

COMcheck Software Version 4.1.1.0
Mechanical Compliance Certificate

Section 1: Project Information

Energy Code: 2009 IECC
Project Title: City of Monroe Law Enforcement
Project Type: New Construction
Construction Side: Owner/Agent: Designer/Contractor:
140 Blaine Street
Monroe, GA 30655

Section 2: General Information

Building Location (for weather data): Monroe, Georgia
Climate Zone: 3a

Section 3: Mechanical Systems List

- System 1: RTU-1 (Single Zone)**
Heating: 1 each - Central Furnace, Electric, Capacity = 184 kBtu/h
No minimum efficiency requirements apply.
Cooling: 1 each - Single Package DX Unit, Capacity = 177 kBtu/h, Air-Cooled Condenser, Air Economizer
Proposed Efficiency = 10.30 EER, Required Efficiency: 10.50 EER > 9.7 IPLV
Fan System: RTU-1: Variable - Compliance (Break HP method): Passes
Fans:
FAN 1 Supply, Multi-Zone VAV, 10560 CFM, 10.0 motor nameplate hp, 9.0 design brake hp (9.0 max. BHP)
- System 2: RTU-2 (Single Zone)**
Heating: 1 each - Central Furnace, Electric, Capacity = 82 kBtu/h
No minimum efficiency requirements apply.
Cooling: 1 each - Single Package DX Unit, Capacity = 45 kBtu/h, Air-Cooled Condenser, Air Economizer
Proposed Efficiency = 11.69 EER, Required Efficiency: 11.00 EER
Fan System: RTU-2: Constant - Compliance (Break HP method): Passes
Fans:
FAN 2 Supply, Single-Zone VAV, 5810 CFM, 5.0 motor nameplate hp, 3.0 design brake hp (3.0 max. BHP)
- System 3: RTU-3 (Single Zone)**
Heating: 1 each - Central Furnace, Electric, Capacity = 62 kBtu/h
No minimum efficiency requirements apply.
Cooling: 1 each - Single Package DX Unit, Capacity = 45 kBtu/h, Air-Cooled Condenser, No Economizer, Economizer exception: None
Proposed Efficiency = 13.00 SEER, Required Efficiency: 13.00 SEER
Fan System: RTU-3: Variable Storage - Compliance (Break HP method): Passes
Fans:
FAN 3 Supply, Constant Volume, 1300 CFM, 1.6 motor nameplate hp, 0.6 design brake hp (0.6 max. BHP)
- System 4: RTU-4 (Single Zone)**
Heating: 1 each - Central Furnace, Electric, Capacity = 92 kBtu/h
No minimum efficiency requirements apply.
Cooling: 1 each - Single Package DX Unit, Capacity = 69 kBtu/h, Air-Cooled Condenser, Air Economizer
Proposed Efficiency = 11.20 EER, Required Efficiency: 11.20 EER
Fan System: RTU-4: Variable - Compliance (Break HP method): Passes
Fans:
FAN 4 Supply, Constant Volume, 2150 CFM, 1.6 motor nameplate hp, 1.0 design brake hp (1.0 max. BHP)
- System 5: RTU-5 (Single Zone)**
Heating: 1 each - Central Furnace, Electric, Capacity = 41 kBtu/h
No minimum efficiency requirements apply.

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- System 6: RTU-6 (Single Zone)**
Heating: 1 each - Central Furnace, Electric, Capacity = 34 kBtu/h, Air-Cooled Condenser, No Economizer, Economizer exception: None
Cooling: 1 each - Single Package DX Unit, Capacity = 34 kBtu/h, Air-Cooled Condenser, No Economizer, Economizer exception: None
Proposed Efficiency = 13.00 SEER, Required Efficiency: 13.00 SEER
Fan System: RTU-6: Variable Processing - Compliance (Break HP method): Passes
Fans:
FAN 5 Supply, Constant Volume, 1000 CFM, 0.9 motor nameplate hp, 0.4 design brake hp (0.4 max. BHP)
- System 7: RTU-7 (Single Zone)**
Heating: 1 each - Central Furnace, Electric, Capacity = 82 kBtu/h
No minimum efficiency requirements apply.
Cooling: 1 each - Single Package DX Unit, Capacity = 90 kBtu/h, Air-Cooled Condenser, Air Economizer
Proposed Efficiency = 11.20 EER, Required Efficiency: 11.20 EER
Fan System: RTU-7: Constant - Compliance (Break HP method): Passes
Fans:
FAN 6 Supply, Constant Volume, 2450 CFM, 2.0 motor nameplate hp, 1.2 design brake hp (1.2 max. BHP)
- System 8: CAHU/CCU-1 (Single Zone)**
Cooling: 1 each - Split System, Capacity = 24 kBtu/h, Air-Cooled Condenser, No Economizer, Economizer exception: None
Proposed Efficiency = 17.00 SEER, Required Efficiency: 13.00 SEER
Fan System: CAHU-1: Server - Compliance (Motor nameplate HP method): Passes
Fans:
FAN 7 Supply, Constant Volume, 635 CFM, 0.1 motor nameplate hp

Section 4: Requirements Checklist

- Requirements Specific To: RTU-1 :**
- Equipment minimum efficiency: Single Package Unit: 10.00 EER > 9.7 IPLV
 - Minimum one temperature control device per zone
 - Integrated economizer is required for this location and system
 - Coating system provides a means to relieve excess outdoor air during economizer operation
 - Systems serving more than one zone must be VAV systems
 - Single-zone VAV terminals reduce primary air before reentering
 - Controls capable of reheat supply air set: (SAT) by 25% of SAT-room temp difference
Exceptions:
 - Systems that prevent reheating, recooling or mixing of heated and cooled supply air
 - Seventy five percent of the energy for reheating is from also-recovered energy from other zone's exhaust
 - Zones with peak supply air quantities of 300 cfm (142 L/s) or less
 - Hot gas systems prohibited unless system has multiple stages of uncooled or continuously capacity modulated
 - Hot gas systems limited to 25% of total cooling capacity
 - VAV fans with static pressure sensors are placed in a position that the controller cannot be no greater than one-third the total length from static pressure. It placed in the supply duct location where the controller cannot be no greater than one-third the total length from static pressure. It placed in the supply duct location where the controller cannot be no greater than one-third the total length from static pressure.
 - Systems with DDC of individual zone boxes report to the central control panel and reset of static pressure setpoint based on the zone requiring the most pressure.
 - Systems with DDC of individual zone boxes reporting to the central control panel has static pressure setpoint reset based on the zone requiring the most pressure.
- Requirements Specific To: RTU-2 :**
- Equipment minimum efficiency: Single Package Unit: 11.00 EER
 - Newly purchased equipment meets the efficiency requirements
 - Integrated economizer is required for this location and system
 - Coating system provides a means to relieve excess outdoor air during economizer operation
 - Hot gas systems prohibited unless system has multiple stages of uncooled or continuously capacity modulated
 - Hot gas systems limited to 50% of total cooling capacity
- Requirements Specific To: RTU-3 :**
- Equipment minimum efficiency: Single Package Unit: 13.00 SEER
 - Newly purchased equipment meets the efficiency requirements
- Requirements Specific To: RTU-4 :**
- Equipment minimum efficiency: Single Package Unit: 11.00 EER
 - Newly purchased equipment meets the efficiency requirements
 - Integrated economizer is required for this location and system
 - Coating system provides a means to relieve excess outdoor air during economizer operation
 - Hot gas systems prohibited unless system has multiple stages of uncooled or continuously capacity modulated
 - Hot gas systems limited to 50% of total cooling capacity

- Equipment minimum efficiency: Single Package Unit: 11.00 EER
 - Newly purchased equipment meets the efficiency requirements
 - Integrated economizer is required for this location and system
 - Coating system provides a means to relieve excess outdoor air during economizer operation
- Requirements Specific To: RTU-5 :**
- Equipment minimum efficiency: Single Package Unit: 13.00 SEER
 - Newly purchased equipment meets the efficiency requirements
- Requirements Specific To: RTU-6 :**
- Equipment minimum efficiency: Single Package Unit: 11.00 EER
 - Newly purchased equipment meets the efficiency requirements
 - Integrated economizer is required for this location and system
 - Coating system provides a means to relieve excess outdoor air during economizer operation
- Requirements Specific To: CAHU/CCU-1 :**
- Equipment minimum efficiency: Split System: 13.00 SEER
- Generic Requirements: Must be met by all systems to which the requirement is applicable:**
- Plant equipment and system capacity no greater than needed to meet loads
Exceptions:
 - Standby equipment automatically off when primary system is operating
 - Multiple units controlled to sequence operation as a function of load
 - Minimum one temperature control device per system
 - Minimum one humidity control device per installed humidification/dehumidification system
 - Load calculations per ASHRAE-ACCA Standard 15J
 - Automatic Controls: Setback to 55°F (heat) and 60°F (cool); 7-day clock, 2-hour occupant override, 12-hour backup
Exceptions:
 - Continuously operating zones
 - Outside-air source for ventilator: system capable of reducing OSA to required minimum
 - R-5 supply and return air duct insulation in unconditioned spaces
 - R-8 supply and return air duct insulation outside the building
R-8 insulation between ducts and the building exterior when ducts are part of a building assembly
Exceptions:
 - Ducts located within equipment
 - Ducts with interior and exterior temperature difference not exceeding 15°F
 - Mechanical fasteners and sealants used to connect ducts and air distribution equipment
 - Ducts sealed - longitudinal seams on rigid ducts; transverse seams on soft ducts, UL 181A or 181R tapes and mastic
 - Hot water pipe insulation: 1.5 in. for pipes < 1.5 in. and 2 in. for pipes > 1.5 in.
Cold water pipe insulation: 1.5 in. for pipes < 1.5 in. and 1.5 in. for pipes > 1.5 in.
Steam pipe insulation: 1.5 in. for pipes < 1.5 in. and 3 in. for pipes > 1.5 in.
Exceptions:
 - Piping within HVAC equipment
 - Fluid temperatures between 55 and 165°F
 - Fluid not heated or cooled with renewable energy
 - Piping within room fan-coil (with AHR140 rating) and unit ventilators (with AHR140 rating)
 - Runouts < 4 ft in length
 - Operation and maintenance manual provided to building owner
 - Thermostatic controls have 5°F deadband
Exceptions:
 - Thermostats requiring manual changeover between heating and cooling
 - Special occupancy or special applications where wide temperature ranges are not acceptable and are approved by the authority having jurisdiction
 - Balancing devices provided in accordance with IMC 603.17
 - Demand control ventilation (DCV) present for high design occupancy areas (>40 persons/1000 sq ft in spaces >100 sq ft) and served by systems with any one of 1) an air-side economizer, 2) automatic modulating control of the outdoor air damper, or 3) a design outdoor airflow greater than 3000 cfm.
Exceptions:
 - Systems with heat recovery
 - Multiple-zone systems without DDC of individual zones communicating with a central control panel

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- Where more than 80 percent of the outdoor heating energy is provided from site-recovered or site-sustainability
- Heating systems in climates with less than 3000 HDD
- Coating systems in climates with a 1 percent cooling design wet-bulb temperature less than 60°F
- Systems requiring dehumidification that employ energy recovery in series with heating coils
- Laboratory fume hood exhaust systems that have either a variable air volume system or a system of reducing exhaust and makeup air volume to 50 percent or less of design volume supply rate, make up air supply meeting minimum makeup air requirements, or at least 75 percent of exhaust flow rate, maintained to no less than 2°F below room air temperature, or cooled to no lower than 2°F above room setpoint temperature, or no humidification added, or no simultaneous heating and cooling.

Section 5: Compliance Statement

Compliance Statement: The proposed mechanical design presented in this document is consistent with the building plans, specifications and other calculations submitted with this permit application. The proposed mechanical systems have been designed to meet the 2009 IECC requirements in COMcheck Version 4.1.1.0 and to comply with the efficiency requirements in the Requirements Checklist.

ANDY WILSON, MECH. ENGR. Date: 2019.08.05

Section 6: Post Construction Compliance Statement

- As-built records of the actual installation, system capacities, calibration information, and performance data for each equipment provided to the owner
 - HVAC unit documents for all mechanical equipment and system provided to the owner by the mechanical contractor
 - Written report of balancing and operations report provided to the owner
- The post construction requirements have been completed.
- Principal Mechanical Designer Name: Signature: Date:

EF-12, EF-13, SEF-1 AND SEF-2
SEQUENCE OF OPERATION

1. EF-12, 13 AND SEF-1, 2
NORMAL OPERATION (BAS CONTROL)
RUN CONDITIONS - CONTINUOUS:
EF-12 AND 13 SHALL RUN CONTINUOUSLY. THE FAN START SHALL DELAY 30 SEC (ADJ.) UPON START TO ALLOW FAN DAMPER TO FULLY OPEN.
SEF-1 & 2 SHALL BE OFF.
FAN:
EF-12 & 13 SHALL HAVE A USER DEFINABLE (ADJ.) MINIMUM RUNTIME.
EXHAUST AIR DAMPER:
EF-12 & 13 EXHAUST AIR DAMPERS SHALL OPEN ANYTIME THE UNIT RUNS AND SHALL CLOSE ANYTIME THE UNIT STOPS. THE EXHAUST AIR DAMPER SHALL CLOSE 30 SEC (ADJ.) AFTER THE FAN STOPS.
ALARMS SHALL BE PROVIDED AS FOLLOWS:

- DAMPER FAILURE: COMMANDED OPEN, BUT THE STATUS IS CLOSED.
- DAMPER IN HAND: COMMANDED CLOSED, BUT THE STATUS IS OPEN.

DAMPER STATUS:
THE FAN SHALL BE ENABLED AFTER THE DAMPER STATUS HAS PROVEN.
ALARMS SHALL BE PROVIDED AS FOLLOWS:

- DAMPER FAILURE: COMMANDED OPEN, BUT THE STATUS IS CLOSED.
- DAMPER IN HAND: COMMANDED CLOSED, BUT THE STATUS IS OPEN.

FAN STATUS:
THE CONTROLLER SHALL MONITOR THE FAN STATUS.
ALARMS SHALL BE PROVIDED AS FOLLOWS:

- FAN FAILURE: COMMANDED ON, BUT THE STATUS IS OFF.
- FAN IN HAND: COMMANDED OFF, BUT THE STATUS IS ON.
- FAN RUNTIME EXCEEDED: FAN STATUS RUNTIME EXCEEDS A USER DEFINABLE LIMIT (ADJ.).

EMERGENCY OPERATION (FIRE ALARM CONTROL)
RUN CONDITIONS - CONTINUOUS:
SEF-1 & 2 SHALL RUN CONTINUOUSLY. THE FAN START SHALL DELAY 30 SEC (ADJ.) UPON START TO ALLOW FAN DAMPER TO FULLY OPEN.
EF-12 & 13 SHALL BE OFF.
EXHAUST AIR DAMPER:
SEF-1 & 2 EXHAUST AIR DAMPERS SHALL OPEN ANYTIME THE UNIT RUNS AND SHALL CLOSE ANYTIME THE UNIT STOPS. THE EXHAUST AIR DAMPER SHALL CLOSE 30 SEC (ADJ.) AFTER THE FAN STOPS.
ALARMS SHALL BE PROVIDED AS FOLLOWS:

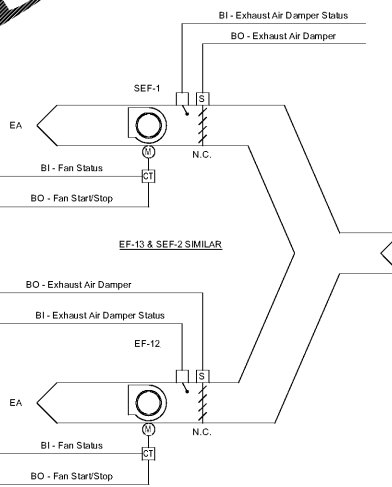
- DAMPER FAILURE: COMMANDED OPEN, BUT THE STATUS IS CLOSED.
- DAMPER IN HAND: COMMANDED CLOSED, BUT THE STATUS IS OPEN.

DAMPER STATUS:
THE FAN SHALL BE ENABLED AFTER THE DAMPER STATUS HAS PROVEN.
ALARMS SHALL BE PROVIDED AS FOLLOWS:

- DAMPER FAILURE: COMMANDED OPEN, BUT THE STATUS IS CLOSED.
- DAMPER IN HAND: COMMANDED CLOSED, BUT THE STATUS IS OPEN.

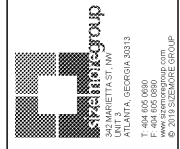
FAN STATUS:
THE CONTROLLER SHALL MONITOR THE FAN STATUS.
ALARMS SHALL BE PROVIDED AS FOLLOWS:

- FAN FAILURE: COMMANDED ON, BUT THE STATUS IS OFF.
- FAN IN HAND: COMMANDED OFF, BUT THE STATUS IS ON.



POINT NAME	HARDWARE POINTS				SOFTWARE POINTS				SHOW ON GRAPH/IC	
	AI	AO	BI	BO	AV	BO	SCHED	TREND		ALARM
EF-12 EXHAUST AIR DAMPER STATUS		X						X		X
EF-13 EXHAUST AIR DAMPER STATUS		X						X		X
SEF-1 EXHAUST AIR DAMPER STATUS		X						X		X
SEF-2 EXHAUST AIR DAMPER STATUS		X						X		X
EF-12 FAN STATUS		X						X		X
EF-13 FAN STATUS		X						X		X
SEF-1 FAN STATUS		X						X		X
SEF-2 FAN STATUS		X						X		X
EF-12 EXHAUST AIR DAMPER			X					X		X
EF-13 EXHAUST AIR DAMPER			X					X		X
SEF-1 EXHAUST AIR DAMPER			X					X		X
SEF-2 EXHAUST AIR DAMPER			X					X		X
EF-12 FAN START/STOP			X					X		X
EF-13 FAN START/STOP			X					X		X
SEF-1 FAN START/STOP			X					X		X
SEF-2 FAN START/STOP			X					X		X
EF-12 EXHAUST AIR DAMPER FAILURE									X	
EF-13 EXHAUST AIR DAMPER FAILURE									X	
SEF-1 EXHAUST AIR DAMPER FAILURE									X	
SEF-2 EXHAUST AIR DAMPER FAILURE									X	
EF-12 EXHAUST AIR DAMPER IN HAND									X	
EF-13 EXHAUST AIR DAMPER IN HAND									X	
SEF-1 EXHAUST AIR DAMPER IN HAND									X	
SEF-2 EXHAUST AIR DAMPER IN HAND									X	
EF-12 FAN FAILURE									X	
EF-13 FAN FAILURE									X	
SEF-1 FAN FAILURE									X	
SEF-2 FAN FAILURE									X	
EF-12 FAN IN HAND									X	
EF-13 FAN IN HAND									X	
SEF-1 FAN IN HAND									X	
SEF-2 FAN IN HAND									X	

CITY OF MONROE
PUBLIC SAFETY & MUNICIPAL
COURT COMPLEX RENOVATION
140 BLAINE ST. MONROE, GA 30655



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MECHANICAL CONTROLS AND ENERGY COMPLIANCE

PROJECT # 19160MONRpo
DATE: Issue Date
DRAWN BY: KM
CHECKED BY: AW

M403

SCALE NTS

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