ABBREVIATIONS

AC	AIR CONDITIONING UNIT
ACR	AIR CURTAIN
AD	ACCESS DOOR
AF	AIRFOIL
AFF	ABOVE FINISHED FLOOR
AHU	AIR HANDLING UNIT
AL	ACOUSTICAL LINING
AMS	AIRFLOW MEASURING STATION
AP	ACCESS PANEL
AS	AIR SEPARATOR
ATC	AUTOMATIC TEMPERATURE CONTROL
B	BOILER
BAS	BUILDING AUTOMATION SYSTEM
BBD	BOILER BLOWDOWN
BD	BACKDRAFT DAMPER
BF	BOILER FEED UNIT
BFP	BACK FLOW PREVENTER
BFW	BOILER FEEDWATER
BG	BLAST GATE
BHP	BRAKE HORSEPOWER
BI	BACKWARD INCLINE
BOD	BOTTOM OF DUCT
BOP	BOTTOM OF PIPE
BPD	BYPASS AIR DAMPER
BTU	BRITISH THERMAL UNIT
BTUH	BRITISH THERMAL UNIT PER HOUR
BV	BUTTERFLY VALVE
C	COMMON
C	CONDENSATE – PSIG
CBD	CONTINUOUS BOILER BLOWDOWN
CC	COOLING COIL
CDR	CONDENSER WATER RETURN
CDS	CONDENSER WATER SUPPLY
CF	CHEMICAL FEED UNIT
CFH	CUBIC FEET PER HOUR
CFM	CUBIC FEET PER MINUTE
CH	CHILLER
CHEM	CHEMICAL
CI	CAST IRON
CIP	CLEAN IN PLACE
COMP	COMPRESSOR
CON	CONCENTRIC
COND	CONDENSATE
CP	CONDENSATE PUMP
CRU	COMPUTER ROOM AIR CONDITIONING UNIT
CS	CLEAN STEAM – PSIG
CT	COOLING TOWER
CU	CONDENSING UNIT
CUH	CABINET UNIT HEATER
CV	CONSTANT VOLUME
CVB	CONSTANT VOLUME BOX
CW	COLD WATER
CWR	CHILLED WATER RETURN
CWS	CHILLED WATER SUPPLY
DA	DIRECT ACTING
DB	DRY BULB
DC	DUST COLLECTOR
DCR	DRY COOLER
DDC	DIRECT DIGITAL CONTROLS
DEH	DEHUMIDIFIER
DF	DUCT FURNACE
DI	DEIONIZED WATER
DIA./ø	DIAMETER
DIFF	DIFFERENTIAL
DISCH	DISCHARGE
DIW	DOWN IN WALL
DL	DOOR LOUVER
DN	DOWN
DOM	DOMESTIC
DR	DRAIN
DT	DRIP AND TRAP
DWDI	DOUBLE WIDTH DOUBLE INLET
DX	DIRECT EXPANSION
(E)	EXISTING
EAT	ENTERING AIR TEMPERATURE
EB	ELECTRIC BASEBOARD
EC	EVAPORATIVE CONDENSOR
ECC	ECCENTRIC
EDH	ELECTRIC DUCT HEATER
EDR	EQUIVALENT DIRECT RADIATION
EF	EXHAUST FAN
EG	EXHAUST GRILLE
EGE	EMERGENCY GENERATOR EXHAUST
EJ	EXPANSION JOINT
EMCS	ENERGY MONITORING CONTROL SYSTEM
EP	ELECTRIC–PNEUMATIC
ER	EXHAUST REGISTER
ES	END SWITCH
ESP	EXTERNAL STATIC PRESSURE
ET	EXPANSION TANK
EUH	ELECTRIC UNIT HEATER
EWT	ENTERING WATER TEMPERATURE
EXH	EXHAUST
(F)	FUTURE
°F	DEGREES FAHRENHEIT
F	FILTER
FC	FORWARD CURVED
FCU	FAN COIL UNIT
FCV	FLOW CONTROL VALVE
F/D	FIRE DAMPER
FD	FIRE DAMPER
FG	FIBERGLASS
FH	FUME HOOD
FHE	FUME HOOD EXHAUST
FLA	FULL LOAD AMPS
FLD	FUSIBLE LINK DAMPER
FLT	FLASH TANK
FM	FLOW METER
FOB	FLAT ON BOTTOM
FOR	FUEL OIL RETURN
FOS	FUEL OIL SUPPLY
FOT	FLAT ON TOP
FOV	FUEL OIL VENT
FPM	FEET PER MINUTE
FPS	FEET PER SECOND
FRP	FIBERGLASS REINFORCED PIPE
FS	FLOW SWITCH
FT	FEET
FTB	FAN TERMINAL BOX
FT/WG	FEET WATER GAUGE
F&T	FLOAT & THERMOSTATIC TRAP
FTR	FIN TUBE RADIATION
FV	FACE VELOCITY
FZ	FREEZESTAT
G	GAS
GPH	GALLONS PER HOUR
GPM	GALLONS PER MINUTE
GR	GRILLE OR GLYCOL RETURN
GRAV	GRAVITY
GR/LB	GRAINS PER POUND
GS	GLYCOL SUPPLY
GV	GATE VALVE
H	HUMIDISTAT
HC	HEATING COIL
HD	HEAD
HE	HEAT EXCHANGER
HEP	HEAT EXCHANGER PACKAGE
HEPA	HIGH EFFICIENCY PARTICULATE ARRESTANCE FILTER
HL	HIGH LIMIT
HOA	HAND–OFF AUTOMATIC SELECTOR SWITCH
H/O	HAND–OFF SELECTOR SWITCH WITH PILOT LIGHT
HP	HORSEPOWER
HPC	HIGH PRESSURE CONDENSATE
HPD	HIGH PRESSURE DRIP
HPS	HIGH PRESSURE STEAM
HTHW	HIGH TEMPERATURE HOT WATER
HTHWR	HIGH TEMPERATURE HOT WATER RETURN
HTHWS	HIGH TEMPERATURE HOT WATER SUPPLY
HTP	HEAT PUMP
HTR	HEATER
HUM	HUMIDITY OR HUMIDIFIER
HV	HEATING & VENTILATING UNIT
HVAC	HEATING, VENTILATING, AIR CONDITIONING
HW	HOT WATER
HWR	HOT WATER RETURN
HWS	HOT WATER SUPPLY
H&V	HEATING & VENTILATING
Hz	HERTZ
ID	INSIDE DIAMETER
I/L	INTERLOCK
IN	INCH
IN/WG	INCHES WATER GAUGE
LDD	LIQUID DESSICANT DEHUMIDIFIER
LF	LINEAR FEET
LH	LATENT HEAT
LPC	LOW PRESSURE CONDENSATE
LPD	LOW PRESSURE DRIP
LPS	LOW PRESSURE STEAM
LRA	LOCKED ROTOR AMPS
LVR	LOUVER
LWT	LEAVING WATER TEMPERATURE
M	MAIN AIR
MB	MIXING BOX
MBH	1000 BTU PER HOUR
MCC	MOTOR CONTROL CENTER
MER	MECHANICAL ELECTRICAL ROOM
MHP	MOTOR HORSEPOWER
MOD	MOTOR OPERATED DAMPER
MPC	MEDUIM PRESSURE CONDENSATE
MPD	MEDIUM PRESSURE DRIP
MPS	MEDIUM PRESSURE STEAM
MU	MAKE UP WATER
MVD	MANUAL VOLUME DAMPER
N	NEUTRAL
NC	NORMALLY CLOSED
NO	NORMALLY OPEN
NIMC	NOT IN MECHANICAL CONTRACT
NTS	NOT TO SCALE
OA	OUTSIDE AIR
OAD	OUTSIDE AIR DAMPER
OAI	OUTSIDE AIR INTAKE
OBD	OPPOSED BLADE DAMPER
OCC	OCCUPIED
OD	OUTSIDE DIAMETER
OP	ORIFICE PLATE
OV	OUTLET VELOCITY
P	PUMP
PBD	PARALLEL BLADE DAMPER
PC	PUMPED CONDENSATE – PSIG
PD	PRESSURE DROP
PERF	PERFORATED
PFHE	PLATE AND FRAME HEAT EXCHANGER
PH	PHASE
PHC	PREHEAT COIL
PNEU	PNEUMATIC
PRD	PRESSURE REDUCING DEVICE
PRV	PRESSURE REDUCING VALVE
PS	PRESSURE SENSOR DUCT STATIC
PSF	POUND PER SQUARE FOOT
PSIA	POUNDS PER SQUARE INCH ABSOLUTE
PSIG	POUNDS PER SQUARE INCH GAUGE
PT	PRESSURE TRANSMITTER
PVC	POLYVINYL CHLORIDE
RA	RETURN AIR
RAD	RADIATION
RCP	REFLECTED CEILING PLAN
RD	RETURN AIR DAMPER
REFR	REFRIGERANT
REG	REGULATOR
RE	RELIEF AIR
RELD	RELIEF DAMPER
RF	RETURN AIR FAN
RG	RETURN AIR GRILLE
RH	RELATIVE HUMIDITY
RHC	REHEAT COIL
RHG	REFRIGERANT HOT GAS
RHR	REHEAT HOT WATER RETURN
RHS	REHEAT HOT WATER SUPPLY
RL	REFRIGERANT LIQUID
RPM	REVOLUTIONS PER MINUTE
RR	RETURN AIR REGISTER
RS	REFRIGERANT SUCTION
RTU	ROOFTOP UNIT
RV	REFRIGERANT – VENT
S	SMOKE DETECTOR
SA	SUPPLY AIR
SD	SMOKE DAMPER
SDA	SOUND ATTENUATOR
SDF	SUPPLY AIR DIFFUSER
SEF	SMOKE EXHAUST FAN
SF	SUPPLY AIR FAN
SF	SUPPLY AIR FAN
SFD	SMOKE/FIRE DAMPER
SH	SENSIBLE HEAT
SMD	SMOKE DETECTOR
SP	STATIC PRESSURE
SPLD	SPLITTER DAMPER
SPT	SET POINT
SQ FT	SQUARE FEET
SR	SUPPLY AIR REGISTER
SRD	SAFETY RELIEF VALVE DISCHARGE
SRV	SAFETY RELIEF VALVE
ST	STORAGE TANK
STM	STEAM
ST STL	STAINLESS STEEL
SUCT	SUCTION
SW	SOFT WATER
SWSI	SINGLE WIDTH SINGLE INLET
T	THERMOSTAT
TAB	TESTING AND BALANCING
TAD	TRANSFER AIR DUCT
TAF	TERMINAL AIR FILTER
TE	TOILET EXHAUST
TEMP	TEMPERATURE
TH	TOTAL HEAT
THERM	THERMOMETER
TOD	TOP OF DUCT
TOP	TOP OF PIPE
TOS	TOP OF STEEL
TP	TOTAL PRESSURE
TSP	TOTAL STATIC PRESSURE
TT	TEMPERATURE TRANSMITTER
TUR	TERMINAL AIR UNIT RETURN
TUS	TERMINAL AIR UNIT SUPPLY
UC	UNDERCUT
UH	UNIT HEATER
UNO	UNLESS NOTED OTHERWISE
UNOCC	UNOCCUPIED
UV	UNIT VENTILATOR
V	VENT OR VOLTS
VAC	VACUUM
VAV	VARIABLE AIR VOLUME
VB	VACUUM BREAKER
VEL	VELOCITY
VF	VENTILATING FAN
VI	VIBRATION ISOLATOR
VIB	VIBRATION
VIV	VARIABLE INLET VANES
VP	VACUUM PUMP
VTR	VENT THROUGH ROOF
VV	VARIABLE AIR VOLUME BOX
WB	WET BULB
WC	WATER COLUMN
WG	WATER GAUGE
W.M.S.	WIRE MESH SCREEN
WP	WATERPROOF
X	EXISTING EQUIPMENT
XP	EXPLOSION PROOF
(+)	POSITIVE PRESSURE
(–)	NEGATIVE PRESSURE

MISC. DWG. SYMBOLS

- POINT OF CONNECTION BETWEEN NEW AND EXISTING WORK
- POINT OF CONNECTION BETWEEN EXISTING AND TO BE REMOVED WORK
- POINT OF CONNECTION FOR FUTURE WORK
- DETAIL NUMBER / DETAIL DRAWING NUMBER
- SHEET KEY NOTE
- DRAWING REVISION NUMBER
- AIR DISTRIBUTION TAG DESIGNATION/CFM

DUCTWORK SYMBOLS

SINGLE LINE	DOUBLE LINE	DESCRIPTION
12x10	12x10	DENOTES RECTANGULAR OR SQUARE DUCT, SIZE IN INCHES
10ø	10ø	DENOTES ROUND DUCT, SIZE IN INCHES
12/10	12/10	DENOTES FLAT OVAL DUCT, SIZE IN INCHES
8ø	8ø	FLEXIBLE DUCT
		SPIN IN WITH DAMPER
		LINEAR SUPPLY DIFFUSER
		SUPPLY DIFFUSER
		RETURN DIFFUSER
		EXHAUST DIFFUSER
		SQUARE VANED ELBOW – 90°
		RADIUS ELBOW – 90°
		TRANSITION – CONCENTRIC
		TRANSITION – ECCENTRIC
		TRANSITION – RECTANGULAR TO ROUND
		45° ENTRY TAKEOFF, RECTANGULAR TO RECTANGULAR
		90° TAKEOFF, RECTANGULAR TO ROUND, STRAIGHT
		90° TAKEOFF, RECTANGULAR TO ROUND BELLMOUTH
		90° CONICAL TAKEOFF, ROUND TO ROUND
VD	VD	MANUAL VOLUME DAMPER
FD	FD	FIRE DAMPER
FSD	FSD	FIRE/SMOKE DAMPER
M	M	MOTOR OPERATED DAMPER
H	H	HUMIDISTAT
T	T	THERMOSTAT
S	S	DUCT MOUNTED SMOKE DETECTOR (PROVIDED BY EC, INSTALLED BY MC)
TS	TS	TEMPERATURE SENSOR, DUCT MOUNTED AND CONNECTED TO ASSOCIATED AHU AND THERMOSTAT
S_{ES}	S_{ES}	AHU EMERGENCY SHUTOFF SWITCH

NOTES

1. NOT ALL SYMBOLS, ABBREVIATIONS AND LINE DESIGNATIONS ARE NECESSARILY USED ON THIS PROJECT.
2. ANY EQUIPMENT MARKED WITH AN "E" IS INDICATED AS EXISTING.
3. ALL WORK SHALL BE COORDINATED WITH ALL OTHER TRADES.
4. ALL WORK IN THE NEW AND EXISTING AREAS ON THESE DRAWINGS SHALL BE INSTALLED AS REQUIRED FOR THE FOLLOWING SEISMIC REQUIREMENTS AS SHOWN ON THE ARCHITECTURAL COVER SHEET.
5. ALL EQUIPMENT SHALL BE INSTALLED TO PROVIDE MAXIMUM SPACE FOR MAINTENANCE AND SERVICE.
6. THE MECHANICAL CONTRACTOR SHALL REFER TO THE ARCHITECTURAL PLANS FOR FLOOR PLAN DIMENSIONS. DO NOT SCALE THESE DRAWINGS.
7. ALL DUCT AND PIPING LAYOUT AND LOCATIONS ARE DIAGRAMMATIC. THE CONTRACTOR SHALL COORDINATE THE DUCTWORK AND PIPING LAYOUT WITH ALL OTHER CONTRACTORS PRIOR TO THE START OF WORK.
8. REFER TO ARCHITECTURAL RCP FOR EXACT LOCATION OF AIR DISTRIBUTION.
9. ALL THERMOSTATS SHALL BE MOUNTED AT ELEVATIONS THAT MEETS ALL APPLICABLE CODES AND AS PER THE ARCHITECTURAL DETAILED ELEVATION.

ENERGY CODE

MECHANICAL SYSTEMS, SERVICE SYSTEMS AND EQUIPMENT

METHOD OF COMPLIANCE: [PRESCRIPTIVE] PERFORMANCE ENERGY COST BUDGET

THERMAL ZONE: 4

EXTERIOR DESIGN CONDITIONS
- WINTER DRY BULB: 16 F
- SUMMER DRY BULB: 94 F

INTERIOR DESIGN CONDITIONS
- WINTER DRY BULB: 70 F (VARIES W/SPACE USAGE)
- SUMMER DRY BULB: 75 F (VARIES W/SPACE USAGE)
- RELATIVE HUMIDITY: 50% SUMMER MAX, 35% WINTER MIN.

BUILDING HEATING LOAD: 76.84 MBH

BUILDING COOLING LOAD: 18.6 TONS

MECHANICAL SPACING CONDITIONING SYSTEM
- UNITARY
- DESCRIPTION OF UNIT: DX HEATPUMP – HIGH EFFECIENCY
- HEATING EFFICIENCY: 10 SEER
- COOLING EFFICIENCY: 10 SEER
- HEAT OUTPUT OF UNIT: 90 MBH
- COOLING OUTPUT OF UNIT: 20 TONS/181.4 MBH
- BOILER
- TOTAL BOILER OUTPUT: N/A
- CHILLER
- TOTAL CHILLER CAPACITY: N/A

LIST EQUIPMENT EFFICIENCIES:

EQUIPMENT SCHEDULES WITH MOTORS
- MOTOR HORSEPOWER: AS SCHEDULED
- NUMBER OF PHASES: AS SCHEDULED
- MINIMUM EFFICIENCY: N/A
- MOTOR TYPE: N/A
- NUMBER OF POLES: N/A

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 THE NORTH CAROLINA STATE ENERGY CODE, 2009 EDITION.

SIGNED: [signature]
NAME: VICTOR BIRD, PE
TITLE: PROFESSIONAL ENGINEER

GATES COUNTY

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DATE: 12.23.2011

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REVISIONS:

No.	Description	Date

PROJECT: 11013
DATE: DECEMBER 23, 2011
DRAWN BY: BCL/VTB
CHECKED BY: VTB

MECHANICAL SYMBOLS AND LEGEND

M-001

SOLUTIONS THROUGH LISTENING
SERVICE BY DESIGN
FOR CONSTRUCTION