



ADDENDUM No. 1

PROJECT: Spartanburg Community College
Tyger River HVAC and Boiler Replacements
OSE Project No. H59-6315-JM
DEVITA Project No. 25531

DATE: February 18, 2026

TO: Prospective Bidders

This Addendum is hereby made a part of the Contract Documents on the subject work as though originally included therein. The following clarifications, amendments, additions, deletions and/or modifications to the original Bid Documents dated January 19, 2026, change the original documents only in the manner and the extent stated.

Acknowledge receipt of this addendum in the space provided in the Bid Form. Failure to do so may be grounds for rejection of the bid.

The following are **CHANGES OR CLARIFICATIONS** to

GENERAL

1. Spartanburg Community College will allow the awarded contractor 4000 SF in the 89 and 94 warehouses for staging materials.
2. Any removal of cameras, Wi-Fi routers, and other IT related equipment included in the ceiling removal portion of this project will be performed by the Spartanburg Community College IT Department.
3. Furniture removal from the office areas will be handled by Spartanburg Community College.

PRIOR ADDENDA

Not applicable.

PROJECT MANUAL - BID OR CONTRACT REQUIREMENTS

1. The bid date of this project has been extended to March 11, 2026. The updated schedule is as follows:
 - a. Open site visits: Feb 24 & 26, 2026, 10am – 2pm. Visitors must sign in at the front door.
 - b. Questions deadline for Addendum 2: Feb 27, 2026
 - c. Addendum 2: March 3, 2026
 - d. New Bid Date: March 11, 2026
2. Siemens controls vendors which are authorized to work on the Tyger River campus are Siemens Charlotte and CMI.
3. Bid to include cost to protect flooring in areas of scope.
4. Assume a mixture of internally insulated and uninsulated ductwork to be demolished when bidding demolition scope.
5. The roof is under materials warranty only, and any Johns Mannville approved contractor may perform roofing work for this project.
6. Refer to 11-35-3020(d) in the SC Code of Laws if all bids exceed the available funds.

7. Documents due at bid opening are AIA Document A310 BID BOND with power of attorney and SE-330 LUMP SUM BID FORM.

PROJECT MANUAL - TECHNICAL SPECIFICATIONS

1. Section 232113 – 2.04 has been edited to allow PVC and Type M copper for equipment drains.

DRAWINGS

A200

- Demolition scope updated to include more ceiling in the Ready SC area to accommodate medium pressure supply air ductwork installation.

FP100

- 89 Warehouse scope updated to show sprinkler lines below AHU ductwork as elevated instead of removed to maintain sprinkler coverage.
- Sheet was erroneously left unsealed and has been updated to be sealed by the mechanical engineer.

M001

- Smoke detectors are not required in return sections of ARU-1 thru 6 per 2021 SC Mechanical Code Section 606.2 – Exception.
- Variable Air Volume Terminal Unit Schedule – Added Carrier 35E and 45N as approved equals.
- Air Handling Unit Schedule – Added Carrier 39MN as an approved equal.
- Air Rotation Unit Schedule
 - Corrected ARU-5 supply air volume.
 - Corrected ARU-4 fan HP.
 - Updated EAT and LAT for cooling and heating on units with outside air.
 - Updated notes column
 - Added Johnson Air Rotation AR-75SI, AR-55.5SI, and AR-85SI as approved equals.
 - Added unit height requirement.

M102

- Added note 5 to cover capping existing outside air louvers.

M105

- Added note 9 to cover preparation of existing outside air louvers.

M201

- Note D – Pipe to be wrapped is approximately 300' of 2" PVC and approximately 50' of 3" PVC.

M201 & M202

- Hydronic piping routed above corridor adjacent to 86/87 warehouse to be bid as drawn.

ENCLOSURES

Drawings:

- A200
- FP100
- M001
- M102
- M105

Specifications:

- 232113 – Hydronic Piping

END OF ADDENDUM



REFLECTED CEILING PLAN NOTES

- A. ALL CEILING MOUNTED COMPONENTS ARE REPRESENTATIVE. EXISTING CEILING COMPONENTS ARE TO BE VERIFIED IN FIELD PRIOR TO GRID REMOVAL AND RE-INSTALLED IN THEIR EXACT LOCATIONS UNLESS NOTED OTHERWISE.
- B. COORDINATE ALL HVAC MECHANICAL DEVICES WITH MECHANICAL DRAWINGS.
- C. IF AS-BUILT CONDITIONS DEMAND THAT A CEILING BOARD LARGER THAN 2'-0" IN ANY DIMENSION BE USED IN THE PERIMETER BOARDS OF A TYPICAL 2'X2' GRID, THEN THAT BOARD SHALL BE CUT FROM A 2'X4' BOARD. A DOUBLE WALL ANGLE SHALL NOT BE USED IN THE CEILING GRID SYSTEM.
- D. CEILING SUSPENSION SYSTEM TO MEET SEISMIC REQUIREMENTS OF THE INTERNATIONAL BUILDING CODE CURRENT EDITION.
- E. LOCATE ALL TRACK & RECESSED FIXTURES AT THE CENTERLINE OF TILE UNLESS NOTED OTHERWISE. INSTALL ALL ELECTRICAL SYSTEM COMPONENTS WITHOUT INTERFERING WITH DUCTS, PIPES, BEAMS, ETC. LOCATE LIGHT FIXTURES SYMMETRICALLY AS DIMENSIONED, OR AS INDICATED ON THE REFLECTED CEILING PLANS. IN THE EVENT OF CONFLICT, THE ARCHITECT WILL DECIDE WHICH ITEM TO RELOCATE WITHOUT REGARD TO WHICH WAS INSTALLED FIRST.

DRAWING NOTES

- 9.01 PROTECT ALL SURFACES UNDER AREA OF WORK DURING CONSTRUCTION. TOUCH UP, PAINT, AND REPAIR ALL FINISHES DAMAGED DURING CONSTRUCTION. TYP.
- 9.04 PATCH AND REPAIR WALL WHERE SIDEWALL RETURNS WERE REMOVED. PAINT.
- 50.01 ALL EXISTING LIGHT FIXTURES, CAMERAS, CLOCKS, SPEAKERS, SENSORS, WIRELESS ACCESS POINTS, AND OTHER NON-HVAC DEVICES TO REMAIN. VERIFY ALL OTHER ITEMS WITH ARCHITECT PRIOR TO THEIR REMOVAL. PROTECT DURING CONSTRUCTION. TYP.
- 50.04 EXISTING OPERABLE WALL TRACK TO REMAIN.
- 50.05 BATT INSULATION EXISTS ABOVE CEILING TILES. SALVAGE 50% FOR REUSE AND INSTALL 50% NEW OVER REINSTALLED CEILING TILES.
- 50.07 ALL EXISTING CEILING HEIGHTS TO BE VERIFIED IN EACH ROOM. NEW GRID TO MATCH EXISTING HEIGHT.
- 50.08 CEILING ACCESS PANEL.
- 50.09 TIE IN NEW GRID TO EXISTING.
- 50.10 EXISTING GYPSUM BOARD CEILING LOCATED ABOVE CEILING GRID. VERIFY HEIGHT IN FIELD.
- 90.07 EXISTING CEILING GRID TO BE REMOVED FOR ACCESS TO MECHANICAL WORK. CEILING TILES TO BE SALVAGED FOR REUSE IN NEW GRID. REFER TO LEGEND.

REFLECTED CEILING PLAN LEGEND

- EXISTING CEILING GRID AND TILES TO BE REMOVED. 50% OF EXISTING CEILING TILES TO BE SALVAGED FOR REUSE. PROVIDE NEW CEILING GRID AND 50% NEW CEILING TILES TO MATCH EXISTING. VERIFY IN FIELD.
- LIGHT FIXTURE TO REMAIN.
- RETURN DIFFUSER. REFER TO MECHANICAL DRAWINGS.
- SUPPLY DIFFUSER. REFER TO MECHANICAL DRAWINGS.
- CEILING MOUNTED CLOCK.
- WIRELESS ACCESS POINT TO REMAIN.
- SPRINKLER HEAD TO REMAIN.
- CEILING MOUNTED SPEAKER TO REMAIN.
- OCCUPANCY SENSOR.
- FIRE ALARM STROBE TO REMAIN.
- 2 HOUR RATED WALL

NOTE: EXACT LOCATIONS OF CEILING AND MEP COMPONENTS ARE TO BE VERIFIED IN FIELD. REFER TO MEP DRAWINGS FOR ALL CEILING MOUNTED COMPONENTS TO BE REMOVED. ALL CEILING MOUNTED COMPONENTS TO REMAIN SHALL BE REINSTALLED OR REPLACED IN THE NEW CEILING GRID IN ITS EXISTING CONDITION.



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TYGER RIVER CAMPUS HVAC AND BOILER REPLACEMENTS

1875 E MAIN ST,
DUNCAN, SC 29334

State Project No. H59-6315-JM
DP3 Project No. 25177
Issue Date: 12 JANUARY 2026

REVISIONS		
NO.	DATE	DESCRIPTION
A	12/10/25	05E SUBMISSION
B	01/12/26	05E REVIEW COMMENTS
C	01/19/26	05E REVIEW COMMENTS
1	02/17/26	ADDENDUM 1

KEY PLAN



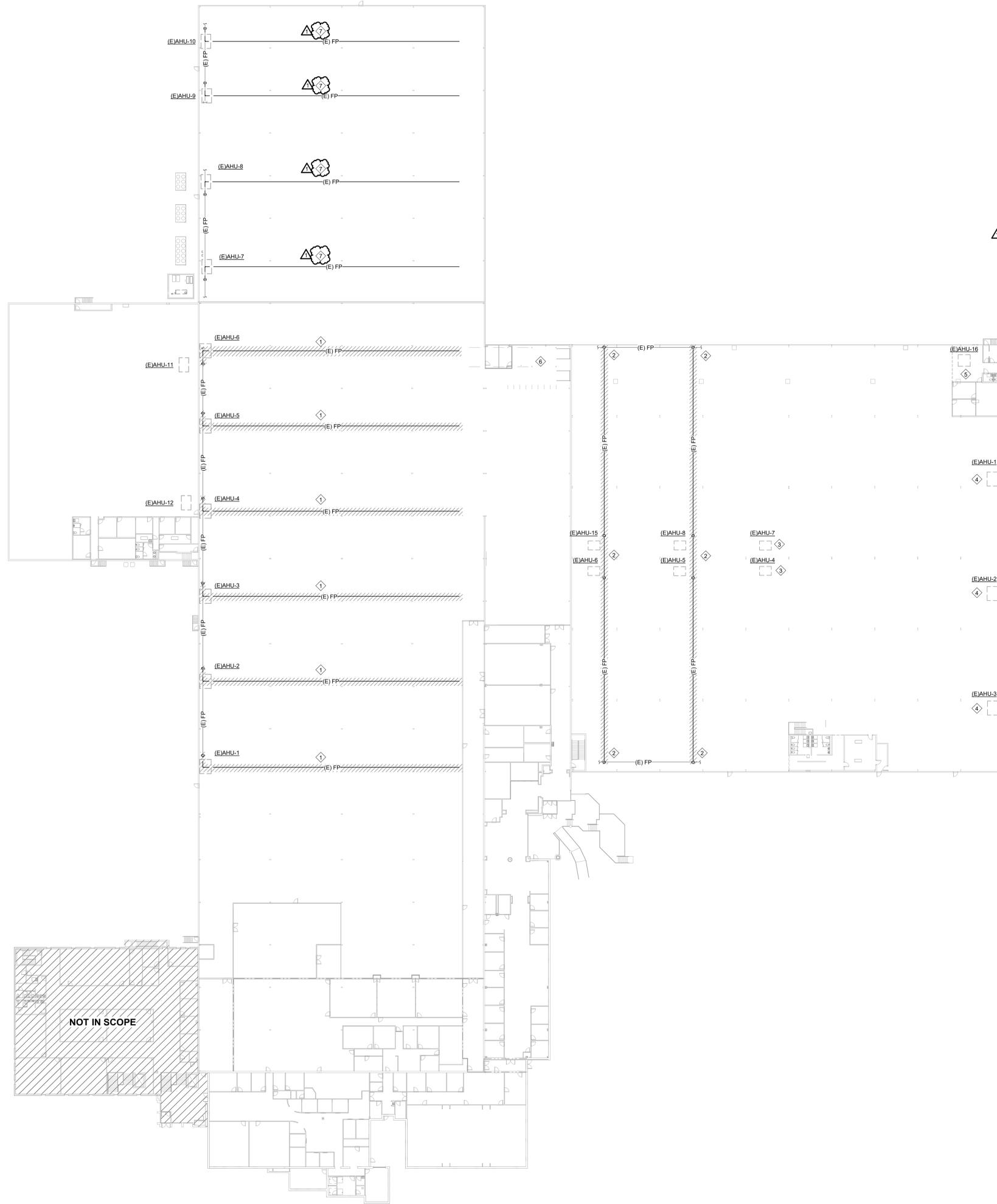
DRAWING NAME
ENLARGED DEMOLITION & NEW WORK PLAN - OFFICE AREA

DRAWING NO.
A200

Drawn By: ALS Checked By: KTP

1 ENLARGED DEMOLITION & NEW WORK PLAN - OFFICE AREA
A200 1/8" = 1'-0"





PLAN KEYED NOTES:

1. REMOVE SPRINKLER PIPING AND HEADS BELOW AIR HANDLER AND DUCTWORK BACK TO BRANCH AND CAP.
2. REMOVE SPRINKLER PIPING AND HEADS BELOW AIR HANDLERS AND DUCTWORK BACK TO MAIN ON BOTH SIDES OF 84 WAREHOUSE AND CAP.
3. REMOVE SPRINKLER PIPING AND HEADS BELOW AIR HANDLER BACK TO BRANCH AND CAP. HEADS ARE SERVED BY A DROP OFF OF OVERHEAD SPRINKLER GRID. ENSURE THAT OVERHEAD COVERAGE FOR THE SPACE IS MAINTAINED.
4. REMOVE SPRINKLER HEADS AND ASSOCIATED PIPING BELOW AIR HANDLER AND DUCTWORK UP TO BRANCH AND CAP. HEADS ARE SERVED BY INDIVIDUAL DROPS OFF OF OVERHEAD SPRINKLER GRID. ENSURE THAT COVERAGE FOR THE SPACE IS MAINTAINED. APPROX. SPRINKLER HEAD QTY: 15
5. REMOVE SPRINKLER HEADS AND ASSOCIATED PIPING BELOW AIR HANDLER AND DUCTWORK UP TO BRANCH AND CAP. HEADS ARE SERVED BY INDIVIDUAL DROPS OFF OF OVERHEAD SPRINKLER GRID. ENSURE THAT COVERAGE FOR THE SPACE IS MAINTAINED. APPROX. SPRINKLER HEAD QTY: 11
6. VERIFY THAT THE TEMPERATURE RATING OF THE SPRINKLER HEADS BELOW THE MEZZANINE IN THIS AREA IS 288°F OR GREATER. REPLACE WITH HEADS OF THIS RATING IF THEY ARE NOT.
7. SPRINKLER PIPING AND HEADS BELOW AIR HANDLER AND DUCTWORK TO BE ELEVATED TO MATCH EXISTING FIRE SUPPRESSION SYSTEM AND MAINTAIN SPACE COVERAGE.

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PROJECT INFORMATION:



**TYGER RIVER
CAMPUS HVAC AND
BOILER
REPLACEMENTS**

1875 EAST MAIN ST.,
DUNCAN, SC 29334

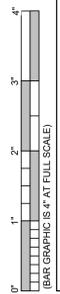
State Project No. H59-6315-JM
DEVITA Project No. 25531
Issue Date: 12 JANUARY 2026

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NO.	DATE	DESCRIPTION
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**DRAWING NAME
FIRE PROTECTION
DEMOLITION PLAN**

DRAWING NO.
FP100
Drawn By: ASE Checked By: CIC



1 FIRE PROTECTION DEMOLITION PLAN
FP100 1" = 30'-0"

FAN SCHEDULE														
MARK	MANUFACTURER MODEL	AREA SERVED	SERVICE	TYPE	CFM	STATIC PRESSURE (IN WG)	NOMINAL RPM	DRIVE TYPE	ELECTRICAL DATA VOLTAGE PHASE	MOTOR HP	CONTROL	SONES	WEIGHT (LBS)	NOTES
SF-1	GREENHECK SQ-20-M2-VG	8687 WAREHOUSE	OUTSIDE AIR	INLINE	6500	0.5	1108	DIRECT	460 3	3	SPEED CONTROLLER	7.5	220	1-8
SF-2	GREENHECK SQ-12-M1-VG	89 WAREHOUSE	OUTSIDE AIR	INLINE	2550	0.5	1867	DIRECT	460 3	2	SPEED CONTROLLER	7.6	84	1-8
SF-3	GREENHECK SQ-12-M2-VG	92 WAREHOUSE	OUTSIDE AIR	INLINE	1450	0.5	1404	DIRECT	208 1	1/2	SPEED CONTROLLER	6.1	67	1-8
SF-4	GREENHECK SQ-16-M2-VG	94 WAREHOUSE	OUTSIDE AIR	INLINE	5400	0.75	1758	DIRECT	460 3	3	SPEED CONTROLLER	9.3	173	1-8

NOTES:
1. PROVIDE UNIT WITH GRAVITY BACKDRAFT DAMPER.
2. PROVIDE VIBRATION ISOLATION.
3. UNIT SHALL BE UL LISTED AND AMCA CERTIFIED.
4. PROVIDE FACTORY MOUNTED DISCONNECT.
5. PROVIDE SPEED CONTROL.
6. PROVIDE MOTOR WITH THERMAL OVERLOAD PROTECTION.
7. PROVIDE INSULATED HOUSING FOR SOUND ATTENUATION.
8. APPROVED EQUALS INCLUDE LOREN-COOK SON AND TWIN CITY FAN DSI.

GRAVITY HOOD SCHEDULE							
MARK	UNIT SERVED	MANUFACTURER MODEL	TYPE	THROAT	CFM	MAX PRESSURE DROP (IN WG)	NOTES
GH-1	ARU-1	GREENHECK GRSI-48	INTAKE	48"x48"	6500	0.064	1 - 4

NOTES:
1. PROVIDE WITH INTEGRAL INSECT SCREEN.
2. PROVIDE MANUFACTURER'S STANDARD CORROSION RESISTANT FINISH.
3. PROVIDE WITH ROOF CURB.
4. APPROVED EQUALS INCLUDE LOREN COOK PR AND TWIN CITY FAN GRV.

LOUVER SCHEDULE								
MARK	MANUFACTURER MODEL	UNIT SERVED	OPENING	FREE AREA (FT²)	MAX VELOCITY (FPM)	PRESSURE DROP (IN WG)	SCREEN TYPE	NOTES
L-1	GREENHECK ESD-635-56x24	AHU-1	56 x 24	4.4	451	0.03	BIRD	1 - 4

NOTES:
1. LOUVER DIMENSIONS ARE 1/4" LESS THAN OPENING DIMENSIONS.
2. LOUVER SHALL BE AMCA CERTIFIED.
3. PROVIDE WITH MANUFACTURER STANDARD CORROSION RESISTANT FINISH. PAINT TO MATCH EXTERIOR WALL.
4. APPROVED EQUALS INCLUDE RUSKIN ELF6350OMP AND UNITED ENERTECH FL-D6.1

VARIABLE AIR VOLUME TERMINAL UNIT SCHEDULE														
MARK	AREA SERVED	MANUFACTURER MODEL	INLET SIZE	VOLUME REGULATION				HEATING				ELECTRICAL DATA	NOTES	
				MAX PRIMARY AIR (CFM)	MIN PRIMARY AIR (CFM)	FAN CFM	FAN HP	MAX HEATING AIR (CFM)	HEATING E.A.T. (°F)	HEATING L.A.T. (°F)	HEATER KW			STAGES
VAV-1-1	VESTIBULE & RESTROOMS	PRICE SDV06	6"	450	65	---	---	275	56.4	90.9	3.0	2	480V/3Ø	1,2,4,5,7,9-12
VAV-1-2	OFFICES & CONFERENCE	PRICE SDV06	6"	350	91	---	---	180	56.4	91.5	2.0	2	480V/3Ø	1,2,4,5,7,9-12
VAV-1-3	CORRIDOR & BREAKROOM	PRICE SDV06	8"	850	143	---	---	650	56.4	90.4	7.0	2	480V/3Ø	1,2,4,5,7,9-12
FPVAV-1-4	MEETING ROOM 354A	PRICE FDV2010	10"	1200	377	330	1/3	707	62.7	91.8	6.5	2	480V/3Ø	1,3,6,8-12
FPVAV-1-5	MEETING ROOM 354B	PRICE FDV2010	10"	1200	386	330	1/3	716	62.7	91.3	6.5	2	480V/3Ø	1,3,6,8-12
FPVAV-1-6	TRAINING ROOM 354C	PRICE FDV2010	10"	1200	383	380	1/3	763	63.1	90.1	6.5	2	480V/3Ø	1,3,6,8-12
VAV-1-7	OFFICES	PRICE SDV06	6"	250	65	---	---	120	56.4	95.8	1.5	2	480V/3Ø	1,2,4,5,7,9-12
VAV-1-8	OFFICES	PRICE SDV06	6"	225	65	---	---	110	56.4	99.5	1.5	2	480V/3Ø	1,2,4,5,7,9-12
VAV-1-9	OFFICES & WORKROOMS	PRICE SDV06	8"	550	125	---	---	445	56.4	91.8	5.0	2	480V/3Ø	1,2,4,5,7,9-12
VAV-1-10	HALL & BREAKROOM	PRICE SDV06	6"	300	65	---	---	200	56.4	95.8	2.5	2	480V/3Ø	1,2,4,5,7,9-12
VAV-1-11	OFFICES	PRICE SDV06	6"	325	65	---	---	165	56.4	94.7	2.0	2	480V/3Ø	1,2,4,5,7,9-12
VAV-1-12	OFFICE 320	PRICE SDV06	6"	400	65	---	---	220	56.4	92.3	2.5	2	480V/3Ø	1,2,4,5,7,9-12
VAV-1-13	CONFERENCE 323	PRICE SDV06	6"	400	129	---	---	260	56.4	92.8	3.0	2	480V/3Ø	1,2,4,5,7,9-12
VAV-1-14	OFFICES	PRICE SDV06	6"	375	65	---	---	200	56.4	95.8	2.5	2	480V/3Ø	1,2,4,5,7,9-12

NOTES:
1. PROVIDE UNIT WITH 1" THICK FIBERGLASS INSULATION.
2. FULL SHUTOFF TYPE BOX.
3. THE TRUE MINIMUM AIR VOLUME IS THE MINIMUM BOX CAPACITY WHEN THE ZONE IS UNOCCUPIED. MINIMUM VOLUME SHOWN IS THE MINIMUM VENTILATION REQUIREMENT.
4. PROVIDE SIEMENS VAV CONTROLLER MOUNTED AT FACTORY WHICH INTEGRATES WITH SIEMENS DESIGO BUILDING MANAGEMENT SYSTEM.
5. PROVIDE UNIT WITH DOOR INTERLOCK DISCONNECT SWITCH.
6. PROVIDE ERM VALVE/DAMPERS.
7. APPROVED EQUALS SHALL BE TRANE VCEP GREENHECK XG-TH-500, AND CARRIER 3SE.
8. APPROVED EQUALS SHALL BE TRANE VCEP GREENHECK XG-TH-500, AND CARRIER 3SE.
9. PROVIDE WITH BOTTOM ACCESS DOOR.
10. PROVIDE WITH VIBRATION ISOLATION.
11. PROVIDE WITH FACTORY MOUNTED CONTROL TRANSFORMER.

AIR SEPARATOR SCHEDULE						
MARK	MANUFACTURER MODEL	TYPE	SERVICE	MAX GPM	INLET SIZE (IN)	NOTES
AS-2	BELL AND GOSSETT 5360-08F-12-004	CENTRIFUGAL WITH STRAINER	HOT WATER	1300	8	1-5
AS-3	BELL AND GOSSETT 5360-08F-12-004	CENTRIFUGAL WITH STRAINER	CHILLED WATER	1300	8	1-5

NOTES:
1. PROVIDE WITH HIGH CAPACITY AUTOMATIC AIR VENT.
2. PROVIDE WITH MANUAL BLOW DOWN VALVE.
3. DESIGNED AND CONSTRUCTED IN ACCORDANCE WITH SECTION VIII, DIVISION 1 OF THE ASME BOILER AND PRESSURE VESSEL CODE.
4. STAINLESS STEEL STRAINER.
5. APPROVED EQUALS INCLUDE TACO ACT SERIES AND AMTRLO MODEL AS.

AIR HANDLING UNIT SCHEDULE																											
MARK	AREA SERVED	NOMINAL TONS	MANUFACTURER	MODEL NUMBER	COOLING										PRE-HEAT						ELECTRICAL DATA		WEIGHT (LBS)	NOTES			
					TOTAL COOLING (MBH)	SENSIBLE COOLING (MBH)	SUPPLY AIR (CFM)	OUTSIDE AIR (CFM)	ESP (IN WG)	FAN HP	FLOW (GPM)	EWT (°F)	LWT (°F)	WATER PRESSURE DROP (FT WG)	EAT (°F)	LAT (°F)	TOTAL PRE-HEAT (MBH)	FLOW (GPM)	EWT (°F)	LWT (°F)	WATER PRESSURE DROP (FT WG)	EAT (°F)			LAT (°F)	VOLTAGE	PHASE
AHU-1	SOUTH OFFICES	23.5	TRANE	UCCA17	282.00	209.38	8075	2000	2	7.5	59.77	45.00	54.40	7.38	80.00	54.40	213.41	21.38	140.0	120.0	1.69	59.10	83.47	460	3	1801.6	1-14

NOTES:
1. COOLING CAPACITIES BASED ON 80°F DB / 67°F WB ENTERING COIL.
2. PROVIDE BACNET IP COMMUNICATION WHICH INTEGRATES WITH SIEMENS DESIGO BUILDING MANAGEMENT SYSTEM.
3. PROVIDE FACTORY INSTALLED DIRTY FILTER SWITCH AND BLOWER PROVING SWITCH.
4. PROVIDE 1 YEAR PARTS AND LABOR WARRANTY.
5. FIRE ALARM VENDOR TO FURNISH DUCT SMOKE DETECTOR. MECHANICAL CONTRACTOR TO INSTALL DUCT SMOKE DETECTOR IN THE RETURN AIR DUCT OF THE UNIT. FIRE ALARM VENDOR TO WIRE AND PROGRAM. DUCT SMOKE DETECTOR SHALL SHUT DOWN UNIT UPON ACTIVATION.
6. PROVIDE A SECOND SET OF FILTERS TO BE INSTALLED UPON SUBSTANTIAL COMPLETION.
7. PROVIDE RESTRAINED SPRING VIBRATION ISOLATION.
8. PROVIDE WITH MIXING BOX FROM FACTORY WITH BOTTOM RETURN OPENING AND REAR OUTSIDE AIR OPENING WITH MOTORIZED AIR DAMPERS.
9. CONFIRM ALL UNITS HAVE BEEN PROPERLY STARTED AND CONFIRMED RUNNING PROPERLY.
10. LABEL UNITS WITH MARK OR STENCIL MARK ON SIDE OF OUTSIDE UNIT WITH BLACK EXTERIOR PAINT.
11. PROVIDE WITH VIBRATION ISOLATION.
12. PROVIDE WITH FACTORY MOUNTED DISCONNECT.
13. PROVIDE WITH FACTORY MOUNTED VFD WITH OUTPUT FOR CONNECTION TO SIEMENS DESIGO BMS.
14. APPROVED EQUALS SHALL BE DUKER MATO-04SK, TRANE ARUB, AND JOHNSON AIR ROTATION AR-55.SSI.

CHEMICAL BYPASS FEEDER SCHEDULE					
MARK	MANUFACTURER MODEL	TYPE	SERVICE	CAPACITY (GAL)	NOTES
CBF-1	NEPTUNE DBF-5HP	VERTICAL	HOT WATER	5	1

NOTES:
1. APPROVED EQUALS INCLUDE J.L. WINGERT DB SERIES AND GWS DB SERIES

EXPANSION TANK SCHEDULE							
MARK	MANUFACTURER MODEL	TYPE	SERVICE	MAX ACCEPTANCE (GAL)	SYSTEM CONNECTION SIZE (IN)	FILL CONNECTION SIZE (IN)	NOTES
EXP-1	BELL AND GOSSETT 8400	BLADDER	HOT WATER	106.0	1 1/2	3/4	1-5
EXP-2	BELL AND GOSSETT B35	BLADDER	CHILLED WATER	10.0	3/4	3/4	1-5

NOTES:
1. DESIGNED AND CONSTRUCTED IN ACCORDANCE WITH SECTION VIII, DIV. 1 OF THE ASME BOILER AND PRESSURE VESSEL CODE.
2. PROVIDE WITH PRESSURE GAUGE, BLADDER INTEGRITY MONITOR, AND AIR CHARGING VALVE.
3. CARBON STEEL SHELL.
4. REPLACEABLE HEAVY DUTY BUTYL RUBBER BLADDER.
5. APPROVED EQUALS INCLUDE TACO CA SERIES AND AMTRLO EXTLROL L-SERIES.

AIR ROTATION UNIT SCHEDULE																										
MARK	AREA SERVED	NOMINAL TONS	MANUFACTURER	MODEL NUMBER	COOLING										HEATING						ELECTRICAL DATA		WEIGHT (LBS)	NOTES		
					SUPPLY AIR (CFM)	OUTSIDE AIR (CFM)	FAN HP	TOTAL COOLING (MBH)	SENSIBLE COOLING (MBH)	FLOW (GPM)	EWT (°F)	LWT (°F)	WATER PRESSURE DROP (FT WG)	EAT (°F)	LAT (°F)	TOTAL HEATING (MBH)	FLOW (GPM)	EWT (°F)	LWT (°F)	WATER PRESSURE DROP (FT WG)	EAT (°F)	LAT (°F)			VOLTAGE	PHASE
ARU-1	8687 WAREHOUSE	85	POWRMATIC	TE-41HC	34000	6500	(2) 7.5	1034.1	762.3	203.1	45.00	55.1	15.69	78.2	53.9	896.7	91.4	140.0	120.1	1.81	59.9	84.4	480	3	6000	1-7,9-12,14,15
ARU-2	8687 WAREHOUSE	85	POWRMATIC	TE-41HC	34000	6500	(2) 7.5	1034.1	762.3	203.1	45.00	55.1	15.69	80.00	56.8	896.7	91.4	140.0	120.1	1.81	70.0	94.5	480	3	6000	1-7,9-12,14,15
ARU-3	89 WAREHOUSE	79	POWRMATIC	TE-41HC	31600	2550	(2) 7.5	973.3	713.1	188.8	45.00	55.3	13.13	76.4	55.5	821.2	81.3	140.0	119.5	1.81	64.6	88.7	480	3	6000	1-8,10-12,14,15
ARU-4	92 WAREHOUSE	45	POWRMATIC	TE-21HC	18000	1450	(2) 3.0	552.2	402.5	107.5	45.00	55.2	19.06	76.4	55.6	507.7	50.8	140.0	119.7	1.38	64.6	90.7	480	3	4000	1-8,10-11,13,14,15
ARU-5	94 WAREHOUSE	96	POWRMATIC	TE-41HC	38400	5400	(2) 7.5	1169.8	852.9	229.4	45.00	55.2	17.18	77.4	56.7	903.0	91.4	140.0	119.9	1.92	62.1	83.8	480	3	6000	1-7,9-11,13,14,15
ARU-6	94 WAREHOUSE	96	POWRMATIC	TE-41HC	38400	5400	(2) 7.5	1169.8	852.9	229.4	45.00	55.2	17.18	80.00	59.0	903.0	91.4	140.0	119.9	1.92	70.0	91.8	480	3	6000	1-7,9-11,13,14,15

NOTES:
1. COOLING CAPACITIES BASED ON 80°F DB / 67°F WB ENTERING COIL.
2. PROVIDE BACNET IP COMMUNICATION WHICH INTEGRATES WITH SIEMENS DESIGO BUILDING MANAGEMENT SYSTEM.
3. PROVIDE 1 YEAR PARTS AND LABOR WARRANTY.
4. MECHANICAL CONTRACTOR SHALL PROVIDE A SECOND SET OF FILTERS TO BE INSTALLED UPON SUBSTANTIAL COMPLETION.
5. PROVIDE VIBRATION ISOLATION PADS.
6. MECHANICAL CONTRACTOR SHALL CONFIRM ALL UNITS HAVE BEEN PROPERLY STARTED AND CONFIRMED RUNNING PROPERLY.
7. LABEL UNITS WITH MARK OR STENCIL MARK ON SIDE OF OUTSIDE UNIT WITH BLACK EXTERIOR PAINT.
8. PROVIDE UNIT WITH 3-WAY DISCHARGE PLENUM.
9. PROVIDE UNIT WITH 4-WAY DISCHARGE PLENUM.
10. PROVIDE WITH FACTORY MOUNTED VFD WITH OUTPUT FOR CONNECTION TO SIEMENS DESIGO BMS.
11. PROVIDE WITH FACTORY MOUNTED DISCONNECT.
12. APPROVED EQUALS SHALL BE APPLIED AIR MATO-04SK, TRANE ARUB, AND JOHNSON AIR ROTATION AR-55.SSI.
13. APPROVED EQUALS SHALL BE APPLIED AIR MATO-030K, TRANE ARUB, AND JOHNSON AIR ROTATION AR-55.SSI.
14. APPROVED EQUALS SHALL BE APPLIED AIR MATO-04SK, TRANE ARUB, AND JOHNSON AIR ROTATION AR-55.SSI.
15. UNIT SHALL BE 24" IN HEIGHT.

MAGNETIC SEPARATOR SCHEDULE						
MARK	MANUFACTURER MODEL	SERVICE	DESIGN FLOW (GPM)	CAPACITY @ 5 FPS (GPM)	INLET/OUTLET SIZE (IN)	NOTES
MS-1	BOILERMAG BMXT300HF8/ANSI	HOT WATER	576	775	8	1

NOTES:
1. APPROVED EQUALS INCLUDE MAGSTRAINER H2 AND ADEY MAGNACLEAN

MAKEUP WATER APPURTENANCE SCHEDULE				
MARK	MANUFACTURER MODEL	SIZE (IN)	DESCRIPTION	NOTES
RPZ-1	WATTS LF009	3/4"	LEAD FREE BRONZE REDUCED PRESSURE ZONE BACKFLOW PREVENTER, ASSE 1013	1-2
PRV-1	BELL AND GOSSETT 87-12	3/4"	LEAD FREE BRONZE PRESSURE REDUCING VALVE, 10-25 PSI, SET TO 20 PSI	3-4
PRV-2	BELL AND GOSSETT MODEL 7	3/4"	LEAD FREE BRONZE PRESSURE REDUCING VALVE, 25-60 PSI, SET TO 30 PSI	3-4
RV-1	BELL AND GOSSETT 790-50	3/4"	LEAD FREE BRONZE PRESSURE RELIEF VALVE, RELIEF SETTING OF 90 PSI, ASME SECTION IV	3,5

NOTES:
1. PROVIDE WITH AIR GAP FITTING, INLET STRAINER, AND QUARTER TURN BALL VALVES
2. APPROVED EQUALS INCLUDE ZURN WILKINS 975X3 AND FEBCO LF860 SMALL
3. A PREASSEMBLED MAKEUP WATER PACKAGE MAY BE USED IN LIEU OF AN INDIVIDUAL PRV AND RELIEF VALVE.
4. APPROVED EQUALS INCLUDE WATTS LF123LP AND ZURN WILKINS 500X3
5. APPROVED EQUALS INCLUDE WATTS LF174A AND ZURN WILKINS P1000AXL

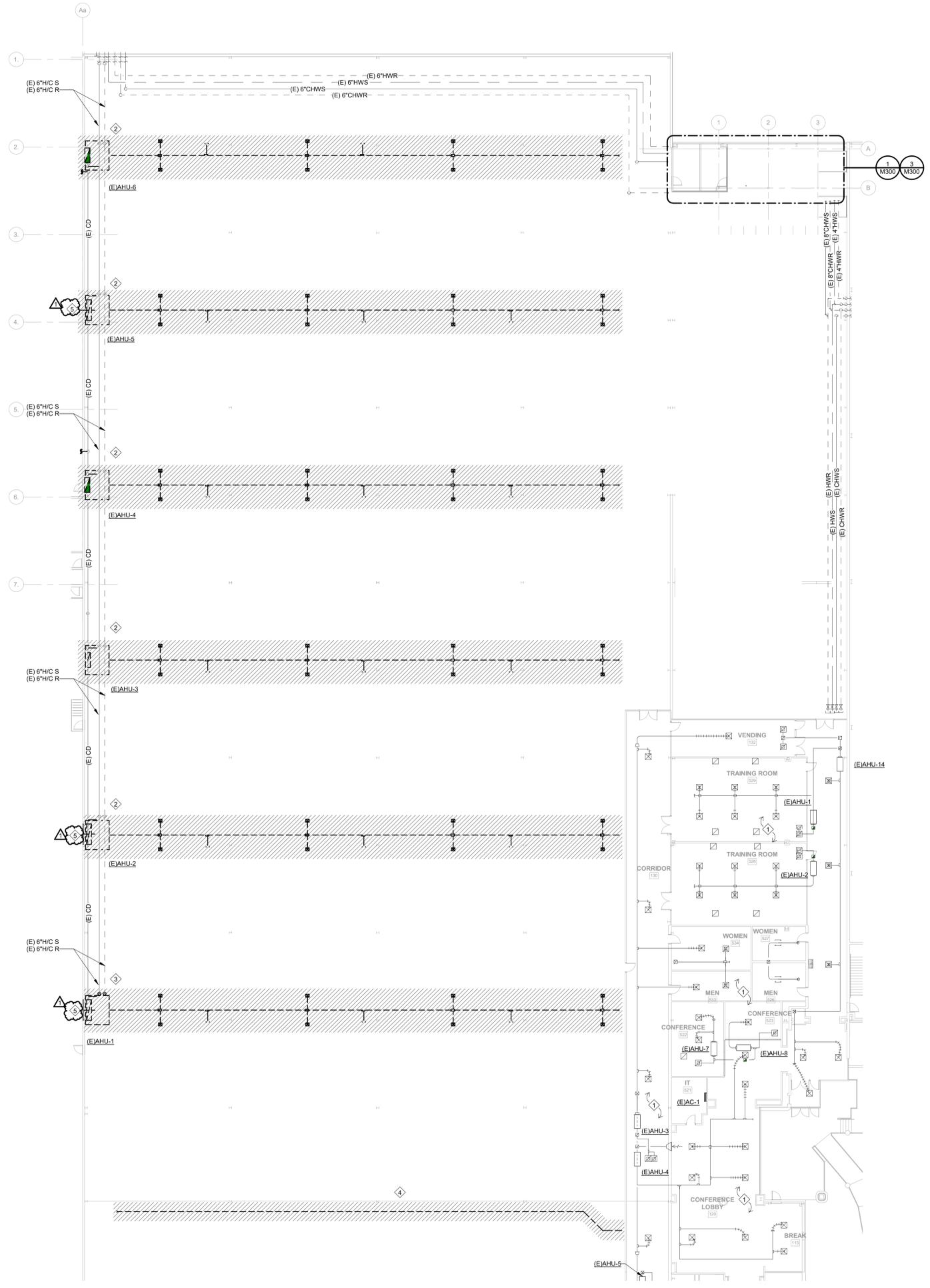
AIR DISTRIBUTION SCHEDULE								
MARK	TYPE	DESCRIPTION	DESIGN BASIS		FACE SIZE	NECK SIZE	MATERIAL	NOTES
			MANUFACTURER	MODEL				
S-1	SUPPLY	SQUARE CONE, 3-CONE, FIXED PATTERN	PRICE	SCD	12"x12"	6"Ø	STEEL	1 - 3
S-2	SUPPLY	SQUARE CONE, 4-CONE, FIXED PATTERN	PRICE	SCD	24"x24"	6"Ø	STEEL	1 - 3
S-3	SUPPLY	SQUARE CONE, 4-CONE FIXED PATTERN	PRICE	SCD	24"x24"	8"Ø	STEEL	1 - 3
R-1	RETURN	PERFORATED FACE, PLENUM RETURN	PRICE	PDDR	24"x24"	22"x22"	STEEL	1-3

NOTES:
1. FINISH SHALL MATCH CEILING AND DIFFUSERS IN ADJACENT, OUT OF SCOPE, AREAS FOR A CONTIGUOUS LOOK.
2. MOUNTING TYPE SHALL BE SUITABLE FOR THE CEILING TYPE INTO WHICH DIFFUSER IS INSTALLED.
3. ACCEPTABLE EQUALS INCLUDE METALARE AND TITUS.

CONDENSING BOILER SCHEDULE										
MARK	MANUFACTURER MODEL	INPUT MBH	OUTPUT MBH	MINIMUM EFF.	FLOW (GPM)	EWT (°F)	LWT (°F)	WATER PRESSURE DROP (FT WG)	ELECTRICAL DATA	NOTES
B-1	LOCHINVAR FB-3001	3000	2507	96.0%	288	120.0	140.0	8.0	208 3	1-9
B-2	LOCHINVAR FB-3001	3000	2507	96.0%	288	120.0	140.0	8.0	208 3	1-9

NOTES:
1. BOILER SHALL BE CSD-1 COMPLIANT.
2. PROVIDE WITH STAINLESS STEEL HEAT EXCHANGER.
3. MINIMUM 10:1 TURNDOWN RATIO.
4. PROVIDE WITH CONDENSATE NEUTRALIZATION KIT.
5. BOILER SHALL BE COMPATIBLE WITH POLYPROPYLENE FLUE/COMBUSTION VENT SYSTEM.
6. PROVIDE BACNET IP COMMUNICATION PROTOCOL COMPATIBLE W/ SIEMENS DESIGO BUILDING MANAGEMENT SYSTEM.
7. PROVIDE 1 YEAR PARTS AND LABOR WARRANTY AND 10 YEAR HEAT EXCHANGER WARRANTY.
8. APPROVED EQUALS: PATTERSON-KELLY STORM 3000 AND BRYAN BFIT-3000.
9. HEAT EXCHANGER SHALL BEAR THE ASME "H" STAMP.

PUMP SCHEDULE															
MARK	MANUFACTURER MODEL	SERVICE	TYPE	FLOW (GPM)	HEAD (FT)	SUCTION SIZE (IN)	DISCHARGE SIZE (IN)	IMPELLER DIAMETER (IN)	MOTOR			ELECTRICAL DATA		WEIGHT (LBS)	NOTES
									HP	RPM	CONTROL	VOLTAGE	PHASE		
HWP-1	BELL & GOSSETT BG-E1510-3BD-SS-254T-S	HOT WATER	BASE MOUNTED END SUCTION	597	60	4	3	9.5	15	1800	VFD	480	3	310	1-7
HWP-2	BELL & GOSSETT BG-E1510-3BD-SS-254T-S	HOT WATER	BASE MOUNTED END SUCTION	597	60	4	3	9.5	15	1800	VFD	480	3	310	1-7
HWP-3	BG-E80-12SAB-050-1725-1	HOT WATER	CLOSE COUPLED IN-LINE CENTRIFUGAL	28	20	1 1/4	1 1/4	4.625	0.5	1800	CONSTANT	480	3	55	1,3,5,8,9
BP-1</															



PLAN GENERAL NOTES:

A. DIAGONAL HATCHING INDICATES EXISTING EQUIPMENT, PIPING, AND DUCTWORK TO BE REMOVED.

PLAN KEYED NOTES:

1. EXISTING UNITS AND DUCTWORK IN THIS AREA TO REMAIN. UNITS TO BE RELABELED IN SEQUENTIAL ORDER. REFER TO NEW WORK PLAN AND EXISTING UNIT SCHEDULES ON M022 FOR NEW LABELS.
2. REMOVE EXISTING AIR HANDLER, THERMOSTAT, CONTROLS WIRING, CONTROLS WIRING CONDUIT, AND ASSOCIATED DUCTWORK. REMOVE DUAL TEMP SUPPLY AND RETURN (H/C S, H/C R) PIPING BACK TO HEADER IN CEILING AND CAP. REMOVE CONDENSATE DRAIN BACK TO CONDENSATE PIPING ON WALL AND CAP.
3. REMOVE EXISTING AIR HANDLER, THERMOSTAT, CONTROLS WIRING, CONTROLS WIRING CONDUIT, AND ASSOCIATED DUCTWORK. REMOVE DUAL TEMP SUPPLY AND RETURN (H/C S, H/C R) PIPING AND ELBOW AT HEADER IN CEILING AND EXTEND NEW PIPING AS SHOWN ON NEW WORK PLAN. REMOVE CONDENSATE PIPING BACK TO CONDENSATE PIPING ON WALL AND CAP.
4. REMOVE ABANDONED OVERHEAD DUCTWORK IN THIS AREA.
5. REMOVE OUTSIDE AIR DUCTWORK ASSOCIATED WITH EXISTING AIR HANDLER BACK TO LOUVER. COVER LOUVER WITH METAL CAP INSULATED WITH 2" THICK INSULATION AND SEAL WEATHER TIGHT.



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PROJECT INFORMATION:



**TYGER RIVER
CAMPUS HVAC AND
BOILER
REPLACEMENTS**

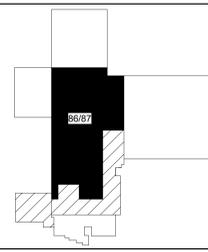
1875 EAST MAIN ST.,
DUNCAN, SC 29334

State Project No. H59-6315-JM
DEVITA Project No. 25531
Issue Date: 12 JANUARY 2026

REVISIONS		
NO.	DATE	DESCRIPTION
A	12/10/25	OSE SUBMISSION
B	01/12/26	OSE REVIEW COMMENTS
C	01/19/26	OSE REVIEW COMMENTS
1	02/17/26	ADDENDUM 1

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KEY PLAN



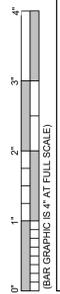
DRAWING NAME
MECHANICAL 86/87
AREA DEMOLITION
PLAN

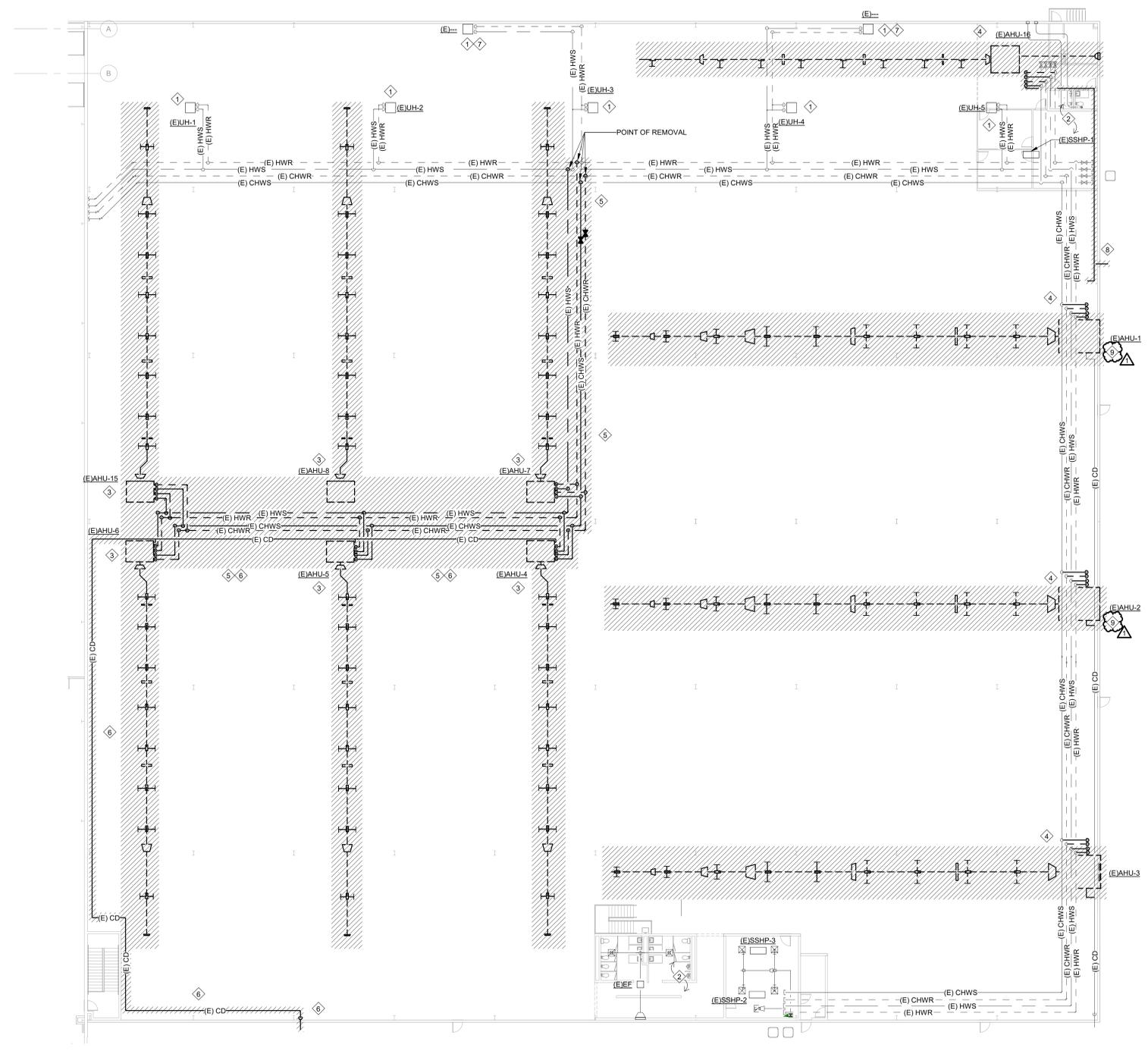
DRAWING NO.

M102

Drawn By: ASE Checked By: CIC

1 MECHANICAL 86/87 AREA DEMOLITION PLAN
M102 1/16" = 1'-0"





- PLAN GENERAL NOTES:**
 A. DIAGONAL HATCHING INDICATES EXISTING EQUIPMENT, PIPING, AND DUCTWORK TO BE REMOVED.
- PLAN KEYED NOTES:**
- EXISTING UNIT HEATER, CONTROLS, AND ASSOCIATED PIPING AND DUCTWORK TO REMAIN. REFER TO NEW WORK PLAN FOR RELABELING.
 - EXISTING EQUIPMENT ON MEZZANINE TO REMAIN. REFER TO NEW WORK PLANS FOR AIR HANDLER LABELING.
 - REMOVE EXISTING AIR HANDLER, THERMOSTAT, CONTROLS WIRING, CONTROLS WIRING CONDUIT, AND ASSOCIATED DUCTWORK.
 - REMOVE EXISTING AIR HANDLER, THERMOSTAT, CONTROLS WIRING, CONTROLS WIRING CONDUIT, AND ASSOCIATED DUCTWORK. REMOVE CHWS, CHWR, HWS, HWR PIPING BACK TO HEADER IN CEILINGS AND CAP. REMOVE CONDENSATE DRAIN BACK TO CONDENSATE PIPING ON WALL AND CAP.
 - REMOVE CHWS, CHWR, HWS, AND HWR PIPING AS SHOWN BACK TO POINT OF REMOVAL AT HEADER SHOWN. EXTEND NEW PIPING AS SHOWN IN NEW WORK PLAN.
 - REMOVE CONDENSATE DRAIN PIPING SERVING EXISTING UNITS AS SHOWN BACK THRU WALL PENETRATION. SEAL WALL PENETRATION WEATHER TIGHT.
 - EXISTING HOT WATER UNIT HEATER EITHER DOES NOT HAVE A TAG OR A TAG WAS NOT ABLE TO BE OBTAINED FROM EXISTING DRAWINGS AND FIELD OBSERVATIONS.
 - REMOVE EXISTING CONDENSATE AS SHOWN AND DOWN THROUGH WALL. SEAL PENETRATION WEATHER TIGHT.
 - REMOVE OUTSIDE AIR DUCTWORK ASSOCIATED WITH EXISTING AIR HANDLER BACK TO LOUVER. EXTEND NEW OUTSIDE AIR DUCTWORK FROM LOUVER AS SHOWN IN NEW WORK PLAN.



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CONSULTANT
PROJECT INFORMATION:



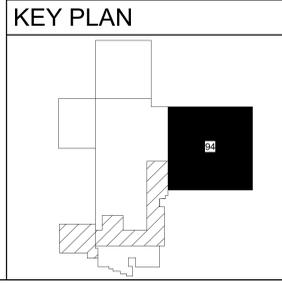
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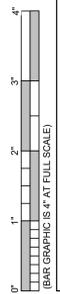
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DRAWING NAME
 MECHANICAL 94 AREA
 DEMOLITION PLAN

DRAWING NO.
M105
 Drawn By: ASE Checked By: CIC

1 MECHANICAL 94 AREA DEMOLITION PLAN
 M105 1/16" = 1'-0"



**SECTION 232113
HYDRONIC PIPING**

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Hydronic system requirements.
- B. Heating water and glycol piping, buried.
- C. Heating water piping, above grade.
- D. Chilled water piping, above grade.
- E. Equipment drains and overflows.
- F. Pipe hangers and supports.
- G. Unions, flanges, mechanical couplings, and dielectric connections.
- H. Valves:
 - 1. Ball valves.
 - 2. Butterfly valves.
 - 3. Check valves.
 - 4. Pressure independent temperature control valves and balancing valves.
- I. Flow controls.

1.02 RELATED REQUIREMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this section.
- B. Section 078400 - Firestopping.
- C. Section 230516 - Expansion Fittings and Loops for HVAC Piping.
- D. Section 230523 - General-Duty Valves for HVAC Piping.
- E. Section 230548 - Vibration and Seismic Controls for HVAC.
- F. Section 230553 - Identification for HVAC Piping and Equipment.
- G. Section 230719 - HVAC Piping Insulation.
- H. Section 232114 - Hydronic Specialties.
- I. Section 232500 - HVAC Water Treatment: Pipe cleaning.

1.03 REFERENCE STANDARDS

- A. ANSI/FCI 70-2 - Control Valve Seat Leakage; 2021.
- B. ASME BPVC-IX - Boiler and Pressure Vessel Code, Section IX - Qualification Standard for Welding, Brazing, and Fusing Procedures; Welders; Brazers; and Welding, Brazing, and Fusing Operators; 2025.
- C. ASME B16.3 - Malleable Iron Threaded Fittings: Classes 150 and 300; 2021.
- D. ASME B16.5 - Pipe Flanges and Flanged Fittings: NPS 1/2 Through NPS 24 Metric/Inch Standard; 2025.
- E. ASME B16.15 - Cast Copper Alloy Threaded Fittings: Classes 125 and 250; 2024.
- F. ASME B16.18 - Cast Copper Alloy Solder Joint Pressure Fittings; 2021.
- G. ASME B16.22 - Wrought Copper and Copper Alloy Solder-Joint Pressure Fittings; 2021.
- H. ASME B16.34 - Valves — Flanged, Threaded, and Welding End; 2025.
- I. ASME B16.51 - Copper and Copper Alloy Press-Connect Pressure Fittings; 2021.
- J. ASME B31.9 - Building Services Piping; 2025.

- K. ASTM A53/A53M - Standard Specification for Pipe, Steel, Black and Hot-Dipped, Zinc-Coated, Welded and Seamless; 2024.
- L. ASTM A106/A106M - Standard Specification for Seamless Carbon Steel Pipe for High-Temperature Service; 2019a.
- M. ASTM A123/A123M - Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products; 2024.
- N. ASTM A183 - Standard Specification for Carbon Steel Track Bolts and Nuts; 2014 (Reapproved 2020).
- O. ASTM A234/A234M - Standard Specification for Piping Fittings of Wrought Carbon Steel and Alloy Steel for Moderate and High Temperature Service; 2025.
- P. ASTM A536 - Standard Specification for Ductile Iron Castings; 2024.
- Q. ASTM B32 - Standard Specification for Solder Metal; 2020.
- R. ASTM B88 - Standard Specification for Seamless Copper Water Tube; 2022.
- S. ASTM B88M - Standard Specification for Seamless Copper Water Tube (Metric); 2020.
- T. ASTM D1785 - Standard Specification for Poly(Vinyl Chloride) (PVC) Plastic Pipe, Schedules 40, 80, and 120; 2021a.
- U. ASTM D2000 - Standard Classification System for Rubber Products in Automotive Applications; 2018, with Editorial Revision (2024).
- V. ASTM D2241 - Standard Specification for Poly(Vinyl Chloride) (PVC) Pressure-Rated Pipe (SDR Series); 2025a.
- W. ASTM D2310 - Standard Classification for Machine-Made "Fiberglass" (Glass-Fiber-Reinforced Thermosetting-Resin) Pipe; 2006 (Reapproved 2012).
- X. ASTM D2466 - Standard Specification for Poly(Vinyl Chloride) (PVC) Plastic Pipe Fittings, Schedule 40; 2024.
- Y. ASTM D2467 - Standard Specification for Poly(Vinyl Chloride) (PVC) Plastic Pipe Fittings, Schedule 80; 2024.
- Z. ASTM D2855 - Standard Practice for the Two-Step (Primer and Solvent Cement) Method of Joining Poly (Vinyl Chloride) (PVC) or Chlorinated Poly (Vinyl Chloride) (CPVC) Pipe and Piping Components with Tapered Sockets; 2020 (Reapproved 2024).
- AA. ASTM F708 - Standard Practice for Design and Installation of Rigid Pipe Hangers; 2024.
- BB. ASTM F877 - Standard Specification for Crosslinked Polyethylene (PEX) Hot- and Cold-Water Distribution Systems; 2025.
- CC. ASTM F1476 - Standard Specification for Performance of Gasketed Mechanical Couplings for Use in Piping Applications; 2007 (Reapproved 2024).
- DD. AWS A5.8M/A5.8 - Specification for Filler Metals for Brazing and Braze Welding; 2019.
- EE. AWS D10.12M/D10.12 - Guide for Welding Mild Steel Pipe; 2000.
- FF. AWWA C110/A21.10 - Ductile-Iron and Gray-Iron Fittings; 2021.
- GG. AWWA C111/A21.11 - Rubber-Gasket Joints for Ductile-Iron Pressure Pipe and Fittings; 2023.
- HH. AWWA C151/A21.51 - Ductile-Iron Pipe, Centrifugally Cast; 2023.
- II. AWWA C606 - Grooved and Shouldered Joints; 2022.
- JJ. MSS SP-58 - Pipe Hangers and Supports - Materials, Design, Manufacture, Selection, Application, and Installation; 2025.

1.04 SUBMITTALS

- A. See Section 013000 - Administrative Requirements for submittal procedures.
- B. Product Data:

1. Indicate valve data and ratings.

- C. Project Record Documents: Record actual locations of valves.

1.05 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Company specializing in manufacturing products of the type specified in this section, with minimum three years of documented experience.
- B. Welder Qualifications: Certify in accordance with ASME BPVC-IX.

1.06 DELIVERY, STORAGE, AND HANDLING

- A. Accept valves on site in shipping containers with labeling in place. Inspect for damage.
- B. Provide temporary protective coating on cast iron and steel valves.
- C. Protect piping systems from entry of foreign materials by temporary covers, completing sections of the work, and isolating parts of completed system.

1.07 FIELD CONDITIONS

- A. Do not install underground piping when bedding is wet or frozen.

PART 2 PRODUCTS

2.01 HYDRONIC SYSTEM REQUIREMENTS

- A. Comply with ASME B31.9 and applicable federal, state, and local regulations.
- B. Piping: Provide piping, fittings, hangers, and supports as required, as indicated, and as follows:
 1. Where more than one piping system material is specified, provide joining fittings that are compatible with piping materials and ensure that the integrity of the system is not jeopardized.
 2. Use non-conducting dielectric connections whenever jointing dissimilar metals.
 3. Grooved mechanical joints may be used in accessible locations only.
 - a. Accessible locations include those exposed on interior of building, in pipe chases, and in mechanical rooms, aboveground outdoors, and as approved by Engineer/Architect.
 - b. Use rigid joints unless otherwise indicated.
 4. Provide pipe hangers and supports in accordance with ASME B31.9 or MSS SP-58 unless indicated otherwise.
- C. Pipe-to-Valve and Pipe-to-Equipment Connections: Use flanges, unions, or grooved couplings to allow disconnection of components for servicing; do not use direct welded, soldered, or threaded connections.
- D. Valves: Provide valves where indicated:

2.02 HEATING WATER PIPING, ABOVE GRADE

- A. Steel Pipe: ASTM A53/A53M, Schedule 40, black, using one of the following joint types:
 1. Welded Joints: ASTM A234/A234M, wrought steel welding type fittings; AWS D10.12M/D10.12 welded.
 2. Threaded Joints: ASME B16.3, malleable iron fittings.
 3. Grooved Joints: AWWA C606 grooved pipe, fittings of same material, and mechanical couplings.
- B. Copper Tube: ASTM B88 (ASTM B88M), Type K (A), drawn, using one of the following joint types:
 1. Solder Joints: ASME B16.18 cast brass/bronze or ASME B16.22 solder wrought copper fittings.
 - a. Solder: ASTM B32 lead-free solder, HB alloy (95-5 tin-antimony) or tin and silver.
 - b. Braze: AWS A5.8M/A5.8 BCuP copper/silver alloy.

2.03 CHILLED WATER PIPING, ABOVE GRADE

- A. Steel Pipe: ASTM A53/A53M, Schedule 40, black; using one of the following joint types:

1. Welded Joints: ASTM A234/A234M, wrought steel welding type fittings; AWS D10.12M/D10.12 welded.
2. Threaded Joints: ASME B16.3, malleable iron fittings.
3. Grooved Joints: AWWA C606 grooved pipe, fittings of same material, and mechanical couplings.

2.04 EQUIPMENT DRAINS AND OVERFLOWS

- A. Steel Pipe: ASTM A53/A53M, Schedule 40 galvanized; using one of the following joint types:
 1. Threaded Joints: Galvanized cast iron, or ASME B16.3 malleable iron fittings.
- B. Copper Tube: ASTM B88 (ASTM B88M), Type M (C), drawn; using one of the following joint types:
 1. Solder Joints: ASME B16.18 cast brass/bronze or ASME B16.22 solder wrought copper fittings; ASTM B32 lead-free solder, HB alloy (95-5 tin-antimony) or tin and silver.
- C. PVC Pipe: ASTM D1785, Schedule 40, or ASTM D2241, SDR 21 or 26.
 1. Fittings: ASTM D2466 or D2467, PVC.
 2. Joints: Solvent welded in accordance with ASTM D2855.

2.05 PIPE HANGERS AND SUPPORTS

- A. Provide hangers and supports that comply with MSS SP-58.
 1. If type of hanger or support for a particular situation is not indicated, select appropriate type using MSS SP-58 recommendations.
- B. In grooved installations, use rigid couplings with offsetting angle-pattern bolt pads or with wedge-shaped grooves in header piping to permit support and hanging in accordance with ASME B31.9.

2.06 UNIONS, FLANGES, MECHANICAL COUPLINGS, AND DIELECTRIC CONNECTIONS

- A. Unions for Pipe of 2 Inches and Less:
 1. Ferrous Piping: 150 psi brass or malleable iron, threaded.
 2. Copper Pipe: Bronze, soldered joints.
- B. Flanges for Pipe 2 Inches and Greater:
 1. Ferrous Piping: 150 psig forged steel, slip-on.
 2. Copper Piping: Bronze.
- C. Mechanical Couplings for Grooved and Shouldered Joints: Two or more curved housing segments with continuous key to engage pipe groove, circular C-profile gasket, and bolts to secure and compress gasket.
 1. Dimensions and Testing: In accordance with AWWA C606.
 2. Mechanical Couplings: Comply with ASTM F1476.
 3. Bolts and Nuts: Hot dipped galvanized or zinc-electroplated steel.
 4. When pipe is field grooved, provide coupling manufacturer's grooving tools.

2.07 BALL VALVES

- A. Manufacturers:
 1. Anvil International: www.anvilintl.com/#sle.
 2. Apollo Valves: www.apollovalves.com/#sle.
 3. Crane Fluid Systems: <https://www.cranefs.com/>
 4. Flotite Valves and Controls: <https://flotite.com/>
 5. Jomar Valve: <https://www.jomarvalve.com/>
 6. Milwaukee Valve: <https://www.milwaukeevalve.com/>
 7. Nibco: <https://www.nibco.com/>
 8. Red-White Valve Corp.: <https://redwhitevalvecorp.com/>
 9. Victaulic Company: www.victaulic.com/#sle.
 10. Watts: <https://www.watts.com/>
 11. Substitutions: See Section 016000 - Product Requirements.

- B. Up To and Including 2 Inches:
 - 1. Bronze one piece body, chrome plated brass ball, teflon seats and stuffing box ring, lever handle with balancing stops, solder ends with union.
- C. Over 2 Inches:
 - 1. Ductile iron body, chrome plated stainless steel ball, teflon or Virgin TFE seat and stuffing box seals, lever handle or gear operated, flanged ends, rated to 800 psi.

2.08 BUTTERFLY VALVES

- A. Manufacturers:
 - 1. Anvil International: www.anvilintl.com/#sle.
 - 2. Apollo Valves: www.apollovalves.com/#sle.
 - 3. Crane Fluid Systems: <https://www.cranefs.com/>
 - 4. Flotite Valves and Controls: <https://flotite.com/>
 - 5. Milwaukee Valve: <https://www.milwaukeevalve.com/>
 - 6. Nibco: <https://www.nibco.com/>
 - 7. Red-White Valve Corp.: <https://redwhitevalvecorp.com/>
 - 8. Victaulic Company: www.victaulic.com/#sle.
 - 9. Watts: <https://www.watts.com/>
 - 10. Substitutions: See Section 016000 - Product Requirements.
- B. Body: Cast or ductile iron with resilient replaceable EPDM seat, wafer, lug, or grooved ends, extended neck.
- C. Disc: Construct of aluminum bronze, chrome plated ductile iron, stainless steel, ductile iron with EPDM encapsulation, or Buna-N encapsulation.
- D. Operator: 10 position lever handle.

2.09 SWING CHECK VALVES

- A. Manufacturers:
 - 1. Anvil International: www.anvilintl.com/#sle.
 - 2. Apollo Valves: www.apollovalves.com/#sle.
 - 3. Crane Fluid Systems: <https://www.cranefs.com/>
 - 4. Flotite Valves and Controls: <https://flotite.com/>
 - 5. Milwaukee Valve: <https://www.milwaukeevalve.com/>
 - 6. Nibco: <https://www.nibco.com/>
 - 7. Red-White Valve Corp.: <https://redwhitevalvecorp.com/>
 - 8. Victaulic Company: www.victaulic.com/#sle.
 - 9. Watts: <https://www.watts.com/>
 - 10. Substitutions: See Section 016000 - Product Requirements.
- B. Up To and Including 2 Inches:
 - 1. Bronze body, bronze trim, bronze rotating swing disc, with composition disc, solder ends.
- C. Over 2 Inches:
 - 1. Iron body, bronze trim, stainless steel, bronze, or bronze faced rotating swing disc, renewable disc and seat, flanged or grooved ends.

2.10 SPRING LOADED CHECK VALVES

- A. Manufacturers:
 - 1. Anvil International: www.anvilintl.com/#sle.
 - 2. Apollo Valves: www.apollovalves.com/#sle.
 - 3. Crane Fluid Systems: <https://www.cranefs.com/>
 - 4. Flotite Valves and Controls: <https://flotite.com/>
 - 5. Milwaukee Valve: <https://www.milwaukeevalve.com/>
 - 6. Nibco: <https://www.nibco.com/>
 - 7. Red-White Valve Corp.: <https://redwhitevalvecorp.com/>

8. Victaulic Company: www.victaulic.com/#sle.
 9. Watts: <https://www.watts.com/>
 10. Substitutions: See Section 016000 - Product Requirements.
- B. Iron body, bronze trim, split plate, hinged with stainless steel spring, resilient seal bonded to body, wafer, or threaded lug ends.

2.11 PRESSURE INDEPENDENT TEMPERATURE CONTROL VALVES AND BALANCING VALVES

- A. Manufacturers:
1. Griswold Controls: <https://griswoldcontrols.com/>
 2. Hays Fluid Controls: <https://www.haysfluidcontrols.com/>
 3. Nexus: <https://nexusvalve.com/>
 4. Nibco: <https://www.nibco.com/>
 5. Victaulic Company: www.victaulic.com/#sle.
 6. Xylem: <https://www.xylem.com/>
 7. Substitutions: See Section 016000 - Product Requirements.
- B. Control Valves: Factory-fabricated pressure independent with internal differential pressure regulator (DPRV), which automatically adjusts to normal changes in system pressure and provides 100 percent control valve authority at all positions of the valve.

2.12 FLOW CONTROLS

- A. Manufacturers:
1. Anvil International: www.anvilintl.com/#sle.
 2. Bell & Gossett, a brand of Xylem, Inc: www.bellgossett.com/#sle.
 3. Griswold Controls: www.griswoldcontrols.com/#sle.
 4. Hays Fluid Controls: www.haysfluidcontrols.com/#sle.
 5. ITT Bell & Gossett: www.bellgossett.com/#sle.
 6. Taco, Inc: www.taco-hvac.com/#sle.
 7. Victaulic Company: www.victaulic.com/#sle.
 8. Substitutions: See Section 016000 - Product Requirements.
- B. Construction: Class 125, Brass or bronze body with union on inlet and outlet, temperature and pressure test plug on inlet and outlet, blowdown/backflush drain.
- C. Calibration: Control flow within 10 percent of selected rating, over operating pressure range of 10 times minimum pressure required for control, minimum pressure 2 psi.

PART 3 EXECUTION

3.01 PREPARATION

- A. Ream pipe and tube ends. Remove burrs. Bevel plain end ferrous pipe.
- B. Prepare pipe for grooved mechanical joints as required by coupling manufacturer.
- C. Remove scale and dirt on inside and outside before assembly.
- D. Prepare piping connections to equipment using jointing system specified.
- E. Keep open ends of pipe free from scale and dirt. Protect open ends with temporary plugs or caps.
- F. After completion, fill, clean, and treat systems. See Section 232500 for additional requirements.

3.02 INSTALLATION

- A. Install in accordance with manufacturer's instructions.
- B. Install heating water, glycol, chilled water, condenser water, and engine exhaust piping to ASME B31.9 requirements.
- C. PVC Pipe: Make solvent-welded joints in accordance with ASTM D2855.
- D. Route piping in orderly manner, parallel to building structure, and maintain gradient.

- E. Install piping to conserve building space and to avoid interference with use of space.
- F. Group piping whenever practical at common elevations.
- G. Sleeve pipe passing through partitions, walls, and floors.
- H. Install firestopping to preserve fire resistance rating of partitions and other elements, using materials and methods specified in Section 078400.
- I. Slope piping and arrange to drain at low points.
- J. Install piping to allow for expansion and contraction without stressing pipe, joints, or connected equipment. See Section 230516.
 - 1. Flexible couplings may be used in header piping to accommodate thermal growth, thermal contraction in lieu of expansion loops.
 - 2. Use flexible couplings in expansion loops.
- K. Pipe Hangers and Supports:
 - 1. Install in accordance with ASME B31.9, ASTM F708, or MSS SP-58.
 - 2. Place hangers within 12 inches of each horizontal elbow.
 - 3. Use hangers with 1-1/2 inches minimum vertical adjustment. Design hangers for pipe movement without disengagement of supported pipe.
 - 4. Support vertical piping at every floor. Support riser piping independently of connected horizontal piping.
 - 5. Provide copper plated hangers and supports for copper piping.
 - 6. Prime coat exposed steel hangers and supports. Hangers and supports located in crawl spaces, pipe shafts, and suspended ceiling spaces are not considered exposed.
- L. Provide clearance in hangers and from structure and other equipment for installation of insulation and access to valves and fittings. See Section 230719.
- M. Where pipe support members are welded to structural building framing, scrape, brush clean, and apply one coat of zinc-rich primer to welds.
- N. Install valves with stems upright or horizontal, not inverted.

3.03 SCHEDULES

- A. Hanger Spacing for Copper Tubing.
 - 1. 1/2 Inch and 3/4 inch: Maximum span, 5 feet; minimum rod size, 1/4 inch.
 - 2. 1 Inch: Maximum span, 6 feet; minimum rod size, 1/4 inch.
 - 3. 1-1/2 Inches and 2 Inches: Maximum span, 8 feet; minimum rod size, 3/8 inch.
 - 4. 2-1/2 Inches: Maximum span, 9 feet; minimum rod size, 3/8 inch.
 - 5. 3 Inches: Maximum span, 10 feet; minimum rod size, 3/8 inch.
 - 6. 4 Inches: Maximum span, 12 feet; minimum rod size, 1/2 inch.
 - 7. 6 Inches: Maximum span, 14 feet; minimum rod size, 1/2 inch.
 - 8. 8 Inches: Maximum span, 16 feet; minimum rod size, 5/8 inch.
 - 9. 10 Inches: Maximum span, 18 feet; minimum rod size, 3/4 inch.
 - 10. 12 inches: Maximum span, 19 feet; minimum rod size, 7/8 inch.
- B. Hanger Spacing for Steel Piping.
 - 1. 1/2 Inch, 3/4 Inch, and 1 Inch: Maximum span, 7 feet; minimum rod size, 1/4 inch.
 - 2. 1-1/4 Inches: Maximum span, 8 feet; minimum rod size, 3/8 inch.
 - 3. 1-1/2 Inches: Maximum span, 9 feet; minimum rod size, 3/8 inch.
 - 4. 2 Inches: Maximum span, 10 feet; minimum rod size, 3/8 inch.
 - 5. 2-1/2 Inches: Maximum span, 11 feet; minimum rod size, 3/8 inch.
 - 6. 3 Inches: Maximum span, 12 feet; minimum rod size, 3/8 inch.
 - 7. 6 Inches: Maximum span, 17 feet; minimum rod size, 1/2 inch.
 - 8. 8 Inches: Maximum span, 19 feet; minimum rod size, 5/8 inch.
 - 9. 10 Inches: Maximum span, 20 feet; minimum rod size, 3/4 inch.
 - 10. 12 Inches: Maximum span, 23 feet; minimum rod size, 7/8 inch.
 - 11. 16 Inches: Maximum span, 27 feet; minimum rod size, 1 inch.

12. 18 Inches: Maximum span, 28 feet; minimum rod size, 1-1/4 inches.
13. 20 Inches: Maximum span, 30 feet; minimum rod size, 1-1/4 inches.

END OF SECTION