walraven

Optimising Your Building Services Installation

Reduce Cost, Reduce Time On Site, Reduce Risk

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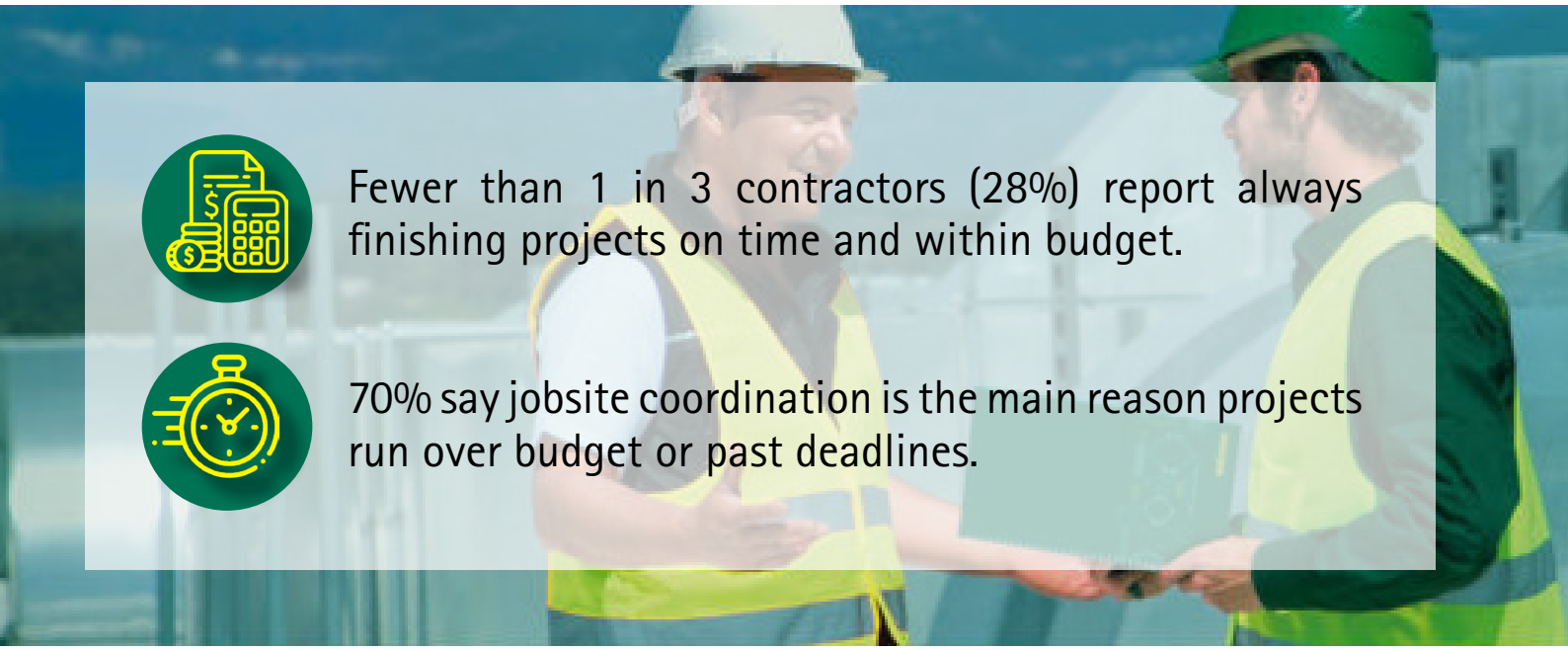
Contents

Introduction

Building services play a pivotal role in contributing to the design of a building. Despite this, a lack of planning and engagement with stakeholders can mean that outcomes are compromised, resulting in a loss of time and money.

Delays in the construction sector are a Nationwide issue. According to a survey from The 2020 National Construction Payment Report - in which 540 construction businesses took part – the industry has come to accept a status quo that is far from ideal, noting that:



Fewer than 1 in 3 contractors (28%) report always finishing projects on time and within budget.

70% say jobsite coordination is the main reason projects run over budget or past deadlines.

In other words, building services design must be integrated into the overall building design from an early stage, particularly on complex building projects.

This eBook was born out of the need to improve productivity for professionals working within building services. With some simple adjustments in the way we work, we can strive to create better outcomes for everyone involved in the built process.

"Of all the causes of time wastage within the industry, 'improper planning' was highlighted as a primary cause of project delay."

About Walraven

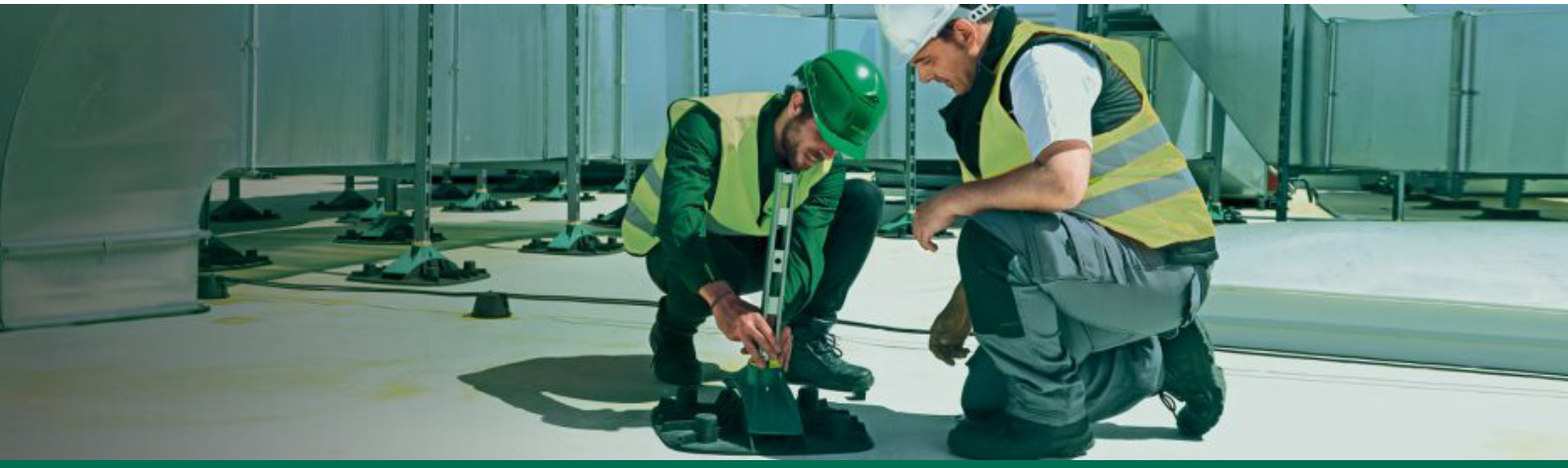
Walraven is a global innovator within the installation market, driven to develop simple, yet smart product systems for building services.

With their wide range of products and expert advice, Walraven provide complete fixing solutions for any project, no matter how large or complex.

Walraven is passionate about improving productivity within the construction industry, through early engagement, product innovations and 'clever' design of fixing solutions, aimed to save time and cost and increase productivity.

"We believe that it's the small parts that can make all the difference. If well thought-out, manufactured and supplied excellently, they can save time, add durability and generally make the lives of installers a lot easier and more effective."

-Pelle van Walraven CEO, Walraven



Chapter 1

6 Challenges That Building Services Contractors Face Today

As we highlighted in the introduction, the biggest challenge faced with building service installations is the lack of planning and engagement with stakeholders early enough in the project to make a difference.

In other words, the building services fixing solutions can become an afterthought for many contractors.

By closely considering the installation's fixing requirements at the beginning of the project, we can help you to identify potential issues before they become a problem.

"Whilst we are happy to solve problems at installation stage, we would rather help you ensure they don't happen in the first place by engaging with you earlier in the design stage".

When we are not engaged until installation phase, quite often, the most efficient use of fixings may not be possible. There may be more obstacles to overcome in order to fix what has become a challenging layout, and there may be building infrastructure and environmental factors that have to be considered in retrospect. These could all have been more easily and efficiently solved if planned for earlier.

Here we will cover the following challenges:

1. Spiralling costs
2. Risk of installation failures
3. Product selection
4. Time on-site
5. Product availability
6. Building infrastructure and building environment considerations

Challenge #1 Spiralling Costs

Costs can easily increase throughout a construction project, with many stakeholders noting a daily cost of up to fifteen thousand pounds for every overrun project.

According to Design Buildings, the largest cost overruns tend to occur due to a change in requirements. If, for example, the client needs a space to be 20% larger than originally anticipated, then the cost is likely to increase by at least 20%. It is very important therefore to ensure that the project brief is comprehensive and that all project stakeholders accept it and agree on the specific scope of work and performance requirements.

Costs can also increase if the wrong products are chosen or if they are installed incorrectly, leading to costly re-work. We will cover ways that costs can be controlled or reduced in chapter 3.

Challenge #2 Risk of Installation Failures

Another challenge that Building Services Contractors face is the risk of installation failures. These can occur for a number of reasons including poor installation methods, incorrect product selections, or the use of poor-quality solutions that aren't properly tested and accredited.

Using tested and accredited products will give the Building Services Contractor peace of mind that they are providing a solution that's built to last, as the products have been fully tested and certified to show that the performance data is accurate and reliable. Using untested, uncertified products significantly increases the risk that the product is not of a suitable quality or reliable performance, which could ultimately lead to installation failure.

Alongside selecting quality products, following correct installation methods are also key to retain the integrity of the installation. Manufacturers all provide installation instructions with their products, so training of installers is crucial. Many will also provide some sort of onsite toolbox talks if required.

"What I care about the most is the reliability of the fixings, which Walraven always provides." -Large Installer, UK

Challenge #3 Product Selection – Traditional VS. Modern

When it comes to selecting fixings, the default choice for M&E installers can often be to select products that they have always used. Whilst this can be a 'safe' choice, because you have experience installing the product and you know it works, there is a case to be built for looking into more innovative, labour-saving fixings. Labour-saving fixing solutions will also drive costs down, as often they can be installed much faster than traditional alternatives.

Cleverly engineered fixings can yield efficiencies that are somewhat hidden to the naked eye and often aren't considered.

Take, for example, modern alternatives to traditional strut systems. Traditional 41x41 channel is frequently used as standard for pipe fixing bracketry. This bulky channel with hundreds, if not thousands, of loose nuts, bolts and washers can be back-breaking and time-consuming to install throughout an installation. Using a modern alternative lightweight channel with pre-assembled nuts like our RapidRail® fixing system can provide a number of benefits.

For example:

Easier to install – especially when used in overhead applications, a lighter rail is easier to handle, and is less likely to result in accident or injury.

Easier to store and transport – as well as being lighter, our RapidRail® is available in 2m lengths which makes it easier to store, carry and transport.

Environmental benefits – a light rail is more environmentally friendly as it uses less steel.

Fast-fit accessories for faster installation - with a full range of fast-fit accessories, installations can be made a lot quicker than with traditional strut systems, saving hours or even days on the jobsite.

You can read more about Walraven's RapidRail® fixing system here.

Challenge #4 Time On-Site

A widely spoken about topic within the UK Construction industry is time spent on site. Cost implications and the environmental impact are just two of the reasons why more and more are seeking new initiatives to reduce installation time on site.

We have already looked at how choosing the right products can have an impact on speeding up installation and reducing labour costs. Another key time-saver is offsite manufacture.

Pre-fabricated solutions for pipe fixing brackets will boost the likelihood of ensuring deadlines are met while maintaining high-quality standards. According to Mark Reynolds, Chief Executive Officer of the Construction Leadership Council, it is estimated that off-site methods could improve productivity by up to 50%.

When you consider that, according to government research, lifting productivity growth by even one-quarter of 1% a year, on a sustained basis, could add £56bn over 10 years to GDP, 50% improvement is huge.

Additionally, offsite fabrication encourages those involved to think about the design, risks and complications which may arise at the start of the process, to decrease the number of errors. With better upfront planning, essentials can be built simultaneously, and you won't be faced with any unexpected delays.

Challenge #5 Product Availability

Procurement challenges can occur throughout the construction process. As we're aware, problems and delays with product procurement and scheduling can lead to projects falling behind schedule, or becoming unprofitable.

The objective is to ensure the adequate and timely supply of resources, whilst at the same time maximising the utilisation of resources between projects.

For building services fixings, it is worth remembering that these days merchants are unlikely to stock everything you need ready on the shelf. Even more-so if there are specialist fixings required for the project such as expansion guides or anti-vibration hangers for example.

So planning out your fixing requirements well in advance, and sharing quantities and key dates with merchants and manufacturers as early as possible in the process will help improve your chances of getting everything you need on time.

Challenge #6 Building Infrastructure and Building Environment Considerations

Building movement, pipe movement, fire stopping, corrosive environments or sound, acoustic and vibration requirements are all key challenges that need to be considered when fixing HVAC and piped services. In this instance, specialist fixings may be required.

For example, our case study for a large residential development in London demonstrates that often these challenges go hand in hand. There was pipework in the basement that was subject to significant expansion and contraction, as well as penetrating through fire walls. These two considerations had an impact on each other and needed to be considered together, rather than as separate problems.

Expansion and contraction of a pipe through a fire wall requires a fire stop that still allows that movement, otherwise the fire stop will be at risk of failure. Read the full case study here.

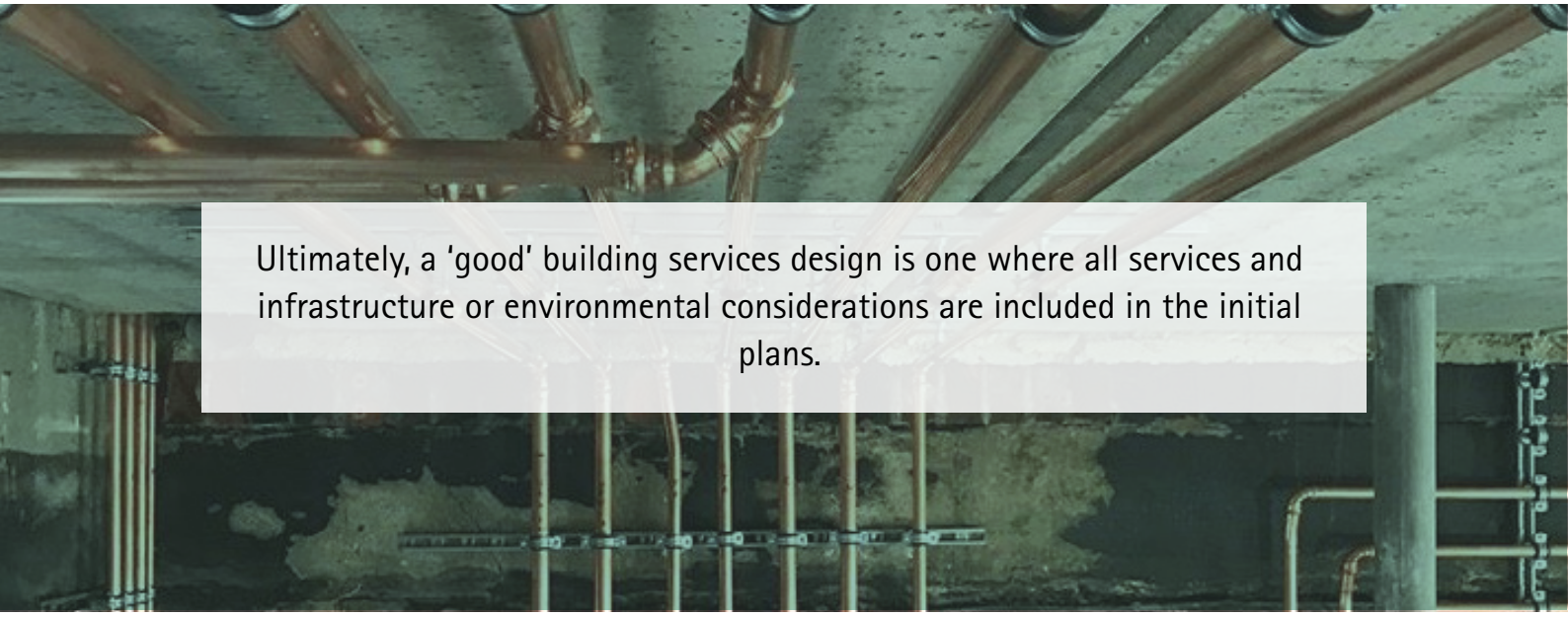
Chapter 2

What Makes an 'Effective' Building Services Installation?

Mechanical, electrical and plumbing systems represent a large fraction of building development costs. However, smart design decisions can make these installations less expensive and more productive.

In fact, performance enhancements can often be achieved simultaneously with cost reductions.

In this chapter, we consider some of the topics you should think about when designing your M&E installation to ensure the result is a smart and effective solution.



Ultimately, a 'good' building services design is one where all services and infrastructure or environmental considerations are included in the initial plans.

1. Dealing With Pipe Movement

Pipes are not immune to nature's laws and thermal expansion and contraction is one of the largest dynamic forces acting upon piped services.

It's crucial that expansion and contraction of pipework is addressed in the design stage of a project to avoid significant problems occurring.

To overcome (or accommodate) pipe movement, we recommend using existing bends or expansion loops, or the use of products such as expansion joints. You can read our detailed article on how to deal with thermal pipe expansion here.

2. Remember To Include All Services And Infrastructural Requirements

An effective building services installation plan is not just one that takes into account the most obvious and immediate service requirements, such as hot and cold water.

Quite often, more specialist services such as fire stopping or sound and vibration requirements can be forgotten (or avoided) as it is generally passed over to a specialist.

3. Passive Fire Protection Solutions

Every service that is installed in a building, such as water pipes, electrical sockets, cable trunking and lighting units, can compromise the fire resistance of a room by creating openings in its walls, floor and ceiling.

The role of PFP is to seal the gaps these penetrations create to prevent fire or smoke passing through in the event of a fire.

Ultimately the selection and correct installation of a fire stop can potentially save people's lives. It is therefore a decision that should involve qualified parties to ensure effective fire stopping solutions are specified. All buildings are different, and it is important to consider not just the product you require, but also the environment and situation into which it is being installed.

Each construction situation can be different, so simply using the same firestop you have used on a previous build may not be the answer. Read our fire stopping guide for more about passive fire protection of building services.

4. Building Environment Considerations

We have already touched on the importance of considering the building environment into which the services are being fixed. Every installation environment differs, and therefore needs will vary from project-to-project.

For example, it's important that you consider whether you can fix the components to the building structure itself. More frequently we are being asked to design fixing systems that do not directly penetrate the building structure. This can be a common request for rooftop installations, so special fixing frame solutions can be required.

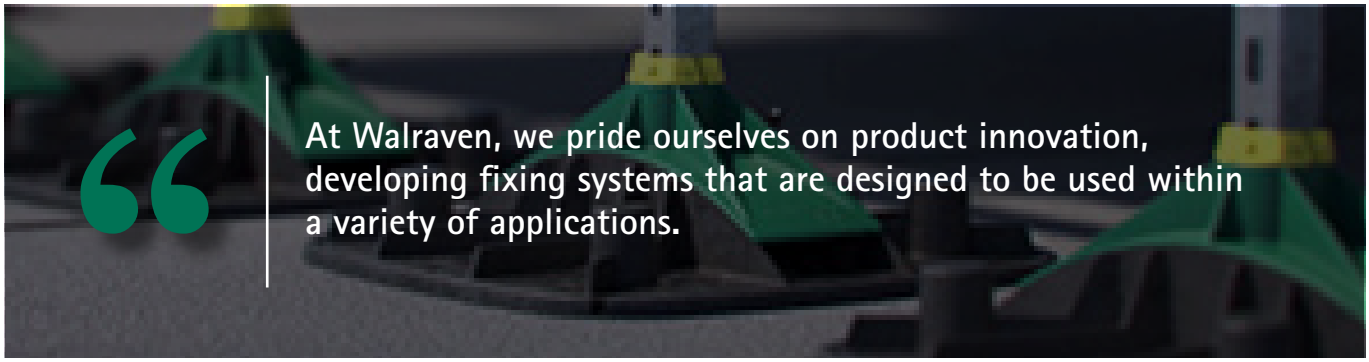
For corrosive settings, such as chemical environments, factories, offshore or outdoor (weather exposed) installations, specialist fixings will need to be considered to ensure there is no corrosion. These could include products made with different materials such as stainless steel and plastic, or with specialist coatings such as zinc plating or our BIS UltraProtect 1000 products.

Find out more about different surface treatments here.

5. Standardised Solutions

If fixing requirements are planned early enough, you are more likely to benefit from a high-quality, cost-effective standardised solution.

The later the fixings are brought into the plans, the more likely that a bespoke solution will be required to work around the issues that crop up. Bespoke solutions can become costly, so it is important that you seek to avoid this, where possible.



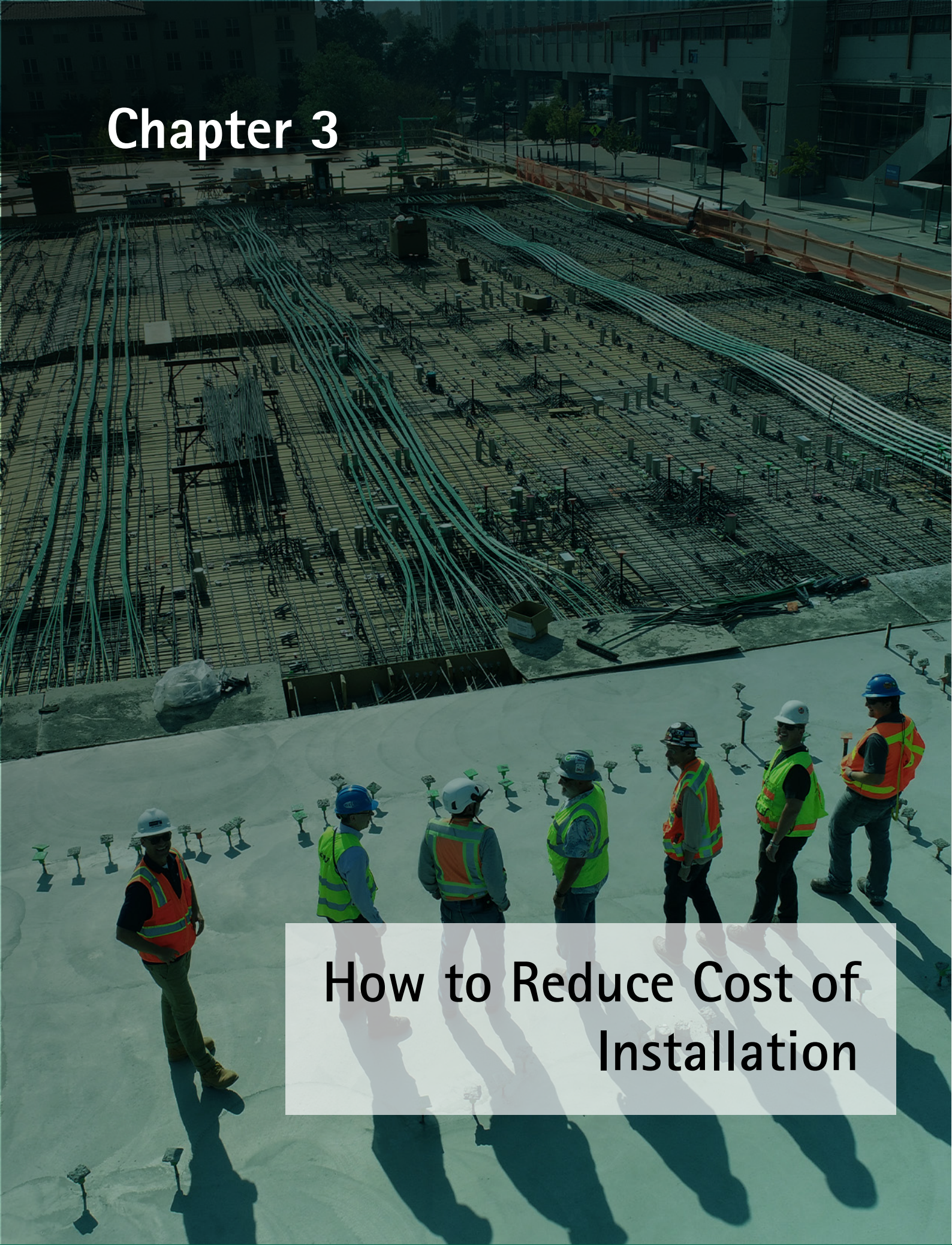
6. Creating Optimal Installations Using BIM

Historically, MEP layouts have been designed with the approach of overlaying the design drawings and sequentially comparing them. Spatial and functional interferences, otherwise known as 'clashes', are then dealt with by professionals from multi disciplines. This process can involve several revisions before one set of coordinated drawings is finalised.

The rise in the use of BIM – Building Information Modelling – has empowered MEP contractors to plan, design and install equipment services much more efficiently than ever before. Projects utilising BIM have a greater chance of success and maximise effectiveness for every stage of the project lifecycle and beyond.

> At Walraven, our BIM models mean we can feed into your MEP design process for better, more efficient project designs.

Find out more about how we can work with you to reduce costs and improve processes with BIM.



Chapter 3

How to Reduce Cost of Installation

Smart building services installation and reduced costs come hand-in-hand, as highlighted in the previous chapter.

Here, we explore seven different ways that you can reduce the cost of installation.

1. Product Selection
2. Training
3. Using One Manufacturer
4. Start Thinking at Design Phase
5. Offsite Assembly
6. BIM
7. Design Rationalisation

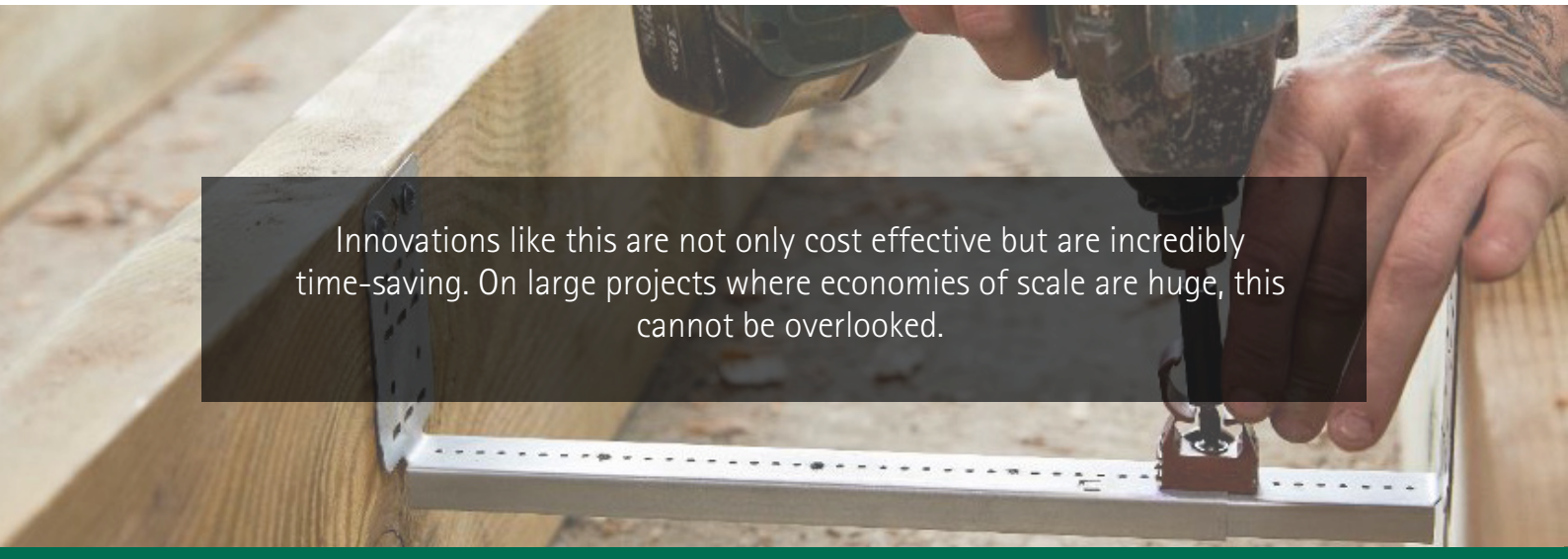
1. Choosing The Right Products

As technology advances, so does the innovative engineering that goes into the design of MEP fixings. Such components can dramatically save time and reduce labour costs. Despite this, however, many contractors are drawn to using more traditional methods.

We see so frequently that building services fixings are not specified, nor included in the design phase of a system layout. Therefore, it is understandable that when the time comes to choose the fixings for the job, the default option is to go to traditional methods that have been used before. Often the contractor will not have time to research the best fixings for the job. However, there can be some great advantages of doing so for not only cost saving, but more efficient installation, reducing risk of failure and saving time on site.

At Walraven, we're passionate about producing solutions that are highly effective, yet simple in their design and use.

For example, our Rail Systems with 'fast fit' accessories can save up to 40% installation time compared to a traditional strut, nuts and bolts.
Old wooden noggins for fixing between joists can now be replaced with much more effective and time-saving adjustable metal noggins.



Innovations like this are not only cost effective but are incredibly time-saving. On large projects where economies of scale are huge, this cannot be overlooked.

2. Training and Installation Methods

Making sure installers on site are properly trained to install the fixings correctly is crucial, otherwise there can be costly implications further down the line. Consult manufacturers for advice on their products, or seek on-site training, if available.

You should always follow the manufacturers installation instructions to ensure costly mistakes are not made. One example of the importance of this would be regarding installation of concrete anchors.

In 2012 the CFA introduced a Code of Practice for the installation of anchor systems (BS8539:2012) due to a number of historical installation failures leading to injury or even death. One of the reasons they found for the catastrophic installation failures was incorrect installation of the anchors.

Find out more about BS8539:2012

3. Look at Full System Procurement From One Manufacturer For Your Fixings

Buying the full fixing system from one manufacturer can not only offer potential cost savings, but it can also offer quality and performance guarantees. Some manufacturers will put their products through testing procedures not only as individual products, but also as full systems.

For example, RAL quality and performance testing is carried out on Walraven products individually and as a system. This gives peace of mind to the contractor that the products will perform to tested and reliable standards when installed together.

4. Think About Fixings In the Design Phase

One of the best ways to stay on track with building services costs on your project is to design the fixings requirements earlier in the construction process. As we have touched on before, this can help you to identify potential issues before they become a problem and make the most of standard fixing system designs.

5. Offsite Assembly

This is a growing trend within the construction industry. Pre-assembly of elements can play host to a range of benefits, including reduced waste, reduced time and more overall efficiency.

Many manufacturers or their distribution partners can offer both design and pre-assembly of fixing systems that can be delivered to site and simply fixed into place. This can reduce labour costs. Read our case study to find out how one customer saved 70% installation time using pre-assembled Walraven brackets.

6. Building Information Modelling (BIM) and Services Co-Ordination

Increased use of BIM in high-value, high-risk areas such as plant rooms and risers is enabling contractors to design systems more effectively, and to take into account the need for installation, maintenance and replacement. This can have a knock-on effect of cost-efficiencies for the overall project.

The take-up of BIM continues to be uneven, particularly as end-user demand for FM applications is low.

However, the potential benefits in terms of clash detection, automatic component scheduling and so on are increasingly important for specialist contractors, so the extent of BIM usage is increasing.

7. Design Rationalisation

Value engineering supported by the contractor can identify opportunities for rationalisation, although best practice has eliminated most of the quick wins. Specification reviews and rationalisation of containment are two examples from electrical contracting where savings can be secured.

Similarly, moving from a unique specification to a performance specification on some components may give greater flexibility.

Tying this all together, we will now explore Walraven's unique process for achieving better outcomes with you for building services installation.

Chapter 4

Walraven: Making Your Job Easier From Start to Finish

Our research tells us that competence, reliability, technical compliance, cost savings and a helpful approach are all factors that influence buying behaviours for Building Services Contractors.

Having been established as a global brand for over 75 years, we pride ourselves on our product quality, customer service and desire to innovate as technology advances.

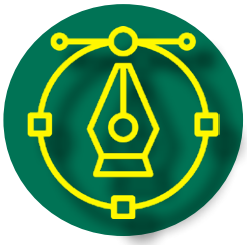
With a suite of products that are made in the EU - and tested in our own Holland-based facility – as well as via third parties, confidence and quality are what we consistently achieve for our clients. Through continuous development of our product systems, sharing our know-how, thinking beyond just our products and engaging our customers through outstanding services, we stay true to our founding philosophy: creating value in a smart way.

Our reputation as innovative and forward-thinking leaders within the space ensures that we produce solutions to make your job easier and to help you deliver your job more efficiently.

Project Support Service

Part of our aim is to help you find the most effective solutions for your construction challenges, and our team of Technical Sales Support Advisors can answer all your questions to take the stress out of your M&E installations. We can support you at every stage of your project.

Technical Design Service

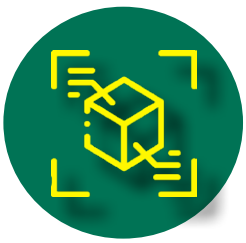


Based on your requirements, our team of experts deliver you a proposal, well-grounded with detailed calculations, CAD drawings, parts lists and pricing.

Design Validation

There are times when it is necessary to propose a non-standard or untested solution. In these situations, we have the ability to test and validate these solutions in-house, giving you a bespoke, tailor-made solution.

BIM Library



To support the digital planning and working method of BIM (Building Information Modelling) we can provide BIM models for many of our product families, allowing you to design, construct and manage buildings more efficiently, reducing design, construction and operations costs.

Prefabrication

Besides our standard products and tailor-made solutions, we can also supply the goods pre-assembled and ready for use on site. Cutting, grinding, drilling, measuring: they all cost a lot of time on the building site.

Not to mention the costs of lost materials or faults. Walraven, and our business partners, can prefabricate solutions for you and deliver them direct to site.

3D Modelling

As standard, we design our solutions in 3D CAD software. This helps you to visualise the use of the proposed solution. It also allows you to understand the intricacies of our products and measure in augmented reality.
Our designs are always checked on strength and desired installation method.

Consultation at Job Site

If your installation is not straight-forward and you need practical advice, or when remote support is simply not cutting it, we are more than happy to support you directly on location.

Pull tests, toolbox talks, onsite problem-solving: these are all things that our professional experts can provide for you.

Case Study: A 70% Reduction in Installation Time

For Luxury Care Home Project

Location: South of England
Client: Heatcare, Luxury Care Home Provider

Speeding Up Installation Process

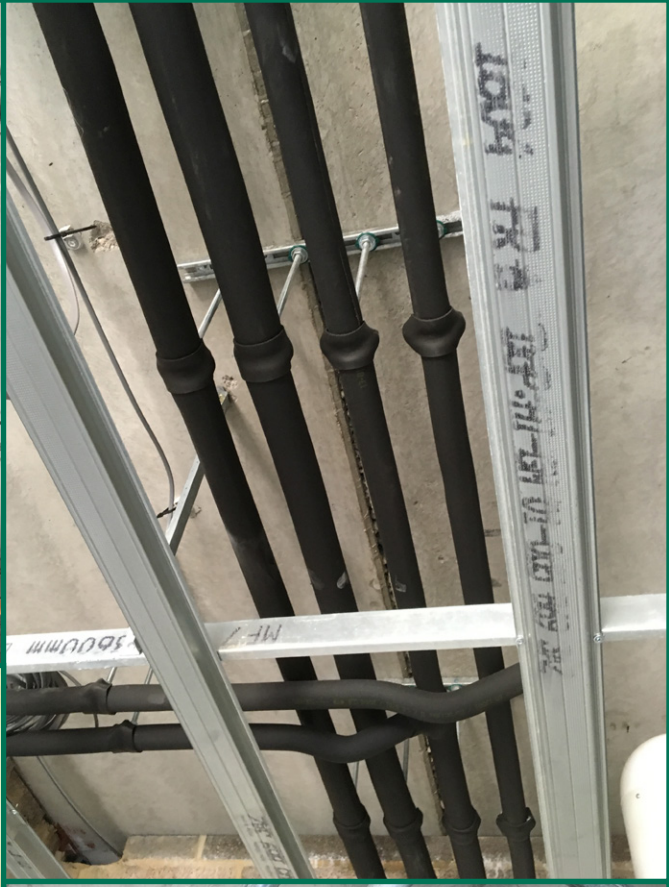
As a busy care home provider, Heatcare needed a solution to help them speed up the installation process for mechanical services on site.

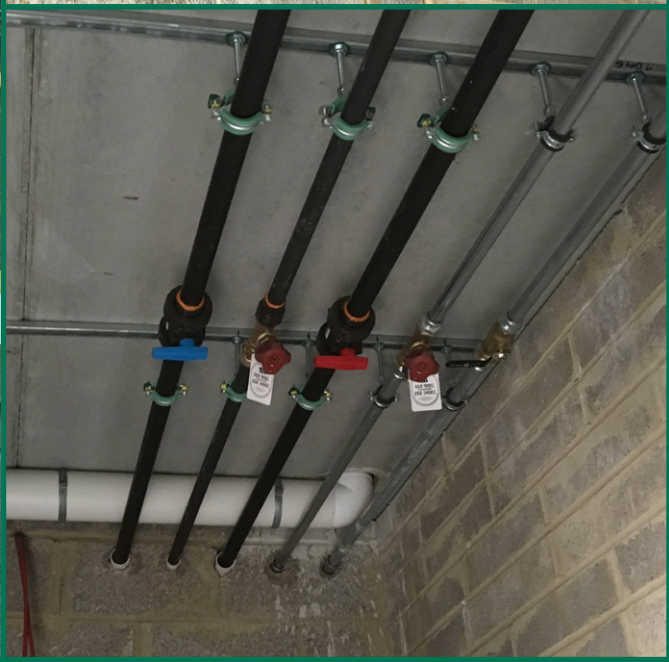
RapidRail® to the Rescue

Our technical team recommended the RapidRail® system with fast-fit accessories to speed up installation.

Combined with offsite prefabrication of the brackets and fixings, they were delivered to site pre-assembled for immediate installation.

> "RapidRail® is our preferred bracketry system for installation projects. It's a great quality product that is fast and easy to install.
>
> We have saved over 150hrs installation time using this product range. We have also used Walraven's design and prefab services which helped the project run very smoothly.
>
> We would highly recommend Walraven products and services".





Conclusion: The Future of M&E

20-30% of a total project value is typically down to building services installations. In recent years, the range and complexity of service installations has increased as demand has grown for intelligently operated environments. This drive in innovation is leading to reduced carbon emissions, improved occupier comfort and, of course, extended building performance.

This demand for lower running costs and increased occupier comfort has led to considerable investment in public sector facilities, for example, Building Schools for the Future (BSF).

This investment is generating a healthy workload for M&E contractors. Stringent Building Regulations require holistic solutions which in turn require greater integration between the design and installation of the building envelope and the building services.

That being said, M&E professionals should closely consider their choice of products and solutions in order to keep up with these increased demands to ensure they deliver an efficient, highly-effective service installation that is not only productive, but environmentally conscious, too.

The MEP industry has been evolving from multiple angles and looks to continue in this direction over the coming years. However, establishing more of a connection between design and construction is continuing to be a key issue that needs to be addressed, particularly when considering increased productivity between design modelling and construction modelling.

Walraven continues to lead the way for product innovation and with a suite of simple, yet smart product systems - along with our wide range of products and expert advice - we can provide complete fixing solutions for any project.

Find out how we can support you

For more information on how Walraven can help to optimise your building services installation to reduce cost, reduce time on site and reduce risk, don't hesitate to talk to an expert today.

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