

Tunnel Research 2023:

Introduction:

Pipe tunnels are common obstacles used in dog agility courses, which require the dog to run through a flexible pipe that is supported by a series of hoops. Currently, these tunnels can be made of different materials such as PVC, nylon, or rubber and can vary in length and diameter. Safety is a crucial concern in dog agility, as the sport involves a high degree of physical activity from dogs. Therefore, it is important to evaluate the safety of pipe tunnels used in dog agility courses in the UK.

The Kennel Club, which is the governing body for dog agility in the UK, has established safety standards that include guidelines for the construction of pipe tunnels. According to these guidelines, the pipe tunnels must be made of materials that are safe for dogs, with no sharp edges or protrusions that could cause injury. The tunnels must also be securely anchored to prevent them from collapsing during use.

Current Regulation: 3.h.i

“Pipe Tunnel—This obstacle should have a diameter of a minimum of 600mm and should be a minimum of 3m in length. The tunnel may only curve in a single direction.”¹

Pipe tunnels used in dog agility courses in the UK are typically made of PVC or nylon. Both materials are flexible, durable, and lightweight, which makes them ideal for use in agility courses. PVC pipes are typically more rigid and provide a more stable tunnel for dogs to run through, while nylon tunnels are more flexible. However, the choice of material used for pipe tunnels ultimately depends on the preference of the equipment manufacturer.

Rationale:

- Apart from jumps, tunnels are one of the most commonly used pieces of equipment in agility with sometimes upwards of six being completed in any one course, in comparison to tyres/walls that are rarely used and if they are, they are only used once on a course.
- Tunnels often generate speed from dogs, who accelerate into and out of tunnels as they are ‘fun’ pieces of equipment that dogs are introduced to from a young age.

“The primary objective of the kennel club is to promote in every way, the general improvement of dogs and furthermore protect and promote the dog’s varied roles in society” ².

This research asks the Kennel Club to consider further research and improvement in specific relation to tunnels.

¹ [H Regs Mini Guide 2023 \(thekennelclub.org.uk\)](https://www.thekennelclub.org.uk)

² Kennel Club Website

Data Collection:

The Competitor Questionnaire

- A fully anonymised questionnaire was shared on 'Agilitynet' and 'dog agility UK pages' on Facebook
- There were 200 responses in total, which means on at least 200 occasions dogs have slipped/fallen
- This data only looked at those dogs who have sustained a fall/slip in a tunnel and therefore does not ask questions on those that have not had a fall/slip.

The Judges and Trainers Questionnaire

- A fully anonymised questionnaire was shared on 'Agilitynet' and 'Dog agility UK pages' on Facebook
- There were 83 responses in total

Emails were also sent to gather addition information to:

- Head Team GB Vet Victoria Fraser
- Kennel Club Agility
- Manufactures Galican and Agiflex

Throughout this report I will refer to different types of tunnels by the following abbreviations:

Type of Tunnel	Abbreviation
No Anti-Slip Technology Tunnel	NAS
Half Anti-Slip Technology and Half No Anti-Slip Technology Tunnel	H&H
Full Anti-Slip Technology Tunnel	FAS

Results:

Trainers/Judges were asked how often they use tunnels in their course design with 100% saying very frequently or all of the time.

Tunnels are used for a number of reasons with trainers/judges stating these as the most common reasons:

- Creating safe lines onto contacts
- Allowing handlers to send to tunnels and cut corners or easily change sides (especially for lower grades)
- Provide an opportunity for dogs to accelerate
- Provide fun, interesting and challenging courses
- Test tunnel skills such as sending to tunnels, tunnel threadles, tight turns out of tunnels, object discrimination such as weave entry / tunnel

1. What is the height of the dog who fell/slipped in the tunnel?

[More Details](#)

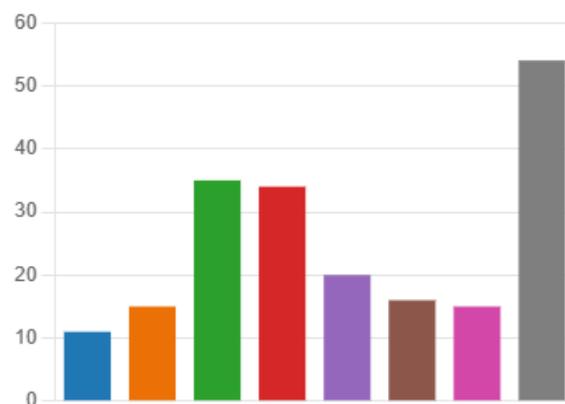
● Large	64
● Intermediate	53
● Medium	53
● Small	30



2. What was the grade of your dog when the fall/slip occurred?

[More Details](#)

● Pre-Competition/Young dog	11
● Grade 1	15
● Grade 2	35
● Grade 3	34
● Grade 4	20
● Grade 5	16
● Grade 6	15
● Grade 7	54



Wide range of heights and grades surveyed in this questionnaire. It appears that grade 7 dogs are more likely to fall, however, it could be that more grade 7 handlers responded to the survey.

The significant majority of falls/slips occurred at a competition (152/200) and at outdoor venues (130/200). This could be due to the lack of indoor venues and that most competitions are held throughout the summer in outdoor venues.

Outside Show conditions:

Outside Conditions	Surface	Type of tunnel slip/fall occurred in:
Dry (68)	Grass 85%	NAS (64%), H&H (25%), FAS (11%)
	Sand 15%	NAS (44%), H&H (44%), FAS (11%)
Wet (68)	Grass 96%	NAS (50%), H&H (38%), FAS (13%)
	Sand 3%	NAS (100%)

Indoor Show conditions:

Indoor Conditions	Surface	Type of tunnel slip/fall occurred in:
Dry (64)	Astro (17%)	NAS (66%), FAS (34%)
	Sand (83%)	NAS (33%), H&H (30%), FAS (37%)

The majority of the slips/falls occurred on grass, this could also be due to the high number of competitions held on grass throughout the summer. In addition, the lowest numbers were Astro/rubber, but this could be due to the low number of venues that have these surfaces. Many judges/trainers and competitors reported that wax/silica based sand was the most dangerous due to the inside of tunnels building up with grease. The build up of sand in the bottom of tunnels may prevent any anti-slip technology from working.

The majority of falls/slips occurred in

- NAS 48%
- H&H 31%
- FAS 21%

Judges/trainers were given an open text box to expand on any points they wished to raise. 67% suggested more research was needed to be done into tunnel manufacture and quality of tunnels so that there was a minimum standard. 72% said that the tunnels should be one uniform material and that H&H slip should not be permitted.

One judge/trainer said "1/2 anti-slip tunnels are by far the most dangerous, dogs bank at different points and even a reasonably well placed 1/2 slip so it is on the curve will not be in the correct place for all dogs going through it. Securing tunnels with pegs and compressing with the canvas/waterproof material can be very dangerous for restriction of tunnel shape and impact. Poor quality tunnels that do not have a good spiral binding on the outside mishape far too easily. Full anti slip tunnels are what should be mandatory, but we still then need very high quality. Equipment suppliers are not held to account enough at shows, equipment should be checked at regular times, quality of materials should be improved and regulations need to be more precise about expectations of equipment quality".

63% of falls/slips occurred in dark tunnels (dark red, Dark purple, dark green, dark blue, black, other dark shades). This was supported by the judges/trainers questionnaire where 88% said they would not use a dark coloured tunnel because:

- More difficult for dogs to see
- Lighter tunnels allow more light to penetrate
- Dark tunnels may make it hard for dogs eyes to adjust quickly
- Dark tunnels may get hotter in warmer weather
- Dark tunnels may be unwelcoming for younger/inexperienced dogs

One judge/trainer said “Black inside a tunnel is a no-no in my opinion as should be half non-slip design. Equates to when I did motor sport and you got ‘slide’ when normal conditions but with those the dog wasn’t used to the grip half then lost it on the top half.”

28% of judges/trainers have had to remove tunnels. Reasons given are:

- Rain caused slippery conditions.
- Poor fixings
- Exposed wires/damaged tunnels
- Not enough tunnel fixings available
- Only poor-quality tunnels available

67% of dogs slipped/fell in tunnels that were secured by sand bags that were not drilled into the ground. 33% of dogs slipped/fell in tunnels that has straps that were secured with pegs in the ground. By having tunnels that are not pegged it could be that they move during the course of a class and therefore angles of entry and exit are different. Bags made with Velcro fixings may not be as secure on sand arenas due to the sand getting into the Velcro, preventing a firm grip.

One judge said, “I’ve seen tunnel slips frequently at indoor shows where unable to peg tunnels so have shifted (especially with large dogs) Sandbagged tunnels need to be checked regularly”.

66% of judges and trainers also reported that there were not enough sandbags on the tunnels (4 bags on 5m tunnel) and that this was a significant contributing factor to any fall/slip. Many judges commented that there were often not enough tunnel bags available at shows and that show managers were unable to provide them when they were requested. It would therefore be recommended that a minimum number of fixings should be stipulated so that equipment providers can ensure that the correct number of fixings are provided for each tunnel at each competition.

One judge stated “it is very important that the tunnels have an adequate number of bags/straps (min 1/m) and that they don’t make the top of the tunnel protrude downward. Straps should be wide and consideration should be give to them being less secure when the ground is wet and/or very soft. Preferably dogs should have a straight entry into tunnels when approaching at full speed.

Judges/Competitors were asked if they felt any manufacturers were safer than others:

- 64% stated that Naylor/JDA were more slippery
- Agiflex full anti slip + were stated as being the most safe by 82% of trainers and judges
- 52% also stated that Galican were most safe

One competitor said, "the tunnels I have seen most slips in are naylor, this being inside both on astro & sand", another said "Galican and agiflex are now the only tunnels I would personally teach on, but also train & compete on".

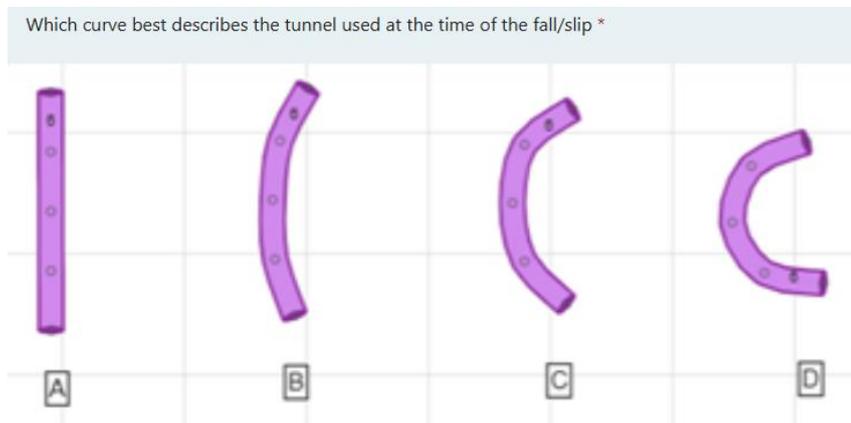
It is also worth noting that a 55% also commented on the fixings being just as important as the material that the tunnel is made from.

As many judges/trainers commented on Agiflex being the best manufacturers I contacted them to ask about their design and materials. Agiflex did not want to provide the exact materials their tunnels are made from, however, they did say the "**binding material and frequency of the binding is as important** as the tunnel material itself". They explained that they had done extensive research into materials used to produce their full antislip+ tunnel that was made from a complex technical polymer.

61% of dogs slipped and fell in tunnels that were 5m in length, with 25% falling in 6m tunnels and 13% in 4m and only 1% in 3m. It could be due to the amount of time dogs spend in tunnels, however, it would have been anticipated that the 6m tunnel would have the most falls/slips. Therefore, it could be suggested that this is instead to do with the amount of curve on a tunnel instead, with 4m and 3m having very little curve and 5m/6m tunnels having more curve.

Slips or falls occurred:

- A: 2%
- B: 8%
- C: 44%
- D: 35%
- With 11% stating 'other' and 'L', 'U' or 'V' shaped tunnels were used.



73% of judges/trainers stated that they would like more clarity on the angles each tunnel should be used for and 55% would like to see a ban on 'V', 'U' and 'L' shaped tunnels.

One judge said "I don't like to see tunnels curved in the opposite direction of dog entry as they have to change lead legs inside the tunnel which is more likely to cause slips. In an ideal world, all tunnels should be full non slip. All tunnels should be either straight or a gentle curve and not allowed to become L shaped".

³Competitors were asked what happened to their dogs:

- 72% of dogs suffered from a Fall – rotational fall and end up on their side
- 24% of dogs suffered from a Slip – such as an over extension of front or hind limb
- 3% couldn't see at the time but stated there was a significant time delay in dogs coming out of the other in of the tunnel
- 1% had a trip, such as catching their toe



Injuries reported by handlers included (in order of frequency):

- Shoulder injury 28%
- illopoas strain 14%
- Lameness 12%
- Bruising 11%
- Rear leg strain 9%
- Bicep injury (tear/rupture) 6%
- Toe strain 5%
- Pelvis injury 5%
- Lower back pain 3%
- Ripped dew claw 3%
- Slipped disc 1.5%
- Torn ALC 1.5%
- Cut under eye 1.5%

³ Hannah Grantham: Rush had a rotational fall (dog wet on side of body) Photo: Della Bachelor Photography

Some competitor responses quoted below as some dogs have suffered some very serious injuries:

- *“Tore his biceps tendon, couldn’t manage the injury so had surgery 18 months later to cut the tendon (BURPS procedure) and had to retire from agility aged 6”*
- *“5 months off agility, 2 months cage rest. Physio, laser and Chiropractic treatment required. Injury to infraspinatus. This happened in competition, on an over curved tunnel, on grass, in a third (JDA) slip and non-slip tunnel which had the non-slip part at the bottom of the tunnel. One paw was on the non-slip part and one on slip part of tunnel”*
- *“Total rupture of bicep”*
- *“Broken toe and bruised shoulder muscle and sore neck”*
- *“As a result of the slip my dog sustained a slipped disc requiring major back surgery at a specialist centre. Although he made a good and full recovery I was advised to retire him from agility which I have done. Such a shame as he was in his prime.”*

From those dogs needing rehabilitation/treatment before returning to agility

- 40% were out for up to 1 month
- 24% were out for 1-3 months
- 17% were out for 3-6 months
- 9% were out for 6-12 months
- 11% of dogs needed 12 months + or are still in recovery.

61% of dogs needed more than 1 month to recover and demonstrates that the safety of tunnels need to be investigated.

One competitor said, “my dog now refuses to do tunnels without a lot of encouragement”.

Another competitor said “my dog never returned to agility- reported to the KC but didn’t ever hear a response back - I think it was due to the failure of checking the tunnel was properly secured and re-securing the tunnel bags. I think the force of multiple large dogs going through a significantly curved tunnel with the tunnels pegged to the ground meant that the Velcro kept loosening because nothing else could give and it wasn’t checked often enough”

This would be consistent with my research from Head Vet for Team GB Victoria Fraser who states:

‘Slipping in a tunnel would likely cause a muscle/tendon tear especially paraspinals and iliopsoas along the back. These injuries are usually a 3 month rehab period’.

From those incidences that occurred at shows, only 9/156 competitors and 6/58 judges recorded the incidences in the incident book out of a possible. Therefore, the KC may not be aware of the significant injuries and incidences occurring. The KC were emailed on Wednesday 22nd February to ask for information about how many incidences had been recorded in relation to tunnels, however, they have not yet provided information at the time of writing this report.

One competitor said "I went to report this in the incident book and was told I was not allowed as it would make the show look bad...my dog came back after 6 months off and expensive cost for recovery etc...she then soon retired as the injury kept coming back after a run or 2. She had to have her broken toe amputated and still limps"

Another one said "I was not allowed to write in incident book as the show deemed it not there problem. My boy was a boxer X and he was powerful and lean. To hear the fall and him coming out upside down and twisted and screaming was awful. I scooped him up and went got my vet friend to see him and I drove straight to my vet 2 hours away. Chiro and physio, laser treatments hydrotherapy was done".

The final question gave competitors and judges/trainers an opportunity to have a free text box to expand on any points they wished to raise or be considered:

- a. 68% raised concerns about course design, with inappropriate approaches. It was commented that on some courses the tunnel was used numerous times but dogs came from a number of different approaches and not all the angles were suitable. If the line of approach means that the dog hits the inside of the curve of the tunnel instead of the outside of the curve, it can create a pinball effect as they try to correct their trajectory through the tunnel whilst also trying to maintain speed.
- b. 33% raised concerns over lead leg change in tunnel through course design being a factor in slips/falls.
- c. 7 competitors commented that judges need to ensure that tunnels are fully stretched out to prevent ridges
- d. 15 competitors raised concerns about judges not keeping an eye on the movement of tunnels throughout a class, and that ring party should be directed better to check on tunnels and ensure that they didn't move, perhaps introducing 'spray paint' to aid judges

One judge said "Course design is one of the main factors in dogs slipping in tunnels. A clearer guidance on approach's and bends would be helpful".

Another said "Use in course design and understanding of lead legs, speed vs turns and using tunnels in soft curves or straight lines needs to be conveyed more to the judging/training community. The love the lines seminar were excellent"

a, b, c, d— can all be addressed through quality CPD for existing judges and training of judges, with specific examples and diagrams shared in the equipment guidance

- e. 48% raised concerns about too much curve being created in shorter tunnels.
- f. 59% raised concerns about the number of fixings holding tunnels and felt that there were not enough or that the fixings used were not fit for purpose and kept coming off/were too loose.
- g. 88% felt that dark colours, especially black shouldn't be used
- h. 82% raised concerns about quality of some equipment manufacturers and the lack of consistency/statutory requirements for their manufacture, with different materials used and different distribution/quality of binding

e, f, g specific regulations could be brought in to clarify for judges the specific angles allowed in each length of tunnel, the minimum number of fixings on each length of tunnel, the colours of tunnels allowed and regulations on the minimum expectations of the materials used and binding requirements

- i. In those incidents occurring in H&H tunnels 92% stated that their dogs had 'banked' the tunnel and the change in material on the H&H had caused them to fall/slip

i – the KC could bring in a regulation to ban the use of H&H tunnels

- j. 33 competitors and judges/trainers raised concerns about quality of surface dogs were asked to run on, such as long grass, or recently mowed grass where cuttings built up inside the tunnel, or sand arenas where sand filled the base of the tunnel after dogs have ran through it and were not checked during classes

One competitor said "the venue's grass was not short enough for fast small dogs with small paws. Smaller dogs can get paws caught in internal grooves of curves tunnels more easily. Not enough sandbags meant move movement."

j – more research needs to be carried out by the KC equipment panel to look at surfaces dogs run on to see if they are all fit for use. Wax coated sand appeared on 33 occasions as being unsafe due to the build of grease on dogs paws/inside of tunnels preventing grip.

- k. 5 competitors were 'not allowed' to write in the incident book when they tried to record the incident

k - this is an issue which needs to be raised within the agility community through ALC and KC need to send a statement out to show organisers to ensure this practice is not continued in the future

Other factors that are difficult to consider in this survey but will have an impact are:

- **Different breeds/weights/shapes and sizes of dog** (this will affect the velocity of dogs when travelling through tunnels)
- **Different speeds of dogs** (this will affect the velocity of dogs when travelling through tunnels)
- **Amount of hair on feet of dogs** (more work could be done through training and education from the KC to explain to competitors about the importance of keeping hair trimmed around and in-between pads)
- **Nail length of dogs** (more work could be done through training and education from the KC to explain to competitors about the importance of keeping dog's nails short)
- **Position of tunnel in course/course design** as this variable will be different depending on the judge, grade and course (more work could be done to education new judges and carry out continuing mentoring and CPD for existing judges to support with course design and dog lines)

Conclusions/Recommendations:

A large study of over 1000 participants carried out by Frontiers stated that:

“The highest-ranking research topics were identification of risk factors for specific types of injuries, improvements in equipment and understanding of safe course design, and physical conditioning programs to prevent injury”⁴.

This research project has opened a variety of factors that have an impact on the safety of tunnels. These are the main factors based on the research:

1. **Approaches into tunnels**; CPD, mentoring and better training for judges on safe, realistic, and appropriate (not fantasy) lines, with clear guidance and diagrams given in the judges equipment document
2. The **appropriateness of sand surfaces** for competitions, should competitions be allowed to silica-wax sand which creates a grease inside tunnels?
3. The **appropriateness of grass venues**, show organisers should ensure that recently cut grass is collected when mowed and not left on the ground to collect inside tunnels.
4. **Moisture** such as rain collecting inside tunnels, are tunnels checked regularly to ensure they are not collecting water
5. **Maximum curvature** on tunnels for lengths being clearly specified for judges
6. **‘L’, ‘U’ and ‘V’** shaped tunnels are not permitted
7. **Stretching of tunnels** fully to prevent ridging
8. There is a huge discrepancy in the **types of fixings** used and their quality. More research is needed to constitute which are suitable and fit for function and which are not.
9. A specific **number of fixings** needs to be specified. Many judges stated a rule of 1 per m + 1.
10. **Movement of tunnels** during a class to be closely monitored by the judge.
11. With the advancement of **materials and manufacturing** tunnels can now be made from a variety of quality materials. However, there are no regulations to state which materials are suitable. There should be a minimum requirement stated to ensure consistency and quality.
12. The **binding of tunnels** is just as important as the material that tunnels are made from. The frequency and material the binding is made from should be regulated so that there is a standard binding material and minimum distance the binding must occur to ensure tunnels keep their structure.
13. Only **light-coloured tunnels** are permitted. Black and dark coloured tunnels are not permitted.
14. Only **single material tunnels** are permitted (NAS / FAS). H&H are not permitted.
15. Competitors and judges using the **incident book** for recording falls/slips. Template to be looked at to collect data on manufacturer, number of straps, type of strapping, course plan, ground conditions, surface, colour of tunnel as examples of criteria needed.

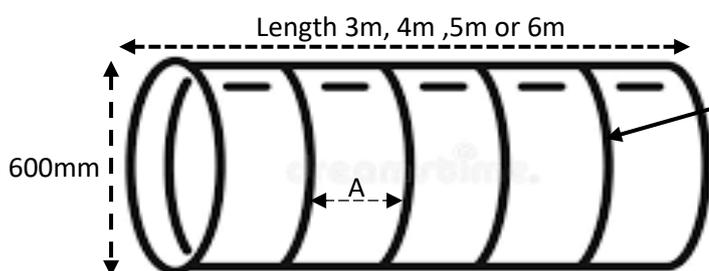
⁴ [Frontiers | Adverse health events and recommended health research priorities in agility dogs as reported by dog owners \(frontiersin.org\)](https://www.frontiersin.org). March 2023.

Proposal for ALC to discuss at next meeting:

Change to: Regulation - 3.h.i to: (insert in green)

Pipe Tunnel

- This obstacle should have a diameter of a minimum of 600mm
- Should be a minimum of 3m in length, can be 4m, 5m and be a maximum of 6m.
- The tunnel may only curve in a single direction. The angle of curvature must be a maximum of
 - 3m = 0° curve- straight only
 - 4m = 0° curve- straight only
 - 5m = -60° maximum curve
 - 6m = -90° maximum curve
 - V, U or L shaped tunnels are not permitted
- Be made in bright/light colours only- such as bright blue, green, pink, purple or yellow
- Must not be made of dark colours such as black, dark purple, dark blue or dark red
- Tunnels should be made in one uniform flexible material. This material should be made of a high quality technical polyester-based fabric covered with PVC on both sides.
- The inner surface could be rough to be fully anti-slip with a minimum gripping depth of 300µm.
- H&H are not permitted (tunnels must only be NAS or FAS)
- Tunnels must be fully extended to prevent ridges forming
- Tunnels should be made in a way that its shape/form does not change when fixed by sandbags or other fixings
- Tunnel fixings must be safe for dogs and avoid excessive movement of the tunnel when a dog negotiates it
- Fixings **must** occur in a frequency of 1 per m + 1, for example a 5m tunnel must have a minimum of 6 fixings



Thick metallic spiral covered in black rubber ensures the tunnel is resistant to deformation and maintains 'roundness'. The spirals must be fully attached to the tunnel material with no exposed wiring.

Metallic spirals should be frequent enough to provide strength and support to the tunnel. A - the distance between the spiralling should be a maximum of 110mm.

Appendix

Suggestion of equipment regulations:



A and B: 3m and 4m tunnels have 0° angle and must only be used straight

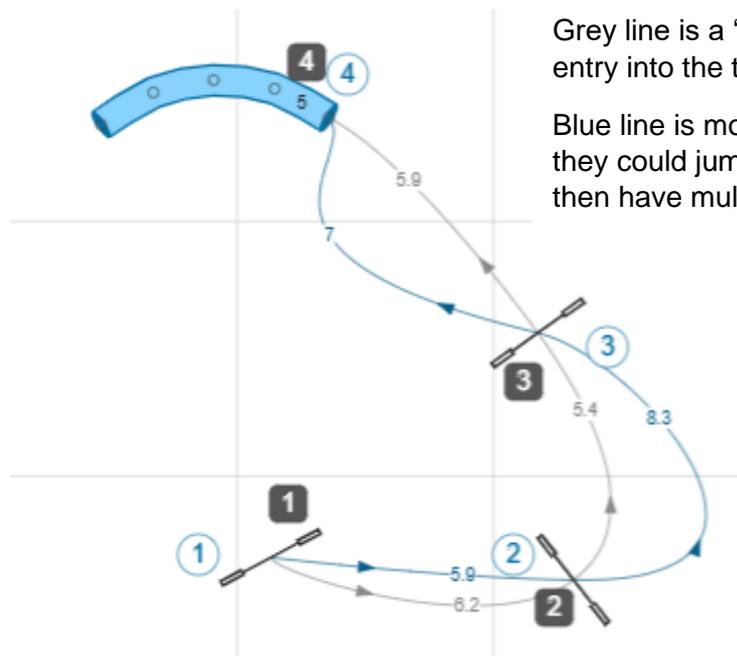
C: 5m -60° angle maximum curvature

D: 6m -90° angle maximum curvature

E: L shaped tunnel not permitted

F: U shaped tunnel not permitted

G: V shaped tunnel not permitted



Grey line is a 'fantasy line' and may not provide a straight entry into the tunnel

Blue line is more realistic, if the dog jumps long over 2 they could jump 3 more on a slice towards the handler and then have multiple change of legs to get into the tunnel

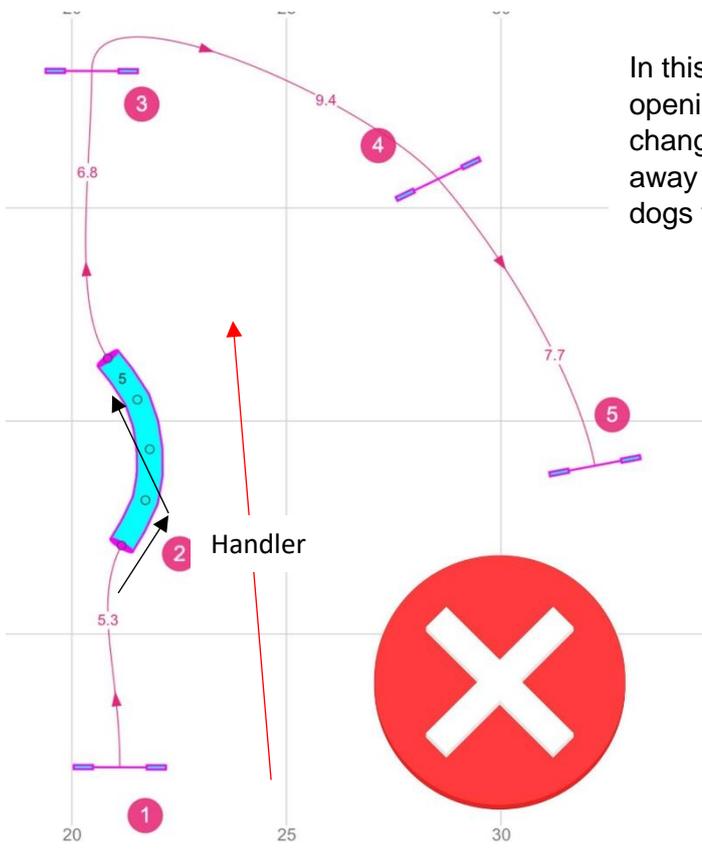
Examples of good and bad course plans as designed and shared by **Martin Reid**

In this course design the dog will hit the left hand opening of the tunnel and potentially pinball along the length of the tunnel

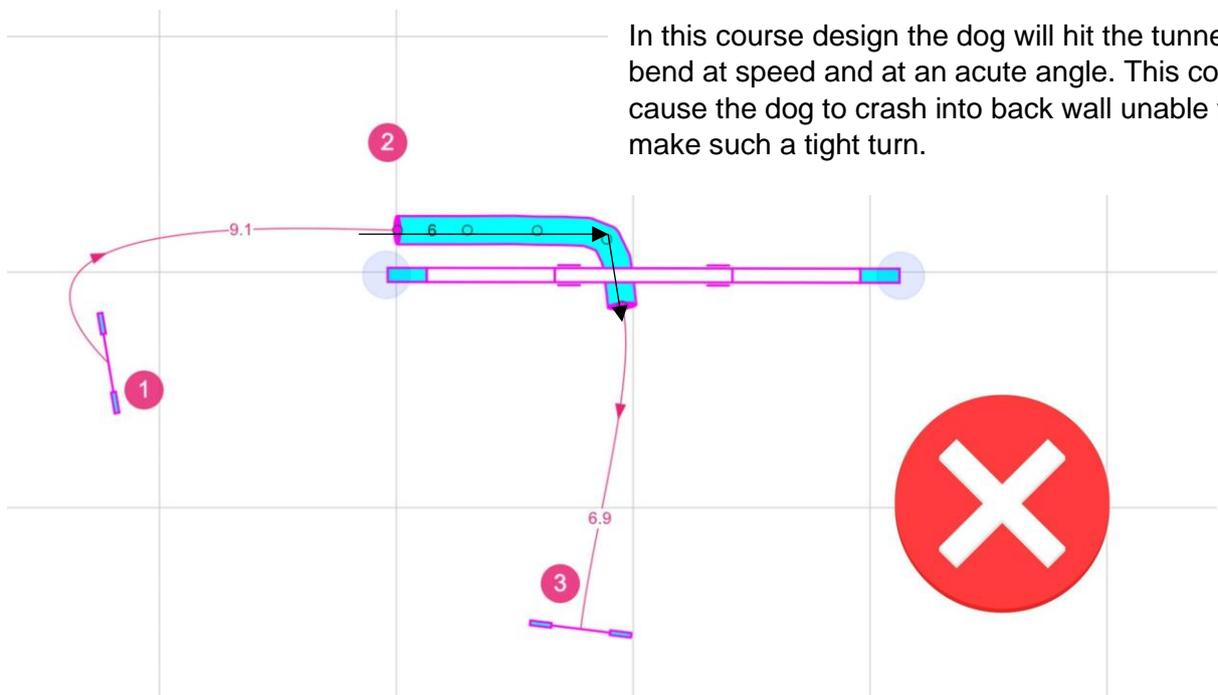


In this course design the dog will hit the tunnel opening on the left leg and then must change lead leg twice throughout the tunnel





In this course design the dog will hit the tunnel opening on the right lead leg and then must change lead leg in the tunnel. This will also be away from the direction of the handler which many dogs would find challenging.



In this course design the dog will hit the tunnel bend at speed and at an acute angle. This could cause the dog to crash into back wall unable to make such a tight turn.

