RSPB Langford Lowfields artificial sand martin bank creation

Partnership project delivered by RSPB and Lafarge Tarmac with support from Sita funding and construction by Sandinyoureye Ltd.

At Langford Lowfields, a 175ha reedbed restoration reserve, **Sandinyoureye** sand sculptors and RSPB designed and created an artificial sand martin bank that is purpose built to look and function as naturally as possible with sand martin nesting ecology.

Creating an artificial bank with washed reject sand from the quarry can be a challenge - particularly on an exposed site and with sand that is not immediately compatible for high quality sand compaction, as it has little clay and fewer angular fragments.

The Langford Lowfields bank was created over four days of construction with **130 tonnes** of reject sand combined with low mix rates (75-1 to 100-1) of cement and keyed into an existing subsoil bank with a view over the water.

It was built according to key sand martin specifications including a **vertical face** (2.5 meters high) to limit predation impacts from predators such as weasels and foxes. It is also designed to be **concave** as the birds have a preference to view each other in a colonial set-up.

Main construction points:

- The main construction process involves creating a sturdy framework of wooden forms that hold the sand for compaction. The Langford structure is 7 metres wide, 2.5 metres high and 5 metres deep (to allow several years of use by carving back the face).
- Sand and cement are mixed at 100 to 1 ratio in 300mm layers which are then rotavated with large quantities of water followed by hydraulic compaction.
- This process is repeated to create highly compacted layers, raising the structural forms as required. It is critical to **ensure compaction is wet** as the quality of the final structure and settling of the sand requires large quantities of water.
- After a minimum of a week the forms are removed and the main face can be cleaned/carved by hand with the blade of a spade to create a concave vertical face.
- It is advisable to add a layer of **chicken wire and seeded topsoil** to the surface to encourage vegetation growth that will reduce the impact of surface run-off from large precipitation events and reduce surface burrowing from predators/rabbits.

Sandinyoureye constructing the sand bank with Paul Afford plant hire on the digger.

In 2012 the bank was occupied by 150 nests, in 2013 over 200 nests occupied. Parasite loading – in particular fleas, are a key reason for sand martin's excavating new nest chambers annually. For this reason the bank is designed so that it can be cut annually for between 4-7 years by the volunteers so a new face is exposed for each spring.

The first sand martins made nests three weeks after construction.

Measuring a cross section of the sand martin bank. The burrows run on a slight incline for on average of 650mm with a nesting chamber at the back

RSPB images courtesy of Ben Hall, Jamie Wardley and Michael Copleston

Naturalised appearance of structure

Compacted sand is critically stronger at resisting digging from fox as shown above

RSPB images courtesy of Ben Hall, Jamie Wardley and Michael Copleston

Early establishment in 2013 of the banks second year of colonists – note the face has been re-carved following winter flooding and the establishment of turf on the surface has improved.

In summary:

- Each bank will be site-specific with regards to topography, availability of sand, and cost of machinery.
- Compaction is required to retain strength in the structure and create a vertical face – ensure this process is completed with water.
- Maintenance will be required to carve back a new face of the bank every 1-2 years by 500mm to 1000mm
- Costs for a standard structure of this size following similar protocol should be in the region of £2,000 to £5,000 pending resources for labour and machinery.
- For more information and advice contact michael.copleston@rspb.org.uk

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