

MONITORING REPORT SEPTEMBER 2024

For Neath Port Talbot CBC

By

Shoreline Management Wales (CEDM Ltd)

Post Construction Survey + 4 Years – Cliff Monitoring – SURVEY 6 (S6).

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See also the complete set of inspection pictures and drone video files previously issued separately on USB stick.

1 – Introduction & Historic Review

This monitoring report includes the fifth cliff edge survey. The surveys completed to date are as follows:

- 1 – Pre-Commencement Survey – Survey Date 6th October 2019.
- 2 – Post Construction Survey - Survey Date 28th June 2020.
- 3 – Post Construction Survey + 1 Year – Survey Date 5th June 2021.
- 4 – Post Construction Survey + 2 years – Survey Date 7th August 2022.
- 5 - Post Construction Survey + 3 years – Survey Date 27th May 2023.
6. – Post Construction Survey + 4 years – Survey Date 3rd June 2024.

Survey 6, executed on 3rd June 2024, is the latest and last in the present survey campaign. The survey includes shoreline inspection images and a drone survey which amounts to a significant volume of large files which have been previously issued (within the USB for earlier full shoreline inspection report). Some of the still photographs are provided as low-resolution files submitted with this report. The product has therefore been submitted in parts and this main report has been delayed due to the adoption of a new Auto Cad system which has taken some time to settle in. The final main report and drawings are issued electronically via email.

This is the final survey in the monitoring campaign required in a planning condition for the Aberavon Coastal works. It is possible that further monitoring surveys will be undertaken in due course and this is considered in the report with recommendations.

It is worth noting that a review of historic Google images was carried out in 2019 which sought to identify and approximate rates of historic erosion. The position of the promenade and other features provide a strong indication that erosion along the study frontage has been historically significant. Apart from the unstable nature of the front face of the shoreline, the recessed position of the coastal edge in relation to the nearby defenced shoreline suggests a long-term trend of erosion. The composition of the storm beach along the study frontage is also a good indicator of long-term erosion as it contains unnatural material that has been yielded from the adjacent eroding shoreline/cliff. The study frontage and hinterland comprise a former tip area in which industrial and commercial waste has been deposited. The material on the foreshore can easily be matched to the seams of waste present in the vertical face of the eroding cliff.

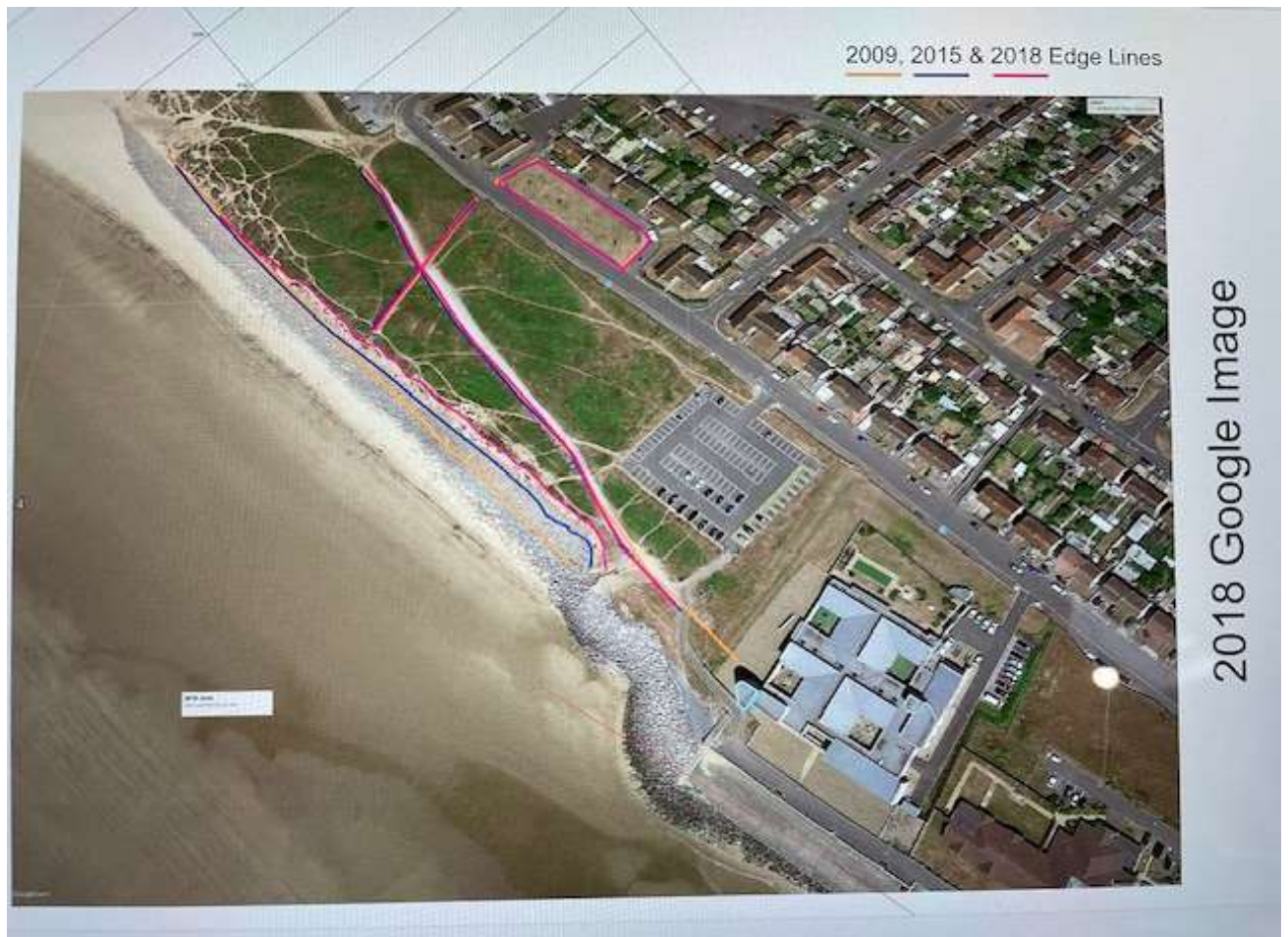
The following text extract is presented from the 2019 report regarding the Google Earth edge analysis:

A series of Google Earth images were downloaded with key dates selected being 2009, 2012 and 2018. The images are stored in the electronic file in folder 'Google Aberavon' (2002, 2006, 2006-2, 2009, 2010, 2013, 2015, 2016, 2016-2, 2018). The images were imported into an Auto Cad drawing with a key reference feature being the structure at the west end of the promenade. The images were scaled and moved to a geo-referenced point. A series of polylines were drawn along the line of the eroding cliff through the study area. In addition, key features were traced with additional polylines to check the fit of the various images. The overlays produced a reasonable match although some small adjustments were necessary and are estimated to be up to a maximum of 2.5m. Once these small adjustments were made, the key features lined up well and plots were produced with the 2009 and 2018 google image. Reference should be made to the electronic file and folder 'Google Analysis'.

The erosion is clearly more pronounced adjacent to the hard defence at the end of the promenade and gradually reduces in a westerly direction. This ties in with the long-term trend evidenced by the exposure of the sheet pile wall at end of the promenade some years ago. Run-round erosion protection was first installed in 2009 with permanent protection installed in 2013 as part of the Respite Care Home development.

Erosion has been identified along the shoreline west of the defence which comprises industrial waste material. Erosion rates vary from 150mm / year at the western extremity to 1.3m/ year close to the promenade. The average rate of recession appears to be approximately 700mm / year. This ties in with the long-term trend for recession at the end of the existing promenade. Recession up to 2009 at the location was estimated to be over 20m. See Below Recession image from 2019 report:

The Image of Google Earth Recession Analysis is presented on the next page:



2 - 2024 Survey 6 (S6) Results Tables and Observations.

Results and Tables

Reference should be made to the survey plan – Drawing 1- 2024 which is included with this monitoring package. The recession lines are plotted on the drawing and attention is focussed on the top of the vertical edge. Data has been taken from the drawing sheet and presented in the following table – Table 1, with Table 2 presenting some basic analysis of the data.

Table 1

No	Chainage	Recession m S1 to S2	Recession m S2 to S3	Recession m S3 to S4	Recession m S4 to S5	Recession m S5 to S6	
1	0 Wks	0					
2	20 Wks	0					
3	40 Wks	0					
4	60 END	1.7	0	0.25		0	
5	80	2.7	0.4	0.25	0.85 Advance Local Slump Ignore	1.5	From Local Grouping
6	100	1.0	0.9	0.25	0	0	
7	120	1.7	0	0.6	0	0	
8	140	1.9	0.3	0.4	0	0.25	
9	160	2.5	0	0.8	0.35	0.3	
10	180	3.75	0.7	0.1	0.4	0.15	
11	200	4.85	0.9	0.2	0.25	0.3	
12	220	5.4	1.4	0.7	0.5	0.85	
13	240	2.9	2.4	0	0.15	0	
14	260	1.4	3.35	0.1	1.2 Advance	Edge lost definition rollover – back to zero	
15	280	0	1.0	0.1	1 Advance	Ditto	
16	300	0	0	0	0	0	

S1 = Survey 1 – Pre-Commencement; S2 = Survey 2 – Post Construction; S3 = Survey 3 - 2021 etc.

Table 2, on the following page, presents some basic analysis of the data:

Table 2 – S1 to S2, S2 to S3, S3 to S4 & S4 to S5, S5 to S6.

No	Chain	Recession m S1 to S2	Prog. Cum. Ave.	Rolling 3 Ave. Going West	Recession m S2 to S3	Prog. Cum. Ave.	Rolling 3 Ave. Going West	Recess s S3 to S4	Prog. Cum. Ave.	Rolling 3 Ave West.	Recess S4 to S5	Prog. Sum Ave.	Rolling 3 Ave West	TOTAL RECES. from Pre Constn.	Rate/Y 4 year m/y	Rec ess. S5 to S6	Rolling 3 Ave West	Total Recess. Post Constn.
1	0	0	0		0	0		0	0									
2	20	0	0		0	0		0	0									
3	40	0	0	0	0	0	0	0	0	0								
4	60end	1.7	0.425	0.57	0	0	0	0.25	0.1	0.1			0	1.95	0.5	0	0	0.55
5	80	2.7	0.88	1.46	0.4	0.08	0.13	0.25	0.1	0.15	0	0	0	5.3	1.3	1.5	0.5	2.3
6	100	1.0	0.9	1.8	0.9	0.2	0.43	0.25	0.1	0.25	0	0	0	2.15	0.5	0	0.5	1.15
7	120	1.7	1.01	1.8	0	0.18	0.43	0.6	0.2	0.35	0	0	0	2.3	0.6	0	0.5	0.8
8	140	1.9	1.125	1.53	0.3	0.2	0.4	0.4	0.2	0.4	0	0	0	2.6	0.7	0.25	0.1	0.8
9	160	2.5	1.28	2.03	0	0.18	0.1	0.8	0.3	0.6	0.35	0	0.1	3.65	0.9	0.3	0.2	1.65
10	180	3.75	1.53	2.72	0.7	0.23	0.33	0.1	0.25	0.4	0.4	0.1	0.25	4.95	1.2	0.15	0.25	1.4
11	200	4.85	1.83	3.7	0.9	0.29	0.53	0.2	0.25	0.35	0.25	0.1	0.33	6.2	1.6	0.3	0.25	1.75
12	220	5.4	2.13	4.7	1.4	0.38	1.0	0.7	0.3	0.35	0.5	0.13	0.38	8	2	0.85	0.4	0.75
13	240	2.9	2.18	4.4	2.4	0.54	1.6	0	0.25	0.3	0.15	0.13	0.3	5.45	1.4	0		2.4
14	260	1.4	2.13	3.2	3.35	0.74	2.4	0.1	0.25	0.25	Adv							3.5
15	280	0	1.99	1.4	1.0	0.76	2.25	0.1	0.25	0.1	Adv							1.2
16	300	0	1.86	0.47	N/D													
																Post Wks	Ave = Rate/Y	1.5m 0.4m

Reference should be made to Drawing 1 and 2. Appendix I PDF files provided separately.

Observations

Drawing 1 shows recession line detail whilst Drawing 2 provides a more illustrative presentation including a shaded area highlighting the recession since construction of the works. The 2023 report highlighted the difficulty in identifying small changes which included factors such as the spread of survey data points, the masking effect of the vegetation and it also worth mentioning the need for the surveyors to work safely. Although some survey data points have indicated some local anomalies, we can be confident about the overall data sets as time smoothed out discrepancies introduced by the issues referred to above.

The recession experienced since the construction of the Aberavon Coastal Defences does not appear to be out with the historic trend. Erosion tends to be sporadic as the toe of the cliff is undercut over a prolonged period culminating in a sudden collapse resulting in the loss of perhaps several metres of land in one event. It may be helpful to have a longer timeline and possibly carry out repeat surveys biannually. This would provide a good representation of medium and ultimately long-term erosion.

Recession as a result of storm activity will continue although the healthy storm beach does provide an effective defence for all but the highest tides when accompanied by a storm. It is also worth noting the precipitous nature of the cliff with the material composition of the eroding face producing erosion because of the natural instability of the shoreline. It is anticipated that erosion rates will reduce over time as the shoreline becomes further set back from the adjacent defended shoreline to the east. General recession of the study shoreline and the Baglan dune system to the west will continue and this is an issue that should provoke further investigation. In the meantime, there are some recommendations that should be adopted should any development be considered in the area. Any development that might be considered throughout the hinterland of the study frontage or the behind the Baglan dune system to the west, should take account of the following:

- 1 – Coastal engineering and shoreline evolution matters should be assessed and included in any development plans.
- 2 – All development should be set back a reasonable distance from the shoreline to allow for the introduction of coastal defences or for natural shoreline evolution to take place. This will be particularly important behind the Baglan dune system where it is likely that a development exclusion zone will need to be established to allow the narrow dune system to roll back naturally.
- 3 – The study frontage cannot be reasonably described as a dune as it is a former industrial tip which contains sand. Development in this area would be possible and relatively straight forward as a coastal scheme could be easily established. Such a scheme would need to include transitional works along the western flank near the interface with the dune system.

The storm beach remains in a healthy condition in terms of coastal processes and, as indicated above, provides some protection to the vertical face for all except the highest tides and storm events. Human traffic remains an issue at the west end of the rock armour transition and fence. As stated in previous reports, there is a 'line of desire' and an informal pathway has been created by people gaining access to the beach along the armour/ cliff interface.

It is also worth noting, although it has been referred to in previous reports, that the face of the cliff includes a thick band of demolition material located some way up the cliff face and near the top in places. This band of demolition material will react differently to sand and this is evident in the images as the face of the 'cliff' which, in places, comprises different slope profiles. The band of demolition material can act as a berm or platform and may result in the erosion being slightly more erratic. It is worth noting that there is a risk that the former tip could contain contaminated material although potentially 'hot' material has not been observed. It should however be noted that if there were to be any contaminated material present, it is likely to be ad hoc and difficult to trace in a site investigation. The Authority can only reasonably be expected to react appropriately to material of concern as it is revealed in the eroding cliff or found on the foreshore. The potential risk could however be referred to, should it be necessary, to make a case for preventing further erosion of the shoreline.

3 – Recommendations

The following recommendations are provided for consideration and discussion:

- 1 – Continue with the recession monitoring surveys with an option to carry them out biannually.
- 2 – Highlight the need to take account of coastal erosion and dune management in any potential local development proposal along the study frontage and extending to the hinterland behind Baglan dunes.
- 3 – To note the potential 'ad hoc' contamination risk arising from the tipped waste. There is no evidence of any general contamination but there is a risk that some 'hot' material could be present. This could be presented as an argument to support the prevention of further erosion by extending the coastal protection across the study frontage.
- 4 – To monitor the steep informal beach access at the end of the transitional rock armour. It may be worth attaching a 'no beach access' sign to the fence to cover the authority with regards to public liability risk.

5 – To undertake a walk over inspection of the storm beach prior to the start of the summer season to identify and deal with protruding steel or sharp objects that might be undesirable in a publicly accessible area.

APPENDICIES

APPENDIX I – DRAWING 1 and Drawing 2 – 2024 PDF – Including in file pack.

APPENDIX II - Selected Images with Comments

Plate 1 – Drone.



Refer to Drone Video (USB stick)

This image provides a good strategic view of the study area and how it relates to the recent coastal works and the Aberavon seafront. Note the effective promontory at the west end of the Aberavon seafront and the recessed position of the undefended shore in the study area.

Plate 2 (4389) – Baglan Dune Recession – 2024.



This view shows the transition from the study shoreline to the Baglan dune system. Note the tapering out of the storm beach and the rock armour line seaward of the current dune toe. The rock armour line denotes the historic position of the dune toe. The extent of dune recession is evident. Text also applies to Plate 3 below.

Plate 3 (4391)– Baglan Dune Recession & Transition from Storm Breach - 2024



Plate 4 (4390) – Storm Beach.



Note the vegetation on the near vertical face indicating no recent erosion.

Plate 5 (4395) – ‘Dune’ face, Tarmac and Concrete.



This section of shoreline comprises sand that has slumped onto the storm beach and also shows the tarmac, concrete and masonry produced from the erosion.

Plate 6 (4396) – Tarmac, Concrete, Steel and Masonry from Eroding Cliff.



Removal of sharp steel is recommended.

Plate 7 (4398) – Debris / Waste from Eroding Cliff.



Plate 8 (4403) – Storm Beach – Cobble and Demolition Material.



Plate 9 (4404) – Storm Beach Supplied by Eroding Cliff.

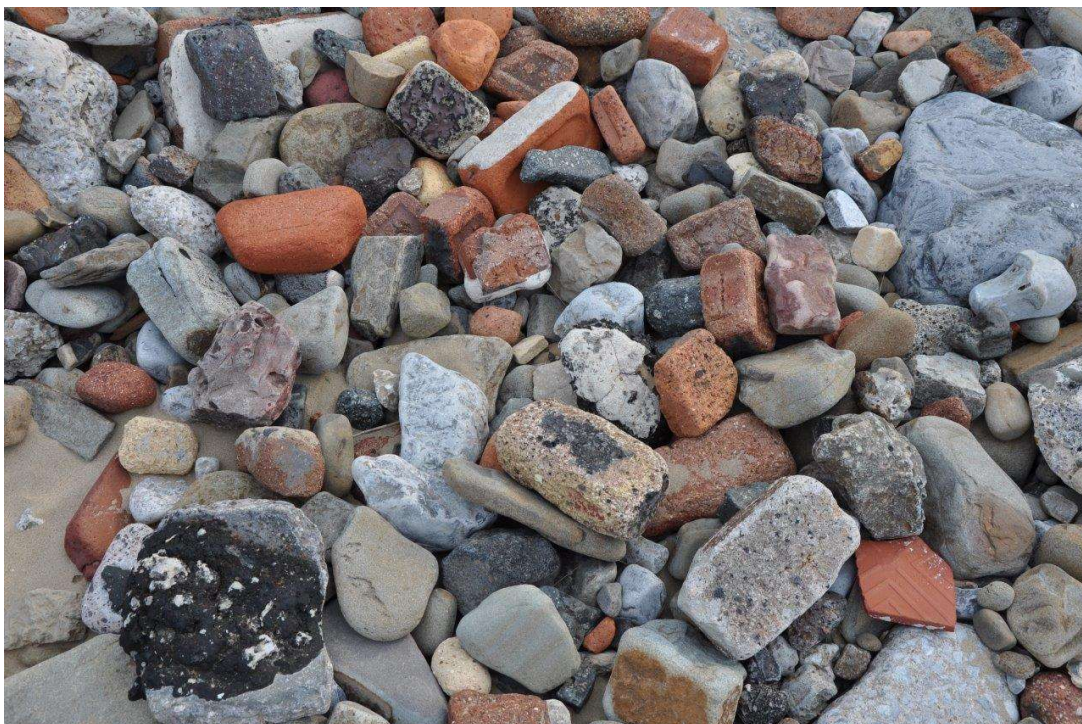


Plate 10 – (4415) Storm Beach Composition – Slag, Brick and natural stone.

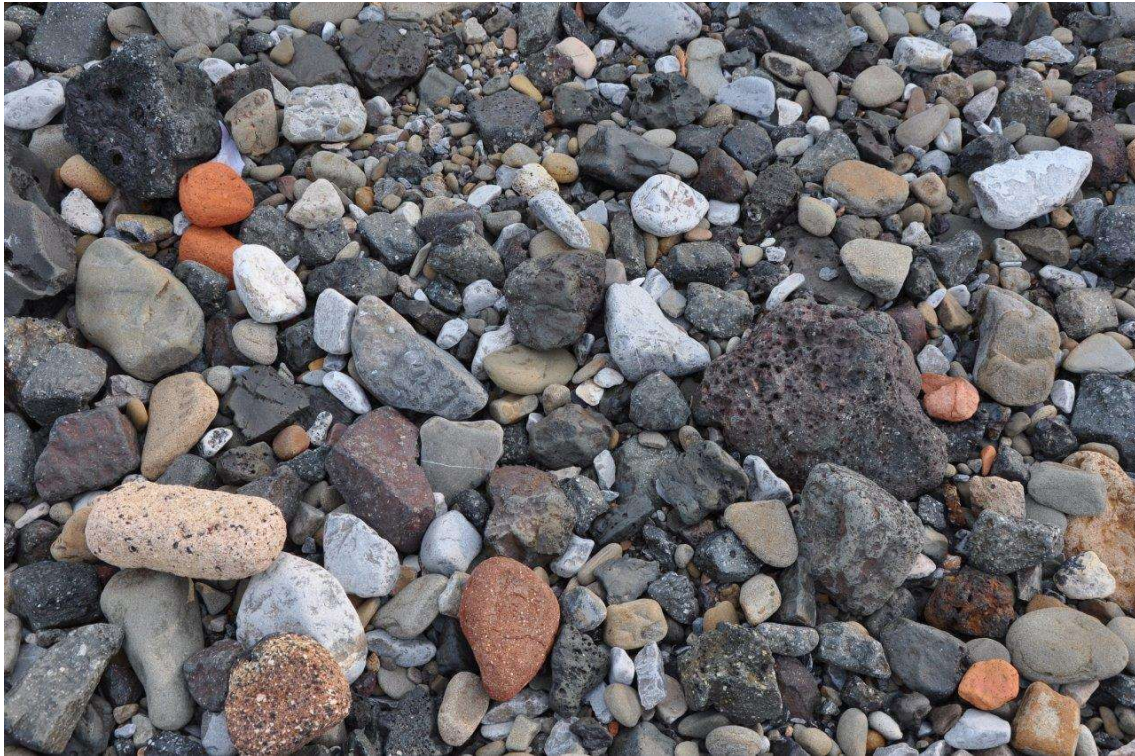


Plate 11 (4407) – Hanging Gate and Crow Perch.



Plate 12 - (4402) – Eroding Cliff – Note the band of debris part way up face and composition of storm beach.



Plate 15 (4416) - Eroding Cliff Nr Transition – Note band of waste in eroding face.



Plate 16 (4420) – Eroding Cliff and Storm Beach. Band of waste in eroding cliff.



Plate 17 (4426) – Eroding Cliff / Recession Pocket and Band of Demolition Material.



Plate 18 (4425) – Close up of Band of Demolition Material/ Industrial Waste.



Plate 19 (4429) – Local Erosion Pocket with substantial storm beach providing increasing protection.



END