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 State of North Carolina  
 Mechanical Engineering

**Hardee's**  
 CHARACTERS & PRODUCTIONS  
 HARDEE'S TAKE PROTOTYPE  
 143 CHURCH STREET  
 BATESBURG-LEESVILLE, SOUTH CAROLINA 29024

NO.	REVISIONS	DESCRIPTION	DATE

DRAWN BY	CHECKED BY #1	CHECKED BY #2	APPROVED BY
BT	MJM		

C&E SITE ID.:  
 DATE: 2-28-17

SHEET NUMBER:  
**M4**

**BLDG. PRESSURE BALANCE PROCEDURE**

REF: ME27-CB  
 INITIAL OUTSIDE AIR DAMPER POSITION, FULL OPEN FOR ALL RTU'S. BACK DOOR OF RESTAURANT MUST BE FULLY OPEN WITH ALL EXHAUST FANS ON, AND ROTATING IN THE CORRECT DIRECTION. USING VELOMETER, OBTAIN SPECIFIED CFM ON THE FOLLOWING EXHAUST EQUIPMENT. AFTER SETTING EXHAUST FANS CFM ADJUST RTU'S TO SPECIFIED OUTSIDE AIR, EXHAUST FANS AND RTU FANS MUST BE RUNNING CONTINUOUSLY.

**CHAINBOILER HOOD (EF-1)**

- FILTER SIZES: SEE HOOD DRAWINGS FOR SIZES
1. TAKE 9 READINGS PER FILTER EQUALLY SPACED ACROSS FACE OF FILTER ABOUT 1 1/2" FROM FILTER FACE.
  2. ADD THE 9 READINGS AND DIVIDE BY 9 TO GET AVERAGE VELOCITY. REPEAT FOR EACH FILTER.
  3. MULTIPLY THE AVERAGE VELOCITY OF EACH FILTER BY 1.78 FOR SIZE 16"x16" AND 2.22 FOR 16"x20" TO OBTAIN CFM ACROSS EACH FILTER. SUM CFMS FOR EACH FILTER TO OBTAIN TOTAL CFM ACROSS HOOD.
  4. VERIFY CFM ANSWER AS THE SAME ON M-2 SHEET.

**OVEN HOOD (EF-2)**

- FILTER SIZES: SEE HOOD DRAWINGS FOR SIZES
1. TAKE 9 READINGS PER FILTER EQUALLY SPACED ACROSS FACE OF FILTER ABOUT 1 1/2" FROM FILTER FACE.
  2. ADD THE 9 READINGS AND DIVIDE BY 9 TO GET AVERAGE VELOCITY. REPEAT FOR EACH FILTER.
  3. MULTIPLY THE AVERAGE VELOCITY OF EACH FILTER BY 1.78 FOR SIZE 16"x16" AND 2.22 FOR 16"x20" TO OBTAIN CFM ACROSS EACH FILTER. SUM CFMS FOR EACH FILTER TO OBTAIN TOTAL CFM ACROSS HOOD.
  4. VERIFY CFM ANSWER AS THE SAME ON M-2 SHEET.

**GRIDDLE HOOD (EF-3)**

- FILTER SIZES: SEE HOOD DRAWINGS FOR SIZES
1. TAKE 9 READINGS PER FILTER EQUALLY SPACED ACROSS FACE OF FILTER ABOUT 1 1/2" FROM FILTER FACE.
  2. ADD 9 READINGS AND DIVIDE BY 9 TO GET AVERAGE VELOCITY. REPEAT FOR EACH FILTER.
  3. MULTIPLY THE AVERAGE VELOCITY OF EACH FILTER BY 2.22 FOR SIZE 20"x16" AND 2.78 FOR 20"x20" TO OBTAIN CFM ACROSS EACH FILTER. SUM CFMS FOR EACH FILTER TO OBTAIN TOTAL CFM ACROSS HOOD.
  4. VERIFY CFM ANSWER AS THE SAME ON M-2 SHEET.

**FRYER (EF-4)**

- FILTER SIZES: SEE HOOD DRAWINGS FOR SIZES
1. TAKE 9 READINGS PER FILTER EQUALLY SPACED ACROSS FACE OF FILTER ABOUT 1 1/2" FROM FILTER FACE.
  2. ADD 9 READINGS AND DIVIDE BY 9 TO GET AVERAGE VELOCITY. REPEAT FOR EACH FILTER.
  3. MULTIPLY THE AVERAGE VELOCITY OF EACH FILTER BY 2.22 FOR SIZE 20"x16" AND 2.78 FOR 20"x20" TO OBTAIN CFM ACROSS EACH FILTER. SUM CFMS FOR EACH FILTER TO OBTAIN TOTAL CFM ACROSS HOOD.
  4. VERIFY CFM ANSWER AS THE SAME ON M-2 SHEET.

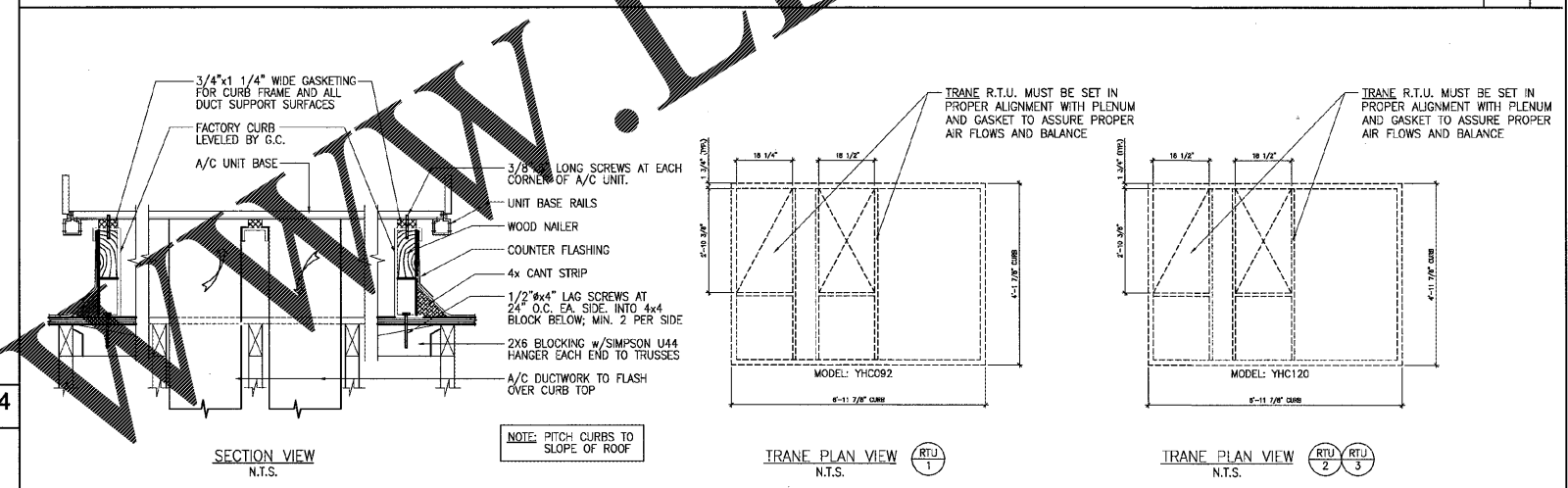
**RTU NO. 1, 2 & 3**

1. WITH O.A. DAMPER IN FULL OPEN POSITION TAKE 12 READINGS ACROSS FACE OF O.A. INTAKE AND CALCULATE AVERAGE FACE VELOCITY (Fv). MULTIPLY FACE VELOCITY (FPM) x 3.14 x 100 SQ. FT. TO OBTAIN AIR VOLUME (CFM).
2. WITH O.A. DAMPER IN FULL OPEN POSITION TAKE 9 READINGS ACROSS FACE OF THE TOP RETURN AIR GRILLE AND CALCULATE AVERAGE FACE VELOCITY (Fv). MULTIPLY FACE VELOCITY (FPM) x 6.6 SQ. FT. TO OBTAIN R.A. VOLUME (CFM).
3. SUM COMPONENT CFM'S AND COMPARE TO SPECIFIED ON M-2 SHEET. MAKE NECESSARY ADJUSTMENTS TO DRIVE AND BALANCE DAMPERS TO OBTAIN PROPER CFM.

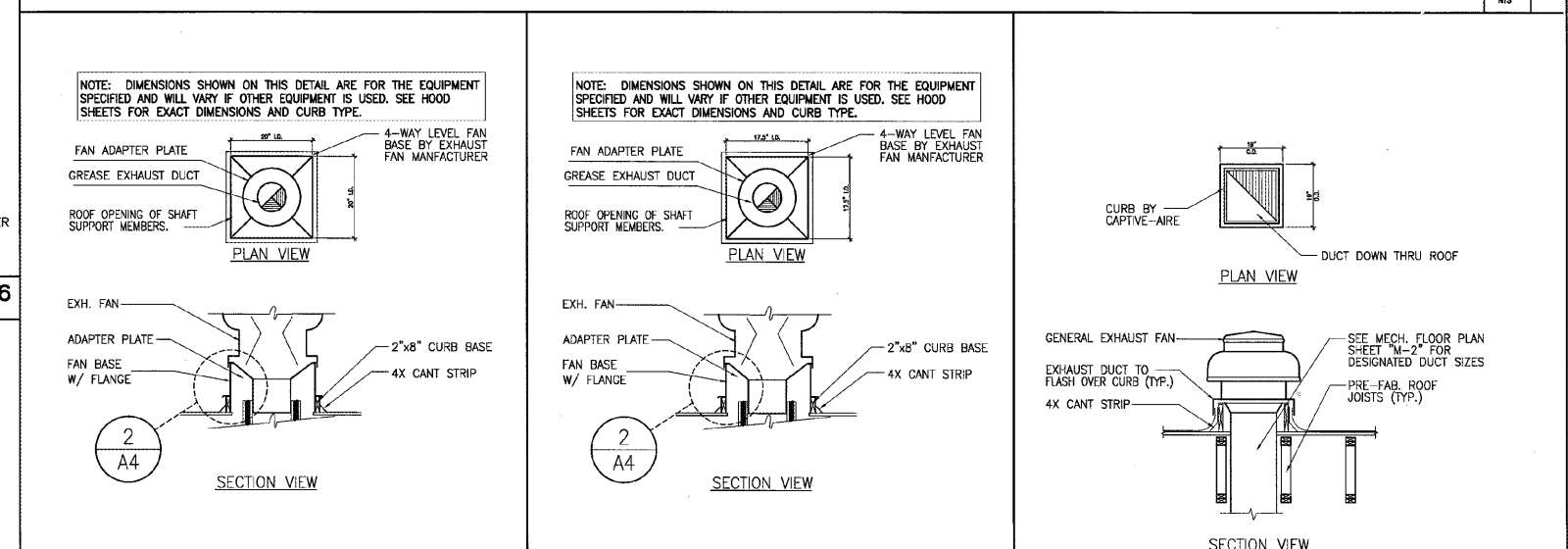
**CLOSE BACK DOOR**

CHECK ALL DOORS AND DRIVE THRU WINDOW TO INSURE BUILDING IS UNDER POSITIVE PRESSURE. THIS CAN BE VERIFIED BY USING A "SMOKER", CIGARETTE, TISSUE OR METER TO VERIFY PRESSURE. DIFFERENTIAL OPEN DOOR OR WINDOW (2" MAX.), AIR SHOULD FLOW TO THE OUTSIDE OF BUILDING. SYSTEM IS PROPERLY BALANCED.

**BALANCING PROCEDURE**



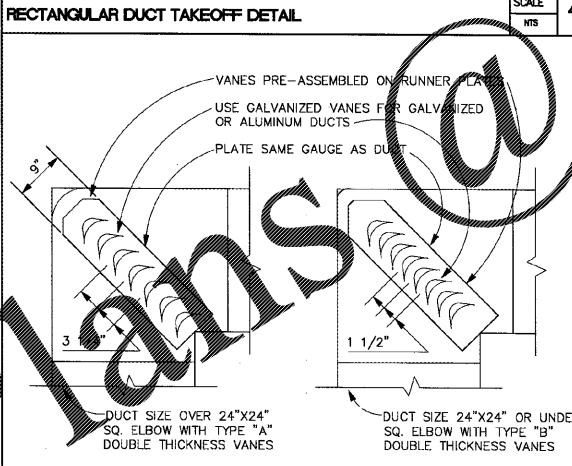
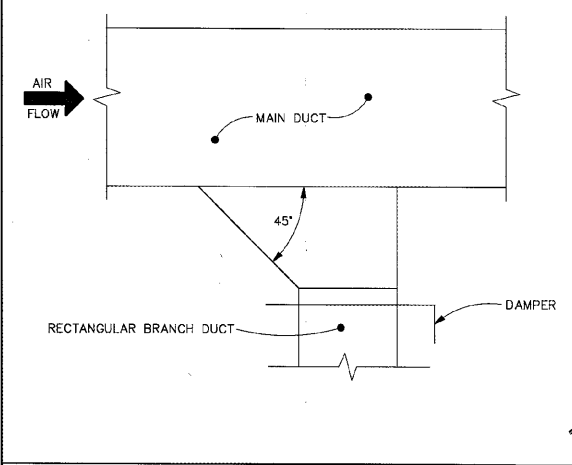
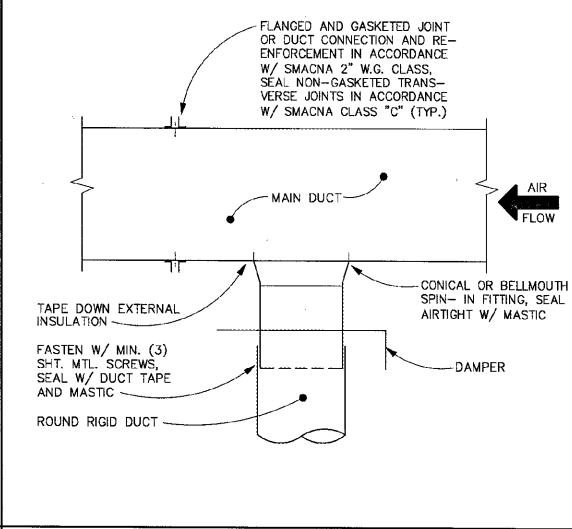
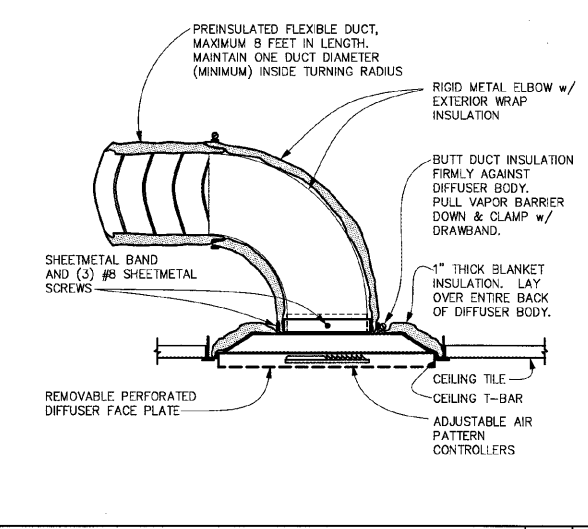
**ROOFTOP UNIT DETAIL**



EXHAUST FAN DETAIL - EF-1

EXHAUST FAN DETAIL - EF-2,3,4

EXHAUST FAN DETAIL - EF-5



LAY-IN DIFFUSER DETAIL

ROUND DUCT TAKEOFF DETAIL

RECTANGULAR DUCT TAKEOFF DETAIL

TURNING VANE DETAIL

NOT USED

NOT USED

Order Plans @