



the
grc
centre

EXPERTS IN
GRC

WHO WE ARE

The GRC CENTRE is a wholly owned subsidiary of Pennine Building Solutions, a company formed in 1993 and still solely owned and operated as a family business, something we are very proud of.

Over the last 30 years the PBS Synergies group as we are now known has devoted itself to improving quality standards in both the cast stone and the GRC industries. Through our operating companies and involvement with various bodies including the GRCA, British Standards Committees and the European Standards Institute (CEN) we believe we have contributed to the development and advancement of GRC to its current position as a mainstream construction material.

We are proud to have founded and operated two of the largest manufacturing companies in the UK, both of which we subsequently sold to multi-national organisations with the resources to take them to their natural next growth level in an expanding marketplace.

Since 2014 the group's consultancy divisions have worked for most of the large construction companies and façade specialists operating in the UK. Our services have also been employed by government bodies, local authorities and property management companies.

THE GRC CENTRE is a further evolution of our journey, helping anyone involved in projects featuring this amazing composite through industry leading consultancy, installation and repair services. Using the group's 20-year experience across all GRC key stages we believe we can bring both value and quality driven solutions to any project featuring GRC elements.

The following pages will hopefully provide an insight as to how we may be able to help on any development featuring GRC.

Bob Faulding
Managing Director



**SPECIFICATIONS FOR GRC CLADDING
MUST BE CUSTOMISED TO THE SPECIFIC
PROJECT APPLICATION.**

Unlike many modern construction materials the 50-year evolutionary cycle of GRC has resulted in a wide variety of standards being developed.

These cover both quality control measures and the associated testing requirements..

In the UK and Europe these are however, based on the material and not the finished product.

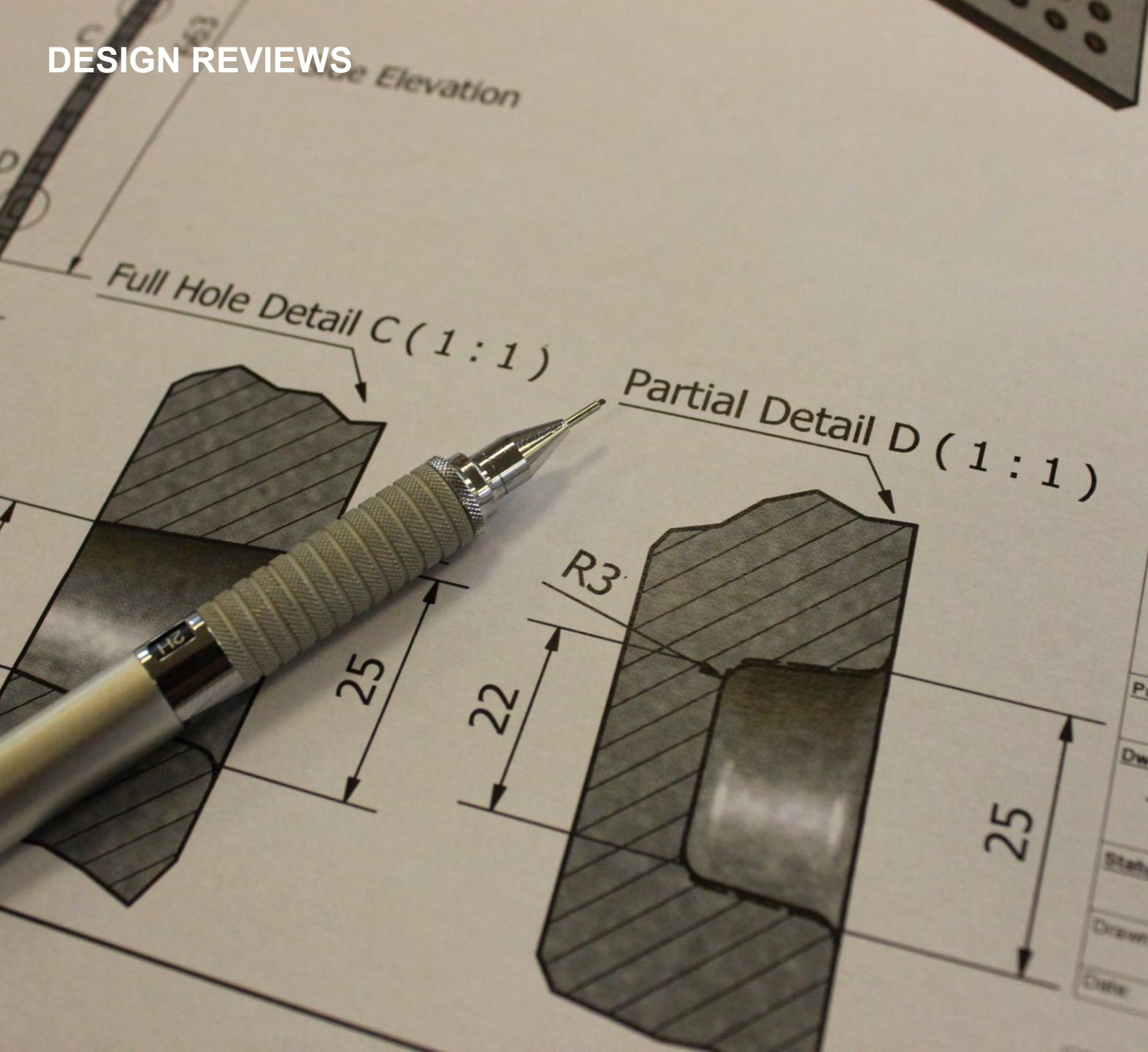
Consequently important in-service performance aspects such as architectural finishes, fixings and product testing are not part of these standards.

We can advise both architects and façade consultants on wider global standards, elements of which can be incorporated into project specifications to ensure both the durability and safety of the finished works.

SPECIFICATION DEVELOPMENT



DESIGN REVIEWS



THE DESIGN ENGINEERING OF GRC ELEMENTS MUST RESPECT THE UNIQUE CHARACTERISTICS OF THE MATERIAL

Over the last two decades we have seen many GRC projects where the design and engineering principles have been based around incorrect assumptions of how the composite behaves, mode of collapse and consequences of failure.

Whilst many design engineers will look towards BS EN 1990/1991 these do not address many of the unique characteristics of GRC as a composite material.

In 2010 the International Glassfibre Reinforced Concrete Association (GRCA) published its "Practical Design Guide". This used nearly 40 years of experience adopting an approach of factoring design loads up whilst also allowing for variations in properties of handmade products and the effect of ageing on flexural strength.

We can provide an independent third-party review of designs to ensure that best practices appropriate to the material are followed and allowed for.

WITH OUR EXPERT KNOWLEDGE OF BOTH ALL ASPECTS OF THE SUPPLY CHAIN AND THE CAPABILITIES OF VIRTUALLY EVERY UK AND EUROPEAN MANUFACTURER WE CAN ADVISE PURCHERS ON THE SELECTION OF A SUITABLE SUPPLY PARTNER FOR ANY GIVEN PROJECT

Given the various manufacturing methods to produce GRC elements selection of the correct supplier can be not only time consuming but can create difficulties post order when the limitations of the chosen producer become clear.

These limitations can cause both programme delays and post order cost variations neither of which are beneficial to overall project deliverables.

Understanding the cost build-up of any GRC proposal is also critical in the supplier selection process.

We can assist anyone placing orders or sub-contracts for GRC packages to ensure they are obtaining the best combination of capability, standards compliance, quality, service and price.

PROCUREMENT SUPPORT



INDEPENDENT INSPECTIONS



STANDARDS AND BEST PRACTICE COMPLIANCE ARE AN ESSENTIAL PART OF THE GRC PROJECT LIFE CYCLE

When produced correctly GRC products are durable, long lasting and require minimal maintenance.

It is however well recognised that internal quality and testing controls require third party monitoring and surveillance to ensure high quality and standard compliant GRC is being supplied to any given project.

Whilst many specifiers and purchasers will carry out these quality inspections unless staff have experience in both the correct manufacturing and testing procedures non-compliances are very difficult to identify.

Our practical experience in both these key stages of the product realisation process allows us to quickly identification any issues.

Importantly we can rapidly provide the manufacturer with help and assistance to implement corrective actions to avoid problem escalation.

TESTING OF PRODUCTS DOES NOT FORM PART OF ANY CURRENT QUALITY ASSURANCE STANDARDS AND SPECIFICATIONS

Despite the complexity of the material and the variables of the manufacturing process, all standards are based on testing of GRC test boards and not manufactured products

It is assumed that these sample boards represent broadly the same characteristics as the finished products (generally within 5%).

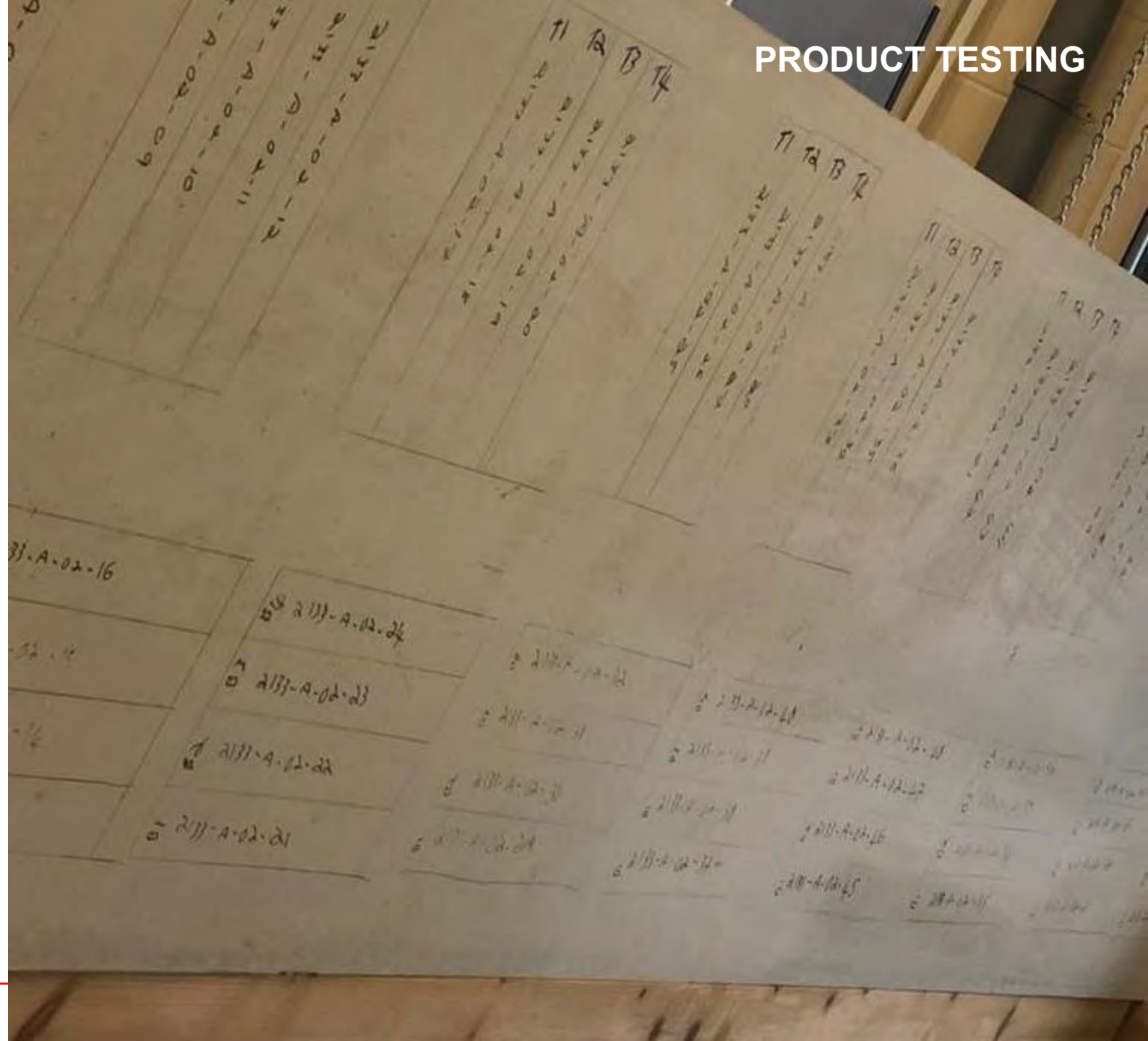
In our experience this is seldom the case.

This is not surprising given the variables between a small flat sheet produced solely for testing purposes and large 3-dimensional products manufactured by hand.

Factory testing also does not cover validating manufactured product thickness against factors of safety that should be used within the design engineering

Our In-house test laboratory is fully equipped to sample test boards from large manufactured panels randomly selected either as part of a factory quality assurance assessment or from site.

PRODUCT TESTING



PROJECT MANAGEMENT



MANAGING THE GRC ELEMENT OF A FAÇADE PACKAGE IS TIME CONSUMING TASK REQUIRING SIGNIFICANT KNOWLEDGE OF DESIGN, PRODUCTION AND INSTALLATION PROCESSES

Anyone who has worked with GRC on a large façade contract will be painfully aware of the amount of time that needs to be dedicated to a successful outcome.

Selecting suppliers, considering design solutions, ensuring quality and specification compliance, dealing with logistics, storage and finally installation are the primary challenges facing the construction team.

We can combine all the services detailed on previous pages into one full project management package which will provide a cost-effective solution for any GRC works.

WITH ALL THE POTENTIAL FOR DESIGN AND MANUFACTURING ERRORS CONTRACTUAL DISPUTES BECOME INEVITABLE.

When the material was first introduced in the 1970s the potential for market expansion was significantly restricted due to the lack of attention to quality systems and processes.

The industry has worked hard to shake off this legacy but, unfortunately, we continue to see history repeating itself as standards and guidance are ignored.

We can provide expert opinions regarding industry best practice and standards compliance along with establishing a “golden thread” traceability from project information.

Importantly we will always approach any problem on the basis of achieving the best outcome for all concerned.

DISPUTE RESOLUTION





THE INSTALLATION OF GRC ELEMENTS REQUIRES THE SAME LEVEL OF PROFESSIONAL INPUT AS BOTH THE DESIGN AND MANUFACTURING STAGES

Incorrect storage, handling, lifting and fitment all put the performance of the GRC product at risk of premature failure. Each part of the installation process should therefore only be undertaken by skilled operatives who fully understand the material, how it's manufactured and its associated properties.

Ideally the entire design, manufacturing and installation delivery cycle should be awarded to one company however most GRC manufacturers do not offer an installation services.

This disconnect can of course be problematical and create long term issues which are difficult to resolve.

For this reason we offer our customers a full labour only installation service as part of our market offering.

With our in-depth knowledge of both the design and manufacturing processes we can bring a unique level of experience to this critical last step of the project delivery process.

REPAIRS ARE AN UNAVOIDABLE ASPECT OF ANY GRC PROJECT

Damage to manufactured units can occur at any stage of the project delivery life cycle.

Those caused by demoulding and other factory instances are generally repaired at the factory however damage caused during transportation, storage or installation must be repaired on-site

This work can only be carried out by craftsmen who are factory trained in post casting repair techniques .

Using our unique colour matching and finishing systems along with durability testing methods developed in our own laboratory we can carry out on-site repairs to industry standards including the re-application of any surface sealants .

We can also offer a post completion cleaning service using specialist chemicals and equipment. Our processes are specifically designed to be non-aggressive and minimise the risk of post cleaning efflorescence.

REPAIRS AND CLEANING





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