



Concrete and composites: a powerful partnership

Aaron McConkey

Fibrelite has formed a number of strategic partnerships with major precast manufacturers in Europe and the USA to provide a range of composite covers to fit each company's trench layouts.

At the end of 2016, the UK government unveiled a record infrastructure spend pipeline of £500 billion-plus, £300 m of which will be invested by 2020/21 [1]. Europe is on a similar track with the European Commission's 2014 unveiling of a three year €315 billion economic infrastructure growth initiative to mobilize public and private investment [2]. Three years on the initiative is on target and has grown to €515 bn [3] with scope to continue growing. A Linklaters report estimated that global institutional investors have funds of up to US\$1 trillion to divest into European infrastructure over the 2013–2023 period (Fig. 1) [4].

Composite materials play an important role in this, with expected growth in the UK construction industry alone of 42–78% by 2020 (to £510–640 m) and £1240–1520 m by 2030 [5]. A recent position paper from the University of Southampton cites clear drivers of this growth:

“As economic and sustainability pressures have grown, there is increased pressure to reduce energy consumption, ‘through-life costs’ and installation times. This has increased demand for stronger, lighter, more intelligent and more durable [composite] materials tailor made for purpose.” [6] Predicted composite market growth to US\$105bn by 2030 [7] is a testament to this.

Fibrelite has been spearheading composite development and innovation in the access cover market since 1980. Starting with development of the world's first composite cover for Esso UK (ExxonMobil) their covers were then specified as standard for the majority of major oil companies and still are to this day. They then branched out into engineering and manufacturing GRP composite covers for a wide range of industries including infrastructure, construction, transportation and many more. When first marketing their covers in these new industries, they had to educate the market to the existence of a lighter stronger more

durable alternative to traditional materials. Now their markets are far more familiar with composite material, often specifying them at the planning stage.

“In recent years we're seeing more and more traditional industries favouring composite access covers over metal and concrete alternatives, the most recent of which is precast concrete trench systems” – Ian Thompson, Managing Director, Fibrelite

Precast concrete trench systems are used extensively in infrastructure to provide protection for and easy access to underground



FIGURE 1

Fibrelite's custom composite covers for precast concrete trenches are available in all load ratings.



FIGURE 2

All Fibrelite trench covers can be safely removed manually.

services. As composites adoption grows, many precast trench manufacturers are extending their product lines to offer glass reinforced plastic (GRP) covering options by partnering with Fibrelite.

Precast concrete trenches

Precast concrete trenches (also known as troughs, ducts or channels) are used extensively to carry cabling and piping in power and sub stations, water and sewerage plants, data centers, wind farms, telecoms, universities, refineries and many more.

In contrast to direct burying or overhead suspension, precast trenches house and protect services from weather changes like freezing or overheating and accidental or deliberate damage while allowing ease of access for monitoring and maintenance. They also allow for easy expansion when growth is anticipated.

Precast concrete trenches are frequently favored over concrete cast in situ to reduce install time and skilled labor required on site.

Historically precast concrete trenches have only been covered with concrete or metal covers. Where high load ratings are required (like road crossings) covers can weigh hundreds of kilograms. Over time environmental factors can cause covers to crack, fracture, crumble or corrode.

As specifications are changing to favor GRP access covers, precast trench manufacturers and composite cover manufacturer Fibrelite are working together to bring joint offerings to the market (Fig. 2).

Why composite access covers?

Manual handling causes over a third of workplace injuries in the UK [8] the majority of which are caused by the handling of loads whether lifting, lowering, pushing pulling or carrying. Advice to prevent injuries includes not stooping, bending your back or lifting heavy loads from ground level. Unfortunately, for operators dealing with metal and concrete access covers in their jobs, this describes the process they must undertake to remove traditional access covers.

The light, strong, durable properties of composite materials coupled with Fibrelite's engineering enables creation of a far safer,

simpler solution. Fibrelite covers weigh a fraction of concrete or metal alternatives and offer load ratings from A15 (1.5 tonne/3400 lb) to F900 (90 tonne/202,000 lb). This means that all trench covers can be safely manually removed by two people at all load ratings. Ergonomically designed lifting handles ensure operators use the optimal lifting technique, lifting from the waist instead of bending or stooping, eliminating possible back injuries and crushed fingers. Composites allow creation of an incredibly strong inert monolithic cover structure that will not crack or delaminate and eliminates deterioration from corrosion and extreme temperatures in service.

Fibrelite holds accreditation to the ISO quality standard (ISO 9001:2008) and British Standards Kitemark, the first composite cover manufacturer to be awarded this certification of quality. In fact, a Fibrelite cover was tested after 14 years in service on a highly trafficked forecourt and still fulfilled the requirements.

"Safety and efficiency are key to everything we do at Fibrelite. Our goal is to make products as safe and simple to operate as possible" – David Holmes, Technical Director, Fibrelite

To provide a safe walking and driving surface, all covers have an anti-slip pattern equivalent to a high-grade road surface wet or dry, far exceeding health and safety advisory requirements.

Fibrelite products are manufactured in the UK, US and Malaysia and supported by a global network of distributors. Fibrelite serves as strategic partner on a number of large scale developments specifying composite covers around the world. Their team works with contractors, architects and engineers to create custom covering solutions for each access requirement in a load rating and size to suit, with optional of custom colors and branding.

Strategic partnerships

Fibrelite has formed strategic partnerships with major precast manufacturers in Europe and the USA to provide a range of covers to fit each company's trench layouts. Fibrelite's flexible design and manufacturing capabilities enable them to create covers to fit directly into existing precast concrete trench configurations meaning that no adjustment of the precast trench manufacturing process is needed. Covers can be manufactured to fit all precast trenches including flat tops with or without side flags, and trenches with a factory formed recess. This allows precast manufacturers to quickly extend their product range to meet client's composite requirements without any changes to their manufacturing setup.

Recent installation: Garreg Lwyd wind farm, Wales

As part of the UK's 2020 renewable energy target (to meet 15% of their energy needs from renewable energy sources including generating 30% of electricity from wind, solar and other low carbon sources) Garreg Lwyd was selected as one of 7 optimal Welsh locations for wind farms; once completed it will be capable of providing sufficient electricity to meet the average needs of over 26,000 homes (Fig. 3).

The project consists of 17 turbines, a control building and a substation to supply power to the grid at the correct voltage and amperage. At the substation, there are two long precast concrete trenches to hold the large amounts of cabling and utilities

Download English Version:

<https://daneshyari.com/en/article/7871591>

Download Persian Version:

<https://daneshyari.com/article/7871591>

[Daneshyari.com](https://daneshyari.com)