

MAN news

| JUNE 2017 | NEWSLETTER ISSUE 10 |

IN FOCUS

Sustainable Cities and Infrastructure

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Sustainable Cities and Infrastructure

Green building is the planning, design, construction, and operation of buildings with several considerations including energy and water use, indoor environmental quality, materials selection, and on-site building effects. The construction and operation promote a healthy environment for all stakeholders, and it does not disrupt the land, water, resources or energy in and around the building.



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32 Beirut Marathon 2016

This year more than 300 MAN Group members and their families participated in the Beirut Marathon.

**THIERRY ABI NADER**

For the past few years, businesses in the Middle East & Africa have been facing dramatic economic slowdown due to harsh political instability and plummeting oil prices. Subsequently, government cuts on spending affected financial liquidity. Construction companies in particular, are confronted with high overhead costs and shortage of cash flows. Hence, finding difficulties to cope with the current situation.

While, at MAN Enterprise, we are sitting in the shade of the tree that our founder planted 20 years ago. We had the right temperament and proved resilience, adaptability and generated revenue growth. In 1998, our founder initiated a reorganization or a spark that flamed MAN Enterprise to what we know today. Nevertheless, at MAN we believe that the pain of remaining the same outweighs the pain of change, we should discover the founder's fire again, because "In the middle of difficulty lies opportunity".

In 2050, the number of people living in cities will nearly double to 6 billion. Yet the world's urban areas, particularly in developing countries, suffer from shortages of clean water, electricity, and other resources necessary to support exploding populations and fragile economies.

Governments don't have the political will, money, or managerial skills to solve the problems on their own. Hence, governmental institutions will seek the support of the private sector to provide products and services and optimize the use of resources. This will cover the energy, environment/water and transit sectors, with post project operation and maintenance.

"When you're finished CHANGING, you're finished."

Benjamin Franklin

Therefore, the construction industry can diversify the upstream infrastructure value chain mainly by promoting and financing such infrastructure projects and building alliances with infrastructure funds.

Consequently, MAN Enterprise needs to attract future opportunities by positioning itself as an indispensable solution provider in the future marketplace by becoming a utility service provider.

First, this starts with a clarity of purpose and sense of mission that will lead us to imagine the impossible and deliver it. MAN Enterprise has brought value and quick returns to customers through record project delivery times. We have also positively impacted communities by investing in people and systems. Every day we commit to excellence for social, professional and spiritual fulfillment.

Next is culture, the most important driver of success. Change starts in our thoughts, and the most dangerous saying is, 'we've always done it this way.' We need to be continually curious and embrace the latest trends. A culture of learn-it-all instead of know-it-all is essential.

Today we are invited to exercise new growth mindsets by adopting the following trends that will shape the construction industry:

• Emergence of Mega Cities and Privatization.

Governments will seek privatization to cope with rapid city development. By aligning the interests of the different stakeholders through the combination of technical expertise and financial engineering that attracts capital and offers investors a spectrum of risks and rewards, MAN Enterprise will be able to bid for BOT/PPP projects in the desired new environmental sector, energy and transit.

• Digitization

The construction industry is the least digitized industry in the world. Therefore, room for improvement exists. We are in the process of implementing an Enterprise Resource Planning (ERP)

software that will align and automate all processes and increase visibility. MAN Enterprise is also considering collaboration and field management software. Moreover, we plan to invest in 5D BIM software to connect cost and schedule 3D models. Finally, high-definition surveying, such as drones for infrastructure projects on 3D laser scanning for buildings, are becoming a trend.

• Operation Efficiency, Lean & Modular Construction

MAN Enterprise has initiated different lean construction improvements through its Business Improvement Department. We proudly created a Lean Interactive Schedule Application (LISA) tool, that through "what if" scenarios, identifies bottlenecks of activities in current schedules with the responsible parties. Furthermore, with the help of our partner we introduced simplicity and intuitiveness in the design of new solutions and modifications that impact time delivery, such as precast and modular construction.

• Efficiency of resources through Sustainable Built Environment

Due to global warming and the scarcity of resources, governments have had to enforce laws that reduce CO2 emissions and optimize the use of resources through green building laws, renewable energy, smart grid and smart water metering. As a response to the end consumer demand, MAN Enterprise delivered LEED projects and is building its technical capabilities through training and partnership to meet this new foreseeable market.

Again, at MAN Enterprise, we have a duty to follow our founder's vision. We must keep moving forward, take necessary risks and meet all challenges. When we fall, we rise, and recognize that this process is part of the road to success.

May the next few months be a period of management transformations...

Thierry Abi Nader
Board Member

UPDATES FROM THE FIELD

Newly Awarded Projects

PALOMA RESTAURANT, STAFF HOUSING, AND POOL KITCHEN AT THE INTERCONTINENTAL HOTEL

DOHA, QATAR

General Contractor:
MAN Enterprise

Client: Gulf Hotels Company

Consultant: Dar Al Handasah

Duration: 12 months

Start Date: January 2017

Paloma is a five star restaurant consisting of two floors including a show kitchen, dining area, private dining area, bar area, BBQ area and a cigar lounge.

Works in Paloma consist of concrete structure, internal finishes, fit out works, electro-mechanical works and soft and hard landscaping. The connection of BMS to the existing hotel and connection of all required utilities includes gas, drainage, potable water, power and chilled water.



DARWISH RESIDENTIAL TOWER PROJECT

DOHA, QATAR

MEP Contractor:
Metrix

The Darwish Tower embodies luxurious living in Doha.

This state-of-the-art skyscraper integrates innovative technology with environmental friendliness. Exclusively located in the heart of Doha's Corniche, the Darwish Tower is poised to become a striking architectural masterpiece against Doha's changing skyline. Metrix is handling the execution, testing, and commissioning of the complex electro-mechanical works of this landmark.



Handed Over Projects

HOLIDAY INN HOTEL DOHA, QATAR

General Contractor:
MAN Enterprise

MEP Contractor: Metrix

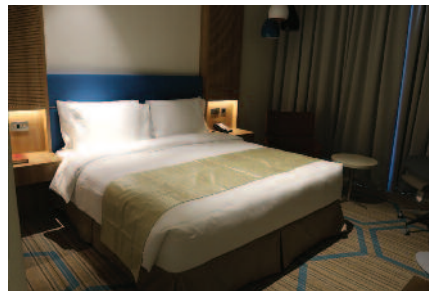
FF&E Contractor:
Tecman Industry

The four-star Holiday Inn Hotel consists of three basements, one ground floor, one mezzanine level, and seven upper floors with an approximate overall built-up area of 35,000m².

The development is comprised of 305 guest rooms, two restaurants, sports bar, all-day dining facility, main and specialized kitchens spread out over four levels, public areas, reception area, office area, lobbies, three ballrooms, gym, function areas, pool area, three floors of parking, and external landscaping.

MAN Enterprise's scope of work included the turnkey construction of all works from excavation to the final finishing touches.

Metrix executed the electro-mechanical works, and Tecman Industry the FF&E works.



UPDATES FROM THE FIELD

Handed Over Projects

WEST SIDE CAR PARK

DOHA, QATAR

General Contractor:
MAN Enterprise

MEP Contractor:
Metrix

The four-story car park is located in the heart of the heart of Education City in Doha.

This iconic building is distinguishable by its high-end internal finishes, fit outs, and state-of-the-art MEP systems, as well as the unique architectural display shell spread over 27,000 square meters of an aluminum facade enclosure. It rests on 1,500 tons of steel framed with a variety of hot rolled, built-up sections, and hollow circular members. The car park's capacity is approximately 3,000 cars. Two People Mover Systems (PMS) link the different buildings within the complex. There is an underground PMS station on the north side and a 275 steel ton aboveground station in the south. Both stations are equipped with power charging facilities. Access to the stations is secured via security controlled turnstile gate barriers integrated to the central security room through the autonomous SCADA building management system technology.



OXYGEN PARK AT EDUCATION CITY

DOHA, QATAR

General Contractor:
MAN Enterprise

MEP Contractor: Metrix

The Oxygen Park project is a world class state-of-the-art park land space located in the southern zone of the Qatar Foundation's Education City.

It is the largest open space within the campus of the Qatar Foundation's Education City and will be principally used for hosting large events. The park is divided into horticultural and activity zones, using a levelled topography to create bowls to help protect users from prevailing winds and provide sculptural level changes to differentiate between zones of activity. Oxygen Park features an externally ventilated running track with an aerodynamic shape. It also features its own people mover corridors and links to multiple other facilities within the city.

MAN Enterprise and Metrix executed all works.



UPDATES FROM THE FIELD

Handed Over Projects

COMMERCIAL BUILDING (B+G+P7+13F) ON PLOT NO. MARINA - MIX DOHA, QATAR

General Contractor:
MAN Enterprise

MEP Contractor: Metrix

The Office Tower development is on a core and shell basis. It is comprised of one basement, one ground floor, one mezzanine level, seven upper floors serving as parking spaces, and 13 floors of office space with an approximate overall built-up area of 34,250m².

MAN Enterprise's scope of work included the structural reinforced concrete and metal works, electro-mechanical works, finishing works for the common areas, façade, and the conveying systems. Tecman Industry's scope of work included the woodworks.



SAGESSE UNIVERSITY EXTENSION – POLYTECH AND HEALTH FACULTY FURN EL CHEBBAK, LEBANON

General Contractor: MAN Enterprise

Located in Furn el Chebbak, the Sagesse University compound showcases its new Faculty of Engineering with a diversity of specialties.

The faculty building consists of two parking basements, 15 classrooms accommodating 1,000 students, and 12 specialized laboratories newly equipped with the latest technology including articulated arms, and Sorbonne. MAN Enterprise's scope included the enabling and shoring works followed by the execution of the structural, electro-mechanical, and finishing works.

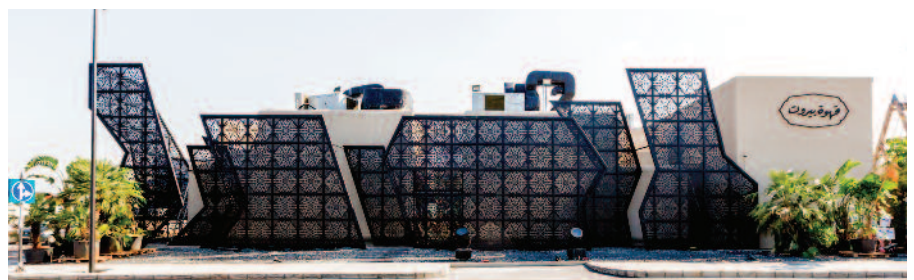


AHWIT BEIRUT BEIRUT, LEBANON

Metal Works Contractor Tecman Industry

The project consists of four main alleys aligned with shops and food sections designed as a small-scale traditional Beirut neighborhood.

Tecman Industry's scope of work included the fabrication and erection of the central metal dome covered with polycarbonate sheets, and the peripheral skin made of customized perforated metal sheets.



UPDATES FROM THE FIELD

Handed Over Projects

ABC VERDUN

BEIRUT, LEBANON

General Contractor:
MAN Enterprise

FF&E Contractor:
Tecman Industry

ABC Verdun is a landmark shopping mall in the heart of Beirut. With an approximate built-up area of 150,000 m² comprised of six basements mainly composed of underground parking and service areas. The shopping mall includes retail units of different sizes, the multi-level ABC Department Store and movie theaters at the top level.

The ABC Verdun Mall encompasses public spaces both indoor and outdoor, shopping venues, and food and beverage outlets as well as entertainment spaces – a unique approach to luxury mixed with an urban lifestyle.

The project was delivered on time in 30 months, and will open its doors on July 27, 2017.



Tecman Industry's scope of work:

Tecman Industry scope of work covered a wide range of metal works, structural steel and glass canopies, joinery and furniture, metal stairs, glass balustrades, and brass and bronze furniture items. Under the joinery scope, Tecman Industry produced a 10,000 m² wood ceiling made of retractable French oak veneer strips.



Ongoing Projects

DISTRICT // S BEIRUT, LEBANON

General Contractor: MAN Enterprise

The District S Project is located in Saifi, in the heart of the Beirut Central District facing Martyrs' Square. The built-up area is 130,000 m² and is to be developed into residential buildings as well as retail shops. The divisions include 17 residential buildings of five to seven floors, a cultural center, three townhouses, six underground levels for parking and technical areas, 135 apartments, eight penthouses, roof gardens, one piazza, courtyards, health club, child activity areas, and 41 retail units.

The concrete works of the project, whose volume reaches 78,000 m³ and embraces around 14,700 tons of steel reinforcement, have almost been completed. The internal finishing works are progressing exceptionally well, specifically the masonry and plaster works which are 80% completed (as opposed to the tiling works - marble, agglomerated and ceramic - of which 25% have been completed). As for the external skin of the buildings, almost 17,000 m² out of 25,000 m² of natural stone cladding have been installed with diverse types and colors. There are also two basements of 25,000 m² for parking.

In terms of MEP works, design upgrades are being applied to several systems such as the Fuel Boiler Heating System which has been replaced by a new VRV System including HYDROBOX. The advantages of this new system can be summarized as follows:

- Gain of a large open space previously required in basement for boilers and fuel tanks.
- Lower running electrical cost for VRV HYDROBOX System compared



to high cost of diesel consumption on each ignition of the Boiler System.

- Less heating pipes in basements and shafts and free domestic hot water during cooling operation of AC indoor units through heat recovery.
- Tremendous yearly energy savings.



BU FSILA LOGISTIC VILLAGE

DOHA, QATAR

General Contractor: MAN Enterprise

The 100,000m² logistics park at the Bu Fsila area in Qatar consists of eight warehouses with 43 offices, two shops, technical car repair, two mousallas, mosque, administration building, labor utility building, gates and guard houses, and 17 service blocks / substations with a sewage treatment plant, and two no. 25m high elevated tanks.

The park includes several thousand square meters of temperature controlled and ambient temperature warehouses, chilled and frozen goods warehouses, container depots, chemical storage warehouses, and administration buildings.

Concrete works in the project have been completed in addition to 3,000 tons of steel structure for 108,000m² fully erected warehouses, and 165,500m² of installed sandwich panels.

10 labor accommodation buildings for 1,440 workers will be constructed. Infrastructure for the 500,000m² area is expected to start as well.

131,000m² of asphalted roads and concrete truck parking is expected to proceed following the progress of the underground services.



U-Boot

New technology has been introduced for the Beirut Terraces Project in order to achieve a light weight slab (U-Boot system for reinforced concrete slabs). This innovative system has been implemented successfully for the first time in Lebanon.

The U-Boot is a modular element made of recycled propylene formwork used in all applications that require a structural plate, together with the need to use less concrete, and therefore, for a lighter structure. U-Boot is an ideal solution for creating slabs with a large span and/or great load-bearing capacity. It is particularly suited for structures that require considerable open spaces, such as executive, commercial and industrial



FORMWORK BETWEEN U-BOOT SLAB AND SOLID SLAB



INSTALLATION OF DUCTS FOR POST TENSIONING WITHIN THE U-BOOT SLAB

buildings as well as public, civil and residential structures. With its high inertia level, this building system makes it possible to build large-scale constructions with a distinct cost advantage compared to traditional building solutions and in direct completion with prefabricated structures. It makes it possible to more irregularly distribute the pillars, as beams do not need to be created. In the case of yards that are difficult to access or restructuring work, U-Boot, due to its

stack ability, modularity, lightness and maneuverability, can be used to make horizontal structures without the help of handling and hoisting equipment. With U-Boot, foundation rafters can be created with a larger thickness and a reduced amount of concrete. For the concrete bed, the distribution of weight due to high inertia is rationalized in order to permit maximum stiffness and lightness for the structure which makes it possible to eliminate, wherever possible, the foundation piles.



U-BOOT

For better efficiency and speed, MAN Enterprise is combining the U-boot with a post-tension slab 45 cm thick, with high inertia and less concrete quantity and weight. Having less material, the U-boot slab, coupled with post-tension, is more efficient than any other alternative. Furthermore, seismic forces are directly proportional to the weight of the structure, as less weight means less lateral forces.

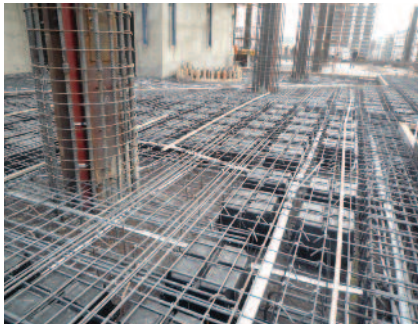
At the same time, the post-tension reinforcement makes work faster and reduces congestion of steel rebar, thus improving vibration and concrete quality. The speed gained by the contractor increases the buffer time and the chances of finishing the project on time.



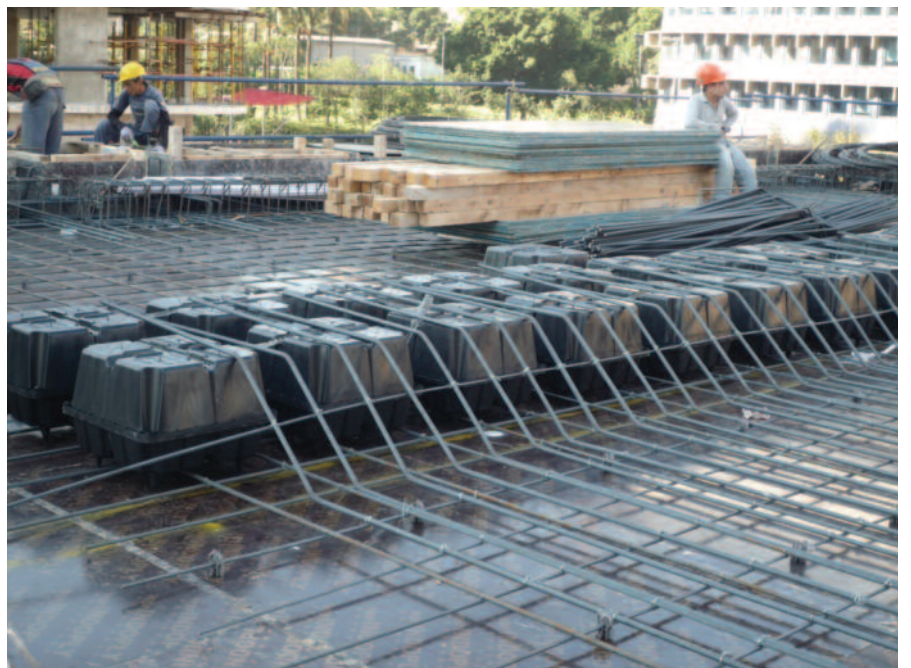
INSTALLATION OF U-BOOT ELEMENTS



DIFFERENT PHASES OF CASTING A U-BOOT SLAB



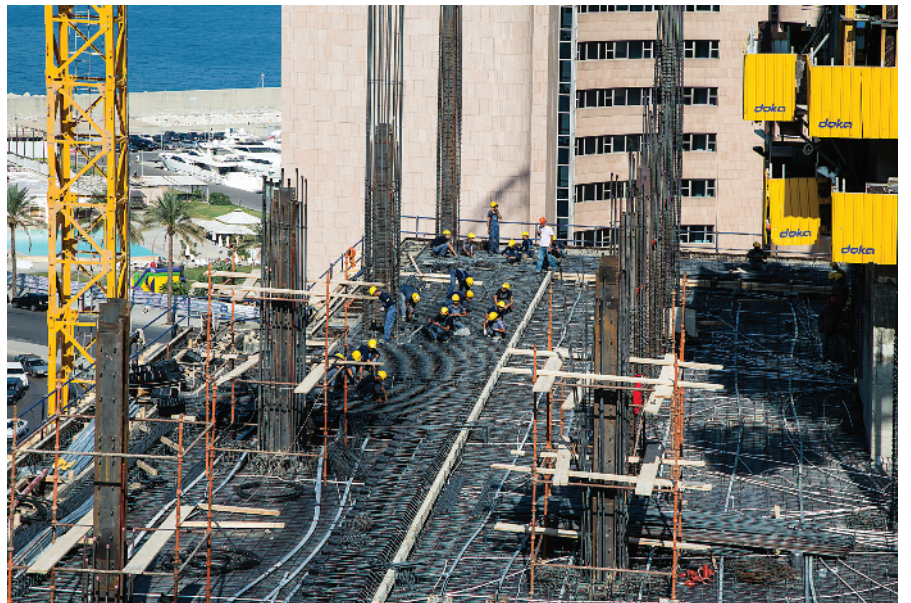
COMPOSITE COLUMNS WITHIN THE U-BOOT SLAB



STEEL REINFORCEMENT BETWEEN U-BOOT SLAB AND SOLID SLAB



DIFFERENT PHASES OF CASTING A U-BOOT SLAB



U-BOOT SLABS AND COMPOSITE COLUMNS

A photograph of a modern, multi-story building with a white facade and large glass windows. A prominent feature is a large, lush vertical garden wall that runs along the side of the building, filled with various green plants and flowers. In the foreground, there is a wide, paved walkway made of light-colored tiles. Two people are walking on the path: one in a white shirt and dark pants, and another in an orange shirt and blue jeans. The sky is clear and blue, and some trees are visible in the background.

IN FOCUS

Collaborators:

Rayan Najjar - Operation Manager | Qatar Branch

Walid Khalife - PMO Manager | Lebanon Branch

Joseph Kadissi - Architect / LEED Coordinator | Lebanon Branch

Carel Rouhana - Planning Engineer | Lebanon Branch



Sustainable Cities and Infrastructure

Green building is the planning, design, construction, and operations of buildings with several considerations including energy and water use, indoor environmental quality, materials selection, and on-site building effects. The construction and operations promote a healthy environment for all stakeholders, and it does not disrupt the land, water, resources or energy in and around the building.

With new technology continuously being developed to complement current practices in creating greener structures, the benefits of green building are many. They range from environmental (reducing water waste, conserving natural resources, improving air and water quality, protecting biodiversity and ecosystems), to economical (reducing operating costs, improving occupant productivity, creating markets for green product and services), to social (improving quality of life, minimizing strain on local infrastructure, improving occupant health and comfort).

MAN Enterprise is working toward executing more green buildings to help preserve the environment in its natural state.

IN FOCUS

MAN ENTERPRISE'S ROLE IN LEED TARGETING PROJECTS

LEED, a registered trademark of the U.S. Green Building Council (USGBC), is a green building certification system that provides third-party verification to measure how well a building performs across the metrics that matter most: energy savings, water efficiency, CO2 emissions reduction, improved indoor environmental quality, and stewardship of resources and sensitivity to their impact. Points are awarded to meet LEED criteria per the following scale: Certified, Silver, Gold, and Platinum. The LEED certification requires that both the design and the construction team adhere to certain concepts and thresholds that are challenging in five categories:

- Sustainable Sites
- Water Efficiency
- Energy and Atmosphere
- Materials and Resources
- Indoor Air Quality

MAN Enterprise has been the general contractor on several green building projects and has greatly contributed to their certifications. There are a variety of strategies that have been successfully implemented.



ABC VERDUN, LEBANON
LEED BD+C: CORE AND SHELL



DISTRICT//S, LEBANON
LEED FOR NEIGHBORHOOD DEVELOPMENT



USGBC MEMBERSHIPS



CONSTRUCTION ACTIVITIES POLLUTION PREVENTION

Under this strategy, MAN Enterprise has developed and implemented an Erosion and Sedimentation Control Plan (ESC) that is compliant with the USA EPA Construction General Permit. The plan requires the contractor to protect against environmental pollution caused by water and wind erosion.

- Surrounding streets and sidewalks were monitored and kept clean from construction activities
- All vehicles leaving the site had to pass through a tire-wash station
- During rainy seasons, all water leaving the site was mud-free in order to protect the public drainage network
- All wind activities were closely monitored and their impact minimized through best managerial practices (BMP) such as covering piles, wetting, compacting, etc.
- Dust screens were erected on all façades

INDOOR AIR QUALITY PRACTICES

An Indoor Air Quality Plan was developed to reduce air quality problems resulting from construction and to promote the comfort and well-being of construction workers and future building occupants.

During construction, MAN Enterprise met the recommended control measures of the Sheet Metal and Air Conditioning National Contractors Association (SMACNA) IAQ Guidelines for Occupied Buildings under Construction, 2nd Edition 2007, ANSI/SMACNA 008-2008. The main measures for compliance were:

- Protect stored on-site and installed absorptive materials from moisture damage
- Protect HVAC equipment from dust accumulation
- Protect workers from construction activities such as dust inhalation

PURCHASING REGIONAL MATERIALS

To increase demand for building materials and products that were extracted and manufactured within the region, the purchasing of regional materials supported the use of indigenous resources and reduced environmental impact resulting from transportation.

MAN Enterprise used materials that were extracted, harvested, recovered or manufactured within 500 miles of the site.



PURCHASING RECYCLED MATERIALS

The goal behind purchasing recycled materials was to increase the demand for building products that incorporated recycled content materials, thereby reducing the overall impact resulting from the extraction and processing of virgin materials. At least 10% of all used materials were recycled.



LOW EMITTING MATERIALS

There are several elements related to low emitting materials that required careful planning, purchasing, and implementation practices from the MAN Enterprise on-site team. The use of paints and adhesives with low VOC (Volatile Organic Compounds) content is a major contributor seeking to reduce the quantity of indoor air contaminants that are odorous, irritating and/or harmful to the comfort and well-being of installers and occupants.

CERTIFIED WOOD

It was also important to encourage environmentally responsible forest management by using a minimum of 50% (based on cost) of wood-based materials and products that were certified in accordance with the Forest Stewardship Council's principles and criteria for wood building components. Wood products include structural and general dimensional framing, flooring, sub-flooring, wood doors, and finishes.



EA: COMMISSIONING AND ENHANCED COMMISSIONING

Commissioning serves to verify that the project's energy-related systems are installed, calibrated and performing according to the project requirements, basis of design, and construction documents.

IN FOCUS

MAN ENTERPRISE'S GREEN BUILDINGS PROJECTS

DISTRICT // S BEIRUT, LEBANON

LEED for Neighborhood Development

The District S project features a 22 building compound in the heart of Beirut's Central District, a high-density neighborhood.

The District S project is targeting LEED for Neighborhood Development (ND) for the entire project to act as a leader in promoting sustainable values in the urban development sector and beyond individual building limits. Additionally, LEED for New Construction (NC) is targeted for one of the buildings, the cultural center.



District S | Beirut, Lebanon

- ✓ Construction Activities Pollution Prevention

District S The Cultural Central | Beirut, Lebanon

- ✓ Construction Activities Pollution Prevention
- ✓ Indoor Air Quality Practices
- ✓ Purchasing Regional Material
- ✓ Purchasing Recycled Material
- ✓ Low Emitting Materials
- ✓ Certified Wood
- ✓ Commissioning & Enhanced Commissioning



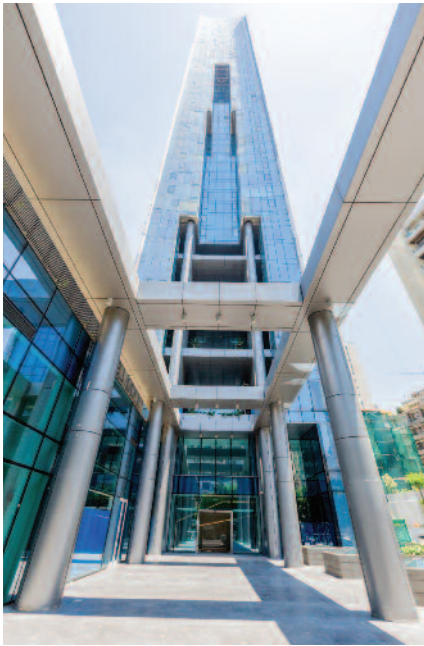
SAMA BEIRUT

BEIRUT, LEBANON

LEED Silver

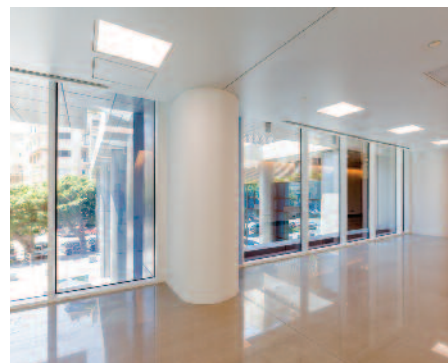
A high-rise building is usually criticized as unsustainable as it requires more materials and running cost, consuming large amounts of energy and generating excessive greenhouse emissions.

Creating a new type of mixed high-rise that is environmentally friendly for users and the surroundings from design, development, and construction, to completion and maintenance of the building, Sama Beirut advocates green building practices.



Sama Beirut | Beirut, Lebanon

- ✓ Construction Activities Pollution Prevention
- ✓ Indoor Air Quality Practices
- ✓ Purchasing Regional Material
- ✓ Purchasing Recycled Material
- ✓ Low Emitting Materials
- ✓ Commissioning & Enhanced Commissioning



IN FOCUS

ABC VERDUN PROJECT BEIRUT, LEBANON

LEED BD+C: Core and Shell

ABC Verdun Mall project is targeting "LEED Certified" LEED BD+C: Core and Shell.

Aiming to achieve this certification, the contraction collaborated closely and regularly with third-party consultants and auditors to achieve high building performance.



ABC Verdun | Beirut, Lebanon LEED Certified Project

- ✓ Construction Activities Pollution Prevention
- ✓ Indoor Air Quality Practices
- ✓ Purchasing Regional Material
- ✓ Purchasing Recycled Material
- ✓ Low Emitting Materials
- ✓ Commissioning & Enhanced Commissioning



INTERNATIONAL COLLEGE BEIRUT, LEBANON

LEED Gold



International College - New Elementary School | Beirut, Lebanon LEED Gold

- ✓ Construction Activities Pollution Prevention
- ✓ Indoor Air Quality Practices
- ✓ Purchasing Regional Material
- ✓ Purchasing Recycled Material
- ✓ Low Emitting Materials
- ✓ Certified Wood
- ✓ Commissioning & Enhanced Commissioning



IN FOCUS

QATAR FOUNDATION STUDENT HOUSING DOHA, QATAR

LEED Platinum

The project is comprised of the construction of structural components for 10 buildings three stories high with a total built-up area of 70,000 m².

One of the notable project highlights was the targeted LEED certification for platinum rating. The scope included the removal and relocation of existing utilities, including new infrastructure, earth works, excavation, backfill, and grading for a total site area of approximately 100,000 m².



Qatar Foundation Student Housing | Doha, Qatar

- ✓ Construction Activities Pollution Prevention
- ✓ Indoor Air Quality Practices
- ✓ Purchasing Regional Material
- ✓ Purchasing Recycled Material
- ✓ Low Emitting Materials



BU FSILA LOGISTIC VILLAGE DOHA, QATAR

GSAS 2 stars



Bu Fasila Logistic Village | Doha, Qatar

- ✓ Construction Activities Pollution Prevention
- ✓ Indoor Air Quality Practices
- ✓ Purchasing Regional Material
- ✓ Purchasing Recycled Material
- ✓ Low Emitting Materials
- ✓ Commissioning & Enhanced Commissioning

COMMERCIAL BUILDING DOHA, QATAR

GSAS 3 stars

Commercial Building | Doha, Qatar

- ✓ Construction Activities Pollution Prevention
- ✓ Indoor Air Quality Practices
- ✓ Purchasing Regional Material
- ✓ Purchasing Recycled Material
- ✓ Low Emitting Materials
- ✓ Commissioning & Enhanced Commissioning



OFFICE TOWER AT LUSAIL MARINA PLOT DOHA, QATAR

GSAS 3 stars



GSAS DESIGN & BUILD CERTIFICATE -
COMMERCIAL BUILDING



CERTIFICATE OF RECOGNITION -
MIX 52



BEST HEALTHCARE



BEST HEALTHCARE

Office Tower at Lusail Marina Plot | Doha, Qatar

- ✓ Construction Activities Pollution Prevention
- ✓ Indoor Air Quality Practices
- ✓ Purchasing Regional Material
- ✓ Purchasing Recycled Material
- ✓ Low Emitting Materials
- ✓ Commissioning & Enhanced Commissioning

IN FOCUS

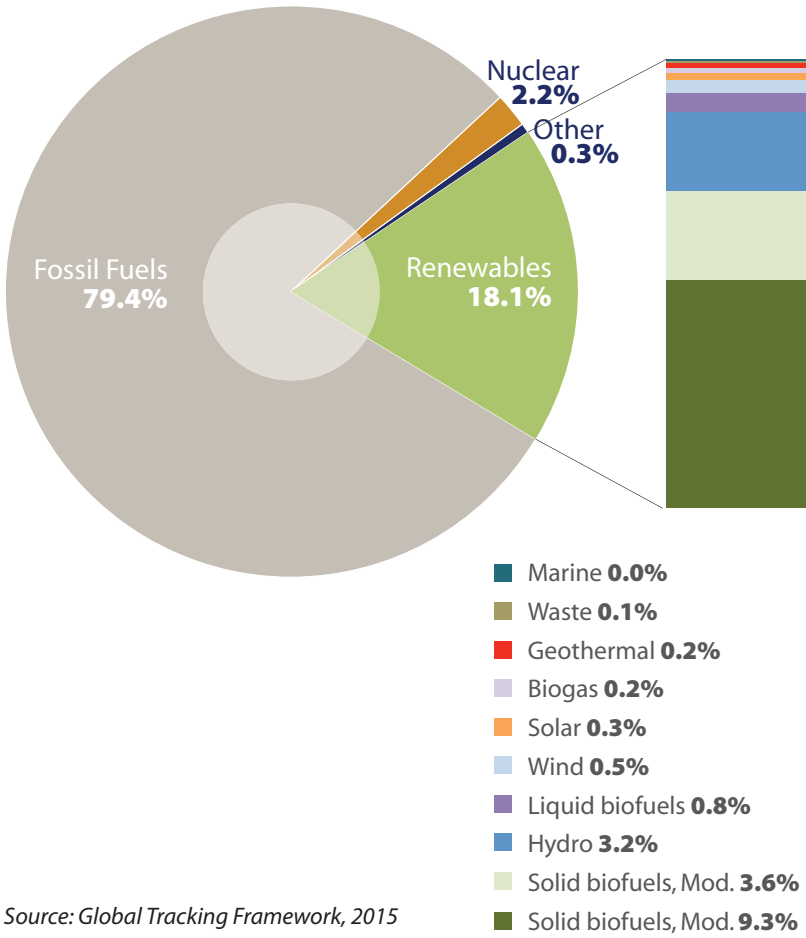
MARKET TRENDS:
GREEN ENERGY

Renewable energy has exhibited a stagnant trend since 1990, barely increasing from 16.6% in 1990 to 18% in 2012, of total energy consumption as reported in Global Tracking Framework, 2015. However, new renewable energy technology, such as solar, wind and geothermal power, are increasingly making their way into the energy mix.

Recent developments have dramatically altered the costs, risk profiles, and dynamics of investing in renewable energy technologies, which are becoming attractive business propositions for the private sector, governments and consumers. Substantial drops in equipment and component prices, enhanced grid integration protocols, innovative off-grid business models, improvements in storage technologies, and other developments are changing the energy landscape, with renewable energy emerging as an increasingly important contributor in both on-grid and off-grid power generation investments.



FIGURE 1 – RENEWABLE ENERGY IN GLOBAL ENERGY MIX

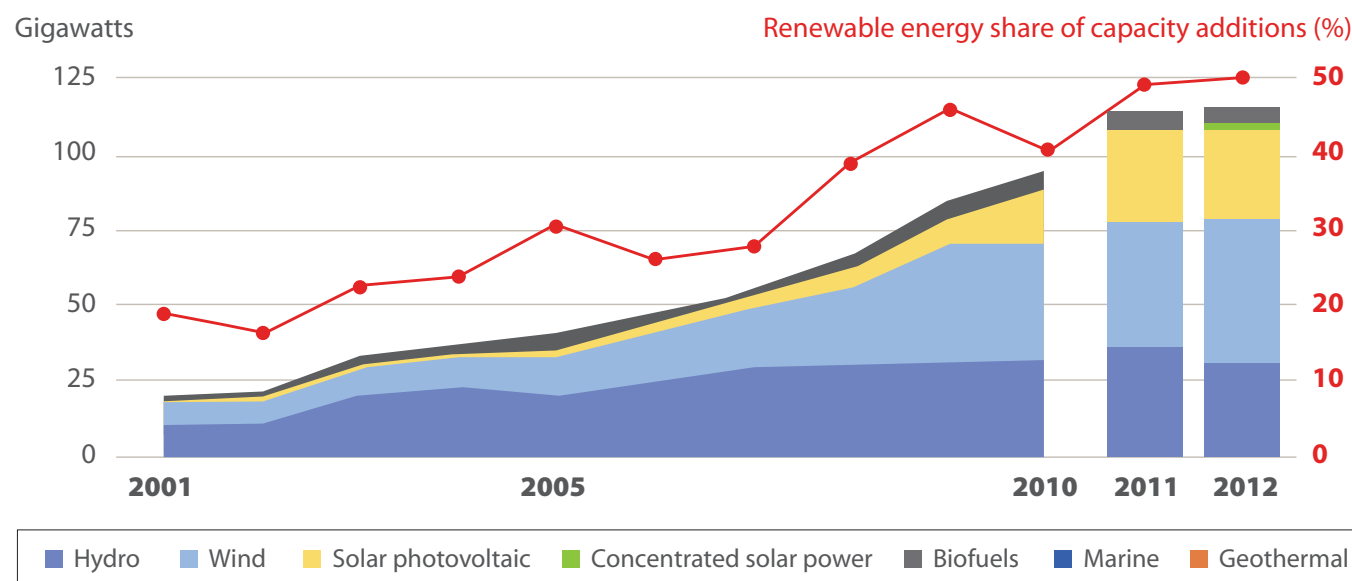


Source: Global Tracking Framework, 2015



ZENITH TOWER - SPECIAL SOLAR PANELS

FIGURE 2 – RENEWABLE ENERGY CAPACITY ADDITIONS AND SHARE OF TOTAL CAPACITY ADDITIONS (2001-2012)



Source: Global Tracking Framework, 2015

Global outlook

Historically, renewable capacity for power generation grew at a CAGR of 9% in 2009–12 (from around 1,210 to 1,440 GW and accounted for half of all capacity additions), up from 5% in the previous decade, and more than double the growth rate of fossil fuel capacity over the same period (figure 2). Wind capacity increased by 90 GW globally, while solar and hydropower capacity climbed by 61 GW and 68 GW respectively. Over the

past decade (2002–12), solar PV saw an extraordinary 40-fold increase in capacity².

Looking ahead, preliminary estimations show that the global installed capacity of power generation is projected to grow about threefold from 5,584 GW in 2012 to 14,216 GW in 2040. The composition of the capacity mix will be much altered – fossil fuels are expected to reduce from 65% to 36% while solar energy will increase from a miniscule share to about 26%. The share of other

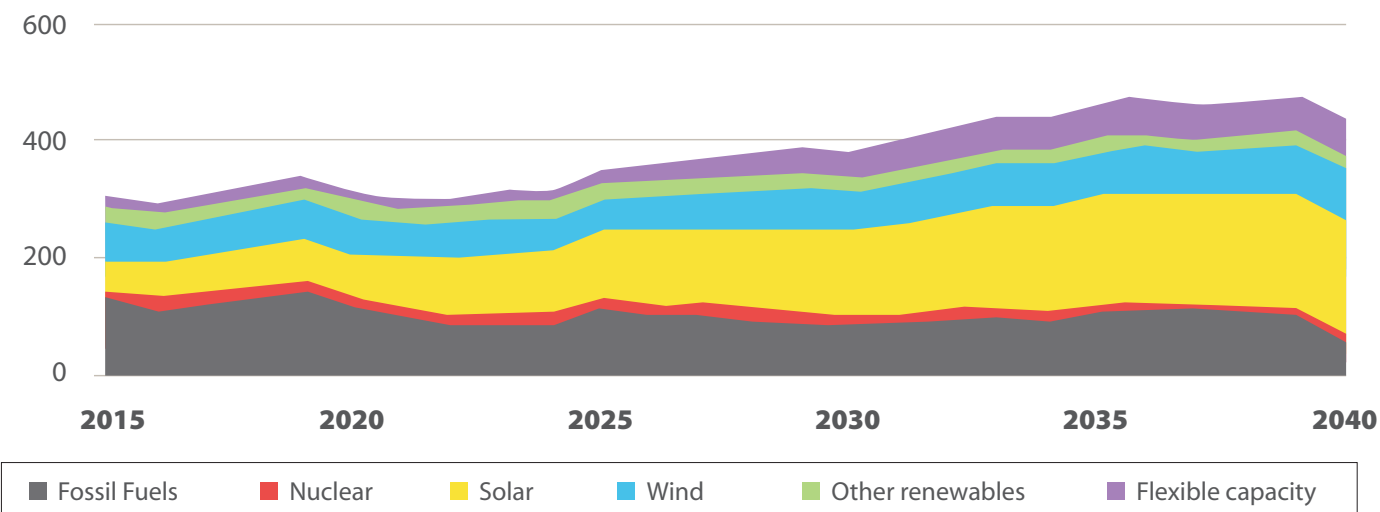
renewables is expected to remain somewhat similar during this period. Together, renewable energy is projected to capture more than half of the global energy mix in 2040 (figure 3).

Solar will add the largest capacity among the fuels for power generation. About \$3.7 trillion will be added (of the total \$12.2 trillion) on investment in solar energy – evenly split between utility scale solar and small installations between 2012 and 2040³.

²<http://trackingenergy4all.worldbank.org/>

³<http://www.bloomberg.com/company/new-energy-outlook/>

FIGURE 3 – GLOBAL INSTALLED CAPACITY (GW), 2012 TO 2040



In Collaboration with:

Mr. Jamal Saghir - Advisory Board Member

CAREER DEVELOPMENT

Trainings

Safety

BASIC FIRST AID AND CPR

JUNE 2; AUGUST 2, 8, 9; SEPTEMBER 22; NOVEMBER 8 AND 15, 2016; JANUARY 18 AND 19, 2017; AND MARCH 29, 2017 - DOHA, QATAR

The Basic First Aid and CPR course covered theoretical knowledge and practical skills. The 17 attendees learned about standard situations that require first aid and the proper procedures in administering treatment.

SCAFFOLDING INSPECTOR

JULY 14, SEPTEMBER 27, AND NOVEMBER 8, 2016 - DOHA, QATAR

11 employees attended the training that covered scaffold users, erectors and inspectors. It discussed regulations, safety guidelines, and procedures needed to recognize and eliminate hazards in the field.

FIRE WARDEN/MARSHALL TRAINING

AUGUST 8; SEPTEMBER 24; OCTOBER 5; NOVEMBER 8 AND 15, 2016; AND MARCH 28, 2017 - DOHA, QATAR

This course, given to 16 employees holding fire marshal positions, discussed levels and knowledge of fire safety, including how it spreads and how to respond. It explained the key risks and basic requirements of the post.

SPILL PREVENTION AND CONTROL

AUGUST 27, 2016 AND MARCH 28, 2017 - DOHA, QATAR

Induction training was given to 13 employees on spill prevention control which is the practice of reducing the number of incidents that release oil or hazardous substances into the environment and limiting the amount released during those incidents.

SAFE TOWER CRANE OPERATOR

AUGUST 28, 2016 - DOHA, QATAR

This course discussed the basic skill requirements, practical application and

associated job safety information for personnel involved in tower crane operations and signaling procedures.

CONFINED SPACE SUPERVISOR

AUGUST 30, 2016 - DOHA, QATAR

The aim of this course was to prepare the selected candidates to supervise confined space operations, write safe systems of work for confined areas, and draft and issue work permits. In addition, individuals learned how to write rescue plans and be defined as competent persons by their employer in order to be a Confined Space Manager / Supervisor (appointed/authorized person).

WORKING AT HEIGHTS SUPERVISOR

SEPTEMBER 1, 2016 - DOHA, QATAR

The Working at Heights Course for Supervisors provided the 10 participants with the appropriate knowledge so that they could perform their activities properly and safely.

AUTHORIZED GAS TESTING

**SEPTEMBER 22, 2016
DOHA, QATAR**

One employee participated in the Authorized Gas Testing course that provided attendees with the knowledge and understanding to work safely when performing tests for oxygen, and flammable and toxic gases. It included testing in confined spaces, relevant legislative control, atmosphere measuring and monitoring equipment, gas testing in confined spaces, and interpreting and documenting results.

WORKING AT HEIGHTS AND RESCUE

NOVEMBER 6, 2016 - DOHA, QATAR

This course covered the use of protective fall protection systems, equipment, and various rescue scenarios. It covered suspension trauma and practical skills required for a rescuer. Nine employees from MAN Enterprise attended the training.

LOCK OUT TAG OUT

**NOVEMBER 6 AND 19, 2016
DOHA, QATAR**

Three employees attended the training for Lockout/Tagout (LOTO) practices and procedures, which taught about safeguarding workers from hazardous energy releases. The course described the practices and procedures necessary to disable machinery or equipment in order to prevent hazardous energy release.

NOISE AND VIBRATION CONTROL

FEBRUARY 20 AND MARCH 23, 2017 - DOHA, QATAR

Induction training on noise and vibration control was attended by 30 employees. It demonstrated how vibration and noise are two interrelated concepts in the field of mechanical engineering.

Technical

ISO AWARENESS

**JULY 11, 2016
BEIRUT, LEBANON**

ISO Awareness training was held at the MAN Enterprise Training Center in Sin El Fil for eight attendees. The topics of the training were definitions and benefits of ISO certification, quality management principles, process approach, and ISO certification requirements.

INTRODUCTION TO MEP SYSTEMS-HVAC

DECEMBER 6, 2016 - DOHA, QATAR

This introductory presentation and workshop was attended by seven employees. It was one of many MEP related presentations that were given to the MAN Enterprise execution team with respect to the MEP systems involved in construction projects. The presentation covered the various types of HVAC systems and their importance, equipment, distribution systems, accessories, major interfaces, pitfalls and pre-requisites with civil works. The presentation was followed by a workshop aimed at improving the understanding of HVAC execution drawings and its interpretation onsite.



ARCHIBUS/SOFTWARE ON ASSET MANAGEMENT **FEBRUARY 23, 2017 - DOHA, QATAR**

The ARCHIBUS/Software on Asset Management training was held for 12 employees optimizing capital and other asset investments through integrated lifecycle management of asset acquisition, utilization, repurposing, and decommissioning/disposal covering asset management.

ISO 14001 INTERNAL AUDIT TRAINING - WORKSHOP **MARCH 22, 2017 - DOHA, QATAR**

12 employees covered the various sections of the ISO 14001-2015 standard and reviewed the approach toward the standard requirements from the eyes of an auditor.

TEKLA STRUCTURES SOFTWARE **APRIL 19 AND MAY 25, 2017** **BEIRUT, LEBANON**

One employee from Tecman Industry attended the Tekla software training that showed how to minimize costly errors and manage projects with total process optimization. The flexible software creates a detailed, constructible 3D model of any steel structure from industrial and commercial buildings to stadiums and high rise buildings in order to support projects for timely error-free delivery.

PMC'S HIDDEN AGENDA **APRIL 24, 2017 - DOHA, QATAR**

The PMC's Hidden Agenda training was held in the Crowne Plaza with 46 attendees. Topics included the employer/PMC/contractor relationship, PMC's responsibilities and limits of power, the employer's overall strategy, and how to administer contract agreements.

Managerial

CONTRACT PROCEDURE AND ADMINISTRATION **JUNE 19, 2016 - DOHA, QATAR**

41 employees from MAN Enterprise Qatar and Metrix Qatar attended the Contract Procedure and Administration course that reviewed the formation and interpretation of contracts as the rules of engagement between parties embarking on a project. It examined the administration and management processes throughout the course of a project. Furthermore, the course provided information for developing procedures to deliver a streamlined contract administration process.

TIME MATTERS - PROGRAMS, EXTENSIONS AND ISSUES OF DELAY **JUNE 22, 2016 - DOHA, QATAR**

The Time Matters training was conducted by Quantum Global Solutions, one of the global leaders in contract management. The training for 47 participants from MAN Enterprise Qatar and Metrix Qatar included four sessions covering simple delay analysis, identifying critical paths, issues with recovery programs, and delay with awards and variation orders. The highly interactive training included several group exercises and discussions.



PROJECT PLANNING AND SCHEDULING USING PRIMAVERA P6 **JULY 12 - JULY 28, 2016** **BEIRUT, LEBANON**

A professional trainer from Advisors conducted the Project Planning and Scheduling using Primavera P6 sessions for 29 employees. The classes provided

attendees with hands-on training for Oracle Primavera P6 client / server based solutions. Participants were given in-depth information about the concepts of planning and scheduling.



APPLIED PROJECT MANAGEMENT **SEPTEMBER 2, 2016 - DOHA, QATAR**

The Applied Project Management Program is geared toward practicing project managers who want to formalize and build on their existing practical project management skills while achieving national qualification. The qualification is intended for persons working as a Project Manager of small to moderately complex projects and it is based on the key competencies expected of someone fulfilling that role. One employee attended the training.

ENVIRONMENTAL IMPACT ASSESSMENT **NOVEMBER 22, 2016** **DOHA, QATAR**

Environmental Impact Assessment training was given in accordance with MAN Enterprise's EMS Manual. EIA is the process of evaluating the likely environmental impacts of a proposed project or development, considering inter-related socio-economic, cultural and human-health impacts, both beneficial and adverse. The training was given to 11 employees.

CAREER DEVELOPMENT

Trainings

Managerial



MAN ENTERPRISE ENVIRONMENTAL POLICY DECEMBER 12, 2016, JANUARY 15 AND APRIL 30, 2017 - DOHA, QATAR

Training on MAN Enterprise's Environmental Policy was given to 26 employees covering MAN's vision, aim, objectives, accountability and communication with regards to its Environmental Management System.

ENVIRONMENTAL MANAGEMENT SYSTEM INTERNAL AUDIT TRAINING FEBRUARY 21, 2017 - DOHA, QATAR

13 employees attended the Environmental Management System Internal Audit Training covering the requirements of the ISO 14001-2015 by section, and reflected the implementations MAN has adopted in compliance with these requirements. The workshop highlighted what to look for during an Environmental Management System Internal Audit.

GLOBAL CLAIMS; AVOIDING RELIANCE ON A GLOBAL CLAIM MARCH 14, 2017 - DOHA, QATAR

Six participants attended the Global Claims training in which case studies were reviewed in order to better understand work processes.

WASTE PREVENTION AND MANAGEMENT MARCH 16, 2017 - DOHA, QATAR

46 employees attended the training on waste management in accordance with MAN Enterprise's EMQ Manual. Waste management is the process of treating solid waste and offers a variety of solutions for recycling items. As garbage can be used as a valuable resource, waste management offers options for



the disposal of products and substances in a safe and efficient manner.

WATER, ENERGY AND PAPER CONSUMPTION MARCH 17, 2017 - DOHA, QATAR

Induction training on water, energy and paper consumption management in accordance with MAN Enterprise's EMQ Manual was given to 46 employees. The focus was on the management of such items and how to better oversee their use and disposal.

LEAN CONSTRUCTION TRAINING MARCH 22, 24, 27 AND MAY 5, 8, 9, 2017 - BEIRUT, LEBANON

A three-day interactive lean construction training for 90 engineers, architects and managers was held at MAN's training center in Sin el Fil during the second quarter of 2017. It covered the theory behind lean management and lean construction, along with implementation practices in both the manufacturing and construction environments. The training was part of the collaboration between MAN Enterprise and the Department of Civil and Environmental Engineering in AUB.



STRATEGIC LEADERSHIP MARCH 27 AND 30, 2017 BEIRUT, LEBANON

One employee from Tecman Industry attended the unique program that redefined the art of leadership in a whole new context. The training simulation provided executives with vital leadership skills to navigate the challenges of a changing and complex world.

EXTENSION OF TIME CLAIMS: EFFECT, CAUSE, LIABILITY APRIL 3, 2017 - DOHA, QATAR

The Effect-Cause Liability training was held in the Crowne Plaza for 45 attendees with the objective of identifying the causes and effects of delays in the construction industry. As delays are generally regarded as the most common industrial problem, it is a crucial subject to review and assess.

AIR QUALITY CONTROL APRIL 4, 2017 - DOHA, QATAR

Six employees attended the induction training on Air Quality Control in accordance with MAN Enterprise's EMQ Manual. The session explained the techniques employed to reduce or eliminate atmospheric emissions of substances that can harm the environment or human health.

APPLIED PROJECT MANAGEMENT APRIL 8 AND MAY 3, 2017 DOHA, QATAR

This training covered hazardous materials management in accordance with MAN Enterprise's EMQ Manual. 33 employees attended the training which reviewed substances of a chemical, physical, and biological nature.

FUEL, CHEMICAL AND HAZARDOUS MATERIALS MANAGEMENT SEPTEMBER 1, 2016 - DOHA, QATAR

The Working at Heights Course for Supervisors provided the ten participants with the appropriate knowledge so that they could perform their duties, properly and safely.

SOCIAL NEWS

Weddings



| MAN Enterprise |

- Muthu Veeraiah & Lakshmi May 12, 2016
- Roy Malkoun & Noura Sfeir June 10, 2016
- Nouman Sulaiman & Samara Ali July 6, 2016
- Georges Ibrahim & Mona Bassil August 26, 2016
- Elsan Lapidante & Anniecar Obrero September 12, 2016
- Tony Ross & Stephanie Lebbos October 14, 2016
- Mirick Gammad & Jackie Lou R. Gammad January 6, 2017
- Althaf Ahamed Lebbe & Fathima Ajeefa Abdul Latheef February 3, 2017
- Mohamed Naizer Amjadeen & Fathima Nusha February 9, 2017
- Haytham Chehade & Soha Saleh May 12, 2017

| Metrix |

- Elia Abou Chabke & Tania Chamoun September 11, 2016
- Joe Andary & Samar Abboud April 1, 2017

Newborns



| MAN Enterprise |

- Tony Badine, Theana May 9, 2016
- Gunamurugan K., Helina G. May 11, 2016
- Samoon Ibraheem, Ahmath Hamthi June 13, 2016
- Hamdy Atta, Tashnim June 15, 2016
- Marco Maher, Marita July 1, 2016
- Roy Gedeon, Raymond July 28, 2016
- Paul Peralta, Jewel Carylle August 1, 2016
- Bhim Kumar Limbu, Ravi August 11, 2016
- Cynthia Fenianos, Raphael September 14, 2016
- Ian Raquintan, Ian Kyle October 20, 2016
- Shafi Fathima, Ayana October 31, 2016
- Fadi Hnein, Sophia November 1, 2016
- Youssef Jouni, Abbas November 9, 2016
- Rabih Richany, Priscilla November 15, 2016
- Prasanth Antony Puthenveetil, Dhanvin November 21, 2016
- Mohammad Al Jabal, Abdel Aziz November 28, 2016
- Philippe Simon Harrak, Simon February 8, 2017
- Joven Corpuz, Kyler Rein March 1, 2017
- Latheesh Kalambath, Hridaya March 22, 2017
- Chawki Abi Jomaa, Ramy March 27, 2017
- Nouman Sulaiman, Lamar April 7, 2017
- Fabienne Sybil Carrillo, James Alexander April 27, 2017
- Kanaan Ali Kanaan, Ali April 29, 2017

| Tecman Industry |

- Lama Mansour, Charbel October 26, 2016
- Nadim Hazouri, Samuel December 16, 2016

| Metrix |

- Abraham Vargehese, Adiya Mary July 28, 2016
- Elie Nakhoul, Nour November 4, 2016
- Joe Batanian, Gio November 26, 2016
- Abdel Karim Dergham, Ahmad February 19, 2017
- Ramy Berbary, Aya Maria March 2, 2017
- John Michael Dasig, Zayme Axel March 9, 2017

ACTIVITIES & EVENTS

MAN Group

Beirut Marathon 2016



This year more than 300 MAN Group employees and their families participated in the Beirut Marathon on Sunday, November 13, 2016, running to promote wellness and physical activity among its personnel.

The MAN Group supported "Donner Sang Compter" in raising awareness about voluntary blood donation, reinforcing the commitment to humanitarian causes supported by the marathon in a display of Corporate Social Responsibility (CSR).

Participating in organized sporting events helps work performance and allows the members to be more team oriented, providing an experience of physical and mental challenges. It brings together athletes and enthusiastic participants in a fun yet competitive environment.



MAN Enterprise Qatar Cricket Game



The MAN Cricket League season five was organized and sponsored by MAN Enterprise Qatar.

Competition was between six teams within the company, with the Area General Manager and the Project Managers as the honored guests of the final game.

Finals were held on December 30, 2016, between the VIBA Warriors and the SLA Challengers. The Viba Warriors won season five's trophy against the SLA by 17 runs. The MCL trophy was given to the winners along with medals for each member. The SLA Challengers were the first runners-up and the Rising Stars were the second runners-up.



MAN Enterprise on Lean Construction at AUB

MAN Enterprise was invited by the Department of Civil and Environmental Engineering of the American University in Beirut (AUB), to be a yearly speaker in one of its Lean Construction courses.

The first class that MAN Enterprise was part of was held in November 2016 and included undergraduates, master's and PHD students. Two representatives from MAN Enterprise presented "Lean Construction in Practice" which relates to MAN Enterprise's newly implemented project delivery strategy on construction sites. The session was very interactive and interesting especially because it related to the first implementation of



Lean construction in Lebanon. The session also opened doors for students to continually collaborate with MAN Enterprise on conducting research for their final year projects, theses and dissertations.

ACTIVITIES & EVENTS

MAN Enterprise Lebanon

AUB Job Fair 2017

The AUB Job Fair was held April 20-21, 2017, at the AUB campus in Beirut.

Eight representatives from MAN Group attended the event, meeting around 300 students and graduates to advise them about job vacancies, recruitment, and application process.



MAN - AUB Presentation at The IGLC Conference in Boston - 2016 | USA

Founded in 1993, the International Group for Lean Construction (IGLC) is an international network of researchers from practice and academia in Architecture, Engineering, and Construction (AEC) who believe that the practice, education, and research of the AEC industry must be radically renewed in order to respond to the global challenges ahead.

In July 2016, MAN Enterprise's representatives presented a paper with Dr. Farook Hamzeh, professor from the Department of Civil and Environmental Engineering at the American University (AUB).

The paper was a result of a joint research collaboration between MAN Enterprise and AUB titled "The First Extensive Implementation of Lean and LPS in Lebanon: Results and Reflections." This

published paper focuses on what MAN Enterprise has implemented and accomplished in its initial lean implementation. The paper can be accessed via the IGLC Website, <http://iglc.net>.

The maturity of Lean Implementation in MAN Enterprise impressed the attendees and received applause.

Since then, MAN Enterprise has been an active member of the IGLC.



Popsicle Stick Bridge Competition

The ASCE Lebanon section organized a Popsicle Stick Bridge Competition (PSBC) on April 1, 2017, at the Lebanese American University (Byblos Campus).

MAN Enterprise was one of the companies that sponsored and supported the event where 27 teams from 10 universities participated. The full day program was comprised of several presentations from leading engineering companies. Students had the opportunity to learn, engage, interact, and most importantly, be exposed to innovation in bridge design and construction.

The event featured the patronage of the Federation of Lebanese Engineers and the presence of its President, Mr. Khaled Chehab. The winning team was from Notre Dame University (NDU), while the Lebanese American University (LAU) ranked second and the Lebanese University (LU), third.



The Art of Dining – Beirut Edition

The Art of Dining landed in Beirut to celebrate Lebanon's top architects and interior designers in District //S, the award-winning development of 22 modules ranging from three to seven stories in the heart of Beirut's Central District.

On April 26 and 27, 2017, renowned designers were given the opportunity to showcase their designed dining tables in their own space, with no limits to creativity. The exhibition theme was to be bold and adventurous, and create an unforgettable experience for guests.



ASCE Annual Seminar and Dinner

The ASCE Annual Seminar and Dinner was held on March 1, 2017, at Le Royal Dbayeh.

An assembly was held and lifetime achievement awards were presented by Dr. Hisham Joma, Chief Development Officer at Jeddah Economic City. Dr. Joma received a Certificate of Appreciation from the ASCE Lebanon Section Board of Officers.



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