

IN THE MATTER OF AN APPLICATION TO
AN BORD PLEANÁLA

FOR APPROVAL OF THE FOYNES TO LIMERICK ROAD (INCLUDING
ADARE BYPASS) COMPRISING:

- (I) FOYNES TO RATHKEALE PROTECTED ROAD SCHEME,
2019;
- (II) RATHKEALE TO ATTYFLIN MOTORWAY SCHEME, 2019;
- (III) FOYNES SERVICE AREA SCHEME, 2019.

ABP Ref. ABP-306146-19 and ABP-306199-19

ORAL HEARING

Brief of Evidence
Equine

By Michael P Sadlier MVB CertESM MACVSc(EqSurg) CertES(Orth)
MRCVS EVC

February 2021

1. QUALIFICATIONS AND EXPERIENCE

- 1.1. My name is Michael Sadlier and I graduated from the Veterinary College of Ireland in Dublin in 1983. Since graduation, I have spent the last 35 years in veterinary practice in Ireland, England, Australia, New Zealand, France, USA and Japan. I am now the principal of a veterinary practice in Dublin and a consultant on equine issues at Equine and Veterinary Consultancy (EVC).
- 1.2. I have acted as a consultant on equine related issues on major and minor infrastructural projects over the past 14 years. These projects include road development schemes, gas pipelines, water and drainage schemes, electricity transmission lines and industrial developments.

2. ROLE IN PROPOSED ROAD DEVELOPMENT

- 2.1 My role in the Foynes to Limerick Road Project was to examine, assess and report on the potential impacts that the proposed road development would have on equine enterprises along the route and to recommend mitigation measures, during both the construction and operational stages to minimise any impact identified.
- 2.2 A total of ten agricultural enterprises were identified along the alignment of the proposed road development where equine activity was significant. During the summer of 2018, I contacted 9 of the 10 stakeholders individually to arrange a visit and to objectively consider their equine enterprise and to assess the impact that the proposed road development may have on their equine enterprise and to suggest possible mitigation methods. I met with six of the nine stakeholders with the other three stakeholders politely refusing to engage with me. I discussed the one stakeholder that I did not contact with Mr John Bligh of John Bligh & Associates at length and agreed fully with Mr Bligh's assessment and conclusions.

3. KEY ISSUES IN RELATION TO EQUINE ISSUES

- 3.1 Chapter 15 of the EIAR is to be taken as read in its entirety and is not replicated here. To assist the Board in its consideration of the applications for approval, for the convenience of all participants at this hearing and to put some context to the responses to objections/submissions, the key items pertaining to the equine assessment of the proposed road development detailed in Chapter 15 of the EIAR are summarised briefly below.
- 3.2 The site of the proposed road development is situated in a rural part of County Limerick, predominantly comprised of high-quality grassland. There are 105 agricultural properties impacted by the proposed road development. Principal agricultural systems in the study area are specialist beef (36.8%), specialist dairy (14.2%) and mixed grazing livestock (11.3%). There is a significant equine industry within the region and farms in the study area include predominantly equine farms (9.5%) and farms with an equine element as part of a mixed livestock enterprise (2.9%). The average farm size in the study area is 38.9 ha, which exceeds both the National and County averages.
- 3.3 The equine enterprises were further identified as:
- 10 were classified as Predominantly Equine – These farms were primarily farms where horses were the main animal on the land (Farm Reference No. – 023, 024, 040, 042, 062, 080, 084, 086, 089 and 090)
 - 5 were classified as Horses as Part of Mixed Enterprise – These enterprises had some horses on the farm grazing along with food producing animals (Farm Reference No. – 007, 026, 046, 094 and 103)
- 3.4 An initial assessment of the equine enterprise was made based on the principle of intensive and extensive equine management. Intensive equine management was defined as the close interaction between man and horse such as riding, breaking, race training, yearling preparation, mare and foal management. Health and safety issues for the horse handlers are important considerations in intensive equine management. Extensive management was defined as horses at pasture that required minimal interaction between man and horse.
- 3.5 The farms were further classified as follows:
- Very High Sensitivity Equine Enterprises (1) – These are classified as areas of intense equine activity with significant human interaction such as race meetings, horse shows and equestrian events. (Farm Reference 090)
 - High Sensitivity (2) – These are classified as areas of intense equine activity with reduced human interaction such as stud farms, racing yards, riding schools, show-jumping yards, all with significant equine orientated infrastructure. (Farm Reference 080, 086)
 - Medium Sensitivity (5) – These are less intensive equine activities such as small riding schools, small stud farms with specific adjunctive facilities such as stables, exercise arena, dedicated gallops/cross country course, foaling boxes (Farm References - 023, 024, 040, 084, 103)

- Low and Very Low Sensitivity (7) – These are extensively managed equine activities with no specific ancillary facilities but which may (in the case of low sensitivity) or may not (in the case of very low sensitivity) have occasional stable and non-dedicated exercise area (Farm Reference: 007, 026, 042, 046, 062, 089, 094)
- 3.6 The potential impacts on the agricultural lands of equine enterprises are detailed on a farm by farm basis in Table 15.6 of the EIAR. In general terms, for ease of reference, the principal potential impacts on horses and equine enterprises are considered below.
- 3.7 The negative stimuli (sound and visual) associated with the construction of the proposed road development was carefully considered in my assessment. The building of the proposed road development has the potential to create a significant amount of abnormal noise and visual stimuli that may be quite intrusive to horses in the immediate vicinity. Horses are sentient animals and when confronted with an exposure to unfamiliar stimuli (noise, movement, sights or a combination) can either remain to assess the perceived threats (fight) or run away to escape the threat (flight). The introduction of horses into an area where there are extensive stimuli, such as those associated with road construction, can result in horses running away blindly from the stimuli or remaining unperturbed. It has been shown in scientific studies that there is a “flight distance” or a stimulus threshold specific for every horse – the nearer the unfamiliar and familiar stimuli are to the horse, the more likely the horse is to demonstrate the flight response and conversely, the further the unfamiliar and familiar stimuli are from the horse, the more likely the horse is to demonstrate the fight response. Horses, bolting in fright, can injure themselves running into an obstruction or even other horses. However, more disturbingly, they can injure their riders and/or other personnel.
- 3.8 The noises and visual stimuli associated with the operational traffic can also be a cause of some concern. However, horses are normally very adaptive to environmental changes and become very quickly receptive to the aural and visual stimuli associated with normal traffic flow.
- 3.9 Measures for the mitigation of impacts on the nine equine properties have been included in the assessment table 15.6 of Chapter 15 – Material Assets and Land – Agriculture in the EIAR. In addition, Section 12.5 of Chapter 12 Noise and Vibration of the EIAR includes mitigation measures for the construction stage as follows:
- A designated noise liaison officer will be appointed to site during construction works. All noise complaints will be logged and followed up in a prompt fashion by the liaison officer; and
 - A Public Communications Strategy will also be implemented by the contractor prior to the commencement of any blast works.
- 3.10 Specific mitigation measures proposed for equine facilities include:
- For farm holdings with equine livestock, permanent fencing will be stockproof timber post fence in accordance with TII CC-SCD-00302 (beyond the clearzone) and TII CC-SCD-00321 (within the clear zone). See Appendix A for details.

- Supplementary equine noise barriers have been provided at specific locations along the carriageway to provide additional noise and visual mitigation to equine properties at the following locations:

Table 1 **Locations of Supplementary Equine Barriers**

Chainage	To Chainage	Height	Side of the Alignment
23+100	24+000	1 m	South
55+900	55+975	3.5 m	South
57+350	57+475	1.5 m	North
57+250	57+475	1.5 m	South
58+025	58+150	1.5 m	South

4. RESPONSES TO SUBMISSIONS/OBJECTIONS

4.1 Overview

4.1.1 Of the 154 submissions/objections made to An Bórd Pleanála (ABP) in respect of the Foynes to Limerick Road (including Adare Bypass), 8 submissions/observations are relevant to equine issues. The issues raised in these submissions/observations are:

- 2 raised an issue in respect to the impact of noise on horses during construction and operation of the road (submission/observation SCH-014 and SCH-018)
- 1 raised an issue that the scheme will seriously impact on management, training and exercise of foxhounds (submission/observation SCH-014)
- 3 raised issues of suitable boundary fencing for horses (submission/observation SCH-03, SCH-045 and SCH-118)
- 1 raised an issue that the lands will not be suitable for grazing horses during the construction phase (submissions/observation SCH-102)
- 1 raised an issue that they had plans to develop an equestrian enterprise that will no longer be possible and that compensation will not be adequate to replace a holding in this location for the purpose for which it was intended (submissions/observation SCH-102)
- 1 raised issues in respect to an inadequate assessment of the impact the Scheme will have on their equine business (submissions/observation SCH-037)
- 1 stated that Michael Sadlier “expressed concerns relating to the proximity of the new road to the horse lorry/car park and the outdoor and indoor riding arenas and the effect of noise both during the construction and subsequent use of the road on horses, especially given so many riders have some form of disability.”(submission/observation SCH-014)

4.1.2 I will address each submission/objection separately in the following sections.

4.2 Impact of Noise on Horses during Construction and Operation of the Proposed Road

Issues Raised in Submissions /Objections

4.2.1 Two submissions/objections suggested that the noise created during construction and operation of the proposed road will impact of on horses and their riders.

Submission/Objection SCH-14 states “*Clearly the unpredictable nature of construction noise and traffic would have a far greater impact on the animals and there appears to be no mitigating measures in place to try and protect the future operation of Clonshire Equestrian Centre*”.

Submission/Objection SCH-18 states “*Due to the threat posed by noise to the health and safety of riders and horses especially when one considers the amount of novice riders and those with special needs and disabilities which use the facilities, the riding arenas and car park will have to be relocated to elsewhere on site*”.

Response

- 4.2.2 In response to Submissions/Objections SCH-14 and SCH-18, as I stated previously, horses can react to noise in different ways. Some horses will remain unperturbed by most noises and sounds yet other horses can react in an unpredictable and erratic manner when confronted with an unusual noise. However, horses normally accommodate quite fast to repeated stimuli and it is this predictable response that has permitted man to domesticate horses to perform many variable tasks in often hostile environments.
- 4.2.3 I visited the two properties involved in these submissions/objections – Clonshire Equestrian Centre and Mr. Daniel and Susan Foley's dwelling house. Clonshire is a large equestrian centre as shown in Figure 1 below and is very much the "go to" place in west Limerick for horse shows and other equestrian activities. The car park for the equestrian centre and one large outdoor school are within 100 metres of the proposed mainline. The proposed road will be elevated which will require considerable civil engineering works. As the car park is used to load and unload a vast variety of horses and ponies coming to horse shows or lessons, some of these horses will not have had any previous exposure to the noises associated with road construction of this scale. These horses may react in an unpredictable manner which could have negative consequences on their handlers or riders. Once the road is operational, the risk of noise from construction activity is reduced to zero. There remains however, a much lower risk from operational traffic which cannot be ignored.

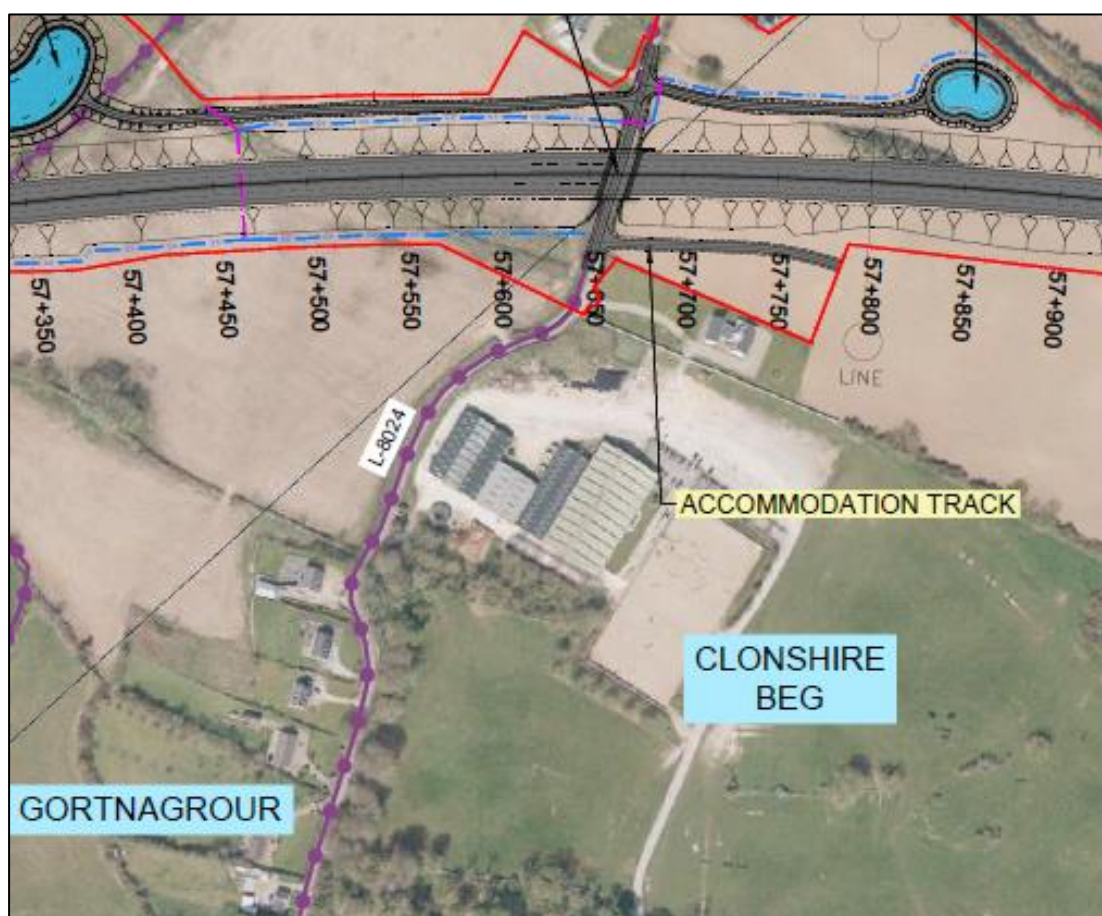


Figure 1 Screenshot from Figure 4.18 of the EIAR

- 4.2.4 The EIAR for the proposed development includes mitigation measures for Clonshire Equestrian Centre in Table 12.14 of Chapter 12 and in Table 15.6 of Chapter 15. These mitigation measures comprise the following elements.
- 4.2.5 Construction Stage: A visual barrier of a minimum of 2.4 metres high will be provided for the construction stage above the working ground level for the property in question.
- 4.2.6 Operational Stage: Noise Barriers will be provided as illustrated in Figures 12.17 and 12.18 of the EIAR, including NB-025, a 3.5m high noise barrier from Ch.57+475 to Ch.58+025. A supplementary equine barrier of 1.5m height will also be provided from Ch. 57+240 to Ch. 57+475 and from Ch. 58+025 to 58+150m to further mitigate the noise and visual effects of operational activities as provided for within the EIAR.
- 4.2.7 Screen planting will also be provided for the operational stage as detailed in Chapter 11 The Landscape of the EIAR and as shown in Figure 2 below. This screen planting will comprise woodland planting with a specific emphasis on quick establishment of a woodland screen, with larger material to create woodland screening and effective woodland in the long-term, as well as an understorey of planting to screen at lower levels. Screen Planting from Chainage 57+150 to 58+160 is provided on the southern side of the proposed road development, in proximity to the property in question as shown in Figure 2 below. There are two areas of land within the CPO at approximately Ch.57+625 and Ch.57+725, in which the landscape planting will be established and which will provide screening to the property in question. Further information including species types is included in Section 11.5.1 of Chapter 11 in the EIAR.



Figure 2 Extract from Figure 11.17 of the EIAR

- 4.2.8 In my opinion, I consider that the mitigation measures outlined above will reduce both the construction and operational activity to a level that would allow continued usage of the current carpark and arenas.

4.3 Seriously Impact on Management, Training and Exercise of Foxhounds Issues Raised in Submissions/Objections

- 4.3.1 Submission/Objection SCH-14 raises an issue that part of training the foxhounds was that

“the hounds will frequently be taken to the old railway bridge in order to access lands on the other side of the old railway line and to bring them swimming in the local rivers. The impact of the construction works and ongoing use of the new road would seriously impact upon management, training and exercise of the hounds”

Response

- 4.3.2 The issue at stake here is the requirement for the foxhounds to exercise on local roads and also to give them access to swimming in local rivers. During the road construction, the foxhounds can be exercised throughout the property and out onto Local Road L-8024 for exercise and access to the local rivers. During the construction phase there is likely to be pre planned closures to this local road. These will be minimized in frequency and temporary, will be signalled to all road users by signage and other communication means. At all other times all road users will be free to pass. Further information on road closures is available in section 4.16.5 Traffic Management of the EIAR. Once the proposed road is developed, the fox hounds can use the new underbridge on the local road to access the old railway bridge and local rivers as heretofore. There will be some inconvenience caused by this temporary disruption.

4.4 Suitable Boundary Fencing for Horses

Issues Raised in Submissions/Objections

- 4.4.1 There were three submissions expressing concern about the boundary fences:

Submission/Objection SCH-118 - *“the type and specification of fence proposed and the responsibility and maintenance of same into the future has not been clarified by the County Council. The boundary treatment must be suitable for horses.”*

Submission/Objection SCH-045 - *“the type and specification of fence proposed and the responsibility and maintenance of same into the future has not been clarified by the County Council. The boundary treatment must be suitable for horses.”*

Submission/Objection SCH-32 - *“the type and specification of fence proposed and the responsibility and maintenance of same into the future has not been clarified by the County Council. The boundary treatment must be suitable for horses.”*

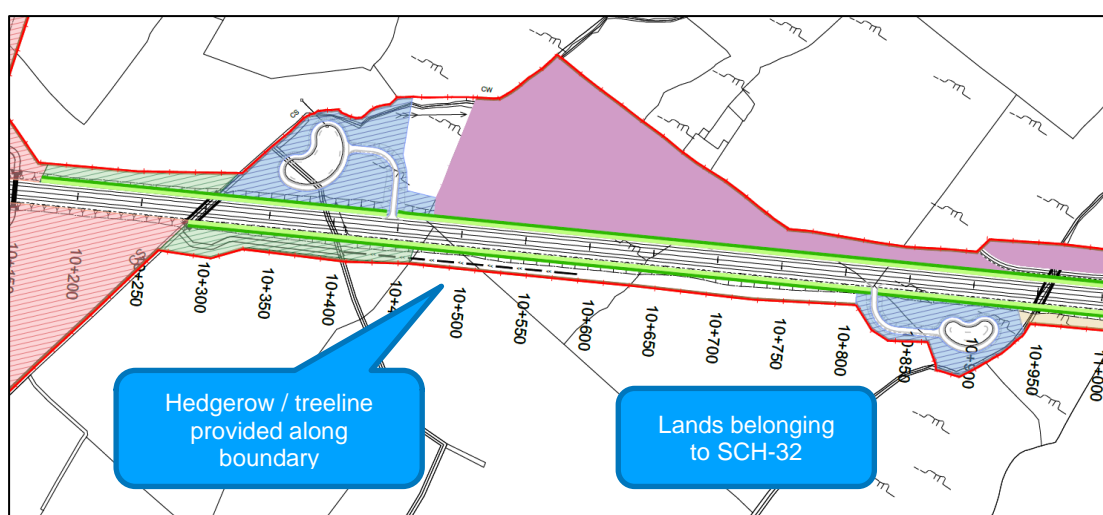
Response

- 4.4.2 The purpose of a boundary fence for horses is to provide a safe and secure barrier preventing the horses leaving the paddock or field.
- 4.4.3 Section 15.5 of Chapter 15 outlines the measures to be implemented to mitigate the adverse impacts on agricultural lands. The general mitigation measures as outlined in

this section include the following Transport Infrastructures Ireland (TII) Standards with regards to fencing for equine properties:

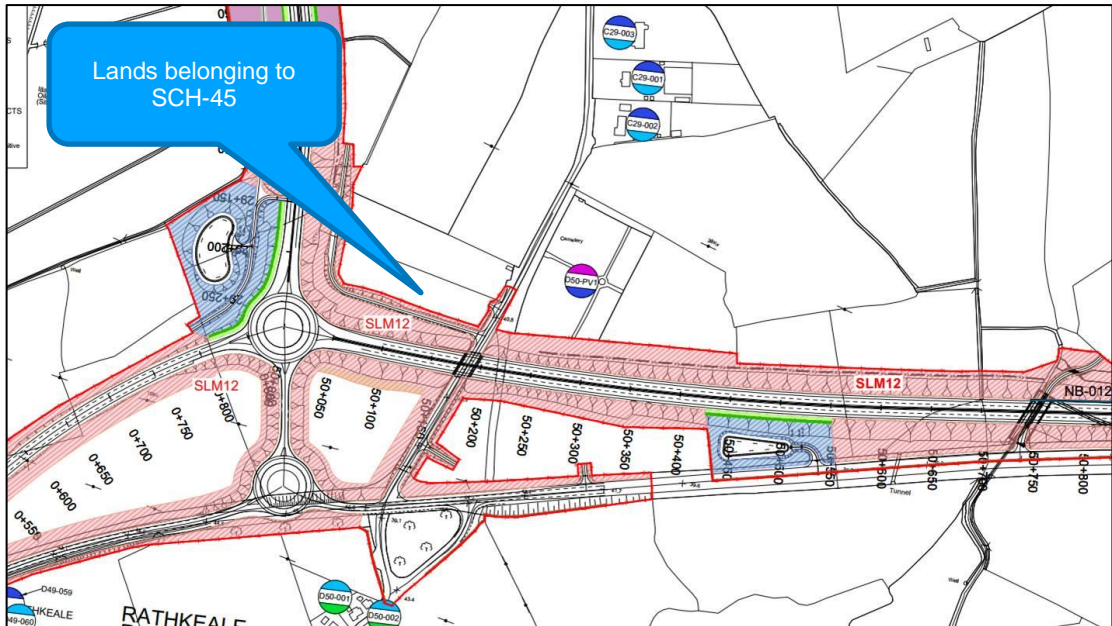
“For farm holdings with equestrian livestock, permanent fencing will be a stock-proof timber post fence in accordance with TII CC-SCD-00302 and TII CC-SCD-00321. Where permanent fencing occurs within the clear-zone area it will be timber post and tension mesh construction in accordance with CC-SCD-00321. At locations beyond the clear-zone the fence may be timber post and rail construction with PVC coated chain link complying with TII CC-SCD-00302. Where permanent fencing is erected on the boundary of the proposed mainline or the associated attenuation ponds, it will be maintained by the Local Authority.” In both cases timber post and tension mesh construction in accordance with CC-SCD-00321 will be provided and maintained by the Local Authority

4.4.4 In response to SCH-32, a hedgerow and treeline is also proposed along the land take boundary of the proposed development comprising mixed native species. This is illustrated in Figure 11.5 of Volume 3 of the EIAR.



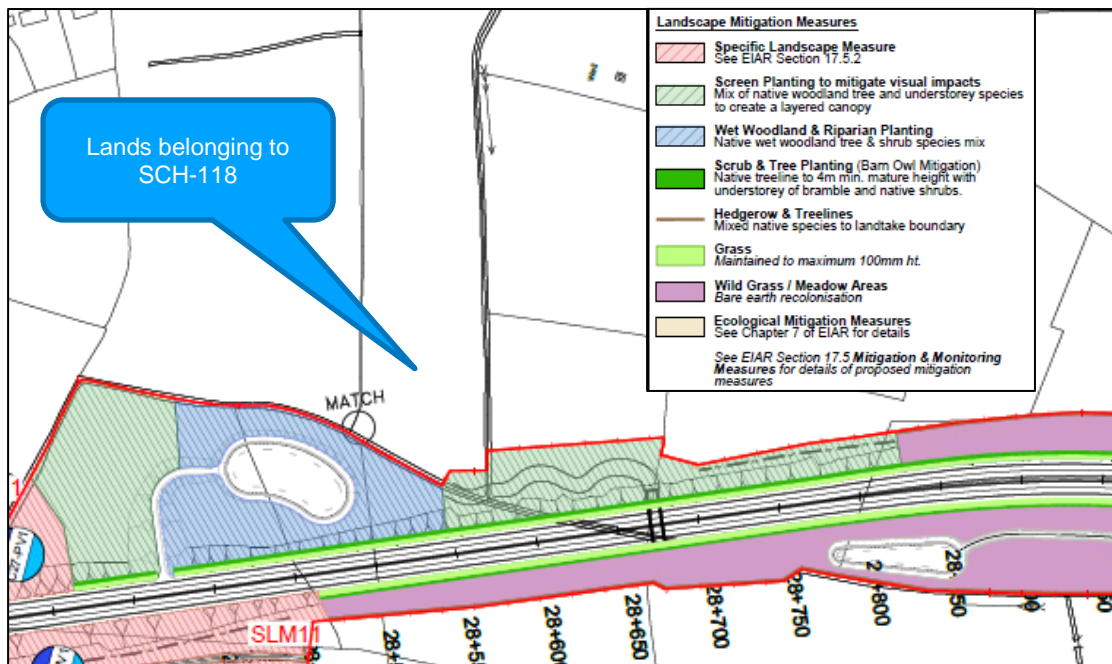
(Extract from Figure 11.5 of Volume 3 of the EIAR)

4.4.5 In response to SCH-045, the landscape areas created by the realigned roadways offer an opportunity for a landscape or artistic feature at the entrance to Rathkeale to create a sense of place and aid in wayfinding. Such a feature could reference the heritage of the town. Screen planting for the cemetery and other visual receptors is proposed. The majority of the current mature planting along the existing Rathkeale Bypass will be maintained and protected. Compensatory planting for all trees removed is to be instated in the SLM area, which should be of a similar low canopy native woodland type plantation. Noise barriers to be screened with hedgerow or shrub species. Barn Owl protection strategy is also to be implemented around the junction.



SLM 12 Rathkeale Junction (Chainage 50+000 & environs),

4.4.6 In response to SCH-118, a mix of Screen Planting, Wet Woodland and Riparian Planting is provided to screen the proposed road development from the property. This is shown in Figure 11.12 of Volume 3 of the EIAR.



Extract from Figure 11.12 of the EIAR

**4.5 Lands will Not be Suitable for Grazing Horses During the Construction Phase
Issues Raised in Submissions/Objections**

4.5.1 There was one submission expressing concern about the construction phase impacts:

Submission/Objection SCH-102 states - “the lands are currently used the grazing of horses and this will no longer be possible for the duration of the construction works due to the effect of the construction noise”.

Response

4.5.2 The land in question, as illustrated in Figure 3 below by landholding 089, is approximately 30 acres in size and laid out currently in grazing lands. The proposed road development will be elevated along its full length and bisects this parcel of land. There will be considerable activity on site to build this elevated section of roadway and I acknowledge that horses may react differently to the noise and visual stimuli that would be involved in such construction activity.

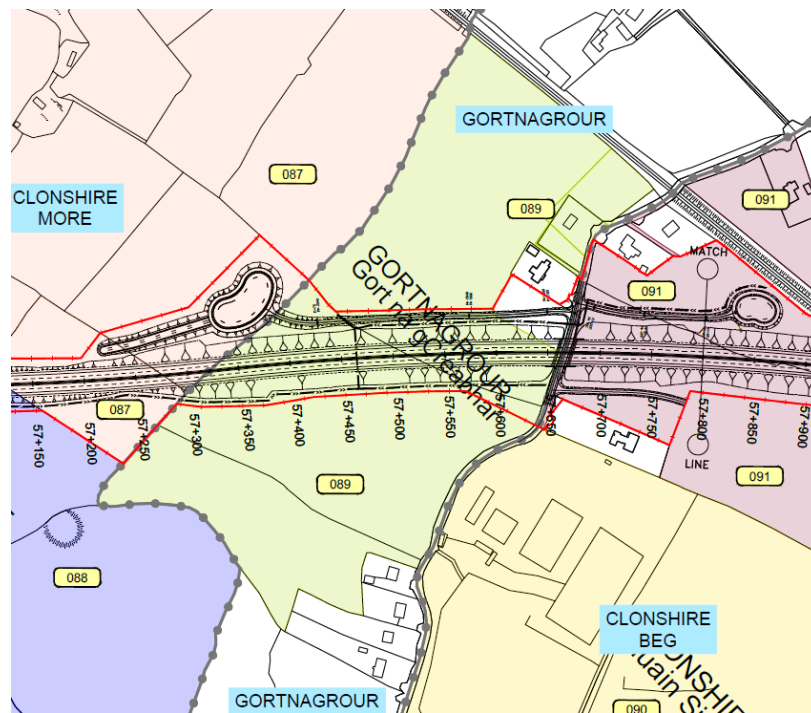


Figure 3 Extract from Figure 15.17 of Volume 3 of the EIAR

4.5.3 In Chapter 12.6 of the EIAR, it is acknowledged that during the construction phase of the proposed road development noise levels at farms closest to working areas will be temporarily increased above the ambient noise environment when works are occurring in proximity to the farms. Various mitigation measures will be selected in order to control construction noise levels to within the limit values included in Table 12.1 of the EIAR as shown below.

Table 12.1 Maximum Permissible Noise Levels at the Façade of Dwellings During Construction Phase

Road Link	Noise Levels (dB re. 2×10^{-5} Pa)	
	$L_{Aeq,1hr}$	$L_{A Smax}$
Monday to Friday 07:00 to 19:00hrs	70	80
Monday to Friday 19:00 to 22:00hrs	60*	65*
Saturdays 08:00 to 16:30hrs	65	75

Road Link	Noise Levels (dB re. 2×10^{-5} Pa)	
	$L_{Aeq,1hr}$	$L_{A Smax}$
Sundays & Bank Holidays 08:00 to 16:30hrs	60*	65*

Note * Construction activity at these times, other than that required for emergency works, will normally require the explicit permission of the local authority.

4.5.4 The most appropriate noise mitigation measures for each work area will be determined taking account of the various control measures included within Section 12.5.1 of the EIAR.

4.6 Plans to develop an equestrian enterprise will no longer be possible and that compensation will not be adequate to replace a holding in this location for the purpose for which it was intended

Issues Raised in Submissions/Objections

4.6.1 There was one submission expressing concern about the potential development of an equestrian enterprise.

Submission/Objection SCH-102 states - *“It was my Client’s intention to construct an equestrian enterprise on their lands and this would clearly be impossible given the location of the proposed new road and in this instance compensation in its own right will not be adequate to replace a holding in this location for the purpose to which it was intended to be used”.*

Response

4.6.2 The land in question, as illustrated in Figure 3 as landholding 089, is approximately 30 acres in size and is laid out currently in grazing lands. The owners explained to me in details their plans for an equestrian facility, including a gallop. However, these lands are currently agricultural lands with no planning permission in place. The development of any equestrian enterprise would be subject to the planning process.

4.7 Adequacy of Assessment of the Impact the Proposed Road Development on Commercial Equine Business

Issues Raised in Submissions/Objections

4.7.1 There was one submission expressing concern about the potential impact the proposed road development will have on their commercial equine business:

Submission/Objection SCH-37 states - *“My Clients produce high value thoroughbreds and Sport Horses on their farm, and the scheme currently before the Board has not considered the impacts of the Scheme on my clients business and their ability to continue in their business.”*

Response

4.7.2 In 2018, I contacted the landowner on two separate occasions and explained my role as equine specialist on the Limerick to Foynes Road (including Adare Bypass). I requested his consent to visit his farm and have him guide me around the lands and explain the nature of their equine enterprise and his assessment of the impact the

proposed road development would have on his equine operation. On both occasions, he politely refused to meet me.

- 4.7.3 Subsequently, I completed a desktop assessment of the property and the potential physical impact the proposed road development would have on this property. The property is a residential and mixed enterprise farm holding comprising of lands in two separate plots of lands. The main holding consists of the dwelling house, equine and agricultural farmyard and agricultural lands. The affected lands, or outfarm, consists of approximately 41.0 ha of agricultural lands. Facilities on the outfarm include a farm building at the northern end. It consists of moderate to good quality grassland and grazed by cattle and horses. It would appear, due to the paucity of handling and training facilities that the equine enterprise at this location is extensive in nature.
- 4.7.4 The Foynes to Limerick Road project will have an impact on agricultural lands on the property. The impact will include a total land acquisition of 2.8281 ha comprising of 2.6536 ha agricultural lands, 0.1683 ha public roadbed and 0.0062 ha of private roadbed. These lands are on the southern end of the affected plot, appear to be grassland only and remote from the farm building and there is no land severance.
- 4.7.5 On the affected plot, there will be a temporary impact on the existing hedgerow field boundary until such time as the proposed landscape planting matures. There may be temporary impacts of dust and noise which may occur during construction due to traffic from construction vehicles and related activities.
- 4.7.6 General mitigation measures for agricultural properties are outlined in Chapter 15 of the EIAR, section 15.5, with regard to replacement access arrangements, stockproof fencing, boundary treatments, drainage and watercourses, services and ducting.
- 4.7.7 In response to the submission received, the mitigation measures and moderate residual impact within Chapter 15 of the EIAR are considered appropriate.

4.8 Effect of Noise During Construction and Operation Stage of Road on Disabled Riders

Issues Raised in Submissions/Objections

- 4.8.1 There was one submission expressing concern about the potential impact that the proposed road development would have on disabled riders:

Submission/Objection SCH-14 states - Michael Sadlier expressed concerns relating to the proximity of the new road to the horse lorry/car park and the outdoor and indoor riding arenas and the effect of noise both during the construction and subsequent use of the road on horses, especially given so many riders have some form of disability."

Response

- 4.8.2 In my initial assessment on Clonshire Equestrian Centre, it was my considered opinion that "Although horses are very adaptive and once familiar with the stimuli associated with road construction and traffic flow, will usually not over-react to normal traffic activity. However, in Clonshire a significant amount of their business comes from horse shows and competitions where the horses arrive into the car park, are unloaded to compete in either the indoor or outdoor arenas and then return to the transport boxes

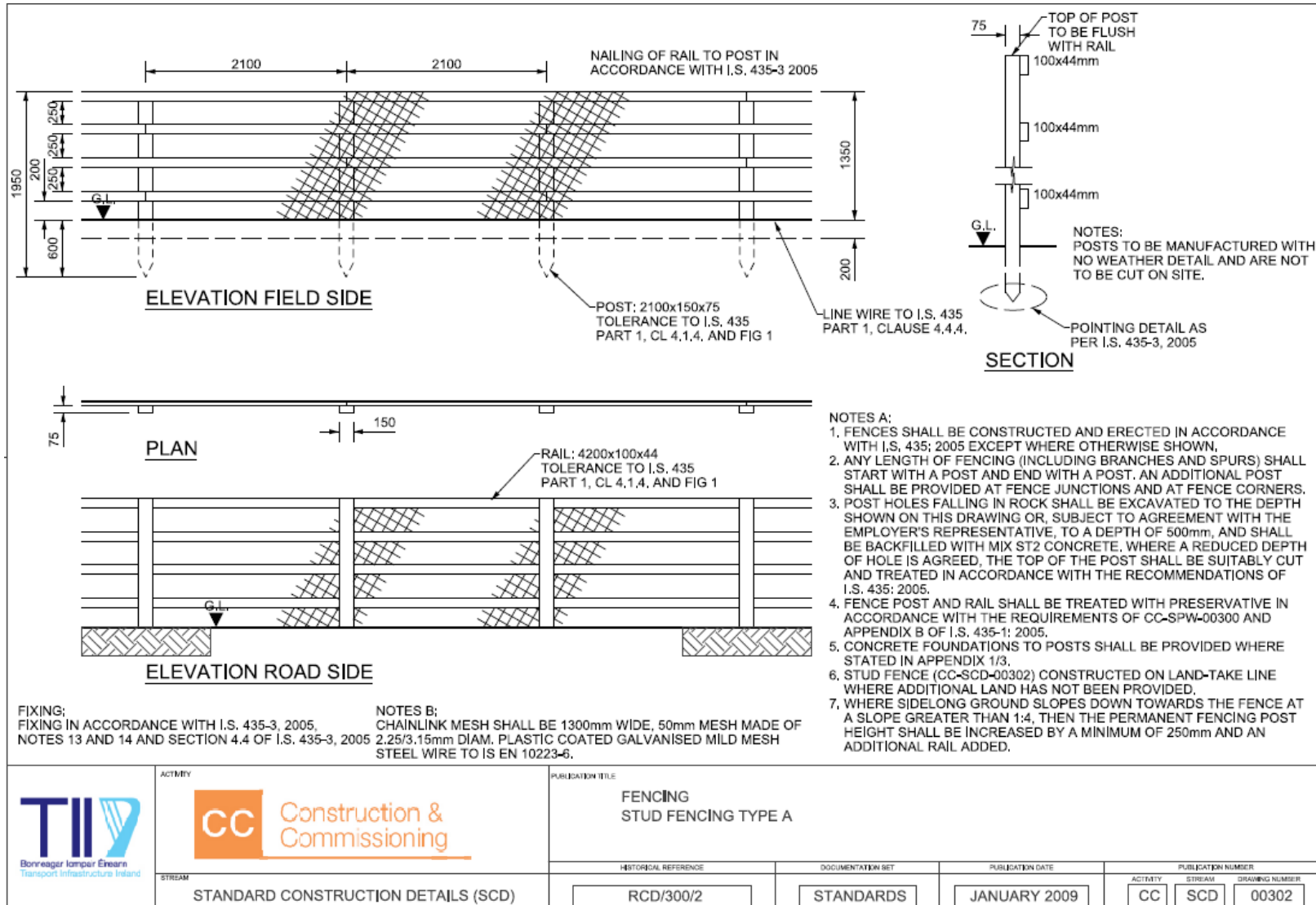
to wait their next event. These horses will not have been exposed to the road construction stimuli or traffic on an elevated section of road and are quite prone to reacting in a negative manner.

- 4.8.3 I also refer to Section 4.2 of this Brief of Evidence where I have outlined the proposed mitigation measures in the landtake closest to Clonshire
- 4.8.4 In conclusion, the proposed road development is very close to an area of intensive equine activity. During the road construction and when it is in use, there will be abnormal stimuli that could cause an unfamiliar horse or in rare cases a familiarised horse to react in a negative manner with possibly severe consequences. “
- 4.8.5 I feel that the risks pertain to equine behavior regardless of who is handling/riding the horse.
- 4.8.6 During my visit to Clonshire, I understood that disabled riders who used the facility normally rode in the indoor arena. The horses used were either suitable riding school horses or horses brought in by the volunteers who helped with the riding lessons. I was told that these horses were pre-selected for their quiet temperaments and docile natures.

5. CONCLUSION

- 5.1 The majority of equine enterprises along the proposed road development are high to medium sensitivity.
- 5.2 The equine assessment considered the types of farms, the farming operations, mitigation measures and all potential impacts, including direct, indirect and cumulative impacts and potential interactions with other environmental topics.
- 5.3 The results of the nine equine property assessments found that 4 holdings are significantly affected (3 directly - Farm Reference 080 (Hayes), 084 (Cahill), 089 (Myers and Barnwell) and (1 indirectly - Farm Reference 090 (Clonshire Equestrian Centre), and five that were moderately affected (Farm Reference 023 (R Brennan), 024 (T Kelly) 040 (G Hayes), 042 (Leonard), and 086 (Murphy). These impacts are typical of other major road infrastructural projects and are acceptable when the wider societal benefits are taken into account.
- 5.4 The issues raised in the submissions and objections in relation to potential impacts on equine enterprises have been fully considered, and having considered those issues, the conclusions of the equine impact appraisal remain as set out in the application documentation.

Appendix A TII Standard Construction Details CC-SCD-00302



TII Standard Construction Detail CC-SCD-00321

FENCE ELEVATION

2.5mm Ø, 14-130-5 mesh wire manufactured to BS EN 10223-5
Wire to be Zinc Aluminium Alloy (95% Zinc, 5% Aluminium)
Coating Weight 135g/m²
Tensile Strength of Horizontal Wire: Min 1,235MPa
Max. spacing between horizontals to be 150mm.
Vertical Wires at 50mm Spacing with joints as per Detail 1.

120mm wide flexible plastic rail with a minimum of 3 embedded wires (see notes 19 - 21 and CC-SPW-00300).

Mesh shall be fixed to intermediate posts using 40mm x 4mm Ø galvanized staples on every second horizontal line wire. Staples to be hammered in diagonally so as to limit potential splitting of posts.

4000

1200

1270

2100

750

Intermediate Post: 2100x150x75
Tolerances to I.S. 435:1

Provide Clear Gap at Base of Fencing (50mm Recommended, Gap shall not be >100mm)

FENCE PLAN

DETAIL 1 - JOINTS

SECTION 1 POINTING DETAIL

NOTES:

- FENCES SHALL BE CONSTRUCTED AND ERECTED IN ACCORDANCE WITH CC-SPW-00300 & CC-GSW-00300.
- ANY LENGTH OF FENCING (INCLUDING BRANCHES OR SPURS) SHALL START AND END WITH A STRAINING POST. ADDITIONAL STRAINING POSTS SHALL BE PROVIDED AT FENCE JUNCTIONS, CORNERS AND WHERE CURVES AND ANGLES EXCEED 10°. STRAINING POSTS ARE TO BE PROVIDED AT MAX 15m SPACING. WHERE A FENCE CROSSES A LANDOWNER BOUNDARY (I.E. CHANGE IN OWNERSHIP AND BOUNDARY) AN ADDITIONAL STRAINING POST SHALL BE LOCATED ON THE BOUNDARY CENTER. WHERE STRAINING AND INTERMEDIATE POSTS ARE TO BE DRIVEN, THEY SHOULD BE POINTED AS PER SECTION 1.
- STANDARD POST HOLES FALLING IN ROCK TO BE EXCAVATED TO THE DEPTH SHOWN ON THIS DRAWING OR, WITH THE EMPLOYERS REPRESENTATIVES APPROVAL, TO A DEPTH OF 0.5m. AND SHALL BE BACK FILLED WITH MK 5/2 CONCRETE, IN ACCORDANCE WITH IS EN 205-1. WHERE A REDUCED DEPTH OF HOLE IS AGREED, THE TOP OF THE POST SHALL BE SUITABLY CUT AND TREATED IN ACCORDANCE WITH THE RECOMMENDATIONS OF IS 435. END POST HOLES TO BE EXCAVATED TO 1.10m.
- ALL FENCE POSTS SHALL BE TREATED WITH PRESERVATIVE IN ACCORDANCE WITH ANNEX B OF IS 435:1.
- WHEN THE GROUND CROSS-FALL ACROSS A SECTION OF FENCE EXCEEDS 1%, THE PERMANENT FENCE & FENCING POST HEIGHTS SHALL BE INCREASED BY A MINIMUM OF 0.25m.
- CURVES SHOULD BE AVOIDED WHERE POSSIBLE. WHERE A CURVE CANNOT BE AVOIDED THE WIRE SHOULD ALWAYS BE ON THE OUTSIDE OF THE CURVE WITH THE WIRE PRESSING AGAINST THE POST (REFER FIG 1).
- WHERE A CURVE CANNOT BE AVOIDED AND THE CHANGE IN DIRECTION MEASURED AT EACH POST WITHIN THE CURVE IS GREATER THAN 10°, THE INTERMEDIATE POSTS SHALL BE REPLACED WITH STRAINING POSTS AND THE SPACING BE REDUCED TO 3M UNTIL THE CHANGE IN DIRECTION MEASURED AT THE POST IS <10°. SEE DETAIL 5.
- WHERE A CHANGE IN HORIZONTAL DIRECTION OF THE FENCE LINE IS GREATER THAN 30° A DOUBLE END POST ASSEMBLY SHOULD BE INSTALLED (E.G. AT FIELD CORNERS).
- WIRE MESH SHOULD BE TERMINATED AT AN END POST BY WRAPPING THE HORIZONTAL LINE WIRES AROUND THE END POST FIVE TIMES AND SECURING THEM BACK ONTO THEMSELVES. ALTERNATIVELY, GRIPPLE T-CLIPS OR SIMILAR WIRE JOINING DEVICES CAN BE USED FOR THIS PURPOSE. THE WIRE SHOULD NOT BE STAPLED TO THE END POST AS THEY MAY CAUSE ROTATION OF THE STRAINING POST.
- WIRE MESH SHALL BE SECURED TO THE FIELD SIDE OF POSTS (SEE NOTE 7 FOR EXCEPTION) WITH WIRE STAPLES ON EVERY SECOND WIRE HORIZONTALLY. WIRE STAPLES SHALL BE GALVANIZED 40mm x 4mm ROUND.
- WHERE 2 SECTIONS OF THE WIRE MESH ARE TO BE JOINED, CRIMPING SLEEVES OR GRIPPLE-TYPE WIRE JOINERS ARE TO BE USED.
- THE RECOMMENDED TENSION FOR THE WIRE MESH IS 45kg/m PER LINE WIRE. MESH IS TO BE INSTALLED IN ACCORDANCE WITH MANUFACTURERS GUIDELINES AND TENSION CHECKED ON SITE BY AUTHORITIES REP.
- WHERE THE FENCE IS REQUIRED TO BE MAMMAL RESISTANT, THE DETAIL IN CC-SCD-00324 SHALL BE USED.
- WHERE THE FENCE IS REQUIRED TO TRAVERSE AN UNEVEN GROUND PROFILE, THE CONTRACTOR SHALL PRE-CLEAR A SMOOTH PATH FOR THE FENCE PRIOR TO ITS INSTALLATION. ADDITIONAL STRAINING POSTS WILL BE REQUIRED AT PEAKS AND TROUGHS IN AREAS OF SHARPLY UNDULATING TERRAIN TO PREVENT ANY SLACKNESS DEVELOPING IN THE FENCE. SUCH ADDITIONAL STRAINING POSTS TO BE FOUND ON MK 5/2 CONCRETE, IN ACCORDANCE WITH IS EN 205-1 TO AVOID THE RISK OF BECOMING LOOSE OVER THE LIFE OF THE FENCE. THE FENCE SHALL BE CUT AND RE-TENSIONED AT EACH ADDITIONAL STRAINING POST AS GUIDANCE, IT IS NOT RECOMMENDED TO EXCEED A 4° CHANGE IN VERTICAL DIRECTION WHERE 4M POST SPACING IS PROVIDED. IN AREAS OF POOR GROUND, INTERMEDIATE POST SPACING SHALL BE REDUCED TO 2m CENTERS AND 2.5m X 0.17m DIAMETER POSTS SHALL BE USED TO PROVIDE ADDITIONAL RIGIDITY TO THE FENCE. WHERE THE PERFORMANCE OF THE FENCE MAY BE COMPROMISED BY POOR GROUND CONDITIONS, THE EXISTING GROUND SHALL BE EXCAVATED AND REINSTATED AS PER CC-SPW-00300.
- FLEXIBLE RAIL TO BE TO BE CONNECTED TO STRAINING POSTS USING COMBINED GALVANIZED TENSIONER AND END BUCKLE FIXED TO STRAINING POSTS WITH 1x HOT DIPPED GALVANIZED 100mm x M12 COACH SCREW.
- FLEXIBLE RAIL TO BE BLACK IN COLOUR UNLESS OTHERWISE STATED.
- WHERE LENGTHS OF FLEXIBLE RAIL ARE TO BE JOINED, THE CONNECTION IS TO BE MADE WITH A GALVANIZED JOINING/SPLICING BUCKLE OR BY JOINING INTERNAL WIRES WITH 3x CRIMPING SLEEVES. REFER TO CC-SPW-00300.

End Assembly Details

Item	Quantity	Description
End Posts / Straining Posts	1	2500mm x 170mm (+/- 3mm) Ø Timber Post
Cross Member	1	2700mm x 100mm (+/- 3mm) Ø Timber post
Brace Pin	1	12mm x 250mm Galvanized Pin
	1	12mm x 100mm Galvanized Pin
Galvanized Steel Brace Plate	1	1.8mm min Thick Galvanized Steel Brace Plate
	5 minimum	100mm x 4mm Galvanized Round Wire Fencing Nails
Bed Log	1	150mm x 75mm x 300mm minimum Timber post
Grippler T-Clips	13	Galvanized Wire Joiners

DETAIL 2 - END POST ASSEMBLY ELEVATION

DETAIL 3 - END POST ASSEMBLY PLAN

DETAIL 4 - PLAN VIEW OF CURVED FENCELINE STRAINING POST & END POST ASSEMBLY REQUIREMENTS

DETAIL 5 - CURVES

DETAIL 6 - GALVANIZED STEEL BRACE PLATE (FIXING DETAIL)

Flexible plastic rail. See note 19.

12 x 250mm Brace Pin or Galvanized Steel Brace Plate (see Detail 6).

470 (POST HEIGHT)

12 x 100mm Brace Pin

Straining Post

Standard Post

Bed Log

2700

30°

End Post assembly required at junctions and at ends of fencing runs.

End Post Assembly

Note 2.

Double end post assembly required when fence line rotates at an angle of greater than or equal to 30°. Wire mesh stapled to each cross member.

Intermediate Posts to be substituted for 2500mm x 170mm dia posts where change in direction exceeds 10° (see note 8 and Detail 5)

ACTIVITY

CC Construction & Commissioning

PUBLICATION TITLE

**FENCING
TIMBER POST AND TENSION MESH STUD FENCE**

HISTORICAL REFERENCE	DOCUMENTATION SET	PUBLICATION DATE	PUBLICATION NUMBER
RCD/300/21	STANDARDS	AUGUST 2018	CC SCD 00321

STREAM

STANDARD CONSTRUCTION DETAILS (SCD)