

Comparison of Energy Analysis Platforms for Completion of Title 24 Documentation

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Sub-Category: Model, digital creation
related to construction industry

Individual
Project Based

ENERGY MODELING, TITLE 24 ANALYSIS AND CALGREEN



AUTODESK SUSTAINABILITY WORKSHOP

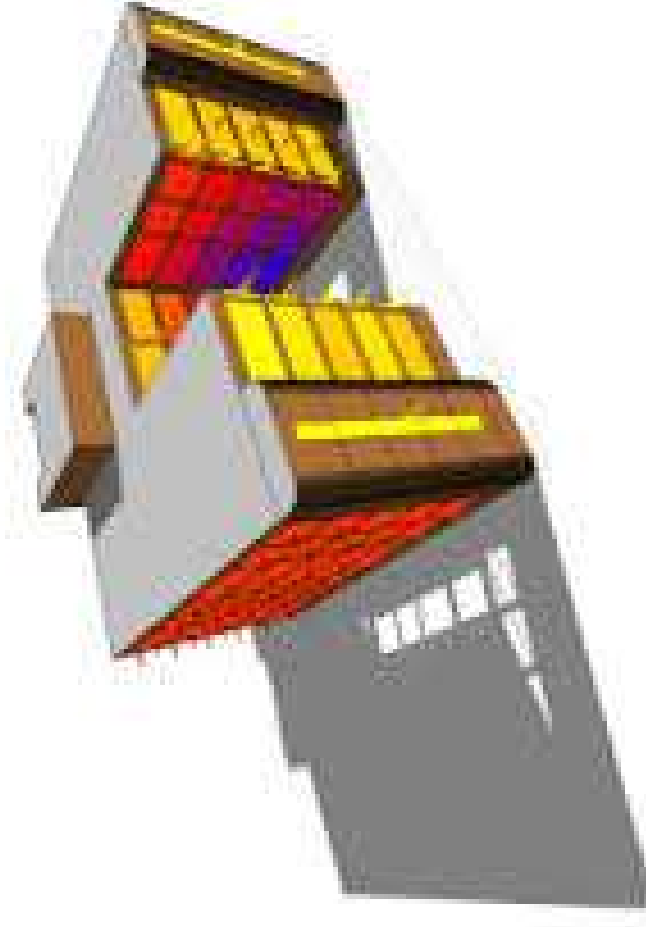
The 2013 Building Energy Efficiency Standards for Low-Rise Residential Buildings allow users to demonstrate compliance via two methods: performance or prescriptive.

Prescriptive documentation requires analysis to be conducted by-hand while performance compliance utilizes computer modeling software to analyze trade-offs, and demonstrate compliance through alternative building design parameters.

Typically computer demonstrated compliance via the performance method is the most popular choice because it allows for complex buildings to be analyzed using their actual metrics which results in a more accurate report of proposed energy consumption (Ross, 2016).

This method however requires additional software outside of the tools that architects and designers are already utilizing to create their working designs and construction documents.

The purpose of this paper is to give an overview of both compliance methods and the three approved software packages and then compare and contrast one of the most popular BIM software packages, Autodesk Revit, with documentation required to demonstrate compliance with the Building Energy Efficiency standard to access whether the two could be integrated in future to create one platform for design, analytics and documentation.



PERFORMANCE CERTIFICATE OF COMPLIANCE (Part 2 of 3)				PERF-1C					
Project Name Roseland University Prep			Date 6/18/2014						
ANNUAL TDV ENERGY USE SUMMARY (kBtu/sqft-yr)									
Energy Component	Standard	Proposed	Design	Compliance Margin					
Space Heating	13.97	6.48	7.49						
Space Cooling	96.09	92.88	1.20						
Indoor Fans	26.01	25.95	0.06						
Heat Rejection	0.00	0.00	0.00						
Pumps & Misc.	0.00	0.00	0.00						
Domestic Hot Water	0.00	0.00	0.00						
Lighting	62.59	32.09	29.50						
Receptacle	57.01	57.01	0.00						
Process	0.00	0.00	0.00						
Process Lighting	0.00	0.00	0.00						
TOTALS	254.67	216.41	38.25						
Percent better than Standard		15.0%	(15.0% excluding process)						
BUILDING COMPLIES									
GENERAL INFORMATION									
Building Orientation	(E) 90 deg	Conditioned Floor Area	20,271 sqft.						
Number of Stories	1	Unconditioned Floor Area	0 sqft.						
Number of Systems	24	Conditioned Footprint Area	14,146 sqft.						
Number of Zones	24	Natural Gas Available On Site	Yes						
Orientation									
Front Elevation	(E)	Gross Area	9,813 sqft.	Glazing Area	3,354 sqft.	Glazing Ratio	57.7%		
Left Elevation	(S)		3,047 sqft.		872 sqft.		28.6%		
Rear Elevation	(W)		6,544 sqft.		2,779 sqft.		42.4%		
Right Elevation	(N)		2,913 sqft.		620 sqft.		21.3%		
Roof		Total	18,319 sqft.		7,621 sqft.		41.6%		
			16,196 sqft.		0 sqft.		0.0%		
Prescriptive Lighting Power Density					Standard	1.000 W/sqft.	Proposed	0.529 W/sqft.	Prescriptive Values for Comparison only. See LTG-1C for allowed LPD.
Prescriptive Envelope TDV Energy					Standard	1,002,926		1,118,432	
Remarks:									

Purpose / Objectives / Goals:

- Purpose of the Building Energy Efficiency Standards and the two means of compliance
- Explain the three software programs certified for performance based compliance
- Explain the energy analysis capabilities embedded in Autodesk Revit
- Compare and contrast the usefulness and applicability of a Revit model when filling out the CF-1R