacchus Marsh, Victoria	Design of 6m high Terramesh (wire-mesh reinforced soil structure with gabion facing) walls with about 18m high upslope batters for a 500m long rail embankment section.
Defence Road Point Nepean, Victoria	Design of anchored screw pile wall for stabilisation of 50m long roadside slope stretch at Port Nepean.
St Falls Resort Falls Creek, Victoria	Geotechnical assessment for the proposed basement and design of geogrid walls for the stabilisation of steep batters associated with temporary excavations.
North South Bypass Brisbane, Queensland	Proof Engineering of 6m high 60m long geotextile reinforced wall designed for temporary road widening.

Calder Freeway Victoria	Proof engineering of Keysteel retaining walls for various bridge abutments in Calder Freeway.
Mitcham Frankston Freeway - Tender Victoria	Preliminary geotechnical design of reinforced soil structures for bridge abutments and ramps for the tender design.
Gateway Upgrade Brisbane, Queensland	Geotechnical design of reinforced soil structures for bridge abutments including soft ground treatment and settlement analysis.
Brisbane Airport Northern Access - Tender Brisbane, Queensland	Preliminary geotechnical design of reinforced soil structures for bridge abutments and approaches including soft ground treatment and settlement analysis.
Windsor Road Upgrade Sydney, New South Wales	Geotechnical design of gravity and cantilevered concrete retaining walls and contiguous bored pile walls for road widening.
East Coast Expressway Pahang, Malaysia	Geotechnical design of reinforced soil structures including anchored earth walls and reinforced soil walls for bridge abutments and ramps associated with 7 major intersections and 20 bridges for a 165km long 4 lane dual carriageway. The maximum designed wall height heights was 16m.
Kuala Lumpur – Karak Highway Selangor/Pahang	Geotechnical design of reinforced soil structures including anchored earth walls, reinforced soil walls, geogrid walls and terramesh walls for bridge abutments and road embankments for an upgrading of 60km long highway stretch including about 1km long tunnel and a 1.7km long river diversion.
Pos Selim – Logging Highway Perak, Malaysia	Geotechnical design of reinforced soil structures including anchored earth walls and terramesh walls for high road embankments for a 35km long highway through a mountainous terrain. Terramesh walls were designed either as toe walls or crest walls for high road embankments so as to limit the total height 36m. Anchored earth walls were designed up to 21m height replacing initially proposed viaducts through deep valleys and gouges.
East West Highway Perak/Kelanthan, Malaysia	Geotechnical design of seven anchored bored pile walls at high road embedment locations as remedial measures for the slope failures in 65km long highway stretch through a mountainous terrain.

PROJECT EXPERIENCE – SLOPE STABILITY

Oliver's Hill – Frankston Marina Frankston, Victoria	Hazard/risk assessment, slope stability analysis and preliminary design of various stabilisation measures for 40m high steep slope adjacent to Nepean Highway and proposed Frankston Marina.
Horseshoe Bend Rail Embankment Bacchus Marsh, Victoria	Geotechnical investigation, assessment of slope stability, and detailed design of remedial measures including slope flattening, reinforcement with soil nailing and reinforced soil structures for an 18m high, 500m long rail embankment.

Defence Road Point Nepean, Victoria	Geotechnical investigation, assessment of slope stability and detailed design of remedial measures for a 30m high roadside slope.
Kildrummie Court Sorrento, Victoria	Geotechnical investigation, assessment of slope stability and detailed design of remedial measures including soil nailing and slope flattening for a 30m high sea cliff adjacent to holiday housing.
Mitcham Frankston Freeway - Tender Victoria	Slope stability analysis for the design of cut and embankment slopes associated with about 40m long road alignment. Soil nailing, ground anchoring and earth retaining structures were adopted for the stabilisation of designed slopes.
Gateway Upgrade Brisbane, Queensland	Slope stability analysis for soil and rock slopes and design of steep cut slopes using soil nailing/rock bolting with shotcrete facings for roadside slope and bridge abutments.
East Coast Expressway Selangor/Pahang, Malaysia	Hazard/risk assessment, geotechnical investigation, slope stability analysis and conceptual and detailed slope design for roadside cut and embankment slopes associated with a 165km long 4 lane dual carriageway aligned through a varying topography from mountainous to low-lying. The maximum designed slope heights were 120m and 36m for the cut and embankment slopes, respectively. The slope design has incorporated 2m wide bench/berm at every 6m height interval and additional stabilisation techniques such as soil nails, rock bolts, shotcrete facings, reinforced soil structures, horizontal drains and interface drainage layers.
Pos Selim – Lojjing Highway Perak, Malaysia	Geotechnical and geophysical investigations slope stability analysis and conceptual and detailed slope design for a 35km long highway through the Central Mountain Range of Malaysia with starting and end elevation difference of 950m. The client's geometric design requirements (the maximum gradient of 7% and the minimum horizontal radius of 80m for a design speed of 70kmph) warrant high cut and embankment slopes with an average height of 60m. The slope design has incorporated a 2m wide bench/berm at every 6m height interval. Steep cut slopes were designed by using long soil nails so as to control excessive amount of earthwork. Soil nail design has incorporated conventional prefabricated nails and "Ischebeck" (bottom up pressure grouting through sacrificial drill rod and bit) nails up to 24m length. Stability of the slopes in rock was re-assessed during construction, based on the orientation of discontinuities, and additional ground support such as soil nails, ground anchors or rock bolts were adopted if required. Maximum height of fill slopes was limited to 36m adopting steep reinforced soil structures where necessary.
Kuala Lumpur – Karak Highway Selangor/Pahang, Malaysia	Geotechnical and geophysical investigations, slope stability analysis and conceptual and detailed slope design for an upgrading of 60km long highway stretch including about 1km long tunnel and a 1.7km long river diversion. The maximum designed slope heights were 120m and 54m for the cut and embankment slopes, respectively. The slope design has incorporated 2m wide bench/berm at every 6m height interval and additional stabilisation techniques such as soil nails, shotcrete facings or wire-mesh netting, reinforced soil structures, gabions and rock mattress, horizontal drains and interface drainage layers.

East West Highway Perak/Kelanthan, Malaysia	Design of remedial measures for slope failures occurred along a 65km long highway stretch through a mountainous terrain. The remedial measures included slope flattening, realignment, retaining walls with downslope trimming, and erosion control measures such as hydroseeding, Vetiver Grass hedge row and tree planting.

PROJECT EXPERIENCE – PAVEMENTS

Deer Park Bypass Victoria	Design of various alternative pavement options and value engineering for Deer Park Bypass from Western Ring Road to Western Highway. Pavement design included full depth asphalt and CTCR subbase pavements with various subgrade improvements using CIRCLEY.
Dynon Port Rail Link Melbourne, Victoria	Assessment of existing pavement conditions and design of rigid pavements for temporary and permanent road widening.
Logic Timber Storage Facility Wodonga, Victoria	Subgrade evaluation and design of unbound granular pavement for loading conditions imposed by forklift and heavy machinery movements.
Melbourne Freight Terminal Melbourne, Victoria	Assessment of footing/subgrade conditions for gantry footings and pavements, analysis of heavy duty pavements and track formation design.
Regional Rail Link Melbourne, Victoria	Assessment of subgrade conditions and track formation design for Package C - Footscray to Deer Park.
Glenfield Juction Alliance Sydney, NSW	Assessment of subgrade conditions and track formation design and design optimisation with geogrids for 5 km long rail embankments on improved ground conditions.
Sydney Rail Passing Lane Formation Design Donnybrook, Victoria	Assessment of subgrade conditions and design of alternative formation options using finite element analysis for Sydney Rail Passing Lane at Donneybrook.
Kuala Lumpur – Karak Highway Selangor/Pahang, Malaysia	Assessment of existing pavement conditions, subgrade evaluation and design of full depth asphalt pavements for an upgrading of 60km long highway stretch.
East Coast Expressway Pahang, Malaysia	Subgrade evaluation for the entire project including a 165km long 4 lane dual carriageway and seven major intersections. Design of full depth asphalt pavements for 50km long section of East Coast Expressway.

PROJECT EXPERIENCE – GROUND IMPROVEMENT

Christchurch Residential Rebuild Canterbury, New Zealand	Ground improvement design for residential structures using Rammed Aggregate Piers, stone columns, timber piles and pre loading. Numerical modelling and analysis of ground improvement measures using 2D and 3D finite element programs.

Regional Rail Link - Package B Melbourne, Victoria	Design of ground improvement measures for rail embankments and reinforced earth structures founded on soft ground using preloading with pre-fabricated vertical drains (PVD) and rigid inclusions, Numerical modelling and analysis of ground improvement measures using PLAXIS 3D and 2D.
Glenfield Junction Alliance Sydney, NSW	Design of rail abutments and embankments on soft ground with preloading. Numerical modelling and analysis of staged preloading using PLAXIS 3D and 2D to assess the settlement and stability criteria.
Kempsey Bypass Kempsey, NSW	Peer review of detailed geotechnical design including soft ground treatment designs (preloading with PVD, stone columns and rigid inclusions) for highway embankments and bridge abutments on deep soft clay areas.
Gateway Upgrade Brisbane, Queensland	Assessment of ground conditions and designed ground improvement measures for road embankments, bridge approaches and retaining structures for about 7km long, 6 lane dual carriageway section including 3 intersections on deep soft clay area. The ground improvement measures including pre-loading, preloading with wick drains, dynamic replacement, rigid inclusions and piled embankments were designed based on settlement, stability and stress-deformation analyses. Preparation of geotechnical instrumentation program to monitor the performance of designed ground improvement measures including settlement, lateral displacement and pore pressure variations during and after construction.
Brisbane Airport Northern Access - Tender Brisbane, Queensland	Assessment of ground conditions and designed ground improvement measures for road embankments and bridge approaches for about 4km long, 6 lane road with 4 bridges on deep soft clay area. The ground improvement measures adopted included pre-loading, preloading with wick drains and piled embankments.
East Coast Expressway Pahang, Malaysia	Assessment of ground conditions and designed ground improvement measures for road embankments and bridge approaches for about 2km long road section on soft clay area. The ground improvement measures adopted included pre-loading, lightweight fill, stone columns and piled embankments.
Second Bangkok International Airport Nong Ngu Hau, Thailand	Predicting and monitoring of the performances of a series of trial test embankments constructed on soft clay with pre-fabricated vertical drains (wick drains) for the Second Bangkok International Airport Project.

PROFESSIONAL AFFILIATIONS

Member of the Institution of Engineers Australia

PUBLICATIONS

Refereed Journal Articles

Nilaweera, Nimal and Prinya Nutalaya, 1999. Role of Tree Roots in Slope Stabilization. *Bull. of the Eng. Geol. Env*, 57 (1999), 337 - 342.

Conference Proceedings

Nilaweera, Nimal and Chris Haberfield, 2015. *Geotechnical Analysis of Deep Foundation for Nakheel Tower Dubai using 3D Finite element Modelling,* International Conference on Geotechnical Engineering ICGE Colombo 2015.

Nilaweera, Nimal. 2001. *Slope Stabilisation in Pos Selim-Ladang Blue Valley*

Highway Project. National Slope Seminar 2001, Public Works Department of Malaysia. Cameron Highland, Malaysia.

Nilaweera, Nimal. 1999. *Some Engineering Geological Aspects Related to Design of Roadside Slopes in Malaysia*. Keynote paper - Engineering Geology Session, Annual Conference on Geology of Malaysia, Geological Survey Department of Malaysia. Ipho, Malaysia.

Nilaweera, Nimal and Diti Hengchaovanich. 1996. *An Assessment of Strength Properties of Vetiver Grass Roots in Relation to Slope Stabilization*. Intl. Conference on Vetiver, Vetiver, Miracle Grass. Chaing Rai, Thailand.

Nilaweera, Nimal and Prinya Nutalaya. 1994. *Factors influenced on Slope Failures in Khao Luang Mountain Area, Southern Thailand*. Intl. Conference on Landslides, Slope Stability & the Safety of Infra-structures. Kuala Lumpur, Malaysia.

Lee, Chee Hai and Nimal Nilaweera. 2002. *Design and Construction of a 20.5 m High Anchored Earth Wall in Cameron Highland Pahang*. 2nd World Engineering Congress, IEM. Kuching, Malaysia.

Indraratna, Budhima and Nimal Nilaweera. 1991. *Seismic Relationships for Rockbursting Using Energy Considerations*. 7th Intl. Congress on Rock Mechanics. Aachen, Germany.

Other

Nilaweera, N. 1994. Effects of Tree Roots on Slope Stability: The Case of Khao Luang Mountain Area, Southern Thailand, Doctoral Dissertation, Diss. GT-93-2, Asian Institute of Technology, Bangkok, Thailand

Nilaweera, N. 1990. Engineering Geology and Land Use Planning in Nakhon Si Thammarat Area, M. Sc. Thesis No. GT-89-22, Asian Institute of Technology, Bangkok, Thailand.