

Technical note

Subject:	Swansea Bay Campus – Revetment Inspection		
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Date:	30 th November 2012	Authoriser:	Mike Hunting

1. Introduction

A visual inspection of the rock revetment fronting the Transit site was undertaken on Wednesday 14th November 2012. The revetment extends for a distance of some 1,200m. This technical note summarises the condition of the existing revetment and gives some recommendations on the way forward.

The inspection includes the western extremity of the defence (further west than the university development site) that previously was thought to have failed. Exposure(s) of the sea wall are evident on aerial imagery available from Bing maps. The exposure of the wall is thought to have occurred at least 3 years ago.

There are no historic construction / as built drawings for the structure. Knowledge of the historic land use of the site would indicate the age of the revetment is c. 50 years.

2. Observations

WESTERN END

Working east from the western end of the revetment, photo 4587 indicates the two areas of damage where the sea wall has been exposed. These are c. 30m apart (ref. photo 4588-89 and 90-91). Rock from the crest has likely been removed by storm damage and now sits at the toe of the structure on the beach. At the western of these two areas there is evidence of damage to the steel sheet pile toe (photo 4588). There is also a strong smell of hydrocarbons in this area. The steel sheet pile toe is in a better condition to the east (ref. photo 4591) although there is extensive cracking in the concrete wall at this location.

The remaining revetment along this length sits at a very steep angle (c. 1 in 1) against the concrete sea wall. There is no formal horizontal crest to the top of the revetment, (ref. photo 4590). The storm damage was likely caused by waves impacting the steep revetment and reflecting off the underlying impermeable wall and removing the rocks.

Working east, the profile evidenced by photo 4592 is one where the main slope has been removed by wave action and now sits on the beach at a lower level. The lower slope is resultantly convex and the upper slope appears concave.

Either side of the defunct outfall (ref. photo 4583) the revetment appears composed of smaller grade material with greater packing density and in general better condition relative to adjacent areas. The slope slackens in this region which has contributed to its better condition.

EASTERN END

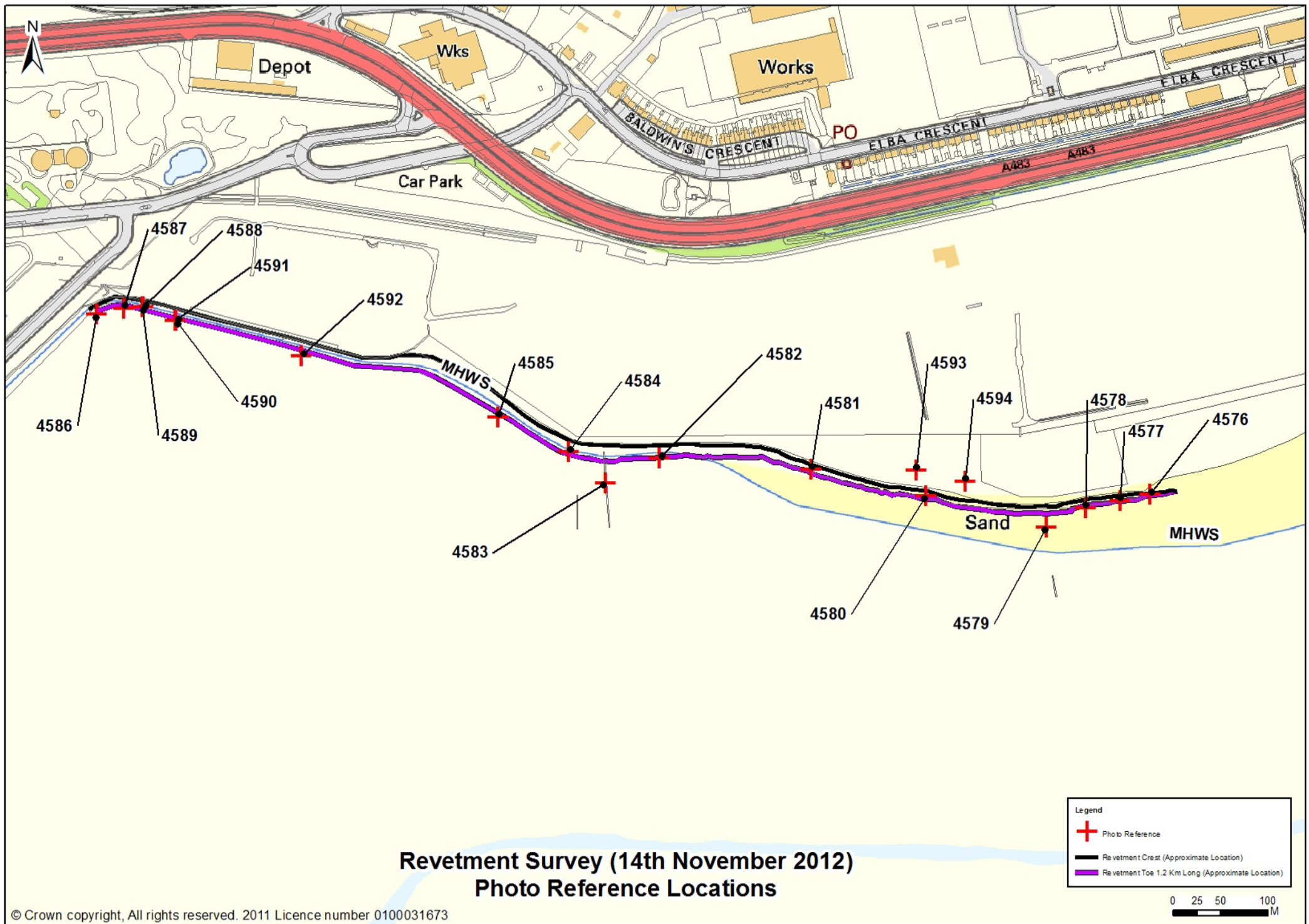
In general the revetment along this reach is akin to an informal rock slope rather than an engineered revetment. All parameters of the revetment are variable, namely: crest elevation (ref. photo 4580) and width, slope, armour thickness (ref. photo 4577) and packing density. There appears to be no underlying geotextile present. At its eastern extremity the toe of the revetment is buried by sand accretion and appears to decrease in height. There appears to be no formal engineered termination of the structure and the rock slope simply merges into the dunes which front the foreshore to the east of the university site.

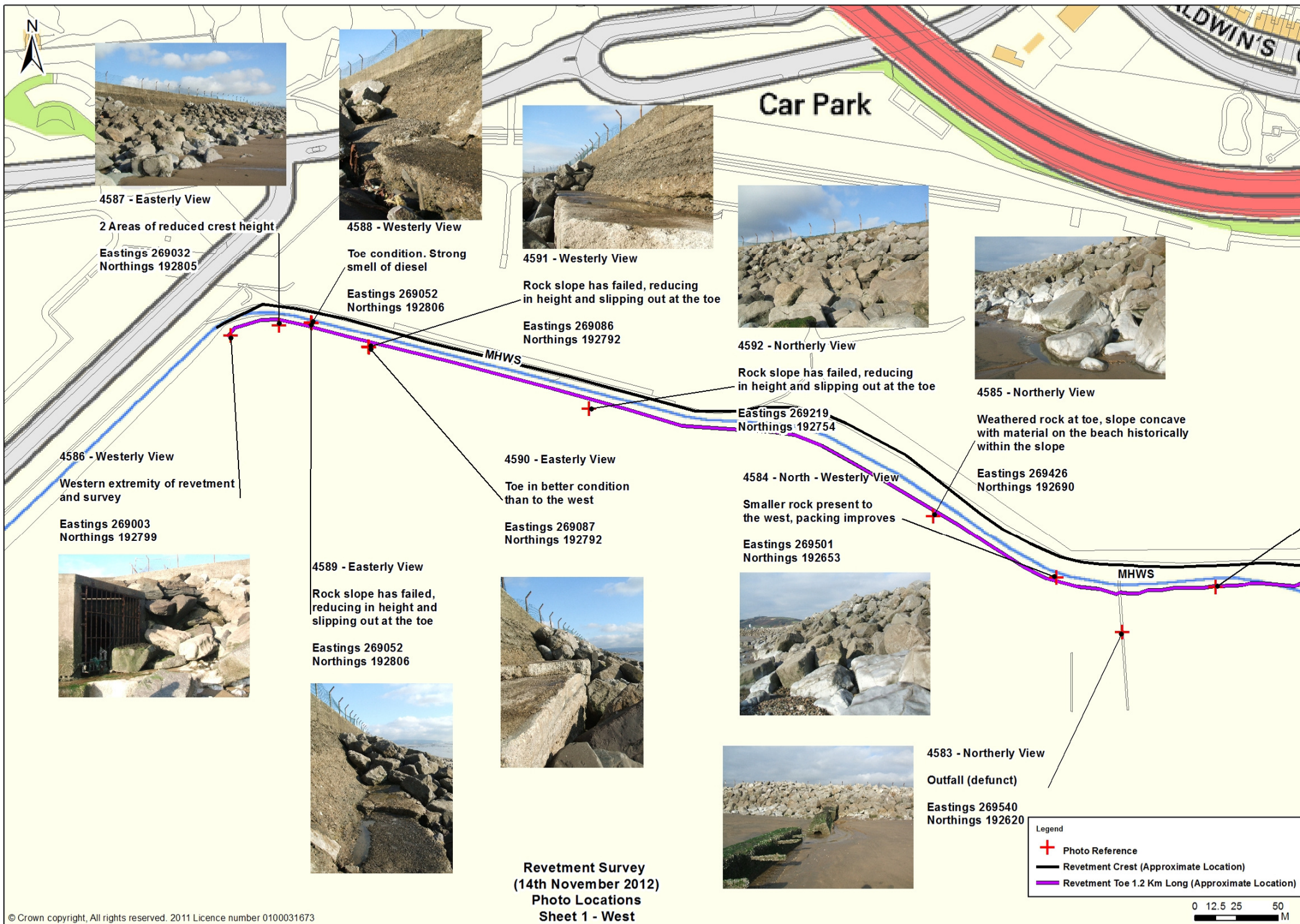
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Along this eastern reach, MHWS diverges from the structure and as such it is not subject to breaking waves like the western defences.

3. Conclusions

The condition of the revetment observed although variable has remained intact during its lifetime (c. 50 years). To the east the structure is not subject to breaking waves. Along the western reach, there are two areas of historic damage that have exposed the sea wall where rock has been removed from the armour slope. The rock now sits on the foreshore. There is a possibility that during severe storms, adjacent areas of this stretch will become similarly damaged.







4582 - South Westerly View

Slope slackens
approaching outfall

Eastings 269596
Northings 192647



4581 - Westerly View

Sinuous profile as crest
and toe levels vary and
slope alters

Eastings 269757
Northings 192634.2



4594 North Westerly View

Reverse slope to landward on
the revetment crest, plateau area
between rock and dunes

Eastings 269919
Northings 192621
Reverse slope to landward on
the revetment crest, plateau area
between rock and dunes



4577 North Westerly View

Gap in revetment, triangular
in shape, 1 layer thick

Eastings 270082
Northings 192601



4593 Westerly View

Highest point on the survey reach.
Reverse slope to landward on
the revetment crest

Eastings 269867
Northings 192633



4580 Westerly View

Crest level lowers

Eastings 269878
Northings 192606



4579 North Westerly View

Outfall (operational)

Eastings 270004
Northings 192574



4578 South Westerly view

Example of poor packing
density and large number
of voids throughout

Eastings 270046
Northings 192594



4576 Westerly View

Eastern extremity of
revetment and survey

Eastings 270113
Northings 192608

MHWS

Sand

MHWS

Legend

- Photo Reference
- Revetment Crest (Approximate Location)
- Revetment Toe 1.2 Km Long (Approximate Location)

Revetment Survey
(14th November 2012)
Photo Locations
Sheet 2 - East

0 12.5 25 50
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