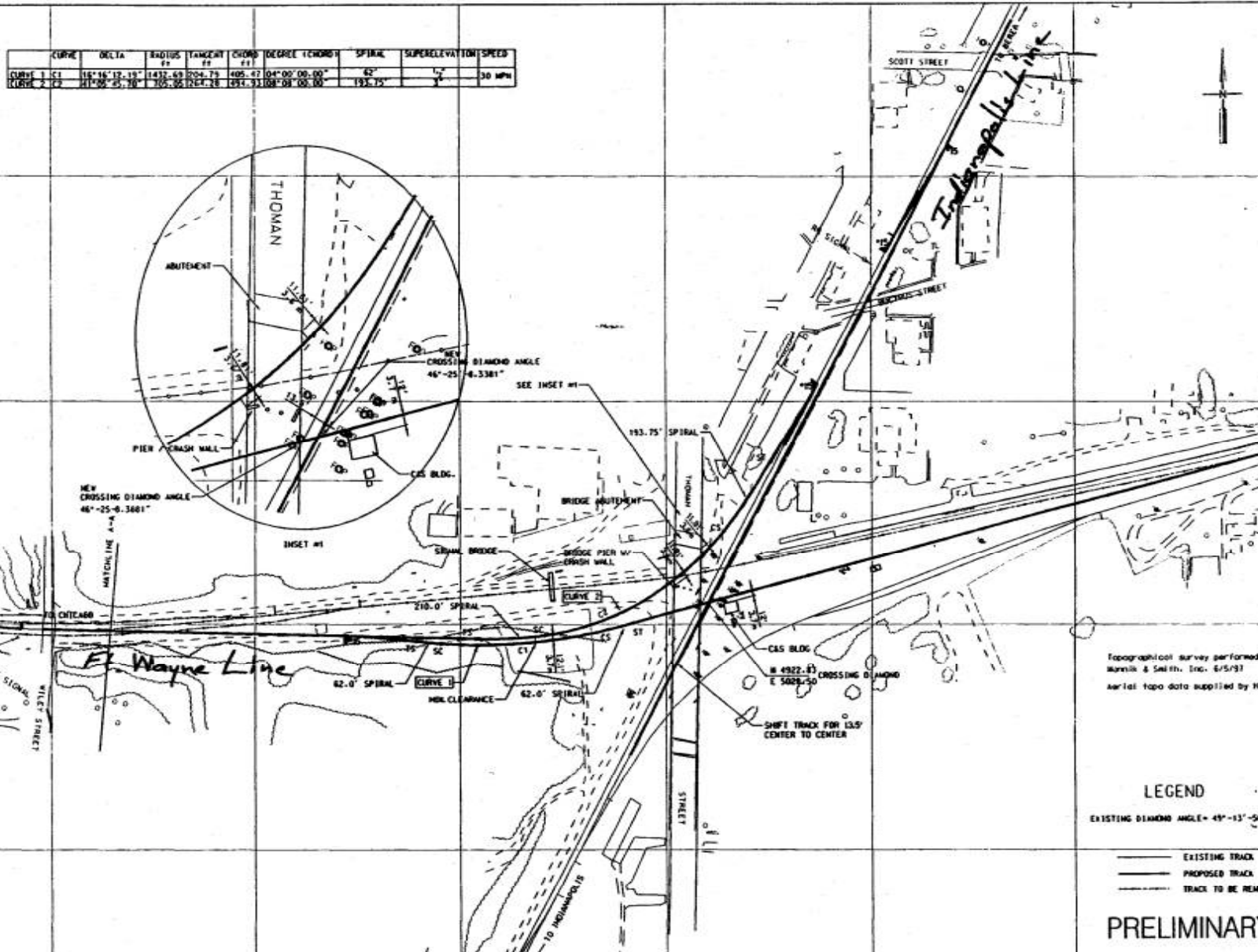


Case Study Survey

Project Sketch Crestline Ohio

CURVE	DELTA	RADIUS	TANGENT	CHORD	DEGREE (CHORD)	SPIRAL	SUPERELEVATION	SPEED
CURVE 1 C1	116°-16'-12.19"	1432.69	204.79	405.47	04°-00'-00.00"	62'		30 MPH
CURVE 2 C2	117°-00'-25.30"	705.35	124.78	194.33	08°-09'-00.00"	193.75'		



Topographical survey performed by
 Morris & Smith, Inc. 6/5/97
 Aerial topo data supplied by HMR

LEGEND
 EXISTING DIAMOND ANGLE = 49°-13'-56"

— EXISTING TRACK
 — PROPOSED TRACK
 - - - TRACK TO BE REMOVED

PRELIMINARY

NO.	DATE	REVISION
1	7/25/97	RELocate TURNOUTS
2	7/30/97	MISC NOTES
3	9/18/97	DIAMOND ANGLES

CONRAIL CORPORATION
 CONSOLIDATED RAIL CORPORATION
 100 WEST 100th STREET, INDIANAPOLIS, IN 46206

CRESTLINE, OH
 PROP. 30 MPH CONNECTION BETWEEN THE INDIANAPOLIS LINE MP 75.77
 AND THE FORT WAYNE LINE MP 180.5

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<p>Project Summary</p>	<p>Location: Crestline, OH</p> <p>Early in 1998, as plans were being implemented to divide the Conrail assets between CSXT and NS, CSXT and Conrail formulated engineering concepts to achieve a number of strategic imperatives that would ensure operational viability prior to the acquisition of Conrail. One such strategic imperative involved the creation of an alternate route for CSX coal and grain trains between Cleveland and Chicago. In order to create this alternate route, a direct link in the form of a connection between the Indianapolis Line and the Fort Wayne Line was necessary.</p> <p>This connection involved the construction of approximately 6,000' of track, installation of 2 - No. 15 turnouts, 1- No. 15 crossover and 2 - crossing diamonds. The design speed for the connection was 30mph. Included in the Modification to the existing signal systems along both the Fort Wayne Line and the Indianapolis Line was also required.</p> <p>The estimated cost of the connection was \$3.6 Million with \$2.2 Million for Track and Civil work and \$1.4 Million for Signal and Communication work. The project schedule called for the design and construction to be completed within a fourteen-month timeframe.</p>
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<p>Statement of Need</p>	<p>Prior to the acquisition of Conrail by CSXT and Norfolk Southern Railroad (NS), Conrail owned and operated both the Indianapolis Line and the Fort Wayne Line. The Indianapolis Line runs in a Southwesterly direction from Berea, Ohio just south of Cleveland connecting to the St. Louis Line in Indianapolis, Indiana. The Fort Wayne Line extends from Pittsburgh, PA and generally runs in a Easterly and Northeasterly direction connecting to the Chicago Line just east of Chicago, Il. The two lines cross each other at-grade with crossing diamonds at Crestline, Ohio. At Crestline the Indianapolis Line is a two track mainline and the Fort Wayne Line is a single track mainline.</p>
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	<p>As part of the acquisition of Conrail, CSXT acquired ownership of the Indianapolis Line in its entirety with no operating rights provided to NS in the vicinity of Crestline. The ownership of the Fort Wayne Line however was divided up between both the NS and the CSXT with the NS acquiring the Fort Wayne Line between Pittsburgh and Crestline while the CSXT acquired the line between Crestline and Chicago with NS retaining operating rights over the Fort Wayne Line from Crestline west to Chicago.</p> <p>The new network envisioned by CSXT following the Conrail acquisition, included a new route to Chicago from Berea using the Indianapolis Line and the Fort Wayne Line. This meant that a new connection needed to be constructed between the two lines at Crestline prior to the acquisition date known as “Day One” set as June 1999. Because this connection had to be in operation prior to the acquisition, it was necessary for CSXT to work with Conrail, as the owner, to design and construct the connection.</p>
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<p>Project Understanding (Definition)</p>	<p>Existing Condition In Crestline, OH, two Conrail lines cross on diamonds at grade. The Indianapolis Line double track runs SW and the Fort Wayne Line single track runs east/west. There is an existing control tower in the SE quadrant in the close proximity of the diamonds. An overhead bridge carrying Thoman Street (SR-61) crossed over both lines in a north/south direction.</p> <p>To the north there is one grade crossing of Bucyrus Street and an underpass of Scott Street on the Indy Line. The Indy mains are on 20’ centers through the diamonds due to an old center passenger platform, now removed.</p> <p>To the west on the Fort Wayne Line at a signal bridge, the single track divides into three tracks passing through Wiley Street at grade.</p> <p>To the east the single main crosses Washington Street at grade approximately 1,400’ east of the diamonds.</p> <p>To the south on the Indy Line was an existing connection in</p>
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	<p>the SE quadrant approximately 700' from the diamonds and a #15 crossover between the mains.</p> <p>Existing rail traffic per day was _____ trains on the Indy Line and _____ trains on the Fort Wayne Line over the diamonds.</p> <p>There were three separate signal control points: East Crest, Crest and West Crest</p> <p>Proposed Condition</p> <p>The proposed connection was to accommodate ____ trains per day and _____ trains east-west used by NS. The trackage east of the diamonds would belong to NS. Speed through the connection would be 30 MPH and 25 MPH for the NS Fort Wayne Line.</p>
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<p>Identify Stakeholders Railroad (Critical Dependencies)</p>	<ul style="list-style-type: none"> • CSXT proposed train operations between Cleveland , OH and Chicago, Il. • Norfolk Southern Railway Co. proposed train operations between St Louis and Pittsburgh, PA. • Conrail train operations during the construction between Cleveland, OH and St Louis and between Pittsburgh, PA and the OH and Ind. State line.
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<p>Project Approach</p>	<p>Initially the connection was designed to tie into the mains without relocating the main. However, the bridge abutment of the overhead bridge prevented this approach without rebuilding the bridge, which was cost prohibitive. The next alternative suggested was relocation of the Fort Wayne west of the diamonds to a southward direction, without relocating the diamonds. This too proved to be unsuccessful due to excessive curvature in the connection and relocated main track.</p> <p>Finally it was decided to relocate the entire Fort Wayne Line southward from Washington Street on the east end to Wiley Street on the west end. This would give sufficient room to construct the connection for 30 MPH, while missing the bridge abutment and piers. It was also necessary to clear the old tower by 12' since it would remain to house signal equipment. The #15 turnout in the Fort Wayne Line would be designed for</p>
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	<p>the straight side to the connection since the majority of the rail traffic would go through the connection.</p> <p>The track layout on the west end of the Fort Wayne Line was modified to only one track through Wiley Street and all turnouts would be placed west of the crossing. On the Indy Line, the track centers were moved closer at 13-1/2' and a right hand #15 crossover was installed north of Bucyrus Street to accommodate trains off either main to the connection.</p> <ul style="list-style-type: none"> • Design <ul style="list-style-type: none"> ○ Conrail Design & Construction handled the engineering on the project with approvals from CSX Design and Construction. Outside services were used for topography and existing layout plans. Conrail in Philadelphia handled design and field supervisors and company forces handled track construction. Signal design was performed by a consultant and constructed by company forces. This project was the typical design-bid-build, using contractors for grading, drainage and utility work.
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Key Project Elements	<ul style="list-style-type: none"> • CSXT Design Standards - Indianapolis Line • NS Design Standards - Fort Wayne Line • Operating Design Speed Indianapolis Line - 50 MPH • Operating Design Speed Fort Wayne Line - 25 MPH • Operating Design Speed New Connection - 30 MPH • Rationalize Signal Interlocking Control Points • Construction Phasing • Crossing Diamond Procurement and Installation • Drainage • Project Schedule (Completion - June 1999)
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Critical Design Considerations	<ul style="list-style-type: none"> • Maintenance of Train Operations • Avoidance of Existing Signal Tower • Avoidance of Overhead Bridge Pier / Abutement • Operating Speed Requirements
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Project	<ul style="list-style-type: none"> • Accurate Definition of Project Scope
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Challenges	<ul style="list-style-type: none">• Project Schedule• Design Coordination - CR / CSXT / NS• Maintenance of Train Operations
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Lessons Learned	<ul style="list-style-type: none">• Need for Continual Communication<ul style="list-style-type: none">○ Weekly Project Status Review• Importance of Inter-company Coordination<ul style="list-style-type: none">○ Conrail, CSXT, NS• Importance of Intra-company Coordination<ul style="list-style-type: none">○ Track and Signal Design / Train Operations○ Design / Construction / Transportation Depts
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Recipe for Success	<ul style="list-style-type: none">• Establishment of Project Core Team Members• Clear Project Target Scope• Continual Communication• Inter and Intra Company Coordination
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AREMA Reference #	<ul style="list-style-type: none">•
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