

WOODBIDGE TOWN COUNCIL ORAL PRESENTATION

ISH (6) – COASTAL GEOMORPHOLOGY

Wednesday 14 July 2021

Councillor Robin Sanders of Woodbridge Town Council.

I want to come onto this topic with particular regard to the HCDF.

Mr. Patterson has raised the issue of the toe depth and extent and I would reiterate the point he raises, as it is crucial to the toe not being undermined so as to prevent unravelling of the rock slope. Further, as Mr. Patterson intimated the adaptive design includes a deeper and wider toe to be built, but in my view, as an engineer, it would be sensible to construct that deeper, wider buried toe now as construction when there are raised sea levels and possible limited, soft coastal defence would pose very considerable difficulties.

Onto the matter of foundations for the HCDF. There has been comment by East Suffolk Council about defence resilience needing to be considered and on the need for more detail to be given by the Applicant. Mr. Paul Collins has also raised the matter of a lack of detail. I have noticed, as have many IPs have, that there's been no development of the ground improvement details under the defence. It is that I wish to deal with now.

The Applicant has stated this improvement is to increase the strength of the peat which underlies the HCDF with respect to stability of the embankment. Raising an embankment on peat requires more than just considering traditional foundation and slope behaviour that one gets with traditional sand, silt and clay foundations. Peat has particular fundamental properties, it's low bulk weight, it's very low resistance to lateral spreading and it compresses significantly more than other soils under load, particularly in the long term. All these properties impact markedly on foundation behaviour on loading. It is quite common for fill placed on such ground to cause displacements of the peat towards the edges of an embankment area. Many ground improvement techniques struggle to cope with this type of foundation behaviour and can fail in their function due to displacements.

I have dealt with a number of litigation cases as an expert witness where such failures and displacements have occurred. This particular embankment has a very narrow crest compared to the length of the slopes and therefore has greater propensity for this type of lateral displacement behaviour. The impact of this is that the overlying embankment may well start to spread laterally if the technique doesn't work, and that the fill may start to effectively punch into the ground forming continuous type of failure leading to continuous significant settlement.

Whilst catastrophic failures rarely occur with this sort of situation, where soft organic clays are present, which they are here, such failure can occur. Notwithstanding such potential failures the embankments will have a propensity to become compromised

through the peat's behaviour and it is likely this would also compromise the rock armour and therefore impact on the coastal processes.

Finally, without the details of the ground improvement, the impact on coastal processes and geomorphology if the HCDF is removed, cannot be assessed and certain ground improvement techniques may well leave columns of hard material over the ground improvement footprint. Such material will not be able to be removed because of the way it is formed.

It is for the reasons I have referred to that I consider there is need for the ground improvement design to be provided by the Applicant so this can be looked at with regard to the coastal process and future geomorphology of the coast..