

		NETWORK RAIL Underwater Examination Report							
ELR:	DJP	Contract Mileage: 99 m 0913 yds 41.5 ch				Struct Ref:	99 41.5		
Examination Type: Underwater		NR ID:			Exam Date: 18/04/2023				
Area: Dyfi		BRS:			OS Ref: SH62441487				
Structure Name: Barmouth Viaduct (Timber)				Type:	BV		Exam ID:	15614452	
Route: Dovey Jct to Pwllheli					Complete Exam: Yes				
Section A: To Be Completed By The Examining Organisation									
HIDDENPARTS NOT EXAMINED (EXCLUDING FOUNDATIONS)		Part				Reason			
		Bracing				Some are buried beneath the sand			
ITEM	DESCRIPTION	LOCATION	Est. Cost £k +/- 20%	Priority Within	Quantity	Severity	Probability	Risk Score	Works Category
1	Concrete repairs including crack injection to or widely cracked or damaged pile casings (Works ongoing)	T4/P1 T6/P1&4 T9/P3 T10/P1 T15/P3 T20/4 T27/P4 T39/P2 T42/P1&4 T54/P4	12K	2yrs	12unit	1	4	S4	Concrete Repairs
2	To piles. Use a specialist sub-contractor (Trac Structural or similar) to cut out and replace decayed timber and voids with Rotafix TG6 timber grout (or similar). Crack inject rotafix CB10T (or similar) into crevices<12mm. All as like-for-like replacement of resin with timber.	T2/P4 T28/P3 T41/P4 T42/P4 T44/P2 T47/P4 T49 P2 T61/P3 T62/P2 T64/P4 T82Up&DnOutrig T85/P3 T87/P1 T106/P2	14K	2yrs	14unit	4	2	S8	Timber Deck Repair/Renewal
3	To timber bracing. Use a specialist sub-contractor (Trac Structural or similar) to cut out and replace decayed timber and voids with Rotafix TG6 timber grout (or similar). Crack inject rotafix CB10T (or similar) into crevices<12mm. All as like-for-like replacement of resin with timber.	T6LMHorz T29LMDgn T33Dgn T35LMDgn T39LMDgn T40HMDgn T46LM&HMDgn T49HMDgn T57LMDgn T100LM&HMDgn	18K	2yrs	13unit	1	4	S4	Timber Deck Repair/Renewal
4	Repair metallic clamp / bolt and / or timber pack	T25/P2 T30/P4 T48/P3 / Dgn	2.5K	26weeks	3unit	3	3	S9	Timber Deck Repair/Renewal
5	Remove mussels or other very heavy marine growth from timber (barnacles are not considered heavy, and concrete can remain infested) sufficient to allow complaint exam, and if possible, treat to prevent re-growth. (Works ongoing)	Frames 74 to 112 (approx.)	12K	2yrs	40m2	3	2	M	Vegetation
6	Refer to structural assessment to check the adequacy of this frame in combined bending and axial load given it is 10	Frame 24	8K	26weeks	1unit	4	2	S8	Other

	degrees out of plumb. Arrange for a competent person to visit site to determine the probable cause of the leaning and the lean is likely to worsen. Set up two sets of brass / stainless steel plumb bob monitoring points for use at future exams.											
History of Live Significant Defects												
No	Description	Location	Exam Date	Access Gained	Exam Type	Rec Raised	Risk Score	Access Req'd	Deterioration	Repaired	Flagged For Closure	Engineer Comments
7	Rot / loss of section / severe splits / shakes / necking to piles.	Virtually all frames to varying extents	07/03/13	Y	D	Y	10	Y	Baseline	N/A	N	See report for details
7	Rot / loss of section / severe splits / shakes / necking to piles.	Virtually all frames to varying extents	27/02/14	Y	D	Y	6	Y	Y	N	N	Not new defects.
7	Rot / loss of section / severe splits / shakes / necking to piles.	Virtually all frames to varying extents	28/07/14	Y	U.WAT	Y	6	Y	Y	N	N	.
7	Rot / loss of section / severe splits / shakes / necking to piles.	Virtually all frames to varying extents	06/03/15	Y	D	Y	9	Y	Y	N	N	Additional piles added on the following trestles: 16 49 53 58 66 67 70 72 75 86 91. Other piles not listed showing minor shakes/splits and minor areas of rot. Risk increased from 6 to 9
7	Rot / loss of section / severe splits / shakes / necking to piles.	Virtually all frames to varying extents	17/05/16	Y	V	Y	9	Y	N	N	N	.
7	Rot / loss of section / severe splits / shakes / necking to piles.	Virtually all frames to varying extents	28/04/17	Y	D	Y	9	Y	Y	N	N	37units. Locations of substantial decay given. Splits and shakes not recommended unless accompanied by rot.
7	Rot / loss of section / severe splits / shakes / necking to piles.	Virtually all frames to varying extents	26/06/17	Y	U.WAT	Y	9	N	Y	N	N	Replace defective piles.
7	Rot / loss of section / severe splits / shakes / necking to piles.	Virtually all frames to varying extents	19/11/17	Y	V	Y	9	N	Y	N	N	Slight deterioration noted.
7	Rot / loss of section / severe splits / shakes / necking to piles.	Virtually all frames to varying extents	09/08/18	Y	V	Y	9	N	Y	N	N	T65 pile 3 showing a split to 7mm full height on HM face.
7	Rot / loss of section / severe splits / shakes / necking to piles.	Virtually all frames to varying extents	28/06/19	Y	D	Y	9	N	Y	N	N	Significant deterioration
7	Rot / loss of section / severe splits / shakes / necking to piles.	Virtually all frames to varying extents	19/04/20	Y	V	Y	9	N	Y	N	N	SSD
7	Rot / loss of section / severe splits / shakes / necking to piles.	Virtually all frames to varying extents	26/01/22	Y	D	Y	9	N	Y	N	N	SSD - ongoing repairs, some have been replaced
7	Rot / loss of section / severe splits / shakes / necking to piles.	Virtually all frames to varying extents	09/11/22	N	V	Y	9	Y	NV	N	N	Unable to view. Restricted access.
7	Rot / loss of section / severe splits / shakes / necking to piles.	Virtually all frames to varying extents	17/04/23	Y	U.WAT	Y	4	N	N	Y	Y	Majority repaired – close and re-start
8	Missing and severed metal straps and hangers	Throughout trestles and spans.	07/03/13	Y	D	Y	8	Y	Baseline	N/A	N	See report for details
8	Missing and severed metal straps and hangers	Throughout trestles and spans.	27/02/14	Y	D	Y	9	N	Y	N	N	28No to Frames 9 11 15 21 30 31 39 40

												41 51 57 59 66 71 90 93 110 111 112. 28No to spans 13 15 22 42 52 56 57 61 64 65 66 76 79 83.
8	Missing and severed metal straps and hangers	Throughout trestles and spans.	28/07/14	Y	U.WAT	Y	9	N	Y	N	N	.
8	Missing and severed metal straps and hangers	Throughout trestles and spans.	06/03/15	Y	D	Y	9	N	Y	N	N	Trestle Nos. 9 21 24 30 40 41 42 57 59 66 71 72 79 90 92 93 110 111 112. Span Nos. 13 15 to 23 incl. 39 50 52 56 57 60 61 65 66 76 79 81 83 85 91 101 102 109 110 112.
8	Missing and severed metal straps and hangers	Throughout trestles and spans.	17/05/16	Y	V	Y	9	N	N	N	N	.
8	Missing and severed metal straps and hangers	Throughout trestles and spans.	28/04/17	Y	D	Y	9	N	Y	N	N	Trestle Nos. 15 16 20 21 24 29 31 41 45 46 51 57 59 64 66 67 71 72 76 79 90 92 93 110 111 112 and Span Nos. 1 13 15 to 19 22 23 33 34 35 42 56 60 to 66 81 83 85 91 97 101 102 103 109 110 112
8	Missing and severed metal straps and hangers	Throughout trestles and spans.	26/06/17	Y	U.WAT	Y	9	N	Y	N	N	Replace
8	Missing and severed metal straps and hangers	Throughout trestles and spans.	19/11/17	Y	V	Y	9	N	Y	N	N	Slight deterioration noted.
8	Missing and severed metal straps and hangers	Throughout trestles and spans.	09/08/18	Y	V	Y	9	N	Y	N	N	Additional elements affected.
8	Missing and severed metal straps and hangers	Throughout trestles and spans.	28/06/19	Y	D	Y	9	N	Y	N	N	SSD
8	Missing and severed metal straps and hangers	Throughout trestles and spans.	19/04/20	Y	V	Y	9	N	Y	N	N	SSD
8	Missing and severed metal straps and hangers	Throughout trestles and spans.	26/01/22	Y	D	Y	9	N	Y	N	N	SSD - ongoing repairs, some have been replaced
8	Missing and severed metal straps and hangers	Throughout trestles and spans.	09/11/22	N	V	Y	9	Y	NV	N	N	Not viewed.Restricte d access
8	Missing and severed metal straps and hangers	Throughout trestles and spans.	17/04/23	Y	U.WAT	N	1	N	N	Y	Y	Majority repaired – close and re-start
9	Damaged pile casings	Throughout	27/02/14	Y	D	Y	8	N	Baseline	N	N	137No at Frames 2-15, 17-19, 21- 23, 26-30, 32, 34- 44, 46-48, 50- 52, 56-58
9	Damaged pile casings	Throughout	28/07/14	Y	U.WAT	Y	8	N	Y	N	N	.
9	Damaged pile casings	Throughout	06/03/15	Y	D	Y	8	N	Y	N	N	T2 -T15 inclusive. T17- T19. T21- T24. T26- T48. T50- T52. T56- T58.
9	Damaged pile casings	Throughout	17/05/16	Y	V	Y	8	N	Y	N	N	.
9	Damaged pile casings	Throughout	28/04/17	Y	D	Y	9	N	Y	N	N	130no. Repairs required at frames T2 - T15 inclusive. T17- T19. T22-T24. T26-T36. T40 - T47. T50- T52.

												T56- T58
9	Damaged pile casings	Throughout	26/06/17	Y	U.WAT	Y	9	N	Y	N	N	Replace or repair where possible.
9	Damaged pile casings	Throughout	19/11/17	Y	V	Y	9	N	N	N	N	NFD
9	Damaged pile casings	Throughout	09/08/18	Y	V	Y	9	N	Y	N	N	Further deterioration note
9	Damaged pile casings	Throughout	28/06/19	Y	D	Y	9	N	Y	N	N	SSD
9	Damaged pile casings	Throughout	19/04/20	Y	V	Y	9	N	Y	N	N	SSD
9	Damaged pile casings	Throughout	26/01/22	Y	D	Y	9	N	Y	N	N	SSD - ongoing repairs, some have been removed and assumed to being replaced
9	Damaged pile casings	Throughout	09/11/22	N	V	Y	9	Y	Cannot Determine	N	N	Unable to determine.
9	Damaged pile casings	Throughout	17/04/23	Y	U.WAT	Y	4	N	N	Y	N	
10	Missing, loose and decayed timber packings	Substructure	27/02/14	Y	D	Y	6	N	Baseline	N	N	8No at Frames 1 34 43 45 47 62 69.
10	Missing, loose and decayed timber packings	Substructure	28/07/14	Y	U.WAT	Y	6	Y	N	N	N	.
10	Missing, loose and decayed timber packings	Substructure	06/03/15	N	D	Y	N/A	Y	NV	N	N	Frames underwater not viewed at detailed exam.
10	Missing, loose and decayed timber packings	Substructure	17/05/16	N	V	Y	N/A	Y	NV	N	N	Under water
10	Missing, loose and decayed timber packings	Substructure	28/04/17	N	D	Y	N/A	Y	Y	N	N	Between main timber members in frames 20 34 35 47 48
10	Missing, loose and decayed timber packings	Substructure	19/11/17	N	V	Y	9	Y	NV	N	N	Restricted access for examiner
10	Missing, loose and decayed timber packings	Substructure	09/08/18	N	V	Y	9	Y	Cannot Determine	N	N	Cannot determine
10	Missing, loose and decayed timber packings	Substructure	28/06/19	Y	D	Y	9	Y	Y	N	N	Significant deterioration, splits common virtually throughout
10	Missing, loose and decayed timber packings	Substructure	19/04/20	Y	V	Y	9	Y	Y	N	N	SSD where seen
10	Missing, loose and decayed timber packings	Substructure	26/01/22	Y	D	Y	9	Y	Y	N	N	SSD
10	Missing, loose and decayed timber packings	Substructure	09/11/22	N	V	Y	9	Y	NV	N	N	Unable to view from ground level
10	Missing, loose and decayed timber packings	Substructure	17/04/23	Y	U.WAT	N	4	N	N	Y	N	Majority repaired – within UW scope
11	Trestle leaning out of plumb toward low mileage	Frame 24	27/02/14	Y	D	Y	6	N	Baseline	N	N	Not previously noted
11	Trestle leaning out of plumb toward low mileage	Frame 24	28/07/14	Y	U.WAT	Y	6	Y	N	N	N	.
11	Trestle leaning out of plumb toward low mileage	Frame 24	06/03/15	Y	D	N/A	N/A	Y	Cannot Determine	N	N	Monitoring points need to be established for this defect for future monitoring (digital inclinometer or similar for use by examiner)

11	Trestle leaning out of plumb toward low mileage	Frame 24	17/05/16	Y	V	Y	6	Y	Cannot Determine	N	N	.
11	Trestle leaning out of plumb toward low mileage	Frame 24	28/04/17	Y	D	Y	8	Y	Cannot Determine	N	N	.
11	Trestle leaning out of plumb toward low mileage	Frame 24	19/11/17	Y	V	Y	8	N	N	N	N	NFD visual exam only..
11	Trestle leaning out of plumb toward low mileage	Frame 24	09/08/18	Y	V	Y	8	N	Cannot Determine	N	N	Cannot determine
11	Trestle leaning out of plumb toward low mileage	Frame 24	28/06/19	Y	D	Y	8	N	N	N	N	NFD
11	Trestle leaning out of plumb toward low mileage	Frame 24	19/04/20	Y	V	Y	8	N	N	N	N	NFD
11	Trestle leaning out of plumb toward low mileage	Frame 24	26/01/22	Y	D	Y	8	N	N	N	N	NFD
11	Trestle leaning out of plumb toward low mileage	Frame 24	09/11/22	N	V	Y	8	Y	NV	N	N	Unable to view at VE. Restricted access
11	Trestle leaning out of plumb toward low mileage	Frame 24	17/04/23	Y	U.WAT	Y	8	N	N	N	N	
15	Evidence of Teredo worm infestation to walings	47 No at Frames:23 28-32 35-47 49-52 54-58 62 66 67 69 72 73 79 85 105	27/02/14	Y	D	Y	6	N	Baseline	N	N	44 horizontal walings
	Evidence of Teredo worm infestation to walings	47 No at Frames:23 28-32 35-47 49-52 54-58 62 66 67 69 72 73 79 85 105	28/07/14	Y	U.WA	Y	9	Y	Y	N	N	
15	Evidence of Teredo worm infestation to walings	47 No at Frames:23 28-32 35-47 49-52 54-58 62 66 67 69 72 73 79 85 105	06/03/15	Y	D	Y	9	Y	Y	N	N	A total of 29 no. frames with a total of 44 no. individual walings showing evidence of infestation. Frame 30 is reported a showing possible evidence of Gribble worm. Frame 36 added to original defect
15	Evidence of Teredo worm infestation to walings	47 No at Frames:23 28-32 35-47 49-52 54-58 62 66 67 69 72 73 79 85 105	17/05/16	Y	V	Y	9	Y	N	N	N	
15	Evidence of Teredo worm infestation to walings	47 No at Frames:23 28-32 35-47 49-52 54-58 62 66 67 69 72 73 79 85 105	28/04/17	Y	D	Y	9	Y	Y	N	N	
15	Evidence of Teredo worm infestation to walings	47 No at Frames:23 28-32 35-47 49-52 54-58 62 66 67 69 72 73 79 85 105	19/11/17	Y	U.WAT	Y	9	Y	N	N	N	Replace
15	Evidence of Teredo worm infestation to walings	47 No at Frames:23 28-32 35-47 49-52 54-58 62 66 67 69 72 73 79 85 105	09/08/18	Y	V	Y	9	Y	Cannot	N	N	T38 horizontal waling
15	Evidence of Teredo worm infestation to walings	47 No at Frames:23 28-32 35-47 49-52 54-58 62 66 67 69 72 73 79 85 105	28/06/19	Y	D	Y	9	Y	Y	N	N	SSD - now also to Frames 36, 62, 66, 69, 72 and 73
15	Evidence of Teredo worm infestation to walings	47 No at Frames:23 28-32 35-47 49-52 54-58 62 66 67 69 72 73 79 85 105	19/04/20	Y	V	Y	9	Y	Cannot Determine	N	N	Large areas obscured

15	Evidence of Teredo worm infestation to walings	47 No at Frames:23 28-32 35-47 49-52 54-58 62 66 67 69 72 73 79 85 105	26/01/22	Y	D	Y	9	Y	Y	N	N	SSD - numerous exams of possible insect infestation noted (unknown if Teredo worm)
15	Evidence of Teredo worm infestation to walings	47 No at Frames:23 28-32 35-47 49-52 54-58 62 66 67 69 72 73 79 85 105	09/11/22	N	V	Y	9	Y	NV	N	N	Unable to view at visual exam
15	Evidence of Teredo worm infestation to walings	47 No at Frames:23 28-32 35-47 49-52 54-58 62 66 67 69 72 73 79 85 105	17/04/23	Y	U.WAT	N	3	Y	N	Y	Y	Members replaced
16	Insect or other holes in timber elements. 5No corbels, 40 piles, a crosshead 3no walings and 3No corbels	Numerous trestles throughout	27/02/14	Y	D	Y	8	N	Baseline	N	N	Probably not Teredo worm; require further investigation.
16	Insect or other holes in timber elements. 5No corbels, 40 piles, a crosshead 3no walings and 3No corbels	Numerous trestles throughout	28/07/14	Y	U.WAT	Y	8	Y	N	N	N	.
16	Insect or other holes in timber elements. 5No corbels, 40 piles, a crosshead 3no walings and 3No corbels	Numerous trestles throughout	06/03/15	Y	D	Y	8	Y	Y	N	N	Additional items added for corbels on frames. 30/5 66/4. Frame 83 pile 4.
16	Insect or other holes in timber elements. 5No corbels, 40 piles, a crosshead 3no walings and 3No corbels	Numerous trestles throughout	17/05/16	Y	V	Y	8	Y	Cannot Determine	N	N	.
16	Insect or other holes in timber elements. 5No corbels, 40 piles, a crosshead 3no walings and 3No corbels	Numerous trestles throughout	28/04/17	Y	D	N	8	Y	Cannot Determine	N	N	Included in recommendation s for individual member types
16	Insect or other holes in timber elements. 5No corbels, 40 piles, a crosshead 3no walings and 3No corbels	Numerous trestles throughout	26/06/17	Y	U.WAT	Y	8	Y	Cannot Determine	N	N	.
16	Insect or other holes in timber elements. 5No corbels, 40 piles, a crosshead 3no walings and 3No corbels	Numerous trestles throughout	19/11/17	N	V	Y	8	Y	Cannot Determine	N	N	Restricted access for examiner
16	Insect or other holes in timber elements. 5No corbels, 40 piles, a crosshead 3no walings and 3No corbels	Numerous trestles throughout	09/08/18	Y	V	Y	8	Y	Y	N	N	Possible insect infestation, additional members added following visual although not all areas identified are submerged.. Spans 5/Beam 6, Sp19/B5, T6 P1 and 2, T31 P1 and 2, T36 P1 and 2, T51 P1 and 2,
16	Insect or other holes in timber elements. 5No corbels, 40 piles, a crosshead 3no walings and 3No corbels	Numerous trestles throughout	28/06/19	Y	D	Y	8	Y	Y	N	N	5No corbels at frames 30/5 41/5 66/4 72/5 and 80/4. 40No Piles at frames 1/1-4 6/1,2 31/1,2 36/1,2 50/1-4 51/1,2 53/4 55/1,3 58/4 61/3 63/1,3 67/1,3 68/3

												70/1-4 80/3 81/3 83/4 86/2 91/3,4 97/1 111/2
16	Insect or other holes in timber elements. 5No corbels, 40 piles, a crosshead 3no walings and 3No corbels	Numerous trestles throughout	19/04/20	Y	V	Y	8	Y	Cannot Determine	N	N	Unable to determine from GL
16	Insect or other holes in timber elements. 5No corbels, 40 piles, a crosshead 3no walings and 3No corbels	Numerous trestles throughout	26/01/22	Y	D	Y	8	Y	Y	N	N	SSD
16	Insect or other holes in timber elements. 5No corbels, 40 piles, a crosshead 3no walings and 3No corbels	Numerous trestles throughout	09/11/22	N	V	Y	8	Y	NV	N	N	Unable to view at visual exam.
16	Insect or other holes in timber elements. 5No corbels, 40 piles, a crosshead 3no walings and 3No corbels	Numerous trestles throughout	17/04/23	Y	U.WAT	N	6	Y	NV	Y	N	No examiner comments – within UW scope
19	PNE - below water level at low tide	Bases of trestles 73 - 113 inclusive	27/02/14	N	D	N	4	Y	Baseline	N	N	Include at underwater examinations
19	PNE - below water level at low tide	Bases of trestles 73 - 113 inclusive	28/07/14	Y	U.WAT	N	4	Y	N/A	N	N	Accessed for U/W
19	PNE - below water level at low tide	Bases of trestles 73 - 113 inclusive	06/03/15	N	D	N	4	Y	NV	N	N	Unable to view lower parts of trestles due to scour pools remaining full of water at low tide.
19	PNE - below water level at low tide	Bases of trestles 73 - 113 inclusive	17/05/16	N	V	N	4	Y	NV	N	N	.
19	PNE - below water level at low tide	Bases of trestles 73 - 113 inclusive	28/04/17	N	D	N	4	Y	NV	N	N	Barnacles hinder view of elements throughout this area.
19	PNE - below water level at low tide	Bases of trestles 73 - 113 inclusive	26/06/17	Y	U.WAT	N	4	Y	N/A	N	N	Accessed for UW
19	PNE - below water level at low tide	Bases of trestles 73 - 113 inclusive	19/11/17	N	V	N	4	Y	NV	N	N	Restricted access for examiner and Barnacles growing at this location.
19	PNE - below water level at low tide	Bases of trestles 73 - 113 inclusive	09/08/18	Y	V	N	4	Y	Cannot Determine	N	N	Cannot determine
19	PNE - below water level at low tide	Bases of trestles 73 - 113 inclusive	28/06/19	Y	D	N	4	Y	NV	N	N	Below water at time of exam
19	PNE - below water level at low tide	Bases of trestles 73 - 113 inclusive	19/04/20	Y	V	N	4	Y	NV	N	N	Water still present at low tide
19	PNE - below water level at low tide	Bases of trestles 73 - 113 inclusive	26/01/22	N	D	N	4	Y	NV	N	N	Water never full clears these Spans, deep pools surrounding trestles allows water to pool
19	PNE - below water level at low tide	Bases of trestles 73 - 113 inclusive	09/11/22	N	V	N	4	Y	NV	N	N	PNE
19	PNE - below water level at low tide	Bases of trestles 73 - 113 inclusive	17/04/23	Y	U.WAT	N	3	N	N/A	Y	Y	.
23	Rot or severe splits/shakes to walings and bracings	virtually all frames to varying extents	27/02/14	Y	D	Y	6	N	Baseline	N	N	Not new but shows SSD
23	Rot or severe splits/shakes to walings and bracings	virtually all frames to varying extents	28/07/14	Y	U.WAT	Y	6	Y	Y	N	N	.

23	Rot or severe splits/shakes to walings and bracings	virtually all frames to varying extents	06/03/15	Y	D	Y	9	Y	Y	N	N	Additional frames added: 8 20 29 36 37 41 50 57 60 70 72 77 87 88 107. Separate item exists for walings affected by Teredo worm. Risk raised from 6 to 9.
23	Rot or severe splits/shakes to walings and bracings	virtually all frames to varying extents	06/03/15	Y	D	Y	9	Y	Y	N	N	Additional frames added: 8 20 29 36 37 41 50 57 60 70 72 77 87 88 107. Separate item exists for walings affected by Teredo worm. Risk raised from 6 to 9.
23	Rot or severe splits/shakes to walings and bracings	virtually all frames to varying extents	17/05/16	Y	V	Y	9	Y	Cannot Determine	N	N	.
23	Rot or severe splits/shakes to walings and bracings	virtually all frames to varying extents	28/04/17	Y	D	Y	9	Y	Y	N	N	90 no.
23	Rot or severe splits/shakes to walings and bracings	virtually all frames to varying extents	26/06/17	Y	U.WAT	Y	9	N	Y	N	N	Replace
23	Rot or severe splits/shakes to walings and bracings	virtually all frames to varying extents	19/11/17	Y	V	Y	9	N	Y	N	N	Frame 86 lower horiz'l waling on HM face added.Restricted access for examiner.
23	Rot or severe splits/shakes to walings and bracings	virtually all frames to varying extents	09/08/18	Y	V	Y	9	N	Y	N	N	See item 35 also.
23	Rot or severe splits/shakes to walings and bracings	virtually all frames to varying extents	28/06/19	Y	D	Y	9	N	Y	N	N	SSD
23	Rot or severe splits/shakes to walings and bracings	virtually all frames to varying extents	19/04/20	Y	V	Y	9	N	Cannot Determine	N	N	Unable to determine from GL
23	Rot or severe splits/shakes to walings and bracings	virtually all frames to varying extents	26/01/22	Y	D	Y	9	N	Y	N	N	SSD
23	Rot or severe splits/shakes to walings and bracings	virtually all frames to varying extents	09/11/22	N	V	Y	9	Y	NV	N	N	Unable to view from ground level
23	Rot or severe splits/shakes to walings and bracings	virtually all frames to varying extents	17/04/23	Y	U.WAT	Y	1	N	N	Y	Y	Majority repaired – close and re-start
24	Scour holes up to 2m deep	Between Frames 74 and 112 (river channel).	27/02/14	Y	D	Y	6	N	Baseline	N	N	Arising from previous examination reports.
24	Scour holes up to 2m deep	Between Frames 74 and 112 (river channel).	28/07/14	Y	U.WAT	N	4	N	N	N	N	Not evident at U/W exam. Dependant upon tide.
24	Scour holes up to 2m deep	Between Frames 74 and 112 (river channel).	06/03/15	Y	D	N	4	N	N	N	N	No deterioration noted where viewed.
24	Scour holes up to 2m deep	Between Frames 74 and 112 (river channel).	06/03/15	N	D	N	4	Y	NV	N	N	Unable to view to determine current status.
24	Scour holes up to 2m deep	Between Frames 74 and 112 (river channel).	17/05/16	N	V	N	4	Y	NV	N	N	.
24	Scour holes up to 2m deep	Between Frames 74 and 112 (river channel).	28/04/17	N	D	N	4	Y	NV	N	N	.
24	Scour holes up to 2m deep	Between Frames 74 and 112 (river channel).	26/06/17	Y	U.WAT	N	4	Y	N	N	N	Mobile bed, scour not thought to be developing.

24	Scour holes up to 2m deep	Between Frames 74 and 112 (river channel).	19/11/17	N	V	N	4	Y	NV	N	N	Restricted access for examiner
24	Scour holes up to 2m deep	Between Frames 74 and 112 (river channel).	09/08/18	N	V	N	4	Y	NV	N	N	Below water at time of exam
24	Scour holes up to 2m deep	Between Frames 74 and 112 (river channel).	28/06/19	N	D	N	4	Y	NV	N	N	Below water at time of exam
24	Scour holes up to 2m deep	Between Frames 74 and 112 (river channel).	19/04/20	N	V	N	4	Y	NV	N	N	Below water at time of exam
24	Scour holes up to 2m deep	Between Frames 74 and 112 (river channel).	26/01/22	N	D	N	4	Y	NV	N	N	Unable to view, water never fully clears these spans due to scour holes surrounding Trestles
24	Scour holes up to 2m deep	Between Frames 74 and 112 (river channel).	09/11/22	N	V	N	4	Y	NV	N	N	Below water at time of exam
24	Scour holes up to 2m deep	Between Frames 74 and 112 (river channel).	17/04/23	Y	U.WAT	N	4	Y	N	N	N	Low risk scour score 13.8
32	Loose and hanging steel cleat between pile and cross head. (U/S face) and 1 missing (D/S)	Trestle 43, to the top of Pile 2	08/08/18	Y	P.A.N	Y	5	N	Baseline	N	N	Risk of falling and failed connection.
32	Loose and hanging steel cleat between pile and cross head. (U/S face) and 1 missing (D/S)	Trestle 43, to the top of Pile 2	09/08/18	Y	V	Y	5	N	Y	N	N	PAN raised at time of exam
32	Loose and hanging steel cleat between pile and cross head. (U/S face) and 1 missing (D/S)	Trestle 43, to the top of Pile 2	28/06/19	Y	D	Y	5	N	Y	N	N	Repair loose/hanging and replace missing steel cleats
32	Loose and hanging steel cleat between pile and cross head. (U/S face) and 1 missing (D/S)	Trestle 43, to the top of Pile 2	19/04/20	Y	V	Y	5	N	Cannot Determine	N	N	Unable to determine
32	Loose and hanging steel cleat between pile and cross head. (U/S face) and 1 missing (D/S)	Trestle 43, to the top of Pile 2	26/01/22	Y	D	Y	5	N	Y	N	N	SSD
32	Loose and hanging steel cleat between pile and cross head. (U/S face) and 1 missing (D/S)	Trestle 43, to the top of Pile 2	09/11/22	N	V	Y	5	Y	NV	N	N	Unable to view at visual exam.
32	Loose and hanging steel cleat between pile and cross head. (U/S face) and 1 missing (D/S)	Trestle 43, to the top of Pile 2	17/04/23	Y	U.WAT	N	1	N	N	Y	Y	
34	Missing loose laid concrete blocks 1.5m2	LM abutment extension/wing	09/08/18	Y	V	Y	9	N	Baseline	N	N	Potential for further damage as tidal estuary. does not directly support deck.
34	Missing loose laid concrete blocks 1.5m2	LM abutment extension/wing	28/06/19	Y	D	Y	9	N	Y	N	N	SSD - repair
34	Missing loose laid concrete blocks 1.5m2	LM abutment extension/wing	19/04/20	Y	V	Y	9	N	Y	N	N	SSD
34	Missing loose laid concrete blocks 1.5m2	LM abutment extension/wing	26/01/22	Y	D	Y	9	N	Y	N	N	SSD
34	Missing loose laid concrete blocks 1.5m2	LM abutment extension/wing	09/11/22	Y	V	Y	9	N	N	N	N	NFD

34	Missing loose laid concrete blocks 1.5m2	LM abutment extension/wing	17/04/23	Y	U.WAT	N	1	N	N	Y	Y	
35	PNE – heavy marine growth including mussels	Timber parts of low Lv frames 74 to 112 (approx.)	17/04/23	N	U.WAT	Y	6	Y	Baseline	N	N	3X2
36	Local timber decay or deep split to pile	12 piles	17/04/23	N	U.WAT	Y	8	Y	Baseline	N	N	
37	Local timber decay or deep split to horizontal or diagonal brace	14 members	17/04/23	N	U.WAT	Y	4	Y	Baseline	N	N	
38	Defective metallic clamp / bolt and / or timber pack	T25/P2 T30/P4 T48/P3 / Dgn	17/04/23	N	U.WAT	Y	9	Y	Baseline	N	N	

Engineers Notes

Many of the bulk timbers have shakes (usually termed herein as splits). This is a normal occurrence and happens in service because it is difficult to dry / season timbers more than 100 mm thick (BS 5268 Sect 2.6.1). Assessment safety factors already account for the strength reduction due to shakes. Thus, shakes to piles, less than 5mm in width, have not been considered significant defects. However, shakes that penetrate deeply will likely have an effect on the timber's durability, hence the recommendations for some timber resin repairs. Piles will be more sensitive than bracing members.

Loss of timber section exceeding 20mm all-round has been recorded as a significant defect for piles. Bracing members are less stressed and therefore less sensitive.

Out of plumb columns attract bending moments in addition to their axial compressive stress. This can make a big difference and these columns should be assessed for combined bending and axial compression, if not already done so – hence the assessment recommendation.

It is assumed that the concrete jackets are intended to strengthen decayed timber columns and form a barrier for Teredo worm respiration. Large splits in the concrete may allow marine boring insects to survive – hence the recommendations to repair.

The current scour score for this structure is 13.9 (low risk). As such, the defective invert protection is a low risk item and not a significant defect.

Signed: 	Name: N Ankrah	Date: 27/10/2023
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		NETWORK RAIL Underwater Examination Report										
ELR:	DJP	Contract Mileage: 99 m 0913 yds 41.5 ch			Struct Ref: 99 41.5							
Struct Type:	BV	NR ID:	Rpt ID:	OS Ref: SH 6244 1487	Exam ID: 15614452							
Exam Date:	17/04/2023											
The examiner should record any deterioration in condition or development of defects or other factors, which might place at risk the rail traffic, customers, staff or the public at large. Special reference should be made to those structures or parts of structures whose condition may require action before the next examination.												
Examiner General Comments See main report												
Has the NR Scour database been updated?		Yes	If No, reason:									
<table border="1"> <tr> <th>Signed</th> <th>Examiner Name</th> <th>Date</th> </tr> <tr> <td></td> <td>A Bennett</td> <td>28/06/2023</td> </tr> </table>							Signed	Examiner Name	Date		A Bennett	28/06/2023
Signed	Examiner Name	Date										
	A Bennett	28/06/2023										
Examining Engineer Comments & Recommendations												
<table border="1"> <tr> <td>See attached summary sheet</td> <td>Further action require/query</td> <td>No action required at present</td> </tr> <tr> <td align="center">x</td> <td></td> <td></td> </tr> </table>							See attached summary sheet	Further action require/query	No action required at present	x		
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Signed	Engineer Name	Date										
	N Ankrah	27/10/2023										

		NETWORK RAIL Underwater Examination Report																						
ELR: DJP		Contract Mileage: 99 m 913 yds 41.50 ch			Struct Ref: 99 41.5																			
Examination Type:		Underwater		Examination Date:		18/04/2023																		
Previous Examination Date:		14/11/2020		Penultimate Examination Date:		26/06/2017																		
Area:		Dyfi		OS Ref:		SH 6190 1540																		
Structure Name:		Barmouth Viaduct (TIMBER)		Group:		BV																		
Route:		Dovey Junction to Pwllheli			Complete Examination:																			
					YES																			
Examiners Name:		A Bennett (STE 07)		Examiners Signature:																				
Section A; To be completed by the examining organisation <table border="1"> <thead> <tr> <th></th> <th>Part</th> <th>Reason</th> </tr> </thead> <tbody> <tr> <td rowspan="3">Hidden parts not examined (excluding foundations)</td> <td>Bracing</td> <td>Some are buried beneath the sand</td> </tr> <tr> <td></td> <td></td> </tr> <tr> <td></td> <td></td> </tr> </tbody> </table>								Part	Reason	Hidden parts not examined (excluding foundations)	Bracing	Some are buried beneath the sand												
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Elevation Photograph 																								

		NETWORK RAIL				
Underwater Examination Report						
ELR: DJP		Contract Mileage: 99 m 0913 yds 41.5 ch			Struct Ref: 99 41.5	
Structure Name: Barmouth Viaduct (Timber)		Examination Date: 18/04/2023				
Area: Dyfi		OS Ref: SH 6244 1487		No of Spans: 113		
Route: Dovey Jct to Pwllheli		Group: BV		Exam ID: 15614452		
						
OS Map – Location of structure						
Structure Description						
The structure is a 113 span viaduct consisting of 112 timber trestles, each trestle consist of 4 No piles supporting a traverse crosshead and braced by 2 No diagonal and horizontal timber members. The viaduct is constructed from an assortment of wood consisting of Pitch Pine, Green Heart and Douglas Fir types. The high mileage end of the structure joins the metal bridge DJP 99m 1633yds. The structure carries a single non-electrified bi-directional line between Morfa Mawddach (Low Mileage) and Barmouth (High Mileage) stations over the Afon Mawddach.						
Access Route						
If travelling on the A5 in an Westerly direction from Corwen take a left onto the A494 before reaching Maerdy Continue to follow this road towards Dolgellau and take a right turn at the junction onto the A470. On approaching the roundabout at Llanelltyd take a left exit onto the A496. Follow this road into Barmouth and stop when the Viaduct is visible. Park up where suitable and access the structure via the footpath passing over the bridge.						
Contact Details and Access Restrictions						
Tidal - visit at low tide slack to complete examination in one day						

		NETWORK RAIL Underwater Examination Report				
ELR: DJP		Contract Mileage: 99 m 0913 yds 41.5 ch			Struct Ref:	99 41.5
Structure Name:	Barmouth Viaduct (Timber)			Examination Date:	18/04/2023	
Area:	Dyfi	OS Ref:	SH 6244 1487	No of Spans:	113	
Route:	Dovey Jct to Pwllheli	Group:	BV	Exam ID:	15614452	

Name of Part	Good/Fair/Poor/NA	Remarks
Weather	-	Dry
Watercourse	-	Estuary – Afon Mawddach
Salt or Fresh	-	Salt
Flow/Tidal	-	Tidal – moderate
Bed material	-	Sand and Gravel
Invert	-	Natural bed
Bed pitching	F	Gabion mattress
Aprons	F	Concrete
Piling	F	Timber
Banking	F	Stable
Foundations	N/E	No Information supplied
Sidewalls	N/A	
Abutments	F	Stone
Wing/Retaining Walls	N/A	
Tow path	N/A	
Piers / Trestles	F	Timber
Fenders	N/A	
Headwalls	N/A	
Pointing	F	Stable
Painting	N/A	
Vegetation	No	None
Number plates	No	None found
Navigation	-	No
Datum used	10m	None used
Inaccessible parts	Yes	Some bracing buried in sand
Mortar tabs or Avongard	N/A	
Monitoring or Plumb points	N/A	
Change to high water mark	N/A	
Works done with exam	-	None
Trestle/Crossheads	N/A	
Bedstones/Cills	N/A	
Soffit/Floorplate	N/E	Beyond scope
Rail bearers	N/A	
Cross girders	N/A	
Main girders	N/A	
Waterproofing	N/A	
Observed under live load	-	No trains passed over

		NETWORK RAIL Underwater Examination Report				
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Structure Name: Barmouth Viaduct (Timber)		Examination Date: 18/04/2023				
Area: Dyfi		OS Ref: SH 6244 1487		No of Spans: 113		
Route: Dovey Jct to Pwllheli		Group: BV		Exam ID: 15614452		

CONDITION:

The examination of this structure was undertaken during daylight hours and in line with GW Marine Systems Ltd. Detailed Underwater Examination procedures. The examination includes all elements of the structure from 2m above normal water level, extending down to the river bed. The examination excludes any part of the structure beyond 2m above normal water level & buried foundation elements.

All photographs taken on day of examination.

Personnel: Examiner: A Bennett Assistant: S Wheatley

General Photo:

- Photo 6 – Trestles 2 to 10.
- Photo 14 – Trestles 11 to 20
- Photo 22 – Trestles 21 – 30.
- Photo 29 – Trestles 31 – 40.
- Photo 32 – Trestles 41 – 50.
- Photo 40 – Trestles 101 – 100
- Photo 43 – Trestles 91 – 100.
- Photo 44 – Trestles 51 – 60.
- Photo 46 – Looking downstream.
- Photo 47 – Looking upstream
- Photo 48 – Trestles 61 – 70.
- Photo 49 – Trestles 71 – 80.
- Photo 52 – Typical sour pool to trestles 74 – 80.
- Photo 55 – Trestles 81 – 90.
- Photo 56 – Remains of old timber in spans 80 – 112.
- Photo 57 – Typical mesh on bed, lifting to spans 1 – 80.
- Photo 59 – Downstream elevation
- Photo 60 – Downstream low mileage revetment – separate structure.
- Photo 61 – Typical view of a deck.
- Photo 62 – Typical cross head and clamps.
- Photo 63 – Upstream low mileage revetment – separate structure.
- Photo 64 – Upstream elevation.

		NETWORK RAIL Underwater Examination Report			
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Structure Name:	Barmouth Viaduct (Timber)			Examination Date:	18/04/2023
Area:	Dyfi	OS Ref:	SH 6244 1487	No of Spans:	113
Route:	Dovey Jct to Pwllheli	Group:	BV	Exam ID:	15614452

CONDITION: (Cont.)

Abutments

Low Mileage

Abutment is fronted by a sloping concrete revetment in fair overall condition. (Photo 1)
No scour or undermining at the interface with the river bed.

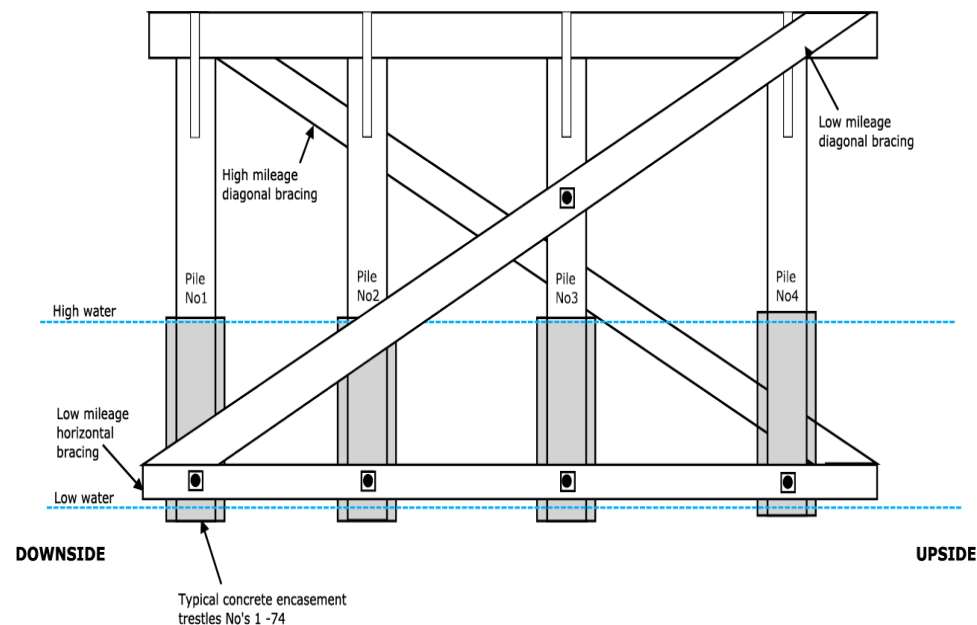
High Mileage

High mileage end of the structure joins onto DJP 99m 1633yds.

Trestles

Trestles consist of 4 No timber piles supporting a traverse crosshead timber each of which is braced by 2 x diagonal and horizontal timber members. The viaduct is constructed from an assortment of wood consisting of Pitch Pine, Green Heart and Douglas Fir types. Trestles 1 - 75 have received additional protection in the form of reinforced concrete encasements.

Typical Trestle Arrangement



		NETWORK RAIL Underwater Examination Report			
ELR: DJP		Contract Mileage: 99 m 0913 yds 41.5 ch			Struct Ref: 99 41.5
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Area:	Dyfi	OS Ref:	SH 6244 1487	No of Spans:	113
Route:	Dovey Jct to Pwllheli	Group:	BV	Exam ID:	15614452

CONDITION: (Cont.)

Trestle 1

Trestle 1 is fronted by the same sloping concrete revetment as the low mileage abutment and is in fair overall condition (Photo 2) with the following defects noted:

Pile 1 – NEW pile. (Photo 3)

Pile 2 – Fair overall condition with multiple splits throughout 1mm - 3mm wide.

Pile 3 – Fair overall condition, with multiple splits throughout, 1mm – 3mm wide.

Pile 3 – Low mileage face, 1.7m below the cross head, there is an area of decay, 0.5m high x 0.1m wide x 80mm deep. [NEW]

Pile 3 – High mileage face, 2.4m below the cross head, there is an area of decay, 0.2m2 x 60mm deep. [NEW]

Pile 4 – Fair overall condition with multiple splits throughout 1mm - 3mm wide.

Pile 5 – Fair overall condition with multiple splits throughout 1mm - 3mm wide.

Pile 6 – Fair overall condition with multiple splits throughout 1mm - 3mm wide.

Pile 7 – Fair overall condition with multiple splits throughout 1mm - 3mm wide.

Pile 8 – Fair overall condition with multiple splits throughout 1mm - 3mm wide.

Pile 8 – Area of decay has been repaired with resin.

LM diagonal bracing, has been replaced.

HM diagonal bracing, in fair overall condition.

Internal bracing piles, in fair overall condition with multiple splits.

Timber wedges between the internal bracing, in fair overall condition.

The decayed timber wedges, between internal bracing of pile 4 and 5 has been replaced. (Photo 4)

All steel fixings have been replaced. (Photo 5)

No scour or undermining at the interface with the river bed.

Trestle 2

Trestle 2 in fair overall condition with the following defects noted.

Pile 1 – Has been encased in concrete. (Photo 7)

Pile 2 – Fair overall condition with a concrete encasement to the lower 2.4m from bed level. The vertical cracks to the concrete encasement have been repaired.

Pile 3 – NEW concrete encasement installed 2.8m below the cross head, 1.7m tall.

Pile 4 – Fair overall condition with a concrete encasement to the lower 2.1m from bed level. The concrete encasement is in fair overall condition. The vertical crack to the up face has been repaired. (Photo 8) Area of timber decay, 1200mm H x 100mm W x 50mm penetration, down face. (Photo 9)

DN outrigger, fair overall condition, fully encased in concrete, the area of spalling has been repaired.

UP outrigger, fair overall condition, fully encased in concrete, the area of spalling has been repaired.

LM diagonal brace, fair overall condition with multiple splits 1mm - 3mm wide.

HM diagonal brace, fair overall condition with multiple splits 1mm - 3mm wide.

LM horizontal brace, fair overall condition with multiple splits 1mm - 3mm wide and minor decay throughout.

HM horizontal brace, fair overall condition with multiple splits 1mm - 3mm wide.

All of the steel fixings have been replaced.

No scour or undermining at the interface with the river bed.

Trestle 3

Trestle 3 in fair overall condition with the following defects noted.

Pile 1 – Fair overall condition with a concrete encasement to the lower 2.3m from bed level. The concrete encasement is in fair overall condition with vertical cracks at the construction joints 1mm - 2mm wide.

Pile 2 – Fair overall condition with a concrete encasement to the lower 2.3m from bed level. The concrete encasement is in fair overall condition. (Photo 10)

Pile 3 – Fair overall condition with a concrete encasement to the lower 2.3m from bed level. The concrete encasement has been repaired.

Pile 4 – New timber installed. To the UP face a new casement has been installed 3m below the cross head, 1.5m long.

LM diagonal brace, fair overall condition with multiple splits 1mm - 3mm wide and minor decay.

HM diagonal brace, fair overall condition. [NEW 10/21]

LM horizontal brace, fair overall condition with multiple splits 1mm - 3mm wide.

HM horizontal brace, fair overall condition with multiple splits 1mm - 3mm wide.

All of the steel fixings have been replaced.

No scour or undermining at the interface with the river bed.

		NETWORK RAIL Underwater Examination Report			
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Area:	Dyfi	OS Ref:	SH 6244 1487	No of Spans:	113
Route:	Dovey Jct to Pwllheli	Group:	BV	Exam ID:	15614452

CONDITION: (Cont.)

Trestle 4

Trestle 4 in fair overall condition with the following defects noted.

Pile 1 – Fair overall condition with concrete encasement to lower 2.5m from bed level. The concrete encasement is in fair condition overall with vertical cracks to up and down faces 1mm - 5mm wide. 2m long splits to rest of piles.

Pile 2 – New pile with new concrete encasement to lower 2.5m.

Pile 3 – Fair overall condition with a new concrete encasement to lower 2.5m from bed level. The pile where seen has splits. (Photo 11)

Pile 4 – Fair overall condition with concrete encasement to lower 2.5m from bed level. The concrete encasement has been repaired.

LM diagonal brace, fair overall condition.

HM diagonal brace, replaced 10/21.

LM horizontal brace, fair overall condition.

HM horizontal brace, fair overall condition.

All bolts and clamps have been replaced.

No scour or undermining at the interface with the river bed.

Trestle 5

Pile 1 – Fair overall condition with concrete encasement to lower 2.5m from bed level. The concrete encasement is in fair overall condition, the vertical cracks have been repaired. Where seen the pile has splits.

Pile 2 – New pile and encasement to lower 2.5m. 10/21

Pile 3 – Fair overall condition with a new concrete encasement to the lower 2.5m from bed level. Split to pile where seen.

Pile 4 – Fair overall condition with a new concrete encasement to the lower 2.5m from bed level. Where seen there are splits.

LM diagonal brace, fair overall condition.

HM diagonal brace, fair overall condition.

LM horizontal brace, fair overall condition.

HM horizontal brace, fair overall condition with some splits.

All bolts and clamps have been replaced.

No scour or undermining at the interface with the river bed.

Trestle 6

Trestle 6 in fair overall condition with the following defects noted.

Pile 1 – Fair condition with concrete encasement to lower 2.5m from bed level. The concrete encasement is in fair overall condition with vertical cracks to up and down faces 1mm - 5mm wide, at construction joint 0.5m long x 80mm high x 100mm deep area of spalling to down face at top. 0.9m long vertical crack to high mileage face of encasement 1mm - 3mm wide starts at top. Pile where seen has splits.

Pile 2 – Fair condition with concrete encasement to lower 2m from bed level. Pile has splits and minor decay to corners.

Pile 3 – Fair condition with concrete a new encasement to lower 2.5m from bed level. Where seen there are splits. (Photo 12)

Pile 4 – Fair condition with concrete encasement to lower 2.5m from bed level. The concrete encasement is in fair overall condition with vertical crack at construction joint up and down face 1mm - 5mm wide. Also, there is an area 500mm high x 5000mm wide x 100mm deep of spalling 2m below top of down face. Rest of pile were seen has splits.

LM diagonal brace, replaced 10/21.

HM diagonal brace, replace 10/21.

LM horizontal brace, fair overall condition with splits and decay to down end 1000mm x 100mm x 200mm deep

HM horizontal brace, fair overall condition both minor decay and splits.

All bolts and clamps have been replaced.

No scour or undermining at the interface with the river bed.

		NETWORK RAIL Underwater Examination Report			
ELR: DJP		Contract Mileage: 99 m 0913 yds 41.5 ch			Struct Ref: 99 41.5
Structure Name:	Barmouth Viaduct (Timber)			Examination Date:	18/04/2023
Area:	Dyfi	OS Ref:	SH 6244 1487	No of Spans:	113
Route:	Dovey Jct to Pwllheli	Group:	BV	Exam ID:	15614452

CONDITION: (Cont.)

Trestle 7

Trestle 7 in fair overall condition with the following defects noted.

Pile 1 – Fair condition with concrete encasement to lower 2.5m from bed level. The concrete encasement is in fair overall condition with vertical crack at construction joint to up and down face 1mm - 5mm wide. The area of spalling to down face has been repaired. Rest of pile where seen has splits

Pile 2 – Fair condition with a new concrete encasement to lower 2.5m from bed level. Rest of pile where seen has splits.

Pile 3 – Fair condition with a new concrete encasement to lower 2.5m from bed level. Rest of pile where seen has splits.

Pile 4 – Fair condition with a new concrete encasement to lower 2.5m from bed level. Rest of pile where seen has splits.

DN outrigger has a new concrete encasement.

UP outrigger fair overall condition, encased in steel.

LM diagonal brace, fair overall condition with splits.

HM diagonal brace, fair overall condition with splits.

LM horizontal brace, fair overall condition with splits.

HM horizontal brace, fair overall condition with splits.

All of the bolts and clamps have been replaced.

No scour or undermining at the interface with the river bed.

Trestle 8

Trestle 8 in fair overall condition with the following defects noted.

Pile 1 – Fair condition with a new concrete encasement to lower 2.5m from bed level. Rest of pile where seen has splits. (Photo 13)

Pile 2 – Fair condition with a new concrete encasement to lower 2.5m from bed level. Rest of pile where seen has splits.

Pile 3 – Fair condition with a new concrete encasement to lower 2m from bed level. Rest of pile where seen has splits.

Pile 4 – Fair condition with concrete encasement to lower 2m from bed level. The concrete encasement is in good overall condition.

Rest of pile where seen has splits

LM diagonal brace, has been replaced 10/21

HM diagonal brace, has been replaced 10/21

LM horizontal brace, fair overall condition, weathered and has splits.

HM horizontal brace, fair overall condition, weathered and with splits.

All of the clamps and bolts have been replaced.

No scour or undermining at the interface with the river bed.

Trestle 9

Trestle 9 in fair overall condition with the following defects noted.

Pile 1 – Fair condition with concrete encasement to lower 2.5m from bed level. The concrete encasement has had the cracks repaired. Rest of pile were seen has splits.

Pile 2 – Fair condition with a new concrete encasement to lower 2.5m from bed level. Rest of pile where seen has splits.

Pile 3 – Fair condition with concrete encasement to lower 2.5m from bed level. The concrete encasement is in fair overall condition with vertical cracks to up and down faces 1mm - 5mm wide to up and down faces at construction joints. Rest of pile where seen has splits.

Pile 4 – Fair condition with a new concrete encasement to lower 2.5m from bed level. Rest of pile where seen has splits.

LM diagonal brace, has been replaced. 10/21.

HM diagonal brace, fair overall condition with multiple splits.

LM horizontal brace, fair overall condition with some splits.

HM horizontal brace, fair overall condition with some splits.

All of the clamps and bolts have been replaced.

No scour or undermining at the interface with the river bed.

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Area:	Dyfi	OS Ref:	SH 6244 1487	No of Spans:	113
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CONDITION: (Cont.)

Trestle 10

Trestle 10 in fair overall condition with the following defects noted.

Pile 1 – Fair condition with concrete encasement to lower 2.5m from bed level. The concrete encasement is in fair overall condition, with vertical cracks to both the upside and downside face at the construction joint 1mm – 10mm wide.

Pile 2 – Fair condition with concrete encasement to lower 2.5m from bed level. The concrete encasement is in fair overall condition.

Pile 3 – fair condition with concrete encasement to lower 2.5m from bed level. The concrete encasement is in fair overall condition.

Pile 4 – Fair condition with concrete encasement to lower 2.5m from bed level. The concrete encasement is in fair overall condition.

All piles have splits above the concrete encasement.

LM diagonal brace, has been replaced 10/21.

HM diagonal brace, fair overall condition.

LM horizontal brace, fair overall condition with splits

HM horizontal brace, fair overall condition.

All of bolts and clamps have been replaced.

No scour or undermining at the interface with the river bed.

Trestle 11

Trestle 11 in fair overall condition with the following defects noted.

Pile 1 – Fair condition with concrete encasement to lower 2m from bed level. The concrete encasement has had the area of spalling repaired. Rest of pile where seen has splits.

Pile 2 – Fair condition with a new concrete encasement to lower 2m from bed level. Rest of pile where seen has splits.

Pile 3 – Fair condition with GRP encasement to lower 1.4m from bed level. The concrete encasement is in fair overall condition. Rest of pile where seen has splits.

Pile 4 – Fair condition with GRP encasement to lower 1.4m from bed level. The concrete encasement is in fair overall. Rest of piles where seen has splits.

LM diagonal brace, has been replaced 10/21.

HM diagonal brace, fair overall condition with some splits.

LM horizontal brace, fair overall condition, with splits

HM horizontal brace, fair overall condition, with splits

All bolts and clamps have been replaced.

No scour or undermining at the interface with the river bed.

Trestle 12

Trestle 12 in fair overall condition with the following defects noted.

Pile 1 – Fair condition with concrete encasement to lower 2.5m from bed level. The concrete encasement is in fair overall condition. Rest of pile where seen has splits.

Pile 2 – Fair condition with concrete encasement to lower 2.5m from bed level. The concrete encasement has had the crack repaired. Rest of pile where seen has splits.

Pile 3 – Fair condition with concrete encasement to lower 2.5m from bed level. The concrete encasement is in fair overall condition.

Pile 4 – Fair condition with concrete encasement to lower 2.5m from bed level. The concrete encasement is in fair overall condition

Rest of piles where seen has splits.

LM diagonal brace, fair overall condition with splits to lower sections 1mm - 6mm wide.

HM diagonal brace, replaced 10/21

LM horizontal brace, fair overall condition.

HM horizontal brace, fair overall condition

New bolts and clamps.

Upside outrigger, fair condition.

Downside outrigger, fair condition.

No scour or undermining at the interface with the river bed.

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CONDITION: (Cont.)

Trestle 13

Trestle 13 in fair overall condition with the following defects noted.

Pile 1 – Fair condition with a new concrete encasement to lower 2.5m from bed level. Rest of pile where seen has splits.

Pile 2 – Fair condition with a new concrete encasement to lower 2.5m from bed level. Rest of pile where seen has splits.

Pile 3 – Fair condition with a new concrete encasement to lower 2.5m from bed level. Rest of pile where seen has splits.

Pile 4 – Fair condition with concrete encasement to lower 2.5m from bed level. The concrete encasement is in good overall condition.

Rest of pile where seen has splits.

LM diagonal brace, fair overall condition.

HM diagonal brace, fair overall condition.

LM horizontal brace, fair overall condition.

HM horizontal brace, fair overall condition, with some splits.

All of the bolts and clamps have been replaced.

No scour or undermining at the interface with the river bed.

Trestle 14

Trestle 14 in fair overall condition with the following defects noted.

Pile 1 – Fair condition with concrete encasement to lower 2.5m from bed level. The concrete encasement has had the cracks repaired.

Rest of pile where seen has splits.

Pile 2 – Fair condition with concrete encasement to lower 2.5m from bed level. The concrete encasement is in fair overall condition with the cracks and area of spalling repaired. Rest of pile where seen has splits.

Pile 3 – Fair condition with a new concrete encasement to lower 2.5m from bed level. Rest of pile where seen has splits.

Pile 4 – Fair condition with concrete encasement to lower 2.5m from bed level. The concrete encasement is in fair overall condition with a loss of concrete chamfer to top of 0.3m². There is new timber.

LM diagonal brace, fair overall condition, with some splits.

HM diagonal brace, fair overall condition with some splits.

LM horizontal brace, fair overall condition, with some splits.

HM horizontal brace, fair overall condition, with some splits.

New bolt and clamps

No scour or undermining at the interface with the river bed.

Trestle 15

Trestle 15 in fair overall condition with the following defects noted.

Pile 1 – Fair condition with concrete encasement to lower 2.5m from bed level. The concrete encasement is in fair overall condition with cracks and delamination repaired. Rest of pile where seen has splits.

Pile 2 – Fair condition with concrete encasement to lower 2.5m from bed level. The concrete encasement is in fair overall condition with the cracks having been repaired. Rest of pile where seen has splits with 2 No clamps at high level with corrosion 1mm - 3mm deep.

Pile 3 – Fair condition with concrete encasement to lower 2.5m from bed level. The concrete encasement is in fair overall condition with a full height crack 5mm wide to high mileage face and also a 0.7m vertical crack 2mm wide to high mileage face both, start top of case.

Rest of pile where seen has splits.

Pile 4 – Fair condition with concrete a new encasement to lower 2.5m from bed level. Rest of pile where seen has splits.

LM diagonal brace, has been replaced 10/21.

HM diagonal brace, fair overall condition with some splits.

LM horizontal brace, fair overall condition, with some splits and minor decay.

HM horizontal brace, fair overall condition, new.

New bolts and clamps.

No scour or undermining at the interface with the river bed.

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CONDITION: (Cont.)

Trestle 16

Trestle 16 in fair overall condition with the following defects noted.

Pile 1 – Fair condition with concrete encasement to lower 2.5m from bed level. The concrete encasement is in fair overall condition with cracks been repaired. Rest of pile where seen has splits.

Pile 2 – Fair condition with concrete encasement to lower 2.5m from bed level. The concrete encasement is in fair overall condition with a 1.1m long vertical crack 1mm - 3mm wide at construction joint up face. Rest of pile where seen has splits.

Pile 3 – Fair condition with concrete encasement to lower 2.5m from bed level. The concrete encasement is in fair overall condition with a vertical crack 1-3mm wide at construction joint down face. Rest of pile where seen has splits.

Pile 4 – Fair condition with concrete encasement to lower 2.5m from bed level. The concrete encasement is in fair overall condition. Rest of pile where seen has splits.

LM diagonal brace, replaced.

HM diagonal brace, has been replaced 10/21. This is bowed. (Photo 15)

LM horizontal brace, fair overall condition with some splits and minor decay.

HM horizontal brace, fair overall condition, with some splits and minor decay. (Photo 16)

All bolt and clamps have been replaced.

No scour or undermining at the interface with the river bed.

Trestle 17

Trestle 17 in fair overall condition with the following defects noted.

Pile 1 – Fair condition with concrete encasement to lower 2.5m from bed level. The concrete encasement is in fair overall condition with cracks and spalling have been repaired. Rest of pile where seen has minor splits.

Pile 2 – Fair condition with concrete encasement to lower 2.5m from bed level. The concrete encasement is in fair overall condition with a vertical crack 1mm - 3mm wide at construction joint down. Rest of pile where seen has splits.

Pile 3 – Fair condition with concrete encasement to lower 2.5m from bed level. The concrete encasement is in fair overall condition with a vertical crack 1mm - 3mm wide at construction joint down and up. Rest of pile where seen has splits.

Pile 4 – Fair condition with concrete encasement to lower 2.5m from bed level. The concrete encasement is in good overall condition with the crack been repaired. Rest of pile where seen has splits.

DN Outrigger in fair condition overall, encased with concrete

UP Outrigger in fair condition overall, encased with concrete which has now been repaired. (Photo 17)

LM diagonal brace, replaced 10/21 (Photo 18)

HM diagonal brace, replaced 10/21.

LM horizontal brace, fair condition.

HM horizontal brace, fair condition.

All bolt and clamps have been replaced.

No scour or undermining at the interface with the river bed.

Trestle 18

Trestle 18 in fair overall condition with the following defects noted.

Pile 1 – Fair condition with a new concrete encasement to lower 2.5m from bed level. Rest of pile where seen has minor splits. (Photo 29)

Pile 2 – Fair condition with concrete encasement to lower 2.5m from bed level. The concrete encasement is in fair overall condition with 2No vertical cracks 0.9m long 2mm wide to high mileage face starts top of encasement. Rest of pile were seen has splits. New area of spalling at bolt, 0.2m2 x 50mm deep to high mileage face.

Pile 3 – Fair condition with concrete encasement to lower 2.5m from bed level. The concrete encasement is in fair overall condition with vertical cracks 1mm - 2mm wide at construction joint up face. Rest of pile where seen has splits.

Pile 4 – Fair condition with concrete encasement to lower 2.5m from bed level. The concrete encasement is in fair overall condition with vertical cracks 1mm - 2mm wide at construction joint down and up face. Rest of pile where seen has splits.

LM diagonal brace, replaced 10/21.

HM diagonal brace, replaced 10/21.

LM horizontal brace, fair condition.

HM horizontal brace, fair condition.

All bolts and clamps are new bolts.

No scour or undermining at the interface with the river bed.

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CONDITION: (Cont.)

Trestle 19

Trestle 19 in fair overall condition with the following defects noted.

Pile 1 – Fair condition with a new concrete encasement to lower 2.5m from bed level. Rest of pile where seen has minor splits.

Pile 2 – Fair condition with concrete encasement to lower 2.5m from bed level. The concrete encasement is in fair overall condition Rest of pile where seen has splits.

Pile 3 – Fair condition with concrete encasement to lower 2.5m from bed level. The concrete encasement is in fair overall condition with vertical cracks 1mm - 3mm wide to down and up face. Rest of pile where seen has splits.

Pile 4 – Fair condition with concrete encasement to lower 2.5m from bed level. The concrete encasement is in fair overall condition with the cracks been repaired. Rest of pile where seen has splits.

LM diagonal brace fair overall condition, with some splits up to 4mm wide.

HM diagonal brace fair overall condition, with some splits up to 4mm wide.

LM horizontal brace, fair overall condition.

HM horizontal brace, fair overall condition.

All bolts and clamps have been replaced.

No scour or undermining at the interface with the river bed.

Trestle 20

Trestle 20 in fair overall condition with the following defects noted.

Pile 1 – Fair condition with concrete encasement to lower 2.5m from bed level. The concrete encasement is in fair overall condition with the crack having been repaired. Rest of pile where seen has minor splits.

Pile 2 – Fair condition with concrete encasement to lower 2.5m from bed level. The concrete encasement is in fair overall condition with a vertical crack 1-3mm wide to down face at construction joint also a 0.5m long vertical crack 2mm wide to high mileage face starts top of casement. Rest of pile where seen has minor splits.

Pile 3 – Fair condition with concrete encasement to lower 2.5m from bed level. The concrete encasement is in fair overall condition with vertical cracks 5mm wide at construction joint to down face. Rest of pile where seen has splits.

Pile 4 – Fair condition with concrete encasement to lower 2.5m from bed level. The concrete encasement is in fair overall condition with vertical cracks 5mm wide at construction joint to up face at construction joint. Rest of pile where seen has splits.

LM diagonal brace, replaced with new packer. (Photo 20)

HM diagonal brace, replaced 10/21.

LM horizontal brace, fair overall condition.

HM horizontal brace, fair overall condition.

All bolts and clamps have been replaced.

No scour or undermining at the interface with the river bed.

Trestle 21

Trestle 21 in fair overall condition with the following defects noted.

Pile 1 – Fair condition with concrete encasement to lower 2.5m from bed level. The concrete encasement is in fair overall condition with the cracks and spalling having been repaired. Rest of pile where seen has minor splits.

Pile 2 – Fair condition with concrete encasement to lower 2.5m from bed level. The concrete encasement is in fair overall condition with a vertical crack 1mm - 3mm wide to down face at construction joint and top 0.3m long has spalled 100mm to down face and high mileage face. Rest of pile where seen has minor splits.

Pile 3 – A new concrete encasement has been installed 10/21. (Photo 21) Rest of pile where seen has splits.

Pile 4 – Fair condition with a new concrete encasement to lower 2.5m from bed level. Rest of pile where seen has splits.

LM diagonal brace, replaced.

HM diagonal brace, replaced.

LM horizontal brace, fair overall condition.

HM horizontal brace, fair overall condition.

All bolts and clamps are new.

No scour or undermining at the interface with the river bed.

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CONDITION: (Cont.)

Trestle 22

Trestle 22 in fair overall condition with the following defects noted.

Pile 1 – Fair condition with a new concrete encasement to lower 2.5m from bed level. Rest of pile where seen has minor splits.

Pile 2 – Fair condition with a new concrete encasement to lower 2.5m from bed level. Rest of pile where seen has minor splits.

Pile 3 – Fair condition with a new concrete encasement to lower 2.5m from bed level. Rest of pile where seen has splits.

Pile 4 – Fair condition with a new concrete encasement to lower 2.5m from bed level. Rest of pile where seen has splits.

DN Out rigger, new concrete encasement installed.

UP Out rigger, new concrete encasement installed.

LM diagonal brace, replaced 10/21.

HM diagonal brace, replaced 10/21.

LM horizontal brace, fair overall condition.

HM horizontal brace, fair overall condition.

All bolt and clamps are new.

No scour or undermining at the interface with the river bed.

Trestle 23

Trestle 23 in fair overall condition with the following defects noted.

Pile 1 – Fair condition with a new concrete encasement to lower 2.5m from bed level. Where seen the pile has splits.

Pile 2 – Fair condition with concrete encasement to lower 2.5m from bed level. The concrete encasement is in fair overall condition with minor cracks 1mm wide. Where seen the pile has splits.

Pile 3 – Fair condition with concrete encasement to lower 2.5m from bed level. The concrete encasement is in fair overall condition with a 1m high x 0.5m wide area of spalling to high mileage face at top. Where seen the pile has splits.

Pile 4 – Fair condition with concrete encasement to lower 2.5m from bed level. The concrete encasement is in fair overall condition with areas of minor cracks 1mm wide. Where seen the pile has splits.

LM diagonal brace fair overall condition, with some splits.

HM diagonal brace fair overall condition, with some splits.

LM horizontal brace, fair overall condition, with some splits.

HM horizontal brace, fair overall condition, with some splits.

With new bolts and clamps.

No scour or undermining at the interface with the river bed.

Trestle 24

Trestle 24 in fair overall condition with the following defects noted.

All piles appear to be out of plumb 10°. (Photo 23)

Pile 1 – Fair condition with a new concrete encasement to lower 2.5m from bed level. Where seen the pile has splits. There are 2 clamps at high level. (Photo 24)

Pile 2 – Fair condition with a new concrete encasement to lower 2.5m from bed level. Where seen the pile has splits. Has had a packer replaced.

Pile 3 – Fair condition with a new concrete encasement to lower 2.5m from bed level. Where seen the pile has splits.

Pile 4 – Fair condition with a new concrete encasement to lower 2.5m from bed level. Where seen the pile has splits.

LM diagonal brace, replaced 10/21.

HM diagonal brace, replaced 10/21.

LM horizontal brace, fair overall condition, with splits.

HM horizontal brace, fair overall condition, with splits.

All bolts and clamps are new.

No scour or undermining at the interface with the river bed.

Trestle 25

Trestle 25 in fair overall condition with the following defects noted.

Pile 1 – Fair condition with concrete encasement to lower 2.5m from bed level. Where seen the pile has splits.

Pile 2 – New pile with new concrete encasement to lower 2.5m.

Pile 3 – New pile with new concrete encasement to lower 2.5m.

Pile 4 – New pile with new concrete encasement to lower 2.5m.

LM diagonal brace, replaced 10/21.

HM diagonal brace, replaced 10/21.

LM horizontal brace, fair condition with splits.

HM horizontal brace, fair condition with splits.

New bolts and clamps, but pier 2 has a missing bolt to diagonal brace and missing packer.

No scour or undermining at the interface with the river bed.

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CONDITION: (Cont.)

Trestle 26

Trestle 26 in fair overall condition with the following defects noted.

Pile 1 – Fair condition with concrete encasement to lower 2.4m from bed level with the crack at construction joint been repaired. Rest of pile where seen has splits 1mm - 3mm wide.

Pile 2 – Fair condition with concrete encasement to lower 2.4m from bed level with 1m long crack at construction joints 1mm - 3mm wide with 2 smaller cracks 0.2m long 1mm - 3mm wide to high mileage up face. Rest of pile where seen has splits 1mm - 3mm wide.

Pile 3 – Fair condition with concrete encasement to lower 2.4m from bed level. The concrete encasement is in fair overall condition with cracks at construction joints 1mm - 3mm wide. Rest of pile where seen has splits 1mm - 3mm wide to the down face.

Pile 4 – Fair condition with concrete encasement to lower 2.4m from bed level. The concrete encasement is in fair overall condition with areas of repair. Rest of pile where seen has splits 1mm - 3mm wide.

LM diagonal brace, replaced. (Photo 25)

HM diagonal brace, replaced.

LM horizontal brace, fair overall condition, with some splits.

HM horizontal brace, fair overall condition, with some splits.

New clamps and bolts.

No scour or undermining at the interface with the river bed.

Trestle 27

Trestle 27 in fair overall condition with the following defects noted.

Pile 1 – Fair condition with concrete encasement to lower 2.5m from bed level in fair condition overall.

Pile 2 – Fair condition. A new concrete encasement to lower 2.5m from bed level has been installed. Where seen the pile has splits. (Photo 26)

Pile 3 – Fair condition with concrete encasement to lower 2.5m from bed level. The concrete encasement is in fair overall condition with areas of repairs to cracks and spalling. Rest of pile where seen has splits 1mm - 3mm wide.

Pile 4 – Fair condition with concrete encasement to lower 2.5m from bed level. The concrete encasement is in fair overall condition with 1m crack at construction joints 5mm wide. Rest of pile where seen has splits 1mm - 3mm wide.

UP Outrigger, repaired. (Photo 27)

DN Outrigger, repaired.

LM diagonal brace fair overall condition, with some splits 1mm - 3mm wide.

HM diagonal brace fair overall condition, with some splits 1mm - 3mm wide.

LM horizontal brace, fair overall condition, with some splits, partly buried.

HM horizontal brace, fair overall condition, with some splits, partly buried.

All clamps and bolts have been replaced.

No scour or undermining at the interface with the river bed.

Trestle 28

Trestle 28 in fair overall condition with the following defects noted.

Pile 1 – New pile and concrete encased installed 10/21.

Pile 2 – Fair condition with a new concrete encasement to lower 2m from bed level. Rest of pile where seen has splits.

Pile 3 – Fair condition with a new concrete encasement to lower 2.2m from bed level. Rest of pile where seen has splits. Has 3 clamps with a 3m long 5mm wide split at the top.

Pile 4 – Fair condition with concrete encasement to lower 2m from bed level. The concrete encasement is in fair overall condition. Rest of pile where seen has splits.

LM diagonal brace, replaced 10/21.

HM diagonal brace, replaced 10/21.

LM horizontal brace, fair overall condition, with some splits, partly buried

HM horizontal brace, fair overall condition, with some splits, partly buried.

All clamps and bolts are new.

No scour or undermining at the interface with the river bed.

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CONDITION: (Cont.)

Trestle 29

Trestle 29 in fair overall condition with the following defects noted.

Pile 1 – Fair condition with a new concrete encasement to lower 2.4m from bed level. Rest of pile where seen has splits.

Pile 2 – Fair condition with a new concrete encasement to lower 2.4m from bed level. Rest of pile where seen has splits.

Pile 3 – Fair condition with a new concrete encasement to lower 2.4m from bed level. Rest of pile where seen has splits.

Pile 4 – Fair condition with concrete encasement to lower 2.4m from bed level. The concrete encasement is in fair overall condition.

Rest of pile where seen has splits.

LM diagonal brace fair overall condition, with deep splits.

HM diagonal brace, replaced

LM horizontal brace, fair overall condition, partly buried.

HM horizontal brace, fair overall condition, partly buried.

All bolts and clamps are new.

No scour or undermining at the interface with the river bed.

Trestle 30

Trestle 30 in fair overall condition with the following defects noted.

Pile 1 – Fair condition with a new concrete encasement to lower 2.4m from bed level. Rest of pile where seen has splits.

Pile 2 – Fair condition with concrete encasement to lower 2.4m from bed level in fair condition overall with 1m long cracks to both sides

1mm - 3mm wide. Spalling repair to down face. Rest of pile where seen has splits.

Pile 3 – Fair condition with a new concrete encasement to lower 2.4m from bed level. Rest of pile where seen has splits.

Pile 4 – Fair condition with a new concrete encasement to lower 2.4m from bed level. Rest of pile where seen has splits. Loose bolt to high mileage side. (Photo 28)

LM diagonal brace fair overall condition, with splits.

HM diagonal brace, replaced 10/21.

LM horizontal brace, fair condition.

HM horizontal brace, fair condition.

All bolts and clamps have been replaced. No scour or undermining at the interface with the river bed.

Trestle 31

Trestle 31 in fair overall condition.

Pile 1 – Fair condition with concrete encasement to lower 2.1m from bed level. The concrete encasement is in fair overall condition.

Pile 2 – Fair condition with concrete encasement to lower 2.4m from bed level. The concrete encasement is in fair overall condition with 1.5m long crack at construction joint 1mm - 3mm wide and 0.3m³ area of spalling to high mileage side 60mm deep.

Pile 3 – Fair condition with concrete encasement to lower 2.4m from bed level. The concrete encasement is in fair overall condition with 1.5m long crack at construction joint 1mm - 3mm wide. New spalling, 1.2m long x 0.5m wide x 10mm deep, 0.4m from the top and to the high mileage face. Loss of concrete to casement, 0.3m high x 0.6m wide x 150mm deep to the Low Mileage face. [NEW] (Photo 31)

Pile 4 – Fair condition with concrete encasement to lower 2.4m from bed level. The concrete encasement is in fair overall condition with 1.5m long crack at construction joint 1mm - 3mm wide and spalling to up face, both 200mm x 200mm x 20mm deep.

LM diagonal brace, replaced.

HM diagonal brace, replaced.

LM horizontal brace, Mostly buried, appear in an overall fair condition.

HM horizontal brace, Mostly buried, appear in an overall fair condition.

All bolts and clamps are new.

No scour or undermining at the interface with the river bed.

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CONDITION: (Cont.)

Trestle 32

Trestle 32 in fair overall condition.

Pile 1 – Fair condition with concrete encasement to lower 2.4m from bed level. The concrete encasement is in fair overall condition with 1m long crack at construction joint 1mm - 3mm wide. Rest of pile where seen has splits.

Pile 2 – Fair condition with a new concrete encasement to lower 1.5m from bed level. Rest of pile where seen has splits.

Pile 3 – Fair condition with a new concrete encasement to lower 2.4m from bed level. Rest of pile where seen has splits.

Pile 4 – Fair condition with a new concrete encasement to lower 2.4m from bed level. Rest of pile where seen has splits.

UP Outrigger, repaired.

DN Outrigger, repaired

LM diagonal brace, replaced.

HM diagonal brace, replaced.

LM horizontal brace, buried.

HM horizontal brace, buried.

All bolts and clamps are new.

No scour or undermining at the interface with the river bed.

Trestle 33

Trestle 33 in fair overall condition.

Pile 1 – Fair condition with concrete encasement to lower 2.5m from bed level. The concrete encasement is in fair overall condition.

Rest of the pile where seen, in an overall fair condition.

Pile 2 – Fair condition with concrete encasement to lower 2.3m from bed level. The concrete encasement is in fair overall condition.

Rest of the pile where seen, in an overall fair condition.

Pile 3 – Fair condition with concrete encasement to lower 2.5m from bed level. The concrete encasement is in fair overall condition with the crack been repaired. Rest of pile where seen has splits.

Pile 4 – Fair condition with concrete encasement to lower 2.5m from bed level. The concrete encasement is in fair overall condition with areas of repair. Rest of pile where seen has splits. NEW area of spalling to the upside low mileage corner 0.3m² x 20mm deep, 0.4m from the top.

LM diagonal brace fair overall condition, with low level full depth splits. (Photo 32)

HM diagonal brace fair overall condition.

LM horizontal brace buried.

HM horizontal brace buried.

All bolts and clamps are new.

No scour or undermining at the interface with the river bed.

Trestle 34

Trestle 34 in fair overall condition.

Pile 1 – Fair condition with concrete encasement to lower 2.5m from bed level. The concrete encasement is in fair overall condition.

Where seen the pile has splits.

Pile 2 – Fair condition with a new concrete encasement to lower 2.5m from bed level. Where seen the pile has splits.

Pile 3 – Fair condition with concrete encasement to lower 2.5m from bed level. The concrete encasement is in fair overall condition.

Pile 4 – Fair condition with concrete encasement to lower 2.5m from bed level. The concrete encasement is in fair overall condition with the crack having been repaired. Where seen the pile has splits.

LM diagonal brace, replaced.

HM diagonal brace, replaced.

LM horizontal brace buried.

HM horizontal brace buried.

All bolts and clamps area new.

No scour or undermining at the interface with the river bed.

		NETWORK RAIL Underwater Examination Report			
ELR: DJP		Contract Mileage: 99 m 0913 yds 41.5 ch			Struct Ref: 99 41.5
Structure Name:	Barmouth Viaduct (Timber)			Examination Date:	18/04/2023
Area:	Dyfi	OS Ref:	SH 6244 1487	No of Spans:	113
Route:	Dovey Jct to Pwllheli	Group:	BV	Exam ID:	15614452

CONDITION: (Cont.)

Trestle 35

Trestle 35 in fair overall condition.

Pile 1 – Fair condition with concrete encasement to lower 2.5m from bed level. A new GRP encasement has been installed. Rest of pile in a fair condition.

Pile 2 – Fair condition with concrete encasement to lower 2.5m from bed level. The concrete encasement is in fair overall condition with the cracks having been repaired. Rest of pile in a fair condition.

Pile 3 – Fair condition with concrete encasement to lower 2.5m from bed level. The concrete encasement is in fair overall with crack having been repaired. Rest of pile in a fair condition.

Pile 4 – Fair condition, a new concrete encasement to lower 2.5m from bed level has been installed. Rest of pile in a fair condition.

LM diagonal brace, fair overall condition, with deep splits to bottom.

HM diagonal brace, replaced

LM horizontal brace buried.

HM horizontal brace buried.

New bolts and clamps.

No scour or undermining at the interface with the river bed.

Trestle 36

Trestle 36 in fair overall condition.

Pile 1 – Fair condition with a new concrete encasement to lower 2.5m from bed level. Rest of pile in a fair condition with splits.

Pile 2 – Fair condition with a new concrete encasement to lower 2.5m from bed level. Rest of pile in a fair condition with splits.

Pile 3 – Fair condition with concrete encasement to lower 2.5m from bed level. The concrete encasement is in fair overall with areas of repair to the crack an area of spalling. Rest of pile in a fair condition with splits.

Pile 4 – Fair condition with a new concrete encasement to lower 2.5m from bed level. Rest of pile in a fair condition with splits.

LM diagonal brace, replaced 10/21.

HM diagonal brace, replaced 10/21.

LM horizontal brace buried.

HM horizontal brace buried.

All bolt and clamps are new.

No scour or undermining at the interface with the river bed.

Trestle 38

Trestle 38 in fair overall condition.

Pile 1 – Fair condition with a new concrete encasement to lower 2.5m from bed level. Where seen the pile has splits.

Pile 2 – Fair condition with a new concrete encasement to lower 2m from bed level. Where seen the pile has splits.

Pile 3 – Fair condition with concrete encasement to lower 2.5m from bed level. The concrete encasement is in fair overall condition.

Pile in fair condition.

Pile 4 – Fair condition with concrete encasement to lower 2.5m from bed level. The concrete encasement is in fair overall condition with full height cracks at construction joint. Pile in fair condition. 1.2m below the top to the US LM corner, there is a 1m long crack. [NEW]

LM diagonal brace fair overall condition.

HM diagonal brace, replaced.

LM horizontal brace part buried.

HM horizontal brace part buried.

All bolts and clamps are new.

No scour or undermining at the interface with the river bed.

		NETWORK RAIL Underwater Examination Report				
ELR: DJP		Contract Mileage: 99 m 0913 yds 41.5 ch			Struct Ref: 99 41.5	
Structure Name: Barmouth Viaduct (Timber)		Examination Date: 18/04/2023				
Area: Dyfi		OS Ref: SH 6244 1487		No of Spans: 113		
Route: Dovey Jct to Pwllheli		Group: BV		Exam ID: 15614452		

CONDITION: (Cont.)

Trestle 39

Trestle 39 in fair overall condition.

Pile 1 – Fair condition with a new concrete encasement to lower 2.5m from bed level. Where seen the pile has splits.

Pile 2 – Fair condition with concrete encasement to lower 2.5m from bed level. The concrete encasement is in fair overall condition with 1.5m² spalling 100mm deep. Cracks to construction joints. Where seen the pile has splits.

Pile 3 – Fair condition with a new concrete encasement to lower 1.8m from bed level. Where seen the pile has splits.

Pile 4 – Fair condition with concrete encasement to lower 1.8m from bed level. The concrete encasement is in fair overall condition.

Where seen the pile has splits.

LM diagonal brace, fair overall condition with deep splits at low level.

HM diagonal brace, replaced.

LM horizontal brace part buried.

HM horizontal brace part buried.

All bolts and clamps are new.

No scour or undermining at the interface with the river bed.

Trestle 40

Trestle 40 in fair overall condition.

Pile 1 – Fair condition with a new concrete encasement to lower 2.5m from bed level. Where seen the pile has splits.

Pile 2 – Fair condition with concrete encasement to lower 2m from bed level. The concrete encasement is in fair overall condition.

Where seen the pile has splits.

Pile 3 – Fair condition with a new concrete encasement to lower 2.5m from bed level. Where seen the pile has splits.

Pile 4 – Fair condition with concrete encasement to lower 2.5m from bed level. The concrete encasement is in fair overall condition cracks to construction joints, 1mm – 2mm wide. Where seen the pile has splits.

LM diagonal brace, replaced.

HM diagonal brace fair overall condition with deep splits at low level.

LM horizontal brace part buried.

HM horizontal brace part buried.

All bolts and clamps are new.

No scour or undermining at the interface with the river bed.

Trestle 41

Trestle 41 in fair overall condition.

Pile 1 – Fair condition with a new concrete encasement to lower 2.5m from bed level. Pile in fair condition with splits.

Pile 2 – Fair condition with a new concrete encasement to lower 2m from bed level. A new pile has also been installed 10/21.

Pile 3 – Fair condition with concrete encasement to lower 2.5m from bed level. The concrete encasement is in fair overall condition.

Pile in fair condition with splits and decay to first 1m above the casement.

Pile 4 – Fair condition with a new concrete encasement to lower 2.5m from bed level. Pile in fair condition, with 10mm wide split to top 2m long.

LM diagonal brace, replaced 10/21.

HM diagonal brace, replaced 10/21.

LM horizontal brace buried.

HM horizontal brace buried.

New bolts and clamps have been installed.

No scour or undermining at the interface with the river bed.

		NETWORK RAIL Underwater Examination Report				
ELR: DJP		Contract Mileage: 99 m 0913 yds 41.5 ch			Struct Ref:	99 41.5
Structure Name:	Barmouth Viaduct (Timber)			Examination Date:	18/04/2023	
Area:	Dyfi	OS Ref:	SH 6244 1487	No of Spans:	113	
Route:	Dovey Jct to Pwllheli	Group:	BV	Exam ID:	15614452	

CONDITION: (Cont.)

Trestle 42

Trestle 42 in fair overall condition.

Pile 1 – Fair condition with concrete encasement to lower 2.5m from bed level. The concrete encasement is in fair overall condition with 1.3m long split x 100mm wide to encasement low mileage side. Pile in fair condition with splits. (Photo 34)

Pile 2 – Fair condition with concrete encasement to lower 2.5m from bed level. The concrete encasement is in fair overall condition with cracks to construction joint. Pile in fair condition with splits.

Pile 3 – Fair condition with a new concrete encasement to lower 2m from bed level. Pile in fair condition with splits.

Pile 4 – Fair condition with concrete encasement to lower 2.5m from bed level. The concrete encasement is in fair overall. Pile in fair condition with deep splits above the casement to the low mileage face.

UP Outrigger, replaced.

DN Outrigger, replaced.

LM diagonal brace fair overall condition.

HM diagonal brace, replaced.

LM horizontal brace, buried.

HM horizontal brace, buried.

New bolts and clamps have been installed.

No scour or undermining at the interface with the river bed.

Trestle 43

Trestle 43 in fair overall condition.

Pile 1 – Fair condition with a new concrete encasement to lower 2.5m from bed level. Pile in fair condition with splits.

Pile 2 – Fair condition with concrete encasement to lower 2m from bed level. The concrete encasement is in fair overall condition. Pile in fair condition with splits.

Pile 3 – Fair condition with concrete encasement to lower 2m from bed level. The concrete encasement is in fair overall condition. Pile in fair condition with splits.

Pile 4 – Fair condition with concrete encasement to lower 2.5m from bed level. The concrete encasement is in fair overall with crack to down face at construction joint. Pile in fair condition with splits.

LM diagonal brace fair overall condition with heavy splits to lower section.

HM diagonal brace, replaced

LM horizontal brace, buried

HM horizontal brace, buried.

New bolts and clamps have been installed.

No scour or undermining at the interface with the river bed.

Trestle 44

Trestle 44 in fair overall condition.

Pile 1 – Fair condition with concrete encasement to lower 2m from bed level. The concrete encasement is in fair overall condition. Pile in fair condition with splits.

Pile 2 – Fair condition with a new concrete encasement to lower 2.5m from bed level. Area of decay that was mentioned in the previous report 200mm x 700mm x 100mm to down face high mileage up 1.5m from top remains. Pile in fair condition with splits.

Pile 3 – Fair condition with a new concrete encasement to lower 2m from bed level. Pile in fair condition with splits.

Pile 4 – Fair condition with a new concrete encasement to lower 2.5m from bed level. Pile in fair condition with splits.

LM diagonal brace, replaced.

HM diagonal brace fair overall condition.

LM horizontal brace, fair condition.

HM horizontal brace, fair condition.

New bolts and clamps.

No scour or undermining at the interface with the river bed.

		NETWORK RAIL Underwater Examination Report			
ELR: DJP		Contract Mileage: 99 m 0913 yds 41.5 ch			Struct Ref: 99 41.5
Structure Name:	Barmouth Viaduct (Timber)			Examination Date:	18/04/2023
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CONDITION: (Cont.)

Trestle 45

Trestle 45 in fair overall condition.

Pile 1 – Fair condition with a new concrete encasement to lower 2m from bed level. Pile in fair condition with splits.

Pile 2 – Fair condition with a new concrete encasement to lower 2.5m from bed level. A new pile also been installed.

Pile 3 – Fair condition with concrete encasement to lower 2m from bed level. The concrete encasement is in fair overall condition with the spalling been repaired. Pile in fair condition with splits.

Pile 4 – Fair condition with a new concrete encasement to lower 2.5m from bed level. Pile in fair condition with splits.

LM diagonal brace, replaced.

HM diagonal brace fair overall condition with splits.

LM horizontal brace, partly buried.

HM horizontal brace, partly buried.

New bolts and clamps.

No scour or undermining at the interface with the river bed.

Trestle 46

Trestle 46 in fair overall condition.

Pile 1 – Fair condition with a new concrete encasement to lower 2.5m from bed level. Pile in fair condition with splits.

Pile 2 – Fair condition with a new concrete encasement to lower 2.5m from bed level. Pile in fair condition with splits.

Pile 3 – Fair condition with concrete encasement to lower 2.5m from bed level. The concrete encasement is in fair overall condition with cracks to construction joints and a 0.3m long crack 3mm wide to down face. Pile in fair condition with splits.

Pile 4 – Fair condition with a new concrete encasement to lower 2.5m from bed level. Pile in fair condition with splits.

LM diagonal brace fair overall condition with deep cracks to lower section.

HM diagonal brace fair overall condition with deep cracks to lower section.

LM horizontal brace part buried.

HM horizontal brace part buried.

New bolts and clamps.

No scour or undermining at the interface with the river bed.

Trestle 47

Trestle 47 in fair overall condition.

Pile 1 – Fair condition with concrete encasement to lower 2.5m from bed level. The concrete encasement is in fair overall condition.

Pile in fair condition with splits

Pile 2 – Fair condition with a new concrete encasement to lower 2.5m from bed level. Pile in fair condition with splits.

Pile 3 – Fair condition with a new concrete encasement to lower 2.5m from bed level. Pile in fair condition with splits.

Pile 4 – Fair condition with concrete encasement to lower 2.5m from bed level. The concrete encasement is in fair overall with 100mm² area of spalling 20mm deep to low mileage face. Pile in fair condition with splits. 1.5m below the top there is a 0.7m long x 2mm wide crack with 10mm displacement. [NEW]

UP Outrigger, repaired.

DN Outrigger, repaired.

LM diagonal brace fair overall condition with splits.

HM diagonal brace, replaced.

LM horizontal brace part buried.

HM horizontal brace part buried.

New bolts and clamps.

No scour or undermining at the interface with the river bed.

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Structure Name:	Barmouth Viaduct (Timber)			Examination Date:	18/04/2023
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Route:	Dovey Jct to Pwllheli	Group:	BV	Exam ID:	15614452

CONDITION: (Cont.)

Trestle 48

Trestle 48 in fair overall condition.

Pile 1 – Fair condition with a new concrete encasement to lower 2.5m from bed level. Pile in fair condition with splits.

Pile 2 – Fair condition with a new concrete encasement to lower 2.5m from bed level. Pile in fair condition with splits.

Pile 3 – Fair condition with a new concrete encasement to lower 2.5m from bed level. Pile in fair condition with splits. There is a missing packer to the HM diagonal member. (Photo 35)

Pile 4 – Fair condition with a new concrete encasement to lower 2.5m from bed level. Pile in fair condition with splits.

LM diagonal brace fair overall condition with splits.

HM diagonal brace fair overall condition with splits.

LM horizontal brace buried.

HM horizontal brace buried.

New bolts and clamps.

No scour or undermining at the interface with the river bed.

Trestle 49

Trestle 49 in fair overall condition.

Pile 1 – Fair condition with concrete encasement to lower 1m from bed level. The concrete encasement is in fair overall condition with. To the first 0.5m above the encasement, there is some thinning by 10mm to all faces.

Pile 2 – Fair condition with concrete encasement to lower 1m from bed level. The concrete encasement is in fair overall condition with deep splits rest in fair condition.

Pile 3 – Fair condition with concrete encasement to lower 1m from bed level. The concrete encasement is in fair overall condition. Pile in fair condition with splits.

Pile 4 – Fair condition with concrete encasement to lower 1m from bed level. The concrete encasement is in fair overall. Pile in fair condition with splits

LM diagonal brace, replaced.

HM diagonal brace fair overall condition with deep splits

LM horizontal brace buried.

HM horizontal brace buried.

New clamps and bolts.

No scour or undermining at the interface with the river bed.

Trestle 50

Trestle 50 in fair overall condition.

Pile 1 – Fair condition with concrete encasement to lower 2.5m from bed level. The concrete encasement is in fair overall condition with areas of repair. Pile in fair condition with splits.

Pile 2 – Fair condition with a new concrete encasement to lower 2.5m from bed level. The pile has been replaced.

Pile 3 – Fair condition with concrete encasement to lower 1m from bed level. The concrete encasement is in fair overall condition. Pile in fair condition with splits.

Pile 4 – Fair condition with concrete encasement to lower 2.5m from bed level. The concrete encasement is in fair overall with areas of repair. Pile in fair condition with splits.

LM diagonal brace, replaced.

HM diagonal brace fair overall condition with splits.

LM horizontal brace, partly buried.

HM horizontal brace, partly buried.

New bolts and clamps.

No scour or undermining at the interface with the river bed.

		NETWORK RAIL Underwater Examination Report			
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Route:	Dovey Jct to Pwllheli	Group:	BV	Exam ID:	15614452

CONDITION: (Cont.)

Trestle 51

Trestle 51 in fair overall condition.

Pile 1 – Fair condition with concrete encasement to lower 1.5m from bed level. The concrete encasement is in fair overall condition with the cracks repaired. Pile in fair condition with splits.

Pile 2 – Fair condition with concrete encasement to lower 1.5m from bed level. The concrete encasement is in fair overall condition with the cracks repaired. Pile in fair condition with splits. There is spalling at the bolt 0.3m² x 60mm deep. [NEW] (Photo 45)

Pile 3 – Fair condition with concrete encasement to lower 1.5m from bed level. The concrete encasement is in fair overall condition the defects to the downside have been repaired, the upside defects remain. Pile in fair condition. With splits.

Pile 4 – Fair condition with concrete encasement to lower 1.5m from bed level. The concrete encasement is in fair overall with cracks to construction joints. Pile in fair condition, with splits

LM diagonal brace, replaced.

HM diagonal brace, replaced.

LM horizontal brace, buried.

HM horizontal brace, buried.

New bolts and clamps.

No scour or undermining at the interface with the river bed.

Trestle 52

Trestle 52 in fair overall condition.

Pile 1 – Fair condition with a new concrete encasement to lower 2.5m from bed level. Pile in fair condition with splits.

Pile 2 – Fair condition with a new concrete encasement to lower 2.5m from bed level. Pile in fair condition with splits.

Pile 3 – Fair condition with a new concrete encasement to lower 2.5m from bed level. Pile in fair condition with splits.

Pile 4 – Fair condition with a new concrete encasement to lower 2.5m from bed level. Pile in fair condition with splits.

Up Outrigger fair overall condition.

DN Outrigger fair overall condition.

LM diagonal brace, replaced.

HM diagonal brace, replaced.

LM horizontal brace, buried.

HM horizontal brace, buried.

New bolts and clamps.

No scour or undermining at the interface with the river bed.

Trestle 53

Trestle 53 in fair overall condition.

Pile 1 – Fair condition with concrete encasement to lower 1.1m from bed level. The concrete encasement is in fair overall condition.

Pile in fair condition with splits and thinning to all faces 5mm to 10mm.

Pile 2 – Fair condition with concrete encasement to lower 1.1m from bed level. The concrete encasement is in fair overall condition with 0.5m x 200mm x 30mm deep area of decay and 1m long area of thinning 10mm - 20mm deep. Pile in fair condition.

Pile 3 – Fair condition with concrete encasement to lower 0.8m from bed level. The concrete encasement is in fair overall condition.

Pile in fair condition, with splits.

Pile 4 – Fair condition with concrete encasement to lower 1.1m from bed level. The concrete encasement is in fair overall condition.

The pile with splits, the first 1m above the casement there is thinning to all faces 10mm to 20mm.

LM diagonal brace fair overall condition with splits 1mm to 3mm.

HM diagonal brace fair overall condition with splits 1mm to 3mm.

LM horizontal brace, buried.

HM horizontal brace, buried.

New bolts and clamps.

No scour or undermining at the interface with the river bed.

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Route:	Dovey Jct to Pwllheli	Group:	BV	Exam ID:	15614452

CONDITION: (Cont.)

Trestle 54

Trestle 54 in fair overall condition.

Pile 1 – Fair condition with concrete encasement to lower 1.3m from bed level. The concrete encasement is in fair overall condition with some thinning. Pile in fair condition.

Pile 2 – Fair condition with concrete encasement to lower 1m from bed level. The concrete encasement is in fair overall condition. Pile in fair condition with splits.

Pile 3 – Fair condition with a new concrete encasement to lower 1.3m from bed level. Pile in fair condition with splits.

Pile 4 – Fair condition with concrete encasement to lower 1.3m from bed level. The concrete encasement is in fair overall condition with 0.8m² area of spalling 20mm - 100mm deep. Pile in fair condition.

LM diagonal brace fair overall condition with some thinning to lower section.

HM diagonal brace, replaced.

LM horizontal brace, buried.

HM horizontal brace, buried.

New bolts and clamps.

No scour or undermining at the interface with the river bed.

Trestle 55

Trestle 55 in fair overall condition.

Pile 1 – Fair condition with concrete encasement to lower 1.3m from bed level. The concrete encasement is in fair overall condition with some thinning. Pile in fair condition with splits.

Pile 2 – Fair condition with concrete encasement to lower 1m from bed level. The concrete encasement is in fair overall condition. Pile in fair condition with splits.

Pile 3 – Fair condition with a new concrete encasement to lower 1.3m from bed level. Pile in fair condition with splits, first 1m above the casement there is thinning at all faces 10mm to 20mm.

Pile 4 – Fair condition with a new concrete encasement to lower 1.3m from bed level. Pile in fair condition.

LM diagonal brace, replaced.

HM diagonal brace fair overall condition with some thinning to lower section.

LM horizontal brace, buried.

HM horizontal brace, buried.

New bolts and clamps.

No scour or undermining at the interface with the river bed.

Trestle 56

Trestle 56 in fair overall condition.

Pile 1 – Fair condition with concrete encasement to lower 2.6m from bed level. The concrete encasement is in fair overall condition areas of repair. Pile in fair condition with splits.

Pile 2 – Fair condition with a new concrete encasement to lower 2.6m from bed level. Pile in fair condition with splits

Pile 3 – Fair condition with concrete encasement to lower 2.6m from bed level. The concrete encasement is in fair overall condition with cracking to construction joints. Pile in fair condition with splits. There is a failed repair to the DS LM corner running full height 1mm to 2mm.

Pile 4 – Fair condition with concrete encasement to lower 2.6m from bed level. The concrete encasement is in fair overall condition with areas of repair. Pile in fair condition with splits 1mm to 5mm.

LM diagonal brace, replaced.

HM diagonal brace, replaced.

LM horizontal brace, replaced.

HM horizontal brace, replaced.

New bolts and clamps.

No scour or undermining at the interface with the river bed.

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Structure Name:	Barmouth Viaduct (Timber)			Examination Date:	18/04/2023
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Route:	Dovey Jct to Pwllheli	Group:	BV	Exam ID:	15614452

CONDITION: (Cont.)

Trestle 57

Trestle 57 in fair overall condition.

Pile 1 – Fair condition with a new concrete encasement to lower 2.1m from bed level. A new pile has also been installed.

Pile 2 – Fair condition with a new concrete encasement to lower 2m from bed level. Pile in fair condition with splits.

Pile 3 – Fair condition with concrete encasement to lower 2m from bed level. The concrete encasement is in fair overall condition with areas of repair. Pile in fair condition with splits 1mm to 2mm.

Pile 4 – Fair condition with a new concrete encasement to lower 2m from bed level. The concrete encasement is in fair overall condition. Pile in fair condition with splits 1mm to 3mm.

UP Outrigger, fair condition.

DN Outrigger fair condition.

LM diagonal brace fair overall condition with deep splits to the downside end 1mm to 10mm.

HM diagonal brace, replaced.

LM horizontal brace, buried.

HM horizontal brace, buried.

New bolts and clamps.

No scour or undermining at the interface with the river bed.

Trestle 58

Trestle 58 in fair overall condition.

Pile 1 – Fair condition a concrete encasement to lower 2.6m from bed level with areas of repair. Pile in fair condition with splits.

Pile 2 – Fair condition a new concrete encasement to lower 2.6m from bed level. Pile in fair condition with splits.

Pile 3 – Fair condition a new concrete encasement to lower 2.6m from bed level. Pile in fair condition with splits 1mm to 3mm.

Pile 4 – Fair condition a concrete encasement to lower 2.6m from bed level with an area of repair. Pile in fair condition with splits 1mm to 3mm.

LM diagonal brace, replaced.

HM diagonal brace, replaced.

LM horizontal brace, replaced.

HM horizontal brace, replaced

New bolts and clamps.

No scour or undermining at the interface with the river bed.

Trestle 59

Trestle 59 in fair overall condition.

Pile 1 – Fair condition with concrete encasement to lower 1.4m from bed level. The concrete encasement is in fair overall condition.

Pile in fair condition with splits 1mm to 3mm to the downside low mileage, shake 2m long x 1mm to 5mm, 1m below the cross head.

Pile 2 – Fair condition with concrete encasement to lower 0.7m from bed level. The concrete encasement is in fair overall condition.

Pile in fair condition with splits.

Pile 3 – Fair condition with concrete encasement to lower 0.7m from bed level. The concrete encasement is in fair overall condition.

Pile in fair condition with splits.

Pile 4 – Fair condition with concrete encasement to lower 1.4m from bed level. The concrete encasement is in fair overall condition.

Pile in fair condition with splits.

LM diagonal brace fair overall condition.

HM diagonal brace fair overall condition.

LM horizontal brace, replaced.

HM horizontal brace, replaced.

New bolts and clamps.

No scour or undermining at the interface with the river bed.

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CONDITION: (Cont.)

Trestle 60

Trestle 60 in fair overall condition.

Pile 1 – Fair condition with concrete encasement to lower 0.8m from bed level. The concrete encasement is in fair overall condition. There is 100% barnacle cover. Rest of pile where seen has splits 1mm - 2mm wide.

Pile 2 – Fair condition with concrete encasement to lower 1.2m from bed level. The concrete encasement is in fair overall condition. There is 100% barnacle cover. Rest of pile where seen has splits 1mm - 2mm wide.

Pile 3 – Fair condition with concrete encasement to lower 1.3m from bed level. The concrete encasement is in fair overall condition. There is 100% barnacle cover. Rest of pile where seen has splits 1mm - 2mm wide.

Pile 4 – Fair condition with concrete encasement to lower 0.9m from bed level. The concrete encasement is in fair overall condition. There is 100% barnacle cover. Rest of pile where seen has splits 1mm - 2mm wide.

LM diagonal brace fair overall condition.

HM diagonal brace, replaced.

LM horizontal brace, replaced, mostly buried.

HM horizontal brace, replaced, mostly buried.

New bolts and clamps.

No scour or undermining at the interface with the river bed.

Trestle 61

Trestle 61 in fair overall condition.

Pile 1 – Fair condition with concrete encasement to lower 1.4m from bed level. The concrete encasement is in fair overall condition. There is 100% barnacle cover. Rest of pile where seen has splits 1mm - 2mm wide.

Pile 2 – Fair condition with concrete encasement to lower 0.7m from bed level. The concrete encasement is in fair overall condition. There is 100% barnacle cover. Rest of pile where seen has splits 1mm - 2mm wide.

Pile 3 – Fair condition with concrete encasement to lower 1.2m from bed level. The concrete encasement is in fair overall condition. There is 100% barnacle cover. Has decay to lower section 0.6m from case 0.3m² x 50mm deep with splits.

Pile 4 – Fair condition with concrete encasement to lower 1.2m from bed level. The concrete encasement is in fair overall condition. There is 100% barnacle cover. Rest of pile where seen has splits 1mm - 2mm wide.

LM diagonal brace, replaced.

HM diagonal brace, replaced.

LM horizontal brace, replaced.

HM horizontal brace, replaced.

New bolts and clamps.

No scour or undermining at the interface with the river bed.

Trestle 62

Trestle 62 in fair overall condition.

Pile 1 – Fair condition with concrete encasement to lower 0.7m from bed level. The concrete encasement is in fair overall condition. There is 100% barnacle cover. Pile in fair condition.

Pile 2 – Fair condition with concrete encasement to lower 1.6m from bed level. The concrete encasement is in fair overall condition. There is 100% barnacle cover also first 0.5m above encasement is thinning by 20mm to all faces.

Pile 3 – Fair condition with a new concrete encasement to lower 1.6m from bed level. Pile in fair condition.

Pile 4 – Fair condition with concrete encasement to lower 1.45m from bed level. The concrete encasement is in fair overall condition. There is 100% barnacle cover. Pile in fair condition with splits.

DN Outrigger fair overall condition fully encased with 100% barnacle cover.

UP Outrigger fair overall condition fully encased with 100% barnacle cover.

LM diagonal brace fair overall condition.

HM diagonal brace, replaced.

LM horizontal brace fair overall condition.

HM horizontal brace, replaced.

New bolts and clamps.

No scour or undermining at the interface with the river bed.

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Structure Name:	Barmouth Viaduct (Timber)			Examination Date:	18/04/2023
Area:	Dyfi	OS Ref:	SH 6244 1487	No of Spans:	113
Route:	Dovey Jct to Pwllheli	Group:	BV	Exam ID:	15614452

CONDITION: (Cont.)

Trestle 63

Trestle 63 in fair overall condition.

Pile 1 – Fair condition with concrete encasement to lower 1.5m from bed level. The concrete encasement is in fair overall condition. There is 100% barnacle cover. Rest of pile where seen has splits 1mm - 3mm wide.

Pile 2 – Fair condition with a new concrete encasement to lower 1.5m from bed level. Pile in fair condition.

Pile 3 – Fair condition with concrete encasement to lower 2m from bed level. The concrete encasement is in fair overall condition.

There is 100% barnacle cover. Rest of pile where seen has splits 1mm - 3mm wide.

Pile 4 – Fair condition with concrete encasement to lower 1.3m from bed level. The concrete encasement is in fair overall condition.

There is 100% barnacle cover. Rest of pile where seen has splits 1mm - 3mm wide.

LM diagonal brace fair overall condition with some splits 1mm - 3mm wide.

HM diagonal brace fair overall condition with some splits 1mm - 3mm wide.

LM horizontal brace fair overall condition.

HM horizontal brace fair overall condition.

New bolts and clamps.

No scour or undermining at the interface with the river bed.

Trestle 64

Trestle 64 in fair overall condition.

Pile 1 – Fair condition with concrete encasement to lower 1.2m from bed level. The concrete encasement is in fair overall condition. There is 100% barnacle cover. Rest of pile where seen has splits 1mm - 3mm wide. Thinning from top of case for 0.5m by 10mm - 15mm.

Pile 2 – Fair condition with concrete encasement to lower 1.2m from bed level. The concrete encasement is in fair overall condition. There is 100% barnacle cover. Rest of pile where seen has splits 1mm - 3mm wide.

Pile 3 – Fair condition with concrete encasement to lower 1.2m from bed level. The concrete encasement is in fair overall condition.

There is 100% barnacle cover. Rest of pile where seen has splits 1mm - 3mm wide. Thinning from top of case for 0.5m x 10mm - 15mm.

Pile 4 – Fair condition with concrete encasement to lower 1.2m from bed level. The concrete encasement is in fair overall condition.

There is 100% barnacle cover. Rest of pile where seen has splits 1mm - 3mm wide. There is thinning to the first 0.6m from the

casement 20mm deep.

LM diagonal brace fair overall condition.

HM diagonal brace fair overall condition.

LM horizontal brace, replaced.

HM horizontal brace, replaced.

New bolts and clamps.

No scour or undermining at the interface with the river bed.

Trestle 65

Trestle 65 in fair overall condition.

Pile 1 – Fair condition with concrete encasement to lower 1.5m from bed level. The concrete encasement is in fair overall condition. There is 100% barnacle cover. Thinning to lower section 0.5m above case x 10mm - 15mm. Rest of pile where seen has splits 1mm - 3mm wide.

Pile 2 – Fair condition with concrete encasement to lower 1.5m from bed level. The concrete encasement is in fair overall condition. There is 100% barnacle cover. Thinning to lower section 0.5m above case x 10mm - 15mm. Rest of pile where seen has splits 1mm - 3mm wide.

Pile 3 – Fair condition with a new concrete encasement to lower 1.5m from bed level. Pile in fair condition.

Pile 4 – Fair condition with concrete encasement to lower 1.5m from bed level. The concrete encasement is in fair overall condition.

There is 100% barnacle cover. Rest of pile where seen has splits 1mm - 3mm wide.

HM diagonal brace fair overall condition.

LM diagonal brace fair overall condition with some splits 1mm - 2mm wide.

LM horizontal brace fair overall condition.

HM horizontal brace fair overall condition.

New bolts and clamps.

No scour or undermining at the interface with the river bed.

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Structure Name:	Barmouth Viaduct (Timber)			Examination Date:	18/04/2023
Area:	Dyfi	OS Ref:	SH 6244 1487	No of Spans:	113
Route:	Dovey Jct to Pwllheli	Group:	BV	Exam ID:	15614452

CONDITION: (Cont.)

Trestle 66

Trestle 66 in fair overall condition.

Pile 1 – Fair condition with concrete encasement to lower 1.3m from bed level. The encasement is in fair overall condition. There is 100% barnacle cover. Rest of pile where seen has splits 1mm - 2mm wide.

Pile 2 – Fair condition with concrete encasement to lower 1.3m from bed level. The encasement is in fair overall condition. There is 100% barnacle cover. Rest of pile where seen has splits 1mm - 2mm wide.

Pile 3 – Fair condition with concrete encasement to lower 1.3m from bed level. The encasement is in fair overall condition. There is 100% barnacle cover. Rest of pile where seen has splits 1mm - 2mm wide.

Pile 4 – Fair condition with concrete encasement to lower 1.3m from bed level. The concrete encasement is in fair overall condition. There is 100% barnacle cover. Rest of pile where seen has splits 1mm - 2mm wide. First 0.5m above encasement there is thinning to all faces by 10mm.

LM diagonal brace fair overall condition with some splits 1mm - 2mm wide.

HM diagonal brace fair overall condition with some splits 1mm - 5mm wide. [WAS 1mm – 2mm]

LM horizontal brace, replaced.

HM horizontal brace, replaced.

New bolts and clamps.

No scour or undermining at the interface with the river bed.

Trestle 67

Trestle 67 in fair overall condition.

Pile 1 – Fair condition with a new concrete encasement to lower 1.3m from bed level. A new pile has also been installed.

Pile 2 – Fair condition with concrete encasement to lower 1.3m from bed level. The encasement is in fair overall condition. There is 100% barnacle cover. Rest of pile where seen has splits 1mm - 3mm wide.

Pile 3 – Fair condition with concrete encasement to lower 1.3m from bed level. The encasement is in fair overall condition. There is 100% barnacle cover. Rest of pile where seen has splits 1mm - 3mm wide. First 0.5m above encasement there is thinning to all faces by 10mm.

Pile 4 – Fair condition with concrete encasement to lower 0.9m from bed level. The concrete encasement is in fair overall condition.

There is 100% barnacle cover. Rest of pile were seen has splits 1mm - 3mm wide. First 0.5m above encasement there is thinning to all faces by 10mm.

DN Outrigger fair condition overall, fully encased.

UP Outrigger fair condition overall, fully encased.

LM diagonal brace, replaced.

HM diagonal brace, replaced.

LM horizontal brace fair overall condition with some weathering.

HM horizontal brace fair overall condition with some weathering.

New bolts and clamps.

No scour or undermining at the interface with the river bed.

Trestle 68

Trestle 68 in fair overall condition.

Pile 1 – Fair condition with concrete encasement to lower 1.3m from bed level. The concrete encasement is in fair overall condition.

There is 100% barnacle cover. Rest of pile were seen has splits 1mm - 2mm wide. First 0.5m above encasement there is thinning to all faces by 10mm.

Pile 2 – Fair condition with concrete encasement to lower 1.3m from bed level. The concrete encasement is in fair overall condition.

There is 100% barnacle cover. Rest of pile where seen has splits 1mm - 2mm wide.

Pile 3 – Fair condition with a new concrete encasement to lower 1.3m from bed level. Rest of pile where seen has splits 1mm - 2mm wide.

Pile 4 – Fair condition with a new concrete encasement to lower 1.3m from bed level. A new pile installed.

LM diagonal brace fair overall condition with some splits 1mm - 3mm wide.

HM diagonal brace, replaced.

LM horizontal brace fair overall condition.

HM horizontal brace fair overall condition.

New bolts and clamps.

No scour or undermining at the interface with the river bed.

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Structure Name:	Barmouth Viaduct (Timber)			Examination Date:	18/04/2023
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Route:	Dovey Jct to Pwllheli	Group:	BV	Exam ID:	15614452

CONDITION: (Cont.)

Trestle 69

Trestle 69 in fair overall condition.

Pile 1 – Fair condition with concrete encasement to lower 1.4m from bed level. The concrete encasement is in fair overall condition. There is 100% barnacle cover. Rest of pile where seen has splits 1mm - 3mm wide.

Pile 2 – Fair condition with concrete encasement to lower 1.4m from bed level. The concrete encasement is in fair overall condition. There is 100% barnacle cover. Rest of pile where seen has splits 1mm - 3mm wide. Thinning to the 0.6m above the casement 10mm – 20mm to all faces.

Pile 3 – Fair condition with concrete encasement to lower 1.4m from bed level. The concrete encasement is in fair overall condition. There is 100% barnacle cover. Rest of pile where seen has splits 1mm - 3mm wide.

Pile 4 – Fair condition with concrete encasement to lower 1.4m from bed level. The concrete encasement is in fair overall condition. There is 100% barnacle cover. Rest of pile where seen has splits 1mm - 3mm wide.

LM diagonal brace, replaced.

HM diagonal brace fair overall condition with some splits 1mm - 2mm wide.

LM horizontal brace fair overall condition with some weathering with splits 1mm – 3mm.

HM horizontal brace fair overall condition with some weathering with splits 1mm – 3mm.

New bolts and clamps.

No scour or undermining at the interface with the river bed.

Trestle 70

Trestle 70 in fair overall condition with the following defects noted.

Pile 1 – Fair condition with concrete encasement to lower 1.5m from bed level. The concrete encasement is in fair overall condition. There is 100% barnacle cover from top of encasement for 0.6m. Pile is thinner by 15mm all round. Rest of pile where seen has splits 1mm - 4mm wide.

Pile 2 – Fair condition with concrete encasement to lower 1.5m from bed level. There is 100% barnacle cover from top of encasement for 0.6m. Pile is thinner by 15mm all round. Rest of pile where seen has splits 1mm - 4mm wide.

Pile 3 – Fair condition with concrete encasement to lower 1.5m from bed level. There is 100% barnacle cover. Rest of pile where seen has splits 1mm - 4mm wide.

Pile 4 – Fair condition with concrete encasement to lower 1.5m from bed level. There is 100% barnacle cover. Rest of pile where seen has splits 1mm - 4mm wide. The first 1m above the casement there is thinning 10mm – 20mm.

LM diagonal brace, replaced.

HM diagonal brace, replaced.

LM horizontal brace, fair overall condition.

HM horizontal brace, fair overall condition.

New bolts and clamps.

No scour or undermining at the interface with the river bed.

Trestle 71

Missing number plate.

Trestle 71 in fair overall condition with the following defects noted.

Pile 1 – Fair condition with a new concrete encasement to lower 1.5m from bed level. A new pile also been installed. (Photo 50)

Pile 2 – Fair condition with concrete encasement to lower 1.5m from bed level. The encasement is in fair overall condition with 100% barnacle cover. From top of encasement 0.6m long area of thinning by 20mm to all faces. Rest of pile where seen has splits 1mm - 3mm wide. A new packer has been installed.

Pile 3 – Fair condition with a new concrete encasement to lower 1.5m from bed level. A new pile also been installed.

Pile 4 – Fair condition with concrete encasement to lower 1.5m from bed level. The encasement is in fair overall condition with 100% barnacle cover). 0.6m length of pile above encasement is thinning by 15mm. Rest of pile where seen has splits 1mm - 3mm wide.

LM diagonal brace, replaced.

HM diagonal brace, replaced.

LM horizontal brace, fair overall condition.

HM horizontal brace, fair overall condition.

New bolts and clamps.

No scour or undermining at the interface with the river bed.

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Structure Name:	Barmouth Viaduct (Timber)			Examination Date:	18/04/2023
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CONDITION: (Cont.)

Trestle 72

Trestle 72 in fair overall condition with the following defects noted.

Pile 1 – Fair condition with a new concrete encasement to lower 1.5m from bed level. A new pile also been installed.

Pile 2 – Fair condition with concrete encasement to lower 1.5m from bed level. There is 100% barnacle cover. Rest of pile where seen has splits 1mm - 3mm wide.

Pile 3 – Fair condition with concrete encasement to lower 1.5m from bed level. There is 100% barnacle cover. 0.5m from top of encasement there is thinning to all face 20mm deep. Rest of pile where seen has splits 1mm - 3mm wide.

Pile 4 – Fair condition with concrete encasement to lower 1.5m from bed level. There is 100% barnacle cover. Rest of pile where seen has splits 1mm - 3mm wide.

DN Outrigger encased. All good with 100% barnacle cover.

UP Outrigger encased. All good with 100% barnacle cover.

LM diagonal brace fair overall condition,

HM diagonal brace, replaced.

LM horizontal brace, fair overall condition, with some minor splits 1mm - 3mm wide.

HM horizontal brace, fair overall condition, with some minor splits 1mm - 3mm wide.

New bolts and clamps.

No scour or undermining at the interface with the river bed.

Trestle 73

Trestle 73 in fair overall condition with the following defects noted.

Pile 1 – Fair condition with an encasement to lower 1.5m. There is 100% barnacle cover. Rest of pile where seen has splits 1mm - 3mm wide. Have thinning by 15mm for 0.5m starting above encasement to all face.

Pile 2 – Fair condition with a new concrete encasement to lower 1.5m from bed level. A new pile also been installed.

Pile 3 – Fair condition with concrete encasement to lower 1.5m from bed level. There is 100% barnacle cover. Rest of pile where seen has splits 1mm - 3mm wide.

Pile 4 – Fair condition with concrete encasement to lower 1.5m from bed level. There is 100% barnacle cover. Rest of pile where seen has splits 1mm - 3mm wide.

LM diagonal brace fair overall condition, with some splits 1mm - 5mm wide. New packer installed. (Photo 51)

HM diagonal brace fair, replaced.

LM horizontal brace, fair overall condition, with weathering 5mm - 10mm max.

HM horizontal brace, fair overall condition, with weathering 5mm - 10mm max.

New bolts and clamps.

No scour or undermining at the interface with the river bed.

Trestles 74 – 80 & 84

Scour pools around piles.

Trestle 74

Trestle 74 in fair overall condition.

Pile 1 – Fair condition. The pile has splits 1mm – 3mm plus thinning to lower 2m 10mm – 20mm plus 1m² of mussel cover.

Pile 2 – Fair condition. The pile has splits 1mm – 3mm plus thinning to lower 2m 10mm – 20mm plus 1m² of mussel cover.

Pile 3 – Fair condition. The pile has splits 1mm – 3mm plus thinning to lower 2m 10mm – 20mm plus 1m² of mussel cover.

Pile 4 – Fair condition. The pile has splits 1mm – 3mm plus thinning to lower 2m 10mm – 20mm plus 1m² of mussel cover.

LM diagonal brace, replaced.

HM diagonal brace, replaced.

LM horizontal brace, fair overall condition with splits 1mm – 3mm plus thinning to corners 10mm.

HM horizontal brace, fair overall condition with splits 1mm – 3mm plus thinning to corners 10mm.

New bolts and clamps.

Scour pockets, not considered progressive.

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CONDITION: (Cont.)

Trestle 75

Trestle 75 in fair overall condition.

Pile 1 – Fair condition. The pile has splits 1mm – 3mm plus thinning to lower 2m, 10mm – 20mm.

Pile 2 – Fair condition. The pile has splits 1mm – 3mm plus thinning to lower 2m, 10mm – 20mm.

Pile 3 – Fair condition. The pile has splits 1mm – 3mm plus thinning to lower 2m, 10mm – 20mm.

Pile 4 – Fair condition. The pile has splits 1mm – 3mm plus thinning to lower 2m, 10mm – 20mm.

LM diagonal brace, replaced.

HM diagonal brace, replaced.

LM horizontal brace, fair overall condition, with splits 1mm – 3mm plus weathering.

HM horizontal brace, fair overall condition, with splits 1mm – 3mm plus weathering.

New bolts and clamps.

Scour pockets, not considered progressive.

Trestle 76

Trestle 76 in fair overall condition.

Pile 1 – Fair condition.

Pile 2 – Fair condition.

Pile 3 – Fair condition.

Pile 4 – Fair condition.

LM diagonal brace, replaced.

HM diagonal brace, replaced.

LM horizontal brace, fair overall condition.

HM horizontal brace, fair overall condition.

New bolts and clamps.

Scour pockets, not considered progressive.

Trestle 77

Trestle 77 in fair overall condition

Pile 1 – Fair condition.

Pile 2 – Fair condition with a 3m long split 10mm wide to high mileage face starting below cross head.

Pile 3 – Fair condition.

Pile 4 – Fair condition.

UP Outrigger in overall fair condition.

DN Outrigger, to the downside face, area of decay 1m long x 50mm wide x 200mm deep starts top of rigger.

LM diagonal brace, replaced.

HM diagonal brace, replaced.

LM horizontal brace, fair overall condition.

HM horizontal brace, fair overall condition.

New bolts and clamps.

Scour pockets, not considered progressive.

Trestle 78

Trestle 78 in fair overall condition

Pile 1 – Fair condition.

Pile 2 – Fair condition.

Pile 3 – Fair condition.

Pile 4 – Fair condition with a splice and clamps, all in overall fair condition.

LM diagonal brace, replaced.

HM diagonal brace, replaced.

LM horizontal brace, fair overall condition.

HM horizontal brace, fair overall condition.

New bolts and clamps.

Scour pockets, not considered progressive.

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CONDITION: (Cont.)

Trestle 79

Trestle 79 in fair overall condition

Pile 1 – Fair condition with concrete encasement to lower 0.6m from bed level. The concrete encasement is in fair overall condition.

Pile 2 – Fair condition.

Pile 3 – Fair condition.

Pile 4 – Fair condition.

LM diagonal brace, replaced.

HM diagonal brace, replaced.

LM horizontal brace, fair overall condition.

HM horizontal brace, fair overall condition.

New bolts and clamps.

Scour pockets, not considered progressive.

Trestle 80

Trestle 80 in fair overall condition

Pile 1 – Fair condition with a new concrete encasement below the horizontal brace.

Pile 2 – Fair condition.

Pile 3 – Fair condition.

Pile 4 – Fair condition.

LM diagonal brace fair overall condition.

HM diagonal brace, replaced.

LM horizontal brace, fair overall condition.

HM horizontal brace, fair overall condition.

New bolts and clamps.

Scour pockets, not considered progressive.

Trestle 81

Trestle 81 in fair overall condition

Pile 1 – Fair condition.

Pile 2 – Fair condition with 4m long split 5mm wide to high mileage face.

Pile 3 – Fair condition.

Pile 4 – Fair condition.

LM diagonal brace, replaced.

HM diagonal brace, replaced.

LM horizontal brace, fair overall condition.

HM horizontal brace, fair overall condition.

New bolts and clamps.

No scour or undermining at the interface with the river bed.

Trestle 82

Trestle 82 in fair overall condition

Pile 1 – Fair condition.

Pile 2 – Fair condition.

Pile 3 – Fair condition.

Pile 4 – Fair condition.

DN Outrigger in overall fair condition. Broken between horizontal and diagonal down end. (Photo 53)

UP Outrigger in overall fair condition with a 1.2m long split 40mm wide 80mm deep to up face brace. (Photo 54)

LM diagonal brace fair overall condition.

HM diagonal brace, replaced.

LM horizontal brace, fair overall condition.

HM horizontal brace, fair overall condition.

New bolts and clamps.

No scour or undermining at the interface with the river bed.

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Structure Name:	Barmouth Viaduct (Timber)			Examination Date:	18/04/2023
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CONDITION: (Cont.)

Trestle 83

Trestle 83 in fair overall condition

Pile 1 – Fair condition with a new concrete encasement below the horizontal brace and new a pile.

Pile 2 – Fair condition.

Pile 3 – Fair condition.

Pile 4 – Fair condition.

LM diagonal brace, replaced.

HM diagonal brace, replaced.

LM horizontal brace, fair overall condition.

HM horizontal brace, fair overall condition.

All bolts and clamps have surface corrosion 1mm - 3mm deep. Decay to cross head. New bolt to diagonal Pile 4

No scour or undermining at the interface with the river bed.

Trestle 84

Trestle 84 in fair overall condition

Pile 1 – Fair condition.

Pile 2 – Fair condition, with a new concrete encasement to the lower 1m above bed level. A new pile has been installed.

Pile 3 – Fair condition.

Pile 4 – Fair condition.

LM diagonal brace, fair overall condition.

HM diagonal brace, fair overall condition.

LM horizontal brace, fair overall condition.

HM horizontal brace, fair overall condition.

All bolts and clamps have surface corrosion 1mm - 3mm deep.

Scour pockets, not considered progressive.

Trestle 85

Trestle 85 in fair overall condition

Pile 1 – Fair condition.

Pile 2 – Fair condition, with a new concrete encasement to the lower 1m above bed level. A new pile has been installed.

Pile 3 – Fair condition, 2m long split 10mm wide 3m above bed level to low mileage face.

Pile 4 in overall fair condition.

LM diagonal brace, fair overall condition with new bolts.

HM diagonal brace, replaced.

LM horizontal brace, fair overall condition.

HM horizontal brace, fair overall condition.

New bolts and clamps.

No scour or undermining at the interface with the river bed.

Trestle 86

Trestle 86 in fair overall condition

Pile 1 – Fair condition.

Pile 2 – Fair condition.

Pile 3 – Fair condition.

Pile 4 – New pile in a fair condition.

LM diagonal brace fair overall condition with some splits 3mm - 8mm wide to lower section..

HM diagonal brace fair overall condition.

LM horizontal brace, fair overall condition

HM horizontal brace, fair overall condition

New bolts to high mileage diagonal and both horizontal beams. The rest have surface corrosion 1mm - 3mm deep.

No scour or undermining at the interface with the river bed.

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CONDITION: (Cont.)

Trestles 87 - 100

Scour pools around piles.

Trestle 87

Trestle 87 in fair overall condition

Pile 1 – Fair condition with an area of decay 0.3m2 x 60mm deep 1.5m above bed level.

Pile 2 – Fair condition.

Pile 3 – Fair condition.

Pile 4 – Fair condition.

UP Outtrigger, replaced

DN Outtrigger, replaced

LM diagonal brace fair overall condition, replaced

HM diagonal brace fair overall condition.

LM horizontal brace, fair overall condition.

HM horizontal brace, fair overall condition.

Bolts and clamps have surface corrosion 1mm - 3mm deep.

Scour pockets, not considered progressive.

Trestle 88

Trestle 88 in fair overall condition

Pile 1 – Fair condition.

Pile 2 – Fair condition.

Pile 3 – Fair condition.

Pile 4 – Fair condition.

LM diagonal brace fair overall condition with some decay 1.5m long x 70mm wide x 100mm deep between piles 3 and 4 high mileage brace.

HM diagonal brace, replaced.

LM horizontal brace, fair overall condition.

HM horizontal brace, fair overall condition.

Clamps in overall fair condition. Bolts have surface corrosion 1mm - 3mm deep

Scour pockets, not considered progressive.

Trestle 89

Trestle 89 in fair overall condition.

Pile 1 – Fair condition with some splits.

Pile 2 – Fair condition with a new concrete encasement and new timber pile.

Pile 3 – Fair condition with some splits.

Pile 4 – Fair condition with some splits.

LM diagonal brace, replaced.

HM diagonal brace fair overall condition.

LM horizontal brace, fair overall condition.

HM horizontal brace, fair overall condition.

New clamps to cross head, bolts have surface corrosion 1mm - 3mm deep.

Scour pockets, not considered progressive.

Trestle 90

Trestle 90 in fair overall condition.

Pile 1 – Fair condition.

Pile 2 – Fair condition, new concrete encasement and new timber pile.

Pile 3 – Fair condition.

Pile 4 – Fair condition

LM diagonal brace fair overall condition with some splits.

HM diagonal brace, replaced.

LM horizontal brace, fair overall condition.

HM horizontal brace, fair overall condition.

New clamps to cross head, bolts have surface corrosion 1mm - 3mm deep.

Scour pockets, not considered progressive.

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CONDITION: (Cont.)

Trestle 91

Trestle 91 in fair overall condition.

Pile 1 – Fair condition.

Pile 2 – Fair condition, with splits 1mm – 3mm and thinning of 10mm – 20mm.

Pile 3 – Fair condition, with splits 1mm – 3mm and thinning of 10mm – 20mm.

Pile 4 – Fair condition, with splits 1mm – 3mm and thinning of 10mm – 20mm.

LM diagonal brace fair overall condition with splits 1mm – 3mm.

HM diagonal brace, repalced with split to the upside end 1m long x 2mm wide.

LM horizontal brace, fair overall condition, with splits 1mm – 3mm & thining 10mm – 20mm.

HM horizontal brace, fair overall condition.

New bolts and clamps.

Scour pockets, not considered progressive.

Trestle 92

Trestle 92 in fair overall condition.

Pile 1 – Fair condition, with splits 1mm – 3mm and thinning throughout 10mm.

Pile 2 – Fair condition, with splits 1mm – 3mm and thinning throughout 10mm.

Pile 3 – Fair condition, with splits 1mm – 3mm and thinning throughout 10mm.

Pile 4 – Fair condition, with splits 1mm – 3mm and thinning throughout 10mm.

DN Outrigger in overall fair condition, with splits 1mm – 3mm and thinning throughout 10mm.

UP Outrigger in overall fair condition, with splits 1mm – 3mm and thinning throughout 10mm.

LM diagonal brace, replaced.

HM diagonal brace, replaced.

LM horizontal brace, fair overall condition, with splits 1mm – 3mm and thinning throughout 10mm – 30mm.

HM horizontal brace, fair overall condition, with splits 1mm – 3mm and thinning throughout 10mm – 30mm.

New bolts and clamps.

Scour pockets, not considered progressive.

Trestle 93

Trestle 93 in fair overall condition.

Pile 1 – Fair condition, with splits 1mm – 3mm and thinning throughout 5mm – 10mm.

Pile 2 – Fair condition, with splits 1mm – 3mm and thinning throughout 5mm – 10mm.

Pile 3 – Fair condition with a new concrete encasement to bottom 1.2m above bed level. A new timber pile has been installed. (Photo 42)

Pile 4 – Fair condition, with splits 1mm – 3mm and thinning throughout 5mm – 10mm.

LM diagonal brace, replaced.

HM diagonal brace, replaced.

LM horizontal brace, fair overall condition, with splits 1mm – 3mm and thinning throughout.

HM horizontal brace, fair overall condition, with splits 1mm – 3mm and thinning throughout.

New bolts and clamps.

Scour pockets, not considered progressive.

Trestle 94

Trestle 94 in fair overall condition.

Pile 1 – Fair condition, with splits 1mm – 3mm.

Pile 2 – Fair condition, with splits 1mm – 3mm.

Pile 3 – Fair condition, with splits 1mm – 3mm.

Pile 4 – Fair condition, with splits 1mm – 3mm.

LM diagonal brace, replaced.

HM diagonal brace, replaced.

M horizontal brace, fair overall condition, with splits 1mm – 3mm and weathering.

HM horizontal brace, fair overall condition, with splits 1mm – 3mm. and weathering.

New bolts and clamps.

Scour pockets, not considered progressive.

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CONDITION: (Cont.)

Trestle 95

Trestle 95 in fair overall condition.

Pile 1 – Fair condition, with splits 1mm – 3mm and thinning to lower 3m by 5mm – 10mm.

Pile 2 – Fair condition with a new concrete encasement below the horizontal brace and a new pile.

Pile 3 – Fair condition, with splits 1mm – 3mm and thinning to lower 3m by 5mm – 10mm - 15mm.

Pile 4 – Fair condition, with splits 1mm – 3mm and thinning to lower 3m by 2mm – 10mm

LM diagonal brace, replaced.

HM diagonal brace, replaced.

LM horizontal brace, fair overall condition, with splits 1mm – 3mm and thinning by 5mm – 10mm

HM horizontal brace, fair overall condition, with splits 1mm – 3mm and thinning by 5mm – 10mm

New bolts and clamps.

Scour pockets, not considered progressive.

Trestle 96

Trestle 96 in fair overall condition.

Pile 1 – Fair condition with splits 1mm - 3mm wide, thinning to lower 2m by 10mm.

Pile 2 – Fair condition with splits 1mm - 3mm wide, thinning to lower 2m by 10mm.

Pile 3 – Fair condition with splits 1mm - 3mm wide, thinning to lower 2m by 10mm.

Pile 4 – Fair condition with splits 1mm - 3mm wide, thinning to lower 2m by 10mm.

LM diagonal brace fair overall condition with splits to low level 1mm - 6mm wide.

HM diagonal brace, replaced.

LM horizontal brace, fair overall condition, splits 1mm – 3mm and weathering.

HM horizontal brace, fair overall condition, splits 1mm – 3mm and weathering.

New bolts and clamps.

Scour pockets, not considered progressive.

Trestle 97

Trestle 97 in fair overall condition.

Pile 1 – Fair condition with splits 1mm - 3mm wide, with thinning to lower 2m by 10mm.

Pile 2 – Fair condition with splits 1mm - 3mm wide, with thinning to lower 2m by 10mm.

Pile 3 – Fair condition with splits 1mm - 3mm wide, with thinning to lower 2m by 10mm.

Pile 4 – Fair condition with splits 1mm - 3mm wide, with thinning to lower 2m by 10mm.

DN Outrigger in fair condition with 5mm of thinning and splits.

US Outrigger in fair condition with 5mm of thinning and splits.

LM diagonal brace, replaced.

HM diagonal brace, replaced.

LM horizontal brace, replaced.

HM horizontal brace, replaced.

New bolts and clamps.

Trestle 98

Trestle 98 in fair overall condition.

Pile 1 – Fair condition with splits 1mm - 4mm wide. Lower 2.5m section is thinning by 10mm. (Photo 41)

Pile 2 – Fair condition with splits 1mm - 4mm wide. Lower 2.5m section is thinning by 10mm.

Pile 3 – Fair condition with splits 1mm - 4mm wide. Lower 2.5m section is thinning by 10mm.

Pile 4 – Fair condition with splits 1mm - 4mm wide. Lower 2.5m section is thinning by 10mm.

LM diagonal brace, replaced.

HM diagonal brace, replaced.

LM horizontal brace, fair overall condition, with weathering.

HM horizontal brace, fair overall condition, with weathering.

New bolts and clamps.

Scour pockets, not considered progressive.

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CONDITION: (Cont.)

Trestle 99

Trestle 99 in fair overall condition.

Pile 1 – Fair condition with splits 1mm - 4mm wide. Lower 2.5m section is thinning by 10mm.

Pile 2 – Fair condition with splits 1mm - 4mm wide. Lower 2.5m section is thinning by 10mm.

Pile 3 – Fair condition with splits 1mm - 4mm wide. Lower 2.5m section is thinning by 10mm.

Pile 4 – Fair condition with splits 1mm - 4mm wide. Lower 2.5m section is thinning by 10mm.

LM diagonal brace, replaced.

HM diagonal brace, replaced.

LM horizontal brace, fair overall condition, with some splits and thinning by 10mm.

HM horizontal brace, fair overall condition, with some splits and thinning by 10mm.

New bolts and clamps.

Scour pockets, not considered progressive.

Trestle 100

Trestle 100 in fair overall condition with the following defects noted.

Pile 1 – Fair condition. The piles have splits 1mm - 3mm wide and shakes, lower 2m thinning x 10mm.

Pile 2 – Fair condition. The piles have splits 1mm - 3mm wide and shakes, lower 2m thinning x 10mm.

Pile 3 – Fair condition. The piles have splits 1mm - 3mm wide and shakes, lower 2m thinning x 10mm.

Pile 4 – Fair condition. The piles have splits 1mm - 3mm wide and shakes. Has a 0.3m² x 40mm deep area of decay to low mileage face plus thinning to lower 2m x 10mm

LM diagonal brace, replaced.

HM diagonal brace, replaced.

LM horizontal brace, fair overall condition, with some splits.

HM horizontal brace, fair overall condition, with some splits.

New bolts and clamps.

Scour pockets, not considered progressive.

Trestle 101

Trestle 101 in fair overall condition with the following defects noted.

Pile 1 – Fair condition with some splits 1mm - 3mm wide. Lower 2.5m sections are thinning by 10mm.

Pile 2 – Fair condition with some splits 1mm - 3mm wide. Lower 2.5m sections are thinning by 10mm.

Pile 3 – Fair condition with some splits 1mm - 3mm wide. Lower 2.5m sections are thinning by 10mm.

Pile 4 – Fair condition with some splits 1mm - 3mm wide. Lower 2.5m sections are thinning by 10mm.

LM diagonal brace fair overall condition, with some splits 1mm - 3mm wide, lower section has deep splits 10mm wide.

HM diagonal brace fair overall condition, with some splits 1mm - 3mm wide, lower section has deep splits 10mm wide.

LM horizontal brace, fair overall condition, with some thinning by 5mm.

HM horizontal brace, fair overall condition, with some thinning by 5mm.

New bolts and clamps.

Muscle and barnacle cover to lower 2.5m sections.

No scour or undermining at the interface with the river bed.

Trestle 102

Trestle 102 in fair overall condition with the following defects noted.

Pile 1 – Fair condition with a new concrete encasement and new pile. (Photo 39)

Pile 2 – Fair condition with a new concrete encasement and new pile. (Photo 39)

Pile 3 – Fair condition. The piles have splits 1mm - 3mm wide and shakes. Lower 2.5m section is thinning by 10mm.

Pile 4 – Fair condition. The piles have splits 1mm - 3mm wide and shakes. Lower 2.5m section is thinning by 10mm.

DN Outrigger in fair condition overall with some minor weathering.

UP Outrigger in fair condition overall with some minor weathering.

LM diagonal brace, replaced.

HM diagonal brace, replaced.

LM horizontal brace, fair overall condition, with some splits.

HM horizontal brace, fair overall condition, with some splits.

New bolt and clamps.

No scour or undermining at the interface with the river bed.

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CONDITION: (Cont.)

Trestle 103

Trestle 103 in fair overall condition with the following defects noted.

Pile 1 – Fair condition. The piles have splits 1mm - 3mm wide. Lower 2.5m section is thinning by 10mm. The tenant joint below the horizontal brace has 3 clamps with 1mm – 5mm of corrosion plus a 10mm gap at the joint.

Pile 2 – Fair condition with a new concrete encasement and pile.

Pile 3 – Fair condition. The pile has splits 1mm - 3mm wide. Lower 2.5m section is thinning by 10mm.

Pile 4 – Fair condition. The pile has splits and shakes 1mm - 3mm wide. Lower 2.5m section is thinning by 10mm.

LM diagonal brace, replaced.

HM diagonal brace, replaced.

LM horizontal brace, fair overall condition, with some weathering.

HM horizontal brace, replaced.

New bolts and clamps, except at tenant joint.

No scour or undermining at the interface with the river bed.

Trestle 104

Trestle 104 in fair overall condition with the following defects noted.

Pile 1 – Fair condition. The pile has splits and shakes 1mm - 3mm wide. Lower 2.5m section is thinning by 10mm.

Pile 2 – Fair condition. The pile has splits and shakes 1mm - 3mm wide. Lower 2.5m section is thinning by 10mm.

Pile 3 – Fair condition. The pile has splits and shakes 1mm - 3mm wide. Lower 2.5m section is thinning by 10mm.

Pile 4 – Fair condition. The pile has splits and shakes 1mm - 3mm wide. Lower 2.5m section is thinning by 10mm.

LM diagonal brace fair overall condition, with some splits and shakes. Low mileage beam has thinning to down end 10mm.

HM diagonal brace fair overall condition, with some splits and shakes.

LM horizontal brace, replaced.

HM horizontal brace, fair overall condition, with some weatherings.

New bolts and clamps.

No scour or undermining at the interface with the river bed.

Trestle 105

Trestle 105 in fair overall condition with the following defects noted.

Pile 1 – Fair condition. Some splits and shakes 1mm - 3mm wide. Lower 2.5m section is thinning by 5mm - 10mm. 1.2m long split to down high mileage corner.

Pile 2 – Fair condition with a new concrete encasement below the horizontal brace with a new timber pile.

Pile 3 – Fair condition. Some splits and shakes 1mm - 3mm wide. Lower 2.5m section is thinning by 5mm - 10mm.

Pile 4 – Fair condition. Some splits and shakes 1mm - 3mm wide. Lower 2.5m section is thinning by 5mm - 10mm.

LM diagonal brace, replaced.

HM diagonal brace fair overall condition, with some splits.

LM horizontal brace, fair overall condition, with some splits

HM horizontal brace, fair overall condition, with some splits. Plus 2m long x 100mm x 60mm deep are of decay between piles 1 and 2.

New bolts and clamps.

No scour or undermining at the interface with the river bed.

Trestle 106

Trestle 106 in fair overall condition with the following defects noted.

Pile 1 – Fair condition. Some splits and shakes 1mm - 3mm wide.

Pile 2 – Fair condition. Some splits and shakes 1mm - 3mm wide. 2 areas of decay to low mileage face, 600mm x 100mm x 50mm deep 1.2m above bed level and 1200mm x 200mm 30mm deep 2.6m above bed level.

Pile 3 – Fair condition. Some splits and shakes 1mm - 3mm wide.

Pile 4 – Fair condition. Some splits and shakes 1mm - 3mm wide.

LM diagonal brace, replaced.

HM diagonal brace, replaced.

LM horizontal brace, fair overall condition, covered with muscles.

HM horizontal brace, fair overall condition, covered with muscles.

New bolts and clamps.

No scour or undermining at the interface with the river bed.

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CONDITION: (Cont.)

Trestle 107

Trestle 107 in fair overall condition with the following defects noted.

Pile 1 – Fair condition. Some splits and shakes 1mm - 3mm wide. Lower 2.5m has wear 5mm - 10mm deep.

Pile 2 – Fair condition, a new concrete encasement below the horizontal brace and a new timber pile.

Pile 3 – Fair condition. Some splits and shakes 1mm - 3mm wide. Lower 2.5m has wear 10mm deep.

Pile 4 – Fair condition. Some splits and shakes 1mm - 3mm wide. Lower 2.5m has wear 10mm deep.

DN Outrigger in fair condition overall with some weathering.

UP Outrigger fair condition overall with some weathering.

LM diagonal brace, replaced.

HM diagonal brace fair overall condition, with some splits. with thinning to lower 3m section by 10mm and a 3m long split 10mm wide

LM horizontal brace, fair overall condition, with weathering and thinning by 10mm throughout.

HM horizontal brace, fair overall condition, with weathering and thinning by 10mm throughout.

New bolts and clamps.

No scour or undermining at the interface with the river bed.

Trestle 108

Trestle 108 in fair overall condition with the following defects noted.

Pile 1 – Fair condition. Some splits 1mm - 3mm wide. Lower 2.5m has thinning by 10mm.

Pile 2 – Fair condition. Some splits 1mm - 3mm wide. Lower 2.5m has thinning by 10mm.

Pile 3 – Fair condition. Some splits 1mm - 3mm wide. Lower 2.5m has thinning by 10mm.

Pile 4 – Fair condition. Some splits 1mm - 3mm wide. Lower 2.5m has thinning by 10mm.

LM diagonal brace, replaced.

HM diagonal brace, replaced.

LM horizontal brace, fair overall condition, with some splits.

HM horizontal brace, fair overall condition, with some splits.

New bolts and clamps.

No scour or undermining at the interface with the river bed.

Trestle 109

Trestle 109 in fair overall condition with the following defects noted.

Pile 1 – Fair condition with a new concrete encasement to lower 1m and new timber pile.

Pile 2 – Fair condition with a new concrete encasement to lower 1m and new timber pile.

Pile 3 – Fair condition. Some splits 1mm - 3mm wide. Lower 2.5m has thinning. There is a 1m long splinter to down high mileage corner 1.2m above bed level. (Photo 38)

Pile 4 – Fair condition. Some splits 1mm - 3mm wide. Lower 2.5m has thinning.

LM diagonal brace fair overall condition, with some splits. Lower section is thinning by 5mm - 10mm.

HM diagonal brace fair overall condition, with some splits. Lower section is thinning by 5mm - 10mm.

LM horizontal brace, fair overall condition, with some splits.

HM horizontal brace, fair overall condition, with some splits.

New bolts and clamps.

No scour or undermining at the interface with the river bed.

Trestle 110

Trestle 110 in fair overall condition with the following defects noted.

Pile 1 – Fair condition with some splits 1mm - 3mm wide. Lower 2.5m has thinning 5mm - 10mm.

Pile 2 – Fair condition with a new concrete encasement below the horizontal brace and new timber pile.

Pile 3 – Fair condition. Some splits 1mm - 3mm wide. Lower 2.5m has thinning 5mm - 10mm.

Pile 4 – Fair condition. Some splits 1mm - 3mm wide. Lower 2.5m has thinning 5mm - 10mm.

LM diagonal brace, replaced

HM diagonal brace fair overall condition, with some splits to lower section 1mm - 8mm wide.

LM horizontal brace, fair overall condition, with some splits and weathering.

HM horizontal brace, fair overall condition, with some splits and weathering.

New bolts and clamps.

No scour or undermining at the interface with the river bed.

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CONDITION: (Cont.)

Trestle 111

Trestle 111 in fair overall condition with the following defects noted.

Pile 1 – Fair condition with some splits 1mm - 5mm wide. Lower 2.5m has thinning 5mm - 10mm.

Pile 2 – Fair condition with a new concrete encasement below the horizontal brace and new timber pile.

Pile 3 – Fair condition with some splits 1mm - 5mm wide. Lower 2.5m has thinning 5mm - 10mm.

Pile 4 – Fair condition with some splits 1mm - 5mm wide. Lower 2.5m has thinning 5mm - 10mm.

LM diagonal brace fair overall condition, with some splits 1mm - 3mm wide. Lower section is thinning by 10mm.

HM diagonal brace fair overall condition, with some splits 1mm - 3mm wide. Lower section is thinning by 10mm.

LM horizontal brace, fair overall condition, with some splits 1mm - 3mm wide.

HM horizontal brace, fair overall condition, with some splits 1mm - 3mm wide.

New bolts and clamps.

No scour or undermining at the interface with the river bed.

Trestle 112

Trestle 112 (Photo 36) in fair overall condition with the following defects noted.

Pile 1 – Fair condition with some splits 1mm - 5mm wide, deep splits to downside face.

Pile 2 – Fair condition with some splits 1mm - 5mm wide.

Pile 3 – Fair condition with some splits 1mm - 5mm wide.

Pile 4 – Fair condition with a new concrete encasement below the horizontal brace and a new timber pile. (Photo 37)

DN Outrigger in fair condition overall with thinning by 10mm and some splits.

UP Outrigger in fair condition overall with thinning by 10mm and some splits.

LM diagonal brace, replaced.

HM diagonal brace, replaced.

LM horizontal brace, fair overall condition with thinning by 5mm.

HM horizontal brace, fair overall condition with thinning by 5mm.

New bolts and clamps.

No scour or undermining at the interface with the river bed.

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Conclusion and recommendations:

Structure exhibited a fair to poor overall condition at time of inspection. A large number of the piles have been replaced with new timber piles and new concrete encasements, in addition a large number of bolt and clamps have been replaced. Caution should be exercised to ensure that galvanic process do not occur with the selected materials.

The invert as a whole, exhibits a stable condition with minor areas of damaged noted. These areas should be repaired. Scour pockets noted between trestles 74 – 80, also to Pier 84 and between trestles 87 – 100. The scour may not be progressing and could be symptomatic of historical rock armour placed in the area. This should be monitored at the next inspection.

Marine growth on the structure may conceal further defects and it is strongly recommended that this is removed before the next inspection.

Cross Sections and Radials

In line with the past report no cross-sectional soundings or radials were taken.

Evidence of Scour

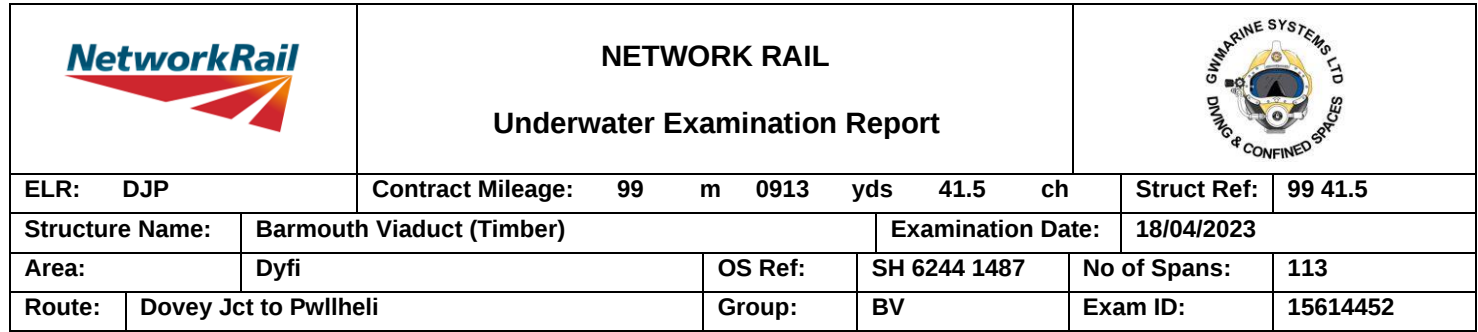
Scour pockets noted between trestles 74 – 80, also to Pier 84 and between trestles 87 – 100. Not thought to be progressive.

Changes in Bed Profile

No significant changes

Signatures if underwater exam was completed by sub-contractor

	Print Name	Signature	Date
Prepared by:	A Marshall BEng		28/08/2023
Checked by:	A Bennett (STE 07)		28/08/2023



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Due to enormity of structure drawings have not been provided.

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Appendix B – Photographs

All photos are referenced to specific members

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Photo 1 Low Mileage abutment and Trestle 1



Photo 2 Trestle 1

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Photo 3 **Pile 1 - New**



Photo 4 **New wedge between piles 4 and 5**



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Photo 5 All steel fixing, have been replaced



Photo 6 Trestles 2 - 10



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Photo 7 Trestle 2 - Pile 1, new encasement



Photo 8 Trestle 2 – Pile 4, area of repair

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Photo 9 Trestle 2 – Pile 4, decay



Photo 10 Trestle 10 – Pile 2, new encasement



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Photo 11 Trestle 4 – Pile 3, new encasement



Photo 12 Trestle 6 – Pile 3, new encasement



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Photo 13 Trestle 8 – Pile 1, new encasement



Photo 14 Trestles 11 to 20



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Photo 15 Trestle 16 – New HM diagonal brace is bowed.



Photo 16 Trestle 16 – HM horizontal brace, splits and minor decay



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Photo 17 Trestle 17 – Upside outrigger repaired

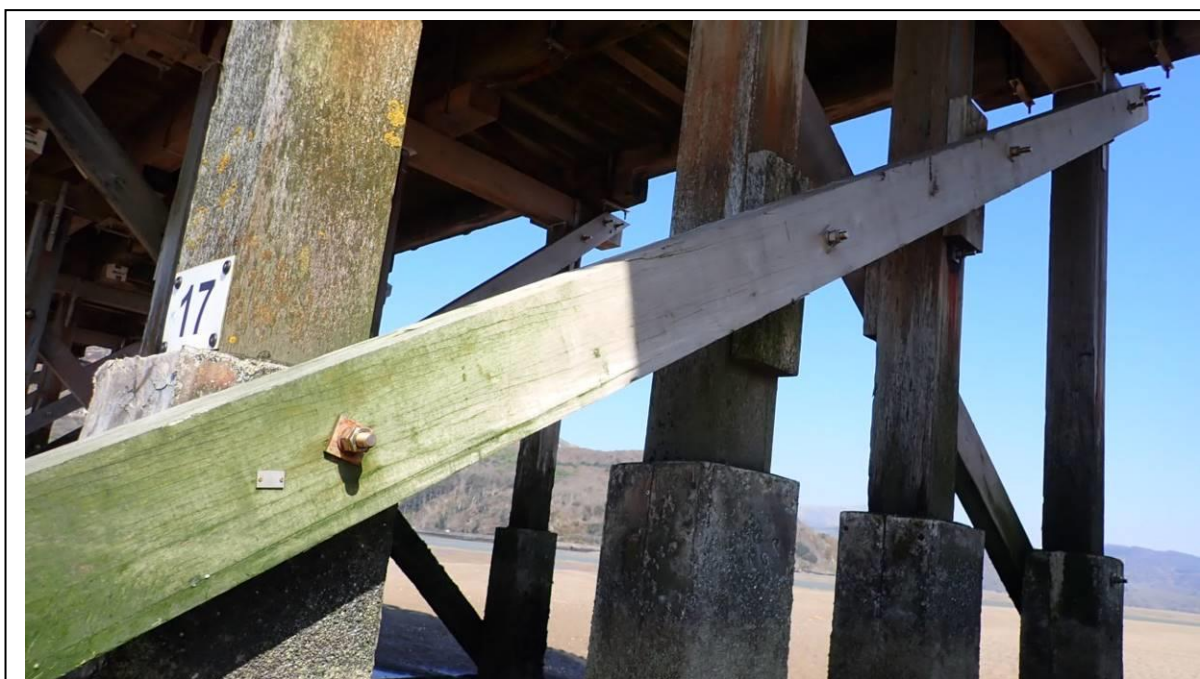


Photo 18 Trestle 17 – LM diagonal brace replaced 10/21



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Photo 19 Trestle 18 – Pile 1, new encasement



Photo 20 Trestle 20 – New timber to LM diagonal brace, plus new packer



NETWORK RAIL
Underwater Examination Report



ELR:	DJP	Contract Mileage:	99 m 0913 yds 41.5 ch	Struct Ref:	99 41.5
Structure Name:	Barmouth Viaduct (Timber)			Examination Date:	18/04/2023
Area:	Dyfi	OS Ref:	SH 6244 1487	No of Spans:	113
Route:	Dovey Jct to Pwllheli	Group:	BV	Exam ID:	15614452



Photo 21 Trestle 21 – Pile 2 – Encasement in fair condition



Photo 22 Trestles 21 – 30



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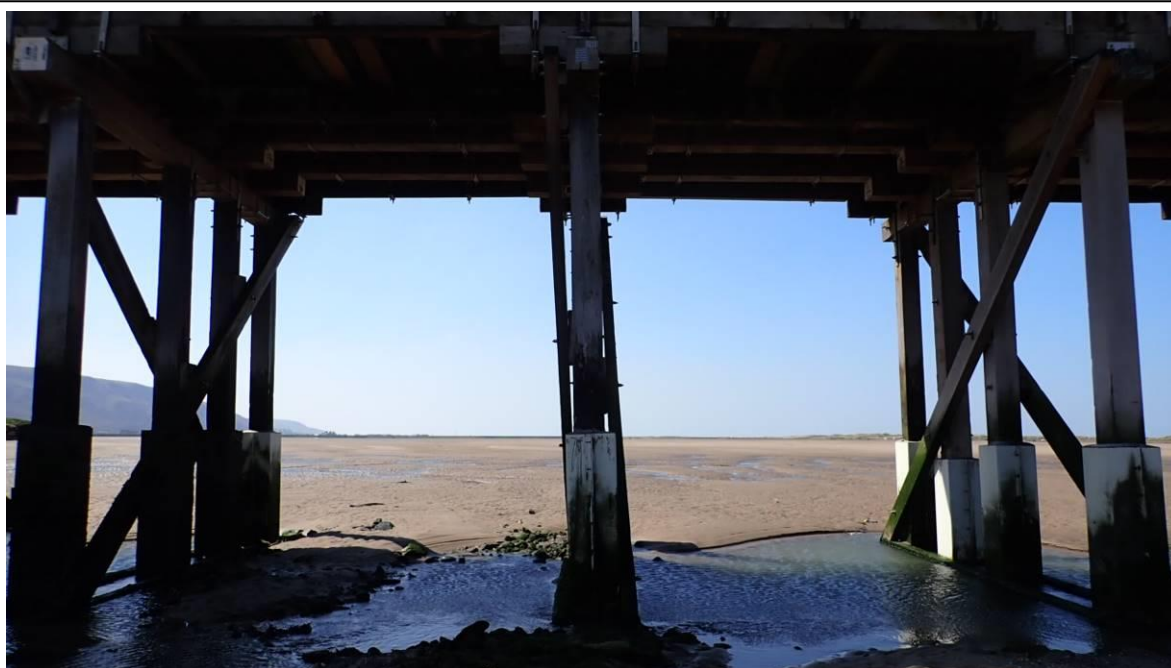


Photo 23 Trestle 24 – All piles appear to be out of plumb 10 degrees.



Photo 24 Trestle 25 – Repairs



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Photo 25 Trestle 26 – NEW LM diagonal brace



Photo 26 Trestle 27 – Pile 2, new encasement



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Photo 27 Trestle 27 – Upside outrigger has been repaired

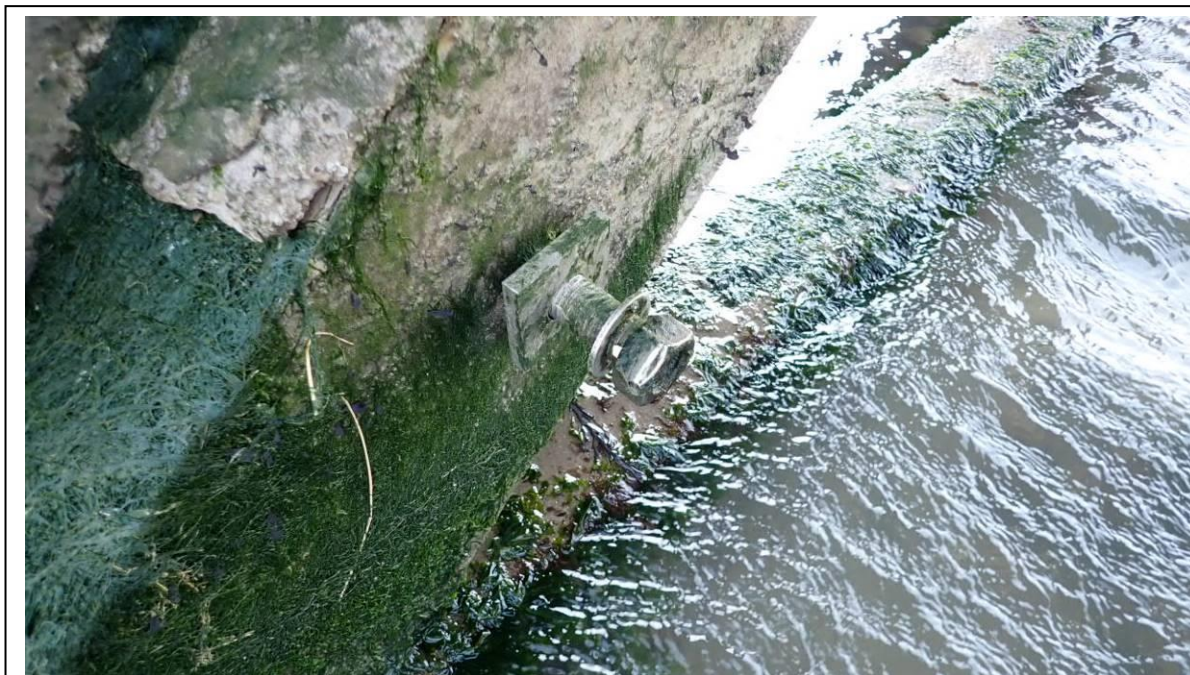


Photo 28 Trestle 30 – Pile 4, HM side loose bolt



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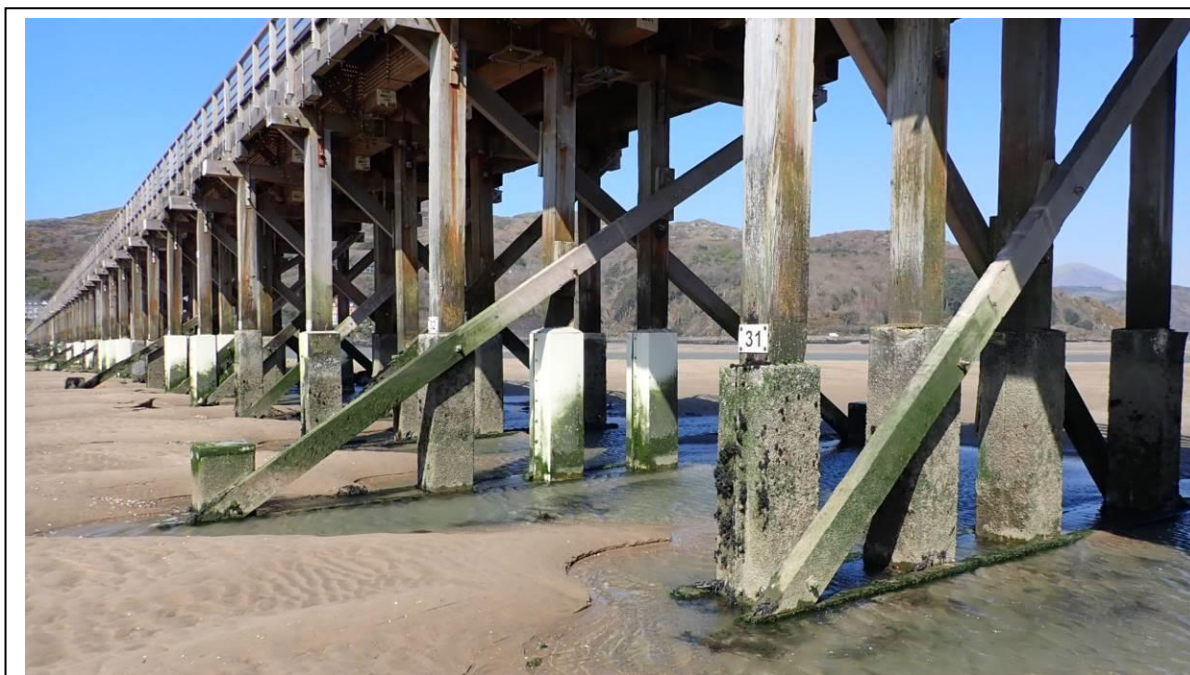


Photo 29 Trestles 31 – 40



Photo 30 Trestle 31 – Pile 3, NEW area of spalling to encasement.

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Area: Dyfi		OS Ref: SH 6244 1487		No of Spans: 113		
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Photo 31 Trestle 31 – Pile 4, loss of casement at top, LM face [NEW]



Photo 32 Trestle 33 – LM diagonal brace has low level splits



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Photo 33 Trestles 41 - 50

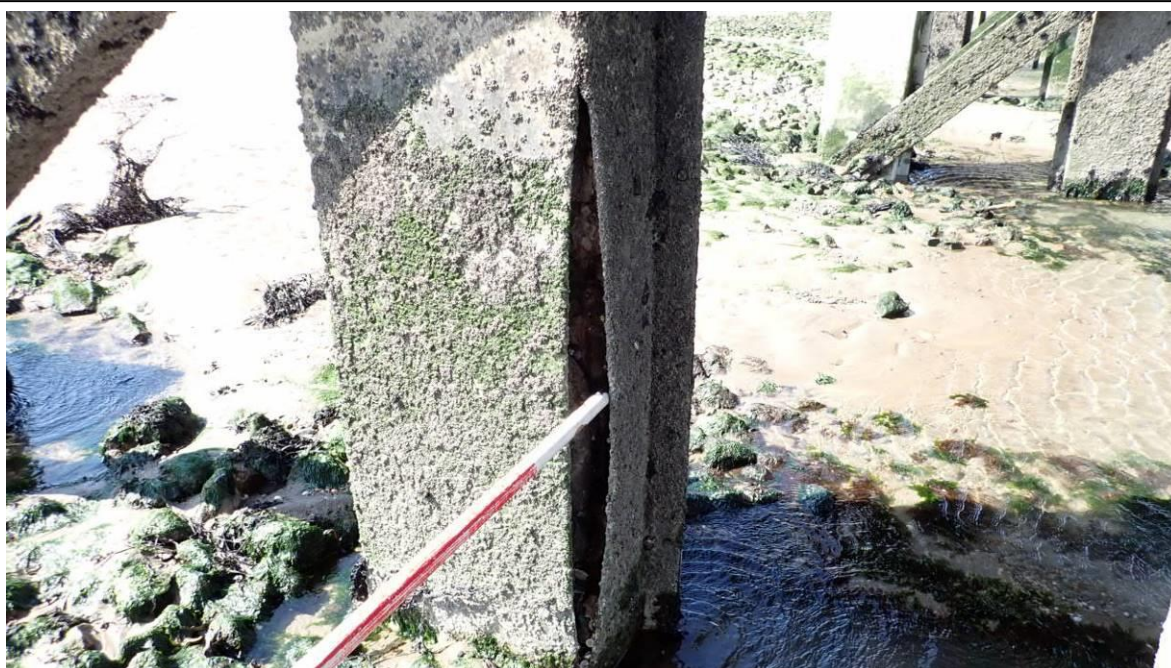


Photo 34 Trestle 42 – Pile 1, split to encasement to LM side



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Photo 35 Trestle 48 – Pile 3, missing packer to HM Diagonal brace



Photo 36 Trestle 112



NETWORK RAIL
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Photo 37 Trestle 112 – Pile 4, new encasement



Photo 38 Trestle 109 – Pile 3, Splinter to DS HM corner

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Route:	Dovey Jct to Pwllheli	Group:	BV	Exam ID:	15614452

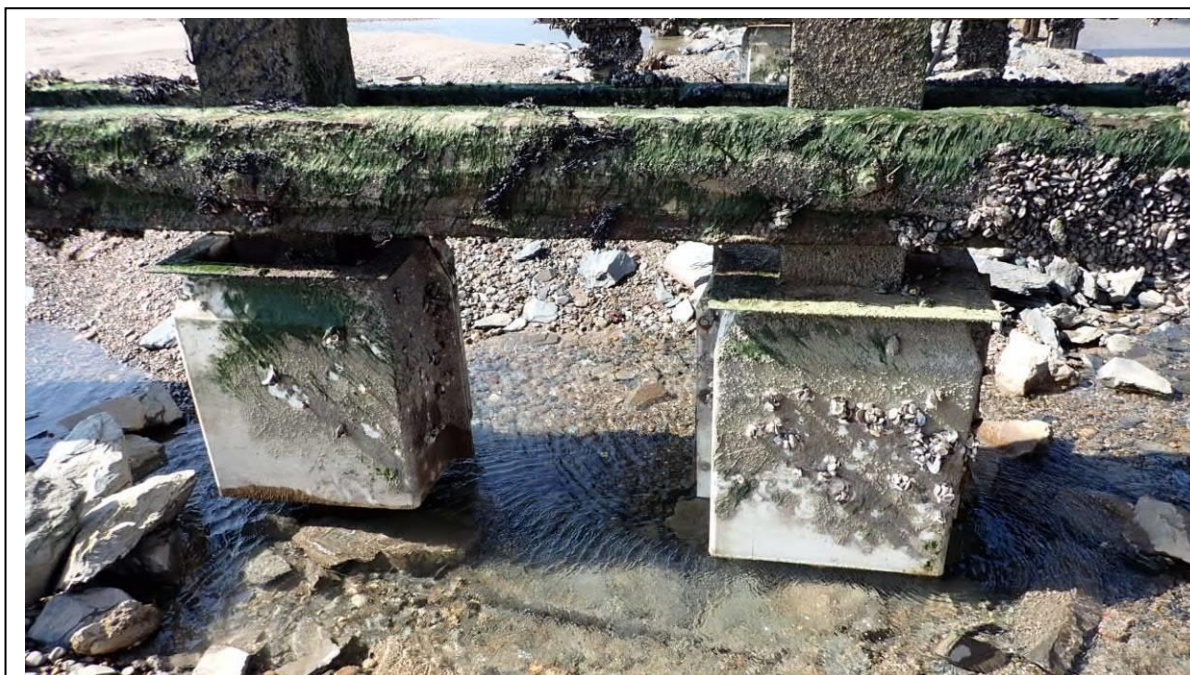


Photo 39 Trestle 102 – View of new encasements / piles to piles 1 & 2



Photo 40 Trestles 101 - 110



NETWORK RAIL
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Photo 41 Trestle 98 – Pile 1, splits and thinning



Photo 42 Trestle 93 – Pile 3, New encasement and pile



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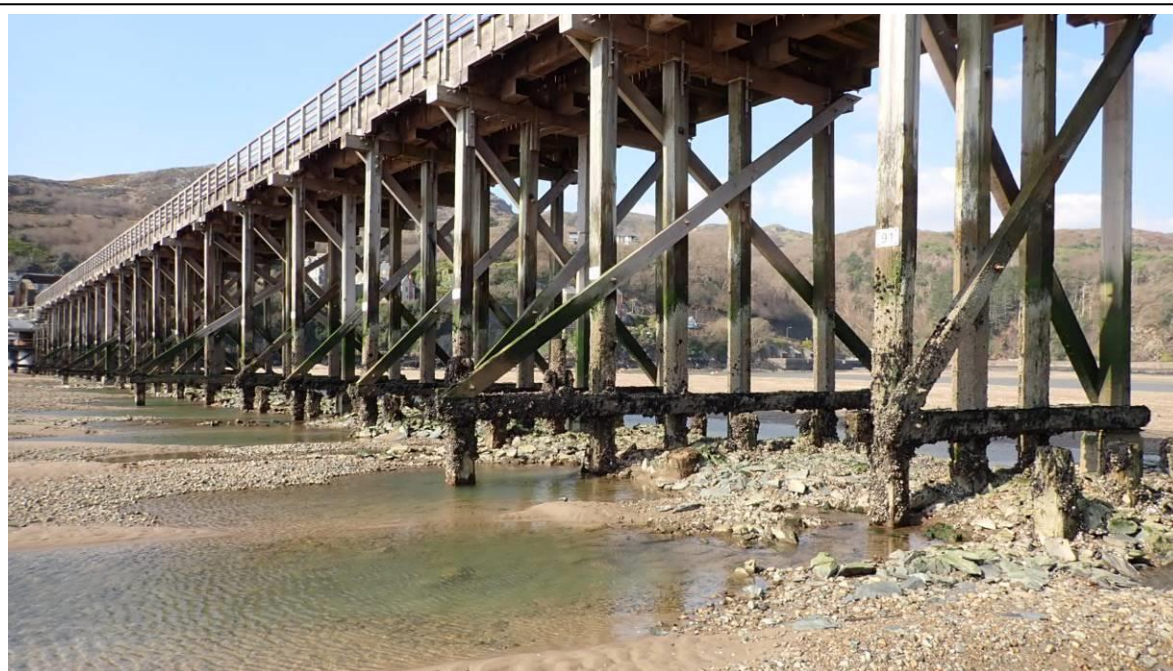


Photo 43 Trestles 91 - 100

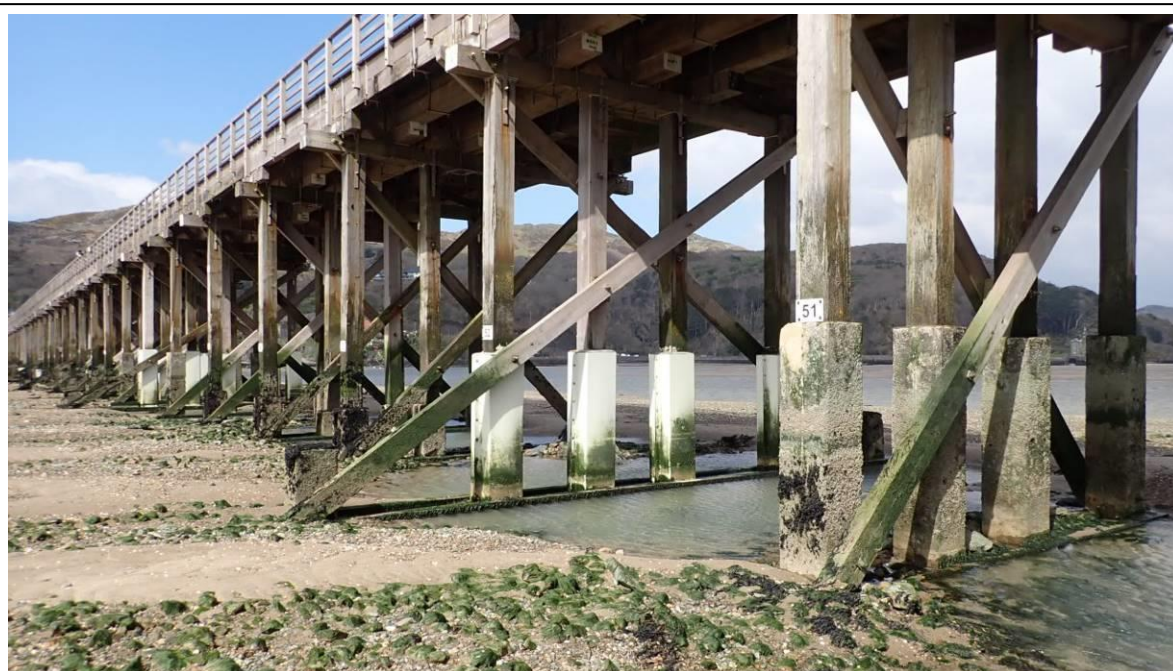


Photo 44 Trestles 51 - 60

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Photo 45 Trestle 51 – Pile 2, spalling at bolt [NEW]



Photo 46 Looking downstream

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Photo 47 Looking upstream



Photo 48 Trestles 61 - 70



NETWORK RAIL
Underwater Examination Report



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Photo 49 Trestles 71 – 80



Photo 50 Trestle 71 – Pile 1, new encasement and pile



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Photo 51 Trestle 73 – New packer installed to LM diagonal brace



Photo 52 Trestles 74 – 80 & 84. Typical scour pools forming



NETWORK RAIL
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Photo 53 Trestle 82 – Down side outrigger, broken between horizontal and diagonal brace



Photo 54 Trestle 82 – Upside outrigger, split



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Photo 55 Trestles 81 – 90

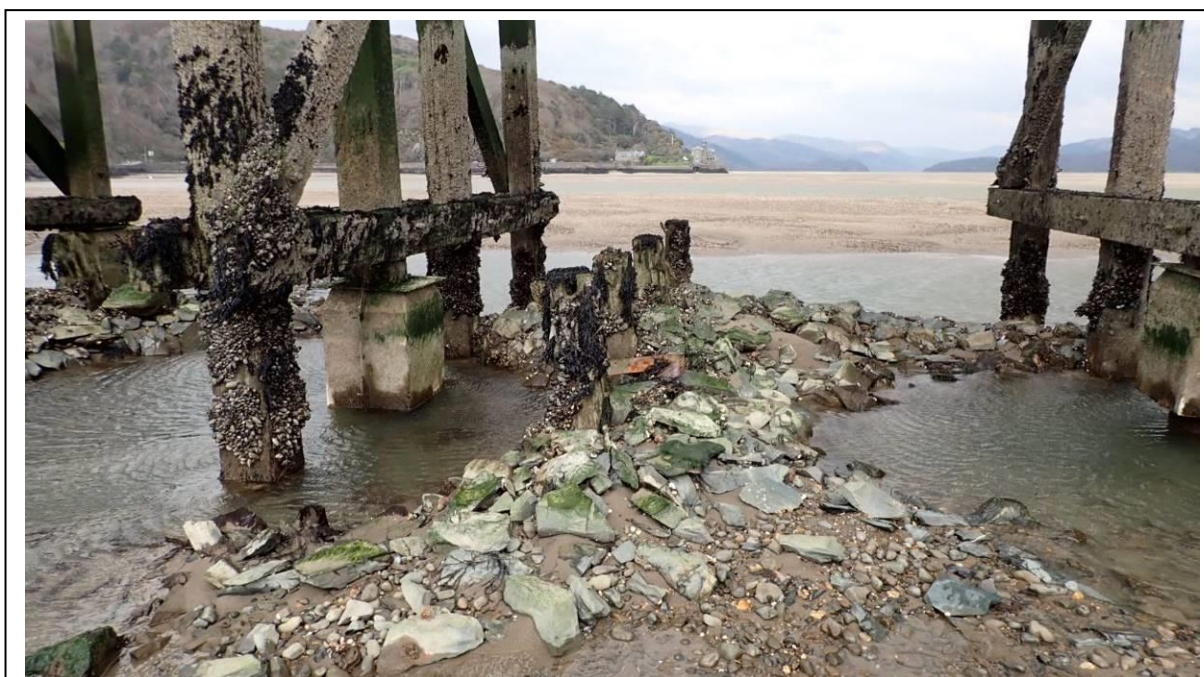


Photo 56 Remain of old timber piles from spans 80 – 112

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Route: Dovey Jct to Pwllheli		Group: BV		Exam ID: 15614452		



Photo 57 Typical mesh on bed – poor condition, lifting to span 1 - 80



Photo 58 Typical view of damaged mesh

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Photo 59 Downstream elevation



Photo 60 Downstream low mileage concrete revetment – Separate structure



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Photo 61 Typical view of the deck



Photo 62 Typical view of cross heads and clamps

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Photo 63 Upstream Low Mileage revetment – separate structure



Photo 64 Upstream elevation

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Appendix C – Riverbed Samples

Description	Clay	Silt	Sand	Gravel	Gravel/Stone
Particle Size (mm)	<0.002	0.002 – 0.06	0.6 – 2.0	2.0 – 20	>20
Sample Ref. No					
1			X	X	X
2			X	X	X
3			X	X	X
4			X	X	X
5			X	X	X

SAMPLE LOCATION TABLE

SAMPLE LOCATION TABLE	
Sample 1	3m from upstream face of structure
Sample 2	In line with upstream abutments
Sample 3	Centre line of structure
Sample 5	In line with downstream abutment
Sample 5	3m from downstream face of structure

Sample Location Sketch

No location sketch provided due to enormity of structure.
Samples were taken at sporadic intervals around the structure.

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Area:		Dyfi		OS Ref:		SH 6244 1487		No of Spans: 113		
Route:		Dovey Jct to Pwllheli			Group:		BV		Exam ID: 15614452	

Appendix D – Diving Operational Records

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Area: Dyfi		OS Ref: SH 6244 1487		No of Spans: 113			
Route: Dovey Jct to Pwllheli		Group: BV		Exam ID: 15614452			

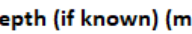
Appendix E – Engineers Recommendations

ITEM	DESCRIPTION	LOCATION	PRIORITY	COMMENTS
1	Further investigations	Timbers	High	
2	Marine growth removal	Throughout	High	
3	Invert repair	Invert	High	
Signed: 		Engineer : G Williams (CRE)		Date: 28/06/2023

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Appendix F – Riverbed Soundings

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APPENDIX G – SCOUR ASSESSMENT SHEET									
Watercourse Type (one only)		Canal	Channel in Rock/valley	Controlled River	River (Braided)	River (unbraided)	Tidal		
General Bed Material (one only)		Clay	Silt	Sand	Gravel	Cobble	Rock		
Bed Material Grading (any of significant presence)		Clay	Silt	Sand	Gravel (fine/med)		Gravel (coarse)		
Measurements		Floodplain (To flood banks of walls if present, or use EA Flood Map.)		Upstream Channel (average for 10x width away. Bank top to bank top)		Channel Under Bridge (bank top to bank top minus any pier widths)			
Width (m)		375		75		678			
Average Depth (m) (to bank top)		2.1		7		4			
Element Data		RH (ES1)	PIER 1 - 112 (IS1 - IS112)						
Element Category (1 or 2)		1	1						
Element Length (m)		6.9	1.4						
Element Width (m)		0.1	0.65						
Location in Channel (tick one)	Inside	X							
	Inner 1/3		X						
	Central 1/3								
	Outer 1/3								
	Outside								
Element Shape (tick one)									
									
									
									
		X	X						
Foundation Depth (if known) (m)			5						
Attack Angle (0°/10°/20° etc.)		0	0						
Scour protection present? (Y/N)		Y	N	N					
State type of protection:		Concrete Revetment							
If "Inadequate" state why									
Column Groups (if apply)	C1 (m) (with flow)		1.35						
	C2 (m) (across flow)								
	Column Width (m)		0.65						
Bank Stability (any that apply)		Loose-No veg	Slumping	Tree roots exposed	Erosion of Bank	Widened by erosion	None of these		
Catchment (one only)		Steep		Hilly	Moderate		Flat		
Vegetation (one only)		Heavily forested		Wooded	Fertile, bank vegetation		Few trees, bushes		
Bend Sharpness (one only)		Straight (0°-10°)		Slight (10°-20°)	Moderate (20°-40°)		Severe (>40°)		
O.S. Data (for "Canal" watercourses use data for main river serving flood plain)		Contour A 85% U/Str (m)		Contour B 10% U/Str (m)		Distance to Source 100% U/Str (km)			
		185		1		34.2			
Stream Slope (using OS Data)		Steep		Moderate	Mild		Flat		
Floodplain Adjustment Factor (to adjust floodplain width for Cat 2 element		Flood Arch Width		Summation of Widths of All Openings			Proportion (%)		