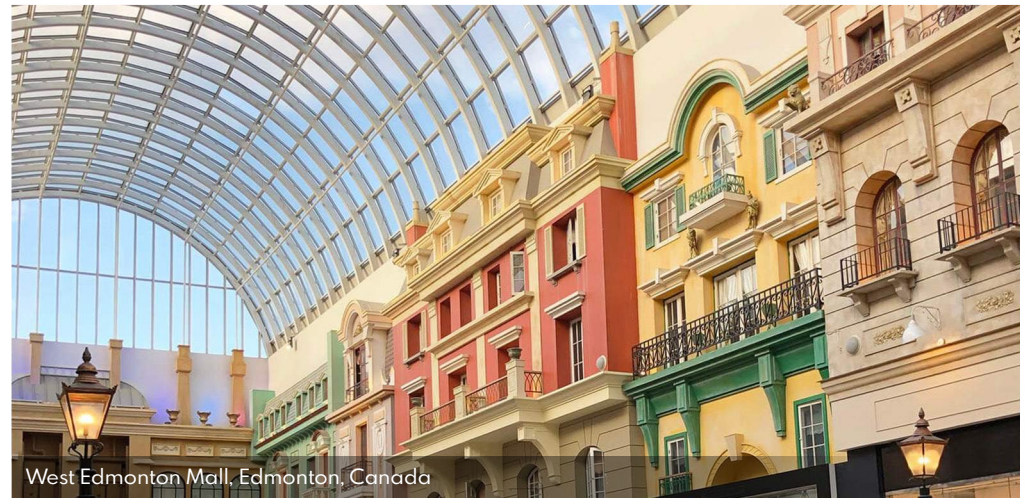




BUILDING SERVICES **GUIDE**



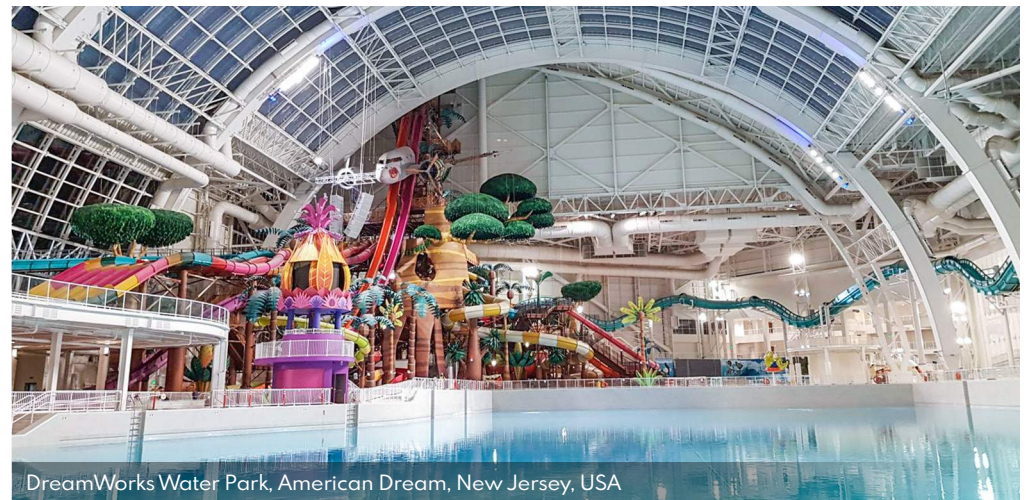
MGA
Engineering
mgaeng.com



West Edmonton Mall, Edmonton, Canada



American Dream, New Jersey, USA



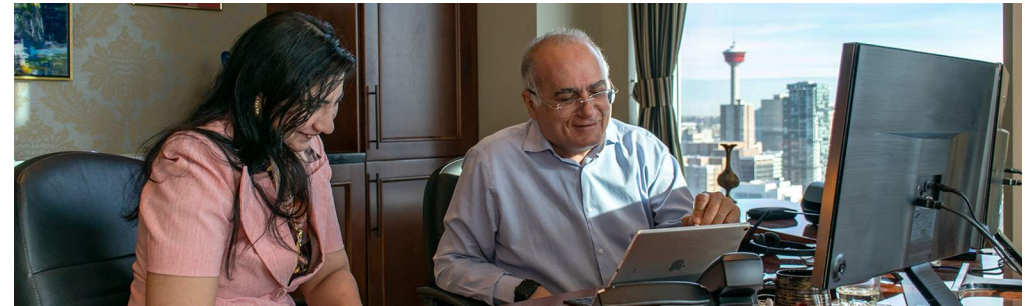
DreamWorks Water Park, American Dream, New Jersey, USA



The Company

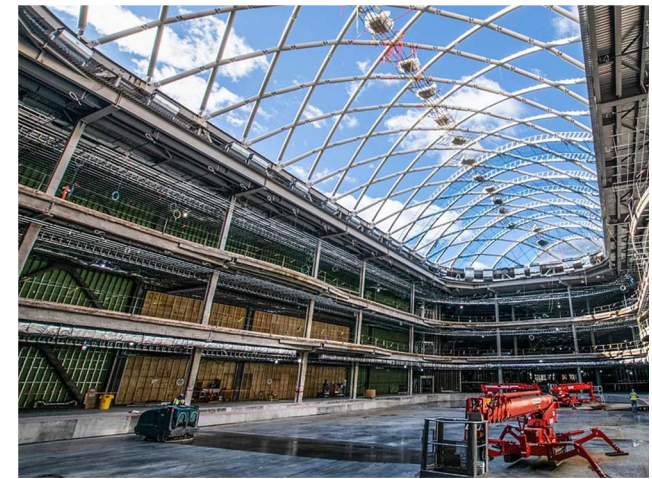
Headquartered in Calgary, Canada and founded in 1996, MGA Engineering works on a variety of structural and mechanical systems deployed across the globe. Maged Ghali, MGA's founder and CEO, is the Engineer of Record for several high-profile buildings across North America, including the world-famous West Edmonton Mall and the Edmonton City Centre shopping mall (formerly the Eaton Centre). MGA's most recent high-profile building project is the American Dream Meadowlands shopping center, located in New Jersey, USA, which opened in 2020.

MGA is equipped to tackle even the most challenging building, offering a full range of engineering, design and analytics for structures, foundations and piping systems. Building on its extensive expertise from past projects, MGA has in-depth knowledge of the inner workings of a project, including the required steps and procedures needed for successful completion and commission. MGA's design work is complemented by a world-class engineering expertise in extreme design conditions, including seismic and vibratory loads, extreme pressure and temperature, and non-competent soil behavior.



The Roles

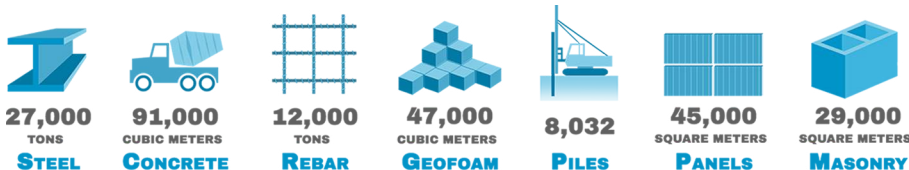
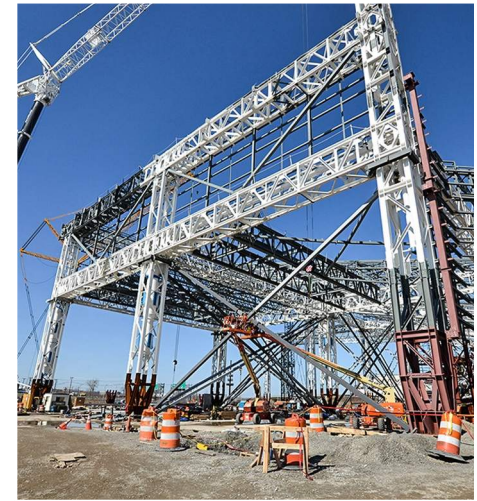
MGA is dedicated throughout a project's life-cycle; from concept and feasibility studies, to engineering/design, fabrication, construction oversight, and post-construction support. Typically hired as the Engineer-of-Record, MGA's mandate can be tailored to the unique needs of the Client - be it as the designer, compliance consultant, simulation analyst, or the Client's project manager.



The Versatility

MGA proved itself as a structural engineering powerhouse on the American Dream Meadowlands project, between 2013 and 2020. Located minutes from New York City, the American Dream shopping and entertainment complex features over 500 stores and restaurants, the country's first indoor ski hill, an indoor amusement park, an indoor NHL regulation sized rink, the country's largest indoor water park and more.

MGA designed and engineered the four most complex buildings: The Water Park, the Amusement Park, the Core Building and the Connector Building. MGA participated in all aspects of the project, from conceptual design to detail engineering, modularization studies and planning, fabrication oversight, erection planning, on-site construction support, and tenant fit-out.





Structural Engineering

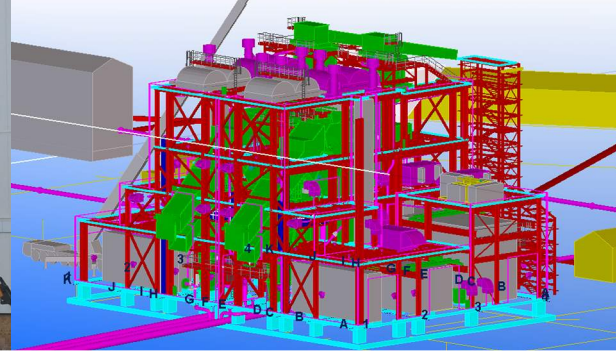
MGA offers an experienced team with a history of successful structural engineering projects in both design and general support roles. In addition to the technical aspects, MGA provides full owner support, contract administration and interfaces with consultants and contractors during the project. MGA's portfolio includes:

- Building layouts
- Piles
- Civil infrastructure
- Foundations, including mat foundations and piles
- Heavy concrete work
- Steel structures and superstructures
- Structural steel connections and welding
- Masonry structures
- Water retaining structures, including pools
- Static and mobile roofs

Special Engineering

MGA has decades of experience with design scenarios that could not be solved with traditional engineering approaches. Much of our experience is drawn from solving unique problems by seeking innovative but also practical solutions to problems when more traditional approaches do not meet the client's needs. Our Special Engineering group is tasked with handling these unique scenarios, including:

- New erection studies
- Structural vibration mitigation
- Structural fire protection
- Building code studies
- Building envelope studies
- Corrosion protection
- Extreme temperature analysis



Fit-Outs and Finishes

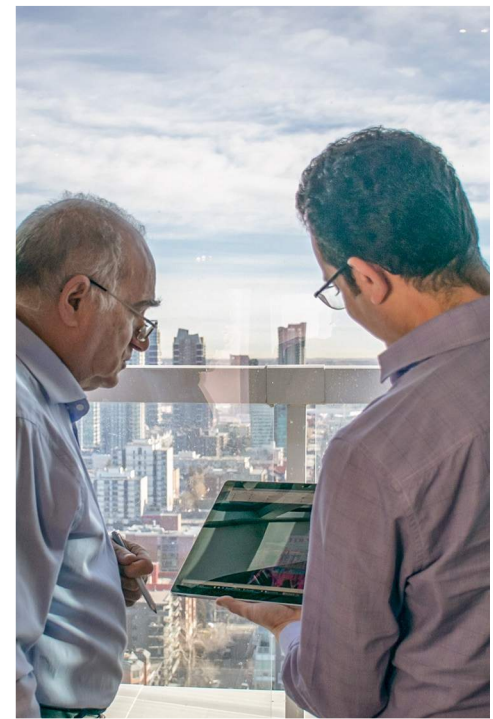
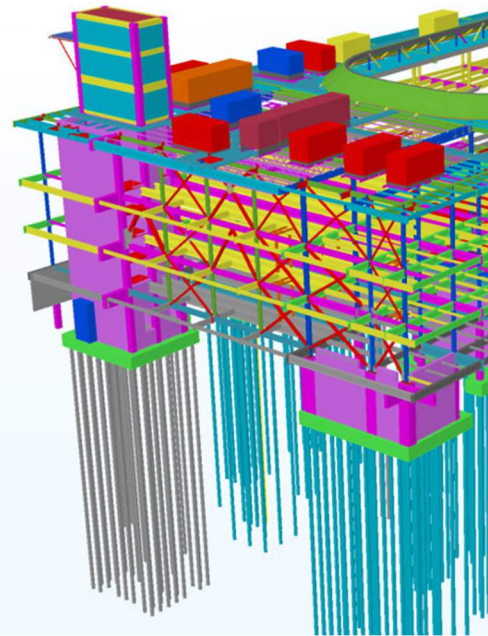
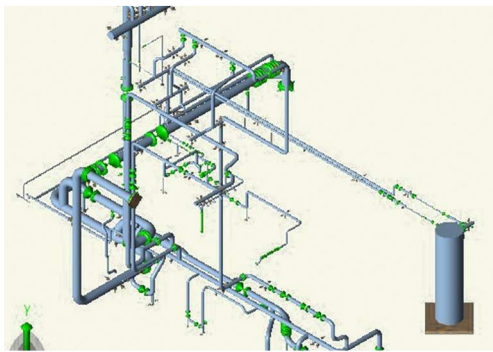
MGA gets involved with fit-outs and finishes once the bulk of a building's structural requirements has been addressed. MGA has a vast experience with tenant fit outs, theming installations, cold-formed steel framing and a number of other finishing touches, such as:

- Wall partitions and cold-formed steel
- Facades (glass, precast, ETFE, metal cladding, etc.)
- Escalators and elevators
- Flooring and floor tolerances
- Railings and feature stairs
- Parapets
- Fall restraint and fall arrest systems
- Hanging theming elements

Structural Rehabilitation

MGA works closely with owners, architects, general contractors and consultants to expedite solutions to design changes, structural modifications, and building re-purposing. Such works will typically entail:

- Repair and rehabilitation
- Modification to existing structures
- Reviewing existing and new loads
- Presenting cost-effective solutions



Utilities and Mechanical

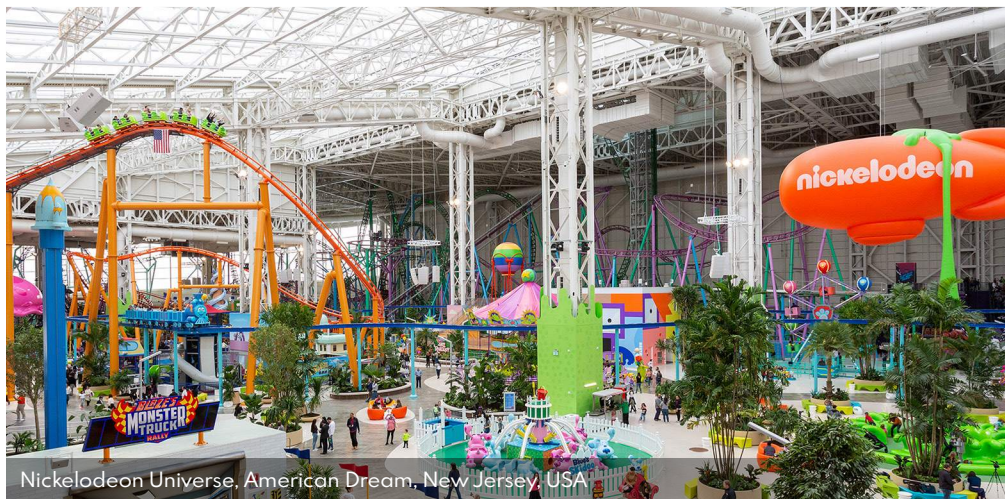
Utilities and mechanical systems have a great influence in the structural design process. MGA is especially versed in complex piping layouts, an expertise that grew out of the company's involvement with heavy industrial projects. The scope of MGA's utilities and mechanical expertise includes:

- Piping, HVAC and electrical layouts
- Pipe stress analysis
- Equipment pads and dunnage
- Deep underground utilities
- Integration of mechanical units into the structure
- Required seismic restraints for MEP

Resource and Energy Management

Sustainability and resources management are integral to the design of modern building projects. Accordingly, sustainable design principles are embedded in MGA's design philosophy from the beginning. Sustainability management items may include:

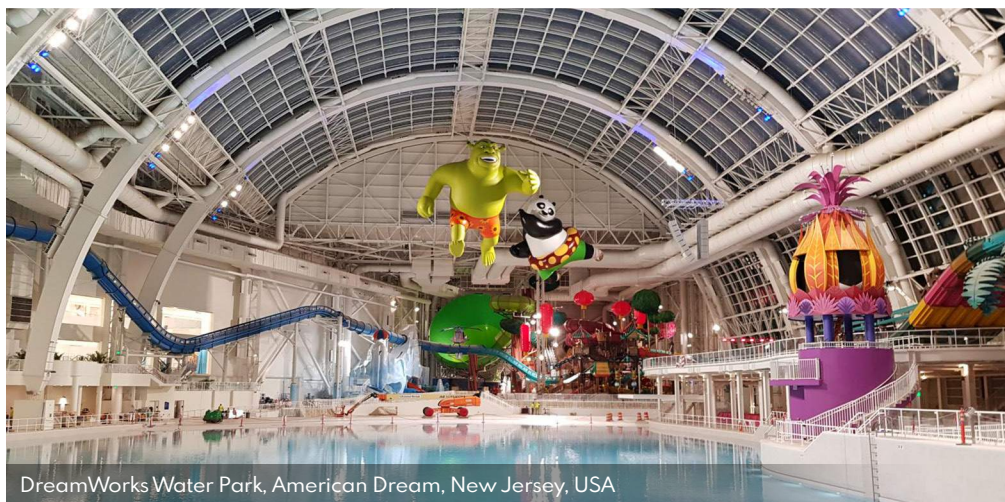
- Design flexibility for future modifications
- Project management to minimize working hours
- Design for reuse
- Use of renewable and energy efficient materials
- Performance-based design (where justified)
- Integrated sustainable solutions



Nickelodeon Universe, American Dream, New Jersey, USA



West Edmonton Mall, Edmonton, Alberta, Canada



DreamWorks Water Park, American Dream, New Jersey, USA

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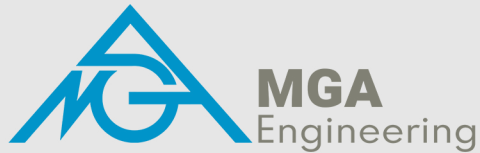
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