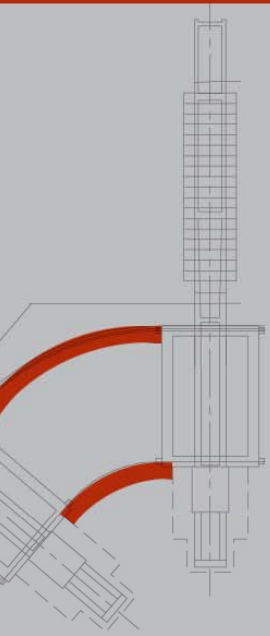


A technical line drawing illustrating a container crane's movement around a corner. The crane is shown in a side profile, with its boom and trolley assembly. Two red curved arrows indicate the path of the crane as it turns. The background shows a simplified layout of a container yard with rows of containers.

Transferring Container Cranes Around Corners

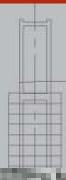
Erik Soderberg, SE
Liftech Consultants Inc.

Liftech



Types of Transfer Methods

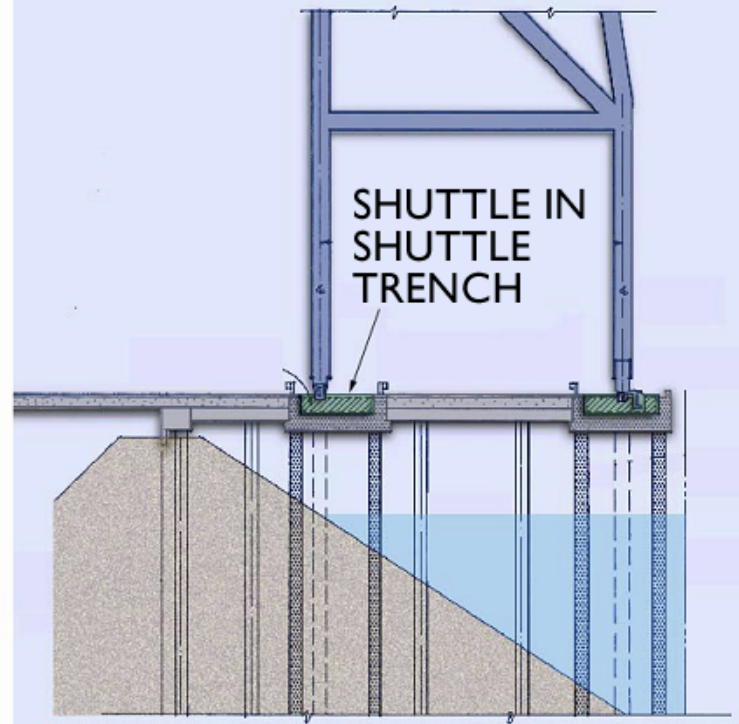
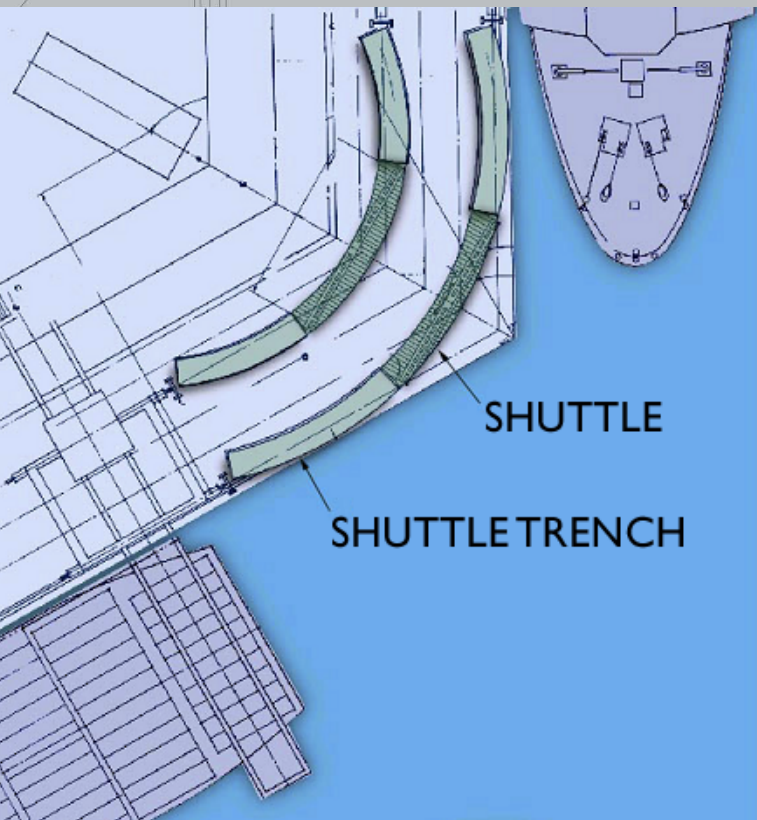
1. Mechanisms that minimize modifications to the crane
 - A. Turntable
 - B. Shuttles
 - i. Above Grade
 - ii. Below Grade
2. Mechanisms requiring more crane modification
 - A. Curved Rails
 - i. Without Switches
 - ii. With Switches



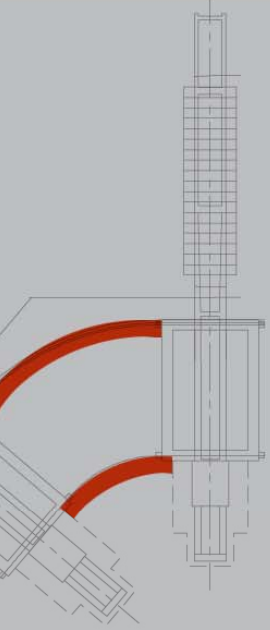
Turntable



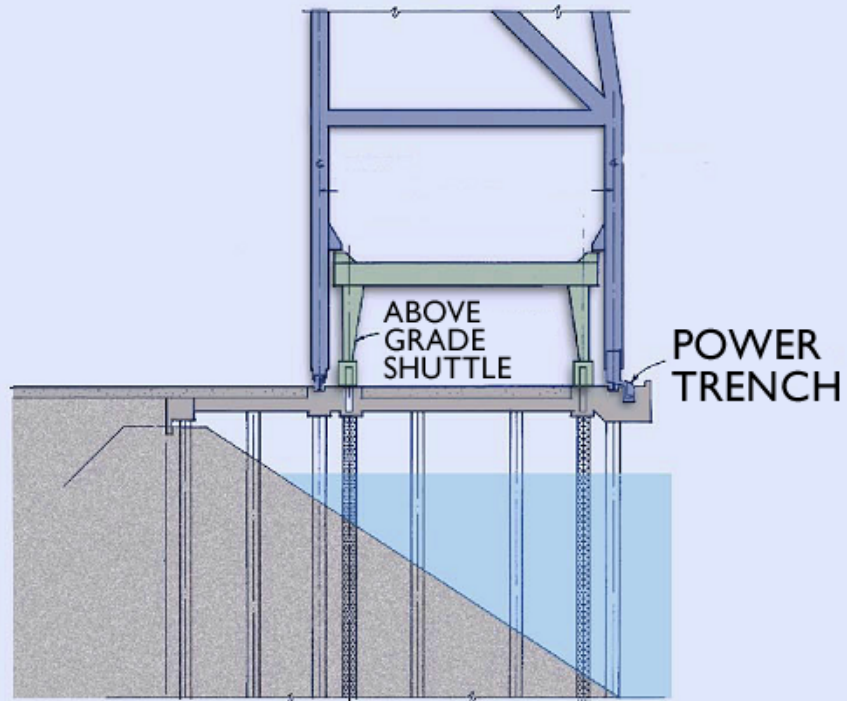
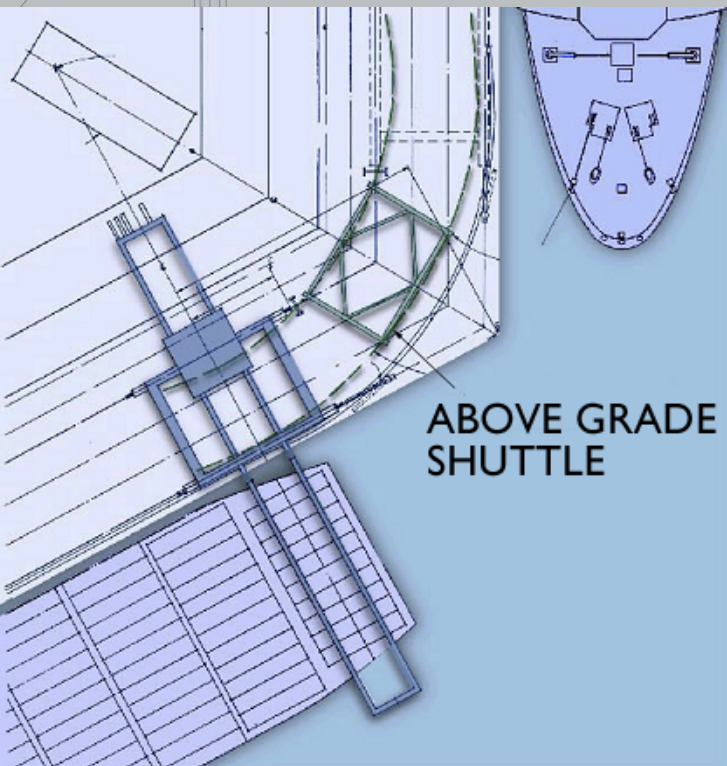
Below Grade Shuttle

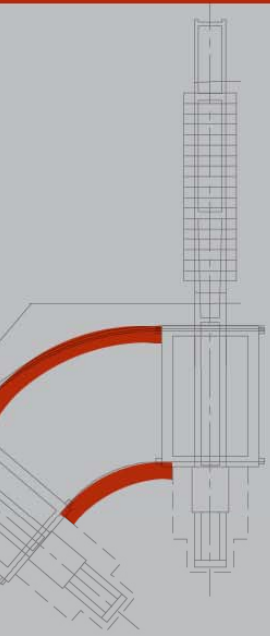


Below Grade Shuttle



Above Grade Shuttle

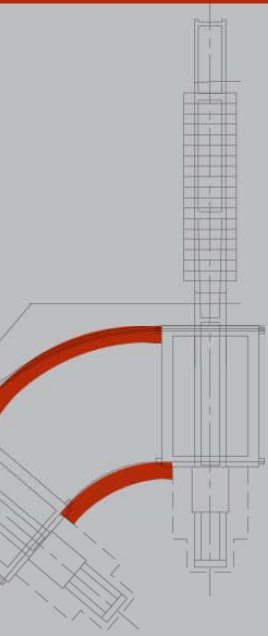




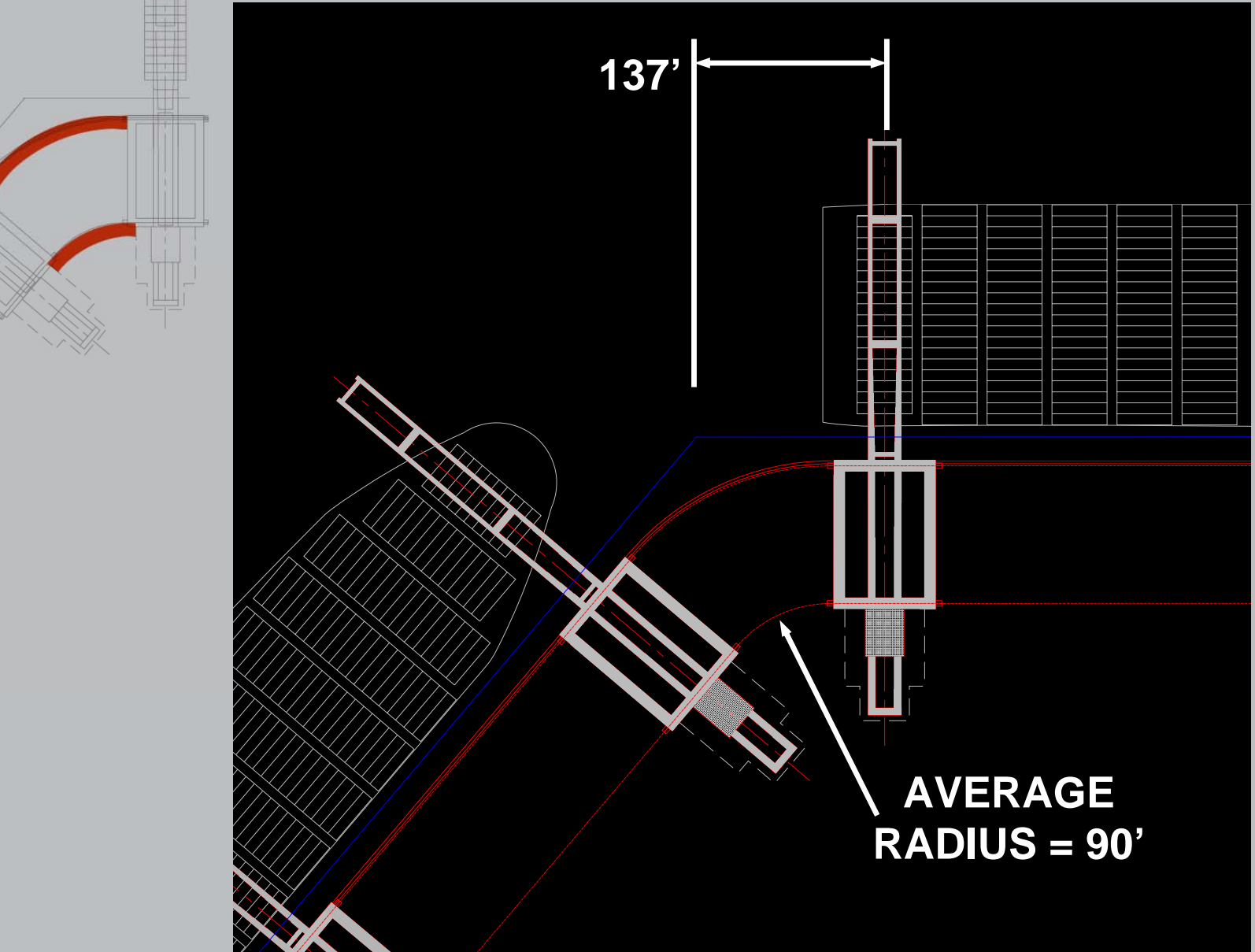
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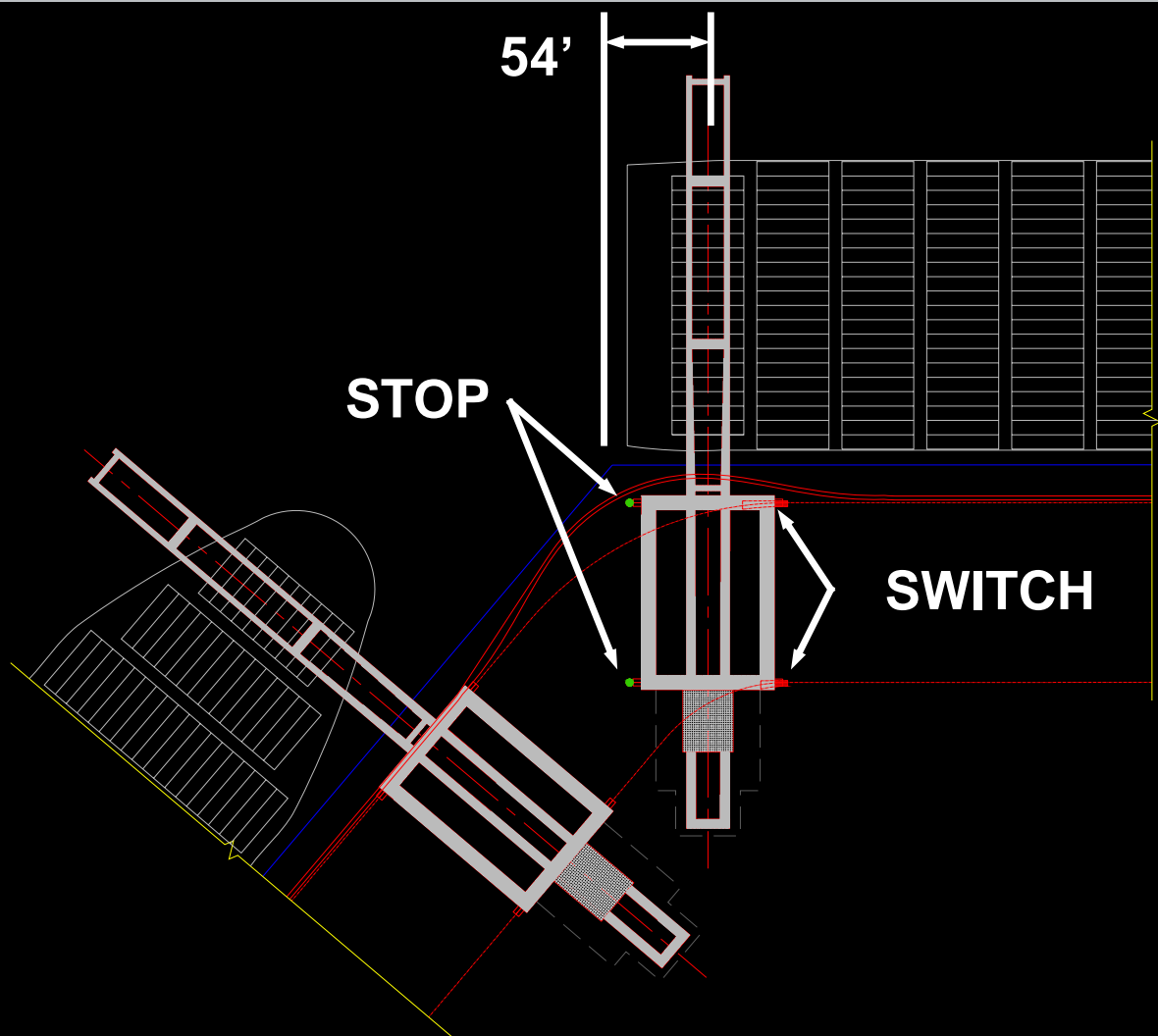
Curved Rail System



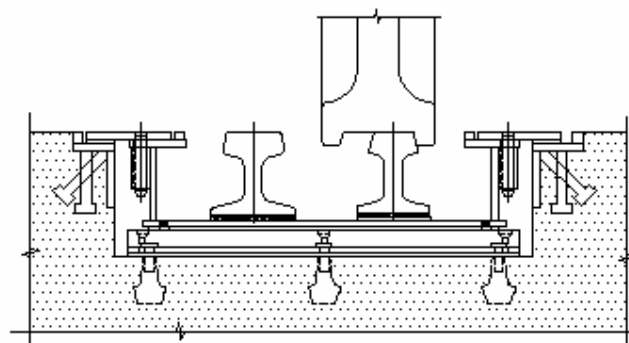
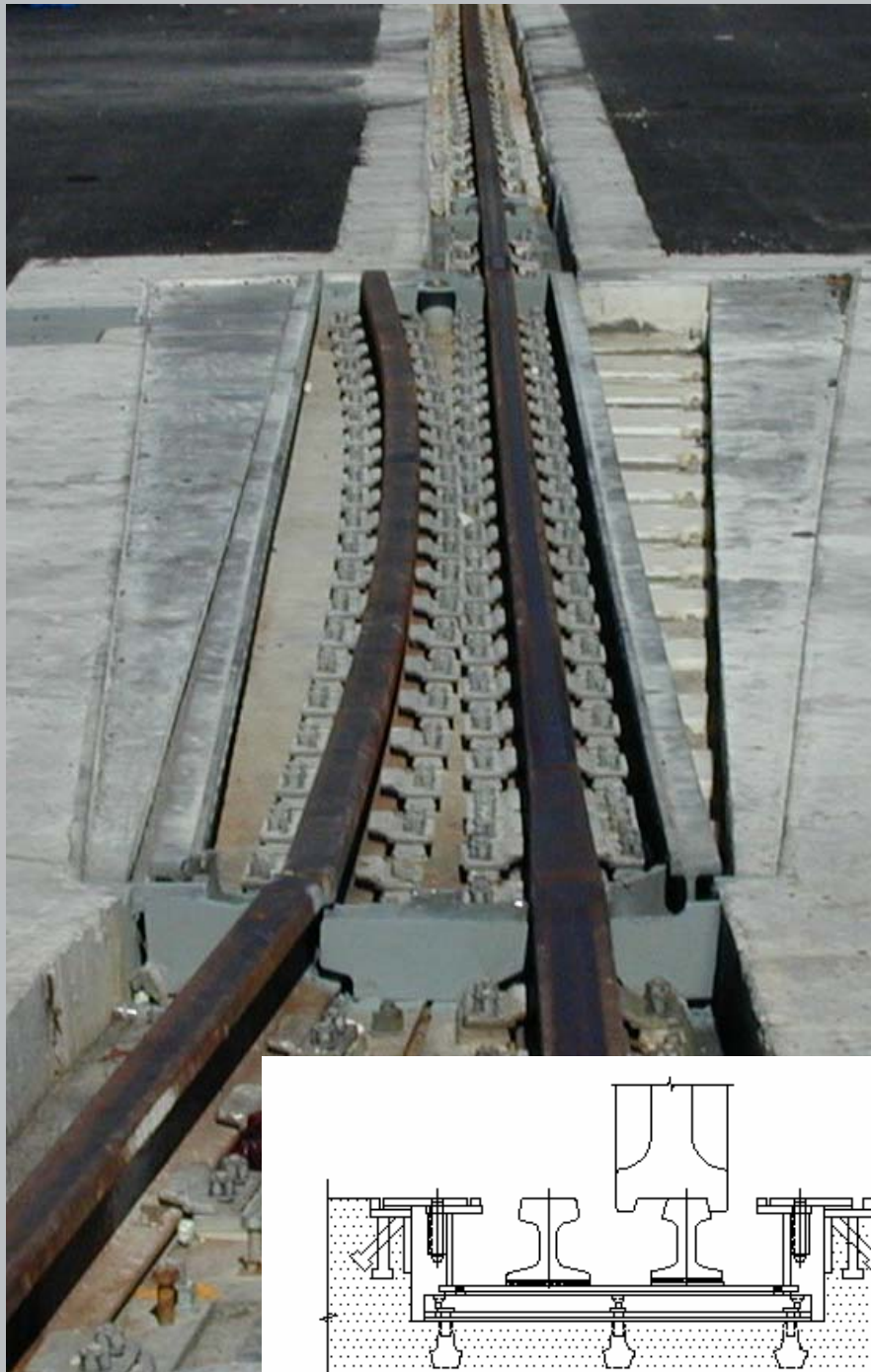
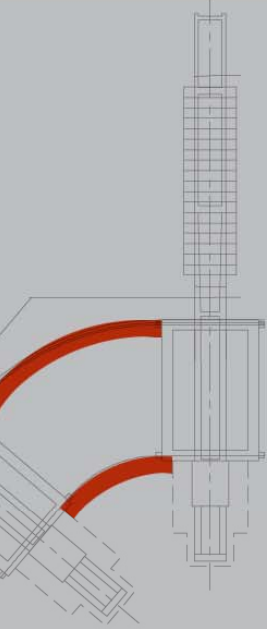
Without Switch



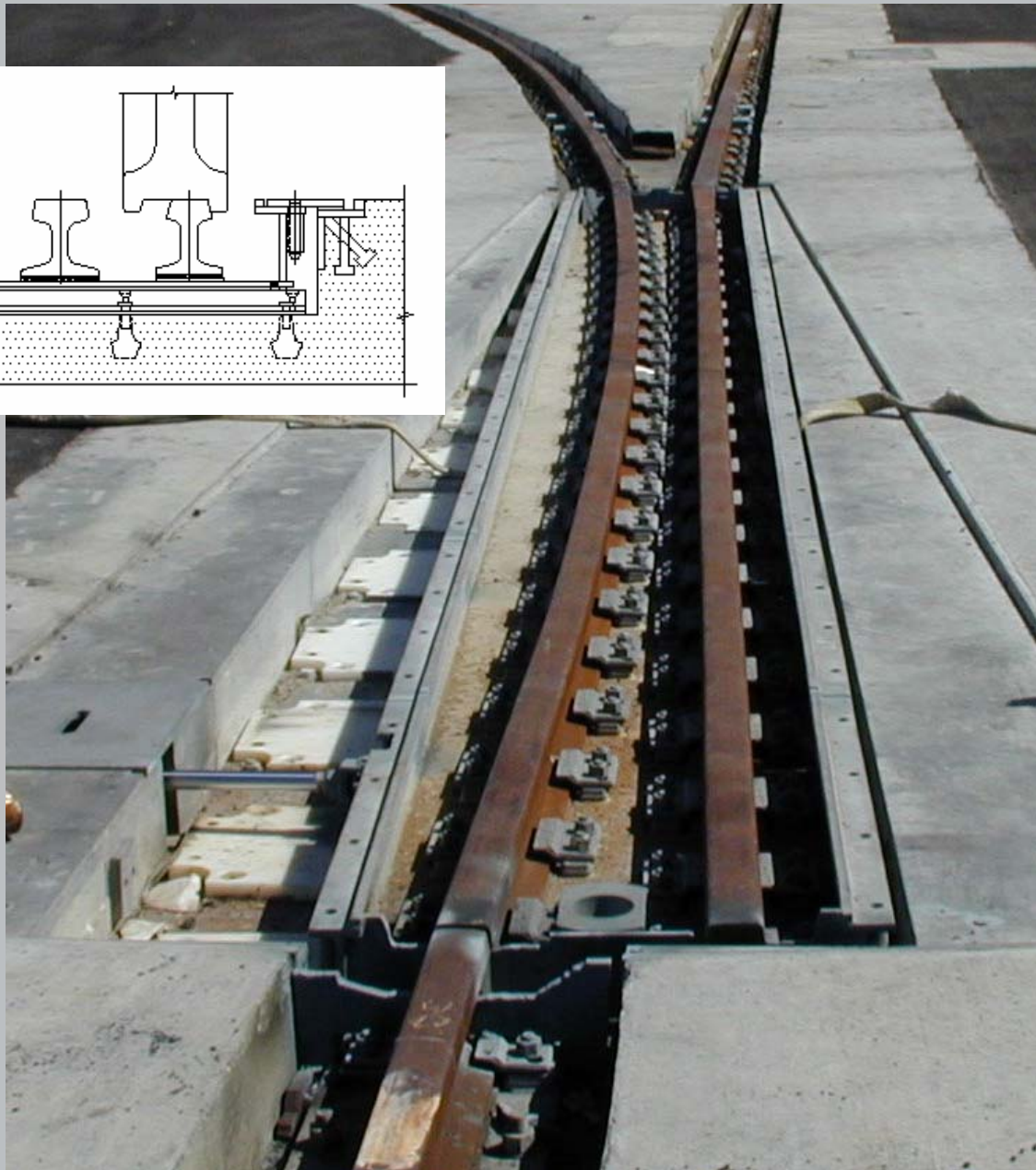
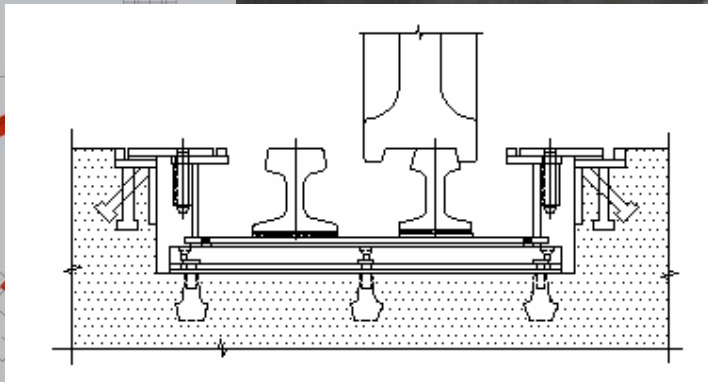
With Switch

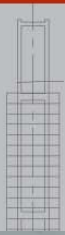


Switch - Straight Position



Switch - Curved Position



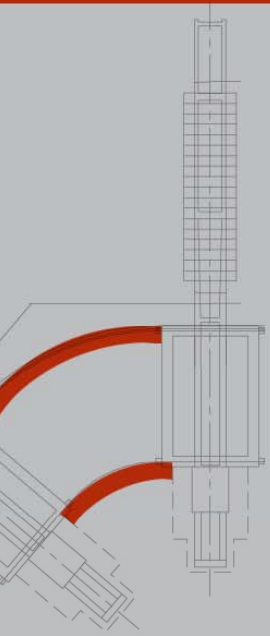


Hydraulic System

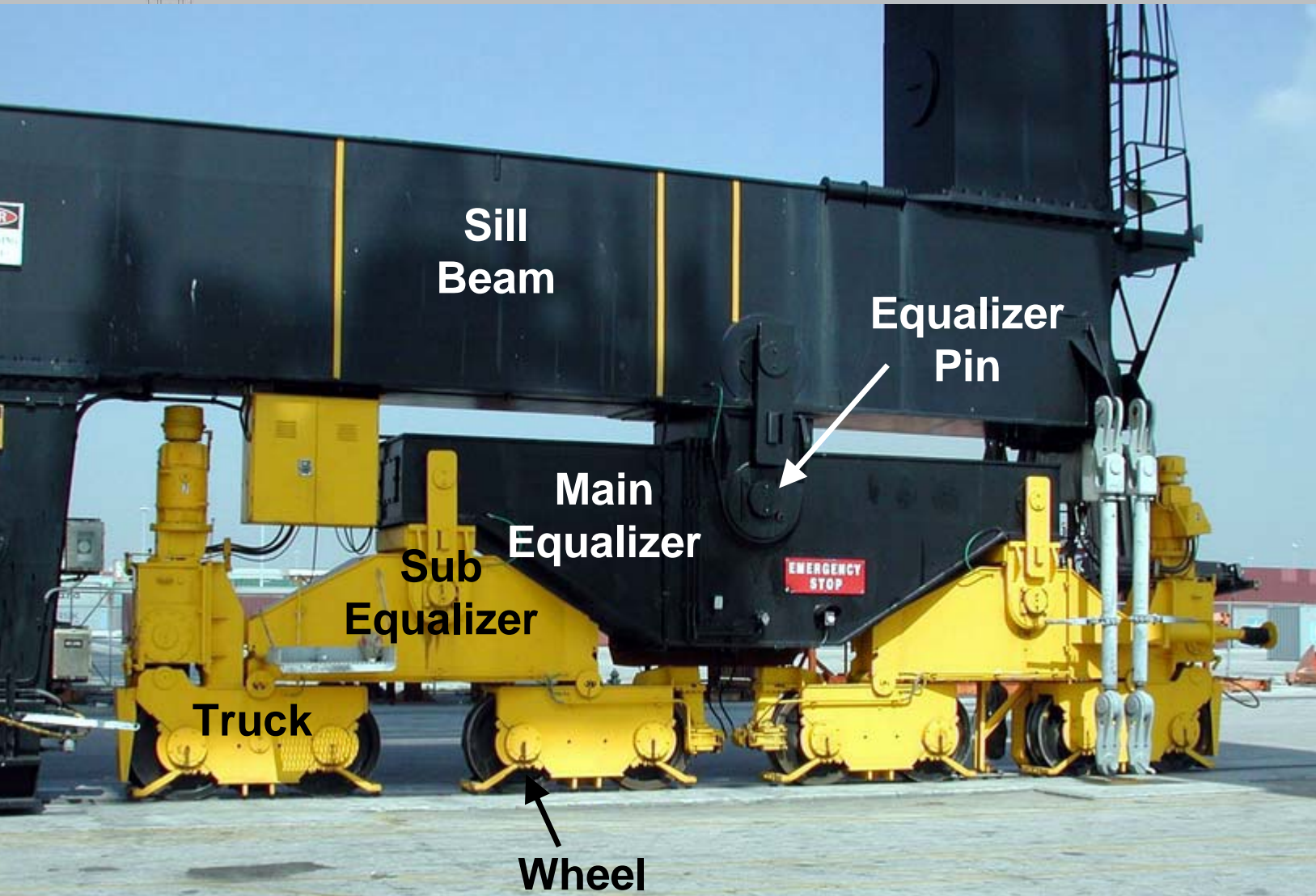


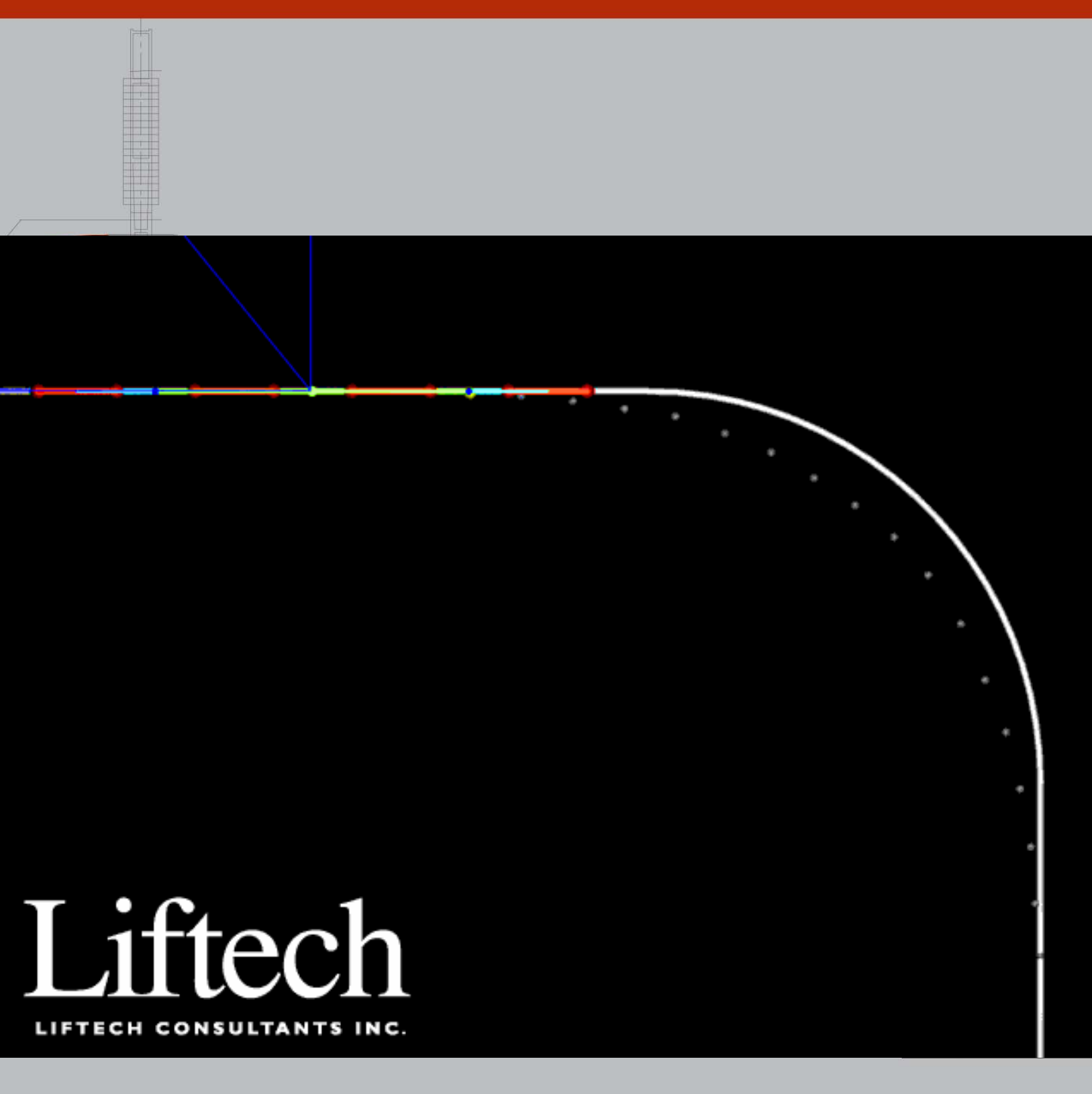
Phenomenon

1. Gage change as crane gantries around curve



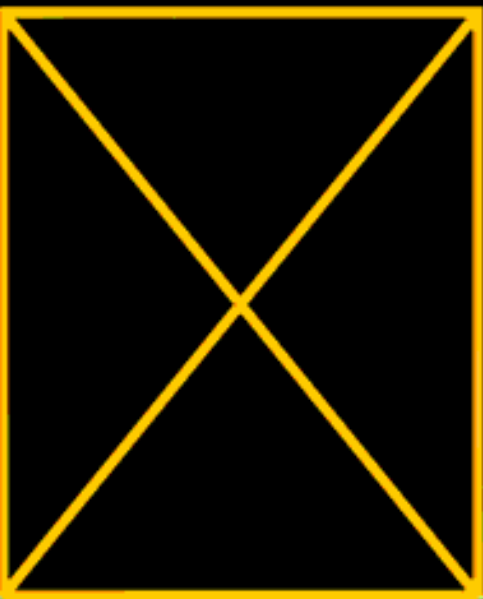
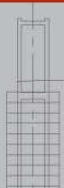
Gantry System Components

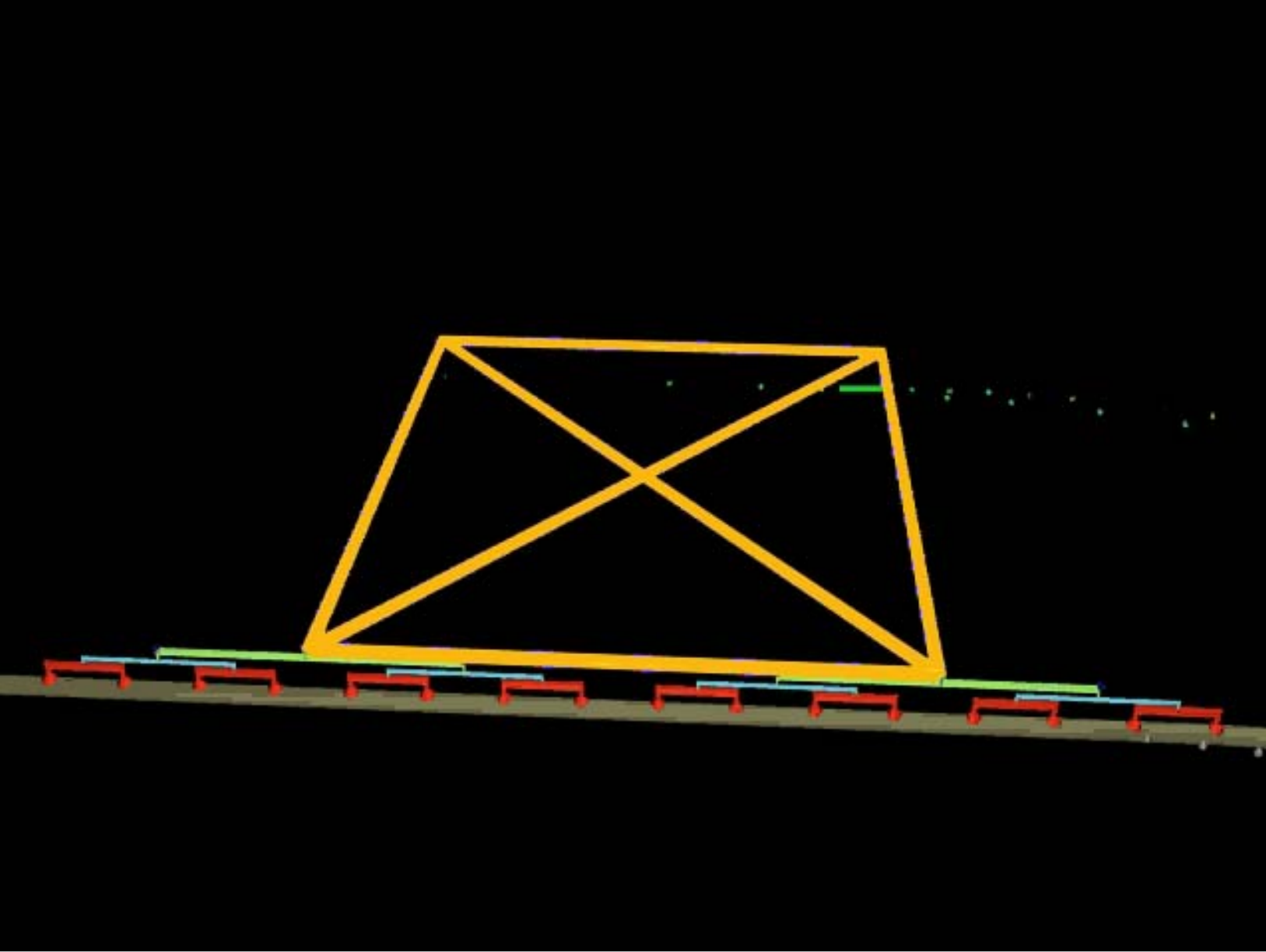
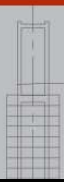




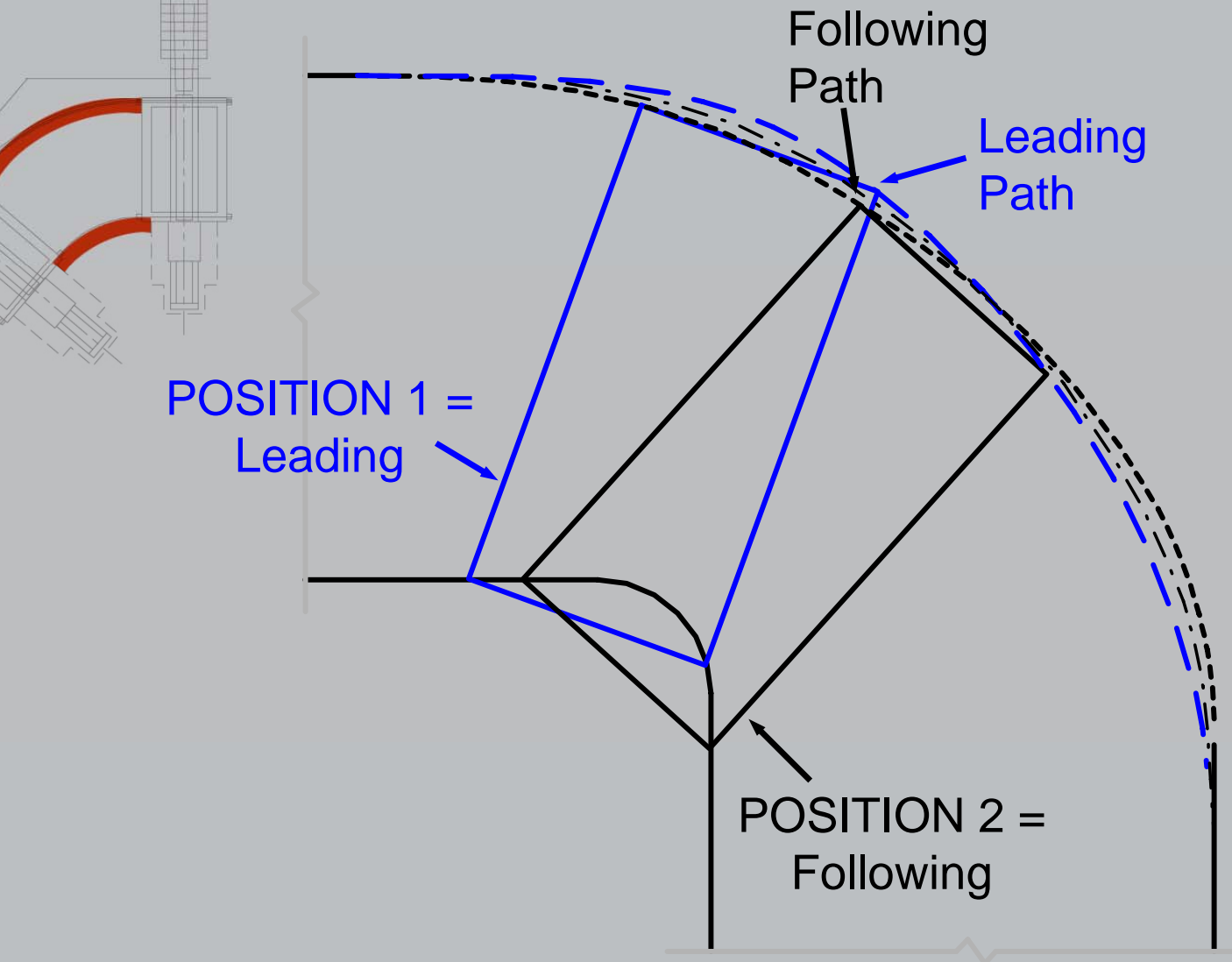
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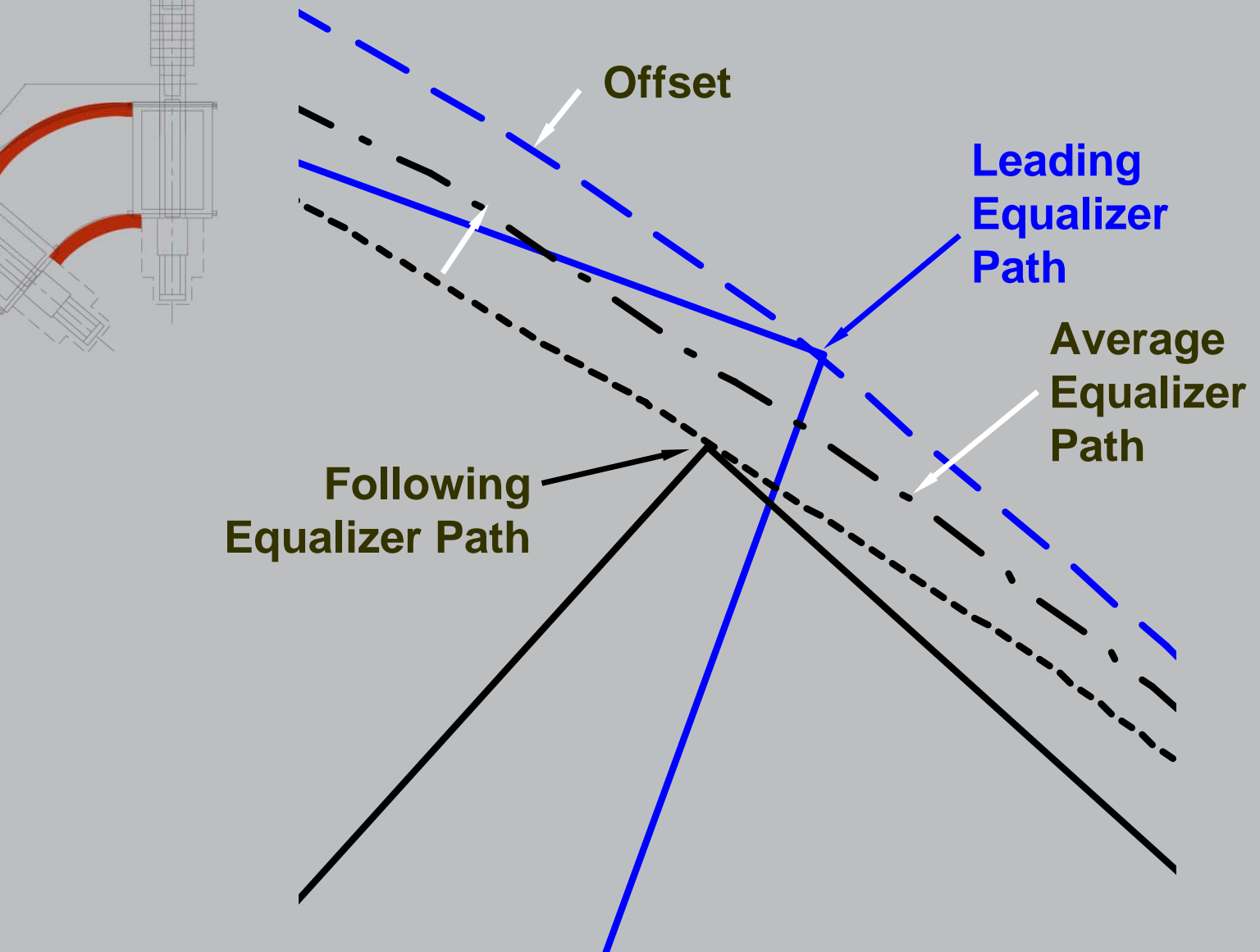


Variation in Gage

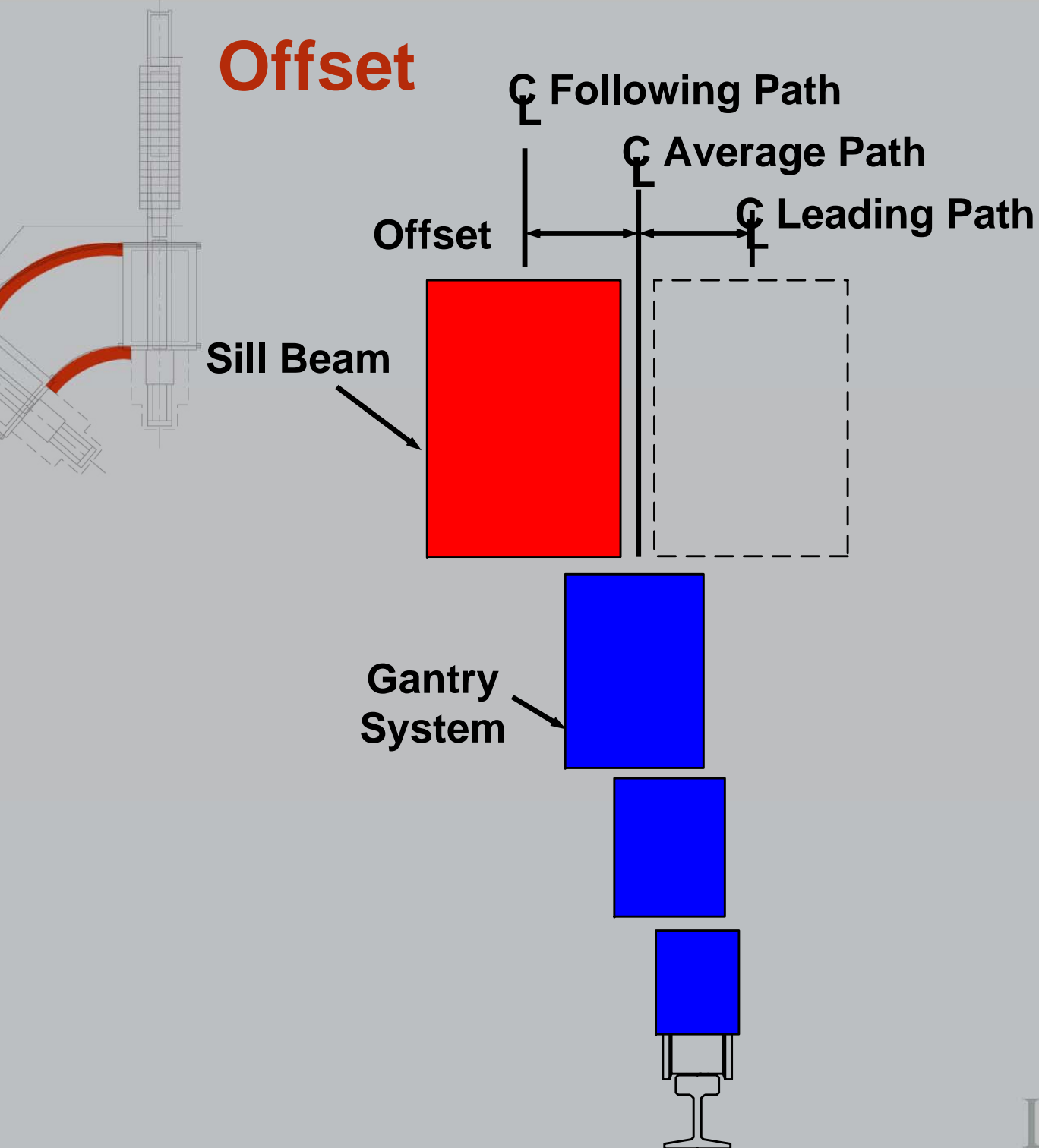


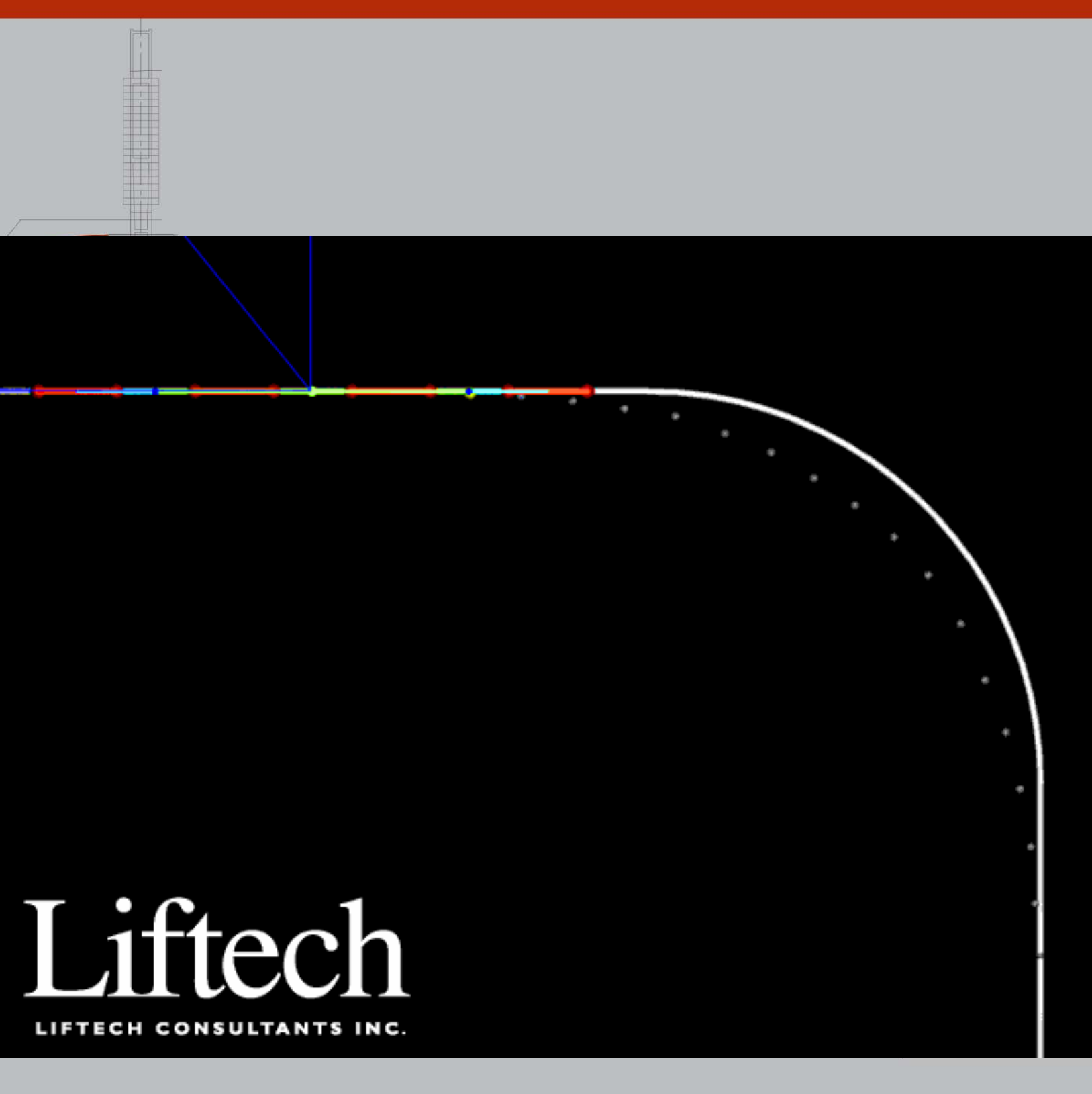
PLAN VIEW OF CURVE

Variation in Gage - Offset



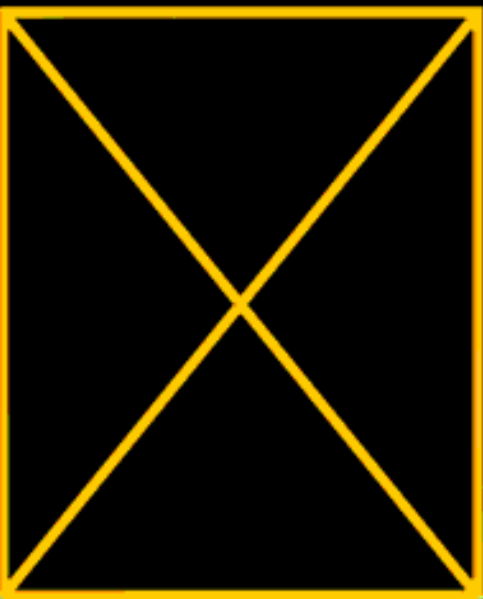
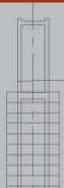
Offset

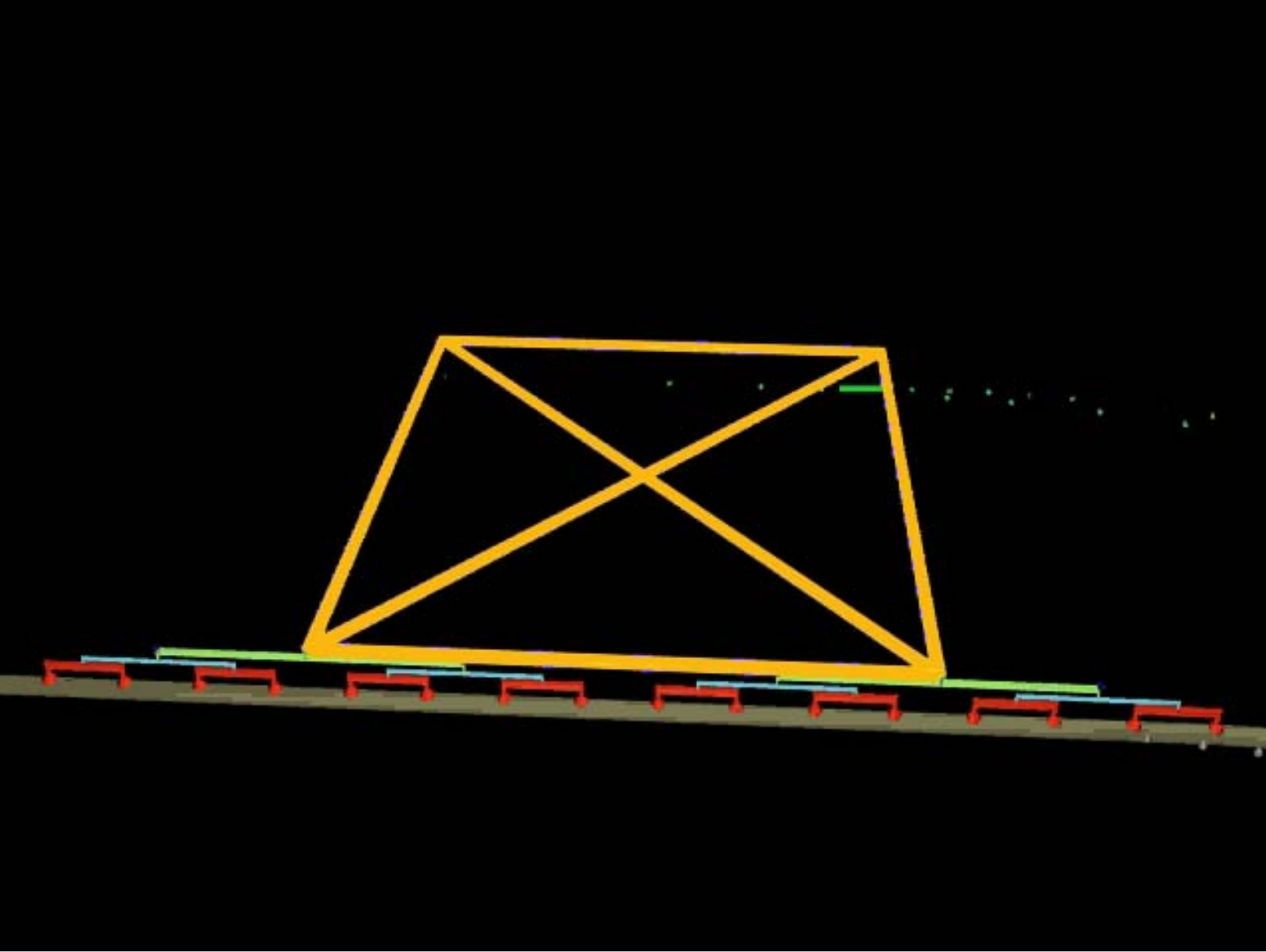
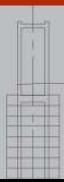




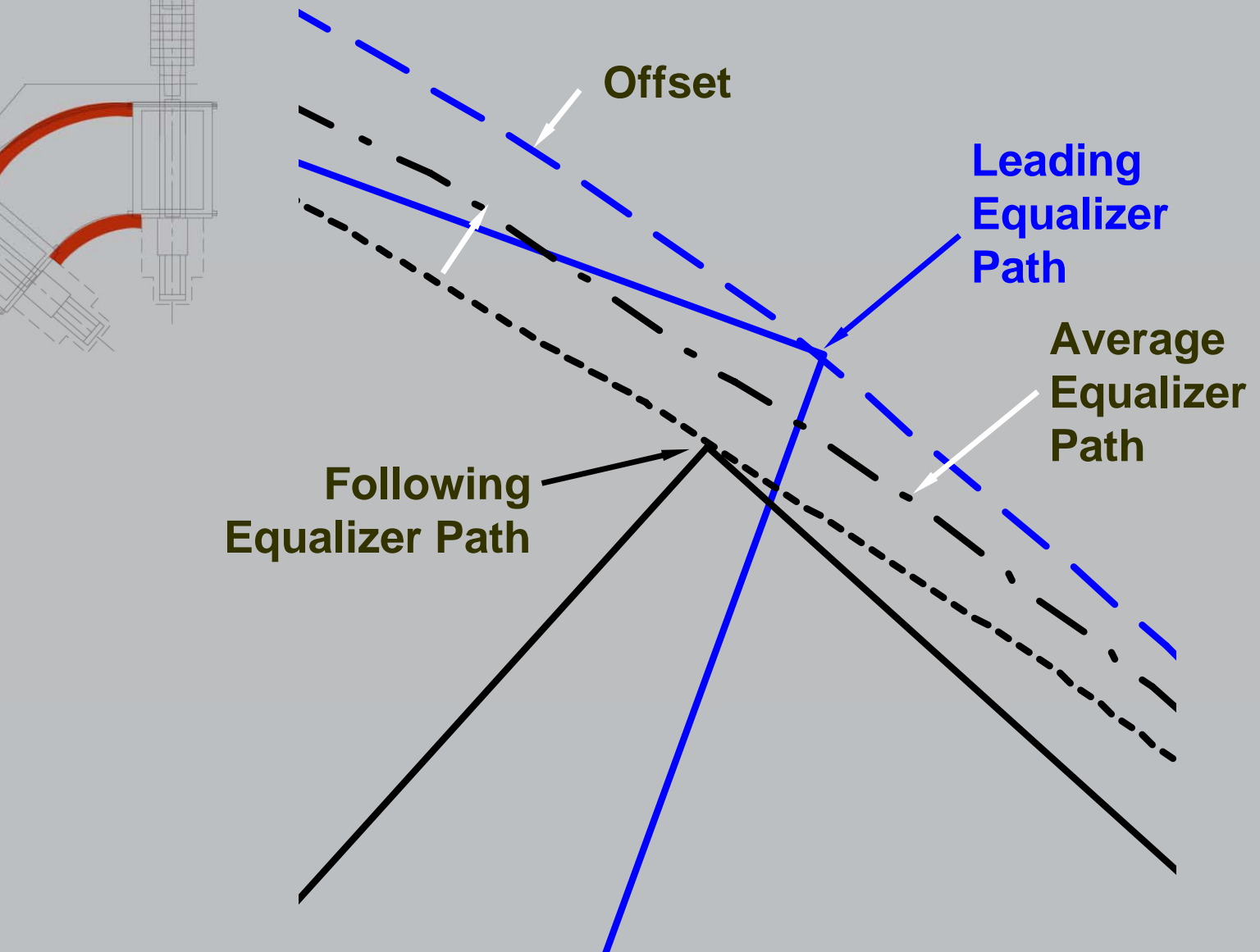
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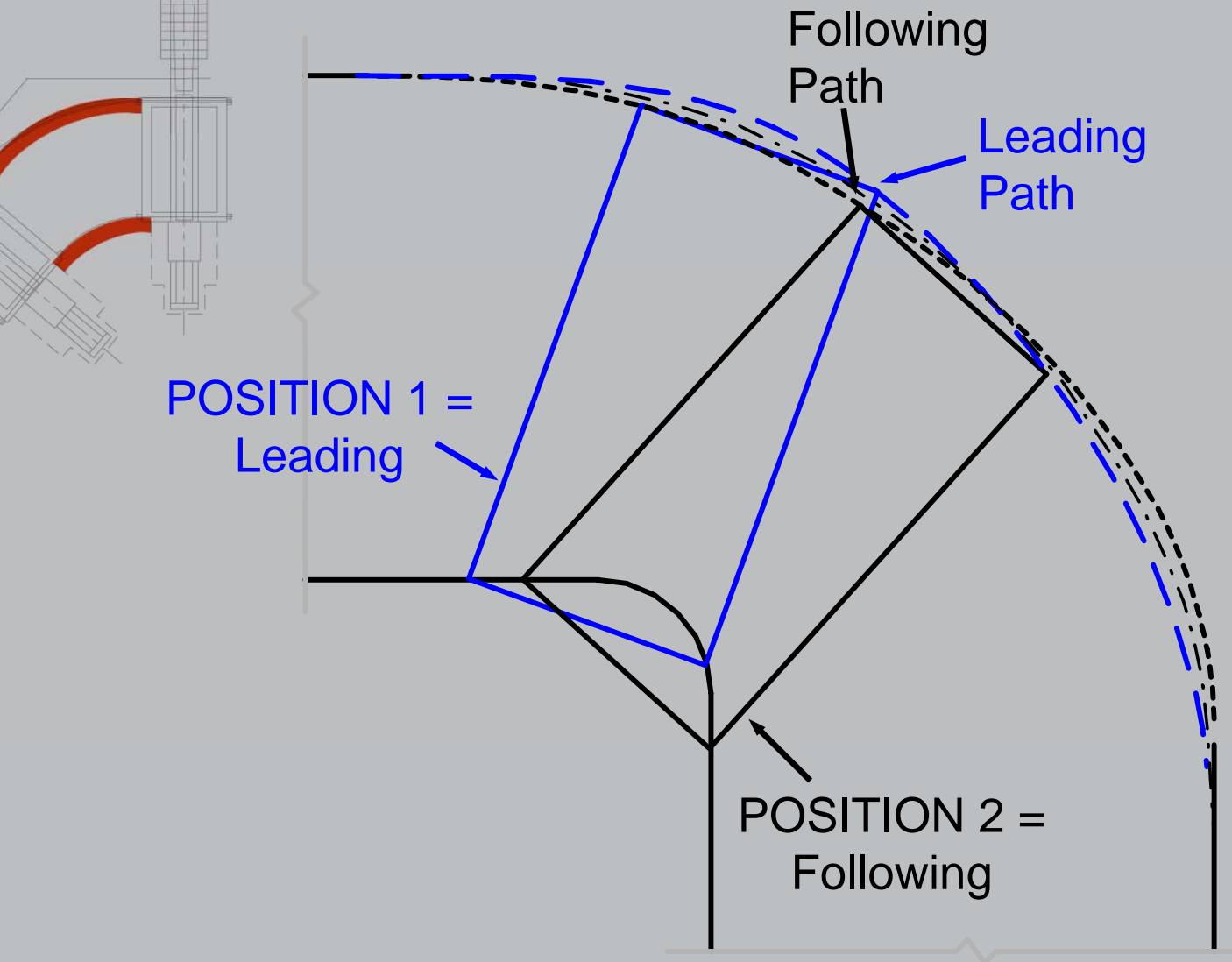




Variation in Gage - Offset

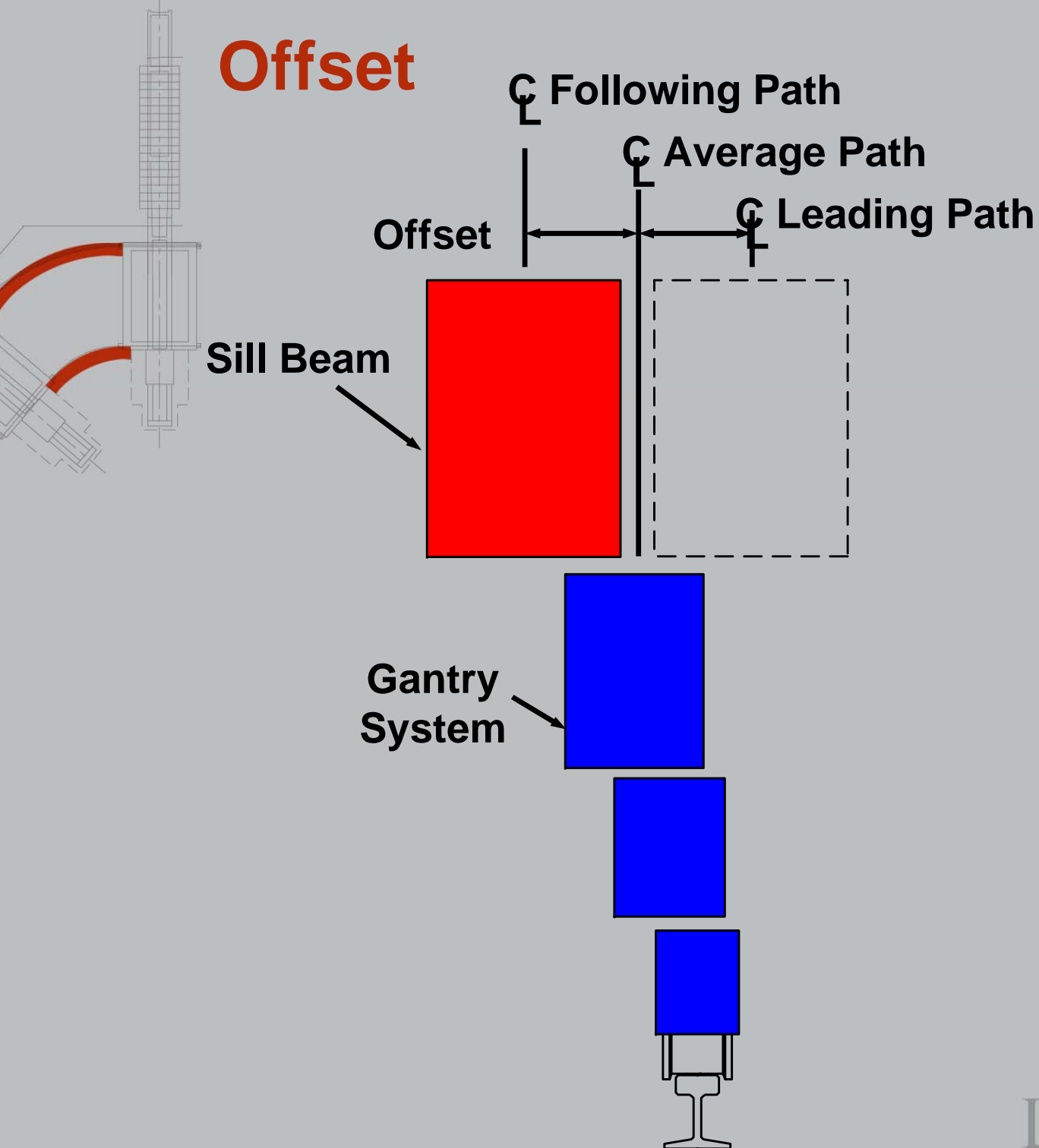


Variation in Gage

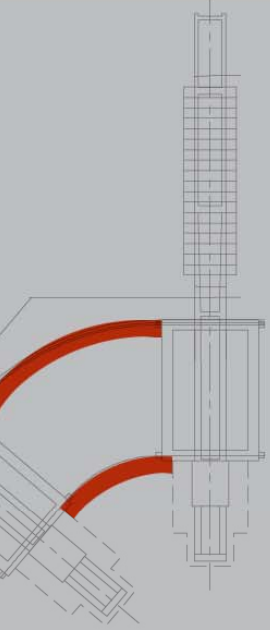


PLAN VIEW OF CURVE

Offset

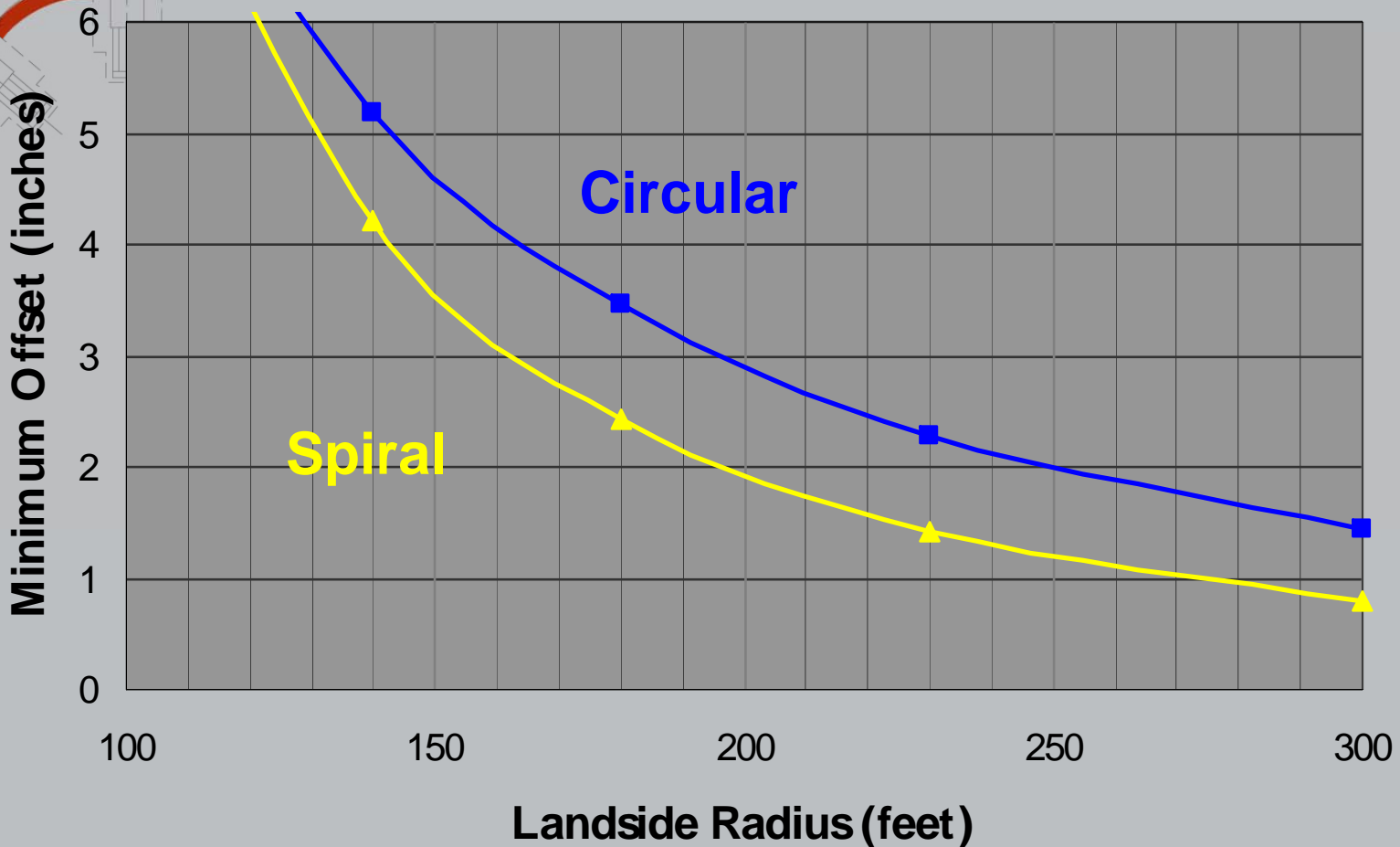


Design Solutions to Accommodate Offset

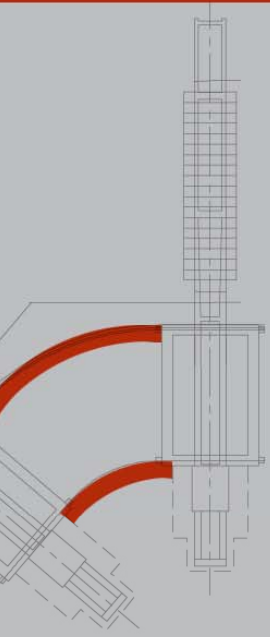


1. Minimize offset by optimizing rail geometry.
2. Provide for movement between the rail and wheel.
 - A. Decrease wheel size through rail.
 - B. Increase landside wheel width.
3. Provide side shift mechanism in the gantry system.

Comparison of Offsets resulting from Circular and Spiral Landside Curve Geometries

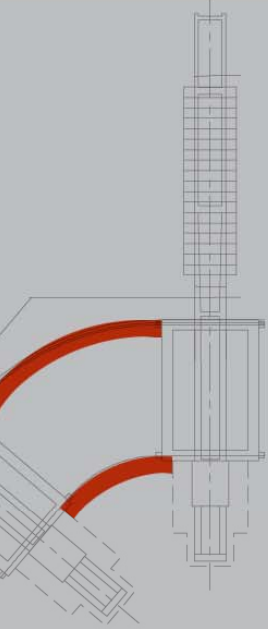


Design Solutions to Accommodate Offset

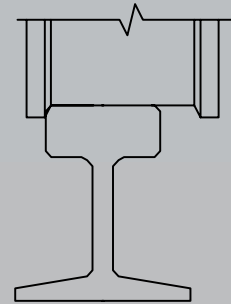


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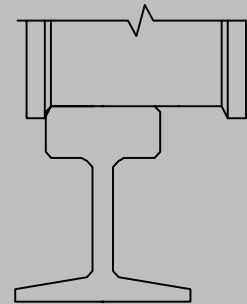
Provide Larger Wheel to Rail Gap



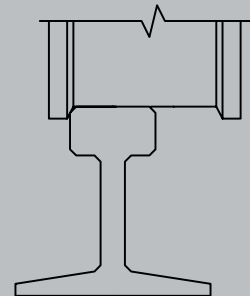
Typical Wheel and Rail



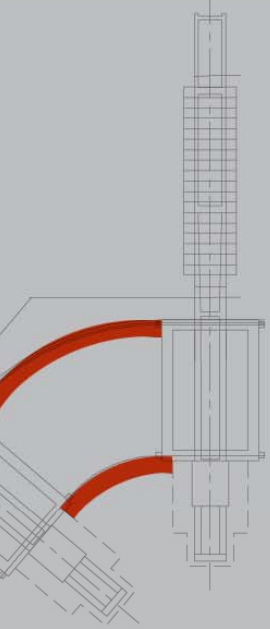
Widen Landside Wheel



Provide Smaller Rail at Curve

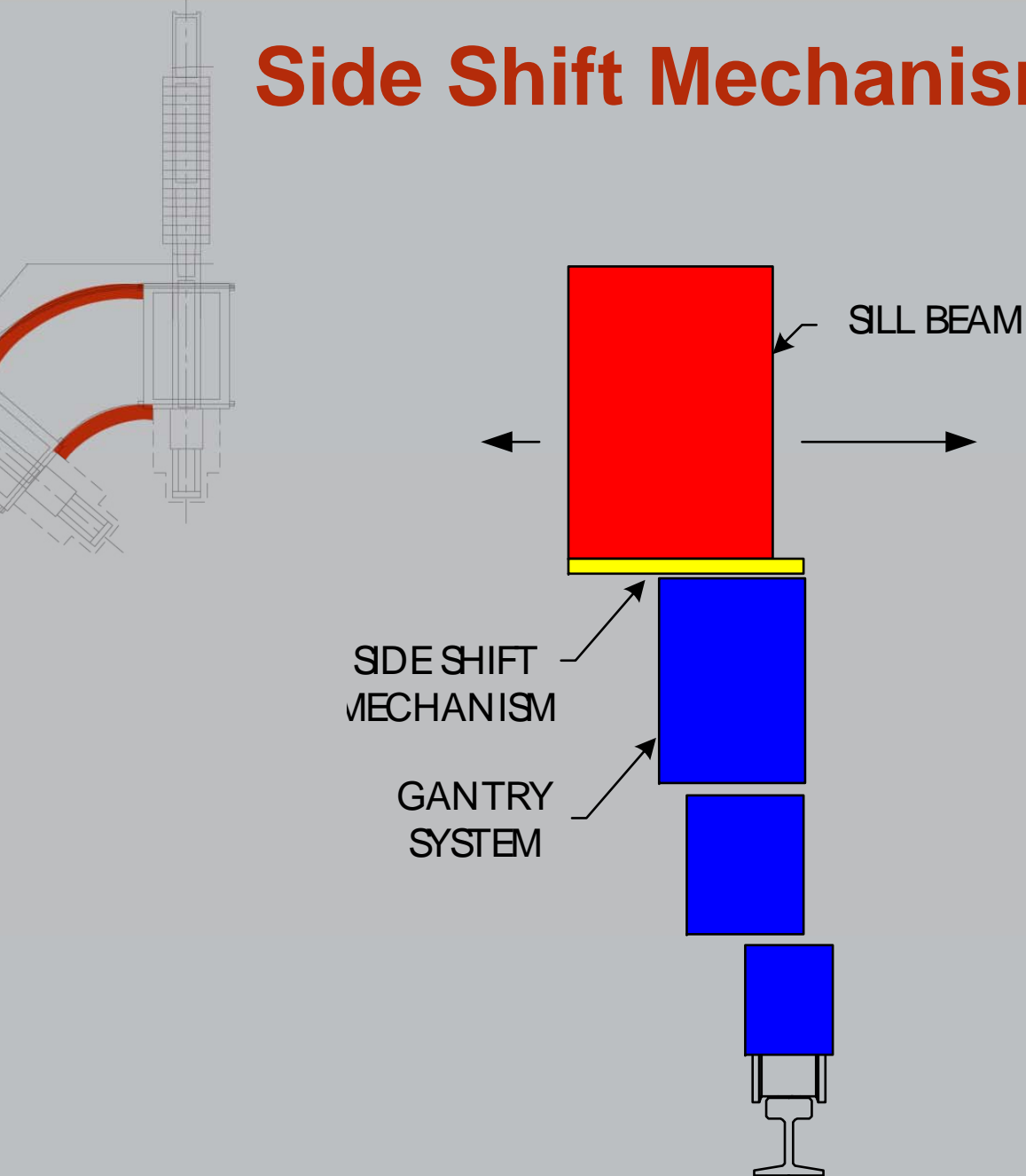


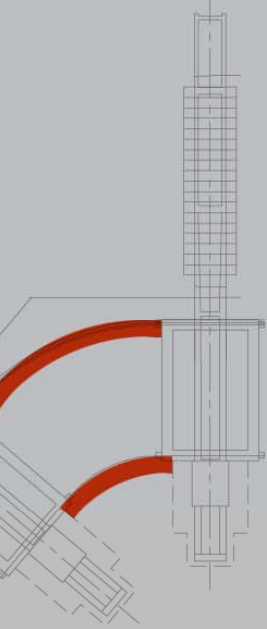
Design Solutions to Accommodate Offset



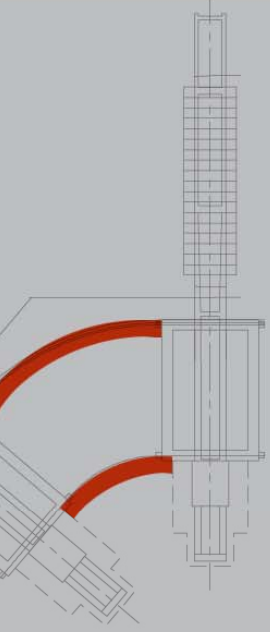
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Side Shift Mechanism





Articulation Mechanism



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