WORLD OBSTACLE

FÉDÉRATION INTERNATIONALE DE SPORTS D'OBSTACLES

OCR 100 M CHAMPIONSHIP COURSE SPECIFICATION MANUAL

as of 18 May 2025

OCR 100m Championship Course Specification Manual

This document defines the course requirements and specification for the international standard OCR 100 m Championship Course. All dimensions must be verified by an independent auditor per the World Record Guide to Evidence if the course is used to establish national, continental, or world records.
This document was prepared by Obstacle Formula in association with World Obstacles. *Obstacle Formula is the only approved and recommended manufacture of international standard coruses. Other manufacturers may be approved by national member federations of World Obstacle.*

A. OVERVIEW

The international standard OCR 100 m Championship Course is a one hundred meter (100 m) long "sprint" obstacle course race (OCR) with eleven (11) standard obstacles, validated by Fédération International de Sports d 'Obstacles (FISO) for international competitions and records. The course may be one or more lanes arranged with the finish lines in the same location (lanes that are parallel, radial, etc.) Courses may be linear or curved (minimum radius 63.66 m (90 degrees of a 400.00 m circumference circle.) Courses built to these specifications can be used for OCR 100m Championships at any level but must be supplied and / or validated by an official supplier or FISO, to be approved for records.

B. COURSE LENGTH & SLOPE

The Length of the course is 100.00 meters from the start line to the finish line. The course must be level to 1% slope or less in any direction, i.e. no more than 1.0 m drop or rise of over the length of the course or 10 mm (1 cm) per meter. If end to end slope exceeds 1%, the course can be validated if the athletes run up hill.

Lane width of 1.5 m (5 ft) minimum. 2.0 m (6 ft) is recommended to provide clearance between athletes and obstacle structures. Lane spacing is 1400 mm minimum centre line to centre line.

C. OBSTACLE STRUCTURES

Obstacle structures, including platforms, walls, and hanging obstacle frames (bars, wheels, rings, climbing holds, rope swing) must not appreciably move or deform during competition. Structures should be capable of supporting athletes weighing 110 kg while moving at 5.5 m per second (20 km/h).

Structures may be constructed from metal, wood, plastic, composites, or a combination of materials that satisfy the above criteria. If horizontal sections are constructed from two or more pieces, joints must be verified by an engineer or other qualified person to ensure they are structurally sound under expected loads and fatigue (100,000 cycles minimum). Spigot connections are recommended, plated box truss is acceptable. Nuts on bolted joints should be tightened with an impact drill and include lock washers. Truss frames must meet or exceed EN Standard and must be constructed from 6082-T6 aluminium alloy (50 mm x 3 mm F34 / 290 box truss) or stronger material and include base plates. F32 and 2 mm wall thickness main tubes are not acceptable. Corner joints must meet or exceed EN Standards for F34 box truss.

D. TRUSS

Notes on Truss (also known as stage or lighting truss)

Truss sizes vary but we strongly recommend using light-duty (290 mm x 290 mm or 12" x 12" inch truss or equivalent.)

Aluminium alloy truss structures made of 6061 T6 or 6082 T6 are recommended as both are standardized for lighting truss and have a high strength to weight ratio.

Truss tube wall thickness must be sufficient to prevent bending, flexing and vibration of structures under competition conditions (2 x 110 kg athletes with synchronized movements at speed.)

Minimum wall thickness for light truss is 3 mm (1/8 inch) on the main tubes, which are 50 mm (2 inches) diameter. Diagonals are 25 mm (1 inch) diameter and 3 mm (1/8 inch) wall thickness.

All truss connections must be inspected and verified prior to using an obstacle. Properly torqued electric drills should be used to assemble plated truss and 2 kg (3 lb) hammers are recommended for pinned spigot assembly. Pinned spigots must have ring locks in place.

Plated truss allows 4-pattern bolted connections for horizontal members. A properly bolted horizontal 6000 mm truss (two 3000 mm sections) can support a static centre load of 482 kg (1,060 lb). Truss frames typically have two horizontal members and properly bolted, 2-section 6000 m spans can support 964 kg (2,120 lb) static centre load, equivalent to 482 kg (1,060 lb) per vertical.

The bolts used for friction plate connections should be Grade 8.8 and tightened to a maximum of 200Nm (140ft lbs.)

Spigoted truss has a greater distance between the connections, which reduces the load on each connection. Properly connected spigots use double ended conical couplers with tapered shear pins and R-clips and are as strong, or stronger than plated truss.

All truss connections must be inspected and verified prior to use. Properly torqued electric drills should be used to assemble plated truss and 2 kg (3 lb) hammers are recommended for pinned spigot assembly. Pinned spigots must have ring locks in place.

E. SAFETY PADDING

Safety padding shall be provided in all areas where athletes can collide with a hard surface. Mats over hard surfaces under hanging obstacles (fall protection "fall pro") should be 200 mm (8 inches) thick and 21 kg/m^3. Landing surfaces after obstacles shall be covered with 50 mm thick / 80 kg/m^3 closed cell foam matting extending a minimum of 2.0 m from the end of an obstacle to reduce risk of impact and reparative injury. Landing surface protection shall be provided after the Bars, Wall, Wheels, Rings, and Climbing Holds. Other surfaces and Penguin Slide padding should be 10 mm. Soft mats (less than 80 kg/m^3) are prohibited where athletes land after obstacles.

F. STEP SURFACES

Step surfaces including offset steps, island steps, walls and boxes shall have a surface that provides traction in wet conditions. Rubber with texture or traction patterns are recommended, for example running shoe type material and patterns for steps and boxes. Walls should have a textured, non-abrasive surface.

G. HAND GRIP SURFACES

Hand grip surfaces used on the Bars, Wall, Wheels, Rings and Wave Wall must have a surface finish that is smooth and free of entrapments and other hazards, but not slippery to provide adequate grip under reasonable competition conditions.

H. BELLS & TETHERS

Bells for trussed obstacles (Bars, Rings, Wheels, Climbing Holds) shall:

- Be secured to structures to ensures they return to their intended location within 60 seconds of being hit.
- Have semi flexible tethers to prevent the tether wrapping over the support frame. PVC or hose pipe may be used over tethers to prevent wrapping.
- Be stable and unaffected by wind or other forces that can be reasonably expected during competition.
- Not contain sharp or protruding features that could cause a hazard to participants.
- Neat in appearance to meet branding and sport presentation criteria.

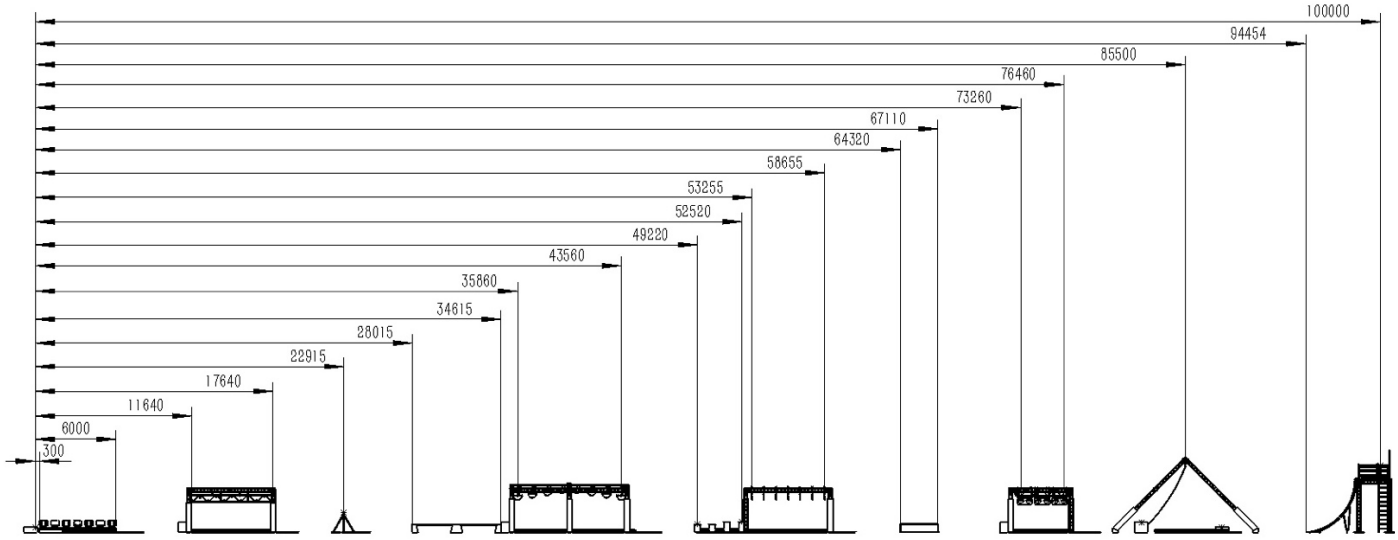
"Cow bell" style, nominal dimensions 60 mm (2.5 inch) wide and 60 mm (2.5 inch) high but no more than 100 mm (4 inches) wide or 100 mm (4 inches) high.

I. DIMENSIONS

Linear and radial dimensions (including wave wall radius) shall be accurate to +/- 5 mm (3/16 inch) from reference datum. Radial dimensions (pipe diameters) and wall thicknesses shall be accurate to 5%.

Reference datum for all obstacles is the start line at 0.000 m. Locations are specified to the start or centre of an obstacle, e.g. the start of the Balance Beams or the centre of the first wheel.

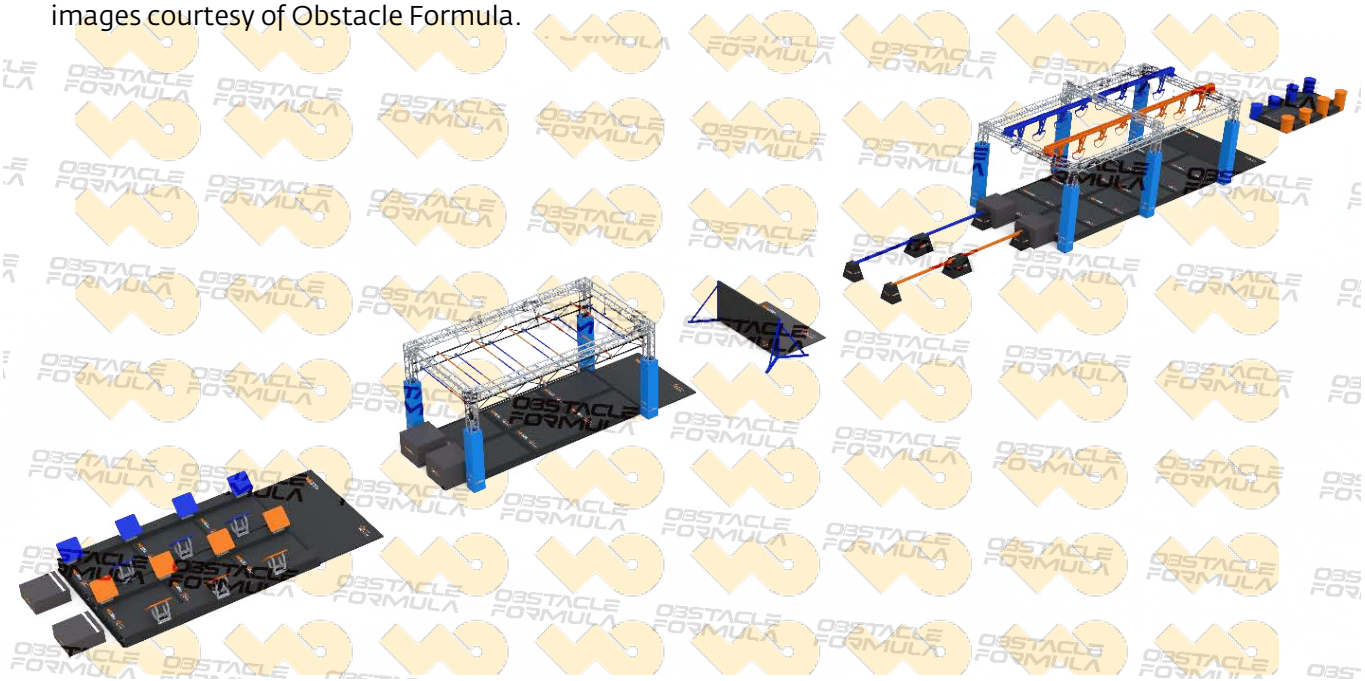
A general tolerance of 1% is allowable for all dimensions. Allowances may be provided for out of specification dimensions provided there is no advantage to athletes, e.g. a wall that is 2% taller than the specification is not an advantage and could be allowed.

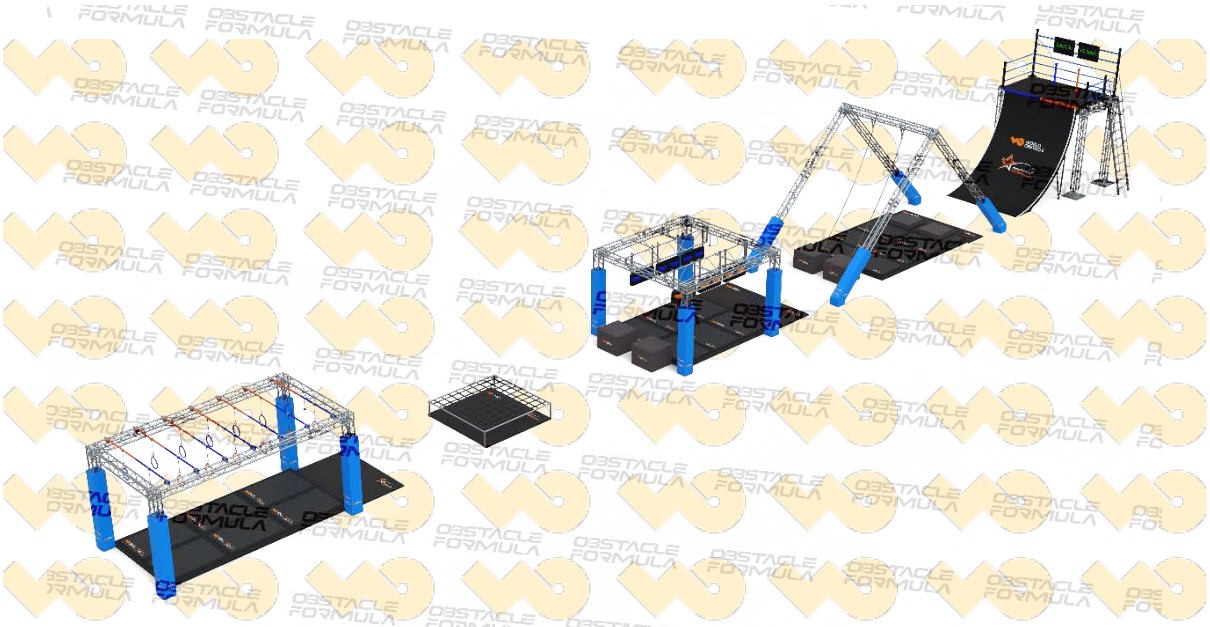


Dimensions in mm

J. OBSTACLES

Suspended obstacles (monkey bars, wheels, rings, climbing holds, rope swing) are suspended from fames (truss, scaffold, welded metal, wood) and can be designed to allow banners to be mounted. Scaffolding and wood framing can be used but require additional engineering. Trussed obstacle images courtesy of Obstacle Formula.





The 11 standard obstacles and structures are (in order):

- Starting platform
- (1) 7 Offset Steps
- (2) 11 Bars
- (3) 1.5 m Wall
- (4) 2 x 3 m Balance Beams
- (5) 8 Wheels
- (6) 4 Island Steps
- (7) 7 Rings
- (8) 3.0 m Penguin Slide
- (9) 6 Climbing Holds
- (10) 5.0 m Swing
- (11) 4.0 m Wave Wall

a. Start Line

The start "line" is a vertical plane perpendicular to the course direction and 300 mm before the first step. If an athletics type starting "block" with a switch is used to measure the starting time of an athlete, it shall be placed for the back foot of the athlete to ensure accurate timing for false starts and in a location that prevents the athlete from crossing the start plane before their foot leaves the block.

NOTE 1: The timing systems shall measure the reaction time of athletes (the time it takes for them to cross the start plane after the start signal.) An athlete who crosses the start plane or departs the starting block 0.1 seconds or less after the start signal has a false start.

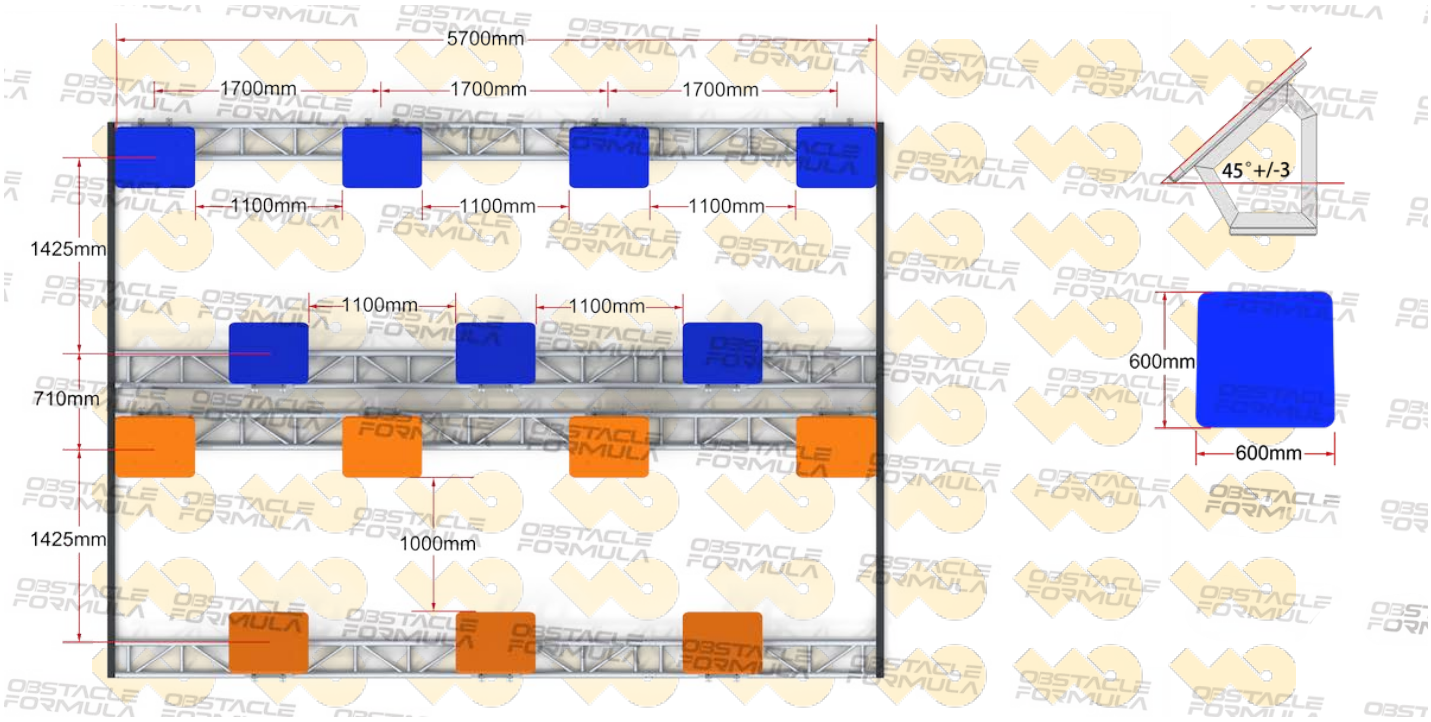
NOTE 2: Pressure pads (speed climbing / swimming) are not recommended starts because they are unreliable for measuring false starts in this application. Laser and systems with mechanical / electrical switches are recommended.

b. Start Platform

The start platform(s) are 400 mm high, a minimum of 1000 mm long and x 1000 mm wide. A single start step for multiple lanes meeting these criteria is acceptable.

c. Obstacle 1 - Offset Steps

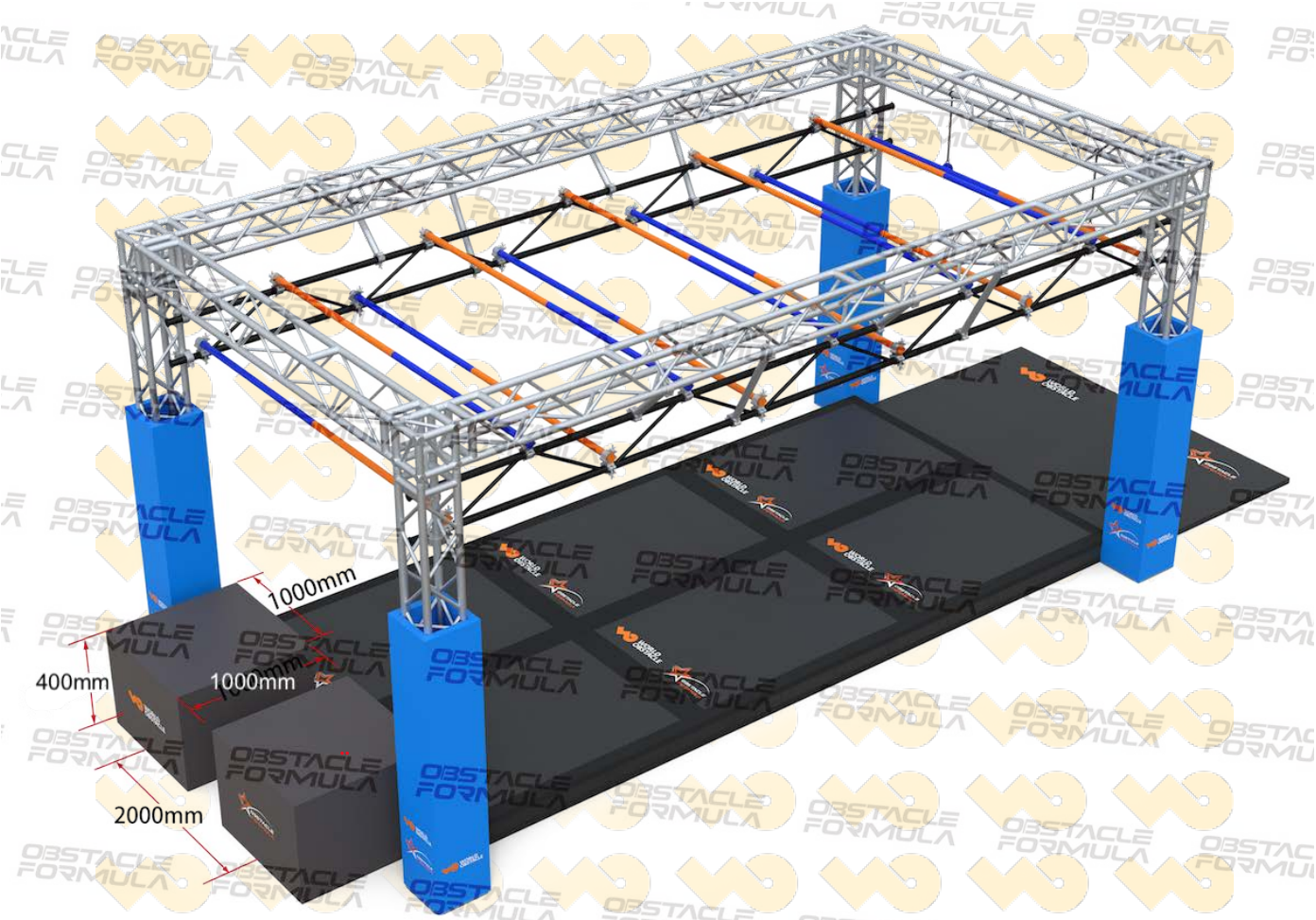
There shall be seven steps per lane. Steps can be arranged with 3 right - 4 left (image below) or 4 right - 3 left but both lanes must be the same layout to minimize interaction between athletes.



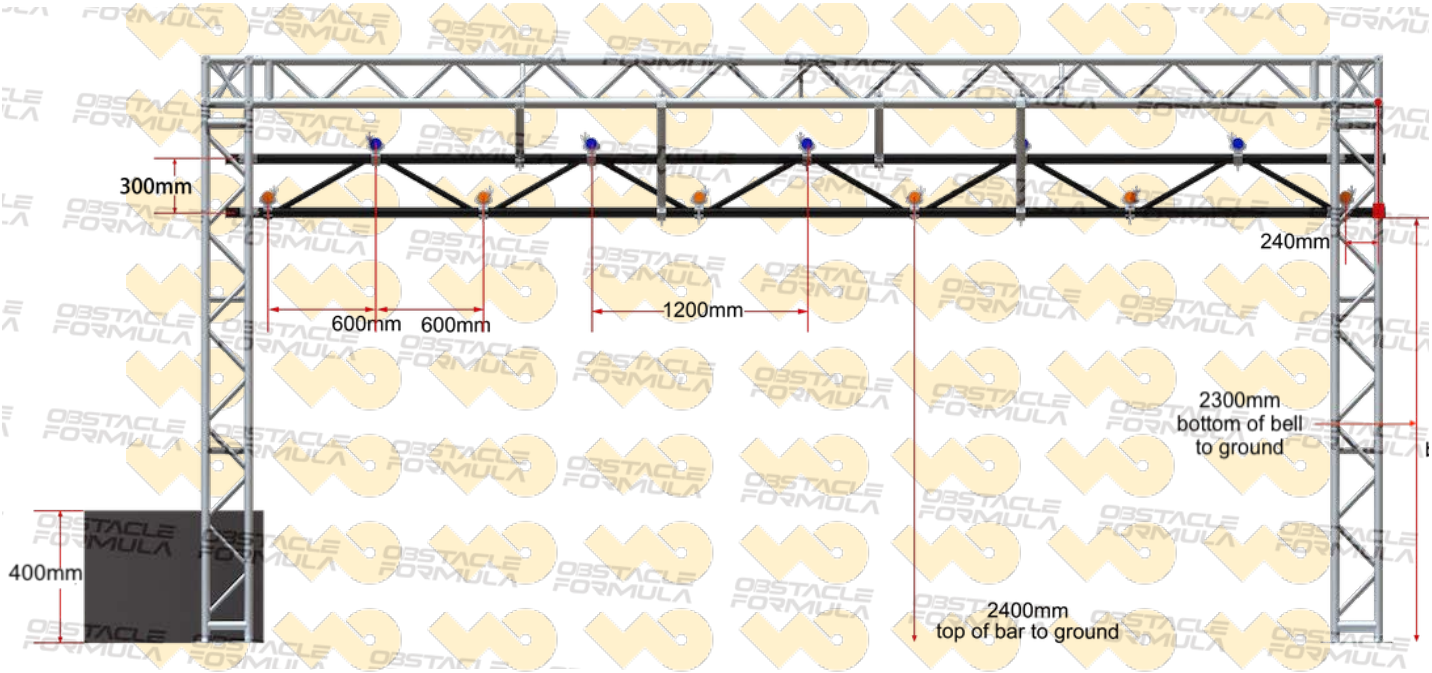
- The bottom of each step is 400 mm from the ground.
- Each step is 600 mm wide x 600 mm high and angled at 45 degrees +/- 3 degrees.
- Steps must not have sharp edges (chamfered / padded), and step corners must have a radius of between 10 mm and 20 mm.
- All support framing must be covered / padded to eliminate foot entrapments and provide impact attenuation for athlete who fall.
- Landing mats from the end of the structure 2000 mm wide and 2000 mm deep and 50 mm high per lane
- There are no finish platforms.

d. Obstacle 2 – Bars & Steps

The start step(s) are 400 mm high (including padding) and a minimum of 1000 mm long and x 1000 mm wide per lane. A single start step for multiple lanes meeting these criteria is acceptable.



- The end of the start step is aligned no more than 100 mm from a vertical plane through the leading edge of the first bar, typically in line with the inside of the truss leg on a 6.0 m longitudinal truss.
- Recommended inside frame width allows 1500 mm minimum per lane to provide clearance between the support frames and athletes.
- All exposed edges should be smooth and free of protrusions. Support frames should be padded where (if) athletes can make contact.
- Bar outside dimeter is 50 mm. Bars should be sufficiently ridged to minimize flex under load. Steel scaffold bars are recommended. Aluminium bars are acceptable, recommended minimum wall thickness 5 mm or with internal structure and bracing.
- Bar surface finish should be smooth and not slippery to provide adequate grip under reasonable competition conditions.
- There are 6 low bars and 5 high bars. Bars alternate from low (2,400 mm from bar top to ground) to high (2700 mm to ground). The first and last bars are low. High and low bars should be contrasting colours to remove visual confusion between upper and lower bars.
- The bell is 240 mm past the last bar (centre to centre). Bottom of the bell is 2300 mm above the ground (100 mm below the last bar).
- Landing mats from the end of the structure 3000 mm wide and 2000 mm deep and 50 mm high.



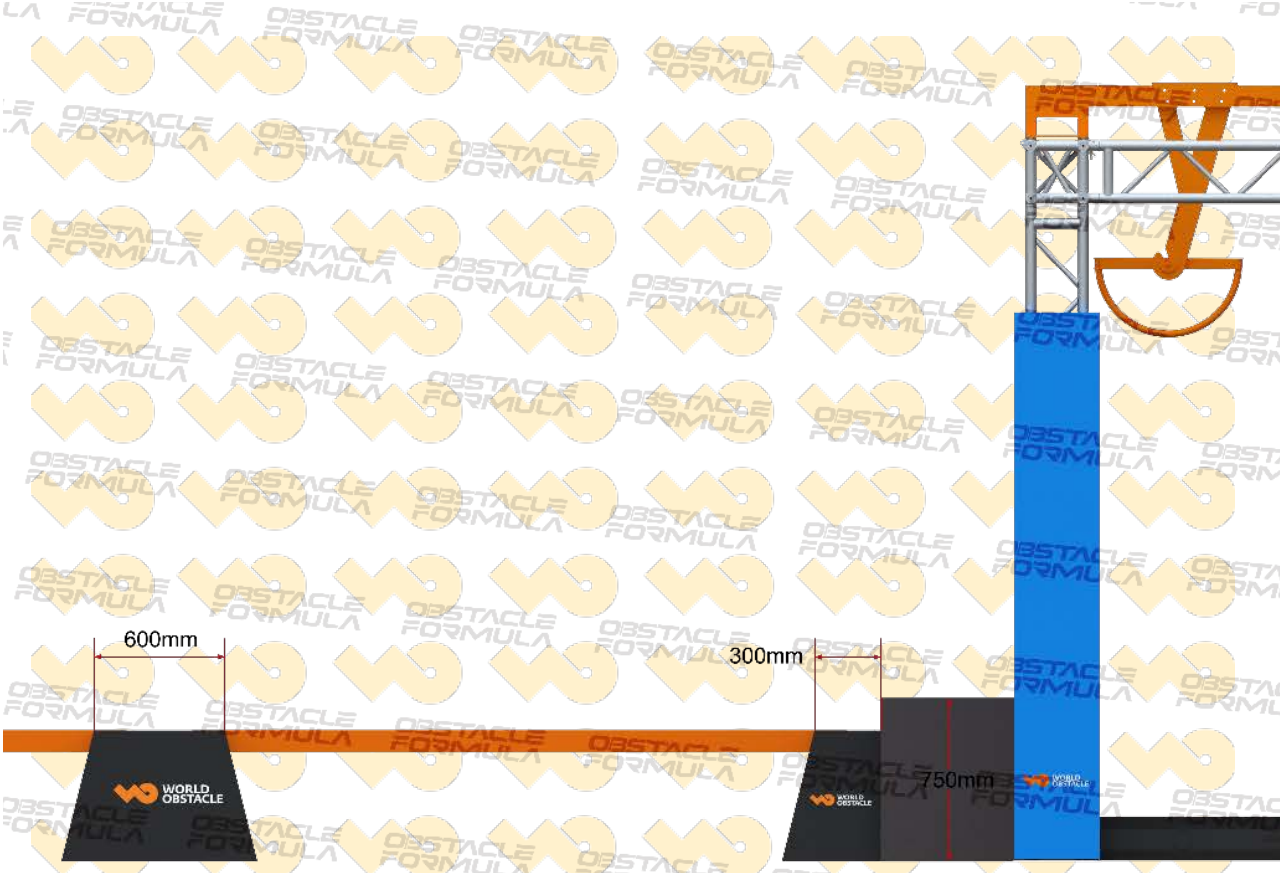
e. Obstacle 3 - 1.5 m Wall

- All exposed edges should be smooth and free of protrusions. Support frames shall not create a tripping hazard or interfere with athlete movement. Nominal width 1500 mm per lane.
- Wall surfaces should be capable of withstanding repeated impacts from athletes colliding with the wall at full speed.
- The wall surface shall be textured but not abrasive to provide traction for shoes under all expected conditions.
- The underside of the support structure shall provide traction with the support surface (ground), for example rubber feet.
- The wall shall be of sufficient weight to prevent movement and/or shall have provision to add weights to prevent movement due to heavy athletes pushing into / off the wall at speed.
- 12 mm construction plywood, composite board, 5 mm Plexiglas (Perspex), 5 mm HDPE, 2 mm sheet metal or similar material is recommended.

f. Obstacle 4 - Balance Beams

- All exposed edges should be smooth and free of protrusions that can cause a hazard to participants. Balance beams are two 3000 mm beams end to end. Total length is 6600 mm, 400 mm between end of the first beam step and start of the second beam step.
- Step surface (300 mm x 300 mm square start and finish steps) and beam should be non-slip under expected competition conditions (heat, cold, moisture).
- Nominal distance between beams (centre to centre) is 1500 mm, no less than 1400 mm.
- Beam width is 75 mm.
- Padding on the beam top surfaces is recommended, minimum 10 mm thick closed cell foam or rubber recommended to reduce risk of injury in the event of a fall. Exposed corners must be chamfered and padded.
- The underside of the support structures shall provide traction with the underlying surface, for example rubber feet, to prevent movement under competition conditions.
- All gaps shall be covered to eliminate entrapment of limbs.
- It is acceptable for the beam to be continuous, or for a third filler piece to be placed in the 600 mm gap.
- The base of each support shall be wide enough to provide stability under competition conditions.
- Beams and supports shall be heavy enough to ensure stability under competition conditions.

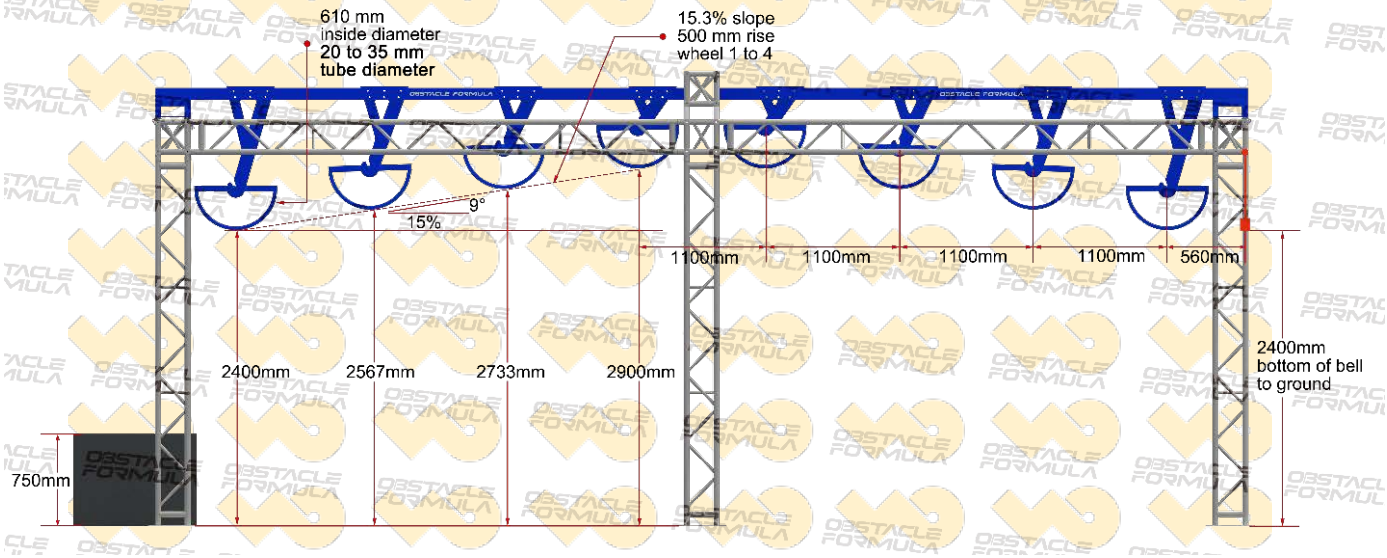
- All gaps between adjoining beams and steps must be covered / filled to prevent a foot / limb entrapment.



g. Obstacle 5 – 8 Wheels

- There is a 7500 mm high step in front of the wheels. Steps surfaces must be a minimum of 1000mm wide x 1000m deep.
- There are 8 wheels, four ascending followed by four descending. The descending wheels are a mirror image of the ascending wheels.
- Semicircular "wheels" without spokes are recommended to mitigate the hazard of athletes' hands hitting spokes. Spoked wheels are acceptable but must be reset during competition to minimize potential for athletes' hands hitting them.
- Inside frame width 4000 mm (2000 mm per lane) recommended to ensure clearance between support frames and athletes.
- All exposed edges should be smooth and free of protrusions. Step surface (600 mm deep x 750 mm high) should be non-slip. Support frames should be padded where (if) athletes can make contact.
- Gradient of the wheels (slope) is 15% / 8.6 degrees.

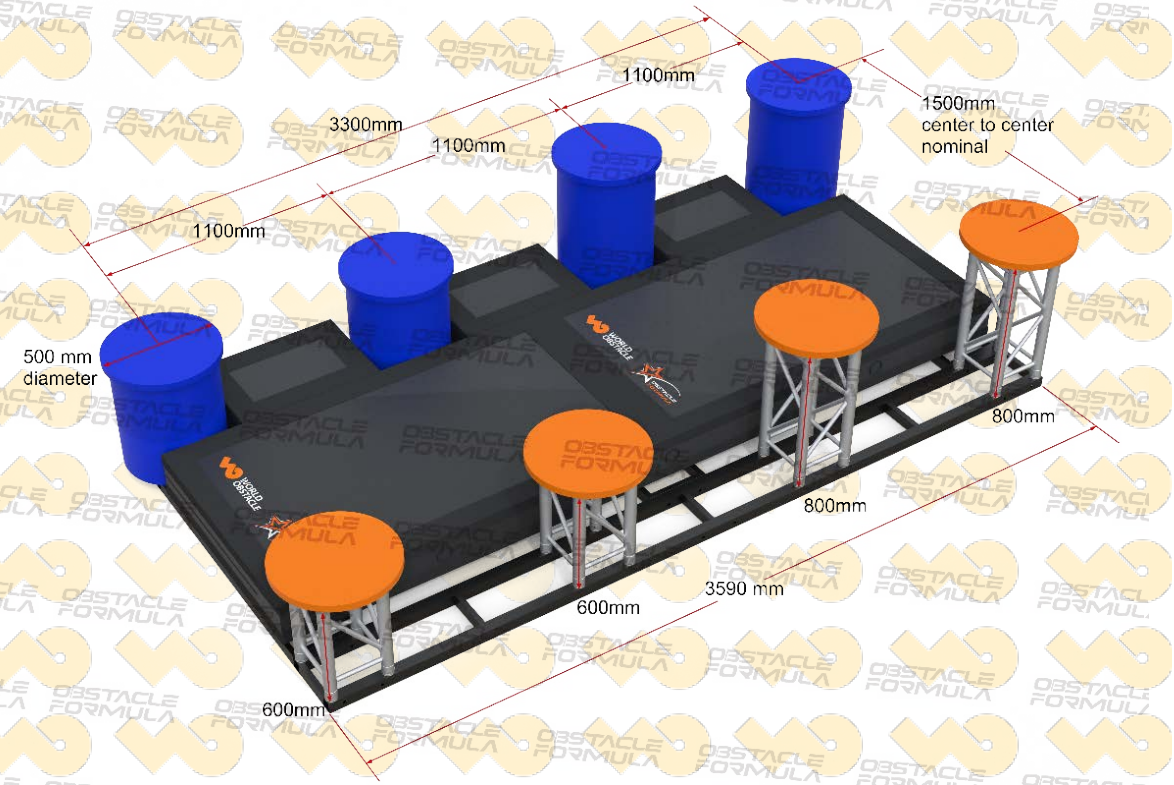
- The bottom of the bell is the height of the bottom of the last wheels (2400 mm to ground), 560 mm past the center of the last wheel.



- Wheels shall move freely and reset (cease movement) within 60 seconds of an athlete passing the obstacle.
- Wheels shall be secured in a manner that eliminates lateral movement and vibration under competition conditions

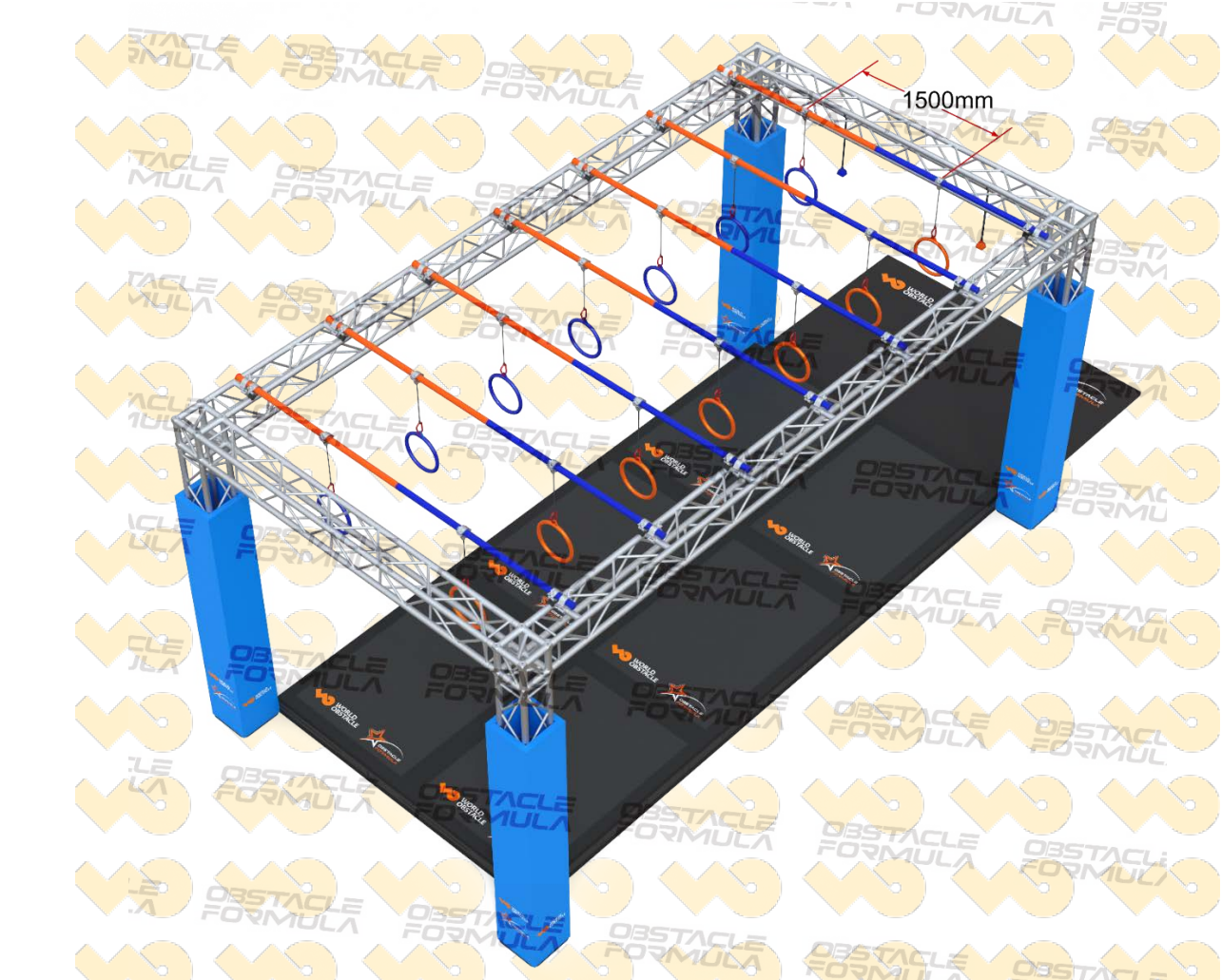
h. Obstacle 6 – Island Steps

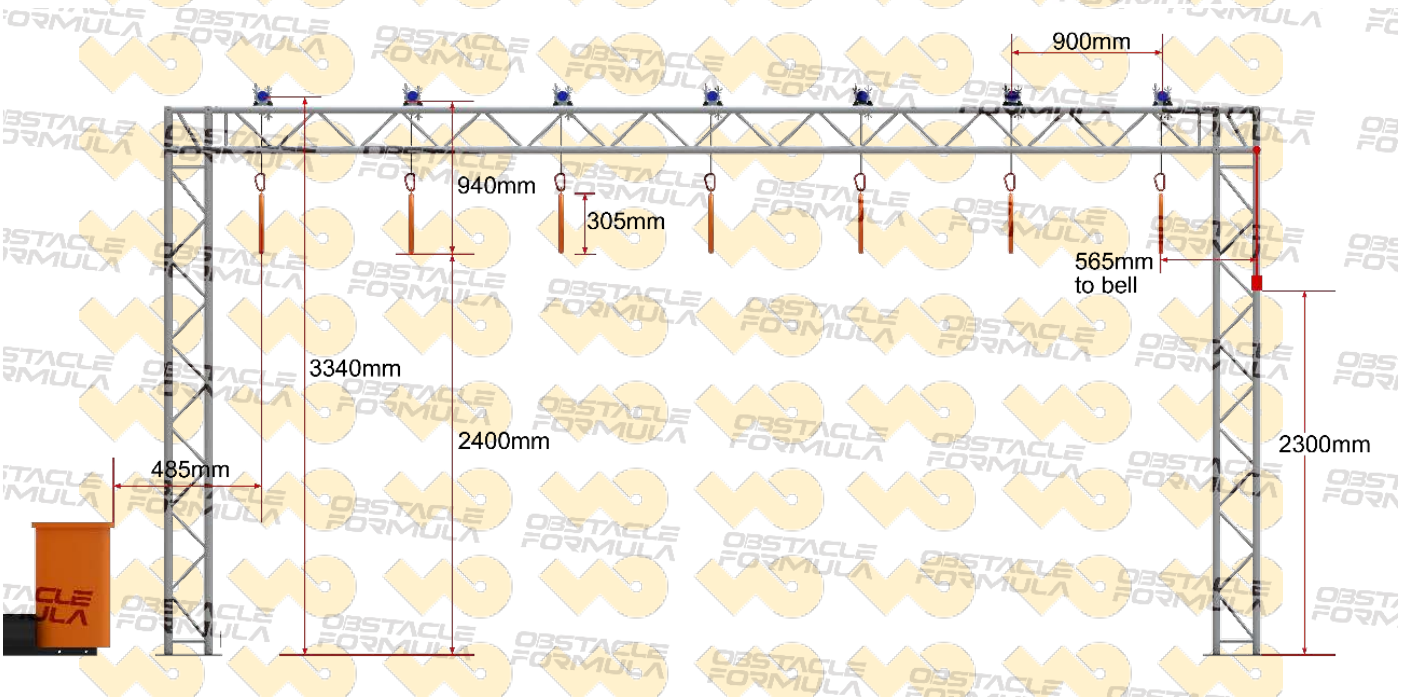
- All exposed edges should be smooth and free of protrusions. Step surface should be non-slip. Nominal spacing 1500mm, minimum spacing 1400 mm.
- Support frames shall not create a tripping hazard or interfere with athlete movement. Support frames should be padded where (if) athletes can make contact.
- Steps shall be stable in all directions under loads created by athletes running at full speed.



i. Obstacle 7 – Rings

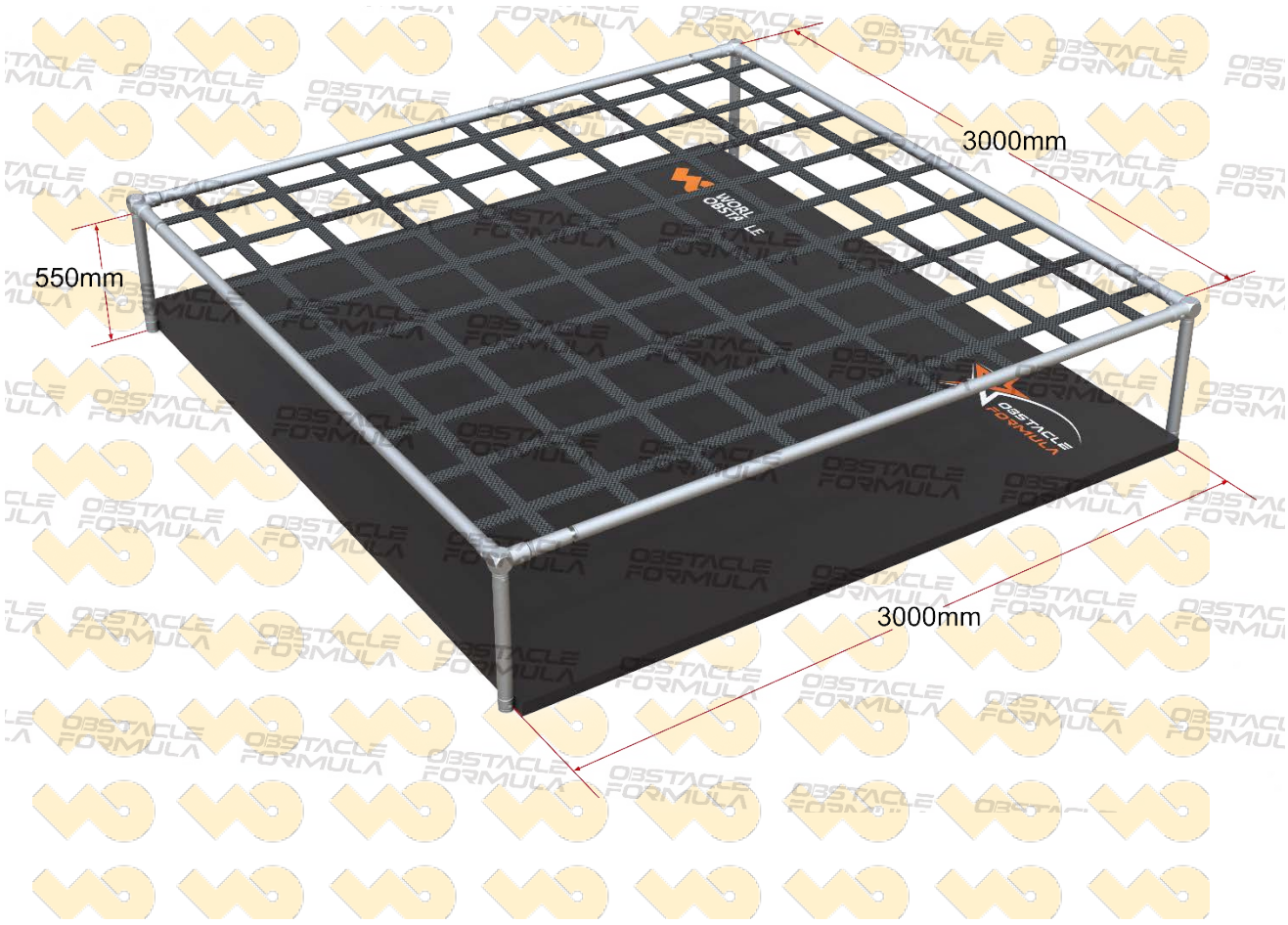
- The distance from the center of the last island step to the first ring should be 485 mm
- Centre to centre pacing between rings 1500 mm minimum. Inside frame width 4000 mm recommended to ensure clearance between support frames and athletes.
- All exposed edges should be smooth and free of protrusions. Step surface (600 mm x 750 mm) should be non-slip. Step 750 mm high x minimum 600 mm deep. Support frames should be padded where (if) athletes can make contact.
- Rings are 305 mm inside diameter. Ring tube diameter is 20-35 mm. Swing length (top attachment pivot point to inside ring bottom) 940 mm.
- The distance from the inside (grip surface) of the rings to the ground is 2,400 mm.
- The bottom of the bell is 565mm away from the last ring and 100 mm below the bottom of the rings (2300 mm to ground).
- Rings must be aligned 90 degrees to the direction of travel and should automatically reset to their original position within 60 seconds of an athlete passing the obstacle.


1500mm


900mm
940mm
305mm
565mm
to bell
3340mm
2400mm
485mm
2300mm

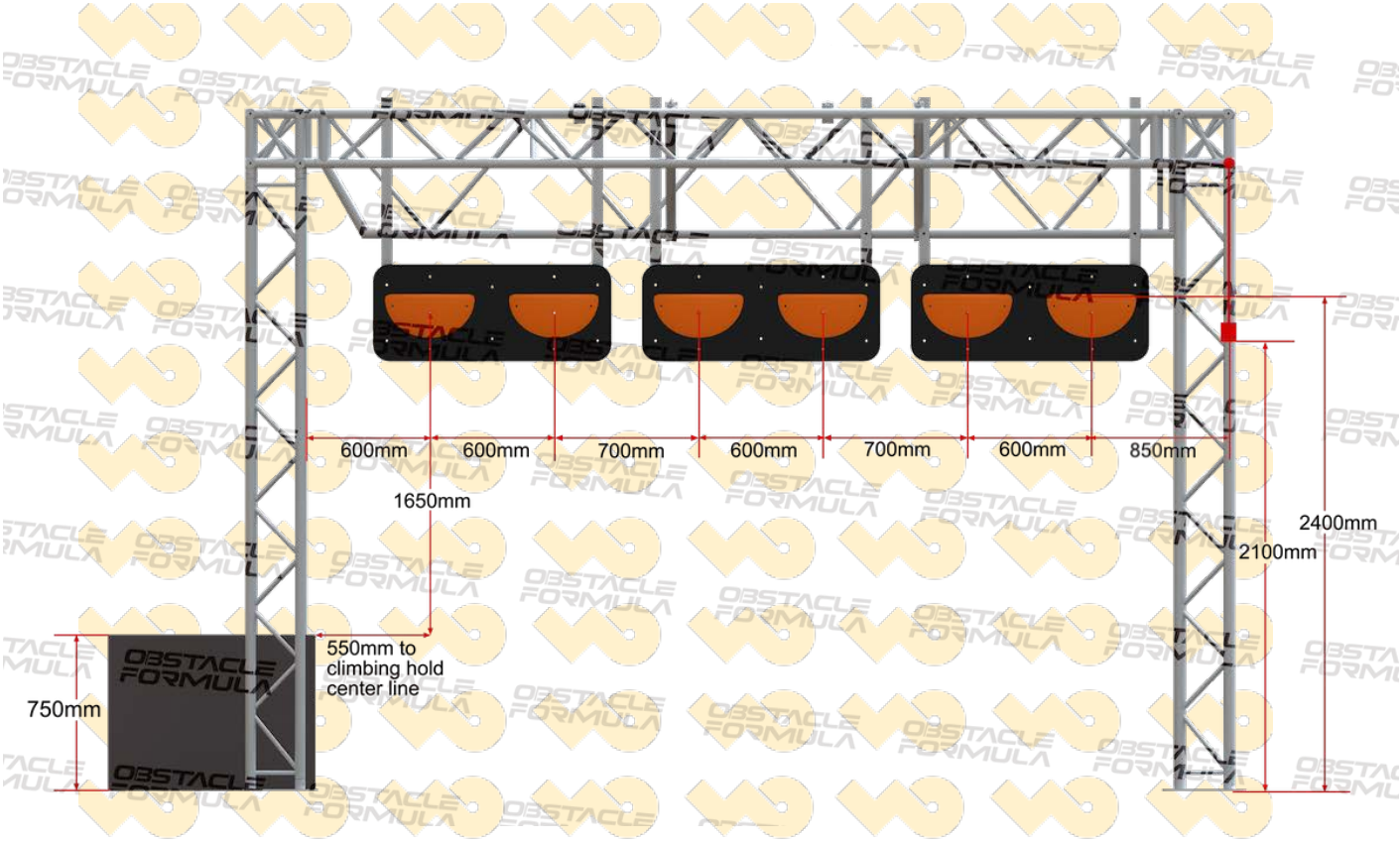
j. Obstacle 8 – Penguin Slide

- Clearance between the net and ground padding must be 550 mm.
- Net must be tight and be suspended in a manner that prevents athletes lifting it.
- Framing shall be rigid but allow movement to prevent injury in the event of an athlete collision. Lane width 1500 mm minimum.
- Padding (10 mm thick and 80 km/m^3 martial arts mats or equivalent) shall cover the ground under the net. The ground must be level, and free from rocks, gravel or any item that could cause injury.
- Padding surface shall be smooth to allow sliding and secured to prevent movement. A vinyl banner can be used over the padding to facilitate sliding.
- Front and back horizontal bars should be padded to reduce risk of injury.
- Padding on the horizontal frame members is desirable to reduce injury potential for athletes as the enter and exit the obstacle.
- The padding shall be secured to prevent movement or displacement under competition conditions.
- A Vinyl or similar cover is recommended to facilitate sliding on the surface.
- A light colour should be used to reduce heat gain in warm conditions. Black and other dark colours are not appropriate as they can cause burning if in direct sunlight.



k. Obstacle 9 - Climbing Holds

- Lane width 2000 mm minimum to ensure clearance between athletes and reduce the risk of collision with support frames.
- All exposed edges should be smooth and free of protrusions. Step surface (600 mm x 750 mm) should be non-slip. Steps are 750 mm high and minimum 1000 mm wide by 1000mm deep. A single step spanning both lanes can be used for 2-lane courses.
- Support frames should be padded where (if) athletes can make contact.



- Each pair of climbing holds shall be spaced at 600 mm (centre to centre), starting 600 mm from the end of the step. Distance between each pair of climbing holds shall be 700 mm centre to centre.
- Bells are located 850 mm past the centre of the last holds and the bottom of the bells are 300 mm below the top of the holds (2100 mm to ground).
- Climbing holds are 2-hand Juggy hold like the Atomik XXXL Ledge #1.
- Holds must have a "climbing hold" texture and be free of finger traps, sharp edges, rough spots, and any feature that could cause injury. Ledges shall have a radius that can be easily gripped by small and large hands (30 mm to 50 mm radius).
- Abrasive finishes shall be smoothed off to reduce tearing of the skin. Grip and abrasion should be evaluated by a range of athletes, e.g. light, heavy, amateur and elite.
- Ledge length shall accommodate two large hands for matching grip, 250 to 350 mm wide.
- Ledge depth shall be sufficient to accommodate large hands, 100 mm nominal.
- Two (2) set of six (6) holds may be provided for each lane, a right-hand set and a left-hand set.
- Side to side (lateral) clearance between holds shall allow athletes using both inside lanes sufficient room to pass.
- Lateral clearance to vertical supports shall allow athletes to pass and minimize the risk of hitting the supports (example of clearances for a 4000 mm wide truss frame.)
- Padding on verticals is recommended if clearance envelope allows contact with the frames.

Obstacle 10 - Rope Swing

- Lane width 1500 mm minimum to provide clearance between the support frames and athletes.
- Distance between platforms 5000 mm.
- All exposed edges should be smooth and free of protrusions.
- Step surface (600 mm x 750 mm) should be non-slip. Support frames should be padded where (if) athletes can make contact.
- Rope diameter 38 mm nominal, 5000 mm long minimum. Rope material should be selected for strength, grip when wet, flexibility, and weather resistance, e.g. Polydac (polypropylene – Dacron), etc. Smooth synthetic fibres that are slippery may be difficult to hold and can cause rope burns. Manila, hemp and similar water absorbent fibres should not be used.
- A-frame, prismatic, and curved frames are acceptable provided they have sufficient stability and strength under competition conditions.
- There must be a mechanism or to secure the rope in the start position. This can be a Velcro, magnetic, mechanical, or a combination that will release safely and not impede the momentum of the competitor.
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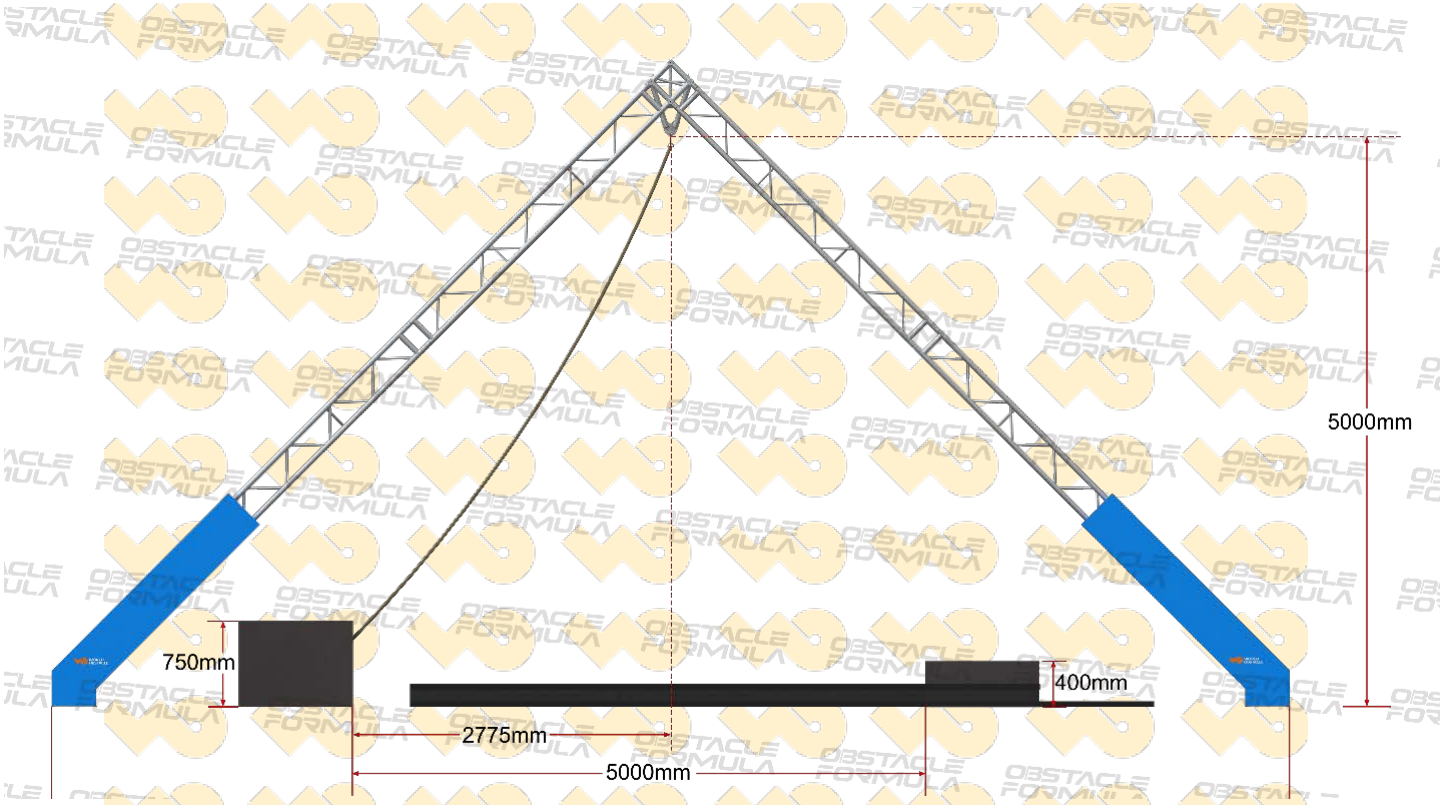
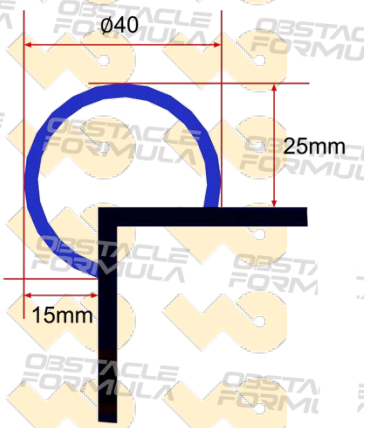


J. Obstacle 11 - Wave Wall

- The wall is a ¼ pipe (90 degrees of an arch) with a radius of 4000 mm. The surface is vertical at deck height and tangential to the ground.
- The transition from the running surface to the start of the curved wall must not have a lip more than 12 mm. A tapered transition "wedge" is allowable provided it is no more than 25 mm high on the wall side and no less than 30 drees from horizontal. Transition wedges must be coloured dayglow/reflective green, red, orange or yellow to provide notice to participants.
- All exposed edges should be smooth and free of protrusions.
- Wall surface shall be smooth but not slippery, e.g. Skatelight, wood with exterior matt paint, epoxy, or polyurethane. 1500 mm lane width minimum.
- The top hand grip rail should be one piece; 40 mm diameter or rectangular piece extending 25 mm above the platform deck and protrude above the wave wall by 15 mm.
- Surface textures such as sand or pool decking that can cause abrasion is prohibited.
- Railing height shall be 864 mm to 965 mm per the International Building Code (IBC).
- There must be a distinctive line, no more than 25 mm from the edge and at least 25 mm minimum width, running along each side of the wall.



K. Finish Platform

- The finish platform shall be constructed to support 480 kg (1,056 lb) and accommodate up to six people: two athletes, two judges and two camera operators.
- Railings shall have a continuous horizontal top bar at International Building Code height on both sides and the back. At least one additional horizontal railing shall be included (two recommended), evenly spaced between the deck and top bar.
- Stairs or a ladder with hand grips should be provided for access to and from the platform.

L. Finish Line

- The finish line is the finish button.
- Finish button shall be supported on a vertical post capable of withstanding an 80 kg force at the top of the post in any direction.
- Laser timing for the finish is not appropriate because an athlete can pass through the laser beam without hitting the button.
- Each finish button shall be connected to the timing system to stop the time and the clock for the athlete.
- Timing clocks for each lane should be placed above and behind the finish buttons, visible to spectators. Suggested height 2000 to 2500 mm above the platform.
- Finish mechanisms such as smoke, fireworks, steam, lights may be activated by the finish button.

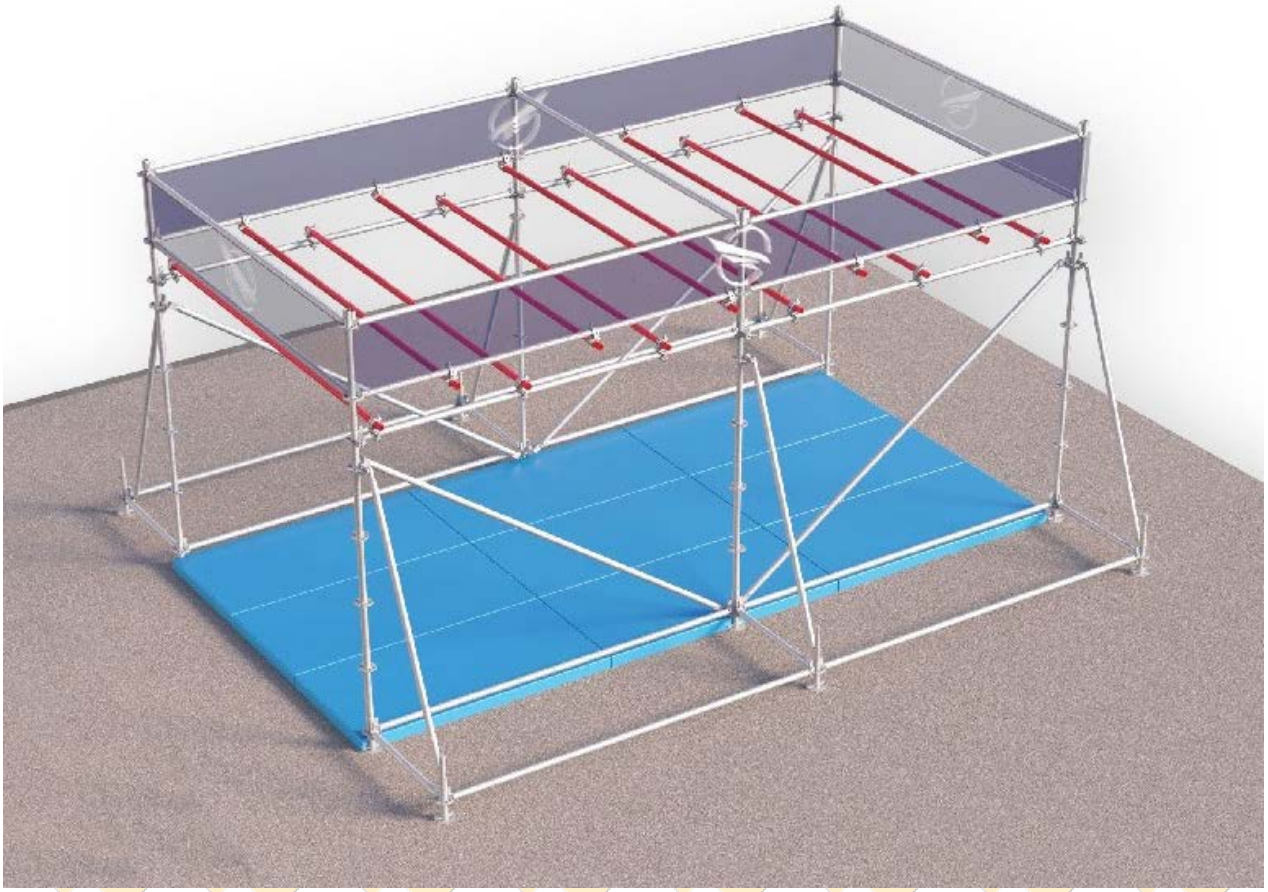
K. COURSE CHECKLIST

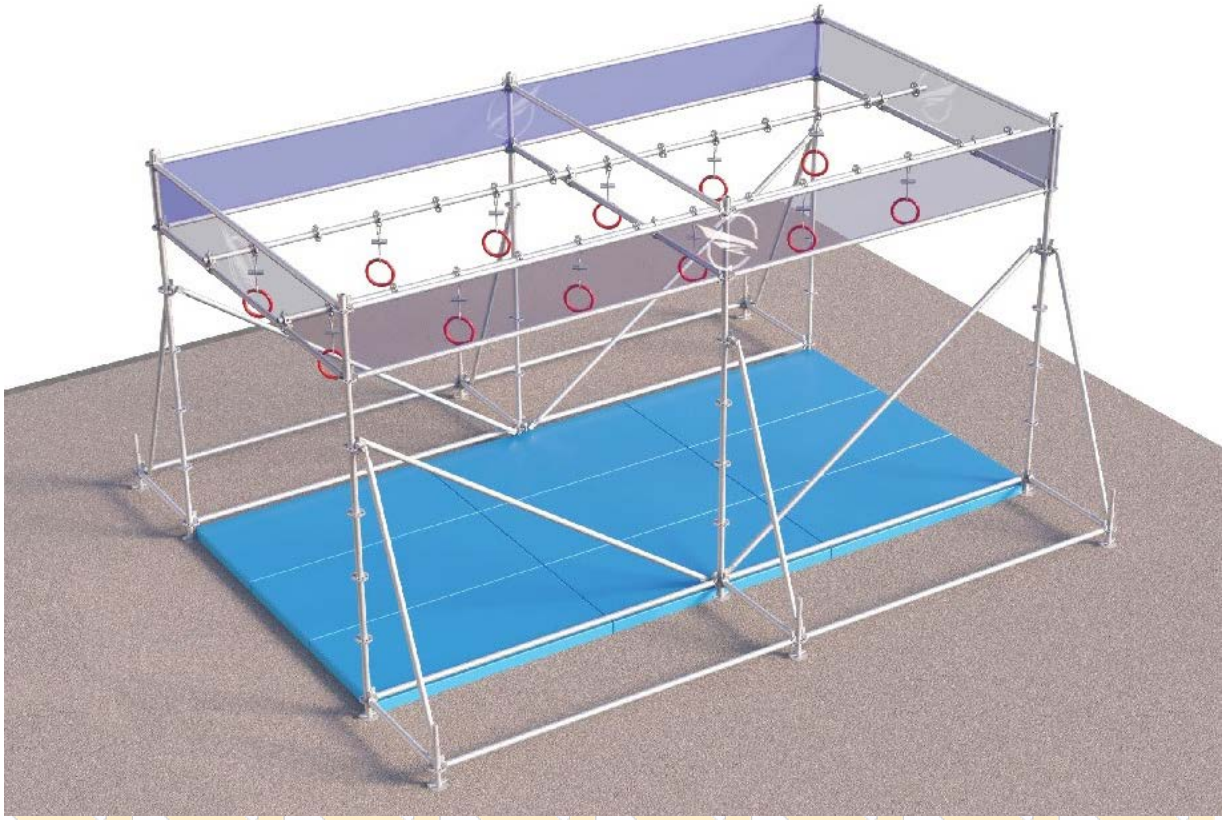
Enter measurements.

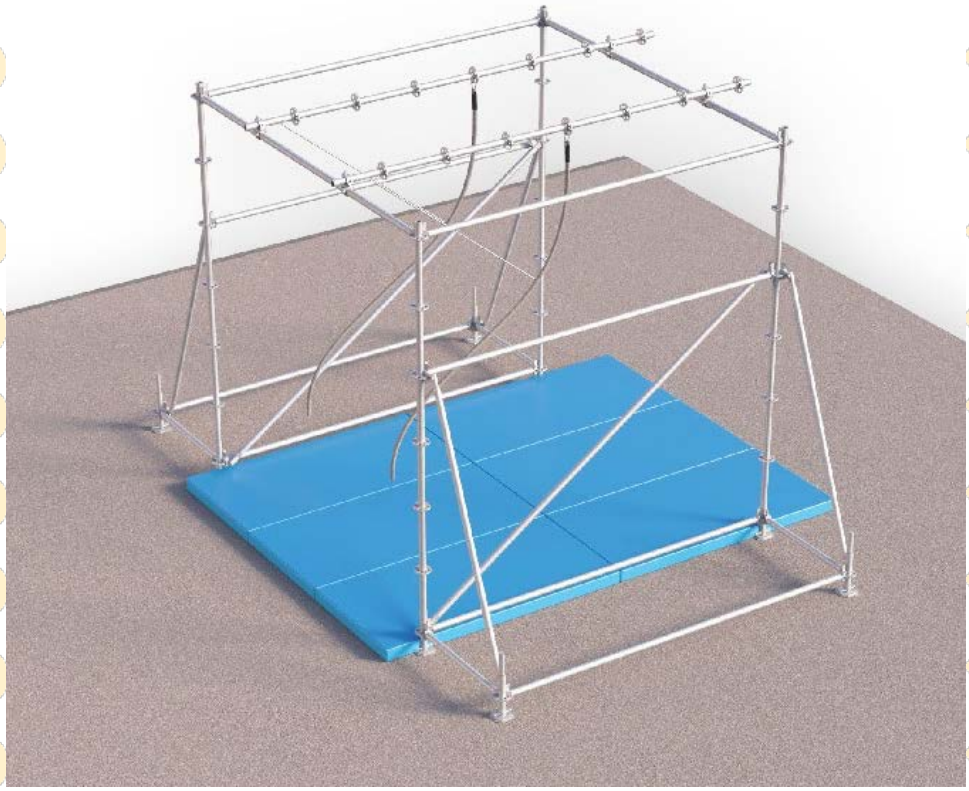
- [ ] Course length:
- [ ] Maximum slope: longitudinal (lengthwise):
- [ ] Maximum slope: lateral (side to side):
- [ ] Lane width:
- [ ] Start platform:
- [ ] Offset steps:
- [ ] Finish platform
- [ ] Bar start steps:
- [ ] Bars:
- [ ] 1.5 m wall:
- [ ] Balance beam:
- [ ] Wheels:
- [ ] Island steps:
- [ ] Rings:
- [ ] Penguin slide:
- [ ] Climbing holds:
- [ ] Rope swing:
- [ ] Wave wall:
- [ ] Finish platform:
- [ ] Finish button:
- [ ] Eliminate sharp edges:
- [ ] Eliminate limb entrapments:
- [ ] Fall protection:
- [ ] Landing mats:

APPENDIX A – Scaffold Frames

Ring lock scaffold examples. Images courtesy of OCR Russia

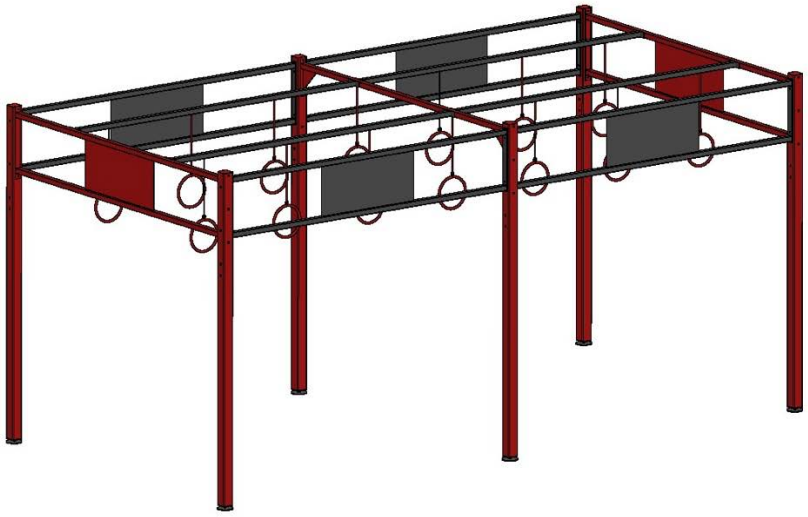






APPENDIX B – Welded Frames

Welded frame examples. Images courtesy of Hungarian OCR Association




Ladder