



DM BUILDTM

FABRICATION & INSTALL

03 • INTRODUCTION

05 • OUR EXPERTISE

07 • OUR SERVICES

09 • SUSTAINABLE PRACTICES

11 • FABRICATION

13 • HAND TOOLS

14 • RECOMMENDATIONS

15 • CUTTING

16 • DRILLING

17 • GRINDING AND SANDING

19 • SEALING

20 • EDGE-BANDING

21 • PAINTING

23 • REPAIRS

24 • INSTALLATIONS

26 • DOCUMENTS & PERMITS

27 • SURVEY

28 • INSTALL METHODS

29 • FASTENING

31 • LOGISTICS

32 • CONTACT US

INTRODUCTION

Welcome to **DMBUILD™**, your comprehensive guide to the construction, fabrication, and installation of bespoke Fibreglass Reinforced Plastic (FRP) engineered solutions by DM Composites. Tailored to serve civil contractors and construction professionals, **DMBUILD™** offers valuable insights and guidance for the successful installation of our FRP products on site and provides comprehensive insights into crucial construction processes such as drilling, cutting, notching, and edge banding, ensuring a seamless and high-quality experience. From innovative construction approaches like the top-down method and modular construction to logistics, compliance, and environmental considerations, **DMBUILD™** covers the spectrum, providing valuable knowledge for successful FRP installations.



At DM Composites, we go beyond guidance – our **DMBUILD™** services extend to design and construct solutions, with experienced site crews ready to install FRP solutions across Australia and New Zealand. Whether you're a seasoned professional or new to FRP construction, **DMBUILD™** is your go-to resource for mastering the intricacies of working with FRP. Unlock the expertise needed for successful FRP construction projects and embark on a journey with DM Composites, your trusted partner for innovative and reliable construction solutions.



OUR EXPERTISE

| OUR EXPERTISE



At DM Composites, we take pride in our exceptional team of experts who collectively boast over 30 years of invaluable experience in the Fibreglass Reinforced Plastic (FRP) industry. Our expertise extends beyond the mere creation of FRP solutions; we are adept at foreseeing and addressing potential challenges during installation, proactively designing our engineered solutions with a focus on avoiding clashes and post-delivery issues. With an in-depth understanding of our products, we are well-equipped to either install goods ourselves or provide comprehensive guidance to civil contractors on site.



Our wealth of experience spans various industries, from public infrastructures to industrial applications, covering marine installations, oil and gas, mining, water management, underground projects, and railway applications.



Collaborating with Tier-1 Australian civil contractors, our reputation serves as a testament to our commitment and reliability within the industry. From the inception to the completion of projects, we offer expert guidance and utilize our FRP solutions to craft jetties, boardwalks, walkways, suspended platforms, flights of stairs, bridges, sheds, shelters, and even more complex FRP structural systems. Trust DM Composites to bring your projects to fruition with unrivaled expertise and innovative FRP solutions, ensuring installations adhere to Australian standards and/or National Construction Code (NCC).



OUR SERVICE

At DM Composites, we offer a comprehensive suite of services under **DMBULD™**, leveraging our unparalleled expertise in the FRP industry. With a blend of technical prowess, commercial acumen, and robust project management capabilities, we excel in managing **Design and Construct (D&C), Engineering, Procurement, and Construction (EPC)**, as well as **Turnkey contracts**. From project inception to completion, our seasoned team provides invaluable expertise and guidance, ensuring seamless execution and delivery.



With a proven track record in handling multi-million dollar contracts, we bring a wealth of experience to every project we undertake. Our fit-for-purpose engineered solutions are meticulously crafted to meet the unique needs of each client, delivering unparalleled performance and durability. Additionally, our highly qualified installation crew is adept at installing FRP systems across all states in Australia, guaranteeing consistent quality and reliability in every installation. Trust DM Composites for end-to-end solutions that exceed expectations and set new standards in the industry.

Our comprehensive suite of services under DMBULD™ extends beyond engineering and construction to encompass civil works, structural solutions, building services, piling, and mechanical installations. From landscaping and site preparation to earthworks, foundation construction, utility installation, and road construction, we offer a comprehensive suite of services to support FRP infrastructure development and industrial projects nationwide.



SUSTAINABLE PRACTICES

At DM Composites, sustainability is at the core of our business ethos. We are committed to integrating environmentally responsible practices into every aspect of our operations, from design and manufacturing to construction and beyond. Our sustainable practices are not just a commitment to the environment but also a reflection of our dedication to creating long-lasting, resilient infrastructure solutions.

1. Eco-Friendly Materials:

We prioritize the use of eco-friendly FRP materials in our manufacturing processes, with a focus on reducing our carbon footprint and minimizing waste. Our FRP (Fiber Reinforced Plastic) products are manufactured using recyclable materials, ensuring that our solutions are not only durable but also environmentally sustainable.

2. Energy Efficiency: We continuously strive to improve energy efficiency across our operations, from our manufacturing facilities to our construction sites. By optimizing our energy usage and investing in energy-efficient technologies, we minimize our environmental impact while reducing operational costs.

3. Waste Reduction: Waste reduction is a key focus area for us, and we employ various strategies to minimize waste generation throughout our value chain. By implementing efficient manufacturing processes, recycling initiatives, and waste management practices, we strive to reduce waste sent to landfills and promote a circular economy.

4. Sustainable Construction Practices: In our construction projects, we prioritize sustainable construction practices that minimize environmental impact while maximizing resource efficiency. From using locally sourced materials to employing green building techniques, we aim to create infrastructure that is resilient, energy-efficient, and environmentally friendly.

5. Environmental Compliance: We adhere to strict environmental regulations and standards, ensuring compliance with all relevant laws and regulations. By proactively addressing environmental risks and implementing robust environmental management systems, we mitigate potential environmental impacts and uphold our commitment to sustainability.

With **DMBUILD™**, sustainability is not just a goal; it's a fundamental principle that guides our actions and decisions. Through our sustainable install practices, we aim to create a greener, more resilient future for generations to come.



FABRICATION



Welcome to the fabrication section of our **DMBULLD™** product guide. Here, we delve into the various techniques employed when working with fiberglass reinforced polymer (FRP), offering insights and tips to ensure successful fabrication processes.

While the content provided in this manual is general, it serves as a valuable resource, offering a plethora of useful information for fabrication. It's important to note that almost all fabrication methods commonly utilized for wood, aluminum, and steel can be adapted for the fabrication of our FRP building materials.



Whether you're familiar with FRP fabrication or new to the process, this section aims to equip you with the knowledge and techniques necessary to effectively work with our materials. From cutting and shaping to assembly and installation, our fabrication guidelines ensure seamless integration and optimal performance of our FRP products in diverse applications.

HAND TOOLS

When it comes to fabricating fibreglass reinforced polymer (FRP) materials on-site, having the right hand tools at your disposal is essential for achieving precision and efficiency. Here are some key tools that are well-suited for working with FRP:



Drill:

A drill is a versatile tool used for creating holes in FRP materials. It's essential for tasks such as installing fasteners, creating openings for pipes or wires, and general assembly work. When working with FRP, it's recommended to use drill bits specifically designed for fiberglass to ensure clean and precise holes without causing damage to the material.



Circular Saw:

A circular saw is a powerful cutting tool that's ideal for making straight and curved cuts in FRP panels or sheets. It's commonly used for cutting large pieces of FRP material to size or for shaping them to fit specific dimensions. When using a circular saw with FRP, it's crucial to use a carbide-tipped blade designed for cutting fiberglass to minimize chipping and ensure smooth edges.



Jig Saw:

A jig saw is a versatile cutting tool that excels at making intricate or curved cuts in FRP material. It's particularly useful for cutting shapes, patterns, or irregular contours where a circular saw may not be suitable. When using a jig saw with FRP, use a fine-toothed blade designed for cutting fiberglass to achieve precise and clean cuts.



Reciprocating Saw:

Also known as a sawzall, a reciprocating saw is a handheld tool with a push-and-pull motion that's ideal for cutting through thicker or denser FRP materials. It's commonly used for tasks such as cutting FRP pipes, structural supports, or composite materials where other saws may struggle. When using a reciprocating saw with FRP, choose a blade specifically designed for cutting fiberglass to ensure efficient cutting and minimal vibration.



Hand Grinder:

A hand grinder, also known as an angle grinder, is a versatile tool used for grinding, cutting, and polishing FRP materials. It's particularly useful for tasks such as trimming edges, shaping curves, or removing excess material. When using a hand grinder with FRP, it's essential to use the appropriate grinding wheel or cutting disc designed for fiberglass to achieve precise and controlled material removal without causing damage to the surface.

RECOMMENDATIONS

When it comes to fabrication practices, it's crucial to prioritize safety and efficiency:

1. Always adhere to common safety practices, with eye protection and PPE being a non-negotiable requirement.
2. Since FRP generates dust during fabrication, wearing a P2/N95 dust mask or respirator along with long-sleeved clothing is recommended. To reduce dust exposure on sensitive sites, fabricate FRP materials on protective sheets. Clean up with wet cloths or mops to contain debris. Use an industrial vacuum to efficiently remove dust during and after fabrication.
3. Due to its abrasive nature, FRP can cause rapid wear on tools, necessitating frequent sharpening.
4. Opting for diamond-coated or tungsten-carbide router bits and saw blades ensures optimal performance and longevity.
5. Adjust machine speeds accordingly based on material thickness, with slower speeds for thicker sections.
6. Avoid applying excessive pressure during cutting, drilling, or routing to prevent premature tool dulling.
7. Properly preparing the surface for adhesive fastening is essential for achieving strong bonds.
8. Regular cleaning of machines is necessary to prevent the buildup of abrasive dust and glass particles.
9. For robust connections, a combination of mechanical fasteners and high-quality adhesive bonding is recommended.
10. Flipping FRP grating panels upside down provides a smoother cutting surface, effectively minimizing chipping. Applying consistent, moderate pressure without excessive force helps to prevent the accumulation of heat during the cutting process.

By adhering to these recommended practices, you can ensure safe and efficient fabrication of FRP materials while achieving strong and reliable results.



PROTECTIVE GLOVES



PROTECTIVE EYE WEAR



LONG SLEEVE SHIRT



PARTICULATE RESPIRATOR



HEARING PROTECTION



PROTECTIVE FOOTWEAR



CUTTING

When it comes to cutting FRP, it's crucial to maintain a delicate touch, applying light and even pressure to avoid blade clogging caused by dust particles. This careful approach not only extends the life of your blade but also ensures a smoother cutting process. Finding the right balance in cutting speed is equally important – too fast, and you risk fraying the material's edge or even causing discoloration. Therefore, it's essential to adjust the cutting speed according to the material thickness and type.

Moreover, proper support is paramount during cutting operations to prevent material shifting and potential chipping. Adequate support ensures cleaner cuts and minimizes waste. For small-scale projects requiring on-site fabrication, a handheld circular saw proves practical and efficient. However, for larger volumes or more precise cuts, investing in a table saw equipped with the appropriate blade is advisable. A diamond-coated blade not only delivers superior cutting performance but also boasts extended durability, making it a wise choice for long-term projects. Additionally, for handling larger or thicker sections of FRP, consider utilizing a radial-arm saw to achieve accurate and consistent results.

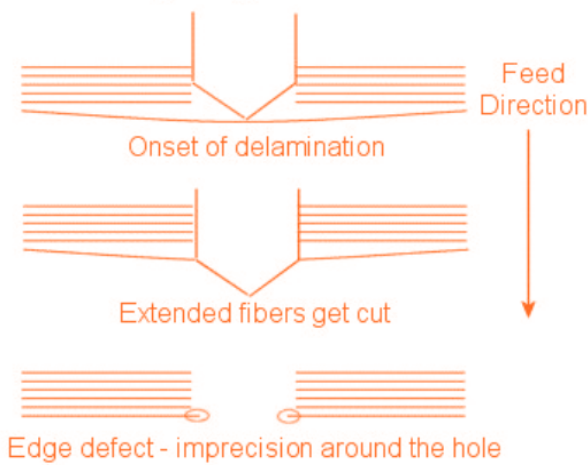


For circular or curved cuts, saber saws or band saws are suitable for smaller tasks, with diamond-coated blades enhancing efficiency and longevity. Hand routers offer an alternative for precise curves but involve more material removal. Carbide grit saw blades are ideal for jig saws or reciprocating saws.

For bar stock or rod cutting, hand hacksaws work well for limited tasks, using blades with 10 to 13 teeth per centimeter and light strokes. Power hacksaws are better for larger quantities, with diamond abrasive or tungsten carbide blades delivering optimal results. Chop saws with diamond abrasive blades also offer efficient cutting for various materials.

DRILLING

Drilling into FRP profiles is a straightforward task, typically utilizing standard high-speed steel drill bits, albeit requiring regular sharpening. For optimal results, sharpened brad-point bits are recommended. Key considerations when drilling FRP include matching drill speed to that used for hardwood and employing carbide-tipped drills for larger volumes. Holes drilled in FRP are typically slightly smaller than desired, and using a wood backup plate for large holes helps minimize breakout.



Routing operations in fabrication often employ CNC routers for precise, repetitive tasks. These routers, programmable for exact routing operations, predominantly utilize diamondcoated bits for efficiency. Both handheld and table routers produce smooth, uniform cuts suitable for straight, angled, and radius cuts. Rotary file bits, particularly tungsten-carbide or diamond-coated varieties, excel in high-volume routing. While wood bits are an option, they require frequent sharpening and wear out quickly. It's essential to apply light pressure during cutting to prevent FRP overheating and softening, which can damage both the material and the bit.

Manual deburring is a crucial step in FRP fabrication, especially for drilled parts. It involves using tools like deburring knives or sandpaper to remove burrs and rough edges around holes. Skilled operators delicately smooth out edges to ensure parts meet precise specifications and fit seamlessly into assemblies. This process enhances product aesthetics and reduces the risk of injury from sharp edges.



GRINDING AND SANDING

Grinding is sometimes necessary for tasks like notching and refining edges, despite not being generally recommended due to dust loading. Medium or coarse carbide grinding wheels are ideal, and regular cleaning of the wheel is essential. While any standard grinder can be used, air-powered equipment is preferred for efficiency. Light pressure is key to prevent overheating and burning the part.

For sanding, open-grit sandpaper (40 to 80 grit) on a high-speed sanding wheel works best. Avoid applying excessive pressure to prevent heating up the FRP and softening the resin. Air-powered equipment is effective and readily available.

Turning FRP requires standard metalworking equipment, with carbide tool bits preferred for large production runs. Round-nose lathe tools deliver a smooth finish, while single-point tools may cause tearing. Maintain dimensional tolerances akin to cold-rolled steel, and adjust feed and speed similar to aluminum or brass machining. Continuous, steady feeding yields optimal results, while stopping and starting may leave noticeable marks on the material. Adjust surface speed based on material hardness for desired finish quality.



SEALING

Sealing is a vital part of the fabrication process for FRP grating panels and structural profiles, ensuring their durability and longevity. We suggest using a resin and catalyst to seal any exposed fibers resulting from fabrication.



500mL Resin



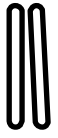
Catalyst



Application Brushes



Measuring Cup



Mixing Utensils

Our sealing kit, available for an extra charge, equips customers with all the necessary materials to perfect the grating before or after installation. Applying the sealer with smooth, even brush strokes is key, with just one coat needed and a drying time of up to 12 hours.



Our **DMRESIN** sealing and bonding resin kit, available upon request, includes all necessary items and instructions for proper application. This comprehensive kit ensures the protection of FRP grating panels and other components, safeguarding against corrosive elements and enhancing their longevity. Additionally, sealing spray cans are available for addressing scratches and scuffs on grating surfaces, providing a convenient solution for minor touch-ups.

SEALING

Gel Time, the duration for a mixed resin system to reach a highly viscous state, depends on catalyst concentration and working temperature. This critical information is summarized in the following table:

WORKING TEMPERATURE	CATALYST CONCENTRATION
10-15°C	2.5% (25 g for 1 kg of resin)
20°C	2.0% (20 g for 1 kg of resin)
20°C	2.0% (20 g for 1 kg of resin)

The values provided in the table are approximate and may vary based on specific resin formulations, environmental conditions, and application techniques. It is advisable to conduct small-scale tests to determine the exact gel time for your particular resin system under your specific working conditions.

During the curing process, the catalyzed resin transitions from a liquid to a "soft gel" in about 20 to 25 minutes, progressing to a firm gel in 30-40 minutes, and finally achieving a click-hard stage within 1 to 24 hours. It's essential to apply the resin mixture to grating or profile cuts during the soft gel stage. Temperature significantly influences curing time; warmer temperatures expedite curing, while colder temperatures slow it down.

For damaged parts, apply resin with a brush onto affected areas, then firmly press down fiber mat and saturate it with resin using the brush. Depending on the severity of damage, multiple layers of mat may be necessary.

After resin has fully cured (typically after a few hours), tools become nearly impossible to clean, necessitating disposal. To prevent this, clean tools promptly after use with acetone to maintain their functionality for future projects.



EDGE-BANDING

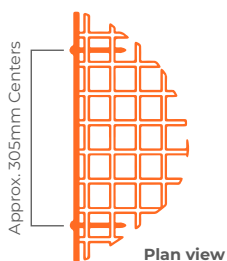
When it comes to **DMGRATE™** moulded FRP Gratings, edge-banding is not a structural necessity, unlike steel or aluminum gratings. As FRP cannot be welded, edge-banding does not transfer load to the grating. However, DM Composites recommends edge-banding in areas where personnel might pass through to prevent injury from stub bars or prongs.

NATURAL EDGE-BANDING: Achieving closed load bars on FRP gratings naturally involves adjusting the length or width to the nearest closed load bars of the grating. Since all our FRP gratings are manufactured with a mould, the pitch of the load bars is predetermined and cannot be altered.

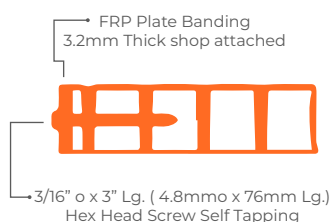
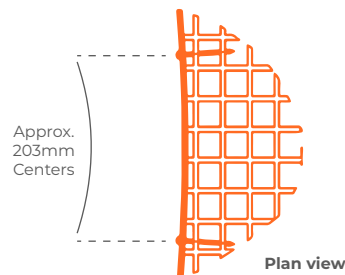
ARTIFICIAL EDGE-BANDING: This involves chemically bonding FRP load bars or plates to the cross load bars after trimming to size to ensure a uniform appearance on all sides of a grating panel section. Skilled operators with expertise in composite materials typically carry out this process at our factory. Artificial edge-banding includes gluing and/or bolting different stripes of fibers with polyester resin, following surface treatment, finishing, and polishing of the grating.

MECHANICAL EDGE-BANDING: For straight edges, mechanical bonding with an FRP ELA (Equal Leg Angle) structural profile can serve as a viable alternative to artificial edge-banding. This method can be executed on-site but is not applicable for circular sections. Mechanical edge-banding involves attaching nosing to FRP stair treads using fasteners or adhesives for a secure bond. It enhances safety and aesthetics, improving traction and visibility on stairs.

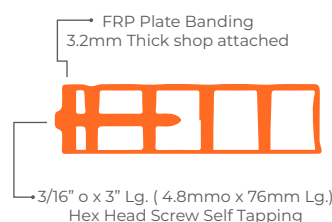
FRP EDGE-BANDING
Straight Opening



FRP EDGE-BANDING
Radius Opening



Section view



Section view



PAINTING

Before applying paint to FRP materials, it's crucial to prepare the surface properly. Failure to do so can result in paint not adhering properly or peeling soon after application. Begin by lightly sanding the FRP to remove the top layer of gloss. Then, wipe down the surface to remove any dust with water. To protect areas you don't want to paint, use tape or drop sheets. When applying paint using a spray gun, ensure even coverage to achieve a professional finish without runs or sagging.

For domestic applications in non-harsh environments, DM Composites recommends using Outdoor water-based Acrylic Paint. In harsh commercial environments, a 2-Pack Linear Polyurethane Base and Hardener is preferred. Norglass or Wattyl are brands that has been successful in the past. Painting FRP serves as a protective measure against UV damage and water incursion, enhancing both aesthetics and longevity. However, proper preparation and choice of paint are crucial for effective protection.



Unfinished or coated FRP may be susceptible to UV damage or water incursion, particularly in outdoor settings. Epoxy resins used in FRP can degrade over time in direct sunlight, leading to fiber blooming and eventual delamination. To combat this, industrial coatings or paints are applied to provide a protective barrier against UV light and water. These coatings not only safeguard the FRP but also enhance its appearance and can be customized in various colors.

FRP painting can be done using spray application or the roll and tip method. Spray application is commonly used for commercial FRP products like grating and panels, providing even coverage over large areas quickly. The roll and tip method, on the other hand, involves using a roller followed by a fine tip brush, often used for consumer FRP products like outdoor furniture. Regardless of the method chosen, surface preparation is critical for successful paint adhesion and durability.



PAINTING

We provide an extensive selection of popular colors, and our FRP materials offer unparalleled flexibility for matching any existing color scheme. All DM Composites products are available in custom colors or can be matched to any RAL color. Below is a sample of the colors we offer. Please note that our selection is not confined to these colors, and availability may vary for some products. Manufacturing lead times and product availability may be impacted if custom colors are required.



REPAIRS

While our FRP products are designed to be extremely low maintenance, occasional cleaning may be desired for aesthetic reasons. DM Composites provides easy-to-follow guidelines for cleaning and repairing FRP materials, ensuring their longevity and appearance. Whether you're performing routine maintenance or addressing minor damage, proper tools, materials, and techniques are essential for effective results.

CLEANING PROCEDURE

- 1. Pressure Washing:** Use a pressure washer with a maximum pressure of 140 bar to remove most types of soil from FRP surfaces. Maintain a distance of at least 30 cm from the FRP to prevent damage.
- 2. Light Cleaning:** For light to moderate dust or soil, use a damp cloth, broom, or compressed air to wipe, scrub, or blow off the debris.
- 3. Soap and Water:** Employ common household mild detergents with rags, soft bristle brushes, or brooms for slightly heavier soil. Scrub the surface with soap and water and rinse thoroughly with clean water.

SCRATCHES, SCRAPES, AND SCUFFS

- 1.** Clean the affected area thoroughly without damaging 1. adjacent surfaces.
- 2.** Wipe the scratches with a rag dampened with acetone or denatured alcohol.
- 3.** Allow to dry completely.
- 4.** Apply a clear spray paint over the scratches to seal them, ensuring they mostly disappear.

DEEPER GOUGES

- 1.** Clean the gouged area and wipe with a rag dampened with acetone or denatured alcohol.
- 2.** Allow to dry completely.
- 3.** Fill the gouge with an epoxy adhesive and allow it to cure.
- 4.** Lightly sand the epoxy patch smooth and apply a seal coat of clear spray paint.

For major structural damage or repairs not covered in this manual, contact our experts for assistance. Always prioritize safety and wear appropriate protective gear during cleaning and repairs.



INSTALLATION

DRILLING

At DM Composites, we prioritize precision and efficiency in every installation project. Our Installation section is designed to provide comprehensive guidance and best practices for seamlessly integrating our FRP solutions into your projects. From meticulous planning to expert execution, we ensure that your installation experience is smooth and successful.

EXPERTISE IN ACTION

Backed by decades of combined experience in the FRP industry, our team of professionals brings unparalleled expertise to every installation endeavour. We understand the nuances of FRP materials and their applications, allowing us to offer tailored solutions that meet your project requirements with precision. Whether you choose us to design and supply or opt for our design and construct services, we're here to ensure your project's success.

COMPREHENSIVE GUIDANCE

Our Installation section covers everything you need to know, from initial site surveys to the final touches. Whether you're working on a marine installation, industrial project, or infrastructure development, our guidelines provide step-by-step instructions for achieving optimal results.

EFFICIENCY AND RELIABILITY

With a focus on efficiency and reliability, our installation techniques ensure timely project completion without compromising quality. By following our proven methodologies, you can rest assured that your FRP structures will be installed with the utmost care and attention to detail.



EFFICIENCY AND RELIABILITY

With a focus on efficiency and reliability, our installation techniques ensure timely project completion without compromising quality. By following our proven methodologies, you can rest assured that your FRP structures will be installed with the utmost care and attention to detail.

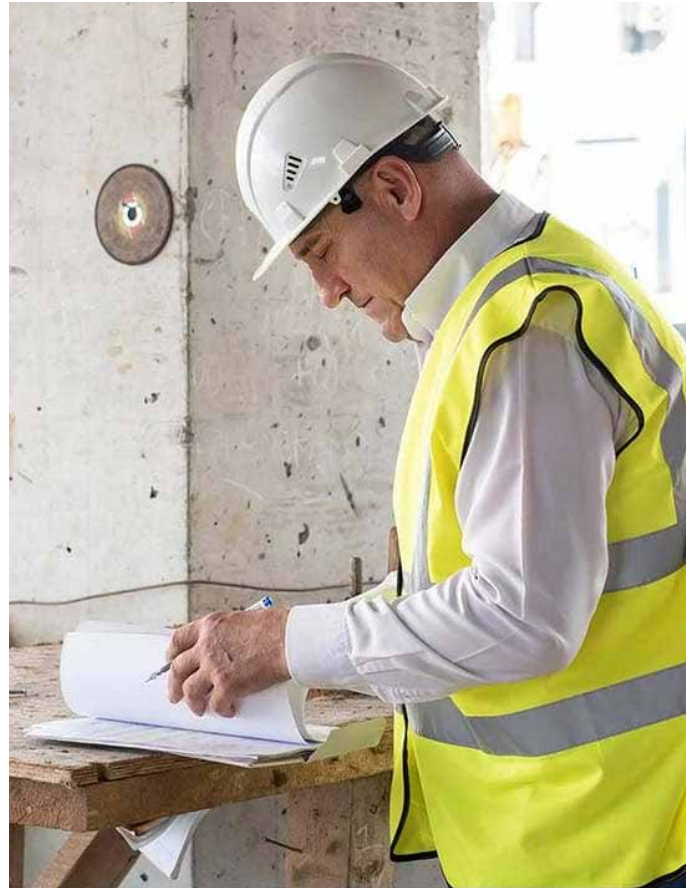


DOCUMENTS AND PERMITS

Understanding the documentation and permit process is crucial for the success of any construction project. At DM Composites, we offer comprehensive guidance on the various documents and permits required for FRP installations, covering everything from planning approvals to environmental assessments.

Our goal is to streamline the document and permit process, saving you time and effort while ensuring compliance with all relevant regulations. From obtaining Australian/New Zealand building permits to environmental impact assessments, we provide step-by-step instructions and valuable resources to simplify the process.

In the realm of FRP installation, a plethora of permits and documents are crucial to ensure compliance, safety, and effective management of projects. Development Approval (DA) and Building Permits are fundamental for regulatory adherence and approval of FRP construction or modification.



Additionally, specialized permits like Excavation Permits and Road Works Permits are essential for tasks involving groundwork and infrastructure adjustments.

From securing development approvals to implementing stringent safety protocols through tailored SWMS and SMPs for FRP installations, each document serves a vital role in ensuring project success and adherence to industry standards. Moreover, specialized permits such as Excavation and Road Works Permits, alongside documents like HIRAC, WZTM Plans, ITPs, DWPs underscore the comprehensive approach required to manage the complexities of FRP installations effectively for both public infrastructures and industrial applications.

Through meticulous planning, regulatory compliance, and adherence to safety standards outlined in these documents, DMBUILD™ ensures that FRP installation projects proceed with confidence and efficiency, mitigating risks and ensuring the durability and longevity of your structures.

SURVEY

In the installation phase of FRP projects, conducting a comprehensive survey is paramount to ensure precise planning and execution. Our survey process begins with a thorough assessment of the installation site, encompassing factors such as terrain topology, existing infrastructure, and environmental considerations. Through meticulous surveying techniques and advanced technology, we accurately capture site dimensions, elevations, and any potential obstacles or challenges that may impact the installation process.



During the surveying process for FRP installations, we employ various techniques and tools to ensure precise measurements and accurate planning. This includes the use of peg markers, bore logs, and other surveying equipment (Total Stations, GPS receivers or 3D Laser scanners), particularly beneficial when installing FRP boardwalks in environmentally sensitive areas such as reserves, beachside locations and national parks. Peg markers and bore logs help us verify the RL (Reduced Level) levels between ground level and the top of the structure, ensuring proper alignment and elevation.

In addition to peg markers and bore logs, we utilize a wide range of survey nails, markers, and deck spikes for all surveying applications. These tools enable us to check slopes, identify native vegetation or sensitive environments, locate site boundary points, and verify concrete levels for abutments or end ramps, which is especially crucial for FRP bridges and boardwalks. Furthermore, geotechnical reports play a vital role by providing valuable information about soil strata, including soil type, cohesion, friction factors, and rock termination levels. This data is particularly useful for determining the appropriate foundation methods, such as FRP piles for jetties or concrete foundations, ensuring the structural integrity and stability of the installation.

INSTALL METHODS

DMBUILD™ offers various approaches tailored to different project requirements and environments. For public infrastructure projects like boardwalks, jetties, and bridges, we typically provide stock lengths of FRP products for site cutting and fabrication. This allows for flexibility in adapting the materials to specific site conditions and design requirements, ensuring a precise fit and seamless integration within the surrounding environment.

In industrial applications, we offer cut-to-size FRP products or pre-assembled modules based on project specifications. Cut-to-size products enable quick and efficient assembly on-site, offering convenience and flexibility in installation. Alternatively, for projects requiring complex structures or components, we provide pre-assembled modules such as staircases and step ladders, reducing on-site labor and installation time.



Our installation methods encompass both the top-down approach and build-as-you-go strategies. The top-down approach involves assembling and installing prefabricated components from the top of the structure downwards, ensuring stability and structural integrity as the construction progresses. Conversely, the build-as-you-go method involves constructing the FRP structure incrementally, with each section assembled and installed as the project advances. Both approaches offer advantages depending on the project's complexity, timeline, and site conditions. For example, in the construction of a FRP bridge, the top-down approach may be preferred for installing prefabricated deck panels, while the build-as-you-go method could be more suitable for building structural supports and abutments.



FASTENING

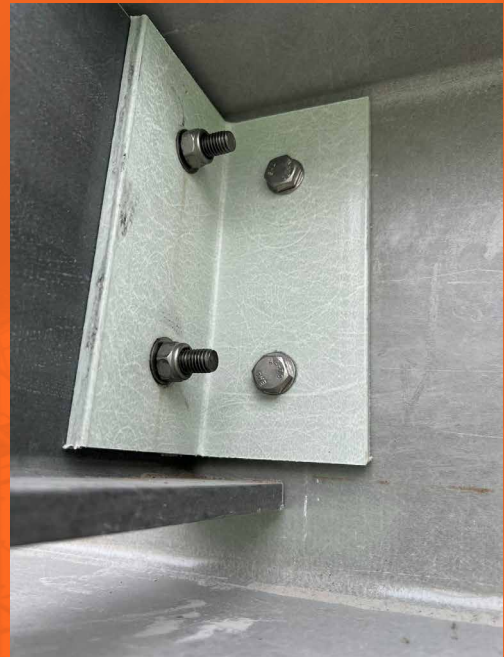
In the realm of fastening FRP materials, there exists a plethora of methods to explore and consider. However, there are 2 primary categories: mechanical and bonded connections.

MECHANICAL

Mechanical fasteners, including self-tapping screws, rivets, and bolts, provide immediate strength and facilitate assembly without the need to wait for curing.

Self-drilling and self-tapping screws, for instance, offer reliable shear strength and are often enhanced when combined with adhesives to maximize overall structural integrity.

For screw connections, it's advisable to utilize large flat washers on both ends of the bolted connection to evenly distribute the bearing load. Incorporating an adhesive on properly prepared mating surfaces can further reinforce the strength of this connection, ensuring robust performance in various applications.

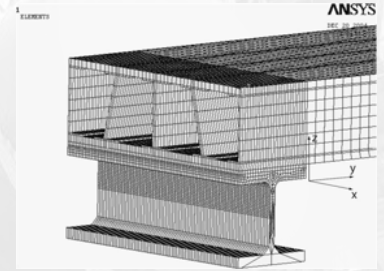
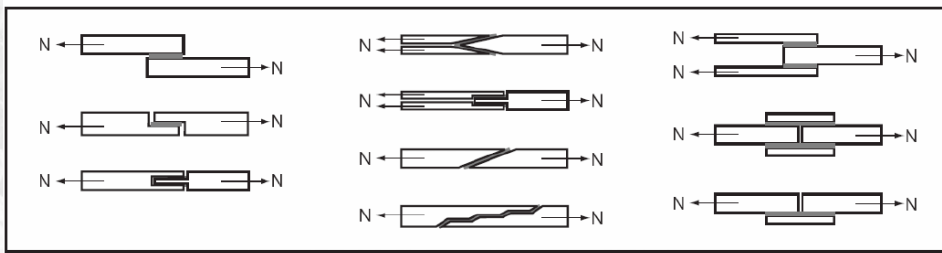


When it comes to joining hollow sections, structural bolts or rivet nuts emerge as a viable alternative. These nuts come in assorted sizes, materials, and head styles, including options like nylon, aluminum, stainless steel, and more. It's essential to drill the hole for the rivet slightly larger than the rivet itself to facilitate proper installation and secure fastening. With these versatile options at your disposal, you can select the most suitable fastening method tailored to your specific project requirements and objectives.

The choice of fastener grade is critical for ensuring the longevity of FRP structures, especially in corrosive environments. In highly corrosive settings like marine or chemical facilities, stainless steel grade 316 (SS316) is preferred for its exceptional corrosion resistance, while duplex and super duplex stainless steel are used in ultra-high corrosive conditions. For less corrosive environments like boardwalks, hot-dip galvanized (HDG) fasteners provide adequate protection against moisture and outdoor elements, though their effectiveness may vary in coastal areas with exposure to saltwater, sand, and wind. Selecting the right grade of fasteners ensures the durability and reliability of FRP structures, reducing maintenance and replacement costs in the long run.

FASTENING

DIFFERENT TYPES OF BONDED JOINT CONFIGURATIONS



BONDED

Adhesives serve as a reliable means to establish robust bonds between FRP shapes or between FRP and various structural materials. To ensure optimal results, meticulous preparation of mating surfaces and the use of recommended adhesives are imperative. Additionally, the application of adhesive should be conducted in a controlled environment, as factors like air temperature and humidity can influence the curing process.

Various types of adhesives exhibit compatibility with FRP materials, each offering distinct open and clamp times suited for different applications. DM Composites has observed exceptional outcomes with epoxy, methacrylate, and urethane adhesives, among others. It's crucial to adhere to MSDS (Material Safety Data Sheets) when handling adhesives to ensure safe and effective application.

Proper surface preparation is paramount for achieving successful adhesion. Contaminated surfaces should be meticulously cleaned with a solvent like methyl alcohol and thoroughly dried before sanding. Sanding the mating surfaces with an 80-grit sandpaper to remove the surface veil is essential. After sanding, wiping the surfaces with a clean, dry rag to eliminate any remaining dust is vital to prevent contamination and potential bond failure.

Following the manufacturer's recommendations for adhesive mixing and application is critical. Applying a thin film of adhesive to both surfaces to be joined ensures comprehensive coverage. Holding the bonded joints in position until the adhesive cures is necessary, with clamp time varying based on the adhesive type. Mechanical fasteners like self-tapping screws, rivets, or bolts can aid in maintaining bond pressure and securing freshly bonded joints, allowing for expedited fabrication in some cases. However, relying solely on clamps or weight may necessitate allowing sufficient time for the joint to cure before proceeding with fabrication or assembly.

LOGISTICS

Ensuring smooth logistics is vital for all our projects. Our materials are primarily transported to sites via road freight, with meticulous planning to optimize delivery efficiency. For projects overseas, such as those in New Zealand, we coordinate sea freight shipments, leveraging our expertise in container logistics to ensure timely and cost-effective delivery. In urgent situations, airfreight may be utilized, although this option comes with limitations on volumetric weight and maximum length, making it a costly alternative.



Our products are designed with logistics in mind, with lengths typically limited to 6 meters or 12 meters to facilitate easy transportation in standard containers. To overcome challenges posed by limited access to sites, especially in native vegetation areas, we develop custom logistic solutions, including specialized trailer systems tailored for efficient material transport. In some cases, airlifting materials via helicopter proves to be the most viable option, leveraging FRP's lightweight properties to strike a balance between efficiency and timeliness in construction and installation processes.

Various types of road freight are employed, including semi-trailers, b-doubles, flat beds, side curtain trailers, and hiab trucks equipped with built-in cranes for locations where forklifts are unavailable. Our goods are meticulously palletized and organized for easy unloading, typically requiring the use of a forklift upon arrival at the site.

When navigating site constraints with trucks, one critical consideration is the turning circle—the minimum space required for a vehicle to make a complete 180-degree turn. This factor is particularly crucial in tight or confined areas where manoeuvrability is limited. Our team carefully assesses the turning circle requirements for trucks delivering materials to ensure seamless access to construction sites.

We optimize logistics planning to accommodate site-specific constraints. This includes accounting for factors such as road width, obstructions, and the layout of the surrounding environment. Through meticulous planning and coordination, we ensure that trucks can safely and efficiently navigate the turning circles necessary to access project sites without compromising on delivery timelines or site integrity.



DMBUILD™

 www.dmcomposites.com.au

 info@dmcomposites.com.au

 (+61) 469 871 368

 (61+) 411 820 538

 Australia

 Connect with us