ADFIL
Construction Fibres

CASE STUDY

Biogen Biogas Generation Facility

Atherstone, Warwickshire, United Kingdom

Biogen operates a number of biogas facilities across the UK, where organic waste is fermented to produce methane gas for fuel. The organic liquid waste is acidic in nature, and therefore poses a high risk of corrosion to conventional steel fabric. Adfil fibres provide a better solution.

Project owner
Biogen

Product
DURUS S400
Fibrin XT

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

Contractor
Toureen Mangan

Volume
8000 kg Durus S400
1000 kg Fibrin XT

Challenge

This project required an original specification for a ground bearing reinforced concrete pavement using steel fabric to be redesigned to incorporate polypropylene macro and micro fibres. The acidic nature of the organic liquid waste being stored and handled during the fermentation process, poses a high risk of corrosion to the initially specified steel fabric reinforcement and as a consequence post failure serviceability and service life would be greatly reduced. The post failure residual strength of the concrete pavement needed to be maintained, without the use of steel fabric.

Solution

- By replacing the steel fabric with inert DURUS S400 polypropylene macro fibres, the risk of a shortened service life resulting from steel corrosion, has been eliminated
- By incorporating the fibres into the concrete the capacity of the pavement to cope with high levels of HGV and Mobile Plant traffic has been maintained
- By also incorporating Fibrin XT into the concrete, durability and freeze thaw resistance has been enhanced

Bonar
partners in performance

Acidic organic waste is stored in large fermenter tanks before the gas is drawn off; the risk of corrosion in this area is now eliminated

Large areas of pavement could be poured and then saw cut contraction joints made, without delays from steel fixing

Benefits of the solution

The replacement of steel fabric with DURUS S400 and Fibrin XT has eliminated the high risk of shortened service life from steel corrosion.

Installation of the FRC (Fibre Reinforced Concrete) pavement saved approximately two weeks of steel fixing, and also allowed a busy site to maintain an effcient works programme, as traffic movement were not hindered by in-situ steel fabric placement and storage.

Due to inclement weather, the project timeline was delayed, with financial penalties in place for late completion of the project. Toureen Mangan were able to bring the project back on track due to the time saving resulting from the use of FRC in the external reinforced concrete pavement.

Installation benefits

- Significant time saving due to no requirement for steel fabric placement.
- Minimal disruption to site operations during pavement construction, as the FRC could be poured with the reinforcement already contained within it.

Result

Risk of a shortened service life of the pavement due to spalling and accellerated failure caused by steel fabric corrosion has been eliminated.

Project timeline was brought back on track due to time saved as there was no requirement for steel fabric fixing.

Design performance for HGV Traffic has been maintained without the need for steel fabric.

Products used

DURUS S400
Macro fibre made out of polypropylene.
Improves the bond with the concrete.

Fibrin XT
Micro fibre made out of polypropylene.
Reduces plastic shrinkage.

Belgium	T +32 52 457 487	Netherlands	T +31 85 744 13 00
Czech Republic	T +420 518 329 113	Slovakia	T +421 37 6556010
France	T +33 1 57 63 67 40	United Kingdom	T +44 1482 863777
Germany	T +49 6022 812020	USA	T +1 828 665 50 50
Hungary	T +36 49 540 190	**www.adfil.co.uk / info@bonar.com**	