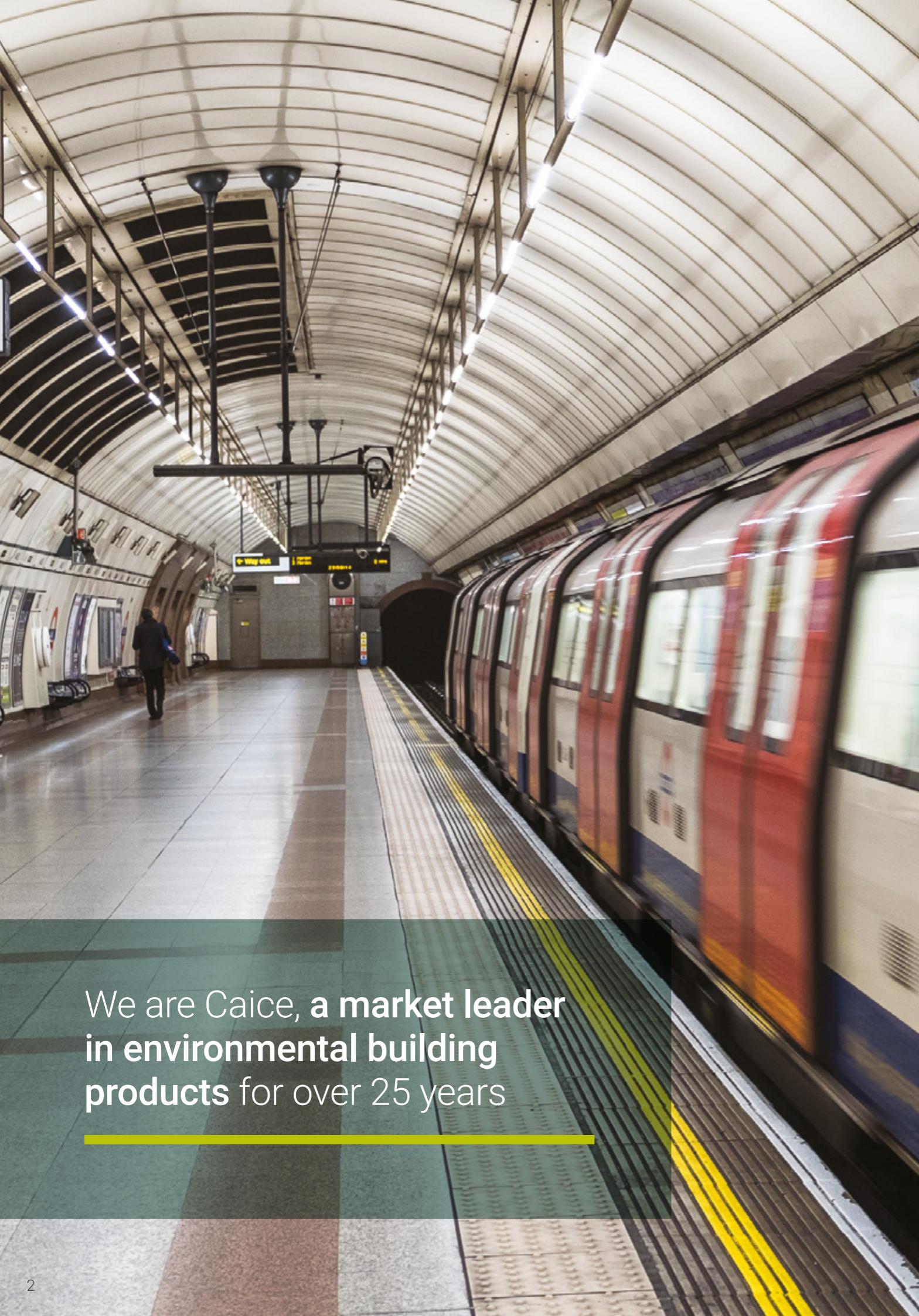




MANUFACTURING  
WITH INNOVATION  
In the UK



# Tunnel Ventilation Attenuators



We are Caice, a market leader in environmental building products for over 25 years

An expert manufacturer of attenuation and noise control solutions enabling us to create the most diverse attenuator product range on the market today, with our industrial attenuator variant perfectly suited to tunnel ventilation applications.

Through our team of experts we are able to offer a turnkey solution for you. Encompassing acoustic survey, technical design, structural design, project management & manufacture, ensuring every element of your project is covered.

Our past and current work portfolio demonstrates our ability to fully resource and deliver on the largest and most prestigious of global tunnel ventilation projects.

## Benefits & Features

- ✓ **Acoustic expertise**  
Survey and acoustic consultancy
- ✓ **Technical design**  
Designed to meet your noise requirements
- ✓ **Modular design**  
Lifting points for crane distribution and loading, for easy handling and access restrictions
- ✓ **Years of low maintenance operation**  
Robust construction for a long life span
- ✓ **Reversible airflow**  
With separate bullnose fairings for both ends of the splitters
- ✓ **Off site manufacture**  
Efficient, cost effective and safe
- ✓ **Accredited performance**  
UKAS accredited testing for insertion loss data to BS EN ISO 7235:2009\*
- ✓ **Easy installation for authorised personnel**  
Detailed drawings and installation method taking account of restrictions to each site
- ✓ **Authorised for use**  
Included in the London Underground Approved Product Register
- ✓ **Relevant project experience**  
Over 25 years of current and past projects proves the quality and longevity of our product
- ✓ **Proactive project management**  
Our professional project managers liaise with you throughout

\* BS EN ISO 7235:2009 Acoustics laboratory measurement procedures for ducted silencers and air terminal units-insertion loss, flow noise and total pressure loss.

# Six Fold Splitter System for years of low maintenance

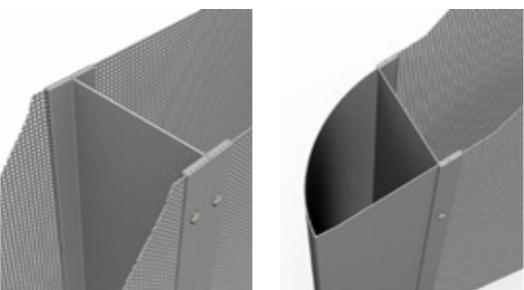
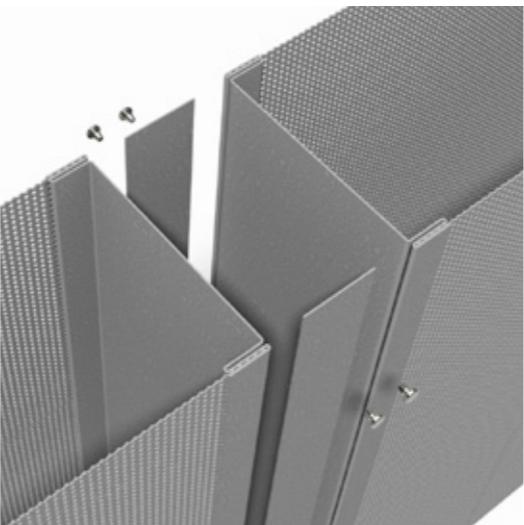
Our robust Six Fold Splitter System has been specifically designed and developed for use on tunnel ventilation projects.

As these generally require more than just a conventional HVAC attenuator product. Factors such as high pressure, corrosive environments and local airflow conditions dictate that a more resilient product with an extended life span will be required.

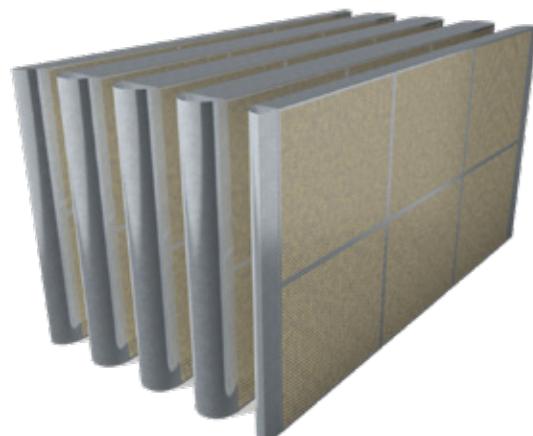
Using our unique system, splitters are constructed with an effective retaining frame thickness of between 2.4mm up to 3.6mm around the total periphery of the splitter face (thickness dependant upon the gauge of material employed).

The system also allows for the perforated sheet metal facings and bullnose fairings to be mechanically fixed using the same channels, meaning they are continuously retained around the periphery and there are no exposed edges for many years of low maintenance operation.

With the use of integral woven glass fabric and bespoke manufacturing techniques the product has gained authorisation for use on the London Underground Network.



**Six Fold Splitter Construction** Perforated metal face is retained around the unit's periphery.



**Modular Splitter Assembly** A splitter assembly constructed of modular panels.

## Modular and versatile

This highly versatile product can be used in a choice of either stand-alone or cased formation, giving improved flexibility of application.

As a stand-alone system, splitters can be inserted into rectangular and round concrete shafts. Alternatively, the splitters can be added to a purpose made heavy duty casing which could include all of the associated supporting steelwork.

Splitters are assembled in modules, where required. This allows multiple panels to be bolted together to achieve the required attenuator length.

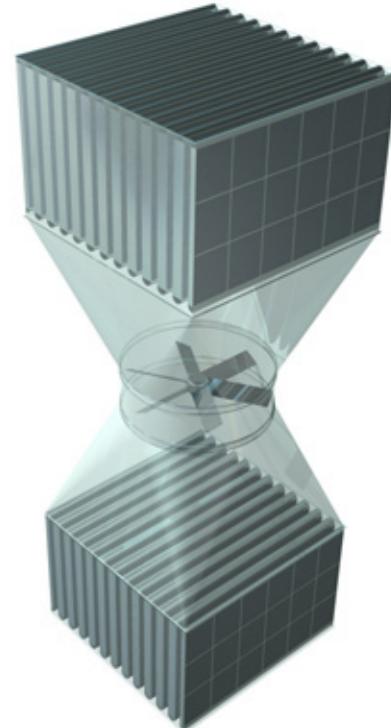
Bullnose fairing sections are provided at each end of the splitter, meaning that the system is completely reversible.

## Performance tested

We understand the importance of being able to meet the acoustic requirements of any attenuation project.

This is why having certainty over the noise reduction performance of an attenuator is vital in making sure that any product solution meets your needs.

Our entire attenuator product range has been performance tested at our testing facility. Fully compliant with **BS EN ISO 7235: 2009**, for the measurement of insertion loss, flow noise and total pressure loss for ducted silencers, our attenuator performance data is the most accurate in the industry and UKAS accredited.



**Splitters** shown within a fan system.

## Knowing precisely how our products perform means we guarantee noise reduction



**Splitter Line** A bespoke piece of machinery at our product centre for automated manufacturer of splitters.

## Higher quality and reduced installation time

Our comprehensive product range is expertly manufactured at our state of the art production centre in Dorset, UK.

Off site manufacturing enables us to offer an innovative approach to projects that require an engineering solution to reduce site installation time.

Whilst this solution enhances quality and site productivity, it also offers improved health and safety and environmental benefits.

# Experience on **prestigious projects**

We are currently working on or have provided attenuation and noise control solutions on the following prestigious tunnel ventilation projects.



## Riyadh Metro, Saudi Arabia

We're currently working with the project team to engineer, manufacture and deliver six fold attenuator splitters to control the acoustic environment

Photo credit: © Avant\_Première



## The Northern Line Extension

Modular six fold splitter only attenuators and modular six fold cased attenuators were installed in vertical & horizontal shafts as part of the tunnel ventilation.



## Athens Metro

Working with G&H Montage on this £1.2M project we provided six fold splitters for inclusion in the builder's work shafts.



## Heathrow Express

This project for Ventilation Sirocco Howden involved a six fold splitter system being installed into the builders work shafts.



## Heathrow Terminal 5

Caice six fold attenuators were supplied to our client, Balfour Beatty, for inclusion in builder's work shafts.



## The Jubilee Line extension

Working with Woods Fans, our modular tunnel ventilation attenuators were installed in vertical & horizontal shafts up to 6000mm square.



## Channel Tunnel Rail Link

Heavy duty attenuators were supplied for use within rail tunnels.



## Docklands Light Railway

A range of modular attenuators were supplied to our client, Flakt Woods.



**Partner with experts** who understand you and your challenges

## Supporting you every step of the way

### Acoustic survey

Our acoustic consultancy division, Lee Cunningham Partnership, are expertly placed to provide survey and consultancy services.

Working to local authority noise requirements, our experienced team of acoustic consultants and survey technicians can provide an accurate assessment of the likely impact of plant equipment in noise sensitive areas.

This can prove particularly useful when noise recommendations within a development area change and a reassessment is required.



### Technical design

Our technical design team work closely with you to design the best possible solution for your project's needs.

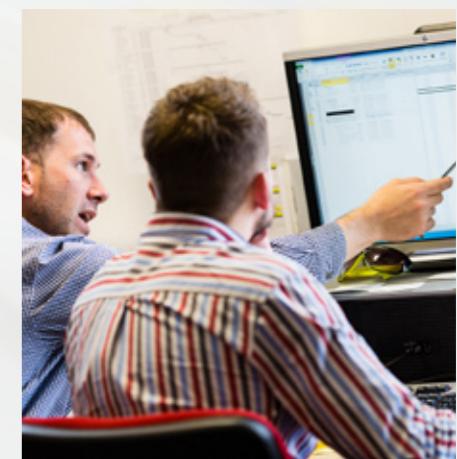
Our recommendations can be quickly incorporated into the product design to ensure the most appropriate noise control solution is put in place.

Our engineers examine factors which influence noise control performance within a ventilation system and optimise conditions to improve air flow ensuring that an effective and efficient system is provided.

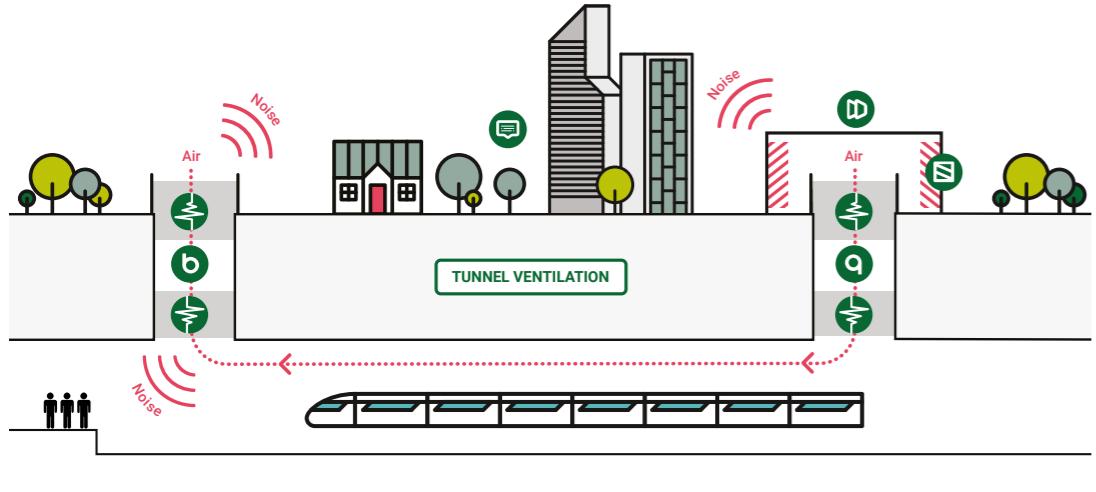
### Project management experts

One of our experienced project managers will be appointed to establish what restrictions there are for delivery and access to your site along with health and safety considerations for installation.

Throughout the project they will liaise with you and our drawing office team with regular progress meetings to keep you updated.



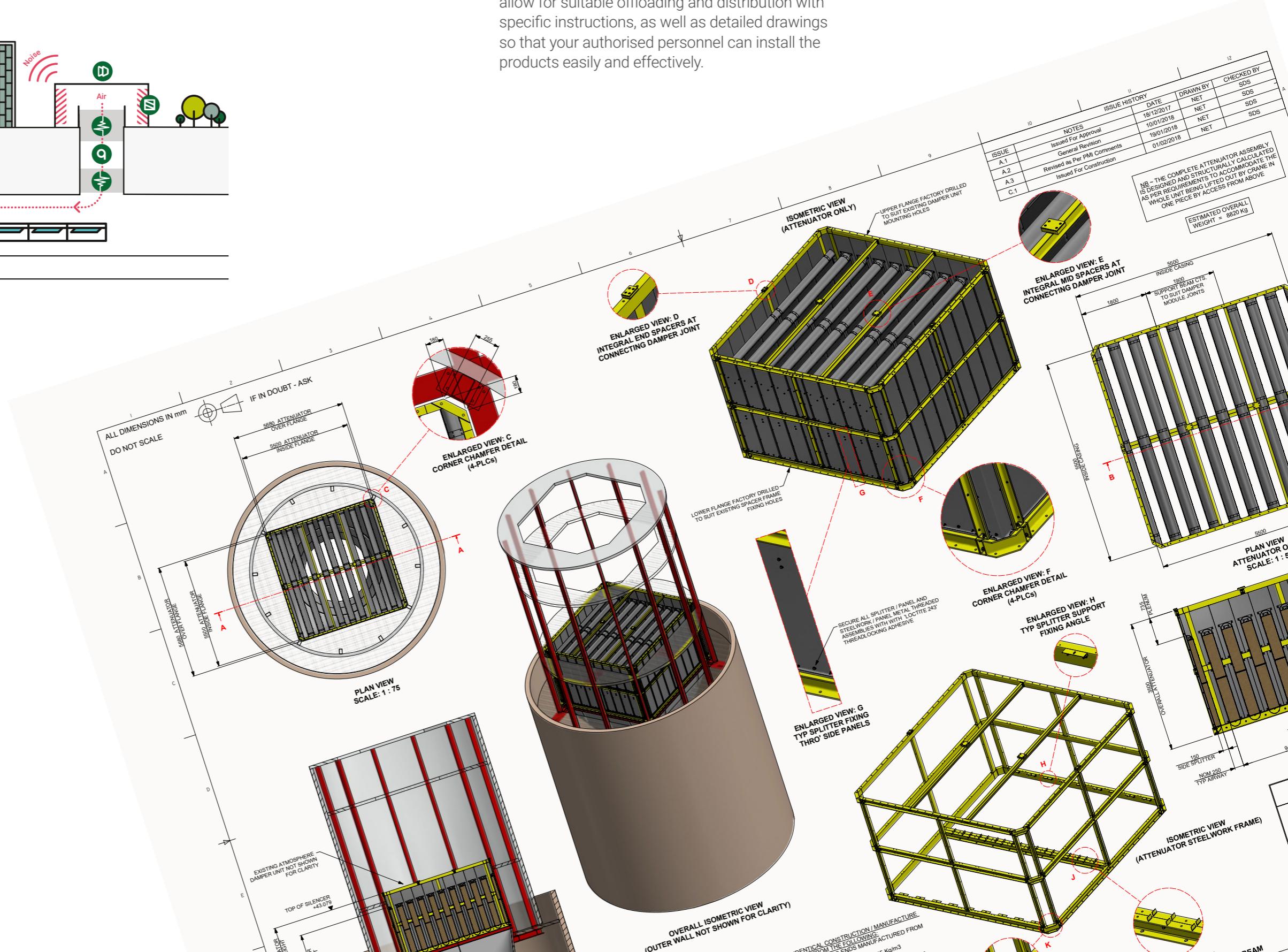
Our acoustic louvres, enclosures, wall linings and attenuators are all designed to **work together in one complete system**



Providing fresh air and a safe and comfortable environment for weary train passengers or vehicle drivers. Whilst up top, they prevent noisy plant and equipment from disturbing neighbours and spoiling the environment for everyone else.

## Easy installation for authorised personnel

We co-ordinate the design of the product to allow for suitable offloading and distribution with specific instructions, as well as detailed drawings so that your authorised personnel can install the products easily and effectively.



# Specifying the Tunnel Ventilation Attenuator

---

If you have a tricky question or challenging project then you are in the right place. Our acousticians have specialist expertise and deep experience across a broad range of different types of project.

t: +44 (0)118 918 6470

f: +44 (0)118 918 6480

[enquiries@caice.co.uk](mailto:enquiries@caice.co.uk)

[caice.co.uk](http://caice.co.uk)



#### Head office & registered office

Riverside House, Unit 3, Winnersh Fields  
Wokingham, Berkshire  
RG41 5QS

#### Northern region sales office

Ground Floor, Units C - E  
Toller Court, Short Bank Road  
Skipton, North Yorkshire  
BD23 2HG

#### South west region sales office

Bank House, Bath Road  
Chippenham, Wiltshire  
SN15 2SA



\* Gold Award in the prestigious Command Wessex BEST Awards 2001, with a "World Class" benchmarked score against thousands of other similar businesses throughout the UK and Europe.

