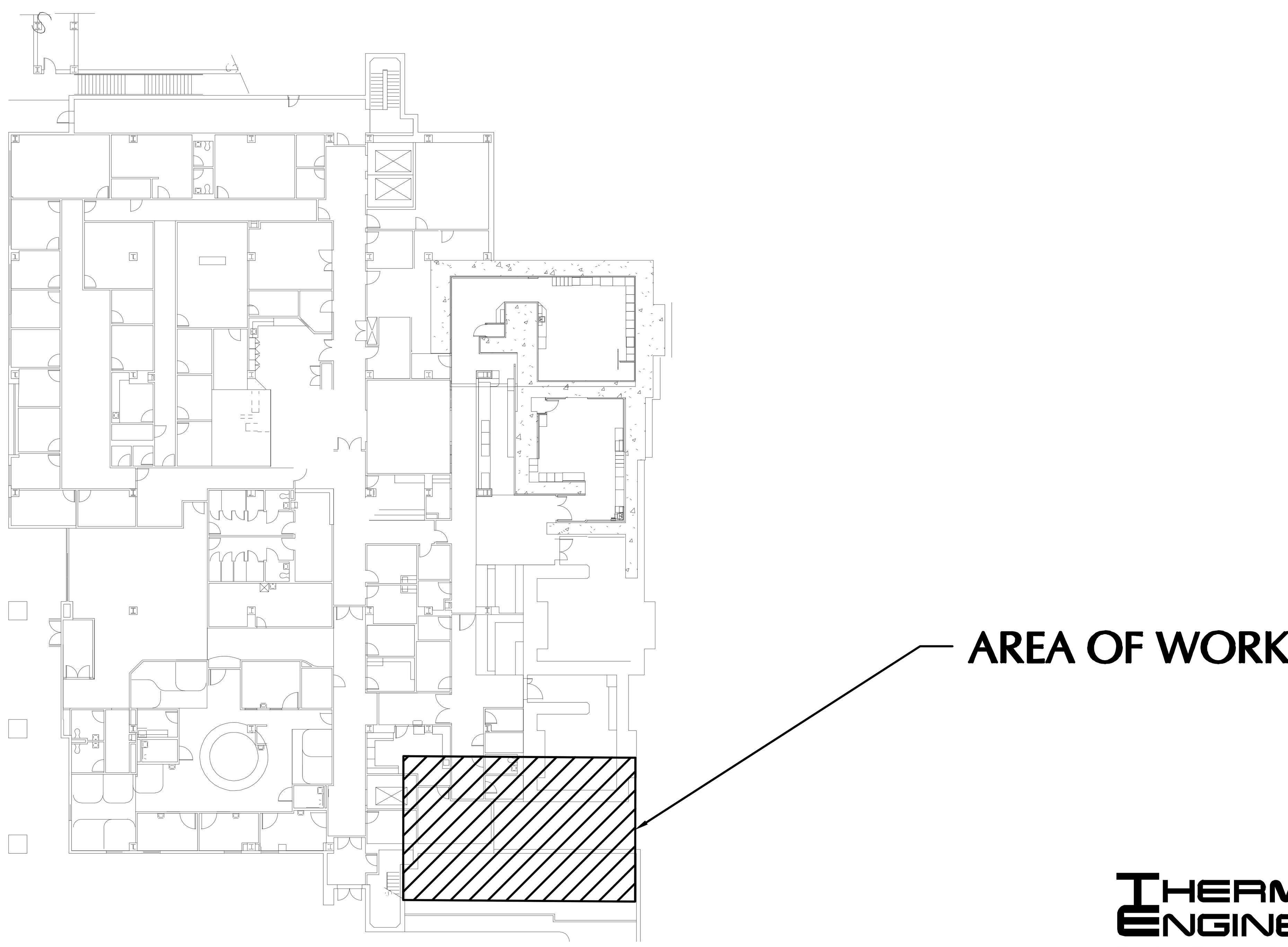
CINCINNATI, OHIO

BARRETT CANCER CENTER
PHARMACY AHU REPLACEMENT



KEY PLAN
SCALE: NONE
NORTH
1
CS01

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TE PROJECT NO.: 13331.590
DATE: FEBRUARY, 2024

DRAWING INDEX	
JOB # 13331.590	JOB NAME: BARRETT CANCER PHARMACY AHU REPLACEMENT
DRAWING NO.	DRAWING TITLE
CS01	COVER SHEET
MECHANICAL	
M001	LEGEND SHEET
M100	PARTIAL PLAN – DEMOLITION
M200	PARTIAL PLAN – NEW WORK
M700	SCHEDULES AND DETAILS
M701	AHU CONTROL DIAGRAM
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E100	PARTIAL PLAN – DEMOLITION
E200	PARTIAL PLAN – NEW WORK
E600	SINGLE LINE DIAGRAM
E700	PANEL SCHEDULES

DRAWING INDEX	
BUILDING	BARRETT CENTER
GROSS AREA	28,047
YEAR BUILT	1989
USE GROUP	I2
CONST TYPE	1B
FIRE SUPPRESS	FULLY SPRINKLERED
BUILDING CODES	2024 OHIO BUILDING CODE 2024 OHIO MECHANICAL CODE 2024 OHIO PLUMBING CODE 2023 NFPA 70 (NEC)

PROJECT DESCRIPTION

REPLACEMENT OF THE EXISTING AIR HANDLING UNIT AHU-3 WHICH SERVES A PORTION OF THE FIRST FLOOR LEVEL. CAPACITY IS INCREASED TO MEET THE CURRENT AND PROJECT FUTURE SPACE LOADS.

No.	REVISIONS	DATE
0	ISSUED FOR PERMIT AND CONSTRUCTION	02-26-24

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Project Number: 13331.490

University of Cincinnati Medical Center | UC Health.
DESIGN and CONSTRUCTION DEPARTMENT
234 GOODMAN STREET M.L. 0766
Cincinnati Ohio 45219 – 2316

Plot Scale | Drawn by CMM/SM | Date 02-26-24

PROJECT NAME: BARRETT CANCER CENTER
PHARMACY AIR HANDLING UNIT REPLACEMENT
DRAWING NAME: COVERSHEET
PROJECT NUMBER
CAD FILENAME
DC NO.

STATE OF OHIO
TERRANCE THOMPSON SHANNON
75602
REGISTERED
PROFESSIONAL ENGINEER

CS01

AIR DISTRIBUTION SYSTEM LEGEND

DOUBLE LINE	SINGLE LINE	DESCRIPTION
		NEW DUCTWORK
		EXISTING DUCTWORK
		DUCTWORK TO BE REMOVED
20x12	20x12	DUCT DIMENSIONS STATED ARE THE INSIDE, CLEAR DIMENSION. THE FIRST NUMBER IS THE DIMENSION OF THE SIDE SHOWN. THE SECOND DIMENSION THE DUCT DEPTH.
20x12	20x12	SUPPLY DUCT SECTION-(NET, INSIDE AREA). THE FIRST NUMBER IS THE HORIZONTAL DIMENSION IN VIEW, THE SECOND IS THE VERTICAL DIMENSION IN VIEW.
20x12	20x12	RETURN DUCT SECTIONS. DUCT DIMENSION AS DEFINED ABOVE.
		DUCT TURNING BEYOND PLANE OF DRAWING (SUPPLY DUCT SHOWN TURNING AWAY FROM VIEW).
		ELBOW, VANED TYPE
		ELBOW, RADIUS TYPE
		SUPPLY AIR OUTLET SOLID SHADING REFLECTS BLANKED THROW
		RETURN OR EXHAUST AIR INLET
		EXHAUST AIR INLET
		SIDEWALL OUTLET
		SIDEWALL INLET
AIR FLOW		FLEXIBLE DUCT - ROUND TAP INTO MAIN WITH SPIN-IN COLLAR & INTEGRAL BALANCING DAMPER.
AIR FLOW		45° RECTANGULAR TAP
		DAMPER IN VERTICAL POSITION - WITH ACCESS DOOR FD = FIRE DAMPER SD = SMOKE DAMPER FS = FIRE/SMOKE DAMPER RD = RADIATION DAMPER
		DAMPER IN HORIZONTAL POSITION - WITH ACCESS DOOR FD = FIRE DAMPER SD = SMOKE DAMPER FS = FIRE/SMOKE DAMPER RD = RADIATION DAMPER
		VOLUME DAMPER, MANUAL (HAND DAMPER)
		DAMPER - SEE SCHEDULE FOR BLADE TYPE AND DAMPER SPECIFICATIONS

MISCELLANEOUS SYMBOLS

- # SPECIFIC DRAWING NOTE (NUMBERED)
- EQUIP EQUIPMENT TAG
- * EXISTING EQUIPMENT
- ** OWNER FURNISHED EQUIPMENT
- \+ DESIGNATES EQUIPMENT FURNISHED BY OTHERS
- ++ DESIGNATES EQUIPMENT FURNISHED & INSTALLED BY OTHERS
- **EQUIP** EXISTING EQUIPMENT TAG
- 2 REVISION NUMBER
- 12 VALVE NUMBER
- 123 ROOM NUMBER
- NEW TIE-IN POINT
X = TIE-IN POINT NUMBERS IF USED
XXX
- 12B COLUMN NUMBER

WR / 1 — RISER LABEL W=WASTE, E=EXHAUST, D=DOMESTIC WATER S=SUPPLY, R=RETURN; DESIGNATION NUMBER

PLAN -
SCALE: 1/8" = 1'-0"
NORTH
1 / M100
DETAIL NUMBER OF DRAWING
DRAWING NUMBER IN SERIES WHERE DETAIL APPEARS
SCALE OF PLAN
BUILDING NORTH INDICATOR

DETAIL
SCALE: 1/4" = 1'-0"
NORTH
1 / M100
DETAIL NUMBER OF DRAWING
DRAWING NUMBER IN SERIES WHERE DETAIL APPEARS
SCALE OF DETAIL
DIRECTION FACING WHEN VIEWING

DIRECTION OF SECTION CUT
1 / M100 SECTION
DETAIL NUMBER OF SECTION
DRAWING NUMBER IN SERIES WHERE SECTION APPEARS

1 / 111 MATCH LINE
PLAN NUMBER WHERE THIS SIDE OF PLAN APPEARS
DRAWING NUMBER WHERE THIS SIDE OF PLAN APPEARS

PIPE FITTING SYMBOLS

- ELBOW, TURNED UP
- ELBOW, TURNED DOWN
- OFFSET AT 45°
- TEE, OUTLET UP
- TEE, OUTLET DOWN
- UNION
- CAP, THREADED
- CAP, WELDED
- BLIND FLANGE
- REDUCER
- DIRECTION OF FLOW
- DIRECTION OF PIPE SLOPE
- FLANGED CONNECTION
- GROOVED CONNECTION

SEE SPECIFICATIONS FOR PIPE CONNECTIONS (THREADED, SOLDERED, WELDED, ETC.)

VALVE SYMBOLS

- BALL VALVE
- BUTTERFLY VALVE
- DIAPHRAGM VALVE
- GATE VALVE
- GLOBE VALVE
- ANGLE VALVE
- PLUG VALVE
- THREE-WAY BALL VALVE
- THREE-WAY GLOBE VALVE
- BACK FLOW PREVENTER
- PRESET FLOW CONTROL VALVE
- CALIBRATED BALANCING VALVE
- CHECK, SWING GATE
- CHECK, SPRING
- PRESSURE REDUCING, SELF-REGULATED
- PRESSURE REDUCING, EXTERNAL PRESSURE
- QUICK OPENING
- *SET AT ___ X RELIEF (R) OR SAFETY (S)
- SQUARE HEAD COCK
- TRIPLE-DUTY VALVE
- BOILER NON-RETURN (STOP-CHECK) VALVE
- ROTARY VALVE

PIPING SPECIALTY SYMBOLS

- AUTOMATIC AIR ELIMINATOR
- MANUAL AIR ELIMINATOR
- S AIR SEPARATOR
- EXPANSION JOINT
- FLEXIBLE CONNECTOR
- FO FLOW ORIFICE
- FE FLOW METER
- WM WATER METER WITH DIGITAL READ OUT
- PRESSURE/TEMPERATURE TAP
- STEAM SIPHON
- T STEAM TRAP
- TA-x TRAP TYPE (SEE SCHEDULE, IF SPECIFIED)
- STRAINER, BASKET TYPE
- STRAINER, WYE TYPE.
- THERMOWELL
- SUCTION DIFFUSER
- VB VACUUM BREAKER

PIPE FLUID ABBREVIATIONS

BBD	BOILER BLOW DOWN
BD	BLOW DOWN
BCA	BOILER COMBUSTION AIR
BFG	BOILER FLUE GAS
BFW	BOILER FEED WATER
CBD	CONTINUOUS BOILER BLOW DOWN
CD	CONDENSATE DRAIN
CHWR	CHILLED WATER RETURN
CHWS	CHILLED WATER SUPPLY
CW	CITY WATER (POTABLE, DOM)
CWS	CONDENSER WATER SUPPLY
CWR	CONDENSER WATER RETURN
DHW	DOMESTIC HOT WATER (POTABLE)
DHWR	DOMESTIC HOT WATER RETURN (POTABLE)
DR	DRAIN
EXH	ENGINE EXHAUST
FOR	FUEL OIL RETURN
FOS	FUEL OIL SUPPLY
FP	FIRE PROTECTION
GLR	GLYCOL RETURN
GLS	GLYCOL SUPPLY
HWR	HOT WATER RETURN
HWS	HOT WATER SUPPLY
IA-XXX	INSTRUMENT AIR (PSIG)
MUW	MAKE UP WATER
NG-XXX	NATURAL GAS (PSIG)
PC	PUMPED CONDENSATE
PW	PROCESS WASTE, VENTS & DRAINS
RHG	REFRIGERANT HOT GAS
RL	REFRIGERANT LIQUID
RS	REFRIGERANT SUCTION
RV	RELIEF VENT
SC-XXX	STEAM CONDENSATE (PSIG)
ST	STORM SEWER
STM-XXX	STEAM (PSIG)
SS-XX/XX	SUPERHEATED STEAM (PSIG/TEMP)
V	VENT
VSC	VACUUM STEAM CONDENSATE
VTR	VENT THROUGH ROOF

MISCELLANEOUS ABBREVIATIONS

ACFM	ACTUAL CUBIC FEET/MINUTE
AFF	ABOVE FINISHED FLOOR
BLDG	BUILDING
BLR	BOILER
BOD	BOTTOM OF DUCT
BOI	BOTTOM OF INSULATION
BOP	BOTTOM OF PIPE
BOS	BOTTOM OF STEEL
BTU	BRITISH THERMAL UNIT
C	COMMON
CC	CONTROLS CONTRACTOR
CONC	CONCRETE
COND	CONDENSER
COP	CENTER OF PIPE
CFM	CUBIC FEET PER MINUTE
DIA	DIAMETER
DWG	DRAWING
EA	EXHAUST AIR
EC	ELECTRICAL CONTRACTOR
F	FAHRENHEIT (DEGREES)
FBO	FURNISHED BY OTHERS
FC	FIRE PROTECTION CONTRACTOR
FPM	FEET PER MINUTE
FPS	FEET PER SECOND
FOB	FLAT ON BOTTOM
FOT	FLAT ON TOP
FT	FEET
FTF	FITTING TO FITTING
GAL	GALLONS
GC	GENERAL TRADES CONTRACTOR
GPH	GALLONS PER HOUR
GPM	GALLONS PER MINUTE
HB	HOSE BIB
HP	HORSEPOWER
HZ	HERTZ
IE	INVERT ELEVATION
IN	INCHES
KEC	KITCHEN EQUIPMENT CONTRACTOR
KW	KILOWATT
M	MOTOR
MAX	MAXIMUM
MC	MECHANICAL CONTRACTOR
MCC	MOTOR CONTROL CENTER
MGC	MEDICAL GAS COLUMN
MIN	MINIMUM
NC	NORMALLY CLOSED
NO	NORMALLY OPEN
NPC	NITROGEN PRESSURE CONTROL
NPS	NITROGEN PRESSURE SWITCH
NTS	NOT TO SCALE
OA	OUTSIDE AIR
OD	OUTSIDE DIAMETER
OF	OWNER FURNISHED
PC	PLUMBING CONTRACTOR
P&ID	PROCESS & INSTRUMENTATION DIAGRAM
PSIA	POUNDS PER SQUARE INCH ABSOLUTE
PSIG	POUNDS PER SQUARE INCH GAUGE
RA	RETURN AIR
SA	SUPPLY AIR
SC	SECURITY CONTRACTOR
SCFM	STANDARD CUBIC FEET PER MINUTE
SPEC	SPECIFICATIONS
TA	TRANSFER AIR
TDH	TOTAL DYNAMIC HEAD
TOD	TOP OF DUCT
TOP	TOP OF PIPE
TOS	TOP OF STEEL
TYP	TYPICAL
VB	VALVE BOX
VIF	VERIFY IN FIELD
VS	VACUUM SWITCH
WK	WORK POINT (ELEVATION)
WP	WATER PROOF

PIPING LEGEND

- NEW PIPE
- EXISTING PIPE
- PIPE TO BE REMOVED
- PIPING BELOW FLOOR
- PIPING WITH HEAT TRACE

ACTUATOR SYMBOLS

- HANDWHEEL OR LEVER
- MODULATING CONTROL
- ELECTRONIC CONTROL
- ROTARY MOTOR
- RELIEF VALVE
- ELECTRONIC CONTROL - 2 POSITION

EQUIPMENT LEGEND

- HORIZONTAL SPLIT CASE PUMP
- IN-LINE PUMP WITH SUCTION DIFFUSER
- END SUCTION PUMP
- M MOTOR
- ROTARY PUMP
- TURBINE
- FAN OR BLOWER

SOME SYMBOLS AND ABBREVIATIONS APPEARING ON THIS SHEET MAY NOT BE USED ON THE PROJECT.

GENERAL NOTES

APPLIES TO ALL DRAWINGS OF THIS TRADE

A FOR KEY PLAN, COVERSHEET, AND CODE INFORMATION SEE CS01.

B FOR LEGEND, SYMBOLS AND GENERAL NOTES, SEE THIS DRAWING.

C COORDINATE ALL MECHANICAL AND TEMPERATURE CONTROL WORK WITH EXISTING CONDITIONS, THE OWNER'S MAINTENANCE STAFF, AND THE WORK OF OTHER CONTRACTORS. THE CONTRACTOR SHALL INCUR ALL COSTS FOR RELOCATION OF EQUIPMENT CONFLICTING WITH EXISTING EQUIPMENT OR NEW WORK BY OTHER DISCIPLINES.

D EXAMINE ALL EXISTING CONDITIONS. VERIFY ALL DIMENSIONS. THE DRAWINGS ARE ILLUSTRATIVE AND MAY NOT REFLECT EXACT CONDITIONS OR DIMENSIONS.

E DO NOT SCALE DRAWINGS. THE DRAWINGS ARE DIAGRAMMATIC AND SHOW THE GENERAL ARRANGEMENT OR GEOMETRICAL RELATIONSHIP OF EQUIPMENT AND SERVICES. THEY ARE NOT INTENDED TO SHOW EVERY OFFSET, FITTING, AND COMPONENT. VERIFY THE EXACT LOCATION OF EXISTING SERVICES, CONDITIONS AND NEW EQUIPMENT PRIOR TO CONSTRUCTION.

F THE DESIGN AND DRAWINGS ARE BASED ON THE USE OF SPECIFIC REFERENCE PRODUCTS, THE SELECTION OF WHICH HAS IMPACTED THE DESIGNS OF OTHER TRADES. IF ALTERNATE MANUFACTURERS, FUEL SOURCES, SIZES, OR MODELS ARE SUBMITTED OR BID, IT IS THE RESPONSIBILITY OF THE GENERAL CONTRACTOR AND ALL SUBCONTRACTORS TO COORDINATE ALL IMPACTS PRIOR TO BID. NO EXTRAS WILL BE ALLOWED FOR CHANGES REQUIRED TO ACCOMMODATE ALTERNATE PRODUCTS THAT ARE BID OR INSTALLED AT THE CONTRACTOR'S OPTION. ENGINEERING FEES WHICH RESULT FROM RE-DESIGN FOR ALTERNATE PRODUCTS, SHALL BE PAID BY THE CONTRACTORS AT NO ADDITIONAL COST TO THE OWNER.

G DRAWINGS SPECIFIC TO THIS TRADE DO NOT LIMIT THE RESPONSIBILITY OR WORK REQUIRED BY THE CONTRACT DOCUMENTS. REFER TO DRAWINGS AND SPECIFICATIONS OF OTHER TRADES FOR COMPLETE INFORMATION PRIOR TO BID. COORDINATE ALL WORK WITH THE CONSTRUCTION PHASES OF THE PROJECT.

H WHERE CONFLICTS EXIST AMONG DRAWINGS, SPECIFICATIONS, AND EQUIPMENT SCHEDULES, THE MORE STRINGENT SHALL APPLY. NOTIFY THE ENGINEER OF ALL CONFLICTS FOR RESOLUTION OR INTERPRETATION.

I NOTIFY THE OWNER AND FIELD VERIFY CONDITIONS BEFORE TRENCHING, SAW CUTTING, CORING, OR MAKING OTHER STRUCTURAL MODIFICATIONS. ENSURE THAT NO ADVERSE EFFECT TO THE BUILDING'S STRUCTURAL INTEGRITY WILL OCCUR.

J ANY EXISTING CONDITION DISCOVERED DURING THE DEMOLITION OR CONSTRUCTION PROCESS, WHICH BY GENERALLY ACCEPTED CONSTRUCTION PRACTICES, SHOULD BE REMEDIED, SHOULD BE BROUGHT TO THE ATTENTION OF THE OWNER/ENGINEER IMMEDIATELY, IN WRITING.

K PROVIDE PROTECTION TO THE EXISTING FACILITY FROM DAMAGE OF ANY KIND DURING ALL PHASES OF THE PROJECT.

L OBTAIN WRITTEN APPROVAL FROM THE OWNER/ENGINEER BEFORE RE-USING EXISTING EQUIPMENT, COMPONENTS, OR OPENINGS.

M EXCEPT WHERE MODIFIED BY SPECIFIC NOTATION, THE INDICATION OR DESCRIPTION OF ANY ITEM IN THE DRAWINGS, SPECIFICATIONS, OR BOTH CARRIES WITH IT THE INSTRUCTION TO FURNISH AND INSTALL THE ITEM, REGARDLESS OF WHETHER OR NOT THIS INSTRUCTION IS EXPLICITLY STATED AS PART OF THE INDICATION OR DESCRIPTION.

N COORDINATE ALL SERVICE OUTAGES WITH THE OWNER. MAINTAIN SERVICE TO OTHER PARTS OF THE BUILDING DURING DEMOLITION.

O THE CONTRACTOR SHALL HAVE A FORMAL WORK SAFETY PROGRAM APPROVED BY THE OWNER, WHICH MEETS WEEKLY AND INCLUDES ALL EMPLOYEES AND SUB-CONTRACTORS ON SITE.

P COORDINATE ALL DEMOLITION WORK WITH THE NEW WORK OF ALL OTHER TRADES.

Q PATCH ALL HOLES IN FLOORS, WALLS, AND CEILINGS RESULTING FROM DEMOLITION WHICH WILL NOT BE USED FOR THE NEW WORK. USE MATERIALS TO MATCH THE EXISTING FINISH AND FIRE RATING.

R PATCH ALL INSULATION TO MATCH EXISTING THAT IS DISTURBED BY THIS WORK. COORINATE THE EXTENTOF REMOVAL OF THE EXISTING INSULATION ON DUCTWORK AND PIPING SYSTEMS THAT ARE TO REMAIN WITH THE NEW WORK. PROVIDE UNIFORM SEALED CONNECTIONS BETWEEN THE EXISTING AND THE NEW INSULATION MATERIALS.

S VERIFY ALL EXISTING DUCTWORK, PIPING, CONDUITS TEMPERATURE CONTROLS AND SPECIALTIES THAT INTERFERE OR ARE ASSOCIATED WITH DEMOLITION AND NEW WORK. PROVIDE ALL NECESSARY LABOR AND MATERIALS TO REMOVE, RELOCATE AND REINSTALL AS REQUIRED ANY DUCTWORK, PIPING, CONDUITS, ELECTRICAL POWER, TEMPERATURE CONTROLS AND SPECIALTIES TO MEET THE REQUIREMENTS OF THE DEMOLITION AND NEW WORK. COORDINATE THIS WORK PRIOR TO STARTING DEMOLITION.

T THE TEMPERATURE CONTROL CONTRACTOR SHALL PROVIDE ALL DEMOLITION, TEMPORARY AND PERMAMENT RELOCATION, MODIFICATIONS OF EXISTING AND NEW WORK ASSOCIATED WITH THE BUILDING TEMPERATURE CONTROL SYSTEMS TO COMPLETE THIS PROJECT. THE TEMPERATURE CONTROL CONTRACTOR ALL NECESSARY ELECTRICAL POWER AND CONDUIT TO ALL CONTROL DEVICES AS REQUIRED BY THE OWNER.

U REMOVE ALL EXISTING SUPPORTS ASSOCIATED WITH SYSTEMS REMOVED UNDER THE DEMOLITION PORTION OF THE PROJECT.

V OWNER TO PROVIDE DUMPSTERS TO COMPLETE THE DEMOLITION AND NEW WORK. COORDINATE FINAL LOCATION WITH THE OWNER.

W THE WORK ASSOCIATED WITH THIS PROJECT MUST BE COMPLETED WITHIN THE REQUIREMENTS OF DIVISION 1. SUBMIT A SCHEDULE OF CONTRUCTION TO THE OWNER PRIOR TO STARING WORK.

X REMOVE ALL EXISTING PNUEMATIC TUBING ASSOCIATED WITH THE DEMOLITION WORK. REMOVE TUBING BACK TO THE MAINS AND HARD CAP. DO NOT BEND OR CRIMP TUBING TO CAP.

Y PROVIDE TEMPORARY DUCTWORK AND PIPING CAPS FOR USE DURING DEMOLITION IN SYSTEMS THAT ARE REMOVED OR RECONNECTED TO. PIPING AND DUCTWORK CAPS SHALL BE OF MATERIALS THAT MATCH THE EXISTING SYSTEM MATERIALS. COORDINATE ALL WORK WITH PROJECT CONSTRUCTION PHASES.

Z COORDINATE THE NEW AND DEMOLISHED EQUIPMENT SIZE WITH ROUTING THROUGH ELEVATORS, CORRIDORS, DOORWAYS, ETC. DISMANTLE & REASSEMBLE UNIT(S) AS REQUIRED TO TRANSPORT TO INSTALLATION LOCATION. REMOVE AND REINSTALL BUILDING COMPONENTS AS REQUIRED TO TRANSPORT EQUIPMENT TO NEW INSTALLATION LOCATION. FOLLOW THE OWNERS REQUIREMENTS FOR THIS WORK.

AA MOUNT DUCTS, PIPING, AND EQUIPMENT TO ALLOW FOR SERVICE CLEARANCE, COIL PULLS, AND 42" FROM ELECTRICAL PANELS & JUNCTION BOXES. COORDINATE WITH ALL TRADES PRIOR TO CONSTRUCTION.

AB CUT AND PATCH ALL FLOORS AND WALLS AS REQUIRED FOR DEMOLITION AND NEW WORK.

AC COORDINATE THE MODIFICATIONS OF THE FIRE PROTECTION SYSTEM AS REQUIRED FOR INSTALLATION OF NEW WORK, AND FOR THE REVISED OCCUPANCY.

AD IF WORK SHALL BE DONE THROUGH EXISTING CEILING GRIDS, CEILING TILE REMOVAL & REINSTALLATION, FOR THIS TRADES WORK, SHALL BE THE RESPONSIBILITY OF THIS CONTRACTOR. COORDINATE AREAS WHERE THE EXISTING CEILING IS TO REMAIN PRIOR TO CONSTRUCTION.

AE PROVIDE TEMPORARY SUPPORTS FOR CEILING MOUNTED AIR DEVICES WHERE CEILINGS ARE REMOVED UNDER THIS CONTRACT.

AF PROVIDE TEMPORARY AND PERMAMENT PATCHES TO WALL AND FLOOR SLAB PENETRATIONS DURING CONSTRUCTION TO PROVIDE PROPER SEALING OF THE SPACE DURING CONSTRUCTION. REFER TO THE ARCHITECTURAL DRAWINGS AND OWNERS REQUIREMENTS FOR BARRIERS DURING CONSTRUCTION AND COORDINATE PATCHING OF ALL WALL AND SLAB PENETRATIONS.

AG REFER TO THE ARCHITECTURAL PLANS FOR CONSTRUCTION PHASING AND CONSTRUCTION BARRIERS. PROVIDE TEMPORARY CAPS ON PIPING AND DUCTWORK TO ISOLATE THE MECHANICAL SYSTEMS AS REQUIRED DURING CONSTRUCTION. COORDINATE MECHANICAL SYSTEM SHUTDOWNS TO INSTALL CAPS WITH THE OWNER PRIOR TO CONSTRUCTION.

AH DUCTWORK AND PIPING CAPS SHALL BE INSTALLED BY REMOVING THE BRANCH SYSTEMS CONNECTIONS AHEAD OF TERMINAL UNITS, AIR DEVICES AND PIPE BRANCHES AT THE START OF DEMOLITION. THE REMAINDER OF THE DEMOLITION SHALL BE COMPLETED AFTER THE DUCTWORK AND PIPING CAPS ARE INSTALLED, ALLOWING THE CENTRAL PIPING AND AIR DISTRIBUTION SYSTEMS TO REMAIN IN OPERATION DURING THE CONSTRUCTION PHASES.

AI COMPLY WITH THE UC HEALTH INFECTION CONTROL REQUIREMENTS DURING CONSTRUCTION.

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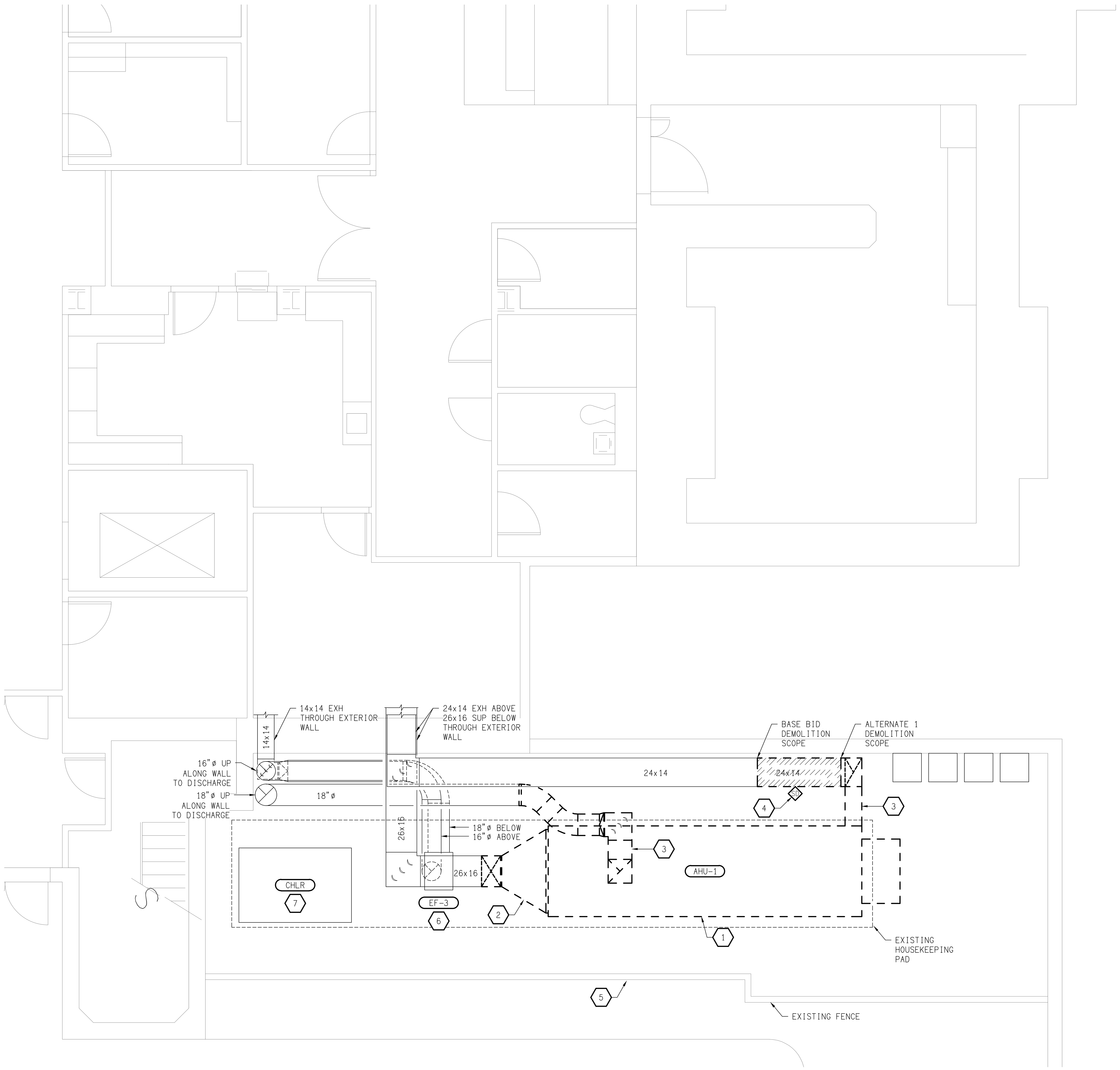
Cincinnati Ohio 45219 - 2316

Plot Scale | Drawn by CMM/SM | Date 02-26-24

PROJECT NAME: BARRETT CANCER CENTER PHARMACY AIR HANDLING UNIT REPLACEMENT
DRAWING NAME: MECHANICAL LEGENDS & GENERAL NOTES
PROJECT NUMBER
DC NO.
CAD FILENAME

STATE OF OHIO
TERRANCE THOMPSON CANNON
75602
REGISTERED
PROFESSIONAL ENGINEER

M001



PARTIAL PLAN - 1ST FL - DEMOLITION

SCALE: 1/4" = 1'-0"

NORTH

1
M100

DRAWING NOTES

DRAWING M100

1 DEMOLISH EXISTING AIR HANDLING UNIT AND ALL ASSOCIATED ACCESSORIES FROM APPROXIMATE LOCATION INDICATED. EXISTING CONCRETE HOUSEKEEPING PAD TO REMAIN IN PLACE FOR USE WITH NEW EQUIPMENT.

2 DEMOLISH EXISTING SUPPLY DUCTWORK, FITTINGS, INSULATION, AND SUPPORTS AS INDICATED. MAINTAIN CONNECTION POINT FOR TIE IN IN NEW WORK SCOPE. PROVIDE TEMPORARY SUPPORTS FROM GRADE AS REQUIRED DURING CONSTRUCTION.

3 DEMOLISH EXISTING EXHAUST DUCTWORK, FITTINGS, INSULATION, AND SUPPORTS AS INDICATED. PROVIDE TEMPORARY SUPPORTS FOR ELEVATED DUCTWORK SUPPORTED FROM REMOVED EQUIPMENT. BASE BID AND ALTERNATE 1 DEMOLITION SCOPE SHOWN VIA HATCHED AREA.

4 BASE BID: DEMOLISH EXISTING DUCT MOUNTED SMOKE DETECTOR IN APPROXIMATE LOCATION INDICATED. EC TO REMOVE WIRING TO DEMOLISH DEVICE. ALTERNATE 1: EXISTING DUCT MOUNTED SMOKE DETECTOR TO REMAIN OPERATIONAL IN PLACE.

5 TEMPORARILY REMOVE EXISTING FENCE ENCLOSURE AS REQUIRED FOR DEMOLITION AND NEW WORK SCOPE.

6 EXISTING EXHAUST FAN TO REMAIN OPERATIONAL IN PLACE.

7 EXISTING CHILLER TO REMAIN OPERATIONAL IN PLACE.

EQUIPMENT NOTES

* AHU-1 EXISTING AIR HANDLING UNIT. TO BE DEMOLISHED.

* CHLR EXISTING AIR-COOLED CHILLER. ASSOCIATED WITH INTERIOR LINEAR ACCELERATORS. TO REMAIN OPERATIONAL IN PLACE.

* EF-1 EXISTING GREENHECK UTILITY SET EXHAUST FAN. 1,950 CFM, 2 HP MOTOR, 460/60/3. M/N: 12-BISW-21-X. TO REMAIN OPERATIONAL IN PLACE.

* DESIGNATES EXISTING EQUIPMENT

GENERAL NOTES

APPLIES TO ALL DRAWINGS OF THIS TRADE

A FOR KEY PLAN AND DRAWING INDEX SEE DRAWING CS01.

B FOR GENERAL NOTES, LEGEND AND SYMBOLS SEE DRAWING M001.

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PROJECT NAME: BARRETT CANCER CENTER PHARMACY AIR HANDLING UNIT REPLACEMENT

DRAWING NAME: MECHANICAL PARTIAL PLAN-1ST FL-DEMOLITION

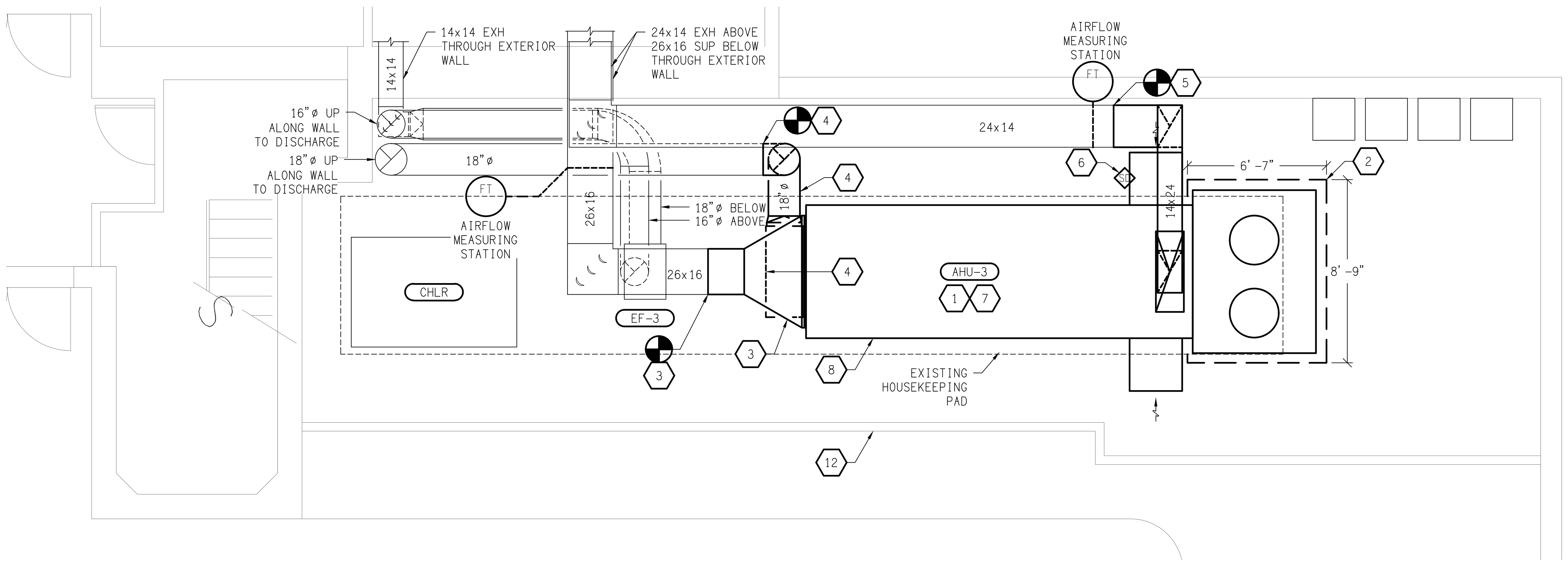
PROJECT NUMBER

CAD FILENAME

DC NO.

STATE OF OHIO
TERRANCE THOMPSON SHANNON
75602
REGISTERED
PROFESSIONAL ENGINEER

M100



PARTIAL PLAN - 1ST FL - NEW WORK - BASE BID

SCALE: 1/4" = 1'-0"

NORTH

1 / M200

DRAWING NOTES

DRAWING M200

1 RIG AND INSTALL NEW AIR HANDLING UNIT IN APPROXIMATE LOCATION INDICATED. COORDINATE EXACT LOCATION WITH OPERATIONAL CLEARANCE REQUIREMENTS AND EXISTING DUCTWORK CONNECTION POINTS.

2 EXPAND EXISTING CONCRETE HOUSEKEEPING PAD TO MATCH NEW AIR HANDLING UNIT FOOTPRINT. EXCAVATE AND REFILL GRAVEL AND SOIL AROUND NEW PAD FOOTPRINT AS REQUIRED. TOP OF NEW PAD TO BE LEVEL. MATCH EXISTING PAD CONSTRUCTION AND THICKNESS. CHAMFER NEW PAD EDGES TO MATCH EXISTING PAD EDGES.

3 PROVIDE NEW SUPPLY DUCTWORK, FITTINGS, SUPPORTS, AND INSULATION FROM TOP END DISCHARGE TO EXISTING TIE-IN POINT AS INDICATED. TIE-IN TO EXISTING MAIN IN APPROXIMATE LOCATIONS INDICATED. SUPPORT NEW DUCTWORK FROM GRADE WITH NON-PENETRATING SUPPORTS.

4 BASE PLAN: PROVIDE NEW EXHAUST DUCTWORK, FITTINGS, SUPPORTS, AND INSULATION FROM ELEVATED MAIN DOWN TO BOTTOM END DISCHARGE CONNECTION ON AHU. EXTEND DISCHARGE CONNECTION OUT FULL SIZE. SUPPORT FROM GRADE AND WALL AS APPLICABLE. ALTERNATE 1: PROVIDE NEW EXHAUST DUCTWORK, FITTINGS, SUPPORTS, AND INSULATOIN FROM ELEVATED MAIN TO TOP DISCHARGE CONNECTION ON AHU. SUPPORT FROM THE WALL AND TOP OF UNIT AS APPLICABLE.

5 PROVIDE NEW EXHAUST DUCTWORK, FITTINGS, SUPPORTS, AND INSULATION FROM ELEVATED MAIN ALONG WALL TO TOP EXHAUST INLET CONNECTION ON NEW AHU. ADJUST NEW DUCTWORK ELEVATION AS REQUIRED. SUPPORT NEW DUCTWORK FROM WALL AND FROM TOP OF UNIT WITH NON-PENETRATING SUPPORTS.

6 BASE PLAN: MOUNT NEW SMOKE DETECTOR ON EXHAUST DUCTWORK IN APPROXIMATE LOCAITON INDICATED. SD TO BE FURNISHED AND WIRED BY EC. ALTERNATE 1: EXISTING DUCT MOUNTED SMOKE DETECTOR TO REMAIN OPERATIONAL IN PLACE.

7 MOUNT ALL FIELD INSTALLED COMPONENTS AND CONTROL DEVICES ASSOCATED WITH NEW AIR HANDLING UNIT AS APPLICABLE. DEVICES MAY INCLUDE DUCT MOUNTED PRESSURE / TEMPERATURE SENSORS AND WEATHER HOODS.

8 PROVIDE CONDENSATE DRAIN PIPING FROM DRAIN PAN CONNECTION. DISCHARGE TO GRADE.

9 ALTERNATE 1: RIG AND INSTALL NEW CONDENSING UNIT IN APPROXIMATE LOCATION INDICATED. COORDINATE EXACT LOCATION WITH OPERATIONAL CLEARANCE REQUIREMENTS AND EXISTING SITE CONDITIONS. PROVIDE NEW CONCRETE HOUSEKEEPING PAD BELOW NEW CONDENSING UNIT. TOP OF PAD TO BE LEVEL. CHAMFER NEW PAD EDGES TO MATCH EXISTING PAD EDGES.

10 ALTERNATE 1: PROVIDE NEW REFRIGERANT PIPING, FITTINGS, SUPPORTS, AND INSULATION BETWEEN NEW AIR HANDLING UNIT DX COIL AND SPLIT CONDENSING UNIT. SIZE AND INSULATE PER MANUFACTURER'S GUIDELINES.

11 ALTERNATE 1: REMOVE AND WORK EXISTING FENCE AND GATE TO ENCLOSE NEW CONDENSING UNIT. PROVIDE (1) GATE FOR ENCLOSURE ACCESS. COORDINATE GATE LOCATION WITH OWNER.

12 RE-INSTALL FENCING ENCLOSURE FOLLOWING INSTALLATION OF AIR HANDLING UNIT IN COURTYARD.

13 PROVIDE NEW FENCING ENCLOSURE SURROUNDING NEW CONDENSING UNIT. COORDINATE EXACT FENCING REQUIREMENTS WITH CU SERVICE AND OPERATION CLEARANCES, EXISTING BUILDING STRUCTURES, AND PARKING LOT CURBS. NEW FENCE CONSTRUCTION TO MATCH EXISTING COURTYARD FENCE CONSTRUCTION. PROVIDE GATE FOR ACCESS TO FENCING ENCLOSURE AS NEEDED. COORDINATE GATE LOCATION WITH OWNER.

EQUIPMENT NOTES

\+ AHU-3 NEW AIR HANDLING UNIT. PACKAGED SYSTEM. SEE SCHEDULES FOR ADDITIONAL DETAIL.

\+ AHU-3A NEW AIR HANDLING UNIT. SPLIT CONDENSING SECTION. SEE SCHEDULES FOR ADDITIONAL DETAIL.

\+ CU-3A NEW CONDENSING UNIT. SEE SCHEDULES FOR ADDITIONAL DETAIL.

* CHLR EXISTING AIR-COOLED CHILLER. ASSOCIATED WITH INTERIOR LINEAR ACCELERATORS. TO REMAIN OPERATIONAL IN PLACE.

* EF-1 EXISTING GREENHECK UTILITY SET EXHAUST FAN. 1,950 CFM, 2 HP MOTOR, 460/60/3. M/N: 12-BISW-21-X. TO REMAIN OPERATIONAL IN PLACE.

* DESIGNATES EXISTING EQUIPMENT
\+ DESIGNATES EQUIPMENT FURNISHED BY OTHERS

GENERAL NOTES

APPLIES TO ALL DRAWINGS OF THIS TRADE

A FOR KEY PLAN AND DRAWING INDEX SEE DRAWING CS01.

B FOR GENERAL NOTES, LEGEND AND SYMBOLS SEE DRAWING M001.

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Project Number: 13331.490

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Cincinnati Ohio 45219 - 2316

Plot Scale | Drawn by CMM/SM | Date 02-26-24

PROJECT NAME: BARRETT CANCER CENTER
PHARMACY AIR HANDLING UNIT REPLACEMENT

DRAWING NAME: MECHANICAL
PARTIAL PLAN-1ST FL-NEW WORK

PROJECT NUMBER

CAD FILENAME

DC NO.

STATE OF OHIO
TERRANCE THOMPSON SHANNON
75602
REGISTERED
PROFESSIONAL ENGINEER

M200

CUSTOM AIR HANDLING UNIT SCHEDULE

UNIT	LOCATION	PREFERRED UNIT FOOTPRINT L x W IN.	UNIT WEIGHT LBS	PERFORMANCE CONDITION	FAN DATA: FAN	TOTAL AIR FLOW, CFM	MIN ESP, IN. WG [1]	MAX FAN RPM	FAN TYPE	ARRANG ROWS X COLUMNS	# OF FANS	NO. FAN SPEEDS	MOTOR SIZE, HP EA.	LOAD AT DESIGN HP EA.	FAN V/F/PH	MINIMUM OUTDOOR AIR FLOW: DESIGN, CFM	OPERATE, CFM
AHU-3	ON GRADE CONCRETE SUPPORT PAD	263 x 76	10248	BASE	SUPPLY	4,000	2.50		PLENUM	2 x 1	2	VAR	10		460/60/3	4,000	4,000
					RELIEF	2,660	1.25		PLENUM	2 x 1	2	VAR	3		460/60/3	4,000	4,000
				FUTURE	SUPPLY	5,000	2.50	2,937	PLENUM	2 x 1	2	VAR	10	6.93	460/60/3	5,000	5,000
					RELIEF	3,325	1.25	1,877	PLENUM	2 x 1	2	VAR	3	1.84	460/60/3	5,000	5,000

UNIT / CONDITION / FAN	COIL DATA: COIL TYPE OR MODE [2]	COIL AIR FLOW, CFM	OUTDOOR AIR DB, DEG F	OUTDOOR AIR WB, DEG F	O.A. FROM ENERGY EXCHANGER DB, DEG F	O.A. FROM ENERGY EXCHANGER WB, DEG F	SUP FAN POSIT, BLOW/ DRAW	MOTOR POSIT, IN/ OUT	FAN TEMP RISE, DEG F	COIL EAT, DB, DEG F	COIL EAT, WB, DEG F	COIL LAT [3], DB, DEG F	COIL LAT [3], WB, DEG F	COIL LOAD [6], MBH	MIN FACE AREA, SF	ELECTRICAL HEATING COIL: COIL LOAD, KW	COIL SIZE KW	VOLT/ FREQ/ PH	CAPACITY CONTROL	REFRIGERANT COIL: SUCT TEMP, DEG F	CAPAC [6], TONS	MIN # OF CIRCUITS	# OF STAGES	REFRIG TYPE
AHU-3 BASE SUPPLY	HEAT	4,000	0		40		DRAW	IN	0.0	40.0		60		-87	8.0	25	25.0	460/60/3	SCR					
AHU-3 BASE RELIEF	COOL	4,000	92.7	76	85	72	DRAW	IN	0.0	85.0	72.0	53	52	257	8.0					45	21.4	2	MODUL	R-410A
AHU-3 FUTURE SUPPLY	HEAT	5,000	0		40		DRAW	IN	0.0	40.0		60		-108	10.0	32	32.0	460/60/3	SCR					
AHU-3 FUTURE RELIEF	COOL	5,000	92.7	76	85	72	DRAW	IN	0.0	85.0	72.0	53	52	322	10.0					45	26.8	2	MODUL	R-410A

GENERAL NOTES:

[1] FAN ESP IS EXTERNAL TO THE UNIT. ALL FILTER AND COIL PRESSURE DROPS ARE TO BE INCLUDED IN THE INTERNAL LOSSES OF THE UNIT. USE DIRTY FILTER PRESSURE DROPS TO COMPUTE INTERNAL LOSS. THE "LOAD HP AT DESIGN" IS APPROXIMATE, AND MAY CHANGE BASED ON THE PARTICULAR UNIT SELECTED. NOTIFY THE ENGINEER IF A MOTOR SIZE OTHER THAN LISTED IS REQUIRED TO PROVIDE A MOTOR THAT IS NOT OVERLOADED AT THE DESIGN ESP, INCLUDING THE AFFECTS OF DRIVE LOSSES AND INTERNAL LOSSES.

[2] STATE COIL TYPE (HW, CHW, ETC.) IF MORE THAN ONE COIL PER UNIT. STATE MODE IF ONE COIL IS USED FOR MULTIPLE DUTY (HEATING, COOLING).

[3] MAXIMUM FOR COOLING COILS, MINIMUM FOR HEATING COILS

[4] MIN AVAILABLE EWT, MAX ALLOWABLE LWT FOR COOLING COILS. MAX AVAILABLE EWT, MIN ALLOWABLE LWT FOR

HEATING COILS

[5] ROW = ROW SPLIT, FACE=FACE-SPLIT, INTER=INTERTWINED CIRCUITING

[6] CAPACITY INFO IS FOR REFERENCE ONLY. DO NOT USE FOR COIL SELECTION. USE ENTERING AND LEAVING TEMPS AND FLOW RATE TO CALCULATE PERFORMANCE.

FILTER DATA: FILTER	CLEAN PRESS. DROP, IN. WG	DIRTY PRESS. DROP, IN. WG	AIR STREAM POSITION	MAX FILTER VEL, FPM	UNIT ELECTRICAL DATA: MAX UNIT MCA	MAX UNIT MOCP	VOLT/FREQ/PH	REFERENCE PRODUCT
F-1 F-2 F-3	0.1 0.5 0.8	0.5 1 1.6	OA & EXH MIXED - PRE MIXED - FINAL	400	79.3	100	460 / 60 / 3	SOLUTION AIR

NOTES (SEE BELOW)

A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z	AA	AB	AC	AD	AE	AF	AG	AH	AI	AJ	AK	AL	AM	AN	AO	AP
X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X		X		X	X	X	X	X	X	X			X

FILTER TYPES:

F-1 2" PLEATED, MERV 8, 30% EFFIC CAMFIL FARR 30/30 OR EQUAL

F-2 V-BANK, MERV 15 / OZONE 9 CAMFIL CITYCARB 1 OR EQUAL

F-3 HEPA, CAMFIL ABSOLUTE V OR EQUAL

NOTES AND OPTIONS:

A INITIAL AIR BALANCE TO BE SET TO "OPERATING MIN OUTDOOR AIR FLOW"
B MIN 2" DOUBLE WALL FOAM FILLED THERMAL BREAK CONSTR
C OUTDOOR UNIT WITH STACKED CONFIGURATION
D VAV UNIT

FAN/MOTOR OPTIONS:
E INTERNAL FAN VIBRATION ISOLATION
F PREMIUM EFFICIENCY MOTORS W/ DISCONNECTS
G FACTORY MOUNTED VFD FOR EACH SA / EXH FAN
BASE BID: SQUARE D ALTIVAR 660 VFDs
DEDUCT: MANUFACTURER'S PREFERRED VFDs
H MAXIMUM SOUND POWER LEVELS PER SPEC
I N+1 FAN REDUNDANCY
J BACKDRAFT DAMPERS ON ARRAY FANS

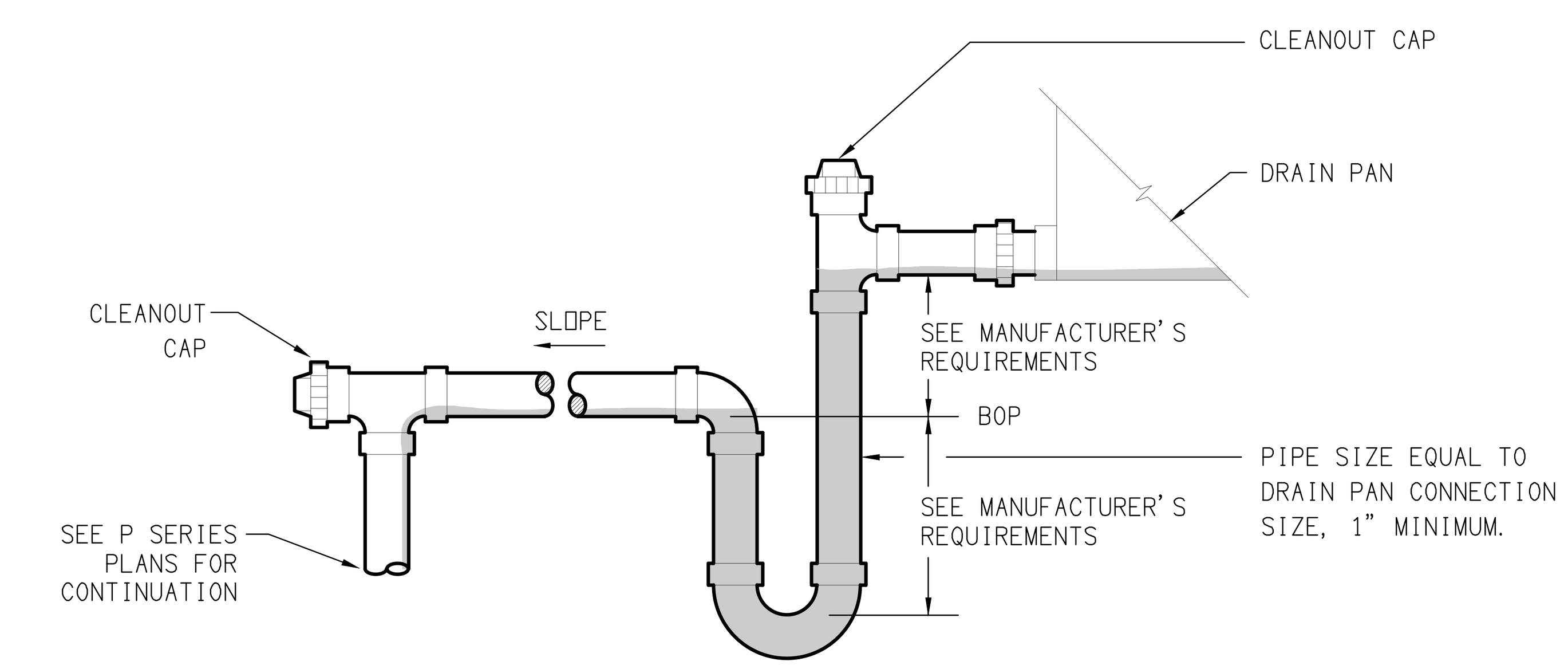
UNIT OPTIONS
K END SUPPLY DISCHARGE
L SIDE EXHAUST INLET
M GALVANIZED STEEL INTERIOR LINERS
N STAINLESS STEEL DRAIN PANS
O TRAPPED CONDENSATE DRAIN PIPING
P MODULATING LOW LEAKAGE OA DAMPER WITH WEATHERHOOD
Q MODULATING LOW LEAKAGE RA & EA DAMPERS
R STRUCTURAL SUPPORT RAILS INTEGRAL TO UNIT
S ENERGY RECOVERY AIR TO AIR HX W/ OA BYPASS AND DAMPER
T MAGNAHELIC GAUGES ACROSS FILTER SECTIONS
U HINGED ACCESS DOORS
V 120 V CONVENIENCE LIGHT AND OUTLETS
W UNIT MOUNTED DISCONNECT SWITCH
X FACTORY MOUNTED UV LIGHT SECTION W/ AUTOMATIC SHUTOFF SWITCH

ELECTRIC COIL OPTIONS:
Y AIR FLOW PROVING SWITCH
Z HIGH TEMPERATURE CUT-OUT SWITCH
AA SCR CONTROLLER
AB INTEGRAL COIL DISCONNECT SWITCH

REFRIGERANT COIL OPTIONS:
AC PACKAGED CONDENSING SECTION
AD SPLIT CONDENSING SECTION
AE COMPRESSOR VIBRATION ISOLATION
AF LOW AMBIENT KIT FOR STARTING AND OPERATION TO 20 DEG F
AG FULLY MODULATING COMPRESSOR CONTROL
AH CONDENSOR HAIL GUARDS
AI LOW LIMIT TEMPERATURE SWITCH
AJ FIN AND TUBE EVAPORATOR AND CONDENSER COIL CONSTRUCTION

CONTROLS OPTIONS:
AK RETURN AIR SMOKE DETECTOR
AL CONTROL COMPONENTS FURNISHED BY THE TEMPERATURE CONTROL CONTRACTOR; INSTALLED BY MC
AM FACTORY INSTALLED DDC CONTROLS, COORDINATE WITH TEMPERATURE CC.
AN INTEGRAL OUTDOOR AIR MEASUREMENT STATION
AO MANUFACTURER'S REMOTE CONTROL PANEL FOR FULL SPLIT CONDENSING UNIT INTEGRATION

MISCELLANEOUS:
AP EQUAL BY AIR ENTERPRISES, ENERGY LABS, NORTEK, OR SUBSTITUTION PER PROVISIONS OF SPECS



DETAIL - CONDENSATE DRAIN
SCALE: NONE

4 / M700

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Plot Scale | Drawn by CMM/SM | Date 02-26-24

PROJECT NAME: BARRETT CANCER CENTER PHARMACY AIR HANDLING UNIT REPLACEMENT

DRAWING NAME: MECHANICAL DETAILS & SCHEDULES

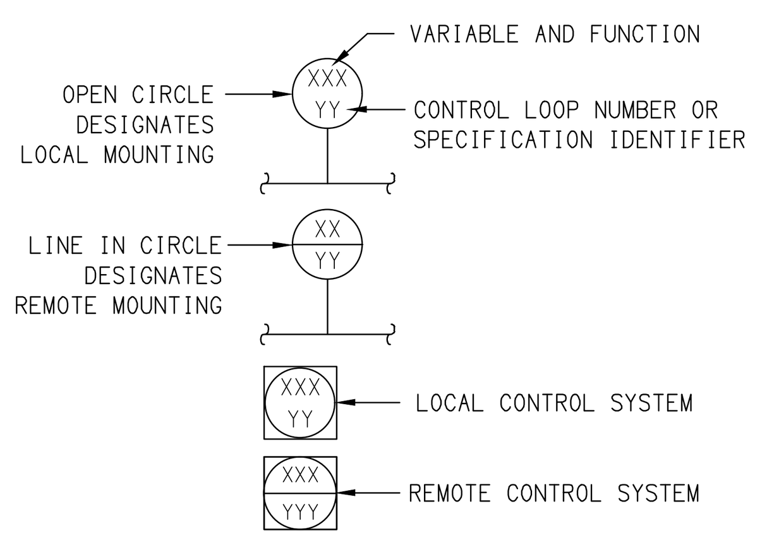
PROJECT NUMBER

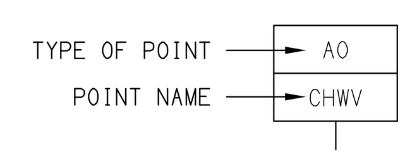
DC NO. | CAD FILENAME

STATE OF OHIO TERRANCE THOMPSON SHANNON 75602 REGISTERED PROFESSIONAL ENGINEER

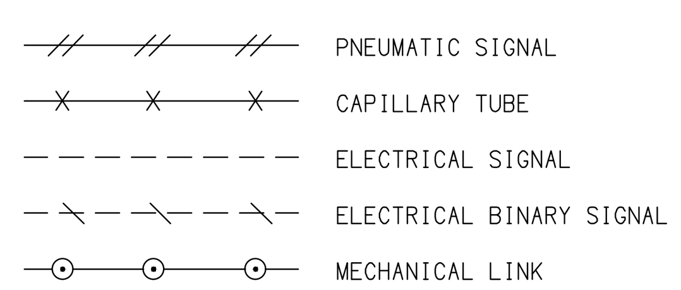
M700

INSTRUMENT AND CONTROL LOOP TAGGING (PER ISA STANDARD 2003)

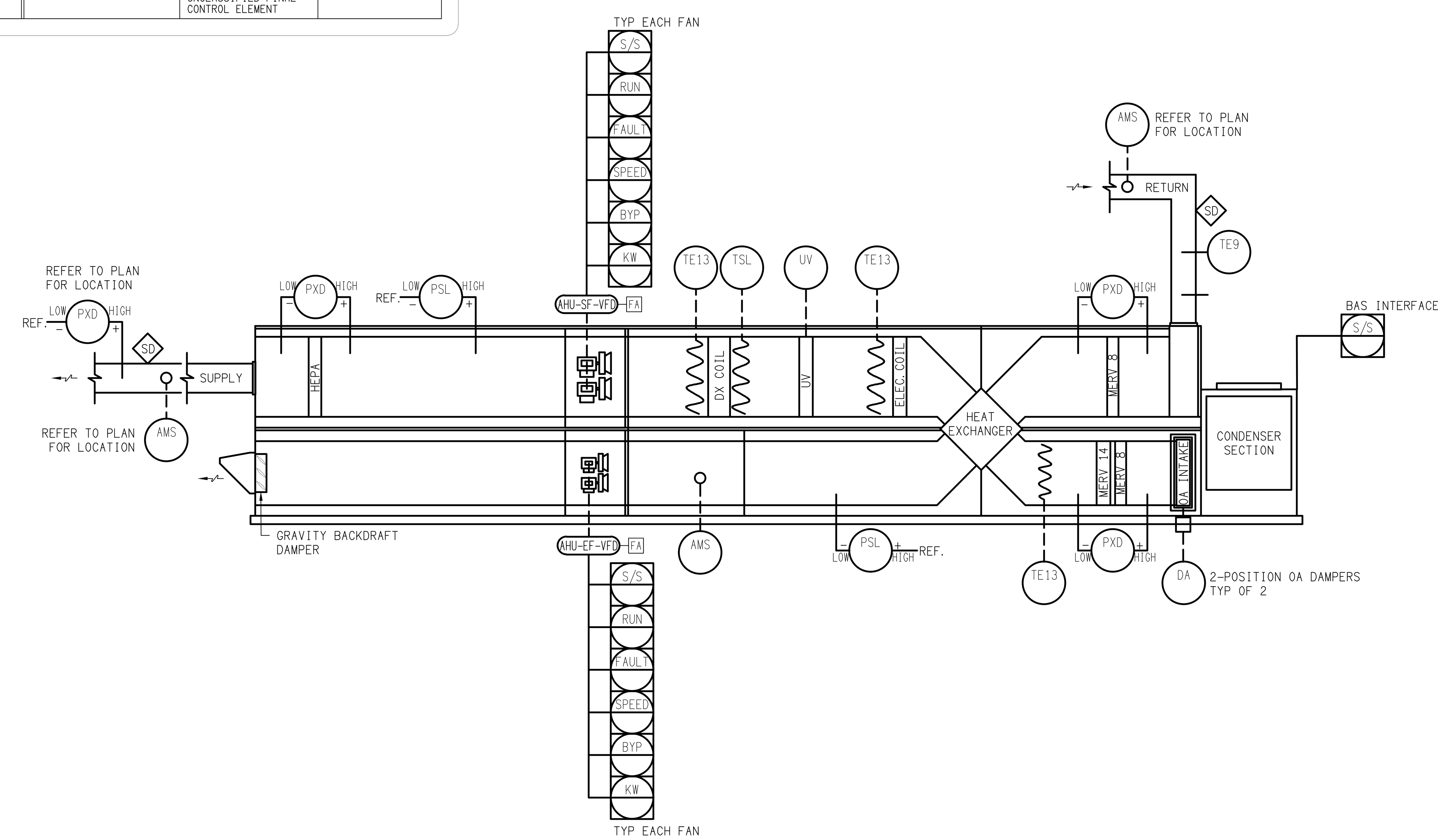




POINT TYPES
AI - ANALOG IN
AO - ANALOG OUT
DI - DIGITAL IN
DO - DIGITAL OUT



	FIRST LETTER		SUCCEEDING LETTERS		
	MEASURED OR INITIATING VARIABLE	MODIFIER	READOUT OR PASSIVE FUNCTION	OUTPUT FUNCTION	MODIFIER
A	ANALYSIS, QUALITY		ALARM		
B	BURNER FLAME, COMBUSTION		USER'S CHOICE	USER'S CHOICE	USER'S CHOICE
C	COND, pH, ORP			CONTROL	
D	DEW POINT	DIFFERENTIAL			
E	VOLTAGE (ELECTRICAL)		SENSOR (PRIMARY ELEMENT)		
F	FLOW RATE	RATIO (FRACTION)			
G	USER'S CHOICE		GLASS, VIEWING DEVICE		
H	MANUAL OPERATING				HIGH (OPEN)
I	CURRENT (ELECTRICAL)		INDICATE		
J	POWER	SCAN			
K	TIME SCHEDULE	TIME RATE OF CHANGE		CONTROL STATION	
L	LEVEL		LIGHT (PILOT)		LOW (CLOSE)
M	MOISTURE (HUMIDITY)	MOMENTARY			MIDDLE (INTERMEDIATE)
N	NOT USED		USER'S CHOICE	USER'S CHOICE	USER'S CHOICE
O	NOT USED		ORIFICE, RESTRICTION		
P	PRESSURE		POINT (TEST) CONN.		
Q	QUANTITY	TOTALIZE, INTEGRATE			
R	RADIATION		RECORD (HARDWIRE)		
S	SPEED, FREQUENCY	SAFETY		SWITCH	
T	TEMPERATURE			TRANSMITTER	
U	MULTIVARIABLE		MULTIFUNCTION	MULTIFUNCTION	MULTIFUNCTION
V	VIBRATION			VALVE, DAMPER, LOUVER	
W	WEIGHT, FORCE		WELL		
X	UNCLASSIFIED	X AXIS	UNCLASSIFIED	UNCLASSIFIED	UNCLASSIFIED
Y	EVENT, STATE OR PRESENCE	Y AXIS		RELAY, COMPUTE, CONVERT	
Z	POSITION, DIMENSION	Z AXIS		DRIVER, ACTUATOR, UNCLASSIFIED FINAL CONTROL ELEMENT	



AHU-1 CONTROL DIAGRAM

SCALE: NO SCALE

1
M701

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PROJECT NAME: BARRETT CANCER CENTER PHARMACY AIR HANDLING UNIT REPLACEMENT
DRAWING NAME: MECHANICAL AHU CONTROL DIAGRAM
PROJECT NUMBER
DC NO.
CAD FILENAME

STATE OF OHIO
TERRANCE THOMPSON SHANNON
75602
REGISTERED
PROFESSIONAL ENGINEER

M701

GENERAL SCOPE OF WORK

1 PROVIDE A COMPLETE CONTROL SYSTEM TO CONTROL THE NEW AHU-1 SYSTEM. COMPLY WITH UC HEALTH SPECIFICATION AND STANDARDS. INTEGRATE THE NEW SYSTEM INTO THE OWNERS EXISTING ANDOVER/SCHNEIDER SYSTEM. UTILIZE THE EXISTING BAS CONTROL PANEL LOCATED ON THE BUILDING WALL NEXT TO EXISTING AHU-1.
2 AHU-1 SHALL HAVE PACKAGED COOLING SYSTEMS AND CONTROLS. PROVIDE BACNET IP CONNECTIONS TO THE BAS. MONITOR COMPRESSOR / CONDENSER COOLING SYSTEM OPERATION AND FUNCTIONALITY.
3 ALL OTHER AHU-1 CONTROL DEVICES TO BE PROVIDED BY THE TEMPERATURE CONTROL CONTRACTOR. REFER TO THE CONTROL DIAGRAM FOR DEVICES. COORDINATE THE INSTALLATION OF THE CONTROL DEVICES WITH THE UNIT MANUFACTURER PRIOR TO AHU-1 SUBMITTAL PREPARATION.
4 THE EXISTING EXHAUST FAN AND CONTROLS SERVING THE SPACE IS TO REMAIN.
5 PROVIDE NEMA 4 ENCLOSURES FOR DEVICES AND EQUIPMENT INSTALLED OUTDOORS.
6 REUSE EXISTING CONTROL DEVICES AS APPROVED BY THE OWNER.

CONTROL DEVICES

AMS AIRFLOW MEASURING STATIONS - EBTRON GTX116E-PC/H

TSL LOW TEMP SWITCH - FREEZE STATS: JOHNSON CONTROLS, HONEYWELL, OR EQUAL, SPDT CONTACTS IF NOT MONITORED BY DDC SYSTEM, TWO SPDT CONTACTS IF MONITORED BY DDC SYSTEM, MANUAL RESET, 20-FOOT CAPILLARY TUBE, 15-55F RANGE.

PSL HIGH-STATIC-PRESSURE CUT-OUT SWITCH FOR FANS: DWYER MODEL 1900-5-MR OR EQUAL, LOW-DIFFERENTIAL PRESSURE SWITCH, SPDT CONTACTS, MANUAL RESET, 1.4-5.5" WG DIFFERENTIAL, INCLUDING DUCT SENSOR, TUBING AND ADAPTERS.

SD KELE D4120 4-WIRE, PHOTOELECTRIC DUCT MOUNTED SMOKE DETECTOR. UL268A.

DA ELECTRIC DAMPER ACTUATORS (PROPORTIONAL, DIRECT-MOUNT, NON-SPRING-RETURN): BELIMO OR EQUAL, 24 VDC/AC, 35 IN.-LB (LM), TORQUE MIN, POSITION INDICATION, 35-60 SECOND OPERATING TIME, -22-122F OPERATING RANGE, NEMA 2 ENCLOSURE, OPTIONAL AUXILIARY SWITCHES. PROVIDE MULTIPLE ACTUATORS WHERE REQUIRED FOR PROPER DAMPER OPERATION. PROVIDE SEPARATE DAMPER ACTUATORS WHEN THE LENGTH OF A JACKSHAFT FOR A BANK OF COMMON DAMPERS WOULD CAUSE THE BLADES TO NOT OPEN OR SEAL IN UNISON. PROVIDE LOCAL ON/OFF TOGGLE SWITCH TO INTERRUPT POWER TO ACTUATOR SUCH THAT MANUAL OVERRIDE OF ACTUATOR CAN BE MADE WITH CRANK.

UV UVGI TYPE UV-C LIGHTS. LIGHTING SYSTEM TO BE MODELED AND FURNISHED BY THE UNIT MANUFACTURER TO ACHIEVE A 90% KILL RATE DENSITY. LIGHTING SYSTEM TO BE GRID MOUNTED AND HAVE POWER AND CONTROL SYSTEM CONNECTIONS. LOCATE THE LIGHTING SYSTEM UPSTREAM OF THE COOLING COIL.

SPT STATIC PRESSURE TRANSMITTERS. MAMAC MODEL A-520

PXD DIFFERENTIAL PRESSURE TRANSMITTER (GAS) (FOR STATIC PRESSURE MEASUREMENT AND OTHER LOW-DIFFERENTIAL APPLICATIONS): KELE & ASSOCIATES (MODUS INSTRUMENTS) MODEL T40 OR EQUAL, 0-0.1" TO 0-10" RANGES, 24 VAC OR 120 VAC INPUT, 4-20 MA OUTPUT (ISOLATED FROM INPUT), 32F TO 125F OPERATING RANGE. FURNISH WITH BI-DIRECTIONAL RANGE WHEN USED FOR SPACE PRESSURE MEASUREMENT, FAN PLENUM PRESSURE MEASUREMENT, AND OTHER APPLICATIONS WHERE THE DIFFERENTIAL PRESSURE MAY REVERSE. FURNISH DWYER MODEL A-306 OUTDOOR STATIC PRESSURE PROBE WHERE ONE PORT OF THE TRANSMITTER IS USED TO SENSE OUTDOOR PRESSURE.

PSL HIGH-STATIC-PRESSURE CUT-OUT SWITCH FOR FANS: DWYER MODEL 1900-5-MR OR EQUAL, LOW-DIFFERENTIAL PRESSURE SWITCH, SPDT CONTACTS, MANUAL RESET, 1.4-5.5" WG DIFFERENTIAL, INCLUDING DUCT SENSOR, TUBING AND ADAPTERS.

TE9 DUCT-MOUNTED AVERAGING SENSOR: KELE & ASSOCIATES (PRECON CORPORATION) MODEL ST-FZ3 OR EQUAL, 0.36F ACCURACY, 12.5 OR 25-FOOT AVERAGING ELEMENT, 10,000 OHM @ 77F

TE13 TEMPERATURE SENSOR: KELE & ASSOCIATES (PRECON CORPORATION) MODEL ST-U5 OR EQUAL, 0.36F ACCURACY, 10F TO 230F RANGE, 5-INCH PROBE ELEMENT, 10,000 OHM @ 77F. INCLUDE OPTION B FOR BRASS WELL FOR IMMERSION MOUNTING OR OPTION O FOR OUTDOOR TEMPERATURE MOUNTING KIT.

AHU-1 SEQUENCE OF OPERATION

RUN CONDITIONS:
THE UNIT SHALL RUN 24/7/365 OR WHEN REQUESTED.

FREEZE PROTECTION:
THE UNIT SHALL SHUT DOWN AND GENERATE AN ALARM UPON RECEIVING A FREEZE STAT STATUS.

HIGH STATIC SHUTDOWN:
THE UNIT SHALL SHUT DOWN AND GENERATE AN ALARM UPON RECEIVING AN HIGH STATIC SHUTDOWN SIGNAL.

SUPPLY AIR SMOKE DETECTION:
THE UNIT SHALL SHUT DOWN AND GENERATE AN ALARM UPON RECEIVING A SUPPLY AIR SMOKE DETECTOR STATUS.

SUPPLY FANS: N+1 REDUNDANCY
THE SUPPLY FAN SHALL RUN ANYTIME THE UNIT IS COMMANDED TO RUN, UNLESS SHUTDOWN ON SAFETIES. TO PREVENT SHORT CYCLING, THE SUPPLY FANS SHALL HAVE A USER DEFINABLE (ADJ.) MINIMUM RUNTIME. FANS SHALL OPERATE EQUALIZE RUN TIMES.
ALARMS SHALL BE PROVIDED AS FOLLOWS:
SUPPLY FAN FAILURE: COMMANDED ON, BUT THE STATUS IS OFF.
SUPPLY FAN IN HAND: COMMANDED OFF, BUT THE STATUS IS ON.
SUPPLY FAN RUNTIME EXCEEDED: STATUS RUNTIME EXCEEDS A USER DEFINABLE LIMIT (ADJ.).
HIGH SUPPLY AIR STATIC PRESSURE: IF THE SUPPLY AIR STATIC PRESSURE IS 25% (ADJ.) GREATER THAN SETPOINT.
LOW SUPPLY AIR STATIC PRESSURE: IF THE SUPPLY AIR STATIC PRESSURE IS 25% (ADJ.) LESS THAN SETPOINT.
SUPPLY FAN VFD FAULT.

SUPPLY AIR DUCT STATIC PRESSURE CONTROL:
THE CONTROLLER SHALL MEASURE DUCT STATIC PRESSURE AND SHALL MODULATE THE SUPPLY FAN VFD SPEED TO MAINTAIN A DUCT STATIC PRESSURE SETPOINT OF 1.5IN H20 (ADJ.). THE SUPPLY FAN VFD SPEED SHALL NOT DROP BELOW 30% (ADJ.).

RETURN FANS:
THE RETURN FAN SHALL RUN WHENEVER THE SUPPLY FANS RUN.
ALARMS SHALL BE PROVIDED AS FOLLOWS:
RETURN FAN FAILURE: COMMANDED ON, BUT THE STATUS IS OFF.
RETURN FAN IN HAND: COMMANDED OFF, BUT THE STATUS IS ON.
RETURN FAN RUNTIME EXCEEDED: STATUS RUNTIME EXCEEDS A USER DEFINABLE LIMIT (ADJ.).
RETURN FAN VFD FAULT.

RETURN PLENUM STATIC PRESSURE CONTROL:
THE CONTROLLER SHALL MEASURE RETURN PLENUM STATIC PRESSURE AND MODULATE THE RETURN FAN VFD SPEED TO MAINTAIN A RETURN PLENUM STATIC PRESSURE SETPOINT OF 0.2IN H20 (ADJ.). THE RETURN FAN VFD SPEED SHALL NOT DROP BELOW 20% (ADJ.).
ALARMS SHALL BE PROVIDED AS FOLLOWS:
HIGH RETURN PLENUM STATIC PRESSURE: IF THE RETURN AIR PLENUM STATIC PRESSURE IS 25% (ADJ.) GREATER THAN SETPOINT.
LOW RETURN PLENUM STATIC PRESSURE: IF THE RETURN AIR PLENUM STATIC PRESSURE IS 25% (ADJ.) LESS THAN SETPOINT.

SUPPLY AIR TEMPERATURE SETPOINT:
THE CONTROLLER SHALL MONITOR THE SUPPLY AIR TEMPERATURE AND SHALL MAINTAIN A SUPPLY AIR TEMPERATURE SETPOINT RESET BASED ON ZONE COOLING AND HEATING REQUIREMENTS.
THE SUPPLY AIR TEMPERATURE SETPOINT SHALL BE RESET FOR COOLING BASED ON ZONE COOLING REQUIREMENTS AS FOLLOWS:
THE INITIAL SUPPLY AIR TEMPERATURE SETPOINT SHALL BE 55°F (ADJ.).
AS COOLING DEMAND INCREASES, THE SETPOINT SHALL INCREMENTALLY RESET DOWN TO A MINIMUM OF 53°F (ADJ.).
AS COOLING DEMAND DECREASES, THE SETPOINT SHALL INCREMENTALLY RESET UP TO A MAXIMUM OF 72°F (ADJ.).
IF MORE ZONES NEED HEATING THAN COOLING, THEN THE SUPPLY AIR TEMPERATURE SETPOINT SHALL BE RESET FOR HEATING AS FOLLOWS:
THE INITIAL SUPPLY AIR TEMPERATURE SETPOINT SHALL BE 80°F (ADJ.).
AS HEATING DEMAND INCREASES, THE SETPOINT SHALL INCREMENTALLY RESET UP TO A MAXIMUM OF 85°F (ADJ.).
AS HEATING DEMAND DECREASES, THE SETPOINT SHALL INCREMENTALLY RESET DOWN TO A MINIMUM OF 70°F (ADJ.).

PACKAGED COOLING SYSTEMS
FULLY MODULATING VARIABLE COOLING CONTROL:
THE PACKAGED CONTROLLER SHALL MEASURE THE SUPPLY AIR TEMPERATURE AND CONTROL THE COOLING SYSTEM TO MAINTAIN ITS COOLING SETPOINT. TO PREVENT SHORT CYCLING, THERE SHALL BE A DEFINABLE (ADJ.) DELAY BETWEEN COMPRESSOR STARTS, AND EACH COMPRESSOR SHALL HAVE A USER DEFINABLE (ADJ.) MINIMUM RUNTIME.
THE COOLING SHALL BE ENABLED WHENEVER:
OUTSIDE AIR TEMPERATURE IS GREATER THAN 50°F (ADJ.).
AND THE SUPPLY FAN STATUS IS ON.
AND THE HEATING (IF PRESENT) IS NOT ACTIVE.
ALARMS SHALL BE PROVIDED AS FOLLOWS:
HIGH SUPPLY AIR TEMP: IF THE SUPPLY AIR TEMPERATURE IS 5°F (ADJ.) GREATER THAN SETPOINT.

ELECTRIC HEATING WITH SCR:
THE PACKAGED CONTROLLER SHALL MEASURE THE SUPPLY AIR TEMPERATURE AND MODULATE THE HEATING TO MAINTAIN ITS HEATING SETPOINT.
THE HEATING SHALL BE ENABLED WHENEVER:
OUTSIDE AIR TEMPERATURE IS LESS THAN 65°F (ADJ.).
AND THE SUPPLY FAN STATUS IS ON.
AND THE COOLING (IF PRESENT) IS NOT ACTIVE.
ALARMS SHALL BE PROVIDED AS FOLLOWS:
LOW SUPPLY AIR TEMP: IF THE SUPPLY AIR TEMPERATURE IS 5°F (ADJ.) LESS THAN SETPOINT.

100% OUTSIDE AIR VENTILATION - FIXED PERCENTAGE:
THE OUTSIDE AIR DAMPERS SHALL FULLY OPEN DURING UNIT OPERATION AND CLOSE WHEN THE UNIT IS NOT OPERATING.

DEHUMIDIFICATION:
THE CONTROLLER SHALL MEASURE THE RETURN AIR HUMIDITY AND OVERRIDE THE COOLING SEQUENCE TO MAINTAIN RETURN AIR HUMIDITY AT OR BELOW 60% RH (ADJ.). DEHUMIDIFICATION SHALL BE ENABLED WHENEVER THE SUPPLY FAN STATUS IS ON. ENABLE AND CONTROL THE ELECTRIC HEATING COIL IF REQUIRED TO MAINTAIN DISCHARGE AIR SET POINT.

PRE AND MAIN FILTER DIFFERENTIAL PRESSURE MONITOR:
THE CONTROLLER SHALL MONITOR THE DIFFERENTIAL PRESSURE ACROSS THE PREFILTER.
ALARMS SHALL BE PROVIDED AS FOLLOWS:
PRE/MAIN FILTER CHANGE REQUIRED: PREFILTER DIFFERENTIAL PRESSURE EXCEEDS A USER DEFINABLE LIMIT (ADJ.).
FINAL (HEPA) FILTER DIFFERENTIAL PRESSURE MONITOR:
THE CONTROLLER SHALL MONITOR THE DIFFERENTIAL PRESSURE ACROSS THE FINAL FILTER.
ALARMS SHALL BE PROVIDED AS FOLLOWS:
FINAL FILTER CHANGE REQUIRED: FINAL FILTER DIFFERENTIAL PRESSURE EXCEEDS A USER DEFINABLE LIMIT (ADJ.).

MIXED AIR TEMPERATURE:
THE CONTROLLER SHALL MONITOR THE MIXED AIR TEMPERATURE AND USE AS REQUIRED FOR ECONOMIZER CONTROL OR PREHEATING CONTROL.
ALARMS SHALL BE PROVIDED AS FOLLOWS:
HIGH MIXED AIR TEMP: IF THE MIXED AIR TEMPERATURE IS GREATER THAN 85°F (ADJ.).
LOW MIXED AIR TEMP: IF THE MIXED AIR TEMPERATURE IS LESS THAN 45°F (ADJ.).

RETURN AIR TEMPERATURE:
THE CONTROLLER SHALL MONITOR THE RETURN AIR TEMPERATURE AND USE AS REQUIRED FOR SETPOINT CONTROL.
ALARMS SHALL BE PROVIDED AS FOLLOWS:
HIGH RETURN AIR TEMP: IF THE RETURN AIR TEMPERATURE IS GREATER THAN 85°F (ADJ.).
LOW RETURN AIR TEMP: IF THE RETURN AIR TEMPERATURE IS LESS THAN 45°F (ADJ.).

SUPPLY AIR TEMPERATURE:
THE CONTROLLER SHALL MONITOR THE SUPPLY AIR TEMPERATURE.

ALARMS SHALL BE PROVIDED AS FOLLOWS:
HIGH SUPPLY AIR TEMP: IF THE SUPPLY AIR TEMPERATURE IS GREATER THAN 120°F (ADJ.).
LOW SUPPLY AIR TEMP: IF THE SUPPLY AIR TEMPERATURE IS LESS THAN 45°F (ADJ.).

CONTROL POINTS	DIGITAL						ANALOG						DIGITAL				ANALOG											CONTROLLED DEVICES														DEVICES		
DESCRIPTION	PRESSURE SWITCH	FLOW SWITCH	AUXILIARY CONTACT	METER PULSES	SERIAL DATA STREAM	OTHER	TEMPERATURE	RELATIVE HUMIDITY	PRESSURE	VOLTAGE/CURRENT	4-20 mA, 0-10 V, etc.	OTHER	CONTROL RELAY	SOLENOID AIR VALVE	CONTACTOR	OTHER	EPT + PNEUM ACTUATOR	ELECTRIC ACTUATOR	4-20 mA, 0-10 V, etc.	OTHER	PNEUMATIC	ELECTRIC/ELECTRONIC	LINE VOLTAGE	LOW VOLTAGE	MODULATING	STAGED		THERMOSTAT	HUMIDISTAT	SENSOR/TRANSMITTER	RECVR-CONTROLLER	VALVE/DAMPER	PNEUM/ELECT SWITCH	ELECT/PNEUM TRANSD.	SOLENOID AIR VALVE	STARTER/RELAY		SMOKE DETECTOR	FREEZESTAT			PNEUMATIC	ELECTRIC	OTHER
AHU-1																																												
SF VFD																																												
START/STOP													X																															
SPEED CONTROL																			X																									
RUN STATUS			X																																									
FAULT STATUS			X																																									
BYPASS STATUS			X																																									
KW MONITOR											X																																	
RF VFD																																												
START/STOP													X																															
SPEED CONTROL																			X																									
RUN STATUS			X																																									
FAULT STATUS			X																																									
BYPASS STATUS			X																																									
KW MONITOR											X																																	
DX COOLING STAGES													X																															
ELEC HEATING COIL			X										X						X																								X	
MIN OA FLOW TRANSMITTER											X																																	
FLOW COMPUTER																																											X	
BLDG STATIC PRESSURE									X																																			
EA DAMPER													X																															
EA STATIC PRESSURE									X																																			
SA STATIC PRESSURE TRANSM									X																																			
MIXED AIR TEMP							X																																					
SUPPLY AIR TEMP							X																																					
RETURN AIR TEMP							X																																					
SA STATIC PRESSURE HIGH LIMIT																						X	X			X				X														
RA STATIC PRESSURE HIGH LIMIT																						X	X			X				X														
PREFILTER DIFF PRESS									X																																			
PRIMARY FILTER DIFF PRESS									X																																			
FINAL FILTER DIFF PRESS									X																																			
SMOKE DETECTORS																																						X						
FREEZESTAT			X																			X	X			X													X					
FIRE ALARM INTERFACE																																											X	
MISCELLANEOUS POINTS																																												
OUTDOOR TEMP/HUMIDITY							X	X																																				
OUTDOOR CO2 SENSOR											X																																	
UV-C LIGHTING			X										X						X																								X	
NETWORK CONNECTIONS																																											X	
NETWORK CONNECTIONS																																											X	

No.	REVISIONS	DATE
0	ISSUED FOR PERMIT AND CONSTRUCTION	02-26-24

THERMALTECH ENGINEERING
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Project Number: 13331.490

University of Cincinnati Medical Center | UC Health.
DESIGN and CONSTRUCTION DEPARTMENT
234 GOODMAN STREET M.L. 0766
Cincinnati Ohio 45219 - 2316

Plot Scale | Drawn by CMM/SM | Date 02-26-24

PROJECT NAME: BARRETT CANCER CENTER
PHARMACY AIR HANDLING UNIT REPLACEMENT

DRAWING NAME: MECHANICAL
AHU CONTROL SEQUENCE

PROJECT NUMBER

DC NO.

CAD FILENAME

STATE OF OHIO
TERRANCE THOMPSON SHANNON
75602
REGISTERED
PROFESSIONAL ENGINEER

[illegible]

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