



# Modular Handrail and Balustrade Systems

Common Design and Installation Mistakes to Avoid

**moddex**<sup>®</sup>  
EVERYTHING FITS



## INTRODUCTION

Our public ramps, stairways, and walkways all have handrails and balustrades as necessary design features. Handrails are there to help users and give them stability. With the aid of these handrails, everyone can safely navigate the ascent and descent of a ramp or set of stairs, especially those who struggle with balance or vision impairment.

Thoughtful, considered and compliant design is essential otherwise the handrail and balustrade system will not achieve what it is intended to do. An incorrectly designed system will not be able to withstand the required loading or provide a stable and durable structure, thus posing a safety hazard to users—factors that can open up stakeholders to economic and regulatory risks.

Handrail and balustrade installation is a task that often comes at the end of a project. In such instances, the pressure is high and last-minute installation errors can lead to unnecessary and costly delays and budget overruns. If a project is completed late, the client may be entitled to compensation from the contractor. Furthermore, a contractor's reputation may suffer if a project is completed late without a good, authorised reason.

In this whitepaper, we take a closer look at common design and installation mistakes affecting handrail and balustrade system builds as well as how working with a reliable manufacturer throughout the build can help you reduce end-of-project risks. The sooner you understand these potential errors, the better you can plan to avoid them.









## FAILING TO CATCH MISTAKES EARLY

Safety should always be the main focus of any handrail and balustrade system. It should be high enough to serve as a safety barrier for children and adults of average height, and follow the dimensions required by the relevant standards and regulations precisely.

The first step in specifying any railing system is to make sure you have the proper dimensions. A few careless mistakes early in the design and specification of a railing system can detract from its appearance and functionality, and necessitate significant rework. This includes mistakes regarding the measurement of the site, improper specification of heights, measuring too close to the wall, and failing to specify a continuous rail when required.

It is common in building projects for the wrong stakeholders to review drawings and designs before installation begins, which leads to errors during installation that cost time and money to rectify. It is advised to work closely with experienced professionals who have a deep understanding of the relevant standards and can conduct detailed site measurements to inform the accurate development of technical drawings. These drawings can then be submitted for stakeholder sign-off as another layer of verification.

It is always easier and less expensive to make changes early in the project than it is to discover, after the components have been manufactured and installed, that they have not been measured correctly.

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## FAILING TO FOLLOW LOCAL BUILDING REGULATIONS

In addition to varying from country to country, state to state and city to city, different standards can also apply to different parts of the same project. For example, the standards that apply to walkways within a building are not the same as those that apply to walking and cycle paths. Further, there are specific access and mobility requirements on new building work to enable safe access for people with disabilities. For more information, refer to the “Barrier Design Basics” whitepaper found [here](#).

Delays and cost overruns may occur if the project’s plans are inaccurate or fail to take the right standards into account. The most important requirements cover the following areas:

- where and when a handrail or barrier balustrade is required;
- how high the handrail should be designed;

- the dimensions of different components within a railing system; and
- the height of the platform or base the handrail is being installed on.

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Choosing a product or system that has been specially designed to meet local regulations is the most efficient path to compliance. This avoids a situation where the selected product is found to be inappropriate for the job and must be completely replaced.

## SELECTING A POOR-QUALITY PRODUCT

The adage “You get what you pay for” applies to handrails and balustrades. The price of a handrail and balustrade system depends on many things, including quality, safety, research and development costs, durability, warranty, installation, and delivery. Although there might be less expensive options, they are less likely to be supported by a strong warranty, made out of materials that are not fit for purpose, and are more likely to break down quickly or need expensive maintenance.

Cost is always a significant factor when it comes to product specification. However, choosing a low-quality product up front carries with it a hidden cost—the extra time required to re-specify and, in some cases, remanufacture the solution. In the worst-case scenarios, it may necessitate replacing the entire system or certain components in order to comply with regulations.

Choosing the wrong materials is another common mistake. The climate and environmental factors can vary significantly from project to project. The solution will need to be replaced earlier than intended and may fail, posing a safety risk, if the materials used cannot effectively withstand the local environmental conditions.

## TRADITIONAL WELDED VS. MODULAR SYSTEMS

Failing to consider the construction benefits of modular systems represents a lost opportunity for many projects, particularly given the rising cost of labour and materials. Specific types of modular railing systems are much easier and more cost-effective to install than traditional welded systems, which require exacting welds or other complex steps.

Traditional welded railing systems must be welded on site, which requires heavy tools and machinery, hot tools licenses, the implementation of toxic fume safety procedures and comes with a range of safety risks that can lead to site shutdowns. Unlike traditional welded systems, modular handrail systems come already designed, engineered

## COMMON INSTALLATION ISSUES

There are a range of issues that can occur during the installation of a handrail and balustrade system. For example, failing to clean up during the installation process may lead to metal shavings getting embedded in the handrails, which can injure users when they are grasping the rail. A poor-quality substrate or working too closely to live electrical or water services are common site issues that can cause the railing system to become unsafe.

The raw materials used to create the handrails and balustrades will need to be selected to provide a suitable level of durability based on the proposed location of the works. Metal products can be finished in a variety of ways, and they must have a protection level class that is appropriate for the proposed location, such as hot-dipped zinc coating, aluminum coatings, stainless steel, aluminum, or applied paint finishes that follow the manufacturer’s recommendations.

Both indoor and outdoor railing systems are significantly impacted by the volume of traffic in a location, which frequently necessitates the use of stronger materials. In addition, consider using marine-grade materials for applications that are subject to extreme temperatures, precipitation, saltwater, or chlorination, such as in swimming pools.

Choosing the wrong product or materials often goes hand-in-hand with a failure to adequately consider long-term maintenance requirements and costs. Although some materials may be more aesthetically pleasing than others, maintaining them can be very expensive.

and tested with a simple set of assembly instructions. Fittings are prefabricated, components are cut to size and everything can be put together using an easy fastening system or an industrial metal-to-metal glue.

Modular systems can often be customised to meet site-specific requirements. Changes can also be made much more quickly and easily on site with modular components than with welded products. The lack of flexibility of non-modular components can require an entire system to be taken out and replaced, which adds extra cost and time, especially when heavy equipment or specialised labour have to be brought back in.

A misaligned railing system can sometimes result from poor communication or a lack of attention to detail. There may be several reasons this could occur, including a failure to follow the design, failure to adhere to the manufacturer’s instructions or carelessness when measuring and cutting posts and balusters. Rather than ignoring the specifications or installation instructions, it is advised to work closely with an experienced installer and the manufacturer throughout the installation process to ensure the best outcome.

## AVOID END-OF-PROJECT PAIN POINTS WITH MODDEX

Moddex are Australasia's leading manufacturer of modular, no-weld barrier systems. Pre-engineered for structural integrity, their proprietary systems are load tested and configured to Australian and New Zealand Standards (AS/NZS), Workplace Health and Safety guidelines (WHS/OSH), Australia's National Construction Code (NCC/BCA) and the New Zealand Building Code (NZBC).

Investing in the Moddex system means they take care of the design, manufacture and installation of your project barrier requirements, delivering a turnkey, design build package. Being pre-engineered, with many years of research, development, design and engineering behind every pre-designed configuration, Moddex engineers can conduct a detailed evaluation of your handrail and balustrade design to ensure your Moddex system complies with the relevant building code and standards.

Moddex eliminates design and engineering costs, reduces installation costs, and minimises onsite fabrication issues with their smart modular handrail, balustrade and barrier systems. Supplied as a series of components with simple assembly instructions, every Moddex system can be adapted or extended with additional components or cut to size on site.

### End-to-end design process eliminates mistakes

One reason project managers choose Moddex over the competition is because of their end-to-end design process that competitors cannot match. Moddex are alert to the risks and has well-developed processes to identify and eliminate potential design and installation issues.

A good example is the Moddex two-phase design process that includes Design Intent (DI) followed by detailed shop drawings.

Completed early in the piece, DI is a snapshot of the proposed installation before embarking on detailed shop drawings that picks up the extent and location of handrails and balustrades and allows for early identification of compliance issues.

DI is typically reviewed by the project team and often signed-off by a compliance certifier, but the process provides enormous flexibility for customers to have input at an early stage and surfaces all potential issues before committing resources to shop drawings.

After finalisation of shop drawings, Moddex pick and pack all necessary components according to the section that is being installed and ship them to the site accompanied by detailed drawings for installers. This minimises clutter on the job site and allows Moddex installers to work with fewer tools, less dust and noise, and with no hot works.

Despite everyone's best efforts, issues sometimes arise that require an on-site fix and, without missing a beat, the modular design means that the installation team can quickly and easily accommodate changes and adjustments can be made on the fly.

Moddex's unique design process is structured to ensure compliance and ensures that the way architects specify the project is exactly the way it gets built onsite. They also back their install teams to deliver neat and compliant installations every time.

## DESIGN THROUGH TO INSTALLATION



Even in the largest, most complex projects, Moddex can take care of the design and installation of railings and balustrades from start to finish.

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