From: [redacted]
To: SizewellC
Subject: Suggested site visit locations
Date: 12 May 2021 13:16:55
Attachments: Suggested site visit locations for Sizewell C ExA.pdf

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Dear Planning Inspectors,

I have attached a proposal and rational for a site visit to Thorpeness which would provide valuable inside into coastal issues relevant to Sizewell C. Although you visited Thorpeness in August 2020 and again in February 2021 neither visit would have covered the understanding that this proposed site visit would provide on coastal change.

Please note that any site visit should be at low tide to enable the maximum benefit to be gained.

Please do not hesitate to contact me directly if you have any queries on this suggested site visit.

Kind regards

Bill Parker

Sizewell C Examining Authority (ExA) suggested site visits – Bill Parker

Further to the ExA request for suggested site visit locations I would strongly recommend a visit to Thorpeness beach to start to understand some of complexity of coast process issues in the area.

Until my retirement in July 2019 I was Head of Coastal Management at Coastal Partnership East and have significant experience in this area. I would be happy to provide further detailed notes if required and I am also be available to accompany the examiners if this would be helpful.

Thorpeness Beach

1) Location – On the beach, parallel to Northend Avenue. In particular the northern most end where the failed sea defences are and the adjacent open cliff.
Note Thorpeness is within 2 miles of Sizewell and there are similar geological compositions between the 2 locations.

Red circle – Location of failed sea defences
Green circle – Access to beach from Old Holmes road

Thorpeness has suffered from episodic erosion for at least the last century, believed to be in an approximate 30-year cycle. However, since 2008 the erosion episodes have been far more frequent. This beach is known to be volatile and is believed to be reacting to movements in off shore sand banks. Future increased sea levels, changes to offshore banks and increased storminess are likely to accelerate this erosional pressure.

2) Things to observe –

Beach, Cliffs and Sea

a. The nature and composition of the beach.
The beach is made up of shingle and sand. The shingle is in a large bank that has been significantly eroding over the last 15+ years. Whilst shingle is a feature of the Suffolk shoreline its location, composition and mix with sand varies depending on multiple factors. It is however unconsolidated and highly vulnerable to storm, surge and wave energy. In the event of benign conditions during the summer the beach can appear to be healthy. However, there is clear evidence that there has been a steady net loss of material causing the beach to steeped and narrow. During any site visit, the inspectors should be aware that the volatility of this beach would be replicated at Sizewell, especially with long-term changes to the Sizewell- Dunwich banks.

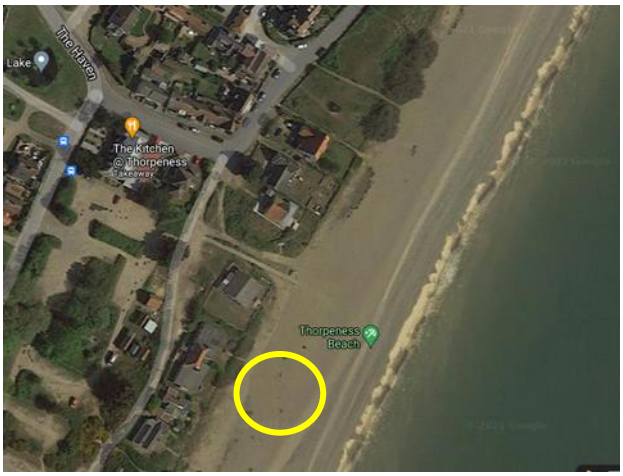
In 2013 during the St Judes storm, 3m of beach depth was lost in 24 hours. This part of the English coastline is capable of sudden, unpredictable and dramatic spikes of erosion.

St Judes storm October 2013 – Access to the beach from Old Holmes road.

b. The nature and composition of the cliffs.
The best location to view the composition of the cliffs is at the failed sea defences or just north of the defences on the open cliff face.
Examiners will note that the cliffs are made up on unconsolidated sand and gravels. There is some clay on the upper levels visible on the open cliffs. There is little resistant material to wave energy and the strength of the cliffs is equivalent to a large children's sandcastle. Where beaches lower and there is direct wave attach on these cliffs then they fail easily. Cliffs are eroded from the bottom and then collapse. This risk is little understood by the public and sadly there was a fatality from a cliff fall in 2017 in Thorpeness.

c. Coralline Crag
The only natural structure with some erosion resistance is the outcrop of crag that extends into the north-sea with its landward root from underneath the most northerly property in Northend Avenue (Red House). This origin has been recently seen at beach level following the recent erosion events however the volatility of the beach means that it is may now be covered up with dynamic surface sand / shingle. This crag is known to be very important with regard to the protection of Sizewell A

and B however it has less relevance for Sizewell C. Examples of this rock can be seen at a recently build cairn built by a local artist that can be seen near the Bent Hills access point / Board walk to the beach from the middle of the village. Examiners should note that this rock is a shelly, fragile, fails along its strata into slabs of rock and is easily broken up in storm conditions. The cairn was recently built by a local artist utilising an unusually large amount of crag pieces found on the beach following a minor storm event.



Yellow circle – approximate location of Crag cairn.

d. Visibility of near shore sand banks
Depending on the prevailing weather and wave conditions at the time of visit Examiners should note that clear arcs of disturbed water can be seen close to shore, originating from Thorpeness ness to the north of the site being visited. These indicate shallow areas caused by volatile sand banks. Examiners may also see these when visiting Sizewell beach.

Sea defences.
The sea defences in Thorpeness are made of several distinct elements:

a. Wire filled gabion baskets – It is believed they were installed in the 1970's as a response to coastal erosion. This methodology would now be considered inappropriate for such an aggressive environment.
b. Geotextile bags – Installed between 2008 to 2010 on the basis that they would offer short term protection to episodic spikes in erosion. They were installed with an estimated 20 to 25 year life. Initially successful and without them the cliffs (and properties) they protect and the gabion baskets would undoubtably failed sooner. However, the level of erosional intensity was not predicted by the consultants Royal Haskoning DHV who were advising Suffolk Coastal District Council (now East Suffolk) at the time and who recommended this solution. There was also little understanding of the level of maintenance required nor how these bags would be removed once they had passed their useful life. Major oversights in hindsight. Those bags have been subject to persistent erosional pressure and have failed in approximately half their lifespan.
c. Small rocks, placed in May 2021 as an emergency measure to reduce the erosion rate in the short term

The impact of sea defences and the re-alignment of the coastline

a. Sea defences (as with Sizewell) are utilised to protect key assets from flooding and the erosional pressures of the sea. On an eroding coastline this type of intervention always has a weakness, the point where coast defences finish and the natural coastline resumes. In Thorpeness as with any potential development of Sizewell C, this is immediately to the north and the south.
b. As the soft coastline naturally erodes the defence then becomes prominent and depending on the direction of long-shore drift (the natural process of beach sediment movement) then one side of the defence may see a build-up of material and the other a starvation of replenishment material and therefore a more rapid rate of erosion. In Thorpeness (as with Sizewell) the direction of long shore drift is often north south but due to off shore changes in sand banks and the direction of the wind this can vary and are difficult to predict. As the coast erodes the ability to maintain effective defences becomes more difficult the further forward the defence becomes from the natural beach / cliff line.

c. The coastline will naturally create an embayment between two hard points. These hard points can be natural (eg Coralline crag) or man made (e.g. sea defences). If one of these hard points fails / is removed the coast will erode and reshape to form a new embayment.
d. Where a defence then fails there is a period of rapid erosion as the cliff / shore line tries to return to an equilibrium and its natural shape. Therefore, when viewing the northern end of the Thorpeness defences the coastline is less prominent since the defences have failed, however the properties (or assets) defended are now highly vulnerable. The rapid erosion during late 2020 and the Spring 2021 highlight the vulnerability of this coastline.
e. The examiners should also be aware that the erosion at Thorpeness has taken place during a very short time period and this is a very useful learning with regard to Sizewell over a much longer time scale. This has happened with little in the way of noticeable climate change impacts (increasing sea level rise, storminess etc..). The longer-term implications for Sizewell that will need to be defended for 150+ years are very hard to predict.

Useful lessons

Whilst none of these types of defence would be considered for the protection of Sizewell C there are some useful lessons to be learnt with regard to:

a. The difficulty in predicting how future shoreline will erode and therefore what type of defence will work and for how long.
b. There are costs to maintain any form of sea defence, the need to be clear as to who is responsible for this and how it will be funded.
c. What is the end-of-life plan, is it practical, affordable and budgeted for?
d. A sea defence should be considered a last resort and mitigating works are both difficult and costly.

When sea defences fail it is always when it is the most difficult technically and expensive time to repair / maintain. Failed sea defences blight many locations on England's coastline often blighting the coastline permanently.

3) When and where to go

a. Due to recent erosion and falling beach levels the access from Old Holmes Road north beyond the sea defences may be closed. Therefore, it is suggested that the Examiners access the beach via Old Holmes Road and walk north as far as possible to observe the beach, sea and sea defences – if possible, continue north and observe the nature of the unprotected cliffs.
However if this is not possible after viewing the site from the south retrace the route and walk north on the foot path diversion along North End Avenue, along the cliff top on Sizewell Common and return to the beach down one of several well-worn footpaths. Then return south as far as possible towards the sea defences. Observe the cliffs and the impact of failed sea defences.

b. Timing: An hour either side of low tide to enable the maximum opportunity to examine the cliff and sea defences.

c. Health and Safety – The Examiners should be aware of the following:
    1. Rough surface (beach sand and shingle) and trip hazards to walk on
    2. Weather can be extreme and appropriate clothing etc needed
    3. Coastal location, be aware that the sea is hazardous and care should be taken.
    4. Cliffs can and do collapse so a safe distance from the cliffs should be maintained at all times
    5. Should the tidal / wave conditions make a return from viewing the unconsolidated cliffs south across the failed sea defences unwise then the examiners may find it prudent to walk north and take one of the paths back along the top of the cliff and back through North end Avenue.

Thorpeness at night

The examiners should be aware of the particularly clear and dark skies at night in Thorpeness. There is anticipated to be significant spill over of light pollution from the proposed Sizewell c development. The ExA is encouraged to visit Thorpeness at night to appreciate quite how special this location is for dark night skies.

Additional comments regarding other Examining Authority visits

1. Sizewell Beach
   When the examiners visit Sizewell beach it would be helpful to understand where the most easterly point of the hard coastal defence is located and its proximity to the beach. This should be both at existing ground level and also include the most easterly point of the proposed buried toe of the structure.
2. Hinkley Point.
   I welcome the proposed visit to Hinkley Point C. However, one of the significant concerns in East Suffolk is the impact of light pollution during development. Whilst the ExA will have the opportunity to see this in Somerset they should be aware that the proposed visit date co-insides with the longest day of the year and there is a full moon on 24th June. The night therefore may not become very dark at all and therefore the full impact of the light pollution that would occur during the winter months cannot be fully appreciated. The examiners should be aware of this.

Bill Parker
12/5/21