Kera Lagios
Designer, Lam Partners
Developer, DIVA-for-Rhino

EARLY PHASE SIMULATIONS
Radiance International Workshops 2013
National Renewable Energy Lab
Golden, CO
Oh, were it that easy...
The Importance of Observation
Where can daylighting metrics be introduced during the design process?
Where can daylighting metrics be introduced during the design process?
Where can daylighting metrics be introduced during the design process?
Definition of SKETCH

1

a : a rough drawing representing the chief features of an object or scene and often made as a preliminary study

b : a tentative draft (as for a literary work)

2

: a brief description (as of a person) or outline

3

a : a short literary composition somewhat resembling the short story and the essay but intentionally slight in treatment, discursive in style, and familiar in tone

b : a short instrumental composition usually for piano

c : a slight theatrical piece having a single scene; especially : a comic variety act

Sketching

Cocktail Napkin Sketch Contest 2013

If you are a licensed architect or related professional who practices in the United States, you can enter this remarkable contest. All you need is a white cocktail napkin and pen to demonstrate that the art of the sketch is still alive. Two grand prize winning submissions will be published in the September issue of Architectural Record and winners will receive a box of napkins with their sketch printed on it. Winners and finalists will be seen in our online Cocktail Napkin Sketch Gallery.

View Entry Form
View Complete Rules

Deadline is 5:00 PM EST on June 28, 2013.

Founding Sponsor

Supporting Sponsor

Drawing by Geoff Parker

Radiance IW 2013 - NREL - Golden, CO
Sketching and Digital Integration

VECTORWORKS: FROM SKETCH TO BIM

GET INVOLVED

FOLLOW THE SKETCH TO BIM PROCESS THROUGH THE PHASES BELOW.
Share your workflow issues while we create the model.

- Project Chosen - Eco Resort
- Concept Chosen - Research Center
- Sketch Chosen - Seaside Eco Resort
- Ends August 15th

PHASE 1 | START HERE
Choose which project you’d like to

PHASE 2 | IMAGINE
Choose the conceptual sketch that

PHASE 3 | DESIGN
As the project progresses, choose

PHASE 4 | CREATE
We’ll share tools to help your firm
Sketching and Digital Integration
Can we use performance metrics in the earliest phases of design?

The Generic
Codes
Rules of Thumb

The Conceptual
Pre-Design
SD Phase Design

The Specific
DD Phase Designs
CD Phase Designs
Buildings
Can we use performance metrics in the earliest phases of design?

How do simulations, assumptions, expectations change as we move through the phases of design?
When during the design process are simulations the most valuable?
Which simulations should be used when?
Challenges to Early Phase Simulations

• Level of detail
• Determining acceptable assumptions
• Time constraints
Atrium Reflector Design

Location of Reflector

Scrim
Initial Results (Static Model)

9am
Initial Results (Static Model)

<table>
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Radiance IW 2013 - NREL - Golden, CO
Dynamic Reflector Model

Plan

Dec 21 9AM

UML Atrium Reflector Study

Section

Radiance IW 2013 - NREL - Golden, CO
IGCC – International Green Construction Code

Using Grasshopper to analyze the IgCC daylighting requirements.
 IGCC – International Green Construction Code

Note to viewers: The IgCC information found in this presentation is for demonstration purposes only and should not be used to design from. For the current version of the IgCC, please go to:
http://www.iccsafe.org/Pages/default.aspx
Daylighting Requirement for 1 or 2 storey buildings

808.3 Daylit area of building spaces. In buildings not greater than two stories above grade, not less than 50 percent of the net floor area shall be located within a daylit area.
### Effective Aperture

<table>
<thead>
<tr>
<th>Sky Type</th>
<th>Sidelighting from fenestration in a wall (see figure 808.3.1.1(1))</th>
<th>Sidelighting from rooftop monitor (see figures 808.3.1.1(2) and 808.3.1.1(3))</th>
<th>Toplighting (see figure 808.3.1.2)</th>
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</table>

**FIGURE 808.3.1.1(4)**

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Calculating Effective Aperture

\[ EA = \frac{(AF \times VT)}{DA} \]

- \( EA \): effective aperture
- \( AF \): area of fenestration
- \( VT \): visible transmittance of the fenestration
- \( DA \): daylit area
Prescriptive

Where fenestration is located in a wall, the daylit area shall extend laterally to the nearest 56 inch high partition, or up to 1.0 times the height from the floor to the top of fenestration facing within 45 degrees of east or west or up to 1.5 times the height from the floor to the top of all other fenestration, whichever is less, and longitudinally from the edge of the fenestration to the nearest 56 inch high partition, or up to 2 feet, whichever is less, as indicated in Figure 808.3.1.1(1)
IgCC Initial Results Animations
Thank you