

Earls Colne Airfield Lorry Park External Paving

CASE STUDY

Earls Colne, Essex, United Kingdom



A private investor identified the opportunity to develop a large area of hardstanding for use as a HGV freight traffic overnight administration area in Essex. ADFIL were approached by the Investor and appointed Contractor to provide a formal design using a combination of DURUS macro and Fibrin micro fibres to replace 2 layers of conventional steel mesh reinforcement in the external ground bearing reinforced concrete slab specification.



Project Owner

PRIVATE OWNER

Product

DURUS EasyFinish
Fibrin XT

Function

- Replace conventional steel mesh reinforcement to reduce construction time
- Provide a very durable concrete subject to high volumes of 44T articulated HGV traffic
- Reduce embedded CO2
- Eliminate H&S hazards during installation

Contractor
DA Cant Ltd

Volume
Circa 7000m3

Challenge

Due to high volume HGV traffic use, the initial specification for the external concrete pavement included Air Entrainment and heavy grade conventional steel mesh reinforcement.

The appointed contractor, DA Cant Ltd asked ADFIL to provide an equivalent solution using a combination of DURUS synthetic macro and Fibrin synthetic micro fibre to allow them to minimise construction time and cost, whilst ensuring service life and durability of the hardstanding area was assured.

Solution

- A professionally indemnified synthetic fibre solution, using DURUS EasyFinish in combination with Fibrin XT micro fibre, was provided by ADFIL Design Engineers.
- The addition of Fibrin XT micro fibre improves the durability of the concrete and also provides freeze/thaw protection in lieu of AEA and also enhances the durability of the hardened concrete to protect against heavy surface wear.
- The solution was accepted by the Client and Contractor.
- The concrete supplier was given Technical Support to ensure the mix design was correct.
- Site support was also given during installation.

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By eliminating steel mesh, large areas can be poured and finished, with saw cut contraction joints being made the following day.



Without the need for handling, cutting and fixing of steel mesh, construction time is vastly reduced and associated health & safety hazards eliminated.

Benefits of the solution

The Contractor was able to show a significant reduction in construction time by eliminating the need for steel placement and fixing in the construction schedule. This also presented an significant overall cost saving due to reduced man hours and spiralling costs of steel mesh.

Air Entrainment was not required due to the addition of Fibrin XT to give the concrete frost protection and improve durability.

The use of ADFIL DURUS synthetic macro fibres to replace conventional steel mesh reinforcement give an embedded carbon saving of around 60%, allowing the project to improve its sustainability credentials.*

*Reference DURUS EasyFinish macro synthetic fibre Environmental Product Declaration (EPD)

Installation benefits

The concrete could be poured directly into the formwork in larger volumes, with saw cut joints being made the following day.

There was no requirement for heavy steel mesh to be handled, cut and placed, which eliminated significant Health & Safety hazards and reduced construction time.

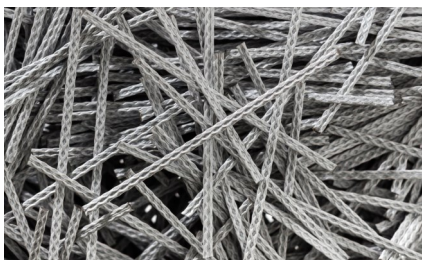
Result

The external concrete works were completed inline with a challenging construction schedule, to the satisfaction of the Client.

The use of DURUS synthetic macro fibres has maintained post crack structural performance, while reducing construction time, overall cost and embedded carbon.

The use of Fibrin XT has improved the durability of the concrete pavement and given frost protection in lieu of AEA.

Products used



DURUS EasyFinish Synthetic Macro Fibre
Replaces conventional steel mesh reinforcement for post crack residual flexural strength in ground bearing applications.



Fibrin XT Monofilament Micro Fibre
Improves the durability of the hardened concrete in terms of impact & abrasion resistance and gives frost protection in lieu of air entrainment.