

Alamance Consulting Engineers

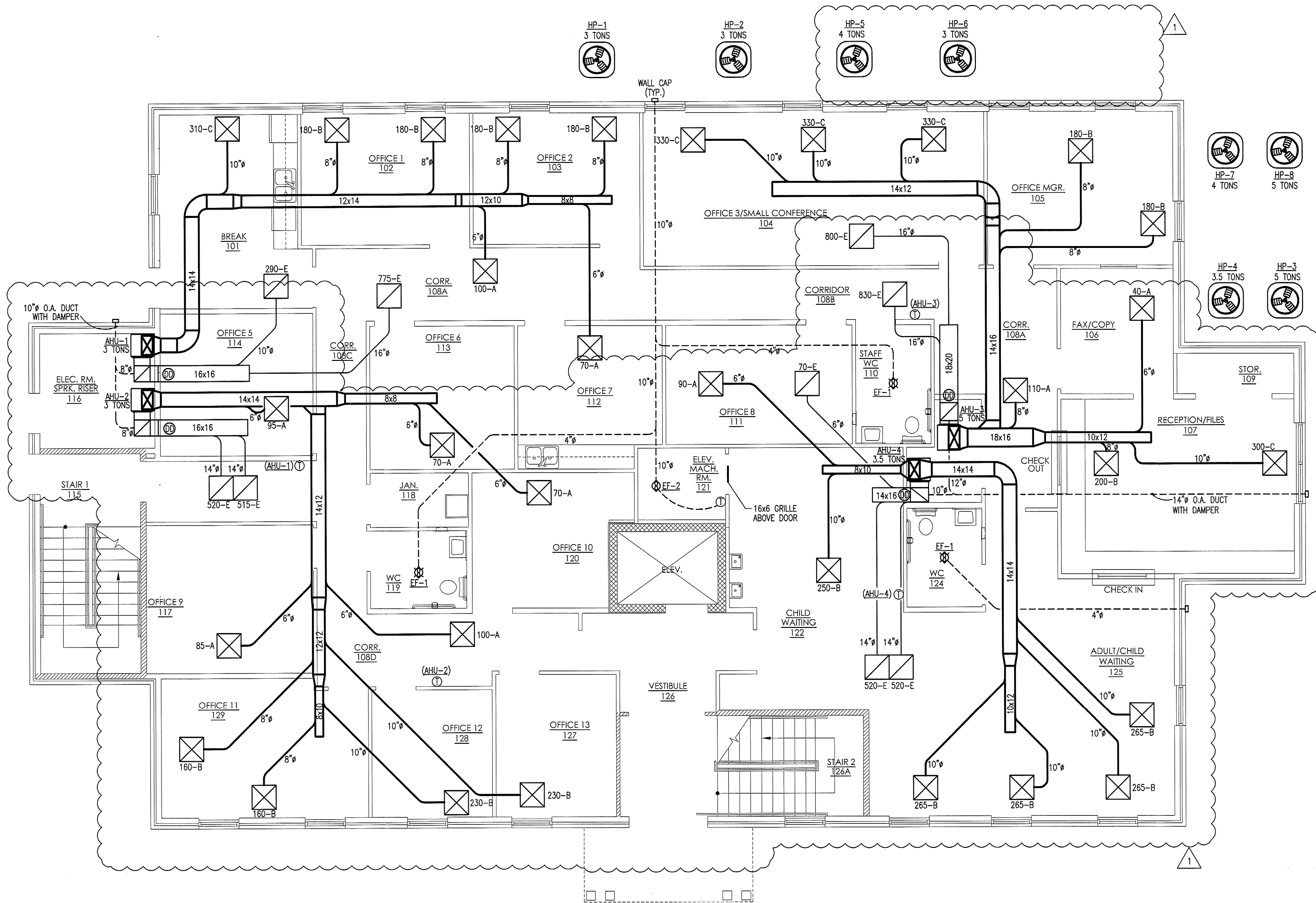
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HOUSEWRIGHT BUILDING CO.

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CARRBORO, NC 27510
919-524-2074

**NEW BUILDING FACILITY:
CBC OFFICE BUILDING**

Hillsborough, North Carolina



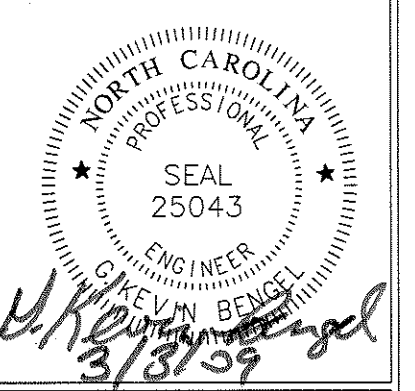
1st FLOOR
MECHANICAL PLAN
M-1 SCALE: 3/16" = 1'-0"

SYMBOLS & ABBREVIATIONS LEGEND	
SYMBOL	DESCRIPTION
⊕	THERMOSTAT (PROGRAMMABLE)
⊠	CEILING SUPPLY DIFFUSER
⊡	CEILING RETURN GRILLE
▬	SUPPLY DUCT SECTION
▬	RETURN DUCT SECTION
CFM	CUBIC FEET PER MINUTE
∅	DIAMETER OR POWER PHASE
O.A.	OUTSIDE AIR
R.A.	RETURN AIR
S.A.	SUPPLY AIR
A.F.F.	ABOVE FINISHED FLOOR
⊗	EXHAUST FAN/LIGHT COMBO
⊘	EXHAUST FAN
⊙	DUCT MOUNTED SMOKE DETECTOR

WALL LEGEND	
▨	1HR. RATED GYPSUM WALL
▩	1HR. RATED MASONRY WALL

REV #	DATE	BY	CHECKED	DESCRIPTION
1	3/3/09	EDM	JNK	REVISED TO SUIT NEW FLOOR PLAN, RELOCATED AIR HANDLERS, REMOVED DUCTWORK IN VESTIBULE, AND REMOVED HVAC SYSTEM 9 AT THE REQUEST OF THE GENERAL CONTRACTOR (A. KNIGHT). REFER TO EMAIL FROM ARCHITECT (D. RIPPERTON) DATED 2-20-09.

DRAWING NAME
1st FLOOR
MECHANICAL PLAN



DRAWN
TGW
CHECKED
JNK
DATE
1/8/09
SCALE
AS NOTED
JOB NO.
8123
SHEET

M-1

MECHANICAL NOTES:

- ALL HVAC EQUIPMENT AND DUCTWORK TO BE INSTALLED IN ACCORDANCE WITH STATE AND LOCAL CODES.
- THE CONTRACTOR SHALL COORDINATE THE LOCATION OF ALL DUCTWORK, PIPING, AND ELECTRICAL REQUIREMENTS WITH ALL OTHER TRADES PRIOR TO BEGINNING INSTALLATION TO AVOID CONFLICTS AND INTERFERENCE WITH OTHER TRADES.
- ALL EQUIPMENT TO BE INSTALLED AS SUGGESTED BY MANUFACTURER.
- INSULATE SUPPLY AND RETURN DUCTWORK LOCATED IN UNCONDITIONED SPACES BY WRAPPING WITH INSULATION WITH A MINIMUM INSTALLED R-VALUE OF 5.0. DIMENSIONS SHOWN ARE INSIDE CLEAR AREA DIMENSIONS.
- EQUIP RETURN AIR GRILLES WITH FILTERS.
- MECHANICAL SYSTEM TO BE BALANCED AND TESTED AFTER INSTALLATION TO ASSURE PROPER OPERATION.
- COORDINATE EXACT LOCATION OF THERMOSTATS WITH OWNER.
- ANY FIRE RATED ASSEMBLY PENETRATIONS ARE TO BE PER CODE. CONTRACTOR SHOULD REVIEW ALL FIRE RATING PENETRATIONS.
- BATHROOM EXHAUST FANS ARE TO BE FURNISHED, INSTALLED AND DUCTED TO OUTDOORS BY THE MECHANICAL CONTRACTOR. EXHAUST FAN TO BE WIRED BY THE ELECTRICAL CONTRACTOR.
- SMOKE DETECTORS ARE TO BE PROVIDED IN RETURN AIR DUCT OF EACH UNIT AHEAD OF MAKE-UP AIR CONNECTIONS TO SHUT DOWN THE UNIT IN CASE OF FIRE.
- DUCT SMOKE DETECTORS ARE TO BE CONNECTED TO FIRE ALARM.
- EXHAUST FAN DISCHARGE TO BE AT LEAST TEN FEET AWAY FROM HVAC FRESH AIR IN-TAKE.
- FINAL UTILITY CONNECTIONS (GAS, ELECTRIC, ETC.) TO EQUIPMENT SHALL BE MADE BY THE CONTRACTOR INSTALLING THE EQUIPMENT REQUIRING THE UTILITIES.
- DUCT DRAWINGS ARE DIAGRAMMATIC AND ARE INTENDED TO SHOW THE INTENT OF THE ENGINEER. THE CONTRACTOR SHALL BE RESPONSIBLE FOR PROVIDING ANY ADDITIONAL TRANSITIONS, OFFSETS, OR TURNS, IN THE DUCTWORK AND/OR PIPING, NOT SHOWN BUT REQUIRED FOR A COMPLETE AND OPERATING SYSTEM.
- ALL DUCTWORK SHALL BE INSTALLED TIGHT AGAINST THE STRUCTURE UNLESS OTHERWISE NOTED OR SHOWN.
- AIR DISTRIBUTION LOCATIONS SHOWN ON MECHANICAL PLANS ARE APPROXIMATE. SEE ARCHITECTURAL REFLECTED CEILING PLANS FOR ACTUAL LOCATIONS.
- REFER TO ARCHITECTURAL DRAWINGS FOR DIMENSIONED LOCATIONS OF WALLS AND PARTITIONS AND FOR PARTITION THICKNESS AND CONSTRUCTION MATERIALS.

MECHANICAL SYSTEMS, SERVICE SYSTEMS AND EQUIPMENT METHOD OF COMPLIANCE

PRESCRIPTIVE ENERGY COST BUDGET

THERMAL ZONE 8
 EXTERIOR DESIGN CONDITIONS
 WINTER DRY BULB 18 °F
 SUMMER DRY BULB 90 °F
 INTERIOR DESIGN CONDITIONS
 WINTER DRY BULB 68 °F
 SUMMER DRY BULB 78 °F
 RELATIVE HUMIDITY 50%
 BUILDING HEATING LOAD 294,194 BTU/AIR
 BUILDING COOLING LOAD 28.67 TONS
 MECHANICAL SPACING CONDITIONING SYSTEM
 UNITARY
 DESCRIPTION OF UNIT SPLIT SYSTEM
 HEATING EFFICIENCY HEAT PUMP
 COOLING EFFICIENCY
 HEATING OUTPUT OF UNIT 350,180 BTU/AIR
 COOLING OUTPUT OF UNIT 30.5 TONS
 LIST EQUIPMENT EFFICIENCIES
 EQUIPMENT SCHEDULES WITH MOTORS (MECHANICAL SYSTEM)
 MOTOR HORSEPOWER HP
 NUMBER OF PHASES 3
 MINIMUM EFFICIENCY %
 MOTOR TYPE
 # OF POLES

DESIGNER STATEMENT:
 TO THE BEST OF MY KNOWLEDGE AND BELIEF, THE DESIGN OF THIS BUILDING COMPLIES WITH THE MECHANICAL SYSTEMS, SERVICE SYSTEMS AND EQUIPMENT REQUIREMENTS OF NORTH CAROLINA STATE BUILDING CODES.

OCCUPANCY CLASSIFICATION (PER TABLE 403.3)	NET (GROSS) SQUARE FOOTAGE	OCCUPANCY LOAD PERSONS PER 1,000 S.F.	CALCULATED # OF PEOPLE	OUTSIDE AIR REQUIRED PER PERSON (CFM)	OUTSIDE AIR REQUIRED PER S.F. (CFM)	OUTSIDE AIR REQUIRED (CFM)	OUTSIDE AIR PROVIDED (CFM)
BREAKROOM 101	128	30	4	15	-	60	60
OFFICE 102	131	7	1	20	-	20	20
OFFICE 103	131	7	1	20	-	20	20
CORRIDOR 108C	115	-	-	-	0.1	12	15
OFFICE 112	104	7	1	20	-	20	20
TOTAL OUTSIDE AIR						132	135

OCCUPANCY CLASSIFICATION (PER TABLE 403.3)	NET (GROSS) SQUARE FOOTAGE	OCCUPANCY LOAD PERSONS PER 1,000 S.F.	CALCULATED # OF PEOPLE	OUTSIDE AIR REQUIRED PER PERSON (CFM)	OUTSIDE AIR REQUIRED PER S.F. (CFM)	OUTSIDE AIR REQUIRED (CFM)	OUTSIDE AIR PROVIDED (CFM)
CORRIDOR 108D	227	-	-	-	0.1	23	25
OFFICE 113	108	7	1	20	-	20	20
OFFICE 114	137	7	1	20	-	20	20
OFFICE 117	124	7	1	20	-	20	20
OFFICE 120	104	7	1	20	-	20	20
OFFICE 127	90	7	1	20	-	20	20
OFFICE 128	80	7	1	20	-	20	20
OFFICE 129	149	7	1	20	-	20	20
TOTAL OUTSIDE AIR						163	165

OCCUPANCY CLASSIFICATION (PER TABLE 403.3)	NET (GROSS) SQUARE FOOTAGE	OCCUPANCY LOAD PERSONS PER 1,000 S.F.	CALCULATED # OF PEOPLE	OUTSIDE AIR REQUIRED PER PERSON (CFM)	OUTSIDE AIR REQUIRED PER S.F. (CFM)	OUTSIDE AIR REQUIRED (CFM)	OUTSIDE AIR PROVIDED (CFM)
OFFICE/CONFERENCE 104	272	50	14	20	-	280	280
OFFICE MANAGER 105	112	7	1	20	-	20	20
FAX/COPY 106	47	-	-	-	0.15	7	10
RECEPTION/FILES 107	272	7	2	20	-	40	40
CORRIDOR 108B	176	-	-	-	0.1	18	20
TOTAL OUTSIDE AIR						365	370

OCCUPANCY CLASSIFICATION (PER TABLE 403.3)	NET (GROSS) SQUARE FOOTAGE	OCCUPANCY LOAD PERSONS PER 1,000 S.F.	CALCULATED # OF PEOPLE	OUTSIDE AIR REQUIRED PER PERSON (CFM)	OUTSIDE AIR REQUIRED PER S.F. (CFM)	OUTSIDE AIR REQUIRED (CFM)	OUTSIDE AIR PROVIDED (CFM)
OFFICE 111	116	7	1	20	-	20	20
CHILD WAITING 122	236	30	7	15	-	105	105
ADULT WAITING 125	367	30	11	15	-	165	165
TOTAL OUTSIDE AIR						290	290

MARK	TONS	MANUFACTURER	INDOOR UNIT				OUTDOOR UNIT				FAN DATA				COOLING CAPACITY			HEATING CAPACITY AT 47 °F (BTUH)	MINIMUM ELECTRIC HEAT CAPACITY	MINIMUM HEATING EFFICIENCY		
			MODEL NO.	STRIP HEAT	POWER	MCA	MCB	MODEL NO.	POWER	MCA	MCB	AIR FLOW (CFM)	R.A. FLOW (CFM)	O.A. FLOW (CFM)	E.S.P. (IN. W.G.)	MOTOR SIZE (H.P.)	SENSIBLE (BTUH)				TOTAL (BTUH)	MIN. EFF.
AHU-1/HP-1	3	CARRIER	FA4C036	6.8 KW	208/3ø	32	35	25HBR336	208/3ø	14.3	20	1,200	1,065	135	0.53	1/3 HP	25,530	32,070	13 SEER	34,400	3 KW	7.5 HSPF
AHU-2/HP-2	3	CARRIER	FA4C036	6.8 KW	208/3ø	32	35	25HBR336	208/3ø	14.3	20	1,200	1,035	165	0.53	1/3 HP	25,530	32,070	13 SEER	34,400	3.5 KW	7.5 HSPF
AHU-3/HP-3	5	CARRIER	FA4C060	11.3 KW	208/3ø	47.7	50	25HBR360	208/3ø	24.6	40	2,000	1,630	370	0.35	3/4 HP	42,980	54,170	13 SEER	55,990	7.3 KW	7.9 HSPF
AHU-4/HP-4	3.5	CARRIER	FA4C042	6.8 KW	208/3ø	32	35	25HBR342	208/3ø	17.2	25	1,400	1,110	290	0.44	1/2 HP	29,510	38,040	13 SEER	41,000	5.7 KW	8 HSPF
AHU-5/HP-5	4	CARRIER	FA4C048	11.3 KW	208/3ø	47.7	50	25HBR348	208/3ø	18.4	30	1,600	1,405	195	0.42	3/4 HP	34,610	43,120	13 SEER	47,000	7.8 KW	8 HSPF
AHU-6/HP-6	3	CARRIER	FA4C036	6.8 KW	208/3ø	32	35	25HBR336	208/3ø	14.3	20	1,200	1,100	100	0.53	1/3 HP	25,530	32,070	13 SEER	34,400	3 KW	7.5 HSPF
AHU-7/HP-7	4	CARRIER	FA4C048	11.3 KW	208/3ø	47.7	50	25HBR348	208/3ø	18.4	30	1,800	1,200	400	0.42	3/4 HP	34,610	43,120	15 SEER	47,000	7.8 KW	8 HSPF
AHU-8/HP-8	5	CARRIER	FA4C060	6.8 KW	208/3ø	32	35	25HBR360	208/3ø	24.6	40	2,000	1,745	255	0.35	3/4 HP	42,980	54,170	13 SEER	55,990	5.5 KW	7.9 HSPF

MARK	MANUFACTURER	MODEL	TYPE	CFM	SP	MOTOR	POWER	SONES	WATTS	CONTROL
EF-1	GREENHECK	SP-A90-L	FAN/LIGHT	75	0.125" W.G.	FHP	115/1ø	1.4	129	SWITCH
EF-2	GREENHECK	SP-A410	FAN ONLY	400	0.125" W.G.	FHP	115/1ø	3.7	121	THERMOSTAT

OCCUPANCY CLASSIFICATION (PER TABLE 403.3)	NET (GROSS) SQUARE FOOTAGE	OCCUPANCY LOAD PERSONS PER 1,000 S.F.	CALCULATED # OF PEOPLE	OUTSIDE AIR REQUIRED PER PERSON (CFM)	OUTSIDE AIR REQUIRED PER S.F. (CFM)	OUTSIDE AIR REQUIRED (CFM)	OUTSIDE AIR PROVIDED (CFM)
BREAKROOM 201	154	30	5	15	-	75	75
OFFICE 202	309	7	2	20	-	40	40
CORRIDOR 206C	(157)	-	-	-	0.1	16	20
OFFICE 210	104	7	1	20	-	20	20
OFFICE 212	104	7	1	20	-	20	20
OFFICE 211	177	7	1	20	-	20	20
TOTAL OUTSIDE AIR						191	195

OCCUPANCY CLASSIFICATION (PER TABLE 403.3)	NET (GROSS) SQUARE FOOTAGE	OCCUPANCY LOAD PERSONS PER 1,000 S.F.	CALCULATED # OF PEOPLE	OUTSIDE AIR REQUIRED PER PERSON (CFM)	OUTSIDE AIR REQUIRED PER S.F. (CFM)	OUTSIDE AIR REQUIRED (CFM)	OUTSIDE AIR PROVIDED (CFM)
CORRIDOR 206D	(170)	-	-	-	0.1	17	20
OFFICE 216	104	7	1	20	-	20	20
OFFICE 223	182	7	1	20	-	20	20
OFFICE 224	156	7	1	20	-	20	20
OFFICE 225	127	7	1	20	-	20	20
TOTAL OUTSIDE AIR						97	100

OCCUPANCY CLASSIFICATION (PER TABLE 403.3)	NET (GROSS) SQUARE FOOTAGE	OCCUPANCY LOAD PERSONS PER 1,000 S.F.	CALCULATED # OF PEOPLE	OUTSIDE AIR REQUIRED PER PERSON (CFM)	OUTSIDE AIR REQUIRED PER S.F. (CFM)	OUTSIDE AIR REQUIRED (CFM)	OUTSIDE AIR PROVIDED (CFM)
OFFICE/CONFERENCE 203	386	50	18	20	-	360	360
FAX/COPY 204	42	-	-	-	0.15	6	10
CORRIDOR 206B	98	-	-	-	0.1	10	10
OFFICE 209	116	7	1	20	-	20	20
TOTAL OUTSIDE AIR						396	400

OCCUPANCY CLASSIFICATION (PER TABLE 403.3)	NET (GROSS) SQUARE FOOTAGE	OCCUPANCY LOAD PERSONS PER 1,000 S.F.	CALCULATED # OF PEOPLE	OUTSIDE AIR REQUIRED PER PERSON (CFM)	OUTSIDE AIR REQUIRED PER S.F. (CFM)	OUTSIDE AIR REQUIRED (CFM)	OUTSIDE AIR PROVIDED (CFM)
RECEPTION/FILES 205	257	7	2	20	-	40	40
OFFICE 218	157	7	1	20	-	20	20
ADULT/CHILD WAITING 221	447	30	13	15	-	195	195
TOTAL OUTSIDE AIR						255	255



MARK	MANUFACTURER	NECK SIZE	PANEL SIZE	CFM RANGE	USE	TYPE	MODEL	MATERIAL	FILTER SIZE
A	METALAIR	6"	24X24	0-150	SUPPLY	STAMPED LOWER FACE	5700-6	STEEL	-
B	METALAIR	8"	24X24	151-280	SUPPLY	STAMPED LOWER FACE	5700-6	STEEL	-
C	METALAIR	10"	24X24	281-450	SUPPLY	STAMPED LOWER FACE	5700-6	STEEL	-
D	METALAIR	12"	24X24	451-700	SUPPLY	STAMPED LOWER FACE	5700-6	STEEL	-
E	METALAIR	22X22	24X24	0-965	RETURN	RETURN FILTER GRILLE	SRHF	STEEL	22x22

REV #	DATE	BY	CHECKED	DESCRIPTION
1	3/3/09	EDM	[Signature]	REVISED TO SUIT PLAN VIEW CHANGES AND REMOVED HVAC SYSTEM 9 AT THE REQUEST OF THE GENERAL CONTRACTOR (A. KNIGHT). REFER TO EMAIL FROM ARCHITECT (D. RIPPERTON) DATED 2-20-09.

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**NEW BUILDING FACILITY:
 CBC OFFICE BUILDING**
 Hillsborough, North Carolina

MECHANICAL NOTES AND DETAILS

DRAWING NAME

ENGINEER
 KEVIN BECK
 3/18/09

DRAWN: TGW
 CHECKED: JNK
 DATE: 1/8/09
 SCALE: AS NOTED
 JOB NO.: 8123
 SHEET

M-3