

# Kenninghall Anaerobic Digester Plant

Norfolk, United Kingdom

Anaerobic Digester Plants utilize organic waste by fermenting it to produce natural gas. This gas is then used to make 'clean energy' which can supplement the national network. These facilities are becoming more common as the focus on renewable energy becomes evermore important.



Project owner  
Kenninghall Anaerobic  
Digester Plant

Product  
DURUS S400  
Fibrin XT

Function  
Polypropylene Fibres used  
to replace conventional  
steel fabric whilst  
maintaining post failure  
serviceability

Contractor  
J H Vaudrey

Volume  
2000 kg DURUS S400  
500 kg Fibrin XT

## Challenge

Bonar were approached by the Consulting Structural Engineer to provide a synthetic macro fibre solution for the ground bearing external reinforced concrete slab. The nature of the Process involves the storage and fermentation of acidic organic waste (from maize production) which would corrode conventional steel fabric reinforcement leading to a shortened service life and also pose a risk of contamination of the ground beneath the facility in the event of a containment failure. The Environment Agency took a keen interest in this during planning approval.

## Solution

- Design loadings were provided, with the designated concrete grade and pavement thickness to allow one of Bonar's Consulting Engineers to calculate a sufficient dosage of DURUS S400 and supply a professionally indemnified solution.
- Fibrin XT was also incorporated into the solution to give improved plastic shrinkage cracking resistance, enhance durability and frost protection.



Large areas can be poured straight from the truck without the need for pumping.



Macro fibre reinforced concrete eliminates the use of steel and the risk of shortened service life due to corrosion and spalling.

#### Benefits of the solution

- High risk of accelerated failure and spalling due to corrosion of steel reinforcement over time has been eliminated.
- Design loading requirements have been maintained by the use of DURUS S400 macro fibres.
- The use of Fibrin XT has resulted in enhanced durability and frost protection.
- Embedded carbon has been reduced, promoting sustainability.
- Health and Safety hazards associated with steel fixing, handling and placement have been eliminated.

#### Installation benefits

- Construction time has been reduced as no steel fixing was required.
- Concrete could be poured directly into formwork, without the need for pumping due to in-situ steel fabric.
- Larger areas of pavement can be poured, contraction joints made after initial set (12-24 Hours).

#### Result

Structural requirements for traffic and loadings have been maintained whilst eliminating the risk of accelerated failure due to steel reinforcement corroding after prolonged contact with the acidic waste liquid, or a containment failure.

Construction time and Health & Safety Hazards have been reduced. Sustainability has been improved due to the reduction in embedded carbon from using synthetic macro fibres in place of traditional steel mesh.

#### Products used



##### DURUS S400

Synthetic Macro Fibre used to replace structural steel mesh reinforcement.



##### Fibrin XT

Monofilament Micro Fibre for protection against plastic shrinkage cracking whilst improving durability and frost resistance.