



FEI Cross Country Course Design Guidelines

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FEI Cross Country Course Design Guidelines

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Preamble

This document sets out the fundamental aims and expectations of the FEI with regard to Cross Country Course Design at the different levels and types of our sport.

Being the official document of the FEI Eventing Committee on Cross Country Design it is intended to set a clear indication of what is expected from the Course Designers in the next years, but is also intended, as an "open project", to reflect all new ideas, findings and lessons learned.

This document will be constantly updated with all new findings and best practices based on experience at both international and national level.

The following notes are for guidance and do not want to represent a complete guide to course design!

Aim and philosophy

	FEI Eventing Rules	
	The Cross Country Test constitutes the most exciting and challenging all-round test of riding ability and Horsemanship where correct principles of training and riding are rewarded. This test focuses on the ability of Athletes and Horses to adapt to different and variable conditions of the Competition (weather, terrain, obstacles, footing, etc.) showing jumping skills, harmony, mutual confidence, and in general "good pictures".	

The aim of the CD is to set the appropriate test for each level but also produce a good 'picture'. Therefore the best Horses and Athlete Athletes should be able to make the course look easy.

It is the Course Designer's responsibility to design courses that help to produce better Horses and Athlete Athletes.

The CD should not build to "test the best" but rather be thinking about a fair course for the level so all have the opportunity to complete without taking a multitude of Black Flag options.

At the lower levels the emphasis is very much on the education of Horse and Athlete introducing both parties to a wide variety of fences and simple questions. As the levels progress so the degree of difficulty of the courses should suitably reflect the particular level. At the highest level the balance is more on the examination of the skills of the Horse and Athlete in a sophisticated manner. The "intensity" of the courses may increase as the levels become higher.

As a general philosophy the numbers of finishers is more important than the number of clear rounds. It has to be accepted that the quality of the field and the weather conditions can impact on the statistics and that, particularly at the higher levels, many Athletes now choose to retire once they are clearly out of contention or are not going to achieve a qualifying result, and that these issues are reflected on the scoreboard with more retirements and less "cricket scores". Similarly the 'elimination after an Athlete fall' will create many more eliminations.

The goal of seeing as many finishers as possible is desirable for all levels, but the degree of difficulty must not be compromised in order to achieve this, for example by the over-use of alternatives.

It is felt that one of the essential skills of riding cross-country is being lost with the advent of bigger timber and softer profiles. Athletes must be able to slow down and be able to jump, out of a rhythm, the occasional simple, more "upright" type of fence.

This applies to all levels of Competition. Any fence like this, if created, must be suitably positioned in the middle of a course off a turn and/or on slightly rising ground where Athletes will not be tempted to gallop fast at it and it must be built of 'Horse friendly' materials and not 'sawn timber'.

Special care must be taken, particularly at the lower levels, in how and where these fences are sited and constructed.

It also is important that all officials recognize the different standards of, and understand what is appropriate at, the various star levels. The belief is that the levels should be the same around the world, i.e. a 2 star in the UK or Brazil should be the same degree of difficulty as a 2 star in Australia or Russia.

Additionally, it is expected that national classes of this level (CNC**'s) should in principle be of the same standard.

Where different levels are running on the same venue at all levels there should not be more than two shared fences.

General guidelines and levels

Some simple guidelines for all levels

- The aim of the designer is to provide a suitable test for the level of Competition without exposing Horses and Athletes to a higher risk than what is strictly necessary to produce the right test for that level.
- Fences and questions should never be above the particular standard of Competition or justified by the use of alternatives or options.
- Horses and Athletes should be encouraged and have their confidence built, not destroyed.
- It must be recognized that our sport is about achieving a standard, not about pushing the standard above what it should be. This includes measuring the length of the courses fairly and reasonably.
- Any/all questions must be fair. It is not acceptable to try to catch Horses out using unfair distances or by trying to be too clever or over complicated.
- Horses must be given time (2 or 3 strides) to understand clearly what they are being asked to jump.
- Course designers have to appreciate and take into consideration the part that inclement weather can play on the severity of a course. If or when conditions deteriorate officials must readily be prepared to reduce the jumping "effort" required by the Horse at all levels because of the energy sapping nature of the conditions.
- Course designers have to be their own biggest critics!
- Course designers must understand that courses must prepare Horses and Athletes for the next level of Competition and need to be of the correct degree of difficulty.
- Course designers are encouraged to use occasional more vertical fences, open oxers and open corners at all levels where it is appropriate to site them in a user friendly place (ie off a turn and/or slightly up hill). **The reintroduction of such type of fences should anyway be done gradually and with great care.**
- Any Horse should be able to jump a straightforward fence of maximum dimensions at any particular level – big does not necessarily equate to difficult!
- We should be looking to give Horses and Athletes the opportunity to show what they can do and are capable of rather than seeking to find out what they cannot do.
- All courses must "flow" and permit a good "rhythm". Tight turns should be avoided early in the course and especially late in the course. 'S' bends are not recommended unless there are four or more strides between elements.
- Wherever possible it is better to have turns before fences and especially at combinations rather than after fences.
- All courses should offer a positive experience.

One star

- The One Star level is truly an educational and introductory level to international Competition. It is not appropriate to put exercises seen at the four star level onto one star courses at 1.10 metre height!
- The first step on the ladder introducing Horses and Athletes to a wide variety of fences and simple questions.
- There will probably be a wide variety in the age group of the Horses competing and a wide range of Athlete ability.
- The emphasis is very much on education of Horse and Athlete.
- Simple combinations, turning and accuracy/line questions, corners, ditches, etc. need to be introduced.
- The "intensity of effort" is low and regular "let up" fences are needed.
- The Course Designer should ask himself if the direct route is appropriate or if it is felt that an alternative is needed.
- If an alternative is needed the direct route is probably too difficult. Alternatives should be the absolute exception at the One Star Level, except for 'skinny' fences and/or where it is difficult to re-present the Horse at the fence.
- We should not be embarrassed if the majority of the Horses jump around at this level, "clear and inside the time".
- To always remember that this level also needs to prepare Horses for 2 star Competitions.

Two star

- Many consider this the most difficult level to design well for, as it is still an "educational" level, but it must also prepare the big step to the three star level.
- Often the best way to determine this level is to ask if the question is a one star question or a three star question. If the answer to both is "no" then it is probably a two star question!
- If the answer is yes then the level of difficulty needs increasing or decreasing as appropriate.
- As this is still an educational level CD's should again ask themselves the appropriateness of the direct route if it is felt an alternative is needed as alternatives at the Two Star Level should again be the exception, except for 'skinny' fences and/or where it is difficult to re-present the Horse at the fence.
- More sophisticated types of questions must be asked building on what has been learned at 1 star level.
- Less "let up fences" than 1 star but still recognizing that this level is where many Athletes will introduce their Horses to Long Format Competition having by-passed the 1 star level.
- The trend is currently to begin to "cluster" fences at this level which puts more emphasis on the intensity in those sections of the course. This should never be overdone at any level and keeping a certain regularity of fences is key for the balance and flow of the course.

Three star

- Three star is the first level that should start to examine the skill of the Athlete and the athleticism and rideability of the Horse. The balance begins to swing from education to examination.
- Therefore the questions will start to become more sophisticated and there will be more clustering of fences for spectators and TV. This should never be overdone at any level and keeping a certain regularity of fences is key for the balance and flow of the course.
- This is a level that qualifies Horses for Championship Events so must be a stepping stone to those competitors.
- The "intensity of effort" increases from the two star level, there will therefore be less "let up" fences and more related obstacles. However this level should still give Horses and Athletes the chance to learn and benefit from their experience.
- In setting this test Course Designers need to be careful not to overdo the intensity of the questions asked (refer to section on intensity of effort).

Four star

- This is the ultimate Cross Country examination with the most sophisticated courses where the accumulation of jumping efforts has an effect on the mental and physical tiredness and confidence of both the Horse and Athlete.
- These are the most difficult courses to set as the margin for error is the smallest so only experienced designers and officials should be used.

Flow and measurement of the course

Flow

In every course there should be a beginning, middle and end.

- **Beginning:** 3- 5 fences to get Horses and Athletes thinking forward with a good rhythm. The lower the level the more fences you need.
- **Middle:** The meat of the course, where the main questions are asked. Don't start with the most difficult question. But rather let the difficulty progress and then ease off towards the end when Horses maybe getting tired. In principle after every question there should be an easier confidence boosting fence, particularly at the lower levels.
- **End:** 3 or 4 easier fences to produce a feel good factor. At the end of the course these fences should if possible be off a turn to prevent a mad gallop to the finish.
- **Wherever possible try and avoid the possibility of Horses landing static after a fence particularly at combinations and where a turn is involved after the fence**

Measurement

The course must be measured on a realistic riding line after the fences and string are in position. It is inappropriate if Athletes are measuring the course 50-100 metres longer then the officials.

Intensity of effort - CICs and CCIs

- ⌚ When considering the "intensity of effort" officials should take into account both terrain and ground conditions and discuss with the Course Designer their thought process in courses that are outside these guidelines.
- ⌚ Course Designers should understand the number of efforts they have on every minute of their course. A large number of efforts (6-9) combined with significant terrain is not appropriate in any given minute.
- ⌚ The Course Designer should also understand the physical effort involved with every fence. For example the straight forward galloping fence jumped out of rhythm actually gives a Horse a 'breather'. The fence where the Horse lands 'static' and has to accelerate away is very tiring.
- ⌚ Important to remember also the mental effect that a course can have on Horses; courses can be mentally demanding. Every time a Horse or Athlete steps up a level it is like them going to their first 4 star!!
- ⌚ Intensity is a much debated subject and it is up to all officials not to overdo this. It is impossible to cover this subject in detail since each site is different.
- ⌚ The window of distances and efforts is there to give designers flexibility but it is essential that courses must still flow and have a good feel and balance.
- ⌚ If the Course Designer wishes to use the maximum number of permitted efforts in a Short Format Competition the course will inevitably be much more intense than if the maximum number of permitted efforts are used at a Long Format Competition, so Course Designers should always relate to the Guidelines below
- ⌚ It is suggested that in Short Format Competition, recognizing the intensity is a possible issue, there will be one or two less "related" types of questions or combinations compared to what one would expect in Long Format Competition.

Guidelines

Short Format Competition: There should never be more than one jumping effort per commenced 100 metres at all levels. The Guideline is not more than one effort per 110 metres at three star, 105 at two star and 100 at one star.

Long Format Competition: not more than one jumping effort per commenced 125 metres.

Eventing Rules 24th Edition effective 1st January 2014

Long Format	Four Star (4*)	Three Star (3*)	Two Star (2*)	One Star (1*)
Distance	6270 - 6840 m	5700 - 6270 m	4400 - 5500 m	3640 - 4680 m
Jump. Efforts	40 - 45	35 - 40	30 - 35	25 - 30

While the CD and TD may adjust in either direction to take account of the terrain, the number of efforts should be broadly proportional to the length of the course

Short Format	Three Star (3*)	Two Star (2*)	One Star (1*)
Distance	3420-3990 m	3025-3575 m	2600-3120 m
Jump. Efforts	30-35	27-32	25-30

Frangible deformable devices

“2014 Eventing Rules – Article 547.2.4 Frangible/Deformable Obstacles :

Obstacles can be provided with frangible/deformable technology only if such technology has been approved by the FEI according to the FEI Standard for the minimum strength of frangible/deformable cross country fences. A list of approved technologies is published on the FEI website.”

As from the 1 January 2013, all frangible/deformable devices used in FEI competitions will have to be approved by the FEI according to standard.

In order to have devices approved to be used in FEI competitions the manufacturers are called to comply with this standard and apply for the registration of their product on the FEI list of approved frangible/deformable devices to be used in FEI competitions.

The device can and will be approved by the FEI after passing all the tests and requirements (fitting instructions, etc) as detailed in the standard.

- **Standard for the minimum strength of frangible/deformable Cross Country fences**
<http://fei.org/fei/disc/eventing/risk-management>

For the purposes of this standard, TRL (Transport Research Laboratory (GBR)) has been appointed so far as the FEI approved inspection authority.

If needed, the FEI will examine requests to approve additional institutes to act as FEI approved inspection authority for the purposes of this standard. (04.06.2012)

- **Register of Products** having met the Standard for the minimum strength of frangible / deformable cross country fences <http://fei.org/fei/disc/eventing/risk-management>

A frangible device must only be used after the specifications, appropriate sitting and materials of a normal fixed obstacle have been established, whereby the use of such a device will only enhance the safety of the fence.

The design and construction of a traditional fixed fence must never be compromised by the use of a frangible device.

Fences difficulty and risk level

	Vision statement for Eventing Risk Management Policy	
	<p>Eventing constitutes an exciting and challenging all-round test of riding ability and Horsemanship within an accepted and acceptable level of risk. Every effort must be taken by all involved in order to ensure that, at each level, responsible Athletes are participating with progressively trained Horses in order not to be exposed to a higher risk than what is strictly inherent to the nature of the Competition and generally acceptable to stakeholders.</p>	

The safety of Horse and Athlete has an ever-increasingly high profile in the image, evolution and financial well-being of our sport and cannot be overemphasized.

The task of a Course Designer is to produce a Cross Country Test of the level required without exposing Horses and Athletes to a higher risk than what is strictly necessary to produce the right test for that level.

Questions can be difficult, but should not be "risky" and the course designer must always visualize what can be the consequences of an error from the less experienced Horses and/or Athletes.

Course Designers must consider the possible consequences of a fall at any fence, eg hazards after a fence.

	The International Hartington Report - April 2000	
	<p>A fundamental conclusion which pervades every detailed recommendation is that everything should be done to prevent Horses from falling: this single objective should greatly reduce the chances of Athletes being seriously injured as well as significantly improving the safety of competing Horses.</p>	

Significant studies are under way, which may well lead to improvements in lowering the level of risk inherent in the Cross Country test both in the form and setting of obstacles, and in devising special devices which can limit the consequences of error or accidents in certain situations.

The FEI is committed to making this promptly available through all channels at its disposal and this document constantly updated will reflect all new findings and lessons learned.

These notes are based on experience in the use of certain types of obstacles on both International and National level, and are intended to constitute a guide as to how to design and construct fences to lower the risk for Horses and Athletes in the Cross Country test.

Criteria for evaluating difficulty and risk level

Approach

- Uphill – easier
- Downhill – more difficult
- Straight – more difficult
- Off a turn - easier

Footing

- Good footing – easier
- Deep or loose footing – more difficult

Materials

- Brush – easiest and most forgiving
- Roof/sloping leading edge – forgiving
- Log – still forgiving
- Rails/rounded leading edge – less forgiving
- Sawn Timber/90 degree leading edge – unforgiving
- Stone – unforgiving

Profile

- Vertical with uphill approach – acceptable
- Vertical with downhill approach – unacceptable
- Vertical with flat approach – 3* and 4* only

Ground lines

- Ground lines should be used to improve the profile of fences where felt essential.
- It is appropriate for there to be a discussion with the Course Designer as to the need or not of a ground lines. (Roof shaped tops of fences and large logs don't need ground lines unless on the down slope)
- Ground lines are generally appropriate at all levels on a downhill approach.
- Ground lines can be appropriate on steps out of water.

Every effort should be made not to have an unforgiving leading edge. Research has shown that the more a Horses mass can be deflected and the less it is stopped at impact the more forgiving the fence and the less the chance of a rotation. In the same vein a smooth surface is more forgiving than rough bark.

Dimensions

- Apart from the first fence all straight forward fences should be built to the height of the level being jumped. It does nobody any favours to get a 1.15 qualification over a 1.10 track.
- As a guideline fences on the down slope, before a step, ditch or other unexpected situation should be @ 5cms below maximum height.
- All spread fences should have the back edge not less than 2 centimetres higher than the front edge.

Combinations and related distances

- CD's should not try and trick Horses or Athletes and Horses should have 2 or 3 strides to be able to understand the question.
- Anything 4 stride (18 metres) or less must be on a true distance.
- All Officials should be clear that the more steps/strides there are between fences the easier the question because the Athlete has more time to make adjustments. The exceptions are the distances where the CD has used a fence as a set up for an exercise.

Guidelines for Bending Lines (subject to the types of fences used)

- In 1 - 2 strides it is very difficult to bend more than approximately 10 degrees. This would only be appropriate for the 3* and 4* levels.
- In 3 strides it is possible to bend more (60 degrees). Again this is only appropriate for the 3* and 4* levels.
- In 4 strides you could bend 90 degrees for the 3* and 4* level, 60 degrees for 2* and 45 degrees for 1*
- In 5 strides you could bend 90 degrees for the 2* and 60 degrees for 1*
- In 6 strides or more you can ask the 1* to bend through 90 degrees.

Lessons learned!!!

A Clear Question

- First and foremost, the question that the Horse has to answer must be a clear one, which should not be misunderstood by the Horse.

Hazards

- Unnatural hazards should not be placed behind a fence in a way that may distract a Horse at take-off, particularly if they resemble a human being

Table Fences

- At all levels up to and including 3-star, tables should be built with a sloping front face, sloping upwards away from the Horse on the take-off side of the fence.
- In the case of picnic tables with a bench in front, the top line of the table can have a vertical face of at least 25 cm and the bench in front should also have a vertical face of at least 25 cm.
- At all levels, the possibility of a false ground line must be avoided. Thus for instance in the case of a picnic table be careful when having a bench on the landing side of the obstacle.
- It is vital that the Horse is able to judge the spread of an obstacle – this may mean it is necessary to make the top of a table slightly ascending or to colour the landing edge if it might blend into the background.
- The back part of the table should be about 3 - 5 cm higher than the front part.

Verticals

- True vertical fences should not be sited where it is likely or very possible that Athletes/Horses will approach them at a very fast pace and out of balance.
- The precise degree of slope for such fences cannot be specified – this must depend on the particular site and fence, the level of difficulty of the course and the experience of the Athletes.

Spread Fences

- Fences with a top spread close to the maximum permitted for the level of Competition should not be sited in close proximity to hazards. Consideration should always be given in these circumstances to filling-in such spreads. It is important to ensure that the Horse can see the back part, using different materials, colours, flowers, etc. Special care must be taken when using spread fences as last element of a combination as they could be very punishing for a Horse in trouble in the combination.

Triple Bars

- A maximum of three-quarters of permitted base spread for each star level should be used for triple bars or open ditches.
- In general, where the maximum base spread is to be used, the highest point of the fence should be at a point between half and three-quarters of the spread.

Ditches

- At the one and two star levels a significant ditch should not normally be used in front of an obstacle forming the second or subsequent part of a combination, if the distance between the 1st and 2nd part (or 2nd / 3rd as relevant) is less than three strides.
- It is very important that the sides (back face) and bottom of the ditch can be clearly distinguished from the surrounding ground - the colour of the ground / surface should be different – even spraying ground with a coloured paint has been tried with some success!
- Consideration must be given to the depth of ditches: a very shallow ditch is not impressive enough for the Horse, whilst if a ditch is more than 60 cm deep arrangements must be made such that a Horse can be extracted if it becomes blocked in it.
- All ditches should be arranged with a ramp (slope) so that a Horse can be walked out of the ditch readily.

Brush Fences

- Where there is both a solid or fixed part and a soft "brush" part (for Horses to brush through it without causing injury to the Horse) to an obstacle, the fence will jump better if there is 25 cm or 30 cm of brush above the solid part.
- As the Rules specify the maximum height for the brush, then the solid part of the obstacle should be lower than the maximum permitted.
- For instance, at 3 and 4 star Event s where 1.40 - 1.45 m is permitted for the maximum height of the brush, the fixed part should actually be set at approximately 1.10 – 1.15 m.

Double and Triple Brushes

- It is highly recommended that double and triple brushes are "filled in" between the rows of brush, so that a Horse can Event ually put a foot down with safety.
- In the case of double brushes, it is recommended to "fill in" between the two rows of hedge.

Unjumpable parts of fences

- Unjumpable parts of a fence or combination of fences must be truly "unjumpable". This means that the Course Designer and Technical Delegate must be sure they close the places where they do not want the Athletes to jump in a way that for the Horse it is clearly a barrier and is impossible to try to jump.

Alternative obstacles

- Alternative obstacles, if possible, should be designed as the same type as the direct route, and not interfering with it.
- An alternative obstacle must not be sited in such a way as to encourage a quick jump following a refusal. For example it is not permitted to have an "elbow" attached to an obstacle on the front side as an alternative.
- Where possible, alternatives should be sited only behind the direct route, and on the landing side of obstacles. If this is not practicable (where ground slopes away or water involved) the alternative obstacle must be some distance away ensuring sufficient space to recover the impulsion is taken to jump it (at least three strides).
- For this purpose the black flag methodology is often very helpful for the Course Designer.

Bounce fences

- The elements of a bounce fence should not consist of true verticals – the face of the elements should be sloping. The use of contrasting colours for each element is highly recommended.
- At 1 or 2 star Events, bounce fences must not be built on downhill slopes. A bounce of maximum height is not appropriate at a lower level Event.
- Double bounce fences are allowed only at 3- and 4-star Events, except in the case of 'steps'.

Hole fences

- The height of the hole should not be less than 1.80 m and the width not less than 1.60 m.
- Any surface that can be touched by the Horse must always be soft (not susceptible to hurt the Horse or the Athlete).
- The spread should not be more than 50% of that permitted for the level. The comment about double brushes (see above) applies.

Fences with roof

- The roof should not be placed at less than 2.20 m from the top of the fence.
- It is not recommended to use roofs at water complexes where the Horse has to jump into the roofed area (e.g. where there is a roofed bank in the water).

Water fences

- Using different shades of colours or clearly differentiated colours is recommended. This makes the Horse quickly understand what he has to jump. Avoid optical illusions and also avoid reflective materials / gloss paint/ shiny varnishes.

Top line of bank or step out of water must be very visible in all conditions especially when wet after a few Horses have passed.

- Step out of water, a groundline is recommended and the previous fence should be not less than 13.7m before the step.
- While a slight slope on the ground where Horses land in water is recommended there must not be more than a 20cm change in the depth of water in the first two strides after landing.
- Water to water with a drop is not considered to be an appropriate question at any level.
- The use of 'white' coloured fences is not recommended when jumping into water.

Corners

- Open Corners are recommended at all levels where the approach is either 'straight' or off a turn.
- Closed in 'solid top' corners are recommended where there is limited re-action time, ie after a step or ditch or shortly after crest of hill.
 - Corners with a 'short' back rail are preferably not to be used at the lower levels, but can be used at the higher levels provided care is given to present a fence that is not confusing to the Horse. This should be achieved through the flagging and a correct use of decoration, so to create a clear single visual passage across the fence. If a frangible rail is used great care must be taken to avoid the risk of a Horse jumping onto the retaining post.
- **angles:**
 - 1 star 45 – 50 degrees
 - 2 star 60 – 65 degrees
 - 3 star 75 – 80 degrees
- **short back rails length:**
 - 1 star 2.70m
 - 2 star 2.35m
 - 3 star 2.00m

A Horse's Perspective

- **Uphill approach** – easier as long as there is the opportunity to keep the revs up.
- **Downhill approach** – more difficult because the Horse needs more help from the Athlete to maintain balance.
- **Approach off a turn** – easier because the turn helps with the balance.
- **Light into Dark** – difficult because it takes time for the Horse to establish where he is going/landing.
- **Towards daylight** – much easier for it is easy for the Horse to understand where it is going but guard against jumping a silhouette as this is potentially unsafe.
- **Straight-line combinations** – easier for the Horse as it has the most time to understand and assess the "question".
- **Bending line combination** – can be more difficult as the Athlete has to take a decision!
- **Blind turns** – difficult and not appropriate at 1* and 2* levels because the Horse has little time to assess to question.
- **Vision** – a Horse is a 'prey animal' and can see forwards and backwards so cannot focus like a Athlete, a 'predator.' Therefore at narrow questions and corners it sees the fence out of one eye and a wide open space with the other.
- **Color** – all two legged creatures see in color, all four legged animals including Horses see in contrast. Therefore officials must be cognisant of contrast (eg a dark colored rail in shadow is not a good idea).
- **Tiredness** – Remember a Horse can get mentally tired as well as physically.