

# Passive House Project Documentation

# Six&Kane - EnerPHit Plus



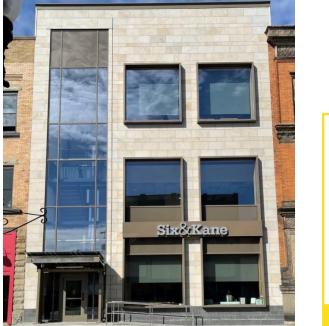


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### 1.Abstract





Six&Kane, Kane, PA, US

The West Penn Power Sustainable Energy Fund is a non-profit organization that provides investment capital and grant making to spur the deployment of renewable energy and energy efficiency. In 2019 WPPSEF purchased a vacant and decaying mid-block commercial building on US Route 6 in Kane PA, a rural community, and committed to renovating the building to the EnerPHit standard, in keeping with their mission and to demonstrate the Passive House strategies, training the local workforce in the methods necessary to achieve Certification.

The community embraced and supported the project enthusiastically during and after the construction period. Several dozen local tradespeople were trained in the craft of creating and maintaining an air barrier and thermally broken envelope throughout construction. In addition, during the project, several key team members earned their Passive House credentials.

Completed in late 2022, the renovated building houses a smoothie bar, Chamber of Commerce office, a law firm, economic incubator space, the WPPSEF office and community meeting rooms.

Six&Kane achieved EnerPHit Plus Certification and is the first EnerPHit Plus Office Building in North America. Although a renovation, the building exceeds the criteria for Passive House Plus for new construction.



### 1.1 Data

Year of Construction	2022	Climate Zone	6 Cold			
Treated Floor Area	9839 ft²	Space Heating Demand	4.53			
Heat/Humidity Recovery	85% 65%		kBTU/sf. yr.			
Average R-value external	25.1	Primary Energy Renewable	13.75			
wall	hr.ft2. °F/BTU	(PER)	kBTU/sf. yr.			
Average R-value floor	38.6	Generation of renewable	37.72			
slab/basement ceiling	hr.ft2. °F/BTU	energy	kBTU/sf. yr.			
U-value roof	39.9	Non-renewable Primary Energy	30.03			
	hr.ft2. °F/BTU	(PE)	kBTU/sf. yr.			
Average U-value window	0.13	Pressure Test n50	0.2			
	BTU/hr.ft2. °F		h-1			
Special Features	<ul> <li>Energy Recovery Elevator</li> <li>Heat Pump Water Heater in smoothie bar uses rejected heat from reach-in refrigeration units.</li> </ul>					

By attaining the EnerPHit Plus level of performance the building achieved an Architecture 2030 Zero Score of 15, and a Site EUI of 12 kBTU/sf. yr. against a benchmark of 76 kBTU/sf. yr. Total Greenhouse Gas Emissions are projected to be 28 metric tons CO<sub>2</sub>e/yr against a benchmark of 121 metric tons CO<sub>2</sub>e/yr.

#### **1.2 Project Description**

Built in 1897 as a 2-story building to house a dry goods store, the 3rd floor was added in the 1920's after the adjacent buildings were constructed. Those buildings used this building's north and south walls as their structure, creating a true party wall condition. The last occupant of the building was a Loyal Order of Moose Lodge. The roof and front façade had deteriorated to the point where both needed to be replaced. This presented the opportunity to construct new high-performance assemblies for most of the exposed envelope of the building, as well as cladding the remaining masonry walls on the rear of the building. Changing the east wall from mass masonry to a structural steel frame also allowed larger windows, admitting daylight and winter solar gain.

The climate of Kane is challenging, sitting 2000 Ft above sea level on an exposed hilltop. The winters can be cold and snowy, with a 13°F average temperature in January & February and an annual average snowfall of 92 inches. The summers are warm and often humid due to the surrounding forests.

Beyond energy performance drivers, the design of the building needed to both respect the local context yet move the streetscape in a future-looking direction. Placing the vertical circulation at the front façade provided an opportunity to share the elevator with the neighboring building. Accessibility was integrated into the new entrance design. The oversize windows not only bring light into the building but allow views of the



Chamber of Commerce offices and the gallery space from the street. The stairway lighting takes advantage of LED sources to allow color-changes seasonally or to support local celebrations and organizations. The front stone, a regional material, matches some of the materials of the surrounding buildings and gives a landmark quality to this building. The materials chosen for the back of the building, metal panels, provide durability, economy, and visual punch.

The interior of the building features locally sourced and milled maple flooring, stair treads, handrails and standing and running trim. The triple glazed timber framed curtainwall system ties into this interior wood detailing and the framing was extended on the large windows to provide an integration of structure and finish. The exposed structural elements and the painted exposed brick provide detail and human scale and the light colors and wood tones impart openness and serenity.

A major focus of the design and construction was airtightness. A fluid-applied vaporpermeable air barrier was applied to the party and rear walls after the inside surfaces were cleaned and pointed. The OSB sheathing on the roof and east wall have a factory-applied vapor-permeable air barrier attached, which was sealed with acrylic tape and flashing. The same sheathing product was used over the existing wood subfloor on the ground floor to separate the unconditioned basement from the conditioned upper floors.

The insulation scheme was to apply eight (8) in. of continuous insulation to the outside of the air barriers on the new construction and to the outside of the air-sealed and weather-sealed existing masonry. All wall insulation is graphite-enhanced expanded polystyrene foam board insulation (GPS), and the roof insulation is polyisocyanurate board. The ground floor over the basement has 12 in. of dense-pack blown-in fiberglass in the joist spaces, with four (4) in. of GPS continuous below. Interior mineral fiber insulation was added at transition zones where the party walls intersected with exterior walls and inside the structural steel frame to mitigate conditions where the frame contacted the ground, and locations where the continuous insulation needed to be reduced due to adjacent construction.

The windows are a combination of fixed and operable UPVC windows and timberframed curtainwall. All are triple-glazed with various low-e coatings tuned to the orientation. The east façade is clad with 50mm (2 in) thick regionally sourced sandstone panels, and the rear façades are clad with ribbed steel siding. Both cladding systems are attached with thermally broken clip systems. The location of the building on busy U.S. Route 6 made combined with limited hours of free cooling and the need to maximize morning daylight penetration, dictated that the front windows to be fixed curtainwall. The fixed and operable windows are Ventana brand select series 86 (Rehau Geneo lineals) Uf - 0.1346 BTU/hr.ft<sup>2</sup>°F. with Guardian ClimaGuard triple glazed insulated glazing units with Ug-value of 0.09 BTU/hr.ft<sup>2</sup>°F and SHGC of 42%. The curtain walls are Raico THERM+ 50 HI Uf - 0.160 BTU/hr.ft<sup>2</sup>°F with Saint-Gobain Planitherm Ultra



XN triple glazed insulated glazing units with Ug-value of 0.09 BTU/hr.ft<sup>2</sup>°F and SHGC of 55%.

The mechanical system consists of a single Ventacity RS3000 Energy Recovery Ventilator serving the entire building. Heating and cooling are supplied by a Variable Refrigerant Flow heat pump with 12 ducted and un-ducted air handlers throughout the building.

Domestic Hot Water for the toilet rooms and office kitchenettes is heated by Eemax point-of-use electric demand heaters. The Root Bar is served by a State room air source heat pump water heater. The waste heat rejected by the commercial kitchen reach-in freezer and refrigerators located in the same room and room adjacent to the water heater is recovered by the heat pump water heater and used to heat the water.

LED lighting is used throughout the building, and all appliances are Energy Star rated.

An Otis Gen 2 Elevator with regenerative drive meeting the ISO25745 Class A efficiency rating was installed.

One hundred and two 435-Watt PV panels on the roof, plus three 305-Watt panels on the front canopy supply 47,547 kWh/yr. of on-site renewable energy.



# 1.3 Responsible Project Participants

Architect, Passive House Designer, & Energy	
Modeler:	Gary P. Moshier, AIA, LEED AP BD+C, CPHD Moshier Studio
Associated Architect:	<b>Donna L. Zariczny RA</b> , LEED GA, CPHD Inscale Architects
MEP Engineer:	Michael L. Norris, PE Michael L. Norris &Associates, Inc
Structural Engineer:	Dave Brace, PE Brace Engineering, Inc
Thermal Bridge Modeling:	Rick Eckstrom CPHD-T
	Dave Fraser Peel Passive House Consulting Ltd.
Construction Manager:	Norm Horn, CPHC-T Envinity
Passive House Certifier:	Tad Everhart CertiPHiers Cooperative
Certification ID;	38246-38254_CO_EP_20230324_TE
PHI Project ID	6642
Project Documentation Authors:	Gary P. Moshier, AIA, LEED AP BD+C, CPHD Emel Guner-Ekin, Assoc. AIA Moshier Studio
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Gary P. Moshier, AIA, LEED AP BD+C, CPHD

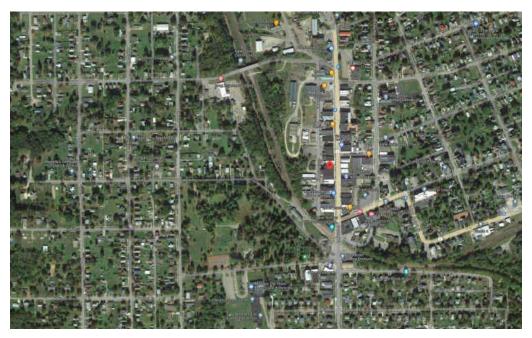
1 September 2023







The Borough of Kane is in Northwestern Pennsylvania in the Allegheny National Forest and Pennsylvania Wilds District



Six&Kane is at 63 N. Fraley Street in Uptown Kane. Fraley Street is US Route 6 and is the main street of the borough.

Imagery @2023 Google, Imagery @2023 CNES / Airbus, Maxar Technologies, PA Department of Conservation and Natural Resources-PAMAP/USGS, USDA/FPAC/GEO, Map data @2023





Subject Building with neighboring buildings on west side of Fraley Street



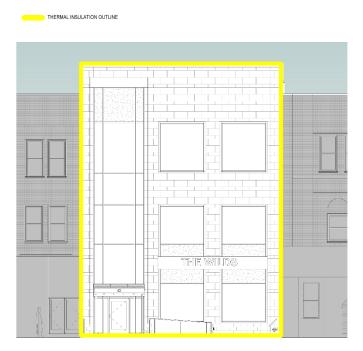
East side of Fraley street



### 3. Elevations

#### **East Elevation**





#### West Elevation







#### **South Elevation**



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1 1			r.
			<mark>Ear An Anna</mark>

### North Elevation







# 4. Building Sections



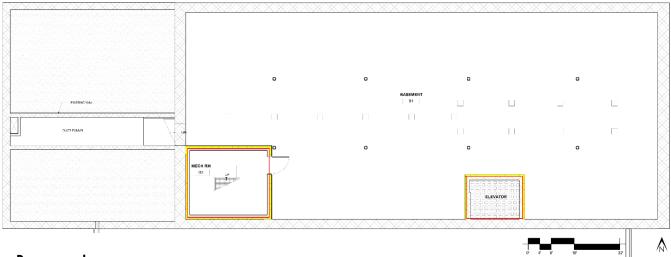
**East-West Section** 



#### North-South Section



# 5. Floor Plans

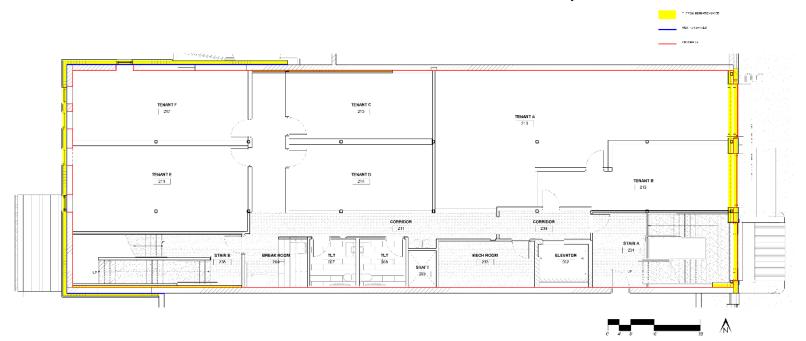




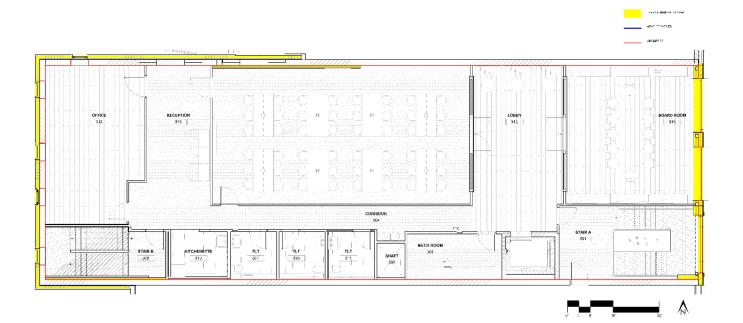


#### First Floor





Second Floor



**Third Floor** 



### 6. Interior Photos



Fraley Street Lobby



Gallery



Gallery & Root Bar

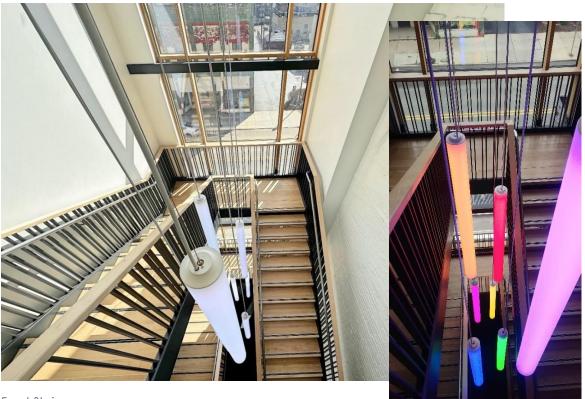


Detail of extended curtainwall frame



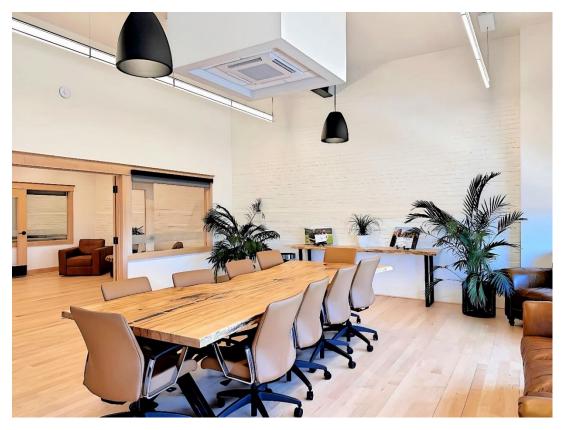


Business Incubator Collaborative Space showing frame of curtainwall



Front Stair



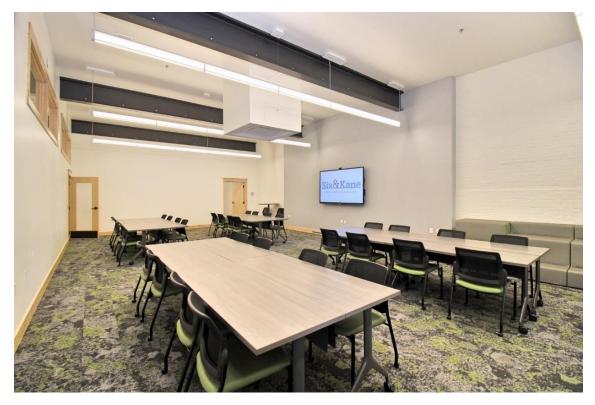


McClery Den



Third Floor Lobby





The Wilds



WPPSEF Office



# 7. Existing Conditions



Aerial View from East



West Side





Third Floor



First Floor – note center wall



### 8. Thermal Envelope

#### Foundation





#### Peel Passive House Consulting Calculations

Results for the interior column penetrations with Armatherm and Neopor base isolation

- Chi-value = 0.311 W/K
- fRSI = 0.85 (with conservative boundary condition of ground of -10°C)





#### Walls



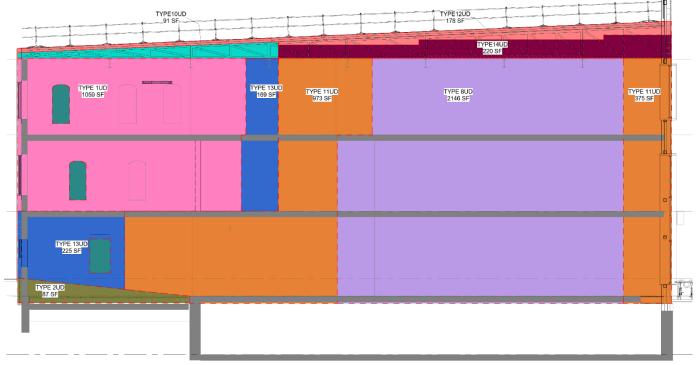
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South Wall Assembly Key Elevation



Basement Wall Assembly Key Elevations





North Wall Assembly Key Elevation



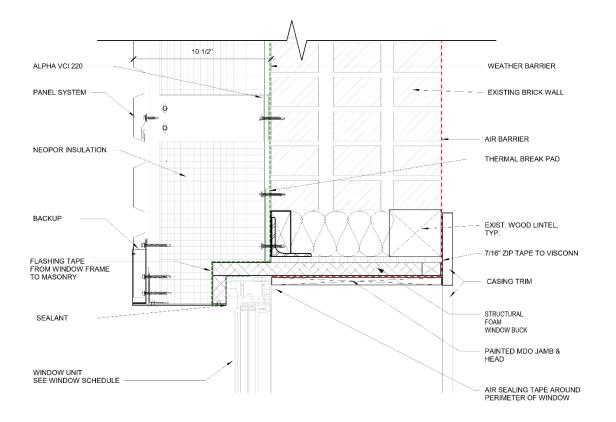


East Wall Assembly Key Elevation



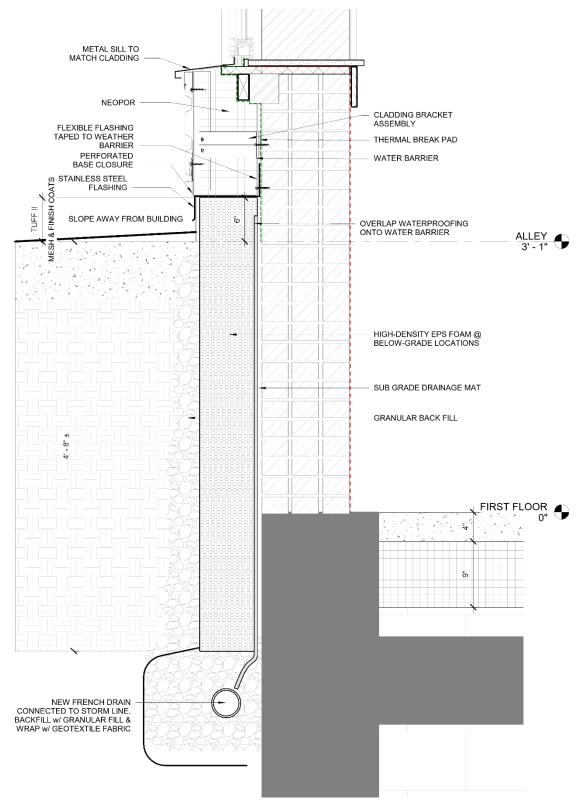
East Wall Assembly Key Elevation





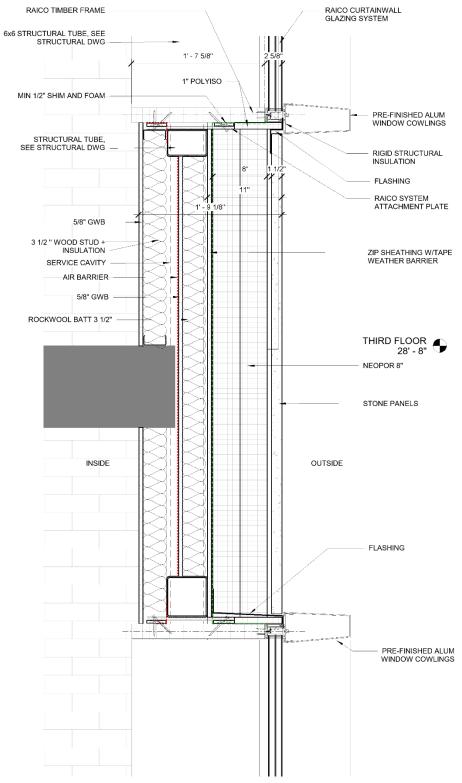
Rear Wall Section - Wall Assembly 01 UD





Rear Wall Section - Wall Assembly 02 UD





Front Wall Section - Wall Assembly 03 UD



8	building assen					Interior insulation?
UTuu		nbly description	ulation on	d Cladding Ambient		
		asonry with Exterior Insu Heat transmission resistance [I		a cladding - Ambient		
Orientation of building element		interior R <sub>s</sub>	0.74			
-						
Adjacent to	1-Outdoor air	exterior R <sub>se</sub> :	0.23			
Area section 1	R per inch	Area section 2 (optional)	R per inch	Area section 3 (optional)	R per inch	Thickness [in]
EPS Board Type VII - Neropor	4.80					8.00
Fluid Applied Weather						
Barrier						
Existing Masonry	0.12					12.00
Fluid Applied Air						
Barrier						
Percen	ntage of sec. 1	Percenta	ge of sec. 2	Percent	age of sec. 3	Total
	100%					<b>20.00</b> in
					L	20.00
	0.02	BTU/hr.ft².°F		Dualua	40.2	.ft <sup>2</sup> .°F/BTU
U-value supplement	0.03	BIU/mi.nt.r		R-value:	: <b>18.3</b> hr	.1[, [/DIU
Assembly no.	D 11 11					
		nbly description	nainct Gro	und		Interior insulation?
	Existing wi	th Exterior Insulation ag		und		Interior insulation?
02ud	Existing wi	th Exterior Insulation ac Heat transmission resistance [I	hr.ft².F/BTU]	und		Interior insulation?
02ud Orientation of building element	Existing wi	th Exterior Insulation ac Heat transmission resistance [I interior R <sub>si</sub>	hr.ft².F/BTU] 0.74	und		Interior insulation?
02ud	Existing wi	th Exterior Insulation ac Heat transmission resistance [I	hr.ft².F/BTU]	und		Interior insulation?
02ud Orientation of building element Adjacent to	Existing wi	th Exterior Insulation ac Heat transmission resistance [I interior R <sub>si</sub>	hr.ft².F/BTU] 0.74	und		Interior insulation?
02ud Orientation of building element Adjacent to Area section 1	Existing wir F 2-Wall 2-Ground	th Exterior Insulation ac Heat transmission resistance [I interior R <sub>si</sub>	hr.ft².F/BTUJ 0.74 0.00	und Area section 3 (optional)	R per inch	Thickness [in]
02ud Orientation of building element Adjacent to Area section 1 Dimpled waterproofing	Existing wir F 2-Wall 2-Ground	<b>th Exterior Insulation ag</b> Heat transmission resistance [I interior R <sub>si</sub> exterior R <sub>se</sub> :	hr.ft².F/BTUJ 0.74 0.00		R per inch	
02ud Orientation of building element Adjacent to Area section 1 Dimpled waterproofing EPS Board Type VII -	Existing wir F 2-Wall 2-Ground	<b>th Exterior Insulation ag</b> Heat transmission resistance [I interior R <sub>si</sub> exterior R <sub>se</sub> :	hr.ft².F/BTUJ 0.74 0.00		R per inch	Thickness [in]
02ud Orientation of building element Adjacent to Area section 1 Dimpled waterproofing EPS Board Type VII - Neropor	Existing wir 2-Wall 2-Ground R per inch	<b>th Exterior Insulation ag</b> Heat transmission resistance [I interior R <sub>si</sub> exterior R <sub>se</sub> :	hr.ft².F/BTUJ 0.74 0.00		R per inch	Thickness [in]
02ud Orientation of building element Adjacent to Area section 1 Dimpled waterproofing EPS Board Type VII - Neropor Fluid Applied	Existing wir 2-Wall 2-Ground R per inch	<b>th Exterior Insulation ag</b> Heat transmission resistance [I interior R <sub>si</sub> exterior R <sub>se</sub> :	hr.ft².F/BTUJ 0.74 0.00		R per inch	Thickness [in]
02ud Orientation of building element Adjacent to Area section 1 Dimpled waterproofing EPS Board Type VII - Neropor Fluid Applied waterproofing	Existing wir 2-Wall 2-Ground R per inch 4.80	<b>th Exterior Insulation ag</b> Heat transmission resistance [I interior R <sub>si</sub> exterior R <sub>se</sub> :	hr.ft².F/BTUJ 0.74 0.00		R per inch	Thickness [in] 0.25 8.00 0.06
02ud Orientation of building element Adjacent to Area section 1 Dimpled waterproofing EPS Board Type VII - Neropor Fluid Applied waterproofing Parge Coat	Existing wir 2-Wall 2-Ground R per inch 4.80 0.21	<b>th Exterior Insulation ag</b> Heat transmission resistance [I interior R <sub>si</sub> exterior R <sub>se</sub> :	hr.ft².F/BTUJ 0.74 0.00		R per inch	Thickness [in] 0.25 8.00 0.06 0.25
02ud Orientation of building element Adjacent to Area section 1 Dimpled waterproofing EPS Board Type VII - Neropor Fluid Applied waterproofing Parge Coat Existing Masonry	Existing wir 2-Wall 2-Ground R per inch 4.80	<b>th Exterior Insulation ag</b> Heat transmission resistance [I interior R <sub>si</sub> exterior R <sub>se</sub> :	hr.ft².F/BTUJ 0.74 0.00		R per inch	Thickness [in] 0.25 8.00 0.06 0.25 12.00
02ud Orientation of building element Adjacent to Area section 1 Dimpled waterproofing EPS Board Type VII - Neropor Fluid Applied waterproofing Parge Coat Existing Masonry Fluid Applied Air	Existing wir 2-Wall 2-Ground R per inch 4.80 0.21	<b>th Exterior Insulation ag</b> Heat transmission resistance [I interior R <sub>si</sub> exterior R <sub>se</sub> :	hr.ft².F/BTUJ 0.74 0.00		R per inch	Thickness [in] 0.25 8.00 0.06 0.25
02ud Orientation of building element Adjacent to Area section 1 Dimpled waterproofing EPS Board Type VII - Neropor Fluid Applied waterproofing Parge Coat	Existing wir 2-Wall 2-Ground R per inch 4.80 0.21	<b>th Exterior Insulation ag</b> Heat transmission resistance [I interior R <sub>si</sub> exterior R <sub>se</sub> :	hr.ft².F/BTUJ 0.74 0.00		R per inch	Thickness [in] 0.25 8.00 0.06 0.25 12.00
02ud Orientation of building element Adjacent to Area section 1 Dimpled waterproofing EPS Board Type VII - Neropor Fluid Applied waterproofing Parge Coat Existing Masonry Fluid Applied Air	Existing wir 2-Wall 2-Ground R per inch 4.80 0.21	<b>th Exterior Insulation ag</b> Heat transmission resistance [I interior R <sub>si</sub> exterior R <sub>se</sub> :	hr.ft².F/BTUJ 0.74 0.00		R per inch	Thickness [in] 0.25 8.00 0.06 0.25 12.00
02ud Orientation of building element Adjacent to Area section 1 Dimpled waterproofing EPS Board Type VII - Neropor Fluid Applied waterproofing Parge Coat Existing Masonry Fluid Applied Air Barrier	Existing wir 2-Wall 2-Ground R per inch 4.80 0.21 0.12	th Exterior Insulation ac Heat transmission resistance [ interior R <sub>si</sub> exterior R <sub>se</sub> : Area section 2 (optional)	hr.ft².F/BTUJ 0.74 0.00 R per inch	Area section 3 (optional)		Thickness [in]         0.25         8.00         0.06         0.25         12.00         0.06
02ud Orientation of building element Adjacent to Area section 1 Dimpled waterproofing EPS Board Type VII - Neropor Fluid Applied waterproofing Parge Coat Existing Masonry Fluid Applied Air Barrier	Existing wir 2-Wall 2-Ground R per inch 4.80 0.21 0.12 0.12	th Exterior Insulation ac Heat transmission resistance [ interior R <sub>si</sub> exterior R <sub>se</sub> : Area section 2 (optional)	hr.ft².F/BTUJ 0.74 0.00	Area section 3 (optional)	R per inch	Thickness [in]         0.25         8.00         0.06         0.25         12.00         0.06         12.00         0.06         Total
02ud Orientation of building element Adjacent to Area section 1 Dimpled waterproofing EPS Board Type VII - Neropor Fluid Applied waterproofing Parge Coat Existing Masonry Fluid Applied Air Barrier	Existing wir 2-Wall 2-Ground R per inch 4.80 0.21 0.12	th Exterior Insulation ac Heat transmission resistance [ interior R <sub>si</sub> exterior R <sub>se</sub> : Area section 2 (optional)	hr.ft².F/BTUJ 0.74 0.00 R per inch	Area section 3 (optional)		Thickness [in]         0.25         8.00         0.06         0.25         12.00         0.06
02ud Orientation of building element Adjacent to Area section 1 Dimpled waterproofing EPS Board Type VII - Neropor Fluid Applied waterproofing Parge Coat Existing Masonry Fluid Applied Air Barrier	Existing wir 2-Wall 2-Ground R per inch 4.80 0.21 0.12 0.12	th Exterior Insulation ac Heat transmission resistance [ interior R <sub>si</sub> exterior R <sub>se</sub> : Area section 2 (optional)	hr.ft².F/BTUJ 0.74 0.00 R per inch	Area section 3 (optional)	age of sec. 3	Thickness [in]         0.25         8.00         0.06         0.25         12.00         0.06         12.00         0.06         Total



Assembly no. Building assembly description						Interior insulation?
03ud	New East S	Stone Clad Wall - Ambie	nt			
<u></u>	-0	Heat transmission resistance [	hr.ft².F/BTU]			
Orientation of building element	2-Wall	interior R <sub>si</sub>	0.74			
Adjacent to	1-Outdoor ai	exterior R <sub>se</sub> :	0.23			
	L	3	A	3		
Area section 1	R per inch	Area section 2 (optional)	R per inch	Area section 3 (optional)	R per inch	Thickness [in]
Sandstone Panels	0.06					1.50
U-Kon Girts/Airspace	1.34					2.50
EPS Board Type VII - Neropor	4.800					8.00
Zip Sheathing - Weather Barrier	1.11					0.50
Rockwool CavityRock	3.20	Metal Stud, 20 GA, 16" O.C.	0.00			6.00
Zip Sheathing - Air Barrier	1.11					0.44
Rockwool ComfortBatt Service Cavity	3.20		0.00	Wood Stud	1.11	3.50
GWB	0.69					0.63
Perce	Total					
10,000	90%	10100110	ge of sec. 2		age of sec. 3	23.07 in
			L	1	L	
U-value supplement	0.01	BTU/hr.ft <sup>2</sup> .°F		R-value	36.0	hr.ft <sup>2</sup> .°F/BTU

Assembly no.	Building asser	mbly description				Interior insulation?
05ud	Floor over	Ventilated Basement				
		Heat transmission resistance [	hr.ft².F/BTU]			
Orientation of building elemen	t 3-Floor	interior R <sub>si</sub>	0.97			
Adjacent to	3-Ventilated	exterior R <sub>se</sub> :	0.97			
	Noonconconconconconconconconconco	od	6	×		
Area section 1	R per inch	Area section 2 (optional)	R per inch	Area section 3 (optional)	R per inch	Thickness [in]
Zip Sheathing - Air Barrier	1.11					0.44
Existing Wood	1.11					0.88
Blown Fiber Glass 1.56 Ib/cf	2.88	Joists	1.20			12.00
Air Barrier						
EPS Board Type VII - Neropor	4.80					2.00
DensGlas GWB	0.69					0.63
Perce	entage of sec. 1	Percenta	ge of sec. 2	Percen	tage of sec. 3	Total
	88%		12.5%			<b>15.94</b> in
U-value supplemen	t	BTU/hr.ft <sup>2</sup> .°F		R-value	43.4	hr.ft <sup>2</sup> .°F/BTU



Assembly no.	Building asse	mbly description				Interior insulation?
06ud	Slab on G	rade				
		Heat transmission resistance [	hr.ft².F/BTU]			
Orientation of building element	3-Floor	interior R <sub>si</sub>	0.97			
Adjacent to	2-Ground	exterior R <sub>se</sub> :	0.00			
	8	ad .		d		
Area section 1	R per inch	Area section 2 (optional)	R per inch	Area section 3 (optional)	R per inch	Thickness [in]
Concrete	0.06					5.00
Air/Vapor Barrier						
EPS Board Type VII - Neropor	4.80					6.00
Perce	ntage of sec. 1	Percenta	ge of sec. 2	Percent	tage of sec. 3	Total
	100%					<b>11.00</b> in
				3	L	
U-value supplement		BTU/hr.ft <sup>2</sup> .°F		R-value	30.1	hr.ft <sup>2</sup> .°F/BTU
	L			N-Value	30.1	

Assembly no.	Building asser	mbly description				Interior insulation?
07ud	Spandrel F	Panel				
		Heat transmission resistance [	hr.ft².F/BTU]			
Orientation of building elemen	t <mark>2-Wall</mark>	interior R <sub>si</sub>	0.74	]		
Adjacent to	<b>1-Outdoor a</b>	exterior R <sub>se</sub> :	0.23			
Area section 1	R per inch	Area section 2 (optional)	R per inch	Area section 3 (optional)	R per inch	Thickness [in]
GWB	0.69					0.63
Rockwool Batt	3.20	Metal Stud	0.00			3.50
Gypsum Sneatning &	0.69					0.63
Air Board Type VII -	4.80					11.00
Spandrel Glass	0.90					0.25
Deres		Descente				Tatal
Perce	entage of sec. 1 100%	Percenta	ge of sec. 2 0.1%	Percent	age of sec. 3	Total In
U-value supplemen	t	BTU/hr.ft².⁰F		R-value	63.2	hr.ft <sup>2</sup> .°F/BTU



Assembly no.	Building asser	mbly description				Interior insulation?
08ud	Party Wall					
		Heat transmission resistance [	hr.ft².F/BTU]			
Orientation of building element	nt <mark>2-Wall</mark>	interior R <sub>si</sub>	0.74			
Adjacent	to 3-Ventilated	exterior R <sub>se</sub> :	0.74			
		aad	******	0		
Area section 1	R per inch	Area section 2 (optional)	R per inch	Area section 3 (optional)	R per inch	Thickness [in]
Existing Masonry	0.12					12.00
Fluid Applied Air Barrier						0.06
Perc	entage of sec. 1	Percenta	ge of sec. 2	Percent	age of sec. 3	Total
	100%					12.06 in
				0		
U-value supplement	nt	BTU/hr.ft <sup>2</sup> .°F		R-value	2.9	hr.ft².°F/BTU

Assembly no.	Building asser	nbly description				Interior insulation?
09ud	Elevator SI	naft in Basement				
		Heat transmission resistance [	hr.ft².F/BTU]			
Orientation of building element	2-Wall	interior R <sub>si</sub>	0.74			
Adjacent to	3-Ventilated	exterior R <sub>se</sub> :	0.74			
		•				
Area section 1	R per inch	Area section 2 (optional)	R per inch	Area section 3 (optional)	R per inch	Thickness [in]
CMU	0.12					7.75
Air Barrier						
Foil faced Polyiso Board	4.75					6.00
Perce	ntage of sec. 1	Percenta	ge of sec. 2	Percei	ntage of sec. 3	Total
	100%					13.75 in
U-value supplement		BTU/hr.ft <sup>2</sup> .°F		R-value	e: 30.9	hr.ft <sup>2</sup> .°F/BTU



Assembly no.	Building asser	mbly description				Interior insulation?		
10ud	Gable Trus	ss plus Clad Masonry						
		Heat transmission resistance [	hr.ft².F/BTU]			h		
Orientation of building elemen	t 2-Wall	interior R <sub>si</sub>	0.74					
Adjacent to	1-Outdoor ai	exterior R <sub>se</sub> :	0.23					
Area section 1	R per inch	Area section 2 (optional)	R per inch	Area section 3 (optional)	R per inch	Thickness [in]		
Rockwool Board	3.20					4.00		
Rockwool Board	3.20	Stud Frame	1.20			1.50		
Polylso Comonent of Zip R Sheathing	4.75					1.50		
OSB Component of Zip- R Sheathing	1.11					0.44		
Existing Masonry	1.20					12.00		
EPS Board Type VII- Neopor	4.80					8.00		
Perce	Percentage of sec. 1 Percentage of sec. 2 Percentage of sec. 3 Total							
	80%	1 croonia	<b>20.0%</b>			<b>27.44</b> in		
U-value supplement 0.03 BTU/hr.ft <sup>2</sup> .°F R-value: 23.7 hr.ft <sup>2</sup> .°F/BTU								

Assembly no.	Building assen	nbly description				Interior insulation?
11ud	Transition	Wall plus Party Wall				
		Heat transmission resistance [	hr.ft².F/BTU]			
Orientation of building element	2-Wall	interior R <sub>si</sub>	0.74			
Adjacent to	1-Outdoor ai	exterior R <sub>se</sub> :	0.23			
	6	•	******	ŭ		
Area section 1	R per inch	Area section 2 (optional)	R per inch	Area section 3 (optional)	R per inch	Thickness [in]
Existing Masonry	0.12					12.00
Visconn Air Barrier						0.25
Rockwool ComfortBoard 80	3.20					4.00
GWB	0.69					0.63
Service Cavity	1.30	WOOD Framing 2X4	1.20			4.00
Perce	ntage of sec. 1	Percenta	ge of sec. 2	Percer	tage of sec. 3	Total
	91%		9.4%			<b>20.88</b> in
U-value supplement		BTU/hr.ft².°F	*****	R-value	20.8	hr.ft².°F/BTU



Assembly no.	Building asse	mbly description				Interior insulation?
12ud	Parapet Ex	ctensions				
		Heat transmission resistance [	hr.ft².F/BTU]			
Orientation of building element	2-Wall	interior R <sub>si</sub>	0.74			
Adjacent to	1-Outdoor ai	exterior R <sub>se</sub> :	0.23			
Area section 1	R per inch	Area section 2 (optional)	R per inch	Area section 3 (optional)	R per inch	Thickness [in]
Rockwool Board	3.20					1.50
Rockwool Comfortboard	3.20	Stud Frame	1.20			1.50
Polyiso component of Zip R Sheathing	4.75					1.50
OSB Component of Zip R Sheathing	1.11					0.44
Poyiso Insulation	4.75					12.00
TPO Membrane	0.60					0.06
Perce	ntage of sec. 1	Percenta	ige of sec. 2	Percen	tage of sec. 3	Total
	93%		6.7%			17.00 in
U-value supplement		BTU/hr.ft <sup>2</sup> .°F		R-value	· 74.9	hr.ft <sup>2</sup> .°F/BTU

Assembly no.	Building assen	nbly description				Interior insulation?
13ud	Transition	Wall plus Exterior Clad	ding			
		Heat transmission resistance [	hr.ft².F/BTU]			
Orientation of building element	2-Wall	interior R <sub>si</sub>	0.74			
Adjacent to	1-Outdoor air	exterior R <sub>se</sub> :	0.23	*		
	8	4	8	d		
Area section 1	R per inch	Area section 2 (optional)	R per inch	Area section 3 (optional)	R per inch	Thickness [in]
Rockwool Cavity Rock	3.20					8.00
Existing Masonry	0.12					12.00
Visconn Air Barrier						
ComfortBoard 80	3.20					4.00
GWB	0.69					0.63
Service Cavity	1.30	Wood Framing 2x4 @16" O.C.	1.20			3.50
Perce	ntage of sec. 1	Percenta	ge of sec. 2	Percen	tage of sec. 3	Total
	90%		10.0%			28.13 in
U-value supplement	0.01	BTU/hr.ft².⁰F	Democrane and a second s	a R-value	31.4	hr.ft <sup>2</sup> .°F/BTU



Assembly no.	Building asse	mbly description				Interior insulation?
14ud	Gable Trus	ss plus party wall				
		Heat transmission resistance [	hr.ft².F/BTU]			
Orientation of building element	2-Wall	interior R <sub>si</sub>	0.74			
Adjacent to	3-Ventilated	exterior R <sub>se</sub> :	0.74			
	Bannan (1997)	ool	201001000000000000000000000000000000000	•		
Area section 1	R per inch	Area section 2 (optional)	R per inch	Area section 3 (optional)	R per inch	Thickness [in]
Rockwool Board	3.20					4.00
Rockwool Comfortboard	3.20	Stud Frame	1.20			1.50
Polyiso component of JSB Component or Lip	4.75 1.11					1.50 0.44
B. Shoothing Existing Masonry	0.12					12.00
Percer	ntage of sec. 1	Percenta	ge of sec. 2	Percer	ntage of sec. 3	Total
	93%		6.7%			<b>19.44</b> in
U-value supplement		BTU/hr.ft <sup>2</sup> .°F		R-value	e: 27.8	hr.ft <sup>2</sup> .°F/BTU

Assembly no.	Building asser	mbly description				Interior insulation?
15ud	Elevated S	lab over Ventilated Bas	ement			
		Heat transmission resistance [	hr.ft².F/BTU]			
Orientation of building element	3-Floor	interior R <sub>si</sub>	0.97			
Adjacent to	3-Ventilated	exterior R <sub>se</sub> :	0.97			
		~		*		
Area section 1	R per inch	Area section 2 (optional)	R per inch	Area section 3 (optional)	R per inch	Thickness [in]
Concrete	0.06					5.00
20 ga Metal Deck	0.01					0.03
EPS Board Type VII - Neropor	4.80					6.00
Perce	ntage of sec. 1	Percenta	ge of sec. 2	Percen	tage of sec. 3	Total
	100%					11.03 in
U-value supplement		BTU/hr.ft <sup>2</sup> .°F		R-value	31.0	hr.ft <sup>2</sup> .°F/BTU



Assembly no.	Building asser	nbly description				Interior insulation?
16ud	Basement	Mechanical Room Wall	s			
		Heat transmission resistance [	hr.ft².F/BTU]			
Orientation of building elemen	t 2-Wall	interior R <sub>si</sub>	0.74			
Adjacent to	o 3-Ventilated	exterior R <sub>se</sub> :	0.74	]		
Area section 1	R per inch	Area section 2 (optional)	R per inch	Area section 3 (optional)	R per inch	Thickness [in]
GWB	0.69					0.63
Rockwool Comfortbatt	3.20	wood Studs @ 24	1.20			3.50
Zip Sheathing w/Air Barrier	1.11					0.44
Rockwool Comfort Board 80	3.20					4.00
				Furring Strips	1.11	0.75
DensGlass Sheathing	0.69					0.63
Perce	entage of sec. 1	Percenta	ge of sec. 2	Percer	ntage of sec. 3	Total
	83%		6.7%		10.0%	<b>9.94</b> in
U-value supplemen	ıt	BTU/hr.ft <sup>2</sup> .°F		R-value	e: 26.0	hr.ft <sup>2</sup> .°F/BTU

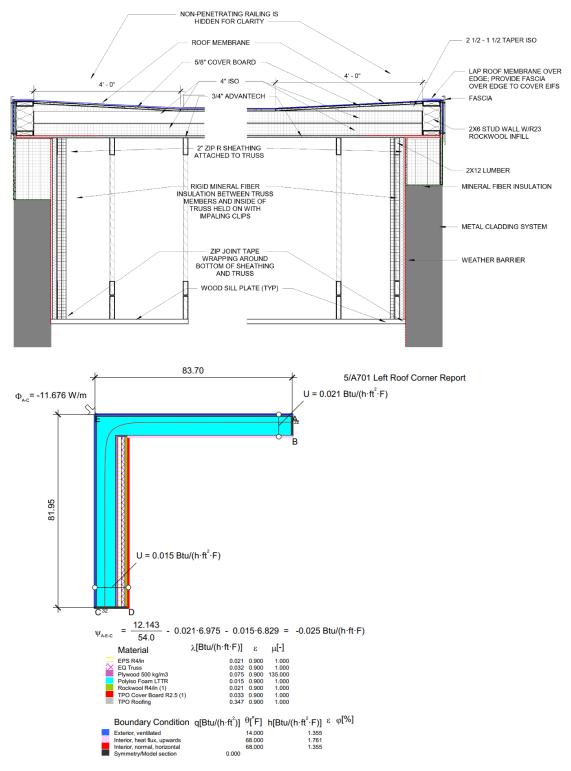
#### Roof

Assemblyno.	Building asser	mbly description				Interior insulation?
04ud	Roof					
		Heat transmission resistance [	hr.ft².F/BTU]			
Orientation of building elemen	t 1-Roof	interior R <sub>si</sub>	0.57			
Adjacent t	• 1-Outdoor ai	exterior R <sub>se</sub> :	0.23			
Area section 1	R per inch	Area section 2 (optional)	R per inch	Area section 3 (optional)	R per inch	Thickness (in)
Advantech OSB Roof Sheathing	1.11					0.75
Vapor Barrier				<b>0</b>		
Poyiso Insulation - Faced	4.75	÷				8.00
TPO Membrane	0.24	•	•			0.13
DensDeck Prime Coverboard	0.69					0.63
Perce	entage of sec. 1 100%	Percenta	ge of sec. 2	Percen	tage of sec. 3	Total 9.50 in
U-value supplemen	t	BTU/hr.ft².°F		R-value	•: <b>40.1</b> h	r.ft².°F/BTU



# 9. Junction Details





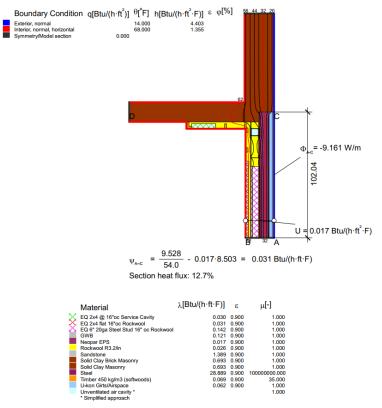


### Front wall





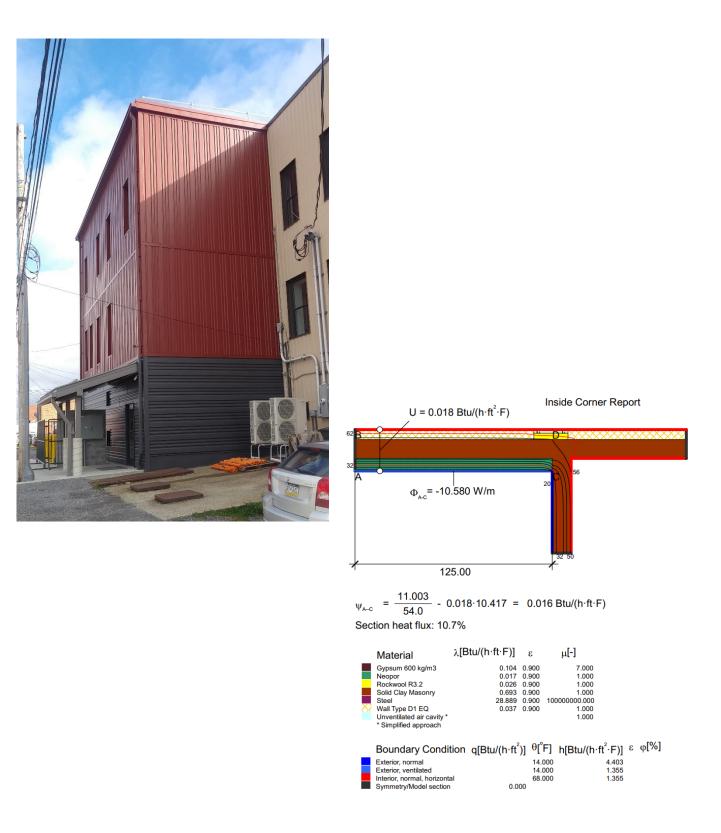
NE Corner Report



**37 |** Page



### Side wall at neighboring building





### 10. Windows

Front windows and curtainwall



RAICO Timber Frame assembly.



Installation of frame

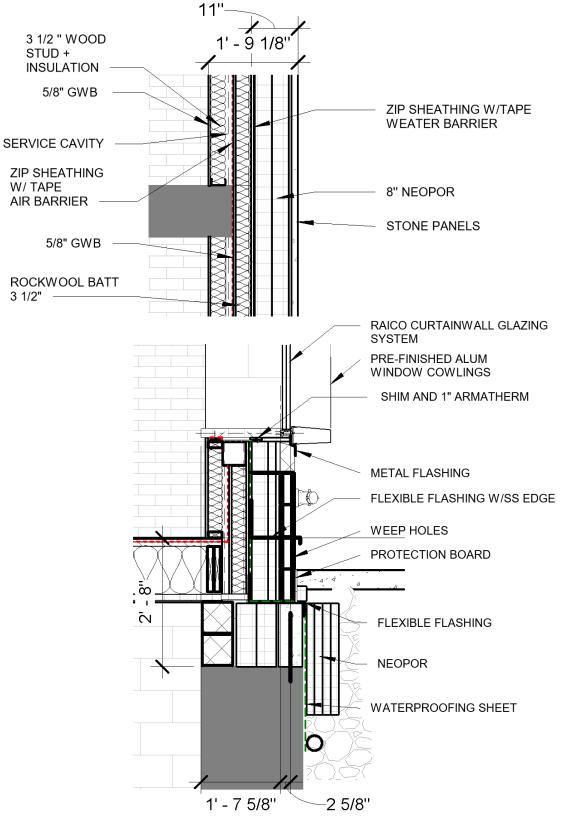


Installation of curtainwall glazing



Installation of window glazing.





Front wall sections



### **Rear Windows**





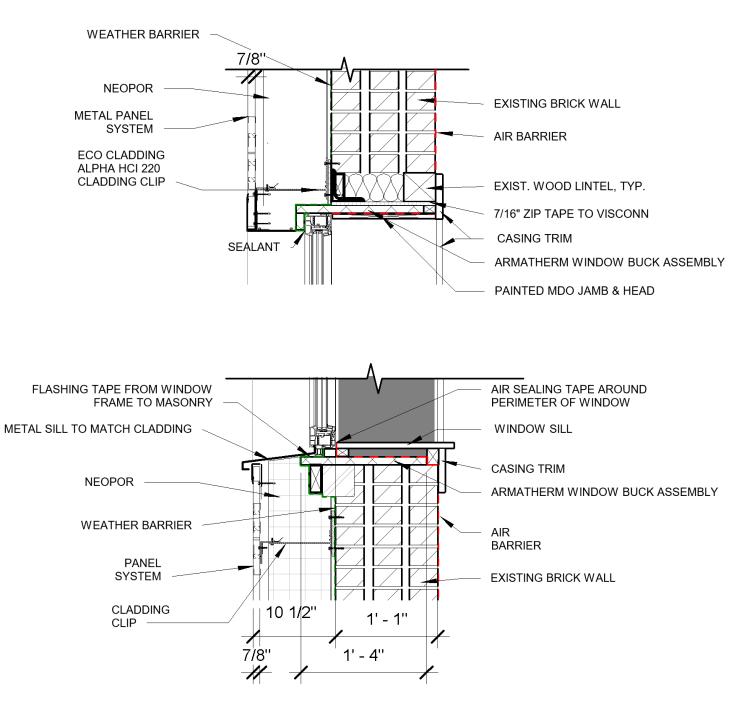
Armatherm window buck assembly in place.

Ventana windows in place and flashed.



Interior taping of window and buck.





Rear window details



## 11. Infrared Images

**Front elevation of Six&Kane, with neighboring buildings.** Taken at approximately 10:00pm (after dark), with outdoor temperature about 42°F, and cloudy skies. The temperature span of the color scale is a total of 21.9°F, from 30.0°F to 51.9°F. Taken at an oblique angle, which is not ideal for quantitative analysis of thermograms, but was necessary to be able to fit the full height of all the buildings in one photo from the sidewalk on the opposite side of the street.

**Rear elevation of Six&Kane, with neighboring buildings.** Taken at approximately 10:15pm (after dark), with outdoor temperature about 42°F, and cloudy skies. The temperature span of the color scale in this photo is a total of 18.5°F, from 30.5°F to 49.0°F

For both photos, the color palettes are in the following order:

- Rainbow high contrast Many colors through the palette enables seeing fine details and gives a better sense of depth than other palettes.
- Rainbow A smoother distribution of color than rainbow high contrast, less sense of depth, but good for reading patterns of thermal contrast on a planar surface.
- Lava Dramatic differences in color from cold end to hot end of the scale. Being very dark, the coolest things look "more cold," and being very bright, the warmest things look "more hot."
- Iron Limited range of colors from cold to hot enables quick reading of contrast without overwhelming the viewer's visual processing. This palette is the default setting on many infrared cameras and is the setting we use while actively observing with the camera.
- Grayscale Eliminates the distraction of colors when reading a thermogram. Black = coldest items in image; white = warmest items. Some say this palette is best for clear, unbiased analysis of temperatures. Enables slower, more deliberate study.
- Arctic Split between two color groups, yellow and blue, this palette groups warmer items together on the yellow side, and cooler items together on the blue side.

Images and Narrative by Rob Hosken, AIA, BECxP

Building Performance Architecture, WPPSEF Board Member





## Front elevation of Six&Kane

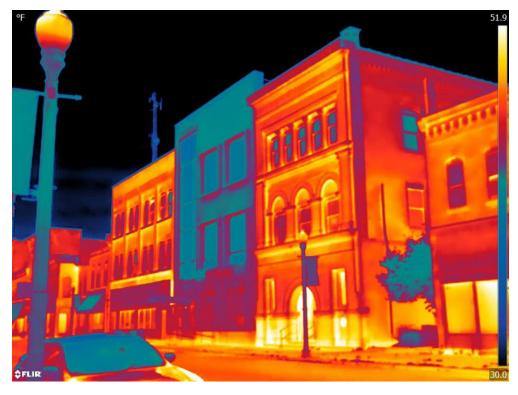


Rainbow high contrast.





Rainbow



Lava



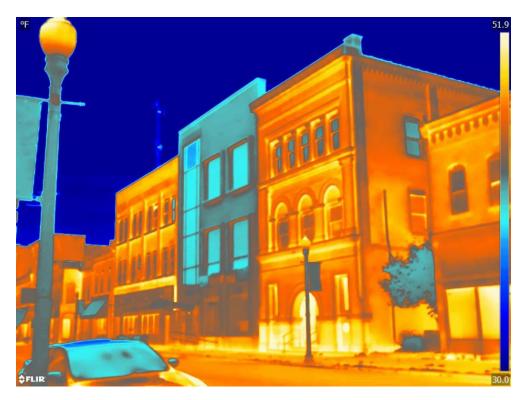


Iron



Greyscale



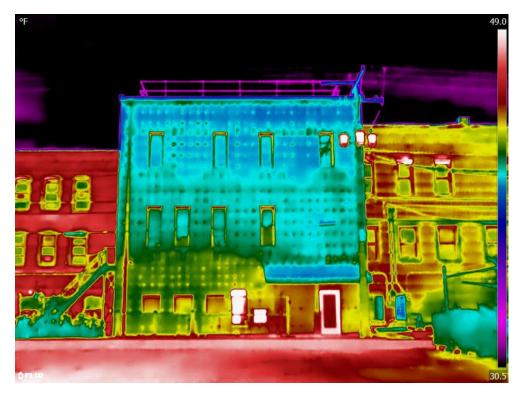


Arctic



Rear elevation of Six&Kane



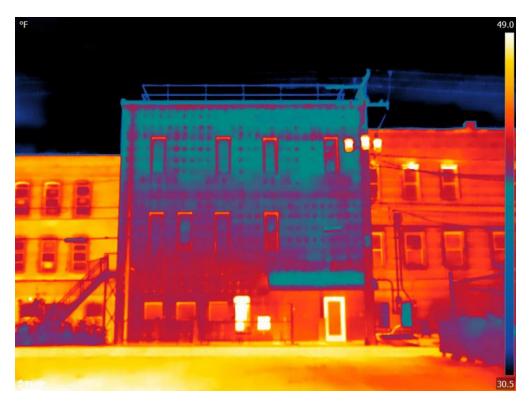


Rainbow high contrast



Rainbow





Lava



Iron





Greyscale



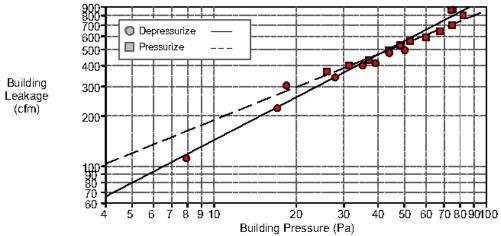
Arctic



# 12. Airtight Envelope

### BUILDING LEAKAGE TEST

Date of Test: 9/19/2022 Test File: 63 Fraley S Technician: Rhett Major Project Number: The Wilds	t final		
Customer: 63 Fraley St., LLC, Limited Liability Co. 40 North Pennsylvania Ave. Suite 510 Greensburg, PA 15601 Phone: 814-441-1100 Fax:	Building Address:	The Wilds 63 N. Fraley St. Kane, PA 16735	
Test Results at 50 Pascals:	Depressurization	Pressurization	<u>Average</u>
V50: cfm50 (Airflow)	563 (+/-10.0 %)	543 (+/-2.3 %)	553
n50: 1/h (Air Change Rate)	0.24	0.23	0.23
w50: cfm/ft² (Floor Area)	0.0608	0.0587	0.0598
q50: cfm/ft² (Envelope Area)	0.0341	0.0329	0.0335
Leakage Areas: Canadian EqLA @ 10 Pa (in²) in²/ft² Surface Area LBL ELA @ 4 Pa (in²) in²/ft² Surface Area	42.2 (+/- 16.7 %) 0.0026 18.8 (+/- 27.2 %) 0.0011	55.5 (+/- 10.3 %) 0.0034 29.4 (+/- 16.0 %) 0.0018	48.9 0.0030 24.1 0.0015
Building Leakage Curve:			
Air Flow Coefficient (Cenv) cfm/Pan	20.6 (+/- 44.0 %)	42.9 (+/-24.7 %)	
Air Leakage Coefficient (CL)_cfm/Pan	20.4 (+/- 44.0 %)	41.7 (+/-24.7 %)	
Exponent (n)	0.848 (+/- 0.124)	0.656 (+/- 0.063)	
Correlation Coefficient	0.98417	0.99309	
Test Standard: Test Mode: Type of Test Method: Regulation complied with:	EN 13829 Depressurization and Pressurization A PHI n50 ≤ .6 1/h		





### BUILDING LEAKAGE TEST Page 2 of 5

Date of Test: 9/19/2022 Test File: 63 Fraley St final

Building Information		
Volume (ff <sup>*</sup> )	142484	
Floor Area: (ff <sup>2</sup> )	9252	
Surface Area: (ft <sup>2</sup> )	16508	
Height (ft)	45	
Uncertainty of Dimensions (%)	5	
Year of Construction	2022	
Type of Heating	Air source heat pump	
Type of Air Conditioning	Air source Heat Pump	
Type of Ventilation	HRV	
Building Wind Exposure	Partly Exposed Building	
Wind Class	Light Breeze	

### Equipment Information

Туре	Manufacturer	Model	Serial Number	Custom Calibration Date
Fan	Energy Conservatory	Model 3 (110V)		-
Micromanometer	Energy Conservatory	DG700	5356	10/14/2021



# 13. Heating and Ventilation System





Ventacity VS3000RTe ERV



Fujitsu VRF Heat Pump

Wall mounted cassette





Ducted AHU



Ceiling Cassette

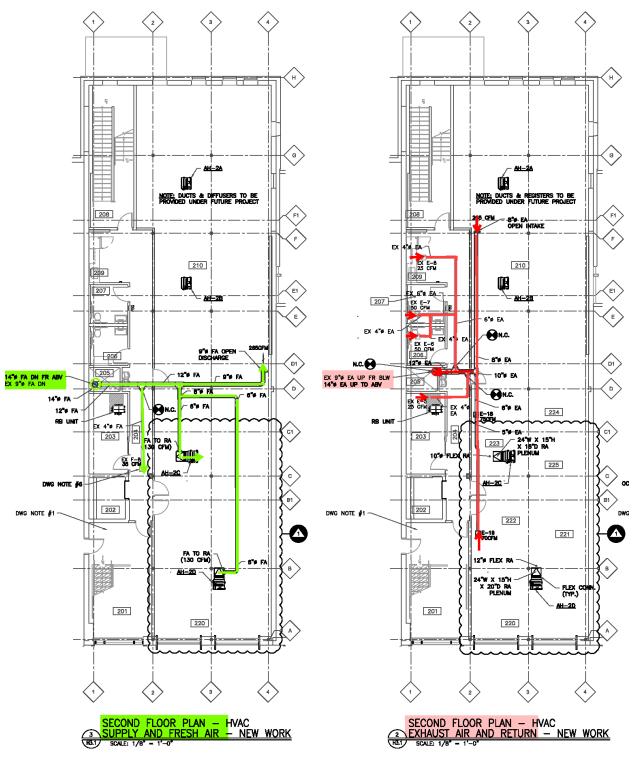


### EX <u>HP-1</u> ™≏ NOTE **#**8 EX <u>HP−1</u> ™G NOTE #8 $\langle 2 \rangle$ EX 10 9 EXH UP FR BLW EX 10"# FA DN TO BLW EX FAI-2 (+) ΠIJ Ъ <u>ا</u> 108 117 117 EX 4 # FA 24 1 X 17"H SA PLE gla. و به جالا 126 EX DUH-1 12 8"# 54 (•) 9 8 × 54 EX § CON (TYP) 4H-10 (165 CFM) LENUM teres and ZĂCÊN<sup>6</sup> 118 FA 118 110 110 EX 4"# FA D-8 350F DWG NOTE #9 111 SA \_\_\_\_\_\_ E-16 EA 116 116 EX E-3 50 CFM 5"# SA **95** E1 119 109 E1 109 EX 4"# EX E-3 50 CFM EX 6 115 119 115 E 104 2 104 EX E-2 4"9 EA EX 6'0 EA 7# EA 129 106 Ex 4\*# FA 106 7\*# FA 114 EX 979 EA 140 EX 9"# -[7] 129 9"# FA 8"# FA EA FA CONNEC RA PLENUM (50 CFM) EX 9"# EA UP -Ì 5 # FA 114 RA PLENUM BOX 24"W X 15"H X 20"D EX 9"# FA DN FR ABV 🖌 N.C. RA PLENUM BOX RB LINIT 124 EX ⊕ RE UNIT AH-1D 103 103 \_\_\_\_ -||ex 43 i stêr MINI-SPLIT CONTROL PANEL (C1) EX MINI-SPLIT CONTROL PANEL 24"W X 15"H X 15"D SA PLENUM 105 8 SA 127 SSCFW<sup>5</sup> lls 127 **Rock** 121 121 EX 4"# FA . 197 Posch B1 105 81 102 102 DWG NOTE #5 DWG NOTE #5 Ţ 120 120 AH-1a EX AH-1g EX 4\*# AH-1E Sidewall M EX FLEX CONN 円 $( \mathbf{P} )$ в SINC N EX 122 101 125 101 ₩cFin4 125 Ľ۴ õ 裔 ā ī UCE DW ς 5 Я 9 EX SIDEWALK EX SIDEWALK COI PROF 3 $\langle \cdot \rangle$ $\langle 2 \rangle$ $\langle \cdot \rangle$ 2 ้ง (+) TIRST FLOOR PLAN - HVAC SUPPLY AND FRESH AIR - NEW WORK SCALE: 1/8" = 1'-0' FIRST FLOOR PLAN - HVAC EXHAUST AIR AND RETURN -NEW WORK (म्हिन्

### **Ventilation Diagrams**

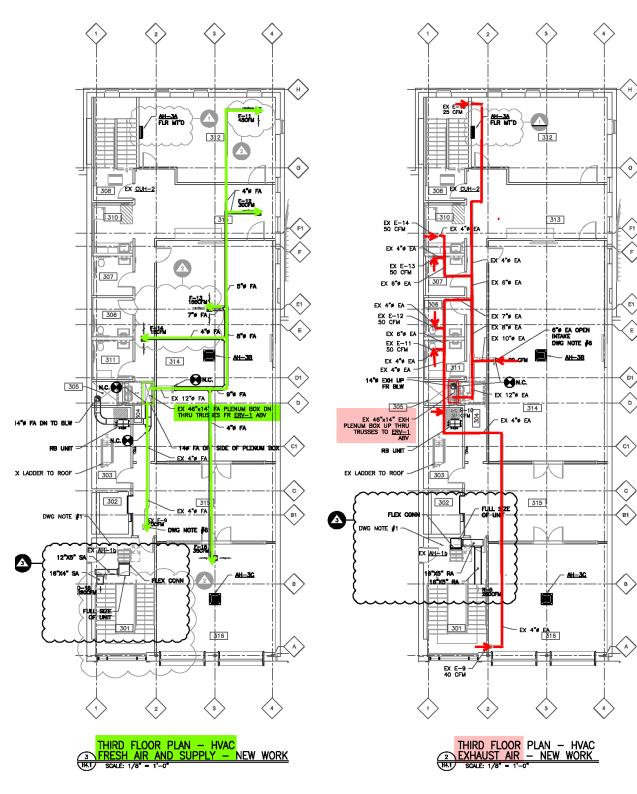
**First Floor** 





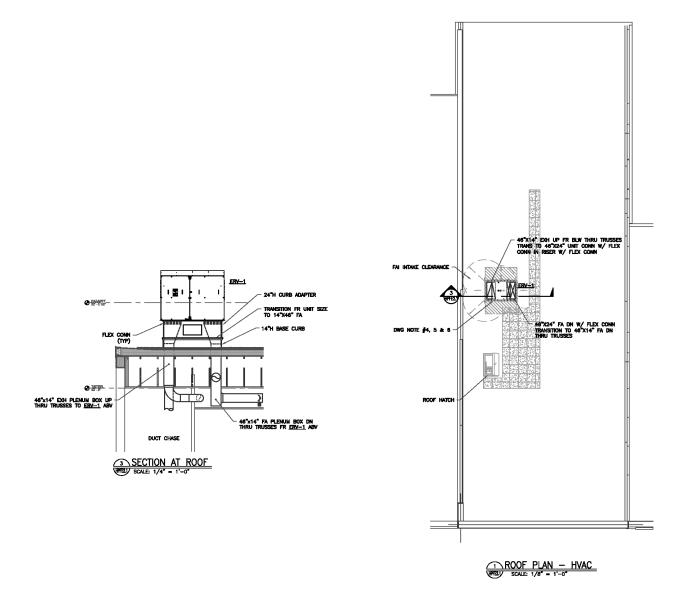
**Second Floor** 





**Third Floor** 





Roof



### 14. Domestic Hot Water



Heat pump water heater in Root Bar

			1		
	Heat P	ump Located	in Cafe		
	-		and the second	and the second	
SP-LLC	RESIDE	NTIAL HEA	TPUMP	0	-
MODEL NUMBER	FOR	INDOOR USE O	ER	(VL)LIS	TED
HPX-50-DHPTN		3125750489	TEM I	PART NUMBER 3R	VI
VOLTS AC	1	IRCUIT AMPS CIRCUIT	TANK MAX	0313153	7
208 - 240	60 23.6	0 25.80 30	150 1.03	US GAL LITRE	
COMPRESSOR:	1.88/	AD AMPS (RLA)	LOCKED R	OTOR AMPS (LRA)	
		).2 Wer	12.	0/14.0	
ELEMENT WATTS	3380	4500	208 V HIG	240 Y	
REFRIGERANT	R1	34A	CHARGE (Ibs)	4500 CHARGE (kg)	
DESIGN PRESS		SIDE Mps		0.649	
Hater he	ater complies w	2.517 Ith the current edit E IN MEXICO	0.0	0.0	
HUMMAN					
Model Number		D CITY, TN USA			
Admber	HPX-60-DHPTNE	130 2300 Serial N	umber 21221	25750489	
			21331.	10700409	
ANGER					



Typical point-of-use water heaters



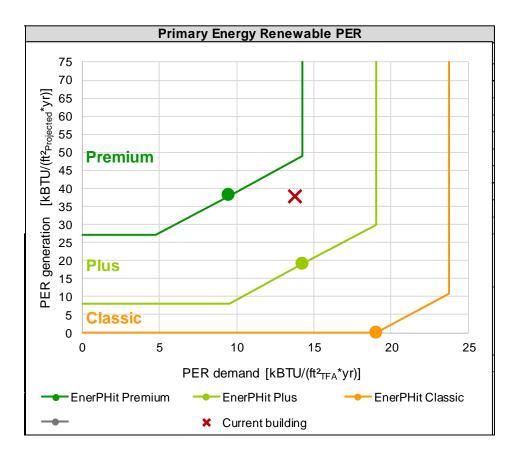


# 15. Passive House Planning Package

# **EnerPHit Verification**

		Building:	: Six&Kane					
		Street:	63 N. Fraley Street					
		Postcode/City:	16735 Kane					
		Province/Country:	PA	A US-United States of America				
		Building type:	Mixed Office/ Assembly /Retail					
		Climate data set:	ud01-Bradford PA					
			Climate zone:	2: Cold	Altitude of location: 2034 ft			
	SixXxXang		Home owner / Client:	63 Fraley St	3 Fraley Street LLC			
			Street:	40 North Pennsylvania Avenue, Suite 510				
			Postcode/City:	15601	5601 Greensburg			
			Province/Country:	PA	PA US-United States of America			
Architecture:	Gary Moshier - Moshier Studio		Mechanical engineer:	Michael L. I	Norris & Associ	ates, Inc.		
Street:	363 Newburn Drive		-	171 Technology Drive, Suite 300				
Postcode/City:	15216 Pittsburgh		Postcode/City:	16827	Boalsburg			
Province/Country:	PA US-United St	ates of America	Province/Country:	PA		US-United States	of America	
Energy consultancy:	Gary Moshier - Moshier Studio		Certification:	CertiPHiers	Cooperative			
	363 Newburn Drive		Street:					
Postcode/City:			Postcode/City:		Portland			
Province/Country:		ates of America	Province/Country:	OR		US-United States	of America	
Year of construction:	2022	Intorio	temperature winter [°F]:	68.0	Interior tom	p. summer [°F]:	77.0	
No. of dwelling units:			eating case [BTU/(hr.ft <sup>2</sup> )]:	1.19		se [BTU/(hr.ft²)]:	1.19	
No. of occupants:			acity [BTU/F per ft <sup>2</sup> TFA]:	23.2	-	chanical cooling:	x	
				L	1	3		
Specific building cha	aracteristics with reference to the treated	l floor area						
	Treated floor area ft <sup>2</sup>	9839		Criteria	Alternative		Fullfilled? <sup>2</sup>	
Space heating	Heating demand kBTU/(ft <sup>2</sup> yr)		≤	9.51	criteria		Tunneu :	
Space heating				3.51	_		yes	
	Heating load BTU/(hr.ft <sup>2</sup> )	4.32	≤		-			
Space cooling	Cooling & dehum. demand kBTU/(ft²yr)	1.30	≤	4.75	4.75			
	Cooling load BTU/(hr.ft <sup>2</sup> )	4.27	≤	-	3.69		yes	
Fre	quency of overheating (> 77 °F) %	_	≤	-		انہ ا	-	
	ely high humidity (> 0.012 lb/lb) %	0.3	≤	10			Ves	
i requeries of excessive	Significantion (~ 0.012 10/10) /0		-	10			yes	
Airtightness	Pressurization test result n <sub>50</sub> 1/hr	0.2	≤	1.0			yes	
Non-renewable Prim (PE)	PE demand kBTU/(ft²yr)	30.03	≤	-			-	
	PER demand kBTU/(ft <sup>2</sup> yr)	13.75	≤	14	14	] [		
Primary Energy	Generation of renewable						yes	
Renewable (PER)	energy (in relation to pro- kBTU/(ft²yr)	37.72	≥	19	17		yes	
	jected building footprint area)		l l					
<sup>2</sup> Empty field: Data missing; '-': No requirement								
	es given herein have been determined followir			e	F	nerPHit Plus?	yes	
characteristic values o Task:	of the building. The PHPP calculations are att First name:	ached to this verifi	ication.	Surname:			Signature:	
1-Designer	Gary	1	Moshier	Sumarile:	1		Signature:	
		Issued on:		City:				
		1	Pittsburgh		]			





## 16. Primary Energy Renewable

## 17. Construction Cost

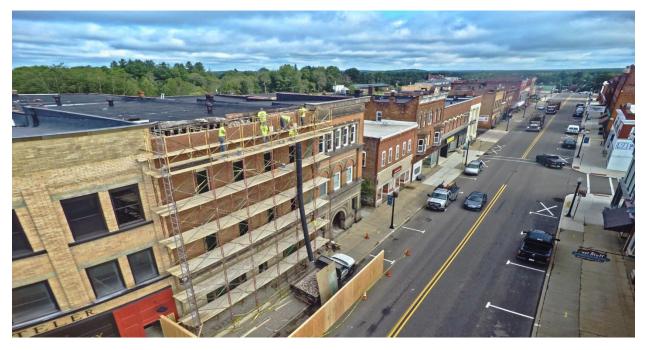
\$5,940,000

### 18. Acknowledgments

Photographs by Norm Horn, Envinity; Gary Moshier, Moshier Studio; Rob Hoskin, Building Performance Architecture; Sixty Foot Films and West Penn Power Sustainable Energy Fund.



## **19. Construction Photos**

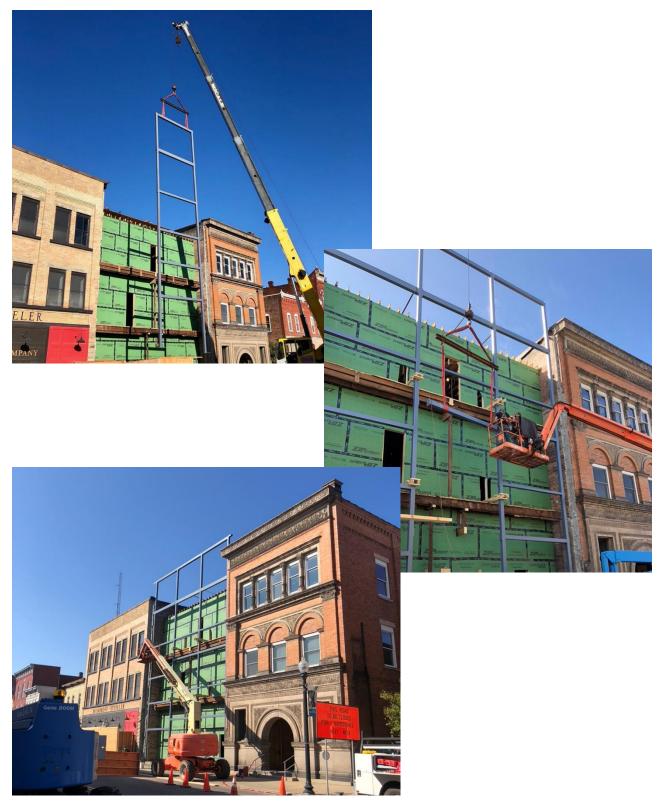


Demolition of East facade



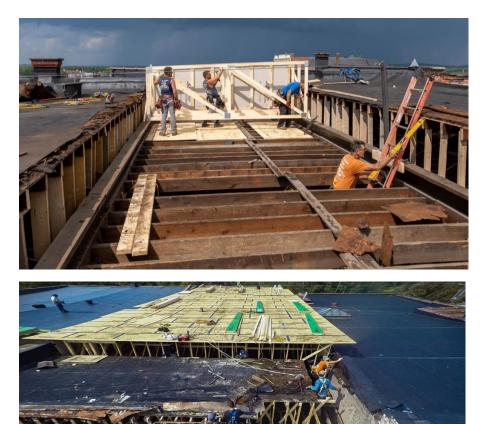
Shoring and temporary enclosure





Erection of steel farming



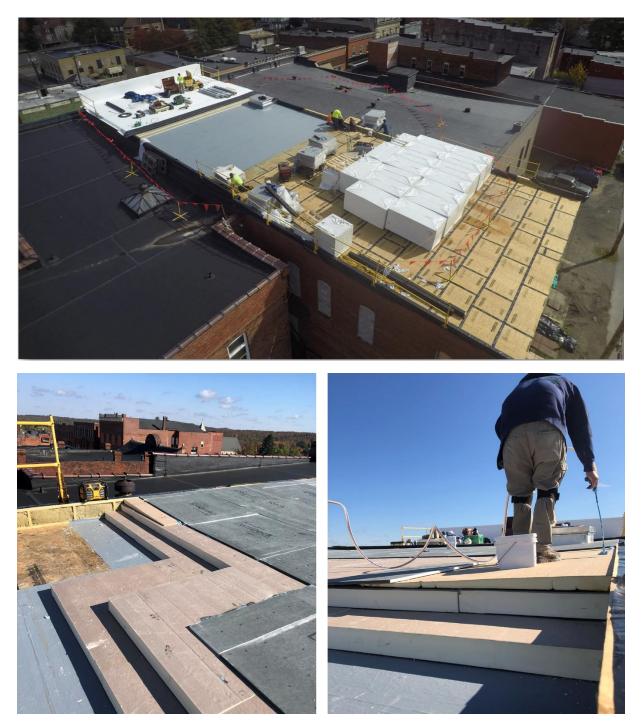




Roof demolition and replacement







New roof assembly





New East wall ready for windows and cladding





Mockup





Installation of curtainwall frames...



...and glass.



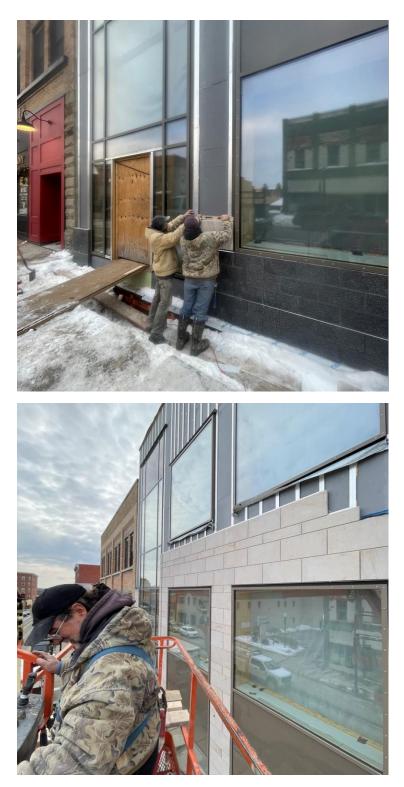


Installation of cladding clips and insulation



Ready for stone panels





Setting the panels





West and South façade insulation and cladding





Parging at joist pockets before Visconn application, typical.







Applying the first coat of Visconn on masonry walls, second floor, typical.



Applying a second coat, third floor, typical.



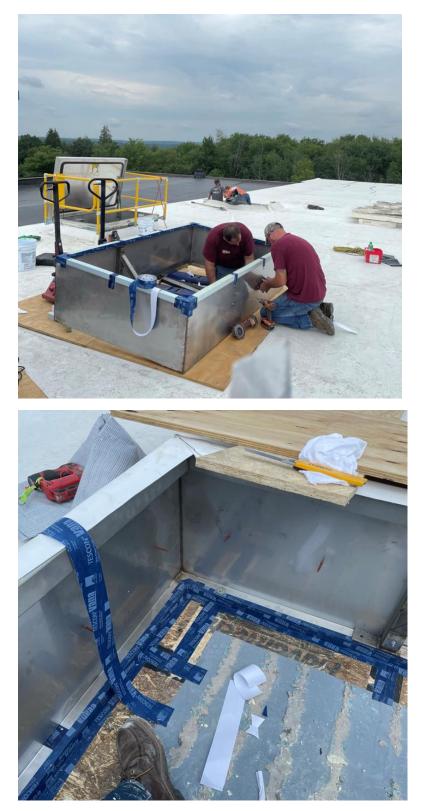


Third floor, NE corner, prior to adding more interior insulation to mitigate thermal bridge at building intersection with neighbor.



After addition of return wall to insulate corner





Attaching 2" Armatherm to the ERV roof curb and taping to the roof deck/air barrier.







Lining the inside of the ERV curb with layers of 2" Rockwool board and filling the space around the ducts with Rockwool batts





West entry door threshold condition.

8" Neopor below grade, 2" XPS under slab, 1" Armatherm threshold saddle



#### 20. Major Product Sources and Contractors

#### Masonry

Trendstone Ground Face Block Bloom Run and Roaring Run Sandstone Metals Structural Steel Decorative Stairs and Front Canopy Front Wall Cladding Clips Rear Wall Cladding Clips Wood Zip Sheathing Stair treads, Flooring, Railings and Standing and Running Trim **Roof Trusses Thermal And Moisture Protection** Internal Air Barrier Exterior Water-Resistant Barrier Structural Foam Insulation Mineral Fiber Insulation Graphite Enhanced Extruded Polystyrene Roofing Membrane and Insulation Metal Siding **Openings** Glazed Timber Curtainwall and Windows **UPVC Windows** Aluminum Storefront Doors Elevator Mechanical **Energy Recovery Ventilator VRF Heat Pump** Plumbina Lavatories

Point of use water heaters Root Bar Heat Pump water heater

#### Electrical

Stair Chandelier Pendant Fixtures Linear Wall Fixtures Other Lighting

#### Steger Masonry

Echelon Masonry **Russell Stone Products Dinsmore Welding and Fabricating** Dinsmore Welding and Fabricating Dinsmore Welding and Fabricating U-Kon EcoCladding

J.A Luciano & Sons Builders Huber Engineered Woods Collins Wood products

Keystone Truss and Manufacturing

Proclima Visconn & Visconn Fibre/ Cavallaro Paint and Restoration Prosoco Cat 5 Armatherm Rockwool Neopor/Brinc Building Products Carlisle/Marcon Roofing Nexgen Metal Design Systems

Raico/Tanner Windows and Doors Ventana USA Kawneer Arconic Otis Gen 2 with regenerative drive **Allied Systems** Ventacity VS3000Rte

Fujitsu Airstage VR-II

**Allied Systems** Bradley Verge with Washbar Technology Eemax State HPX 50 DHPT Elco Electrical OCL Tubie 5

Fluxwerx Profile Spoke & View Star Tek Beam Lithonia



# 21. SI Values

Year of Construction	2022	Climate Zone	6 Cold
Treated Floor Area	914.05 m²	Space Heating Demand	14
Heat/Humidity Recovery	85% 65%		kWh∕ m² yr.
Average U-value	0.23	Primary Energy Renewable	43
external wall	W/(m²K)	(PER)	kWh/ m² yr.
Average U-value	0.15	Generation of renewable	119
basement ceiling/floor	W/(m²K)	energy	kWh/ m² yr.
slab			
U-value roof	0.142	Non-renewable Primary Energy	95
	W/(m²K)	(PE)	kWh/ m² yr.
Average U-value	0.75	Pressure Test n50	0.2
window	W/(m²K)		h-1
Special Features	Energy Reco	very Elevator	
	Heat Pump V	Vater Heater in smoothie bar uses	rejected heat
	from reach-ir	n refrigeration units.	

Assembly no.	Building assen	nbly description				Interior insulation?
01ud	Existing Ma	asonry with Exterior Ins	ulation an	d Cladding - Ambient		
		Heat transmission resistar	nce [m²K/W]			
Orientation of building element	2-Wall	interior R <sub>si</sub>	0.13			
Adjacent to	1-Outdoor air	exterior R <sub>se</sub> :	0.04			
		A		и		
Area section 1	λ[W/(mK)]	Area section 2 (optional)	λ[W/(mK)]	Area section 3 (optional)	λ[W/(mK)]	Thickness [mm]
	0.000		0.000		0.000	0
EPS Board Type VII - Neropor	0.030		0.000		0.000	203
Fluid Applied Weather Barrier	0.000		0.000		0.000	0
	0.000		0.000		0.000	0
Existing Masonry	1.202		0.000		0.000	305
Fluid Applied Air Barrier	0.000		0.000		0.000	0
	0.000		0.000		0.000	0
	0.000		0.000		0.000	0
Perce	ntage of sec. 1	Percenta	ge of sec. 2	Percent	age of sec. 3	Total
	100%		0.0%		0.0%	<b>50.8</b> cm
U-value supplement	0.17	W/(m²K)	8	U-value	: <b>0.310</b> v	



Assembly no.	Building asse	mbly description				Interior insulation?
02ud	Existing w	ith Exterior Insulation ag	ainst Gro	ound		
		Heat transmission resistan	ce [m²K/W]			terrene and the second se
Orientation of building element	2-Wall	interior Rsi	0.13			
Adjacent to	2-Ground	exterior Rse:	0.00			
	000000000000000000000000000000000000000	and		ad		
Area section 1	λ[W/(mK)]	Area section 2 (optional)	λ[W/(mK)]	Area section 3 (optional)	λ[W/(mK)]	Thickness [mm]
Dimpled waterproofing	0.000		0.000		0.000	6
EPS Board Type VII -	0.030		0.000		0.000	203
Neropor	0.000		0.000		0.000	200
Fluid Applied waterproofing	0.000		0.000		0.000	2
Parge Coat	0.687		0.000		0.000	6
Existing Masonry	1.202		0.000		0.000	305
Fluid Applied Air	0.000		0.000		0.000	2
Barrier	0.000		0.000		0.000	0
	0.000		0.000		0.000	0
Daraa	1	Dereente		Dereet		
Perce	ntage of sec. 1 100%	Percenta	ge of sec. 2 0.0%	Percent	age of sec. 3	Total Cm
	100%		U.U70		0.0%	<b>32.4</b>
U-value supplement		W/(m²K)		U-value:	• <b>0.140</b> •	
Assembly no.	Building asse	mbly description		U-value:	: 0.140 W	//(m²K)
	Building asse	mbly description Stone Clad Wall - Ambie			<mark>0.140</mark> ₩	
Assembly no. 03ud	Building asse	mbly description Stone Clad Wall - Ambie Heat transmission resistan	ce [m²K/W]		: <b>0.140</b> №	
Assembly no. 03ud Orientation of building element	Building asse	mbly description Stone Clad Wall - Ambie Heat transmission resistan interior Rsi	ce [m²K/W] 0.13		: <u>0.140</u> ₩	
Assembly no. 03ud Orientation of building element	Building asse	mbly description Stone Clad Wall - Ambie Heat transmission resistan interior Rsi	ce [m²K/W]		: <u>0.140</u> ∾	
Assembly no. 03ud Orientation of building element Adjacent to	Building asse New East 2-Wall 1-Outdoor ai	mbly description Stone Clad Wall - Ambie Heat transmission resistan interior Rsi exterior Rse:	ce [m²K/W] 0.13 0.04			Interior insulation?
Assembly no. 03ud Orientation of building element Adjacent to Area section 1	Building asse	mbly description Stone Clad Wall - Ambie Heat transmission resistan interior Rsi	ce [m²K/W] 0.13 0.04		<ul> <li>0.140 W</li> <li>λ.[W/(mk)]</li> <li>0.000</li> </ul>	
Assembly no. 03ud Orientation of building element Adjacent to Area section 1 Sandstone Panels	Building asse New East \$ 2-Wall 1-Outdoor ai λ.[W/(mK)]	mbly description Stone Clad Wall - Ambie Heat transmission resistan interior Rsi exterior Rse:	ce [m²K/W] 0.13 0.04 λ[W/(mK)]		<u>λ[W/(mK)]</u>	Interior insulation?
Assembly no. 03ud Orientation of building element Adjacent to Area section 1 Sandstone Panels U-Kon Girts/Airspace EPS Board Type VII -	Building asse New East \$ 2-Wall 1-Outdoor ai λ[W/(mK)] 2.404	mbly description Stone Clad Wall - Ambie Heat transmission resistan interior Rsi exterior Rse:	ce [m²K/W] 0.13 0.04 λ [W/(mK)] 0.000		λ [W/(mK)] 0.000	Interior insulation?
Assembly no. 03ud Orientation of building element Adjacent to Area section 1 Sandstone Panels U-Kon Girts/Airspace EPS Board Type VII - Neropor Zip Sheathing -	Building asse New East \$ 2-Wall 1-Outdoor ai λ[W/(mK)] 2.404 0.108	mbly description Stone Clad Wall - Ambie Heat transmission resistan interior Rsi exterior Rse:	ce [m²K/W] 0.13 0.04 λ [W/(mK)] 0.000 0.000		λ [W/(mK)] 0.000 0.000	Interior insulation?
Assembly no. 03ud Orientation of building element Adjacent to Area section 1 Sandstone Panels U-Kon Girts/Airspace EPS Board Type VII - Neropor Zip Sheathing - Weather Barrier	Building asse New East 2-Wall 1-Outdoor ai λ [W/(mK)] 2.404 0.108 0.030 0.130	mbly description Stone Clad Wall - Ambie Heat transmission resistan interior Rsi exterior Rse:	ce [m²K/W] 0.13 0.04 λ [W/(mK)] 0.000 0.000 0.000		λ [W/(mK)] 0.000 0.000 0.000 0.000	Interior insulation? Thickness [mm] 38 64 203 13
Assembly no. 03ud Orientation of building element Adjacent to Area section 1 Sandstone Panels U-Kon Girts/Airspace EPS Board Type VII - Neropor Zip Sheathing - Weather Barrier Rockwool CavityRock	Building asse New East \$ 2-Wall 1-Outdoor ai λ[W/(mK)] 2.404 0.108 0.030	mbly description Stone Clad Wall - Ambie Heat transmission resistan interior Rsi exterior Rse: Area section 2 (optional)	ce [m²K/W] 0.13 0.04 λ.[W/(mK)] 0.000 0.000 0.000		λ [W/(mK)] 0.000 0.000 0.000	Interior insulation?
Assembly no. 03ud Orientation of building element Adjacent to Area section 1 Sandstone Panels U-Kon Girts/Airspace EPS Board Type VII - Neropor Zip Sheathing - Weather Barrier Rockwool CavityRock Zip Sheathing - Air	Building asse New East 2-Wall 1-Outdoor ai λ [W/(mK)] 2.404 0.108 0.030 0.130	mbly description Stone Clad Wall - Ambie Heat transmission resistan interior Rsi exterior Rse: Area section 2 (optional) Metal Stud, 20 GA, 16"	ce [m²K/W] 0.13 0.04 λ [W/(mK)] 0.000 0.000 0.000		λ [W/(mK)] 0.000 0.000 0.000 0.000	Interior insulation? Thickness [mm] 38 64 203 13
Assembly no. 03ud Orientation of building element Adjacent to Area section 1 Sandstone Panels U-Kon Girts/Airspace EPS Board Type VII - Neropor Zip Sheathing - Weather Barrier Rockwool CavityRock Zip Sheathing - Air Barrier Rockwool ComfortBatt	Building asse New East 2-Wall 1-Outdoor ai λ[W/(mK)] 2.404 0.108 0.030 0.130 0.045	mbly description Stone Clad Wall - Ambie Heat transmission resistan interior Rsi exterior Rse: Area section 2 (optional) Metal Stud, 20 GA, 16"	ce [m²K/W] 0.13 0.04 λ [W/(mK)] 0.000 0.000 0.000 45.071		λ [W/(mk)] 0.000 0.000 0.000 0.000 0.000	Interior insulation? Thickness [mm] 38 64 203 13 152
Assembly no. 03ud Orientation of building element Adjacent to Area section 1 Sandstone Panels U-Kon Girts/Airspace EPS Board Type VII - Neropor Zip Sheathing - Weather Barrier Rockwool CavityRock Zip Sheathing - Air Barrier Rockwool ComfortBatt Service Cavity	Building asse New East \$ 2-Wall 1-Outdoor ai λ [W/(mK)] 2.404 0.108 0.030 0.130 0.045 0.130	mbly description Stone Clad Wall - Ambie Heat transmission resistan interior Rsi exterior Rse: Area section 2 (optional) Metal Stud, 20 GA, 16"	ce [m²K/W] 0.13 0.04 λ [W/(mK)] 0.000 0.000 0.000 45.071 0.000	Area section 3 (optional)	λ [W/(mK)]           0.000           0.000           0.000           0.000           0.000           0.000           0.000           0.000           0.000	Interior insulation? Thickness [mm 38 64 203 13 152 11
Assembly no. 03ud Orientation of building element Adjacent to Area section 1 Sandstone Panels U-Kon Girts/Airspace EPS Board Type VII - Neropor Zip Sheathing - Weather Barrier Rockwool CavityRock Zip Sheathing - Air Barrier Rockwool ComfortBatt Service Cavity GWB	Building asse New East \$ 2-Wall 1-Outdoor ai λ[W/(mK)] 2.404 0.108 0.030 0.130 0.045 0.130 0.045	mbly description Stone Clad Wall - Ambie Heat transmission resistan interior Rsi exterior Rse: Area section 2 (optional) Metal Stud, 20 GA, 16" O.C.	ce [m²K/W] 0.13 0.04 λ [W/(mK)] 0.000 0.000 0.000 45.071 45.071	Area section 3 (optional)	λ [W/(mK)]         0.000         0.000         0.000         0.000         0.000         0.000         0.000         0.000         0.000         0.000         0.000         0.000         0.130	Interior insulation? Thickness [mm] 38 64 203 13 152 11 89
Assembly no. 03ud Orientation of building element Adjacent to Area section 1 Sandstone Panels U-Kon Girts/Airspace EPS Board Type VII - Neropor Zip Sheathing - Weather Barrier Rockwool CavityRock Zip Sheathing - Air Barrier Rockwool ComfortBatt Service Cavity GWB	Building asse New East 2-Wall 1-Outdoor ai 2.404 0.108 0.030 0.130 0.045 0.130 0.045 0.209	mbly description Stone Clad Wall - Ambie Heat transmission resistan interior Rsi exterior Rse: Area section 2 (optional) Metal Stud, 20 GA, 16" O.C.	ce [m²K/W] 0.13 0.04 λ[W/(mK)] 0.000 0.000 0.000 45.071 0.000 45.071 0.000	Area section 3 (optional)	λ [W/(mk)]           0.000           0.000           0.000           0.000           0.000           0.000           0.000           0.000           0.000           0.000           0.000           0.000           0.000           0.130           0.000	Interior insulation?



ssembly no. 04ud	Roof	nbly description				
	.l	Heat transmission resistan	ce [m²K/W]			L
Orientation of building element	1-Roof	interior Rsi	0.10			
Adjacent to	1-Outdoor air	exterior Rse:	0.04			
	b	2		à		
Area section 1	λ[W/(mK)]	Area section 2 (optional)	λ[W/(mK)]	Area section 3 (optional)	λ[W/(mK)]	Thickness [mm]
	0.000		0.000		0.000	0
Advantech OSB Roof Sheathing	0.130		0.000		0.000	19
/apor Barrier	0.000		0.000		0.000	0
Poyiso Insulation - Faced	0.030		0.000		0.000	203
FPO Membrane	0.601		0.000		0.000	3
DensDeck Prime Coverboard	0.209		0.000		0.000	16
	0.000		0.000		0.000	0
	0.000		0.000		0.000	0
Percei	ntage of sec. 1	Percenta	ge of sec. 2	Percen	tage of sec. 3	Total
	100%		0.0%		0.0%	24.1
U-value supplement		W/(m²K)		U-value	e: 0.142 W	
Assembly no.	Building asser	nbly description		U-value	»: 0.142 W	//(m²K)
U-value supplement Assembly no. 05ud	Building asser	nbly description Ventilated Basement			»: 0.142 w	
Assembly no.	Building asser	nbly description Ventilated Basement Heat transmission resistan			»: 0.142 w	
Assembly no. 05ud Orientation of building element	Building asser Floor over 3-Floor	nbly description Ventilated Basement Heat transmission resistan interior Rsi	0.17		9: 0.142 W	
Assembly no. 05ud Orientation of building element	Building asser	nbly description Ventilated Basement Heat transmission resistan			»: 0.142 w	
Assembly no. 05ud Orientation of building element Adjacent to	Building asser Floor over 3-Floor 3-Ventilated	nbly description Ventilated Basement Heat transmission resistan interior Rsi exterior Rse:	0.17 0.17			Interior insulation
Assembly no. 05ud Orientation of building element Adjacent to	Building asser Floor over 3-Floor	nbly description Ventilated Basement Heat transmission resistan interior Rsi	0.17 0.17		<ul> <li>0.142 W</li> <li>λ[W/(mK)]</li> <li>0.000</li> </ul>	
Assembly no. 05ud Orientation of building element	Building asser Floor over 3-Floor 3-Ventilated λ.[W/(mK)]	nbly description Ventilated Basement Heat transmission resistan interior Rsi exterior Rse:	0.17 0.17 λ[W/(mK)]			Interior insulation
Assembly no. 05ud Orientation of building element Adjacent to Area section 1 21p Sheathing - Air	Building asser Floor over 3-Floor 3-Ventilated λ[W/(mK)] 0.000	nbly description Ventilated Basement Heat transmission resistan interior Rsi exterior Rse:	0.17 0.17 λ.[W/(mK)] 0.000		λ.[W/(mK)]	Interior insulation
Assembly no. 05ud Orientation of building element Adjacent to Area section 1 Zip Sheathing - Air Barrier	Building asser Floor over 3-Floor 3-Ventilated λ.[W/(mK)] 0.000 0.130	nbly description Ventilated Basement Heat transmission resistan interior Rsi exterior Rse:	0.17 0.17 λ [W/(mK)] 0.000 0.000		λ.[V/(mK)] 0.000 0.000	Interior insulation
Assembly no. 05ud Orientation of building element Adjacent to Area section 1 Zip Sheathing - Air Barrier Existing Wood Blown Fiber Glass 1.56	Building asser Floor over 3-Floor 3-Ventilated λ[W/(mK)] 0.000 0.130 0.130	nbly description Ventilated Basement Heat transmission resistan interior Rsi exterior Rse: Area section 2 (optional)	0.17 0.17 λ [W/(mK)] 0.000 0.000 0.000		λ.[W/(mK)] 0.000 0.000 0.000	Interior insulation
Assembly no. 05ud Orientation of building element Adjacent to Area section 1 Zip Sheathing - Air Barrier Existing Wood Blown Fiber Glass 1.56 b/cf	Building asser Floor over 3-Floor 3-Ventilated λ [W/(mK)] 0.000 0.130 0.130 0.050	nbly description Ventilated Basement Heat transmission resistan interior Rsi exterior Rse: Area section 2 (optional)	0.17 0.17 λ.[W/(mK)] 0.000 0.000 0.000 0.120		λ.[W/(mK)] 0.000 0.000 0.000 0.000	Interior insulation
Assembly no. 05ud Orientation of building element Adjacent to Area section 1 Zip Sheathing - Air Barrier Existing Wood Blown Fiber Glass 1.56 b/cf Air Barrier EPS Board Type VII -	Building asser Floor over 3-Floor 3-Ventilated λ [W/(mK)] 0.000 0.130 0.130 0.050 0.000	nbly description Ventilated Basement Heat transmission resistan interior Rsi exterior Rse: Area section 2 (optional)	0.17 0.17 λ [W/(mK)] 0.000 0.000 0.000 0.120 0.000		λ.[W/(mK)] 0.000 0.000 0.000 0.000 0.000	Interior insulation
Assembly no. 05ud Orientation of building element Adjacent to Area section 1 Zip Sheathing - Air Barrier Existing Wood Blown Fiber Glass 1.56 b/cf Air Barrier EPS Board Type VII - Neropor	Building asser Floor over 3-Floor 3-Ventilated λ [W/(mK)] 0.000 0.130 0.130 0.050 0.000 0.030	nbly description Ventilated Basement Heat transmission resistan interior Rsi exterior Rse: Area section 2 (optional)	0.17 0.17 0.17 λ [W/(mK)] 0.000 0.000 0.120 0.000 0.000		<ul> <li>λ.[W/(mK)]</li> <li>0.000</li> <li>0.000</li> <li>0.000</li> <li>0.000</li> <li>0.000</li> <li>0.000</li> <li>0.000</li> <li>0.000</li> </ul>	Interior insulation
Assembly no. 05ud Orientation of building element Adjacent to Area section 1 Zip Sheathing - Air Barrier Existing Wood Blown Fiber Glass 1.56 b/cf Air Barrier EPS Board Type VII - Neropor DensGlas GWB	Building asser Floor over 3-Floor 3-Ventilated λ [W/(mK)] 0.000 0.130 0.130 0.050 0.000 0.030 0.209 0.000	nbly description Ventilated Basement Heat transmission resistan interior Rsi exterior Rse: Area section 2 (optional) Joists	0.17 0.17 0.17 λ.[W/(mK)] 0.000 0.000 0.120 0.000 0.000 0.000 0.000	Area section 3 (optional)	λ. [W/(mK)]           0.000           0.000           0.000           0.000           0.000           0.000           0.000           0.000           0.000           0.000           0.000           0.000           0.000           0.000           0.000           0.000	Interior insulation           Thickness [mm]           0           11           22           305           0           51           16           0
Assembly no. 05ud Orientation of building element Adjacent to Area section 1 Zip Sheathing - Air Barrier Existing Wood Blown Fiber Glass 1.56 b/cf Air Barrier EPS Board Type VII - Neropor DensGlas GWB	Building asser Floor over 3-Floor 3-Ventilated λ [W/(mK)] 0.000 0.130 0.130 0.050 0.000 0.030 0.209	nbly description Ventilated Basement Heat transmission resistan interior Rsi exterior Rse: Area section 2 (optional) Joists	0.17 0.17 0.17 λ[W/(mK)] 0.000 0.000 0.120 0.000 0.000 0.000	Area section 3 (optional)	λ.[W/(mK)] 0.000 0.000 0.000 0.000 0.000 0.000 0.000	Interior insulation



ssembly no.	8	mbly description				Interior insulat
06ud	Slab on G					
	P	Heat transmission resistan		1		
Orientation of building elemen		interior Rsi	0.17			
Adjacent t	o <mark>2-Ground</mark>	exterior Rse:	0.00			
Area section 1	λ[W/(mK)]	Area section 2 (optional)	λ[W/(mK)]	Area section 3 (optional)	λ[W/(mK)]	Thickness (mr
Concrete	2.404		0.000		0.000	127
Air/Vapor Barrier	0.000		0.000		0.000	0
EPS Board Type VII - Neropor	0.030		0.000		0.000	152
Perci	entage of sec. 1	Percenta	ge of sec. 2	Perce	entage of sec. 3	Total
	-		,			
U-value supplemer	I	W/(m²K)	0.0%	U-valu	0.0%	
Assembly no.	nt 0.00 Building asser	mbly description	0.0%	U-valu		
	nt 0.00	mbly description				(m²K)
Assembly no. 07ud	t 0.00 Building asser	mbly description	nce [m²K/W]			(m²K)
Assembly no. 07ud Orientation of building elemer	t 0.00 Building asser	mbly description Panel Heat transmission resistan interior Rsi				(m²K)
Assembly no. 07ud Orientation of building elemer Adjacent t	Building asser Spandrel F	mbly description Panel Heat transmission resistan interior Rsi exterior Rse:	ice [m²K/W] 0.13 0.04		w	(m²K)
Assembly no. 07ud Orientation of building elemer Adjacent t	t 0.00 Building asser Spandrel F t 2-Wall ο 1-Outdoor ai λ.[W/(mk)]	mbly description Panel Heat transmission resistan interior Rsi	ice [m²K/W] 0.13 0.04 λ.[W/(mK)]		ie: 0.189 W/	(m²K)
Assembly no. 07ud Orientation of building elemer Adjacent t Area section 1 GWB	t 0.00 Building asser Spandrel F 2-Wall ο 1-Outdoor ai λ [W/(mK)] 0.209	mbly description Panel Heat transmission resistan interior Rsi exterior Rse: Area section 2 (optional)	ice [m²K/W] 0.13 0.04 λ.[W/(mK)] 0.000		le: 0.189 W/	(m²K) Interior insulat Thickness [mr 16
Assembly no. 07ud Orientation of building elemer Adjacent t Area section 1 GWB Rockwool Batt	t 0.00 Building asser Spandrel F t 2-Wall ο 1-Outdoor ai λ.[W/(mk)]	mbly description Panel Heat transmission resistan interior Rsi exterior Rse:	ice [m²K/W] 0.13 0.04 λ.[W/(mK)]		ie: 0.189 W/	(m²K)
Assembly no. 07ud Orientation of building elemer Adjacent t Area section 1 GWB Rockwool Batt Gypsum Sheathing & Air Barrier	t 0.00 Building asser Spandrel F 2-Wall ο 1-Outdoor ai λ [W/(mK)] 0.209	mbly description Panel Heat transmission resistan interior Rsi exterior Rse: Area section 2 (optional)	ice [m²K/W] 0.13 0.04 λ.[W/(mK)] 0.000		le: 0.189 W/	(m²K) Interior insulat Thickness [mr 16
Assembly no. 07ud Orientation of building elemer Adjacent t Area section 1 GWB Rockwool Batt Gypsum Sheathing & Air Barrier EPS Board Type VII -	Building asser           Spandrel F           2-Wall           0           1-Outdoor ai           λ [W/(mK)]           0.209           0.045	mbly description Panel Heat transmission resistan interior Rsi exterior Rse: Area section 2 (optional)	hce [m²K/W] 0.13 0.04 λ.[W/(mK)] 0.000 45.071		Le: 0.189 W	(m²K) Interior insulat Thickness [mm 16 89
Assembly no. 07ud Orientation of building elemer Adjacent t Area section 1 GWB Rockwool Batt Gypsum Sheathing & Air Barrier EPS Board Type VII - Neropor	t 0.00 Building asset Spandrel F t 2-Wall ο 1-Outdoor ai λ [W/(mK)] 0.209 0.209	mbly description Panel Heat transmission resistan interior Rsi exterior Rse: Area section 2 (optional)	ice [m²K/W] 0.13 0.04 λ [W/(mK)] 0.000 45.071 0.000		Le: 0.189 W/ λ.[W/(mK)] 0.000 0.000 0.000	(m²K) Interior insulat Thickness [mm 16 89 16
Assembly no. 07ud Orientation of building elemer	t 0.00 Building asser Spandrel F 2-Wall 0 1-Outdoor ai λ [W/(mK)] 0.209 0.045 0.209 0.030	mbly description Panel Heat transmission resistan interior Rsi exterior Rse: Area section 2 (optional)	ice [m²K/W] 0.13 0.04 λ.[W/(mK)] 0.000 45.071 0.000 0.000		Le: 0.189 W/ λ [W/(mK)] 0.000 0.000 0.000 0.000	(m²K) Interior insulat Thickness [mr 16 89 16 279
Assembly no. 07ud Orientation of building elemer Adjacent t Area section 1 GWB Rockwool Batt Gypsum Sheathing & Air Barrier EPS Board Type VII - Neropor Spandrel Glass	t 0.00 Building asser Spandrel F 2-Wall 0 1-Outdoor ai λ[W/(mk)] 0.209 0.045 0.209 0.030 0.160	mbly description Panel Heat transmission resistar interior Rsi exterior Rse: Area section 2 (optional) Metal Stud	<ul> <li>λ. [W/(mK)]</li> <li>0.000</li> <li>45.071</li> <li>0.000</li> <li>0.000</li> <li>0.000</li> </ul>	Area section 3 (optional)	λ. [W/(mK)]         0.000         0.000         0.000         0.000         0.000         0.000         0.000         0.000         0.000         0.000         0.000	(m²K) Interior insulat Thickness [mr 16 89 16 279
Assembly no. 07ud Orientation of building elemer Adjacent t Area section 1 GWB Rockwool Batt Gypsum Sheathing & Air Barrier EPS Board Type VII - Neropor Spandrel Glass	t 0.00 Building asser Spandrel F 2-Wall 0 1-Outdoor ai λ [W/(mK)] 0.209 0.045 0.209 0.030	mbly description Panel Heat transmission resistar interior Rsi exterior Rse: Area section 2 (optional) Metal Stud	ice [m²K/W] 0.13 0.04 λ.[W/(mK)] 0.000 45.071 0.000 0.000	Area section 3 (optional)	Le: 0.189 W/ λ [W/(mK)] 0.000 0.000 0.000 0.000	(m²K) Interior insulat Thickness [mr 16 89 16 279



Assembly no.	Building assem	bly description				Interior insulation
08ud	Party Wall				1	
		Heat transmission resistan	ce [m²K/W]			1
Orientation of building element	2-Wall	interior Rsi	0.13			
	3-Ventilated	exterior Rse:	0.13			
Aujacom to	J-ventilated	extend rac.	0.15			
Area section 1	1 [[ <b>\</b> ]///mel/[]]	Area agation 2 (antional)	1 [M///mk/]] A re-	a a action 2 (antional)	) [M///m//)]	Thiskness [mm]
Existing Masonry	λ[W/(mK)] <b>1.202</b>	Area section 2 (optional)	0.000	a section 3 (optional)	λ [W/(mK)] <b>0.000</b>	Thickness [mm] 305
Fluid Applied Air						
Barrier	0.000		0.000		0.000	2
~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~						
Perce	ntage of sec. 1 100%	Percenta	ge of sec. 2	Perc	entage of sec. 3	Total
			0.0%		0.0%	<b>30.6</b>
U-value supplement	*	W/(m²K)		U-val	ue: <b>1.947</b> W/	(m²K)
	0.00	· · ·		U-val	ue: <b>1.947</b> W/	
Assembly no.	0.00 Building assem	bly description		U-val	ue: <b>1.947</b> W	(m²K)
	0.00 Building assem	bly description haft in Basement		U-valı	ue: 1.947 W	
Assembly no. 09ud	0.00 Building assem Elevator Sh	bly description aft in Basement Heat transmission resistan	ce [m²K/W]	U-val	ue: 1.947	
Assembly no. 09ud Orientation of building element	0.00 Building assem Elevator Sh 2-Wall	bly description aft in Basement Heat transmission resistan interior Rsi	ce [m²K/W] 0.13	U-val	ue: 1.947 W	
Assembly no. 09ud Orientation of building element	0.00 Building assem Elevator Sh	bly description aft in Basement Heat transmission resistan	ce [m²K/W]	U-val	ue: 1.947 W	
Assembly no. 09ud Orientation of building element Adjacent to	0.00 Building assem Elevator Sh 2-Wall 3-Ventilated	bly description aft in Basement Heat transmission resistan interior Rsi exterior Rse:	ce [m²K/W] 0.13 0.13			Interior insulation
Assembly no. 09ud Orientation of building element Adjacent to Area section 1	0.00 Building assem Elevator Sh 2-Wall 3-Ventilated λ.[W/(mK)]	bly description aft in Basement Heat transmission resistan interior Rsi	ce [m²K/W] 0.13 0.13 λ.[W/(mK)] Are	U-val	λ.[W/(mK)]	Interior insulation
Assembly no. 09ud Orientation of building element Adjacent to Area section 1 CMU	0.00 Building assem Elevator Sh 2-Wall 3-Ventilated λ[W/(mK)] 1.202	bly description aft in Basement Heat transmission resistan interior Rsi exterior Rse:	ce [m <sup>2</sup> K/W] 0.13 0.13 λ[W/(mK)] Are 0.000		λ.[W/(mK)] 0.000	Interior insulation
Assembly no. 09ud Orientation of building element Adjacent to Area section 1 CMU Air Barrier	0.00 Building assem Elevator Sh 2-Wall 3-Ventilated λ.[W/(mK)]	bly description aft in Basement Heat transmission resistan interior Rsi exterior Rse:	ce [m²K/W] 0.13 0.13 λ.[W/(mK)] Are		λ.[W/(mK)]	Interior insulation
Assembly no. 09ud Orientation of building element	0.00 Building assem Elevator Sh 2-Wall 3-Ventilated λ[W/(mK)] 1.202	bly description aft in Basement Heat transmission resistan interior Rsi exterior Rse:	ce [m <sup>2</sup> K/W] 0.13 0.13 λ[W/(mK)] Are 0.000		λ.[W/(mK)] 0.000	Interior insulation
Assembly no. 09ud Orientation of building element Adjacent to Area section 1 CMU Air Barrier Foil faced Polyiso	0.00           Building assem           Elevator Sh           2-Wall           3-Ventilated           λ.[W/(mK)]           1.202           0.000	bly description aft in Basement Heat transmission resistan interior Rsi exterior Rse:	ce [m²K/W] 0.13 0.13 λ[W/(mK)] Are 0.000 0.000		λ [W/(mK)] 0.000 0.000	Interior insulation Thickness [mm] 197 0
Assembly no. 09ud Orientation of building element Adjacent to Area section 1 CMU Air Barrier Foil faced Polyiso	0.00           Building assem           Elevator Sh           2-Wall           3-Ventilated           λ.[W/(mK)]           1.202           0.000	bly description aft in Basement Heat transmission resistan interior Rsi exterior Rse:	ce [m²K/W] 0.13 0.13 λ[W/(mK)] Are 0.000 0.000		λ [W/(mK)] 0.000 0.000	Interior insulation Thickness [mm] 197 0
Assembly no. 09ud Orientation of building element Adjacent to Area section 1 CMU Air Barrier Foil faced Polyiso	0.00           Building assem           Elevator Sh           2-Wall           3-Ventilated           λ.[W/(mK)]           1.202           0.000	bly description aft in Basement Heat transmission resistan interior Rsi exterior Rse:	ce [m²K/W] 0.13 0.13 λ[W/(mK)] Are 0.000 0.000		λ [W/(mK)] 0.000 0.000	Interior insulation Thickness [mm] 197 0
Assembly no. 09ud Orientation of building element Adjacent to Area section 1 CMU Air Barrier Foil faced Polyiso	0.00           Building assem           Elevator Sh           2-Wall           3-Ventilated           λ.[W/(mK)]           1.202           0.000	bly description aft in Basement Heat transmission resistan interior Rsi exterior Rse:	ce [m²K/W] 0.13 0.13 λ[W/(mK)] Are 0.000 0.000		λ [W/(mK)] 0.000 0.000	Interior insulation Thickness [mm] 197 0
Assembly no. 09ud Orientation of building element Adjacent to Area section 1 CMU Air Barrier Foil faced Polyiso	0.00           Building assem           Elevator Sh           2-Wall           3-Ventilated           λ.[W/(mK)]           1.202           0.000	bly description aft in Basement Heat transmission resistan interior Rsi exterior Rse:	ce [m²K/W] 0.13 0.13 λ[W/(mK)] Are 0.000 0.000		λ [W/(mK)] 0.000 0.000	Interior insulation Thickness [mm] 197 0
Assembly no. 09ud Orientation of building element Adjacent to Area section 1 CMU Air Barrier Foil faced Polyiso Board	0.00           Building assem           Elevator Sh           2-Wall           3-Ventilated           λ [W/(mK)]           1.202           0.000           0.030	bly description aft in Basement Heat transmission resistar interior Rsi exterior Rse: Area section 2 (optional)	ce [m²K/W] 0.13 0.13 λ [W/(mK)] Are 0.000 0.000 0.000	a section 3 (optional)	λ.[W/(mK)] 0.000 0.000 0.000	Interior insulation Thickness [mm] 197 0 152
Assembly no. 09ud Orientation of building element Adjacent to Area section 1 CMU Air Barrier Foil faced Polyiso Board	0.00           Building assem           Elevator Sh           2-Wall           3-Ventilated           λ.[W/(mK)]           1.202           0.000	bly description aft in Basement Heat transmission resistar interior Rsi exterior Rse: Area section 2 (optional)	ce [m²K/W] 0.13 0.13 λ[W/(mK)] Are 0.000 0.000	a section 3 (optional)	λ [W/(mK)] 0.000 0.000	Interior insulation Thickness [mm] 197 0



Assembly no.	1	nbly description				Interior insulat	tion?
10ud	Gable Trus	s plus Clad Masonry					]
		Heat transmission resistan	ce [m²K/W]	7			
Orientation of building element	2-Wall	interior Rsi	0.13				
Adjacent to	1-Outdoor ai	exterior Rse:	0.04				
	£	2		2			
Area section 1	λ[W/(mK)]	Area section 2 (optional)	) [\///mk)]	Area section 3 (optional)	λ[W/(mK)]	Thickness [m	~1
Rockwool Board	0.045		0.000		0.000	102	
Rockwool Board	0.045	Stud Frame				38	-
	0.040		0.120		0.000	30	-
Polylso Comonent of Zip R Sheathing	0.030		0.000		0.000	38	
OSB Component of Zip-							-
R Sheathing	0.130		0.000		0.000	11	
Existing Masonry	0.120		0.000		0.000	305	1
EPS Board Type VII-	0.1.20		0.000		0.000		-
Neopor	0.030		0.000		0.000	203	
							-
							-
					II	L	
Perce	ntage of sec. 1	Percenta	ge of sec. 2	Percenta	age of sec. 3	Total	-
	80%		20.0%		0.0%	69.7	cm
		_					
U-value supplement	0.17	W/(m²K)		U-value:	0.240	//(m²K)	
	L	1					
Assembly no.	Building assor	nbly description				Interior insulat	tion?
11ud	······	Wall plus Party Wall			1		
	Indiadon	Heat transmission resistan	co [m²k/\//			L	
Orientation of building element	0.14/-11	interior Rsi		1			
-			0.13				
Adjacent to	1-Outdoor ai	exterior Rse:	0.04				
Area section 1	λ[W/(mK)]	Area section 2 (optional)	λ[W/(mK)]	Area section 3 (optional)	λ[W/(mK)]	Thickness [m	m]
Existing Masonry	1.202		0.000		0.000	305	
Visconn Air Barrier	0.000		0.000		0.000	6	
Rockwool	0.045		0.000		0.000	102	7
ComfortBoard 80	0.040		0.000		0.000	102	_
GWB	0.209		0.000		0.000	16	_
Service Cavity	0.111	Wood Framing 2x4	0.120		0.000	102	
Control Outily		@16" O.C.	0.120		0.000	172	
			~~~~~				
L	ntage of sec. 1	Percenta	ge of sec. 2	Percent	age of sec. 3	Total	ð
Feice	91%	reiventa	9.4%	reiteille	0.0%	<b>53.0</b>	cm
	3170		3.470		0.070	53.0	
					T		
U-value supplement	0.00	W/(m²K)		U-value:	0.273	//(m²K)	



Assembly no.	Building asser	nbly description				Interior insulation?
12ud	Parapet Ex					
1200		Heat transmission resistar	ice [m²K/W]			
Orientation of building element	2-Wall	interior Rsi	0.13	]		
	1-Outdoor air	exterior Rse:	0.04			
Adjubbili to			0.04			
Area section 1	λ[W/(mK)]	Area section 2 (optional)	λ [\\//(mK)]	Area section 3 (optional)	λ[W/(mK)]	Thickness [mm]
Rockwool Board	0.045		0.000		0.000	38
	0.000		0.000		0.000	0
Rockwool Comfortboard	0.045	Stud Frame	0.120		0.000	38
Polyiso component of Zip R Sheathing	0.030		0.000		0.000	38
OSB Component of Zip R Sheathing	0.130		0.000		0.000	11
Poyiso Insulation	0.030		0.000		0.000	305
TPO Membrane	0.240		0.000		0.000	2
Percer	ntage of sec. 1	Percenta	ge of sec. 2	Percenta	age of sec. 3	Total
	93%		6.7%		0.0%	<b>43.2</b> cm
Assembly no.	Building assen	nbly description			1	Interior insulation?
13ud	Transition	Wall plus Exterior Clad	ding			
		Heat transmission resistar	ice [m²K/W]			
Orientation of building element	2-Wall	interior Rsi	0.13			
Adjacent to	1-Outdoor aiı	exterior Rse:	0.04			
Area section 1	λ[W/(mK)]	Area section 2 (optional)	λ.[W/(mK)]	Area section 3 (optional)	λ[W/(mK)]	Thickness [mm]
	0.000		0.000		0.000	0
Rockwool Cavity Rock	0.045		0.000		0.000	203
	0.000		0.000		0.000	0
Existing Masonry	1.202		0.000	*****	0.000	305
Visconn Air Barrier	0.000		0.000		0.000	0
ROCKWOOI	0.045		0.000		0.000	102
ComfortBoard 90 GWB	0.209		0.000		0.000	16
Service Cavity	0.111	Wood Framing 2x4 @16" O.C.	0.120		0.000	89
Percer	ntage of sec. 1	1	ge of sec. 2	Percent	age of sec. 3	Total
	90%		10.0%		0.0%	<b>71.4</b> cm
U-value supplement	0.06	W/(m²K)		U-value:	0.181	₩/(m²K)



Assembly no.	Building asser	mbly description				Interior insulation?
14ud	8	s plus party wall				
L	Å	Heat transmission resistar	nce [m²K/W]			1
Orientation of building element	2-Wall	interior Rsi	0.13			
-	3-Ventilated	exterior Rse:	0.13			
·,···			1			
Area section 1	λ[W/(mK)]	Area section 2 (optional)	) [\///mk)]	Area section 3 (optional)	λ[W/(mK)]	Thickness [mm]
	0.000		0.000		0.000	0
Rockwool Board	0.045		0.000		0.000	102
licoline of Board	0.000		0.000		0.000	0
Rockwool Comfortboard		Stud Frame	0.000		0.000	38
Polyiso component of	0.045		0.120		0.000	
Zip R Sheathing	0.030		0.000		0.000	38
OSB Component of Zip R Sheathing	0.130		0.000		0.000	11
Existing Masonry	1.202		0.000		0.000	305
	0.000		0.000		0.000	0
Percer	ntage of sec. 1	Percenta	ge of sec. 2	Percenta	age of sec. 3	Total
	93%		6.7%		0.0%	<b>49.4</b> cm
			L	â	L	
Assembly no.	Building asser	mbly description				Interior insulation?
15ud	8	lab over Ventilated Bas	ement			
	2.014.04 0	Heat transmission resistar				L
Orientation of building element	3-Eloor	interior Rsi	0.17	1		
	3-Ventilated	exterior Rse:	0.17			
Aujacentio	J-Ventilateu	exterior rise.	0.17			
Area section 1	λ[W/(mK)]	Area section 2 (optional)	8	Area section 3 (optional)	λ[W/(mK)]	Thickness [mm]
Concrete	2.404		0.000		0.000	127
20 ga Metal Deck	14.423		0.000		0.000	1
EPS Board Type VII - Neropor	0.030		0.000		0.000	152
Neropor						
	8			1	1	
					1	
Percer	ntage of sec. 1	Percenta	ge of sec. 2	Percenta	age of sec. 3	Total
Percei	ntage of sec. 1 100%	Percenta	ge of sec. 2 0.0%	Percenta	age of sec. 3	Total cm
Percei	•	Percenta	ř		0.0%	<b>28.0</b> cm
Percer U-value supplement	100%	Percenta	ř		ř	<b>28.0</b> cm



Assembly no.	Building asser	mbly description				Interior insulation?
16ud	Basement	Mechanical Room Wal	ls			
		Heat transmission resista	nce [m²K/W]			
Orientation of building elemen	t 2-Wall	interior Rsi	0.13			
Adjacent to	3-Ventilated	exterior Rse	0.13			
Area section 1	λ[W/(mK)]	Area section 2 (optional)	λ[W/(mK)]	Area section 3 (optional)	λ [W/(mK)]	Thickness [mm]
	0.000		0.000		0.000	0
GWB	0.209		0.000		0.000	16
Rockwool Comfortbatt	0.045	wood Studs @ 24" O.C.	0.120		0.000	89
Zip Sheathing w/Air Barrier	0.130		0.000		0.000	11
Rockwool Comfort Board 80	0.045		0.000		0.000	102
	0.000		0.000	Furring Strips	0.130	19
DensGlass Sheathing	0.209		0.000		0.000	16
	0.000		0.000		0.000	0
Perce	entage of sec. 1	Percenta	age of sec. 2	Perc	centage of sec. 3	Total
	83%		6.7%		10.0%	<b>25.2</b> cm
U-value supplemen	t 0.00	W/(m²K)		U-val	ue: 0.218	/(m²K)

#### Roof

Assembly no.	Building assem	bly description				Interior insulation?
04ud	Roof					
		Heat transmission resistar	nce [m²K/W]			
Orientation of building elemen	t 1-Roof	interior Rsi	0.10			
Adjacent to	0 1-Outdoor air	exterior Rse:	0.04			
	8			4		
Area section 1	λ[W/(mK)]	Area section 2 (optional)	λ[W/(mK)]	Area section 3 (optional)	λ [W/(mK)]	Thickness [mm]
	0.000		0.000		0.000	0
Advantech OSB Roof Sheathing	0.130		0.000		0.000	19
Vapor Barrier	0.000		0.000		0.000	0
Poyiso Insulation - Faced	0.030		0.000		0.000	203
TPO Membrane	0.601		0.000		0.000	3
DensDeck Prime Coverboard	0.209		0.000		0.000	16
	0.000		0.000		0.000	0
	0.000		0.000		0.000	0
Perce	entage of sec. 1	Percenta	ge of sec. 2	Percent	age of sec. 3	Total
	100%		0.0%		0.0%	<b>24.1</b> cm
U-value supplemer	t 0.00	W/(m²K)		U-value	0.142	W/(m²K)



EnerPHit	Verific	ation							
	and the second second	ALCONT OF T	1-		Building:	Six&Kane			
	Times I				Street:	63 N. Fraley	Street		
			Contract of Contra		Postcode/City:	16735	Kane		
					Province/Country:	PA		US-United States d	of America
					Building type:	Mixed Office	Assembly /Re	etail	
			C		Quinate data set:	ud01-Brad	ford PA		
			1		Quinate zone:	2: Cold		Altitude of location.	619.9632 m
2		Statistione	No.		Home owner/Client:	63 Fraley Str	eet LLC		
								nue, Suite 510	
					Postcode/Crity:		Greensburg		
		a sign	(marks		Province/Country:			US-United States of	of America
·									
	Gary Moshier -		)		Mechanical engineer:				
Street:							agy Drive, Suit	te 300	
Rostcode/Crity:		Pittsburgh			Postcode/Crity:		Boalsburg		
Province/Country:	PA		US-United Stat	es dt America	Province/Country:	PA		US-United States of	at America
Energy consultancy:	Gary Moshier -	Moshier Studic	1		Certification:	CertiPHiers (	Cooperative		
Street:	363 Newburn D	rive			Street:		_		
Postcode/Crity:	15216	Pittsburgh			Postcode/Crty:		Portland		
Province/Country:	PA		US-United Stat	es of America	Province/Country:	OR		US-United States of	of America
Year of construction:	2022			onehni	:[O*] rehnwierutereq met	20.0	et ronethi	:[O*] nemmus.qm	25.0
No. of dwelling units:	1		In	ilemai heal gains (l	HG) heating case (W/m²):	3.8	HG cox	oling case [W/m²]:	3.8
No. of occupants:	55.0			Specific cap	sorty [Wh/K per m² TFA]:	132	1 м	echanical cooling:	x
							-		
Providing building along			- too ato al file.		DUDD has not been as	and an all the last	and and below and	- Martine (see 10)	ha a bil sun alsa ha ati)
Specific building char	acteristics with	reference to th	e treated flo	or area	PHPP has not been co	mpleted; it is			heck' worksheet)
Specific building char		reference to the		or area 914.1	PHPP has not been co	mpleted; it is Criteria	not valid as ve Alternative criteria		heck' worksheet) Fullfilled? <sup>2</sup>
Specific building char Space heating	Τœ		11 <sup>2</sup>	<u>г</u>	PHPP has not been co ≤		Alternative		Fulffilled? <sup>2</sup>
	Τœ	ealed floor area leating demaind	៣² kWh(៣²a)	914.1 14	£	Criteria	Alternative		
	Τœ	saled floor area	៣² kWh(៣²a)	914.1	1	Criteria	Alternative criteria		Fulffilled? <sup>2</sup>
	Tra H	ealed floor area leating demaind	m² kWh/(m²a) W/m²	914.1 14	£	Criteria 30	Alternative criteria		Fulffilled? <sup>2</sup> yes
Space heating	Tra H	ealed floor area lealing demand Healing load	m² kWhY(m²a) W/m² kWhY(m²a)	914.1 14 14	4 4	Criteria 30 -	Alternative criteria -		Fulffilled? <sup>2</sup>
Space heating	Tra H	saled floor area lealing demand Healing load lehum, demand Cooling load	ni² kWh/(ni²a) W/ni² kWh/(ni²a) W/ni²	914.1 14 14 4	<u>द</u>	Criteria 30 -	Alternative criteria - - 15		Fulffilled? <sup>2</sup> yes
Space heating Space cooling Fre	Tre H Cooling & d	ealed floor area leating demand Heating load lehum, demand Cooling load eating (> 25 °C)	m² KWh/(m²a) W/m² KWh/(m²a) W/m² %	914.1 14 14 4 13 -	द द द द	Criteria 30 - 15 -	Alternative criteria - - 15		Fullfilled? <sup>2</sup> yes yes
Space heating Space cooling Fre	Tir H Cooling & d	ealed floor area leating demand Heating load lehum, demand Cooling load eating (> 25 °C)	m² KWh/(m²a) W/m² KWh/(m²a) W/m² %	914.1 14 14 4	द द द	Criteria 30 -	Alternative criteria - - 15		Fulffilled? <sup>2</sup> yes
Space heating Space cooling Fre	Tre H Cooling & d queincy of overhe servely high hum	ealed floor area leating demand Heating load lehum, demand Cooling load eating (> 25 °C)	m² kWh/(m²a) W/m² kWh/(m²a) W/m² % %	914.1 14 14 4 13 -	द द द द	Criteria 30 - 15 -	Alternative criteria - - 15		Fullfilled? <sup>2</sup> yes yes
Space heating Space cooling Free Frequency exce Airtightness	Tre Cooling & d squeincy of overhe servely high hum Pressunzatio	ealed floor area leating demand Heating toad lethum, demand Cooling toad sating (> 25 °C) dity (> 12 g/kg) n test result n <sub>50</sub>	m² KWh/(m²a) W/m² KWh/(m²a) W/m² % % 1/h	914.1 14 14 4 13 - 0 0.2	લ લ લ લ લ લ લ લ લ લ	Criteria 30 - 15 - - 10	Alternative criteria - - 15		Fullfilled? <sup>2</sup> yes yes - yes
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