

COMPLICATIONS WITH MANAGING DESIGN AND BUILD PROJECTS

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Whilst design and build projects are inherently complex, it does not always follow that their management needs to be as difficult. Like every project, a successful design and build project is reliant on good communication between the team and the stakeholders with a 'Critical Path' mapped out to identify potential issues in advance. Steps may then be taken to, at worst, mitigate and at best, remove unwanted complications.

Geographical Locations

It's not uncommon for the Design team and Fabrication/build team to be based in separate locations. In fact, it is more common nowadays for this to be the case. Naturally, this promotes isolated working and can often leave gaps. Involving the build team throughout the design process is crucial to ensure industry knowledge and expertise is captured and incorporated into the design details from the outset.

A joined-up approach is crucial to ensure maximum efficiency, compliance, quality and a happy customer when designing equipment. It also allows the build team to plan properly and be ready for when the build phase begins. Planning for the correct resource to be available, all procedures

confirmed together with approved Inspection & Test Plan (ITP), any designated work areas required, etc all indicate forward thinking and a concerted effort to identify any problems in advance.

In summary, although the build team do not directly get involved until further into the project, if a design and build project is to run smoothly, it is advantageous to keep all stakeholders engaged throughout the concept to completion program.

Buildability

Buildability is a complicated aspect of a Design and Build project which must be thoroughly considered. Often, whilst ideas appear great on paper, the practicalities of fabrication and build are a whole different story. It is not uncommon for details to be unachievable when it comes time to build, as often areas that look accessible on the 3D model are inaccessible in real life.

The build team have a pragmatic approach to what is possible and what 'typical details' are best to use. Of course, what Designers/Engineers envisage may not always be possible or the best methods and processes. There is often a juggling act between

fig. 1/ a tilt trailer used for jig transportation



what's preferred and what's physically possible to build, hence reaffirming the importance of a joined-up approach between the design and build team, itself becoming a vital component in ensuring complications are minimised.

Black Build

Whether it involves internal or external stakeholders, it is crucial to undertake a "black build" of structures which are formed from interfacing components. Before committing to surface finishing or transportation, it's in everyone's interests to confirm that the structures are not only as per the fabrication drawings but that they also seamlessly interface with each other at connection points.

The black build is a crucial risk management activity and assures all stakeholders that the equipment is in accordance with the design, before proceeding to the next phase. If this phase is not undertaken, it opens up a wide variety of potential issues later down the line, such as rework of physical parts, revisions to the design and worst case could result in parts being disposed of and new parts made, all of which adds time and money. At all times the end goal is for a happy customer, maximised profitability and efficient use of labour. Forward planning and a cohesive team approach with each member having clearly defined roles and responsibilities is therefore essential.

Factory Acceptance Testing

The Factory Acceptance Test (FAT) is not only beneficial for end-users and buyers but also for those manufacturing and packaging the product. The FAT helps assure both parties that the new equipment complies with all contractual specifications. Moreover, it helps address any functional issues before the equipment arrives at the client's installation site.

Rectifying manufacturing issues while the system is still with the manufacturer helps control aspects of the project, such as timeline and budget. The FAT is a cost-effective solution and is preferable to addressing issues post-deployment.

The typical process for the final stages of a design and build project is as follows:

- Black build
- Disassemble
- Surface finish application
- Full assembly/build
- FAT

Loading and Transport:

Once the FAT is complete, the equipment should then be transported to its final location. Again, this is something that should have been considered early on in the design phase.

Although transport is every bit as vital as the build phase, naturally, the focus is always on the job at hand. It's important not to lose sight of the fundamental practicalities such as lifting padeyes for manoeuvring during the build and thereafter for transport/installation.

If these aspects are considered during the main design phase it is not only a more commercially viable method (rather than retrofitting padeyes to the structure) but also provides the best and most professionally finished solution.

This paper has suggested that the development of a critical path is crucial to complex and simple projects alike; it enables you to effectively and efficiently identify and mitigate against any potential issues, before they arise. It also enables you to document these issues and resulting actions, to offer noted best practice to cascade across the wider organisation.

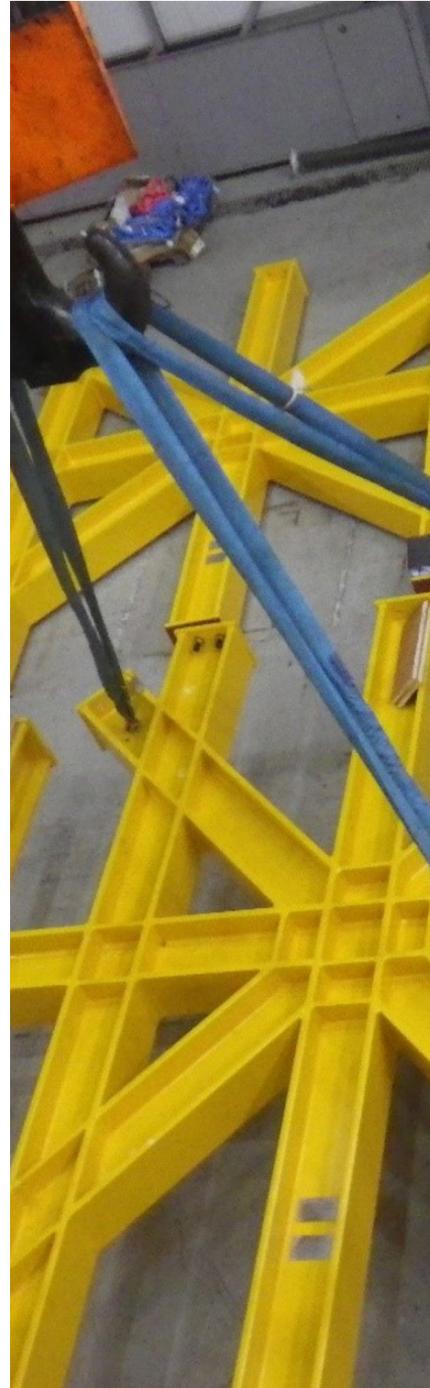


fig. 2/ frame lifted at 4 points with gantry



fig. 3/ black build of support jig prior to painting and delivery