

Rail Profile Consulting



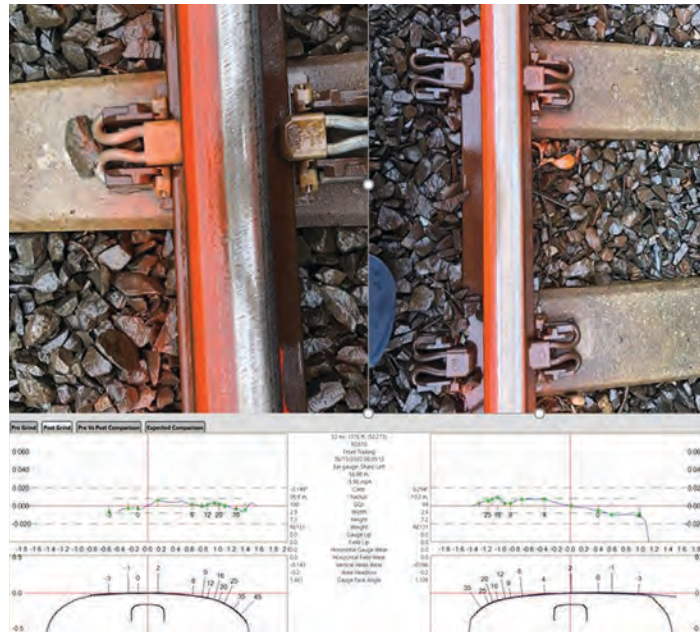
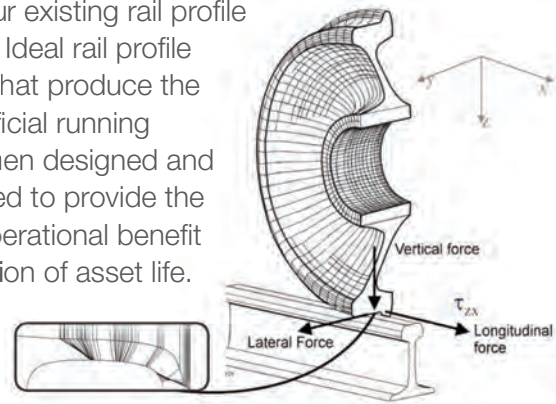
Rail Condition and Rail Profile
Template Consulting Services

Manage the integrity of your wheel/rail interface. Extend the life of your rail and rolling stock.

Loram Rail Profile Template Consulting Services

With unparalleled experience in understanding and managing wheel/rail interaction, Loram offers a proven service to design custom rail profile templates based on the unique operating conditions of your system.

Loram's proprietary technologies, technical personnel and specialized equipment combine to collect and analyze your existing rail profile conditions. Ideal rail profile templates that produce the most beneficial running band are then designed and implemented to provide the greatest operational benefit and extension of asset life.



Hands-on approach with in-field validation

Implications of underperforming rail profiles

Rail is the most expensive asset of a railroad. As contact fatigues advance, the likelihood of premature rail replacement increases, resulting in significant additional costs to the railroad. With their high-speed, sharper curvature, and frequent unique assets (stations, grade, changes in fixation and ballasting, etc.), transit and commuter systems require a deeper look into their rail and maintenance needs.

The contact patch between wheel and rail is typically only 1.5–3.0 cm² and undergoes extremely high stresses from the vertical, lateral, and longitudinal forces of the train. Issues with the wheel/rail interface arise due to various forces from revenue traffic. When these forces are not properly distributed due to an ineffective or worn rail profile, they cause stresses and fatiguing of the wheel/rail interface leading to problems such as:

- Ineffective traction and braking leading to rail burns and flat wheels
- Undesirable plastic flow and thermal cracking (sometimes referred to as Head Checking)
- Excessively worn profile shape that promotes unwanted vehicle dynamics (e.g., truck hunting, flange steering, false flanging, etc.)
- Excess noise output
- In extreme cases, derailment by fracture or wheel flange climbing the rail

Common rail defects introduced by rolling contact fatigue include:

Head Checking

Corrugation

Spalling and Squats



Optimized rail profile templates for enhanced track performance.

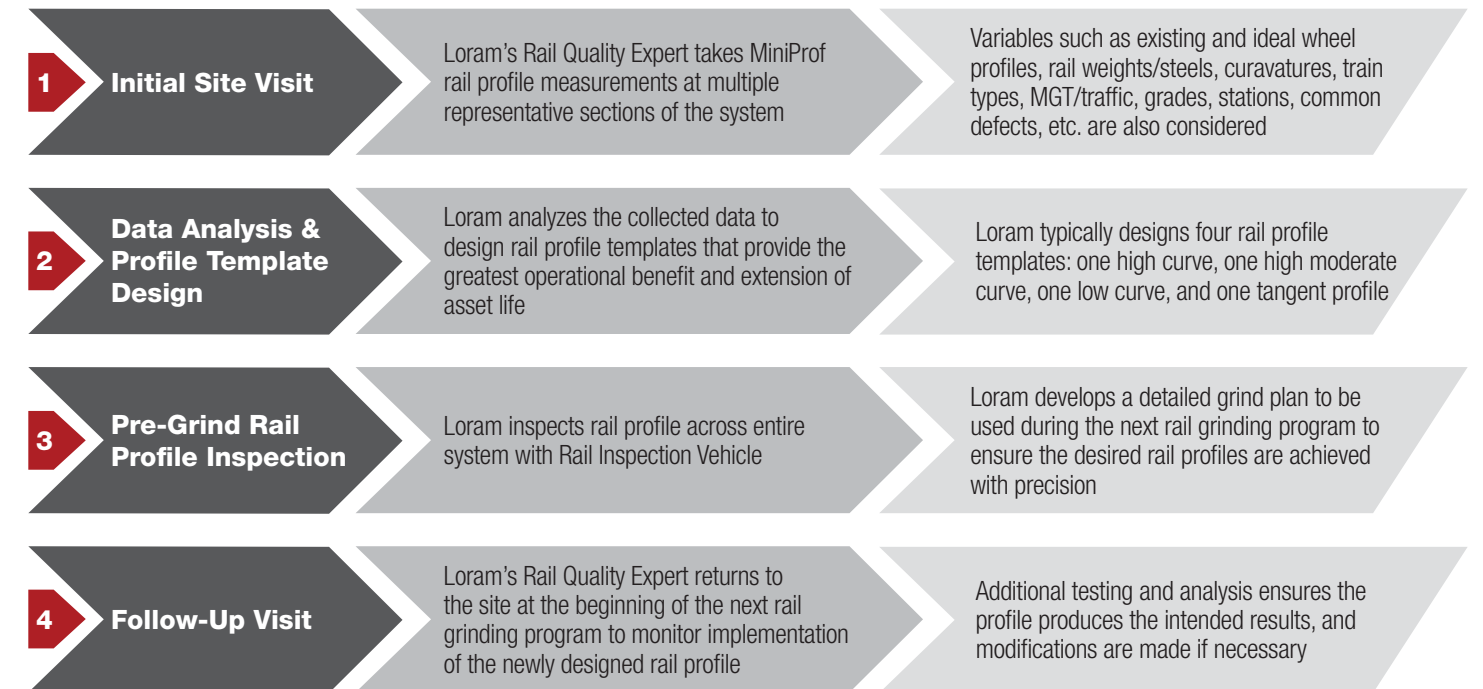
Custom-designed rail profile templates produce measurable benefits

Ideal rail profiles produce wheel/rail dynamics that balance wheel and rail wear and rolling contact fatigue by creating optimal contact bands in tangents and steering in curves. This is achieved by encouraging proper utilization of the rolling radius differential, eliminating undesirable steering forces in tangents that lead to truck hunting, and reducing stresses contributing to RCF development.

Operational and financial benefits of rail profile templates include:

- Enhanced safety by reducing the probability of rail failure and derailments
- Reduced contact stresses between the rail and wheels leading to:
 - Life extension through slower rolling contact fatigue development
 - Lower natural wear rates
- Improved wheel-set steering and lessened flange steering, increasing wheel life and reducing noise
- Reduced frequency of wheel truing
- Reduced corrugation development and lower wheel / rail noise
- Improved ride quality
- Reduced fuel usage and energy consumption
- Improved traction for more efficient acceleration and more effective braking

Loram Rail Profile Template Development Process



Efficient, automated rail profile inspection by rail experts

This hands-on approach with in-field verification is more effective than a solely theoretical approach. Loram's proven service delivers custom-designed rail profile templates based on the unique operating conditions of our customers' systems and ensures that the newly designed rail profile templates are validated and are providing the anticipated results.

Leading the digital transformation of railway maintenance



LORAM RAIL TECHNOLOGIES, SERVICES AND SOLUTIONS



- RAIL GRINDING
- BALLAST MAINTENANCE
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