



Richard Lanyi, P.Eng., FCSCE

President, Senior Railway Engineer

LANYI RAIL SOLUTIONS LTD

Richard has over 39 years of experience in the railway industry. He provides senior technical guidance related to railway engineering and operational matters. Richard's experience ranges from rail line route studies to freight and passenger rail corridor expansion projects, and from rail yards and terminals to ports and other transloading facilities. He has successfully managed large multi-discipline railway projects involving planning, design, material procurement and distribution, construction and project management. Richard is a career "Railroader" who has held senior technical and managerial positions for two North American Class 1 Railways (CN Rail and CP Rail). He is a former Assistant Chief Engineer for Structures at CN Rail, and as Senior Manager Engineering, he was responsible for capacity expansion initiatives across Western Canada's mainline network involving planning, design, procurement, and construction of over 150 Km of new track. Most recently, Richard was Stantec's Rail Sector Lead, responsible for business and resource development, and senior technical advisory services for Transit and Rail.

Richard specializes in the development of rail yard/terminal and linear rail corridor projects. His wealth of development experience brings a large body of relevant "lessons learned" knowledge. These lessons are based on a "quadruple bottom line" approach involving functionality, economy, economics, and social acceptance. With all railway clients, he promotes a large focus on understanding operational requirements, both locally and network wide, prior to delving into the engineering aspects of a project, where form must follow function. He also understands that success will be largely dependent on social and environmental considerations, and as such, welcomes regular stakeholder interaction.

Richard's "hands on" experience covers all aspects of railway engineering and operations. He is a trusted advisor to his railway clients and understands the importance of safety and the need to plan and execute the work with minimal disruption to train service. Richard has a proven track record of leadership ability and a reputation as a "driver" who is results oriented. He has managed and delivered infrastructure projects as an owner, as well as a consultant. This includes alternative project delivery methods.

QUALIFICATIONS

Diploma in Pure & Applied Sciences, John Abbott College (CEGEP), Montreal, Quebec, 1978

Bachelor of Science in Civil Engineering (Co-op Program), University of Waterloo, Waterloo, Ontario, 1982

Professional Engineer #25484, Engineers & Geoscientists British Columbia

Professional Engineer #24208, Association of Professional Engineers and Geoscientists of Saskatchewan

Professional Engineer #100166054, Professional Engineers Ontario

Registered Member #38561, Association of Professional Engineers and Geoscientists of Alberta

MEMBERSHIPS

Member, American Railway Engineering and Maintenance-of-Way Association (AREMA)

Member, AREMA Committee 16 – Economics of Railway Engineering and Operations

Fellow, Canadian Society for Civil Engineering

SPECIALIZATIONS

Linear rail corridor capacity expansions

Rail yard and terminal developments

Integrated transportation studies

Railway operations analyses and studies

Planning of railway track and bridge projects

Railway economic studies

PROJECT EXPERIENCE

Rail Yards and Terminals

Railway Terminal Development Projects*

Richard has worked with dozens of clients in the industrial and mining sectors in developing railway terminal engineering and operations plans. Richard typically leads teams of environmental/regulatory specialists, as well as, surveyors, geotechnical, grading, drainage and track design engineers in preparation of the site plans to suit the specific requirements of each site and operations. He has also incorporated materials handling, process design and building services groups in development of the entire terminal, based on client needs. These projects typically commence with the development of concept site and operations plans for railway approvals. Richard's extensive railway engineering and operations background, and knowledge of CN and CP's specific requirements, assist clients in minimizing their development costs, while focusing on safety, and the most efficient and economical solutions which suit both client and railway.

Port of Vancouver Roberts Bank Terminal 2* Vancouver, BC

This project involved the preparation of 30% design plans and P3/DB tender documents for a new 2.4 Million TEU capacity container terminal at Roberts Bank, BC. As the Owners Engineer Rail Lead, Richard led a team of railway engineering and operations specialists in supporting this project. Challenges include facilitating the relocation of existing Westshore Coal terminal tracks to make room for proposed new roads and overpasses; as well as, developing workable solutions for inbound and outbound lead tracks at the congested east (mainland) connection. Richard worked with the Port in reviewing proposed terminal rail operations to ensure the proposed storage and loading/unloading yards have sufficient capacity and can accommodate the proposed traffic flows. Richard also led static and dynamic

railway operations simulations related to integrated operations with Westshore Coal and Deltaport Intermodal terminals, including liaison with CN, CP, BNSF, and BC Rail. Other responsibilities included the preparation of DB procurement documents for Rail to ensure that the owner's requirements are well defined in terms of operations, constructability, quality, safety and service.

KiwiRail Palmerston North Regional Economic Hub/Terminal*

Palmerston North, NZ

Richard was responsible for developing the Master Plan for this strategic intermodal transload Hub. In support of creating economic growth in south central North Island, this facility was designed to accommodate inbound / outbound storage tracks, a marshalling yard, intermodal container terminal, freight forwarding facilities, log loading and fuel transloads, as well as, railcar and locomotive maintenance and railway engineering maintenance facilities. Richard work with KiwiRail in developing improved network and terminal operations efficiencies, as well as, site selection evaluation for this strategic facility within the Palmerston North Industrial Zone. This Master Plan was developed to KiwiRail engineering standards and forecasts for future economic growth in the Region.

CN McBain Intermodal Terminal*

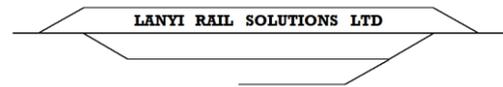
Edmonton, Alberta

Richard worked with CN on several improvements within their McBain Intermodal Terminal in Edmonton, AB. These improvements were developed with the intention of improving the operational through put of the facility. Richard worked with CN to define the scope of these projects for funding approval, then overviewed engineering designs and supported the construction efforts with survey and materials testing. Improvements to the terminal include Chassis Parking area, Rolled Compacted Concrete Pad

* denotes projects completed with other firms

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Expansions, Track Expansions, and Redesign of Terminal Entrance. Each of these projects has allowed CN to improve the operation to increase productivity and volumes moving through the terminal.

CN Lynton Yard Expansion*

Fort McMurray, Alberta

CN's Lynton Yard has existed since 1905 and has seen sporadic development over the last 100 years. With the increased demand for goods in the Fort McMurray area, the rail yard has seen exceptional growth. This in turn has led to several development projects within the Lynton Yard. In order to meet the needs of existing projects and forecasted growth, CN required development a storm water management plan. Richard worked with CN to determine how storm water containment could be placed in future development to maximize the development potential of the rail yard space. Within this terminal Richard was also engaged in design a new fuel transloading facility, and trackwork for crude and sulphur transloads.

Athabasca Upgrader - Preliminary Design, Fort Saskatchewan, Canada*

Client: Fluor Canada Ltd.

This project involved plant infrastructure preliminary design for Total's oil upgrader in Fort Saskatchewan, Alberta, including grading, roads, rail and drainage design. The rail yard is designed for 3 separate loadout facilities (Coke, Sulphur and LPG) to accommodate a daily production involving 150 cars. The railway plant includes approximately 12 miles of track. Apart from alignment design, Richard developed railway logistics plans which included recommendations for custody transfer weighing and car indexing for each loadout facility. As Senior Engineer for Track Design, Richard provided technical guidance regarding alignment design, rail yard layout and logistics planning.

Agrium Redwater - Site Wide Loadout Facility Efficiency Study - Rail Component*, Redwater

Client: Agrium

This project involved the assessment of the performance of the railway operation and materials handling systems for Canada's largest fertilizer plant. Richard assisted with identification of deficiencies and development of proposed operational improvements.

Sulphur Terminal Rail Yard Design*, Bruderheim, Client: Alberta Sulphur Terminals

Richard provided senior reviews of railyard operations/logistics plans, preliminary and detailed design track alignments and railyard layouts. This terminal included a 44 car/day loadout facility for inbound molten sulphur. A separate rail loop to accommodate 110-car outbound loaded unit trains. Railcar storage and maintenance facilities were also studied, and recommendations provided regarding future expansion.

Canadian Methanol Pre-Feasibility Study*, Chetwynd and Kitimat, BC

This project involved the development of an upstream production facility/terminal in Chetwynd, BC, and a downstream transload (rail to ship) facility in Kitimat, BC. Richard was the Rail Lead on the project responsible for upstream/downstream rail yard designs and operating plans, as well as, the capacity assessment of CN's rail operations between terminals. Richard oversaw the development of cost estimates and implementation plans for all Rail facilities, and provided railway liaison services between the client and CN. Project deliverables included estimations of fleet size for railcars, as well as, requirements for railcar storage. Operating plans were developed to accommodate upstream plant production, as well as, intermediate rail service and downstream ship schedules.

* denotes projects completed with other firms

Railway Corridors and Route Studies

CP Rail Mainline & Capacity Expansion Projects*

Richard has been the Railway Lead for numerous corridor expansion projects. This has included over 15 new siding, siding extension, and double tracking projects involving over 50 Km of new track. Engineering services included geomatics, geotechnical investigations, track and bridge design, and construction administration and supervision in the field. To facilitate the delivery of multiple projects, Richard assembled a Program Management team to handle project management and administration requirements. Richard was active in the development of preliminary designs and construction staging plans, as well as, the review of final designs and support during construction.

CN Rail Mainline & Capacity Expansion Projects*

Richard has been the Railway Lead for several corridor expansion projects. This has included expansion of yards and terminals, bridge projects, and environmental studies and regulatory approvals. Engineering services have included geomatics, geotechnical investigations, track and bridge design, and engineering support during construction.

Port of Vancouver Pitt Meadows Grade Separation Projects*, Vancouver, BC

The Port of Vancouver is engaged in improving road and rail traffic flows throughout the Lower Mainland. Richard provided senior technical railway advisory and railway liaison services related to grade separations of Kennedy Road and Harris Road across CP's Cascade Subdivision. Harris Road is intended to be a rail over road design involving numerous roadway, utility, and property constraints, and railway operations logistical issues. Richard has supported the development of railway detours and constructability reviews focused on minimizing impacts to CP's operations.

CN Skeena 87.2 Bridge Expansion*

Prince Rupert, BC

CN has been expanding capacity along their BC North Line from Prince George to Prince Rupert. The existing six span single track bridge (Zanardi Rapids) has been a local constraint to numerous new port developments in the Prince Rupert region. Richard was engaged as the senior technical advisor supporting preliminary and detailed design involving the expansion of up to 3 new tracks/bridges. Challenges involved construction of new substructures within a 25 foot tidal zone into, and on top of, fractured rock foundation conditions. Richard provided input into assessment of existing site conditions, concept designs, and constructability considerations.

Yancoal Potash Rail Route Study*

Yancoal required preliminary designs for 2 potential railway routes connecting their proposed potash mine site to both CN and CP mainlines. Richard led the route study efforts and provided coordination with both rail carriers. Designs were developed based on minimizing grades and overall route length, while avoiding unsuitable ground conditions, minimizing at-grade crossings, and minimizing impacts and land acquisition requirements from local land owners. Up to three options were developed for each route, with lengths of up to 30 km.

International Pipeline – Spur Track Design*, Alberta

This project involved 5 Km of new spur track connecting CN's Scotford Yard, in the Alberta Industrial Heartland, to IPL's new Polyethylene plant in the region. Richard overviewed the development of preliminary design, which included numerous crossings for high pressure gas lines, local road crossings, and allowance for service connections to Shell Oil and Keyera Energy. Designs were completed to CN standards. Richard also provided liaison services with CN Marketing and Engineering.

* denotes projects completed with other firms

Northern Alberta Rail Study*, Alberta

Richard provided technical direction into this feasibility study of a proposed rail line servicing the Oil and Gas sector in Northern Alberta. This study involved two separate alignments of over 100 km of new rail line, as well as, several track carrying structures, including 2 long river structures across the Athabasca and Clearwater Rivers. Also included was an initial evaluation of Environmental constraints and development of a framework for future development, as well as, a cost estimate and project implementation plan.

Northern British Columbia Rail Study*, BC

Richard provided technical direction into this feasibility study of a proposed rail line connecting CN's BC North Line to the Ports of Stewart (CAN) and Hyder (US). This study involved two separate alignments of over 300 km of new rail line, as well as, several track carrying structures, and protection sheds through this mountainous region. Also included was an initial evaluation of Environmental constraints and development of a framework for future development, as well as, a cost estimate and project implementation plan.

Winnipeg BRT Stage 2 P3/DB Pursuit*, Winnipeg, Manitoba

This project involved the extension of the Winnipeg BRT by another 8 km. The new alignment had significant impacts along CN's Rivers Subdivision, the Portage Junction Wye connection, and the Letellier Subdivision branchline. Richard was the Rail Lead on the Prime Consultant Team working with the Graham/Ellis Don JV construction team. The project included 3 new railway bridges and the demolition of an existing 3 track mainline structure. Trackwork included mainline and branchline relocations, and reconfiguration of the Junction Wye to facilitate bridge construction. Richard led teams of railway engineers in developing solutions to reduce impacts to the railway and reduce construction costs.

Alderon Iron Ore Rail Line Feasibility Study and Preliminary Rail Design*, Newfoundland and Labrador

Richard provided technical direction and technical review into this feasibility study of a proposed rail spur servicing the proposed iron ore mine near Labrador City. The study also included development of a unit train loading facility at the mine site and unloading facility at the downstream Port of Pointe Noire. Richard also provided technical direction and review of the preliminary designs for all railway aspects of the project, including operation plans, cost estimates, schedules and technical reports.

CN VIA Expansion - Kingston West Subdivision Rail Bridges*, Multiple Sites, Ontario

Client: CN Rail

CN needed to add a third track along 64 km (40 miles) of the Kingston West Subdivision to provide more capacity for VIA Rail passenger train traffic. Part of the overall project involved modifications to existing structures along the north side of the existing track, adjacent to existing structures. This project involved detailed design and tendering for five bridges, environmental assessments/approvals, and a third of the geotechnical services for the project. The bridge types ranged from double voided box, precast prestressed concrete spans to ballasted steel beams. The bridge designs were performed in compliance with CN requirements and the AREMA Manual of Practice. Richard provided technical support and peer reviews.

Labrador Railway Constraints Study*, Newfoundland and Labrador

The Province of Newfoundland and Labrador required evaluation of existing railway capacity issues in support of future iron ore demand in the Labrador Trough. Richard supported capacity analyses and provided recommendations for staged capacity increase based on incremental forecasts in demand. Richard provided technical direction on the project and review of project deliverables.

* denotes projects completed with other firms

Iron Ore Rail Line Feasibility Study*, Peru

Richard provided technical direction into this feasibility study of a proposed rail line connecting iron ore reserves within the interior or Southern Peru to port facilities at San Juan de Marcona, nearly 600 km away, crossing the Andes mountains at a peak elevation of 4.5 km. Richard led teams in both Canada and Peru to provide the end product of an investor-grade feasibility report. The project developed a preferred route over mountainous terrain, evaluated new railway infrastructure and rolling stock requirements, developed a railway operating plan, and established capital and operating cost estimates in support of a 30-year operations financial analysis.

Conceptual Rail Route Analysis*, Saskatchewan

Client: Confidential Client

Richard provided technical oversight into the conceptual study for establishing potential rail routes for connecting a proposed new mine to existing CN and CP railway networks. The project involved identifying and evaluating alternative routes as well as evaluating options to upgrade existing railway branch lines, and the building of new railway infrastructure to service the proposed new mine.

Circle Drive South – Design Build – Ring Road Expansion*, Saskatoon, Saskatchewan

Client: City of Saskatoon

Acting as Owners Engineer on this \$300M highway/railway design build project, Richard's responsibilities included development of technical terms of reference, technical evaluation of proposal submissions, and liaison with both CN Rail and CP Rail. The rail component of the project includes the design and construction of three railroad bridges over the proposed four lane highway, several at grade rail crossing relocations, and temporary rail detours to facilitate bridge construction. Richard led the development of technical requirements for track, structures and signals, as well as coordination with both major railways

(CN and CP). Richard also led teams of technical specialists concerning the review of technical and pricing submittals during the RFP stages, as well as teams of technical specialists to review the Contractor's detailed designs, along with technical support during all aspects of railway construction, and/or construction impacts to existing railway operations.

Brandon Eastern Access*, Brandon, Manitoba

Client: Manitoba Ministry of Transportation

Design for a new double track railway bridge over a proposed four lane highway identified that a rail detour was the most cost-effective way to construct the new railway bridge. Operational requirements required the design of a double track diversion to Canadian Pacific Railway's Carberry main line. Works included construction of subgrade, sub-ballast, ballast, and track. It also involved the addition of a new track over an existing double track bridge, as well as, reconfiguration of the existing CTC signals. Richard was responsible for preliminary and detailed track designs and technical specifications. He also provided planning and coordination with Canadian Pacific Railway regarding track and signals design and construction and oversaw preparation of final documents for tender and construction.

Canadian Pacific Railway (CPR) Montana Subdivision Mainline Relocation*, Milk River, Client: Province of Alberta

This project involved the relocation of Highway 4 which necessitated 4 km of mainline relocation of CPR's Montana Subdivision in Milk River. Railway engineering components of the project included track alignment design, including grading and drainage; grade crossing assessment, design and regulatory approvals; design of a new steel railway bridge to current CP Rail standards; track material procurement; and track construction supervision. Richard assisted with the procurement of track materials, supervision of track construction and installation of road/rail crossings.

* denotes projects completed with other firms

CN Long Siding Projects (2006-2008)*

Client: CN Rail

Richard was responsible for planning, design, construction and project management services for over 50 long siding capacity expansion projects in Western Canada. He led teams of transportation planners; engineering designers; surveyors; geotechnical, hydrotechnical and environmental engineers. During construction he overviewed grade, signals, structures and track contracts, construction supervisors; and materials procurement specialists. He interacted with railway operations and transportation personnel regarding the planning and execution of workblocks, work trains and movement of OCS cars. He also developed and managed integrated schedules involving design, construction (grades, signals, structures and track), property acquisition, and materials procurement, including second hand rail and tie relay programs.

CN Western Region Mainline Capacity Evaluation*

Client: CN Rail

Richard managed a team of transportation planners, operations and engineering personnel involved with the analysis of existing daily train traffic volumes and line segment capacity limitations. He summarized the supply and demand characteristics of all core mainline routes in Western Canada. He also identified existing bottlenecks on these core routes and developed a multi-year plan to upgrade line capacity to suit existing and future demand.

Passenger Rail/Transit

Metrolinx Bowmanville Expansion*, GTA, Ontario

Client: Metrolinx

As part of their initiative to increase passenger rail capacity in the GTA, Metrolinx is developing new infrastructure connecting existing Oshawa Station, on the Lakeshore East Corridor, to Bowmanville. This project includes a connecting

track from the existing GO Oshawa Station to CP's Belleville Subdivision. From there, the new GO track will run along the south side of the CP corridor for approximately 20 Km. The GO/CP connection will utilize the existing GM Spur corridor, including the existing bridge over Highway 401. It will also include a new station south of the CP corridor. The CP corridor expansion component will include 3 new stations, 15 grade separation upgrades, and 9 at-grade crossing upgrades. Richard served as the Senior Project Manager and Design Manager for preliminary designs, involving the development of stations, civil works, roadways, track, and bridge designs, project schedules, and cost estimates. He has also been engaged in establishing design QA/QC plans and managing stakeholder engagement.

Metrolinx South Blair Grade Separation*, GTA, Ontario

Client: Metrolinx

South Blair Street was originally an at-grade crossing of 2 GO mainlines, 2 CN Kingston Sub mainlines, and a CN industrial lead to the south. The project involved the lowering of South Blair below these 5 tracks, as well as, 4 additional tracks, including the new lead to the Whitby Rail Maintenance Facility. Richard acted as the Railway Lead and Engineer of Record for the project which involved completion of preliminary and detailed design of the new multi-track grade separation; as well as, 50 MPH detour tracks for both GO and CN.

Richard was intimately involved in the development and evaluation of structural options for the new structures, including the use of a longitudinal secant pile shoring wall between CN and GO tracks, as well as, the development of construction staging plans and track detours. Poor ground conditions in the area required the use of soil preloading along the north side of the corridor. Richard was involved with incorporating this construction sequencing into the project and developing a track monitoring procedure to

* denotes projects completed with other firms

ensure safe mainline railway operations at all times. His personal relationships with local CN engineering staff and their Bridges and Structures Group helped move this project along efficiently and cost effectively.

Metrolinx Stouffville GO Stations DB Pursuit* GTA, Ontario

Client: Metrolinx

As part of their Regional Express Rail initiative to increase passenger rail capacity in the GTA, Metrolinx was developing new infrastructure along the Stouffville Corridor. Part of this development includes the expansion of two existing Stations, one new Station, and a new rail under road grade separation at Steeles Avenue. Richard was the senior technical advisor for Rail for the Prime Consultant who were teamed with the Kiewit/Bird JV Construction Team. Richard was involved in a support role to the Design Manager involving the development of project agreements, project schedules, and design costs. He was also been engaged in establishing design QA/QC plans and providing technical assistance to the Grade Separation and Track Design Technical Leads.

Metrolinx Whitby Rail Maintenance Facility* P3/DB, GTA, Ontario

Client: Metrolinx

In the Greater Toronto Area (GTA), moving commuters to their jobs and home again is essential and GO Transit does that effectively and efficiently. Part of that efficiency lies in careful management and maintenance of their fleet at sites like the Whitby Rail Maintenance Facility (WRMF). Richard was involved with providing railway design services for the WRMF project as part of the prime consultant role to Bird-Kiewit in Joint Venture. Richard was involved as a Technical Advisor to the Track Design Team, and also provided support to the development of the Design QA Program.

Metrolinx Highway 401/409 Tunnel*, Kitchener, Ontario

Client: Metrolinx

To accommodate additional GO traffic and the new UP Express service, 2 additional tracks were required along the Kitchener Subdivision between Kipling Avenue and the Islington overpass. Though the project only covers a few kilometres of trackwork, it has many challenging constraints and obstacles. The project needs to facilitate a new and expanded Kipling station and platform configurations at one end, a new 2 track tunnel under Highways 401 and 409 ramps in the middle, and the existing Islington overpass at the other end. The project also needed to accommodate relocation of the existing CN industrial lead south of Kipling, along the east side of the corridor. Richard acted as Railway Lead during preliminary and detailed design.

Metrolinx Georgetown South Bridges*, Kitchener, Ontario

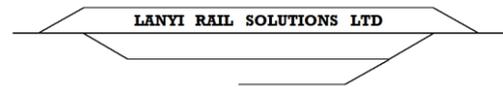
Client: Metrolinx

This project involved the widening of 3 existing railway bridge structures to accommodate multiple new tracks over Kipling Avenue, Martin Grove Avenue and Highway 27; as well as, the design of retaining walls under Highway 427 to allow for the new UP Express tracks. Richard acted as the Project Manager during the design phase, and Railway Lead on the project which involved completion of preliminary and detailed design, preparation of tender documents, and construction administration and supervision. Richard's experience helped resolve several challenges involving construction in a confined urban environment. Many of these involved working around existing and relocated utility services, utilizing temporary shoring techniques to minimize work space, and planning the work utilizing daily evening workblocks while minimizing disruptions to daytime GO and CN traffic. Through the development of a close working relationship with the Metrolinx and Stantec Team, all projects were delivered on time and on budget, with zero safety incidents.

* denotes projects completed with other firms

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Edmonton North LRT Preliminary Track Design*, Edmonton, Alberta

Client: City of Edmonton

This project involves 3.2 km of new LRT double track design through the heart of Edmonton's city centre. The new rail line runs from the existing underground Churchill Station to the Northern Alberta Institute of Technology. Portions of the alignment include a tunnelled section, an in-street section and a complex connection to the existing underground network. Richard provided senior engineering and project management support to the design team for this project whose estimated construction value is over \$800M CDN.

Calgary West LRT DB Pursuit*, Calgary, Alberta

Client: City of Calgary

This Design/Build pursuit involved 8km of light rail extension for the City of Calgary that included six stations. The cost of the West LRT line was valued at \$1.4 billion. Richard was the Track Design Lead responsible for horizontal and vertical alignments, as well as, special trackwork designs to meet Calgary LRT specifications. The scope of this trackwork included the construction of 8km of double track LRT, 3 direct fixation diamond crossovers, 1 ballasted crossover, 1 ballasted turnout, and 5 road level crossings.

South Light Rail Transit*, Edmonton, Alberta

Client: City of Edmonton

On the final 3 km of construction of this urban Light Rail Transit project, Richard ensured proper representation of the Rail Team and provided guidance to track construction management staff. Richard provided senior technical advisory services, particularly on critical field issues, and resolved process or operational issues that affected communications between track designers, the Rail Contractor, and the Project Management Office.

Lagos Blue Line LRT*, Lagos, Nigeria

Client: Lagos Metropolitan Area Transport Authority (LAMATA)

Richard was the Technical Director responsible for preliminary design development, capital cost estimates, and preparation of design/build tender documents for a 27 km transit rail line in Lagos, Nigeria. The work included 27 km of roadbed, drainage and trackwork, 4 km of guideway, 5 double track bridge structures, and 10 stations.

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