

## Six Construct MIDMAC JV (Khalifa Stadium)

### Productivity Improvement through Rapid Intervention



The Six Construct – MIDMAC JV was engaged in the complete renovation, construction, completion and maintenance of Khalifa Stadium and Museum at ASPIRE Zone, in Doha, Qatar. The objective of the program was to support the QS2 (Six Construct – MIDMAC) JV in effectively using the PERFORM methods to further improve the direct labour productivity in the MEP works.

“We were very pleasantly surprised as to how work front heads accepted and implemented solutions developed for improving productivity”

**Frederic Brunelle**  
(Project Director)

#### Key Results

Improvement of 32% of actual hours versus target hours

Closed the gap between authorized man-hours and actual direct man-hours

The gain in productivity not only reduced overspent man-hours but also improved production, thereby improving progress on site

Improved the buy-in of construction managers and work front engineers for productivity measurement and control initiative (PERFORM)

#### PROJECT GENESIS

PERFORM as a methodology was initiated by Six Construct in 2015 following successful development and trialing; Renoir was engaged for the development of the program and supporting its implementation across selected sites. The PERFORM initiative has been rolled out across all sites with central monitoring from the corporate office.

The Khalifa Stadium had implemented the initiative for both civil (including façade works) and MEP works, the latter being the first time PERFORM was used for MEP works. However, actual direct man-hours consumed were higher than the authorized man-hours, mainly in relation to MEP. Renoir was contracted to assist in the deployment of the PERFORM process in the MEP discipline at the stadium in order to reduce this gap.

#### PROJECT APPROACH

The engagement was a rapid intervention to improve productivity through the better organization of activities. The work fronts for the intervention were selected based on manpower overspend as reported in the weekly productivity report, which was reviewed as part of the PERFORM meetings.

The following tasks were undertaken as part of the engagement:

**Investigation:** Time and motion studies were carried out to identify the following losses:

- Loss of man-hours because of inappropriate crew size (more people being deployed to a task than necessary) and improper sequencing of jobs (activities arranged without successive sequencing leading to losses due to idle times).
- Supervisory lapses leading to poor work organization, and
- Lack of preparation.

During the course of investigation, issues such as relevancy of target were also reviewed through direct observation.

**Development of the Solution:** The solution focused on:

- Re-engineering crew size commensurate with job scope,
- Developing appropriate task sequencing: leading tasks (measurement, fabrication and installation of supports), production tasks (installation of main MEP services and accessories), and finishing tasks (connections and other tasks),
- Identifying supervisory shortfalls, tool shortages and multiskilling capabilities.

**Pilot Implementation:** The defined solution was implemented in a pilot area and then rolled out across the entire work front.

**Monitoring the progress:** Audit and monitor work front progress through PERFORM meeting and take corrective actions as required.

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## IMPLEMENTATION

Several work fronts were included as part of the implementation. The larger, more critical ones were:

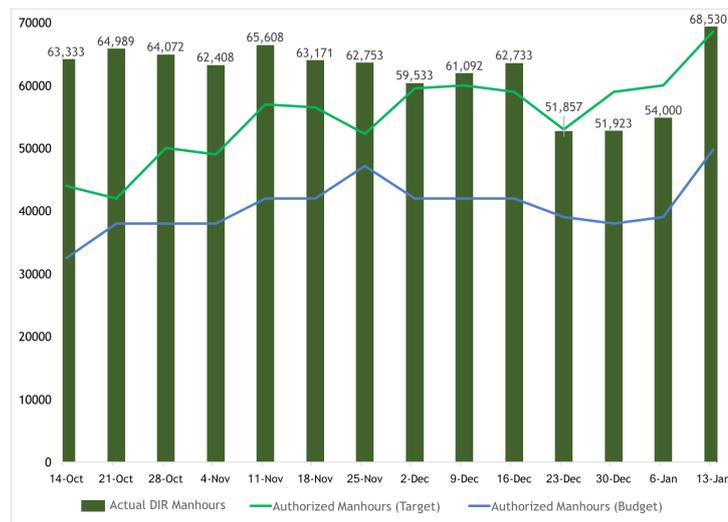
**Mechanical rooms** – the productivity for chilled water pipe installation was improved by changing work sequencing. Welders were released from pipefitting jobs by using multiskilled pipefitters for tack-welding. This allowed crew sizes to be reduced by 50% and maximised the use of welders. In addition, better task planning reduced time wasted due to waiting on materials, access, tools and tackles. Budget rates for other support and testing activities were also developed to control productivity.

**Repetitive duct works** – productivity and production for duct installation was improved through appropriate task sequencing, implementing a modular schedule to exploit productivity gains and better defining job scopes for efficient manpower utilisation. Active supervisory skills for the work front engineers and foremen were also developed

**Facade works** – jobs scopes were better defined to ensure optimum utilisation of manpower. As for the other work fronts, more appropriate job sequencing was implemented.

## RESULTS

The rapid intervention produced significant results within 14 weeks, with a significant closing of the gap between actual versus authorised man-hours. The trend is as per the graph below:



## THE RENOIR GROUP

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Visually, the stadium can be seen to have changed dramatically over the period of implementation:



Before 31st Oct



Close of engagement 29th Jan

All in all, the rapid intervention proved to be a great success – not only in delivering immediate measurable benefits but also in developing the disciplines required to execute a major construction project efficiently.

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