



Design for Manufacture and Assembly (DfMA) saves 25% Project Costs and 90% Programme

Key benefits

- Improved Health & Safety
- £250k project cost savings
- 11 weeks time saving - 1 week installation period not 12 weeks
- Risk reduced programme and quality assurance
- Managed interfaces
- 50% reduction in labour
- 20% improvement in quality
- Zero defects

Background

Frankley Water Treatment works is a strategic Severn Trent Water site supplying water to 1 million people in Birmingham including sole provision to 11 hospitals - interrupting supply was not an option. The main contract, run by MWH Treatment, was for the replacement of an unreliable existing Lime Dosing system which was a potential water quality risk for customers.

The project included a new £14m lime batching and dosing plant, largely built within and around existing building infrastructure. meps provided 5 DFMA packages including pump skids, pipework and integrated structures. The main DFMA package was a 25m x 7m lime manifold pipework assembly complete with access, valves and flowmetres.

Main project scope items included:

- Lime batching and dosing plant
- Lime storage tanks
- Chemical dosing for pH control
- Pumps and pipework
- Water conditioning - degasser package
- All ICA and asset integration

The challenge and the need for change

Severn Trent Water's regulatory efficiency targets reflect those typical of the water industry:

- 30% capital
- 20% productivity
- 30% programme

On top of this Severn Trent are targeting 70% off-site construction and are driving towards a digital environment with their 'Go Digital' agenda using digital engineering in design and whole life asset management.

The project aspirations are in line with the Government's 2025 Construction Strategy targeting 33% cost reductions and 0% faster construction. Off-site fabrication, was identified at the project outset as the means to achieve these targets safely with less carbon and to a higher quality.

DFMA CASE STUDY: FRANKLEY WTW

Adopting the DFMA approach

Key to the success of the project was meps' early engagement at design feasibility stage to unlock off site engineering opportunities.

Autodesk BIM360 provided the centralised design platform ('one source of truth') for effective supply collaboration, communication and design review. 4D Synchro provided the facility to digitally rehearse the installation sequence and methodology before shipment and plan in detail the required temporary works.

meps attended collaborative planning sessions, designed the Lime Manifold in 4D and provided manufacture, full assembly, factory testing, client inspection and safe delivery from our in house manufacturing facility.



3D Laser Scan and Federated Model ('one source of truth')

Key aspects of the different way of delivering were:

- Procure Engineer Assemble (PEA) – early engagement and appointment of the supply chain gained commitment and timely progress of design development
- Collaborative planning sessions with the supply chain fostered commitment, relationship building, trust, best for task idea sharing, detailed interface checking through a forum of open discussion using 4D visuals sequences
- 4D Digital Rehearsals were used for pre-site checking and communication of delivery methodology, off-loading and installation sequencing including lifting and temporary works planning
- Pre-slung factory assemblies delivered with QA packs accompanying each load

- meps managed the interfaces with other Tier 2s within our battery limits of supply
- Laser scanning and clash detection was used to scan the existing building structure for incorporation into a single 3D federated model

How meps added value through DFMA

- Improved health and safety with minimal working at height and manufacture in factory conditions
- Programme and quality assurance - no surprises
- 80% reduction in site time from 3 months to 4 days
- 50% reduction in overall labour time
- 80% reduction in indirect costs (prelims and site costs)
- Cost certainty - less risk for main contractor
- 10% reduction in unit cost due to manufacturing and design repeatability
- 20% improvement in quality due to factory type conditions
- 15% reduction in carbon
- 20% increase in product robustness

meps capability

- In-house 3D design
- 4D Synchro digital installation rehearsal
- In-house assembly and factory test
- Collaborative behaviours

Positive customer experience

- We achieved the Severn Trent target of 70% off-site constructions
- We met the Severn Trent 'Go Digital' agenda
- The client recognised best practice
- Best in class safety thinking
- Customer care - reduced vehicle movements and deliveries

Further Information

For more details on this case study, or to discuss what meps can offer to enhance your project using off-site-build and our broad product range, please contact Shaun Stevens, meps Key Account Manager, on 07823 777871 or shaun.stevens@mepswater.com.

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