

**CORRESPONDENCE**  
**on a Paper published in**  
**Proceedings, Part II, February 1953**

---

Paper No. 5897

“ Post-war Coast Protection Works along the South-East Coast of  
England, which have been Undertaken by the Kent River Board  
as Part of their Functions in Connexion with Land Drainage ” †

by

George Cubley Crowther, O.B.E.

---

**Correspondence**

**Mr Jack Duvivier** congratulated the Author on his originality and enterprise in breaking away from the traditional earth bank with a protected face, when promoting a scheme for the protection of the low land between Reculver and Birchington.

The estimated cost mentioned by the Author worked out at approximately £19 per foot run, which was very reasonable in view of the high standard of protection afforded by the work, and the increased freeboard obtained over what had been there previously.

Incidentally, would the Author explain what he had meant on p. 202 by “ 12 feet above mean high-tide level ” ? The level of mean high-water of spring tides at Reculver was approximately 7 feet above Newlyn Datum, so that a crest level of 21·00 O.D. would be 14 feet above M.H.W.S. and rather more above the mean of high-water spring and neap tides.

Mr Duvivier understood that the length of wall which had been completed by the end of January 1953 had withstood the abnormal storm surge on the 1st February with complete success in contrast with the clay banks on either side, which had been overtopped and badly breached.

The question of dead weight was an important consideration in the design of many of the Thames-side sea walls. At some places the marsh land on which the banks had been originally constructed had a very low bearing capacity, and there was a certain amount of risk involved in heightening an existing earth bank by depositing further clay on the top and side slopes.

---

† Proc. Instn Civ. Engrs, Part II, vol. 2, p. 196 (Feb. 1953).

Mr Duvivier noted that both at Reculver and Dymchurch the Author had paved the aprons with pre-cast blocks. Since it was appreciably cheaper to lay a 6-inch thickness of in-situ concrete than a 6-inch thickness of precast concrete, he concluded that the Author had been afraid that a differential settlement might occur in the underlying filling, which might lead to the destruction of a rigid slab.

Although Mr Duvivier doubted whether the relative movement between one part of the bank and another would be sufficient to necessitate the adoption of a flexible apron consisting of small precast units, there was no special difficulty in obtaining a reasonable measure of flexibility in a cast-in-situ concrete apron. It was only necessary to divide the apron into a sufficient number of sections by means of transverse and longitudinal joints. The thicker the apron the wider apart would be the joints. If settlement occurred the joints would, of course, have to be pointed with a mastic compound from time to time, but the same thing applied in the case of aprons of precast units, except that there were more joints to maintain—and joints were always a potential source of weakness in a sea wall.

Possibly the Author was dubious about the sort of concrete which could be obtained by in-situ deposit between tides, but there was no need for apprehension on that score either, provided the Engineer specified his requirements with precision and the work was properly supervised. The essential requirements to be observed in casting an in-situ apron, apart from the obvious requirements that the mix should be properly designed and well graded, and the concrete thoroughly consolidated after being placed in position, were that the work should be organized in such a way as to ensure that the concrete had taken up its initial set before the flood tide covered it, and that it should have acquired sufficient early strength to withstand wave action without undue abrasion, should rough seas be experienced.

Obviously, there were certain weather conditions under which concreting between tides at a low level should not be attempted or resumed until more favourable conditions were forecast. Such conditions were most frequently encountered during the winter, and it was therefore advisable to do as much of the low level work as possible during the summer and concentrate on the superstructure, or other less vulnerable work, during the winter.

The Author, in reply, observed that Mr Duvivier, in his remarks on the Northern Sea Wall, had asked for an explanation of the term "12 feet above mean high-tide level," and had rightly pointed out that, at Reculver, "high water at spring tides" was given as approximately 7 feet above Newlyn Datum. The crest of the wall designed by the Author would therefore be 14 feet above the latter level.

The Author pointed out that from a series of observations taken during the past 20 years, he had found that it was reasonable to expect a high

tide at Reculver, without any influence of surge or local storm, of 9 feet above Newlyn Datum, several times each year ; he had therefore used his experience in that connexion as a basis for the 12-foot margin. He was convinced that that margin was a reasonable one for that length of wall, and that if the scheme as designed had been completed before the recent high tide and surge there would have been little damage on that length of coast.

With regard to Mr Duvivier's second point, concerning the advisability of providing a facing of precast interlocking blocks, the Author stated that he was still in favour of heavy interlocking precast blocks rather than larger facings cast in situ. Settlement even in reasonably sized local areas was very varied and unless the facing was very substantial it would break up under the stress of storm conditions and might even do so under its own weight if not heavily reinforced ; that was especially pronounced where the underlying strata contained beach and shingle. Mr Duvivier had also to some extent answered his own question when he admitted the necessity of extreme care in the control of placing and mixing in-situ concrete, but the Author did not think that he (Mr Duvivier) had given sufficient prominence to the extreme difficulty of carrying concrete work and of placing in cases where the period of low tide, when the work would not be submerged, was short. Even if the work was carefully planned to be undertaken at low neap tide it was very hard to predict that some abnormal condition would not prevail, so often the tidal conditions as forecast were unreliable. Of course, a cofferdam could be provided for each length as undertaken, but where miles of sea walls were to be constructed, as had often been the case in his experience, the expense was prohibitive.

---