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Oger International is the Architecture and Engineering arm of Saudi Oger. Drawing on a heritage of 50 years of operation, and with specialist divisions of Engineering Services, Project Management, Sustainability, Intelligent Buildings, Building Management Systems and Building Information Modelling, Oger International has been involved in some of the world’s most prestigious construction projects within both the public and private sectors.

**AREAS OF EXPERTISE**
- Building Information Modeling
- Structural Engineering
- Building Services
- Sustainability
- Intelligent Buildings
- Facilities Management

**INTERNATIONAL OFFICES**
- UAE
- Saudi Arabia
- Lebanon
- Morocco
- France
- Tunisia
- Philippines
- India

**CERTIFICATIONS AND MEMBERSHIPS**
- ISO Certified 9001 (2008)
- Corporate & Board Member of US Green Building Council
- Emirates Green Building Council
- Swiss Village Masdar

The Oger International BIM Division has several years of experience in realised BIM projects around the world. With proficiencies in many of the leading BIM software Oger International is actively pioneering developments in BIM processes and deployment. These capabilities are supported by strong partnerships with BIM-operative subconsultants and subcontractors.

**BIM AT OI IS SEEN AS VIRTUAL CONSTRUCTION**
In short, the ability to build twice.
- Firstly, by building the project virtually, enabling us to gain unprecedented know how and to optimise the project.
- Secondly, leveraging the virtual experience onsite.

**BIM CAPABILITIES**
- Design Review & Optimisation
- Engineering Design & Analysis
- Services Coordination
- Issue Reporting & Tracking
- BoQ & Cost Estimation
- Method & Construction Sequencing
- Shop Drawing Production

**ADVANCED BIM FUNCTIONS**
- Building Performance Analysis
- LEED/Estidama Certification
- Model Integrity Checking
- Digital Fabrication
- Onsite Verification
- As-Built Record Model
- Facilities Management
Building Information Modelling affords numerous benefits to the design, construction and operation of a facility. The degree to which these benefits are realised is dependent on the suitability of the technology deployed, the competency of the operators and the effectiveness of the execution processes. Oger International develops a unique execution plan for each project undertaken, this is supported by a carefully selected project team and software that is fit for purpose and best in class. Following this methodology the benefits of BIM are more readily achievable – as listed below.

**COORDINATION**
- Consolidate building information from all disciplines in a single repository
- Allow more accurate 3D submissions and proposals
- Track modifications by time and user in a version-controlled context

**QUALITY**
- Improve quality through enhanced geometric control
- 3D and virtual reality design reviews
- Verify fitting and installation in advance, through complete 3D information
- As-built verification & deviance mitigation

**COST CONTROL**
- Clash detection in advance of construction
- More accurate quantity extractions and cost estimates at any stage of the design process
- Extraction of precise mechanical and geometric information required for specialty fabrication
- Bid controls through preparation of bids to include 3D BIM information

**TIME REDUCTION**
- Accelerate communication through real-time BIM collaboration system
- Construction sequence simulation for optimisation and on-site layout planning
- Clarify installation process through explicit work package design in 3D BIM Model
- Plan more accurate temporary works through explicit 3D modeling of works, cranes, and installation sequencing

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**BIM PROJECT MANAGEMENT**
- Strategy and process development
- Defining BIM requirements
- Multi-disciplinary coordination
- Managing BIM processes and workflows
- RFI and DCR reporting and tracking

**MODEL PRODUCTION AND UTILISATION**
- Architecture, Structure and MEP model authoring
- Engineering analysis
- Building performance simulation
- LEED and Estidama certification
- Shop drawing production and digital fabrication
- Operation and facilities management

**CONSTRUCTION MANAGEMENT**
- Site logistics and construction sequencing
- BIM-to-field deployment and supervision
- Onsite verification
- Production of As-Built models

**AUDITING & QUALITY ASSURANCE**
- Integrity checking of third-party models
- Reviewing structural analyses and MEP system design
- Auditing Energy models for green building certification
Examples of BIM Deployment

MEP SYSTEM DESIGN AND VERIFICATION

Oger International has experience in developing detailed MEP service models that are accurate according to equipment specification, system definition (e.g., return or supply air) and design information (e.g., air volume, and flow rates). The models can be developed from existing 2D drawings or schematics, or can be produced entirely from design requirements. Developing a comprehensive and detailed MEP model will ensure logical and complete service systems, and allow for accurate coordination with other disciplines. Oger International has experience in producing detailed models that include all necessary fixings, hangers, valves and meters, insulation and accommodate required access and maintenance.

SERVICES COORDINATION

One of the most accessible and beneficial areas of BIM deployment is for services coordination. This function enables the contractor to visualise potential constructability and accessibility issues before going to site. Oger International has extensive experience in this area, and can facilitate coordination review meetings between all project stakeholders to ensure the most effective use of the model. This includes RFI and DCR reporting and tracking, as well as model change monitoring.
Examples of BIM Deployment

**CONSTRUCTION SEQUENCING AND LOGISTICS PLANNING**

A Building information Model can be an effective tool for construction sequencing and logistics planning for tender or during construction. Oger International has experience in modelling detailed and complex assemblies, including all associated temporary works, drainage, earth moving, and other site logistics.

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**BIM-TO-FIELD**

Onsite deployment is essential for ensuring that the valuable design information developed in the production of the BIM is effectively carried through to the construction phase. The model can be used as a visual reference for resolving congested areas. It can also be deployed to establish setting-out points, and for onsite verification of as-built information.

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Dome structure construction sequencing and assessment of temporary work, Louvre Abu Dhabi, UAE - Tender

Stills from detailed construction simulation, King Abdullah University of Science and Technology, Thuwal, Saudi Arabia

deploying the BIM for digital verification of prefabricated elements as they arrive on site (above). The BIM was also used to identify setting-out points for complex assemblies, King Abdullah University of Science and Technology, Riyadh, Saudi Arabia
**Project Description**

King Abdullah University of Science and Technology is a graduate-level research university that opened for its first academic year in September 2009 as the Kingdom’s first LEED certified project and the largest LEED Platinum project in the world. The project was delivered in record time - 27 months from concept to phase one delivery - and demonstrated an exceptional level of BIM.

**Scope** BIM Construction Management.

Oger International - as BIM Consultant to the Main Contractor, Saudi Oger - produced and managed a detailed Building Information Model that was used for the design, coordination, construction sequencing, fabrication and erection of complex areas of the project. **Construction Sequencing** - The entire assembly of the Solar Towers was managed through the BIM, using detailed construction sequencing developed to the level of fixing details and all temporary works.

**Digital Fabrication.** Steel elements were manufactured from shop drawings extracted directly from the BIM. **Onsite Installation.** Onsite, the BIM had a further critical function as a QA/QC tool. As each prefabricated element arrived on site it was measured and cross referenced against dimensions from the BIM.
CLEVELAND CLINIC ABU DHABI – BIM FOR TENDER

Project Description
Cleveland Clinic Abu Dhabi Hospital (CCAD) is a world renowned healthcare destination offering Abu Dhabi and the region the latest in cutting edge medical technology and facilities. The hospital is located on Al Sowwah Island adjacent to Al Reem Island. The hospital will be organized into the five institutes of Digestive Disease, Eye, Heart and Vascular, Neurological, and Respiratory and Critical Care, to offer an advanced range of tertiary/quaternary medical services. Number of inpatient beds: 364 (256 Beds + 32 VIP’s Beds + 72 ICU + 4 Royal Suites) – expandable to 490. Number of outpatient rooms: 342 (includes treatment and exam rooms).

Scope
Oger International developed a BIM for the Main Contractor tender bid – in partnership with Oger Abu Dhabi. The model involved developing a section of the hospital with complete architecture, structure and MEP models. The BIM demonstrated a high level of understanding of the complexity of the project, and provided examples of coordination detection and resolution.

ABU DHABI FINANCIAL CENTRE – SERVICES COORDINATION

Project Description
Abu Dhabi Financial Centre (currently under construction at Sowwah Island), consists of four high-rise office towers, the Abu Dhabi Stock Exchange, retail space and 460,000 square meters of parking. The Stock Exchange has a total floor area of 20,119sqm over 4 levels.

Scope - Services Coordination.
BIM was deployed on the ADFC project to support services coordination in complex areas, including the Stock Exchange and the Towers technical levels. The BIM process was integrated into the conventional 2D workflows. Models were developed from the subcontractor shop drawings, clashes and coordination issues were resolved, and the information was fed-back to the subcontractors in 2D outputs for them to incorporate into their traditional workflows. The BIM was used in the field, to support Construction Managers in resolving further issues onsite.
**LOUVRE ABU DHABI - BIM FOR TENDER**

**Project Information**
- **Name:** Louvre Abu Dhabi
- **Location:** Saadiyat Island, Abu Dhabi
- **Client:** TDIC
- **Architect:** Jean Nouvel
- **Design Engineers:** Buro Happold
- **Main Contractor:** not awarded
- **Project Size:** 24,000 m²
- **Construction Cost:** €100 million
- **Expected Completion:** 2013
- **LEED Certification:** Gold
- **Status:** To be awarded

**Project Description**
The Louvre Abu Dhabi is one of the landmark museums to be located on Saadiyat Island. The total area of the museum will be approximately 24,000m², including 6,000m² of permanent collection galleries and 2,000 m² of temporary exhibition space. The development is particularly complex in terms of design (crowned by an enormous steel framed dome), logistics (a compact site with integrated marine works) and programme (project delivery within three years).

**Scope**
Oger International developed a detailed BIM as part of the tender package for the Main Contractor, in partnership with Oger Abu Dhabi. The model was used for detailing and coordinating the complex architectural, structural and MEP design, producing BOQ’s, and supporting construction management and logistic planning.

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**KING ABDULAZIZ CENTRE FOR WORLD CULTURE COMPLETE BIM DEPLOYMENT**

**Project Information**
- **Name:** King Abdulaziz Centre for World Culture
- **Location:** Dhahran, Saudi Arabia
- **Client:** Saudi ARAMCO
- **Architect:** Snohetta
- **Engineering Consultant:** Buro Happold
- **Turnkey Contractor:** Saudi Oger
- **Project Size:** 45,000 m²
- **Construction Cost:** USD 400 million Commencement: May 2008 (ceremonial)
- **Completion:** 2013
- **LEED Certification:** Gold

**Project Description**
The King Abdulaziz Center for Knowledge and Culture is a bold new initiative on the part of the Saudi Aramco Oil Company to promote cultural development within the Kingdom. This prestigious project incorporates 45,000 m2 of cultural facilities, including an auditorium, cinema, library, exhibition hall, museum and archive.

**Scope**
Oger International is managing and delivering complete BIM deployment, on behalf of the Main Contractor, Saudi Oger. The requirements demanded the development of highly detailed models for all services. The images below depict the various MEP models and the structural model for the main Tower building. These models are to be fully coordinated and then delivered to subcontractors for them to produce fabrication models.

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Images:
- Construction methodology and sequencing
- Complex and multi-layered cladding to dome
- Site logistics and planning of temporary works
- Services coordination for temporary exhibition gallery
- MEP Services and Structure models, King Abdulaziz Centre for Knowledge and Culture, Dammam, Saudi Arabia