

027 Scale

Straight Switch Turnout

TURNOUT DIMENSIONS

Revised: February 2015

RP-12.43

Design and calculations by Van S. Fehr

(1)	FROG NUMBERS	4	5	6	7	8	9	10	11	12
PROPERTIES OF STRAIGHT SWITCHES										
(2)	Switch Rail Length	3.804	3.820	3.902	5.783	6.025	6.077	6.424	7.979	8.087
(4)	Switch Heel Spread	0.252	0.252	0.252	0.252	0.252	0.252	0.252	0.252	0.252
(5)	Switch Heel Angle (deg.)	3.796	3.780	3.701	2.496	2.396	2.375	2.247	1.809	1.785
LEAD TO THEORETICAL POINT OF FROG										
(8)	Lead	9.354	10.583	11.812	15.448	16.917	17.979	19.583	22.849	24.042
CLOSURE DISTANCE										
(9)	Straight Rail Length	4.284	5.339	6.329	7.738	8.765	9.347	10.487	11.946	12.726
(10)	Curved Rail Length	4.383	5.419	6.396	7.795	8.814	9.392	10.527	11.982	12.760
(11)	Curved Rail Radius	24.022	40.635	62.900	78.699	106.160	135.057	173.412	202.145	244.728
GAGE LINE OFFSETS ON CURVED CLOSURE RAIL										
(12)	1st Point Y1	0.347	0.362	0.374	0.360	0.366	0.369	0.375	0.368	0.372
(13)	1st Point X1	4.875	5.155	5.484	7.717	8.217	8.413	9.046	10.965	11.269
(14)	Mid-Point Y2	0.491	0.517	0.537	0.516	0.526	0.527	0.537	0.529	0.533
(15)	Mid-Point X2	5.946	6.490	7.066	9.652	10.408	10.750	11.668	13.952	14.450
(16)	3rd Point Y3	0.684	0.717	0.740	0.720	0.732	0.726	0.740	0.734	0.736
(17)	3rd Point X3	7.017	7.825	8.649	11.586	12.599	13.087	14.289	16.938	17.632
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	2.475	2.841	3.206	3.823	4.189	5.056	5.297	5.966	6.489
(20)	Toe Length	1.266	1.424	1.581	1.927	2.126	2.556	2.672	2.924	3.228
(21)	Heel Length	1.209	1.417	1.625	1.896	2.063	2.500	2.625	3.042	3.261
(22)	Toe Spread	0.314	0.283	0.263	0.275	0.265	0.284	0.267	0.266	0.269
(23)	Heel Spread	0.300	0.282	0.270	0.270	0.257	0.277	0.262	0.276	0.271
(35)	Wing Rail Extension	0.740	0.839	0.938	1.037	1.136	1.235	1.333	1.432	1.531
(36)	Wing Rail Flare Length	0.375	0.375	0.375	0.375	0.500	0.500	0.667	0.667	0.750
(37)	Wing Rail Flare Width	0.050	0.050	0.050	0.050	0.047	0.047	0.045	0.045	0.045
(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	0.073	0.073	0.073	0.073	0.073	0.073	0.073	0.073	0.073
POINT OF FROG TO INTERSECTION OF CENTERLINES										
(24)	PF to ICL	5.000	6.250	7.500	8.750	10.000	11.250	12.500	13.750	15.000
DATA FOR CROSSOVERS: PF TO PF ON PARALLEL TRACKS										
For Track Centers of:		3.250	(13 prototype feet)							
(25)	Straight Track Dist.	2.797	3.588	4.365	5.134	5.898	6.660	7.419	8.176	8.932
(26)	Crossover Track Dist.	3.203	3.913	4.635	5.366	6.102	6.840	7.581	8.324	9.068
For Track Center Increment of:		0.250	(1 prototype foot)							
(28)	Straight Track Incr.	0.984	1.238	1.490	1.741	1.992	2.243	2.494	2.744	2.995
(29)	Crossover Track Incr.	1.016	1.263	1.510	1.759	2.008	2.257	2.506	2.756	3.005
GUARD RAILS										
(30)	Parallel End Setback	0.167	0.177	0.188	0.198	0.208	0.219	0.229	0.240	0.250
(31)	Bevel Length	0.271	0.271	0.271	0.271	0.271	0.271	0.271	0.271	0.271
(32)	Flare Length	0.604	0.688	0.688	0.688	0.750	0.750	0.854	0.854	0.854
(33)	Overall Length	2.063	2.750	2.750	2.750	3.250	3.250	4.125	4.125	4.125
(34)	Parallel Length	0.854	1.375	1.375	1.375	1.750	1.750	2.417	2.417	2.417
(37)	Flare Width	0.040	0.040	0.040	0.040	0.040	0.040	0.040	0.040	0.040
(38)	Plane Width	0.024	0.021	0.021	0.021	0.020	0.020	0.019	0.019	0.019
(39)	End Chamfer	0.063	0.063	0.063	0.063	0.063	0.063	0.063	0.063	0.063

O27 Scale

Straight Switch Turnout

TURNOUT DIMENSIONS

Revised: February 2015

RP-12.43

Design and calculations by Van S. Fehr

(1)	FROG NUMBERS	13	14	15	16	17	18	19	20
PROPERTIES OF STRAIGHT SWITCHES									
(2)	Switch Rail Length	8.249	8.425	11.065	11.128	11.248	11.378	11.575	11.782
(4)	Switch Heel Spread	0.252	0.252	0.252	0.252	0.252	0.252	0.252	0.252
(5)	Switch Heel Angle (deg.)	1.750	1.713	1.304	1.297	1.283	1.268	1.247	1.225
LEAD TO THEORETICAL POINT OF FROG									
(8)	Lead	25.331	26.620	31.437	32.667	33.859	35.052	36.417	37.781
CLOSURE DISTANCE									
(9)	Straight Rail Length	13.643	14.545	16.419	17.479	18.242	18.995	20.055	21.107
(10)	Curved Rail Length	13.674	14.574	16.445	17.504	18.265	19.017	20.077	21.127
(11)	Curved Rail Radius	295.012	351.191	374.795	439.293	501.608	569.297	650.571	738.374
GAGE LINE OFFSETS ON CURVED CLOSURE RAIL									
(12)	1st Point Y1	0.376	0.379	0.368	0.373	0.375	0.377	0.380	0.384
(13)	1st Point X1	11.660	12.061	15.169	15.497	15.808	16.127	16.589	17.059
(14)	Mid-Point Y2	0.539	0.545	0.529	0.537	0.539	0.541	0.547	0.553
(15)	Mid-Point X2	15.070	15.698	19.274	19.867	20.369	20.875	21.603	22.336
(16)	3rd Point Y3	0.742	0.748	0.735	0.745	0.745	0.746	0.753	0.760
(17)	3rd Point X3	18.481	19.334	23.379	24.237	24.929	25.624	26.617	27.612
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	7.012	7.535	7.850	8.373	8.896	9.419	9.739	10.059
(20)	Toe Length	3.439	3.650	3.954	4.060	4.370	4.679	4.786	4.892
(21)	Heel Length	3.573	3.886	3.896	4.313	4.526	4.740	4.953	5.167
(22)	Toe Spread	0.264	0.261	0.263	0.254	0.257	0.260	0.252	0.245
(23)	Heel Spread	0.275	0.277	0.260	0.269	0.266	0.263	0.261	0.258
(35)	Wing Rail Extension	1.698	1.865	1.964	2.167	2.266	2.365	2.531	2.698
(36)	Wing Rail Flare Length	0.977	1.106	1.155	1.294	1.339	1.384	1.515	1.646
(37)	Wing Rail Flare Width	0.044	0.043	0.043	0.043	0.043	0.043	0.042	0.042
(38)	Wing Rail Bend Width	0.044	0.043	0.043	0.043	0.043	0.043	0.042	0.042
(39)	Wing Rail End Chamfer	0.073	0.073	0.073	0.073	0.073	0.073	0.073	0.073
POINT OF FROG TO INTERSECTION OF CENTERLINES									
(24)	PF to ICL	16.250	17.500	18.750	20.000	21.250	22.500	23.750	25.000
DATA FOR CROSSOVERS: PF TO PF ON PARALLEL TRACKS									
For Track Centers of:		3.250	(13 prototype feet)						
(25)	Straight Track Dist.	9.688	10.442	11.196	11.949	12.702	13.455	14.207	14.959
(26)	Crossover Track Dist.	9.813	10.558	11.304	12.051	12.798	13.545	14.293	15.041
For Track Center Increment of:		0.250	(1 prototype foot)						
(28)	Straight Track Incr.	3.245	3.496	3.746	3.996	4.246	4.497	4.747	4.997
(29)	Crossover Track Incr.	3.255	3.504	3.754	4.004	4.254	4.503	4.753	5.003
GUARD RAILS									
(30)	Parallel End Setback	0.261	0.271	0.281	0.292	0.302	0.313	0.323	0.333
(31)	Bevel Length	0.271	0.271	0.271	0.271	0.271	0.271	0.271	0.271
(32)	Flare Length	0.854	0.958	0.958	0.958	0.958	1.063	1.063	1.063
(33)	Overall Length	4.125	4.875	4.875	4.875	4.875	5.750	5.750	5.750
(34)	Parallel Length	2.417	2.958	2.958	2.958	2.958	3.625	3.625	3.625
(37)	Total Flare at End	0.040	0.040	0.040	0.040	0.040	0.040	0.040	0.040
(38)	Bevel Cut at End	0.019	0.018	0.018	0.018	0.018	0.017	0.017	0.017
(39)	End Chamfer	0.063	0.063	0.063	0.063	0.063	0.063	0.063	0.063