# Energy Audit

Sponsored by

EVERSOURCE ENERGY


## Sunapee Safety Services

9 Sargent Road

July 31, 2021

Audit Prepared by

BUILDING STRATEGIES FOR AN AFFORDABLE FUTURE
S.E.E.D.S.
SUSTAINABLE ENERGY EDUCATION DEMONSTRATION SERVICES
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## Introduction

This Energy Audit has been paid for by Eversource as part of their municipal energy efficiency program. Funding may also be available to help reduce energy usage through weatherization efforts.

The purpose of an energy audit is to identify energy saving measures (ESM) in a building. Computer simulated and other energy models were developed for this project using multiple strategies and software. The models predict energy consumption based on the local climate conditions, physical dimensions and characteristics of a building, mechanical systems, lighting, equipment, and occupancy patterns, in addition to a number of other variables.

With the building modeled in existing conditions, called here Existing Conditions, energy savings can be estimated for improvements to the thermal envelope or mechanical systems. The cost of those measures can then be analyzed in terms of predicted energy saved. The primary objective is to evaluate the level of investment warranted by energy and dollars saved from those specific measures. There are often benefits to recommended measures beyond potential energy and dollars saved. Improved comfort, air quality, and reduced maintenance, are all potential non energy saving benefits.

This audit has been prepared with the best of intentions to assist Eversource and the Town of Sunapee make informed decisions regarding improvements. We do not make any warranty, expressed or implied, or assume any legal liability or responsibility for the accuracy, completeness, or usefulness of any information, apparatus, product or process disclosed.

## Executive Summary

Sunapee's Safety Services Building was constructed in 2006 and houses the police and fire stations. As such, the building has varying occupancy levels though the second floor at least is occupied by two people 24/7365. Architectural plans were made available for the site visit and helpful to the assessment and analysis.

### Summary of Cost Savings Analysis of Recommendations

There are three recommended ESM Envelope Improvements involving air sealing and adding insulation above the ceiling plane of the administration side of the complex. The total estimated cost of those three ESM is estimated at $11,961. Based on the existing oil fired boiler, and price of oil at $2.75 per gallon, those improvements are predicted to have an annual dollar savings of $1,034. With an overall average life of service of 20 years (12-25 years) the investment gain would be $11,146 (at steady $2.75/gallon) with an annualized return on investment (ROI) of 3.4%.

| ESM # | Envelope Condition / ESM | Cost of Measure | Annual Savings | Simple Payback Years | Life of Measure | Invest-ment Gain | ROI | Annual ROI |
|---|---|---|---|---|---|---|---|---|
| 1 | Admin Air Sealing | $3,475 | $519 | 6.7 | 25 | $9,500 | 273.4% | 5.4% |
| 2 | Ceiling | $6,336 | $304 | 20.8 | 25 | $1,264 | 20.0% | 0.7% |
| 3 | Overhead D | $2,150 | $211 | 10.2 | 12 | $382 | 17.7% | 1.1% |
| ESM 1-3 | TOTALS | $11,961 | $1,034 | 11.6 | 20 | $11,146 | 93.2% | 3.4% |

Energy savings resulting from implementing the three ESM is estimated to be 51.1 million Btus a year (MMBTU) site energy and 57MMBH for source energy. (Source energy for fossil fuels is roughly estimated at 1.1 times site energy). A reduction of 376 gallons of oil per year is expected to reduce CO2 emissions by a minimum of 10 tons per year.

| ESM # | Envelope Condition / ESM | Cost of Measure | Oil Gallons Saved | Site Energy Reduction | Source Energy Reduction | Tons CO2 Reductions |
|---|---|---|---|---|---|---|
| 1 | Admin Air Sealing | $3,475 | 189 | 26.1 | 28.8 | 3.7 |
| 2 | Ceiling | $6,336 | 111 | 15.3 | 16.8 | 6.1 |
| 3 | Overhead D | $2,150 | 77 | 10.6 | 11.2 | 3.7 |
| ESM 1-3 | TOTALS | $11,961 | 376 | 52.1 | 57 | 10 |

Estimated energy reductions are based on the following assessment of existing envelope and tightness values and impacts from implementing the recommended ESM>

| Envelope Component | FT2 Area | u-value | UA | BTU/Hr Load @ 72ΔT | Improved u-Value | UA | BTU/Hr Load @ 72ΔT | Load Reduction |
|---|---|---|---|---|---|---|---|---|
| Walls: 2x6 Frame | 2835 | 0.065 | 184.3 | 13,267.8 | | | | |
| Wall: Basement | 2413 | 0.038 | 91.7 | 6,602.0 | | | | |
| Walls: Block, Insulated | 1448 | 0.125 | 181.0 | 13,032.0 | | | | |
| Walls: Block, Un-insulated | 744 | 0.584 | 434.5 | 31,283.7 | | | | |
| Windows | 312 | 0.35 | 109.2 | 7,862.4 | | | | |
| Glass Door- Entry | 40 | 0.57 | 22.8 | 1,641.6 | | | | |
| Exterior Doors | 57 | 0.5 | 28.5 | 2,052.0 | | | | |
| Overhead Doors (10) | 1776 | 0.083 | 147.4 | 10,613.4 | | | | |
| Flat Ceiling - Admin | 3840 | 0.049 | 188.2 | 13,547.5 | 0.02 | 76.8 | 5,529.6 | - 8,017.9 |
| Slopes | 704 | 0.077 | 54.2 | 3,903.0 | | | | |
| Flat Ceiling - Bays | 6630 | 0.044 | 291.7 | 21,003.8 | | | | |
| Slab Floor & Perimeter | 496 | 0.589 | 292.1 | 21,034.4 | | | | |
| Shell Sensible Losses | | | | 145,844 | | | | |
| ACH (Infil & Vent) | | 1770 | cfm | 55,384 | 1620 | cfm | 50,691.0 | - 4,693.0 |
| Overhead Door Seals | | | | | 1510 | cfm | 47,429.0 | - 3,262.0 |
| System / Distribution | | | | 26,523 | | | | |
| Total Heating Loads | | | | 227,751 | | | | 211,778 |

## Existing Energy Use Analysis

The energy analysis below is based on the energy data provided from oil and electric for the Safety Services Building. Oil consumption and cost is based on an average usage and price from 2018 and 2019 and electric is averaged over three years: 2018 through 2020 since limited data was provided for 2021. The cost of electricity, however, is based on rates as the May 2021 Eversource statement.

| Energy | Units | Site Btus | Source Btus | $Cost |
|---|---|---|---|---|
| Electric kWh | 92,560 | 315,814,720 | 1,051,574,160 | $15,587 |
| Oil | 5,502 | 762,027,000 | 838,229,700 | $15,131 |
| Propane | 86 | 7,851,800 | 8,636,980 | $151 |
| Totals | | 1,085,693,520 | 1,898,440,840 | $30,868 |
| EUI KBtu/FT2 | 20133 | 53.9 | 94.3 | $1.53 |

The Energy Utilization Index (EUI) offers a simple snapshot analysis of a building's energy use by looking at total amount of energy input (converted to Btu's) divided by the floor area of conditioned space. "Site Energy" refers to units of energy delivered to a site. Source energy includes transmission and some allowance for off site generation and other considerations. Source energy attempts to reflect the amount of energy is required to generate and deliver energy to the site, for a more accurate calculation of costs and carbon emissions.

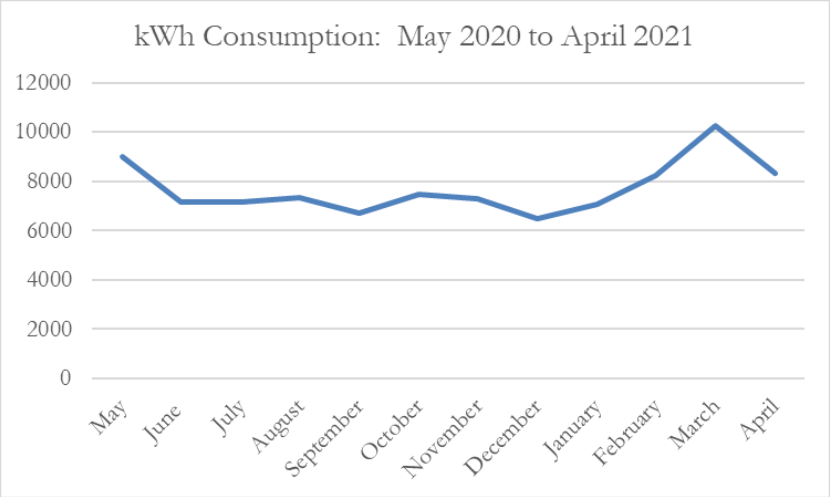
Based on the information provided the EUI is 53.9 KBtu/ft2 at a cost $1.53 per ft2 at current energy prices.

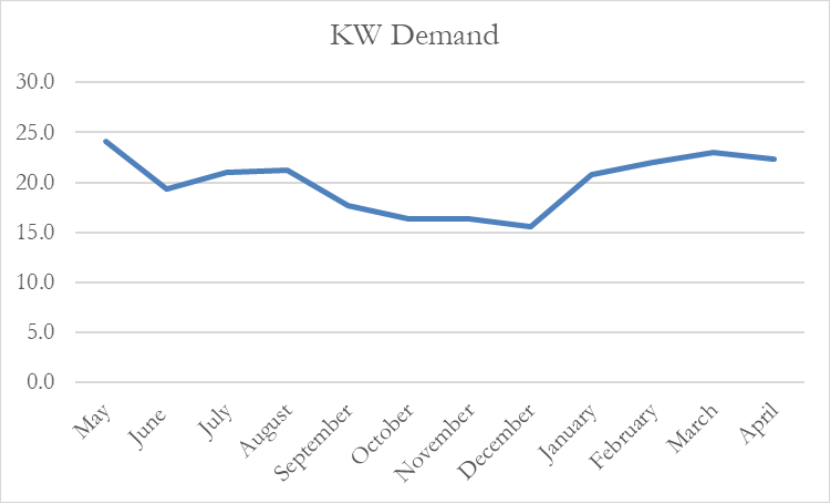
Breaking down the charges on your electric bill. The chart below breaks down 2020 kWh Usage and KW De-mand for 2020 with the rates from December 2020, for a total annual cost of $14,999. Reducing electric kWh energy consumption will reduce costs for kWh Supply and Delivery.

The KW Demand, which is determined each month by the peak 1-3 hours of demand on the grid, and accounted for over 24% of 2020 costs, may be impacted by a reduction in kWh consumption, but is mostly determined by the time. That is, when energy is used by the grid. For example, plugging in block warmers or chargers only at night, may reduce loads during the day enough to lower KW demand.

| Charges | 3 yr Avg |
|---|---|
| Service Charge | $389 |
| Supply | $6,892 |
| KW Demand | $3,672 |
| Dist & Trans | $2,321 |
| Strnd Cost | $1,074 |
| Systems Benefit | $651 |
| | $14,999 |

| Year | Total kWh | Averages |
|---|---|---|
| 2015 | 106,080 | |
| 2016 | 104,600 | |
| 2017 | 100,960 | |
| 2018 | 94,080 | 101,430 |
| 2019 | 81,640 | |
| 2020 | 87,320 | 87,680 |



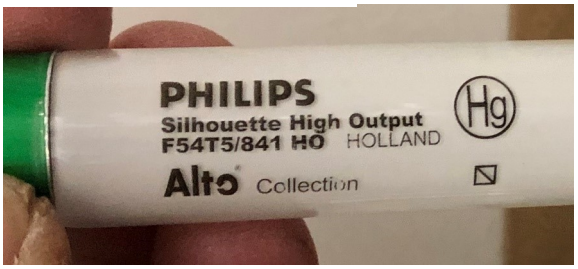

## Lighting

Lighting consists of both LED replacement tubes and remaining four foot T5 fluorescent. A Smart Start Loan is paid down $233 per month, presumably for the 2019 lighting conversion.

**Loan Summary**

**Smart Start - Service Ref # 812593005**

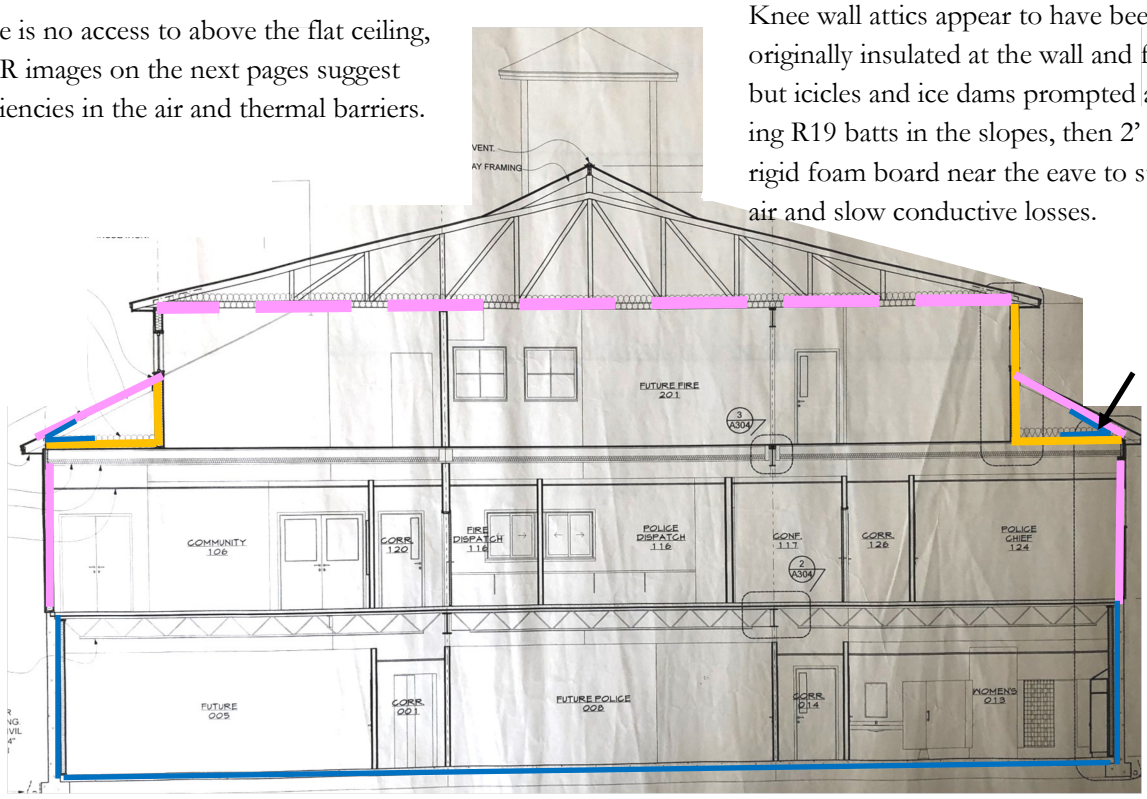
| | |
|---|---|
| Initial Loan Amount | $9,087.00 |
| Amount Paid to Date | $7,223.00 |
| Loan Balance | $1,864.00 |

**Thermal Barriers** This graphic attempts to describe the original insulation strategies, subsequent additions, and improvement recommendations.

There is no access to above the flat ceiling, but IR images on the next pages suggest deficiencies in the air and thermal barriers.

Knee wall attics appear to have been originally insulated at the wall and floor, but icicles and ice dams prompted adding R19 batts in the slopes, then 2' XPS rigid foam board near the eave to stop air and slow conductive losses.




## ESM 1 and 2

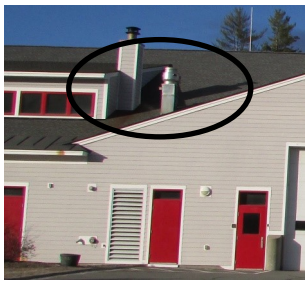
### Thermographic, aka Infra Red or IR, Images

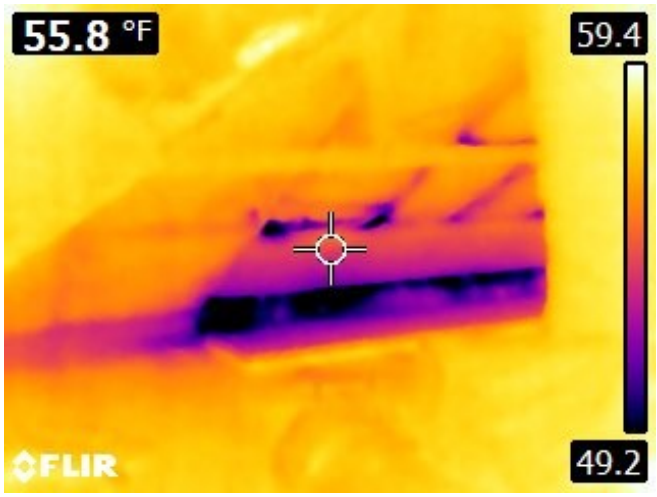
IR images depict differences in surface temperatures. Darker colors indicate cooler surfaces, either from missing or poorly performing insulation or outside air infiltration. Streaking or 'dark blobs' usually indicate cold air infiltration.

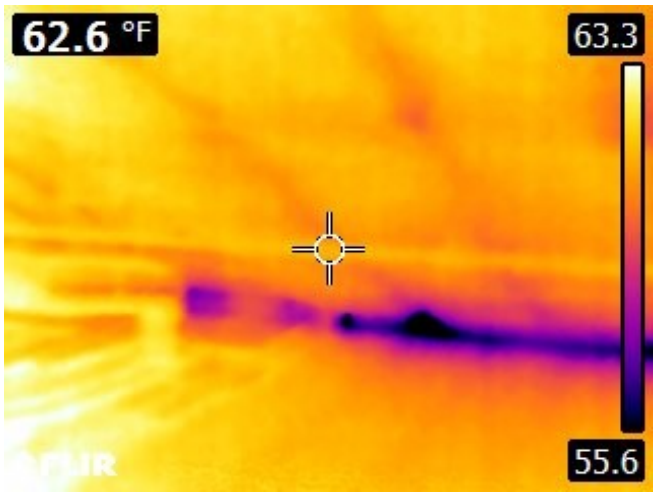
Valiant efforts were made to address ice damns on the NE facing slopes by installing rigid foam board on the floor and slope. This did result in a reduction of ice, but did not eliminate the issue.

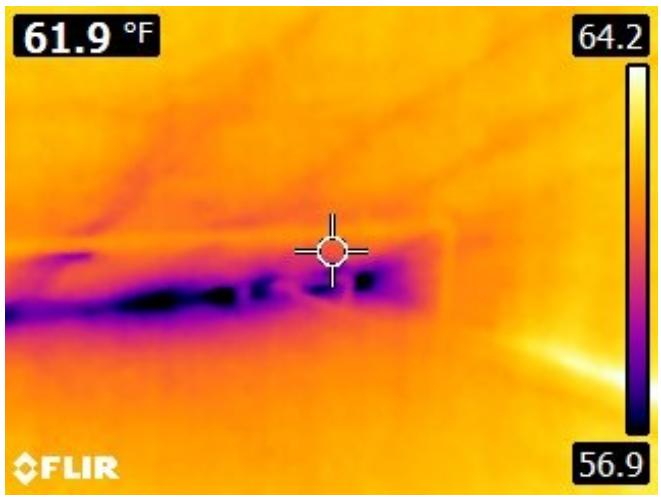
Part of the issue can be resolved by labor intensive air sealing all seams of the foam board and taping gaps or seams in membranes. This is included in ESM#1 for an estimated cost of $2500.

Any remaining heat loss would be due to the jacket and chimney losses from the boiler room directly below. It may be possible to reduce those losses by installing additional, rock or mineral wool and fire stop caulk in the attic area above the boiler room, but access is limited



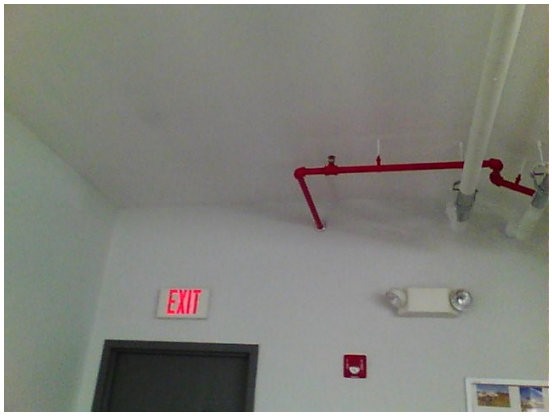


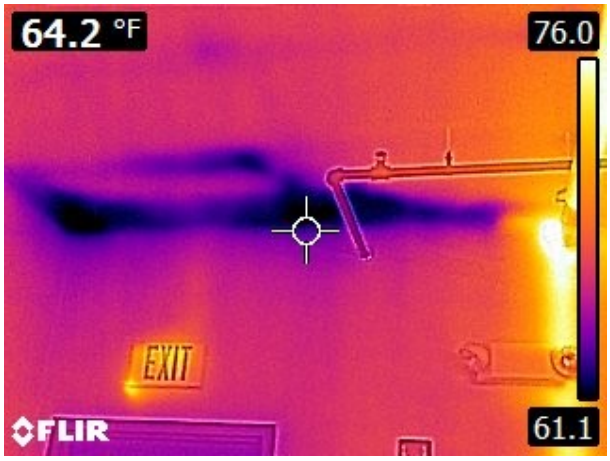



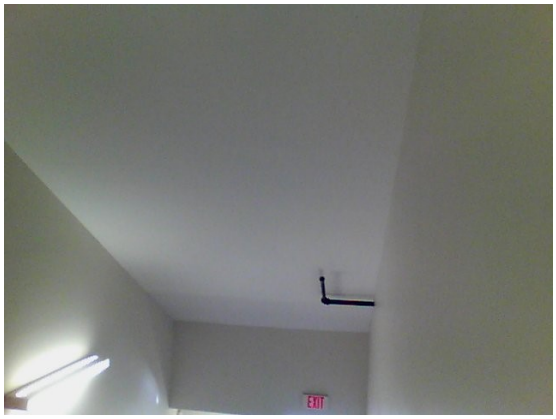



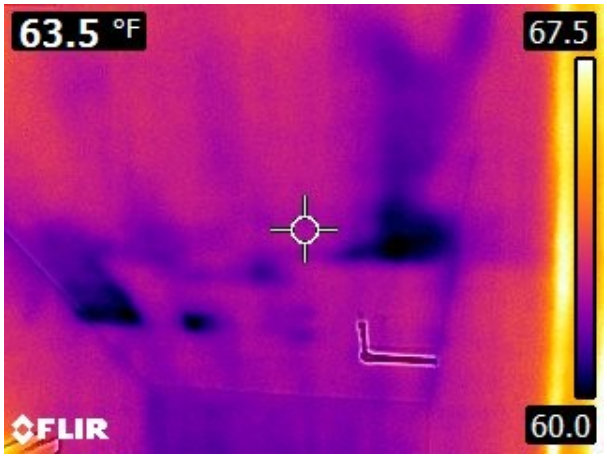
## ESM 1 and 2 Continued

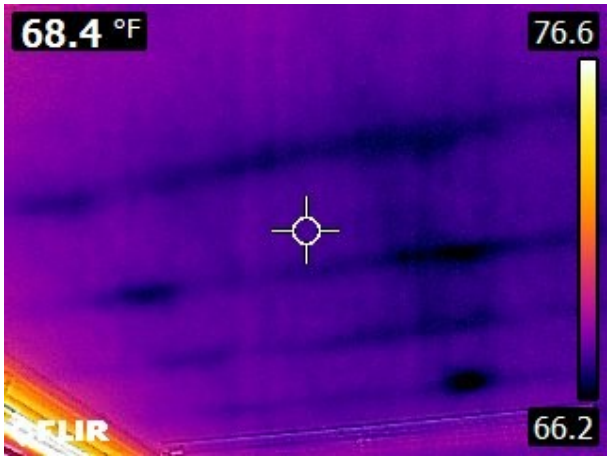
ESM 1 focuses on air sealing the Admin side of the building and ESM 2 involves adding insulation above the ceiling to create an effective R50 assembly. At present, there was no access found above the ceiling, so recommendations are based on IR images alone, which means the condition of the insulation is not known and some may need to be removed. The thermal bridging shown in the lower left suggests that the batts do not cover framing joists and is missing or diminished from wetting in other areas.



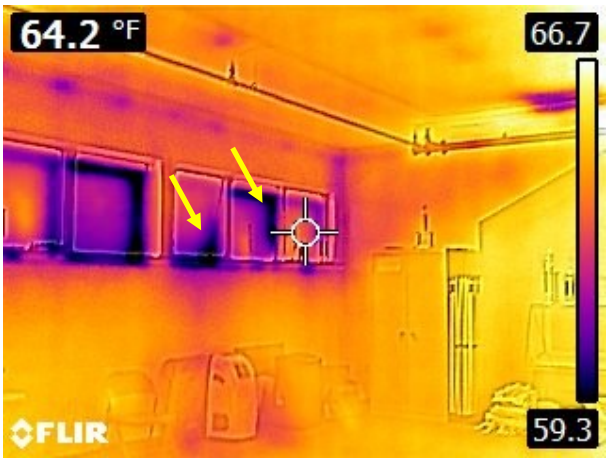



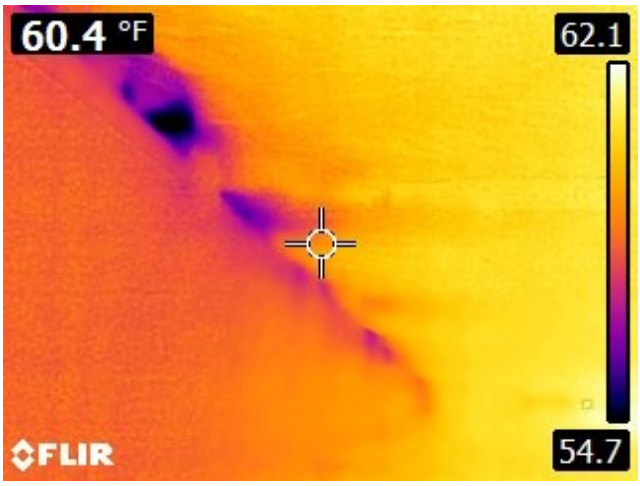
## ESM 1 and 2 Continued

Some of the windows were not fully closed. If they can't be closed, then replacing the mechanisms is in order. The more important issue remains air sealing above the ceiling wherever there are material transitions above wall framing.

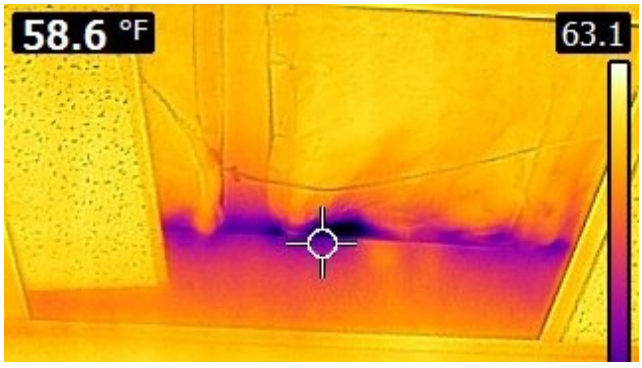

## ESM 1 and 2 Continued First Floor Rim and Band Joists

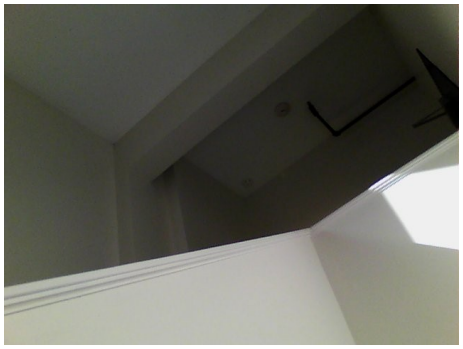
Fiberglass stuffed into rim and band joists do slow conductive heat loss, but do not stop air which results in a) outside air infiltration contributing to exfiltration from the second floor air gaps and b) thermal bypass losses as air migrates through low density and air permeable insulation.




Ideally, these rim and band joist framing members would have been air sealed during construction as the cost to retrofit involves either cutting rigid foam and sealing with silicone or one part foam, or removing all ceiling tiles, protecting all interior surfaces and covering everything with plastic and spraying 2-3" closed cell foam.

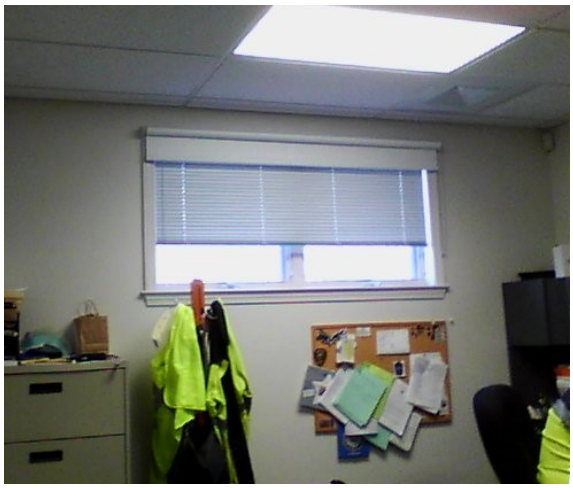
ESM 1 Air Sealing Package includes a more modest effort of using froth pack to air seal behind the fiberglass on all exterior rim/band joists accessible above suspended ceiling tiles, estimated at 75 lineal feet. This is still labor intensive but a more cost effective option than the ideal.



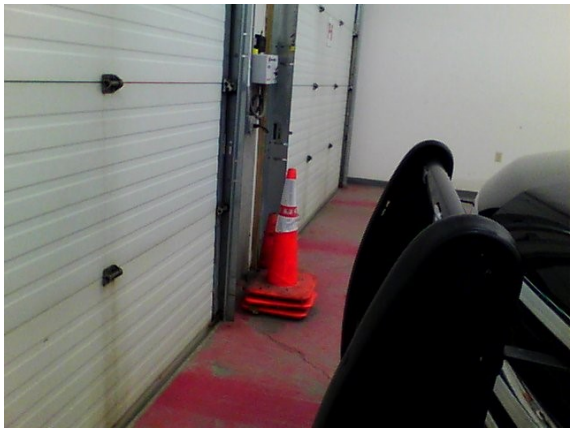



## ESM 1 and 2 Continued Limited Weather-Stripping

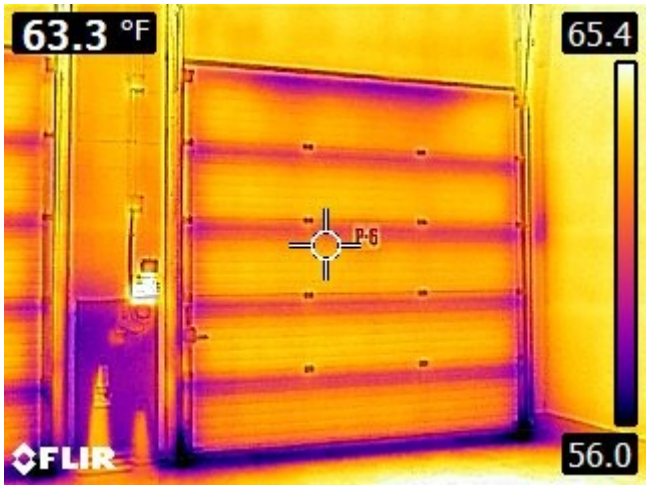


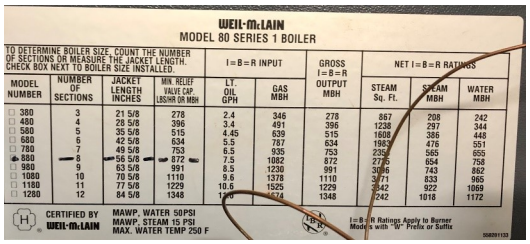
## ESM 3 Overhead Door Seals

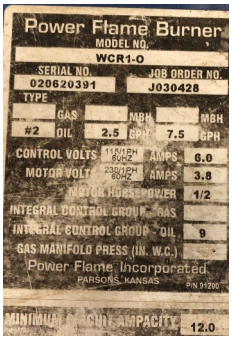






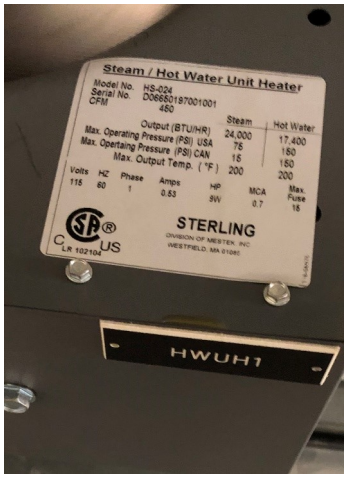

## Boiler and Hot Water Heating & Thermal Storage




Weil McLain Model
80 Series 1 Boiler
Model 880
Gross IBR Output: 872 MBH
Net IBR Rating: 758 MBH







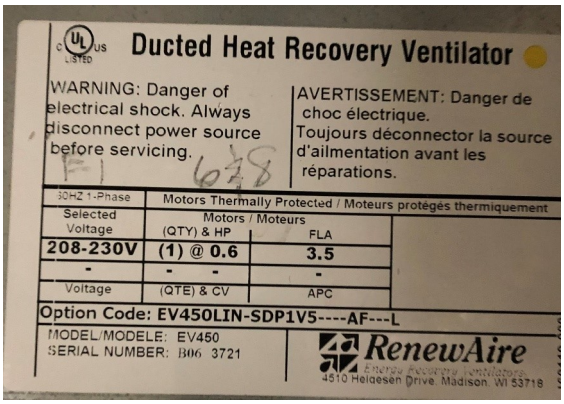
Hot Water Unit Heater 115 V 2.2 Amps
Output 17,400 BTU/HR

Serves AH 4

Hot Water Unit Heater 115 V 2.2 Amps
Output 61,000 BTU/HR

Serves 2nd floor

## Energy Recovery Ventilation

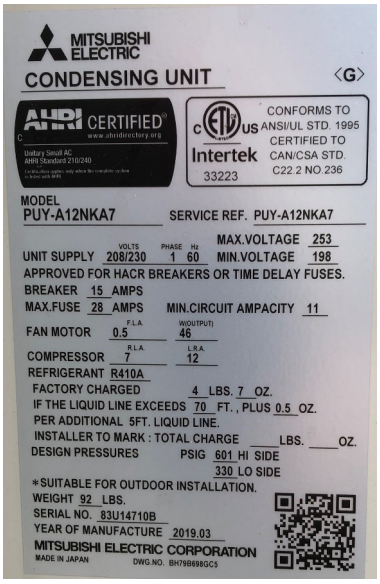


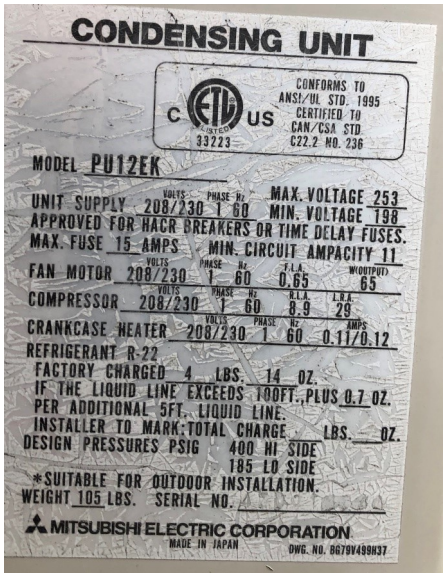


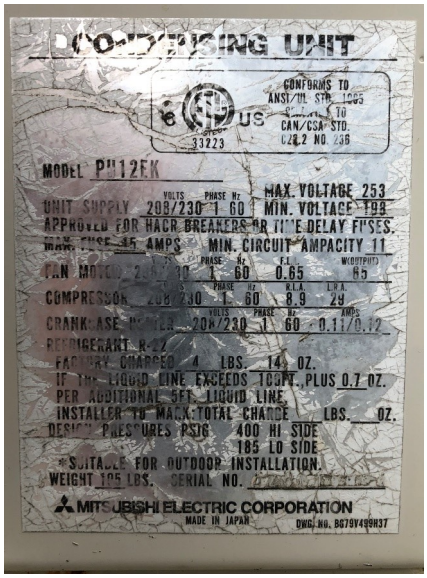
| ERV | Make | Model | S/E CFM | Total eff % Wint/Sum | Blower HP |
|---|---|---|---|---|---|
| ERV-1 | RenewAire | EV450 | 350 | 66/45 | 0.6 |
| ERV-2 | RenewAire | EV450 | 375 | 66/46 | 0.6 |

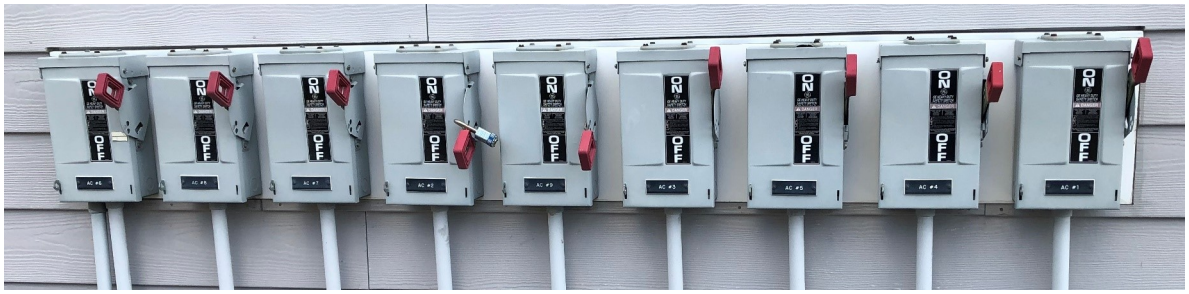
## Outdoor Condensing Units

Manufactured dates either 2003 or 2006



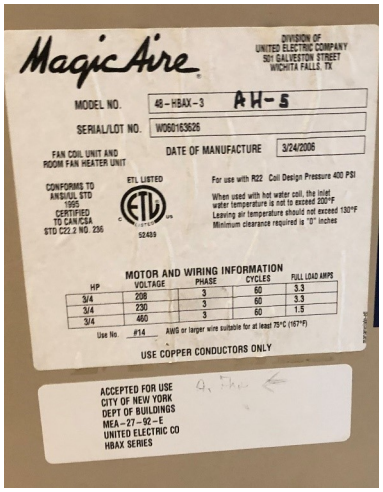



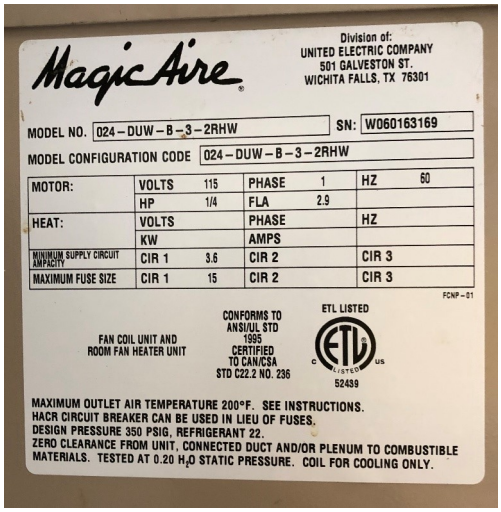



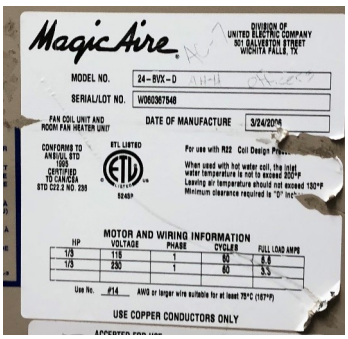

| Mark | Make | Model | SEER | Hi-Lo CFM | Total Cooling Capacity MBH |
|---|---|---|---|---|---|
| CCU-1-4 | Mitsubishi | PU12EK | 11.5 | | 12.5 |
| CCU-5 | Carrier | 38CKCO24 | 10 | | 24 |
| CCU-6-8 | Carrier | 38CKC30 | 11 | | 29 |
| CCU 9 | Carrier | 38CKCO48 | 10.5 | | 48 |
| AC-1-4 | Mitsubishi | PK12FK | | 490-350 | 12.5 |

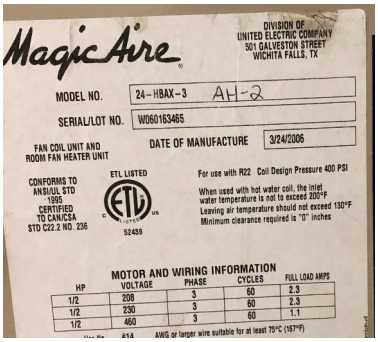
## Fan Coil Units and Room Heater Fan Units



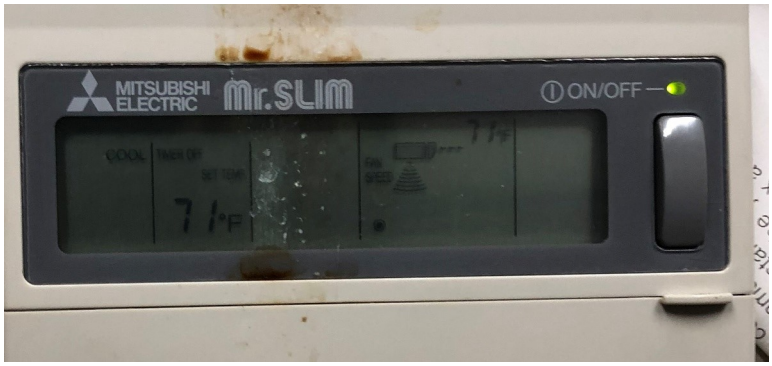


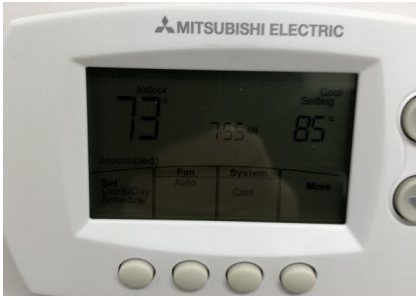




| Mark | Make | Model | CFM | OA Air CFM | ERV | Blower HP | Total Cooling Capacity MBH | Area Served (if labeled) | Manu-factured |
|---|---|---|---|---|---|---|---|---|---|
| AH-1 | Magic Aire | 24 BVX | 800 | 350 | ERV-1 | 1/4 | 27.4 | | 2006 |
| AH-2 | Magic Aire | 24 HBAX-3 | 800 | 275 | ERV-2 | 1/2 | 29.4 | | 2006 |
| AH-3 | Magic Aire | 24 HBAX-3 | 900 | 100 | n/a | 1/2 | 30.5 | | |
| AH-4 | Magic Aire | 24 HBAX-3 | 600 | 100 | n/a | 1/3 | 23.8 | | |
| AH-5 | Magic Aire | 48-BVX | 1200 | 300 | | 3/4 | 47.5 | | 2006 |
| AH-6 | Magic Aire | | | | | | | | |
| AH-7 | Magic Aire | 24 BVX - D | 800 | 350 | n/a | 1/3 | 36 | Officers | 2006 |
| AH-8 | Magic Aire | 24 BVX - D | 800 | 350 | n/a | 1/3 | 36 | Lobby | 2006 |

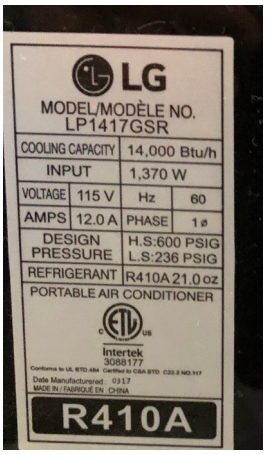
## Other Indoor Units and Controls



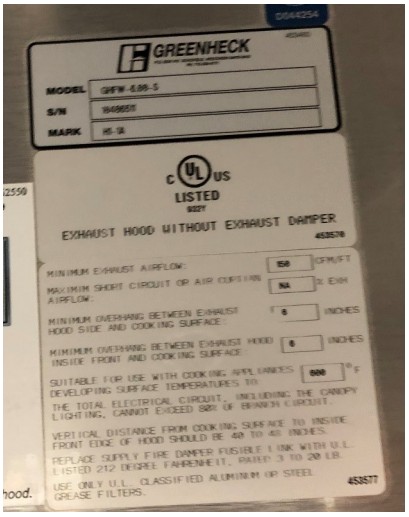




## Kitchen and Other Appliances

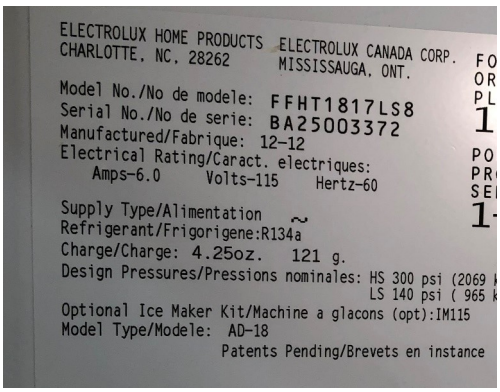
An estimated 18 computer stations throughout the building with multiple communication stations. A detailed inventory of electric devices is not possible for police and fire stations due to high security and areas off limits to the public.



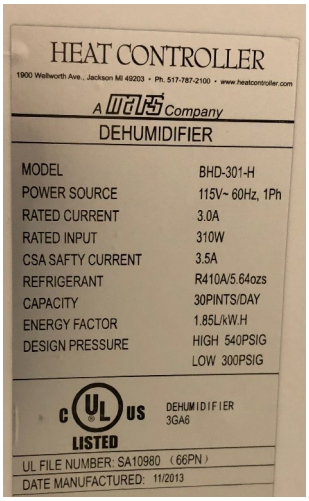

LG 14,000 Btu/hr floor standing , window vented AC unit serving second floor








2012 Electrolux Refrigerator

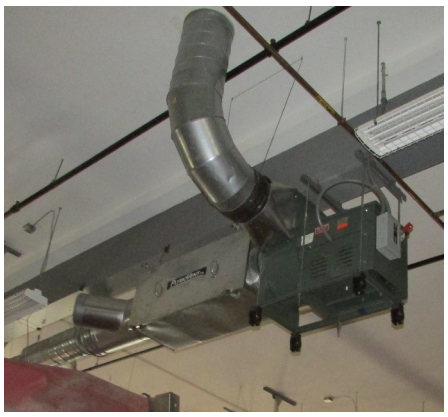


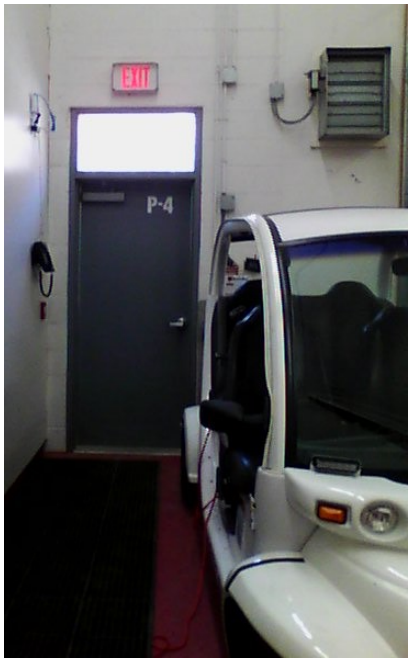


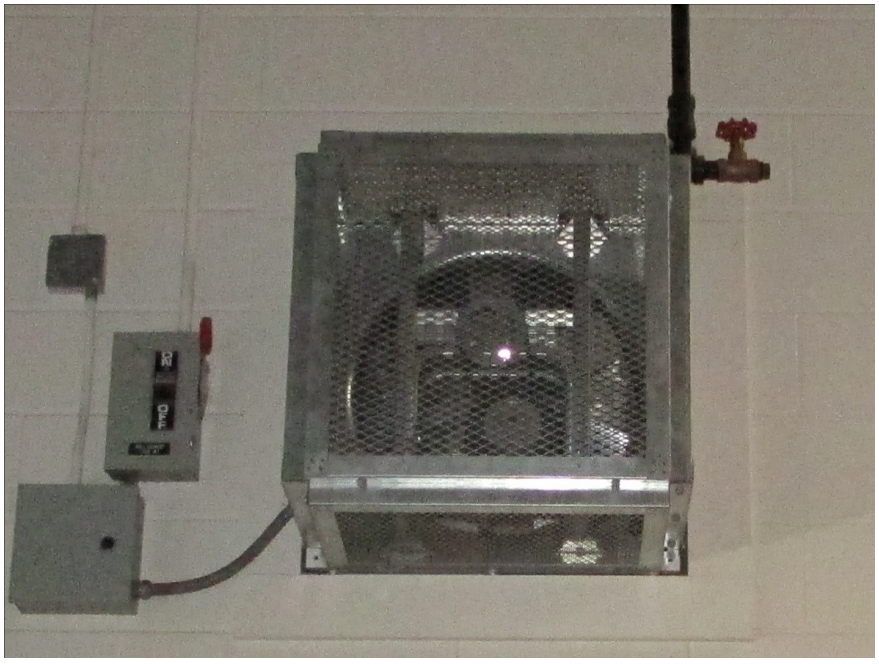
2007 Sears Refrigerator

## Apparatus Bay Ventilation and Exhaust

Vehicle Exhaust fumes are removed by louvred intake/exhaust fans (Sally Port) and both Wall Exhaust fans and Plymo Vent systems in the Apparatus Bays





## Service Panel Legends

TYPE : GE AQ Panelboard
DIMENSIONS : 64.4 x 20 x 5.75
MOUNTING : Surface
PANEL FEED : Bottom

Sunapee Safety Complex
PANEL – EDP
THREE PHASE PANEL

VOLTAGE : 208Y120
MAINS : 400 Amp
A.I.C. RATING : 22,000 AIC
LUGS SIZE : 500 MCM

| DESCRIPTION | BKR | PHASE A | PHASE B | PHASE C | BKR | DESCRIPTION |
|---|---|---|---|---|---|---|
| Panel ECP | 125/3 | 1 | • | 2 | 125/3 | Panel EMP |
| Panel ECP | 125/3 | 3 | • | 4 | 125/3 | Panel EMP |
| Panel ECP | 125/3 | 5 | • | 6 | 125/3 | Panel EMP |
| Panel EPP2 | 125/3 | 7 | • | 8 | 20/1 | CCU #1 |
| Panel EPP2 | 125/3 | 9 | • | 10 | 20/1 | CCU #1 |
| Panel ELP1 | 125/3 | 11 | • | 12 | 20/1 | CCU #4 |
| Panel ELP1 | 125/3 | 13 | • | 14 | 20/1 | CCU #4 |
| Panel ELP1 | 125/3 | 15 | • | 16 | 20/1 | CCU #3 |
| Panel EPP1B | 125/3 | 17 | • | 18 | 20/1 | CCU #3 |
| Panel EPP1B | 125/3 | 19 | • | 20 | 20/1 | CCU #2 |
| PanelEPP1B | 125/3 | 21 | • | 22 | 20/1 | CCU #2 |
| Machine Room Exhaust Fan | 125/3 | 23 | • | 24 | 20/1 | ~~Elevator Pit Sump~~ Pump ~~& Oil Minder~~ CONDENSAT |
| Basement Receptacles – Future Police | 20/1 | 25 | • | 26 | 20/1 | Basement Receptacles |
| Basement Receptacles – Electrical, Tel/Data | 20/1 | 27 | • | 28 | 20/1 | ~~Basement~~ Receptacles PIT |
| Elevator Machine Room Receptacles | 20/1 | 29 | • | 30 | 20/1 | Elevator Machine Room Receptacles OIL MINDER |
| – | – | 31 | • | 32 | 20/1 | Elevator Car Light |
| – | – | 33 | • | 34 | – | – |
| – | – | 35 | • | 36 | – | – |

TYPE : GE Spectra Panelboard
DIMENSIONS : 89.25 x 27 x 11.5
MOUNTING : Surface
PANEL FEED : Bottom

Sunapee Safety Complex
THREE PHASE PANEL – MDP

VOLTAGE : 208Y120
MAINS : 600 Amps
A.I.C. RATING : 22,000 AIC
LUGS SIZE : Parralell 500 MCM

| DESCRIPTION | BKR | PHASE A | PHASE B | PHASE C | BKR | DESCRIPTION |
|---|---|---|---|---|---|---|
| CCU #5 | 20/2 | 1 | • | 2 | 20/1 | Fire Alarm Control Panel |
| CCU #5 | 20/2 | 3 | • | 4 | 20/3 | AC Unit #7 |
| CCU #6 | 20/3 | 5 | • | 6 | 20/3 | AC Unit #7 |
| CCU #6 | 20/3 | 7 | • | 8 | 20/3 | AC Unit #7 |
| CCU #6 | 20/3 | 9 | • | 10 | 20/3 | AC Unit #8 |
| CCU #9 | 30/3 | 11 | • | 12 | 20/3 | AC Unit #8 |
| CCU #9 | 30/3 | 13 | • | 14 | 20/3 | AC Unit #8 |
| CCU #9 | 30/3 | 15 | • | 16 | 60/3 | ATS #2 |
| – | 20/1 | 17 | • | 18 | 60/3 | ATS #2 |
| Elevator Machine | 175/3 | 19 | • | 20 | 60/3 | ATS #2 |
| Elevator Machine | 175/3 | 21 | • | 22 | 20/1 | – |
| Elevator Machine | 175/3 | 23 | • | 24 | 20/1 | – |
| – | 20/1 | 25 | • | 26 | 20/1 | – |
| ATS #1 | 400/3 | 27 | • | 28 | 20/1 | – |
| ATS #1 | 400/3 | 29 | • | 30 | 20/1 | – |
| ATS #1 | 400/3 | 31 | • | 32 | – | – |

TYPE : GE AQ Panelboard
DIMENSIONS : 37.5 x 20 x 5.75
MOUNTING : Surface
PANEL FEED : Top

Sunapee Safety Complex
PANEL – EMP
THREE PHASE PANEL

VOLTAGE : 208Y120
MAINS : 125 Amps
A.I.C. RATING : 10,000 AIC
LUGS SIZE : 1/0

| DESCRIPTION | BKR | PHASE A | PHASE B | PHASE C | BKR | DESCRIPTION |
|---|---|---|---|---|---|---|
| Boiler Control | 20/1 | 1 | • | 2 | 20/1 | Spare |
| Sprinkler Compressor | 20/1 | 3 | • | 4 | 20/1 | Mechanical Room Unit Heater |
| Sprinkler Bell | 20/1 | 5 | • | 6 | 20/2 | ERV #1 – Mechanical Room |
| Spare | 20/1 | 7 | • | 8 | 20/2 | ERV #1 – Mechanical Room |
| Basement A/C Units | 20/1 | 9 | • | 10 | 20/1 | Mechanical Room Receptacles |
| Hot Water Circulator Pumps | 20/1 | 11 | • | 12 | 20/2 | Sewage Pump |
| Boiler Circulator Pump #1 | 20/1 | 13 | • | 14 | 20/2 | Sewage Pump |
| Boiler Circulator #2 | 20/1 | 15 | • | 16 | 20/2 | Boiler Feed Pump |
| Spare | 20/1 | 17 | • | 18 | 20/2 | Boiler Feed Pump |
| Circulator Pump #2 | 20/1 | 19 | • | 20 | 20/1 | Circulator Pumps #1, #4 and #5 |
| Circulator Pump #3 | 20/1 | 21 | • | 22 | 20/1 | Spare ~~Condensate outlet~~ |
| Temperature Control Panel | 20/1 | 23 | • | 24 | 20/2 | Air handler #1 – Mechanical Room |
| Spare | 20/1 | 25 | • | 26 | 20/2 | Air handler 31 – Mechanical Room |
| Spare | 20/1 | 27 | • | 28 | – | – |
| Spare | 20/1 | 29 | • | 30 | – | – |

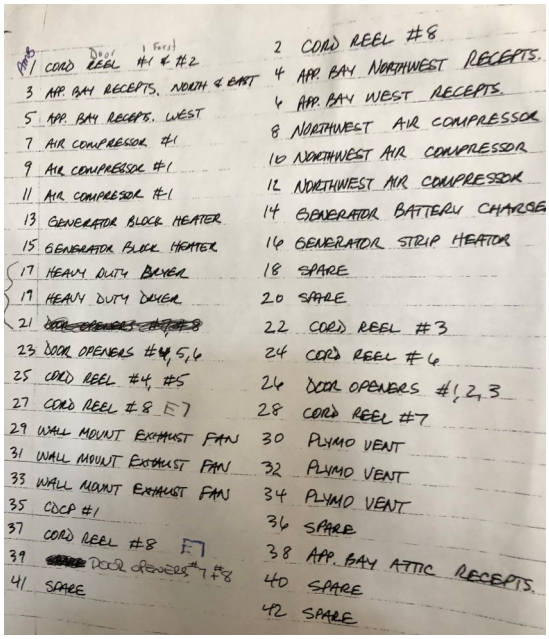
TYPE : GE AQ Panelboard
DIMENSIONS : 37.5 x 20 x 5.75
MOUNTING : Surface
PANEL FEED : Bottom

Sunapee Safety Complex
PANEL – ECP
THREE PHASE PANEL

VOLTAGE : 208Y120
MAINS : 125 Amps
A.I.C. RATING : 10,000 AIC
LUGS SIZE : 1/0

| DESCRIPTION | BKR | PHASE A | PHASE B | PHASE C | BKR | DESCRIPTION |
|---|---|---|---|---|---|---|
| Recepts. – Rooms 119, 123 and 124 | 20/1 | 1 | • | 2 | 20/1 | – |
| Recepts. – Rooms 114, 117, 120 | 20/1 | 3 | • | 4 | 20/1 | Recepts. – Room 115 |
| Recepts. – Room 106 | 20/1 | 5 | • | 6 | 20/1 | Recepts. – Room 005 |
| Recepts. – Room 008 | 20/1 | 7 | • | 8 | 20/1 | Junction Box – 2nd Floor Future |
| Junction Box – 2nd Floor Future | 20/1 | 9 | • | 10 | 20/1 | Junction Box – 2nd Floor Future |
| Dedicated Recept. – Room 009 | 20/1 | 11 | • | 12 | 20/1 | Dedicated Receptacle –Room 009 |
| Dedicated Recept. – Room 009 | 20/1 | 13 | • | 14 | 20/1 | Dedicated Receptacle – Room 009 |
| Dedicated Recept. – Cable Backboard | 20/1 | 15 | • | 16 | 20/1 | Dedicated Receptacle – Phone Backboard |
| Security Panel – 120 Volt Feed | 20/1 | 17 | • | 18 | 20/1 | Recepts. – Room 125 |
| Recepts. – Room 125 | 20/1 | 19 | • | 20 | 20/1 | Recepts. – Room 125 |
| Dedicated Recept. – Room 125 | 20/1 | 21 | • | 22 | 20/1 | Dedicated Recept. – Room 125 |
| Dedicated Recept. – Room 125 | 20/1 | 23 | • | 24 | 20/1 | Receptacles – Room 116 |
| – | 20/1 | 25 | • | 26 | 20/1 | – |
| – | 20/1 | 27 | • | 28 | 20/1 | – |
| POLE LITE OUTLET | 20/1 | 29 | • | 30 | 20/1 | – |
| – | – | 31 | • | 32 | – | – |
| – | – | 33 | • | 34 | – | – |

Fire Truck Bays



## Architect's Plans –July 15, 2005

Thermal Layers

### Foundation:

Exterior: R5 Warm-N Dri from footing to 4" below grade

Interior: 3.5" unfaced fiberglass batts "R13"

Effective: R16

Drawings call for R10 sub slab insulation

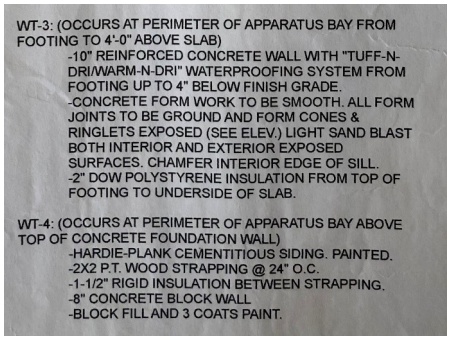
### Administration Walls:

High density unfaced fiberglass batts in 2x6 wood cavities @ 16" OC "R21" Effective: R16

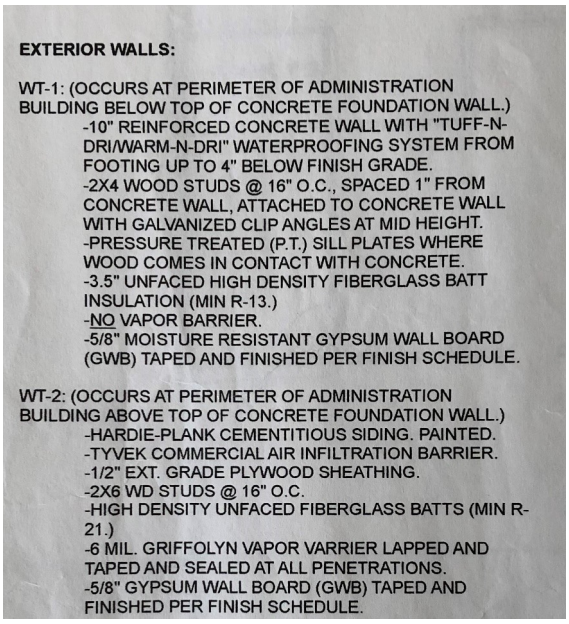
Interior vapor barrier lapped and sealed

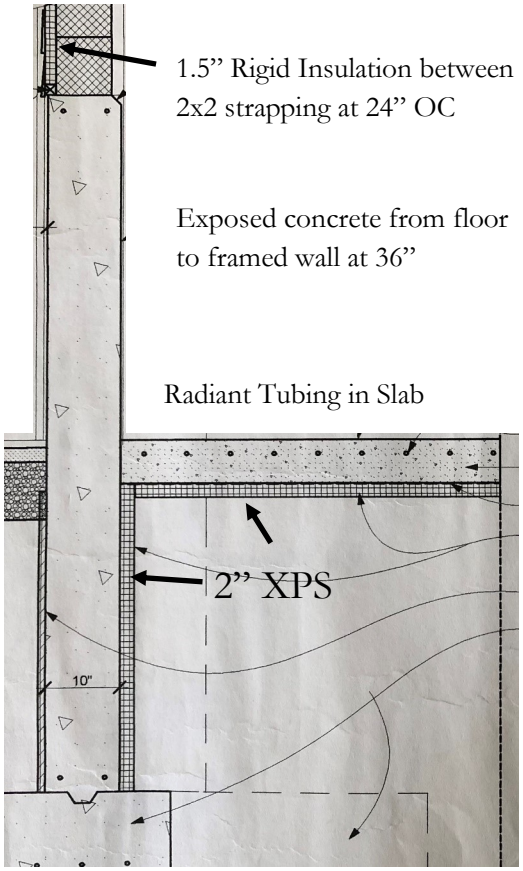
| | |
|---|---|
| Framing Member Depth (inches) | 5.5 |
| Framing Member Thermal Resistance (R/inch) | 1.10 |
| Framing Member % of assembly surface area | 16% |
| Cavity Insulation Depth (inches) | 5.5 |
| Cavity Insulation Thermal Resistance (R/inch) | 3.4 |
| Continuous Insulation Thickness (inches) | 0.00 |
| Continuous Thermal Resistance (R/inch) | 0.00 |
| Drywall, sheathing and air films | 2.00 |
| | |
| Nominal R Value, framing + insulation | 18.70 |
| System R Value, framing + insulation | 14.01 |
| Overall R value | *16* |

### Apparatus Bay Foundation and Walls

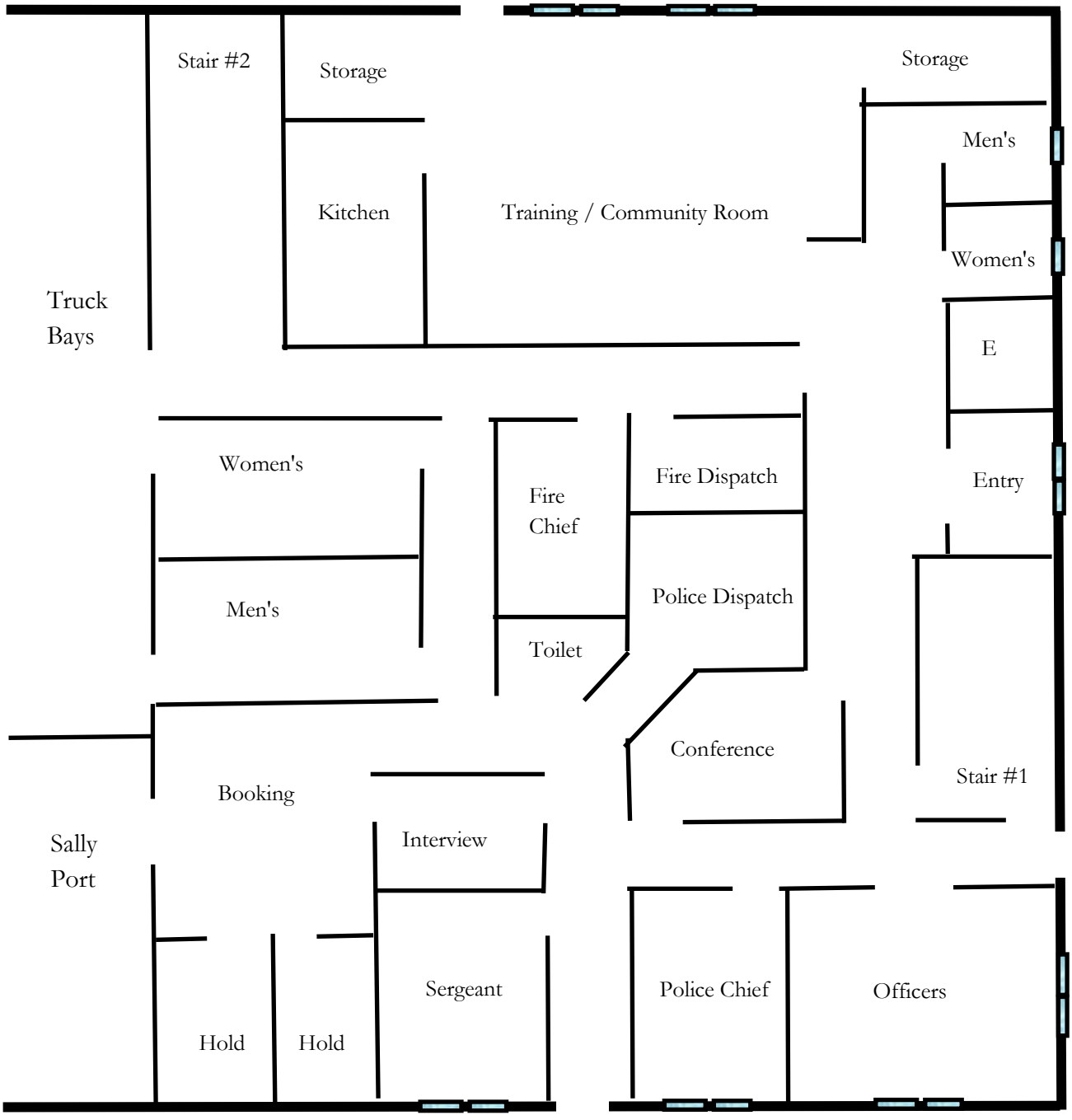






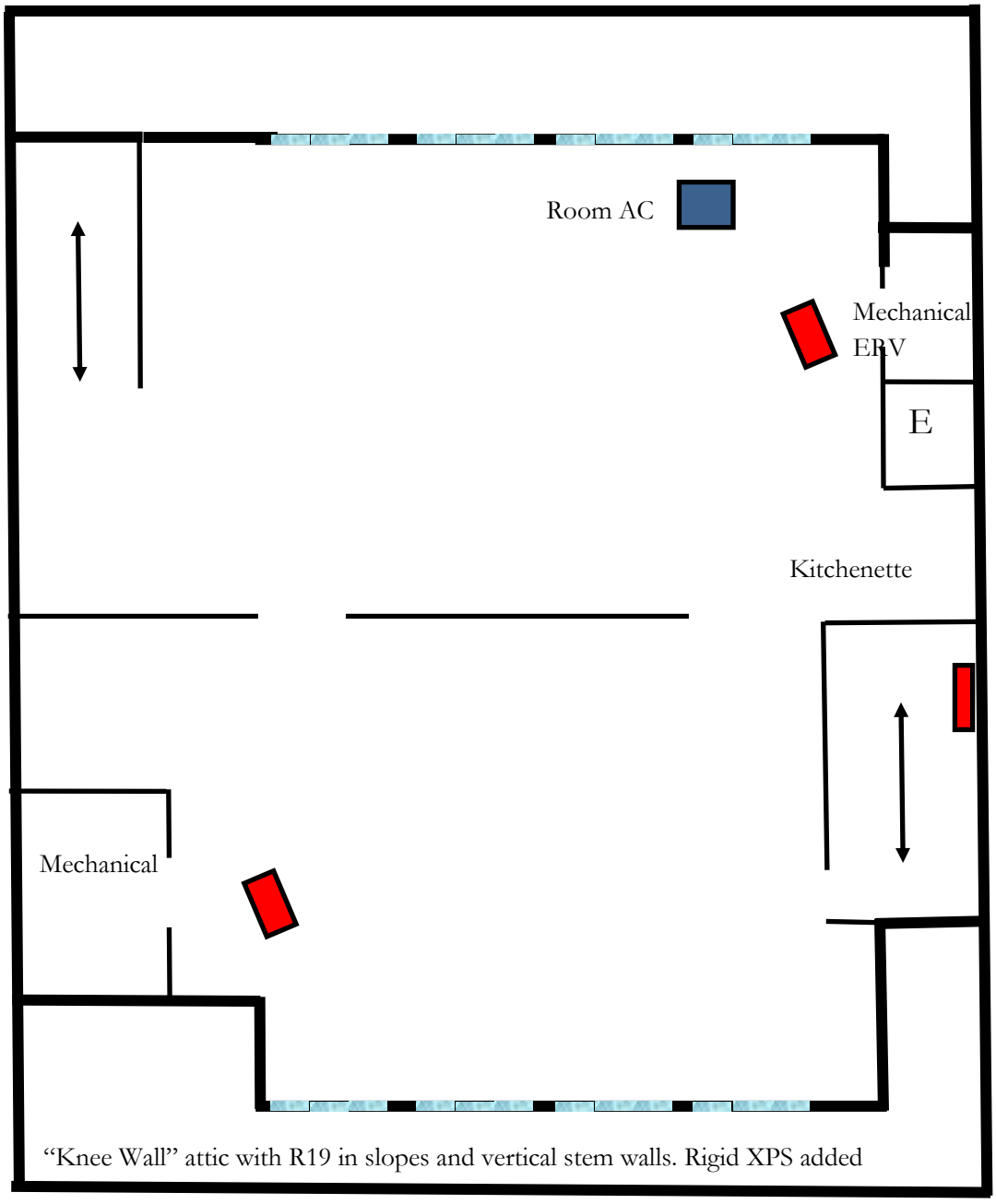



## Main Floor


Stair #2
Storage
Storage
Men's
Kitchen
Training / Community Room
Women's
Truck
Bays
E
Women's
Fire
Chief
Fire Dispatch
Entry
Men's
Police Dispatch
Toilet
Conference
Stair #1
Booking
Sally
Port
Interview
Sergeant
Police Chief
Officers
Hold
Hold

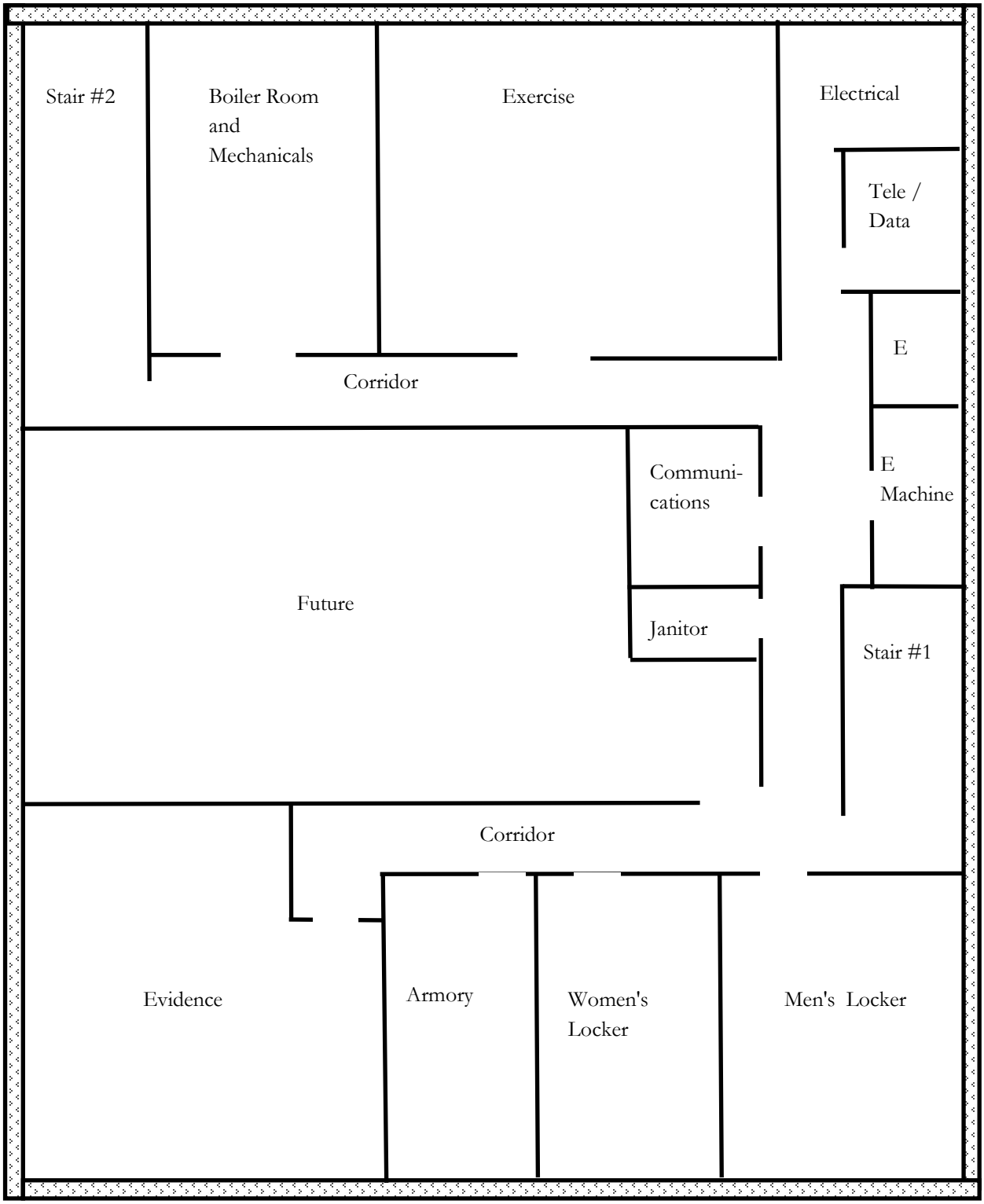
## Second Floor

Some design changes were made from original Architect plans and generally incorporated in the graphic.

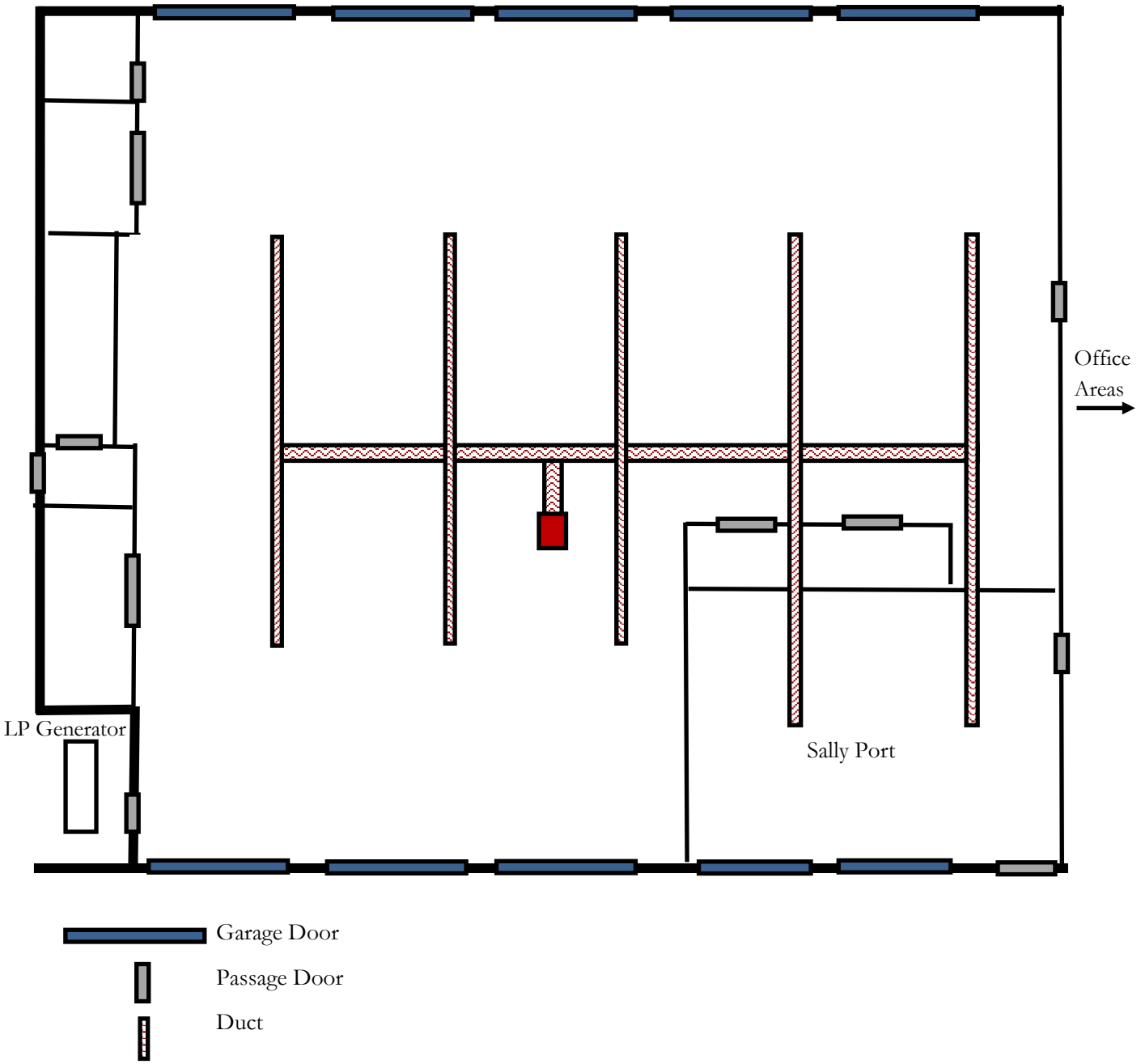


## Basement

Based on Architect's Plans. On site verification limited to inaccessibility to many areas.



## Apparatus Bays and Sally Port



North

West

East

South

# *Sunapee Safety Services*
# *Energy Cost Analysis*

for

Town Of Sunapee

Sunapee, NH, 03782

Elite Software
ENERGY AUDIT
Residential and Light Commercial Energy Analysis

Prepared By:

Margaret Dillon
S.E.E.D.S.

603-532-8979
Monday, August 2, 2021

## Project Information

| | | | |
|---|---|---|---|
| Project Title: | Sunapee Safety Services | Company Name: | S.E.E.D.S. |
| Designed By: | | Company Rep.: | Margaret Dillon |
| Project Date: | Friday, July 30, 2021 | Company Address: | |
| Project Comment: | | Company City: | |
| Client Name: | Town Of Sunapee | Company Phone: | 603-532-8979 |
| Client Address: | | Company Fax: | |
| Client City: | Sunapee, NH, 03782 | Company Comment: | |
| Client Phone: | | | |
| Client Fax: | | | |
| Client Comment: | | | |

## Cooling Equipment System 1

| | |
|---|---|
| Model Type: | Standard Air Conditioner |
| Model Number: | |
| Capacity: | 0 Btuh |
| Efficiency: | 0 |

## Heating Equipment System 1

| | |
|---|---|
| Model Type: | Fuel Oil Boiler |
| Model Number: | |
| Capacity: | 758,000 Btuh |
| Efficiency: | 80 AFUE |
| System Description: | Existing |

## Cooling Equipment System 2

| | |
|---|---|
| Model Type: | Standard Air Conditioner |
| Model Number: | |
| Capacity: | 0 Btuh |
| Efficiency: | 0 |

## Heating Equipment System 2

| | |
|---|---|
| Model Type: | Fuel Oil Boiler |
| Model Number: | |
| Capacity: | 758,000 Btuh |
| Efficiency: | 80 AFUE |
| System Description: | Ceiling and Sealing |

## Cooling Equipment System 3

| | |
|---|---|
| Model Type: | Standard Air Conditioner |
| Model Number: | |
| Capacity: | 0 Btuh |
| Efficiency: | 0 |

## Heating Equipment System 3

| | |
|---|---|
| Model Type: | Fuel Oil Boiler |
| Model Number: | |
| Capacity: | 758,000 Btuh |
| Efficiency: | 80 AFUE |
| System Description: | Overhead Doors |

# Project Summary

## General Project Information

| | | | |
|---|---|---|---|
| Project Title: | Sunapee Safety Services | Company Name: | S.E.E.D.S. |
| Project Date: | Friday, July 30, 2021 | Company Rep: | Margaret Dillon |
| Client Name: | Town Of Sunapee | Company Phone: | 603-532-8979 |
| Client City: | Sunapee, NH, 03782 | Company E-Mail Address: | mdillon@myfairpoint.net |

## Design Data

| | | | |
|---|---|---|---|
| Building Area: | 20,133 sq.ft. | Cooling Load: | 90,214 Btuh |
| People: | 22 | Heating Load: | 185,351 Btuh |
| Occupancy: | 0 | Loads Adj. Factor: | 0.80 |
| | | AC On Temp.: | 0 °F |
| Actual City: | Sunapee, New Hampshire | | |
| Weather Ref. City: | Concord AP, New Hampshire | | |
| Summer Outdoor: | 87 °F | Winter Outdoor: | -2 °F |
| Summer Indoor: | 75 °F | Winter Indoor: | 70 °F |
| Cooling Hours: | 400 | Degree Days: | 7,220 |

## Annual Operating Cost Estimate

| System Description | Fuel Rates Set | Total Heating Cost | Total Cooling Cost | Annual Service Charges | Total Oper. Cost | Average Monthly Cost |
|---|---|---|---|---|---|---|
| Existing | 1 | $14,746 | $0 | $389 | $15,134 | $1,261 |
| Ceiling and Sealing | 1 | $13,923 | $0 | $389 | $14,311 | $1,193 |
| Overhead Doors | 1 | $13,711 | $0 | $389 | $14,100 | $1,175 |