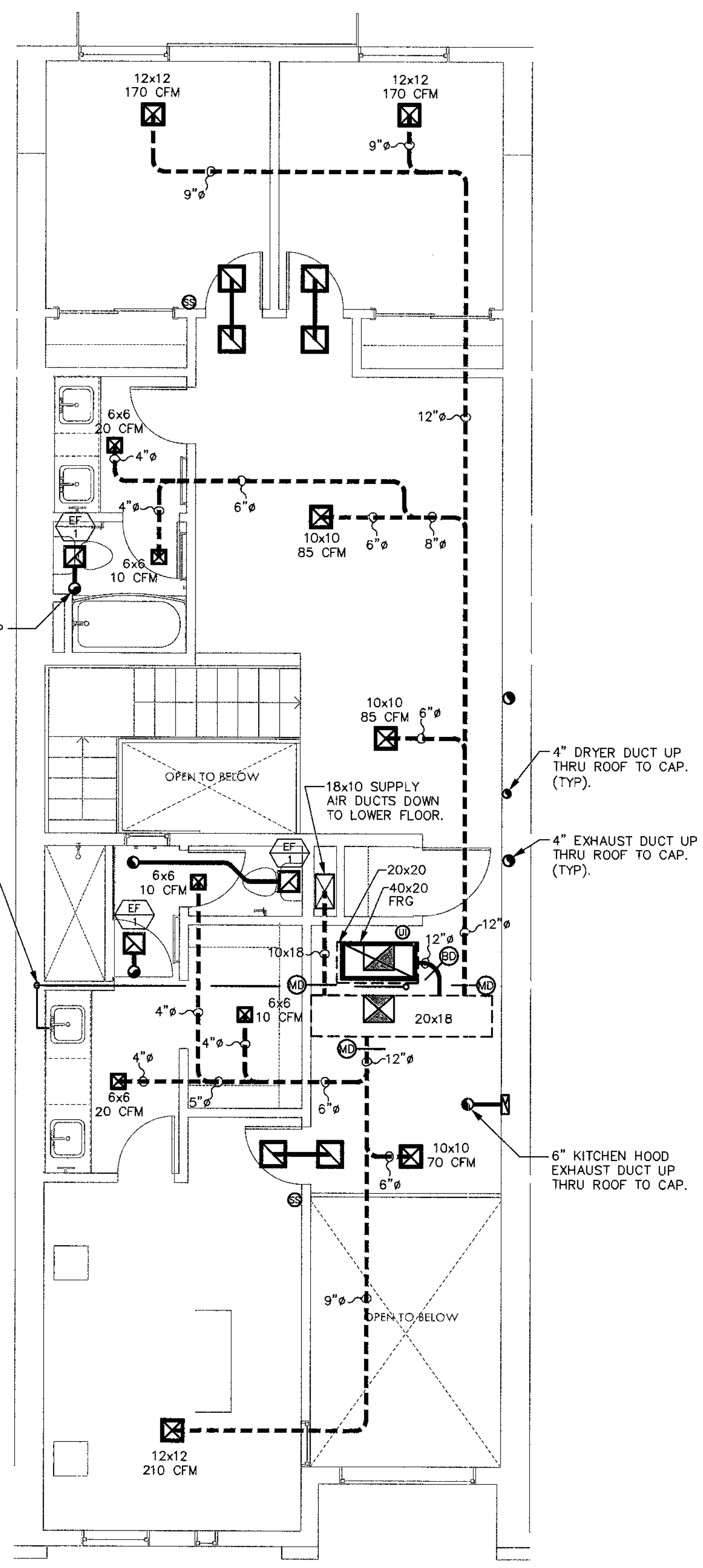
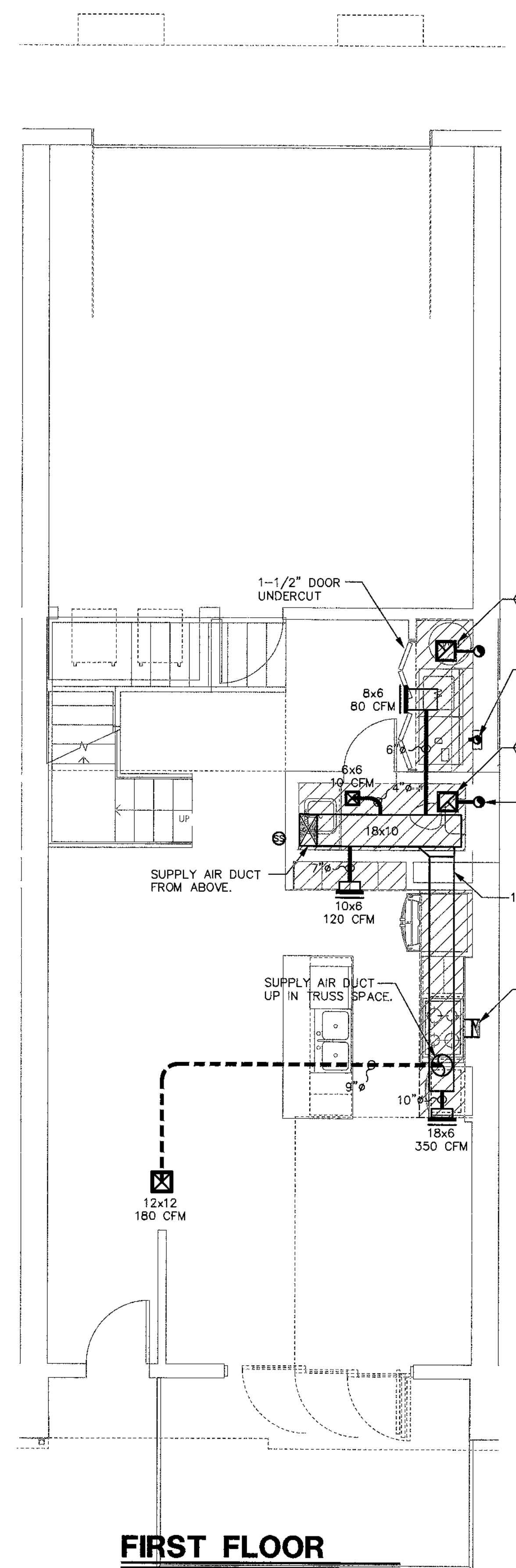


**ROOF**



**SECOND FLOOR**



**FIRST FLOOR**

SYMBOL LEGEND	
	CEILING MOUNTED DIFFUSERS (CD-1)
- x -	SIZE OF DIFFUSER
- CFM	BALANCE TO INDICATED CFM
	SIDE WALL SUPPLY REGISTER (SR-1)
- x -	SIZE OF REGISTER
- CFM	BALANCE TO INDICATED CFM
	CEILING MOUNTED FILTER RETURN GRILLE (FRG-1)
- x -	SIZE OF GRILLE
	CEILING MOUNTED TRANSFER AIR GRILLE (TG-1)
14x14 TG	
	CEILING MOUNTED TRANSFER AIR GRILLE (TG-1)
14x14 TG	
ZONING SYSTEM	
	USER INTERFACE (MOUNTED @ 48 A.F.F.)
	SMART SENSOR (MOUNTED @ 48 A.F.F.)
	ZONE MOTORIZED DAMPER
	BYPASS DAMPER
NOTES:	
A. ALL BEDROOM, BATHROOM AND CLOSET DOORS ARE PROVIDED WITH 1" UNDERCUT. SEE ARCHITECTURAL DOOR SCHEDULE FOR DETAIL.	
B. FLEXIBLE DUCT SHALL BE PULLED TIGHT WITH NO KINKS.	
C. ELBOWS SHALL BE SMOOTH AND NOT REDUCE THE FREE AREA OF THE DUCTWORK. PROVIDE SHEET METAL ELBOWS AS REQUIRED.	
D. WHERE A DRYER EXHAUST DUCT THAT PENETRATES A WALL OR CEILING ASSEMBLY, THE ANNULAR SPACE SHALL BE SEALED WITH NON-COMBUSTIBLE MATERIAL, APPROVED FIRE CAULKING OR A NON-COMBUSTIBLE DRYER EXHAUST DUCT WALL RECEPTACLE.	
E. ALL EXHAUST TERMINATION SHALL BE MINIMUM 3 FEET AWAY FROM OPENINGS TO THE BUILDING AND 3 FEET AWAY FROM PARAPET WALL.	

**CONSTRUCTION DOCUMENTS**

Revision Schedule		
No.	Date	Description

CITY OF PHOENIX  
 Planning and Development Department  
 Approved by: ROBERT [Signature]  
 2019

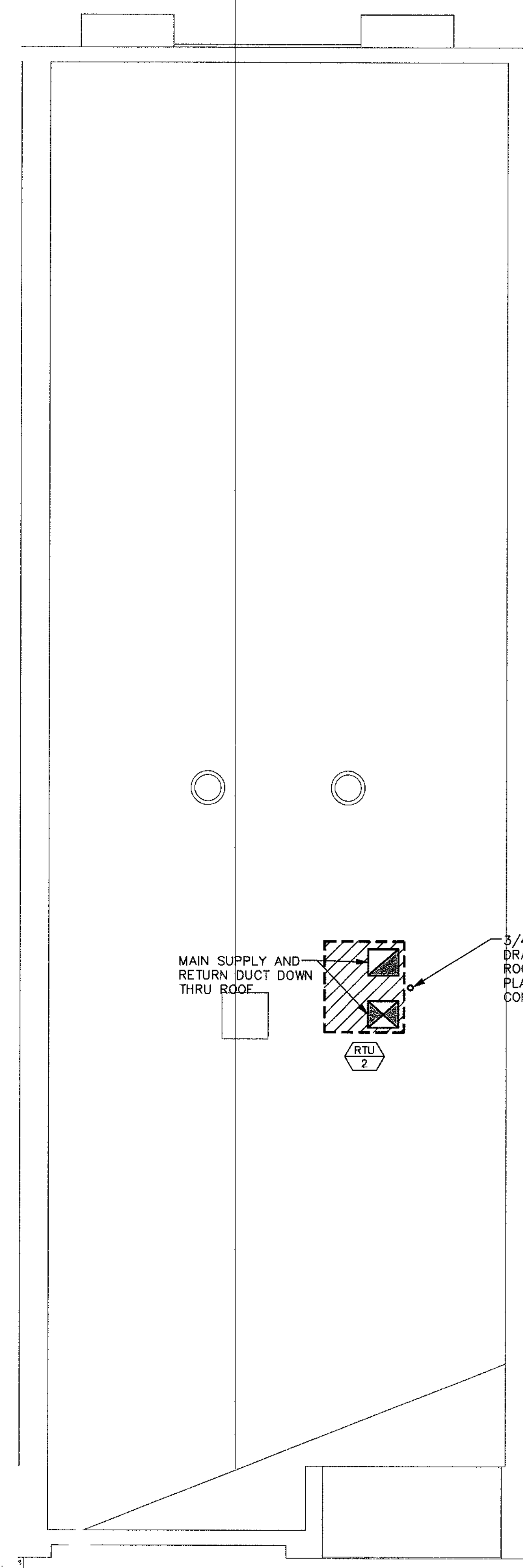
This set of plans has been prepared in accordance with the PHOENIX CONSTRUCTION CODE prior to the issuance of a Stop Work Order and shall be held in full compliance with the City of Phoenix. The City of Phoenix does not warrant the accuracy or completeness of the information contained herein and shall not be held liable for any errors or omissions.

**MECHANICAL PLAN - UNIT TYPE 1**

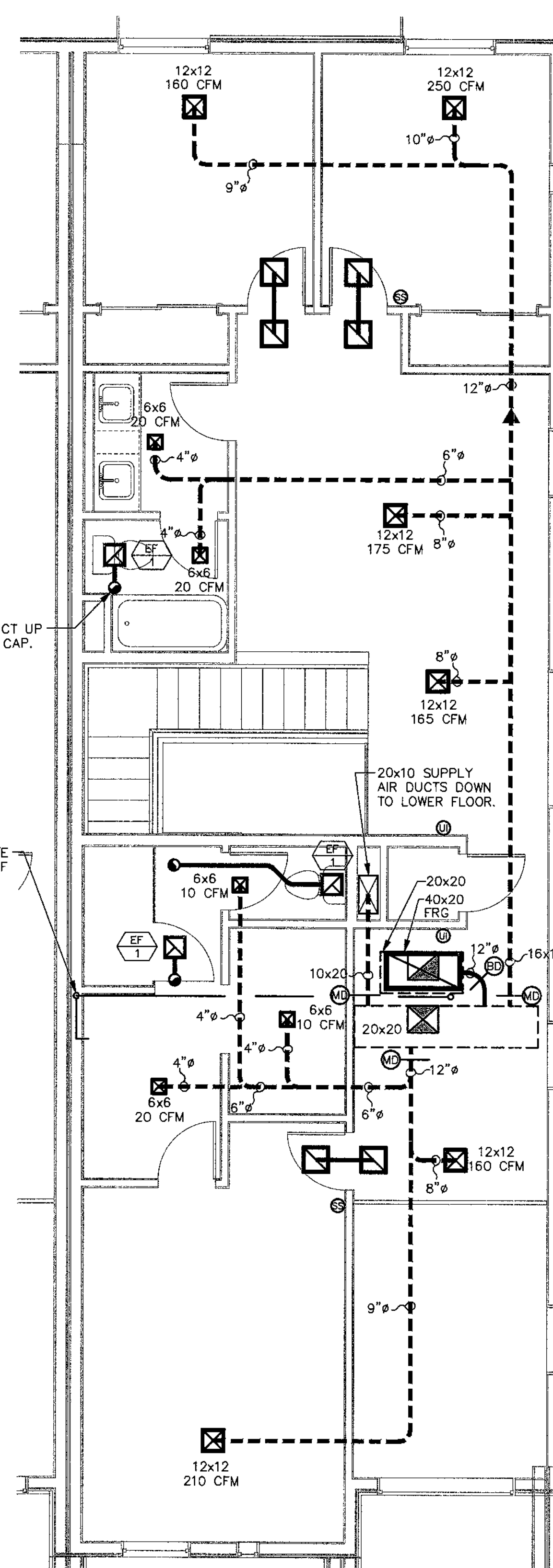
SCALE: 1/4" = 1'-0"

DRAWING TITLE  
**Unit Type 1  
 Mechanical  
 Floor Plans**

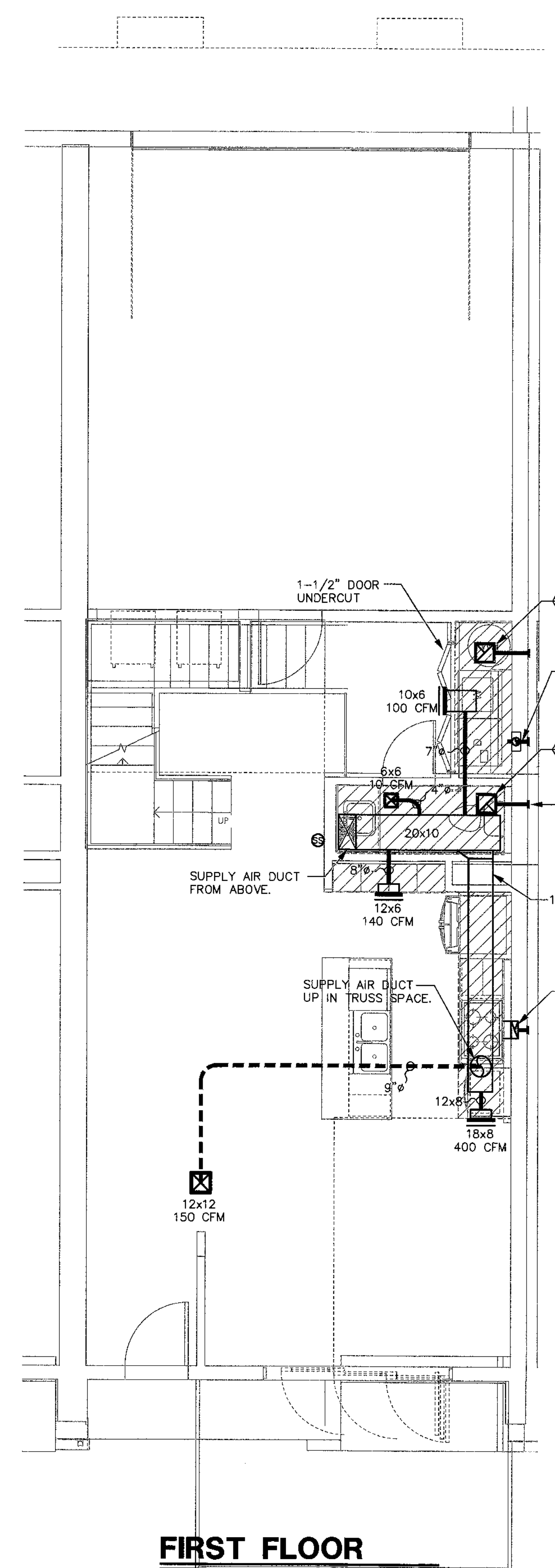
**M1.1**



**ROOF**



**SECOND FLOOR**



**FIRST FLOOR**

**SYMBOL LEGEND**

- CEILING MOUNTED DIFFUSERS (CD-1)
- x - — SIZE OF DIFFUSER
- CFM — BALANCE TO INDICATED CFM
- SIDE WALL SUPPLY REGISTER (SR-1)
- x - — SIZE OF REGISTER
- CFM — BALANCE TO INDICATED CFM
- CEILING MOUNTED FILTER RETURN GRILLE (FRG-1)
- x - — SIZE OF GRILLE
- 14x14 TG — CEILING MOUNTED TRANSFER AIR GRILLE (TG-1)
- 12"φ
- 14x14 TG

**ZONING SYSTEM**

- USER INTERFACE (MOUNTED @ 48 A.F.F.)
- SMART SENSOR (MOUNTED @ 48 A.F.F.)
- ZONE MOTORIZED DAMPER
- BYPASS DAMPER

**NOTES:**

- A. ALL BEDROOM, BATHROOM AND CLOSET DOORS ARE PROVIDED WITH 1" UNDERCUT. SEE ARCHITECTURAL DOOR SCHEDULE FOR DETAIL.
- B. FLEXIBLE DUCT SHALL BE PULLED TIGHT WITH NO KINKS.
- C. ELBOWS SHALL BE SMOOTH AND NOT REDUCE THE FREE AREA OF THE DUCTWORK. PROVIDE SHEET METAL ELBOWS AS REQUIRED.
- D. WHERE A DRYER EXHAUST DUCT THAT PENETRATES A WALL OR CEILING ASSEMBLY, THE ANNULAR SPACE SHALL BE SEALED WITH NON-COMBUSTIBLE MATERIAL, APPROVED FIRE CAULKING OR A NON-COMBUSTIBLE DRYER EXHAUST DUCT WALL RECEPTACLE.
- E. ALL EXHAUST TERMINATION SHALL BE MINIMUM 3 FEET AWAY FROM OPENINGS TO THE BUILDING AND 3 FEET AWAY FROM PARAPET WALL.

**CONSTRUCTION DOCUMENTS**

Revision Schedule		
No.	Date	Description

CITY OF PHOENIX  
 Planning and Development Department  
 By: ROBERT BERGQUIST  
 2019

This set of plans has been reviewed for PHOENIX CONSTRUCTION CODES prior to the issuance of Building Permit and shall be kept at the construction site. Such review shall not constitute an approval for any other code requirements of the City of Phoenix. Such review shall not constitute an approval for any other code requirements of any other jurisdiction.

**MECHANICAL PLAN - UNIT TYPE 2**

SCALE: 1/4" = 1'-0"

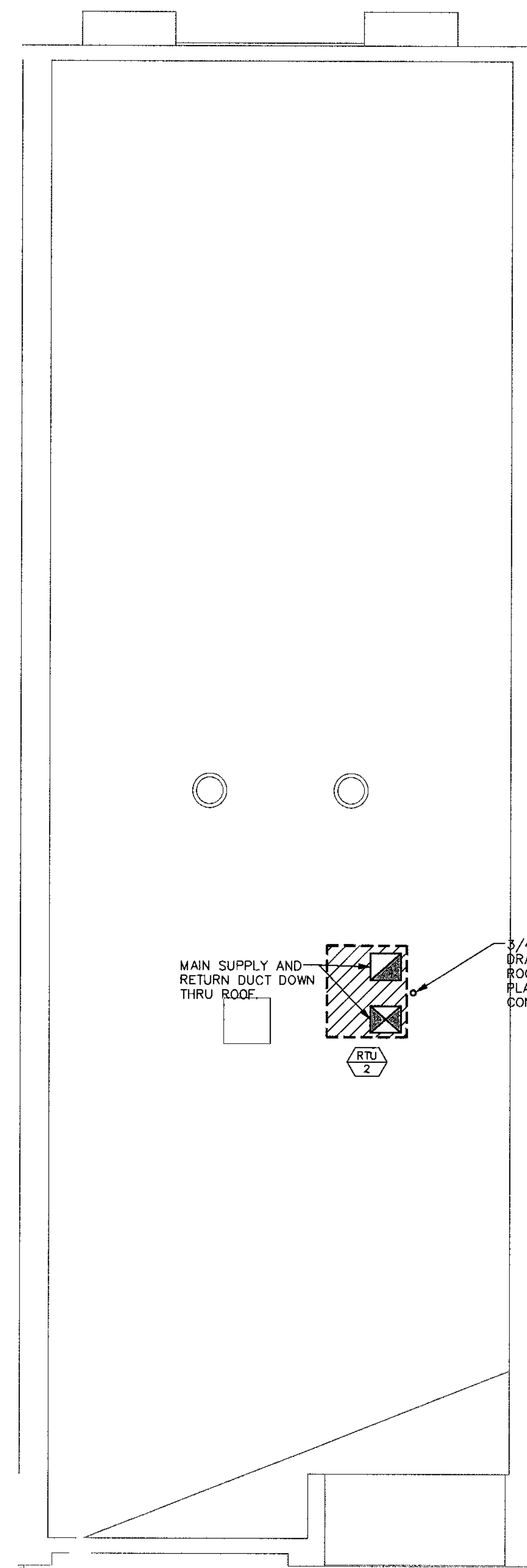
DRAWING TITLE  
**Unit Type 2  
 Mechanical  
 Floor Plans**

DRAWING No.  
**M1.2**

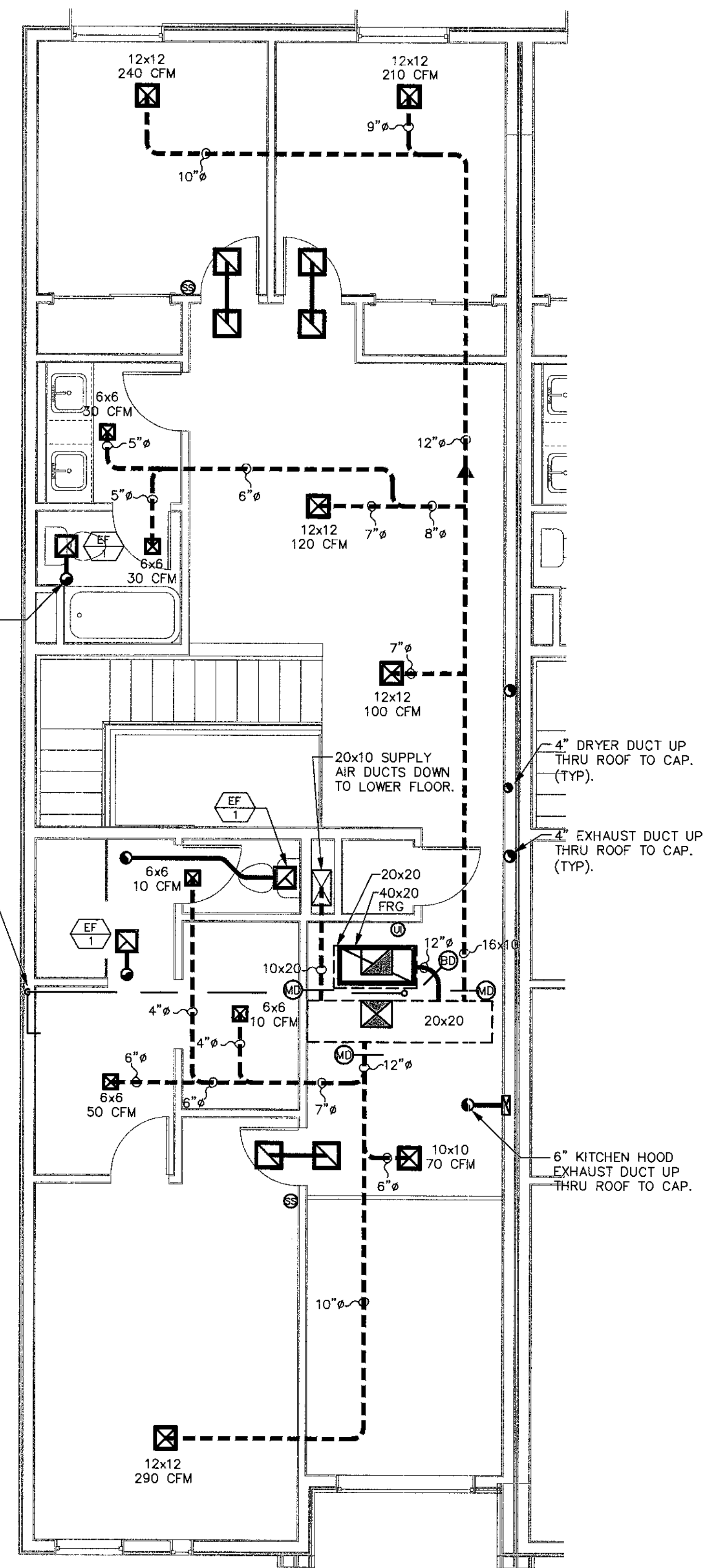
### SYMBOL LEGEND

- ☒ — CEILING MOUNTED DIFFUSERS (CD-1)
  - x - — SIZE OF DIFFUSER
  - CFM — BALANCE TO INDICATED CFM
  - ☐ — SIDE WALL SUPPLY REGISTER (SR-1)
  - x - — SIZE OF REGISTER
  - CFM — BALANCE TO INDICATED CFM
  - ☐ — CEILING MOUNTED FILTER RETURN GRILLE (FRG-1)
  - x - — SIZE OF GRILLE
  - 14x14 TG — CEILING MOUNTED TRANSFER AIR GRILLE (TG-1)
  - 12"φ — SIZE OF GRILLE
  - 14x14 TG
- ZONING SYSTEM**
- Ⓜ — USER INTERFACE (MOUNTED @ 48 A.F.F.)
  - Ⓢ — SMART SENSOR (MOUNTED @ 48 A.F.F.)
  - Ⓩ — ZONE MOTORIZED DAMPER
  - Ⓟ — BYPASS DAMPER

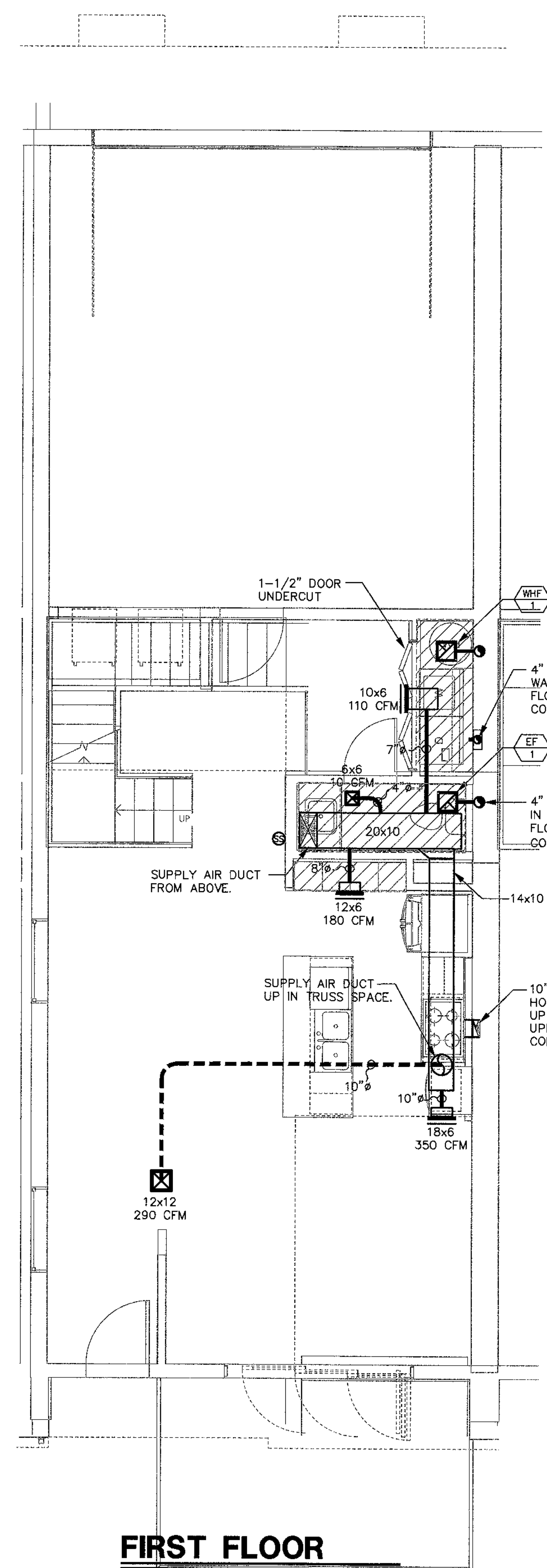
- NOTES:**
- A. ALL BEDROOM, BATHROOM AND CLOSET DOORS ARE PROVIDED WITH 1" UNDERCUT. SEE ARCHITECTURAL DOOR SCHEDULE FOR DETAIL.
  - B. FLEXIBLE DUCT SHALL BE PULLED TIGHT WITH NO KINKS.
  - C. ELBOWS SHALL BE SMOOTH AND NOT REDUCE THE FREE AREA OF THE DUCTWORK. PROVIDE SHEET METAL ELBOWS AS REQUIRED.
  - D. WHERE A DRYER EXHAUST DUCT THAT PENETRATES A WALL OR CEILING ASSEMBLY, THE ANNULAR SPACE SHALL BE SEALED WITH NON-COMBUSTIBLE MATERIAL, APPROVED FIRE CAULKING OR A NON-COMBUSTIBLE DRYER EXHAUST DUCT WALL RECEPTACLE.
  - E. ALL EXHAUST TERMINATION SHALL BE MINIMUM 3 FEET AWAY FROM OPENINGS TO THE BUILDING AND 3 FEET AWAY FROM PARAPET WALL.



**ROOF**



**SECOND FLOOR**



**FIRST FLOOR**

### MECHANICAL PLAN - UNIT TYPE 3

SCALE: 1/4" = 1'-0"

### CONSTRUCTION DOCUMENTS

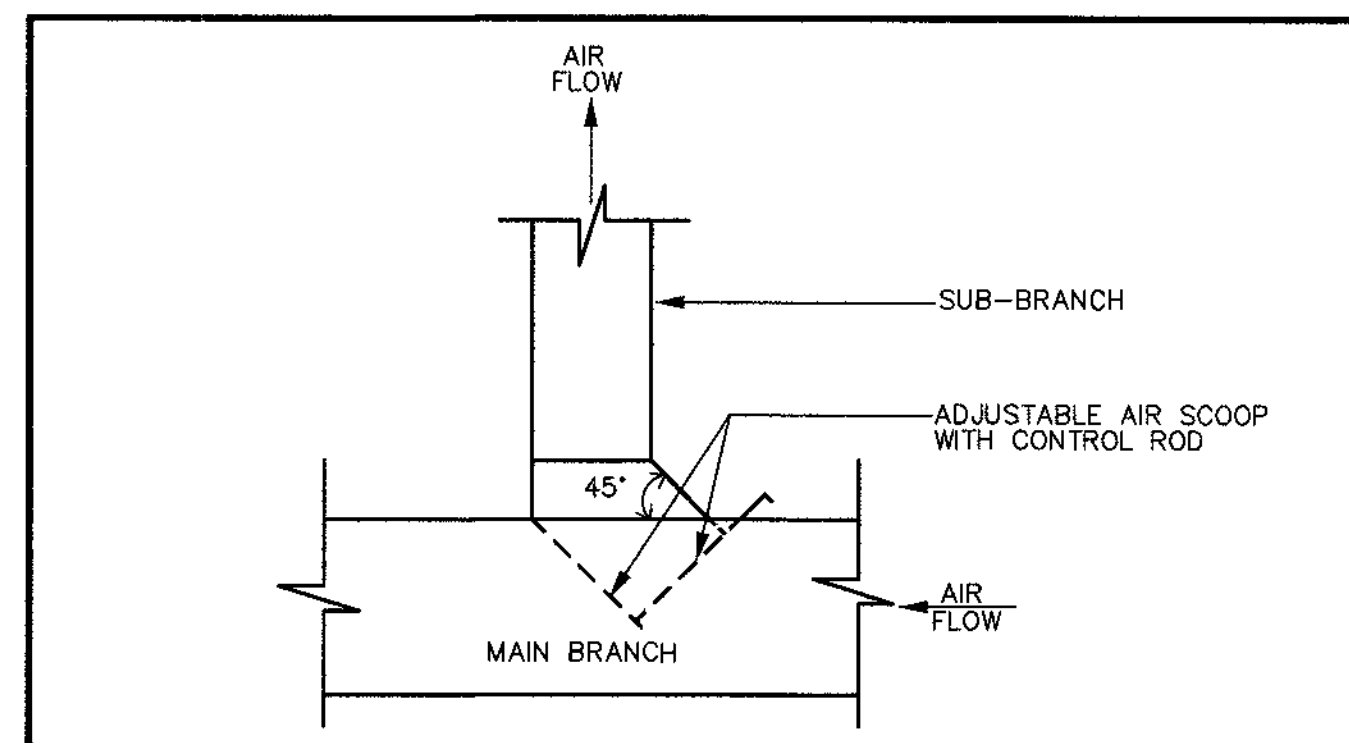
Revision Schedule		
No.	Date	Description

CITY OF PHOENIX  
 Planning and Development Department  
 By: ROBERT BERGHESE  
 1019

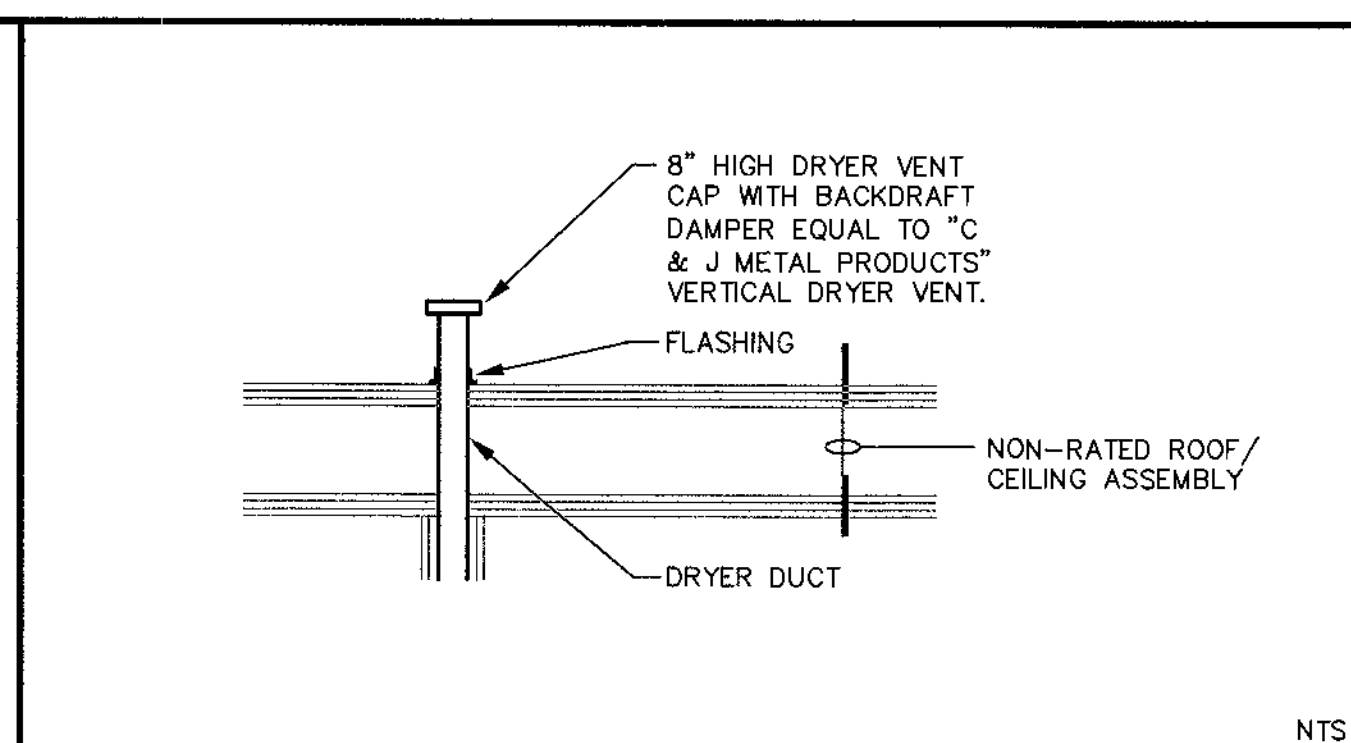
This set of plans has been reviewed by PHOENIX CONSTRUCTION CODES per the Source of Supply Permit and shall be part of the construction file. Such review shall not constitute an approval of the construction file or any other code, nor shall it be a substitute for the review of any law or ordinance.

DRAWING TITLE  
**Unit Type 3  
 Mechanical  
 Floor Plans**

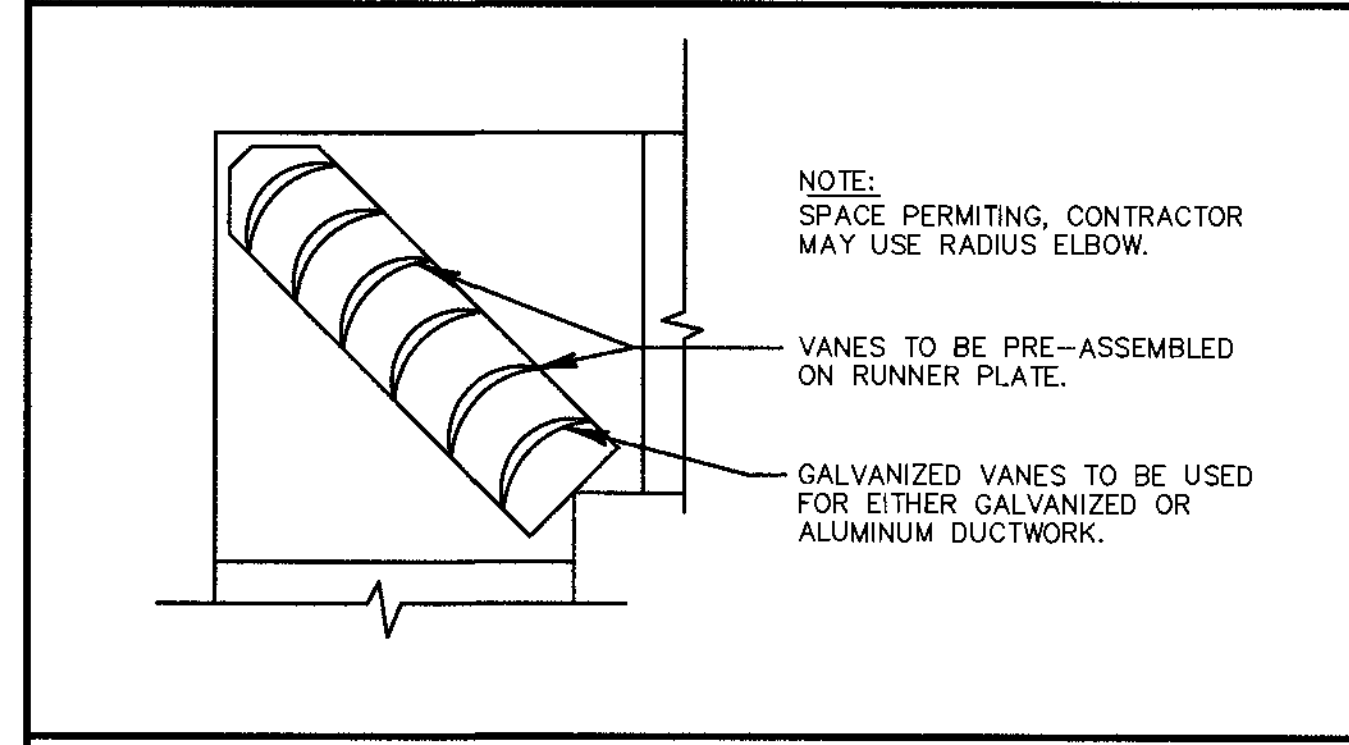
DRAWING No.  
**M1.3**



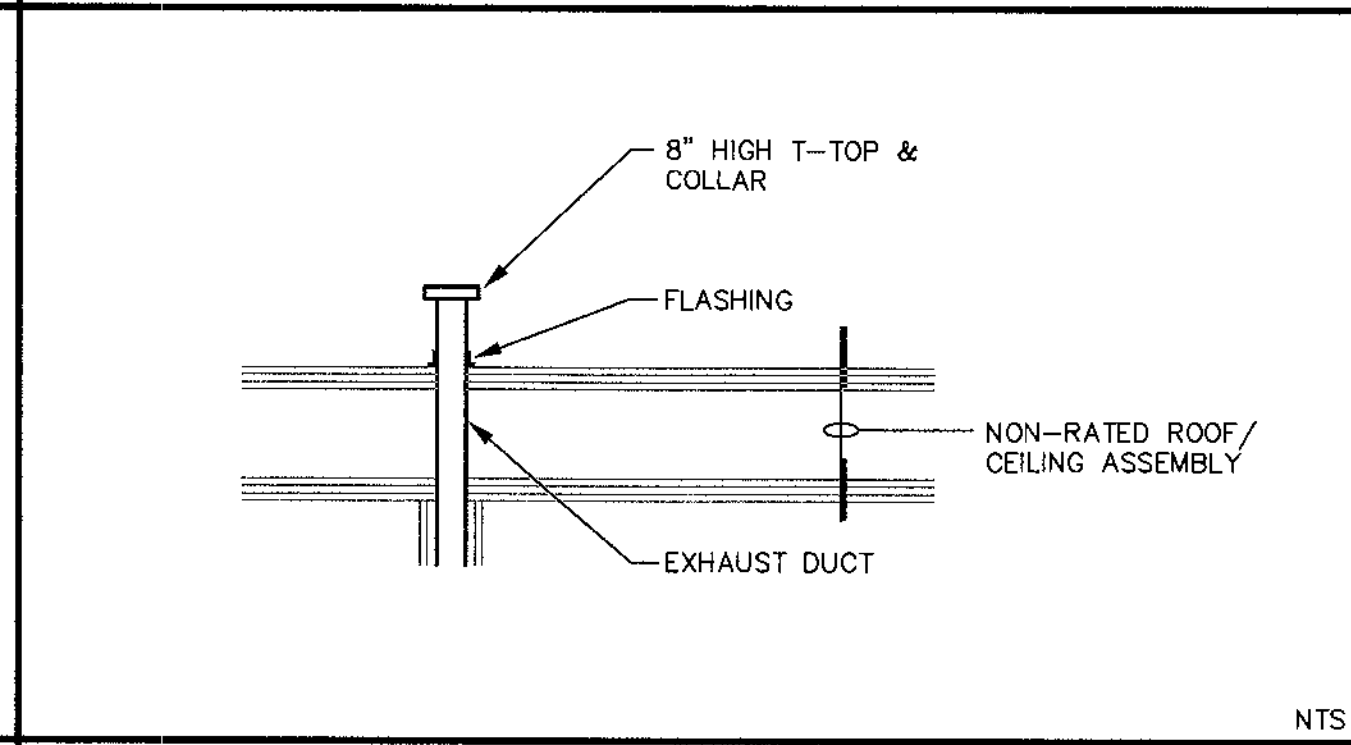
**SUPPLY BRANCH TAKE-OFF**



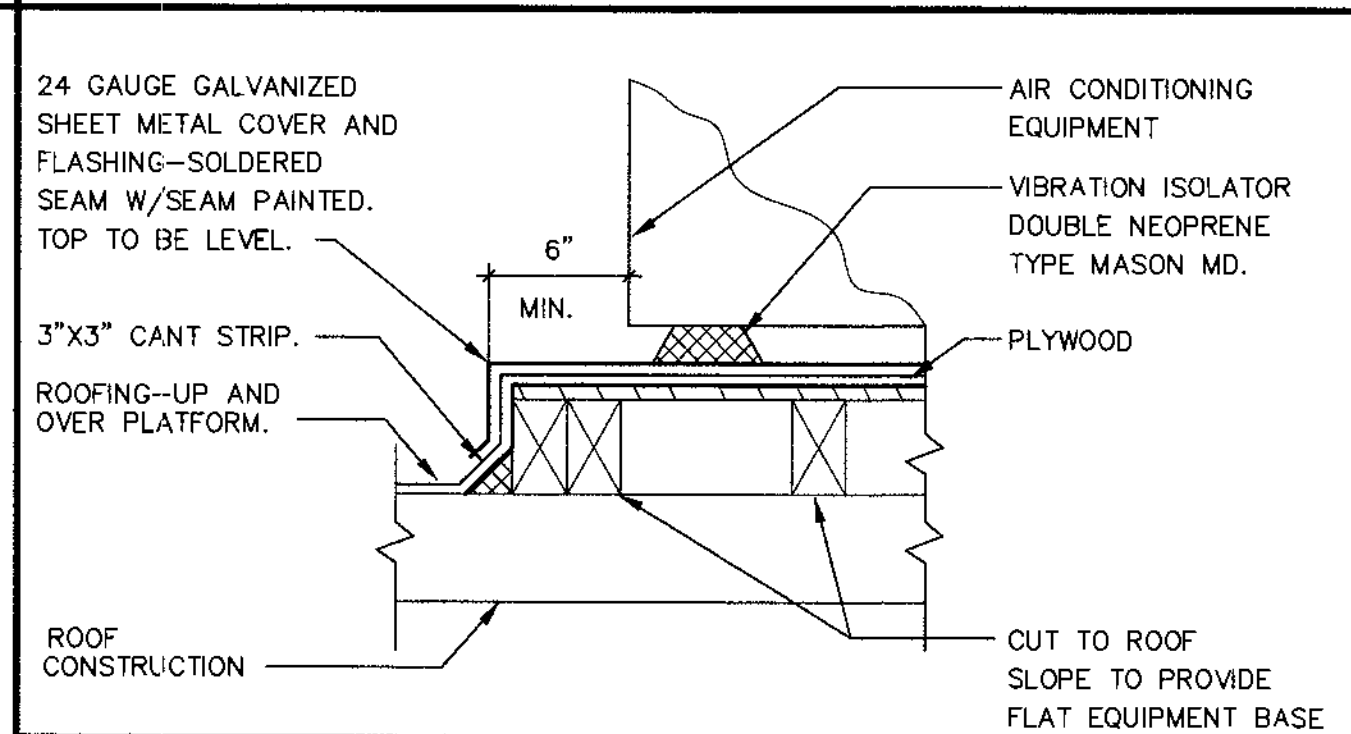
**DRYER DUCT THRU ROOF DETAIL**



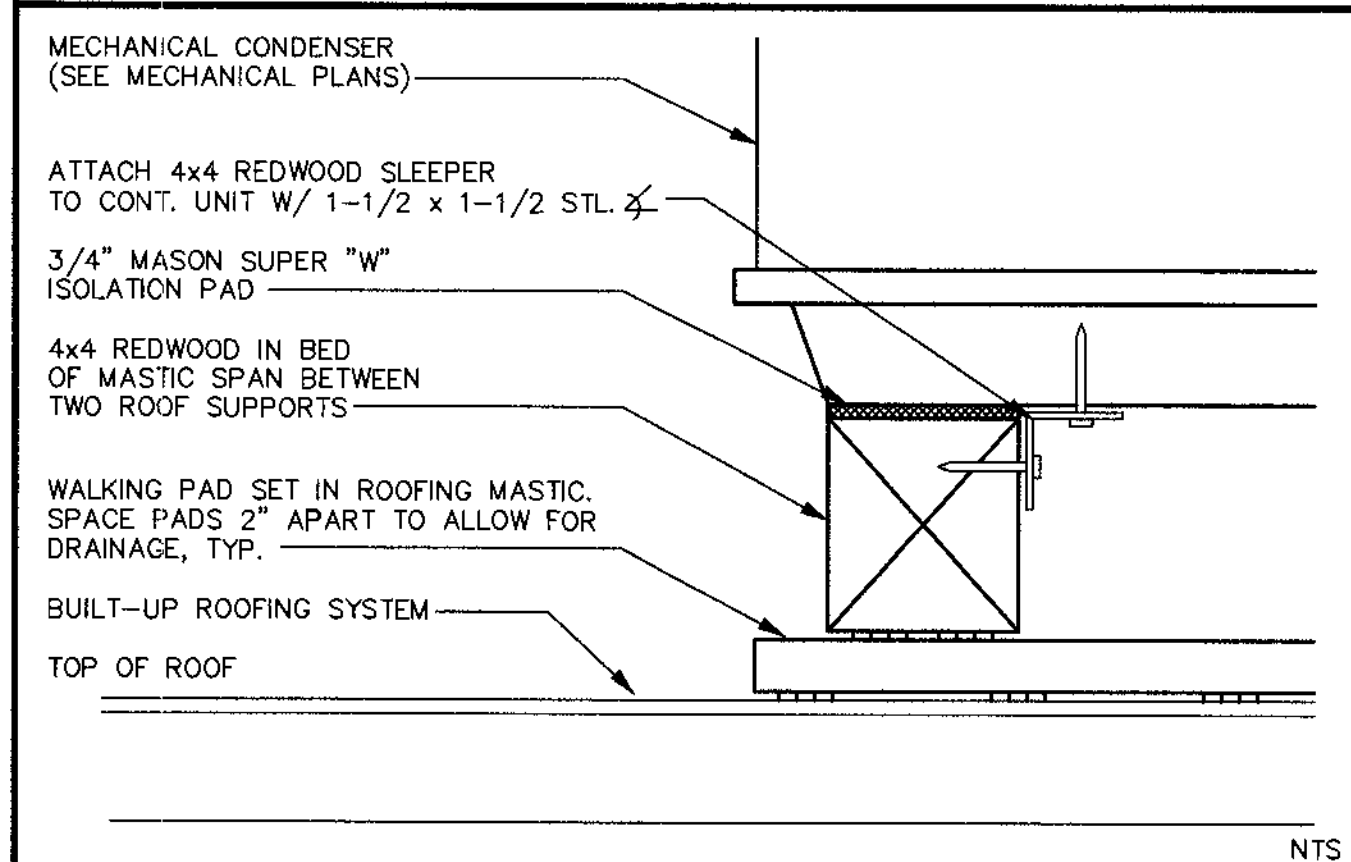
**TURNING VANE DETAIL**



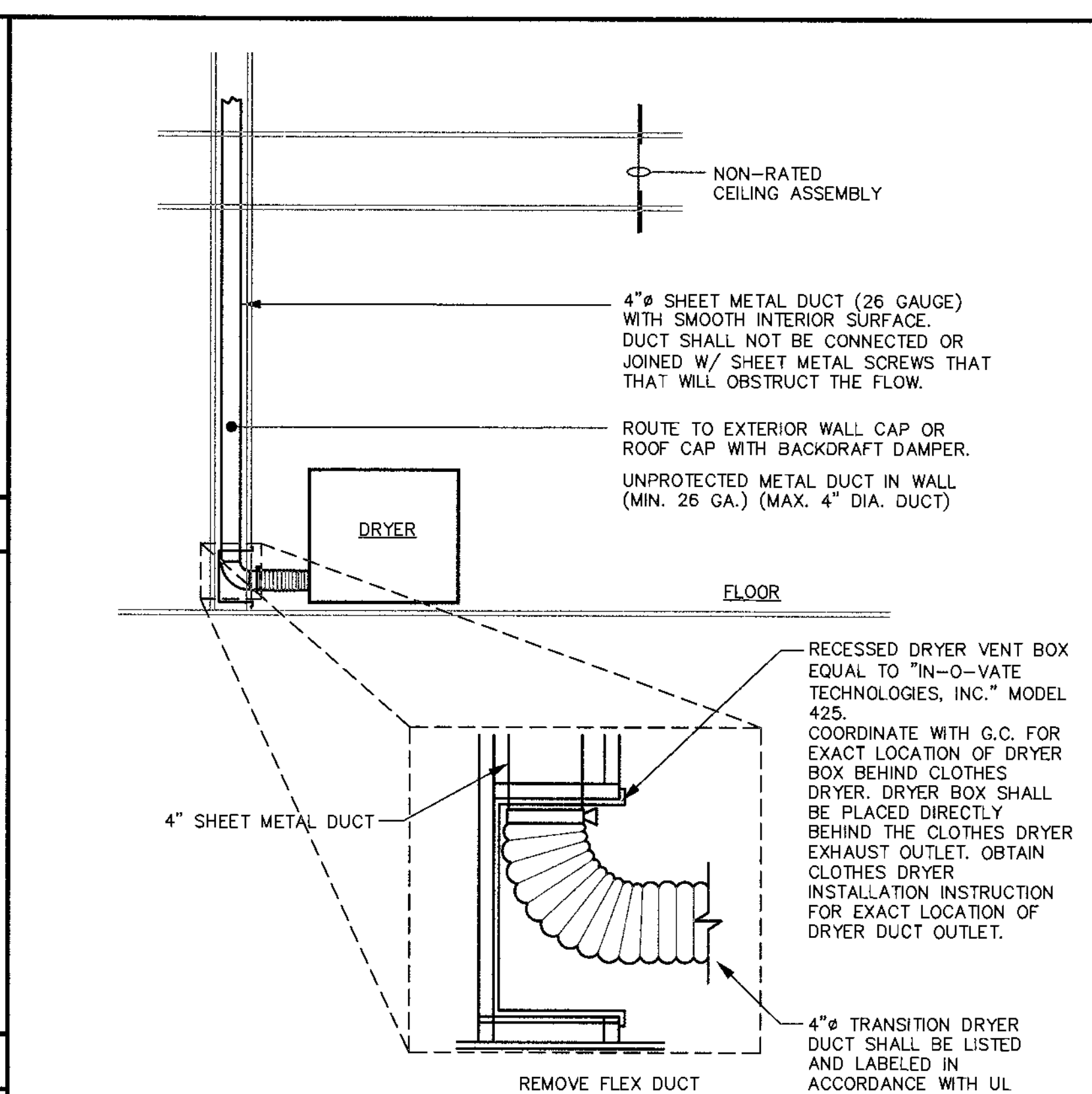
**EXHAUST DUCT THRU ROOF DETAIL**



**RTU PACKAGE UNIT BASE DETAIL**



**CONDENSING UNIT DETAIL - 4x4 REDWOOD**



NOTES:

CLOTHES DRYER SHALL BE EXHAUSTED IN ACCORDANCE WITH THE MANUFACTURER'S INSTRUCTIONS. DRYER EXHAUST SYSTEM SHALL BE INDEPENDENT OF ALL OTHER SYSTEMS.

DUCTS SHALL NOT PENETRATE OR BE LOCATED WITHIN ANY FIREBLOCKING, DRAFTSTOPPING OR ANY WALL, FLOOR/CEILING OR OTHER ASSEMBLIES REQUIRED BY THE IBC TO BE FIRE-RESISTANCE RATED, UNLESS 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 IBC.

PROVIDE MEANS OF CLEANOUT FOR EACH VERTICAL DUCT RISER.

PROVIDE WITH BACKDRAFT DAMPER.

SCREENS SHALL NOT BE INSTALLED AT THE DUCT TERMINATION.

DUCTS SHALL NOT BE CONNECTED OR INSTALLED WITH SHEET METAL SCREWS OR OTHER FASTENERS THAT WILL OBSTRUCT THE EXHAUST FLOW.

DUCT SHALL NOT BE CONNECTED TO A VENT CONNECTOR, VENT OR CHIMNEY.

DUCT SHALL NOT EXTEND INTO OR THROUGH DUCTS OR PLENUMS.

NOTE:

CONTRACTOR SHALL MEASURE EXACT DISTANCE OF DRYER VENT DUCT AND NUMBER OF 90° ELBOWS.

CONTRACTOR SHALL PROVIDE A PERMANENT PLAQUE OF MINIMUM DIMENSION OF 3" x 4" AND SHALL BE AFFIXED ON THE WALL NEAR THE INTERIOR DUCT OUTLET. THE SIGN ON SHALL STATE THE FOLLOWING:

**WARNING  
DO NOT REMOVE**

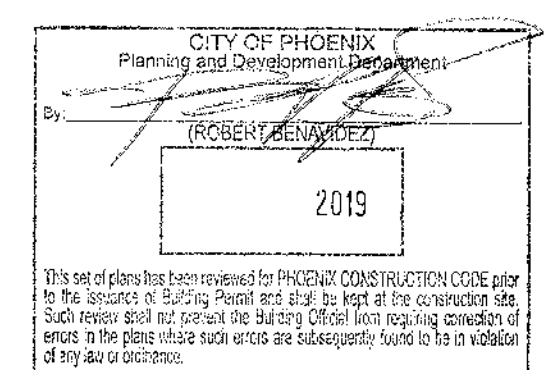
TO REDUCE THE RISK OF FIRE CAUSED BY LINT BUILD-UP IN THE EXHAUST DUCT, ALL DOMESTIC DRYERS INSTALLED AT THIS LOCATION SHALL BE MANUFACTURER APPROVED (UL LISTED) FOR CONNECTION TO AN EXHAUST DUCT THAT IS

— WITH —  
FEET OR GREATER 90° ELBOWS

**TYPICAL UNIT DOMESTIC DRYER DETAIL**

**CONSTRUCTION DOCUMENTS**

Revision Schedule		
No.	Date	Description





IECC NOTES (RESIDENTIAL)	
IECC 2018 Section	Description
R402.4.2	Fireplaces. New wood-burning fireplaces shall have tight-fitting flue dampers or doors, and outdoor combustion air. Where using tight-fitting doors on factorybuilt fireplaces listed and labeled in accordance with UL 127, the doors shall be tested and listed for the fireplace.
R402.4.4	Rooms containing fuel-burning appliances. In Climate Zones 3 through 8, where open combustion air ducts provide combustion air to open combustion fuel burning appliances, the appliances and combustion air opening shall be located outside the building thermal envelope or enclosed in a room that is isolated from inside the thermal envelope. Such rooms shall be sealed and insulated in accordance with the envelope requirements of Table R402.1.2, where the walls, floors and ceilings shall meet not less than the basement wall R-value requirement. The door into the room shall be fully gasketed and any water lines and ducts in the room insulated in accordance with Section R403. The combustion air duct shall be insulated where it passes through conditioned space to an Rvalue of not less than R-8. Exceptions: 1. Direct vent appliances with both intake and exhaust pipes installed continuous to the outside. 2. Fireplaces and stoves complying with Section R402.4.2 and Section R1006 of the International Residential Code.
R403.1	Controls (Mandatory). Not less than one thermostat shall be provided for each separate heating and cooling system.
R403.1.1	Programmable thermostat. The thermostat controlling the primary heating or cooling system of the dwelling unit shall be capable of controlling the heating and cooling system on a daily schedule to maintain different temperature setpoints at different times of the day. This thermostat shall include the capability to set back or temporarily operate the system to maintain zone temperatures of not less than 55°F (13°C) to not greater than 85°F (29°C). The thermostat shall be programmed initially by the manufacturer with a heating temperature setpoint of not greater than 70°F (21°C) and a cooling temperature setpoint of not less than 78°F (26°C).
R403.1.2	Heat pump supplementary heat (Mandatory). Heat pumps having supplementary electric-resistance heat shall have controls that, except during defrost, prevent supplemental heat operation when the heat pump compressor can meet the heating load.
R403.3.2	Sealing (Mandatory). Ducts, air handlers and filter boxes shall be sealed. Joints and seams shall comply with either the International Mechanical Code or International Residential Code, as applicable.
R403.3.2.1	Sealed air handler. Air handlers shall have a manufacturer's designation for an air leakage of not greater than 2 percent of the design airflow rate when tested in accordance with ASHRAE 193.
R403.3.3	Duct testing (Mandatory). Ducts shall be pressure tested to determine air leakage by one of the following methods: 1. Rough-in test: Total leakage shall be measured with a pressure differential of 0.1 inch w.g. (25 Pa) across the system, including the manufacturer's air handler enclosure if installed at the time of the test. Registers shall be taped or otherwise sealed during the test. 2. Postconstruction test: Total leakage shall be measured with a pressure differential of 0.1 inch w.g. (25 Pa) across the entire system, including the manufacturer's air handler enclosure. Registers shall be taped or otherwise sealed during the test. Exceptions: 1. A duct air-leakage test shall not be required where the ducts and air handlers are located entirely within the building thermal envelope. 2. A duct air-leakage test shall not be required for ducts serving heat or energy recovery ventilators that are not integrated with ducts serving heating or cooling systems. A written report of the results of the test shall be signed by the party conducting the test and provided to the code official.
R403.3.5	Building cavities (Mandatory). Building framing cavities shall not be used as ducts or plenums.
R403.4	Mechanical system piping insulation (Mandatory). Mechanical system piping capable of carrying fluids greater than 105°F (41°C) or less than 55°F (13°C) shall be insulated to an R-value of not less than R-3.
R403.4.1	Protection of piping insulation. Piping insulation exposed to weather shall be protected from damage, including that caused by sunlight, moisture, equipment maintenance and wind. The protection shall provide shielding from solar radiation that can cause degradation of the material. Adhesive tape shall be prohibited.
R403.5.1	Heated water circulation and temperature maintenance systems (Mandatory). Heated water circulation systems shall be in accordance with Section R403.5.1.1. Heat trace temperature maintenance systems shall be in accordance with Section R403.5.1.2. Automatic controls, temperature sensors and pumps shall be accessible. Manual controls shall be readily accessible.
R403.5.1.1	Circulation systems. Heated water circulation systems shall be provided with a circulation pump. The system return pipe shall be a dedicated return pipe or a cold water supply pipe. Gravity and thermosiphon circulation systems shall be prohibited. Controls for circulating hot water system pumps shall start the pump based on the identification of a demand for hot water within the occupancy. The controls shall automatically turn off the pump when the water in the circulation loop is at the desired temperature and when there is no demand for hot water.
R403.6	Mechanical ventilation (Mandatory). The building shall be provided with ventilation that complies with the requirements of the International Residential Code or International Mechanical Code, as applicable, or with other approved means of ventilation. Outdoor air intakes and exhausts shall have automatic or gravity dampers that close when the ventilation system is not operating.
R403.6.1	Whole-house mechanical ventilation system fan efficacy. Fans used to provide whole-house mechanical ventilation shall meet the efficacy requirements of Table R403.6.1. Exception: Where an air handler that is integral to tested and listed HVAC equipment is used to provide whole-house mechanical ventilation, the air handler shall be powered by an electronically commutated motor.
R403.7	Equipment sizing and efficiency rating (Mandatory). Heating and cooling equipment shall be sized in accordance with ACCA Manual S based on building loads calculated in accordance with ACCA Manual J or other approved heating and cooling calculation methodologies. New or replacement heating and cooling equipment shall have an efficiency rating equal to or greater than the minimum required by federal law for the geographic location where the equipment is installed.

MECHANICAL NOTES	
1.	ALL WORK SHALL COMPLY WITH ALL APPLICABLE FEDERAL, STATE AND LOCAL CODES, LAWS, ACTS AND ALL AUTHORITIES HAVING JURISDICTION.
2.	THE COMPLETED INSTALLATION SHALL BE IN ACCORDANCE WITH ALL APPLICABLE INDUSTRY STANDARDS OF GOOD PRACTICE AND SAFETY; AND THE MANUFACTURER'S STRICTEST RECOMMENDATION FOR EQUIPMENT AND PRODUCT APPLICATION AND INSTALLATION.
3.	DUCTWORK SHALL BE FABRICATED AND ERECTED IN ACCORDANCE WITH ASHREA AND LATEST "SMCNA" STANDARDS.
4.	PROVIDE OPPOSED BLADE DAMPER AT ALL SUPPLY REGISTERS AND CEILING DIFFUSERS.
5.	ALL MECHANICAL EQUIPMENT LOCATIONS TO COMPLY WITH ALL APPLICABLE CODES.
6.	COORDINATE EXACT DIFFUSER AND GRILLE LOCATIONS WITH ELECTRICAL CONTRACTOR.
7.	ALL FLEX DUCT TO BE THERMAFLEX TYPE MKE.
8.	PROVIDE 1/2" ACOUSTICAL LINER IN ALL SUPPLY AND RETURN DUCTWORK.
9.	EXTEND CONDENSATE DRAINS AS SHOWN ON PLANS.
10.	ALL EXHAUST AND DRYER VENT SHALL BE MINIMUM 26 GAUGE SHEET METAL DUCT AND SHALL DISCHARGE SEPARATELY TO THE OUTSIDE.
11.	PENETRATIONS THRU FIRE RATED ASSEMBLY SHALL BE PROVIDED WITH UL LISTED FIRE CAULK. DRYER DUCTS SHALL HAVE SMOOTH INTERIOR SURFACES.
12.	DRYER DUCT LENGTH SHALL BE INSTALLED PER MANUFACTURER'S RECOMMENDATION AND SHALL BE APPROVED BY THE BUILDING OFFICIAL.
13.	DUCTS FOR EXHAUSTING CLOTHES DRYER SHALL NOT BE CONNECTED OR INSTALLED WITH SHEET METAL SCREWS.
14.	COMBUSTION AIR DUCT OPENINGS SHALL BE COVERED WITH CORROSION RESISTANT 1/4" MESH SCREEN.
15.	ALL DUCT SIZES SHOWN ARE CLEAR INSIDE DIMENSIONS.
16.	ALL DUCTWORK SHALL BE SUPPORTED WITH HANGERS TO THE STRUCTURE AT 8 FEET MAX. INTERVALS ALONG THE LENGTH OF THE DUCT.
17.	PROVIDE RADIUS ELBOWS, TURNING VANES AND SPLITTER DAMPERS IN BRANCHES AND EXTRACTORS WHERE APPLICABLE.
18.	COORDINATE THERMOSTAT LOCATION WITH OWNER.
19.	MATERIALS EXPOSED WITHIN DUCTS OR PLENUMS SHALL HAVE A FLAME-SPREAD INDEX OF NOT MORE THAN 25 AND SMOKE-DEVELOP RATING OF NOT MORE THAN 50 WHEN TESTED IN ACCORDANCE WITH THE TEST FOR SURFACE BURNING CHARACTERISTICS OF BUILDING MATERIALS.
20.	COORDINATE ALL MECHANICAL WORK TO AVOID CONFLICTS WITH OTHER TRADES PRIOR TO STARTING WORK. PROVIDE ADEQUATE CLEARANCE FOR ARCHITECTURAL DESIGN, PROPER OPERATION AND SERVICE OF EQUIPMENT.
21.	REFRIGERANT PIPING SHALL BE ISOLATED FROM THE STRUCTURE.
22.	EQUIPMENT AND APPLIANCES SHALL BE INSTALLED AS REQUIRED BY THE TERMS OF THEIR APPROVAL, IN ACCORDANCE WITH THE CONDITIONS OF THE LISTING, THE MANUFACTURER'S INSTALLATION INSTRUCTION AND THIS CODE. MANUFACTURER'S INSTALLATION INSTRUCTIONS SHALL BE AVAILABLE ON THE JOB SITE AT THE TIME OF INSPECTION. FINAL APPROVAL THAT ALL APPLICABLE INSTRUCTIONS ARE AVAILABLE AT THE JOB SITE RESTS WITH THE CODE OFFICIAL.
23.	A/C EQUIPMENT CONTAINING REFRIGERANTS SHALL MEET UL 1995 STANDARDS.
24.	REFRIGERANT R410a QUANTITIES SHALL BE PER MANUFACTURER'S RECOMMENDATIONS AND SHALL NOT EXCEED PER 2018 IMC.
25.	SHEET METAL DUCTS (ROUND AND ENCLOSED RECTANGULAR) IN DWELLING UNITS SHALL BE MINIMUM 26 GAUGE FOR DUCTS 16 AND 18 INCHES.
26.	SHEET METAL DUCTS (ROUND AND ENCLOSED RECTANGULAR) IN DWELLING UNITS SHALL BE MINIMUM 28 GAUGE FOR DUCTS 14 INCHES OR LESS.
27.	RIGID DUCTS SHALL BE SUPPORTED AT INTERVALS THAT DO NOT EXCEED 10 FEET ON CENTER.
28.	FLEXIBLE CONNECTORS MUST NOT EXCEED 14 FEET IN LENGTH.
29.	ALL ROOF MOUNTED MECHANICAL EQUIPMENT SHALL BE FULLY SCREENED BY PARAPET WALLS EQUAL TO, OR GREATER THAN, THE HIGHEST POINT ON THE MECHANICAL EQUIPMENT. ALL GROUND MOUNTED MECHANICAL EQUIPMENT SHALL BE SCREENED BY SOLID MASONRY WALLS AND GATES EQUAL TO, OR GREATER THAN, THE HIGHEST POINT ON THE MECHANICAL EQUIPMENT.

GENERAL DUCTWORK SYMBOLS			
SINGLE	DOUBLE	ABBR.	DESCRIPTION
		•	RECTANGULAR DUCT
		•	ROUND DUCT
		•	45 DEG. TAP: USE AT BRANCH DUCTS ONLY
		•	DUCT SPLIT W/DAMPER: USE AT ELBOWS AND TEES: PROPORTION DUCT AREAS BY CFM'S
		•	CURVED ELBOW—MIN. RADIUS R: 1.5 WIDTH
		•	90 DEG. ELBOW WITH SINGLE RADIUS TURNING VANES
		•	FLEXIBLE DUCT CONNECTION
		FD	FIRE DAMPER
		FS	COMBINATION FIRE/SMOKE DAMPER
		BD	BALANCING DAMPER (USE O.B.D. UNLESS NOTED OTHERWISE)
		---	NEW TO EXISTING CONNECTION
		•	SPIN-IN FLEX DUCT TAKE-OFF W/DAMPER
		SA	SUPPLY AIR
		EXH	EXHAUST AIR
		RA	RETURN AIR
		REL	RELIEF AIR
		OSA	OUTSIDE AIR
		T	THERMOSTAT X: UNIT OR ZONE NUMBER
		T	THERMOSTAT W/SHERWOOD GUARD

ROOFTOP PACKAGED HEAT PUMP UNIT																	
MARK	MANUFACTURER	MODEL	INDOOR BLOWER			GROSS COOLING CAP			HEAT (MBH)	O.S.A CFM	WT. (LB)	ELECTRICAL DATA					
			CFM	"ESP	HP	SEN MBH	TOT MBH	ENT. AIR DBF				WBF	VOLT/PHASE	COMP. RLA	COND. FAN FLA	EVAP. FAN FLA	MOCP
RTU-1	CARRIER	50VT-A48	1600	0.65	1.0	28.9	34.4	75	63	30.3	-	500	230/1	22.1	1.5	7.6	50
RTU-2	CARRIER	50VT-A60	2000	0.65	1.0	39.9	44.3	75	63	40.5	-	500	230/1	26.4	1.9	7.6	60

- NOTES:
- SIZE ALL UNITS ON SUMMER AMBIENT TEMPERATURE: 115°F. WINTER: 32°F.
  - VERIFY VOLTAGE/PHASE WITH ELECTRICAL CONTRACTOR PRIOR TO ORDERING.
  - COOLING CAPACITY, MINIMUM HEAT CAPACITY AND CFM ARE MINIMUM OUTPUT REQUIRED. ALL UNITS SHALL HAVE NO LESS THAN 98% OF THESE CAPACITIES. COOLING CAPACITY IS GROSS COIL CAPACITY REQUIRED (FAN HEAT NOT DEDUCTED).
  - PROVIDE ROOF MOUNTING CURB, FILTERS AND FILTER RACK SIZED AT 500 FPM VELOCITY.
  - PROVIDE WITH COMFORT ZONE II (4 ZONES) ZONING SYSTEM. COORDINATE WITH GC FOR EXACT LOCATION OF EQUIPMENT CONTROLLER.

MINI-SPLIT SYSTEM HEAT PUMP UNIT																	
INDOOR UNIT					OUTDOOR UNIT					ELECTRICAL DATA							
MARK	MODEL	CFM	ESP "WC	FAN MOTOR (FLA)	ELECTRICAL	MARK	MODEL	COOLING CAP. SENS. MBH	TOTAL MBH	DB "F	WB "F	HTG. CAP. (MBH)	WT. (LBS)	VOLT/PHASE	COMP. RLA	FAN FLA	MOCP
FC-A	MSZ-GE18NA	533	-	0.76	DC12-24 SEE NOTE 7	CU-A	MUZ-GE18NA	10.4	14.7	80	67	13.4	119	230/1	10.0	0.93	15

- NOTES:
- UNITS SHALL BE AS MANUFACTURED BY: "MITSUBISHI" OR EQUAL.
  - UNITS ARE SIZED FOR 115°F SUMMER AMBIENT TEMPERATURE, 32°F WINTER TEMPERATURE.
  - COOLING CAPACITY, MINIMUM HEAT CAPACITY AND CFM ARE MINIMUM OUTPUT REQUIRED. ALL UNITS SHALL HAVE NO LESS THAN 98% OF THESE CAPACITIES. COOLING CAPACITY IS GROSS COIL CAPACITY REQUIRED (FAN HEAT NOT DEDUCTED).
  - PROVIDE FAN COIL UNIT WITH FILTERS AND FILTER RACK SIZED AT 500 FPM VELOCITY.
  - PROVIDE WITH PROGRAMMABLE THERMOSTAT.
  - SEE ELECTRICAL PLANS FOR VOLTAGE & PHASE. VERIFY WITH ELECTRICAL CONTRACTOR.
  - INDOOR UNIT RECEIVES POWER FROM OUTDOOR UNIT THROUGH FIELD SUPPLIED INTERCONNECTED WIRING.

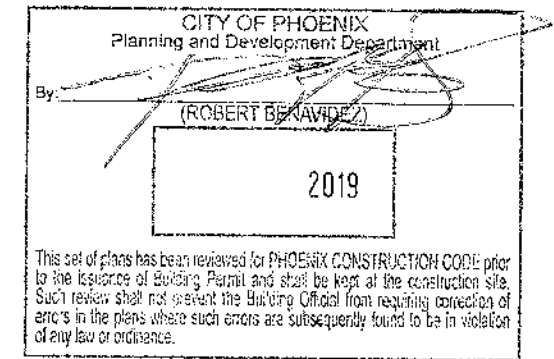
EXHAUST FAN SCHEDULE											
MARK	AREA SERVED	MANUFACTURER	MODEL	CFM	ESP ("WC)	VOLT/PHASE	MOTOR HP	DRIVE	BAROMETRIC DAMPER	SOUND (SONES)	CONTROL (NOTE 2)
EF-1	BATHROOM	PANASONIC	FV-0510VSI	50	0.25	120/1	FRAC.	DIRECT	YES	1.0	A

- NOTES:
- VERIFY VOLTAGE AND PHASE WITH ELECTRICAL CONTRACTOR.
  - FAN CONTROL: "A" = SEPARATE SWITCH, "B" = SWITCH WITH LIGHTS.

WHOLE HOUSE FAN SCHEDULE											
MARK	AREA SERVED	MANUFACTURER	MODEL	CFM	ESP ("WC)	VOLT/PHASE	MOTOR HP	DRIVE	BAROMETRIC DAMPER	SOUND (SONES)	CONTROL (NOTE 2)
WHF-1	WHOLE HOUSE FAN @ LAUNDRY ROOM	PANASONIC	FV-08VKM3	60	0.1	120/1	FRAC.	DIRECT	YES	0.3	*

- NOTES:
- VERIFY VOLTAGE AND PHASE WITH ELECTRICAL CONTRACTOR.
  - FAN CONTROL: RUNS CONTINUOUS (LOW SPEED), PROVIDE WITH MANUAL OVERRIDE SWITCH.
  - CALCULATION: 2 BEDROOMS, 1500 - 3000 SQ. FT. = 60 CFM.

GRILLE, REGISTER, AND DIFFUSER SCHEDULE									
MARK	DESCRIPTION	MANUFACTURER	MODEL	MATERIAL	FRAME	MODULE	FRONT BLADES	DAMPER	FINISH
CD-1	CEILING DIFFUSER	TRU AIRE	104	STEEL	FLANGE	-	LOUVERED	YES	WHITE
SR-1	SUPPLY REGISTER	TRU AIRE	102	STEEL	FLANGE	-	LOUVERED	YES	WHITE
FRG-1	FILTER RETURN GRILLE	TRU AIRE	270	STEEL	FLANGE	-	LOUVERED	NO	WHITE
TG	TRANSFER GRILLE	TRU AIRE	170	STEEL	FLANGE	-	LOUVERED	NO	WHITE



CONSTRUCTION DOCUMENTS

Revision Schedule		
No.	Date	Description

### LOAD CALCULATIONS (MANUAL J EQUIVALENT)

**Air System Sizing Summary for Unit 1 (Middle)**

Project Name: 18127 - Moli Gardens, Phoenix, AZ 02/20/2019  
 Prepared by: NP MECHANICAL 03:15PM

**Air System Information**  
 Air System Name: Unit 1 (Middle) Number of zones: 1  
 Air System Type: Single Zone CAV Floor Area: 1998.0 sqft  
 Location: Phoenix, Arizona

**Sizing Calculation Information**  
 Calculation Months: Jan to Dec Calculation method: Transfer Function Method

**Central Cooling Coil Sizing Data**  
 Total coil load: 2.3 Tons  
 OA DB / WB: 114.3/69.8 F  
 Entering DB / WB: 78.8/61.6 F  
 Leaving DB / WB: 60.1/54.4 F  
 Coil airflow: 1600 CFM  
 Sensible heat ratio: 1.000  
 Area per unit load: 851.0 sqft/Ton  
 Load per unit area: 13.9 BTU/(hr-sqft)

**Central Heating Coil Sizing Data**  
 Max coil load: 14.8 MBH  
 OA DB / WB: Des Htg  
 Ent DB / Lvg DB: 68.6/77.5 F  
 Coil airflow: 1600 CFM  
 Load per unit area: 7.4 BTU/(hr-sqft)

**Supply Fan Sizing Data**  
 Actual max airflow: 1600 CFM  
 Standard airflow: 1637 CFM  
 Actual max airflow per unit area: 0.80 CFM/sqft

**Outdoor Ventilation Air Data**  
 Design airflow: 60 CFM  
 Airflow per unit floor area: 0.03 CFM/sqft

**Space Sizing Data**

Space Name	Maximum Cooling Sensible Load MBH	Design Airflow CFM	Time of Peak Load	Maximum Heating Load MBH	Space Floor Area sqft	Space CFM/sqft
11 210 Liv	2.9	184	Sep 1500	1.3	150.0	1.22
11 242 Kl	2.1	133	Jul 1900	0.4	261.0	0.51
11 243 Stair	1.4	86	Jul 1700	1.2	194.0	0.47
11 244 Powder	0.1	4	Jul 1500	0.1	38.0	0.11
12 201 Large Flex	2.8	176	Jul 1500	1.5	352.0	0.50
12 203 Small Flex	1.4	87	Jul 1500	0.4	143.0	0.61
12 204 MBed	3.6	231	Sep 1500	1.5	211.0	1.09
12 205 MBath	0.5	31	Jul 1500	0.3	126.0	0.25
12 205 MBed W/C	0.2	11	Jul 1500	0.1	46.0	0.25
12 208 Bath	0.3	20	Jul 1500	0.3	46.0	0.44
12 208 Toilet	0.3	19	Jul 1500	0.3	44.0	0.44
12 240 Liv 2 Story	5.6	359	Oct 1400	2.6	111.0	3.24
12 210 Bed A	2.8	176	Jul 1500	1.5	140.0	1.25
12 212 Bed B	2.7	172	Jul 1500	1.5	146.0	1.18
Zone	25.1	1600	Sep 1500	12.8	1998.0	0.80

Note: Table contains data for all spaces controlled by a single thermostat.  
 Space sizing basis: Peak space load  
 Zone sizing basis: Peak zone load

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SOFTWARE USED: CARRIER E20-II BLOCK LOAD.

### LOAD CALCULATIONS (MANUAL J EQUIVALENT)

**Air System Sizing Summary for Unit 2 (Kitchen End)**

Project Name: 18127 - Moli Gardens, Phoenix, AZ 02/20/2019  
 Prepared by: NP MECHANICAL 03:15PM

**Air System Information**  
 Air System Name: Unit 2 (Kitchen End) Number of zones: 1  
 Air System Type: Single Zone CAV Floor Area: 2023.0 sqft  
 Location: Phoenix, Arizona

**Sizing Calculation Information**  
 Calculation Months: Jan to Dec Calculation method: Transfer Function Method

**Central Cooling Coil Sizing Data**  
 Total coil load: 3.1 Tons  
 OA DB / WB: 114.3/69.8 F  
 Entering DB / WB: 76.6/61.5 F  
 Leaving DB / WB: 58.7/54.9 F  
 Coil airflow: 2000 CFM  
 Sensible heat ratio: 1.000  
 Area per unit load: 654.2 sqft/Ton  
 Load per unit area: 18.3 BTU/(hr-sqft)

**Central Heating Coil Sizing Data**  
 Max coil load: 20.5 MBH  
 OA DB / WB: Des Htg  
 Ent DB / Lvg DB: 68.6/77.5 F  
 Coil airflow: 2000 CFM  
 Load per unit area: 10.1 BTU/(hr-sqft)

**Supply Fan Sizing Data**  
 Actual max airflow: 2000 CFM  
 Standard airflow: 1921 CFM  
 Actual max airflow per unit area: 0.99 CFM/sqft

**Outdoor Ventilation Air Data**  
 Design airflow: 60 CFM  
 Airflow per unit floor area: 0.03 CFM/sqft

**Space Sizing Data**

Space Name	Maximum Cooling Sensible Load MBH	Design Airflow CFM	Time of Peak Load	Maximum Heating Load MBH	Space Floor Area sqft	Space CFM/sqft
11 210 Liv(2)	2.8	153	Sep 1500	1.2	150.0	1.02
11 242 Kl(2)	2.7	155	Jul 1200	0.8	272.0	0.57
11 243 Stair(2)	1.7	101	Jul 1800	1.5	191.0	0.53
11 244 Powder(2)	0.3	16	Jul 1200	0.2	45.0	0.39
12 201 Large Flex(2)	6.0	349	Jul 1400	3.3	352.0	0.99
12 203 Small Flex(2)	3.0	173	Jul 1300	1.3	143.0	1.21
12 204 MBed(2)	3.6	212	Sep 1500	1.5	211.0	1.00
12 205 MBath(2)	0.5	26	Jul 1500	0.3	126.0	0.23
12 205 MBed W/C(2)	0.2	10	Jul 1500	0.1	46.0	0.23
12 208 Bath(2)	0.3	18	Jul 1500	0.3	46.0	0.40
12 208 Toilet(2)	0.3	18	Jul 1500	0.3	45.0	0.40
12 210 Bed A(2)	4.3	251	Jul 1500	2.5	141.0	1.78
12 212 Bed B(2)	2.9	167	Jul 1500	1.6	147.0	1.14
12 240 Liv 2 Story(2)	7.3	425	Sep 1400	3.8	111.0	3.83
Zone	34.2	2000	Aug 1400	18.4	2023.0	0.99

Note: Table contains data for all spaces controlled by a single thermostat.  
 Space sizing basis: Peak space load  
 Zone sizing basis: Peak zone load

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SOFTWARE USED: CARRIER E20-II BLOCK LOAD.

### LOAD CALCULATIONS (MANUAL J EQUIVALENT)

**Air System Sizing Summary for Unit 3 (Living Rm End)**

Project Name: 18127 - Moli Gardens, Phoenix, AZ 02/20/2019  
 Prepared by: NP MECHANICAL 03:15PM

**Air System Information**  
 Air System Name: Unit 3 (Living Rm End) Number of zones: 1  
 Air System Type: Single Zone CAV Floor Area: 2019.0 sqft  
 Location: Phoenix, Arizona

**Sizing Calculation Information**  
 Calculation Months: Jan to Dec Calculation method: Transfer Function Method

**Central Cooling Coil Sizing Data**  
 Total coil load: 3.0 Tons  
 OA DB / WB: 114.3/69.8 F  
 Entering DB / WB: 76.3/61.4 F  
 Leaving DB / WB: 60.1/55.1 F  
 Coil airflow: 2000 CFM  
 Sensible heat ratio: 1.000  
 Area per unit load: 679.7 sqft/Ton  
 Load per unit area: 17.7 BTU/(hr-sqft)

**Central Heating Coil Sizing Data**  
 Max coil load: 17.1 MBH  
 OA DB / WB: Des Htg  
 Ent DB / Lvg DB: 68.6/77.5 F  
 Coil airflow: 2000 CFM  
 Load per unit area: 8.5 BTU/(hr-sqft)

**Supply Fan Sizing Data**  
 Actual max airflow: 2000 CFM  
 Standard airflow: 1921 CFM  
 Actual max airflow per unit area: 0.99 CFM/sqft

**Outdoor Ventilation Air Data**  
 Design airflow: 60 CFM  
 Airflow per unit floor area: 0.03 CFM/sqft

**Space Sizing Data**

Space Name	Maximum Cooling Sensible Load MBH	Design Airflow CFM	Time of Peak Load	Maximum Heating Load MBH	Space Floor Area sqft	Space CFM/sqft
11 210 Liv(1)	2.4	212	Sep 1600	1.6	150.0	1.42
11 242 Kl(1)	3.1	194	Jul 1700	0.9	265.0	0.73
11 243 Stair(1)	1.9	116	Jul 1800	1.5	189.0	0.62
11 244 Powder(1)	0.1	4	Jul 1500	0.1	38.0	0.10
12 201 Large Flex(1)	3.7	226	Jul 1500	1.9	355.0	0.64
12 203 Small Flex(1)	1.4	85	Jul 1500	0.4	145.0	0.59
12 204 MBed(1)	4.8	298	Sep 1600	2.2	211.0	1.41
12 205 MBath(1)	1.2	73	Jul 1600	0.7	126.0	0.57
12 205 MBed W/C(1)	0.2	11	Jul 1500	0.1	46.0	0.24
12 208 Bath(1)	0.7	43	Jul 1800	0.5	46.0	0.93
12 208 Toilet(1)	0.6	39	Sep 1500	0.5	44.0	0.89
12 210 Bed A(1)	3.5	215	Jul 1700	1.6	144.0	1.49
12 240 Liv 2 Story(1)	5.7	360	Oct 1400	2.6	113.0	3.09
12 212 Bed B(1)	3.9	242	Jul 1700	2.1	146.0	1.63
Zone	32.4	2000	Aug 1600	16.5	2019.0	0.99

Note: Table contains data for all spaces controlled by a single thermostat.  
 Space sizing basis: Peak space load  
 Zone sizing basis: Peak zone load

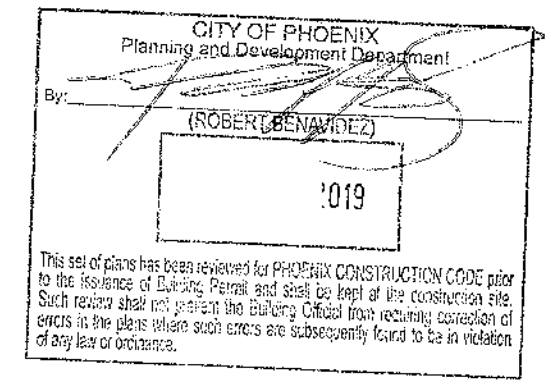
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SOFTWARE USED: CARRIER E20-II BLOCK LOAD.

UNIT	AREA (SQ. FT.)	VENTILATION					MANUAL S SUMMARY			MANUAL D SUMMARY				
		People Outdoor Airflow Rate (Rp - CFM/Person)	Area Outdoor Airflow Rate (Ra - CFM/SP)	Number of Person	Required Minimum Outdoor Air Intake (CFM)	Design Outdoor Air Intake (CFM)	Calculated Heat Gain (BTU/HR)	A/C Unit Sensible Capacity (BTU/HR)	Equipment Capacity % Over Calculated Loads	Manufacturer's Blower Data External Static Pressure (IWC)	Device Pressure Loss (IWC)	Available Static Pressure (IWC)	Total Effective Length (FT)	Friction Rate Design Value (Wx/100')
UNIT 1	1998	7.5	0.01	5	57	60	27.8	31.1	12%	0.52	0.24	0.28	350	0.08
UNIT 2	2023	7.5	0.01	5	58	60	37.1	39.8	7%	0.52	0.24	0.28	350	0.08
UNIT 3	2019	7.5	0.01	5	58	60	35.6	39.8	11%	0.52	0.24	0.28	350	0.08

**CONSTRUCTION DOCUMENTS**

Revision Schedule		
No.	Date	Description



Mechanical Notes & Schedules

M3.2