

R.A. (Bob) Patrick, M.Sc., P.Eng.

EDUCATION

B.Eng.Sc.,	University of Western Ontario, London	1975	Civil Engineering
M.Sc.,	University of Newcastle-Upon-Tyne, Newcastle, England	1979	Soil Mechanics and Foundation Engineering

FIELDS OF SPECIAL COMPETENCE

- Earthfill Dam Design and Construction
- Dam Safety Evaluations
- Slope Stability Analysis
- Retaining Wall Design and Construction

EARTHFILL DAM DESIGN AND CONSTRUCTION

- **Little Bow Dam, Alberta** Geotechnical Design Engineer for this 25 m high, 1000 m long zoned earthfill dam in southern Alberta on a clay shale foundation.
- **Horizon Dam, Fort MacMurray, Alberta** Senior Geotechnical Engineer for the design construction and performance monitoring of this 28 m high embankment dam on a pre-sheared clay shale foundation.
- **Anderson Creek Dam, Meares Island, BC** Internal Reviewer for design of replacement water supply dam. Included development and completion of a decision matrix to select the dam type.
- **Rhonda Lake Dam, Big White** Geotechnical Design Engineer for the re-construction of the water supply dam at the Big White Ski Resort. The dam site is in a remote location near the summit of Big White Mountain.
- **Minto Creek Tailings Dam, Yukon** Internal Reviewer for preliminary design of a 32 m high embankment to retain water supply and tailings for a copper mine.
- **Metford Dam, Salmon Arm; Hydraulic Creek Dam, Kelowna; Saunier Lake Dam, Beaverdell; MacLean Mill Dam, Port Alberni, BC** Project Geotechnical Engineer for site investigation and geotechnical design of remedial/reconstruction measures of small embankment dams.
- **Stocking Lake Dam and Holland Lake Dam, Ladysmith, BC** Project Geotechnical Engineer for studies to raise these water supply embankment dams.
- **Pingston Creek, Nakusp; Upper Mamquam, Squamish; Upper and Lower Clowhom River, Sechelt; Long Lake, Stewart, BC** Project Geotechnical Engineer for these small hydro projects.
- **Rafferty Project, Saskatchewan** Project Geotechnical Engineer responsible for field and office studies including site investigation, test pitting for borrow, parametric analysis, design, slope stability studies and seepage analysis for a 20 metre high earthfill dam founded on 30 metres of soft clay.

- **Alameda Project, Saskatchewan** Project Geotechnical Engineer responsible for the site investigation to establish the location and foundation conditions and for the preliminary design for this 25 metre high earthfill dam.
- **Nipawin Hydro, Saskatchewan** Instrumentation Engineer responsible for the installation, monitoring, preliminary analysis and reporting of instrumentation and pressure relief systems at the Nipawin Hydro-electric Project which comprised of a 40 m high, 1200 m long earthfill embankment with a 1.2 km long drainage tunnel in the underlying glacial till.
- **ARA - MSPW - Retention Pond Bunds, New Zealand** Geotechnical Project Engineer for the site investigation, stability and settlement analysis and design of approximately 3 km of proposed 3 m high separation berms founded on up to 10 m of soft sediments.
- **Tailings Dam, KPC Coal Mine, East Kalimantan, Indonesia** Site Engineer during construction of test fill and starter dam on deep soft clays.

DAM SAFETY EVALUATIONS

- **1992 Dam Safety Program Nanaimo, BC** Project Geotechnical Engineer for a Phase 1 Dam Safety Program for the 7 dams within the City of Nanaimo. This included gathering of background information, inspection and preliminary assessment of stability of the dams.
- **2008 Annual Dam Inspection for 9 dams in the City of Nanaimo, BC** This includes a concrete arch structure, a concrete buttress and several embankments. A review of the consequence rating for these dams was undertaken as part of this study.
- **Arrowsmith Dam, Parksville, BC** Completed the formal annual inspection of the concrete gravity dam for the past 4 years.
- **Ladysmith BC** Completed the formal annual inspections of the four water supply embankment dams three times in the past 8 years.
- **Genesse Thermal Station Dykes** Assisted with and reviewed the report for dam safety inspection of these dykes which contain the cooling pond.
- **Regina Dykes, Saskatchewan** Geotechnical Project Engineer for the inspection and analysis of 2.25 km of dyke to assess the level of flood protection and recommend remedial work.

SLOPE STABILITY ANALYSIS

- **Anthony Henday Drive Crossing of North Saskatchewan River** Senior Geotechnical Review for design of approach fills which incorporated piles to resist slope deformation.
- **Stafford Coulee, Lethbridge, Alberta** Principal Geotechnical Engineer for the investigation, analysis and monitoring of remediation of a large scale (35 m high) slope failure in a residential neighbourhood.
- **North Slope, Nanaimo, BC** Project Geotechnical Engineer for the site investigation, slope stability analysis and development of remedial options for several residential developments on the north slope of Nanaimo.

- **Escarpment Stability, Qualicum Beach, BC** Project Geotechnical Engineer for the development of a report presenting the geological conditions and factors influencing the stability of an escarpment which runs through Qualicum Beach.
- **Subdivision, North Nanaimo, BC** Project Geotechnical Engineer for the site investigation and stability assessment of a proposed 15 hectare residential subdivision on the slope above Hammond Bay Road.
- **French Creek VIHP, Parksville, BC** Project Geotechnical Engineer for the slope stability analysis, site investigation drilling, monitoring, assessment and remediation recommendations for major bridge on the new Island Highway.
- **Gas Pipeline Creek Crossings, Vancouver Island** Project Geotechnical Engineer for investigation and recommendations for remedial works for unstable slopes at gas pipeline crossings of several creeks and rivers.
- **Crofton Highway, Crofton, BC** Project Geotechnical Engineer for the drilling and slope stability analysis of Bonsall Hill adjacent to the proposed new highway alignment to Crofton.
- **Central Park Drive Extension, Waitemata, New Zealand** Project Geotechnical Engineer for the supervision of site investigation, laboratory testing, slope stability analysis and design of approximately 0.7 km of road.

RETAINING WALL DESIGN AND CONSTRUCTION

- **Forest Road Reconstruction, Nakusp, BC** Project Geotechnical Engineer for the design and construction supervision of a geogrid reinforced wall to repair a section of a logging road lost in a slope failure.
- **Hall Road, Qualicum Beach, BC** Project Geotechnical Engineer for reconstruction of Hall Road using a geogrid reinforced retaining wall.
- **Bridge Abutments, French Creek and Highway 4A, Vancouver Island** Project Geotechnical Engineer for retaining wall design for bridge abutments, including seismic coefficients and loading.
- **Newport Development Seawall, Nanaimo, BC** Project Geotechnical Engineer for site investigation and design parameters for this 3 m high lock block seawall, including quality control of the fill placement.
- **Arutmin Port Site, South Kalimantan, Indonesia** Project Geotechnical Engineer responsible for the site investigation, design and technical specifications of an 8 m high reinforced concrete dump station wall. Three designs were completed (cantilever, tied-back and buttressed) with the buttressed option chosen for construction. The design of the approach ramp and fill was also carried out.
- **St. Lukes Shopping Centre, Auckland, New Zealand** Project Geotechnical Engineer responsible for the site investigation, design, and construction supervision for a 6.5 m high vertical crib wall supporting the access road to the shopping centre.
- **25 Elam Street and 19 Peacock Street, Auckland, New Zealand** Project Geotechnical Engineer involved with the site investigation, design, preparation of contract documents and construction supervision for three 15+m high retaining walls. Walls comprised 600 mm diameter cast-in-place reinforced concrete piles, a reinforced concrete waler beam and grouted anchors.

- **13 Hanene Street, Auckland, New Zealand** Project Geotechnical Engineer responsible for design and construction supervision for a 15 m high soil-nailed wall. The design included a seismic assessment of the slope stability.
- **Timber Pole Walls** Project Geotechnical Engineer for the design and construction of numerous timber pole retaining walls to heights of 3.5 m. Also investigated 2 timber pole wall failures and designed remedial works.

EXPERIENCE

1997 - present	Principal Engineer, Engineering Services EBA Engineering Consultants Ltd Nanaimo, BC
1991 - 1997	Senior Geotechnical Engineer, Vancouver Island EBA Engineering Consultants Ltd Nanaimo, BC
1988 - 1991	Senior Geotechnical Engineer Beca Carter Hollings & Ferner Ltd Auckland, New Zealand
1986 - 1988	Manager, Project Geotechnical Engineer Geocon Inc. Regina, Sask.
1983 - 1986	Instrumentation Engineer Crippen Acres Saskatchewan Nipawan, Sask.
1981 - 1983	Intermediate Geotechnical Engineer Crippen Consultants North Vancouver
1979 - 1981	Junior Geotechnical Engineer Hardy Associates (1978) Ltd Calgary, Alberta

MEMBERSHIPS

Association of Professional Engineers and Geoscientists of British Columbia
 Association of Professional Engineers, Geologists and Geophysicists of Alberta
 Canadian Geotechnical Society
 Canadian Dam Association