

Autodesk and COBIE

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Autodesk

Agenda

- Autodesk Update
- Autodesk AEC Solutions Quick Overview
- Interoperability Efforts and Examples
- Applying COBIE to Autodesk BIM Solutions

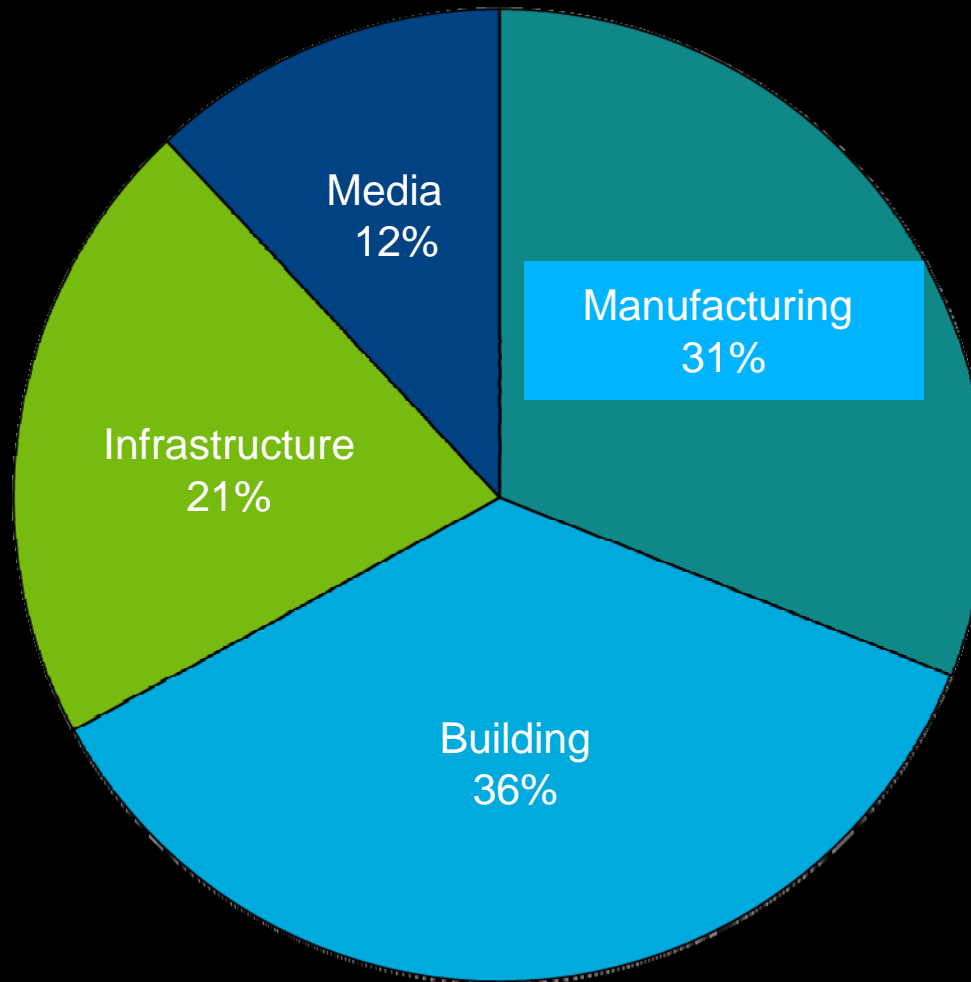


World's Leading 2D and 3D Design Software Company

Unparalleled Global Presence:

- Portfolio of markets and industries
- Geographically diversified revenue stream
- From small business to enterprise customers
- Over 8 million seats have been registered globally
- Unsurpassed Channel:
 - 1,700 Partners with 7,500 Feet on the Street
 - 4,500 Instructors
 - 2,700 Development Partners

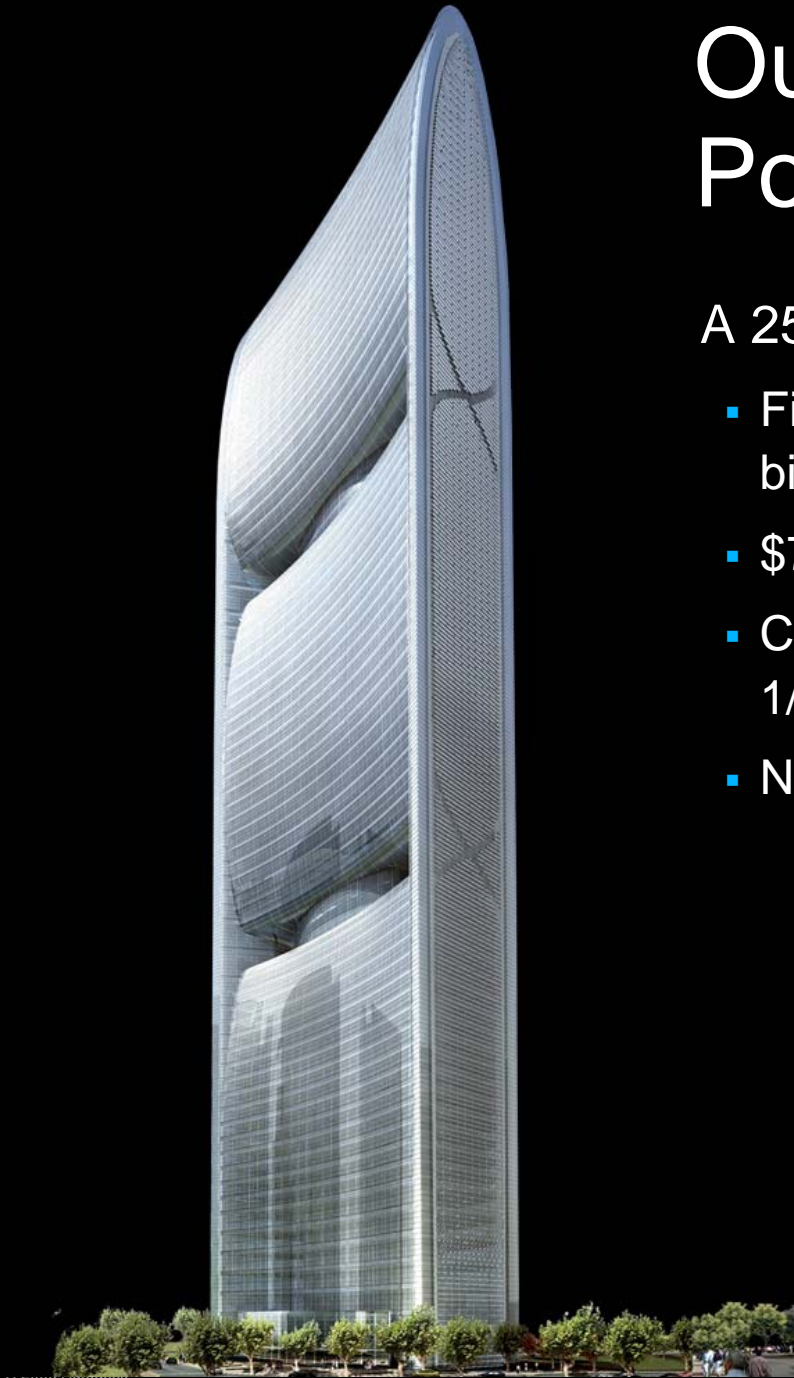
Diversified Industry Revenues



Outstanding Financial Position

A 25-year history of financial success:

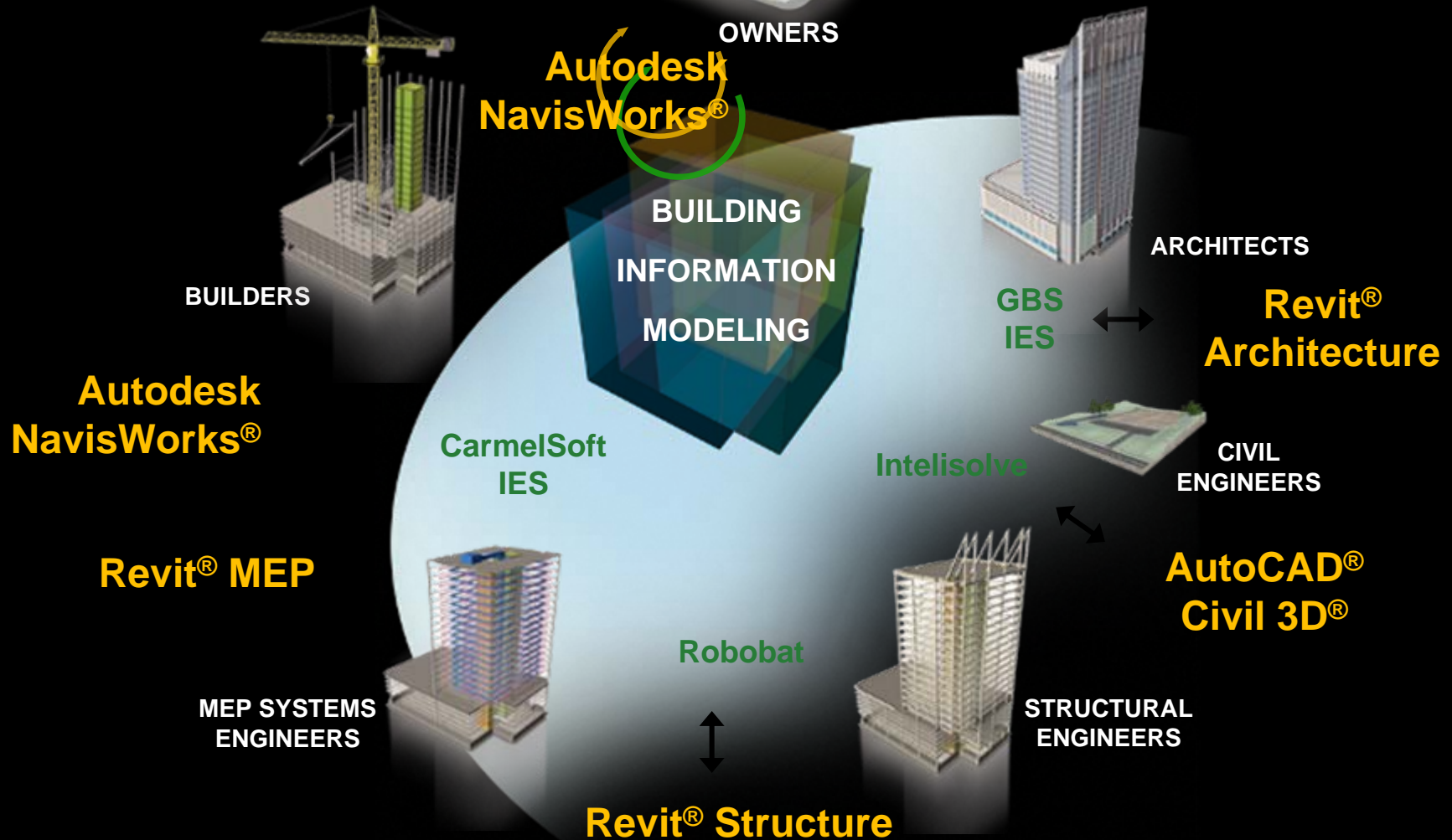
- Fiscal 2008 net revenue was \$2.172 billion
- \$7.25 billion market cap
- Cash and equivalents of \$958 million, as of 1/31/08
- No debt



Building Information Modeling

Design Authoring Tools

Analysis Tools



Analysis + Prediction + Simulation + Validation

Daylighting

Carbon emissions

Lifecycle analysis

Energy

Ecological footprint

Electrical lighting

Thermal comfort/HVAC (dry-side)

Building water use (wet-side)

Material takeoffs

Bill of materials

Consultant integration

Structural/MEP/Interiors

Clash detection

Sequence of construction



1.2 Building systems carbon dioxide summary

Carbon dioxide totals in lbCO₂

Month	System (boilers, chillers, fans, pumps etc.)	Lights	Equip.
Jan	22835.6	6954.5	2003.7
Feb	19754.2	6281.5	1809.8
Mar	17454.9	6954.5	2003.7
Apr	11782.7	6730.2	1939.0
May	10493.3	6954.5	2003.7
Jun	13574.2	6730.2	1939.0
Jul	17822.1	6954.5	2003.7
Aug	15875.6	6954.5	2003.7
Sen	11654.3	6730.2	1939.0

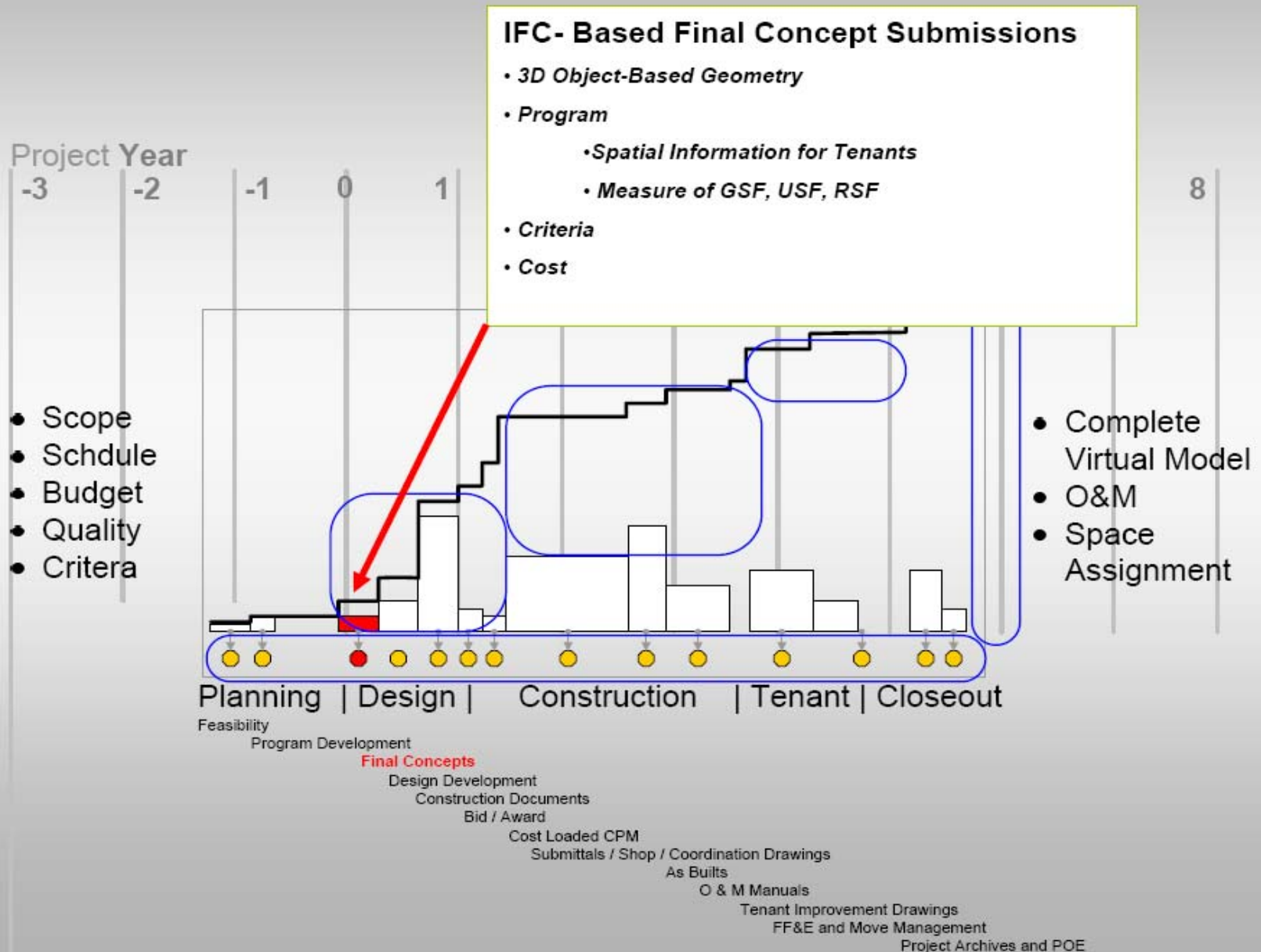
Interoperability ?

- API's
- CIS/2
- DGN
- DXF™
- DWF™
- DWG
- gbXML
- COBIE
- IFC
- ODBC
- OGC
- PDF
- SAT
- XLS
- XML

IFC Advantages

- Predictable 3D objects for exchanging data between application software(s)
- 3D object definitions facilitate interoperability discussions
- A vehicle to test interoperability concepts
- Efficient with “well documented business practices” – GSA Program

Focus of GSA BIM Initiative



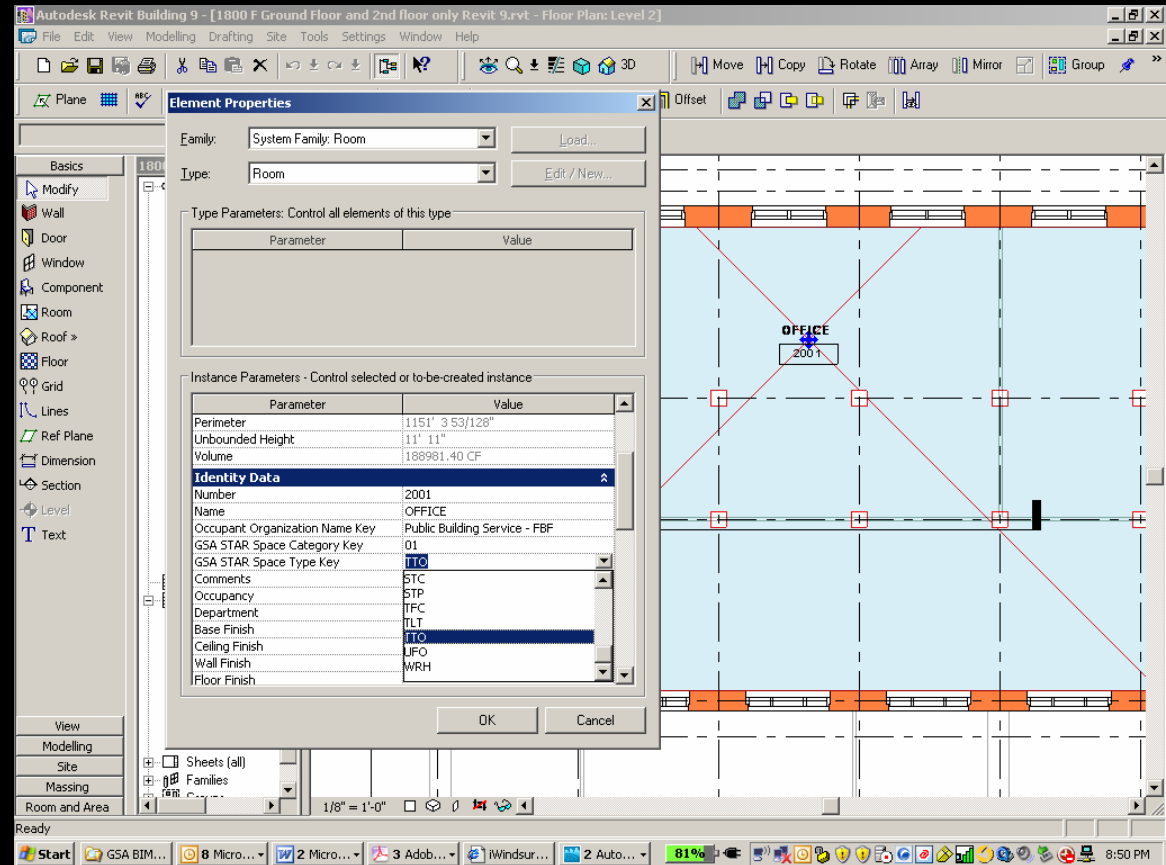
GSA Spatial Program BIM – Data Elements

GSA Requirements

- GSA Net Area
- Space Name
- Space Number
- Occupant Organization
- GSA Space Type

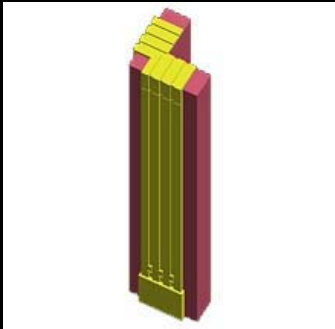
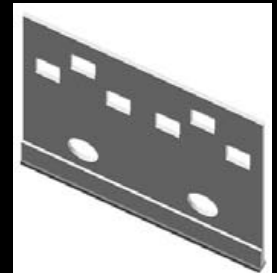
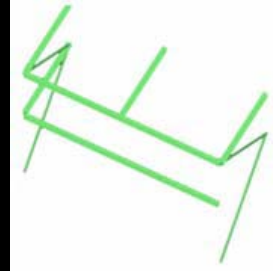
Model Elements

- Walls
- Doors
- Windows
- Columns
- Beams



Pankow Precast Interoperability Pilot

- Modeled
- Documented
- Exported **IFC, SAT, DWG, DWF, RVT**
- Imported files back to Revit



Energy Analysis

Green Building Studio Client

File Edit View Resources Tools Help

Address: http://www.greenbuildingstudio.com/

Recent: 7212_Energy.xml

About Green Building Studio Tutorial Downloads Support

Project List

Title Date Rights Runs Members

gbXML File
VRML View
DOE-2 File
Run List
Notes

GeoPraxis

Product Advice

Products by CSI Division

Add New Run

Select gbXML File

C:\Documents\7212_1\Energy.xml

VRML Display Options

☒ Exterior Surfaces

☒ Interior Surfaces

☒ Underground Surfaces

Run Title: 7212_Energy.xml

Get Results for Active File

1.0.1596.14518

Exit

Annual Peak Electric Demand 16.4 kW

Lifecycle² Energy

Electric 1,516,016 kWh

Fuel 59,175 Therms

Energy End-Use Charts

Click on chart for more or less detail

Annual Electric End-Use

Light 32.5%

Pumps & Aux 1.0%

Space Heating 4.1%

Space Cooling 10.9%

Fans 18.8%

Misc Equip 31.8%

Autodesk's Involvement with Standards Bodies

- Fiatech Member
- IAI (International Alliance for Interoperability)/BuildingSmart
- National BIM Standard (Under NIBS)
- AGC (Association of General Contractors)
- AIA
- US Green Building Council
- Open Geospatial Consortium
- Participating in ICC Smartcodes Project
- COBIE (Construction Operations Building Information Exchange)
- BIM to Facilities Management / O&M at LetterKenny Arsenal
- Various others (STEP, IGES)

Autodesk NavisWorks – Model Aggregation

Single, Unified Design & Construction Model

Problem

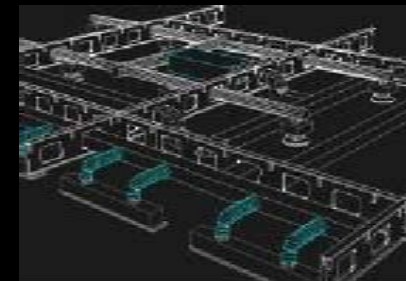
Architects, engineers and subcontractors use several modeling tools that do not easily work with each other (Revit, Civil 3D, ADT, ABS, Bentley, Nemetschek, Graphisoft, SolidWorks, QuickPen, CADPIPE etc.)

High definition laser scans (ex. Leica) are used for construction progress & QA (ex. Seattle library) and to capture as-built information, but need to be translated into design app to compare to model but data is not tied back to models

Solution

Create single, unified design model by aggregating models from multiple file formats in a easy to understand environment

Import point cloud data from laser scans into unified environment with the design model for comparison and interrogation



COBIE Demonstration & Discussion

COBIE Data in Revit Model for Demonstration

- Data Computed from BIM Model
- Manual Data entered as attributes attached to BIM Elements
- Methods for exporting this data for downstream use

Autodesk Vision for a more optimal work flow

- Move towards Integrated Project Delivery
- Large gaps between Design Intent Model and one useful for O&M
- Owners need to ask for “As-Built” BIM models

Rolling out COBIE requirement to A&Es and Contractors

- How do you get their buy in?
- How does this effort scale?
- Open questions?



Thank You!

Questions?

Autodesk®