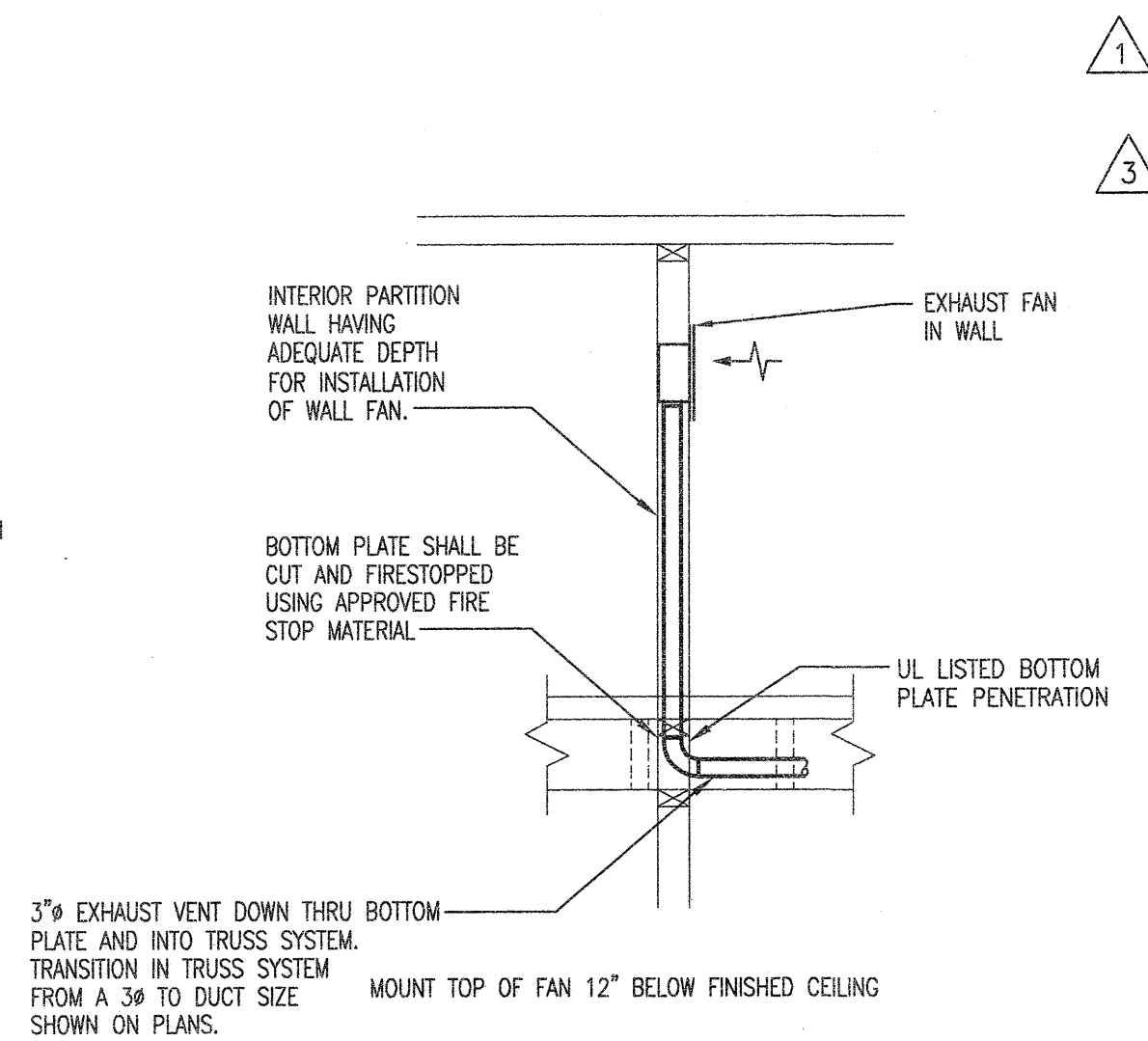
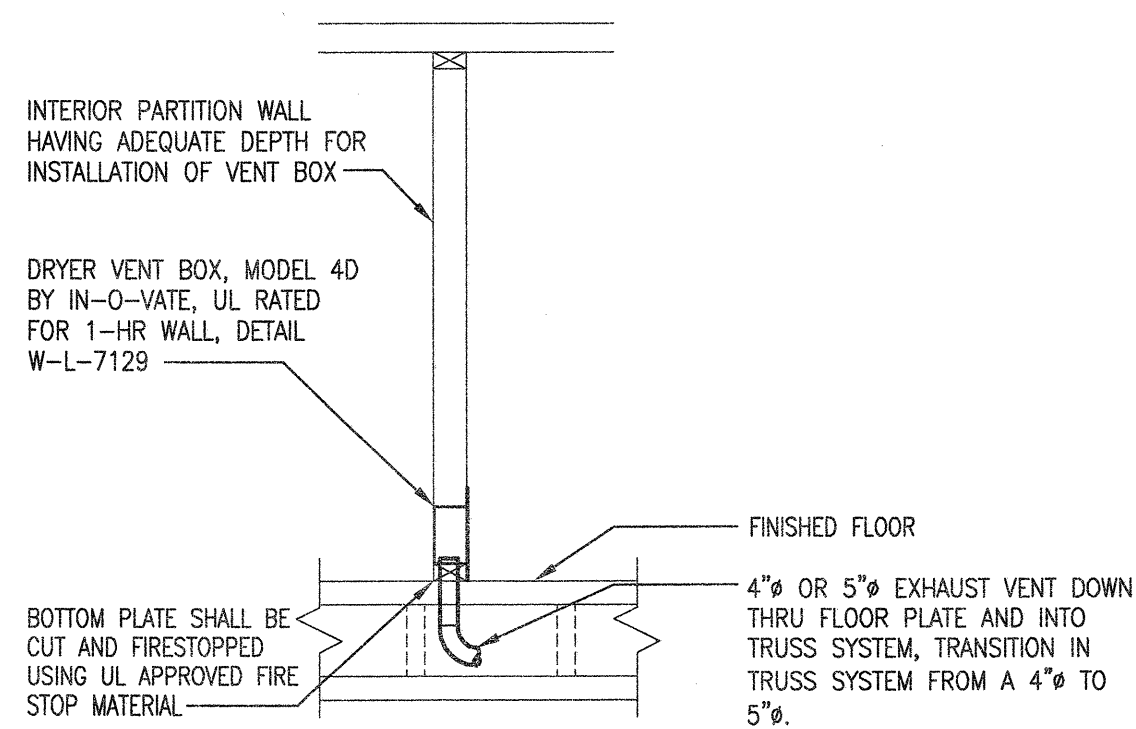


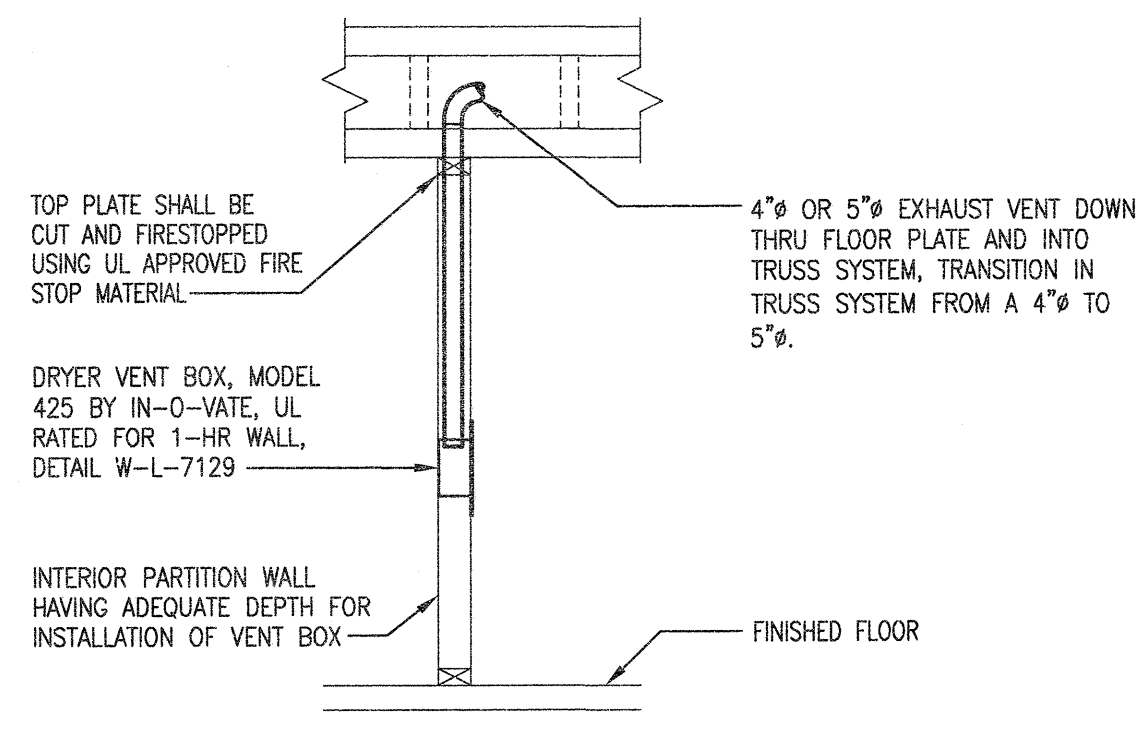
**EXHAUST FAN DUCTING DETAIL**  
SCHEMATIC - NO SCALE



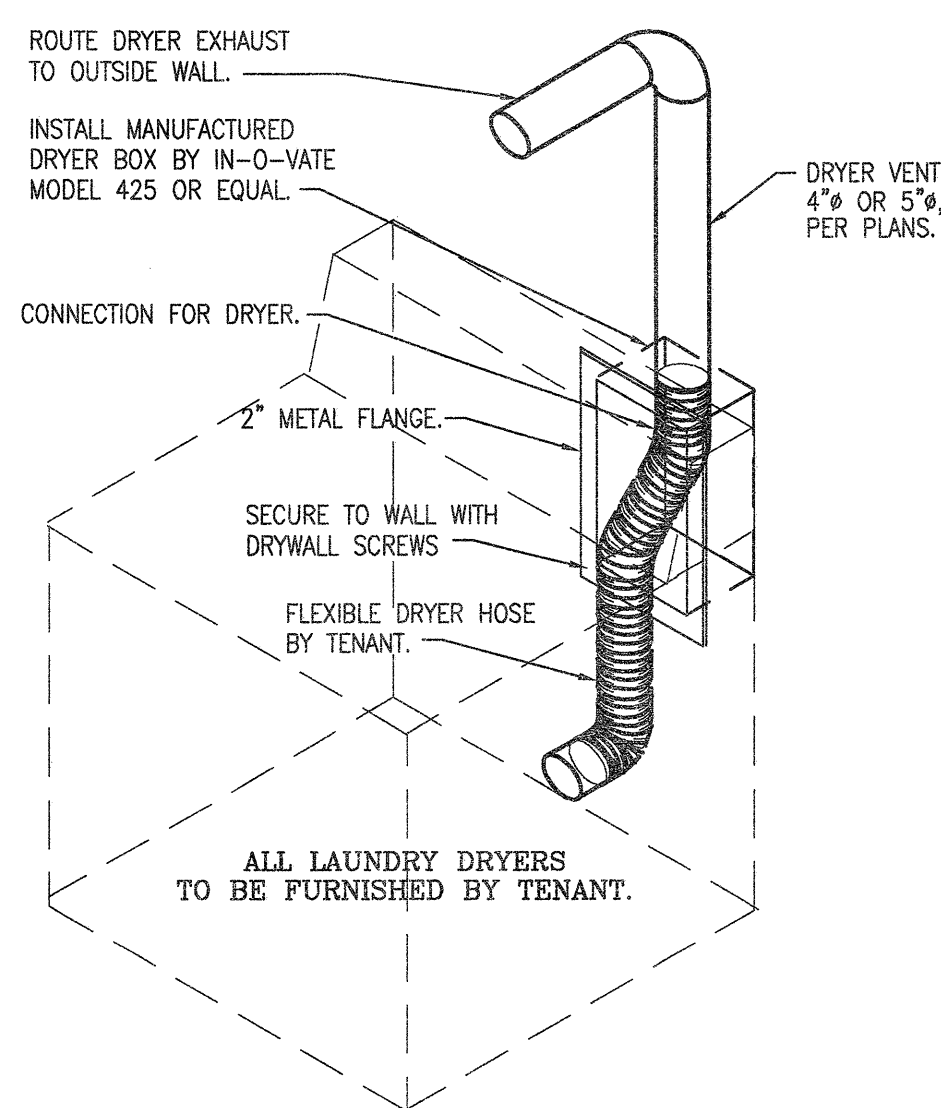
**EXHAUST FAN DUCTING DETAIL**  
SCHEMATIC - NO SCALE



**TOP LEVEL DRYER VENT DUCTING DETAIL**  
SCHEMATIC - NO SCALE

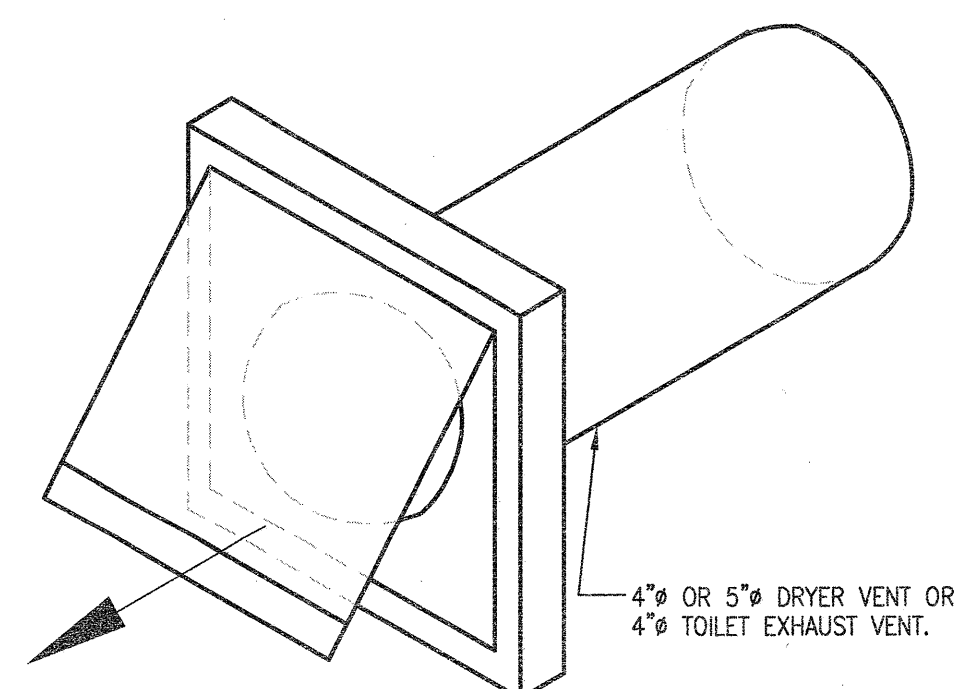


**LOWER LEVELS DRYER VENT DUCTING DETAIL**  
SCHEMATIC - NO SCALE



NOTE:  
1. DRYER VENT BOXES IN FIRE RATED WALLS SHALL BE UL LISTED.  
2. INSTALL MANUFACTURED ONE HOUR RATED "DRYER BOX" BY IN-O-VATE.  
3. INSTALL PER MANUFACTURER'S REQUIREMENTS TO MAINTAIN FIRE RATING. WWW.DRYERBOX.COM

**DRYER VENT BOX DETAIL**  
SCHEMATIC - NO SCALE



NOTE:  
1. PROVIDE WITH INTEGRAL BACKDRAFT DAMPER  
2. WALL CAP BY VENTRAFT, OR APPROVED EQUAL  
3. PROVIDE CAP WITH PAINT GRIP COATING FOR FIELD PAINTING.

**DRYER AND TOILET EXHAUST WALL CAP DETAIL**  
SCHEMATIC - NO SCALE

**DX PACKAGED ROOFTOP UNITS WITH GAS HEAT**

TAG	MODEL No.	NOMINAL TONS	COOL/HEAT DUTY	TOTAL CFM	MIN. O.A. CFM	ESP (IN.WG)	MAX FAN BHP	COOLING		HEATING		ACCESSORIES	
								MBH COOL. TOTAL	MBH COOL. SENSIBLE	EER	INPUT		OUTPUT
RTU-1,2,3,4,5,6,7,8	48HCEB07	6.0	COOL/HEAT	2,400	615	1.0	1.96	70.8	53.0	12.0	90.0/125.0	103.0	1,2,3,4,5,6,7,8,9,10,11,12,13,14,15,16,17,18

NOTES:  
A. COOLING CAPACITY BASED ON 80°F DB/67°F WB ENTERING AIR TEMPERATURE AND 105°F DB OUTDOOR AIR TEMPERATURE.  
B. R-410a REFRIGERANT.

ACCESSORIES:  
1. HORIZONTAL CONFIGURATION WITH 14" MIN HIGH ROOF CURB.  
2. 7-DAY PROGRAMMABLE COMBINATION THERMOSTAT/HUMIDISTAT WITH LOCKING COVER BY UNIT MANUFACTURER.  
3. COMPRESSOR ANTI-RECYCLE CONTROLS.  
4. UNIT SHALL SHUTDOWN UPON SIGNAL FROM BUILDING FIRE ALARM SYSTEM. PROVIDE SMOKE DETECTOR IN RETURN AIR DUCT.  
5. BELT DRIVE MOTOR.  
6. LOW AMBIENT OPERATION.  
7. CRANKCASE HEATER.  
8. SINGLE POINT POWER CONNECTION WITH DISCONNECT.  
9. FACTORY-INSTALLED HUMIDIFIER DEHUMIDIFICATION SYSTEM.  
10. FIELD SUPPLIED BELT DRIVE.  
11. SMOKE DETECTOR IN RETURN AIR DUCT.  
12. SUPPLY AIR FANS SHALL RUN CONTINUOUSLY.  
13. BAROMETRIC RELIEF DAMPER.  
14. ECONOMIZER.  
15. REMOTE THERMOSTAT SENSOR FOR DRY BULB AVERAGING AT LOWEST AND HIGHEST FLOORS SERVED.  
16. MINIMUM OF 2 STAGES OF GAS HEAT.  
17. INSULATED TROOP OUTSIDE AIR DAMPER.  
18. POWERED EXHAUST. (RTU-1,3,5,7) ONLY

SELECTIONS ARE BASED ON PRODUCTS BY: CARRIER.

**GARAGE VENTILATION CONTROL SYSTEM**

CARBON MONOXIDE DETECTION SYSTEM: PROVIDE (1) STAND ALONE GAS DETECTION SYSTEM WITH FIVE TO SIX REMOTE SENSORS PER PARKING GARAGE LEVEL MANUFACTURED BY CRITICAL ENVIRONMENT TECHNOLOGIES (RANDY BARNES AT BARTOS INDUSTRIES 214-350-6871). INCLUDED WITH THE CARBON MONOXIDE CONTROL SYSTEM WILL BE A WATER/DUST TIGHT CORROSION RESISTANT CONTROL PANEL ENCLOSURE AND AUTOMATIC RESETTING THERMAL CIRCUIT FUSE.

EVERY GAS DETECTION CONTROL PANEL AND REMOTE SENSOR SHALL BE INTERLOCKED TO THE FAN(S) AS NOTED ON THESE PLANS AND SCHEDULES. MECHANICAL VENTILATION SYSTEMS FOR ENCLOSED PARKING GARAGES ARE NOT REQUIRED TO OPERATE CONTINUOUSLY WHERE THE SYSTEM IS ARRANGED TO OPERATE AUTOMATICALLY UPON DETECTION OF A CONCENTRATION OF CARBON MONOXIDE OF 25 PARTS PER MILLION (PPM). THE SYSTEM SHALL NOT REDUCE THE VENTILATION RATE BELOW 0.05 CFM/SQFT OF FLOOR AREA AND SHALL BE CAPABLE OF PRODUCING A VENTILATION RATE OF 1.5 CFM/SQFT OF FLOOR AREA.

MODEL NUMBERS:  
CO CONTROL PANEL: PDC08B (LOCATE PANELS AS SHOWN ON PLANS)  
REMOTE CO DETECTION SENSOR (TYP. 5): DST-MCO (LOCATE SENSORS AS SHOWN ON PLANS)

**ELECTRIC HEATERS**

TAG	MODEL No.	DESCRIPTION	HEAT CAPACITY	MOUNTING	ACCESSORIES
EH-A	AFA	WALL HEATER	4.0 kW	SEE DRAWINGS	1,2,3,4
EH-B	AFA	WALL HEATER	3.0 kW	SEE DRAWINGS	1,2,3,4

NOTE:  
A. UNIT INSTALLED MUST BE CAPABLE OF DELIVERING KW OUTPUT SPECIFIED AT AVAILABLE VOLTAGE AND PHASE.

ACCESSORIES:  
1. TAMPER PROOF CONTROLS.  
2. INTEGRAL THERMOSTAT & DISCONNECT SWITCH.  
3. AUTO-RESET THERMAL OVERLOADS.  
4. WALL/CEILING MOUNTING BRACKET.

SELECTIONS ARE BASED ON PRODUCTS BY: RAYWALL

**DUCTLESS SPLIT SYSTEM HEAT PUMPS**

TAG	MODEL NO. OUTDOOR/INDOOR	AIRFLOW (INDOOR UNIT) (CFM)	TOTAL COOLING (MBH)	TOTAL HEATING (MBH)	COOLING EAT (DB/WB)	ACCESSORIES
AH/HP-E1,E2	PUZ-A18NHA/PKA-A18GAL	425	18.0	19.0	80/67	1,2,3,4,5,6
AH/HP-F1	PUZ-A18NHA/PKA-A18GAL	425	18.0	19.0	80/67	1,2,3,4,5,6
AH/HP-M	PUZ-A18NHA/PKA-A18GAL	425	18.0	19.0	80/67	1,2,3,4,5,6
AH/HP-T2	PUZ-A36NHA/PKA-A36GAL	990	34.2	37.0	80/67	1,2,3,4,5,6
AH/HP-FP	PUZ-A36NHA/PKA-A36GAL	990	34.2	37.0	80/67	1,2,3,4,5,6

NOTE:  
A. COOLING CAPACITIES BASED ON 95°F AMBIENT COOLING, 80°F db/67°F wb ENTERING AIR TEMPERATURE AND 47°F AMBIENT HEATING.  
B. ROUTE 3/4" AH CONDENSATE TO NEAREST PLUMBING DRAIN. SEE PLUMBING DRAWINGS.  
C. 13 SEER MINIMUM UNITS.

ACCESSORIES:  
1. MICROPROCESSOR CONTROL WITH NON-REMOVABLE MOUNTING BRACKET.  
2. DISCONNECT SWITCH FOR INDOOR UNIT SHALL BE BY DIVISION 16.  
3. DISCONNECT SWITCH FOR OUTDOOR UNIT SHALL BE BY DIVISION 16.  
4. CONDENSATE PUMP W/CHECK VALVE ON INDOOR UNIT (FIELD MOUNTED).  
5. WASHABLE FILTER.  
6. PRE-CHARGED REFRIGERANT LINE SET.

SELECTIONS ARE BASED ON PRODUCTS BY: MITSUBISHI.

**WALL LOUVERS**

TAG	MODEL No.	DUTY	SIZE WxH (INCHES)	FREE AREA (SQ.FT.)	CFM	MAX. PRESS. DROP (IN. W.C.)	OPERATOR	ACCESSORIES
WL-A	EAH-690	RELIEF	72"x18"	3.0	SEE PLANS	0.05"	ELECTRIC	1,2,3,4
WL-B	EDJ-401	EXHAUST	24"x12"	0.60	SEE PLANS	0.05"	NONE	1,2
WL-C	EDJ-401	INTAKE	30"x12"	0.75	SEE PLANS	0.05"	NONE	1,2

NOTE:  
A. FINAL COLOR SELECTION SHALL BE MADE BY ARCHITECT AT TIME OF SHOP DRAWING APPROVAL.

ACCESSORIES:  
1. BIRD SCREEN.  
2. BAKED ENAMEL FINISH.  
3. SHALL BE NORMALLY CLOSED, BUT OPEN DURING LOSS OF POWER AND DURING FIRE ALARM.  
4. INTERLOCK TO FIRE ALARM SYSTEM / SMOKE DETECTOR.

SELECTIONS BASED ON GREENHECK

**ALTERNATE DRYER VENTING** SUBJECT TO BUILDING OFFICIAL APPROVAL

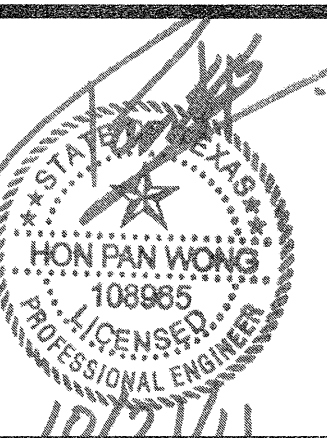
(TO BE USED WHEN 2009 IMC SECTION 506.4.1 CANNOT BE MET)

BASIS FOR ALTERNATE DESIGN:

- CALCULATE ALLOWABLE DUCT PRESSURE LOSS PER 2009 IMC 506.4.1:  
PER CODE - 25 FT. EQUIVALENT  
TYPICAL DRYER EXHAUST RATE - 200 CFM  
COEFFICIENT OF FRICTION (f4) FOR 200 CFM THROUGH 4" ROUND DUCT = 2.2 IN. W.G. PER 100 FT.  
CODE PRESSURE LOSS => 25 FT. x 2.2 IN. W.G. / 100 FT. = 0.55 IN. W.G.
- ALTERNATE ENGINEERED DESIGN IS COMPOSED AS ILLUSTRATED ABOVE:  
1. A VERTICAL LENGTH OF 4" ROUND VENT DUCT STUBBED UP FROM A RECESSED DRYER VENT BOX.  
2. ONE (1) 4" ROUND 90° ELBOW AT THE TOP OF THE VERTICAL DUCT WITHIN THE RATED FLOOR/CEILING ASSEMBLY.  
3. ONE (1) 4"-TO-5" ROUND TRANSITION INCREASER.  
4. A HORIZONTAL LENGTH OF 5" ROUND VENT DUCT ROUTED OUT THROUGH THE EXTERIOR WALL TO A WALL CAP. THEREFORE ALTERNATE ENGINEERED DESIGN MUST NOT EXCEED 0.55 IN. W.G. PRESSURE LOSS THROUGH THE DRYER VENT SYSTEM.
- FITTING PRESSURE LOSS DEDUCTIONS AND FRICTION FACTORS:  
VERTICAL LENGTH 1: 6'-0" OF 4" VERTICAL DUCT = 0.13 IN. W.G.  
4" 90 DEGREE ELBOW = 0.11"  
4"-TO-5" INCREASER = 0.00"  
WALL CAP TERMINATION = 0.00"  
COEFFICIENT OF FRICTION (f5) FOR 200 CFM THROUGH 5" ROUND DUCT = 0.76 IN. W.G. PER 100 FT.
- CALCULATE THE MAXIMUM EQUIVALENT 5" ROUND HORIZONTAL DUCT LENGTH LIMITATIONS:  
MAXIMUM 5" HORIZ. DUCT PRESS. LOSS = CODE PRESS. LOSS - 4" VERTICAL DUCT LOSS - 4" ELBOW =>  
1: 0.55 IN. - 0.13 IN. - 0.11 IN. = 0.31 IN. W.G.  
THEREFORE THE MAXIMUM ALLOWABLE PRESSURE DROP THROUGH THE 5" ROUND DUCT IS 0.31 IN. W.G.  
MAXIMUM EQUIVALENT 5" HORIZ. DUCT LENGTH = MAX. 5" PRESS. LOSS / f5 =>  
1: 0.31 IN. / (0.76 IN./100 FT.) = 40.8 EQUIVALENT FT.

THEREFORE THE MAXIMUM EQUIVALENT 5" ROUND HORIZONTAL DUCT LENGTH IS 40.8 EQUIVALENT FT. AND THE TOTAL EQUIVALENT LENGTH IS 51.8 EQUIVALENT FT.

**CODE ALTERNATE DRYER VENT LENGTH DESIGN WITH VENT BOX**  
SCHEMATIC - NO SCALE



REVISIONS

1	9-2-2011	DESIGN REVISIONS
2	9-13-2011	ANSI/FHA COMMENTS
3	9-23-2011	DESIGN REVISIONS
4	10-17-2011	CONSTRUCTION ISSUE

**KELLER SPRINGS LOFTS**

LOFT APARTMENTS IN ADDISON, TEXAS

**AS BUILT**



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DATE  
08-05-11

PROJECT  
11129

SHEET NUMBER

**M-1.1**  
DETAILS & SCHEDULES MECHANICAL