

Exhibit M Energy Analysis



ANB Carbondale

2018 International Green Construction Code - Compliance Report

December 15, 2022

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Disclaimer: Stok makes no guarantee that energy performance or savings will be achieved as estimated, except that services or work product were performed pursuant to generally accepted standards of practice in effect at the time services were performed. Any recommendations which may be made are for the consideration of the architect and engineers; they are not to be used instead of, or as a replacement for, licensed design. Many factors in the construction and operation of the building will affect the energy use, which are outside of Stok’s ability to control. This report is based on our understanding of the building design at this time, and results are subject to change with changes to the “Current Design.”

1. Executive Summary

ANB Carbondale project consists of a new ~27,300 square-foot mixed-use building. The first level features a bank and future retail/restaurant spaces. The second level consists primarily of residential spaces as well as a future office. This report shows compliance with the 2018 International Green Construction Code (2018 IGCC).

This 2018 IGCC compliance has been evaluated through the Performance-Based compliance option using ASHRAE 90.1-2016's Normative Appendix G, as described in Section 701.5. Compliance is determined by the Performance Cost Index (PCI) calculation and Carbon Dioxide equivalent (CO₂e) emissions as described in section 701.5.2 of the 2018 IGCC.

Compliance was also analyzed to meet the local Carbondale amendments based on the 2012 IGCC code, the latest adopted code at the time of analysis.

This analysis is based on a drawing set dated 11/09/2022, mechanical narratives, and additional information provided through emails and coordination. EnergyPro v6.8.0.4 was used for this analysis.

1.1. Summary of Results

- ✓ ANB Carbondale complies with the 2018 IGCC code:

Section 701.5.1 Annual Energy Cost *with* Renewables

The Proposed Performance Cost Index (PCI) was calculated in accordance with ASHRAE 90.1, Normative Appendix G. The renewables impact was calculated with the Alternate Renewables Approach per 2018 IGCC Section 701.4.1.1.2. **With renewables, the project exceeds PCI compliance by 2.6%.**

Section 701.5.1 Annual Energy Cost *without* Renewable

The Proposed PCI, excluding renewables, meets the requirements of ASHRAE 90.1, Section 4.2.1.1 as required under IGCC Section 701.5.1. **Without renewables, the project exceeds PCI compliance by 1.0%.**

Section 701.5.2 Annual Carbon Dioxide Equivalent (CO₂e)

The Proposed design's CO₂e emissions of 385,800 pounds-per-year is less than the Baseline's emissions of 394,300 pounds-per-year.

- ✓ ANB Carbondale complies with the City of Carbondale's Amendments to the 2012 IGCC code, the latest adopted code at the time of this analysis.

Section 602

A **Zero Energy Performance Index (zEPI) of 31.26** was calculated based on the performance of the Proposed and Baseline models. This is less than the maximum target zEPI of 47 as outlined in the Section 602 of the Performance Pathway Requirements.

Section 610

Installing a **26-kW onsite photovoltaic array** is calculated to offset 10% of the total annual building energy consumption. **-OR-**

Contracting a 10-year commitment to **offsite renewable energy credit ownership of no less than 50,800 kWh/yr** is calculated to offset 15% of the total annual building energy consumption.

Please see supporting calculations in following sections for the complete compliance calculations.

2. Energy Modeling Results - Annual Energy Use

End Use	Baseline Design			Proposed Design		
	kWh	Therms	Emissions	kWh	therms	Emissions
Interior Lighting	67,940 kWh	-	91,583 lbs CO ₂ e	61,921 kWh	-	10,057 lbs CO ₂ e
Exterior Lighting	23,526 kWh	-	31,713 lbs CO ₂ e	9,803 kWh	-	6,561 lbs CO ₂ e
Space Heating	-	4,716 therms	70,340 lbs CO ₂ e	59,717 kWh	-	151 lbs CO ₂ e
Space Cooling	57,317 kWh	-	77,263 lbs CO ₂ e	33,801 kWh	-	12,194 lbs CO ₂ e
Fans-Interior	155,754 kWh	-	209,956 lbs CO ₂ e	52,362 kWh	-	6,843 lbs CO ₂ e
Service Hot Water	7,559 kWh	2,179 therms	42,693 lbs CO ₂ e	19,038 kWh	-	766 lbs CO ₂ e
Receptacle Equipment	53,549 kWh	-	72,184 lbs CO ₂ e	52,856 kWh	-	27,784 lbs CO ₂ e
Appliances and Kitchen Equipment	19,743 kWh	1,000 therms	41,527 lbs CO ₂ e	19,471 kWh	1,000 therms	700 lbs CO ₂ e
TOTALS	385,387 kWh	7,896 therms	637,259 lbs CO₂e	308,969 kWh	1,000 therms	101,536 lbs CO₂e
kBtuh-equivalent		2,104,532 kBtuh			1,154,228 kBtuh	

3. 2018 IGCC Calculations

3.1. Annual Energy Cost with Renewables

Section 701.5.1 – with renewables

$$PCI_t = [BBUEC + (BPF * BBREC) - REC] / (BBUEC + BBREC)$$

	Baseline	Proposed
BBUEC	\$9,106	-
BBREC	\$41,838	-
BPF	0.619	-
REC (see calculations on right)	\$3,184	\$3,667
PCI _t	0.624	-
PCI	-	0.608

Proposed PCI < PCI_t? Yes, Complies 2.6%

REC calculations per 2018 IGCC Section 701.4.1.1.1

Alternate Renewables Approach

	Baseline	Proposed
Roof area	14,315 ft ²	-
Required PV production	7 kBtu/ft ²	-
	100,205 kBtuh	-
Required kWh	29,368 kWh	-
Proposed kWh, 10% energy offset	-	115,423 kBtu or 33,828 kWh
Cost Offset	\$3,184	\$3,667

Proposed kWh > Required kWh? Yes, Complies

3.2. Annual Energy Cost without Renewables

Section 701.5.1 – without renewables

$$PCIt = [BBUEC + (BPF \times BBREC)] / (BBUEC + BBREC)$$

	Baseline	Proposed
BBUEC	\$9,106	-
BBREC	\$41,838	-
BPF	0.619	-
PCIt	0.624	-
PCI	-	0.608

Proposed PCI < PCIt? Yes, Complies 1.0%

3.3. Annual Carbon Dioxide Equivalent (CO₂e)

	Baseline	Proposed
lbs CO ₂ e	637,259 lbs CO ₂ e	431,408 lbs CO ₂ e
Renewables impact, 10% offset	-	-45,601 lbs CO ₂ e
BPF	0.619	-
Total lbs CO ₂ e	394,320 lbs CO₂e	385,807 lbs CO₂e

Proposed CO₂e < Baseline CO₂e? Yes, Complies

4. Carbondale Amendments to 2012 IGCC Calculations

4.1. Zero Energy Performance Index (zEPI)

Equation 6-1

	Baseline	Proposed
Area SF	27,434	
Baseline EUI	76.7	-
Proposed EUIp	-	42.1
zEPI	-	31.3

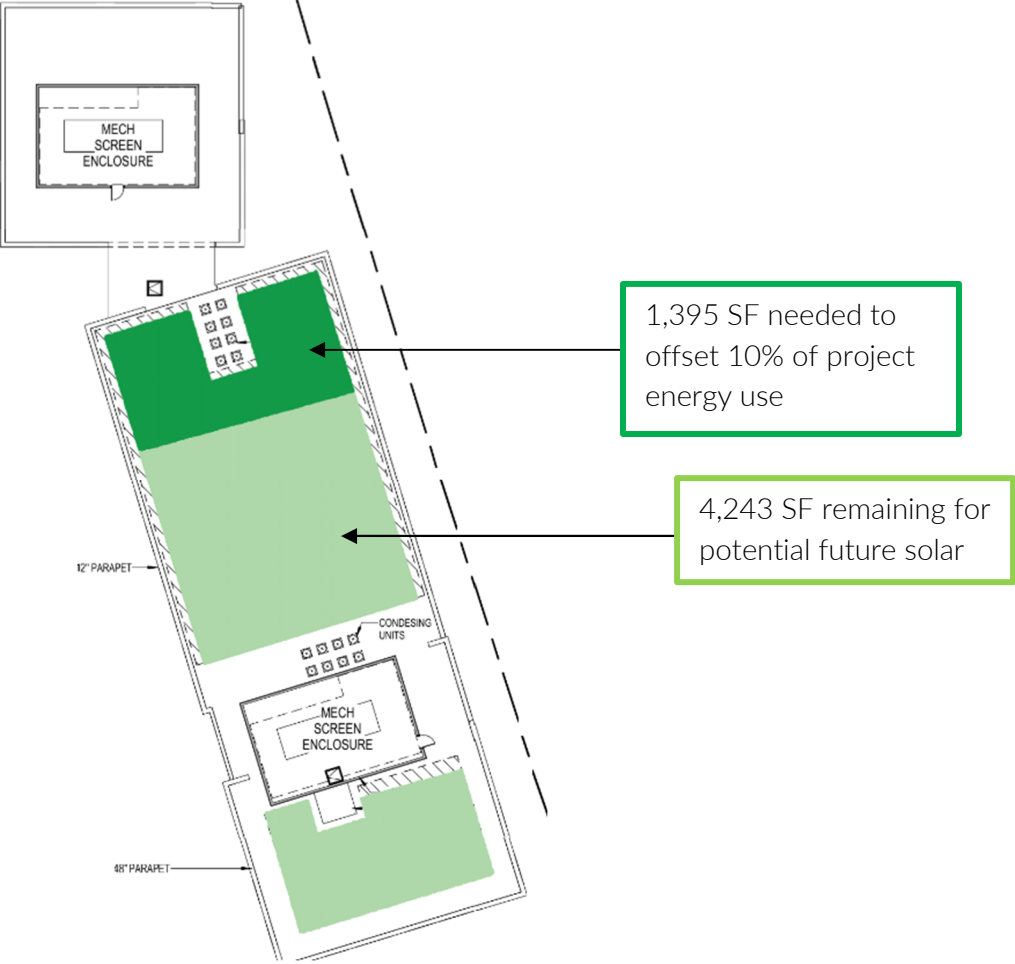
zEPI < 47? Yes, Complies

4.2. Renewable Energy Requirements

Section 610.1.1

On-Site Renewable Offset Target	Annual Energy to be Offset		Array Size		The project is meeting this requirement on site
10%	115,423 kBtu	33,828 kWh	25 kW	1,395 SF	

Roof plan and area available for solar PV



Appendix A: Energy Model Inputs

Design Feature	IECC 2018 Baseline	Proposed Design
Location	Carbondale, CO, Climate Zone 5B Weather file: CO_Rifle_Garfield_Rgnl.bin	
Gross Floor Area	27,300 square-foot stand-alone, commercial bank building	
Hours of Operation	Bank and Office: <ul style="list-style-type: none"> Monday – Friday: 8AM to 5PM Saturday – Sunday: closed Residential <ul style="list-style-type: none"> 24/7 Retail <ul style="list-style-type: none"> Monday – Friday: 8AM to 8PM Saturday: 8AM to 9PM Sunday: 9AM to 4PM Restaurant: <ul style="list-style-type: none"> Monday – Friday: 8AM to 12AM Saturday: 10AM to 12AM Sunday: 11AM to 12AM 	
Energy Cost	Energy Information Administration (EIA) 2021 Average Colorado Commercial <ul style="list-style-type: none"> Electricity: \$0.108/kWh Natural Gas: \$1.161/therm 	
Emission Factor	Table 701.5.2B CO ₂ e Emission Factors <ul style="list-style-type: none"> Electricity: 1,348 lbs CO₂e/MWh Natural Gas: 509 lbs CO₂e /MWh 	

Design Feature	IECC 2018 Baseline	Proposed Design
Exterior Walls	Steel-framed (U=0.084 for Non-Res, U=0.064 for Res)	Brick face over R-7.5 rigid and R-19 batt in 6-inch metal frame (U=0.057)
Exterior Roof	Insulation entirely above deck (U=0.063)	R-31 rigid over deck (U=0.031)
Floors, above grade	Joist/framed floor (U=0.052 for Non-Res, U=0.038 for Res)	R-30 in 10" metal framed floor (U=0.74)
Ground floor	Unheated slab on grade, no perimeter insulation (F=0.73)	Unheated slab on grade, 48-inch vertical, R-10 Insulation (F=0.65)
Windows (WWR = 35%)	U-0.57, SHGC-0.39	Storefronts: SNX 62/27 IGU (Assembly: U=0.43, SHGC=0.27) Residential glazing: Anderson LowE272 Retail: SN 68 1" IGU on Ultraclear

Design Feature	IECC 2018 Baseline	Proposed Design
HVAC	<p>Apartments: Packaged terminal air conditioner</p> <ul style="list-style-type: none"> • Cooling: 9.3 EER • Heating: 78% gas furnace • Constant Volume Fans <p>Bank/Office/Retail/Restaurant: Packaged single zone air conditioner</p> <ul style="list-style-type: none"> • Cooling: 9.5 to 10.1 EER • Heating: 78% gas furnace • Constant Volume Fans 	<p>Apartments: Ducted VRF</p> <ul style="list-style-type: none"> • Cooling: 13.0 EER • Heating: 4.0 COP • Fan coils: 2-tons per apartment • Ventilation: individual ERVs, 60% effectiveness <p>Bank/Office: (1) Packaged Variable Air Volume Heat Pump with electric heat</p> <ul style="list-style-type: none"> • Cooling: 12.5 EER • Heating: 4.0 COP • Supply fan: 2.75" TSP • Fan control: Variable speed drive • Terminal units: electric reheat at exterior zones • Economizer • MERV-13 <p>Retail/Restaurant: (3) Packaged Rooftop Heat Pump with electric backup heat</p> <ul style="list-style-type: none"> • Cooling: 12.5 EER • Heating: 4.0 COP • Supply fan: 2.75" TSP • Fan control: Variable speed drive • Economizer • MERV-13

Design Feature	IECC 2018 Baseline	Proposed Design
Interior Lighting	<p>Bldg. Average LPD = 0.98 W/sf with following occupancy LPD breakdowns</p> <ul style="list-style-type: none"> Banking Activity: 1.50 W/sf Conference/meeting: 1.3 W/sf Corridor: 0.50 W/sf Dining: 0.9 W/sf Electrical/mechanical: 1.50 W/sf Lobby: 1.30 W/sf Lounge/breakroom: 1.20 W/sf Multifamily: 0.70 W/sf Office, enclosed: 1.10 W/sf Office, open plan: 1.10 W/sf Retail: 1.70 W/sf Restrooms: 0.90 W/sf Stairwell: 0.60 W/sf Storage: 0.70 W/sf 	<p>Bldg. Average LPD = 0.87 W/sf with following occupancy LPD breakdowns</p> <ul style="list-style-type: none"> Banking Activity: 0.72 W/sf Conference/meeting: 0.85 W/sf Corridor: 0.50 W/sf Dining: 0.9 W/sf Electrical/mechanical: 0.34 W/sf Lobby: 0.80 W/sf Lounge/breakroom: 0.68 W/sf Multifamily: 0.70 W/sf Office, enclosed: 0.60 W/sf Office, open plan: 1.10 W/sf Retail: 1.70 W/sf Restrooms: 0.68 W/sf Stairwell: 0.46 W/sf Storage: 0.37 W/sf <p>Note: Bolded spaces represent future undesigned tenant spaces where lighting has been modeled as baseline neutral. No lighting credit is taken</p>
Exterior Lighting	Allowance: 6.0 kW	Installed: 2.5 kW
Domestic Hot Water	<p>Apartments: Gas storage</p> <p>Bank/Office/Retail/Restaurant: Electric resistance</p>	<p>Apartments: Central heat pump water heater, 3.5 COP</p> <p>Bank/Office/Retail/Restaurant: Electric resistance</p>
On-Site Renewables	<p>Photovoltaics</p> <ul style="list-style-type: none"> 10% energy offset – 38,828 kWh 425 W/panel, 23 sf/panel, flat mounted, ~1,395 kWh/kW generation 	