



Presented by:
Kimon G. Onuma, FAIA
Susan Mitchell

and other BIMStorm Participants

buildingSMARTalliance™



Presented by:
Kimon Onuma, FAIA
ONUMA, Inc.

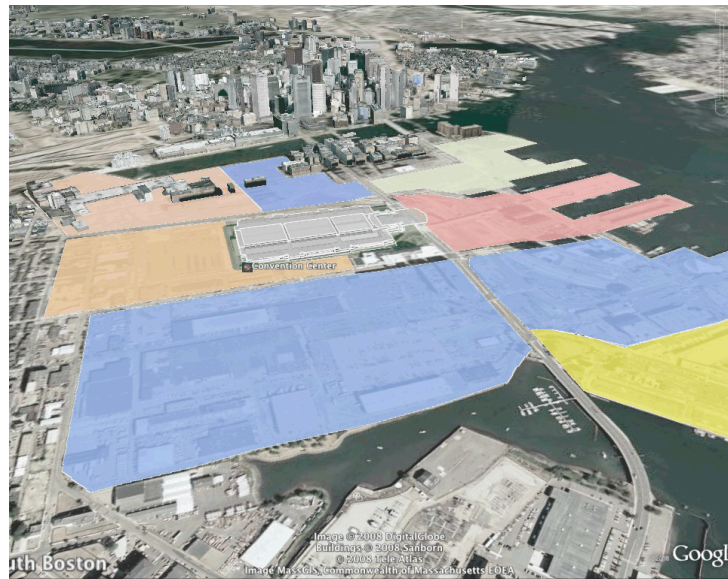
BIM can be Simple



<http://BIMStorm.com/Mobile>
User: BIMStorm Boston Pass: AIA



Participate in BIMstorm Boston Today!



What would you like to see built in Boston? Please fill out the form and hand back to us. We will build BIMs (Building Information Models) of your program.

Example:

Project Name: **John Smith's Hotel**

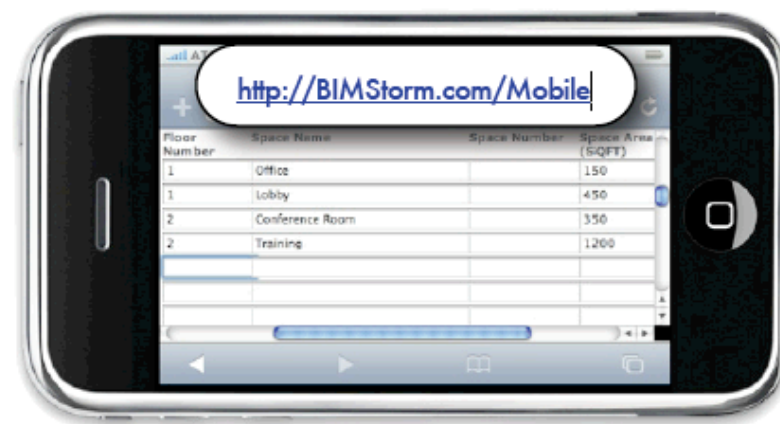
Total GSF: **120,000 SF**

Number of Floors: **14**

Project Name :

Total GSF:

Number Of Floors:



If you have Internet Access
Go to the following link and enter this information yourself.

<http://BIMstorm.com/mobile>

User Group: BIMstorm Boston

Password: AIA



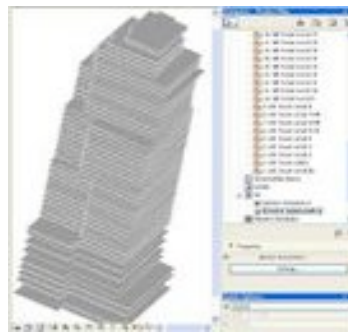
Standards and Rules

Standards

North America Grounded NEMA 5-15	Japan Non-grounded JIS C 8303	Europe German style CEE718 Schuko	Europe French style Schuko	Europe/Russia Non-grounded CEE718 Europlug	Great Britain Grounded BS-1363	Great Britain "Shaver socket" BS-4573
Australia/China Grounded AS-3112	Italy Grounded CEI 23-16	Switzerland Grounded SEV-1011	Denmark Grounded SRAE 1962/08	Israel Grounded SI 32 (IS 16A-R)	India Grounded BS-546 "Small"	South Africa Grounded BS-546 "Large"

Who Likes Rules?

Open Standards in the Center



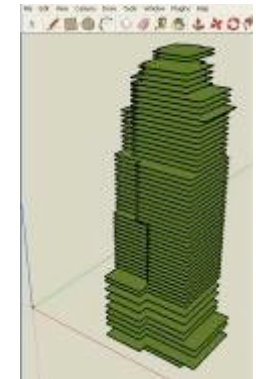
Archicad
IFC



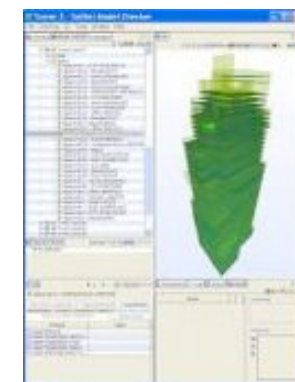
VectorWorks
IFC



DProfiler



SketchUP
IFC



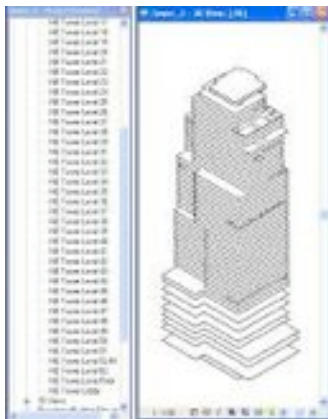
Solibri - IFC



Onuma Planning System
IFC



DDS-CAD - IFC



Revit Architecture
& Structure - IFC



Who Owns The BIM?



Owner



Architect

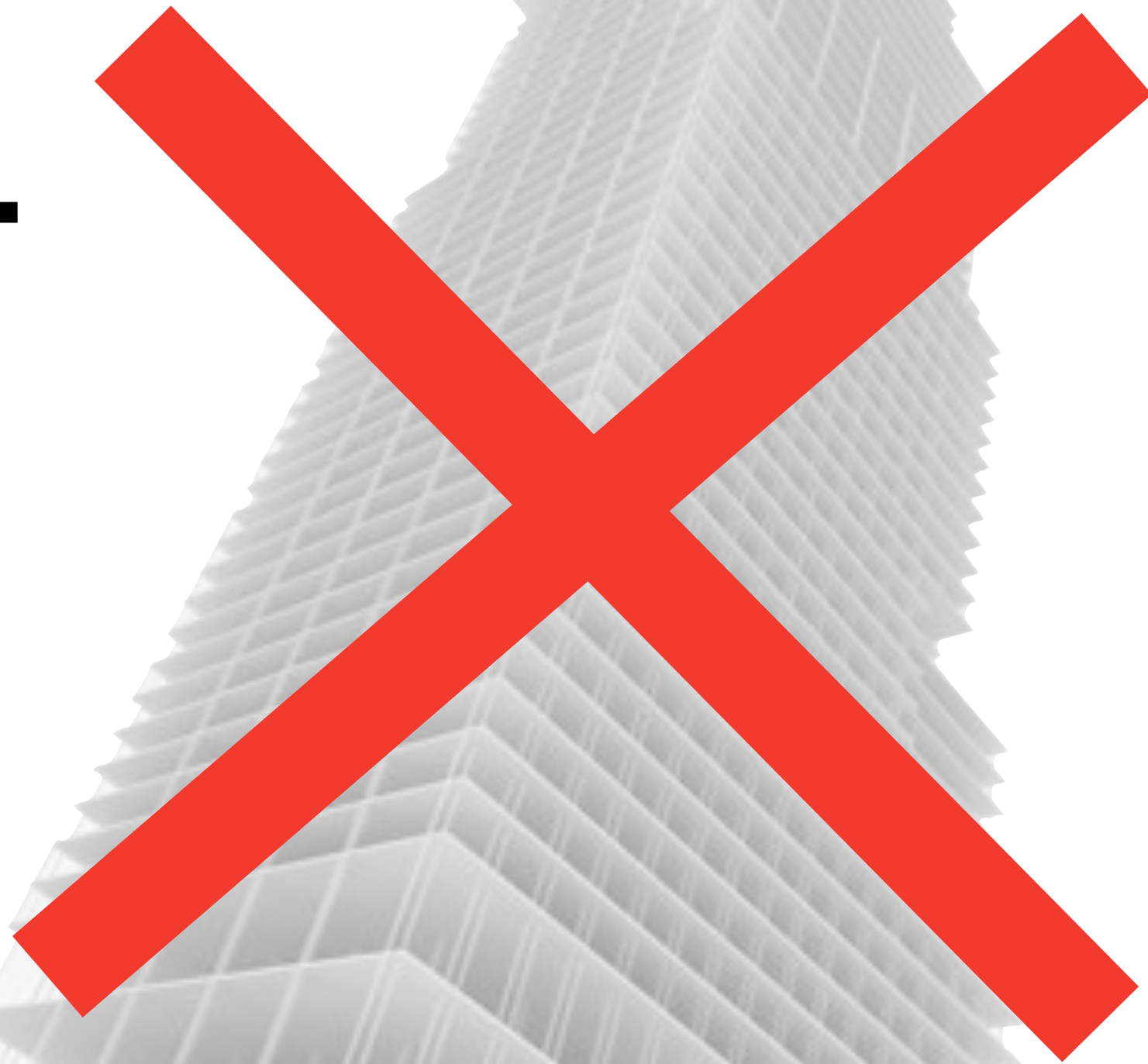


Engineer



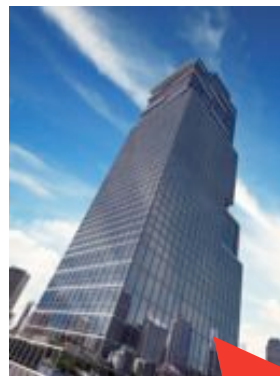
Contractor

It is
NOT
One
BIM





Architect



Arch.



Contractor

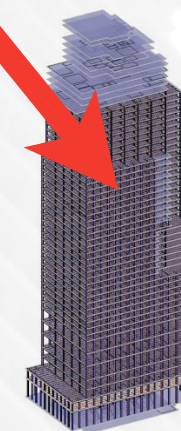
One Standard



Engineer



Mech.



Struct.



Engineer

Many BIMs



Architect



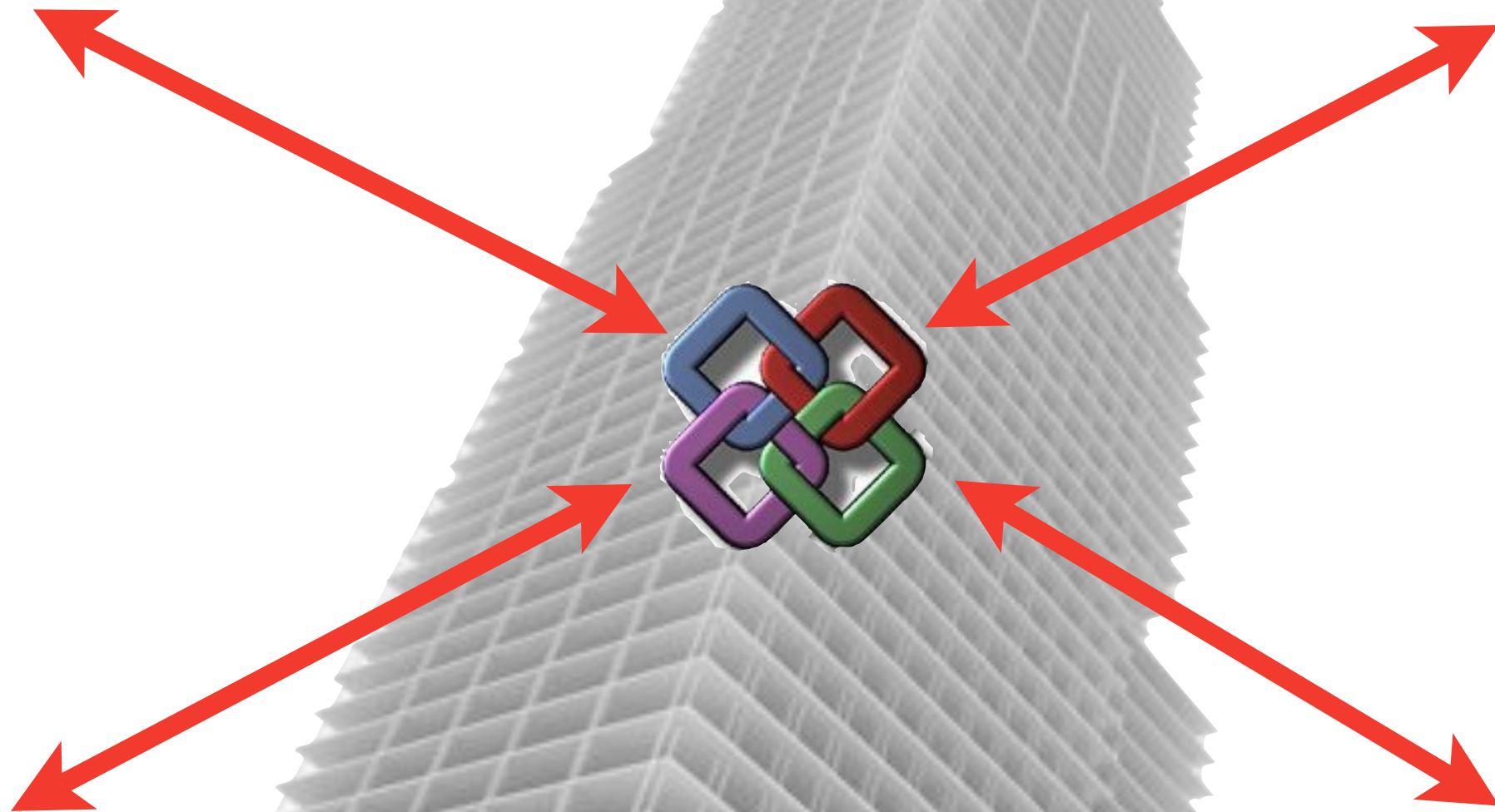
Contractor



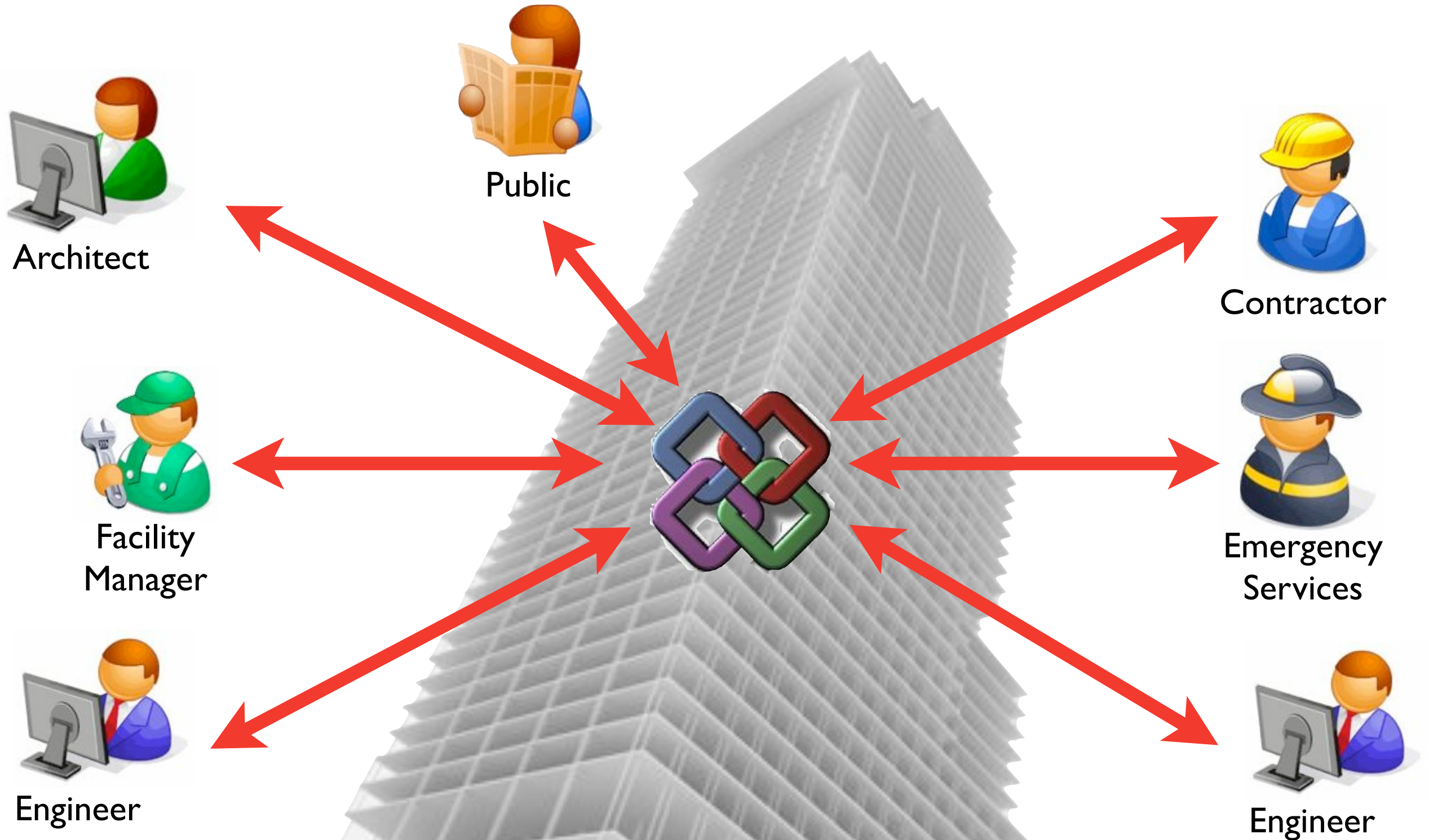
Engineer



Engineer



Accessible to All



Accessible to All



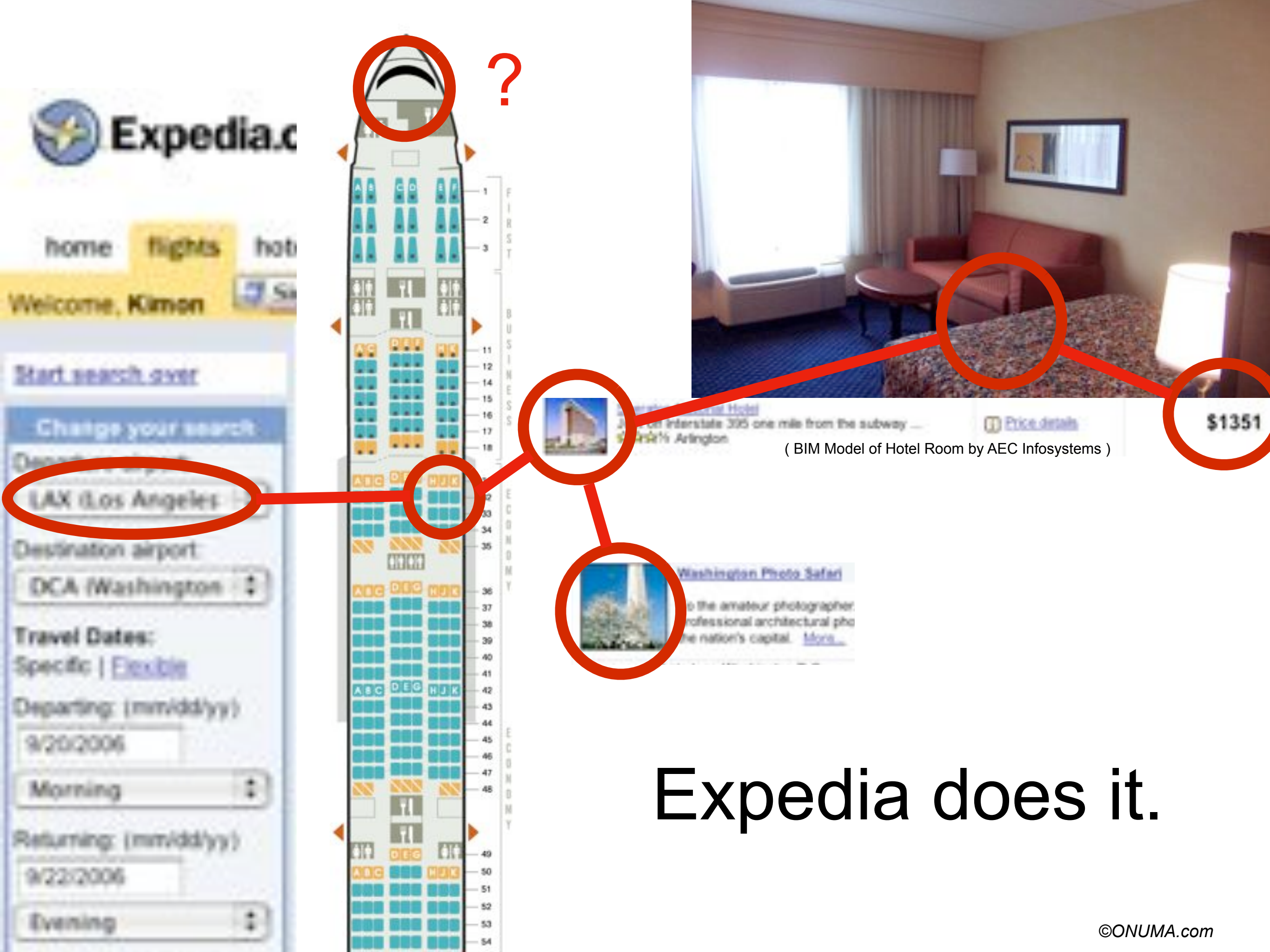
Public



Emergency
Services

BIM has the
Power to Reverse
Global Warming

The
technology
exists Today



home flights hotels

Welcome, Kimon

Start search over

Change your search:

LAX (Los Angeles)

Destination airport:

DCA (Washington)

Travel Dates:

Specific | Flexible

Departing: (mm/dd/yy)

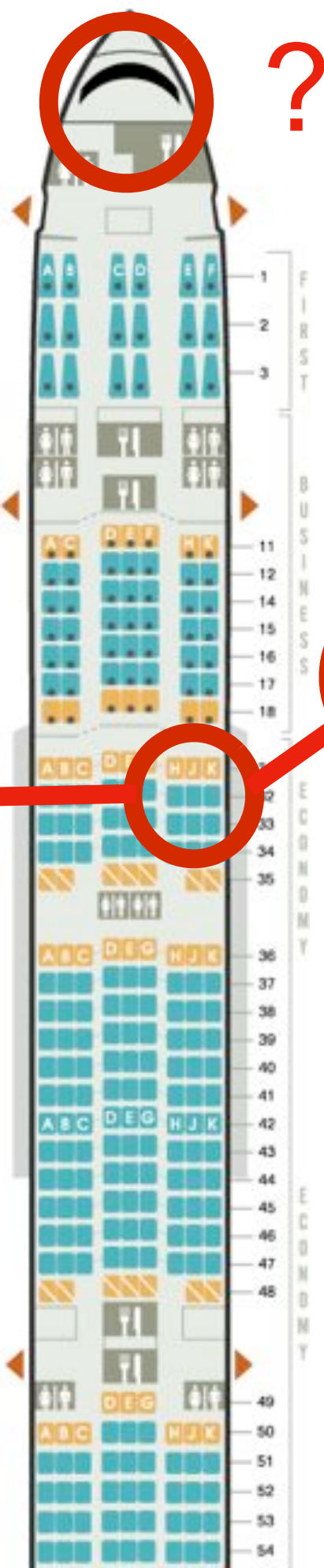
9/20/2006

Morning

Returning: (mm/dd/yy)

9/22/2006

Evening



Washington Photo Safari
to the amateur photographer, professional architectural photo
the nation's capital. [More...](#)



Washington Photo Safari
to the amateur photographer, professional architectural photo
the nation's capital. [More...](#)



Price details

\$1351

(BIM Model of Hotel Room by AEC Infosystems)

Expedia does it.

Break The Rules

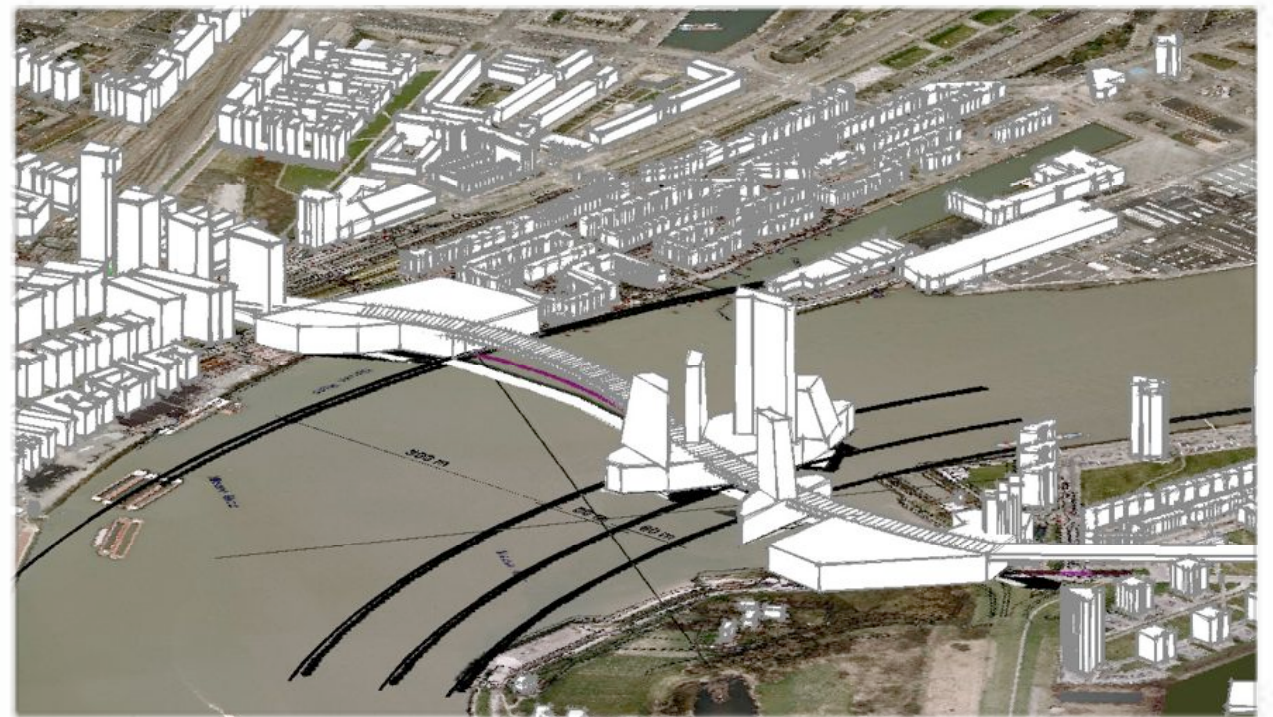
BIMStorm Boston Part I





ROTTERDAM

- ☐ RGD (GSA OF THE NETHERLANDS)
- ☐ 60 ARCHITECTS
- ☐ 5 DAYS
- ☐ 1.3 BILLION EURO PROJECT
- ☐ BRIDGE, ISLAND AND BUILDINGS ON TWO SIDES OF RIVER

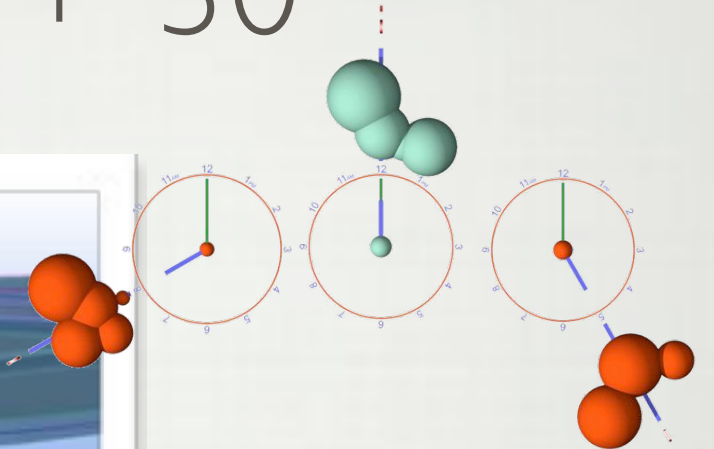
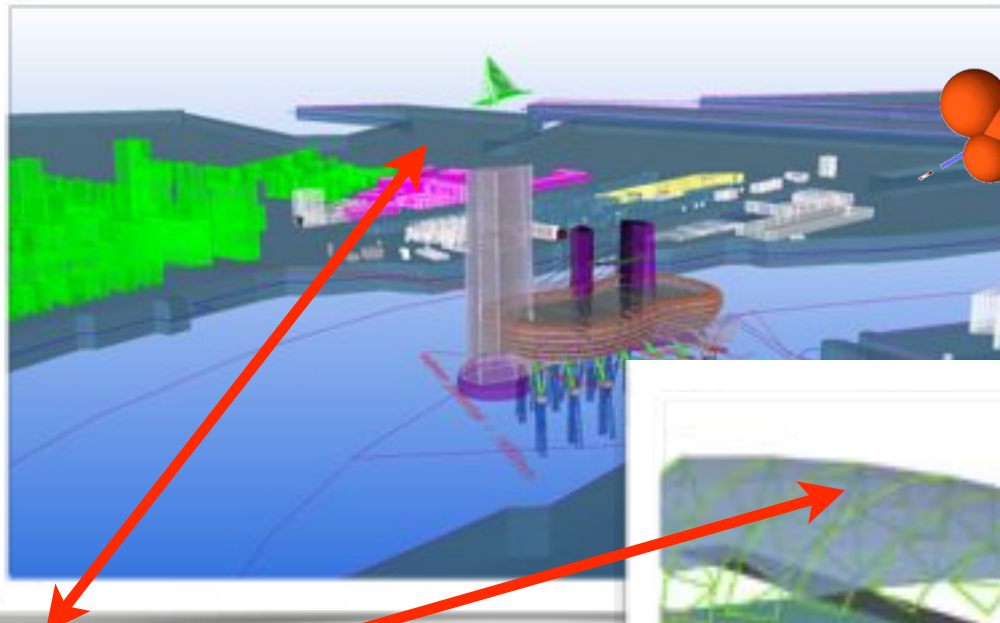


DAY 2

BIM 60 ARCHITECTS + 30



HOW MANY
SQUARE METERS?



MOST INFORMATION WAS BEING SHARED AS .DWG FILES

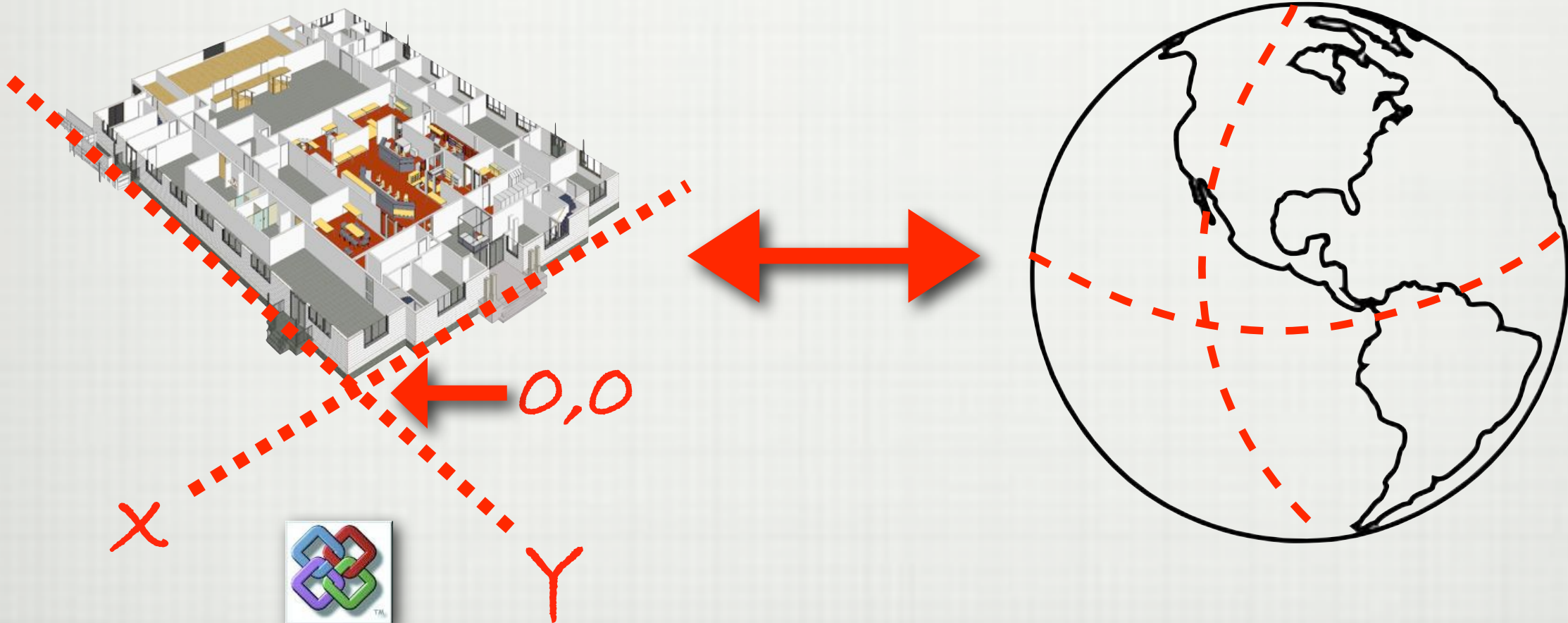
A screenshot of a video conference window. The window has a title bar at the top with the text "Microsoft Teams". The main area shows a group of people in a meeting room, with some individuals visible in the foreground and others in the background. The room has large windows and modern lighting. The video feed is framed by a dark border.

© Onuma

WHERE IS THE ORIGIN?

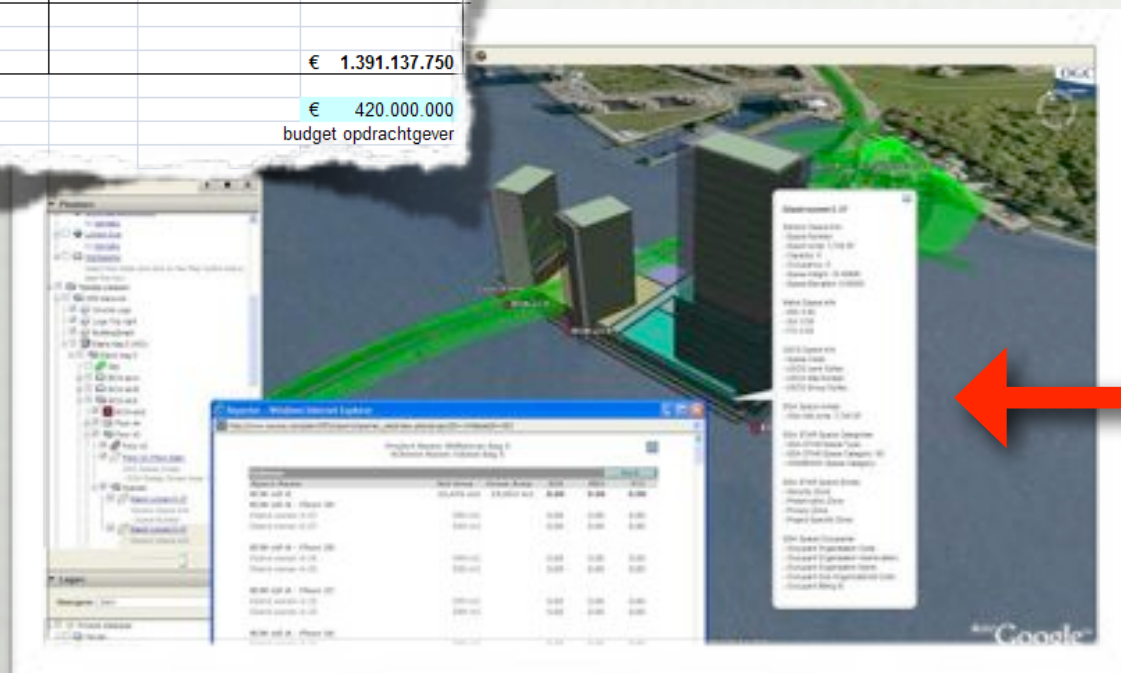
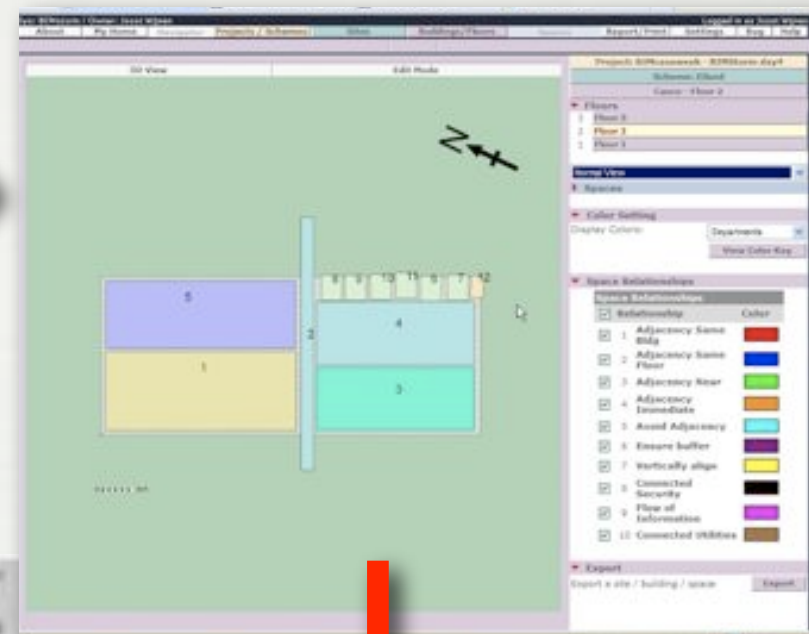
LOCAL COORDINATE

WORLD COORDINATE



GLOBAL REAL TIME MULTI USER

Eenheid	H	P	H*
post	1	€ 420.000.000	€ 420.000.000
m2	16000	€ 5.000	€ 80.000.000
m2	31500	€ 2.000	€ 63.000.000
m2	153510	€ 2.500	€ 383.775.000
m2	48935	€ 1.250	€ 61.168.750
m2	81659	€ 2.500	€ 204.147.500
m2	20865	€ 2.000	€ 41.730.000
m2	4800	€ 1.250	€ 6.000.000
m2	27925	€ 2.500	€ 69.812.500
m2	30752	€ 2.000	€ 61.504.000
		€ 1.391.137.750	
		€ 420.000.000	
		budget opdrachtgever	



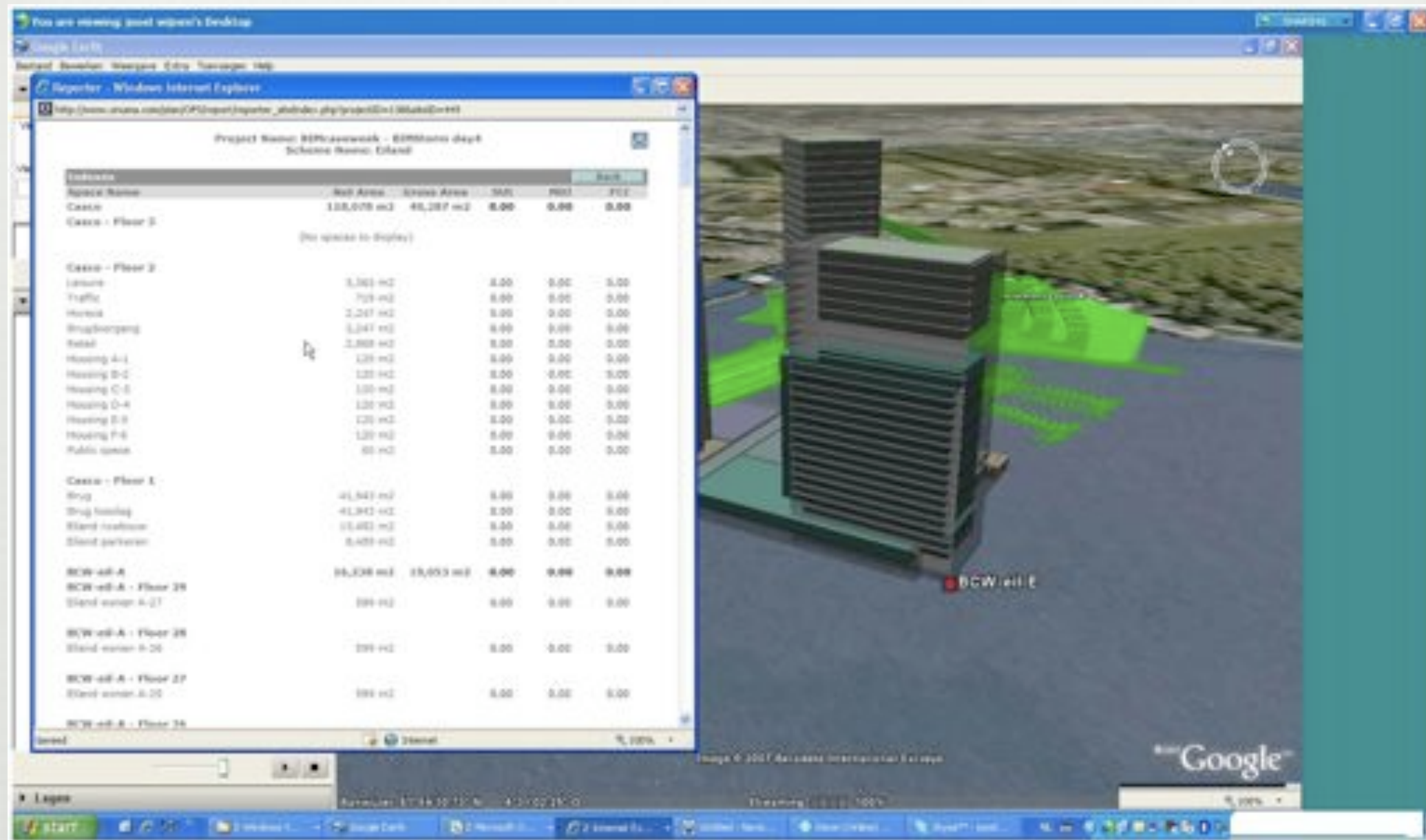
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ST_0102	Winkelwoning	Externe	ITC	KPL
ST_0103	Winkelwoning	Externe	ITC	KPL
ST_0104	Winkelwoning	Externe	ITC	KPL
ST_0105	Winkelwoning	Externe	ITC	KPL
ST_0106	Winkelwoning	Externe	ITC	KPL
ST_0107	Winkelwoning	Externe	ITC	KPL
ST_0108	Winkelwoning	Externe	ITC	KPL
ST_0109	Winkelwoning	Externe	ITC	KPL
ST_0110	Winkelwoning	Externe	ITC	KPL
ST_0111	Winkelwoning	Externe	ITC	KPL
ST_0112	Winkelwoning	Externe	ITC	KPL
ST_0113	Winkelwoning	Externe	ITC	KPL
ST_0114	Winkelwoning	Externe	ITC	KPL
ST_0115	Winkelwoning	Externe	ITC	KPL
ST_0116	Winkelwoning	Externe	ITC	KPL
ST_0117	Winkelwoning	Externe	ITC	KPL
ST_0118	Winkelwoning	Externe	ITC	KPL
ST_0119	Winkelwoning	Externe	ITC	KPL
ST_0120	Winkelwoning	Externe	ITC	KPL
ST_0121	Winkelwoning	Externe	ITC	KPL
ST_0122	Winkelwoning	Externe	ITC	KPL
ST_0123	Winkelwoning	Externe	ITC	KPL
ST_0124	Winkelwoning	Externe	ITC	KPL
ST_0125	Winkelwoning	Externe	ITC	KPL
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ST_0150	Winkelwoning	Externe	ITC	KPL

DAY 3 - BIMstorm IMPORT DATA INTO MODEL SERVER



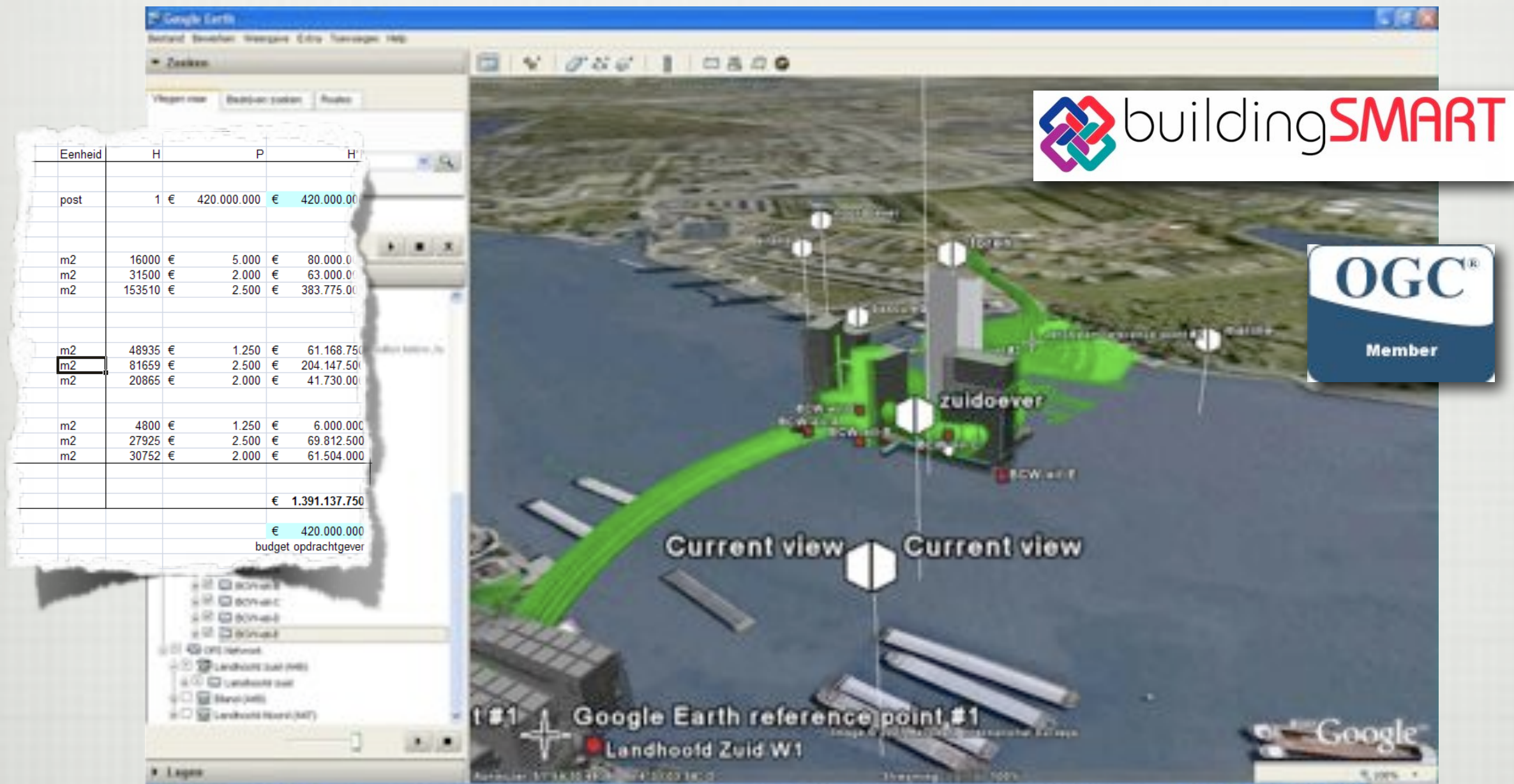
DAY 3

DATA IN REAL TIME IN BIM



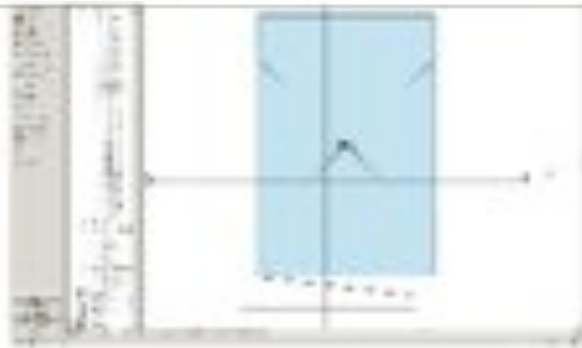
CALCULATIONS IN REAL TIME

DAY 3

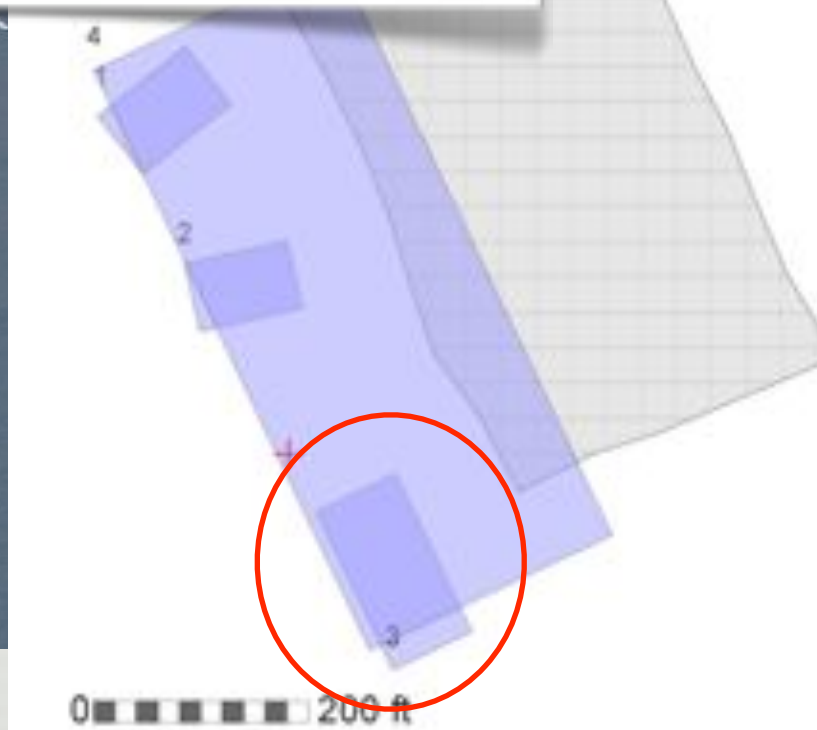


ALL BUILDINGS PLACED BASED ON DATA INTO MODEL

DAY 4 - EXPORT TO BIM



Import into Revit using IFC.
Use Revit to study design of
Curtain Walls



Project: BIMstorm dag 3
Scheme: Eiland dag 3

Buildings	Floors
1 BCW-eil-A	25
2 BCW-eil-B	25
3 BCW-eil-E	44
4 Casco eiland	5

Site Features

Export

Export a site / building / space

Exporter - Windows Internet Explorer

<http://www.onuma.com/plan/OPS/export/exportBldg.php/projectID=1446/siteID=453>

Exporter

ONUMA PLANNING SYSTEM

Export

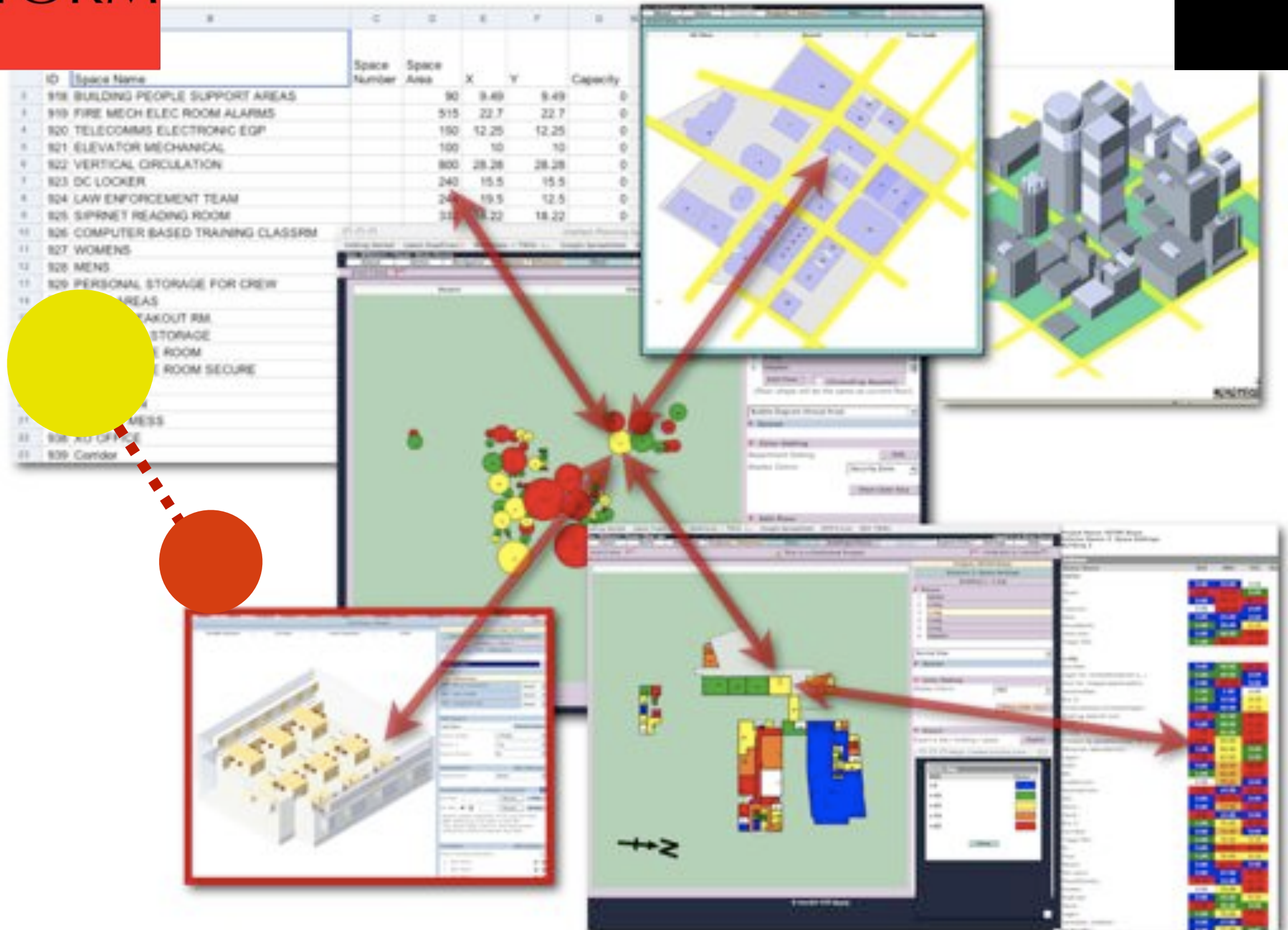
BIMstorm dag 3
Eiland dag 3

Buildings
1 BCW-eil-A
2 BCW-eil-B
3 BCW-eil-E
4 Casco eiland

Format: Objects: ☒ Site ☐ Storey Volume ☒ Floor Slab ☒ Space

Floors:

Onuma Planning System



Global

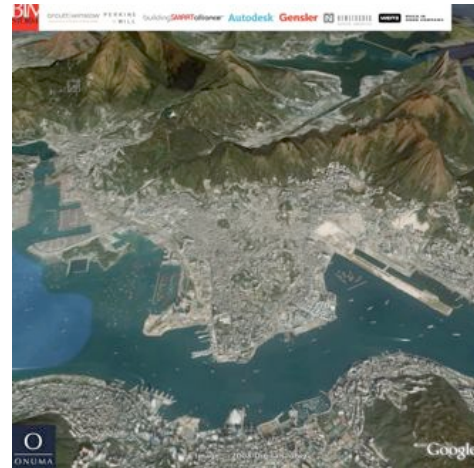
Mexico



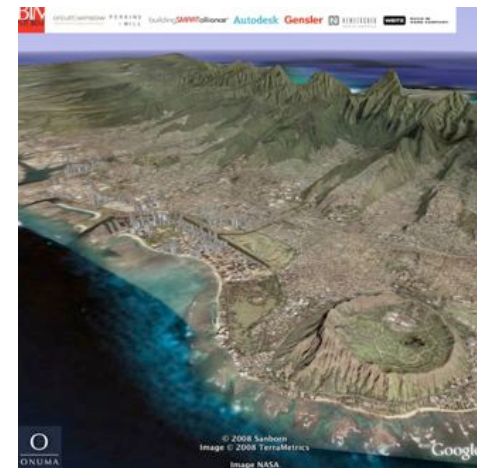
Netherlands



Hong Kong



Honolulu



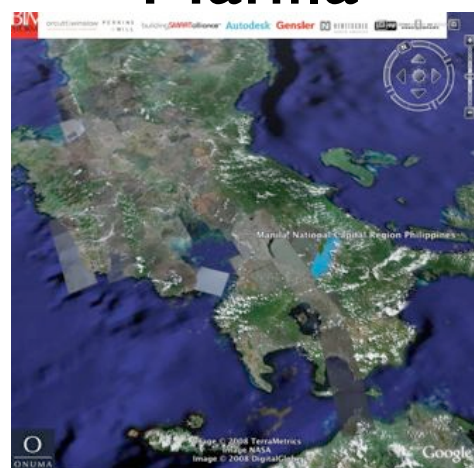
Chicago



Switzerland



Manila



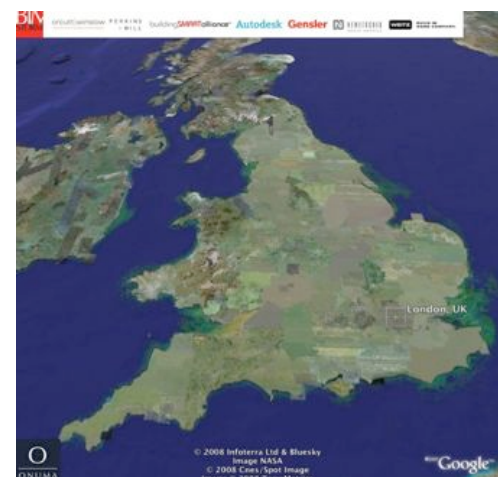
Penn State



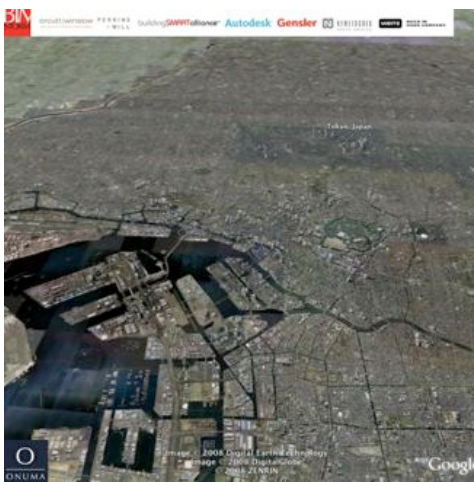
Los Angeles



UK



Tokyo



Many More



Pasadena



orcutt|winslow
ARCHITECTURE PLANNING INTERIOR DESIGN

PERKINS
+ WILL

buildingSMARTalliance™

Autodesk® Gensler

N NEMETSCHKE
NORTH AMERICA

WEITZ

BUILD IN
GOOD COMPANY.



CADVisual
Building Lifecycle Management

DV
Digital
Vision
Automation



GRAPHISOFT®
Virtual Building Solutions



Renee Tietjen, AIA RLA LEED - AP
at Department of Veterans Affairs

SMARTcodes™

ICC INTERNATIONAL
CODE COUNCIL®



National Institute of
Building Sciences



OSCRE

WHITESTONE
RESEARCH



WISCONSIN DEPARTMENT OF
ADMINISTRATION



BUILDING TECHNOLOGIES

Serving the BIM Community since 1997

familia
Corazón

STORZ
KARL STORZ - ENDOSKOPE



MED PLAN
ENGINEERING AG

SOLIBRI

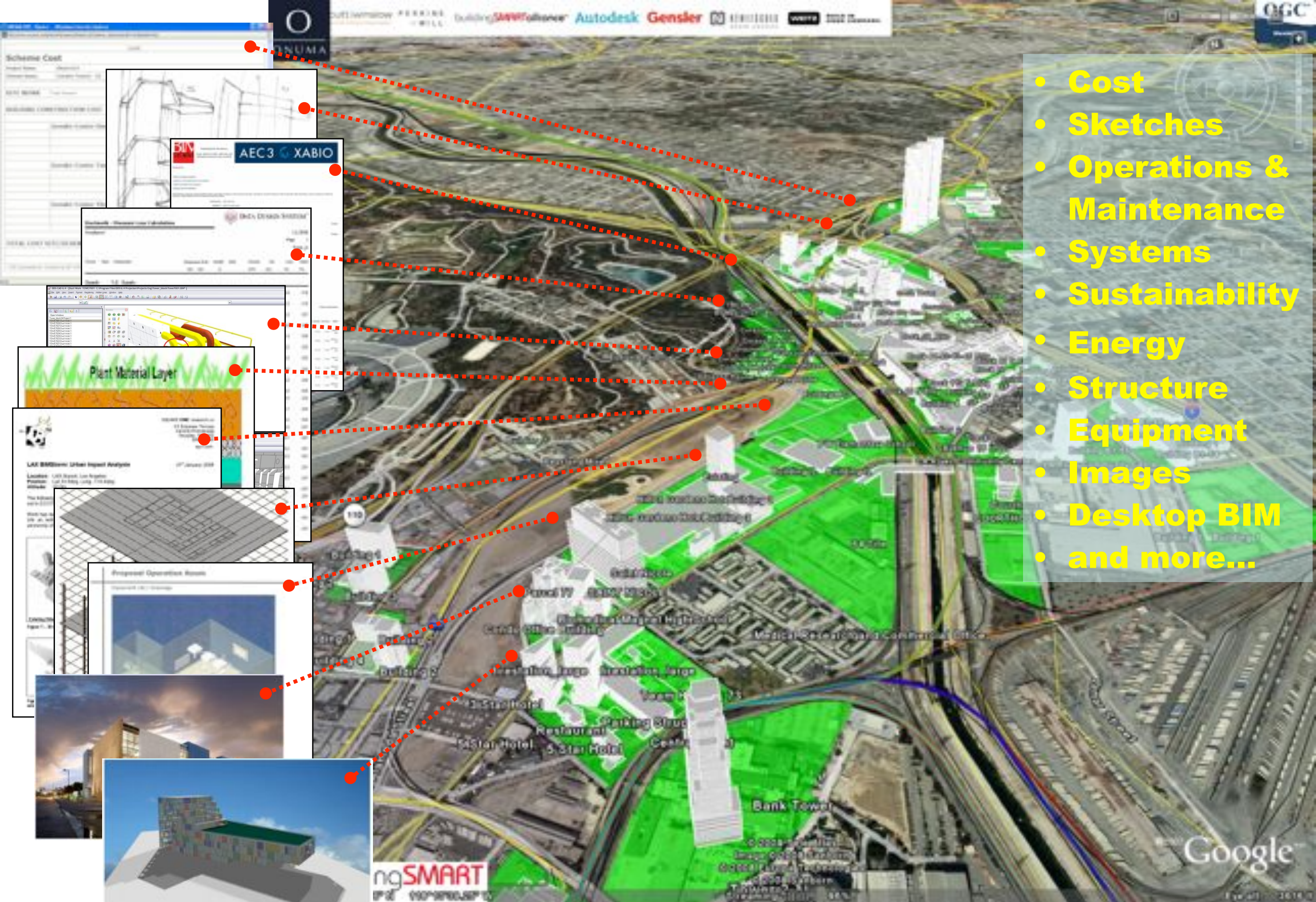


© Onuma



NATIONAL ASSOCIATION
OF REALTORS®

The Voice for Real Estate®



- **Cost**
- **Sketches**
- **Operations & Maintenance**
- **Systems**
- **Sustainability**
- **Energy**
- **Structure**
- **Equipment**
- **Images**
- **Desktop BIM**
- **and more...**



The value of a BIM
increases exponentially as
the number of users that
can access the BIM
increases.

Planners & Architects

Standards Organizations

Fire/ Emergency Planning

Energy Analysis & Sustainable Design

Geographic Information System (GIS)

Cost Estimators

Owners & Developers

Structural Engineering

SMARTCodes

Corazon

Operations & Maintenance Building Lifecycle

Connect many people with different roles and responsibilities in realtime for a single day, design charrette over the web

Hyper-Collaboration of Virtual Team

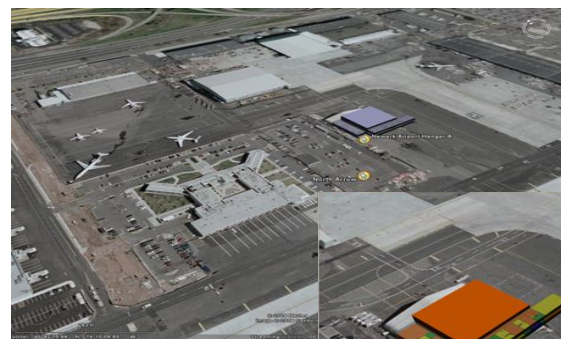


BIN Storm LAX - Session 2 Presentation

Google™

Open Geospatial Consortium - OWS 4

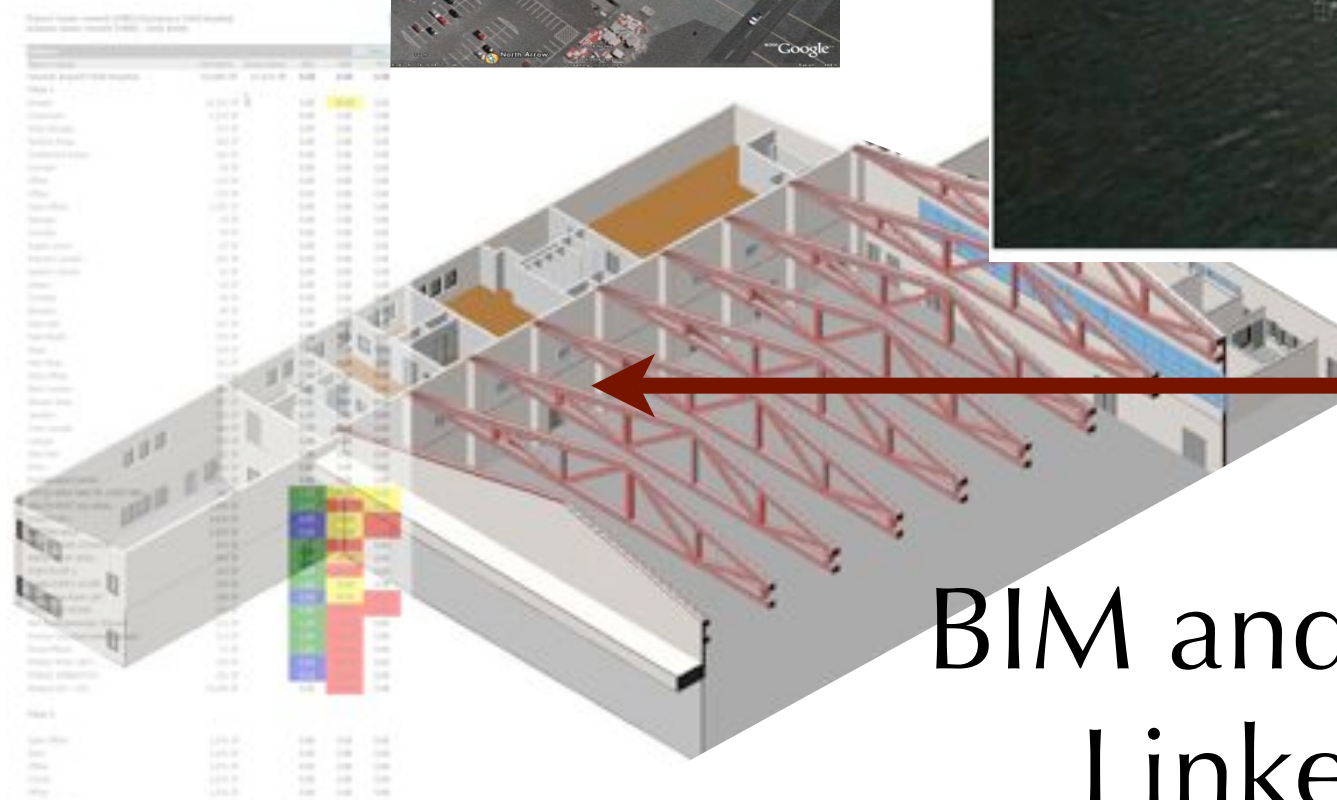
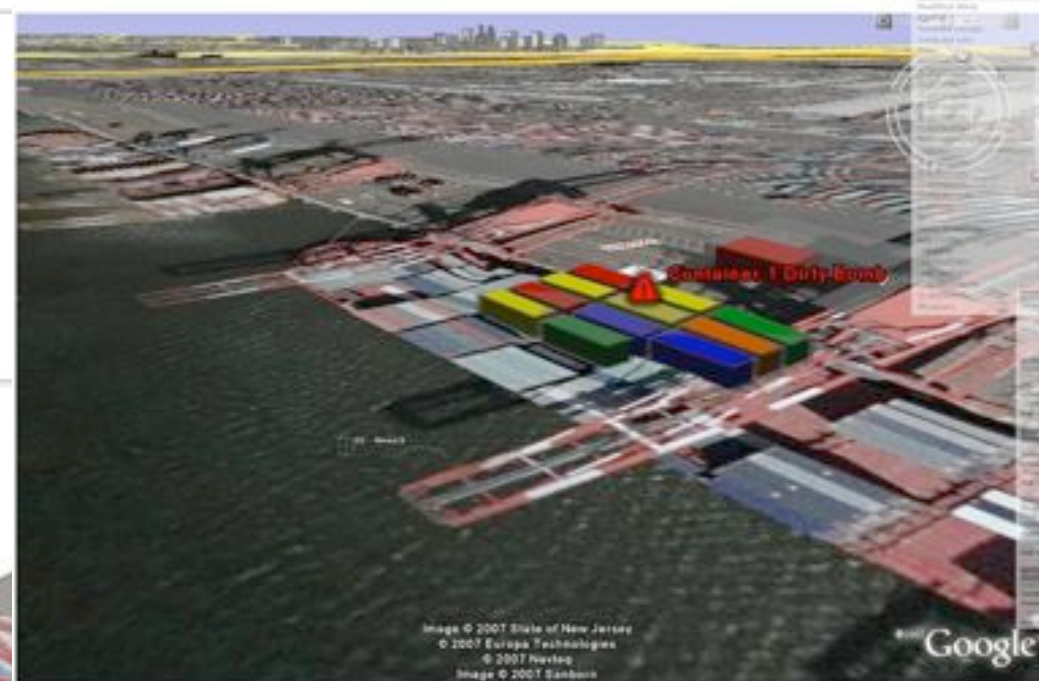
ONUMA Planning System as a Web Feature Server



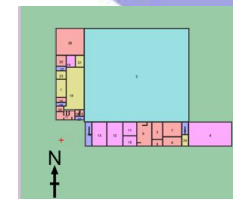
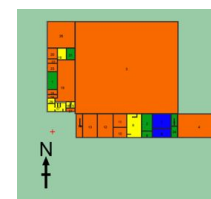
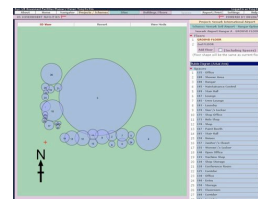
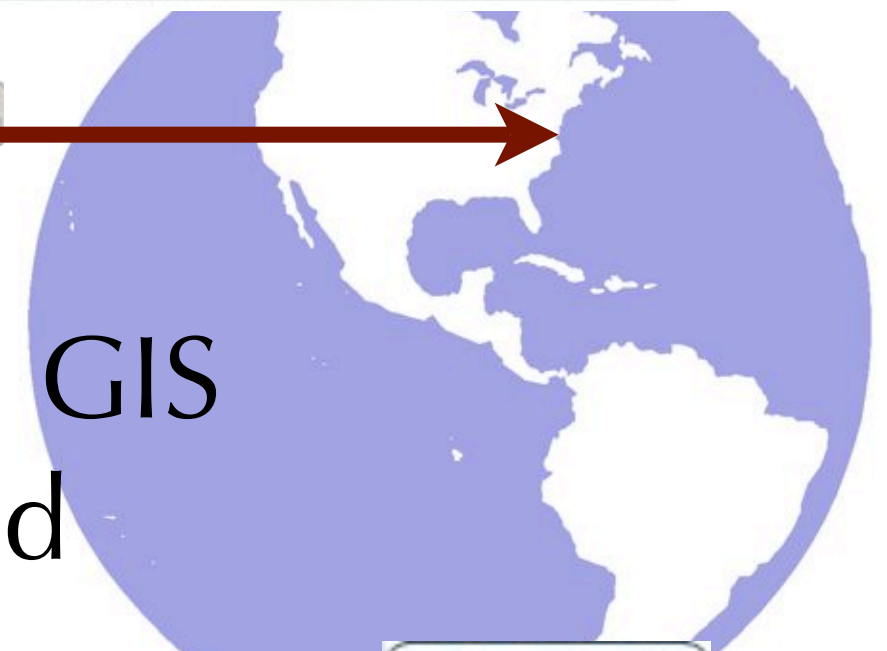
Hangar

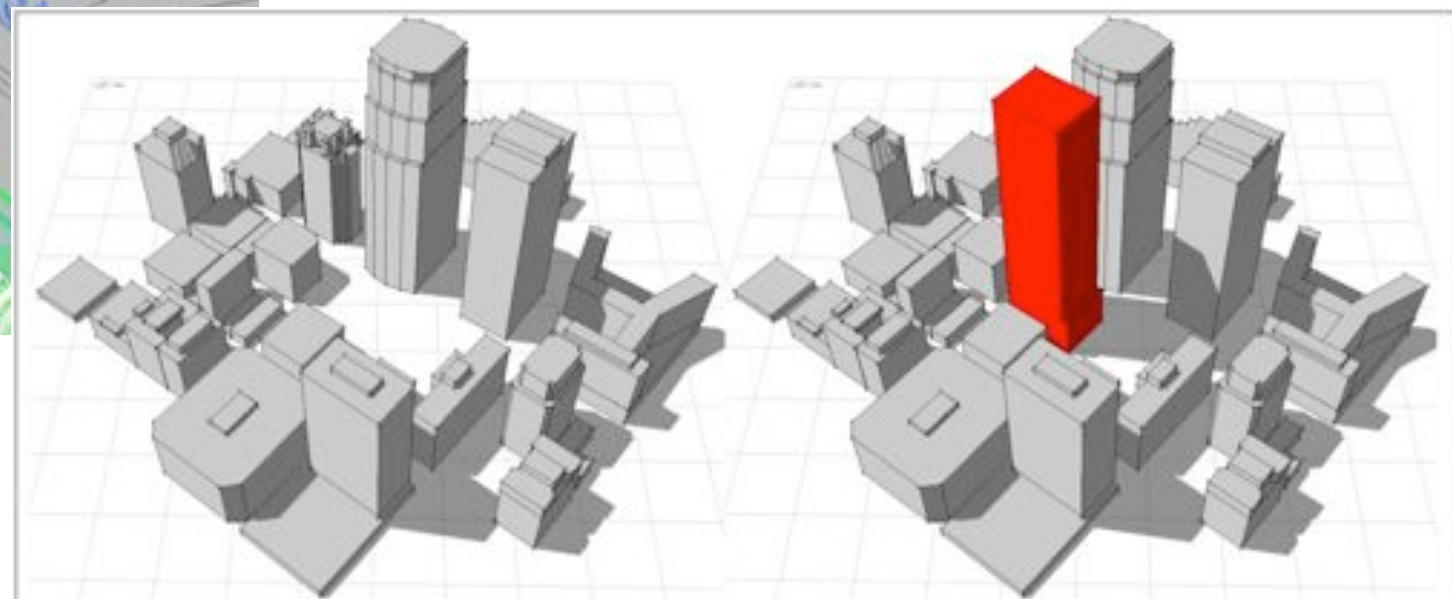
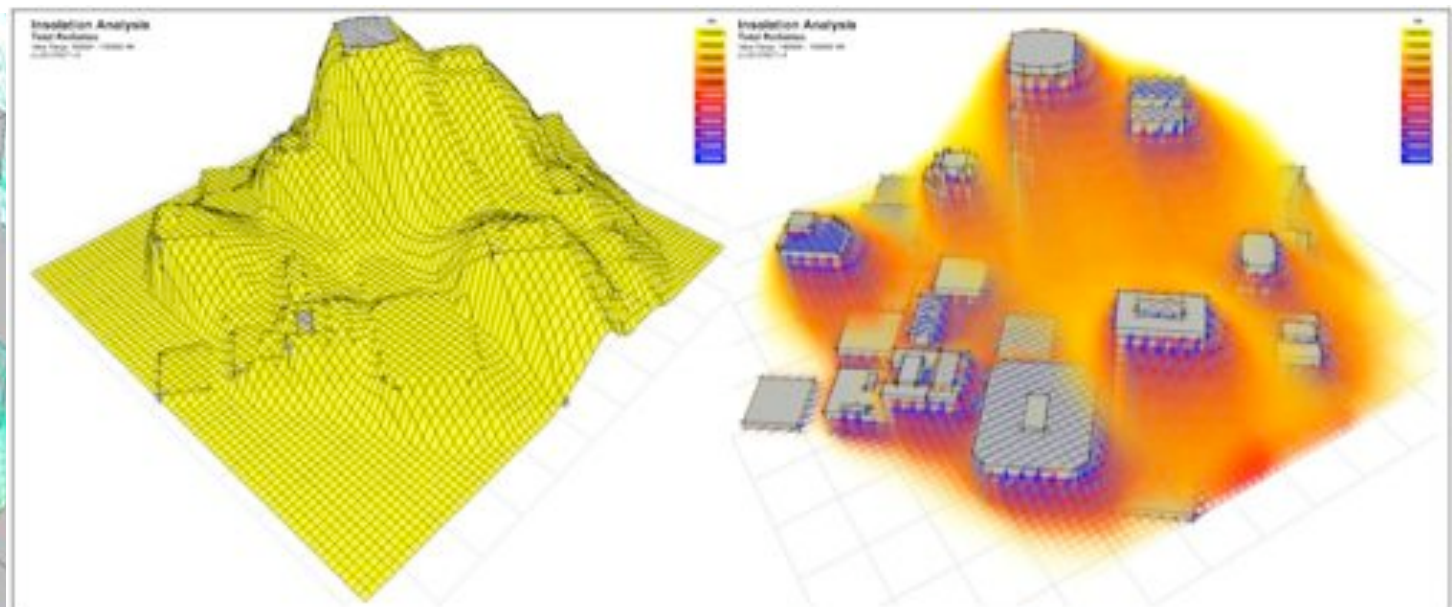
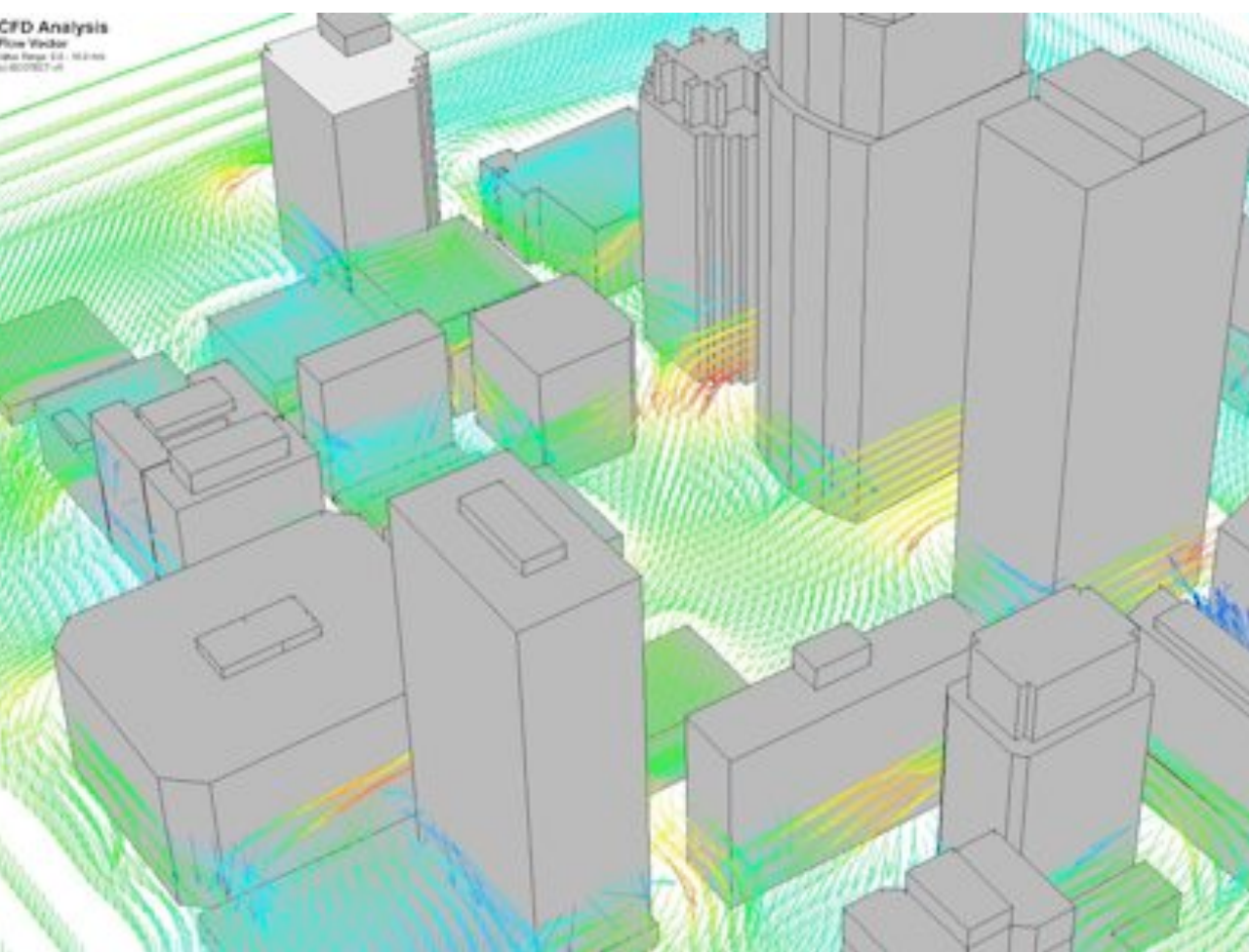
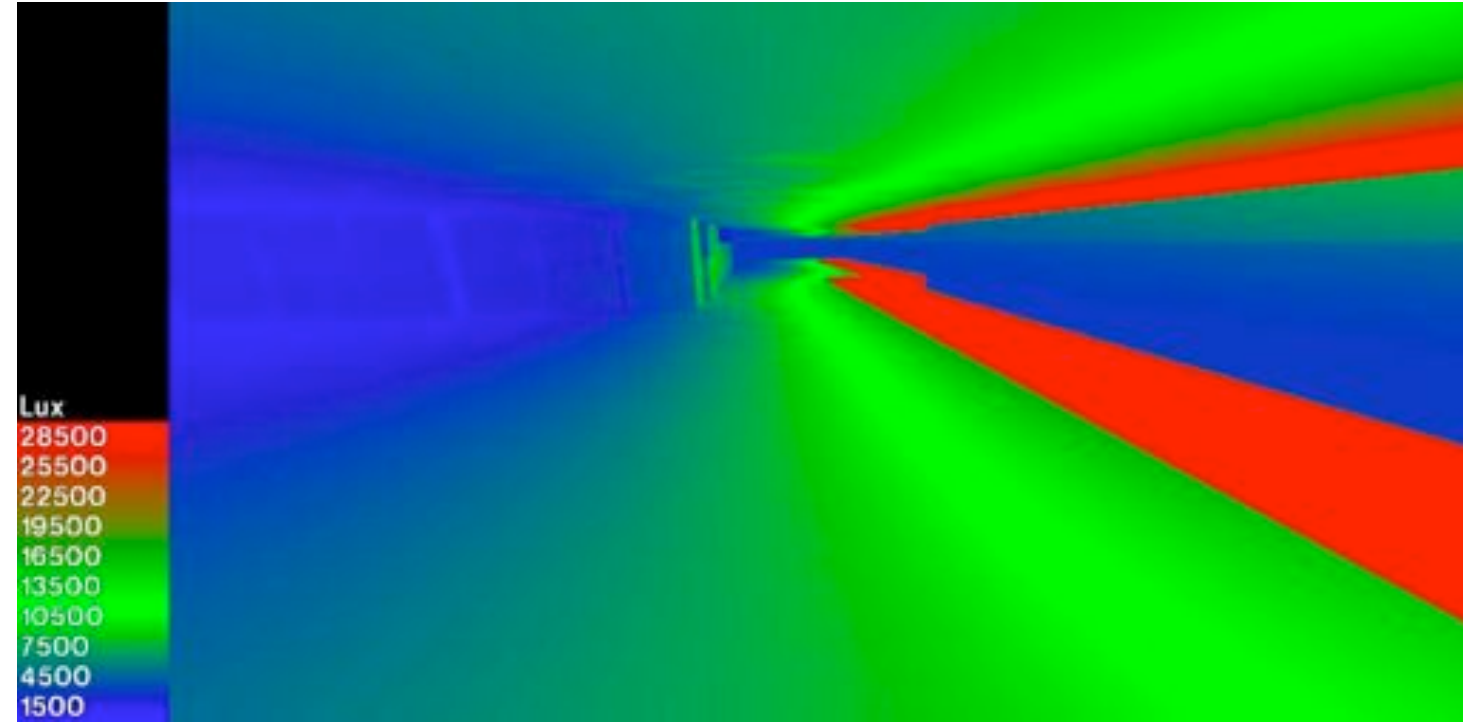
Metric Space Info

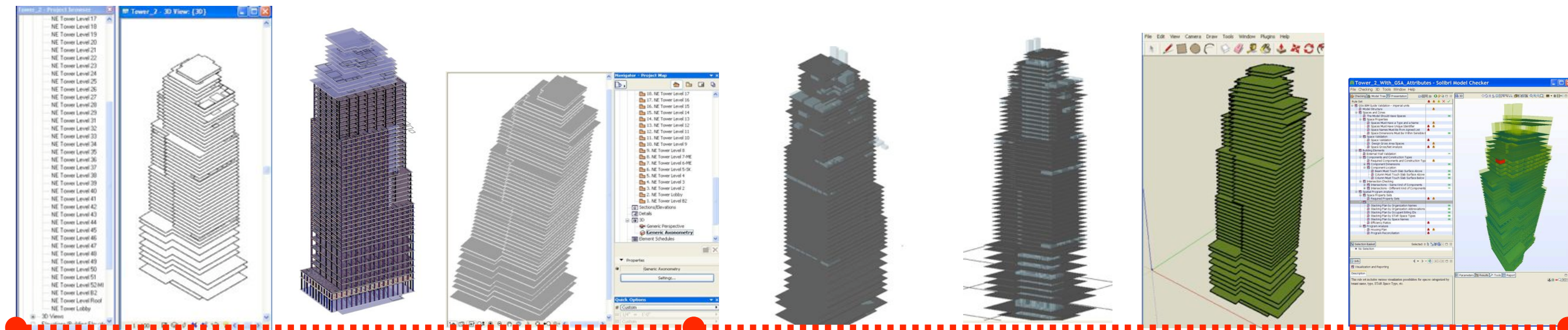
- MDI: 85.00
- SUI: 0.00
- FCI: 0.00



BIM and GIS
Linked







Revit Architecture
& Structure - IFC

Archicad
IFC

VectorWorks
IFC

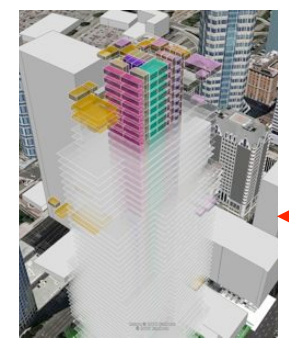
Nemetshek
IFC Viewer

SketchUP
IFC

Solibri
IFC

Onuma Planning System
IFC, KML, GBXML, CSV

Google Earth



Space Name	Floor Number	Space Area
Offices	40	4500
	40	2300
	39	13450
	39	2400
	39	400
Retail	1	7600
Restaurant	1	12800
Lobby	1	6700
Total SF		622,173

Excel

KML

IFC

IFC

IFC

IFC

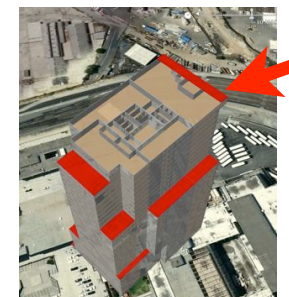
BIM

IFC

Whitestone
O&M

O&M

Acusourcing
3D Model
2/20/08



4D In GE

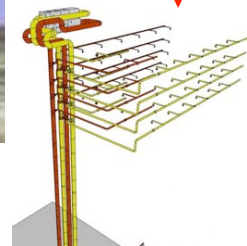


Elite CAD

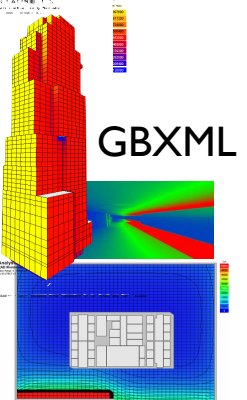
Rhino



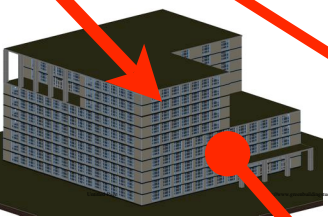
IFC



DDS CAD



Ecotect



GBXML

GBXML

GBXML

GBXML

GBXML

GBXML

GBXML

GBXML

GBXML

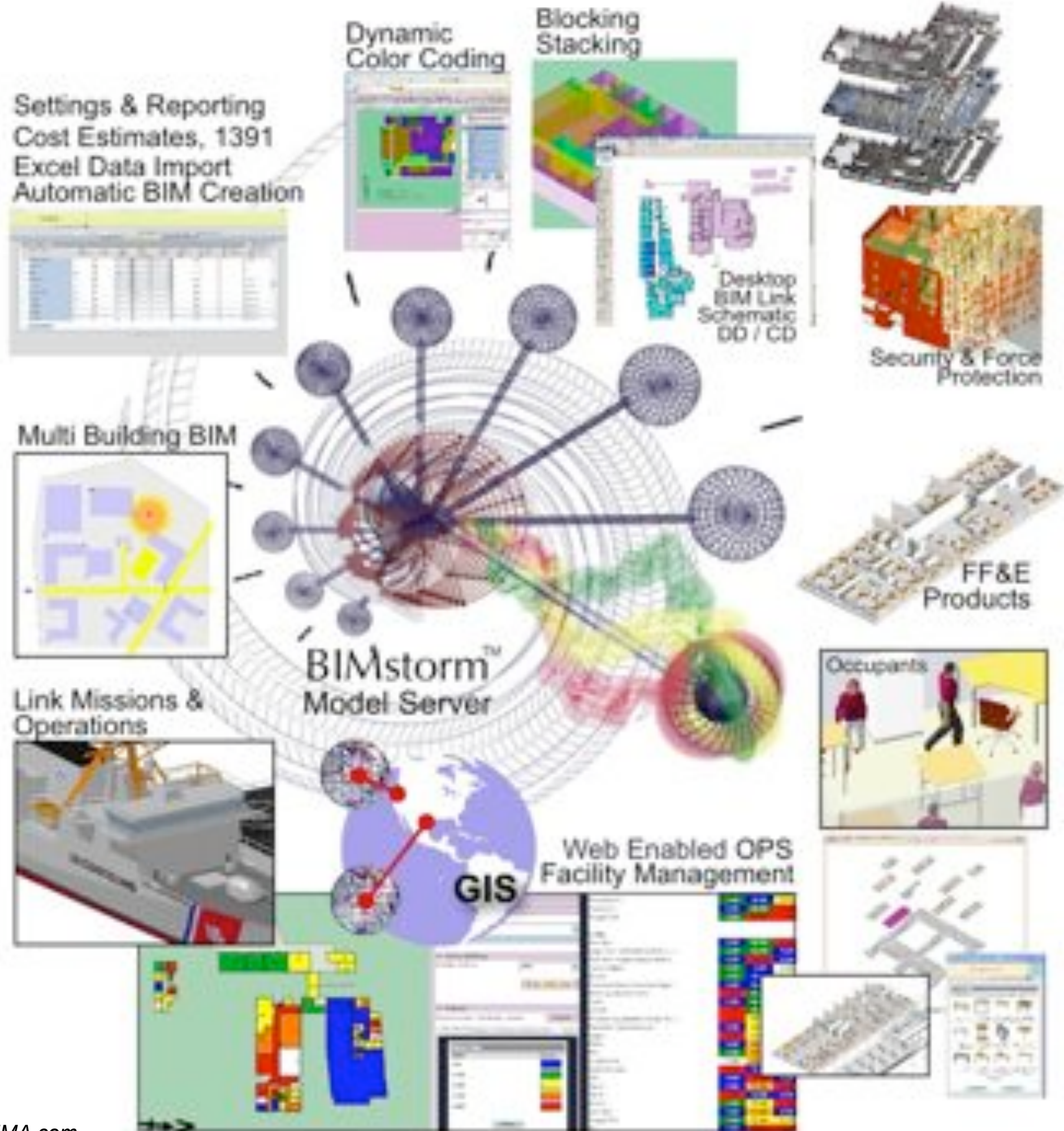
GBXML

Green Building Studio™

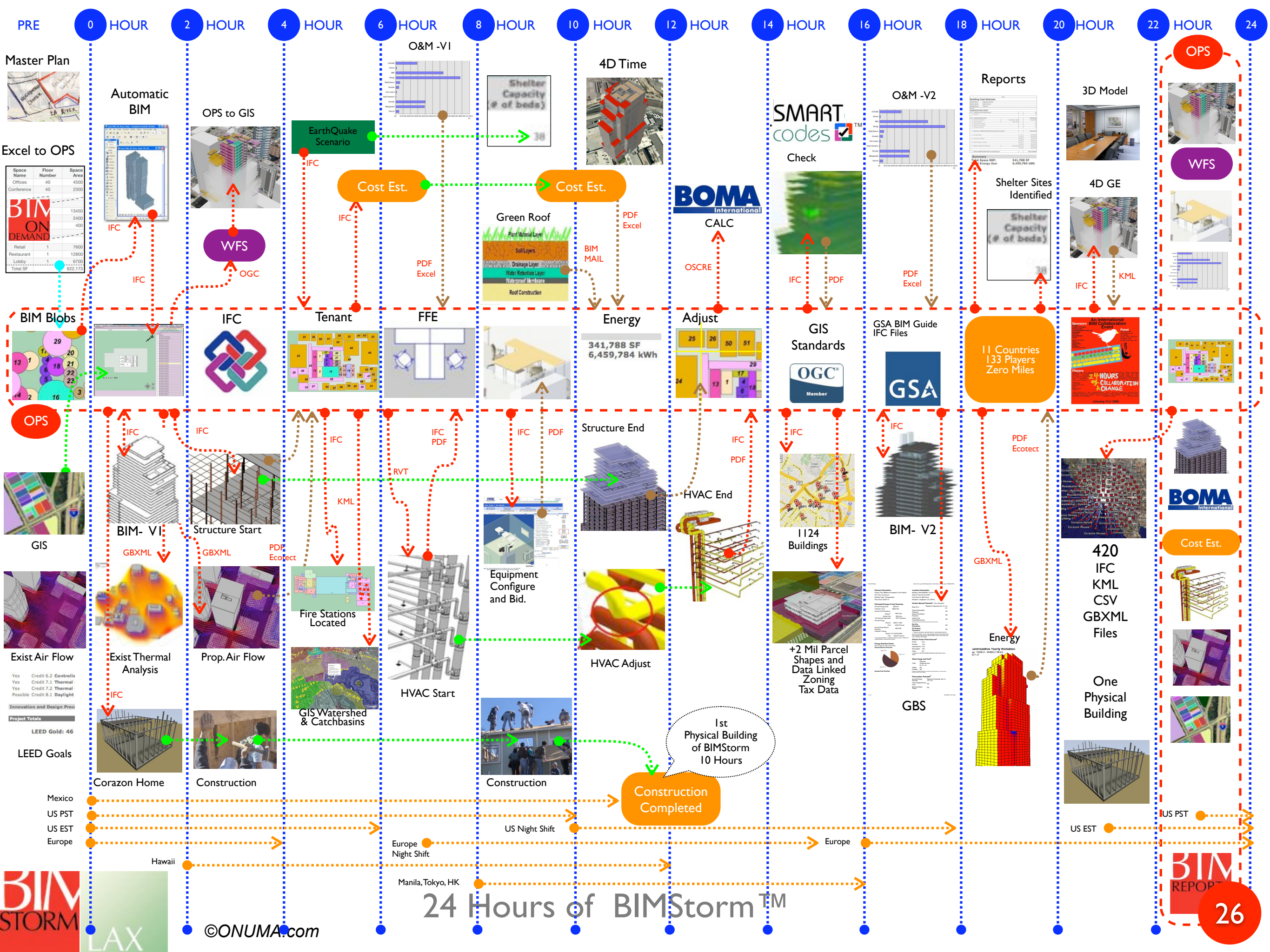


©ONUMA.com

The currency of the
information age is
information.

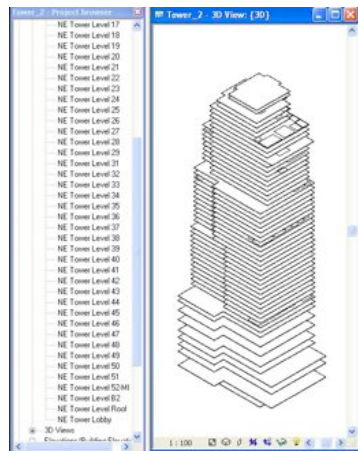


We are in the
information business.

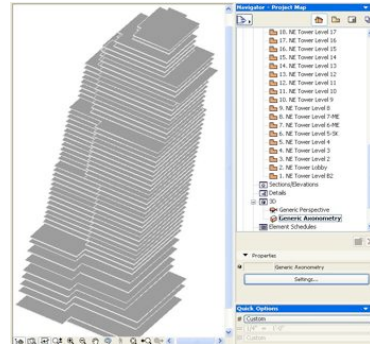


The faster and more
accurately we can share
information the more
relevant we are.

“What BIM platform should we use?”



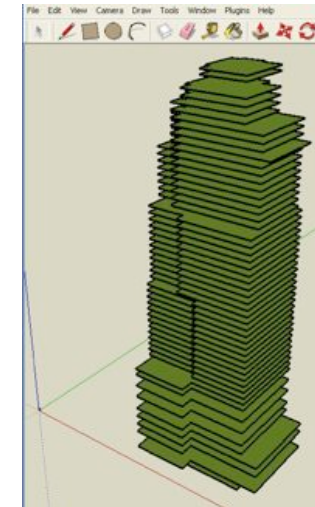
Revit



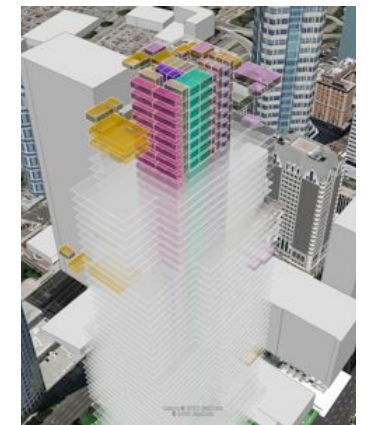
Archicad



VectorWorks



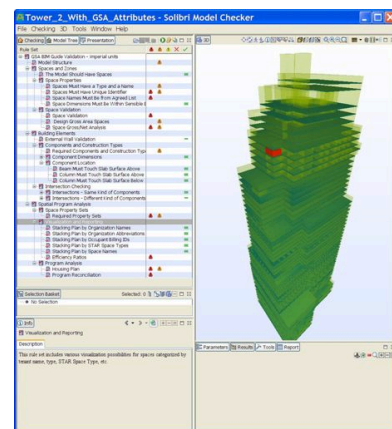
SketchUp



Google Earth

Space Name	Floor Number	Space Area
Offices	40	4500
Conference	40	2300
<hr/>		
Gym	39	13450
Training	39	2400
Storage	39	400
<hr/>		
Retail	1	7600
Restaurant	1	12800
Lobby	1	6700
Total SF		622,173

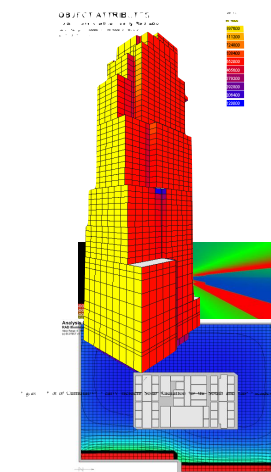
Excel



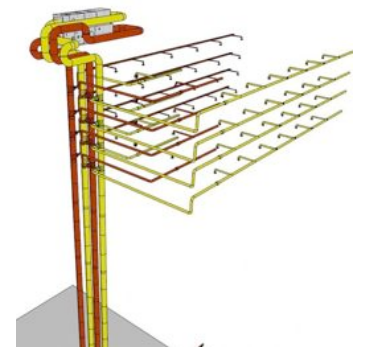
Solibri



OPS



Ecotect



DDS CAD

We all like simple
decisions.

Vanilla or chocolate?

PC or Mac?

Revit, ArchiCAD,
VectorWorks, or other
BIM?

We like
sticking to a
brand.

For BIM,
“Open
Standards” is the
“New Brand”

Information stored in
proprietary formats
will become irrelevant
in this information
centric age.

Organizations that
understand this will
flourish like the
internet and those
that do not will fade
like a Betamax.

Space Name	Floor Number	Space Area
Offices	40	4500
Conference	40	2300
<hr/>		
Gym	39	13450
Training	39	2400
Storage	39	400
<hr/>		
Retail	1	7600
Restaurant	1	12800
Lobby		6700
Total SF		622,173

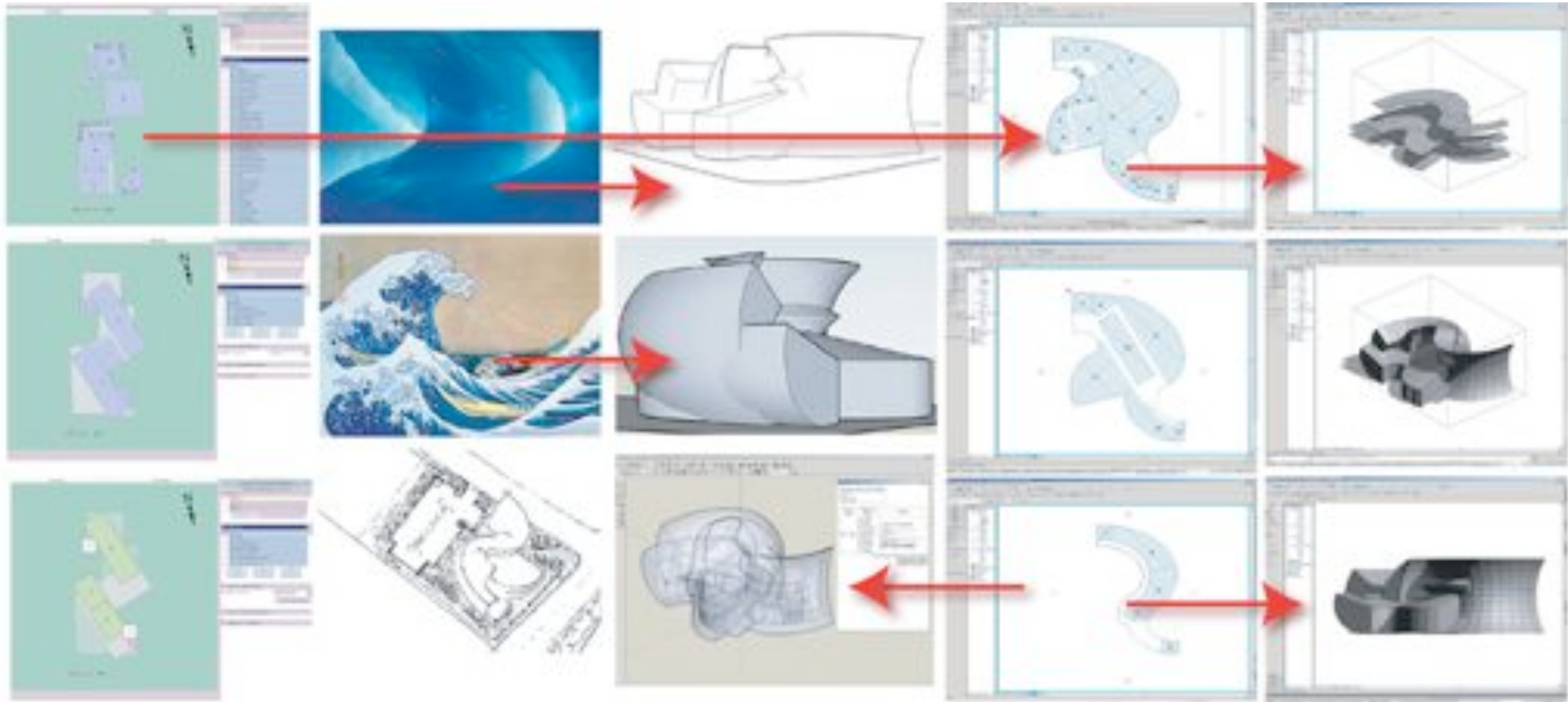


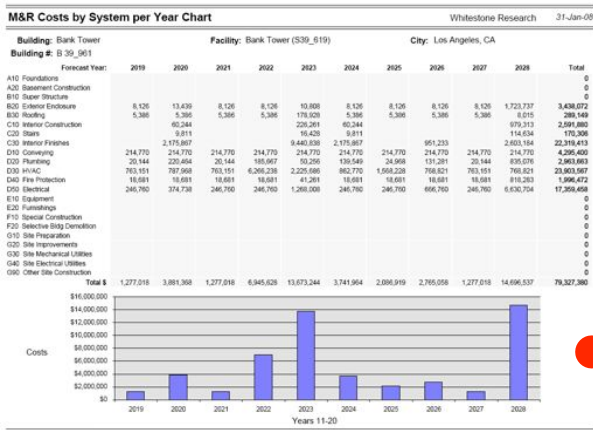
3D Model
by
Square I

Budget: \$80,000,000	Budget: \$80,500,000	Budget: \$81,600,000	Actual: \$79,567,231
Floor Area: 85,000 SF	Floor Area: 85,000 SF	Floor Area: 85,700 SF	Floor Area: 84,540 SF
-	Glazing Area: 20,000 SF	Glazing Area: 19,000 SF	Glazing Area: 21,242 SF
-	5 Floors	6 Floors	6 Floors

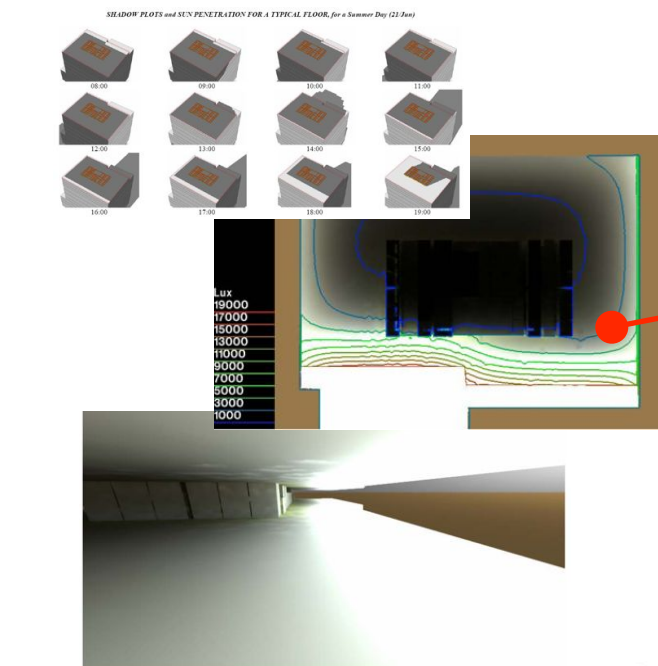


National Capital Planning Commission Washington DC

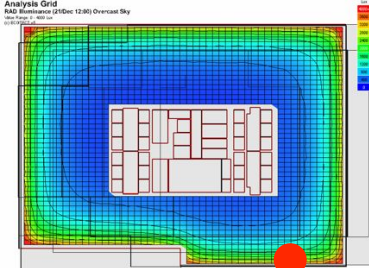




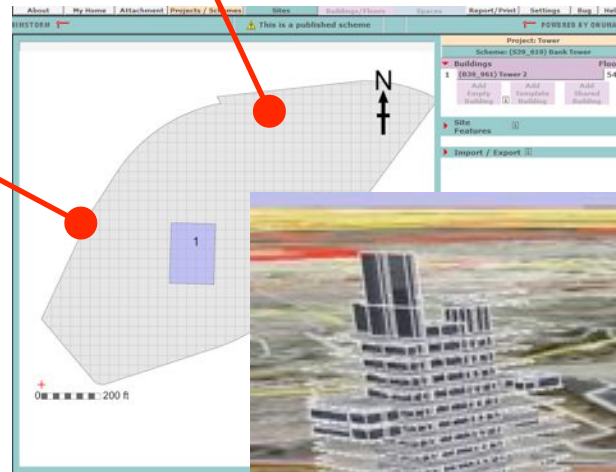
M&R Cost by System

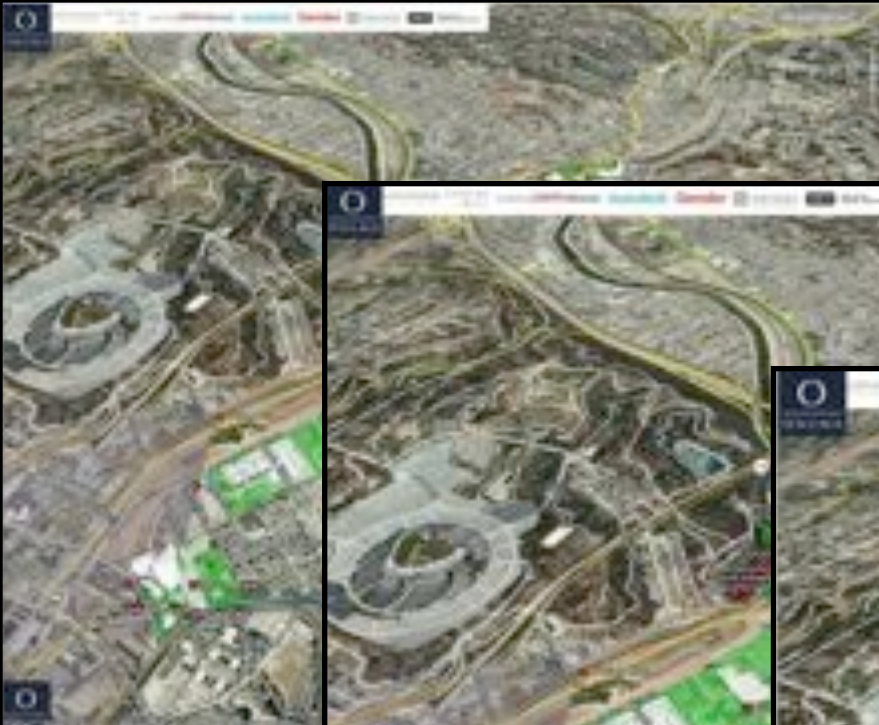


Daylight Studies



Illuminance Contours





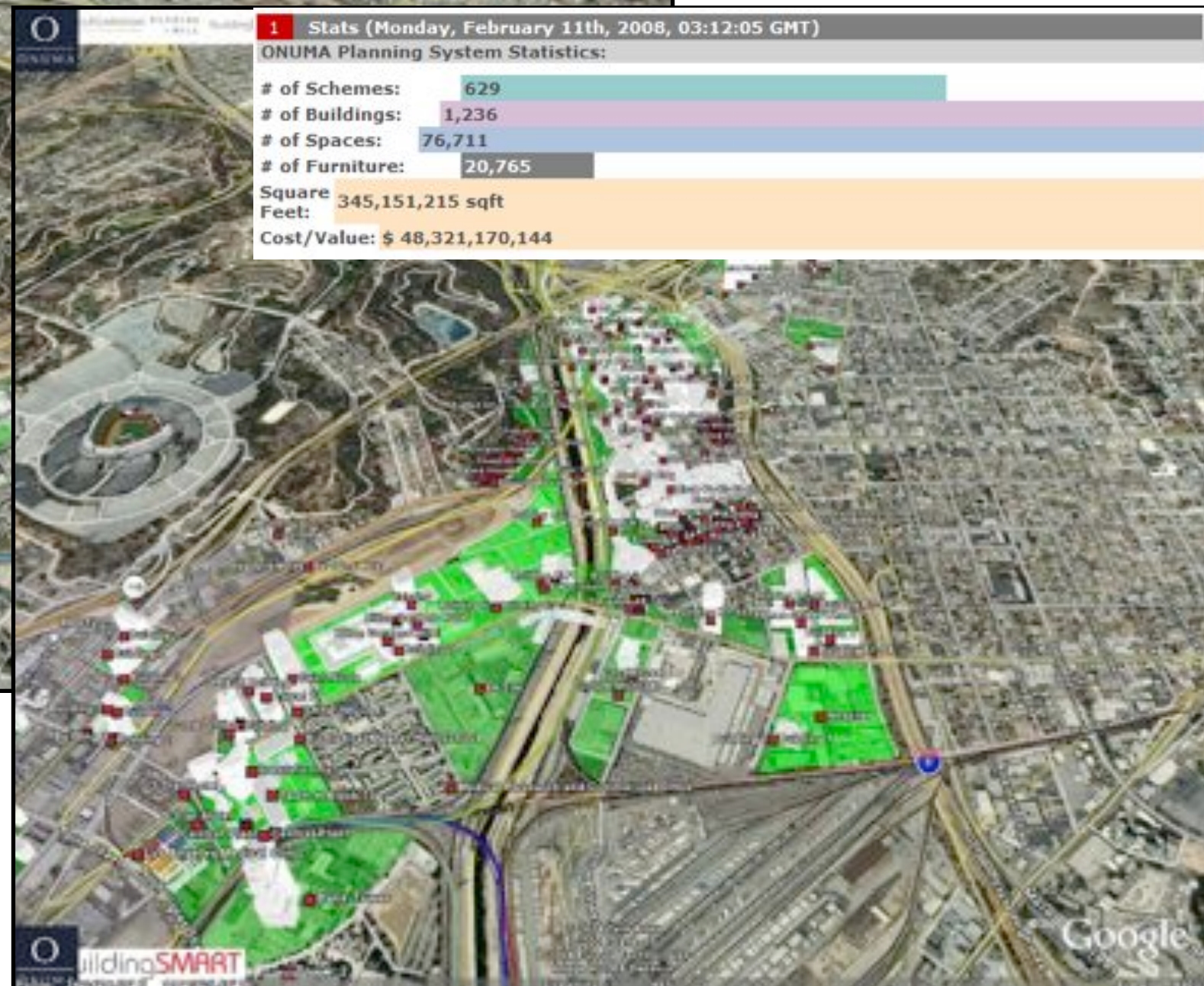
400 Buildings



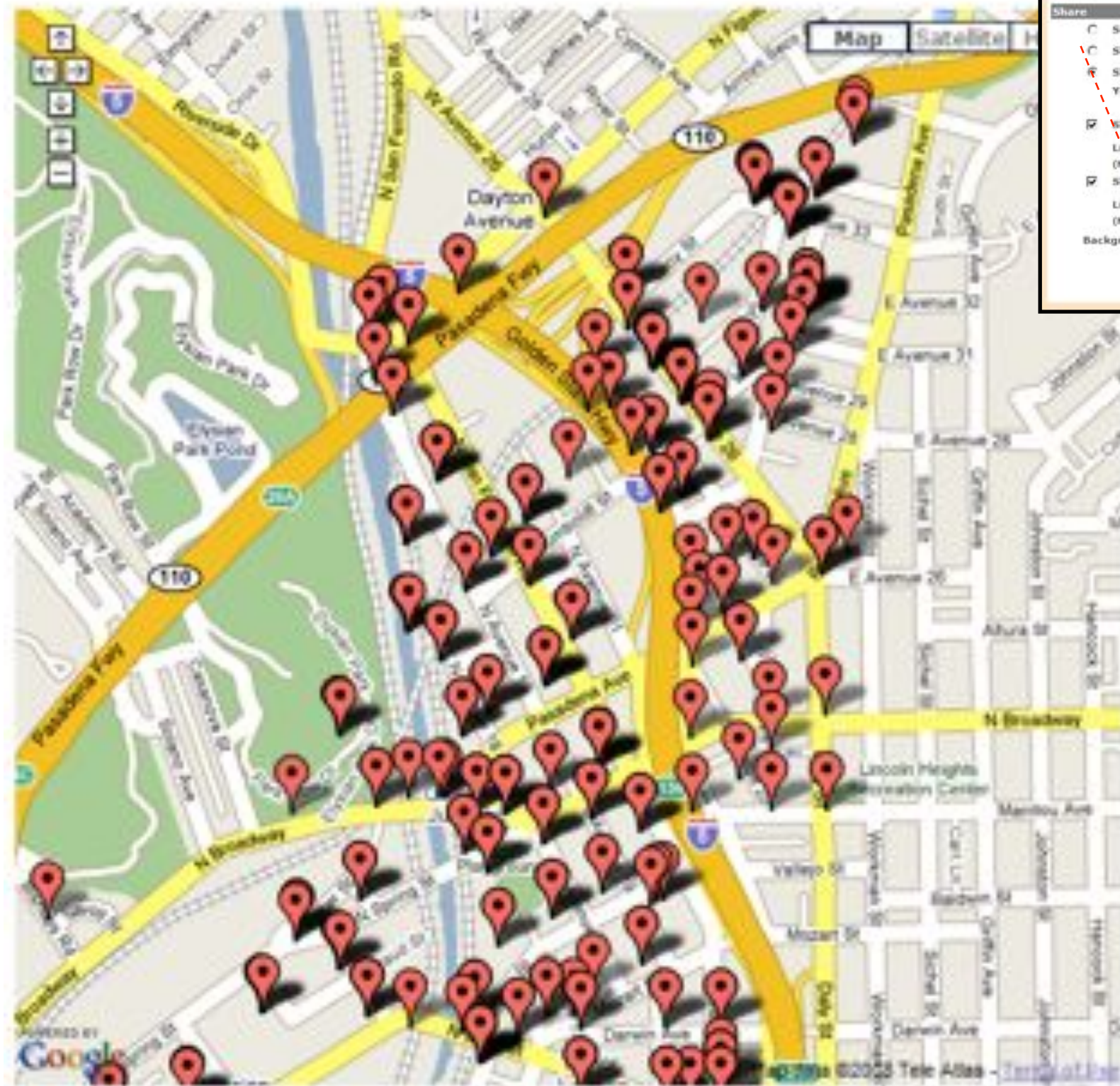
600 Buildings



900 Buildings



Over 1200 Buildings



The screenshot shows the 'Share' dialog box in OPS Studio. The 'Share as teamwork Scheme/Site to allow other users to edit' option is selected. A red dashed line highlights the 'Share as teamwork' option and the 'Unlock scheme' button. A callout box points to the 'Share as teamwork' option.

Share

- ☐ Scheme/Site is not being shared with anyone ⓘ
- ☐ Share Scheme/Site with other users of this OPS Studio™ ⓘ
- ☒ Share as teamwork Scheme/Site to allow other users to edit ⓘ
Yong Ku Kim is editing the scheme Unlock scheme ⓘ
- ☒ Share in the ONUMA Web Services Catalog ⓘ
Limit to the following group: BIMstormTest (Password: BIMstormTest)
(Note: If the default "Public" is being used, the Scheme/Site can be exported into Google Earth or IFC by anybody with access to the Internet.)
- ☒ Share in the ONUMA BIM On Demand page ⓘ
Limit to the following group: BIMstormTest
(Note: If the default "Public" is being used, the Scheme/Site reports can be viewed by anybody with access to the Internet.)

Background

☐ Share Scheme/Site with other users of this OPS Studio™ ⓘ

☒ Share as teamwork Scheme/Site to allow other users to edit ⓘ

Yong Ku Kim is editing the scheme

Unlock

Teams were encouraged to share their projects online with the rest of the entire virtual team early in their design process.

**BIMstorm Los Angeles used OPS,
a web-based BIM application.**

Digital Alchemy Building Code Checking:
SMARTcodes Code Checking Report for BIMstorm LAX

Organization: International Code Council
Date: 31-Jan-08

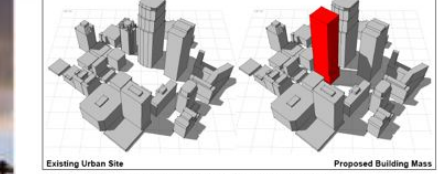
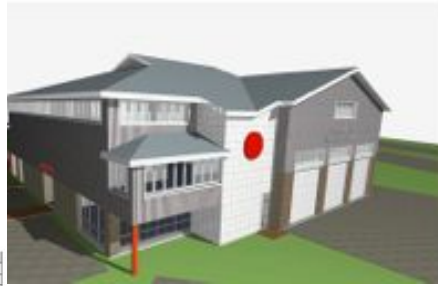
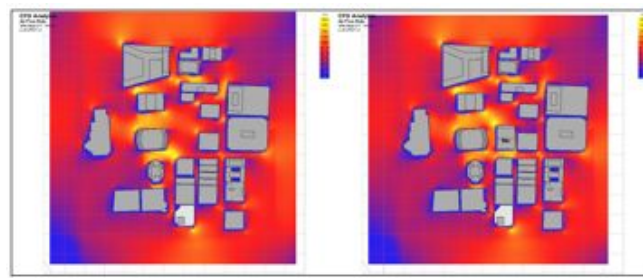
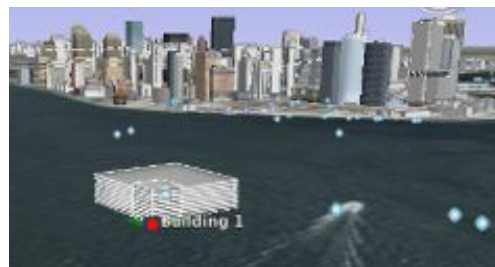
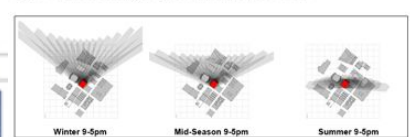


Figure 1 – 3D models showing the original site and the proposed addition



Develop a Wide Range of Project Information

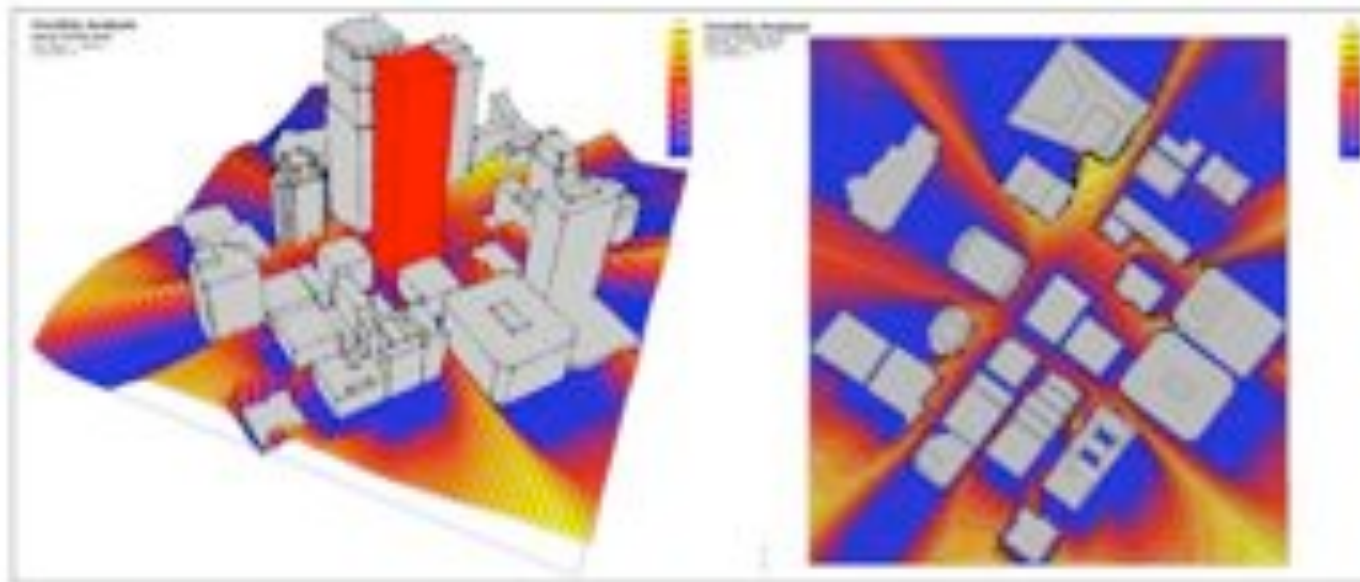


Figure 6 – Spatial mapping of the visual impact of the new building at eye level around site. Useful for determining where the building can be seen from and what views the building might have.

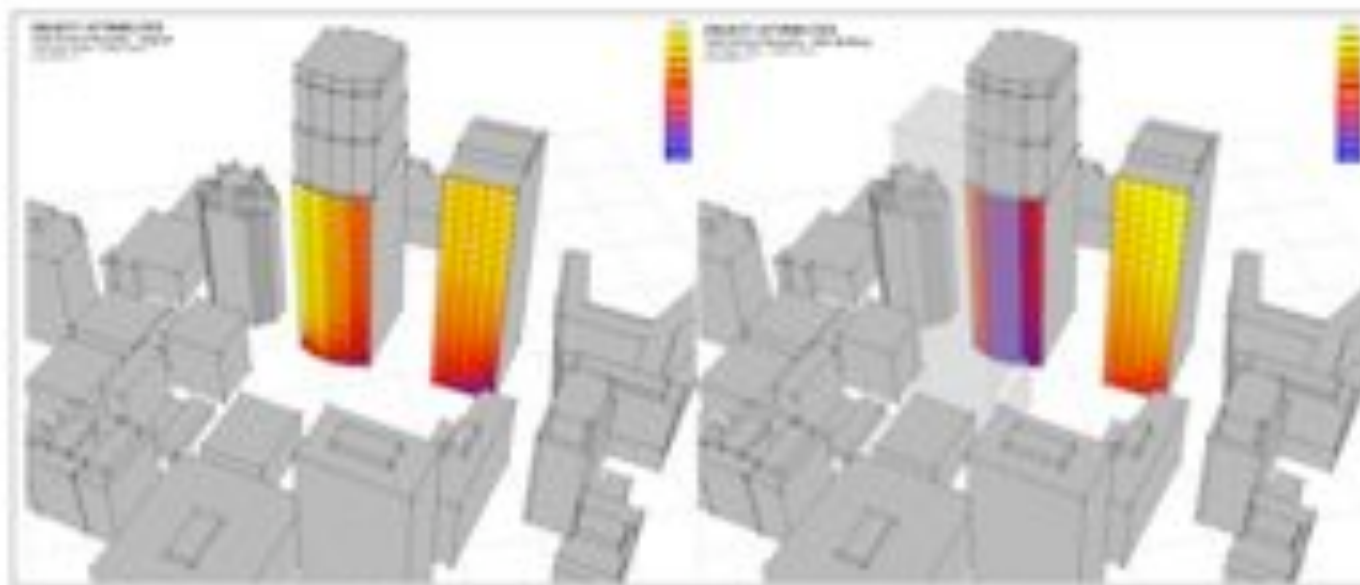
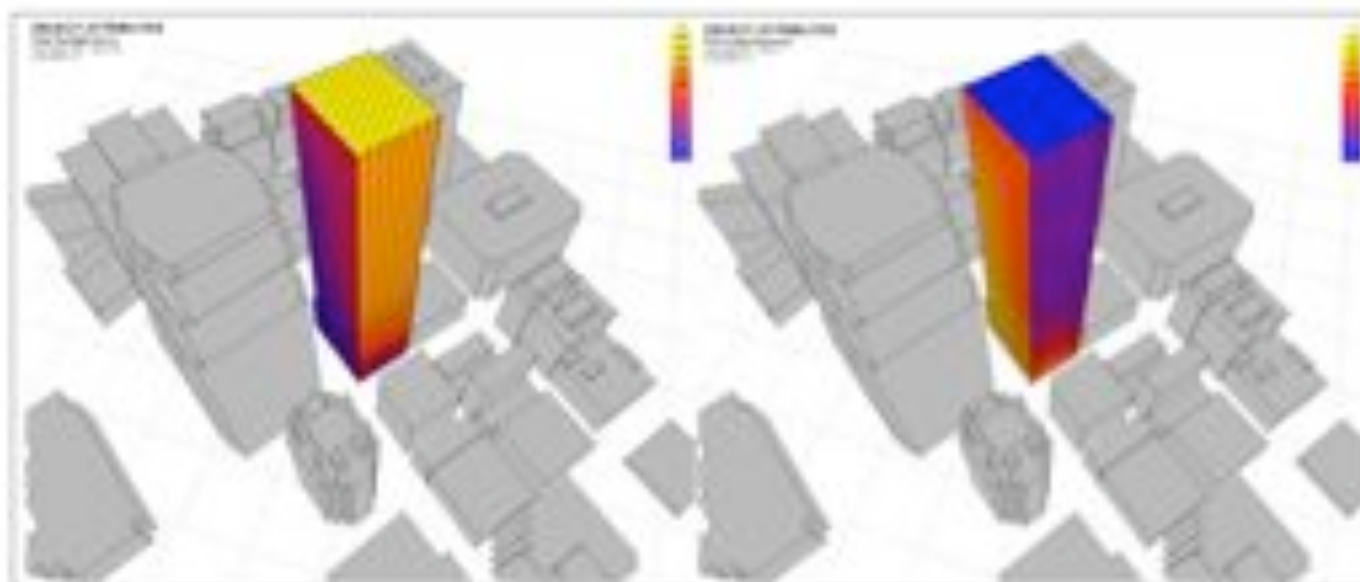
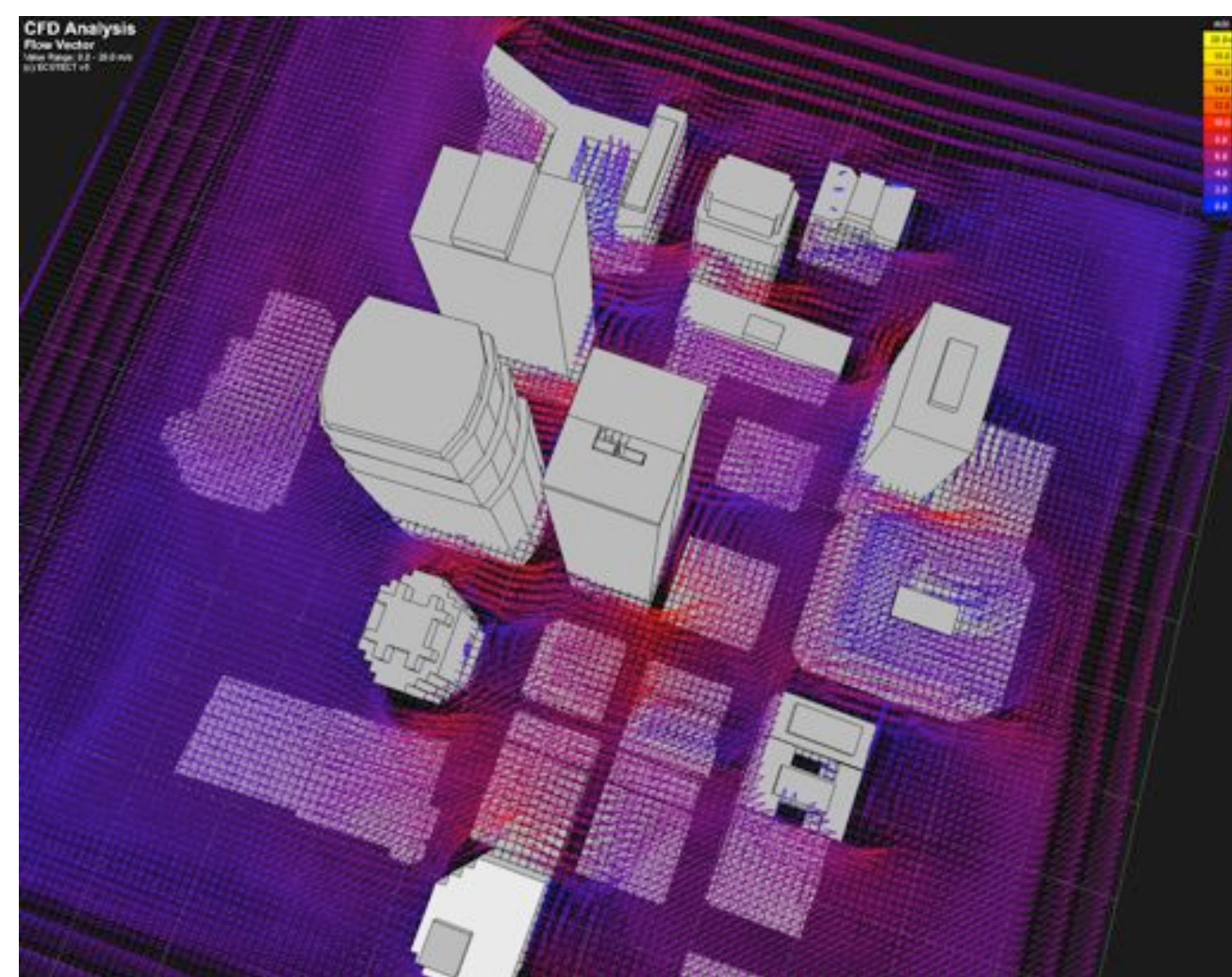
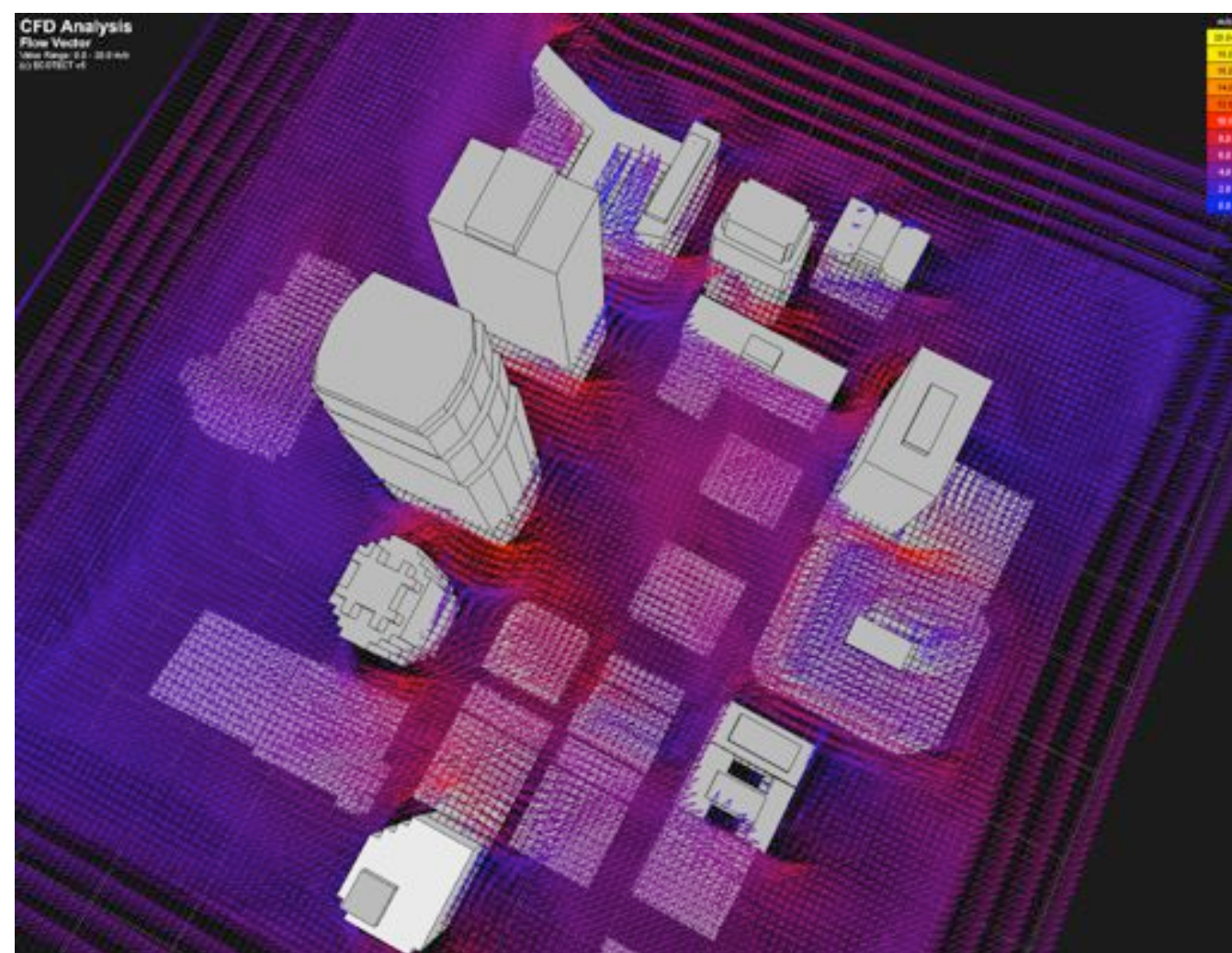


Figure 7 – The impact of the proposed addition on incident solar radiation on adjacent facades. Used to minimise reduction of the solar access of surrounding buildings.





If both, X and Y have a value in their respective fields, X and Y will be U
Values are in decimal square feet (area) or linear feet for all others

Space Name	Floor No	Space No	Space Area	X	Y	Capacity	Occupancy
Barber	8		125			0	0
Barber	9		125			0	0
CG-1	7		5986			0	0
CG-1	8		4715			0	0
CG-1	10		4010			0	0
CG-1	11		1749			0	0
CG-1	9		1187			0	0
CG-2	12		7122			0	0
CG-2	6		1542			0	0
CG-2 JWCIS	3		2036			0	0
CG-4	9		12467			0	0
CG-4	1		5196			0	0
CG-4	1		4368			0	0
CG-4	11		2840			0	0
CG-6B	8		1846			0	0
CG-8	9		4673			0	0
CG-8	10		4673			0	0
CG-8	10		1466			0	0
CGES	9		1806			0	0
CGES	10		1806			0	0
CGES	11		215			0	0
CGES	12		215			0	0
Chief's Mess	2		344			0	0
Chief's Mess	3		344			0	0
Cleaning Staff	11		256			0	0
Cleaning Staff	1		256			0	0
Cleaning Storage	3		158			0	0
Cleaning Storage	4					0	0
Clinic	12	8732	1			0	0
Clinic	1	8732	5807			0	0
Clinic Storage	8	8505	225			0	0
Clinic Storage	9	8505	225			0	0



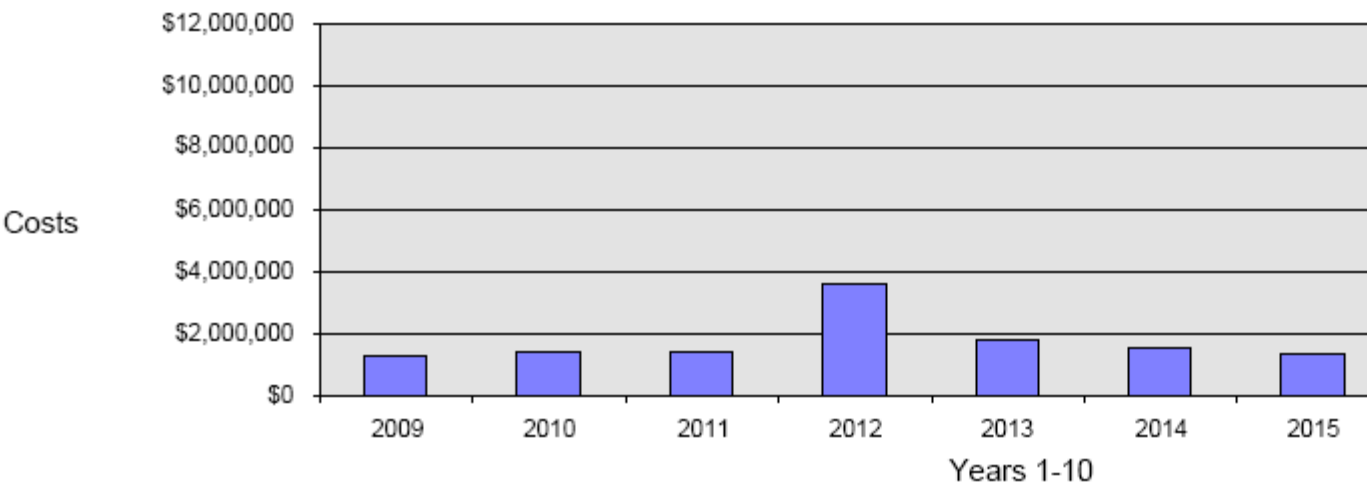
Step I - Excel Program Requirements

Building:
Building Number:
Facility:
City:
Built Date:

M&R Costs by System per Year Chart

Whitestone Research 31-Jan-08

Building: Bank Tower	Facility: Bank Tower (S39_619)						
Building #: B 39_961							
Forecast Year:	2009	2010	2011	2012	2013	2014	2015
A10 Foundations							
A20 Basement Construction							
B10 Super Structure							
B20 Exterior Enclosure	8,126	8,126	8,126	8,126	10,808	8,126	8,126
B30 Roofing	5,386	5,386	5,386	5,386	8,015	5,386	5,386
C10 Interior Construction				60,244	226,261		
C20 Stairs				9,811			
C30 Interior Finishes				2,175,867	188,304		
D10 Conveying	214,770	214,770	214,770	214,770	214,770	214,770	214,770
D20 Plumbing	20,144	131,281	20,144	131,281	55,080	131,281	74,530
D30 HVAC	763,151	768,821	763,151	768,821	763,151	782,373	763,151
D40 Fire Protection	18,681	18,681	18,681	18,681	19,749	18,681	18,681
D50 Electrical	246,760	246,760	374,738	246,760	261,691	374,738	246,760
E10 Equipment							
E20 Furnishings							
F10 Special Construction							
F20 Selective Bldg Demolition							
G10 Site Preparation							
G20 Site Improvements							
G30 Site Mechanical Utilities							
G40 Site Electrical Utilities							
G90 Other Site Construction							
Total \$	1,277,018	1,393,825	1,404,996	3,639,747	1,747,829	1,535,355	1,331,404



Building Summary

Building: Bank Tower
Facility: Bank Tower (S39_619)
City: Los Angeles, CA

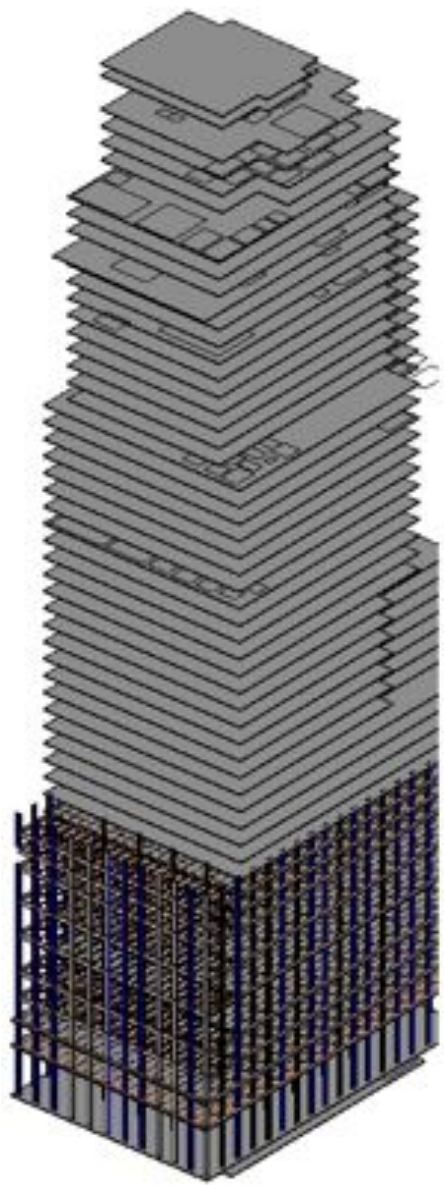
Building Number: B 39_961
Building Type: Corporate Office
Building Use: Office
Building GSFT: 1,940,000
Construction Date: 2008
Number of Floors: 54
Mission Dependency: Mission Critical
Original Value: \$326,937,474
Current Replacement Value: \$326,937,474
^Deferred Maintenance: \$0
*Net Asset Value: \$326,937,474
**Building Condition Index: 100.0%
Last Inspection:
Note:

Utilization Factors

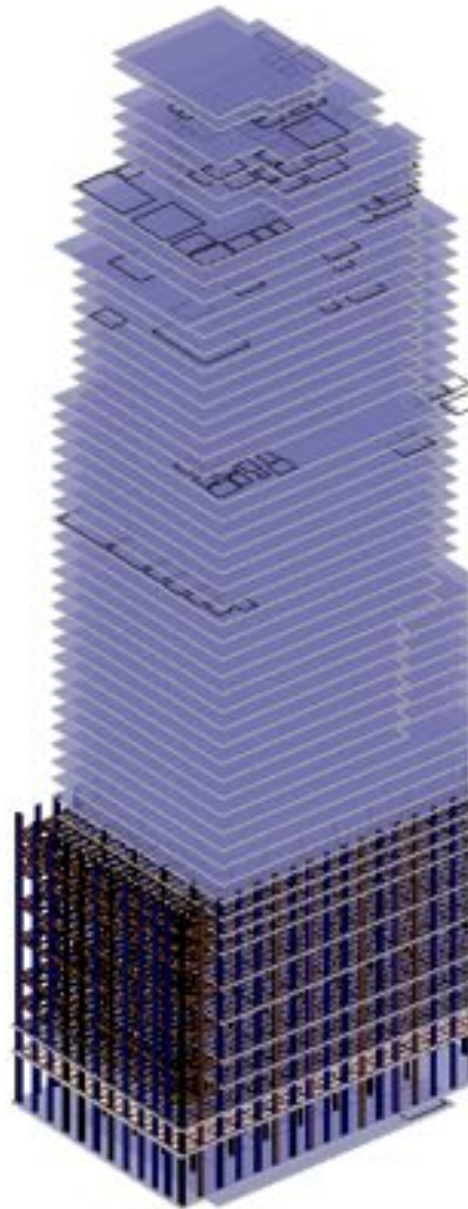
Hours: 1.00 Moderate
Security: 1.00 Low
Safety: 1.00 Low
Other: 1.00 Low
***Total Utilization Multiplier: 1.00



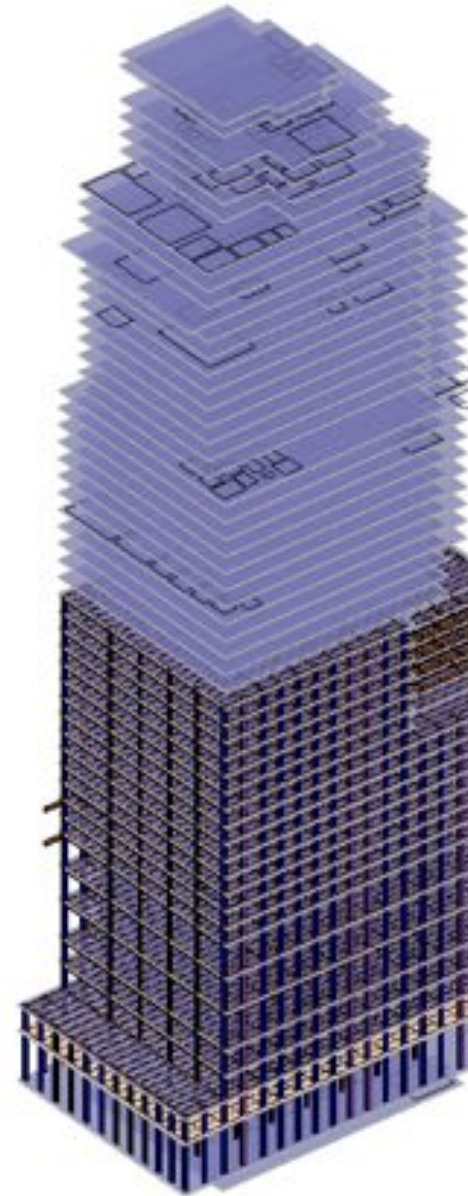




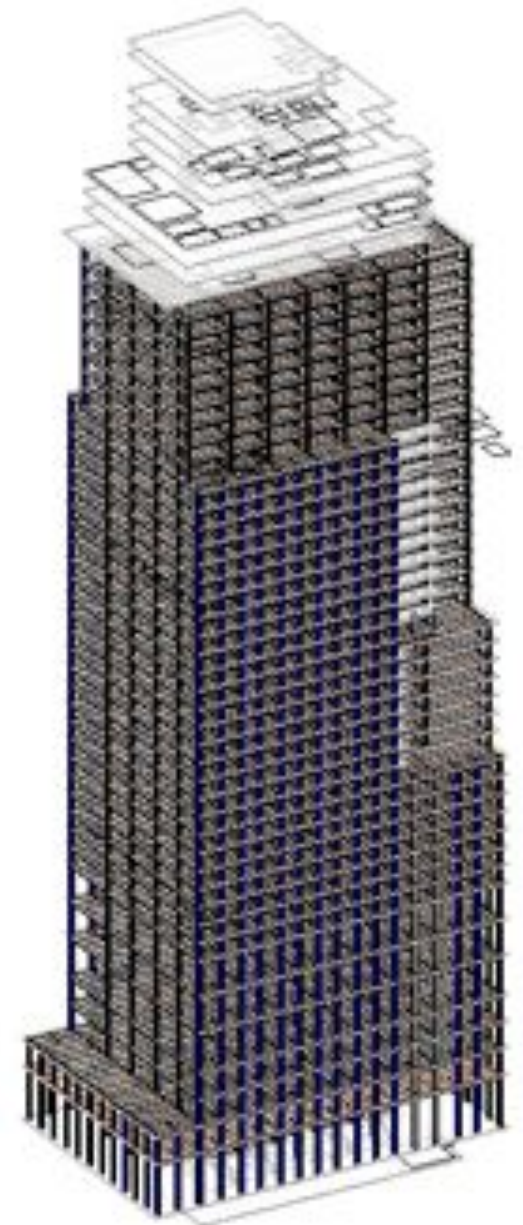
Posted 16:00
PST



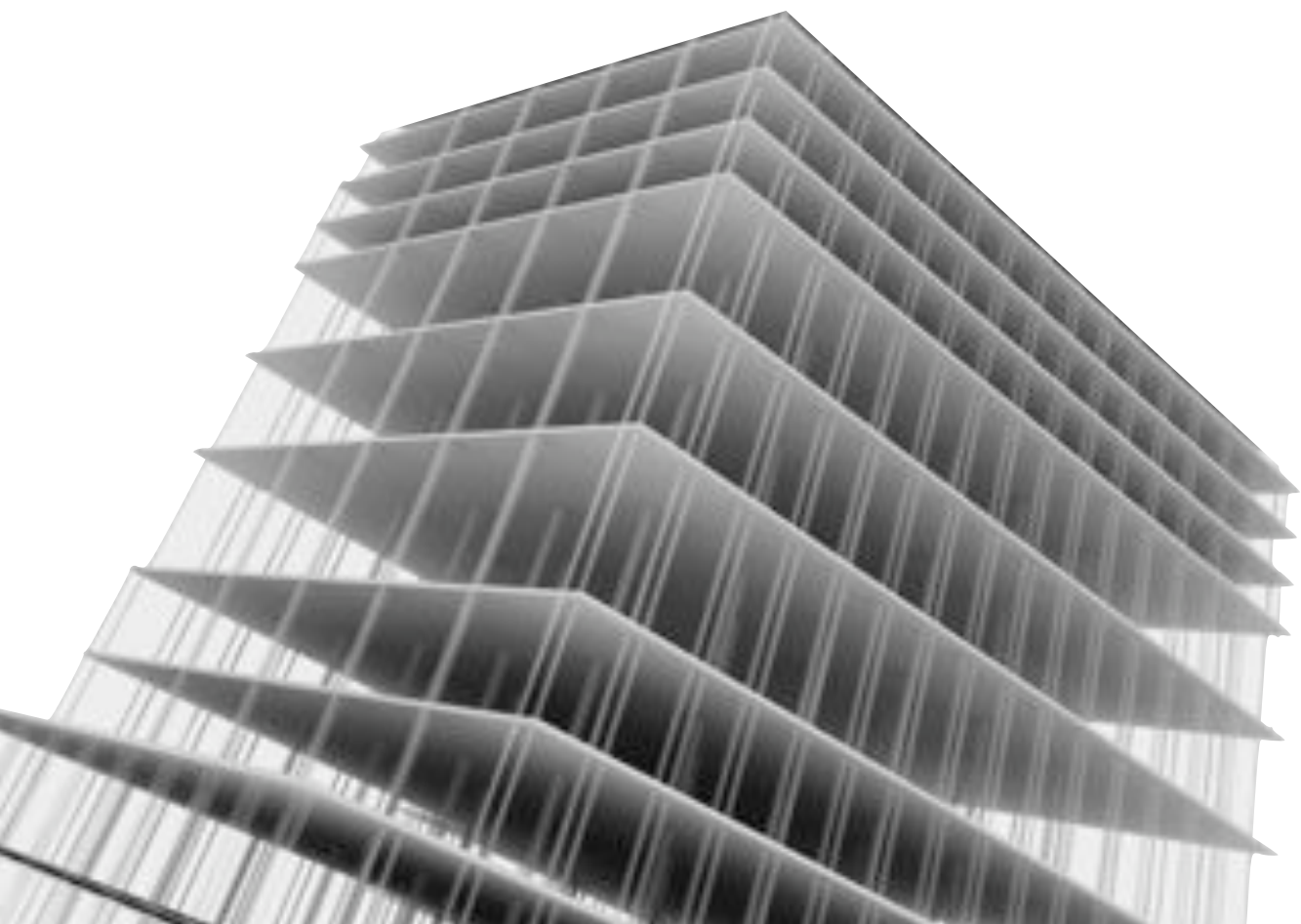
Posted 17:30
PST



Posted 19:00
PST

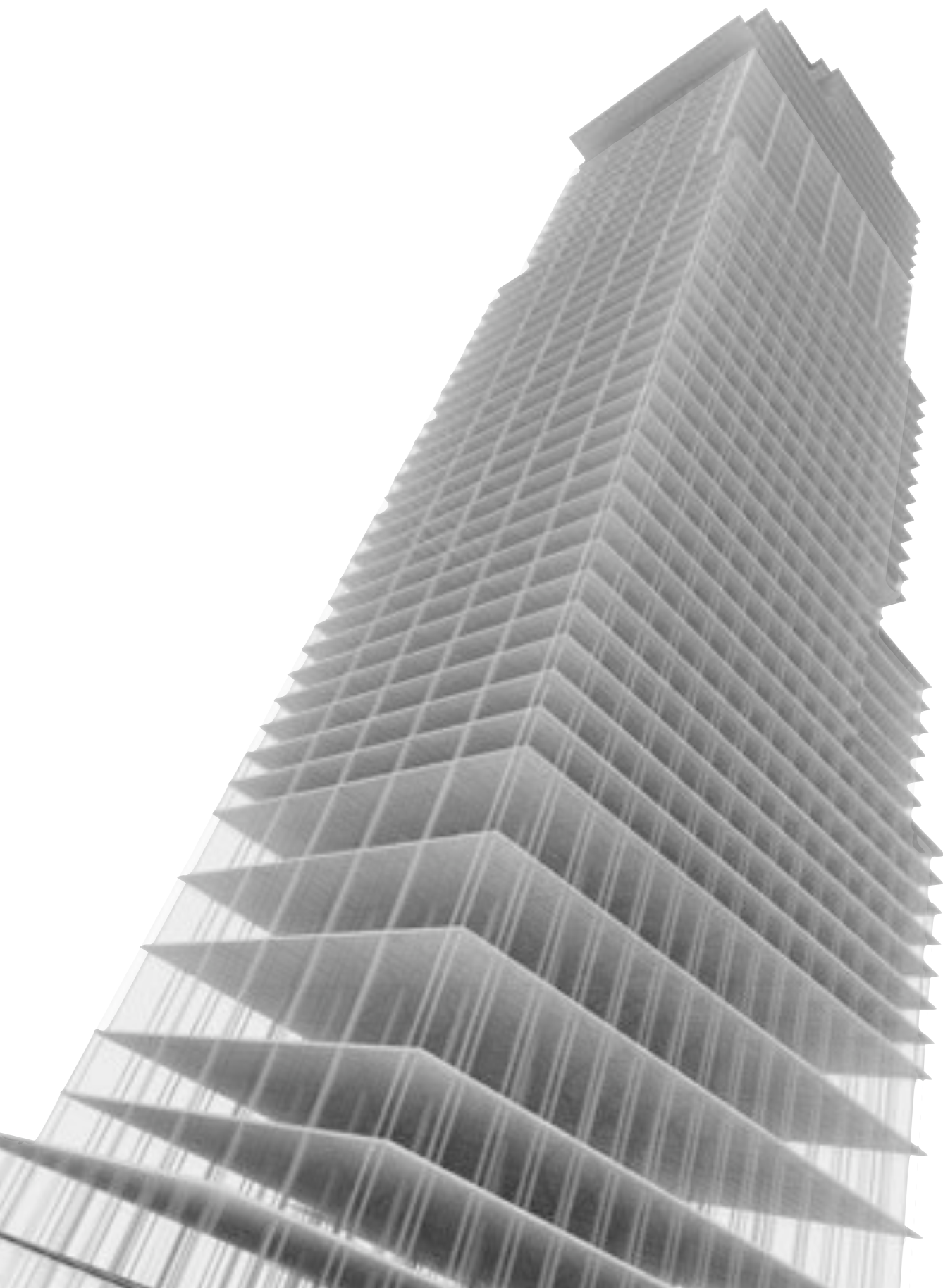


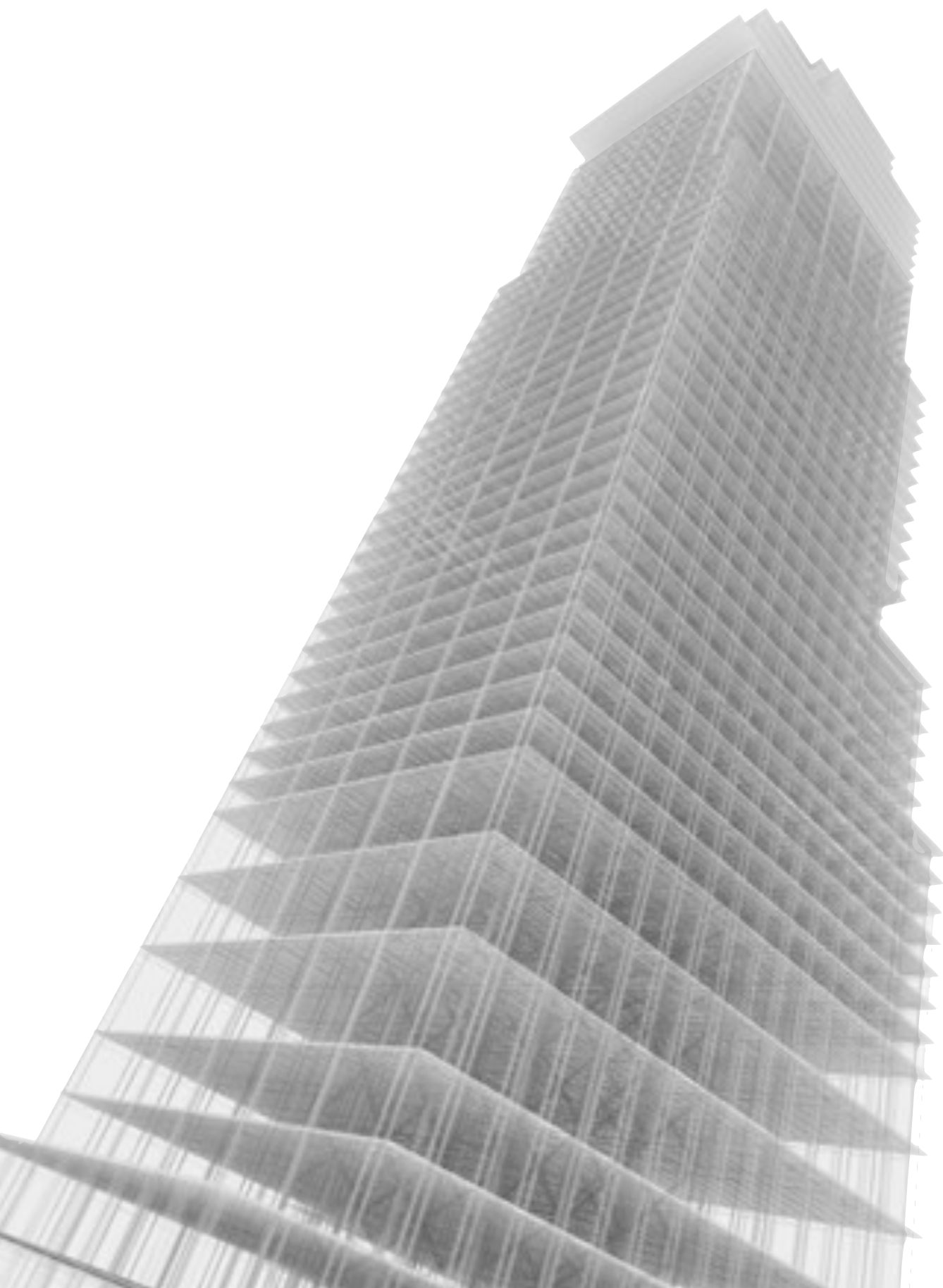
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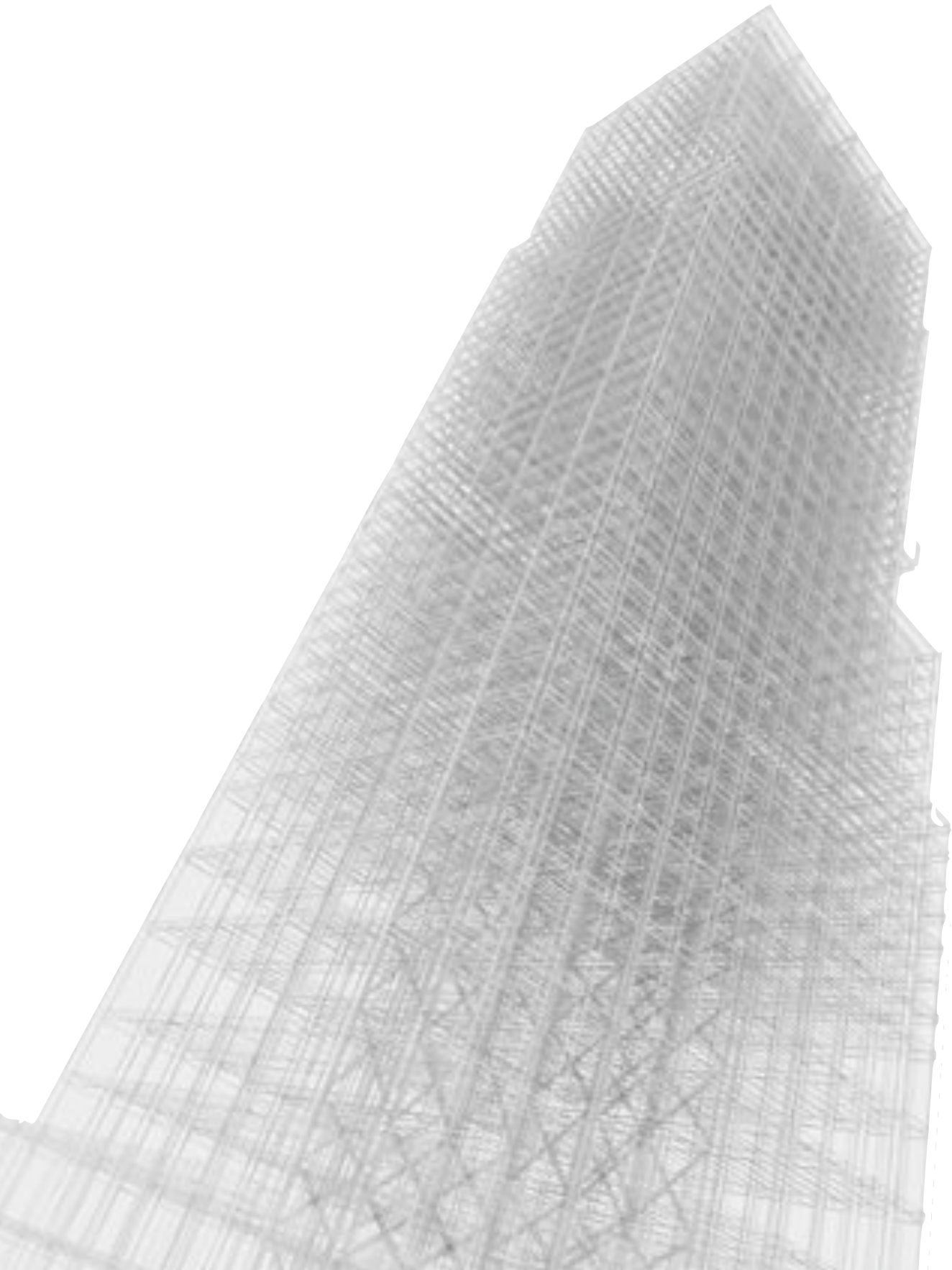














April 23, 2008

Declaration of Information Independence

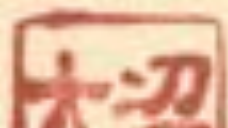
When in the course of human events, it becomes necessary for one industry to reinvent itself to sustain a lasting harmony between nature and humanity we seek a path to business process change that improves efficiency and reduces waste through a declaration supporting Open Standards.

We hold this path to be self evident, all data should be equally accessible.

When equally accessible, data can be used to enhance knowledge-based decision making, integrate data across many industries, increase the collective knowledge of civilization and support better use of our shared planet to promote the right of all people to a sustainable, healthy life on Earth.

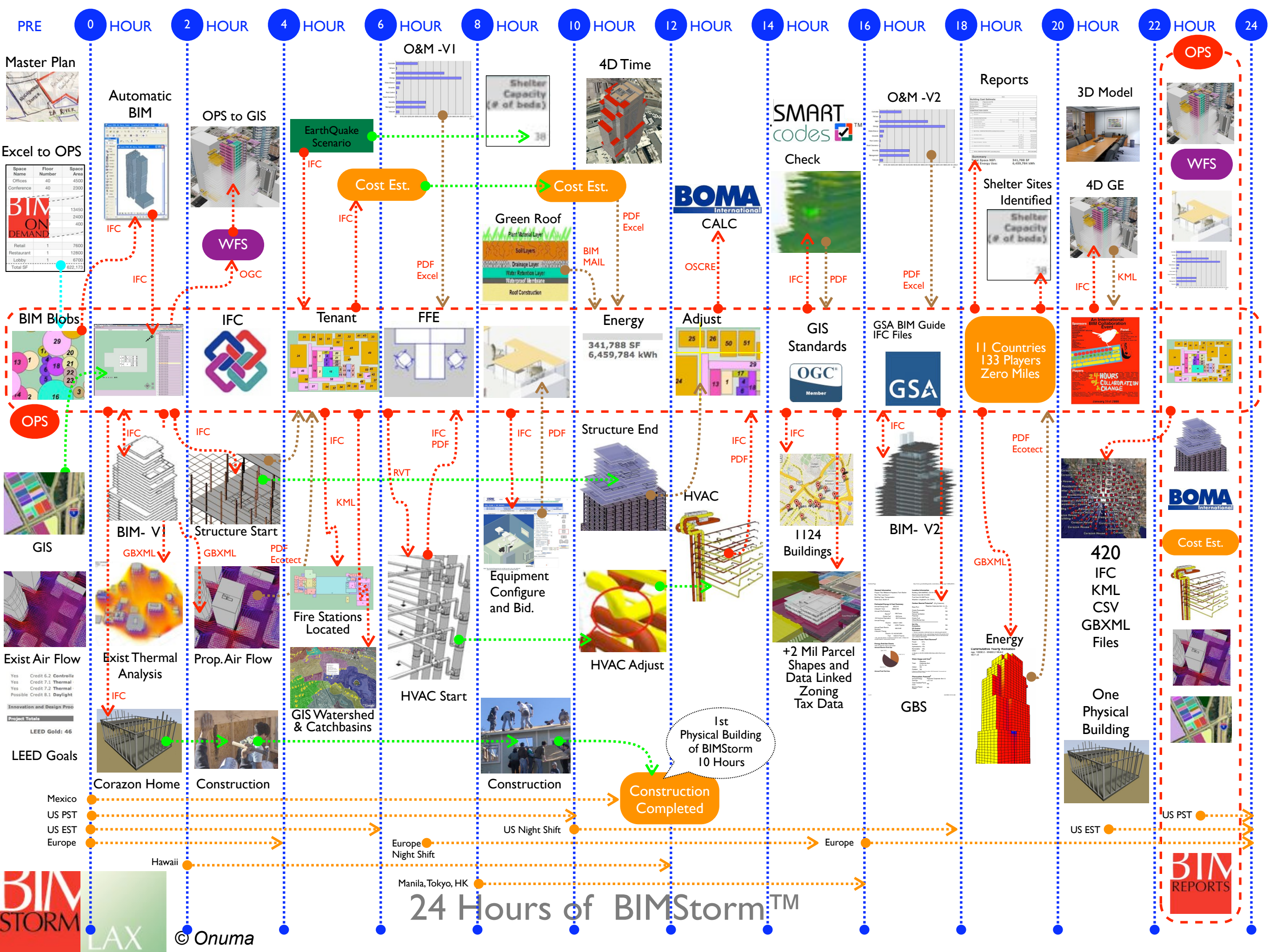
We endorse and implore the alliance of building industry organizations to support Information Independence in order to BuildSmart.

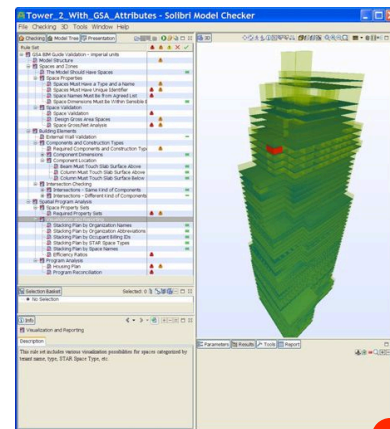
In Pasadena, California, USA - April 23, 2008



Kenn Onuma

Eric B...





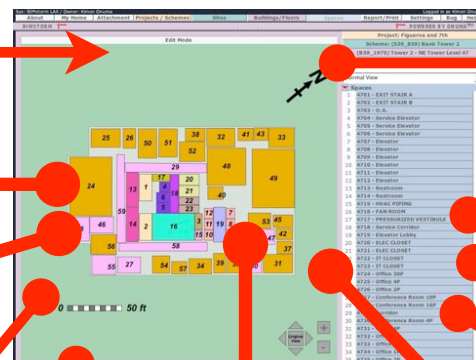
**Solibri
IFC**

Onuma Planning System

IFC, KML, GBXML, CSV



IFC



IFC

IFC

IFC

IFC

BIM

Reports

FFE

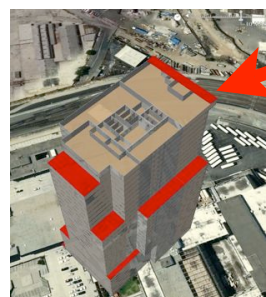


IFC



Acusourcing 3D Model

2/20/08



4D In GE



Elite CAD

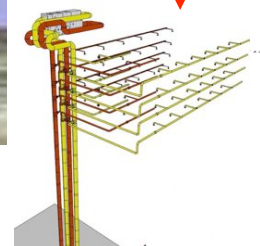


Revit

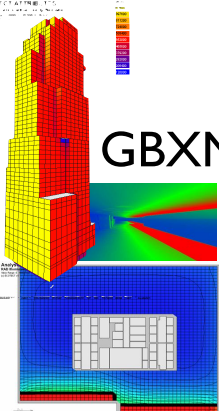
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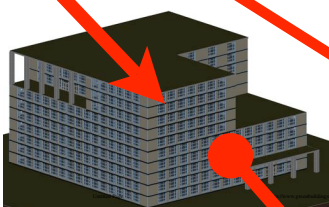
Rhino



DDS CAD



Ecotect

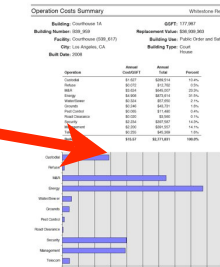


Project Title: BldForm-Pasadena Train
 Axonometric
 GBXML
 Project Manager: [illegible]
 Project Engineer: [illegible]

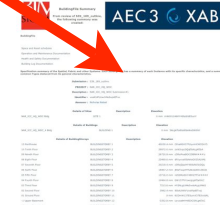


Project Title: BldForm-Pasadena Train
 Axonometric
 GBXML
 Project Manager: [illegible]
 Project Engineer: [illegible]

IFC

Whitestone
O&M

O&M



Green Building Studio

BIMStorms

- Boston AIA TAP Conference - May 14, 2008
- AEC ST, Anaheim, CA - May 19-22
- London, UK - June 2008
- Vancouver - July 21-25, 2008
- Washington DC - Sept. 2008
- <http://BIMStorm.com>

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