

SOUTH WEST AND MID WALES REGIONAL CIVIL ENGINEERING SERVICES FRAMEWORK PROJECT SCREENING AND ASSESSMENT FOR CD377		
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Design Service
CD 377 Screening and Assessment

Scheme Name:	Westfield Pill Bridge Repairs		
Client:	Pembrokeshire County Council		
Six figure OSGR (Start and End Points) of assessed length	Start:	196633, 206071	
	End:	196917, 205997	
Service Provider/Consultant Name:		AtkinsRéalis	

Stage 1 – Screen for the application of CD377

CD377 Applicable?	Outline Risk Assessment approach to be adopted in line with CD377 in consideration of new and existing hazards
Yes	The site is located at Westfield Pill Bridge on the A477 near Neyland, Pembrokeshire at OS Coordinates 196746, 206051. The speed limit on this section of the A477 is 60mph and it is classed as a S2 type road in accordance with Table 2.3 of CD 109 Highway Link Design. In 2022 Pembrokeshire County Council (PCC) commissioned a Principal Inspection of the Westfield Pill Bridge. The inspection identified several defects associated with the bridge parapets and expansion joints that would affect the durability of the structure in the long term. The scheme involves the replacement of the bridge parapets and expansion joints to resolve the defects identified. The proposed remedial works comprise of replacing both eastbound and westbound parapets of the bridge with a BS EN 1317 compliant N2/W2 system, SafeRoad SN2/W2 or equivalent. The length of parapet proposed to be replaced on each side of the bridge is 294m. Due to the presence of an active travel route along the westbound side of the bridge, a 1.4m high parapet will be provided at this location. The eastbound parapet will consist of a 1.0m high vehicle parapet. These height configurations match the existing parapet arrangement at A477 Westfield Pill Bridge. The existing 4no. terminals located at either end of the westbound and eastbound parapets are class P1 un-tensioned corrugated beam (UCB) and are not compliant with CD 377 Clause 5.4 requirement for class P4. This is a known hazard should there be a head on collision with the terminal as it then acts as a ramp with the potential for a vehicle incursion into the Westfield Pill. The existing terminals are also not compatible

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with the proposed BS EN 1317 compliant N2/W2 system. Therefore, it is proposed that a new 14m SafeRoad Megaflex Transition (or similar approved BS EN 1317 compliant transition) is installed to provide the transition between the proposed bridge parapet and the remaining length of existing P1 terminal. Justification for a Departure from Standard (DfS) for the retention of the P1 terminals is included in Stage 2 of this screening form for PCC Technical Approval Authority (TAA) approval.

Initial Screening

CD 377 Para.	If the answer to any of the following questions is 'Y' then CD 377 shall be applied.	Y/N
1.3	New Road?	N
1.3	Is the highway cross-section being altered permanently?	N
1.3	Is there an existing RSS where its serviceable life has expired?	N
1.3	Has a new hazard been introduced and/or moved and/or modified?	N
1.3	Is there a change in risk at or near the edge of the carriageway?	N
1.3	Has an existing VRS been dismantled?	Y

CD 377 Para.	If the answer to any of the following questions is 'Y' then CD 377 should be applied unless otherwise agreed with the Overseeing Organisation	Y/N
1.3.1	Is there other works (excluding routine maintenance) being carried out near a hazard that is currently without provision or near an existing RRS that does not meet the requirements of CD 377?	N
1.3.1	Is there other works (excluding routine maintenance) being carried out near an existing VRS where its serviceable life has expired?	N
1.3.1	Is there other works (excluding routine maintenance) being carried out near an existing RRS that has less than 5 years serviceable life remaining and no other major maintenance works are planned during the remaining life of the existing RRS?	N

CD377 is therefore applicable as an existing VRS system (i.e. the bridge parapet and sections of terminal VRS to accommodate the new BS EN 1317 compliant parapet and transition) is being dismantled as part of the works.

CD 377 Para.	If the answer to both of the following questions is 'Y' then a RRRAP assessment is appropriate.	Y/N
2.2	Is the design speed or imposed speed limit 50mph or greater?	Y
2.2	Is the traffic flow higher than 5,000 AADT?	Y

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In accordance with the table above, a RRRAP assessment is appropriate in terms of conforming with Clause 2.2 of CD 377. However, it is also specified in Clause 2.2 of CD 377 that the RRRAP assessment is to be used for motorways and all-purpose trunk road. This section of the A477 is not part of the trunk road network and the scheme involves replacing a component (bridge parapet) like for like in terms of containment class and extents, therefore a RRRAP assessment is not considered necessary for this scheme. In addition, a CS 461 parapet risk assessment has been undertaken and found the parapet risk level to be very low and the relative risk of the existing parapet is 'as low as reasonably practicable' (ALARP) which in accordance with CS 461 Clause 2.4.1 mitigates the use of a RRRAP assessment.

Non-Compliant Elements

- A477 eastbound and westbound RRS terminals facing oncoming traffic at Westfield Pill Bridge have a CD 377 non-compliant performance class of P1.

Requirements for Compliance

- Install a CD 377 compliant P4 terminal on both ends of the A477 eastbound and westbound terminals at Westfield Pill Bridge.

Risk Assessment

To determine whether the terminal barrier upgrades should be undertaken alongside the bridge parapet replacement works, a risk assessment has been undertaken to identify the risk associated with the 'do nothing' and the 'upgrade terminal barrier to a CD 377 compliant system' scenarios. This, in addition to the anticipated cost, have been used to determine how to best proceed.

Impact Exemplars

Impact Score	Impact Exemplars			
	Health & Safety	Structural	Road User	Financial
1 - Minimal	Incident – no lost time	Minimal impact; non-structural	Routine inspection required	<1% of monthly budget and/or £20,000 limit
2 - Minor	Injury – no lost time	Minor impact; structural	Load restrictions	<2% of monthly budget and/or £40,000 limit
3 - Significant	Injury – lost time. Compensatable injury	Significant impact; structural (i.e. affecting primary elements)	Hard shoulder closure	<5% of monthly budget and/or £100,000 limit
4 - Major	Serious injury/stress resulting in hospitalisation	Major impact compromising capacity	Hard shoulder and Lane 1 closure	<10% of monthly budget and/or £500,000 limit
5 - Critical	Fatality (not natural causes)	Collapse of element / structure	Full closure	<15% of monthly budget and/or £1,000,000 limit

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Likelihood scoring for Risk Assessments

Probability	Score	Likelihood
Low	1	Rare (0-5%). The risk will materialise only in exceptional circumstances.
Low/medium	2	Unlikely (6-25%). The risk will probably not materialise.
Medium	3	Possible (26-75%). The risk might materialise at some time.
Medium/high	4	Likely (76-95%). The risk will probably materialise at least once.
High	5	Almost certain (>95%). The risk will materialise in most circumstances.

Scoring matrix for Risk Assessments

Risk		Impact				
		1 - Minimal	2 - Minor	3 - Significant	4 - Major	5 - Critical
Likelihood	1 - Low	1	2	3	4	5
	2 - Low/medium	2	4	6	8	10
	3 - Medium	3	6	9	12	15
	4 - Medium/high	4	8	12	16	20
	5 - High	5	10	15	20	25

Scoring management for Risk Assessments

Risk Score	Risk Management Category
1-4	Low Risk - The Assembly Government is content to carry these risks. No need to consider the risk appetite nor to proceed any further with the assessment but merely record that the risk has been identified and that due to its low likelihood or impact no further action will be taken.
5-12	Moderate Risk - The Assembly Government is concerned about these risks. The risks need to be managed by the department/division in which they have been identified.
13-19	High Risk - New category – guidance to be confirmed.
20-25	Very High Risk - The Assembly Government is most concerned about these risks. These risks will be considered as significant and should be notified to the Head of Department who will decide whether they need to feature in the Management Board's risk register.

Risk Assessment

Risk Identification and Assessment														
Ref	Risk Description / Scenario	Risk												
		Health & Safety			Structural			Road User			Financial			MAX
		I	L	O	I	L	O	I	L	O	I	L	O	
A	Do Nothing	5	1	5	2	1	2	1	1	1	3	1	3	5
B	Upgrade terminal to be CD 377 Compliant	3	1	3	1	1	1	1	1	1	2	1	2	3

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Collision Data – Collision data for the most recent 5-year period between January 2019 and December 2023 has been reviewed and 1 slight severity collision was recorded at the A477 Westfield Pill Bridge.

The collision is reported to have occurred due to a vehicle failing to properly judge that a second vehicle had stopped in its path and a rear collision occurred. Based on the collision data, this location is considered to be at low risk of re-occurring collisions.

The collision data also supports that the risk of a vehicle mounting the existing P1 terminal and an incursion into the Westfield Pill occurring is considered to be low risk.

Costs – It is anticipated that upgrading the terminals to be CD 377 compliant as detailed previously will cost approximately £50,000, inclusive of TM.

Recommendation – The resulting risk for doing nothing is moderate and the cost of the barrier works is relatively large compared to the overall scheme cost. Based on the above information, it is recommended that the terminal upgrade works **ARE NOT UNDERTAKEN** alongside the bridge parapet replacement works.

Further justification for the Departure from Standard (DfS) for the retention of the P1 terminals is included in Stage 2 of this screening form for PCC TAA approval.

ON COMPLETION OF STAGE 1, SUBMIT PARTIALLY COMPLETE FORM TO SWMWRCES PROJECT MANAGER

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Stage 2 – Outcome of Risk Assessment

Results of Risk Assessment/RRRAP	Cost Estimate for works

Detail any mitigation measures identified to reduce risk, in line with ALARP principle (Non-VRS Solutions, in line with CD377 cl 2.3.1 & 2.3.2)	Cost Estimate

Departures from Standard justification

Are there special circumstances over the length being considered (environmental impact, exceptional layout or cost) meaning a Departure from Standard is required?	Yes/ No * (If Yes, provide details below)
Outline description of Departure from Standard, for consideration by the Overseeing Organisation: The existing 4no. terminals located at either end of the westbound and eastbound parapets have a performance class of P1 and are not compliant with CD 377 Clause 5.4 requirement for a performance class of P4. It is proposed that the existing P1 terminals are retained except for a new 14m SafeRoad Megaflex Transition (or similar approved BS EN 1317 compliant transition) which is to be constructed to provide the transition between the proposed bridge parapet and the remaining length of existing P1 terminal. AtkinsRéalis consider the following to be mitigating factors: Non-trunk road - CD 377 scope of implementation is to motorways and all-purpose trunk roads, whereas the A477 at Westfield Bridge is not part of the trunk road network and can be considered to be exempt from the requirements of CD 377. N2 containment - P1 is not a standard containment level as defined in CD377. However, Clause 4.4 (i) (a) within TD19/06 – Requirements for road restraint systems (superseded by CD377) states that P1 containment is equivalent to N2 containment. Therefore, the containment level provided by the P1 terminals is N2 in accordance with CD377.	

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Risk assessment - A risk assessment has been undertaken to identify the risk associated with the 'do nothing' and the 'upgrade terminal barrier to a CD 377 compliant system' scenarios. The resulting risk for doing nothing is moderate and the cost of the barrier works is relatively large compared to the overall scheme cost.

Collision Data – Collision data for the most recent 5-year period between January 2019 and December 2023 has been reviewed and 1 slight in severity collision was recorded at the A477 Westfield Pill Bridge. The collision is reported to have occurred due to a vehicle failing to properly judge that a second vehicle had stopped in its path and a rear collision occurred. Based on the collision data, this location is considered to be at low risk of re-occurring collisions. The collision data also supports that the risk of a vehicle mounting the existing P1 terminal and an incursion into the Westfield Pill occurring is considered to be low risk.

Costs – It is anticipated that upgrading the RRS to be CD 377 compliant as detailed previously will cost approximately £50,000, inclusive of TM. This is a relatively large cost in comparison to the overall scheme cost.

Code Compliant Transition - A new 14m SafeRoad Megaflex Transition (or similar approved BS EN 1317 compliant transition) will be constructed to provide the transition between the proposed bridge parapet and existing P1 terminal.

Conclusions & Recommendations

Based on the above information, it is recommended that the terminal upgrade works are not undertaken alongside the bridge parapet replacement works.

Framework Consultant/Service Provider* information for Stage 1 & Stage 2*

P01	26/07/24	S3	For TAA Review/Comm ent	 LJ BP BP
Revision	Date	Status	Revision Note	Originated Checked Reviewed
				Service provider

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SWMWRCS Project Manager to complete:

Departure from Standard (if applicable)

The Departure from Standard outlined above has been discussed within the overseeing organisation, and is summarised:

VRS/other mitigation measures

Can the cost of the proposed measures be included in the works within the budget allocation?	Yes/No*	
Comments:		
The VRS works have been included in VRS programme for future years, with reference number:	Y/N*	
The mitigation measures have been included in the appropriate programme for future years.	Y/N*	

SWMWRCS PM	Name	Signature	Date
			