

WHAT HAPPENS WHEN BOMBS EXPLODE?

Engineers at the University of Sheffield are getting to the heart of what happens inside an explosion, in a new project aimed at improving the design of bomb protection systems.

The team will be measuring explosions 'up close', gathering detailed information from inside the fireball of different types of blast and different environmental conditions, ranging from a land mine to a bomb exploding close to a building.

As global threats from terrorist attacks or from armed conflict increase each year, effective materials, buildings and other structures that can withstand a blast are vital to increase public safety. Despite this, little data has been gathered from actual bomb blasts, so engineers have to rely on computer modelling when designing protection systems.

'Just like earthquakes and hurricanes, real world explosions are unpredictable,' explains lead investigator, Professor

Andy Tyas, an expert in blast and impact engineering in the University's Department of Civil and Structural Engineering. 'Seismic and wind engineers have designed tests to predict how buildings and other structures will respond to these natural disasters, but it's much harder to do this for explosions. Although blast engineers do test structures and materials to assess their protection capability, there's a lot of debate about the reliability of these tests and a heavy reliance on computer modelling of explosions. That's because we don't really know what's going on inside the blast, so we can't tell for sure how repeatable the tests are.'

The £1.2m project, funded by the Engineering and Physical Sciences Research Council (EPSRC) will be carried out at the University's research facilities, in Buxton. The first step will be to improve and adapt the CoBL (Characterisation of Blast Loading) testing equipment, previously used by Professor Tyas and his team to measure the

output from shallow buried landmines. New technologies will enable the apparatus to carry out direct measurements of the blast load, in both space and time, to provide detailed data on the aggressive environment after an explosive is detonated very close to a target.

'Blast loading research carried out during the middle of the last century led to a very good understanding of the effects of large blasts over long distances – for example from atomic weapons. But these insights are less useful when looking at modern day blast threats, which are frequently from smaller, close-range explosions,' says Professor Tyas.

'Only by understanding the complex physics and fundamental chemical reactions at play inside the explosion fireball, can we allow our engineers a better understanding of blast loading. These insights will help us design better systems to protect people around the world from explosive attacks.'

£18M NOTTINGHAM STUDENT ACCOMMODATION PROJECT GETS UNDERWAY WITH NMCN

nmcn (formerly North Midland Construction Plc) has started work on an £18m student accommodation development, on Nottingham's Talbot Street.

Due for completion in April 2020, nmcn has been awarded the demolition, construction and delivery of the facility, which will comprise 331 self-contained bedrooms along with communal areas and outdoor space.

Work has now started on the site of former school buildings and a car dealership. The

project will enhance the local area alongside existing student housing on the city centre street and help to meet the growing demand for top quality, sociable student accommodation in the city.

nmcn has been selected for the project by developer RedOak following a string of prestigious city centre residential projects, such as the current Assay Lofts development in Birmingham's Jewellery Quarter and a trio of student developments in Sheffield worth £58m.



LOCAL UNIVERSITY STUDENTS GIVEN LIFETIME OPPORTUNITY TO MAKE A DIFFERENCE TO THE ENVIRONMENT

Talented engineering students from Exeter University (Penryn Campus) and Plymouth University will be battling it out to create the best water fountain design in order to win £500 and the chance of a lifetime to make a difference to the planet.

Organised by Our Only World, a new Polzeath-based charity created by Tina Robinson who is also the treasurer of Polzeath Marine Conservation Group, the competition will run from term start in January 2019 to April 2019 with the ultimate hope of moving the production of UK water refill stations from abroad to the United Kingdom.

The idea for the competition came in October just after Sadiq Khan, Mayor of London, announced he was going to spend £1.7million on over 100 water fountains

around the capital city in a bid to reduce plastic pollution. Up until now, the majority of these refill stations have been imported from the USA and Germany and it is Tina's ambition that this is altered so that they are designed and produced entirely within the UK.

Earlier this year, Polzeath Marine Conservation Group installed two water refill stations in Polzeath and Rock. Since the fountains were installed, they have seen more than 15,000 litres drawn, saving thousands of single-use plastic bottles from entering the waste stream and our oceans. Our Only World is a charity set up to promote the children's song with the same name, composed by David Smart and Joe Broadfoot, and all proceeds will go

towards the funding of marine conservation projects. This song will be professionally recorded in early 2019.

There has already been much interest amongst a range of different South West based companies to support the engineering competition and companies like the South West Manufacturing Advisory Service (SWMAS) are keen to lend their support in any way they can.

● Our Only World welcomes support from businesses and individuals, especially from anyone with engineering expertise. Contact Tina Robinson at ouronlyworld@outlook.com or visit www.ouronlyworld.org.uk for more information.