MIDAS

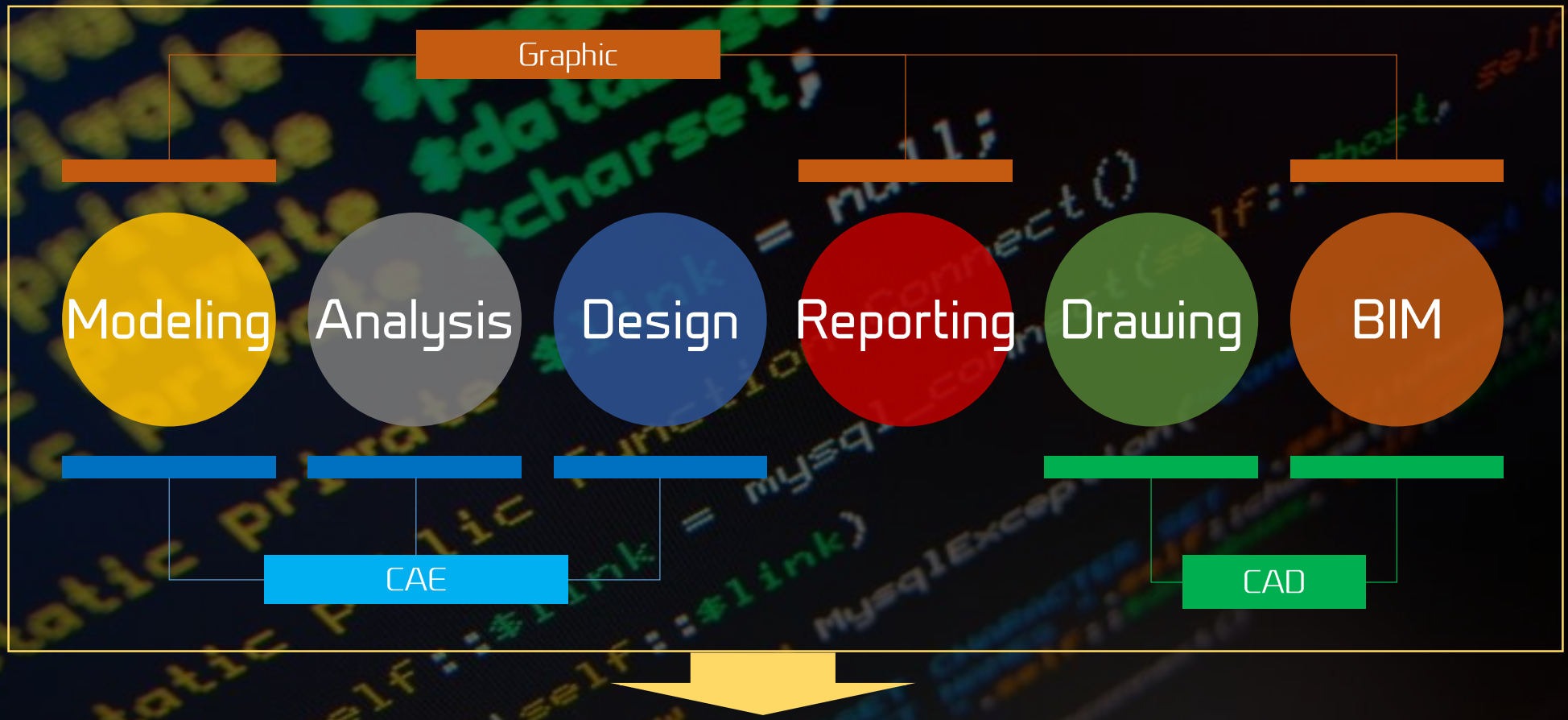
midas nGen

midas nGen

Next Generate Solution
for Building Analysis and Design

Product Overview

midas nGen



Next Generation Software
Through Fusion Technology (CAE + CAD + Graphic)

Core Technology of midas IT

CAD	CAE + Graphic	CAE (Design)
midas Drawing Auto-generation and Revision of Structural Drawings	midas Gen / Civil General Purposed Structural Analysis and Design System	Design+ Structural Component Design & Detailing
I-CAD 2D CAD	Advanced Nonlinear Analysis System	Soil Works Geotechnical Solutions for Practical Design
Dshop Drawing for Members		

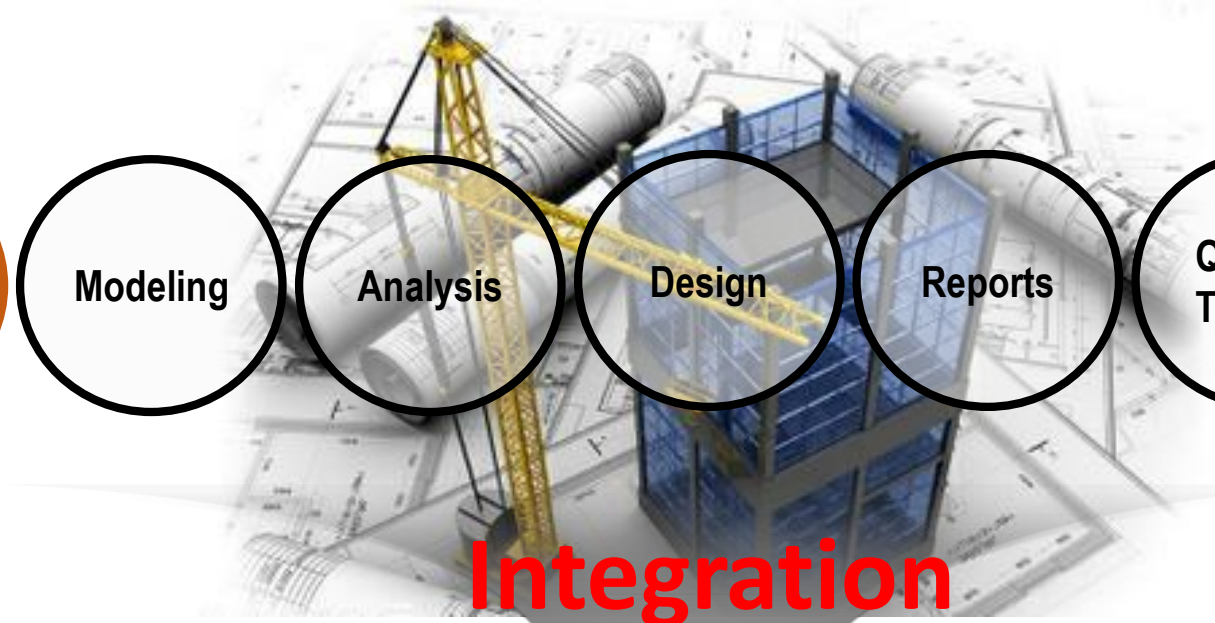
Midas nGen

Next Generate Software
for Building Analysis and Design

Generation for Plan & Section Drawing	Linear/Nonlinear Analysis, Eigenvalue Analysis, Construction Sequence Analysis	Eurocode, BS, ACI, ASCE. National Annex
Generation for Member list	Pushover / Time History Analysis	Design for All Member type
Edit of Drawing	Graphic Base on Parasolid Tech.	Design for Soil, Temporary structure

Concept of nGen

All-In-One Design System



Architectural Drawings

Modeling

Analysis

Design

Reports

Quantity Takeoffs

Structure Drawings

Integration

AUTOMATION

Reduce Production Time Significantly

OPTIMIZATION

Enhance Optimized Quantity Takeoff

HIGH TECH.

High Quality Standardization of Design Deliverables

Main Features of midas nGen

Main Features of midas nGen

INTEGRATION | AUTOMATION | OPTIMIZATION | HIGH TECH.

Total Solution

Automated and optimized process from modeling to report generation

Modeling

Easy & Fast CAD based Modeling

- Cad Tracing based modeling
- Auto-generation of members from 2D drawings

Loading

Building Specialized Loading

- Slab Load
- Auto-generation of wind and seismic loads

Analysis

Accurate Analysis Results

- Auto-generation of mesh by members
- Various analysis cases which can be separately or jointly analyzed

Design

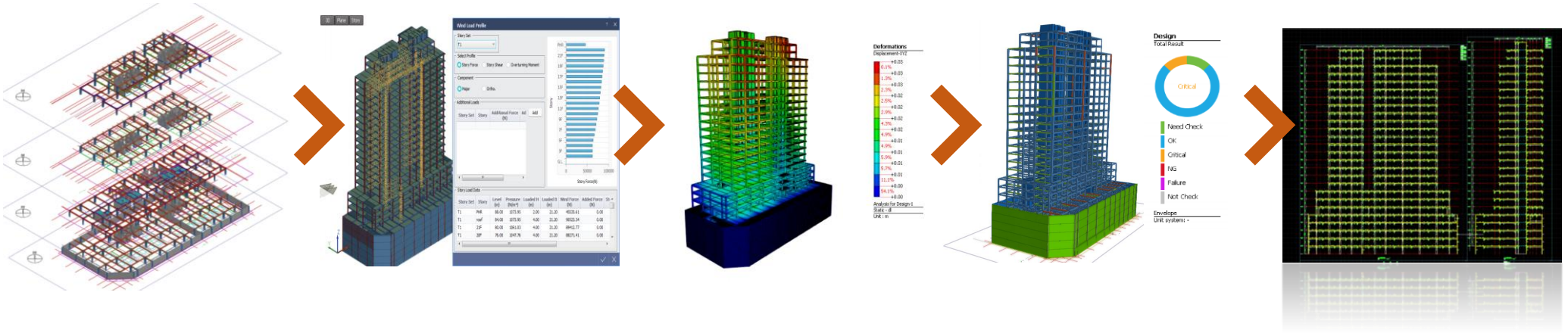
Optimum Design

- Optimum section size by preliminary design
- Status of design acceptance criteria displayed in colors

Output

Auto-generation of Output

- Auto-generation of structural drawings and reports
- Quantity takeoffs by members, materials, etc.



Main Features of midas nGen

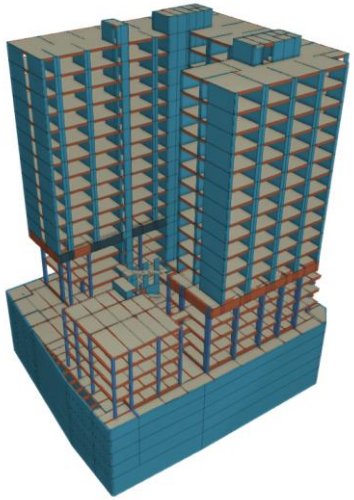
INTEGRATION | AUTOMATION | OPTIMIZATION | HIGH TECH.

Versatile Structural System

Analysis and Design for Versatile Material and Structural System using One Solution

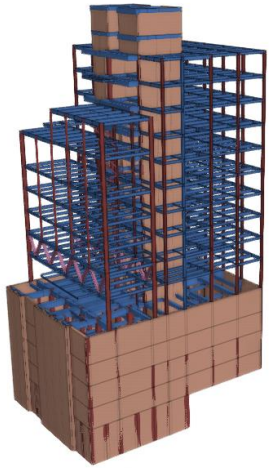
RC Building

Modeling & Design
for Slab and Wall Member



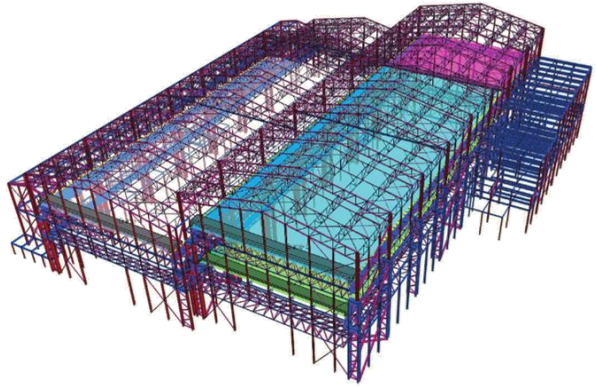
Steel Building

Auto Generation of
Design Parameters



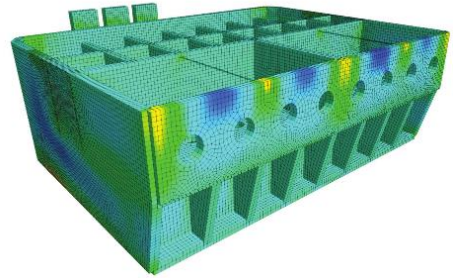
Plant Structure

Crane Girder
Analysis and Design



Irregular

Auto-mesh Generation
considering Openings



Main Features of midas nGen

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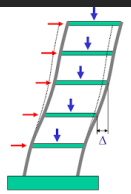
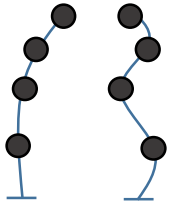
Analysis Type

Various and Advanced Analysis Capabilities

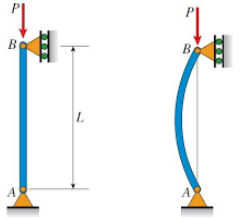
P-Delta Effect



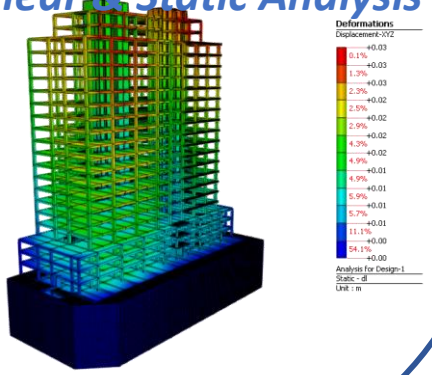
Modal Analysis



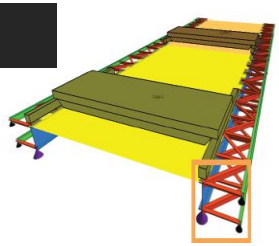
Linear Bucking



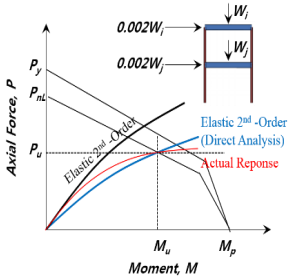
Linear & Static Analysis



Crane Analysis



Direct Analysis (Dec. 2016)



C.S. Analysis (available in 2017)

Parametric analysis using analysis cases

various analysis cases composed of combinations of

Members + Loads + Boundary Conditions

Main Features of midas nGen

INTEGRATION | AUTOMATION | OPTIMIZATION | HIGH TECH.

Steel & RC Design Code

Implementation of International Design Code

Steel Design Code	
US	AISC360-10(LRFD)
	AISC360-10(ASD)
	AISC360-10M(LRFD)
	AISC360-10M(ASD)
	AISC360-05(LRFD)
	AISC360-05(ASD)
	AISC360-05M(LRFD)
	AISC360-05M(ASD)
	AISC-ASD89
Eurocode	EN1993-1-1-2005
	EN1993-1-1-1992
British	BS5950-1-1990
Korean	KSSC-LSD09
	KSSC-ASD03
	AIK-ASD83

RC Design Code	
US	ACI318-11
	ACI318-08
	ACI318-05
	ACI318-02
	ACI318-99
	ACI318-95
	ACI318-89
Eurocode	EN1992-1-1:2004
	EN1992-1-1:1992
British	BS8110-1997
Korean	KCI-USD12
	KCI-USD07
	KCI-USD03
	KCI-USD99

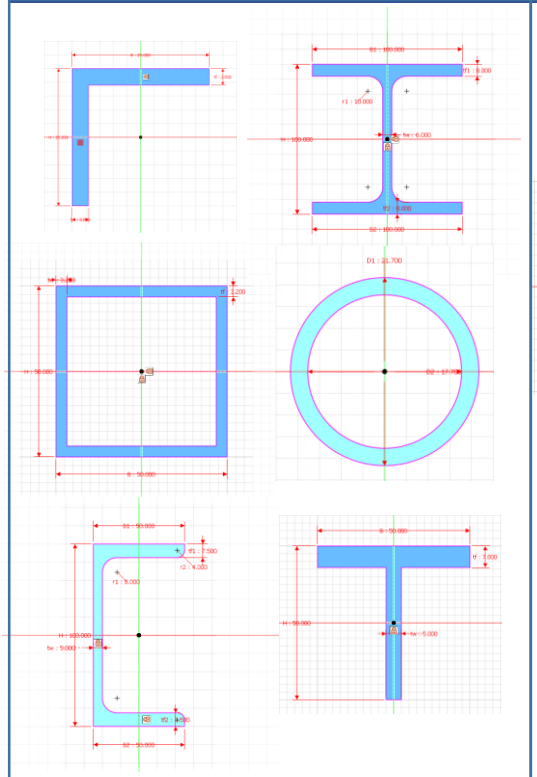
Main Features of midas nGen

INTEGRATION | AUTOMATION | OPTIMIZATION | HIGH TECH.

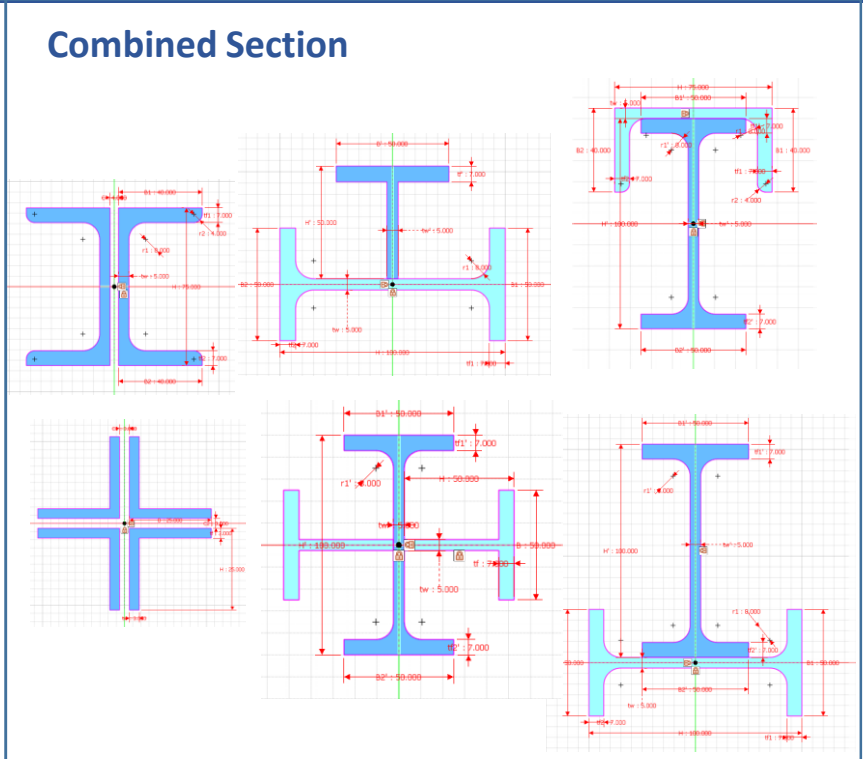
Steel & RC Section

International Section Database and User-defined Sections

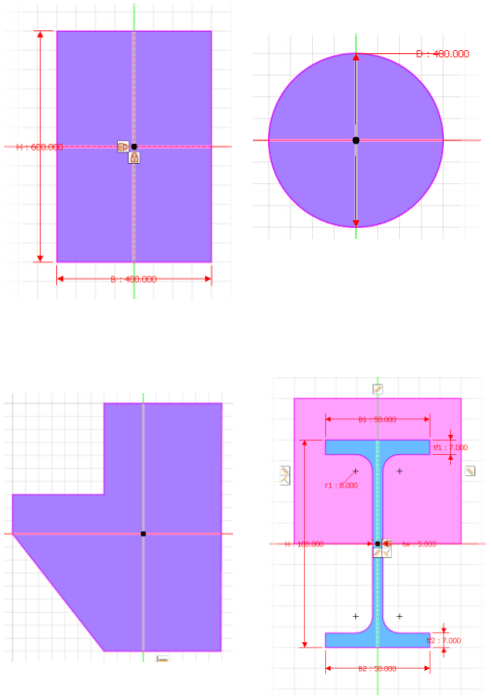
Steel Section



Combined Section



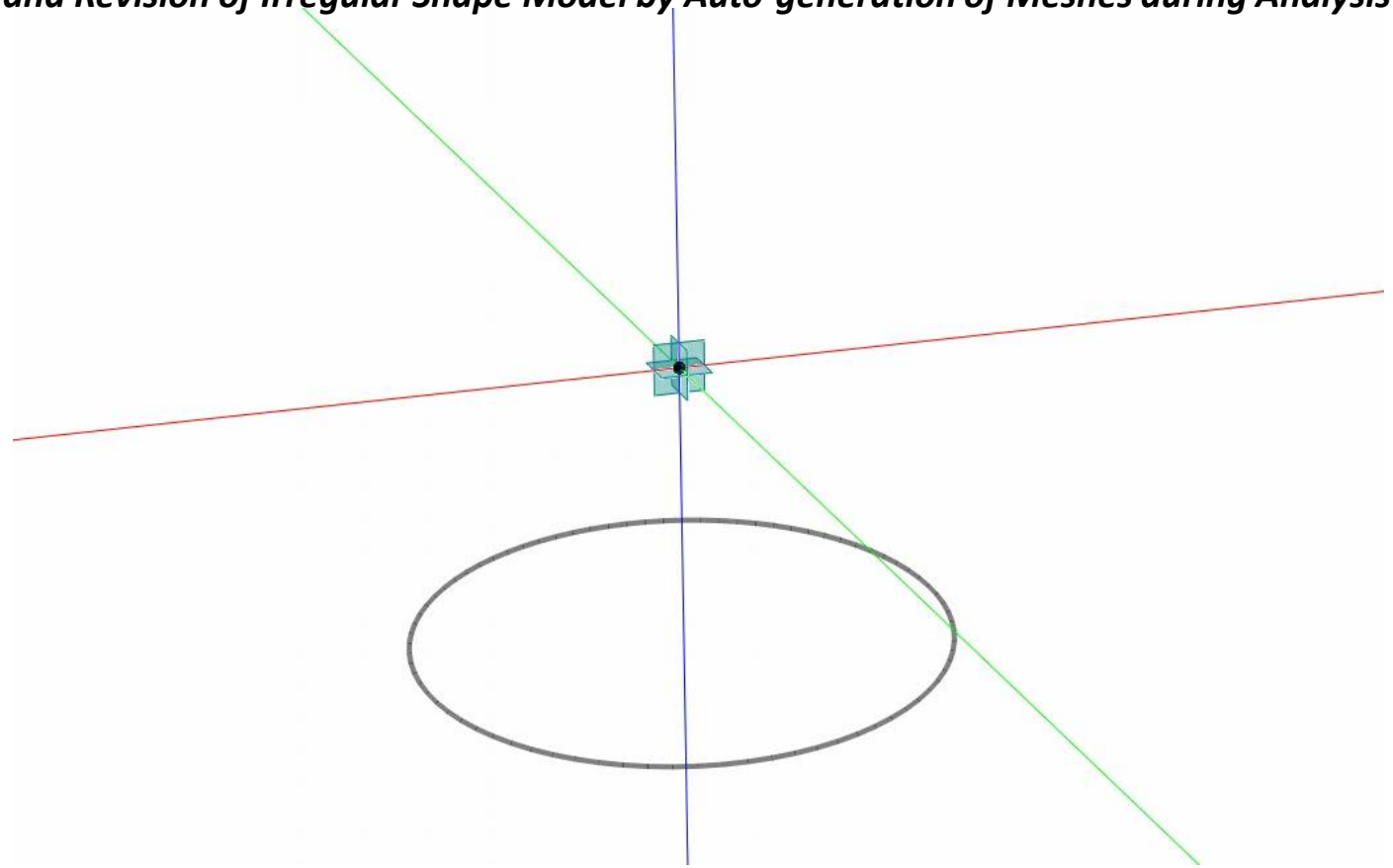
RC Section



Main Features of midas nGen

Auto-generation of Members

Easy Modeling and Revision of Irregular Shape Model by Auto-generation of Meshes during Analysis

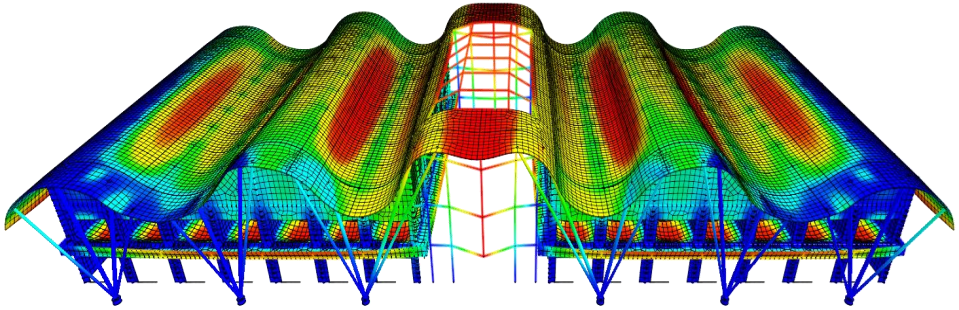


Main Features of midas nGen

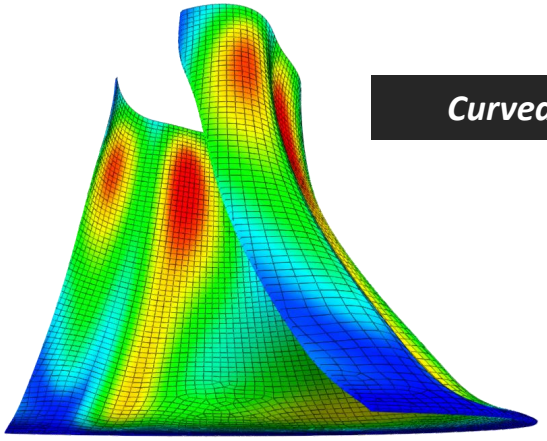
Auto-generation of Members

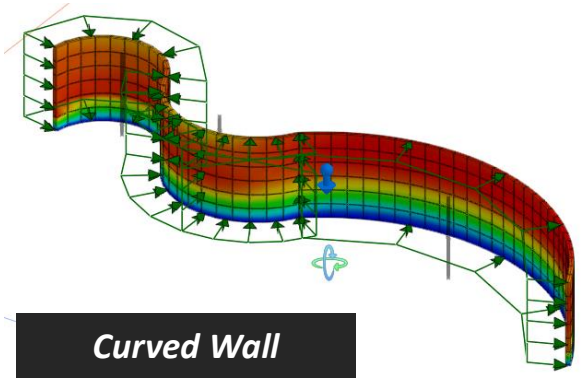
Easy Modeling and Revision of Irregular Shape Model by Auto-generation of Meshes during Analysis

Irregular Shape

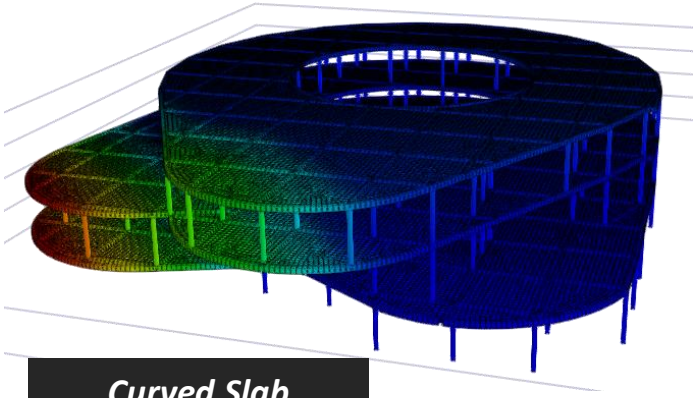


Curved Shell





Curved Wall



Curved Slab

Main Features of midas nGen

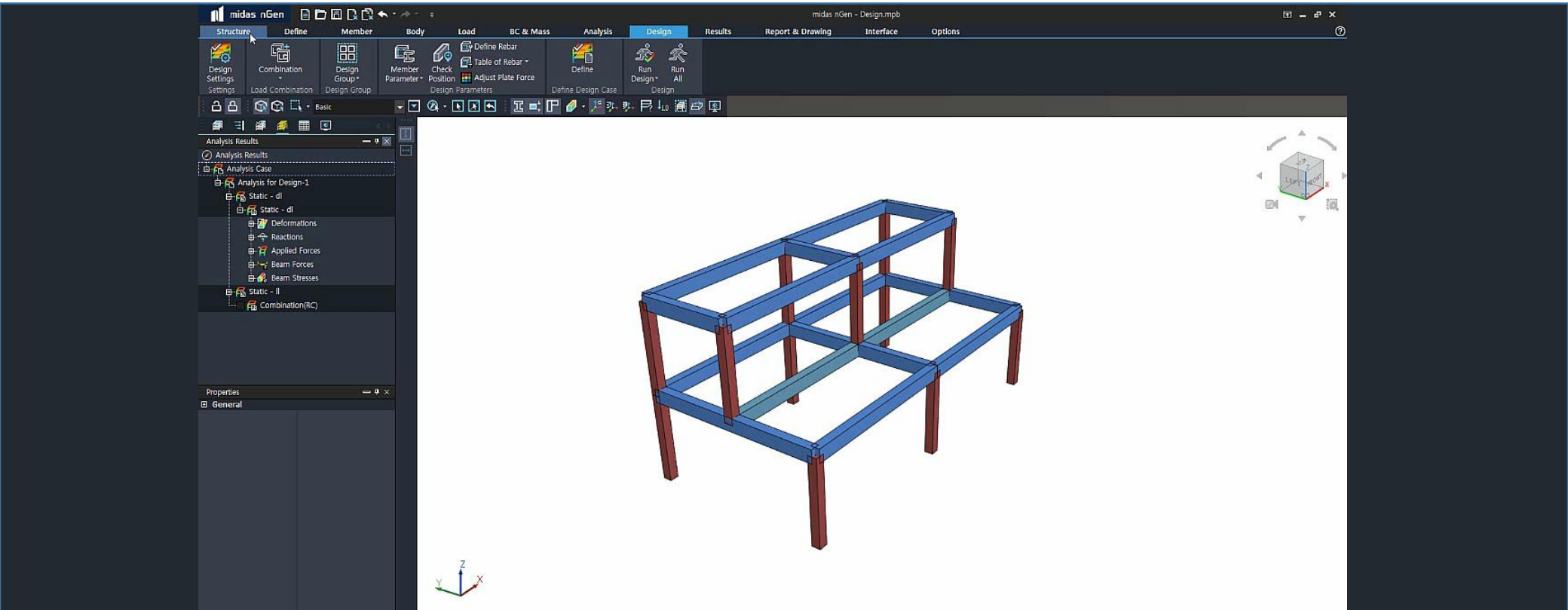
INTEGRATION | AUTOMATION | OPTIMIZATION | HIGH TECH.

Automatic Design

Various National Annex of Eurocode

Change Section / Rebar

Code Setting	Design Grouping	Load Combination	Run Design	Reporting
BS & Eurocode	User-defined Grouping	Auto-generation	User Design Environment	Summary Report
Design Code Setting	Automatic Grouping	Automatic Load Factor	Strength / Service Check	Detail Report

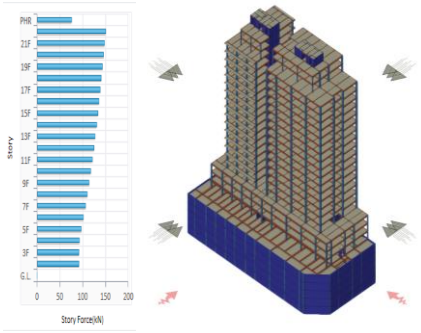


Main Features of midas nGen

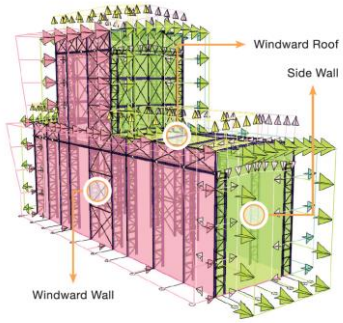
INTEGRATION | AUTOMATION | OPTIMIZATION | HIGH TECH.

Wind Load

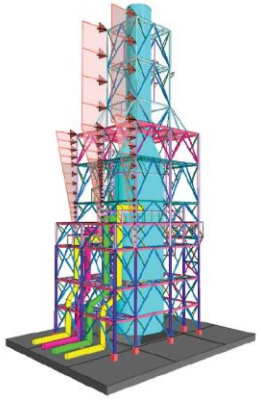
Wind Load for Versatile Structures



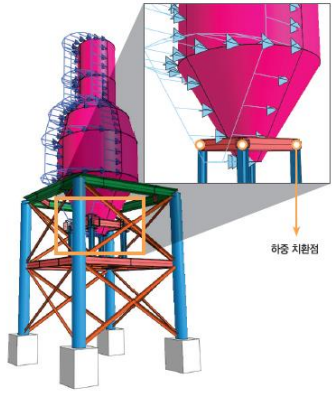
Building



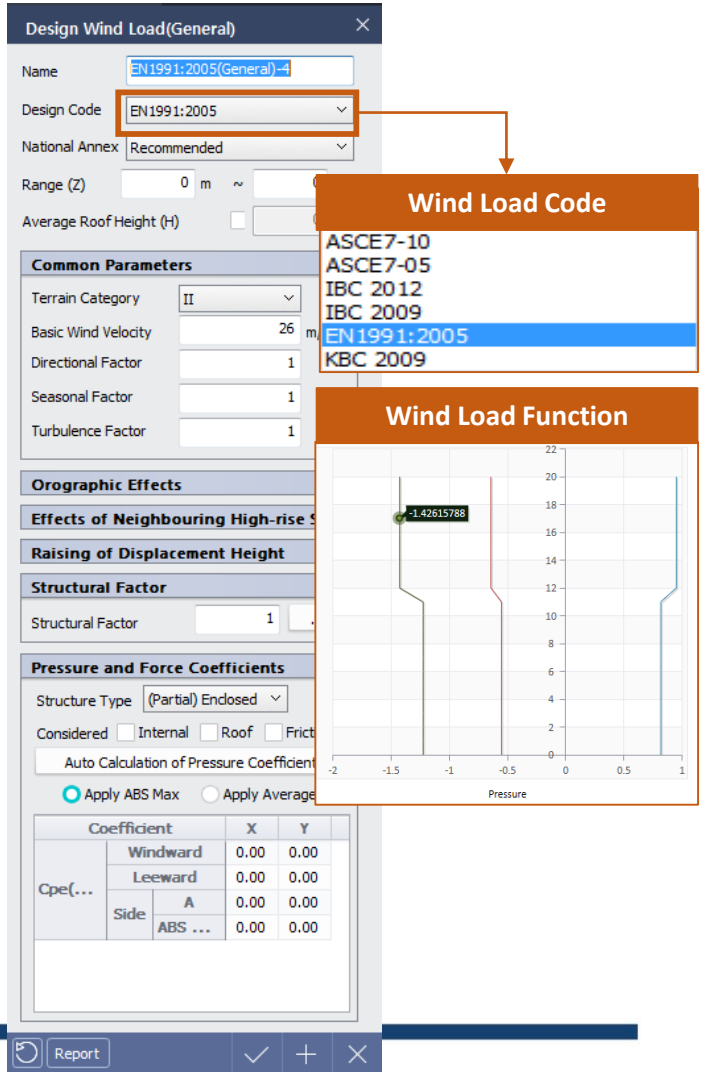
Enclosed Structure



Open Structure



Converted from Reaction

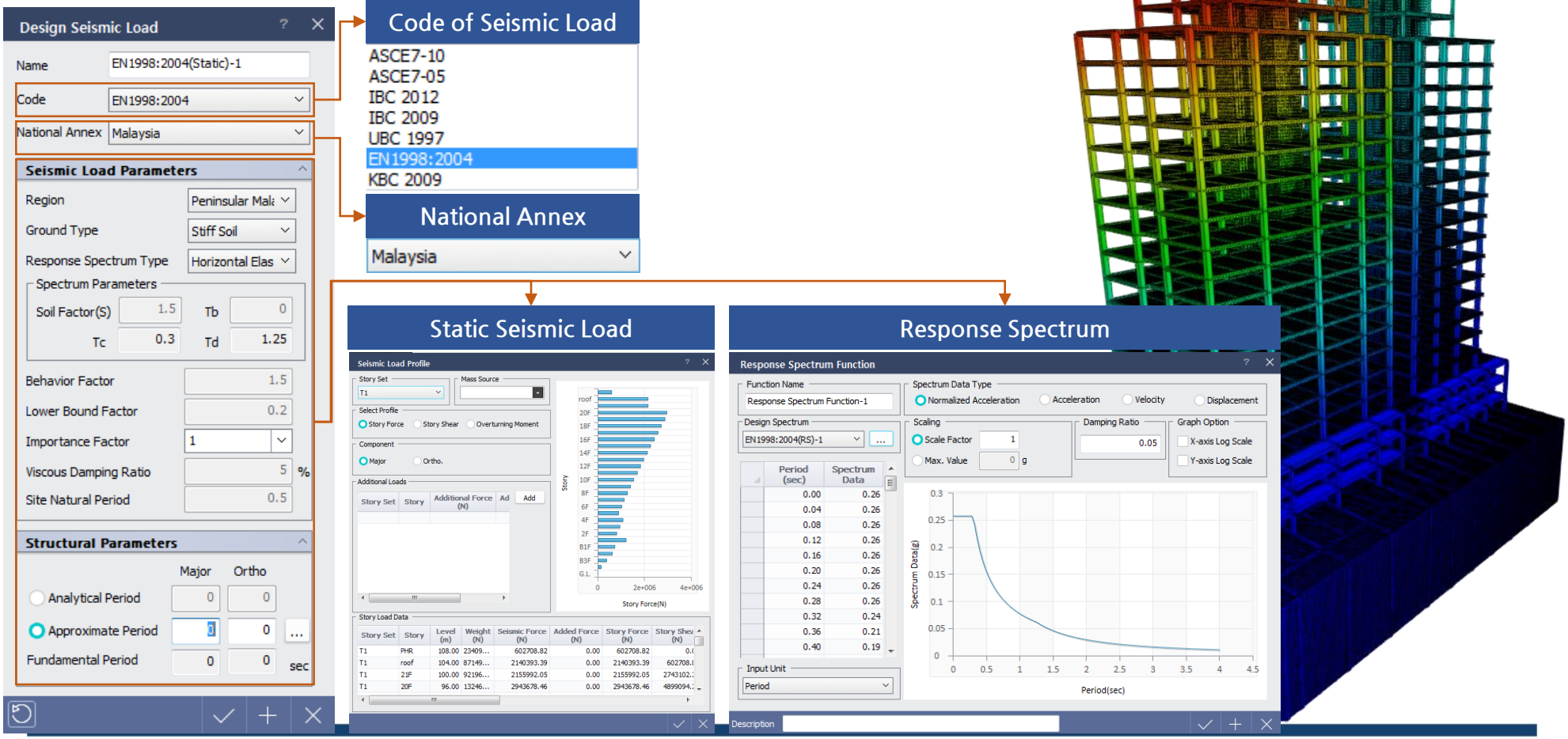


Main Features of midas nGen

INTEGRATION | AUTOMATION | OPTIMIZATION | HIGH TECH.

Seismic Load

Implementation of International Design Code

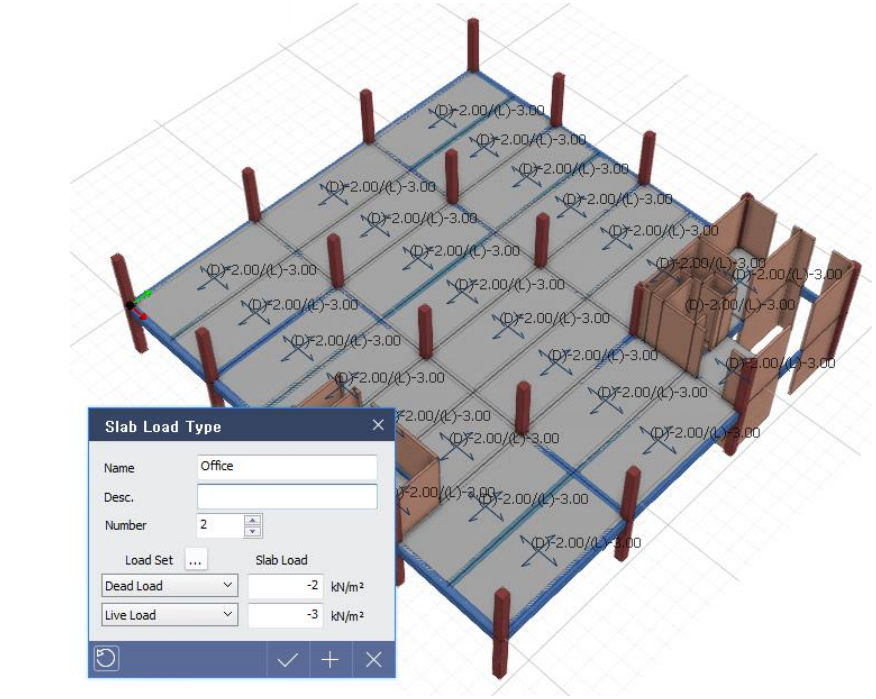


Main Features of midas nGen

INTEGRATION | AUTOMATION | OPTIMIZATION | HIGH TECH.

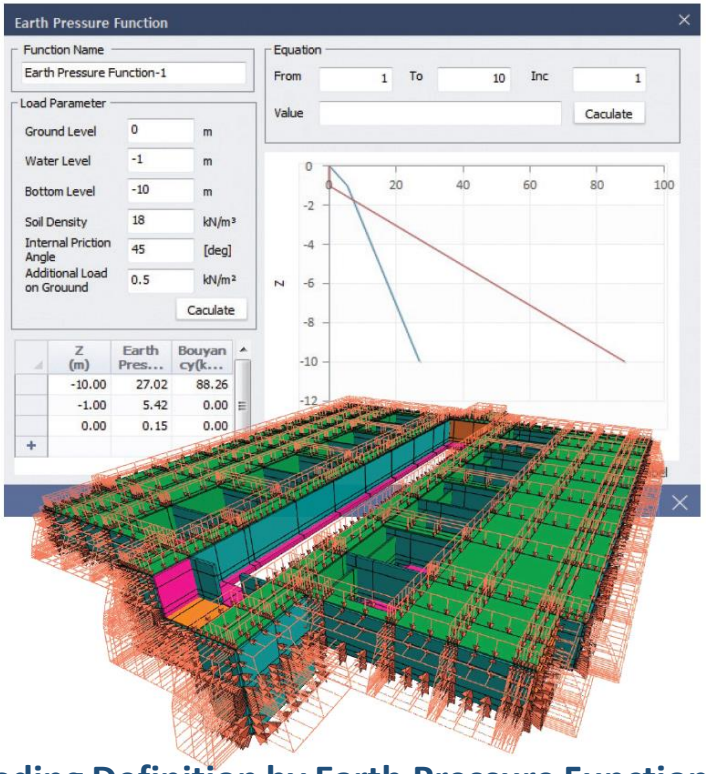
Slab and Pressure Loading

Slab Load



Dead and Live Loads entered to Slab Members

Earth Pressure Load



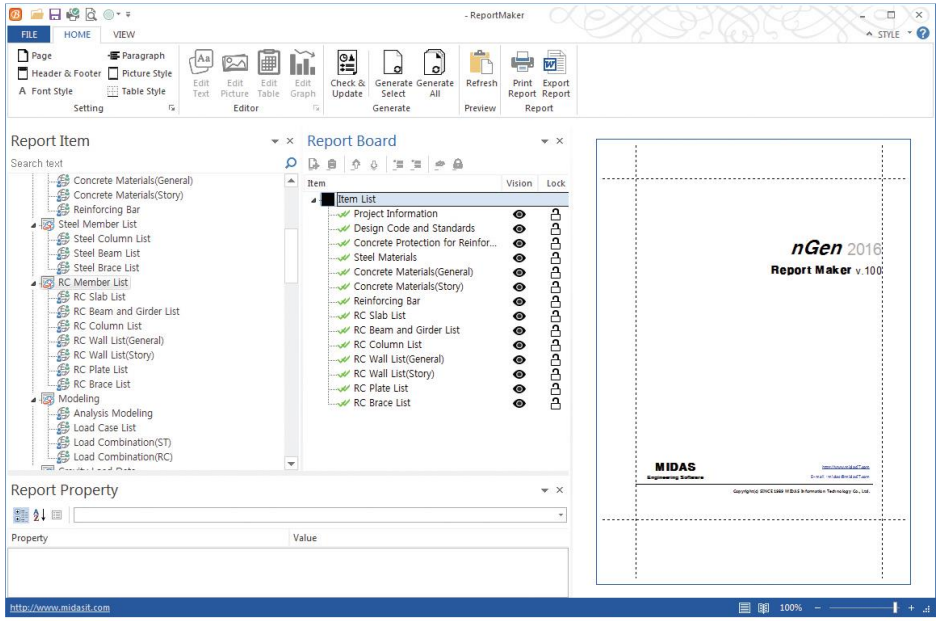
Loading Definition by Earth Pressure Function

Main Features of midas nGen

INTEGRATION | AUTOMATION | OPTIMIZATION | HIGH TECH.

Auto-generation of high-quality outputs

Structural calculation report



User specified templates

Auto-arrange modeling and analysis result graphics

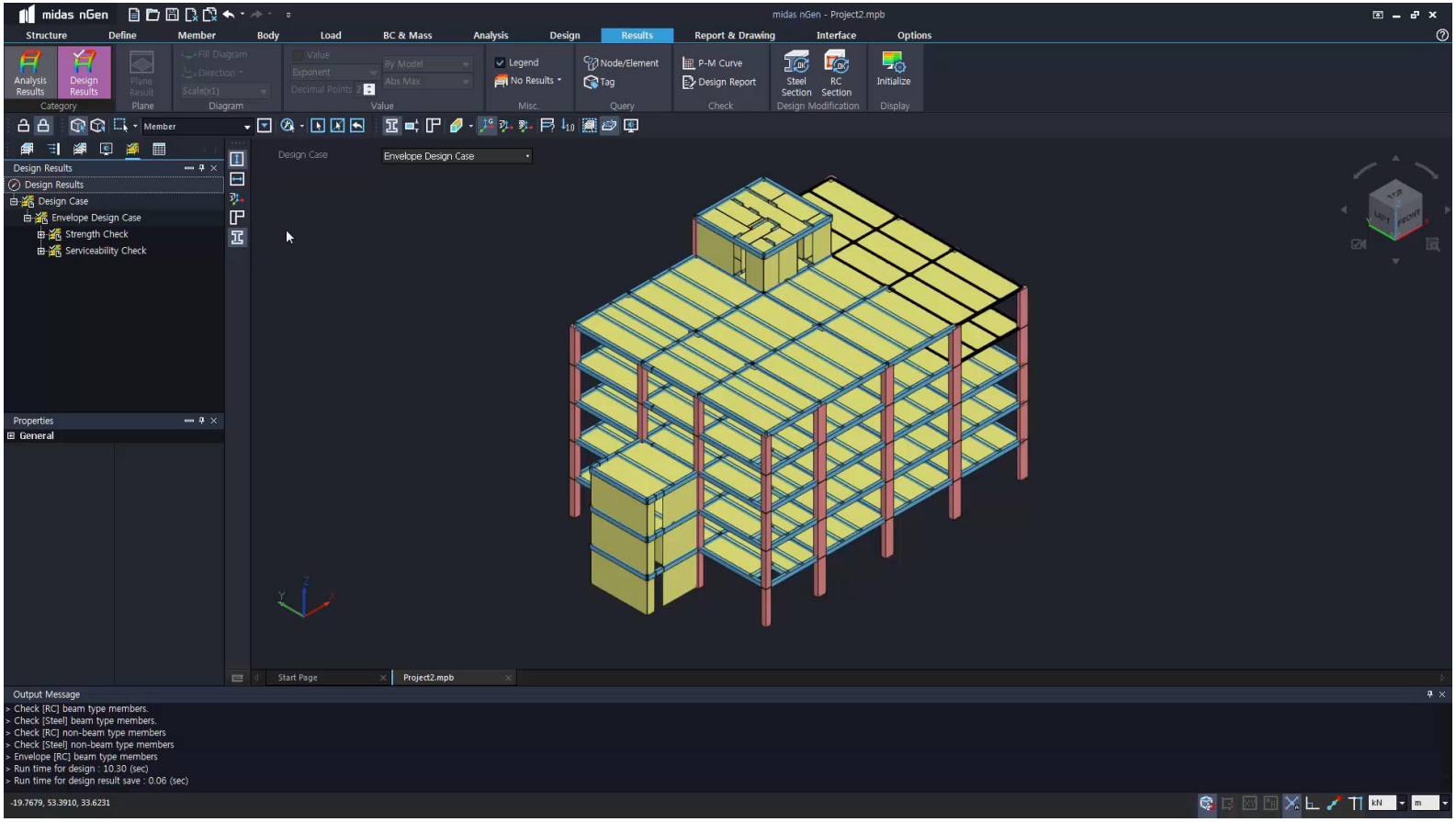
One click to generate a structural calculation report

Main Features of midas nGen

INTEGRATION | AUTOMATION | OPTIMIZATION | HIGH TECH.

Auto-generation of high-quality outputs

Structural calculation report

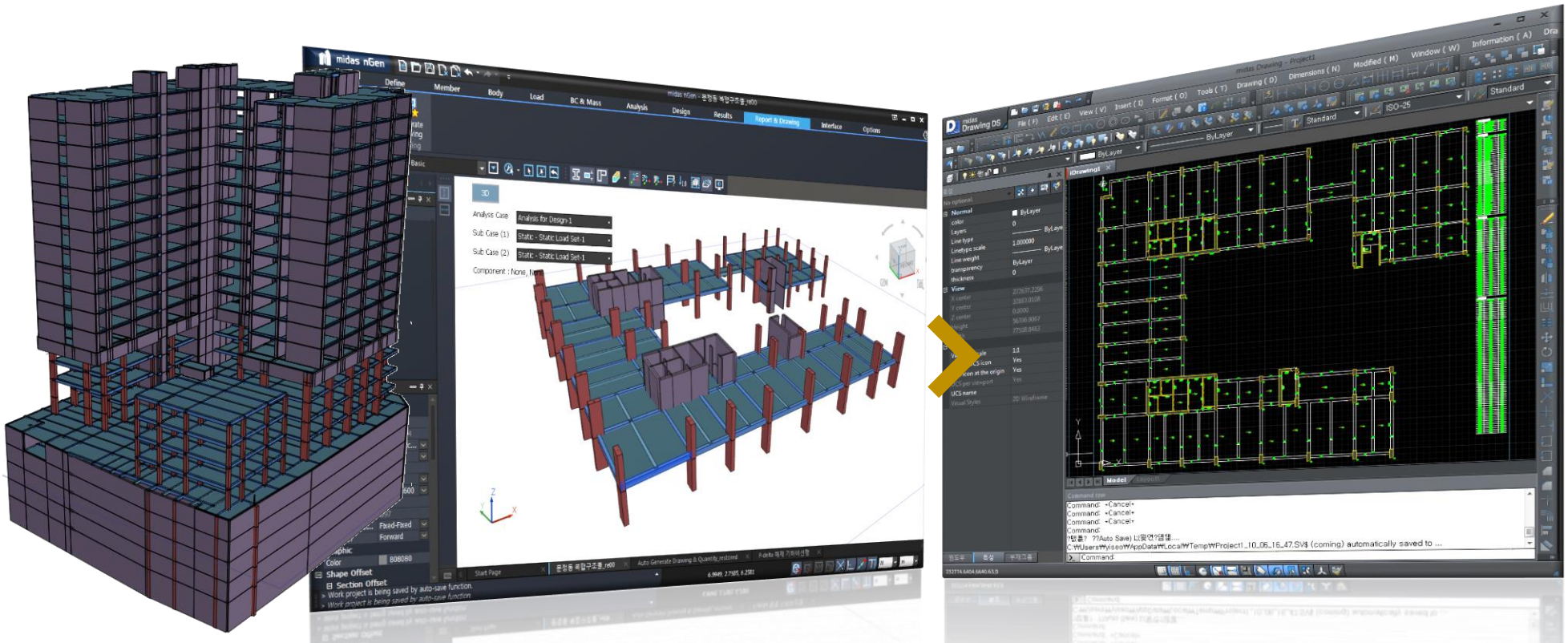


Main Features of midas nGen

INTEGRATION | AUTOMATION | OPTIMIZATION | HIGH TECH.

Auto-generation of high-quality outputs

Auto-generation of Structural Plan/Elevation using Modeling Information



Main Features of midas nGen

INTEGRATION | AUTOMATION | OPTIMIZATION | HIGH TECH.

Member Offset

Easy Generation of Construction Shape Model

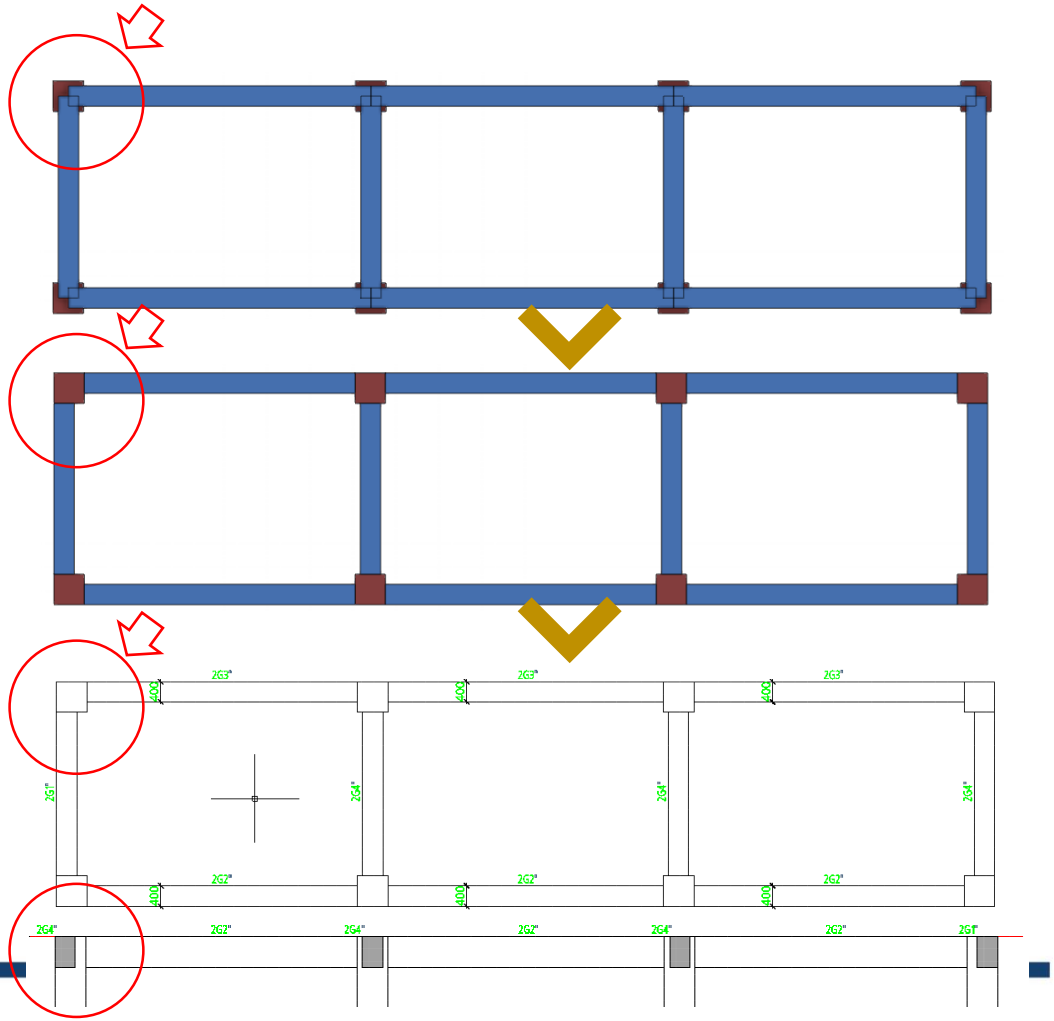
Analytical Model

Construction Shape Model

- Members auto-cut or merged reflecting the connectivity between member types
- Set the reference of section to the top of beam or slab members

Structural Drawing

- Auto-generation of drawings considering offset information
- Framing Plan / Elevation

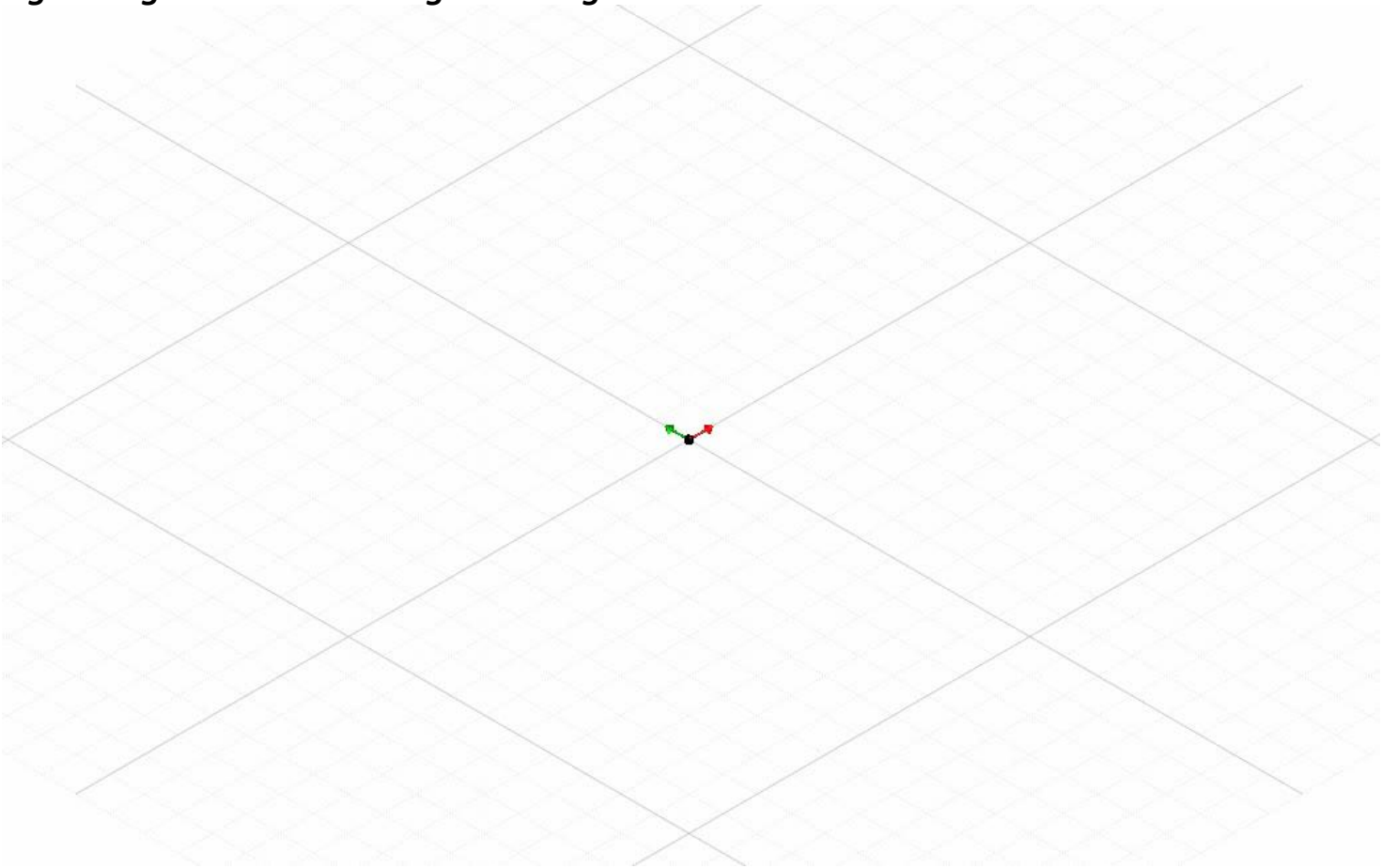


Main Features of midas nGen

CAD based Modeling

Easy & fast CAD based Modeling through Grid and Tracing Modeling

- Define members by a way of drawing lines in CAD
- Use snap points, or define a member by specifying the coordinates of the member end points
- Various editing functionality such as Extend / Trim / Offset



Main Features of midas nGen

Cad Tracing

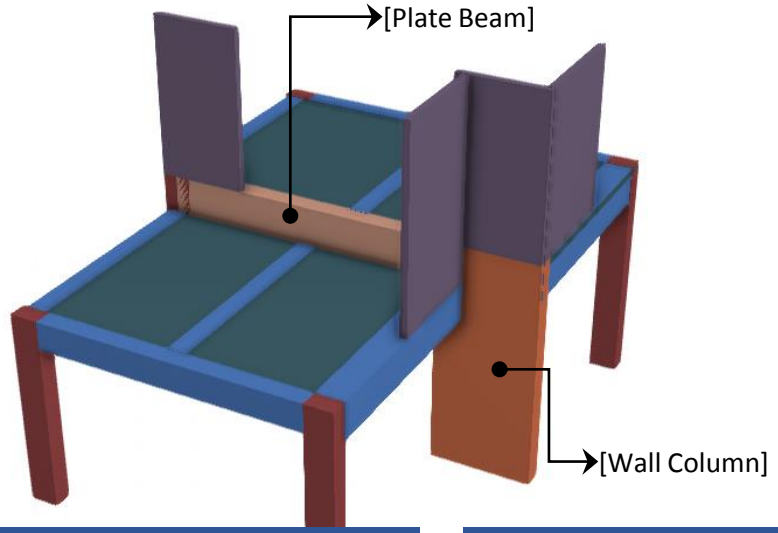
- Assign members on CAD tracing lines
- Snap points on intersect or end points of CAD tracing
- Auto-generation of members by recognizing CAD layer

Main Features of midas nGen

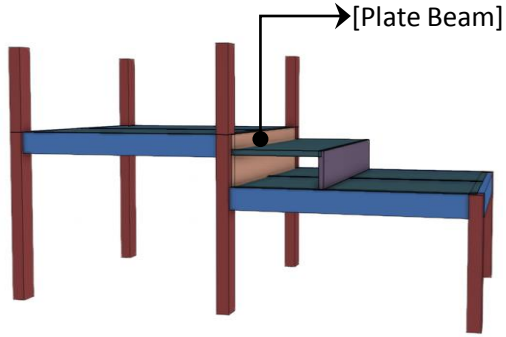
INTEGRATION | AUTOMATION | OPTIMIZATION | HIGH TECH.

Generate Shape

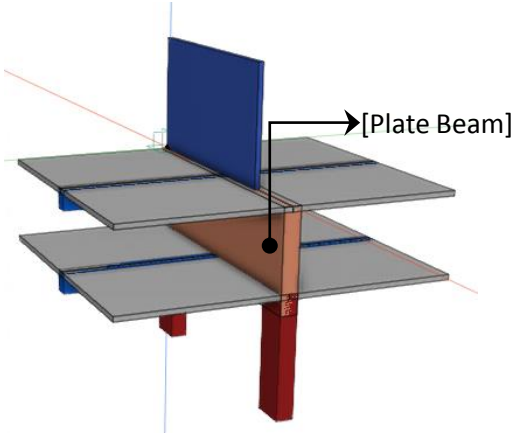
Analysis and Design of Different Slab Level Model



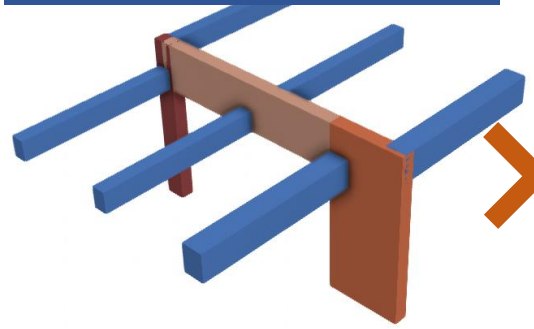
[Different Slab Level Model]

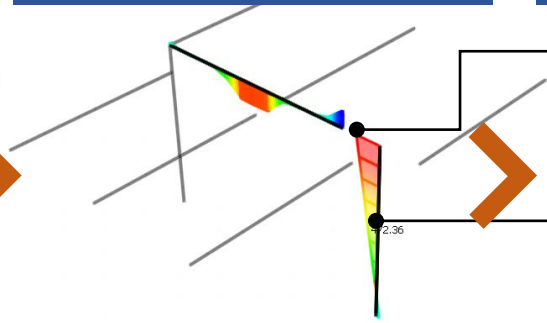


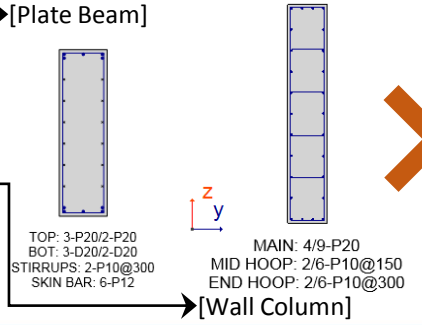
[Transfer Floor Model]

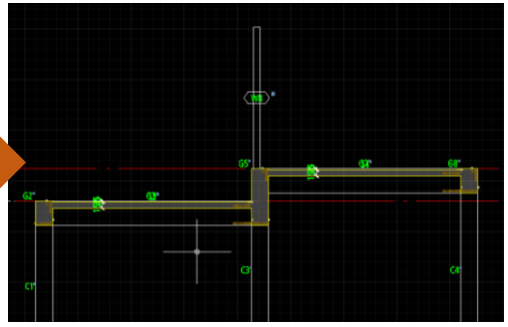


Modeling Shape | **Analysis Result** | **Member Design** | **Drawing (Section)**







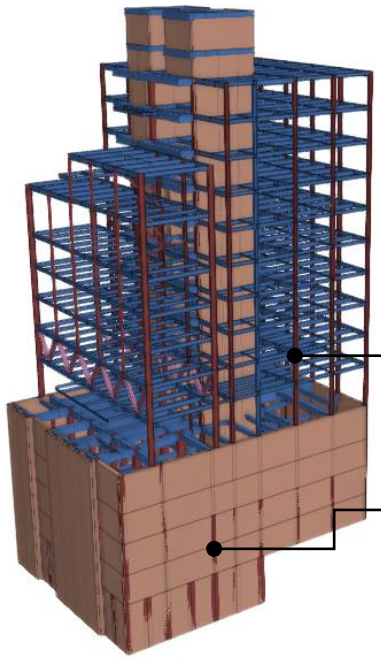


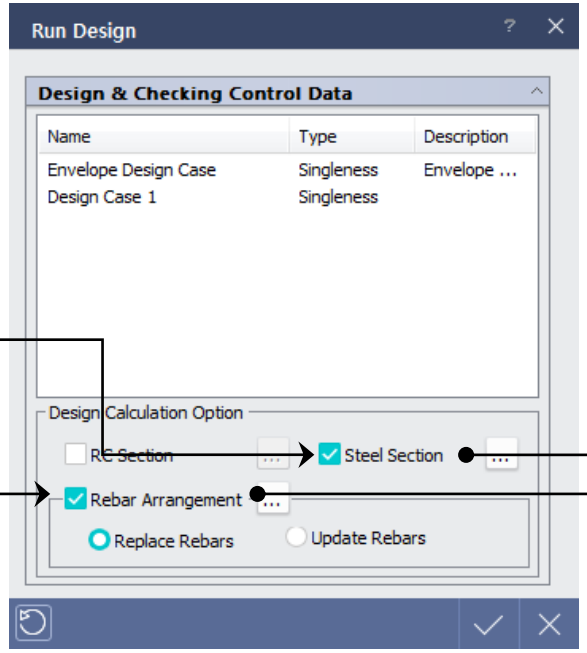
Main Features of midas nGen

INTEGRATION | AUTOMATION | **OPTIMIZATION** | HIGH TECH.

Optimal Design

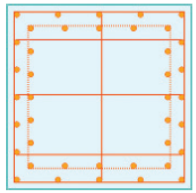
Optimal steel section and reinforcement calculations





Rebar Placement Optimal Design

- Calculate the member capacity satisfying the target design strength ratio for each design category
- Calculate the minimum reinforcement ratio of the most unfavorable member for each member group
- Calculate the reinforcement in reference to the bar placement range settings by section sizes
- Perform design checks



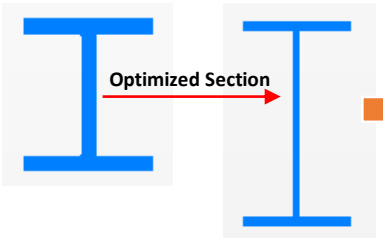
Main Features of midas nGen

INTEGRATION | AUTOMATION | **OPTIMIZATION** | HIGH TECH.

Design Results based on Target Ratio

Optimal Section Size and Rebar Area Calculation

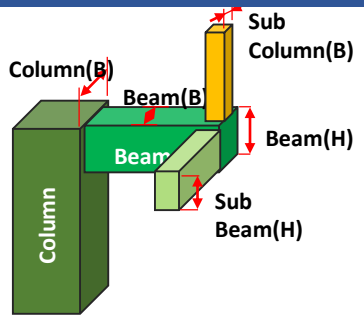
Economical Efficiency.



Finding Optimal Section Size

Based on Target Ratio

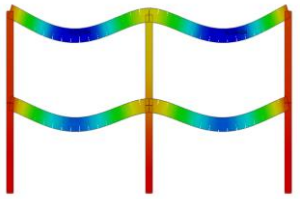
Constructability



Section Size Control

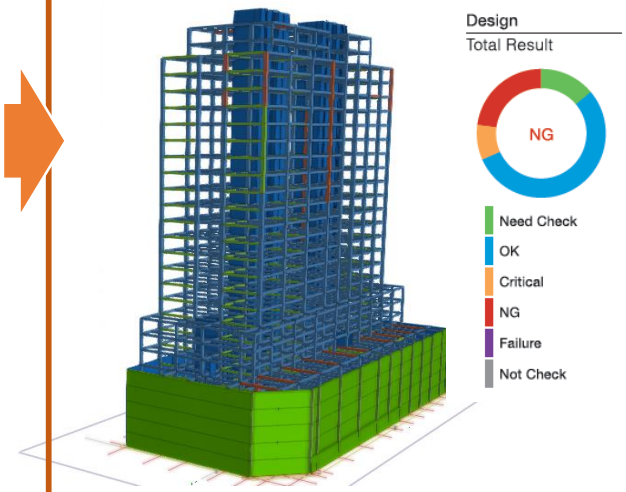
According to Member Priority

Serviceability

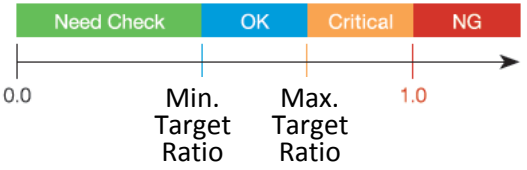


Allowable Deflection Limit

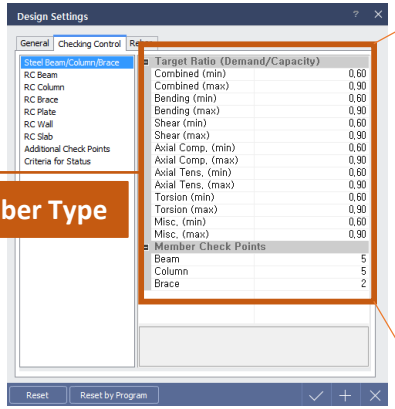
Design Check Result



Graphical Design Evaluation Results



Target Ratio by Member Type



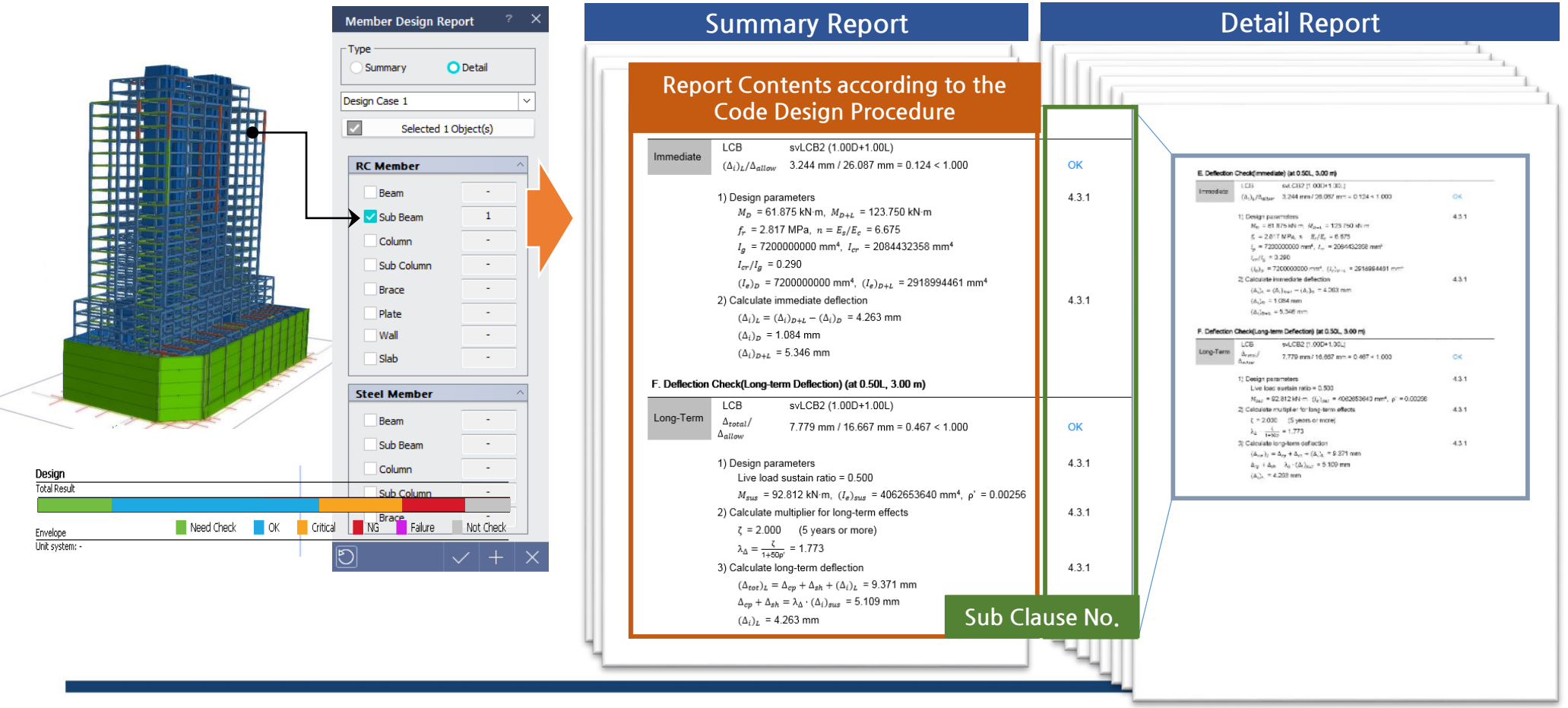
Target Ratio (Demand/Capacity)	
Combined (min)	0,60
Combined (max)	0,90
Bending (min)	0,60
Bending (max)	0,90
Shear (min)	0,60
Shear (max)	0,90
Axial Comp. (min)	0,60
Axial Comp. (max)	0,90
Axial Tens. (min)	0,60
Axial Tens. (max)	0,90
Torsion (min)	0,60
Torsion (max)	0,90

Main Features of midas nGen

INTEGRATION | AUTOMATION | OPTIMIZATION | HIGH TECH.

Design Report

Detail Calculation Report according to the Specified Design Code

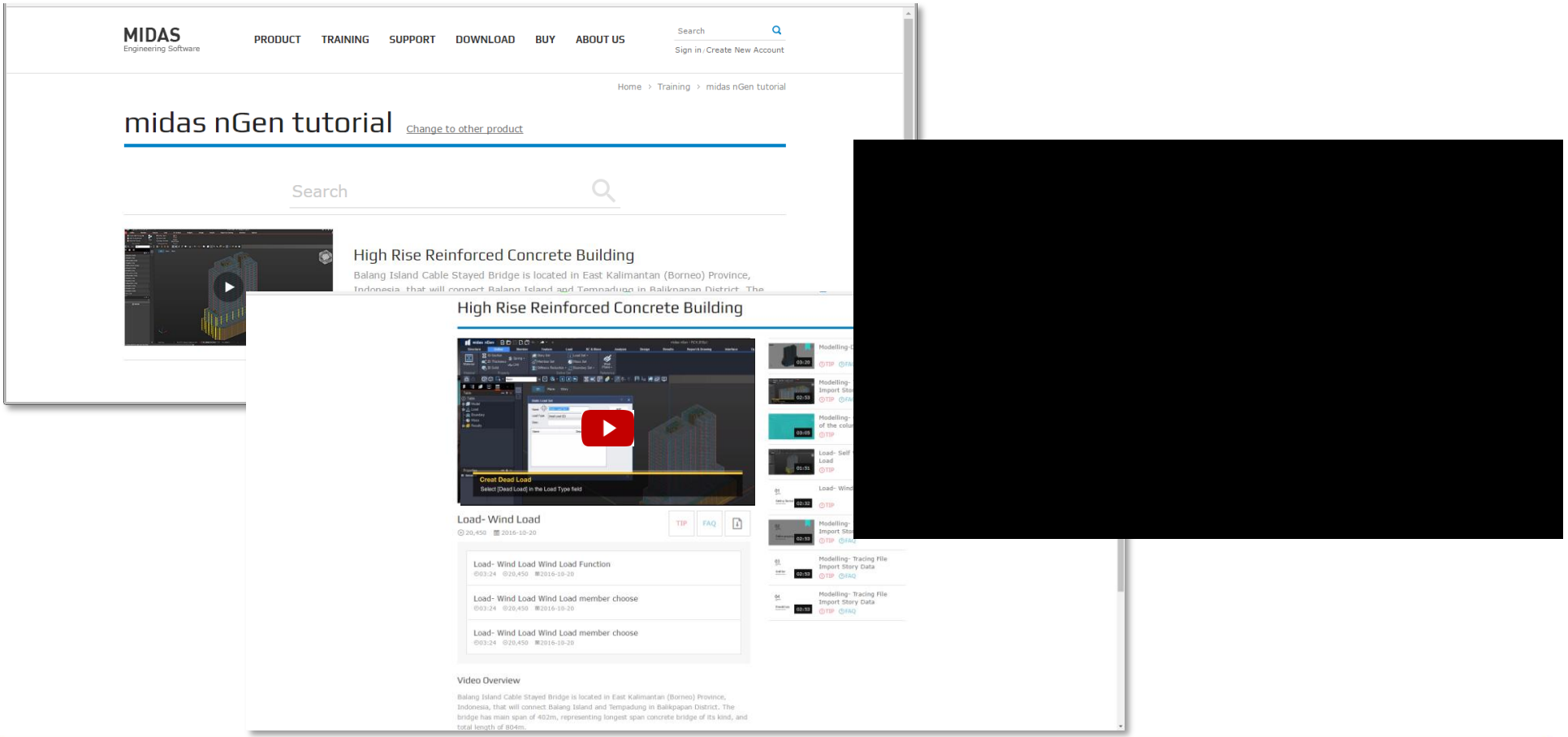


Main Features of midas nGen

INTEGRATION | AUTOMATION | OPTIMIZATION | HIGH TECH.

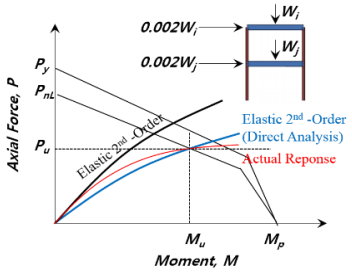
Technical Materials

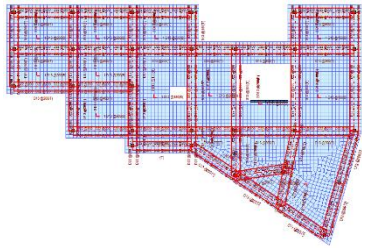
Various Training Materials such as Video Tutorials and Webinars

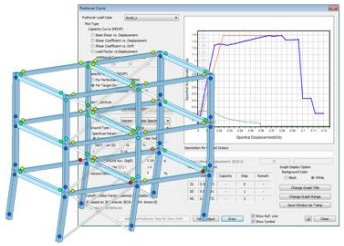


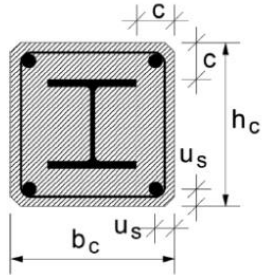
Future Development Plan

Customization of Design and Drawings





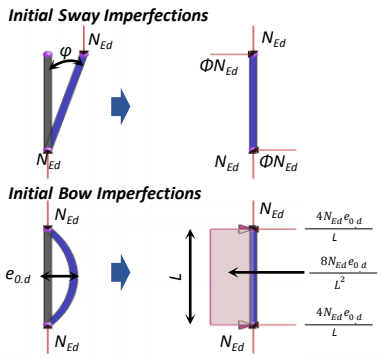


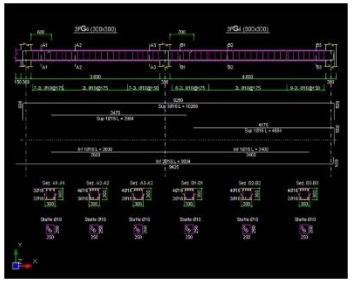


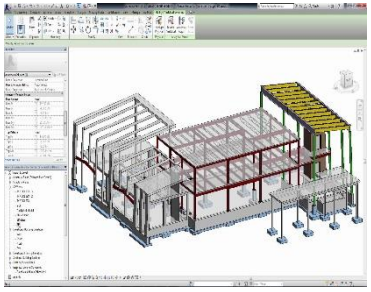
Direct Analysis & Design | ***Flat Slab Analysis & Design*** | ***PBM (P.O. & T.H.)*** | ***SRC / Deck Modeling & Design***

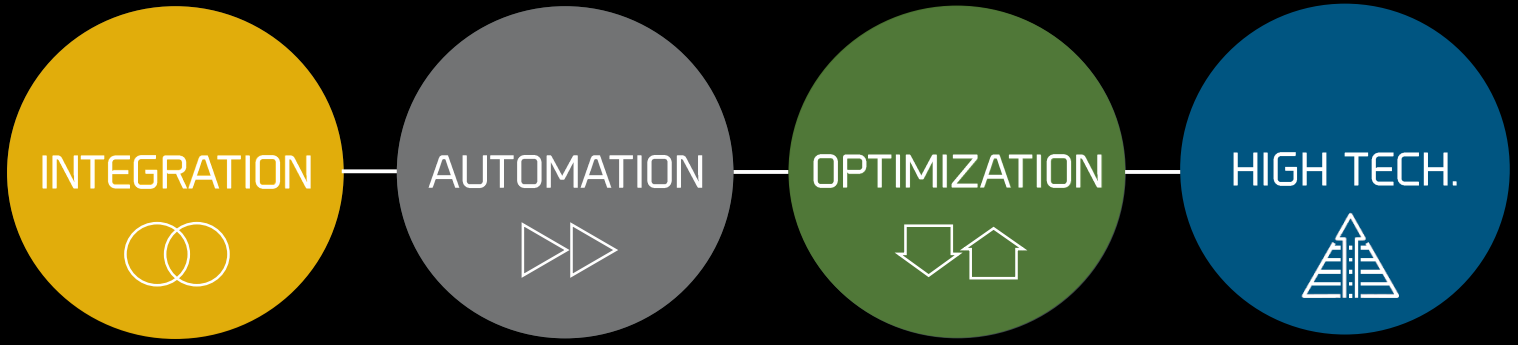
Oct. 2016 → **Dec. 2016** → **2017~**

Notional Load | ***C.S. Analysis*** | ***Customization of Outputs*** | ***Interface for Revit***









Modeling ~ Outputs	Auto-generate Auto-Design Outputs	Analysis & Design System for Optimal Quantity	Design Reporting Advanced Tech.

BENEFIT

FAST	ACCURATE	HIGH QUALITY
Preliminary Design	Practical Design	Construction
Maximize Productivity	High-quality Output	Fast Revision for Changes

Project Applications

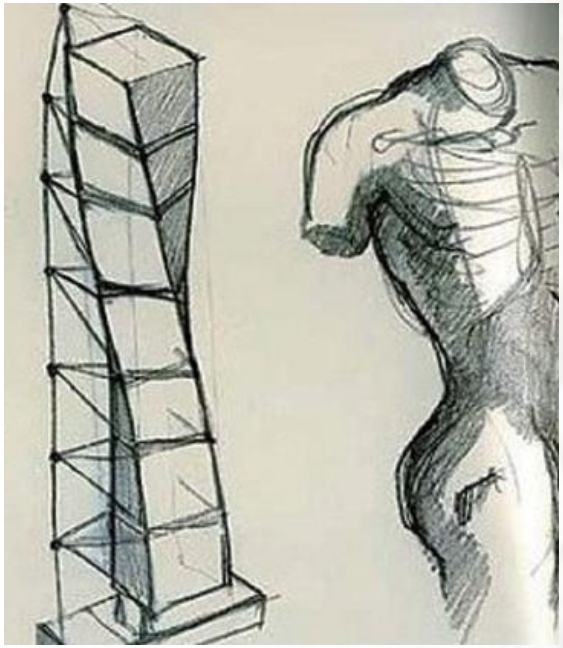
Automated and optimized process
from modeling to report generation
that provides a multidisciplinary
and fully integrated solution for
structural design.

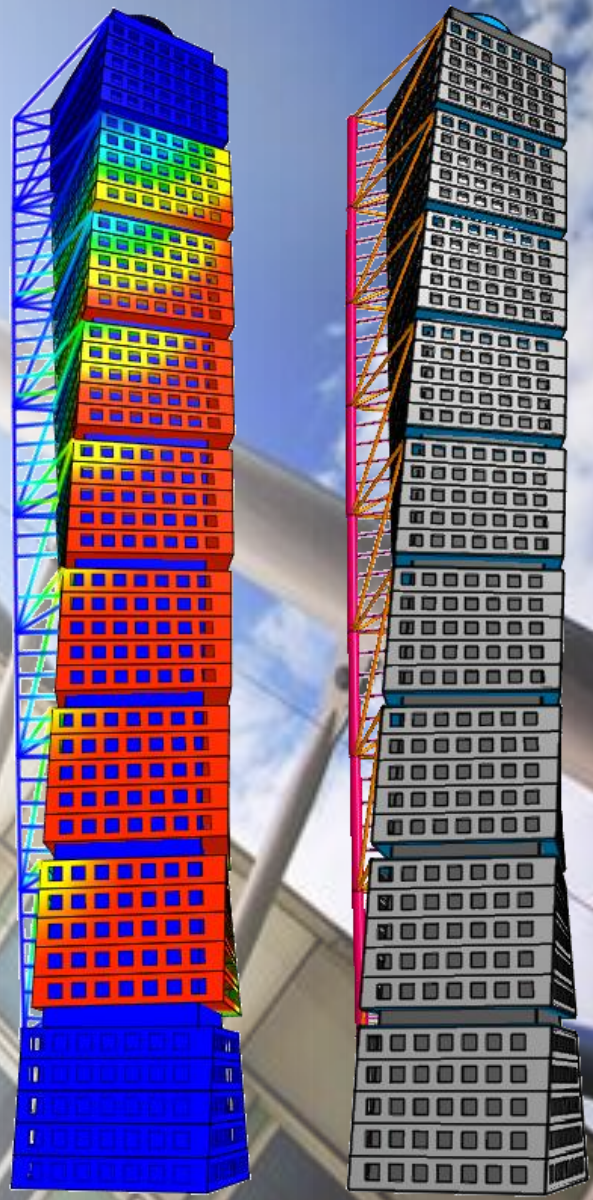
Informal Building

Twisted Shell Member Analysis

Turning Torso is based on a sculpture by Calatrava, called Twisting Torso, which is a white marble piece based on the form of a twisting human being.

In 1999, HSB Malmö's former managing director, Johnny Örbäck, saw the sculpture in a brochure presenting Calatrava in connection with his contribution to the architectural competition for the Öresund Bridge. It was on this occasion that Örbäck was inspired to build HSB Turning Torso. Shortly afterwards he travelled to Zurich to meet Calatrava, and ask him to design a residential building based on the idea of a structure of twisting cubes.





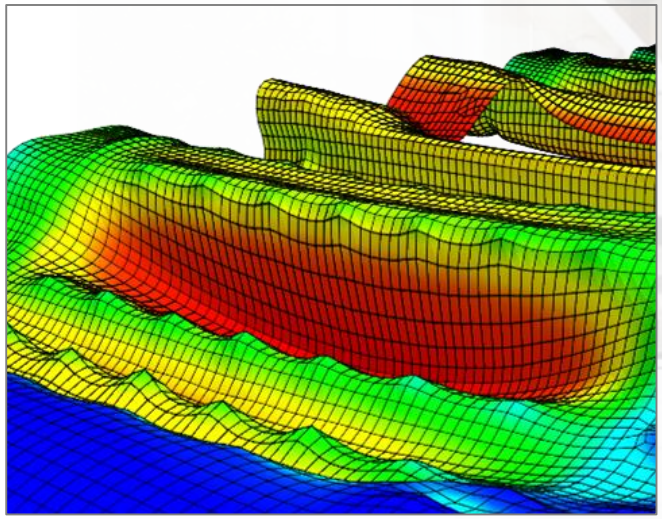
Informal Building

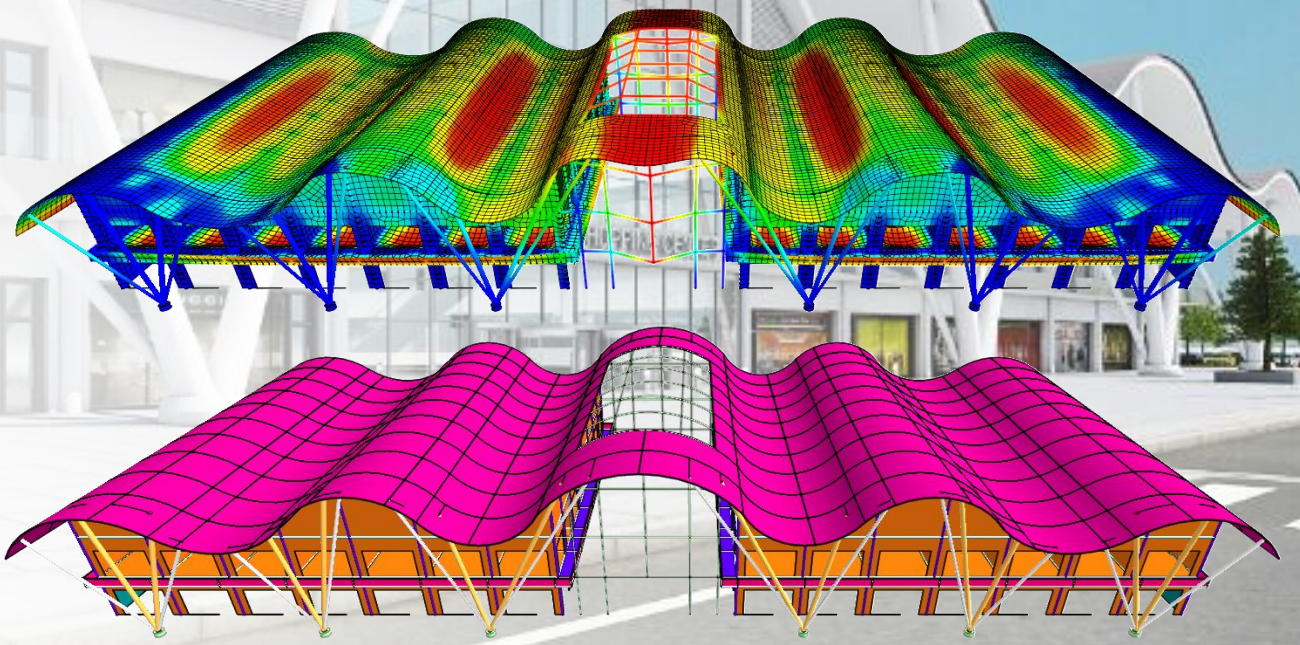
Curved Surface Shape Analysis

In its geometric essence, shape from texture is a cue to 3D shape very similar to binocular stereopsis and structure from motion.

All of these cues are based on the information available in multiple perspective views of the same surface in the scene.

In binocular stereopsis, the two eyes get slightly different views of the same surface; in structure from motion, the relative motion of the observer and the surface generates the different views.





Irregular Structure

Curved Surface Shape Analysis

In its geometric essence, shape from texture is a cue to 3D shape very similar to binocular stereopsis and structure from motion.

All of these cues are based on the information available in multiple perspective views of the same surface in the scene.

In binocular stereopsis, the two eyes get slightly different views of the same surface; in structure from motion, the relative motion
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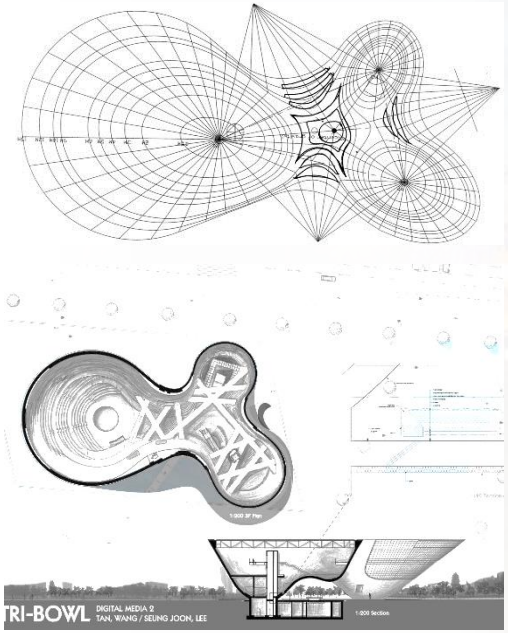
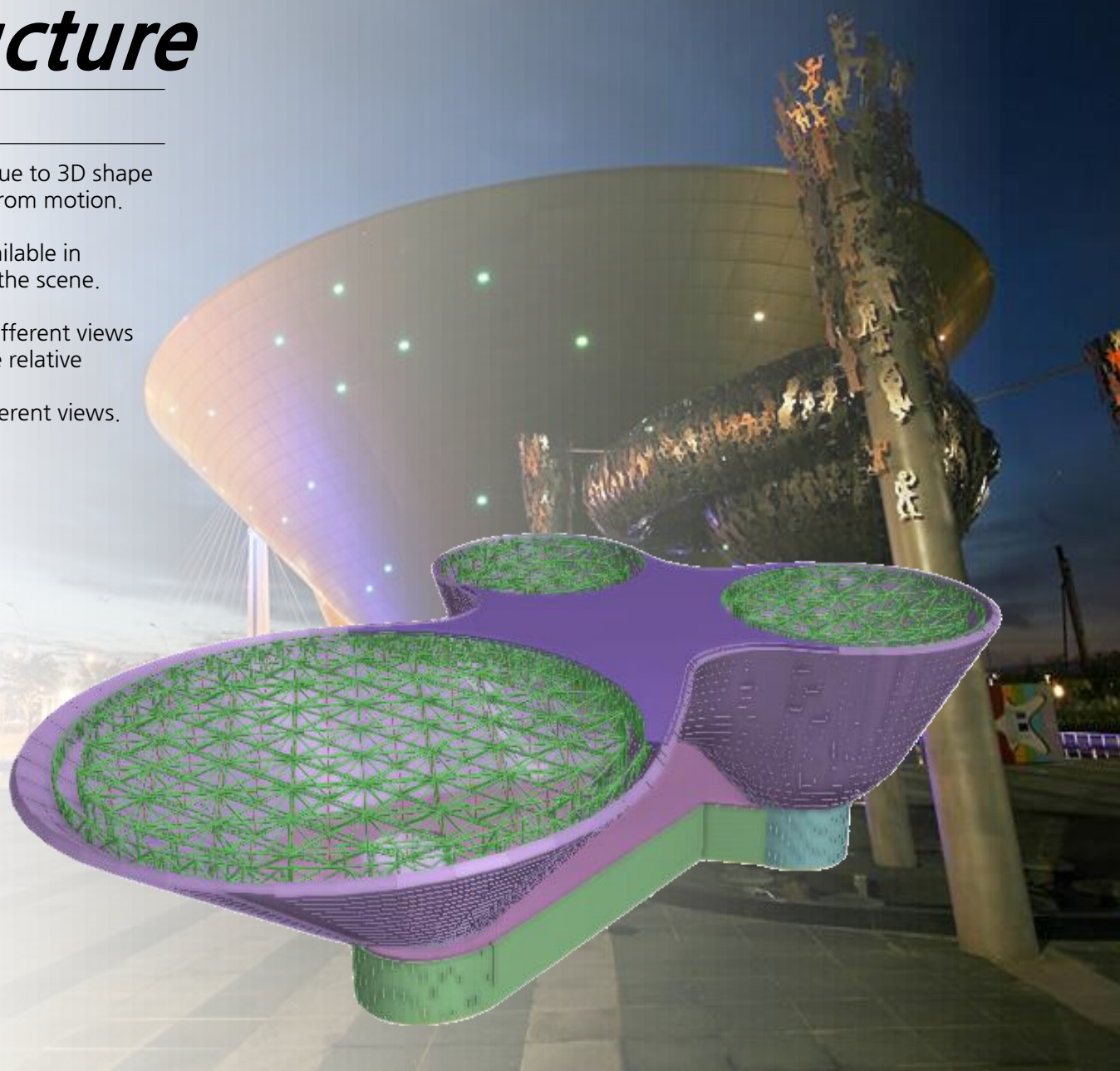
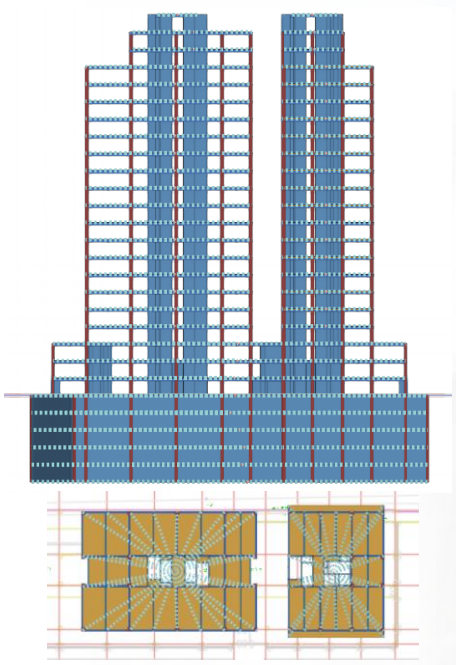


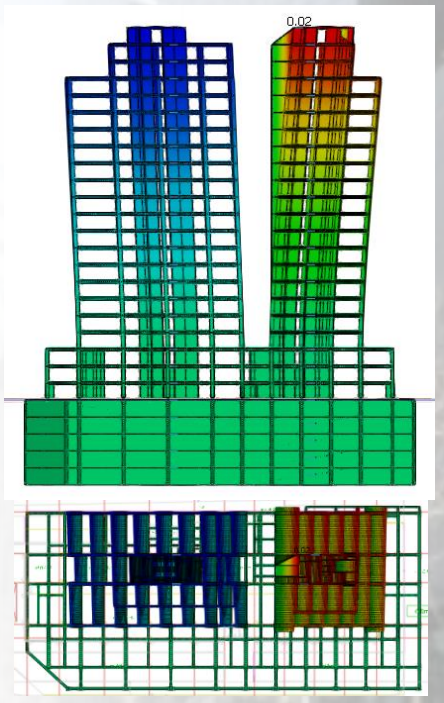


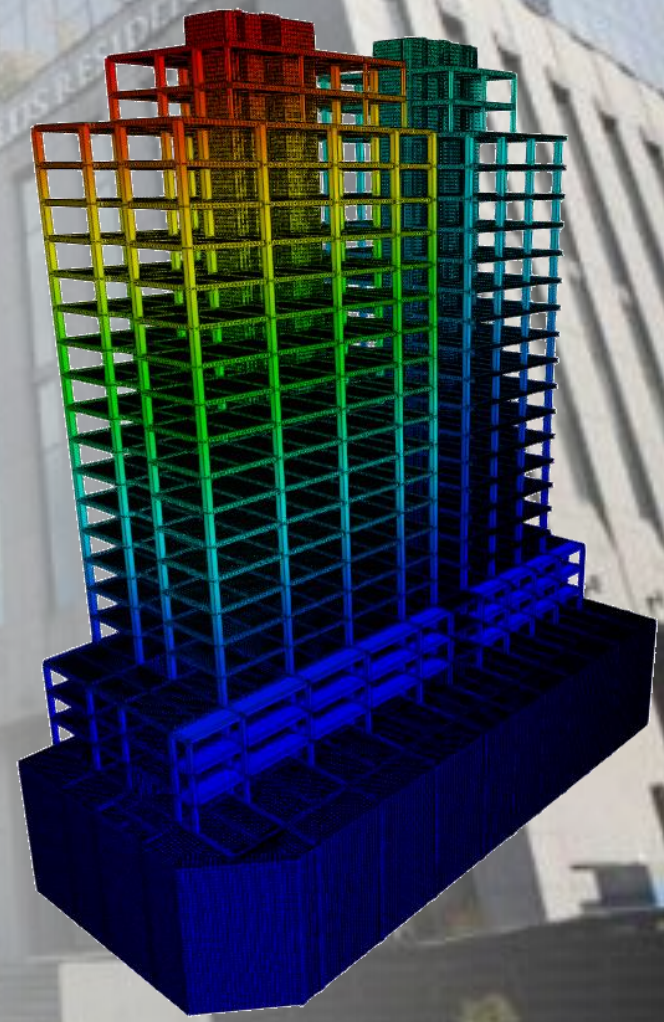
Multi Tower

Analysis for more than Two Independent Structures

Analysis for more than two independent structures can be easily done in midas nGen. Diaphragm setting and analysis can be done conveniently for structures with more than two masses.



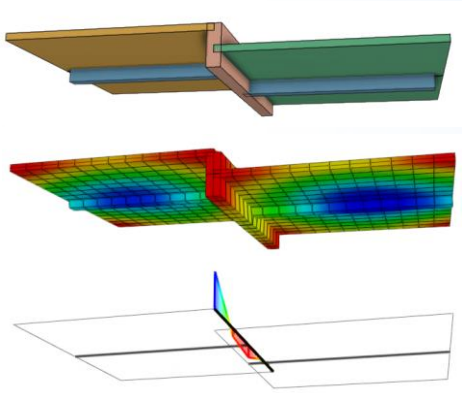


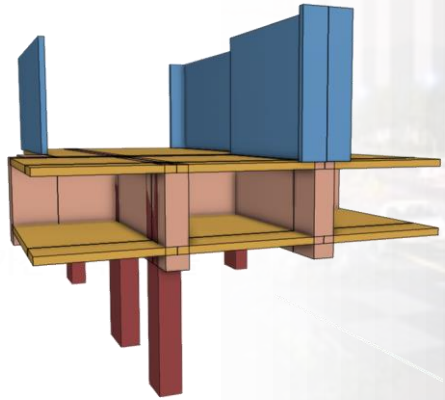


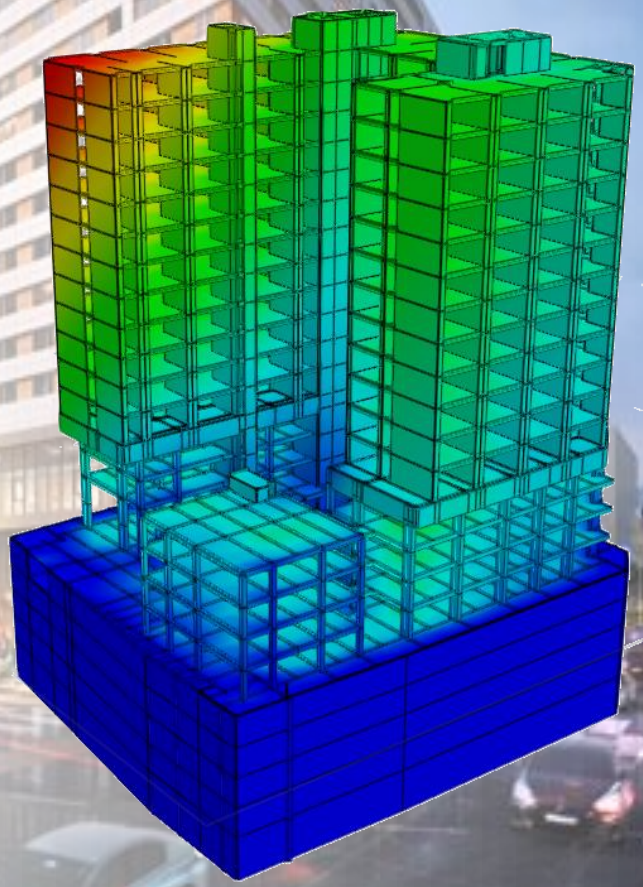
Complex Facilities

RC Structures with Diverse Structural Systems

Realization of diverse geometry and drawings are possible using Plate Beam and Shape Offset. Modeling of beam adjacent to horizontal member at different level can be easily done using Plate Beam members.







Steel/RC Frame

Structural Analysis & Optimal Design

In general, the optimization techniques used in structural design can be categorized into classical and heuristic search methods.

Classical optimization methods such as linear programming, nonlinear programming and optimality criteria often require substantial gradient information.

Refinery Frame

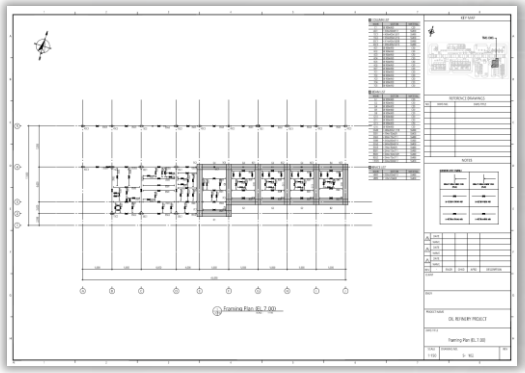
Auto Generate Drawing Data

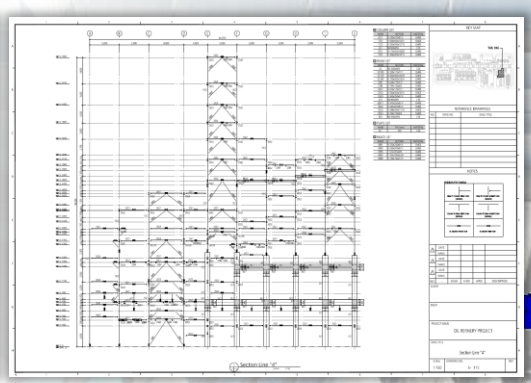
An oil refinery or petroleum refinery is an industrial process plant where crude oil is processed and refined into more useful products such as petroleum naphtha, gasoline, diesel fuel, asphalt base, heating oil, kerosene and liquefied petroleum gas.

Oil refineries are typically large, sprawling industrial complexes with extensive piping running throughout, carrying streams of fluids between large chemical processing units.

In many ways, oil refineries use much of the technology of, and can be thought of, as types of chemical plants. The crude oil feedstock has typically been processed by an oil production plant.

There is usually an oil depot (tank farm) at or near an oil refinery for the storage of incoming crude oil feedstock as well as bulk liquid products.





Refinery Silo

Structural Analysis for Cylindrical Shape

An oil refinery or petroleum refinery is an industrial process plant where crude oil is processed and refined into more useful products such as petroleum naphtha, gasoline, diesel fuel, asphalt base, heating oil, kerosene and liquefied petroleum gas.

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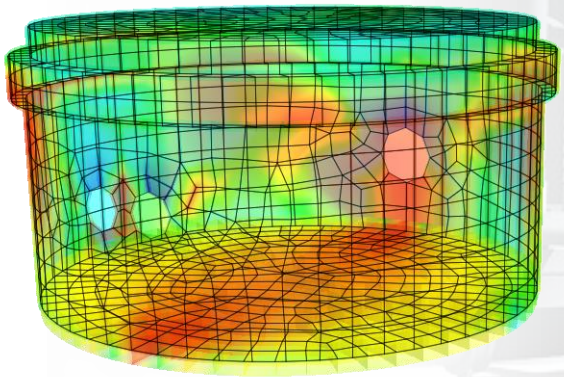
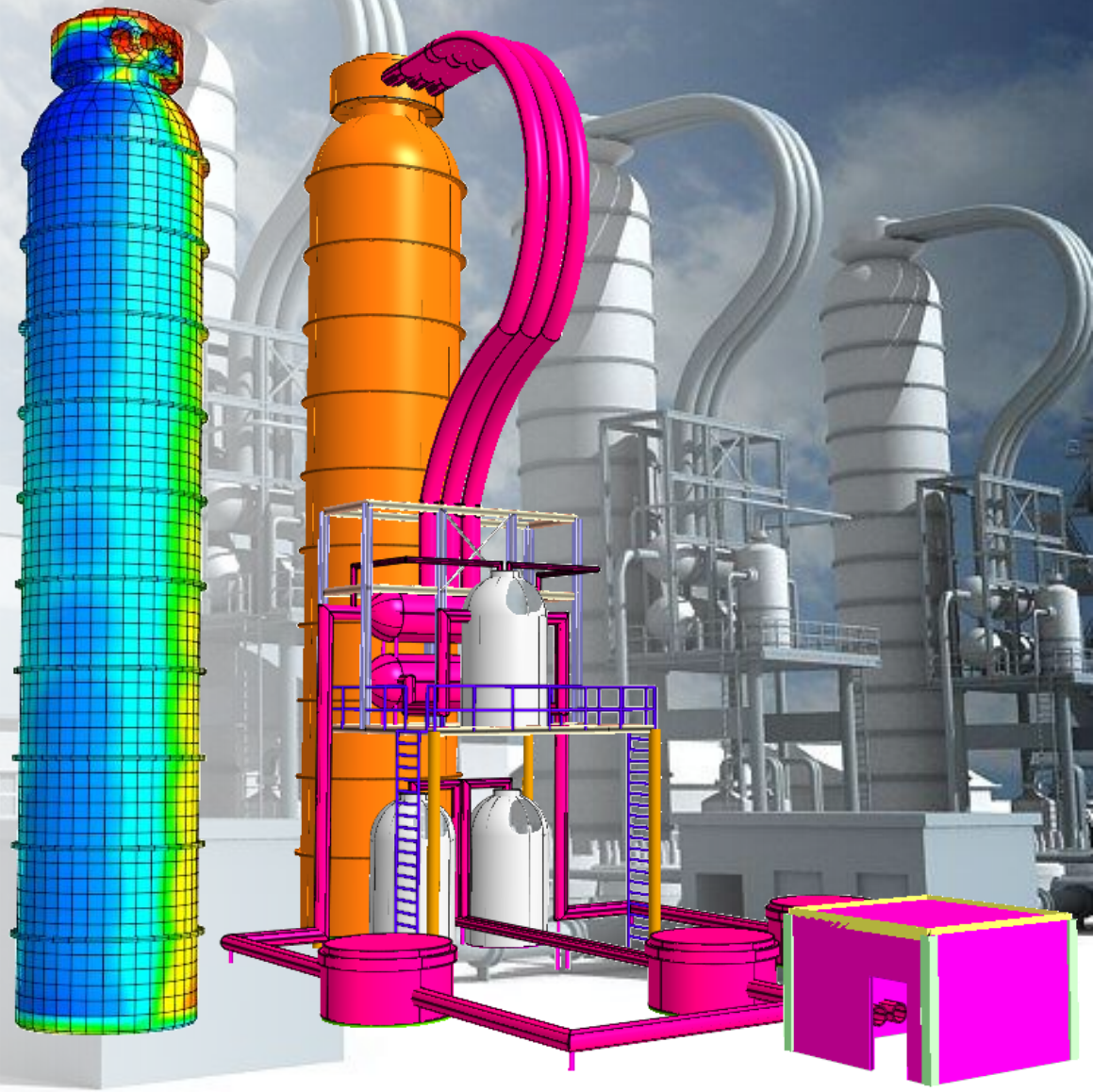




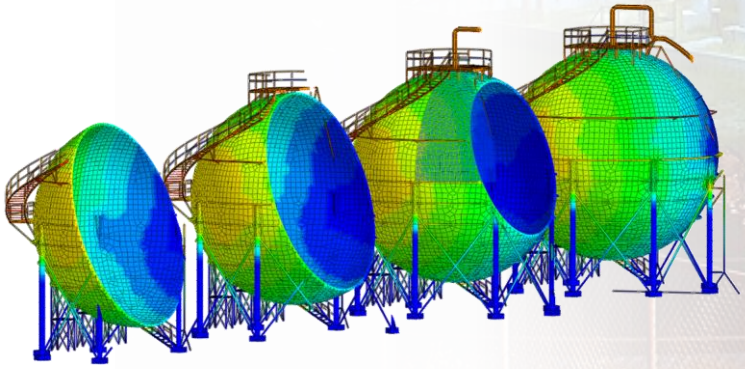
Ball Tank

Structural Analysis for Spherical Shape

This type of storage vessel is preferred for storage of high pressure fluids. A sphere is a very strong structure. The even distribution of stresses on the sphere's surfaces, both internally and externally, generally means that there are no weak points. Spheres however, are much more costly to manufacture than cylindrical or rectangular vessels.

Storage Spheres need ancillary equipment similar to tank storage - e.g. Access manholes, Safety valves, Access ladders, Earthing points .. etc.

An advantage of spherical storage vessels is, that they have a smaller surface area per unit volume than any other shape of vessel. This means, that the quantity of heat transferred from warmer surroundings to the liquid in the sphere, will be less than that for cylindrical or rectangular storage vessels.

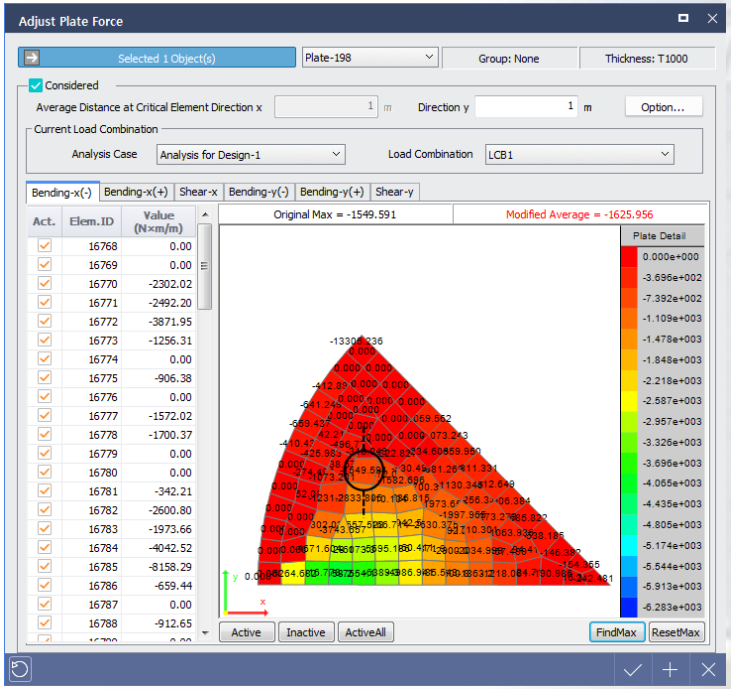


Foundation

Structural Analysis & Design for Mat Foundation

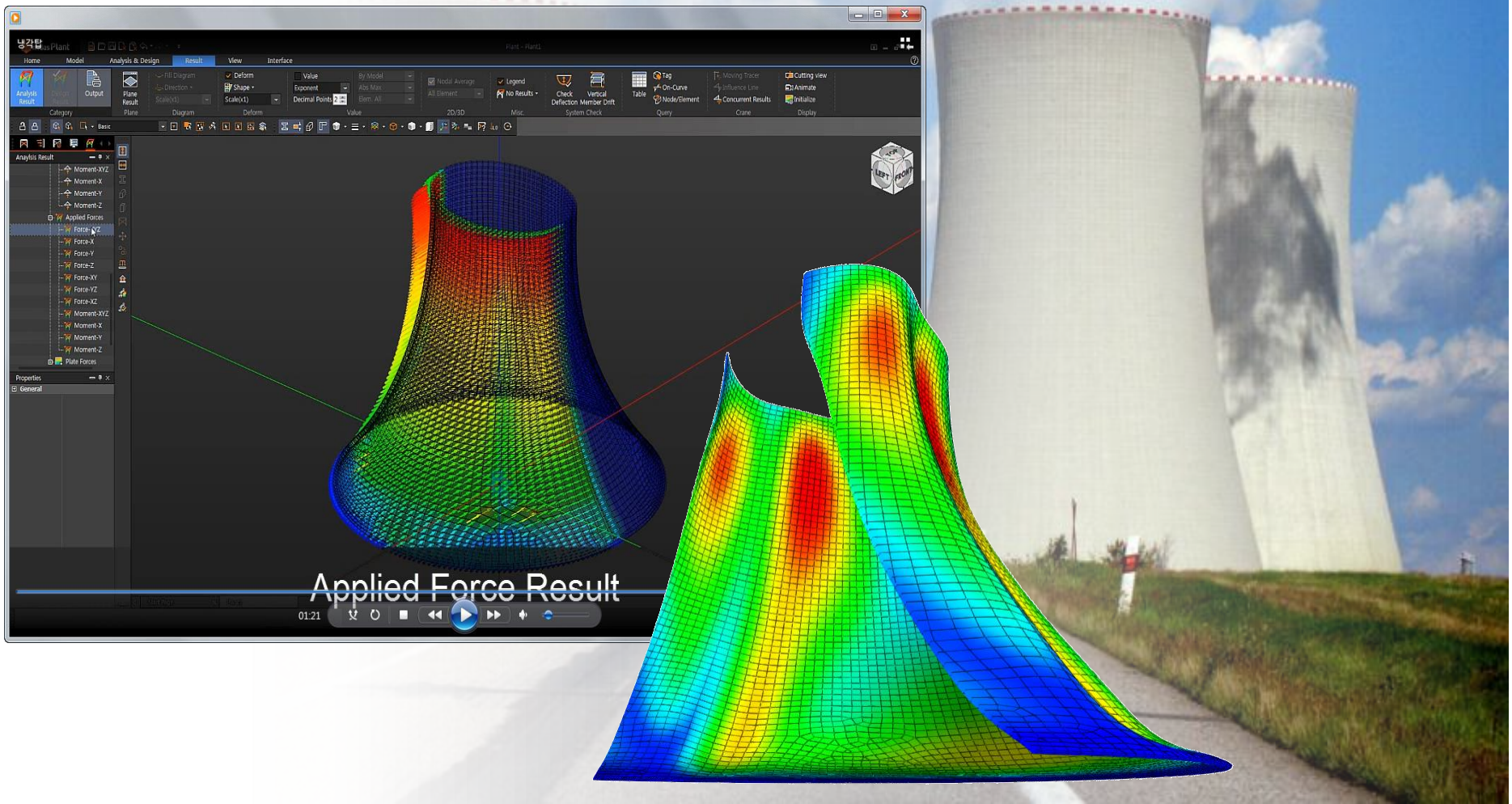
An on-grade mat foundation is an above-ground type of foundation used to provide load-bearing capacity in expansive, rocky or hydro collapsible soils.

The foundation is created by connecting a series of thermal-grade heat resistant plastic forms or Insulated Concrete Forms ICF's often made from Expanded or extruded polystyrene, set directly on grade, and then monolithically pouring a post tension, rebar or Fiber reinforced concrete slab (usually 4" - 8").



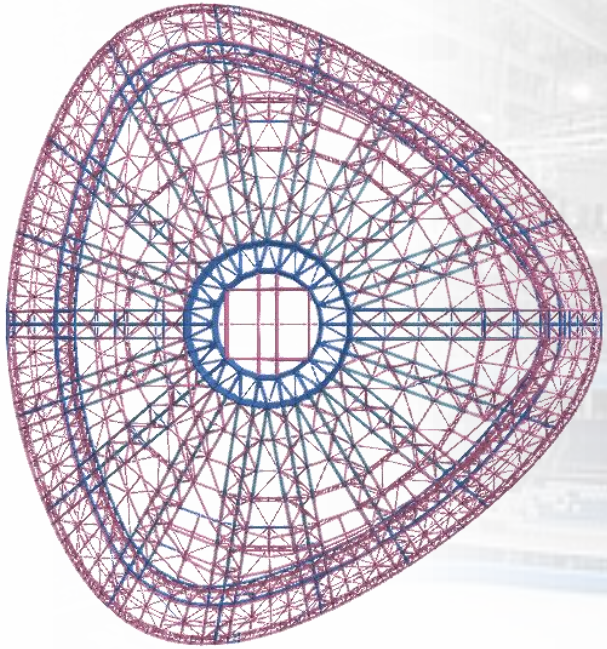
Cooling Tower

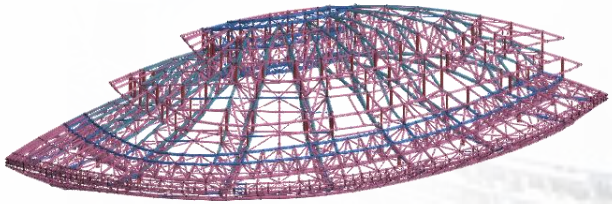
Shell Member Analysis



Stadium

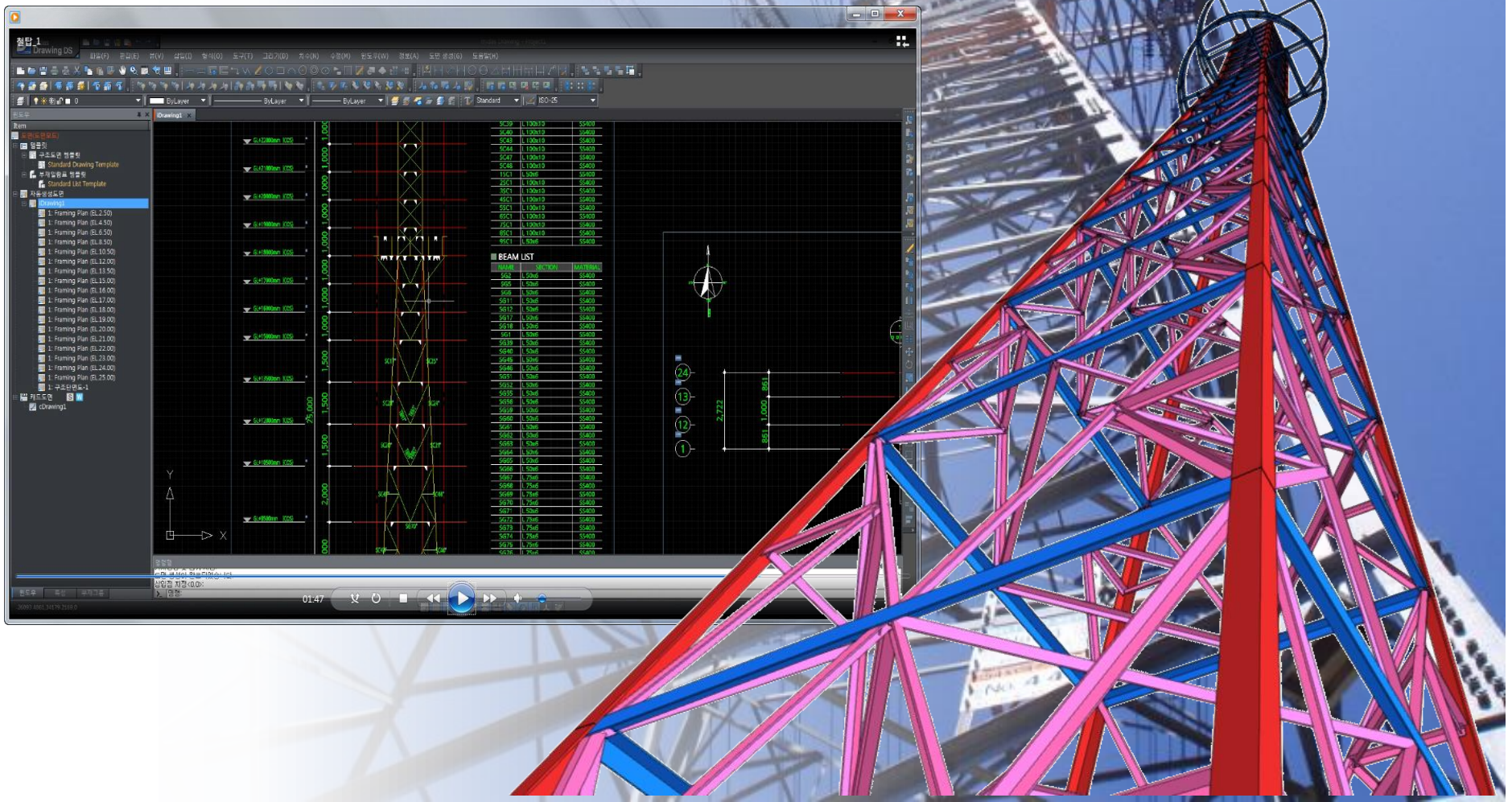
Steel Member Design & Generate Drawings





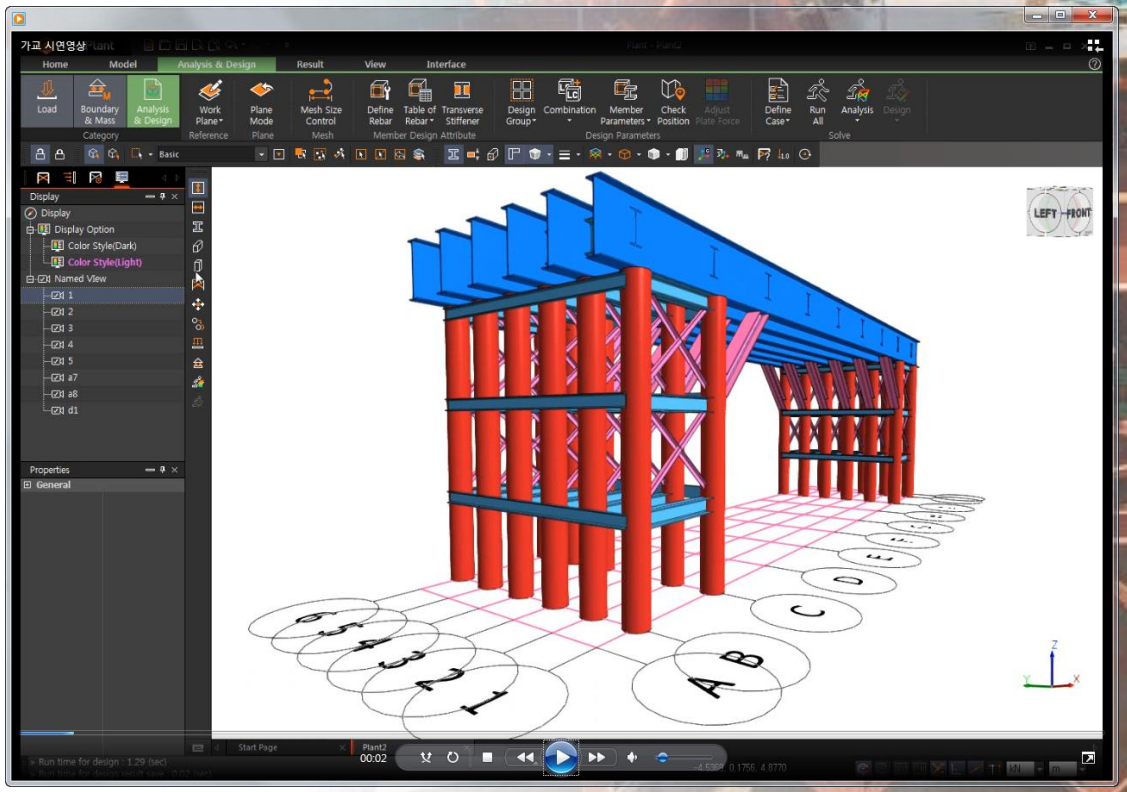
Pylon Tower

Steel Member Design & Generate Drawings



Steel Bridge

Steel Member Design & Generate Drawings



RC Structure

Plate Member Design & Generate Drawings