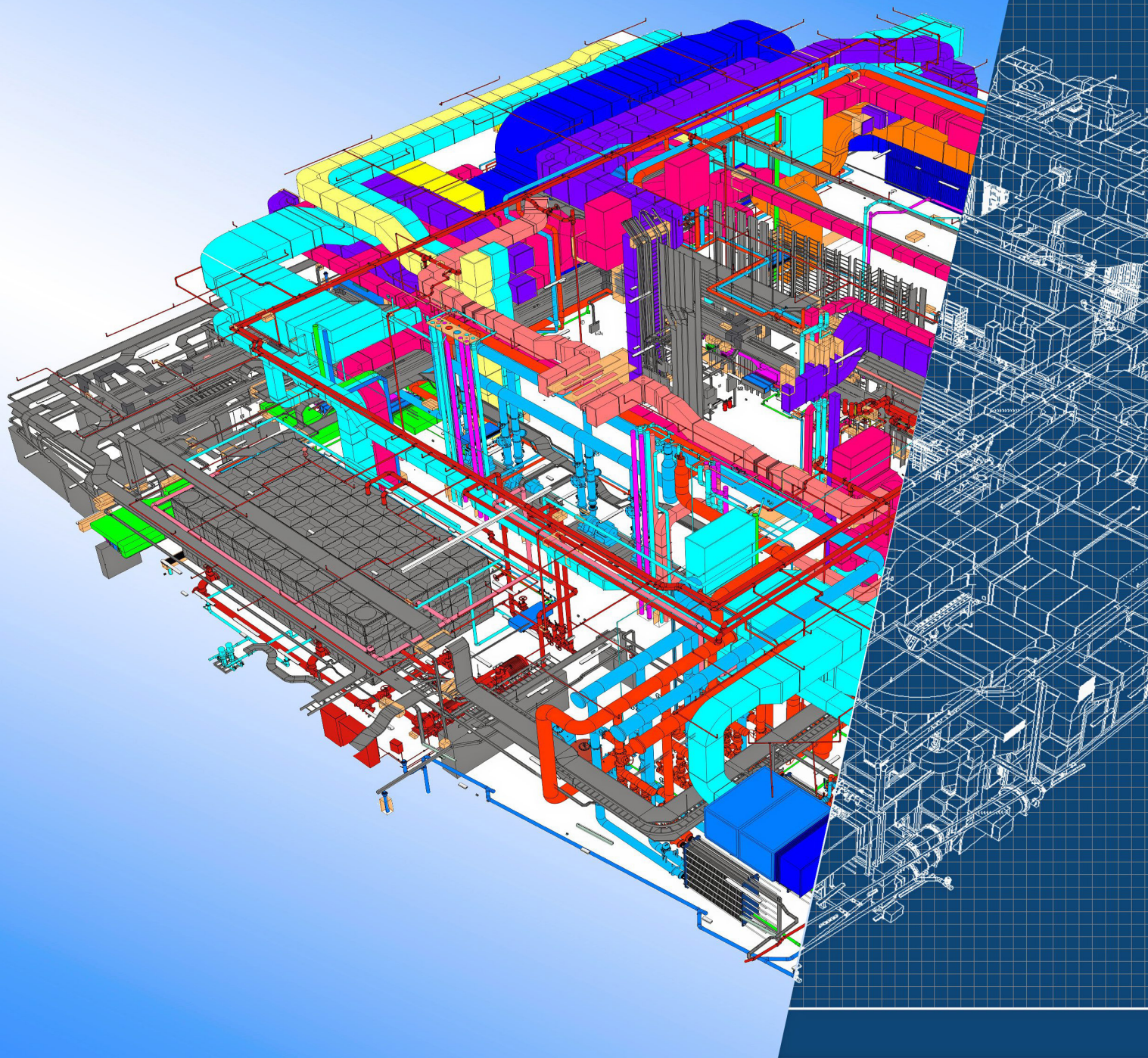


Mechanical Electrical & Plumbing

MIDDLE EAST

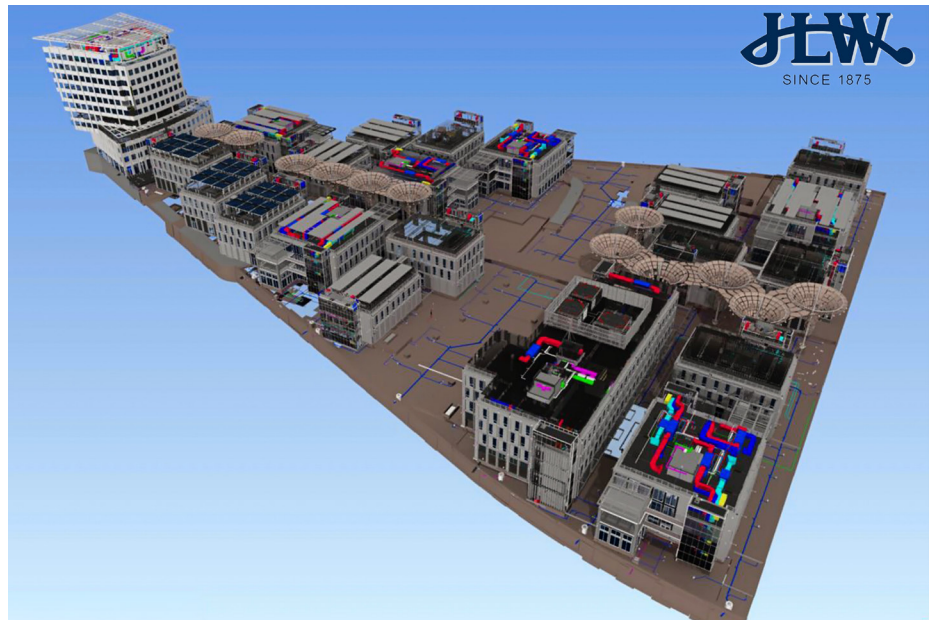
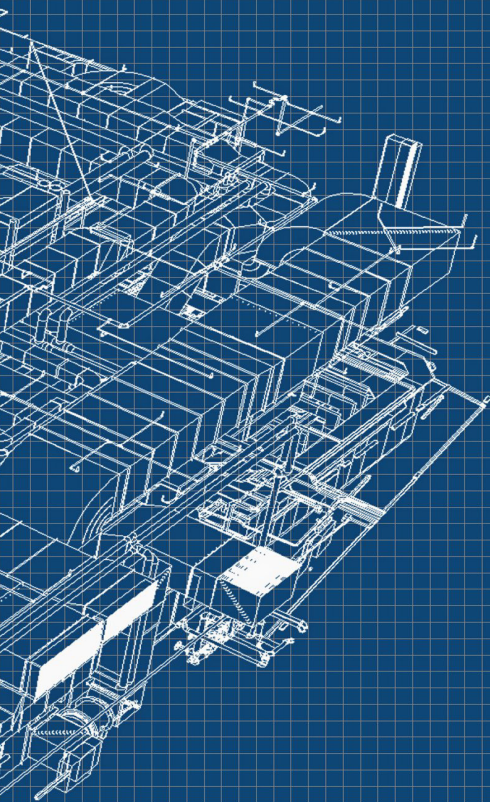
SERVING TECH, WITH TECH

JLW MIDDLE EAST COO **RAMY BOUFARHAT** EXPLAINS HOW ADVANCED BIM MODELS AND OFF-SITE PREFABRICATION ALLOW THE FIRM TO DELIVER DATA CENTRE PROJECTS ON TIME AND WITHIN BUDGET FOR LEADING CLOUD SERVICE PROVIDERS



Serving Tech, With Tech

*The chief operating officer of JLW Middle East, **Ramy Boufarhat**, talks exclusively to MEP Middle East editor, **Anup Oommen**, about how the firm has leveraged design technologies such as advanced BIM models and off-site prefabrication to deliver data centre projects on-time and within budget for some of the world's leading cloud service providers*



UK-based, multi-disciplinary engineering consultancy firm Hoare Lea as the MEP consultant.

Sharing details on the firm's relationship with Expo 2020 Dubai as a client, the chief operating officer of JLW Middle East, Ramy Boufarhat, said: "Following the successful delivery of MEP services on the Sustainability District, the client – Expo 2020 Dubai – encouraged us to stay on and support them on other projects.

"As a result, in collaboration with the main contractor ISG, we also provided our services for the Media Centre at Expo 2020 Dubai, which will house major television networks that will operate during the World Expo from October 1, 2021."

Additionally, JLW Middle East will also deliver Expo 2020 Dubai's "iconic water feature", which is a project that is currently being developed in partnership with the Al Naboodah Construction Group.

During the past 12 months, JLW Middle East has also been actively involved in a number of success stories, including the completion of Atlantis, The Palm's Aquaventure Waterpark Expansion Project, which featured the addition of approximately 44,000m² of additional space.

More than 28 new rides were added during the expansion project, including the world's tallest waterslide; the longest family water coaster in the world; the tallest vertical drop body slide in the Middle East; and the region's first cliff jumping experience. The project also witnessed the addition of 14km of process piping, 1km of beachfront, 110 water pumps, and more.

"JLW Middle East also engaged in the Sharjah Airports Central Utility Plant (CUP) as the main contractor for the Sharjah

Airports Authority, because the majority of the work on the project was MEP, with a smaller civil component," Boufarhat revealed in conversation with MEP Middle East.

"Once completed, the CUP facility will serve the entire existing and new terminal building and associated airport facilities. The CUP will consist of the district cooling plant, pumping stations, power generation, distribution network and equipment, standby power and fuel tanks, fire protection facilities, a mission-critical data centre, a security operations centre, an airport collaboration bay, and a decision-making centre."

The project management consultant (PMC) on the project is Parsons International, with French consulting and engineering firm ADP Ingénierie providing the consultancy services.

JLW Middle East is also well-recognised for its work on the Abrahamic Family House, which is designed by the renowned British architect Sir David Adjaye.

Boufarhat added: "The firm's scope of work on the project included the construction of Abu Dhabi's Abrahamic Family House located on Saadiyat Island, which in recognition of Islam, Christianity, and Judaism, will comprise of three main buildings including a mosque, a church, and a synagogue.

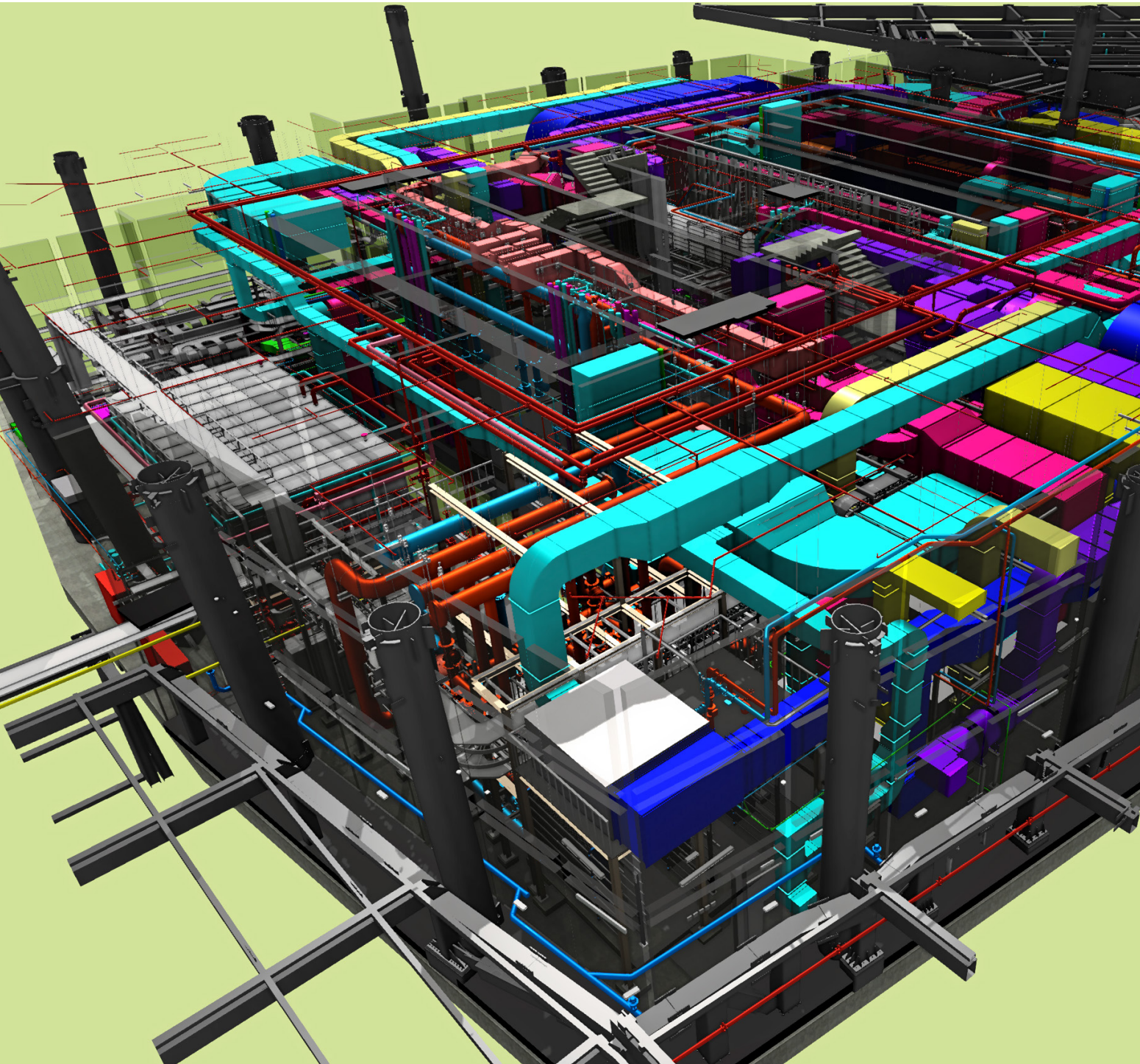
"Each of these buildings will lead to a central garden under which will sit a museum and a centre for education."

Most importantly, JLW Middle East has become synonymous with the development of data centres in the region, providing key design-and-build MEP services for some of the world's Big 5 Cloud Service Providers.

Sharing exclusive details for the first time on-record, Boufarhat teased: "We can now

The MEP works for Expo 2020 Dubai's 110,000m² Sustainability Thematic District – which accounts for approximately one-third of the overall MEP works within the World Expo's Thematic Districts – has been handled by James L Williams Middle East (JLW Middle East), which is a leading MEP contracting firm well-recognised in the industry for its quality of workmanship, engineering excellence, and the ability to deliver projects on-time and within budget.

JLW Middle East's scope of MEP works on Expo 2020's Sustainability District was provided in partnership with Al-Futtaim Construction as the main contractor and



say we have successfully handed over a data centre in Abu Dhabi for one of the world's most comprehensive and broadly adopted cloud platform.

"Millions of customers – including the fastest-growing start-ups, largest enterprises, and leading government agencies will benefit from this data centre owned by a US-based company that is one of the largest tech companies in the world."

Boufarhat added: "We've also secured the contract for another data centre provider, which will be a co-location data centre. Additionally, we are currently tendering design-and-build contracts for new data centres across the Middle East. Given that data centres are an essential part of our future

and design-and-build are our niche, we're really excited to start undertaking these types of projects."

A Notch Above the Rest

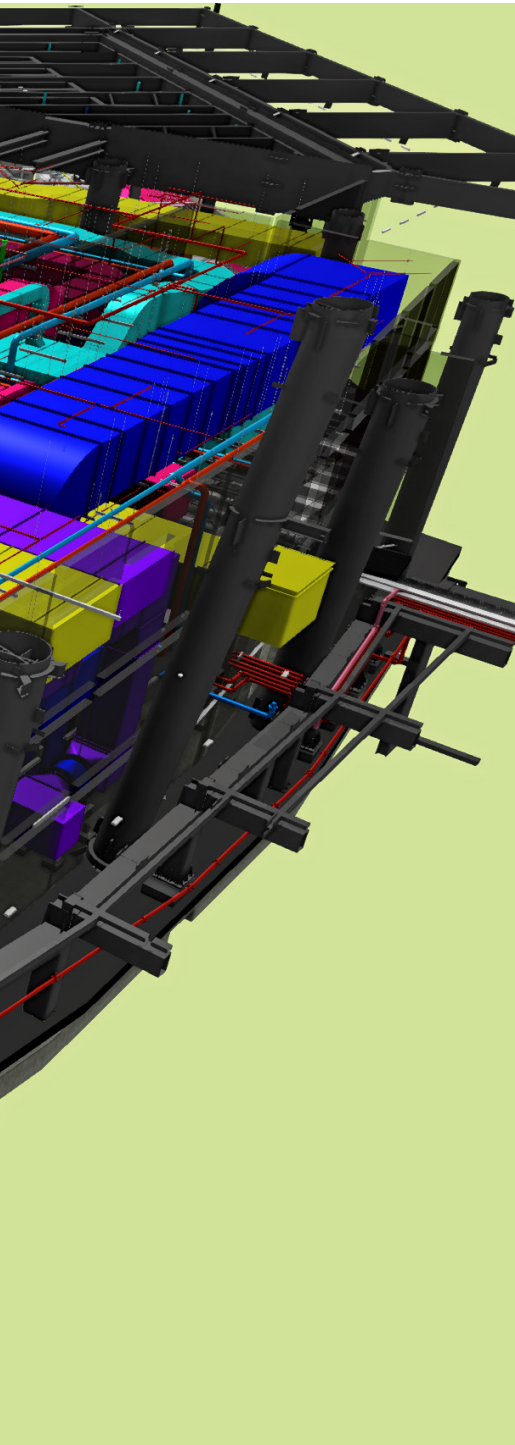
Rising above the competition in its implementation of design-and-build data centre projects, JLW Middle East has raised the bar by offering centralised, integrated, consistent, and reliable services that have incorporated technology-led offerings such as detailed BIM models, 4D simulation, and off-site prefabrication, among others.

"We have served tech, with tech. Data centre projects that are tendered by the world's best cloud service providers offer cutting edge technology solutions to businesses, and it's

only right that such high-tech data centres are constructed using the best technologies," Boufarhat explained.

"The level of engineering for technology-based projects such as data centres is very high. The reliability that the data centre providers expect is also very high. There's absolutely no question of downtime – or shutting down a part of the data centre – for a couple of hours for maintenance. They need everything to be operating all the time at full capacity even when they operate and maintain the data centre. Therefore, this needs to be taken into consideration right at the design and build phase of construction."

One of the reasons that JLW Middle East has been able to successfully win data



and is aware of what work can be done in what timeframe because they have done it themselves.”

This further contributes to the consistency and reliability that the firm assures clients and main contractors on all its projects.

“Because we are centralised and highly integrated, when a client or contractor works with us, they receive the support of the entire company for any given project – not just the support of a specific team that is allocated for that project. Our project teams are not siloed or isolated,” Boufarhat explained.

“This also means that our central department is not just a tool to use; our central department and our project teams are fully integrated. This enables consistency and reliability across all projects because even if there are new lessons and learnings on a project, those lessons learnt are shared across all the teams within the organisation, and we better ourselves project by project.”

In addition, being a highly integrated and centralised organisation, the implementation of the latest technologies – both to improve in-house workflows as well as on construction projects – has become seamless for JLW Middle East.

The need to educate and lobby for the implementation of improved processes and technology across the organisation is simplified, unlike other organisations that have to push for such implementation separately in each siloed department within their firms.

Connecting the dots – a centralised and integrated system of operations has enabled consistency across projects and processes, which in turn has enhanced the firm’s reliability and reputation within the Middle East construction industry.

Technology at the Top

Certain technologies such as 360-degree reality capturing photogrammetry, the Internet-of-Things (IoT), as well as artificial intelligence (AI)- and machine learning (ML)-

based applications have helped JLW Middle East to exponentially improve their internal processes, while the implementation of other technologies such as building information modelling (BIM), off-site prefabrication, and 4D integration and simulation have placed the firm among the crème-de-la-crème of the MEP industry.

Generally speaking, although innovative construction technologies have been developed increasingly during the last decade, most firms have not implemented such technologies to improve efficiencies – either because the technology is too expensive to use, which is the case when the technologies are first introduced to the market; or because the value that the technologies add to the project is not something that the clients or developers may want to pay for.

“The more we adopt practical technologies, the more our consistency and reliability in the processes we are implementing increase,” Boufarhat stated. “Even in cases where the clients aren’t too keen on the costs associated with a technology on-site, we still use technologies within the set budget that are feasible for our internal efficiencies.”

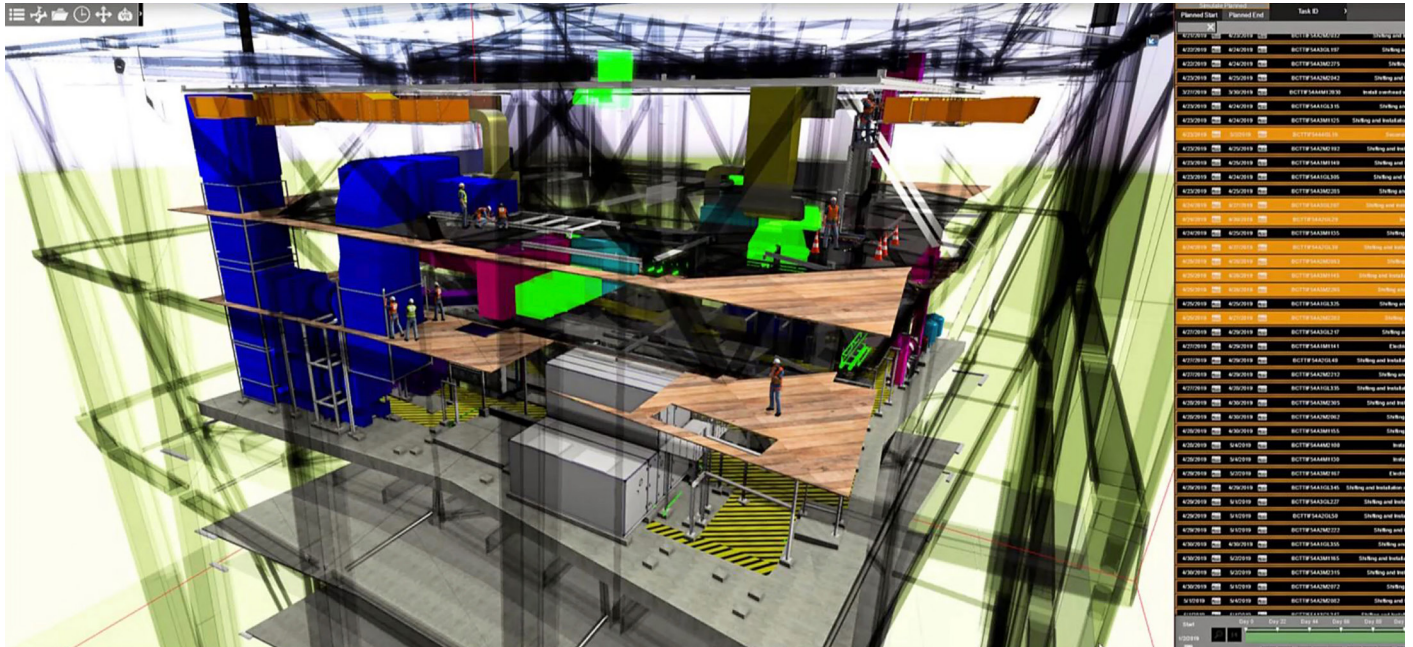
Taking BIM, for instance, discussions at the recent MEP Middle East Conference made it clear that although the technology has been around for a little more than a decade, most MEP firms are far from utilising the technology to its full potential within the construction sphere.

Most firms within the electromechanical and plumbing sector use BIM for shop drawings because they are mandated by the clients or the employers who run the projects. To a large extent, the “technology adoption” within the MEP industry seems to be isolated to specific parts of specific projects that have client-driven directions for the implementation of BIM.

JLW Middle East has departed from such practices to make BIM a part of its DNA. More than 10 years ago, the firm 3D modelled

centre project tenders, and deliver projects on-time and within budget, is because the firm employs highly-skilled and experienced engineers leading each and every division of the company.

“We are an engineering-first company. We are primarily engineers and contractors – that’s what makes up JLW Middle East. The leaders of our departments within the organisation are not just engineers; they are also engineers with years of experience in design and construction,” Boufarhat said. “Those leaders will obviously develop a culture where similar highly skilled people with highly nuanced mindsets work together on a team. Every single manager and leader in the firm has worked hands-on with complex projects,



complicated plant rooms and coordinated MEP hotspots using CAD-Duct Solids. The programme was then bought by AutoDesk. As time passed, the firm began to model everything in 3D, moving away from 2D show drawings completely.

After that, the firm began to 3D model drawings for its sub-contractors, and even began to train and teach its sub-contractors to work on advanced BIM models.

“What this meant is that we had to have staff in-house that were certified BIM instructors to teach and evaluate trainees for Level 1 and Level 2 BIM certifications,” Boufarhat explained.

Following this, the firm began to use its BIM models for quantity take-offs even for procurement, which is remarkably different from undertaking a quantity take-off for estimation.

“When you’re ordering material from overseas to land on-site and you’re installing it from your BIM model, it’s absolutely essential that your model must be extremely accurate, and the details must be added from the model.

“Otherwise, you’ll risk ordering only 90% of what you need and miss the required ancillaries and accessories which should be embedded in the details of the BIM model – and that would be a disaster for your construction programme.”

Now, JLW Middle East even links its BIM model into its construction programme, and using 4D integration and simulation has begun to plan complicated installations and sequencing.

For instance, JLW Middle East incorporated such cutting-edge technology on the ICD Brookfield Place project, which included more

than 900,000 square feet of Grade-A office space, with an adjacent five-storey retail centre offering 13,935m² of best-in-class shopping, dining, fitness, and private club facilities spread along multiple terraces, along with an open garden on the top level.

Sharing the benefits of advanced 4D integration and simulation on the project, Boufarhat said: “The 53-storey ICD Brookfield Place tower was a remarkable project that needed special consideration.”

“We had a very important, and large, MEP plant room at the top of the building, which needed to be installed in between an array of steel members at the top of the tower. With

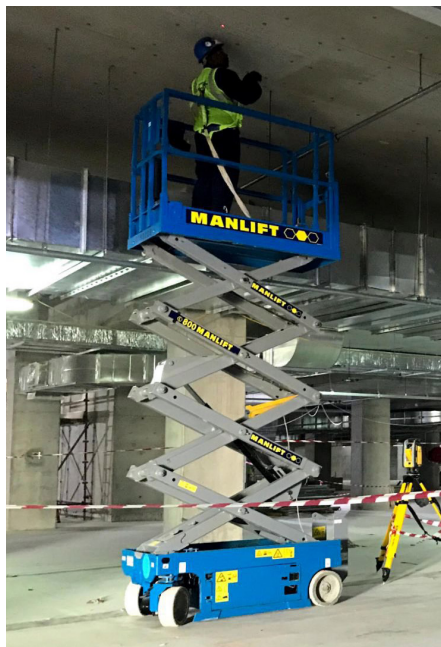
very limited lay-down area, and with very limited crane access to the building site – as it was not possible to have too many cranes in that area – it was critical that every sequence was meticulously planned. Every lift of every product and every installation had to be micro-planned and micro-managed to ensure that the sequence of work was followed ‘to the T.’”

“Each and every piece of the MEP plan had to be lifted up on the crane, and installed in sections. If even a single portion of work was completed out of sequence, it could have caused a lot of delays. However, by detailing the construction programme to an extent of detail where every lift had a programme sequence linked to the programme and BIM, we were able to carry out the entire project in sequence in one go without any delays or cost overruns.”

The world-class ICD Brookfield Place tower has also been awarded the Leadership in Energy and Environmental Design (LEED) Platinum rating for its sustainability and green building initiatives making ICD Brookfield Place EMEA’s tallest and largest LEED® Platinum office building.

Furthermore, JLW Middle East has also started to use its BIM model for off-site prefabrication. Instead of producing the design drawings for off-site prefabrication separately and providing them to the off-site prefabrication manufacturers, the firm now produces drawings in the same BIM model, which makes it easier for the firm and its prefabrication manufacturers to integrate the designs into the project.

In terms of data centres, firms that generally incorporate prefabrication tend to pre-fabricate equipment in a specific containerised format





with different MEP components, which not only tends to be bulky, but also expensive, and lowers the options for suppliers – as most of the equipment that has been containerised is sourced from a single supplier.

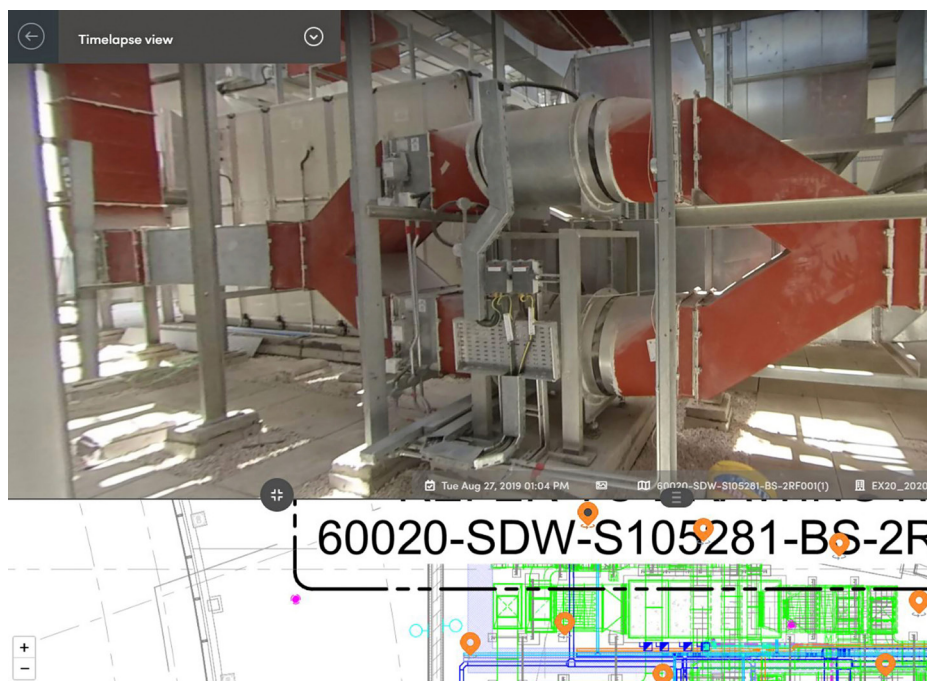
However, JLW Middle East can buy the MEP components and the equipment separately from any supplier. Everything that connects these components and equipment to the data centre is then prefabricated, thus, making the best, customised use of space based on the project design, while also lowering the overall costs.

“Data centres need to be as space-efficient as possible. Unlike residential or commercial tower projects that are built vertically, most data centres are built horizontally and take up land space,” Boufarhat explained. “Ideally, the data service providers would like to utilise as much of that land space as possible for servers, which means that all the supporting equipment such as MEP needs to take as little space as possible, while also serving its purpose consistently and reliably over the entire lifecycle of the project.”

Additionally, JLW Middle East also takes BIM-to-field, such as in the case of Trimble – which engineers use to analyse and design buildings efficiently. Having studied the feasibility of the laser-based, robotic solution, the firm has begun implementing it on some of its larger projects that are being built from the ground up.

Boufarhat said: “The Expo 2020 Dubai project, for instance, had a massive, open basement construction area, which was perfect for the feasible implementation of Trimble.

“If we used traditional methods of construction, we would need to manually



measure the points where every single anchor bolt would need to be placed before drilling holes into the concrete on the roof to place them. These anchor bolts are crucial for supports, which hold the MEP and HVAC equipment – such as the pipes and ducts – securely on the soffit.

“However, with Trimble, we were able to save a lot of time and man-hours, while also improving efficiencies on the project. We were able to integrate our BIM models with the Trimble robot, which brought the computerised BIM model to life, with the robot pointing lasers to the exact spots where

the holes needed to be drilled on the roof for the anchor bolts and the rods to be placed.

He added: “This was not only an efficient way of working, helping ensure that components were perfectly aligned, but it also created a repetitive factory-like installation process that sped up our programme significantly.”

All in all, through digital transformation, research, and the adoption of the right technologies in the right manner, JLW Middle East has raised benchmarks for the engineering and contracting sector, having proven its consistency and reliability on multiple tech-driven projects, including data centres.