



“Lincshire is one of our highest priority schemes which protects over 30,000 properties at risk. It has helped protect 35,000 hectares of land and areas of ecological interest that would be at risk of permanent loss by the encroaching sea under a do-nothing policy. It has also secured the area’s future by providing an attractive tourism amenity.”

Andrew Rouse
the Environment Agency, Project Executive

Sandy solution for reducing flood risk in Lincolnshire

In January 1953 some of the worst floods in living memory devastated the east coast of England. A major storm surge coincided with a high spring tide, raising sea levels by almost three metres and causing extensive flood damage and the loss of over 300 lives. The low lying agricultural land in Lincolnshire has no natural barriers to water, and floods reached two miles inland.

Local sea walls were built to reduce flood risk, but this policy became increasingly unsustainable. The beaches were a thin layer of sand on clay, so whenever the sands are shifted offshore by wind or waves any exposed clay is permanently washed away. This lowering of beach levels compromises the stability of the sea walls, while the deeper water creates larger waves exacerbating the problem and increasing the risk of flooding.

In the early ‘90s the Environment Agency estimated that the sea walls would provide only a 1 in 10 years Standard of Protection, meaning that a breach would be expected once every 10 years. The defences could fail completely within 25 years, losing around £3 billion of assets within the flood plain. The integrated project team including Royal HaskoningDHV proposed a new and innovative solution to build up and maintain all the beaches along the entire 24 km coastline.

Sand dredged from the North Sea increased the level of the beach, reduces the risk of waves overtopping the sea walls, protects the clay foreshore against further erosion and prevents the rapid deterioration of the defences. Furthermore, the new beaches have become an important tourism attraction that contributes to sustaining the local economy.

Lincshire is the largest beach nourishment scheme in the country, covering beaches from Mablethorpe to Skegness. In 1994 the Environment Agency commissioned an integrated project team including to manage and supervise the improvement works at Lincshire. Since then, following the main beach reestablishment in 1996 to 1998, yearly recharge campaigns have been delivered. The project now in its fifth phase started in 2010 with Royal HaskoningDHV appointed as Engineering and Construction Contract (ECC) Project Manager for the this five year programme and providing environmental monitoring expertise.

Comer Mead, Royal HaskoningDHV’s EEC Project Manager said: “Every year contractors survey the beach, compare its existing condition to the target profile and plan the year’s replenishment work accordingly. For the past four years an average of more than 500,000 m³ of sand has been placed each year at an annual cost of about £6 million.



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“Each year the project management team decide what work is needed, and where, when, how and at what target cost. The contract includes a ‘pain and gain’ element based on any variation of results compared to the original target. This has generated both cost savings and progressively improved results year on year. Beach nourishment demands complex and detailed planning and organisation, and the success of this project is a huge achievement for the whole team.”

Safety is a big challenge as these Lincolnshire beaches are very popular, and work has to be planned carefully to keep the public safe at all times. Placing and moving the dredger’s sinker lines, pumping sand, and grading the material to its final profile takes place 24 hours a day, seven days a week and is constantly moving to cover all the beaches as quickly and efficiently as possible.

Royal HaskoningDHV’s Emma Beever, the Public Liaison Officer says: “We adapt our working practices to reduce impact on the public as much as we can, so we liaise with them to plan the work on popular beaches around peaks in the tourist season. We take our mobile information unit wherever we work, and visit schools and organise site trips for children so we can explain what we are doing and the importance of site safety. Watching the new beach being created in front of the promenade has actually become a tourist attraction, and on a sunny day there can often be quite a crowd.”

The success of this approach to public communication was recognised by the Considerate Constructors Scheme who recently presented the team with a prestigious ‘Gold’ award for their excellent work on safety and liaison with local businesses and the public.

Comer Mead continues: “Lincshire is such a successful and environmentally friendly scheme that nobody notices it except

during the annual renourishment. It is an excellent example of how we can enhance society together, enabling thousands of holidaymakers to continue enjoying the beaches while protecting homes and businesses from floods.”

Andrew Rouse, the Environment Agency’s Project Executive concludes: “The scheme gives a unique opportunity to implement and embed lessons learnt into future campaigns, streamlining processes and systems to achieve an extremely efficient delivery model and provide a large contribution to the Environment Agency national efficiency target. It has been great to be part of an extremely successful integrated team and I look forward to future campaign success.”

Facts and figures

- The scheme protects against a one in 200 year tidal flood (0.5%) for 30,000 properties and 35,000 hectares of land
- 530,000 metres³ of sand were pumped from licensed off-shore sites onto 20km of beach in 2013
- The dredger Breughel (named after the famous Belgian Northern Renaissance painter) has a hopper capacity of 11,650 metres³ and can carry 18,710 tonnes of sand. It has a 1,200mm diameter dredging pipe and can dredge down to 43 metres. It also has the lowest carbon footprint in its class
- The average daily sand added to the beach has risen from 4,000 m³ in 2010 to over 11,000 m³ per day in 2013.