

APPENDIX A

Energy Modeling

TABLE C-1 SUMMARY OF ENERGY AND GREENHOUSE GAS EMISSIONS

	Calibrated Existing Building Model	Retrofit Option 1	Retrofit Option 2 - Phase 1	Retrofit Option 2 - Phase 2	Retrofit Option 2 - Phase 3	Retrofit Option 2 - Phase 4
GHGI (LBS/FT2/YR)	12	9	13	12	11	9
TEUI (KBTU/FT2/YR)	64	37	49	47	42	37
TEDI (KBTU/FT2/YR)	31	12	30	27	20	12
FUEL OIL (MBTU)	2,700	-	-	-	-	-
ELECTRICITY (kWh)	369,000	658,400	876,500	832,200	748,200	658,400
CO2E (TONS)	380	290	380	360	330	290
GHG SAVINGS COMPARED TO EXISTING (TONS)		90	-	20	50	90
FUEL OIL COST (\$)	\$62,000	-	-	-	-	-
ELECTRICITY COST (\$)	\$58,000	\$103,000	\$138,000	\$131,000	\$118,000	\$103,000
TOTAL UTILITY COST (\$)	\$120,000	\$103,000	\$138,000	\$131,000	\$118,000	\$103,000
SAVINGS COMPARED TO EXISTING (\$)	-	\$17,000	\$(18,000)	\$(11,000)	\$2,000	\$17,000
TOTAL CAPITAL INVESTMENT (\$)	-	\$18,358,000	\$4,077,000	\$5,771,000	\$5,093,000	\$9,885,000
\$ OF CAPITAL INVESTMENT/GHG AVOIDED (\$/TONS)	-	\$204,000	-	-	\$102,000	\$110,000

TABLE C-2 SUMMARY OF COMPONENT HEAT LOSS FOR AN ASHRAE DESIGN DAY

	HEAT LOSS FOR AN ASHRAE DESIGN DAY				
SYSTEM	Existing	Phase 1 Repairs - 1973	Phase 2 Repairs - 1985	Phase 3 Repairs - 1994	AREA
	W	W	W	W	ft²
ROOF	245,304	73,443	58,109	29,529	67,042
EXTERIOR WALLS	34,714	22,834	21,732	16,972	24,083
SLAB EDGE	96,336	39,964	11,021	11,021	12,510
GLAZING	52,953	19,565	17,454	15,513	5,512
DOORS	19,980	11,078	7,304	2,398	756
AIR LEAKAGE	227,739	100,360	100,360	34,740	102,875
TOTAL	677,025	267,243	215,978	110,173	-

APPENDIX B

Cost Estimating Backup

COST ESTIMATING BACKUP – OPTION 1

West Tisbury Elementary School

OPTION 1

61,000 GSF

Element	Retrofit Scope	QTY	UNIT	Base Cost	Markups ¹	Island Factor (35%)	Pricing Year	Adjustment	Comments
1973 WING; W1, W2, W4, W5, W9									
Slabs	15 Mil Stegowrap at 1973 Wing crawlspace	23500	SF	\$35,250	\$49,350	\$66,623	2022	\$69,287	
Walls	Above grade walls; new AVB, insulation + cladding	6519	SF	\$218,390	\$305,745	\$412,756	2022	\$429,266	
Walls	Below grade walls; new HD EPS insulation	628	LF	\$47,100	\$65,940	\$89,019	2022	\$92,580	
Glazing	Curtain Wall; OPTION 1; Reglaze existing CW with R14 IGU (U-value +/- 0.125)	1691	SF	\$287,470	\$402,458	\$543,318	2022	\$565,051	BOD; Vitroglazing
Glazing	Curtain Wall; Replace existing CW with new triple glazed CW (U-value < 0.18)	1691	SF	\$329,745	\$461,643	\$623,218	2022	\$648,147	BOD; Schuece USA FWS 60 SI)
Glazing	Windows; Andersen composite clad wood windows; Replace existing windows at courtyard with triple glazed fiberglass units	876	SF	\$153,298	\$214,618	\$289,734	2022	\$301,323	BOD; Alpen Tyrol Series
Glazing	Doors; Replace exterior steel doors + HM frames with new insulated doors	147	SF	\$22,050	\$30,870	\$41,675	2022	\$43,341	BOD; Ceco Trio E
Roof	Pitched Roofs; Replace existing asphalt shingles with new insulation and roof assembly	16588	SF	\$746,469	\$1,045,057	\$1,410,827	2022	\$1,467,260	
Roof	Low sloped roofs; Replace existing EPDM assembly with new roof assembly	15907	SF	\$620,374	\$868,523	\$1,172,506	2022	\$1,219,406	
1985 WING; W3, W6									
Walls	Above grade walls; new AVB, insulation + cladding	14561	SF	\$487,793	\$682,910	\$921,929	2022	\$958,806	
Walls	Below grade walls; new HD EPS insulation	534	LF	\$40,050	\$56,070	\$75,695	2022	\$78,722	
Glazing	Window Wall; Replace existing windows at courtyard with triple glazed fiberglass units	1007	SF	\$176,225	\$246,715	\$333,065	2022	\$346,388	BOD; Alpen Tyrol Series
Glazing	Windows; Andersen composite clad wood windows; Replace existing windows at courtyard with triple glazed fiberglass units	1886	SF	\$329,982	\$461,974	\$623,666	2022	\$648,612	BOD; Alpen Tyrol Series
Glazing	Doors; Replace exterior steel doors + HM frames with new insulated doors	462	SF	\$69,300	\$97,020	\$130,977	2022	\$136,216	BOD; Ceco Trio E
Roof	Pitched Roofs; Replace existing asphalt shingles with new insulation and roof assembly	13404	SF	\$603,199	\$844,478	\$1,140,046	2022	\$1,185,648	

COST ESTIMATING BACKUP – OPTION 1

1994 WING; W7, W8									
Walls	Above grade walls; new AVB, insulation + cladding	3003	SF	\$100,591	\$140,827	\$190,117	2022	\$197,721	
Walls	Below grade walls; new HD EPS insulation	989	LF	\$74,175	\$103,845	\$140,191	2022	\$145,798	
Glazing	Windows; Andersen composite clad wood windows; Replace existing windows at courtyard with triple glazed fiberglass units	52	SF	\$9,118	\$12,765	\$17,232	2022	\$17,921	BOD; Alpen Tyrol Series
Glazing	Doors; Replace exterior steel doors + HM frames with new insulated doors	21	SF	\$3,150	\$4,410	\$5,954	2022	\$6,192	BOD; Ceco Trio E
Roof	Pitched Roofs; Replace existing asphalt shingles with new insulation and roof assembly	26817	SF	\$1,206,765	\$1,689,471	\$2,280,786	2022	\$2,372,017	
Mechanical Upgrades									
Heating, Cooling + Ventilation	Plant; Replace existing oil fired boilers(3) with air to water HP; Two units 117 Tons each	234	tons	\$705,000	\$987,000	\$1,332,450	2022	\$1,385,748	Aermec NRB or Similar
Heating, Cooling + Ventilation	Classrooms; Replace Unit Ventilators with vertical unit integrated with an HRV	30	ea	\$360,000	\$504,000	\$680,400	2022	\$707,616	Changeair Freshman Unit or Similar
Heating, Cooling + Ventilation	Cafeteria; Replace existing AHU with new AHU's w/hydronic heat/cool	1	ea	\$115,500	\$161,700	\$218,295	2022	\$227,027	
Heating, Cooling + Ventilation	Gym; OPTION 1; Replace existing AHU (2) with new AHU's w/hydronic heat/cool	2	ea	\$231,000	\$323,400	\$436,590	2022	\$454,054	
Heating, Cooling + Ventilation	Gym; OPTION 2; Replace existing AHU (2) with Seprate H+V	2	ea	\$166,000	\$232,400	\$313,740	2022	\$326,290	Includes a balanced AHU for ventilation + 3-4 VRF heads in the ceiling for feating + cooling
Heating, Cooling + Ventilation	Music Rooms; one AHU per classroom replace with new AHU w/hydronic heat/cooling	2	ea	\$97,000	\$135,800	\$183,330	2022	\$190,663	Includes a balanced AHU for ventilation + 3-4 VRF heads in the ceiling for feating + cooling
Heating, Cooling + Ventilation	Science Rooms; one AHU per classroom replace with new AHU w/hydronic heat/cooling	2	ea	\$97,000	\$135,800	\$183,330	2022	\$190,663	
Domestic Hot Water	General Lavatories; Replace existing electric water heater with new	1	ea	\$47,500	\$66,500	\$89,775	2022	\$93,366	
Domestic Hot Water	Kitchen; Replace existing AO Smith tankless propane fired 199 KBTUh HWH with new electric HWH	1	ea	\$32,500	\$45,500	\$61,425	2022	\$63,882	

COST ESTIMATING BACKUP – OPTION 1

Renewables									
Renewables	Some PV Panels on pitched roof	Based on 525KW		\$1,531,200	\$2,143,680	\$2,893,968	2022	\$3,009,727	

¹ Markups - see below

Design + Pricing Contingency	15%
GC's + GR's	12%
Bonds + Insurances	3%
OH+P	10%
Total Markups	140%

COST ESTIMATING BACKUP – OPTION 2

West Tisbury Elementary School

OPTION 2 PHASED APPROACH

61,000 GSF

Element	Retrofit Scope	QTY	UNIT	Base Cost	Markups ¹	Island Factor (35%)	Pricing Year	Adjustment	Comments
PHASE 1 - 2022 - 2025 (mid-point 2024)									
Heating, Cooling + Ventilation	Plant; Replace existing oil fired boilers(3) with air to water HP; Two units 117 Tons each	234	tons	\$705,000	\$987,000	\$1,332,450	2024	\$1,484,413	Aermec NRB or Similar
Heating, Cooling + Ventilation	Classrooms; Replace Unit Ventilators with vertical unit integrated with an HRV	30	ea	\$360,000	\$504,000	\$680,400	2024	\$757,998	Changeair Freshman Unit or Similar
Heating, Cooling + Ventilation	Cafeteria; Replace existing AHU with new AHU's w/hydronic heat/cool	1	ea	\$115,500	\$161,700	\$218,295	2024	\$243,191	
Heating, Cooling + Ventilation	Gym; Replace existing AHU (2) with new AHU's w/hydronic heat/cool	2	ea	\$231,000	\$323,400	\$436,590	2024	\$486,382	
Heating, Cooling + Ventilation	Music Rooms; one AHU per classroom replace with new AHU w/hydronic heat/cooling	2	ea	\$97,000	\$135,800	\$183,330	2024	\$204,238	Includes a balanced AHU for ventilation + 3-4 VRF heads in the ceiling for feating + cooling
Heating, Cooling + Ventilation	Science Rooms; one AHU per classroom replace with new AHU w/hydronic heat/cooling	2	ea	\$97,000	\$135,800	\$183,330	2024	\$204,238	
Domestic Hot Water	General Lavatories; Replace existing electric water heater with new	1	ea	\$47,500	\$66,500	\$89,775	2024	\$100,014	
Domestic Hot Water	Kitchen; Replace existing AO Smith tankless propane fired 199 KBTUh HWH with new electric HWH	1	ea	\$32,500	\$45,500	\$61,425	2024	\$68,430	
Walls	Air seal the building	1	LS	\$153,493	\$214,890	\$290,102	2024	\$323,187	
Slabs	15 Mil Stegowrap at 1973 Wing crawlspace	23500	SF	\$35,250	\$49,350	\$66,623	2024	\$74,221	

SUBTOTAL	\$3,946,314
Contractor Mobilization	Not Required
TOTAL	\$4,340,945

COST ESTIMATING BACKUP – OPTION 2

1994 WING; W7, W8									
Walls	Above grade walls; new AVB, insulation + cladding	3003	SF	\$100,591	\$140,827	\$190,117	2022	\$197,721	
Walls	Below grade walls; new HD EPS insulation	989	LF	\$74,175	\$103,845	\$140,191	2022	\$145,798	
Glazing	Windows; Andersen composite clad wood windows; Replace existing windows at courtyard with triple glazed fiberglass units	52	SF	\$9,118	\$12,765	\$17,232	2022	\$17,921	BOD; Alpen Tyrol Series
Glazing	Doors; Replace exterior steel doors + HM frames with new insulated doors	21	SF	\$3,150	\$4,410	\$5,954	2022	\$6,192	BOD; Ceco Trio E
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Mechanical Upgrades									
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Domestic Hot Water	General Lavatories; Replace existing electric water heater with new	1	ea	\$47,500	\$66,500	\$89,775	2022	\$93,366	
Domestic Hot Water	Kitchen; Replace existing AO Smith tankless propane fired 199 KBTUh HWH with new electric HWH	1	ea	\$32,500	\$45,500	\$61,425	2022	\$63,882	

COST ESTIMATING BACKUP – OPTION 2

Renewables									
Renewables	Some PV Panels on pitched roof	Based on 525KW		\$1,531,200	\$2,143,680	\$2,893,968	2022	\$3,009,727	

¹ Markups - see below

Design + Pricing Contingency	15%
GC's + GR's	12%
Bonds + Insurances	3%
OH+P	10%
Total Markups	140%

COST ESTIMATING BACKUP

	QTY	UNIT	Base Cost Unit Price	Base Cost
Slabs				
15 Mil Stegowrap at 1973 Wing crawlspace	1	SF	\$1.50	\$1.50
Prep			\$0.50	
Stego Wrap			\$1.00	

Walls				
Above grade walls; new AVB, insulation + cladding	1	SF	\$33.50	\$33.50
Demolish Existing Cladding			\$4.00	
New cedar shingles			\$18.00	
4" of Mineral Wool insulation			\$4.50	
New Air Barrier; Siga Majvest			\$7.00	
Below grade walls; new HD EPS insulation	1	LF	\$75.00	\$75.00
Excavate along face of foundation to expose walls; 3ft deep			\$18.00	
Backfill after installation of new work			\$7.00	
Prepare existing fdn wall			\$10.00	
Repair existing perimeter conditions			\$5.00	
5" HD EPS Insulation + protection board			\$20.00	
Air barrier including lap over rim joist onto fdn wall			\$15.00	

COST ESTIMATING BACKUP

Walls cont.				
<i>Air seal the building</i>	<i>1</i>	<i>LS</i>	<i>\$153,493.00</i>	<i>\$153,493.00</i>
Closed cell insulation to rim joists in crawl spaces and basements			\$32,265.00	
Closed cell insulation to interior of roof to wall connections			\$43,020.00	
Remove and reinstall ceilings			\$17,208.00	
Silicone sealants at interior side of all roof sheathing, ridges, valleys + roof to wall connections			\$61,000.00	

Glazing				
<i>Curtain Wall; OPTION 1; Reglaze existing CW with R14 IGU (U-value +/- 0.125)</i>	<i>1</i>	<i>SF</i>	<i>\$170.00</i>	<i>\$170.00</i>
Remove existing glazing; including temp protection			\$20.00	
New CW glazing with R-14 Vacuum Glazed			\$120.00	
Allowance to modify/repair existing CW frames			\$30.00	
<i>Curtain Wall; OPTION 2; Replace existing</i>	<i>1</i>	<i>SF</i>	<i>\$195.00</i>	<i>\$195.00</i>
Remove existing CW; including temp protection			\$8.00	
New x3 glazed CW system			\$170.00	
Blocking + prep of openings			\$7.00	
New sealants at CW perimeter			\$10.00	

COST ESTIMATING BACKUP

Glazing cont.				
Window Wall; Replace existing windows at courtyard with triple glazed fiberglass units	1	SF	\$175.00	\$175.00
Remove existing windows; including temp protection			\$8.00	
New x3 glazed fiberglass window system			\$150.00	
Blocking + prep of openings			\$7.00	
New sealants at CW perimeter			\$10.00	
Windows; Andersen composite clad wood windows; Replace existing windows at courtyard with triple glazed fiberglass units	1	SF	\$175.00	\$175.00
Remove existing windows; including temp protection			\$8.00	
New x3 glazed aluminum clad window system			\$150.00	
Blocking + prep of openings			\$7.00	
New sealants at CW perimeter			\$10.00	

COST ESTIMATING BACKUP

Doors				
<i>Doors; Replace exterior steel doors + HM frames with new insulated doors</i>	1	SF	\$150.00	\$150.00
Pricing below is for single door (21 SF)				
Remove Existing door			\$220.00	
New HM Door frame			\$350.00	
New steel insulated Door			\$900.00	
Hardware set			\$1,200.00	
Blocking and Sealants			\$250.00	
Painting; door + frame			\$230.00	
			\$3,150.00	
Cost per SF			\$150.00	

Roof				
<i>Pitched Roofs; Replace existing asphalt shingles with new insulation and roof assembly</i>	1	SF	\$45.00	\$45.00
Demolish existing roof system down to roof deck			\$4.00	
Prep roof deck			\$0.50	
New sheathing			\$3.50	
New self-adhered vapor barrier			\$4.00	
8" of Polyiso Insulation; mechanically fastened; insulated nailboard system			\$18.00	
New Architectural Asphalt Shingles			\$15.00	

COST ESTIMATING BACKUP

Roof cont.				
<i>Low sloped roofs; Replace existing EPDM assembly with new roof assembly</i>	1	SF	\$39.00	\$39.00
Demolish existing roof system down to roof deck			\$5.00	
Prep roof deck			\$0.50	
New sheathing			\$3.50	
New self-adhered vapor barrier			\$4.00	
8" of Polyiso Insulation; mechanically fastened			\$10.00	
New EPDM Membrane			\$16.00	

Heating + Cooling				
<i>Plant; Replace existing oil fired boilers(3) with air to water HP; Two units 117 Tons each</i>	234	TONS	\$3,013.00	\$705,042.00
Demolish boilers			\$40.00	
Air to water heat pump/equipment			\$2,600.00	
Piping			\$220.00	
Sheetmetal			\$40.00	
Controls			\$45.00	
Electrical			\$68.00	
<i>Classrooms; Replace Unit Ventilators with vertical unit integrated with an HRV</i>	30	EACH	\$12,000.00	\$360,000.00
Demolish Unit ventilator			\$1,000.00	
Vertical unit ventilator			\$5,000.00	
Piping			\$2,500.00	
Controls			\$2,500.00	
Electrical			\$1,000.00	

COST ESTIMATING BACKUP

Heating + Cooling cont.				
<i>Cafeteria; Replace existing AHU with new AHU's w/hydronic heat/cool</i>	1	EACH	\$115,500.00	\$115,500.00
<i>Demolish AHU</i>			\$3,000.00	
<i>AHU with hydronic coils</i>			\$100,000.00	
<i>Piping</i>			\$5,000.00	
<i>Controls</i>			\$4,000.00	
<i>Electrical</i>			\$3,500.00	
<i>Gym; OPTION 1; Replace existing AHU (2) with new AHU's w/hydronic heat/cool</i>	2	EACH	\$115,500.00	\$231,000.00
<i>Demolish AHU</i>			\$3,000.00	
<i>AHU with hydronic coils</i>			\$100,000.00	
<i>Piping</i>			\$5,000.00	
<i>Controls</i>			\$4,000.00	
<i>Electrical</i>			\$3,500.00	
<i>Gym; OPTION 2; Replace existing AHU (2) with Seprate H+V</i>	2	EACH	\$83,000.00	\$166,000.00
<i>Demolish AHU</i>			\$3,000.00	
<i>AHU with hydronic coils</i>			\$50,000.00	
<i>VRF indoor units</i>			\$10,000.00	
<i>Piping</i>			\$10,000.00	
<i>Controls</i>			\$5,000.00	
<i>Electrical</i>			\$5,000.00	

COST ESTIMATING BACKUP

Heating + Cooling cont.				
<i>Music Rooms; one AHU per classroom replace with new AHU w/hydronic heat/cooling</i>	2	EACH	\$48,500.00	\$97,000.00
<i>Demolish AHU</i>			\$2,000.00	
<i>AHU with hydronic coils</i>			\$35,000.00	
<i>Piping</i>			\$5,000.00	
<i>Controls</i>			\$4,000.00	
<i>Electrical</i>			\$2,500.00	
<i>Science Rooms; one AHU per classroom replace with new AHU w/hydronic heat/cooling</i>	2	EACH	\$48,500.00	\$97,000.00
<i>Demolish AHU</i>			\$2,000.00	
<i>AHU with hydronic coils</i>			\$35,000.00	
<i>Piping</i>			\$5,000.00	
<i>Controls</i>			\$4,000.00	
<i>Electrical</i>			\$2,500.00	
<i>General Lavatories; Replace existing electric water heater with new</i>	1	EACH	\$47,500.00	\$47,500.00
<i>Remove water heater</i>			\$3,000.00	
<i>Electric water heater</i>			\$40,000.00	
<i>Piping</i>			\$1,500.00	
<i>Electrical</i>			\$3,000.00	

COST ESTIMATING BACKUP

Heating + Cooling cont.				
Kitchen; Replace existing AO Smith tankless propane fired 199 KBTUh HWH with new electric HWH	1	EACH	\$32,500.00	\$32,500.00
Remove water heater			\$3,000.00	
Electric water heater			\$25,000.00	
Piping			\$1,500.00	
Electrical			\$3,000.00	

APPENDIX C

Whole Building Airtightness Report

Project: West Tisbury Elementary School Air Tightness Measurement and Diagnostics

Dates: 6/17/2022 and 6/18/2022

Summary

On Friday afternoon from 2pm to 5pm, ABA HERS Raters Michael Browne and Sam Kenney were introduced to the building by the facility manager. We were also shown the Building Management System (BMS) which allows remote control of most of the HVAC Equipment in the building. We measured airflow through a couple of classroom unit ventilators and planned details of the set-up for Saturday testing.

On Saturday from 8am to 5pm, with on-site guidance and assistance from Julia Karg of RDH, ABA HERS Raters Michael Browne and Sam Kenney set up and performed multi-fan air tightness testing and thermal image diagnostics of the whole elementary school. Tests were performed both with and without a large number of roof top ventilation penetrations sealed. Compartmentalization tests of the air tightness of 2 classrooms was also performed. Flow Measurements for classroom unit ventilators were performed on Friday afternoon.

Building Set-up

(See test plan on last page)

5 fans were set up at locations distributed throughout the whole school, with one fan held in reserve in case a particular area of the building needed much more pressurization than others. The basement was closed to the interior, but all other interior doors were opened during the whole building test.

Ventilation systems were all turned off using the BMS.

The first round of whole building tests was performed under negative pressure with all ventilation turned off but not sealed.

The second round of tests was performed under negative pressure with all ventilation turned off and most of the roof top ventilation covered. Note that AHU-4 and 5 were not sealed but were closed with the BMS.

It should be noted that when doing a final walk-around the building before leaving on Saturday, 2 crawlspace exhaust ventilators at window wells below the kindergarten and 1st and 2nd grade classrooms were found to be running. It is not clear whether these were running for the entire duration of the tests. They may be triggered by temperature and/or humidity sensors.

Whole Building Air Tightness Measurements

Baseline pressure measurement was less than -1 pa overall and maximum baseline pressure difference between different blower door locations was 2.5 pa. These are considered good test conditions for the accuracy of the tests.

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The average induced pressure was only 11 Pa, this was much lower than anticipated. Air leakage at typical measured pressures of 50 Pa and 75 Pa is estimated using a Power Law Flow Equation Flow exponent of 0.65.

We used surface areas provided by RDH to normalize the whole building air leakage as 0.68 cfm75/ sf of tested boundary surface are for the first test and 0.65 cfm75/ sf for the second test. The difference between the 2 tests (with and without rooftop ventilation sealed) was approximately 5400 cfm@75pa.

Compartmentalization Air Tightness Measurements

Compartmentalization tests test the leakage rate of the entire enclosure area of a zone with adjacent zones open to the outside. This includes both exterior leakage and leakage to adjacent interior spaces.

For Classroom 315, we measured 2355 cfm75, and we calculated a normalized leakage rate of 0.74 cfm75/sf of enclosure. Note that this compartmentalization leakage rate is similar to the exterior leakage rate of the whole building.

For Classroom 336, we measured 2355 cfm75, and we have calculated a normalized leakage rate of 2.5 cfm75/sf of enclosure. Note that this compartmentalization leakage rate is over 3 times larger than the exterior leakage rate of the whole building.

Thermal Imaging

A complete set of 316 thermal images taken during the negative pressurization of the building is provided along with this summary report.

Conditions for thermal imaging were not optimal because there was little temperature difference between indoor and outdoor air, however the images are very revealing. Solar heating of the roof and walls produced significant heat in sunlit roof and wall cavities, this allowed for visualization of leakage paths through roof assemblies. The solar loading of the 2 atriums was also dramatic.

Every one of these images tells a particular story. Overall they illustrate concern with the air tightness of roof assemblies above acoustic tile ceilings, and at the edges of tongue and groove ceilings.

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Unit Ventilator Outdoor Air measurements

Outdoor air flow of classroom unit ventilators was measured with a Acin Mark 2 powered flow hood while outdoor air was open according to the BMS.

We measured in 2 classrooms which had different size unit ventilators. Room 133 had a smaller size ventilator and Room 230 had the larger size. The air flow from the outside was measured in parts and the parts are summed up.

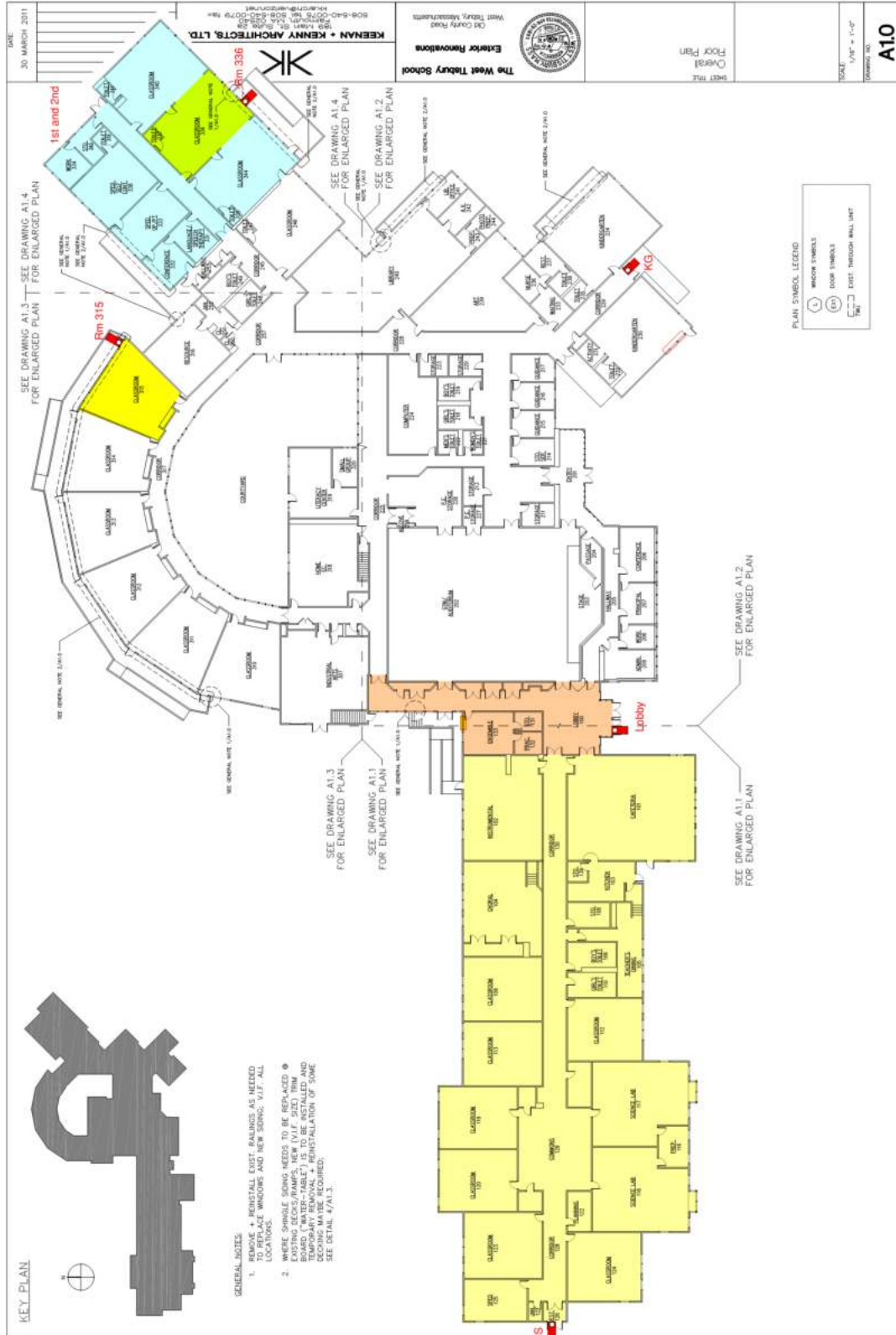
The flow in Room 133 was not consistent across the width and while one side was drawing air, the middle was drawing less and the other side was actually exhausting air. It is not clear how much of this air might actually be exchanged with interior air and how much the exterior positive and negative flows might be short circuiting and not changing air with the room.

Measurements of air from Room 230 was more consistent across the exterior grill and was moving a supply air flow of 90 CFM in total.

Location	Label	Temp		Humid.		Atm P		Flow		Date	Time
Room 133	1	76.7	F	73	%	998	hPa	-21.2	CFM	17-06-2022	3:02
Room 133	2	76.8	F	73	%	998	hPa	-9.3	CFM	17-06-2022	3:03
Room 133	3	76.3	F	73	%	998	hPa	25.8	CFM	17-06-2022	3:04
TOTAL Flow								-4.7			
Room 230	1	73.6	F	81	%	998	hPa	-21.2	CFM	17-06-2022	3:43
Room 230	2	73.7	F	81	%	998	hPa	-24.7	CFM	17-06-2022	3:44
Room 230	3	73.6	F	81	%	998	hPa	-25.2	CFM	17-06-2022	3:44
Room 230	4	73.6	F	81	%	998	hPa	-18.7	CFM	17-06-2022	3:45
TOTAL Flow								-89.8			

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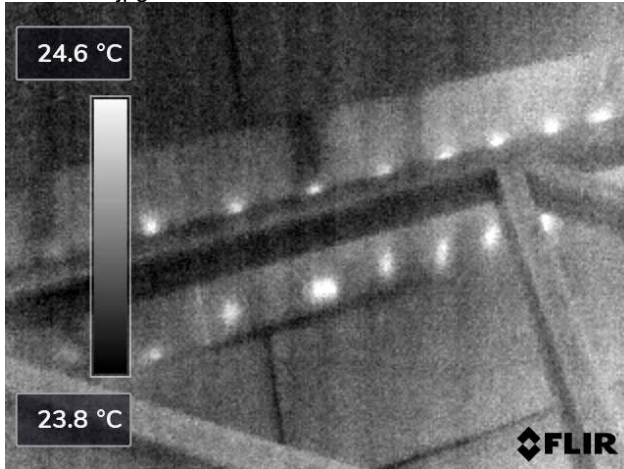


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6/18/2022 7:00:45 AM



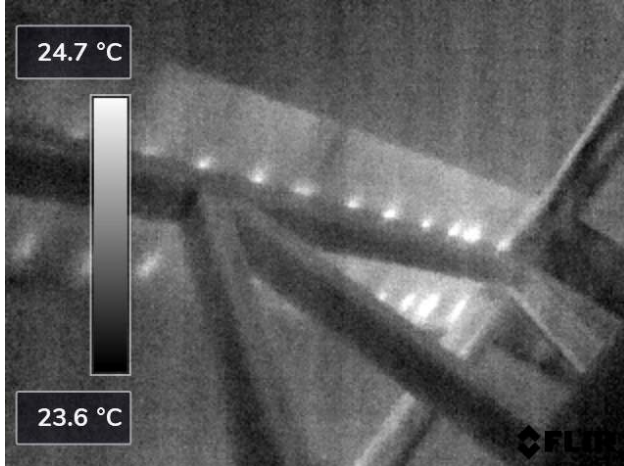
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6/18/2022 7:00:45 AM



FLIR8703.jpg

6/18/2022 7:01:25 AM



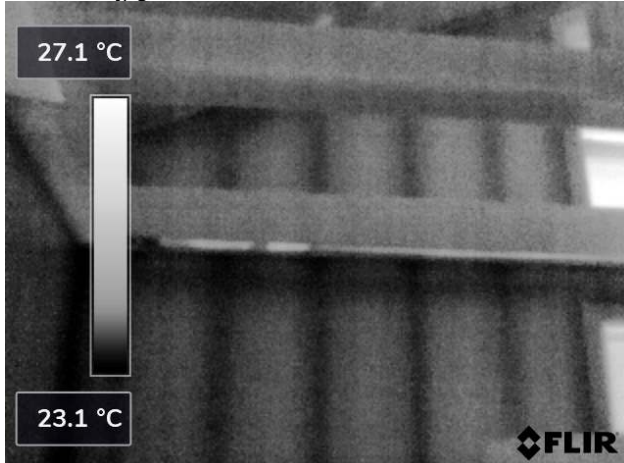
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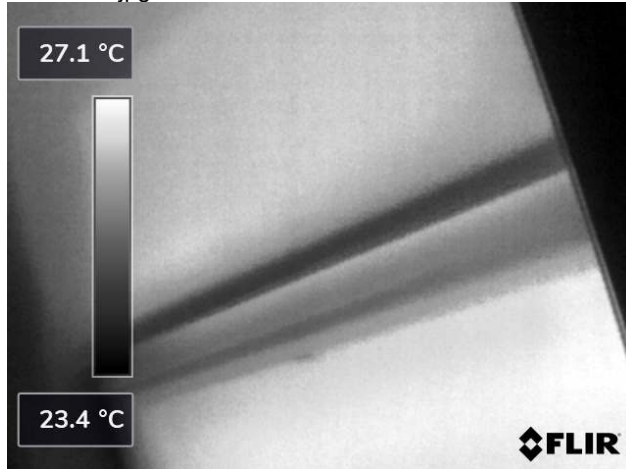
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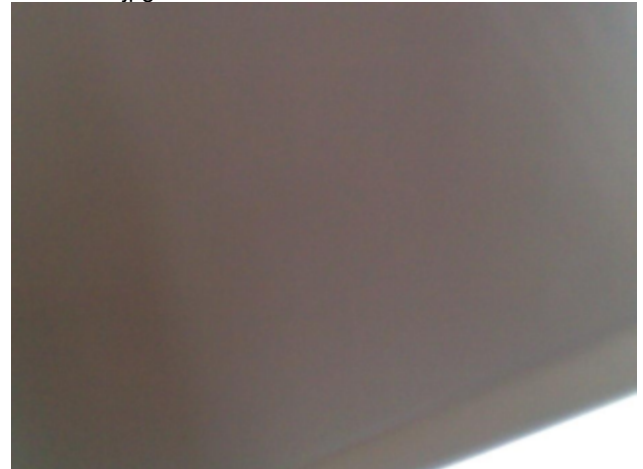
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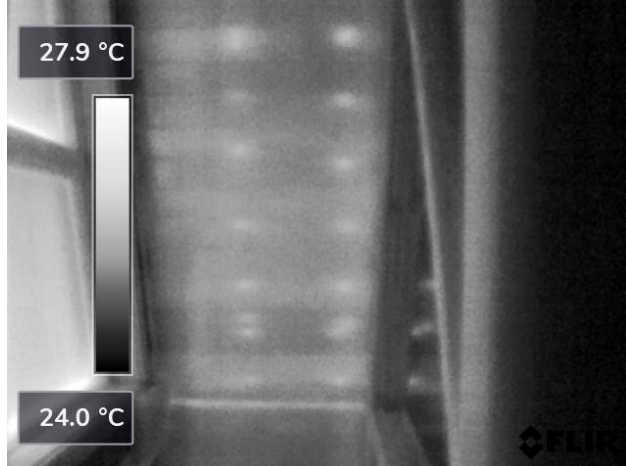
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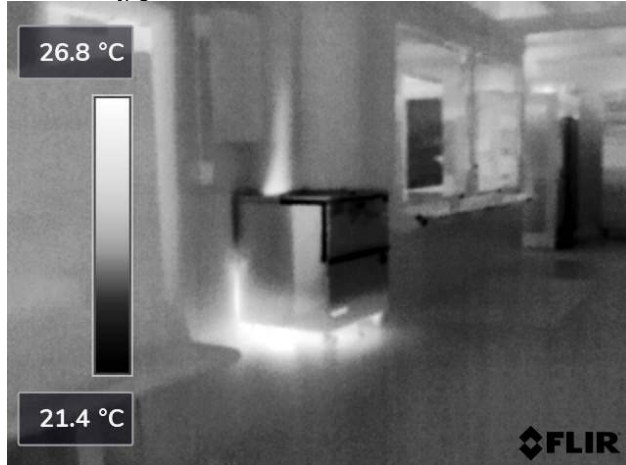
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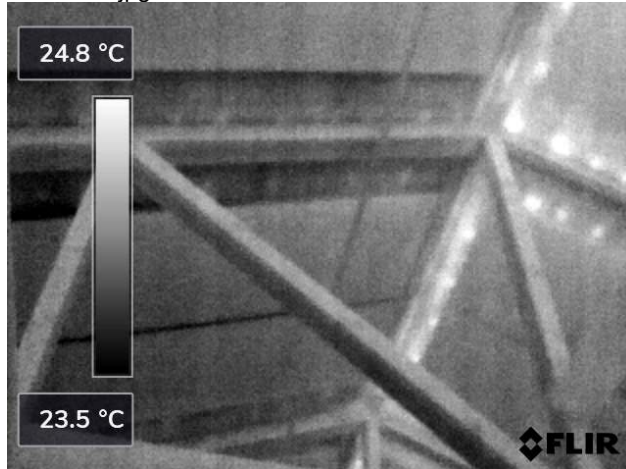
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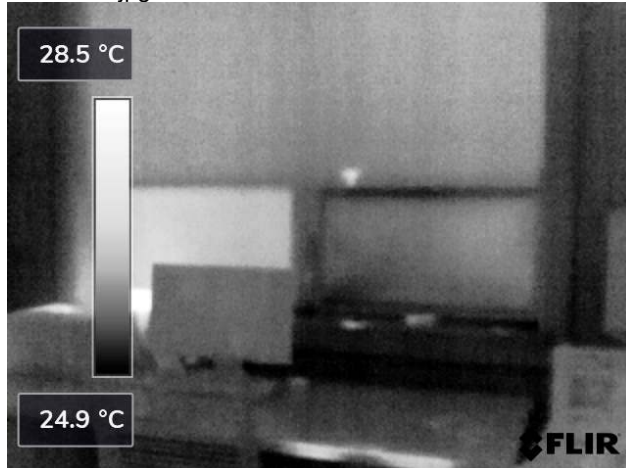
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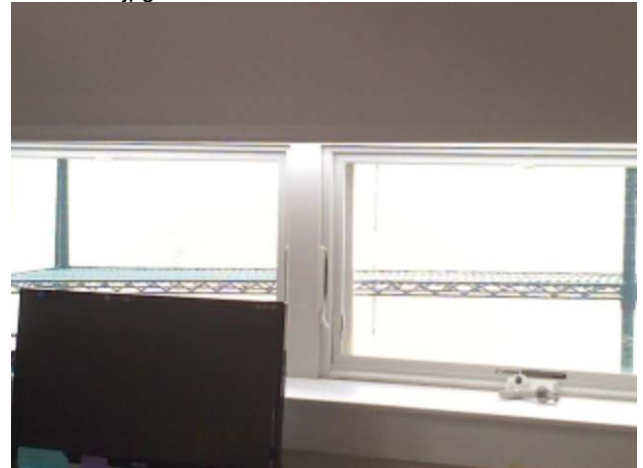
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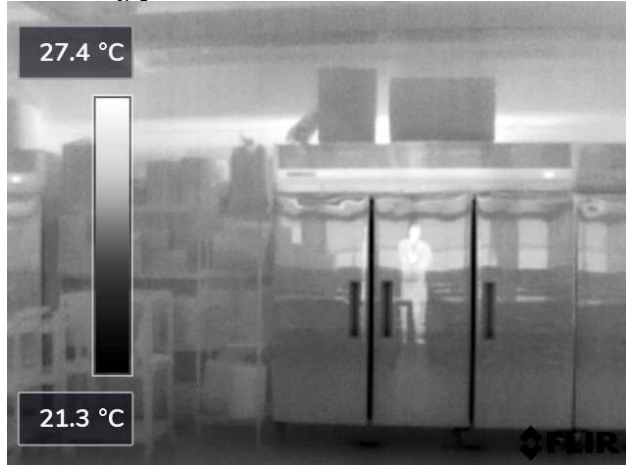
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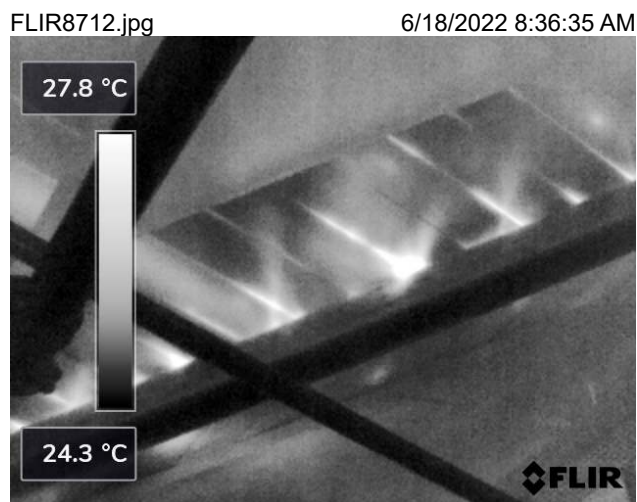
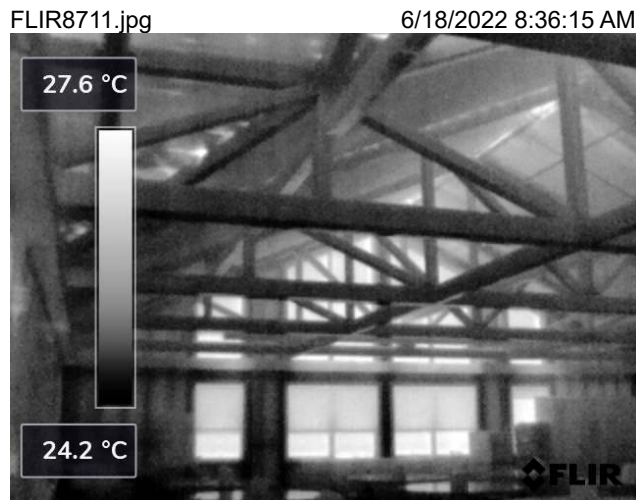
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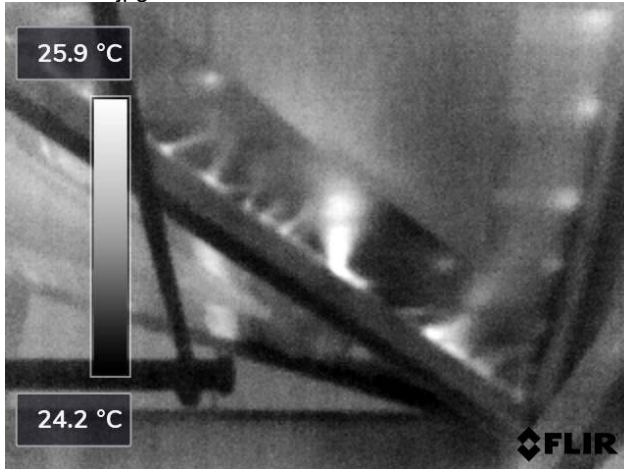
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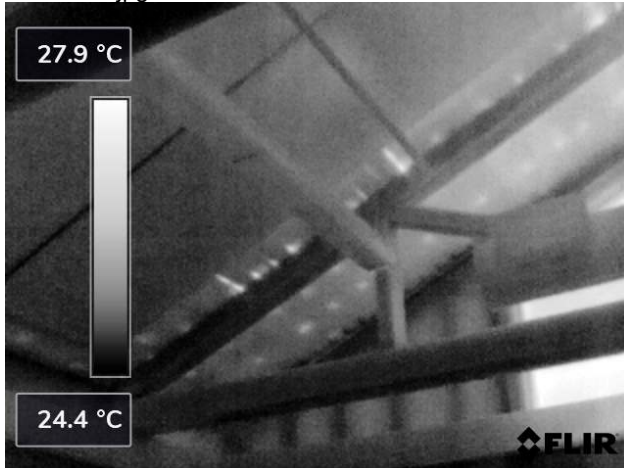
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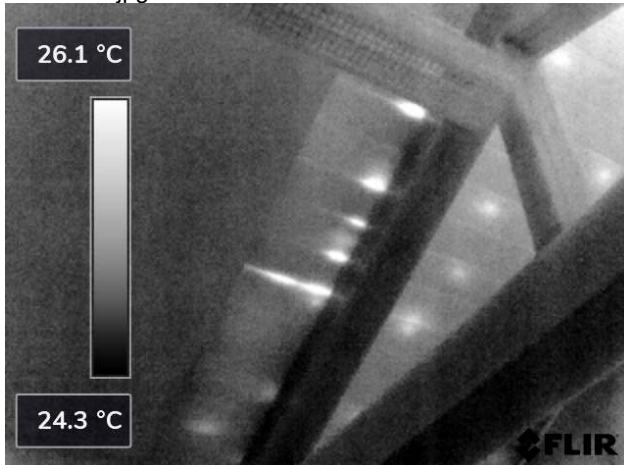
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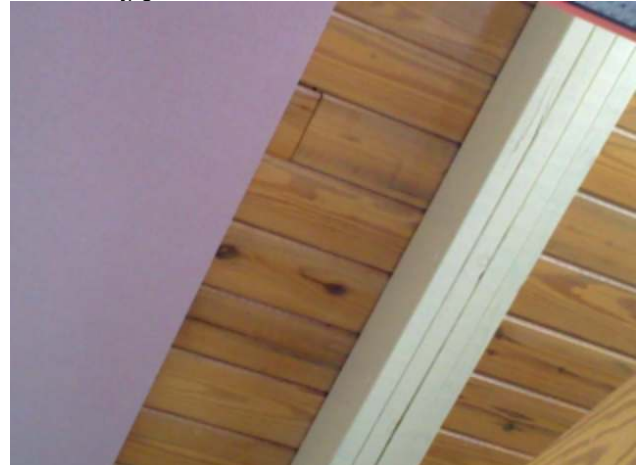
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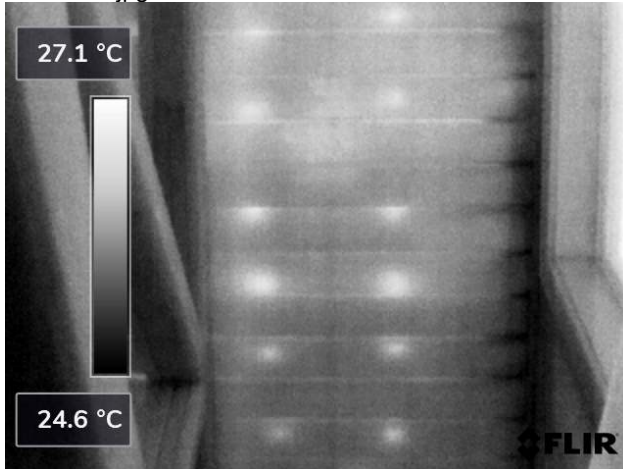
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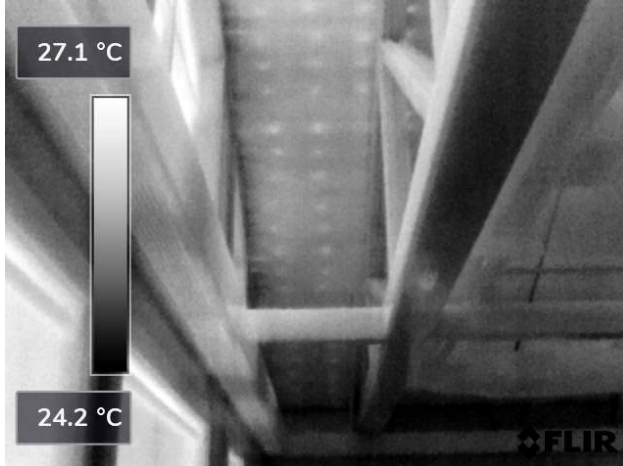
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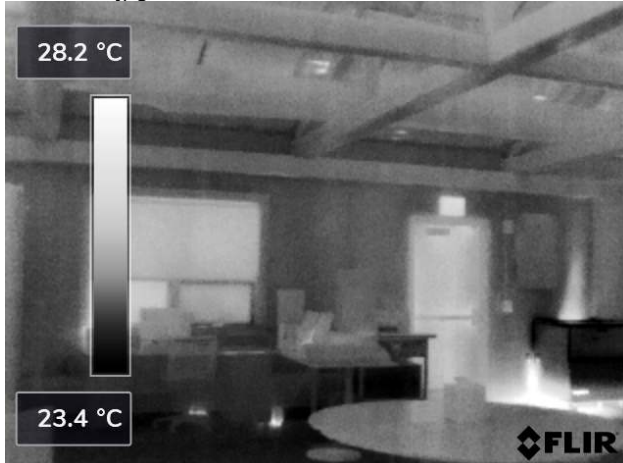
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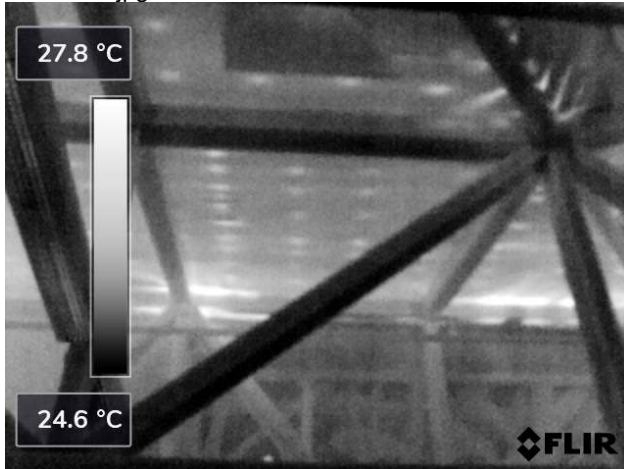


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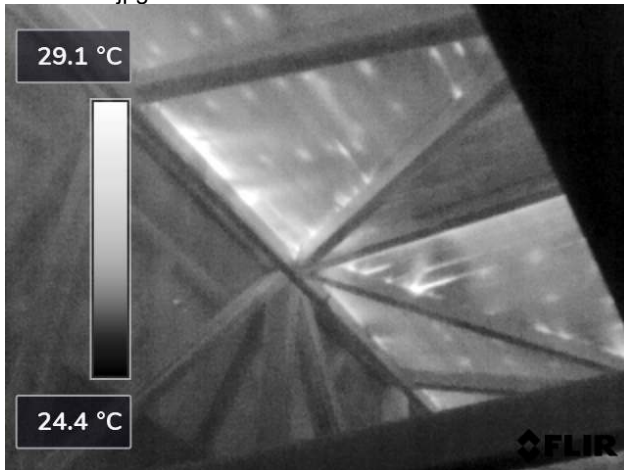
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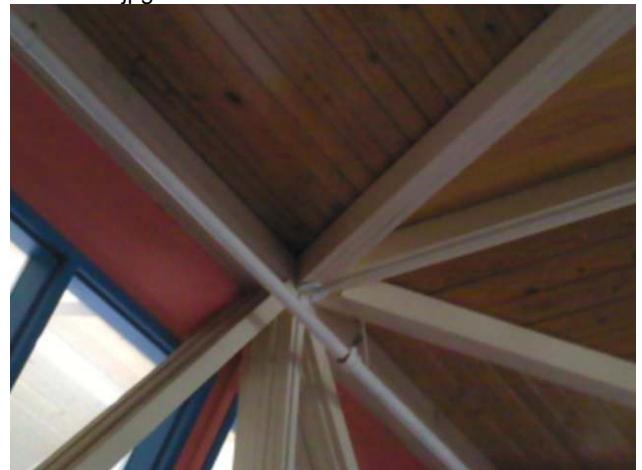
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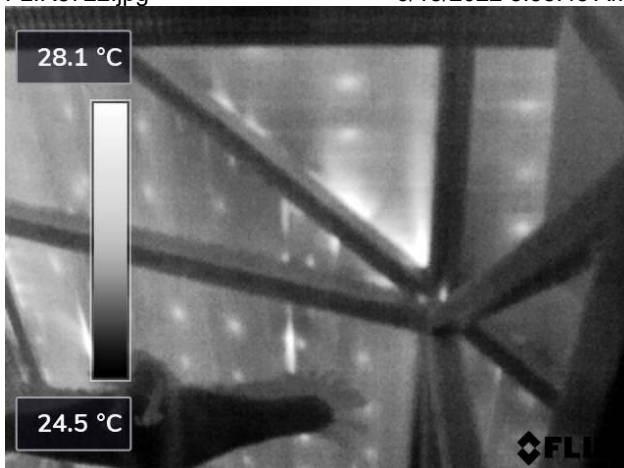
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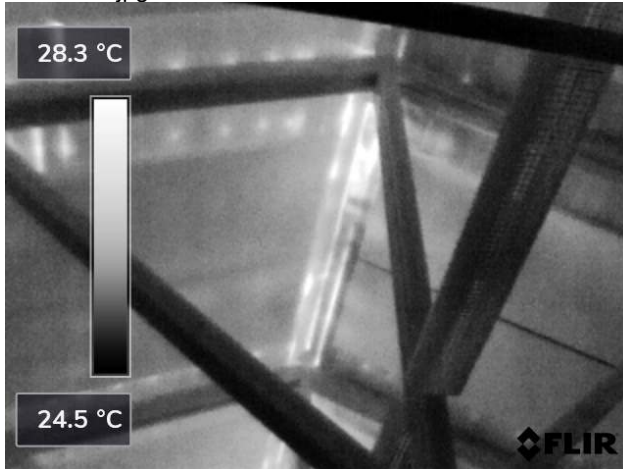
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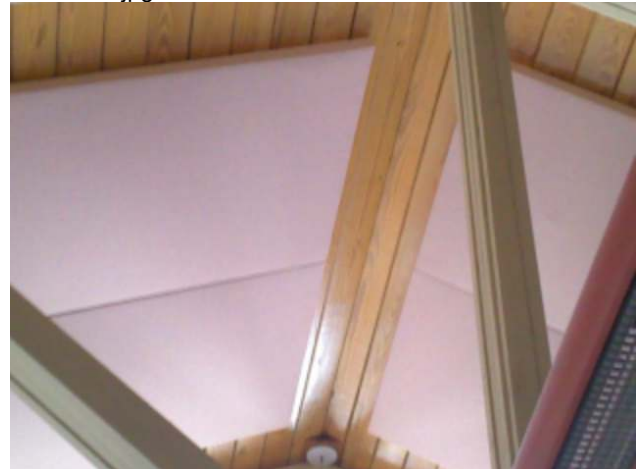
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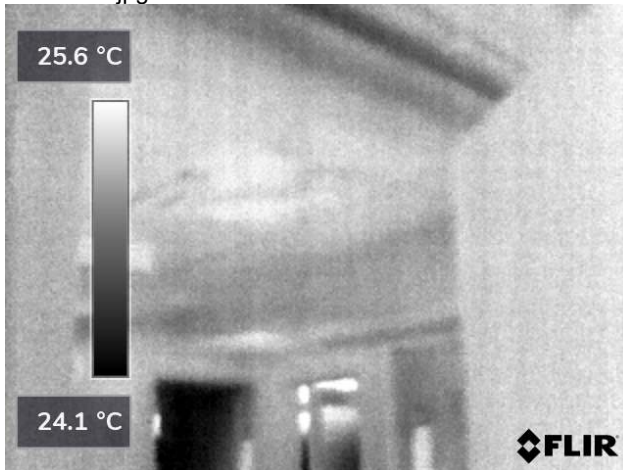
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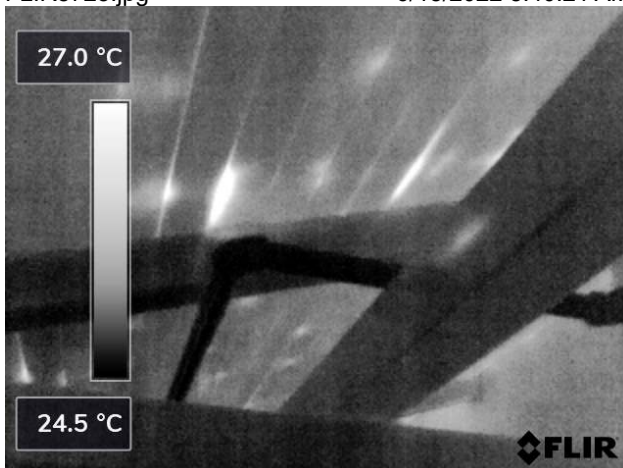
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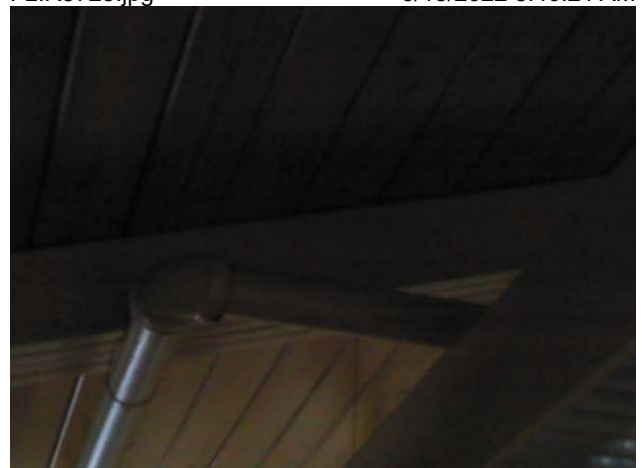
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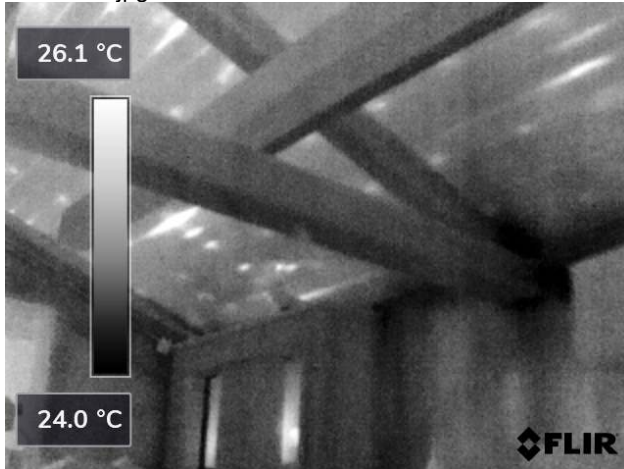


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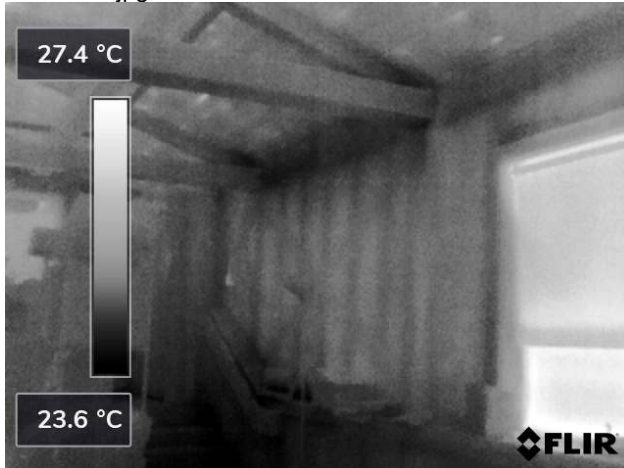
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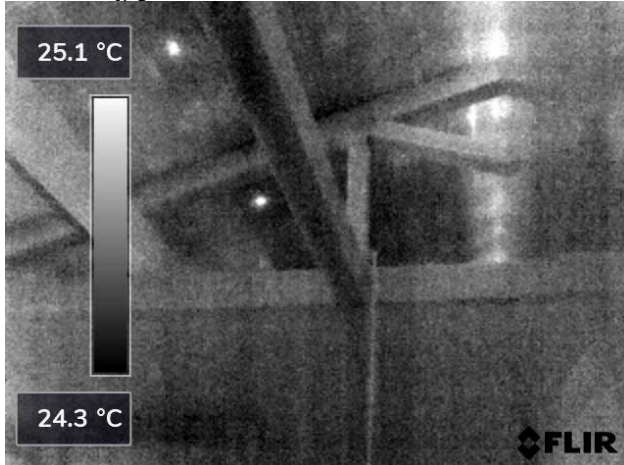
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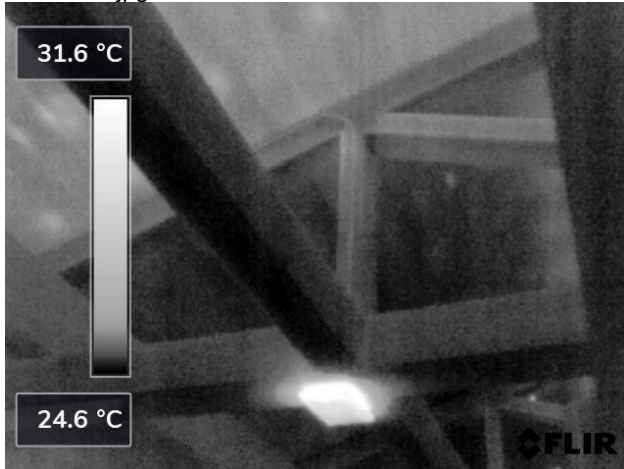
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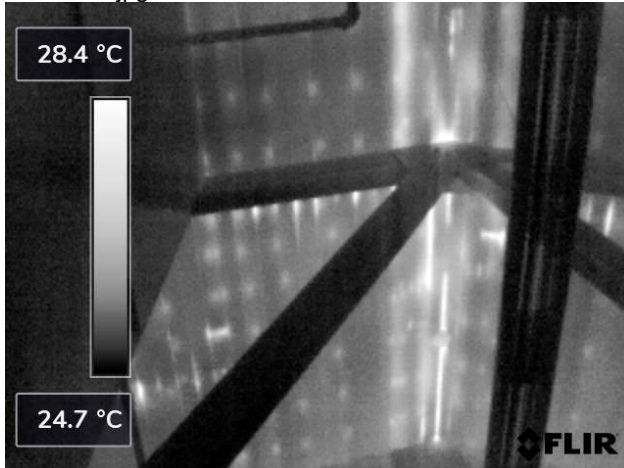
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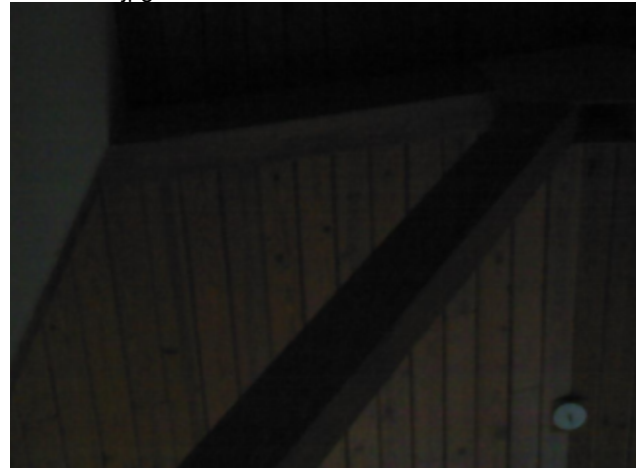
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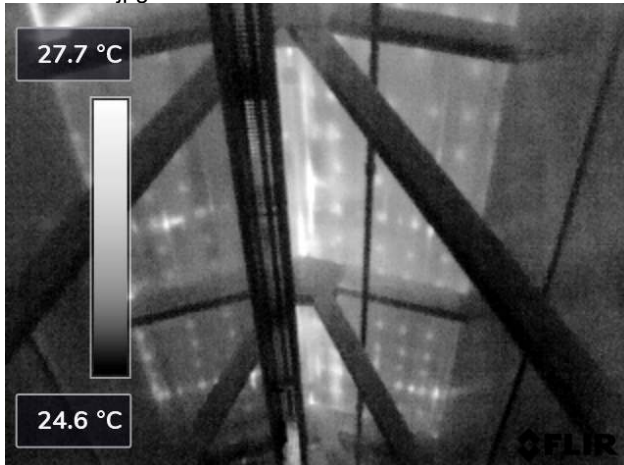
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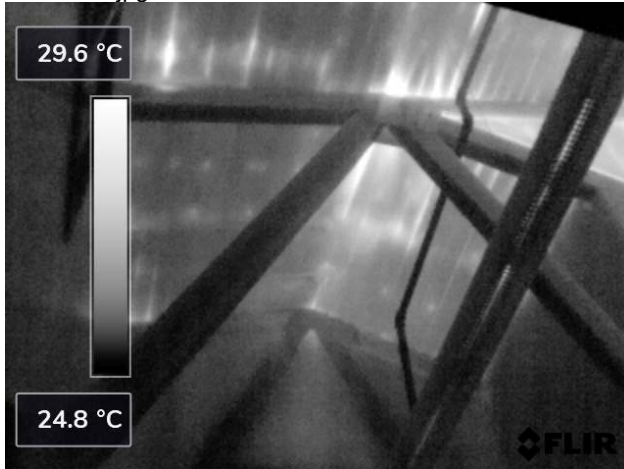


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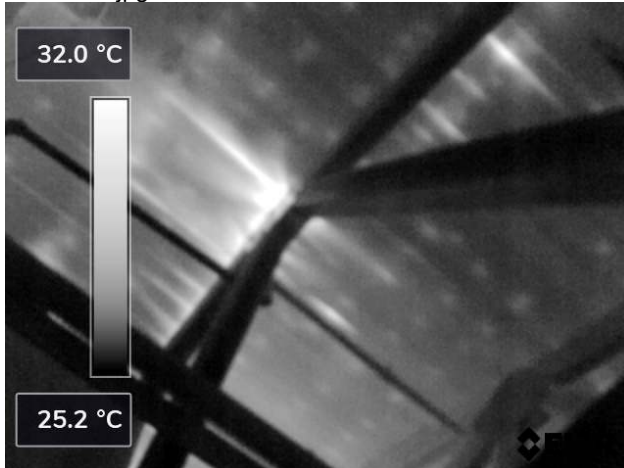
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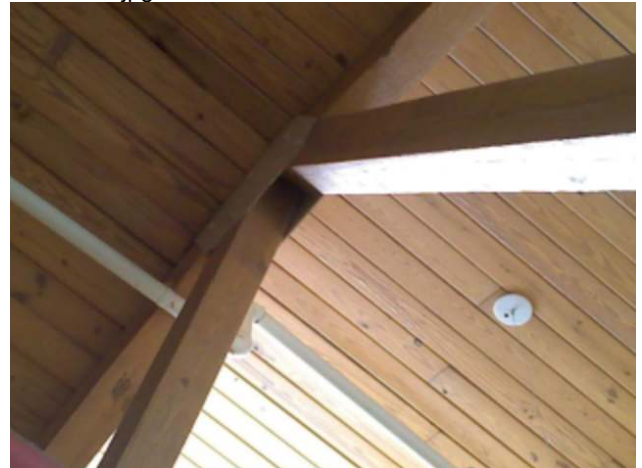
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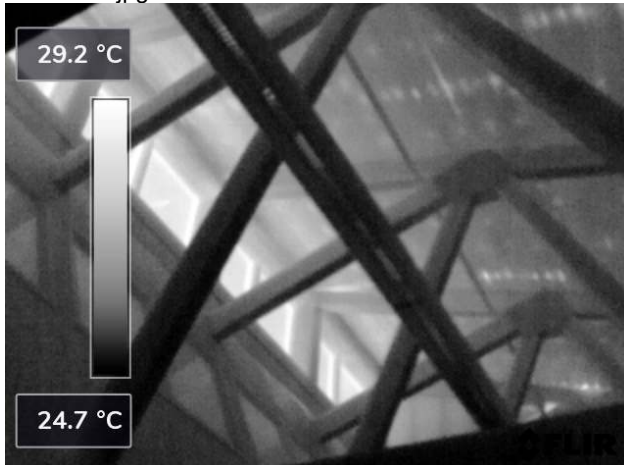
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FLIR8734.jpg 6/18/2022 8:42:49 AM



FLIR8735.jpg 6/18/2022 8:43:02 AM

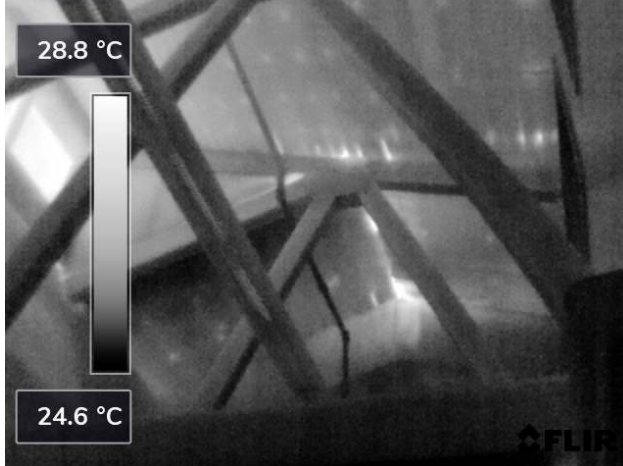


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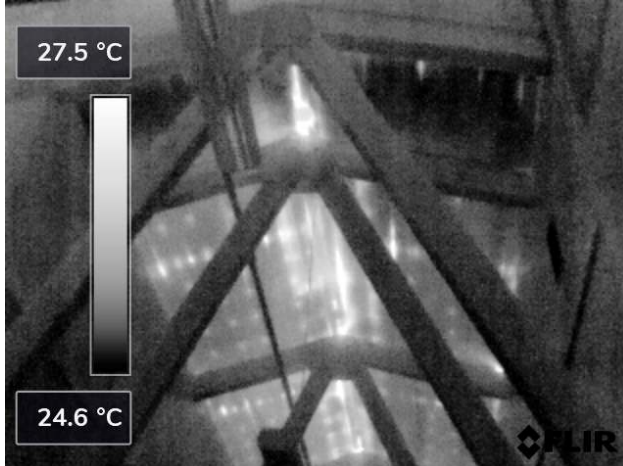
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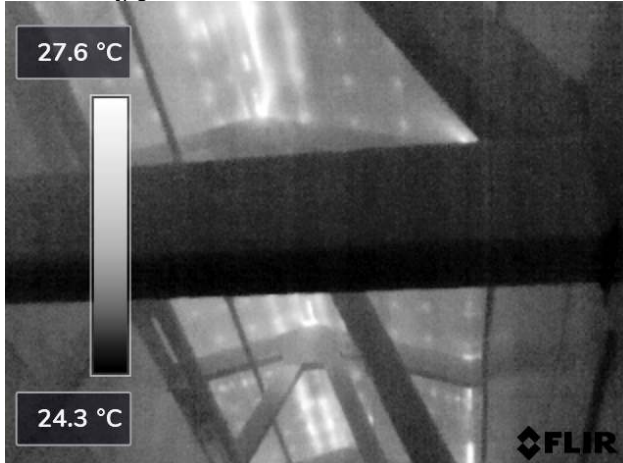
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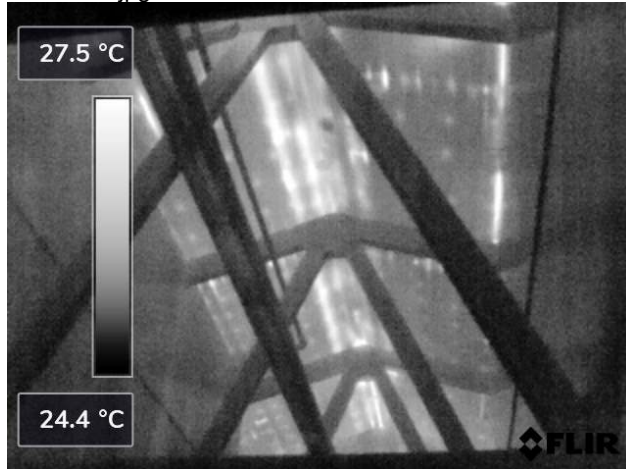
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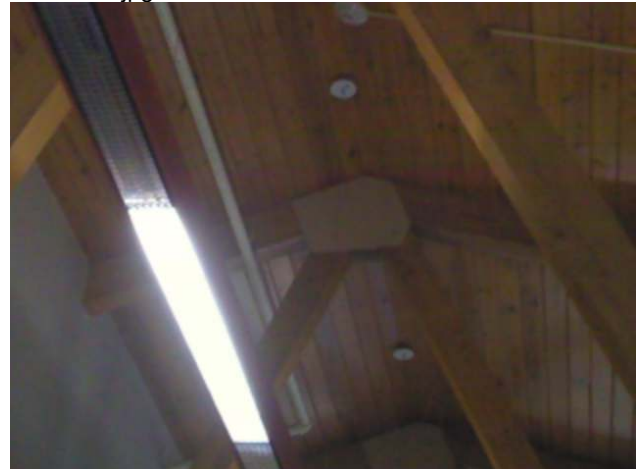
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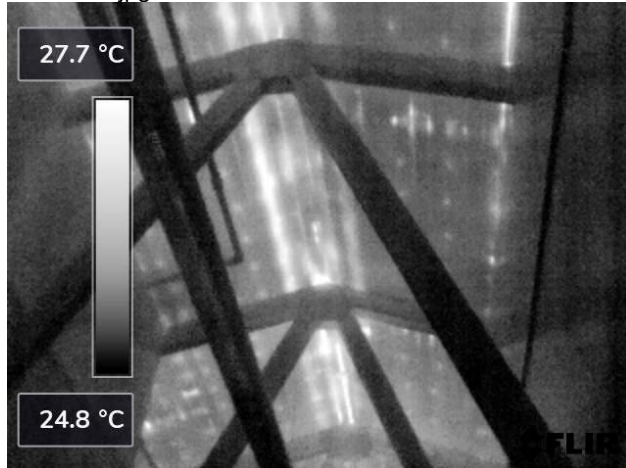
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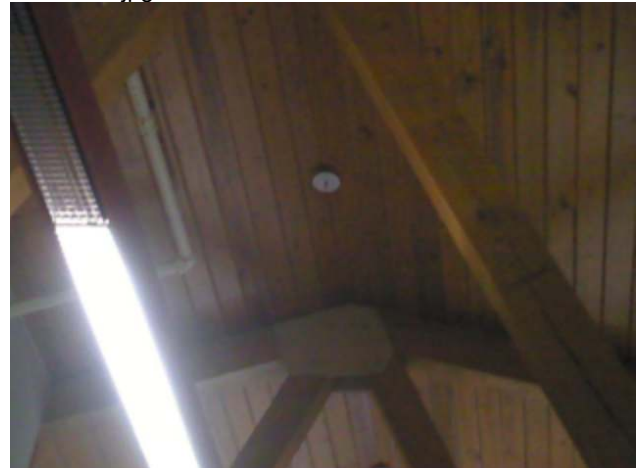
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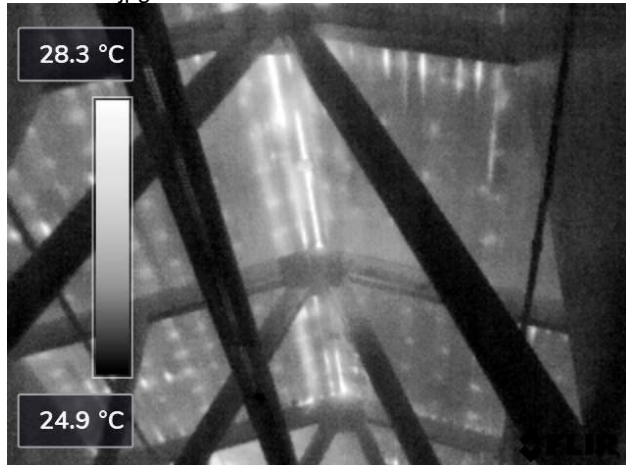
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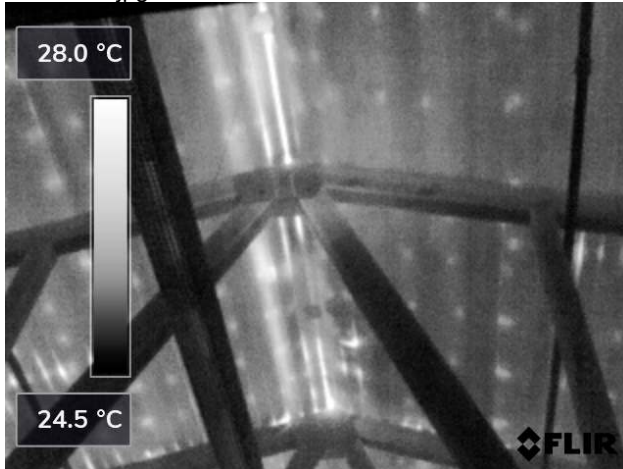


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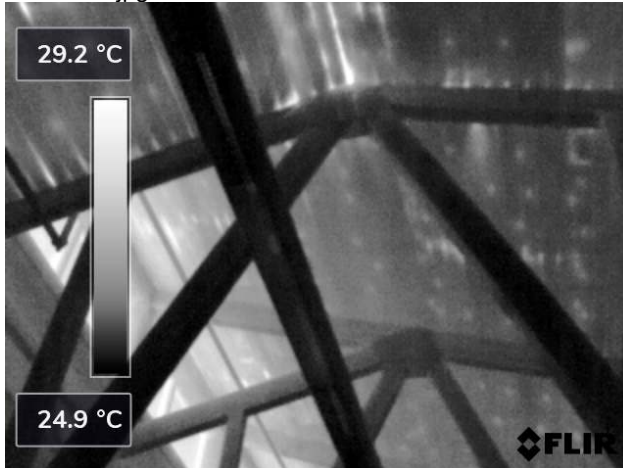
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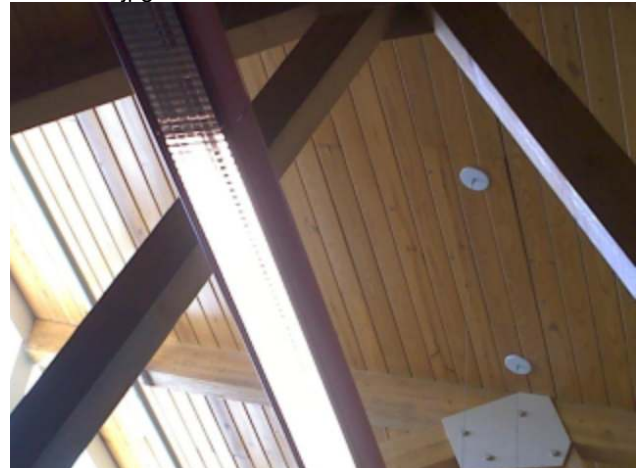
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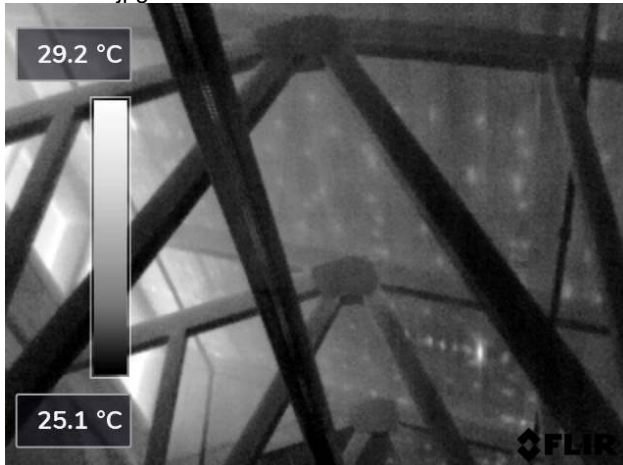
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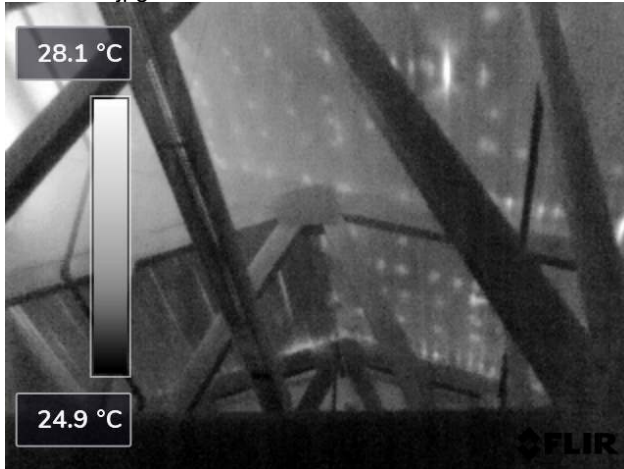


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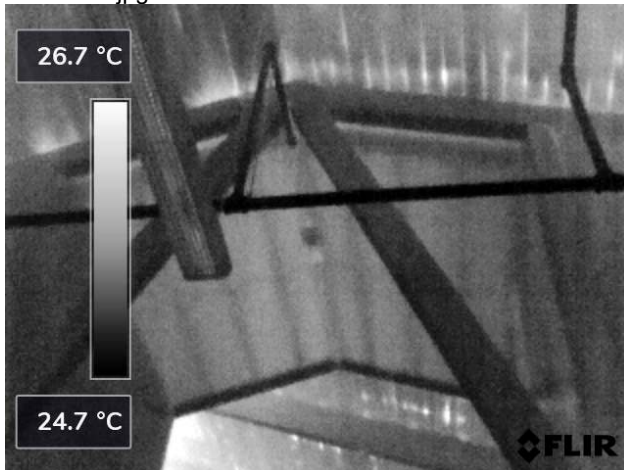
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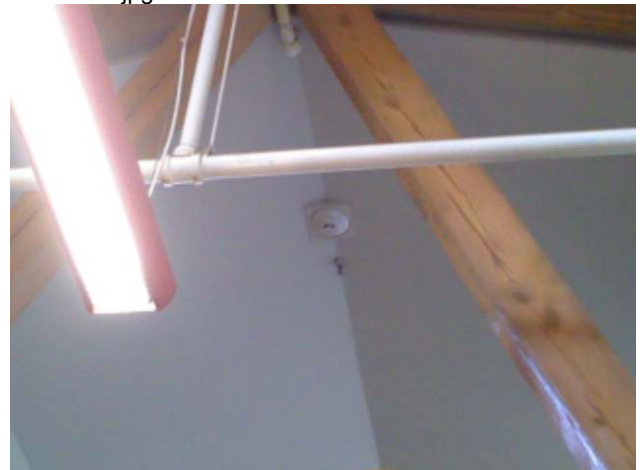
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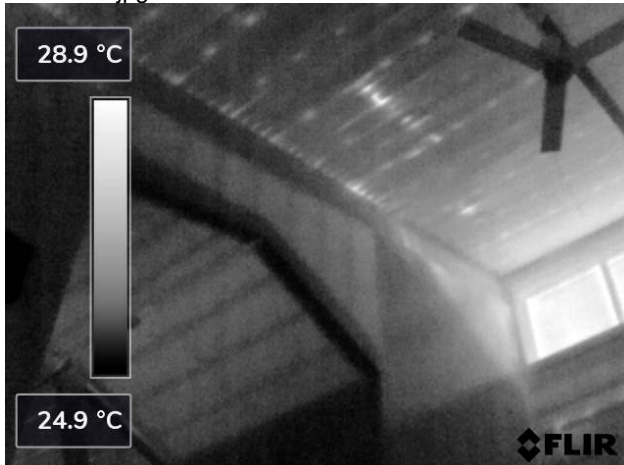
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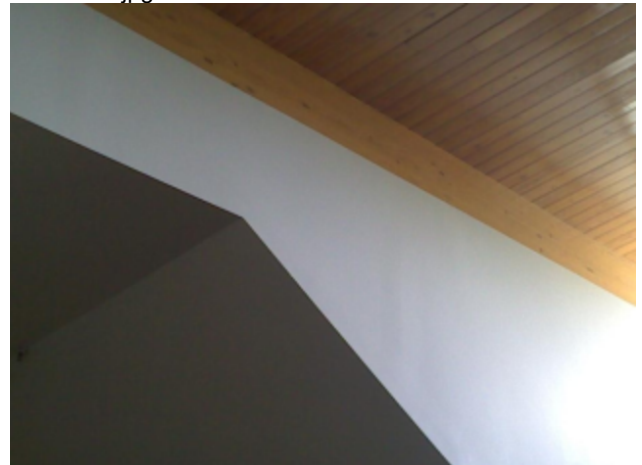
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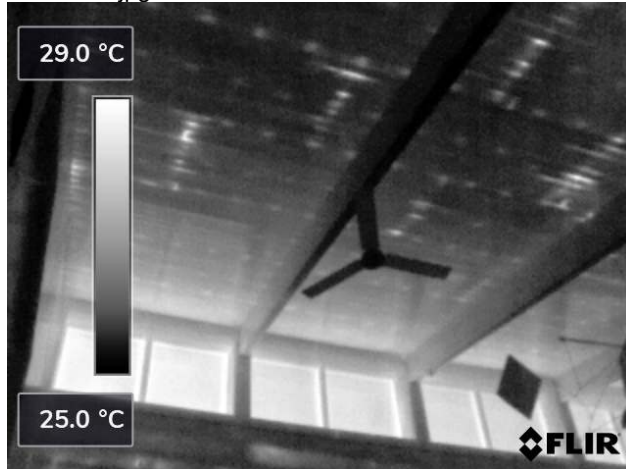
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FLIR8748.jpg

6/18/2022 8:45:26 AM



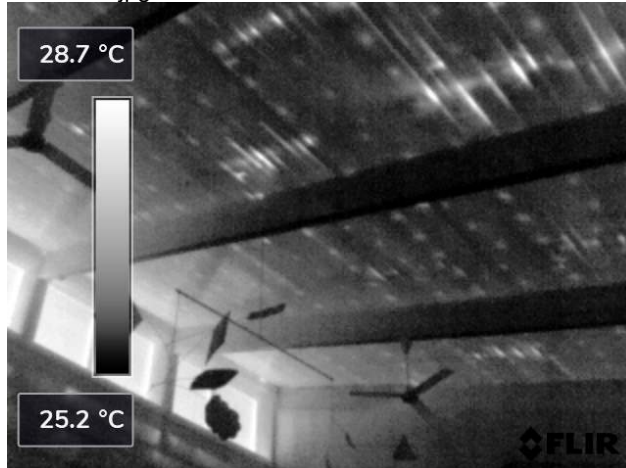
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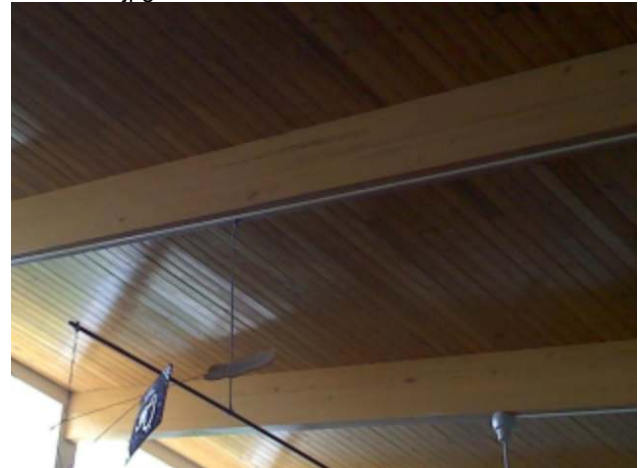
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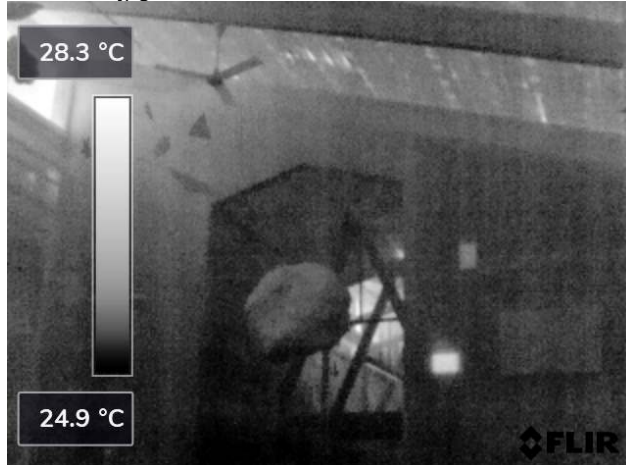
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6/18/2022 8:45:43 AM



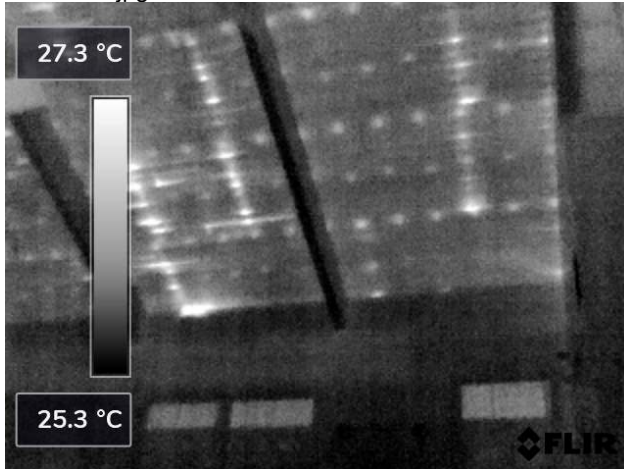
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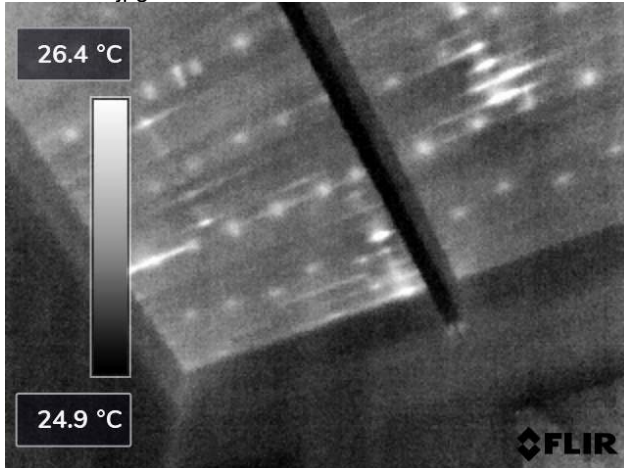
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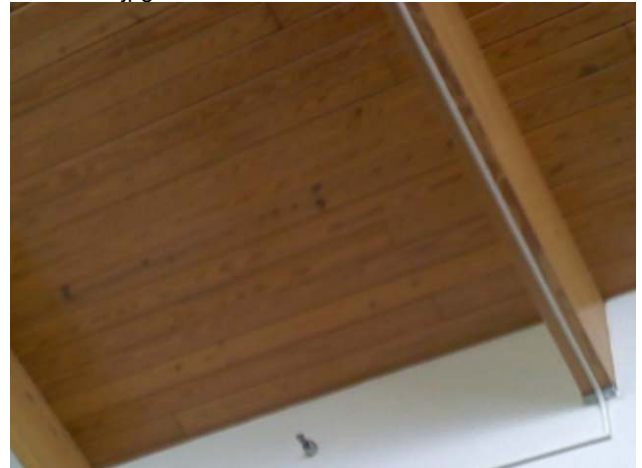
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6/18/2022 8:46:21 AM



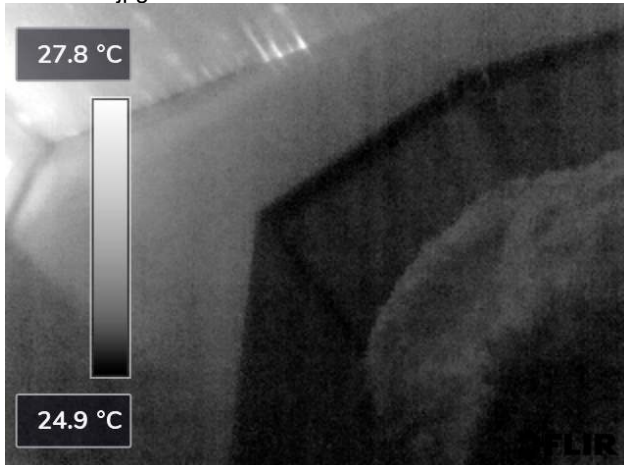
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6/18/2022 8:46:21 AM



FLIR8753.jpg

6/18/2022 8:46:30 AM



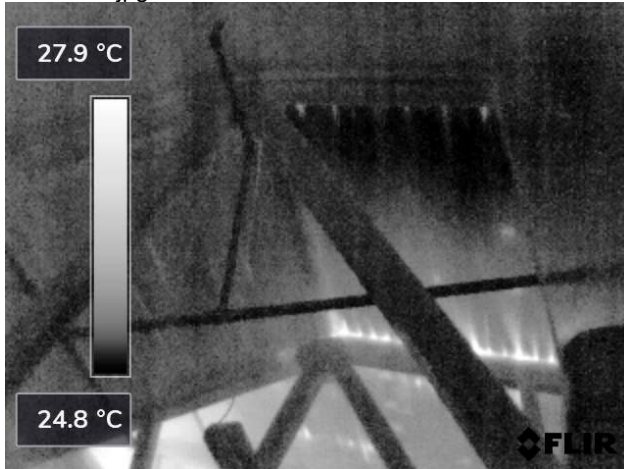
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6/18/2022 8:46:30 AM



FLIR8754.jpg

6/18/2022 8:46:41 AM



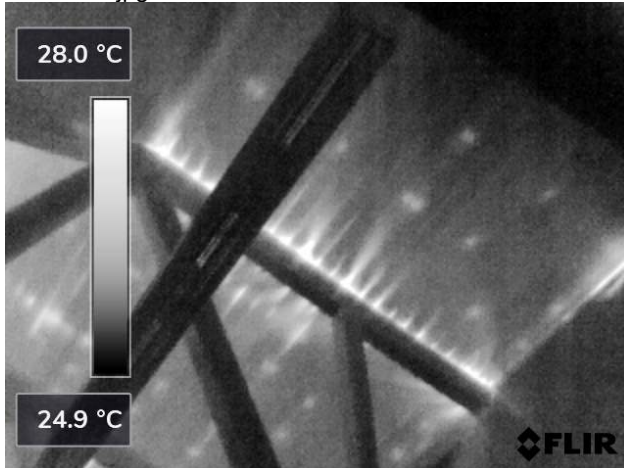
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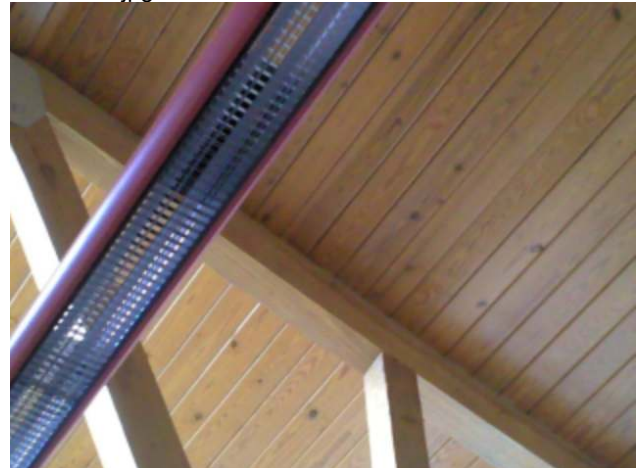
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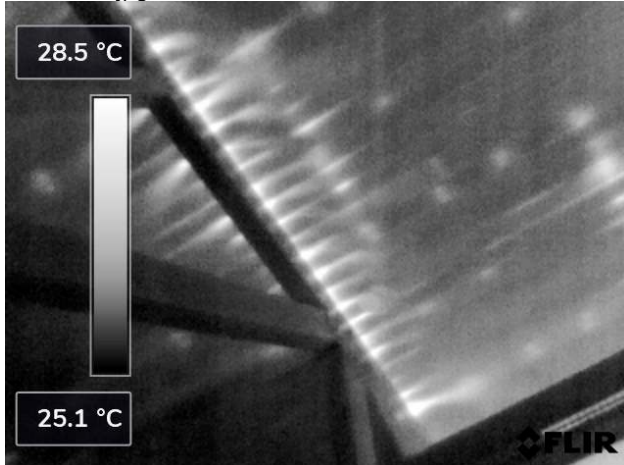
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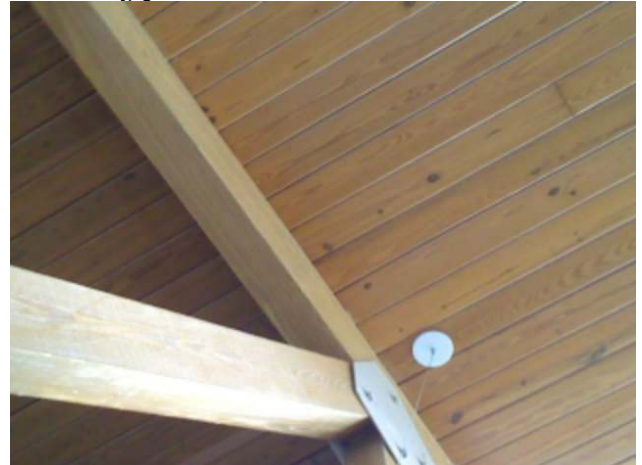
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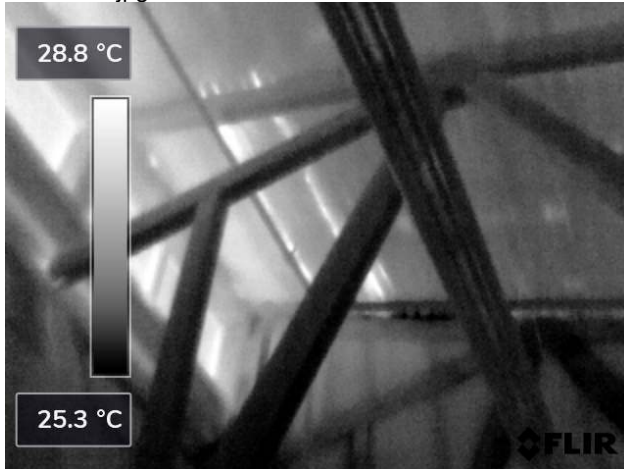
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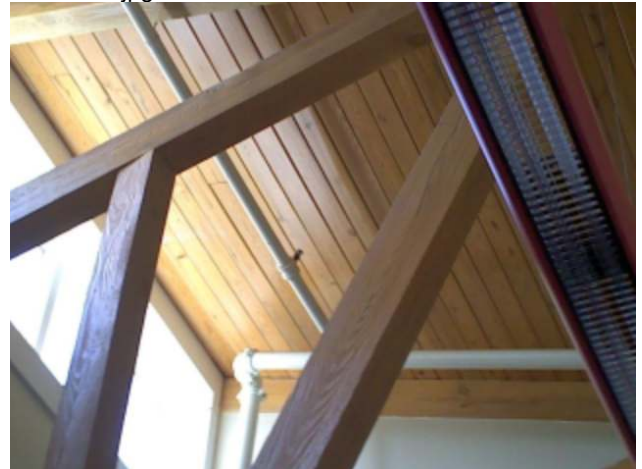
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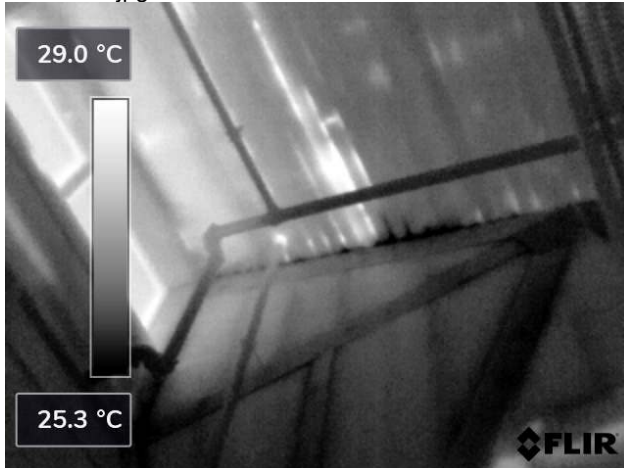
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FLIR8758.jpg

6/18/2022 8:47:25 AM



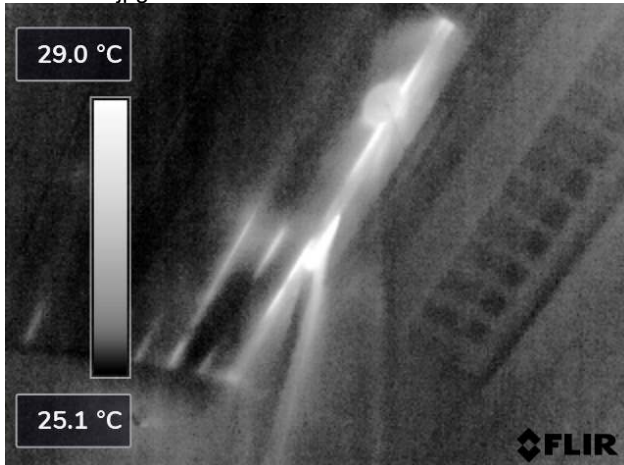
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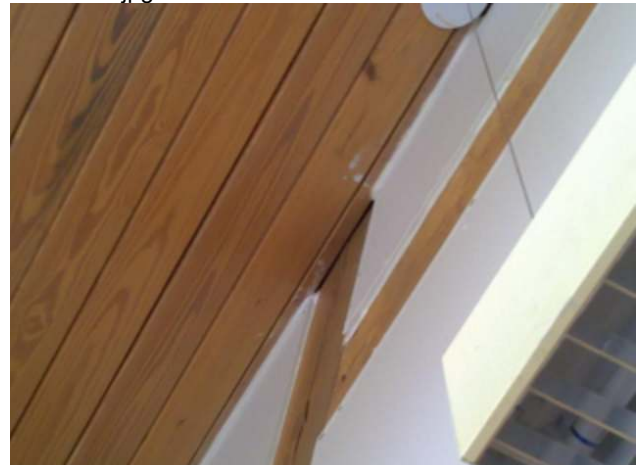
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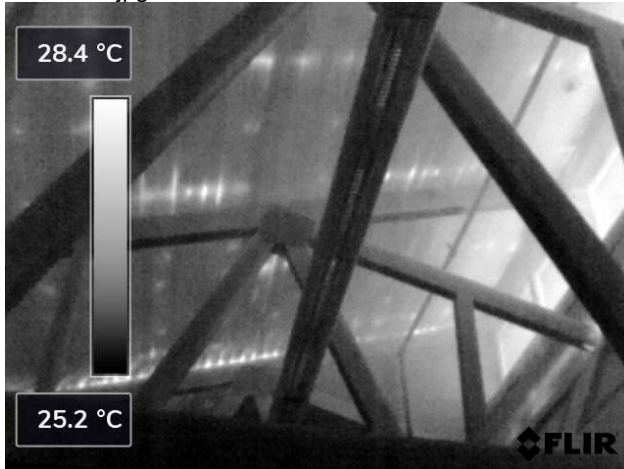


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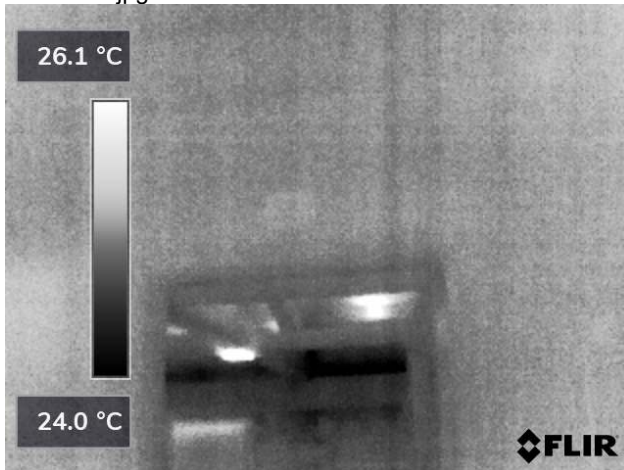
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FLIR8760.jpg 6/18/2022 8:47:54 AM



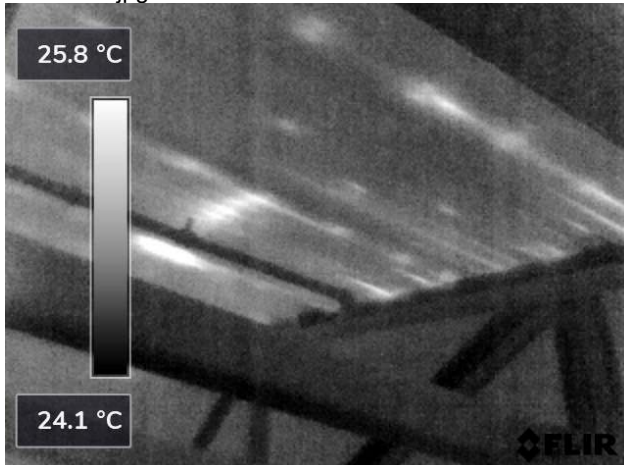
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FLIR8761.jpg 6/18/2022 8:48:01 AM



FLIR8762.jpg 6/18/2022 8:48:37 AM

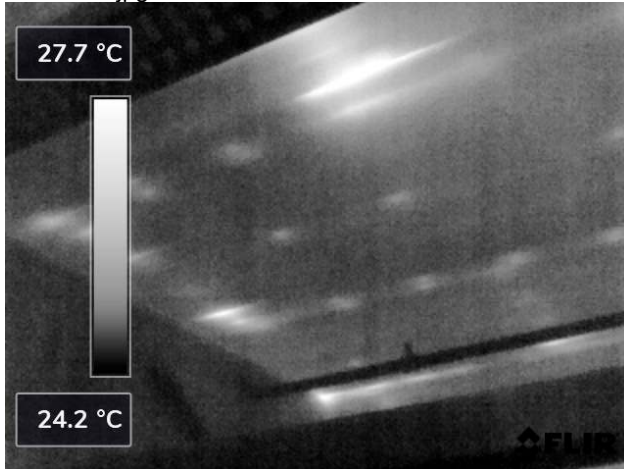


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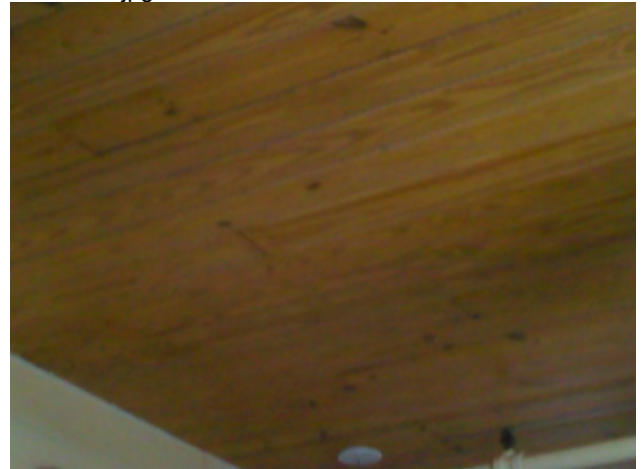
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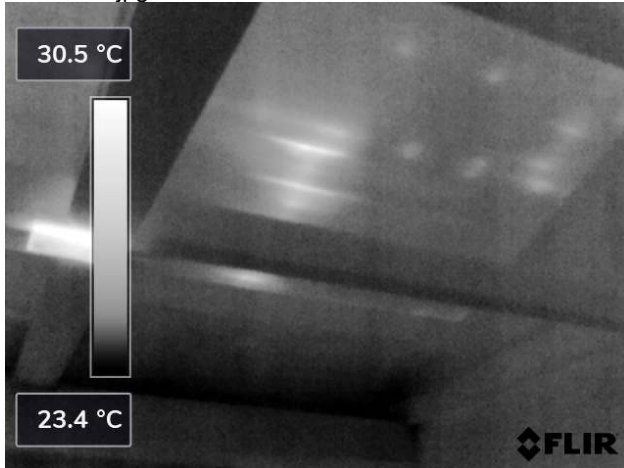
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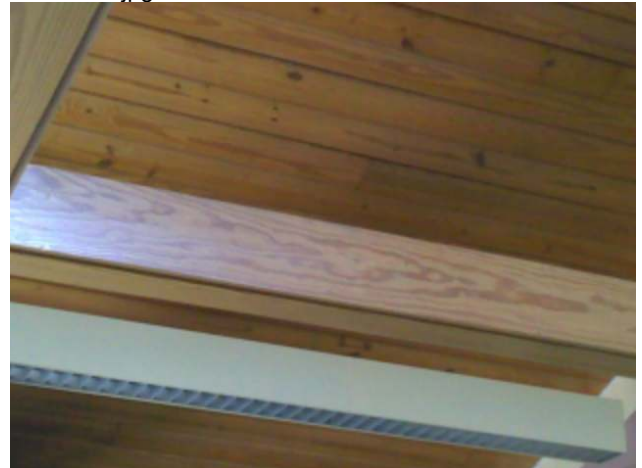
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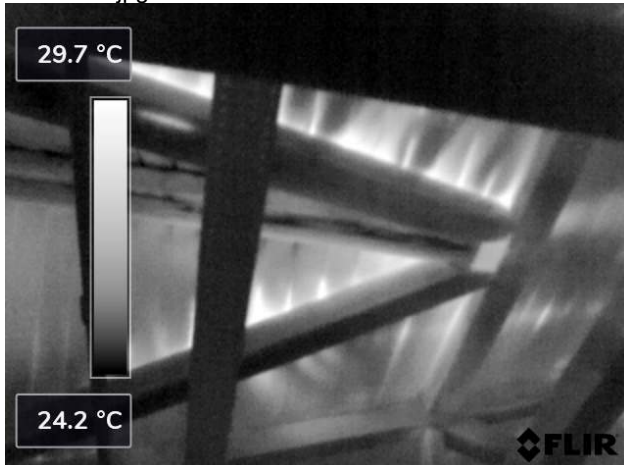
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FLIR8765.jpg

6/18/2022 8:49:25 AM



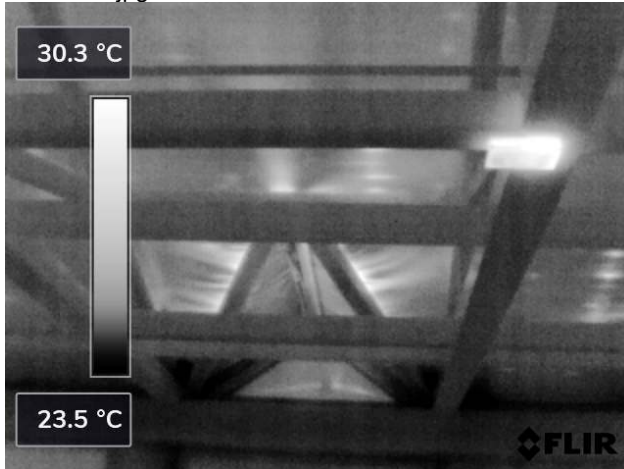
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FLIR8766.jpg

6/18/2022 8:49:44 AM



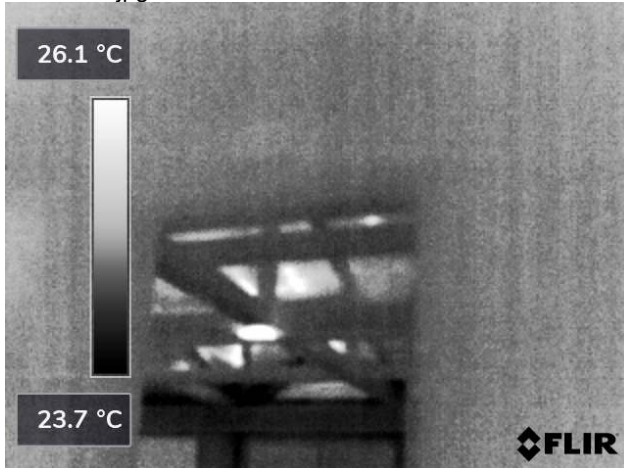
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FLIR8767.jpg

6/18/2022 8:50:05 AM



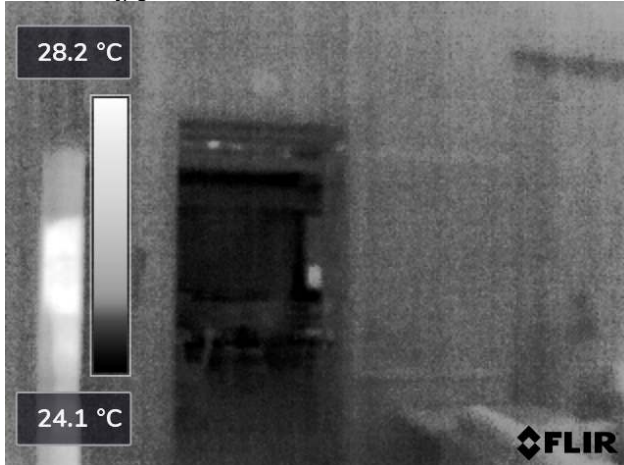
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FLIR8768.jpg

6/18/2022 8:50:13 AM



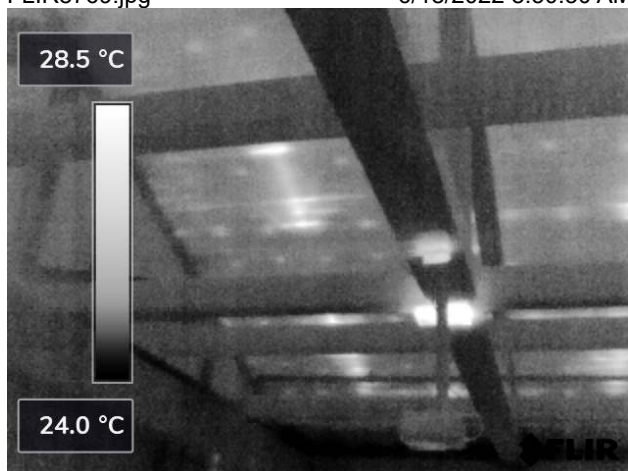
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FLIR8769.jpg

6/18/2022 8:50:30 AM



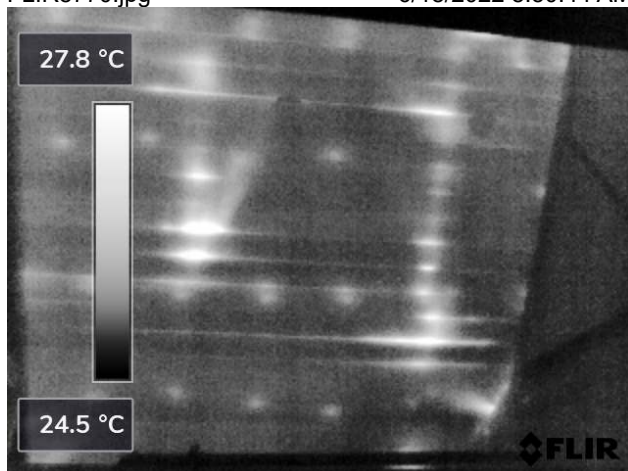
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FLIR8770.jpg

6/18/2022 8:50:44 AM



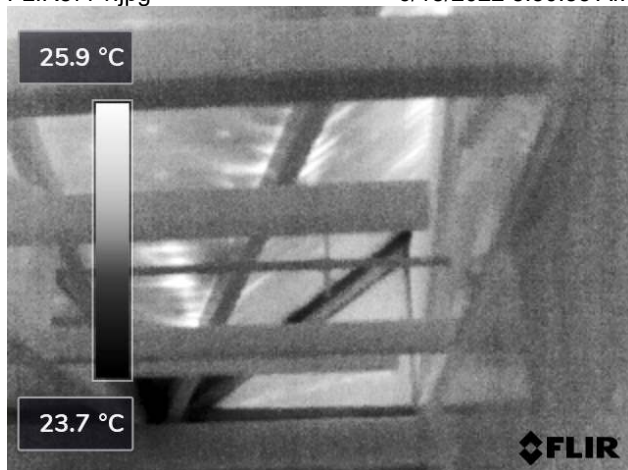
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FLIR8771.jpg

6/18/2022 8:50:53 AM



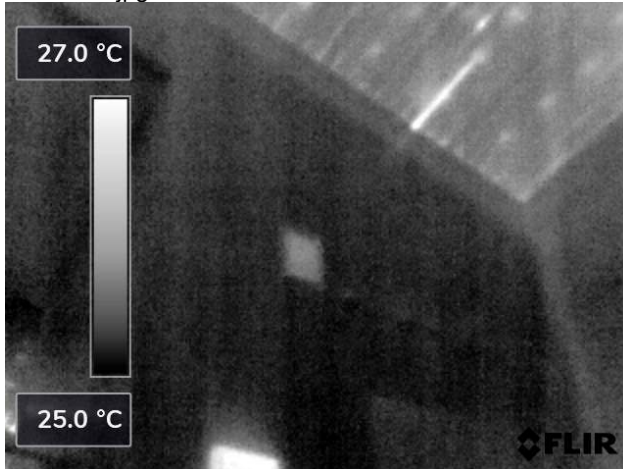
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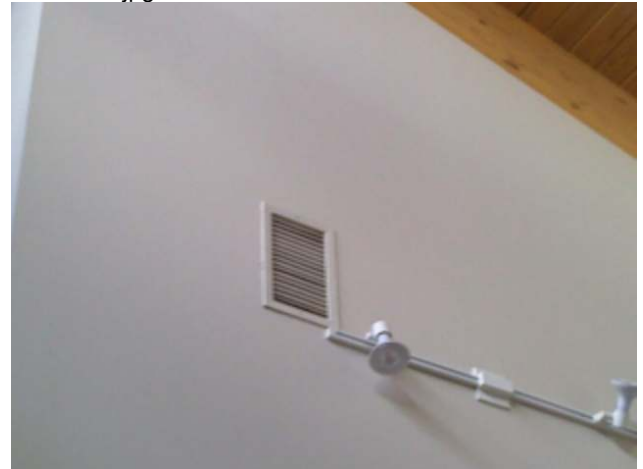
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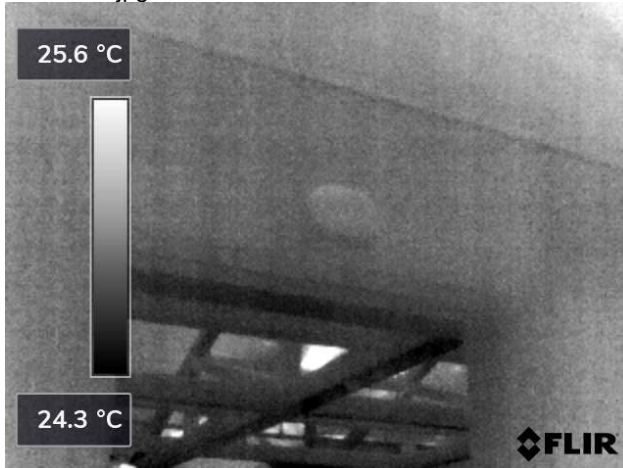
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FLIR8773.jpg

6/18/2022 8:53:46 AM



FLIR8773.jpg

6/18/2022 8:53:46 AM



FLIR8774.jpg

6/18/2022 8:53:56 AM



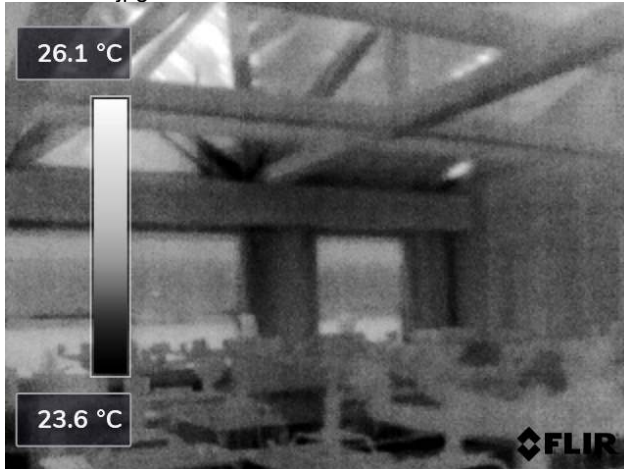
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FLIR8775.jpg

6/18/2022 8:54:12 AM



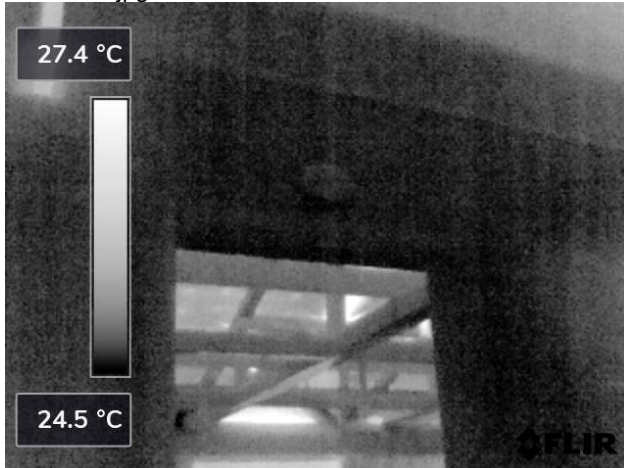
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FLIR8776.jpg

6/18/2022 8:54:42 AM



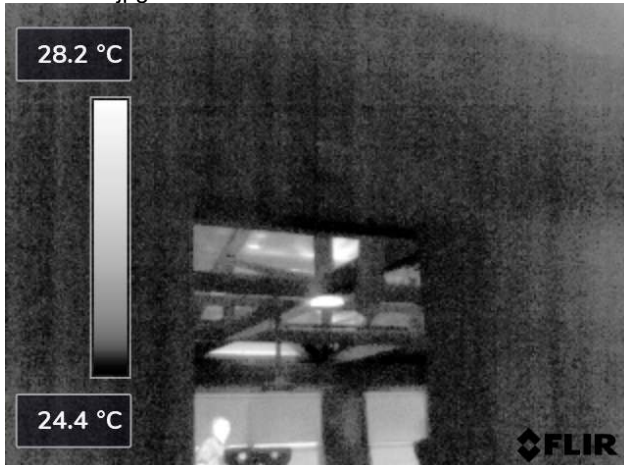
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FLIR8777.jpg

6/18/2022 8:56:07 AM



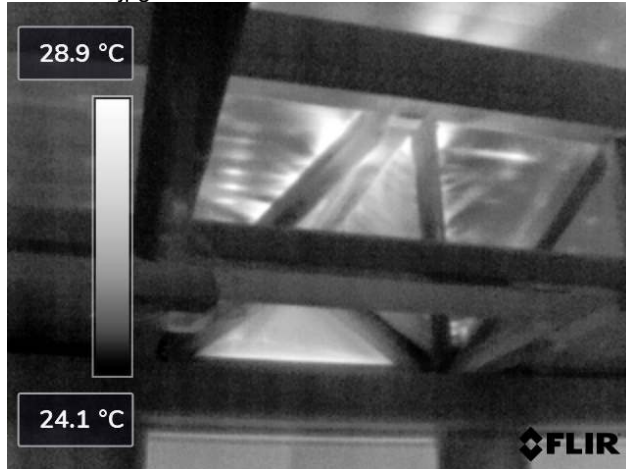
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FLIR8778.jpg

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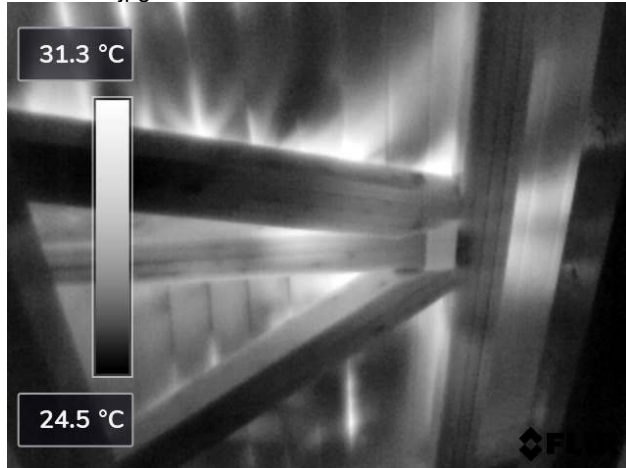
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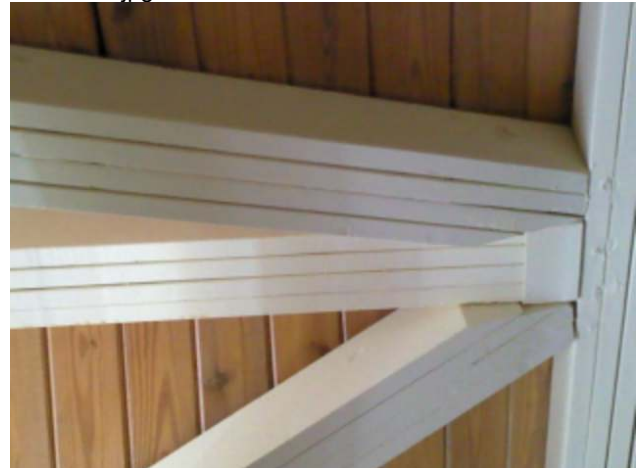
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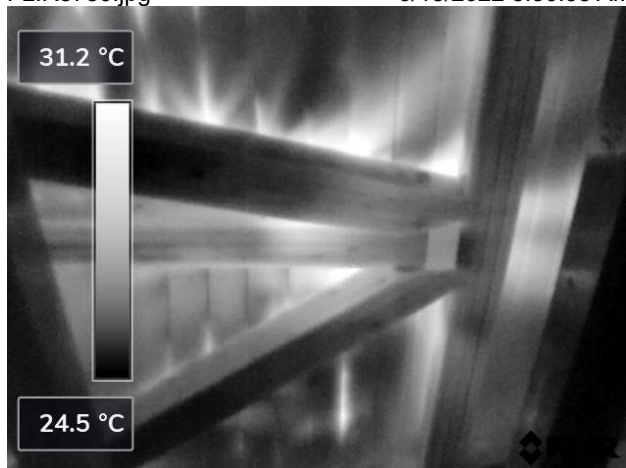
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FLIR8780.jpg

6/18/2022 8:56:38 AM



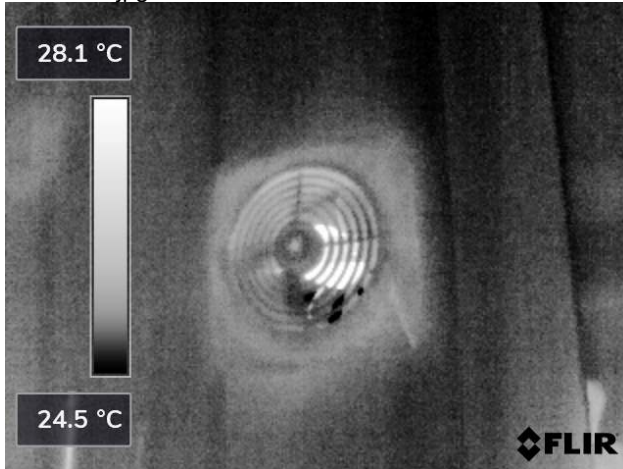
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FLIR8781.jpg

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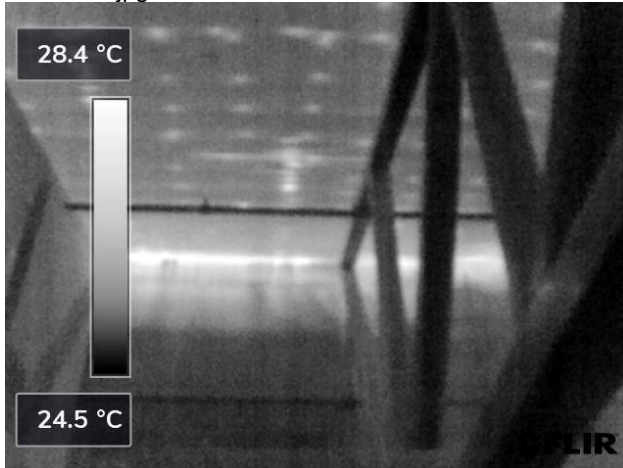
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FLIR8782.jpg

6/18/2022 8:57:22 AM



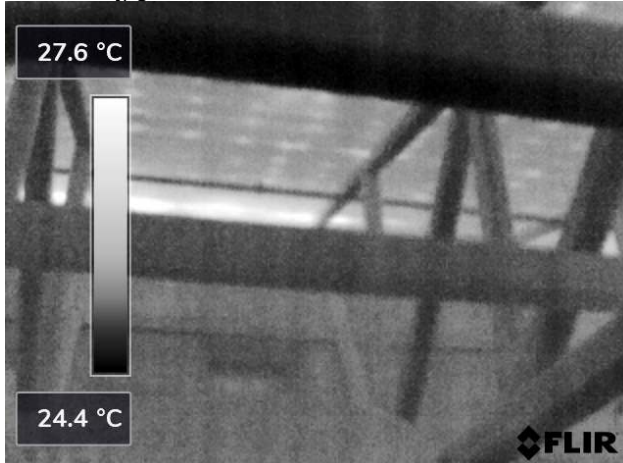
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6/18/2022 8:57:22 AM



FLIR8783.jpg

6/18/2022 8:57:31 AM



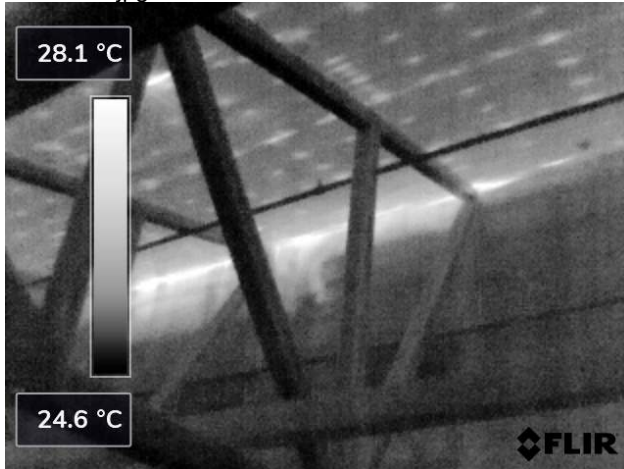
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FLIR8784.jpg

6/18/2022 8:57:45 AM



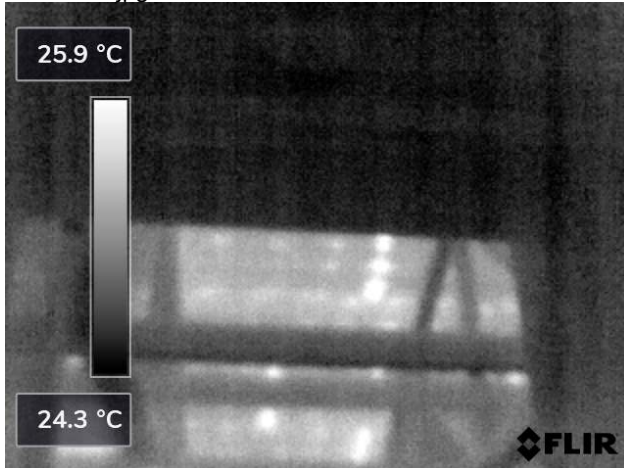
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FLIR8785.jpg

6/18/2022 8:58:03 AM



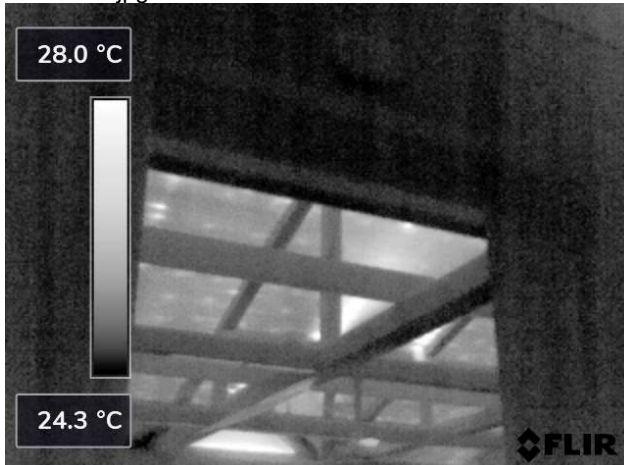
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FLIR8786.jpg

6/18/2022 8:58:26 AM



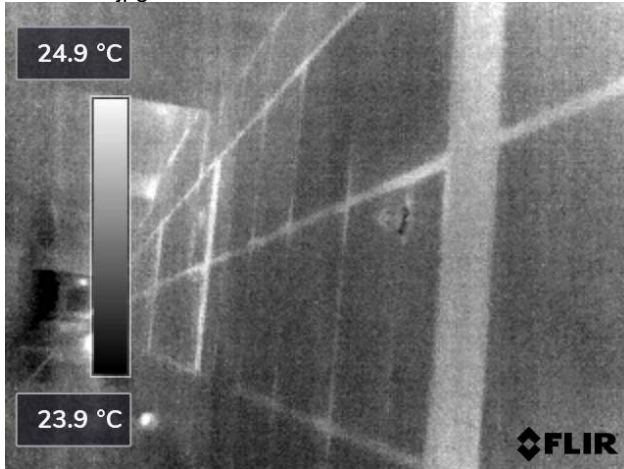
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FLIR8787.jpg

6/18/2022 9:00:49 AM



FLIR8787.jpg

6/18/2022 9:00:49 AM



FLIR8788.jpg 6/18/2022 9:01:03 AM

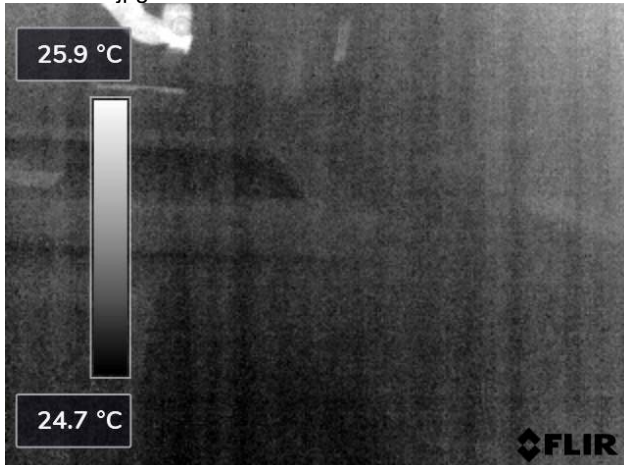


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6/18/2022 9:01:45 AM



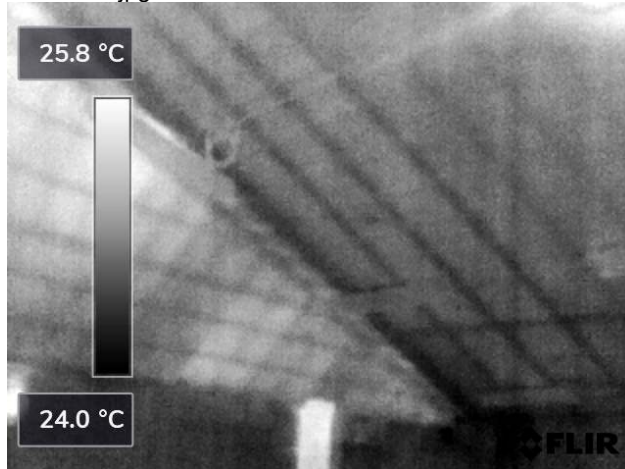
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FLIR8790.jpg

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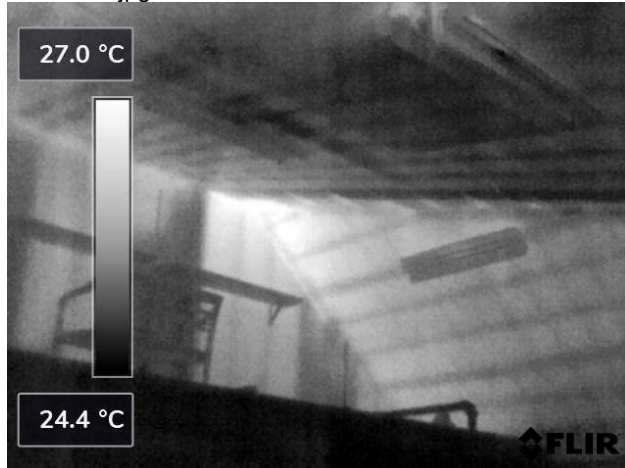
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FLIR8791.jpg

6/18/2022 9:02:14 AM



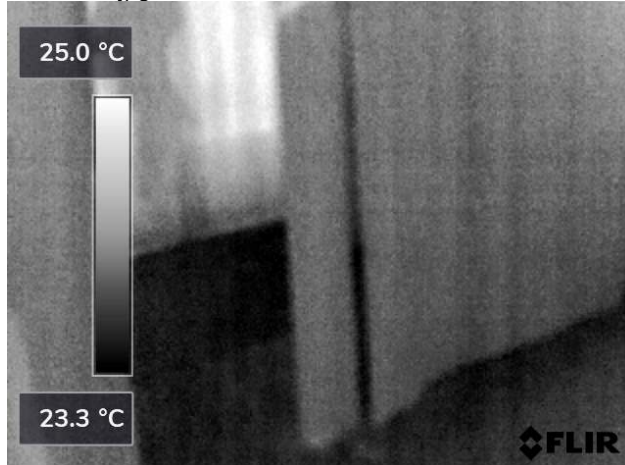
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6/18/2022 9:02:41 AM



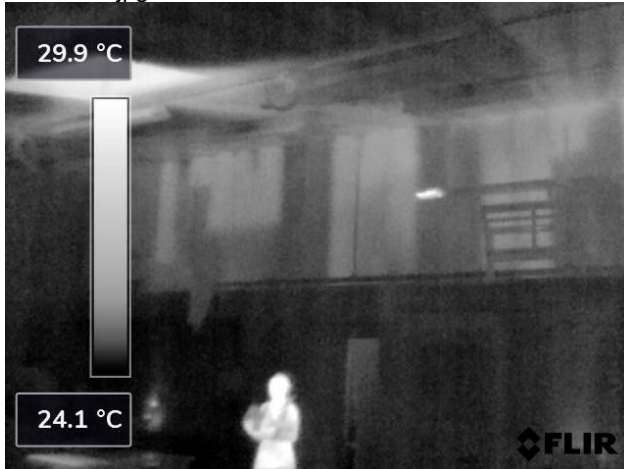
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6/18/2022 9:03:02 AM



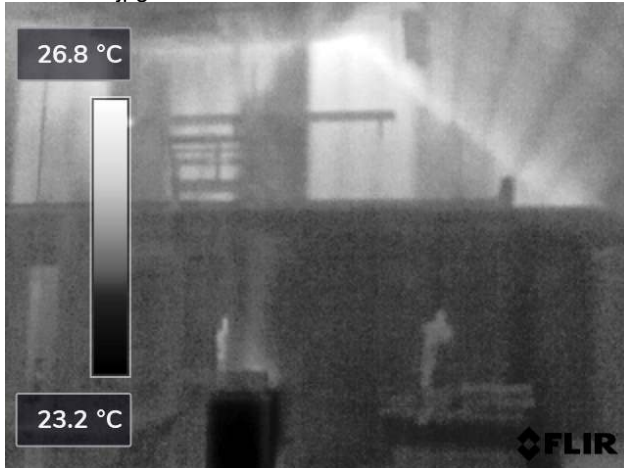
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FLIR8794.jpg

6/18/2022 9:03:12 AM



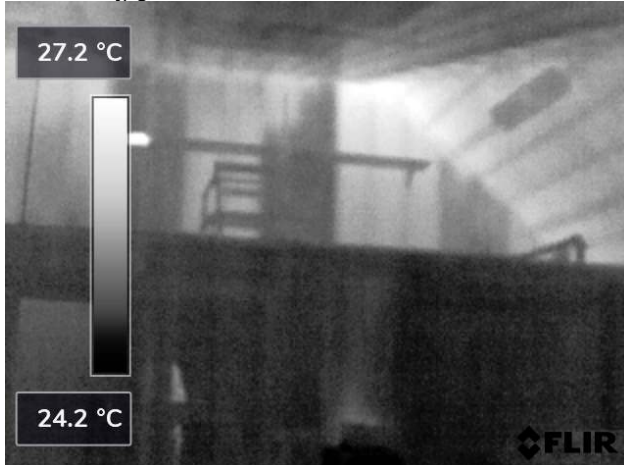
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FLIR8795.jpg

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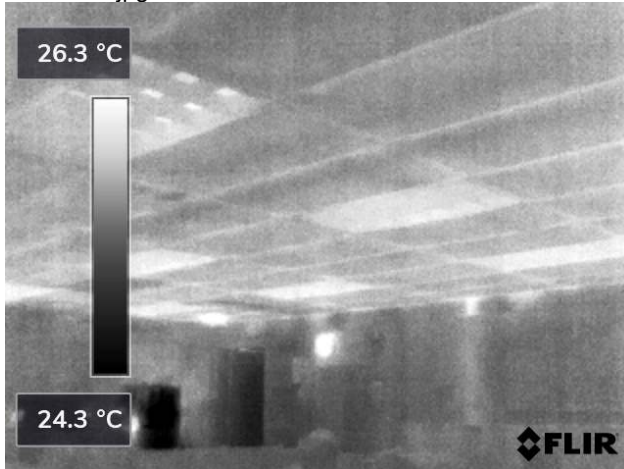
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6/18/2022 9:04:32 AM



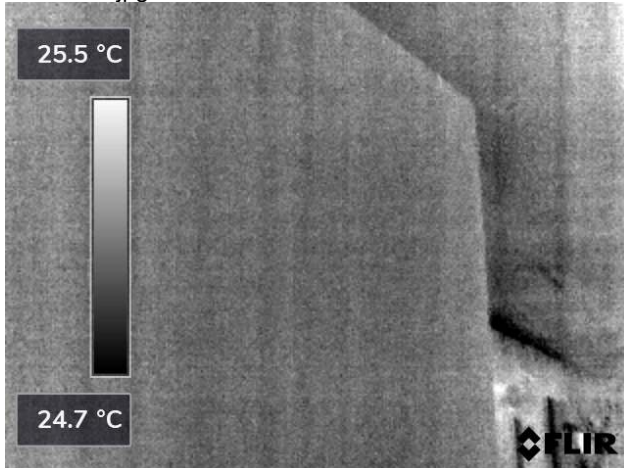
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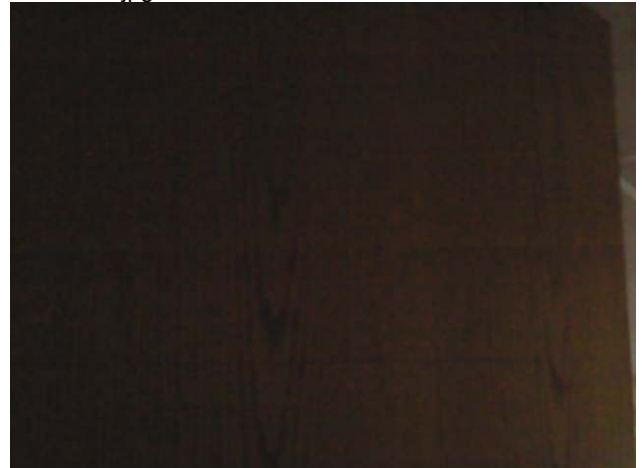
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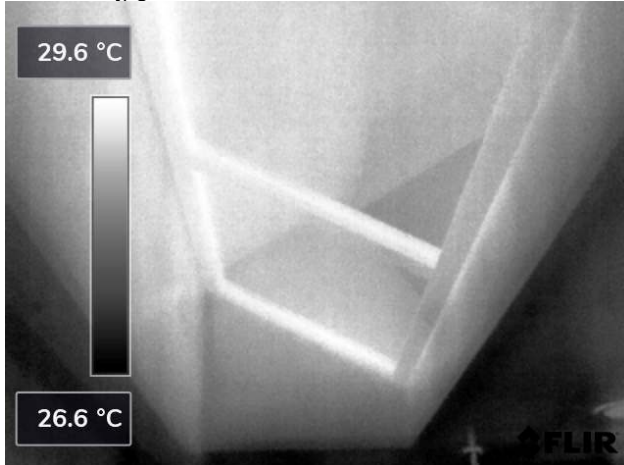
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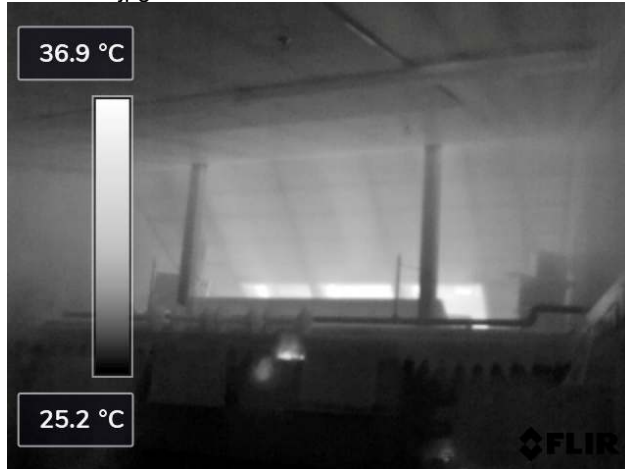
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FLIR8799.jpg

6/18/2022 9:05:37 AM



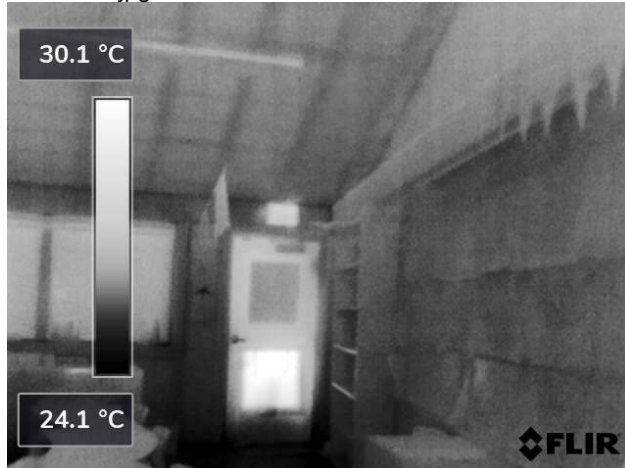
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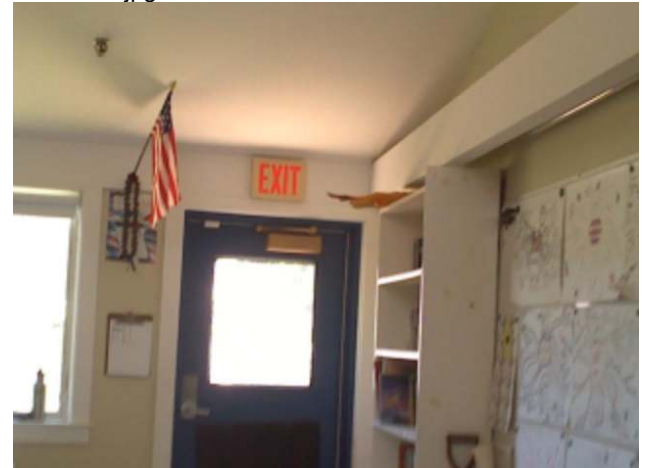
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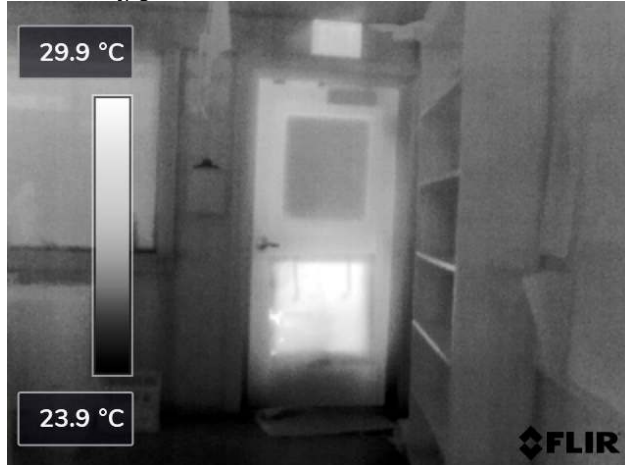
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6/18/2022 9:06:23 AM



FLIR8801.jpg

6/18/2022 9:06:47 AM



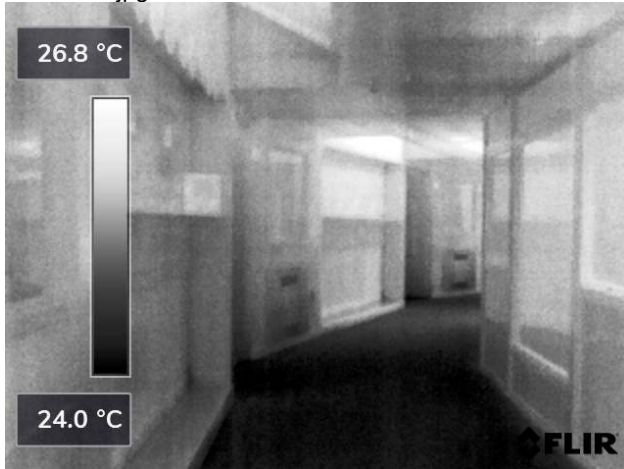
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FLIR8802.jpg

6/18/2022 9:07:08 AM



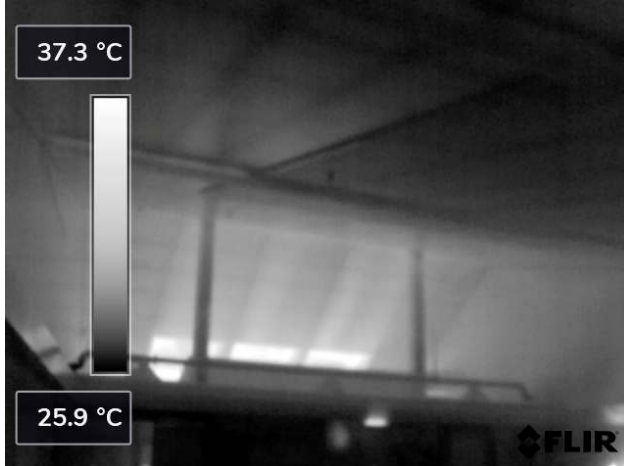
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FLIR8803.jpg

6/18/2022 9:07:35 AM



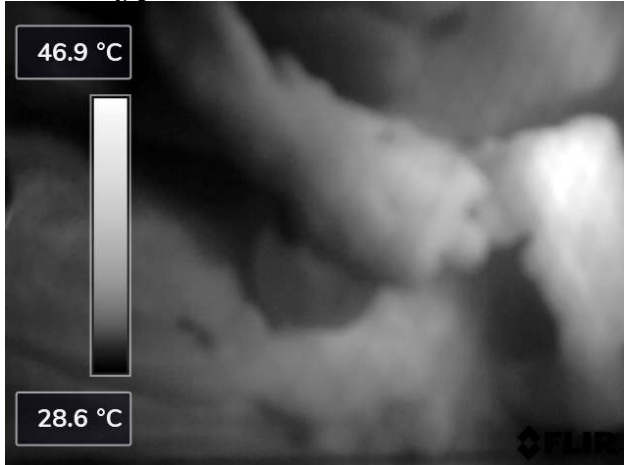
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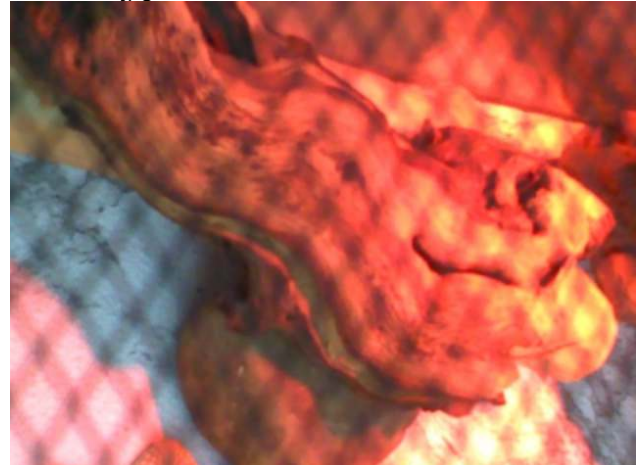
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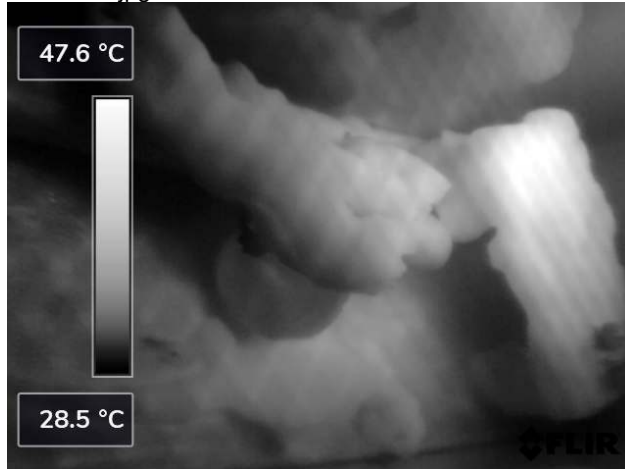
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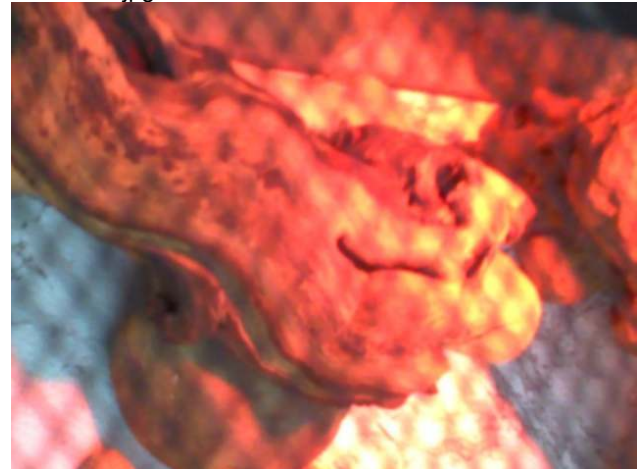
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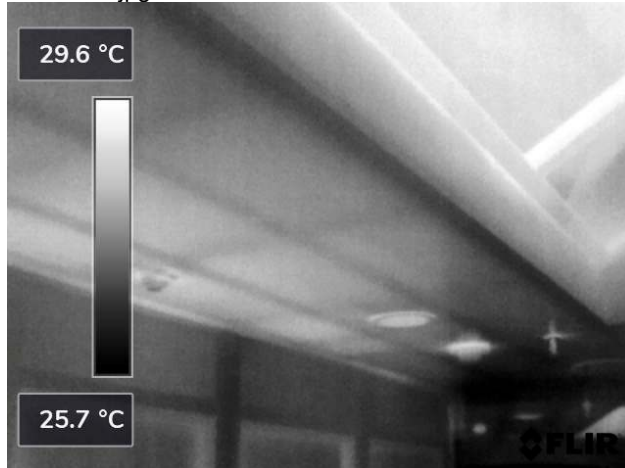
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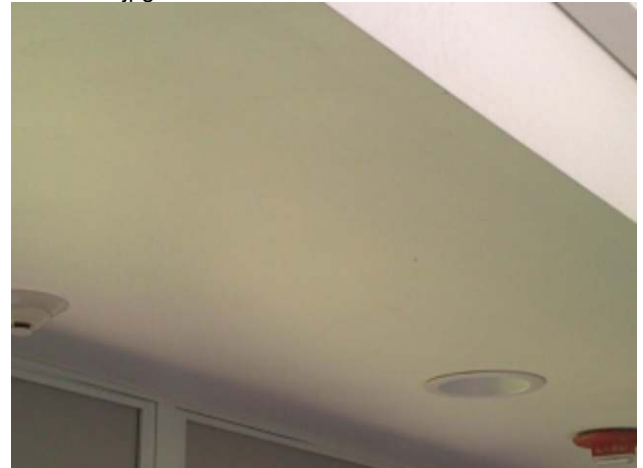
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6/18/2022 9:08:39 AM



FLIR8806.jpg

6/18/2022 9:08:39 AM



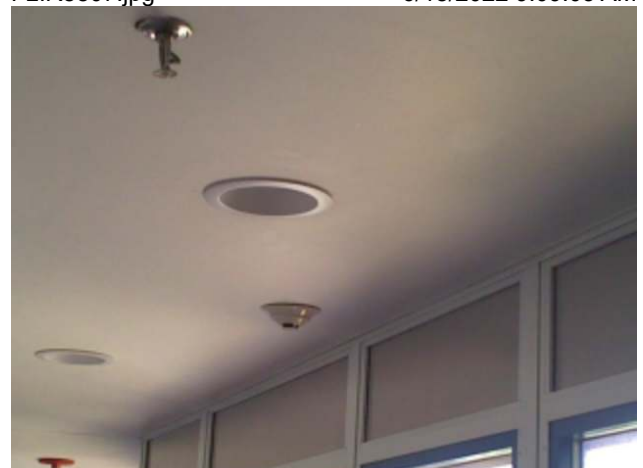
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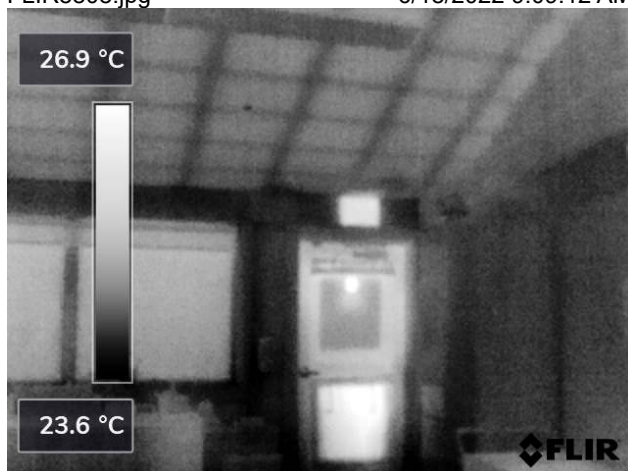
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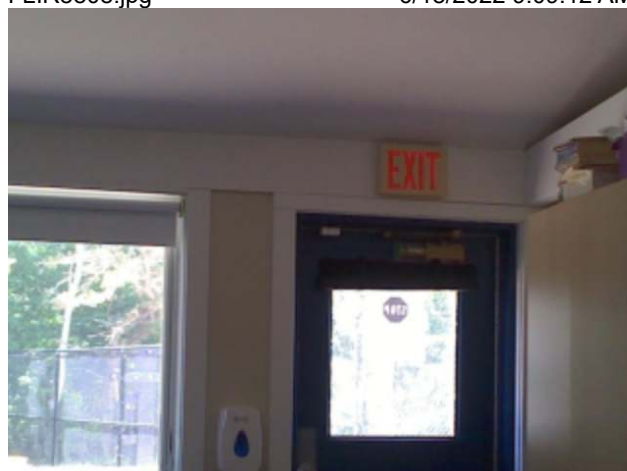
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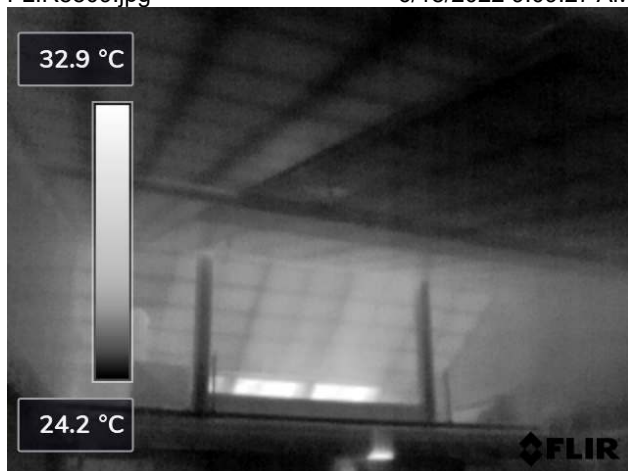
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FLIR8809.jpg

6/18/2022 9:09:27 AM



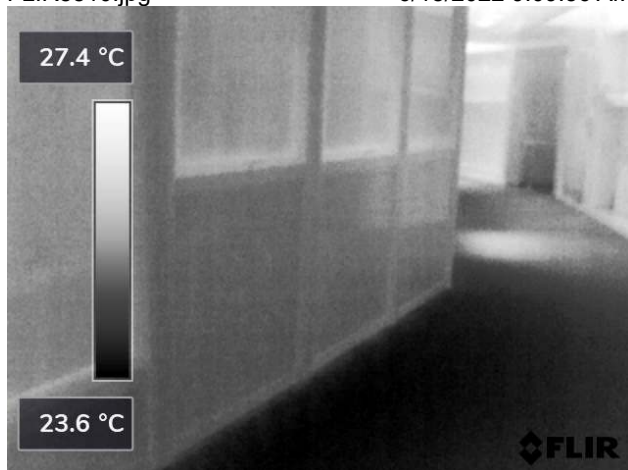
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6/18/2022 9:09:27 AM



FLIR8810.jpg

6/18/2022 9:09:56 AM



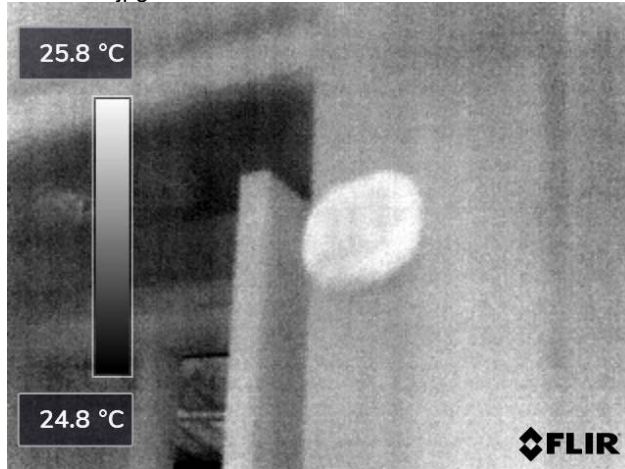
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FLIR8811.jpg

6/18/2022 9:10:13 AM



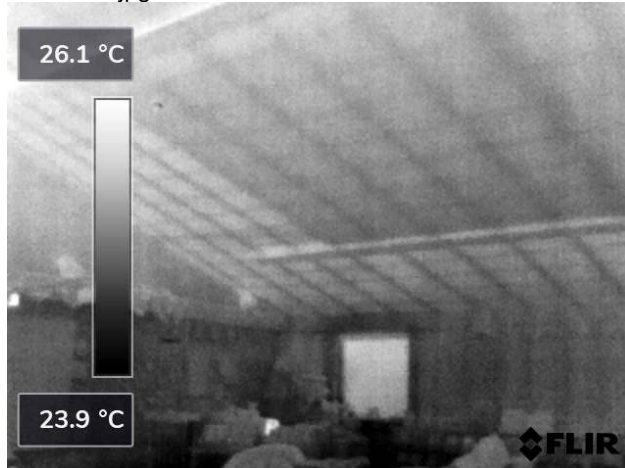
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6/18/2022 9:10:13 AM



FLIR8812.jpg

6/18/2022 9:10:20 AM



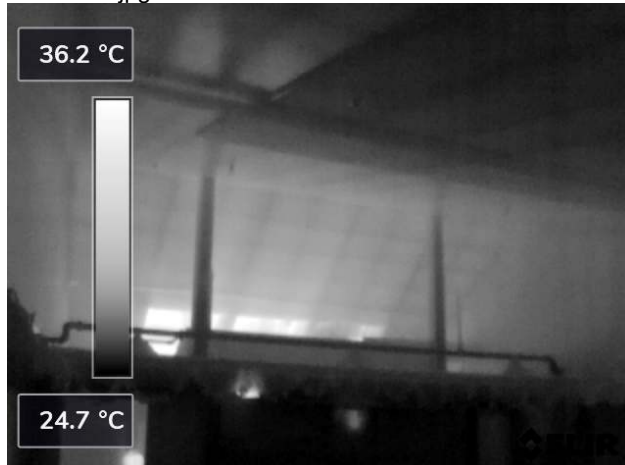
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6/18/2022 9:10:20 AM



FLIR8813.jpg

6/18/2022 9:10:30 AM



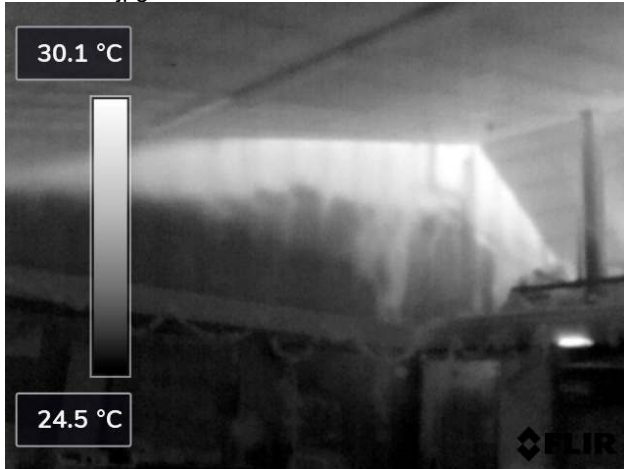
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6/18/2022 9:10:30 AM



FLIR8814.jpg

6/18/2022 9:11:26 AM



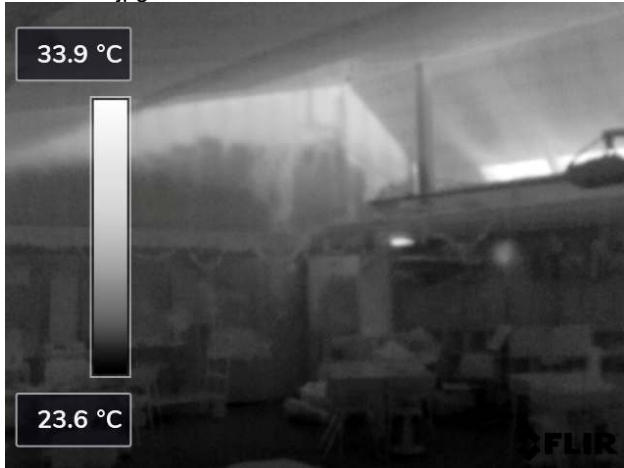
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6/18/2022 9:11:26 AM



FLIR8815.jpg

6/18/2022 9:11:50 AM



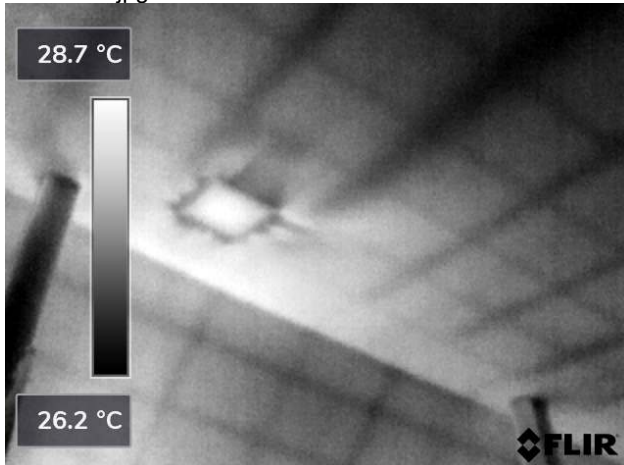
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6/18/2022 9:11:50 AM



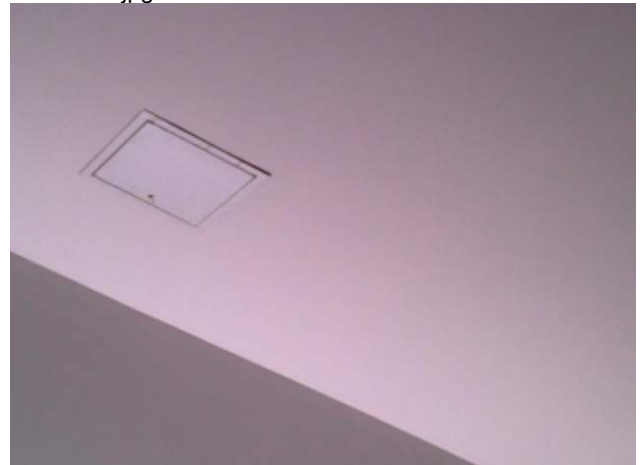
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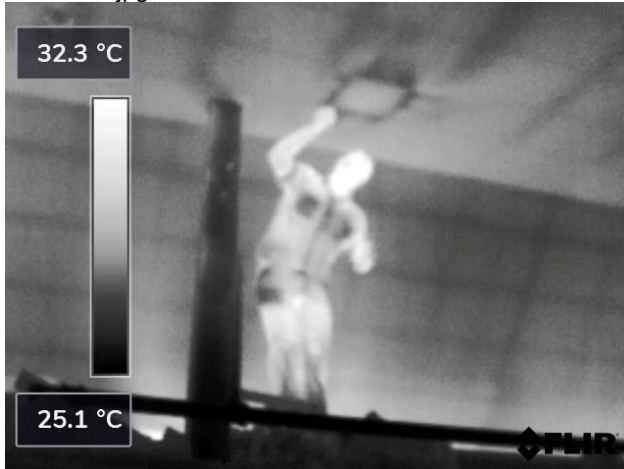
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FLIR8817.jpg

6/18/2022 9:14:57 AM



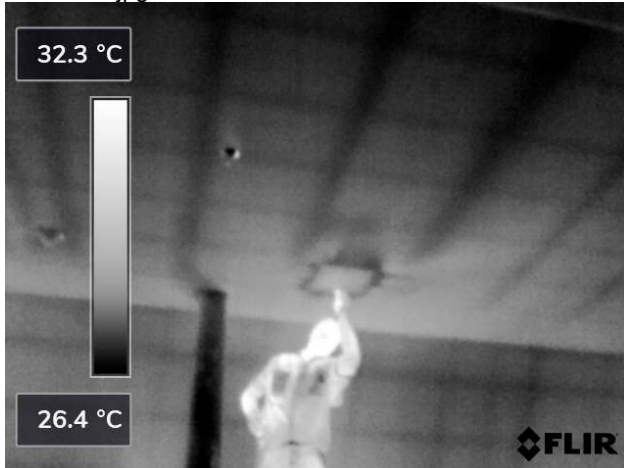
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FLIR8818.jpg

6/18/2022 9:15:25 AM



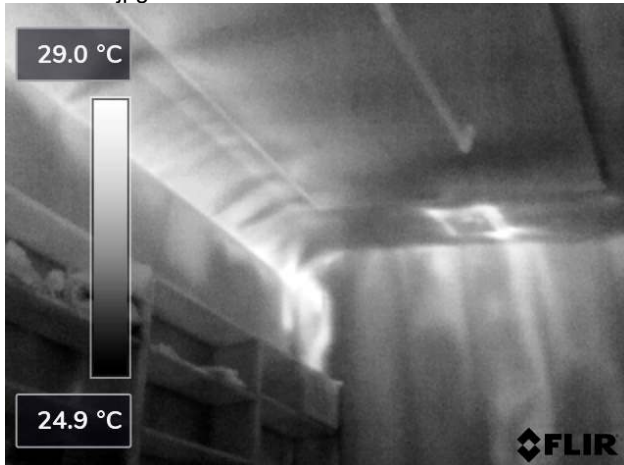
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6/18/2022 9:15:25 AM



FLIR8819.jpg

6/18/2022 9:16:26 AM



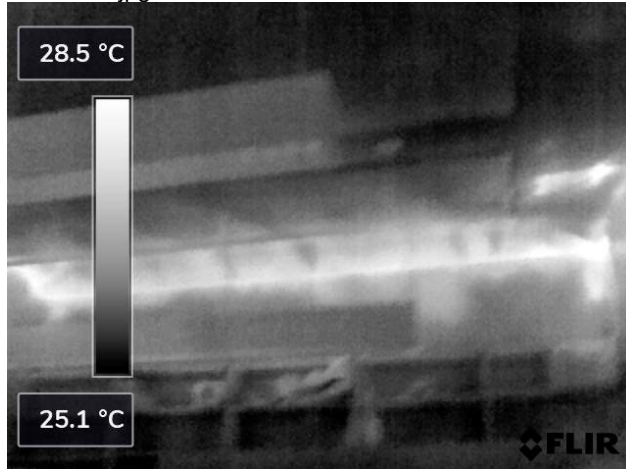
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6/18/2022 9:16:26 AM



FLIR8820.jpg

6/18/2022 9:16:37 AM



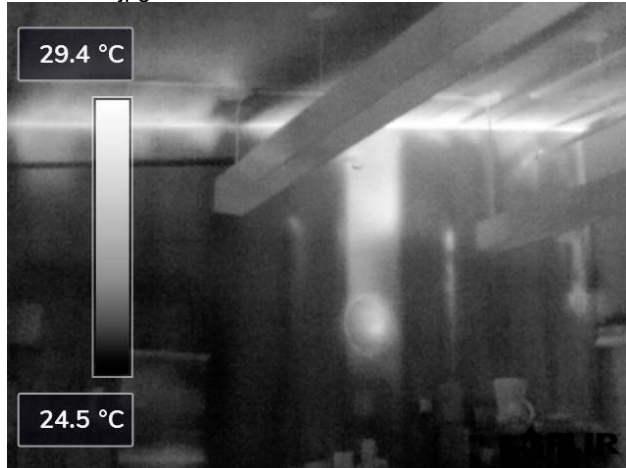
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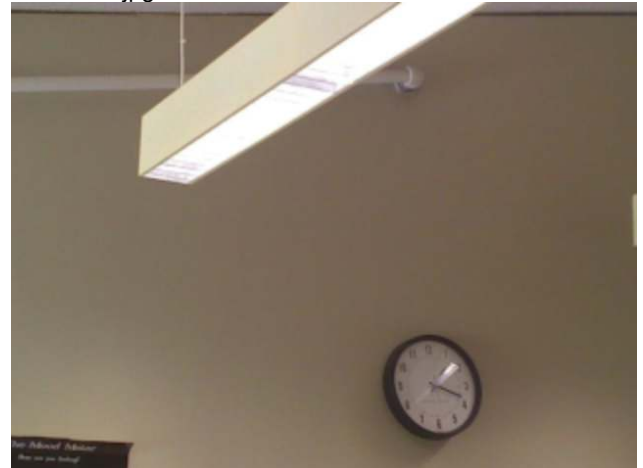
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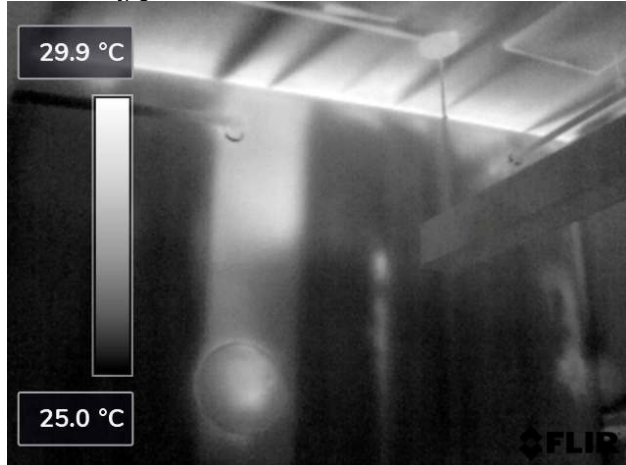
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FLIR8822.jpg

6/18/2022 9:17:04 AM



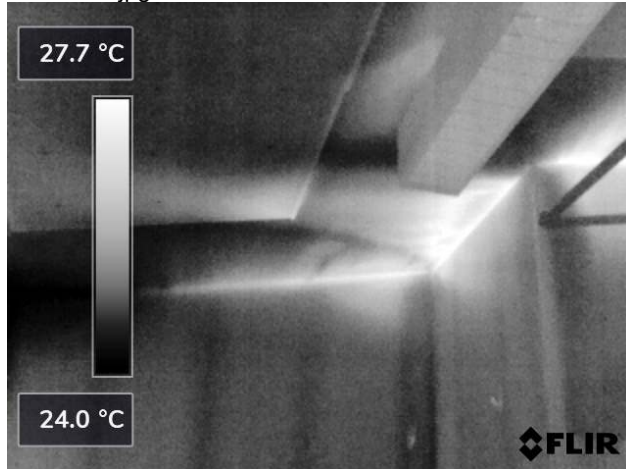
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FLIR8823.jpg

6/18/2022 9:17:12 AM



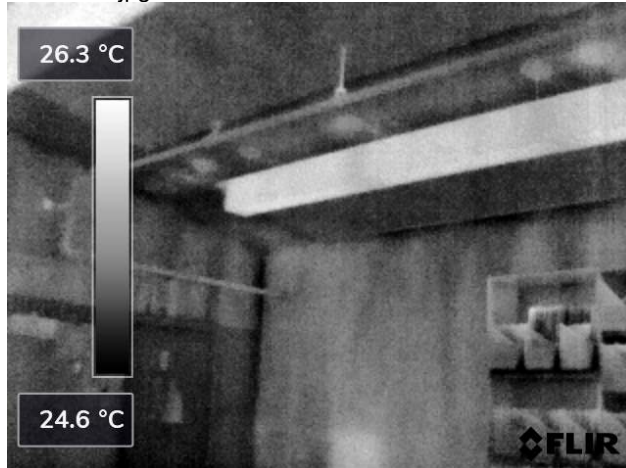
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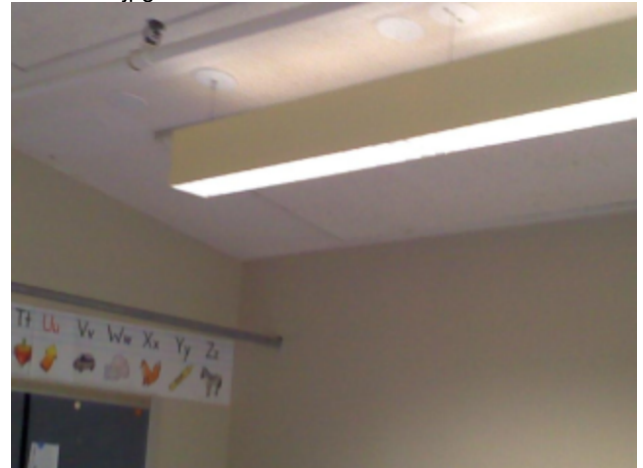
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6/18/2022 9:17:24 AM



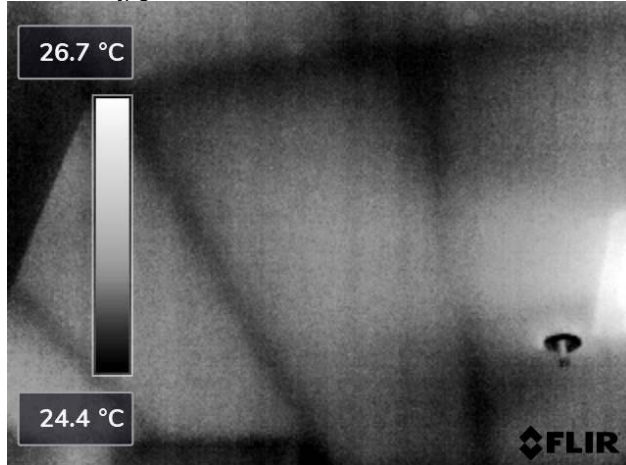
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FLIR8825.jpg

6/18/2022 9:17:52 AM



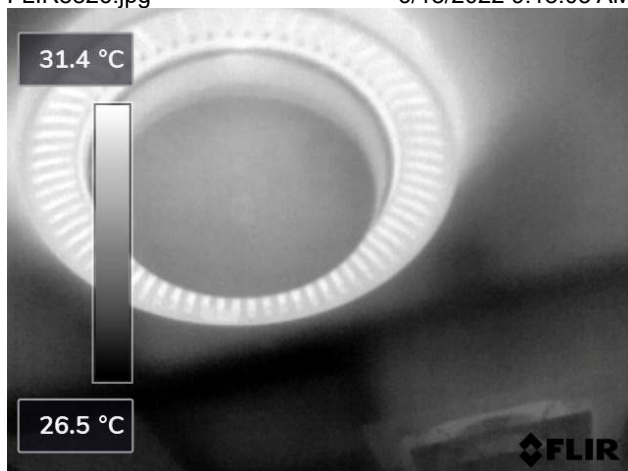
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FLIR8826.jpg

6/18/2022 9:18:03 AM



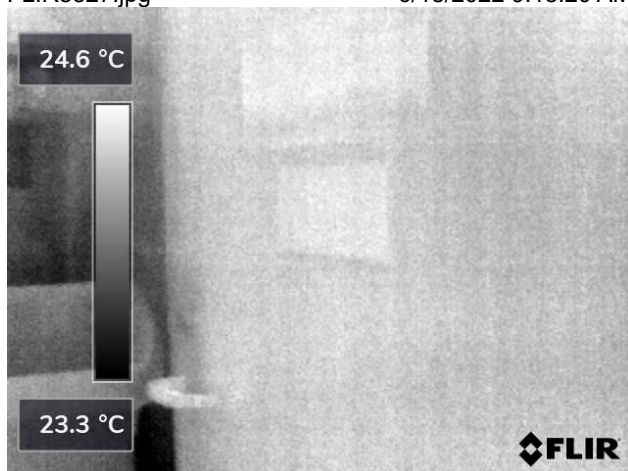
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6/18/2022 9:18:03 AM



FLIR8827.jpg

6/18/2022 9:18:20 AM



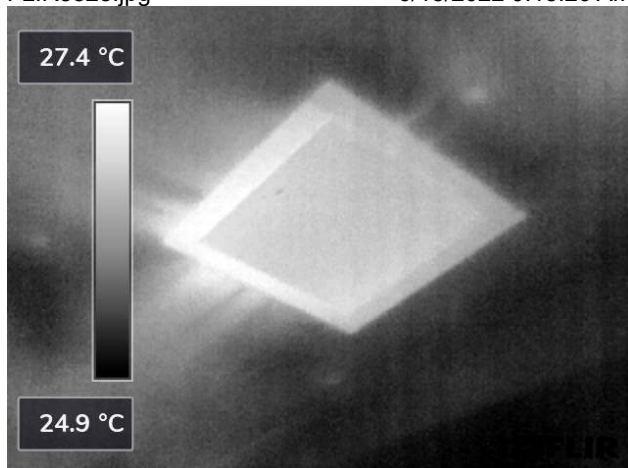
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6/18/2022 9:18:20 AM



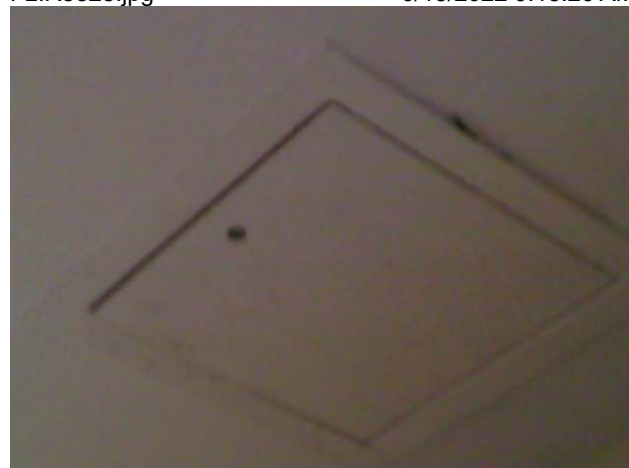
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6/18/2022 9:18:26 AM



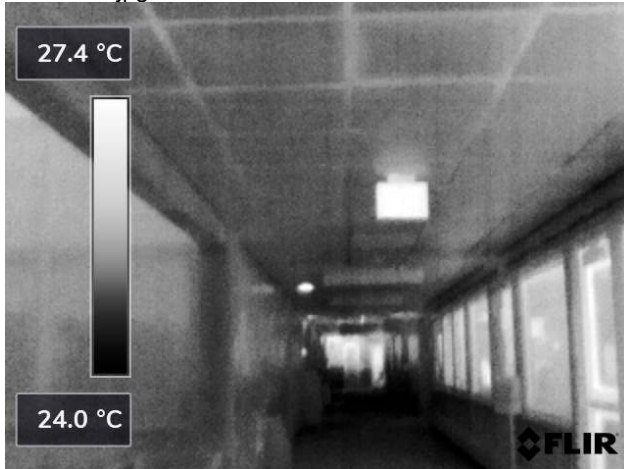
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6/18/2022 9:18:26 AM



FLIR8829.jpg

6/18/2022 9:19:11 AM



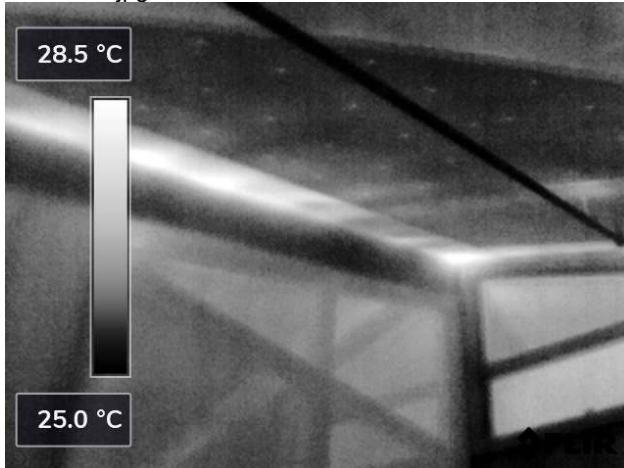
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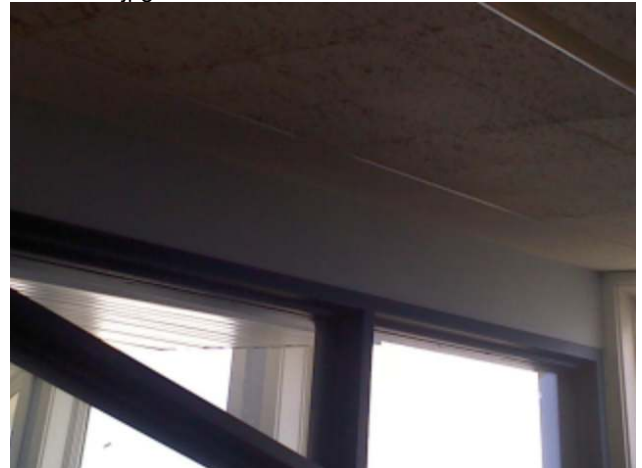
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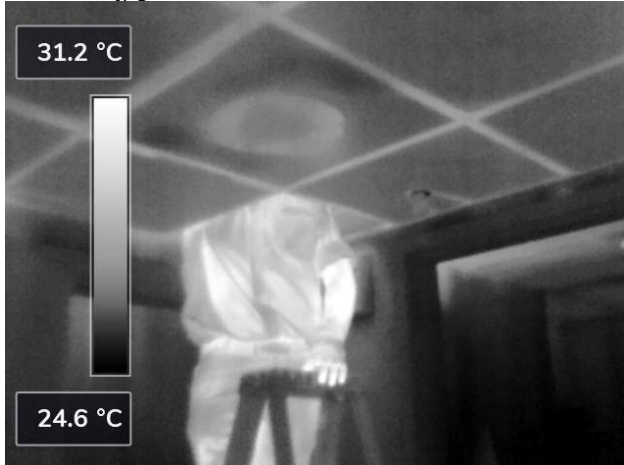
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6/18/2022 9:19:38 AM



FLIR8831.jpg

6/18/2022 9:20:10 AM



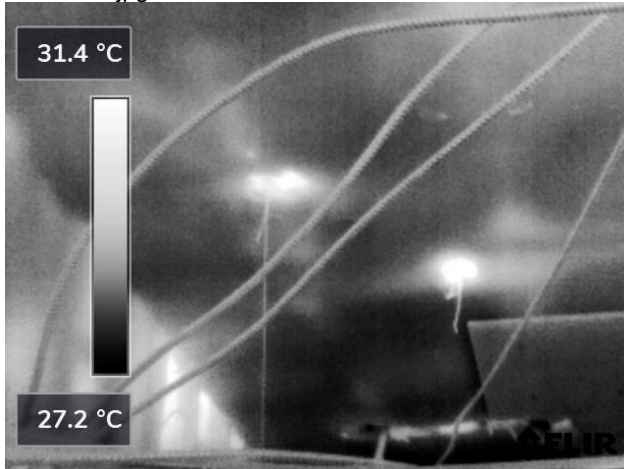
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FLIR8832.jpg

6/18/2022 9:20:22 AM



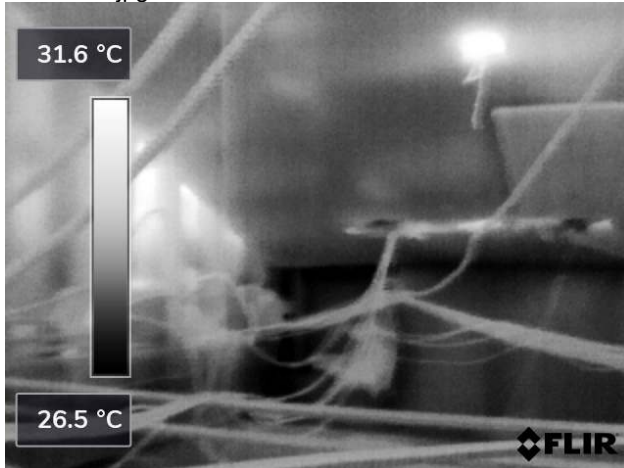
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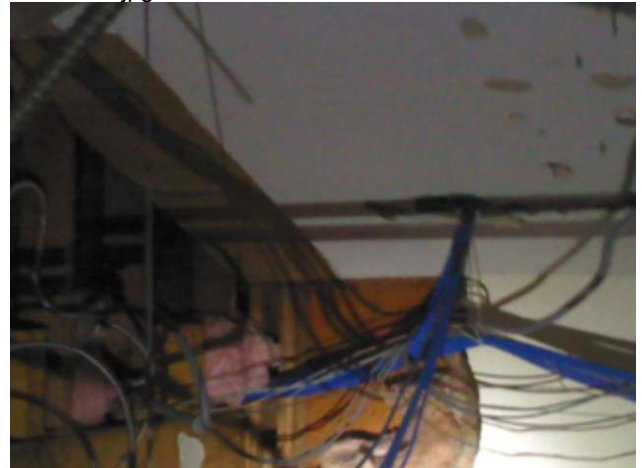
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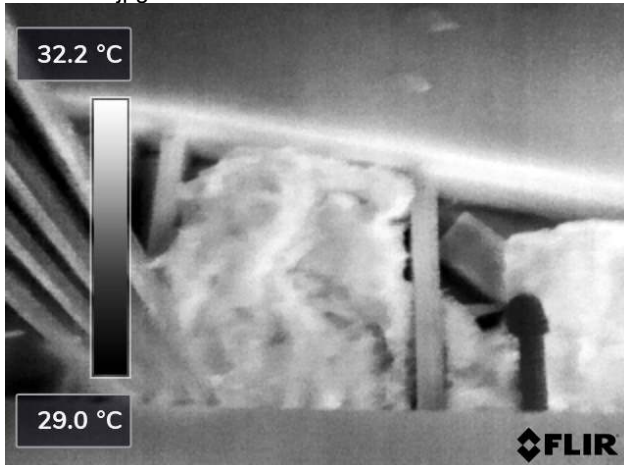
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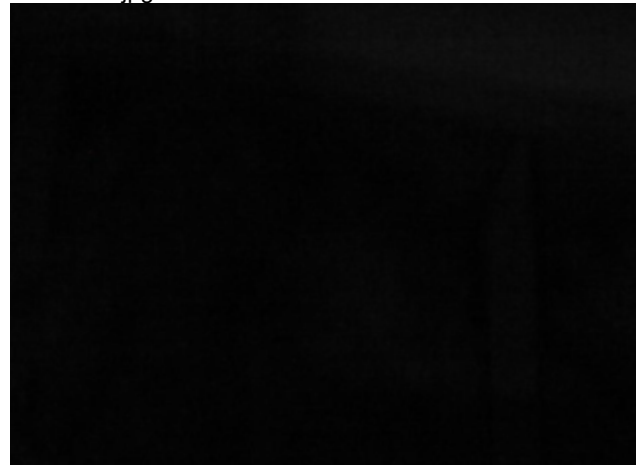
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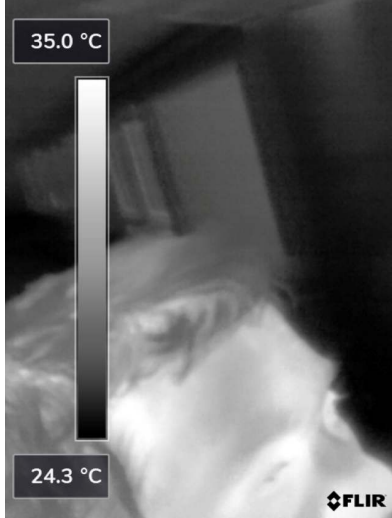


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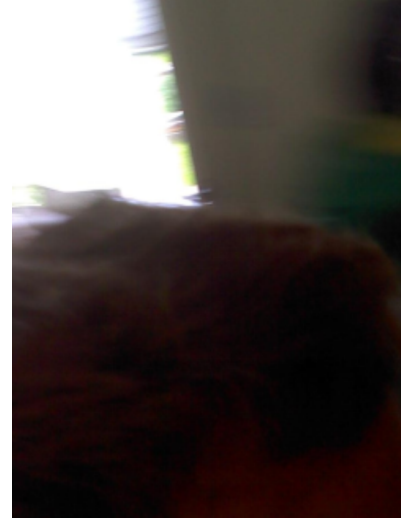
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FLIR8835.jpg 6/18/2022 9:20:49 AM

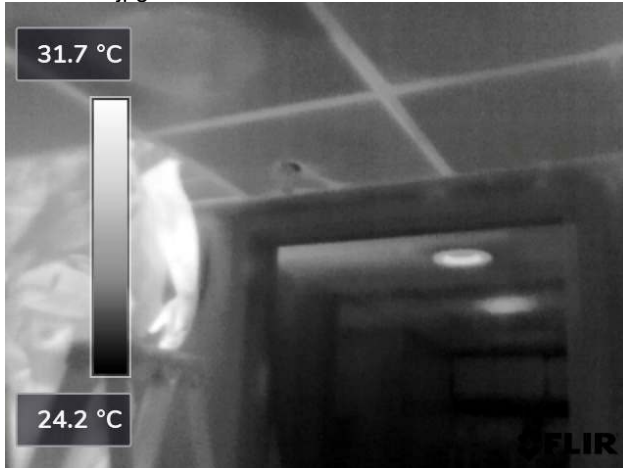


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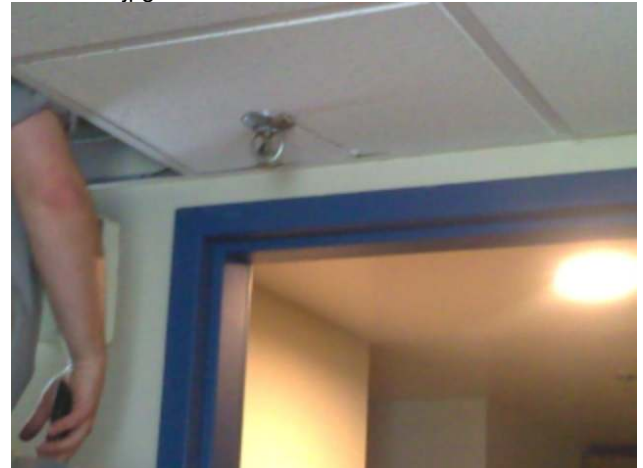
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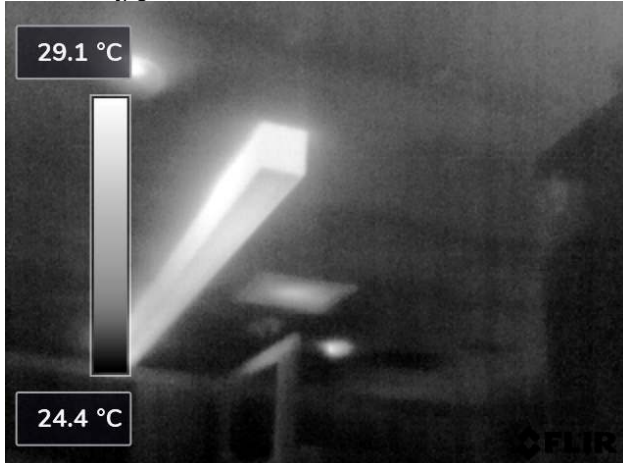
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FLIR8837.jpg

6/18/2022 9:22:06 AM



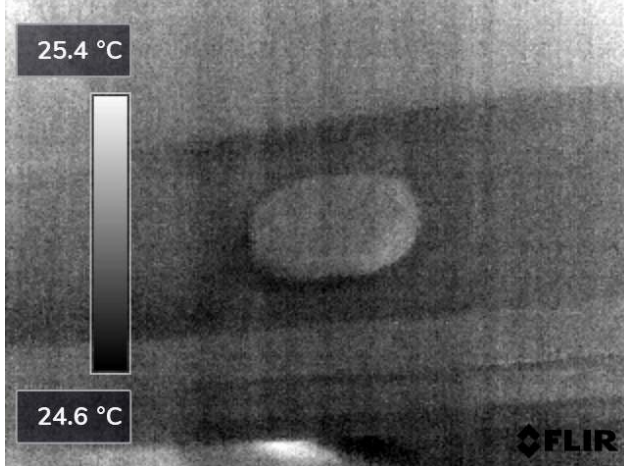
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FLIR8838.jpg

6/18/2022 9:22:12 AM



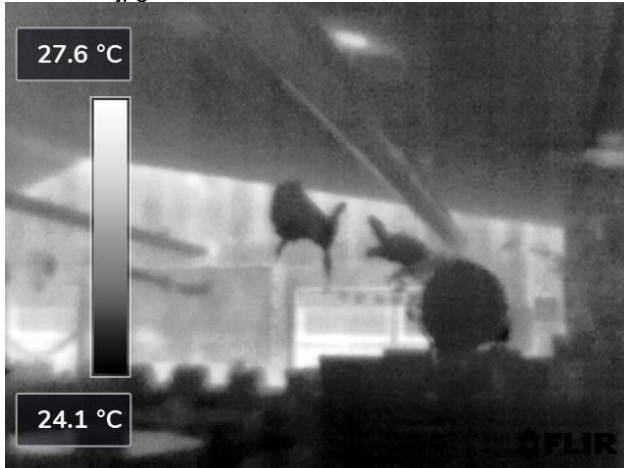
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6/18/2022 9:22:12 AM



FLIR8839.jpg

6/18/2022 9:22:21 AM



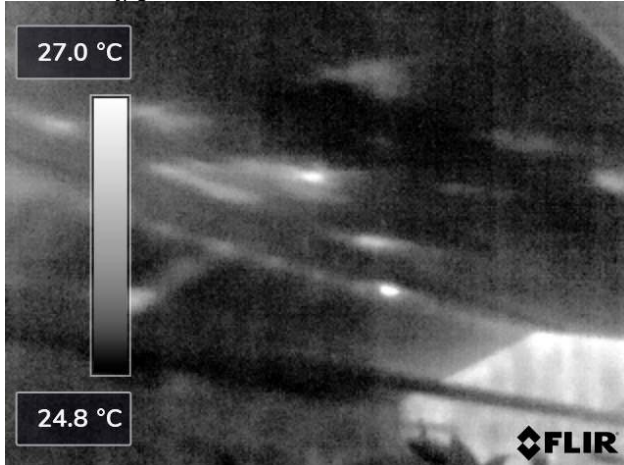
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6/18/2022 9:22:21 AM



FLIR8840.jpg

6/18/2022 9:22:30 AM



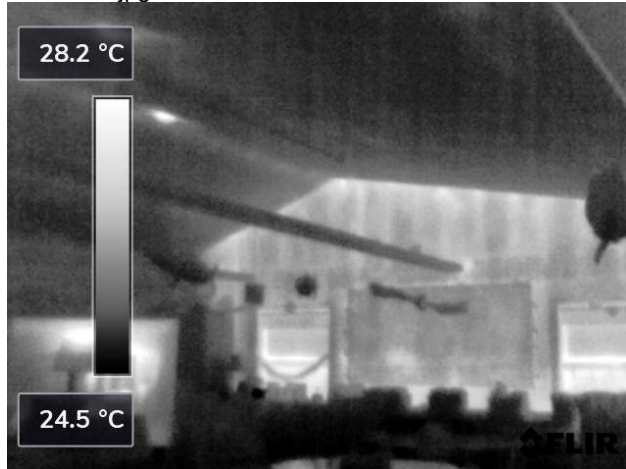
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FLIR8841.jpg

6/18/2022 9:22:39 AM



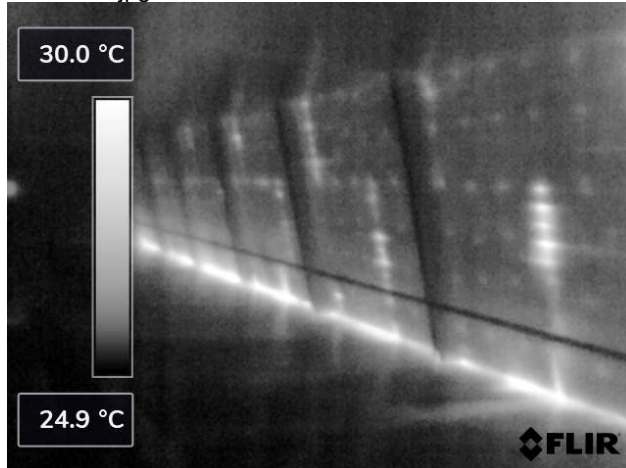
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6/18/2022 9:22:39 AM



FLIR8842.jpg

6/18/2022 9:23:15 AM



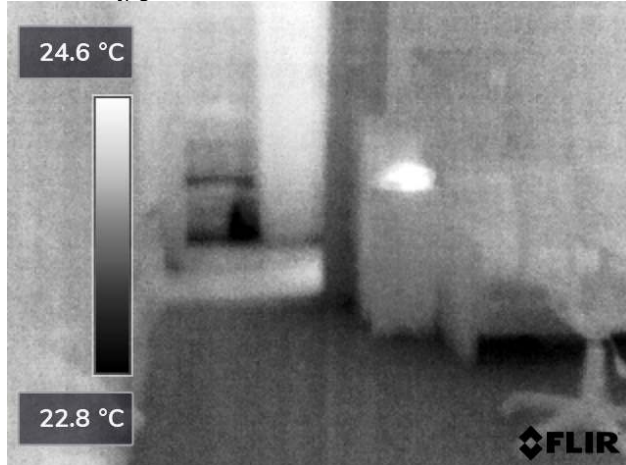
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6/18/2022 9:23:15 AM



FLIR8843.jpg

6/18/2022 9:23:47 AM



FLIR8843.jpg

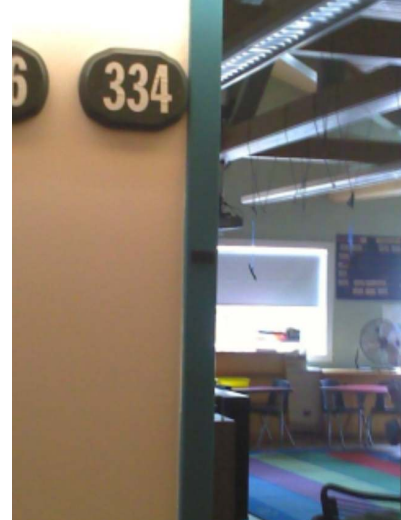
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FLIR8844.jpg 6/18/2022 9:24:06 AM



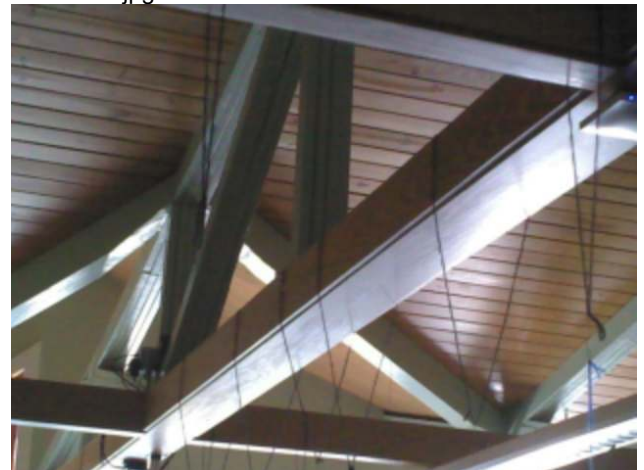
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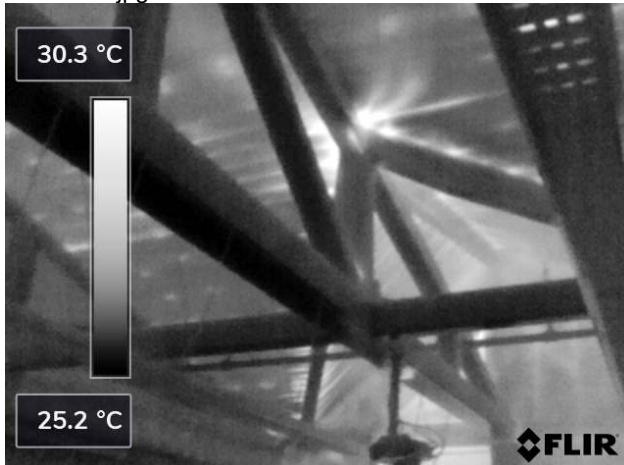
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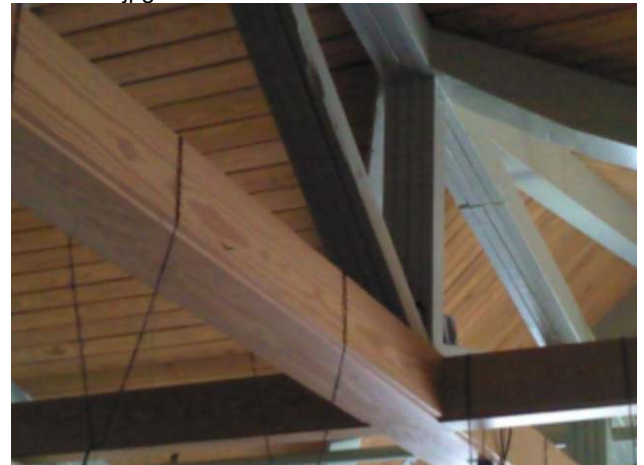
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FLIR8846.jpg 6/18/2022 9:24:24 AM

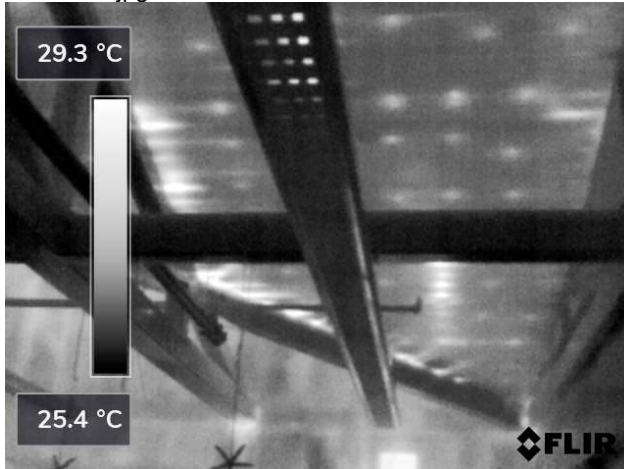


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FLIR8847.jpg

6/18/2022 9:24:31 AM



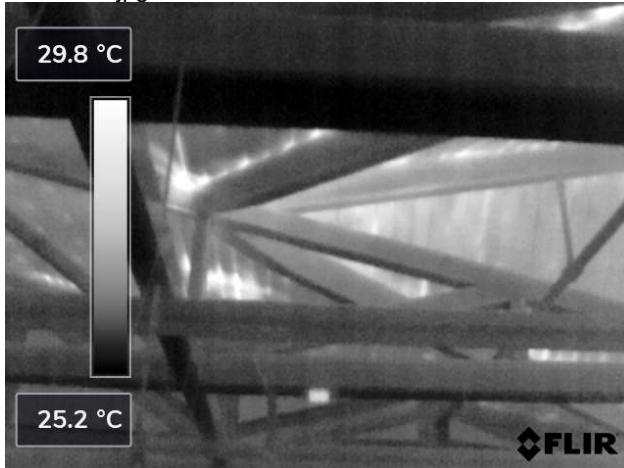
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6/18/2022 9:24:31 AM



FLIR8848.jpg

6/18/2022 9:24:39 AM



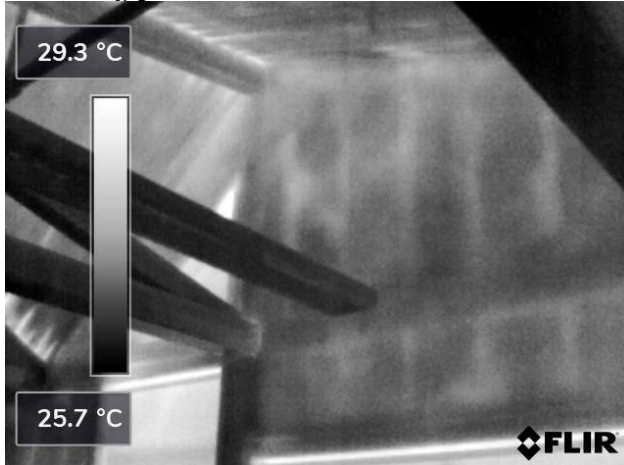
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FLIR8849.jpg

6/18/2022 9:24:49 AM

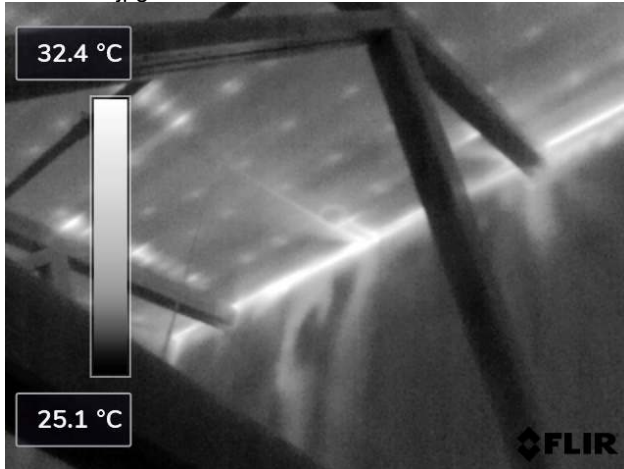


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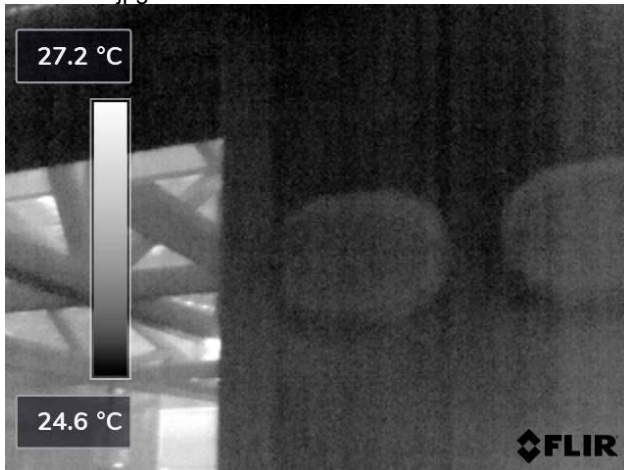
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FLIR8850.jpg 6/18/2022 9:25:02 AM



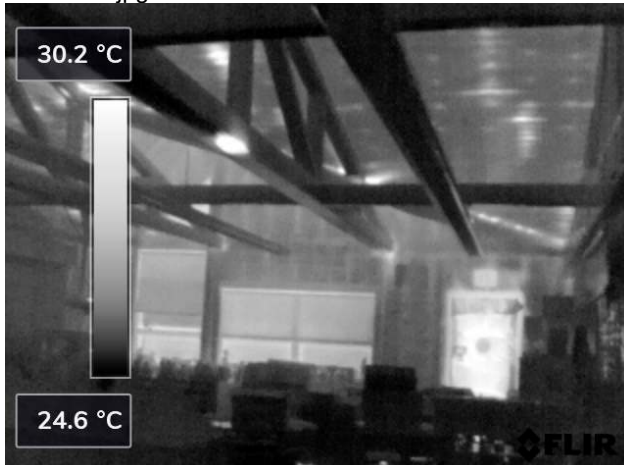
FLIR8851.jpg 6/18/2022 9:25:17 AM



FLIR8851.jpg 6/18/2022 9:25:17 AM



FLIR8852.jpg 6/18/2022 9:25:24 AM

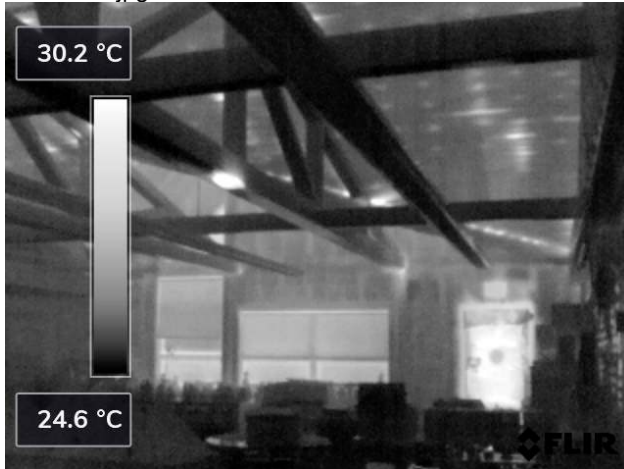


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FLIR8853.jpg

6/18/2022 9:25:33 AM



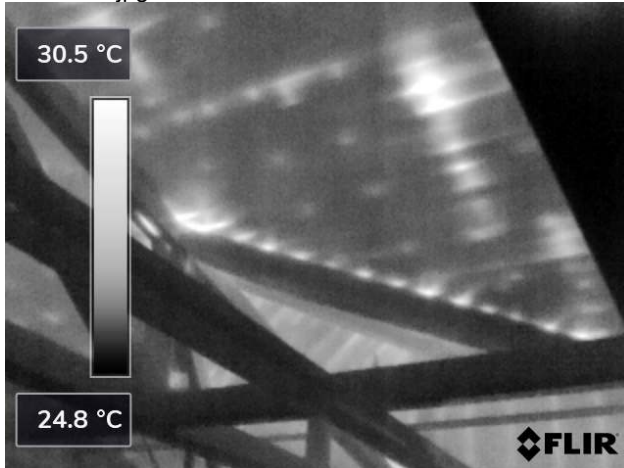
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6/18/2022 9:25:33 AM



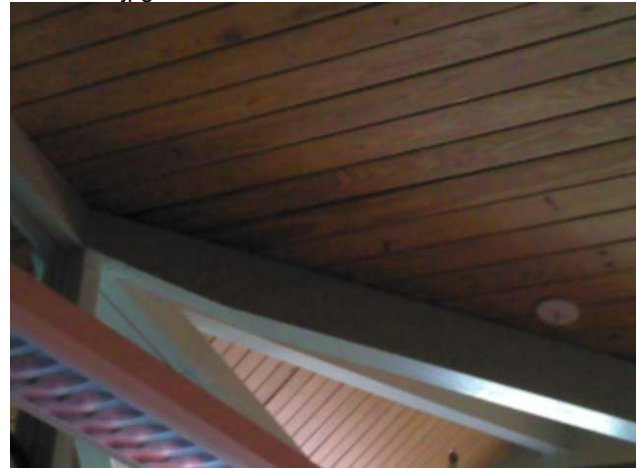
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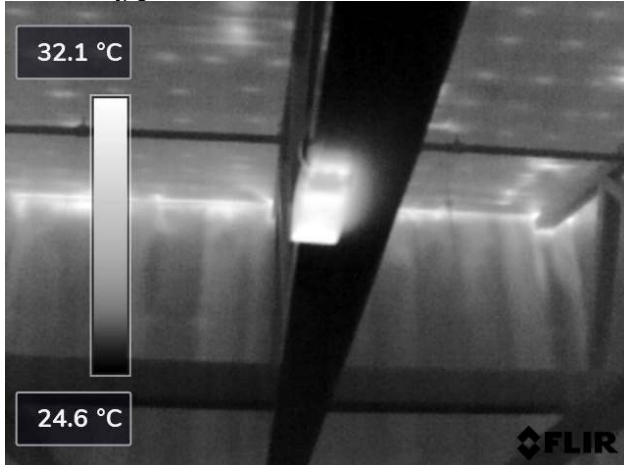
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6/18/2022 9:25:41 AM



FLIR8855.jpg

6/18/2022 9:25:48 AM



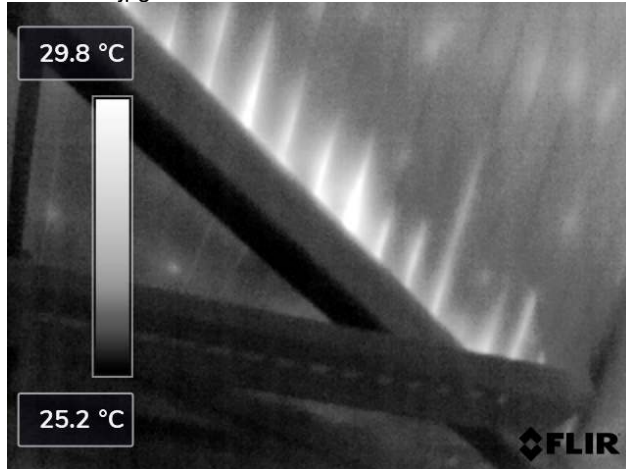
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FLIR8856.jpg

6/18/2022 9:25:59 AM



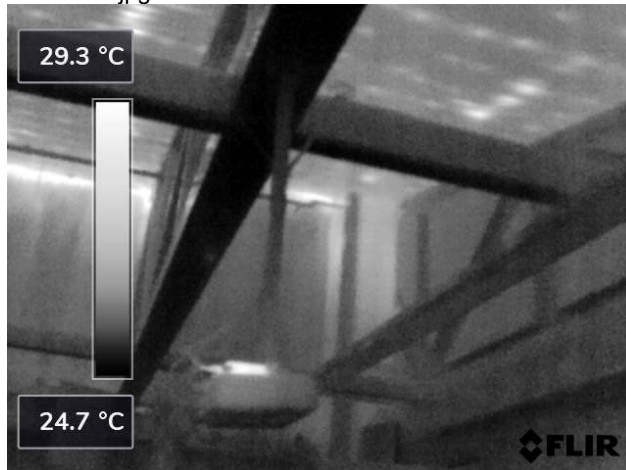
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6/18/2022 9:25:59 AM



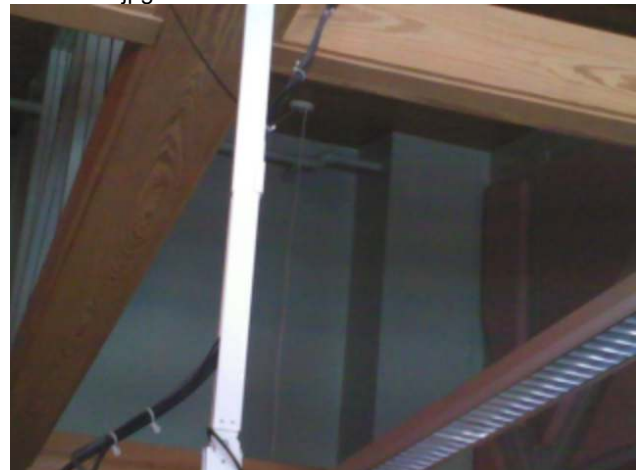
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6/18/2022 9:26:14 AM



FLIR8857.jpg

6/18/2022 9:26:14 AM



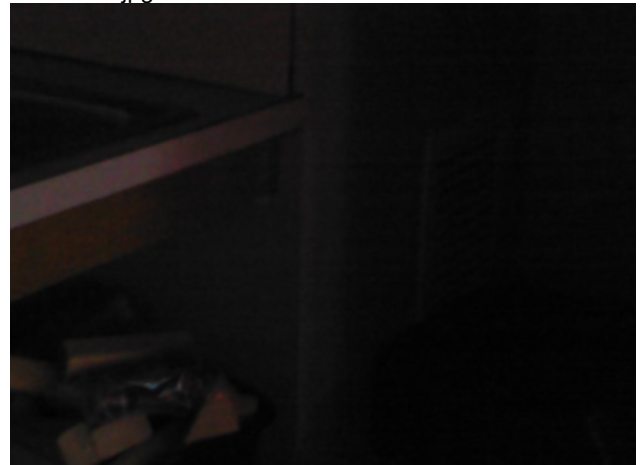
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6/18/2022 9:26:25 AM



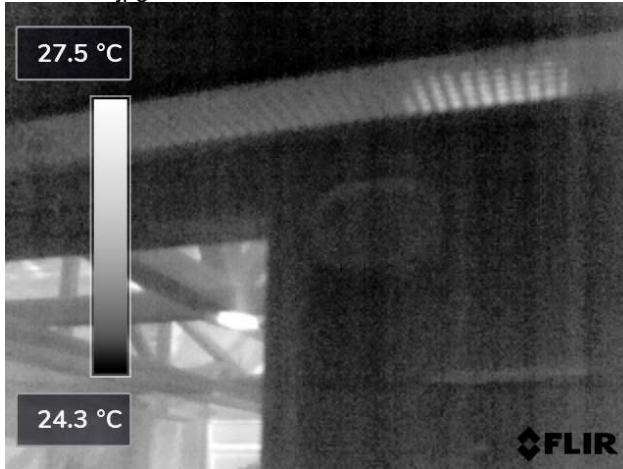
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6/18/2022 9:26:25 AM



FLIR8859.jpg

6/18/2022 9:26:50 AM



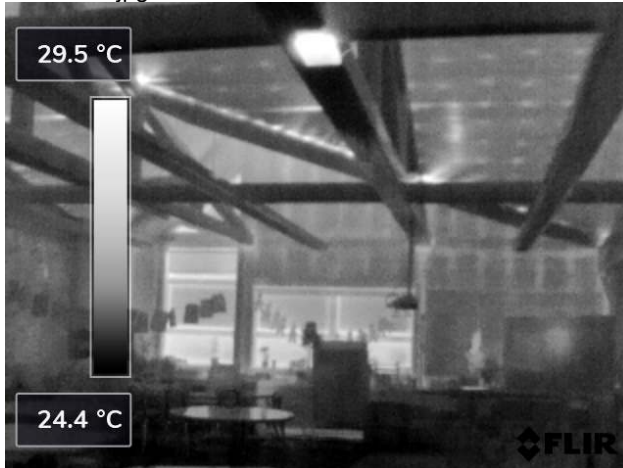
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6/18/2022 9:26:50 AM



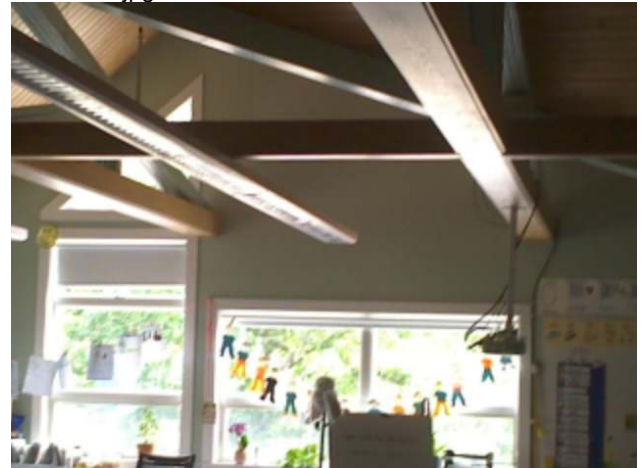
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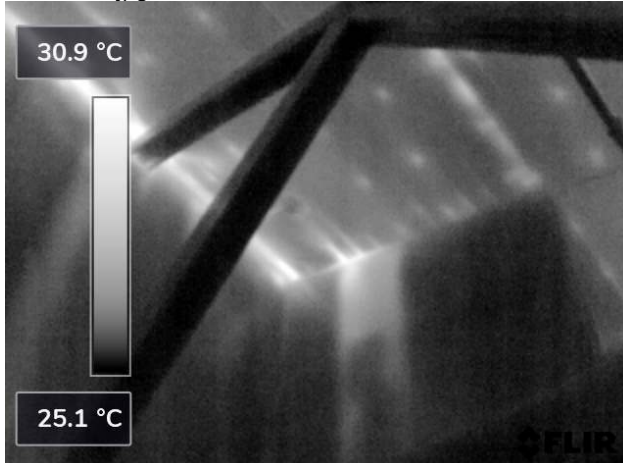
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6/18/2022 9:27:01 AM



FLIR8861.jpg

6/18/2022 9:27:16 AM

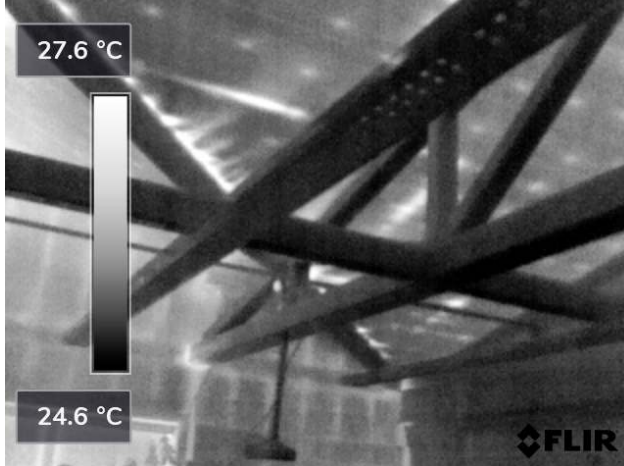


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6/18/2022 9:27:16 AM



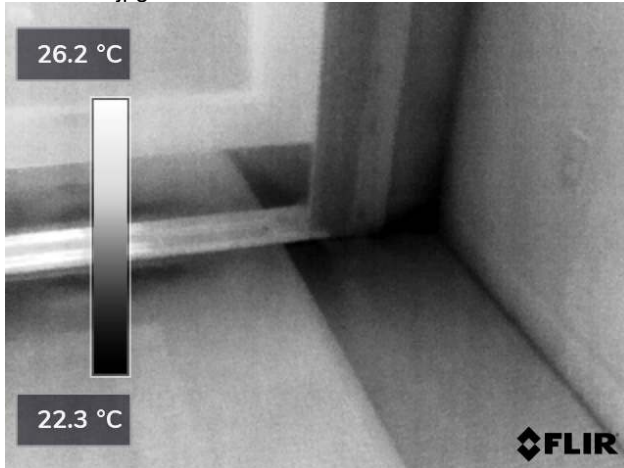
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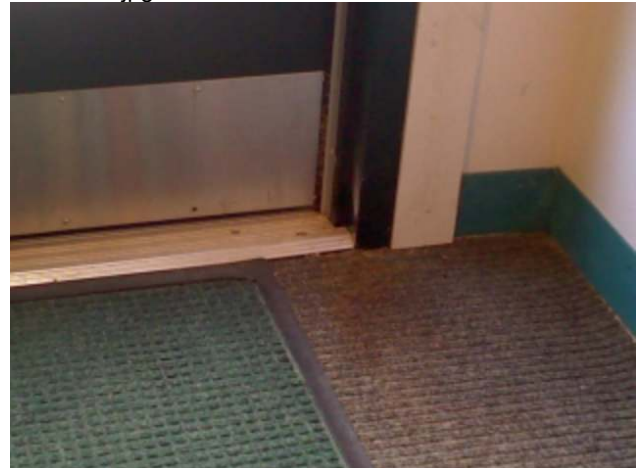
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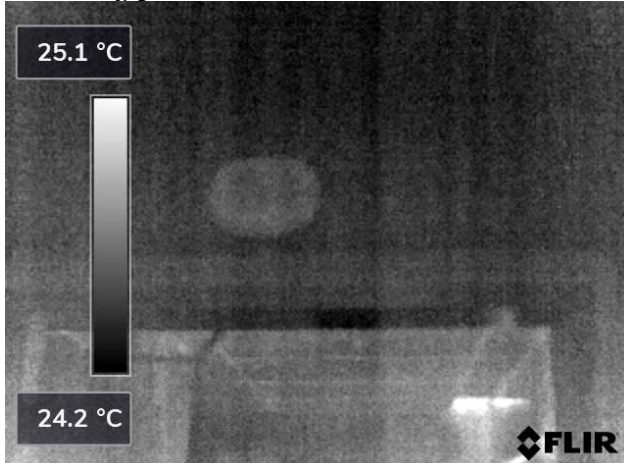
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FLIR8863.jpg 6/18/2022 9:27:47 AM



FLIR8864.jpg 6/18/2022 9:27:54 AM

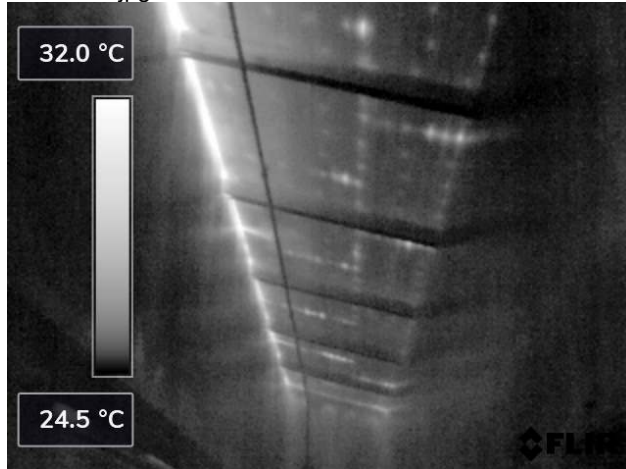


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FLIR8865.jpg

6/18/2022 9:28:14 AM



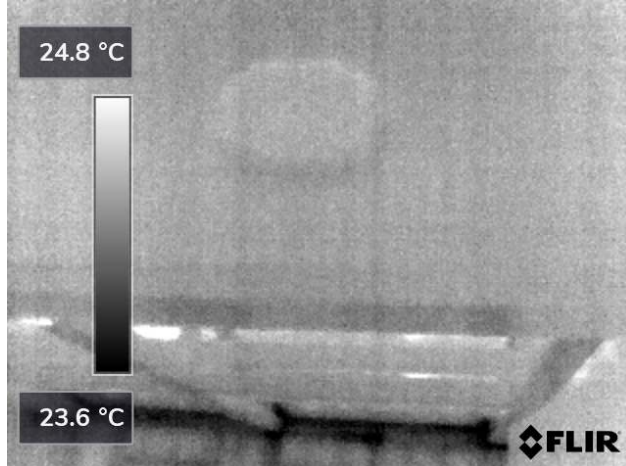
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6/18/2022 9:28:14 AM



FLIR8866.jpg

6/18/2022 9:28:21 AM



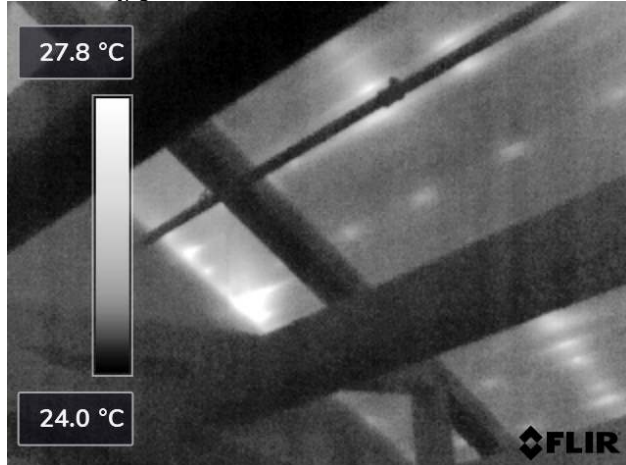
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6/18/2022 9:28:21 AM



FLIR8867.jpg

6/18/2022 9:28:40 AM



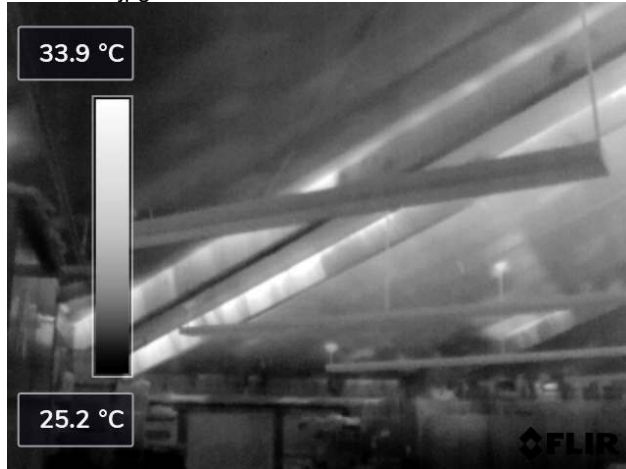
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6/18/2022 9:28:40 AM



FLIR8868.jpg

6/18/2022 9:30:22 AM



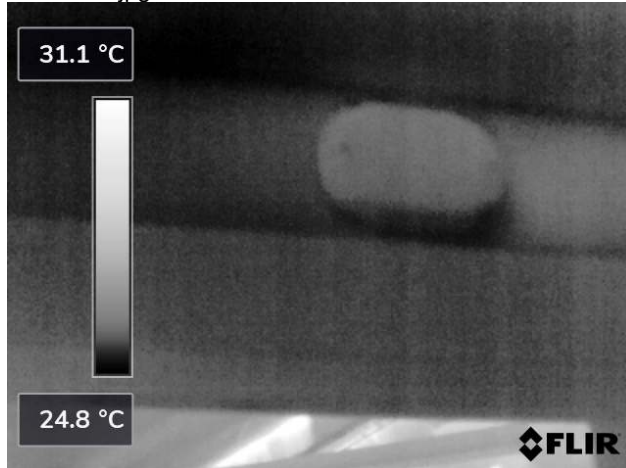
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6/18/2022 9:30:22 AM



FLIR8869.jpg

6/18/2022 9:30:31 AM



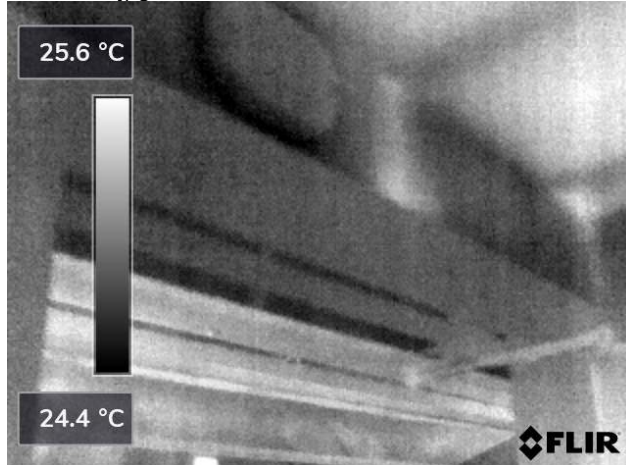
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FLIR8870.jpg

6/18/2022 9:30:40 AM



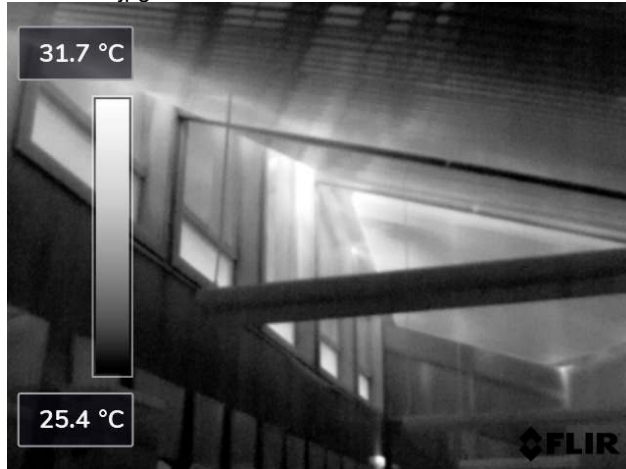
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FLIR8871.jpg

6/18/2022 9:30:47 AM



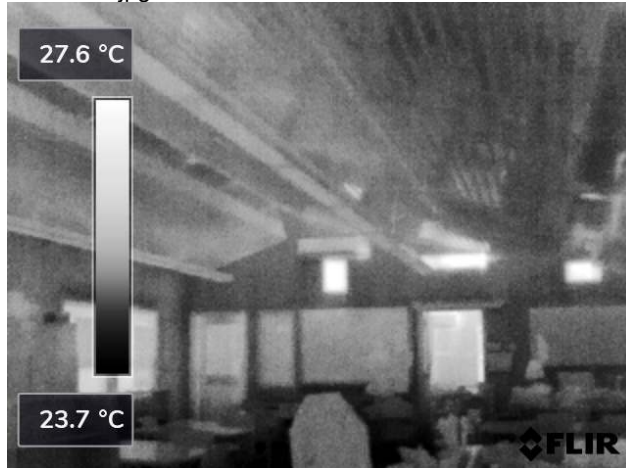
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FLIR8872.jpg

6/18/2022 9:30:54 AM



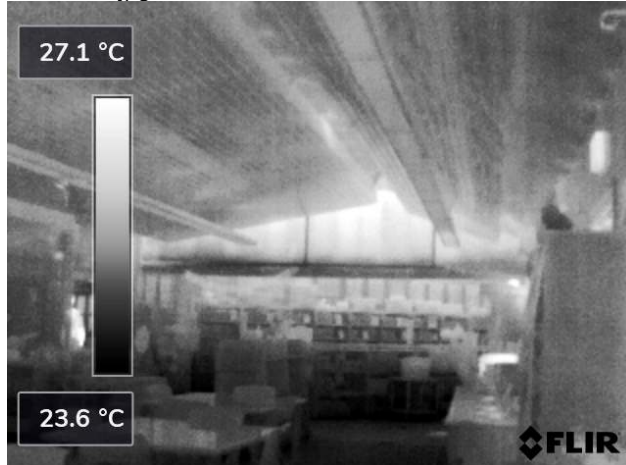
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FLIR8873.jpg

6/18/2022 9:31:37 AM



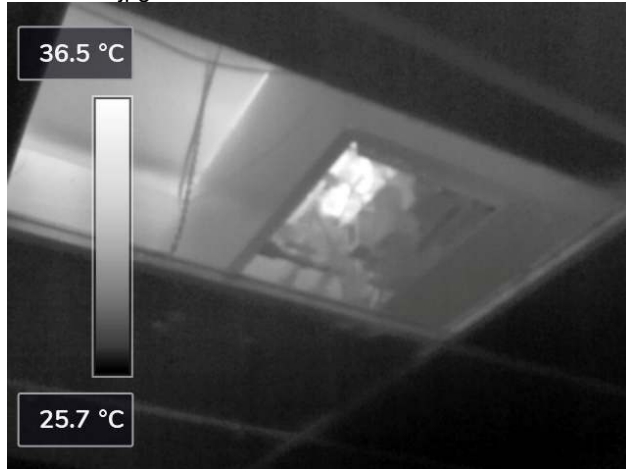
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FLIR8874.jpg

6/18/2022 9:33:04 AM



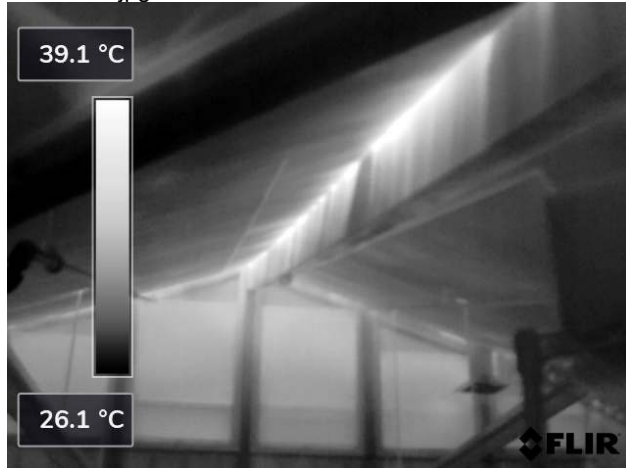
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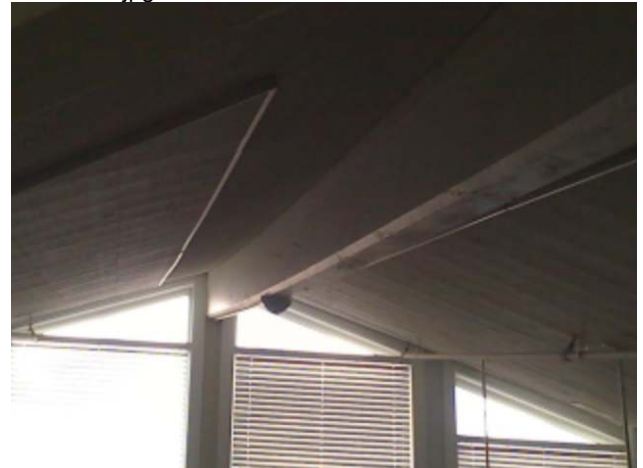
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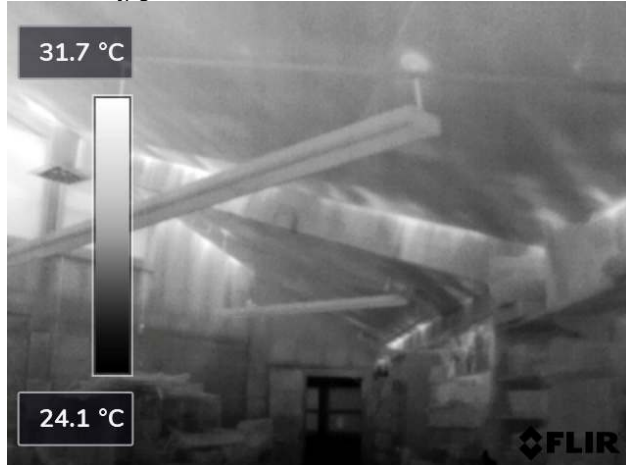
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FLIR8876.jpg

6/18/2022 9:33:27 AM



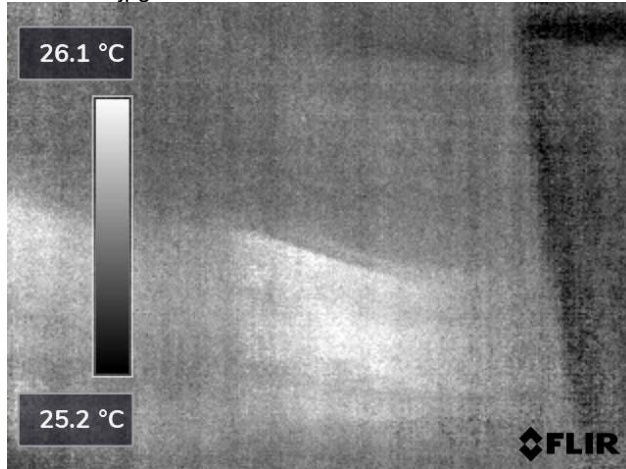
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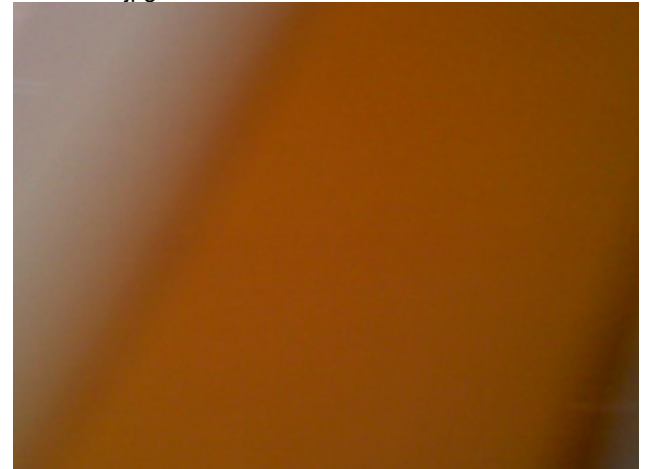
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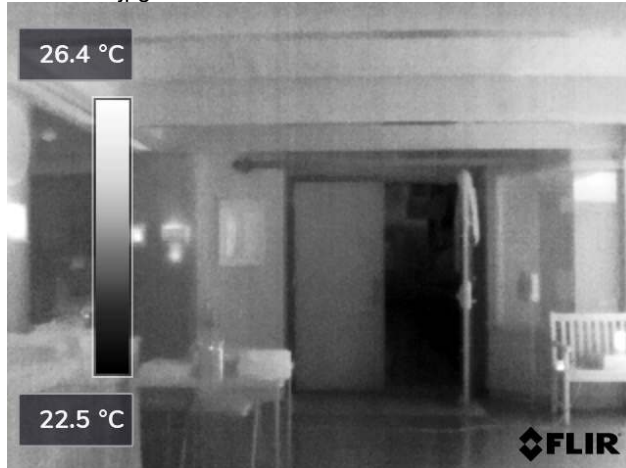
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FLIR8878.jpg

6/18/2022 9:51:25 AM



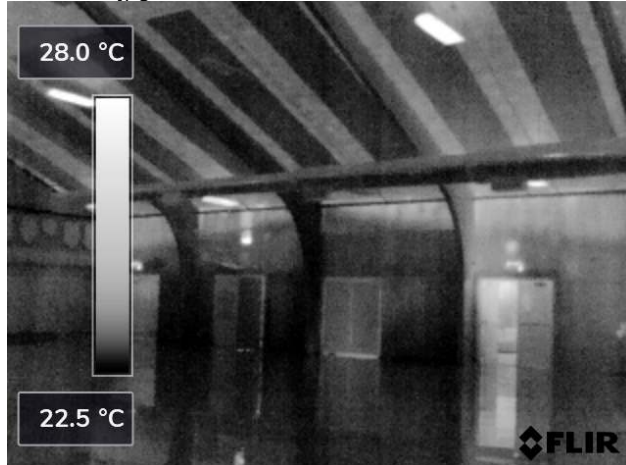
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FLIR8879.jpg

6/18/2022 9:51:40 AM



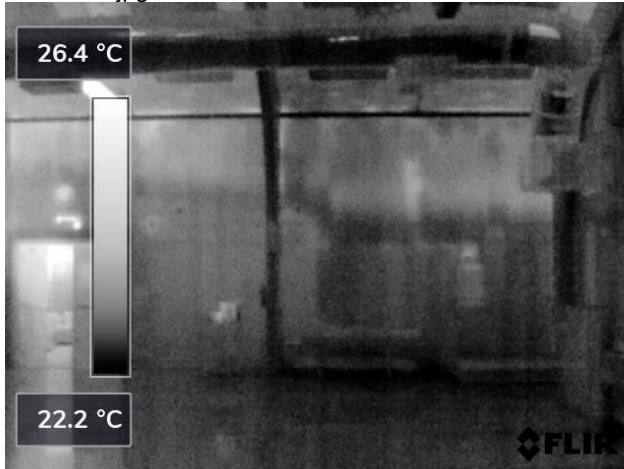
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6/18/2022 9:51:40 AM



FLIR8880.jpg

6/18/2022 9:51:55 AM



FLIR8880.jpg

6/18/2022 9:51:55 AM



FLIR8881.jpg

6/18/2022 9:52:14 AM



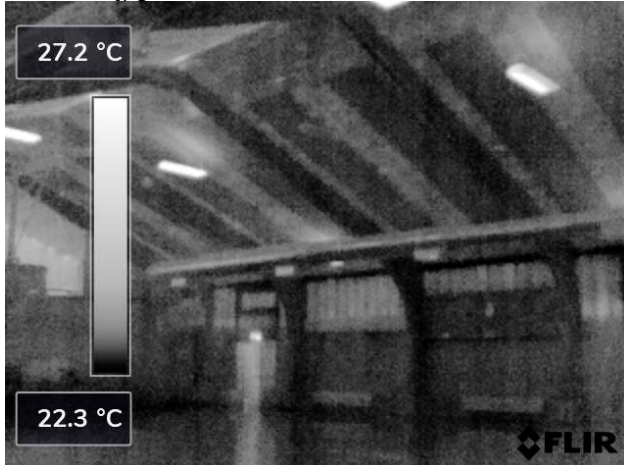
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FLIR8882.jpg

6/18/2022 9:52:34 AM



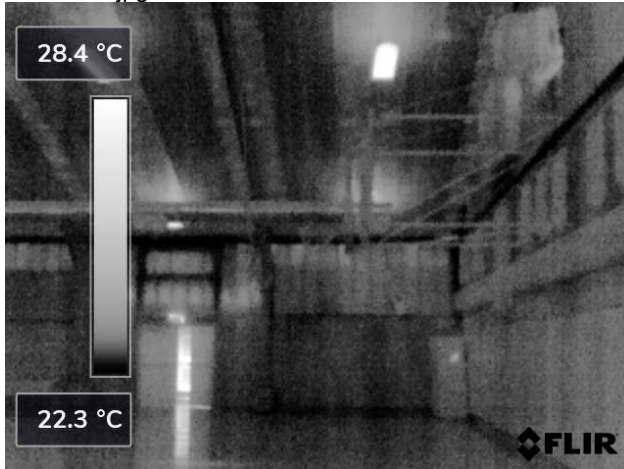
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FLIR8883.jpg

6/18/2022 9:52:43 AM



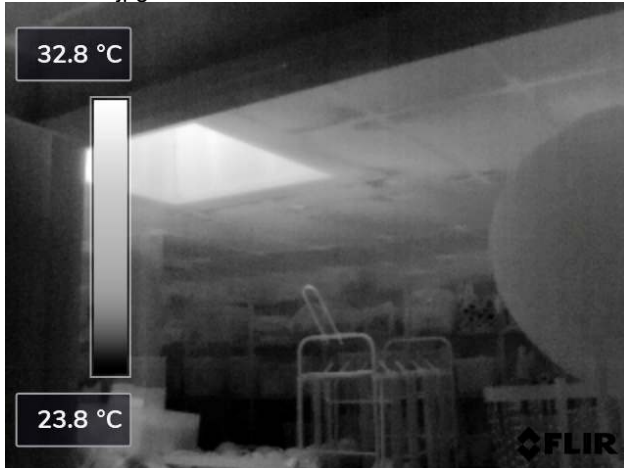
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FLIR8884.jpg

6/18/2022 9:53:02 AM



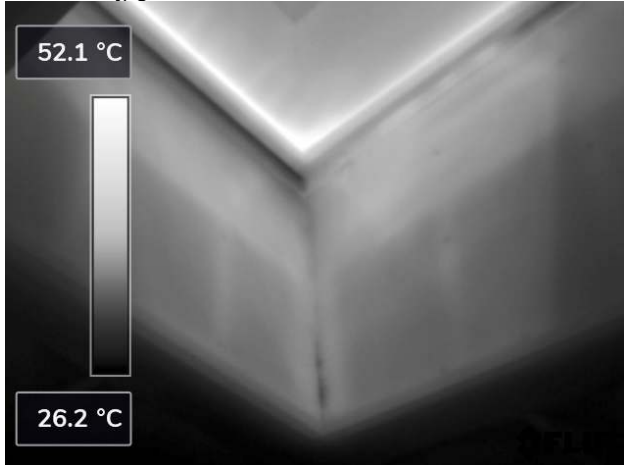
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6/18/2022 9:53:02 AM



FLIR8885.jpg

6/18/2022 9:53:17 AM



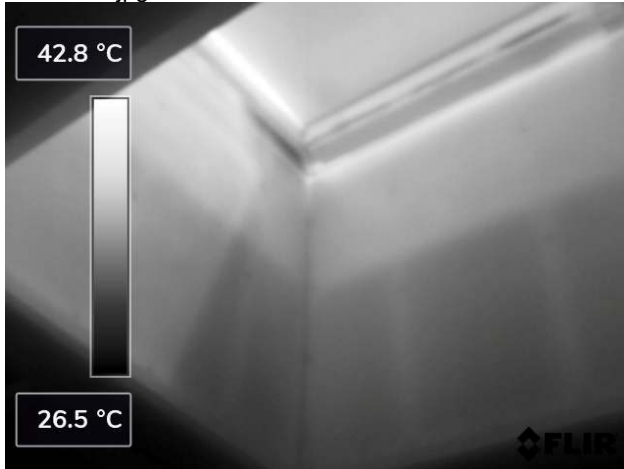
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FLIR8886.jpg

6/18/2022 9:53:26 AM



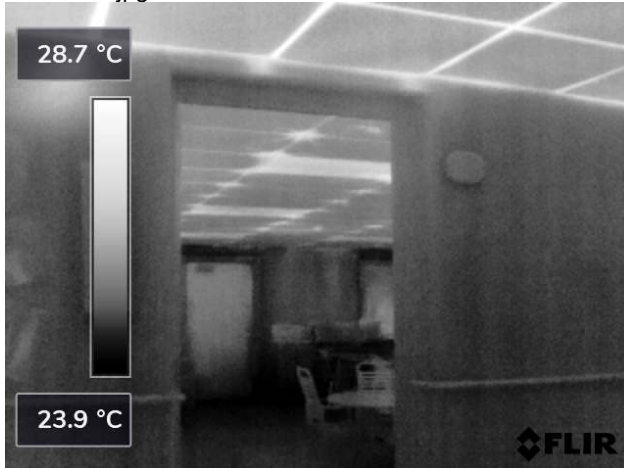
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FLIR8887.jpg

6/18/2022 9:53:40 AM



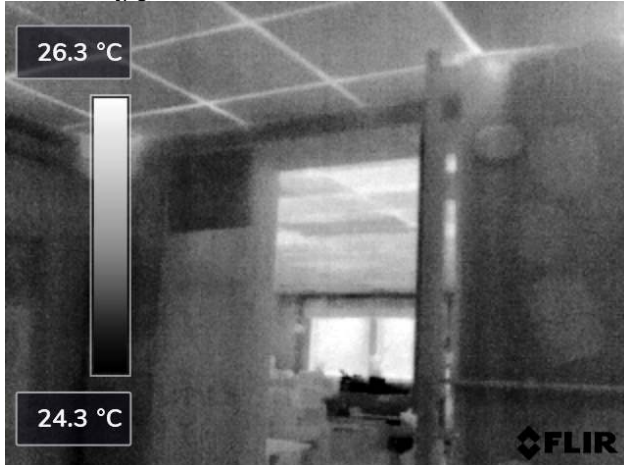
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FLIR8888.jpg

6/18/2022 9:53:48 AM



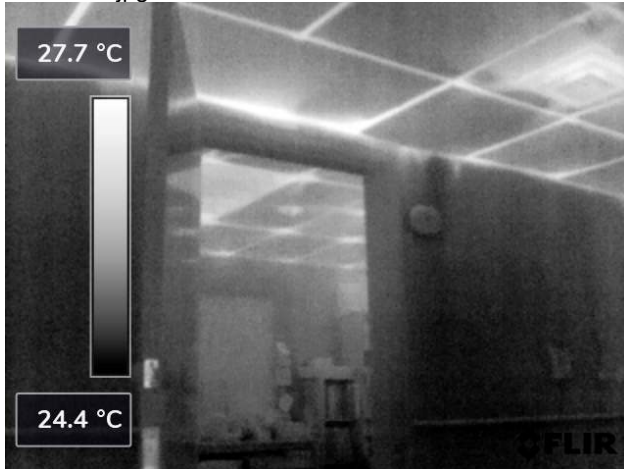
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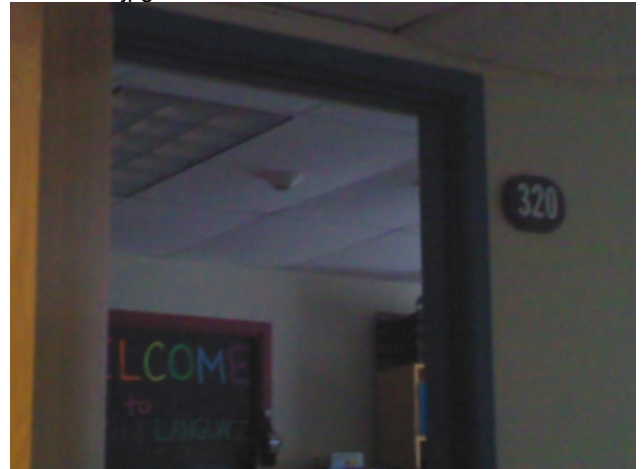
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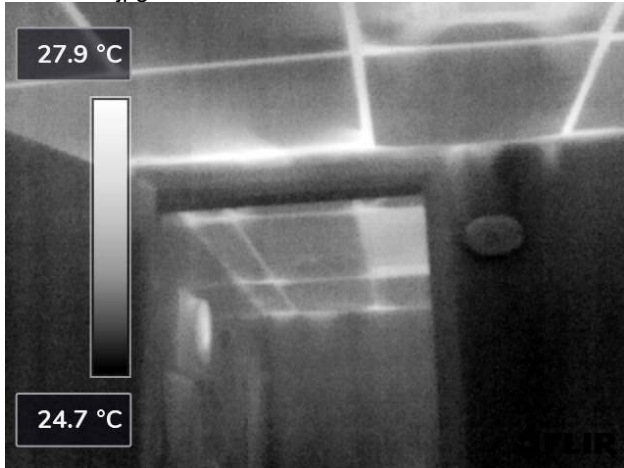
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6/18/2022 9:53:56 AM



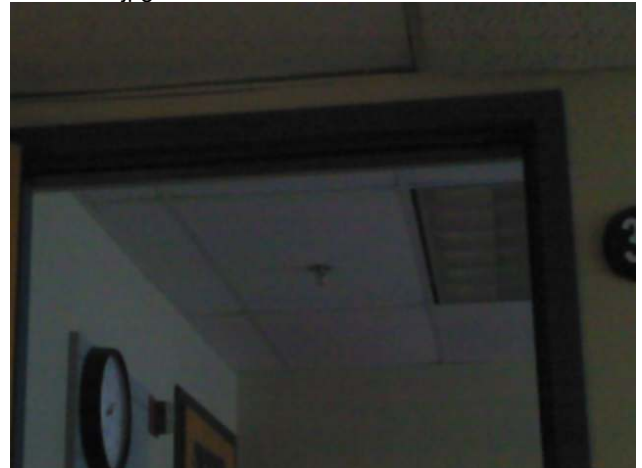
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6/18/2022 9:54:02 AM



FLIR8890.jpg

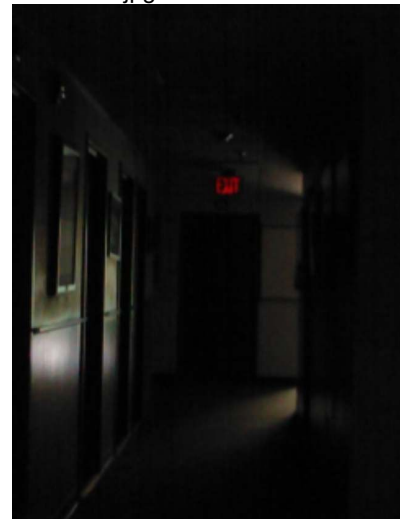
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FLIR8891.jpg 6/18/2022 9:54:09 AM

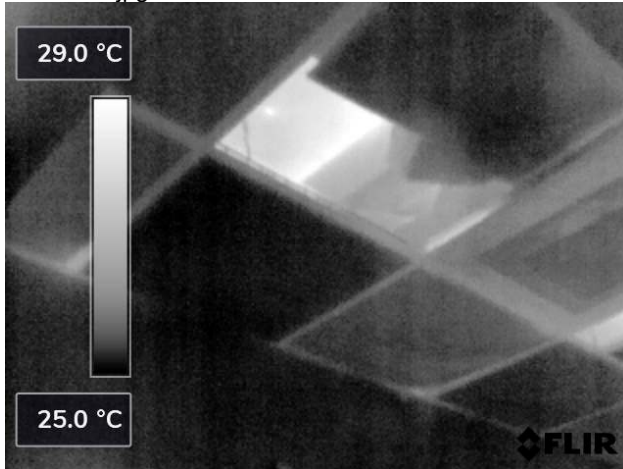


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FLIR8892.jpg

6/18/2022 9:54:26 AM



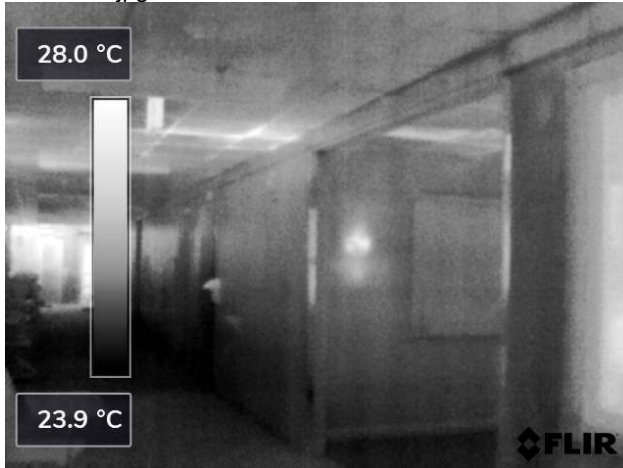
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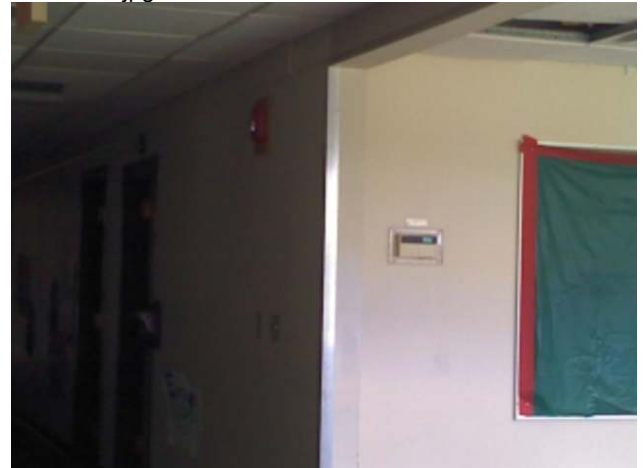
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6/18/2022 9:54:39 AM



FLIR8893.jpg

6/18/2022 9:54:39 AM



FLIR8894.jpg

6/18/2022 9:54:49 AM



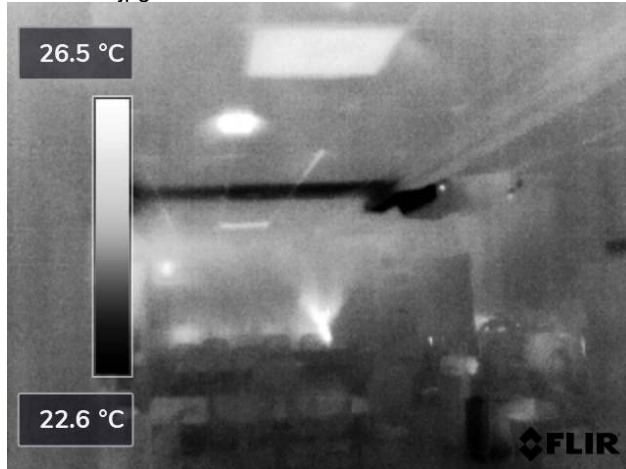
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FLIR8895.jpg

6/18/2022 9:55:01 AM



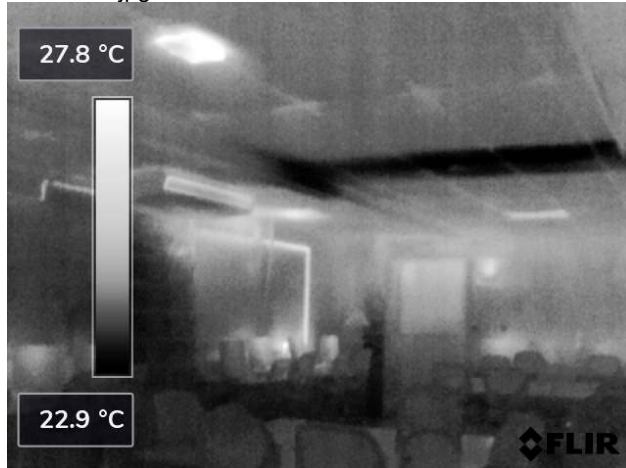
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FLIR8896.jpg

6/18/2022 9:55:10 AM



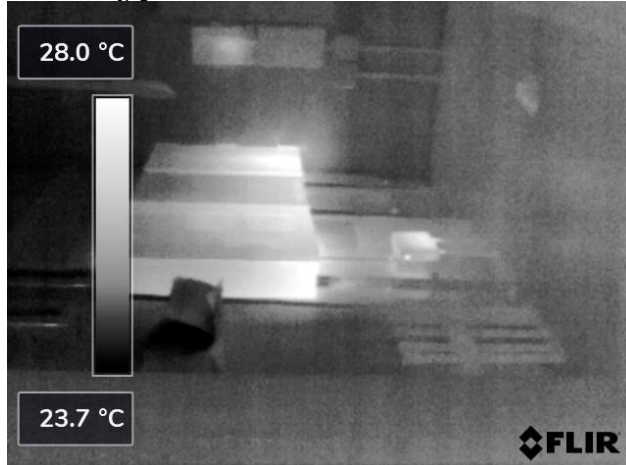
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FLIR8897.jpg

6/18/2022 9:55:27 AM

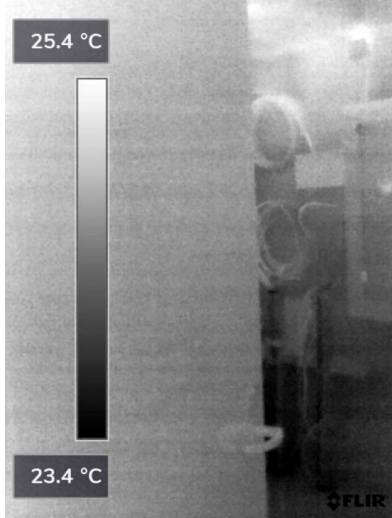


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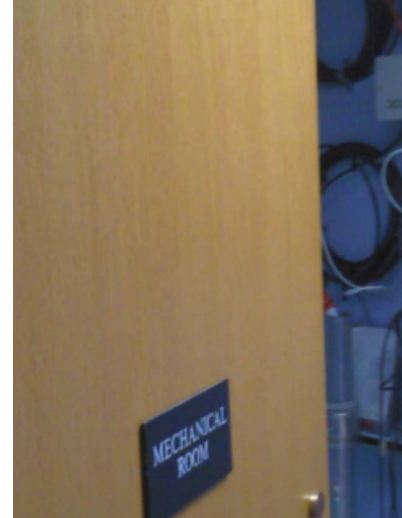
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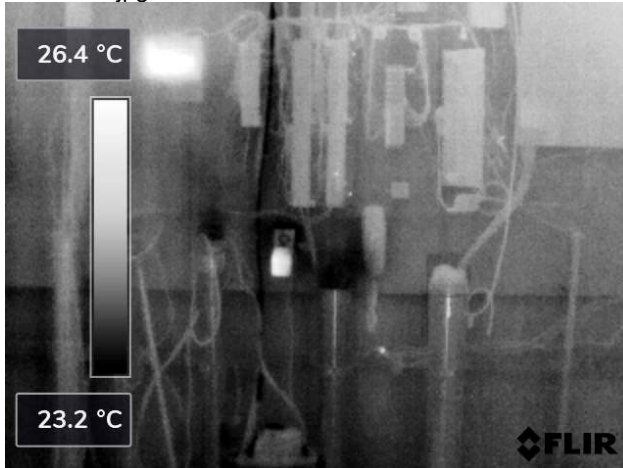


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FLIR8899.jpg

6/18/2022 9:55:43 AM

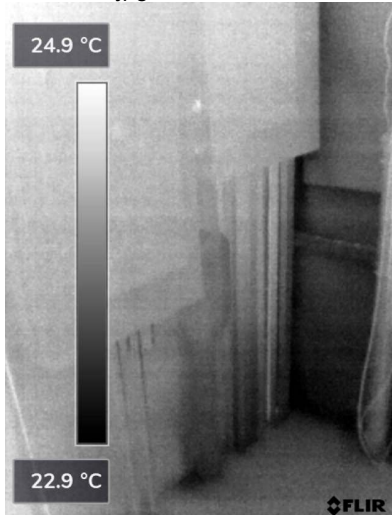


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6/18/2022 9:55:43 AM



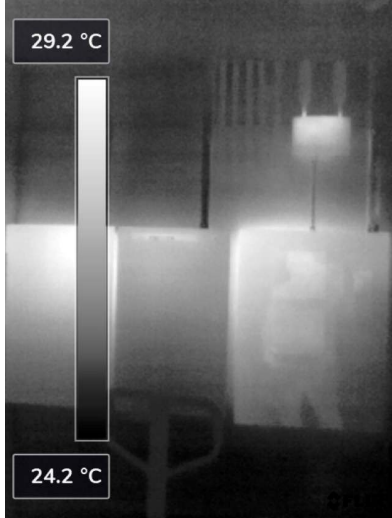
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FLIR8900.jpg 6/18/2022 9:55:55 AM



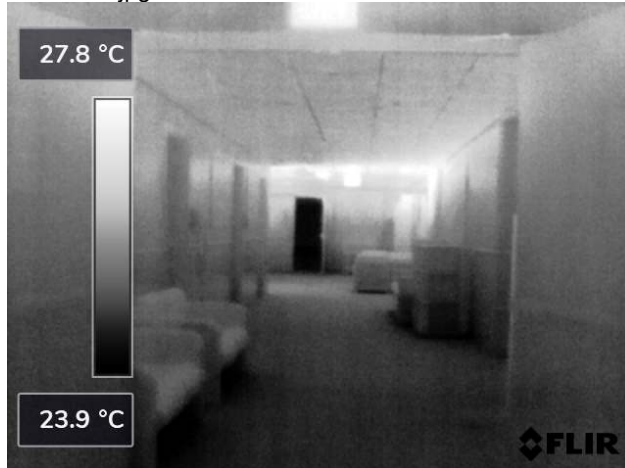
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FLIR8901.jpg 6/18/2022 9:56:08 AM



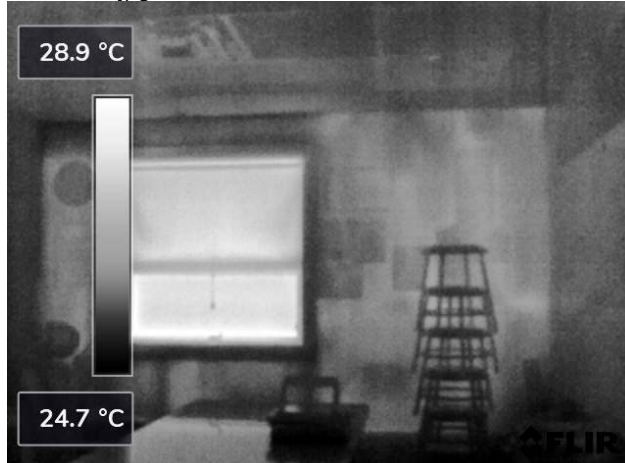
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FLIR8902.jpg 6/18/2022 9:56:23 AM



FLIR8903.jpg 6/18/2022 9:56:52 AM

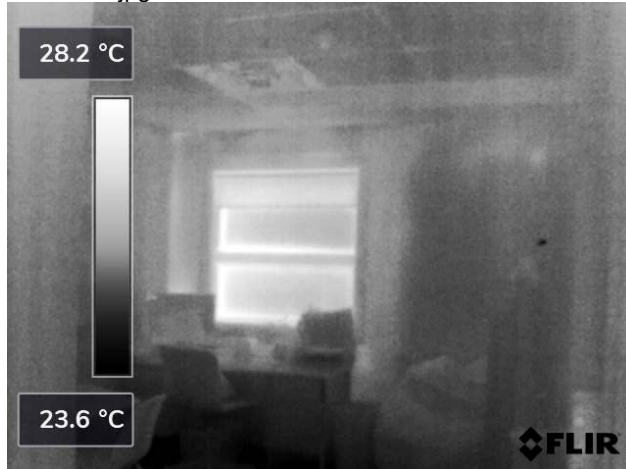


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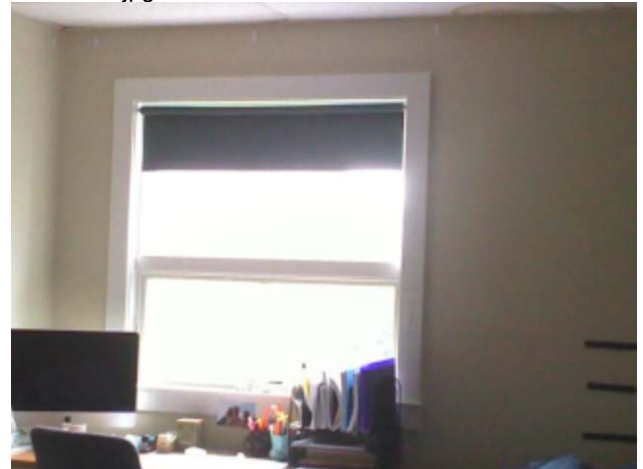
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6/18/2022 9:57:06 AM



FLIR8904.jpg

6/18/2022 9:57:06 AM



FLIR8905.jpg

6/18/2022 9:57:13 AM



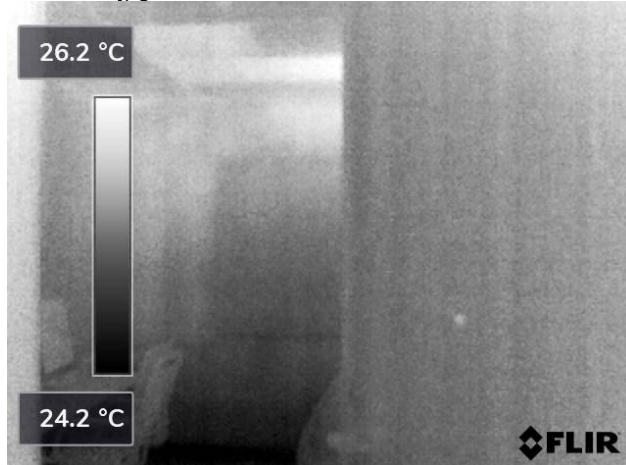
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6/18/2022 9:57:13 AM



FLIR8906.jpg

6/18/2022 9:57:26 AM



FLIR8906.jpg

6/18/2022 9:57:26 AM



FLIR8907.jpg

6/18/2022 9:57:32 AM



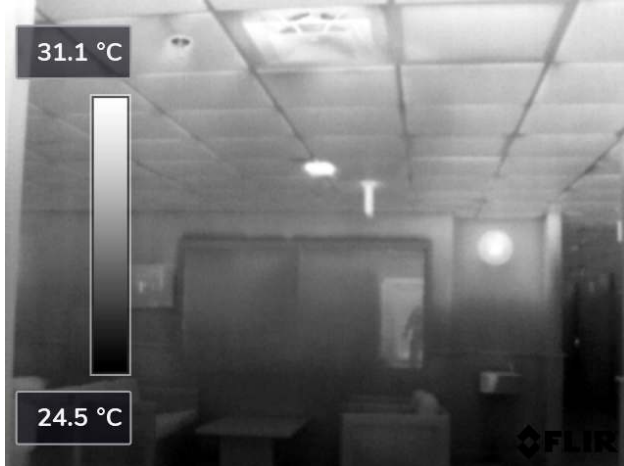
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FLIR8908.jpg

6/18/2022 9:57:44 AM



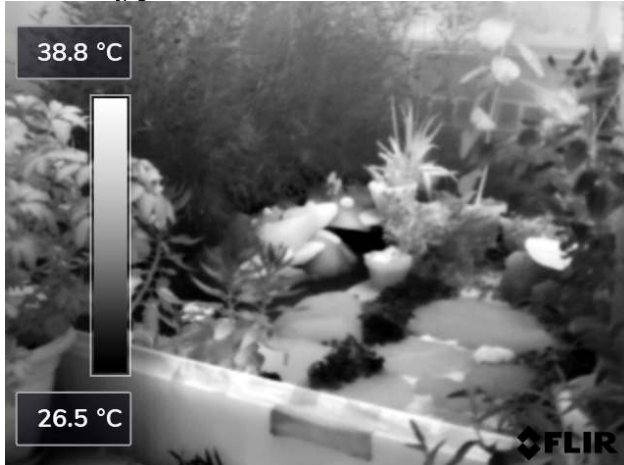
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6/18/2022 9:57:56 AM



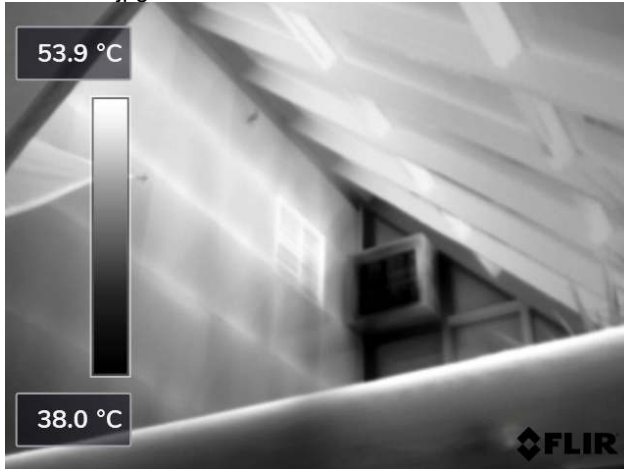
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FLIR8910.jpg

6/18/2022 9:58:04 AM



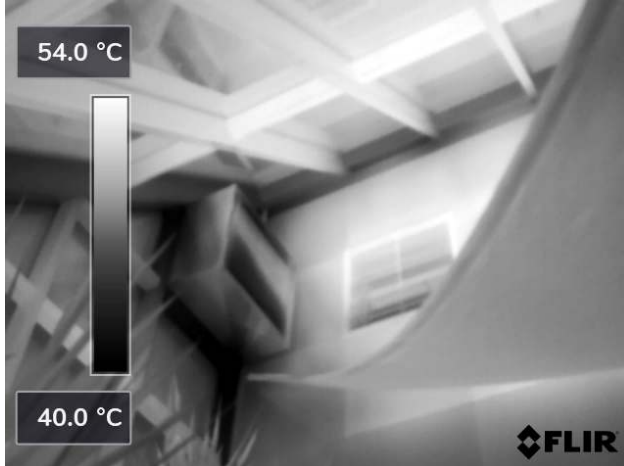
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6/18/2022 9:58:04 AM



FLIR8911.jpg

6/18/2022 9:58:10 AM



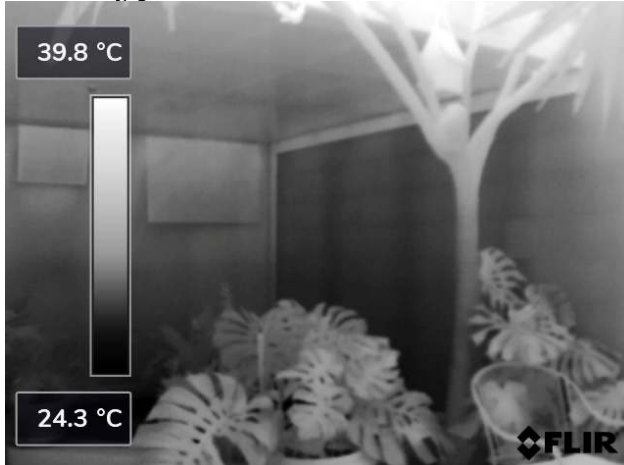
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FLIR8912.jpg

6/18/2022 9:58:18 AM



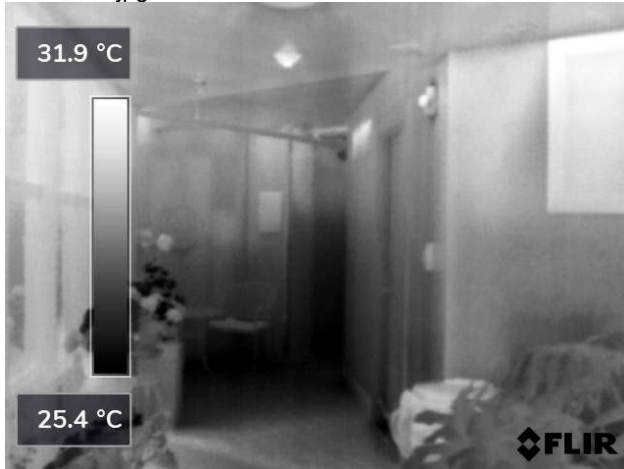
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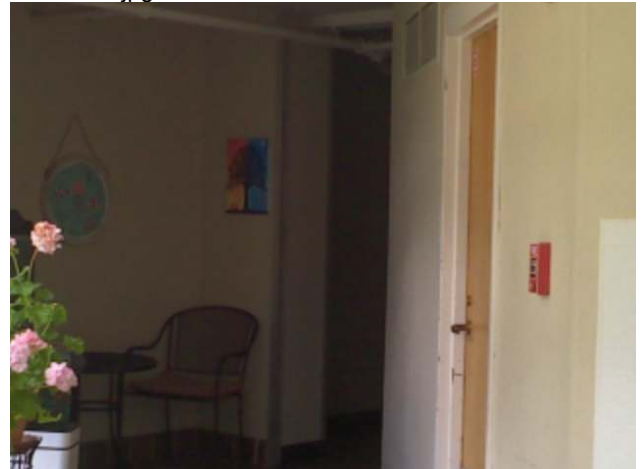
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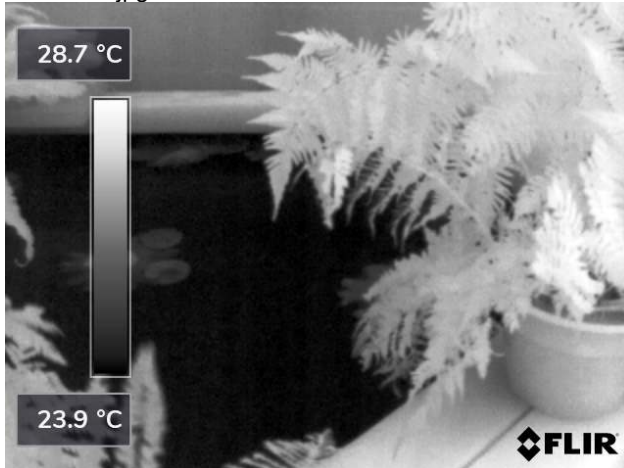
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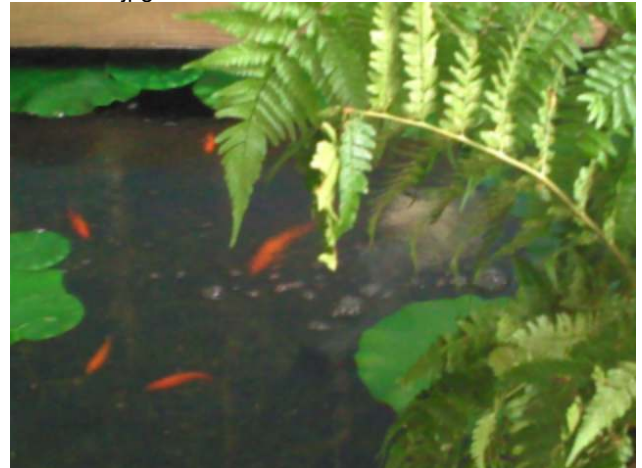
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FLIR8914.jpg

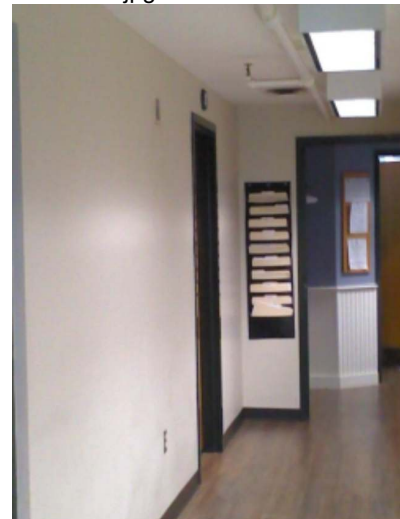
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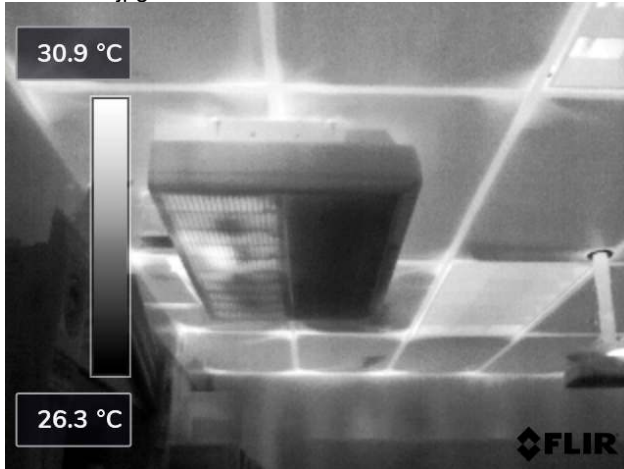
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FLIR8915.jpg 6/18/2022 9:58:47 AM



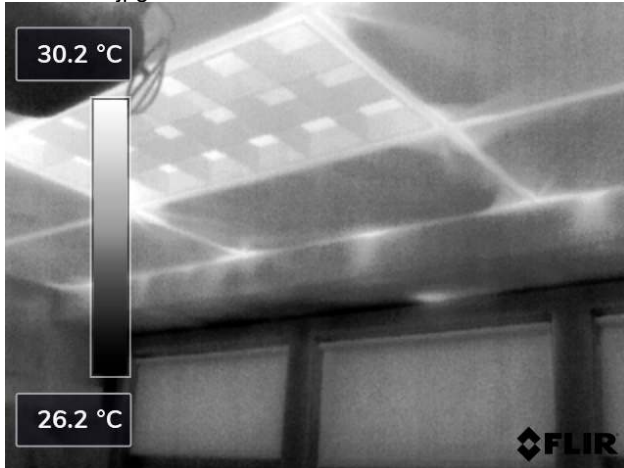
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FLIR8916.jpg 6/18/2022 9:59:02 AM



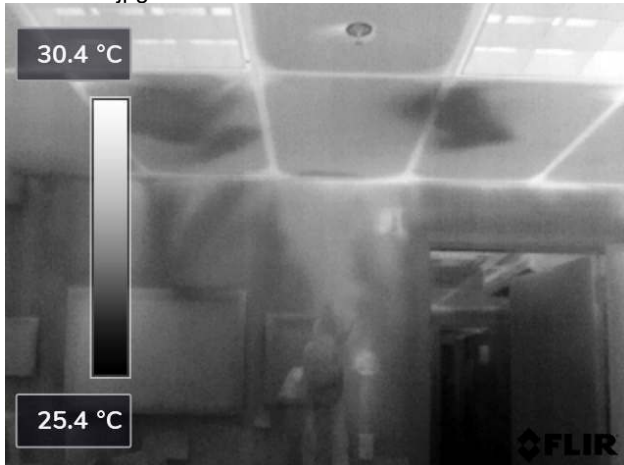
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FLIR8917.jpg 6/18/2022 9:59:09 AM



FLIR8918.jpg 6/18/2022 9:59:18 AM

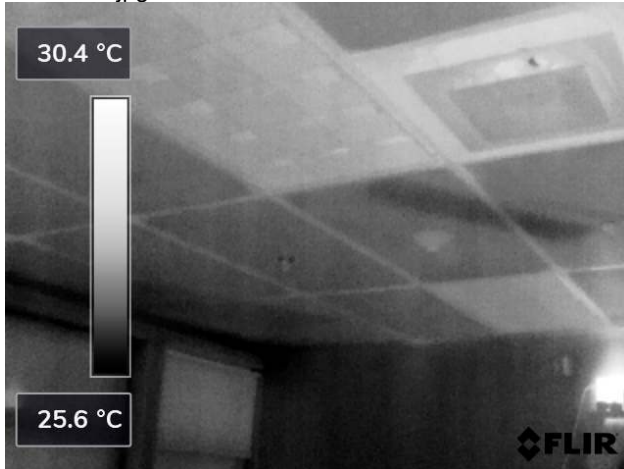


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FLIR8919.jpg

6/18/2022 9:59:26 AM



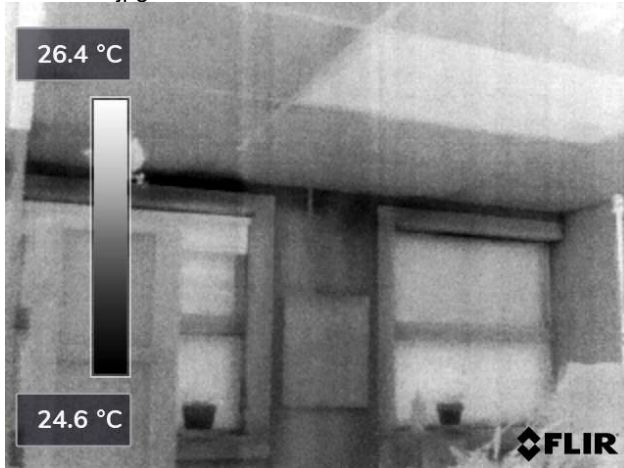
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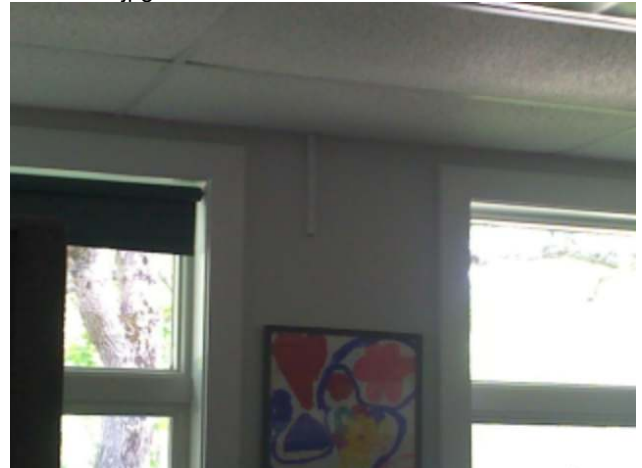
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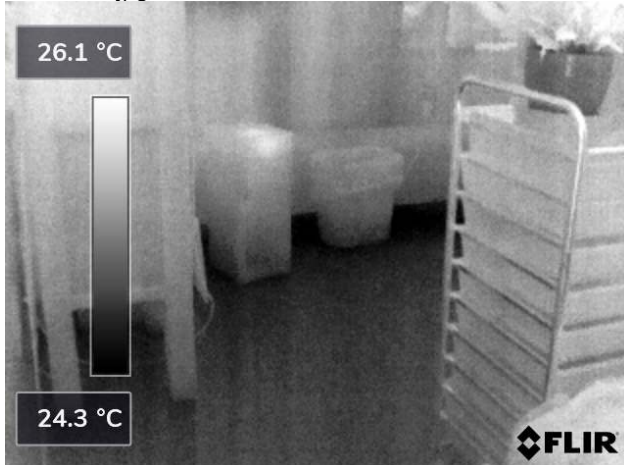
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FLIR8921.jpg

6/18/2022 9:59:48 AM



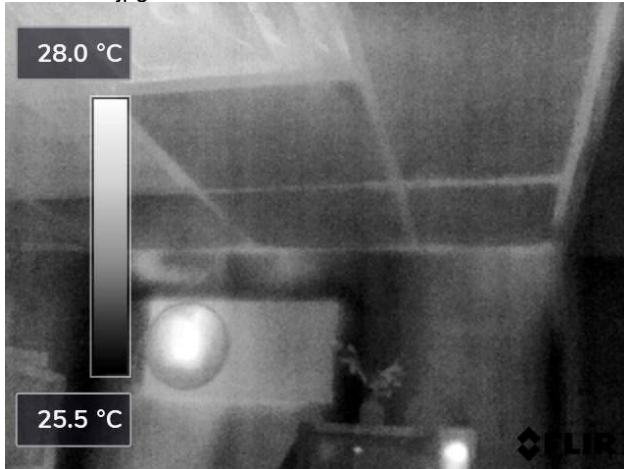
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FLIR8922.jpg

6/18/2022 10:00:02 AM



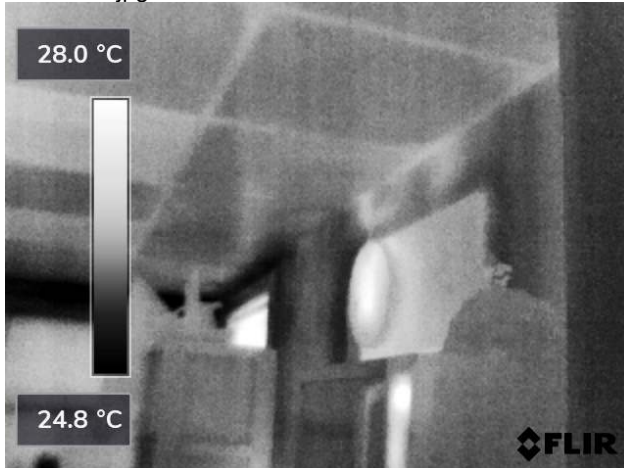
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6/18/2022 10:00:02 AM



FLIR8923.jpg

6/18/2022 10:00:12 AM



FLIR8923.jpg

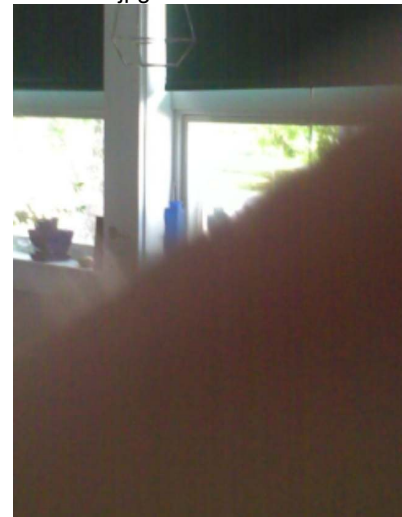
6/18/2022 10:00:12 AM



FLIR8924.jpg 6/18/2022 10:00:30 AM

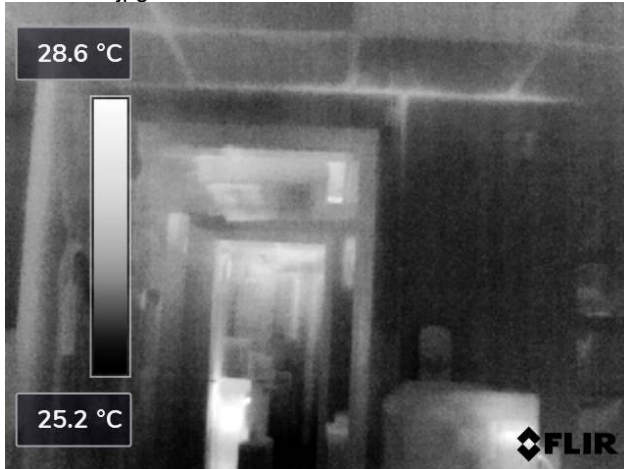


FLIR8924.jpg 6/18/2022 10:00:30 AM



FLIR8925.jpg

6/18/2022 10:00:38 AM



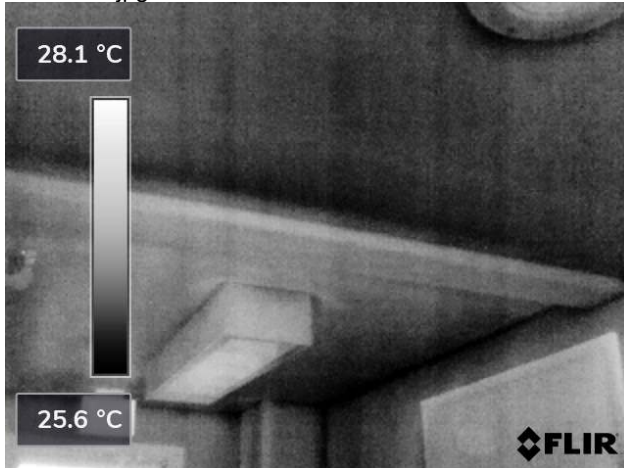
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6/18/2022 10:00:38 AM



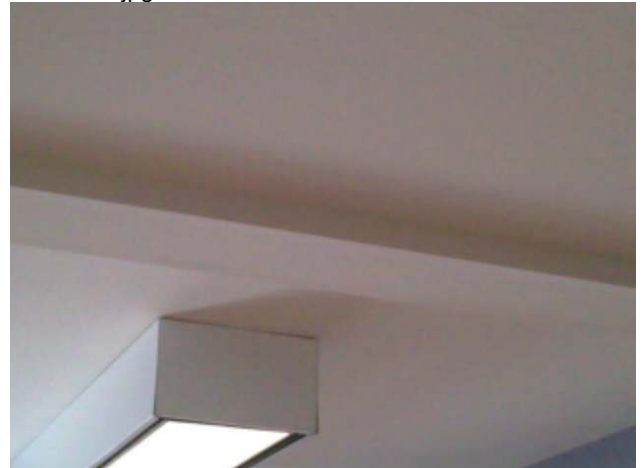
FLIR8926.jpg

6/18/2022 10:00:51 AM



FLIR8926.jpg

6/18/2022 10:00:51 AM



FLIR8927.jpg

6/18/2022 10:01:32 AM



FLIR8927.jpg

6/18/2022 10:01:32 AM



FLIR8928.jpg

6/18/2022 10:01:46 AM



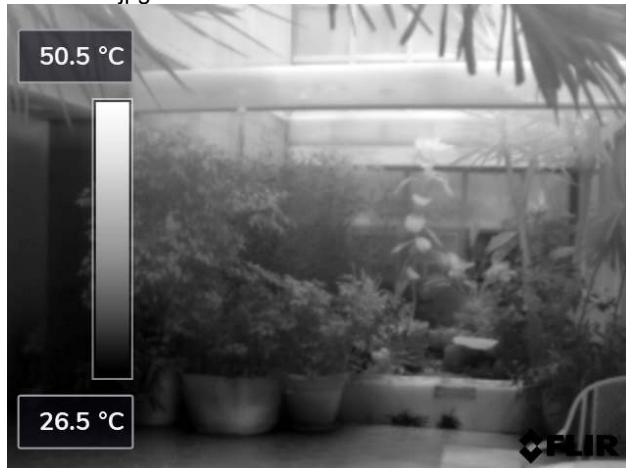
FLIR8928.jpg

6/18/2022 10:01:46 AM



FLIR8929.jpg

6/18/2022 10:01:54 AM



FLIR8929.jpg

6/18/2022 10:01:54 AM



FLIR8930.jpg

6/18/2022 10:02:01 AM



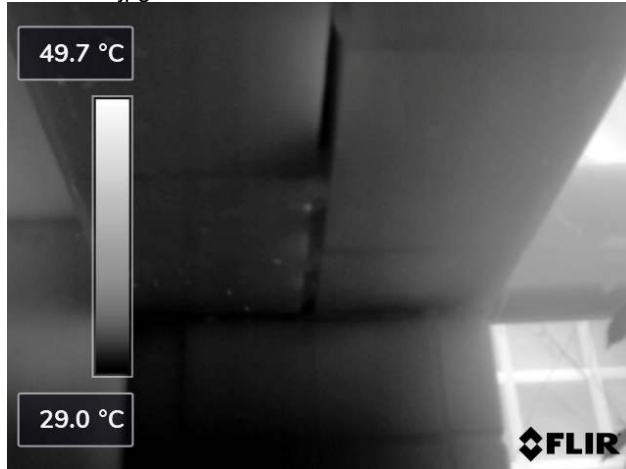
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6/18/2022 10:02:01 AM



FLIR8931.jpg

6/18/2022 10:02:09 AM



FLIR8931.jpg

6/18/2022 10:02:09 AM



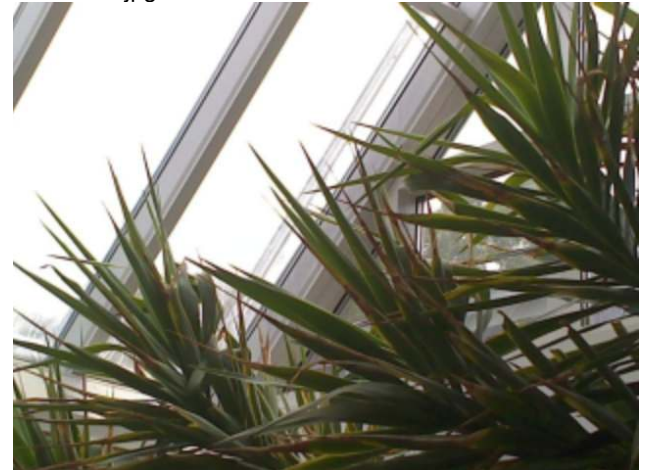
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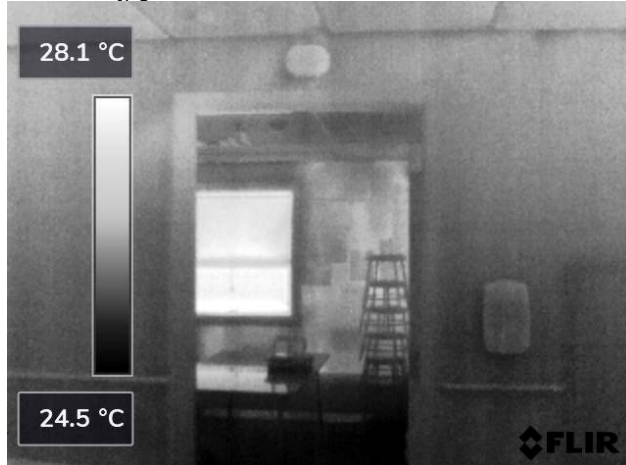
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6/18/2022 10:02:19 AM



FLIR8933.jpg

6/18/2022 10:02:44 AM



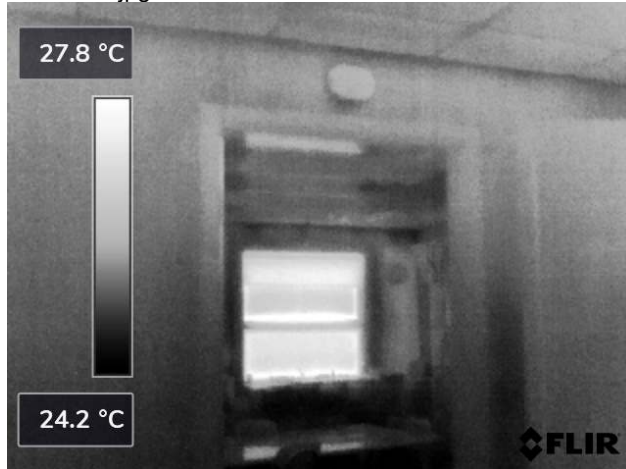
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6/18/2022 10:02:44 AM



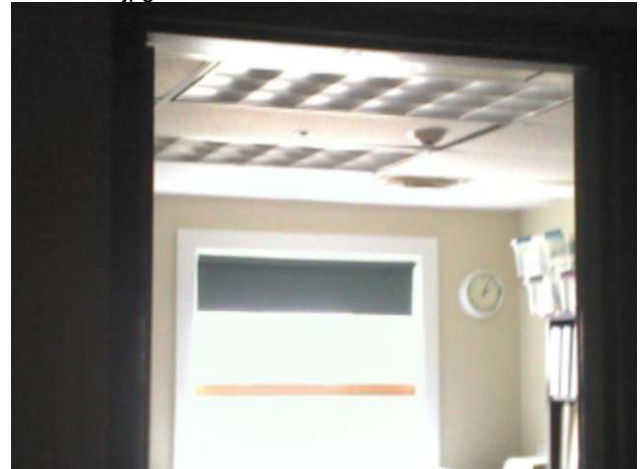
FLIR8934.jpg

6/18/2022 10:02:56 AM



FLIR8934.jpg

6/18/2022 10:02:56 AM



FLIR8935.jpg

6/18/2022 10:03:10 AM



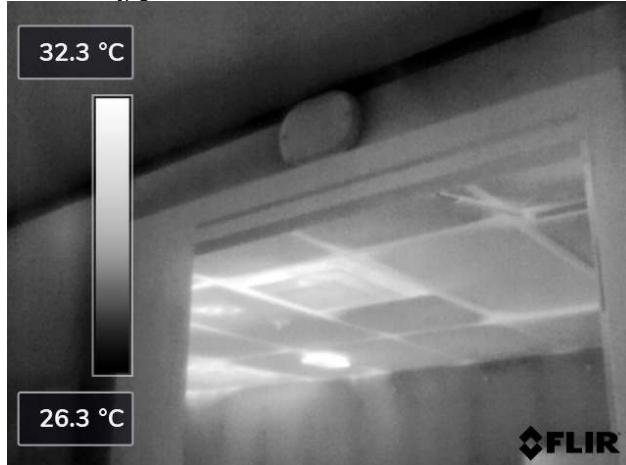
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6/18/2022 10:03:10 AM



FLIR8936.jpg

6/18/2022 10:03:27 AM



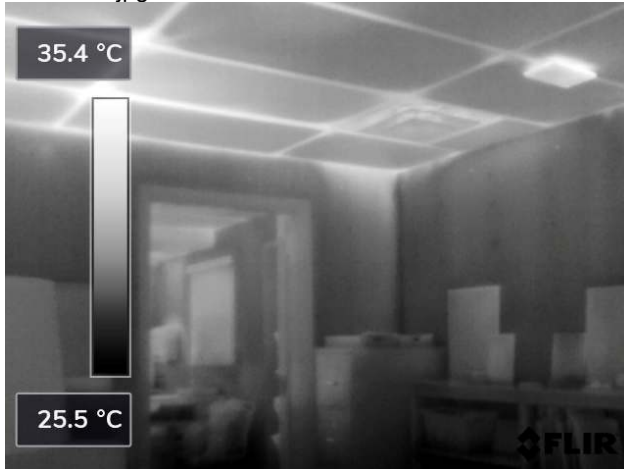
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6/18/2022 10:03:27 AM



FLIR8937.jpg

6/18/2022 10:03:35 AM



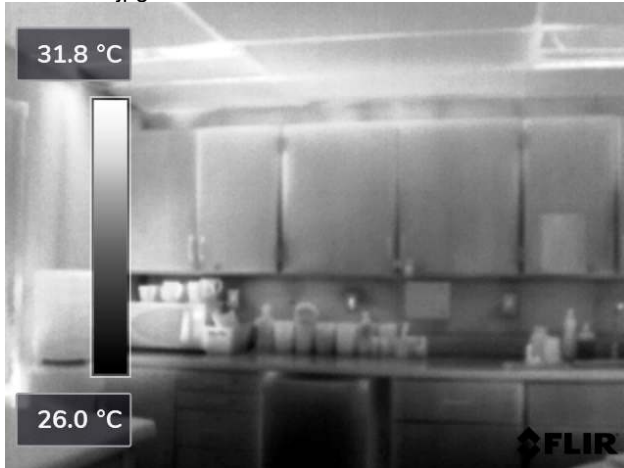
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6/18/2022 10:03:35 AM



FLIR8938.jpg

6/18/2022 10:03:50 AM



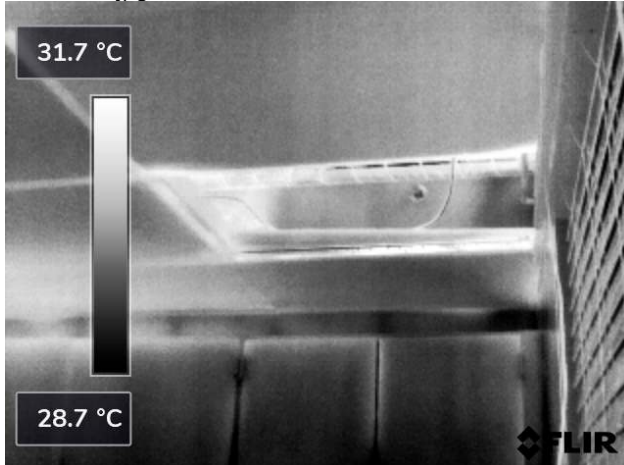
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6/18/2022 10:03:50 AM



FLIR8939.jpg

6/18/2022 10:03:57 AM



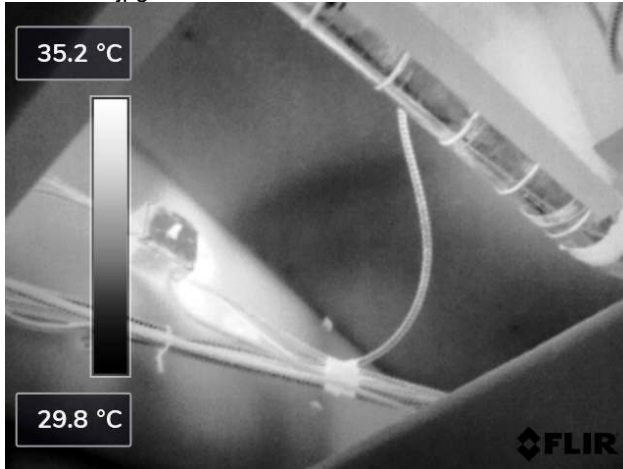
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6/18/2022 10:03:57 AM



FLIR8940.jpg

6/18/2022 10:04:07 AM



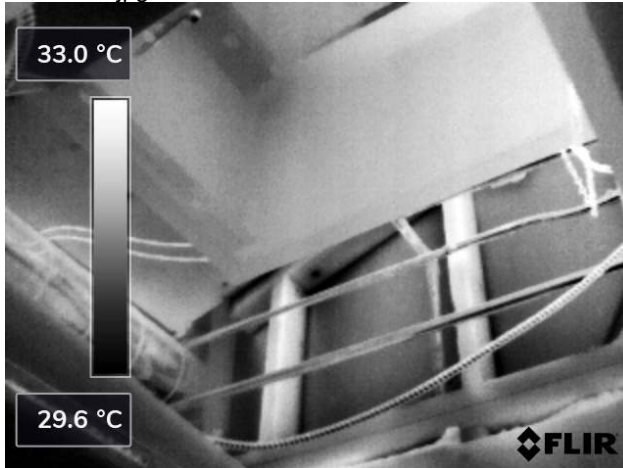
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6/18/2022 10:04:07 AM



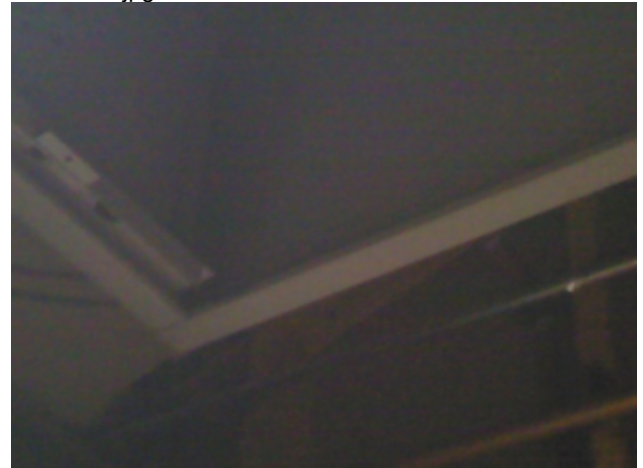
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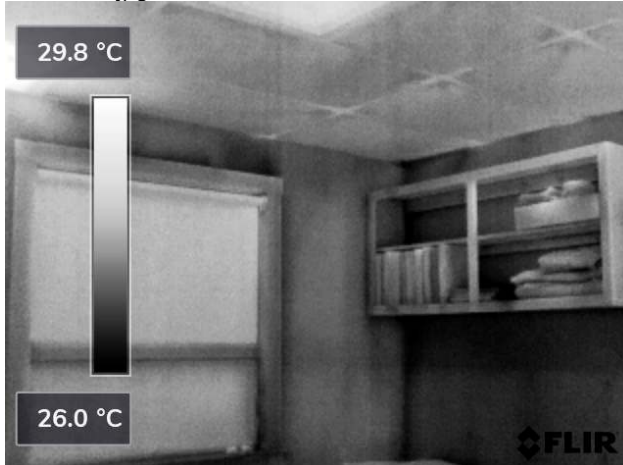
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6/18/2022 10:04:15 AM



FLIR8942.jpg

6/18/2022 10:04:25 AM



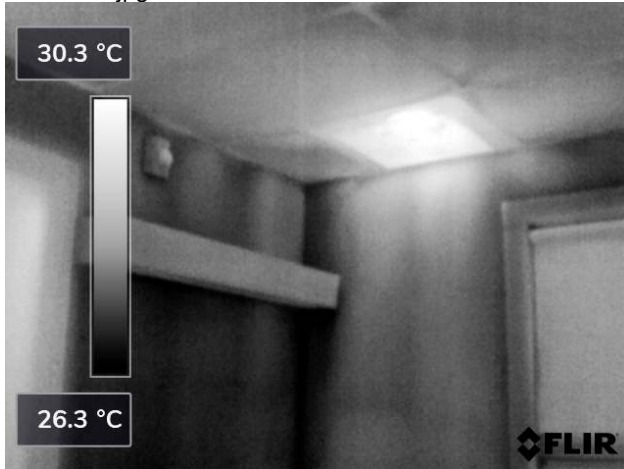
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6/18/2022 10:04:25 AM



FLIR8943.jpg

6/18/2022 10:04:34 AM



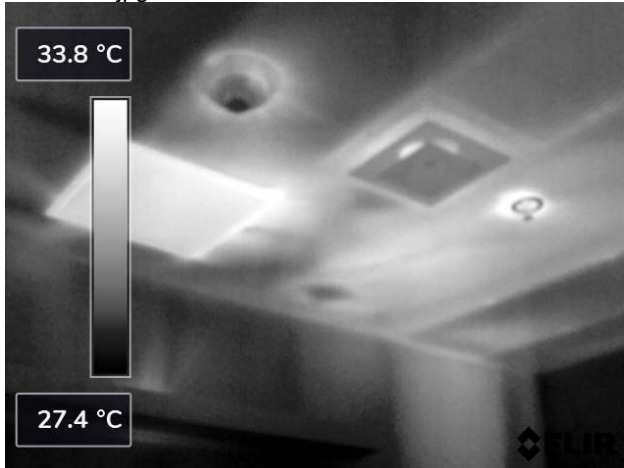
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6/18/2022 10:04:34 AM



FLIR8944.jpg

6/18/2022 10:04:42 AM



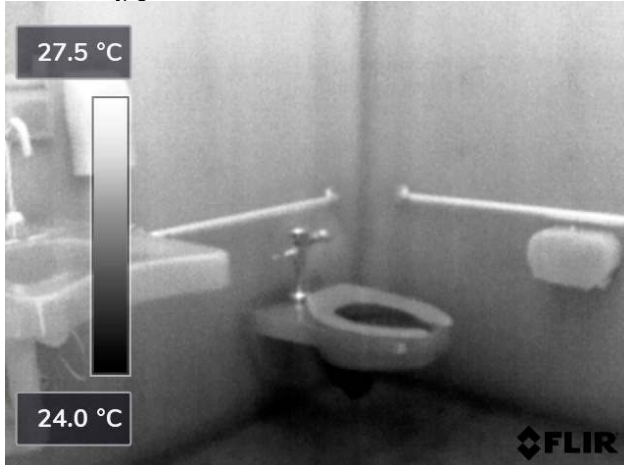
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6/18/2022 10:04:42 AM



FLIR8945.jpg

6/18/2022 10:04:49 AM



FLIR8945.jpg

6/18/2022 10:04:49 AM



FLIR8946.jpg 6/18/2022 10:05:00 AM



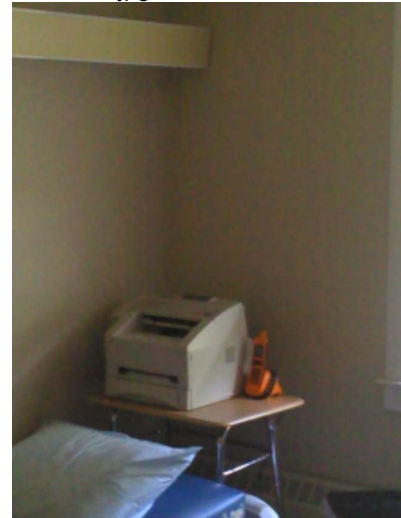
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FLIR8947.jpg 6/18/2022 10:05:11 AM



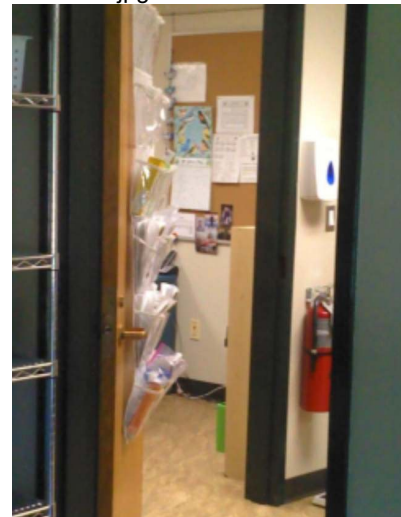
FLIR8947.jpg 6/18/2022 10:05:11 AM



FLIR8948.jpg 6/18/2022 10:05:20 AM



FLIR8948.jpg 6/18/2022 10:05:20 AM



FLIR8949.jpg 6/18/2022 10:05:28 AM



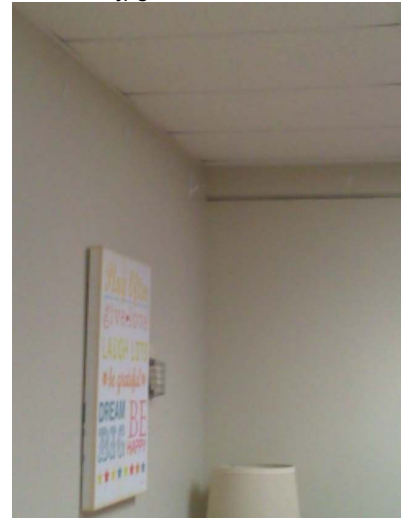
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FLIR8950.jpg 6/18/2022 10:05:38 AM



FLIR8950.jpg 6/18/2022 10:05:38 AM



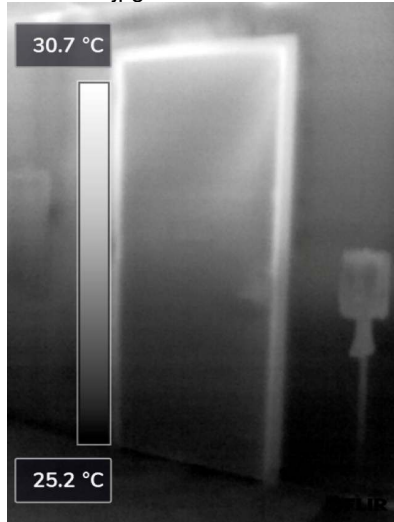
FLIR8951.jpg 6/18/2022 10:06:11 AM



FLIR8951.jpg 6/18/2022 10:06:11 AM



FLIR8952.jpg 6/18/2022 10:06:21 AM



FLIR8952.jpg 6/18/2022 10:06:21 AM



FLIR8953.jpg

6/18/2022 10:06:34 AM



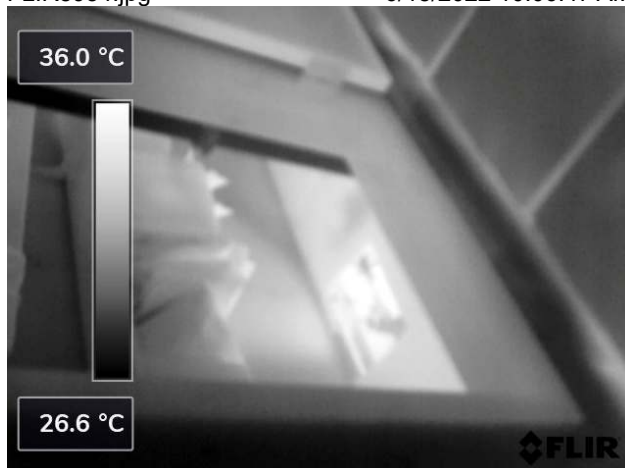
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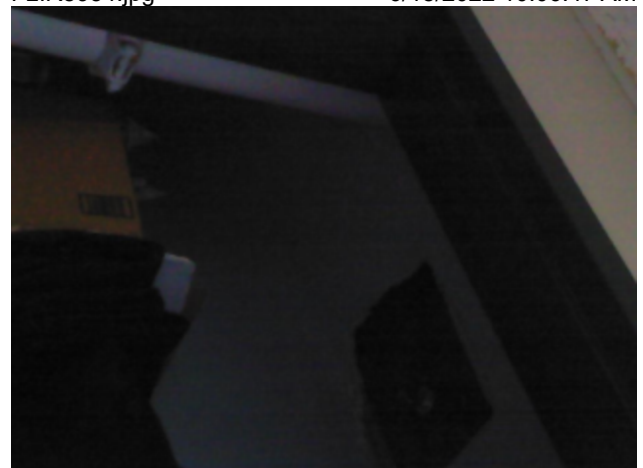
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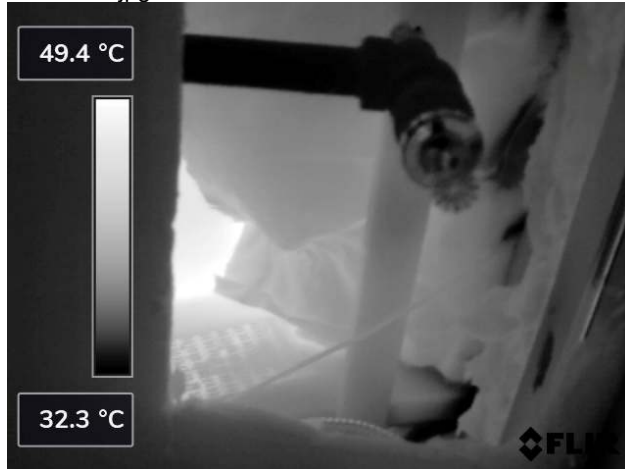
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6/18/2022 10:06:47 AM



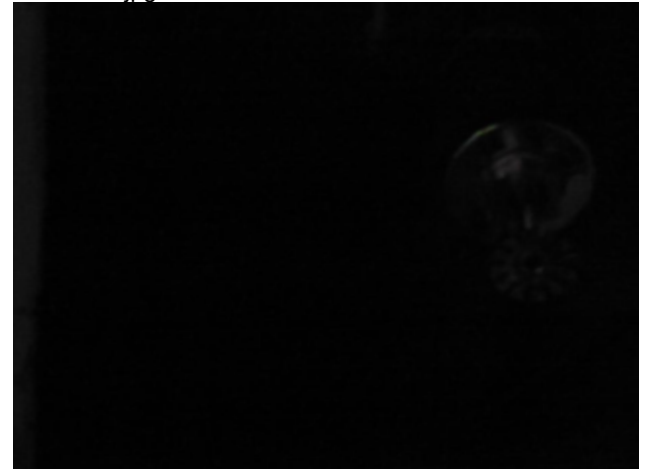
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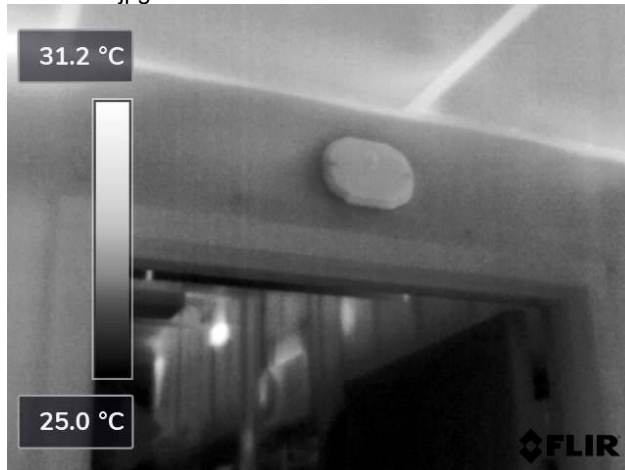
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FLIR8956.jpg

6/18/2022 10:07:12 AM



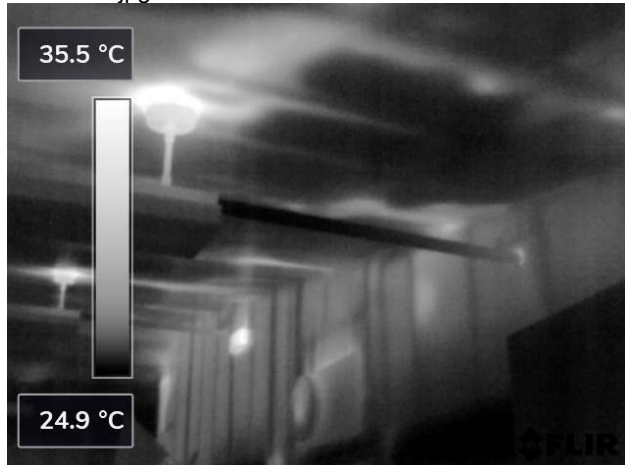
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FLIR8957.jpg

6/18/2022 10:07:20 AM



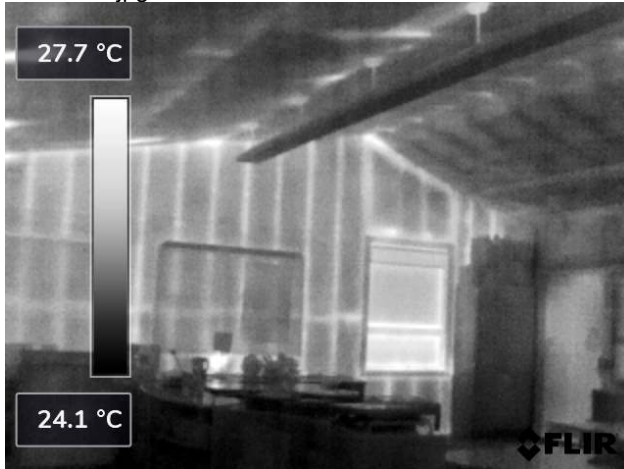
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FLIR8958.jpg

6/18/2022 10:07:28 AM



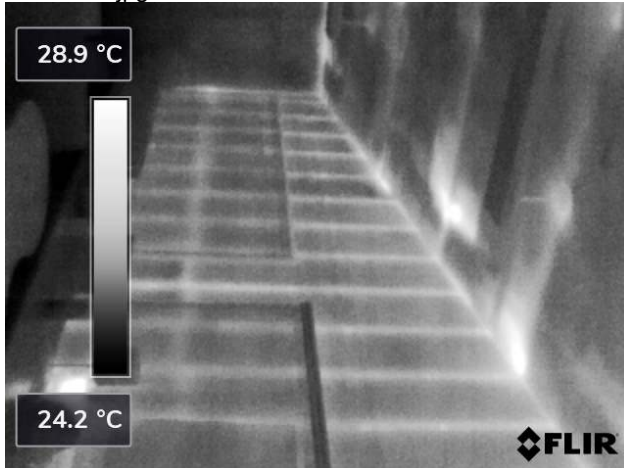
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FLIR8959.jpg

6/18/2022 10:07:51 AM



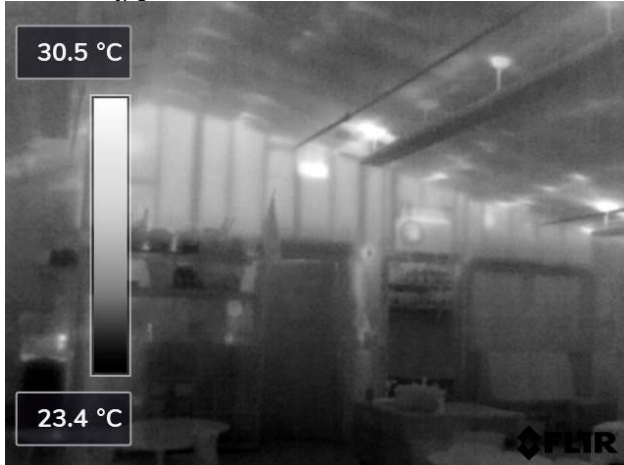
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FLIR8960.jpg

6/18/2022 10:08:03 AM



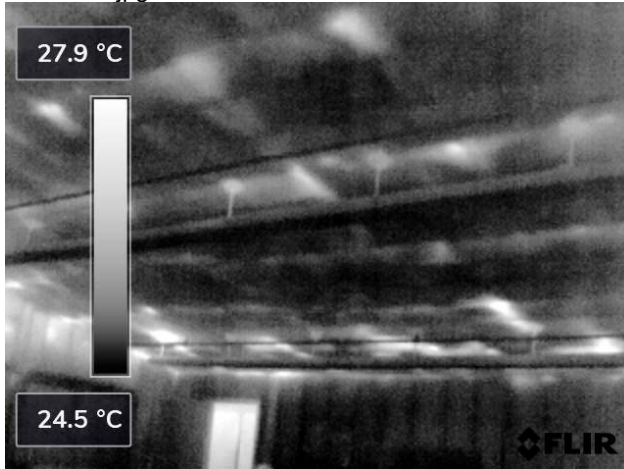
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FLIR8961.jpg

6/18/2022 10:08:17 AM



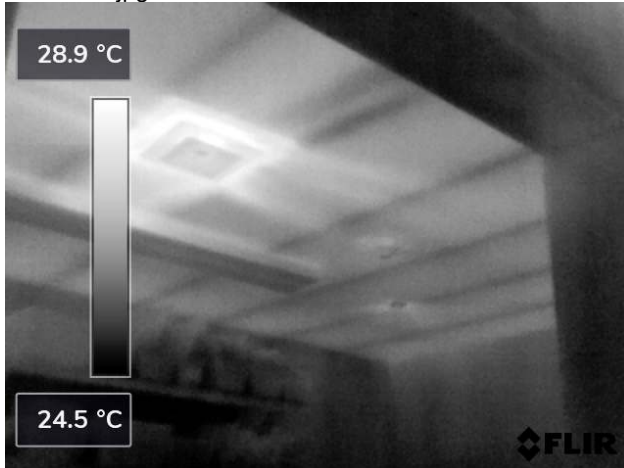
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6/18/2022 10:08:17 AM



FLIR8962.jpg

6/18/2022 10:08:36 AM



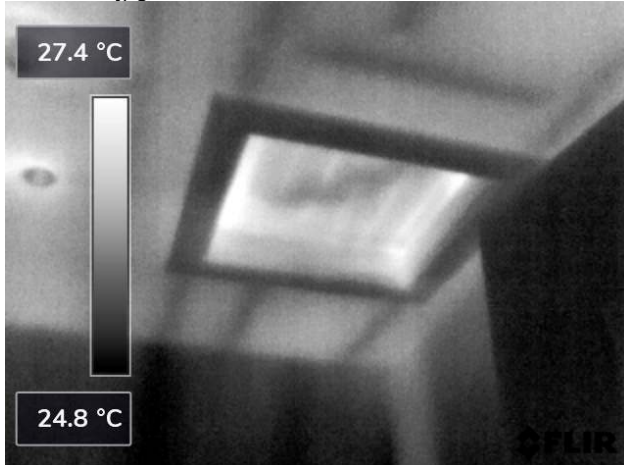
FLIR8962.jpg

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FLIR8963.jpg

6/18/2022 10:08:49 AM



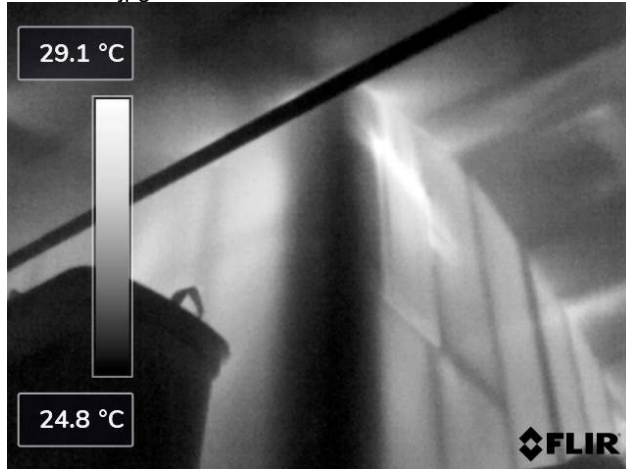
FLIR8963.jpg

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FLIR8964.jpg

6/18/2022 10:09:22 AM



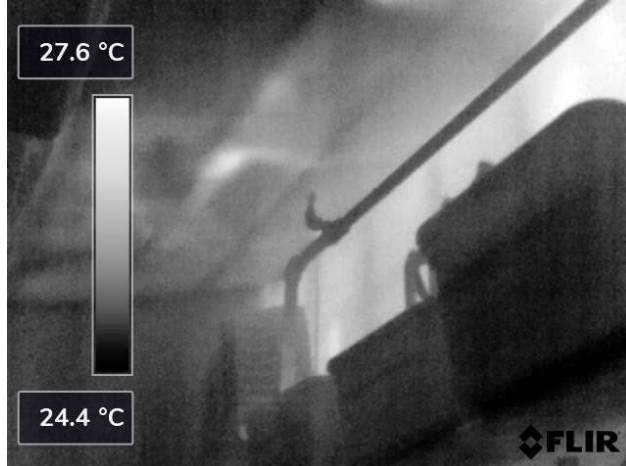
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6/18/2022 10:09:22 AM



FLIR8965.jpg

6/18/2022 10:09:30 AM



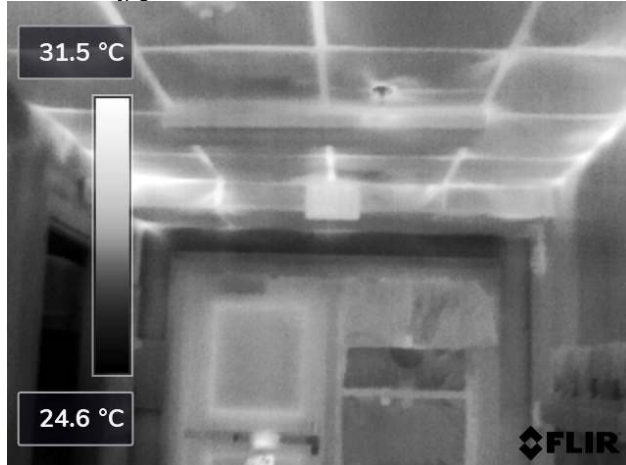
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6/18/2022 10:09:30 AM



FLIR8966.jpg

6/18/2022 10:09:45 AM



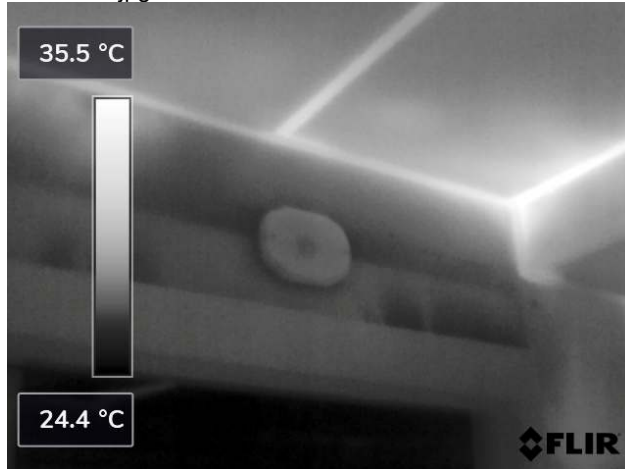
FLIR8966.jpg

6/18/2022 10:09:45 AM



FLIR8967.jpg

6/18/2022 10:09:53 AM



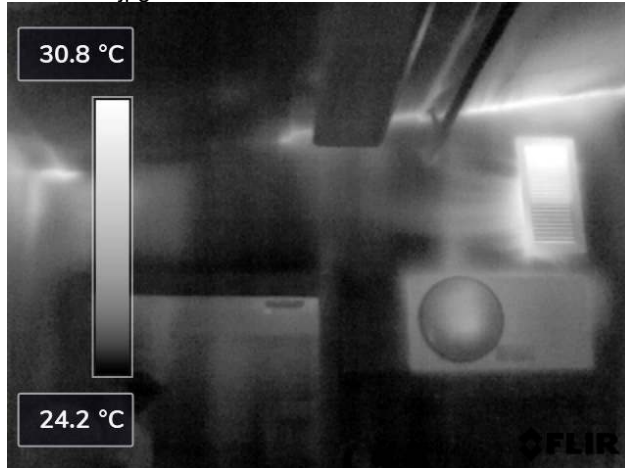
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6/18/2022 10:09:53 AM



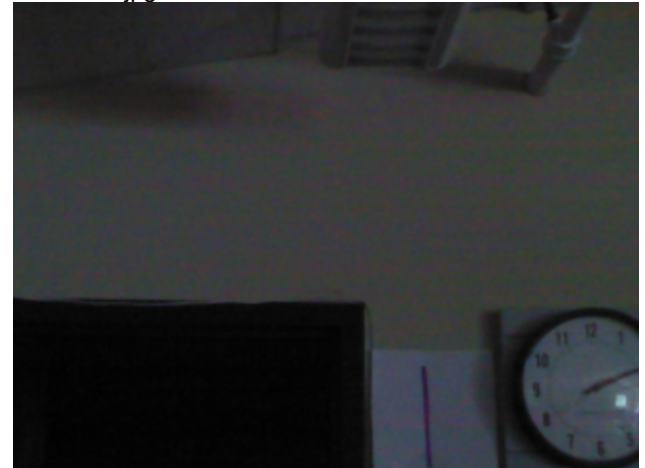
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6/18/2022 10:10:08 AM



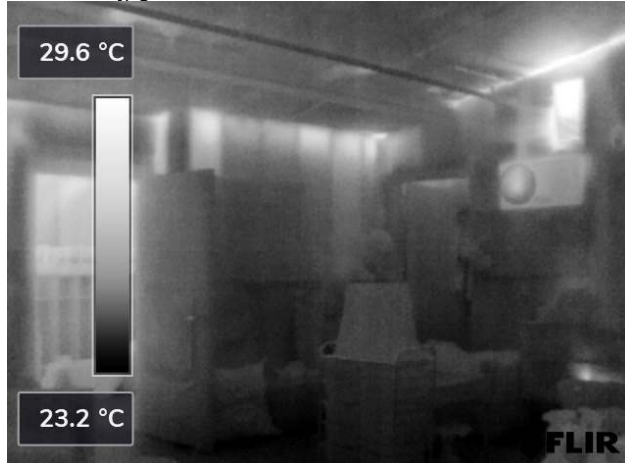
FLIR8968.jpg

6/18/2022 10:10:08 AM



FLIR8969.jpg

6/18/2022 10:10:20 AM



FLIR8969.jpg

6/18/2022 10:10:20 AM



FLIR8970.jpg

6/18/2022 10:10:31 AM



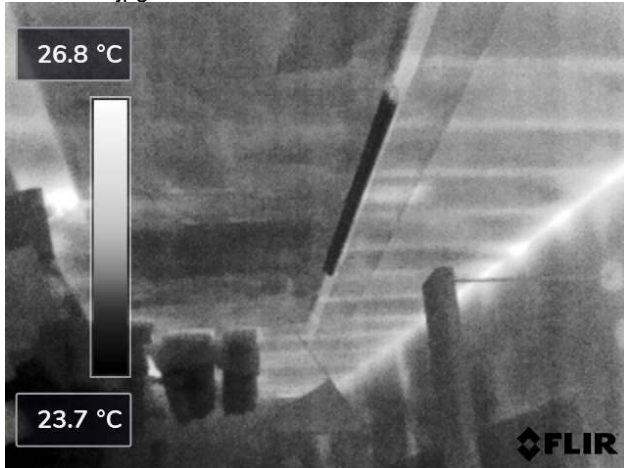
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6/18/2022 10:10:31 AM



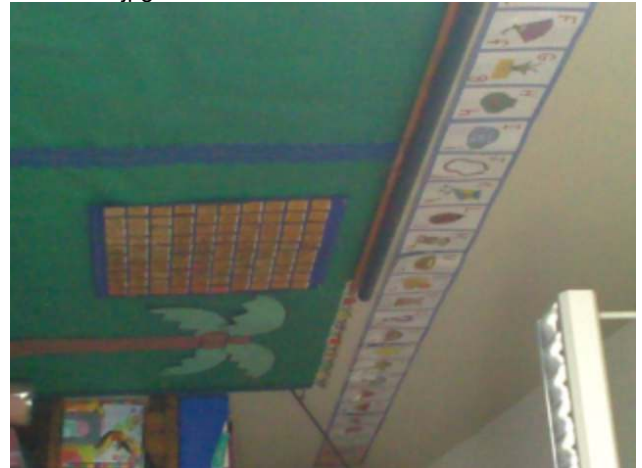
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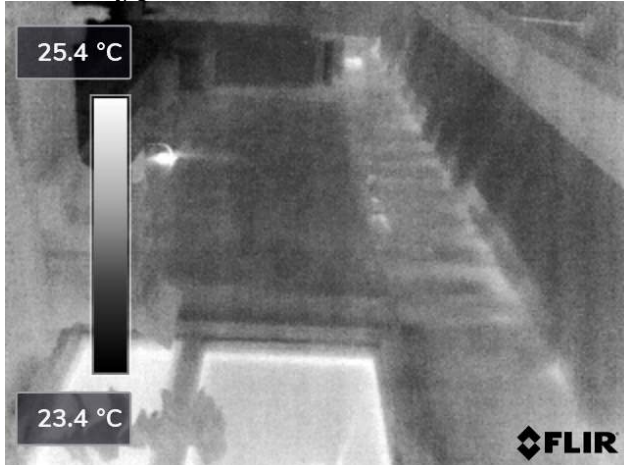
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FLIR8972.jpg

6/18/2022 10:10:49 AM



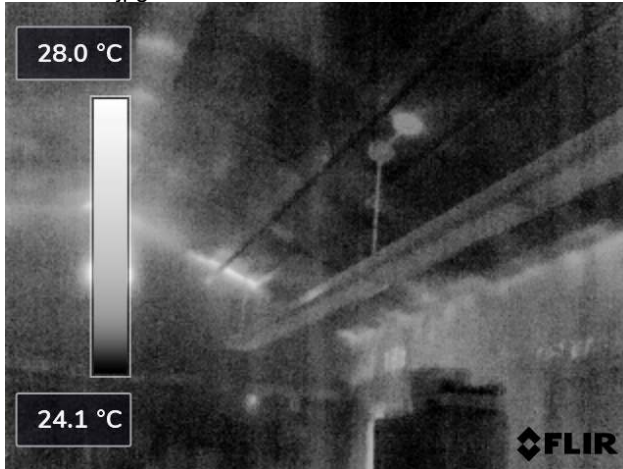
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6/18/2022 10:10:49 AM



FLIR8973.jpg

6/18/2022 10:10:59 AM



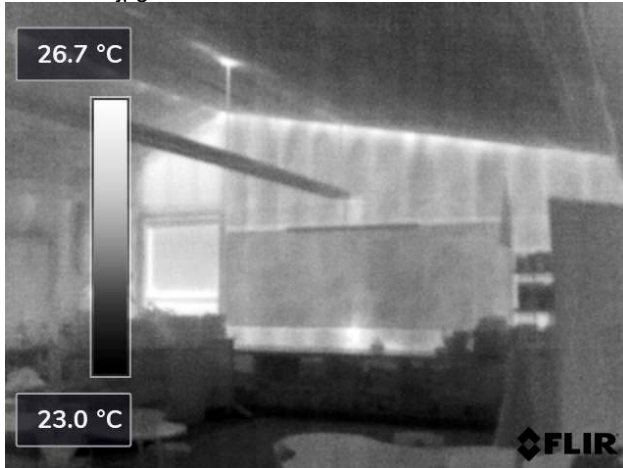
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FLIR8974.jpg

6/18/2022 10:11:11 AM



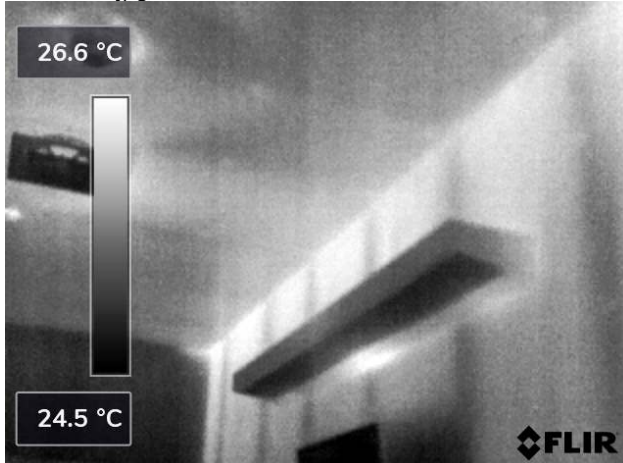
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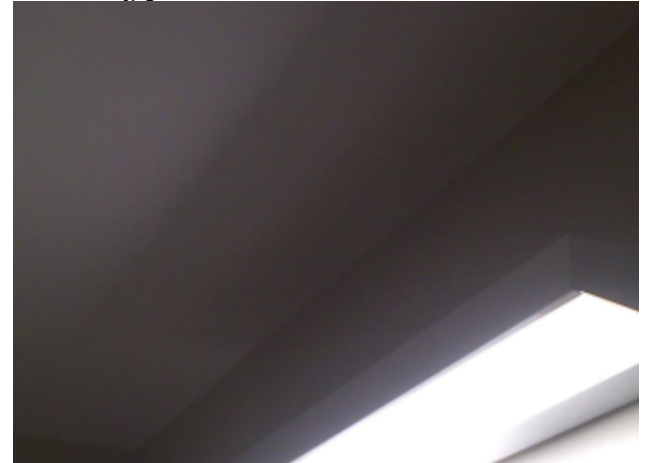
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FLIR8975.jpg

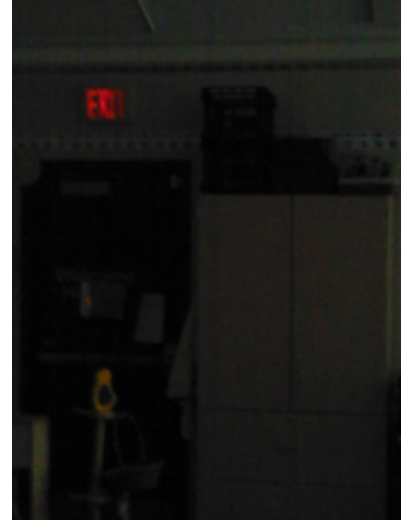
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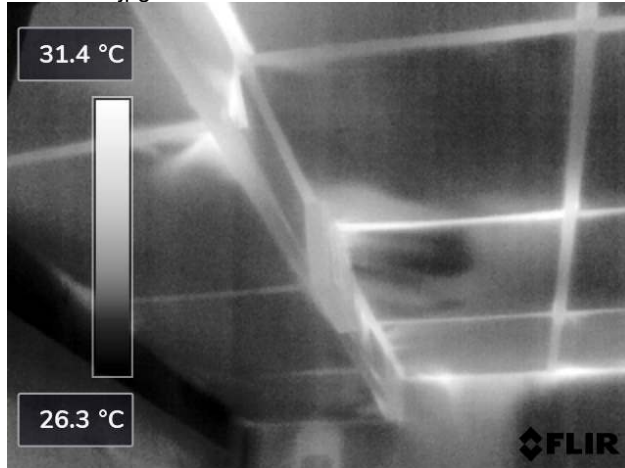
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FLIR8976.jpg 6/18/2022 10:11:38 AM



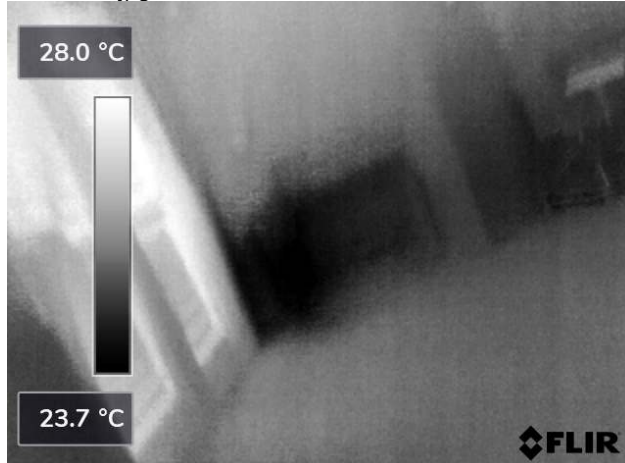
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FLIR8977.jpg 6/18/2022 10:11:49 AM



FLIR8978.jpg 6/18/2022 10:12:28 AM



FLIR8978.jpg 6/18/2022 10:12:28 AM



FLIR8979.jpg 6/18/2022 10:12:36 AM



FLIR8979.jpg 6/18/2022 10:12:36 AM



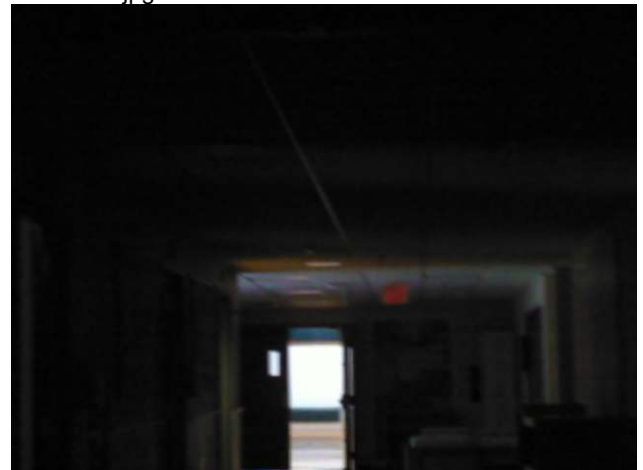
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6/18/2022 10:12:54 AM



FLIR8980.jpg

6/18/2022 10:12:54 AM



FLIR8981.jpg

6/18/2022 10:13:00 AM



FLIR8981.jpg

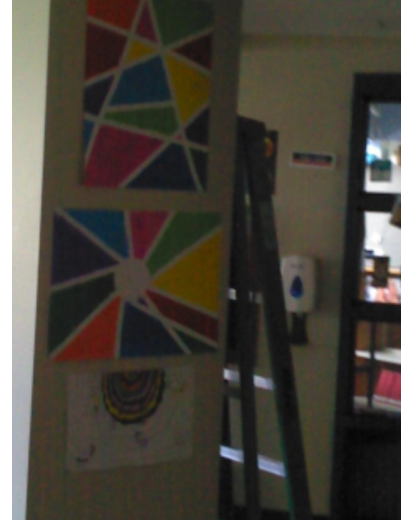
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FLIR8982.jpg 6/18/2022 10:13:11 AM



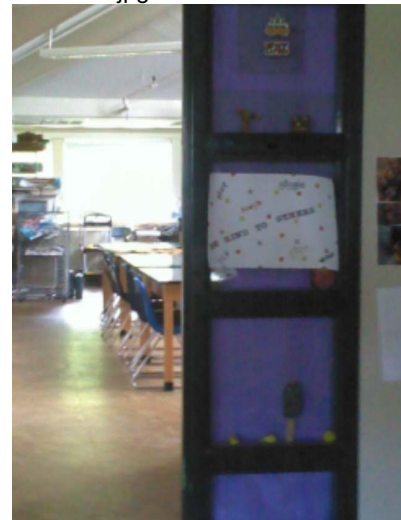
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FLIR8983.jpg 6/18/2022 10:13:22 AM



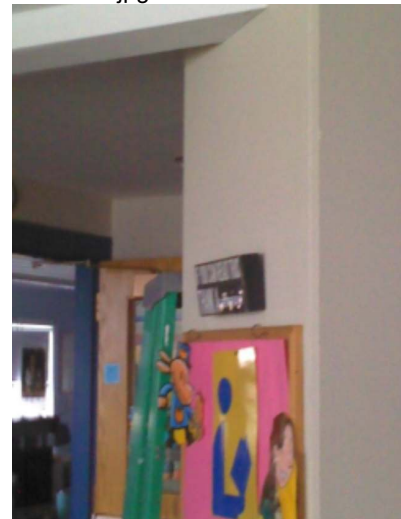
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FLIR8984.jpg 6/18/2022 10:13:30 AM



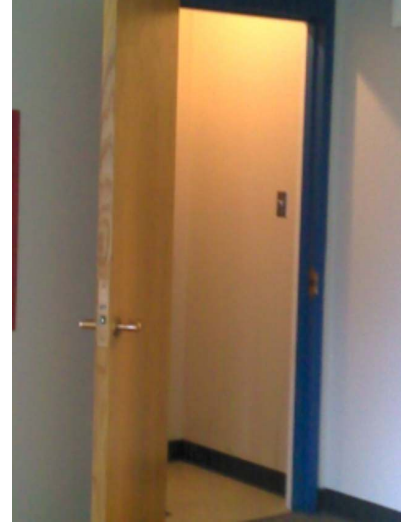
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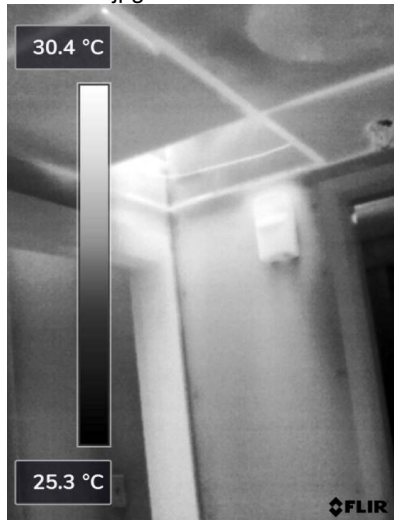
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FLIR8985.jpg 6/18/2022 10:13:49 AM



FLIR8986.jpg 6/18/2022 10:13:58 AM



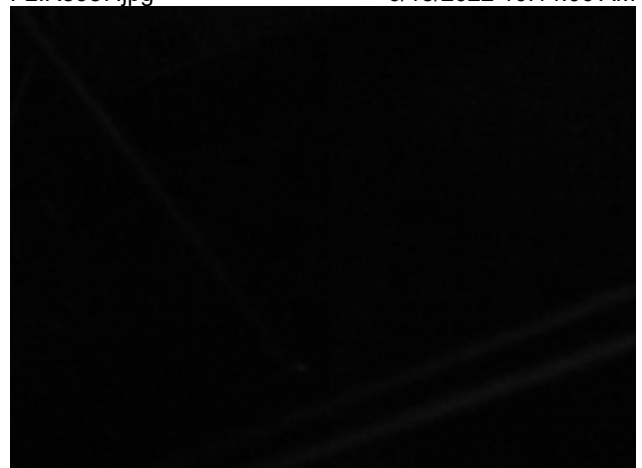
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FLIR8987.jpg 6/18/2022 10:14:06 AM

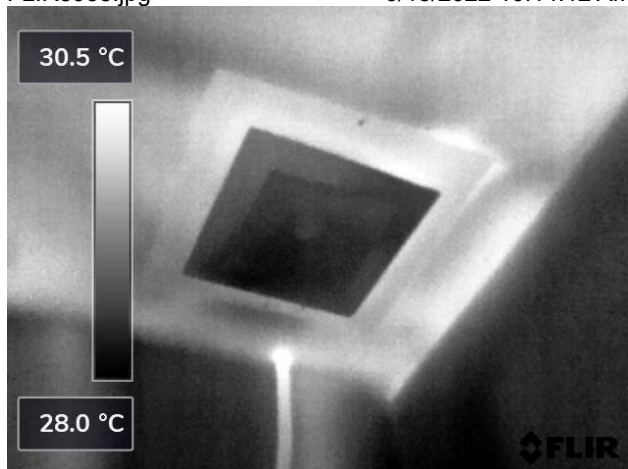


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FLIR8988.jpg

6/18/2022 10:14:12 AM



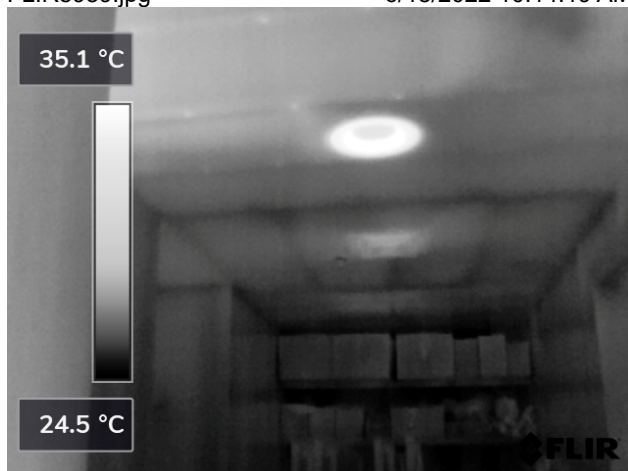
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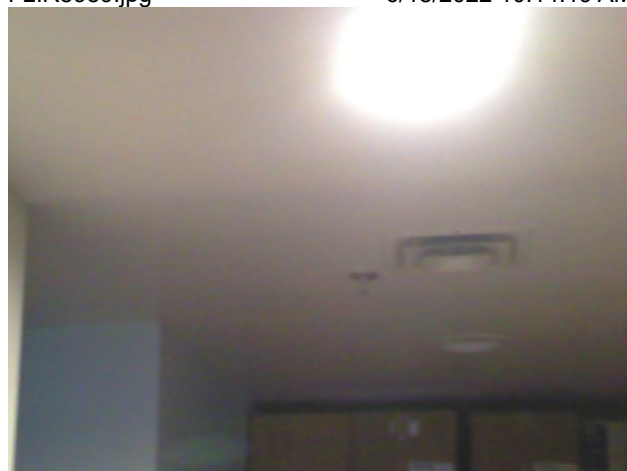
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6/18/2022 10:14:19 AM



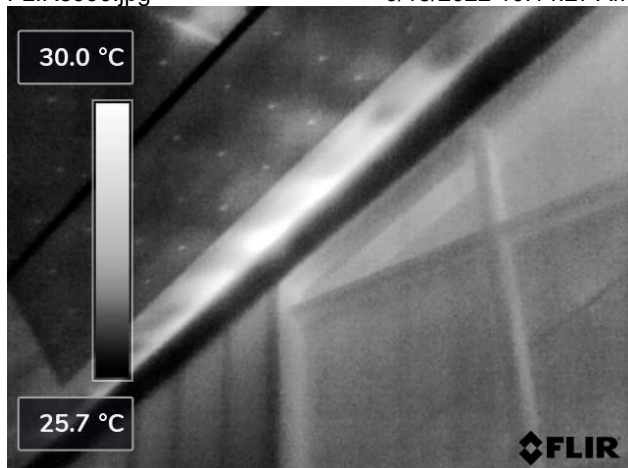
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6/18/2022 10:14:19 AM



FLIR8990.jpg

6/18/2022 10:14:27 AM



FLIR8990.jpg

6/18/2022 10:14:27 AM



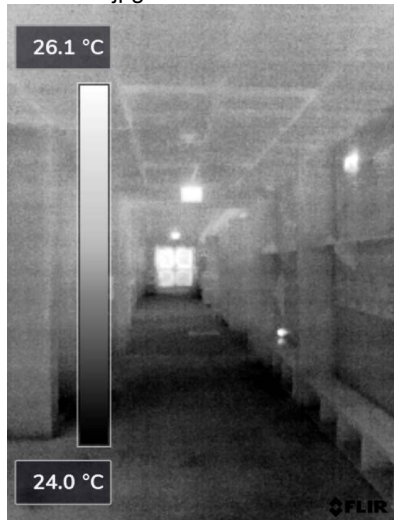
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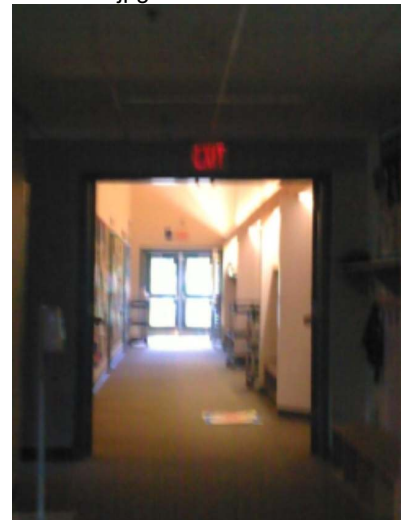
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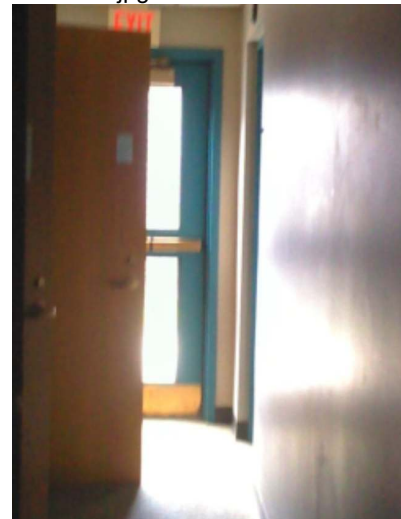
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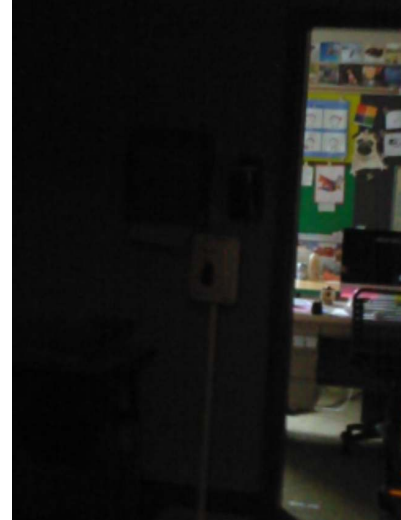
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FLIR8994.jpg 6/18/2022 10:15:11 AM



FLIR8994.jpg 6/18/2022 10:15:11 AM



FLIR8995.jpg 6/18/2022 10:15:24 AM



FLIR8995.jpg 6/18/2022 10:15:24 AM



FLIR8996.jpg 6/18/2022 10:15:32 AM

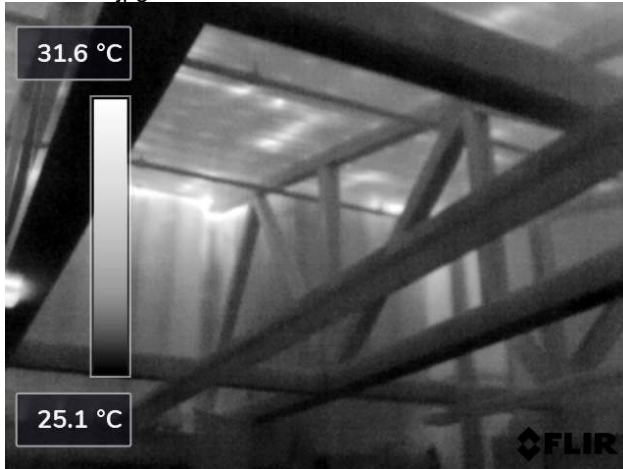


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FLIR8997.jpg

6/18/2022 10:16:25 AM



FLIR8997.jpg

6/18/2022 10:16:25 AM



FLIR8998.jpg

6/18/2022 10:16:35 AM



FLIR8998.jpg

6/18/2022 10:16:35 AM



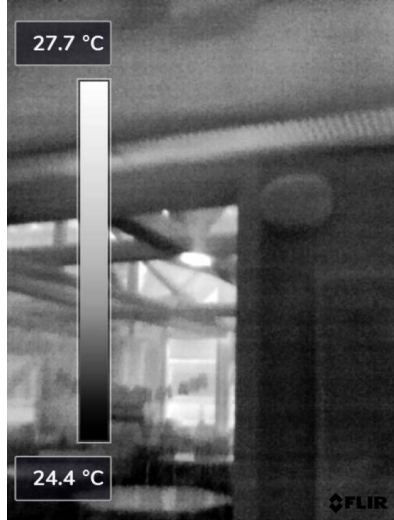
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FLIR8999.jpg 6/18/2022 10:16:55 AM



FLIR9000.jpg 6/18/2022 10:17:02 AM



FLIR9000.jpg 6/18/2022 10:17:02 AM



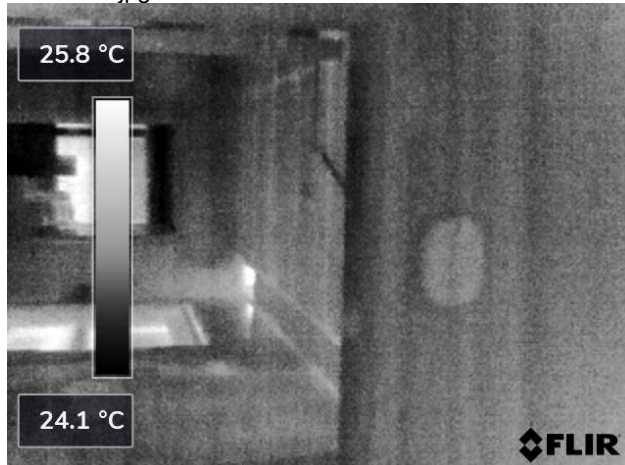
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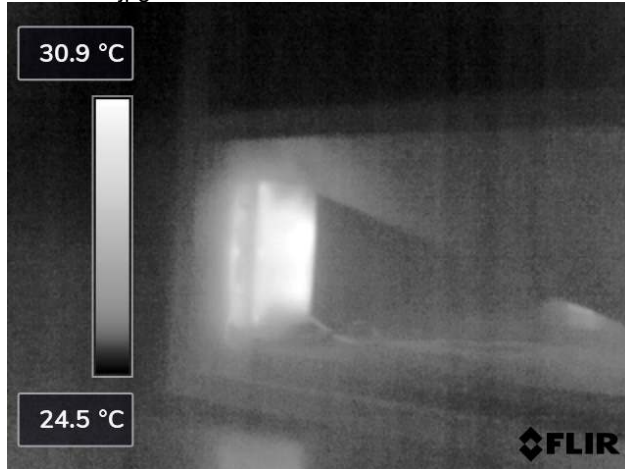


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FLIR9003.jpg

6/18/2022 10:17:27 AM



FLIR9003.jpg

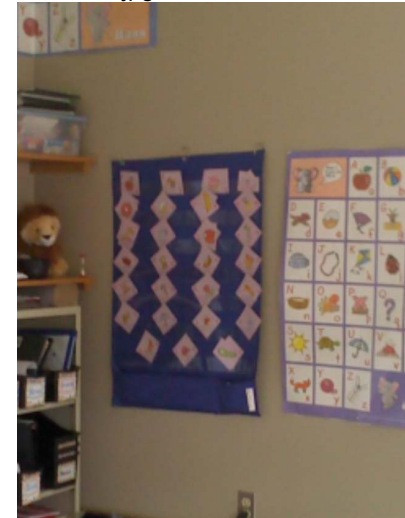
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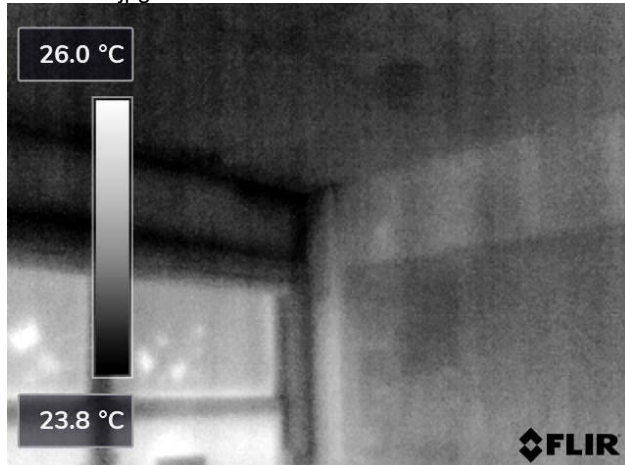


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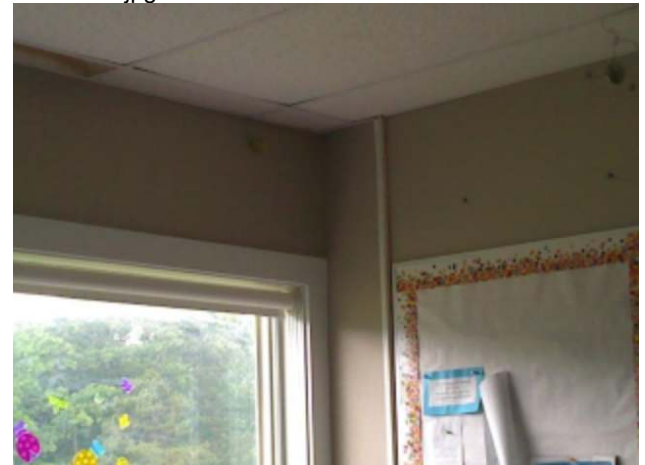
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6/18/2022 10:18:00 AM



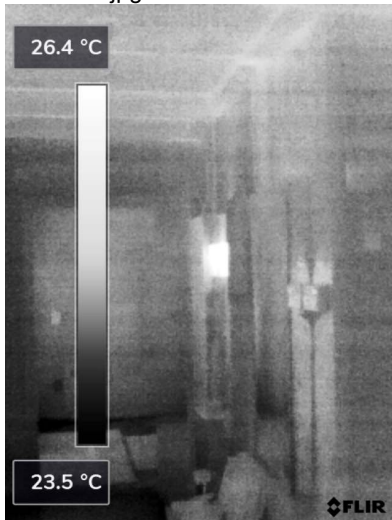
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FLIR9006.jpg 6/18/2022 10:18:15 AM



FLIR9007.jpg 6/18/2022 10:18:29 AM



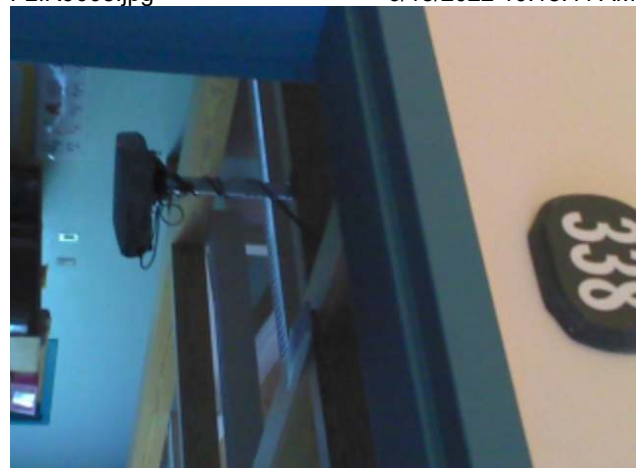
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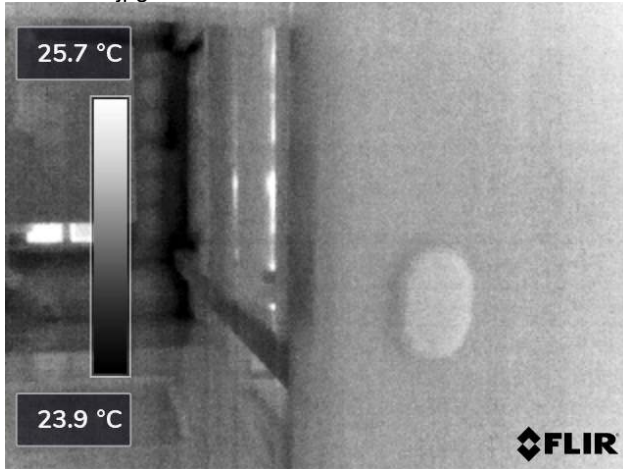


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FLIR9009.jpg

6/18/2022 10:18:48 AM



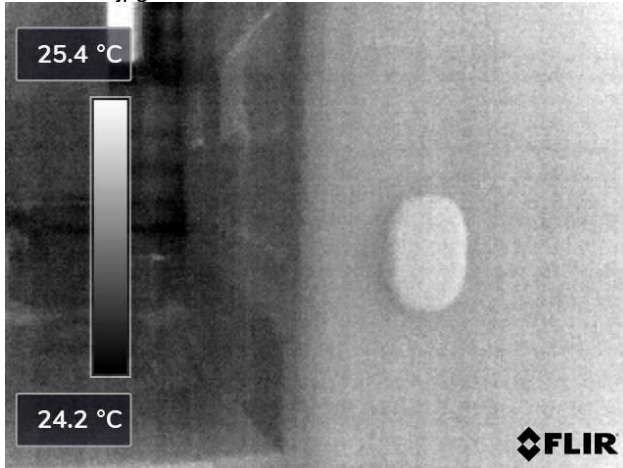
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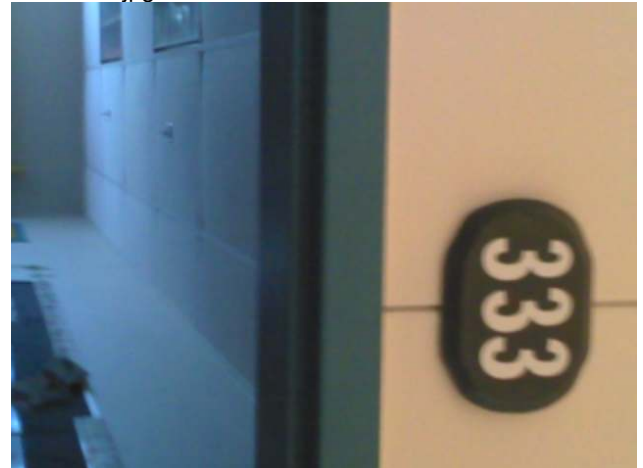
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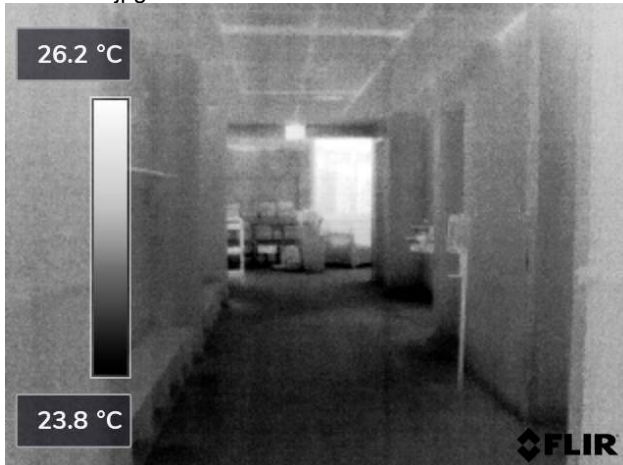
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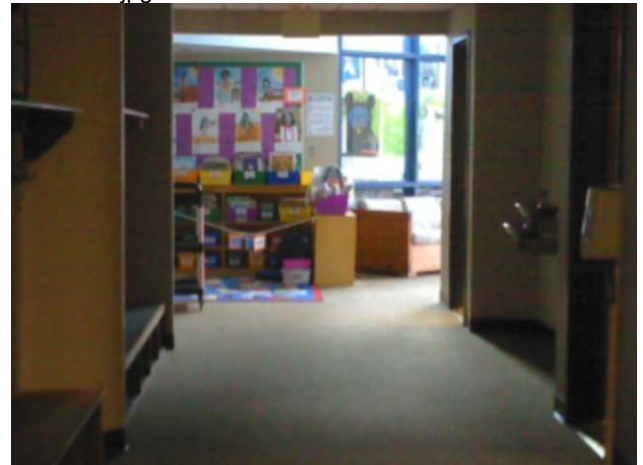
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FLIR9011.jpg

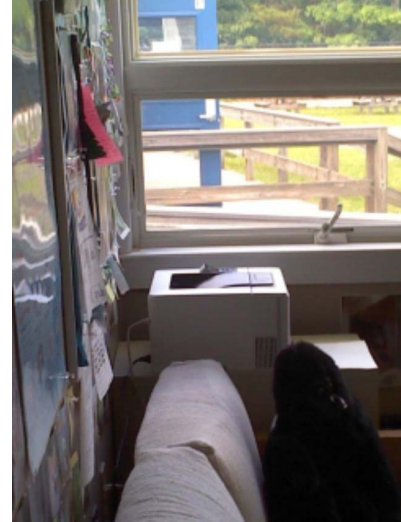
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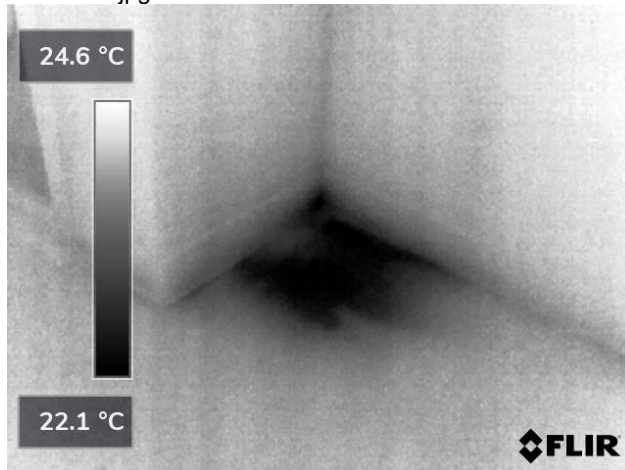
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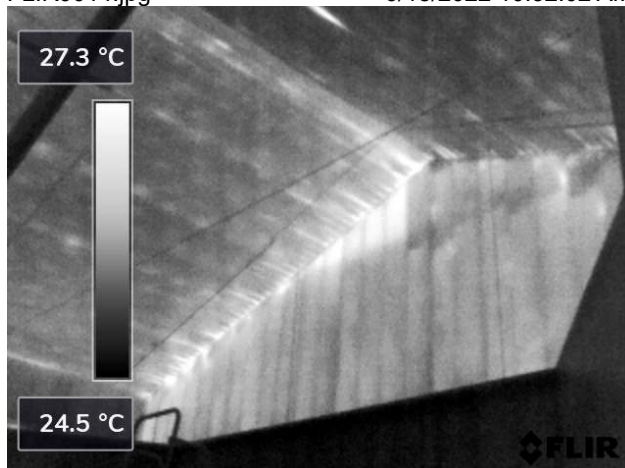
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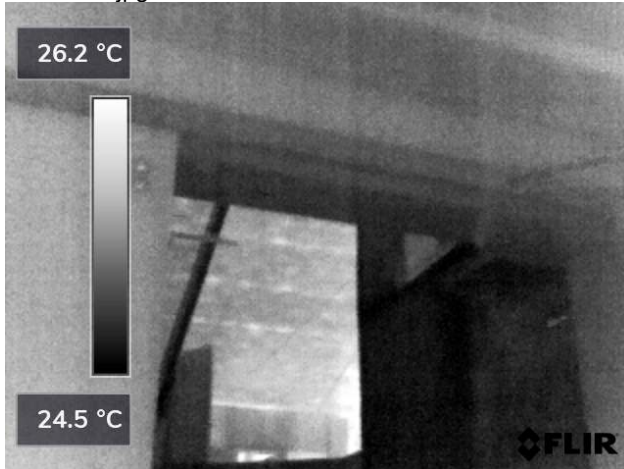


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6/18/2022 10:32:13 AM



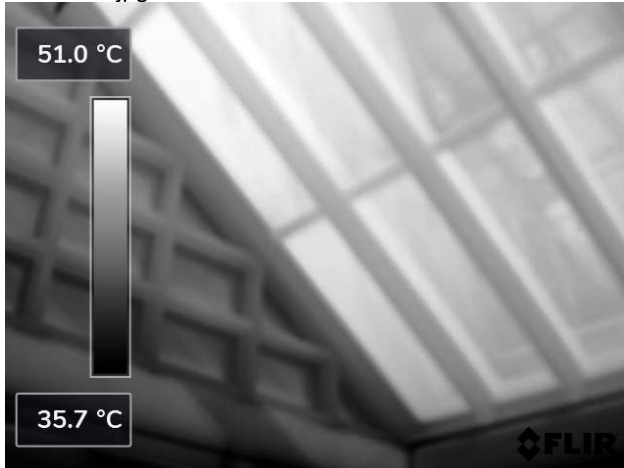
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FLIR9016.jpg

6/18/2022 10:32:33 AM



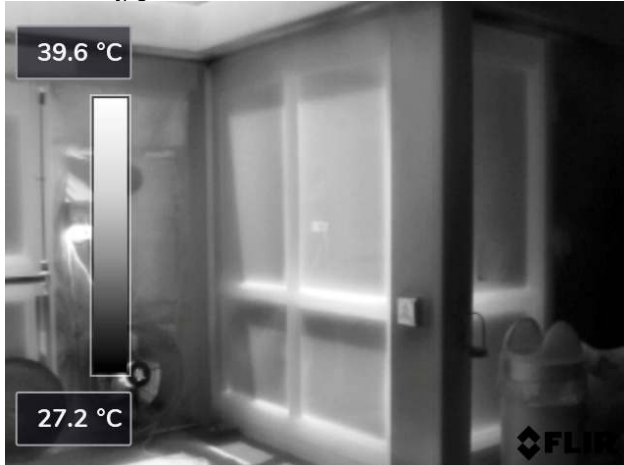
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FLIR9017.jpg

6/18/2022 10:32:43 AM



FLIR9017.jpg

6/18/2022 10:32:43 AM

