Project Management Institute. Kingdom of Saudi Arabia

Precast or steel structure pipe rack?

Engineers weight the costs and benefits before giving the nod to precast pipe rack structural system.

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In our industry, precast and steel structure pipe racks are common, effectively carrying all loads, including pipes, cables, and other utilities required to operate facilities.

Choosing between the two types during engineering and the early phase of projects requires consideration of several criteria, including:

Safety **Schedule** **Cost** **Sustainability**

In recent oil and gas projects, we've elected a precast pipe rack structural system. This decision came after considering a number of factors, including product quality assurance, durability, and safety of execution, as well as our past experience and lessons learned in choosing between precast and steel pipe racks.

A key consideration was pre-cast has greater design flexibility, lower maintenance costs, more project management efficiency, and it promotes our vision toward sustainability where metallics are minimized or replaced by concrete.

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which impact the projects' pillars (cost, budge, quality, safety, resources) of any project, including:

- 1. The fireproofing application in precast is replaced by concrete which leads into less scaffolding erection and bringing the work from height to ground, enhancing the safety of the project and reducing exposure of workers to hazards. While in steel structure, the fire proofing is mandatory and shall be done at height that require scaffolding erection and work stoppage for ground work beneath the scaffolding/ steel structures.

- 2. The precast frames can be done at ground level by installing multiple elements and joints that shift the manhours from height to ground to allow work front opening and enhance schedule activities sequence.

- 3. From quality perspective, the work on the ground has higher control and reduces the number of joints to be executed at height.

- 4. Cost-wise, pre-cast pipe rack is cost-effective compared to steel structure pipe rack, especially for large-scale projects or

Also, because much of the work will be done on the project's premises, this will allow some of the careful mitigations needed in working with pre-cast pipe rack. This helps avoid any potential delays that sometimes occur with pre-fabricated steel structures that are constructed at a vendor or contractor facility.

Nonetheless, the two types of pipe racks are considered workable solutions and commonly used, with the choice between them depending on a variety of considerations such as project costs, schedule, maintenance life cycle, and environmental impacts.

By making the decision at an early stage, it should avoid late changes in projects that could effect the project's timeline and budget.