TITUS DIFFUSER AND GRILLE SCHEDULE

SYMBOL	MODEL NO.	BOOT NECK	CEILING TYPE	CEILING OPENING REQUIRED	QUANTITY	CEILING TYPE	CEILING OPENING REQUIRED	QUANTITY
A	MCPAS-ALUM	1. 12" ø	T-BAR	23 1/2" X 23 1/2"	10	DRYWALL (PF)-PLASTER FRAMES REQUIRED	24 1/2"X24 1/2"	
		2. 10" ø			5			
		3. 8" ø			2			
B	MC 50P	1. 19"SQR/16"ø	T-BAR	23 1/2" X 23 1/2"	9	DRYWALL OR DUCTWORK	19 1/4"X19 1/4"	
		2. 19"SQR/14"ø			2			
		3. 19"SQR/10"ø			2			
C	MC TDC 4WAY	1. 15"SQR/12"ø	T-BAR	23 1/2" X 23 1/2"	1	DRYWALL OR DUCTWORK	18" X 18"	
		2. 15"SQR/10"ø			11			
		3. 15"SQR/8"ø			4			
D	MC TDC 3WAY	1. 15"SQR/12"ø	T-BAR	23 1/2" X 23 1/2"		DRYWALL OR DUCTWORK	18" X 18"	
		2. 15"SQR/10"ø			1			
		3. 15"SQR/8"ø			2			
E	MC TDC 2WAY CORNER	1. 15"SQR/12"ø	T-BAR	23 1/2" X 23 1/2"		DRYWALL OR DUCTWORK	18" X 18"	
		2. 15"SQR/10"ø			1			
		3. 15"SQR/8"ø						
F	MC TDC 1WAY	1. 15"SQR/12"ø	T-BAR	23 1/2" X 23 1/2"		DRYWALL OR DUCTWORK	18" X 18"	
		2. 15"SQR/10"ø						
		3. 15"SQR/8"ø						
G	MC 300FLS5 (SUPPLY)	1. 12"SQR/8"ø	T-BAR OR DRYWALL	12 1/2"x12 1/2"	2			
		2. 6"SQR/6"ø		6 1/2"x6 1/2"	1			
		3. 10" x 10"		10 1/2"x10 1/2"				
H	MC 350FLS5 (EXHAUST)	1. 10"SQR/8"ø	T-BAR OR DRYWALL	10 1/2" X 10 1/2"	4			
		2. 6"SQR/6"ø			1			
		3. 12"SQR/10"ø		12"x12"				
J	MC TDC 2WAY OPPOSITE	1. 15"SQR/12"ø	T-BAR	23 1/2" X 23 1/2"		DRYWALL OR DUCTWORK	18" X 18"	
		2. 15"SQR/10"ø						
		3. 15"SQR/8"ø			1			
K	MC 272RS (SUPPLY)	1. 18" X 8"	DUCTWORK	N\A	5	NOTES: 3/4" BLADE SPACING 0" DOUBLE DEFLECTION		

NOTE: ALL DIFFUSERS, GRILLES AND REGISTERS ARE SPECIALLY MANUFACTURED FOR McDONALDS CORPORATION

PLAY PLACE AIR BALANCE SCHEDULE

UNIT	O.A.	R.A.	S.A.	E.A.	PRESS.
P-1	1000	4000	5000	———	+1000
TOTAL	1000	4000	5000	———	+1000

RESTAURANT AIR BALANCE SCHEDULE

UNIT	O.A.	R.A.	S.A.	E.A.	PRESS.
K-1	1300 (977)	4700 (5023)	6000	———	+1300 (+977)
K-2	435	1565	2000	———	+435
D-1	1700	4300	6000	———	+1700
E-1	———	———	———	1160 (837)	-1160 (-837)
E-2	———	———	———	720	-720
E-3	———	———	———	720	-720
E-4	———	———	———	500	-500
E-5	———	———	———	50	-50
TOTAL	3435 (3112)	10565 (10888)	14000	3150 (2827)	+285 (+285)

NOTE: THE NUMBERS IN PARENTHESES REPRESENT THE AIR QUANTITIES WHEN THE GRILL FAN (E-1) OPERATES AT LOW SPEED. THE GRILL FAN OPERATES AT LOW SPEED ONLY WHEN THERE IS A "NO LOAD" CONDITION AND THE GRILL IS IN "STANDBY"

SETTING KITCHEN EXHAUST AIR QUANTITIES

NOTE: SEE "McDONALD'S HVAC SYSTEM CHECK OUT, START-UP AND AIR BALANCE MANUAL" FOR COMPLETE INFORMATION ON TOOLS AND FORMS REQUIRED.

1. EQUIPMENT SET-UP
   A. GRILLS
      1. REAR CLOSURE PLATES MUST BE INSTALLED ON CLAMSHELL GRILLS
      2. FOR GAS GRILLS FLUE BOX GASKETING MUST BE IN PLACE, FLUE RESTRICTIONS OPEN 1"
      3. FOR ALL ELECTRIC GRILLS, FLUE BOX OPENING BLANKED OFF, NO FLUE RESTRICTOR OPENING
      4. GRILLS HELD FIRMLY UNDER HOOD BY THREADED LOCKING RODS
      5. GRILL CANS IN PLACE AND PUSHED ALL THE WAY IN
      6. FILTER GREASE CHANNEL AND COLLECTING CUP INSTALLED
      7. ALL GREASE FILTERS INSTALLED

   B. FRYERS
      1. SEALING BAR PROPERLY INSTALLED CREATING AIR SEAL BETWEEN BACK OF FRYER AND HOOD APRON
      2. HANGING FLUE BAFFLE IN PLACE AND SEALING AGAINST TOP EDGE OF FRYER
      3. CAPPING PIECE DOWN AND FLAT ACROSS TOP OF VATS HOLDING VATS UNDER HOOD
      4. FILTER GREASE CHANNEL AND COLLECTING CUP INSTALLED

   C. EXHAUST FANS
      1. VENTURI INLET OF FAN SEALING AGAINST GASKET ON ADAPTER
      2. PLATE
      3. FAN ROTATION CORRECT
      4. FAN TURNS FREELY, NO BINDING ON VENTURI
      CHECK FOR LUBRICATION OF FAN SHAFT BEARINGS

II. TAKING FILTER FACE READINGS
   A. READINGS CAN BE TAKEN WITH ALL ROOFTOP UNITS RUNNING IF ALL OUTSIDE AIR DAMPERS ARE OPENED TO 1 3/8" MIN. IF ROOFTOP UNITS ARE NOT RUNNING, THE STORE'S REAR DOOR, ROOF HATCH AND DRIVE-THRU WINDOWS MUST BE LEFT OPEN.
   B. READINGS MUST BE TAKEN WITH EITHER A 4" TAYLOR OR DAVIS ANEMOMETER.
   C. THE FOLLOWING PROCEDURES MUST BE FOLLOWED WHEN TAKING THE READINGS:
      1. THE DIAL OF THE ANEMOMETER SHOULD REST LIGHTLY ON THE SURFACE OF THE FILTER AND BE KEPT PARALLEL TO IT.
      2. THE BODY OF THE ANEMOMETER SHOULD ONLY PASS OVER THE FACE OF THE FILTER AND NOT OVER THE FILTER FRAME.
      3. DO NOT LET YOUR HAND OR ANYTHING ELSE OBSTRUCT THE AIRFLOW TO THE ANEMOMETER.
      4. START EACH FILTER READING AT THE SIDE OF THE FILTER FURTHEST FROM THE CENTER OF THE HOOD.
      5. LET THE FAN BLADE GET UP TO FULL SPEED BEFORE TURNING THE ANEMOMETER "ON".
      6. START YOUR STOP WATCH, OR YOUR CLOCK TIMING, AT THE SAME MOMENT YOU TURN THE ANEMOMETER "ON".
      7. MOST IMPORTANTLY, THE ANEMOMETER MUST BE MOVED AT A VERY EVEN PACE TO GIVE EQUAL EXPOSURE TO ALL AREAS OF THE FILTER. THIS IS BEST ACCOMPLISHED BY MONITORING THE TIME AS THE ANEMOMETER MOVES OVER THE FILTER. WE RECOMMEND A ONE-HALF MINUTE TOTAL READING ON EACH FILTER. ONCE YOU HAVE BEGUN THE TRAVERSE, YOU SHOULD BE AT THE EXACT CENTER OF THE FILTER IN 15 SECONDS, AND AT THE OPPOSITE SIDE IN 30 SECONDS, WHEN YOU IMMEDIATELY SHUT THE ANEMOMETER "OFF" (SEE FIGURE 1).
      8. THIS READING SHOULD BE DOUBLED TO GET THE ONE MINUTE READING.
      9. THIS SAME METHOD IS TO BE USED FOR EACH FILTER IN THE HOOD.
      10. TO GET THE AVERAGE FOR EACH HOOD, ADD THE INDIVIDUAL FPM NUMBERS FOR EACH FILTER IN THE HOOD THEN DIVIDE BY THE TOTAL NUMBER OF FILTERS IN THE HOOD. ADD OR SUBTRACT THE ANEMOMETER CORRECTION FACTOR TO THIS AVERAGE READING TO GET THE CORRECTED AVERAGE READING.
      11. THE CORRECTED AVERAGE READING IS THEN COMPARED TO THE REQUIRED FPM EXHAUST VELOCITY NUMBER SHOWN FOR THAT SPECIFIC APPLIANCE (SEE "McDONALD'S KITCHEN EXHAUST SYSTEM INFORMATION" ON THIS SHEET OR "CERTIFICATION OF AIR BALANCE" FORM). NOTE: THE EXHAUST VELOCITY SHOULD NEVER BE SET LOWER THAN THE VALUE SHOWN OR GREATER THAN 105% OF THE VALUE SHOWN.

III. ADJUSTING FAN RPMs
   A. RAISE OR LOWER THE EXHAUST FAN RPM'S TO ACHIEVE THE REQUIRED EXHAUST VELOCITY VALUES SHOWN ON THE "CERTIFICATION OF AIR BALANCE" FORM.
   B. AFTER THE FINAL EXHAUST FAN RPM SETTING HAS BEEN MADE: (1) CHECK AND ALIGN FAN AND MOTOR SHAFTS AND (2) SET FAN PULLEY AND MOTOR PULLEY ON SAME HORIZONTAL PLANE.
   C. RECORD DATE, FINAL FAN RPM AND MOTOR AMP DRAW ON INSIDE OF EXHAUST FAN MOTOR DOME USING INDELIBLE BALCK MARKER. RECORD SAME DATA ON "CERTIFICATION OF AIR BALANCE" FORM.
   D. SECURE MOTOR DOME TO FAN MAKING SURE DOME SEALS OUT WATER AND HOT/GREASY EXHAUST AIR FROM COMPARTMENT. COMPLETE ADJUSTMENTS OF ALL HOOD EXHAUST FANS BEFORE SETTING OUTSIDE AIR QUANTITIES.

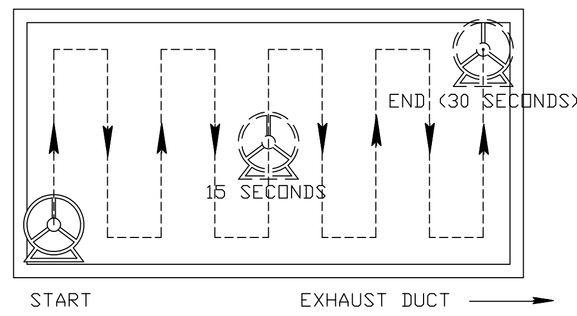

FIGURE 1: FILTER TRAVERSE

HVAC UNIT SCHEDULE

15 TON (K-1)	YORK ROOFTOP COOLING AND HEATING UNITS SERIES: DJ180N32G2BMA (KITCHEN) COOLING CAPACITY: 178,000 BTU – 12.0 EER – 12.5 IPLV (ARI RATINGS) HEATING CAPACITY: 400 MBH INPUT – 320 MBH OUTPUT (80.0% EFFICIENCY) EVAP. BLOWER NOMINAL CFM: 6,000 – EXTERNAL STATIC: 1.0" MOTOR H.P.: 5 – DRIVE TYPE: BELT UNIT AMPACITY: 74.2 (208/60/3) GAS CONNECTION: 1" (N.P.T.) UNIT WEIGHT: 2895 LBS. CURB WEIGHT: 185 LBS.
15 TON (D-1)	YORK ROOFTOP COOLING AND HEATING UNITS SERIES: DJ180N32G2BMB (DINING) COOLING CAPACITY: 178,000 BTU – 12.0 EER – 12.5 IPLV (ARI RATINGS) HEATING CAPACITY: 400 MBH INPUT – 320 MBH OUTPUT (80.0% EFFICIENCY) EVAP. BLOWER NOMINAL CFM: 6,000 – EXTERNAL STATIC: 1.0" MOTOR H.P.: 5 – DRIVE TYPE: BELT UNIT AMPACITY: 74.2 (208/60/3) GAS CONNECTION: 1" (N.P.T.) UNIT WEIGHT: 2895 LBS. CURB WEIGHT: 185 LBS.
12 1/2 TON (P-1)	YORK ROOFTOP COOLING AND HEATING UNITS SERIES: DJ150N20G2BMB (PLAY PLACE) COOLING CAPACITY: 150,000 BTU – 11.35 EER – 12.3 IPLV (ARI RATINGS) HEATING CAPACITY: 240 MBH INPUT – 192 OUTPUT (80.0% EFFICIENCY) EVAP. BLOWER NOMINAL CFM: 5,000 – EXTERNAL STATIC 0.96 MOTOR H.P.: 5 – DRIVE TYPE: BELT UNIT AMPACITY: 72.6 (208/60/3) GAS CONNECTION: 3/4" (N.P.T.) UNIT WEIGHT: 1822 LBS. CURB WEIGHT: 185 LBS.
5 TON (K-2)	YORK ROOFTOP COOLING AND HEATING UNITS SERIES: DJ060N10P2BMB (W/BAROMETRIC RELIEF DAMPER) COOLING CAPACITY: 60,000 BTU – 11.2 EER – 13.0 SEER (ARI RATINGS) HEATING CAPACITY: 125 MBH INPUT – 100 MBH OUTPUT (80.3% EFFICIENCY) EVAP. BLOWER NOMINAL CFM: 2,000 – EXTERNAL STATIC: 0.82" MOTOR H.P.: 1 1/2 – DRIVE TYPE: BELT UNIT AMPACITY: 29.1 (208/60/3) GAS CONNECTION: 1/2" (N.P.T.) UNIT WEIGHT: 746 LBS. CURB WEIGHT: 92 LBS.

NOTES:
1. ALL OF THE ABOVE TECHNICAL DATA IS BASED ON HIGH EFFICIENCY AND NATURAL GAS UNITS AND IS TAKEN FROM THE MANUFACTURERS SPECIFICATIONS.
2. ABOVE UNITS ARE SPECIFICALLY MANUFACTURED FOR McDONALDS CORPORATION, NO SUBSTITUTIONS ARE PERMITTED.
3. PROVIDE UNITS WITH "McDONALIZED" ACCESSORIES AS DENOTED BY UNIT MODEL NUMBER SUFFIX LETTERS LISTED ABOVE, TO INCLUDE:
   - METAL FILTER FRAMES WHICH ACCEPT 1" THICK REPLACEABLE MEDIA
   - LOW LIMIT DISCHARGE THERMOSTAT & COMPRESSOR LOCKOUT ("HIGH HEAT", DINING AREA UNITS ONLY)
   - GAS SHUT-OFF VALVE AND ENTRY PIPING (GAS HEAT UNITS ONLY)
   - CONDENSATE DRAIN TRAP

MARKEL ELECTRIC HEATER SCHEDULE

REF.	OUTDOOR WINTER DESIGN TEMPERATURE PER ASHRAE	HEATER SIZE	MODEL
EH-1	25°F TO 40°F	2 KW	MCDF3482TA1S
	0°F TO 24°F	3 KW	MCDF3483TA1S
	BELOW 0°F	4 KW	MCDF3484TA1S

NOTES:
1. ALL CEILING RECESSED ELECTRIC HEATERS ARE 208V/1Ø/60Hz AND INCLUDE THE FOLLOWING ACCESSORIES:
   - BUILT-IN LOW VOLTAGE TRANSFORMER
   - CONTACTOR
   - THERMOSTAT
   - DISCONNECT SWITCH
2. SEE SHEET E-4.0 FOR ADDITIONAL ELECTRICAL INFORMATION
3. TO ORDER CALL (800) 682-3398

EXHAUST FAN SCHEDULE

E-1	TWO-SPEED, 6 FOOT GRILL FAN, 1160 (837) CFM, 1/2 H.P., 1" S.P., 120-1-60 GREENHECK: MODEL McCUBE 142-5GTSC INCLUDE: DISCONNECT SWITCH, 18" HIGH CURB, ALUMINUM HINGED CURB CAP WEIGHT: 230 LBS. (CURB & FAN)
E-2	3 VAT FRYER FAN, 720 CFM, 1/2 H.P., 1" S.P., 120-1-60 GREENHECK: MODEL McCUBE 102HP-5G INCLUDE: DISCONNECT SWITCH, 18" HIGH CURB, ALUMINUM HINGED CURB CAP WEIGHT: 195 LBS. (CURB & FAN)
E-3	3 VAT FRYER FAN, 720 CFM, 1/2 H.P., 1" S.P., 120-1-60 GREENHECK: MODEL McCUBE 102HP-5G INCLUDE: DISCONNECT SWITCH, 18" HIGH CURB, ALUMINUM HINGED CURB CAP WEIGHT: 195 LBS. (CURB & FAN)
E-4	TOILET EXHAUST FAN, 500 CFM, 1/4 H.P., 0.25" S.P., 120-1-60 GREENHECK: MODEL GB-080-4 INCLUDE: DISCONNECT SWITCH, 12" HIGH CURB, BIRDSCREEN, BACKDRAFT DAMPER WEIGHT: 48 LBS. (CURB & FAN)
E-5	MOP SINK EXHAUST FAN, 50 CFM, 1/4 H.P., 0.25" S.P., 120-1-60 GREENHECK: MODEL SP-A90 INCLUDE: SPEED CONTROLLER (DISCONNECT SWITCH BY ELECTRICAL CONTRACTOR) WEIGHT: 12 LBS.

NOTE: SEE ELECTRICAL DRAWINGS FOR WIRING AND CONTROL OF EXHAUST FANS.

McDONALD'S KITCHEN EXHAUST SYSTEM INFORMATION

UNIVERSAL TYPE 1 EXHAUST HOODS

APPLIANCE	6' GRILL	3 VAT FRYER	4 VAT FRYER
EXHAUST HOOD MODEL No.	No. UH-83	No. UH-50	No. UH-65
EXHAUST HOOD LENGTH	83 3/4"	50"	65 1/2"
HOOD MATERIAL	STAINLESS STEEL	STAINLESS STEEL	STAINLESS STEEL
HOOD GUAGE	#16 MSG	#16 MSG	#16 MSG
NUMBER OF FILTERS	Four	Three	Four
SIZE OF FILTERS (Actual)	10"x20"	10"x16"	10"x16"
NET FILTER AREA (Each)	127.5 Sq. In.	97.5 Sq. In.	97.5 Sq. In.
U.L. REQ'D. EXH. (Min.)	1162 CFM	692 CFM	913 CFM
ACTUAL EXHAUST	1175 CFM	720 CFM	980 CFM
U.L. LISTING No. (YYCW)	MH12755	MH12755	MH12755
FILTER VELOCITY (Gas/Hot)	250 FPM	255 FPM	260 FPM
DUCT SIZE	11 1/4"ø	9"ø	10"ø
DUCT MATERIAL	Black Iron	Black Iron	Black Iron
DUCT GAUGE	#14 Ga.	#14 Ga.	#14 Ga.
DUCT VELOCITY	1702 FPM	1630 FPM	1801 FPM

MECHANICAL LEGEND

SYMBOL	DESCRIPTION
—	THERMOSTATS \ SMOKE DETECTOR REMOTE STATIONS COORDINATE LOCATION WITH CONSTRUCTION MANAGER MOUNTING HEIGHT: 4'-0" A.F.F.
K-1	EQUIPMENT TAG SEE EQUIPMENT SCHEDULES
A-1 600	DIFFUSER TYPE CFM QUANTITY SEE DIFFUSER SCHEDULE
SUPPLY / RETURN/ EXHAUST	DUCT DROP WITH SPIN-IN COLLAR AND VOLUME DAMPER
D-1	TEMPERATURE SENSOR WITH EQUIPMENT SERVICE INDICATED LOCATIONS AS SHOWN ON DRAWINGS MOUNTING HEIGHT: 5'-8" A.F.F.
S	DUCT-MOUNTED SMOKE DETECTOR LOCATIONS AS SHOWN ON DRAWINGS
	BLACK IRON EXHAUST DUCT BY KITCHEN EQUIPMENT SUPPLIER (K.E.S.) WITH FIRE-RATED GREASE DUCT WRAP (THICKNESS DETERMINED BY LOCAL CODE)
	SHEET METAL TEE FOR FLEXIBLE DUCTWORK WITH MIN. 2" THICK EXTERNAL INSULATION (MIN. R-6) (TYP.)
FLEX	SHEET METAL DUCTWORK WITH MIN. 2" THICK EXTERNAL INSULATION (MIN. R-6) AND SPIN-IN DUCT COLLAR WITH INTEGRAL VOLUME DAMPER
VD	DUCT-MOUNTED VOLUME DAMPER
14	INSULATED FLEXIBLE DUCTWORK (MIN. R-6) WITH SIZE INDICATED
FD&AD	FIRE DAMPER AND ACCESS DOOR

REVISIONS

NO.	DATE	BY
1		
2		
3		
4		
5		
6		
7		

Landry ARCHITECTS
389 Main Street - Salem, NH 03079
T 603.898.6004 F 603.894.4398

DATE ISSUED: 08/14/07
SCALE: AS NOTED
JOB NUMBER: M-1032
DRAWN BY: P.S.
CHECKED BY: M.J.M.
DATE DRAWN: 08/10/07

CONSULTANT:

M.J.M.
M.J. MARCHIA, INC.
AIR CONDITIONING SYSTEMS
5 WASHINGTON AVE. BAY SHORE, NY 11706
(631) 586-6060 (631) 586-6077 fax

SHEET TITLE: HVAC SCHEDULES

McDonald's

RESTAURANT LOCATION:
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PORTLAND, ME

PREPARED FOR:
McDonald's USA, LLC
McDONALD'S PLAZA
OAK BROOK, ILLINOIS
60521

SHEET NUMBER: M-3.0