



XC Course Design Guide For all FEI Officials

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Preamble

This XC Design Guide is for ALL FEI officials, not just course designers.

- It is a set of standards that the FEI expects all officials to work and adhere to but not all eventualities are necessarily covered and it is up to the event officials to make decisions based on the fundamental principles of fairness to Horse and rider alongside the overall aim of minimising risk. This Guide provides notes for guidance and do not represent a complete guide to course design.
- The guide seeks to help officials achieve the same standard of cross country course at each level of competition and seeks to improve standards of safety for Horse and rider.
- Fences that may be designed that fall outside this guide should be fair, as safe as possible, and of the right standard for level of the competition.
- 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 and other officials.
- As a general comment it is believed that the technicality of the modern courses has reached the point where we should not be more demanding in our expectations of what Horses are being asked to do in terms of intensity and technicality
- This Guide is also intended to be 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 FEI is committed to making all information at its disposal promptly available to its officials through all possible channels and these Guidelines will be updated on a regular basis to reflect all new findings and lessons learned.
- NFs are encouraged to undertake studies and initiatives with the aim and intention of lowering the level of risk inherent in the Cross Country test both in the form and setting of obstacles, and in devising special devices and mechanisms which can limit the consequences of error or accidents in certain situations.
- All CDs should be able to justify their work and if for any reason a fence or fences is/are produced that do not conform to this Guide the officials responsible at the event should be satisfied that the fence is appropriate
- These notes are based on experience in the use of certain types of obstacles at 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.
- This document should be read in conjunction with the FEI Rules for Eventing

The following points have been taken from the FEI Rules for Eventing to assist with course designing:

11.8 Counting the efforts

The Rules include wordings such as:

- "significant jumping efforts"
- "average Horse"
- "expected to attempt to negotiate"

Inevitably such words require subjective judgments to be made, and no absolute, objective criteria can be laid down.

The TD is required to make these judgments, after discussion with the CD, and should rely on experience and training, bringing a spirit of common sense and above all fair play to his decisions.

For Guidance:

"Significant jumping efforts" will include all artificial ditches, steps, banks, etc., and may include natural hazards. Steps under 0.60m high should not normally count as an effort.

"The average Horse" means the Horse(s) in the middle of the ability/experience range for the level of the Competition.

"Expected to attempt to negotiate" is the usual, expected route that could be taken by the large majority of competitors.

11.9 Obstacles with alternative elements or options

Where an obstacle may be jumped in one effort, but has options involving two or more efforts, each of these options should be lettered as an element.

All alternatives should be within the permitted dimensions for the relevant level. The "black flags" (Article 547.5.3) is of great help in this and should be used intelligently by CD and TD to create smooth lines and options.

In the case of multiple alternatives, the competitor is allowed to change from one line to another provided always that he jumps only one "A", one "B" and one "C" in order, and without contravening the Rules.

11.10 Dimensions of obstacles

It is essential that an obstacle be carefully measured.

For avoidance of doubt, this Rule does not mean that everything between the flags should always be within the height limits - simply that all the parts, which the CD and TD expect the average Horse and rider to attempt should be.

11.11 Dimensions of obstacles involving water

At obstacles involving water crossings, the depth of the water may not exceed 35cm. (10 – 15cm depth is considered sufficient under normal circumstances for lower levels.)

This rule is intended to avoid the Horses from having an extra problem at the take-off and landing in the water. The depth of water should be proportional to the jumping effort into and out of the water. (i.e the bigger the effort required from the Horse, the shallower the water). The minimum length of 9m before a fence or step out of the water is to assure that always the Horse has at least two strides in the water.

11.12 Dimensions of obstacles

The word "excessive" in the Rules is important. The CD and TD should above all take account of the type of drop included in a proposed course and their relationship to the other obstacles and the course as a whole.

Aim and Philosophy

The International Hartington Report - April 2000

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.

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 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 Athletes.

The CD should not design to "test the best" but rather be thinking about a fair course that is appropriate for the level that should give the average Horse and Athlete the opportunity to complete without having to take a multitude of Black Flag alternatives.

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 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. These issues will be reflected on the scoreboard showing 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 should not be compromised in order to achieve this, for example by the over-use of

alternatives.

Athletes should be able to slow down and be able to jump, out of a rhythm, the occasional straightforward, more "upright" type of fence.

This applies to all levels of Competition. Any fence like this, if created, should 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 approach too quickly and it should be built of 'Horse friendly' materials.

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

It is also important that all officials recognise 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 a particular level should in principle be of the same standard as international classes of a comparable level, e.g. a CNC** should be of the same standard as a CIC** etc.

Where different levels are running on the same venue at all levels the goal should be to minimize the number of shared fences (i.e. less than 10% of the fences on course).

Vision statement for Eventing Risk Management Policy

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.

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 should always visualize what can be the consequences of an error from the less experienced Horses and/or Athletes.

Course Designers should consider the possible consequences of a fall at any fence, e.g. hazards after a fence.

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 is strictly necessary to produce the right test for that level.
- Fences and questions should never be justified by the use of alternatives or options.
- Horses and Athletes should be encouraged and have their confidence built, not destroyed.
- It should 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 should be fair. It is not acceptable (and a CD should never try) to catch Horses out using unfair distances or by trying to be too clever or over complicated.
- 'Hidden' fences which surprise Horses should not be used. Horses should be able to understand the question being asked.
- Horses should be given time (ideally 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 should 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 should understand that courses should prepare Horses and Athletes for the next level of Competition and therefore need to be of the correct degree of difficulty.
- Any Horse should be able to jump a straightforward fence of maximum dimensions at any particular level – big does not necessarily equate to difficult nor small too easy
- 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 should "flow" and permit a good "rhythm". Tight turns should be avoided especially early and late in the course. 'S' bends are not recommended unless there are four or more strides between elements. CD's should not attempt to slow Horses down at the expense of 'flow'.
- 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.
- Course Designers should recognise that too many 'gear changes' or interruptions to the flow of the course will make it more physically and mentally tiring for Horses.
- Course Designers need to recognise the effect that their fences, distances in combinations, and related fences will have on the shape of the Horses jump and be mindful of what is good to see and what is not good to see and also the mental and physical effect that

courses and fences have on the Horses

- Course Designers should be mindful not to overdo the use of brush fences on their courses or the test can change significantly. The reasons for this are that by using too many brush fences the amount of effort expended by Horses can increase significantly and that, particularly at the lower levels, the emphasis is more on educating Horses to jump 'fixed fences'
- Too much distance between fences can also have a negative effect on a Horse's performance, causing the Horse to "switch off" Strong consideration should be given to at least a moderate bend approaching a fence after a long gallop.

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 higher levels onto one star courses at 1.10 metre height!
- The aim is to introduce 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 used
- The "intensity of effort" is low and regular "let up" fences are needed.
- Course Designers make sure the direct route is always appropriate.
- 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 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".
- It is important to 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. It is still an "educational" level yet it should also prepare for the next 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. Alternatives at the Two Star Level should again be the exception, except for 'skinny' fences or where it is difficult to represent the Horse at the fence.
- More sophisticated types of questions should be asked building on what has been learned at 1 star level.
- Fewer "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 level that starts to examine the skill of the Athlete and the athleticism and ride-ability 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 perhaps 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 should be a stepping stone to those competitors.
- The "intensity of effort" increases from the two star level, there will therefore be fewer "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 highest level 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

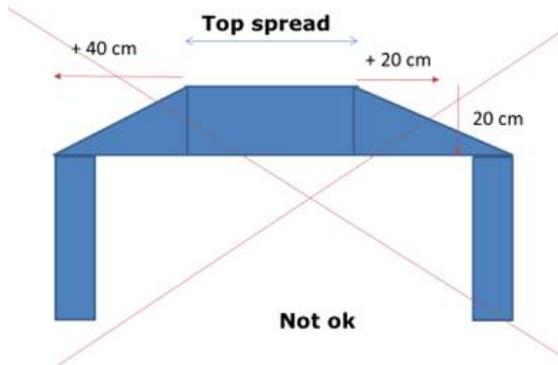
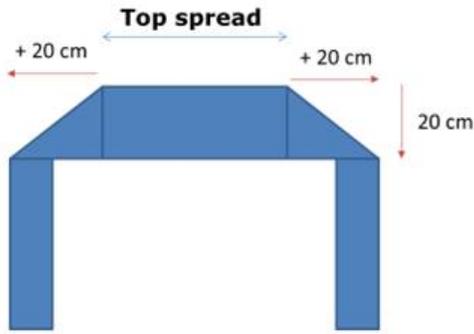
Flow

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 and jumping in a good shape. The lower the level the more fences at this stage of the course are recommended
- **Middle:** The meat of the course, where the main questions are asked. Don't start with the most difficult question (or combination) 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 interesting fences/easier questions to produce a feel good factor. At the end of the course these fences/questions should if possible be off a turn to control and manage pace, and they should still keep Horses and Athletes paying attention.
- 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
- Don't try to slow Horses down at the expense of flow.

Measurement

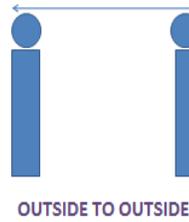
- The course should be measured fairly and on a realistic riding line **after** the fences and course roping are in position. It is inappropriate if Athletes are measuring the course approximately 100 metres longer than the officials. The measurement of the course needs to include the base spread of all fences.
- The use of GPS or an app is not considered best practice in measuring a course. Measuring wheels (regularly checked to ensure continuing accuracy) are considered the best way to measure a course.
- All fences should comply with the permitted dimensions on the line that the CD is inviting the Athletes to jump a fence.
- The fence top spread should also be measured 20cm below the top of the fixed part. This measurement can never exceed 20cm on the front and 20 cm on the back the max top spread for level (see following diagrams).



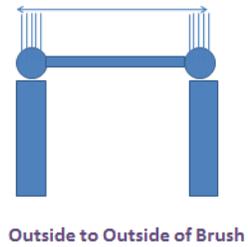
TOP SPREAD



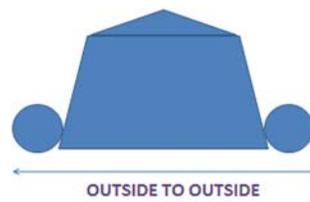
TOP SPREAD



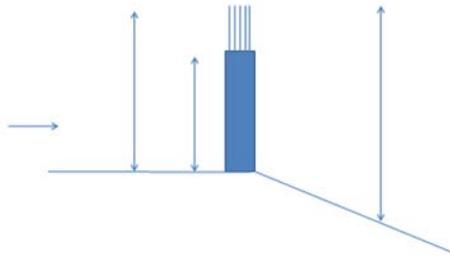
TOP SPREAD with BRUSH



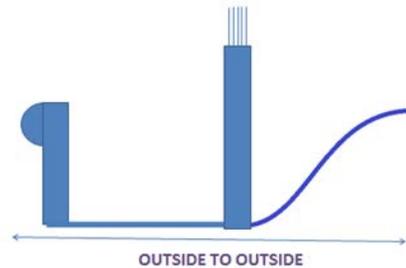
BASE SPREAD



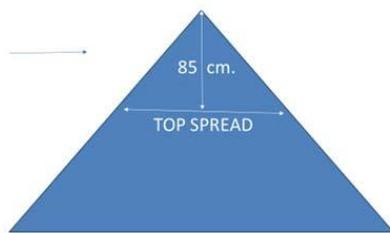
THE BRUSH



BASE SPREAD



TOP SPREAD



Front Shoulder of Spread Fences

By January 1st 2019 all CDs should reshape any spread fences with upright fronts so that the top of the front, and the back edge, of fences with the maximum permitted top spread will slope at approximately 45 degrees to a point 20cms below the top of the leading and the back edges. All new built fences should comply with this henceforth. It is also a requirement that the front leading edge on fences with a square leading edge (except Gates) are adjusted so that there is a slope of approximately 45 degrees on the leading edge.

Intensity of Effort – Short & Long Format

- 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. They should also discuss all fences 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. 3-4 efforts per minute normally allows competitors to 'stay with the clock'.

- 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.
- It is essential to consider 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 to be mindful of this aspect to not overdo it. 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 should 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.

Rules re distances & efforts:

Eventing Rules 24th Edition effective 1st January 2017

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	3420-3990m	3025-3575m	2600-3120m
Jump. Efforts	30-35	27-32	25-30

Anchoring or Securing of Portable Fences

The importance of this cannot be overemphasised and it is not acceptable to assume that, because a fence is heavy, it will not move if hit at speed by a Horse. Course designers, builders and TD's should make every effort to ensure that each and every portable fence is 'anchored' in a way that will prevent movement as fences that do move significantly increase the chance of a fall.

There are various recognised ways of securing portables, with the most traditional being the use of posts and, more recently, the Spirafix Ground Anchor system which is both popular and efficient (see below for more information). There are other methods and, as long as the principle is adhered to, they can also be accepted.

In certain situations, like lined water jumps or all weather arenas, it is not possible to use anything that can pierce the lining/membrane in which case great care should be taken to ensure the fences are secured in another way.

Spirafix System 50mm “C” type Ground Anchors

This is a very efficient & reliable system but some things should be considered:

- The anchors should be at the front of the fence rather than at the back, or at the front AND back. At least two should be used.
- Where fences with small base spreads are being fixed extra anchors may be required at the front of the fence.
- There are two lengths of anchors available – 460mm and 620mm – and the correct ones should be used depending on the ground conditions, i.e. the longer ones in sandy soil.
- The anchor brackets should be securely fixed to the frame of the fence so that the fence cannot break away from the brackets.

Posts

These should be substantial (min 125 mm) and dug (or knocked) deep enough into the ground. A minimum depth of 0.75m is required but in soft conditions this might need to be increased.

- Posts should be at the back of the fence but, if set below half way up the highest part of the fence, should also be put at the front or side as well to stop the front lifting on impact.
- Try not to use posts with lots of knots as they weaken the post.
- Using a combination of posts and anchors can work very well.
 - Posts not at the back of the fence should be secured to the fence using bolt, coach screw, rope or wire.

Frangible Deformable Devices

“2017EventingRules – 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.”

All frangible/deformable devices used in FEI competitions have to be approved by the FEI according to a specified standard.

A fence should never be designed or built with a frangible device if the CD would not normally build it as a fixed obstacle. Frangible's are designed to reduce the possibility of a serious fall NOT compensate for a wrongly or poorly designed or sited fence.

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://inside.fei.org/fei/disc/eventing/risk-management>

For the purposes of this standard, TRL (Transport Research Laboratory (GBR) and Chalmers University (SWE) have been appointed as the FEI approved inspection authorities. If needed, the FEI will examine requests to approve additional institutes to act as FEI approved inspection authorities 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://inside.fei.org/fei/disc/eventing/risk-management>

A frangible device should only be used after the specifications, appropriate siting 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 should never be compromised by the use of a frangible device.

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, loose or soft 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 –should be preferable off a turn

Ground Lines

- Ground lines should be used to improve the profile of fences where felt necessary.
- It is appropriate for there to be a discussion with the Course Designer as to the need or not for a ground line.
- Ground lines are generally appropriate at all levels on a downhill approach.
- Ground lines should be used on steps out of water.

Lessons Learned!!!

A Clear Question

First and foremost, the question that the Horse has to answer should be a clear one, which should not be misunderstood by the Horse. All Horses should be able to clearly understand what they are being asked to jump.

Colour of Rails

It is believed that Horses see fences in contrast and dichromatically therefore if a CD wishes to use different colour rails as the top rails of an open oxer the front rail should be the lighter colour one.

Hazards

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

Light to Dark/Shadows/The Sun

- CD's should understand that Horses see in contrast and, it is believed, dichromatically rather than in colour as we see colour. Therefore the contrast between the top of the fence and the background is of the utmost importance.
- At all levels Course Designers should recognise the effect of shadow and light to dark.
- When going from light to dark Horses should be given time to adjust to new circumstances, the suggestion being that they should have at least 2 full strides.
- Course Designers should recognise and take into account when designing and siting fences the effect of shadows and the sun particularly early and late in the day and the time of year of the competition.
- It is essential to not present a silhouette to Horses when jumping from the dark towards light or towards the sun.
- It is believed that Horses take longer to adjust to light changes than humans

Leading Edges

It is essential that every effort is made not to have an unforgiving leading edge on any fence. Research has shown that the more a Horse's 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.

It is strongly recommended that the front leading edge of spread fences are built at approximately 45 degrees to a point 25cms below the highest point

Profiles of Fences/Lower Rails

Where there is a fence with a top rail and a lower rail on the front face (e.g. an oxer or an upright post & rails) the lower rail needs to be not less than half way up the fence, and that in these situations there should be some sort of ground line also.

Alternatively, if a top rail and a ground line are used there needs to be some dressing (e.g. a shrub/tree/bush) to ensure that there is a good profile to the front of the fence and not just a gap between the top rail and the ground line.

Dimensions

- Apart from the first fence all straightforward fences should be built to the height of the level being jumped. If a fence on flat ground cannot be built to maximum dimensions it is probably the wrong fence in the wrong place. 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 @ 5cm below maximum height.
- All spread fences should have the back clearly visible

Combinations and Related distances

- Course Designers should not try to trick Horses or Athletes and where possible Horses should have 2 or 3 strides to be able to understand the question.
- Any combination on 4 strides or less should 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 Course Designer has used a fence as a set up for an exercise.

Bending Lines

- 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.
- A bending line should not have a radius of less than 20m.

Table Fences

- At all levels the top of tables or table type fences should always be built either with a sloping front face, sloping upwards away from the Horse on the take-off side of the fence or a round or half rounds so that the depth of the front face is not less than 30cm
- In the case of picnic tables with a bench in front, the front face should be at least 30cms deep, not vertical, with a sloping leading front edge of approx. 45 degrees. The bench in front should also have a face of at least 25 cm.
- At all levels, the possibility of a false ground line should be avoided. Thus for instance in the case of a picnic table there should not be a bench on the landing side of the obstacle if it causes a false ground line.
- 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 or perhaps identify the spread by putting decoration on top of the fence at the front and the back, not just the back as this can give the Horse a false impression of where the leading edge is situated.
- The back of the table should be about 5 cm higher than the front part.

Verticals

Vertical fences without a ground line should not be used except at the 3* and 4* levels.

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 essential to ensure that the Horse can see the back of the fence, using different materials, colours, flowers, etc. Special care should be taken when using spread fences as the last element of a combination as they could be very punishing for a Horse in trouble in the combination.

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 four 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 should be given to the depth of ditches: a ditch less than 60cms deep is not impressive enough for the Horse, whilst if a ditch is more than 60 cm deep arrangements should be made such that a Horse can be extracted if required.
- All ditches should be arranged with a ramp (slope) so that a Horse can be walked out of the ditch readily if necessary, preferably at each end.

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 which should be 10cms below the maximum permitted at every level.
- The back of the brush box should be 5cms lower than the front
- For instance, at 3 and 4 star 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 at the front and 1.05 – 1.10m at the back
- Brush fences should be 'brushable' and not present a 'solid' element to the fence. Horses should be able to brush through them without undue stiffness in the brush.
- The material used should be such that the risk of injury to Horses is as small as possible. Thick stems and sharp ends after trimming/cutting should be avoided
- Brush 'shoulders' – care should be taken that Athletes do not try to jump the shoulder itself or the high brush and so it may be necessary to flag the parts of the brush that the Course Designer wants to be jumped.

Double and Triple Brushes

- It is essential that double and triple brushes are "filled in" between the rows of brush, so that a Horse can put a foot down with safety.
- In the case of double brushes, it is essential to "fill in" between the two rows of hedge and to have a ¼ or ½ round in front of the second brush on top of the 'fill'.
- Triple Brushes – the maximum permitted base spread should never be more than 3/4 (75%) of the maximum permitted base spread. The key to the success of these fences is to ensure that they are in proportion with not too much base spread.

Unjumpable Parts of Fences

- Unjumpable parts of a fence or combination of fences should be truly "unjumpable". This means that the Course Designer and Technical Delegate should 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 should not be sited in such a way as to encourage a quick jump following a refusal. For example it is not recommended 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 should be some distance away ensuring sufficient space to recover the impulsion needed 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 should not be built on downhill slopes. A bounce of maximum height is not appropriate at a lower level Event.
- The first element should usually be lower than the second element to help the Horse read the question. Exceptions to this could be where there is water and/or a drop behind the second element
- Double bounce fences should not be used except in the case of 'steps'.
- A bounce having jumped down a step is unacceptable

Keyhole Fences

- At 3* & 4* level the height of the hole should not be less than 1.80 m and the width not less than 1.60 m.
- At 2* level the height of the hole should not be less than 2.00m and the width not less than 1.90m
- At 1* level the height of the hole should not be less than 2.10m and the width not less than 2m
- Any surface that can be touched by the Horse should always be soft (not susceptible to hurt the Horse or the Athlete).

Keyholes should not have a spread of more than 45cms and the bottom of the keyhole should be brush/soft. When using these fences it is essential that there is absolutely minimal chance of an Athlete hitting the brush at top of the fence even if this means that the size of the 'hole' exceeds the minimum recommended

This type of fence should only be built in such a way that the question for the Horse is very clear and this applies to any fence that may follow it; if a Course Designer wishes to use this sort of fence it will be necessary to ensure that the 'hole' is big enough for Horses to understand the question in full. If a fence is used after a keyhole the Horse should be able to understand the question easily i.e. not be surprised by another fence that is 'hidden'

- There should be no chance of an Athlete or a Horse hitting the frame of the keyhole

Fences with Roof

- The lowest part of any roof structure should not be lower than 2.20m from the highest part of the fence.
- It is not recommended to use roofs at water complexes where the Horse has to jump under the roofed area or where there is a roofed bank in the water
- Course Designers should ensure that the shadow from a roof will not impact on the way the fence jumps
- The solid part of any timber frame over a fence should not be less than 3.60m from the ground

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. The top line of bank or step out of water should be very visible in all conditions especially when wet after a few Horses have passed.
- Step out of water, a ground line is recommended and the previous fence should be not less than 2 strides before the step or 3 strides after drop into water.
- While a slight slope on the ground where Horses land in water is recommended there should 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 strongly **not recommended** when jumping into water.
- Rippling the surface of the water has proved to be useful to help Horses 'read' the water especially where there are shadows from trees.
- Any fence in water where a Horse is being asked to run in to the water rather than jump in should be not less than 5m from the beginning of the water

Corners

- Open Corners are recommended at all levels where Horses have time to understand the question.
- Closed in 'solid top' corners are recommended where there is limited re-action time, i.e. after a step or ditch or shortly after crest of hill.
- Corners should not have a back rail shorter than 2.5m and should be longer at the lower levels (1* & 2*). See table below. Use flagging and decoration to create a clear single visual passage across the fence. If a frangible rail is used great care should be taken to avoid the risk of a Horse jumping onto the retaining post.

- Suggested degrees for corners:
 - 1 star 45°-60°
 - 2 star 60°-75°
 - 3&4 star 75°-90°

Short back rails in open corners suggested minimum length:

- 1 star 3.00m
- 2 star 2.80m
- 3&4 star 2.50m

Acute Angle Fences

Course Designers should always avoid asking a Horse to jump a fence at an acute angle as the risk of the Horse misreading it and leaving a leg is significantly increased. A question that encourages riders to jump a maximum spread fence at an angle is inappropriate.

Warm Up Fences

Officials should ensure that there is a minimum of two fixed fences with one designed to get the Horses jumping freely forward and the other a skinny and two show jumps including an upright and an oxer. Care should be taken to make the area large enough that 3-4 Horses can easily canter around at XC speed.

Drops

- The number of drops should not be excessive (10-15% as a guide) on any course.
- Fences jumping downhill with a significantly lower landing than take off should count
- Run away landings are much more forgiving and their use should be encouraged; landing on flat ground from a drop fence should be avoided

Narrow Fences

- The number of narrow fences should not be excessive on any course.
- Jumpable width should be evaluated considering the actual jumpable width presented to the Horse on the intended jumping line.
- If the fence has also base spread (e.g. triple brush) it is recommended to add 5-10 cm to the suggested jumpable width.
- Suggested jumpable width (cm)
 - 1 star 160-150
 - 2 star 150-140
 - 3 star 140-130
 - 4 star 135-125

Footing

The importance of the best possible footing cannot be underestimated and Course Designers should factor this in to their designing.

Good footing gives Horses confidence and security. Poor footing makes Horses suspicious and can lead to a lack or loss of confidence.

Course designers have to recognise that their courses should remain fair and, as far as is possible, the same, for all Horses regardless of the weather conditions. Inevitably when the footing is perfect it is reasonable to expect more combinations to achieve the Time Allowed.

Managing hard ground is much easier than managing wet ground and there is a lot of machinery available nowadays to make hard ground acceptable. Local knowledge of ground conditions and how best to deal with the challenges that Course Designers face is worth finding out about.

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. Should use appropriate timber to facilitate contrast and ensure as good visibility for the Horse as possible
- **Towards daylight** – much easier for it is easier for the Horse to understand where it is going but be very mindful and 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", but more difficult for the Athlete.
- **Bending line combination** – can be more difficult as the Athlete has to take a decision and the Horse has less time to understand what is being asked
- **Blind turns** – difficult and not appropriate at any level 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 'predator.' Therefore at narrow questions and corners it sees the fence out of one eye and a wide open space with the other.
- **Colour** – all two legged creatures see in colour, it is believed that Horses see in contrast and dichromatically. Therefore officials should be cognisant of contrast (eg a dark coloured rail in shadow is not a good idea).
- **Tiredness** – Remember a Horse can get mentally tired as well as physically.