Barn House Holladay – Site Net Zero Energy

Prof. Jörg Rügemer

University of Utah

School of Architecture

Atelier Jörg Rügemer

joerg@ruegemer.com

www.ruegemer.com

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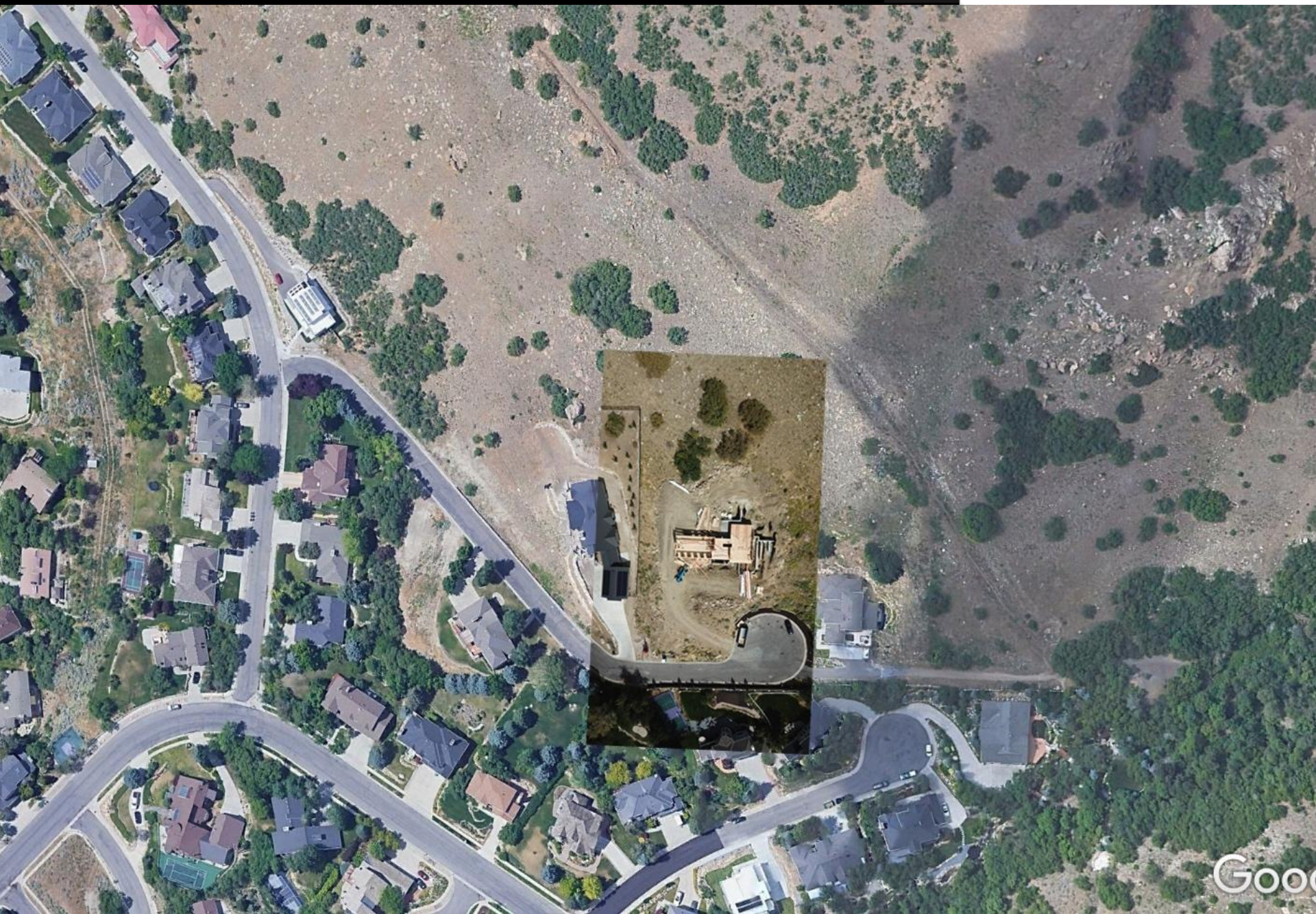

Project Goals:

- Development of a 3,800SF resilient and sustainable single-family residence
- On-Site Net-Zero energy performance through geothermal heating and cooling
- Coupled with a 7 kWh solar panel array
- Designed and build to Passive House standard:
- Walls R-45
- Roof R-60
- Slab R-42
- Windows U 0.21, SHG 0.5 – 0.25

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Predicted Energy Performance

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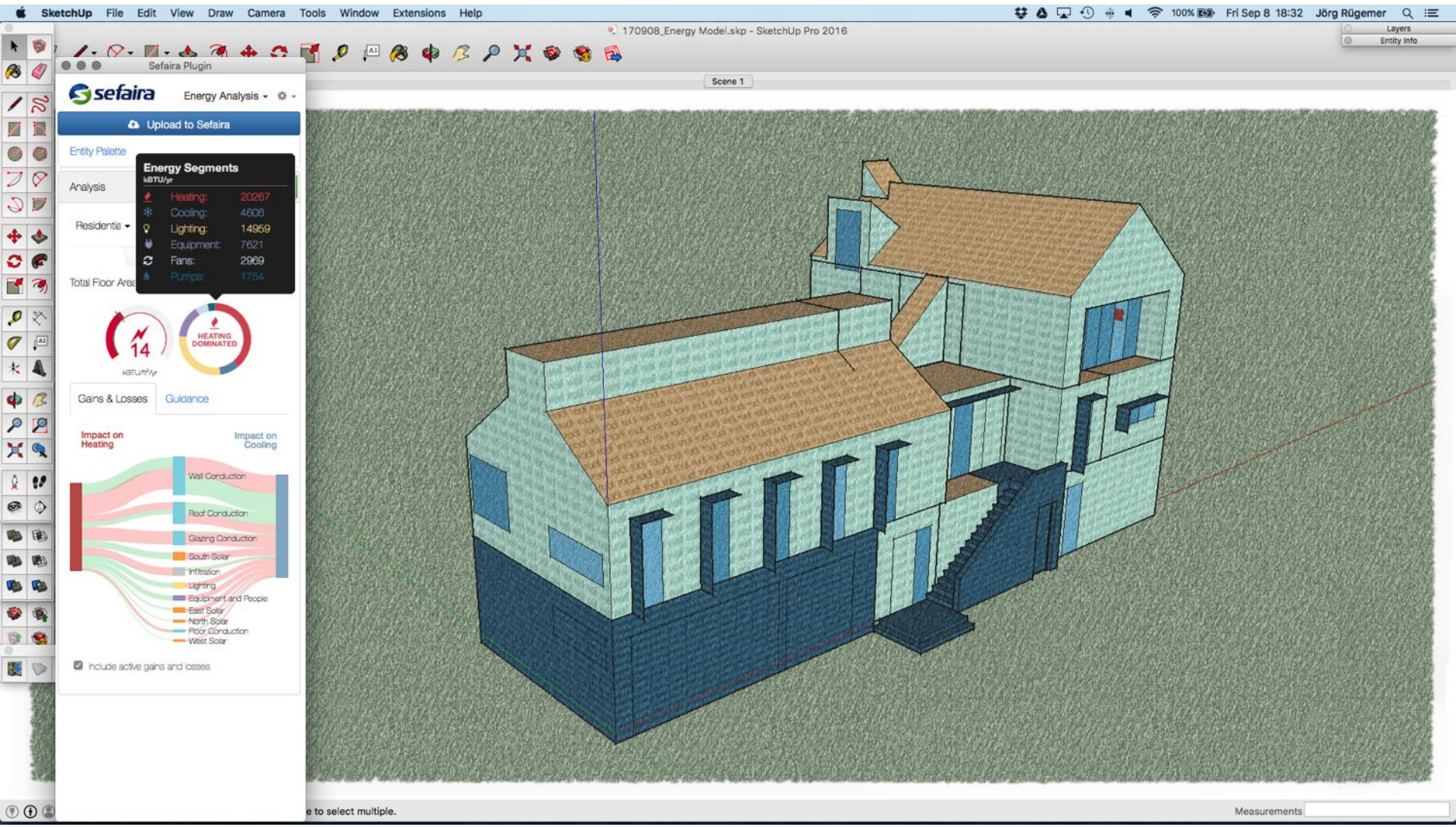

Component Performance Specification

Predicted Energy Performance

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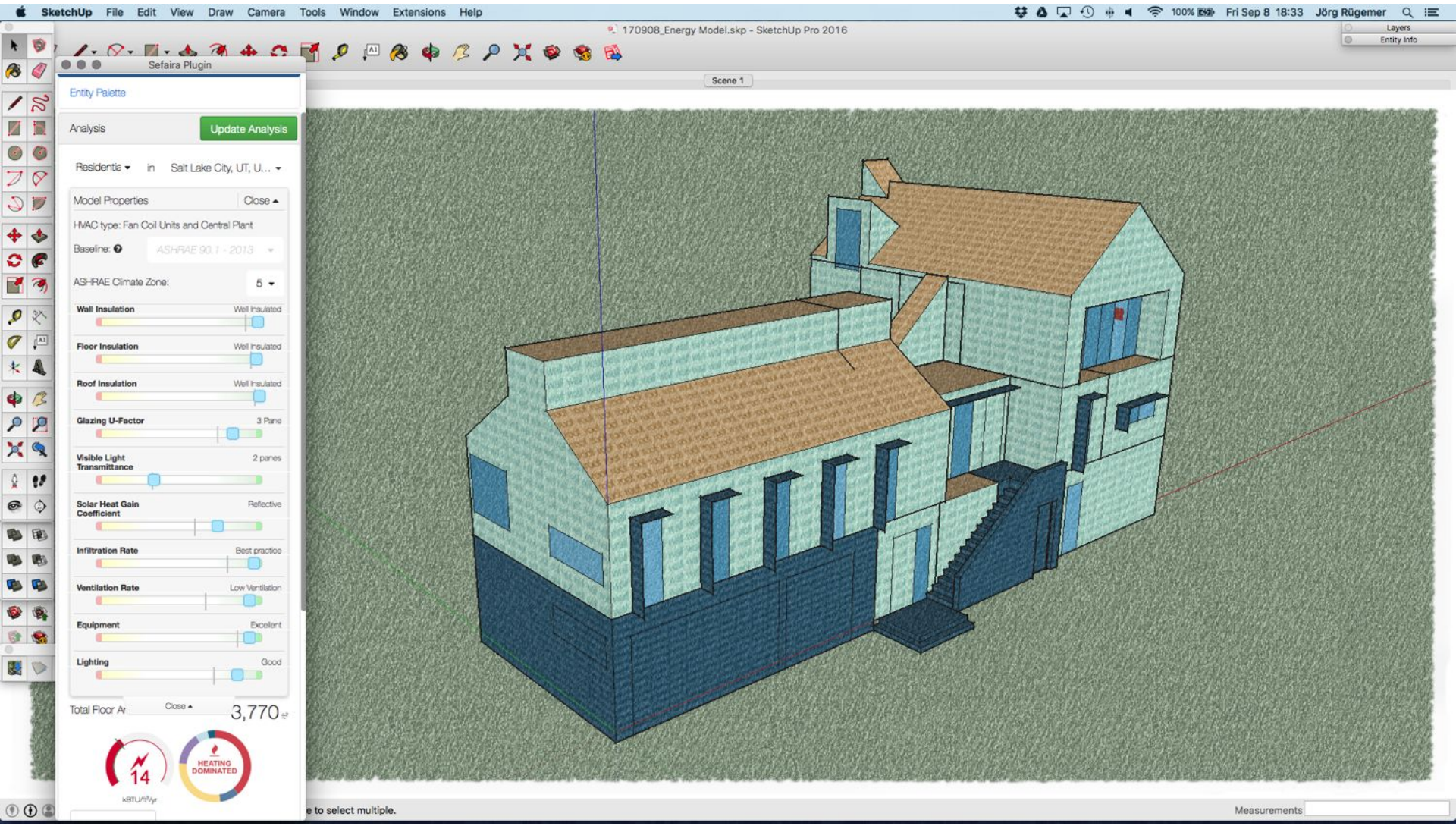

Component Performance Specification

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ASHRAE 90.1 - 2013 / EnergyPlus

Comparision Code-Standard vs. as Proposed: Preliminary Modeling

In this preliminary modeling mode, Ogden Residence will use appoximately 60% less energy compared to the ASHREA 90.1 - 2013 Code Standard Building for Salt Lake City.

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Specifications and Performance - Version 01: as Designed

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Specifications and Performance - Version 02: Triple Pane Windows

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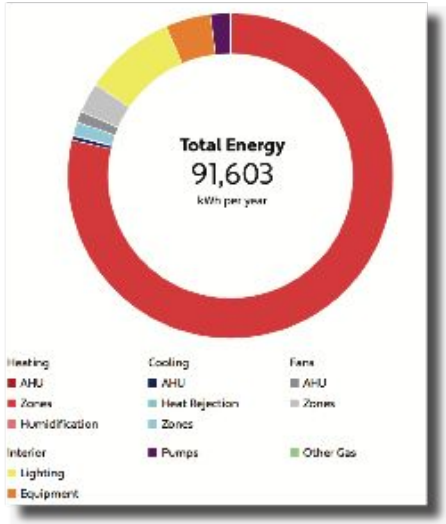
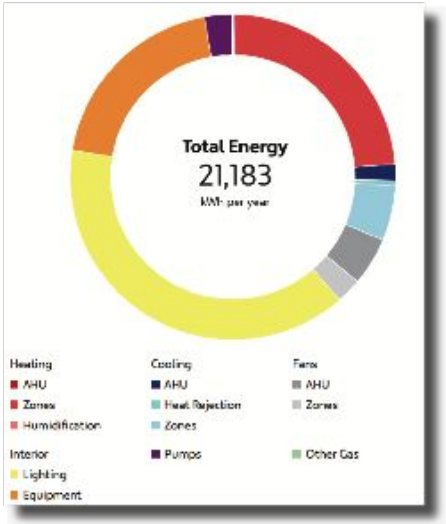
Comparision Code-Standard vs. as Proposed: Advanced Modeling





Ogden Residence will use appoximately 77% less energy compared to the ASHREA 90.1 - 2013 Code Standard Building for Salt Lake City.

This results in roughly 60% annual cost savings - ~$2,320/year, or ~$190/month BEFORE the application of photovoltaic cells.

At 4% interest, this monthly cash savings will finance (principal + interest combined):

- an additional ~$26,000 over a 15-year mortgage*
- an additional ~$40,000 over a 30-year mortgage*

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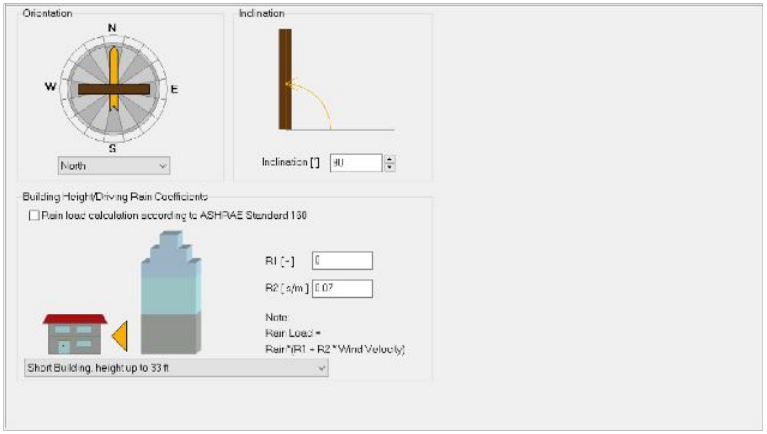
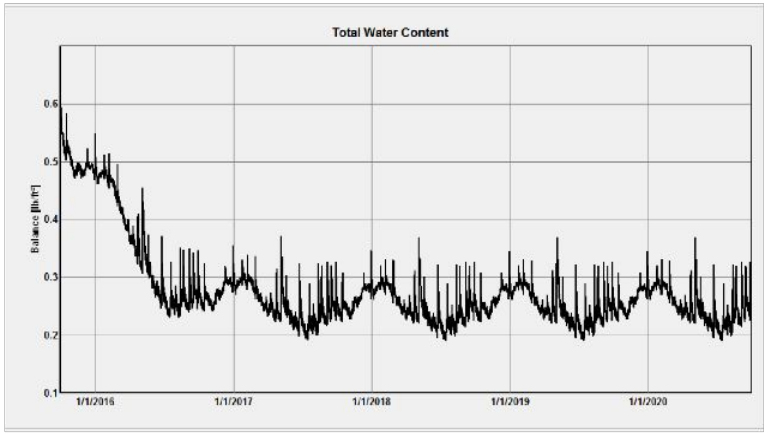
ASHRAE 90.1 - 2013 / EnergyPlus

12" Double Stud NORTH Wall: Component Humidity over Time





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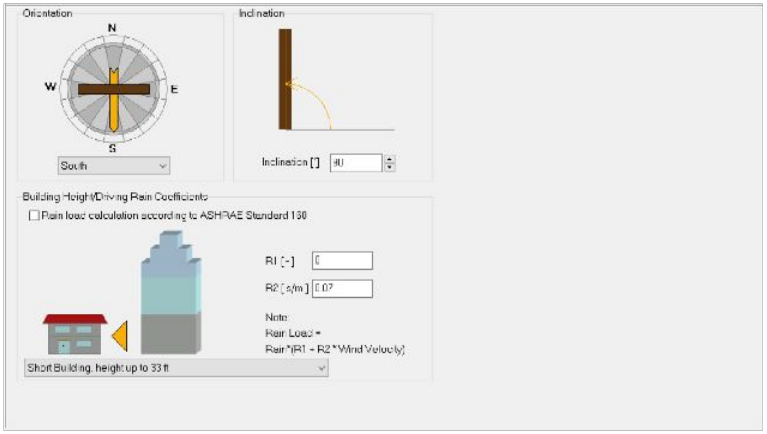
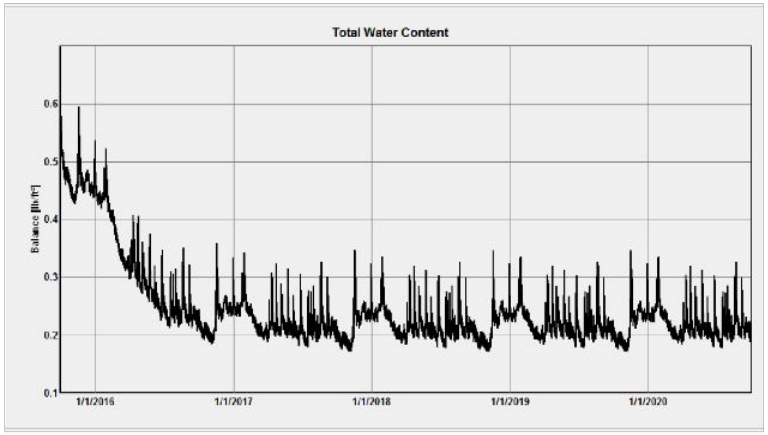
ASHRAE 90.1 - 2013 / EnergyPlus

12" Double Stud SOUTH Wall: Component Humidity over Time





Challenges anticipated:

- Client decided on contractor against architect's recommendation
- GC at times is overwhelmed by standard construction already
- GC at times is not able to build to plans, resulting in faulty concrete works in the basement walls and most retaining walls
- This results in a $75,000 demolition of concrete works as we speak
- The embodied energy in the demolition equals at least 10-15 years of energy savings
- GC is completely inexperienced in Passive House concept, so time will tell once it comes to air infiltration etc.

? + !

Thank you very much!

joerg@ruegemer.com
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