Structural Application of BIM for Construction of Tall RC Buildings Focusing on Movement Prediction and Monitoring

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Picture courtesy of Samsung E&C
ACI Fall 2012 Convention, Toronto
Marina Bay Sands
Singapore

Picture courtesy of Ssangyong E&C

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Capital Gate
Abu Dhabi
UAE

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Misalignment of vertical pipe levels
Sliding of elevator rails
Gaps and slopes in horizontal pipes
Critical shear cracks in deep beams

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What is Building Movement Control?

Monitoring
Time-dependent Material testing
Construction stage analysis

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Commercial Software

Oasys
GSA

Scia Engineer

SOFISTIK
Absolute vs. Differential

Design level of (n+1)th floor

Design level of nth floor

Column

Core

Algorithm

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Creep & Shrinkage

Laboratory Testing
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3D Laser Scanning

I-TOWER
Incheon
South Korea

Strain Gauges Installed on Steel Column

Measured Strains

Strains of both temporary and permanent column remain 10% of proportional limit. Structural safety was guaranteed.
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3D Laser Scan

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3D Model from Scanned Data

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Ilham Baru Tower
Kuala Lumpur
Malaysia

Deviation in Verticality

Preset Program for Deviation
Direction and algebraic sign of SUBTO movement is intentionally shown reversed.