



TOP DOWN<sup>SM</sup> TECHNOLOGY  
LEAN IN - FUSED TEAMING

innovation in building





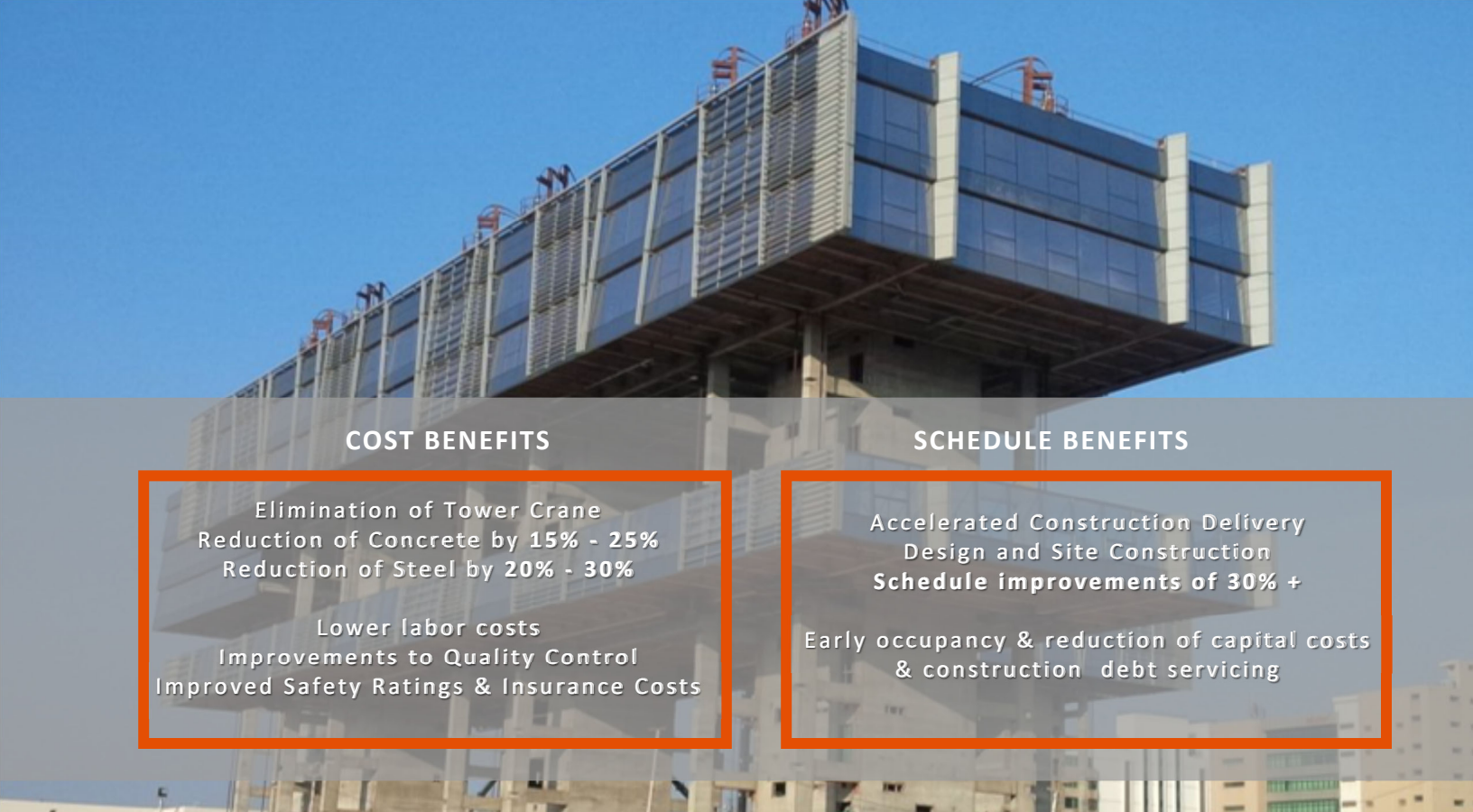
TGE Top Down<sup>SM</sup> Technology (TGE) is a building group specialized in systems integration focused on a revolutionary building process for the construction industry. Our vision is to transform design and construction practices for faster delivery, cost effectiveness, and a more sustainable built environment. TGE Top Down brings a new approach to building, via Lean practices and a structural improvement to conventional construction.

TGE was organized and founded by Dr. Charles H. Thornton. Dr. Thornton is one of the preeminent structural engineers and educators in the world; co-chairman of Thornton Tomasetti until 2004, and as Honorary Chairman/Founder of the ACE Mentor Program, a non-profit organization that, each year, offers guidance and training to inner city high school students in architecture, construction and engineering in cities across the U.S.

Dr. Thornton has been involved in the design, construction and analysis of billions of dollars worth of projects worldwide, including hospitals, arenas, mid/high-rise buildings, airports, transportation facilities and special structures. His award-winning work has set industry standards for innovative thinking and creativity. Dr. Thornton has led the structural design of some of the world's most significant and monumental structures, including two of the tallest: Taipei 101 in Taiwan, and the Petronas Towers in Kuala Lumpur.

Pioneering innovation in tall building construction; TGE is first to market with revolutionary and game-changing innovations providing a vertically integrated structural construction and technology-based solution to mid/high-rise buildings. This is accomplished through the reduction of building weight and elimination of interior and exterior columns, providing the ultimate design flexibility, maintaining the world's first principally manufactured building constructed without the use of a tower crane erected entirely at ground level.

The TGE Top Down<sup>SM</sup> technology platform and building approach is a result of 45 years of research and proven project experience, years of planning, and countless hours testing, designing, and achieving breakthroughs. The Top Down delivery model is a product of dedication to innovation and advancement of improvements in efficiency in construction and a vehicle to assist our clients and industry to **build better**.



### COST BENEFITS

Elimination of Tower Crane  
Reduction of Concrete by 15% - 25%  
Reduction of Steel by 20% - 30%

Lower labor costs  
Improvements to Quality Control  
Improved Safety Ratings & Insurance Costs

### SCHEDULE BENEFITS

Accelerated Construction Delivery  
Design and Site Construction  
**Schedule improvements of 30% +**

Early occupancy & reduction of capital costs  
& construction debt servicing

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## *The TGE Solution*

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Real evolution, game-changing evolution, transforms the industry landscape by drastically reducing the labor and material requirements of mid/high-rise structures and cutting the construction time down to as much as one-third the time of conventional construction. The TGE Top Down<sup>SM</sup> process has reset the bar and forever changed the way mid/high-rise buildings are constructed.

The TGE Top Down<sup>SM</sup> technology platform and building approach has proven to be a critical competitive edge for forward thinking developers and design teams looking for distinct and measurable differentiation from their competition.



# TGE Top Down<sup>SM</sup> Process

ENR October 2018, Tom Sawyer, Deputy Editor

*"We would love every project of ours to be constructed in the Top Down<sup>SM</sup> model," Panaj Keswani, founder and managing director of facade contractor Alufit. He cites the advantages of manufacturing-like schedule predictability, working at ground level, easier quality control, "huge" time savings, and "most important, negligible - as good as zero - risk to life and limb."*

*"We have experienced a reduction in labor of approximately 25% to 35% by adopting the Top Down<sup>SM</sup> construction method, versus a conventional method, but the biggest benefit is the 'predictability of program.'"*

P.V. Prasanth  
Director of Operations and Technology.  
Shapoorji Pallonji



01

## Ground Level Floor Construction

The Top Down<sup>SM</sup> Process provides that the roof and each floor is constructed less than 6' (feet) off the ground so no worker needs to be tied off and can safely work at maximum efficiency.

02

## Reduced Structural Weight

By maximizing the structural efficiency of concrete and steel, the Top Down<sup>SM</sup> Process system cuts total structural weight roughly in half compared to conventional construction.

03

## Column-Free Interiors and Exteriors

The TGE Top Down<sup>SM</sup> Process system is comprised of central cores in lieu of multiple internal and external support columns and shear walls providing maximum stability and complete architectural freedom in floor design.

04

## Increased Safety Performance

By constructing each deck at ground level, numerous safety hazards are eliminated and workers perform at maximum efficiency. Workers are no longer working from exterior or elevated positions and tower crane operations along with risks associated with scaffolding are essentially eliminated.

05

## Elimination of Tower Cranes

The Top Down<sup>SM</sup> Process system eliminates the need for expensive high-rise tower cranes as well as the potential for delays due to high winds or mechanical breakdown

06

## Time Savings

Through a combination of ground level construction, material reduction, and an industrialization of construction procedures, the TGE Top Down<sup>SM</sup> Process Mid/High-Rises are constructed in typically half the time of conventional buildings.

07

## Ultimate Flexibility, Design & Build

The Top Down<sup>SM</sup> Process system can create a mid/high-rise building of virtually any size or shape and can be utilized for almost any application

TGE<sup>SM</sup> System Maximizes Safety, Savings, and Efficiency



## History

TGE is an outgrowth and legacy company from Dr. Charles H. Thornton's development of Intellectual Property and the CHT LIFT build program dating back to the early 1970's.

Early projects were developed through IED & David Termohlen in concert with Dr. Thornton; and include seven buildings using a methodology similar to the TGE Top Down<sup>SM</sup> process system for the structural and assembly approach. East Coast projects include the Russian Mission near New York City and a hotel in West Virginia. All range between 11 and 20 stories in height. Notably, four of the structures are in the San Francisco Bay Area and lie adjacent to the Hayward and San Andreas faults and have operated without structural damage through major earthquakes between 1979 and 2018, four of which were magnitude 6.5 and greater.

Recent TGE Top Down<sup>SM</sup> technology platform and building approach projects include two similar 624,000 GSF buildings in Bangalore, India; both 10-story commercial/laboratory office structures.

TGE continues to develop projects throughout North America and for select international client programs.

Tower Plaza, San Mateo  
California



Great Western "PowerBar Building"  
Berkeley, California



Tisch Tower, San Jose  
California



444 Castro  
Mountain View, California



Radisson Hotel  
Huntington, West Virginia



Russian Mission School  
New York, New York



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## *Executives*

### *Team*

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**Dr. CHARLES H. THORNTON, PhD., PE**  
Chairman, Managing Member

Charles Thornton's forty-four years of experience as an entrepreneur and founder of Thornton Tomasetti has included involvement in the design and construction of hundreds of billions of dollars' worth of projects in the U.S. and overseas, ranging from hospitals, arenas and mid/high-rise buildings, to airports, transportation facilities and special projects.



**JEFFREY GRILLO**

Principal, Member

Mr. Grillo is the former VP of Construction for Intel's Global Construction Team. He successfully managed and oversaw a multibillion-dollar global expansion of leading edge manufacturing capacity.

Mr. Grillo focuses on strategic planning and development supply chain partners to increase construction responsibilities and delivery performance for overall project delivery efficiency.



**DANIEL S. ESPARZA**

Principal, Member

Mr. Esparza is an accomplished executive and entrepreneur with domestic and international construction experience and operations for General Contracting, Design / Build, and Civil / Infrastructure related projects.

Mr. Esparza has managed and operating construction companies from start-up through \$500M in market development.



**JOHN CASOLARO**

Director of Design

Mr. Casolaro has worked for AT&T and other Fortune 500 companies in both the A&E and construction, development sectors – he has overseen and managed the TGE Building System for international program work and provided modeling for MRP II systems.

Mr. Casolaro manages and directs all design and architectural collaboration for Top Down<sup>SM</sup> structures.



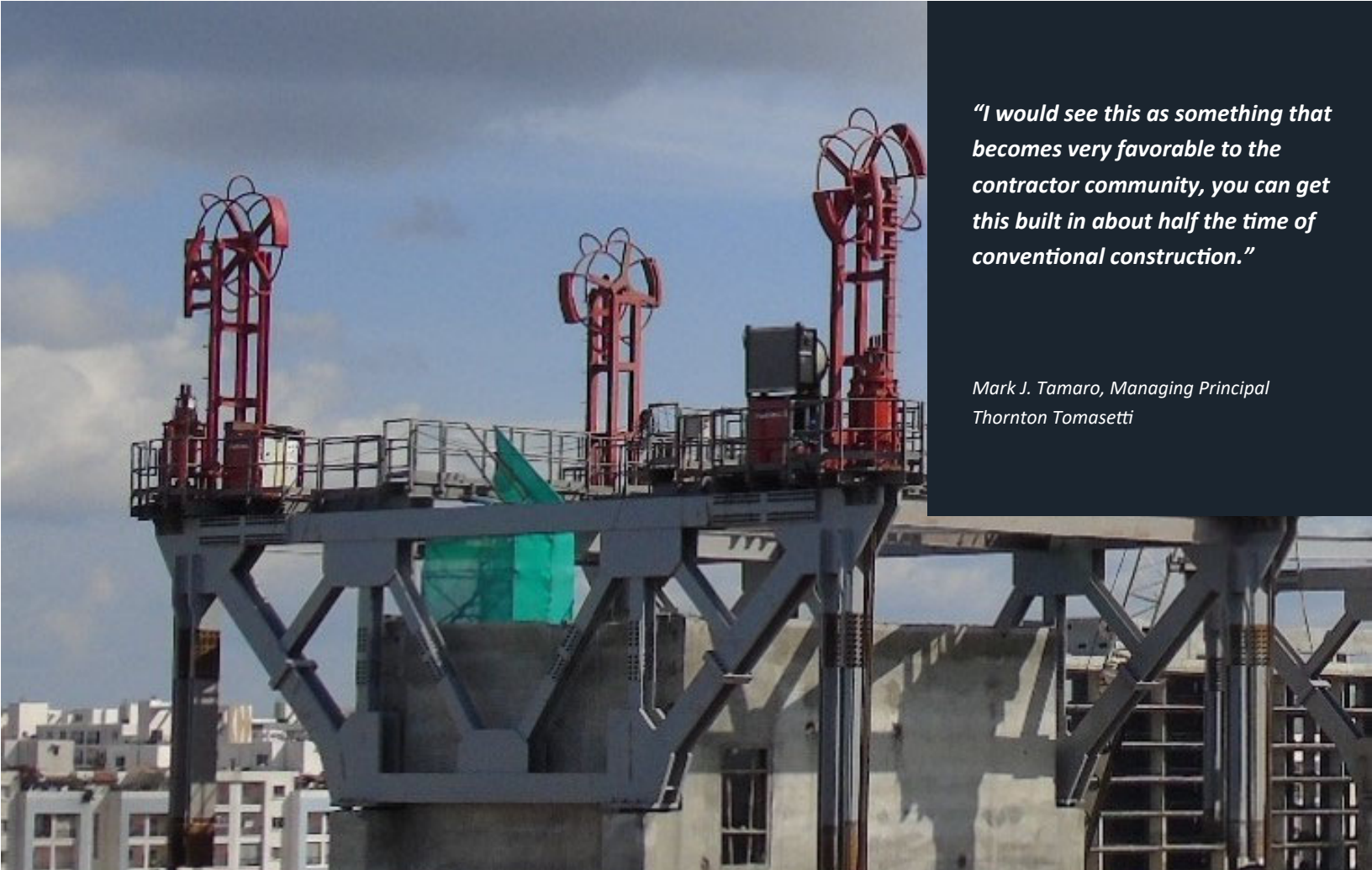
*"The Top Down<sup>SM</sup> structural system's significant reduction in overall building weight is a win-win for designers and owners. As a designer, lower weight means less structure frame and foundation – this is a huge advantage in seismically active areas.*

*Owners benefit from lower overall building costs, and the ability to potentially build on sites previously deemed uneconomical to develop."*

Rudolph P. Frizzi, P.E.  
Langan Engineering & Environmental Services







*"I would see this as something that becomes very favorable to the contractor community, you can get this built in about half the time of conventional construction."*

*Mark J. Tamaro, Managing Principal  
Thornton Tomasetti*

GLOBAL INDUSTRY **LEADER**

## ***TGE Program***

### ***Integrated End-to-End Delivery Platform***



TGE Top Down<sup>SM</sup> technology is an integrated delivery model for core and shell and total building solutions. Our program is an enterprise based, integration of technology applications and collaborative design teams that produce a vertically integrated design and technology model for delivery of Design/Build solution for Mid/High-Rise construction.

The TGE model incorporates integration and planning for IoT (Internet of Things), Smart Building Systems, Material Sciences, Supply Chain Management, and Energy systems. TGE manages and administers the integration of Design and Engineering, Material Resource Planning (MRP), manufacturing, assembly production, and on-site/off-site construction programs. Our turnkey operations provide consistent and managed construction sequencing, trade flow and variance monitoring. The Top Down<sup>SM</sup> building as a enterprise building system is a lean construction operation and follows manufactured principles.





SRR3 SRR4 1.2 Million GSF

RECENT PAST PERFORMANCE

## SRR3 & SRR4 RESULTS

### Total building program (conventional as planned):

New Conventional Construction of two (2) Commercial/Lab Office Buildings, totaling 1.2Mil GSF, (624,000 SF/each) for a discreet cost model of \$200M/each and 36 months/each in construction duration.

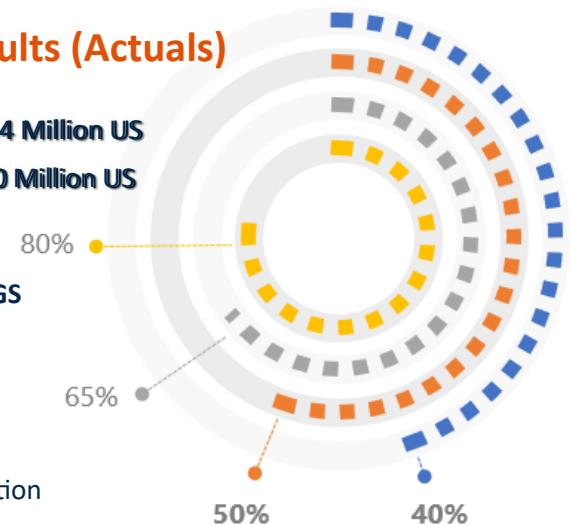
**Total Program Cost: \$400M, 72 months**

### TGE Top Down<sup>SM</sup> Program Performance Results (Actuals)

SRR3 Completion: 2017. **22 months total duration at a construction cost of \$134 Million US**

SRR4 Completion: 2018. **12 months total duration at a construction cost of \$110 Million US**

- 1 **\$166 M SAVINGS** OVERALL CONSTRUCTION COST SAVINGS
- 2 **38 MONTH SCHEDULE SAVINGS** 50% TIME SAVINGS
- 3 Reduced material weight, LEAN Building Design & Construction
- 4 Pre-assembled off-site construction efficiency improvements





**For mid/high-rise Developers, the TGE Top Down<sup>SM</sup> system may be the single greatest tool they have to ensure a profitable and successful project. By utilizing the Top Down<sup>SM</sup> system developers are able to:**

### **Better Time A Project's Entry Into the Market**

By virtue of the fact that buildings completed with the Top Down<sup>SM</sup> system can be built in one-third the time of conventional construction, Developers are able to either wait further into an upturn cycle to confirm a market recovery, or ensure that their project is the first to come to market and secure needed leases or sales. In a mature market, the Top Down<sup>SM</sup> system ensures that a Developer's project is completed on time and on budget and reduces the risk of having construction delays push the project into a market downturn, extending the sales program and reducing profits.

### **Build a "Recession-Proof" Building**

Since buildings completed with the Top Down<sup>SM</sup> system can be completed quicker and for about 1/3 less cost than conventional construction, Developers benefit from a built-in "hedge" against market recession or increases in building costs. Furthermore, price escalation on the project is virtually eliminated through the reduction of change orders and timely completion of the project. By building in one-third the time with minimal delays, the bids your general contractor secured at the beginning of the job are still valid and your project is completed on budget.

### **Secure a Competitive Advantage**

Put very simply, if you build for less with the Top Down<sup>SM</sup> system, you can sell for less and still make full margins while giving your project a competitive advantage over other conventional/traditional buildings. Also, by reducing the building costs so significantly, Developers have the option to include additional features, nicer amenities or higher lease incentives to bolster sales and ensure a rapid return of capital.

### **Complete More Projects**

By building in one-third the time and improving the odds for a successful sales campaign with the Top Down<sup>SM</sup> system, Developers and Owners are able to reduce the amount of capital required for each project and can profitably complete each project in a significantly shorter period of time. This rapid cycling of capital can pave the way to expanding growth and game changing profits within Developer organizations.

### **Simplify the Development Process**

TGE Technology Group provides complete design-build consultation and can ensure that your project maximized the efficiencies and cost reductions available with the TGE Top Down<sup>SM</sup> system by consulting with your development team or helping to assemble one for you with industry leading experts that are familiar with the unique advantages of our system.



### **Corporate office**

16 West Dover  
Easton, Maryland 21601  
(410) 776-7626

[www.tgetopdown.com](http://www.tgetopdown.com)

### **Branch Offices**

Phoenix, Arizona  
Seattle, Washington  
New York, New York



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