

Surveying for the Railroad

- Engineering Department
 - Real Estate Department
 - Valuation Maps
 - Control
 - Geometry
-
- It behooves you to ask as many questions up front as you can.

Surveying for Engineering

- Cross Sections, 100' Typically but 50' in Curves Tighter than 6°
- Topo, All Existing Drainage Structures include Relative Condition and Trees
- At Grade Crossing, Highway and Rail
- Elevated Crossings, Lowest Support Member Above Top of Rail
- Wetlands, Cemeteries, Mining

Surveying for Real Estate

- Longevity is not defined as 50 years
- Acquisitions – Fee or Easements, Typically an ALTA Survey, Locate and Identify Any Visible Utilities
- Sales – Boundary Survey or ALTA Survey, Depends on Structure of Contract
- Lease/License: No Survey

REMEMBER!!!

If Surveying Bridges or
Tunnels

You MUST use Working
Limits Safety Protection,
Keeping Trains Away from
YOU.







Val Map & Labeling

- Title Block on Lower Right Corner
- Val Section
- Sheet Number
- Sub-Sheet Number
- Val Stationing along Corridor
- North Arrow, Usually Upside Down
- County and State

+

CHICAGO AND EASTERN ILLINOIS R.R.
DOLTON JCT. TO EVANSVILLE
RIGHT-OF-WAY AND TRACK MAP

MILE POST 168 TO MILE POST 171.8
STATION 7915+15 TO STATION 8176+82.9
SCALE 1 INCH= 400 FT. JUNE 30. 1916

Chicago and Eastern Illinois Railroad Company
and from survey station 7975+93.2

J. E. Smith
Valuation Engineer

V24348

V-230
42

35
11

23.2 x 54.9

Railroad Stationing and the Hierarchy of Station Control

- Railroad Diamonds
- Bridge Abutments and/or Tunnel Portals
- Old concrete box culverts
- Point of Switch, P.S. (Turnouts)
- Centerline of road crossings at grade
- Map Calls to Land Lot Lines

What About Mile Post?

Mileposts. Least desirable and should be avoided for establishment of railroad station control points.

Mileposts are for the railroad Engineers and Conductors to know their location on the system.

Mileposts have legs and are NOT survey quality and should NOT be used to establish stationing.

Railroad Corridor

Railroad Corridor does not move with the track, riparian/littoral rules do not apply.

Why?

Railroad Corridor

Double Track, typically on 13', 14' or 15' centers

If in doubt, the Assessor's Map is **WRONG!**

The center of track in mainline curve is usually NOT the center of the right-of-way. There is no such thing as parallel spirals.

Railroad Track Geometry

- Surveyor is defined as an expert measurer
- Modern track gauge is 4' 8 ½" or 4.71 feet
- Mainline Track, 136 lb per 3 feet
- Industrial Spur Track, 85 lb to 115 lb per 3 feet
- Siding, does not need to match the Main Line in weight of rail, use "comp joints"

Railroad Track Geometry

- Tangent Track.....straight track, no horizontal curves, can have vertical curves
- Curved Track:
 - Circular Curved Track
 - Spiral Curved Track
- Superelevated Track

Circular Curves

“On a heavy-traffic high-speed railroad, every effort is made to have no curve sharper than 5° or 6° . On lines of light traffic and relatively low speeds, 20° or sharper curves are used.” Surveying Theory and Practice, Fourth Edition, Raymond E. Davis & Francis S. Foote, 1953, McGraw-Hill Book Company, Inc., N.Y., page 672

Spiral Curves

“Fortunately the spiral is not complex, and its properties prove to be simple and general” Arthur N. Talbot, C.E., The Railway Transition Spiral, 1901, McGraw-Hill Book Company, N.Y., Preface.

Curve Data

- Arc Definition of a curve should be used on the boundary
- Chord Definition of a curve should be used on the track

Superelevation

Superelevation = $0.00067V^2D$
expressed in inches, where V is the
train speed in miles per hour and D is
the Degree of curve in degrees.

Typically this elevation will not
exceed 7 or 8 inches and the inside
rail is at grade

Surveying Conundrum

If Double Track is Typically on 13', 14' or 15' centers, What do you do with the next slide?

32754+50 MAT
32754+9

NW 1/4 - SE 1/4

note:-

South bound track is the original track.

Base line of survey is the center between tracks

What do you do if the South bound track has been removed?

No.	GRANTOR
Map No. 3. 5a.	
1.	Owen Jones
2.	Benj. Whitfield
3.	Lydia McLeod
3.	Homer Robinson
3.	H. B. Tippins, Guardian
4.	Phillip Baker
4.	Phillip Baker
5.	John O'Donald
6.	Ed O'Donald
7.	Jno. J. Upchurch
8.	Benj. Stewart
8.	Owen Jones
8.	Hazard Robinson
8.	Geo. C. Coleman
8.	Moses Chapman
8.	Moses Chapman
8.	Homer Robinson
8.	H. B. Tippins, Guardian
10.	John O'Donald
10.	Ed O'Donald