



Leveraging Track Profiles to Model the Northern Pacific Railway

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September 2021

Topics

- **Part 1 – Long Track Profiles**
 - What Are Long Track Profiles?
 - Common Layout, Legends for Markings
 - Basic Tangent Track
 - Signs
 - Small Stations
 - Sidings
 - Buildings
 - Tunnels
 - Bridges And Elevations
 - Curvature of Track
- Modeling summary
- Where can I get this resource?
- Part 2 – Condensed Track Profiles

What Are Long Track Profiles?

- Published internally by NPRy, earliest available dates to 1907
- Technically labeled “Track Profile”, but “Long” often prepended to differentiate between Condensed Track Profiles
- Rolled – 10.5 inches x several feet long, some up to 41 ft
 - Longest - Rocky Mountain Div - First Subdivision - Bozeman to Logan Alternative Main Line - MP 141 to 173 – 1924
- Trivia – “MADE IN GERMANY” on many/most originals

MADE IN GERMANY
“Preferred” PROFILE PLATE. A.

How are they organized?

- **NPRy Published by**
 - **Division**
 - **Main Line or Branch**
 - **Milepost to Milepost**



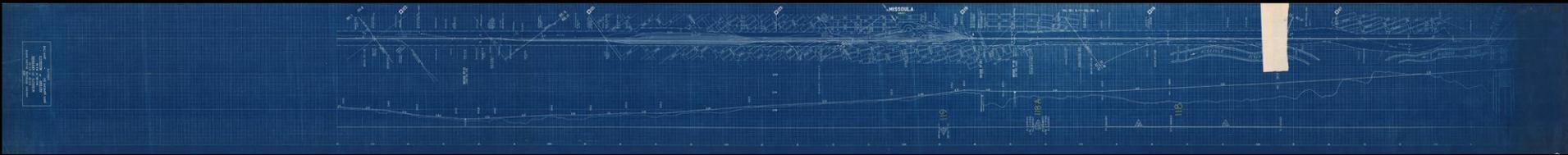
N.P. RY.
TRACK PROFILE
PALOUSE & LEWISTON BRANCH
MARSHALL TO LEWISTON
M.P. 100 TO 120

SCALE HOR. 1" - 400'
VER. 1" - 20'

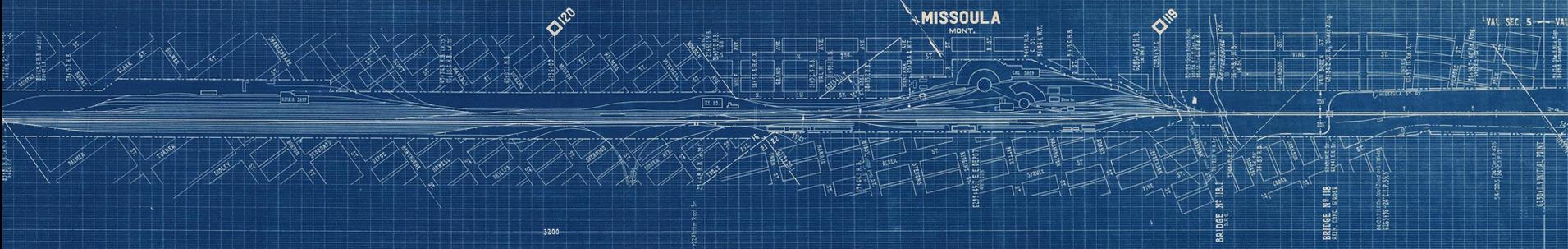
Office of Chief Engineer, St. Paul Minn.

PROFILE
ROCKY MOUNTAIN DIV. - MAIN LINE
HELENA TO MISSOULA
M.P. 102 TO M.P. 118
MISSOULA TO PARADISE
M.P. 118 TO M.P. 122
MONTANA VALUATION SECTIONS No 4 & 5.
1924.

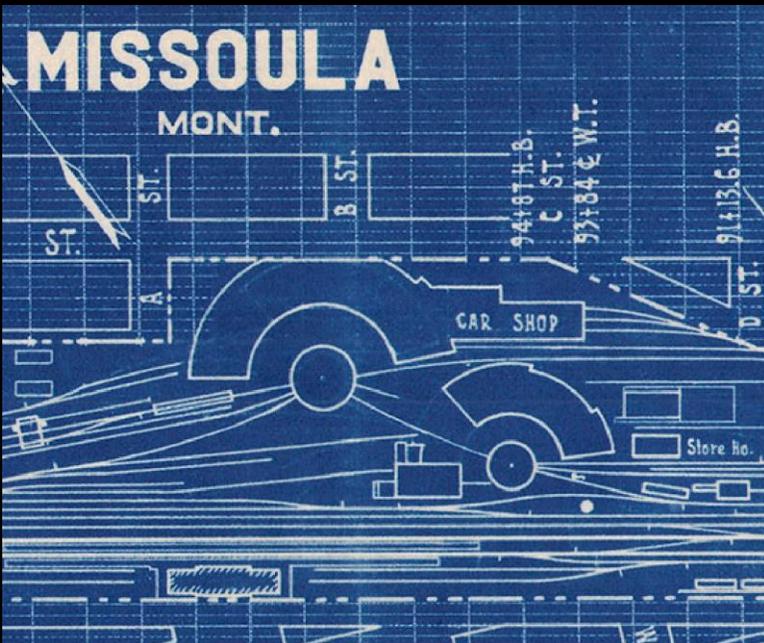
Full View



Zoom In



Detail



Layout

- Mainline/branch always straight line
- Title/Legend at one or both ends
- Horizontal: 1 inch = 400 feet
- Vertical: 1 inch = 20 feet

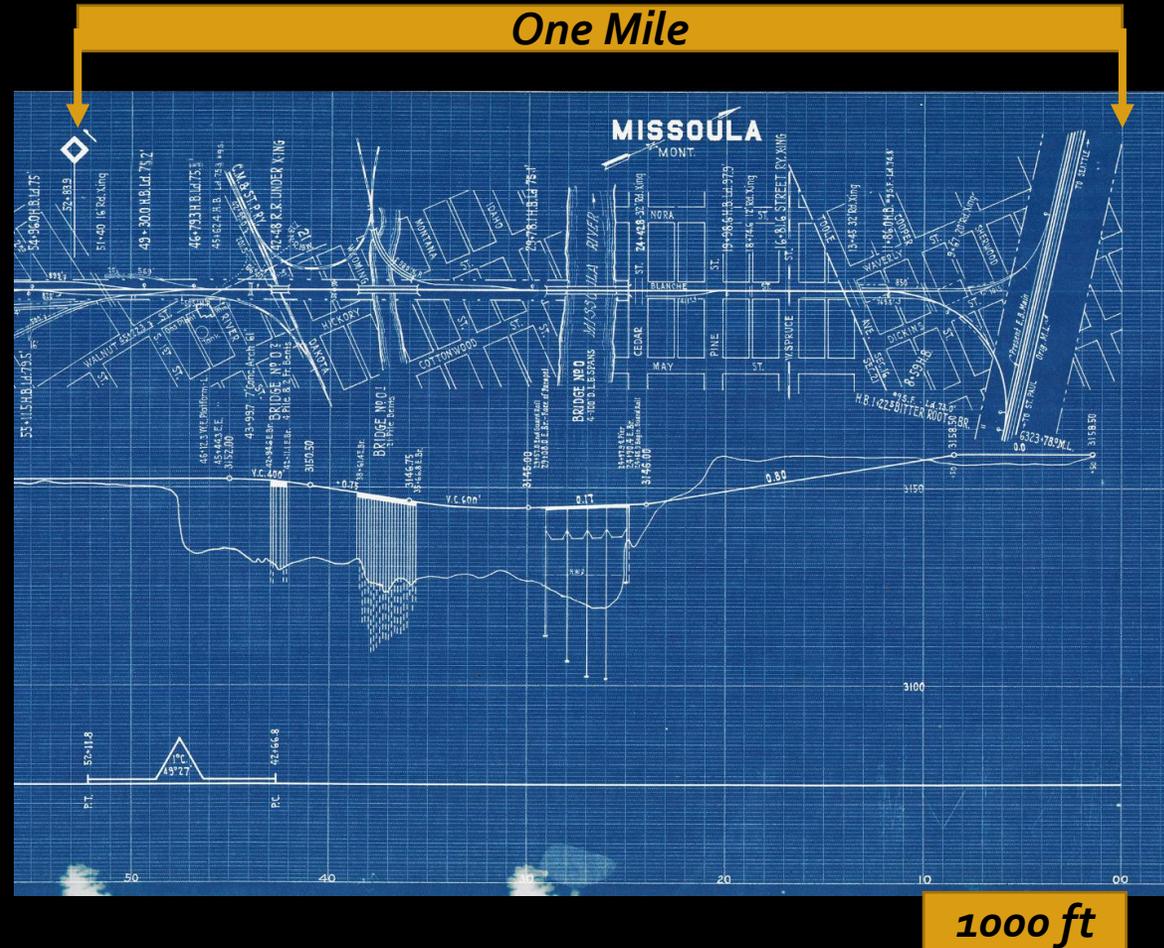
Scanned

Common Layout

Top – Track and Features

Middle – Grades and Bridges

Bottom - Curvature

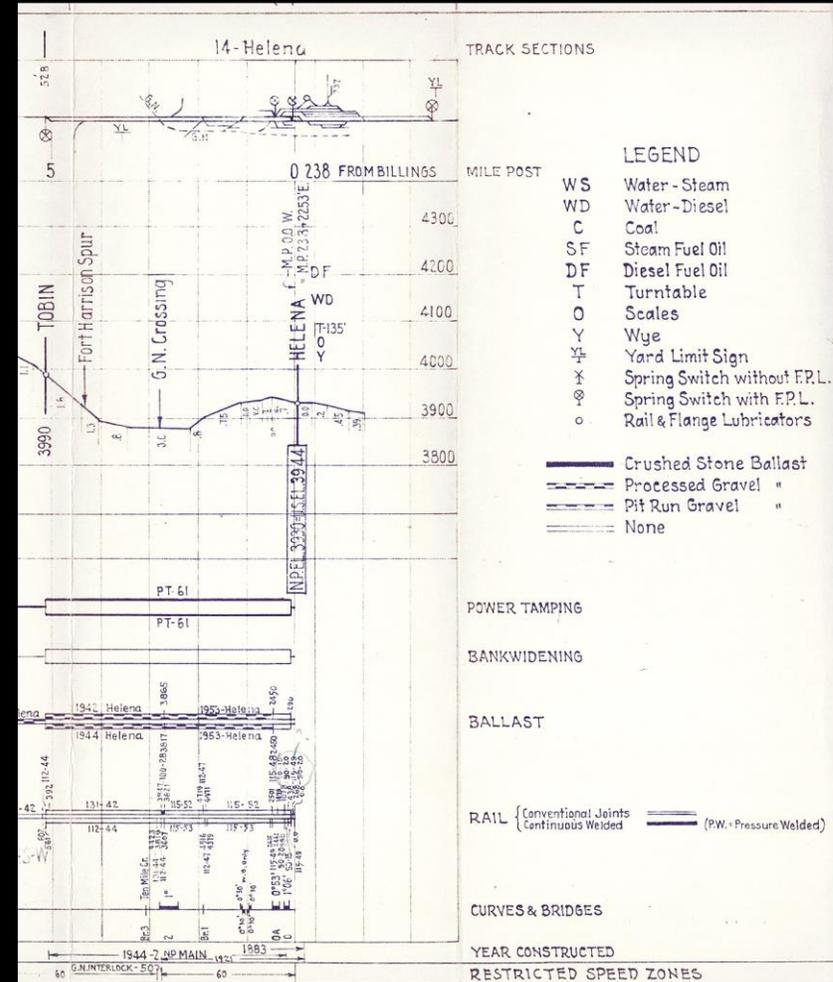


How do Track Profiles Differ from Condensed Track Profiles?

Long Profile



Condensed Profile



Top - Track Schematics

Middle - Stations and Grades

Lower - Track Details

Bottom - Curves, Bridges, Speed Zones

Top - Track and Features

Middle - Grades and Bridges

Bottom - Curvature

LEGEND

WS	Water - Steam
WD	Water - Diesel
C	Coal
SF	Steam Fuel Oil
DF	Diesel Fuel Oil
T	Turntable
O	Scales
Y	Wye
Y-L	Yard Limit Sign
X	Spring Switch without F.P.L.
X-L	Spring Switch with F.P.L.
o	Rail & Flange Lubricators

	Crushed Stone Ballast
	Processed Gravel "
	Pit Run Gravel "
	None

POWER TAMPING

BANKWIDENING

BALLAST

RAIL { Conventional Joints }
{ Continuous Welded } (PW = Pressure Welded)

CURVES & BRIDGES

YEAR CONSTRUCTED

RESTRICTED SPEED ZONES

Legend - Standard Plans Book

9-12-1

Sheet 239

HYDROGRAPHY.

- Stream.
- Springs and Sinks.
- Lakes and Ponds.
- Falls and Rapids.
- Water Lines.
- Marsh.
- Canals.
- Ditches.

RELIEF (Brown)

- Contour System.
- Sand.
- Cliffs.
- Cut.
- Embankment.
- Top of Slope.
- Bottom of Slope.

BOUNDARY & SURVEY LINES.

- Political Divisions, State, County or Township Lines.
- Government Surveys, Range, Meridian, Township, Section or Quarter Line.
- Street Block or other Property Line.
- Survey Lines.
- Center Lines.
- Company Property Line.
- Fence (on Street Line).
- Fence (on Company Property Line).

MINES.

- Tunnel.
- Shaft.
- Test Opening.
- Coal Outcrop.
- Mine in Operation.

STONE FENCES.

- Stone Fence.
- Board Fence.
- Ricket Fence.
- Barb Wire Fence.
- Rail Fence.
- Warm Fence.
- Woven Wire Fence.
- Snow Fence.
- Snow Shed.
- Village.
- City Limits.
- Fire Limits.

HIGHWAYS & CROSSINGS.

- Public and Main Roads.
- Private and Secondary Roads.
- Trails.
- Street and Public Road Crossings.
- Private Road Crossing.
- Road Crossing at Grade.
- " " under " "
- " " overhead.
- Crossing Gate.
- Turnstile.
- Cattle Guard.
- Form Gate.

N.P.R.Y. Standard Plan of Conventional Signs
In four sheets, Sheet No. 1
Office of Chief Engr. July 23-1914, Revised Oct 9-1914

Approved: *W. C. ...*
Chief Engineer

Note: Conventional Signs as recommended by American Railway Engineering Association and adopted by Interstate Commerce Commission, Director of Valuation, Order No. 1.

Sheet 241

WATER SUPPLY & PIPE LINES.

- Water Tank.
- Water Column.
- Track Pipe.
- Company Water Pipe.
- Other Water Pipe.
- Steam or Gas.
- Compressed Air.
- Fire Hydrant.
- Valve.
- Riser.
- Meter.
- Sewer or Drain.

RAIL.

- 56 lb.
- 60 lb.
- 66 & 67 lb. (label 67 lb.)
- 70 & 72 lb. (label 70 lb.)
- 75 lb.
- 80 lb.
- 85 lb.
- 90 lb.
- 100 lb.
- 112 lb.
- 130 & 131 lb. (label 130 lb.)

MISCELLANEOUS.

- Pole Wire Lines.
- Rail Post.
- Gantry Crane.
- Arc Lamp.
- Other Lamps.
- Railway Tunnel.
- Dimension Lines.
- Cribbing.
- Abutment Wall and Pier.
- Track Scales.
- Hoop Scales.
- Mail Crane.
- Graphic Scales.
- Room Crane.
- Gas Container.

ELECTRIFIED LINES.

- Third Rail.
- Jumpers.
- Feeder.
- Switch.
- Overhead Rail or Wire.

BALLAST.

- Earth.
- Sand.
- Cinders.
- Gran. Slag.
- Screenings.
- Burnt Clay.
- Chalk.
- Gravel.
- Slag.
- Broken Stone.

N.P.R.Y. Standard Plan of Conventional Signs
In four sheets, Sheet No. 3
Office of Chief Engr. July 23-1914

Approved: *W. C. ...*
Chief Engineer

Note: Conventional Signs as recommended by American Railway Engineering Association and adopted by Interstate Commerce Commission, Director of Valuation, Order No. 1.

9-12-2

Sheet 260

RAILWAYS (Topographical Map).

- Skirm.
- Electric.
- Street Railways.

RAILWAY TRACKS (Track Map).

- Railway Track or Old Track to Remain.
- Old Track to be Taken up.
- Proposed Tracks.
- Proposed (Future) Tracks.
- Foreign Tracks.
- Minerment (1st Curve to left, 2nd Curve to right).

TRACK FIXTURES.

- Turnout or Switch Stand.
- Interlocked Switch.
- Double Slip Switch.
- Single Slip Switch.
- Penail.
- Bumping Post.

BUILDINGS.

- Stone.
- Frame.
- Brick.
- Concrete.

RAILWAY TRACKS (Track Map) - Continued.

- Consolidated Iron.
- Brick Passenger Station.
- Electrical Sub-Station.
- Lightning Arrester House.
- Platform or Shedway.
- Turntable.
- Interlocking Tower.
- Ash Pit.
- Coal Chute (Mechanical).
- Coal Chute (Trestle).
- Circular Engine House.
- Square Engine House.

BRIDGES.

- Girder.
- Truss.
- Trestle.
- Spigot Bridges.
- Lift Span.
- Drawcule, Double Leaf.
- Drawcule, Single Leaf.
- Draw Span.

CULVERTS, SEWERS, ETC.

- Masonry Arch or Flat Top Culvert.
- Pipe or Wood Box Culvert or Drain.
- Catch Basin.
- Manhole.
- Jump.

SIGNS AND SIGNALS.

- Mile Post.
- Section Post.
- Yard Limits.
- Highway Crossing Bell.
- Flanger Sign.
- Whistle Post.
- Crossing Sign.
- Tell-Tale.

N.P.R.Y. Standard Plan of Conventional Signs
In four sheets, Sheet No. 2
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Chief Engineer

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Legend - Standard Plans Book

BOUNDARY & SURVEY LINES.

Bethel Twp. - Wayne Co., Mich. Posey Twp. - Adams Co., Ind.	} Political Divisions, State, County or Township Lines.
Sec. 18, T. 12 N., R. 1 E., 3rd P.M. Sec. 13, T. 11 N., R. 1 E., 3rd P.M.	
-----	} Government Surveys, Base, Meridian, Township, Section or Harbor Line.
-----	Street, Block or other Property Line.
Road Preliminary Location	Survey Lines.
Original (Track or 7/7) Center Line 7/7 (Korunghol, Start Location and Proper Symbol).	Center Lines.
-----	Company Property Line.
State Kind and Height	Fence (on Street Line)
State Kind and Height	Fence (on Company Property Line).

$\frac{17}{20} \frac{16}{21}$	Section Corner.
$\frac{17}{17}$	Section Center.
\triangle	Triangulation Station
B.M. X 1232	Bench Mark.

HIGHWAYS & CROSSINGS.

	Public and Main Roads.
	Private and Secondary Roads.
	Trails.
	Street and Public Road Crossings.
	Private Road Crossing.
	Road Crossing at Grade.
	" " " under "
	" " " overhead.
	Crossing Gate.
	Turnstile.
	Cattle Guard.
	Farm Gate.

TRACK FIXTURES.

	Turnout or Switch-Stand.
	Interlocked Switch.
	Double Slip Switch.
	Single Slip Switch.
	Derail.
	Bumping Post.

BRIDGES.

	Girder.
	Truss.
	Trestle.
	Signal Bridge.
	Lift Span.
	Bascule, Double Leaf.
	Bascule, Single Leaf.
	Draw Span.

CULVERTS, SEWERS, ETC.

	Masonry Arch or Flat Top Culvert.
	Pipe or Wood Box Culvert or Drain.
	Catch Basin.
	Manhole.
	Sump.

+ BUILDINGS.

Indicate Use and Number of Stories.		Stone.
		Frame.
		Brick.
		Concrete.
Indicate Use and Number of Stories.		Corrugated Iron.
		Brick Passenger Station.
		Electrical Sub-Station.
		Lightning Arrester House
Indicate Kind and Character.		Platform or Driveway.
		Turntable.
		Interlocking Tower.
		Ash Pit.
		Coal Chute (Mechanical).
		Coal Chute (Trestle).
		Circular Engine House.
		Square Engine House.

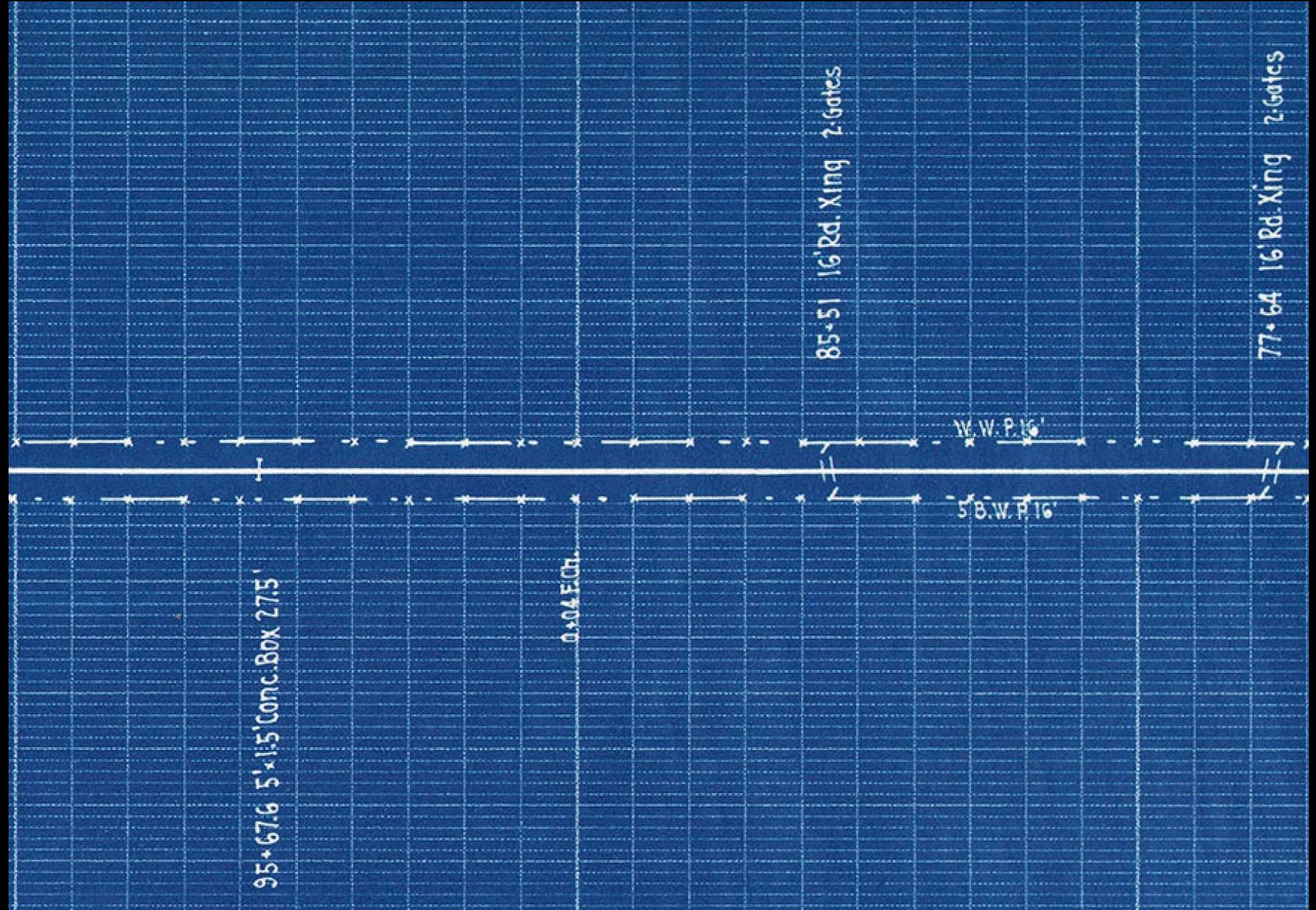
Legend – Standard Plans Book

<u>WATER SUPPLY and PIPE LINES.</u>	
<i>Give Character, Diam & Height.</i> 	Water Tank.
<i>Give Size</i> 	Water Column.
	Track Pier.
<i>Give Size</i> 	Company Water Pipe.
	Other Water Pipe.
<i>Give Size</i> 	Steam or Gas.
<i>Give Size</i> 	Compressed Air.
	Fire Hydrant.
	Valve.
	Riser.
	Meter.
<i>Give Size</i> 	Sewer or Drain.

<u>MISCELLANEOUS.</u>	
<i>Indicate No. of Wires & Ownership</i> 	Pole Wire Lines.
	Rail Rest.
	Gantry Crane.
	Arc Lamp.
<i>State Kind.</i> 	Other Lamps.
	Railway Tunnel.
<i>Red Ink</i> 	Dimension Lines.
<i>Black</i> 	Dimension Lines.
	Cribbing.
	Abutment, Wall and Pier.
<i>Indicate Capacity and Length</i> 	Track Scales.
	Wagon Scales.
	Mail Crane.
	True and Magnetic Meridian.
	Graphic Scales.
	Boom Crane.
	Gas Container.

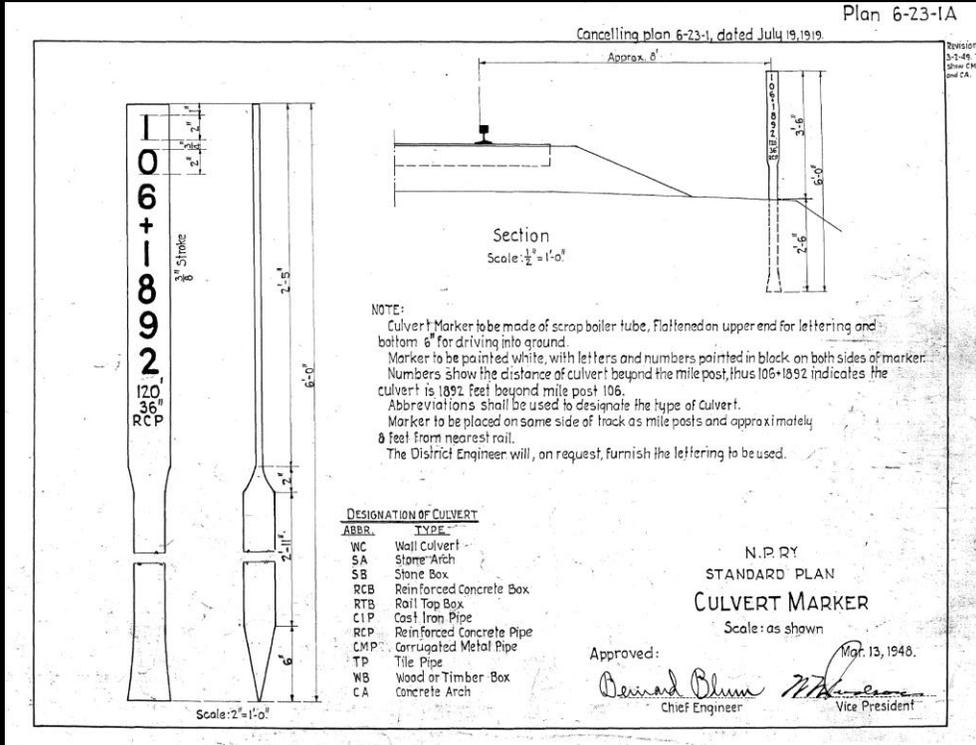
Basic Tangent Track - Modeling

- Culvert
- Fence
- Rd. Xing
- Cattle Guard
- Rail Rest



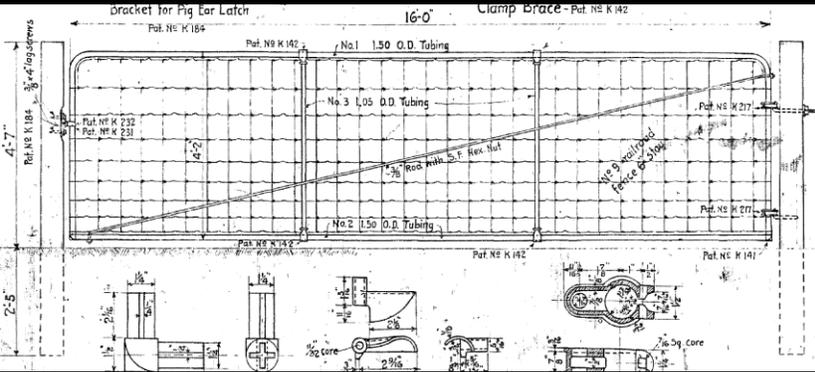
Culvert + Marker Profile

Modeling

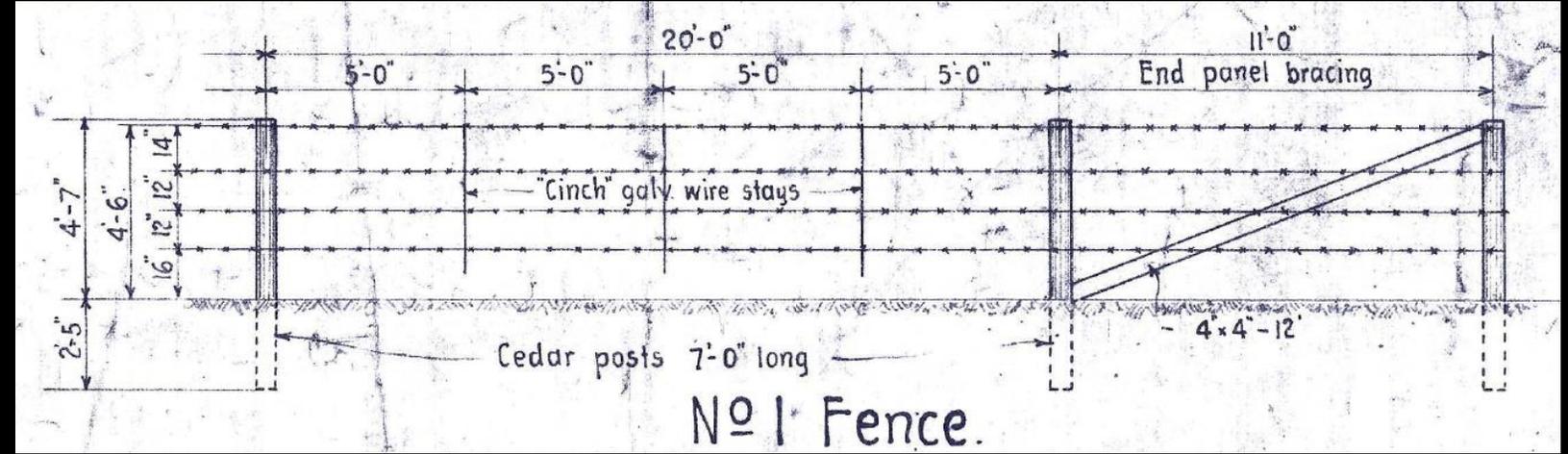
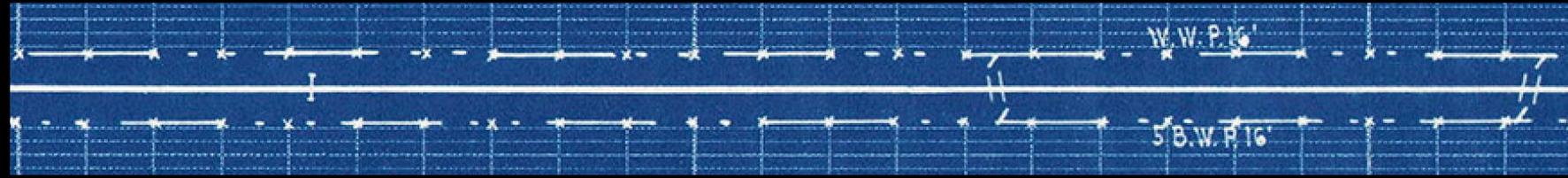


Fence

Note the gate mark on the fence at the road crossing



Profile

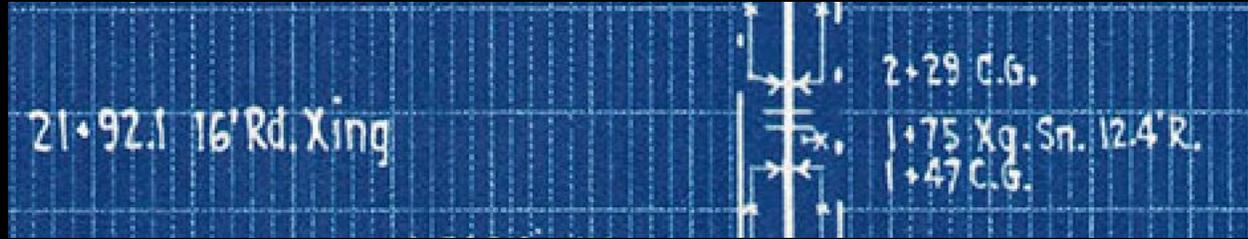
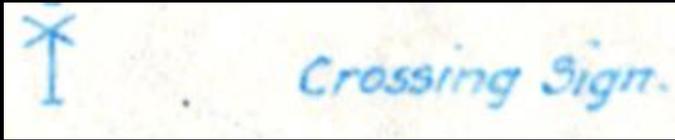
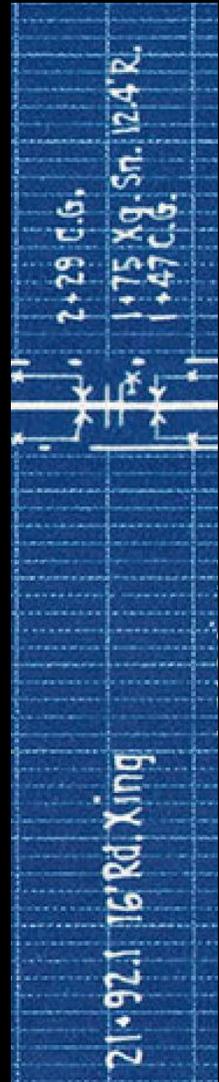


Modeling

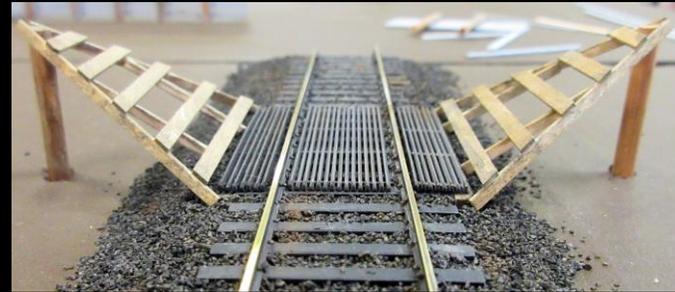


Cattle Guard - CG Crossing Sign - Xg Sn

Profile



Modeling



NPRHA Kits:
N3146-HO
N3146-N
N3146-O



NPRHA Decals:
N3211-HO
N3211-N
N3211-O

Rail Rest



Placed every mile, spare length of rail for repairs

Modeling



MP 98 East of Auburn

Other Signs Included on Long Profiles

- Section 

- Dump Cinders 

- Mile 

SIGN		DESCRIPTION	PLAN No	SIGN		
		TRAIN CONTROL SERIES				
SIGN		CAUTION FLAG	6-1-16	SIGN		
		DERAIL	6-1-13			BRIDGE
		DRAW 800 FT.	6-1-6			COUNTY BOUNDARY
		DRAW 1 MILE	6-1-7			CULVERT MARKER
		DRILLING FOR ROADWAY SIGNS	6-1-0			MILE
		END DOUBLE TRACK	6-1-11			PRIVATE PROPERTY
		FLANGER	6-1-21			SCALE
		FOULING POINT	6-1-14			STATION
		JUNCTION 800 FT.	6-1-8A			TUNNEL
		JUNCTION 1 MILE	6-1-8			
		PERMISSIVE MARKER FOR AUTO. BLOCK SIGNAL	6-1-19			
		R. R. CROSSING 800 FT.	6-1-4			
		R. R. CROSSING 1 MILE	6-1-5 & 6-1-5A			
		SIGNAL CLEARING SECTION	6-1-18			
		SPEED CONTROL (ADVANCE, REDUCE & RESUME)	6-1-22			
		STATION 1 MILE	6-1-23			
		STOP	6-1-1			
		STOP, CAUTION AND RESUME SPEED FLAGS	6-1-17			
	STOP ENGINE	6-1-12				
	SUMMIT	6-1-20				
	WESTWARD AND EASTWARD SIDING	6-1-10				
	WHISTLE	6-1-9				
	YARD LIMIT	6-1-2				
	YARD LIMIT ONE MILE	6-1-3				
		STATION AND STRUCTURE SERIES				
		HIGHWAY SERIES				
					HAZARD MARKERS FOR UNDERPASS SUPPORTS	
					HIGHWAY CROSSING	
					LOW CLEARANCE	
					RAILROAD ADVANCE WARNING	
					STOP (Private Road Crossing)	

Modeling Authentic NP Signs:

- Rick Leach offered decals couple years back
- Project for NPRHA in next year or two. Demand?

Locations of Signs:

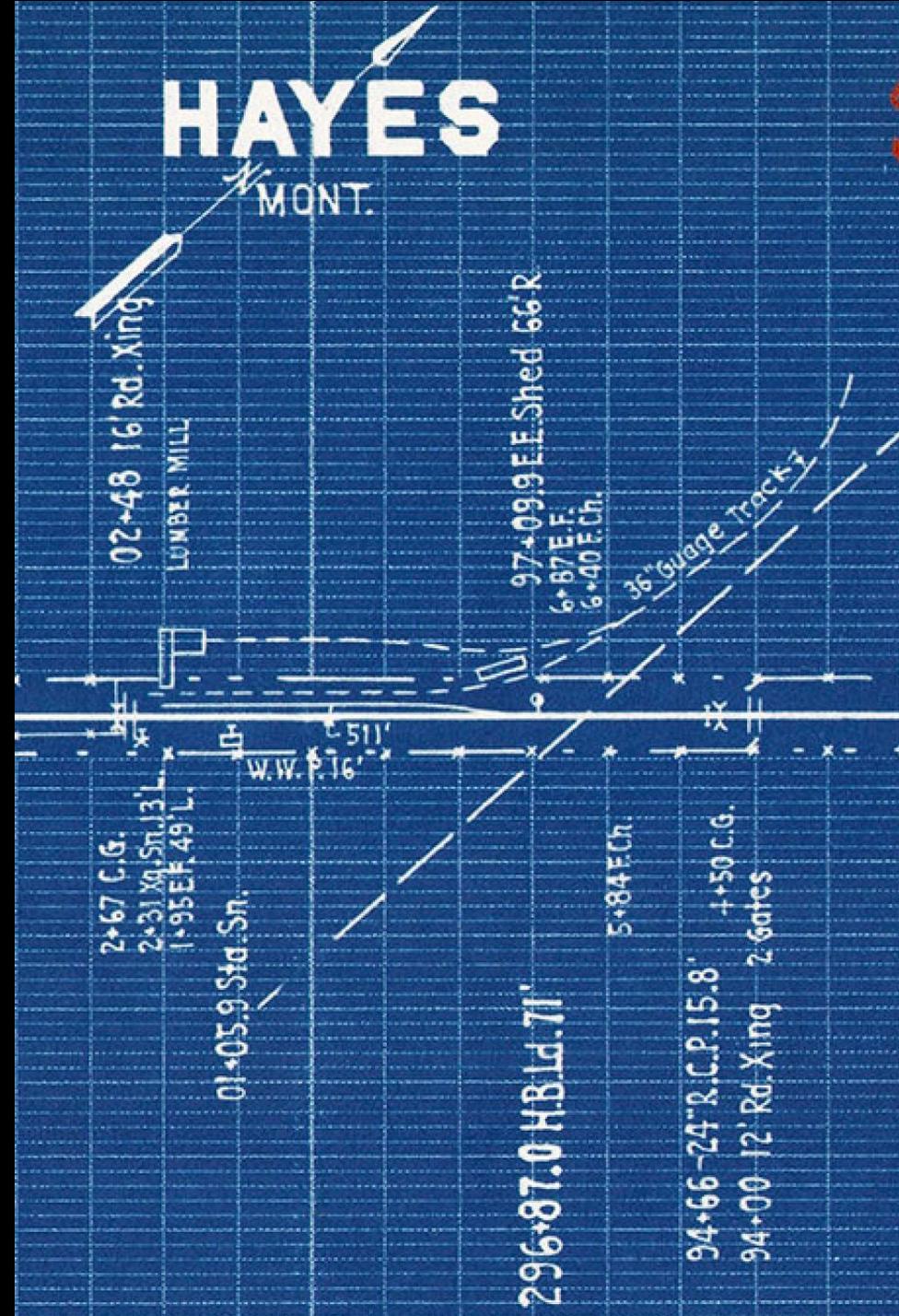
- Sign plans for your era include placement guidance
- Older, complete list: NP Track Maintenance Rules and Plans of 1918

LOCATION OF SIGNS.

KIND	DISTANCE OUT		Top of Sign Above Ground	LOCATION
	From Rail	From Center of Track		
County Line		25'	6'6"	On County Line.
Curve Marker	8'		18"	As directed.
Draw Span One Mile	10'		8'	
Draw Span 800 Feet	10'		8'	
Dump Cinders	8'		8'	As directed.
Derail	8'		5'6"	As directed.
Extra Rail Support	8'		4'	Posts 15' apart and opposite Mile Posts where possible.
End Double Track	10'		8'	
Flanger	8'		8'	50' from obstruction.
Highway Crossing	10'		12'	As directed.
Interest				As directed.
Mile post	6'9"		4'6"	
R. R. Crossing One Mile	10'		8'	
R. R. Crossing 800 Feet	10'		8'	
Stop	10'		8'	As directed.
Station One Mile	10'		8'	One Mile from Depot.
Station One Mile Water	10'		8'	
Speed Limit	10'		8'	As directed.
Station-Blind Siding		25'	8'	As directed.
Section Limit	8'		2'6"	As directed.
Siding	8'		8'	As directed.
Supplemental R. R. Crossing			8'	As directed.
Trespass			8'	As directed.
Tunnel	8'		8'	As directed.
Water One Mile	10'		8'	
Whistle	8'		8'	As directed.
Yard Limit	10'		8'	As directed.

Small Station - Modeling

- Sidings
- Buildings
- Other



Sidings – H.B.

- “H.B.” is short for Head Block. NP standard = two 15’ long Head Block ties under switch stand
- “Ld. #” Lead distance from the switch points to the frog point
- #11S is #11 standard plan, Spring Rail Frog
- “22’ Sp.Sw.” is length of switch points, and it’s a spring switch, with electric switch machine
- F.P.L = Facing Point Lock

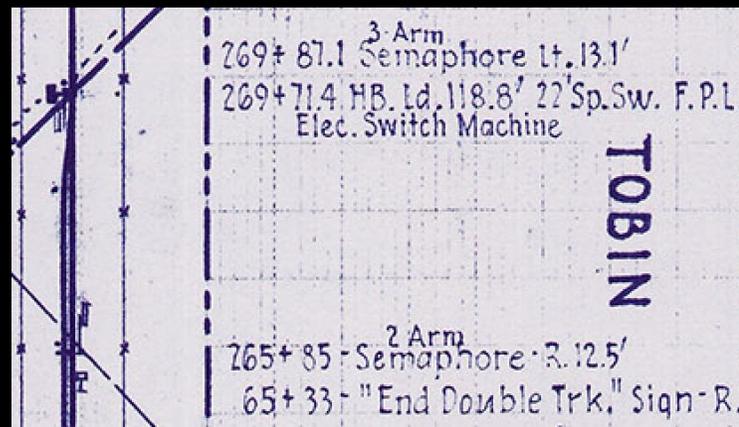
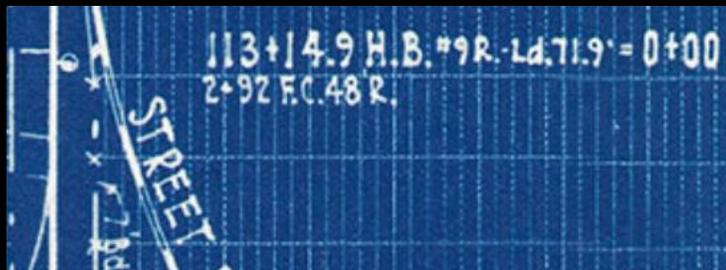
Simple



With Size



Lots of info

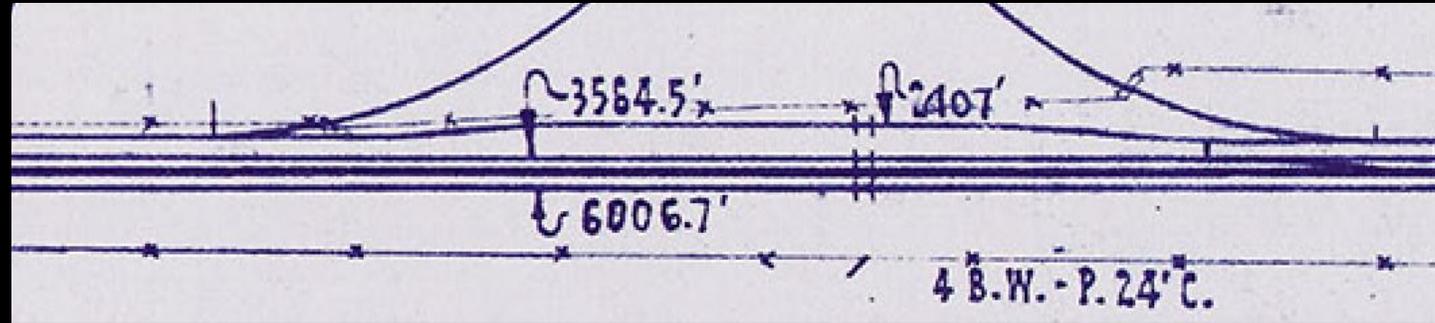


Sidings - Length

Simple - Hays 511 ft



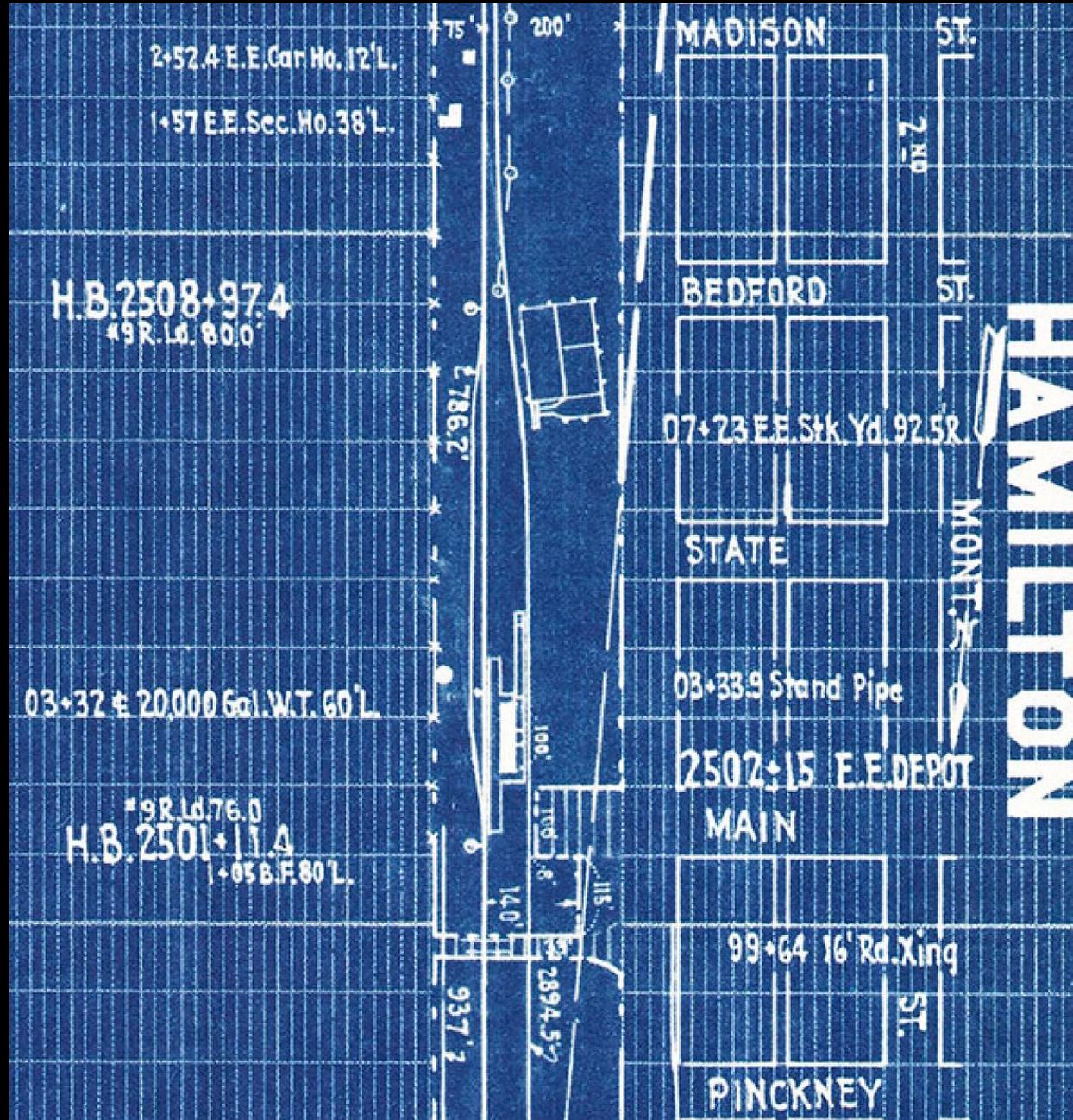
Multiple - Blossburg
3,564.5 ft
6006.7 ft
2407 ft



Buildings - Hamilton

E.E. Car House, 12ft
E.E. Section House, 38ft

20,000 Gal Water Tank

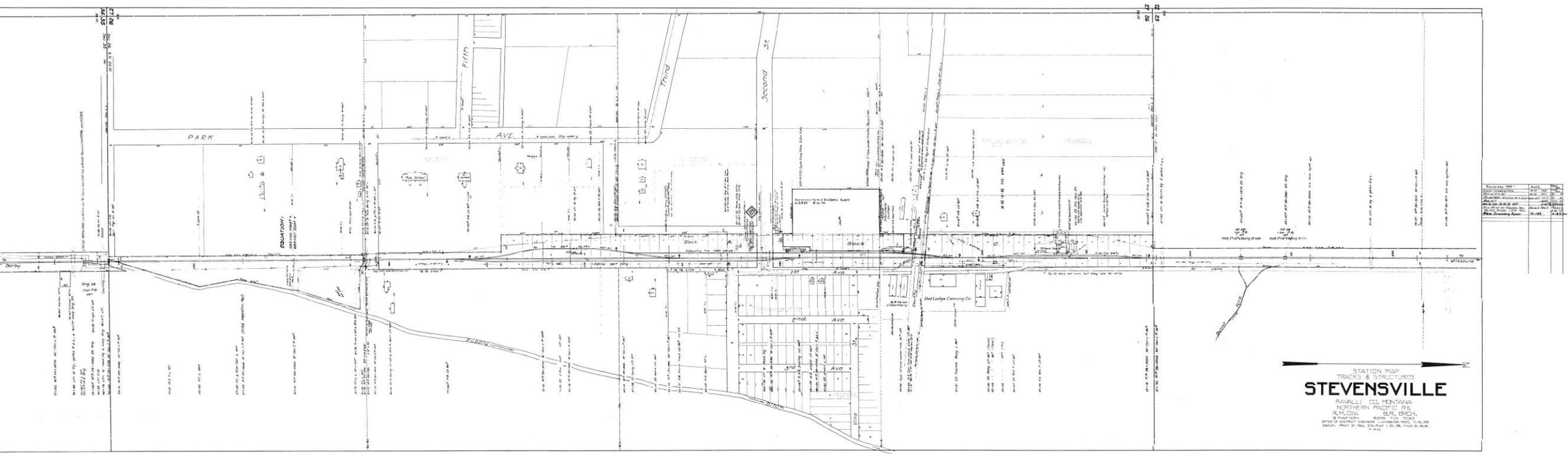


E.E. Stock Yard

Stand Pipe

E.E. Depot

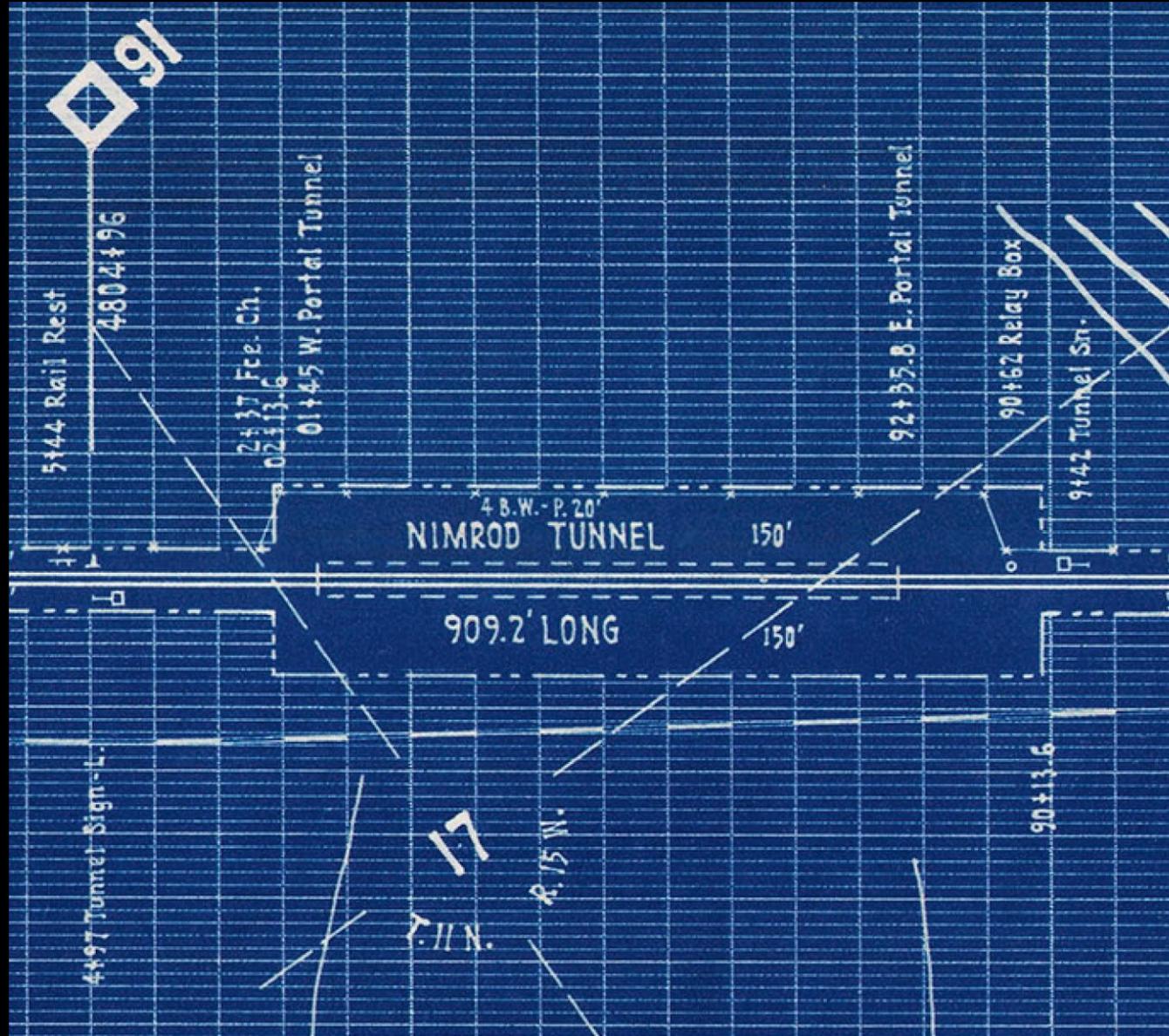
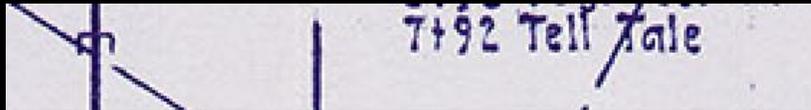
Buildings – all that said... use Station Maps!



- Most NPR structure sizes
- Telegraph line positions, etc.
- Surrounding industrial and town buildings
- Station revisions in convenient table, even for little stations like Weed

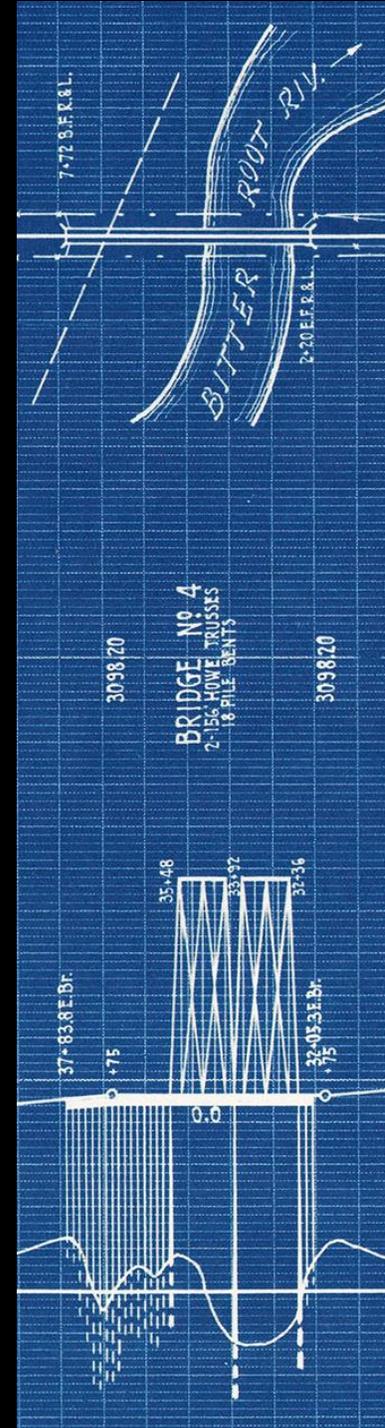
Tunnel - Modeling

- Tunnel Name
- Tunnel Sign
- Portal Tunnel
- Tell Tale



Bridge Example

- Two 156ft Howe Trusses +
- 18 Pile Bents
- $37.83.8 - 32.05.3 = 578.5$ ft



Curvature

Degree of curvature

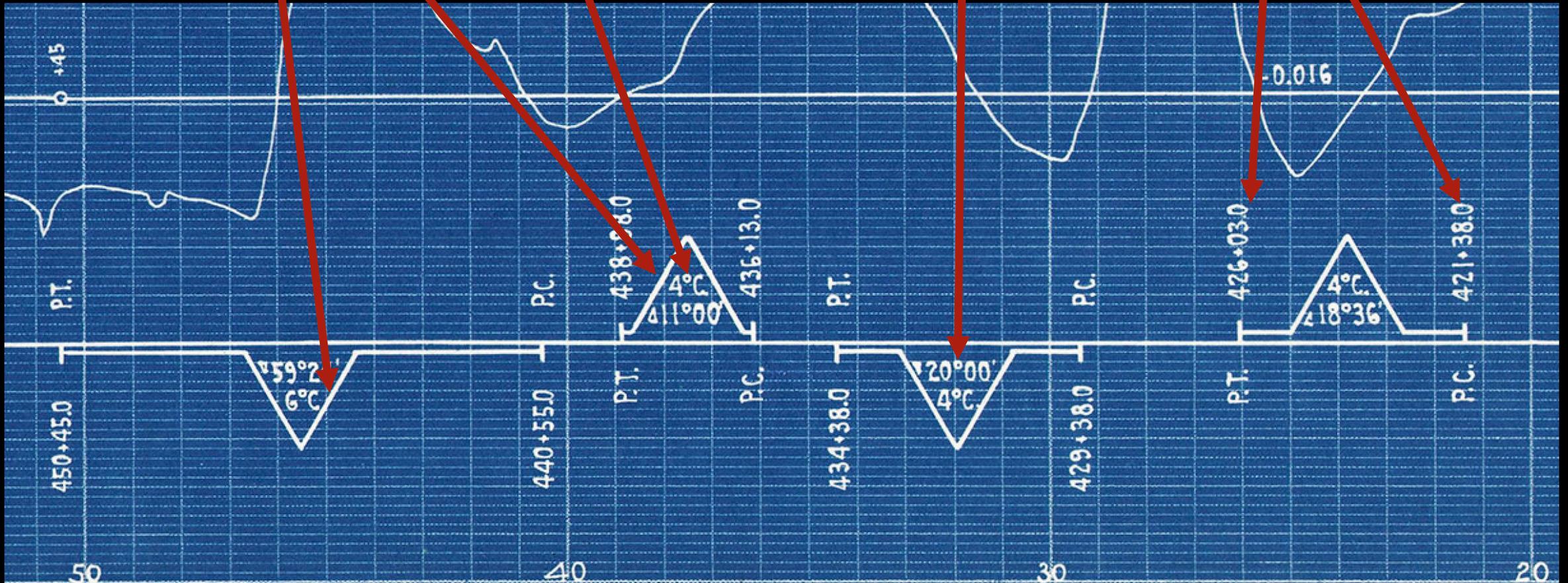
Curvature left, right

Length in Degrees

Length in Feet Curve
= PT - PC

42,603.0 -
42,138.0 = 465 ft

= 5.3 ft in HO... yikes



Modeling Summary

- Profiles are a great resource to help make your layout **AUTHENTIC NP**
- Authentic Kits available today – Cattle Guards, Crossing Signs, Whistle Sign (HO)
- Signage needed – Semaphore, train control signs, structure signs, bridge/tunnel
- Structures needed – Stock yard, water tanks (wood, modern flat top), blow out basin
- Others needed – battery box, phone box, mail crane, telltale



2017 Structure Survey

NPRHA 2017 Structure Survey

All Scales		HO Scale		N Scale		O Scale	
Cattle Guard	108	Cattle Guard ✓	76	Boxcar Shed	38	Watchmans House	9
Boxcar Shed	86	Wood Platform	58	Bunk House	32	Hose House	7
Small Tellegraph	77	Concrete Platform	57	Cattle Guard ✓	28	Small Tellegraph	7
Bunk House	76	Eng House A ✓	51	Watchmans House	25	Eng House B	6
Wood Platform	75	Stock Yard - Basics	50	Hose House	22	Pump House	6
Concrete Platform	73	Small Tellegraph ✓	48	Small Tellegraph	22	Combo Depot	6
Eng House A	67	Two Post Tower	45	Toston Depot	19	Office @ Jct	6
Watchmans House	67	Boxcar Shed ✓	44	Pump House	19	Portable Bunk	5
Stock Yard - Basics	65	Bunk House ✓	43	Combo Depot	18	WT 48K HF	5
Hose House	64	Stock Yard - Bonus	42	Boxcar Cottages	16	Cattle Guard ✓	4
Two Post Tower	61	Toston Depot ✓	36	Two Post Tower	15	Boxcar Shed	4
Combo Depot	60	Combo Depot	36	Eng House B	15	WT 100K MF	4
Toston Depot	55	Hose House ✓	35	Concrete Platform	15	Boxcar Cottages	3
Eng House B	53	Coal Shed ✓	34	Wood Platform	15	Coal Dock	3
Pump House	53	WT 100K MF	34	WT 100K HF	15	Eng House A	3
Stock Yard - Bonus	53	Watchmans House ✓	33	WT Metal	15	Ice House	3
Coal Shed	47	Eng House B	32	Eng House A	13	Coal Shed	3
Office @ Jct	46	Ice House ✓	30	Freight Depot	13	Blow Off Basin	2
WT 100K MF	46	Pump House	28	Office @ Jct	13	Wood Platform	2
Ice House	45	Office @ Jct	27	Stock Yard - Basics	13	WT 48K MF	2
WT Metal	43	WT Metal	25	Ice House	12	WT Metal	2
Coal Dock	38	Coal Dock	24	WT 48K HF	12	Stock Yard - Basics	2
Freight Depot	38	Freight Depot	24	Coal Dock	11	Stock Yard - Bonus	2
WT 100K HF	35	WT 48K MF	22	Portable Bunk	11	Two Post Tower	1
WT 48K HF	35	Section House	21	Coal Shed	10	Bunk House	1
WT 48K MF	31	WT 100K HF	19	Stock Yard - Bonus	9	Freight Depot	1
Boxcar Cottages	30	WT 48K HF	18	Blow Off Basin	8	Section House	1
Section House	30	Blow Off Basin	13	Section House	8	Concrete Platform	1
Portable Bunk	29	Portable Bunk	13	WT 100K MF	8	WT 100K HF	1
Blow Off Basin	23	WT 20K LF	13	WT 20K LF	8	WT 20K LF	1
WT 20K LF	22	Boxcar Cottages	11	WT 48K MF	7	WT 48K LF	1
WT 48K LF	13	WT 48K LF	9	WT 48K LF	3	Toston Depot	0



Where can I get Long Track Profiles?

- Vista Dome Package has:
 - Condensed Profiles - 17 from 1928 set, 26 from 1969 set. All main line
 - Long Profiles – **187** from various era's, branch and main lines. All are WEST of Glendive
 - **Roughly 4986 FEET** of Long Track profiles!
 - Long profiles are too big to go on NPRHA site, VDP only way
- Get yours today – **SEE IT ALL!**



End of Part 1 of 2

Part 1 – Long Track Profiles

Part 2 – Condensed Track Profiles