3DEXPERIENCE CATIA

FAÇADE DESIGN & ENGINEERING SOLUTIONS

Kolon One & Only Tower, Seoul, Korea
Photo Credit: Jasmine Park

Functional Coverage

Sustainability Impact

Value Proposition

Key Roles & Applications for Façades

- Parametric Panel Modeling for Fabrication
- Variable Curtain Wall for Design
- Variable Curtain Wall for Fabrication
- Panel Wall for Design
- Panel Wall for Fabrication
- Generative Façades for Design
- Generative Façades for Fabrication
- Metal Panel Assemblies
- Quantity Take Off & Bill of Materials
- Rendering & Virtual Reality
- Façade Presentations & Design Review

Key Roles & Takeaways

Conclusion

3DEXPERIENCE CATIA

FUNCTIONAL COVERAGE FOR BUILDINGS & INFRASTRUCTURE

Roll over the items you would like to discover.

Infrastructure

- CATIA | CITY Connection
- Terrain
- Greenery
- Railways
- Roadways
- Road Signage
- Concrete Bridge
- Steel Bridge
- Tunnels
- Street Furniture

Structures

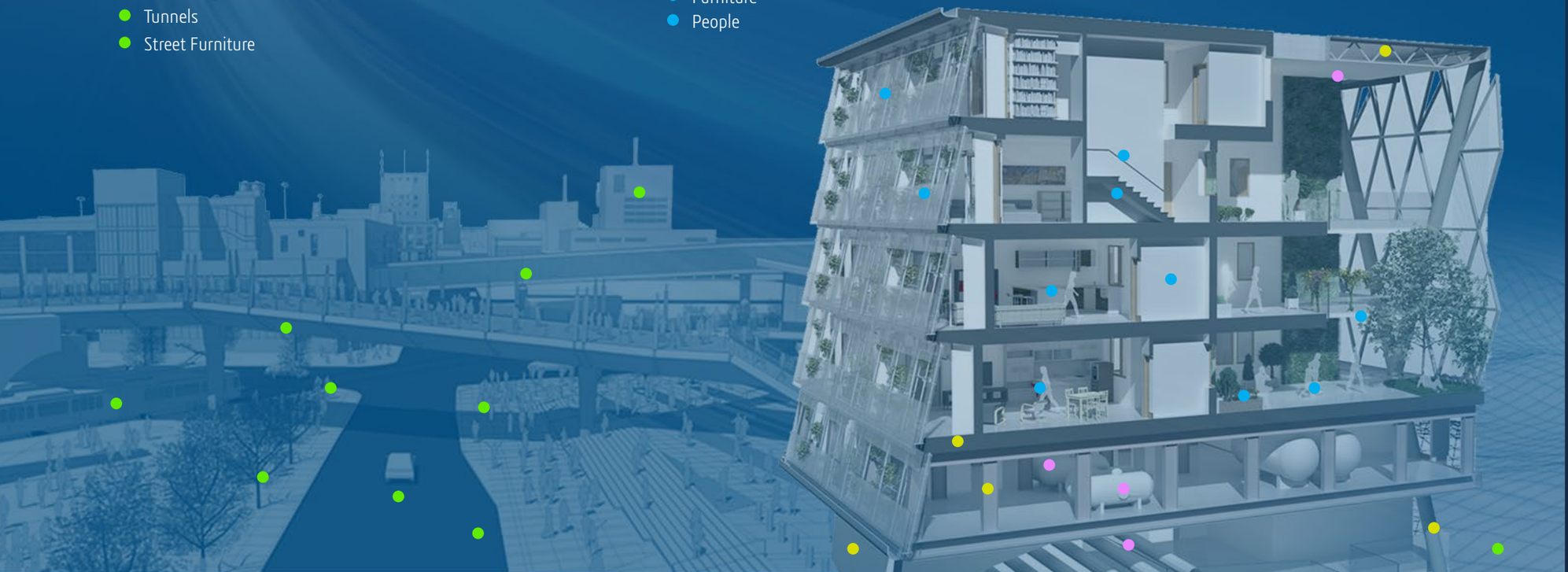
- Foundations
- Columns & Beams
- Slanted Columns
- Concrete Slabs
- Trusses

Architecture

- Façade Patterning
- Façade Paneling
- Ceilings
- Walls
- Stairs
- Handrails
- Floors
- Spaces/Rooms
- Furniture
- People

Systems (MEP)

- Electrical Systems
- HVAC Systems
- Mechanical Systems
- Plumbing Systems



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CONSTRUCTION SUSTAINABILITY WITH CATIA

REDUCE CONSTRUCTION WASTE

70-90%

INCREASE RENEWABLE BUILDING MATERIAL USAGE

20-30%

IMPROVE ASSEMBLY & CONSTRUCTION METHODS

60-80%

REDUCE MATERIAL TRANSPORT

30-50%

REDUCE ENERGY CONSUMPTION IN BUILDINGS

30-80%

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CATIA VALUE PROPOSITION FOR CONSTRUCTION

SMART

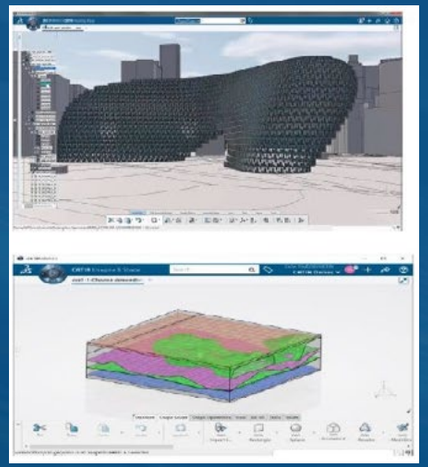
A Systems Engineering Approach addressing end-to-end Multi-Disciplinary Industry Processes

MODULAR

A Parametric, Template-Based Solution leveraging Knowledge & Know-How Capture & Reuse

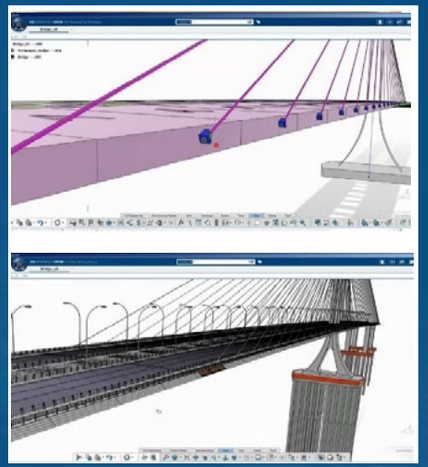
GENERATIVE

The most powerful technology for complex shapes and patterns with Generative Design & Precise Geometry



CONTINUOUS

Seamless Level of Development from Concept to Detailed Design for Manufacturing and Assembly



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CATIA KEY ROLES & APPLICATIONS FOR FACADES

Visual Script Designer

- Visual Scripting

Computational Designer for Construction

- xGenerative Design
- xShape Design
- Building and Civil Assemblies

Building Designer

- Building 3D Design
- Buildings Space Planning
- Civil Structures Design
- Terrain Preparation
- Imagine & Shape
- Live Rendering
- Building and Civil Assemblies
- Natural Sketch
- Sheet Metal Design
- Rendering Scene Design
- Drafting

Building Design Engineer

- Building 3D Design
- Buildings Space Planning
- Civil Structures Design
- Terrain Preparation
- Imagine & Shape
- Live Rendering
- Engineering Rules Capture
- Building and Civil Assemblies
- Natural Sketch
- Sheet Metal Design
- Rendering Scene Design
- Drafting
- Civil Structures Engineering
- Engineering Templates

Building & Civil Presenter

- Product Perception Exp.
- Human Design
- Live Rendering
- Building and Civil Assemblies
- Exp. Models Preparation
- Ambience Studio
- Rendering Scene Design

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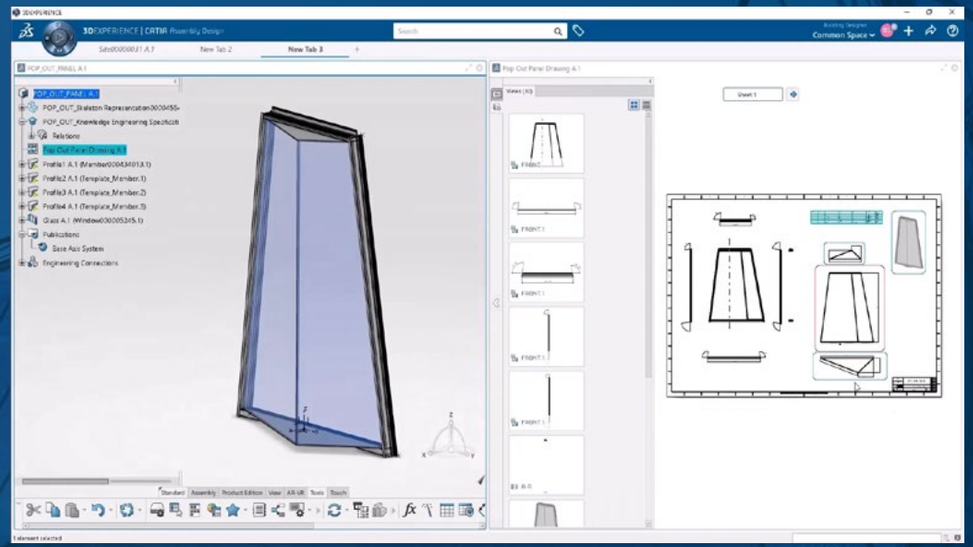
3DEXPERIENCE CATIA - FACADE DESIGN & ENGINEERING SOLUTIONS

PARAMETRIC PANEL MODELING FOR FABRICATION

Key Values:

- Capture assembly and fabrication knowledge into reusable templates
- CATIA supports the highest level of detail parametric & adaptive component assemblies that are automatically instantiated into the master model to create the virtual façade twin
- Easily reuse these component assemblies across all projects saving days of remodeling effort on future projects
- Save hours of work by extracting updated drawings & bills of materials from the instantiated assemblies in context



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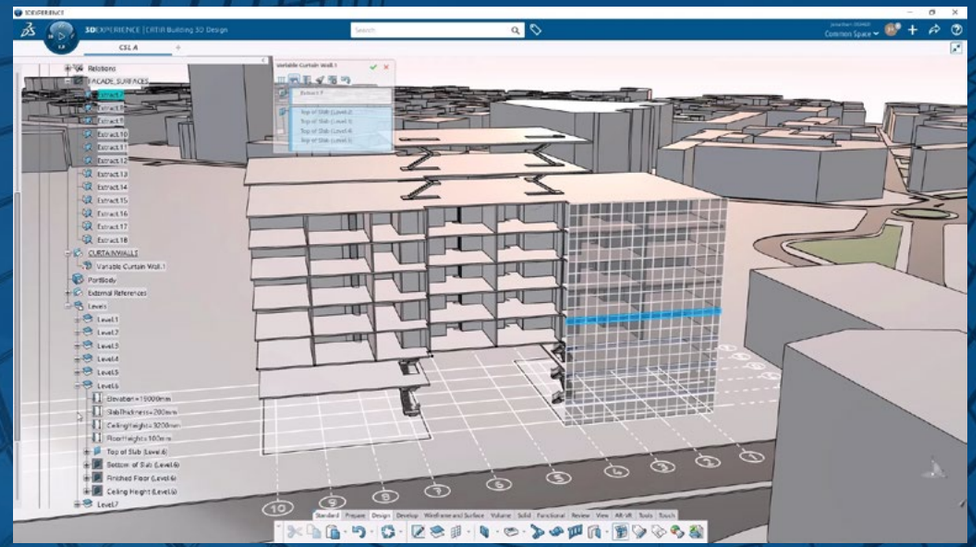
3DEXPERIENCE CATIA - FACADE DESIGN & ENGINEERING SOLUTIONS

VARIABLE CURTAIN WALL FOR DESIGN

Key Values:

- **Fast:** The Variable Curtain Wall (VCW) command is a quick way to create unique and repeated façade patterns
- **Easy:** to create unique façade design concepts
- **Fun:** Delightful user interface to explore and discover
- **Design Productivity:** save potentially hours or days of time by modeling one VCW and matching it to all other façade design surfaces



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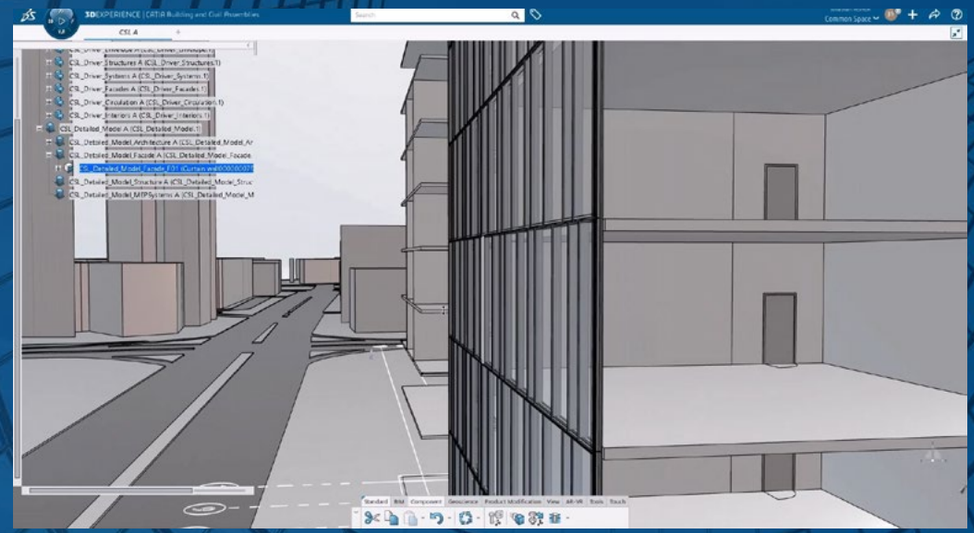
3DEXPERIENCE CATIA - FACADE DESIGN & ENGINEERING SOLUTIONS

VARIABLE CURTAIN WALL FOR FABRICATION

Key Values:

- **Smart:** the VCW smart extract feature identifies similar panels within the VCW pattern and generates wireframe and surface geometry organized to optimize material reuse
- **Easy:** Component Based Design automatically instantiates the Engineering Templates and replaces the inputs on the fly, with no need for complex scripting
- **Scalable:** build the complete façade twin from a catalog of reusable, high level of detail parametric assemblies
- **Productive:** This process saves countless hours of modeling, achieving a detailed model for manufacturing & coordination



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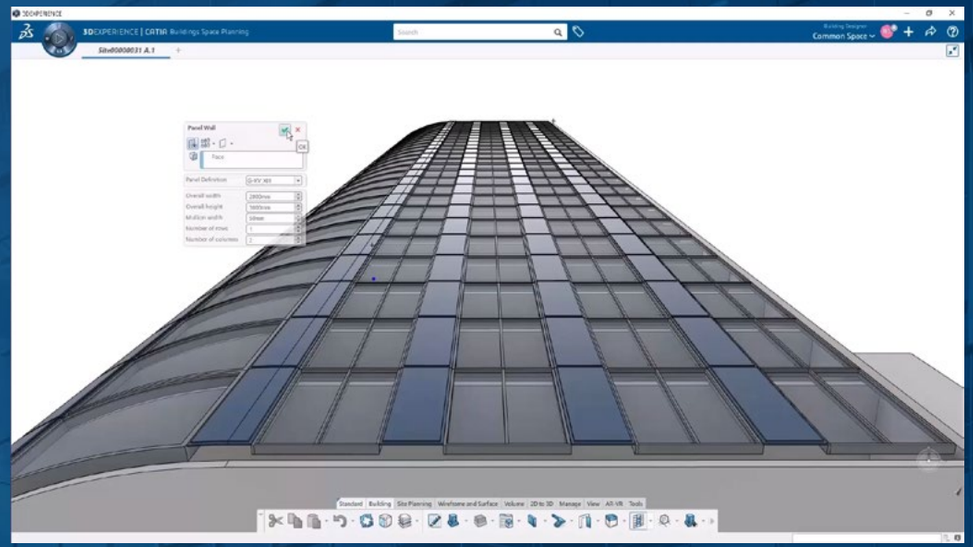
3DEXPERIENCE CATIA - FACADE DESIGN & ENGINEERING SOLUTIONS

PANEL WALL FOR DESIGN

Key Values:

- **Easy:** create facades from a catalog of panels that vary in dimension that are driven by dimensional length x width parameters
- **Extensible:** create either curved or flat panels on either curved or flat design surfaces
- **Smart:** Panel Wall recognizes in the pattern which panels share the same dimensions and parameters and will reuse identical panels
- **Fast:** very quickly model facades with rectangular patterns of varying sized panels
- **Attractive:** an entertaining and intuitive façade design interface



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3DEXPERIENCE CATIA - FACADE DESIGN & ENGINEERING SOLUTIONS

PANEL WALL FOR FABRICATION

Key Values:

- **Capable:** detailed panel assemblies can be instantiated to create the façade twin for fabrication
- **Accelerated:** completely skipping the concept design phase, the detailed model with dimensional variation is generated in a matter of minutes
- **Productive:** this method can save days of modeling effort and create the detailed virtual twin for manufacturing & coordination
- **Flexible:** using a panel based on a surface, detailed non-typical panels can be instantiated along the edges of the façade to create unique panels

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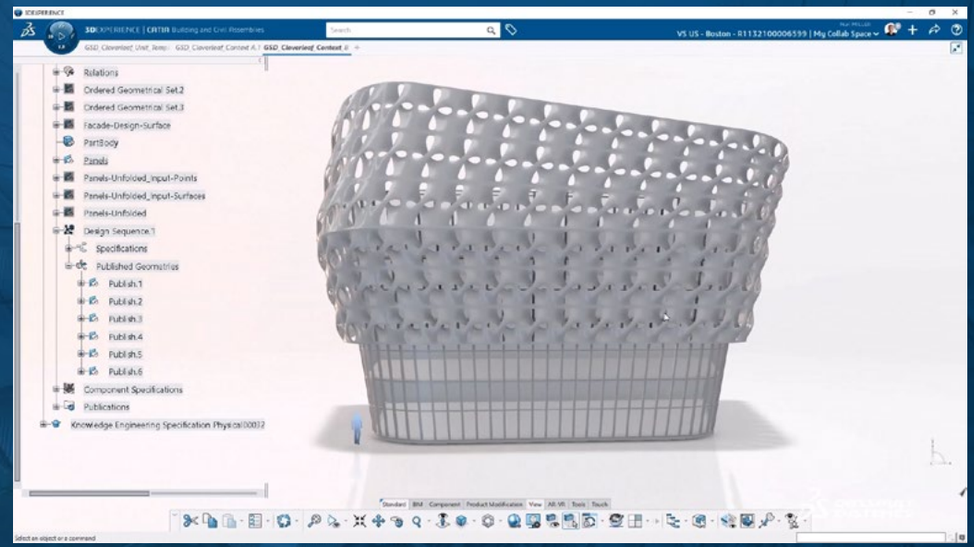
3DEXPERIENCE CATIA - FACADE DESIGN & ENGINEERING SOLUTIONS

GENERATIVE FAÇADES FOR DESIGN

Key Values:

- **Capable:** thanks to CATIA's powerful surface modeling capabilities, panels can take the form of near endless geometric forms
- **Insightful:** the complex surface panels include their unrolled geometry as well as deformation information to ensure each panel can be manufactured within the materials deformation tolerance
- **Reusable:** the same pattern can be used to support a layered façade system composed of multiple pattern assemblies



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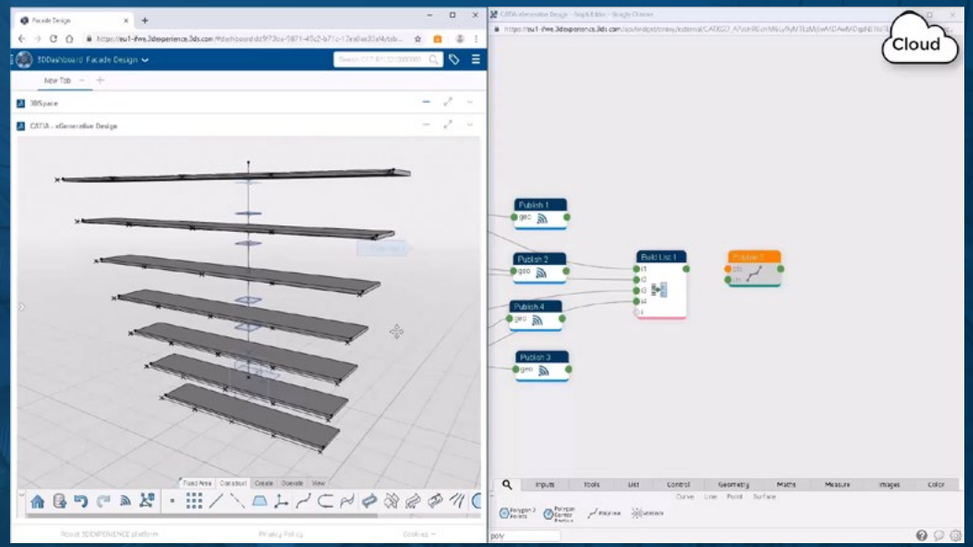
3DEXPERIENCE CATIA - FACADE DESIGN & ENGINEERING SOLUTIONS

GENERATIVE FAÇADES FOR FABRICATION

Key Values:

- **Flexible:** for irregular patterns, xGenerative Design or the Visual Scripting applications is used to create dynamic facades with an algorithmic modeling approach
- **Extensive:** Design Sequences output published geometry that are consumable with Component Based Design to automatically instantiate the detailed panels from the company resource catalog without scripting
- **Reusable:** capitalizing on shared resources maximizes reuse and reduces modeling times
- **Complete:** This end-to-end process is available entirely on the platform and allows for nearly endless design & engineering possibilities linking design to downstream manufacturing



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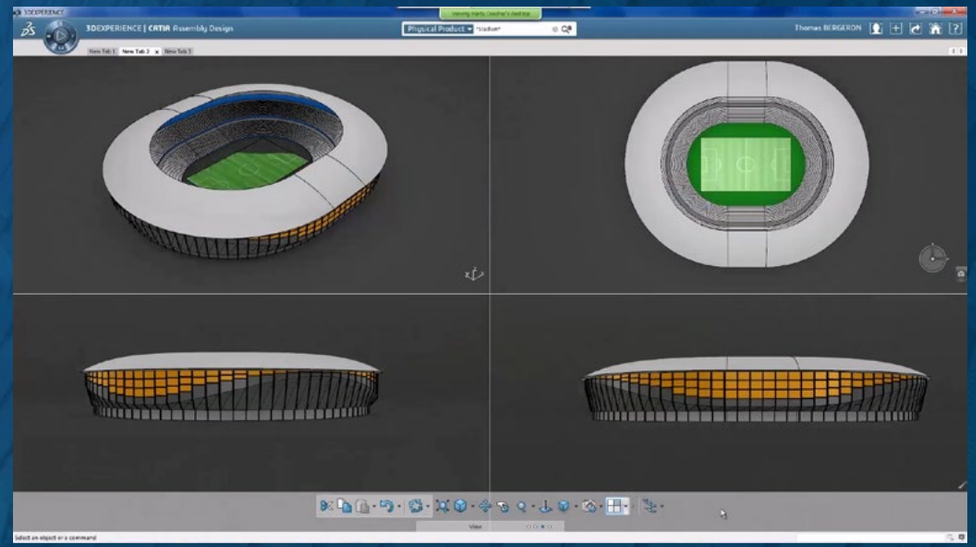
3DEXPERIENCE CATIA - FACADE DESIGN & ENGINEERING SOLUTIONS

METAL PANEL ASSEMBLIES

Key Values:

- **Complete:** specific components are modeled with the Sheet Metal application for façade panels made from flat stock materials
- **Integrated:** the panel assemblies contain their manufacturing and assembly drawings
- **Scalable:** this process can scale from simple buildings to large scale stadiums or arenas



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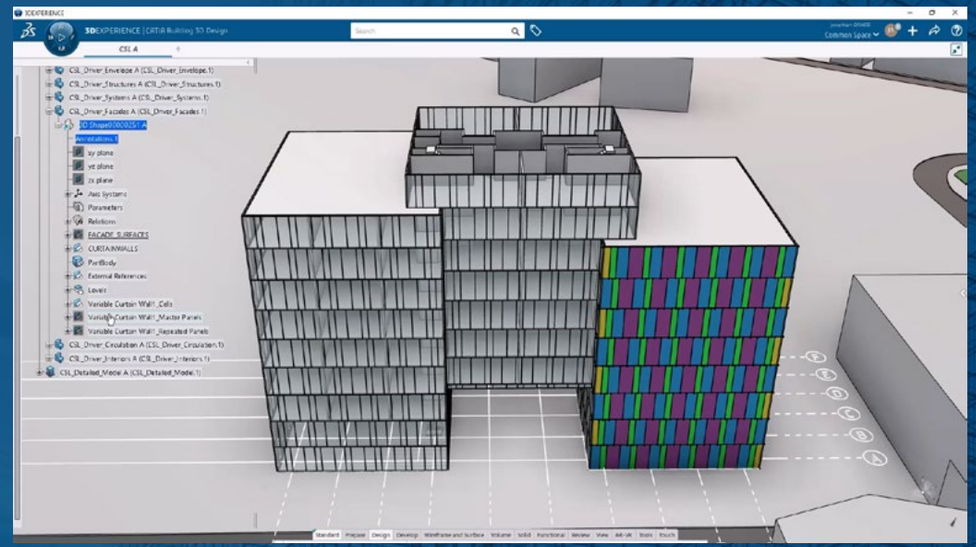
3DEXPERIENCE CATIA - FACADE DESIGN & ENGINEERING SOLUTIONS

QUANTITY TAKE OFF & BILL OF MATERIAL

Key Values:

- **Insightful:** with the Excel Link, all parametric data and IFC attributes are linked in a bi-directional Excel Data Sheet
- **Capable:** changes made in Excel or the model can be pushed bi-directionally
- **Dynamic:** the Data Sheets are saved within the model and can be updated at anytime



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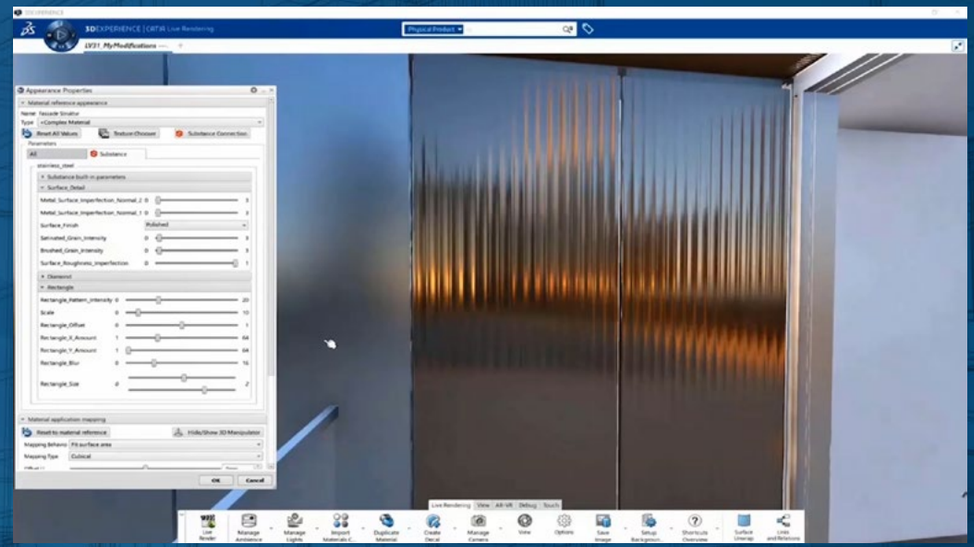
RENDERING & VIRTUAL REALITY

Key Values:

- **Precise:** CATIA's powerful real time rendering engine supports design review sessions in Virtual Reality
- **Dynamic:** Algorithmic substance materials can be applied and modified during the review session to facilitate decision making
- **Easy:** life-like renderings are easy to create in Live Rendering
- **Compelling:** create presentation quality animations or render 360 degree videos



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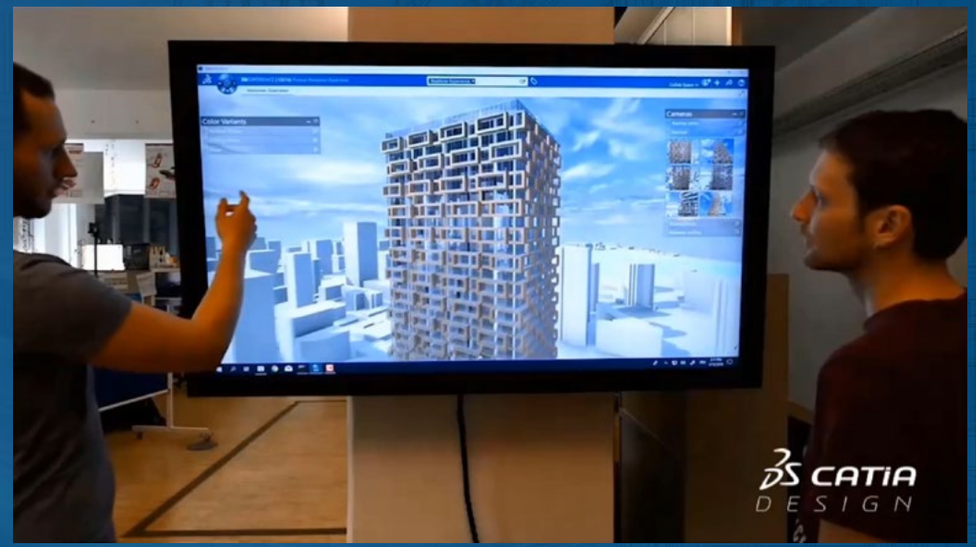
3DEXPERIENCE CATIA - FACADE DESIGN & ENGINEERING SOLUTIONS

FAÇADE PRESENTATIONS & DESIGN REVIEW

Key Values:

- **Attractive:** Create compelling client presentations within the design & engineer model to show off the project
- **Animated:** Include human and other animations to give life to your presentations
- **Integrated:** Reuse the design and engineering model to build the client-facing presentation



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KEY ROLES & TAKEAWAYS

Computational Designer for Construction

Algorithmic & generative design in the rich client within the same modeling environment as most other applications, windows only, 100% compatible with the Computational Designer for Construction

- xGenerative Design
- xShape Design

Visual Script Designer

Algorithmic & generative design on the web, no software to install, the application runs directly in a dashboard widget on both windows and mac operating systems

- Visual Scripting

Building Designer

Design buildings, building components, building structures and surrounding terrain models, subdivision surfaces, parametric solids, sheet metal panels and create life-like renderings

- Building 3D Design
- Sheet Metal Design
- Imagine & Shape
- Buildings Space Planning

Building Design Engineer

Everything you can do with the Building Designer with the additional capabilities to create automation scripts, reusable templates and detailed steel connections

- Building 3D Design
- Sheet Metal Design
- Civil Structures Design
- Imagine & Shape
- Buildings Space Planning
- Engineering Rules Capture

Building & Civil Presenter

Create interactive & immersive 3D presentation within the context of the master design or engineering model

- Product Perception Exp.
- Human Design
- Live Rendering

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