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# **UCI TRIALS FACILITIES BUILDING GUIDE**

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## 1. INTRODUCTION

This guide has been designed for the use of National Federations, clubs, city councils and/or sports organisations that are committed to promote and disseminate sports practice.

Its aim is to assist and provide the essential information and guidelines to design and built permanent trials facilities.

The success of a facility will be determined by the stakeholders' (users, management and local government) satisfaction, which will only be met by approaching their expectations methodically and with attention to detail.

The present document contains the necessary design and built requirements that a facility needs. This guide also provides guidelines to adapt the facility to host trials competitions.

## 2. THE DISCIPLINE

Trials is a cycling discipline in which stability and bike control in extreme situations are the key factors. Speed also plays an important role.

Is a discipline that brings together almost all the cycling skills: Physical fitness, concentration, agility, balance, strength and coordination. All in all, total control of the bike is acquired. Although all cycling's disciplines involve bike-handling skills, these skills constitute the essence of trials. Therefore, trials can certainly offer extremely useful crossover benefits.

The aim of this sport is to get over obstacles without touching the ground with any part of the body or bicycle except the tyres.

In a competition the obstacles are marked to indicate the different grades of difficulty. Obstacles are organised in sections, which the riders must finish within a time limit.

## 3. PLAN OF PROPOSED USES

Before building the trials sports facilities, it is essential to draw up a plan of proposed uses. It must consider two parameters that will help define how the facility must be designed.

- Target users
- Purpose

The following table shows how these two parameters interact and will help design the correct facility:

TARGET USERS	PURPOSE
General public	Promoting leisure activities
Club members	Training
Amateur riders	Promoting social gatherings / local meetings
Professional riders	Promoting competitions

In the most of cases the facilities will not be built by unique target users or by a unique purpose.

## 4. DEFINITION

**Trials facility:** Outdoor or indoor area that encloses different obstacles grouped together. Each grouping is called a section.

**Section:** Set of obstacles placed close together in a determined position with different grade of difficulty. In a competition the section is properly signposted according to the grade of difficulty.

**Obstacle:** Natural or artificial element of a particular geometry and grade of difficulty.

**Difficulty grade:** It is the relative level of difficulty of an obstacle or a set of obstacles within a section. In a competition the different difficulty levels are distinguished by colours. From the lowest to the highest difficulty grade, the following colours are used: white, blue, pink, green, black, pink, red and yellow.

According article 7.1.002 of the UCI Trials regulations, in competition, the most common way to combine the grades of difficulty of the sections is as shown below:

GRADE	LOWER LEVELS	MEDIUM LEVELS	HIGHER LEVELS
CATEGORIE AGE COLOUR ID	Youth Girls (9-11 yo) - White Poussins (9-10 yo) - White Benjamins (11-12 yo) - Blue	Girls (12-15 yo) - Pink Minimes (13-14 yo) - Green Cadets (15-16 yo) - Black	Cadets (15-16 yo) - Black Women (14 yo and over) - Pink Juniors (16-18 yo) - Red Men (19 yo and over) - Yellow

## 5. GENERAL TECHNICAL FEATURES

A trials facility can easily be adapted to the space available and to the purpose stated in the plan of proposed uses. As an example, a facility may offer low, medium or high level of difficulty in only 100 m<sup>2</sup>.



Example of section using stone blocks on a slope and finished with grass - Grade of difficulty: medium and high.

### 5.1. DIMENSIONS

It is recommended to have an area of minimum 300 m<sup>2</sup>. Following the plan of purposes, the number of sections, dimensions and the grade of difficulty of each section will be adapted to the total available surface. Even so, a future gradual expansion of the facility can be envisioned.

## 5.2. SET UP

The distribution and placement of obstacles in a section is not predetermined. A qualified technician should do the design and their advice should be followed.

Facilities with low and medium levels, sections must occupy a space between 50 and 100 m<sup>2</sup>. Facilities with medium and high levels, sections must occupy a space between 100 and 300 m<sup>2</sup>. The plots occupied by each section can be designed in square, rectangular ... shape.

With these dimensions, the design of the sections should consider the total area available and the grade of difficulty indicated in the plan of proposed uses. The sections need to be grouped depending on the grade of difficulty as showed on table on point 4.

Please note that a safety distance must surround each group of obstacles. The safety distance width will depend on the planned purpose, but a minimum width of 2.5 m is recommended. It is strongly recommended to avoid designing a facility without a proper distribution, disorganized sections, piled up elements and no safety distance.

## 5.3. PLANIMETRY AND MORPHOLOGY OF THE AREA

It is recommended to build the facility on a flat area, but with some unevenness, the area is equally functional. Uneven terrains, such as margins or taluses, are a good complement for the facility as they may be part of some sections. If the area does not contain unevenness or slopes, we can create them artificially. They must be correctly built to ensure good drainage when it rains.

## 5.4. SURFACE

Preferably natural, well compacted and consolidated, the surface should contain some type of aggregate, such as gravel or compacted sand that enables its use. It should be weatherproof, as it must be used in case of rain or high humidity. Uncompacted surfaces are totally advised against. Surfaces can be grass also, provided there is regular maintenance, or artificial surfaces like concrete or asphalt.

## 5.5. LAYOUT EXAMPLE

The following layout example (1) shows a lower level facility. It occupies an area of 500 m<sup>2</sup> and is divided into five plots square-shape of 50 m<sup>2</sup> each.

The elements used in the different sections are: concrete rings, wooden beams/railway sleepers, blocks and slabs of stones and custom-made concrete pieces.

All the elements are placed on an uneven grass surface, except for one section which is on concrete.



1. Example of general layout for lower levels



Example of a finished facility which offers all grade of difficulty – Vic (Barcelona)



## 6. DIFFICULTY GRADES FEATURES

Note that the following grades of difficulty and colours don't necessarily have to go linked with the age of the users.

### 6.1. LOWER LEVELS

#### 6.1.1. INITIATION

- Wide spaces that enable pedalling and with obstacles to dodge
- Slight slopes (ascending/descending)
- Balance obstacles (flat and inclined), wider than 0.25 m but lower than 0.30 m
- Upward slopes between 0.05 and 0.20 m high and downward slopes between 0.10 and 0.30 m high

#### 6.1.2. BEGINNERS 1 – WHITE

- Wide spaces that enable pedalling and with obstacles to dodge and get over
- Slightly steeper slopes (ascending/descending)
- Balance obstacles (flat and inclined) wider than 0.25 m and lower than 0.60 m
- Uneven surfaces of about 0,70 m<sup>2</sup>
- Upward slopes between 0.10 and 0.30 m high and maximum drop-off height 0.80 m

#### 6.1.3. BEGINNERS 2 – BLUE

- Smaller spaces for the riders to pedal, with obstacles to get over
- Slopes (ascending/descending) with an inclination of approximately 20°
- Balance obstacles (flat and inclined) less than 0.25 m wide and lower than 0.80 m
- Uneven surfaces of about 0,70 m<sup>2</sup>
- Upward slopes between 0.30 and 0.50 m high and maximum drop-off height 1.00 m

### 6.2. MEDIUM LEVELS

#### 6.2.1. MEDIUM 1 – GREEN AND PINK

- Distance between obstacles between 0.50 and 1.20 m
- Slopes (ascending/descending) with an inclination of approximately 45°
- Balance obstacles (flat and inclined) between 0.15 and 0,25 m wide and lower than 1.20 m high
- Uneven surfaces between 0.25 and 0,7 m<sup>2</sup>
- Upward slopes between 0.50 and 0.80 m high and maximum drop-off height 1.20 m

#### 6.2.2. MEDIUM 2 – BLACK

- Distance between obstacles between 0.50 and 1.50 m
- Slopes (ascending/descending) with an inclination of more than 45°
- Balance obstacles (flat and inclined) between 0.15 and 0,25 m wide and lower than 1.40 m high
- Uneven surfaces between 0.10 and 0.7 m<sup>2</sup>
- Upward slopes between 0.80 and 1.10m high and maximum drop-off height 1.40 m

### 6.3. HIGHER LEVELS

#### 6.3.1. HIGH 1 – RED AND PINK

- Distance between obstacles between 0.50 and 1.80 m
- Slopes (ascending/descending) with an inclination of 60° approximately
- Balance obstacles (flat and inclined) between 0.10 and 0,25 m wide and lower than 1.60 m high
- Uneven surfaces between 0.05 and 0,7 m<sup>2</sup>
- Upward slopes between 1.10 and 1.50m high and maximum drop-off height 1.60 m

### **6.3.2. HIGH 2 – YELLOW**

- Distance between obstacles between 0.50 and 2.00 m
- Slopes (ascending/descending) with an inclination of more than 60°
- Balance obstacles (flat and inclined) between 0.05 and 0.25 m wide and lower than 1.80 m high
- Uneven surfaces between 0.015 and 0.7 m<sup>2</sup>
- Upward slopes between 1.50 and 2.00 m high and maximum drop-off height 1.80 m

## **7. BUDGET**

The budget to build the facility depends on several aspects:

- The surface area, whether it is ready for the facility or whether it needs to be adapted
- The purpose of the facility. See point 3
- Other services. See point 11

## **8. BUILDING MATERIALS**

The materials used to build the obstacles must be strong, stable on their own and weatherproof, especially to rain or frost, when the facility is outside. All the obstacles must be properly attached to prevent any movement. In trials facilities it is common to employ materials that have other uses.

It should be noted that some elements are not suitable to build an obstacle in a trials facility. So, there are serious safety considerations that must be taken into account before accepting given or donated elements, even if they represent a budget reduction.

Recommended materials are listed below:

- Soil
- Slabs and blocks of stone
- Pieces of concrete
- Wooden elements

When designing the sections, it is important to use the materials with clear criteria. It is totally advised against to design a section with a combination of different materials. If you wish to combine two materials, it is better to use them in equal parts.

### **8.1. SOIL**

Soil is a moldable material and it can be very useful when building a facility. It must be clean, without roots or debris.

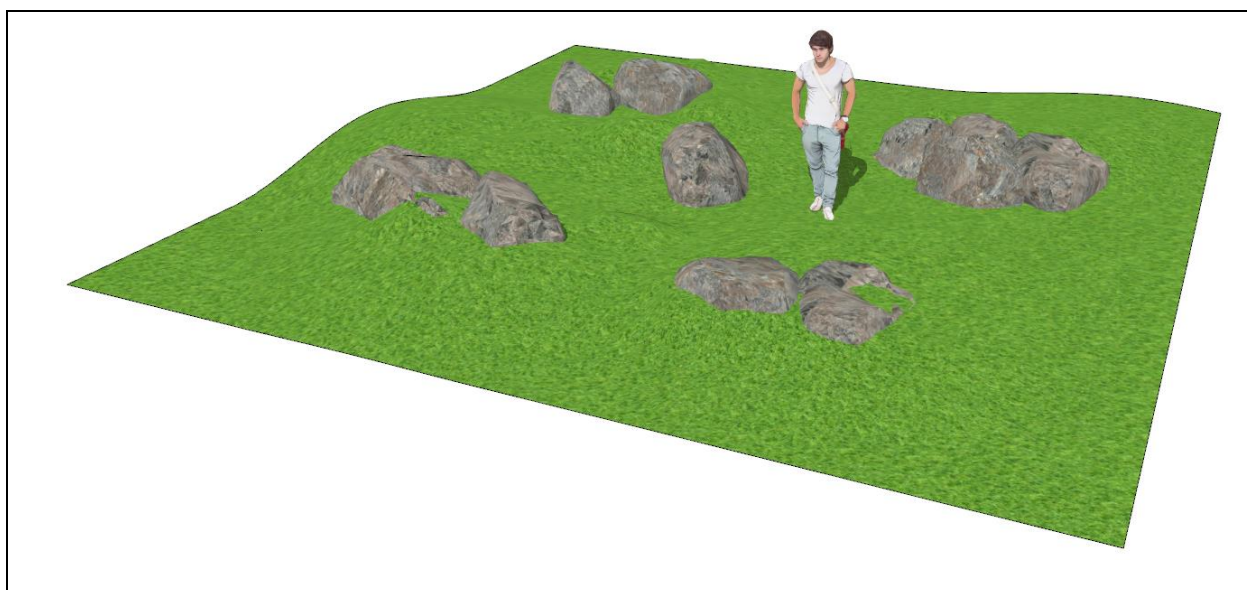
If the area is completely flat, added soil can be used to create different slopes and volumes where later other elements can be placed. Soil is also used to create ramps in front of obstacles in order to reduce their level of difficulty.



Section building using soil to form different slopes - Grade of difficulty: lower and medium.



Section building using slabs and blocks of stone and soil to form different slopes - Grade of difficulty: lower and medium.



Section layout using stone blocks on an uneven surface to obtain different slopes and finished with grass - Grade of difficulty: lower.



## 8.2. SLABS AND BLOCKS OF STONE

Due to its feature, stone is a widely used material for building trials facility. It is resistant, it does not deteriorate easily and it offers many possibilities when building the facility. The stone elements can be placed separately, grouped or stacked; it all depends on the grade of difficulty you want to offer.

Stones are irregular elements and difficult to classify, but the following criteria should be considered:

1. Less than 1 m<sup>3</sup> and 0.30 m high
2. Less than 1 m<sup>3</sup> and 0.50 m high
3. Bigger than 1 m<sup>3</sup> and higher than 1 m
4. Bigger than 1 m<sup>3</sup> and higher than 1.5 m

The following example shows the size of the stones compared to the size of the human body that may be used in a trials facility.



When using stone it is also necessary to take into account its origin, as different types of stones will have different textures with different grip. Mixing different types of stone in the same section should be avoided.



Section building on a soil base with different slopes using slabs and stone blocks.

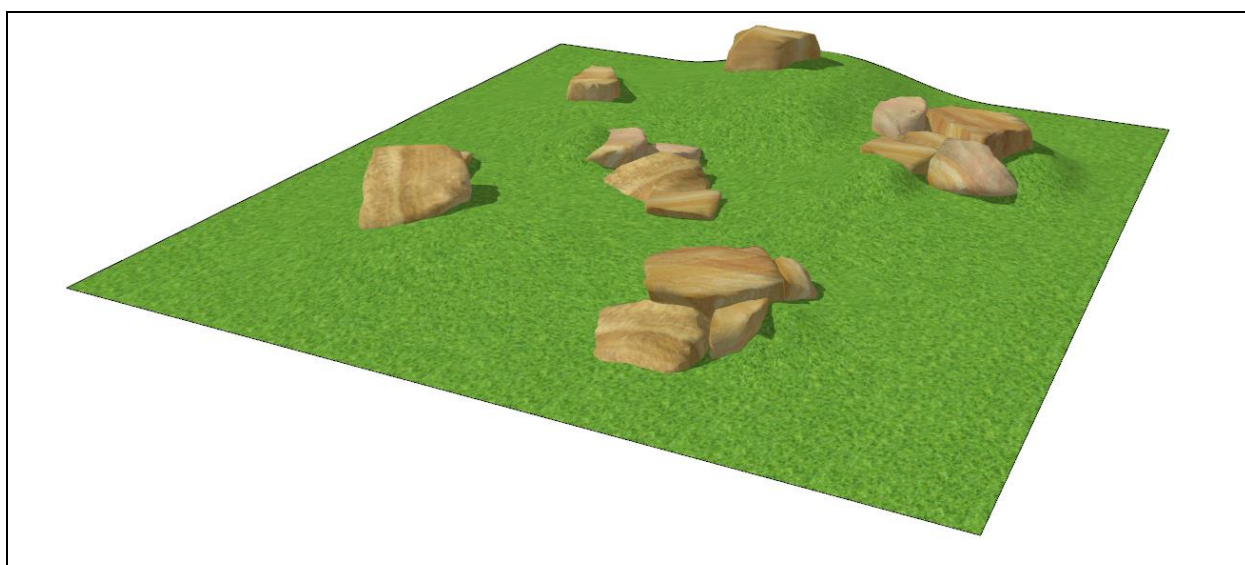


Section using slabs and stone blocks on a soil base and finished with grass - Grade of difficulty: medium and high.

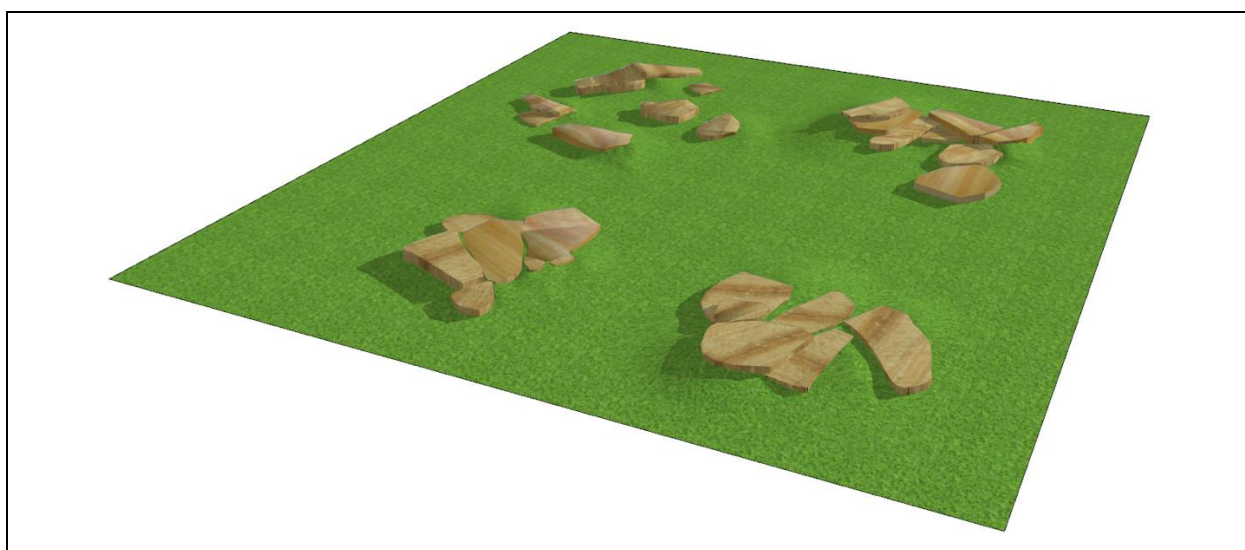




Section using grouped stone blocks taking advantage of soil slopes finished with grass - Grade of difficulty: medium and high.



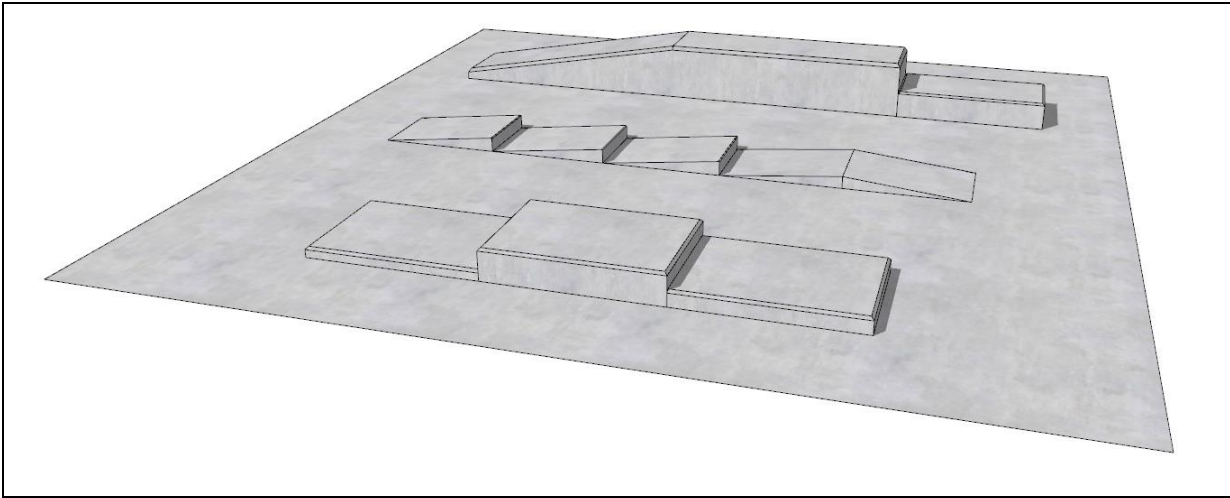
Section layout using stone blocks on an uneven soil surface to obtain different slopes and finished with grass - Grade of difficulty: lower.



Section layout using stone slabs on an uneven soil to obtain different slopes and finished with grass - Grade of difficulty: lower.

### 8.3. PIECES OF CONCRETE

Concrete is a widely used material in trials facilities. It is resistant, it does not deteriorate easily and the pieces afford stability. Concrete offers multiple possibilities when it comes to building the facility because it is very moldable as countless parts can be built using custom-made moulds.



Section layout made using custom-made concrete pieces moulds on a flat surface and finished with pavement - Grade of difficulty: lower and medium.



Custom-made concrete pieces before placing them



Section made using painted custom-made concrete pieces on a flat surface - Grade of difficulty: medium and high.





Section made using painted custom-made concrete pieces on a flat surface - Grade of difficulty: medium and high.

Due to their shapes and dimensions, precast concrete elements can be adapted to the needs of a facility as long as they are suitable to the facility's purpose. The most used elements are:

- Rings
- Pipes
- Drain boxes
- Sidewalks
- Honeycomb concrete pieces
- Crane counterweights
- Reinforced concrete beams
- ...

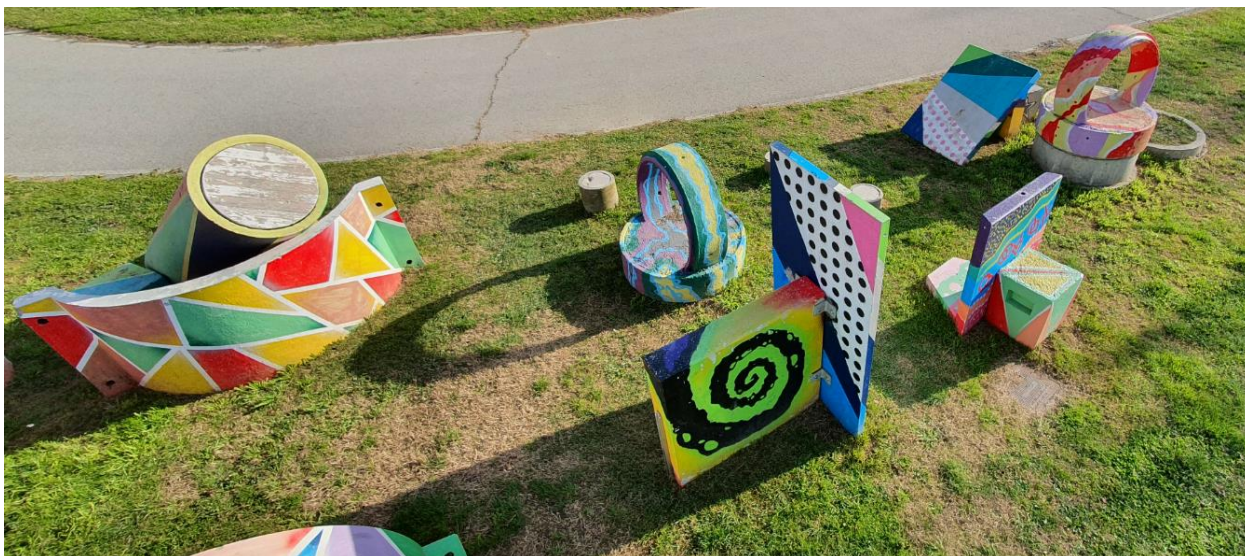
These elements require the following adjustments:

- Rings and pipes placed in an upright position must have a lid
- Pipes placed in a horizontal position must have the ends covered
- Drain boxes must have their openings covered
- All elements must be painted with a suitable exterior paint non-slip material should be placed on the riding areas.
- All concrete elements must be clean, metal elements that could cause any damage cannot protrude.

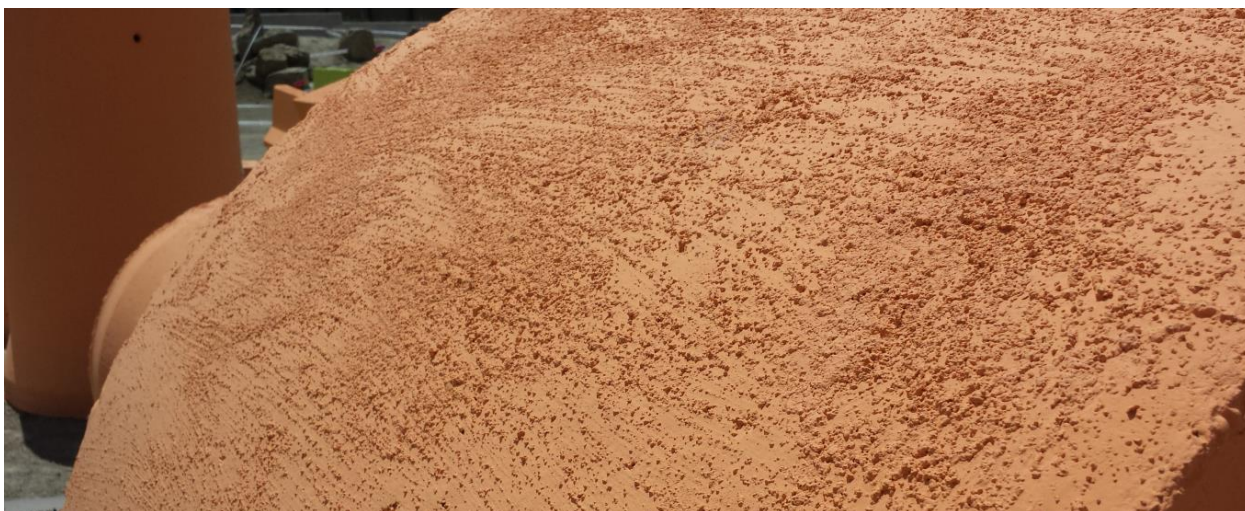


Section made using painted concrete elements on a flat surface - Grade of difficulty: medium and high.

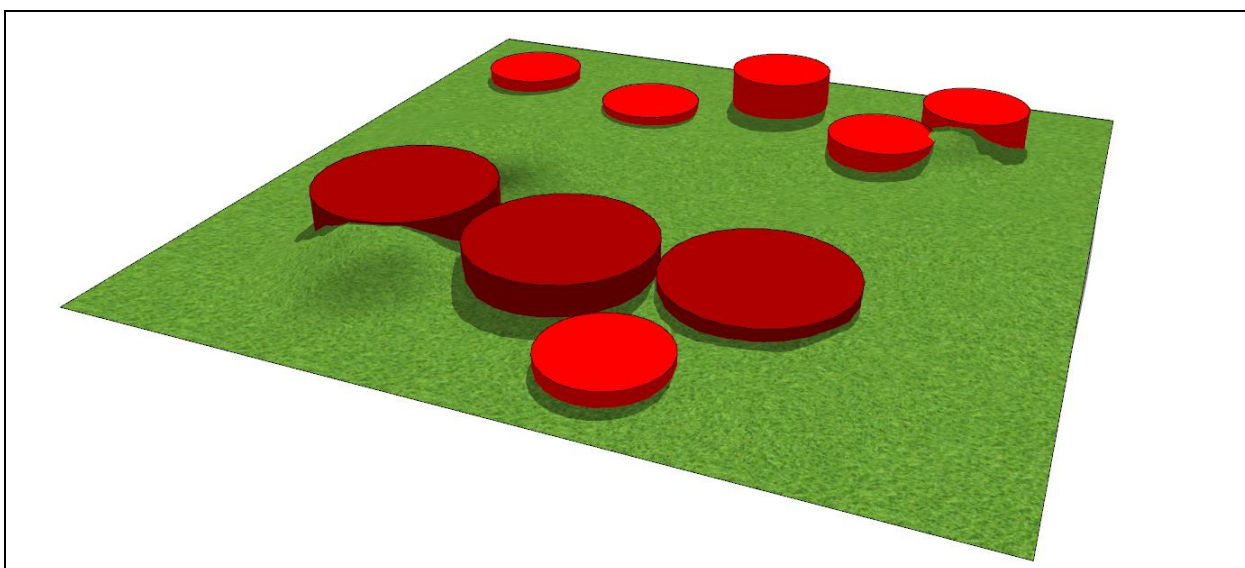




Section made using painted concrete elements on a flat surface - Grade of difficulty: medium and high.



Concrete surface painted with non-slip material.



Section layout using painted concrete rings on an uneven soil surface to obtain different slopes and finished with grass - Grade of difficulty: lower.



#### 8.4. WOODEN ELEMENTS

Wood is commonly used as it can be shaped easily and allows to build a wide variety of structures in a trials facility. It is essential that all the wood used undertake a water-soluble salts treatment -minimum class 4- (known as autoclave treatment) or thermic treatment, which will protect the wood from external agent damage, such as humidity.

Different types of wooden elements used:

- Beams /railway sleepers
- Telephone poles
- Structures such as catwalks, ramps...

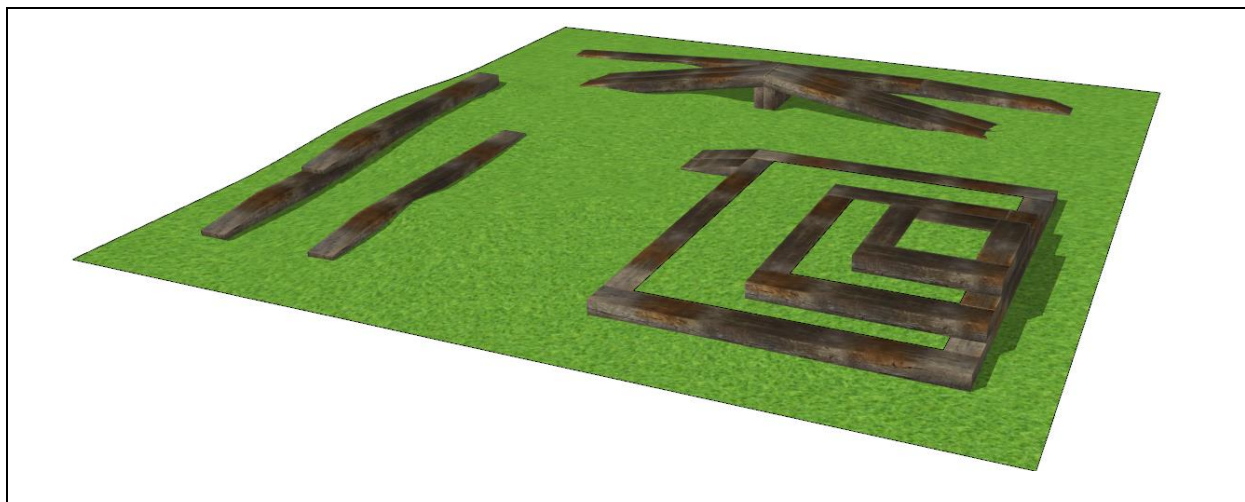
Tree trunks coming directly from sawmill or forest industry can also be used. This material is common in competitions, but they are not advisable for permanent facilities. As trunks are organic, they produce waste, such as bark. Also, depending on the type of wood, they may degrade in a short period of time, which can generate unforeseen costs when the trunks need to be removed or their waste taken care of.



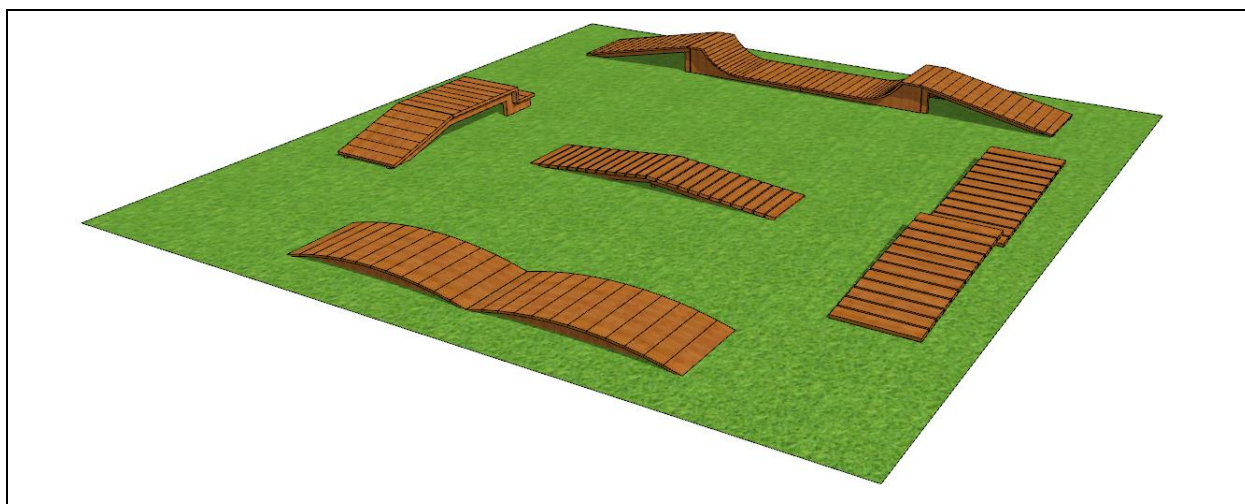
Section made using railway sleepers on a flat surface and finished with grass - Grade of difficulty: lower and medium.



Section made using railway sleepers on a flat surface and finished with grass - Grade of difficulty: medium and high.



Section layout using railway sleepers on an uneven soil surface to obtain different slopes and finished with grass - Grade of difficulty: lower.



Section layout using different handmade structures on a flat surface and finished with grass - Grade of difficulty: lower.

## 9. WORKS TO BE DONE

The building of a trials facility will require the following works:

### 9.1. MAJOR WORKS

- Levelling and conditioning of surface
- Moving soil
- Creating slopes
- Supplying/transporting materials
- Placing material
- Removing excess material

### 9.2. MINOR WORKS

- Fixing materials
- Adapting surfaces
- Adapting materials
- Painting
- Removing excess material
- Cleaning and finishes



## 10. LARGE MACHINES, TOOLS AND FIXING MATERIALS

### 10.1. LARGE MACHINES

The kind of large machines and transports to be used have to be decided according the design of the facility and by the plan of proposed uses.

The use of a lorry or a digger equipped with a hydraulic clamp is the most recommended large machines to move all the heavy materials to build the facility.




Backhoe-loader	
Lorry with hydraulic clamp crane	
Excavator with hydraulic clamp	
Semi-trailer lorry	
Helicoidal drill	
Fork lift	



## 10.2. BASIC HAND TOOLS





The basic hand tools used for minor works will be decided according the design of the facility and by the plan of proposed uses. See below the most common tools that can be used

Drill machine		Stone bit drills, size 6, 8 and 11 mm  Wood bit drills, size 6 and 10 mm	
Screwdriver		Torx drive bit, size T20 and T30	
Electric radial saw for wood		Electric radial 750 W abrasive cutting disc INOX-METAL diamond blade	
Gasoline blower		Gasoline chainsaw	
Carpentry sergeants opening 15 and 30 cm		Hammer	
Ratchet tool		Hexagonal socket, size 13 mm	
Bow saw		Trowel	
Concerte mixer		Wheelbarrow	
Measuring tape 10m length		Bucket 14 litres	

Cutting pliers		Pliers	
Adjustable wrench		Iron lever	
Square and rounded shovel		Hoe	
Broom		Metallic rake	
Double sided ladder high: 2 m		Metallic brush	
Paint bucket		Outside paint water based	
Rollers and brushes		Spray paint	

### 10.3. FIXING MATERIAL







The fixing materials used for minor works to attach the obstacles will be decided according the design of the facility and by the plan of proposed uses. See below the most common materials that can be used:

Screws torx tip T20/T30. Size 4,5 x 50 mm and 6,0 x 100 / 160 / 200 mm		Self-Tapping Concrete Screws M8. Length 60 and 80mm	
Metallic angles 10 cm x 10 cm		Corrugated bar length: 50 cm diameter: 10 mm	

Threaded rod M8 mm, length: 50 cm		Washers and nuts M8 Washer outside diameter: 40 mm	
Wooden wedges		Ratchet straps tie downs	
Fast cement		Crushed grainy marble 0.8 / 1.8 mm granulometry	

#### 10.4. OTHER TOOLS AND SUPPLIES

Other complementary tools and supplies that can be useful to build the sections are listed below:

Power supply (220 V / 50 Hz) or Gasoline Inverter Generator (5kW)		Water supply	
Power cable extender reel 50m and power sockets		Tool box	
Cardboard roll		Big bag container with pallet base	

## 11. OTHER SERVICES

It is recommended for the facility to include the following basic services:

- Trash cans
- Information panel
- Benches
- Picnic tables and benches
- Shadow areas
- Entry access
- Access for large machines
- Parking area
- Fenced outer perimeter

Other services needed depending on the plan of purposes:

- Artificial lighting
- Power supply
- Water point
- Toilets

Other services that can be foregone depending on the plan of purpose:

- Changing rooms
- Showers
- Meeting room
- First aid room
- Warehouse
- Bike washer
- Bar
- Bleachers

## 12. ACTIVITY PLAN

It is recommended for the managing body to have an activity plan to promote the use of the facility in order that the facility does not go down into disuse.

## 13. MAINTENANCE PLAN

The facility must have a maintenance plan that accounts for the different actions that must be carried out throughout the year, in order to keep the facility in optimal conditions. It is recommended to modify the obstacle layout periodically.

## 14. TERMS OF USE

If the facility is in open access to the public, it is essential to indicate on a panel the terms of use and safety considerations, such as:

- The bicycle is the only vehicle authorized in this facility
- Users must be in possession of license issued by National Federation
- Using a helmet is mandatory
- Minors must always be accompanied by an adult
- It is forbidden to move or modify elements of the facility
- Respect the facility and deposit the rubbish in the respective trash cans
- Pets (dogs) are not allowed in the facility



- Management is exempt from liability in case of damage or injuries the users may have when using the facility.
- If the facility is detected to be in a poor condition, you can contact the following telephone number: XXX XXX XXX
- It is forbidden to use the facility after 22h

Mentioned terms of use can be different, as well as its drafted and its number according to the needs of the managing body. If the facility is fenced of the conditions of use have to be regulated by the managing body rules.

## 15. UCI CONTACT

If you need further information about the **UCI Trials Facilities building guide**, please contact:

- **Dani Parramon** - UCI Trials Coordinator  
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