Lifting Frame For Modular Piperacks

A new process plant was designed to have the main services supplied on central piperacks which were to be modular construction. There were 4 units each 26m long, 5m wide and 2.5m high. The design was such that vertical bracing locations were restricted so the units had been designed as bi-axially stiff frames. This caused major problems with the design of connections so initially the frames were designed to be fully welded construction. Peers proposed a piece small fabrication alternative offering simple end connections and cost effective finishing (Galvanized) prior to the offsite assembly of the modules. To achieve this a separate lifting frame was designed to dramatically reduce the design forces in the module by taking the bulk of the lifting loads.

Key Points:-

1. Fabricated from CHS sections the new lifting frame weighed 4 Tonne.
2. The overall module weight was 50 T. The crane used was a 500T mobile.
3. Where possible temporary bracings were used to further reduce forces.
4. The lifting frame reduced the moment connections offering big cost savings.
5. Conventional fabrication was half the cost of welded frames.
6. Painting & Transport cost were reduced as items went piece small galvanised.
7. Welders working at height was eliminated.
8. One frame was used for all 4 modules.
9. Modular construction reduced the overall site time and working at height.
10. Frame could be used again on future projects or material re-used.
11. Bolted members made off site pipe installation easier.
12. Lifting lug detail was incorporated into the frame – Weld testing only.
13. Savings made to fabrication and programme far outweighed the cost of the frame.

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