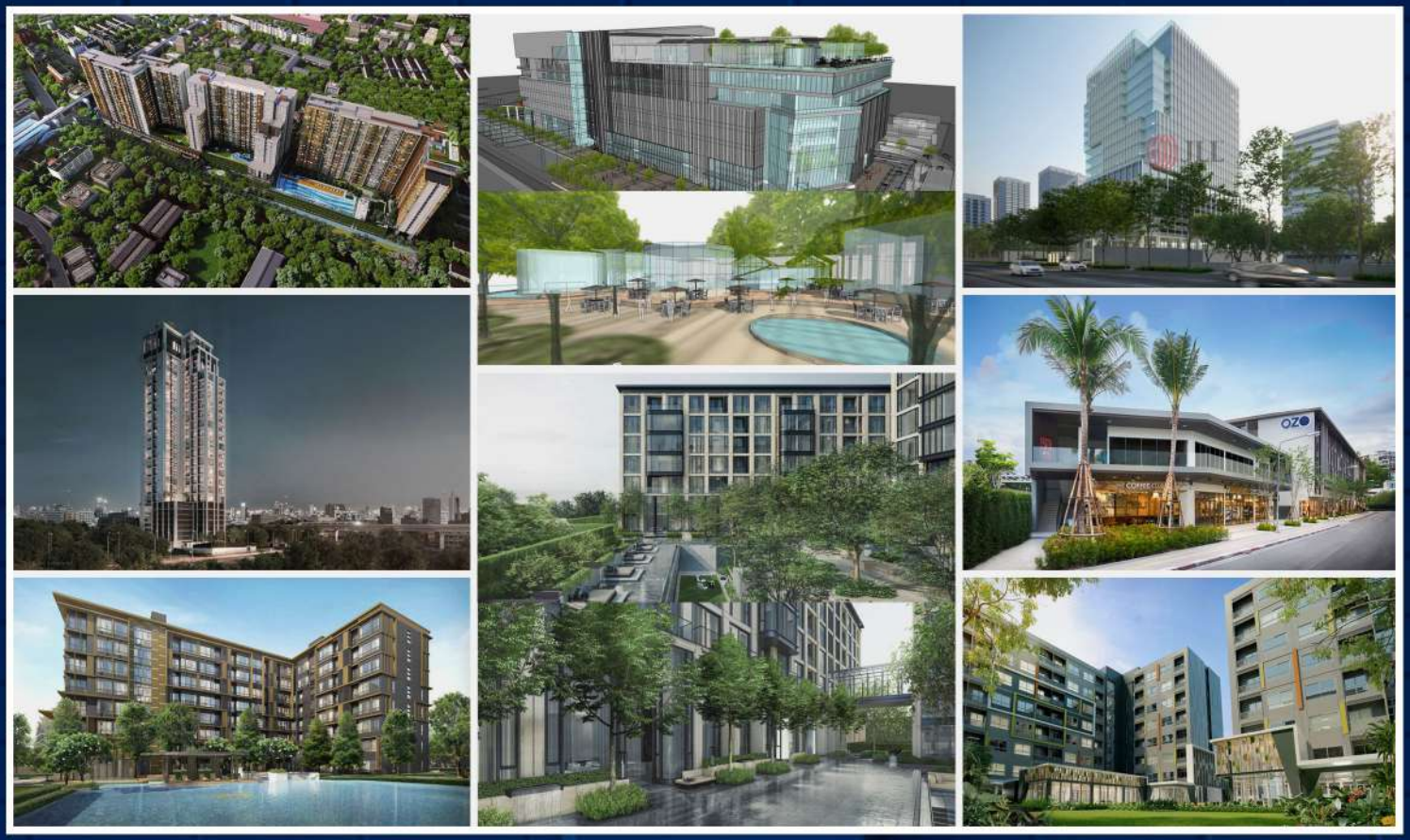
WAG e·news
W. AND ASSOCIATES
Group of Companies

Issue 01.2020



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To our Valued Clients and Partners:

First and foremost, W. and Associates Group wishes you good health in these unprecedented circumstances. These are very challenging times for our communities as well as companies and we hope everyone's safety.

We still would like to reach out and give you latest updates about us so you can still keep track at what we do. Here is the latest WAG E-newsletter. After you have read it, we appreciate you forwarding it to anyone you know who may benefit our services.

We are available to provide –

- Mechanical and Electrical System Designs
- Civil and Structural System Designs
- Project / Construction Management Services
- Quantity Surveying Services
- Building Information Modeling (BIM)

to new clients; contact us to find out how we can help you/them.

Moreover, you may also visit our social pages (links below) and thank you for taking time adding us to be one of your networks and recommending us the same. We promise to attend to your queries as soon as we can.

Mr. Chokewichit Laksanakorn
Group CEO

Our Social Media:

W. And Associates Group - WAG

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W. And Associates Group (WAG)

@w.associates_group

COMPLETED PROJECTS

THE PARKLAND CHARAN – PINKLAO





THE PARKLAND CHARAN – PINKLAO

Location: @Charan 42, Bangkok, Thailand
Owner: Narai Property Company Limited.
Project Summary: Three 22-Storey High-rise Condominium,
Building A : Construction area is estimated at 32,000 sq.m, 542 units.
Building B : Construction area is estimated at 39,000 sq.m, 559 units.
Building C : Construction area is estimated at 49,000 sq.m, 667 units.

W&A Responsibility:
- Mechanical, Electrical and Plumbing System Design.

Project Information

This project is in the pursuit of the art of precious living under the idea of "Living in the Art of Precious Living" which aims to connect the beauty of living at a spacious 3 Ria common garden where every inches mean rush and greenery including the sylvan charm Botanic Garden and pavilion.

OZO KATA, PHUKET


OZO KATA, PHUKET

Location: @Kata Beach, Phuket, Thailand
Owner: ONYX Hospitality Group.
Project Summary: New 3-star hotel, OZO branded in Kata Beach. Land area of 9 rais, approx. 200-250 keys. Construction area is estimated at 15,000 sq.m.

W&A Responsibility:
- Mechanical, Electrical and Plumbing System Design.
- Civil and Structural Design

Project Information

A chill beach resort in Phuket suitable for play and rest or both. A place with mix upbeat beach vibe and a deep sleep ambiance.

COMPLETED PROJECTS

METRO LUXE ROSE GOLD PHAHOL- SUTTHISAN

METRO LUXE ROSE GOLD PHAHOL- SUTTHISAN

Location: @Intamara Soi 14, Bangkok, Thailand
Owner: Property Perfect Public Company Limited.
Project Summary: Two 8-Storey Low-rise condominium
- Building A : 113 units
- Building B : 187 units

Construction area of 48,000 sq.m.

W&A Responsibility:
- Project/ Construction Management.

Project Information

Metro Luxe Rose Gold Phaholyothin - Sutthisan reflect luxury in every degree. A luxury condominium in the heart of the city with unique design details. It has a relaxed atmosphere of Rose Gold, which comes from the combination of two concepts: CHAMPAINGE and RAIN. The rain is coming out in the ceiling, showing the clouds and walls decorated with the pattern of a straight line and SPRING GLOW light reflecting spring colors of the cherry blossom. It includes built-in color materials, decorative walls, ceiling and elegant furniture of the Rose Gold tone.

UNDERCONSTRUCTION PROJECTS

ARK OFFICE

ARK OFFICE

Location: @Narathiwat Ratchanakarin Road, Bangkok, Thailand
Owner: Sathorn Prime Property Company Limited.
Project Summary: Office renovation & extension changed from carpark of 9-storey to 20-storey.

W&A Responsibility:
- Mechanical, Electrical and Plumbing System Design
- Construction Management

Project Information

Sathorn Prime's 20-storey office building is located near the intersection of Sathorn and Narathiwas roads in the heart of Bangkok's thriving Sathorn-Silom business district. A short walk from Chong Nonsi BTS skytrain station, the building is surrounded by multinational corporations and major attractions.

The building offers plenty of advantages for businesses seeking spacious, well-appointed offices in this highly connected part of the city.

UNDERCONSTRUCTION PROJECTS

THE RESERVE PHAHOL – PRADIPAT

THE RESERVE PHAHOL – PRADIPAT

Location: @Pradipat Road, Bangkok, Thailand
Owner: Pruksa Real Estate Public Company Limited.
Project Summary: A 25-Storey High-rise condominium building. Construction area of 23,000 sq.m.

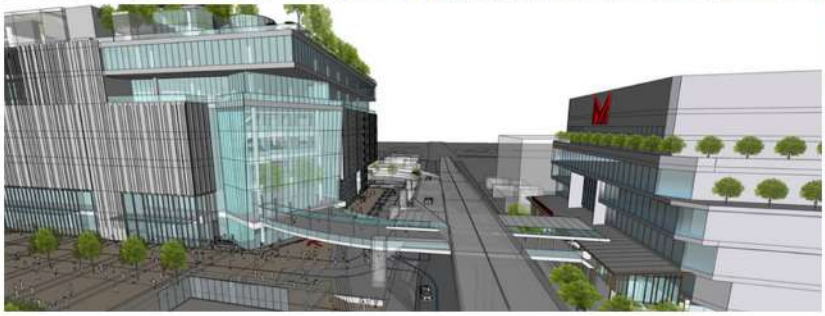
W&A Responsibility:
- Quantity Surveying Service

Project Information

THE STYLISH IS TIMELESS
The Reserve Phahol-Pradipat is designed with modern contemporary look of material, representing "Modern Timeless" concept with delicate design and premium specification. The project was announced to be "The Best Residential High-rise Development in 2018-2019" by ASIA PACIFIC PROPERTY AWARDS.

NEW PROJECTS

THE MALL 2 RAMKHAMHEANG



THE MALL 2 RAMKHAMHEANG

Location: @Ramkhamhaeng Road, Bangkok, Thailand
Owner: The Mall Group
Project Summary: Mixed-Use complexes with construction area Est. at 230,000 sq.m. Construction cost is Est. at 10,000 Million Bath.

W&A Responsibility:
- Mechanical, Electrical and Plumbing System Design

Project Information

A one-stop shopping and retail entertainment complex center. Comprise of Retail Spaces, Parking, Cinemas, Restaurant, Fitness and Etc.

NEW PROJECTS

ICONDO GREENSPACE PHATTANAKARN - SRINAKARIN




ICONDO GREENSPACE PHATTANAKARN – SRINAKARIN

Location: @Phatanakarn - Srinakarin, Bangkok, Thailand
Owner: Property Perfect Public Company Limited.
Project Summary: 2 Low-rise Condominium Buildings, 445 Units
- Tower A : 231 Units
- Tower B : 214 Units
Construction area of 15,000 sq.m.

W&A Responsibility:
- Construction Management

Project Information

This project is with the concept of "Design life close to nature" which has increase green space for every day to feel fresh from the atmosphere and the tropical garden style, every time you return to the residence. It is surrounded by complete facilities with free extra space within the project to create a Community in the Park – another level of living that is different.

THE RESERVE SUKHUMVIT 61 HIDEAWAY





THE RESERVE SUKHUMVIT 61 HIDEAWAY

Location: @Sukhumvit 61, Bangkok, Thailand
Owner: Pruksa Real Estate Public Company Limited.
Project Summary: Two 7-Storey Low-rise Condominium Buildings. Construction area is estimated at 5,200 sq.m.

W&A Responsibility:
- Quantity Surveying Service

Project Information

The Reserve 61 Hideaway is nothing but a truly precious vacation home for extraordinary tranquility. It is designed with 'Your own private residential sanctuary' concept, The Reserve 61 Hideaway outperforms all others in its class. The 'Nestling in nature' architecture concept, awe-inspiring interior décor, grand relaxing mood and tone, top-notch facilities, glittering infinity pool, and magnificent urban landscape - all co-exist flawlessly in an unexpected, secluded yet highly convenient location in the middle of Thonglor-Ekkamai district.

ACTIVITIES

W&A 2020 New Year Party: (RED)'s Celebrate & Have Fun!

On December 20, 2019, W. AND ASSOCIATES Group held a Christmas & Happy New Year at Nathong Restaurant, Pracha-Utid Road.
The event was full of fun. It has been an opportunity for everyone to gather together, share the moment with laughter and joy,
and to loosen up after being fully devoted to work throughout the year.

How Earthquake-Proof Buildings Are Designed

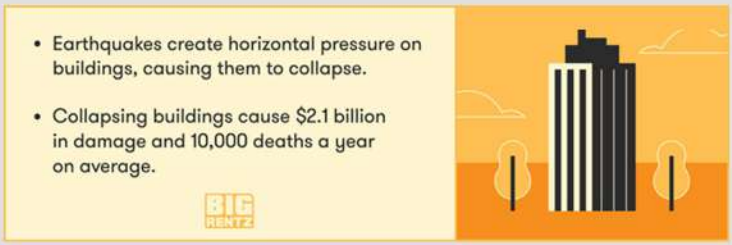
Throughout history, we've built impressive structures and cities only for them to encounter the forces of nature. Earthquakes are one of the Earth's most destructive forces – the seismic waves throughout the ground can destroy buildings, take lives, and costs tremendous amounts of money for loss and repair.

According to the National Earthquake Information Center, there is an average of 20,000 earthquakes each year - 16 of them being major disasters. On September 20, 2017, a magnitude 7.1 rocked Mexico's capital city and killed approximately 230 people. As with the case with other earthquakes, the damage was not caused by the quake itself but by the collapse of buildings with people inside them, making earthquake - proof buildings a must.

Over the past few decades, engineers have introduced new designs and building materials to better equip buildings to withstand earthquakes. Read on to learn how earthquake-proof buildings are designed today.

How Earthquakes Impact Buildings

Over the past few decades, engineers have introduced new designs and building materials to better equip buildings to withstand earthquakes. Read on to learn how earthquake-proof buildings are designed today.



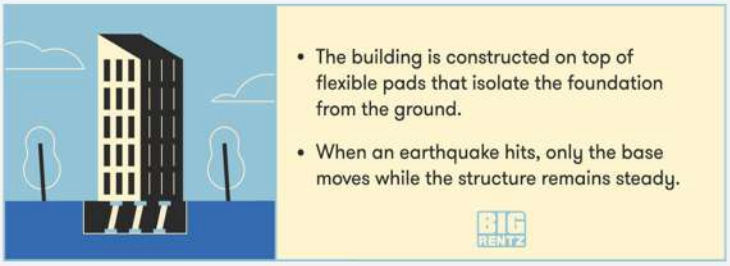
Before we look at the features, it's important to understand how earthquakes impact man-made structures. When an earthquake occurs, it sends shockwaves throughout the ground in short rapid intervals in all different directions. While buildings are generally equipped to handle vertical forces from their weight and gravity, they cannot handle side-to-side forces emitted by quakes.

This horizontal load vibrates walls, floors, columns, beams and the connectors that hold them together. The difference in movement between the bottom and top of buildings exerts extreme stress, causing the supporting frame to rupture and the entire structure to collapse.

How to Make a Building Earthquakes - Proof

To design an earthquake-proof building, engineers need to reinforce the structure and counteract an earthquake's forces. Since earthquakes release energy that pushes on a building from one direction, the strategy is to have the building push the opposite way. Here are some of the methods used to help buildings withstand earthquakes.

1. Create a Flexible Foundation



One way to resist ground forces is to "lift" the building's foundation above the earth. Base isolation involves constructing a building on top of flexible pads made of steel, rubber, and lead. When the base moves during the earthquake, the isolators vibrate while the structure itself remains steady. This effectively helps to absorb seismic waves and prevent them from traveling through a building.

2. Counter Forces with Damping

You might be aware that cars have shock absorbers. However, you might not know that engineers also use them for making earthquake-resistant buildings. Similar to their use in cars, shock absorbers reduce the magnitude of shockwaves and help buildings slow down. This is accomplished in two ways: vibrational control devices and pendulum dampers.

Vibrational Control Devices

The first method involves placing dampers at each level of a building between a column and beam. Each damper consists of piston heads inside a cylinder filled with silicone oil. When an earthquake occurs, the building transfers the vibration energy into the pistons, pushes against the oil. The energy is transformed into heat, dissipating the force of the vibrations.

DevicPendulum Power

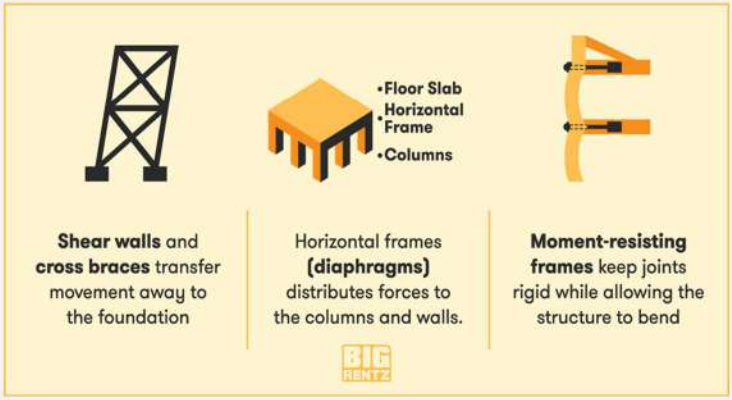
Another damping method is pendulum power, used primarily in skyscrapers. Engineers suspend a large ball with steel cables with a system of hydraulics at the top of the building. When the building begins the sway, the ball acts as a pendulum and moves in the opposite direction to stabilize the direction. Like damping, these features are tuned to match and counteract the building's frequency in the event of an earthquake.

3. Shield Buildings from Vibrations

Instead of just counteracting forces, researchers are experimenting with ways buildings can deflect and reroute the energy from earthquakes altogether. Dubbed the "seismic invisibility cloak", this innovation involves creating a cloak of 100 concentric plastic and concrete rings in and burying it at least three feet beneath the foundation of the building.

As seismic waves enter the rings, they are forced to move through to the outer rings for easier travel. As a result, they are essentially channeled away from the building and dissipated into the plates in the ground.

4. Reinforce the Building's Structure



To withstand collapse, buildings need to redistribute the forces that travel through them during a seismic event. Shear walls, cross braces, diaphragms, and moment-resisting frames are central to reinforcing a building.

Shear walls are a useful building technology that helps to transfer earthquake forces. Made of panels, these walls help a building keep its shape during movement. Shear walls are often supported by diagonal cross braces. These steel beams have the ability to support compression and tension, which helps to counteract the pressure and push forces back to the foundation.

Diaphragms are a central part of a building's structure. Consisting of the floors of the building, the roof, and the decks placed over them, diaphragms help remove tension from the floor and push force to the vertical structures of the building.

Moment-resisting frames provide more flexibility in a building's design. This structure is placed among the joints of the building

and allows for the columns and beams to bend while the joints remain rigid. Thus, the building is able to resist the larger forces of an earthquake while allowing designers more freedom to arrange building elements.

Earthquake-Resistant Materials

While shock absorbers, pendulums, and “invisibility cloaks” may help dispel the energy to an extent, the materials used in a building are equally responsible for its stability.

Steel and Wood

For a building material to resist stress and vibration, it must have high ductility - the ability to undergo large deformations and tension. Modern buildings are often constructed with structural steel - a component of steel that comes in a variety of shapes that allow buildings to bend without breaking. Wood is also a surprising ductile material due to its high strength relative to its lightweight structure.

Innovative Materials

Scientists and engineers are developing new building materials with even greater shape retention. Innovations like shape memory alloys have the ability to both endure heavy strain and revert to their original shape, while fiber-reinforced plastic wrap - made by a variety of polymers - can be wrapped around columns and provide up to 38% greater strength and ductility.

Engineers are also turning to natural elements. The sticky yet rigid fibers of mussels and the strength-to-size ratio of spider silk have promising capabilities in creating structures. Bamboo and 3D printed materials can also function as lightweight, interlocking structures with limitless forms that can potentially provide even greater resistance for buildings.

Over the years, engineers and scientists have devised techniques to create some effective earthquake-proof buildings. As advanced the technology and materials are today, it is not yet possible for building to completely withstand a powerful earthquake unscathed. Still, if a building is able to allow its occupants to escape without collapsing and saves lives and communities, we can consider that a great success.

Sources: https://interestingengineering.com/top-5-earthquake-resistant-structures-around-world
Ref: February 6, 2019 by: Lior ZitzmanShare this article:
https://www.bigrentz.com/blog/earthquake-proof-buildings

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