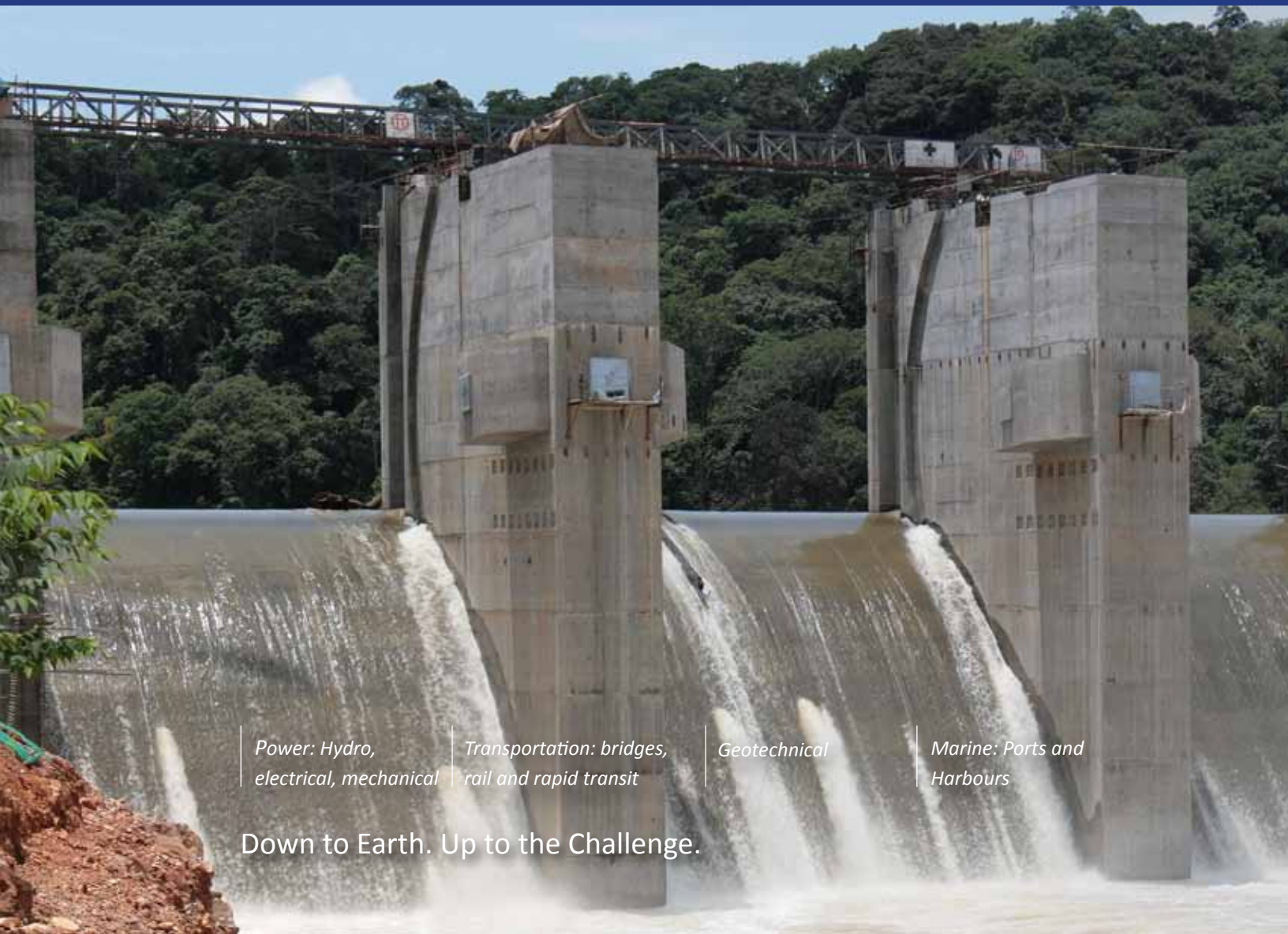




Fully integrated design services

We provide fully integrated design services in the heavy civil and transportation industries

POWER AND TRANSPORTATION SERVICES



*Power: Hydro,
electrical, mechanical*

*Transportation: bridges,
rail and rapid transit*

Geotechnical

*Marine: Ports and
Harbours*

Down to Earth. Up to the Challenge.

About us

Klohn Crippen Berger Ltd. (KCB) is an international engineering and environmental consulting firm with its head office in Vancouver and seven offices in strategic locations in Canada, Peru and Australia. We have a strong reputation for quality service and technical expertise in a range of services including: Mining, Environmental, Water, Power, Transportation, and Oil and Gas. Since forming in 1951, we have a long history of participation in local projects, as well as a strong international reputation. We are working on some of the largest, most challenging engineering projects, both nationally and internationally.

"In business for 58 years, its [KCB's] quality of engineering gives it a stellar reputation."

National Post. 2nd Feb, 2009.

Team leaders

Shane Johnson Vice president, has 32 years of project management, design, construction and commissioning experience on hydroelectric, irrigation, highways, rapid transit, pump storage, drainage, flood protection, water supply and environmental projects.

Dan Campbell Manager Power, has 32 years of varied experience relating to hydroelectric projects, movable bridges, ports and drydock projects.

Garry Stevenson has 35 years of experience in a variety of soil and rock projects. His experience includes conducting site investigations, designs, construction supervision and project management for dams, tunnels, bridges, highways and rapid transit projects.

John Nunn has 37 years of domestic and international experience in the development, rehabilitation and assessment of hydroelectric and water storage projects.

Robin FitzGerald has 30 years of diverse experience in the design and construction of civil, resource development and water resources projects. His areas of expertise are in water resources and municipal infrastructure.

Bruce Hamersley has 18 years of engineering experience with a focus on steel, concrete, timber and masonry structures. His design background includes the design of highway and railway bridges, seismic retrofit and rehabilitation of major bridges and construction engineering for bridge erection.

Neil Heidstra has 35 years of civil and structural engineering experience in the electrical power-generating field. He has extensive experience with hydropower civil/structural analysis and design, dam safety and finite element analysis, as well as the analysis and design of structures for nuclear and coal-fired generating stations.





Power and Transportation Group

KCB have been designing and constructing hydroelectric and water supply dams since the 1950's and provide a complete range of services from environment and engineering to maintenance and rehabilitation of hydroelectric facilities. While the services are provided primarily in Western Canada, we have also carried out major hydroelectric projects in Thailand, Laos, Vietnam, Philippines, Indonesia, Papua New Guinea and the United States and specialist consulting roles on many projects worldwide.

The transportation group provides services for marine, rail, rapid transit and bridge design. Our specialist structural design for bridges includes, for example, our current project of the San Francisco Oakland Bay Bridge structural design.



PSMJ Resources Inc.



ISO 9001:2008 Registered

Our Values

- People first
- Ethics, integrity, honesty
- Professionalism
- Innovation
- Quality
- Technical excellence
- Recognition of individual contributions
- Teamwork
- Sustainability
- A satisfying and fun workplace

Our Vision

Excellence, teamwork, and innovation building a better world.

Our Mission

To attract, develop, and retain talented staff and quality clients who thrive and excel as a team while undertaking exciting projects.



Power

POWER DESIGNS FOR POWER PROJECTS

Services

Klohn Crippen Berger Ltd. (KCB) offers full engineering and environmental services for hydro projects. Our project design experience ranges from a 7 MW, single-unit project in Canada to a large 1074 MW, multi-unit project in Laos. Our professional staff, comprising environmental scientists and geotechnical, hydrotechnical, civil, structural, mechanical and electrical engineers, delivers total facilities design on small to large hydro projects, both domestically and internationally.

Engineering, Environmental and Permitting

Studies: Constructing a new hydro facility or rehabilitating an existing hydro facility requires appropriate studies. KCB staff is experienced in hydrological studies (flow determination, flood studies), environmental and permitting studies, energy calculations and power studies, and equipment optimization studies.

Dams and Intakes: Whether the project is run-of-river with a low coanda weir and minimal storage or a world class roller-compacted concrete (RCC) dam for flood control, irrigation and power generation, our engineers and environmental scientists understand how to permit, design and build economic structures to store, divert and control a project's water.

Geotechnical Design: Geotechnical risk can be one of the most significant risk issues associated with hydro developments. Our extensive geotechnical experience with tunnels (both drill-and-blast and tunnel boring machine, excavated), other underground works and open-cut excavations for powerhouses, tunnel portals, and canals is known throughout the world.

Water Conveyance System: KCB's experience will ensure the water conveyance components including canals, tunnels and

penstocks are configured in a practical, economic arrangement based on a sound technical design that provides appropriate hydraulic performance.

Powerhouses: KCB has extensive experience with the civil-structural and equipment layout design of powerhouses utilizing Francis, Pelton and Kaplan turbines. Our staff is experienced with the mechanical and electrical equipment layout for the entire water-to-wire equipment package.

Project Services: KCB also offers project management and construction supervision services in roles as diverse as Lender's Engineer, Owner's Engineer and Buyer's Due Diligence.

*Klohn
Crippen Berger
delivers total design
for hydro projects.*





Experience

The Nam Theun 2 Hydroelectric Project, Laos: is the most important project in a long-term collaborative effort between the Lao People's Democratic Republic (Laos) and Thailand to develop hydropower energy in Laos for export to Thailand. We provided bid design, final design and construction engineering services for the two main civil works packages of this 1074 MW project.

Snoqualmie Falls Redevelopment, Washington, USA: consists of upgrades of two power plants and a weir to increase the installed capacity from 42 to 52 MW. Our services for this project include preliminary design, detailed design and construction services.

Brilliant Powerplant Expansion Project, Castlegar, BC: a 120 MW expansion at the Brilliant Dam on the Kootenay River. KCB provided Owner's Engineer services from the project identification phase through to commercial operation.

Arrow Lakes Generating Station, Castlegar, BC: is a 170 MW project on the Columbia River. KCB was the Owner's Engineer for this project, responsible for conceptual design, reviewing the EPC contractor's design and monitoring the work of the EPC contractor during construction and commissioning. This project received the prestigious Blue Planet prize in 2005.

Mayo and Wareham Dams, Dam Safety and Seismic Review, Yukon: KCB performed a dam safety review of Mayo and Wareham Dams for Yukon Energy in 2005. During the safety review a high seismic risk was recognised that was subsequently assessed and evaluated as part of a seismic review that was completed in 2007.

Zeballos Hydro Project, Vancouver Island, BC: will add 22 MW of ECOLogo certified green power to the provincial power grid. KCB designed the tunnel, penstock and powerhouses for this project was placed in service in 2009.

Irrican Project, southern Alberta: is a 7 MW run-of-canal project. Three existing irrigation canal drops were bypassed and the water put through a small generating station that utilized an S-type turbine. KCB designed the powerhouse, intake and all associated mechanical and electrical works.





Transportation

Services

Klohn Crippen Berger is one of the leading civil/structural design consultants in British Columbia, providing engineering for major transportation projects for over 50 years. Recently the group has played lead roles for contractors in bid-engineering for numerous design-build and PPP projects. Our engineers have received many awards for their design innovations, including Consulting Engineers of British Columbia Awards of Merit for the rehabilitations of the Oak Street and Lions Gate Bridges, and the CEBC Award of Excellence for the design of the Deltaport Container Terminal.

Services provided by the firm's Transportation Group include:

- Design of bridges in short, medium and long span ranges
- Construction engineering for major bridges

- Comprehensive civil and structural engineering for marine port facilities
- Seismic retrofit and rehabilitation of bridges and port facilities
- Road and highway design
- Design of retaining walls and rockfall protection systems
- Condition assessment and load rating of roads and bridges

We provide a full range of services for transportation projects. Our structural engineers are supported by one of the province's leading geotechnical engineering groups, as well as full service hydraulic, electrical, and mechanical groups.

Key areas of expertise include:

- Project management and construction monitoring for major projects
- Geotechnical investigations and foundation design for bridges, transit, and port facilities
- Geotechnical and structural design for tunnels and retaining structures
- Mechanical and electrical engineering for tunnels and transit stations
- Civil, drainage, and utilities design
- Environmental engineering services



Experience

San Francisco-Oakland Bay Bridge, California, USA: Klohn Crippen Berger (KCB) is providing structural and geotechnical design for the temporary works for the \$1.4B signature span in San Francisco Bay. Once completed, it will be the world's largest self-anchored suspension bridge. Our design component includes: twin 700 m temporary steel trusses, piled marine foundations in the soft soils of San Francisco Bay designed for seismic and ship impact loading, and design of a 163 m tall temporary tower for the erection of the single steel suspension bridge tower.

Kicking Horse Cantilever Structure, BC: KCB provided an innovative Value Engineering design to widen a 2.1km section of the Trans Canada Highway. Through careful realignment of the highway in difficult terrain and the use of a unique cantilever structure, two river crossing bridges were eliminated, resulting in savings of approximately \$2.4M.

Vedder Interchange Design-Build, Chilliwack, BC: Structural and geotechnical design for the \$10M design-build interchange with a 5 lane, 2-span, 48 m long bridge utilizing continuous pre-cast box stringers.

Lions Gate Bridge Rehabilitation, Vancouver, BC: Structural and geotechnical design for the seismic retrofit of the North Approach for the suspension bridge. The project was the first seismic retrofit of a major structure to use the design-build contract format. An innovative "rocking" energy transfer mechanism was utilized, facilitating a very economical retrofit solution.

Deltaport Container Terminal, Delta, BC: Our work on the Deltaport Container Terminal started in the mid 1990's with comprehensive engineering services and contract administration. This project won the Consulting Engineers of British Columbia

award of excellence in 1997. Similar services are being provided for the \$200M Berth 3 Extension project now under construction.

Alex Fraser Bridge, New Westminster, BC: This award winning, six lane, 830 m long cable-stayed crossing of the Fraser River was completed in 1986 after 30 months of construction. Use of repetitive precast concrete deck modules resulted in capital costs 20% lower than earlier North American cable-stayed bridges.

*Over 50 years of
award-winning
engineering*



Geotechnical Services

Klohn Crippen Berger has provided comprehensive geotechnical services for projects in Canada and internationally for over 50 years. Our team of project managers, engineers and geoscientists has a broad range of analytical, design and construction experience on a wide variety of projects having complex and challenging geotechnical problems. Our skills and experience have enabled us to offer our clients practical and cost effective design and construction solutions.

Geotechnical site investigations including geological mapping, drilling and in-situ testing, geophysical testing, subcontract management

Dynamic measurements of standard penetration test (SPT), Becker penetration tests (BPT) and piles

Natural hazard assessment and risk and decision analysis

Geotechnical laboratory testing in our own laboratory

Foundation engineering including shallow and deep foundations for heavy civil structures and equipment, dynamic loading and seismic design, ground improvement

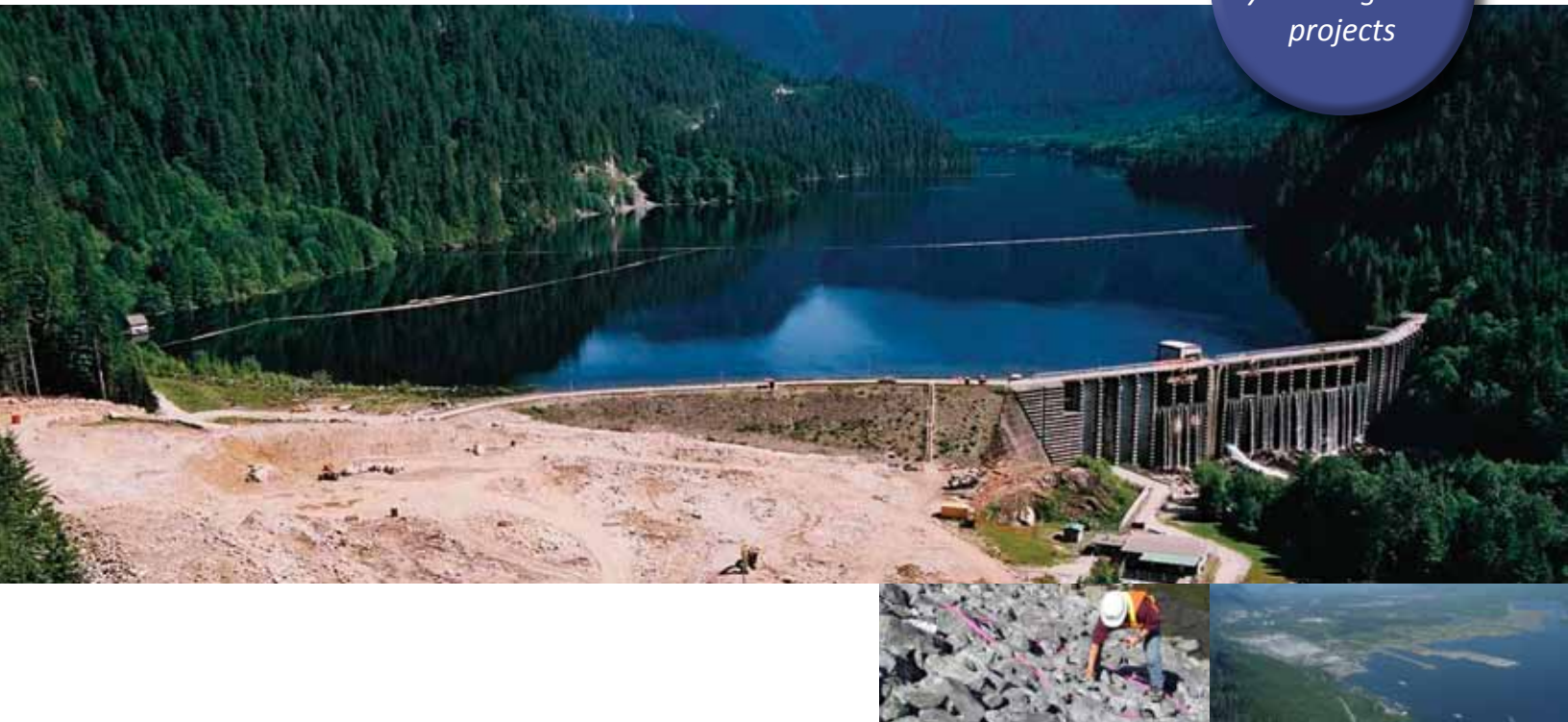
Retaining walls and structures including geosynthetic reinforced walls

Rock slope engineering

Tunnel and cavern engineering

Klohn Crippen Berger's geotechnical services are further backed up by our strengths as a full-service engineering consultant.

Challenge us to take on your toughest projects





Experience

Greens Creek Mine, Alaska, USA: Kohn Crippen Berger Ltd. (KCB) is responsible for geotechnical design for the expansion of a tailings facility for the placement of pressure filtered tailings at an operating 1300 t/d underground mine in Alaska. The scope of work includes geotechnical design, liner design, tailings operation, and construction aspects as well as assisting with reclamation planning for the waste dumps.

Seymour Falls Dam Seismic Upgrade, BC, Canada: KCB performed investigations, static and seismic design including dynamic analyses, designed explosive and dynamic compaction to improve the foundation, and resident engineering services during construction of a new earthfill dam downstream of the existing dam. The dam is one of three to provide Greater Vancouver with its water supply.

Lions Gate Bridge Seismic Retrofit, Vancouver, BC: We provided structural and geotechnical design services for the world's first design-build seismic retrofit of a major structure.

Deltaport Container Terminal and Wharf, BC: In 2005 KCB was selected to lead design and construction management of the next expansion. In the early 1990s the Vancouver Port Corporation wanted to double their container handling capability. KCB was a key member of the team that provided full services for Deltaport.

Trans Canada Highway – Cache Creek to the Rockies, BC: KCB provided geotechnical investigation and design services along a 22 km corridor of the Trans Canada Highway. The work included mapping terrain and terrain hazards, conducting drilling and geophysical investigations and assessing functionality of alternative routes.

Kitimat Modernization, BC: KCB carried out a preliminary geotechnical design study and geotechnical recommendations for the Potlines Modernization and Anode Facilities portions of the Kitimat Modernization and Expansion Project at the Rio Tinto Alcan aluminum smelter.



Marine

Services

For over 40 years, Klohn Crippen Berger, its affiliates and predecessor organizations have been active in the planning, design and construction of a wide variety of ports, harbours, and marine terminals. Our experience ranges from economic evaluations, structural assessments and remedial designs, through to site development, wharf design and site services for major new terminals. KCB's background of marine engineering experience is a significant advantage to clients on port projects.

We can meet the diverse project requirements of our port and harbour clients through the following areas of expertise:

Port Feasibility & Planning from pre-investment and feasibility studies to site selection and conceptual design.

Marine & Structural Engineering ranging from dredging, reclamation works, loading ramps, piled decks, bulkheads and caisson wharves.

Geotechnical & Environmental Engineering including shallow and deep foundations for heavy civil structures and equipment, dynamic loading, seismic design, and ground improvement.

Coastal & River Engineering including aquatic construction considerations such as water levels, floods, foundation and flow considerations particular to wet structures and infrastructure.

Construction Management services including field inspection, contract administration, claims negotiation, scheduling and cost estimating

*Making a
difference
one project
at a time*





Experience

Deltaport Container Wharf and Terminal, BC: Klohn Crippen Berger (KCB) is currently leading the design and construction management for the 430m long Berth 3 expansion of this facility. We led an integrated, multidisciplinary team of engineers to address all aspects of the civil engineering for this important \$200M waterfront development. The original container port facility, built in 1994-1997, was also designed by KCB. Berths 1 and 2 included a two-berth, 670m long caisson wharf for post-Panamax vessels and barges, and development of a 40 hectare container terminal featuring an intermodal rail facility to handle two 2,100m trains, provision for 600 refrigerated containers and up to six wharf cranes.

Guam Kilo Ammunition Wharf Extension, Guam: KCB was retained by the US Navy as part of the Moffatt & Nichol team in early 2006 for detailed engineering for the Kilo

Ammunition Wharf Extension project on Guam, Marianas Islands. Kilo Wharf, located in the outer Apra Harbour, is the primary and most strategically important ordnance facility within the Pacific fleet area of operations. The wharf extension comprises 6 caissons of varying sizes, designed to resist seismic events plus seismic retrofit of existing caissons.

Halifax Caisson Jetty "NJ", Halifax, NS: In 2002, the Department of National Defence decided to construct a replacement wharf for their existing timber Jetties in Halifax Harbour. This new \$35 M marginal wharf, Jetty "NJ", is to provide full-service berthing for Canadian Patrol Frigates and Advanced Logistic Support Carriers. KCB was selected as caisson designer for conceptual and final engineering phases, tender assistance and field review.

Esquimalt Graving Dock Evaluation, BC: KCB was retained by Public Works Canada to evaluate the structural condition and overall stability of 6 existing timber crib (caisson) structures, which form the North Landing Wharf, and to evaluate the seismic integrity and stability of the Dry Dock Walls and South Jetty structures.

Rocky Point Jetty Condition Inspection & Structural Evaluation, BC: KCB conducted a full inspection of the jetty above and below water, including: all piling, pile wraps, sheet piled, caissons, deck structure and the fender pile system.





Through our association with the Louis Berger Group, Inc., a leading infrastructure engineering, environmental science, and economic development consultant we have access to over 100 offices worldwide, and a breadth of technical expertise.

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