

F Scale

Curved Switch Turnout

TURNOUT DIMENSIONS

Revised: February 2015

RP-12.22

Design and calculations by Van S. Fehr

(1)	FROG NUMBERS	4	5	6	7	8	9	10	11	12
PROPERTIES OF CURVED SWITCHES										
(2)	Switch Rail Length	6.852	6.688	6.717	11.661	11.815	11.958	11.863	11.925	18.215
(3)	Switch Point Angle (deg.)	1.413	1.448	1.442	0.830	0.819	0.809	0.816	0.812	0.531
(4)	Switch Heel Spread	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320
(5)	Switch Heel Angle (deg.)	3.937	4.034	4.017	2.313	2.283	2.255	2.273	2.262	1.481
(6)	Switch Rail Radius	155.536	148.191	149.449	450.519	462.492	473.759	466.304	471.180	1099.345
(7)	Switch Mid-Ordinate	0.038	0.038	0.038	0.038	0.038	0.038	0.038	0.038	0.038
LEAD TO THEORETICAL POINT OF FROG										
(8)	Lead	21.161	23.880	26.599	37.020	40.182	42.938	45.534	48.117	60.999
CLOSURE DISTANCE										
(9)	Straight Rail Length	12.408	15.185	17.769	22.697	25.500	27.367	30.050	32.244	38.385
(10)	Curved Rail Length	12.642	15.375	17.930	22.829	25.617	27.473	30.146	32.332	38.463
(11)	Curved Rail Radius	70.237	119.240	186.424	223.275	301.392	383.529	500.447	629.361	669.563
GAGE LINE OFFSETS ON CURVED CLOSURE RAIL										
(12)	1st Point Y1	0.602	0.648	0.685	0.621	0.642	0.650	0.675	0.690	0.637
(13)	1st Point X1	9.954	10.484	11.159	17.335	18.190	18.800	19.376	19.986	27.811
(14)	Mid-Point Y2	1.025	1.100	1.158	1.068	1.099	1.104	1.143	1.164	1.091
(15)	Mid-Point X2	13.056	14.281	15.601	23.009	24.565	25.641	26.888	28.047	37.408
(16)	3rd Point Y3	1.590	1.676	1.738	1.661	1.693	1.680	1.724	1.741	1.684
(17)	3rd Point X3	16.158	18.077	20.044	28.683	30.940	32.483	34.401	36.108	47.004
PROPERTIES OF FROGS										
(18)	Frog Angle (deg.)	14.250	11.421	9.527	8.171	7.153	6.360	5.725	5.205	4.772
(19)	Overall Length	4.756	5.354	5.952	7.141	7.739	9.519	9.822	11.133	12.101
(20)	Toe Length	1.901	2.007	2.113	2.662	2.867	3.613	3.620	3.948	4.399
(21)	Heel Length	2.855	3.347	3.839	4.479	4.872	5.906	6.201	7.185	7.702
(22)	Toe Spread	0.472	0.399	0.351	0.379	0.358	0.401	0.362	0.359	0.366
(23)	Heel Spread	0.708	0.666	0.638	0.638	0.608	0.655	0.619	0.653	0.641
(35)	Wing Rail Extension	1.748	1.981	2.215	2.449	2.682	2.916	3.150	3.384	3.617
(36)	Wing Rail Flare Length	0.886	0.886	0.886	0.886	1.181	1.181	1.575	1.575	1.772
(37)	Wing Rail Flare Width	0.118	0.118	0.118	0.118	0.112	0.112	0.107	0.107	0.106
(38)	Wing Rail Bend Width	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
(39)	Wing Rail End Chamfer	0.172	0.172	0.172	0.172	0.172	0.172	0.172	0.172	0.172
POINT OF FROG TO INTERSECTION OF CENTERLINES										
(24)	PF to ICL	11.132	13.915	16.698	19.481	22.264	25.047	27.830	30.613	33.396
DATA FOR CROSSOVERS: PF TO PF ON PARALLEL TRACKS										
For Track Centers of:		7.677	(13 prototype feet)							
(25)	Straight Track Dist.	7.965	10.172	12.347	14.504	16.649	18.787	20.920	23.048	25.174
(26)	Crossover Track Dist.	8.924	10.940	12.987	15.052	17.129	19.214	21.304	23.397	25.494
For Track Center Increment of:		0.591	(1 prototype foot)							
(28)	Straight Track Incr.	2.325	2.923	3.519	4.113	4.706	5.299	5.891	6.483	7.074
(29)	Crossover Track Incr.	2.399	2.982	3.568	4.155	4.743	5.331	5.920	6.509	7.099
GUARD RAILS										
(30)	Parallel End Setback	0.394	0.419	0.443	0.468	0.493	0.517	0.542	0.566	0.591
(31)	Bevel Length	0.640	0.640	0.640	0.640	0.640	0.640	0.640	0.640	0.640
(32)	Flare Length	1.427	1.427	1.427	1.427	1.427	1.427	1.427	1.427	1.427
(33)	Overall Length	4.872	4.872	4.872	4.872	4.872	4.872	4.872	4.872	4.872
(34)	Parallel Length	2.018	2.018	2.018	2.018	2.018	2.018	2.018	2.018	2.018
(37)	Flare Width	0.095	0.095	0.095	0.095	0.095	0.095	0.095	0.095	0.095
(38)	Plane Width	0.056	0.056	0.056	0.056	0.056	0.056	0.056	0.056	0.056
(39)	End Chamfer	0.148	0.148	0.148	0.148	0.148	0.148	0.148	0.148	0.148

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(1)	FROG NUMBERS	13	14	15	16	17	18	19	20
PROPERTIES OF CURVED SWITCHES									
(2)	Switch Rail Length	18.234	18.312	18.471	18.613	23.317	23.524	23.629	23.772
(3)	Switch Point Angle (deg.)	0.531	0.528	0.524	0.520	0.415	0.411	0.410	0.407
(4)	Switch Heel Spread	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320
(5)	Switch Heel Angle (deg.)	1.479	1.473	1.460	1.449	1.157	1.146	1.141	1.134
(6)	Switch Rail Radius	1101.605	1111.008	1130.453	1147.928	1801.444	1833.637	1849.915	1872.404
(7)	Switch Mid-Ordinate	0.038	0.038	0.038	0.038	0.038	0.038	0.038	0.038
LEAD TO THEORETICAL POINT OF FROG									
(8)	Lead	63.859	66.720	69.537	72.465	82.837	85.777	88.718	91.658
CLOSURE DISTANCE									
(9)	Straight Rail Length	40.997	43.551	45.758	48.561	53.766	56.036	58.889	61.703
(10)	Curved Rail Length	41.070	43.619	45.822	48.621	53.821	56.089	58.939	61.751
(11)	Curved Rail Radius	804.170	954.594	1113.285	1307.312	1393.600	1578.494	1802.456	2045.445
GAGE LINE OFFSETS ON CURVED CLOSURE RAIL									
(12)	1st Point Y1	0.650	0.662	0.670	0.683	0.656	0.662	0.673	0.683
(13)	1st Point X1	28.483	29.199	29.911	30.754	36.759	37.534	38.351	39.198
(14)	Mid-Point Y2	1.111	1.128	1.138	1.160	1.122	1.129	1.147	1.164
(15)	Mid-Point X2	38.733	40.087	41.350	42.894	50.200	51.543	53.073	54.624
(16)	3rd Point Y3	1.703	1.720	1.725	1.749	1.718	1.721	1.741	1.760
(17)	3rd Point X3	48.982	50.975	52.790	55.034	63.642	65.552	67.796	70.049
PROPERTIES OF FROGS									
(18)	Frog Angle (deg.)	4.405	4.091	3.818	3.580	3.369	3.182	3.015	2.864
(19)	Overall Length	13.068	14.035	14.511	15.478	16.445	17.413	17.900	18.388
(20)	Toe Length	4.628	4.857	5.308	5.291	5.754	6.217	6.200	6.183
(21)	Heel Length	8.440	9.178	9.203	10.187	10.692	11.196	11.700	12.205
(22)	Toe Spread	0.356	0.347	0.354	0.331	0.338	0.345	0.326	0.309
(23)	Heel Spread	0.649	0.655	0.613	0.636	0.629	0.622	0.616	0.610
(35)	Wing Rail Extension	4.011	4.405	4.638	5.118	5.352	5.586	5.979	6.373
(36)	Wing Rail Flare Length	2.308	2.613	2.728	3.056	3.162	3.269	3.578	3.887
(37)	Wing Rail Flare Width	0.103	0.102	0.102	0.101	0.101	0.101	0.100	0.100
(38)	Wing Rail Bend Width	0.103	0.102	0.102	0.101	0.101	0.101	0.100	0.100
(39)	Wing Rail End Chamfer	0.172	0.172	0.172	0.172	0.172	0.172	0.172	0.172
POINT OF FROG TO INTERSECTION OF CENTERLINES									
(24)	PF to ICL	36.179	38.962	41.745	44.528	47.311	50.094	52.877	55.660
DATA FOR CROSSOVERS: PF TO PF ON PARALLEL TRACKS									
For Track Centers of:		7.677	(13 prototype feet)						
(25)	Straight Track Dist.	27.298	29.419	31.540	33.659	35.777	37.894	40.011	42.127
(26)	Crossover Track Dist.	27.593	29.693	31.795	33.899	36.003	38.108	40.213	42.319
For Track Center Increment of:		0.591	(1 prototype foot)						
(28)	Straight Track Incr.	7.666	8.257	8.848	9.440	10.031	10.622	11.213	11.804
(29)	Crossover Track Incr.	7.689	8.278	8.868	9.458	10.048	10.638	11.228	11.818
GUARD RAILS									
(30)	Parallel End Setback	0.615	0.640	0.665	0.689	0.714	0.738	0.763	0.788
(31)	Bevel Length	0.640	0.640	0.640	0.640	0.640	0.640	0.640	0.640
(32)	Flare Length	1.427	1.624	1.624	1.624	1.624	1.624	1.624	1.624
(33)	Overall Length	4.872	6.496	6.496	6.496	6.496	6.496	6.496	6.496
(34)	Parallel Length	2.018	3.248	3.248	3.248	3.248	3.248	3.248	3.248
(37)	Total Flare at End	0.095	0.095	0.095	0.095	0.095	0.095	0.095	0.095
(38)	Bevel Cut at End	0.056	0.051	0.051	0.051	0.051	0.051	0.051	0.051
(39)	End Chamfer	0.148	0.148	0.148	0.148	0.148	0.148	0.148	0.148