Old Garisson Road / State Route 49

49
Recreation
Complex

Mattie Wells Drive

Mattie Wells
Elementary School

Erosion
Area

Gym

Existing
Basketball
Court

Outdoor
Classroom

Wetland

Hampton Lakes Drive

Pedestrian
Bridge, Typ.

Active
Construction

Hampton
Lakes

- Existing Trail (1.84 mi)
- Existing Road
- Existing Fence
- Existing Berm/Rock Mound
- Concrete Flume
- Property Line
- Stream
- Existing Building
- Rock Pile
- Culvert

0' 50' 100' 200'

SCALE: 1":100'

March 2022

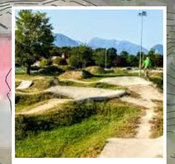
JONES COUNTY POND

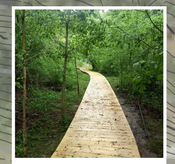
JONES COUNTY MOUNTAIN BIKE TRACK AND FACILITY DESIGN
EXISTING CONDITIONS MAP


Dirt Berm


Wood Berm

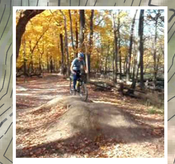

Pedestrian Bridge


Pump Track


Boardway


Rock Garden


Wall Ride


Rollers

Proposed Parking
(Total = 120 Spaces)

Old Garisson Road / State Route 49

FUTURE

Proposed Sidewalk

Future Connector Trail

FUTURE

Berm, Typ. Erosion Area

FUTURE

FUTURE

FUTURE

FUTURE

Proposed Picnic Shelter, Typ.

Proposed Concession Stand

Proposed Playground

Existing Basketball Court

Future Pump Track

Staging Area

Wall Ride

Proposed Basketball Courts (2)

49 Recreation Complex

Mattie Wells Drive

Mattie Wells Elementary School

Pedestrian Bridge, Typ.

Wetland

Outdoor Classroom

Hampton Lakes Drive

Puncheon

Rock Garden, Typ.

Reverse Direction Pump Bypass

Pump Segment / Rollers

Berm, Typ.

FUTURE

FUTURE

Pedestrian Bridge, Typ.

Hampton Lakes

Race Loop (1.70 mi)
Gravel Trail
Paved Trail
Connector Trail
Existing Fence
Existing Road
Proposed Road / Parking
Property Line
Stream
Existing Building
Start / Finish Line
Neighborhood Connection
Culvert

0' 50' 100' 200'

SCALE: 1":100'

March 2022

JONES COUNTY MOUNTAIN BIKE TRACK AND FACILITY DESIGN
RACE LOOP MAP

JONES COUNTY POND

Proposed Parking
(Total = 120 Spaces)

Old Garisson Road / State Route 49

FUTURE

Proposed
Sidewalk

FUTURE

FUTURE

FUTURE

FUTURE

FUTURE

Proposed
Picnic
Shelter, Typ.

Proposed
Concession
Stand

Proposed
Basketball
Courts (2)

Proposed
Playground

Existing
Basketball
Court

Future
Connector
Trail

49
Recreation
Complex

Mattie Wells Drive

Mattie Wells
Elementary School

Pedestrian
Bridge, Typ.

Wetland

Outdoor
Classroom

Puncheon

Hampton Lakes Drive

FUTURE

Pedestrian
Bridge, Typ.

FUTURE

Hampton
Lakes

Walking Loop 1 (1.03 mi)
Walking Loop 2 (0.55 mi)
Walking Loop 3 (0.54 mi)
Paved Trail
Connector Trail
Existing Fence
Existing Road
Proposed Road / Parking
Property Line
Stream
Existing Building
Start / Finish Line
Neighborhood Connection
Culvert

0′ 50′ 100′ 200′
SCALE: 1″:100′

March 2022

JONES COUNTY POND

JONES COUNTY MOUNTAIN BIKE TRACK AND FACILITY DESIGN
WALKING LOOP MAP

Existing Conditions

The site consists of a series of 1.84 miles of interconnected trails that traverse the northern half of the site. The slope varies across the paths and the skill level required for each trail varies accordingly. The current conditions of the trails are not such that they are ridable, and at times not ideal for walking/hiking/trail running. Proper clearing and compaction are necessary for proper footing and grip, and streams and wet areas need structurally sound bridges and boardwalks/puncheon to be installed, where substandard versions, or none currently exist. Additionally, there is an existing outdoor classroom that is adjacent to a wetland area. Several areas for potential pedestrian connections to local neighborhoods and the sports complex were identified during the site visit.

Walking Loops (2.12 mi Total)

The tread of the paths will be comprised of compacted earth except for areas noted on the plan as being paved. The paved trail sections will be found on the neighborhood connector trails and along the frontage of Mattie Wells Elementary School. Additionally, there are several unpaved connector trails shown on the map that provide linkages between the walking loops. All walking loops are reversible and blazing will be provided in each direction to guide the user along the path.

Walking Loop 1 (1.03 mi)

Heading northeast from the start/finish line, the path traverses alongside the recreation facilities and then transitions southeast down the slope alongside Hampton Lakes Drive. At the northeastern property corner adjacent to Hampton Lakes Drive, a paved neighborhood connector trail provides access to the walking path. The walking loop follows the eastern boundary of the parcel weaving through a woodland environment and crosses over two, small, perennial streams on wooden pedestrian bridges. After the second stream, a paved neighborhood connector trail from the Hampton Lakes neighborhood intersects the path. The path then turns west and follows the base of the slope alongside the elementary school. Subsequently, the walking loop meanders in an easterly direction before straightening and finishing at the start/finish line.

Walking Loop 2 (0.55 mi)

This path circles the central interior of the site. Heading east and downhill just south of the start/finish line, the path diverges from Walking Loop 1. Subsequently, the walking loop swings north moving along the slope, and then arcs to the southwest and meanders through the forest crossing a small, perennial stream on a wooden pedestrian bridge. Afterwards, the path travels northeast paralleling the elementary school and then heads north up the slope before reconnecting with Walking Loop 1. To finish the route, the path travels northeast in a straight line to just south of the start/finish line.

Walking Loop 3 (0.54 mi)

This path captures the interior of the site. The path branches off Walking Loops 1 and 2 just south of the start/finish line and then winds downhill before splitting into two paths. The lower elevation path travels in a southerly direction and eventually crosses a small stream via a wooden pedestrian bridge. The path briefly merges with Walking Loop 2 before reconnecting with the upper elevation path segment. The upper elevation path travels southwest passing the outdoor classroom and crossing the wetland via a wooden boardwalk. Afterwards, the path travels uphill in a northern direction and reconnects with Walking Loops 1 and 2.

Racing Loop (1.70 mi)

The track is intended to serve multiple functions. The track would serve the local community by providing a walking and biking destination. Additionally, the site would function as a training and competition course. In this master plan, the site has been maximized to provide the longest viable loop for a racecourse.

As a racing loop, the track shall be ridden in both directions. For example, best practices dictate clockwise directional riding on Saturday, Monday, Wednesday, and counterclockwise on Sunday, Tuesday, Thursday, and Friday. Races can be ridden in either direction as decided by the organizer. Additionally, the tread of the path would be constructed of compacted earth, and blazing would be provided in each direction to guide the user along the path. On either side of the start/finish line, a portion of the path would be constructed of gravel as shown on the map.

Heading northeast from the start/finish line, the path traverses alongside the recreation facilities and then transitions southeast down the slope alongside Hampton Lakes Drive. Along this section of the course berms shall be installed to provide flow and technical aspects of the downhill run. Afterwards, the racing loop follows the eastern boundary of the parcel. This section of the racecourse will include a pump track segment with rollers and jumps. Then the path crosses over two, small, perennial streams on wooden pedestrian bridges and then shifts to the northwest and loops back along the base of the slope adjacent to the elementary school. The path swings around the school and heads northeast towards the parking area for a short distance. Shortly thereafter, the path quickly meanders in an easterly direction and crosses over features such as two berms and wall ride, which are followed by a short uphill segment and a longer downhill segment. The path then travels northeast across a wooden pedestrian bridge. Shifting north, the racing loop crosses the first rock garden and then swings south to cross a second rock garden and followed by a wooden boardwalk over the wetland area. After the boardwalk, the path turns to the north and heads uphill and then shifts northeast on a straightway to cross the start/finish line.

Phasing

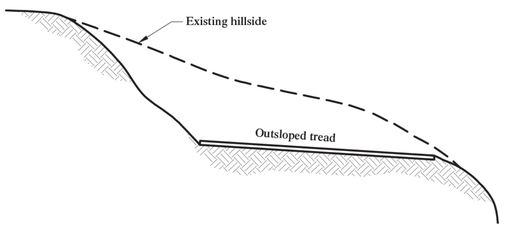
The entire project can be completed in one initiative with the exception of the asphalt pump track, the road frontage trail, and the connector trail that would provide access to the sports complex. These features will be installed in a later phase.

10 Percent Guideline

When plotting the trail on a map, connect the control points, following contour lines. Keep the grade of each uphill and downhill section less than 10 percent. Plotting your trail with 10-percent grades on a topographic map will help keep the route at a sustainable grade. When you get into the field to start scouting the route, you'll have better flexibility to tweak the grades.

Full-Bench Construction

Trail professionals almost always prefer full-bench construction. A full bench is constructed by cutting the full width of the tread into the hillside and casting the excavated soil as far from the trail as possible. Full-bench construction requires more excavation and leaves a larger backslope than partial-bench construction, but the trailbed will be more durable and require less maintenance. You should use full-bench construction whenever possible.



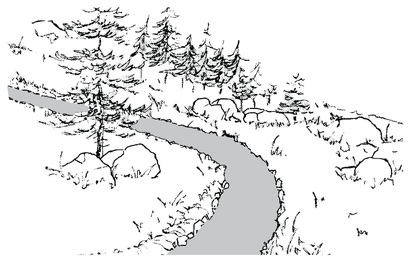
A full-bench trail is constructed by cutting the full width of the tread into the hillside. The tread needs to be outsloped at least 5 percent.

Climbing Turns

Climbing turns are the trail element most often constructed inappropriately. The usual problem is that a climbing turn is built (or attempted) on steep terrain where a switchback is needed. A climbing turn is built on a slope surface, and where it turns, it climbs at the same rate as the slope itself. Climbing turns work best when built on slopes of 15 percent or less. The advantages of climbing turns in appropriate terrain is that wider radius turn of 13 to 20 feet is relatively easy to construct. Trails that serve off-highway-vehicle traffic often use insloped or banked turns so that riders can keep up enough speed for control. Climbing turns are also easier than switchbacks for packstock and bikes to negotiate. Climbing turns are usually less expensive than switchbacks because much less excavation is required and fill is not used.

The tread at each end of the turn should be full-bench construction, matching that of the approaches. As the turn reaches the fall line, less material will be excavated. In the turn, the tread should not require excavation other than that needed to reach mineral soil.

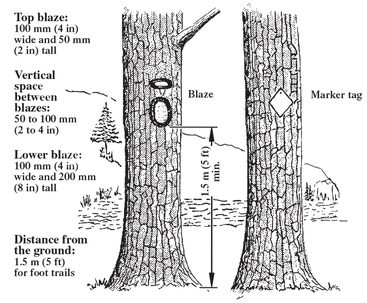
To prevent shortcutting, wrap the turn around natural obstacles or place guide structures along the inside edge of the turn. The psychologically perfect place to build climbing turns is through dense brush or dog-hair thickets of trees. Always design grade reversals into both of the approaches to keep water off the turn.



Climbing turns continue to climb through the turn. They can be insloped or outsloped. Add grade reversals at both approaches to keep water off the turn.

Blaze and Marker Tags

Each marker location should be flagged before installation and check for visibility in the desired direction of travel. Each location should be marked in both directions (on both sides of the same tree) so there is no question whether or not the marker is official. The marking decisions should be based on traffic traveling in both directions. Be conservative with markers. It's better to improve tread visibility than to rely on markers, except on high-challenge trails where tread frequently may not be visible at all.



Blaze trees on both sides. Cut the blaze no deeper than needed for clear visibility.

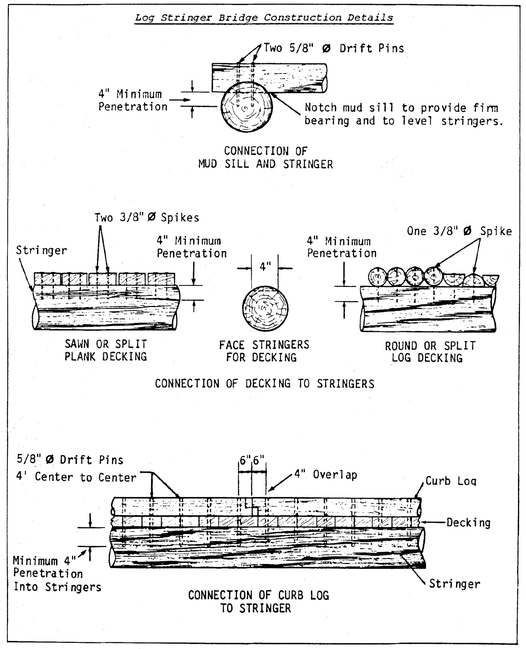
Bridges

Trail bridges range from a simple foot bridge with a handrail to multiple span, suspended, and truss structures. In the Forest Service, handrails are required on all bridges unless an analysis (design warrant) shows that the risk of falling off the bridge is minimal or the trail itself presents a higher risk. All bridges require a curb.

On hiking trails, log footbridges can be used to cross streams or to provide access during periods of high runoff. Log footbridges consist of a log, sills, and bulkheads. The log needs drainage and airspace to keep it from rotting. The foot log should be level and well anchored. Notch the sill, not the log, when leveling the foot log. The foot log should be no less than 18 inches in diameter. The top surface should be hewed to provide a walking surface that is at least 10 inches wide. Don't let the log or rails sit on the bare ground. Remove all bark from logs and poles.
If the foot log is associated with a shallow stream ford, be sure to position the log upstream or well downstream of the ford. Logs immediately below the crossing can trap travelers who lose their footing in the ford.

USDA - Forest Service

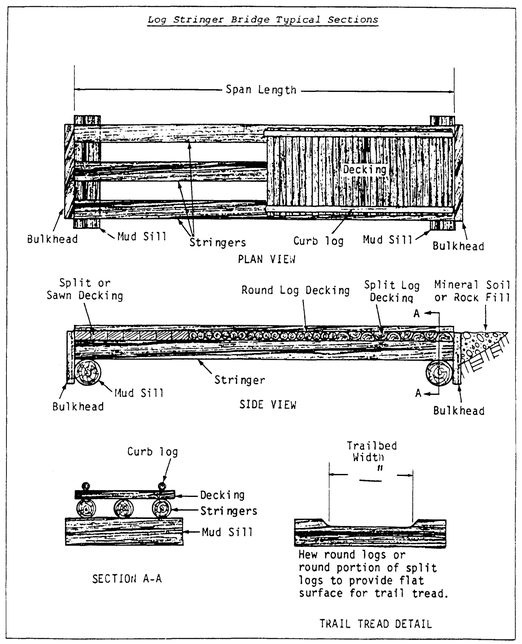
Log Stringer Bridge Construction Details



FS-7700-85 (6/84)

USDA - Forest Service

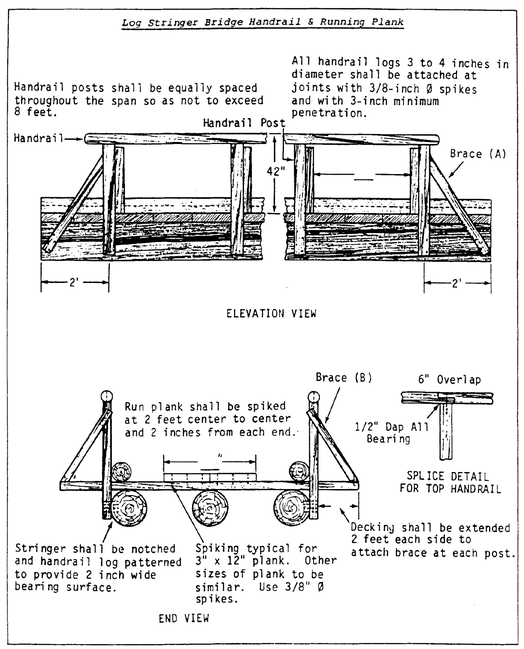
Log Stringer Bridge Typical Sections



FS-7700-84 (6/84)

USDA - Forest Service

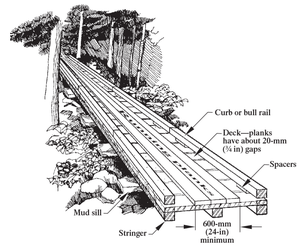
Log Stringer Bridge Handrail & Running Plank



FS-7700-86 (6/84)

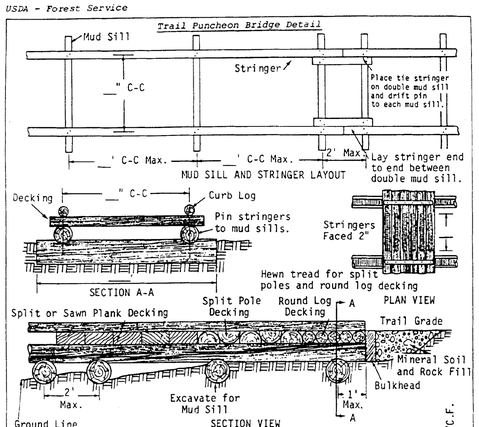
Puncheon

When the ground is so wet the trail cannot be graded and there's no way to drain the trail, use puncheon. Puncheon is a wooden walkway used to cross bogs or wet areas, to bridge boulder fields, or to cross small streams. It can be used where uneven terrain or lack of tread material makes turnpike construction impractical. Puncheon is also preferred over turnpikes where firm, mineral soil cannot be easily reached. Puncheon can be supported on muddy surfaces better than a turnpike, which requires effective drainage. Puncheon resembles a short version of the familiar log stringer trail bridge. It consists of a deck or flooring made of sawed, treated timber or native logs placed on stringers to elevate the trail across wet areas that are note easy to drain. Puncheon that is slightly elevated is termed standard puncheon.



USDA - Forest Service

Trail Puncheon Bridge Detail



Function of Log	Species	Diameter	Length
Mud Sill			
Log Stringer			
Curb Log			
Bulkhead			

Type of Decking	Species	Size	Length
Rough Mill Sawn, Treated			
Rough Mill Sawn			
Split Plank or Field Sawn			
Round Log			
Split Pole			

Preservation Type ——— Lb./C.F.
Min. Net Retention ———

FS-7700-88 (6/84)

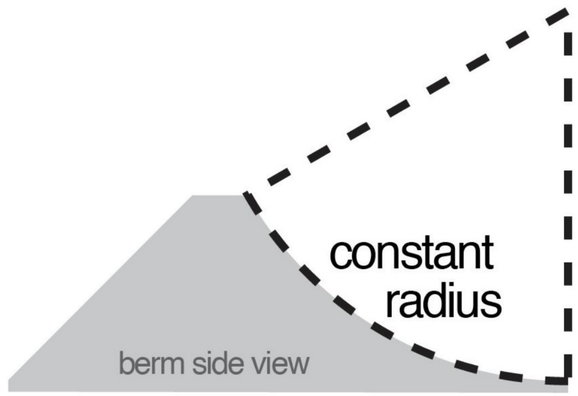
Rock Garden / Rock Skinny

A central line should be created with large rocks, creating a travel surface that is generally flat, but irregular by the nature of the rocks. Excavation of the trail surface shall be made to place and stabilize the rocks in the ground for stability. Width of the single-track line can be narrower or wider based on the shape, size, and orientation of the central line rocks. A narrow center line is by nature more technical and for advanced riders.

To finish the rock garden, smaller rocks shall be placed and embedded along the sides of the central line. The rock garden is typically elevated a few inches to a foot above the existing grade depending on the size of the rocks used. The smaller rocks lining the sides of the rock garden should feather the elevation back in closer to the existing surrounding grade; utilize soil packed in and around the rocks to blend the edges with the surrounding grade. The beginning and end of the central line should ramp up and down for 'easy' transition.

Mountain Bike Berm

Define the line of the trail, and place the berm adjacent; the toe of the berm should be at the outer edge of the trail (not the centerline and not a foot, or feet away from the edge of travel). The height of the berm will depend on the speed of the bike entering the berm, it will be a trial and adjust exercise to ensure the right height. Experienced Trail builders will have a good sense of a point of beginning for the berm height. The travel surface of the berm should have a constant radius from toe to top. Utilize existing soil (in situ) as much as possible to form the backbone of the berm. Existing soil is naturally compact and firm. Utilize an existing bank or dig down below existing grade and pile the excavated soil above. Be sure to remove any organic layer of grass, weeds, stumps, roots, and fallen leaves before piling dirt to form the berm and keep the soil free of organics as it piles up. The piled soil will need to be compacted through either brute force of feet stomping/walking/jumping and hand tools or by mechanical means of small walk behind compactors. Built-up berms need to be compacted on all sides. Begin by compacting the top and continue in 4" to 8" lifts to get the highest level of compaction you can achieve, then compact the riding surface (front) and the 'back' of the berm to ensure it is solid and stable for riding. Berms will require some time to naturally cure and harden. Drainage is of utmost importance; berms must be able to shed and drain water or they will become muddy and fall apart.



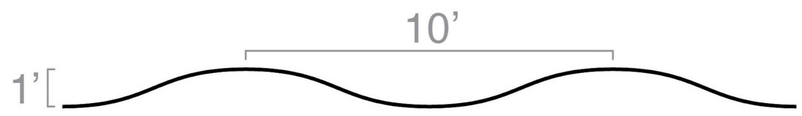
Wood Berms and Wall Ride

Wood berms can be constructed in place of earthen berms for many reasons – lack of soil, lack of terrain, or simply for the experience. Wood berms employ standard wood framing practices similar to building a deck or framing a building. The riding surface is most commonly pressure treated 2x (two-by) lumber, spaced +/- an inch apart. Height of the berm and angle of the berm depend on the radius of the berm and the anticipated speed of riders on the berm. Berms can have compound angles and even flat tracks at the bottom so various levels of riders can build experience and confidence. An experienced trail builder and/or a structural engineer should be engaged in the planning and design of the wood berm.

Flat wall rides are similar to wood berms, except that they are typically large flat trapezoids placed along a curve/change in direction on a trail. They may also be slightly curved. Walls are also built on a frame and with 2x-decking which is typically closer together, with one-quarter to one-half inch gaps between planks. The angle of the wall can be steep to moderate depending on the level of technical skill required for the course. Walls can be purchased through various fabricators, designed meet track specific needs, or an experienced trail builder and/or engineer can be engaged to design the wall.

Pump Track Rollers and Jumpers

A pump track section in your mountain bike course will consist of berms, rollers, and jumps. Building the rollers and jumps is much the same as the previously described earthen berm construction method. Rollers should have a ratio 1:1 meaning 10 feet of length per foot of height. For example, a 1-foot high roller would have a 5-foot-long trough and a 5-foot-long crest – create smooth sine waves for the perfect rollers. As rollers increase in height the length equally increases.



For a pump track to work well, there should be no flat spots at all. The bike should always be moving up and down like riding a wave. When pumping, hitting a flat spot steals momentum and kills the flow. So, pay attention to the space between the rollers – where the soil has been piled to create the hump – in between each hump there needs to be a dip, not a flat spot – again think perfect sine wave.

Jumps can be created by creating roller doubles. A taller roller could be ‘doubled’ to create a smaller intermediate roller that can be ridden or with enough speed jumped. For example, where a 2-foot roller may stand on its one, a second 2-foot roller can be placed 7.5 feet away and the valley between is just 9”, making for a double roller or a jump for more advanced riders.

Applicable Regulations

State buffered waters and wetlands were observed on-site. The features were field estimated and not surveyed as part of a delineation. Therefore, state and federal regulations shall be followed to protect these resources during construction.

1. Clean Water Act - Section 404 - Nationwide Permit 42 - The puncheon crossing the wetland shall require a Pre-Construction Notification (PCN) under Nationwide Permit (NWP) 42.

2. Georgia Environmental Protection Division (EPD) - A stream buffer variance shall be required, and the project is eligible to be exempt as a bicycle facility.

3. National Pollutant Discharge Elimination (NPDES) System

Note

Construction of the trail system and associated features should be facilitated by an experienced trail builder that also provides on-site services to mark the layout of the trail and features.

References

The information presented on trail construction was drawn from the following sources:

1. United States Department of Agriculture. Trail Construction and Maintenance Notebook. 6E62A33. USDA Forest Service. 2007. https://www.fs.fed.us/t-d/pubs/htmlpubs/htm07232806/toc.htm

2. United States Department of Agriculture. Trails Management Handbook: Trails Preconstruction and Construction. 2309.18-91-2. USDA Forest Service. 1991. https://www.fs.fed.us/cgi-bin/Directives/get_dirs/fsh?2309.18

Additionally, there are several other sources and authorities useful to the trail construction process that are listed below:

1. McCormack, Lee. Welcome to Pump Track Nation v2. Boulder, CO. 2019. https://www.leelikesbikes.com/ebook-welcome-to-pump-track-nation

2. IMBA - International Mountain Bicycling Association