IMBA Trail building School, Feb 27, 2016

THE FIVE ESSENTIAL ELEMENTS OF TRAILS (Five parts to Trail Essentials)

* Essential elements of sustainable trails
* Designing successful trails
* Building Dream Trails
* Minimum impact to Eco System
* Economical

 Political (Land management/agencies)

Trail building

Physical social advocacy (social media)

IMBA Trail Crews have 1000 Trail Building projects on all types of land.

* Plan trail with the forces: Wind, rain, Water goes downhill always, volume of water will move trails
* Fall Line: steepest route, path of least resistance. Water follows Fall line.
* Make Contour Trails: Erosion resistant, low maintenance, sustainable, provides water exit off the trail and keeps users on trail.
* Sustainable = purpose, not sanitized, design for purpose and use. One Example: Sandy Ridge bike trail in Oregon. Bike only trail, separate from hikers due to user conflicts. 6000 acres.
* Parts to the Trail:
* Grade = rise/run; tools: Clino percentage on the right side gives precise grades
	+ Run = 100 feet
	+ With the Clino, establish zero out with a partner on level ground
	+ Align horizontal line with partner at 0 level, and read the % grade
	+ Use Dominant eye with both eyes open
	+ Keeping out slope to 5 % grade for flow of water helps avoid erosion; a tool to measure out slope is McCloud, the top of the tool to the bottom to measure 5%.

 Trail

* + Can download free Clino phone apps; Clino costs $150.00
* Essential Elements
	+ Half rolls
	+ User based erosion: If steeper than 15%, dig down the trail
	+ Average grade, guideline – keep avg grade less than 8%
	+ Contour trails grade – to be less than half of the grade of side slope; example side slope is 22% / 2 = 11% grade to build.
	+ Grade reversals: creates water sheds along trails by building small uphill to slow force of water, also used to slow bikes before turns;
* Macro-Level Planning for Successful Trail
	+ Identify Land Manager and management objectives
	+ Natural resource preservation
	+ Resource extraction
	+ Game Hunting
	+ Recreation
	+ Identify user/stakeholders
	+ Identify Opportunities
	+ Land Boundaries
* Control Point: decide where the trail to go; do not let vegetation decide the trail.
* Positive Control Points: identify first scenic overlook, water (lakes, rivers, ponds), historic sites, natural features for view;
* Negative Control Points: where not to go, Fall line, off limits/sensitive areas, low laying areas, environmental areas;
* Private property: need permissions, surrounding developments are the stakeholders, involve them.
* Determine the type of trail flow: constraints of landscape help erosion and user conflict.
* Open and Flowing: long sweeping corners, good sightlines, relatively higher speeds
* Tight and Flowing: twist, tight turns, balance, relative slow speeds
* Poor Flow: abrupt transitions
* Use the following:
	+ Corral Rocks: manage trail and user flow
	+ Chokes: before trail intersections and trail heads
	+ Grade reversals: manage speed and intersections:
	+ Loops: core loop in center, outside of core is middle loop, outside of middle loop is outer loop
	+ Loop designs: clover leaf, Inverted clover leaf, Hubs and clusters
	+ For users, create separate but equal trails with the for mention designs
* Design into the field
	+ Rough corridor flagging (always work with land manager)
	+ Pin Flag the bottom or low side of the trail the perfect flow
	+ Test the flow!
	+ Avoid Ridge Tops because they are the fall lines
* Construction
	+ Bench cut existing soil: cutting into the slop, dig the tread
	+ Turns: climbing turns, elevated turns
	+ Armoring because turns are too tight?
* Key Principles:
	+ Keep steep out of turn
	+ Radius appropriate for the speed
	+ Elevate and inslope when appropriate
	+ Grade reversals keep water out of turn, control speed while entering turns
	+ Side Slope controls turns
	+ Turns may require retaining wall, 1 ft per 10 % grade of turn
* Armor: Fortify wet areas, low flow creeks, stop user erosion; Harden soft tread, stop user erosion
	+ example Captain Ahad trail in Moab, Utah
* Water Crossing:
	+ Consult land manager
	+ Cross high point of drainage
	+ Use rocks in the natural area, already settled
	+ Install grade reversals prior to crossing
	+ Permitting may be required
* Clear Corridor Terminalogy

 Trail Ceiling

 Trail tread

 | Trail corridor |

* Remove Organic Soil
	+ Dig to mineral soil
	+ Broadcast debris (spread debris well below trail)
* Cut into Backslope
	+ Partical Bench Tread NOT recommended, but if needed requires a retaining wall
* Filters and Signage
	+ Use Filter to prepare users for TTFS
	+ Clear signage takes liability from land manager
	+ IMBA adopted standard Ski Ratings at Trailhead and intersections
	+ Provide optional lines on trails
* Push trails as amenities to developers and land managers.
* Provide full maintenance teams
* Trail Waypoints and on trail signage
* One way direction on gravity oriented trails
* Trail Maintenance Techniques:
	+ Maintain Corridor
	+ Maintain sightlines
	+ Improve user experience
	+ Drainage: maintain 5% grade; water bars good intention, bad results
	+ Knicks – Knick outslope 15%, using lower ground of trail
	+ Rolling Grade dip should be 10 – 20 ft long for every 50-80 feet
* Purposeful Maintenance
	+ Visable Signs for maintenance: skidding marks & brake bumps, caused by poor sightlines, fallen trees, bad flow, tight turns.
* Purposeful Re-Route and closure
	+ Re-Route for better flow, for contour trail, get off fall line, route new trail, plant vegetation on old trail to help hide old trail, if it cannot be seen, it will not be used.
* RECAP
	+ Planning: take time up front, meet with land manager and stakeholders, users.
	+ Construction: Environment, user experience, variety
	+ Maintenance: What is happening on the trail, maintenance or re-route, armoring problem areas.

How to approach Land managers in Trail solutions books: IMBA.com coupon code: Buildschool