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# Pilot Single Carriageway Fencing Retrofit Programme

## Design Process

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Fencing Retrofit Programme Workshop  
Tullamore, January 15<sup>th</sup> 2019

# Agenda

1. Background
2. Fencing Replacement Policy & Guidance Notes
3. The Design Process
4. Design Output
5. Workshop

# Background

- Desktop review and site survey of 75 fencing sites along the National Primary and Secondary Network
- Development of an 8 step design process to:
  - Document the decision making process
  - Ensure all roadside hazards are considered
  - Provide a template to guide the designer in selecting the appropriate retrofit option
- Development of a series of 'rules of thumb' in the form of the Fencing Replacement Policy & Guidance Notes



# Fencing Replacement Policy & Guidance Notes

Ref	Policy / Guidance Note
FP-01	Where existing timber or concrete P&R fencing is located within the clear zone on non-motorway/dual carriageway national roads, and where there is a risk that an errant vehicle could strike the fence when leaving the carriageway, this fencing should be replaced with the new Timber Post and Tensioned Mesh fence.
FP-02	The overarching principle when considering what to replace and what not to replace is to 'replace what it makes sense to replace'
FP-03	<p>If significant lengths of P&amp;R fence are adequately protected within the length of need of a compliant VRS, are in reasonably good condition and are beyond the path of an errant vehicle which may leave the carriageway and enter behind the VRS (assessed on the basis of an entry path angle of 8° in accordance with DN-REQ-03034), then they should not be replaced.</p> <p>Where P&amp;R fencing is located within the likely path of an errant vehicle which may leave the carriageway and travel behind a VRS, this fencing should be replaced.</p> <p>Where short lengths of <u>Category 1</u> P&amp;R fence are adequately protected within the length of need of a compliant VRS, and are deemed to be in poor condition, then they should be replaced.</p>
FP-04	If tying new fencing into existing fencing which may be outside the Clear Zone and doesn't pose a hazard, extending the length of replacement fencing beyond what is actually needed may be considered if reasonably short lengths would bring you to a field/land boundary or field gate etc., or where such short lengths are in poor condition.

➤ Timber or concrete P&R within the clear zone and at risk of being struck by an errant vehicle → *Replace with TPTM fence*

➤ Replace what it makes sense to replace

➤ If the fence is protected by a compliant VRS, is in good condition and outside the path of an errant vehicle → *Do Not Replace*

➤ If the fence is within the path of an errant vehicle which may travel behind the VRS → *Replace with TPTM fence*

➤ Where short lengths of Category 1 fencing are protected by a compliant VRS, but in poor condition → *Replace with TPTM fence*

➤ If tying new fencing into existing fencing which is outside the clear zone → *May be appropriate to extend the replacement length were such short lengths are in poor condition or may take you to a field gate/land boundary*

# Fencing Replacement Policy & Guidance Notes

Ref	Policy / Guidance Note
FP-05	Gates and gate piers/pillars are considered isolated momentary hazards and therefore the likelihood of them being impacted by an errant vehicle is significantly less than the long stretches of P&R fencing. Therefore the replacement or setting back of gates and associated piers/pillars is not part of this programme; however in some cases it may be possible to do so with landowner consent.
FP-06	Where it is anticipated that existing timber or concrete P&R fencing shall be replaced or removed is part of major or minor works scheme planned within the next 5 years, the treatment of the existing fencing should be discussed with the overseeing authority and the priority of the works agreed. This may result in the location being reduced in priority level.
FP-07	Where any roadside fence or treatment other than timber or concrete P&R incorporates horizontal rails (e.g. Knee Rail), and are located within the clear zone, this fencing or treatment should be removed. In such cases, the existing support posts may be retained provided that they do not represent a hazard under DN-REQ-03034.
FP-08	Where livestock are present, the most appropriate replacement fencing should be to CC_SCD_00320. Where there is a requirement for Stud fencing CC_SCD_00321 is the most appropriate fencing.
FP-09	Where concrete post and concrete panel fencing is identified, there is no requirement currently to replace this with TPTM fencing.
FP-10	Where new planting, which is currently not considered a hazard, is located in front of or behind existing post and rail fencing, this can be ignored for the purposes of this assessment as it is expected other maintenance regimes and/or periodic RSI's will address these issues in the future. Where there are other linear hazards such as continuous open drains or a line of mature trees, (isolated point hazards dealt with above), then this assessment should consider the most appropriate treatment for the location, such as removal of these other linear hazards or protection in line with DN-REQ-03034.

➤ The replacement or setting back of field gates and piers/pillars *is not part of this programme*, unless it is possible to do so with landowner consent

➤ If the existing fence shall be replaced or removed as part of major/minor works within the next 5 years → *Consult with TII to determine the priority of the retrofit work*

➤ Where other hazardous fence types (e.g. knee rail) are within the clear zone → *Replace with TPTM fence or Remove the existing fence*

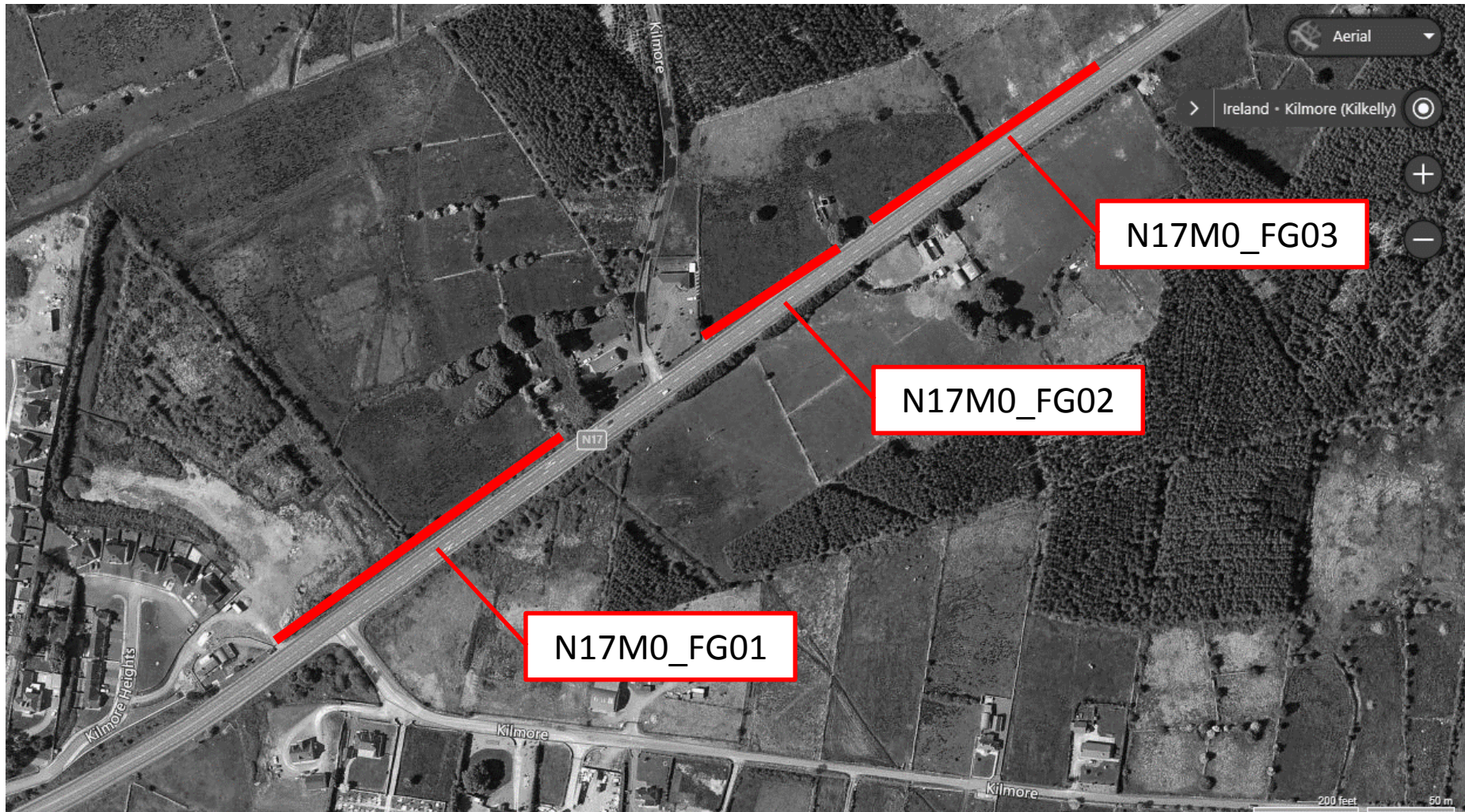
➤ Livestock Present → *CC-SCD-00320*  
Stud Restraint Required → *CC-SCD-00321*

➤ If concrete post and panel fencing is present → *Do Not Replace*

➤ Where new planting which is currently not a hazard is located in front of behind the existing fence → *Ignore for the purpose of assessment*

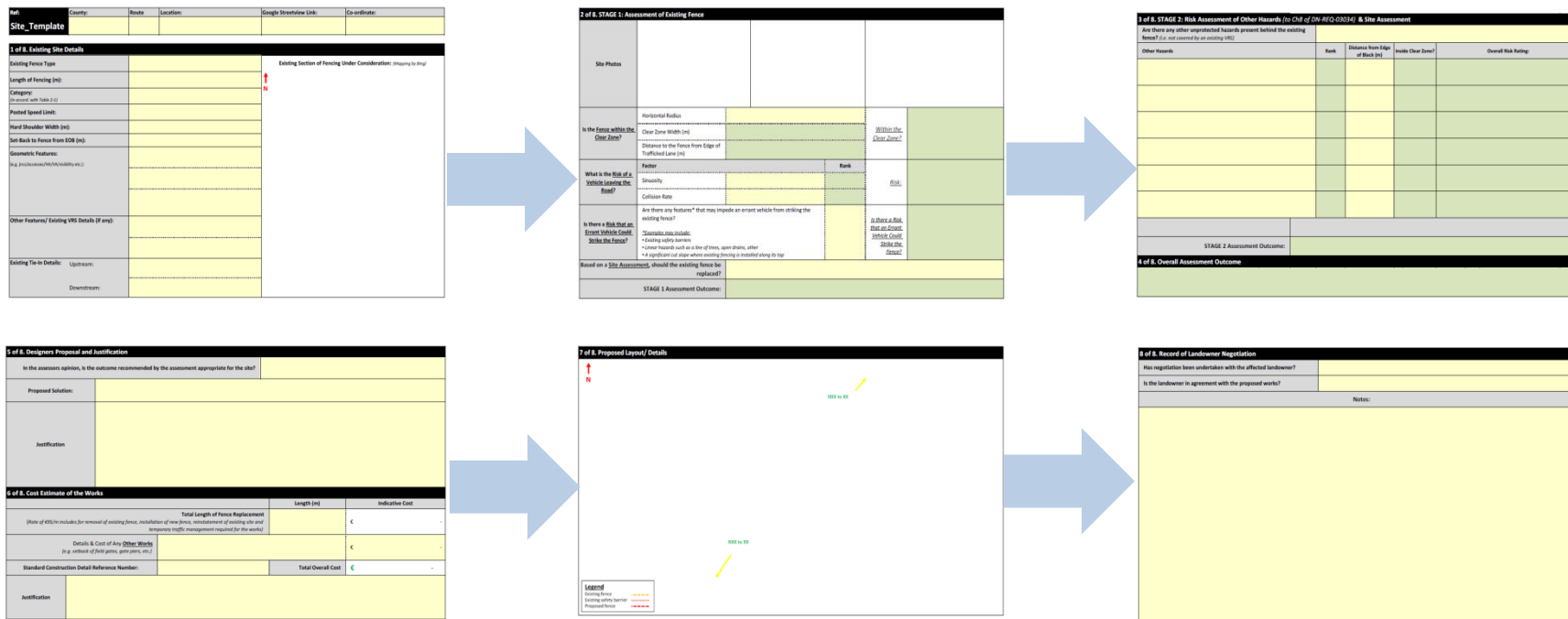
# The Design Process

# The Design Process – Preparation....



# The Design Process

- **8 Step** Microsoft Excel based assessment tool
- Uses a two stage assessment to examine Fencing (Stage 1) and all Other Hazards (Stage 2)
- Draws on Chapter 8 risk assessment principles of DN-REQ-03034





# The Design Process

## STEP 1 – Site Details


- Location & Road Number
- Existing Fence Details (*Type, Category*)
- Speed Limit
- Hard Shoulder Width, Fence Set-Back
- Geometric Features (*Alignment*)
- Tie-In Details
- Site Map

Ref:	County:	Route	Location:	Google Streetview Link:	Co-ordinate:
Site_Template					

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1 of 8. Existing Site Details	
Existing Fence Type	
Length of Fencing (m):	
Category: <small>(in accord. with Table 2-1)</small>	
Posted Speed Limit:	
Hard Shoulder Width (m):	
Set-Back to Fence from EOB (m):	
Geometric Features: <small>(e.g. jncs/accesses/HA/VA/visibility etc.):</small>	
Other Features/ Existing VRS Details (if any):	
Existing Tie-In Details:	
Upstream:	
Downstream:	

Existing Section of Fencing Under Consideration: (Mapping by Bing)



# The Design Process

## STEP 2 – Stage 1 Assessment (*Fencing*)

- Is the fence within the Clear Zone?
- What is the risk of a vehicle leaving the road?
- Is there a risk that an errant vehicle could strike the fence?



### Outcome:

Replace the existing fence with new TPTM fence or Do Nothing

2 of 8. STAGE 1: Assessment of Existing Fence

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Site Photos			
Is the <u>Fence within the Clear Zone?</u>	Horizontal Radius		Within the Clear Zone?
	Clear Zone Width (m)		
	Distance to the Fence from Edge of Trafficked Lane (m)		
What is the <u>Risk of a Vehicle Leaving the Road?</u>	Factor	Rank	Risk:
	Sinuosity		
	Collision Rate		
Is there a <u>Risk that an Errant Vehicle Could Strike the Fence?</u>	Are there any features* that may impede an errant vehicle from striking the existing fence? <i>*Examples may include:</i> <ul style="list-style-type: none"> <li>• Existing safety barriers</li> <li>• Linear hazards such as a line of trees, open drains, other</li> <li>• A significant cut slope where existing fencing is installed along its top</li> </ul>		Is there a Risk that an Errant Vehicle Could Strike the Fence?
Based on a <u>Site Assessment</u> , should the existing fence be replaced?			
STAGE 1 Assessment Outcome:			

# The Design Process

## STEP 3 – Stage 2 Assessment (Other Hazards)

- Review of all other unprotected hazards
- Risk Assessment of other hazards to Ch. 8 of DN-REQ-03034

### Outcome:

Refer the site to TII Road Safety for inclusion in the relevant RSI Programme

or/and

Proceed with Stage 1 Assessment Outcome

3 of 8. STAGE 2: Risk Assessment of Other Hazards (to Ch8 of DN-REQ-03034) & Site Assessment				
Are there any other unprotected hazards present behind the existing fence? (i.e. not covered by an existing VRS)				
Other Hazards	Rank	Distance from Edge of Black (m)	Inside Clear Zone?	Overall Risk Rating:
STAGE 2 Assessment Outcome:				
4 of 8. Overall Assessment Outcome				

## STEP 4 – Overall Assessment Outcome

### Stage 1 Outcome

Replace the Existing Fence with new TPTM Fence or Do Nothing



### Stage 2 Outcome

Refer the site to TII Road Safety for inclusion in the relevant RSI Programme or Proceed with Stage 1 Assessment Outcome or Stage 2 Not Required



**Design Solution**

# The Design Process

## STEP 5 – Designers Judgement

- Designers judgement as to the appropriateness of the proposed retrofit solution

## STEP 6 – Quantify the Works

- Breakdown of replacement length and other costs associated with the works
- Selection of fence type (*CC-SCD-00320 or CC-SCD-00321*)

## STEP 7 – Site Layout Plan

- Plan aerial view of the proposed works showing:
  - Extent of fencing removal
  - Extent of fencing installation
  - Tie-In Locations

5 of 8. Designers Proposal and Justification		
In the assessors opinion, is the outcome recommended by the assessment appropriate for the site?		
Proposed Solution:		
Justification		

6 of 8. Cost Estimate of the Works		
	Length (m)	Indicative Cost
<b>Total Length of Fence Replacement</b> <small>(Rate of €95/m includes for removal of existing fence, installation of new fence, reinstatement of existing site and temporary traffic management required for the works)</small>		€ -
<b>Details &amp; Cost of Any Other Works</b> <small>(e.g. setback of field gates, gate piers, etc.)</small>		€ -
Standard Construction Detail Reference Number:		Total Overall Cost € -
Justification		



# The Design Process

## STEP 8 – Landowner Negotiation

- Record of negotiation with the affected landowner and details of agreement/non agreement with the proposed works

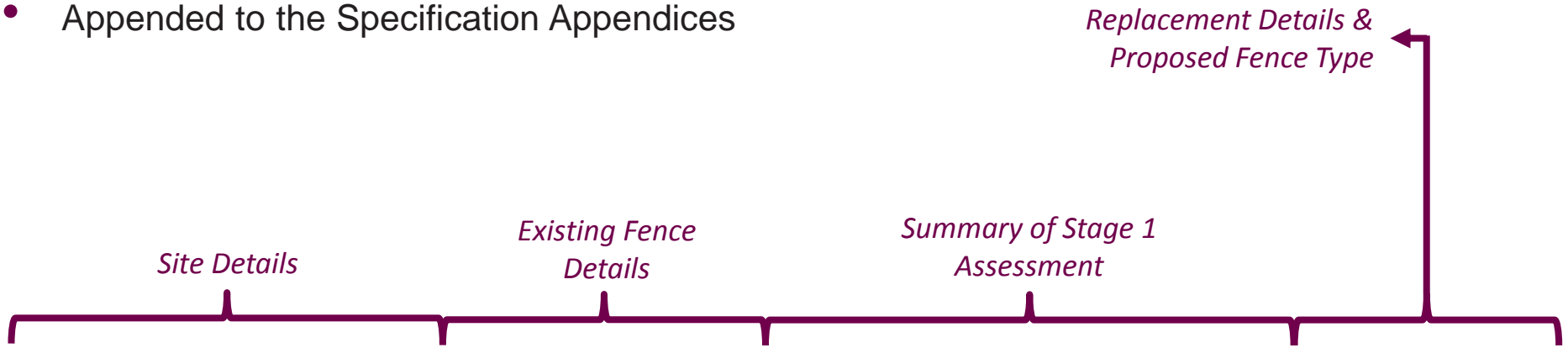
8 of 8. Record of Landowner Negotiation	
Has negotiation been undertaken with the affected landowner?	
Is the landowner in agreement with the proposed works?	
Notes:	

# Design Output

# Design Output

## Schedule of Works

- Summary of existing site & fence details, stage 1 assessment, replacement details and fence type
- Appended to the Specification Appendices



Schedule of Works

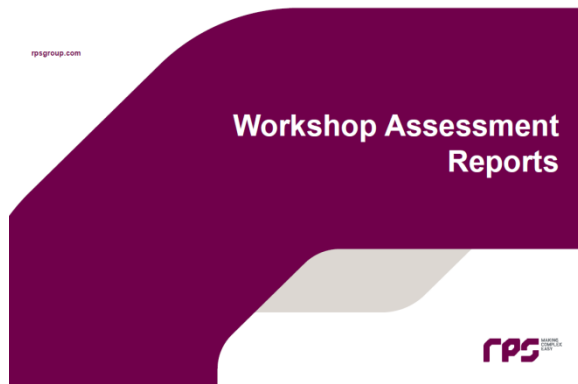
Site Reference	County	Route	Location	Google Streetview Link	Co-Ordinate	Existing Fencing Details				STAGE 1 Assessment Summary			STAGE 1 Proposed Solution	Proposed Replacement Details	
						Fence Type	Length (m)	Category <i>(In accor. With Table 2-1)</i>	Set-Back to Fence from EOB (m)	Is the Fencing within the Clear Zone?	Risk of the Vehicle Leaving the Road	Is there a Risk that an Errant Vehicle Could Strike the Fence?		Replacement Length (m)	SCD Reference No.

# Workshop





- **5 No. Workshop Examples**



- **Answer Booklet**



- **Data & Flowcharts**

**Thank You**