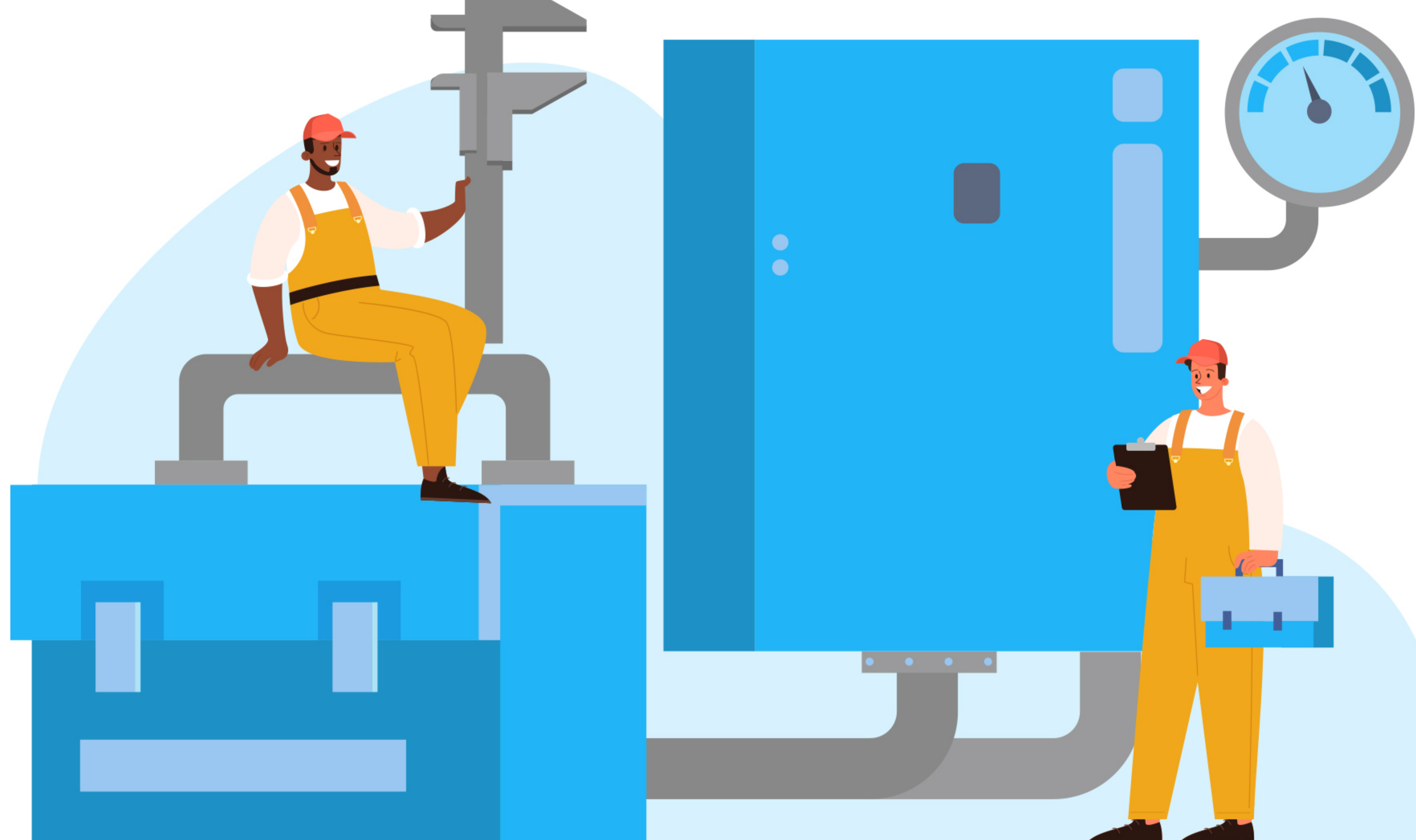


CLEANROOM DESIGN & INSTALLATION

How you build is as important as what you build. For pharmaceutical cleanroom applications, your most crucial consideration is how your design might impact your manufacturing process. Choose materials that are non-absorptive, non-shedding, and non-reactive – this is imperative to ensure the safety, identity, strength, quality, and purity of your drug product. Ensure that there is nothing in your product that is not supposed to be there.



SPACE REQUIREMENTS

The AES design team has **more than 35 years of design** experience overcoming unique project challenges, including less-than-desirable space allocations, unique shapes, reduced overhead clearance – the list is endless.

- Stick-built and AES Modular solutions are both **limitless in flexibility**, designed not only to retrofit into existing spaces but also deployed into new facilities.
- AES modular construction **occupies less space** than traditional stick-built wall assemblies.
- AES modular construction **occupies substantially less space than pre-fabricated building modules** which require additional structural allocations and size limitations.
- Prefab building modules may not be your best option. Did you know that these facilities can require additional space and complex logistics to accommodate the movement of modules within your facility? That means a larger required footprint and associated lifecycle costs.



LATE CHANGE FLEXIBILITY



Projects evolve, processes change, and where a project starts is not always where it ends up.

- AES can make **rapid adaptations** to keep your project on time and your performance objectives in focus throughout the design, fabrication, and installation.
- Pre-engineered modular construction can be **easily and cleanly reconfigured** to address changes such as late arriving equipment, process evolution, or updated business drivers requiring facility flexibility. Now and in the future.

HOST BUILDING ADAPTABILITY

- Both the AES modular solution and stick-built alternatives can be **adapted into any host building environment**. Those solutions are not limited by the size, shape, overhead clearance, or rigging pathway within the host building environment.
- Mobile pre-fabricated building modules, on the other hand, may not be suitable with all host buildings due to the inherent rigging limitations of prefab modules and the increased difficulty of inserting a 3D structure into a limited spacial configuration.



QUALITY



Modular construction takes finish details out of the hands of the mechanics in the field and puts them into the hands of the engineers in the factory environment.

- The AES controlled conditions on the manufacturing floor deliver **repeatable, high quality results** that far exceed those obtained through traditional stick-built finishes in the field.
- AES facilities are pre-engineered as a cleanroom system and are replicated all over the world with the **same quality finishes and performance characteristics, regardless of location**.
- The AES pre-engineered modular construction delivers predictable and repeatable performance while still allowing for **ultimate customization and adaptability** for the ever-changing environment of our clients' businesses.
 - By contrast, stick-built construction quality is highly variable, depending on the crafting skill of person assigned to the job that day.
- The AES Construction Quality Plan (CQP) is a protocol generated expressly for your project, and executed by our field team to document all aspects of the project's lifecycle.
- Most AES clients leverage the CQP to accelerate their validation activities and to reduce total project cost by **minimizing the duplication of efforts** between the cleanroom design/builder and the validation team.

PREDICTABILITY

AES chose the pre-engineered modular construction approach after witnessing its benefits first hand in the 1990's.

- Moving construction into the factory allows for **repeatability and predictability**.
- This construction method **delivers precision** while still offering onsite **adaptability and customization**.

