Fencing Standard Details

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TII Fencing Retrofit Programme Seminar

Tullamore Court Hotel

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Bonneagar Iompair Éireann
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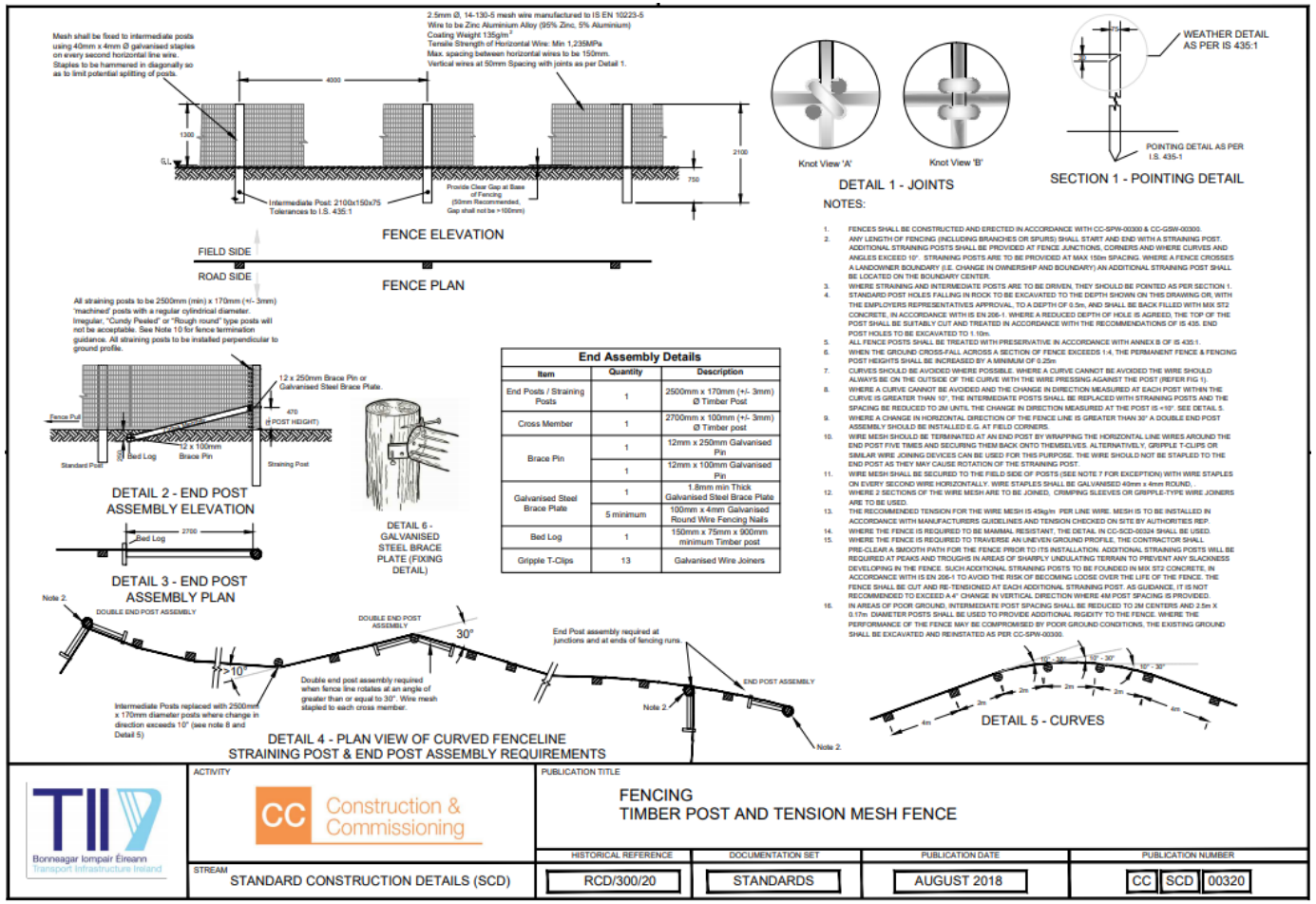
Introduction and Background

- Collision stats highlighted the degree of injuries and fatalities caused due to collisions with road boundary fencing.

December 2014	• SCD's for Timber Post and Tension Mesh published
November 2015	• DN-REQ-03034 Safety Barrier Design designated timber post and rail as a hazard within the Clear Zone
Post 2015	• Implementation of the Timber Post and Tension Mesh detail on projects • *Varying degrees of success*

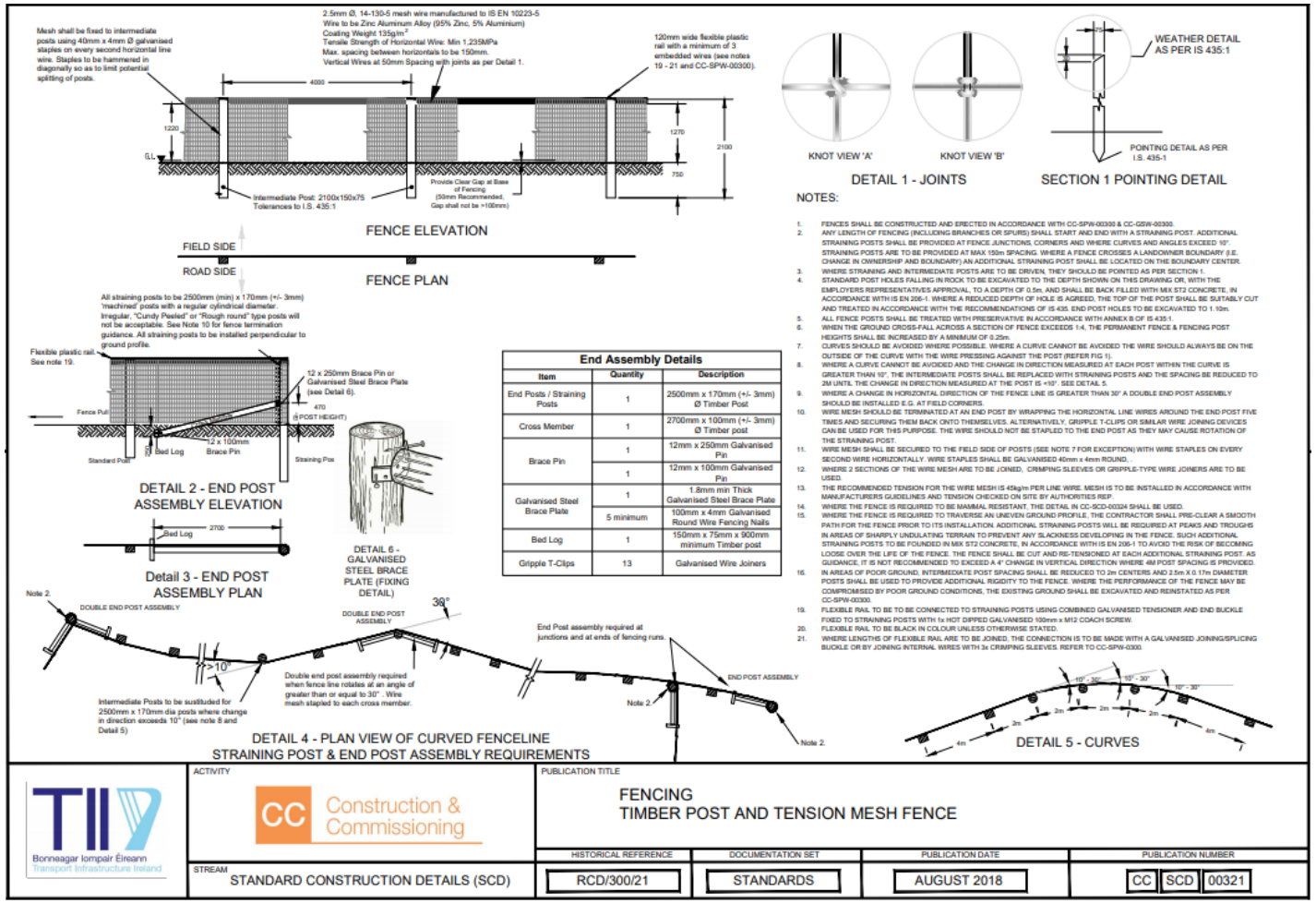
Standard Construction Details Overview

- CC-SCD-00320 – Timber Post and Tension Mesh Fence



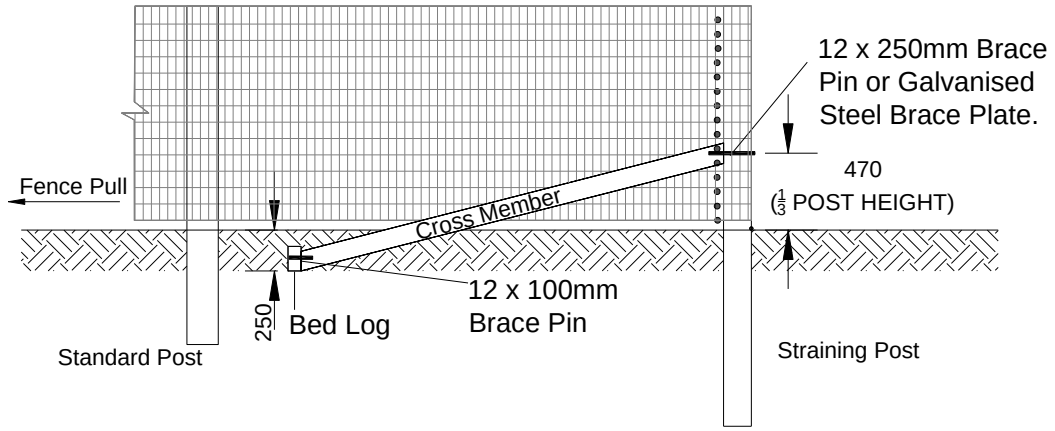
Standard Construction Details Overview

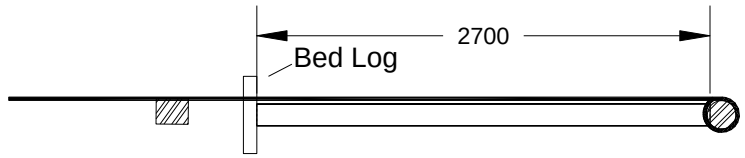
- CC-SCD-00321 – Timber Post and Tension Mesh Stud Fence



Key Requirements - Construction

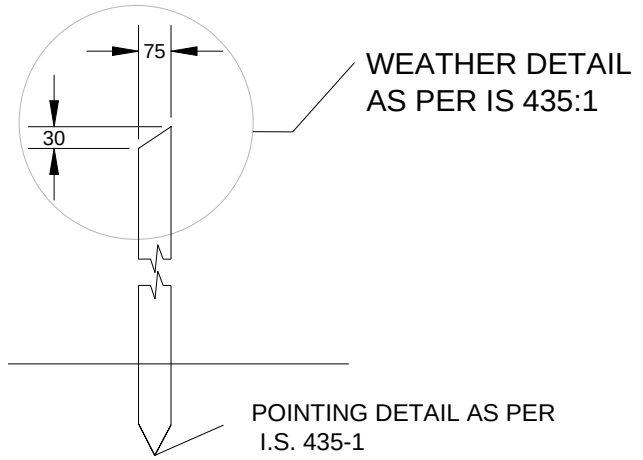
- All runs of fencing must start and end with a straining post as per the end post assembly detail.
- Maximum spacing between straining posts is 150m, in-line straining posts to be as per double end post assembly.
- Additional straining posts are required at fence junctions, corners and curves and angles >10°*.
- Additional straining posts to be provided at landowner boundaries.
- Intermediate Posts provided at 4m centres between straining posts*.





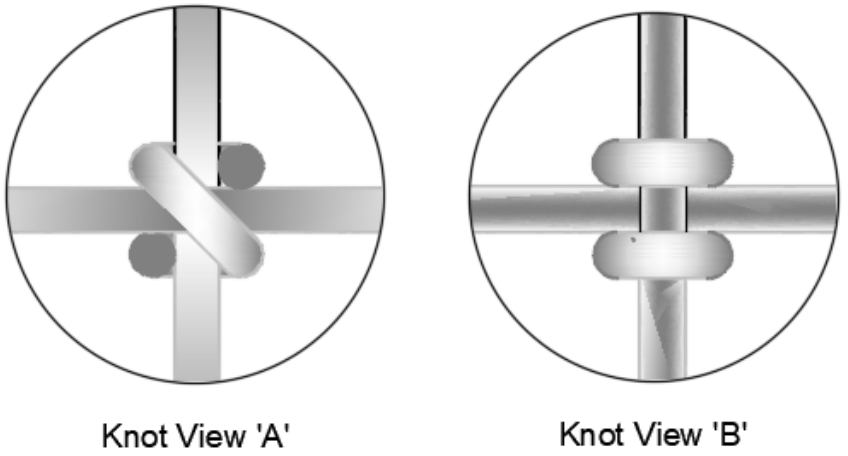
Key Requirements - Timber

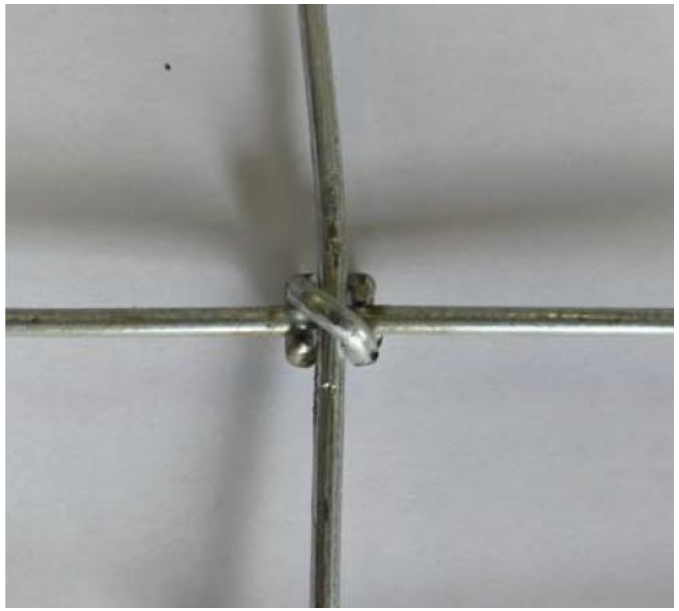
- Timber for permanent fencing shall fully comply with IS 435-1 with the exception of straining posts, cross members and bed logs.
- Timber Species, Timber Grading, Moisture Content, Geometry of posts and Timber Preservation.
- Straining posts for Timber Post and Tension Mesh Fencing shall be 2500mm x 170mm (+/- 5mm) ‘machined’ posts with a regular cylindrical diameter.
- Irregular, “Cundy Peeled” or “Rough round” type posts are not permitted.
- Intermediate posts are as per timber post and rail fencing in accordance with IS 435-1.



Key Requirements – Tensioned Mesh

- “X-Fence” mesh detail with knotted joint.
- Manufactured using high tensile line wires and medium tensile stay wires.
- Knotted joint stronger than conventional tied knots.
- 2.5mm Ø high tensile mesh wire manufactured to IS EN 10223-5.
- Wire to be Zinc Aluminium Alloy - 95% Zinc, 5% Aluminium (Galfan).
- Coating Weight 135g/m^2.
- Min Tensile Strength of Horizontal Wire: 1,235MPa.





Issues Encountered

- Standard Construction Details published – no update to Fencing Specification (CC-SPW-00300).
- Mammal Proofing – SCDs referred to detail for timber post and rail (CC-SCD-00319), not practical.
- Ground conditions - very difficult to achieve tension in poor or undulating ground conditions, further guidance needed.
- Horizontal Alignment – very difficult to achieve tension with changes in direction, further guidance needed.
- Material specification (timber and mesh).
- Installers/ designers not experienced.

➡ Concerned Landowners.

Issues Identified – CC-SPW-00300

- SPW and GSW Updated to account for Timber Post and Tension Mesh Fence types
- Key Updates:
  - Timber quality section updated.
  - Spec for Flexible Rail for Timber Post and Tension Mesh Fence added.
  - Changes in Vertical Alignment updated.
  - Changes in Horizontal Alignment added.
  - Mammal Resistant Fencing updated.
  - Installation of Fencing on Undulating Ground added.
  - Installation of Fencing in Soft/Poor Ground Conditions updated.
  - Retrofitting of Existing Timber Post and Rail Fencing added.

Undulating Ground

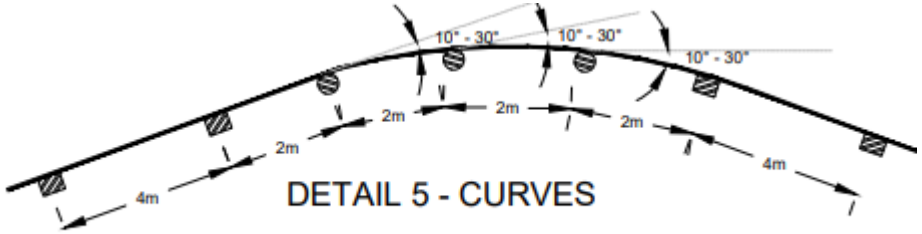
- Guidance added undulating ground:
  - Contractor shall trim and level the ground along the line of the fence.
  - Where a loss of tension to the top or bottom of the mesh in timber post and tension mesh fence occurs, the Contractor shall install additional straining posts located at the peaks of high and troughs of low points and cut and re-tension fencing at the straining posts to maintain consistent tension in the fence.
  - Alternatively, the Contractor may reduce spacing of the intermediate posts to 2m.

Poor Ground Conditions

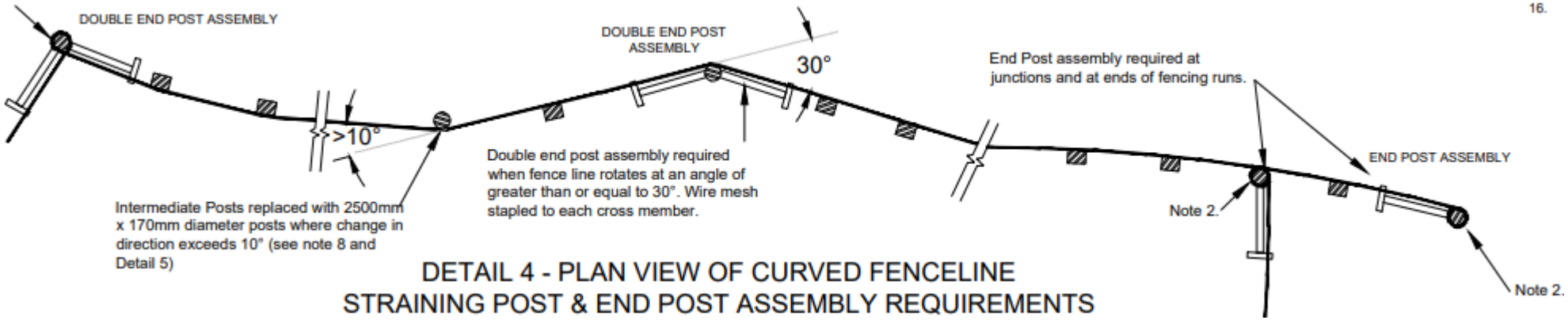
- Guidance added poor ground:
  - Reduce the spacing of intermediate posts from 4m to 2m.
  - Replace the intermediate posts with straining posts until ground conditions allow for regular intermediate posts to support the tension within the fence.
  - Excavate a 1m wide x 1m deep trench along the line of the fence through the poor ground conditions and reinstate with acceptable fill material.
  - Install intermediate posts within the reinstated material.
    - Concrete footings as per Series 2600 if required.

Changes in Horizontal Alignment

- Guidance added horizontal alignment:
  - Change exceeds 10º, replace intermediate post with straining post.
  - Change exceeds an angle of 30º, a Double End Post Assembly will be required.



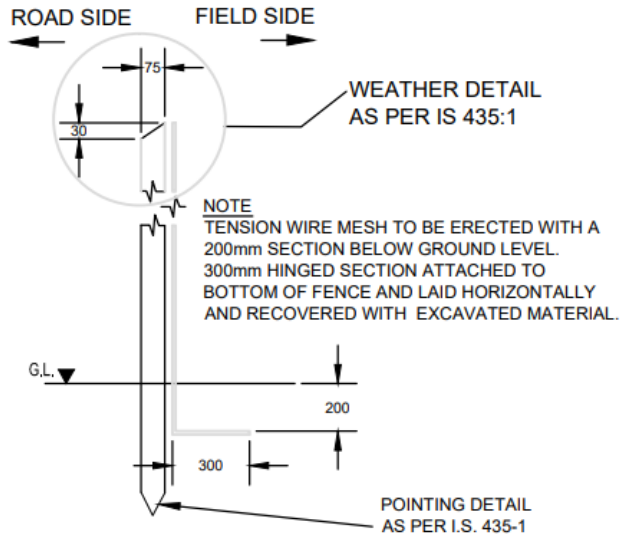
DETAIL 5 - CURVES



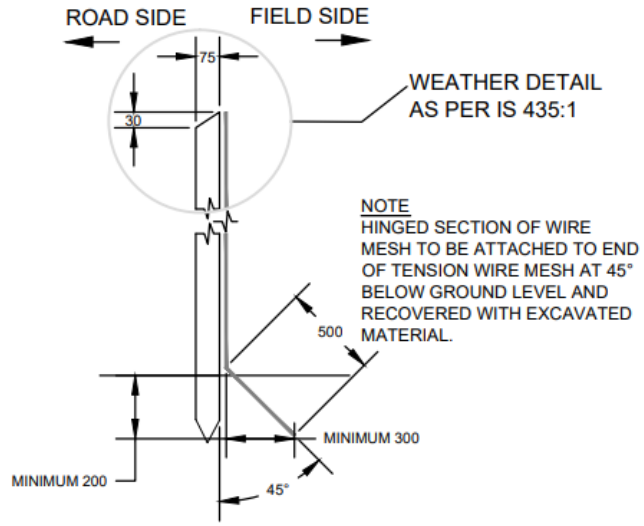
DETAIL 4 - PLAN VIEW OF CURVED FENCELINE
STRAINING POST & END POST ASSEMBLY REQUIREMENTS

Mammal Proofing

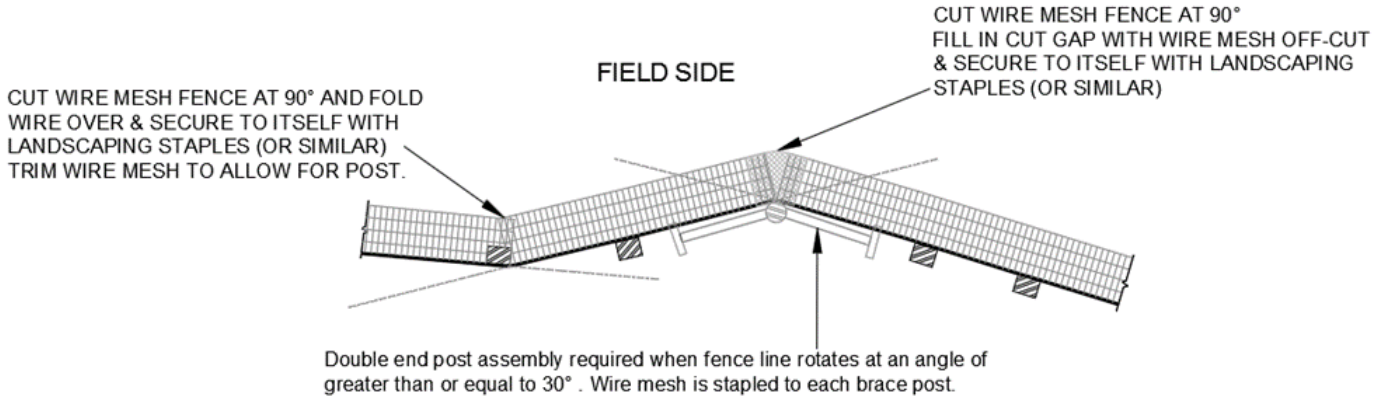
- New SCD introduced (CC-SCD-00324)
  - 2 Options available.
  - Requirement to cut and fix around posts where changes in direction.



OPTION A



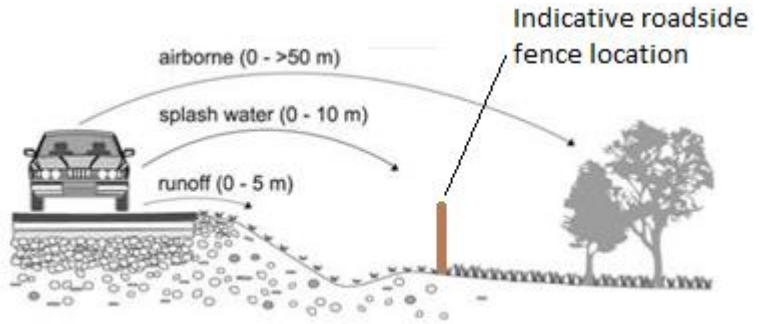
OPTION B



MAMMAL RESISTANT FENCING AT CHANGE IN DIRECTION

Materials – Wire Mesh Specification

- Zinc only versus Zinc Alloy coating?
- Review finding:
  - no reason to change existing requirement.



Re-use of Materials

- Retrofitting Timber post and rail:
  - If timber posts are deemed to have a residual life of 10 years or greater and are well founded on suitable ground, a tolerance of +/- 100mm may be applied to the required spacing posts to allow reuse of the existing posts.
  - The residual life of the posts shall be subject to the approval of the Employer's Representative
- Re-use of existing mammal proofing details
  - Not included in specification but see MMaRC retrofit programme experience

Notes for Designers

- Need to identify areas where additional details may be required when retrofitting:
  - Changes in horizontal alignment (additional straining posts etc.).
  - Curved sections of road boundary fencing (e.g. reduced post spacing).
  - Changes in vertical profile (minor earthworks may be required).
  - Poor ground conditions (concrete and/ or reduced spacing)
  - Reuse of timber posts or mammal proofing.
  - Mammal proofing - additional corrosion protection may be required if highly corrosive ground conditions.

Items to Consider

- Tie-in to gates
- Tying into existing fences/ structures
- Detail at mammal underpasses
- Pedestrian Protection at Culverts

Questions?

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Thank you for listening

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