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Laxey

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Dear Matthew

Firstly, may I thank you for your patient and attentive response to the points I and many other residents raised at the ‘drop-in’ sessions last week.

For most of us, the river drainage is probably the most urgent concern, but given the mass of information and the scale of the problem, it may take some time for us to absorb and consider all the implications.

In the meantime, I hope you will forgive me for commenting on a couple of matters regarding the proposed tidal and storm overtopping defences. Apologies too, for the length of this testimony, although I have tried to keep it as short and succinct as possible.

Item 1:

Proposed Harbour Wall

I believe that some parts of this project may need re-examination, for the following reasons:

It seems to be believed by some that during high tides/storm surges, water exits the inner end of the harbour to flood Tent Road.

Having witnessed many storm surges in the last 14 years, I would tend to disagree, and have found no-one able to produce a picture showing this.

I (and many other locals) have observed that a great deal of overtopping runs along Back Shore Road and down the lanes behind the factory (which is where much of the Tent Road flooding comes from), before draining ***into*** the harbour near its inner end,

The proposed wall may prevent this drainage, and increase the pooling on Tent Road, to the detriment of nearby housing.

The attached pictures, while not perfect, will hopefully show what I mean.

1. Overtopping runs across the promenade, veering to the right into the harbour, but ***also*** to the left, along Back Shore Road *(red arrow).*

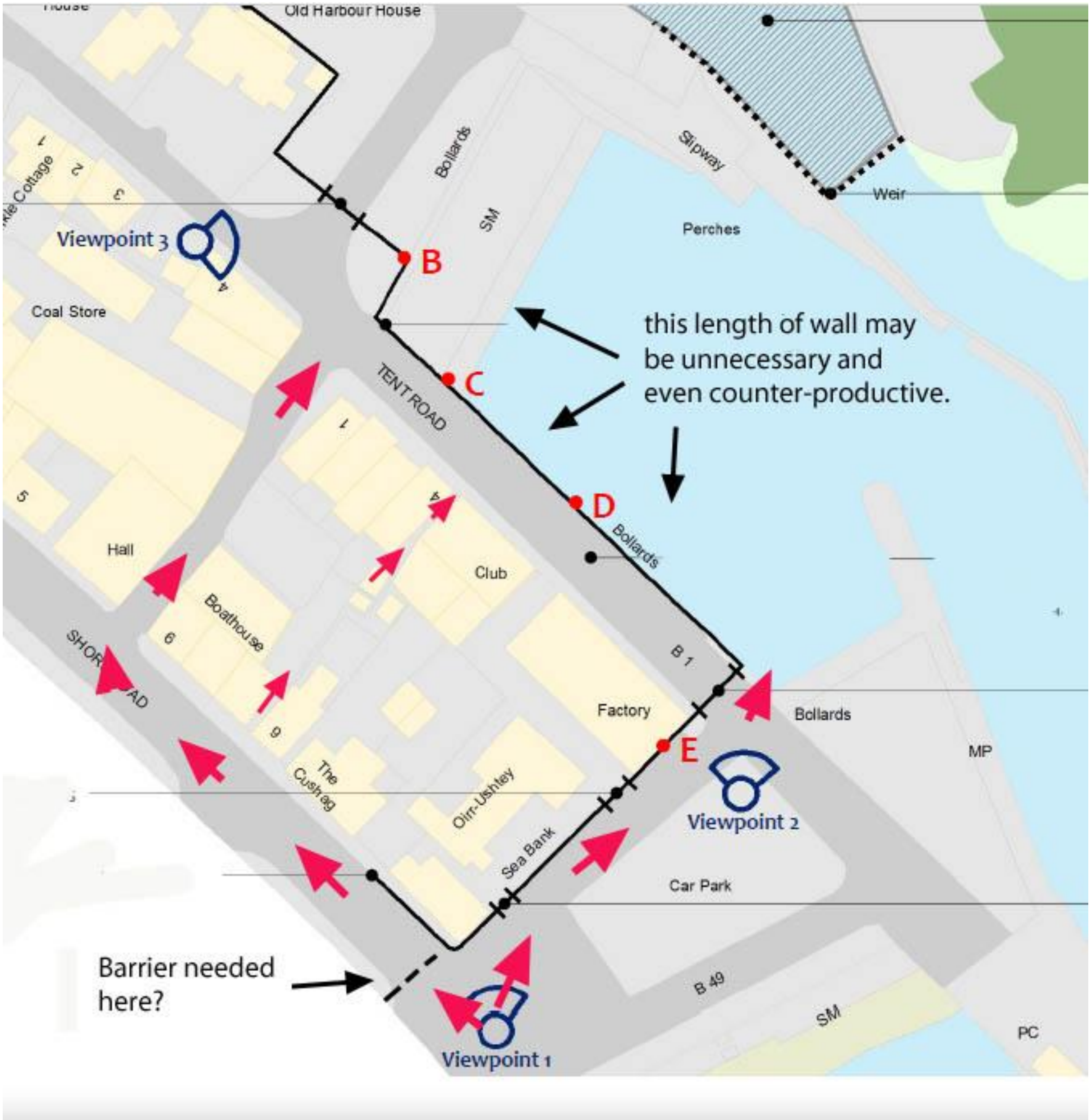
2. Water from Back Shore Road runs down the lanes at the rear of the factory (red arrows in the picture below) – strongly enough to wash the wheeled bin -normally stored in the lane - out into the road.

   As will be appreciated, this water will pool ***behind*** the proposed wall, which will prevent it draining back into the harbour.

In view of this evidence, I would suggest that the plans for the proposed wall should be reviewed to take the above into account.

In the plan below, the red arrows show the flow of overtopping water from the promenade running along Back Shore Road and down the lanes to Tent Road, where (at the moment) it runs back into the harbour.

The proposed wall along Tent Road would very likely impede this flow.



To a degree, it is understandable that to a casual observer, the Back Shore Road flow may seem unlikely, as that road does seem to rise (slightly) above Promenade level.

I suspect this could either be an optical illusion or the slight rise is simply insufficient to impede the flow.
Consultation with residents of Back Shore Road (this morning) confirmed that this flow does indeed happen, with the water eventually running down the connecting lanes as shown in the diagram, and ending up on Tent Road.

I would not wish to assert that my views necessarily over-ride those of your experts and consultants – only that the attached evidence raises sufficient doubt to justify a re-examination of the problem.

Given that we (apparently) have a hundred years to consider it, may I suggest a three or four year pause to carefully observe future overtopping and re-assess the actual salt water drainage routes.

(As a matter of interest, in spite of wide enquiries and dozens of 'storm photographs,' I have so far been unable to find anyone with a single picture which shows water ***exiting*** the inner harbour at any point. There are, however many images showing water flowing ***into*** it from Tent Road).

Item 2:

Promenade Overtopping

Beach Stones

As you can see, over time, the Laxey beach stones have formed a 'ramp' almost to the height of the wall.

It is the opinion of many locals that rather than rush to build an expensive and ugly wall even higher, it may be useful to first try dragging these stones back - away from the existing wall, which some locals assert is around 10 feet high).

This could probably be done quickly and cheaply, and the results observed over the next few winters.

Naturally, no-one knows for sure what the effect would be, but the proposal is rather strongly supported by at least some scientific evidence, derived from the rather old but excellent publication 'Water in the Service of Man' (relevant extract appended below).

Given that this could be done at minimal cost, it seems worth trying as a first step.

Best regards
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had decreased to 16 feet (about one thirtieth of the wave length). Its celerity would now be only about 4 times $\sqrt{16}$, or 16 miles per hour. Hence, waves entering shallow water have their velocities reduced, an effect of the bed proximity, though not of bed resistance. Not only is the velocity reduced but so also is the wave length, for the waves tend to crowd one on the other. The wave shape changes from a pattern of long low crests and long shallow troughs to a series of narrow peaked crests separated by

FIGURE 54. Ocean waves entering shallow water develop peaked crests and flat, shallow troughs.

long flat troughs (Figure 54). The waves approaching a beach look like a series of isolated or solitary waves projecting above a more-or-less level sea, and, in fact, they are often treated as such in theoretical studies.

As these waves move into the shallower water over the sloping bed near the shore, the confined energy causes the crests to rise more steeply, approaching the shape of a cusp. Beyond this stage, the top of the cusp curls over and the wave breaks, the height above the normal water surface at breaking being between one half and two thirds of the depth (Figure 55). A landward wind

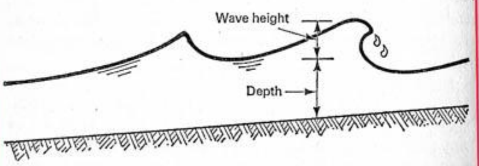

FIGURE 55. Waves break on a sloping beach when their height above the normal water surface is between one half and two thirds of the normal depth.

acting on the waves at this stage produces the well-rounded breakers or tubes that are the delight of surfboard riders.

The slowing down of deep-water waves as they enter shallow water causes the lines of waves coming into the shore at an angle to approach the beach more directly. The section of a wave line, or wave front, reaching the shallows first is retarded before the rest; adjacent sections are successively slowed and the overall effect is a swinging of the wave front like a line of soldiers wheeling, though the line is curved, rather than straight and guardsman-like (Figure 56). This wave refraction is similar in nature to the change of direction of a ray of light entering a layer of glass at an angle, except that the light ray is refracted abruptly at the glass surface whereas the beach wave wheels gradually over the sloping sea bed.

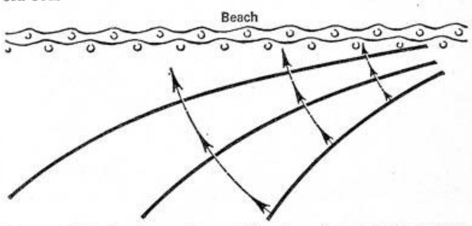

FIGURE 56. Refraction, or change of direction, of waves approaching a beach at an angle.

When a train of waves approaches a vertical wall over a sloping bed there are two possible modes of behaviour, and the fate of the waves depends on their height, measured from trough to crest, in relation to the normal water depth. If the wave height is less than the normal water depth, the waves are reflected with negligible energy loss and the reflected waves leaving the wall are superimposed on those approaching it. The effect of the combination is to produce 'standing' waves, that is, a surface pattern of oscillations which do not move along the water surface. A crest at one instant becomes a trough at the next. The height of the standing waves is double that of the original approaching waves. At the wall, the water level fluctuates, rising to a height above normal water level several times that of the original deep-water wave, so

e on the wall rises above and then falls below the still-water value (Figure 57a).

On the other hand, if the height of the approaching waves is greater than the normal water depth, and the waves do not break before reaching the wall, it is likely that they will break in the immediate vicinity of the wall. Instead of suffering orderly reflection with the production of standing waves, the waves dissipate their energy in breaking. The curling crest entraps and compresses pockets of air which, in effect, explode, throwing water upwards in a high splash. If the air pockets are trapped against the wall, their subsequent, exceedingly rapid expansion produces local shock pressures just above the mean water level which may

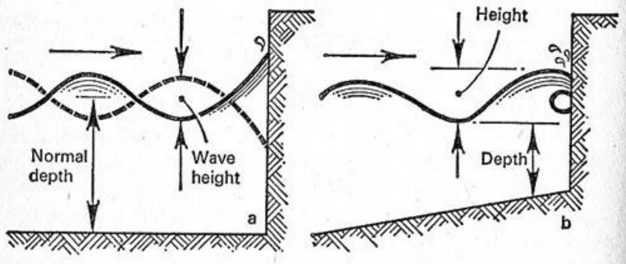

FIGURE 57. Waves approaching a vertical wall. (a) Reflection, where the height is less than the depth. (b) Breaking, where the height equals or exceeds the depth.

be five to ten times those expected from the normal impact of the water elements against the wall. The possibility of the occurrence of these shock pressures must be allowed for in the design and construction of the wall (Figure 57b).

With the reader now out of deep water, our attention can be directed to several interesting forms of shallow-water wave: the oscillatory wave, the solitary wave, and the surge or bore. Each of these types can be produced by appropriate movements of a plate or paddle inserted in a laboratory channel so as to isolate the water on one side from the other. If the plate is moved to and fro along a short length of the channel, trains of oscillatory waves are produced which travel away from the plate in both directions