<u>COASTAL DEFENCE</u> <u>A LOWLAND COAST</u>

<u>CLEETHORPES</u>

The east coast of England has been periodically subjected to incursions by the sea. The most famous occasion was in 1953 when an intense low pressure system entered the North Sea and combined with a high tide to cause a storm surge which raised the sea level by up to 3 metres. This was higher than the coastal defences along much of the east coast and many low lying areas were flooded. The strong winds also caused large waves which did a great deal of damage.

Since then the coastal defences have been improved, sea walls strengthened and raised to protect coastal towns. Despite this, high tides and strong winds have caused great damage and loss of life as recently as 1978 when the north end of Cleethorpes was flooded and damage ran into millions of pounds.

EXTRACT FROM

THE GRIMSBY

EVENING TELEGRAPH

FEBRUARY 2nd 1953

TIDAL TORRENT SMASHES CLEETHORPE SEAWALL, FLOODS HUNDREDS OF HOME

Thousands of pounds' body blow to holiday industry

HUNDREDS of Cleethorpes people had their homes flooded over the week-end after Saturday night's gale-driven spring tide tore a gap in the sea defences near Suggitt's-lane and the sea poured over the railway lines to reach as far as Hart-street and Elliston-street; thousands of pounds' worth of damage was done to buildings on the Cleethorpes sea front; part of Grimsby docks was flooded; and the Humber Bank was breached between Pyewipe and Immingham, where a ship in the graving dock was turned on its side.

The "Golden Mile" at Cleethorpes was a chain of destruction. With many amusement caterers' premises battered into mere heaps of wreckage, the elements had struck a body blow to the town's holiday industry.

Lashed to fury, the great torrent smashed through the sea wall between Suggitt's-lane and Fuller-street, tossing enormous pieces of masonry into the air, splintering a protecting sleeper fence like matchwood, and descending in a swirling mass into the back gardens of Oliver-street.

Within seconds the flood had burst open back doors as families were sitting down to tea, and poured down passages and eight-foots in the surrounding streets—Warneford-road, Wilson-street, and Manchester-street. The water then raced across Grimsby-road like a torrent.

But it was Oliver-street that received the full force of the water's fury.

[illegible]

COULD HAVE BEEN WORSE

[illegible]

SALVAGE BATTLE

[illegible]

FAMILIES EVACUATED

[illegible]

Air Force evacuates N. Coles

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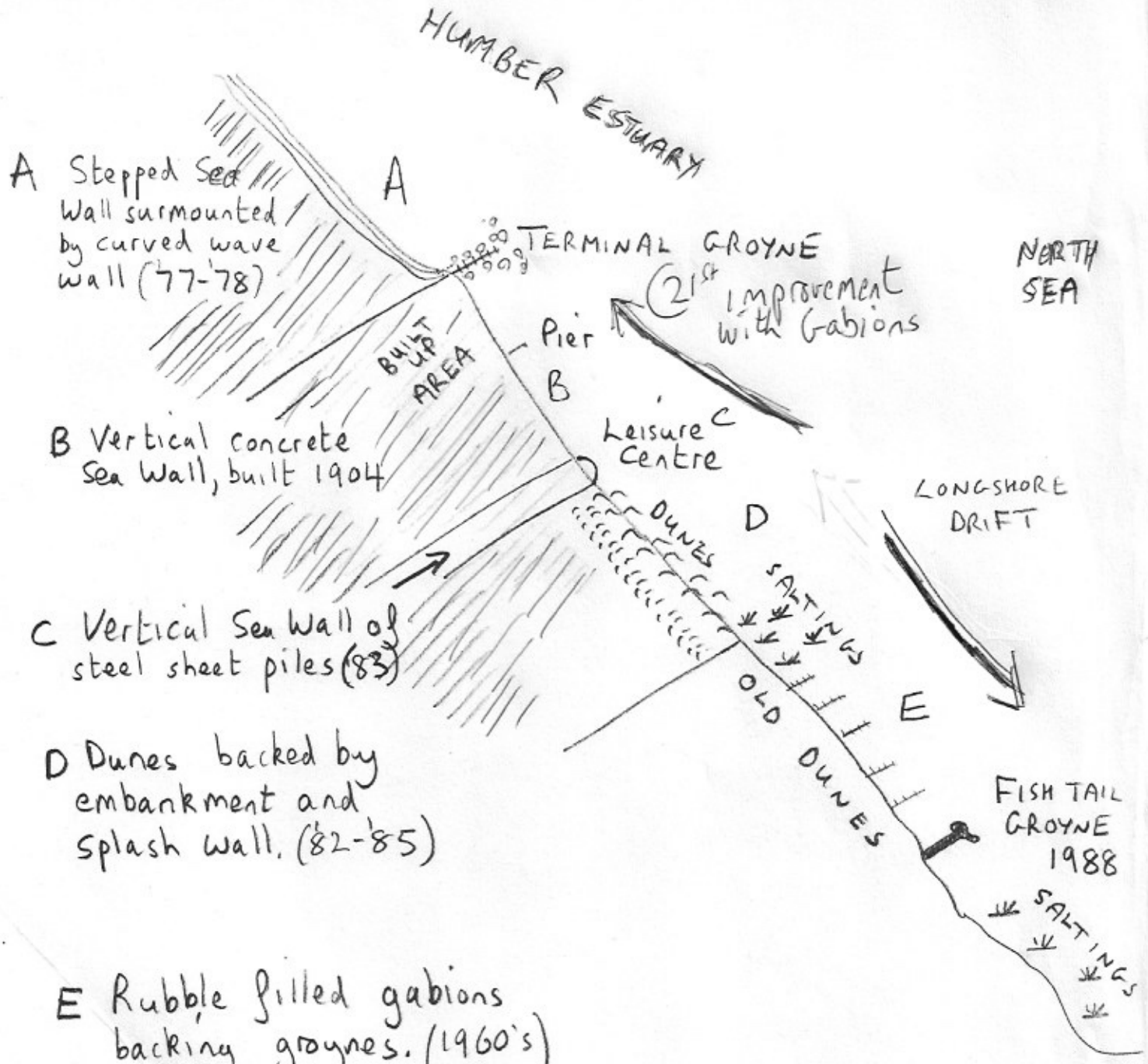
SEA DEFENCES AT CLEETHORPES



A Stepped Sea Wall surmounted by curved wave wall ('77-'78)

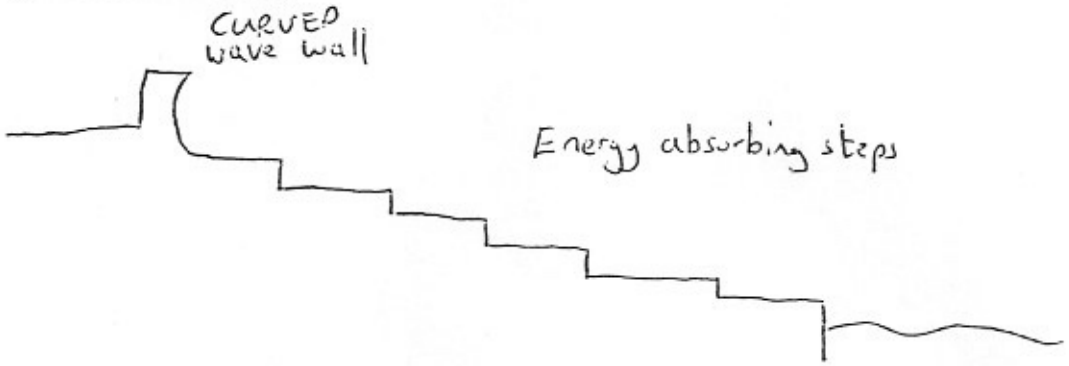
B Vertical concrete Sea Wall, built 1904

C Vertical Sea Wall of steel sheet piles ('83)

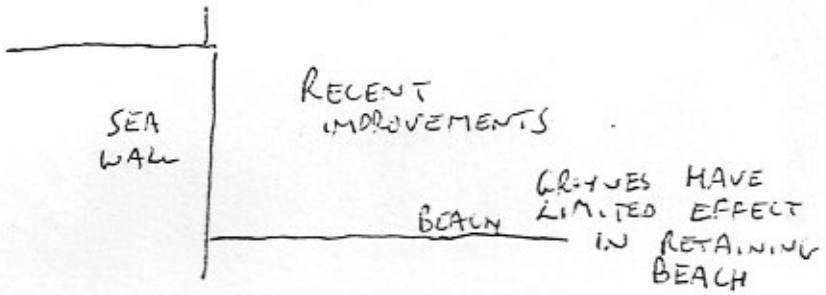
D Dunes backed by embankment and Splash Wall. ('82-'85)

E Rubble filled gabions backing groynes. (1960's)

The coastline from Grimsby south through Cleethorpes to Humberston Fitties exhibits a variety of coastal defences.

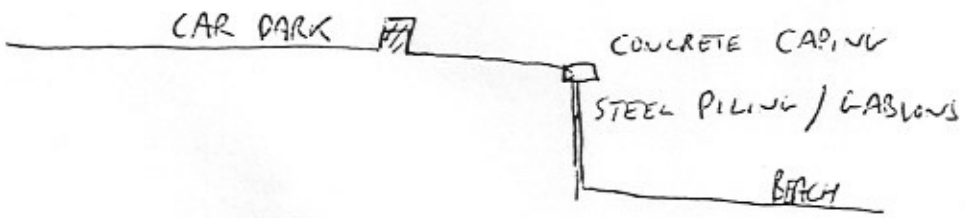


A. In the north is a stepped sea wall surmounted by a curved wave wall (the curve reflects waves) added in 1978.



B. -A terminal groyne at Wonderland is placed to prevent longshore drift to the north in an attempt to retain an energy absorbing beach.

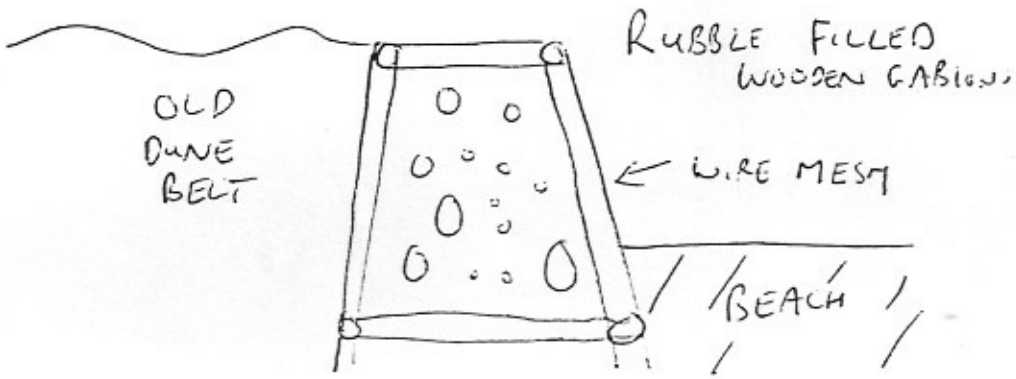
-The vertical concrete sea wall stretches from Wonderland to the Leisure Centre.



C. The Leisure Centre is protected by a vertical sea wall of steel sheet piles and a car park designed to accept water at the higher tides.

D. From the Leisure Centre to the Fitties is a sand dune belt formed by wind blown sand from the broad exposed beach at low tide. This has been supplemented with a raised defensive embankment and splash wall built in the early 1980's.

E. The old dune belt at the Fitties which was being eroded has been strengthened with rubble filled wire Gabions designed to absorb wave energy rather than reflect or repel it. These gabions are fronted by groynes in an attempt to build up the beach.



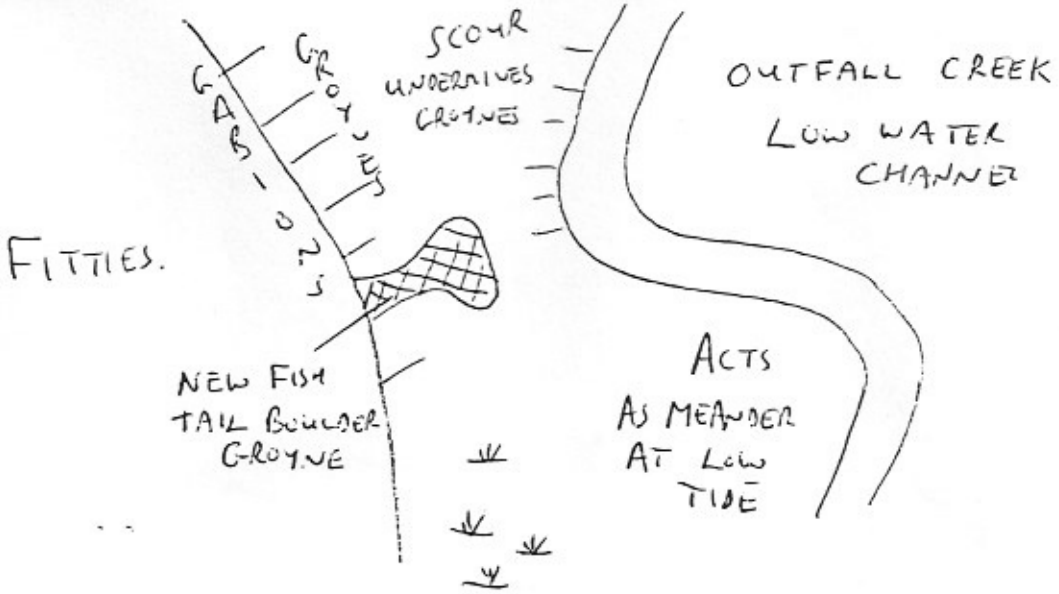
RECENT IMPROVEMENTS AND PLANS

These defences have been shown to be ineffective and 3 danger areas have been recognised.

1. At the Fitties an outfall creek / low water channel was moving steadily towards the shoreline. If it had reached the shore it would have quickly undermined the coastal defences. The distance of the creek to the shore was measured as follows :-

AUG	1984	175 m
FEB	1985	145 m
JULY	1985	115 m
MARCH	1986	95 m

The response was to construct a fish tail boulder groyne to build up the beach and prevent the creek from moving further inshore.

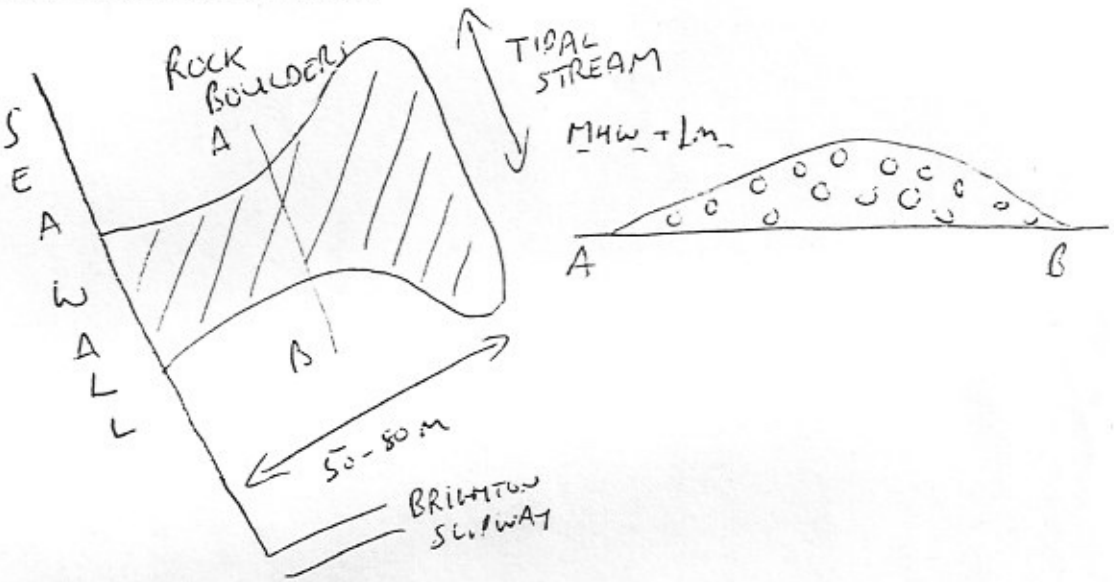


2. In the central promenade section between the Pier and Brighton slipway the groynes have proved to be ineffective. Here the beach in non existent and at high tide the waves directly attack the sea wall. The sea wall is beyond its design life and to extend its life and prevent further damage it is proposed to build a fish tail groyne of rocks and boulders. The aims would be threefold :-

to enhance beach accumulation, supplemented with beach replenishment

to prevent the HWM reaching the foot of the sea wall

to push the tidal stream offshore.



3. At Wonderland the wooden terminal groyne which is essential to the whole defence plan is in a very poor condition. Tidal scour and refraction around the end of the groyne are undermining the groyne and the southern end of the sea wall. It is proposed to build a new end to the groyne armouring it with stones and boulders, this should extend its life and prevent scour.