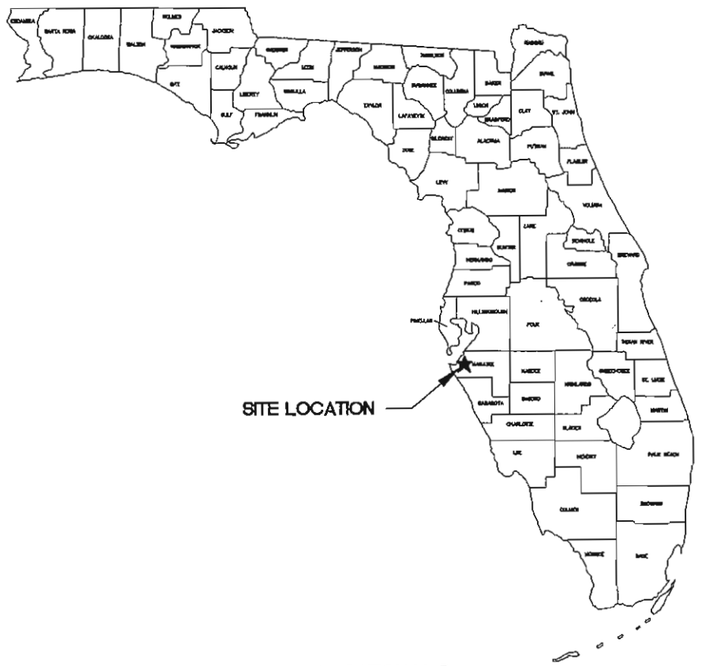
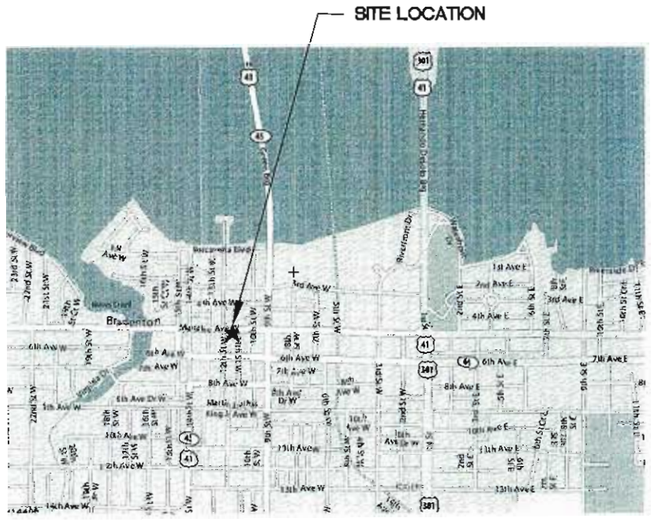
K0S6102

MANATEE COUNTY HISTORIC COURT HOUSE
BOILER ROOM
1051 MANATEE AVE. W.,
BRADENTON, FL 34208
IFAS# W1300159 WA#11



LOCATION MAP
FLORIDA



SITE MAP

SHEET SCHEDULE

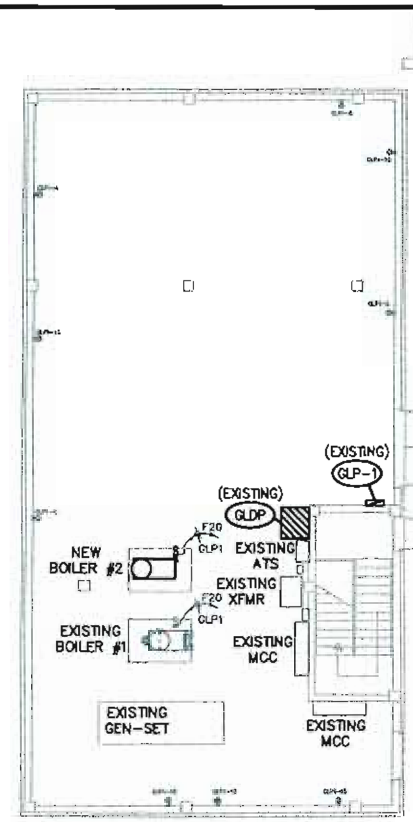
SHEET	DESCRIPTION
COVER	PROJECT NAME, LOCATION & SITE MAP
E1.0	ELECTRICAL PLANS
M1.0	MECHANICAL LEGEND AND GENERAL NOTES
M2.0	MECHANICAL FLOOR PLAN
M3.0	MECHANICAL SCHEDULES AND DETAILS
M4.0	MECHANICAL SPECIFICATIONS
M4.1	MECHANICAL SPECIFICATIONS

To the best of the engineer's knowledge, said plans and specifications comply with the applicable building codes and the applicable minimum fire safety standards as determined in accordance with Chapters 553 and 633, Florida Statutes.

ATP ENGINEERING SOUTH, PL
SARASOTA, FLORIDA
ENGR. BUSINESS #6908
941-360-2181

STATE OF FLORIDA LICENSE No. 53458

MAY 14 2013



PLAN NOTES:

NEW BOILER #2 IS BEING INSTALLED IN A PRE-EXISTING BOILER LOCATION. ORIGINAL BOILER WAS REMOVED, CONDUIT AND CONDUCTORS TO LOCATION ARE EXISTING, STUBBED DOWN FROM CEILING. THERE IS NO BOX AT THE END OF THE EXISTING CONDUIT, JUST WIRES TAPED OFF. VERIFY EXISTING CIRCUIT FROM PANEL GLP-1 IS SERVICEABLE, IF WIRES ARE NOT, REPLACE WITH NEW #12 AWG IN 3/4" CONDUITS. VERIFY CIRCUIT NUMBER. CORRECT THE PANELBOARD SCHEDULE TO SHOW WHICH CIRCUIT GOES TO WHICH BOILER. PROVIDE AND INSTALL 20A SWITCH AND MAKE FINAL CONNECTION TO NEW BOILER WITH (3) #12AWG IN 3/4" CONDUIT.

2 / E1.0 **PARTIAL ROOF PLAN**
1/8" = 1'-0"

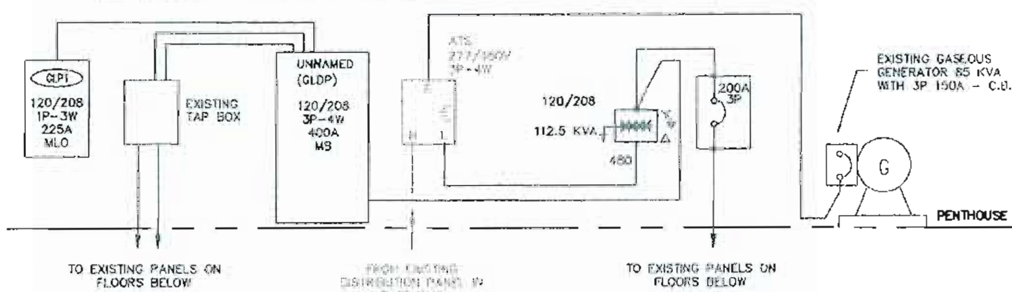
PANELBOARD SCHEDULE — Fed From 100A MB in GLDP

DESIGNATION: GLP-1 — LOCATION: Penthouse — VOLTAGE: 208Y/120 — PHASE: 3 PHASE, 4 WIRE
MAINS: 250 A MLO — BUS SIZE: 250 AMP — PANEL MOUNTING: SURFACE — ALL BREAKERS: 10,000 AIC

CKT NO.	LOAD DESCRIPTION	LOAD CODE	CONN. KVA	BREAKER AMPS	BREAKER POLE	CONNECTED LOAD A	CONNECTED LOAD B	CONNECTED LOAD C	BREAKER AMPS	BREAKER POLE	CONN. KVA	LOAD CODE	LOAD DESCRIPTION	CKT NO.
1	Lights	L	0.62	20	1	1.16			20	1	0.54	R	Outlets	2
3	Lights	L	0.71	20	1		1.25		20	1	0.54	R	Outlets	4
5	EMS	P	0.10	20	1			0.40	20	2	0.30	L	Lights	6
7	Outlets / Battery Charge	R	1.20	20	1	1.50					0.30	L	Lights	8
9	Boiler	M	0.90	20	1		1.90		20	1	1.00	M	Chem Pump #2	10
11	Boiler	M	1.20	20	1			2.20	20	1	1.00	M	Chem Pump #1	12
13	Exhaust Fan	M	0.92	20	1	1.42			20	1	0.50	P	New Gen Control	14
15	Outlets	R	0.54	20	1		1.04		20	1	0.50	R	ICW	16
17	Lights	L	0.62	20	2			1.12	20	1	0.50	L	Exit/Emergency/Fluorescent	18
19	Lights	L	0.62			1.52			20	1	0.90	R	Outside GFI Outlets	20
21				30	3		0.00							22
23								0.00						24
25						0.00								26
27	Blank						0.00							28
29	Blank							0.00						30
31						0.00								32
33							0.00							34
35								0.00						36
37						0.00								38
39							0.00							40
41								0.00						42
						5.60	4.19	3.72	KVA					
	TOTAL CONNECTED AMPS:		46.67 AMPS			46.67	34.90	31.00	AMPS					
	TOTAL CONNECTED LOAD:		13.51 KVA											
	TOTAL DEMAND AMPS:		32.47 AMPS											
	TOTAL DEMAND LOAD:		9.76 KVA											

LOAD CODES:
L= LIGHTING
R= RECEPTACLES
M= MECHANICAL/EQUIPMENT
C= COMPUTER
K= KITCHEN
P= PANELBOARD

EXISTING 30 CIRCUIT PANELBOARD



1 / E1.0 **PARTIAL ONE-LINE RISER DIAGRAM**
NTS

GENERAL NOTES:

(APPLY TO ALL ELECTRICAL SHEETS)

1. PROVIDE COMPLETE AND OPERATIONAL ELECTRICAL SYSTEM.
2. THE WORK INDICATED ON THESE DRAWINGS IS DIAGRAMMATIC AND IS INTENDED TO CONVEY THE SCOPE OF WORK AND INDICATE THE GENERAL ARRANGEMENT OF EQUIPMENT AND DEVICES FOR A COMPLETE SYSTEM IN EVERY RESPECT AND DETAIL, TESTED AND LEFT READY IN PERFECT OPERATING CONDITION FOR THE OWNER'S USE. MATERIALS AND EQUIPMENT SHALL BE LISTED BY UNDERWRITERS' LABORATORIES, OR OTHER ACCEPTABLE LISTING AGENCY, AND SHALL BE INSTALLED IN ACCORDANCE WITH SUCH LISTINGS. INSTALLATIONS SHALL BE MADE IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS. WORK SHALL MEET THE REQUIREMENTS OF THE SPECIFICATIONS AND CONFORM TO THE NEC (NFPA 70 & 72) AND ALL APPLICABLE CODES, AND BE COMPLETED BY A QUALIFIED, EXPERIENCED, LICENSED ELECTRICAL CONTRACTOR.
3. THE ENGINEER HAS MADE AN EFFORT TO COORDINATE WORK WITH OTHER TRADES AND IDENTIFY ANY AND ALL CONFLICTS. THE CONTRACTOR IS RESPONSIBLE TO COORDINATE FIELD WORK BETWEEN TRADES AND TO IDENTIFY FIELD CONDITIONS PRIOR TO INSTALLATION AND REPORT ANY CONFLICTS TO THE ENGINEER.
4. WHEN A CONFLICT OCCURS BETWEEN THE SPECIFICATIONS AND DRAWINGS, THE ITEMS OF GREATER QUANTITY AND/OR COST SHALL BE PROVIDED.
5. CONTRACTOR SHALL VERIFY THE LOCATION AND ELECTRICAL REQUIREMENTS OF ALL EQUIPMENT FURNISHED BY OTHER TRADES PRIOR TO INSTALLATION. COORDINATE ROUGH-IN INSTALLATION WITH EQUIPMENT DETAILS.
6. DO NOT SCALE DRAWINGS. VERIFY FIELD CONDITIONS PRIOR TO AND DURING CONSTRUCTION FOR EXACT DEVICE / EQUIPMENT LOCATION.
7. CONTRACTOR SHALL PROVIDE TO LOCAL AHJ OR PERMITTING AGENCY A COPY OF ALL MAJOR EQUIPMENT CUT SHEETS AT TIME OF APPLICATION IF REQUESTED.
8. ALL WORK SHALL CONFORM TO OR EXCEED THE MINIMUM REQUIREMENTS OF THE CURRENT ANSI/NFPA 70 WITH STATE OF FLORIDA AMENDMENTS, ANSI/IEEE C2 AND ALL FEDERAL, STATE, LOCAL, AND MUNICIPAL CODES AND ORDINANCES. THE ELECTRICAL SUBCONTRACTOR SHALL COMPLY WITH THE DIRECTIONS OF ALL AUTHORITIES HAVING JURISDICTION.
9. INSTALL WORK USING PROCEDURES DEFINED IN NECA STANDARDS OF INSTALLATION. ALL WORK SHALL PRESENT A NEAT MECHANICAL APPEARANCE WHEN COMPLETED.
10. THE ELECTRICAL SUBCONTRACTOR SHALL PROVIDE ALL FLOOR, WALL, AND CEILING PENETRATIONS TO COMPLETE HIS WORK. PROVIDE PROPER FIRE SAFEING FOR ALL PENETRATIONS MADE.
11. COORDINATE ALL ELECTRICAL SYSTEM DOWNTIME WITH THE OWNER, PERFORMANCE SERVICES, AND OTHER TRADES. DOWNTIME OF THE SYSTEM SHALL BE MINIMIZED. WEEKEND AND AFTER HOUR WORK SHALL BE REQUIRED TO PREVENT OR MINIMIZE INTERFERENCE WITH THE OWNER'S OPERATION.
12. ALL NEW EQUIPMENT SHALL BE SUBMITTED TO THIS ENGINEER FOR APPROVAL PRIOR TO ORDERING.
13. PHYSICAL SIZES AND LOCATIONS OF ALL MECHANICAL EQUIPMENT SHOWN ON THESE DRAWINGS ARE APPROXIMATE. COORDINATE ELECTRICAL WORK FOR THIS EQUIPMENT WITH THE OTHER TRADES.
14. PROVIDE APPROPRIATE SEALANT (I.E. FIRESAFEING) TO MAINTAIN CONSTRUCTION INTEGRITY FOR ANY PENETRATIONS THROUGH FLOORS, STRUCTURAL CEILINGS, AND FIRE WALLS.
15. ALL BRANCH CIRCUITS SHALL UTILIZE SEPARATE INDEPENDENT NEUTRAL CONDUCTOR, AND INSULATED GROUNDING CONDUCTOR. DO NOT COMBINE NEUTRAL CONDUCTORS.
16. ALL FEEDER NEUTRAL/GROUNDED CONDUCTORS SHALL BE CONSIDERED CURRENT CARRYING. DERATE MULTIPLE CONDUCTORS IN A RACEWAY ACCORDINGLY WITH NEC TABLES.
17. INSTALL ALL CONDUITS, RACEWAYS, AND CABLE TRAY FOR MAXIMUM HEAD CLEARANCE IN MECHANICAL AREAS, AND ATTIC. COORDINATE CLEARANCES WITH PERFORMANCE SERVICES AND THE OWNER.
18. ALL ELECTRICAL SERVICE WORK SHALL COMPLY WITH THE LOCAL UTILITY. COORDINATE ALL REQUIREMENTS AND MAXIMUM AVAILABLE FAULT CURRENT PRIOR TO BID AND INCLUDE ALL NECESSARY MATERIAL AND LABOR REQUIRED FOR THE ADDITION TO THE ELECTRICAL SERVICE. ADD UTILITY FEES TEXT.
19. RECORD DRAWINGS: PROVIDE AMPERE READINGS ON ALL PANELBOARDS TO PROVE PANELS ARE BALANCED. PROVIDE PHASE ROTATION READINGS ON ALL PANELBBOARDS.

SPECIFICATIONS:

(APPLY TO ALL ELECTRICAL SHEETS)

1. PROVIDE AND INSTALL NEW GREEN INSULATED COPPER GROUNDING CONDUCTORS AS THE EQUIPMENT GROUNDING MEANS FOR ALL ELECTRICAL DEVICES AND EQUIPMENT.
2. ALL PANELBOARDS AND SWITCHBOARDS ARE EXISTING. ALL NEW BREAKERS SHALL MATCH EXISTING.
   2.1. INSURE AIC RATING ARE MATCHED TO EXISTING. VERIFY PHASE ROTATION AND PANEL BALANCE.
3. PROVIDE LABELING FOR ALL PANELBOARDS, SWITCHBOARDS, AND DISCONNECT SWITCHES, THAT ARE TOUCHED IN THIS PROJECT, TO INCLUDE AN ENGRAVED PLASTIC LABEL IDENTIFYING THE EQUIPMENT AND WHERE IT IS FED FROM.
   3.1. ALL NEW BRANCH DEVICES IN THE MAIN SWITCHBOARD SHALL HAVE AN ENGRAVED PLASTIC LABEL.
   3.2. ALL PANELBOARDS TOUCHED IN THIS PROJECT SHALL RECEIVE A NEW TYPEWRITTEN DIRECTORY.
   3.3. ALL NEW JUNCTION BOX COVERS SHALL BE IDENTIFIED TO INDICATE CIRCUITS CONTAINED.
4. ALL CONDUIT INSIDE THE BUILDING SHALL BE A ELECTRICAL METALLIC TUBING (EMT) AND SHALL BE A MINIMUM 3/4" UNLESS OTHERWISE NOTED. ALL CONDUIT INSTALLED UNDERGROUND SHALL BE SCHEDULE 40 PVC UNLESS OTHERWISE NOTED. ALL CONDUIT INSTALLED ABOVE GRADE OUTSIDE THE BUILDING SHALL BE GALVANIZED RIGID STEEL. NO PVC CONDUIT SHALL BE USED ABOVE THE FLOOR SLAB.
5. ALL ELECTRICAL CONNECTORS, LUGS, BREAKERS, EQUIPMENT, ETC. SHALL BE RATED AT A MINIMUM OF 75 DEG. C.
6. WIRING METHODS:

   ALL WIRING SHALL BE COPPER. NO ALUMINUM WIRING WILL BE ALLOWED.

   MC TYPE CABLE SHALL NOT BE USED.

ELECTRICAL SYMBOLS AND ABBREVIATIONS

NOTE:
THESE ARE STANDARD SYMBOLS AND MAY NOT ALL APPEAR ON THE PROJECT DRAWINGS; HOWEVER WHEREVER THE SYMBOL APPEARS ON THE PROJECT DRAWINGS, THE ITEM SHALL BE PROVIDED AND INSTALLED.

EQUIPMENT AND DEVICES

SYMBOL	DESCRIPTION
	DISTRIBUTION PANELBOARD AND CABINET – RECESSED MOUNT
	DISTRIBUTION PANELBOARD AND CABINET – SURFACE MOUNT
	BRANCH PANELBOARD AND CABINET – RECESSED MOUNT
	BRANCH PANELBOARD AND CABINET – SURFACE MOUNT
	LOAD CENTER – SURFACE MOUNT
	LOAD CENTER – RECESSED MOUNT
	DENOTES PANEL/PANELBOARD DESIGNATION
	MOTOR "X" INDICATES HORSEPOWER "Y" INDICATES PHASE
	CAPACITOR "X" INDICATES KVAR
	DISCONNECT SWITCH – FUSED "X"= RATING, "Y" = FUSE SIZE
	DISCONNECT SWITCH – NON-FUSED
	DISCONNECT SWITCH – CIRCUIT BREAKER
	MOTOR STARTER
	COMBINATION MOTOR STARTER
	DRY TYPE TRANSFORMER – "XX" INDICATES KVA
	METER SOCKET
	CURRENT TRANSFORMER METER SOCKET
SPD	SURGE PROTECTION DEVICE (TRANSIENT VOLTAGE SURGE SUPPRESSOR)
	GENERATOR
N E ATS/MTS L	TRANSFER SWITCH ATS = AUTOMATIC TRANSFER SWITCH MTS = MANUAL TRANSFER SWITCH N = NORMAL POWER E = EMERGENCY POWER L = LOAD
	WIREWAY
	GROUND CONNECTION
S	TOGGLE SWITCH – SINGLE POLE
JB	JUNCTION BOX

RACEWAY SYSTEM

SYMBOL	DESCRIPTION
	CONCEALED CONDUIT
	4" CONDUIT SLEEVE WITH BUSHINGS THRU WALL ABOVE CEILING
—XX—	LETTER DESIGNATION REFERS TO SYSTEM (SEE ABBREVIATIONS)
A-XX, F50, PHASE CONDUCTORS, GROUND, SWITCH LEG, NEUTRAL	QUANTITY OF CONDUCTORS OR CABLES IN CONDUIT "F50" DENOTES THE FEEDER SIZE "A-XX" DENOTES PANEL AND CIRCUIT #
	CONDUIT TURNED UP
	CONDUIT TURNED DOWN
	JUNCTION OR PULL BOX
	CABLE TRAY
	U/G CONDUIT TURNED UP
	U/G CONDUIT TURNED DOWN

ABBREVIATIONS

A	AMPERE
AC	AIR CONDITIONING OR ALTERNATING CURRENT
AF	AMPERE FRAME
AFF	ABOVE FINISHED FLOOR
AFG	ABOVE FINISHED GRADE
AHJ	AUTHORITY HAVING JURISDICTION
AT	AMPERE TRIP
ATS	AUTOMATIC TRANSFER SWITCH
AWG	AMERICAN WIRE GAUGE
C	CONDUIT
CB	CIRCUIT BREAKER
CNTL	CONTROL
CU	COPPER
DWG(S)	DRAWING(S)
EC	ELECTRICAL CONTRACTOR
EF	EXHAUST FAN
EM	EMERGENCY
EMS	ENERGY MANAGEMENT SYSTEM
EMT	ELECTRICAL METALLIC TUBING
EPO	EMERGENCY POWER OFF
EWC	ELECTRIC WATER COOLER
EWH	ELECTRIC WATER HEATER
EX	EXISTING TO REMAIN
FLR	FLOOR
FMC	FURNISHED BY MECHANICAL CONTRACTOR
GFI	GROUND FAULT INTERRUPTER
GND,G	GROUND
GRS	GALVANIZED RIGID STEEL CONDUIT
HOA	HAND-OFF-AUTO
HZ	HERTZ
HP	HORSEPOWER
IG	ISOLATED GROUND
IMC	INTERMEDIATE METALLIC CONDUIT
JB	JUNCTION BOX
KAIC	KILO AMPERE INTERRUPTING CAPACITY
KCMIL	THOUSAND CIRCULAR MILS
KVA	KILOVOLT AMPERE
KW	KILOWATT
MC	MECHANICAL CONTRACTOR
MCC	MOTOR CONTROL CENTER
M-G	MOTOR GENERATOR
MDP	MAIN DISTRIBUTION PANEL
MH	METAL HALIDE
NEC	NATIONAL ELECTRICAL CODE
NEMA	NATIONAL ELECTRICAL MANUFACTURERS ASSOCIATION
NF	NON-FUSED
NFPA	NATIONAL FIRE PROTECTION ASSOCIATION
NIC	NOT IN CONTRACT
NTS	NOT TO SCALE
OCPD	OVER CURRENT PROTECTIVE DEVICE
PNL	PANEL
ø	PHASE
PC	PLUMBING CONTRACTOR
PVC	POLYVINYL CHLORIDE CONDUIT
SCH	SCHEDULE
SEC	SECURITY
SPD	SURGE PROTECTION DEVICE
SW	SWITCH
SWGR	SWITCHGEAR
TVSS	TRANSIENT VOLTAGE SURGE SUPPRESSOR
TC	TIME CLOCK
XFMR	TRANSFORMER
XFR	TRANSFER
TYP	TYPICAL
UG	UNDERGROUND
UL,U.L.	UNDERWRITERS LABORATORIES
UPS	UNINTERRUPTIBLE POWER SUPPLY
U.O.N.	UNLESS OTHERWISE NOTED
VT	VAPORTIGHT
VAV	VARIABLE AIR VOLUME
VFD	VARIABLE FREQUENCY DRIVE
VSD	VARIABLE SPEED DRIVE
V	VOLT
W	WATT
WP	WEATHER PROOF

THESE DOCUMENTS HAVE BEEN PREPARED BASED ON INFORMATION PROVIDED BY OTHERS. THE CONSULTANT HAS NOT VERIFIED THE ACCURACY AND/OR COMPLETENESS OF THIS INFORMATION AND SHALL NOT BE RESPONSIBLE FOR ANY ERRORS OR OMISSIONS THAT MAY BE INCORPORATED AS A RESULT OF ERRONEOUS INFORMATION PROVIDED BY OTHERS.
NOTIFY THIS ENGINEER IMMEDIATELY OF ANY DISCREPANCIES FOUND.

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5. ALL OPENINGS IN FIRE AND SMOKE PARTITIONS SHALL BE SEALED AS REQUIRED BY THE NEC/ FLORIDA BUILDING CODE. PROVIDE UL LISTED COMPOUND TO MATCH PARTITION RATING.
6. DO NOT SCALE DRAWINGS. VERIFY FIELD CONDITIONS PRIOR TO AND DURING CONSTRUCTION FOR EXACT DEVICE / EQUIPMENT LOCATION.
7. CONTRACTOR SHALL PROVIDE TO LOCAL AHJ OR PERMITTING AGENCY A COPY OF ALL MAJOR EQUIPMENT CUT SHEETS AT TIME OF APPLICATION IF REQUESTED.

ATP ENGINEERING SOUTH, PL
SARASOTA, FLORIDA
ENGR. BUSINESS #9608
941-751-6485

MAY 14 2013

REV # | DESCRIPTION | DATE

MANATEE COUNTY COURT HOUSE BOILER ROOM
1051 MANATEE AVE. W., BRADENTON, FL 34208
IFAS# W1300159 WA#11

DRAWING TITLE: ELECTRICAL PLANS

FILE:	MCHC BOILER
JOB NO.:	2013.37
DATE:	5/07/2013
PLOT SIZE:	1:1
DRAWN BY:	CMD/MC
CHECKED BY:	JDC
SHEET No.:	E1.0

LEGENDS, GENERAL NOTES AND ABBREVIATIONS

ABBREVIATIONS

AC	AIR CONDITIONING
AD	ACCESS DOOR
AFF	ABOVE FINISHED FLOOR
AHU	AIR HANDLING UNIT
AI	ANALOG INPUT
AO	ANALOG OUTPUT
AP	ACCESS PANEL
BFF	BELOW FINISHED FLOOR
BHP	BRAKE HORSE POWER
BOT	BOTTOM
CC	COOLING COIL
CD	CONDENSATE DRAIN
CFM	CUBIC FEET PER MINUTE
CH	CHILLER
CHWR	CHILLED WATER RETURN
CHWS	CHILLED WATER SUPPLY
CLG	CEILING
CO	CLEANOUT
CT	COOLING TOWER
CU	CONDENSING UNIT
CW	COLD WATER
CWR	CONDENSER WATER RETURN
CWS	CONDENSER WATER SUPPLY
DB	DRY BULB
DCC	DIRECT DIGITAL CONTROL
DG	DOOR GRILLE
DI	DIGITAL INPUY
DO	DIGITAL OUTPUT
DP	DEW POINT
DX	DIRECT EXPANSION
EA	EXHAUST AIR
EAT	ENTERING AIR TEMPERATURE
EC	ELECTRICAL CONTRACTOR
ECC	ENERGY CONTROL CENTER
EER	ENERGY EFFICIENCY RATIO
EF	EXHAUST FAN
ET	EXPANSION TANK
EL	ELEVATION
EQUIP	EQUIPMENT
EWC	ELECTRIC WATER COOLER
EWT	ENTERING WATER TEMPERATURE
EXIST	EXISTING
FDPR	FIRE DAMPER
FCU	FAN COIL UNIT
FD	FLOOR DRAIN
FL	FLOOR
FPI	FINS PER INCH
FPF	FINS PER FOOT
FPM	FEET PER MINUTE
G	GUARD
GC	GENERAL CONTRACTOR
GPH	GALLONS PER HOUR
GPM	GALLONS PER MINUTE
H	HUMIDITY
HB	HOSE BIBB
HG	HEATING COIL
HE	HEAT EXCHANGER
HP	HORSE POWER
HW	HOT WATER
HWR	HOY WATER RETURN
HWS	HOT WATER SUPPLY
KW	KILOWATT
LAT	LEAVING AIR TEMPERATURE
LWT	LEAVING WATER TEMPERATURE
MC	MECHANICAL CONTRACTOR
MD	MOTORIZED DAMPER
MAX	MAXIMUM
MIN	MINIMUM
NC	NORMALLY CLOSED
NO	NORMALLY OPENED
OA	OUTSIDE AIR
OS&Y	OUTSIDE SCREW & YOKE
PC	PLUMBING CONTRACTOR
PD	PRESSURE DROP
PRESS	PRESSURE
RA	RETURN AIR
RD	ROOF DRAIN
RL	RAIN LEADER
RTU	ROOF TOP UNIT
S	SANITARY
SDPR	SMOKE DAMPER
SA	SUPPLY AIR
SP	STATIC PRESSURE
TCC	TEMPERATURE CONTROL CONTRACTOR
T	TEMPERATURE
TYP	TYPICAL
UC	UNDERCUT
UG	UNDERGROUND
UON	UNLESS OTHERWISE NOTED
UV	UNIT VENTILATOR
V	VENT
VAC	VACUUM
VAV	VARIABLE AIR VOLUME
VD	VOLUME DAMPER
VFD	VARIABLE FREQUENCY DRIVE
VSD	VARIABLE SPEED DRIVE
VTR	VENT THRU ROOF
W	WASTE
WB	WET BULB
WCO	WALL CLEANOUT

DUCTWORK

- UP / DN — SUPPLY DUCT (UP & DOWN)
- UP / DN — EXHAUST DUCT (UP & DOWN)
- UP / DN — RETURN AIR DUCT (UP & DOWN)
- CEILING DIFFUSERS
- SIDE WALL REGISTER OR GRILLE
- RETURN OR EXHAUST CEILING GRILLE
- EXHAUST OR RETURN WALL MTD GRILLE
- 10x8 — NEW DUCT – WIDTH X DEPTH
- (SINGLE LINE)
- EXISTING DUCT TO REMAIN
- (SINGLE LINE)
- EXISTING DUCT TO BE REMOVED
- (SINGLE LINE)
- FLEXIBLE DUCTWORK (INSULATED)
- (SINGLE LINE)
- SPIN–IN FITTING
- (SINGLE LINE)
- DUCY SIZE TRANSITION (CONCENTRIC)
- (SINGLE LINE)
- DUCT SIZE TRANSITION (ECCENTRIC)
- (SINGLE LINE)
- DUCT TRANSITION (RECTANGULAR TO ROUND)
- (SINGLE LINE)
- ACOUSTICALLY LINED DUCT
- INCLINED RISE, IN DIRECTION OF AIR FLOW
- INCLINED DROP, IN DIRECTION OF AIR FLOW
- FLEXIBLE CONNECTION
- LOUVER
- MANUAL VOLUME DAMPER
- FIRE DAMPER
- SMOKE DAMPER
- FIRE / SMOKE DAMPER
- SMOKE DETECTOR
- DUCT HEATER
- VANED ELBOW (PROVIDE ALL SQUARE OR RECTANGULAR ELBOWS WITH VANES EVEN IF SYMBOL IS MISSING)
- VANED ELBOW (SHORT RADIUS)
- STANDARD RADIUS ELBOW
- VANE TURN ELBOW & AIR SPLIT TYPE DUCT TAKE–OFF
- THERMOSTAT / TEMPERATURE SENSOR
- HUMIDISTAT / HUMIDITY SENSOR
- UNDERCUT (1" U.O.H.)
- DOOR GRILLE (18"X12" U.O.N.)
- A / 100 / 6"ø — AIR DEVICE TYPE / AIR FLOW CFM / NECK SIZE
- 4–WAY AIR FLOW
- 3–WAY AIR FLOW
- 2–WAY AIR FLOW
- 1–WAY AIR FLOW

PIPING

- — CWS — CONDENSER WATER SUPPLY
- — CWR — CONDENSER WATER RETURN
- — CHWS — CHILLED WATER SUPPLY
- — CHWR — CHILLED WATER RETURN
- — CD — CONDENSATE LINE
- — RL — REFRIGERANT LIQUID
- — RS — REFRIGERANT SUCTION
- — RHG — REFRIGERANT HOT GAS
- — HWS — HOT WATER SUPPLY
- — HWR — HOT WATER RETURN
- DOMESTIC WATER
- GATE VALVE
- GLOBE VALVE
- CHECK VALVE
- BALL VALVE
- PLUG VALVE
- PRESSURE REDUCING VALVE
- 2–WAY CONTROL VALVE
- 3–WAY MODULATING CONTROL VALVE
- SAFETY OR PRESSURE RELIEF VALVE
- MANUAL AIR VENT
- BUTTERFLY VALVE
- HOSE BIBB
- ANGLE GLOBE VALVE
- MOYOR OPERATED GATE VALVE
- MOTOR OPERATED GLOBE VALVE
- TEST PLUG (PRESSURE / TEMPERATURE)
- OUTSIDE SCREW & YOKE (O S & Y)
- DIRECTION OF FLOW
- ANCHOR
- REDUCER OR INCREASER
- ECCENTRIC REDUCER
- TOP CONNECTION, 45 OR 90 DEG.
- BOTTOM CONNECTION, 45 OR 90 DEG.
- SIDE CONNECTION
- CAPPED OUTLET
- RISE OR DROP IN PIPE
- UNION
- STRAINER
- THERMOMETER
- PRESSURE GAGE
- WATER FLOW MEASURING DEVICE
- EXISTING PIPE TO BE REMOVED

DRAWING SYMBOLS

- 2 / FP5 — DETAIL NUMBER / DRAWING NUMBER WHERE DRAWN
- A / FP5 — SECTION LETTER / DRAWING NUMBER WHERE DRAWN
- POINT OF INTERFACE BETWEEN NEW & EXISTING P.O.C.
- POINT OF DEMOLITION P.O.D.
- POINT OF INTERFACE BETWEEN CONTRACTORS

GENERAL NOTES

1. HVAC WORK CONSISTS OF PROVIDING AND INSTALLING A HOT WATER HEATING BOILER SYSTEM FOR A COMPLETE OPERATING SYSTEM AND AS INDICATED ON THE DRAWINGS. ALL WORK SHALL COMPLY WITH APPLICABLE CODES IN SPECIFICATIONS. IT IS THE INTENTION OF THE CONTRACT DRAWINGS AND SPECIFICATIONS TO CALL FOR COMPLETE, FINISHED WORK, TESTED, AND READY FOR OPERATION. MANATEE COUNTY PURCHASING DOCUMENTS TAKE PRECEDENCE IN ALL FACETS OF THE PROJECT.
2. TEST AND BALANCE SHALL BE PROVIDED BY A COMPANY SPECIALIZING IN THE TESTING AND BALANCING OF HVAC SYSTEMS AS SUBCONTRACTOR TO THE HVAC CONTRACTOR, OR OWNER. THE TEST AND BALANCE CONTRACTOR SHALL BE A MEMBER OF NEBB.
3. DUCT DIMENSIONS SHOWN ON THE DRAWINGS ARE CLEAR INSIDE AIR PASSAGE DIMENSIONS.
4. ALL PIPING SUBJECT TO THERMAL EXPANSION AND/OR CONTRACTION THAT PENETRATES A SMOKE, FIRE, OR FIRE/SMOKE WALL, PARTITION, OR FLOOR SLAB SHALL BE SUITABLY SLEEVED AND FIRE SAFED.
5. PROVIDE IDENTIFICATION OF THE LOCATION OF ALL FIRE AND BALANCING DAMPERS. IDENTIFICATION TAGS SHALL BE AFFIXED TO THE WALLS OR CEILINGS AND SHALL BE VISIBLE FROM THE OCCUPIED SPACE.
6. ALL PIPING SHALL BE SUPPORTED WITH COMMERCIAL MANUFACTURED CLAMPS. PROVIDE ISOLATION SLEEVES TO PREVENT CONTACT OF DISSIMILAR METALS.
7. INSTALL ALL EQUIPMENT IN STRICT ACCORDANCE WITH THE MANUFACTURERS' INSTRUCTIONS AND RECOMMENDATIONS.
8. CONTRACTOR TO PROVIDE ALL SUPPLEMENTARY STEEL REQUIRED TO SUSPEND MECHANICAL EQUIPMENT AND MATERIALS. THE EXISITNG CONCRETE FLOOR AND PAD ARE TO BE REUSED FOR THE NEW BOILER.
9. PENETRATIONS THROUGH FIRE RATED ASSEMBLIES, PENETRATIONS FOR PIPES, CONDUITS, OR OTHER PURPOSES THROUGH ASSEMBLIES (FLOORS, ROOF, WALLS, PARTITIONS, ETC.) WITH A REQUIRED FIRE RESISTANCE RATING FIRE STOP MATERIAL. FIRE STOP SEALANTS SHALL BE UL LISTED. APPLY FIRE STOP AS RECOMMENDED BY THE MANUFACTURER AND IN ACCORDANCE WITH ITS LISTING TO MEET OR EXCEED THE FIRE RATING OF THE ASSEMBLY IN WHICH IY IS INSTALLED.
10. ALL INSULATION SHALL BE FIRE RATED IN ACCORDANCE WITH ASHRAE 90A 50/25 SMOKE DEVELOPMENT AND FLAME SPREAD REQUIREMENTS. INSULATION "R" VALUES SHALL COMPLY WITH THE FLORIDA ENERGY CODE.
11. SEE ELECTRICAL DRAWINGS FOR ELECTRICAL CHARACTERISTICS OF MECHANICAL EQUIPMENT.
12. THE ENGINEER HAS MADE AN EXTENSIVE EFFORT TO IDENTIFY ABOVE CEILING CONFLICTS. THE CONTRACTOR IS RESPONSIBLE TO ALSO CHECKING FIELD CONDITIONS PRIOR TO BIDDING AND REPORT ANY PROBLEMS/CONFLICTS TO THE ENGINEER WITHIN 2 DAYS OF DISCOVERY. ANY CHANGES RESULTING FROM CONDITIONS ARISING IN THE FIELD WHICH WERE NOT BROUGHT TO THE ENGINEER'S ATTENTION ARE TO BE MADE BY THIS CONTRACTOR WITH NO ADDITIONAL COST TO THE OWNER.
13. THE WORK INDICATED ON THESE DRAWINGS IS GENERALLY DIAGRAMMATIC AND IS INTENDED TO CONVEY THE SCOPE OF WORK AND INDICATE THE GENERAL ARRANGEMENT OF DUCTWORK AND EQUIPMENT, ETC.
14. ALL WORK IS TO BE FREE OF DEFECTS IN WORKMANSHIP AND MATERIALS FOR A PERIOD OF ONE(1) YEAR FROM DATE OF FINAL ACCEPTANCE. ALL DEFECTS WHICH DEVELOP OR ARE DISCOVERED WITHIN THIS PERIOD SHALL BE REPAIRED BY THE CONTRACTOR TO THE SATISFACTION OF THE OWNER AT NO ADDITIONAL COST TO THE OWNER.
15. UPON COMPLETION OF THE WORK UNDER THIS CONTRACT, THE CONTRACTOR SHALL REMOVE ALL TOOLS, APPLIANCES, SURPLUS MATERIALS, AND SCRAP. ALL IDENTIFIED EXISTING EQUIPMENT TO BE REMOVED SHALL BE TURNED OVER TO THE OWNER.
16. WHEN CONFLICTS OCCUR IN SPECIFICATIONS OR IN THE DRAWINGS, OR BETWEEN EITHER, THE ITEMS OF GREATER QUANTITY OR HIGHER COST SHALL BE PROVIDED.
17. THE CONTRACTOR SHALL COORDINATE WORK WITH OTHER TRADES IN ORDER TO AVOID CONFLICTS.
18. ALL DUCTWORK INSTALLED ON THIS PROJECT SHALL BE OF SHEET METAL CONSTRUCTION. DUCTWORK SHALL BE FABRICATED AND CONSTRUCTED IN ACCORDANCE WITH SMACNA REQUIREMENTS.
19. ALL ROOF ATTACHED EQUIPMENT AND APPURTENANCES INCLUDED IN THE SCOPE OF THIS PROJECT ARE REQUIRED TO BE SECURED TO THE UNDERLYING BUILDING STRUCTURE. THE FASTENING SYSTEMS SHALL BE DESIGNED TO WITHSTAND A 140 MPH WIND LOAD.
20. CONTRACTOR SHALL PROVIDE TO LOCAL AHJ OR PERMITTING AGENCY A COPY OF ALL MAJOR EQUIPMENT CUTS SHEETS AT TIME OF APPLICATION.
21. SUTTER ROOFIHO BRADENTON & SARASOTA HAS THE EXISTING FIBERTITE ROOFING WARRANTY. THE SUCCESSFUL BIDDER SHALL ON ANY ROOF PENETRATIONS PROVIDE REPAIRS AND PROVIDE AN INSPECTION REPORT TO THE COUNTY TO KEEP THE WARRANTY IN EFFECT.
22. NO ENERGY CODE CALCULATIONS ARE PROVIDED . THE BOILER IS A REPLACEMENT AND IS 94 % EFFICIENT WHICH EXCEEDS THE FLORIDA ENERGY CODE.

NOTE:

THESE ARE STANDARD SYMBOLS AND MAY NOT ALL APPEAR ON THE PROJECT DRAWINGS; HOWEVER WHEREVER THE SYMBOL APPEARS ON THE PROJECT DRAWINGS, THE ITEM SHALL BE PROVIDED AND INSTALLED.

ATP ENGINEERING SOUTH, INC.
SARASOTA, FLORIDA
ENGR. BUSINESS #8808
941-751-6485

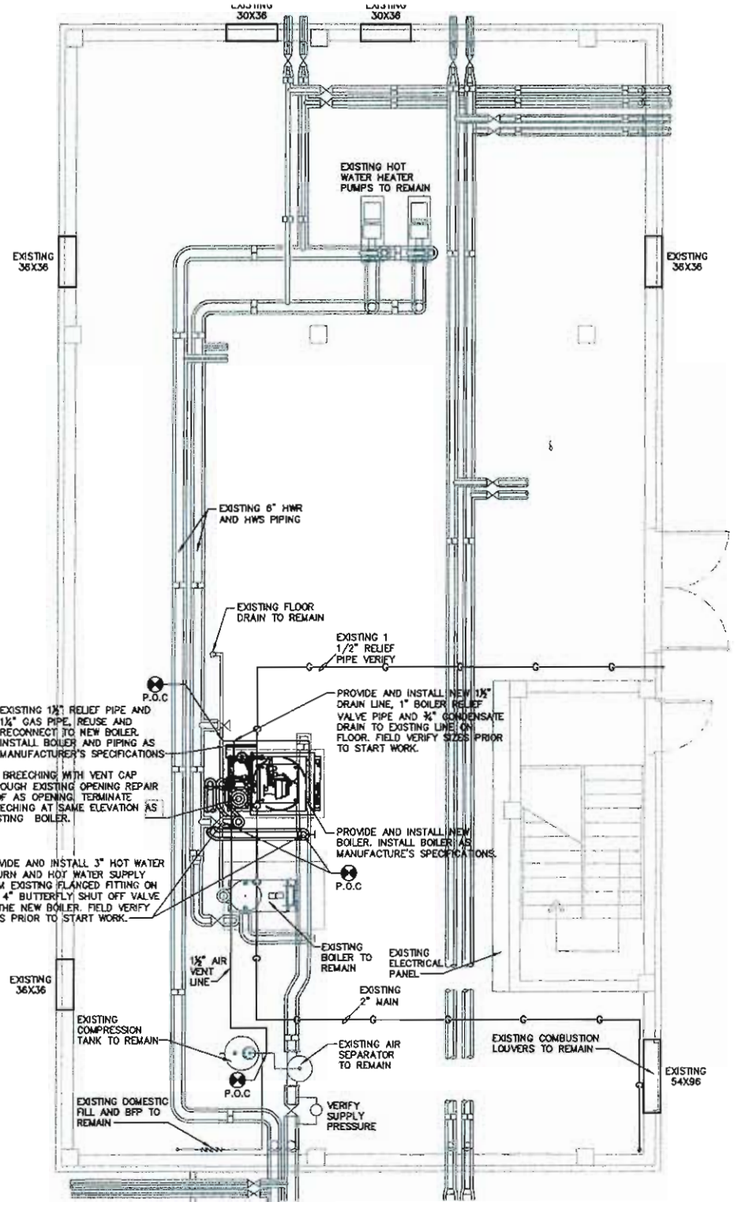
MAY 2 4 2013

REV.#	DESCRIPTION	DATE

MANATEE COUNTY COURT HOUSE BOILER ROOM
1051 MANATEE AVE W., BRADENTON, FL 34208
IFAS# W1300159 WA#11

DRAWING TITLE: MECHANICAL LEGEND AND GENERAL NOTES

FILE:	MCHC BOILER
JOB NO.:	2013.37
DATE :	5/07/2013
PLOT SIZE:	1:1
DRAWN BY:	DC
CHECKED BY:	JDC
SHEET No.:	M1.0



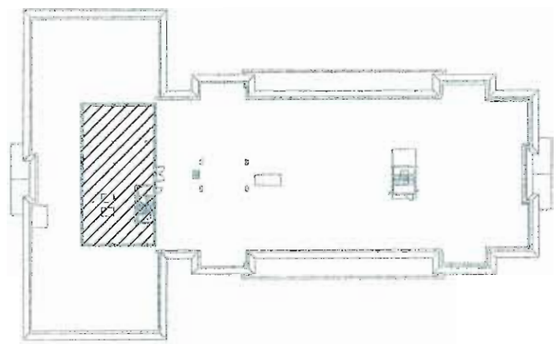
N

1 M2.0 **PENTHOUSE FLOOR PLAN**

1/4"=1'-0"

GENERAL NOTE:

1. REFER TO PLANS AND SPECIFICATIONS FOR ADDITIONAL SCOPE OF WORK.
2. CONTRACTOR SHALL VERIFY ALL EXISTING CONDITIONS PRIOR TO START OF WORK. ANY QUESTIONS SHALL BE ANSWERED BY THE ENGINEER AND PROJECT MANAGER PRIOR TO START WORK.
3. ITEMS IN GRAYSCALE ARE EXISTING AND TO REMAIN FOR DUCTWORK AND DIFFUSERS THAT ARE "TO REMAIN" PRESERVE EXISTING LOCATION.
4. VERIFY HOT WATER SUPPLY AND RETURN LOCATIONS PRIOR TO FIT UP ON BOILER.



N

2 M2.0 **KEY PLAN**

1/32"=1'-0"

ATP ENGINEERING SOUTH, PL
SARASOTA, FLORIDA
ENGR. BUSINESS #6808
941-751-6485

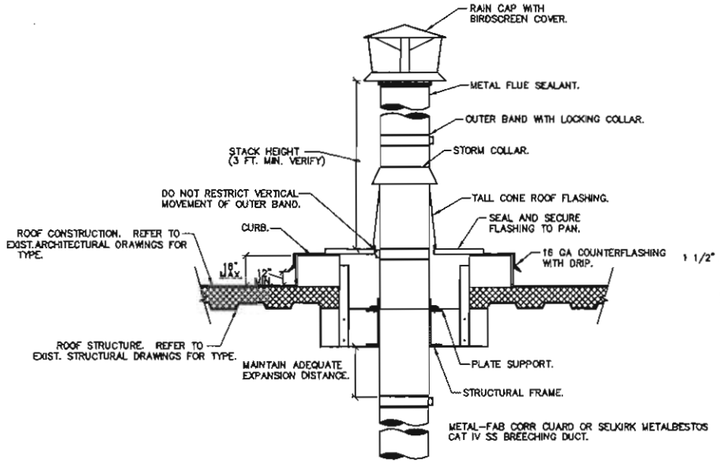
REV'd 5.14.2013

REV#	DESCRIPTION	DATE

MANATEE COUNTY COURT HOUSE BOILER ROOM
1051 MANATEE AVE. W, BRADENTON, FL 34208
IFAS# WI3000659 WA#11

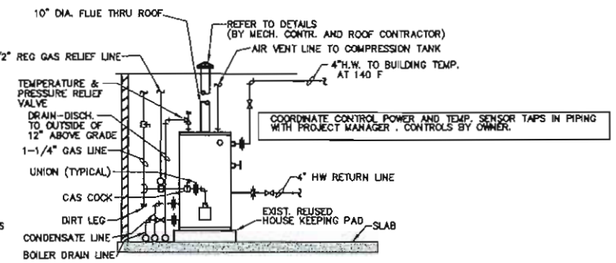
DRAWING TITLE:
MECHANICAL FLOOR PLAN

FILE:	MCHC BOILER
JOB NO.:	2013.57
DATE :	5/07/2013
PLOT SIZE:	1:1
DRAWN BY:	DC
CHECKED BY:	JDC
SHEET No.:	M2.0



1 M3.0 **BOILER BREECHING FLUE DETAIL**

NOT TO SCALE



2 M3.0 **BOILER DETAIL FOR BLDG. HEAT**

NOT TO SCALE

REFER TO POINTS OF CONNECTION P.O.C. ON PLAN FOR DRAIN, GAS, HWS, HWR RELIEF, CONDENSATE AND BREECHING OPENING.

VERIFY MFR. PIPING CONNECTIONS PRIOR TO BID.

BOTH PUMPS SHALL OPERATE IF TWO BOILERS ARE ON. ONE PUMP OR ALTERNATE PUMP SHALL OPERATE IF ONE BOILER IS ON.

P PUMP SCHEDULE EXISTING

Tag No.	Equipment Location	Type	Fluid Data						% Efficient	Variable or Constant Speed	Electrical Data					Manufacturer	Model No.	Combined Pump & Motor Weight only	Remarks
			System	Fluid	GPM	Head Feet	Temp. °F	Specific Gravity			Volts	Phase	Hertz	Horsepower	RPM				
P-1	MECH ROOM	CENTRIF	HWS	WATER	170	65	120-140	1.0	81	CONST	208	3	60	5	1725	TACO	FE2D08E2CIF	----	1
P-2	MECH ROOM	CENTRIF	HWS	WATER	170	65	120-140	1.0	81	CONST	208	3	60	5	1725	TACO	FE2008E2CIF	----	1

NOTES:

1. PUMP SCHEDULE IS PROVIDED FOR A WATER BALANCE VERIFICATION FOR THE BOILER FLOW . ONE EXIST. BOILER FLOWS 150 GPM. 8.45 ICH IMPELLER. 11 / 93 MFR DATE.

BOILER SCHEDULE

ITEM NO.		B-1
SERVICE	---	COURTHOUSE BUILDING
TYPE	---	CONDENSING BOILER
RATED PRESSURE	PSIG	125
INPUT	BTUH	1,500,000
OUTPUT	BTUH	1,440,000
FLUE SIZE	IN	10
FUEL/SIZE	---/IN	NG/ 10"WC MIN.
WATER SIDE PD	FT	4.0 MAX
ELECTRICAL	V/#/ HZ	120/1/60
WEIGHT	LBS	3165
LOCATION	---	MECH ROOM
MANUFACTURER	---	CLEAVER BROOKS
MODEL NO.	---	CFC1500

NOTES:

1. 120° ENT WATER TEMP./140° LVG. WATER TEMP. AT 131 GPM MINIMUM. 94 % EFFICIENT. MAX FLOW 254 GPM
2. FORCED DRAFT-FLAME FALCON TYPE GAS BURNER COMPLETE WITH STATE-OF-THE-ART PROGRAMMING AND SAFETY COMBUSTION CONTROLS, ASME CD-1 GAS TRAIN, COMBINATION TEMPERATURE AND PRESSURE GAUGE, WATER TEMPERATURE LIMIT SAFETY CONTROL, SAFETY SHUTDOWN, AND LOCKOUT CONTROL WITH TIME STAGED DISPLAY, NTC SENSORS, ALARM HORN, RESET, PROBE TYPE LOW WATER CUT-OFF, AUXILIARY LOW WATER CUT OFF, EXCESS WATER CUTOFF, STACK THERMOMETER,PID LOOP CONTROL, ASME SAFETY RELIEF VALVE, AUXILLIARY RELAY CONTROLS WITH MODBUS AND BACNET OUTPUT AND REMOTE SETPOINT CONTROL BY AUTOMATED LOGIC, BOILER LEAD LAG CONTROLS , PUMP RELAYS , ALL CONTROLS INCLUDING PANEL, INSTALLED AND WIRED, MANUAL RESET , MODULATING FIRING CONTROLS, VFD BURNER FAN, LOW NOX BURNER, ALARM BELLS, FM, APPROVED CONTROL SYSTEM.

ATP ENGINEERING SOUTH, P.E.
SARASOTA, FLORIDA
ENGR. BUSINESS #6808
941-751-6485

MAY 24 2013

REV#	DESCRIPTION	DATE

MANATEE COUNTY COURT HOUSE BOILER ROOM
1051 MANATEE AVE. W., BRADENTON, FL. 34208
IFAS# WR300159 WA#11

DRAWING TITLE: MECHANICAL SCHEDULES AND DETAILS

FILE:	MCHC BOILER
JOB NO.:	2013.37
DATE :	5/07/2013
PLOT SIZE:	1:1
DRAWN BY:	DC
CHECKED BY:	JDC
SHEET No.:	M3.0

1. SCOPE

Furnish all necessary labor, materials, and equipment and perform all work called for upon the Drawings and specified herein for a complete boiler system with functioning mechanical, general building, and electrical systems and all utility connections as required. Review and consultation with the Project Manager is required prior to any work being performed and completed. Manatee County Purchasing documents take precedence in all items.
The County representative is denoted also as a Project Manager and or Owner representative.

2. RELATED WORK SPECIFIED ELSEWHERE

All Bidding Documents, including Contract Conditions, Instructions to Bidders, Supplements, and Addendums are part of this specification. Should any questions or conflicts arise, request written clarification from the Project Manager of abide the interpretation of the Project Manager.

3. CODES AND STANDARDS

The following Codes and Standards are in effect or latest approved by the local jurisdiction for the project:
Florida Mechanical Code
Florida Plumbing Code
Florida Fire Prevention Code
Florida Building Code
National Electrical Code
Florida Energy Code
NFPA Pamphlets
Florida Trench Act
City of Bradenton Local Codes and Ordinances
Should any changes be required to the Drawings or Specifications to comply with these codes, request written clarification from the Project Manager or abide by the interpretation of the Project Manager. The current edition of each code shall be the one in effect for the project as adopted by the authority having jurisdiction.

4. PERMITS, LICENSES, FEES, AND INSPECTIONS

Obtain, pay for, and maintain all necessary Permits, Licenses, and Certificates of Inspections, pay for all installation charges, plant investment fees that are required by the Local utility company servicing the project.

5. QUALIFICATION OF CONTRACTOR/SUBCONTRACTOR

The Contractor shall be thoroughly experienced in the installation of the HVAC, plumbing, electrical, and general building systems shown on the Drawings and specified herein. All work performed by the Contractor shall be of the highest quality. The Contractor shall be responsible for his Subcontractors to see that the systems are installed in accordance with the Drawings and Specifications.

6. WORK METHODS AND CONDITIONS

The Contractor shall be responsible for working conditions on the project, and shall see that no unsafe working conditions or methods are used. The Engineer and Project Manager shall not be responsible for unsafe working conditions or methods used on the project. The Engineer and Project Manager is also not responsible for hazardous materials testing, inspection and remediation of any perceived or actual denoted hazardous material on the job site. It is the responsibility of the Project Manager to provide proof to the Contractor if any such substance is not on site.

7. ACCESS TO EQUIPMENT

Provide for easy removal of coils, fan shafts, fan wheels, drives, belts, filters, electrical equipment and other parts requiring periodic replacement or maintenance. Arrange for access to all motors, and controls. Provide all access panels in equipment, walls, ceilings, and floors for same. (ADA) The Americans Disability Act applies to access to all controls, fixtures, and light switches Refer to Florida Building Code for locations of all items.

8. COORDINATION

The Drawings show the general arrangement of the work, piping, equipment, and appurtenances. Follow the Drawings as closely as possible but make necessary offsets, transitions, and fittings that may be required to avoid conflicts. Work shall occur at times beyond the normal Monday–Friday day time schedules; pricing shall include, nights, week–ends, and holiday work to perform change–outs so as not to shutdown the operation of public facilities.
Crane operation shall be scheduled for the installation with the Project Manager.

9. GUARANTEE

Guarantee all work against any defects in equipment, material, or workmanship for a period of 2 years after the final date of acceptance. The guarantee does not include maintenance of equipment.

10. EQUIPMENT SUBMITTALS AND SHOP DRAWINGS

Submit four copies of each of the following submittals to the Project Manager for approval:
Piping, valves, insulation, covering, HVAC Equipment
hydronic specialties
Panel Boards, circuit breakers, receptacles, light switches, wire, conduit, pull boxes
Testing and Balancing Booklets
steel material lists
Refer to each specification sheet for each discipline's requirements (Electrical, and Mechanical)

11. OPERATION AND MAINTENANCE MANUALS

Provide three copies of the Operations and Maintenance Manuals consisting of three ring binders, plastic pressed base. Provide Manufacturers literature for each piece of equipment including installation instructions, operating instructions, maintenance instructions. replacement parts list, as–built drawings, lubrication schedule, name and address, and phone number of nearest service agency.

12. SEISMIC BRACING

All equipment, piping, ductwork, interior and exterior electrical, and appurtenances shall be adequately braced to withstand the lateral forces from the seismic event or weather wind occurrence of a magnitude indicated in the Florida Building Code for the project location. As a minimum this shall include anchoring of all equipment to the walls of floors and double diagonal bracing of every fourth duct, conduit, and pipe hanger.

13. TEMPORARY SERVICES

The Contractor will provide temporary power, water, sewer, utility services and demolition hauling services. If the Contractor interrupts a service, the owner shall be notified and repairs or temporary service arrangements will commence within an eight–hour period. Scheduling of service outages will be notified to owners. Notification will be at least in written form within 24 hours of the outage, with verbal notification 4 hours prior to the service outage of each affected Owner.
The use of the owner's utilities, heating and cooling system, and restrooms is not prohibited unless arrangements have been made, prior to contract signing. An on–site trailer with telephone, and portable restroom, and drinking water, and the demolition container shall be part of the contractor's contract. Waste hauling for excess materials shall be by the contractor. Security of the site will be coordinated with the Owner.

14. MATERIALS AND EQUIPMENT

All materials shall be new and of the highest quality of their respective kinds. The Contractor at no cost to the owner shall replace any material or equipment that is unsound, unfit, or damaged,

15. EXISTING CONDITIONS

The Contractor shall visit the site prior to bidding to verify existing conditions. Resolve any questions prior to bidding. Refer to all documentation provided by the Project Manager during the pre–bid walk–through for clarifications.

16. WORKMANSHIP AND COMPLETION OF INSTALLATION

The Contractor shall be skilled in the trades performed and shall be responsible for a complete and proper installation of all work required for the project. If the contractor damages a portion of the existing facility, he will correct at no expense to the Owner all damages to the original condition including painting and landscape. The Contractor shall also correct at no expense to the Owner all errors in installation and repair all leaks in piping and equipment. The Contractor shall follow the approved manufacturer's recommendations and instructions where details of specific installation instructions are not provided.
Close all pipe, duct and conduit openings with caps or plugs during installation. Protect and store on–site in a secure area all materials, fixtures, and equipment against dirt, water, chemical, vandalism, theft, and mechanical damage. Thoroughly clean all surfaces in areas of work upon completion, and deliver in perfect, unblemished condition to the Owner. Store all equipment as required by the manufacturer's instructions including the covering and storing in a container if need be.
The Contractor shall receive all materials including the unloading of materials to a mutually agreed location with the Owner on–site.
Install all safety devices, request inspection, and obtain approval of the authority having jurisdiction, before placing systems in operation
Demolition includes the following work: disconnect, demolish and remove the work specified, and as indicated. Where pipe, ductwork, insulation, or equipment to remain is damaged or disturbed, remove damaged portions and install new products of equal capacity and quality. Equipment removed by the contractor shall be the contractor's responsibility for clean up, hauling and salvage.
The Project Manager has full power to condemn or reject any work, materials, and equipment not in accordance with the specifications, and drawings or not in compliance with the manufacturer's installation instructions that are approved by the Project Manager. Work that has been rejected shall be removed and replaced to the satisfaction of the Project Manager. All decisions made by the Project Manager shall be stated in writing, and made binding upon the parties thereto.

17. FINAL ADJUSTMENT

Check equipment for proper operation and complete final adjustments prior to final inspection. After the final acceptance make all necessary adjustments to obtain satisfactory operation of the systems in operation.

18. ACCEPTANCE TESTS

Upon completion of final adjustments, demonstrate to Owner, and the Engineer the operation of each system on simulated operation cycles.

19. OWNER OCCUPANCY

The Owner shall occupy the site and existing buildings during the entire construction period. The contractor and subcontractors shall cooperate and coordinate all work with the Owner, and Project Manager during construction operations to minimize conflicts and facilitate Owner usage. Perform the work as to not interfere with the Owner's operations.

20. MISCELLANEOUS PROVISIONS

Minor materials and work not specifically mentioned herein but necessary for the Proper completion of the specified work shall be furnished and installed at no additional cost to the owner.
Should deteriorated materials of major nature be uncovered in the course of work, it should be brought to the attention of the Owner and Project Manager prior to the initiating any repairs. Repairs by the Contractor shall be made as approved in the scope and pricing by the Owner and Project Manager.
No allowances for additional completion times shall be made for these repairs. Should the equipment or material be beyond repair, an adjustment will be considered at the convenience to the Owner, and Project Manager.

21. EXISTING WORK/ CLEAN UP

Where existing work is changed, removed, or where new work adjoins, connects or abuts to existing work, the existing work shall be altered as necessary and connected in a substantial and workmanship like manner. All new work and replacement, reinstalled work, and repairs shall match the adjacent and/or similar work. Protection of existing areas shall be taken. Clean up by the contractor shall be done and reviewed by the Owner, and Project Manager for acceptance. The Owner and Project Manager has full rights to reject any and all work performed including clean up.

22. NO SMOKING / NO INTERACTION

There shall be no smoking by the Contractors and subcontractors allowed on the facility at any time unless specifically arranged. There shall be no interaction with the employees of the Owner, and the contractors.

23. OSHA

All work shall comply with the US Department Of Labor–Occupational Safety and Health Administration, entitles OSHA Standards. National Consensus Standards, and Established Federal Standards.

24. SUBSTANTIAL COMPLETION

The contractor shall submit application of payment showing 100 percent completion based upon work claimed substantially complete. If 100 percent is not shown, a list of outstanding items is required. Submit all warranties, lien releases, workmanship bonds, and final certifications.
Submit all record drawings, operations and maintenance drawings, Building department signed certificates of occupancy. Deliver all spare parts, tools, and extra stock to the Owner. Complete start–up testing and training of maintenance personnel. Complete final clean up.
Provide Contractor's affidavit of debts and claims, lien releases, and the Surety Company's consent to final payment to the Owner. Submit evidence of final, continuing insurance coverage complying with the Owner and Project Manager's requirements.
Provide maintenance instructions on all equipment, arranger for each installer to provide this service with the factory representative. Provide a written list of all personnel who received training.

25. CONTRACTOR'S BID LIST

The contractor shall provide a list of all subcontractors used with each major trade for the site security used on the project.

26. PIPE/CONDUIT HANGERS

Type adjustable clevis with threaded rod. Roller type shall be used for expansion of piping or conduit.
Shield: semi–circular sheet metal, 18 gage under insulation. Materials, steel for all piping except copper, copper plated steel for copper piping. All piping shall be cross–braced for seismic support.

27. PIPE /CONDUIT SLEEVES

Material shall be schedule 40 steel welded.
Wall sleeves flush on both sides of wall.
Floor Sleeves shall be flush on bottom side of floor, ¼" above floor on topside.
Caulking 3M–fire barrier foam or caulk, UL Labeled for rating of penetration.
Finish plates, chrome plated for all exposed pipe/ conduit penetrations.

28. VALVES

Gate, Stockham, Model B–107 or B–109, solid wedge, 125 psig, bronze body, rising stem, soldered or threaded ends.
Ball, Apollo, chrome plated ball, screwed or soldered ends, 150 psig, bronze body, swing away design, full port, Teflon seats, lock handle.
Globe, Stockham B–29, 150 psig, bronze body, rising stem, union bonnet, plug disk, removable seat, threaded or soldered ends.
Eccentric Plug, Dezurik, Series 400, semi–steel plug and body, lever operated with adjustable memory stop. Or Milliken.
Check, Stockham, Model B–310 or B–320, 125 psig, bronze body, swing type, compression disk, soldered or threaded ends.
Butterfly, Dezurik or Lunkenheimer, Model 832 semi–steel body and disk, resilient seat, lug type, lever operated, memory stop, 125 psig.
PRV, B&G, Taco, spring operated, adjustable pressure setting, integral strainer.
Control Johnson, Penn, Delta, Belimo, Flecher, Fisher

29. MOTORS

Manufacturers: Reliance, General Electric, Baldor open drip proof or TEFC, suitable for continuous or intermittent operation unless specified. NEMA Design B minimum. Class F insulation for Variable speed drive motors. Nema 3R minimum installations for exterior use. Service Factor: Minimum of 1.15 at 40 degree C, full load and at project altitude.
Conformance: NEC, AIEE, NEMA.
Features: Ball bearings, conduit connection boxes, cast iron yoke, integral supporting feet, grease lubricated bearings, accessible grease inlet and outlet plug and inner bearing dust caps.
Voltage: Motors ½ HP and larger shall be the voltage and phase shown on the plans.
Motors smaller than ½ HP shall be 120 volts, single phase, 60 cycle.
Speed: 1750 RPM unless noted otherwise.
Efficiency: Meet or exceed ASHRAE Energy Standards, latest edition.
Voltage Motors shall be designed to operate satisfactorily at voltages +/– 10 % of the designated voltage.
Sheave: adjustable slide rails.
Motor Mount: adjustable slide rails.
Belts: matched set rated at 150% of maximum load.
Guards: around belts with holes for Tachometer placement.

30. STARTERS

Type Magnetic.
Location: for each three phase motor.
Transformer: 120–volt control power for each starter unless coordinated by Temperature control contractor as low voltage or dc voltage.
Overload Protection, Manual reset type for each leg.
Conformance: NEC, NEMA, AIEE

31. HANGERS AND SUPPORTS

Support the vertical lines and conduit at the base with a suitable hanger or a pedestal.
Install inserts in concrete structures for hanging of pipe or conduit. Hang piping or conduit from lower cord of steel beams or joists in steel frame buildings. Drilling into concrete structures for means of hanging pipe or conduit will be allowed only if the Project Manager approves. Install hangers so as not to interfere with expansion and contraction of the piping. Space hanger installations in accordance with MSS SP–69 and the Florida Building Code.

32. INSTALLATION OF PIPING OR CONDUIT

Support all piping from the structure.
Make minor modifications to the Drawings to coordinate with other work.
Install all piping or conduit in a neat, workmanlike manner.
Verify that all piping, conduit, boxes, devices, valves, etc. will fit in the designated space. Request clarification if pipe size is not apparent.
Run piping or conduit concealed in all finished areas unless noted otherwise.
Run piping or conduit exposed in all unfinished areas unless noted otherwise.
Run piping or conduit vertically within walls where shown near walls for clarity.
Do not run horizontal pipes and conduit in walls or partitions.
Install exposed risers and runouts as close to the wall or ceiling as practical.
Piping and conduit shall not interfere with other work, door or window.
In general, run piping and conduit parallel or perpendicular with building lines.
Run horizontal lines horizontal or with uniform pitch as indicated.
Run vertical lines exactly plumb.
Cut piping and conduit accurately on the site.
Anchor all piping and conduit securely at the site.
Install piping without strain, forcing or cold springing.
Make all changes in direction with factory fabricated fittings (except underground).
Install no underground fittings for pressurized systems and other systems.
Replace all defective pipe, and fittings for pressurized systems.
Handle piping, and conduit carefully to prevent bending and damage.
Clean all pieces before installation.
Furnish all temporary connections that are required.
Patch all holes in walls, ceilings, and floors required for installation of work under this Division.

33. INSULATION – PIPE

Manufacturers: Armstrong, Johns Manville, Owens Corning, CSC
Insulation Requirements: The following systems shall be insulated as specified:
Heating Hot water piping with 2" cellular glass with PVC jacket for lines less than 5", 2½" thick for heating hot water piping above 5".
Install insulation continuous through walls, floors, ceiling, and roofs.
Seal vapor barriers on all systems carrying fluids below 70 degrees F.
Do not use staples on vapor jackets.
Follow manufacturer's installation instructions carefully.
Do not exceed the recommended adhesive coverage.
Leave all insulation surfaces clean and ready for painting.
Seal all exposed butt ends of insulation with adhesive.
Seal all transverse and longitudinal joints with pressure sensitive tape.
Use a semicircular shield at all piping hangers and supports.
Cover and insulate all valve extensions.

34. GAS PIPING

Exterior/interior above grade
Schedule 40 black steel pipe
Fittings Malleable, 150 psig
Joints welded or screwed
Valves Lubricated plug

35. CONDENSATE DRAIN PIPING

Pipe Type L drawn copper water tube with 95/5 solder, or schedule 40 PVC painted pipe
Fittings Wrought Copper, or solvent welded PVC schedule 40 fittings
Joints sweat soldered copper type, or solvent welded PVC

36. TESTING, ADJUSTING, AND BALANCING

All work performed under this section shall be performed by a competent personnel employed by an independent balancing contractor or the Mechanical contractor. In either case, the personnel shall be certified by NEBB or AABC.
Inspect the installation of various systems. The inspection of the work shall cover the part of the work relating to the proper arrangement and adequate provisions for the testing and balancing of the systems.
Record all pertinent data in a final report and submit three copies to the Engineer for review.

37. IDENTIFICATION

The contractor shall tag each valve, place nameplates riveted to or glued to each piece of equipment. Each tag shall bear it's identification with the County receiving a typewritten copy in the operations and maintenance instructions.

38. HOT WATER PIPING

Pipe Schedule 40 black steel
Fittings malleable iron, 150 psig
Joints screwed or socket welded for 2" and smaller, butt welded for ½" and larger

39. PIPING SPECIALTIES

Manual Air Vents: Bronze body, nonferrous internal parts. Crane Model 700 manual
Automatic Air Vents: Float principle air vent, bronze body, nonferrous internal parts. Crane Model 700 series bucket type
Compression Tanks: Suitable for working pressure and operating temperature, ASME pressure tested, air control tank fittings, tank drain fittings, gage glass,
Diaphragm–Type Compression Tanks: Suitable for working pressure and operating temperature, pressure tested. (125–150 psig, ASME).
Air Separator: Welded black steel. B&G, Taco with strainer Pump Suction Diffusers: Cast–iron body, threaded connections for working pressure required.
Chemical Feeder: Bypass bell or liquid type chemical feeder, welded steel construction. Nalco, Mitco
Diverting Fittings: Cast iron body.
Y–Pattern and Basket Strainers: Cast iron body, ASTM A 126, Class B.
Gauges Marsh Standard 4½" dial, 125– 150 psig Thermometers Trerice. Adjustable angle, 9" scale. 125 psig– 150 psig blue dye P–T plugs Nordell Model 700 Manual, 125–150 psig

40. FLUES FOR GAS APPLIANCES

Manufacturer Metalbestos, Metal Fab Inc.
Model Cat IV
Type Category IV for condensing boilers
Outer shell Galvanized steel
Inner shell stainless steel
Size as indicated on the drawings
Accessories Roof jack, bird proof top, storm collar, guy supports, aircraft ss wire and turn buckles

41. CONDENSING BOILER – HOT WATER HEATING SYSTEM

A. The work to be performed consists of providing all labor, equipment, materials, etc. to furnish and install new factory assembled, low–pressure hot water boilers as described in the specifications herein.

B. Related Sections include the following:

1. The Project Manager shall arrange for water treatment for the boiler and new piping using the County's water treatment vendor.
2. "Breechings, Chimneys, and Stacks" for connections to chimneys and stacks.
3. Control wiring for automatic temperature control is by the County.
4. Power wiring is by the contractor's subcontractor.
5. Piping taps for temperature sensors shall be by the contractor coordinated with the Project Manager.

REFERENCES

A. Product Data: Include rated capacities; shipping, installed, and operating weights; furnished specialties; and accessories for each model indicated.
B. Shop Drawings: Detail equipment assemblies and indicate dimensions, required clearances, and method of field assembly, components, and location and size of each field connection.
C. Wiring Diagrams: Detail wiring for power, signal, and control systems and differentiate between manufacturer–installed and field–installed wiring.
D. Source Quality Control Tests and Inspection Reports: Indicate and interpret test results for compliance with performance requirements before shipping.
E. Field Test Reports: Indicate and interpret test results for compliance with performance requirements.
F. Maintenance Data: Include in the maintenance manuals specified in Division 1. Include parts list, maintenance guide, and wiring diagrams for each boiler.
G. Other:
1. ASME Section IV – Heating Boilers
2. ANSI Z21.13 – Gas Fired Low Pressure Boilers
3. NFPA 54/ANSI Z221.3 – National Fuel Code
4. FM – Factory Mutual
5. ASME CSD–1 – Controls and Safety Devices
6. UL Standards for Gas Fired Boilers
7. FBC – Florida Building Code
8. FMC –Florida Mechanical Code
9. NEC – National Electrical Code

QUALITY ASSURANCE

A. The equipment shall, as a minimum, be in strict compliance with the requirements of this specification and shall be the manufacturer's standard commercial product unless specified otherwise. Additional equipment features, details, accessories, appurtenances, etc. which are not specifically identified but which are a part of the manufacturer's standard commercial product, shall be included in the equipment being furnished.

B. The equipment shall be of the type, design, and size that the manufacturer currently offers for commercial sale and appears in the manufacturer's current catalogue. The equipment shall be new and fabricated from new materials and shall be free from defects in materials and workmanship

C. The equipment must fit within the allocated space, leaving ample allowance for maintenance and cleaning, and must leave suitable space for easy removal of all equipment appurtenances.

D. All units of the same classification shall be identical to the extent necessary to ensure interchangeability of parts, assemblies, accessories, and spare parts wherever possible.

E. To accept unit responsibility for the specified capacities, efficiencies, and performance, the boiler manufacturer shall certify in writing that the equipment being submitted shall perform as specified. The boiler manufacturer shall be responsible for guaranteeing that the boiler provides the performance as specified herein.

SUBMITTALS

A. The contractor shall submit, in a timely manner, all submittals for approval by the Project Manager. Under no circumstances shall the contractor install any materials until the Project Manager has made final approval on the submittals.

B. The Project Manager shall review submittals. Work may proceed and equipment released for fabrication after contractor receives returned submittals stamped with "NO EXCEPTIONS TAKEN" or "MAKE CORRECTIONS NOTED".

C. Shop Drawings – Shop drawings shall be submitted to the engineer for approval and shall consist of:

1. General assembly drawing of the boiler including product description, model number, dimensions, clearances, weights, service sizes, etc.
2. Schematic flow diagram of gas valve trains.
3. Schematic wiring diagram of boiler control system of the ladder–type showing all components, interlocks, etc. Schematic wiring diagram shall clearly identify factory wiring and field wiring by others.

E. Manufacturer's Warranties: Manufacturer's printed warranties, as specified hereinafter, shall be submitted prior to final acceptance by the engineer.

F. Manufacturer's Field Service: Manufacturer's printed field service procedures and reports, as specified hereinafter, shall be submitted prior to final acceptance by the engineer. Report forms shall contain all information as required to do start–up and testing as specified in the product section.

SUBSTITUTIONS/MODIFICATIONS

A. The bidder must submit in writing to the Project Manager any request for a proposed deviation, omission, modification, or substitution to this specification for evaluation no later than ten (10) days prior to the bid date.

B. Technical data, drawings, product samples, and complete data substantiating compliance of proposed substitution with these specifications shall accompany a request for any substitution.

C. No materials shall be deemed acceptable if not in strict and full compliance with these specifications.

D. All bidders must bid solely on the specified materials unless acceptance by the engineer of a deviation, omission, modification, or substitution is granted in writing to all bidders prior to the bid date.

CERTIFICATIONS

A. Manufacturer's Certification: The boiler manufacturer shall certify the following:

1. The products and systems furnished are in strict compliance with the specifications.
2. The boiler, burner, and other associated mechanical and electrical equipment have been properly coordinated and integrated to provide a complete and operable boiler package.
3. ASME Certification in the form of ASME Stamp on the product and completed and signed data sheet.
4. ASME CSD–1 Certification, in the form of completed data sheet.
5. UL Certification in the form of an affixed label to the equipment.
6. The specified factory tests have been satisfactorily performed.
7. The specified field tests have been satisfactorily performed.

B. Contractor's Certification: The contractor shall certify the following:

1. The products and systems installed are in strict compliance with the specifications.
2. The specified field tests have been satisfactorily performed.

ATP ENGINEERING SOUTH, P.A.
BARABOTA, FLORIDA
ENGR. BUSINESS #6808
941-751-6465

NOV 26 2013

REV.#	DESCRIPTION	DATE

MANATEE COUNTY COURT HOUSE BOILER ROOM
1051 MANATEE AVE. W., BRADENTON, FL 34208
IFAS# W13001159 WA#11

DRAWING TITLE:
MECHANICAL SPECIFICATIONS

FILE:	MCHC BOILER
JOB NO.:	2013.37
DATE:	5/07/2013
PLOT SIZE:	1:1
DRAWN BY:	DC
CHECKED BY:	JDC

SHEET No.:
M4.0

C. boiler inspectors' Certification: All boiler inspections during hydrostatic testing shall be performed by an authorized boiler inspector who is certified by the National Board of Boiler and Pressure Vessel inspectors and shall be submitted in writing prior to final acceptance by the engineer.

D. Operation and Maintenance Manuals: Manufacturer's printed operation and maintenance manuals shall be submitted prior to final acceptance by the engineer. Operation and maintenance manuals shall contain dimension and wiring drawings, product data, operating instructions, cleaning procedures, replacement parts list, maintenance and repair data, complete parts list, etc.

DELIVERY, STORAGE, AND HANDLING

A. The contractor shall be responsible for the timely delivery of the equipment to the jobsite. The contractor shall be responsible for unloading and rigging of the equipment. The contractor shall be responsible for protecting the equipment from the weather, humidity and temperature conditions, dirt, dust, other contaminants, as well as jobsite conditions during construction.

B. Equipment shall be unloaded, handled, and stored in accordance with the manufacturer's handling and storage instructions. Crane work shall be by the contractor.

C. Responsibility of making freight claims to be performed by contractor or owner personnel.

PRODUCTS

MANUFACTURERS

A. Contractor shall furnish and install a full condensing boiler with input as scheduled on the drawings and performance as noted in these specifications.
1. Cleaver Brooks
2. Aerco
3. Owner approved equal

B. "Near condensing" copper fin designs, cast iron or "add-on" secondary condensing exchangers will not be considered.

GENERAL DESCRIPTION

A. Each unit shall be a Down-fired Firetube type complete with boiler fittings and automatic controls. The boiler, with all piping and wiring, shall be factory package. Each boiler shall be neatly finished, thoroughly tested and properly packaged for shipping. Boiler design and construction shall be in accordance with Section IV of the ASME Code for hot water heating boilers with a maximum working pressure of 125 PSIG. The boiler shall be UL certified as an indirect or direct vent boiler and comply with ASME CSD-1 Code requirements.

PERFORMANCE: BOILER SIZE AND RATINGS

A. The capacity of each unit shall be as indicated on the drawing schedule.
B. The unit shall be ASME CSD-1 , FM , and UL listed .

C. Noise Sound Levels: Based on ABMA test code for packaged boilers measured @ 4 ½ feet vertically above the bottom of the base and 3'0" horizontally in front of the end of the burner or front surface of control cabinet. Sound levels dBA on the scale in reference to 0.0002 microbars.

BOILER DESIGN

A. Boiler shall be a compact, single-pass, vertical down-fired Firetube type, with Duplex stainless steel tubes, tube sheets, and combustion chamber. The boiler pressure vessel shall be completely insulated with a minimum of 2" of insulation and shall be encased in an 18 gauge metal cabinet with powder coated finish. To prevent installation damage, the casing shall be packaged separately and shall ship loose for field installation by the manufacturer's service representative.

B. The tubes shall be Duplex Stainless Steel and shall be fitted with Aluminum Alloy internal heat transfer fins creating no less than 10 square feet of firside heating surface per boiler horsepower.

C. The Vessel shall be mounted on a structural steel stand with exhaust gasses collected in a polymer drain collection box complete with drain fitting for draining condensation from the products of combustion. A condensate neutralizing box complete with limestone chips shall be shipped loose for field installation by contractor. Note: A condensate trap assembly shall be furnished if a condensate collection tray is not provided due to operating conditions.

D. The top tubesheet shall be fully accessible without burner disassembly or removal from the boiler. The burner assembly shall be complete with lifting hinges and pneumatic lifters. The boiler shall have a built in hinged platform allowing the operator to access the tubesheet, burner, ignition assembly and flame rod without the use of a ladder.

E. The vessel shall be fully insulated with a minimum of 2" of insulation, guaranteeing external convection and radiation heat losses to the boiler room from the boiler shall be less than 0.5% of the rated input.

F. The condensing capability shall allow the boiler to be operated without the use of a 3-way valve for the boiler supply water temperature reset. No minimum boiler return water temperature or secondary pump or minimum flow rate shall be required to protect the boiler against thermal shock or for minimum temperature water.

G. Boiler shall be built to Manatee County hurricane zone requirements and manufacturer shall provide seismic calculations showing tie-down requirements for bolt diameters. Bolts and tie-down shall be by contractor.

H. Each boiler shall be constructed in accordance with the A.S.M.E. Section IV Code and bear the "H" stamp and shall be manufactured within an ISO 9001 Certified facility to ensure high quality standards.

I. The boiler shall be designed for top rear water outlet and bottom rear water inlet; the water inlet [return] shall be equipped with internal baffling. Inlet connection size shall be _____3"_____ flanged. Outlet connection size shall be _____3"_____ flanged. The maximum pressure drop through the boiler shall not exceed 0.45 psi with a 20-degree differential and less than 0.05 psi with a 60-degree differential.

J. The boiler shall be equipped with a second water return connection that will permit low temperature returns to be utilized for condensing, regardless of the primary return temperature water above condensing conditions.

K. A threaded air vent connection shall be furnished at the top rear of the boiler for field piping to an expansion tank or for the addition of an auto-vent valve when a bladder type expansion tank is utilized.

L. To drain the boiler, a bottom-threaded connection shall be provided at the front of the boiler and field piped by the installing contractor with a manual full size shutoff valve to drain.

M. Boiler design shall permit operation with a water condition of 8.0 – 9.5 pH range.

BURNER DESIGN

A. General: Forced draft burner mounted in and integral with the boiler hinged top door so when the door is opened the burner head, furnace, tubesheet, and tubes are exposed. The burner door shall utilize easy removable threaded handles, and the burner shall swing upward on hydraulic piston arms, one on each side to provide open support of the burner assembly.

B. A drop down hinged service platform shall be furnished to provide service personnel an easy means of accessing the burner and controls for service and maintenance. When out of use, this platform shall fold up beneath the front service boiler panel.

C. The burner shall be of the Unitized Venturi, Gas Valve, Blower, and burner head design. This pre-mix design shall utilize a variable speed fan connected to a venturi to simultaneously modulate fuel and air for a minimum a 5:1 turndown ratio. The venturi design shall also act as a method for compensating for changes in barometric pressure, temperature and humidity so the excess air levels are not adversely affected by changes in atmospheric conditions. External linkages, damper motor drives and single speed fans shall not be acceptable.

D. Burner head shall be constructed of a Feoralloy-metal fiber for solid body radiation of the burner flame. Combustion shall take place on the surface of the burner mantle, which shall be constructed of a woven feoralloy material creating a 360 degree low temperature radiant flame.

E. Emissions: The equipment shall be guaranteed to limit NOx emissions to 20 PPM or less, as certified by an independent testing lab. NOx emission levels shall not be exceeded at full operating conditions and at designed turndown of the burner. Proof of such emissions certification shall be made available to the engineer and purchaser and demonstrated at the time of start-up. External flue gas recirculation shall not be accepted for emission control.

F. Gas Train – As a minimum, the gas train shall meet the requirements of CSA/UL and ASME CSD-1 and shall include:

1. Low Gas Pressure Interlock, manual reset.
2. High Gas Pressure Interlock, manual reset.
3. Upstream and downstream manual test cocks.
4. Ball Type manual shutoff valve upstream of the main gas valve.
5. Unibody double safety gas valve assembly.
6. Gas Pressure Regulator
7. Union connection to permit burner servicing.

G. Combustion Air Proving Switch shall be furnished to ensure sufficient combustion airflow is present for burner ignition firing.

H. To ensure that proper draft is not blocked in the stack, the burner shall include a High Air Pressure Switch sensing the outlet pressure connection relative to stack back draft.

BOILER TRIM

A. Safety valve(s) shall be ASME Section IV approved side outlet type mounted on the boiler air vent outlet. Size shall be in accordance with code requirements and set to open at 125 psig.

B. Temperature and pressure gauge shall be mounted on the water outlet.

C. Solid State Low water cut-off probe with manual reset and test switch.

D. Manual Reset High Limit Temperature sensor; range not to exceed 210 0 F and shall be an integral device of the Boiler Burner Control and UL recognized as a limit control.

E. Outlet water supply sensing probe for operating water limit setpoint.

F. Return water-sensing probe for operating water limit setpoint.

BOILER CONTROLS

A. The Boiler shall include a Falcon Computerized Boiler Burner control or equal which shall be an integrated, solid state digital micro-processing modulating device, complete with sequence indication, fault reset, mode selection, and parameter set-point. It shall be mounted at the front of the boiler panel for easy access and viewing. Refer to schedule for additional requirements .

B. Controller shall provide for both flame safeguard and boiler control through separate power supplied CPU's (to meet NFPA) and shall perform the following functions:

1. Burner sequencing with safe start check, pre-purge, Electronic direct spark ignition or pilot ignition to prove combustion.
2. Flame Supervision. The control shall provide pre-purge and post-purge and shall maintain a running history of operating hours, number of cycles, and the most recent six faults. The control shall be connected to a keyboard display module that will retrieve this information.
3. Safety Shutdown with display of error.
4. Modulating control of the variable speed fan for fuel/air input relative to load requirements.
5. Gas pressure supervision, high and low.
6. Combustion Air Proving Supervision.
7. High Air Pressure [back draft too high] Supervision.
8. The supply temperature and set-point temperature shall be displayed at all times on the touch screen display.
9. Controller shall be equipped with a touch screen display for set up, trouble shooting, and operational display, and shall include ModBus communication capability of this information.
10. Include the programming of system pumps and provide the programming of 2 heating loops.

C. All parameter input control set-points shall be factory downloaded with jobsite conditions programmed at the time of initial jobsite operation.

D. All controls to be panel mounted and so located on the boiler as to provide ease of servicing the boiler without disturbing the controls and also located to prevent possible damage by water according to CSA requirements.

E. Electrical power supply shall be 120 volts, 60 cycle single phase (CFC 500-2500) for the fan and 120 volts for control circuit requirements.

F. When multiple boilers are to be installed together, a system integration control shall be provided to stage up to 8 boilers. The control shall include automatic selection of needed boilers based on energy demand, an adjustable outdoor reset schedule, domestic hot water priority, and a system digital display. The control shall force each boiler to a lower fire, before allowing any boiler to operate at high fire. This allows for inverse efficiency (lower fire rate, higher efficiency). The control shall monitor supply water temperature, return water temperature and shall communicate between boilers via RS-485 wiring.

G. All controls shall be capable of interfacing with the Automated Logic Bac-net system.

BOILER FLUE VENTING

A. The Boiler shall be UL certified as an indirect or direct vent boiler. Venting shall be accomplished with a stainless steel, double-wall, vent piping installed in accordance with applicable national and local codes. Refer to vent manufacturer's specifications for applicability.

MANUFACTURER'S FIELD SERVICES

A. General: The boiler supplier's factory authorized service organization shall be responsible for performance of inspections, start up and testing of the package boiler, and accessory equipment and materials furnished under this Section. A detailed written record of the start up performance, including burner setting data over the entire load range shall be furnished to the engineer before final acceptance. All labor, equipment, and test apparatus shall be furnished by the authorized service organization. All equipment defects discovered by the tests shall be rectified either by the service organization or boiler manufacturer.

B. Equipment Inspection: Boiler representative to provide _4___ hours of jobsite assistance to inspect boilers and other equipment upon arrival, verifying completeness of equipment supplied and potential damages. All shipped loose components, such as casing, to be mounted on boiler by boiler provider after contractor has set boiler in building.

C. Pre start-up walk through: Boiler representative shall spend ___2_ hours at jobsite reviewing installation with mechanical contractor to be conducted approximately 1 week prior to startup.

D. Start-up shall be conducted by experienced and factory authorized technician in the regular employment of the authorized service organization, and shall include:

1. Demonstrate that boiler, burner, controls, and accessories comply with requirements of this Section as proposed by the boiler and accessories supplier. Pre-test all items prior to scheduling the final testing that will be witnessed by the test engineer.

2. Readings at different firing rates (20, 50, 75 and 100%) of load for the modulating burner shall be taken with a written report of the tests submitted to the engineer. The reports shall include readings for each firing rate tested and include stack temperatures, 02, CO, NOx, and overall boiler efficiency.

3. Auxiliary Equipment and Accessories: Observe and check all valves, draft fans, electric motors and other accessories and appurtenant equipment during the operational and capacity tests for leakage, malfunctioning, defects, and non compliance with referenced standards or overloading as applicable.

4. Commissioning Requirements:

a. Fireside inspection
b. Set up fuel train and combustion air system
c. Set up operating set points
d. Check all safeties, including Flame safeguard, LWCO, Airflow, Fuel pressures, High limits.
g. Set up and verify efficiencies at 20%, 50%, 75%, and 100%
h. Set up and verify burner turndown.

E. Training to include all safety procedures, maintenance procedures, control operations, and diagnostic procedures. Training to be provided in a single ___4___ hour continuous session to accommodate operator's availability on site.

OPERATING & MAINTENANCE MANUALS

A. Provide (3) three Operating and Maintenance manuals including cut-away views of boiler and burner, schematics including fuel trains, general instructions for maintenance and inspections, complete spare parts lists and trouble shooting procedures.

B. A wiring diagram corresponding to the boiler shall be affixed to the boiler near the electrical panel.

WARRANTY DATA

A. The pressure vessel shall be guaranteed against thermal shock for 20 years when utilized in a closed loop hydronic heating system with a temperature differential of 120 °F or less. The boiler pressure vessel shall be guaranteed accordingly without a minimum flow rate or return water temperature requirement. The boiler shall not require the use of flow switches or other devices to ensure minimum flow.

B. The pressure vessel, tubes and tube sheets (heat exchanger) shall be guaranteed against flue gas corrosion and materials/workmanship for a period of 10 years. The condensate collection box shall be guaranteed for 20 years. The burner cylinder shall be warranted for a period of 5 years.

C. All parts not covered by the above warranties shall carry a 2 year warranty from startup. This shall include all electrical components and burner components.

EXECUTION

GENERAL

Installation shall be provided by the contractor in accordance with the requirements of the codes specified hereinbefore. All of the contractor's work shall be performed by experienced personnel previously engaged in boiler plant construction and shall be under the supervision of a qualified installation supervisor.

INSTALLATION

A. Install equipment in strict compliance with manufacturer's installation instructions.
B. Install equipment in strict compliance with state and local codes and applicable NFPA standards.
C. Maintain manufacturer's recommended clearances around sides and over top of equipment.
D. Install components that were removed from equipment for shipping purposes.
E. Install components that were furnished loose with equipment for field installation.
F. Provide all interconnecting electrical control and power wiring.
G. Provide all fuel gas vent and service piping.
H. Provide all piping for boiler pipe connections.

FIELD TESTING

A. The manufacturer's representative shall test all boiler and burner interlocks, actuators, valves, controllers, gauges, thermometers, pilot lights, switches, etc. Any malfunctioning component shall be replaced at the time of initial start-up if found to be inoperative.

B. All adjustments to boiler, burner, and boiler control system shall be performed by the manufacturer's authorized service representative.

START UP, INSTRUCTION AND WARRANTY SERVICE

A. The manufacturer's representative shall provide start-up and instruction of each new boiler, including burner and boiler control system as specified herein. Start-up and instruction shall cover all components assembled and furnished by the manufacturer whether or not of his own manufacture.

B. Warranty service shall be in accordance with the manufacturer's warranty statement unless other provisions have been agreed to during project bidding.

ATP ENGINEERING SOUTH, LLC
8ARASOTA, FLORIDA
ENGR. BUSINESS #48008
941-751-6485

MAY – 6 2013

REV #	DESCRIPTION	DATE

MANATEE COUNTY COURT HOUSE BOILER ROOM
1051 MANATEE AVE W, BRADENTON, FL 34208
IFAS# WK300159 WA#11

DRAWING TITLE:
MECHANICAL SPECIFICATIONS

FILE:	MCHC BOILER
JOB NO.:	2013.37
DATE :	5/07/2013
PLOT SIZE:	1:1
DRAWN BY:	DC
CHECKED BY:	JDC

SHEET No.:
M4.1