

Trail Specifications Matrix
Duluth Traverse Trail System

Version: 1.8 (01/03/23)

Label	Working title	Difficulty Rating	Symbol ¹	Use	Directional	Feature Frequency ²	Constructed Tread Width ^{3, 4}	Ave Trail Grade per 1000'	Max Trail Grade: climbing ⁵	Max Trail Grade: descending ⁶	Min Turn Radius	Max Turnpad Grade ⁷	Max Berm/Turn Camber ⁸	Corridor Width (4' above tread)	Corridor Height Minimum	Boardwalk Width	Boardwalk Exposure (without railing)	Unavoidable Obstacles	Avoidable Obstacles (over 50% of tread or less)	Min Roller Spacing	Rollable Feature Height (jumps, berms, etc.)	Roughasity (surface texture) ⁹	Tread and trail features	Notes
Spec 1	Green Singletrack (Traditional bike optimized shared-use singletrack)	Easier	Green Circle	bike, foot	Two-Way	Low	48"	5%	20%	20%	10'	10%	15%	48"-72"	10-12'	48"	less then 36"	less then 2"	less then 6"	Varies	12"	low	Firm trail surface. May include rock armored section.	
Spec 2	Blue Singletrack (Traditional bike-optimized singletrack)	More Difficult	Blue Square	bike, foot	Two-Way	Medium	36"	7%	25%	50% (armored over 25%)	8'	15%	30%	36"-72"	8-12'	36"	less then 48"	less then 8"	less then 24"	Varies	24"	med	Modest rough tread is expected. May include steps and terraces.	May include features similar to those on easier "Bump and Pump" or "Jump" trails.
Spec 3	Black Singletrack (Traditional technical singletrack)	Most Difficult	Black Diamond	bike, foot	Preferred	High	18"	10%	50% (armored over 25%)	100% (armored over 25%)	6'	15%	50%	36"-48"	8-12'	24"	no limit	less then 18"	less then 48"	Varies	36"	high, some very high	Significant unavoidable obstacles are expected. May include steps, stairs, rock gardens, loose rock, and significantly exposed sections.	Seek out rocky ridges. Selective machine work to create very organic appearing rock strewn tread. Most rock and tread work is aimed at sustainability rather than ease of passage. Trials-like sections ok.
Spec 4	Green Flow Trail (Bump Pump) Singletrack	Easier	Green Circle	bike, foot	Preferred	High	48"	3-5%	20%	30% (armor as function of flow)	15'	10%	30%	48-72"	8-10'	48"	less then 36"	less then 2"	less then 6"	Varies	12"	low	Firm trail surface. Rollers and berms. May include rock surfaced sections.	The Lester River Trail in Lester Park, Enger Park Trail and the Upper Cathedral Trail in Mission Creek are examples of this spectrum
Spec 5	Blue Flow Trail (Bump Pump) Singletrack	More Difficult	Blue Square	bike, foot	Preferred	High	36"	7-10%	30%	100% (armor as function of flow)	10'	15%	50%	36"-72"	10'-12'	36"	less then 60"	less then 2"	less then 24"	Varies	24"	low	Firm trail surface. Rollers, roller doubles, berms predominate. May include significant armored sections.	Demonstration trail at Spirit Mtn is an example of the upper end of this spectrum.
Spec 6	Black Flow Trail (Bump Pump) Singletrack	Most Difficult	Black Diamond	bike	One-Way	High	36"	10-12%	n/a	150% (armor as function of flow)	7'	25%	150%	36"-72"	10'-12'	36"	less then 120"	less then 8"	less then 48"	Varies	36"	med	Firm trail surface. Rollers, roller doubles, berms predominate. May also include steps, stairs, rock gardens and exposed sections.	
Spec 7	Green Jump	Easier	Green Circle	bike	One-Way	Medium	60"	3-5%	n/a	30% (armor as function of flow)	20'	10%	150%	48-72"	10-12'	60"	less then 36"	less then 2"	less then 6"	Varies	18"	low	Smooth continuously cambered trail surface. Easily rollable jumps.	A green jump trail could fit within a stacked-loop system. Blue and Black are likely best done at a resort.
Spec 8	Blue Jump	More Difficult	Orange Pill, medium	bike	One-Way	Low	72"	7-10%	n/a	100% (armor as function of flow)	15'	15%	175%	48-72"	12'-15'	72"	less then 60"	less then 2"	less then 24"	Varies	30"	low	Smooth continuously cambered trail surface. May include significant armored sections. More complex jump configurations.	Complete berms, plan on extreme drainage solutions - sumps + culverts.
Spec 9	Black Jump	Most Difficult	Orange Pill, large	bike	One-Way	Low	72"	10-12%	n/a	150% (armor as function of flow)	15'	25%	200%	48-72"	12'-15'	72"	less then 120"	less then 8"	less then 48"	Varies	48"	med	Firm trail surface. May include rock surfaced sections. Some jumps may not be rollable.	Complete berms, plan on extreme drainage solutions - sumps + culverts.
Spec 10	Green Gravity	Easier	Orange Pill, small	bike	One-way	Medium	48"	7-10%	n/a	100% (armor as function of flow)	20'	15%	150%	48-72"	12'	60"	less then 36"	less then 18"	less then 24"	Varies	18"	high	Entry level downhill course. Will include rocks, steps, and terraces. Drops will be rollable.	For all DH types, potentially only at Spirit Mtn.
Spec 11	Blue Gravity	More Difficult	Orange Pill, medium	bike	One-way	Medium	36"	10-15%	n/a	100% (mandatory drops expected)	15'	25%	175%	36"-72"	12'	48"	less then 60"	less then 48"	n/a	Varies	30"	very high	Intermediate level downhill course. Mandatory drops. Will include significant steps, stairs, rock gardens and exposed sections.	
Spec 12	Black Gravity	Most Difficult	Orange Pill, large	bike	One-way	High	24"	15-20%	n/a	150% (mandatory drops expected)	15'	25%	200%	36"-72"	12'	48"	less then 120"	less then 72"	n/a	Varies	48"	very high	Advanced level downhill course. Significant mandatory drops. Will include extreme terrain that has a high penalty for failure.	
Spec 13	Gateway trail	Easiest	White Circle	bike, foot, horse	Two-Way	low	48"+	3-5%	10%	15%	12'	5%	10%	72"+	10-12'	60"	less then 30"	less than 2"	less than 6"	8'	n/a	low	Firm trail surface. May be capped with exposed stone flush with grade.	Very front-country, likely connected to a recreation park. Typically under a mile.
Spec 14	Accessible trail	Easiest	TBD	bike, foot, horse	Two-Way	none	36" clear tread width	5%	12%	12%	6'-10'	2%	2%	72"+	10-12'	60"	less then 30"	less than 2"	less than 2"	n/a	n/a	must be firm and stable	See "ABA Trails Standards" for specific details.	Passing spaces every 1000 lf at a width of 60" min. Surface to be firm and stable.
Spec 15	aMTB Green Square	Easier	aMTB Green Square	bike, foot, adaptive cycles	Two-Way	low	60" straight/66" turns	3-5%	10%	20%	20'	10%	36.50%	48-72"	10-12'	48"	less then 30"	less than 2"	less than 5"	8'	n/a	low, mostly stable some variability	See appendix "KOOTENAY ADAPTIVE SPORT ASSOCIATION ADAPTIVE TRAIL STANDARDS - 2020" for specific details	Ditching and culverts to be avoided. Eliminate off camber or one-sided obstacles exceeding 12% slope of provide full tread width ride-around.

Footnotes...

1. Orange Pill Symbol assumes trails inside controlled-access facilities, like a bike park or resort.

2. Feature Frequency is averaged over long distances. Per 100': "low" = 2-3 features, "med" = 3-5 features, "high" = 5-10 features.

3. Constructed tread width may narrow over short distances to 50% of spec. Examples include rock or tree gateways.

4. Tread width also applies to bridges and boardwalks. Check with local regulations for overriding guidelines on width or any other requirements (height restrictions, railings, etc.).

5 & 6. Max grades climbing and descending refer to extremely short segments, 10 feet or less.

7. Turnpad grade measures the rise/fall across the turning surface at the base of any inslope.

8. Max camber is measured at the top of the inslope. More advanced berms will go to "near vertical".

9. Roughasity attempts to capture average tread coarseness. Tread area with obstacles: "low" = less then 5%, "med" = less then 20%, "high" = over 20%, "very high" = over 50%.

General Notes!

Sustainable trails guidelines provide the foundation for all design + construction decisions ("half rule", frequent grade reversals, max grades function of soils + use, etc.).

All trails should have a minimum grade and camber (in/outslope) of 3% to ensure a well-drained tread. (except for Accessible Trail)