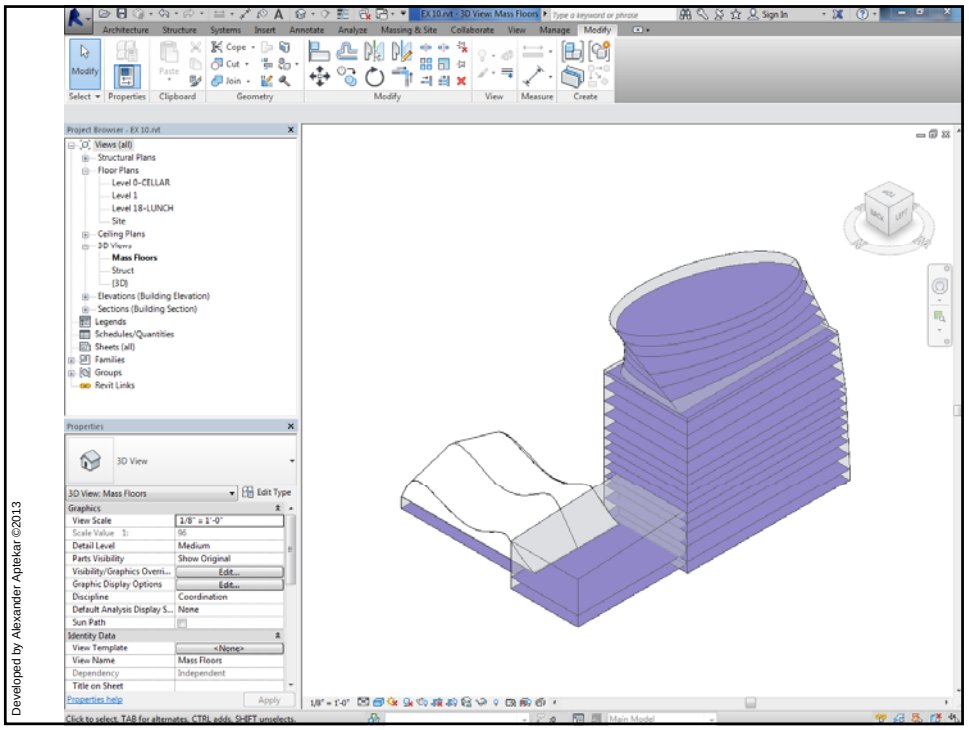
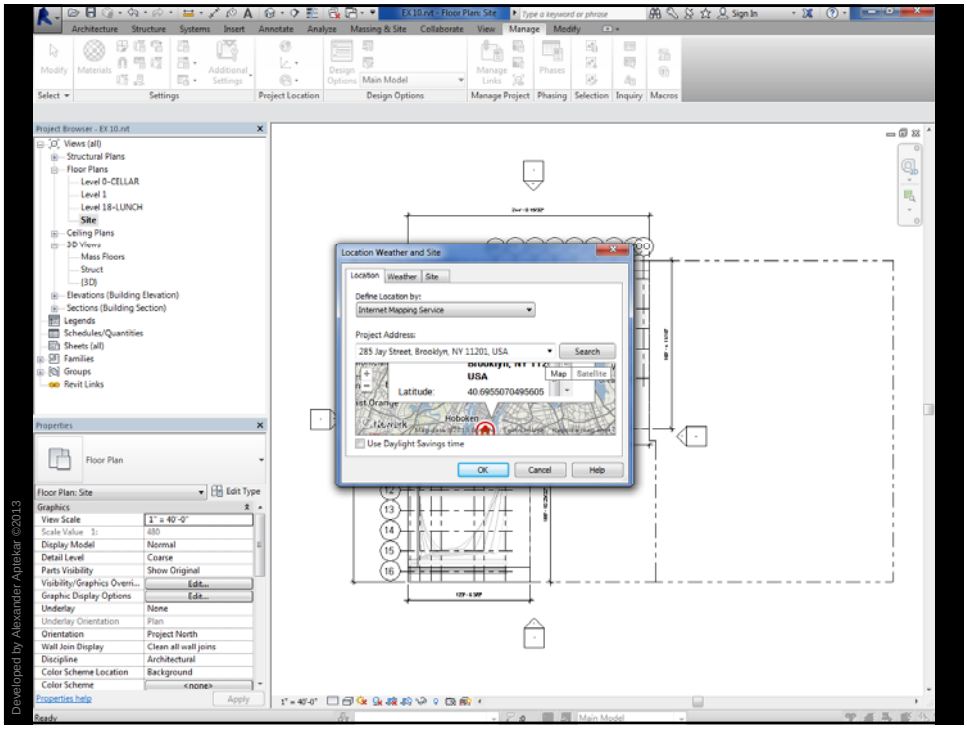
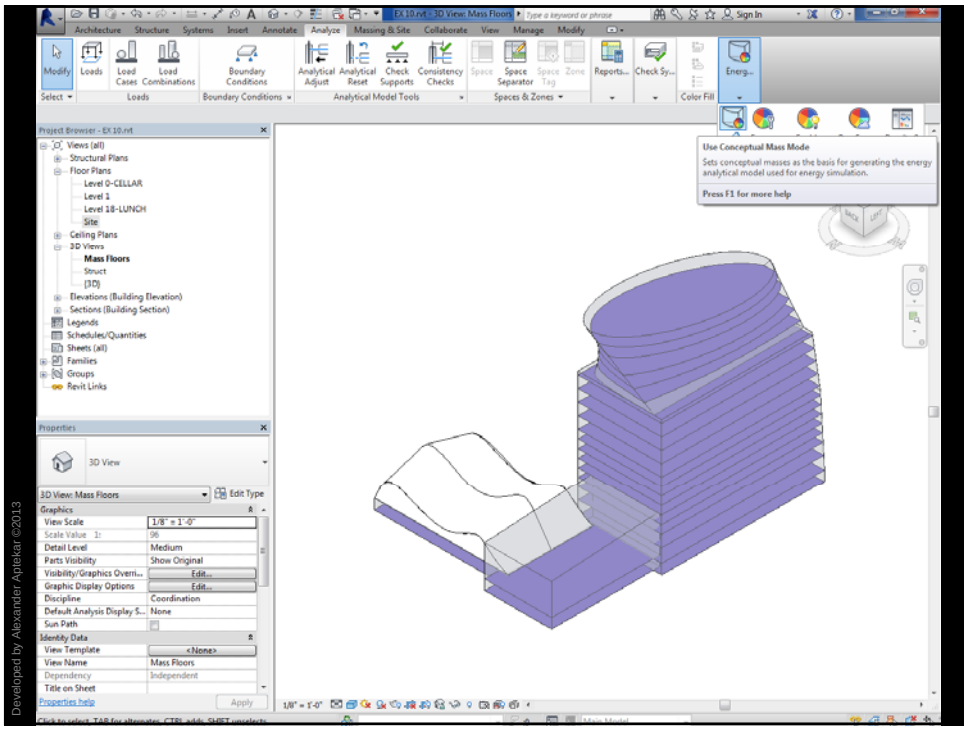
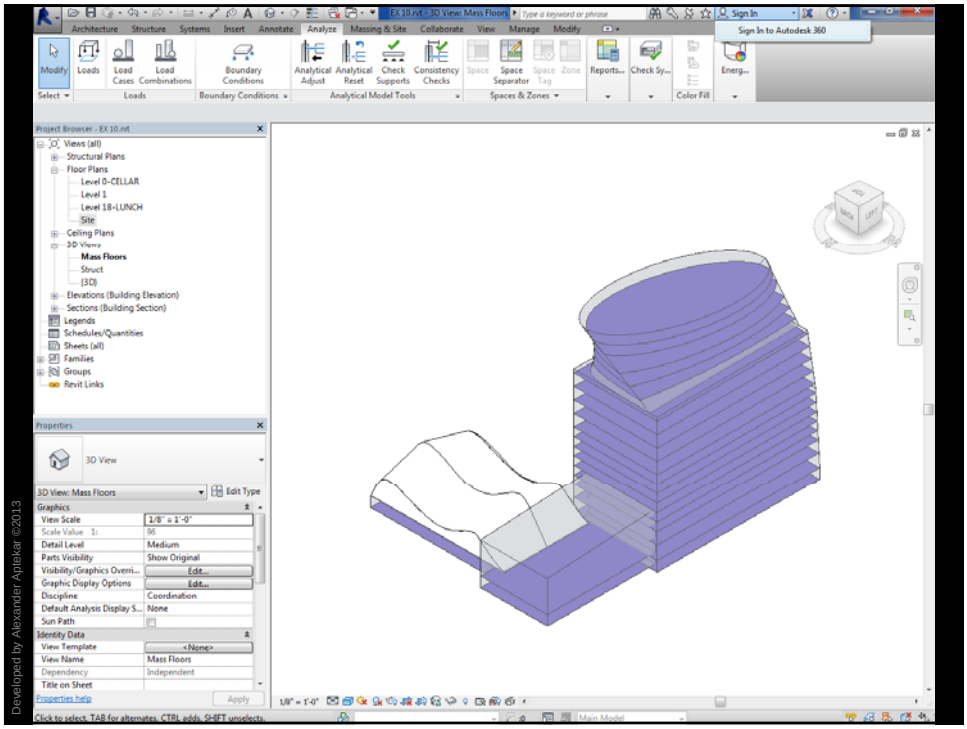
WELCOME TO: ARCH 2430

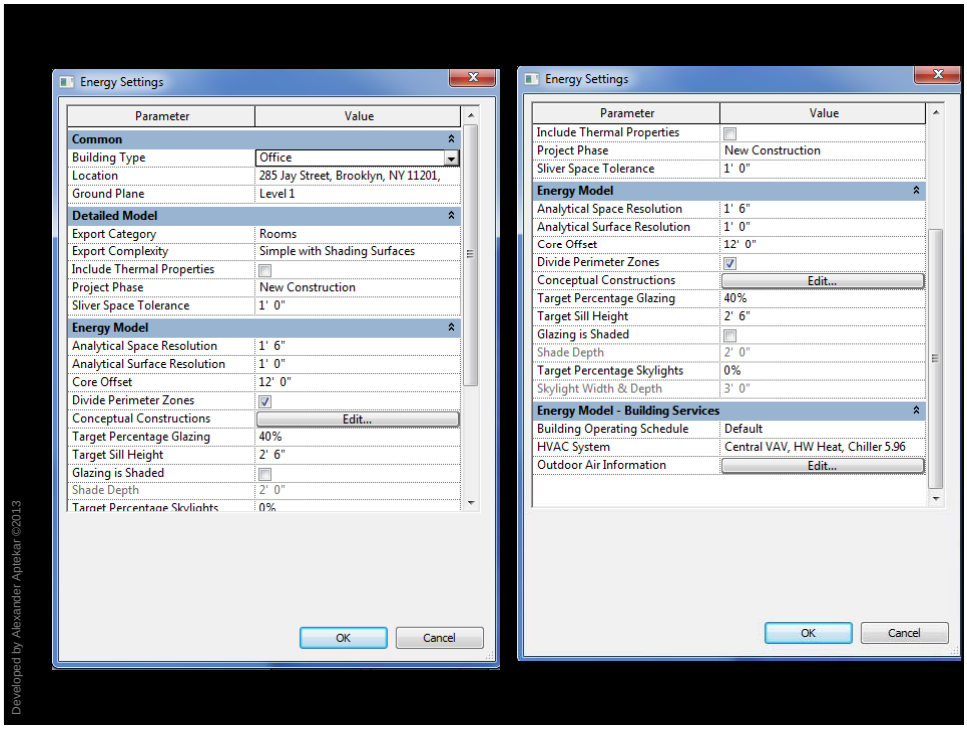
BUILDING TECHNOLOGY IV

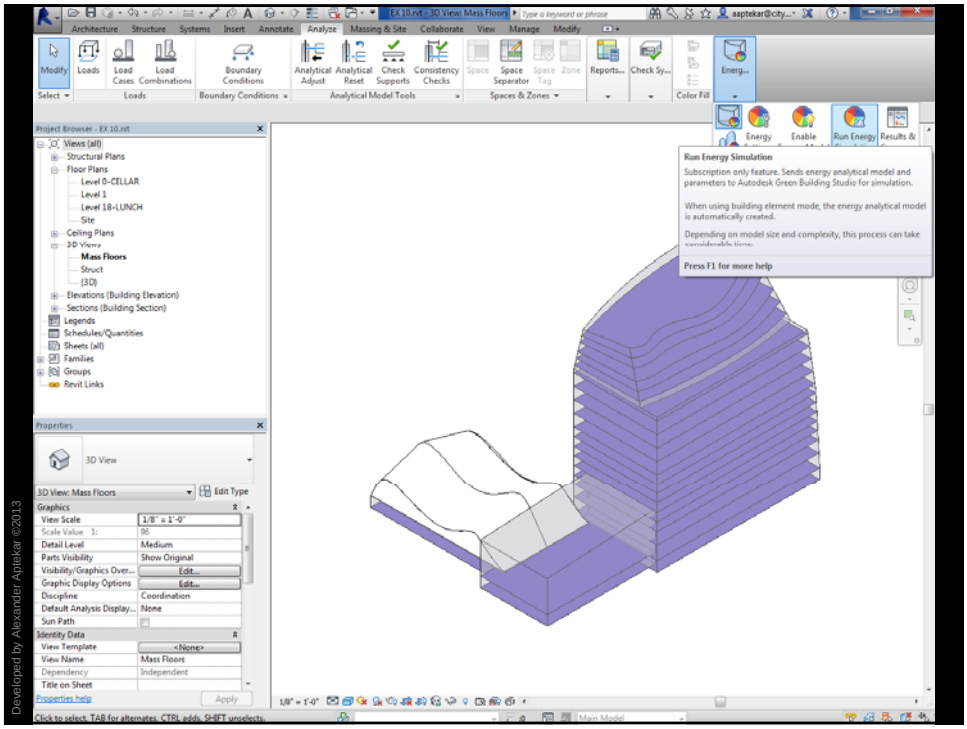


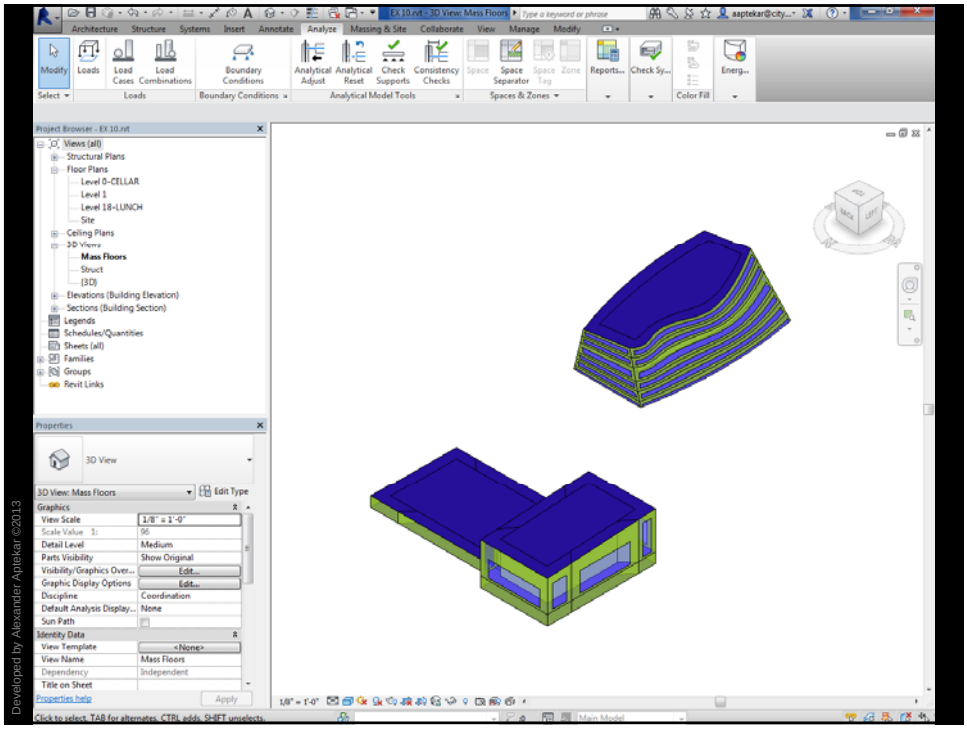

Location Weather and Site
Location
Weather
Site
Define Location by:
Internet Mapping Service
Project Address:
285 Jay Street, Brooklyn, NY 11201, USA
Search
Latitude: 40.6955070495605
Use Daylight Savings time
OK
Cancel
Help
Developed by Alexander Aptekar ©2013

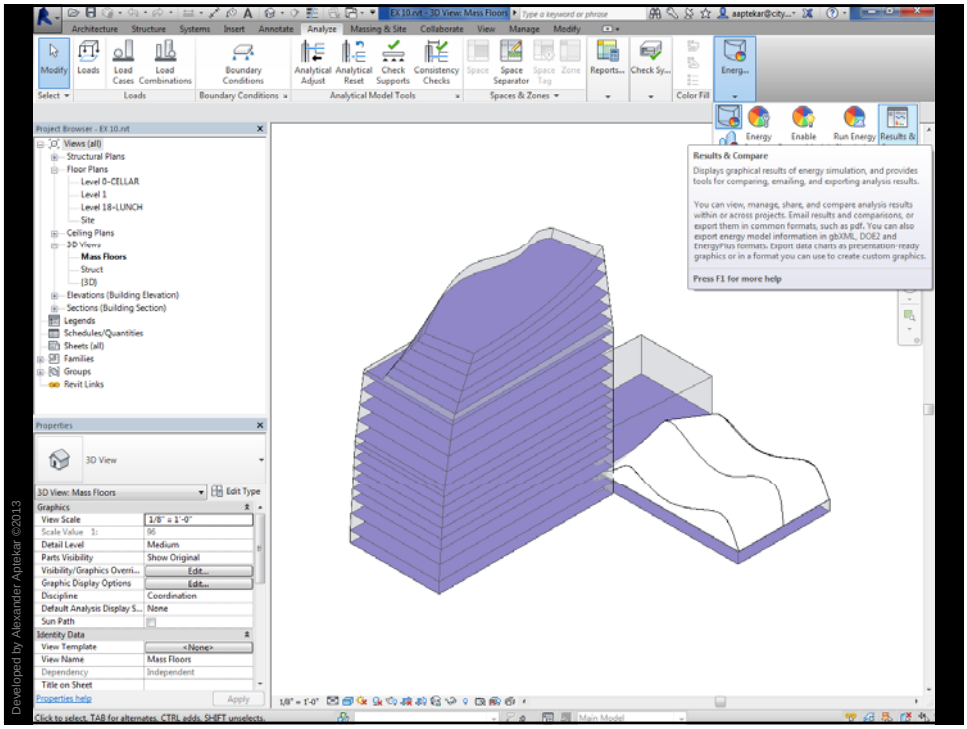

Use Conceptual Mass Mode
Sets conceptual masses as the basis for generating the energy analytical model used for energy simulation.
Press F1 for more help
Developed by Alexander Aptekar ©2013

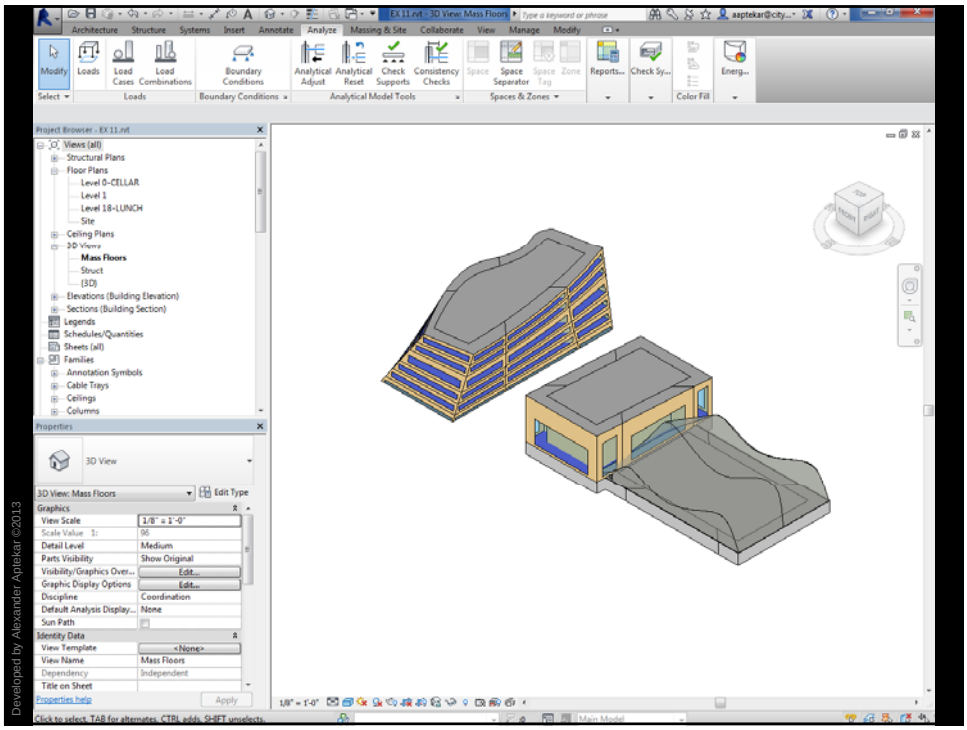

Developed by Alexander Aptekar ©2013


Energy Settings
Parameter
Value
Common
Building Type
Office
Location
285 Jay Street, Brooklyn, NY 11201,
Ground Plane
Level 1
Detailed Model
Export Category
Rooms
Export Complexity
Simple with Shading Surfaces
Include Thermal Properties
Project Phase
New Construction
Sliver Space Tolerance
1' 0"
Energy Model
Analytical Space Resolution
1' 6"
Analytical Surface Resolution
1' 0"
Core Offset
12' 0"
Divide Perimeter Zones
Conceptual Constructions
Edit...
Target Percentage Glazing
40%
Target Sill Height
2' 6"
Glazing is Shaded
Shade Depth
2' 0"
Target Percentage Skylights
0%
OK
Cancel
Energy Settings
Parameter
Value
Include Thermal Properties
Project Phase
New Construction
Sliver Space Tolerance
1' 0"
Energy Model
Analytical Space Resolution
1' 6"
Analytical Surface Resolution
1' 0"
Core Offset
12' 0"
Divide Perimeter Zones
Conceptual Constructions
Edit...
Target Percentage Glazing
40%
Target Sill Height
2' 6"
Glazing is Shaded
Shade Depth
2' 0"
Target Percentage Skylights
0%
Skylight Width & Depth
3' 0"
Energy Model - Building Services
Building Operating Schedule
Default
HVAC System
Central VAV, HW Heat, Chiller 5.96
Outdoor Air Information
Edit...
OK
Cancel
Developed by Alexander Aptekar ©2013


Run Energy Simulation
Subscription only feature. Sends energy analytical model and parameters to Autodesk Green Building Studio for simulation.
When using building element mode, the energy analytical model is automatically created.
Depending on model size and complexity, this process can take
Press F1 for more help
Developed by Alexander Aptekar ©2013


Developed by Alexander Aptekar ©2013


Results & Compare
Displays graphical results of energy simulation, and provides tools for comparing, emailing, and exporting analysis results.
You can view, manage, share, and compare analysis results within or across projects. Email results and comparisons, or export them in common formats, such as pdf. You can also export energy model information in gbXML, DOE2 and EnergyPlus formats. Export data charts as presentation-ready graphics or in a format you can use to create custom graphics.
Press F1 for more help
Developed by Alexander Aptekar ©2013


Developed by Alexander Aptekar ©2013

Vasari Massing Energy Analysis

Vasari

Vasari is a building design and analysis tool that lets you focus on the conceptual design phase. With built in features such as energy analysis, solar radiation analysis, and more, you can create, analyze, and refine whole building models. Conceptual building models created with Vasari can also be used in Autodesk Revit to develop more detailed building models.

Task : asses the effects of solar radiation and wind on the project.

1. Solar Radiation.
2. Wind tunnel.

For more information go to:

http://autodeskvasari.com/

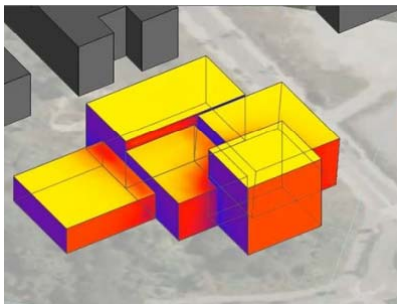
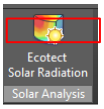


Image: http://sustainabilityworkshop.autodesk.com/buildings/solar-radiation-metrics

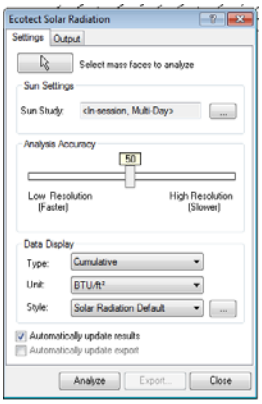
Solar Radiation

1. Open a model which has a building massing or create one in vasari. Ensure that the location is set and the building is correctly oriented on site relative to north. (if not location can be set in vasari by going to anaylze tab→location.
2. On the analyze tab select 'Ecotect Solar Radiation' --- → → →
3. If prompted, go to sun settings; otherwise select it from the dialog.
4. Since we want to test the amount of sun during the summer, we can choose an multiday setting during summer from sunrise to sunset.

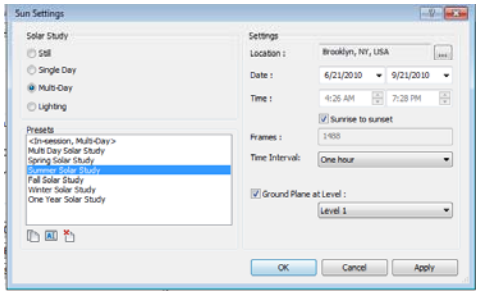
2

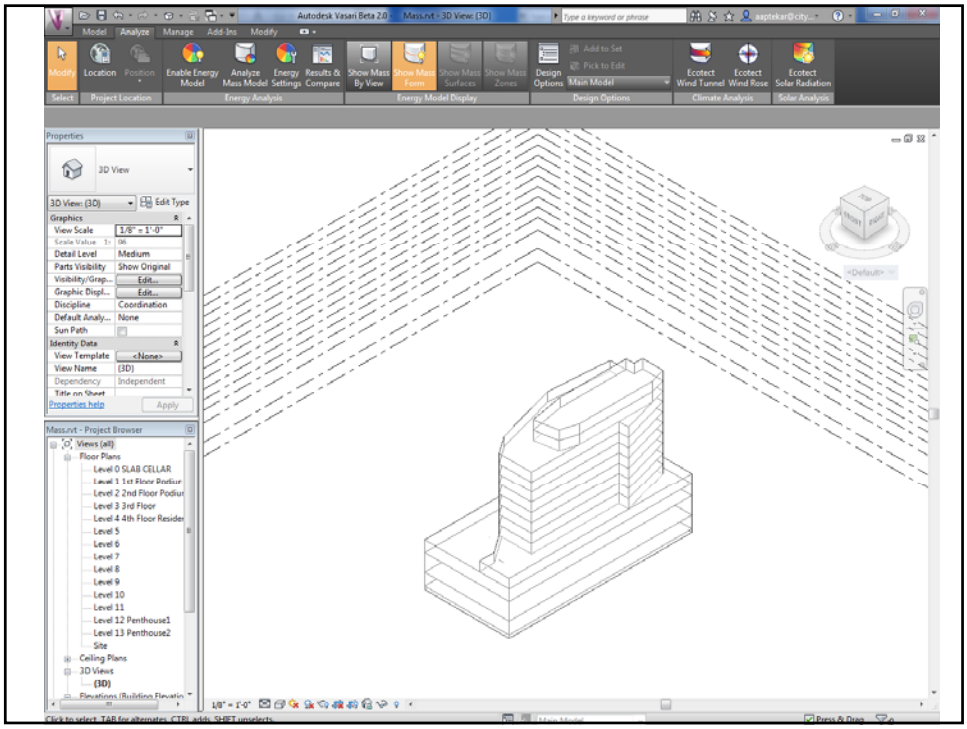


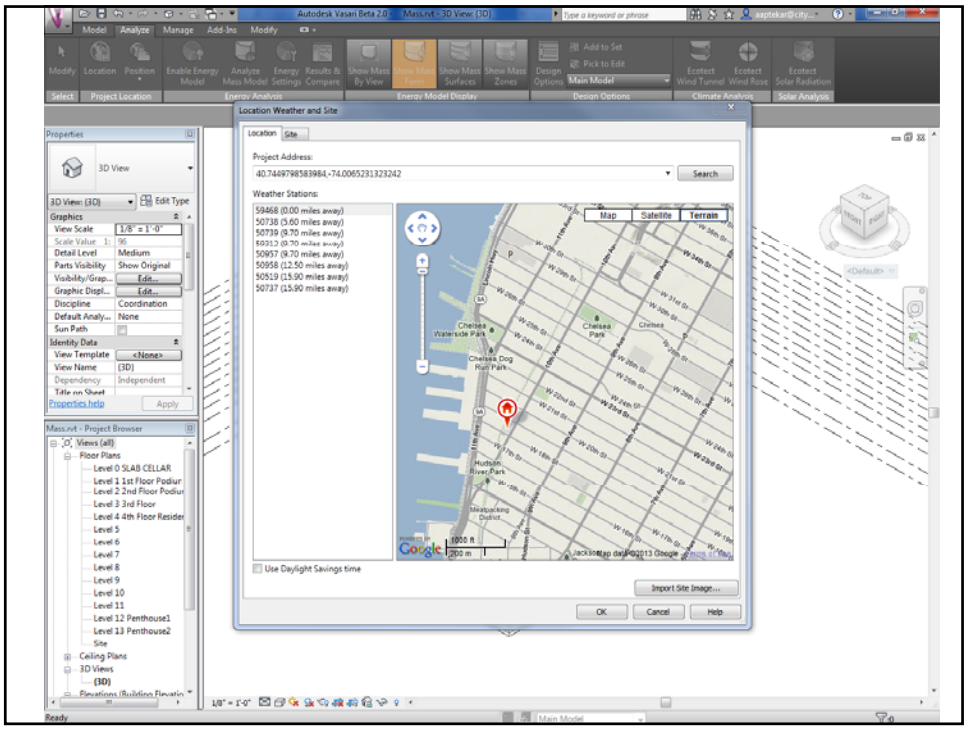
4



3

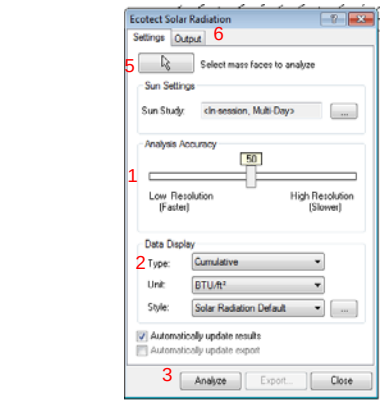


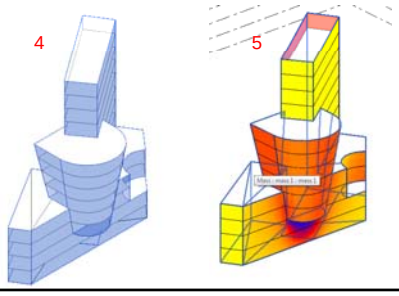


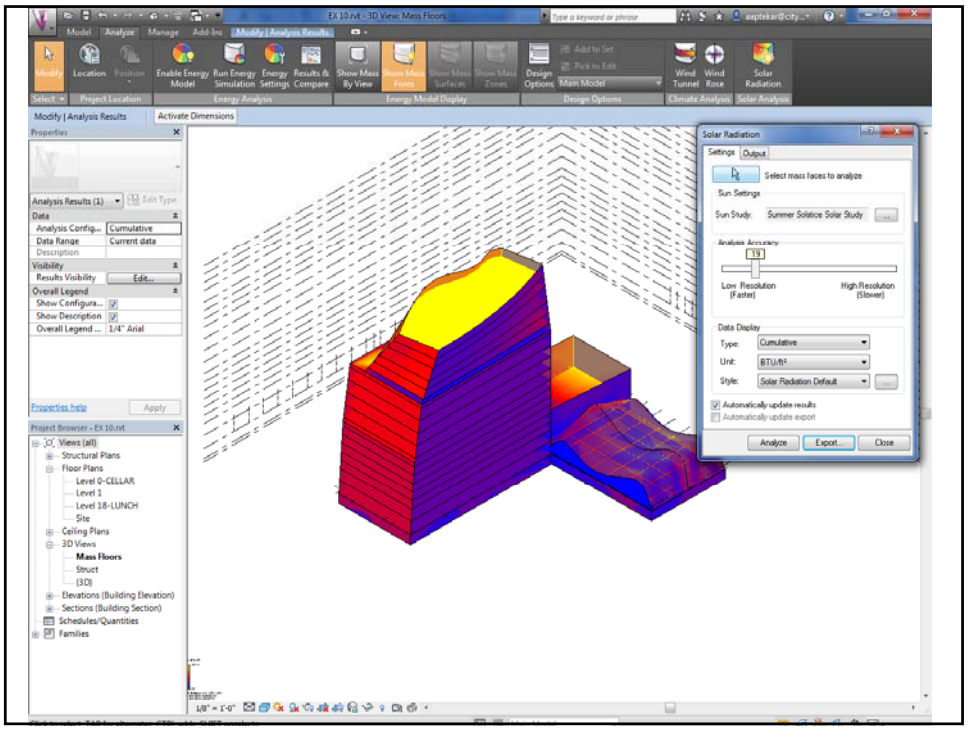

Location Weather and Site
Location
Site
Project Address:
Search
Weather Stations:
Map
Satellite
Terrain
Use Daylight Savings time
Import Site Image...
OK
Cancel
Help

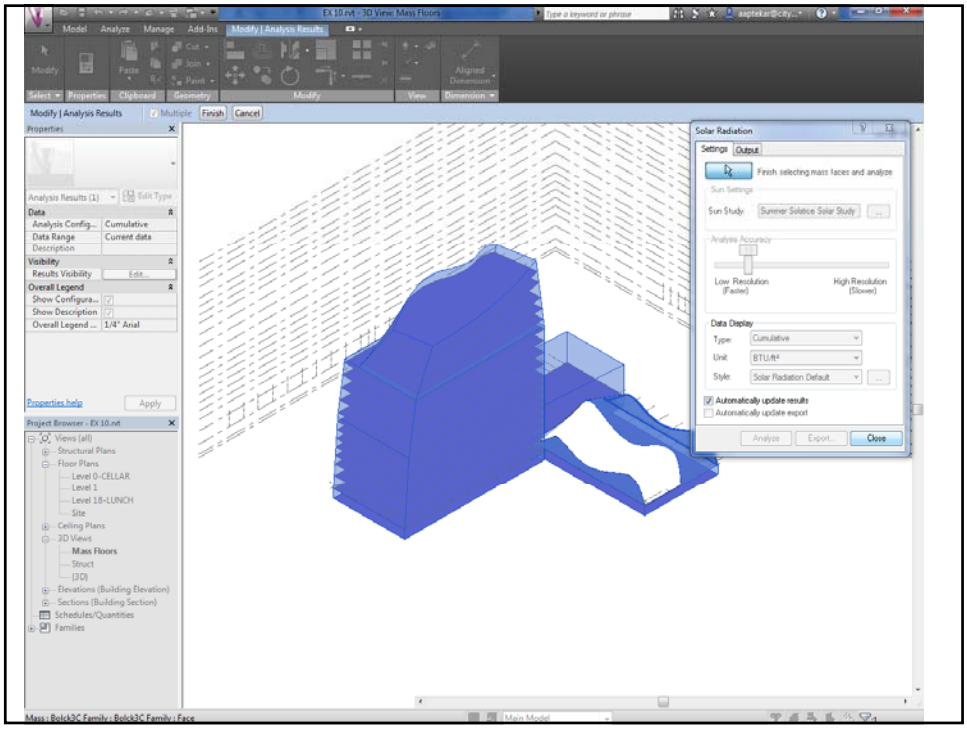
Solar Radiation

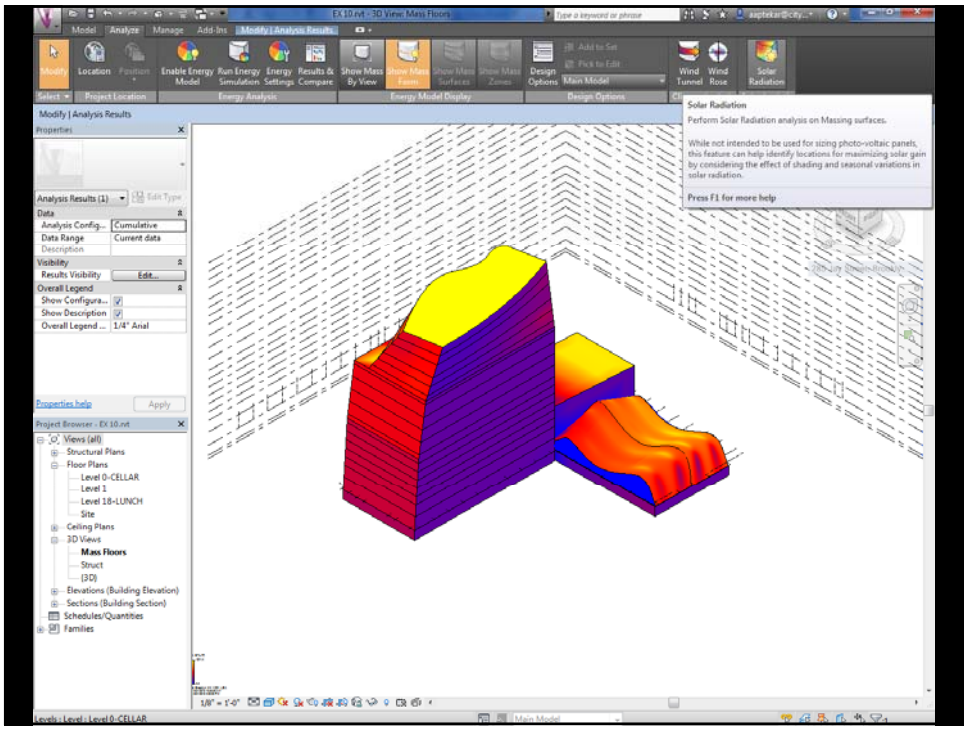
1. Next we specify the number of pixels of color for each façade (analysis accuracy resolution).
2. Adjust additional setting if needed. (For instance to change the way it displays go to style for different colors, points, or arrow vectors).
3. Select analyze. Then select all façade wanted to display the result'
4. Since we want to test the amount of sun during the summer, we can choose an multiday setting during summer from sunrise to sunset.
5. Click the arrow to finish selection
6. To save the image go to the output tab, save to project as large. The image will now be located on your project browser under renderings.

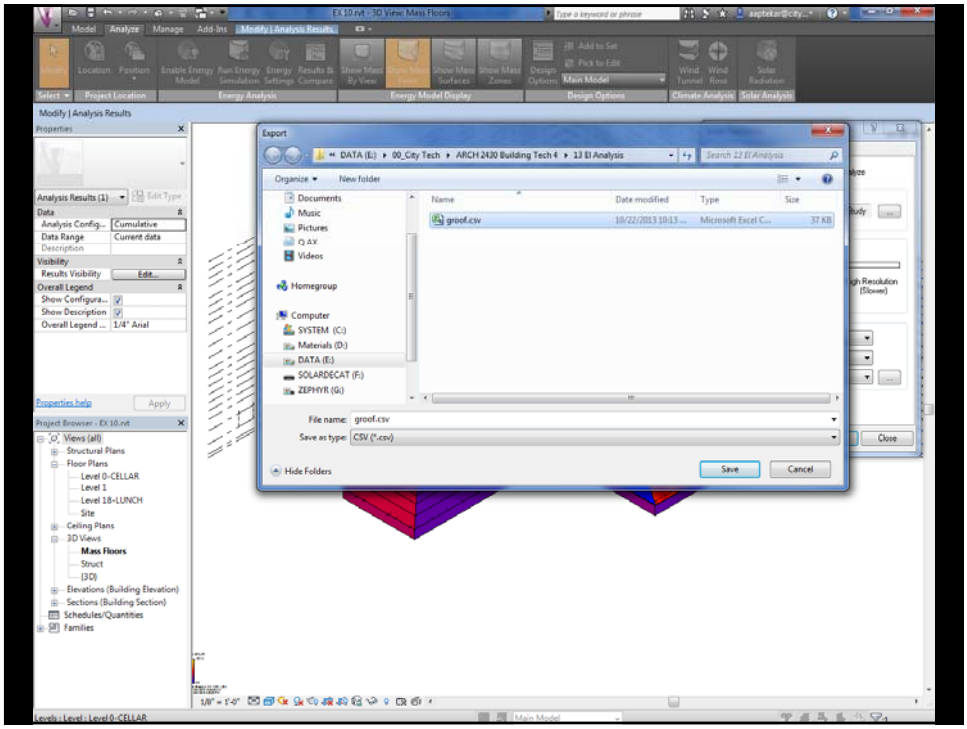


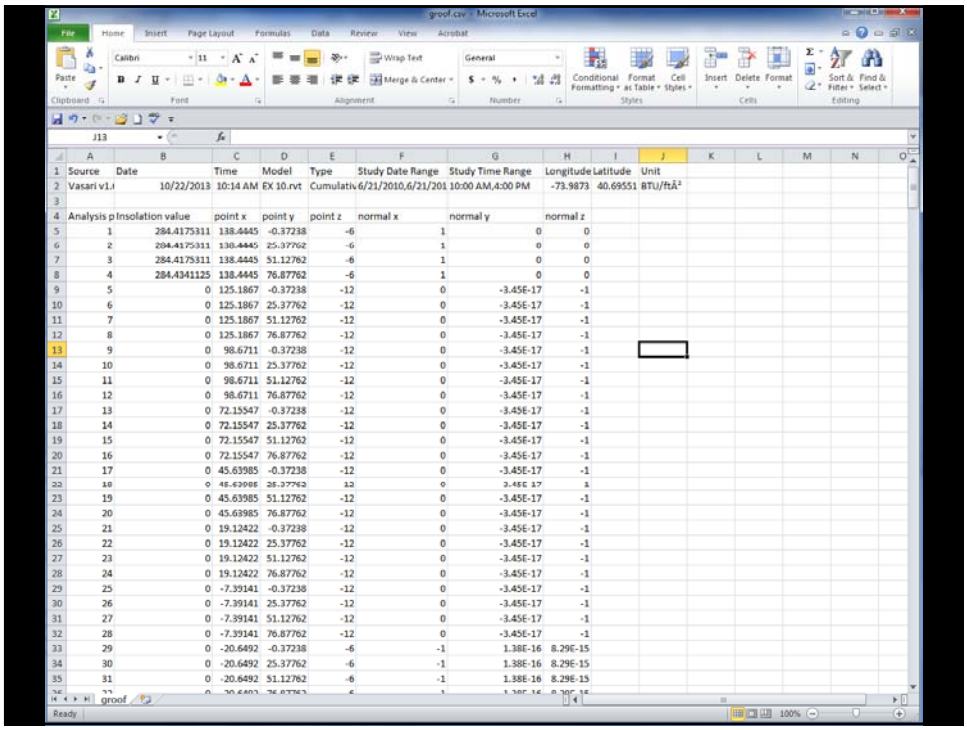





Solar Radiation
Settings
Output
Finish selecting mass faces and analyze
Sun Settings
Sun Study:
Summer Solstice Solar Study
Analysis Accuracy
Low Resolution (Faster)
High Resolution (Slower)
Data Display
Type:
Cumulative
Unit:
BTU/ft²
Style:
Solar Radiation Default
Automatically update results
Automatically update export
Analyze
Export...
Close

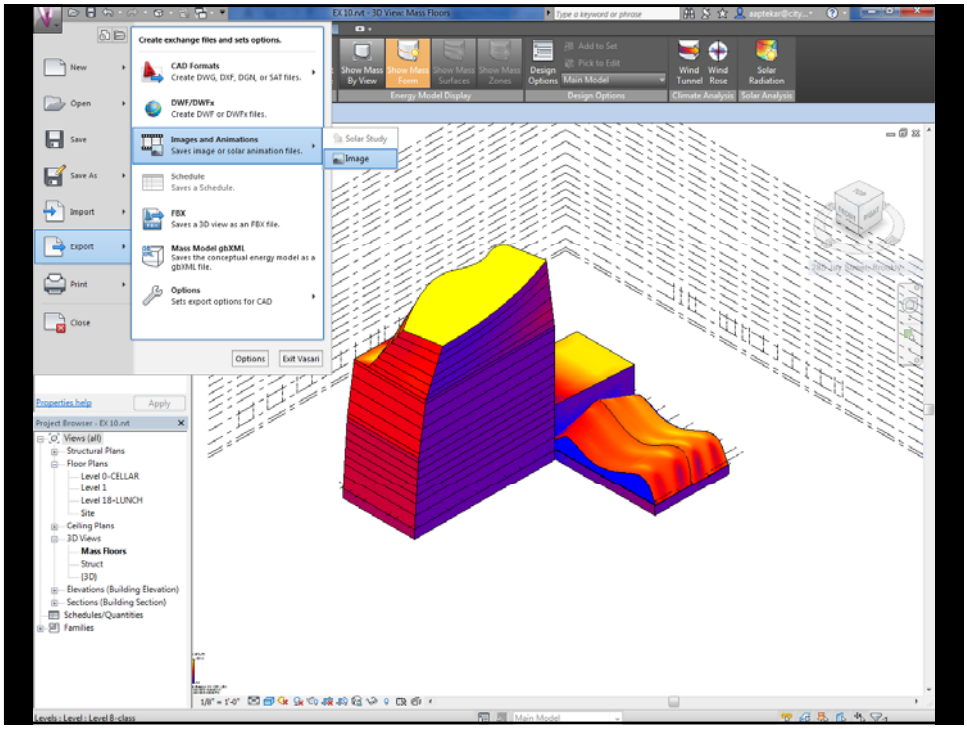

Solar Radiation
Perform Solar Radiation analysis on Massing surfaces.
While not intended to be used for sizing photo-voltaic panels, this feature can help identify locations for maximizing solar gain by considering the effect of shading and seasonal variations in solar radiation.
Press F1 for more help

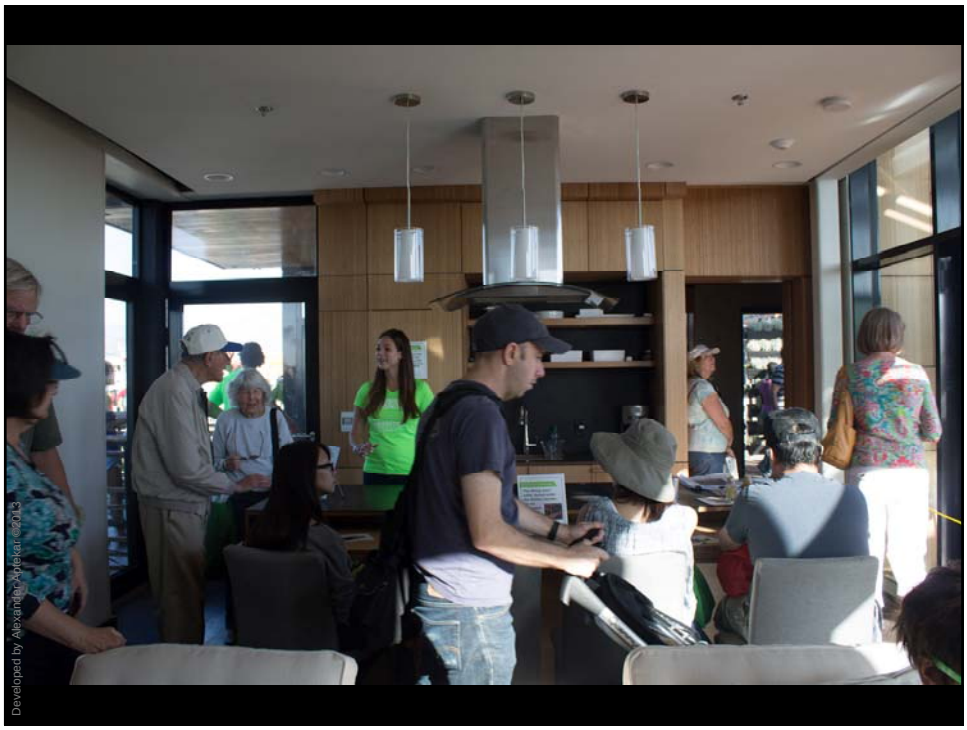




Source	Date	Time	Model	Type	Study Date Range	Study Time Range	Longitude	Latitude	Unit
Vasari v1.I	10/22/2013	10:14 AM	EX 10.rvt	Cumulativ	6/21/2010,6/21/201	10:00 AM,4:00 PM	-73.9873	40.69551	BTU/ftÂ²

Analysis p	Insolation value	point x	point y	point z	normal x	normal y	normal z
1	284.4175311	138.4445	-0.37238	-6	1	0	0
2	284.4175311	138.4445	25.37762	-6	1	0	0
3	284.4175311	138.4445	51.12762	-6	1	0	0
4	284.4341125	138.4445	76.87762	-6	1	0	0
5	0	125.1867	-0.37238	-12	0	-3.45E-17	-1
6	0	125.1867	25.37762	-12	0	-3.45E-17	-1
7	0	125.1867	51.12762	-12	0	-3.45E-17	-1
8	0	125.1867	76.87762	-12	0	-3.45E-17	-1
9	0	98.6711	-0.37238	-12	0	-3.45E-17	-1
10	0	98.6711	25.37762	-12	0	-3.45E-17	-1
11	0	98.6711	51.12762	-12	0	-3.45E-17	-1
12	0	98.6711	76.87762	-12	0	-3.45E-17	-1
13	0	72.15547	-0.37238	-12	0	-3.45E-17	-1
14	0	72.15547	25.37762	-12	0	-3.45E-17	-1
15	0	72.15547	51.12762	-12	0	-3.45E-17	-1
16	0	72.15547	76.87762	-12	0	-3.45E-17	-1
17	0	45.63985	-0.37238	-12	0	-3.45E-17	-1
18	0	45.63985	25.37762	-12	0	-3.45E-17	-1
19	0	45.63985	51.12762	-12	0	-3.45E-17	-1
20	0	45.63985	76.87762	-12	0	-3.45E-17	-1
21	0	19.12422	-0.37238	-12	0	-3.45E-17	-1
22	0	19.12422	25.37762	-12	0	-3.45E-17	-1
23	0	19.12422	51.12762	-12	0	-3.45E-17	-1
24	0	19.12422	76.87762	-12	0	-3.45E-17	-1
25	0	-7.39141	-0.37238	-12	0	-3.45E-17	-1
26	0	-7.39141	25.37762	-12	0	-3.45E-17	-1
27	0	-7.39141	51.12762	-12	0	-3.45E-17	-1
28	0	-7.39141	76.87762	-12	0	-3.45E-17	-1
29	0	-20.6492	-0.37238	-6	-1	1.38E-16	8.29E-15
30	0	-20.6492	25.37762	-6	-1	1.38E-16	8.29E-15
31	0	-20.6492	51.12762	-6	-1	1.38E-16	8.29E-15

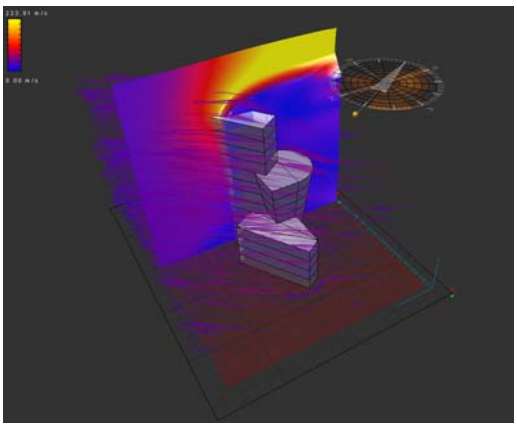

Create exchange files and sets options.
CAD Formats
Create DWG, DXF, DGN, or SAT files.
DWF/DWFx
Create DWF or DWFx files.
Images and Animations
Saves image or solar animation files.
Schedule
Saves a Schedule.
FBX
Saves a 3D view as an FBX file.
Mass Model gbXML
Saves the conceptual energy model as a gbXML file.
Options
Sets export options for CAD
New
Open
Save
Save As
Import
Export
Print
Close
Options
Exit Vasari
Solar Study
Image
Show Mass By View
Show Mass Form
Show Mass Surfaces
Show Mass Zones
Design Options
Add to Set
Pick to Edit
Main Model
Wind Tunnel
Wind Rose
Solar Radiation
Energy Model Display
Design Options
Climate Analysis
Solar Analysis
Properties help
Apply
Project Browser - EX 10.rvt
Views (all)
Structural Plans
Floor Plans
Level 0-CELLAR
Level 1
Level 18-LUNCH
Site
Ceiling Plans
3D Views
Mass Floors
Struct
{3D}
Elevations (Building Elevation)
Sections (Building Section)
Schedules/Quantities
Families


Developed by Alexander Aptekar, 2013

Wind Tunnel analysis

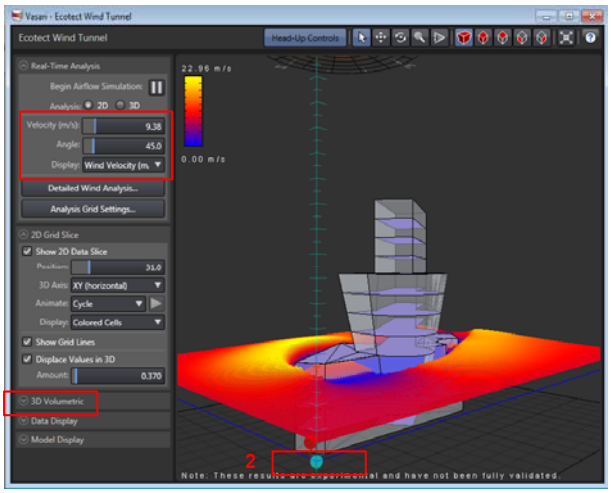
- We Use the Ecotect Wind Tunnel feature to run computational fluid dynamics (CFD) simulations in order to analyze the potential impact of wind speed and direction on your project. The Wind Tunnel feature allows you to run either 2D or 3D airflow analyses using an interactive grid control and multiple options for displaying the analysis data and how it interacts with your model.

- You can use the Wind Tunnel feature in conjunction with the Ecotect Wind Rose feature to dynamically simulate the impact of wind speed, direction, and relative frequency for the location that you specified for your current project.

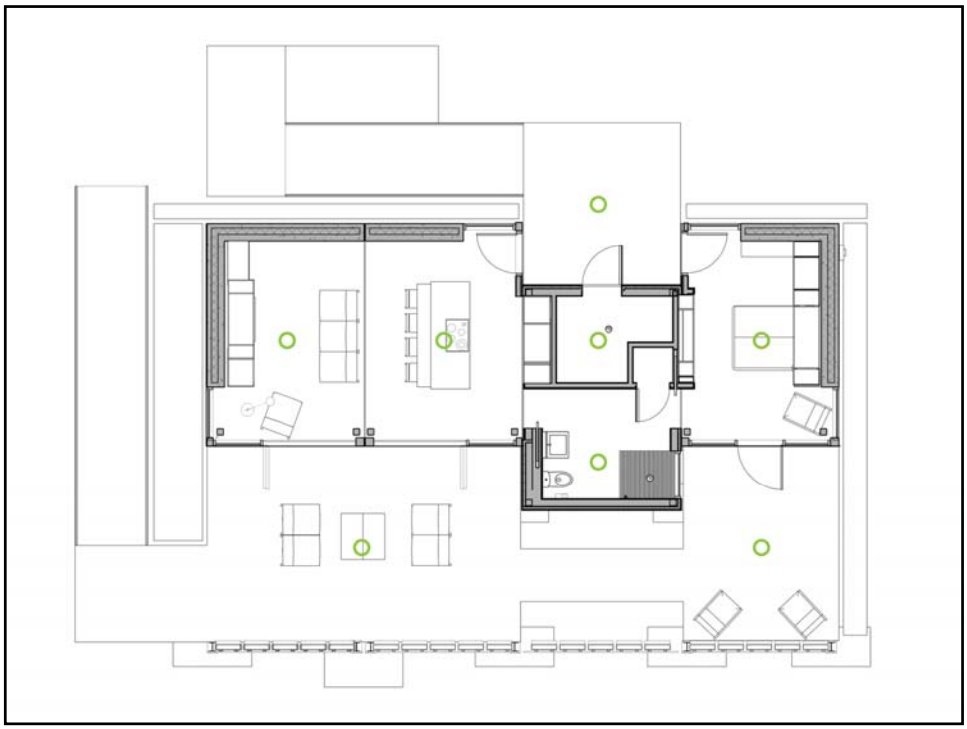


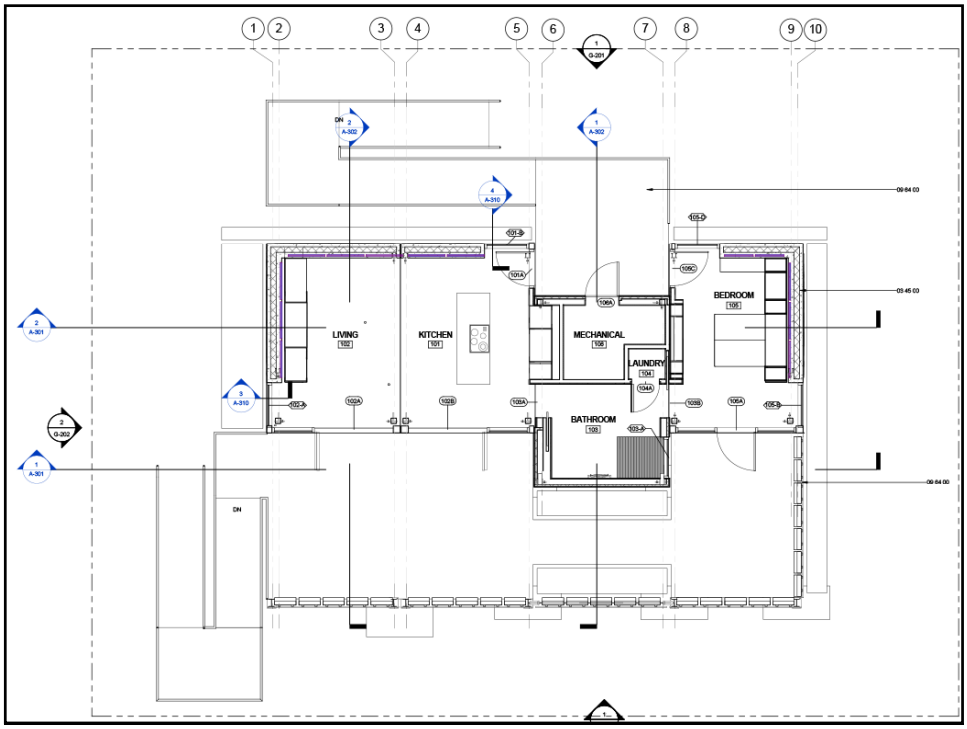
Wind Tunnel analysis

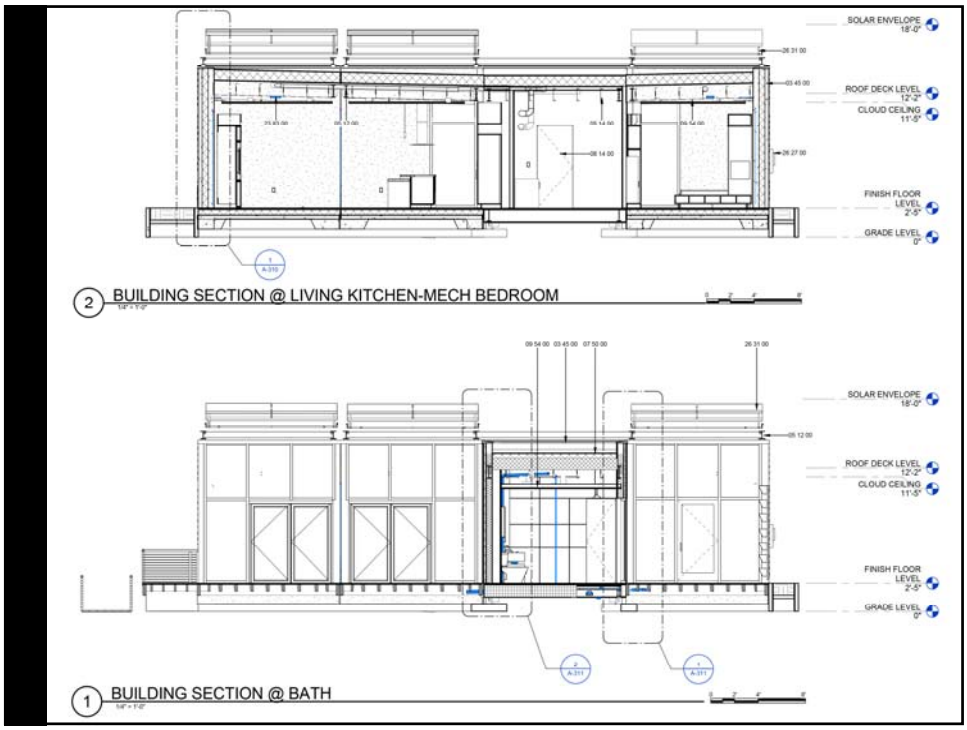
1. On the analyze tab select 'Ecotect Wind Tunnel'
2. Move the plane up and down using the axis
3. Change the speed and orientation
4. Show 3d analysis like arrows and point clouds.




© Jason Flakes/U.S. Department of Energy Solar Decathlon

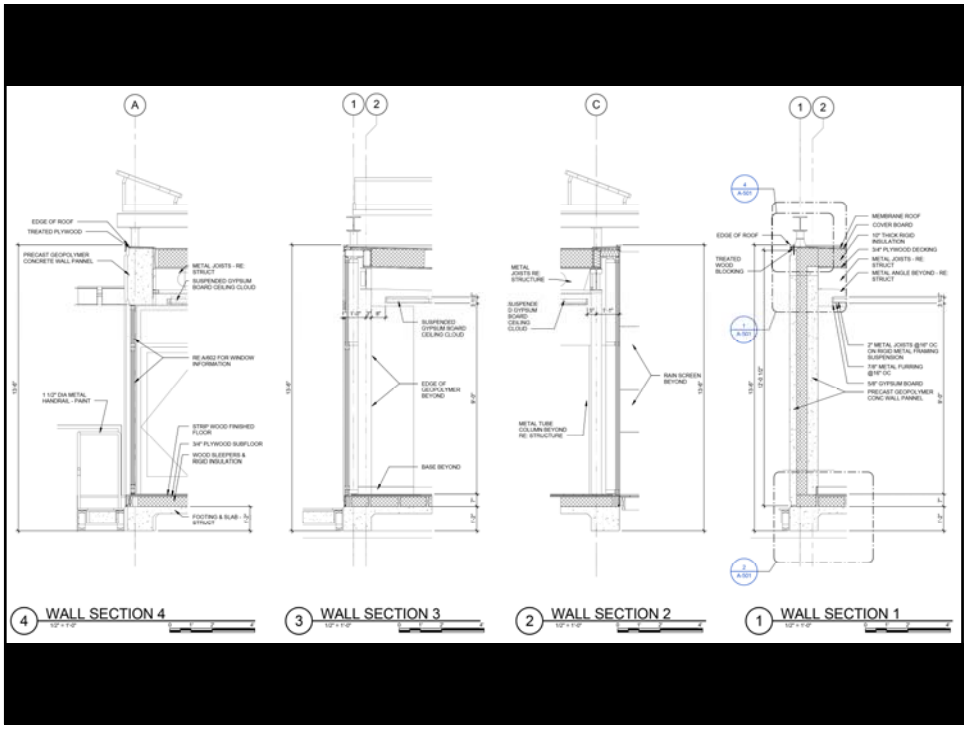


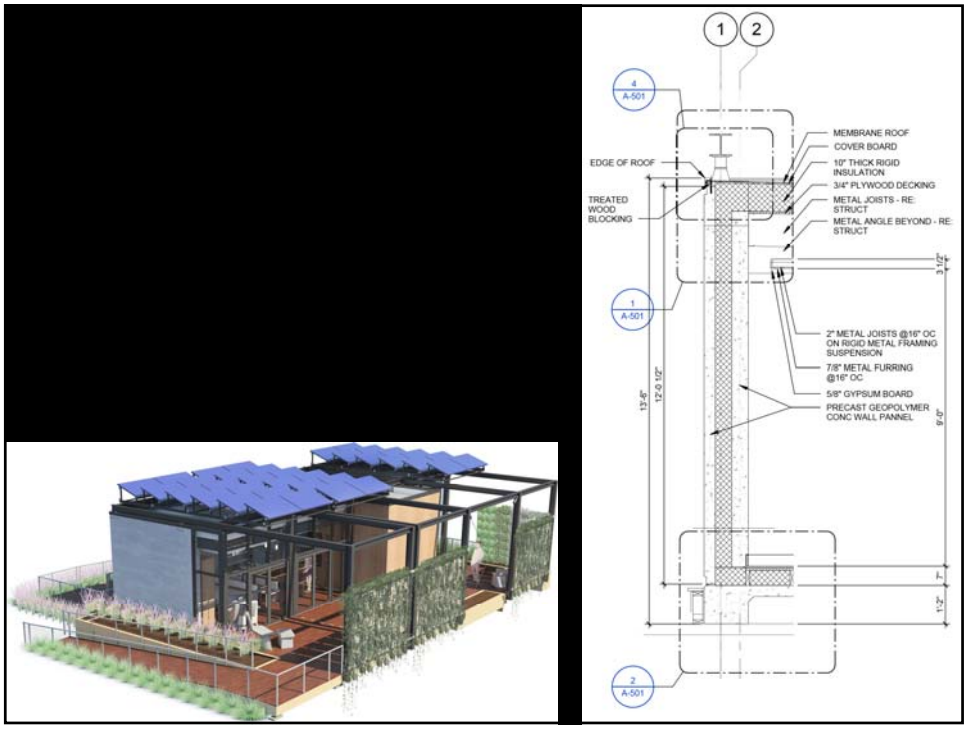

LIVING
KITCHEN
MECHANICAL
LAUNDRY
BATHROOM
BEDROOM

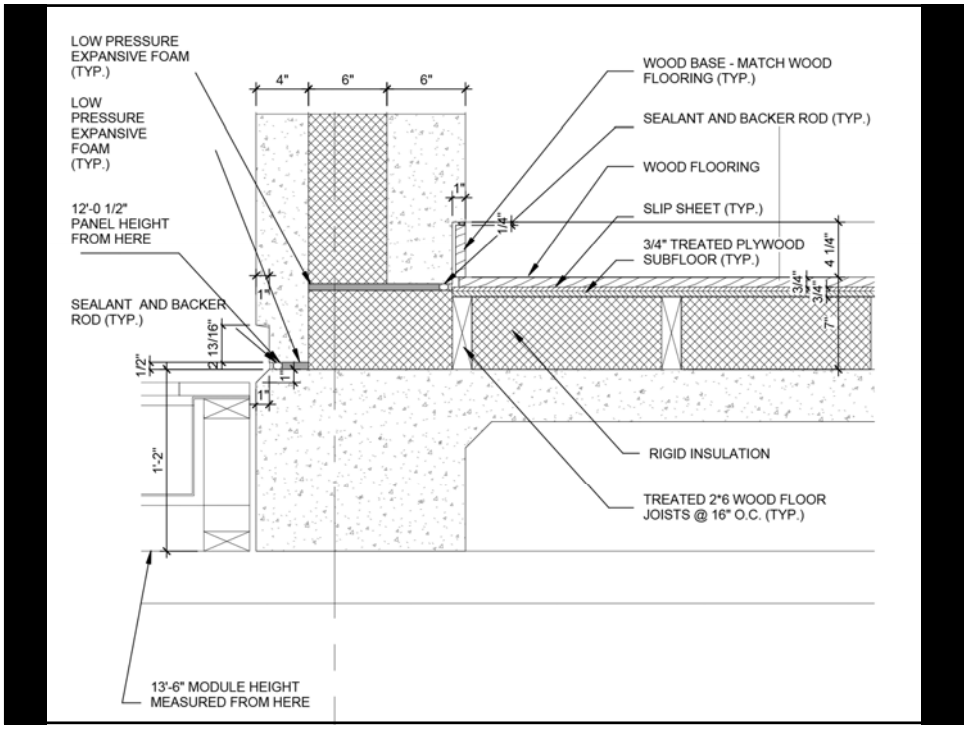

SOLAR ENVELOPE
18'-0"
ROOF DECK LEVEL
12'-2"
CLOUD CEILING
11'-5"
FINISH FLOOR
LEVEL
2'-5"
GRADE LEVEL
0"
2 BUILDING SECTION @ LIVING KITCHEN-MECH BEDROOM
SOLAR ENVELOPE
18'-0"
ROOF DECK LEVEL
12'-2"
CLOUD CEILING
11'-5"
FINISH FLOOR
LEVEL
2'-5"
GRADE LEVEL
0"
1 BUILDING SECTION @ BATH

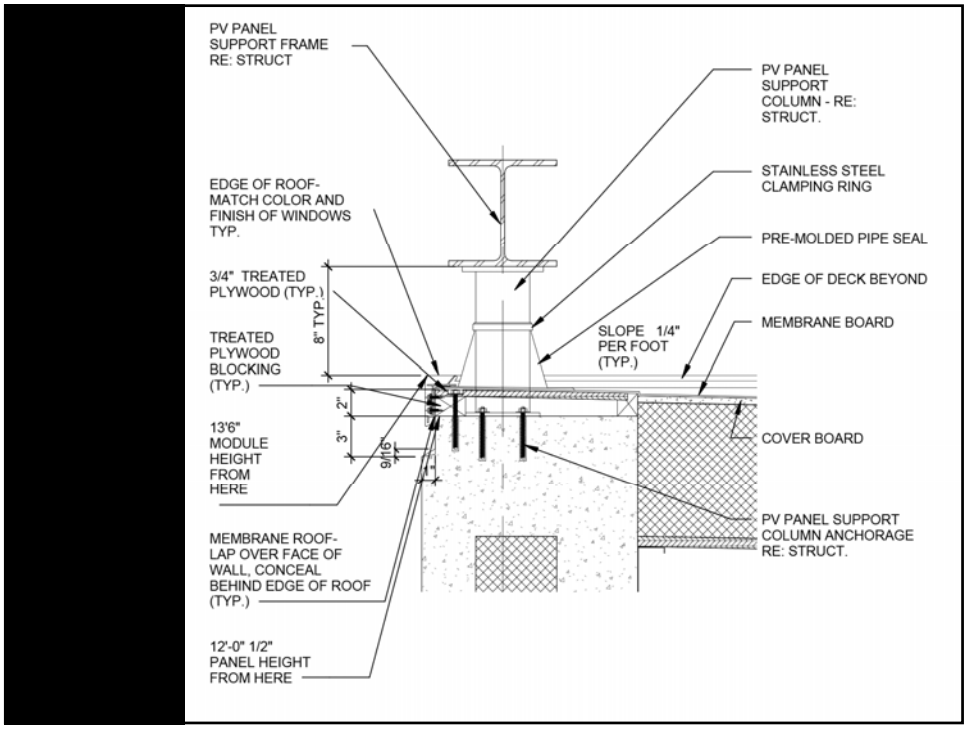
© Jason Flakes/U.S. Department of Energy Solar Decathlon

© Jason Flakes/U.S. Department of Energy Solar Decathlon




1
2
4
A-501
MEMBRANE ROOF
COVER BOARD
10" THICK RIGID INSULATION
3/4" PLYWOOD DECKING
METAL JOISTS - RE: STRUCT
METAL ANGLE BEYOND - RE: STRUCT
EDGE OF ROOF
TREATED WOOD BLOCKING
1
A-501
2" METAL JOISTS @16" OC ON RIGID METAL FRAMING SUSPENSION
7/8" METAL FURRING @16" OC
5/8" GYPSUM BOARD
PRECAST GEOPOLYMER CONC WALL PANNEL
13'-6"
12'-0 1/2"
9'-6"
1'-2"
2
A-501


LOW PRESSURE EXPANSIVE FOAM (TYP.)
LOW PRESSURE EXPANSIVE FOAM (TYP.)
12'-0 1/2" PANEL HEIGHT FROM HERE
SEALANT AND BACKER ROD (TYP.)
4"
6"
6"
WOOD BASE - MATCH WOOD FLOORING (TYP.)
SEALANT AND BACKER ROD (TYP.)
WOOD FLOORING
SLIP SHEET (TYP.)
3/4" TREATED PLYWOOD SUBFLOOR (TYP.)
1"
1/4"
4 1/4"
3/4"
3/4"
7"
13/16"
1/2"
1"
1"
1'-2"
RIGID INSULATION
TREATED 2"6 WOOD FLOOR JOISTS @ 16" O.C. (TYP.)
13'-6" MODULE HEIGHT MEASURED FROM HERE


PV PANEL SUPPORT FRAME RE: STRUCT
PV PANEL SUPPORT COLUMN - RE: STRUCT.
STAINLESS STEEL CLAMPING RING
EDGE OF ROOF- MATCH COLOR AND FINISH OF WINDOWS TYP.
PRE-MOLDED PIPE SEAL
EDGE OF DECK BEYOND
3/4" TREATED PLYWOOD (TYP.)
8" TYP.
MEMBRANE BOARD
SLOPE 1/4" PER FOOT (TYP.)
TREATED PLYWOOD BLOCKING (TYP.)
2"
3"
9/16"
13'6" MODULE HEIGHT FROM HERE
COVER BOARD
PV PANEL SUPPORT COLUMN ANCHORAGE RE: STRUCT.
MEMBRANE ROOF- LAP OVER FACE OF WALL, CONCEAL BEHIND EDGE OF ROOF (TYP.)
12'-0" 1/2" PANEL HEIGHT FROM HERE


Development by Alexander Aptekar, 2013