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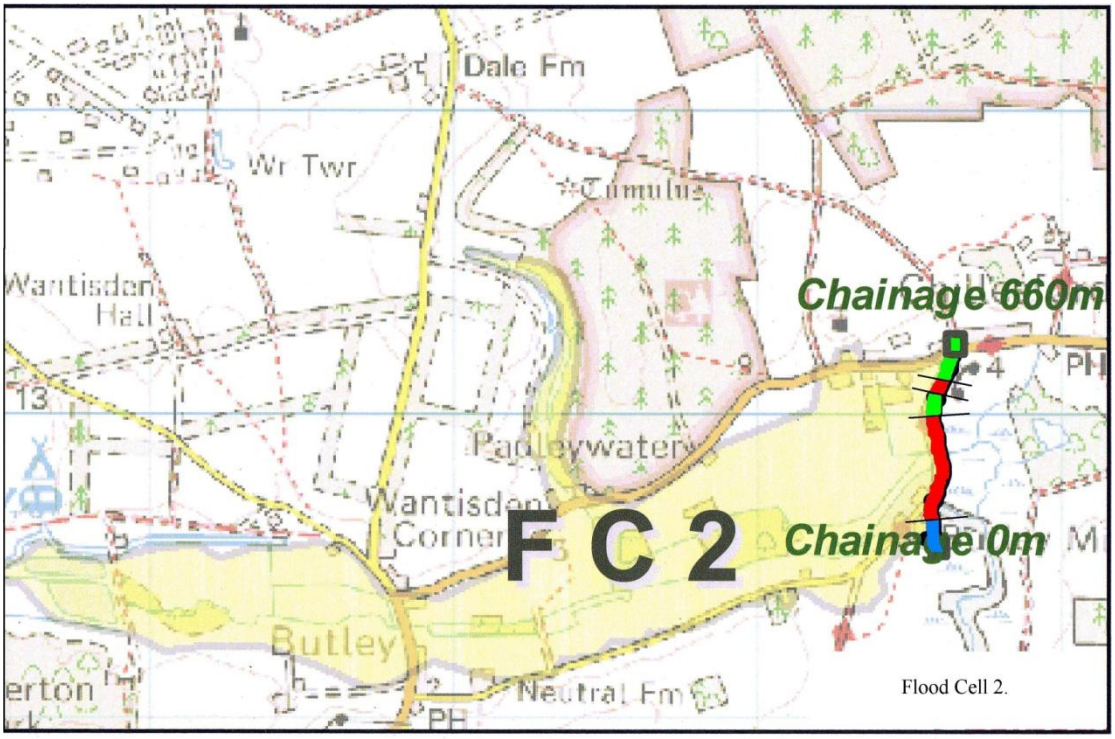
AOEP Flood Cell defence upgrade designs.
Flood Cell 02, Butley Creek.



Standard of defence prior to E.A. upgrade works.

Introduction.

Measures detailed below and on enclosed drawings are to provide a design upgrade to allow the defence to survive a 1 : 200 surge event in the year 2050, as defined by the Environment Agency surge modelling. Where the defence already meets or exceeds this criteria no detail is provided.

With reference to the Environment Agency Flood Cell level and chainage data FC 02 extends from Ch 0 – Ch 660. Of note is the fact that at this moment in time the Environment Agency are raising the banks levels along this length of defence to a minimum level of + 3.3m O.D..

If this work is carried out successfully and suitable vegetated landward slopes are re established then this defence would achieve a 1:75 survivability in 2050 with 100mm overtopping during a 1:20 year event. The recent tidal surge in December 2013 was a 1 : 20 year event according to current Environment Agency modelling.

It is recommended that when the current works has been completed the condition of the defence is reviewed, ideally before the Contractor has left site.

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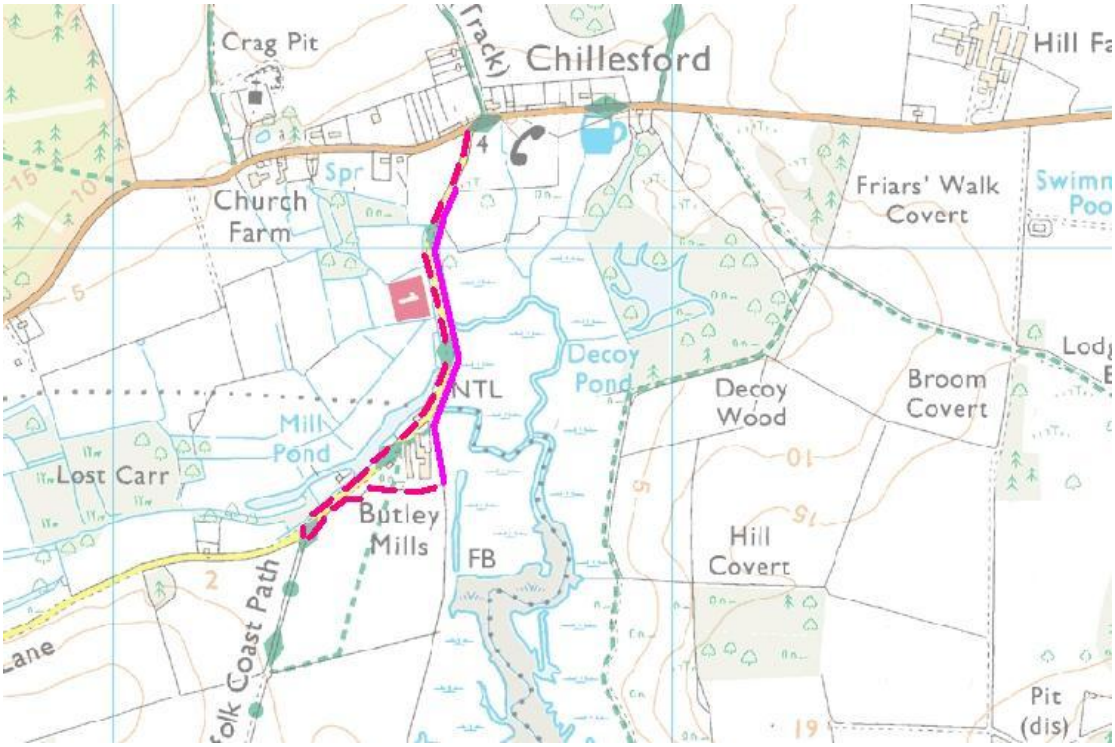
<u>Ch 0m – Ch 550m.</u>

Turf reinforcement and bank strengthening, for all sections able to survive a 1:75 surge event in 2050 but unable to survive a 1:200 year surge event in 2050.

Existing crest level < 500mm and > 300mm below the forecast 1:200 surge level in 2050. When the turf is reinforced, bank anchored and landward slope < 25° the survivable overtopping depth increases from 300mm to 500mm. To achieve the design standard here with an expected crest level of +3.3m O.D. only resistance to a 400mm overtop is required.

Method:

See A4 design sections enclosed detailing examples of defence upgrade: Chainage 88m, 286m and 490m. 6 / 5 / 2014



Purple line = extent of the works. Dashed red lines = access routes.

Phase one.

Cut grass very short on landward bank, crest and 0.5m of seaward bank, collect all cuttings and pile adjacent.

Phase two.

Lay double twist galvanised UPVC coated mesh (see Specification) from top of seaward bank across crest and down landward bank into anchor trench. Join all edges with Spenax stainless steel rings at 200mm centres. Compact arisings into trench to secure mesh.

Phase three.
Install mechanical anchors (see Specification), two rows at 2m horizontal centres, as shown in design sketch. Profile tight to ground all meshed areas not in contact with ground, allow four U pins/m.

Above, entire frontage of FC02 defence, looking north from Ch. 0m.

Brambles covering southern end of defence, minimal overtopping resistance in this sandy soil.

Ch. 100m sewage treatment built into defence, significant reduction in resistance to over topping caused by flow obstruction resulting in scour, also steep un vegetated down landward spill way, see below.

The above un vegetated sandy backfill at Ch. 100m has no resistance to overtopping. Final crest level should reach +3.7m O.D. if overtopping damage is to be avoided in design flood event.

View north from Chainage 70m showing the removal of all topsoil and grass and the subsequent colonisation of weeds and reeds which will desiccate bank.

View north from Chainage 200m showing "work in progress", note reed infestation.

Ch. 290m level markers above clay level, clay un compacted and cracked.

Ch. 490m, clay merges with existing ground level at +3.3m O.D. (assumed), no evidence of compaction, severe cracking as a result. Vertical landward slope. As this work stands it has no overtopping resistance, however it may simply be laid out to dry for subsequent reworking, ***this needs to be ascertained****.*

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