

PROBLEM SOLVER

Problem: Concrete ties have proven their value to North American railroads, however over 90% of all tracks are still built with treated wood ties. Wood ties have historically been inexpensive, available, and easily maintained, leading to their widespread use. Recently, rising timber tie costs and decreased consistency have strained supply chains to meet demand. Additionally, a leading cause of mainline derailments is failure to maintain gauge attributed to timber tie decay. Railroads are seeking alternatives that would provide more reliable infrastructure and a move away from creosote treatment, however wholesale conversion to concrete ties can be costly and operationally disruptive.

Solution: The Keyway Concrete Tie, exclusively available from voestalpine Railway Systems Nortrak, brings together the robust design of concrete crossties and innovative fastener systems to achieve a seamless balance that provides the enhanced performance of concrete ties while avoiding the sweeping and time-consuming replacement of track segments. Interspersing concrete crossties on timber tracks has been a long sought-after method to realize numerous concrete crosstie advantages on timber tie tracks, but challenges regarding cross-compatibility of track stiffnesses between timber ties and concrete ties have historically prevented this ideal solution. Current trials on portions of a Class-1 railroad are comparing the results of complete track replacement to concrete ties versus interspersed concrete crossties about performance and cost metrics. Preliminary results are compelling in showing that the interspersed concrete tie trial alternative maximizes the effect of capital track replacement expenditures while minimizing track disruption time and potential track defects.

The Keyway Concrete Tie stiffness matches timber

ties using a fresh approach. By grouping resilient components with heavy-duty ductile tie plates and 10,000 psi concrete ties, the Keyway provides the durability and gauge holding strength of concrete ties while matching the lower track stiffness and fastening system interchangeability of wood ties. Despite having the longevity of concrete, the Keyway is made with wood tie track maintenance infrastructure in mind. It is a similar size to standard timber ties and is designed to be interspersed with wood ties at strategic intervals using standard maintenance of way equipment. The Keyway fastening assembly has gauge adjustability incorporated which allows the tie to be placed in the existing track without gauge adjustment.

Keyway Ties have been successfully installed in high-tonnage heavy haul, commuter rail, and light rail tracks

intermixed with existing wood ties, utilizing standard MOW equipment. All installations have provided immediate gauge strengthening as they perform the function of a concrete gauge rod while extending the functional life of the adjacent wood ties by reducing the gauge stresses on them. The ability to intersperse the Keyway Tie in wood tie track allows the railroad to exhaust the asset life of installed wood ties by increasing the reliability, availability, maintainability, and safety of the track while converting it to a more durable infrastructure system in an incremental and capital efficient manner. Railroads are seeking better-performing alternatives to environmentally hazardous and increasingly expensive wood ties, and the Keyway Tie demonstrates being a significant step forward in the evolution of track infrastructure.

