

GENERAL NOTES

- GENERAL NOTES ON THIS DRAWING ARE APPLICABLE TO EACH MECHANICAL DRAWING OF THIS SET. NOTES SPECIFIC TO INDIVIDUAL MECHANICAL DRAWINGS WILL BE SHOWN ON THE RESPECTIVE MECHANICAL DRAWING.
- THE CONTRACTOR SHALL PROVIDE A COMPLETE HVAC SYSTEM TO INCLUDE ALL LABOR, MATERIALS, TOOLS, AND EQUIPMENT FOR A COMPLETE AND FUNCTIONAL SYSTEM INCLUDING ALL NECESSARY APPURTENANCES CUSTOMARILY INCLUDED IF NOT SPECIFICALLY CALLED OUT.
- ENTIRE INSTALLATION, INCLUDING MATERIALS, EQUIPMENT, AND WORKMANSHIP, SHALL CONFORM WITH ALL APPLICABLE LAWS, CODES, AND REGULATIONS OF MUNICIPAL, STATE AND FEDERAL AUTHORITIES.
- THIS PROJECT SHALL CONFORM TO APPLICABLE ASHRAE, NFPA, AND SMACNA STANDARDS AND OTHER REGULATORY BODIES HAVING JURISDICTION OVER THE CLASS OF WORK.
- MATERIALS AND EQUIPMENT SHALL HAVE STAMPS OR SEALS OF ARI, ASME, UL, AND ASTM.
- THE CONTRACTOR SHALL MAKE TESTS FOR ACCEPTANCE AND APPROVAL AS REQUIRED BY CODE AND THE REQUIREMENTS OF APPLICABLE REGULATORY AGENCIES. REQUIRED TESTS SHALL BE PERFORMED IN THE PRESENCE OF THE GOVERNMENT UNLESS OTHERWISE WAIVED IN WRITING.
- THE CONTRACTOR SHALL OBTAIN AND PAY FOR ALL PERMITS, LICENSES, DOCUMENTS, AND SERVICES RELATED TO INSTALLATION OF THE WORK.
- THE CONTRACTOR SHALL COORDINATE HIS WORK WITH THE OTHER TRADES IN ORDER TO RESOLVE ANY CONFLICT THAT MIGHT ARISE DUE TO THE LOCATION OF EQUIPMENT OR THE USE OF SPACE.
- EQUIPMENT OF HIGHER ELECTRICAL CHARACTERISTICS MAY BE FURNISHED PROVIDED SUCH PROPOSED EQUIPMENT IS APPROVED IN WRITING AND CONNECTING ELECTRICAL SERVICE, CIRCUIT BREAKERS AND CONDUIT SIZES ARE APPROPRIATELY MODIFIED AT NO COST TO THE OWNER.
- RUN ALL HORIZONTAL PIPING AND DUCTWORK ABOVE CEILING UNLESS OTHERWISE NOTED.
- CUT OPENINGS, AS REQUIRED, IN THE EXISTING CONSTRUCTION FOR THE INSTALLATION OF PIPING, DUCTWORK, AND EQUIPMENT. PATCH AND REPAIR TO MATCH THE EXISTING ADJACENT CONSTRUCTION.
- MAKE DUCT PENETRATIONS OF ALL WALLS WITH SHEET METAL DUCTS. FLEXIBLE DUCT PENETRATIONS OF WALLS ARE NOT ACCEPTABLE.
- REFER TO ARCHITECTURAL REFLECTED CEILING PLANS FOR EXACT LOCATION OF DIFFUSERS, REGISTERS, AND GRILLES. FINISH AND COLOR TO BE SELECTED BY GOVERNMENT FROM MANUFACTURER'S STANDARD PALETTE.
- DUCTWORK SIZES ARE INSIDE CLEAR DIMENSIONS.
- ALL ELBOWS IN DUCTWORK SHALL BE RADIUS ELBOWS UNLESS OTHERWISE NOTED. WHERE SQUARE ELBOWS ARE SHOWN, INSTALL TURNING VANES.
- PROVIDE DYNAMIC FIRE DAMPERS IN ACCORDANCE WITH THEIR U.L. LISTING AND THE REQUIREMENTS OF NFPA-90A.
- DO NOT INSTALL EQUIPMENT, PIPING OR DUCTWORK OVER ANY ELECTRICAL EQUIPMENT OR ELECTRICAL SERVICE SPACE.
- LAYOUT OF PIPING AND DUCTWORK IS DIAGRAMMATIC. RUN ALL EXPOSED PIPING AND DUCTWORK AS HIGH AS POSSIBLE UNLESS OTHERWISE NOTED. ALLOW FOR RISES, DROPS AND OFFSETS AS REQUIRED.
- EXTEND DRAIN LINES TO NEAREST DRAIN OR AS INDICATED. ALL CONDENSATE DRAIN PIPING SHALL BE TRAPPED AND PITCHED DOWN IN DIRECTION OF FLOW A MINIMUM OF 1/8" PER FOOT.
- INSTALL MECHANICAL EQUIPMENT TO FACILITATE SERVICING, MAINTENANCE, AND REPAIR OR REPLACEMENT OF EQUIPMENT COMPONENTS. AS MUCH AS PRACTICAL, CONNECT EQUIPMENT FOR EASE OF DISCONNECTING, WITH A MINIMUM OF INTERFERENCE WITH OTHER INSTALLATIONS. PIPING SHALL NOT INTERFERE WITH FILTER PULL.
- MECHANICAL CONTRACTOR SHALL PROVIDE AUTOMATIC CONTROL DEVICES, SUCH AS TEMPERATURE SENSORS, RELAYS, PRESSURE SWITCHES WHICH ARE ASSOCIATED WITH MECHANICAL EQUIPMENT AND ASSOCIATED CONTROL WIRING FROM STARTER TO THE CONTROL DEVICE. ELECTRICAL CONTRACTOR SHALL PROVIDE CONDUIT AND WIRING FROM POWER SOURCE TO DISCONNECT SWITCH, FROM DISCONNECT SWITCH TO STARTER, AND FROM STARTER TO THE EQUIPMENT.
- ALIGN THERMOSTATS WITH LIGHT SWITCHES.
- PROVIDE AUXILIARY DRAIN PANS UNDER EQUIPMENT LOCATED ABOVE CEILINGS.
- ALL VALVES ARE FULL LINE SIZE EXCEPT CONTROL AND BALANCING VALVES.
- PROVIDE PRESSURE/TEMPERATURE (P/T) PLUGS, WITH CAPS UP AND DOWNSTREAM OF ALL EQUIPMENT, AT THE SUPPLY AND RETURN TAPS OF ALL PIPING BRANCHES AND/OR WHERE INDICATED. PROVIDE EXTENDED PLUGS AND LABELS WHERE PIPING IS INSULATED. PROVIDE REMOVABLE INSULATION PLUG.
- PROVIDE MANUAL AIR VENTS AT ALL HIGH SPOTS AND THE ENDS OF ALL PIPING LOOPS. PROVIDE 1/2" DRAIN VALVES AT LOW POINTS IN PIPING. PROVIDE MINIMUM PITCH SUFFICIENT TO INSURE ADEQUATE VENTING AND DRAINING.
- PROVIDE FLUSHING VALVES AND TEES AT BOTH SIDES OF ALL EQUIPMENT. TAPS SHALL MATCH EQUIPMENT PIPING UP TO 1". FOR LARGER EQUIPMENT AND PIPE LOOPS PROVIDE 1 1/2" TAPS AND VALVES.
- LOCATE AND SIZE 5 1/2" THICK CONCRETE HOUSEKEEPING PADS AND CURBS IN ACCORDANCE WITH ACTUAL EQUIPMENT PURCHASED. EXTEND PAD BEYOND EQUIPMENT FOR 6" IN ALL DIRECTIONS.
- ALL EQUIPMENT REMOVED FROM THE BUILDING, DURING DEMOLITION, SHALL BECOME THE PROPERTY OF THE CONTRACTOR AND SHALL BE REMOVED FROM THE SITE UNLESS OTHERWISE NOTED.
- EXISTING DUCT, PIPE AND EQUIPMENT SIZES NOTED ARE FOR THE CONVENIENCE OF THE CONTRACTOR ONLY AND ARE NOT WARRANTED TO BE CORRECT. THE CONTRACTOR SHALL FIELD VERIFY ALL EXISTING DUCT, PIPE AND EQUIPMENT SIZES AND THEIR RESPECTIVE LOCATIONS BEFORE PROCEEDING WITH ANY ASSOCIATED WORK.
- PRIOR TO SUBMITTING A PROPOSAL THE CONTRACTOR IS STRONGLY ENCOURAGED TO VISIT THE SITE AND THOROUGHLY INSPECT ALL EXISTING CONDITIONS TO INSURE THAT THE WORK REPRESENTED ON THE DRAWINGS CAN BE INSTALLED AS INDICATED.
- REFER TO ELECTRICAL DRAWINGS FOR VOLTAGE AND PHASE REQUIREMENTS FOR ALL EQUIPMENT REQUIRING AN ELECTRICAL CONNECTION.

LEGEND

GENERAL

- DEMOLITION NOTE IDENTIFICATION
- CONSTRUCTION NOTE IDENTIFICATION
- INDICATES EXISTING ITEM
- INDICATES NEW ITEM
- INDICATES ITEM TO BE REMOVED
- REMOVE TO THIS POINT
- CONNECT NEW TO EXISTING
- ROOM NUMBER IDENTIFICATION
- AD ACCESS DOOR
- AFG ABOVE FINISHED FLOOR
- AFG ABOVE FINISHED GRADE
- ALUM ALUMINUM
- ARCH ARCHITECTURAL
- DIA DIAMETER
- DWG DRAWING
- EX EXISTING
- EXR EXISTING TO REMAIN
- GA GAUGE
- GALV GALVANIZED
- GFCI GOVERNMENT FURNISHED CONTRACTOR INSTALLED
- MISC MISCELLANEOUS
- NIC NOT IN CONTRACT
- RBJ RUN THRU JOISTS
- REX REMOVE EXISTING
- TYP TYPICAL
- UNON UNLESS OTHERWISE NOTED
- EXHAUST GRILLE DESIGNATION WITH CFM INDICATED
- CEILING DIFFUSER DESIGNATION WITH CFM INDICATED
- RETURN GRILLE DESIGNATION

DUCTWORK

- SUPPLY DUCT TURNING UP (ROUND OR RECTANGULAR)
- SUPPLY DUCT TURNING DOWN (ROUND OR RECTANGULAR)
- SUPPLY DUCT TURNING UP (OVAL)
- SUPPLY DUCT TURNING DOWN (OVAL)
- RETURN DUCT TURNING UP
- RETURN DUCT TURNING DOWN
- EXHAUST DUCT TURNING UP
- EXHAUST DUCT TURNING DOWN
- CEILING RETURN, EXHAUST OR TRANSFER REGISTER
- CEILING SUPPLY DIFFUSER
- MITERED ELBOW WITH TURNING VANES
- SQUARE OR RECTANGULAR DUCTWORK
- OVAL DUCTWORK
- FLEXIBLE DUCT CONNECTION
- FLEXIBLE DUCT CONNECTION
- VERTICAL FIRE DAMPER
- VOLUME DAMPER
- MOTORIZED CONTROL DAMPER
- INDICATES ROUND DUCTWORK
- FLEXIBLE CONNECTION
- RETURN, EXHAUST OR TRANSFER AIR FLOW
- SUPPLY AIR FLOW
- DUCT SMOKE DETECTOR

VALVES AND ACCESSORIES

- AUTOMATIC AIR VENT
- AUTOMATIC FLOW CONTROL VALVE
- BACKFLOW PREVENTER
- BALL VALVE
- BOTTOM CONNECTION
- BUTTERFLY VALVE
- CAPPED PIPE
- CHECK VALVE
- CLEAN OUT
- CONCENTRIC REDUCER
- ACCESS DOOR
- ECCENTRIC REDUCER
- FLANGED CONNECTION
- FLEXIBLE CONNECTION
- FLOW METER
- BALL VALVE FOR 2" & UNDER
- BUTTERFLY FOR 2.5" AND LARGER
- GLOBE VALVE
- MANUAL AIR VENT
- METERED BALANCING VALVE
- W/PRESSURE TAPS
- NEEDLE VALVE
- PLUG VALVE
- PRESSURE/TEMPERATURE TEST PLUG
- PIPE ANCHOR (W=WALL, C=CEILING, F=FLOOR)
- PIPE GUIDE
- PIPE SLEEVE
- PIPE TURNING UP
- PIPE TURNING DOWN
- PITCH
- PRESSURE REDUCING VALVE
- PRESSURE RELIEF VALVE
- PRESSURE GAUGE WITH GAUGE COCK
- SQUARE HEAD COCK
- STEAM TRAP
- STRAINER
- STRAINER W/BLOW DOWN VALVE
- TWO WAY CONTROL VALVE
- THREE WAY CONTROL VALVE
- THERMOMETER
- THERMOSTATIC RADIATOR VALVE
- TOP CONNECTION
- UNION
- VACUUM BREAKER
- VALVE IDENTIFICATION

CONTROLS

- ANALOG INPUT (TO PANEL)
- ANALOG OUTPUT (OUT OF PANEL)
- DIGITAL INPUT (TO PANEL)
- DIGITAL OUTPUT (OUT OF PANEL)
- TWO WAY CONTROL VALVE
- THREE WAY CONTROL VALVE
- BYPASS TIMER SWITCH
- COMMON
- CONTROL WIRING (SIGNAL PATH)
- DATA TERMINAL CABINET
- DIFFERENTIAL PRESSURE SWITCH
- DIFFERENTIAL PRESSURE SENSOR
- DUCT SMOKE DETECTOR
- FAN ON-OFF SWITCH
- FAN VARIABLE SPEED SWITCH
- FLOW MEASURING SYSTEM
- FIRESTAT
- FREEZESTAT
- HIGH LIMIT TEMPERATURE SENSOR
- HUMIDISTAT
- LOCAL TEMPERATURE CONTROL PANEL
- LOW LIMIT TEMPERATURE SENSOR
- MOTOR
- MOTORIZED CONTROL DAMPER
- MOTOR STARTER
- PIPE TURNING UP
- NORMALLY CLOSED
- NORMALLY OPENED
- POWER WIRING
- SENSOR
- STATIC PRESSURE SENSOR
- STATIC TOTALIZER STATION
- SWITCH
- ZONE TEMPERATURE SENSOR WITH ASSOCIATED EQUIPMENT ID
- TEMPERATURE TRANSMITTER
- THERMOSTAT (C=COOLING, H=HEATING, H,C=HEATING AND COOLING)
- TIME CLOCK
- VALVE IDENTIFICATION
- CURRENT SENSING RELAY
- NORMALLY OPEN CONTROLS
- NORMALLY CLOSED CONTROLS

PIPING

- CHILLED WATER SUPPLY
- CHILLED WATER RETURN
- CHILLED/HOT WATER SUPPLY
- CHILLED/HOT WATER RETURN
- CONDENSER WATER SUPPLY
- CONDENSER WATER RETURN
- DIESEL FUEL SUPPLY
- DIESEL FUEL RETURN
- DIRECTION OF FLOW
- DOMESTIC COLD WATER
- DOMESTIC HOT WATER
- DOMESTIC HOT WATER RECIRCULATING
- CONDENSATE DRAIN LINE
- FUEL OIL SUPPLY
- FUEL OIL RETURN
- FUEL OIL VENT
- NATURAL GAS PIPING
- HUMIDISTAT
- HEAT RECOVERY SUPPLY
- HEAT RECOVERY RETURN
- HIGH PRESSURE STEAM
- HIGH PRESSURE CONDENSATE
- HOT WATER SUPPLY
- HOT WATER RETURN
- LOW PRESSURE CONDENSATE
- LOW PRESSURE STEAM
- MEDIUM PRESSURE CONDENSATE
- MEDIUM PRESSURE STEAM
- PUMPED CONDENSATE
- REFRIGERANT HOT GAS
- REFRIGERANT LIQUID
- REFRIGERANT SUCTION
- STEAM VENT LINE

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 one eighth inch = one foot

Revisions:	Date:

CONSULTANTS:

INNOVATIVE ENGINEERING INCORPORATED

TRIAD ENGINEERING, INC.

CLARK NEXSEN



ARCHITECT/ENGINEERS:

TOLAND MIZELL MOLNAR

590 MEANS ST NW ATLANTA, GA 30318

Drawing Title:
MECHANICAL LEGEND AND GENERAL NOTES

Approved Project Director:

Project Title:
CONSTRUCT DOM CLINIC AND CLC ADMINISTRATION ADDITION

Location:
MARTINSBURG, WV

Date: JUNE 27, 2018
 Checked: WAW
 Drawn: WNW

Project Number:
613-121

Building Number:
501D & 502F

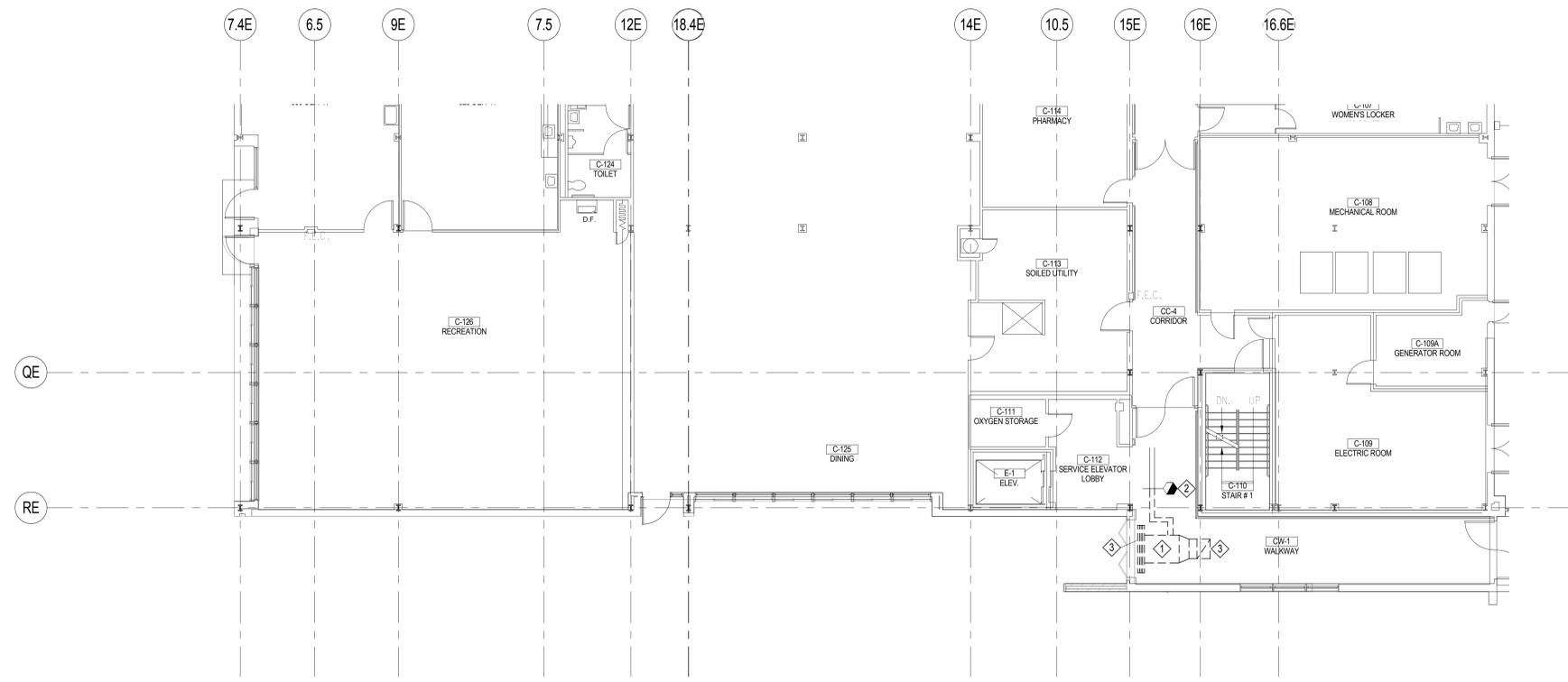
Drawing Number:
M001

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BID DOCUMENTS

OFFICE OF CONSTRUCTION AND FACILITIES MANAGEMENT

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FIRST FLOOR DEMO PLAN - CLC ADMIN
 1/8" = 1'-0"

GENERAL NOTES

KEY NOTES

1. REMOVE EXISTING HEATING UNIT AND ALL ASSOCIATED CONTROLS, DUCTWORK, ETC RENDERED USELESS BY THE REMOVAL OF THE UNIT.
2. CAP HOT WATER PIPING, REPAIR INSULATION.
3. REMOVE SUPPLY AND RETURN GRILLES.

GRAPHIC SCALE(S)

1/8" = 1'-0"

Revisions:	Date:

CONSULTANTS:

INNOVATIVE ENGINEERING INCORPORATED

TRIAD TRIAD ENGINEERING, INC.

CLARK NEXSEN



ARCHITECT/ENGINEERS:

TOLAND MIZELL MOLNAR

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Drawing Title:
FIRST FLOOR DEMO PLAN - CLC ADMIN

Approved Project Director:

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CONSTRUCT DOM CLINIC AND CLC ADMINISTRATION ADDITION

Location:
MARTINSBURG, WV

Date:
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Checked:
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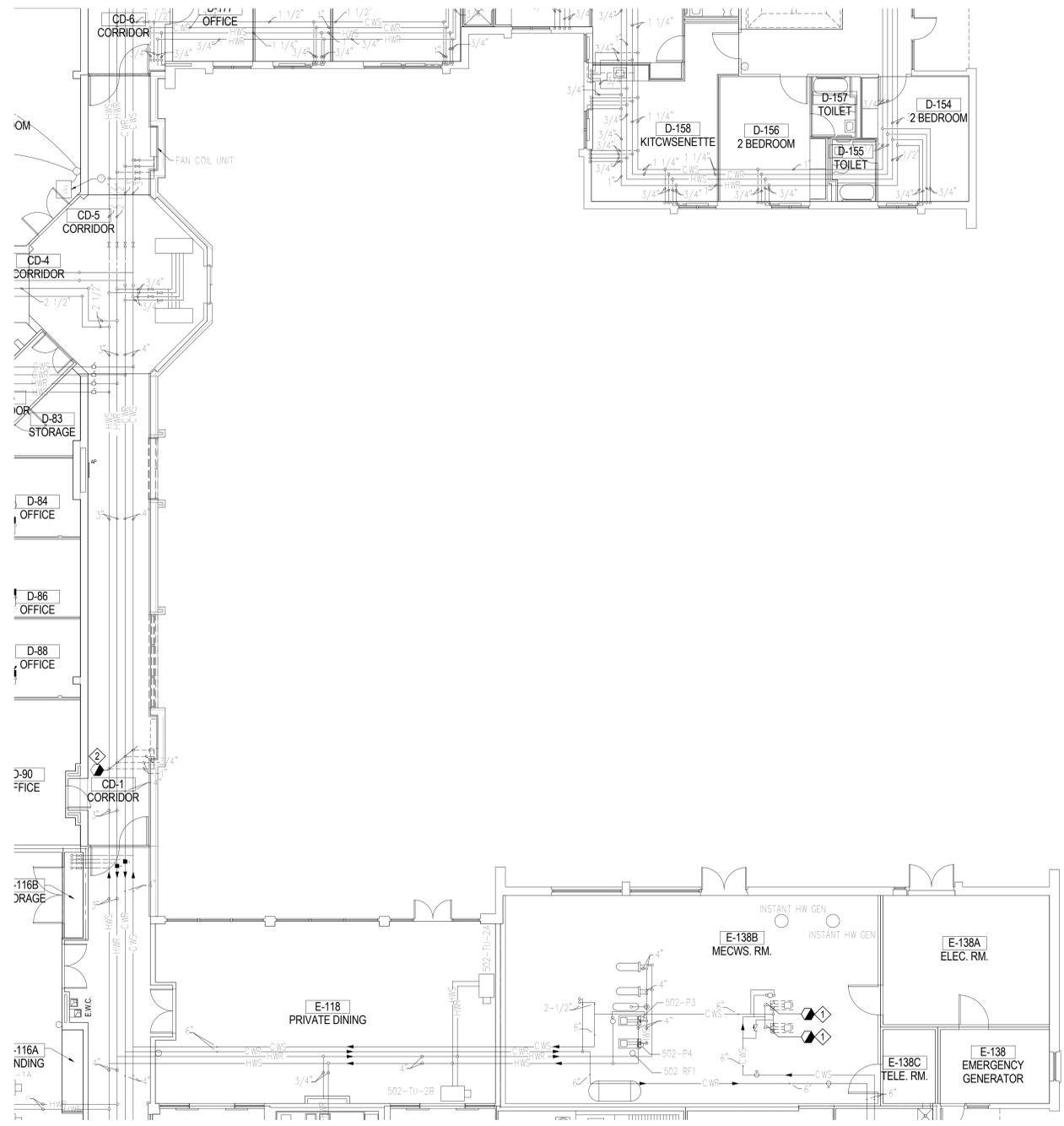
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OFFICE OF CONSTRUCTION AND FACILITIES MANAGEMENT

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FIRST FLOOR DEMO PLAN - DOM CLINIC
 1/8" = 1'-0"



GENERAL NOTES

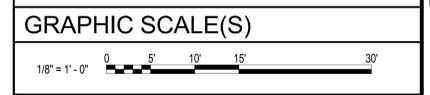
A. ALL UTILITY OUTAGES SHALL BE COORDINATED WITH THE COR. REFER TO SPECIFICATION SECTION 01 00 00 FOR ADDITIONAL INFORMATION.

B. CHILLED WATER SUPPLY SHALL BE MAINTAINED TO THE EXISTING SYSTEM. REMOVE AND REPLACE PUMPS ONE AT A TIME.

KEY NOTES

1. REMOVE EXISTING CHILLED WATER PUMP. LEAVE PIPING READY FOR RECONNECTION.

2. REMOVE PIPING TO SCOPE OF WORK MARK. CAP PIPE AND REPAIR INSULATION.



Revisions:	Date:

CONSULTANTS:

INNOVATIVE ENGINEERING INCORPORATED

TRIAD ENGINEERING, INC.

CLARK NEXSEN



ARCHITECT/ENGINEERS:

TOLAND MIZELL MOLNAR

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Drawing Title:
FIRST FLOOR DEMO PLAN - DOM CLINIC

Approved Project Director:

Project Title:
CONSTRUCT DOM CLINIC AND CLC ADMINISTRATION ADDITION

Location:
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Project Number:
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Drawing Number:
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OFFICE OF CONSTRUCTION AND FACILITIES MANAGEMENT

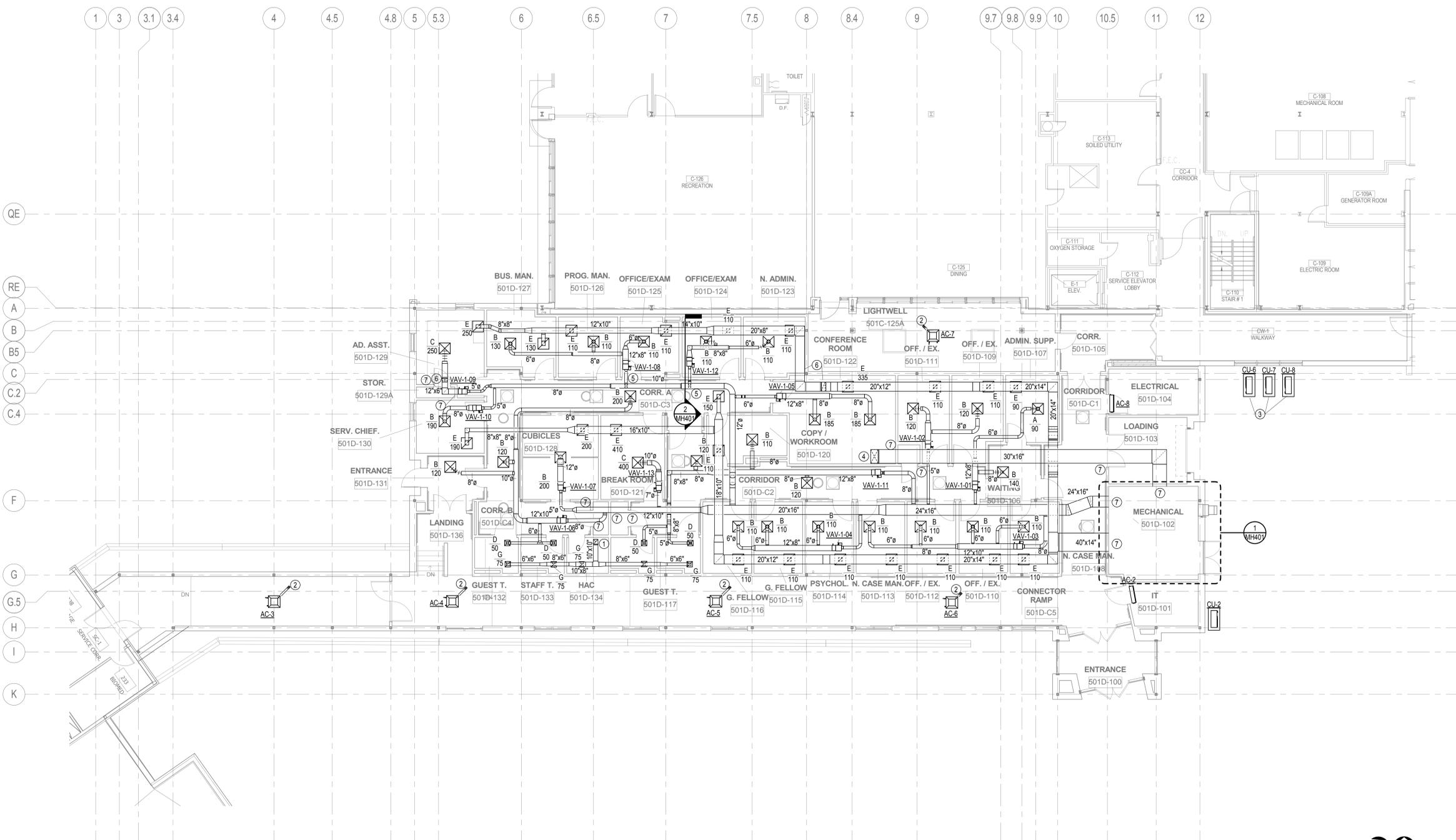
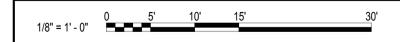
GENERAL NOTES

- A. THERE IS LIMITED CEILING SPACE. COORDINATE WITH ALL DISCIPLINES TO PREVENT CONFLICTS.
- B. PROVIDE A MANUAL VOLUME DAMPER ON ALL LOW PRESSURE TAKEOFFS ON SUPPLY, RETURN, AND EXHAUST.
- C. SEE SHEET MH105 FOR MECHANICAL WORK REQUIRED IF ALTERNATE NO.5 - (BID ITEM NO. 6) IS ACCEPTED.

KEY NOTES

- 1. 10X10 EXHAUST DUCT UP TO EF-1 ON ROOF.
- 2. 4" OUTSIDE AIR DUCT UP TO ROOF.
- 3. COORDINATE CONDENSING UNIT LOCATION AS TO NOT BLOCK FIRE DEPARTMENT CONNECTION ON EXTERIOR OF BUILDING. PROVIDE CONCRETE PAD UNDER CONDENSING UNIT.
- 4. O.A. INTAKE UP TO ROOF INTAKE HOOD.
- 5. TAP OUT OF BOTTOM OF DUCT. ROUTE DUCT UNDER BEAM.
- 6. DUCT TURN DOWN. ROUTE DUCT UNDER BEAM.
- 7. DUCT THROUGH A SMOKE PARTITION. SEE DETAIL ON SHEET M502.

GRAPHIC SCALE(S)



FIRST FLOOR DUCTWORK PLAN - CLC ADMIN
1/8" = 1'-0"



three inches = one foot
 one and one half inches = one foot
 one inch = one foot
 three quarters inch = one foot
 one half inch = one foot
 one quarter inch = one foot
 three eighths inch = one foot
 one eighth inch = one foot
 one sixteenth inch = one foot

Revisions:	Date:

CONSULTANTS:



ARCHITECT/ENGINEERS:

Drawing Title:
FIRST FLOOR DUCTWORK PLAN - CLC ADMIN

Approved Project Director:

Project Title:
CONSTRUCT DOM CLINIC AND CLC ADMINISTRATION ADDITION

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WNV

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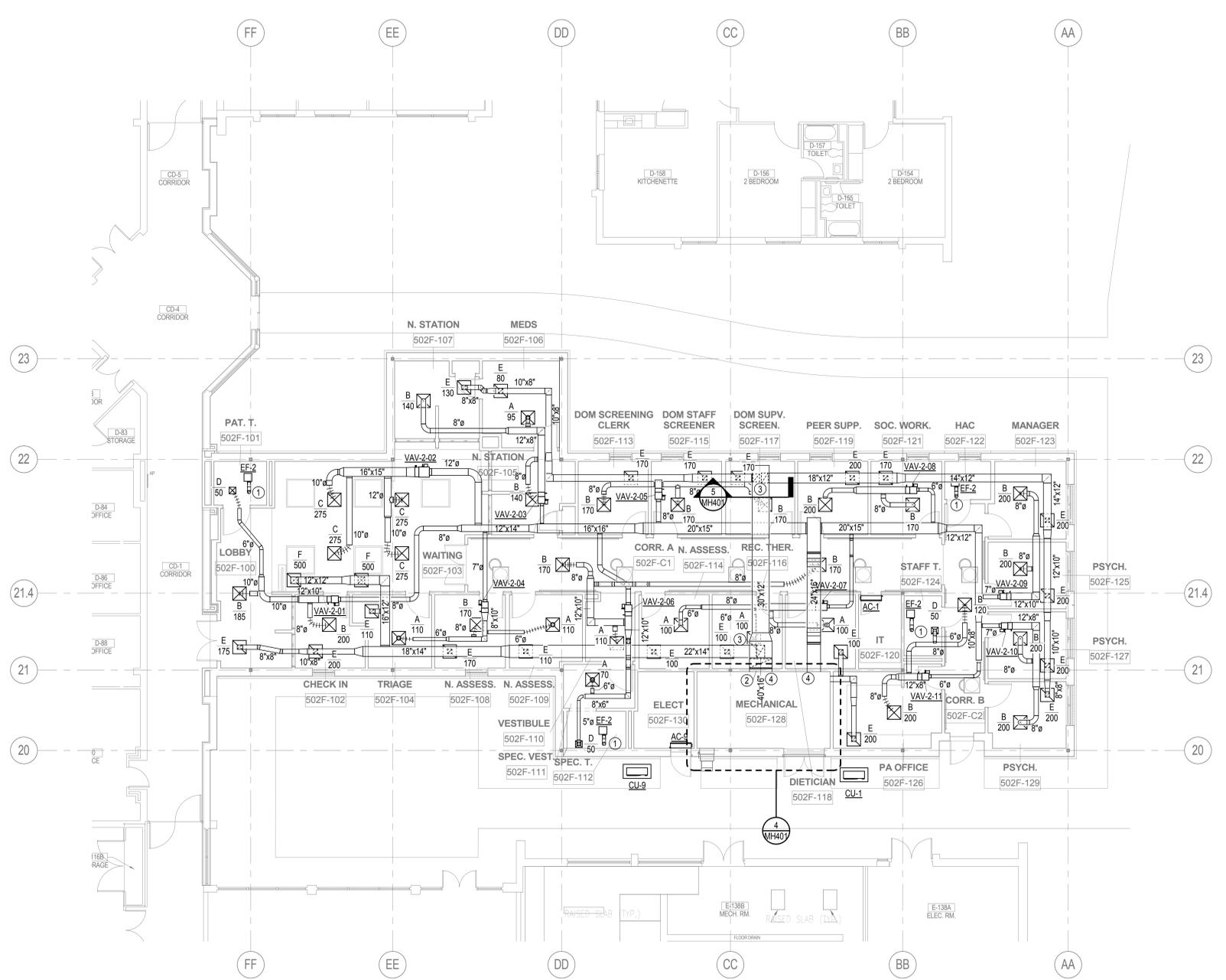
Drawing Number:
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DOMICILARY DUCTWORK PLAN
 1/8" = 1'-0"



GENERAL NOTES

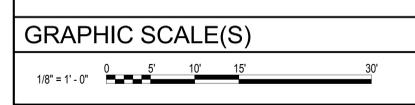
A. THERE IS LIMITED CEILING SPACE. COORDINATE WITH ALL DISCIPLINES TO PREVENT CONFLICTS.

B. CHILLED WATER SUPPLY SHALL BE MAINTAINED TO THE EXISTING SYSTEM. REMOVE AND REPLACE PUMPS ONE AT A TIME.

C. PROVIDE A MANUAL VOLUME DAMPER ON ALL LOW PRESSURE TAKEOFFS ON SUPPLY, RETURN, AND EXHAUST.

KEY NOTES

- EXHAUST DUCT UP THROUGH ROOF.
- ROUTE DUCT UNDER STEEL BEAM AND THEN UP IN BETWEEN BAR JOIST.
- TAP OUT OF BOTTOM OF RETURN DUCT.
- DUCT THROUGH A SMOKE PARTITION. SEE DETAIL ON SHEET M502.



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CONSULTANTS:

INNOVATIVE ENGINEERING INCORPORATED

TRIAD ENGINEERING, INC.

CLARK NEXSEN



ARCHITECT/ENGINEERS:

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590 MEANS ST NW ATLANTA, GA 30318

Drawing Title:
FIRST FLOOR DUCTWORK PLAN - DOM CLINIC

Approved Project Director:

Project Title:
CONSTRUCT DOM CLINIC AND CLC ADMINISTRATION ADDITION

Project Number:
613-121

Building Number:
502F

Location:
MARTINSBURG, WV

Date:
 JUNE 27, 2018

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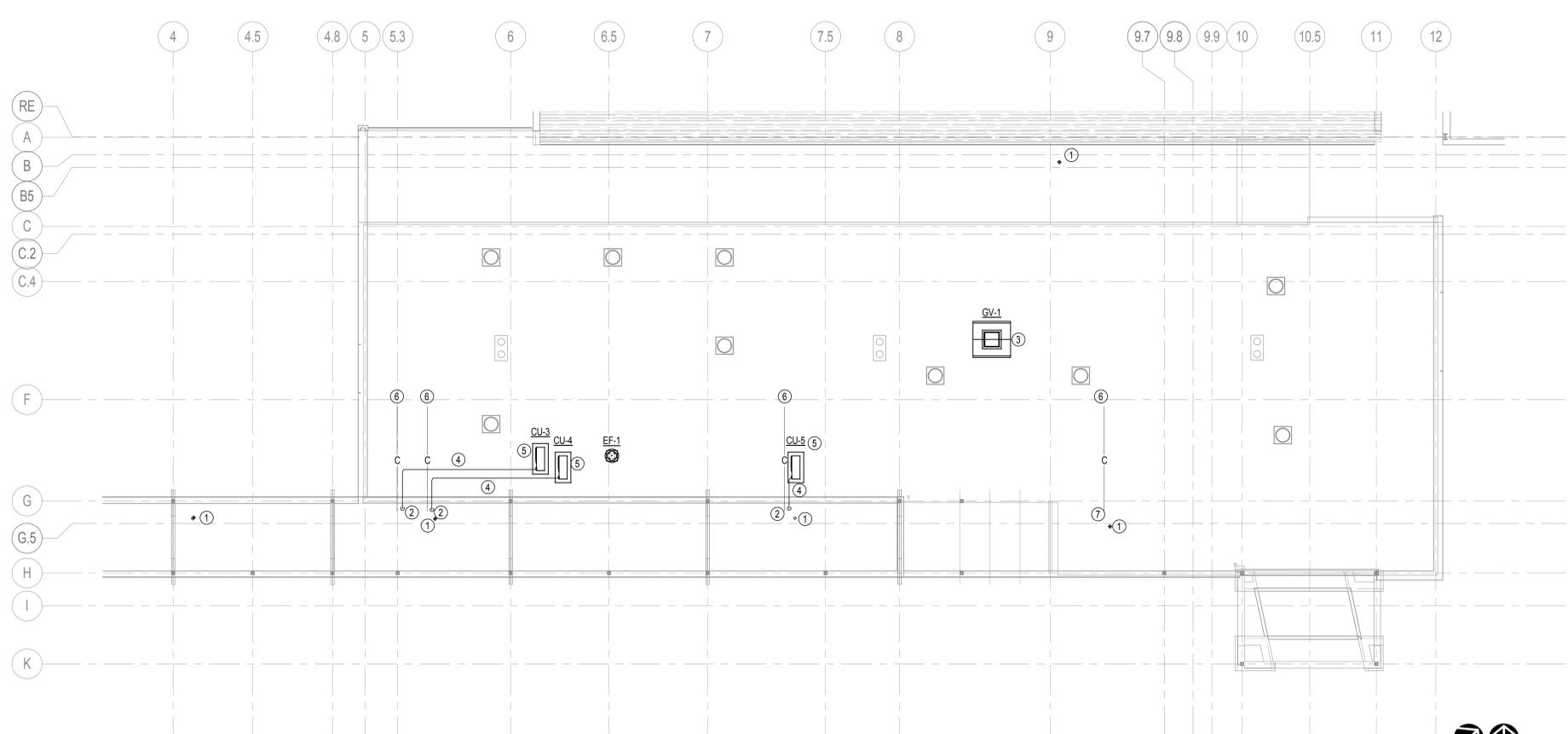
Dwg. Number:
MH102

Dwg. of

BID DOCUMENTS

OFFICE OF CONSTRUCTION AND FACILITIES MANAGEMENT

three inches = one foot
 one and one half inches = one foot
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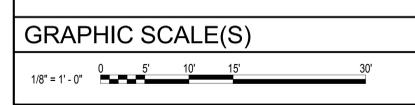


ROOF PLAN - CLC ADMIN
 1/8" = 1'-0"



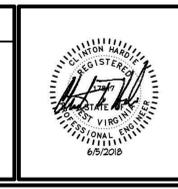
GENERAL NOTES

- KEY NOTES**
1. 4" OUTSIDE AIR DUCT DOWN TO CEILING CASSETTE.
 2. REFRIGERANT AND CONDENSATE PIPING DOWN TO CEILING CASSETTE. SEE SHEET MP101 FOR CONTINUATION.
 3. OUTSIDE AIR INTAKE HOOD FOR AHU-1. SEE SHEET MH101 FOR CONTINUATION.
 4. PROVIDE ROOF PIPING SUPPORT. MAXIMUM SPACING SHALL BE AS DEFINED IN SPECIFICATION SECTIONS 23 21 13 AND 23 23 00.
 5. SEE DETAIL ON M502 FOR UNIT SUPPORT.
 6. ROUTE CONDENSATE PIPING TO NEAREST ROOF DRAIN.
 7. CONDENSATE PIPING UP FROM AC-6.



Revisions:	Date:

CONSULTANTS:



ARCHITECT/ENGINEERS:

Drawing Title:
ROOF PLAN - CLC ADMIN

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CONSTRUCT DOM CLINIC AND CLC ADMINISTRATION ADDITION

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 JUNE 27, 2018

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 WNW

Project Number:
613-121

Building Number:
501D

Drawing Number:
MH103

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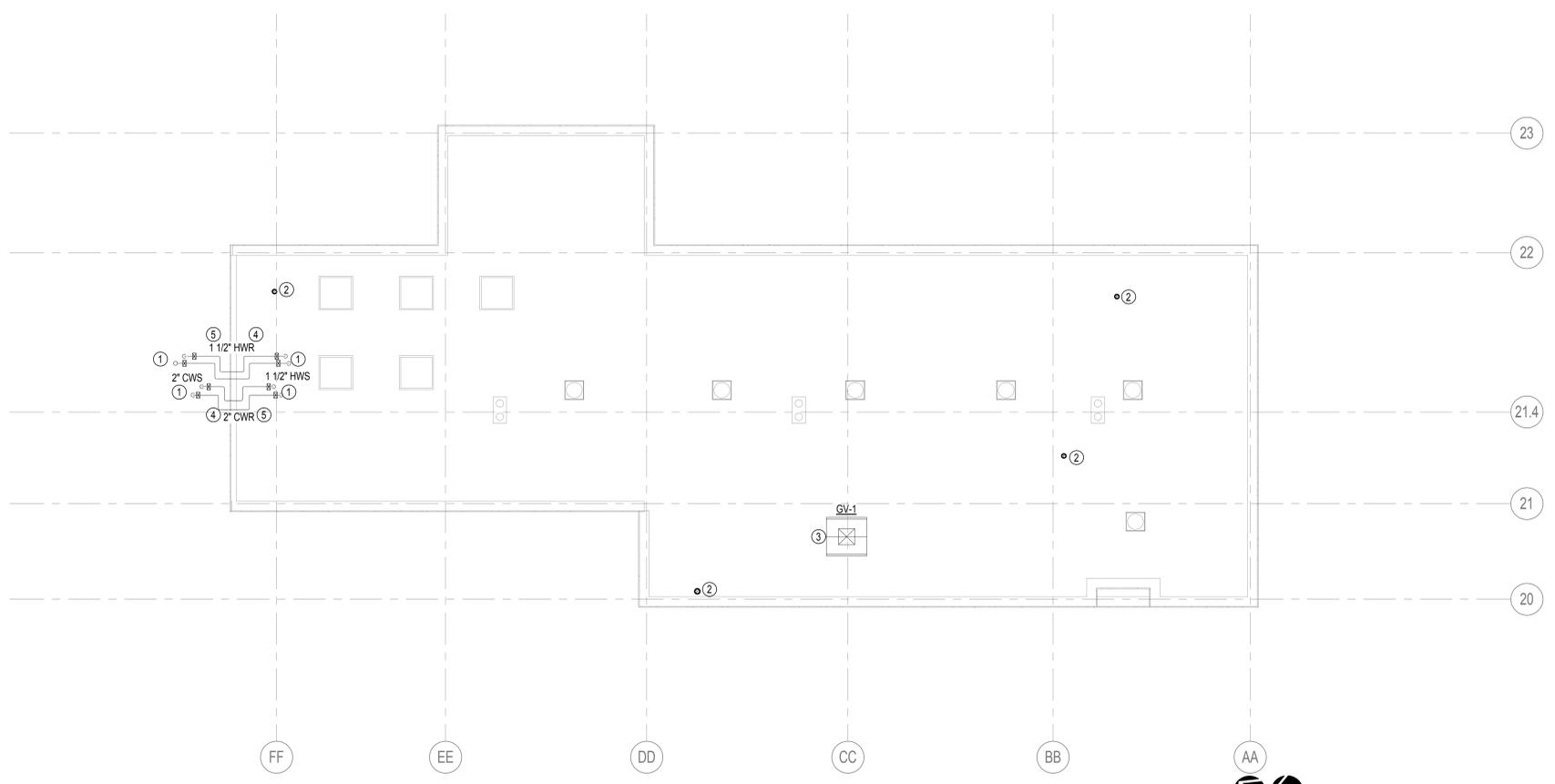
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OFFICE OF CONSTRUCTION AND FACILITIES MANAGEMENT

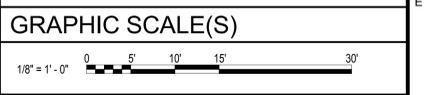
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GENERAL NOTES

- KEY NOTES**
1. PIPING DOWN THROUGH ROOF. SEE CONTINUATION ON SHEET MP102.
 2. 6" EXHAUST DUCT TO CEILING MOUNTED EXHAUST FAN. SEE SHEET MH102 FOR CONTINUATION.
 3. OUTDOOR AIR INTAKE HOOD FOR AHU-2. SEE SHEET MH102 FOR CONTINUATION.
 4. PROVIDE ROOF PIPING SUPPORT. MAXIMUM SPACING SHALL BE AS DEFINED IN SPECIFICATION SECTIONS 23 21 13 AND 23 23 00.
 5. PROVIDE FLEXIBLE EXPANSION JOINT TO ALLOW FOR A 1" DEFLECTION BETWEEN BUILDINGS. SEE DETAIL C ON SHEET M501.



ROOF PLAN - DOM CLINIC
 1/8" = 1'-0"



Revisions:	Date:

CONSULTANTS:

INNOVATIVE ENGINEERING INCORPORATED
CLARK NEXSEN



ARCHITECT/ENGINEERS:

TOLAND MIZELL MOLNAR
 590 MEANS ST NW ATLANTA, GA 30318

Drawing Title:
ROOF PLAN - DOM CLINIC

Approved Project Director:

Project Title:
CONSTRUCT DOM CLINIC AND CLC ADMINISTRATION ADDITION

Project Number:
613-121

Building Number:
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Location:
MARTINSBURG, WV

Date:
 JUNE 27, 2018

Checked:
 WAW

Drawn:
 WNW

Drawing Number:
MH104

Dwg. of

BID DOCUMENTS

OFFICE OF CONSTRUCTION AND FACILITIES MANAGEMENT

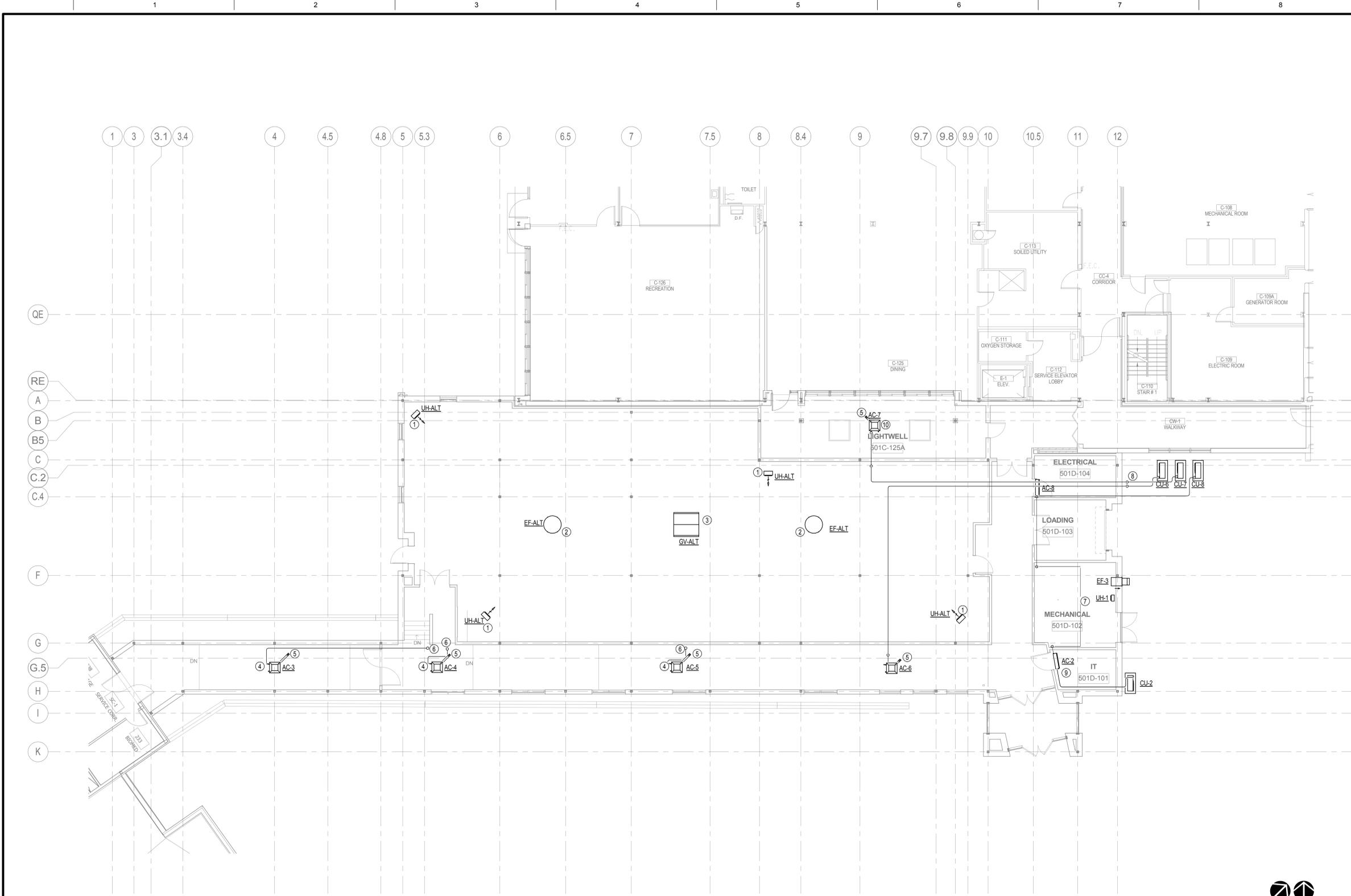
GENERAL NOTES

A. THIS PLAN SHOWS WORK REQUIRED IF BID ITEM NO. 6 IS TAKEN. CLC ADMIN SPACE SHALL BE HEATED AND VENTILATED ONLY.

KEY NOTES

1. ELECTRIC UNIT HEATER. MOUNT 10' AFF.
2. EXHAUST FAN ON ROOF. OPEN TO SPACE BELOW. PROVIDE WITH ROOF CURB AND BACKDRAFT DAMPER.
3. GRAVITY VENTILATOR ON ROOF. OPEN TO SPACE BELOW. PROVIDE WITH ROOF CURB AND GRAVITY DAMPER.
4. SEE SHEET MH103 FOR CONDENSING UNIT LOCATION ON ROOF.
5. 4" OUTSIDE AIR DUCT UP TO ROOF.
6. REFRIGERANT AND CONDENSATE PIPING TO ROOF. SEE SHEET MH103 FOR CONTINUATION.
7. ROUTE CONDENSATE PIPING TO FLOOR DRAIN IN MECHANICAL ROOM. FOLLOW AHU HOUSE KEEPING PAD OVER TO FLOOR DRAIN. SEE PLUMBING DRAWINGS FOR DRAIN LOCATION.
8. ROUTE REFRIGERANT PIPING UP WALL AND INTO BUILDING ABOVE CEILING. ROUTE PIPING IN ELECTRICAL ROOM TO AVOID RUNNING ABOVE A ELECTRICAL PANEL.
9. MOUNT AC-2 DIRECTLY ABOVE THE DOOR. ROUTE CONDENSATE PIPING THROUGH WALL TO MECHANICAL ROOM.
10. ROUTE CONDENSATE PIPING TO ROOF DRAIN.

GRAPHIC SCALE(S)

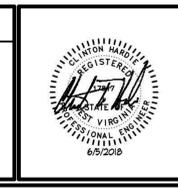


1 FIRST FLOOR MECHANICAL PLAN - CLC ADMIN - ALTERNATE NO. 5 - (BID ITEM NO. 6)
1/8" = 1'-0"



Revisions	Date

CONSULTANTS:



ARCHITECT/ENGINEERS:

Drawing Title:
FIRST FLOOR MECHANICAL PLAN - CLC ADMIN - ALTERNATE NO.5 - (BID ITEM NO. 6)

Approved Project Director:

Project Title:
CONSTRUCT DOM CLINIC AND CLC ADMINISTRATION ADDITION

Location:
MARTINSBURG, WV

Date:
JUNE 27, 2018

Checked:
WAW

Drawn:
WNV

Project Number:
613-121

Building Number:
501D

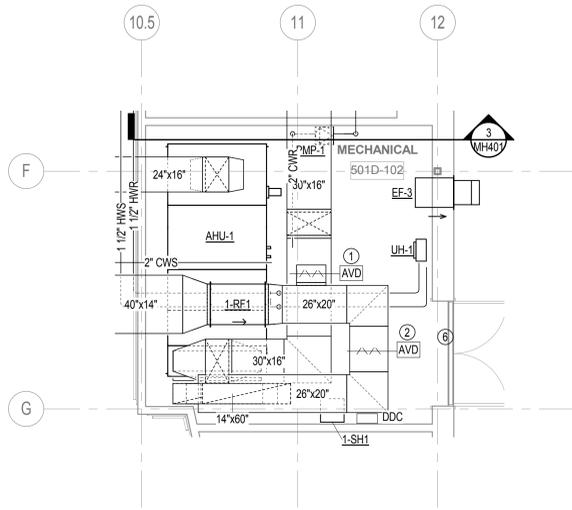
Drawing Number:
MH105

Dwg. of

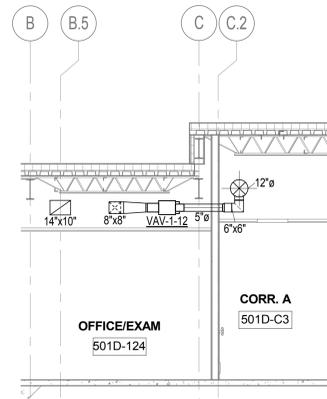
BID DOCUMENTS

OFFICE OF CONSTRUCTION AND FACILITIES MANAGEMENT

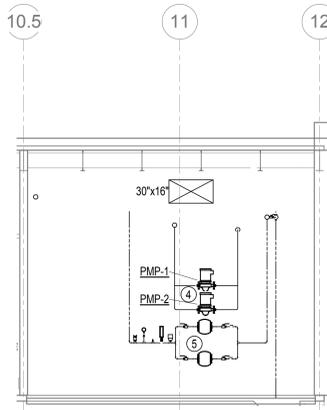
three inches = one foot
 one and one half inches = one foot
 one inch = one foot
 three quarters inch = one foot
 one half inch = one foot
 three eighths inch = one foot
 one quarter inch = one foot
 one eighth inch = one foot



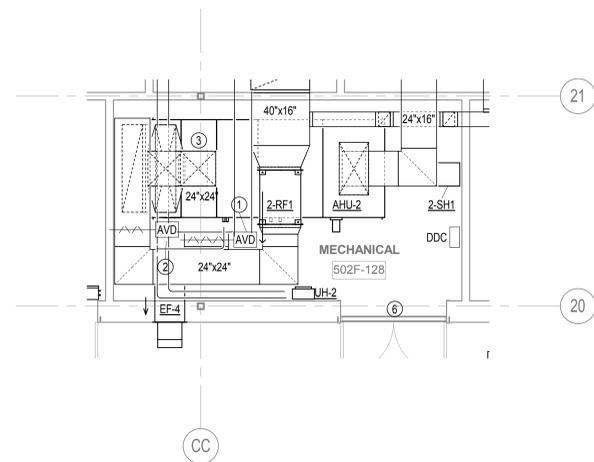
1 LARGE SCALE MECHANICAL ROOM PLAN - CLC ADMIN
 1/4" = 1'-0"



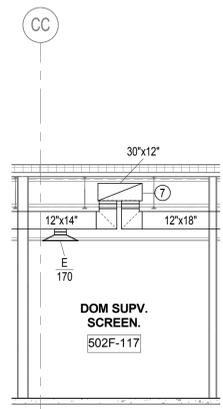
2 CLC ADMIN SECTION
 1/4" = 1'-0"



3 CHILLED WATER PUMP SECTION - CLC ADMIN
 1/4" = 1'-0"



4 LARGE SCALE MECHANICAL ROOM PLAN - DOM CLINIC
 1/4" = 1'-0"



5 DUCT ROUTING SECTION DETAIL - DOM CLINIC
 1/4" = 1'-0"

GENERAL NOTES

KEY NOTES

1. RELIEF AIR DAMPER.
2. RETURN AIR DAMPER.
3. 24X24 O.A. INTAKE UP TO INTAKE HOOD ON ROOF. OFFSET TO MISS STRUCTURE.
4. CHILLED WATER PUMP IN PARALLEL. MOUNT ON WALL ABOUT DOMESTIC WATER PUMPS.
5. DOMESTIC WATER PUMPS.
6. 72X30 RELIEF AIR LOUVER ABOVE THE DOOR.
7. DUCT ROUTED BETWEEN JOIST.

GRAPHIC SCALE(S)



Revisions:	Date:

CONSULTANTS:



ARCHITECT/ENGINEERS:

Drawing Title:
ENLARGED PLANS

Approved Project Director:

Project Title:
CONSTRUCT DOM CLINIC AND CLC ADMINISTRATION ADDITION

Project Number:
613-121

Building Number:
501D & 502F

Location:
MARTINSBURG, WV

Date:
 JUNE 27, 2018

Checked:
 WAW

Drawn:
 WNW

Dwg. Number:
MH401

Dwg. of

BID DOCUMENTS

OFFICE OF CONSTRUCTION AND FACILITIES MANAGEMENT

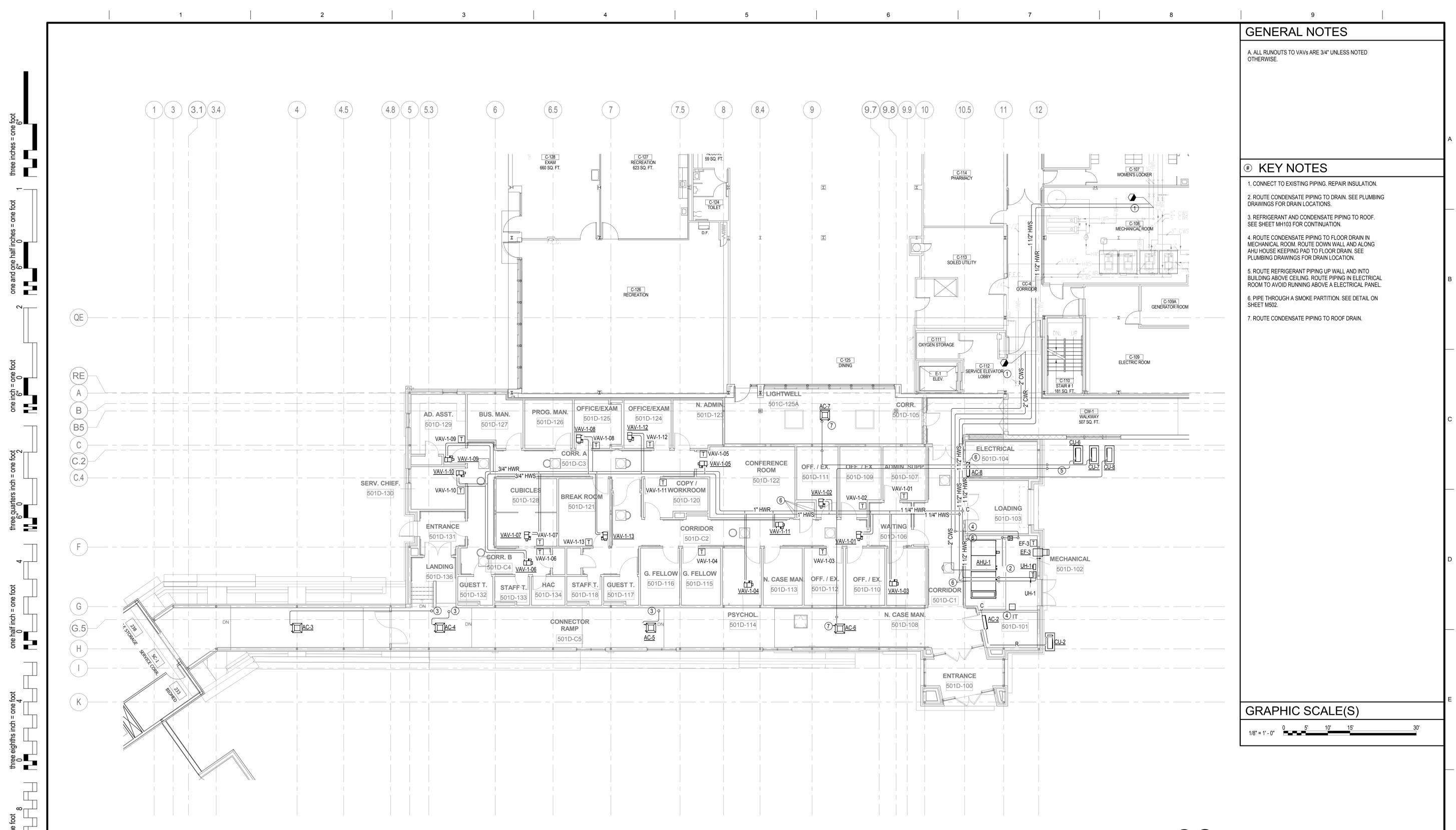
GENERAL NOTES

- A. ALL RUNOUTS TO VAVs ARE 3/4" UNLESS NOTED OTHERWISE.

KEY NOTES

1. CONNECT TO EXISTING PIPING. REPAIR INSULATION.
2. ROUTE CONDENSATE PIPING TO DRAIN. SEE PLUMBING DRAWINGS FOR DRAIN LOCATIONS.
3. REFRIGERANT AND CONDENSATE PIPING TO ROOF. SEE SHEET MH103 FOR CONTINUATION.
4. ROUTE CONDENSATE PIPING TO FLOOR DRAIN IN MECHANICAL ROOM. ROUTE DOWN WALL AND ALONG AHU HOUSE KEEPING PAD TO FLOOR DRAIN. SEE PLUMBING DRAWINGS FOR DRAIN LOCATION.
5. ROUTE REFRIGERANT PIPING UP WALL AND INTO BUILDING ABOVE CEILING. ROUTE PIPING IN ELECTRICAL ROOM TO AVOID RUNNING ABOVE AN ELECTRICAL PANEL.
6. PIPE THROUGH A SMOKE PARTITION. SEE DETAIL ON SHEET M502.
7. ROUTE CONDENSATE PIPING TO ROOF DRAIN.

GRAPHIC SCALE(S)



three inches = one foot
 one and one half inches = one foot
 one inch = one foot
 three quarters inch = one foot
 one half inch = one foot
 one quarter inch = one foot
 three eighths inch = one foot
 one eighth inch = one foot
 one sixteenth inch = one foot

FIRST FLOOR PIPING PLAN - CLC ADMIN
1/8" = 1'-0"



Revisions:	Date:

CONSULTANTS:



ARCHITECT/ENGINEERS:

Drawing Title:
FIRST FLOOR PIPING PLAN - CLC ADMIN

Approved Project Director:

Project Title:
CONSTRUCT DOM CLINIC AND CLC ADMINISTRATION ADDITION

Location:
MARTINSBURG, WV

Date:
JUNE 27, 2018

Checked:
WAW

Drawn:
WNW

Project Number:
613-121

Building Number:
501D

Drawing Number:
MP101

Dwg. of

BID DOCUMENTS

OFFICE OF CONSTRUCTION AND FACILITIES MANAGEMENT

three eighths inch = one foot
 one eighth inch = one foot
 one quarter inch = one foot
 three eighths inch = one foot
 one half inch = one foot
 one inch = one foot
 one and one half inches = one foot
 three inches = one foot



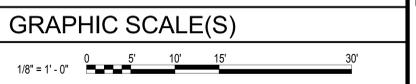
FIRST FLOOR PIPING PLAN - DOM CLINIC
 1/8" = 1'-0"



GENERAL NOTES

A. ALL RUNOUTS TO VAVs ARE 3/4" UNLESS NOTED OTHERWISE.

- KEY NOTES**
1. CONNECT CHILLED WATER PUMP TO EXISTING PIPING. REPAIR INSULATION.
 2. PIPING DOWN FROM ROOF. CONNECT TO EXISTING PIPING. REPAIR INSULATION.
 3. PIPING UP TO ROOF. SEE SHEET MH104 FOR CONTINUATION.
 4. ROUTE CONDENSATE PIPING TO FLOOR DRAIN. SEE PLUMBING DRAWING FOR CONTINUATION.
 5. PROVIDE CONCRETE PAD FOR CONDENSING UNIT.
 6. THERE IS VERY LIMITED CEILING SPACE. THE TAPS FOR THE HOT AND CHILLED WATER PIPING SHALL BE MADE ON TOP OF THE PIPE. ACCESS TO THE TOP OF THE PIPE WILL BE THROUGH THE ROOF.
 7. PIPE THROUGH A SMOKE PARTITION. SEE DETAIL ON SHEET M502.
 8. ROUTE CONDENSATE TO FLOOR DRAIN IN CORNER OF ROOM.
 9. ROUTE CONDENSATE THROUGH THE WALL AND INTO THE MECHANICAL ROOM. ROUTE DOWN THE WALL AND OVER TO THE AHU HOUSE KEEPING PAD AND TO FLOOR DRAIN.



Revisions:	Date:

CONSULTANTS:



ARCHITECT/ENGINEERS:

Drawing Title:
FIRST FLOOR PIPING PLAN - DOM CLINIC

Approved Project Director:

Project Title:
CONSTRUCT DOM CLINIC AND CLC ADMINISTRATION ADDITION

Location:
MARTINSBURG, WV

Date:
 JUNE 27, 2018

Checked:
 WAW

Drawn:
 WNW

Project Number:
613-121

Building Number:
502F

Drawing Number:
MP102

Dwg. of

BID DOCUMENTS

OFFICE OF CONSTRUCTION AND FACILITIES MANAGEMENT

CHILLED WATER COOLING COIL SCHEDULE

MARK	LOCATION	AREA AND/OR BLDG SERVED	SYSTEM AND/OR SERVICE	AIR FLOW		MAX FACE VELOCITY		APD		EAT				LAT				TOTAL CAPACITY		SENSIBLE CAPACITY		CHILLED WATER				REMARKS				
				CFM	[L/s]	FPM	[M/s]	IN WG	[Pa]	*F	[*C]	*F	[*C]	*F	[*C]	*F	[*C]	MBH	[kW]	MBH	[kW]	FLOW		EWT			LWT		WPD	
																						GPM	[L/s]	*F	[*C]		*F	[*C]	FT	[M]
1-CC1	501D-102	CLC ADDITION	AHU-1	4635	[2200]	450	[2]	0.65	[160]	80	[27]	67	[19]	55	[13]	54	[12]	166.6	[49]	107.2	[31]	27.7	[2]	44	[7]	56	[13]	6	[2]	1.
2-CC1	502F-128	DOM ADDITION	AHU-2	5745	[2700]	450	[2]	0.65	[160]	83.2	[28.4]	65.5	[19]	55	[13]	54	[12]	182.1	[53]	143.1	[42]	30.35	[2]	44	[7]	56	[13]	6	[2]	1.

NOTE
1. THE COOLING COIL FIN SPACING SHALL NOT EXCEED 132 FINS PER FOOT [400 FINS PER METER].

SINGLE DUCT AIR TERMINAL UNIT SCHEDULE

MARK	LOCATION	AREA AND/OR ROOM SERVED	SYSTEM AIR HANDLING	SIZE	AIR FLOW		ADDITIONAL SOUND ATTENUATION REQUIRED	CONTROL TYPE	CONTROL SEQUENCE	REHEAT			PERIMETER SUPPLEMENTAL HEAT LINK	REMARKS
					MAX	MIN				HW	ELEC	NONE		
VAV 1-01	501D-C2	WAITING	AHU-1	B	230	[110]	175	[83]	NONE	VAV	5 DEGREE DEADBAND	X	NONE	---
VAV 1-02	501D-111	OFFICE/EXAM	AHU-1	C	240	[110]	240	[110]	NONE	VAV	5 DEGREE DEADBAND	X	NONE	---
VAV 1-03	501D-108	OFFICE	AHU-1	D	440	[210]	365	[170]	NONE	VAV	5 DEGREE DEADBAND	X	NONE	---
VAV 1-04	501D-114	OFFICE	AHU-1	C	330	[160]	215	[100]	NONE	VAV	5 DEGREE DEADBAND	X	NONE	---
VAV 1-05	501D-120	CONFERENCE	AHU-1	C	370	[170]	185	[87]	NONE	VAV	5 DEGREE DEADBAND	X	NONE	---
VAV 1-06	501D-C4	CORRIDOR	AHU-1	E	540	[250]	420	[200]	NONE	VAV	5 DEGREE DEADBAND	X	NONE	---
VAV 1-07	501D-128	OFFICE	AHU-1	B	200	[94]	130	[61]	NONE	VAV	5 DEGREE DEADBAND	X	NONE	---
VAV 1-08	501D-125	OFFICE	AHU-1	C	350	[170]	260	[120]	NONE	VAV	5 DEGREE DEADBAND	X	NONE	---
VAV 1-09	501D-129	OFFICE	AHU-1	B	250	[120]	110	[52]	NONE	VAV	5 DEGREE DEADBAND	X	NONE	---
VAV 1-10	501D-130	OFFICE	AHU-1	B	190	[90]	75	[35]	NONE	VAV	5 DEGREE DEADBAND	X	NONE	---
VAV 1-11	501D-C2	CORRIDOR	AHU-1	D	450	[210]	150	[71]	NONE	VAV	5 DEGREE DEADBAND	X	NONE	---
VAV 1-12	501D-124	OFFICE/EXAM	AHU-1	B	220	[100]	180	[85]	NONE	VAV	5 DEGREE DEADBAND	X	NONE	---
VAV 1-13	501D-121	BREAK ROOM	AHU-1	D	400	[190]	160	[78]	NONE	VAV	5 DEGREE DEADBAND	X	NONE	---
VAV 2-01	502F-102	LOBBY	AHU-2	D	435	[210]	290	[140]	NONE	VAV	5 DEGREE DEADBAND	X	NONE	---
VAV 2-02	502F-100	WAITING	AHU-2	H	1100	[520]	475	[220]	NONE	VAV	5 DEGREE DEADBAND	X	NONE	---
VAV 2-03	502F-105	N. STATION	AHU-2	C	375	[180]	150	[71]	NONE	VAV	5 DEGREE DEADBAND	X	NONE	---
VAV 2-04	502F-108	EXAM	AHU-2	D	390	[190]	250	[120]	NONE	VAV	5 DEGREE DEADBAND	X	NONE	---
VAV 2-05	502F-115	OFFICE	AHU-2	E	510	[240]	280	[130]	NONE	VAV	5 DEGREE DEADBAND	X	NONE	---
VAV 2-06	502F-110	CORRIDOR	AHU-2	F	570	[270]	475	[220]	NONE	VAV	5 DEGREE DEADBAND	X	NONE	---
VAV 2-07	502F-118	OFFICE	AHU-2	C	300	[140]	245	[120]	NONE	VAV	5 DEGREE DEADBAND	X	NONE	---
VAV 2-08	502F-121	OFFICE	AHU-2	C	370	[170]	150	[76]	NONE	VAV	5 DEGREE DEADBAND	X	NONE	---
VAV 2-09	502F-125	OFFICE	AHU-2	D	400	[190]	200	[94]	NONE	VAV	5 DEGREE DEADBAND	X	NONE	---
VAV 2-10	502F-127	OFFICE	AHU-2	D	400	[190]	200	[94]	NONE	VAV	5 DEGREE DEADBAND	X	NONE	---
VAV 2-11	502F-126	OFFICE	AHU-2	C	370	[170]	160	[78]	NONE	VAV	5 DEGREE DEADBAND	X	NONE	---

FAN SCHEDULE

MARK	LOCATION	AREA AND/OR BLDG SERVED	SYSTEM AND/OR SERVICE	AIR FLOW		TSP		FAN										MOTOR ELECTRICAL				CONTROL SEQUENCE	REMARKS		
				CFM	[L/s]	IN	[Pa]	TYPE	WHEEL	CLASS	ARRANGEMENT, ROTATION, AND DISCHARGE	DIAMETER	MIN % EFF	DRIVE	FAN MAX RPM	NOMINAL POWER		PHASE	VOLT	RPM	SPEED CONTROL				
																BHP	HP							[kW]	
1-SF1	501D-102	CLC ADD	AHU-1	4,635	[2200]	2.5	[630]	PLENUM	AIRFOIL	II			16.5	[410]	55%	DIRECT	3,275	4.4	5	[4]	3	460	1800	VARIABLE	1, 4.
1-RF1	501D-102	CLC ADD	AHU-1	3,295	[1600]	1.619	[400]	INLINE TUBULAR	MIXED FLOW	II	ARRANGEMENT 9, MOTOR AT 180 DEGREES, HORIZONTAL DISCHARGE	24.5	[610]	60%	DIRECT	2,517	1.6	2	[2]	3	460	1725	VARIABLE	---	
2-SF1	502F-128	DOM ADD	AHU-2	5,745	[2700]	2.5	[630]	PLENUM	AIRFOIL	II			16.5	[410]	54%	DIRECT	3,275	5.8	7.5	[6]	3	460	1800	VARIABLE	1, 4.
2-RF1	502F-128	DOM ADD	AHU-2	4,155	[2000]	1.65	[410]	INLINE TUBULAR	MIXED FLOW	II	ARRANGEMENT 9, MOTOR AT 180 DEGREES, HORIZONTAL DISCHARGE	24.5	[610]	60%	DIRECT	2,517	1.85	2	[2]	3	460	1725	VARIABLE	---	
EF-1	ROOF	RESTROOMS	EXHAUST	375	[180]	0.5	[130]	ROOF EXHAUST	BACKWARD INCLINED	II			15	[380]	-	DIRECT	1,674	0.07	[]	1	115	1725	CONSTANT	---	
EF-2	ABOVE CEILING	RESTROOMS	EXHAUST	75	[35]	0.2	[50]	CEILING MOUNTED	FORWARD CURVED	II			7	[180]	-	DIRECT	943	6.1W	[]	1	115	-	CONSTANT	1.	
EF-3	501D-102	CCL ADD	MECH ROOM EXHAUST	1,000	[470]	0.29	[73]	WALL PROP	PROPELLER	I			14	[350]	-	DIRECT	1,400	0.15	0.5	[]	1	208	1725	CONSTANT	2, 3.
EF-4	502F-128	DOM ADD	MECH ROOM EXHAUST	1,000	[470]	0.29	[73]	WALL PROP	PROPELLER	I			14	[350]	-	DIRECT	1,400	0.15	0.5	[]	1	208	1725	CONSTANT	2, 3.
EF-ALT	ROOF	CLC ADD	SHELL SPACE EXHAUST	1,235	[600]	0.29	[73]	ROOF EXHAUST	BACKWARD INCLINED	II			19	[480]	-	DIRECT	1,720	0.28	0.25	[]	1	115	1725	CONSTANT	1, 5.

NOTE
1. SEE FLOOR PLAN FOR NUMBER OF FANS.
2. PROVIDE WITH EC MOTOR FOR BALANCING. FAN SPEED CONTROL SHALL BE ON MOTOR.
3. PROVIDE WITH GRAVITY OPERATED BACKDRAFT DAMPER, SHORT WALL HOUSING, FLUSH TO THE EXTERIOR WITH OSHA APPROVED FAN GUARD, GALVANIZED 45 DEGREE WEATHER HOOD WITH BIRD SCREEN, AND A FACTORY DISCONNECT. WEATHER HOOD SHALL HAVE HI-PRO POLYESTER COATING. ALL OTHER COMPONENTS SHALL HAVE AN INDUSTRIAL EPOXY COATING.
4. CFM SCHEDULED REFLECTS A 5% LEAKAGE ALLOWANCE AND A 5% SAFETY FACTOR.
5. PROVIDE ONLY IF ALTERNATE NO. 5 - (BID ITEM NO. 6) IS TAKEN.

AIR HANDLING UNIT SCHEDULE

MARK	LOCATION	AREA AND/OR BLDG SERVED	TYPE	AIR FLOW						SUPPLY FAN MARK	RETURN OR RELIEF FAN MARK	EXHAUST FAN MARK	PRE-FILTER MARK	AFTER FILTER MARK	FINAL FILTER MARK	HEAT RECOVERY MARK	PREHEAT COIL MARK	COOLING COIL MARK	REHEAT COIL	HUMIDIFIER MARK	REMARKS	
				SUPPLY		MIN OA		RETURN														
				CFM	[L/s]	CFM	[L/s]	CFM	[L/s]													
AHU-1	501D-102	CLC ADDITION	MODULAR	VAV	4635	[2200]	1270	[600]	3295	[1600]	1-SF1	N/A	N/A	1-PF1	1-AF1	N/A	N/A	1-PHC1	1-CC1	AT TU	N/A	---
AHU-2	502F-128	DOM ADDITION	MODULAR	VAV	5745	[2700]	1105	[520]	4155	[2000]	2-SF1	N/A	NA	2-PF1	2-AF1	N/A	N/A	2-PHC1	2-CC1	AT TU	N/A	---

HOT WATER HEATING COIL SCHEDULE

MARK	LOCATION	AREA AND/OR BLDG SERVED	SYSTEM AND/OR SERVICE	APPLICATION	AIR FLOW		MAX FACE VELOCITY		APD		TEMPERATURES				TOTAL MIN CAPACITY		HOT WATER				% GLYCOL	REMARKS				
					CFM	[L/s]	FPM	[M/s]	IN WG	[Pa]	EAT		LAT		MBH	[kW]	FLOW		EWT				LWT		WPD	
											*F	[*C]	*F	[*C]			GPM	[L/s]	*F	[*C]			*F	[*C]	FT	[kPa]
1-PHC1	501D-102	CLC ADDITION	AHU-1	PREHEAT	2665	[1300]	450	[2]	0.2	[50]	43.7	[7]	65	[18]	61.3	[210]	4.09	[]	180	[82]	150	[66]	8	[24]	0	---
2-PHC1	502F-128	DOM ADDITION	AHU-2	PREHEAT	4160	[2000]	450	[2]	0.2	[50]	52.5	[11]	65	[18]	56.2	[190]	3.74	[]	180	[82]	150	[66]	8	[24]	0	---

PUMP SCHEDULE

MARK	LOCATION	AREA AND/OR BLDG SERVED	SYSTEM AND/OR SERVICE	TYPE	CIRCULATING FLUID						ELECTRICAL MOTOR				REMARKS							
					FLUID	FLOW		HEAD		NPSH AVAILABLE	TEMPERATURE		SP GR	MIN % EFF		NOMINAL POWER	PHASE	VOLT	MAX RPM	SPEED CONTROL		
						GPM	[L/s]	FT	[kPa]		FT	[kPa]									*F	[*C]
CHP-1	E-1388	502	CHILLED WATER	END SUCTION	CHILLED WATER	650	[41]	100	[1600]	18.1	[290]	44	[7]	1	80.7	25	[19]	3	460	3600	VARIABLE	---
CHP-2	E-1388	502	CHILLED WATER	END SUCTION	CHILLED WATER	650	[41]	100	[1600]	18.1	N/A	44	[7]	1	80.7	25	[19]	3	460	3600	VARIABLE	---
PMP-1	501D-102	501	CHILLED WATER	INLINE	CHILLED WATER	27.7	[2]	10	[160]	4.1	N/A	44	[7]	1	63	0.25	[]	3	208	1725	VARIABLE	---
PMP-2	501D-102	501	CHILLED WATER	INLINE	CHILLED WATER	27.7	[2]	10	[160]	4.1	N/A	55	[13]	1	63	0.25	[]	3	208	1725	VARIABLE	---

AIR TERMINAL UNIT SIZING SCHEDULE

SIZE	MIN ALLOWABLE AIR FLOW	MAX ALLOWABLE AIR FLOW	DUCT INLET SIZE	MAX APD	MAXIMUM SOUND POWER LEVEL (Re: 10 ⁻¹² WATTS) FOR BOX DISCHARGE AT MAXIMUM INLET DUCT												HOT WATER HEATING COIL				REMARKS				
					OCTAVE BANDS							EAT		EWT		FLOW		MAX WPD		PIPE RUNOUT SIZE TO COIL					
					2	3	4	5	6	7	*F	[*C]	*F	[*C]	GPM	[L/m]	FT	[kPa]	IN	[mm]					
A	60	[28]	170	[80]	4	[100]	0.4	[100]	69	65	58	52	51	47	55	[13]	140	[60]	0.5	[2]	3	[9]	0.75	[19]	1,2,3,4.
B	90	[42]	260	[120]	5	[130]	0.4	[100]	69	63	59	52	51	47	55	[13]	140	[60]	0.5	[2]	3	[9]	0.75	[19]	1,2,3,4.
C	130	[61]	380	[180]	6	[150]	0.4	[100]	69	67	61	55	52	49	55	[13]	140	[60]	0.7	[3]	4	[12]	0.75	[19]	1,2,3,4.
D	160	[78]	490	[230]	7	[180]	0.4	[100]	70	68	63	57	53	49	55	[13]	140	[60]	0.7	[3]	4	[12]	0.75	[19]	1,2,3,4.
E	230	[110]	680	[320]	8	[200]	0.4	[100]	71	68	59	53	51	47	55	[13]	140	[60]	1	[4]	3	[9]	0.75	[19]	1,2,3,4.
F	270	[130]	790	[370]	9	[220]	0.4	[100]	71	69	60	54	51	47	55	[13]	140	[60]	1.5	[6]	4	[12]	0.75	[19]	1,2,3,4.
G	350	[170]	1050	[500]	10	[250]	0.4	[100]	74	68	61	57	54	52	55	[12]	140	[60]	1.5	[6]	4	[12]	0.75	[19]	1,2,3,4.
H	500	[240]	1500	[710]	12	[300]	0.4	[100]	73	69	64	59	57	53	55	[13]	140								

three inches = one foot
 one and one half inches = one foot
 one inch = one foot
 three quarters inch = one foot
 one half inch = one foot
 three eighths inch = one foot
 one quarter inch = one foot
 one eighth inch = one foot

SPLIT SYSTEM AIR CONDITIONER HEAT PUMP SCHEDULE

MARK	LOCATION	AREA AND/OR BLDG SERVED	TYPE	TOTAL SUPPLY AIR FLOW		MIN. OUTSIDE AIR FLOW		EXT. STATIC PRESSURE		COOLING CAPACITY								HEATING CAPACITY								ELECTRICAL DATA					SUPPLEMENTAL HEAT			REMARKS							
				CFM	[L/s]	CFM	[L/s]	IN	[Pa]	EAT				COMP Kw	MIN. HEAT CAPACITY		EAT DB		LAT DB		OSA DESIGN TEMP		AIR FILTER MARK NO.	INDOOR FAN		OUTDOOR UNIT FAN			MCA	PHASE	VOLT	Kw	PHASE		VOLT						
										MIN TOTAL CAPACITY	MIN SENS CAPACITY	MIN SEER	Db		Wb	OSA DESIGN TEMP	MBH	KW	*F	[°C]	*F	[°C]		*F	[°C]	*F	[°C]	HP								[W]	CONTROL	HP	[W]	CONTROL	
										[kW]	[kW]	[SEER]	[°F]		[°C]	[°F]	[°C]	[°F]	[°C]	[°F]	[°C]	[°F]		[°C]	[°F]	[°C]	[°F]	[°C]								[°F]	[°C]	[°F]	[°C]	[°F]	[°C]
AC-1 & CU-1	GRADE	502F-120	DUCTLESS SPLIT	350	[170]		[]	0	[]	22.4	[78]	18	[5]	20.5	75	[24]	62	[17]	[90]	[32]		[8]	[2]	70	[21]	80	[27]	[47]	[8]	N/A		[55]		[68]			1	208/230			
AC-2 & CU-2	GRADE	501D-101	DUCTLESS SPLIT	350	[170]		[]	0	[]	22.4	[78]	18	[5]	20.5	75	[24]	62	[17]	[90]	[32]		[8]	[2]	70	[21]	80	[27]	[47]	[8]	N/A		[55]		[68]			2	208/231			
AC-3 & CU-3	ROOF	501D-110	CEILING CASSETTE	710	[340]	25	[12]	0	[]	36	[120]	12	[4]	13.1	75	[24]	62	[17]	[90]	[32]		[12]	[4]	70	[21]	80	[27]	[12]	[-11]	N/A		[70]		[55]			3	208/232			
AC-4 & CU-4	ROOF	501D-110	CEILING CASSETTE	710	[340]	25	[12]	0	[]	36	[120]	12	[4]	13.1	75	[24]	62	[17]	[90]	[32]		[12]	[4]	70	[21]	80	[27]	[12]	[-11]	N/A		[70]		[55]			4	208/233			
AC-5 & CU-5	ROOF	501D-110	CEILING CASSETTE	710	[340]	25	[12]	0	[]	36	[120]	12	[4]	13.1	75	[24]	62	[17]	[90]	[32]		[12]	[4]	70	[21]	80	[27]	[12]	[-11]	N/A		[70]		[55]			5	208/234			
AC-6 & CU-6	GRADE	501D-110	CEILING CASSETTE	710	[340]	25	[12]	0	[]	36	[120]	12	[4]	13.1	75	[24]	62	[17]	[90]	[32]		[12]	[4]	70	[21]	80	[27]	[12]	[-11]	N/A		[70]		[55]			6	208/235			
AC-7 & CU-7	GRADE	501C-125A	CEILING CASSETTE	710	[340]	25	[12]	0	[]	36	[120]	12	[4]	13.1	75	[24]	62	[17]	[90]	[32]		[12]	[4]	70	[21]	80	[27]	[12]	[-11]	N/A		[70]		[55]			7	208/236			
AC-8 & CU-8	GRADE	501D-104	DUCTLESS SPLIT	350	[170]		[]	0	[]	22.4	[78]	18	[5]	20.5	75	[24]	62	[17]	[90]	[32]		[8]	[2]	70	[21]	80	[27]	[47]	[8]	N/A		[55]		[68]			2	208/231			
AC-9 & CU-9	GRADE	502F-130	DUCTLESS SPLIT	350	[170]		[]	0	[]	22.4	[78]	18	[5]	20.5	75	[24]	62	[17]	[90]	[32]		[8]	[2]	70	[21]	80	[27]	[47]	[8]	N/A		[55]		[68]			2	208/231			

NOTE
 1. PROVIDE WITH CONDENSATE PUMP.

AIR FILTER SCHEDULE

MARK	LOCATION	AREA AND/OR BLDG SERVED	SYSTEM AND/OR SERVICE	MERV RATING	AIR FLOW		APD		HOUSING TYPE	CARTRIDGES		ARRANGEMENT	REMARKS				
					CFM	[L/s]	INITIAL	CHANGEOVER		#	SIZE						
														IN	[mm]	IN	[mm]
														[mm]	[mm]		
1-PF1	522-102	CLC ADDITION	AHU-1	8	4635	[2200]	0.15	[4]	0.4	[10]	2	24 x 24 x 2	[600 x 600 x 50]	3 WIDE BY 1 HIGH	----		
1-FF1	522-102	CLC ADDITION	AHU-1	13	4635	[2200]	0.3	[8]	0.6	[15]	2	24 x 24 x 12	[600 x 600 x 300]	3 WIDE BY 1 HIGH	----		
2-PF1	521-128	DOM ADDITION	AHU-2	8	5745	[2700]	0.18	[5]	0.4	[10]	2	24 x 24 x 2	[600 x 600 x 50]	3 WIDE BY 1 HIGH	----		
2-FF1	521-128	DOM ADDITION	AHU-2	13	5745	[2700]	0.35	[9]	0.7	[18]	2	24 x 24 x 12	[600 x 600 x 300]	3 WIDE BY 1 HIGH	----		

AIR DEVICE SCHEDULE

MARK	TYPE	AIR FLOW		MAX APD	MOUNTING	PANEL/FRAME SIZE		NECK SIZE		NC	DAMPER	FINISH	REMARKS				
		CFM	[L/s]			IN x IN	[mm x mm]	IN	[mm]								
														MIN	MAX	IN WG	[Pa]
														[Pa]	[Pa]		
A	LOUVERED FACE	40	[19]	160	[78]	0.100	[25]	CEILING	24 x 24	[600 x 600]	6 ø	[152 ø]	30	OBD	WHITE	1,2,3	
B	LOUVERED FACE	70	[33]	280	[130]	0.100	[25]	CEILING	24 x 24	[600 x 600]	8 ø	[203 ø]	30	OBD	WHITE	1,2,3	
C	LOUVERED FACE	200	[94]	400	[190]	0.100	[25]	CEILING	24 x 24	[600 x 600]	10 ø	[254 ø]	30	OBD	WHITE	1,2,3	
D	LOUVERED FACE	50	[24]	110	[52]	0.100	[25]	CEILING	12 x 12	[600 x 600]	6 ø	[305 ø]	30	OBD	WHITE	1,2,3	
E	PERFORATED	90	[42]	400	[190]	0.100	[25]	CEILING	24 x 24	[203 x 203]	8 x 8	[152 x 152]	30	OBD	WHITE	1,2,3	
F	PERFORATED	405	[190]	570	[270]	0.100	[25]	CEILING	24 x 24	[600 x 600]	12 x 12	[152 DIAM]	30	OBD	WHITE	1,2,3	
G	PERFORATED	50	[24]	100	[47]	0.100	[25]	CEILING	12 x 12	[600 x 600]	6 x 6	[203 DIAM]	30	OBD	WHITE	1,2,3	

NOTES
 1. FOUR WAY THROW PATTERN.
 2. SEE DETAIL FOR DAMPER IN BRANCH DUCT SERVING EACH DIFFUSER.
 3. PROVIDE SQUARE TO ROUND ADAPTER.

HOT WATER UNIT HEATER SCHEDULE

MARK	LOCATION	AREA AND/OR BLDG SERVED	TYPE UNIT	AIR FLOW		MIN CAPACITY		TEMPERATURES				FLOW		WPD	CONTROL SEQUENCE	MOTOR				REMARKS			
				CFM	[L/s]	BTUH	[W]	EAT		EWT		GPM	[L/s]			FT	[Pa]	HP	[W]		PHASE	VOLT	RPM
								*F	[°C]	*F	[°C]												
								[°F]	[°C]	[°F]	[°C]												
UH-1	501D-102	CLC ADDITION	HORIZONTAL	340	[160]	12000	[3500]	55	[13]	180	[82]	0.8	0.05	0.5	[13]		0.02	[12]	1	120	----		
UH-2	502F-128	DOM ADDITION	HORIZONTAL	340	[160]	12000	[3500]	55	[13]	180	[82]	0.8	0.05	0.5	[13]		0.02	[12]	1	120	----		

ELECTRIC UNIT HEATER SCHEDULE

MARK	LOCATION	AREA AND/OR BLDG SERVED	TYPE	AIR FLOW		EAT		MIN CAPACITY		POWER			FAN MOTOR			REMARKS			
				CFM	[L/s]	*F	[°C]	BTUH	[W]	AMP	PHASE	VOLT	HP	[W]	PHASE		VOLT		
																		MIN	MAX
																		[Pa]	[Pa]
UH-ALT		CLC ADDITION	HORIZONTAL	830	[390]	9.7	[-12]	34120	[10000]					0.07	[50]	1	120	1,2,3	

NOTE
 1. PROVIDE ONLY IF ALTERNATE NO. 5 - (BID ITEM NO. 6) IS TAKEN.
 2. SEE SHEET MH105 FOR NUMBER OF UNITS REQUIRED.
 3. PROVIDE WITH SINGLE PIONT ELECTRICAL CONNECTION.

ELECTRIC TO STEAM HUMIDIFIER SCHEDULE

MARK	LOCATION	SYSTEM AND/OR SERVICE	HUMIDIFIER TYPE	AIR FLOW		EAT				LAT		SOURCE	ELECTRICAL	REMARKS		
				CFM	[L/s]	Db		Wb		DEWPOINT					DEWPOINT	
						*F	[°C]	*F	[°C]	*F	[°C]				*F	[°C]
						[°F]	[°C]	[°F]	[°C]	[°F]	[°C]				[°F]	[°C]
1-SH1	501D-102	1-AHU1	UNIT-MOUNTED DISPERSION TUBE	4240	[2000]	65	[18]	46.8	[8]	22	[-6]	45	[7]	ELECTRIC	10	
2-SH1	502F-128	1-AHU2	UNIT-MOUNTED DISPERSION TUBE	5120	[2400]	65	[18]	46.8	[8]	22	[-6]	45	[7]	ELECTRIC	10	

INTAKE/EXHAUST HOOD SCHEDULE

MARK	LOCATION	SYSTEM AND/OR SERVICE	TYPE	APPLICATION	THROAT SIZE		AIR FLOW		APD		DAMPER TYPE	REMARKS		
					IN	[mm]	CFM	[L/s]	IN	[Pa]				
													MIN	MAX
													[Pa]	[Pa]
GV-1	ROOF	AHU-1	INTAKE	DUCTED	22 X 22	[600 x 450]	2665	[1300]	0.107	[27]	BACKDRAFT	----		
GV-2	ROOF	AHU-2	INTAKE	DUCTED	24 X 24	[480 x 480]	2885	[1400]	0.088	[22]	BACKDRAFT	----		
GV-ALT	ROOF	CLC ADMIN	INTAKE	GRAVITY	22 X 22	[600 x 450]	2470	[1200]	0.107	[27]	BACKDRAFT	1,		

NOTE
 1. PROVIDE ONLY IF ALTERNATE NO. 5 - (BID ITEM NO. 6) IS TAKEN.

HVAC DESIGN DATA

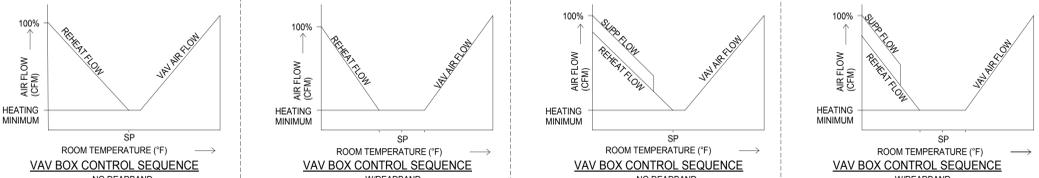
DESIGN CONDITIONS	SUMMER						WINTER						LOWEST AVERAGE ANNUAL DEWPOINT
	TEMP		WET BULB TEMP		% HUMIDITY		TEMP		DEWPOINT TEMP		% HUMIDITY		
	*F	[°C]	*F	[°C]	%	%	*F	[°C]	*F	[°C]	%	%	
	[°F]	[°C]	[°F]	[°C]	[]	[]	[°F]	[°C]	[°F]	[°C]	[]	[]	
OUTDOOR DESIGN CONDITIONS	90.4	[32]	73.1	[23]	44.2	9.7	[-12]	0	[-18]	NA	0.3	[-18]	
INDOOR AREA DESIGN CONDITIONS													
OFFICE	75	[24]	65.3	[19]	60	70	[21]	27	[-3]	20			
EXAM ROOM	75	[24]	65.3	[19]	60	70	[21]	27	[-3]	20			
WAITING	75	[24]	65.3	[19]	60	70	[21]	27	[-3]	20			
CONFERENCE ROOM	75	[24]	65.3	[19]	60	70	[21]	27	[-3]	20			
CORRIDORS	75	[24]	65.3	[19]	60	70	[21]	27	[-3]	20			
TOILETS - PUBLIC (INTERIOR)	N/A		N/A		N/A	N/A	N/A	N/A	N/A	N/A			
TOILETS - PUBLIC (PERIMETER)	N/A		N/A		N/A	58	[20]	N/A	N/A	N/A			
VESTIBULES	N/A		N/A		N/A	50	[10]	N/A	N/A	N/A			
HAC	N/A		N/A		N/A	N/A	N/A	N/A	N/A	N/A			

AIR FLOW MEASURING DEVICE SCHEDULE

MARK	LOCATION	SYSTEM AND/OR SERVICE	AIR FLOW		DUCT SIZE		APD		REMARKS				
			CFM	[L/s]	IN	[mm]	IN	[mm]					
										MIN	MAX		
										[Pa]	[Pa]		
1-AFMD1	501D-102	AHU-1	1270	[600]	4635	[2200]	60	[1500]	14	[350]	0.2	[5]	OA
1-AFMD2	501D-102	AHU-1	1395	[660]	2970	[1400]	N/A	N/A	N/A	N/A	0.2	[5]	RETURN - FAN MOUNTED
1-AFMD3	501D-102	AHU-1	2665	[1300]	4635	[2200]	N/A	N/A	N/A	N/A	0.2	[5]	MAIN SUPPLY - FAN MOUNTED
2-AFMD1	502F-128	AHU-2	1105	[520]	5745	[2700]	60	[1500]	14	[350]	0.2	[5]	OA
2-AFMD2	502F-128	AHU-2	1815	[860]	3545	[1700]	N/A	N/A	N/A	N/A	0.2	[5]	RETURN - FAN MOUNTED
2-AFMD3	502F-128	AHU-2	2920	[1400]	5745	[2700]	N/A	N/A	N/A	N/A	0.2	[5]	MAIN SUPPLY - FAN MOUNTED

Revisions:	Date:

three inches = one foot
 one and one half inches = one foot
 one inch = one foot
 three quarters inch = one foot
 one half inch = one foot
 three eighths inch = one foot
 one quarter inch = one foot
 one eighth inch = one foot

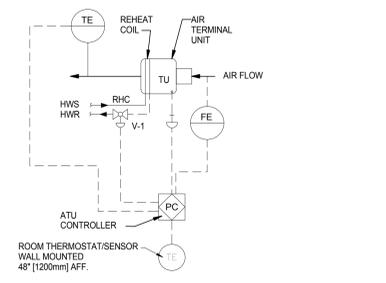


VAV BOX CONTROL SEQUENCE
 NO DEADBAND
 A. UPON FALL IN SPACE TEMPERATURE THE VAV DAMPER WILL MODULATE TO MINIMUM POSITION.
 B. UPON FURTHER DROP IN SPACE TEMPERATURE VALVE V-1 WILL MODULATE TO MAINTAIN SET POINT $\pm 5^\circ\text{F}$. THE ADJUSTABLE TOLERANCE OF $\pm 5^\circ\text{F}$ HAS BEEN SELECTED TO PREVENT VALVE HUNTING.
 C. THE REVERSE SHALL OCCUR ON THE RISE IN SPACE TEMPERATURE.

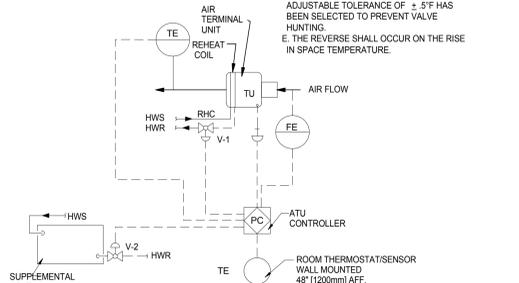
VAV BOX CONTROL SEQUENCE
 DEADBAND
 A. SET POINTS SHALL BE SET AS FOLLOWS: COOLING 75°F (ADJ) HEATING 77°F (ADJ). DEADBAND OF 5°F BETWEEN HEATING AND COOLING SET POINTS WILL BE MAINTAINED.
 B. UPON FALL IN SPACE TEMPERATURE THE VAV DAMPER WILL MODULATE TO MINIMUM POSITION.
 C. UPON FURTHER DROP IN SPACE TEMPERATURE VALVE V-1 WILL MODULATE TO MAINTAIN SET POINT $\pm 5^\circ\text{F}$. THE ADJUSTABLE TOLERANCE OF $\pm 5^\circ\text{F}$ HAS BEEN SELECTED TO PREVENT VALVE HUNTING.
 D. THE REVERSE SHALL OCCUR ON THE RISE IN SPACE TEMPERATURE.

VAV BOX CONTROL SEQUENCE
 NO DEADBAND
 A. UPON FALL IN SPACE TEMPERATURE THE VAV DAMPER WILL MODULATE TO MINIMUM POSITION.
 B. UPON FURTHER DROP IN SPACE TEMPERATURE VALVE V-1 WILL MODULATE TO MAINTAIN SET POINT $\pm 5^\circ\text{F}$. THE ADJUSTABLE TOLERANCE OF $\pm 5^\circ\text{F}$ HAS BEEN SELECTED TO PREVENT VALVE HUNTING.
 C. VALVE V-2 SHALL BE ENABLED WHEN OUTSIDE AIR FALLS BELOW 40°F (ADJ) AND VALVE V-1 HAS BEEN MODULATED OPEN ABOVE 30% (ADJ). VALVE V-2 SHALL MAINTAIN SET POINT $\pm 5^\circ\text{F}$. THE ADJUSTABLE TOLERANCE OF $\pm 5^\circ\text{F}$ HAS BEEN SELECTED TO PREVENT VALVE HUNTING. THE REVERSE SHALL OCCUR ON A RISE IN SPACE TEMPERATURE.

VAV BOX CONTROL SEQUENCE
 DEADBAND
 A. SET POINTS SHALL BE SET AS FOLLOWS: COOLING 75°F (ADJ) HEATING 77°F (ADJ). DEADBAND OF 5°F BETWEEN HEATING AND COOLING SET POINTS WILL BE MAINTAINED.
 B. UPON FALL IN SPACE TEMPERATURE THE VAV DAMPER WILL MODULATE TO MINIMUM POSITION.
 C. UPON FURTHER DROP IN SPACE TEMPERATURE VALVE V-1 WILL MODULATE TO MAINTAIN SET POINT $\pm 5^\circ\text{F}$. THE ADJUSTABLE TOLERANCE OF $\pm 5^\circ\text{F}$ HAS BEEN SELECTED TO PREVENT VALVE HUNTING.
 D. VALVE V-2 SHALL BE ENABLED WHEN OUTSIDE AIR FALLS BELOW 40°F (ADJ) AND VALVE V-1 HAS BEEN MODULATED OPEN ABOVE 30% (ADJ). VALVE V-2 SHALL MAINTAIN SET POINT $\pm 5^\circ\text{F}$. THE ADJUSTABLE TOLERANCE OF $\pm 5^\circ\text{F}$ HAS BEEN SELECTED TO PREVENT VALVE HUNTING.
 E. THE REVERSE SHALL OCCUR ON THE RISE IN SPACE TEMPERATURE.

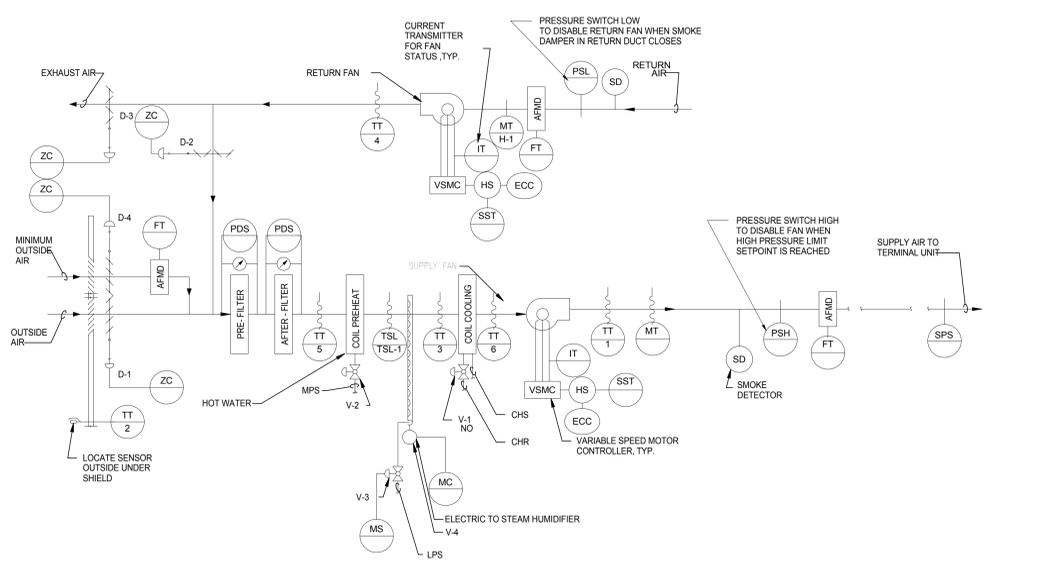


NO SUPPLEMENTAL HEATING



WITH SUPPLEMENTAL HEATING

1 VARIABLE VOLUME AIR TERMINAL UNIT CONTROL DIAGRAM



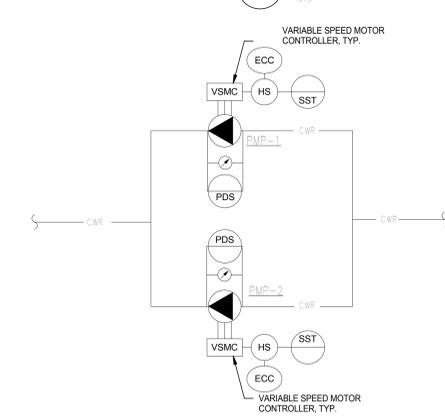
2 VARIABLE AIR VOLUME AIR HANDLING UNIT WITH OUTSIDE AIR CONTROL DIAGRAM (AHU-1 AND AHU-2)

SEQUENCE OF OPERATION FOR VARIABLE AIR VOLUME AIR HANDLING UNIT WITH MINIMUM OUTSIDE AIR

- GENERAL**
 - UNIT IS NORMALLY STARTED AND STOPPED REMOTELY AT THE ECC. H-O-A SWITCH SHALL BE KEPT IN THE "AUTO" POSITION. "HAND" AND "OFF" POSITIONS SHALL BE USED ONLY FOR MAINTENANCE. WHEN THE UNIT IS "OFF" D-1, D-3, D-3 SHALL BE FULLY CLOSED. WHEN THE UNIT IS "ON" D-1, SD-1 AND SD-2 SHALL BE FULLY OPEN. D-2 AND D-3 SHALL MODULATE IN ACCORDANCE WITH THE FOLLOWING SEQUENCE:
- TEMPERATURE CONTROL**
 - SUPPLY AIR TEMPERATURE, SENSED BY TT-1, SHALL BE MAINTAINED AT SETPOINT VIA DIGITAL CONTROL PANEL BY MODULATING V-1 OR D-2 AND D-3 IN SEQUENCE.
 - WHEN THE TEMPERATURE OF THE OUTSIDE AIR, SENSED BY TT-2, IS ABOVE 75°F (ADJ) [23.8°C], THE DIGITAL CONTROL PANEL SHALL PREVENT THE MODULATION OF D-2 AND D-3 AND SHALL ASSUME THE MINIMUM OUTSIDE AIR POSITION (D-2 FULLY OPENED AND D-3 FULLY CLOSED). THE DIGITAL CONTROL PANEL SHALL MODULATE V-1 TO MAINTAIN THE SUPPLY AIR TEMPERATURE, SENSED BY TT-1.
 - WHEN THE TEMPERATURE OF THE OUTSIDE AIR, SENSED BY TT-2, IS BETWEEN 65°F [18.3°C] AND THE SUPPLY AIR TEMPERATURE SENSED BY TT-1, DAMPER D-2 SHALL FULLY CLOSE AND D-1 AND D-3 SHALL BE FULLY OPEN (MAXIMUM OUTSIDE AIR POSITION). THE DIGITAL CONTROL PANEL SHALL MODULATE V-1 TO MAINTAIN THE SUPPLY AIR TEMPERATURE, SENSED BY TT-1.
 - WHEN THE TEMPERATURE OF THE OUTSIDE AIR, SENSED BY TT-2, IS BELOW THE SUPPLY AIR TEMPERATURE, SENSED BY TT-1, DAMPERS D-1, D-2 AND D-3 SHALL MODULATE TO MAINTAIN THE SCHEDULED SUPPLY AIR TEMPERATURE. IF D-2 IS OPEN AND D-3 IS CLOSED TO MINIMUM OUTSIDE AIR, V-2 SHALL MODULATE OPEN TO MAINTAIN THE SUPPLY AIR TEMPERATURE, SENSED BY TT-1.
- AIR FLOW CONTROL**
 - THE SUPPLY AIR FLOW SHALL BE CONTROLLED BY THE DIGITAL CONTROL PANEL MODULATING THE SUPPLY FAN VARIABLE SPEED MOTOR CONTROLLER TO MAINTAIN 1.5" OF DUCT STATIC PRESSURE (FIELD ADJUSTABLE), SENSED BY SPS-1. RESET STATIC PRESSURE BASED ON ACTUAL BUILDING LOAD BY POLLING ALL ATU.
 - THE DIGITAL CONTROL PANEL, USING TOTAL SUPPLY AIR AND RETURN AIR FLOW SIGNALS, SHALL RESET THE RETURN AIR FAN VSMC TO MAINTAIN A CONSTANT AIR FLOW DIFFERENCE BETWEEN THE SUPPLY AIR AND THE RETURN AIR EQUAL TO MINIMUM OUTSIDE AIR.
 - USING HIGH PRESSURE SENSOR SPS-2 LOCATED AT THE SUPPLY FAN DISCHARGE, SHALL PREVENT THE SUPPLY FAN FROM DEVELOPING OVER 9" OF STATIC PRESSURE (FIELD ADJUSTABLE). IF STATIC PRESSURE AT SPS-2 DOES EXCEED 9" THE SUPPLY AIR FAN SHALL STOP. SPS-2 SHALL BE HARDWIRED TO THE SUPPLY FAN VSMC AND UNIT SHALL BE SHUTDOWN IN HAND AUTO OR BYPASS MODE. SPS-2 WILL REQUIRE MANUAL RESET AT THE DEVICE.
- HUMIDITY CONTROL**
 - WHEN THE DIGITAL CONTROL PANEL IS NOT CALLING FOR HUMIDITY, SENSED BY RETURN AIR HUMIDITY H-1, 2-WAY "ON-OFF" CONTROL VALVE V-3 SHALL REMAIN CLOSED. WHEN THE DIGITAL CONTROL PANEL IS CALLING FOR HUMIDITY, V-3 SHALL REMAIN OPEN.
 - RETURN AIR HUMIDITY SHALL BE MAINTAINED AT SETPOINT OF 35% RH (ADJ) VIA DIGITAL CONTROL PANEL BY MODULATING CONTROL VALVE V-4 TO MAINTAIN THE DESIRED HUMIDITY. THE DCP SHALL OVERRIDE THIS CONTROL TO MAINTAIN HUMIDITY OF 80% AS SENSED BY H-2. DCP SHALL CLOSE VALVE V-3 WHENEVER THE SUPPLY FAN IS OFF. VALVE V-4 SHALL BE INTERLOCKED WITH A TEMPERATURE SWITCH TO KEEP THE HUMIDIFIER OFF UNTIL CONDENSATE TEMPERATURE APPROACHES STEAM TEMPERATURE.
 - IF THE AIR TEMPERATURE AS SENSED BY TT-3 FALLS BELOW 45°F [7°C], AN ALARM SIGNAL SHALL INDICATE AT THE DCP AND ECC. IF THIS TEMPERATURE FALLS BELOW 40°F [4°C], AS SENSED BY THE TSL THE SUPPLY AND RETURN FANS SHALL SHUT DOWN AND A CRITICAL ALARM SHALL INDICATE AT THE DIGITAL CONTROL PANEL AND ECC. TSL SHALL BE HARDWIRED TO THE SUPPLY FAN AND UNIT SHALL BE SHUTDOWN IN HAND AUTO OR BYPASS MODE. TSL WILL REQUIRE MANUAL RESET AT THE DEVICE.
 - WHEN SMOKE IS DETECTED BY DUCT SMOKE DETECTOR, SD, THE SUPPLY AND RETURN FANS SHALL SHUT "OFF" AND AN ALARM SIGNAL SHALL BE TRANSMITTED TO THE FIRE ALARM SYSTEM.
 - EXHAUST FANS SERVING AREA OF THE SUPPLY FAN SHALL CONTINUE TO RUN. SUPPLY AND RETURN FANS SHALL RESTART WHEN FIRE ALARM CIRCUIT IS RESET.
 - UPON FAILURE OF THE VSMC, THE SUPPLY AND RETURN FANS SHALL BE STARTED/STOPPED MANUALLY AT THE DIGITAL CONTROL PANEL OR THE ECC THROUGH THE BY-PASS STARTER. FANS SHALL THEN BE OPERATED AT CONSTANT SPEED.
- MIXED AIR SECTION OPERATION**
 - DURING OCCUPIED PERIODS THE CONTROL SYSTEM SHALL PLACE THE OUTSIDE AIR, RETURN AIR, AND RELIEF AIR DAMPERS EITHER IN THE MINIMUM OUTSIDE AIR POSITION OR IN THE CONTROL POSITION DETERMINED BY THE ECONOMIZER CONTROLS WHICHEVER IS GREATER IN CFM OF OUTSIDE AIR DELIVERED.
 - MINIMUM OUTSIDE AIR: THE MINIMUM OUTSIDE AIR POSITION OF THE OUTSIDE AIR, RETURN AIR, AND RELIEF AIR DAMPERS SHALL BE CALIBRATED DURING TEST AND BALANCE.
 - ECONOMIZER: THE CONTROL SYSTEM SHALL MODULATE THE OUTSIDE AIR, RETURN AIR, AND RELIEF AIR DAMPERS TO MAINTAIN MIXED AIR TEMPERATURE AT 55 DEGREES F (ADJUSTABLE SETPOINT).
 - HIGH LIMIT LOCK OUT: WHEN THE OUTSIDE AIR TEMPERATURE EXCEEDS 67 DEGREES F (ADJUSTABLE SETPOINT) THE ECONOMIZER CONTROLS SHALL BE DISABLED.

JOB: 612-121 BUILDING: 501D AND 502F	POINT LEGEND	SYSTEM OUTPUTS		SYSTEM INPUTS		SYSTEM SOFTWARE/CONTROL		PAGE:
		BINARY	ANALOG	BINARY	ANALOG	ALARM PROCESSING	APPLICATION/FUNCTION	
SYSTEM: VAV AIR HANDLER								
SYSTEM COMPONENT:								
Return air Humidity	AI-1	RAT						
Return Air Humidity	AI-2	RAH						
Return Air Flow (cfm)	AI-3	RAF						
Mixed Air Temperature	AI-4	MAT						
Pre-Heat Temperature	AI-5	PHT						
Cooling Coil Temperature	AI-6	CCT						
Discharge Air Temperature	AI-7	DAT						
Discharge Static Pressure	AI-8	DASP						
Discharge Air Humidity	AI-9	DAH						
Supply Air Flow (cfm)	AI-10	SAF						
OUTSIDE AIR TEMPERATURE	AI-11	OAT						
OUTSIDE AIR FLOW (CFM)	AI-12	OAF						
RETURN FAN STATUS	BI-2	RF-ST5						
SUPPLY FAN STATUS	BI-3	SF-ST5						
MIXED AIR LOW LIMIT	BI-4	TSL-1						
STATIC PRESSURE HIGH LIMIT	BI-5	SPS-2						
HUMIDITY HIGH LIMIT	BI-6	HHL						
SUPPLY FAN VSMC ALARM	BI-7	SF-ALA						
RETURN FAN VSMC ALARM	BI-8	RF-ALA						
RETURN FAN VSMC	AO-1	RF-SPD						
SUPPLY FAN VSMC	AO-2	SF-SPD						
OUTSIDE AIR DAMPER	AO-3	OAD						
RETURN AIR DAMPER	AO-4	RAD						
EXHAUST AIR DAMPER	AO-5	EAD						
MINIMUM OUTSIDE AIR DAMPER	AO-7	MIN-OAD						
PRE-HEAT VALVE V-2	AO-8	PHT-V1						
COILING VALVE V-1	AO-9	CLG-V1						
HUMIDIFIER VALVE V-4	AO-10	HUM-V4						
RETURN FAN START/STOP	BO-1	RF-SST						
SUPPLY FAN START/STOP	BO-2	SF-SST						
HUMIDIFIER ISOLATION VALVE V-3	BO-3	HUM-ISO-V3						

3 POINTS LIST FOR VAV AIR HANDLING UNIT WITH OUTSIDE AIR



SEQUENCE OF OPERATION FOR INLINE PUMPS

PUMP OPERATION:
 DURING SCHEDULED OCCUPIED HOURS PROVIDED BY A LOCAL SCHEDULER SIGNAL, WITH THE HAND-OFF-AUTO SWITCH IN THE AUTO POSITION, THE COOLING SYSTEM PUMP SHALL BE TURNED ON WHEN THE COOLING COIL HAS CALLED FOR COOLING FOR 15 MINUTES (ADJUSTABLE) OR LONGER.

THE PUMP SHALL BE TURNED OFF WHEN THE COOLING COIL IS NOT CALLING FOR COOLING FOR 15 MINUTES (ADJUSTABLE) OR LONGER.

UNOCCUPIED MODE:
 DURING UNOCCUPIED HOURS THE CONTROL SYSTEM SHALL TURN ON THE LEAD PUMP WHENEVER ANY SPACE IS 85 F (ADJUSTABLE) OR GREATER. DURING UNOCCUPIED HOURS ONCE ACTIVATED THE CONTROL SYSTEM SHALL DISABLE THE LEAD PUMP WHENEVER ALL SPACES ARE BELOW 80 F (ADJUSTABLE).

PUMP ROTATION:
 THE CONTROL SYSTEM SHALL OPERATE THE PUMPS AS LEAD AND LAG ON A WEEKLY BASIS (ADJUSTABLE).

PUMP SPEED CONTROL:
 THE CONTROL SYSTEMS SHALL MODULATE THE PUMP SPEED TO MAINTAIN A SYSTEM DIFFERENTIAL PRESSURE SETPOINT. SETPOINT TO BE DETERMINED AT TEST AND BALANCE.

WHEN CHILLED WATER PUMPS ARE AT MINIMUM SPEED THE CONTROL SYSTEM SHALL MODULATE THE BYPASS VALVE TO MAINTAIN MINIMUM FLOW THROUGH THE CHILLER (60 GPM). MINIMUM FLOW SHALL BE DETERMINED BY THE PRESSURE DROP ACROSS THE CHILLER EVAPORATOR BUNDLE.

FREEZE PROTECTION MODE:
 THE CONTROL SYSTEM SHALL TURN ON THE LEAD PUMP AND RUN IT AT FULL SPEED WHENEVER THE OUTDOOR AIR IS BELOW 36 F (ADJUSTABLE) FOR 15 MINUTES. THE CONTROL SYSTEM SHALL TURN OFF THE LEAD PUMP WHENEVER THE OUTDOOR AIR RAISE ABOVE 36 F (ADJUSTABLE).

4 CHILLED WATER PUMP CONTROL DIAGRAM (PMP-1/PMP-2)

CONSULTANTS: 	ARCHITECT/ENGINEERS: 	Drawing Title: CONTROLS	Project Title: CONSTRUCT DOM CLINIC AND CLC ADMINISTRATION ADDITION	Project Number: 613-121	OFFICE OF CONSTRUCTION AND FACILITIES MANAGEMENT
		Approved Project Director:	Location: MARTINSBURG, WV	Building Number: 501D & 502F	
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