What is Modular and Prefabrication Construction?

Worksheet

Modular and prefabrication systems are construction methods where components or complete volumetric units are manufactured off-site under controlled conditions, then transported and assembled on-site - usually to save time, improve quality and reduce waste.

Questions

1. A traditional build takes 60 weeks; a modular version takes 36 weeks. What is the schedule reduction?

A) 24%
B) 40%
C) 60%
D) 36%

2. Why is modular construction often faster than site-built construction?

A) It uses more on-site labor
B) Factory fabrication runs in parallel with site work
C) It always uses less material
D) It requires no design phase

3. What is a common constraint of modular/prefab systems?

A) Unlimited module size
B) Design must be locked early, limiting late changes
C) No quality control possible
D) Impossible to combine with site-built elements

4. Which best describes prefabrication?

A) On-site casting of concrete only
B) Off-site manufacturing of building components before installation
C) A type of facade system
D) A structural analysis method

5. A hotel project takes 52 weeks with traditional construction. Using modular prefabrication, the site and factory work in parallel and the project finishes in 30 weeks. Find the schedule reduction.

6. A school must be built in a remote area with limited skilled labor and a short construction season.

7. A high-rise residential tower wants faster delivery but the ground floor needs large column-free retail space that doesn't suit standard modules.

8. Define: What is modular construction?

9. Define: What is prefabrication?

10. Define: Why is modular construction faster?

Answer Key

1. B) 40% - (6036)/60100 = 40%.

2. B) Factory fabrication runs in parallel with site work - Parallel factory and site work shortens the overall schedule.

3. B) Design must be locked early, limiting late changes - Because modules are manufactured ahead of time, design changes late in the process are costly or impossible.

4. B) Off-site manufacturing of building components before installation - Prefabrication means manufacturing components in a factory before bringing them to site.

5. Reduction % = (t_trad t_mod) / t_trad 100 = (52 30) / 52 100 = 22 / 52 100 42.3%

6. Identify constraints: limited local labor, short weather window Option: modular volumetric units built in a factory, shipped and craned into place Factory construction is weather-independent and needs a smaller on-site crew for assembly only Decision: specify volumetric modular classrooms, reducing on-site duration and labor risk

7. Identify the mismatch: standard modules work well for repetitive floors, not for open-plan retail Option: hybrid system - cast-in-place or steel structure for the retail podium, stacked volumetric modules above for repetitive residential floors This captures modular speed for the repetitive upper floors while keeping design flexibility at the base Decision: specify a podium-plus-modular hybrid structural strategy

8. A method where 3D volumetric units (modules) are manufactured off-site in a factory, then transported and assembled on-site.

9. Manufacturing building components - panels, modules or structural elements - off-site under controlled conditions before installation.

10. Because factory fabrication happens in parallel with on-site foundation and utility work, instead of sequentially.