LRC
LIGHT RAIL CONSULTANTS

CAPABILITY STATEMENT

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Light Rail Consultants (LRC) Pty Ltd is a privately-owned company that provides innovative engineering design and management services to all sectors of the Australian and New Zealand rail and light rail industries.

History

LRC was established in 2008 to capitalise on specialised expertise in the design of Overhead Line Equipment (OLE) and in Track for both railway and tramway projects.

Purpose

The mission of LRC is to be the leader in the market that we serve, to the benefit of our clients and their customers, the local transport authorities and the community who rely on their services.
LRC's objective is to consistently meet client demands and expectations for world class solutions, with high quality designs delivered at competitive rates and to schedule.

Our strategy, through recruitment and training is to provide professionals with proven experience in overhead wiring, track and civil design.

Value

Our value to clients is based on our specialist knowledge in overhead wiring systems and rail designs, and our ability to channel this knowledge into comprehensive tailored solutions for the client's specific requirements.

At LRC, we consistently stay in the forefront of design by closely studying industry trends and the latest innovations and techniques, so we can provide each client with the most up-to-date best-practice advice.

In order to meet all our obligations to our clients, we stay familiar with all relevant legislation, authorised engineering policies and publications and with all applicable Australian and international standards.

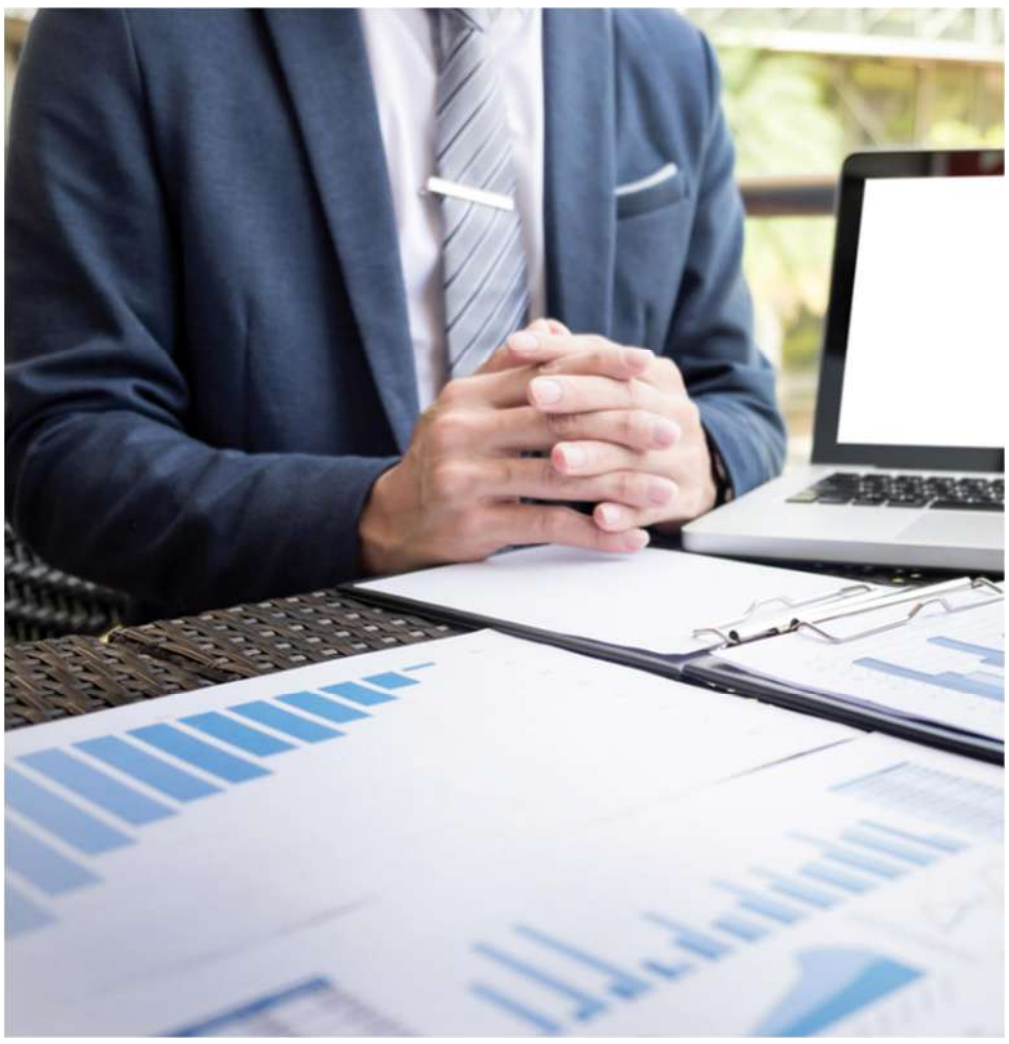
MANAGEMENT PHILOSOPHY

People

Our management philosophy is to:

- Position our team for success by focusing on individual team members and their skills
- Treat people with respect and transparency by clearly communicating team goals and management expectations
- Judge the work by the quality of the outcome, not just the amount of effort
- Maintain team morale and motivation through positive reinforcement; and
- Structure the team and management to provide consistent mutual assistance and support

LRC employs experienced design experts in civil, structural and electrical disciplines and engages with its partners to provide further expertise to complement other areas, ensuring LRC is well placed to manage complex engineering design projects.



Clients

We work closely with our clients to fully understand the engineering scope, schedule and budget.

As a result, we provide high quality engineering design solutions, with minimal cost variations and schedule disruptions, traditionally required to cover rework after misunderstood design requirements.

As an integral part of our philosophy, we view stakeholders as co-developers, ensuring that we maintain their design intent and that they stay up to date with design developments.

Our approach to engineering is focused on achieving:

- Quality engineering project deliverables - on time and budget
- Practical designs to meet agreed project objectives
- Zero rework

Clients benefit from cost saving and practical, workable designs. LRC benefits from building long-term client relationships.

Risk Management

All aspects of health and safety, quality and environmental standards are assessed according to LRC's risk management approach, based on based on AS/NZS ISO 31000:2009 practices and guidelines.
LRC's risk management approach allows us to develop comprehensive controls and treatment strategies, with emphasis on accountability and continuous improvement in risk management.

Every aspect of decision-making includes consideration of risk management, and risk management is an important item at monthly and project review meetings.

Business

To achieve viable business benefit, LRC strives at all times to act with integrity to maintain high standards of business ethics and conduct. This principle is applied in our dealings with employees, partners, contractors, clients, suppliers, authorities, governments, competitors and the community. Our policies and procedures are consistent with this principle and are part of our framework to guide business operation.

Compliance

Monitoring compliance is a key element of our business systems, aligned to AS 3806-2006, including: legislative requirements, industry codes, risk management, governance, project audits, and we maintain a strong culture of promoting awareness while maintaining transparency and honest reporting.

Health and Safety

LRC has a commitment in all its actions and undertakings to ensure the occupational health and safety of its staff, contractors and clients, and the safety and wellbeing of the general public, through adherence to the Victorian Occupational Health and Safety Compliance Framework, in line with the standard AS/NZS 4801:2001.

Quality

Quality is managed at LRC through constant supervision, assessment and revision of all internal and external project processes and practices. Our current Quality Management System (QMS) is aligned to the Australian Business Excellence Framework, consistent with the standard AS/NZS ISO 9001:2008, and implementation to achieve full accreditation is underway. Quality in all LRC designs ensures reliability, performance, ease of installation and maintenance.

Environment

At LRC, in our business and with our designs, we understand the importance of our role in ensuring that environmental issues are addressed in all our projects.

This begins with understanding the environmental laws, regulations and standards, ensuring all LRC members are fully informed and accountable and that all reasonable steps are taken, in accordance with AS/NZS ISO 14001:2004, to achieve zero environmental impacts.

Our designs focus on longevity, low visual impact and the use of environmentally friendly materials.

Overhead Wiring Design

We provide a comprehensive engineering design service, comprising all elements of overhead wiring systems. By making use of the latest design techniques, we deliver modern and innovative designs that are lighter and reduce visual impact.

- System design consulting
- 600V to 1500V AC/DC expertise
- Catenary design
- Power feeder and connection details
- Interlocking solutions and platform design
- Pole, mast and wall bracket design
- Overhead suspension and fitting solutions

Track & Civil Design

We undertake engineering designs for new installations and for upgrading operating facilities.

- System and concept design
- Horizontal and vertical design alignments
- Advanced 3D modelling
- Rail fabrication details
- Swept path analysis
- Railway pedestrian crossing
- Track drainage
- Structural design of stations, tram stops, depots and yards

Construction Services

We provide skilled individuals for engineering and project support, supervision and management, so we can ensure planned, essential outcomes.

- Design and supply of steel poles
- Consultation on purchasing Overhead Line Equipment
- Installation supervision
- Project management

Ancillary Services

We offer specialised engineering services, providing breadth of support to important aspects of project development and execution.

- Tram signalling solution
- Infrastructural & interface management
- Structural design
- Traffic Design
- Traffic engineering

Kevin Karamad

SENIOR OVERHEAD DESIGN ENGINEER

Kevin possesses over 20 years of experience in tramway and train Overhead tractions Systems, Structural Design and Civil Design.
His tram expertise has encompassed the complete infrastructure design of tram Overhead including curve networks, traditional rigid suspension along with more modern elastic suspension systems and custom pole, support systems and fitting design in accordance with project requirements.
Kevin has been a lead overhead design engineer on a variety of tram way projects; including the major tram depot in Melbourne and Adelaide. Other Kevin's works includes; Docklands tram extension (Nominated for Vic. Eng. Excellence Award 2005), Overhead detail design for NSW Homebush turn back, Adelaide tram extension (received a High commendation), the Richmond Overhead rehabilitation and Newport stabling and training school.
Kevin has developed his own programming software's which are excellent design tools.
Over the past year, Kevin has been involved in Rail Infrastructure Alliance (RIA) project, working as OHLE Design Lead for Eastern Portal package. And in parallel, he's been also a checker to Western Portal, Western corridor and Western Turnback packages. He is currently a design lead for Sunbury Power Upgrade project in RIA.

Kevin has MTM Designer, Checker and Approver for OHW competency.

Qualifications

Bachelor of Civil Engineering (Structural Design)

Discipline

- Overhead wiring
- Feeder & switching
- Civil/Structural

Memberships

- Fellow Member of Engineers, Australia, (FIEAust), CPEng, NER, , APEC Engineer IntPE(Aus)
- Railway Technical Society of Australia (RTSA)

Russell Conabere
SENIOR TRACK DESIGNER

Russell has over 37 years' experience as a Track designer in light and heavy infrastructure works and is responsible for the design of some of the most complex track configurations in the Melbourne tram network.
He has also designed complex heavy rail alignments, both in Melbourne and interstate.
As a Senior Track Designer, Russell specialises in both light and heavy rail alignment, with horizontal and vertical design and advanced 3D modelling.
Russell has also gained experience working with the Dublin Light Rail Project and with a mining railway project in Chile.
Russell has worked with LRC as a contractor for over 10 years.

Qualifications

- Associate Diploma Civil Engineering

Discipline

- Track

Bert Oin
SENIOR OVERHEAD WIRING ENGINEER

Bert is a qualified Electrical Engineer who has more than 7 years' practical working experience in Australia and overseas, including Chinese Metropolitan Train System.
After joining LRC, he has worked on both Light and Heavy Rail projects and has recently been involved in Level Crossing projects, including design/drafting role in Furlong Main Blackburn & Heatherdale, design lead in Caulfield to Dandenong.
Bert is currently leading Western Portal OHLE design of the Rail Infrastructure Alliance RIA project, with the work package forming part of the Metro Tunnel Project (MTP). He will be leading Western Portal to Tottenham OHLE upgrade design of RIA project.
Bert has MTM designer and checker ticket with MTM.

Qualifications

- Bachelor of Engineering (Electrical)
- Graduate Diploma of Electrical Engineering

Discipline

- Overhead Wiring
- Feeder & Switching

Shervin Hosseini
OVERHEAD WIRING ENGINEER

Shervin is a qualified Civil Engineer who has more than 4 years practical working experience in overhead wiring.
He has been involved with many Light Rail projects in Melbourne, including Power Supply Upgrade Projects (PSUP) and Annual Renewal Packages for both Overhead and Track projects.

Over the last 2 years, Shervin has been involved in Rail Infrastructure Alliance (RIA) Project with the work package forming part of the Metro Tunnel Project (MTP), working as OHLE design/drafting role in Eastern Portal and Sandringham Line packages. He is currently a design lead for the portion of Sunbury Power Upgrade project in RIA. Shervin has MTM designer ticket with MTM.

Qualifications
- Bachelor of Engineering - Civil & Infrastructure (Honours)
- Diploma of Engineering Drafting

Discipline
- Overhead Wiring
- Feeder
- Feeder & Switching

Amir Foroodi
SENIOR PROJECT MANAGER

Amir is an experienced project manager and driven expert with over 20 years track record of managing medium to large-scale projects across public and private sectors.

At LRC, he has successfully led Track, Overhead and Feeder projects with multiple dependencies and constraints; monitoring and managing risk, quality, safety, standards and legislations and handling conflicts.

Amir has built solid and strong relationship with YT project team, forging trust, working collaboratively to achieve successful project delivery outcomes and customer satisfaction.

Qualifications
- Master of Electronics & Communications Engineering
- Bachelor of Electrical & Electronics Engineering
- PRINCE2® Practitioner

Discipline
- Project & People Management

Memberships
- Engineers Australia, MIEAust CPEng NER APEC Engineer IntPE(Aus)

David Donaldson

CIVIL ENGINEER

David is a Civil Engineer who joined LRC at the start of 2016, where he assists the drafting and design team by preparing drawings, completing AIS drawings, writing reports and contributing to initial project investigations.

Qualifications

- Bachelor of Engineering - Civil & Infrastructure (Honours)

Discipline

- Feeder
- Civil
- Project Management

Memberships

- Engineers Australia

Kamyar Karamad

SENIOR CIVIL DRAFTSPERSON

With 16 years' experience in Information Technology and design/drafting, Kam's responsibilities at LRC encompass design, drafting overhead wiring, IT support for computer systems, development for in-house software applications and managing QA and documentation aspects for the IT design environment.

Qualifications

- Bachelor of Science in Information Technology
- Advanced Diploma of Computer Systems Engineering – Computer

Discipline

- Overhead wiring
- Feeder

Memberships

- Australian Computer Society

Niruethan Sundarasivam

CIVIL ENGINEER

Niru has been involved in design and drafting of track and feeder works. He has been involved in the design and drafting for many projects such as Yarra Trams annual Track renewal package, William St Feeder, Barkers Rd, Glenhuntly Rd, Sub ZF, CCTV and Wi-Fi attachments to Vic track Poles.

Qualifications

- Bachelor of Engineering – Civil (Honours.) Swinburne University of Technology.
- Diploma of Engineering, Swinburne University.

Disciplines

- Track
- Feeder
- Drafting

Merna Abosh

Civil ENGINEER

Merna is a civil engineer capable of working independently with minimum supervision and committed to providing high quality service to every project. She has gained practical working experience such as drafting, plotting MOCs and finalising As Built drawings for track and overhead projects. Merna will continue to do her best and tackle any challenge that comes upon her.

Qualifications

- Bachelor of Engineering – Civil

Discipline

- Drafting

Memberships

- Engineers Australia

Shaz Seirafi

OFFICE/ADMIN MANAGER

Shaz is an integral part of LRC, undertaking accounting and bookkeeping alongside other activities including:

- Ensuring operations adhere to policies and regulations
- Planning and coordinating administrative procedures and systems and devise ways to streamline processes
- Monitoring costs and expenses to assist in budget preparation
- Collecting, organizing, and storing information using computers and filing systems
- Assisting and supporting staff with their administrative queries

Qualifications

Graduate Certificate - Accounting

Bachelor of business and Administarion

Public Clients

As a major public client, Yarra Trams relies on LRC designs for many of its overhead and track upgrades at tram depots, stops and intersections.

Yarra Trams

Yarra Trams is the trading name of the Melbourne tram network, which is owned by the Victorian State Government. The current franchise is operated by the KDR Melbourne consortium, owned by Keolis and Downer Rail. As at May 2014, Yarra Trams operate 487 trams, across 26 tram routes, over 1,763 tram stops. With 250 km (155.3 miles) of double track. Melbourne's tram network is the largest in the world.

Vic Roads

VicRoads or the Roads Corporation of Victoria is a statutory corporation which is the road and traffic authority in the state of Victoria, Australia. It is responsible for maintenance and construction of the arterial road network, as well as driver licensing and vehicle registration

Vic Track

VicTrack owns Victoria’s transport land, assets and infrastructure – and works to protect and grow the value of the portfolio to support a thriving transport system and make travel and living better for Victorians.

Coleman Rail

Part of the Geotech Group of companies, Coleman Rail is a construction contractor in heavy and light rail infrastructure projects, offering design and construction, renewal, upgrade, maintenance and project management.

Aurecon

Aurecon is an engineering, design and advisory company, based in Australia and South Africa. The company delivers project design and management across twelve markets. They are built environment, construction, data and telecommunications, defence, energy, government, international development assistance, manufacturing, resources, transport and water.

AECOM

AECOM is an international leader, providing integrated professional technical and management support services for: transportation, energy, water systems, architecture, engineering, construction, mining, environment, economics and government market sectors.

SMEC Holdings

SMEC Holdings Limited is an Australian based-firm that provides consulting services on major infrastructure projects around the world. SMEC undertakes feasibility studies, design, tender and contract management, construction supervision and project management.

GHD

GHD is one of the world's leading professional services companies operating in the global markets of water, energy and resources, environment, property and buildings, and transportation. GHD is also a contractor client of LRC.

Jacobs

Jacobs Engineering Group Inc. is an American international technical professional services firm. The company provides technical, professional and construction services, as well as scientific and specialty consulting for a broad range of clients globally including companies, organizations, and government agencies

Abigroup

Abigroup is one of Australia's leading and most diverse national contractors, with 50 years' experience delivering works in building, roads, rail, water, mining services, tunnels, bridges and telecommunications. Abigroup is part of Lend Lease Infrastructure, a division of the Lend Lease Group.

Activate Rail

Activate is a Design and Construction Joint Venture between Coleman Rail (40%), John Holland Rail (30%) and John Holland Civil (30%). The joint venture, formed in 2012, completed works for the Regional Rail Link project, main track and engineering between Southern Cross Station and Moonee Ponds Creek.

McConnell Dowell

Formed in 1961, McConnell Dowell is a major Australian engineering, construction, building and maintenance contractor, delivering engineering excellence in three key industry sectors of building, infrastructure and resources.

LRC works in partnership with the below organisations to bring additional expertise and oversight to improve designs integration.

Pitt & Sherry

Pitt and Sherry is a leading Australian engineering and multi-specialist infrastructure consultancy servicing the transport, industrial, mining, energy, food and beverage and community sectors. Pitt & Sherry provide their expertise to LRC in bridge and other structural design.

Traffic Group Australia

Traffic Group Australia specialises in the provision of traffic management services to local authorities, road maintenance providers, large utility/infrastructure companies and civil engineering contractors throughout Australia.

Traffix Group

Traffix Group is an industry leader in transport planning, transport engineering and transport related infrastructure and construction works.

We provide a full suite of traffic and transport services.

LRS

LRS (LRC Registration System) is an in-house developed, project system that supports office management. Its main purpose is to allow the company to run more smoothly.

LRS helps control project work including documents, schedules, resources, contacts, timesheets, time costs, expenses, invoice billing, contracts, reports and transmittals. The system provides better visibility and control of projects in a real-time, day-to day environment, improving work scheduling, productivity, timesheets and ensuring deadlines are met.

LRC-Developed Computer Software Design Tools

LRC has developed design tools based on MS Excel and MS Visual Basic, to reduce computation and checking time.

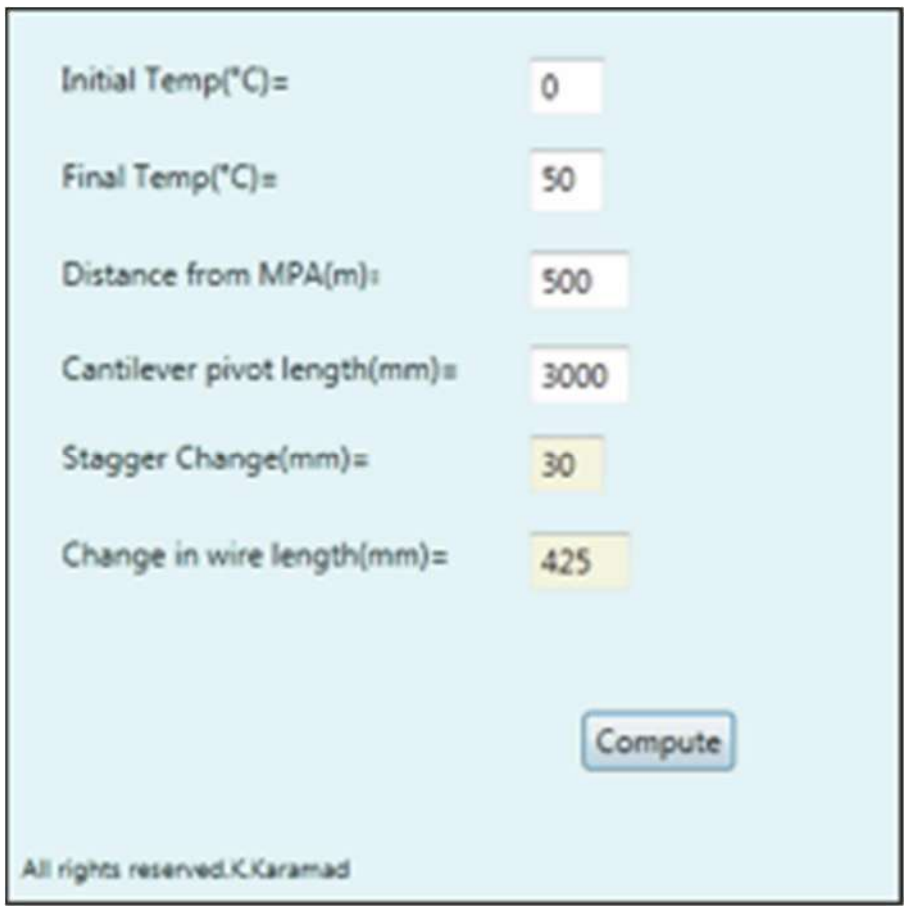
The design tools produce calculations for overhead line geometry, with result-checking, for wiring tensioning and swing parameters, curve loading and support spacing, stagger and pendulum height, across temperature differentials.

Elements of the LRC Design Tools are shown below.

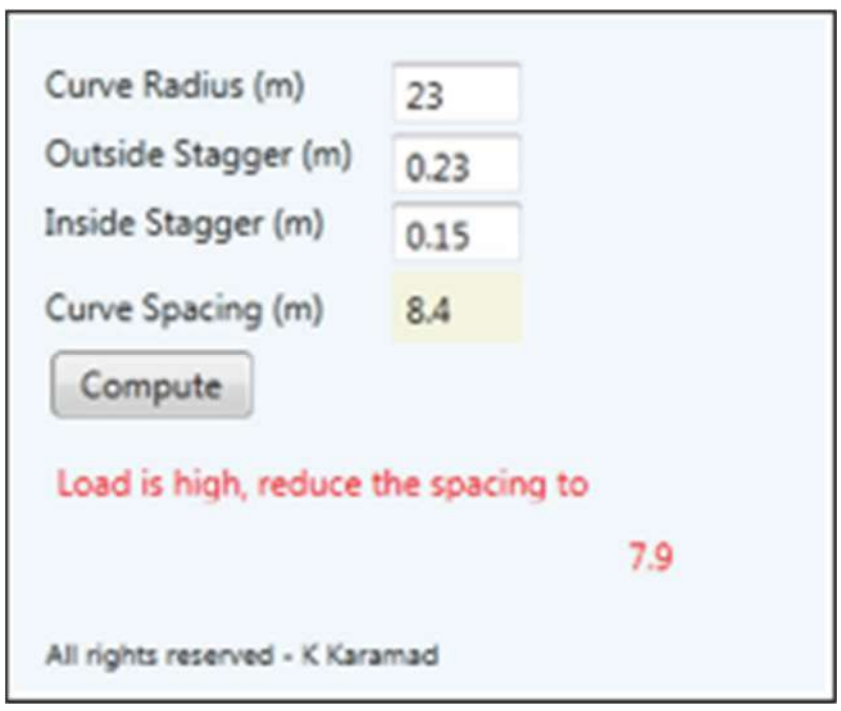
The Auto-tension Swing program calculates stagger change and wire creepage for given lengths of auto-tensioned overhead wiring on cantilever supports, within a temperature differential.

The Curve Spacing program calculation ensures that trolley wire stagger is within the specified limits throughout the prescribed curve radius, with consideration of mid-span offset, to produce acceptable support span spacing and segment loading.

Auto-tension Swing

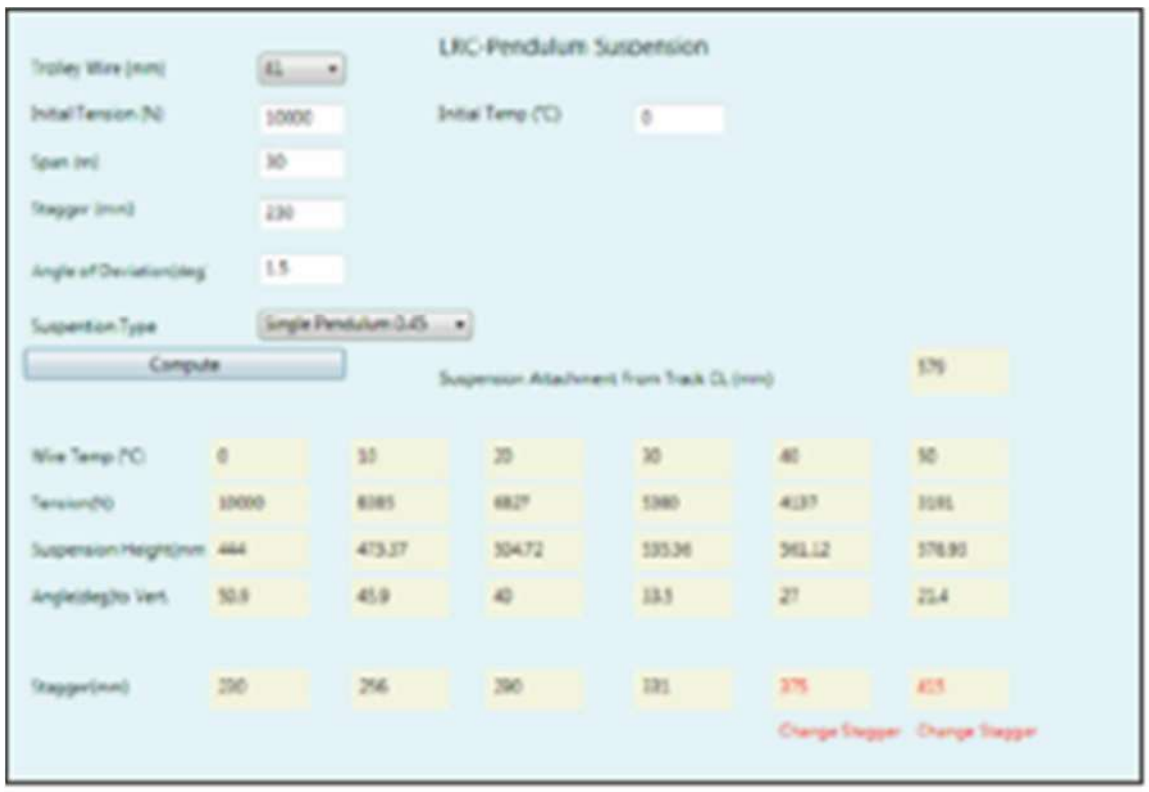


Curve Spacing



The Pendulum Suspension program, shown below, checks the stagger and height of pendulum against the cross-section temperature suspension height and stagger tables.

Pendulum Suspension Temperature Sag and Offset



These software programs, amongst others including Contact Wire Wear and Centre/End Throw calculations, are available to our design team members either in-house or online via the LRC web site.

Rail Infrastructure Design and Maintenance Software Suite

The proprietary design software suite employed by LRC includes state-of-the-art features, including, amongst others:

- Generates preliminary 2D plans and realistic 3D models for concept analysis and visualisation against prerequisite parameters, alternative layouts and design options
- Accommodates hybrid systems that involves merging of old and new technologies
- Includes a user configurable and updatable suite of integrated design rules and checks, to optimise the design and guide and alert designers when tolerances are reached and exceeded
- Provides full connectivity that allows project engineers to apply their skill and judgement to refine and optimise designs prior to construction, or to capture as-built changes after construction
- Has parametric templates containing variations and dependencies, supports changes in track geometry and spacing, curvature, cant, wire height and stagger, which simplifies and automates the design process, providing consistency, productivity improvements and cost savings
- Can facilitate templates to provide an evolving OLE library for client, project or corporate future use as standards or for rework in other projects
- Produces fully annotated project drawings and deliverables including design check sheets, reports and schedules: asset lists, cost estimates, delivery schedules, construction pick lists and site set out
- Incorporates restricted ‘fixed zones’ and clearances to avoid obstacles such as over-track distributions, tunnels, crossings, bridges, structures and underground utilities
- Maintains complete information for use, not only with the current project, but for future use in operations, maintenance and rehabilitation works to sustain the network
- Caters for to a range of configurable international standards for global infrastructure projects
- Addresses both horizontal and vertical track geometry, and also station, yard and depot layouts, as well as earthworks and track ballast

Overhead Wiring

- Annual Package 3, 4, 5 and 6 to 8 (Glenferrie High St/Malvern, Mt. Alexander Rd, Spencer St, Kew High St, Royal Park, Swan St,…) - Yarra Trams
- SPA - Additional Works Package 3 - Montmorency
- SPA - Additional Works Package 4 – Glenhuntly OHW & Feeder
- RIA - Sandringham & Eastern Portal package, Western Portal & Sunbury Traction power upgrade
- Thompsons Road Level Crossing
- Kananook Stabling Yard – Stage 2
- Aurecon – Grade Separation –Furlong Rd, Main Road, Blackburn Rd & Heatherdale Rd
- Aurecon – Calder Park & Cardinia Rd Level Crossing
- Sunbury Traction Upgrade- Aecom
- Caulfield to Dandenong Level Crossing (CTD)- Aurecon
- Preston Workshops- Aecom and Coleman Rail
- Eastern/Western Portal – Aecom
- Weight Tension System Design, St Georges Rd & Plenty Rd -Yarra Trams
- Nicholson Street Upgrade (Route 96)- GHD & Argot
- Brunswick Depot- Jacobs
- 'H' Crossing Upgrades, various locations – Yarra Trams
- Adelaide Tram Museum line upgrade- WGA
- Domain Interchange- GHD
- Gold Coast Rapid Transit- Abigroup and Yarra Trams
- Tram Route 1 Overhead Upgrade- Yarra Trams
- Brunswick, Essendon, Kew, Malvern, East Preston & Glen Huntly Depots Planned Upgrades- Yarra Trams
- South Bank Depot- Yarra Trams AND many more

Track

- Annual Package 3, 4, 5 and 6 to 8 (Essendon Depot, Mt Alexander, Kew High St, Plenty Rd, High St, Park St/Montague, La Trobe X-overs, Grantham St, Spring St, Preston Depot, Royal Park…)- Yarra Trams
- Queens Parade- Yarra Trams
- Federation Sq platform – Yarra Trams
- St Kilda Rd- Yarra Trams
- Toorak Road- Yarra Trams
- Pascoe Vale Road- Yarra Trams
- Ballarat Tramways
- Holmes Street- Yarra Trams AND many more

Feeder

- Annual Package 3, 4, 5 and 6 to 8 (Plenty Rd, Swan St, High St Kew, Bridge Rd, High St & St Kilda Rd…)- Yarra Trams
- R58 NW- Yarra Trams – Carlton Sub, C.Y1, Royal Park Sub, West Brunswick Sub
- SUB ZF Re-sectioning- Yarra Trams
- Queens Bridge- Yarra Trams
- SUB ZU Mitigation- Yarra Trams
- Wattletree Road Underground Feeder- Yarra Trams
- Queens Way Overhead Feeder- Yarra Trams
- Brunswick Substation (LY) Feeder- Yarra Trams
- St Kilda Junction Substation (JU) Interface – Yarra Trams
- Sub WX and Sub RP – Yarra Trams
- Feeder related item for Track Renewal projects
- William Street- Jacobs AND many more

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