LEGEND

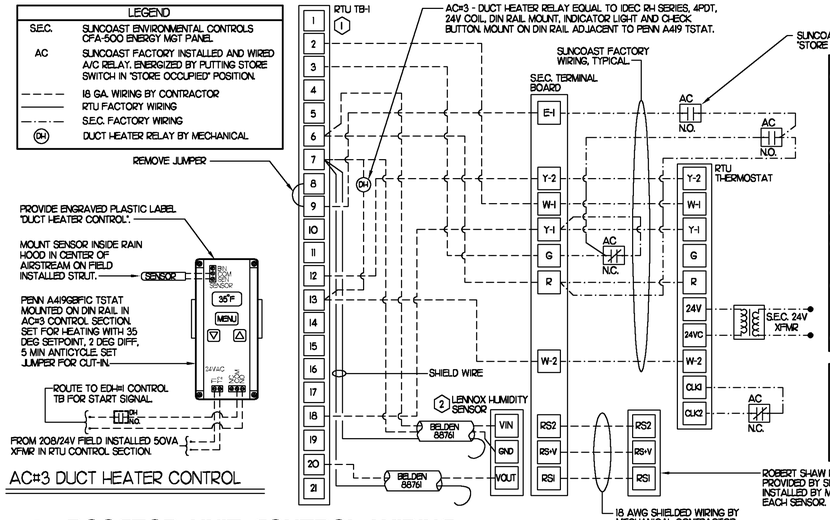
A-12-400	TYPE - NECK SIZE - CFM	EF#1	EXHAUST FAN #1 (TYP.)
	SPIN-IN FITTING WITH MANUAL BALANCING DAMPER, WITHOUT SCOOP	AC#1	AIR CONDITIONING UNIT #1 (TYP.)
	SPIN-IN HARD ϕ FLEXIBLE ϕ DIFFUSER		RETURN/EXHAUST (TYP.)
S	REMOTE TEMPERATURE SENSOR		SUPPLY DIFFUSER, SQ FACE (TYP.)
H	HUMIDITY SENSOR	1	PLAN NOTE REFERENCE
SD	SMOKE DETECTOR		MANUAL VOLUME DAMPER
12X18	DUCT SIZE 1ST NUMBER - HORIZONTAL DIMENSION 2ND NUMBER - VERTICAL DIMENSION		DIRECTION OF THROW ON DIFFUSER

LENNOX FRESH AIR TEMPERING SETUP

1. INSTALL FRESH AIR TEMPERING KIT WIRING HARNESS AS RECOMMENDED BY LENNOX.
2. LOCATE SUPPLY AIR TEMPERATURE SENSOR IN SUPPLY DUCT DOWNSTREAM OF FIRST ELBOW. SECURE WIRING TO DUCT OR STRUCTURE WITH RUBBER COATED CLAMPS. DO NOT RUN WIRING INSIDE DUCT WORK. PROTECT ALL WIRING PENETRATIONS WITH RUBBER GROMMETS.
3. CHANGE ROOFTOP UNIT ECTO PARAMETER 6.20 TO A VALUE OF 145. THIS WILL PREVENT THE SUPPLY AIR TEMPERATURE FROM DROPPING BELOW 66F DEG DURING HEATING MODE WHEN THERMOSTAT IS NOT ACTIVELY CALLING FOR HEAT. ECTO PARAMETER 6.20 MUST BE CHANGED TO ACTIVATE THE FRESH AIR TEMPERING FEATURE.
4. CHANGE ROOFTOP UNIT ECTO PARAMETER 6.21 TO A VALUE OF 21 WHICH WILL MAKE THE DEADBAND VALUE EQUAL 14F.
5. CHANGE ROOFTOP UNIT ECTO PARAMETER 6.22 TO A VALUE OF 37 WHICH WILL MAKE THE CYCLE TIME VALUE EQUAL 5 MINUTES.

KEY NOTES

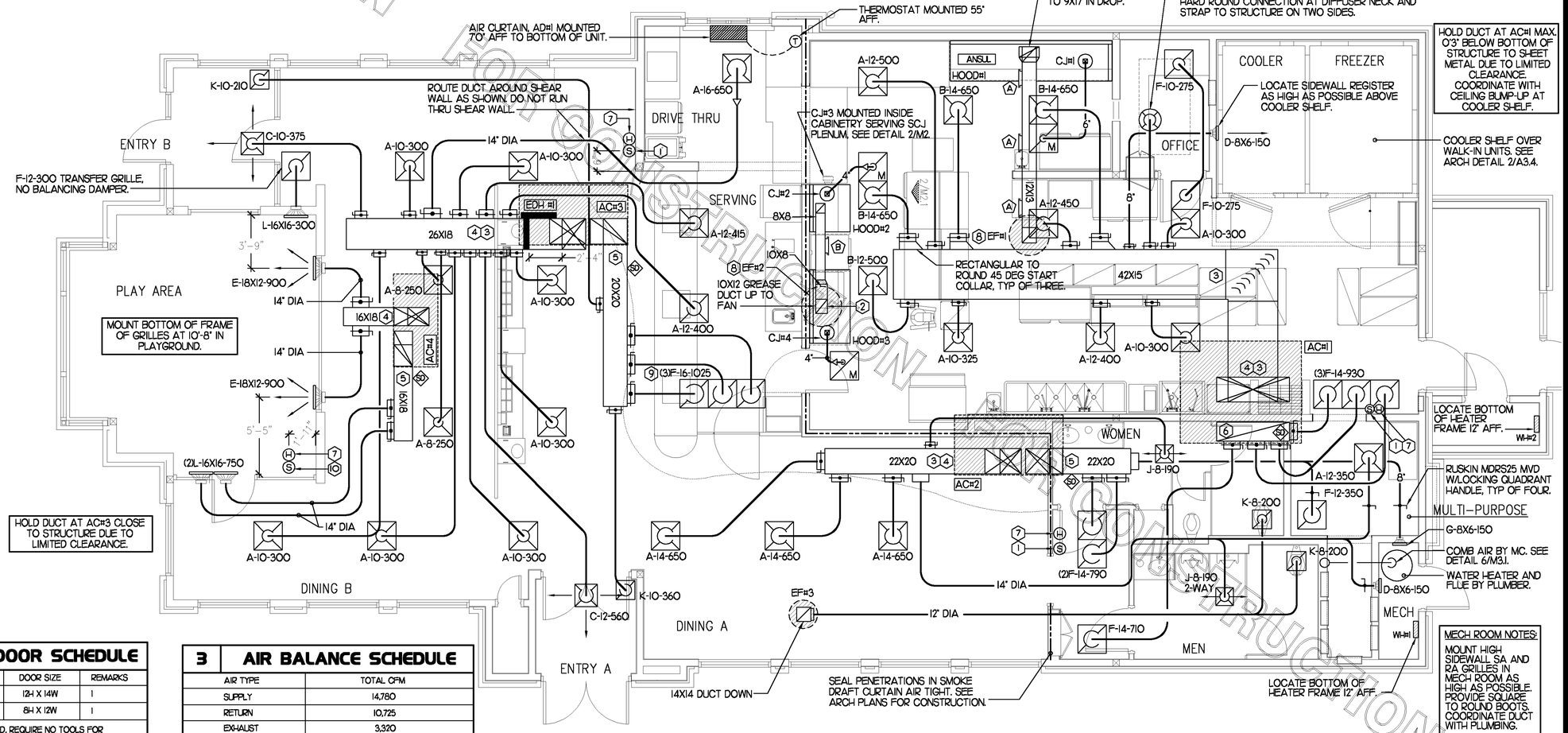
1. MOUNT REMOTE SENSOR ON WALL AT 5'-0" AFF AND ROUTE WIRING BACK TO SUNCOAST TEMP CONTROL PANEL.
2. 6X8 CONNECTION TO HOOD#3 WITH HALTON KBD EQUALIZER IN RISER. SEE DWG M2.1 FOR MORE INFORMATION.
3. BRANCH TAKE-OFFS ARE NOT TO BE LOCATED CLOSER THAN 3'-0" FROM ANY ELBOW INCLUDING THE SUPPLY AIR DROP FROM CURB.
4. TRANSITION IN VERTICAL DROP FROM FULL SIZE OF CURB OPENING TO SIZE SHOWN. PROVIDE TURNING VANES IN ELBOW.
5. TRANSITION IN VERTICAL DROP FROM FULL SIZE OF CURB OPENING TO SIZE SHOWN. NO TURNING VANES IN ELBOW.
6. R/A DUCT DROP TO BE FULL SIZE OF CURB CONNECTION. TERMINATE DROP 0'-5" ABOVE CEILING.
7. MOUNT LENNOX HUMIDITY SENSOR ON WALL ABOVE SPACE TEMP SENSOR AND ROUTE WIRING TO UNIT ON ROOF.
8. EF#1 AND EF#2 MUST BE LOCATED A MINIMUM OF 10 FT FROM PARAPETS.
9. INSULATION ON DUCT DROP THROUGH UPPER CEILING TO STOP AT UPPER CEILING PENETRATION. SAND/DEGREASE GALVANIZED SHEET METAL AND PAINT FLAT WHITE. CEILING TILE AT UPPER CEILING TO BE CUT TO FIT AROUND DUCT DROP.
10. MOUNT REMOTE SENSOR FOR PLAYGROUND 10'-4" AFF. ROUTE WIRING BACK TO SUNCOAST TEMP CONTROL PANEL.



AC#3 DUCT HEATER CONTROL

2 ROOFTOP UNIT CONTROL WIRING

NONE



4 GREASE ACCESS DOOR SCHEDULE

MARK	OPENING SIZE	DOOR SIZE	REMARKS
A	10H X 12W	12H X 14W	1
B	6H X 10W	8H X 12W	1

1) ACCESS DOOR SHALL BE U.L. 1978 LISTED, REQUIRE NO TOOLS FOR REMOVAL AND BE EQUAL TO DUCTMATE ULTIMATE DOOR II WELD ON TYPE.

3 AIR BALANCE SCHEDULE

AIR TYPE	TOTAL CFM
SUPPLY	14,780
RETURN	10,725
EXHAUST	3,320
OUTSIDE AIR	4,055
BUILDING POSITIVE PRESSURE	735

1 MECHANICAL FLOOR PLAN

1/4"=1'-0"

SHEET NOTES

1. DUCT SIZES SERVING DIFFUSERS AND GRILLES ARE SAME SIZE AS DIFFUSER OR GRILLE NECK UNLESS NOTED OTHERWISE.

Chick-fil-A
5200 Buffington Rd.
Atlanta Georgia,
30349-2998

Revisions:

Mark	Date	By

Seal

BENNOR ENGINEERING, LLC
3000 Langford Road
Building 2400
Norcross, GA 30071
(770) 729-1422 Bus
(770) 729-0490 Fax
contact@BennorEng.com
MECHANICAL ENGINEER

STORE
Quakertown
FSU S06-E

Richland Marketplace
Hwy 309
Quakertown,
Pennsylvania

SHEET TITLE
MECHANICAL FLOOR PLAN

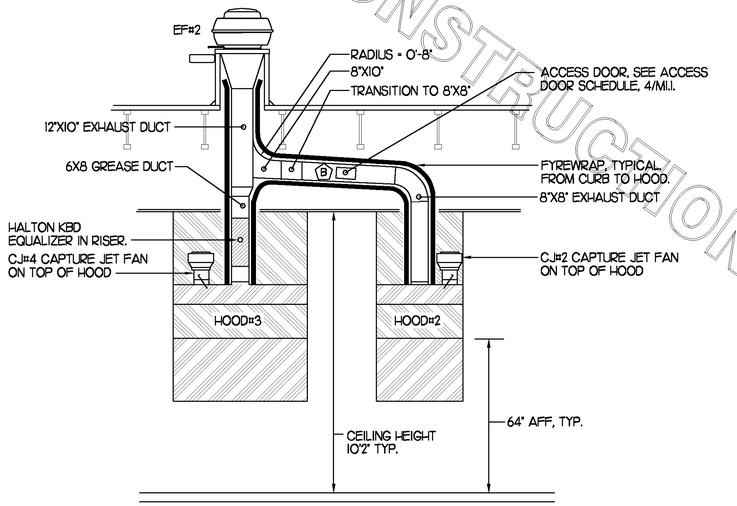
DWG EDITION 07.1
REVISION –

Job No. : 7046
Store : 2219
Date : 6/1/07
Drawn By : JAL
Checked By: RDB

Sheet
M-1.1

6 KITCHEN HOOD SYSTEMS NOTES

1. CHICK-FIL-A MAINTAINS A NATIONAL ACCOUNT WITH HALTON CO. FOR THE HOODS. CHICK-FIL-A WILL PURCHASE AND PROVIDE THE HOODS FOR INSTALLATION BY THE MECHANICAL CONTRACTOR. THE MECHANICAL CONTRACTOR SHALL BE RESPONSIBLE FOR RECEIVING THE HOODS. CONTACT HALTON CO. AT 270-237-5600 FOR MORE INFO.
2. THE FIRE SUPPRESSION SYSTEM SHALL CONSIST OF A COMPLETE WET ANSUL SYSTEM FURNISHED BY HALTON. THE HOOD SHALL BE FURNISHED PRE-PIPED BY HALTON.
3. THE R-102 ANSUL FIRE SUPPRESSION SYSTEM EXTERNAL TO THE HOODS SHALL BE INSTALLED IN ACCORDANCE WITH HOOD MANUFACTURER'S SHOP DRAWINGS BY AN AUTHORIZED ANSUL SYSTEM INSTALLER HIRED BY HALTON.
4. HOOD EXHAUST DUCTWORK SHALL BE 16 GA. BLACK STEEL WITH CONTINUOUS LIQUID TIGHT WELD OF JOINTS & SEAMS.
5. TURNS IN GREASE EXHAUST DUCTWORK SHALL BE LONG RADIUS TYPE, WITH A CENTERLINE RADIUS R-3W/2, NO EXCEPTIONS ALLOWED. NO MITERED FITTINGS ALLOWED.
6. ALL STAINLESS STEEL CLOSURE PANELS SHALL BE SUPPLIED BY HOOD MANUFACTURER AND INSTALLED BY THE MECHANICAL CONTRACTOR ACCORDING TO MANUFACTURER'S RECOMMENDATIONS.
7. SLOPE ALL GREASE EXHAUST DUCT BACK TO HOOD AT 1/4" PER FOOT OF RUN.
8. WRAP NEW GREASE DUCT WITH UNIFRAX FYREWRAP. ACCESS DOORS SHALL BE INSTALLED ACCORDING TO MANUFACTURER'S INSTALLATION RECOMMENDATIONS. FYREWRAP PRODUCT USED SHALL MEET LOCAL CODE REQUIREMENTS.
9. SUPPORT HOODS WITH THREADED ROD AT FOUR CORNERS. ATTACH TO STRUCTURE AS DETAILED ON STRUCTURAL DRAWING S5-1.

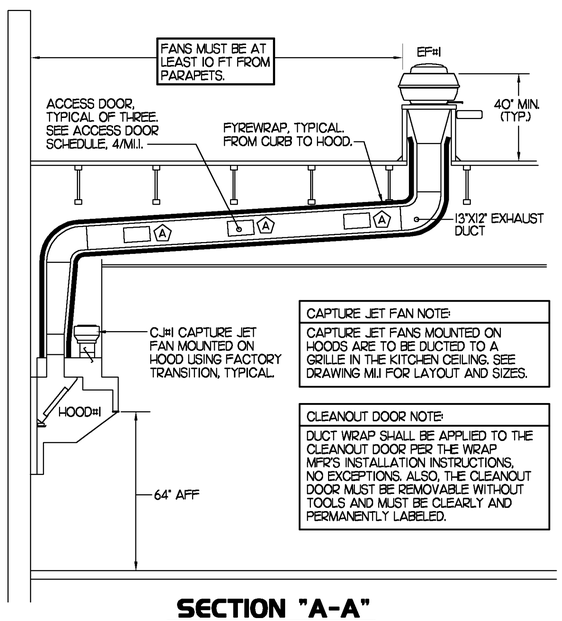


4 HOOD ELEVATION SECTION "D-D"

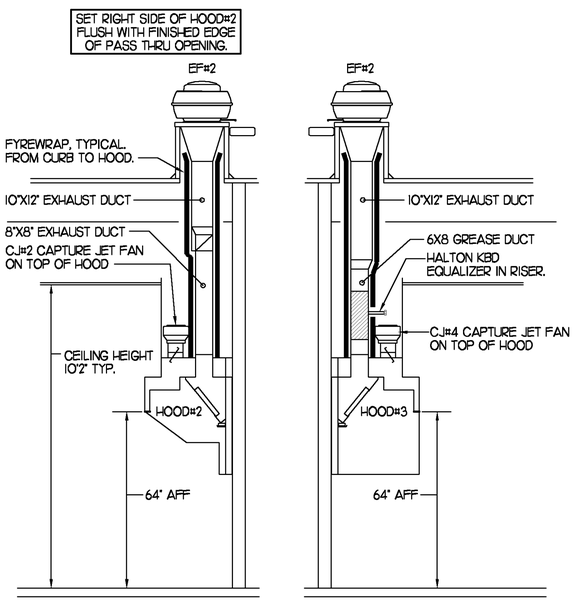
NONE

5 HOOD SCHEDULE

MARK	EXHAUST CFM	SP • TAB PORT	CAPTURE JET CFM & S.P.	TYPE	COLLAR SIZE	WIDTH	DEPTH	HEIGHT	MANUFACTURER	MODEL	REMARKS
HOOD#1	1,700	0.20"	100 • 0.30"	BACK SHELF	9"X17"	136.5"	34"	48"	HALTON	KVL	1,2,3,4,5,6,7,9,10,15
HOOD#2	700	0.27"	30 • 0.30"	BACK SHELF	8"X8"	40"	34"	48"	HALTON	KVL	1,2,4,5,8,10,11,14
HOOD#3	520	0.07"	30 • 0.30"	BACK SHELF	8"X8"	62"	34"	48"	HALTON	KVL	1,2,4,5,10,12,13,14,15
NOTES	DIMENSIONS OF HOODS INCLUDE BACK AND SIDE SPACERS (HEIGHT DOES NOT INCLUDE CLOSURE PANELS).										
REMARKS	1) STAINLESS STEEL CONSTRUCTION. 2) PROVIDE FULL HEIGHT SS CLOSURE PANEL WITH ACCESS PANEL IN FRONT LARGE ENOUGH TO REMOVE CAPTURE JET FAN. 3) PROVIDE FULL HEIGHT SS CLOSURE PANEL WITH ACCESS PANEL IN FRONT LARGE ENOUGH TO SERVICE ANSUL COMPONENTS. 4) PROVIDE PRE-PIPED ANSUL R-102 WET FIRE EXTINGUISHING SYSTEM. 5) PROVIDE 3" BACK SPACER. 6) PROVIDE 3" RIGHT SIDE SPACER. 7) PROVIDE NOTCHED LEFT END SIDE PANEL. 8) PROVIDE NOTCHED RIGHT END SIDE PANEL. 9) ANSUL CABINET AND COMPONENTS ON LEFT SIDE ABOVE HOOD. 10) PROVIDE TOP PLENUM CAPTURE JET FAN, SPEED CONTROLLER AND COLLAR. 11) PROVIDE COUNTER MOUNTED SIDE CAPTURE JET PLENUM ASSEMBLY AND FAN ON RIGHT SIDE OF HOOD. 12) PROVIDE HALTON KBD EQUALIZER WITH FACTORY INSTALLED 8X6 TRANSITIONS ON LEAVING CONNECTION FLANGE. 13) PROVIDE ACCESS PANEL IN FRONT LARGE ENOUGH TO ACCESS KBD EQUALIZER JACK SCREW. 14) PROVIDE FULL LEFT END PANEL EXTENDING BELOW TOP OF COOKING SURFACE. 15) PROVIDE FULL RIGHT END PANEL EXTENDING BELOW TOP OF COOKING SURFACE.										



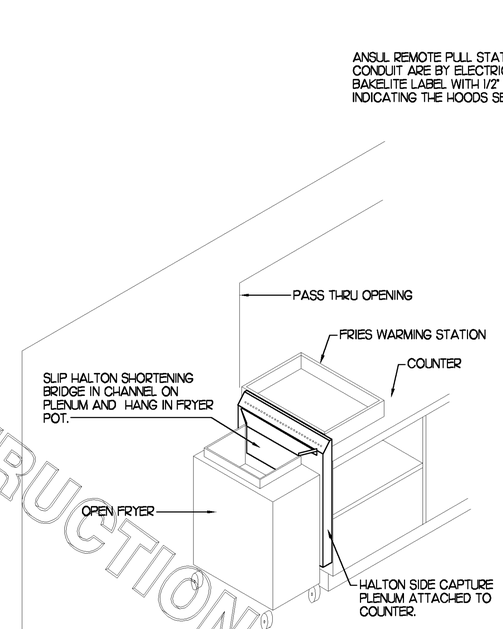
SECTION "A-A"



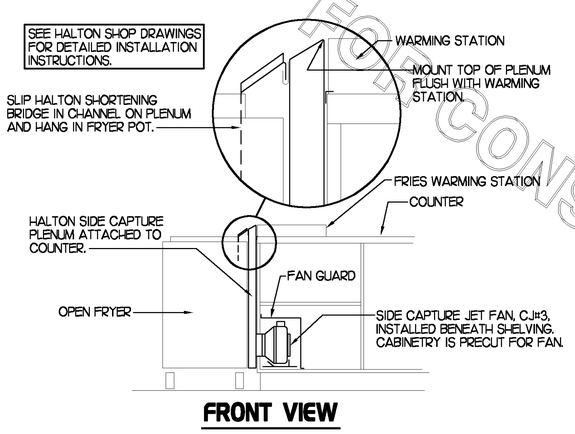
SECTION "B-B" **SECTION "C-C"**

3 HOOD ELEVATIONS

NONE



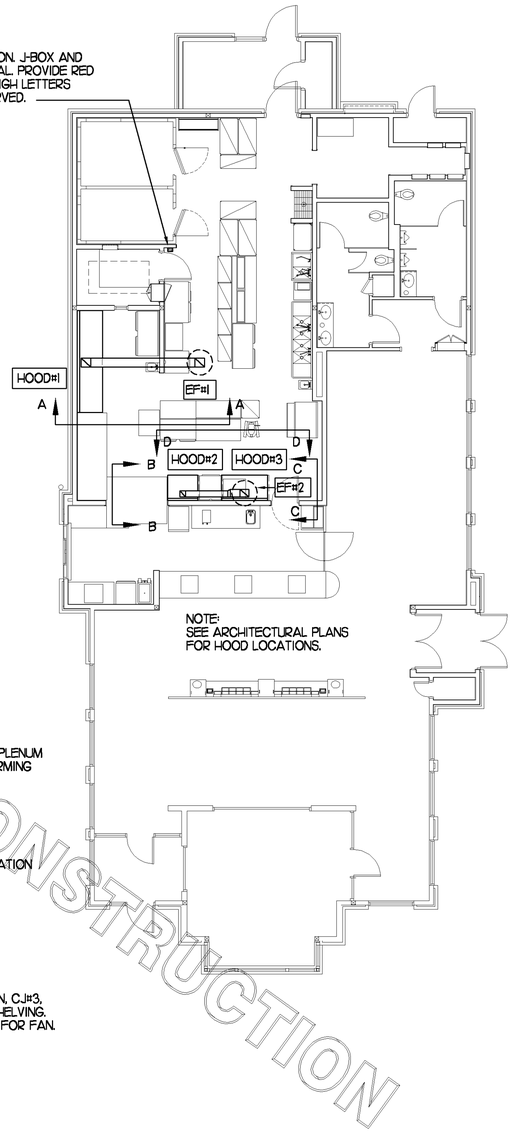
ISOMETRIC VIEW



FRONT VIEW

2 HALTON SIDE CAPTURE JET PLENUM

NOT TO SCALE



1 HOOD LAYOUT

1/8"=1'-0"

5200 Buffington Rd.
Atlanta Georgia,
30349-2998

Revisions:

Mark	Date	By

Seal

BENNOR ENGINEERING, LLC
MECHANICAL ENGINEERS
3000 Langford Road
Building 2400
Norcross, GA 30071
(770) 729-1422 bus
(770) 729-0490 fax
contact@BennorEng.com

STORE
Quakertown
FSU S06-E

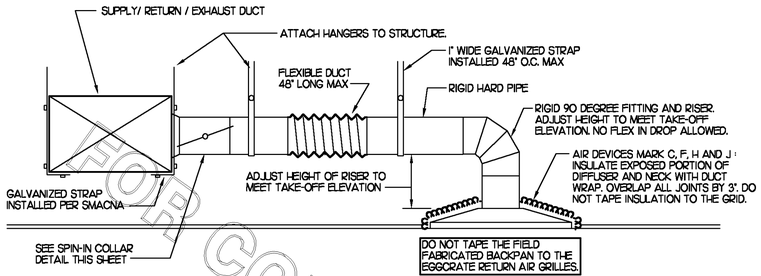
Richland Marketplace
Hwy 309
Quakertown,
Pennsylvania

SHEET TITLE
HOOD DETAILS & SCHEDULES

DWG EDITION 07.1
REVISION –

Job No. : 7046
Store : 2219
Date : 6/1/07
Drawn By : JAL
Checked By: RDB

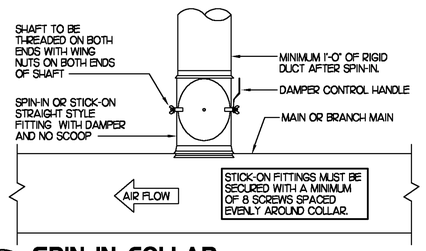
Sheet
M-2.1



1 SAG/RAG/GRILLE TAKE-OFF

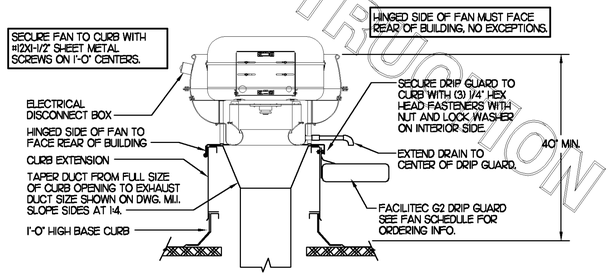
NO SCALE

DAMPER CONTROL HANDLE MUST BE LEFT EXPOSED. ATTACH A YELLOW FLUORESCENT CONSTRUCTION RIBBON TO THE HANDLE. RIBBON MUST HANG 12" BELOW DUCT AND BE EASILY IDENTIFIABLE FOR TEST AND BALANCE CONTRACTOR.



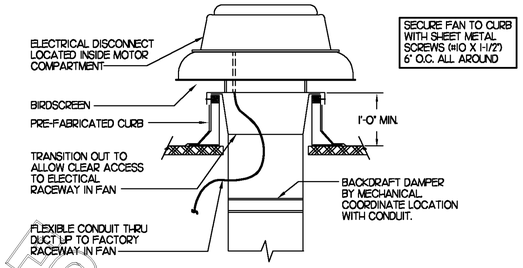
2 SPIN-IN COLLAR

NO SCALE



3 KITCHEN HOOD EXHAUST FAN

NO SCALE



4 RESTROOM EXHAUST FAN

NO SCALE

10 GAS FIRED ROOFTOP UNIT SCHEDULE

MARK	COOLING CAPACITY (MBH)		HEATING CAPACITY (MBH)		FAN SECTION (CFM)				MODEL	MANUFACTURER	REMARKS
	TOTAL	SENS	INPUT	OUTPUT	SUPPLY	O.A.	HP	ESP			
AC#1	168.1	135.4	480.0	384.0	5,150	1,650	5	.70	LGC180H-2	LENNOX	1,3,5,6,8,9,10,11,12,13,15
AC#2	105.9	76.2	240.0	192.0	2,830	750	2	.70	LGA102H-2	LENNOX	2,3,5,8,9,10,11,12,13,14,15
AC#3	145.6	99.0	240.0	192.0	5,000	1,355	5	.70	LGC150S2	LENNOX	1,3,5,8,9,10,11,12,13,14,15
AC#4	63.9	47.3	125.0	100.0	1,800	300	1.5	.70	LGA060H-2	LENNOX	3,4,5,7,8,9,10,11,12,13,14,15

NOTES
- COOLING CAPACITIES ARE GROSS, BASED ON INDOOR: 80FDB/67FWB, OUTDOOR: 95FDB, AND 400 CFM PER TON.
- CHICK-FIL-A MAINTAINS A NATIONAL ACCOUNT FOR EQUIPMENT WITH LENNOX CORPORATION. CONTACT LENNOX NATIONAL ACCOUNTS AT 972-497-6260 (OR BY FAX AT 972-497-5112) FOR PRICING, ORDERING AND AVAILABILITY.

REMARKS
1) PROVIDE DIFFERENTIAL ENTHALPY ECONOMIZER WITH POWER EXHAUST.
2) PROVIDE DIFFERENTIAL ENTHALPY ECONOMIZER WITH BAROMETRIC EXHAUST.
3) PROVIDE 14" HIGH ROOF CURB.
4) PROVIDE 0-100% MOTORIZED OUTSIDE AIR DAMPER ASSEMBLY.
5) SEE DETAIL 2/M1.1 FOR SETTING OF ECTO PARAMETERS BY MC.
6) PROVIDE FACTORY INSTALLED AND UNIT POWERED 115V GFI SERVICE OUTLET.
7) PROVIDE FACTORY INSTALLED 115V GFI SERVICE OUTLET.
8) PROVIDE FACTORY INSTALLED RETURN SIDE SMOKE DETECTOR.
9) PROVIDE FACTORY INSTALLED NON-FUSED DISCONNECT.
10) PROVIDE 2" FARR 30/30 THROW AWAY FILTERS.
11) PROVIDE HINGED PANELS FOR FILTER ACCESS, FAN MOTOR ACCESS, COMPRESSOR ACCESS AND CONTROL COMPARTMENT ACCESS.
12) ADJUST GAS MANIFOLD PRESSURE AT LOCATIONS WHERE ELEVATION EXCEEDS 2000' ABOVE SEA LEVEL AS RECOMMENDED BY MANUFACTURER.
13) PROVIDE HUMIDITROL OPTION WITH FACTORY WALL MOUNTED HUMIDITY SENSOR (STATES OF CA AND AZ EXCLUDED).
14) NOT USED.
15) PROVIDE FRESH AIR TEMPERING KIT.

9 EXHAUST FAN SCHEDULE

MARK	CFM	ESP	RPM	TIP SPEED (FPM)	HP	AREA SERVED	MODEL	MANUFACTURER	REMARKS
EF#1	1,700	3/4	1,163	4641	1/2	HOOD#1	150V5B	LOREN COOK	1,2,3,4,5,6,12
EF#2	1,220	3/4	1,586	6228	1/2	HOOD#2 & HOOD#3	150W-5B	LOREN COOK	1,2,3,4,5,6,12
EF#3	400	3/8	1,429	3413	1/8	RESTROOMS	ACED-90C150H	LOREN COOK	2,7,8,9,10,11,12

NOTES: GREASE EXHAUST FAN RPM BASED ON 80 DEGREE F AIR AT 1000 FEET ABOVE SEA LEVEL.

REMARKS
1) PROVIDE FACTORY 1'-0" BASE CURB AND EXTENSION.
2) PROVIDE FACTORY INSTALLED, PRE-WIRED, NEMA 3 NON-FUSED DISCONNECT.
3) PROVIDE FACTORY INSTALLED HINGED BASE KIT.
4) PROVIDE FACTORY INSTALLED WIND BAND CLEAN OUT PORT.
5) PROVIDE FACTORY INSTALLED HELICAL SPRING AUTOMATIC BELT TENSIONER.
6) PROVIDE AND INSTALL FACILITEC G2 DRIP GUARD. THE MECHANICAL CONTRACTOR IS TO CONTACT FACILITEC AT 800-284-8273 FOR PURCHASING AND SHIPPING ARRANGEMENTS.
7) PROVIDE BIRDSCREEN.
8) BACKDRAFT DAMPER IN DUCT BY MECHANICAL CONTRACTOR AS SHOWN ON 4/M-3.1.
9) STARTER BY ELECTRICAL CONTRACTOR. INTERLOCK WITH LIGHTS BY ELECTRICAL CONTRACTOR.
10) PROVIDE 12" HIGH CURB.
11) PROVIDE FACTORY INSTALLED AND WIRED SPEED CONTROLLER.
12) CHICK-FIL-A HAS A NATIONAL ACCOUNT WITH TOM BARROW COMPANY FOR THE FAN/CURB PACKAGE. THE MECHANICAL CONTRACTOR IS REQUIRED TO PURCHASE THE FAN/CURB PACKAGE DIRECTLY FROM TOM BARROW COMPANY. CONTACT MR. SCOTT GEORGE AT 404-351-1010 FOR PRICING AND AVAILABILITY. FANS AND CURBS NOT PURCHASED THRU TOM BARROW COMPANY WILL NOT BE ACCEPTED.

11 ELECTRIC WALL HEATER SCHEDULE

MARK	KW	FRAME SIZE WIDTH	FRAME SIZE HEIGHT	CFM	MOUNTING TYPE	MODEL	MANUFACTURER
WH#1,2	1.5	16"	21"	175	SURFACE	HF3324TTD-RP	MARKEL

REMARKS
1) AUTOMATIC FAN DELAY SWITCH AND INTEGRAL DISCONNECT.
2) INTEGRAL TAMPERPROOF THERMOSTAT SET AT 65 DEG. F.
3) CAPACITY SHOWN IS FOR 208V SERVICE.
4) CONFIRM ELECTRICAL CHARACTERISTICS PRIOR TO ORDERING EQUIPMENT.
5) POWDER COATED 18 GA. STEEL GRILLE WITH ALUMINUM FRAME.
6) AUTOMATIC RESET THERMAL LIMIT SWITCH.
7) TUBULAR STEEL ELEMENT WITH STEEL FINS.

12 ELECTRIC DUCT HEATER SCHEDULE

MARK	KW	DUCT SIZE (IN) WIDTH	DUCT SIZE (IN) HEIGHT	CFM	TEMP RISE	TYPE	MODEL	MANUFACTURER
EDH-1	25.0	26	18	5,000	16	SLIP-IN	HF	MARKEL

REMARKS
1) PROVIDE FACTORY AIR FLOW SWITCH. NON ADJUSTABLE, .05"WC MINIMUM.
2) PROVIDE FACTORY INTEGRAL DOOR DISCONNECT WITH INTERLOCK.
3) CONTROL AS A SINGLE STAGE HEATER, SEE DETAIL 2/M1.1.
4) CONFIRM ELECTRICAL CHARACTERISTICS PRIOR TO ORDERING EQUIPMENT.
5) PROVIDE FACTORY INTEGRAL CONTROL TRANSFORMER.
6) PROVIDE FACTORY DEFINITE PURPOSE MAGNETIC CONTACTOR(S).
7) PROVIDE FACTORY OVERCURRENT AND THERMAL OVER-TEMPERATURE PROTECTION.
8) SEE FLOOR PLAN FOR HEATER AND CABINET ORIENTATION.

8 AIR DEVICE SCHEDULE

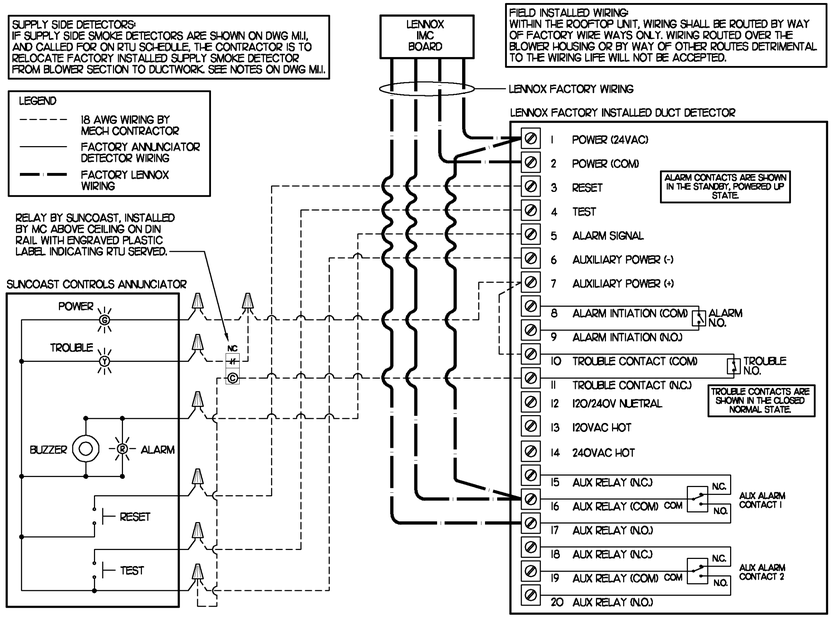
MARK	DESCRIPTION	LOCATION	NECK SIZE	FACE SIZE	FRAME TYPE	REMARKS
A	TITUS MODEL PSS-AA ALUMINUM SUPPLY AIR DIFFUSER WITH AIR PATTERN CONTROLLER.	DINING AREA KITCHEN	SEE PLAN	24X24	LAY-IN	1,8,9
B	TITUS MODEL PAR-AA ALUMINUM RETURN AIR GRILLE USED AS A SUPPLY DIFFUSER.	KITCHEN	SEE PLAN	24X24	LAY-IN	1,8,9
C	TITUS MODEL MCD STEEL SUPPLY AIR DIFFUSER FIELD ADJUSTABLE AIR PATTERN CONTROLLERS.	ENTRY 'A' ENTRY 'B'	14X14	19X19	SURFACE	1,5,7,9
D	TITUS MODEL 272FS DOUBLE DEFLECTION ALUMINUM SIDEWALL SUPPLY GRILLE. FRONT BLADE PARALLEL TO SHORT SIDE.	MECHANICAL ROOM MEZZANINE	8X6	10X8	SURFACE	1,9
E	TITUS MODEL 272FL DOUBLE DEFLECTION ALUMINUM SIDEWALL SUPPLY GRILLE. FRONT BLADE PARALLEL TO LONG SIDE.	PLAYGROUND	18X12	20X14	SURFACE	1,9
F	DONCO MODEL CFDF EGGCRATE RETURN AIR GRILLE WITH REMOVABLE WHITE CORE. FACTORY FLAT BACKPAN AND ROUND NECK.	DINING/OFFICE KITCHEN	SEE PLAN	24X24	LAY-IN	1,7,9
G	TITUS MODEL 56FL ALUMINUM SIDEWALL RETURN GRILLE. FRONT BLADE PARALLEL TO LONG SIDE.	MECHANICAL ROOM	8X6	10X8	SURFACE	1,9
H	TITUS MODEL TMR-AA ALUMINUM CONCENTRIC ROUND CONE SUPPLY DIFFUSER.	OFFICE	10	18	LAY-IN	1,6,7,9
J	TITUS MODEL MCD STEEL SUPPLY AIR DIFFUSER FIELD ADJUSTABLE AIR PATTERN CONTROLLERS.	RESTROOMS	10X10	15X15	SURFACE	1,2,3,5,7,9
K	TITUS MODEL PAR STEEL PERFORATED FACE RETURN AIR GRILLE WITH OBD.	RESTROOMS ENTRY 'A' & 'B'	14X14	16X16	SURFACE	1,4,9
L	TITUS MODEL 56FL ZERO DEGREE DEFLECTION ALUMINUM SIDEWALL RETURN GRILLE. FRONT BLADE PARALLEL TO LONG SIDE.	PLAYGROUND	16X16	18X18	SURFACE	1,9
M	TITUS MODEL PAR-AA ALUMINUM RETURN AIR GRILLE.	KITCHEN	6	24X24	LAY-IN	1,9

REMARKS
1) STANDARD OFF WHITE FINISH.
2) PROVIDE MODEL AG-85 NECK DAMPER.
3) SEE DRAWING M1.1 FOR THROW.
4) PROVIDE MODEL AG-75 NECK DAMPER ON GRILLES IN RESTROOMS.
5) FIELD FABRICATE 8" DEEP BACKPAN. SEAL JOINTS WITH MASTIC AND INSULATE EXTERNALLY.
6) PROVIDE AG-75 NECK DAMPER, ADJUSTABLE THRU DIFFUSER FACE.
7) FIELD INSULATE BACKPAN AS SHOWN ON DETAIL 1/M-3.1.
8) FACTORY INSULATED R-6 BACKPAN.
9) CHICK-FIL-A HAS A NATIONAL ACCOUNT WITH TOM BARROW COMPANY FOR THE AIR DEVICES. THE MECHANICAL CONTRACTOR SHALL PURCHASE THE AIR DEVICES DIRECTLY FROM TOM BARROW COMPANY. CONTACT MR. SCOTT GEORGE AT 404-351-1010, FOR PRICING AND AVAILABILITY. AIR DEVICES NOT PURCHASED THRU TOM BARROW COMPANY WILL NOT BE ACCEPTED.

7 AIR DOOR SCHEDULE

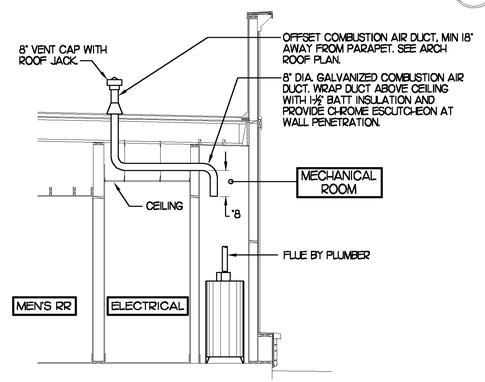
MARK	CFM	VELOCITY	HEATING CAP	HP	AREA SERVED	MODEL	MANUFACTURER	REMARKS
AD#1	750	3,050	7.2 KW	1/5	DRIVE THRU	MP-1-30E	POWERED-AIRE	1,2,3

REMARKS
1) FACTORY PROVIDED REMOTE MOUNTED HEAT/ON/AUTO CONTROLS.
2) FACTORY PROVIDED, UNIT MOUNTED SPEED CONTROLLER.
3) CHICK-FIL-A HAS A NATIONAL ACCOUNT WITH TOM BARROW COMPANY FOR THE AIR DOOR. THE MECHANICAL CONTRACTOR SHALL PURCHASE THE AIR DOOR DIRECTLY FROM TOM BARROW COMPANY. CONTACT MR. SCOTT GEORGE AT 404-351-1010, FOR PRICING AND AVAILABILITY. AN AIR DOOR NOT PURCHASED THRU TOM BARROW COMPANY WILL NOT BE ACCEPTED.



5 SMOKE DETECTOR AND ANNUNCIATOR WIRING DIAGRAM

NO SCALE



6 WATER HEATER VENT/C.A. ROUTING

NO SCALE

5200 Buffington Rd.
Atlanta Georgia,
30349-2998

Revisions:

Mark	Date	By

Seal

BENNOR ENGINEERING, LLC
3000 Langford Road
Building 2400
Norcross, GA 30071
(770) 729-1422 bus
(770) 729-0490 fax
contact@bennorEng.com
MECHANICAL ENGINEERS

STORE
Quakertown
FSU S06-E

Richland Marketplace
Hwy 309
Quakertown,
Pennsylvania

SHEET TITLE
HVAC DETAILS & SCHEDULES

DWG EDITION 07.1
REVISION –

Job No. : 7046
Store : 2219
Date : 6/1/07
Drawn By : JAL
Checked By: RDB

Sheet
M-3.1

NATIONAL ACCOUNTS

1.	LENNOX EQUIPMENT - CONTACT LENNOX NATIONAL ACCOUNTS AT 972-497-6260 (OR BY FAX AT 972-497-5112) FOR PRICING, ORDERING AND AVAILABILITY.
2.	LOREN COOK FAN AND CURB PACKAGE - THE MECHANICAL CONTRACTOR IS REQUIRED TO PURCHASE THE FAN/CURB PACKAGE DIRECTLY FROM FROM TOM BARROW COMPANY. CONTACT MR. SCOTT GEORGE AT 404-351-1010 FOR PRICING AND AVAILABILITY. FANS AND CURBS NOT PURCHASED THRU TOM BARROW COMPANY WILL NOT BE ACCEPTED.
3.	TITUS AIR DEVICES - THE MECHANICAL CONTRACTOR IS REQUIRED TO PURCHASE THE FAN/CURB PACKAGE DIRECTLY FROM FROM TOM BARROW COMPANY. CONTACT MR. SCOTT GEORGE AT 404-351-1010 FOR PRICING AND AVAILABILITY. AIR DEVICES NOT PURCHASED THRU TOM BARROW COMPANY WILL NOT BE ACCEPTED.
4.	SUNCOAST ENVIRONMENTAL CONTROLS - CONTACT SUNCOAST ENVIRONMENTAL CONTROLS FOR THE SMOKE DETECTOR TEST/RESET ANNUNCIATOR STATIONS. THE TEST/RESET STATIONS WILL BE PURCHASED AND PROVIDED BY THE MECHANICAL CONTRACTOR AS A PART OF A NATIONAL ACCOUNT PACKAGE.
5.	HALTON HOODS - CHICK-FIL-A WILL PURCHASE AND PROVIDE THE HOODS FOR INSTALLATION BY THE MECHANICAL CONTRACTOR. THE MECHANICAL CONTRACTOR SHALL BE RESPONSIBLE FOR RECEIVING THE HOODS. CONTACT HALTON CO. AT 270-237-5600 FOR MORE INFO.

I. MECHANICAL SPECIFICATIONS

PART I GENERAL

1. IT IS THE RESPONSIBILITY OF CONTRACTOR TO READ ALL SPECIFICATIONS AND CONSULT ALL DRAWINGS WHICH MAY AFFECT THE INSTALLATION AND COORDINATION OF HIS WORK WITH OTHER TRADES. CONTRACTOR SHALL COORDINATE AND MAKE MINOR ADJUSTMENTS IN LOCATION OF EQUIPMENT AND MATERIALS AS NECESSARY TO SECURE COORDINATION.

2. COMPLETED INSTALLATION SHALL CONFORM TO ALL APPLICABLE FEDERAL, STATE AND LOCAL CODES AND ORDINANCES, INCLUDING BUT NOT LIMITED TO THE LATEST APPROVED EDITIONS OF NFPA-96, NFPA-90A, NFPA-54, SMACNA, ASHRAE 90.1 AND ASHRAE 62.

3. SYSTEM LAYOUT IS SCHEMATIC AND EXACT LOCATIONS SHALL BE DETERMINED BY STRUCTURAL CONDITIONS, COORDINATION WITH OTHER TRADES, COORDINATION WITH FINISHES AND OTHER CONDITIONS. STRUCTURAL SUPPORTS SHALL NOT BE CUT OR ALTERED TO ASSURE FIT OF HVAC SYSTEM. TEN FOOT CLEARANCE SHALL BE MAINTAINED BETWEEN OUTSIDE AIR INTAKES AND EXHAUST FANS AND PLUMBING VENT TERMINALS.

4. CONTRACTOR SHALL BE RESPONSIBLE FOR ALL DEFECTS, REPAIRS AND REPLACEMENTS IN MATERIALS AND WORKMANSHIP FOR A PERIOD OF ONE (1) YEAR AFTER FINAL PAYMENT IS APPROVED. CONTRACTOR SHALL HONOR FACTORY WARRANTIES ON ALL EQUIPMENT PROVIDED AS PART OF THIS SYSTEM.

5. UPON COMPLETION OF PROJECT, ALL SYSTEM EQUIPMENT AND MATERIALS SHALL BE IN NEW, CLEAN CONDITION WITH ALL DAMAGE RESTORED TO CONDITION ACCEPTABLE TO THE OWNERS REPRESENTATIVE. ALL EQUIPMENT, COMPONENTS AND DUCTWORK SHALL BE INSPECTED AND THOROUGHLY CLEANED, READY FOR USE. AT COMPLETION OF JOB, ALL MISCELLANEOUS TOOLS, SCAFFOLDING, SURPLUS MATERIALS, RUBBISH AND DEBRIS SHALL BE REMOVED BY CONTRACTOR.

6. CONTRACTOR SHALL PROVIDE FARR 30/30 2" OR EQUAL THROW AWAY TYPE FILTERS. A CLEAN SET SHALL BE PROVIDED PRIOR TO UNIT STARTUP AND AGAIN PRIOR TO OPENING.

PART II PRODUCTS

1. HEATING AND COOLING EQUIPMENT

   A. FURNISH AND INSTALL ROOFTOP SINGLE PACKAGE COMBINATION ELECTRIC COOLING AND NATURAL GAS FIRED HEATING UNITS BY LENNOX AS SHOWN ON DRAWINGS. EQUIPMENT SHALL BE ARI CERTIFIED AND A.G.A. AND U.L. LISTED.

   B. ACCESSORIES SHALL INCLUDE LOW AND HIGH PRESSURE SAFETIES, CRANK CASE HEATER, OVERCURRENT AND OVERTEMPERATURE SAFETY, COMPRESSOR VIBRATION ISOLATORS, FILTER DRIERS, REFRIGERANT SERVICE VALVES, COIL HAIL GUARDS WHERE SCHEDULED, CONVENIENCE OUTLETS FACTORY INSTALLED ON SCHEDULED UNITS, UNIT MOUNTED NON-FUSED DISCONNECTS, LOW AMBIENT OPERATION DOWN TO 30 DEGREES F AND EVAPORATOR FREEZE STAT.

   C. COMPRESSORS SHALL BE FULLY HERMETIC SCROLL TYPE WITH INTERNAL VIBRATION ISOLATORS. COMPRESSORS SHALL BE PROVIDED WITH A MINIMUM FIVE (5) YEAR FULL WARRANTY.

   D. THE UNIT HEAT EXCHANGERS SHALL BE STEEL WITH ALUMINIZED STEEL COATING. HEATING CONTROLS SHALL CONSIST OF REDUNDANT GAS VALVES, INTERMITTENT PILOT WITH ELECTRONIC SPARK OR HOT PLATE IGNITION SYSTEM, COMBUSTION/EXHAUST FAN PROTECTED BY CENTRIFUGAL SWITCHES, HEAT LIMIT SWITCHES, TIME-DELAY RELAY, FLAME, AND PILOT SENSORS. ALL UNITS SHALL BE CAPABLE OF TWO STAGES OF HEAT. HEAT EXCHANGES SHALL HAVE A TEN (10) YEAR WARRANTY. BURNERS SHALL BE ALUMINIZED IN-SHOT TYPE. THE DRAFT MOTOR SHALL BE MONITORED BY THE CONTROL SYSTEM.

   E. CHICK-FIL-A MAINTAINS A NATIONAL ACCOUNT FOR EQUIPMENT WITH LENNOX CORPORATION. PRICING FOR THE EQUIPMENT HAS BEEN ESTABLISHED IN ADVANCE. CONTACT LENNOX NATIONAL ACCOUNTS AT 972-497-6260 (OR BY FAX AT 972-497-5112) FOR PRICING, ORDERING AND AVAILABILITY.

2. DUCTWORK, INSULATION & INSTALLATION (SEE DWG M2.1 FOR GREASE DUCT)

   A. ACCEPTABLE MANUFACTURERS OF INSULATION ARE MANVILLE, OWENS CORNING OR KNAUF.

   B. ALL DUCTWORK SHALL BE SHEET METAL.

   C. DUCT DIMENSIONS SHOWN ARE INSIDE CLEAR DIMENSIONS.

   D. CONSTRUCTION OF DUCTWORK SHALL MEET SMACNA 1" W.C. PRESSURE CLASS STANDARD AND RECOMMENDATIONS. SMACNA SHALL BE FOLLOWED WITH RESPECT TO GAGE THICKNESS, JOINTS, REINFORCING, CONSTRUCTION, INSTALLATION AND SUPPORT FOR PRESSURE CLASS STATED. ALL TRANSVERSE JOINTS IN RECTANGULAR AND ROUND DUCT SHALL BE SEALED PER SMACNA SEAL CLASS C WITH U.L. DUCT MASTIC SEALANT APPROVED FOR INTENDED USE. DUCT TAPE IS NOT AN ACCEPTABLE SUBSTITUTE FOR MASTIC.

   E. ALL DUCT INSULATION SHALL MEET MINIMUM R-VALUE REQUIRED BY ASHRAE 90.1 LATEST EDITION. ALL DUCT WRAP SHALL BE MINIMUM 2" THICK, 3/4 PCF AND 5.6 R-VALUE INSTALLED WITH EITHER A VAPOR BARRIER WITH MAXIMUM PERMEANCE 0.05 OR A MINIMUM 2 MIL ALUMINUM REINFORCED FOIL/KRAFT FACING.

   F. ALL DUCT DROPS FROM THE ROOFTOP UNITS SHALL BE EXTERNALLY INSULATED.

   G. SUPPLY AND RETURN AIR DUCTWORK SERVING THE PLAYGROUND, KITCHEN, SERVING AND DINING AREAS SHALL BE EXTERNALLY INSULATED.

   H. RESTROOM RECTANGULAR EXHAUST AIR DUCTWORK SHALL BE LINED WITH 1" THICK, 1-1/2 PCF INSULATION.

   I. TRUNK DUCTS SHALL BE ISOLATED FROM UNIT VIBRATION WITH THE USE OF NFPA AND U.L. APPROVED FLEXIBLE CONNECTORS INSTALLED AT THE TOP OF BOTH SUPPLY AND RETURN DROPS.

   J. INSULATED FLEXIBLE DUCT MAY BE UTILIZED FOR RUNOUTS TO GRILLES AND DIFFUSERS ONLY IN THE HORIZONTAL POSITION AND IN MAXIMUM LENGTHS OF 4'-0", NO EXCEPTIONS. SEE TAKE-OFF DETAIL ON DRAWING M3.1.

   K. CONSTRUCTION OF FLEXIBLE DUCTWORK SHALL INCLUDE SPIRAL METAL HELIX BONDED TO A POLYESTER CORE, FIBERGLASS INSULATION WITH POLYETHYLENE OR MYLAR VAPOR BARRIER. ALL COMPONENTS SHALL HAVE APPROPRIATE U.L. APPROVAL AND SHALL BE EQUIVALENT TO THERMAFLEX MKE.

   L. FLEXIBLE DUCT SHALL BE INSTALLED USING DRAWBANDS AND U.L. 181B FOIL TAPE ON THE INNER CORE AND OUTER INSULATION.

   M. DUCT TAPE SHALL BE EQUAL TO FASSON 181-B FX, 2-1/2" WIDE.

   N. SINGLE THICKNESS TURNING VANES SHALL BE INSTALLED AT 90 DEGREE TURNS IN SUPPLY DUCTWORK WHERE ANY ONE DIMENSION IS GREATER THAN 12".

   O. RADIUSED ELBOWS MAY BE SUBSTITUTED FOR 90 DEGREE ELBOWS AT THE DISCRETION OF THE CONTRACTOR. CENTERLINE RADIUS EQUAL TO, 3W/2 PER FIGURE NO. 2-2 IN SMACNA HVAC DUCT CONSTRUCTION STANDARDS.

   P. EXTERNAL INSULATION ON BOTTOM OF DUCTS 24" OR WIDER SHALL BE SUPPORTED WITH STICK PINS ON 18" CENTERS. STICK PIN WASHERS SHALL BE COVERED WITH DUCT TAPE OR MASTIC.

3. CONTROLS

   A. SYSTEMS SHALL BE COMPLETE WITH CONNECTIONS TO CFA-500 TEMPERATURE CONTROL PANEL AS MANUFACTURED BY SUNCOAST ENVIRONMENTAL CONTROLS (S.E.C.) (PH: 877-544-6679). THE PANEL IS PROVIDED AND MOUNTED BY THE ELECTRICAL CONTRACTOR. CONTROL WIRING TERMINATIONS ARE BY THE MECHANICAL CONTRACTOR.

   B. THE SMOKE DETECTORS SHALL BE FACTORY INSTALLED AND WIRED BY THE ROOFTOP UNIT MANUFACTURER.

   C. A FACTORY INSTALLED SMOKE DETECTOR IN THE RETURN AIR SECTION OF EACH AIR CONDITIONING UNIT SHALL STOP THE INDOOR FAN AND CLOSE THE OUTSIDE AIR DAMPER IN THE EVENT OF EXCESSIVE TEMPERATURE OR SMOKE. SMOKE DETECTOR SHALL BE LOCATED PRIOR TO ANY EXHAUST FROM THE BUILDING OR MIXING WITH FRESH AIR MAKE-UP. UPON DETECTION, THE SYSTEM SHALL NOT RESTART UNTIL THE DEVICE IS MANUALLY RESET. DEVICES SHALL BE LOCATED WHERE THEY CAN BE EASILY ACCESSED AND WHERE CLEAR OF FILTERS.

   D. CHICK-FIL-A HAS A NATIONAL ACCOUNT WITH SUNCOAST ENVIRONMENTAL CONTROLS FOR THE SMOKE DETECTOR TEST/RESET ANNUNCIATOR STATIONS. THE TEST/RESET STATIONS WILL BE PURCHASED AND PROVIDED BY THE MECHANICAL CONTRACTOR AS A PART OF A NATIONAL ACCOUNT PACKAGE.

   E. THE REMOTE TEST/RESET ANNUNCIATORS SHALL BE PROVIDED, INSTALLED AND WIRED BY THE MECHANICAL CONTRACTOR. INSTALLATION BY MECHANICAL SHALL INCLUDE MOUNTING OF THE ANNUNCIATORS AND ALL WIRING FROM EACH DEVICE TO THE RTU. ELECTRICAL WILL PROVIDE A JUNCTION BOX IN THE WALL WITH 1/2" CONDUIT STUBBED UP ABOVE THE CEILING FOR EACH REMOTE TEST STATION AS SHOWN ON THE ELECTRICAL PLANS. ANNUCIATOR SHALL BE SUNCOAST CONTROLS REMOTE TEST/RESET STATION WITH POWER LED, ALARM LED, 90DB HORN AND TEST/RESET BUTTON.

   F. WHERE REQUIRED BY LOCAL CODE , INSTALL A FIRESTAT IN THE RETURN AIR DUCT OF EACH PIECE OF AIR CONDITIONING EQUIPMENT HANDLING 2000 CFM OR MORE TO STOP THE INDOOR FAN AND CLOSE THE OUTSIDE AIR DAMPER WHEN HEAT WITHIN THE DUCT IS IN EXCESS OF 135 DEGREES FAHRENHEIT. FIRESTAT SHALL BE EQUIVALENT TO HONEYWELL MODEL #L4029E HIGH LIMIT CONTROLLER. FIRESTATS SHALL BE PROVIDED AND MOUNTED BY THE MECHANICAL CONTRACTOR. INSTALLATION BY MECHANICAL SHALL INCLUDE MOUNTING OF THE DEVICE AND ALL WIRING FROM THE DEVICE TO THE RTU. SHUTDOWN OF UNIT AND INDOOR FAN SHALL BE IMMEDIATE WITH NO DELAY.

   G. THE RESTROOM FAN SHALL BE INTERLOCKED TO THE LIGHTS SERVING THE MEN AND WOMEN'S RESTROOMS. THE HOOD FANS SHALL BE CONTROLLED VIA THE SUNCOAST CFA-500 CONTROL PANEL. WIRING, RELAYS AND SWITCHES FOR CONTROL OF ALL FANS ARE BY ELECTRICAL CONTRACTOR.

   H. THERMOSTATS ARE PROVIDED AND INTEGRATED INTO THE TEMPERATURE CONTROL PANEL BY SUNCOAST ENVIRONMENT CONTROLS. SUNCOAST WILL PROVIDE A ROBERTSHAW SERIES 300 THERMOSTAT PRE-WIRED IN THE TEMPERATURE CONTROL PANEL. A REMOTE TEMPERATURE SENSOR FOR EACH THERMOSTAT IS ALSO PROVDED. MECHANICAL CONTRACTOR SHALL INSTALL ALL WIRING BETWEEN THE THERMOSTAT, THE REMOTE SENSOR AND THE ROOFTOP UNIT.

   I. MECHANICAL CONTRACTOR SHALL INSTALL CONTROL WIRING IN 1/2" CONDUIT WHERE REQUIRED BY CODE. WHERE NOT REQUIRED TO BE IN CONDUIT, ALL WIRING SHALL BE RUN PARALLEL TO STRUCTURAL MEMBERS OR PERPENDICULAR WITH NO DIAGONAL ROUTING. ALL WIRING SHALL BE SECURED TO THE FRAMING TO PREVENT SAGGING IN RUNS. WIRING TO ROOFTOP UNITS SHALL BE ROUTED THROUGH THE FACTORY THRU-BASE FITTING IN THE UNIT BASE. NO SPLICING OF WIRING WILL BE ACCEPTED. ALL WIRING ABOVE THE ROOF SHALL BE INSTALLED IN EXTERIOR GRADE FLEXIBLE CONDUIT. ALL CONTROL WIRING AND CONTROL WIRING CONDUIT SHALL BE FURNISHED AND INSTALLED BY THE MECHANICAL CONTRACTOR. WIRING SHALL BE INSTALLED IN ACCORDANCE WITH LATEST EDITION OF NEC.

PART III EXECUTION

   A. FURNISH AND INSTALL SYSTEM IN ACCORDANCE WITH REFERENCED STANDARDS, APPLICABLE CODES, MANUFACTURER'S RECOMMENDATIONS AND AS INDICATED ON DRAWINGS.

   B. OWNER SHALL TEST AND BALANCE MECHANICAL SYSTEM IN ACCORDANCE WITH NBI OR AABC STANDARDS TO ASSURE CONFORMANCE WITH DESIGN. G.C. WILL MAKE MECHANICAL CONTRACTOR AVAILABLE DURING TEST AND BALANCE TO ASSIST TESTING AGENCY AND TO MAKE CORRECTIONS IMMEDIATELY NECESSARY. CONTRACTOR SHALL CORRECT ITEMS ON WRITTEN TEST AND BALANCE REPORT.

   C. CONTRACTOR SHALL INSTRUCT THE OWNER'S REPRESENTATIVE IN ALL MATTERS PERTAINING TO THE PROPER MAINTENANCE OF EQUIPMENT FURNISHED UNDER THIS CONTRACT THROUGH DEMONSTRATION AND EXPLANATION OF OPERATING & MAINTENANCE MANUALS.

   D. CONTRACTOR SHALL PROVIDE A "SAMPLE MAINTENANCE PROPOSAL" TO THE OWNER'S REPRESENTATIVE IN ALL MATTERS PERTAINING TO THE PROPER MAINTENANCE OF EQUIPMENT FURNISHED UNDER THIS CONTRACT.

   E. CONTRACTOR SHALL COMPLETE A/C EQUIPMENT STARTUP DOCUMENTATION PROVIDED BY OWNER.

Chick-fil-A
5200 Buffington Rd.
Atlanta Georgia,
30349-2998

Revisions:

Mark	Date	By
1		
Mark	Date	By
1		
Mark	Date	By
1		

Seal

BENNOR ENGINEERING, LLC
MECHANICAL ENGINEERS
3000 Langford Road
Building 2400
Norcross, GA 30071
(770) 729-1422 bus
(770) 729-0490 fax
contact@BennorEng.com

STORE
Quakertown
FSU S06-E

Richland Marketplace
Hwy 309
Quakertown,
Pennsylvania

SHEET TITLE
MECHANICAL SPECIFICATIONS

DWG EDITION 07.1
REVISION –

Job No. : 7046
Store : 2219
Date : 6/1/07
Drawn By : JAL
Checked By: RDB

Sheet
M-4.1

COMcheck Software Version 3.4.0

Envelope Compliance Certificate

2006 IECC

Report Date: 05/30/07

Data filename: J:\AUTOCA~1\CFA\STEAD~2\PA_QUA~1\COMcheck\QUAKER~1.CCK

Section 1: Project Information

Project Title: Chick-fil-A

Construction Site:	Owner/Agent:	Designer/Contractor:
Richland Marketplace Hwy 309 Quakertown, PA 18951	Rudy D. Bennor, PE Bennor Engineering, LLC 3000 Langford Road Bldg 2400 Norcross, GA 770-729-1422	Rudy D. Bennor, PE Bennor Engineering, LLC 3000 Langford Road Bldg 2400 Norcross, GA 770-729-1422

Section 2: General Information

Building Location (for weather data): Quakertown, Pennsylvania
Climate Zone: 4a
Heating Degree Days (base 65 degrees F): 5785
Cooling Degree Days (base 50 degrees F): 3828
Project Type: New Construction
Vertical Glazing / Wall Area Pct.: 15%

Activity Type(s)	Floor Area
Dining: Cafeteria/Fast Food	3916

Section 3: Requirements Checklist

Envelope PASSES: Design 3% better than code

Climate-Specific Requirements:

Component Name/Description	Gross Area or Perimeter	Cavity R-Value	Cont. R-Value	Proposed U-Factor	Budget U-Factor
Roof 1: Insulation Entirely Above Deck	3916	---	14.0	0.065	0.063
Exterior Wall 1: Wood Frame, Any Spacing	3674	19.0	0.0	0.067	0.089
Window 1: Metal Frame with Thermal Break, Double Pane, Clear, SHGC 0.65, PF 0.50	374	---	---	0.630	0.550
Window 2: Metal Frame with Thermal Break, Double Pane, Clear, SHGC 0.66, PF 0.20	110	---	---	0.630	0.550
Door 1: Glass, Entrance Door, SHGC 0.44, PF 0.40	42	---	---	0.920	0.850
Door 2: Glass, Entrance Door, SHGC 0.44, PF 0.40	42	---	---	0.920	0.850
Floor 1: Slab-On-Grade:Unheated	350	---	---	---	---

(a) Budget U-factors are used for software baseline calculations ONLY, and are not code requirements.

Air Leakage, Component Certification, and Vapor Retarder Requirements:

- [ ] 1. All joints and penetrations are caulked, gasketed or covered with a moisture vapor-permeable wrapping material installed in accordance with the manufacturer's installation instructions.
- [ ] 2. Windows, doors, and skylights certified as meeting leakage requirements.
- [ ] 3. Component R-values & U-factors labeled as certified.
- [ ] 4. Insulation installed according to manufacturer's instructions, in substantial contact with the surface being insulated, and in a manner that achieves the rated R-value without compressing the insulation.

- [ ] 5. No roof insulation is installed on a suspended ceiling with removable ceiling panels.
- [ ] 6. Stair, elevator shaft vents, and other outdoor air intake and exhaust openings in the building envelope are equipped with motorized dampers.
- [ ] 7. Cargo doors and loading dock doors are weather sealed.
- [ ] 8. Recessed lighting fixtures are: (i) Type IC rated and sealed or gasketed; or (ii) installed inside an appropriate air-tight assembly with a 0.5 inch clearance from combustible materials and with 3 inches clearance from insulation material.
- [ ] 9. Building entrance doors have a vestibule and equipped with closing devices.
  Exceptions:
  Building entrances with revolving doors.
  Doors that open directly from a space less than 3000 sq. ft. in area.
- [ ] 10. Vapor retarder installed.

Section 4: Compliance Statement

Compliance Statement: The proposed envelope design represented in this document is consistent with the building plans, specifications and other calculations submitted with this permit application. The proposed envelope system has been designed to meet the 2006 IECC requirements in COMcheck Version 3.4.0 and to comply with the mandatory requirements in the Requirements Checklist.

Rudy D. Bennor, P.E. - President
Name - Title ____ Signature ____ Date ____

COMcheck Software Version 3.4.0

Mechanical Compliance Certificate

2006 IECC

Report Date: 05/30/07

Data filename: J:\AUTOCA~1\CFA\STEAD~2\PA_QUA~1\COMcheck\QUAKER~1.CCK

Section 1: Project Information

Project Title: Chick-fil-A

Construction Site:	Owner/Agent:	Designer/Contractor:
Richland Marketplace Hwy 309 Quakertown, PA 18951	Rudy D. Bennor, PE Bennor Engineering, LLC 3000 Langford Road Bldg 2400 Norcross, GA 770-729-1422	Rudy D. Bennor, PE Bennor Engineering, LLC 3000 Langford Road Bldg 2400 Norcross, GA 770-729-1422

Section 2: General Information

Building Location (for weather data): Quakertown, Pennsylvania
Climate Zone: 4a
Heating Degree Days (base 65 degrees F): 5785
Cooling Degree Days (base 50 degrees F): 3828
Project Type: New Construction

Section 3: Mechanical Systems List

Quantity	System Type & Description
1	HVAC System 2: Heating: Central Furnace, Gas / Cooling: Rooftop Package Unit, Capacity >=90 - <135 kBtu/h, Air-Cooled Condenser / Single Zone
2	HVAC System 1: Heating: Central Furnace, Gas / Cooling: Rooftop Package Unit, Capacity >=135 - <240 kBtu/h, Air-Cooled Condenser / Single Zone
1	HVAC System 3: Heating: Central Furnace, Gas / Cooling: Rooftop Package Unit, Capacity >=54 - <90 kBtu/h, Air-Cooled Condenser / Single Zone
1	Water Heating 1: Gas Instantaneous Water Heater, Capacity: 75 gallons, Input Rating: 80000 Btu/h

Section 4: Requirements Checklist

Requirements Specific To: HVAC System 2 :

- [ ] 1. Newly purchased heating equipment meets the heating efficiency requirements
- [ ] 2. Equipment minimum efficiency: Rooftop Package Unit: 10.1 EER

Requirements Specific To: HVAC System 1 :

- [ ] 1. Newly purchased heating equipment meets the heating efficiency requirements
- [ ] 2. Equipment minimum efficiency: Rooftop Package Unit: 9.5 EER

Requirements Specific To: HVAC System 3 :

- [ ] 1. Newly purchased heating equipment meets the heating efficiency requirements
- [ ] 2. Equipment minimum efficiency: Rooftop Package Unit: 10.1 EER

Requirements Specific To: Water Heating 1 :

- [ ] 1. Hot water system sized per manufacturer's sizing guide
- [ ] 2. Unknown hot water system type. Efficiency requirements can not be determined.
- [ ] 3. First 8 ft of outlet piping is insulated

Generic Requirements: Must be met by all systems to which the requirement is applicable:

- [ ] 1. Load calculations per 2001 ASHRAE Fundamentals
- [ ] 2. Plant equipment and system capacity no greater than needed to meet loads
  - Exception: Standby equipment automatically off when primary system is operating
  - Exception: Multiple units controlled to sequence operation as a function of load
- [ ] 3. Minimum one temperature control device per system
- [ ] 4. Minimum one humidity control device per installed humidification/dehumidification system
- [ ] 5. Thermostatic controls has 5 degrees F deadband
  - Exception: Thermostats requiring manual changeover between heating and cooling
- [ ] 6. Automatic Controls: Setback to 55 degrees F (heat) and 85 degrees F (cool); 7-day clock, 2-hour occupant override, 10-hour backup
  - Exception: Continuously operating zones
  - Exception: 2 kW demand or less, submit calculations
- [ ] 7. Outside-air source for ventilation; system capable of reducing OSA to required minimum
- [ ] 8. R-5 supply and return air duct insulation in unconditioned spaces R-8 supply and return air duct insulation outside the building R-8 insulation between ducts and the building exterior when ducts are part of a building assembly
  - Exception: Ducts located within equipment
  - Exception: Ducts with interior and exterior temperature difference not exceeding 15 degrees F.
  - Exception: Continuously welded and locking-type longitudinal joints and seams on ducts operating at static pressures less than 2 inches w.g. pressure classification
- [ ] 9. Mechanical fasteners and sealants used to connect ducts and air distribution equipment
- [ ] 10. Ducts sealed - longitudinal seams on rigid ducts; transverse seams on all ducts; UL 181A or 181B tapes and mastics
- [ ] 11. Operation and maintenance manual provided to building owner
- [ ] 12. Balancing devices provided in accordance with IMC 603.15
- [ ] 13. Piping, insulated to 1/2 in. if nominal diameter of pipe is <1.5 in.; Larger pipe insulated to 1 in. thickness
- [ ] 14. Lavatory faucet outlet temperatures in public restrooms limited to 110 degrees F (43 degrees C)
- [ ] 15. Motorized, automatic shutoff dampers required on exhaust and outdoor air supply openings
  - Exception: Gravity dampers acceptable in buildings <3 stories
  - Exception: Gravity dampers acceptable in systems with outside or exhaust air flow rates less than 300 cfm where dampers are interlocked with fan
- [ ] 16. Stair and elevator shaft vents are equipped with motorized dampers

Section 5: Compliance Statement

Compliance Statement: The proposed mechanical design represented in this document is consistent with the building plans, specifications and other calculations submitted with this permit application. The proposed mechanical systems have been designed to meet the 2006 IECC requirements in COMcheck Version 3.4.0 and to comply with the mandatory requirements in the Requirements Checklist.

Rudy D. Bennor, P.E. - President
Name - Title ____ Signature ____ Date ____

COMcheck Software Version 3.4.0

Mechanical Requirements Description

2006 IECC

Report Date:

Data filename: J:\AUTOCA~1\CFA\STEAD~2\PA_QUA~1\COMcheck\QUAKER~1.CCK

The following list provides more detailed descriptions of the requirements in Section 4 of the Mechanical Compliance Certificate.

Requirements Specific To: HVAC System 2 :

1. The specified heating equipment is covered by Federal minimum efficiency requirements. New equipment of this type can be assumed to meet or exceed ASHRAE 90.1 Code requirements for equipment efficiency.
2. The specified heating and/or cooling equipment is covered by ASHRAE 90.1 Code and must meet the following minimum efficiency: Rooftop Package Unit: 10.1 EER

Requirements Specific To: HVAC System 1 :

1. The specified heating equipment is covered by Federal minimum efficiency requirements. New equipment of this type can be assumed to meet or exceed ASHRAE 90.1 Code requirements for equipment efficiency.
2. The specified heating and/or cooling equipment is covered by ASHRAE 90.1 Code and must meet the following minimum efficiency: Rooftop Package Unit: 9.5 EER

Requirements Specific To: HVAC System 3 :

1. The specified heating equipment is covered by Federal minimum efficiency requirements. New equipment of this type can be assumed to meet or exceed ASHRAE 90.1 Code requirements for equipment efficiency.
2. The specified heating and/or cooling equipment is covered by ASHRAE 90.1 Code and must meet the following minimum efficiency: Rooftop Package Unit: 10.1 EER

Requirements Specific To: Water Heating 1 :

1. Service water heating system design loads for the purpose of sizing systems and equipment must be determined in accordance with manufacturers' published sizing guidelines.
2. Service water heating equipment used solely for heating potable water, pool heaters, and hot water storage tanks must meet the following minimum efficiency: Unknown hot water system type. Efficiency requirements can not be determined.
3. Insulation must be provided for the first 8 ft of outlet piping for a constant temperature nonrecirculating storage system and for the inlet pipe between the storage tank and a heat trap in a storage system.

Generic Requirements: Must be met by all systems to which the requirement is applicable:

1. Design heating and cooling loads for the building must be determined using procedures in the ASHRAE Handbook of Fundamentals or an approved equivalent calculation procedure.
2. All equipment and systems must be sized to be no greater than needed to meet calculated loads. A single piece of equipment providing both heating and cooling must satisfy this provision for one function with the capacity for the other function as small as possible, within available equipment options.
   - Exception: The equipment and/or system capacity may be greater than calculated loads for standby purposes. Standby equipment must be automatically controlled to be off when the primary equipment and/or system is operating.
   - Exception: Multiple units of the same equipment type whose combined capacities exceed the calculated load are allowed if they are provided with controls to sequence operation of the units as the load increases or decreases.
3. Each heating or cooling system serving a single zone must have its own temperature control device.
4. Each humidification system must have its own humidity control device.
5. Thermostats controlling both heating and cooling must be capable of maintaining a 5 degrees F deadband (a range of temperature where no heating or cooling is provided).
   - Exception: Deadband capability is not required if the thermostat does not have automatic changeover capability between heating and cooling.
6. The system or zone control must be a programmable thermostat or other automatic control meeting the following criteria: a) capable of setting back temperature to 55 degrees F during heating and setting up to 85 degrees F during cooling; b) capable of automatically setting back or shutting down systems during unoccupied hours using 7 different day schedules; c) have an accessible 2-hour occupant override; d) have a battery back-up capable of maintaining programmed settings for at least 10 hours without power.

   - Exception: A setback or shutoff control is not required on thermostats that control systems serving areas that operate continuously.
   - Exception: A setback or shutoff control is not required on systems with total energy demand of 2 kW (6,826 Btu/h) or less.
7. The system must supply outside ventilation air as required by Chapter 4 of the International Mechanical Code. If the ventilation system is designed to supply outdoor-air quantities exceeding minimum required levels, the system must be capable of reducing outdoor-air flow to the minimum required levels.
8. Air ducts must be insulated to the following levels: a) Supply and return air ducts for conditioned air located in unconditioned spaces (spaces neither heated nor cooled) must be insulated with a minimum of R-5. Unconditioned spaces include attics, crawl spaces, unheated basements, and unheated garages. b) Supply and return air ducts and plenums must be insulated to a minimum of R-8 when located outside the building. c) When ducts are located within exterior components (e.g., floors or roofs), minimum R-8 insulation is required only between the duct and the building exterior.
   - Exception: Duct insulation is not required on ducts located within equipment.
   - Exception: Duct insulation is not required when the design temperature difference between the interior and exterior of the duct or plenum does not exceed 15 degrees F.
   - Exception: Continuously welded and locking-type longitudinal joints and seams on ducts operating at static pressures less than 2 inches w.g. pressure classification.
9. Mechanical fasteners and seals, mastics, or gaskets must be used when connecting ducts to fans and other air distribution equipment, including multiple-zone terminal units.
10. All joints, longitudinal and transverse seams, and connections in ductwork must be securely sealed using weldments; mechanical fasteners with seals, gaskets, or mastics; mesh and mastic sealing systems; or tapes. Tapes and mastics must be listed and labeled in accordance with UL 181A and shall be marked "181A-P" for pressure sensitive tape, "181A-M" for mastic or "181A-H" for heat-sensitive tape. Tapes and mastics used to seal flexible air ducts and flexible air connectors shall comply with UL 181B and shall be marked "181B-FX" for pressure-sensitive tape or "181B-M" for mastic. Unlisted duct tape is not permitted as a sealant on any metal ducts.
11. Operation and maintenance documentation must be provided to the owner that includes at least the following information: a) equipment capacity (input and output) and required maintenance actions; b) equipment operation and maintenance manuals; c) HVAC system control maintenance and calibration information, including wiring diagrams, schematics, and control sequence descriptions; desired or field-determined set points must be permanently recorded on control drawings, at control devices, or, for digital control systems, in programming comments; d) complete narrative of how each system is intended to operate.
12. Each supply air outlet or diffuser and each zone terminal device (such as VAV or mixing box) must have its own balancing device. Acceptable balancing devices include adjustable dampers located within the ductwork, terminal devices, and supply air diffusers.
13. Service hot water piping, where required, must be insulated to 1/2 in. if pipe less than 1.5 in. nominal diameter. Larger pipe must be insulated to 1 in.. Pipe insulation will have a conductivity of less than 0.28 Btu.in/(h.ft2.degrees F).
14. Temperature controlling means must be provided to limit the maximum temperature of water delivered from lavatory faucets in public facility restrooms to 110 degrees F.
15. Outdoor air supply and exhaust systems must have motorized dampers that automatically shut when the systems or spaces served are not in use. Dampers must be capable of automatically shutting off during preoccupancy building warm-up, cool-down, and setback, except when ventilation reduces energy costs (e.g., night purge) or when ventilation must be supplied to meet code requirements. Both outdoor air supply and exhaust air dampers must have a maximum leakage rate of 3 cfm/ft2 at 1.0 in w.g. when tested in accordance with AMCA Standard 500.
   - Exception: Gravity (non-motorized) dampers are acceptable in buildings less than three stories in height.
   - Exception: Systems with a design outside air intake or exhaust capacity of 300 cfm (140 L/s) or less that are equipped with motor operated dampers that open and close when the unit is energized and de-energized, respectively.
16. Stair and elevator shaft vents must be equipped with motorized dampers capable of being automatically closed during normal building operation and interlocked to open as required by fire and smoke detection systems. All gravity outdoor air supply and exhaust hoods, vents, and ventilators must be equipped with motorized dampers that will automatically shut when the spaces served are not in use. Exceptions: - Gravity (non-motorized) dampers are acceptable in buildings less than three stories in height above grade. - Ventilation systems serving unconditioned spaces.

Chick-fil-A
5200 Buffington Rd.
Atlanta Georgia,
30349-2998

Revisions:

Mark	Date	By

Seal

BENNOR ENGINEERING, LLC
3000 Langford Road
Building 2400
Norcross, GA 30071
(770) 729-1422 bus
(770) 729-0490 fax
contact@BennorEng.com
MECHANICAL ENGINEERS

STORE
Quakertown
FSU S06-E

Richland Marketplace
Hwy 309
Quakertown,
Pennsylvania

SHEET TITLE
ENERGY CALCULATIONS

DWG EDITION 07.1
REVISION –

Job No. : 7046
Store : 2219
Date : 6/1/07
Drawn By : JAL
Checked By: RDB

Sheet
M-5.1