

ASHRAE 62.89 CALCULATIONS
 BASED ON ACTUAL SEATING

| | |
|------------------------------|-----------------|
| AREA | PEOPLE |
| BAR | 28 |
| DINING | 164 |
| TOTAL | 192 |
| OUTSIDE AIR PER ASHRAE 62.89 | |
| BAR | 50 CFM / PERSON |
| DINING | 20 CFM / PERSON |
| TOTAL | 28 * 30 = 840 |
| | 164 * 20 = 3280 |
| | 4120 CFM |

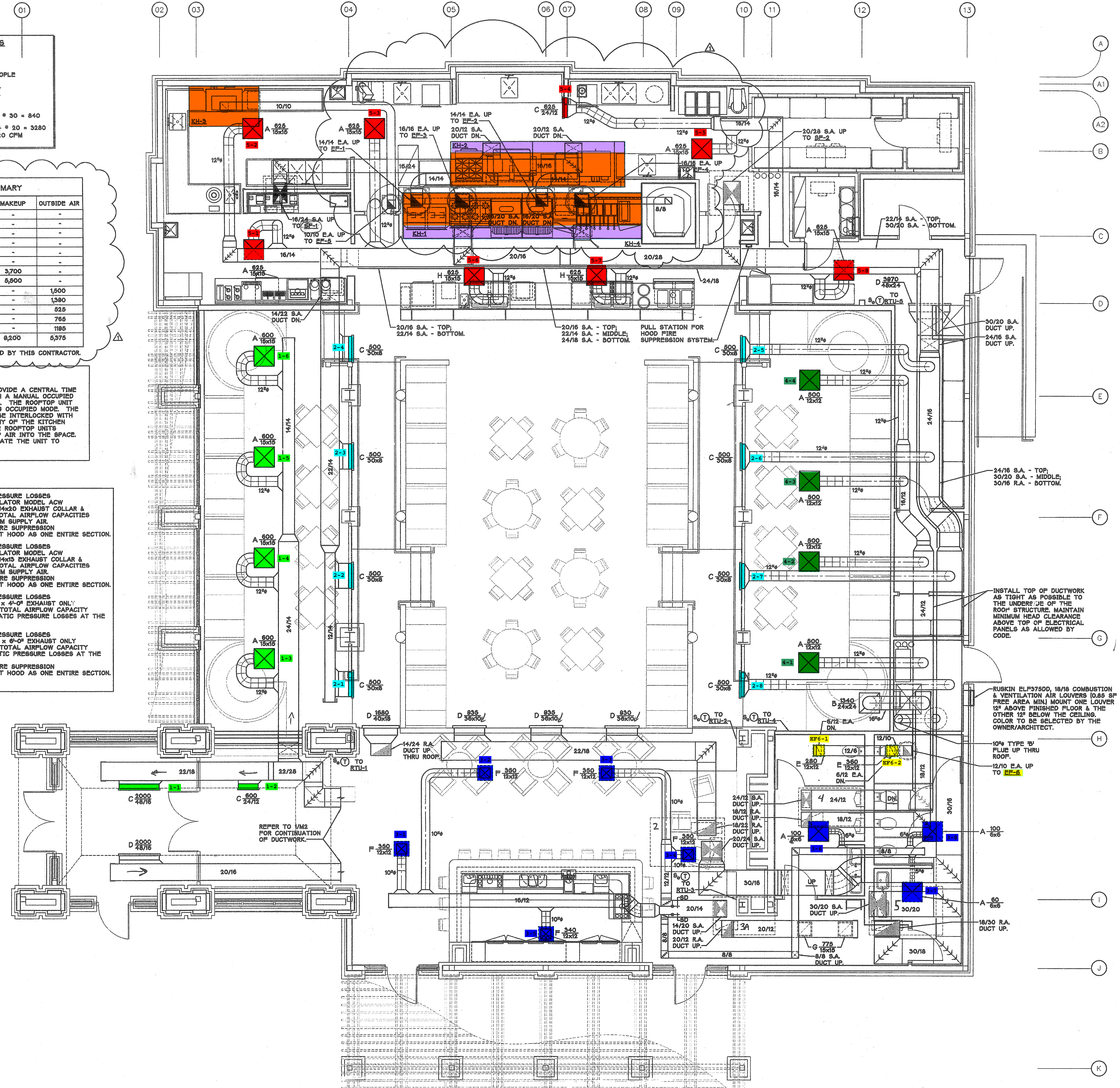
AIR BALANCE SUMMARY

| UNIT | EXHAUST | MAKEUP | OUTSIDE AIR |
|--------|---------|--------|-------------|
| EF-1 | 2,400 | - | - |
| EF-2 | 2,400 | - | - |
| EF-3 | 3,600 | - | - |
| EF-4 | 4,380 | - | - |
| EF-5 | 1,000 | - | - |
| EF-6 | 640 | - | - |
| SF-1 | - | 3,700 | - |
| SF-2 | - | 5,600 | - |
| RTU-1 | - | - | 1,500 |
| RTU-2 | - | - | 1,380 |
| RTU-3 | - | - | 525 |
| RTU-4 | - | - | 765 |
| RTU-5 | - | - | 1185 |
| TOTALS | 14,980 | 9,200 | 5,375 |

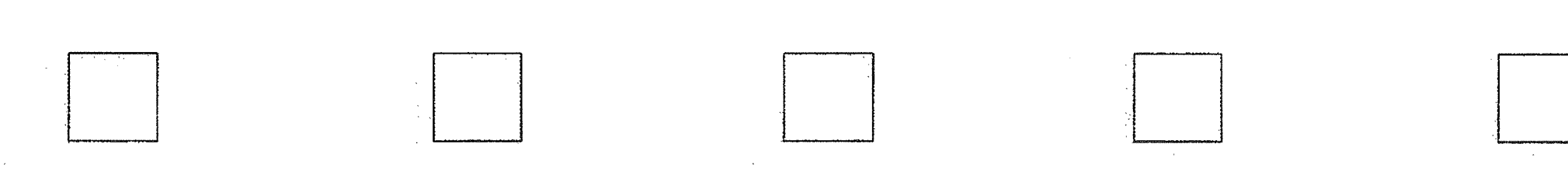
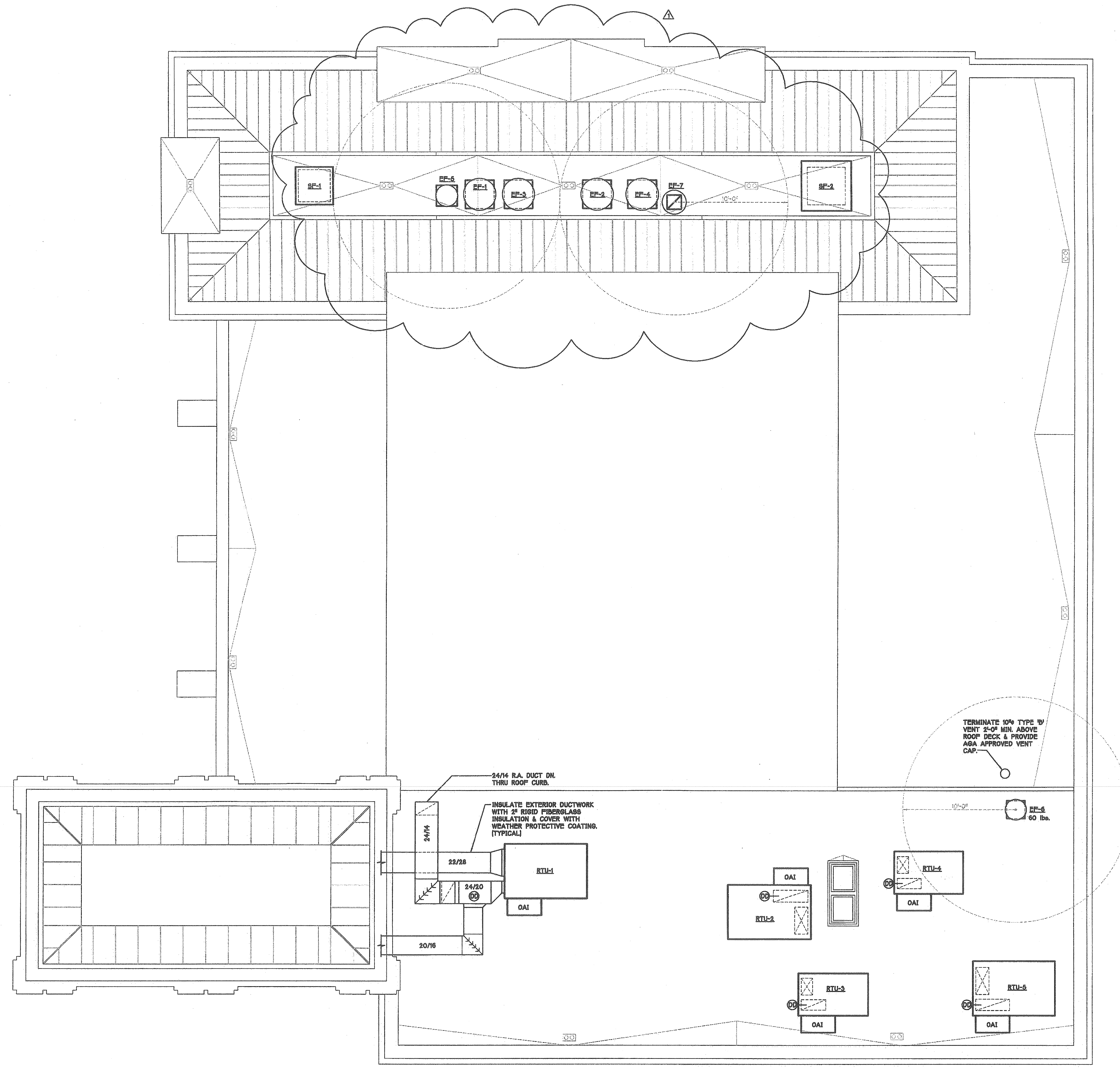
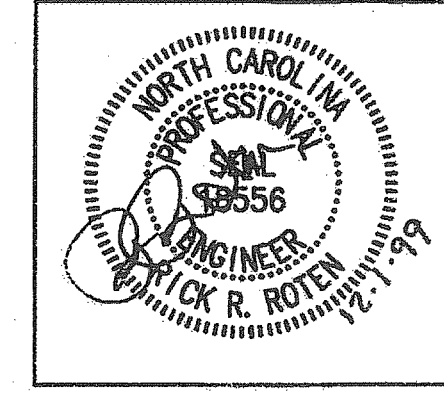
** HOODS WILL BE PROVIDED & INSTALLED BY THIS CONTRACTOR.

CONTROL NOTES:
 THE CONTROLS CONTRACTOR SHALL PROVIDE A CENTRAL TIME CLOCK IN THE MANAGERS OFFICE WITH A MANUAL OCCUPIED SWITCH TO START THE ROOFTOP UNITS. THE ROOFTOP UNIT FANS SHALL RUN CONTINUOUSLY DURING OCCUPIED MODE. THE KITCHEN HOOD EXHAUST FANS SHALL BE INTERLOCKED WITH THEIR RESPECTIVE SUPPLY FAN. IF ANY OF THE KITCHEN HOOD SYSTEMS IS OPERATING, ALL THE ROOFTOP UNITS SHALL OPERATE TO INTRODUCE MAKEUP AIR INTO THE SPACE. THE SPACE THERMOSTAT SHALL MODULATE THE UNIT TO MAINTAIN SETPOINT.

- KH-1** KITCHEN HOOD AIR VOLUMES & STATIC PRESSURE LOSSES BASED ON (2) 11'-0" x 4'-0" SECTIONS, AEROLATOR MODEL ACW SELF-COMPENSATING WALL HOOD WITH (1) 14x20 EXHAUST COLLAR & (1) 12x20 SUPPLY COLLAR EACH SECTION. TOTAL AIRFLOW CAPACITIES SHALL BE 7200 CFM EXHAUST & 5400 CFM SUPPLY AIR. PROVIDE COMPLETE ANSUL R-102 LIQUID FIRE SUPPRESSION SYSTEM & CONTROLS TO OPERATE EXHAUST HOOD AS ONE ENTIRE SECTION.
- KH-2** KITCHEN HOOD AIR VOLUMES & STATIC PRESSURE LOSSES BASED ON (2) 9'-0" x 4'-0" SECTIONS, AEROLATOR MODEL ACW SELF-COMPENSATING WALL HOOD WITH (1) 14x20 EXHAUST COLLAR & (1) 12x20 SUPPLY COLLAR EACH SECTION. TOTAL AIRFLOW CAPACITIES SHALL BE 4800 CFM EXHAUST & 3600 CFM SUPPLY AIR. PROVIDE COMPLETE ANSUL R-102 LIQUID FIRE SUPPRESSION SYSTEM & CONTROLS TO OPERATE EXHAUST HOOD AS ONE ENTIRE SECTION.
- KH-3** KITCHEN HOOD AIR VOLUMES & STATIC PRESSURE LOSSES BASED ON A AEROLATOR MODEL ADH 7'-0" x 4'-0" EXHAUST ONLY WALL HOOD WITH 10x10 EXHAUST COLLAR. TOTAL AIRFLOW CAPACITY SHALL BE 1000 CFM EXHAUST. DESIGN STATIC PRESSURE LOSSES AT THE EXHAUST COLLAR WERE BASED ON 25". PROVIDE COMPLETE ANSUL R-102 LIQUID FIRE SUPPRESSION SYSTEM & CONTROLS TO OPERATE EXHAUST HOOD AS ONE ENTIRE SECTION.
- KH-4** KITCHEN HOOD AIR VOLUMES & STATIC PRESSURE LOSSES BASED ON A AEROLATOR MODEL ASW 5'-0" x 8'-0" EXHAUST ONLY WALL HOOD WITH 10x10 EXHAUST COLLAR. TOTAL AIRFLOW CAPACITY SHALL BE 780 CFM EXHAUST. DESIGN STATIC PRESSURE LOSSES AT THE EXHAUST COLLAR WERE BASED ON 25". PROVIDE COMPLETE ANSUL R-102 LIQUID FIRE SUPPRESSION SYSTEM & CONTROLS TO OPERATE EXHAUST HOOD AS ONE ENTIRE SECTION.



1 MECHANICAL FLOOR PLAN - HVAC
 M1 SCALE: 1/4" = 1'-0"



1 MECHANICAL ROOF PLAN - HVAC
 M2 SCALE: 1/4" = 1'-0"

| GAS FIRED ROOFTOP UNIT SCHEDULE | | | | | | | | | | | | | | |
|---------------------------------|------------------|----------|------|--------|------|------------------|-----------|------------------|------------|-----------------|------|----------|-----------|---------|
| MARK | MANF. & MODEL | FAN DATA | | | | COOLING CAPACITY | | HEATING CAPACITY | | ELECTRICAL DATA | | | WEIGHT | NOTES |
| | | CFM | O.A. | E.S.P. | FLA | TOTAL MBH | SENS. MBH | INPUT MBH | OUTPUT MBH | VOLT/PH | MCA | MAX FUSE | | |
| RTU-1 | CARRIER 48TJD014 | 5000 | 1500 | 0.60" | 10.6 | 155.7 | 117.3 | 224 | 178.2 | 208V/3ø | 63.6 | 70 | 1250 LBS. | 1,2,3,4 |
| RTU-2 | CARRIER 48TJE012 | 4000 | 1380 | 0.60" | 5.8 | 118.8 | 89.8 | 224 | 178.2 | 208V/3ø | 48.8 | 60 | 1200 LBS. | 1,2,3,4 |
| RTU-3 | CARRIER 48TJE006 | 2000 | 525 | 0.60" | 5.8 | 60.8 | 45.3 | 115 | 82 | 208V/3ø | 28.4 | 35 | 600 LBS. | 1,2,3,4 |
| RTU-4 | CARRIER 48TJE006 | 2000 | 785 | 0.60" | 5.8 | 60.8 | 45.3 | 115 | 82 | 208V/3ø | 28.4 | 35 | 600 LBS. | 1,2,3,4 |
| RTU-5 | CARRIER 48TJD014 | 5000 | 1195 | 0.60" | 10.6 | 155.7 | 117.3 | 224 | 178.2 | 208V/3ø | 63.6 | 70 | 1250 LBS. | 1,2,3,4 |

- NOTES:**
- COOLING CAPACITIES ARE RATED IN ACCORDANCE WITH ARI STANDARD 210/290 AT 85° AMBIENT OUTDOOR AIR TEMP, 80° DRY BULB, 67 WET BULB ENTRANCE AIR TEMP, AND NOMINAL AIR QUANTITY LISTED.
 - PROVIDE A 7-DAY, AUTOMATIC CHANGEVER HEAT/COOL PROGRAMMABLE THERMOSTAT AND EMERGENCY SHUT DOWN SWITCH.
 - PROVIDE NEW FILTERS FOR EACH UNIT.
 - ACCEPTABLE MANUFACTURERS: CARRIER, TRANE & YORK.

| AIR DISTRIBUTION SCHEDULE | | | | | | | | | | | |
|---------------------------|------------------------|------------|-------------------|-----------------|--------|----------|---------|-----------|---------|---------|-------|
| MARK | MANUFACTURER & MODEL # | FRAME TYPE | FACE TYPE | PATTERN | DAMPER | MATERIAL | SERVICE | FINISH | MAX. PD | MAX. NC | NOTES |
| A | METAL-AIRE 5500-65 | A.C.T. | LOUVER | 4-WAY | NO | ALUMN. | SUPPLY | OFF-WHITE | 0.10" | <30 | 1,2,3 |
| B | METAL-AIRE 7000R-6 | A.C.T. | PERFORATED | NA | NO | ALUMN. | RETURN | OFF-WHITE | 0.10" | <30 | 1,2,3 |
| C | METAL-AIRE V4004D | SURFACE | VERTICAL BLADES | DOUBLE DEFLECT. | YES | ALUMN. | SUPPLY | OFF-WHITE | 0.10" | <30 | 1,5 |
| D | METAL-AIRE RHD | SURFACE | HORIZONTAL BLADES | NA | YES | ALUMN. | RETURN | OFF-WHITE | 0.10" | <30 | 1,5 |
| E | METAL-AIRE CCID | SURFACE | EGG CRATE | NA | YES | ALUMN. | EXHAUST | OFF-WHITE | 0.10" | <30 | 1,5 |
| F | METAL-AIRE 6500-15 | SURFACE | LOUVER | 4-WAY | YES | ALUMN. | SUPPLY | OFF-WHITE | 0.10" | <30 | 1,2,3 |
| G | METAL-AIRE 7000R-1 | SURFACE | PERFORATED | NA | YES | ALUMN. | RETURN | OFF-WHITE | 0.10" | <30 | 1,2,3 |
| H | METAL-AIRE 5500-65 | A.C.T. | LOUVER | 2-WAY | NO | ALUMN. | SUPPLY | OFF-WHITE | 0.10" | <30 | 1,2,3 |

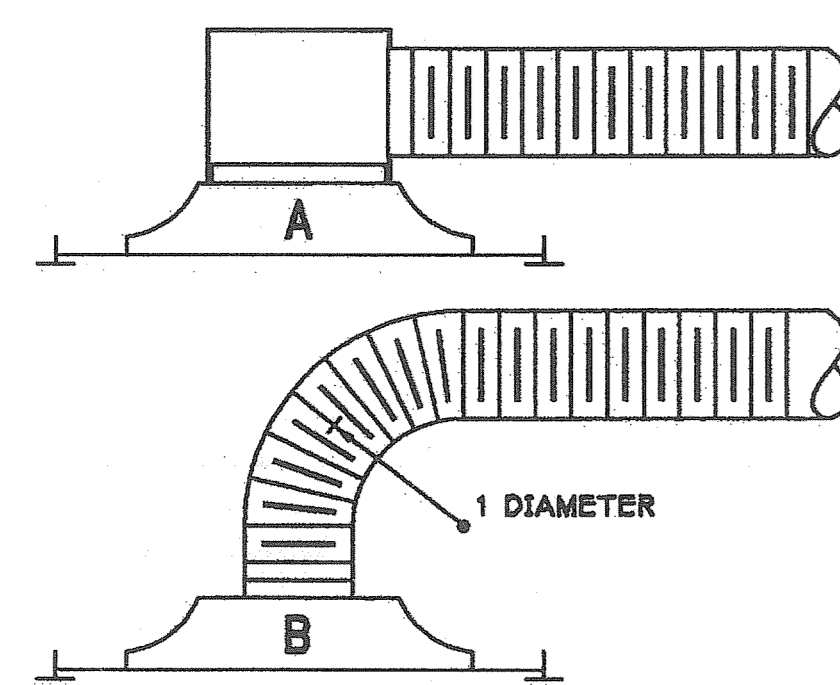
- NOTES:**
- DIFFUSER DESIGNATIONS ON PLANS AS FOLLOWS:
- DIFFUSER TYPE AS NOTED ABOVE

A CFM

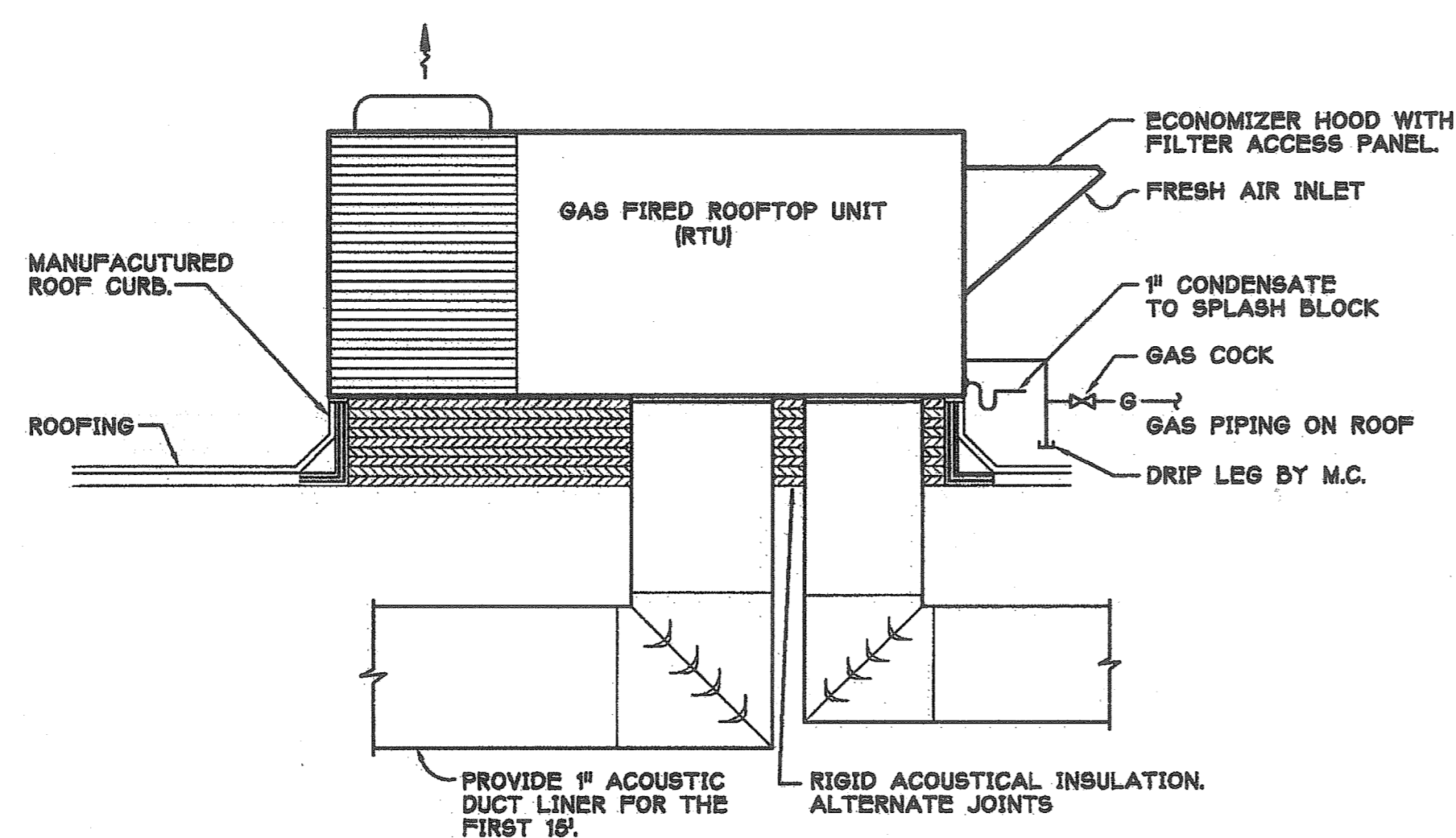
DIFFUSER OR NECK SIZE
- PROVIDE SQUARE TO ROUND TRANSITION MODEL TR.
 - ACCEPTABLE MANUFACTURERS: CARNES, TUTTLE & BAILEY, PRICE & TITUS. (NO SUBSTITUTIONS)

| EXHAUST FAN SCHEDULE | | | | | | | | | | |
|----------------------|----------------------|------|-------|----------------------------|----------|-------|------------|------------|---------|--------------|
| MARK | MANUFACTURER & MODEL | CFM | S.P. | FAN TYPE | MOUNTING | DRIVE | MAX. SONES | MOTOR DATA | | NOTES |
| | | | | | | | | HP | VOLT/PH | |
| EF-1 | GREENHECK CUBE-180HP | 2400 | 1.0" | CENTRIFUGAL UP-BLAST | ROOF TOP | BELT | 13.2 | 3/4 | 208V/3ø | 2,3,5,6,8 |
| EF-2 | GREENHECK CUBE-180HP | 2400 | 1.0" | CENTRIFUGAL UP-BLAST | ROOF TOP | BELT | 13.2 | 3/4 | 208V/3ø | 2,3,5,6,8 |
| EF-3 | GREENHECK CUBE-180HP | 3600 | 1.0" | CENTRIFUGAL UP-BLAST | ROOF TOP | BELT | 22.0 | 1-1/2 | 208V/3ø | 2,3,5,6,7 |
| EF-4 | GREENHECK CUBE-200HP | 4950 | 1.0" | CENTRIFUGAL UP-BLAST | ROOF TOP | BELT | 22.0 | 1-1/2 | 208V/3ø | 2,3,5,6,7 |
| EF-5 | GREENHECK CUBE-100 | 1000 | 0.6" | CENTRIFUGAL UP-BLAST | ROOF TOP | BELT | 8.5 | 1/4 | 208V/1ø | 1,2,3,6,8 |
| EF-6 | GREENHECK GB-80 | 640 | 0.25" | CENTRIFUGAL ROOF-EXHAUSTER | ROOF TOP | BELT | 8.6 | 1/4 | 208V/1ø | 1,2,3,4,6 |
| EF-1 | GREENHECK RSFP-120 | 3700 | 0.75" | FILTERED ROOF-SUPPLY | ROOF TOP | BELT | - | 1-1/2 | 120V/3ø | 1,2,3,6,8,10 |
| EF-2 | GREENHECK RSFP-150 | 5500 | 0.75" | FILTERED ROOF-SUPPLY | ROOF TOP | BELT | - | 3 | 120V/3ø | 1,2,3,6,7,10 |

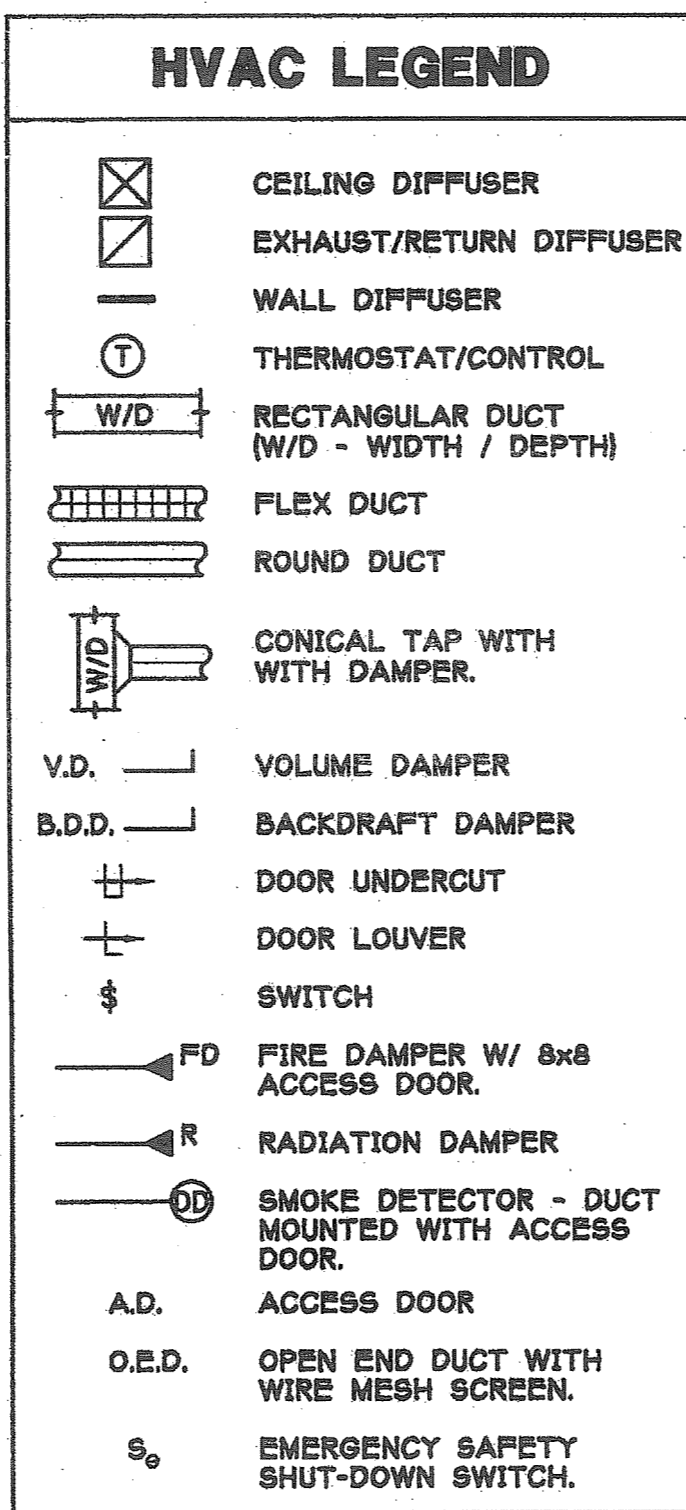
- NOTES:**
- PROVIDE WITH BACKDRAFT DAMPER
 - PROVIDE WITH ROOF CURB.
 - ACCEPTABLE MANUFACTURERS: CARNES, GREENHECK, PENN & LOREN COOK.
 - INTERLOCK WITH TOILET LIGHT SWITCHES.
 - TERMINATE EXHAUST FAN 40" (MIN) ABOVE THE ROOF SURFACE.
 - PROVIDE WITH WATERPROOF, UNIT MOUNTED DISCONNECT SWITCH & GREASE COLLECTOR.
 - INTERLOCK WITH KITCHEN EXHAUST HOOD (KH-1) CONTROL PANEL.
 - INTERLOCK WITH KITCHEN EXHAUST HOOD (KH-2) CONTROL PANEL.
 - INTERLOCK WITH KITCHEN EXHAUST HOOD (KH-3) CONTROL PANEL.
 - PROVIDE PERMANENT, WASHABLE 2" THICK ALUMINUM FILTERS.



- 1 CEILING DIFFUSER DETAIL**
M3 N.T.S.
- A. LIMITED CEILING SPACE -**
PROVIDE RECTANGULAR Ø9M PLENUM TO MATCH NECK SIZE. SEAL AIR TIGHT AGAINST DIFFUSER. CONNECT FLEX DUCT TO PLENUM. WRAP PLENUM WITH EXTERNAL INSULATION.
- B. ADEQUATE CEILING SPACE -**
CONNECT FLEX DUCT DIRECTLY TO DIFFUSER WITH A 1-DUCT-1 DIAMETER CENTERLINE RADIUS BEND.



2 GAS FIRED ROOFTOP DETAIL
M3 N.T.S.



MECHANICAL GENERAL NOTES

- DO NOT SCALE DRAWINGS. SEE ARCHITECTURAL DRAWINGS AND REFLECTED CEILING PLAN FOR EXACT LOCATION OF DOORS, WINDOWS, CEILING DIFFUSERS, ETC.
- ALL DUCTWORK AND PIPING SHALL BE COORDINATED WITH THE WORK PERFORMED UNDER OTHER DIVISIONS TO AVOID INTERFERENCE.
- LOCATE ALL THERMOSTATS 9'-0" ABOVE THE FINISHED FLOOR, UNLESS OTHERWISE NOTED.
- HVAC CONTRACTOR SHALL REPAIR, REPLACE, OR REPAINT TO MATCH EXISTING SURFACES DAMAGED BY THE HVAC CONTRACTOR DURING INSTALLATION OF MECHANICAL EQUIPMENT.
- HVAC CONTRACTOR SHALL REMOVE FROM THE JOBSITE ANY MATERIALS NOT ECONOMICALLY RECOVERABLE. ANY MATERIALS REMOVED FROM THE JOBSITE AND SOLD FOR SALVAGE SHALL BE CREDITED TO THE OWNERS ACCOUNT.
- INSTRUMENT TEST HOLES SHALL BE LOCATED IN ALL NEW SUPPLY, EXHAUST, AND RETURN DUCTS.
- HVAC CONTRACTOR SHALL PROVIDE AND INSTALL MANUAL BALANCING DAMPERS IN DUCTWORK FIVE FEET UPSTREAM OF ALL DUCTED DIFFUSERS. IF FIVE FEET CANNOT BE MAINTAINED THE MAXIMUM DISTANCE POSSIBLE SHOULD BE OBSERVED. THE CONTRACTOR SHALL ALSO PROVIDE AND INSTALL ALL DAMPERS NECESSARY TO BALANCE THE SYSTEM TO AIR FLOW VALUES SHOWN ON PLANS.
- MAXIMUM LENGTH OF FLEXIBLE DUCT SHALL BE SEVEN FEET.
- DUCT SIZES GIVEN ARE INSIDE CLEAR DIMENSIONS.
- HVAC CONTRACTOR SHALL PROVIDE AND INSTALL FIRE AND/OR SMOKE DAMPERS WHERE INDICATED ON PLANS AND IN SUCH LOCATIONS AS REQUIRED BY APPLICABLE CODE. INSTALLATION OF FIRE AND/OR SMOKE DAMPERS SHALL BE IN STRICT ACCORDANCE WITH THE DAMPER MANUFACTURERS RECOMMENDATIONS.
- ALL VALVES AND PIPING SPECIALTIES SHALL BE LINE SIZED UNLESS NOTED OTHERWISE. USE ECCENTRIC REDUCERS ON CONTROL VALVES WHERE REQUIRED.
- DUCTWORK SHALL BE GALVANIZED SHEET METAL CONSTRUCTED IN ACCORDANCE WITH THE LATEST SMACNA STANDARDS. FIBERGLASS DUCTWORK IS UNACCEPTABLE.
- DUCTWORK SHALL BE WRAPPED WITH 1 1/2" FIBER GLASS INSULATION EQUAL TO MANVILLE MICROGLITE.
- FLEXIBLE DUCTWORK SHALL BE EXTERNALLY INSULATED AND CONFORM TO ALL REQUIREMENTS OF U.L. 181 FOR CLASS 1 DUCTS.
- ALL PIPING, DUCTS, VENTS, ETC. EXTENDING THROUGH THE WALL AND/OR ROOF SHALL BE FLASHED AND COUNTERFLASHED IN A WATERPROOF MANNER.
- ALL PIPING INSULATION SHALL RUN CONTINUOUSLY THROUGH FLOOR, WALLS, AND PARTITIONS.
- ALL PIPING SHALL BE SUPPORTED ADJACENT TO EQUIPMENT, TO PREVENT WEIGHT OF PIPING BEING PLACED ON EQUIPMENT.
- HVAC CONTRACTOR SHALL PROVIDE ALL ROOF CURBS TO THE GENERAL CONTRACTOR FOR ASSEMBLY AND INSTALLATION PRIOR TO THE INSTALLATION OF ROOFING MATERIALS.
- HVAC CONTRACTOR SHALL VERIFY ALL EXISTING CONDITIONS ON JOBSITE.
- VERIFY ALL ROUTING OR ALL WORK ON JOBSITE.
- GENERAL CONTRACTOR SHALL FURNISH AND INSTALL ALL SUPPORTING ANGLES AND EXTRA SUPPORT BEAMS FOR ROOF-TOP A.C. UNITS, EXHAUST FANS, ETC.
- IT IS THE INTENTION OF THESE DRAWINGS TO COVER ALL WORK FOR A COMPLETE FIRST CLASS MECHANICAL INSTALLATION. ANY EQUIPMENT, TRIM HARDWARE AND/OR DEVICES USUALLY UTILIZED IN THE CLASS OF WORK, THOUGH NOT SPECIFICALLY MENTIONED OR SHOWN ON THE DRAWINGS, BUT WHICH MAY BE NECESSARY FOR THE SATISFACTORY COMPLETION OF THE WORK (AS DETERMINED BY THE ARCHITECT) SHALL BE FURNISHED AND INSTALLED BY THE HVAC CONTRACTOR AS PART OF HIS TOTAL WORK.
- HVAC CONTRACTOR SHALL HAVE THE MECHANICAL SYSTEMS BALANCE BY AN INDEPENDENT CERTIFIED BALANCE CONTRACTOR. THIS CONTRACTOR SHALL PREPARE A WRITTEN REPORT FOR SUBMISSION TO THE ENGINEER.

MECHANICAL SYSTEMS, SERVICE SYSTEMS AND EQUIPMENT
METHOD OF COMPLIANCE:
Prescriptive • Energy Cost Budget •

Thermal Zone: Zone V.

Exterior design conditions
winter dry bulb: 18 Deg. F.
summer dry bulb: 89 Deg. F.

Interior design conditions
winter dry bulb: 72 Deg. F.
summer dry bulb: 74 Deg. F.
relative humidity: 45%-65%

Building heating load: Space load = 210,000 Btuh.
Building cooling load: Space load = 440,840 Btuh.

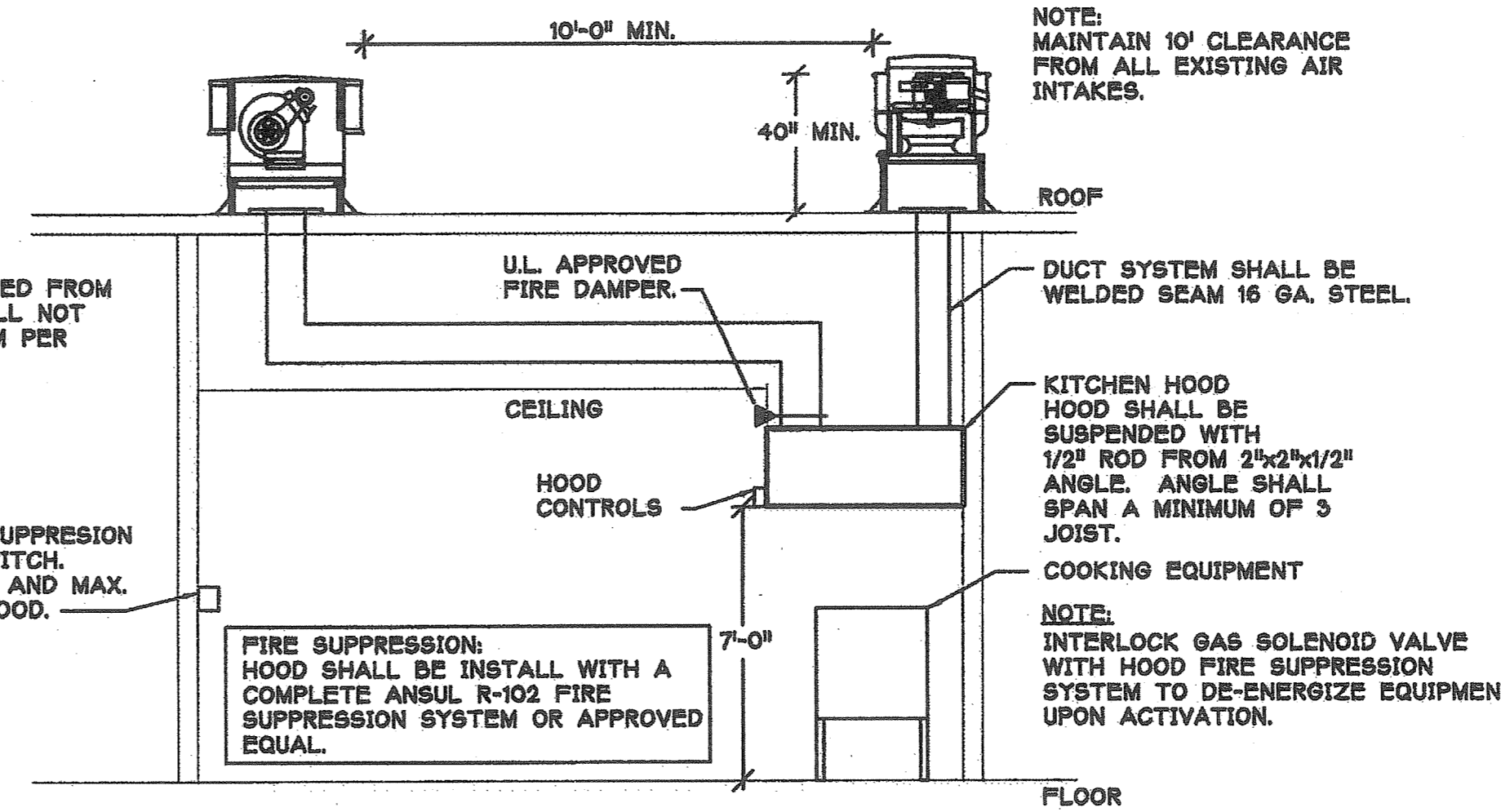
Mechanical Spacing Conditioning System
Unitary: N/A
description of unit: Gas fire rooftops
heating efficiency: 80%
cooling efficiency: 10.0 EER
heating output of unit: Total = 618,000 Btuh
cooling output of unit: Total = 464,100 Btuh.
boiler: N/A
total boiler output: N/A
if oversized, state reason: N/A
chiller: Existing chiller.
total chiller capacity: N/A
if oversized, state reason: N/A

List equipment efficiencies: N/A

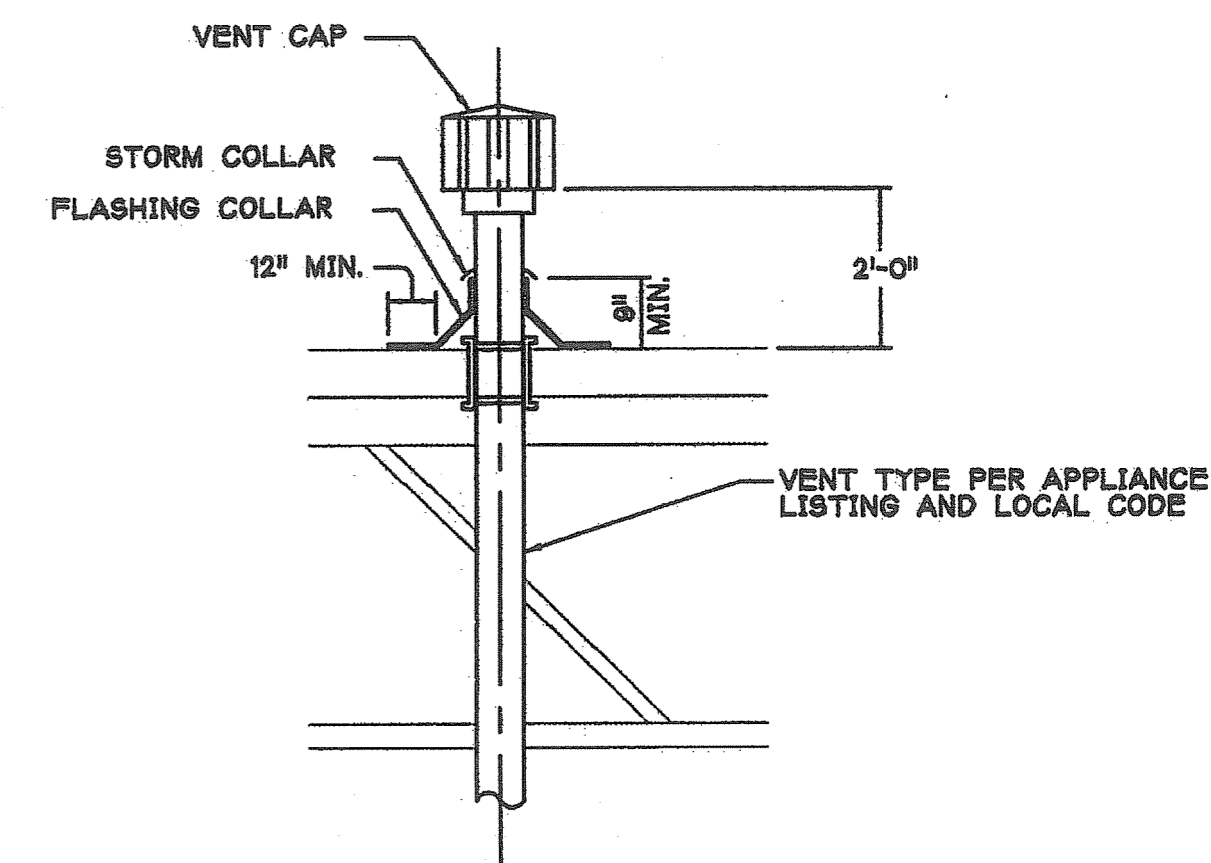
Equipment schedules with motors (mechanical systems)
motor horsepower: Less than 10 HP, exempt per exceptions.
number of phases: N/A
minimum efficiency: N/A
motor type: N/A
number of poles: N/A

DESIGNER STATEMENT:
To the best of my knowledge and belief, the design of this building complies with the mechanical systems, service systems and equipment requirements of the North Carolina State Building Code, Volume 1 - Energy.

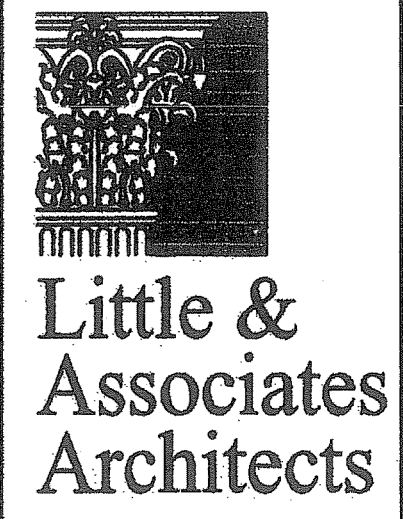
SIGNED:
NAME: Rick R. Roten, PE
TITLE: Mechanical Engineer



3 KITCHEN HOOD DETAIL
M3 SCALE: NONE



4 TYPICAL VENT DETAIL
M3 NTS

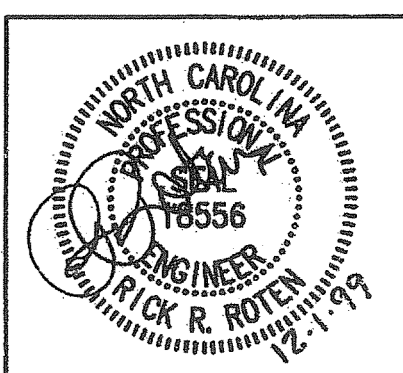


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CONSTRUCTION SET



MECHANICAL SCHEDULES AND DETAILS

Division President
TIM MORRISON
Project Manager
STEVIE STARR
Job Captain
SCOTT FRAZIER
Drawn By
M. SMITH-R3 ENGINEERING
Date Drawn
09-17-99
Drawing File Name

Revisions
No. Date
1 12/01/99

Issue Date: 12-01-99

Project Number
09-1538-02

UNIT Sheet
M3