

# MECHANICAL GENERAL NOTES

**GENERAL MECHANICAL PROVISIONS:**  
FURNISH ALL LABOR, MATERIALS, EQUIPMENT, FIXTURES, APPARATUS, SPECIAL OR OCCASIONAL SERVICES, AND OTHER APPURTENANCES REQUIRED FOR INSTALLATION OF COMPLETE AND OPERATIONAL HEATING, VENTILATING, AIR CONDITIONING(HVAC) AND PLUMBING SYSTEMS AS INDICATED IN THE DRAWINGS AND AS DESCRIBED IN THESE SPECIFICATIONS. THIS WORK SHALL INCLUDE ALL MATERIALS, APPARATUS, AND APPLIANCES NOT SPECIFICALLY MENTIONED HEREIN OR NOTED SPECIFICALLY ON THE DRAWINGS AS BEING FURNISHED AND INSTALLED UNDER ANOTHER SECTION.

\*\*ALL WORK SHALL BE PERFORMED BY PROPERLY LICENSED MECHANICAL CONTRACTORS OR UNDER THEIR DIRECT SUPERVISION.

THE MECHANICAL DRAWINGS ACCOMPANYING THESE SPECIFICATIONS ARE GENERALLY DIAGRAMMATIC AND ARE NOT TO BE SCALED. WHILE THESE ARE TO BE FOLLOWED AS CLOSELY AS POSSIBLE, THE CONTRACTOR SHALL COORDINATE THE WORK TO AVOID INTERFERENCES WITH THE OTHER TRADES. THE CONTRACTOR SHALL CONFIRM AND CORRELATE ALL DIMENSIONS AT THE JOB SITE

**WORK INCLUDED:**  
THIS WORK INCLUDES BUT IS NOT LIMITED TO THE FOLLOWING SYSTEMS: COOLING/HEATING UNIT, AIR HANDLER UNIT(S), ERV UNIT(S), COOLING LINE SCHEMATICS, VENTING.

THE WORKMANSHIP SHALL BE ACCOMPLISHED IN A THROUGH AND COMPLETE MANNER, TO BE SATISFACTORY TO BOTH THE PROJECT GC AND THE PROPERTY OWNER.

**PERMITS AND INSPECTIONS:**  
OBTAIN ALL PERMITS AND INSPECTIONS AND PAY ALL FEES FOR COMPLETION OF THIS WORK.

**CODES AND STANDARDS:**  
COMPLY WITH THE 2018 VERSION OF THE IMC AND IPC, APPLICABLE SECTIONS OF THE NFPA, AND OTHER APPLICABLE CURRENT LAWS, CODES, ORDINANCES, ETC. OF ALL FEDERAL, STATE, AND LOCAL AUTHORITIES WHETHER INCLUDED OR NOT IN THE CONTRACT DOCUMENTS. ALL MECHANICAL EQUIPMENT SHALL BE LABELED BY UL, ETL, AGA, OR OTHER APPROVED INDEPENDENT TESTING AUTHORITY.

**PRODUCT DELIVERY, STORAGE AND HANDLING:**  
PROTECT ALL FIXTURES, MATERIAL, EQUIPMENT AND APPURTENANCES FROM PHYSICAL AND WEATHER DAMAGE. ALL DAMAGED ITEMS WILL BE RESTORED TO ORIGINAL CONDITION OR REPLACED AT OWNER'S OPTION BEFORE FINAL ACCEPTANCE. CONTRACTOR IS RESPONSIBLE FOR RECEIVING, HOLDING & STORING ALL EQUIPMENT PROVIDED BY OWNER.

**TEMPORARY SERVICES:**  
PROVIDE TEMPORARY SERVICES AND UTILITIES AS REQUIRED.

**ACCESS DOORS:**  
PROVIDE ACCESS DOORS AFTER FIELD VERIFICATION OF EQUIPMENT FINAL LAYOUT

**CAULKING AND FLASHING:**  
SEAL ALL FLOOR, WALL AND ROOF PENETRATIONS WATER TIGHT WITH SUITABLE SEALANT. SEAL PENETRATIONS THROUGH FIRE RATED ASSEMBLIES WITH MINIMUM 1" THICKNESS 3M BRAND FIRE BARRIER CAULK CP-25 (OR OTHER APPROVED MANNER) TO MAINTAIN RATING OF ASSEMBLY.

**OPENINGS, CUTTING, PAINTING AND PATCHING:**  
COORDINATE REQUIRED OPENINGS WITH OTHER TRADES. UNDERTAKE NO CUTTING WITHOUT ENGINEER'S APPROVAL. ALL PATCHING SHALL BE STRUCTURALLY AND AESTHETICALLY EQUAL TO THE SURFACE SURROUNDING THE AREA PATCHED. PAINT AREA TO MATCH EXISTING COLOR. FIELD VERIFY EXACT LOCATION, SIZE, ROUTING, AND AVAILABILITY OF HVAC AND PLUMBING SYSTEMS. VERIFY SUFFICIENT SPACE IS AVAILABLE TO INSTALL NEW EQUIPMENT AND SYSTEMS AS INDICATED ON DRAWINGS. IF CHANGES ARE NECESSARY, NOTIFY ENGINEER AS SOON AS POSSIBLE AND MODIFY SYSTEMS AS INSTRUCTED. COORDINATE EXACT LOCATION OF CEILING DIFFUSERS AND RECESSED EQUIPMENT WITH LIGHT FIXTURES, CEILING GRID, ETC.

- PROVIDE AND INSTALL U.L. LISTED TYPE "B" FIRE DAMPERS AT ALL PENETRATIONS IN NEW AND EXISTING FIRE RATED WALLS AS REQUIRED. FIELD VERIFY ALL EXISTING DUCTWORK TO VERIFY FIRE DAMPER LOCATION REQUIREMENTS. PROVIDE COMBINATION FIRE/SMOKE DAMPERS AS SHOWN ON DRAWINGS. CLASS II FOR VELOCITIES UP TO 1,500 FPM. CLASS I FOR VELOCITIES ABOVE 1,500 FPM. FIRE/SMOKE DAMPERS SHALL BE DYNAMIC RATED. PROVIDE INSTALLATION INSTRUCTIONS FOR FIRE/SMOKE DAMPERS TO FIELD INSPECTOR AT TIME OF INSPECTION.

- FIRE CAULK FIRE RATED WALLS, CEILINGS, AND FLOOR PENETRATION OPENINGS WITH HILTI (OR EQUAL) FIRE RATED CAULKING.

**CLEANING AND STERILIZATION:**  
REMOVE ALL CONSTRUCTION DEBRIS FROM SITE AND CLEAN ALL MECHANICAL EQUIPMENT. EXISTING ROOF SHALL BE CLEANED PRIOR TO CONSTRUCTION.

**TESTING OF PIPING:**  
ALL PIPING SHALL BE TESTED WITH HYDROSTATIC OR PNEUMATIC PRESSURE, OR OTHER MEANS AS DIRECTED, AND SHALL BE PROVED TIGHT AS HEREINAFTER SPECIFIED IN THE PRESENCE OF THE LOCAL BUILDING INSPECTOR BEFORE IT IS CONCEALED OR COVERED IN ANY WAY. THIS CONTRACTOR SHALL FURNISH AND INSTALL ALL PLUGS AND MAKE ALL TEMPORARY CONNECTIONS NECESSARY TO PERFORM THESE TESTS. HE SHALL FURNISH ALL LABOR, TOOLS AND EQUIPMENT NECESSARY TO PERFORM SUCH TESTS. DURATION OF TESTS SHALL BE SUFFICIENT TIME TO PERMIT INSPECTION OF ALL JOINTS BY THE LOCAL BUILDING INSPECTOR, AND GENERALLY HOLDING TEST PRESSURE FOR A PERIOD OF NOT LESS THAN 12 HOURS CONTINUOUSLY WITHOUT LOSS OF ANY PRESSURE.

**CONDENSATE DISPOSAL - REF. IMC SEC. 307**  
LIQUID COMBUSTION BY-PRODUCTS OF CONDENSING APPLIANCES SHALL BE COLLECTED AND DISCHARGED TO AN APPROVED PLUMBING FIXTURE OR DISPOSAL AREA IN ACCORDANCE WITH THE MANUFACTURER'S INSTALLATION INSTRUCTIONS. CONDENSATE PIPING SHALL BE OF APPROVED CORROSION RESISTANT MATERIAL AND SHALL NOT BE SMALLER THAN THE DRAIN CONNECTION ON THE APPLIANCE. SUCH PIPING SHALL MAINTAIN A MIN. HORIZONTAL SLOPE IN THE DIRECTION OF DISCHARGE OF NOT LESS THAN ONE-EIGHTH UNIT VERTICAL IN 12 UNITS HORIZONTAL (1%SL/0.2%)

**FREEZE PROTECTION:**  
PIPING AND EQUIPMENT LOCATED IN AREAS SUBJECT TO FREEZING SHALL BE INSTALLED IN A MANNER TO PREVENT FREEZING. INSTALL ALL PIPING ON WARM SIDE OF BUILDING INSULATION TO PREVENT FREEZING. PROVIDE ADDITIONAL INSULATION IN ATTIC AREA AS NEEDED TO HELP MITIGATE ANY POTENTIAL FREEZE ISSUES. REFER TO ELECTRICAL DRAWINGS FOR DETAILS ON HEAT TRACING OF PIPING IN ATTIC AREA.

**START-UP INSTRUCTIONS:**  
STARTUP EQUIPMENT IN ACCORDANCE WITH MANUFACTURER'S INSTRUCTIONS. REVIEW EQUIPMENT AND INSTRUCT OWNER IN PROPER OPERATION OF THE EQUIPMENT. THIS INCLUDES ALL EQUIPMENT PROVIDED BY OWNER.

**EQUIPMENT AND SYSTEMS INSTALLATION:**  
INSTALL EQUIPMENT AND SYSTEMS IN ACCORDANCE WITH MANUFACTURER'S PRINTED INSTALLATION INSTRUCTIONS AND IN ACCORDANCE WITH ACCEPTED INDUSTRY STANDARDS AND ALL APPLICABLE CODES. MEET ALL REQUIRED CLEARANCES AND PROVIDE ALL NECESSARY EQUIPMENT ACCESSORIES, BASES, SUPPORTS, SHIELDS, ETC. FOR A COMPLETE INSTALLATION. ALL MECHANICAL EQUIPMENT SHALL BE LABELED WITH THE EQUIPMENT IDENTIFICATION NUMBER.

**PIPE IDENTIFICATION:**  
INSTALL PIPE IDENTIFICATION MARKERS AND DIRECTION ARROWS ON ALL PIPING THAT IS EXPOSED AND ABOVE CEILINGS. MARKERS TO BE COLOR CODED AND IDENTIFIED PER ANSI SPECIFICATIONS. INSTALL AT VALVES AND NO FURTHER THAN THIRTY (30) FEET APART ALONG ANY RUN OF PIPE, EXCEPT EQUIPMENT ROOMS WHERE SPACING WILL BE TWENTY (20) FEET.

**BALANCING AND ADJUSTING:**  
THE MECHANICAL CONTRACTOR SHALL HAVE A 3RD PARTY, NEBB CERTIFIED TAB CONTRACTOR ADJUST AND BALANCE THE MECHANICAL SYSTEMS AND CHECK EVERY OPERATIONAL PIECE OF EQUIPMENT. SYSTEM SHALL BE BALANCED TO AIRFLOW QUANTITIES AS INDICATED ON DRAWINGS. CHECK, ADJUST AND BALANCE TO PROVIDE A COMPLETE AND OPERATIONAL SYSTEM. A TYPE WRITTEN FINAL BALANCE REPORT SHALL BE PROVIDED TO THE ENGINEER FOR RECORD PURPOSES. TEMPERATURE CONTROL BUILDING AUTOMATION SYSTEM (BAS) THE MECHANICAL CONTRACTOR SHALL FURNISH AND INSTALL A COMPLETE SYSTEM OF AUTOMATIC TEMPERATURE CONTROLS INCLUDING ALL DAMPERS, THERMOSTATS, SENSORS, RELAYS, TRANSFORMERS, ETC.. NECESSARY FOR PROPER OPERATION. THE MECHANICAL CONTRACTOR SHALL PROVIDE BREAKOUT CONTROLS PRICING FOR OWNER APPROVAL OF EACH APPROVED VENDOR. REFER TO CONTROLS DRAWINGS FOR ALLOWABLE VENDORS. SYSTEM SHALL CONTROL ALL EQUIPMENT IN THE CONTRACT DOCUMENTS AS INDICATED. THE ELECTRICAL CONTRACTOR SHALL ROUGH-IN FOR ALL CONTROL COMPONENTS AND PROVIDE/INSTALL ALL ASSOCIATED WIRING AND INTERLOCKS. AT COMPLETION OF THE PROJECT THE TEMPERATURE CONTROLS CONTRACTOR SHALL INSTRUCT THE OWNER ON OPERATION OF THE HVAC SYSTEM.

- EXISTING FLEXIBLE DUCTWORK WHICH REMAINS IN PLACE MAY BE REUSED IF IT IS PROPERLY LABELED WITH U.L. 181 TAG. EXISTING FLEXIBLE DUCTWORK NOT U.L. APPROVED SHALL BE REMOVED AND REPLACED WITH THAT SPECIFIED IN NOTES ABOVE

- MECHANICAL CONTRACTOR SHALL INSTALL DUCT SMOKE DETECTOR IN MAIN AIR DUCT OF ALL MECHANICAL AIR-MOVING SYSTEMS WHERE REQUIRED BY CODE OR LOCAL AUTHORITIES. DETECTORS SHALL BE FURNISHED AND CONNECTED TO THE FIRE ALARM SYSTEM (WHERE APPLICABLE) AND HARDWIRED TO THE FAN UNIT FOR AUTOMATIC SHUTDOWN BY ELECTRICAL/FIRE ALARM CONTRACTOR.

- EXHAUST FANS; FURNISH AND INSTALL UNITS COMPLETE WITH ALL SWITCHING AND SAFETY CONTROLS NECESSARY FOR A COMPLETE OPERATIONAL SYSTEM. INSTALL BACKDRAFT DAMPER IF NOT INTEGRAL TO THE EXHAUST FAN.

- CUT AND PATCH TO MATCH ADJACENT AREAS. NO STRUCTURAL MEMBER SHALL BE CUT OR NOTCHED.

- ALL MOTORIZED EQUIPMENT SHALL BE PROVIDED WITH SUITABLE VIBRATION ISOLATION. FLEXIBLE CONNECTORS SHALL BE PROVIDED AT ALL DUCTWORK AND PIPING CONNECTIONS TO SUCH MOTORIZED EQUIPMENT.

- OPERATIONS AND MAINTENANCE DATA: PROVIDE OPERATION AND MAINTENANCE DATA FOR ALL EQUIPMENT. IDENTIFY EACH PIECE OF EQUIPMENT AS INDICATED IN THE CONTRACT DOCUMENTS. INFORMATION SHALL INCLUDE BUT IS NOT LIMITED TO STARTUP, SHUT DOWN, SERVICE AND LUBRICATION PROCEDURES. BIND INFORMATION IN 3-RING, LOOSE LEAF, HARD BACK BINDER.

- ALL EQUIPMENT SHALL BE FASTENED SECURELY TO THE BUILDING STRUCTURE WITH CODE APPROVED VIBRATION ISOLATORS.

- Each piece of equipment and system shall be tested and adjusted as needed to ensure proper function, adequate flows and capacities.

- each mechanical ventilation system shall be equipped with a means of shut-off when ventilation is not required. Backdraft dampers which can be closed on fan shutdown shall be provided for intakes and/or discharges.

- provide unit only thermostat(s) for each VAV unit, to be made independent from buildings air system controls.

**DUCTWORK:**

1 contractor to review all plan sets before starting any work on site. adjustments may be made for any space requirements needed to avoid conflict with building structure and work of other trades. coordinate with other contractors and trades on site as needed.

2 ALL EXPOSED DUCTWORK TO BE PAINTED TO OWNERS PREFERENCE.

3 FLEXIBLE DUCT USED SHALL BE U.L. APPROVED, WITH A MAXIMUM OF 5FT. IN LENGTH.

4 DOUBLE THICKNESS TURNING VANES SHALL BE USED ON ALL DUCT TURNS OF 90°

5 PROVIDE HANGERS & SUPPORT SPACED PER CODE AND ANSI REQS.

6 ALL DUCT JOINTS SHALL BE SEALED AIR TIGHT WITH APPROVED DUCT SEALER AND TAPE

7 ALL DUCTWORK (HIGH PRESSURE AND LOW PRESSURE), NEW AND EXISTING, SHALL BE SEALED AIR TIGHT. SEAL ALL DUCTWORK, JOINTS AND SEAMS WITH MASTIC NON-HARDENING DUCT SEALER. COORDINATE THIS WORK WITH THE BUILDING OPERATING PERSONNEL SO THAT THE MAIN HIGH AND MEDIUM PRESSURE DUCTWORK CAN BE SHUT OFF TO ALLOW MANUFACTURER'S REQUIRED CURE TIME FOR THE DUCT SEALER.

8 ALL DUCT DIMENSIONS SHOWN ARE INSIDE CLEAR DIMENSIONS IN INCHES

**INSULATION:**

1 INSULATION SHALL BE U.L. LISTED IN COMPLIANCE WITH FLAME SPREAD RATING OF NOT MORE THAN 25 AND SMOKE DENSITY NOT EXCEEDING 50, PER IMC.

2 INSULATE ALL INTERIOR CONDITIONED SUPPLY AND RETURN AIR DUCTING PER CODE.

3 ALL EQUIPMENT TO BE INSTALLED PER MANUFACTURER'S INSTALLATION INSTRUCTIONS AND PER ALL GOVERNING CODES.

**BUILDING CONTRACTOR/HOME OWNER TO REVIEW AND VERIFY ALL DIMENSIONS, SPECS, AND CONNECTIONS BEFORE CONSTRUCTION BEGINS.**

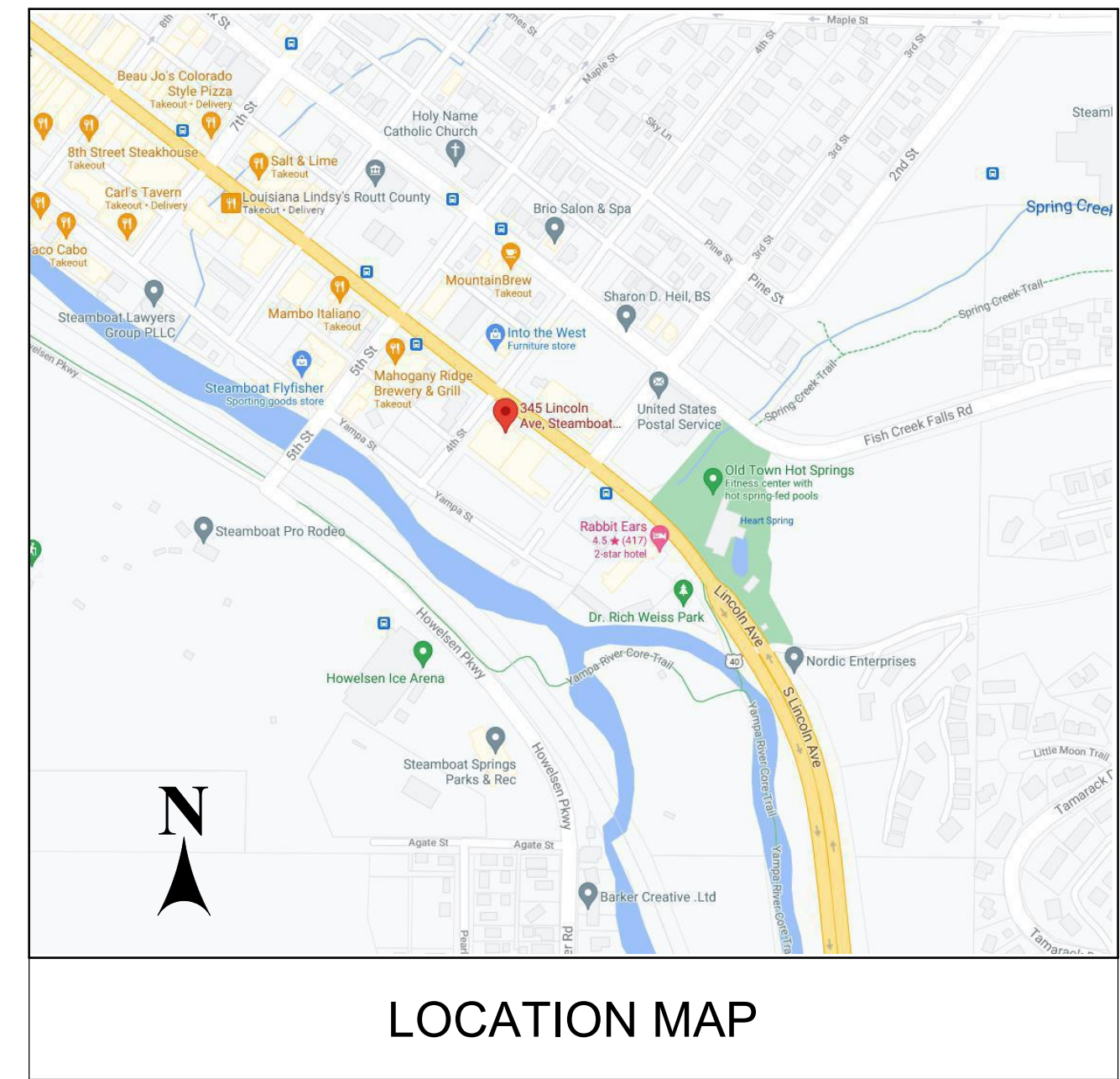
## PROJECT DIRECTORY

**OWNER:**  
FIRST/LAST NAME: MATT EIDT  
ADDRESS: 345 LINCOLN AVE, #205,  
STEAMBOAT SPRINGS, CO 80487 - CHIEFTAIN SUITES  
TELEPHONE: 970-819-0827  
EMAIL: MATT@MYBROKERS.COM

**GENERAL CONTRACTOR:** FLAVIO QUEZADA; PINECONE INTERIORS  
TELEPHONE: 970-620-2205

**MECHANICAL DESIGN:**  
NAME COMPANY: ENGINEERING STUDIO DENVER  
FIRST/LAST NAME: JAKE FRIEDERICHS  
ADDRESS #1: 1801 WEWATTA ST, 11TH FLOOR  
DENVER, CO 80202  
TELEPHONE: 720-612-7563  
EMAIL: JAKE@ESDENVER.COM

| ABBREVIATIONS  | SYMBOLS  |
|--|--|
| ACT - ACOUSTIC CEILING TILE<br>AD - AREA DRAIN<br>AFF - ABOVE FINISHED FLOOR<br>ALUM - ALUMINUM<br>ANOD - ANODIZED<br>BSMT - BASEMENT<br>BYND - BEYOND<br>BOT - BOTTOM<br>CIP - CAST IN PLACE<br>CHNL - CHANNEL<br>CJ - CONTROL JOINT<br>CLG - CEILING<br>CLR - CLEAR<br>CMU - CONCRETE MASONRY UNIT<br>COL - COLUMN<br>COMPR - COMPRESSIBLE<br>CONC - CONCRETE<br>CONT - CONTINUOUS<br>CPT - CARPET<br>CT - CERAMIC TILE<br>DBL - DOUBLE<br>CTYD - COURTYARD<br>DCL - DEMO<br>DEM - DEMOLISH OR DEMOLITION<br>DIA - DIAMETER<br>DIM - DIMENSION<br>DIMS - DIMENSIONS<br>DN - DOWN<br>DR - DOOR<br>DWG - DRAWING<br>EA - EACH<br>EJ - EXPANSION JOINT<br>EL - ELEVATION<br>ELEC - ELECTRICAL<br>ELEV - ELEVATOR OR ELEVATION<br>EP - ELECTRIC PANEL<br>EPDM - ETHYLENE PROPYLENE DIENE M-CLASS (ROOFING)<br>EQ - EQUAL<br>EXIST - EXISTING<br>EXP JT - EXPANSION JOINT<br>EXT - EXTERIOR<br>FD - FLOOR DRAIN OR FIRE DEPT.<br>FEC - FIRE EXTINGUISHER CABINET<br>FLR - FLOOR<br>FM - FILLED METAL<br>FO - FACE OF<br>FND - FOUNDATION<br>GA - GAUGE<br>GALV - GALVANIZED<br>GWB - GYPSUM WALL BOARD<br>HC - HOLLOW CORE<br>HI - HIGH<br>HM - HOLLOW METAL<br>HP - HIGH POINT<br>HR - HOUR<br>HVAC - HEATING, VENTILATING, AND AIR CONDITIONING | ILO - IN LIEU OF<br>INSUL - INSULATED OR INSULATION<br>INT - INTERIOR<br>LO - LOW<br>MAX - MAXIMUM<br>MO - MASONRY OPENING<br>MECH - MECHANICAL<br>MEMBR - MEMBRANE<br>MIN - MINIMUM<br>MRGB - MOISTURE-RESISTANT GYPSUM WALL BOARD<br>MTL - METAL<br>NIC - NOT IN CONTACT<br>NO - NUMBER<br>NOM - NOMINAL<br>OC - ON CENTER<br>OH - OVERHANG OR OPPOSITE HAND<br>OPP - OPPOSITE OR OPPOSITE HAND<br>OZ - OUNCE<br>PCC - PRE CAST CONCRETE<br>PLUMB - PLUMBING<br>PLYD - PLYWOOD<br>PT - PRESSURE TREATED<br>PNT - PAINT OR PAINTED<br>PVC - POLYVINYL CHLORIDE<br>RBR - RUBBER<br>RCP - REFLECTED CEILING PLAN<br>RD - ROOF DRAIN<br>REQD - REQUIRED<br>RM - ROOM<br>SIM - SIMILAR<br>SPEC - SPECIFIED OR SPECIFICATION<br>SPR - SPRINKLER OR SPEAKER<br>SSTL - STAINLESS STEEL<br>STC - SOUND TRANSMISSION COEFFICIENT<br>STL - STEEL<br>STRUCT - STRUCTURE OR STRUCTURAL<br>TAG - TONGUE AND GROOVE<br>TME - TO MATCH EXISTING TO<br>TOP OF<br>TOC - TOP OF CONCRETE<br>TOS - TOP OF STEEL<br>TID - TELEPHONE/DATE<br>TYP - TYPICAL<br>UNO - UNLESS NOTED OTHERWISE<br>U/S - UNDERSIDE<br>VF - VERIFY IN FIELD<br>VP - VISION PANEL<br>W/ - WITH<br>WD - WOOD |
|  | PROPERTY LINE  |
|  | CONCRETE   |
|  | CROSS SECTION VIEW/ELEVATION   |
|  | VENT   |
|  | GAS LINE   |
|  | RETURN DUCT  |
|  | AIR CON. DUCT  |
|  | FLOW DIRECTION   |
|  | SHUTOFF VALVE  |



## CLIMATE AND GEOGRAPHICAL DESIGN CRITERIA

ELEVATION FT.: 6732

| RISK CATEGORY | SNOW DESIGN          |                    | WIND DESIGN    |          | SUBJECT TO DAMAGE FROM |            |            | ICE BARRIER UNDER-LAYMENT REQUIRED | WINTER DESIGN TEMP | FLOOD HAZARDS | AIR FREEZING INDEX | MEAN ANNUAL TEMP, F | SEISMIC DESIGN CATEGORY | CLIMATE ZONE |         |
|---------------|----------------------|--------------------|----------------|----------|------------------------|------------|------------|------------------------------------|--------------------|---------------|--------------------|---------------------|-------------------------|--------------|---------|
|               | GROUND SNOW LOAD PSF | ROOF SNOW LOAD PSF | SPEED ULTIMATE | EXPOSURE | TOPOGRAPHIC EFFECT     | WEATHERING | FROST LINE |                                    |                    |               |                    |                     |                         |              | TERMITE |
| II            | 106.62 PSF           | xx PSF             | 115 mph        | B        | NO                     | SEVERE     | 48 IN.     | N/S                                | YES                | -15°F         | 2/4/05             | 2239                | 40-45°F                 | C            | 7       |

## SHEET SCHEDULE

| SHEET NUMBER | SHEET NAME                                     |
|--------------|--|
| M0.0         | COVER SHEET & BUILDING NOTES                   |
| M0.1         | LOT  |
| M1.0         | MECHANICAL                                     |
| M2.0         | MECHANICAL - ELECTRIC 40 GAL. HOT WATER HEATER |
| M2.1         | MECHANICAL - ERV UNIT                          |
| M3.0         | MANUAL J/S/D CALCULATIONS - LOAD SHORT FORM    |
| M3.1         | MANUAL J/S/D FORMS - LAYOUT                    |
| M3.2         | MANUAL J/S/D PROJECT SUMMARY                   |
| M3.3         | MANUAL D - DUCT SYSTEM SUMMARY                 |

## DESIGN CRITERIA & CONDITIONS

PROJECT CITY: STEAMBOAT SPRINGS, COLORADO  
PROJECT ELEVATION: 6732 FT. ABOVE SEA LEVEL  
COUNTY: ROUTT COUNTY  
ZONING: R-1.0 PUD  
BUILDING CONSTRUCTION CLASS: V-NR, SPRINKLED  
UNIT OCCUPANCY GROUP: R-3

### APPLICABLE CODES:

- 2018 International Building Code
- 2018 International Residential Code
- 2018 International Plumbing Code
- 2018 International Fuel Gas Code
- 2018 International Mechanical Code
- 2018 International Fire Code
- 2018 International Energy Conservation Code \*\*
- 2020 National Electric Code

ESDENVER DBA  
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Reviewed for Code Compliance

02/02/2022

MATT EIDT

345 Lincoln Ave., #205  
Steamboat Springs, CO  
80487

DRAWN BY: J.F.

CHECKED BY: D.R.

### REVISIONS:

| No. | DESCRIPTION | DATE |
|-----|-------------|------|
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|     |             |      |
|     |             |      |
|     |             |      |

### ISSUE RECORD:

| No. | DESCRIPTION | DATE |
|-----|-------------|------|
|     |             |      |
|     |             |      |
|     |             |      |

SCALE:

SHEET CONTENTS:

PROJECT NO.: 9923

DATE: 10/19/2021

DRAWING NO.:

M0.0



Reviewed for  
 Code Compliance  
 02/02/2022

**MATT EIDT**  
 345 Lincoln Ave., #205  
 Steamboat Springs, CO  
 80487

DRAWN BY: J.F.  
 CHECKED BY: D.R.

REVISIONS:

| No. | DESCRIPTION | DATE |
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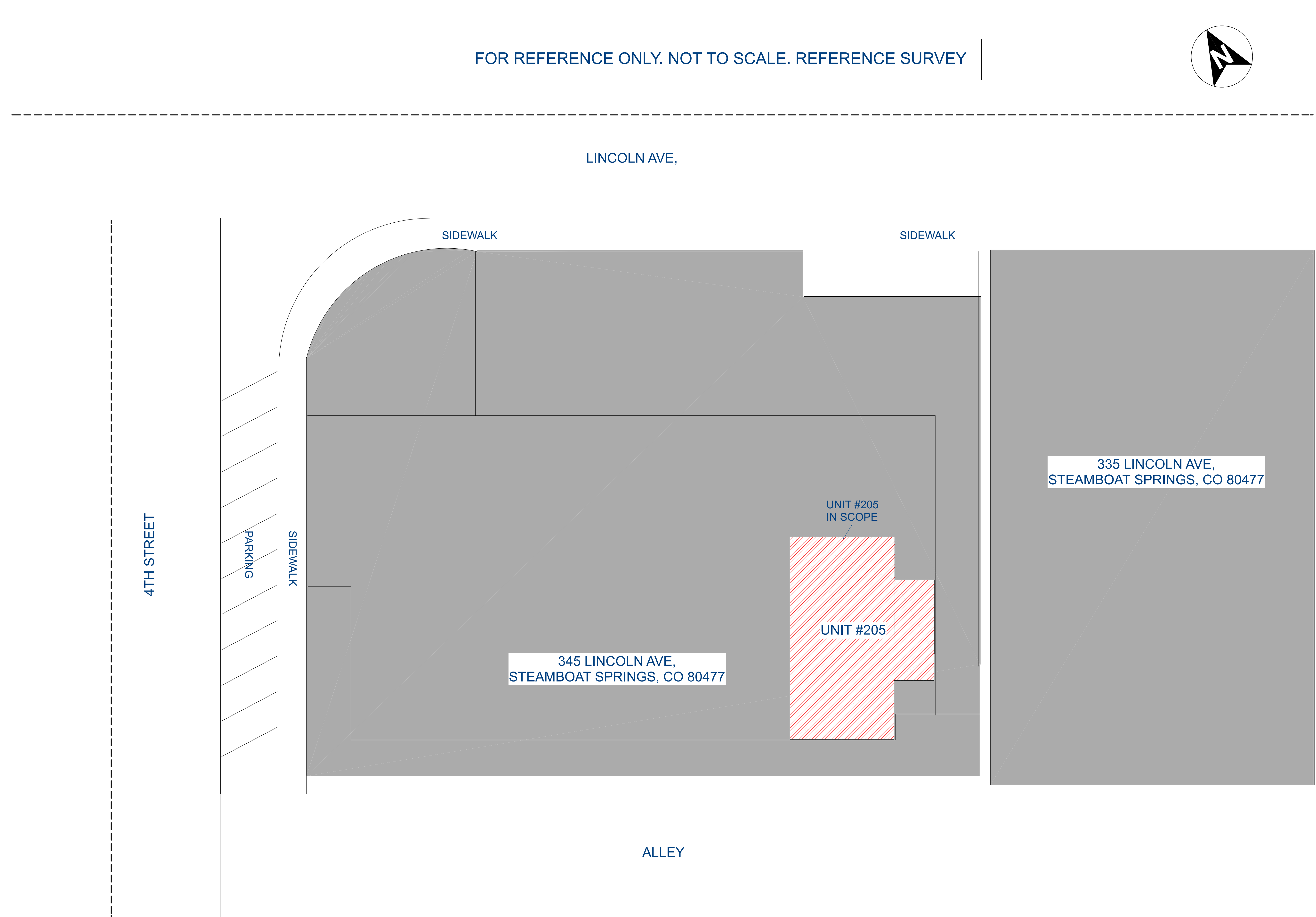
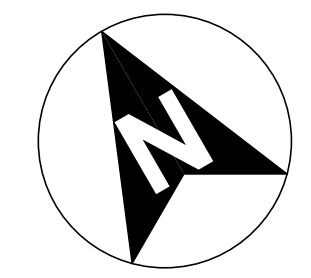
SHEET CONTENTS:

PROJECT NO.: 9923  
 DATE: 10/19/2021

DRAWING NO.: **M0.1**



FOR REFERENCE ONLY. NOT TO SCALE. REFERENCE SURVEY



**P** LOT  
 SCALE: NO SCALE

**SECTION 504 CLOTHES DRYER EXHAUST**

- DRYER VENT TO BE RUN TO THE OUTSIDE, MIN 3 FT. AWAY FROM ANY INTAKE. IF RUN IS GREATER THAN 35', WITH CODE ASSIGNED DISTANCES FOR ELBOWS, A LABEL IS REQUIRED WITHIN 6' OF DRYER VENT. REFER TO MANUFACTURERS INSTALLATION INSTRUCTIONS FOR PROPER VENTING OF SPECIFIC APPLIANCE.

- 504.1 INSTALLATION: CLOTHES DRYERS SHALL BE EXHAUSTED IN ACCORDANCE WITH THE MANUFACTURER'S INSTRUCTIONS. DRYER EXHAUST SYSTEMS SHALL BE INDEPENDENT OF ALL OTHER SYSTEMS AND SHALL CONVEY THE MOISTURE AND ANY PRODUCTS OF COMBUSTION TO THE OUTSIDE OF THE BUILDING.

\*EXCEPTION: THIS SECTION SHALL NOT APPLY TO LISTED AND LABELED CONDENSING (DUCTLESS) CLOTHES DRYERS.

- 504.2 EXHAUST PENETRATIONS: WHERE A CLOTHES DRYER EXHAUST DUCT PENETRATES A WALL OR CEILING MEMBRANE, THE ANNULAR SPACE SHALL BE SEALED WITH NONCOMBUSTIBLE MATERIAL, APPROVED FIRE CAULKING OR A NONCOMBUSTIBLE DRYER EXHAUST DUCT WALL RECEPTACLE. DUCTS THAT EXHAUST CLOTHES DRYERS SHALL NOT PENETRATE OR BE LOCATED WITHIN ANY FIREBLOCKING, DRAFTSTOPPING OR ANY WALL, FLOOR/CEILING OR OTHER ASSEMBLY REQUIRED BY THE INTERNATIONAL BUILDING CODE TO BE FIRE-RESISTANCE RATED, UNLESS SUCH DUCT IS CONSTRUCTED OF GALVANIZED STEEL OR ALUMINUM OF THE THICKNESS SPECIFIED IN SECTION 603.4 AND THE FIRE-RESISTANCE RATING IS MAINTAINED IN ACCORDANCE WITH THE INTERNATIONAL BUILDING CODE. FIRE DAMPERS, COMBINATION FIRE/SMOKE DAMPERS AND ANY SIMILAR DEVICES THAT WILL OBSTRUCT THE EXHAUST FLOW SHALL BE PROHIBITED IN CLOTHES DRYER EXHAUST DUCTS.

- PROVIDE 50 CFM FAN IN BATHROOM TO BE VENTED TO THE EXTERIOR WHEN NO NATURAL VENTILATION IS PROVIDED BY A WINDOW

- ROOF VENTING PER IPC CHAPTER 9.

- 906.1. THE MIN. REQUIRED DIA. OF STACK VENTS AND VENT STACKS SHALL BE DETERMINED FROM THE DEVELOPED LENGTH AND THE TOTAL OF DRAINAGE FIXTURE UNITS CONNECTED THERETO IN ACCORDANCE WITH (SEE TABLE 906.1 IPC), BUT IN NO CASE SHALL THE DIA. BE LESS THAN 1/2 THE DIA. OF THE DRAIN SERVED OR LESS THAN 1 1/4".

HOT WATER HEATER IPC SEC. 501

- WATER HEATERS & STORAGE TANKS SHALL BE LOCATED AND CONNECTED SO AS TO PROVIDE ACCESS FOR OBSERVATION, MAINTENANCE, SERVICING AND REPLACEMENT (IPC 501.4)

- THE TEMPERATURE OF WATER FROM WATER HEATERS SHALL BE NOT GREATER THAN 120°F WHERE INTENDED FOR RESIDENTIAL USES. THIS PROVISION SHALL NOT SUPERSEDE THE REQ. FOR PROTECTIVE SHOWER VALVES IN ACCORDANCE W/ SEC. 412.3 (IPC 501.6)

- THE COLD WATER BRANCH LINE FROM THE MAIN WATER SUPPLY LINE TO EACH HOT WATER STORAGE TANK OR WATER HEATER SHALL BE PROVIDED WITH A VALVE, LOCATED NEAR THE EQUIPMENT AND SERVING ONLY THE HOT WATER STORAGE TANK OR WATER HEATER. THE VALVE SHALL NOT INTERFERE OR CAUSE A DISRUPTION OF THE COLD WATER SUPPLY TO THE REMAINDER OF THE COLD WATER SYSTEM. THE VALVE SHALL BE PROVIDED WITH ACCESS ON THE SAME FLOOR LEVEL AS THE WATER HEATER SERVED. (IPC 503.1)

- AN APPROVED MEANS, SUCH AS A COLD WATER "DIP" TUBE W/ A HOLE AT THE TOP OR A VACUUM RELIEF VALVE INSTALLED IN THE COLD WATER SUPPLY LINE ABOVE THE TOP OF THE HEATER OR TANK, SHALL BE PROVIDED TO PREVENT SIPHONING OF ANY STORAGE WATER HEATER OR TANK (IPC 504.1)

- BOTTOM FED WATER HEATERS AND BOTTOM FED TANKS CONNECTED TO WATER HEATERS SHALL HAVE A VACUUM RELIEF VALVE INSTALLED. THE VACUUM RELIEF VALVE SHALL COMPLY WITH ANSI Z21.22. (IPC 504.2)

- RELIEF VALVE  
A NEW PRESSURE-RELIEF VALVE, COMPLYING WITH THE STANDARD FOR RELIEF VALVES AND AUTOMATIC GAS SHUT-OFF DEVICES FOR HOT WATER SUPPLY SYSTEMS, ANSI Z21.22/CSA 4.4, MUST BE INSTALLED AT THE HOT WATER OUTLET CONNECTION OF THE WATER HEATER DURING INSTALLATION. LOCAL CODES SHALL GOVERN THE INSTALLATION OF ANY RELIEF VALVES

- 502.2 ROOMS USED AS A PLENUM  
WATER HEATERS USING SOLID, LIQUID OR GAS FUEL SHALL NOT BE INSTALLED IN A ROOM CONTAINING AIR-HANDLING MACHINERY WHERE SUCH ROOM IS USED AS A PLENUM.

- 504.7 REQUIRED PAN  
WHERE A STORAGE TANK-TYPE WATER HEATER OR A HOT WATER STORAGE TANK IS INSTALLED IN A LOCATION WHERE WATER LEAKAGE FROM THE TANK WILL CAUSE DAMAGE, THE TANK SHALL BE INSTALLED IN A PAN CONSTRUCTED OF ONE OF THE FOLLOWING:  
1 GALVANIZED STEEL OR ALUMINUM OF NOT LESS THAN 0.0236 INCH (0.6010 MM) IN THICKNESS.  
2 PLASTIC NOT LESS THAN 0.036 INCH (0.9 MM) IN THICKNESS.  
3 OTHER APPROVED MATERIALS.

\*A PLASTIC PAN SHALL NOT BE INSTALLED BENEATH A GAS-FIRED WATER HEATER.

- 504.3 SHUTDOWN  
A MEANS FOR DISCONNECTING AN ELECTRIC HOT WATER SUPPLY SYSTEM FROM ITS ENERGY SUPPLY SHALL BE PROVIDED IN ACCORDANCE WITH NFPA 70. A SEPARATE VALVE SHALL BE PROVIDED TO SHUT OFF THE ENERGY FUEL SUPPLY TO ALL OTHER TYPES OF HOT WATER SUPPLY SYSTEMS.

KITCHEN EXHAUST:  
- IF KITCHEN HOOD GREATER THAN 400CFM, MUST HAVE APPROX EQUAL MAKE UP AIR ON AUTOMATICALLY CONTROLLED DAMPER

307.3 PENETRATION  
ALL FLOOR/CEILING ASSEMBLIES AND FIRE-RESISTANCE-RATED ASSEMBLIES PENETRATIONS OF FLOOR/CEILING ASSEMBLIES AND ASSEMBLIES REQUIRED TO HAVE A FIRE-RESISTANCE RATING SHALL BE PROTECTED IN ACCORDANCE WITH THE INTERNATIONAL BUILDING CODE.

AIR SEALING (IECC SEC. 402.4)  
THE BUILDING ENVELOPE IS REQUIRED TO BE PROPERLY SEALED TO LIMIT AIR INFILTRATION. AIR TIGHTNESS AND INSULATION INSTALLATION MUST BE DEMONSTRATED EITHER BY TESTING OR VISUAL INSPECTION. RECESSED LIGHTING MUST ALSO BE SEALED TO LIMIT AIR LEAKAGE.

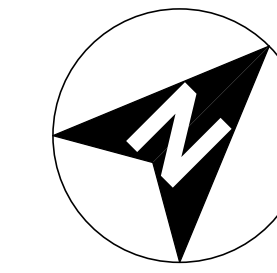
- ALL DUCT PENETRATIONS THROUGH FIRE RATED WALLS TO BE SEALED AIR TIGHT WITH SEALANT APPLIED

- THERMOSTATS TO BE MOUNTED 48" AFF TO CENTERLINE OF THERMOSTAT.

403.1.1 PROGRAMMABLE THERMOSTAT  
- EACH DWELLING UNIT SHALL HAVE AT LEAST ONE THERMOSTAT CAPABLE OF AUTOMATICALLY ADJUSTING THE SPACE TEMPERATURE SET POINT OF THE LARGEST HEATING OR COOLING ZONE AND CAPABLE OF CONTROLLING THE HEATING AND COOLING SYSTEM ON A DAILY SCHEDULE TO MAINTAIN DIFFERENT TEMPERATURE SET POINTS AT DIFFERENT TIMES OF THE DAY. THIS THERMOSTAT SHALL INCLUDE THE CAPABILITY TO SET BACK OR TEMPORARILY OPERATE THE SYSTEM TO MAINTAIN ZONE TEMPERATURES DOWN TO 55°F OR UP TO 85°F. THE THERMOSTAT SHALL INITIALLY BE PROGRAMMED WITH A HEATING TEMPERATURE SET POINT NO HIGHER THAN 70°F AND A COOLING TEMPERATURE SET POINT NO LOWER THAN 78°F.

- DUCTWORK ON PLANS TO BE FIELD MODIFIED BY CONTRACTOR AS REQUIRED. COORDINATE INSTALLATION WITH FRAMING AND OTHER TRADES.

ENGINEER NOTE: CONTRACTOR TO INTERFACE NEW THERMOSTATS TO ACTIVATE EXISTING HVAC SYSTEMS

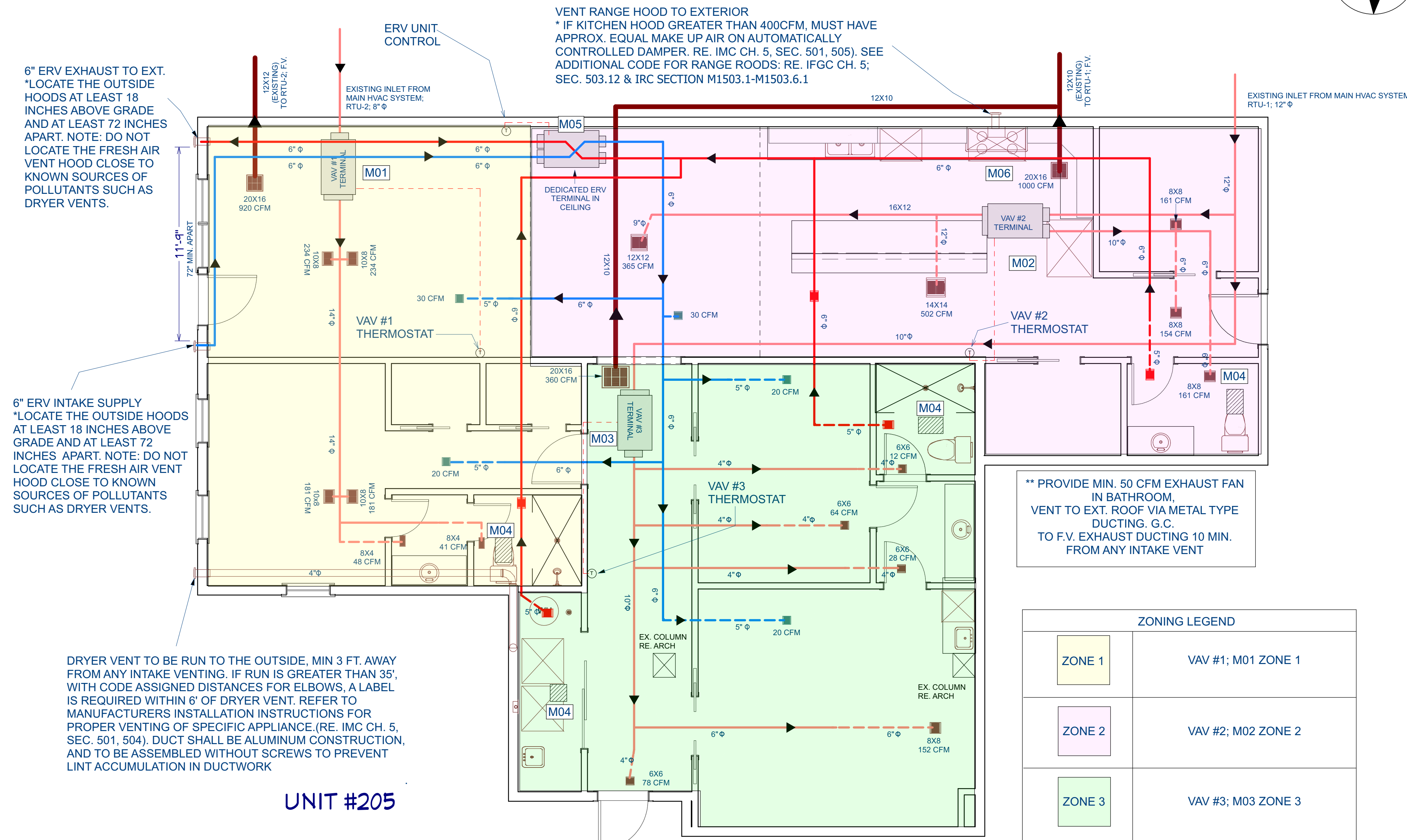


ENGINEERING STUDIO DENVER  
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Reviewed for Code Compliance

02/02/2022

**MATT EIDT**  
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Steamboat Springs, CO  
80487



6" ERV EXHAUST TO EXT. \*LOCATE THE OUTSIDE HOODS AT LEAST 18 INCHES ABOVE GRADE AND AT LEAST 72 INCHES APART. NOTE: DO NOT LOCATE THE FRESH AIR VENT HOOD CLOSE TO KNOWN SOURCES OF POLLUTANTS SUCH AS DRYER VENTS.

6" ERV INTAKE SUPPLY \*LOCATE THE OUTSIDE HOODS AT LEAST 18 INCHES ABOVE GRADE AND AT LEAST 72 INCHES APART. NOTE: DO NOT LOCATE THE FRESH AIR VENT HOOD CLOSE TO KNOWN SOURCES OF POLLUTANTS SUCH AS DRYER VENTS.

DRYER VENT TO BE RUN TO THE OUTSIDE, MIN 3 FT. AWAY FROM ANY INTAKE VENTING. IF RUN IS GREATER THAN 35', WITH CODE ASSIGNED DISTANCES FOR ELBOWS, A LABEL IS REQUIRED WITHIN 6' OF DRYER VENT. REFER TO MANUFACTURERS INSTALLATION INSTRUCTIONS FOR PROPER VENTING OF SPECIFIC APPLIANCE. (RE. IMC CH. 5, SEC. 501, 504). DUCT SHALL BE ALUMINUM CONSTRUCTION, AND TO BE ASSEMBLED WITHOUT SCREWS TO PREVENT LINT ACCUMULATION IN DUCTWORK

**UNIT #205**

**504.8.4 DUCT LENGTH:**

- THE MAXIMUM ALLOWABLE EXHAUST DUCT LENGTH SHALL BE DETERMINED BY ONE OF THE METHODS SPECIFIED IN SECTIONS 504.8.4.1 THROUGH 504.8.4.3.

- 504.8.4.1 SPECIFIED LENGTH: THE MAXIMUM LENGTH OF THE EXHAUST DUCT SHALL BE 35 FT. FROM THE CONNECTION TO THE TRANSITION DUCT FROM THE DRYER TO THE OUTLET TERMINAL. WHERE FITTINGS ARE USED, THE MAXIMUM LENGTH OF THE EXHAUST DUCT SHALL BE REDUCED IN ACCORDANCE WITH TABLE 504.8.4.1.

**TABLE 504.8.4.1: DRYER EXHAUST DUCT FITTING EQUIVALENT LENGTH**

| DRYER EXHAUST DUCT FITTING TYPE   | EQUIVALENT LENGTH |
|-----------------------------------|-------------------|
| 4" RADIUS MITERED 45-DEGREE ELBOW | 2 FEET 6 INCHES   |
| 4" RADIUS MITERED 90-DEGREE ELBOW | 5 FEET            |
| 6" RADIUS SMOOTH 45-DEGREE ELBOW  | 1 FOOT            |
| 6" RADIUS SMOOTH 90-DEGREE ELBOW  | 1 FOOT 9 INCHES   |
| 8" RADIUS SMOOTH 45-DEGREE ELBOW  | 1 FOOT            |
| 8" RADIUS SMOOTH 90-DEGREE ELBOW  | 1 FOOT 7 INCHES   |
| 10" RADIUS SMOOTH 45-DEGREE ELBOW | 9 INCHES          |
| 10" RADIUS SMOOTH 90-DEGREE ELBOW | 1 FOOT 6 INCHES   |

504.8.4.2 MANUFACTURER'S INSTRUCTIONS THE MAXIMUM LENGTH OF THE EXHAUST DUCT SHALL BE DETERMINED BY THE DRYER MANUFACTURER'S INSTALLATION INSTRUCTIONS. THE CODE OFFICIAL SHALL BE PROVIDED WITH A COPY OF THE INSTALLATION INSTRUCTIONS FOR THE MAKE AND MODEL OF THE DRYER. WHERE THE EXHAUST DUCT IS TO BE CONCEALED, THE INSTALLATION INSTRUCTIONS SHALL BE PROVIDED TO THE CODE OFFICIAL PRIOR TO THE CONCEALMENT INSPECTION. IN THE ABSENCE OF FITTING EQUIVALENT LENGTH CALCULATIONS FROM THE CLOTHES DRYER MANUFACTURER, TABLE 504.8.4.1 SHALL BE USED.

\*\* PROVIDE MIN. 50 CFM EXHAUST FAN IN BATHROOM, VENT TO EXT. ROOF VIA METAL TYPE DUCTING. G.C. TO F.V. EXHAUST DUCTING 10 MIN. FROM ANY INTAKE VENT

**ZONING LEGEND**

|        |                    |
|--------|--------------------|
| ZONE 1 | VAV #1; M01 ZONE 1 |
| ZONE 2 | VAV #2; M02 ZONE 2 |
| ZONE 3 | VAV #3; M03 ZONE 3 |

**EXISTING VAV BOX SCHEDULE**

| NUMBER | NUMBER            | LOCATION | INLET SIZE | CFM MIN | CFM MAX | FAN (HP) | HEATING CAP. (KW) | V   | PH | FLA | HZ | ELECTRICAL DATA | MAX. SOUND LEVEL | REMARKS                             |
|--------|-------------------|----------|------------|---------|---------|----------|-------------------|-----|----|-----|----|-----------------|------------------|-------------------------------------|
| M01    | TRANE VPEF-0601   | CEILING  | 6" Ø       | 250     | 500     | 1/3      | 4.0               | 115 | 1  | 1.6 | 60 |                 | 35               | PROVIDE THERMOSTAT CONTROL FOR UNIT |
| M02    | TRANE VPEF-100417 | CEILING  | 10" Ø      | 500     | 1400    | 1/3      | 8.0               | 115 | 1  | 5.4 | 60 |                 | 35               | PROVIDE THERMOSTAT CONTROL FOR UNIT |
| M03    | TRANE VPEF-0601   | CEILING  | 6" Ø       | 250     | 500     | 1/3      | 4.0               | 115 | 1  | 1.6 | 60 |                 | 35               | PROVIDE THERMOSTAT CONTROL FOR UNIT |

**MECHANICAL SCHEDULE - UNIT #205**

| NUMBER            | LABEL | QTY. | DESCRIPTION                 | REMARKS   |
|-------------------|-------|------|-----------------------------|---|
| XX                |       | 3    | RETURN AIR (CEILING)        | 20X16"  |
| M05               |       | 1    | ERV UNIT                    | BRAND: HONEYWELL (OR USE SIMILAR) PRODUCT #: MODEL VNT5150E1000                 |
| M01<br>M02<br>M03 |       | 3    | VAV UNIT                    | (E) M01 TRANE VPEF-0601<br>(E) M02 TRANE VPEF-100417<br>(E) M03 TRANE VPEF-0601 |
| M04               |       | 2    | EXHAUST FAN (50 CFM MIN.)   | BRAND TBD - FINISH=WHITE  |
| XX                |       | 4    | 6X6" HVAC SUPPLY REGISTER   | WHITE   |
| XX                |       | 4    | 8X8" HVAC SUPPLY REGISTER   | WHITE   |
| XX                |       | 2    | 8X4" HVAC SUPPLY REGISTER   | WHITE   |
| XX                |       | 4    | 10X8" HVAC SUPPLY REGISTER  | WHITE   |
| XX                |       | 1    | 14X14" HVAC SUPPLY REGISTER | WHITE   |
| XX                |       | 1    | 12X12" HVAC SUPPLY REGISTER | WHITE   |
| XX                |       | 5    | ERV EXHAUST REGISTER        | COLOR- TBD<br>SIZE- TBD ON SITE   |
| XX                |       | 5    | ERV SUPPLY REGISTER         | COLOR- TBD<br>SIZE- TBD ON SITE   |
| XX                |       | XX   | RETURN AIR DUCTING          | SIZE PER PLAN OR EXISTING. F.V.   |
| XX                |       | XX   | RIGID DUCTING               | SIZE PER PLAN OR EXISTING. F.V.   |
| XX                |       | XX   | FLEX DUCTING                | SIZE PER PLAN OR EXISTING. F.V.   |
| M06               |       | 1    | RANGE HOOD                  | BRAND TBD<br>FINISH TBD<br>SIZE TBD   |

DRAWN BY: J.F.  
CHECKED BY: D.R.  
REVISIONS:  
No. DESCRIPTION DATE  
△  
△  
△  
△  
ISSUE RECORD:  
No. DESCRIPTION DATE  
SCALE:  
SHEET CONTENTS:

PROJECT NO.: 9923  
DATE: 10/19/2021  
DRAWING NO.: **M1.0**



Reviewed for Code Compliance  
02/02/2022

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345 Lincoln Ave., #205  
Steamboat Springs, CO  
80487

DRAWN BY: J.F.  
CHECKED BY: D.R.  
REVISIONS:  
No. DESCRIPTION DATE  
△  
△  
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ISSUE RECORD:  
No. DESCRIPTION DATE  
SCALE:

SHEET CONTENTS:  
PROJECT NO.: 9923  
DATE: 10/19/2021  
DRAWING NO.: **M2.0**



## PERFORMANCE<sup>®</sup> Electric Specifications

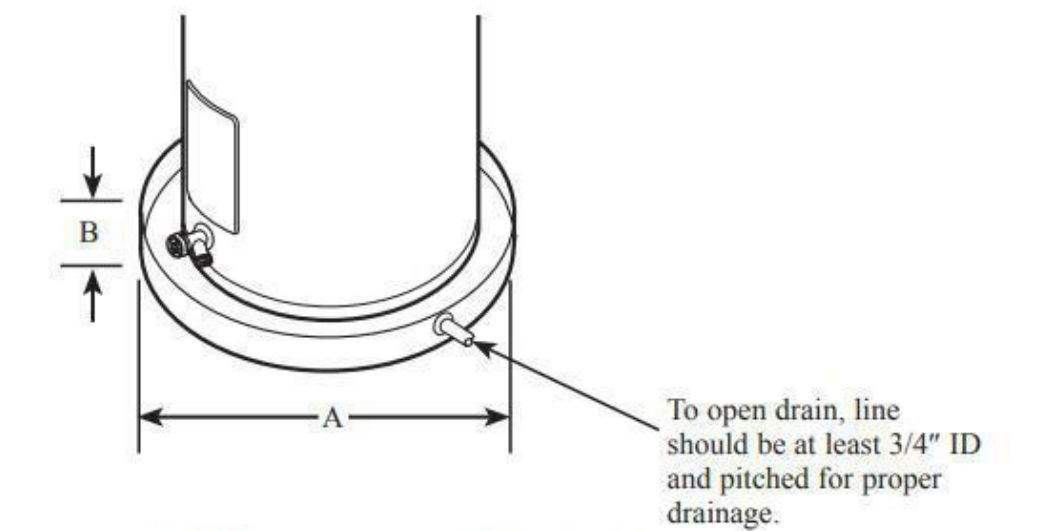
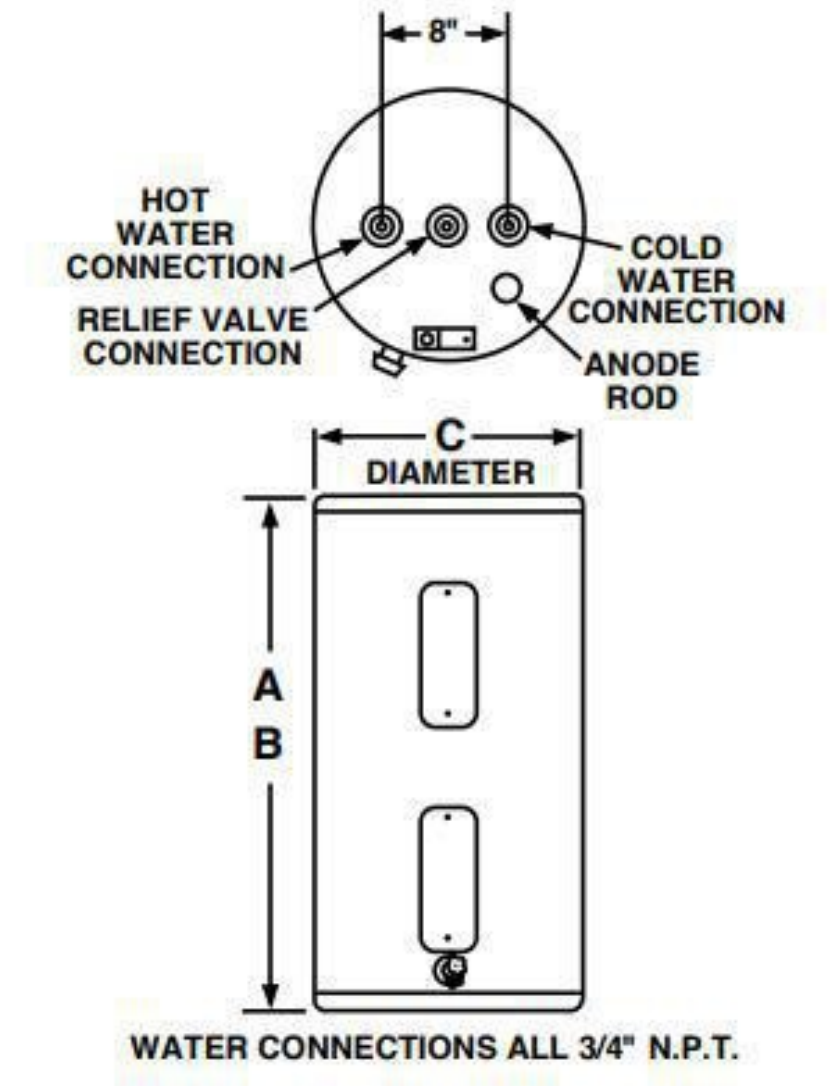
| Fuel Type | Description | Nominal Gallon Capacity | Rated Gallon Capacity | Model Number   | Recovery in G.P.H. 90° F Rise | First Hour Rating G.P.H. | Tank Height A | Height to Water Conn. B | Diameter C | Ship Weight (LBS.) | Uniform Energy Factor (UEF) |
|-----------|-------------|-------------------------|-----------------------|----------------|-------------------------------|--------------------------|---------------|-------------------------|------------|--------------------|-----------------------------|
| Electric  | Tall        | 50                      | 45                    | XE50T06ST45U1  | 21                            | 61                       | 58-7/8        | 61-5/8                  | 20-1/4     | 121                | 0.93                        |
| Electric  | Medium      | 50                      | 45                    | XE50M06ST45U1  | 21                            | 61                       | 48            | 50-1/2                  | 23         | 132                | 0.93                        |
| Electric  | Short       | 47                      | 43                    | XE47S06ST45U1  | 21                            | 54                       | 32            | 34                      | 26-1/4     | 148                | 0.93                        |
| Electric  | Tall        | 40                      | 36                    | XE40T06ST45U1  | 21                            | 54                       | 60-3/4        | 63-5/8                  | 19-1/4     | 109                | 0.93                        |
| Electric  | Medium      | 40                      | 36                    | XE40M06ST45U1  | 21                            | 53                       | 48-1/4        | 50-1/2                  | 20-1/4     | 106                | 0.93                        |
| Electric  | Medium      | 40                      | 36                    | XE40M06ST38U1  | 17                            | 52                       | 48-1/4        | 50-1/2                  | 20-1/4     | 106                | 0.93                        |
| Electric  | Short       | 38                      | 35                    | XE38S06ST45U1* | 21                            | 51                       | 31-1/2        | 34                      | 23         | 108                | 0.92                        |
| Electric  | Short       | 38                      | 35                    | XE38S06ST38U1* | 17                            | 49                       | 31-1/2        | 34                      | 23         | 108                | 0.91                        |
| Electric  | Short       | 36                      | 33                    | XE36S06ST45U0  | 21                            | 46                       | 31-1/2        | 33                      | 24-1/4     | 118                | 0.92                        |
| Electric  | Short       | 36                      | 33                    | XE36S06ST38U0  | 17                            | 34                       | 31-1/2        | 33                      | 24-1/4     | 118                | 0.92                        |
| Electric  | Tall        | 30                      | 27                    | XE30T06ST45U1  | 21                            | 46                       | 47-1/2        | 50-3/8                  | 19         | 92                 | 0.92                        |
| Electric  | Tall        | 30                      | 27                    | XE30T06ST38U1  | 17                            | 36                       | 47-1/2        | 50-3/8                  | 19         | 92                 | 0.92                        |
| Electric  | Medium      | 30                      | 27                    | XE30M06ST45U1  | 21                            | 45                       | 37-1/2        | 40-1/2                  | 20-1/4     | 92                 | 0.90                        |
| Electric  | Short       | 30                      | 27                    | XE30S06ST45U1* | 21                            | 46                       | 30            | 32                      | 19-3/4     | 95                 | 0.92                        |
| Electric  | Short       | 30                      | 27                    | XE30S06ST38U1* | 17                            | 33                       | 30            | 32                      | 19-3/4     | 95                 | 0.92                        |
| Electric  | Short       | 28                      | 25                    | XE28S06ST45U0  | 21                            | 45                       | 30            | 31-1/8                  | 23         | 95                 | 0.92                        |
| Electric  | Short       | 28                      | 25                    | XE28S06ST38U0  | 17                            | 45                       | 30            | 31-1/8                  | 23         | 95                 | 0.92                        |
| Electric  | Short       | 20                      | N/A                   | XE20S06ST38U0  | 17                            | N/A                      | 31-1/2        | 31-1/2                  | 17         | 62                 | N/A                         |

\*Water heater dimensions prior to installing insulation blanket that is included with water heater. The blanket adds 1-1/2 inches to tank height and 2 inches to tank diameter.  
Uniform Energy Factor and rated gallon capacity based on Department of Energy (DOE) requirements.  
• Heaters furnished with standard 240 volt AC, single phase non-simultaneous wiring, and 4500 watt upper and lower heating elements.  
• All models equipped with heat traps.

\*\*Recovery = wattage/2.42 x temp. rise °F.  
Example: 4500W = 21 GPH  
2.42 x 90°

\*\*Recovery = wattage/2.42 x temp. rise °F.  
Example: 3800W = 17 GPH  
2.42 x 90°

\*\*Recovery calculations used are based on 4500 watt elements used in non-simultaneous operation.



A—Diameter of water heater plus 2" min.  
B—Maximum 2"  
To open drain, line should be at least 3/4" ID and pitched for proper drainage.

**NOTICE: Auxiliary catch pan MUST conform to local codes.**  
Drain Pan Kits are available from the store where the water heater was purchased, or any water heater distributor.



PERFORMANCE  
20 to 50-Gallon Capacities  
240 Volt AC/Single Phase

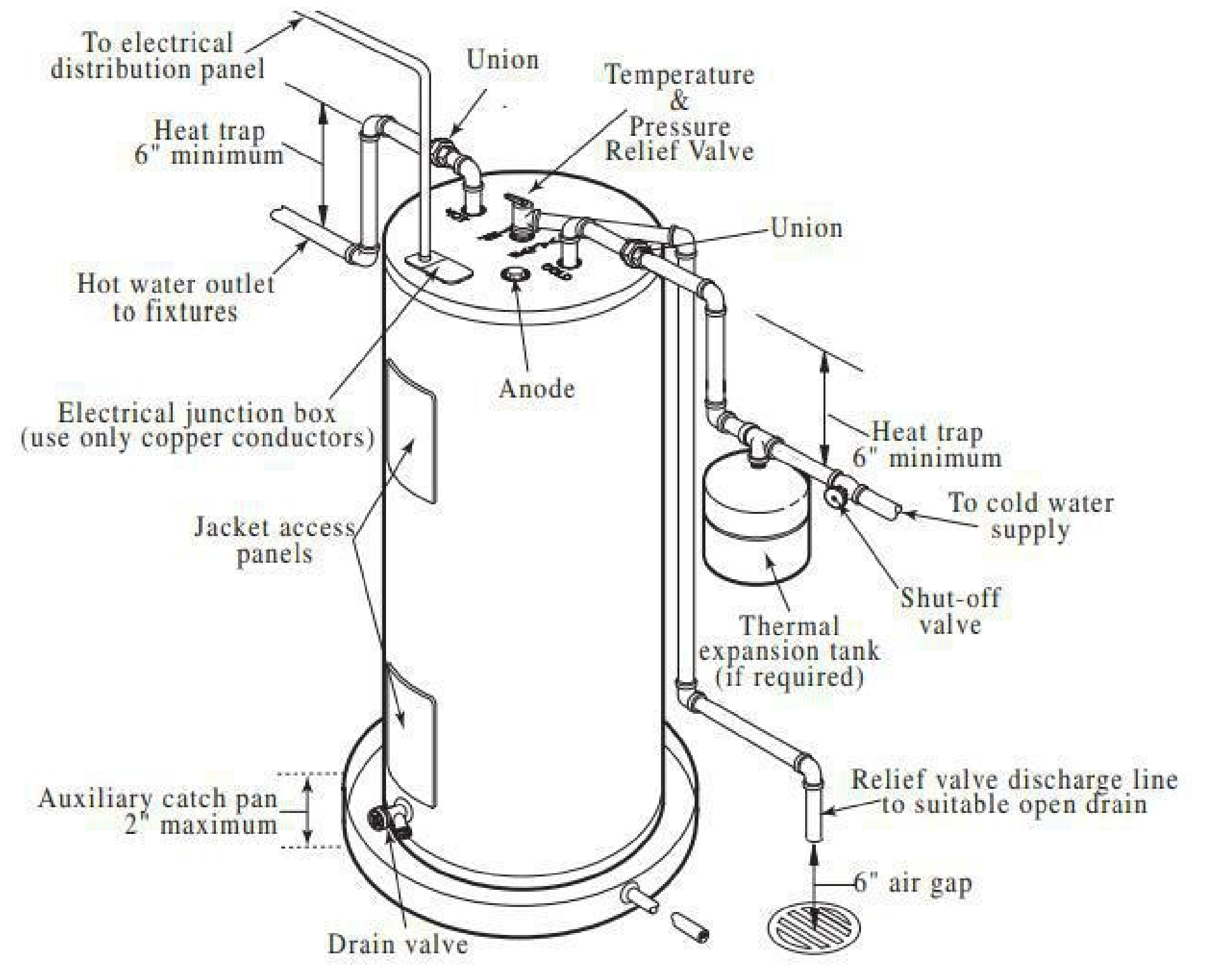
PERFORMANCE 40 GAL. MEDIUM 6 YEAR 4500/4500-WATT ELEMENTS ELECTRIC TANK WATER HEATER (OR SIMILAR)  
- 240-VOLT  
- PHASE - SINGLE PHASE  
- AMPS - 18.75  
- KW - 4.5  
DIMENSIONS:  
- DEPTH (IN.) - 20.25"  
- WIDTH (IN.) - 20.25"  
- HEIGHT (IN.) - 48.5"  
- WATER CONNECTION SIZE- 3/4"  
PRODUCT INFORMATION:  
BRAND: RHEEM (OR SIMILAR)  
MODEL: XE40M06ST45U1  
\*FIELD VERIFY SIZE & LOCATION BEFORE PURCHASING OR INSTALLATION. CONSULT ELECTRICIAN AND PLUMBER FOR INSTALLATION. REFER TO MANUFACTURERS INSTALLATION INSTRUCTIONS

### Specifications

| Dimensions            |         |                             |          |
|-----------------------|---------|-----------------------------|----------|
| Kilo Watt             | 4.5     | Product Depth (in.)         | 20.25 in |
| Product Height (in.)  | 48.5 in | Product Width (in.)         | 20.25 in |
| Tank Valve Size (in.) | .75     | Water Connection Size (in.) | .75      |

| Details                             |  |                          |             |
|-------------------------------------|--|--------------------------|-------------|
| Amperage (amps)                     | 18.75 A  | Application Type         | Residential |
| Commercial/Residential              | Residential  | Efficiency Level         | Super High  |
| Electricity Phase                   | Single Phase   | Finish Family            | Gray        |
| First Hour of Delivery (gallons/hr) | 53   | Fuel Type                | Electric    |
| Household Size                      | 2-4  | Indoor/Outdoor           | Indoor      |
| Maximum Temperature (F)             | 150  | Minimum Temperature (F)  | 90          |
| Nominal Tank Capacity (gallons)     | 40   | Number of Elements       | 2           |
| Pack Size                           | 1  | Product Weight (lb.)     | 106 lb      |
| Rated Tank Capacity (gallons)       | 36   | Required Volt Connection | 240 volt    |
| Returnable                          | 90-Day   | Tank Lining Material     | Glass       |
| Tank Warranty                       | 6 Year   | Uniform Energy Factor    | 0.93        |
| Water Heater Features               | Overheat Protection, Temperature Pressure Relief Valve | Water Heater Profile     | Medium      |
| Wattage (watts)                     | 4500   |                          |             |

### Typical Installation



\*\*REFER TO MANUFACTURERS INSTALLATION INSTRUCTIONS FOR PROPER UNIT INSTALLATION

### Branch Circuit Sizing and Wire Size Guide

| Total Water Heater Wattage | Recommended Over Current Protection (Fuse or circuit breaker amperage rating) |      |      |      |      | Copper Wire Size AWG Based on N.E.C. Table 310-16 (75°C) |      |      |      |      |
|----------------------------|---|------|------|------|------|--|------|------|------|------|
|                            | 120V  | 208V | 240V | 277V | 480V | 120V   | 208V | 240V | 277V | 480V |
| 1,500                      | 20  | 15   | 15   | 15   | 15   | 12   | 14   | 14   | 14   | 14   |
| 2,000                      | 25  | 15   | 15   | 15   | 15   | 10   | 14   | 14   | 14   | 14   |
| 3,000                      | 35  | 20   | 20   | 15   | 15   | 8  | 12   | 12   | 14   | 14   |
| 4,000                      | -   | 25   | 25   | 20   | 15   | -  | 10   | 10   | 12   | 14   |
| 4,500                      | -   | 30   | 25   | 25   | 15   | -  | 10   | 10   | 10   | 14   |
| 5,000                      | -   | 30   | 30   | 25   | 15   | -  | 10   | 10   | 10   | 14   |
| 5,500                      | -   | 35   | 30   | 25   | 15   | -  | 8    | 10   | 10   | 14   |
| 6,000                      | -   | 40   | 35   | 30   | 20   | -  | 8    | 8    | 10   | 12   |
| 8,000                      | -   | 50   | 45   | 40   | 25   | -  | 8    | 8    | 8    | 10   |
| 9,000                      | -   | -    | 50   | 45   | 25   | -  | -    | 8    | 8    | 10   |
| 10,000                     | -   | -    | -    | 50   | 30   | -  | -    | -    | 8    | 10   |
| 11,000                     | -   | -    | -    | 50   | 30   | -  | -    | -    | 8    | 10   |
| 12,000                     | -   | -    | -    | -    | 35   | -  | -    | -    | -    | 8    |

### Single Phase Wiring



**TRUEFRESH ENERGY RECOVERY VENTILATOR (150CFM)**

- BRAND: HONEYWELL (OR SIMILAR)
- APPARENT SENSIBLE EFFECTIVENESS (ASEF): 0.67
- VOLTAGE: 120V
- HERTZ: 60
- AMPS: 1.5
- CFM: 150

- DIMENSIONS:**
- DEPTH (IN.)- 11.5"
  - WIDTH (IN.)- 29.5"
  - HEIGHT (IN.)- 22.5"
  - WEIGHT- 42 LBS.

**PRODUCT INFORMATION:**

BRAND: HONEYWELL (OR USE SIMILAR)  
 PRODUCT #: MODEL VNT5150E1000

\*FIELD VERIFY SIZE & LOCATION BEFORE PURCHASING OR INSTALLATION. CONSULT ELECTRICIAN AND PLUMBER FOR INSTALLATION & PROPER DRAINAGE. REFER TO MANUFACTURERS INSTALLATION INSTRUCTIONS

REVIEW AND FOLLOW ALL SPECIFIC UNIT MANUFACTURERS INSTALLATION INSTRUCTIONS. MODEL SHOWN IS FOR THE TRUEFRESH ENERGY RECOVERY VENTILATOR (150CFM).

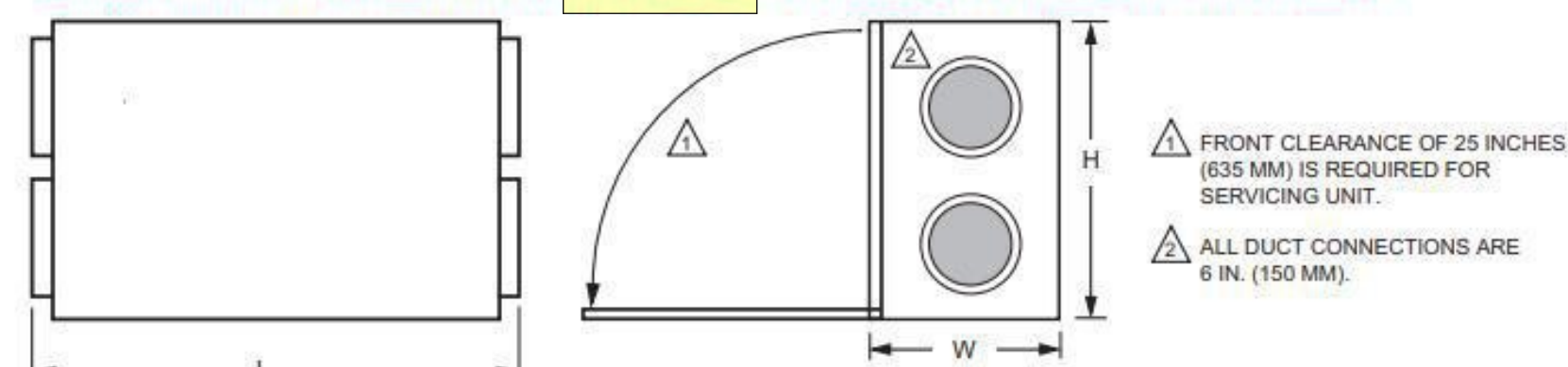
**External Control Options**

The ERV/HRV unit may be used with one of the following external controls:

- T10 Pro Smart Thermostat**
  - Controls both heating/cooling and ventilation.
  - Ventilation programming for time of day or Ashrae standards.
  - Optional ventilation lockouts for high/low temp or humidity conditions using internet weather when registered to the app.
- Prestige™ IAQ Kit**
  - Controls both heating/cooling and ventilation.
  - Wireless sensor for displaying outdoor temperature and humidity.
  - Advanced ventilation programming includes economizing and extreme condition shutdown.
  - Maintenance and service reminders.
  - High definition color display.
  - RedLINK™ Wireless technology
- DG115 IAQ Digital Control**
  - Automatic adjustments maintain fresh air in home.
  - Sensor for displaying outdoor temperature and humidity.
  - Advanced ventilation programming includes economizing and extreme condition shutdown.
  - Maintenance and service reminders.
  - Controls other indoor air quality equipment.
- VisionPRO™ Smart or VisionPRO™ RedLINK**
  - Wi-Fi™ (TH8321WF1001) or RedLINK™ Wireless technology (TH8321R1001)
  - Controls both heating/cooling and ventilation.
  - Display outdoor temperature and humidity.
  - Ventilation programming for time of day or Ashrae standards.
  - Optional ventilation lockouts for high/low temp or humidity conditions
  - C7089R1013 wireless outdoor sensor for RedLINK model. Internet weather for Smart model.
- Manual Dehumidistat and Automatic Ventilation Controls**
  - Manual humidity control with intuitive comfort settings.
  - Automatic W8150 ventilation control to ASHRAE standard, or for continuous operation.
- Boost Control Digital Timer**
  - Ventilation boost control for 20/40/60 minutes.
- Wireless Vent Boost Remote**
  - 20/40/60 minute ventilation timer
  - Works with RedLINK 2.0 thermostats

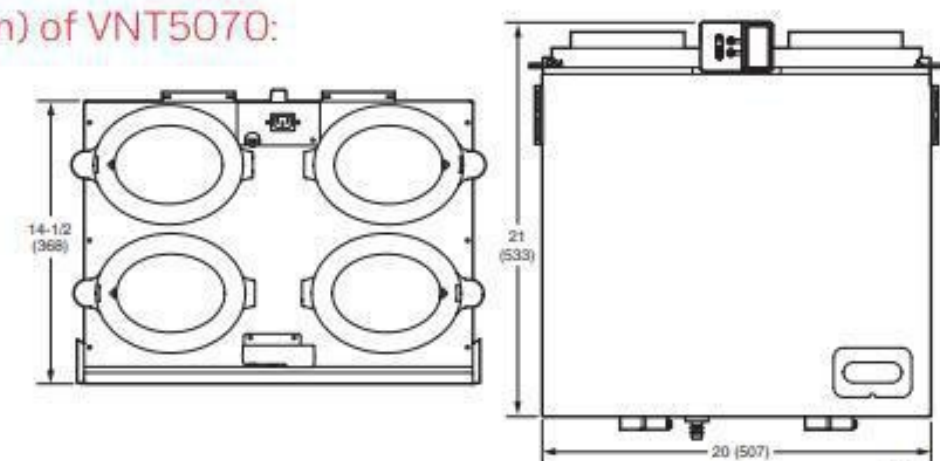
**Specifications**

Dimensions in inches (mm) of VNT5150, VNT5200, VNT6150 and VNT6200



VNT5150H1000, VNT5150E1000 or VNT6150H1000: H = 22 1/2 in. (572 mm), W = 11 1/2 in. (295 mm), L = 29 1/2 in. (749 mm)  
 VNT5200H1000, VNT5200E1000 or VNT6200H1000: H = 22 1/2 in. (572 mm), W = 16 1/2 in. (422 mm), L = 29 1/2 in. (749 mm)

Dimensions in inches (mm) of VNT5070:



**Physical Specifications:**

| Model                        | Product Weight      | Shipping Weight      | Heat/Energy Core Dimensions    | Filter Dimensions          |
|------------------------------|---------------------|----------------------|--------------------------------|----------------------------|
| VNT5150H1000<br>VNT5150E1000 | 42 lbs. (19.0 kg)   | 47.5 lbs. (21.55 kg) | 12"x10"x12"<br>305x254x305 mm  | 10"x12"<br>254x305 mm      |
| VNT5200H1000<br>VNT5200E1000 | 50 lbs. (22.68 kg)  | 57.5 lbs. (26.08 kg) | 12"x15"x12"<br>305x381x305 mm  | 15"x12"<br>381x305 mm      |
| VNT5070H1000<br>VNT5070E1000 | 33 lbs. (15.0 kg)   | 40.5 lbs. (18.4 kg)  | 10"x10"x9"<br>254x254x228.6 mm | 9"x9.75"<br>228.6x247.6 mm |
| VNT6150H1000                 | 43.5 lbs. (19.7 kg) | 50 lbs. (22.7 kg)    | 12"x10"x12"<br>305x254x305 mm  | 10"x12"<br>254x305 mm      |
| VNT6200H1000                 | 51.5 lbs. (23.4 kg) | 61.5 lbs. (27.9kg)   | 12"x15"x12"<br>305x381x305 mm  | 15"x12"<br>381x305 mm      |

**Operating Ranges:**

Ambient Temperature: 34 to 140 °F (1 to 60 °C)  
 Humidity: 0-95% RH

**Electrical Ratings:**

Input Voltage: 120 VAC, 60 Hz  
 Input Current: 1.5 A (VNT5150, VNT5200, VNT6150 & VNT6200), 0.85 A (VNT5070)  
 Output Power to Terminals: 5 VDC, 1.0 A maximum

- Drain tubing diameter:** 1/2 in. (12.7 mm)
- Cabinet:** 20 gauge galvanized steel
- Flexible Duct (2):** VNT5150, VNT5200, VNT6150 & VNT6200: 6 in. round for inlet and outlet. Flexible vinyl, compatible for connection to rigid or flexible ducting with sheet metal screws and/or tape. VNT5070: 5 in. oval for inlet and outlet. Flexible vinyl, compatible for connection to flexible ducting with sheet metal screw and/or tape.

**Standards and Certifications:**

CSA-22.2 #113-10, CSA 439 Standard  
 UL Standard 1812  
 RoHS Compliant  
 FCC Certified  
 FCC Part 15, Class B  
 ENERGY STAR (VNT6150H1000 & VNT6200H1000)



Install the ERV/HRV Ventilation System according to national and local regulations, building, and safety codes.



**VNT5150E1000**

**Ventilation System**

**VNT5150E Capacities and Performance**

- Part Number:** VNT5150E1000
- Product Weight:** 42 lbs (19 Kg)
- Input Voltage:** 120 VAC; 60 Hz.
- Input Current:** 1.5 A
- Output Power to Terminals:** 5 VDC, 1.0 A
- Operating Ranges:**
  - Temp: 34–135 °F (1.1–57.2 °C)
  - Humidity: 0–99% RH
- CFM:** 30–160
- Type of Heat Exchanger:** Cross-flow (Enthalpic)
- Exchange Surface:** 85 sq. ft.

**Energy Core Dimensions:**

- Width: 10 in. (254 mm)
- Height: 12 in. (305 mm)
- Length: 12 in. (305 mm)

**Filter Dimensions:**

- Height: 12 in. (305 mm)
- Width: 10 in. (254 mm)

**Shipping Specs:**

- Length: 27.5 in. (698 mm)
- Height: 13.4 in. (340 mm)
- Width: 25.8 in. (656 mm)
- Weight: 47.5 lbs (21.55 Kg)

**Defrost Type:** Evacuation

**Drain Tubing Diameter:** 1/2 in. (12.7 mm)

**Flexible Duct (2):**

6 in. round for inlet and outlet. Flexible vinyl, compatible for connection to rigid or flexible ducting with sheet metal screws and/or tape.

**Cabinet:**

20 gauge galvanized steel powder-coat painted.

**Certification:**

HVI, QPS, SGSUSTC, ARI 1060, CSA 22.2 N° 113

**Conforms to UL Std. 1812.**

Install the unit according to National Electric Codes.

For more information call 1-800-468-1502 or visit our website at customer.honeywell.com.



**SPECIFICATION DATA**

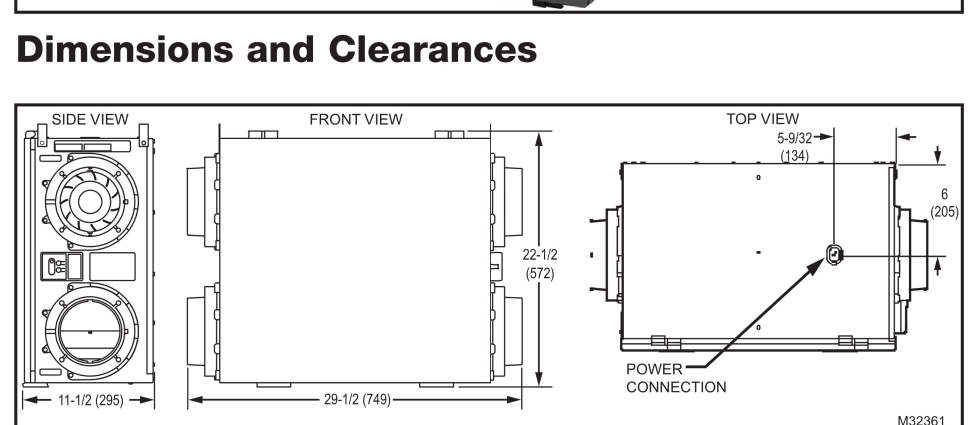


Fig. 1. Dimensions in in. (mm) and clearances.

The Honeywell Ventilation System provides improved indoor air quality through its high performance and efficiency.

**Features**

- 2 operating modes (Intermittent and Continuous Ventilation)
- Variable speed
- Compact installation
- Sloped drain pan
- Backward inclined motor blades
- Permanent lubrication of PSC motors
- Door opens downward
- No obstruction around the drain pan
- Simple electronic control
- Easy access to the control connection box
- Detachable 6 inch (dia.) collar system
- Proportional defrost
- Speed control balancing system
- Simplified mounting system
- Washable ERV core
- 10-year limited warranty on ventilation motors
- 5-year warranty



**Removable Duct Collars**

Spend less time on the ladder by easily connecting the duct-work to the collars away from the unit before it's hung, and then sliding the collars back into place once ducted.

**Intuitive Balancing**

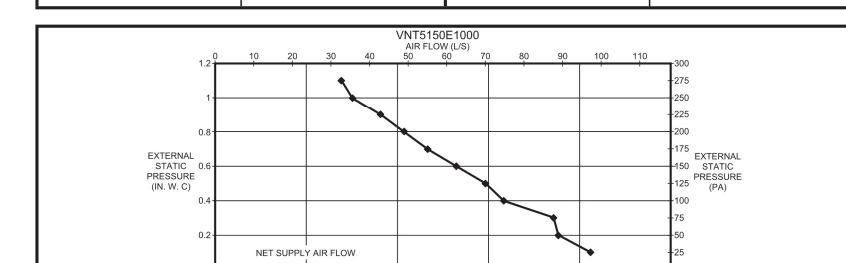
Two variable-speed motors — one for each air stream — work with the integrated speed control so installers can adjust the speed of each motor up and down to easily balance the system. This eliminates the need for adjusting dampers.

**Adjustable Hanging Straps**

Just like tightening or loosening straps on a backpack, these straps make it easy to raise, lower and level the unit into place

**Ventilation Performance VNT5150E**

| External Static Pressure | Net Supply Air Flow |         |     |
|--------------------------|---------------------|---------|-----|
|                          | Pa                  | in w.c. | L/s |
| 25                       | 0.1                 | 97      | 207 |
| 50                       | 0.2                 | 89      | 189 |
| 75                       | 0.3                 | 88      | 187 |
| 100                      | 0.4                 | 75      | 159 |
| 125                      | 0.5                 | 70      | 148 |
| 150                      | 0.6                 | 62      | 131 |
| 175                      | 0.7                 | 55      | 116 |
| 200                      | 0.8                 | 49      | 104 |
| 225                      | 0.9                 | 42      | 90  |
| 250                      | 1.0                 | 37      | 77  |
| 275                      | 1.1                 | 32      | 68  |



**Energy Performance VNT5150E**

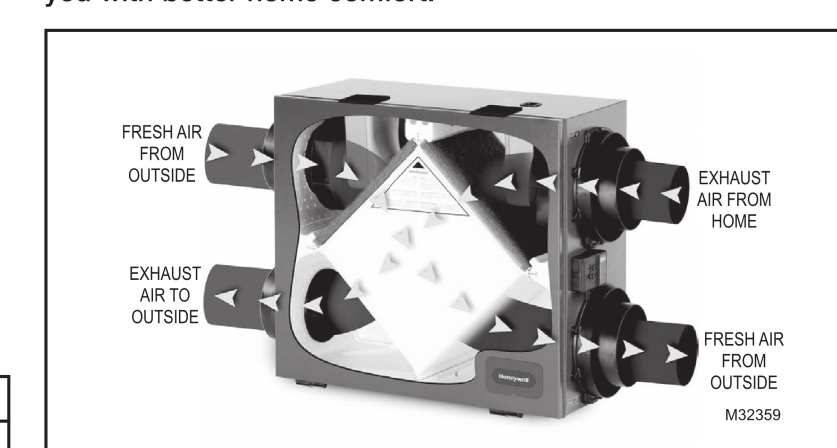
|         | Supply Temperature |    | Net Supply Air Flow |     | Average Power | Sensible Recovery               | Apparent Sensible |
|---------|--------------------|----|---------------------|-----|---------------|---------------------------------|-------------------|
|         | °C                 | °F | L/s                 | CFM | Watts         | Efficiency (%)                  | Effectiveness (%) |
| Heating | 0                  | 32 | 24                  | 51  | 58            | 65                              | 76                |
|         | 0                  | 32 | 38                  | 80  | 76            | 65                              | 73                |
|         | 0                  | 32 | 56                  | 118 | 96            | 62                              | 70                |
| Cooling | -15                | 5  | 26                  | 55  | 59            | 52                              | 78                |
|         | 35                 | 95 | 30                  | 64  | 66            | Total Recovery Efficiency = 34% |                   |

**Automation and Control Solutions**

Honeywell International Inc.  
 1985 Douglas Drive North  
 Golden Valley, MN 55422  
 http://customer.honeywell.com

**Push Through—Operation System**

Outside air is pushed through the heat exchanger, which acts as a noise reducer. This process is very silent and provides you with better home comfort.



**Proportional Defrost—Operation System**

The defrost speed is controlled by the outdoor air temperature. The motor speed essentially increases as outdoor temperature drops to provide increased defrost capability.

**WARNING:** Installation must be performed by a qualified service technician and must comply with local codes. Remove power to the device before installing or servicing the device. Failure to connect the device according to these instructions may result in damage to the device or the controls.

ESDENVER DBA  
 VERADYN ENGINEERING, LLC  
 441 WADSWORTH BLVD, SUITE 206  
 LAKEWOOD, CO 80226  
 720.612.7553  
 DUSTIN@ESDENVER.COM

Reviewed for Code Compliance

02/02/2022

**MATT EIDT**  
 345 Lincoln Ave., #205  
 Steamboat Springs, CO  
 80487

DRAWN BY: J.F.

CHECKED BY: D.R.

**REVISIONS:**

| No. | DESCRIPTION | DATE |
|-----|-------------|------|
|     |             |      |
|     |             |      |
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**ISSUE RECORD:**

| No. | DESCRIPTION | DATE |
|-----|-------------|------|
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SCALE:

SHEET CONTENTS:

PROJECT NO.: 9923  
 DATE: 10/19/2021

DRAWING NO.: **M2.1**



**Load Short Form**  
**ENTIRE HOUSE**

Job: 345 Lincoln Avenue # 205  
Date: September 10th, 2021

**Project Information**

For: Jake Friedrichs, Engineering Studio Denver  
1801 Wewatta Street 11th Floor, Denver, CO 80202  
Phone: 719-688-5616  
Email: jake@esdenver.com

**Design Information**

|                             | Htg | Cig | Method               | Infiltration | Simplified |
|-----------------------------|-----|-----|----------------------|--------------|------------|
| Outside db (°F)             | 5   | 87  | Construction quality |              | Tight      |
| Inside db (°F)              | 72  | 75  | Fireplaces           |              | 2 (Tight)  |
| Design TD (°F)              | 67  | 12  |                      |              |            |
| Daily range                 | -   | M   |                      |              |            |
| Inside humidity (%)         | 30  | 50  |                      |              |            |
| Moisture difference (gr/lb) | 35  | -26 |                      |              |            |

**HEATING EQUIPMENT**

Make n/a  
Trade n/a  
Model n/a  
AHRI ref n/a

Efficiency n/a  
Heating input 0 Btuh  
Heating output 0 °F  
Temperature rise 0 °F  
Actual air flow 0 cfm  
Air flow factor 0 cfm/Btuh  
Static pressure 0 in H2O  
Space thermostat n/a

**COOLING EQUIPMENT**

Make n/a  
Trade n/a  
Cond n/a  
Coil n/a  
AHRI ref n/a

Efficiency n/a  
Sensible cooling 0 Btuh  
Latent cooling 0 Btuh  
Total cooling 0 Btuh  
Actual air flow 0 cfm  
Air flow factor 0 cfm/Btuh  
Static pressure 0 in H2O  
Load sensible heat ratio 0

| ROOM NAME         | Area (ft²)  | Htg load (Btuh) | Cig load (Btuh) | Htg AVF (cfm) | Cig AVF (cfm) |
|-------------------|-------------|-----------------|-----------------|---------------|---------------|
| VAV 2             | 698         | 8126            | 3835            | 360           | 360           |
| EXISTING VAV      | 611         | 10684           | 7757            | 920           | 462           |
| VAV 1             | 717         | 12276           | 8875            | 1000          | 1000          |
| ENTIRE HOUSE      | 2025        | 31086           | 20466           | 2280          | 1822          |
| Other equip loads |             | 1016            | 1016            |               |               |
| Equip. @ 1.00 RSM |             | 21482           | 21482           |               |               |
| Latent cooling    |             | 9236            | 9236            |               |               |
| <b>TOTALS</b>     | <b>2025</b> | <b>37629</b>    | <b>30718</b>    | <b>2280</b>   | <b>1822</b>   |

Calculations approved by ACCA to meet all requirements of Manual J 8th Ed.

**Load Short Form**  
**VAV #1**

Job: 345 Lincoln Avenue # 205  
Date: September 10th, 2021

**Project Information**

For: Jake Friedrichs, Engineering Studio Denver  
1801 Wewatta Street 11th Floor, Denver, CO 80202  
Phone: 719-688-5616  
Email: jake@esdenver.com

**Design Information**

|                             | Htg | Cig | Method               | Infiltration | Simplified |
|-----------------------------|-----|-----|----------------------|--------------|------------|
| Outside db (°F)             | 5   | 87  | Construction quality |              | Tight      |
| Inside db (°F)              | 72  | 75  | Fireplaces           |              | 2 (Tight)  |
| Design TD (°F)              | 67  | 12  |                      |              |            |
| Daily range                 | -   | M   |                      |              |            |
| Inside humidity (%)         | 30  | 50  |                      |              |            |
| Moisture difference (gr/lb) | 35  | -26 |                      |              |            |

**HEATING EQUIPMENT**

Make n/a  
Trade n/a  
Model n/a  
AHRI ref n/a

Efficiency 100 AFUE  
Heating input 11437 Btuh  
Heating output 11437 Btuh  
Temperature rise 14 °F  
Actual air flow 920 cfm  
Air flow factor 0.086 cfm/Btuh  
Static pressure 0.58 in H2O  
Space thermostat

**COOLING EQUIPMENT**

Make n/a  
Trade n/a  
Cond n/a  
Coil n/a  
AHRI ref n/a

Efficiency 0 SEER  
Sensible cooling 0 Btuh  
Latent cooling 0 Btuh  
Total cooling 0 Btuh  
Actual air flow 462 cfm  
Air flow factor 0.060 cfm/Btuh  
Static pressure 0.58 in H2O  
Load sensible heat ratio 0.77

| ROOM NAME         | Area (ft²) | Htg load (Btuh) | Cig load (Btuh) | Htg AVF (cfm) | Cig AVF (cfm) |
|-------------------|------------|-----------------|-----------------|---------------|---------------|
| MASTER BEDROOM    | 210        | 4206            | 3808            | 362           | 227           |
| LIVING ROOM       | 280        | 5436            | 3771            | 468           | 225           |
| HIS               | 25         | 0               | 0               | 0             | 0             |
| HERS              | 24         | 0               | 0               | 0             | 0             |
| VANITY            | 29         | 563             | 93              | 48            | 6             |
| TOILET            | 44         | 479             | 84              | 41            | 5             |
| VAV #1            | 611        | 10684           | 7757            | 920           | 462           |
| Other equip loads |            | 2080            | 2080            |               |               |
| Equip. @ 1.00 RSM |            | 3430            | 3430            |               |               |
| Latent cooling    |            | 2935            | 2935            |               |               |
| <b>TOTALS</b>     | <b>611</b> | <b>14114</b>    | <b>12771</b>    | <b>920</b>    | <b>462</b>    |

Calculations approved by ACCA to meet all requirements of Manual J 8th Ed.

**Load Short Form**  
**VAV #2**

Job: 345 Lincoln Avenue # 205  
Date: September 10th, 2021

**Project Information**

For: Jake Friedrichs, Engineering Studio Denver  
1801 Wewatta Street 11th Floor, Denver, CO 80202  
Phone: 719-688-5616  
Email: jake@esdenver.com

**Design Information**

|                             | Htg | Cig | Method               | Infiltration | Simplified |
|-----------------------------|-----|-----|----------------------|--------------|------------|
| Outside db (°F)             | 5   | 87  | Construction quality |              | Tight      |
| Inside db (°F)              | 72  | 75  | Fireplaces           |              | 2 (Tight)  |
| Design TD (°F)              | 67  | 12  |                      |              |            |
| Daily range                 | -   | M   |                      |              |            |
| Inside humidity (%)         | 30  | 50  |                      |              |            |
| Moisture difference (gr/lb) | 35  | -26 |                      |              |            |

**HEATING EQUIPMENT**

Make n/a  
Trade n/a  
Model n/a  
AHRI ref n/a

Efficiency 80 AFUE  
Heating input 0 Btuh  
Heating output 0 Btuh  
Temperature rise 0 °F  
Actual air flow 1000 cfm  
Air flow factor 0.081 cfm/Btuh  
Static pressure 0.57 in H2O  
Space thermostat

**COOLING EQUIPMENT**

Make n/a  
Trade n/a  
Cond n/a  
Coil n/a  
AHRI ref n/a

Efficiency 0 SEER  
Sensible cooling 0 Btuh  
Latent cooling 0 Btuh  
Total cooling 0 Btuh  
Actual air flow 1000 cfm  
Air flow factor 0.113 cfm/Btuh  
Static pressure 0.57 in H2O  
Load sensible heat ratio 0.77

| ROOM NAME         | Area (ft²) | Htg load (Btuh) | Cig load (Btuh) | Htg AVF (cfm) | Cig AVF (cfm) |
|-------------------|------------|-----------------|-----------------|---------------|---------------|
| KITCHEN           | 284        | 4015            | 4459            | 327           | 502           |
| PANTRY            | 53         | 0               | 0               | 0             | 0             |
| POWDER            | 48         | 1979            | 344             | 161           | 39            |
| ENTRY             | 63         | 1891            | 491             | 154           | 55            |
| MUDROOM           | 73         | 1974            | 344             | 161           | 39            |
| DINING ROOM       | 196        | 2417            | 3237            | 197           | 365           |
| VAV #2            | 717        | 12276           | 8875            | 1000          | 1000          |
| Other equip loads |            | 3083            | 2031            |               |               |
| Equip. @ 1.00 RSM |            | 10906           | 10906           |               |               |
| Latent cooling    |            | 3179            | 3179            |               |               |
| <b>TOTALS</b>     | <b>717</b> | <b>15360</b>    | <b>14085</b>    | <b>1000</b>   | <b>1000</b>   |

Calculations approved by ACCA to meet all requirements of Manual J 8th Ed.

**Load Short Form**  
**VAV #3**

Job: 345 Lincoln Avenue # 205  
Date: September 10th, 2021

**Project Information**

For: Jake Friedrichs, Engineering Studio Denver  
1801 Wewatta Street 11th Floor, Denver, CO 80202  
Phone: 719-688-5616  
Email: jake@esdenver.com

**Design Information**

|                             | Htg | Cig | Method               | Infiltration | Simplified |
|-----------------------------|-----|-----|----------------------|--------------|------------|
| Outside db (°F)             | 5   | 87  | Construction quality |              | Tight      |
| Inside db (°F)              | 72  | 75  | Fireplaces           |              | 2 (Tight)  |
| Design TD (°F)              | 67  | 12  |                      |              |            |
| Daily range                 | -   | M   |                      |              |            |
| Inside humidity (%)         | 30  | 50  |                      |              |            |
| Moisture difference (gr/lb) | 35  | -26 |                      |              |            |

**HEATING EQUIPMENT**

Make n/a  
Trade n/a  
Model n/a  
AHRI ref n/a

Efficiency 80 AFUE  
Heating input 0 Btuh  
Heating output 0 Btuh  
Temperature rise 0 °F  
Actual air flow 360 cfm  
Air flow factor 0.044 cfm/Btuh  
Static pressure 0.57 in H2O  
Space thermostat

**COOLING EQUIPMENT**

Make n/a  
Trade n/a  
Cond n/a  
Coil n/a  
AHRI ref n/a

Efficiency 0 SEER  
Sensible cooling 0 Btuh  
Latent cooling 0 Btuh  
Total cooling 0 Btuh  
Actual air flow 360 cfm  
Air flow factor 0.094 cfm/Btuh  
Static pressure 0.57 in H2O  
Load sensible heat ratio 0.77

| ROOM NAME         | Area (ft²) | Htg load (Btuh) | Cig load (Btuh) | Htg AVF (cfm) | Cig AVF (cfm) |
|-------------------|------------|-----------------|-----------------|---------------|---------------|
| HALL              | 163        | 1767            | 544             | 78            | 51            |
| DEN               | 251        | 3432            | 1263            | 152           | 119           |
| OFFICE            | 145        | 657             | 683             | 29            | 64            |
| VANITY2           | 41         | 623             | 135             | 28            | 13            |
| TOILET2           | 44         | 266             | 65              | 12            | 6             |
| LAUNDRY           | 55         | 1381            | 1145            | 61            | 108           |
| VAV #3            | 698        | 8126            | 3835            | 360           | 360           |
| Other equip loads |            | 2959            | 2025            |               |               |
| Equip. @ 1.00 RSM |            | 5860            | 5860            |               |               |
| Latent cooling    |            | 1760            | 1760            |               |               |
| <b>TOTALS</b>     | <b>698</b> | <b>11084</b>    | <b>7620</b>     | <b>360</b>    | <b>360</b>    |

Calculations approved by ACCA to meet all requirements of Manual J 8th Ed.

Reviewed for Code Compliance  
02/02/2022

MATT EIDT  
345 Lincoln Ave., #205  
Steamboat Springs, CO  
80487

DRAWN BY: J.F.

CHECKED BY: D.R.

REVISIONS:

| No. | DESCRIPTION | DATE |
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ISSUE RECORD:

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SCALE:

SHEET CONTENTS:

PROJECT NO.: 9923

DATE: 10/19/2021

DRAWING NO.: M3.0



Reviewed for Code Compliance

02/02/2022

**MATT EIDT**  
345 Lincoln Ave., #205  
Steamboat Springs, CO  
80487

DRAWN BY: J.F.

CHECKED BY: D.R.

REVISIONS:

| No. | DESCRIPTION | DATE |
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ISSUE RECORD:

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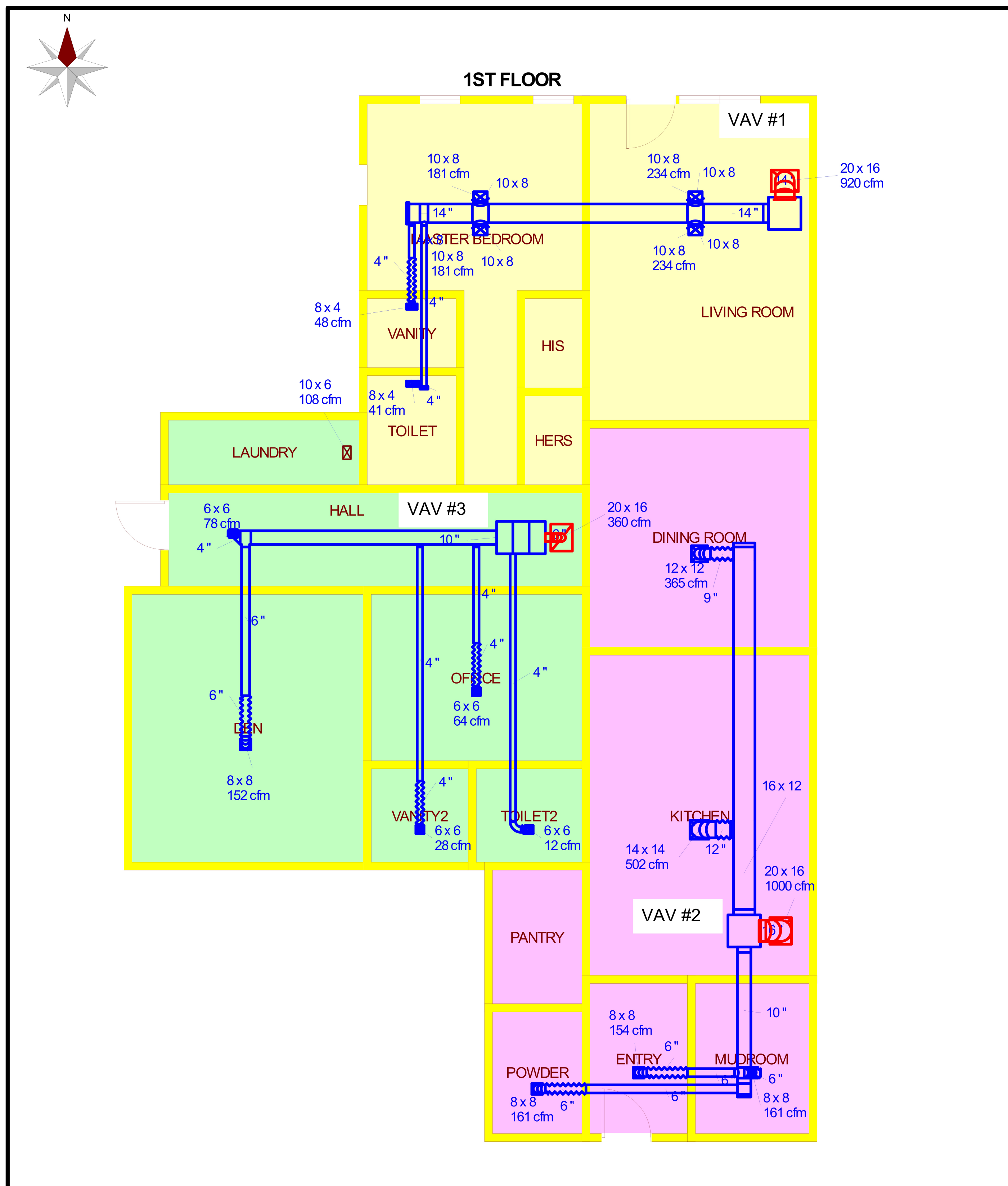
SHEET CONTENTS:

PROJECT NO.: 9923

DATE: 10/19/2021

DRAWING NO.:

**M3.1**



**Job #: 345 Lincoln Avenue # 205**

Jake Friederichs  
1801 Wewatta Street 11th Floor  
Denver, CO 80202  
Phone: 719-688-5616  
jake@esdenver.com

Scale: 1 : 93

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**Project Summary**  
**ENTIRE HOUSE**

Job: 345 Lincoln Avenue # 205  
Date: September 10th, 2021

**Project Information**

For: Jake Friedrichs, Engineering Studio Denver  
1801 Wewatta Street 11th Floor, Denver, CO 80202  
Phone: 719-688-5616  
Email: jake@esdenver.com  
Notes: 345 Lincoln Avenue # 205, Steamboat Springs, CO 80202

**Design Information**

Weather: Fort Collins Downtown, CO, US

Winter Design Conditions and Summer Design Conditions table with columns for Outside db, Inside db, Design TD, Daily range, Relative humidity, and Moisture difference.

**Heating Summary**

Heating Summary table with columns for Structure, Ducts, Central vent (91 cfm), Humidification, Piping, and Equipment load.

**Sensible Cooling Equipment Load Sizing**

Sensible Cooling Equipment Load Sizing table with columns for Structure, Ducts, Central vent (91 cfm), Blower, Use manufacturer's data, Rate/swing multiplier, and Equipment sensible load.

**Infiltration**

Infiltration table with columns for Method, Construction quality, and Fireplaces.

**Latent Cooling Equipment Load Sizing**

Latent Cooling Equipment Load Sizing table with columns for Structure, Ducts, Central vent (91 cfm), and Equipment latent load.

Heating and Cooling summary table with columns for Area (ft²), Volume (ft³), Air changes/hour, and Equiv. AVF (cfm).

**Heating Equipment Summary**

Heating Equipment Summary table with columns for Make, Trade, Model, AHRI ref, Efficiency, Heating input, Heating output, Temperature rise, Actual air flow, Air flow factor, Static pressure, and Space thermostat.

**Cooling Equipment Summary**

Cooling Equipment Summary table with columns for Make, Trade, Model, AHRI ref, Efficiency, Sensible cooling, Latent cooling, Total cooling, Actual air flow, Air flow factor, Static pressure, and Load sensible heat ratio.

Calculations approved by ACCA to meet all requirements of Manual J 8th Ed.

**Project Summary**  
**VAV #1**

Job: 345 Lincoln Avenue # 205  
Date: September 10th, 2021

**Project Information**

For: Jake Friedrichs, Engineering Studio Denver  
1801 Wewatta Street 11th Floor, Denver, CO 80202  
Phone: 719-688-5616  
Email: jake@esdenver.com  
Notes: 345 Lincoln Avenue # 205, Steamboat Springs, CO 80202

**Design Information**

Weather: Fort Collins Downtown, CO, US

Winter Design Conditions and Summer Design Conditions table with columns for Outside db, Inside db, Design TD, Daily range, Relative humidity, and Moisture difference.

**Heating Summary**

Heating Summary table with columns for Structure, Ducts, Central vent (33 cfm), Outside air, Humidification, Piping, and Equipment load.

**Sensible Cooling Equipment Load Sizing**

Sensible Cooling Equipment Load Sizing table with columns for Structure, Ducts, Central vent (33 cfm), Blower, Use manufacturer's data, Rate/swing multiplier, and Equipment sensible load.

**Infiltration**

Infiltration table with columns for Method, Construction quality, and Fireplaces.

**Latent Cooling Equipment Load Sizing**

Latent Cooling Equipment Load Sizing table with columns for Structure, Ducts, Central vent (33 cfm), and Equipment latent load.

Heating and Cooling summary table with columns for Area (ft²), Volume (ft³), Air changes/hour, and Equiv. AVF (cfm).

**Heating Equipment Summary**

Heating Equipment Summary table with columns for Make, Trade, Model, AHRI ref, Efficiency, Heating input, Heating output, Temperature rise, Actual air flow, Air flow factor, Static pressure, and Space thermostat.

**Cooling Equipment Summary**

Cooling Equipment Summary table with columns for Make, Trade, Model, AHRI ref, Efficiency, Sensible cooling, Latent cooling, Total cooling, Actual air flow, Air flow factor, Static pressure, and Load sensible heat ratio.

Calculations approved by ACCA to meet all requirements of Manual J 8th Ed.

**Project Summary**  
**VAV #2**

Job: 345 Lincoln Avenue # 205  
Date: September 10th, 2021

**Project Information**

For: Jake Friedrichs, Engineering Studio Denver  
1801 Wewatta Street 11th Floor, Denver, CO 80202  
Phone: 719-688-5616  
Email: jake@esdenver.com  
Notes: 345 Lincoln Avenue # 205, Steamboat Springs, CO 80202

**Design Information**

Weather: Fort Collins Downtown, CO, US

Winter Design Conditions and Summer Design Conditions table with columns for Outside db, Inside db, Design TD, Daily range, Relative humidity, and Moisture difference.

**Heating Summary**

Heating Summary table with columns for Structure, Ducts, Central vent (29 cfm), Outside air, Humidification, Piping, and Equipment load.

**Sensible Cooling Equipment Load Sizing**

Sensible Cooling Equipment Load Sizing table with columns for Structure, Ducts, Central vent (29 cfm), Outside air, Blower, Use manufacturer's data, Rate/swing multiplier, and Equipment sensible load.

**Infiltration**

Infiltration table with columns for Method, Construction quality, and Fireplaces.

**Latent Cooling Equipment Load Sizing**

Latent Cooling Equipment Load Sizing table with columns for Structure, Ducts, Central vent (29 cfm), and Equipment latent load.

Heating and Cooling summary table with columns for Area (ft²), Volume (ft³), Air changes/hour, and Equiv. AVF (cfm).

**Heating Equipment Summary**

Heating Equipment Summary table with columns for Make, Trade, Model, AHRI ref, Efficiency, Heating input, Heating output, Temperature rise, Actual air flow, Air flow factor, Static pressure, and Space thermostat.

**Cooling Equipment Summary**

Cooling Equipment Summary table with columns for Make, Trade, Model, AHRI ref, Efficiency, Sensible cooling, Latent cooling, Total cooling, Actual air flow, Air flow factor, Static pressure, and Load sensible heat ratio.

Calculations approved by ACCA to meet all requirements of Manual J 8th Ed.

**Project Summary**  
**VAV #3**

Job: 345 Lincoln Avenue # 205  
Date: September 10th, 2021

**Project Information**

For: Jake Friedrichs, Engineering Studio Denver  
1801 Wewatta Street 11th Floor, Denver, CO 80202  
Phone: 719-688-5616  
Email: jake@esdenver.com  
Notes: 345 Lincoln Avenue # 205, Steamboat Springs, CO 80202

**Design Information**

Weather: Fort Collins Downtown, CO, US

Winter Design Conditions and Summer Design Conditions table with columns for Outside db, Inside db, Design TD, Daily range, Relative humidity, and Moisture difference.

**Heating Summary**

Heating Summary table with columns for Structure, Ducts, Central vent (28 cfm), Outside air, Humidification, Piping, and Equipment load.

**Sensible Cooling Equipment Load Sizing**

Sensible Cooling Equipment Load Sizing table with columns for Structure, Ducts, Central vent (28 cfm), Outside air, Blower, Use manufacturer's data, Rate/swing multiplier, and Equipment sensible load.

**Infiltration**

Infiltration table with columns for Method, Construction quality, and Fireplaces.

**Latent Cooling Equipment Load Sizing**

Latent Cooling Equipment Load Sizing table with columns for Structure, Ducts, Central vent (28 cfm), and Equipment latent load.

Heating and Cooling summary table with columns for Area (ft²), Volume (ft³), Air changes/hour, and Equiv. AVF (cfm).

**Heating Equipment Summary**

Heating Equipment Summary table with columns for Make, Trade, Model, AHRI ref, Efficiency, Heating input, Heating output, Temperature rise, Actual air flow, Air flow factor, Static pressure, and Space thermostat.

**Cooling Equipment Summary**

Cooling Equipment Summary table with columns for Make, Trade, Model, AHRI ref, Efficiency, Sensible cooling, Latent cooling, Total cooling, Actual air flow, Air flow factor, Static pressure, and Load sensible heat ratio.

Calculations approved by ACCA to meet all requirements of Manual J 8th Ed.

Reviewed for Code Compliance

02/02/2022

MATT EIDT  
345 Lincoln Ave., #205  
Steamboat Springs, CO  
80487

DRAWN BY: J.F.

CHECKED BY: D.R.

REVISIONS:

Table with columns: No., DESCRIPTION, DATE. Contains three empty rows.

ISSUE RECORD:

Table with columns: No., DESCRIPTION, DATE. Contains three empty rows.

SCALE:

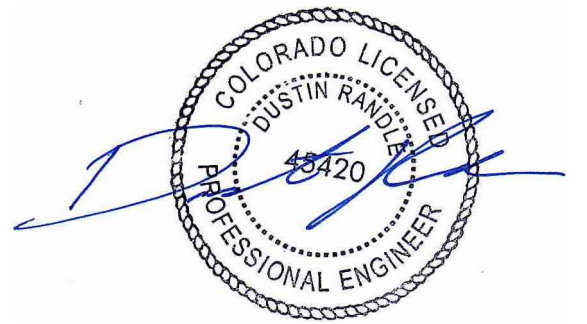
SHEET CONTENTS:

PROJECT NO.: 9923

DATE: 10/19/2021

DRAWING NO.:

M3.2





Reviewed for Code Compliance  
 02/02/2022

**Duct System Summary**  
 VAV #1

Job: 345 Lincoln Avenue # 205  
 Date: September 10th, 2021

**Duct System Summary**  
 VAV #2

Job: 345 Lincoln Avenue # 205  
 Date: September 10th, 2021

**Duct System Summary**  
 VAV #3

Job: 345 Lincoln Avenue # 205  
 Date: September 10th, 2021

**Project Information**

For: Jake Friedrichs, Engineering Studio Denver  
 1801 Wewatta Street 11th Floor, Denver, CO 80202  
 Phone: 719-688-5616  
 Email: jake@esdenver.com

|                                    | Heating              | Cooling              |
|------------------------------------|----------------------|----------------------|
| External static pressure           | 0.58 in H2O          | 0.58 in H2O          |
| Pressure losses                    | 0.23 in H2O          | 0 in H2O             |
| Available static pressure          | 0.35 in H2O          | 0.58 in H2O          |
| Supply / return available pressure | 0.300 / 0.050 in H2O | 0.497 / 0.083 in H2O |
| Lowest friction rate               | 0.082 in/100ft       | 0.135 in/100ft       |
| Actual air flow                    | 920 cfm              | 462 cfm              |
| Total effective length (TEL)       | 429 ft               |                      |

**Supply Branch Detail Table**

| Name             | Design (Btuh) | Htg (cfm) | Clg (cfm) | Design FR | Diam (in) | H x W (in) | Duct Matl | Actual Ln (ft) | Flg.Eqv Ln (ft) | Trunk |
|------------------|---------------|-----------|-----------|-----------|-----------|------------|-----------|----------------|-----------------|-------|
| LIVING ROOM      | h 2718        | 234       | 112       | 0.181     | 7.0       | 8x 10      | VIFx      | 5.5            | 160.0           | st5   |
| LIVING ROOM-A    | h 2718        | 234       | 112       | 0.181     | 7.6       | 8x 10      | VIFx      | 5.5            | 160.0           | st5   |
| MASTER BEDROOM   | h 2103        | 181       | 113       | 0.128     | 10.0      | 8x 10      | VIFx      | 18.8           | 215.0           | st5   |
| MASTER BEDROOM-A | h 2103        | 181       | 113       | 0.128     | 7.0       | 8x 10      | VIFx      | 18.8           | 215.0           | st5   |
| TOILETA          | h 479         | 41        | 5         | 0.082     | 4.0       | 0x 0       | VIFx      | 32.5           | 335.0           | st11  |
| VANITY-A         | h 563         | 48        | 6         | 0.121     | 4.0       | 0x 0       | VIFx      | 27.8           | 220.0           | st13  |

**Supply Trunk Detail Table**

| Name | Trunk Type | Htg (cfm) | Clg (cfm) | Design FR | Veloc (fpm) | Diam (in) | H x W (in) | Duct Material | Trunk |
|------|------------|-----------|-----------|-----------|-------------|-----------|------------|---------------|-------|
| st11 | PeakAVF    | 41        | 5         | 0.082     | 473         | 4.0       | 0 x 0      | ShtMetl       | st5   |
| st5  | PeakAVF    | 920       | 462       | 0.082     | 861         | 14.0      | 0 x 0      | ShtMetl       |       |
| st13 | PeakAVF    | 48        | 6         | 0.121     | 218         | 4.3       | 8 x 4      | ShtMetl       | st12  |
| st12 | PeakAVF    | 48        | 6         | 0.121     | 45          | 14.0      | 0 x 0      | ShtMetl       | st5   |

**Return Branch Detail Table**

| Name | Grille Size (in) | Htg (cfm) | Clg (cfm) | TEL (ft) | Design FR | Veloc (fpm) | Diam (in) | H x W (in) | Stud/Joist Opening (in) | Duct Matl | Trunk |
|------|------------------|-----------|-----------|----------|-----------|-------------|-----------|------------|-------------------------|-----------|-------|
| rb1  | 0x 0             | 920       | 462       | 61.0     | 0.082     | 861         | 14.0      | 0x 0       |                         | VIFx      |       |

**Project Information**

For: Jake Friedrichs, Engineering Studio Denver  
 1801 Wewatta Street 11th Floor, Denver, CO 80202  
 Phone: 719-688-5616  
 Email: jake@esdenver.com

|                                    | Heating              | Cooling              |
|------------------------------------|----------------------|----------------------|
| External static pressure           | 0.57 in H2O          | 0.57 in H2O          |
| Pressure losses                    | 0.23 in H2O          | 0.23 in H2O          |
| Available static pressure          | 0.34 in H2O          | 0.34 in H2O          |
| Supply / return available pressure | 0.251 / 0.089 in H2O | 0.251 / 0.089 in H2O |
| Lowest friction rate               | 0.146 in/100ft       | 0.146 in/100ft       |
| Actual air flow                    | 1000 cfm             | 1000 cfm             |
| Total effective length (TEL)       | 233 ft               |                      |

**Supply Branch Detail Table**

| Name        | Design (Btuh) | Htg (cfm) | Clg (cfm) | Design FR | Diam (in) | H x W (in) | Duct Matl | Actual Ln (ft) | Flg.Eqv Ln (ft) | Trunk |
|-------------|---------------|-----------|-----------|-----------|-----------|------------|-----------|----------------|-----------------|-------|
| DINING ROOM | c 3237        | 197       | 365       | 0.193     | 9.0       | 0x 0       | VIFx      | 25.0           | 105.0           | st1   |
| ENTRY       | h 1891        | 154       | 55        | 0.162     | 6.0       | 0x 0       | VIFx      | 14.3           | 140.0           | st6   |
| KITCHEN     | c 4459        | 327       | 502       | 0.169     | 12.0      | 0x 0       | VIFx      | 8.0            | 140.0           | st1   |
| MUDROOM     | h 1974        | 161       | 39        | 0.169     | 6.0       | 0x 0       | VIFx      | 8.3            | 140.0           | st2   |
| POWDER      | h 1979        | 161       | 39        | 0.146     | 6.0       | 0x 0       | VIFx      | 21.5           | 150.0           | st7   |

**Supply Trunk Detail Table**

| Name | Trunk Type | Htg (cfm) | Clg (cfm) | Design FR | Veloc (fpm) | Diam (in) | H x W (in) | Duct Material | Trunk |
|------|------------|-----------|-----------|-----------|-------------|-----------|------------|---------------|-------|
| st1  | PeakAVF    | 524       | 867       | 0.169     | 650         | 7.6       | 12 x 16    | ShtMetl       |       |
| st6  | PeakAVF    | 154       | 55        | 0.162     | 785         | 6.0       | 0 x 0      | ShtMetl       | st2   |
| st2  | PeakAVF    | 476       | 133       | 0.146     | 873         | 10.0      | 0 x 0      | ShtMetl       |       |
| st7  | PeakAVF    | 161       | 39        | 0.146     | 821         | 6.0       | 0 x 0      | ShtMetl       | st2   |

**Return Branch Detail Table**

| Name | Grille Size (in) | Htg (cfm) | Clg (cfm) | TEL (ft) | Design FR | Veloc (fpm) | Diam (in) | H x W (in) | Stud/Joist Opening (in) | Duct Matl | Trunk |
|------|------------------|-----------|-----------|----------|-----------|-------------|-----------|------------|-------------------------|-----------|-------|
| rb3  | 0x 0             | 1000      | 1000      | 61.3     | 0.146     | 716         | 16.0      | 0x 0       |                         | VIFx      |       |

**Project Information**

For: Jake Friedrichs, Engineering Studio Denver  
 1801 Wewatta Street 11th Floor, Denver, CO 80202  
 Phone: 719-688-5616  
 Email: jake@esdenver.com

|                                    | Heating              | Cooling              |
|------------------------------------|----------------------|----------------------|
| External static pressure           | 0.57 in H2O          | 0.57 in H2O          |
| Pressure losses                    | 0.23 in H2O          | 0.23 in H2O          |
| Available static pressure          | 0.34 in H2O          | 0.34 in H2O          |
| Supply / return available pressure | 0.257 / 0.083 in H2O | 0.257 / 0.083 in H2O |
| Lowest friction rate               | 0.136 in/100ft       | 0.136 in/100ft       |
| Actual air flow                    | 360 cfm              | 360 cfm              |
| Total effective length (TEL)       | 250 ft               |                      |

**Supply Branch Detail Table**

| Name    | Design (Btuh) | Htg (cfm) | Clg (cfm) | Design FR | Diam (in) | H x W (in) | Duct Matl | Actual Ln (ft) | Flg.Eqv Ln (ft) | Trunk |
|---------|---------------|-----------|-----------|-----------|-----------|------------|-----------|----------------|-----------------|-------|
| DEN     | h 3432        | 152       | 119       | 0.136     | 6.0       | 0x 0       | VIFx      | 29.3           | 160.0           | st10  |
| HALL    | h 1767        | 78        | 51        | 0.145     | 4.0       | 0x 0       | VIFx      | 17.3           | 160.0           | st4   |
| LAUNDRY | c 1145        | 61        | 108       | 0         | 0         | 0x 0       | ShMt      | 0              | 0               |       |
| OFFICE  | c 683         | 29        | 64        | 0.241     | 4.0       | 0x 0       | VIFx      | 11.8           | 95.0            | st8   |
| TOILET2 | h 266         | 12        | 6         | 0.207     | 4.0       | 0x 0       | VIFx      | 19.0           | 105.0           |       |
| VANITY2 | h 623         | 28        | 13        | 0.217     | 4.0       | 0x 0       | VIFx      | 23.8           | 95.0            | st9   |

**Supply Trunk Detail Table**

| Name | Trunk Type | Htg (cfm) | Clg (cfm) | Design FR | Veloc (fpm) | Diam (in) | H x W (in) | Duct Material | Trunk |
|------|------------|-----------|-----------|-----------|-------------|-----------|------------|---------------|-------|
| st10 | PeakAVF    | 152       | 119       | 0.136     | 774         | 6.0       | 0 x 0      | ShtMetl       | st4   |
| st6  | PeakAVF    | 29        | 64        | 0.241     | 735         | 4.0       | 0 x 0      | ShtMetl       | st4   |
| st9  | PeakAVF    | 28        | 13        | 0.217     | 316         | 4.0       | 0 x 0      | ShtMetl       | st4   |
| st4  | PeakAVF    | 287       | 246       | 0.136     | 526         | 10.0      | 0 x 0      | ShtMetl       |       |

**Return Branch Detail Table**

| Name | Grille Size (in) | Htg (cfm) | Clg (cfm) | TEL (ft) | Design FR | Veloc (fpm) | Diam (in) | H x W (in) | Stud/Joist Opening (in) | Duct Matl | Trunk |
|------|------------------|-----------|-----------|----------|-----------|-------------|-----------|------------|-------------------------|-----------|-------|
| rb2  | 0x 0             | 360       | 360       | 61.0     | 0.136     | 1833        | 6.0       | 0x 0       |                         | ShMt      |       |

**MATT EIDT**  
 345 Lincoln Ave., #205  
 Steamboat Springs, CO  
 80487

DRAWN BY: J.F.  
 CHECKED BY: D.R.

REVISIONS:

| No. | DESCRIPTION | DATE |
|-----|-------------|------|
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ISSUE RECORD:

| No. | DESCRIPTION | DATE |
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SCALE:

SHEET CONTENTS:

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|--------------|-------------|
| PROJECT NO.: | 9923        |
| DATE:        | 10/19/2021  |
| DRAWING NO.: | <b>M3.3</b> |

