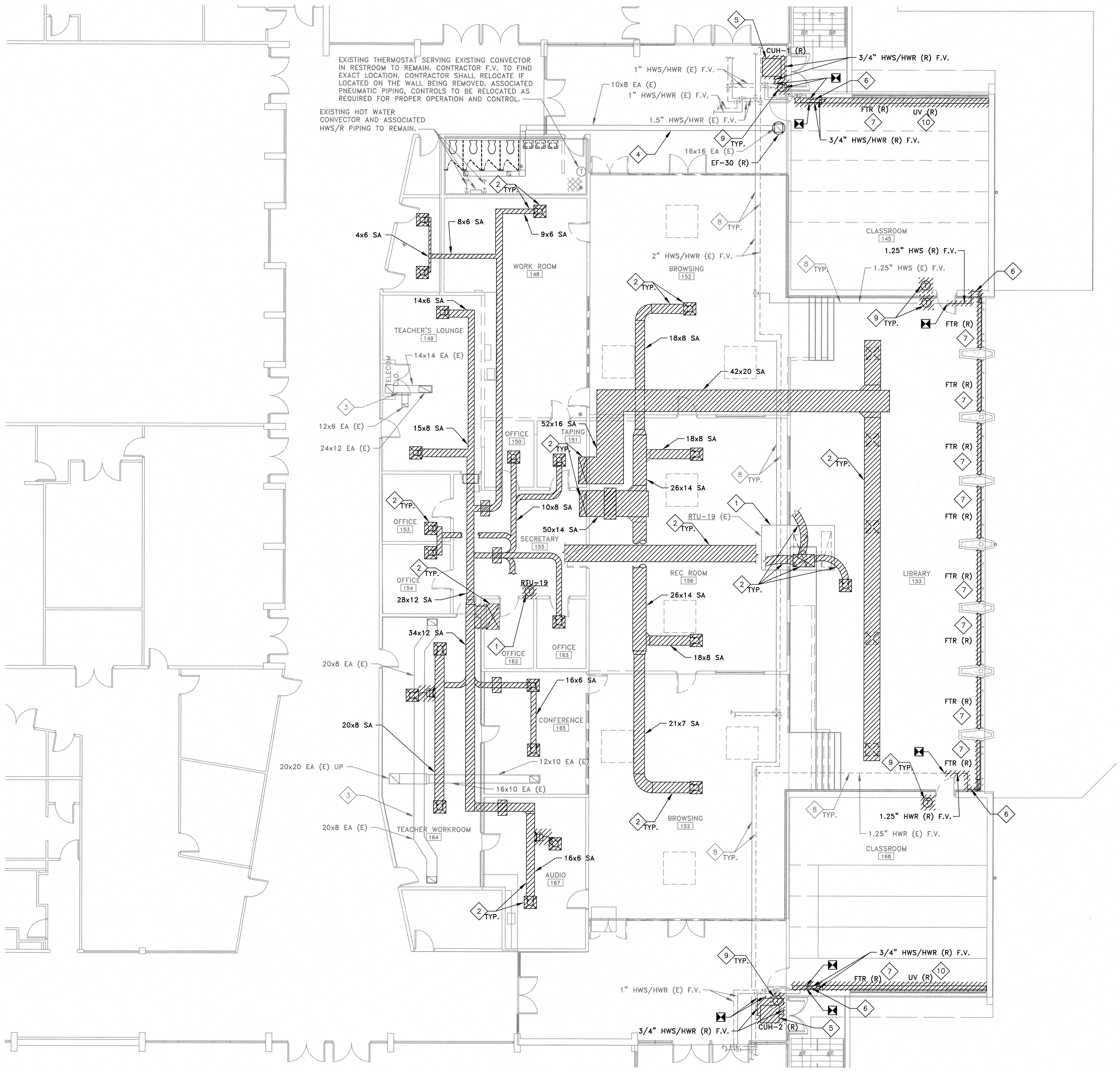

5
CUH-1 (R)
3/4" HWS/HWR (R) F.V.
1" HWS/HWR (E) F.V.
10x8 EA (E)
1" HWS/HWR (E) F.V.
6
1.5" HWS/HWR (E) F.V.
FTR (R)
7
UV (R)
10
9
TYP.
3/4" HWS/HWR (R) F.V.
4
16x16 EA (E)
EF-30 (R)
2
TYP.
8x6 SA
9x6 SA
4x6 SA
8
TYP.
WORK ROOM
148
CLASSROOM
145
1.25" HWS (R) F.V.
2" HWS/HWR (E) F.V.
8
TYP.
1.25" HWS (E) F.V.
BROWSING
152
6
2
TYP.
14x6 SA
TEACHER'S LOUNGE
149
9
TYP.
FTR (R)
18x8 SA
7
14x14 EA (E)
TELECOM
42x20 SA
3
12x6 EA (E)
24x12 EA (E)
15x8 SA
OFFICE
150
52x16 SA
TAPING
151
FTR (R)
18x8 SA
2
TYP.
7
2
TYP.
26x14 SA
8
TYP.
FTR (R)
2
TYP.
10x8 SA
OFFICE
153
1
50x14 SA
2
TYP.
RTU-19 (E)
7
SECRETARY
155
FTR (R)
2
TYP.
RTU-19
REC ROOM
156
OFFICE
154
2
TYP.
LIBRARY
153
FTR (R)
28x12 SA
26x14 SA
7
34x12 SA
FTR (R)
1
OFFICE
162
OFFICE
163
18x8 SA
7
20x8 EA (E)
16x6 SA
FTR (R)
CONFERENCE
165
7
20x8 SA
21x7 SA
12x10 EA (E)
20x20 EA (E) UP
FTR (R)
16x10 EA (E)
9
TYP.
1.25" HWR (R) F.V.
3
6
8
TYP.
20x8 EA (E)
TEACHER WORKROOM
164
1.25" HWR (E) F.V.
2
TYP.
BROWSING
152
8
TYP.
CLASSROOM
168
16x6 SA
AUDIO
167
2
TYP.
9
TYP.
3/4" HWS/HWR (R) F.V.
FTR (R)
7
UV (R)
10
1" HWS/HWR (E) F.V.
6
3/4" HWS/HWR (R) F.V.
CUH-2 (R)
5

EXISTING THERMOSTAT SERVING EXISTING CONVECTOR IN RESTROOM TO REMAIN. CONTRACTOR F.V. TO FIND EXACT LOCATION. CONTRACTOR SHALL RELOCATE IF LOCATED ON THE WALL BEING REMOVED. ASSOCIATED PNEUMATIC PIPING, CONTROLS TO BE RELOCATED AS REQUIRED FOR PROPER OPERATION AND CONTROL.

EXISTING HOT WATER CONVECTOR AND ASSOCIATED HWS/R PIPING TO REMAIN.

1 PARTIAL FIRST FLOOR OFFICE & LOUNGE AREA – HVAC – DEMOLITION

SCALE: 1/8" = 1'-0"

0 2' 4' 8' 16'

NORTH

MECHANICAL DEMOLITION & EXISTING KEYED NOTES (FOR THIS SHEET ONLY):

◇1 EXISTING RTU-19 TO REMAIN AND BE ROTATED 180 DEGREES AS INDICATED ON NEW WORK PLAN. DISCONNECT EXISTING SUPPLY AND RETURN AIR DUCTWORK, CONTROL WIRING/CONDUIT, ELECTRICAL WIRING/CONDUIT, AND CONDENSATE DRAIN PIPING AS REQUIRED TO ALLOW ROTATION OF UNIT. PROTECT EXISTING RTU-19 AND EXISTING ROOF CURB DURING WORK. CLEAN EXISTING RTU-19, INCLUDING FANS, COILS, DRAIN PAN, AND OTHER ACCESSIBLE COMPONENTS. REFER TO HVAC CLEANING SPECIFICATION FOR ADDITIONAL REQUIREMENTS. REMOVE EXISTING THERMOSTAT AND ASSOCIATED CONTROLS THAT ARE NO LONGER REQUIRED. COORDINATE CONTROLS DEMOLITION WITH BMS CONTRACTOR AND NEW VVT CONTROL SYSTEM.

◇2 REMOVE EXISTING SA DUCTWORK FROM RTU-19 AND EXISTING SA & RA DUCTWORK, DIFFUSERS/REGISTERS, REHEAT COILS, AND ASSOCIATED ACCESSORIES SERVING THE PROJECT AREA AS INDICATED. REMOVE EXISTING PNEUMATIC CONTROL VALVES, ASSOCIATED PNEUMATIC CONTROLS, AND THERMOSTATS SERVING REHEAT COILS BEING REMOVED. REMOVE ASSOCIATED PNEUMATIC TUBING BACK TO THE NEAREST ACTIVE MAIN/BRANCH CONNECTION AND PERMANENTLY CAP. REMOVE HOT WATER PIPING CONNECTIONS TO REHEAT COILS BEING REMOVED AND PERMANENTLY CAP EXISTING HOT WATER PIPING AT ACTIVE BRANCH CONNECTIONS. EXISTING SA & RA DUCTWORK ASSOCIATED WITH PREVIOUSLY ABANDONED RTUs SHALL BE REMOVED BACK TO JUST BELOW THE ROOF DECK AND PERMANENTLY CAPPED AND SEALED AIRTIGHT. PROTECT EXISTING ROOF ASSEMBLY AND SEAL ALL AFFECTED OPENINGS AS REQUIRED. NOT ALL EXISTING DUCTWORK IS SHOWN. CONTRACTOR SHALL F.V. EXISTING DUCTWORK LOCATIONS, ROUTING, & CONNECTIONS PRIOR TO DEMOLITION. REMOVE ABANDONED DUCT HANGERS, SUPPORTS, AND ACCESSORIES ASSOCIATED WITH DUCTWORK BEING REMOVED

◇3 EXISTING EA DUCTWORK AND ASSOCIATED EXHAUST FANS TO REMAIN UNLESS OTHERWISE INDICATED. PROTECT EXISTING DUCTWORK AND EQUIPMENT DURING CONSTRUCTION.

◇4 EXISTING EXHAUST AIR DUCTWORK TO REMAIN. REMOVE EXISTING EF-30 AND ASSOCIATED COMPONENTS AS REQUIRED FOR INSTALLATION OF NEW EF-30. PROTECT EXISTING ROOF CURB AND DUCTWORK TO REMAIN. CLEAN EXISTING EA DUCTWORK AND ASSOCIATED EA GRILLES. REFER TO DUCT CLEANING SPECIFICATION FOR ADDITIONAL REQUIREMENTS.

◇5 REMOVE EXISTING FAN-FORCED HOT WATER CABINET UNIT HEATER AND ASSOCIATED ACCESSORIES. REMOVE EXISTING PNEUMATIC CONTROL VALVE AND ASSOCIATED PNEUMATIC CONTROLS. REMOVE PNEUMATIC TUBING BACK TO THE NEAREST ACTIVE MAIN/BRANCH CONNECTION AND PERMANENTLY CAP. DISCONNECT EXISTING HOT WATER SUPPLY AND RETURN PIPING AND TEMPORARILY CAP PIPING FOR CONNECTION TO NEW UNIT. PROTECT EXISTING HOT WATER PIPING TO REMAIN.

◇6 REMOVE EXISTING HOT WATER PIPING AS INDICATED. REMOVE EXISTING PNEUMATIC CONTROL VALVES AND ASSOCIATED PNEUMATIC CONTROLS SERVING EXISTING FIN-TUBE RADIATORS BEING REMOVED. DISCONNECT EXISTING HOT WATER SUPPLY AND RETURN PIPING AND TEMPORARILY CAP PIPING AS REQUIRED FOR CONNECTION TO NEW FIN-TUBE RADIATORS. REMOVE ASSOCIATED PNEUMATIC TUBING BACK TO THE NEAREST ACTIVE MAIN/BRANCH CONNECTION AND PERMANENTLY CAP. PROTECT EXISTING HOT WATER PIPING TO REMAIN DURING CONSTRUCTION

◇7 REMOVE EXISTING FIN-TUBE RADIATORS, ENCLOSURES/COVERS, SUPPORTS, AND ASSOCIATED ACCESSORIES AS INDICATED. REFER TO NEW WORK PLAN FOR REPLACEMENT.

◇8 EXISTING HOT WATER PIPING TO REMAIN. PIPING ROUTING SHOWN IS APPROXIMATE AND FOR REFERENCE ONLY. CONTRACTOR SHALL FIELD-VERIFY EXACT LOCATION, ROUTING, SIZE, AND ELEVATION OF EXISTING PIPING PRIOR TO PERFORMING NEW WORK. PROTECT EXISTING PIPING TO REMAIN DURING CONSTRUCTION.

◇9 REMOVE EXISTING THERMOSTATS, SENSORS, CONTROLLERS, AND ASSOCIATED CONTROL DEVICES SERVING EQUIPMENT BEING REMOVED OR REPLACED, INCLUDING EXISTING FTRs, REHEAT COILS AND CUHs. REMOVE ASSOCIATED ABANDONED CONTROL WIRING AND PNEUMATIC TUBING AS APPLICABLE. COORDINATE CONTROLS DEMOLITION WITH BMS CONTRACTOR AND NEW CONTROL REQUIREMENTS. NOT ALL THERMOSTATS SHOWN. CONTRACTOR SHALL F.V. TO FIND EXACT NUMBER AND LOCATIONS OF THERMOSTATS AND CONTROLS.

◇10 REMOVE EXISTING UNIT VENTILATORS COMPLETELY. PATCH AND REPAIR EXISTING EXTERIOR WALL TO MATCH ADJACENT CONSTRUCTION AFTER DEMOLITION.

GENERAL DEMO NOTES:

1. CONTRACTOR SHALL FIELD-VERIFY EXISTING CONDITIONS PRIOR TO DEMOLITION. COORDINATE DEMOLITION WITH NEW WORK AND REMOVE ONLY EQUIPMENT, DUCTWORK, PIPING, CONTROLS, AND ACCESSORIES REQUIRED TO ACCOMMODATE THE NEW WORK. PROTECT ALL EXISTING SYSTEMS AND COMPONENTS TO REMAIN.

2. PATCH AND REPAIR EXISTING WALLS, FLOORS, CEILINGS, ROOF, AND OTHER SURFACES AFFECTED BY HVAC DEMOLITION TO MATCH ADJACENT EXISTING CONSTRUCTION. SEAL ABANDONED PENETRATIONS AND PROVIDE FIRESTOPPING AT RATED ASSEMBLIES AS REQUIRED.

ISSUED FOR BID-9/25/26

9.23.26

APPROVED

William R. Long
PROFESSIONAL ENGINEER
NEW JERSEY LICENSE NO. 33012

REVISIONS	DATE	BY

Tri-State Architects, P.C. / Alaimo Group
WILLIAM R. LONG, P.E. LIC. 33012
ANITA S. ARADHYA, R.A. LIC. 18769
200 HIGH STREET MOUNT HOLLY, N.J.

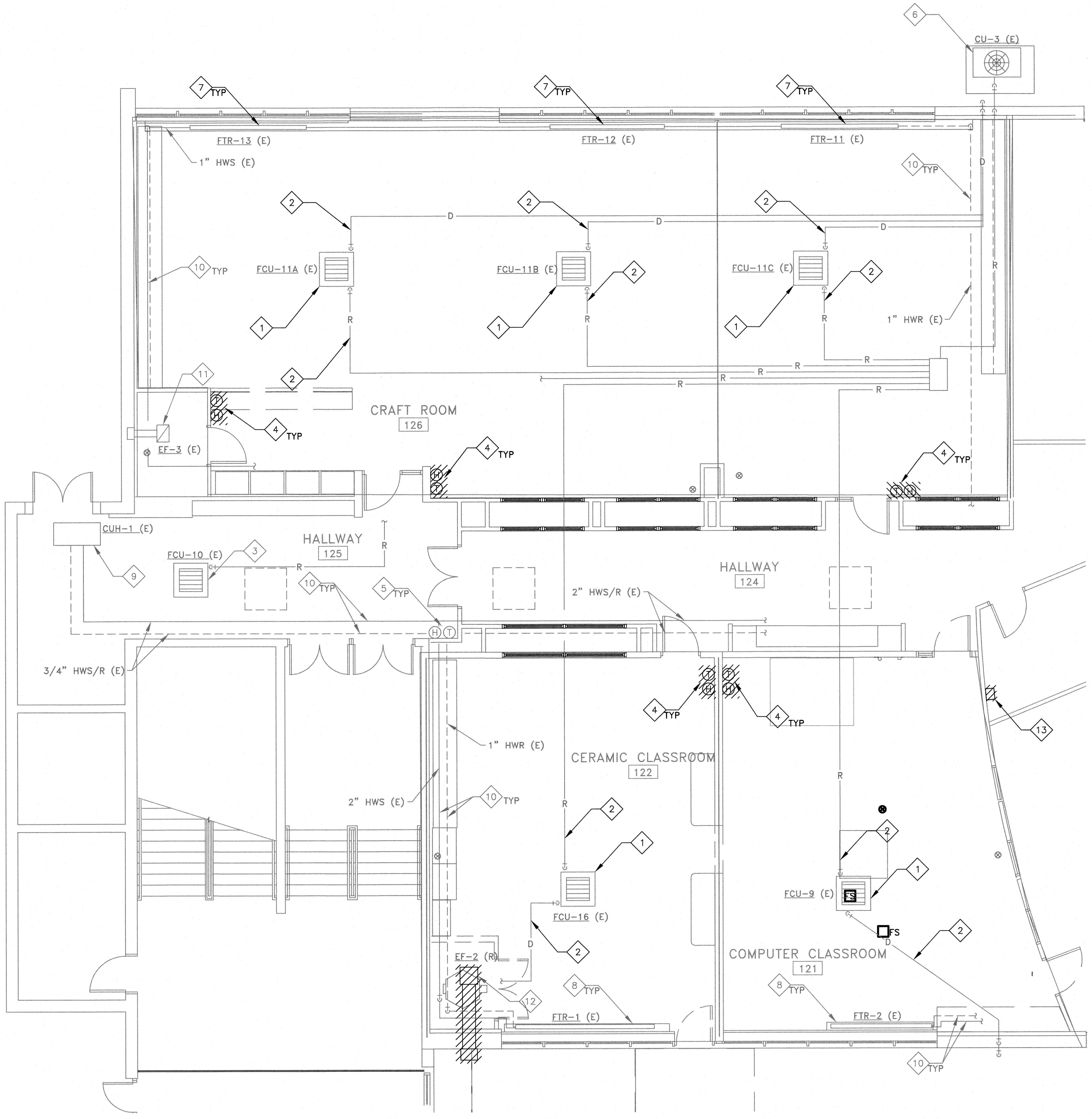
DATE: AUG. 2026
DESIGNED BY: IV
DRAWN BY: RKR
CHECKED BY: [illegible] 9/22/26
DEPT. HEAD: [illegible] 9/22/26

CLIENT: WILLINGBORO TOWNSHIP
PROJECT LOCATION: WILLINGBORO TWP. BURLINGTON COUNTY NEW JERSEY
PROJECT NO.: M-0410-0011-000
CONTRACT NO.: BID#8-2026

KENNEDY CENTER
RENOVATION TO THE SENIOR CENTER
PARTIAL FIRST FLOOR OFFICE & LOUNGE AREA -HVAC- DEMOLITION
SCALE: AS SHOWN

SHEET
HD1
FILE NO.:

Plotted: 9/22/2026 10:15 AM Last saved: 9/21/2026 4:03 PM File Name: M:\Projects\M04100011000\Drawings\GLO-HD1.dwg



① PARTIAL FIRST FLOOR SENIOR CENTER – HVAC – DEMOLITION

SCALE: 3/16" = 1'-0"

MECHANICAL DEMOLITION & EXISTING KEYED NOTES (FOR THIS SHEET ONLY):

1. EXISTING CEILING MOUNTED CASSETTE FCU TO BE REMOVED AND RELOCATED. CONTRACTOR SHALL SAFELY DISCONNECT, REMOVE, AND STORE THE UNIT FOR REINSTALLATION. DISCONNECT AND CAP ALL ASSOCIATED REFRIGERANT PIPING, CONDENSATE DRAIN, ELECTRICAL POWER, AND CONTROL WIRING. EXISTING FCU LOCATION SHOWN FOR REFERENCE ONLY. CONTRACTOR F.V. FOR EXACT LOCATION AND DIMENSIONS. ALL REFRIGERANT SHALL BE SAFELY RECOVERED PRIOR TO DISCONNECTION AND HANDLED OR DISPOSED OF IN ACCORDANCE WITH EPA REGULATIONS AND ASHRAE STANDARD 15. CONTRACTOR RESPONSIBLE TO REMOVE EXISTING CEILING AS REQUIRED FOR ALL MECHANICAL WORK. CONTRACTOR SHALL RESTORE WALL/CEILING SURFACES TO MATCH EXISTING AFTER COMPLETION OF MECHANICAL WORK. COORDINATE ALL WORK WITH OTHER TRADES. REFER TO SHEET H2 FOR RELOCATION DETAILS.

2. DISCONNECT REFRIGERANT PIPING AND CONDENSATE DRAIN PIPING FROM FCU AND REMOVE AS REQUIRED FOR RELOCATION OF FCU. ROUTING AND LOCATIONS OF REFRIGERANT AND CONDENSATE DRAIN PIPING ARE SHOWN FOR REFERENCE ONLY. CONTRACTOR F.V. FOR EXACT LOCATIONS, DIMENSIONS & ROUTING OF THESE PIPING. REFER TO SHEET H2 FOR RELOCATION DETAILS.

3. EXISTING CEILING MOUNTED CASSETTE FCU TO REMAIN.

4. EXISTING THERMOSTAT AND HUMIDISTAT ASSOCIATED WITH THE FCUs BEING RELOCATED SHALL BE REMOVED. DISCONNECT AND REMOVE ALL ASSOCIATED CONTROL WIRING AS REQUIRED. NEW THERMOSTAT AND HUMIDISTAT SHALL BE PROVIDED BY BMS. LOCATION OF EXISTING THERMOSTAT AND HUMIDISTAT IS SHOWN FOR REFERENCE ONLY. CONTRACTOR SHALL FIELD-VERIFY THE EXACT LOCATION PRIOR TO REMOVAL. COORDINATE REMOVAL WITH THE CONTROLS/BMS CONTRACTOR. CONTRACTOR SHALL RESTORE WALL AND CEILING SURFACES AFFECTED BY REMOVAL TO MATCH EXISTING. REFER TO SHEET H2 FOR NEW WORK

5. EXISTING THERMOSTAT AND/OR HUMIDISTAT TO REMAIN.

6. EXISTING AIR COOLED CONDENSING UNIT AND ASSOCIATED CONCRETE PAD TO REMAIN.

7. EXISTING FINNED TUBE CONVECTOR AND ASSOCIATED HOT WATER PIPING TO REMAIN. EXISTING FIN TUBE COVER TO BE REMOVED AS REQUIRED AND MAY BE CUT OR MODIFIED AS NEEDED FOR INSTALLATION OF NEW WALLS. CONTRACTOR PROTECT EXISTING PIPING AND CONVECTOR DURING CONSTRUCTION. REFER TO SHEET H2 FOR INFO ON NEW WORK

8. EXISTING FIN TUBE CONVECTOR, ASSOCIATED HOT WATER PIPING AND FIN TUBE COVER TO REMAIN,

9. EXISTING CABINET UNIT HEATER TO REMAIN.

10. EXISTING HOT WATER PIPING TO REMAIN.

11. EXISTING EXHAUST FAN TO REMAIN.

12. EXISTING EXHAUST FAN, ASSOCIATED EA DUCTWORK, WALL CAP, LOUVER ETC. TO BE REMOVED COMPLETELY. REMOVE ALL UNUSED PENETRATIONS AND SUPPORTS. PATCH AND REPAIR WALLS, CEILINGS, AND OTHER BUILDING SURFACES AFFECTED BY THE REMOVAL TO MATCH EXISTING ADJACENT FINISHES. COORDINATE ALL WORK WITH OTHER TRADES

13. REMOVE EXISTING VRF CENTRAL CONTROLLER SERVING THE EXISTING FCUs IN THIS WING INCLUDING THE FCUs BEING RELOCATED. EXISTING CONTROLLER DOES NOT PROVIDE BACNET COMMUNICATION CAPABILITY REQUIRED FOR INTEGRATION WITH THE BUILDING MANAGEMENT SYSTEM (BMS). DISCONNECT AND REMOVE ALL ASSOCIATED CONTROL WIRING AS REQUIRED. COORDINATE REMOVAL WITH THE CONTROLS/BMS CONTRACTOR. CONTRACTOR SHALL RESTORE WALL/CEILING SURFACES AFFECTED BY REMOVAL TO MATCH EXISTING. REFER TO SHEET H2 FOR NEW WORK.

ISSUED FOR BID-9/25/26

9.23.26
APPROVED
William R. Long
PROFESSIONAL ENGINEER
NEW JERSEY LICENSE NO. 33012

REVISIONS	DATE	BY

Tri-State Architects, P.C. / Alaimo Group
WILLIAM R. LONG, P.E. LIC. 33012
ANITA S. ARADHYA, R.A. LIC. 18769
200 HIGH STREET MOUNT HOLLY, N.J.

DATE: AUG. 2026
DESIGNED BY: IV
DRAWN BY: RKR
CHECKED BY: 9/22/26
DEPT. HEAD: 9/22/26

CLIENT: WILLINGBORO TOWNSHIP
PROJECT LOCATION: WILLINGBORO TWP. BURLINGTON COUNTY NEW JERSEY
PROJECT NO.: M-0410-0011-000
CONTRACT NO.: BID#8-2026

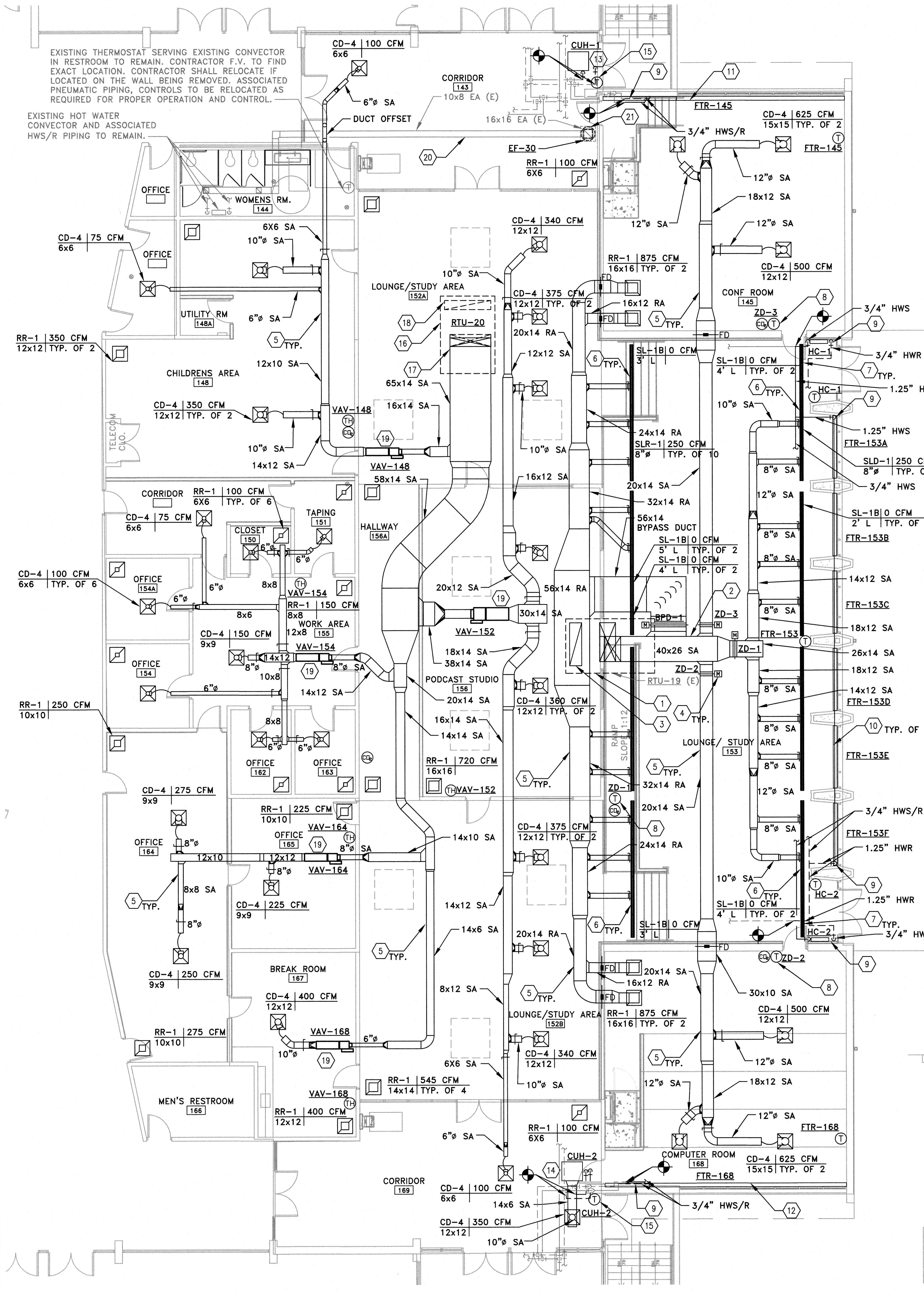
KENNEDY CENTER
RENOVATION TO THE SENIOR CENTER

PARTIAL FIRST FLOOR SENIOR CENTER - HVAC - DEMOLITION
SCALE: AS SHOWN

SHEET
HD2
FILE NO.:

Plotted: 9/22/2026 10:15 AM Last saved: 9/21/2026 4:03 PM File Name: M:\Projects\M04100011000\Drawings\GLQ-HD2.dwg

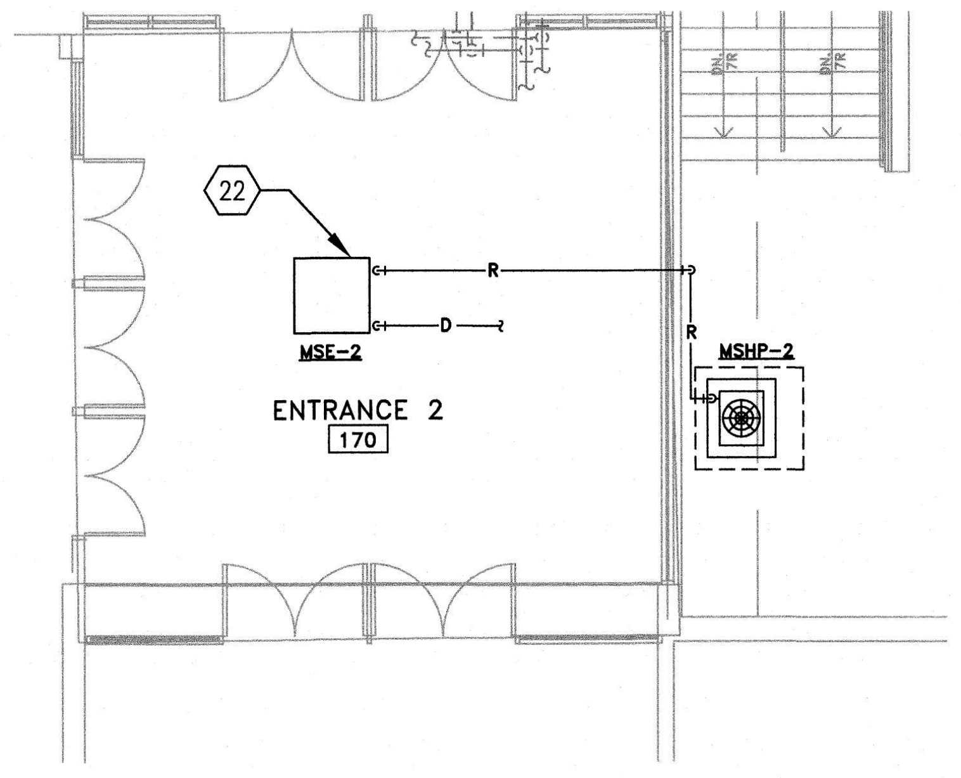
Plotted: 9/22/2026 11:57 AM Last saved: 9/21/2026 4:02 PM File Name: M:\Projects\M04100011000\Drawings\GLQ-H1.dwg


EXISTING THERMOSTAT SERVING EXISTING CONVECTOR IN RESTROOM TO REMAIN. CONTRACTOR F.V. TO FIND EXACT LOCATION. CONTRACTOR SHALL RELOCATE IF LOCATED ON THE WALL BEING REMOVED. ASSOCIATED PNEUMATIC PIPING, CONTROLS TO BE RELOCATED AS REQUIRED FOR PROPER OPERATION AND CONTROL.
EXISTING HOT WATER CONVECTOR AND ASSOCIATED HWS/R PIPING TO REMAIN.
CD-4 100 CFM 6x6
6"ø SA
DUCT OFFSET
CORRIDOR 143
10x8 EA (E)
16x16 EA (E)
EF-30
RR-1 100 CFM 6X6
CUH-1
CORRIDOR 143
FTR-145
3/4" HWS/R
CD-4 625 CFM 15x15 TYP. OF 2
FTR-145
12"ø SA
18x12 SA
12"ø SA
CD-4 500 CFM 12x12
CONF ROOM 145
ZD-3
3/4" HWS
3/4" HWR
HC-1
1.25" HWS
FTR-153A
SLD-1 250 CFM 8"ø TYP. OF 10
OFFICE
WOMENS RM. 144
6X6 SA
10"ø SA
CD-4 75 CFM 6x6
OFFICE
UTILITY RM 148A
6"ø SA
RR-1 350 CFM 12x12 TYP. OF 2
TYP.
12x10 SA
CHILDRENS AREA 148
CD-4 350 CFM 12x12 TYP. OF 2
VAV-148
TH
CO2
10"ø SA
14x12 SA
TELECOM CLO.
VAV-148
58x14 SA
16x14 SA
65x14 SA
LOUNGE/STUDY AREA 152A
RTU-20
CD-4 340 CFM 12x12
10"ø SA
CD-4 375 CFM 12x12 TYP. OF 2
20x14 RA
12x12 SA
16x12 RA
10"ø SA
16x12 SA
RR-1 875 CFM 16x16 TYP. OF 2
FD
SL-1B 0 CFM 3' L
SL-1B 0 CFM 4' L TYP. OF 2
24x14 RA
SLR-1 250 CFM 8"ø TYP. OF 10
20x14 SA
32x14 RA
56x14 BYPASS DUCT
SL-1B 0 CFM 5' L TYP. OF 2
SL-1B 0 CFM 4' L TYP. OF 2
8"ø SA
12"ø SA
3/4" HWS
SL-1B 0 CFM 2' L TYP. OF 4
FTR-153B
14x12 SA
FTR-153C
BPD-1
ZD-3
FTR-153
ZD-1
40x26 SA
26x14 SA
18x12 SA
ZD-2
RTU-19 (E)
14x12 SA
FTR-153D
TYP. OF 6
FTR-153E
3/4" HWS/R
FTR-153F
1.25" HWR
HC-2
3/4" HWR
CORRIDOR
RR-1 100 CFM 6X6 TYP. OF 6
CD-4 75 CFM 6x6
TAPING 151
CLOSET 150
HALLWAY 156A
CD-4 100 CFM 6x6 TYP. OF 6
OFFICE 154A
6"ø
8x8
VAV-154
RR-1 150 CFM 8x8
WORK AREA 155
8x6
12x8
CD-4 150 CFM 9x9
14x12
VAV-154
8"ø SA
10x8
OFFICE 154
14x12 SA
RR-1 250 CFM 10x10
OFFICE 162
OFFICE 163
20x12 SA
VAV-152
56x14 RA
30x14 SA
18x14 SA
38x14 SA
PODCAST STUDIO 156
20x14 SA
16x14 SA
14x14 SA
CD-4 360 CFM 12x12 TYP. OF 2
RR-1 720 CFM 16x16
VAV-152
RAMP SLOPE 1:12
LOUNGE/ STUDY AREA 153
32x14 SA
ZD-1
CD-4 275 CFM 9x9
RR-1 225 CFM 10x10
VAV-164
OFFICE 165
OFFICE 164
12x10
12x12
8"ø SA
VAV-164
14x10 SA
8x8 SA
CD-4 225 CFM 9x9
14x12 SA
14x6 SA
CD-4 375 CFM 12x12 TYP. OF 2
20x14 RA
CD-4 250 CFM 9x9
BREAK ROOM 167
CD-4 400 CFM 12x12
VAV-168
6"ø
10"ø
RR-1 275 CFM 10x10
VAV-168
MEN'S RESTROOM 166
RR-1 400 CFM 12x12
RR-1 545 CFM 14x14 TYP. OF 4
8x12 SA
LOUNGE/STUDY AREA 152B
CD-4 340 CFM 12x12
6X6 SA
6"ø SA
RR-1 100 CFM 6X6
CORRIDOR 169
CD-4 100 CFM 6x6
14x6 SA
CD-4 350 CFM 12x12
10"ø SA
CUH-2
20x14 SA
16x12 RA
30x10 SA
CD-4 500 CFM 12x12
12"ø SA
18x12 SA
12"ø SA
FTR-168
COMPUTER ROOM 168
CD-4 625 CFM 15x15 TYP. OF 2
FTR-168
3/4" HWS/R
DN 7R

1 PARTIAL FIRST FLOOR OFFICE & LOUNGE AREA – HVAC – NEW WORK

SCALE: 1/8" = 1'-0"

0 2' 4' 8' 16' NORTH


22
MSE-2
R
D
R
MSHP-2
ENTRANCE 2 170
DN 7R

2 ENTRACE-2 – HVAC – NEW WORK

SCALE: 1/8" = 1'-0"

0 2' 4' 8' 16'

MECHANICAL DEMOLITION & EXISTING KEYED NOTES (FOR THIS SHEET ONLY):

① EXISTING RTU-19 ON ROOF SHALL BE ROTATED 180 DEGREES SUCH THAT THE SUPPLY AIR OPENING IS ORIENTED TOWARD ROOM 153, AND REINSTALLED ON THE EXISTING ROOF CURB. CONTRACTOR SHALL FIELD-VERIFY AND COORDINATE THE FINAL UNIT POSITION ON THE CURB AS REQUIRED TO AVOID CONFLICTS BETWEEN SUPPLY/RETURN DUCTWORK AND EXISTING STRUCTURAL BEAMS, JOISTS, AND OTHER FIELD CONDITIONS. FINAL RTU-19 LOCATION SHALL BE SUCH THAT THE SUPPLY AIR AND RETURN AIR DUCTS ARE LOCATED ON OPPOSITE SIDES OF THE STRUCTURAL BEAM ALONG THE WALL SEPARATING ROOMS 153 AND 156. COORDINATE FINAL UNIT LOCATION WITH ALL EXISTING CONDITIONS PRIOR TO INSTALLATION. RECONNECT AND EXTEND, AS REQUIRED, EXISTING CONTROL WIRING/CONDUIT, ELECTRICAL WIRING/CONDUIT, AND CONDENSATE DRAIN PIPING TO RTU-19. EXTEND CONDENSATE DRAIN PIPING, PITCHED TO THE NEAREST ROOF DRAIN, AND PROVIDE PIPE SUPPORTS AS REQUIRED. PROVIDE NEW GAS PIPING CONNECTION TO RTU-19, INCLUDING ALL REQUIRED VALVES, REGULATORS, FITTINGS, SUPPORTS, AND ACCESSORIES.

② PROVIDE NEW SA DUCTWORK FROM SA OPENING ON RTU. PROVIDE DUCT TRANSITION FROM SA OPENING ON RTU TO 40x26 SA DUCT. INSTALL SUCH THAT 40x26 SA DUCT SHALL BE BETWEEN TWO JOISTS. CONTRACTOR SHALL F.V. AND COORDINATE WITH ALL EXISTING CONDITIONS LIKE STRUCTURAL BEAMS, JOISTS TO INSTALL SA DUCT WITHOUT ANY CONFLICTS. PROVIDE DUCT OFFSETS OR TRANSITIONS IF/AS REQUIRED TO ACCOMMODATE EXISTING CONDITIONS.

③ PROVIDE NEW RA DUCT FROM RA DUCT OPENING ON RTU AND CONNECT TO NEW 56x14 RA DUCT. CONTRACTOR SHALL F.V. AND COORDINATE WITH ALL EXISTING CONDITIONS LIKE STRUCTURAL BEAMS, JOISTS TO AVOID ANY CONFLICTS WITH NEW RA DUCTWORK. PROVIDE DUCT OFFSETS OR TRANSITIONS IF/AS REQUIRED TO ACCOMMODATE EXISTING CONDITIONS.

④ PROVIDE NEW VVT ZONE DAMPER SYSTEM CONSISTING OF THREE ZONE DAMPERS ZD-1 (26x14), ZD-2 (20x14), ZD-3 (20x14) AND A BYPASS DAMPER BPD-1. ZD-1, ZD-2 AND ZD-3 SHALL BE SERVING ROOMS 153, 168 AND 145 RESPECTIVELY. EACH ZONE SHALL BE INDIVIDUALLY CONTROLLED BY ITS ASSOCIATED ZONE THERMOSTAT TO MODULATE THE ZONE DAMPER AND MAINTAIN THE SPACE TEMPERATURE SETPOINT, ALLOWING EACH ROOM TO RESPOND INDEPENDENTLY TO ITS OWN HEATING OR COOLING DEMAND. REFER TO DETAIL ON SHEET H6 AND SEQUENCE OF OPERATION ON H10 FOR MORE INFO ON THE VVT ZONE DAMPER SYSTEM.

⑤ PROVIDE NEW SA & RA DUCTWORK IN THE CEILING SPACE. DUCT ROUTING SHOWN FOR REFERENCE ONLY. CONTRACTOR SHALL BE RESPONSIBLE TO MODIFY DUCT ROUTING OR PROVIDE DUCT OFFSETS AND TRANSITIONS AS REQUIRED TO AVOID ANY CONFLICTS AND ACCOMMODATE EXISTING CONDITIONS. CONTRACTOR SHALL F.V. AND COORDINATE WITH ALL EXISTING CONDITIONS AND ALL TRADES AS REQUIRED TO INSTALL AND ROUTE ALL DUCTWORK WITHOUT ANY CONFLICTS. PROVIDE DUCT INSULATION ON ALL DUCTWORK AS PER ASHRAE 90.1. REFER TO DUCT INSULATION SPEC FOR MORE INFORMATION.

⑥ PROVIDE NEW LINEAR SUPPLY DIFFUSERS AND RETURN REGISTERS WITH INSULATED PLENUM BOX & VOLUME DAMPER. INSTALL DIFFUSERS/REGISTERS IN THE NEW WOOD SLAT CEILING WITH FRAME/BORDER STYLE COMPATIBLE WITH THE CEILING SYSTEM.

⑦ PROVIDE NEW LINEAR SUPPLY DIFFUSERS AND RETURN REGISTERS WITH BLANK-OFF PANELS. INSTALL REGISTERS IN THE NEW WOOD SLAT CEILING WITH FRAME/BORDER STYLE COMPATIBLE WITH THE CEILING SYSTEM. PROVIDE ALL ACCESSORIES, BLANK-OFF SECTIONS, AND TRIM REQUIRED TO MAINTAIN A CONTINUOUS LINEAR APPEARANCE, EXCEPT AT LOCATIONS WHERE NO CEILING IS PROVIDED. DIFFUSERS/REGISTERS LENGTHS SHOWN ARE FOR REFERENCE ONLY. CONTRACTOR SHALL COORDINATE FINAL LENGTHS, LOCATIONS, AND INSTALLATION REQUIREMENTS WITH THE ARCHITECTURAL REFLECTED CEILING PLANS AND WOOD SLAT CEILING LAYOUT PRIOR TO ORDERING.

⑧ PROVIDE NEW ZONE THERMOSTATS SERVING THEIR RESPECTIVE ZONE DAMPERS AND CO2 SENSORS FOR DEMAND CONTROL VENTILATION. REFER TO SEQUENCE OF OPERATION FOR RTU-19 ON SHEET H10 FOR MORE INFORMATION.

⑨ PROVIDE NEW HW PIPING TO NEW FIN TUBE RADIATORS (FTRs) AND/OR NEW HOT WATER CONVECTORS (HCs). PROVIDE ALL REQUIRED VALVES, CONTROL VALVES, ACTUATORS, FITTINGS, AND ACCESSORIES FOR COMPLETE AND PROPER OPERATION OF THE EQUIPMENT. INSULATE ALL HOT WATER PIPING IN ACCORDANCE WITH ASHRAE 90.1 AND THE PIPING INSULATION SPECIFICATION. PROVIDE COVERS OR ENCLOSURES FOR ALL EXPOSED PIPING WITHIN FINISHED SPACES. PROVIDE ACCESS PANELS OR REMOVABLE SECTIONS AS REQUIRED TO MAINTAIN ACCESS TO ALL VALVES, CONTROL VALVES, ACTUATORS, AND OTHER SERVICEABLE COMPONENTS. PROVIDE SLEEVES, SEALING, AND FIRESTOPPING AT PIPE PENETRATIONS AS APPLICABLE.

⑩ INSTALL NEW FIN-TUBE RADIATORS SUCH THAT THE EXISTING PIPING PENETRATIONS THROUGH THE COLUMN WALLS CAN BE REUSED. FIELD-VERIFY EXISTING PENETRATION LOCATIONS AND SIZES PRIOR TO FABRICATION AND INSTALLATION. PROVIDE NEW OR MODIFY EXISTING PIPE SLEEVES, SEALS, ESCUTCHEONS, AND OTHER ACCESSORIES AS REQUIRED FOR A COMPLETE INSTALLATION. PROVIDE NEW FIN-TUBE ENCLOSURE CONTINUOUS ALONG THE ENTIRE WALL BETWEEN COLUMN WALLS. PROVIDE ACCESS PANELS OR REMOVABLE SECTIONS IN THE FIN-TUBE ENCLOSURE AS REQUIRED TO MAINTAIN ACCESS TO CONTROL VALVES, ACTUATORS, AND OTHER SERVICEABLE COMPONENTS. COORDINATE FIN-TUBE AND ENCLOSURE INSTALLATION WITH EXISTING WALLS, BASE, AND OTHER ARCHITECTURAL CONDITIONS

⑪ PROVIDE NEW FIN-TUBE RADIATOR ALONG EXTERIOR WALL BELOW EXISTING WINDOW. DUE TO THE CHANGE IN ROOM FLOOR ELEVATION, LOCATE NEW FTR AT A LOWER ELEVATION THAN THE EXISTING FTR. FIELD-VERIFY EXISTING HOT WATER PIPING CONNECTION LOCATIONS AND ELEVATIONS PRIOR TO INSTALLATION. ROUTE HOT WATER PIPING ALONG THE EXTERIOR WALL, SLOPING THE PIPING TO FOLLOW THE STEP/ELEVATION CHANGE, AND CONNECT TO THE NEW FTR. PROVIDE FIN-TUBE ENCLOSURE ALONG THE ENTIRE EXTERIOR WALL AS REQUIRED TO CONCEAL THE HOT WATER PIPING, INCLUDING A SLOPED/TRANSITION SECTION AT THE CHANGE IN ELEVATION, AND MAINTAIN A CONTINUOUS FINISHED APPEARANCE. PROVIDE ACCESS PANELS OR REMOVABLE SECTIONS IN THE FIN-TUBE ENCLOSURE AS REQUIRED TO MAINTAIN ACCESS TO CONTROL VALVES, ACTUATORS, AND OTHER SERVICEABLE COMPONENTS.

⑫ PROVIDE NEW FIN-TUBE RADIATOR ALONG EXTERIOR WALL BELOW EXISTING WINDOW. INSTALL NEW FTR AT THE SAME ELEVATION AS THE EXISTING FTR. FIELD-VERIFY EXISTING FTR AND HOT WATER PIPING LOCATIONS AND ELEVATIONS PRIOR TO INSTALLATION. ROUTE AND CONNECT NEW HOT WATER PIPING ALONG THE EXTERIOR WALL TO THE NEW FTR AS REQUIRED. PROVIDE FIN-TUBE ENCLOSURE ALONG THE ENTIRE EXTERIOR WALL AS REQUIRED TO CONCEAL THE HOT WATER PIPING AND MAINTAIN A CONTINUOUS FINISHED APPEARANCE. PROVIDE ACCESS PANELS OR REMOVABLE SECTIONS IN THE FIN-TUBE ENCLOSURE AS REQUIRED TO MAINTAIN ACCESS TO CONTROL VALVES, ACTUATORS, AND OTHER SERVICEABLE COMPONENTS.

⑬ PROVIDE NEW CEILING-MOUNTED CABINET UNIT HEATER (CUH) WITH BOTTOM SUPPLY AND RETURN AIR PANEL. EXTEND EXISTING 3/4" HOT WATER SUPPLY AND RETURN PIPING TO NEW CUH AND PROVIDE ALL REQUIRED ISOLATION VALVES, CONTROL VALVES, ACTUATORS, FITTINGS, SUPPORTS, AND ACCESSORIES FOR COMPLETE AND PROPER OPERATION. PROVIDE REQUIRED CONTROLS AND INTEGRATE CUH INTO THE EXISTING BMS. CUH SHALL BE SUSPENDED AND SUPPORTED FROM THE BUILDING STRUCTURE AS PER MANUFACTURER'S RECOMMENDATIONS. CONTRACTOR SHALL MODIFY THE EXISTING LAY-IN CEILING GRID AND TILES AS REQUIRED FOR INSTALLATION OF THE NEW CUH AND SHALL COORDINATE FINAL UNIT LOCATION WITH ALL EXISTING CONDITIONS AND TRADES LIKE LIGHTS, DIFFUSERS, SPRINKLERS, STRUCTURE, ETC. PROVIDE ACCESS AS REQUIRED FOR SERVICE AND MAINTENANCE OF THE UNIT, VALVES, AND CONTROLS.

⑭ PROVIDE NEW CEILING-MOUNTED CABINET UNIT HEATER (CUH) WITH BOTTOM RETURN AIR INLET AND FRONT DUCTED SUPPLY AIR CONNECTION. EXTEND EXISTING 3/4" HOT WATER SUPPLY AND RETURN PIPING TO NEW CUH AND PROVIDE ALL REQUIRED ISOLATION VALVES, BALANCING VALVES, CONTROL VALVES, ACTUATORS, FITTINGS, SUPPORTS, AND ACCESSORIES FOR COMPLETE AND PROPER OPERATION. PROVIDE REQUIRED CONTROLS AND INTEGRATE CUH INTO THE EXISTING BMS. CUH SHALL BE SUSPENDED AND SUPPORTED FROM THE BUILDING STRUCTURE AS PER MANUFACTURER'S RECOMMENDATIONS. PROVIDE NEW SA DUCTWORK FROM CUH TO NEW SA DIFFUSER AS SHOWN. MODIFY EXISTING LAY-IN CEILING GRID AND TILES AS REQUIRED FOR INSTALLATION OF CUH. COORDINATE FINAL UNIT AND DIFFUSER LOCATIONS WITH ALL EXISTING CONDITIONS AND TRADES LIKE LIGHTS, SPRINKLERS, STRUCTURE, ETC. PROVIDE ACCESS AS REQUIRED FOR SERVICE AND MAINTENANCE OF THE UNIT, VALVES, AND CONTROLS.

⑮ PROVIDE NEW THERMOSTAT SERVING NEW CUH IN THE SAME LOCATION AS EXISTING.

⑯ PROVIDE AND INSTALL NEW RTU-20 ON ROOF WITH NEW MANUFACTURER-APPROVED ROOF CURB. CONTRACTOR SHALL FIELD-VERIFY EXISTING CONDITIONS AND COORDINATE FINAL UNIT AND CURB LOCATION WITH STRUCTURAL BEAMS, JOISTS, PIPING, CONDUITS, SOLAR PANELS, SKYLIGHTS, AND WORK OF ALL OTHER TRADES TO AVOID CONFLICTS WITH THE UNIT, ROOF OPENINGS, AND SUPPLY AND RETURN AIR DUCTWORK. MAINTAIN MANUFACTURER'S REQUIRED SERVICE AND ACCESS CLEARANCES. COORDINATE ROOF OPENINGS AND CURB INSTALLATION WITH STRUCTURAL AND ROOFING TRADES, AND PROVIDE ALL REQUIRED FLASHING, SEALING, AND WEATHERPROOFING FOR A COMPLETE WATERTIGHT INSTALLATION. PROVIDE NEW CONTROL WIRING/CONDUIT TO RTU-20 AND INTEGRATE UNIT INTO THE EXISTING BMS. PROVIDE NEW CONDENSATE DRAIN PIPING FROM RTU, PITCHED TO THE NEAREST ROOF DRAIN, WITH PIPE SUPPORTS AS REQUIRED

⑰ PROVIDE NEW 65x14 SA DUCT FROM RTU-20. PROVIDE DUCT TRANSITION FROM SA OPENING ON RTU-20 TO 65x14 SA DUCT. DUCT ROUTING IS DIAGRAMMATIC AND SHOWN FOR REFERENCE ONLY. CONTRACTOR SHALL BE RESPONSIBLE TO F.V. AND COORDINATE FINAL DUCT ROUTING WITH STRUCTURAL MEMBERS, PIPING, CONDUITS, AND WORK OF OTHER TRADES. MODIFY DUCT ROUTING AND PROVIDE OFFSETS, TRANSITIONS, AND FITTINGS AS REQUIRED TO AVOID CONFLICTS AND ACCOMMODATE FIELD CONDITIONS.

⑱ PROVIDE NEW RA DUCT FROM RTU-20 RA OPENING AND TERMINATE OPEN ABOVE CEILING FOR CEILING PLENUM RETURN. COORDINATE FINAL DUCT LOCATION AND TERMINATION WITH ALL EXISTING CONDITIONS LIKE STRUCTURAL MEMBERS, PIPING, CONDUITS, AND WORK OF OTHER TRADES.

⑲ PROVIDE AND INSTALL NEW VAV TERMINAL UNITS SERVING RTU-20 AS SHOWN. PROVIDE ALL REQUIRED DUCT CONNECTIONS, TRANSITIONS, HANGERS, SUPPORTS, CONTROLS, SENSORS, ACTUATORS, AND ASSOCIATED ACCESSORIES FOR COMPLETE OPERATION. INTEGRATE VAV TERMINAL UNITS INTO THE EXISTING BMS. COORDINATE FINAL UNIT LOCATIONS WITH ALL EXISTING CONDITIONS LIKE STRUCTURAL MEMBERS, LIGHTS, PIPING, CONDUITS, AND WORKS OF OTHER TRADES. MAINTAIN REQUIRED ACCESS FOR CONTROLS, ELECTRIC REHEAT COMPONENTS, AND OTHER SERVICEABLE ITEMS.

⑳ EXISTING EA DUCTWORK TO REMAIN. CLEAN EXISTING EA DUCTWORK AND ASSOCIATED GRILLES. REFER TO DUCT CLEANING SPECIFICATION FOR ADDITIONAL REQUIREMENTS.

㉑ PROVIDE AND INSTALL NEW EXHAUST FAN EF-30 WITH NEW ADAPTER CURB TO FIT EXISTING ROOF CURB/OPENING. FIELD-VERIFY EXISTING CURB AND OPENING DIMENSIONS PRIOR TO ORDERING. CONNECT NEW FAN TO EXISTING EXHAUST AIR DUCTWORK AND PROVIDE REQUIRED TRANSITIONS/ADAPTERS. PROVIDE ALL REQUIRED FASTENERS, SEALING, FLASHING, WEATHERPROOFING, AND ACCESSORIES FOR A COMPLETE WATERTIGHT INSTALLATION.

㉒ PROVIDE AND INSTALL NEW CEILING-CASSETTE-TYPE MINI-SPLIT EVAPORATOR UNIT MSE-2 IN THE LAY-IN CEILING. PROVIDE REFRIGERANT PIPING BETWEEN MSE-2 AND MINI-SPLIT HEAT-PUMP CONDENSING UNIT MSHP-2, LOCATED OUTDOORS ON A CONCRETE PAD ON GRADE. PROVIDE NEW CONDENSATE DRAIN PIPING FROM MSE-2 AND TERMINATE OUTDOORS IN A GRASS AREA. CONDENSATE DRAIN PIPING ROUTING SHOWN IS DIAGRAMMATIC AND FOR REFERENCE ONLY. CONTRACTOR SHALL FIELD-VERIFY EXISTING CONDITIONS AND COORDINATE FINAL ROUTING OF REFRIGERANT AND CONDENSATE PIPING WITH STRUCTURAL MEMBERS, CEILINGS, PIPING, CONDUITS, AND WORK OF ALL OTHER TRADES. COORDINATE FINAL LOCATIONS OF MSE-2 AND MSHP-2 WITH EXISTING CONDITIONS AND WORK OF ALL TRADES, AND RELOCATE AS REQUIRED TO AVOID CONFLICTS. PROVIDE ALL REQUIRED SUPPORTS, HANGERS, SLEEVES, SEALING, AND ACCESSORIES FOR A COMPLETE INSTALLATION. PROVIDE CONTROLS AND ACCESSORIES AS REQUIRED TO INTEGRATE MSE-2/MSHP-2 INTO THE EXISTING BMS.

GENERAL NOTES:

1. DIFFUSER AND REGISTER LOCATIONS SHOWN ARE DIAGRAMMATIC AND FOR REFERENCE ONLY. CONTRACTOR SHALL COORDINATE FINAL LOCATIONS WITH THE ARCHITECTURAL REFLECTED CEILING PLANS AND CEILING LAYOUT, AND SHALL ADJUST LOCATIONS AS REQUIRED TO AVOID CONFLICTS WITH LIGHTING FIXTURES, SPRINKLERS, CEILING DEVICES, STRUCTURAL MEMBERS, AND WORK OF OTHER TRADES. MAINTAIN REQUIRED CLEARANCES AND PROVIDE A SYMMETRICAL INSTALLATION COORDINATED WITH THE CEILING GRID/PATTERN. FIELD-VERIFY CEILING CONDITIONS PRIOR TO INSTALLATION.

2. CONTRACTOR SHALL REMOVE AND REINSTALL EXISTING CEILING IN ROOMS 164,165 AND 167 AS REQUIRED TO PERFORM HVAC DEMOLITION AND NEW WORK ABOVE THE CEILING. REMOVE ONLY THE EXTENT OF CEILING NECESSARY TO COMPLETE THE WORK. PROTECT EXISTING CEILING COMPONENTS TO REMAIN, AND REINSTALL CEILING TILES, GRID, AND ASSOCIATED COMPONENTS UPON COMPLETION OF HVAC WORK. REPLACE ANY DAMAGED CEILING COMPONENTS TO MATCH EXISTING. COORDINATE CEILING REMOVAL AND REINSTALLATION WITH LIGHTING, SPRINKLERS, FIRE ALARM DEVICES, AND WORK OF OTHER TRADES

ISSUED FOR BID-9/25/26

9.23.26

APPROVED

William R. Long
PROFESSIONAL ENGINEER
NEW JERSEY LICENSE NO. 33012

REVISIONS	DATE	BY

Tri-State Architects, P.C. / Alaimo Group
WILLIAM R. LONG, P.E. LIC. 33012
ANITA S. ARADHYA, R.A. LIC. 18769
200 HIGH STREET MOUNT HOLLY, N.J.

DATE: AUG. 2026
DESIGNED BY: IV
DRAWN BY: RKR
CHECKED BY:
DEPT. HEAD:

CLIENT: WILLINGBORO TOWNSHIP
PROJECT LOCATION: WILLINGBORO TWP. BURLINGTON COUNTY NEW JERSEY
PROJECT NO.: M-0410-0011-000
CONTRACT NO.: BID#8-2026

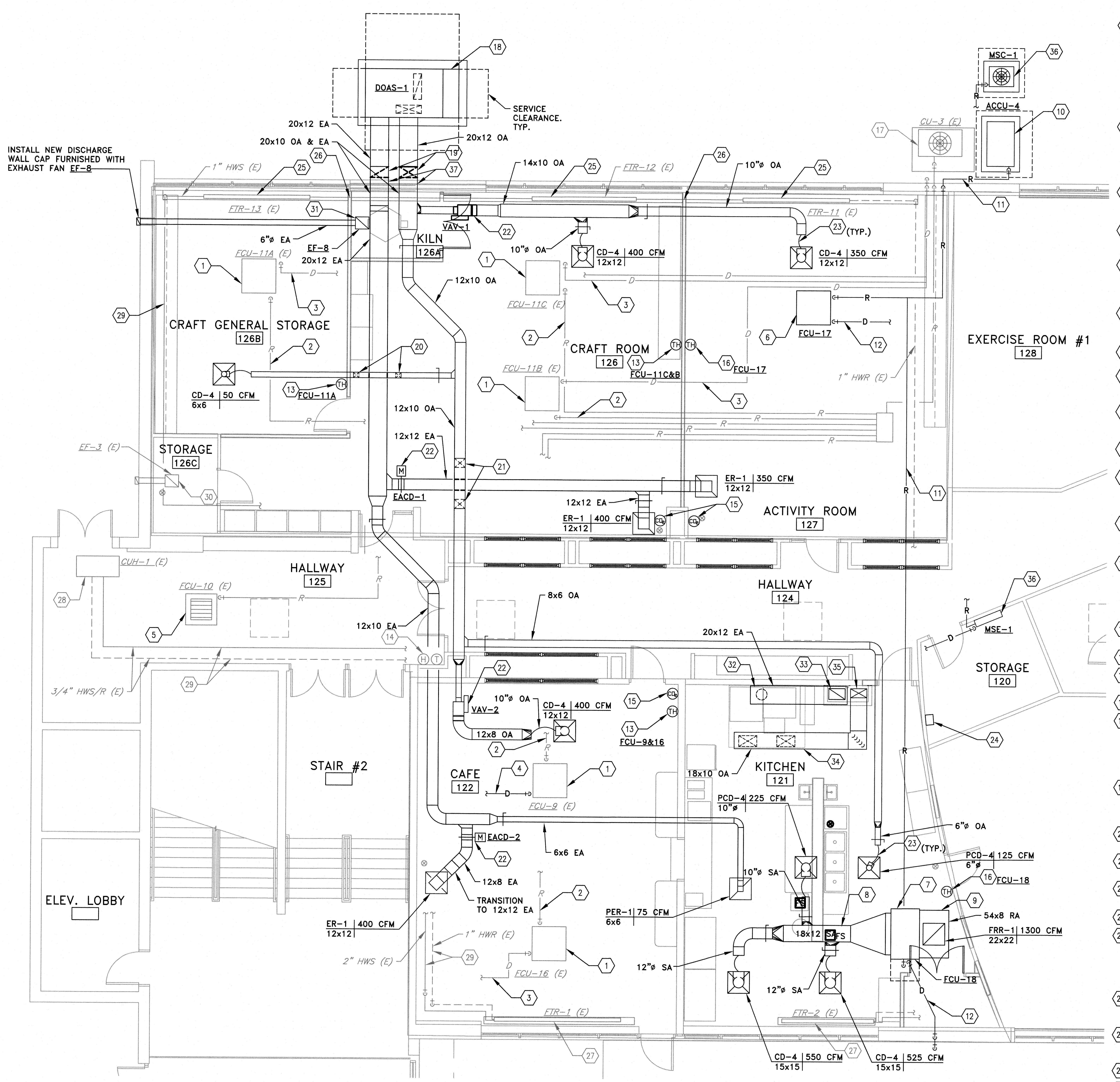
KENNEDY CENTER
RENOVATION TO THE SENIOR CENTER

PARTIAL FIRST FLOOR OFFICE & LOUNGE AREA - HVAC - NEW WORK

SCALE: AS SHOWN

SHEET
H1

FILE NO.:



1 PARTIAL FIRST FLOOR SENIOR CENTER – HVAC – NEW WORK

SCALE: 3/16" = 1'-0"

0 12" 2' 4' 8' NORTH

MECHANICAL DEMOLITION & EXISTING KEYED NOTES (FOR THIS SHEET ONLY):

1 EXISTING CEILING CASSETTE FCU TO BE RELOCATED AND INSTALLED IN NEW LOCATION AS SHOWN. CONTRACTOR SHALL CALCULATE AND FIELD MEASURE THE LENGTHS OF REFRIGERANT PIPING BASED ON NEW LOCATION OF FCUs AND EVALUATE REFRIGERANT LINE SIZES AS PER MANUFACTURER'S RECOMMENDATIONS. BASED ON THE EVALUATION, CONTRACTOR SHALL EXTEND THE REFRIGERANT PIPING AND MODIFY/ADJUST LINE SIZES IF REQUIRED TO COMPLY WITH MANUFACTURER'S REQUIREMENTS. EXTEND AND RECONNECT CONDENSATE DRAIN PIPING, CONTROL WIRING AND ELECTRICAL POWER WIRING AS REQUIRED. REFRIGERANT PIPING AND CONDENSATE DRAIN PIPING ROUTE SHOWN FOR REFERENCE ONLY. CONTRACTOR RESPONSIBLE FOR ROUTING REFRIGERANT PIPING AND CONDENSATE DRAIN PIPING IN BEST POSSIBLE ROUTE BY COORDINATING WITH ALL EXISTING CONDITIONS AND WORKS OF ALL DIVISIONS. RECHARGE THE SYSTEM IN ACCORDANCE WITH THE MANUFACTURER'S REQUIREMENTS. PROVIDE ADDITIONAL REFRIGERANT, IF REQUIRED TO ACCOMMODATE THE REVISED PIPING LENGTHS. CONTRACTOR RESPONSIBLE TO REMOVE EXISTING CEILING AS REQUIRED FOR ALL MECHANICAL WORK AND SHALL RESTORE WALL/CEILING SURFACES TO MATCH EXISTING AFTER COMPLETION OF MECHANICAL WORK. COORDINATE ALL WORK WITH OTHER TRADES AND EXISTING CONDITIONS.

2 REFRIGERANT PIPING ROUTE SHOWN FOR REFERENCE ONLY. CONTRACTOR SHALL CALCULATE AND FIELD MEASURE THE LENGTHS OF REFRIGERANT PIPING BASED ON NEW LOCATION OF FCUs AND EVALUATE REFRIGERANT LINE SIZES AS PER MANUFACTURER'S RECOMMENDATIONS. BASED ON THE EVALUATION, CONTRACTOR SHALL EXTEND THE REFRIGERANT PIPING AND ADJUST/MODIFY LINE SIZES IF REQUIRED TO COMPLY WITH MANUFACTURER'S REQUIREMENTS. CONTRACTOR RESPONSIBLE FOR ROUTING REFRIGERANT PIPING IN BEST POSSIBLE ROUTE BY COORDINATING WITH ALL EXISTING CONDITIONS AND WORKS OF ALL DIVISIONS. RECHARGE THE SYSTEM IN ACCORDANCE WITH THE MANUFACTURER'S REQUIREMENTS. PROVIDE ADDITIONAL REFRIGERANT, IF REQUIRED TO ACCOMMODATE THE REVISED PIPING LENGTHS.

3 CONDENSATE DRAIN PIPING ROUTE SHOWN FOR REFERENCE ONLY. MODIFY, EXTEND AND RECONNECT CONDENSATE DRAIN PIPING AS REQUIRED. CONTRACTOR RESPONSIBLE FOR ROUTING CONDENSATE DRAIN PIPING IN BEST POSSIBLE ROUTE BY COORDINATING WITH ALL EXISTING CONDITIONS AND WORKS OF ALL DIVISIONS.

4 PROVIDE NEW CONDENSATE DRAIN PIPING FROM RELOCATED FCU-9 (E) TO TERMINATE OUTDOOR IN GRASS AREA. CONDENSATE DRAIN PIPING ROUTE SHOWN FOR REFERENCE ONLY. CONTRACTOR RESPONSIBLE FOR ROUTING CONDENSATE DRAIN PIPING IN BEST POSSIBLE ROUTE BY COORDINATING WITH ALL EXISTING CONDITIONS AND WORKS OF ALL DIVISIONS.

5 EXISTING CEILING MOUNTED CASSETTE FCU TO REMAIN. EXISTING REFRIGERANT PIPING SERVING THIS FCU SHALL REMAIN UNLESS MODIFICATIONS TO THE REFRIGERANT PIPING SIZES ARE REQUIRED DUE TO THE RELOCATION OF OTHER FCUs SERVED BY CU-3, AS DESCRIBED IN KEYED NOTE 1. IF REFRIGERANT PIPING SIZE REVISIONS ARE REQUIRED, CONTRACTOR SHALL MODIFY THE REFRIGERANT PIPING SIZES AS NECESSARY TO COMPLY WITH THE MANUFACTURER'S RECOMMENDATIONS.

6 CONTRACTOR PROVIDE AND INSTALL NEW CEILING CASSETTE FCU. CONTRACTOR SHALL FOLLOW MANUFACTURER RECOMMENDATIONS FOR INSTALLATION OF FCU. LOCATION SHOWN FOR REFERENCE ONLY, CONTRACTOR SHALL F.V. AND COORDINATE WITH ALL EXISTING CONDITIONS AND ALL TRADES AND RELOCATE IF REQUIRED TO AVOID ANY CONFLICTS.

7 CONTRACTOR PROVIDE AND INSTALL NEW FCU IN SUCH A WAY TO AVOID ANY CONFLICT WITH LIGHTING, BEAMS, WALLS, ETC. ASSOCIATED FCU SERVICE CLEARANCE SHALL NOT BE BLOCKED BY LIGHTING, BEAMS, WALLS, ETC.

8 PROVIDE NEW SA DUCTWORK FROM FROM NEW FCU. PROVIDE DUCT TRANSITIONS, TAKE-OFFS, OFFSETS, ETC. AS SHOWN AND AS REQUIRED. DUCT ROUTING AND LOCATION SHOWN FOR REFERENCE ONLY. CONTRACTOR SHALL FILED VERIFY AND COORDINATE WITH ALL EXISTING CONDITIONS AND ALL TRADES AND MODIFY DUCTWORK AS REQUIRED TO AVOID ANY CONFLICTS.

9 PROVIDE NEW RA DUCT FROM NEW FCU. PROVIDE A DUCT TAKE-OFF TO NEW FILTER RETURN REGISTER INSTALLED IN THE CEILING. LOCATION SHOWN FOR REFERENCE ONLY. CONTRACTOR SHALL FILED VERIFY AND COORDINATE WITH ALL EXISTING CONDITIONS AND ALL TRADES AND MODIFY DUCTWORK AS REQUIRED TO AVOID ANY CONFLICTS..

10 PROVIDE AND INSTALL NEW HEAT PUMP CONDENSING UNIT ON A CONCRETE PAD. PROVIDE SERVICE CLEARANCE AS REQUIRED. CONTRACTOR FOLLOW MANUFACTURER'S RECOMMENDATIONS FOR INSTALLATION. PROVIDE NEW 6" CONCRETE PAD WITH 6" OVERHANG ON ALL SIDES.

11 PROVIDE NEW REFRIGERANT LINE SETS FROM NEW HEAT PUMP CONDENSING UNIT OFFSET UP ALONG THE EXTERIOR WALL OF THE BUILDING AND INTO FIRST FLOOR CEILING SPACE TO NEW FCUs. CONTRACTOR PROVIDE CONDUIT COVER FOR REFRIGERANT PIPING ON EXTERIOR WALL AND ON GRADE. REFRIGERANT PIPING ROUTE SHOWN FOR REFERENCE ONLY. CONTRACTOR ROUTE THESE PIPING IN SHORTEST AND BEST POSSIBLE ROUTE AVOIDING CONFLICTS WITH WORKS OF ALL TRADES. REFRIGERANT PIPING SIZES AS PER MANUFACTURER'S RECOMMENDATIONS.

12 PROVIDE NEW CONDENSATE DRAIN PIPING FROM NEW FCU TO TERMINATE OUTDOOR IN GRASS AREA. CONDENSATE DRAIN PIPING ROUTE SHOWN FOR REFERENCE ONLY. CONTRACTOR RESPONSIBLE FOR ROUTING CONDENSATE DRAIN PIPING IN BEST POSSIBLE ROUTE BY COORDINATING WITH ALL EXISTING CONDITIONS AND WORKS OF ALL DIVISIONS. CONTRACTOR PROVIDE CONDENSATE PUMPS IF/AS REQUIRED.

13 PROVIDE NEW WALL-MOUNTED COMBINATION TEMPERATURE/HUMIDITY SENSORS SERVING THE RELOCATED FCUs. PROVIDE ONE SENSOR FOR FCU-11A, ONE SENSOR SERVING BOTH FCU-11B AND FCU-11C, AND ONE SENSOR SERVING BOTH FCU-9 AND FCU-16. SENSOR LOCATIONS SHOWN ARE FOR REFERENCE ONLY. CONTRACTOR SHALL FIELD-VERIFY AND COORDINATE THE FINAL SENSOR LOCATIONS WITH EXISTING CONDITIONS, ARCHITECTURAL FEATURES, AND THE CONTROLS/BMS CONTRACTOR. LOCATE SENSORS TO ACCURATELY SENSE THE SPACE CONDITIONS OF THE ASSOCIATED FCU(S). PROVIDE NEW CONTROL WIRING AND CONDUIT, OR EXTEND EXISTING AS REQUIRED. VERIFY PROPER COMMUNICATION AND OPERATION OF ALL SENSORS WITH THE ASSOCIATED FCUs AND THE BUILDING MANAGEMENT SYSTEM (BMS) AFTER INSTALLATION

14 EXISTING THERMOSTAT AND/OR HUMIDISTAT TO REMAIN.

15 PROVIDE AND INSTALL NEW CO2 SENSOR FOR DCV CONTROL SERVING DOAS UNIT. REFER TO SEQUENCE OF OPERATION FOR CONTROLS & OPERATION.

16 PROVIDE AND INSTALL NEW COMBINATION TEMPERATURE AND HUMIDISTAT SERVING NEW FCUs. REFER TO SEQUENCE OF OPERATION FOR CONTROLS & OPERATION

17 EXISTING AIR COOLED CONDENSING UNIT TO REMAIN.

18 PROVIDE AND INSTALL NEW DOAS-1 UNIT OUTSIDE THE BUILDING AS SHOWN. UNIT SHALL BE LOCATED BEHIND THE SOLID EXTERIOR WALL AND NOT IN FRONT OF THE WINDOWS. PROVIDE A MIN. OF 60" CLEARANCE BETWEEN DOAS UNIT AND EXTERIOR WALL, OR AS REQUIRED BY MANUFACTURER, TO ALLOW ADEQUATE SERVICE ACCESS ON THAT SIDE OF DOAS UNIT. UNIT SHALL BE INSTALLED ON A CUSTOM PLENUM CURB TO ACCOMMODATE SIDE OA SUPPLY AND EA INTAKE DUCT CONNECTIONS. REFER TO DETAIL 7/H5. PROVIDE NEW 6" CONCRETE PAD WITH MIN. 6" OVERHANG ON ALL SIDES. INSTALL THE UNIT PLUMB AND LEVEL ON THE CONCRETE PAD IN ACCORDANCE WITH THE MANUFACTURER'S INSTALLATION REQUIREMENTS. REFER TO TYP. EXTERIOR HVAC EQUIPMENT PAD DETAIL ON H5.

19 PROVIDE NEW 20x12 OA & 20x12 EA DUCTS FROM DOAS-1 UNIT'S PLENUM CURB AND OFFSET THEM UP ALONG THE BUILDING EXTERIOR WALL. PROVIDE TRANSITION FROM 20x12 TO 20x10 ALONG THE VERTICAL DUCT RISERS FOR BOTH EA AND OA DUCTS. 20x10 OA AND EA DUCTS SHALL ENTER BUILDING IN FIRST FLOOR CEILING SPACE JUST BELOW LOAD BEARING BEAM ALONG EXTERIOR WALL. CONTRACTOR SHALL PROVIDE 90 DEG. ROUND ELBOWS. CONTRACTOR SHALL COORDINATE WITH ALL EXISTING CONDITIONS AND ALL TRADES TO ROUTE DUCTWORK WITHOUT ANY CONFLICTS.

20 PROVIDE 6x6 OA DUCT OFFSET ABOVE 20x12 EA DUCT. DUCTWORK AND OFFSET SHOWN FOR REFERENCE ONLY. CONTRACTOR SHALL COORDINATE WITH ALL EXISTING CONDITIONS AND ALL TRADES TO ROUTE DUCTWORK WITHOUT ANY CONFLICTS

21 PROVIDE 12x10 OA DUCT OFFSET ABOVE 12x12 EA DUCT. DUCTWORK AND OFFSET SHOWN FOR REFERENCE ONLY. CONTRACTOR SHALL COORDINATE WITH ALL EXISTING CONDITIONS AND ALL TRADES TO ROUTE DUCTWORK WITHOUT ANY CONFLICTS

22 PROVIDE NEW VAV TERMINAL UNIT IN OA DUCTWORK AND NEW EA CONTROL DAMPER IN EA DUCTWORK AS SHOWN ON DRAWING IN ACCESSIBLE LOCATION. REFER TO SEQUENCE OF OPERATION ON SHEET H9 FOR INFO ON OPERATION AND CONTROL.

23 CONTRACTOR PROVIDE FLEXIBLE DUCTWORK AT CONNECTION INTO SUPPLY DIFFUSER. FLEXIBLE DUCTWORK SHALL NOT BE LONGER THAN 5'.

24 PROVIDE AND INSTALL A NEW VRF CENTRAL CONTROLLER COMPATIBLE WITH THE EXISTING VRF SYSTEM AND CAPABLE OF BACNET COMMUNICATION WITH THE EXISTING TRANE BMS. NEW CONTROLLER SHALL SUPPORT COMMUNICATION WITH ALL EXISTING AND RELOCATED VRF INDOOR UNITS. EXTEND AND RECONNECT CONTROL WIRING AS REQUIRED. BMS CONTRACTOR SHALL REPLACE OR MODIFY EXISTING VRF SYSTEM CONTROLLERS, INTERFACES, AND ASSOCIATED CONTROLS SERVING EXISTING AND RELOCATED FCUs AS REQUIRED TO PROVIDE COMPLETE INTEGRATION WITH THE EXISTING TRANE BMS. COORDINATE INSTALLATION, PROGRAMMING, LICENSING, AND COMMISSIONING WITH THE BMS CONTRACTOR AND THE VRF EQUIPMENT MANUFACTURER. VERIFY PROPER OPERATION OF THE COMPLETE VRF SYSTEM UPON COMPLETION OF THE WORK

25 EXISTING FINNED TUBE CONVECTOR AND ASSOCIATED HOT WATER PIPING TO REMAIN. EXISTING FIN-TUBE COVER MAY BE CUT OR MODIFIED AS REQUIRED TO ALLOW INSTALLATION OF NEW WALL. CONTRACTOR SHALL FIELD-VERIFY DIMENSIONS AND ENSURE THAT EXISTING FINNED-TUBE ELEMENTS AND PIPING ARE NOT DAMAGED OR OBSTRUCTED. PROVIDE CLEAN, FINISHED EDGES AND END CAPS AT ALL CUT LOCATIONS.

26 EXISTING HEATING PIPING PASSING THROUGH THE NEW WALL SHALL BE PROTECTED, SUPPORTED, AND RECONNECTED AS REQUIRED. COORDINATE WITH NEW WALL FRAMING TO PROVIDE SLEEVES OR OPENINGS FOR PIPING PENETRATIONS. PATCH AND REPAIR FINISHES TO MATCH ADJACENT SURFACES UPON COMPLETION.

27 EXISTING FIN TUBE CONVECTOR, ASSOCIATED HOT WATER PIPING AND FIN TUBE COVER TO REMAIN,

28 EXISTING CABINET UNIT HEATER TO REMAIN.

29 EXISTING HOT WATER PIPING TO REMAIN.

30 EXISTING EXHAUST FAN TO REMAIN.

31 PROVIDE AND INSTALL NEW EXHAUST FAN EF-8. PROVIDE NEW EA DUCTWORK FROM EF-8 TO EXTERIOR WALL AS SHOWN. INSTALL A NEW DISCHARGE WALL CAP FURNISHED WITH EF-8.

32 PROVIDE AND INSTALL GREASE EXHAUST DUCT FROM EXHAUST OPENING ON KITCHEN HOOD TO KITCHEN EXHAUST FAN ON ROOF. PROVIDE 12" DUCT CONNECTION FROM EXHAUST OPENING ON KITCHEN HOOD TO 20x12 GREASE EXHAUST DUCTWORK.

33 ROUTE 18x12 EA DUCT FROM FIRST FLOOR CEILING SPACE VERTICALLY UP THRU SECOND FLOOR INTO CEILING SPACE ABOVE. 18x12 VERTICAL DUCT RISER SHALL BE LOCATED CLOSE TO THE THE CORRIDOR WALL OF CLASSROOM 236. PROVIDE SOFFIT/CHASE AROUND THE VERTICAL DUCT RISER. REFER TO ARCHITECTURAL DRAWINGS FOR INFORMATION ON SOFFIT/CHASE.

34 PROVIDE AND INSTALL 18x10 MAKE UP AIR DUCT FROM MAKE UP AIR UNIT ON ROOF TO INTAKE OPENINGS ON KITCHEN HOOD. PROVIDE 20x12 DUCT CONNECTIONS FROM BOTTOM OF 18x10 MUA DUCT TO MUA OPENINGS ON KITCHEN HOOD.

35 ROUTE 18x10 EA DUCT FROM FIRST FLOOR CEILING SPACE VERTICALLY UP THRU SECOND FLOOR INTO CEILING SPACE ABOVE. 18x10 VERTICAL DUCT SHALL BE LOCATED CLOSE TO THE THE CORRIDOR WALL OF CLASSROOM 236. PROVIDE SOFFIT/CHASE AROUND THE VERTICAL DUCT RISER. REFER TO ARCHITECTURAL DRAWINGS FOR INFORMATION ON SOFFIT/CHASE.

36 PROVIDE AND INSTALL NEW WALL MOUNTED MINI-SPLIT EVAPORATOR UNIT MSE-1. PROVIDE REFRIGERANT PIPING BETWEEN MSE-1 AND MINI-SPLIT CONDENSING UNIT MSC-1, LOCATED OUTDOORS ON A CONCRETE PAD ON GRADE. PROVIDE NEW CONDENSATE DRAIN PIPING FROM MSE-1 AND TERMINATE OUTDOORS IN GRASS AREA. CONDENSATE DRAIN PIPING ROUTING SHOWN IS DIAGRAMMATIC AND FOR REFERENCE ONLY. CONTRACTOR SHALL FIELD-VERIFY EXISTING CONDITIONS AND COORDINATE FINAL ROUTING OF REFRIGERANT & CONDENSATE PIPING WITH STRUCTURAL MEMBERS, CEILINGS, PIPING, CONDUITS, AND WORK OF ALL OTHER TRADES. COORDINATE FINAL LOCATIONS OF MSE-1 & MSC-1 WITH EXISTING CONDITIONS & WORK OF ALL TRADES, AND RELOCATE AS REQUIRED TO AVOID CONFLICTS. PROVIDE ALL REQUIRED SUPPORTS, HANGERS, SLEEVES, SEALING, & ACCESSORIES FOR A COMPLETE INSTALLATION. PROVIDE CONTROLS & ACCESSORIES AS REQUIRED TO INTEGRATE MSE-1/MSC-1 INTO EXISTING BMS.

37 INSTALL ANGLE LOOSE LINTEL FOR BRICK VENEER OPENINGS ABOVE BOTH DUCTS WITH MIN. 8" BEARING LENGTHS ON EACH SIDE OF THE OPENING. LOOSE LINTEL SHALL BE GALVANIZED STEEL L5 x 3-1/2 x 3/8. INSTALL STAINLESS STEEL FLASHING WITH WEEP HOLES ABOVE LINTEL

GENERAL NOTES:

1. DIFFUSER AND REGISTER LOCATIONS SHOWN ARE DIAGRAMMATIC AND FOR REFERENCE ONLY. CONTRACTOR SHALL COORDINATE FINAL LOCATIONS WITH THE ARCHITECTURAL REFLECTED CEILING PLANS AND CEILING LAYOUT, AND SHALL ADJUST LOCATIONS AS REQUIRED TO AVOID CONFLICTS WITH LIGHTING FIXTURES, SPRINKLERS, CEILING DEVICES, STRUCTURAL MEMBERS, AND WORK OF OTHER TRADES. MAINTAIN REQUIRED CLEARANCES AND PROVIDE A SYMMETRICAL INSTALLATION COORDINATED WITH THE CEILING GRID/PATTERN. FIELD-VERIFY CEILING CONDITIONS PRIOR TO INSTALLATION.

ISSUED FOR BID-9/25/26

KENNEDY CENTER
RENOVATION TO THE SENIOR CENTER

CLIENT:
WILLINGBORO TOWNSHIP

PARTIAL FIRST FLOOR SENIOR
CENTER - HVAC - NEW WORK

SCALE: AS SHOWN

PROJECT LOCATION:
WILLINGBORO TWP.
BURLINGTON COUNTY
NEW JERSEY

PROJECT NO.:
M-0410-0011-000

CONTRACT NO.:
BID#8-2026

DATE:
AUG. 2026

DESIGNED BY:
IV

DRAWN BY:
RKR

CHECKED BY:
9/22/26

DEPT. HEAD:
9/22/26

Tri-State Architects, P.C. / Alaimo Group

WILLIAM R. LONG, P.E. LIC. 33012
ANITA S. ARADHYA, R.A. LIC. 18769
200 HIGH STREET MOUNT HOLLY, N.J.

REVISIONS	DATE	BY

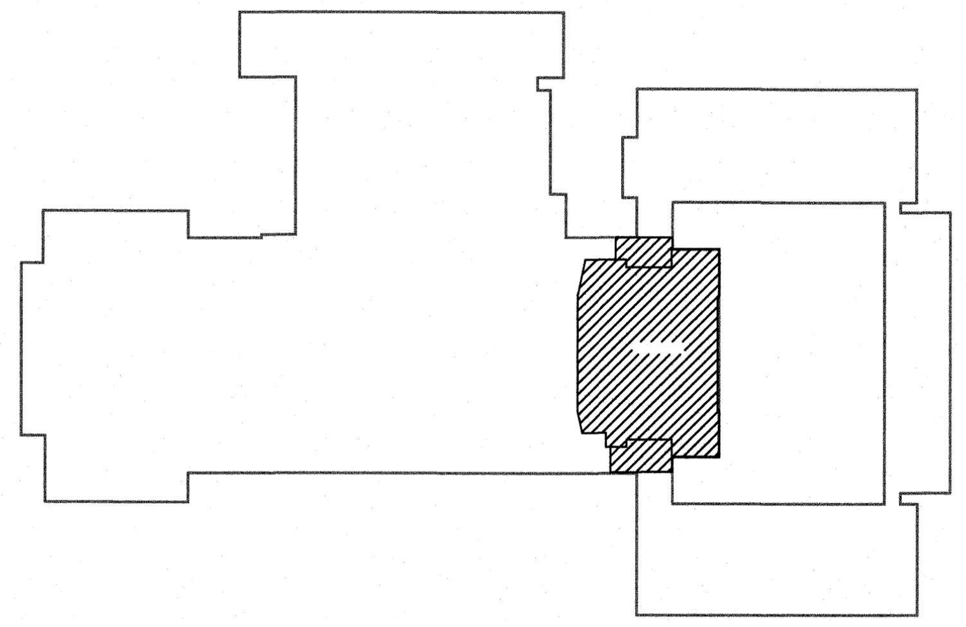
APPROVED 9.23.26

William R. Long
PROFESSIONAL ENGINEER
NEW JERSEY LICENSE NO. 33012

SHEET
H2

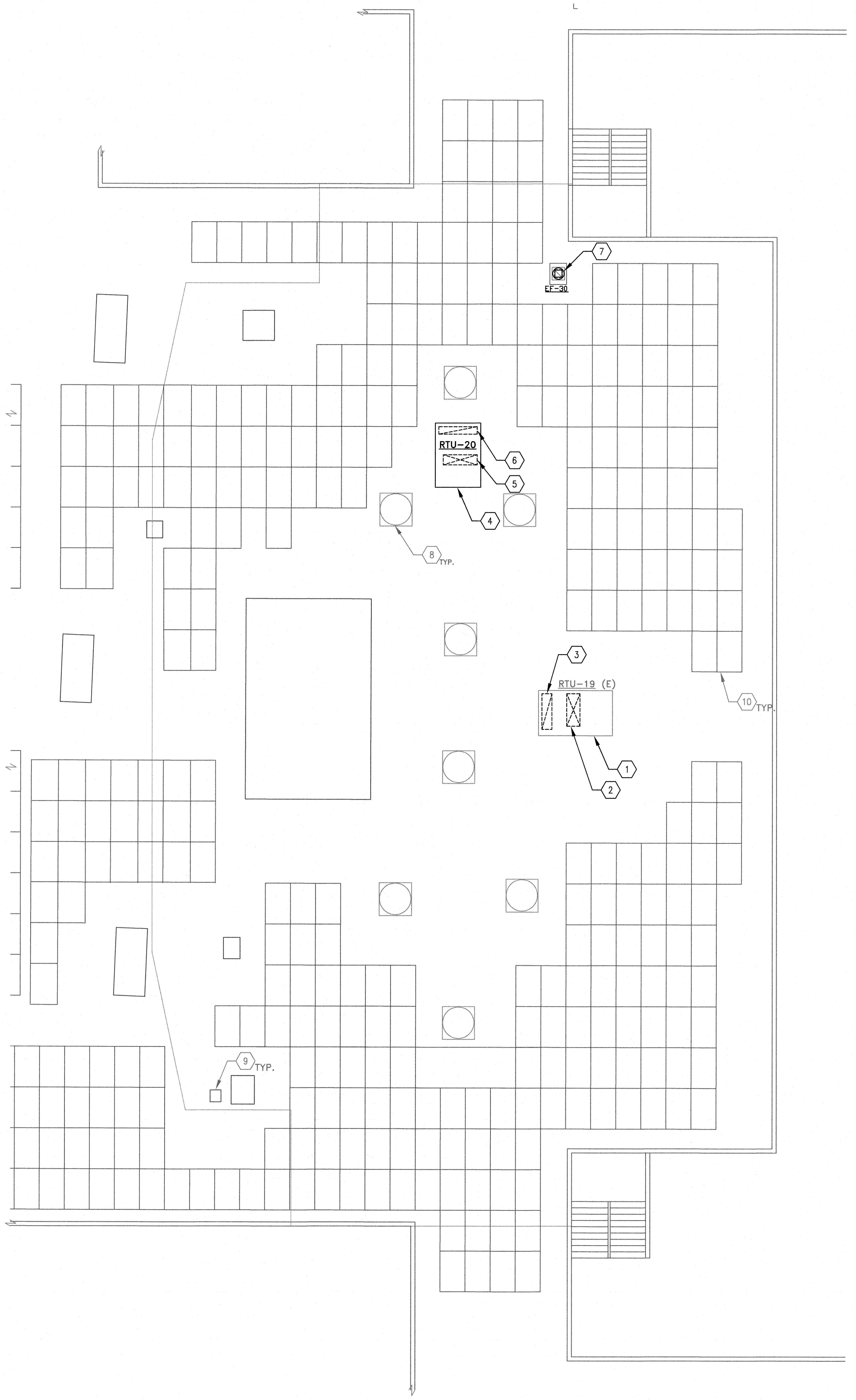
FILE NO.:

Plotted: 9/22/2026 10:02 AM Last saved: 9/21/2026 4:03 PM File Name: M:\Projects\M04100011000\Drawings\GLQ-H2.dwg



KEY PLAN

NOT TO SCALE



① PARTIAL ROOF PLAN OFFICE AND LOUNGE AREA – HVAC – NEW WORK

SCALE: 3/32" = 1'-0"

MECHANICAL DEMOLITION & EXISTING KEYED NOTES (FOR THIS SHEET ONLY):

1. EXISTING RTU–19 ON ROOF SHALL BE ROTATED 180 DEGREES SUCH THAT THE SUPPLY AIR OPENING IS ORIENTED TOWARD ROOM 153, AND REINSTALLED ON THE EXISTING ROOF CURB. CONTRACTOR SHALL FIELD–VERIFY AND COORDINATE THE FINAL UNIT POSITION ON THE CURB AS REQUIRED TO AVOID CONFLICTS BETWEEN SUPPLY/RETURN DUCTWORK AND EXISTING STRUCTURAL BEAMS, JOISTS, AND OTHER FIELD CONDITIONS. FINAL RTU–19 LOCATION SHALL BE SUCH THAT THE SUPPLY AIR AND RETURN AIR DUCTS ARE LOCATED ON OPPOSITE SIDES OF THE STRUCTURAL BEAM ALONG THE WALL SEPARATING ROOMS 153 AND 156. COORDINATE FINAL UNIT LOCATION WITH ALL EXISTING CONDITIONS PRIOR TO INSTALLATION. RECONNECT AND EXTEND, AS REQUIRED, EXISTING CONTROL WIRING/CONDUIT, ELECTRICAL WIRING/CONDUIT, AND CONDENSATE DRAIN PIPING TO RTU–19. EXTEND CONDENSATE DRAIN PIPING, PITCHED TO THE NEAREST ROOF DRAIN, AND PROVIDE PIPE SUPPORTS AS REQUIRED. PROVIDE NEW GAS PIPING CONNECTION TO RTU–19, INCLUDING ALL REQUIRED VALVES, REGULATORS, FITTINGS, SUPPORTS, AND ACCESSORIES.

2. PROVIDE NEW SA DUCTWORK FROM SA OPENING ON RTU. PROVIDE DUCT TRANSITION FROM SA OPENING ON RTU TO 40x26 SA DUCT. INSTALL SUCH THAT 40x26 SA DUCT SHALL BE BETWEEN TWO JOISTS. CONTRACTOR SHALL F.V. AND COORDINATE WITH ALL EXISTING CONDITIONS LIKE STRUCTURAL BEAMS, JOISTS TO INSTALL SA DUCT WITHOUT ANY CONFLICTS. PROVIDE DUCT OFFSETS OR TRANSITIONS IF/AS REQUIRED TO ACCOMMODATE EXISTING CONDITIONS. REFER TO H1 DRAWING FOR DUCT ROUTING AND MORE INFORMATION.

3. PROVIDE NEW RA DUCT FROM RA DUCT OPENING ON RTU AND CONNECT TO NEW 56x14 RA DUCT. CONTRACTOR SHALL F.V. AND COORDINATE WITH ALL EXISTING CONDITIONS LIKE STRUCTURAL BEAMS, JOISTS TO AVOID ANY CONFLICTS WITH NEW RA DUCTWORK. PROVIDE DUCT OFFSETS OR TRANSITIONS IF/AS REQUIRED TO ACCOMMODATE EXISTING CONDITIONS. REFER TO H1 DRAWING FOR DUCT ROUTING AND MORE INFORMATION.

4. PROVIDE AND INSTALL NEW RTU–20 ON ROOF WITH NEW MANUFACTURER–APPROVED ROOF CURB. CONTRACTOR SHALL FIELD–VERIFY EXISTING CONDITIONS AND COORDINATE FINAL UNIT AND CURB LOCATION WITH STRUCTURAL BEAMS, JOISTS, PIPING, CONDUITS, SOLAR PANELS, SKYLIGHTS, AND WORK OF ALL OTHER TRADES TO AVOID CONFLICTS WITH THE UNIT, ROOF OPENINGS, AND SUPPLY AND RETURN AIR DUCTWORK. MAINTAIN MANUFACTURER'S REQUIRED SERVICE AND ACCESS CLEARANCES. COORDINATE ROOF OPENINGS AND CURB INSTALLATION WITH STRUCTURAL AND ROOFING TRADES, AND PROVIDE ALL REQUIRED FLASHING, SEALING, AND WEATHERPROOFING FOR A COMPLETE WATERTIGHT INSTALLATION. PROVIDE NEW CONTROL WIRING/CONDUIT TO RTU–20 AND INTEGRATE UNIT INTO THE EXISTING BMS. PROVIDE NEW CONDENSATE DRAIN PIPING FROM RTU, PITCHED TO THE NEAREST ROOF DRAIN, WITH PIPE SUPPORTS AS REQUIRED

5. PROVIDE NEW 65x14 SA DUCT FROM RTU–20. PROVIDE DUCT TRANSITION FROM SA OPENING ON RTU–20 TO 65x14 SA DUCT. DUCT ROUTING IS DIAGRAMMATIC AND SHOWN FOR REFERENCE ONLY. CONTRACTOR SHALL BE RESPONSIBLE TO F.V. AND COORDINATE FINAL DUCT ROUTING WITH STRUCTURAL MEMBERS, PIPING, CONDUITS, AND WORK OF OTHER TRADES. MODIFY DUCT ROUTING AND PROVIDE OFFSETS, TRANSITIONS, AND FITTINGS AS REQUIRED TO AVOID CONFLICTS AND ACCOMMODATE FIELD CONDITIONS. REFER TO H1 DRAWING FOR DUCT ROUTING AND MORE INFORMATION.

6. PROVIDE NEW RA DUCT FROM RTU–20 RA OPENING AND TERMINATE OPEN ABOVE CEILING FOR CEILING PLENUM RETURN. COORDINATE FINAL DUCT LOCATION AND TERMINATION WITH ALL EXISTING CONDITIONS LIKE STRUCTURAL MEMBERS, PIPING, CONDUITS, AND WORK OF OTHER TRADES. REFER TO H1 DRAWING FOR DUCT ROUTING AND MORE INFORMATION.

7. PROVIDE AND INSTALL NEW EXHAUST FAN EF–30 WITH NEW ADAPTER CURB TO FIT EXISTING ROOF CURB/OPENING. FIELD–VERIFY EXISTING CURB AND OPENING DIMENSIONS PRIOR TO ORDERING. CONNECT NEW FAN TO EXISTING EXHAUST AIR DUCTWORK AND PROVIDE REQUIRED TRANSITIONS/ADAPTERS. PROVIDE ALL REQUIRED FASTENERS, SEALING, FLASHING, WEATHERPROOFING, AND ACCESSORIES FOR A COMPLETE WATERTIGHT INSTALLATION.

8. EXISTING SKYLIGHT TO REMAIN. TYPICAL

9. EXISTING EXHAUST FAN TO REMAIN. TYPICAL. NOT ALL EXHAUST FANS ARE SHOWN.

10. EXISTING SOLAR PANELS TO REMAIN. TYPICAL

9.23.26

William R. Long
PROFESSIONAL ENGINEER
NEW JERSEY LICENSE NO. 33012

APPROVED

REVISIONS	DATE	BY

Tri-State Architects, P.C. / Alaimo Group
WILLIAM R. LONG, P.E. LIC. 33012
ANITA S. ARADHYA, R.A. LIC. 18769
200 HIGH STREET MOUNT HOLLY, N.J.

DATE: AUG. 2026
DESIGNED BY: IV
DRAWN BY: RKR
CHECKED BY: 9/22/26
DEPT. HEAD: 9/22/26

CLIENT: WILLINGBORO TOWNSHIP
PROJECT LOCATION: WILLINGBORO TWP. BURLINGTON COUNTY NEW JERSEY
PROJECT NO.: M-0410-0011-000
CONTRACT NO.: BID#8-2026

KENNEDY CENTER
RENOVATION TO THE SENIOR CENTER

PARTIAL ROOF PLAN OFFICE
& LOUNGE - HVAC -NEW WORK

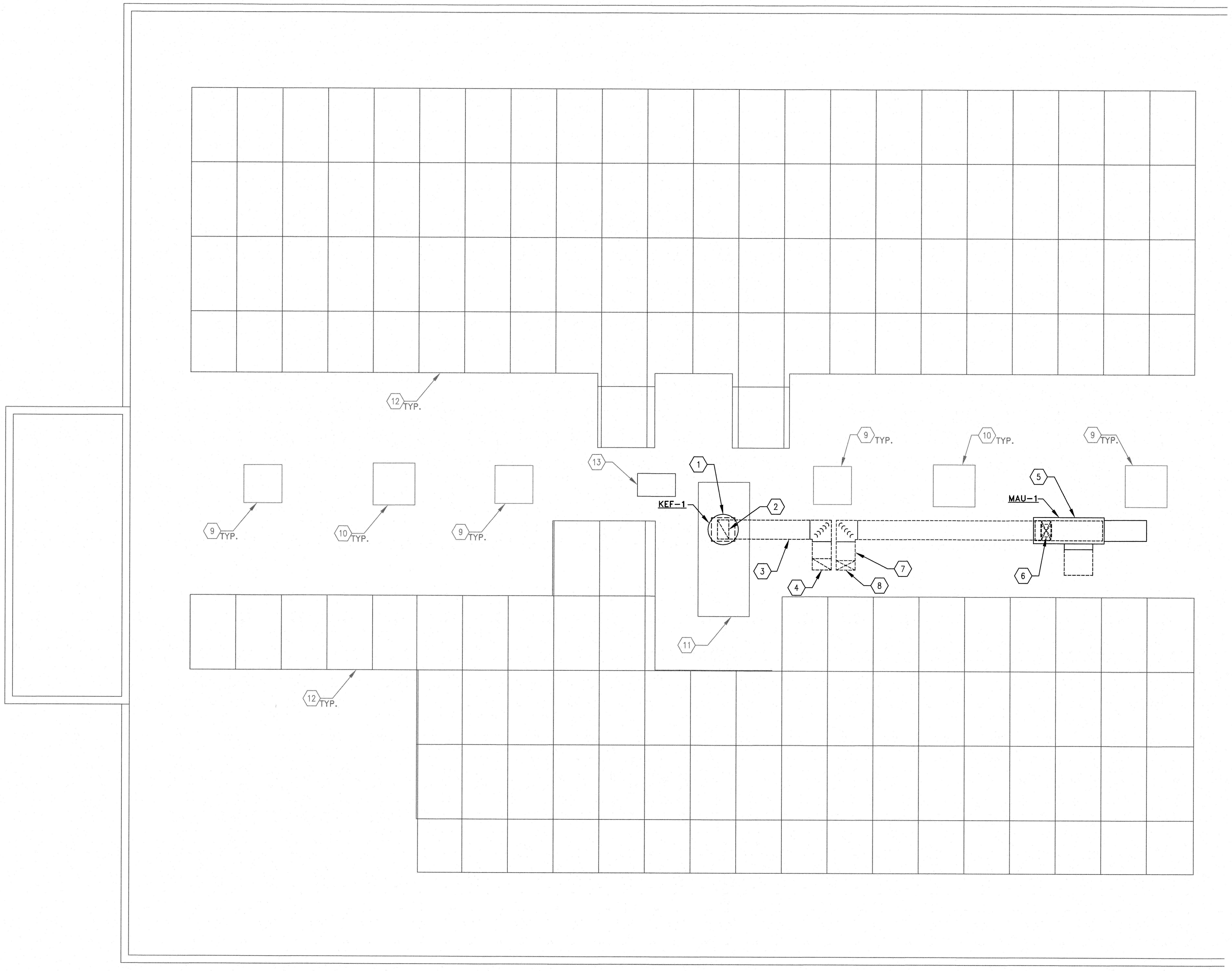
SCALE: AS SHOWN

SHEET
H3

FILE NO.:

ISSUED FOR BID-9/25/26

Plotted: 9/22/2026 10:03 AM Last saved: 9/21/2026 4:02 PM File Name: M:\Projects\M04100011000\Drawings\GLQ-H3.dwg

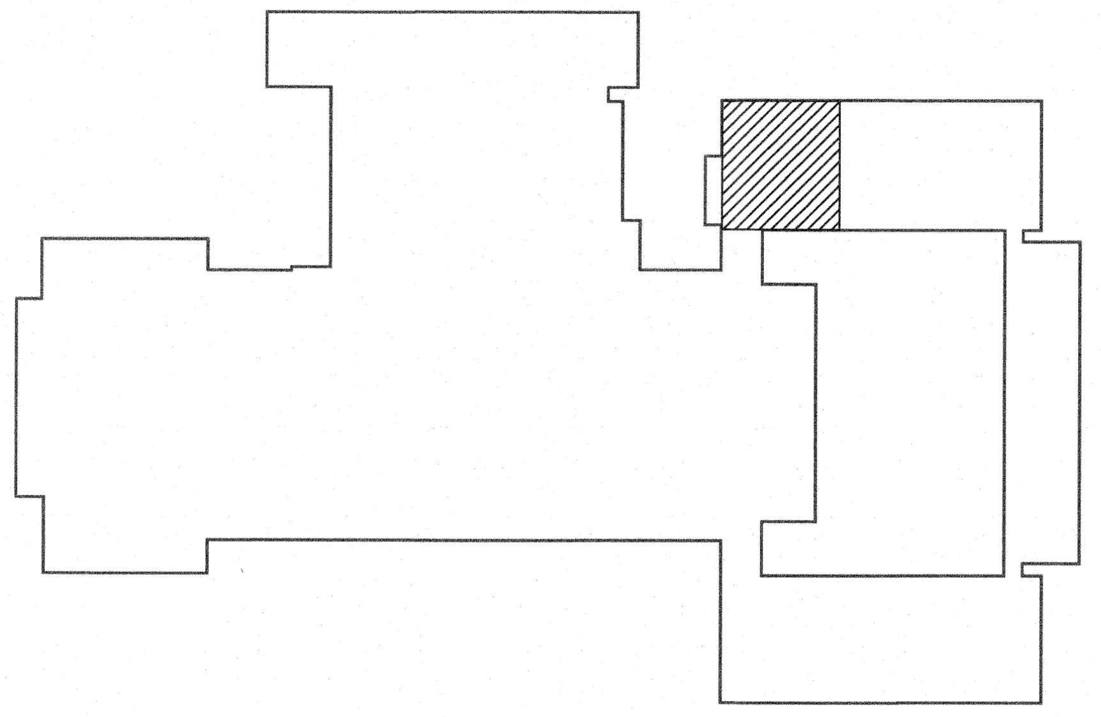


1 PARTIAL ROOF PLAN SENIOR CENTER – HVAC – NEW WORK

SCALE: 3/16" = 1'-0"

MECHANICAL NEW WORK KEYED NOTES (FOR THIS SHEET ONLY):

1. NEW EXHAUST FAN KEF–1 SERVING KITCHEN HOOD TO BE LOCATED ON THE EXISTING CURB. PROVIDE AN ADAPTER CURB OVER EXISTING CURB FOR KEF–1.
2. NEW 18x12 EA DUCTWORK FROM SECOND FLOOR CEILING SPACE CONNECTS INTO KEF–1. PROVIDE DUCT TRANSITION AS REQUIRED AT THE CONNECTION INTO KEF–1.
3. NEW 18x12 EA DUCTWORK TO BE ROUTED BELOW ROOF IN SECOND FLOOR CEILING SPACE. EA DUCT ROUTE SHOWN FOR REFERENCE ONLY. CONTRACTOR F.V. AND COORDINATE WITH EXISTING CONDITIONS AND ALL DISCIPLINES AND MODIFY ROUTING AS REQUIRED. CONTRACTOR SHALL COORDINATE WITH EXISTING WOODEN SUPPORTS OVER DRY WALL AND MODIFY THEM AS REQUIRED TO ROUTE OA DUCTWORK THRU THEM ABOVE THE CEILING ON SECOND FLOOR
4. PROVIDE NEW 18x12 EA DUCTWORK FROM FIRST FLOOR CEILING SPACE ROUTED VERTICALLY THRU SECOND FLOOR INTO CEILING SPACE ABOVE. 18x12 VERTICAL DUCT RISER SHALL BE LOCATED CLOSE TO THE THE CORRIDOR WALL OF CLASSROOM 236. PROVIDE SOFFIT/CHASE AROUND THE VERTICAL DUCT RISER. REFER TO ARCHITECTURAL DRAWINGS FOR INFORMATION ON SOFFIT/CHASE.
5. NEW MAKE UP AIR UNIT WITH GAS HEAT MAU–1 SERVING KITCHEN HOOD SHALL BE LOCATED SUCH THAT THE INTAKE HOOD ON MAU–1 IS MIN. 10' AWAY FROM EXISTING EXHAUST FANS. LOCATION OF MAU–1 SHOWN FOR REFERENCE ONLY. CONTRACTOR SHALL COORDINATE THE LOCATION WITH ALL EXISTING CONDITIONS AND OTHER DIVISIONS. FURNISH WITH A NEW CURB FOR MAU–1.
6. NEW 18x10 OA DUCTWORK FROM MAU–1 TO BE ROUTED IN SECOND FLOOR CEILING SPACE. PROVIDE DUCT TRANSITION AS REQUIRED AT SUPPLY OPENING OF MAU–1.
7. NEW 18x10 OA DUCTWORK TO BE ROUTED BELOW ROOF IN SECOND FLOOR CEILING SPACE. OA DUCT ROUTE SHOWN FOR REFERENCE ONLY. CONTRACTOR F.V. AND COORDINATE WITH EXISTING CONDITIONS AND ALL DISCIPLINES AND MODIFY ROUTING AS REQUIRED. CONTRACTOR SHALL COORDINATE WITH EXISTING WOODEN SUPPORTS OVER DRY WALL AND MODIFY THEM AS REQUIRED TO ROUTE OA DUCTWORK THRU THEM ABOVE THE CEILING ON SECOND FLOOR.
8. NEW 18x10 OA DUCTWORK TO BE ROUTED VERTICALLY DOWN FROM SECOND FLOOR CEILING TO FIRST FLOOR CEILING SPACE. 18x10 VERTICAL DUCT SHALL BE LOCATED CLOSE TO THE THE CORRIDOR WALL OF CLASSROOM 236. COORDINATE LOCATION OF VERTICAL DUCT WITH ALL EXISTING CONDITIONS, KITCHEN HOOD ON FIRST FLOOR AND ALL OTHER DIVISIONS. PROVIDE SOFFIT/CHASE AROUND THE VERTICAL DUCT. REFER TO ARCHITECTURAL DRAWINGS FOR INFORMATION ON SOFFIT/CHASE.
9. EXISTING SKYLIGHT TO REMAIN. TYPICAL
10. EXISTING EXHAUST FAN TO REMAIN. TYPICAL
11. EXISTING CURB TO REMAIN. TYPICAL
12. EXISTING SOLAR PANELS TO REMAIN. TYPICAL
13. EXISTING SOLAR INVERTER TO REMAIN. TYPICAL



KEY PLAN

NOT TO SCALE

APPROVED

9.23.26

William R. Long
PROFESSIONAL ENGINEER
NEW JERSEY LICENSE NO. 33012

REVISIONS | DATE | BY

Tri-State Architects, P.C. / Alaimo Group

WILLIAM R. LONG, P.E. LIC. 33012
ANITA S. ARADHYA, R.A. LIC. 18769
200 HIGH STREET MOUNT HOLLY, N.J.

DATE: AUG. 2026
DESIGNED BY: IV
DRAWN BY: RKR
CHECKED BY: AW 9/22/26
DEPT. HEAD: AW 9/22/26

CLIENT: WILLINGBORO TOWNSHIP
PROJECT LOCATION: WILLINGBORO TWP. BURLINGTON COUNTY NEW JERSEY
PROJECT NO.: M-0410-0011-000
CONTRACT NO.: BID#8-2026

KENNEDY CENTER
RENOVATION TO THE SENIOR CENTER

PARTIAL ROOF PLAN SENIOR CENTER - HVAC - NEW WORK

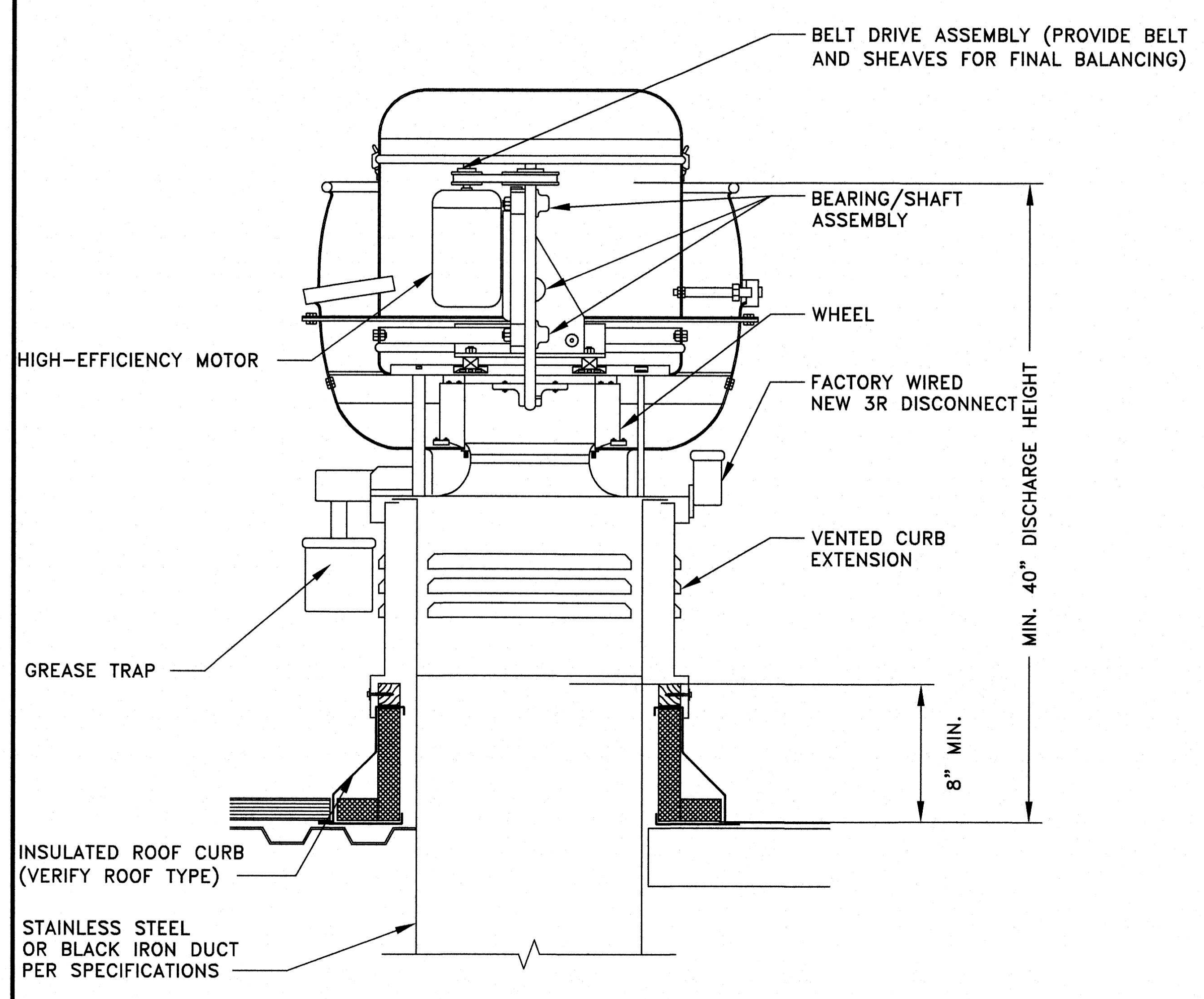
SCALE: AS SHOWN

SHEET
H4

FILE NO.:

ISSUED FOR BID-9/25/26

Plotted: 9/22/2026 10:03 AM Last saved: 9/21/2026 4:03 PM File Name: M:\Projects\M04100011000\Drawings\GLQ-H4.dwg

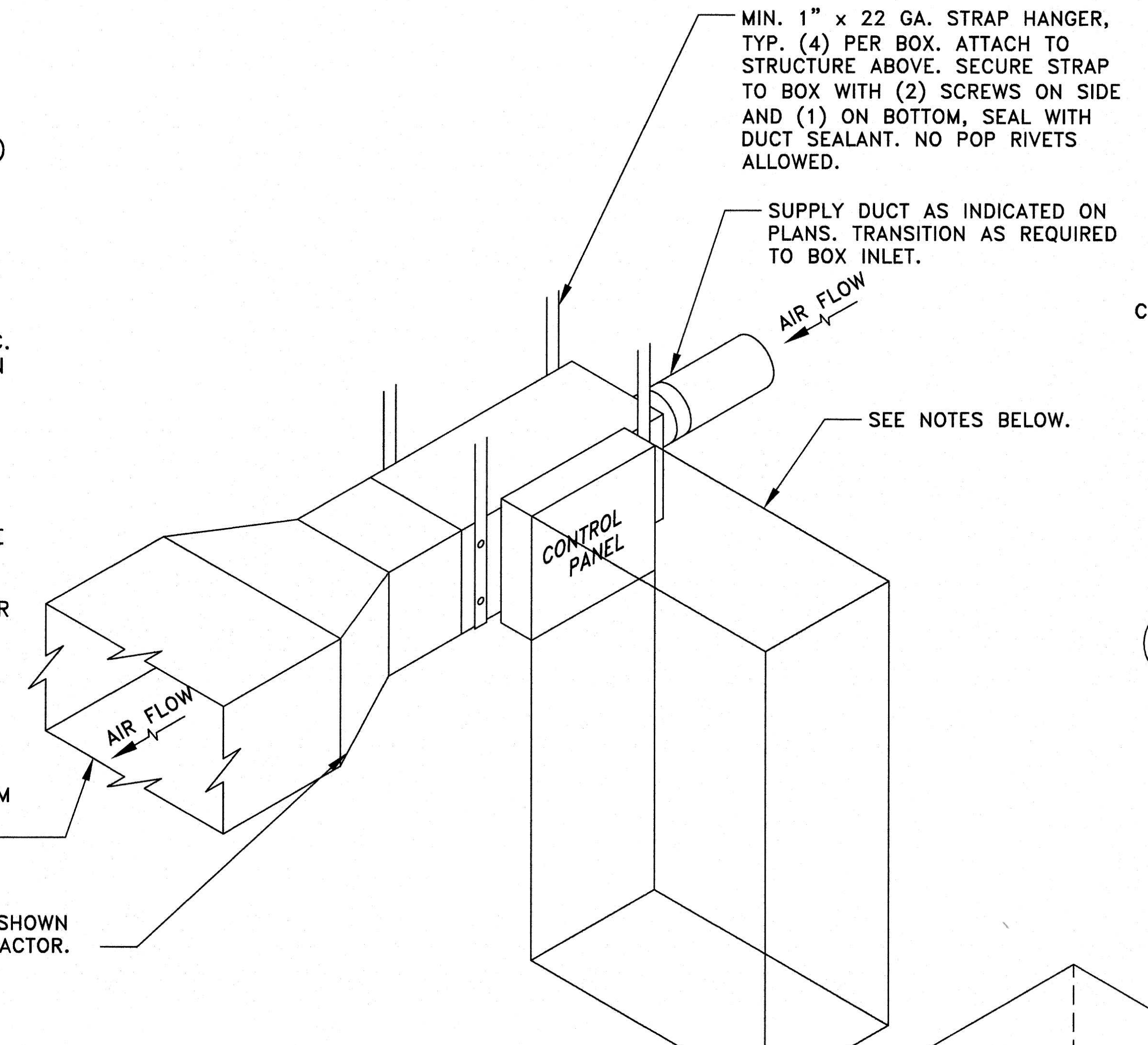

BELT DRIVE ASSEMBLY (PROVIDE BELT AND SHEAVES FOR FINAL BALANCING)
BEARING/SHAFT ASSEMBLY
WHEEL
HIGH-EFFICIENCY MOTOR
FACTORY WIRED NEW 3R DISCONNECT
MIN. 40" DISCHARGE HEIGHT
VENTED CURB EXTENSION
GREASE TRAP
8" MIN.
INSULATED ROOF CURB (VERIFY ROOF TYPE)
STAINLESS STEEL OR BLACK IRON DUCT PER SPECIFICATIONS

NOTES:
1. FAN/CURB ASSEMBLY SHALL BE IN ACCORDANCE WITH NFPA 96.
2. PROVIDE FAN WITH HINGED BASE AND CABLE FOR INSPECTION AND CLEANING.

1 UPBLAST ROOF EXHAUST FAN (GREASE HOOD)

NO SCALE

NOTES:
1. MAINTAIN MIN. 42" CLEARANCE (OR PER N.E.C.) IN FRONT OF ALL VAV ELECTRICAL CONTROL PANELS. WORKING CLEARANCE AREA SHALL ALSO EXTEND BELOW LEVEL PANEL TO ALLOW ACCESS FROM BENEATH. NO PIPES, SPRINKLERS, CONDUITS, ETC. SHALL BE INSTALLED WITHIN THIS ZONE. COORDINATE CAREFULLY WITH OTHER TRADES.
2. WHERE VAV'S OR THEIR WORKING CLEARANCE FALL ABOVE LIGHT FIXTURES, THE FIXTURE MUST HAVE A FLEXIBLE WHIP TO ALLOW TEMPORARY RELOCATION FOR ACCESS TO VAV, COORDINATE WITH ELECTRICAL CONTRACTOR, SEE ELECTRICAL PLAN NOTES.

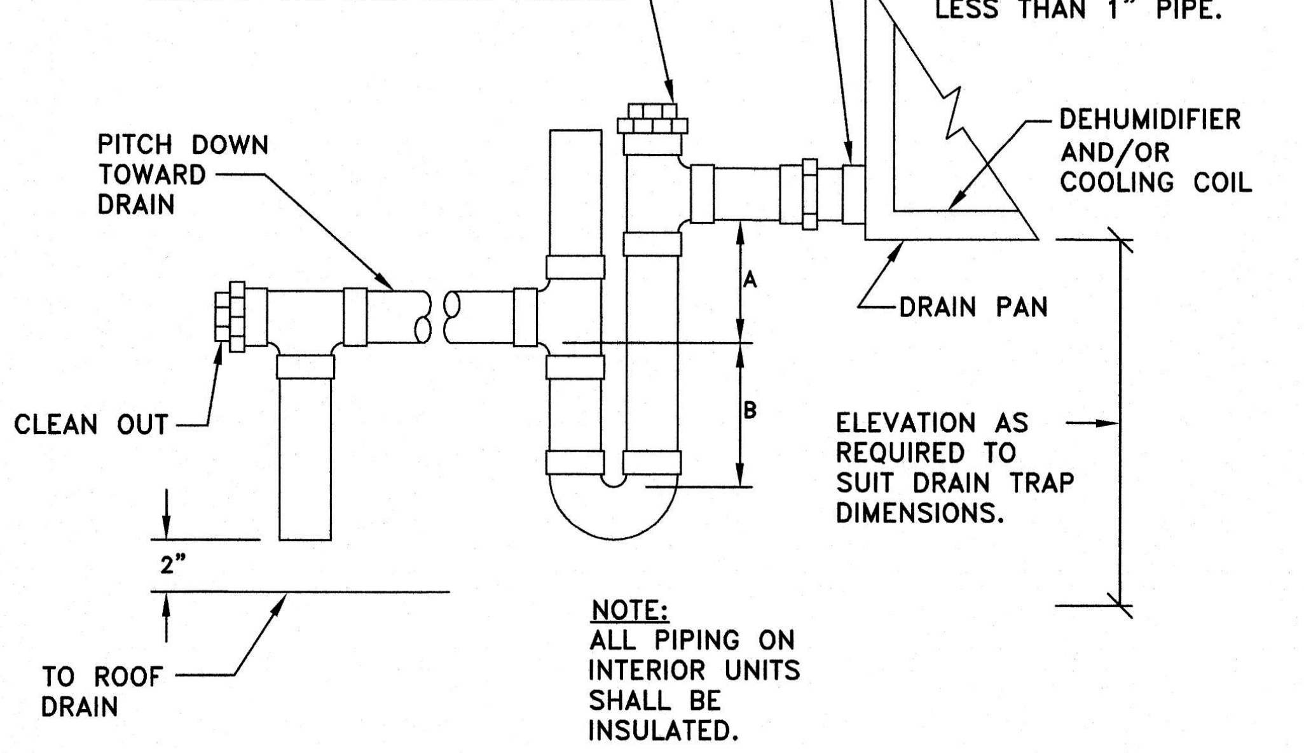

MIN. 1" x 22 GA. STRAP HANGER, TYP. (4) PER BOX. ATTACH TO STRUCTURE ABOVE. SECURE STRAP TO BOX WITH (2) SCREWS ON SIDE AND (1) ON BOTTOM, SEAL WITH DUCT SEALANT. NO POP RIVETS ALLOWED.
SUPPLY DUCT AS INDICATED ON PLANS. TRANSITION AS REQUIRED TO BOX INLET.
AIR FLOW
SEE NOTES BELOW.
CONTROL PANEL
AIR FLOW
MAINTAIN MANUFACTURER'S MINIMUM REQUIRED DISTANCE FROM VAV OUTLET TO FIRST TAKEOFF.
TRANSITION TO SUPPLY DUCT SIZE SHOWN ON PLANS, BY SHEET METAL CONTRACTOR.

2 TYPICAL VAV BOX INSTALLATION DETAIL

NO SCALE

UNIT TYPE	A	B
DRAW THRU	1 + 'X'	A/2
BLOW THRU	1" MIN.	0.5 + X

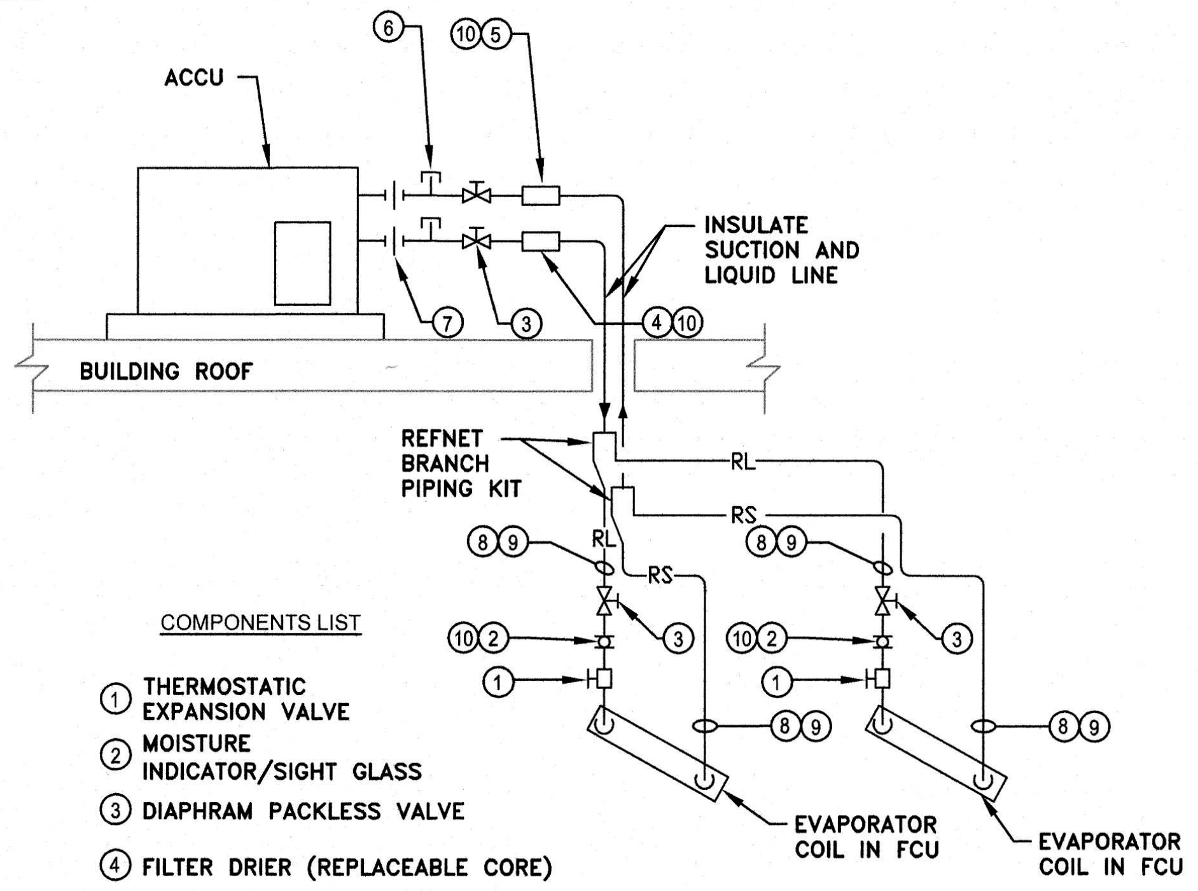
WHERE x= FAN TOTAL STATIC PRESSURE


CLEAN OUT
DRAIN LINE SHALL BE AT LEAST THE SAME SIZE AS THE NIPPLE ON THE DRAIN PAN, NO LESS THAN 1" PIPE.
PITCH DOWN TOWARD DRAIN
DEHUMIDIFIER AND/OR COOLING COIL
A
DRAIN PAN
B
CLEAN OUT
ELEVATION AS REQUIRED TO SUIT DRAIN TRAP DIMENSIONS.
2"
TO ROOF DRAIN

NOTE:
ALL PIPING ON INTERIOR UNITS SHALL BE INSULATED.

3 CONDENSATE DRAIN TRAP DETAIL

NO SCALE

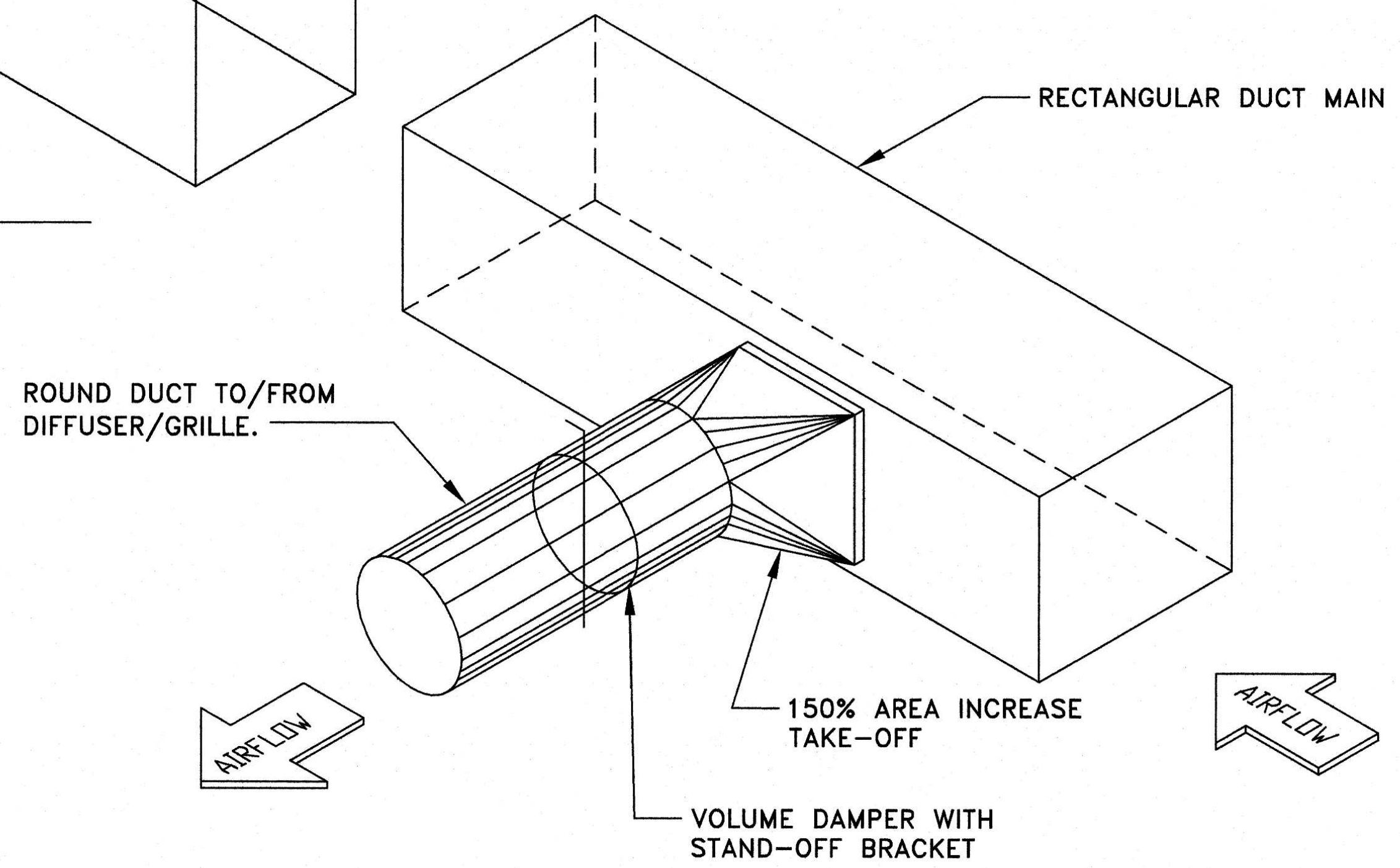

ACCU
⑥ ⑩⑤
INSULATE SUCTION AND LIQUID LINE
⑦ ③ ④⑩
BUILDING ROOF
REFNET BRANCH PIPING KIT
RL
RS
⑧⑨
⑩②
①
③
EVAPORATOR COIL IN FCU
EVAPORATOR COIL IN FCU

COMPONENTS LIST

① THERMOSTATIC EXPANSION VALVE
② MOISTURE INDICATOR/SIGHT GLASS
③ DIAPHRAM PACKLESS VALVE
④ FILTER DRIER (REPLACEABLE CORE)
⑤ SUCTION LINE FILTER
⑥ PURGE/CHARGE CONNECTION. REFRIGERANT ACCESS PORTS LOCATED OUTDOORS SHALL BE FITTED WITH LOCKING-TYPE TAMPER RESISTANCE CAPS OR SHALL BE OTHERWISE SECURED TO PREVENT UNAUTHORIZED ACCESS.
⑦ QUICK COUPLING
⑧ LINE SIZE AS PER MANUFACTURER'S REQUIREMENT.
⑨ INSULATE LIQUID AND SUCTION LINES.
⑩ COORDINATE INLINE DEVICES WITH THE SYSTEM MANUFACTURER'S INSTALLATION INSTRUCTIONS. DELETE THESE ITEMS IF SO INDICATED BY THE MANUFACTURER.

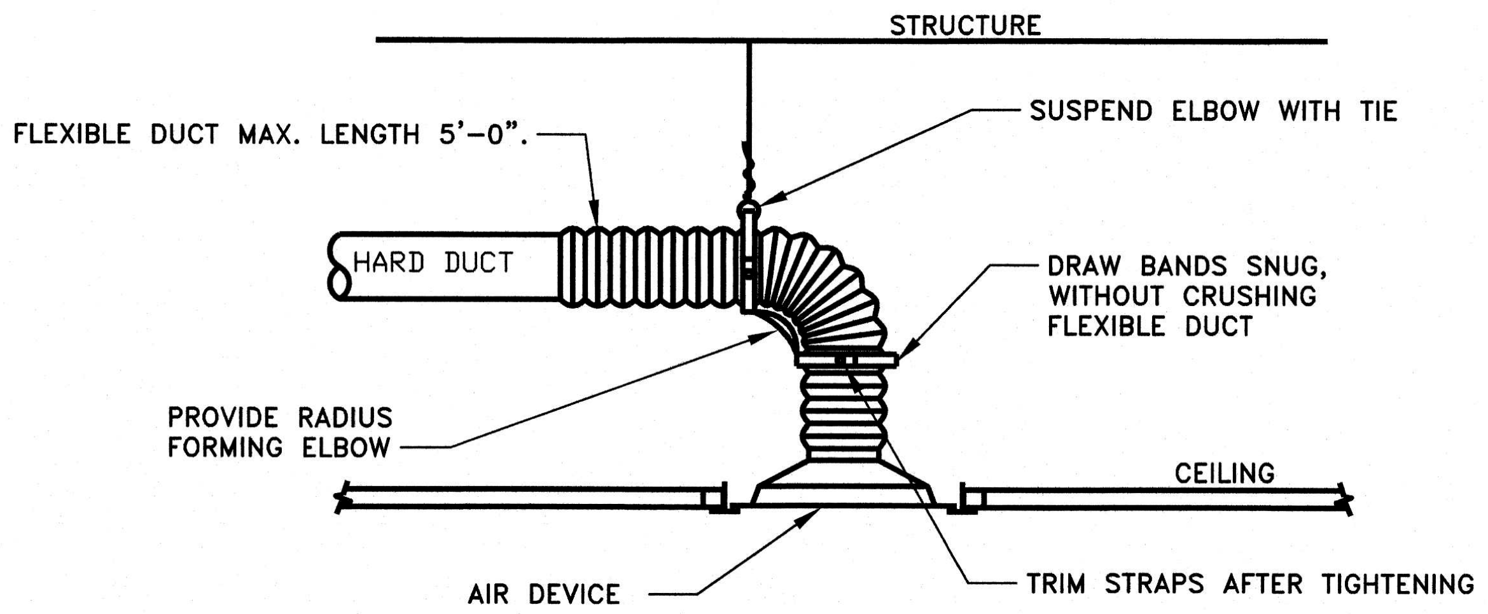
6 TYPICAL REFRIGERATION PIPING DETAIL (FCUs)

NO SCALE


RECTANGULAR DUCT MAIN
ROUND DUCT TO/FROM DIFFUSER/GRILLE.
AIRFLOW
150% AREA INCREASE TAKE-OFF
AIRFLOW
VOLUME DAMPER WITH STAND-OFF BRACKET

5 150% BRANCH TAKE-OFF

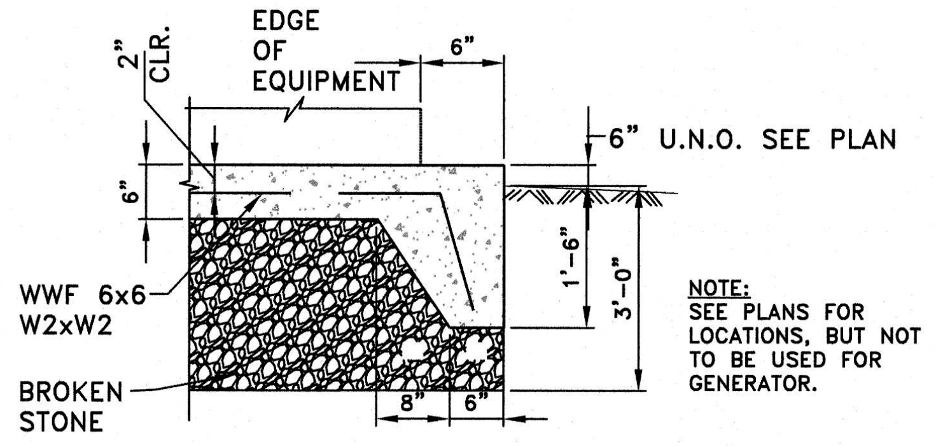
NO SCALE


STRUCTURE
FLEXIBLE DUCT MAX. LENGTH 5'-0".
SUSPEND ELBOW WITH TIE
HARD DUCT
DRAW BANDS SNUG, WITHOUT CRUSHING FLEXIBLE DUCT
PROVIDE RADIUS FORMING ELBOW
CEILING
AIR DEVICE
TRIM STRAPS AFTER TIGHTENING

NOTES:
1. TO ATTACH FLEX DUCT TO THE HARD DUCT AND AIR DEVICE (TYP 2); TAPE THE INNER LINER TO THE HARD DUCT/AIR DEVICE THEN ATTACH WITH TWO STAINLESS STEEL CLAMPS WITH CADMIUM PLATED WORM-GEAR DRIVES; ONE FOR THE INNER LINER AND ONE FOR THE OUTER SHELL. FOLD THE OUTER SHELL INSIDE ITSELF SO IT HAS NEAT EDGES PRIOR TO TIE WRAPPING.
2. PROVIDE RADIUS FORMING ELBOW.

4 DIFFUSER FLEX DUCT CONNECTION

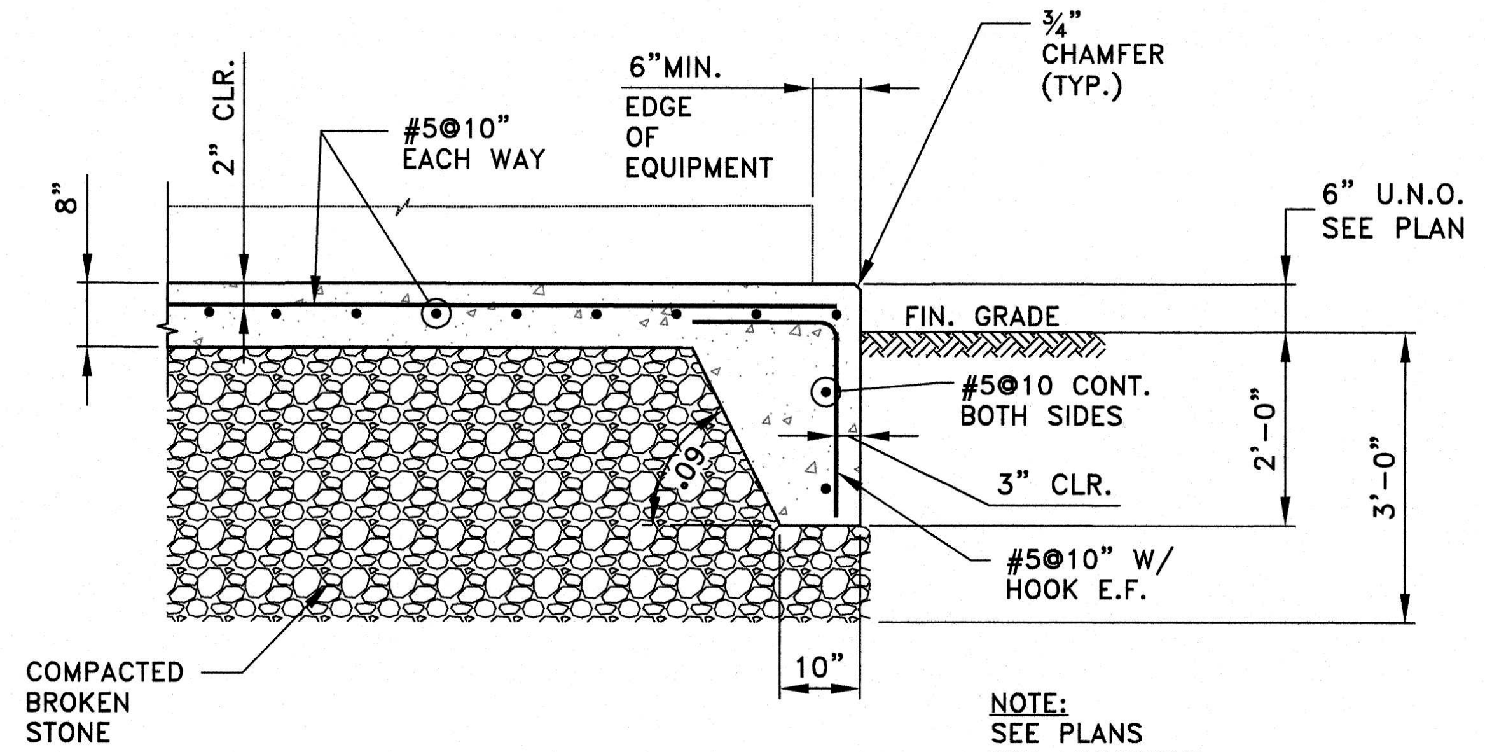
NO SCALE


2" CLR.
EDGE OF EQUIPMENT
6"
6" U.N.O. SEE PLAN
6"
WWF 6x6 W2xW2
1'-6"
3'-0"
BROKEN STONE
8"
6"

NOTE:
SEE PLANS FOR LOCATIONS, BUT NOT TO BE USED FOR GENERATOR.

8 TYPICAL EXTERIOR SMALL EQUIPMENT PAD

NO SCALE


2" CLR.
6"MIN.
EDGE OF EQUIPMENT
¾" CHAMFER (TYP.)
#5@10" EACH WAY
8"
6" U.N.O. SEE PLAN
FIN. GRADE
#5@10 CONT. BOTH SIDES
2'-0"
3'-0"
60°
3" CLR.
#5@10" W/ HOOK E.F.
10"
COMPACTED BROKEN STONE

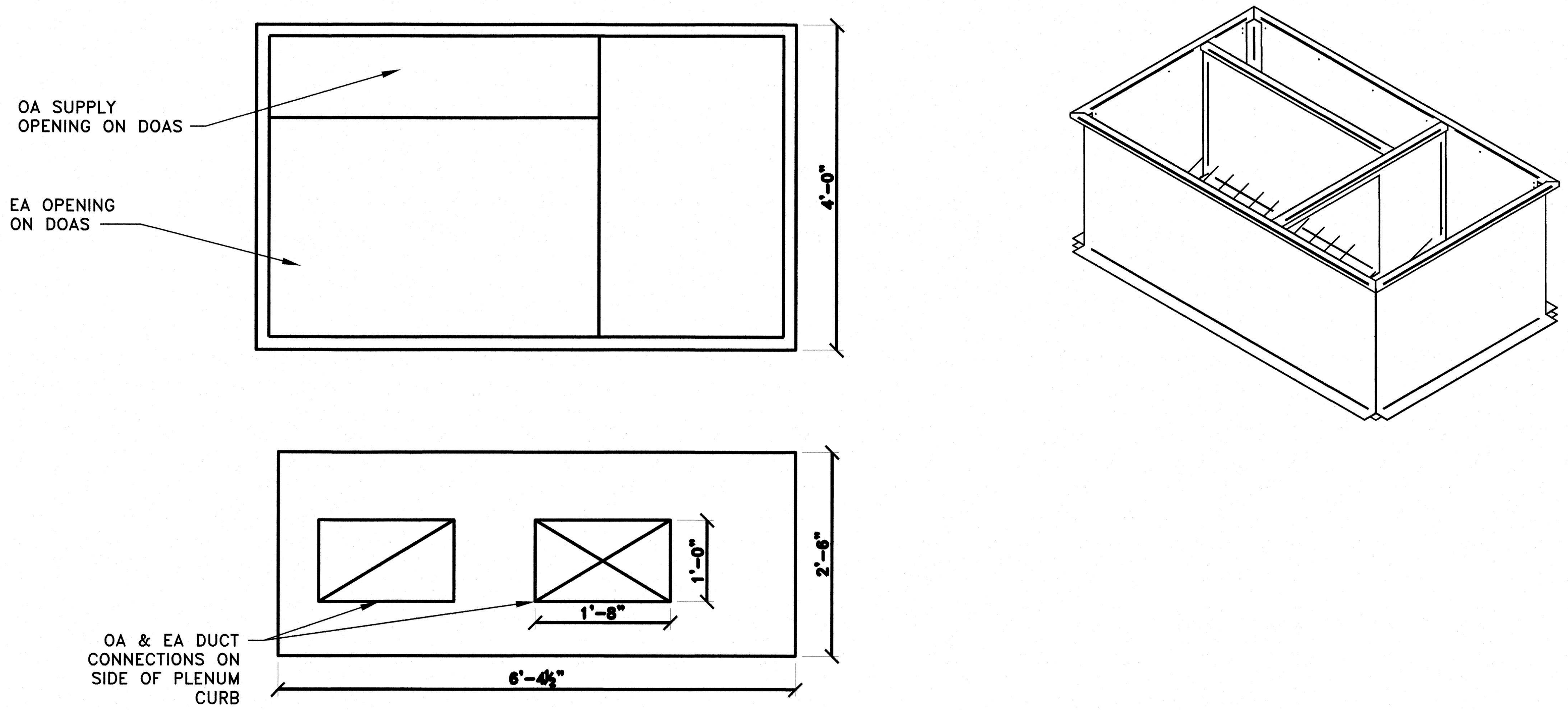
NOTE:
SEE PLANS FOR LOCATIONS

9 TYPICAL EXTERIOR HVAC UNIT EQUIPMENT PAD

NO SCALE

CONCRETE CONSTRUCTION GENERAL NOTES:

1. ALL CONCRETE SHALL CLASS E AND DEVELOP A MINIMUM COMPRESSIVE STRENGTH OF 4,000 PSI IN 28 DAYS WITH 1.5 LBS/C.Y. OF FIBERMESH 150 OR EQUAL. SEE SPECIFICATION.
2. REINFORCING STEEL SHALL CONFORM TO ASTM A615 GRADE 60. REINFORCING STEEL SHALL BE DETAILED AND FABRICATED IN ACCORDANCE WITH ACI 315, LATEST EDITION. WELDED WIRE FABRIC SHALL CONFORM TO ASTM A185; LAP A MINIMUM OF 2 INCHES AT SIDES AND ENDS. REINFORCING STEEL CONTRACTOR SHALL FURNISH ALL NECESSARY ACCESSORIES. REINFORCING CONTRACTOR SHALL SUBMIT SHOP DETAIL DRAWINGS OF ALL REINFORCING FOR APPROVAL PRIOR TO FABRICATION IN ACCORDANCE WITH THE SPECIFICATIONS.
3. ALL CONCRETE CONSTRUCTION SHALL CONFORM TO ACI 318, ACI 301, AND IBC (CURRENT NEW JERSEY ADOPTED EDITIONS). CONCRETE SHALL BE CURED FOR A MINIMUM OF 7 DAYS.
4. ALL FOOTINGS AND FOUNDATIONS SHALL BEAR ON FIRM UNDISTURBED NATURAL SOIL OR CONTROLLED COMPACTED FILL WITH A MINIMUM ALLOWABLE BEARING CAPACITY OF 3000 PSF UNLESS NOTED OTHERWISE ON DRAWING.
5. COLD WEATHER CONCRETING (AVERAGE DAILY TEMPERATURE BELOW 40 DEGREES FOR MORE THAN THREE CONSECUTIVE DAYS AND THE AIR TEMPERATURE IS NOT GREATER THAN 50 DEGREES FOR MORE THAN HALF OF ANY 24 HOUR PERIOD) SHALL BE DONE IN STRICT ACCORDANCE WITH ACI 306R "COLD WEATHER CONCRETING".
6. HOT WEATHER CONCRETING SHALL BE DONE IN STRICT ACCORDANCE WITH ACI 305R "HOT WEATHER CONCRETING".
7. UNFORMED CONCRETE SURFACES SCHEDULED TO RECEIVE A SECOND LIFT OF CONCRETE SHALL BE GIVEN A RAKE OR SCRATCHED FINISH.
8. SECTIONS OF FOUNDATION SLABS, WALLS, AND OTHER SLABS SHALL BE PLACED CONTINUOUSLY BETWEEN CONSTRUCTION JOINTS TO PRODUCE A MONOLITHIC UNIT. AT LEAST 48 HOURS SHALL ELAPSE BETWEEN CASTING OF ADJACENT UNITS TO ALLOW SHRINKAGE TO OCCUR PRIOR TO ADJACENT POUR. ALL CONSTRUCTION JOINTS SHALL BE COATED WITH A BONDING AGENT IMMEDIATELY PRIOR TO PLACING SECOND POUR.


OA SUPPLY OPENING ON DOAS
EA OPENING ON DOAS
4'-0"
1'-0"
1'-8"
2'-6"
OA & EA DUCT CONNECTIONS ON SIDE OF PLENUM CURB
6'-4½"

7 DOAS UNIT PLENUM CURB

NO SCALE

ISSUED FOR BID-9/25/26

9.23.26

APPROVED

William R. Long
PROFESSIONAL ENGINEER
NEW JERSEY LICENSE NO. 33012

REVISIONS	DATE	BY

Tri-State Architects, P.C. / Alaimo Group
WILLIAM R. LONG, P.E. LIC. 33012
ANITA S. ARADHYA, R.A. LIC. 18769
200 HIGH STREET MOUNT HOLLY, N.J.

DATE: AUG. 2026
DESIGNED BY: IV
DRAWN BY: RKR
CHECKED BY: 9/22/26
DEPT. HEAD: 9/22/26

CLIENT: WILLINGBORO TOWNSHIP
PROJECT LOCATION: WILLINGBORO TWP. BURLINGTON COUNTY NEW JERSEY
PROJECT NO.: M-0410-0011-000
CONTRACT NO.: BID#8-2026

KENNEDY CENTER
RENOVATION TO THE SENIOR CENTER

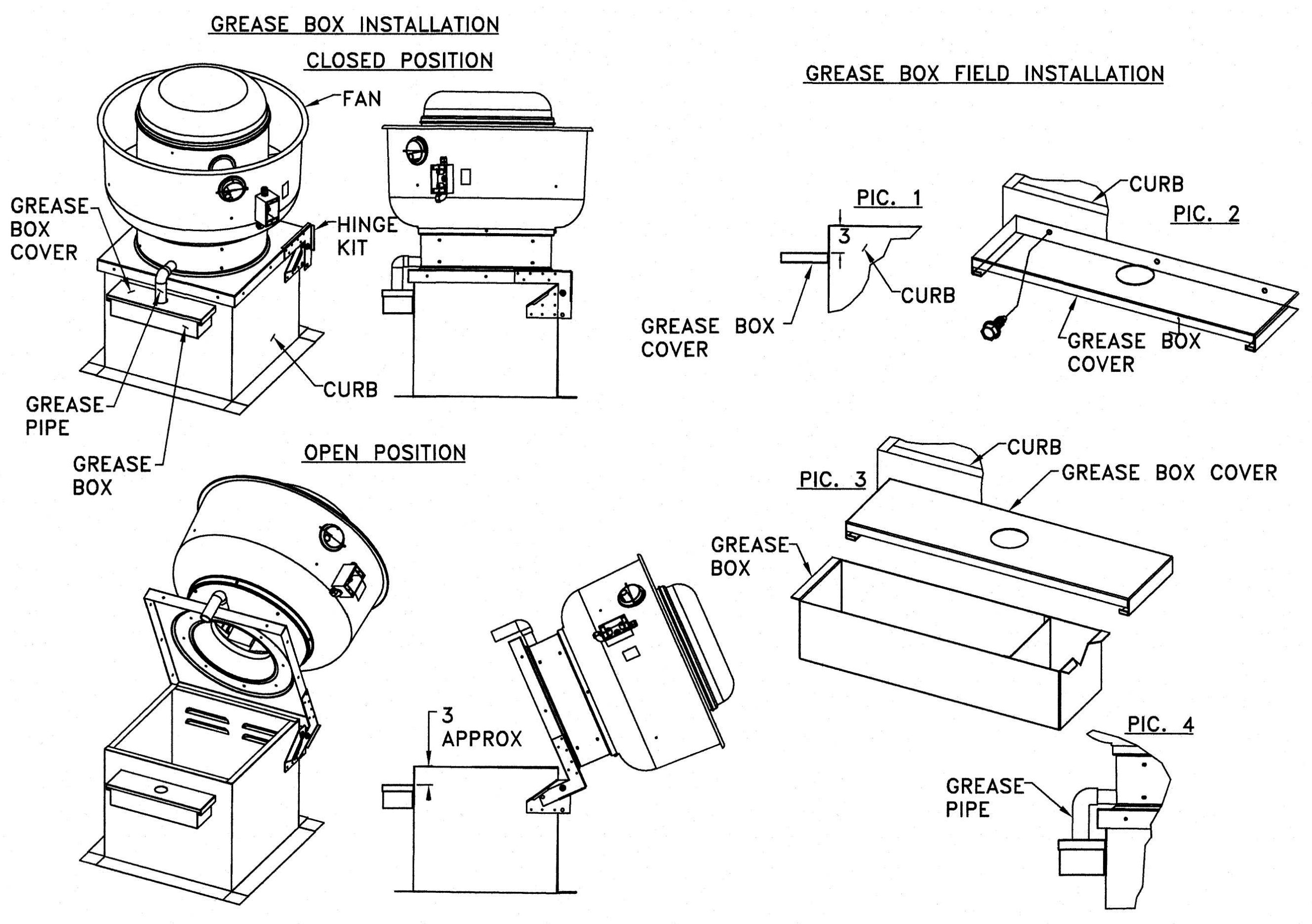
HVAC - DETAILS - I

SCALE: AS SHOWN

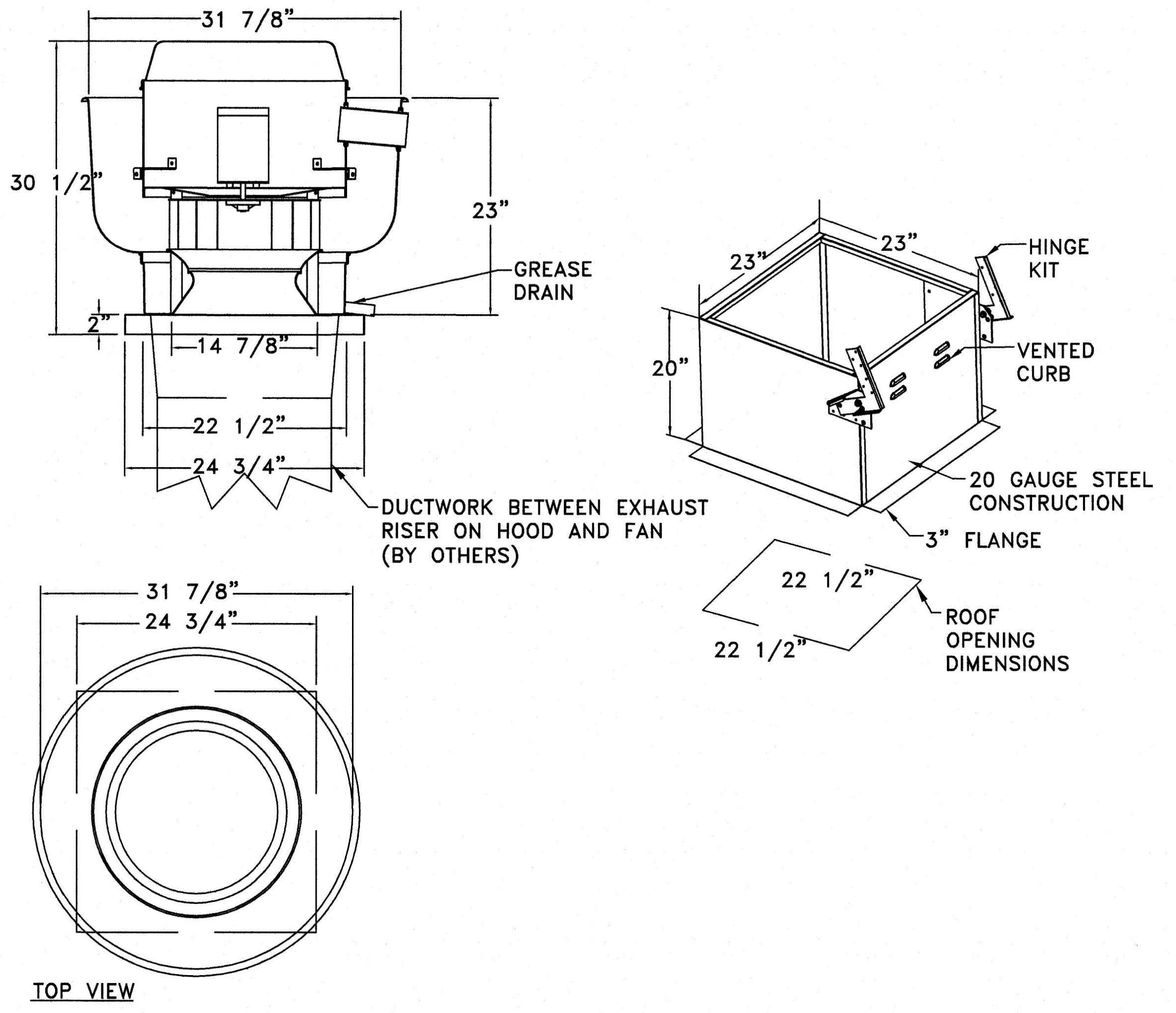
SHEET
H5

FILE NO.:

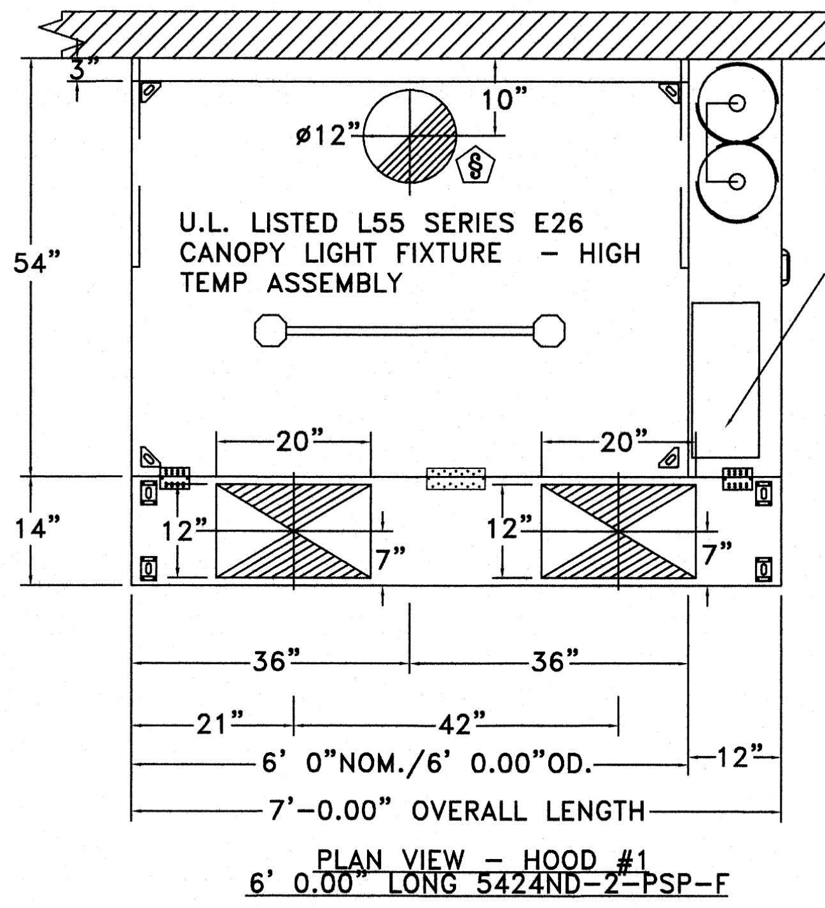
Plotted: 9/22/2026 10:03 AM Last saved: 9/21/2026 4:03 PM File Name: M:\Projects\M04100011000\Drawings\GLQ-H5-H8-Details.dwg


GREASE BOX INSTALLATION
CLOSED POSITION
FAN
GREASE BOX COVER
HINGE KIT
GREASE PIPE
GREASE BOX
CURB
OPEN POSITION
3 APPROX
GREASE BOX FIELD INSTALLATION
PIC. 1
3
CURB
GREASE BOX COVER
PIC. 2
CURB
GREASE BOX COVER
PIC. 3
CURB
GREASE BOX COVER
GREASE BOX
PIC. 4
GREASE PIPE

1 GREASE BOX
NO SCALE

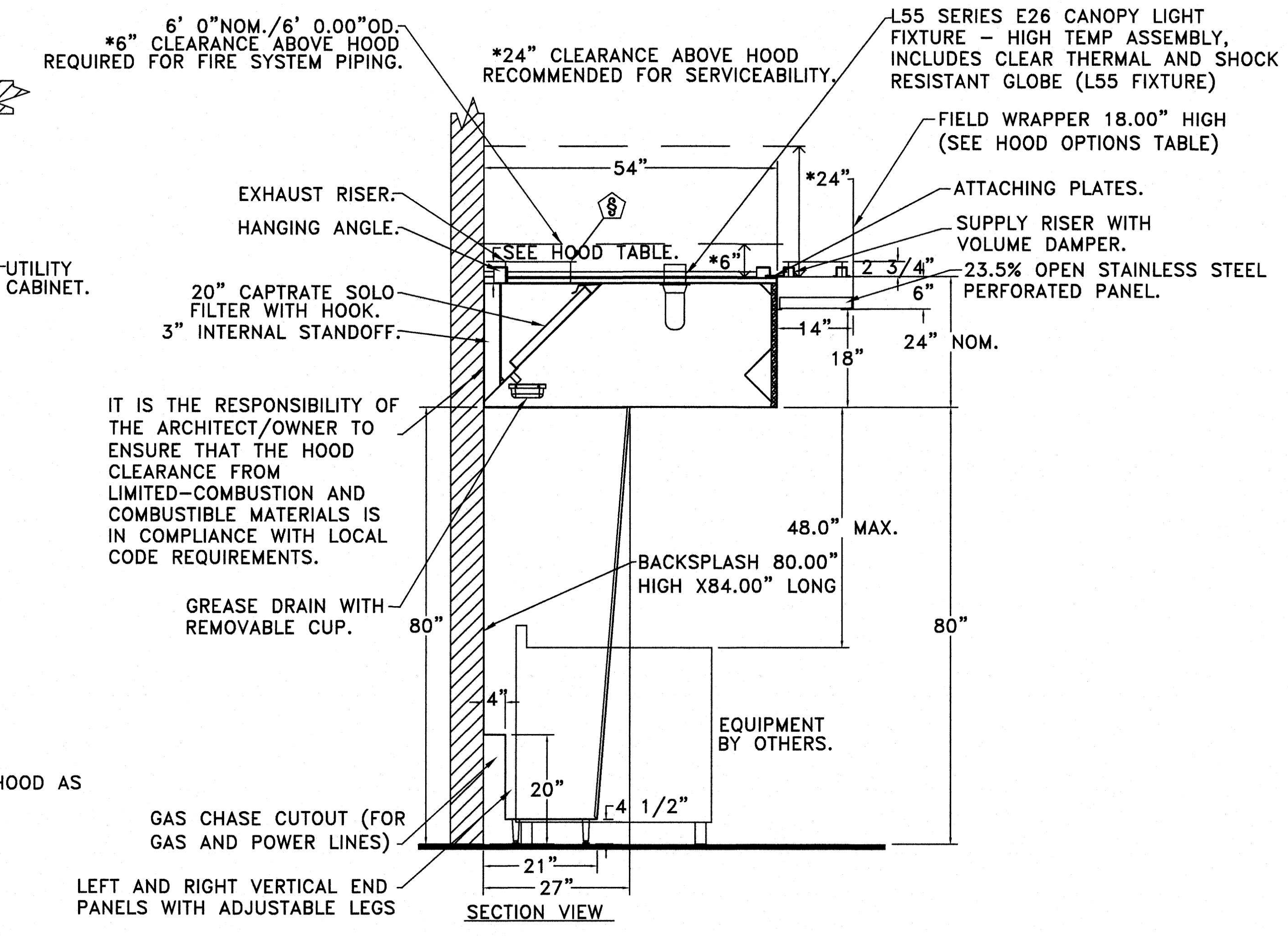

31 7/8"
30 1/2"
23"
GREASE DRAIN
2"
14 7/8"
22 1/2"
24 3/4"
DUCTWORK BETWEEN EXHAUST RISER ON HOOD AND FAN (BY OTHERS)
31 7/8"
24 3/4"
TOP VIEW
23"
23"
HINGE KIT
20"
VENTED CURB
20 GAUGE STEEL CONSTRUCTION
3" FLANGE
22 1/2"
22 1/2"
ROOF OPENING DIMENSIONS

2 KITCHEN EXHAUST FAN
NO SCALE


3"
10"
ø12"
U.L. LISTED L55 SERIES E26 CANOPY LIGHT FIXTURE – HIGH TEMP ASSEMBLY
54"
UTILITY CABINET.
20"
20"
14"
12"
7"
12"
7"
36"
36"
21"
42"
6' 0"NOM./6' 0.00"OD.
12"
7'-0.00" OVERALL LENGTH

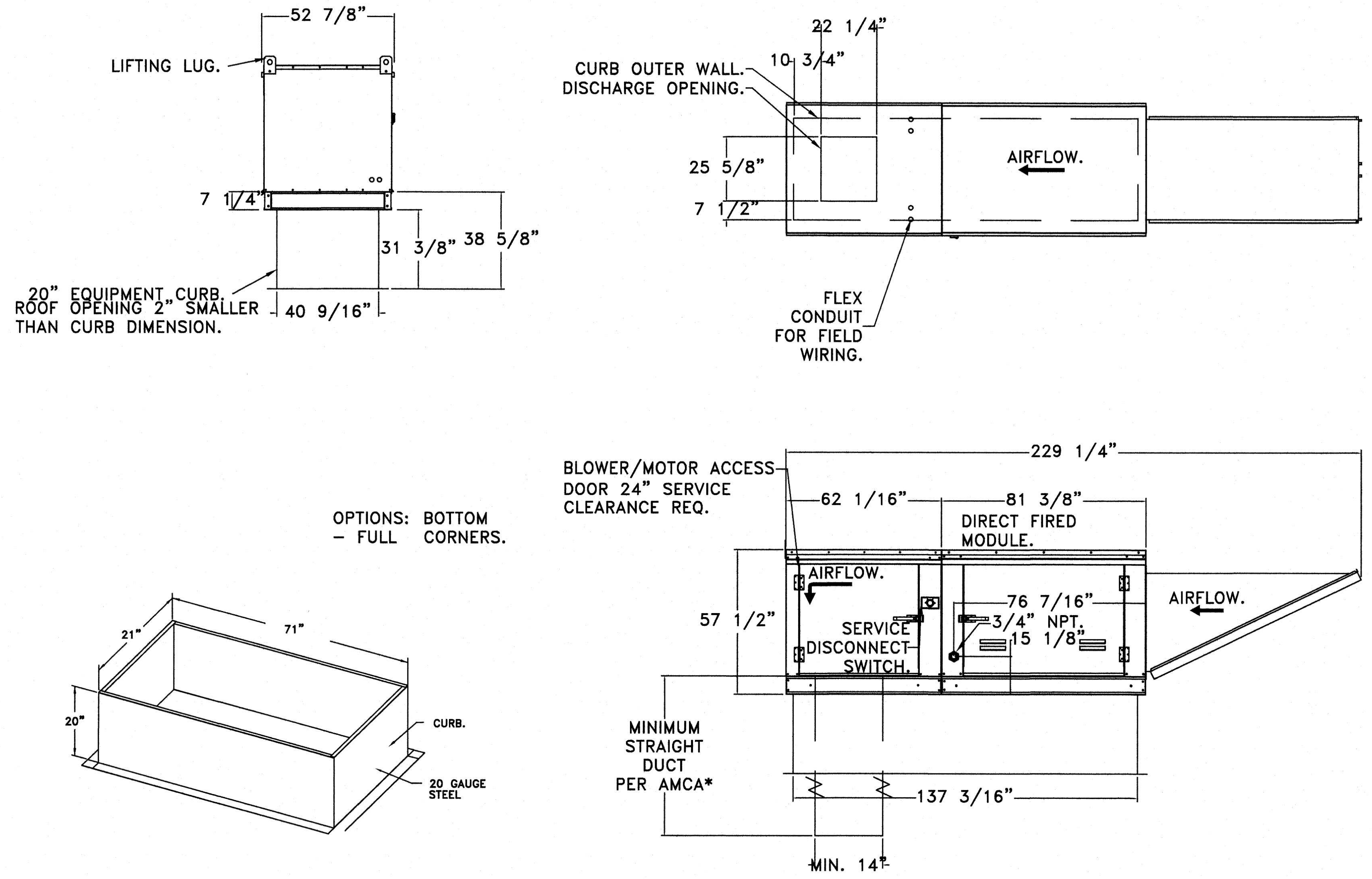
PLAN VIEW – HOOD #1
6' 0.00" LONG 5424ND-2-PSP-F

NOTES:
1) PROVIDE WITH GREASE STOP SOLO FILTER.
2) CONTRACTOR PROVIDE SUPPORT HANGERS FOR HOOD AS PER MANUFACTURE'S RECOMMENDATIONS.
3) ALL INSTALLMENT SHALL BE AS MANUFACTURE RECOMMENDED.

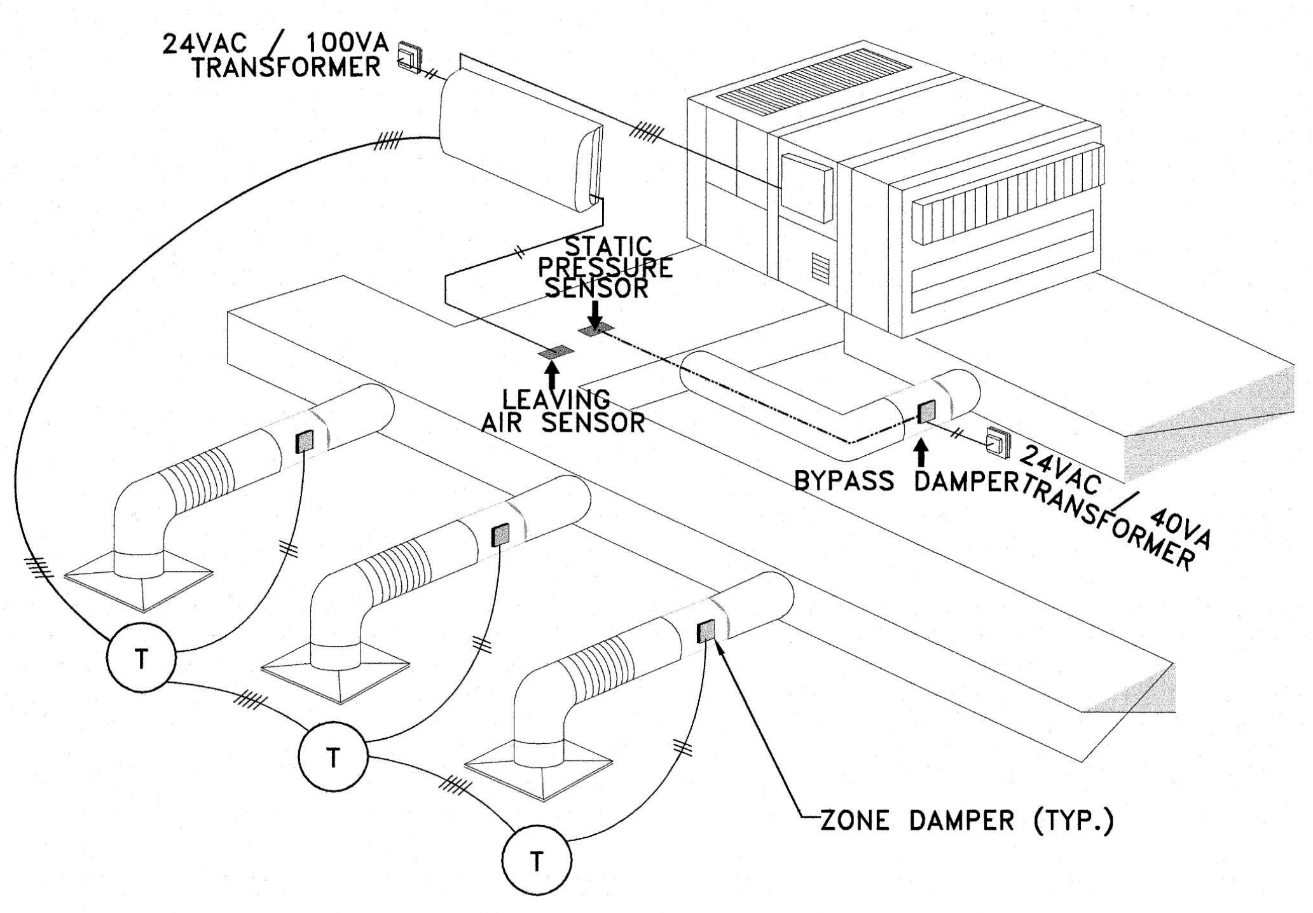

6' 0"NOM./6' 0.00"OD.
*6" CLEARANCE ABOVE HOOD REQUIRED FOR FIRE SYSTEM PIPING.
*24" CLEARANCE ABOVE HOOD RECOMMENDED FOR SERVICEABILITY.
L55 SERIES E26 CANOPY LIGHT FIXTURE – HIGH TEMP ASSEMBLY, INCLUDES CLEAR THERMAL AND SHOCK RESISTANT GLOBE (L55 FIXTURE)
FIELD WRAPPER 18.00" HIGH (SEE HOOD OPTIONS TABLE)
54"
*24"
ATTACHING PLATES.
EXHAUST RISER.
HANGING ANGLE.
SEE HOOD TABLE.
*6"
SUPPLY RISER WITH VOLUME DAMPER.
2 3/4"
23.5% OPEN STAINLESS STEEL PERFORATED PANEL.
6"
20" CAPTRATE SOLO FILTER WITH HOOK.
3" INTERNAL STANDOFF.
14"
18"
24" NOM.
IT IS THE RESPONSIBILITY OF THE ARCHITECT/OWNER TO ENSURE THAT THE HOOD CLEARANCE FROM LIMITED-COMBUSTION AND COMBUSTIBLE MATERIALS IS IN COMPLIANCE WITH LOCAL CODE REQUIREMENTS.
48.0" MAX.
BACKSPLASH 80.00" HIGH X84.00" LONG
GREASE DRAIN WITH REMOVABLE CUP.
80"
80"
4"
EQUIPMENT BY OTHERS.
20"
4 1/2"
GAS CHASE CUTOUT (FOR GAS AND POWER LINES)
21"
27"
LEFT AND RIGHT VERTICAL END PANELS WITH ADJUSTABLE LEGS

SECTION VIEW

3 KITCHEN EXHAUST HOOD
NO SCALE


52 7/8"
LIFTING LUG.
7 1/4"
31 3/8"
38 5/8"
20" EQUIPMENT CURB. ROOF OPENING 2" SMALLER THAN CURB DIMENSION.
40 9/16"
22 1/4"
10 3/4"
CURB OUTER WALL.
DISCHARGE OPENING.
25 5/8"
7 1/2"
AIRFLOW.
FLEX CONDUIT FOR FIELD WIRING.
OPTIONS: BOTTOM – FULL CORNERS.
71"
21"
20"
CURB.
20 GAUGE STEEL
BLOWER/MOTOR ACCESS DOOR 24" SERVICE CLEARANCE REQ.
229 1/4"
62 1/16"
81 3/8"
DIRECT FIRED MODULE.
AIRFLOW.
AIRFLOW.
57 1/2"
SERVICE DISCONNECT SWITCH.
76 7/16"
3/4" NPT.
15 1/8"
MINIMUM STRAIGHT DUCT PER AMCA*
137 3/16"
MIN. 14"

4 MAKE UP AIR UNIT
NO SCALE

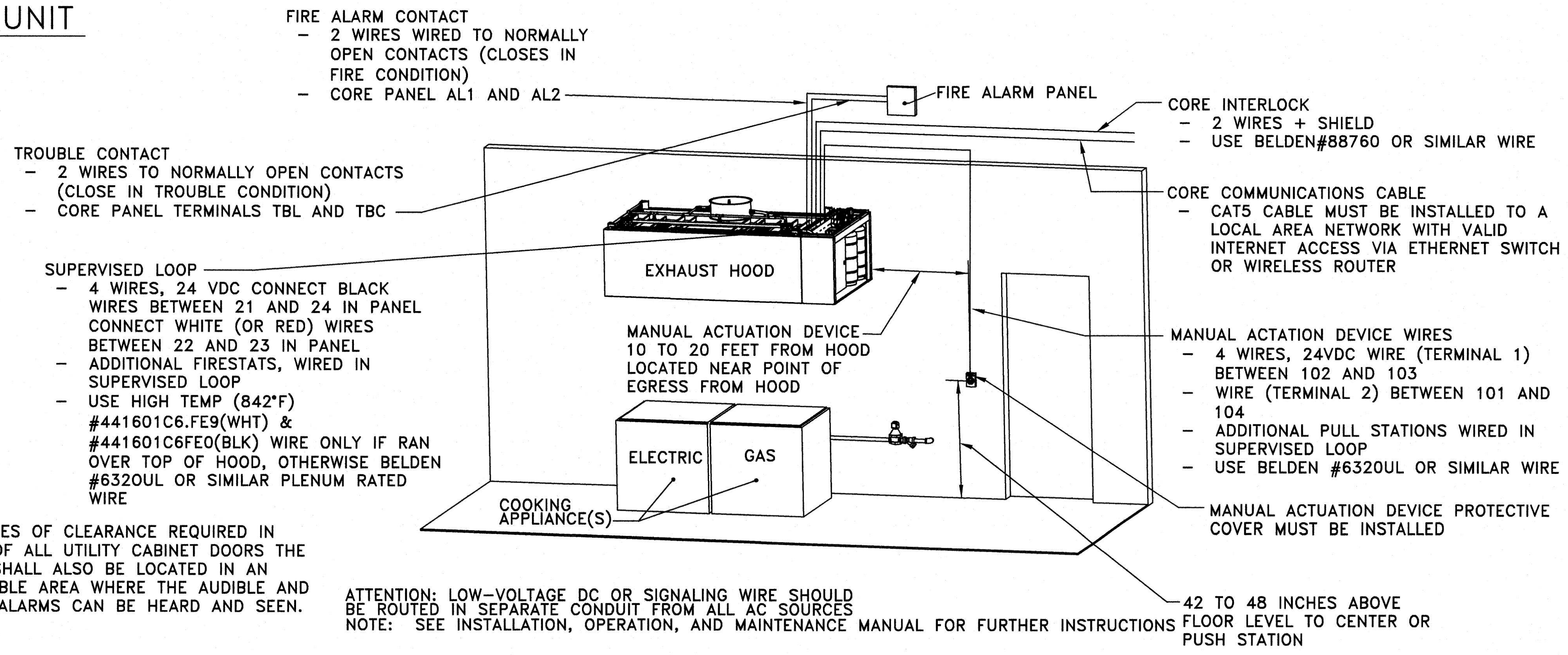

24VAC / 100VA TRANSFORMER
STATIC PRESSURE SENSOR
LEAVING AIR SENSOR
BYPASS DAMPER
24VAC / 40VA TRANSFORMER
T
T
T
ZONE DAMPER (TYP.)

5 ZONE DAMPER SCHEMATIC
NO SCALE

VVT ZONE DAMPER SYSTEM – RTU-19

BASIS OF DESIGN: ZONEX GEN X VVT ZONING CONTROL SYSTEM WITH BACNET/IP INTERFACE/GATEWAY, OR APPROVED EQUIVALENT.

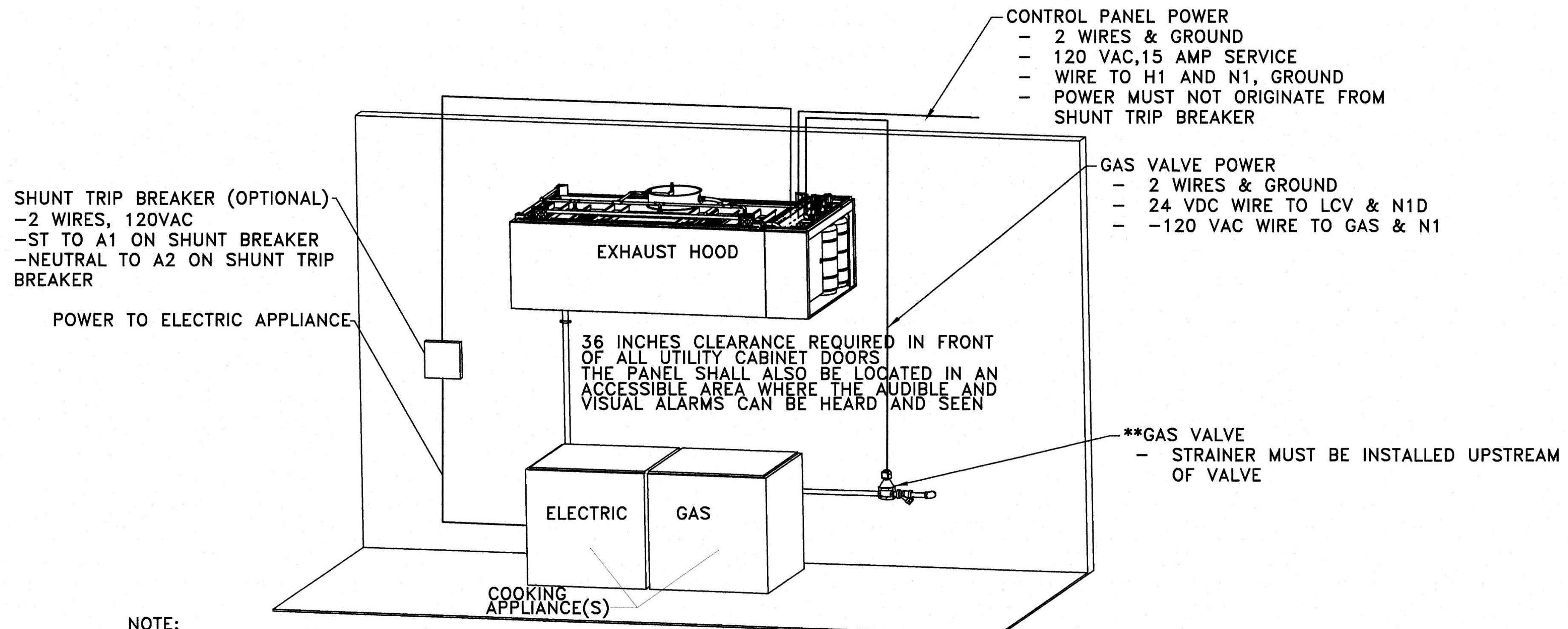
1. PROVIDE A COMPLETE VVT ZONING CONTROL SYSTEM FOR RTU-19, INCLUDING SYSTEM CONTROLLER, MODULATING ZONE DAMPERS AND ACTUATORS, MODULATING BYPASS DAMPER AND ACTUATOR, ZONE THERMOSTATS/SENSORS, SUPPLY DUCT STATIC PRESSURE SENSOR, LEAVING AIR TEMPERATURE SENSOR, CONTROL TRANSFORMERS, RELAYS, BACNET/IP INTERFACE/GATEWAY, CONTROL WIRING, AND ALL ACCESSORIES REQUIRED FOR A COMPLETE AND OPERABLE SYSTEM.
2. PROVIDE THE FOLLOWING VVT ZONE AND BYPASS DAMPERS: ZD-1 – 26"x14", SERVING ROOM 153; ZD-2 – 20"x14", SERVING ROOM 168; ZD-3 – 20"x14", SERVING ROOM 145; AND BPD-1 – 56"x14" MODULATING BYPASS DAMPER. FIELD-VERIFY DUCT DIMENSIONS PRIOR TO ORDERING.
3. EACH VVT ZONE SHALL BE PROVIDED WITH A DEDICATED SPACE THERMOSTAT/SENSOR. ASSOCIATED ZONE DAMPER SHALL MODULATE AS REQUIRED TO MAINTAIN THE SPACE TEMPERATURE SETPOINT. VVT CONTROLLER SHALL MONITOR ZONE HEATING AND COOLING DEMANDS AND COORDINATE RTU-19 OPERATING MODE ACCORDINGLY.
4. BPD-1 SHALL MODULATE TO MAINTAIN THE ADJUSTABLE SUPPLY DUCT STATIC PRESSURE SETPOINT. AS ZONE DAMPERS CLOSE AND SUPPLY DUCT STATIC PRESSURE RISES, BPD-1 SHALL MODULATE OPEN. AS ZONE DAMPERS OPEN AND STATIC PRESSURE FALLS, BPD-1 SHALL MODULATE CLOSED.
5. PROVIDE ALL REQUIRED INTERLOCKS BETWEEN RTU-19 AND THE VVT ZONING CONTROL SYSTEM. HEATING AND COOLING OPERATION SHALL BE COORDINATED WITH ZONE DEMAND. SIMULTANEOUS HEATING AND COOLING SHALL NOT BE PERMITTED.
6. INTEGRATE RTU-19 AND THE COMPLETE VVT ZONING CONTROL SYSTEM INTO THE EXISTING TRANE BMS. BMS CONTRACTOR SHALL PROVIDE ALL REQUIRED BACNET INTERFACES, POINT MAPPING, PROGRAMMING, GRAPHICS, SETPOINTS, ALARMS, CONTROL WIRING, AND ACCESSORIES REQUIRED FOR A COMPLETE INTEGRATION.
7. BMS CONTRACTOR SHALL COORDINATE OPERATION OF RTU-19, VVT CONTROLLER, ZONE DAMPERS, BYPASS DAMPER, SPACE THERMOSTATS/SENSORS, STATIC PRESSURE CONTROL, AND ASSOCIATED SECONDARY/AUXILIARY HEATING SYSTEMS. REFER TO SEQUENCE OF OPERATION FOR ADDITIONAL REQUIREMENTS.
8. VVT SYSTEM MANUFACTURER AND BMS CONTRACTOR SHALL VERIFY DAMPER AND ACTUATOR SIZING, CONTROL TRANSFORMER CAPACITY, STATIC PRESSURE CONTROL REQUIREMENTS, COMMUNICATION REQUIREMENTS, AND COMPATIBILITY WITH RTU-19 AND THE EXISTING BMS PRIOR TO ORDERING.
9. COORDINATE FINAL DAMPER LOCATIONS, CONTROLLERS, SENSORS, ACCESS REQUIREMENTS, AND CONTROL WIRING WITH DUCTWORK, STRUCTURE, CEILING SYSTEMS, AND WORK OF OTHER TRADES. PROVIDE ACCESS TO ALL SERVICEABLE CONTROL COMPONENTS.
10. VVT SYSTEM SHALL BE PROVIDED AS A COMPLETE, FACTORY-COMPATIBLE CONTROL SYSTEM. COMPONENTS FROM DIFFERENT MANUFACTURERS SHALL NOT BE MIXED UNLESS APPROVED BY THE ENGINEER.
11. BMS CONTRACTOR SHALL COORDINATE WITH THE TESTING AND BALANCING CONTRACTOR TO FIELD-ADJUST ZONE DAMPER MINIMUM POSITIONS, BYPASS DAMPER OPERATION, AND SUPPLY DUCT STATIC PRESSURE SETPOINT AS REQUIRED FOR PROPER SYSTEM OPERATION.


FIRE ALARM CONTACT
– 2 WIRES WIRED TO NORMALLY OPEN CONTACTS (CLOSES IN FIRE CONDITION)
– CORE PANEL AL1 AND AL2
FIRE ALARM PANEL
CORE INTERLOCK
– 2 WIRES + SHIELD
– USE BELDEN#88760 OR SIMILAR WIRE
TROUBLE CONTACT
– 2 WIRES TO NORMALLY OPEN CONTACTS (CLOSE IN TROUBLE CONDITION)
– CORE PANEL TERMINALS TBL AND TBC
CORE COMMUNICATIONS CABLE
– CAT5 CABLE MUST BE INSTALLED TO A LOCAL AREA NETWORK WITH VALID INTERNET ACCESS VIA ETHERNET SWITCH OR WIRELESS ROUTER
SUPERVISED LOOP
– 4 WIRES, 24 VDC CONNECT BLACK WIRES BETWEEN 21 AND 24 IN PANEL CONNECT WHITE (OR RED) WIRES BETWEEN 22 AND 23 IN PANEL
– ADDITIONAL FIRESTATS, WIRED IN SUPERVISED LOOP
– USE HIGH TEMP (842°F) #441601C6.FE9(WHT) & #441601C6FE0(BLK) WIRE ONLY IF RAN OVER TOP OF HOOD, OTHERWISE BELDEN #6320UL OR SIMILAR PLENUM RATED WIRE
EXHAUST HOOD
MANUAL ACTUATION DEVICE 10 TO 20 FEET FROM HOOD LOCATED NEAR POINT OF EGRESS FROM HOOD
MANUAL ACTATION DEVICE WIRES
– 4 WIRES, 24VDC WIRE (TERMINAL 1) BETWEEN 102 AND 103
– WIRE (TERMINAL 2) BETWEEN 101 AND 104
– ADDITIONAL PULL STATIONS WIRED IN SUPERVISED LOOP
– USE BELDEN #6320UL OR SIMILAR WIRE
ELECTRIC
GAS
COOKING APPLIANCE(S)
MANUAL ACTUATION DEVICE PROTECTIVE COVER MUST BE INSTALLED
42 TO 48 INCHES ABOVE FLOOR LEVEL TO CENTER OR PUSH STATION

36 INCHES OF CLEARANCE REQUIRED IN FRONT OF ALL UTILITY CABINET DOORS THE PANEL SHALL ALSO BE LOCATED IN AN ACCESSIBLE AREA WHERE THE AUDIBLE AND VISUAL ALARMS CAN BE HEARD AND SEEN.

ATTENTION: LOW-VOLTAGE DC OR SIGNALING WIRE SHOULD BE ROUTED IN SEPARATE CONDUIT FROM ALL AC SOURCES
NOTE: SEE INSTALLATION, OPERATION, AND MAINTENANCE MANUAL FOR FURTHER INSTRUCTIONS

6 TANK PROTECTION LOW–VOLTAGE DETAIL
NO SCALE


CONTROL PANEL POWER
– 2 WIRES & GROUND
– 120 VAC,15 AMP SERVICE
– WIRE TO H1 AND N1, GROUND
– POWER MUST NOT ORIGINATE FROM SHUNT TRIP BREAKER
GAS VALVE POWER
– 2 WIRES & GROUND
– 24 VDC WIRE TO LCV & N1D
– –120 VAC WIRE TO GAS & N1
SHUNT TRIP BREAKER (OPTIONAL)
–2 WIRES, 120VAC
–ST TO A1 ON SHUNT BREAKER
–NEUTRAL TO A2 ON SHUNT TRIP BREAKER
EXHAUST HOOD
POWER TO ELECTRIC APPLIANCE
36 INCHES CLEARANCE REQUIRED IN FRONT OF ALL UTILITY CABINET DOORS
THE PANEL SHALL ALSO BE LOCATED IN AN ACCESSIBLE AREA WHERE THE AUDIBLE AND VISUAL ALARMS CAN BE HEARD AND SEEN
**GAS VALVE
– STRAINER MUST BE INSTALLED UPSTREAM OF VALVE
ELECTRIC
GAS
COOKING APPLIANCE(S)

NOTE:
SEE INSTALLATION, OPERATION, AND MAINTENANCE MANUAL FOR FURTHER INSTRUCTIONS.
* BEFORE WIRING THE GAS VALVE, IT IS CRITICAL TO IDENTIFY AND VERIFY ITS SPECIFIC TERMINAL LABELS. DIFFERENT SERIES AND MANUFACTURERS USE VARYING NOMENCLATURE.
** AGS GAS VALVES 3/4" THROUGH 2" DIAMETERS DO NOT REQUIRE UPSTREAM STRAINERS AS THE STRAINER IS BUILT INTO THE GAS VALVE.

ATTENTION: LOW-VOLTAGE DC OR SIGNALING WIRE SHOULD BE ROUTED IN SEPARATE CONDUIT FROM ALL AC SOURCES

7 TANK PROTECTION ELECTRICAL DETAIL
NO SCALE

ISSUED FOR BID-9/25/26

Plotted: 9/22/2026 10:04 AM Last saved: 9/21/2026 4:03 PM File Name: M:\Projects\M0410011000\Drawings\GLQ-H5-H8-Details.dwg

9.23.25
APPROVED
William R. Long
PROFESSIONAL ENGINEER
NEW JERSEY LICENSE NO. 33012

REVISIONS	DATE	BY

Tri-State Architects, P.C. / Alaimo Group
WILLIAM R. LONG, P.E. LIC. 33012
ANITA S. ARADHYA, R.A. LIC. 18769
200 HIGH STREET MOUNT HOLLY, N.J.

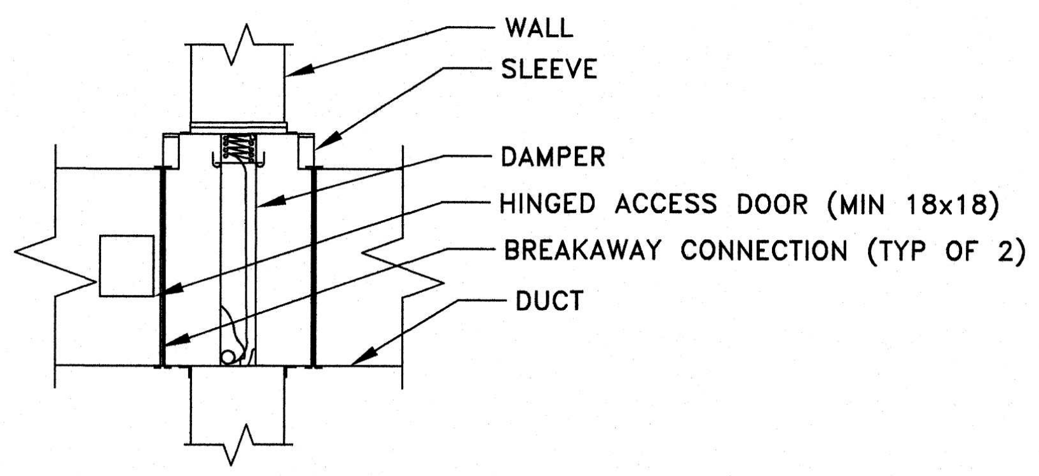
DATE: AUG. 2026
DESIGNED BY: IV
DRAWN BY: RKR
CHECKED BY: 9/22/26
DEPT. HEAD: 9/22/26

CLIENT: WILLINGBORO TOWNSHIP
PROJECT LOCATION: WILLINGBORO TWP. BURLINGTON COUNTY NEW JERSEY
PROJECT NO.: M-0410-0011-000
CONTRACT NO.: BID#8-2026

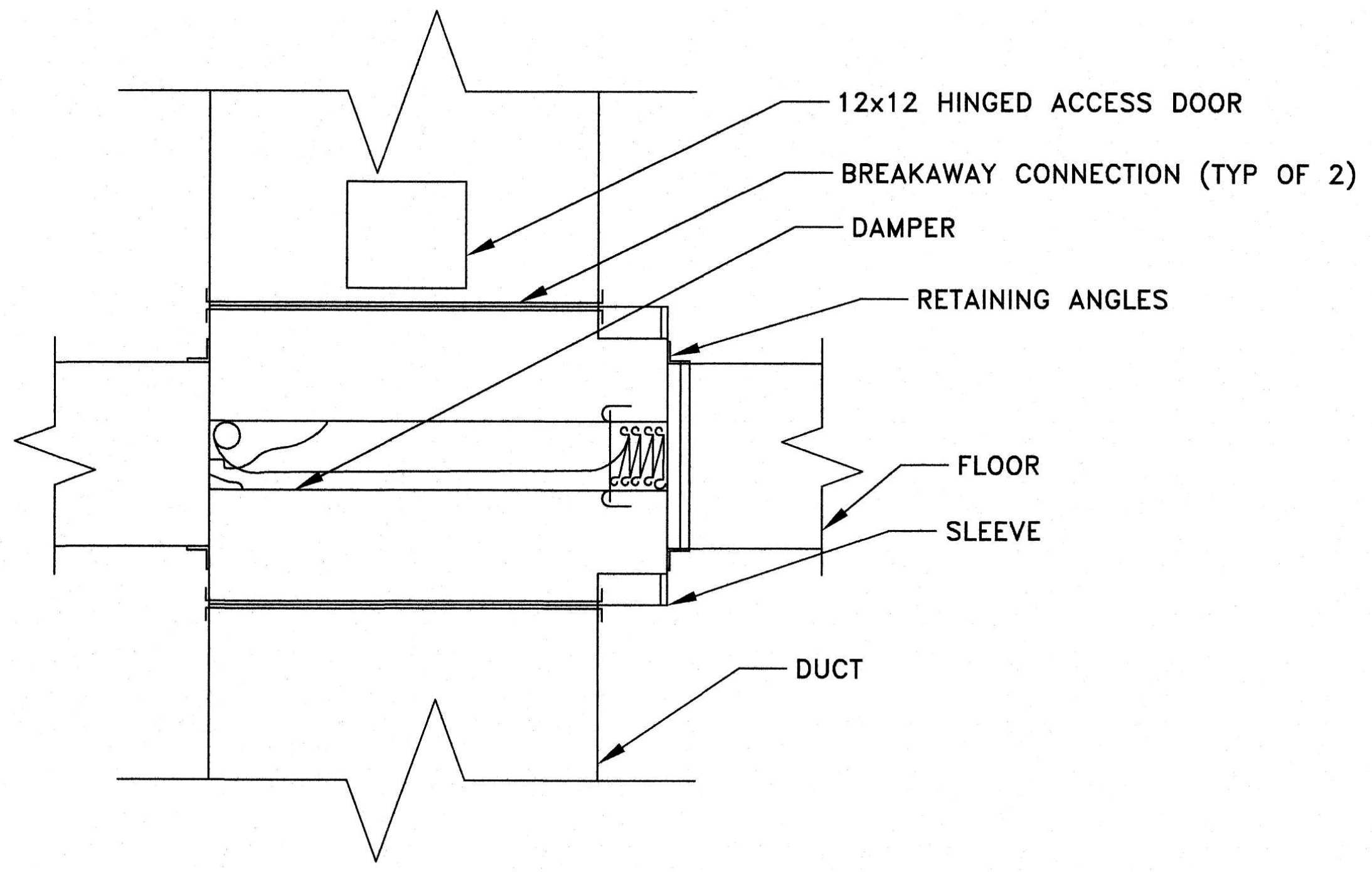
KENNEDY CENTER
RENOVATION TO THE SENIOR CENTER
HVAC - DETAILS - II
SCALE: AS SHOWN

SHEET
H6
FILE NO.:

ASSEMBLY SHALL BE INSTALLED IN ACCORDANCE WITH MANUFACTURER'S INSTALLATION INSTRUCTIONS

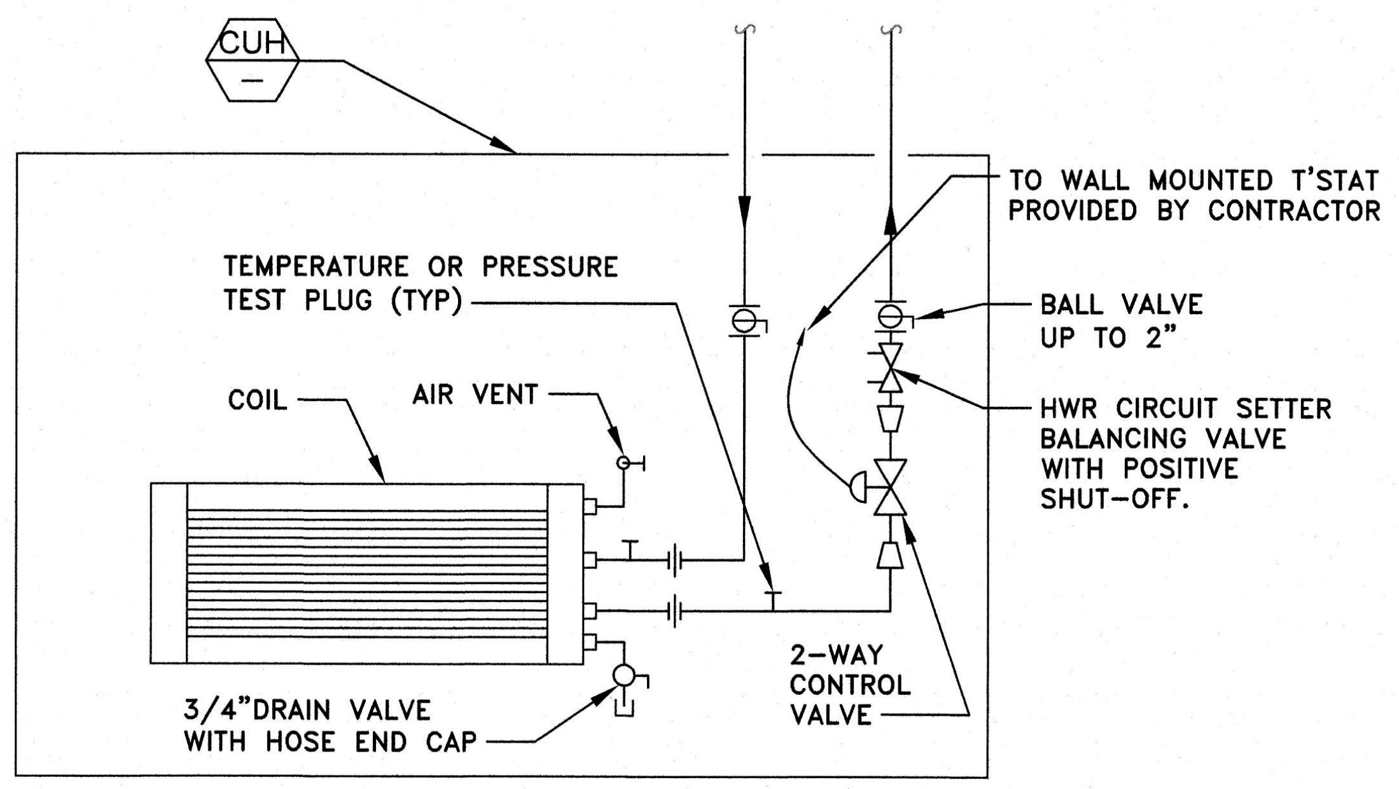

WALL
SLEEVE
DAMPER
HINGED ACCESS DOOR (MIN 18x18)
BREAKAWAY CONNECTION (TYP OF 2)
DUCT

1 FIRE DAMPER – WALL INSTALLATION
NO SCALE


12x12 HINGED ACCESS DOOR
BREAKAWAY CONNECTION (TYP OF 2)
DAMPER
RETAINING ANGLES
FLOOR
SLEEVE
DUCT

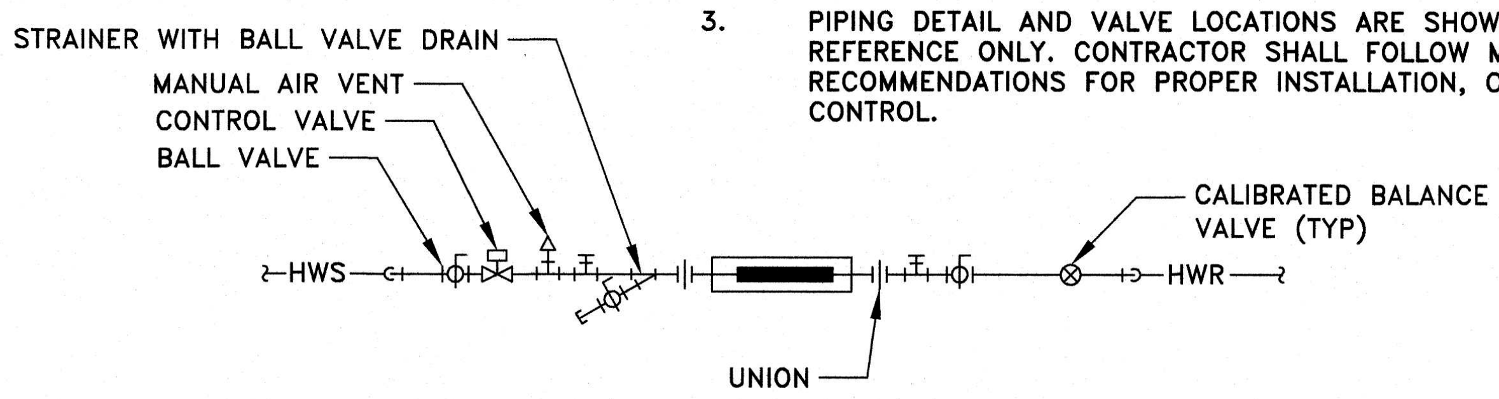
ASSEMBLY SHALL BE INSTALLED IN ACCORDANCE WITH MANUFACTURER'S INSTALLATION INSTRUCTIONS

2 FIRE DAMPER – FLOOR INSTALLATION
NO SCALE

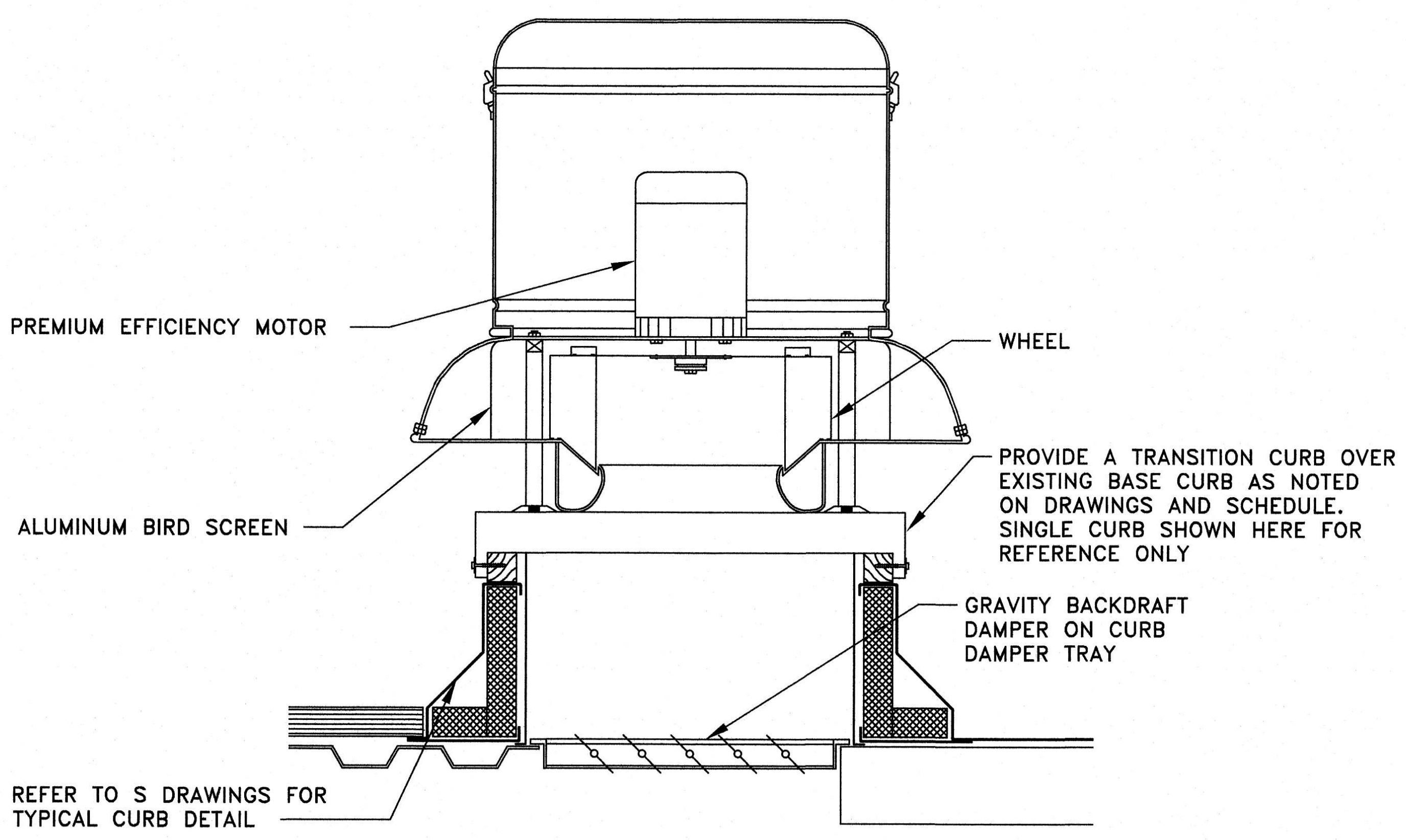

CUH
–
TO WALL MOUNTED T'STAT PROVIDED BY CONTRACTOR
TEMPERATURE OR PRESSURE TEST PLUG (TYP)
BALL VALVE UP TO 2"
COIL
AIR VENT
HWR CIRCUIT SETTER BALANCING VALVE WITH POSITIVE SHUT-OFF.
2-WAY CONTROL VALVE
3/4"DRAIN VALVE WITH HOSE END CAP

3 CABINET UNIT HEATER PIPING DIAGRAM WITH 2-WAY CONTROL VALVE
NO SCALE

NOTES:
1. INSTALL ALL CONTROL AND BALANCING VALVES ABOVE CEILING OR PROVIDE ACCESS DOORS IN HOT WATER CONVECTOR ENCLOSURES FOR ALL VALVING LOCATED AT THE CONVECTOR.
2. ALL SHUT-OFF VALVES, CONTROL VALVES, AND BALANCING VALVES SHOWN ARE TO BE NEW. (TYP FOR ALL)
3. PIPING DETAIL AND VALVE LOCATIONS ARE SHOWN FOR REFERENCE ONLY. CONTRACTOR SHALL FOLLOW MANUFACTURES RECOMMENDATIONS FOR PROPER INSTALLATION, OPERATION, AND CONTROL.

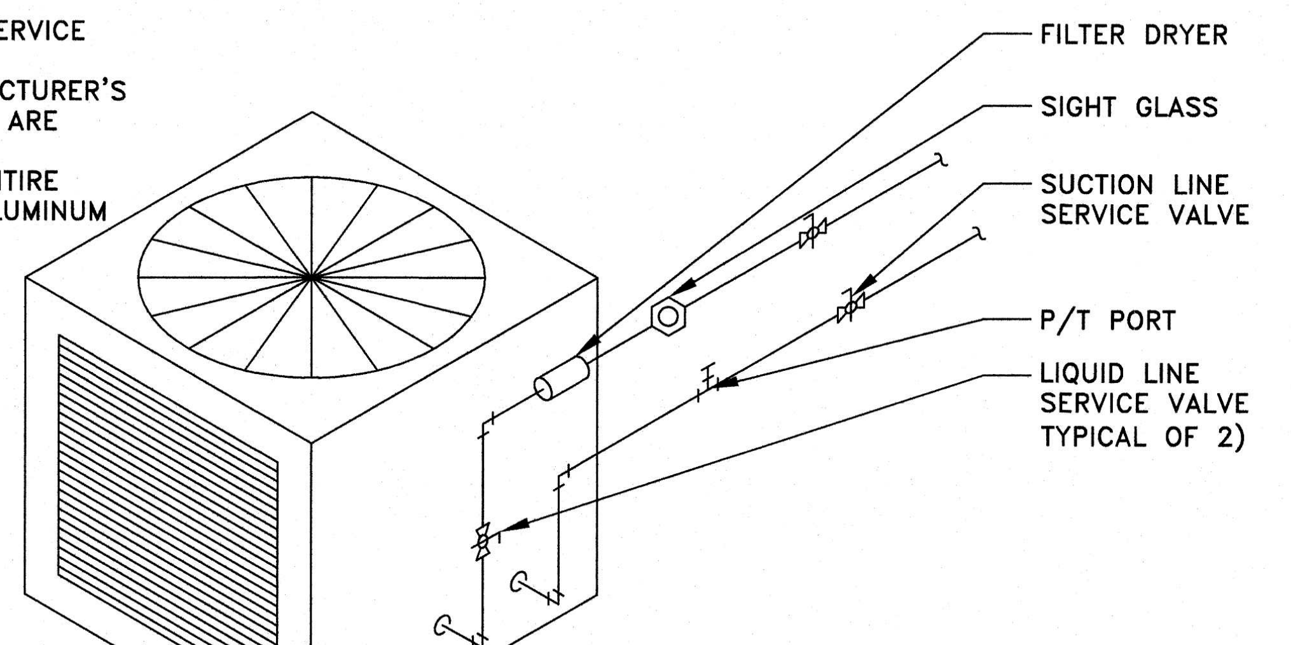

STRAINER WITH BALL VALVE DRAIN
MANUAL AIR VENT
CONTROL VALVE
BALL VALVE
HWS
CALIBRATED BALANCE VALVE (TYP)
HWR
UNION

5 HYDRONIC PIPING FOR HCs
NO SCALE

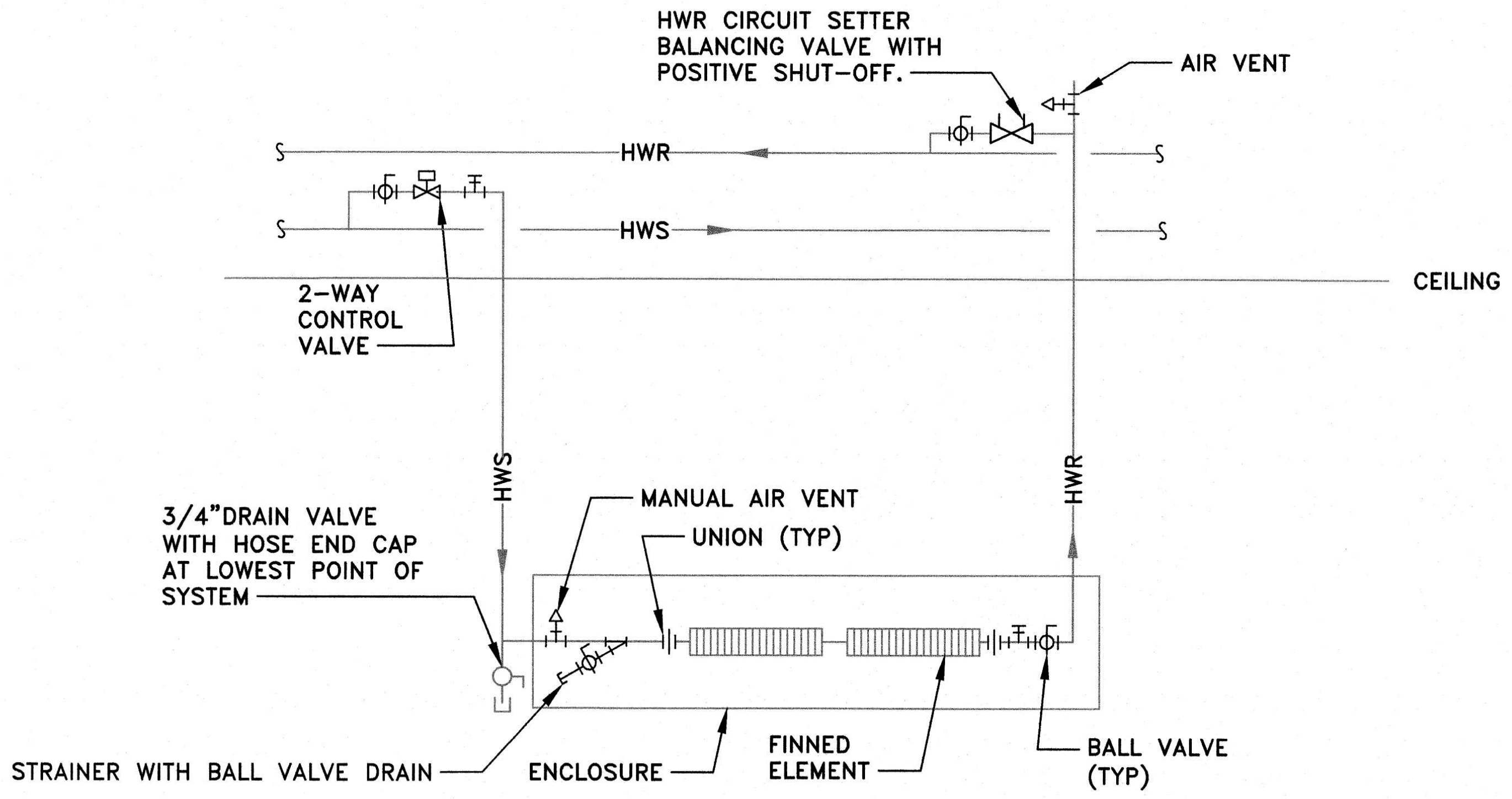

PREMIUM EFFICIENCY MOTOR
WHEEL
PROVIDE A TRANSITION CURB OVER EXISTING BASE CURB AS NOTED ON DRAWINGS AND SCHEDULE. SINGLE CURB SHOWN HERE FOR REFERENCE ONLY
ALUMINUM BIRD SCREEN
GRAVITY BACKDRAFT DAMPER ON CURB DAMPER TRAY
REFER TO S DRAWINGS FOR TYPICAL CURB DETAIL

4 DOWNBLAST ROOF EXHAUST FAN (DIRECT DRIVE)
NO SCALE

NOTES:
1. PROVIDE UNIT WITH MANUAL RESET LOW PRESSURE SUCTION SWITCH AND HIGH PRESSURE COMPRESSOR DISCHARGE SWITCH (NOT SHOWN).
2. PROVIDE UNIT WITH COMPRESSOR DISCHARGE SERVICE VALVE (NOT SHOWN).
3. INSTALL PIPING AND ACCESSORIES PER MANUFACTURER'S RECOMMENDATIONS. VERIFY WHAT ACCESSORIES ARE INTEGRAL TO THE UNIT.
4. PROVIDE ELASTOMERIC FOAM INSULATION ON ENTIRE SUCTION AND LIQUID REFG. PIPING. PROVIDE ALUMINUM JACKET.

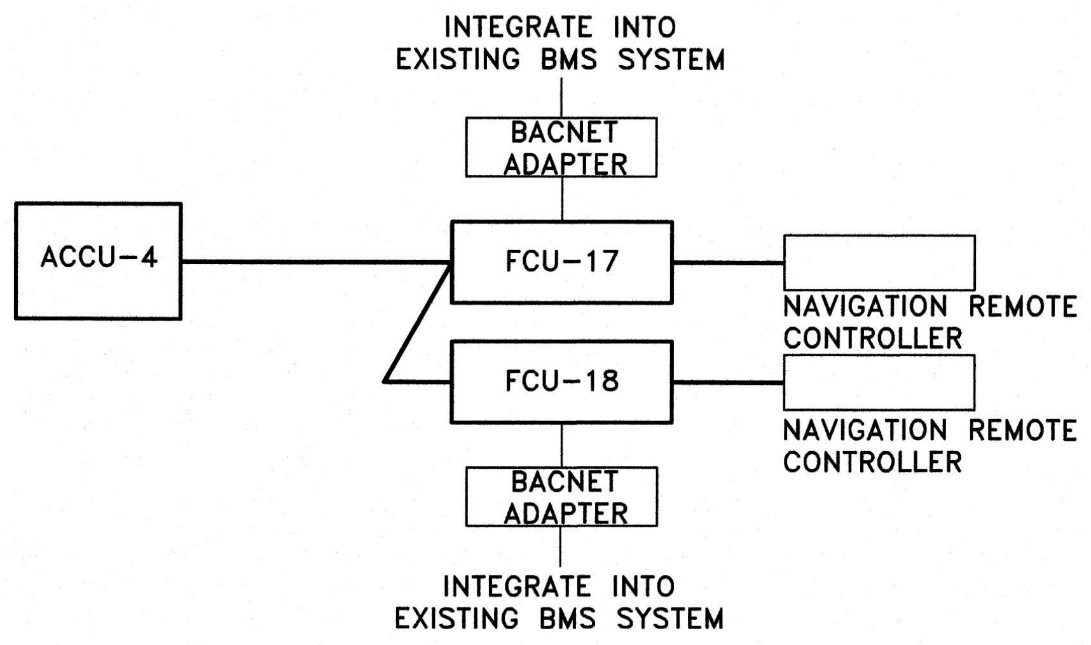

FILTER DRYER
SIGHT GLASS
SUCTION LINE SERVICE VALVE
P/T PORT
LIQUID LINE SERVICE VALVE TYPICAL OF 2)

8 CONDENSING UNIT SCHEMATIC
NO SCALE

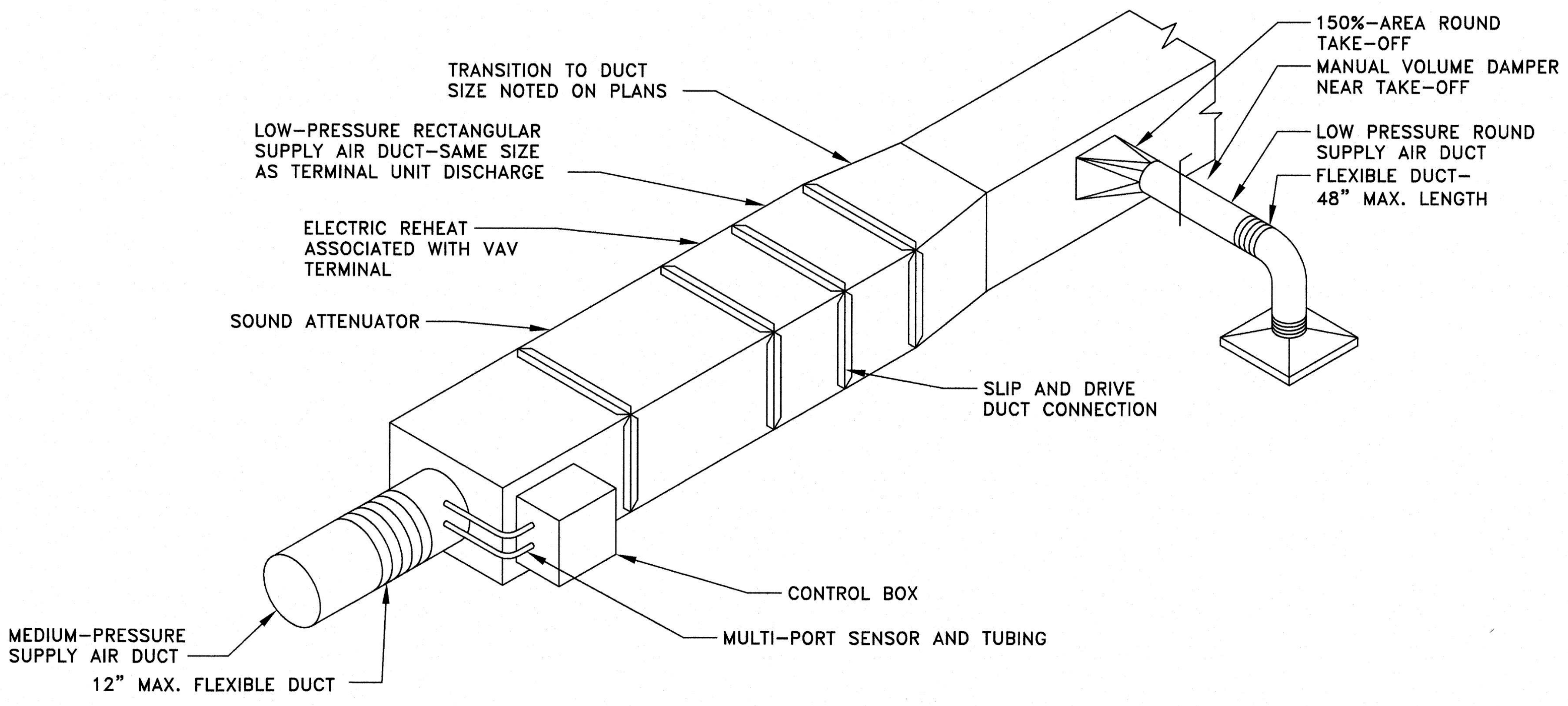

HWR CIRCUIT SETTER BALANCING VALVE WITH POSITIVE SHUT-OFF.
AIR VENT
S
HWR
S
S
HWS
S
CEILING
2-WAY CONTROL VALVE
HWS
HWR
3/4"DRAIN VALVE WITH HOSE END CAP AT LOWEST POINT OF SYSTEM
MANUAL AIR VENT
UNION (TYP)
STRAINER WITH BALL VALVE DRAIN
ENCLOSURE
FINNED ELEMENT
BALL VALVE (TYP)

6 HYDRONIC PIPING FOR FTRs
NO SCALE

NOTES:
1. INSTALL ALL CONTROL AND BALANCING VALVES ABOVE CEILING OR PROVIDE ACCESS DOORS IN FIN TUBE ENCLOSURES FOR ALL VALVING LOCATED AT THE FIN TUBE ELEMENT.
2. ALL SHUT-OFF VALVES, CONTROL VALVES, AND BALANCING VALVES SHOWN ARE TO BE NEW. (TYP FOR ALL)
3. PIPING DETAIL AND VALVE LOCATIONS ARE SHOWN FOR REFERENCE ONLY. CONTRACTOR SHALL FOLLOW MANUFACTURES RECOMMENDATIONS FOR PROPER INSTALLATION, OPERATION, AND CONTROL.


INTEGRATE INTO EXISTING BMS SYSTEM
BACNET ADAPTER
ACCU-4
FCU-17
NAVIGATION REMOTE CONTROLLER
FCU-18
NAVIGATION REMOTE CONTROLLER
BACNET ADAPTER
INTEGRATE INTO EXISTING BMS SYSTEM

7 ACCU-4 WIRING DIAGRAM
NO SCALE


150%-AREA ROUND TAKE-OFF
MANUAL VOLUME DAMPER NEAR TAKE-OFF
TRANSITION TO DUCT SIZE NOTED ON PLANS
LOW-PRESSURE RECTANGULAR SUPPLY AIR DUCT-SAME SIZE AS TERMINAL UNIT DISCHARGE
LOW PRESSURE ROUND SUPPLY AIR DUCT
FLEXIBLE DUCT-48" MAX. LENGTH
ELECTRIC REHEAT ASSOCIATED WITH VAV TERMINAL
SOUND ATTENUATOR
SLIP AND DRIVE DUCT CONNECTION
CONTROL BOX
MEDIUM-PRESSURE SUPPLY AIR DUCT
MULTI-PORT SENSOR AND TUBING
12" MAX. FLEXIBLE DUCT

9 TYPICAL VARIABLE AIR VOLUME BOX WITH ELECTRIC HEAT
NO SCALE

ISSUED FOR BID-9/25/26

9.23.26

APPROVED

William R. Long
PROFESSIONAL ENGINEER
NEW JERSEY LICENSE NO. 33012

REVISIONS	DATE	BY

Tri-State Architects, P.C. / Alaimo Group
WILLIAM R. LONG, P.E. LIC. 33012
ANITA S. ARADHYA, R.A. LIC. 18769
200 HIGH STREET MOUNT HOLLY, N.J.

DATE: AUG. 2026
DESIGNED BY: IV
DRAWN BY: RKR
CHECKED BY: 9/22/26
DEPT. HEAD: 9/22/26

CLIENT: WILLINGBORO TOWNSHIP
PROJECT LOCATION: WILLINGBORO TWP. BURLINGTON COUNTY NEW JERSEY
PROJECT NO.: M-0410-0011-000
CONTRACT NO.: BID#8-2026

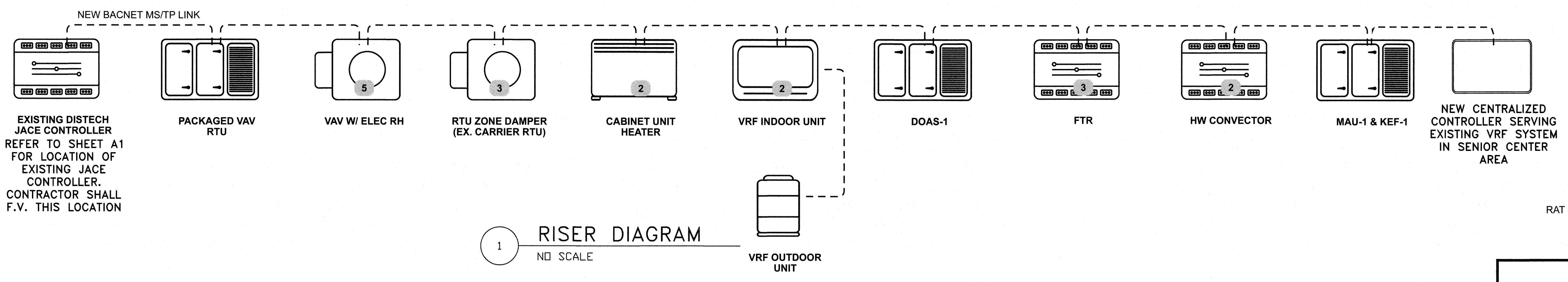
KENNEDY CENTER
RENOVATION TO THE SENIOR CENTER

HVAC - DETAILS - III

SCALE: AS SHOWN

SHEET
H7

FILE NO.:

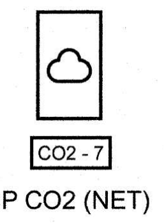

NEW BACNET MS/TP LINK
EXISTING DISTECH JACE CONTROLLER
REFER TO SHEET A1 FOR LOCATION OF EXISTING JACE CONTROLLER. CONTRACTOR SHALL F.V. THIS LOCATION
PACKAGED VAV RTU
5
VAV W/ ELEC RH
3
RTU ZONE DAMPER (EX. CARRIER RTU)
2
CABINET UNIT HEATER
2
VRF INDOOR UNIT
DOAS-1
3
FTR
2
HW CONVECTOR
MAU-1 & KEF-1
NEW CENTRALIZED CONTROLLER SERVING EXISTING VRF SYSTEM IN SENIOR CENTER AREA
VRF OUTDOOR UNIT

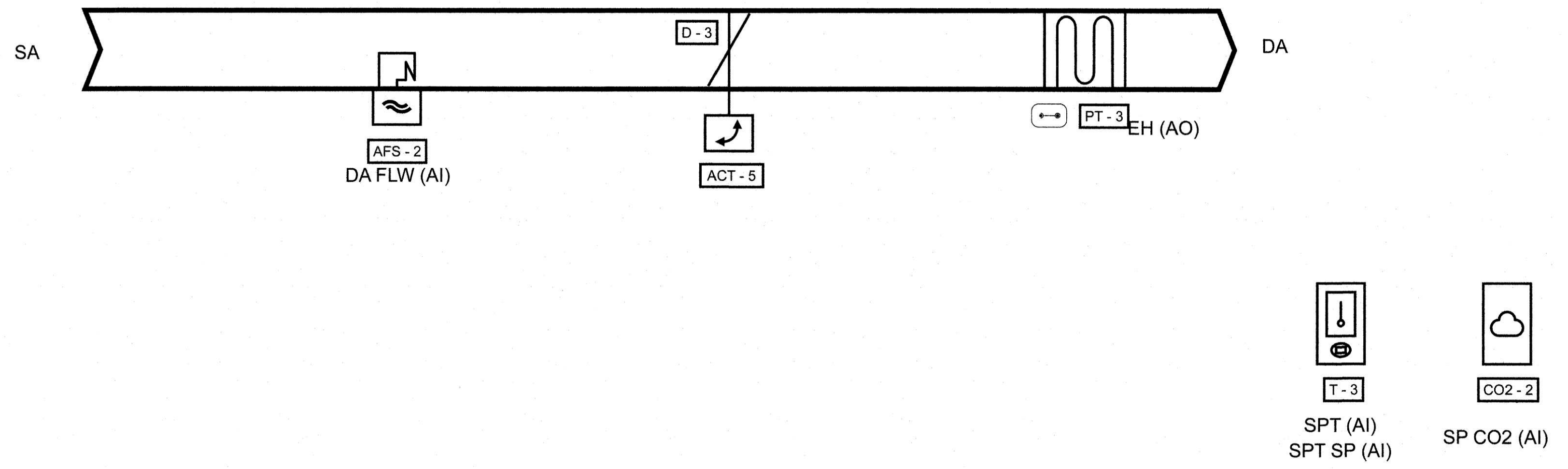
1 RISER DIAGRAM

NO SCALE

NOTE:

CONTROLS RISER DIAGRAM, CONTROL DIAGRAMS, AND POINTS LISTS ARE SHOWN FOR REFERENCE ONLY. CONTRACTOR SHALL UPDATE AND MODIFY THESE AS REQUIRED TO WORK AS PER SEQUENCE OF OPERATIONS, DRAWINGS, SPECS. AND AS REQUIRED FOR THE PROPER OPERATION AND CONTROL OF ALL HVAC EQUIPMENT.



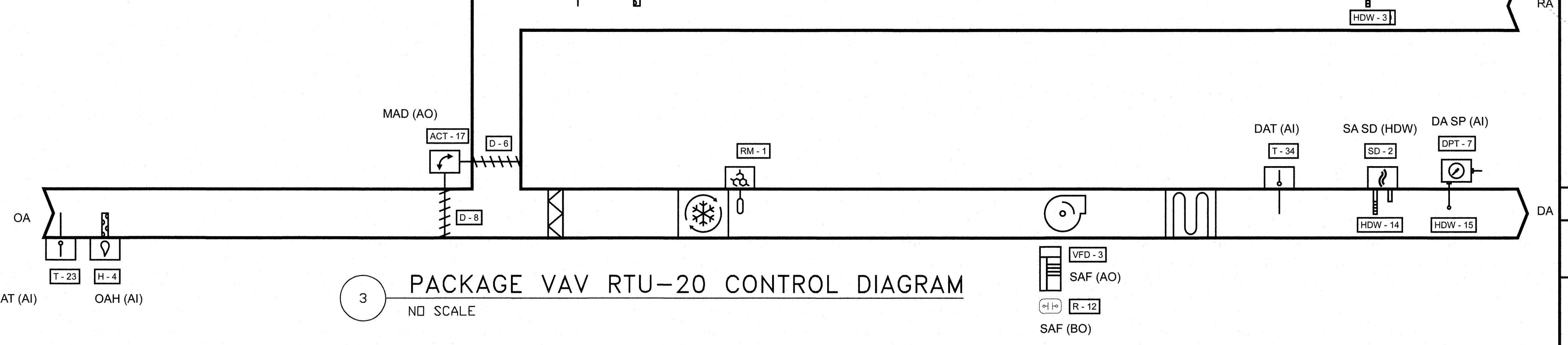


2 VAV TERMINAL UNITS WITH ELECTRIC REHEAT CONTROL DIAGRAM

NO SCALE

POINT NAME	POINTS									ALARMS					
	GRAPHIC	ANALOG HARDWARE INPUT (AI)	BINARY HARDWARE INPUT (BI)	ANALOG HARDWARE OUTPUT (AO)	BINARY HARDWARE OUTPUT (BO)	SOFTWARE POINT (SFT)	HARDWARE INTERLOCK (HDW)	WIRELESS (WLS)	NETWORK (NET)	HIGH ANALOG LIMIT	LOW ANALOG LIMIT	BINARY	LATCH DIAGNOSTIC	SENSOR FAIL	COMMUNICATION FAIL
AIR VALVE MODULATION COMMAND AIR VLV	X			X											
DISCHARGE AIR TEMPERATURE DAT	X	X								X	X			X	
LOCAL HEAT ELECTRIC SCR OUTPUT EH	X			X											
SPACE CO2 CONCENTRATION LOCAL SP C02	X	X								X					
SPACE OCCUPANCY INPUT SP OCC	X		X												
SPACE TEMPERATURE LOCAL	X	X													
SPACE TEMPERATURE SETPOINT LOCAL SPT SP	X	X													
SUPPLY AIRFLOW	X	X								X	X				
BAS COMMUNICATION STATE BAD COM						X									X
MAXIMUM COOLING AIRFLOW SETPOINT						X									
MINIMUM COOLING AIRFLOW SETPOINT						X									

POINT NAME	POINTS									ALARMS					
	GRAPHIC	ANALOG HARDWARE INPUT (AI)	BINARY HARDWARE INPUT (BI)	ANALOG HARDWARE OUTPUT (AO)	BINARY HARDWARE OUTPUT (BO)	SOFTWARE POINT (SFT)	HARDWARE INTERLOCK (HDW)	WIRELESS (WLS)	NETWORK (NET)	HIGH ANALOG LIMIT	LOW ANALOG LIMIT	BINARY	LATCH DIAGNOSTIC	SENSOR FAIL	COMMUNICATION FAIL
MAXIMUM HEATING AIRFLOW SETPOINT						X									
MINIMUM HEATING AIRFLOW SETPOINT						X									
OCCUPIED BYPASS TIMER	X					X									
OCCUPIED COOLING SETPOINT	X					X									
OCCUPIED HEATING SETPOINT	X					X									
UNOCCUPIED COOLING SETPOINT	X					X									
UNOCCUPIED HEATING SETPOINT	X					X									



3 PACKAGE VAV RTU-20 CONTROL DIAGRAM

NO SCALE

POINT NAME	POINTS									ALARMS					
	GRAPHIC	ANALOG HARDWARE INPUT (AI)	BINARY HARDWARE INPUT (BI)	ANALOG HARDWARE OUTPUT (AO)	BINARY HARDWARE OUTPUT (BO)	SOFTWARE POINT (SFT)	HARDWARE INTERLOCK (HDW)	WIRELESS (WLS)	NETWORK (NET)	HIGH ANALOG LIMIT	LOW ANALOG LIMIT	BINARY	LATCH DIAGNOSTIC	SENSOR FAIL	COMMUNICATION FAIL
COOLING OUTPUT COMMAND	X			X											
DISCHARGE AIR STATIC PRESSURE LOCAL		X								X	X		X		
DISCHARGE AIR TEMPERATURE	X	X												X	
DX COIL FROST STAT	X		X									X			
MIXED AIR DAMPER	X			X											
OUTSIDE AIR DAMPER COMMAND	X			X											
OUTSIDE AIR HUMIDITY LOCAL	X	X												X	
OUTSIDE AIR TEMPERATURE LOCAL	X	X												X	
RETURN AIR HUMIDITY LOCAL	X	X												X	
RETURN AIR SMOKE DETECTION LOCAL							X								
RETURN AIR TEMPERATURE LOCAL	X	X												X	

POINT NAME	POINTS									ALARMS					
	GRAPHIC	ANALOG HARDWARE INPUT (AI)	BINARY HARDWARE INPUT (BI)	ANALOG HARDWARE OUTPUT (AO)	BINARY HARDWARE OUTPUT (BO)	SOFTWARE POINT (SFT)	HARDWARE INTERLOCK (HDW)	WIRELESS (WLS)	NETWORK (NET)	HIGH ANALOG LIMIT	LOW ANALOG LIMIT	BINARY	LATCH DIAGNOSTIC	SENSOR FAIL	COMMUNICATION FAIL
DISCHARGE AIR STATIC PRESSURE SETPOINT	X					X									
ECONOMIZER ENABLE						X									
ECONOMIZER MINIMUM POSITION SETPOINT	X					X									
FAN MODE COMMAND						X									
FILTER TIMER HOURS						X									
HEAT / COOL MODE REQUEST	X					X									
HEAT OUTPUT						X									
OCCUPANCY	X					X									
OCCUPIED COOLING SETPOINT	X					X									
TIMED OVERRIDE STATUS						X									
UNOCCUPIED COOLING SETPOINT	X					X									
UNOCCUPIED HEATING SETPOINT	X					X									
COOLING COIL LEAVING TEMPERATURE	X	X													

POINT NAME	POINTS									ALARMS					
	GRAPHIC	ANALOG HARDWARE INPUT (AI)	BINARY HARDWARE INPUT (BI)	ANALOG HARDWARE OUTPUT (AO)	BINARY HARDWARE OUTPUT (BO)	SOFTWARE POINT (SFT)	HARDWARE INTERLOCK (HDW)	WIRELESS (WLS)	NETWORK (NET)	HIGH ANALOG LIMIT	LOW ANALOG LIMIT	BINARY	LATCH DIAGNOSTIC	SENSOR FAIL	COMMUNICATION FAIL
SPACE CO2 CONCENTRATION (COMMUNICATED)	X								X	X					
SUPPLY AIR SMOKE DETECTION LOCAL							X								
SUPPLY FAN SPEED				X											
SUPPLY FAN START/STOP	X				X										
SUPPLY FAN STATUS LOCAL	X		X												
APPLICATION MODE						X									
BAS COMMUNICATION STATE						X									X
COMPRESSOR ENABLE	X					X									
COMPRESSOR LOCKOUT STATUS						X									
COOL OUTPUT						X									

HOOD

HOOD NO.	TAG	MODEL	MANUFACTURE	LENGTH	MAX COOKING TEMP	TYPE	APPLIANCE DUTY	DESIGN CFM	TOTAL EXH CFM	EXHAUST PLENUM RISER(S)					TOTAL SUPPLY CFM	HOOD CONSTRUCTION	HOOD CONFIGURATION	
										HEIGHT	DIA	CFM	VEL	SP			END TO END	ROW
1		5424ND-2-PS P-F	CAPTIVEAIRE	6'-0"	600°	1	HEAVY	215	1290	4'	1'	1290	1642	-0.582"	1030	430 SS WHERE EXPOSED	ALONE	ALONE

HOOD

HOOD NO.	TAG	FILTER(S)					LIGHT(S)			UTILITY CABINET(S)						FIRE SYSTEM PIPING	HOOD HANGING WEIGHT
												FIRE SYSTEM		ELECTRICAL	SWITCHES		
		TYPE	QTY	HEIGHT	LENGTH	EFFICIENCY @ 7 MICRONS	QTY	TYPE	WIRE GUARD	LOCATION	SIZE	TYPE	SIZE	MODEL #	QUANTITY		
1		CAPTRATE SOLO FILTER	4	20"	16"	85% SEE FILTER SPEC	2	L55 SERIES E26	NO	RIGHT	12"x54"x24"	TANK FS	4.0/4.0	SC-311110MA	1 LIGHT 1 FAN	YES	805 LBS

REMARKS:

1. KITCHEN HOOD, FIRE-SUPPRESSION SYSTEM, GAS-FIRED MAKE-UP AIR UNIT, AND ASSOCIATED EXHAUST FAN SHALL BE PROVIDED AS A COMPLETE, COORDINATED SYSTEM BY A SINGLE MANUFACTURER. BASIS OF DESIGN: CAPTIVEAIRE OR APPROVED EQUIVALENT.

HOOD

HOOD NO.	TAG	OPTIONS
1		FIELD WRAPPER 18.00" HIGH FRONT, LEFT, RIGHT
		BACKSPLASH 80.00" HIGH x 84.00" LONG 430 SS VERTICAL
		RIGHT VERTICAL END PANEL 27" TOP WIDTH, 21" BOTTOM WIDTH, 80" HIGH INSULATED 430 SS
		LEFT VERTICAL END PANEL 27" TOP WIDTH, 21" BOTTOM WIDTH, 80" HIGH INSULATED 430 SS
		SENSOR-CV.

FIRE SYSTEM INFORMATION

FIRE SYSTEM NO.	TAG	TYPE	SIZE	MAX FP	DESIGN FP	INSTALLATION	
						SYSTEM	LOCATION ON HOOD
1		TANK FS	4.0/4.0	40	23	FIRE CABINET RIGHT	RIGHT, HOOD 1

ISSUED FOR BID-9/25/26

Plotted: 9/22/2026 10:05 AM Last saved: 9/21/2026 4:03 PM File Name: M:\Projects\M04100011000\Drawings\GLQ-H5-H8-Details.dwg

9.23.26

APPROVED

William R. Long
PROFESSIONAL ENGINEER
NEW JERSEY LICENSE NO. 33012

REVISIONS	DATE	BY

Tri-State Architects, P.C. / Alaimo Group
WILLIAM R. LONG, P.E. LIC. 33012
ANITA S. ARADHYA, R.A. LIC. 18769
200 HIGH STREET MOUNT HOLLY, N.J.

DATE: AUG. 2026
DESIGNED BY: IV
DRAWN BY: RKR
CHECKED BY: 9/22/26
DEPT. HEAD: 9/22/26

CLIENT: WILLINGBORO TOWNSHIP
PROJECT LOCATION: WILLINGBORO TWP. BURLINGTON COUNTY NEW JERSEY
PROJECT NO.: M-0410-0011-000
CONTRACT NO.: BID#8-2026

KENNEDY CENTER
RENOVATION TO THE SENIOR CENTER

HVAC - CONTROL DIAGRAMS, POINTS LISTS, AND SCHEDULES

SCALE: AS SHOWN

SHEET
H8

FILE NO.:

SEQUENCE OF OPERATION

1. VRF SYSTEM SERVING ACTIVITY ROOM, KITCHEN (FCU-17,18 & ACCU-4): – EACH FCU SHALL BE SERVED BY A THERMOSTAT EACH. EACH FCU SHALL BE INTEGRATED INTO BMS SYSTEM THRU BACNET ADAPTERS FURNISHED WITH EACH FCU. HEAT PUMP ACCU-4 SERVES FCU-17 & FCU-18.

A. WORKING SCHEDULE – THESE SHALL WORK ONLY DURING BUILDING WORKING HOURS AND WHEN THE BUILDING IS OCCUPIED. UNITS SHALL WORK ON UNOCCUPIED MODE WHEN THE SCHOOL IS NOT OCCUPIED SUCH AS AT NIGHTS, DURING WEEKENDS, HOLIDAYS, ETC. BAS SHALL SEND THE SCHOOL WORKING HOURS, SCHOOL OCCUPIED AND UNOCCUPIED SCHEDULES TO FCUs. THESE HOURS SHALL ALSO BE INPUTTED INTO FCUs' THERMOSTATS TO ENABLE PROPER OPERATION OF FCUs IN CASE OF A FAILURE OF BAS SYSTEM. CONTRACTOR TO COORDINATE WITH BUILDING AUTHORITY TO INPUT BUILDING WORKING/OCCUPANCY HOURS SCHEDULED INTO BAS SYSTEM AND THERMOSTATS.

B. OCCUPIED HEATING MODE – THE OCCUPIED HEATING SETPOINT FOR BOTH FCU THERMOSTATS SHALL BE 72°F (ADJ.). WHEN THE SPACE TEMPERATURE MEASURED BY EITHER THERMOSTAT FALLS BELOW THE OCCUPIED HEATING SETPOINT, THE ASSOCIATED FCU SHALL INITIATE A HEATING CALL. ACCU-4 SHALL BE ENABLED IN HEATING MODE AND SHALL MODULATE AS REQUIRED TO SATISFY THE HEATING DEMAND. EACH FCU SHALL OPERATE INDEPENDENTLY AND SHALL CONTINUE HEATING UNTIL THE HEATING SETPOINT AT ITS ASSOCIATED THERMOSTAT IS SATISFIED. SATISFACTION OF THE HEATING DEMAND AT ONE FCU SHALL NOT DISABLE HEATING AT THE OTHER FCU WHEN THE OTHER SPACE CONTINUES TO REQUIRE HEATING.

B.A. UNOCCUPIED HEATING MODE – DURING UNOCCUPIED MODE, THE HEATING SETPOINT FOR BOTH FCU THERMOSTATS SHALL BE 60°F (ADJ.). WHEN THE TEMPERATURE IN EITHER SPACE FALLS BELOW THE UNOCCUPIED HEATING SETPOINT OF 60°F, THE ASSOCIATED FCU SHALL INITIATE A HEATING CALL, AND ACCU-4 SHALL BE ENABLED IN HEATING MODE. WHEN THE SPACE TEMPERATURE RISES ABOVE THE UNOCCUPIED HEATING SETPOINT PLUS THE UNOCCUPIED DIFFERENTIAL OF 4°F (ADJ.), HEATING FOR THE ASSOCIATED FCU SHALL BE DISABLED. EACH FCU SHALL RESPOND INDEPENDENTLY TO THE TEMPERATURE IN ITS RESPECTIVE SPACE.

C. OCCUPIED COOLING MODE – THE OCCUPIED COOLING SETPOINT FOR BOTH FCU THERMOSTATS SHALL BE 74°F (ADJ.). WHEN THE SPACE TEMPERATURE MEASURED BY EITHER THERMOSTAT RISES ABOVE THE OCCUPIED COOLING SETPOINT, THE ASSOCIATED FCU SHALL INITIATE A COOLING CALL. ACCU-4 SHALL BE ENABLED IN COOLING MODE AND SHALL MODULATE AS REQUIRED TO SATISFY THE COOLING DEMAND. EACH FCU SHALL OPERATE INDEPENDENTLY AND SHALL CONTINUE COOLING UNTIL THE COOLING SETPOINT AT ITS ASSOCIATED THERMOSTAT IS SATISFIED. SATISFACTION OF THE COOLING DEMAND AT ONE FCU SHALL NOT DISABLE COOLING AT THE OTHER FCU WHEN THE OTHER SPACE CONTINUES TO REQUIRE COOLING.

C.A. UNOCCUPIED COOLING MODE – DURING UNOCCUPIED MODE, THE COOLING SETPOINT FOR BOTH FCU THERMOSTATS SHALL BE 85°F (ADJ.). WHEN THE TEMPERATURE IN EITHER SPACE RISES ABOVE THE UNOCCUPIED COOLING SETPOINT OF 85°F, THE ASSOCIATED FCU SHALL INITIATE A COOLING CALL, AND ACCU-4 SHALL BE ENABLED IN COOLING MODE. WHEN THE SPACE TEMPERATURE FALLS BELOW THE UNOCCUPIED COOLING SETPOINT MINUS THE UNOCCUPIED DIFFERENTIAL OF 4°F (ADJ.), COOLING FOR THE ASSOCIATED FCU SHALL BE DISABLED. EACH FCU SHALL RESPOND INDEPENDENTLY TO THE TEMPERATURE IN ITS RESPECTIVE SPACE.

D. SYSTEM MODE COORDINATION –ACCU-4 IS A HEAT-PUMP VRF SYSTEM AND SHALL NOT PROVIDE SIMULTANEOUS HEATING AND COOLING. FCU-17 AND FCU-18 SHALL OPERATE IN THE SAME SYSTEM MODE WHILE MAINTAINING INDEPENDENT TEMPERATURE CONTROL OF THEIR RESPECTIVE SPACES. THE BMS AND VRF MANUFACTURER'S CONTROLS SHALL PREVENT CONFLICTING HEATING AND COOLING COMMANDS AND SHALL COORDINATE SYSTEM MODE CHANGEOVER IN ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATIONS.

E. LOCAL CONTROL OVERRIDE IN EACH ROOM: EACH THERMOSTAT SHALL HAVE THE ABILITY TO OVERRIDE UNOCCUPIED SCHEDULE, HEATING AND COOLING SETPOINTS WITH LIMITATIONS. ALL THE REMAINING SETPOINTS SHALL BE PASSWORD PROTECTED AND CAN BE ACCESSED OR CHANGED ONLY BY A BUILDING APPOINTED SERVICE TECHNICIAN

E.A. OVERRIDE UNOCCUPIED SCHEDULE: IF A ROOM IS OCCUPIED DURING UNOCCUPIED BUILDING HOURS SET BY BAS, LOCAL THERMOSTATS SHALL HAVE THE ABILITY TO OVERRIDE UNOCCUPIED MODE AND CHANGE IT TO OCCUPIED MODE. THE OVERRIDE OF ONE FCU SHALL NOT CHANGE THE OCCUPANCY MODE OF THE OTHER FCU

E.B. OVERRIDE SETPOINTS WITH LIMITATIONS: EACH THERMOSTAT SHALL HAVE ABILITY TO MODIFY HEATING AND COOLING SETPOINTS BY +/- 2 DEG. F FROM SETPOINTS SET BY BAS. THIS WILL GIVE LIMITED CONTROL OF FCUs. ADJUSTMENT OF ONE THERMOSTAT SHALL AFFECT ONLY THE ASSOCIATED FCU AND SHALL NOT MODIFY THE SETPOINT OF THE OTHER FCU

SEQUENCE OF OPERATION

1. KITCHEN HOOD, MAKE-UP AIR (MAU-1) AND KITCHEN EXHAUST FAN (KEF-1): – THE MAKE-UP AIR UNIT SHALL CONSIST OF A CONSTANT-VOLUME SUPPLY FAN, OUTDOOR-AIR INTAKE DAMPER, AND GAS-FIRED HEATING SECTION. THE MAKE-UP AIR UNIT SHALL BE INTERLOCKED WITH THE KITCHEN EXHAUST FAN, KITCHEN-HOOD CONTROL PANEL, KITCHEN-HOOD FIRE-SUPPRESSION SYSTEM, AND BMS.
THE HOOD CONTROL PACKAGE SHALL BE ETL LISTED IN ACCORDANCE WITH UL 508A. THE CONTROL ENCLOSURE SHALL BE NEMA 1 RATED, LISTED FOR INSTALLATION WITHIN THE EXHAUST-HOOD UTILITY CABINET, AND CONSTRUCTED OF STAINLESS STEEL OR PAINTED STEEL.
A STAINLESS-STEEL TEMPERATURE PROBE SHALL BE INSTALLED IN THE HOOD EXHAUST DUCT OR HOOD RISER TO SENSE AN INCREASE IN EXHAUST-AIR TEMPERATURE RESULTING FROM OPERATION OF THE COOKING APPLIANCES.

A. AUTOMATIC OPERATION – WHEN THE TEMPERATURE SENSED IN THE HOOD EXHAUST DUCT OR HOOD RISER REACHES THE ADJUSTABLE ACTIVATION SETPOINT, THE FOLLOWING SHALL OCCUR

A.A. THE KITCHEN EXHAUST FAN SHALL START AND PROVIDE RUN STATUS TO THE BMS

A.B. FOLLOWING PROOF OF KITCHEN EXHAUST-FAN OPERATION, THE MAKE-UP AIR UNIT OUTDOOR-AIR DAMPER SHALL OPEN AND THE MAKE-UP AIR UNIT SUPPLY FAN SHALL START

A.C. THE MAKE-UP AIR UNIT SUPPLY FAN SHALL PROVIDE RUN STATUS AND AIRFLOW PROOF TO THE BMS. FAILURE OF THE SUPPLY FAN TO OPERATE WHEN COMMANDED SHALL GENERATE AN ALARM THROUGH THE BMS

A.D. UPON PROOF OF MAKE-UP AIR UNIT SUPPLY-FAN AIRFLOW, THE GAS-FIRED HEATING SECTION SHALL BE ENABLED AS REQUIRED

A.E. WHEN THE OUTDOOR-AIR TEMPERATURE FALLS BELOW 55°F (ADJ.), THE GAS-FIRED HEATING SECTION SHALL MODULATE OR STAGE, AS APPLICABLE, TO MAINTAIN A DISCHARGE-AIR TEMPERATURE SETPOINT OF 55°F (ADJ.)

A.F. WHEN THE OUTDOOR-AIR TEMPERATURE RISES ABOVE 55°F (ADJ.), THE GAS-FIRED HEATING SECTION SHALL BE DISABLED. THE MAKE-UP AIR UNIT SUPPLY FAN AND KITCHEN EXHAUST FAN SHALL CONTINUE TO OPERATE

A.G. BURNER IGNITION, FIRING-RATE CONTROL, PRE-PURGE, POST-PURGE, FLAME SAFEGUARDS, HIGH-TEMPERATURE LIMITS, AND OTHER GAS-HEATING SAFETIES SHALL OPERATE IN ACCORDANCE WITH THE MAKE-UP AIR UNIT MANUFACTURER'S FACTORY CONTROL SEQUENCE

B. SYSTEM SHUTDOWN – THE CONTROLS SHALL PROVIDE A FACTORY-SET 2°F HYSTERESIS TO PREVENT SHORT CYCLING. ONCE ACTIVATED BY A RISE IN HOOD EXHAUST TEMPERATURE, THE KITCHEN EXHAUST FAN AND MAKE-UP AIR UNIT SHALL OPERATE FOR A MINIMUM OF 30 MINUTES.
WHEN THE SENSED TEMPERATURE FALLS 2°F BELOW THE ACTIVATION SETPOINT AND THE MINIMUM 30-MINUTE RUN TIMER HAS EXPIRED, THE FOLLOWING SHALL OCCUR:

B.A. THE GAS-FIRED HEATING SECTION SHALL BE DISABLED AND THE GAS VALVE SHALL CLOSE

B.B. THE MAKE-UP AIR UNIT SUPPLY FAN SHALL CONTINUE TO OPERATE FOR ANY MANUFACTURER-REQUIRED POST-PURGE OR COOLDOWN PERIOD AND SHALL THEN STOP

B.C. THE MAKE-UP AIR UNIT OUTDOOR-AIR DAMPER SHALL CLOSE

B.D. THE KITCHEN EXHAUST FAN SHALL STOP, AND THE SYSTEM SHALL RETURN TO STANDBY MODE

C. CONTROL ADJUSTMENTS – THE TEMPERATURE ACTIVATION SETPOINT, HYSTERESIS SETTING, AND MINIMUM FAN RUN-TIME SETTING SHALL BE FIELD-ADJUSTABLE THROUGH THE LCD INTERFACE LOCATED WITHIN THE HOOD CONTROL ENCLOSURE

D. MAKE-UP AIR UNIT / KITCHEN EXHAUST FAN SAFETIES AND ALARMS

D.A. KITCHEN-HOOD FIRE CONDITION –UPON ACTIVATION OF THE KITCHEN-HOOD FIRE-SUPPRESSION SYSTEM, THE MAKE-UP AIR UNIT SUPPLY FAN SHALL STOP, THE GAS-FIRED HEATING SECTION SHALL BE IMMEDIATELY DISABLED, THE GAS VALVE SHALL CLOSE, AND THE OUTDOOR-AIR DAMPER SHALL CLOSE. THE KITCHEN EXHAUST FAN SHALL START OR CONTINUE TO OPERATE, AND THE KITCHEN-HOOD LIGHTS SHALL TURN OFF.
THE FIRE-SUPPRESSION SYSTEM SHALL PROVIDE STATUS INPUT TO THE BMS, AND A KITCHEN-HOOD FIRE-SUPPRESSION ALARM SHALL BE GENERATED. THE SYSTEM SHALL REMAIN IN FIRE MODE UNTIL THE FIRE-SUPPRESSION SYSTEM AND HOOD CONTROL PANEL HAVE BEEN MANUALLY RESET

D.B. KITCHEN EXHAUST-FAN FAILURE –UPON LOSS OF KITCHEN EXHAUST-FAN RUN PROOF, THE MAKE-UP AIR UNIT SUPPLY FAN AND GAS-FIRED HEATING SECTION SHALL BE DISABLED, THE GAS VALVE SHALL CLOSE, AND THE OUTDOOR-AIR DAMPER SHALL CLOSE. A KITCHEN EXHAUST-FAN FAILURE ALARM SHALL BE GENERATED THROUGH THE BMS

D.C. MAKE-UP AIR UNIT SUPPLY-FAN FAILURE –UPON LOSS OF MAKE-UP AIR UNIT SUPPLY-FAN AIRFLOW PROOF, THE GAS-FIRED HEATING SECTION SHALL BE IMMEDIATELY DISABLED AND THE GAS VALVE SHALL CLOSE. A MAKE-UP AIR UNIT SUPPLY-FAN FAILURE ALARM SHALL BE GENERATED THROUGH THE BMS

D.D. GAS-HEATING SAFETY –UPON FLAME FAILURE, IGNITION FAILURE, HIGH-TEMPERATURE LIMIT, AIRFLOW-SAFETY FAILURE, OR OTHER BURNER SAFETY TRIP, THE GAS VALVE SHALL CLOSE AND THE GAS-FIRED HEATING SECTION SHALL BE DISABLED. A COMMON GAS-HEATING FAILURE OR LOCKOUT ALARM SHALL BE GENERATED THROUGH THE BMS. FAN OPERATION SHALL CONTINUE OR TERMINATE IN ACCORDANCE WITH THE MAKE-UP AIR UNIT MANUFACTURER'S FACTORY SAFETY SEQUENCE

SEQUENCE OF OPERATION

1. DOAS-1 – DEDICATED OUTDOOR AIR SYSTEM SHALL PROVIDE OUTSIDE AIR FOR VENTILATION PURPOSE AT NEUTRAL AIR TEMPERATURE i.e 72-74 DEG. F. UNIT SHALL WORK ONLY DURING WORKING SCHEDULE THROUGHOUT THE YEAR. THE DOAS UNIT SHALL ONLY SUPPLY MIN. OA OF 700 CFM UNLESS MORE VENTILATION AIR IS REQUIRED AS PER DCV CO2 SENSORS' CO2 PPM SETPOINT. DOAS-1 IS A VARIABLE AIR VOLUME UNIT AND IS SERVING CRAFT ROOM, CRAFT STORAGE ROOM, ACTIVITY ROOM, KITCHEN AND CAFE. THIS UNIT IS EQUIPPED WITH HEAT PUMP, MODULATING HOT GAS REHEAT, SUPPLEMENTAL ELECTRIC HEAT, ENERGY RECOVERY WHEEL, AND DEMAND CONTROL VENTILATION USING CO2 SENSORS.

A. WORKING SCHEDULE – THE UNIT SHALL WORK ONLY DURING BUILDING WORKING HOURS. THE UNIT SHALL NOT WORK WHEN THE BUILDING AND SPACES ARE NOT OCCUPIED SUCH AS AT NIGHTS, DURING WEEKENDS, HOLIDAYS, ETC. CONTRACTOR TO COORDINATE WITH BUILDING AUTHORITY TO INPUT BUILDING WORKING/OCCUPANCY HOURS SCHEDULED INTO DOAS UNIT'S CONTROLLER.

B. ENERGY RECOVERY WHEEL – ENTHALPY WHEEL WILL BE TURNED ON WHENEVER THE DOAS UNIT IS RUNNING i.e. WHEN BOTH SUPPLY AND EXHAUST FANS ARE RUNNING. ENERGY WHEEL IS FIRST FORM OF HEATING AND COOLING. IT SHALL BE PROVIDED WITH STANDARD ON/OFF DEFROST CONTROL.

C. CHANGEOVER SET POINTS – THE UNIT CHANGEOVER SOURCE TEMPERATURE IS THE OUTDOOR AIR TEMPERATURE (OAT), THE UNIT STATE WILL CHANGE FROM COOLING, FAN ONLY OR HEATING BASED ON THE CHANGEOVER HEATING OR COOLING SET POINTS.

C. WINTER (HEATING) – DURING HEATING MODE, HEAT PUMP WILL ACTIVATE TO SERVE AS PRIMARY HEAT AND WILL MODULATE THE COMPRESSOR TO MEET DISCHARGE AIR TEMPERATURE (DAT) HEATING SETPOINT. IF HEAT PUMP CAPACITY CANNOT SATISFY DAT SETPOINT, THEN SUPPLEMENTAL ELECTRIC HEAT WILL OPERATE AS NEEDED IN ADDITION TO HEAT PUMP OPERATION, TO MAINTAIN HEATING DAT SETPOINT. SCR ELECTRIC HEAT WILL BE MODULATED BY UNIT CONTROLLER TO MAINTAIN HEATING DAT SETPOINT. HEATING DAT SETPOINT SHALL BE 74 DEG. F, ADJUSTABLE AT UNIT CONTROLLER.

D. DEFROST – WILL BE ACTIVATED WHEN A FACTORY MOUNTED TEMPERATURE SENSOR DETERMINES FROST BUILD UP. DURING THE DEFROST CYCLE THE UNIT WILL REVERSE THE INDOOR AND OUTDOOR COIL OPERATION TO SEND HOT GAS TO THE OUTDOOR COIL FOR DEFROST. THE HEATING DAT SHALL BE MAINTAINED BY SUPPLEMENTAL HEAT.

E. SUMMER (COOLING) – IN COOLING MODE, THE UNIT CAPACITY WILL MODULATE THE VARIABLE SPEED COMPRESSOR TO MAINTAIN THE LEAVING COIL TEMPERATURE (LCT) SETPOINT. LCT SHALL BE AROUND 55 DEG. F (52-57), ADJ. THE UNIT WILL ALWAYS OVERCOOL THE AIR TO LCT SETPOINT AND THEN MODULATING HOT GAS REHEAT (HGRH) WILL REHEAT IT TO REHEAT SETPOINT (REHEAT ALWAYS OPTION) WHICH WOULD BE AROUND 74 DEG. F DRY BULB UNLESS THE UNIT IS IN HEATING STATE. THIS REHEAT SET POINT SHALL BE DISCHARGE AIR TEMPERATURE (DAT) SET POINT. LCT, DAT WILL BE ADJUSTABLE AT THE UNIT CONTROLLER. UNIT CAPACITY WILL BE MODULATED BY THE VARIABLE SPEED COMPRESSOR OPERATION.

F. MODULATING HOT GAS REHEAT – WHEN THERE IS A CALL FOR BOTH COOLING AND DEHUMIDIFICATION, REHEAT SET POINT IS SET AS COOLING DAT. WHEN THERE IS A CALL FOR DEHUMIDIFICATION ONLY, THE REHEAT SETPOINT IS RESET IN A LINEAR MANNER BETWEEN TWO END POINTS REFERRED TO AS THE MIN. AND MAX. REHEAT SETPOINTS (ADJ.). THIS RESET IS BASED ON COOLING AND HEATING SETPOINTS FOR THE DOAS UNIT. THIS LOGIC WILL SEND WARMER SUPPLY AIR WHEN SPACE IS APPROACHING HEATING CHANGEOVER SETPOINT AND COOLER SUPPLY AIR WHEN THE SPACE IS APPROACHING COOLING CHANGEOVER SETPOINT. THIS LOGIC PREVENTS UNNECESSARY FLUCTUATIONS BETWEEN COOLING AND HEATING SETPOINTS.

G. CO2 BASED DCV AND VAV BOXES OPERATION – THREE CO2 SPACE SENSORS WILL BE SERVING THREE DIFFERENT SPACES EACH – ACTIVITY ROOM, CRAFT ROOM, CAFE. WHEN CO2 SENSOR IN EITHER ACTIVITY ROOM OR CRAFT ROOM DETECTS CO2 PPM LEVEL BEYOND THE SETPOINT, VAV BOX DAMPER WILL BE MODULATED TO ITS MAX. POSITION SUPPLYING 750 CFM OA. SIMILARLY, WHEN CO2 SENSOR IN CAFE DETECTS CO2 PPM LEVEL BEYOND THE SETPOINT, VAV BOX DAMPER WILL BE MODULATED TO ITS MAX. POSITION SUPPLYING 400 CFM OA. SEE BELOW TABLE FOR MORE INFO:

	STATUS	VAV-1	EACD-1	VAV-2	EACD-2	DOAS SA	DOAS EA
CO2 SENSOR PPM BELOW SETPOINT IN ACTIVITY ROOM	OFF	MIN. POISTION – 350CFM	MIN. POSITION -350 CFM	MIN. POSITION -175 CFM	MIN. POSITION -175 CFM	700 CFM	600 CFM
CO2 SENSOR PPM ABOVE SETPOINT IN ACTIVITY ROOM	ACTIVATES VAV-1 & EACD-1	MAX. POSITION – 750 CFM	MAX. POSITION – 750 CFM	MIN. POSITION -175 CFM	MIN. POSITION -175 CFM	1100 CFM	1000 CFM
CO2 SENSOR PPM BELOW SETPOINT IN CRAFT ROOM	OFF	MIN. POSITION – 350CFM	MIN. POISTION – 350CFM	MIN. POSITION -175 CFM	MIN. POSITION -175 CFM	700 CFM	600 CFM
CO2 SENSOR PPM ABOVE SETPOINT IN CRAFT ROOM	ACTIVATES VAV-1 & EACD-1	MAX. POSITION – 750 CFM	MAX. POSITION – 750 CFM	MIN. POSITION -175 CFM	MIN. POSITION -175 CFM	1100 CFM	1000 CFM
CO2 SENSOR PPM BELOW SETPOINT IN CAFE	OFF	MIN. POSITION – 350CFM	MIN. POSITION – 350CFM	MIN. POSITION -175 CFM	MIN. POSITION -175 CFM	700 CFM	600 CFM
CO2 SENSOR PPM ABOVE SETPOINT IN CAFE	ACTIVATES VAV-2 & EACD-2	MIN. POSITION – 350CFM	MIN. POSITION – 350CFM	MAX. POSITION – 400 CFM	MAX. POSITION – 400 CFM	925 CFM	825 CFM
CO2 SENSOR PPM ABOVE SETPOINT IN EITHER OF CRAFT ROOM OR ACTIVITY ROOM AND CAFE	ACTIVATES VAV-1,2 & EACD-1,2	MAX. POSITION – 750 CFM	MAX. POSITION – 750 CFM	MAX. POSITION – 400 CFM	MAX. POSITION – 400 CFM	1325 CFM	1225 CFM

H. SUPPLY AND EXHAUST FAN VFD CONTROL –DURING OCCUPIED MODE, THE DOAS SUPPLY AND EXHAUST FANS SHALL OPERATE CONTINUOUSLY. THE DOAS SUPPLY AIRFLOW SHALL MODULATE BETWEEN 700 CFM MINIMUM AND 1,325 CFM MAXIMUM, AND THE EXHAUST AIRFLOW SHALL MODULATE BETWEEN 600 CFM MINIMUM AND 1,225 CFM MAXIMUM. THE UNIT SHALL MAINTAIN A 100 CFM POSITIVE AIRFLOW DIFFERENTIAL BETWEEN THE SUPPLY AND EXHAUST AIRFLOWS.

THE DOAS SUPPLY AND EXHAUST FAN SPEEDS SHALL BE MODULATED BY THE UNIT CONTROLLER THROUGH THE RESPECTIVE VFDS IN RESPONSE TO THE CO2-BASED DEMAND-CONTROLLED VENTILATION SEQUENCE AND THE ASSOCIATED VAV BOX AND EXHAUST AIR CONTROL DAMPER POSITIONS, AS FOLLOWS:

H.A. WHEN THE CO2 LEVELS IN THE ACTIVITY ROOM, CRAFT ROOM, AND CAFE ARE BELOW THEIR RESPECTIVE SETPOINTS, VAV-1 AND EACD-1 SHALL REMAIN AT THEIR MINIMUM AIRFLOW OF 350 CFM, AND VAV-2 AND EACD-2 SHALL REMAIN AT THEIR MINIMUM AIRFLOW OF 175 CFM. THE DOAS SHALL PROVIDE 700 CFM SUPPLY AIR AND 600 CFM EXHAUST AIR.

H.B. WHEN THE CO2 LEVEL IN EITHER THE ACTIVITY ROOM OR CRAFT ROOM RISES ABOVE SETPOINT, VAV-1 AND EACD-1 SHALL MODULATE TO THEIR MAXIMUM AIRFLOW OF 750 CFM. VAV-2 AND EACD-2 SHALL REMAIN AT THEIR MINIMUM AIRFLOW OF 175 CFM. THE DOAS SHALL PROVIDE 1,100 CFM SUPPLY AIR AND 1,000 CFM EXHAUST AIR.

H.C. WHEN THE CO2 LEVEL IN THE CAFE RISES ABOVE SETPOINT, VAV-2 AND EACD-2 SHALL MODULATE TO THEIR MAXIMUM AIRFLOW OF 400 CFM. VAV-1 AND EACD-1 SHALL REMAIN AT THEIR MINIMUM AIRFLOW OF 350 CFM. THE DOAS SHALL PROVIDE 925 CFM SUPPLY AIR AND 825 CFM EXHAUST AIR.

H.D. WHEN THE CO2 LEVEL IN EITHER THE ACTIVITY ROOM OR CRAFT ROOM AND THE CO2 LEVEL IN THE CAFE ARE SIMULTANEOUSLY ABOVE THEIR RESPECTIVE SETPOINTS, VAV-1 AND EACD-1 SHALL MODULATE TO 750 CFM, AND VAV-2 AND EACD-2 SHALL MODULATE TO 400 CFM. THE DOAS SHALL PROVIDE 1,325 CFM SUPPLY AIR AND 1,225 CFM EXHAUST AIR.

THE VAV BOXES, EXHAUST AIR CONTROL DAMPERS, AND DOAS FAN AIRFLOWS SHALL MODULATE BETWEEN THE INDICATED MINIMUM AND MAXIMUM VALUES AS THE CO2 LEVELS VARY. AS THE VAV BOX DAMPERS MODULATE CLOSED, THE INCREASE IN SUPPLY-DUCT STATIC PRESSURE SHALL SIGNAL THE UNIT CONTROLLER TO REDUCE THE SUPPLY FAN SPEED. AS THE VAV BOX DAMPERS MODULATE OPEN, THE SUPPLY-DUCT STATIC PRESSURE SHALL DECREASE, AND THE DUCT STATIC-PRESSURE SENSOR SHALL SIGNAL THE UNIT CONTROLLER TO INCREASE THE SUPPLY FAN SPEED TO RESTORE THE DUCT STATIC PRESSURE TO ITS SETPOINT. THE EXHAUST FAN SHALL BE INTERLOCKED WITH THE SUPPLY FAN AND ASSOCIATED EXHAUST AIR CONTROL DAMPERS TO MAINTAIN THE REQUIRED EXHAUST AIRFLOW AND 100 CFM POSITIVE AIRFLOW DIFFERENTIAL. DUCT STATIC-PRESSURE SENSOR LOCATION SHALL BE IN ACCORDANCE WITH THE DOAS MANUFACTURER'S RECOMMENDATIONSTHE DOAS UNIT WILL BE FACTORY SUPPLIED WITH A DIRECT DRIVE SUPPLY FAN. THE SUPPLY FAN WILL WORK AS PER THE WORKING SCHEDULE MENTIONED ABOVE IN 'A' AND ONLY WHEN THERE IS A VENTILATION REQUIREMENT AS PER DCV SETPOINT. THE SUPPLY FAN WILL OPERATE BETWEEN A SPECIFIED MINIMUM AND MAXIMUM SPEED AS REQUIRED BY UNIT CONTROLLER TO SATISFY DEMAND CONTROL VENTILATION REQUIREMENT BASED ON CO2 SENSOR'S CO2 PPM READING.

I. EXHAUST AIR CONTROL DAMPERS EACD-1 AND EACD-2 – EACD-1 SHALL BE INTERLOCKED WITH VAV-1 AND SHALL MODULATE BETWEEN 350 CFM AND 750 CFM IN RESPONSE TO THE CO2 DEMAND FROM THE ACTIVITY ROOM OR CRAFT ROOM. EACD-2 SHALL BE INTERLOCKED WITH VAV-2 AND SHALL MODULATE BETWEEN 175 CFM AND 400 CFM IN RESPONSE TO THE CO2 DEMAND FROM THE CAFE. EACH EACD SHALL TRACK THE AIRFLOW OF ITS ASSOCIATED VAV BOX TO MAINTAIN EQUAL SUPPLY AND EXHAUST AIRFLOWS FOR THE RESPECTIVE DEMAND-CONTROLLED VENTILATION ZONETHE EXHAUST FAN WILL ACTIVATE BASED ON THE OUTSIDE AIR DAMPER POSITION AND WILL MODULATE BETWEEN AN ADJUSTABLE MIN. AND MAX. AS THE OA DAMPER OPENS TO PROVIDE RELIEF.

SEQUENCE OF OPERATION

1. VAV TERMINAL UNITS WITH ELECTRIC REHEAT – VAV-148, VAV-152, VAV-154, VAV-164, AND VAV-168 SHALL BE SINGLE-DUCT, PRESSURE-INDEPENDENT VAV TERMINAL UNITS WITH MODULATING SCR ELECTRIC REHEAT. EACH VAV BOX SHALL BE PROVIDED WITH A DDC CONTROLLER, AIRFLOW SENSOR, DAMPER ACTUATOR, SPACE-TEMPERATURE SENSOR, DISCHARGE-AIR-TEMPERATURE SENSOR, AND ALL REQUIRED ELECTRIC-HEAT SAFETIES. CONTROLS SHALL BE PROVIDED BY THE BMS CONTRACTOR. AIRFLOW AND ELECTRIC-HEAT CAPACITY SHALL BE AS INDICATED ON THE VAV SCHEDULE.

A. OCCUPIED: THE OCCUPANCY MODE SHALL BE COMMUNICATED TO THE VAV CONTROLLER BY THE BAS. DURING OCCUPIED MODE, THE VAV CONTROLLER SHALL MAINTAIN THE SPACE TEMPERATURE AT THE ACTIVE OCCUPIED HEATING OR COOLING SETPOINT. APPLICABLE VENTILATION, MINIMUM-AIRFLOW, HEATING-AIRFLOW, AND MAXIMUM-AIRFLOW SETPOINTS SHALL BE ENFORCED. OCCUPIED MODE SHALL BE THE DEFAULT MODE OF THE VAV BOX.

B. OCCUPIED STANDBY: WHERE AN OCCUPANCY SENSOR IS PROVIDED, THE VAV BOX MAY ENTER OCCUPIED-STANDBY MODE WHILE THE BAS SCHEDULE REMAINS OCCUPIED. DURING OCCUPIED-STANDBY MODE, THE ACTIVE HEATING AND COOLING SETPOINTS SHALL BE RELAXED, AND THE MINIMUM AND VENTILATION AIRFLOW SETPOINTS SHALL BE REDUCED AS INDICATED ON THE VAV SCHEDULE.

C. UNOCCUPIED: DURING UNOCCUPIED MODE, THE VAV DAMPER SHALL REMAIN CLOSED EXCEPT UPON A VALID UNOCCUPIED HEATING OR COOLING DEMAND.
WHEN THE SPACE TEMPERATURE FALLS BELOW THE UNOCCUPIED HEATING SETPOINT OF 60.0 DEG. F (ADJ.), THE VAV CONTROLLER SHALL TRANSMIT A HEATING REQUEST TO THE BAS AND ASSOCIATED RTU. THE VAV DAMPER SHALL OPEN TO THE SCHEDULED HEATING AIRFLOW SETPOINT BEFORE RTU HEATING IS ENABLED. THE ELECTRIC REHEAT SHALL BE ENABLED ONLY WHEN THE PRIMARY-AIR-TEMPERATURE AND AIRFLOW REQUIREMENTS DESCRIBED UNDER HEATING MODE HAVE BEEN SATISFIED.
WHEN THE SPACE TEMPERATURE RISES ABOVE THE UNOCCUPIED HEATING SETPOINT OF 60.0 DEG. F (ADJ.) PLUS THE UNOCCUPIED DIFFERENTIAL OF 4.0 DEG. F (ADJ.), THE ELECTRIC REHEAT SHALL BE DISABLED. FOLLOWING COMPLETION OF THE RTU HEATING AND PURGE SEQUENCE, THE VAV DAMPER SHALL RETURN TO ITS UNOCCUPIED POSITION.
WHEN THE SPACE TEMPERATURE RISES ABOVE THE UNOCCUPIED COOLING SETPOINT OF 85.0 DEG. F (ADJ.), THE VAV CONTROLLER SHALL TRANSMIT A COOLING REQUEST TO THE BAS AND ASSOCIATED RTU, AND THE VAV DAMPER SHALL MODULATE OPEN AS REQUIRED. WHEN THE SPACE TEMPERATURE FALLS BELOW THE UNOCCUPIED COOLING SETPOINT OF 85.0 DEG. F (ADJ.) MINUS THE UNOCCUPIED DIFFERENTIAL OF 4.0 DEG. F (ADJ.), THE COOLING REQUEST SHALL BE REMOVED AND THE VAV DAMPER SHALL RETURN TO ITS UNOCCUPIED POSITION.

D. OCCUPIED BYPASS: THE OCCUPANT SHALL BE ABLE TO TEMPORARILY OVERRIDE UNOCCUPIED MODE FROM THE SPACE SENSOR. THE OVERRIDE SHALL LAST FOR A MAXIMUM OF FOUR HOURS (ADJ.) AND MAY BE CANCELLED AT ANY TIME FROM THE SPACE SENSOR. DURING THE OVERRIDE, THE VAV BOX SHALL OPERATE IN OCCUPIED MODE.

E. HEATING AND COOLING SETPOINTS: THE SPACE-TEMPERATURE SETPOINT SHALL BE DETERMINED BY THE BAS-COMMUNICATED SETPOINT, LOCAL ADJUSTMENT, OR LOCALLY STORED DEFAULT SETPOINT. WHERE BOTH A BAS-COMMUNICATED SETPOINT AND LOCAL SETPOINT ARE AVAILABLE, THE BAS-COMMUNICATED SETPOINT SHALL TAKE PRIORITY.
THE DEFAULT SETPOINTS SHALL BE:
OCCUPIED COOLING: 74.0 DEG. F
UNOCCUPIED COOLING: 85.0 DEG. F
OCCUPIED-STANDBY COOLING: 78.0 DEG. F
OCCUPIED HEATING: 71.0 DEG. F
UNOCCUPIED HEATING: 60.0 DEG. F
OCCUPIED-STANDBY HEATING: 67.0 DEG. F

E.A. SETPOINT OVERRIDE WITH LIMITATIONS: EACH SPACE THERMOSTAT/CONTROLLER SHALL PERMIT LOCAL ADJUSTMENT OF THE OCCUPIED HEATING AND COOLING SETPOINTS BY ±2 DEG. F FROM THE SETPOINTS COMMUNICATED BY THE BAS. LOCAL ADJUSTMENT SHALL NOT OVERRIDE THE UNOCCUPIED SETPOINTS OR BAS-ESTABLISHED SETPOINT LIMITS.

F. COOLING MODE: WHEN THE SPACE TEMPERATURE RISES ABOVE THE ACTIVE COOLING SETPOINT, THE VAV CONTROLLER SHALL MODULATE THE DAMPER BETWEEN THE ACTIVE MINIMUM COOLING AIRFLOW SETPOINT AND MAXIMUM COOLING AIRFLOW SETPOINT TO MAINTAIN SPACE TEMPERATURE. AS THE SPACE TEMPERATURE APPROACHES THE ACTIVE COOLING SETPOINT, THE VAV DAMPER SHALL MODULATE TOWARD THE ACTIVE MINIMUM COOLING AIRFLOW SETPOINT.

G. HEATING MODE – SCR ELECTRIC REHEAT: ELECTRIC REHEAT SHALL BE PERMITTED ONLY WHEN:

G.A. THE SPACE TEMPERATURE IS BELOW THE ACTIVE HEATING SETPOINT.

G.B. THE PRIMARY-AIR TEMPERATURE IS AT LEAST 5.0 DEG. F BELOW THE REHEAT ENABLE SETPOINT OF 70.0 DEG. F (ADJ.).

G.C. THE ASSOCIATED RTU SUPPLY FAN IS PROVEN ON.

G.D. MEASURED VAV AIRFLOW IS AT OR ABOVE THE SCHEDULED MINIMUM HEATING AIRFLOW SETPOINT.
UPON A HEATING DEMAND, THE VAV DAMPER SHALL MODULATE TO THE SCHEDULED HEATING AIRFLOW SETPOINT, AND THE SCR ELECTRIC HEATER SHALL MODULATE AS REQUIRED TO MAINTAIN THE ACTIVE SPACE-HEATING SETPOINT.
THE ELECTRIC HEATER SHALL BE LIMITED TO THE DESIGN HEATING DISCHARGE-AIR-TEMPERATURE SETPOINT (ADJ.). IF ADDITIONAL HEATING IS REQUIRED AFTER THE DISCHARGE-AIR-TEMPERATURE SETPOINT HAS BEEN REACHED, THE VAV DAMPER MAY MODULATE BETWEEN THE SCHEDULED MINIMUM AND MAXIMUM HEATING AIRFLOW SETPOINTS WHILE THE SCR ELECTRIC HEATER MODULATES TO MAINTAIN THE DESIGN HEATING DISCHARGE-AIR-TEMPERATURE SETPOINT.
WHEN THE SPACE HEATING DEMAND IS SATISFIED, THE ELECTRIC HEATER SHALL BE DISABLED AND THE VAV DAMPER SHALL RETURN TO THE APPLICABLE MINIMUM AIRFLOW SETPOINT.

H. RTU HEATING AND MORNING WARM-UP: UPON A SYSTEM HEATING OR MORNING WARM-UP COMMAND FROM THE ASSOCIATED RTU, EACH VAV DAMPER SHALL OPEN TO ITS SCHEDULED HEATING AIRFLOW SETPOINT BEFORE RTU HEATING IS ENABLED.
DURING RTU HEATING, LOCAL ELECTRIC REHEAT SHALL REMAIN SUBJECT TO THE PRIMARY-AIR-TEMPERATURE AND MINIMUM-AIRFLOW INTERLOCKS DESCRIBED ABOVE. ELECTRIC REHEAT SHALL NOT OPERATE WHEN THE PRIMARY AIR IS WARM ENOUGH TO SATISFY THE ZONE HEATING DEMAND.

I. DEMAND-CONTROLLED VENTILATION: THIS SECTION SHALL APPLY ONLY TO VAV-148 AND VAV-152 SERVING ROOM 152A.
THE BAS SHALL MONITOR THE SPACE CO_2 SENSOR ASSOCIATED WITH EACH SPACE. WHEN THE SPACE CO_2 LEVEL RISES ABOVE THE DESIGN MINIMUM CO_2 SETPOINT, THE VAV CONTROLLER SHALL RESET THE ACTIVE MINIMUM AIRFLOW SETPOINT UPWARD, AS REQUIRED, BETWEEN THE SCHEDULED OCCUPIED MINIMUM AIRFLOW AND MAXIMUM COOLING AIRFLOW SETPOINT.
THE BAS SHALL TRANSMIT THE CO_2 DEMAND TO THE ASSOCIATED RTU CONTROLLER. THE RTU OUTDOOR-AIR DAMPER SHALL RESPOND IN ACCORDANCE WITH THE RTU DEMAND-CONTROLLED VENTILATION SEQUENCE.
WHEN THE SPACE CO_2 LEVEL FALLS BELOW THE DCV MINIMUM CO_2 SETPOINT, THE ACTIVE VAV MINIMUM AIRFLOW SETPOINT SHALL RETURN TO THE NORMAL OCCUPIED MINIMUM AIRFLOW SETPOINT.
THE VAV AIRFLOW SHALL NOT EXCEED THE SCHEDULED MAXIMUM COOLING AIRFLOW SETPOINT DURING DCV OPERATION.

J. SPACE-SENSOR FAILURE: UPON FAILURE OF A SPACE-TEMPERATURE SENSOR, AN ALARM SHALL ANNUNCIATE AT THE BAS, THE ELECTRIC REHEAT SHALL BE DISABLED, AND THE VAV DAMPER SHALL:
MODULATE TO THE OCCUPIED MINIMUM AIRFLOW SETPOINT WHEN THE SYSTEM IS OCCUPIED.
CLOSE WHEN THE SYSTEM IS UNOCCUPIED.
UPON FAILURE OF AN AIRFLOW SENSOR, THE ELECTRIC REHEAT SHALL BE DISABLED, THE VAV DAMPER SHALL ASSUME ITS PROGRAMMED FAIL-SAFE POSITION, AND AN ALARM SHALL ANNUNCIATE AT THE BAS.

K. SPACE-HUMIDITY MONITORING: WHERE A SPACE-HUMIDITY SENSOR IS PROVIDED, THE VAV CONTROLLER SHALL MONITOR SPACE RELATIVE HUMIDITY AND TRANSMIT THE VALUE TO THE BAS FOR USE BY THE ASSOCIATED RTU DEHUMIDIFICATION AND DISCHARGE-AIR-TEMPERATURE RESET SEQUENCES.
UPON FAILURE OF A SPACE-HUMIDITY SENSOR, AN ALARM SHALL ANNUNCIATE AT THE BAS, AND THE FAILED SENSOR SHALL BE EXCLUDED FROM THE RTU HUMIDITY-CONTROL LOGIC.

L. ELECTRIC-HEAT SAFETIES: THE ELECTRIC HEATER SHALL BE IMMEDIATELY DISABLED UPON:

L.A. LOSS OF RTU SUPPLY-FAN STATUS.

L.B. LOSS OF VAV AIRFLOW OR AIRFLOW BELOW THE MINIMUM SAFE HEATING AIRFLOW.

L.C. ELECTRIC-HEATER HIGH-TEMPERATURE-LIMIT TRIP.

L.D. VAV CONTROLLER FAILURE.

L.E. RTU SMOKE-DETECTOR SHUTDOWN OR SYSTEM EMERGENCY SHUTDOWN.
ELECTRIC-HEAT SAFETY DEVICES SHALL BE HARDWIRED WHERE REQUIRED BY THE MANUFACTURER. A COMMON ELECTRIC-HEAT FAILURE OR SAFETY ALARM SHALL ANNUNCIATE AT THE BAS.

ISSUED FOR BID-9/25/26

9.23.26

APPROVED

William R. Long
PROFESSIONAL ENGINEER
NEW JERSEY LICENSE NO. 33012

REVISIONS	DATE	BY

Tri-State Architects, P.C. / Alaimo Group
WILLIAM R. LONG, P.E. LIC. 33012
ANITA S. ARADHYA, R.A. LIC. 18769
200 HIGH STREET MOUNT HOLLY, N.J.

DATE: AUG. 2026
DESIGNED BY: IV
DRAWN BY: RKR
CHECKED BY: 9/22/26
DEPT. HEAD: 9/22/26

CLIENT: WILLINGBORO TOWNSHIP
PROJECT LOCATION: WILLINGBORO TWP. BURLINGTON COUNTY NEW JERSEY
PROJECT NO.: M-0410-0011-000
CONTRACT NO.: BID#8-2026

KENNEDY CENTER
RENOVATION TO THE SENIOR CENTER

HVAC- SEQUENCE
OF OPERATIONS - I

SCALE: AS SHOWN

SHEET
H9

FILE NO.:

Plotted: 9/22/2026 10:06 AM Last saved: 9/21/2026 4:03 PM File Name: M:\Projects\M0410001100\Drawings\GLQ-H9-H10-Sequence.dwg

SEQUENCE OF OPERATION

1. RTU-20 – VARIABLE AIR VOLUME ROOF TOP UNITS WITH HEAT PUMP, AUX. ELECTRIC HEATING, HOT GAS REHEAT, COMPARATIVE ENTHALPY ECONOMIZER (0–100%), AND BAROMETRIC RELIEF. CONTROLS SHALL BE PROVIDED BY BMS CONTRACTOR. BMS CONTRACTOR SHALL COORDINATE WITH CONTRACTOR AND UNIT MANUFACTURER TO PROVIDE REQUIRED CONTROLS.
    - A. BAS INTERFACE: THE BUILDING AUTOMATION SYSTEM (BAS) SHALL SEND THE CONTROLLER OCCUPIED BYPASS, MORNING WARM–UP/PRE–COOL, OCCUPIED/UNOCCUPIED AND HEAT/COOL MODES. THE BAS SHALL ALSO SEND THE DISCHARGE AIR TEMPERATURE SETPOINT AND THE DUCT STATIC PRESSURE SETPOINT. IF A BAS IS NOT PRESENT, OR COMMUNICATION IS LOST WITH THE BAS THE CONTROLLER SHALL OPERATE USING DEFAULT MODES AND SETPOINTS.
    - B. OCCUPIED: DURING OCCUPIED PERIODS, THE SUPPLY FAN SHALL RUN CONTINUOUSLY AND THE MIXED AIR DAMPERS SHALL OPEN TO MAINTAIN MINIMUM VENTILATION REQUIREMENTS. THE UNIT CONTROLLER SHALL CONTROL THE SUPPLY FAN SPEED TO MAINTAIN THE CURRENT SUPPLY DUCT STATIC PRESSURE SETPOINT (ADJ.). UPON A CALL FOR DX COOLING, THE UNIT CONTROLLER SHALL ENABLE THE FIRST FIXED–SPEED COMPRESSOR. IF THE FIRST COMPRESSOR CANNOT SATISFY THE COOLING LOAD, THE UNIT CONTROLLER SHALL ENABLE THE NEXT COMPRESSOR IN SEQUENCE UNTIL THE ACTIVE DISCHARGE–AIR–TEMPERATURE COOLING SETPOINT IS SATISFIED. UPON A CALL FOR HEATING, THE UNIT CONTROLLER SHALL ENABLE AND STAGE THE HEAT–PUMP COMPRESSORS AS THE PRIMARY SOURCE OF HEATING TO MAINTAIN THE ACTIVE DISCHARGE–AIR TEMPERATURE SETPOINT. IF THE HEAT–PUMP HEATING CAPACITY IS INSUFFICIENT TO MAINTAIN THE ACTIVE DISCHARGE–AIR TEMPERATURE SETPOINT, THE SUPPLEMENTAL ELECTRIC HEAT SHALL BE ENABLED AS THE LAST STAGE OF HEATING. THE SUPPLEMENTAL ELECTRIC HEAT MAY OPERATE CONCURRENTLY WITH THE HEAT–PUMP HEATING AS REQUIRED AND SHALL BE DISABLED BEFORE THE HEAT–PUMP HEATING STAGES AS THE HEATING DEMAND DECREASES. IF ECONOMIZING IS ENABLED, THE OUTDOOR AIR OR MIXED AIR DAMPERS SHALL MODULATE TO MAINTAIN THE DISCHARGE AIR TEMPERATURE SETPOINT.
    - C. UNOCCUPIED: WHEN THE SPACE TEMPERATURE IS BELOW THE UNOCCUPIED HEATING SETPOINT OF 60.0 DEG. F (ADJ.) THE SUPPLY FAN SHALL BE COMMANDED ON, THE OUTSIDE AIR DAMPER SHALL REMAIN CLOSED AND THE HEAT–PUMP HEATING SHALL BE ENABLED. IF THE HEAT–PUMP HEATING IS INSUFFICIENT TO SATISFY THE UNOCCUPIED HEATING DEMAND, THE SUPPLEMENTAL ELECTRIC HEAT SHALL BE ENABLED AS THE LAST STAGE OF HEATING. WHEN THE SPACE TEMPERATURE RISES ABOVE THE UNOCCUPIED HEATING SETPOINT OF 60.0 DEG. F (ADJ.) PLUS THE UNOCCUPIED DIFFERENTIAL OF 4.0 DEG. F (ADJ.), THE HEAT–PUMP HEATING AND SUPPLEMENTAL ELECTRIC HEAT SHALL BE DISABLED, AND THE SUPPLY FAN SHALL STOP AFTER THE APPLICABLE PURGE PERIOD. WHEN THE SPACE TEMPERATURE IS ABOVE THE UNOCCUPIED COOLING SETPOINT OF 85.0 DEG. F (ADJ.) THE SUPPLY FAN SHALL BE COMMANDED ON, THE OUTSIDE AIR DAMPER SHALL OPEN IF ECONOMIZING IS ENABLED AND REMAIN CLOSED IF ECONOMIZING IS DISABLED AND THE DX COOLING SHALL BE ENABLED. WHEN THE SPACE TEMPERATURE FALLS BELOW THE UNOCCUPIED COOLING SETPOINT OF 85.0 DEG.F MINUS THE UNOCCUPIED DIFFERENTIAL OF 4.0 DEG. F (ADJ.) THE SUPPLY FAN SHALL STOP, THE DX COOLING SHALL BE DISABLED AND THE OUTSIDE AIR DAMPER SHALL CLOSE.
    - D. OPTIMAL START: THE BAS SHALL MONITOR THE SCHEDULED OCCUPIED TIME, OCCUPIED SPACE SETPOINTS AND SPACE TEMPERATURE TO CALCULATE WHEN THE OPTIMAL START OCCURS
    - E. OPTIMAL STOP: THE BAS SHALL MONITOR THE SCHEDULED UNOCCUPIED TIME, OCCUPIED SETPOINTS AND SPACE TEMPERATURE TO CALCULATE WHEN THE OPTIMAL STOP OCCURS. WHEN THE OPTIMAL STOP MODE IS ACTIVE THE UNIT CONTROLLER SHALL MAINTAIN THE SPACE TEMPERATURE TO THE SPACE TEMPERATURE OFFSET SETPOINT. OUTSIDE AIR DAMPER SHALL REMAIN ENABLED TO PROVIDE MINIMUM VENTILATION
    - F. MORNING WARM–UP MODE: DURING OPTIMAL START, IF THE AVERAGE SPACE TEMPERATURE IS BELOW THE OCCUPIED HEATING SETPOINT A MORNING WARM–UP MODE SHALL BE ACTIVATED. WHEN MORNING WARM–UP IS INITIATED THE UNIT SHALL ENABLE THE SUPPLY FAN AND HEAT–PUMP HEATING. SUPPLEMENTAL ELECTRIC HEAT SHALL BE ENABLED AS THE LAST STAGE OF HEATING IF THE HEAT–PUMP HEATING IS INSUFFICIENT TO SATISFY THE MORNING WARM–UP DEMAND. THE OUTSIDE AIR DAMPER SHALL REMAIN CLOSED. WHEN THE SPACE TEMPERATURE REACHES THE OCCUPIED HEATING SETPOINT (ADJ.), THE UNIT SHALL TRANSITION TO THE OCCUPIED MODE.
    - G. PRE–COOL MODE: DURING OPTIMAL START, IF THE AVERAGE SPACE TEMPERATURE IS ABOVE THE OCCUPIED COOLING SETPOINT, PRE–COOL MODE SHALL BE ACTIVATED. WHEN PRE–COOL IS INITIATED THE UNIT SHALL ENABLE THE FAN AND COOLING OR ECONOMIZER. THE OUTSIDE AIR DAMPER SHALL REMAIN CLOSED, UNLESS ECONOMIZING. WHEN THE SPACE TEMPERATURE REACHES OCCUPIED COOLING SETPOINT (ADJ.), THE UNIT SHALL TRANSITION TO THE OCCUPIED MODE
    - H. OCCUPIED BYPASS: THE BAS SHALL MONITOR THE STATUS OF THE ON AND CANCEL BUTTONS OF THE SPACE TEMPERATURE SENSORS. WHEN AN OCCUPIED BYPASS REQUEST IS RECEIVED FROM A SPACE SENSOR, THE UNIT SHALL TRANSITION FROM ITS CURRENT OCCUPANCY MODE TO OCCUPIED BYPASS MODE AND THE UNIT SHALL MAINTAIN THE SPACE TEMPERATURE TO THE OCCUPIED SETPOINTS (ADJ.)
    - I. HEAT/COOL MODE:
        - I.A. COOLING: THE UNIT CONTROLLER SHALL USE THE DISCHARGE AIR TEMPERATURE SENSOR AND DISCHARGE AIR TEMPERATURE COOLING SETPOINT TO DETERMINE WHEN TO INITIATE REQUESTS FOR COOLING. DISCHARGE AIR SETPOINT SHALL BE MAINTAINED BY CONTROLLING THE COOLING AS REQUIRED
        - I.B. HEATING: THE UNIT CONTROLLER SHALL USE THE DISCHARGE AIR TEMPERATURE SENSOR AND DISCHARGE AIR TEMPERATURE HEATING SETPOINT TO DETERMINE WHEN TO INITIATE REQUESTS FOR HEATING. DISCHARGE AIR SETPOINT SHALL BE MAINTAINED BY CONTROLLING THE HEATING AS REQUIRED. DURING UNOCCUPIED HEATING OR MORNING WARM–UP MODE, THE UNIT HEAT REQUEST SHALL BE COMMUNICATED TO THE SYSTEM VAVS PRIOR TO COMMENCING HEATING OPERATION TO ALLOW VAV UNITS TO OPEN. THE VARIABLE FREQUENCY DRIVE SHALL BE COMMANDED TO 100% AND THE HEAT SHALL BE STAGED ON AND OFF TO SATISFY THE ZONE TEMPERATURE SETPOINT
    - J. SUPPLEMENTAL HEAT FOR HEAT PUMP CONFIGURATION: THE SUPPLEMENTAL ELECTRIC HEAT SHALL BE ENABLED AS THE LAST STAGE OF HEATING WHEN THE HEAT–PUMP HEATING IS UNABLE TO MAINTAIN THE ACTIVE DISCHARGE–AIR TEMPERATURE OR SPACE–TEMPERATURE SETPOINT. THE SUPPLEMENTAL ELECTRIC HEAT MAY OPERATE CONCURRENTLY WITH THE HEAT–PUMP HEATING AS REQUIRED. AS THE HEATING DEMAND DECREASES, THE SUPPLEMENTAL ELECTRIC HEAT SHALL BE DISABLED BEFORE THE HEAT–PUMP HEATING STAGES.
    - K. HEAT–PUMP DEFROST AND LOW–AMBIENT OPERATION: HEAT–PUMP DEFROST, COMPRESSOR LOW–AMBIENT LOCKOUT, AND SUPPLEMENTAL ELECTRIC–HEAT OPERATION DURING DEFROST SHALL BE CONTROLLED IN ACCORDANCE WITH THE RTU MANUFACTURER'S FACTORY CONTROL SEQUENCE. SUPPLEMENTAL ELECTRIC HEAT MAY BE ENABLED DURING DEFROST OR WHEN HEAT–PUMP HEATING IS UNAVAILABLE DUE TO A MANUFACTURER–REQUIRED LOW–AMBIENT LOCKOUT.
    - L. DISCHARGE AIR TEMPERATURE RESET CONTROL: THE DISCHARGE AIR TEMPERATURE SETPOINT SHALL BE RESET TO THE OPTIMAL SETPOINT COMMUNICATED BY THE BAS. THE BAS SHALL RESET THE DISCHARGE AIR TEMPERATURE SETPOINT BASED ON THE CURRENT OUTSIDE AIR TEMPERATURE, BUT SHALL OVERRIDE THIS RESET FUNCTION AND RETURN THE DISCHARGE AIR TEMPERATURE SETPOINT TO 55.0 DEG. F (ADJ.) IF MORE THAN TWO (ADJ.) ZONES BEGIN TO OVERHEAT. ALSO, THE BAS SHALL OVERRIDE THIS RESET FUNCTION WHENEVER OUTDOOR DEW POINT IS HIGHER THAN 60.0 DEG. F (ADJ.) OR INDOOR HUMIDITY IS HIGHER THAN 60% RH (ADJ.). IF THE DISCHARGE AIR TEMPERATURE DROPS BELOW THE MINIMUM LIMIT, A LOW TEMPERATURE ALARM SHALL ANNUNCIATE AND THE UNIT SHALL SHUT DOWN. IF THE DISCHARGE AIR TEMPERATURE RISES ABOVE THE MAXIMUM LIMIT, A HIGH TEMPERATURE ALARM SHALL ANNUNCIATE.
    - M. ECONOMIZER:
        - M.A. ENABLE (COMPARATIVE ENTHALPY): OUTSIDE AIR (OA) ENTHALPY SHALL BE COMPARED WITH RETURN AIR (RA) ENTHALPY POINT. THE ECONOMIZER SHALL ENABLE WHEN OA ENTHALPY IS LESS THAN RA ENTHALPY – 2.0 BTU/LB. THE ECONOMIZER SHALL DISABLE WHEN OA ENTHALPY IS GREATER THAN RA ENTHALPY
        - M.B. OPERATION: THE SUPPLY AIR SENSOR SHALL MEASURE THE DRY BULB TEMPERATURE OF THE AIR LEAVING THE EVAPORATOR COIL WHILE ECONOMIZING. WHEN ECONOMIZING IS ENABLED AND THE UNIT IS OPERATING IN THE COOLING MODE, THE ECONOMIZER DAMPER SHALL BE MODULATED BETWEEN ITS MINIMUM POSITION AND 100% TO MAINTAIN THE DISCHARGE AIR TEMPERATURE SETPOINT. THE ECONOMIZER DAMPER SHALL MODULATE TOWARD MINIMUM POSITION IN THE EVENT THE DISCHARGE AIR TEMPERATURE FALLS BELOW THE DISCHARGE LOW LIMIT TEMPERATURE SETPOINT. COMPRESSORS SHALL BE DELAYED FROM OPERATING UNTIL THE ECONOMIZER HAS OPENED TO 100%
    - N. VENTILATION: THE OA DAMPER ON RTU SHALL BE BALANCED AND POSITIONED TO BRING IN MIN. OA OF 950 CFM (16% OA). THE UNIT SHALL BE PROVIDED WITH TWO SPACE MOUNTED CO2 SENSORS – ONE LOCATED IN 152A BROWSING ROOM AND THE OTHER IN 148 CHILDREN'S ROOM. REFER TO H1 FOR LOCATION. WHEN THE SPACE CO2 LEVEL IN EITHER SPACES IS GREATER THAN OR EQUAL TO THE DESIGN MINIMUM CO2 SETPOINT, THE OUTDOOR AIR DAMPER SHALL MODULATE TO POSITION 1 TO BRING IN 1315 CFM (22.5% OA). IF THE CO2 PPM LEVELS IN EITHER SPACE IS STILL GREATER THAN OR EQUAL TO THE DESIGN MINIMUM CO2 SETPOINT, THEN OA DAMPER SHALL MODULATE TO POSITION 2 TO BRING IN 2350 CFM (40%OA). WHEN THE SPACE CO2 LEVEL IS LESS THAN OR EQUAL TO THE DCV MINIMUM CO2 SETPOINT, THE OUTDOOR AIR DAMPER SHALL CLOSE TO THE DCV MINIMUM OUTDOOR AIR DAMPER SETPOINT. IF THERE IS A CALL FOR ECONOMIZER COOLING, THE DAMPER SHALL BE OPENED FURTHER TO SATISFY THE COOLING REQUEST.
    - O. SUPPLY FAN: THE SUPPLY FAN SHALL BE ENABLED WHILE IN THE OCCUPIED MODE AND CYCLED ON DURING THE UNOCCUPIED MODE
    - P. SUPPLY DUCT STATIC PRESSURE CONTROL: DURING THE OCCUPIED MODE THE UNIT CONTROLLER SHALL MODULATE THE OUTPUT TO THE VARIABLE FREQUENCY DRIVE AS REQUIRED TO MAINTAIN THE SUPPLY DUCT STATIC PRESSURE SETPOINT OF 0.75 INCHES OF W.C. (ADJ.). IF THE SUPPLY DUCT STATIC PRESSURE FALLS BELOW 0.65 INCHES OF W.C. (ADJ.) THE UNIT CONTROLLER SHALL INCREASE THE OUTPUT TO THE VARIABLE FREQUENCY DRIVE TO MAINTAIN SETPOINT. IF THE SUPPLY DUCT STATIC PRESSURE RISES ABOVE 0.85 INCHES OF W.C. (ADJ.) THE UNIT CONTROLLER SHALL DECREASE THE OUTPUT TO THE VARIABLE FREQUENCY DRIVE TO MAINTAIN SETPOINT. UPON A CALL FOR HEATING OR COOLING IN THE UNOCCUPIED MODE THE UNIT CONTROLLER SHALL MODULATE THE SPEED OF THE VARIABLE FREQUENCY DRIVE TO 100%. THE FINAL SUPPLY–DUCT STATIC–PRESSURE SETPOINT SHALL BE DETERMINED DURING TESTING AND BALANCING TO MAINTAIN THE REQUIRED INLET PRESSURE AT THE HYDRAULICALLY MOST–REMOTE VAV BOX.
    - Q. STATIC PRESSURE HIGH LIMIT SETPOINT: IF FOR ANY REASON THE SUPPLY AIR PRESSURE EXCEEDS THE SUPPLY AIR PRESSURE HIGH LIMIT, THE SUPPLY FAN SHALL SHUT DOWN. THE UNIT SHALL BE ALLOWED TO RESTART THREE TIMES AFTER A 15 MINUTE OFF PERIOD. IF THE OVERPRESSURIZATION CONDITION OCCURS ON THE FOURTH RESTART, THE UNIT SHALL SHUT DOWN AND A MANUAL RESET DIAGNOSTIC IS DISPLAYED AT THE REMOTE PANEL AND/OR THE BAS SYSTEM. IF FOR ANY REASON THE SUPPLY AIR PRESSURE EXCEEDS THE FIXED SUPPLY AIR PRESSURE LIMIT OF 3.5 INCHES OF W.C. THE SUPPLY FAN SHALL SHUT DOWN. THE UNIT SHALL BE ALLOWED TO RESTART THREE TIMES. IF THE OVER PRESSURIZATION CONDITION OCCURS ON THE FOURTH RESTART, THE UNIT SHALL SHUT DOWN AND A MANUAL RESET DIAGNOSTIC IS DISPLAYED AT THE REMOTE PANEL AND/OR THE BAS SYSTEM.
    - R. RELIEF AIR BUILDING PRESSURE CONTROL: THE BAROMETRIC RELIEF DAMPERS SHALL OPEN WITH INCREASED BUILDING PRESSURE. AS THE BUILDING PRESSURE INCREASES, THE PRESSURE IN THE UNIT RETURN SECTION ALSO INCREASES, OPENING THE DAMPERS AND RELIEVING AIR.
    - S. FILTER STATUS: A DIFFERENTIAL PRESSURE SWITCH SHALL MONITOR THE DIFFERENTIAL PRESSURE ACROSS THE FILTER(S) WHEN THE FAN IS RUNNING. IF THE SWITCH CLOSES DURING NORMAL OPERATION A DIRTY FILTER ALARM SHALL ANNUNCIATE AT THE BAS.
    - T. SMOKE DETECTOR SHUTDOWN: THE UNIT SHALL SHUT DOWN IN RESPONSE TO A SIGNAL FROM THE SMOKE DETECTOR INDICATING THE PRESENCE OF SMOKE AND AN ALARM SHALL ANNUNCIATE AT THE BAS. THE SMOKE DETECTOR SHALL BE INTERLOCKED TO THE UNIT THROUGH THE DRY CONTACTS OF THE SMOKE DETECTOR. A MANUAL RESET OF THE SMOKE DETECTOR SHALL BE REQUIRED TO RESTART THE UNIT
    - U. CONDENSATE OVERFLOW SHUTDOWN: UPON A SIGNAL FROM THE CONDENSATE OVERFLOW SENSOR, MECHANICAL COOLING SHALL BE IMMEDIATELY DISABLED AND A CONDENSATE OVERFLOW ALARM SHALL ANNUNCIATE AT THE BAS. THE SUPPLY FAN AND HEATING SHALL CONTINUE TO OPERATE AS REQUIRED, UNLESS A COMPLETE UNIT SHUTDOWN IS REQUIRED BY THE RTU MANUFACTURER.

SEQUENCE OF OPERATION

1. ELECTRICAL & IT ROOM (COOLING ONLY, MSE–1 & MSC–1) – PROVIDED WITH A COOLING ONLY MINI–SPLIT INDOOR EVAPORATOR UNIT MSE–1 WHICH IS SERVED BY A MINI–SPLIT OUTDOOR CONDENSING UNIT MSC–1.
    - A. COOLING – WHEN THE ROOM TEMPERATURE RISES ABOVE SETPOINT (72 DEG F, ADJ), MINI–SPLIT CONDENSING UNIT MSC–1 IS ENERGIZED AND COOLING IS INITIATED. WHEN THE ROOM TEMPERATURE FALLS BELOW SETPOINT, CONDENSING UNIT MSC–1 IS DE–ENERGIZED AND COOLING IS TERMINATED.
    - B. MSE–1 AND MSC–1 SHALL OPERATE THROUGH THE MANUFACTURER'S FACTORY CONTROLS AND SHALL BE INTEGRATED INTO THE EXISTING BMS
    - C. BMS SHALL GENERATE A HIGH SPACE TEMPERATURE ALARM IF ROOM TEMPERATURE RISES ABOVE 80 DEG F (ADJ.)

2. ROOM 170 – ENTRANCE 2 (MSE–2 & MSHP–2) – PROVIDED WITH A HEAT PUMP MINI–SPLIT INDOOR EVAPORATOR UNIT MSE–2 WHICH IS SERVED BY A MINI–SPLIT OUTDOOR HEAT PUMP UNIT MSHP–2.
    - 2.1. COOLING – WHEN THE ROOM TEMPERATURE RISES ABOVE THE COOLING SETPOINT (72 DEG F, ADJ.), MSHP–2 SHALL OPERATE IN COOLING MODE AND COOLING SHALL BE INITIATED. WHEN THE ROOM TEMPERATURE FALLS BELOW THE COOLING SETPOINT, COOLING SHALL BE TERMINATED
    - 2.2. HEATING – WHEN THE ROOM TEMPERATURE FALLS BELOW THE HEATING SETPOINT (68 DEG F, ADJ.), MSHP–2 SHALL OPERATE IN HEATING MODE AND HEATING SHALL BE INITIATED. WHEN THE ROOM TEMPERATURE RISES ABOVE THE HEATING SETPOINT, HEATING SHALL BE TERMINATED.
    - 2.3. MSE–2 AND MSHP–2 SHALL OPERATE THROUGH THE MANUFACTURER'S FACTORY CONTROLS AND SHALL BE INTEGRATED INTO THE EXISTING BMS

3. FIN TUBE RADIATORS (FTRs) AND HOT WATER CONVECTOR (HCs):
    - 3.1. THE RTU–19/VVT ZONE DAMPER SYSTEM SHALL SERVE AS THE PRIMARY SOURCE OF SPACE HEATING. FIN–TUBE RADIATORS (FTRs) AND HOT WATER CONVECTORS (HCs), WHERE PROVIDED, SHALL OPERATE AS SECONDARY/AUXILIARY HEAT
    - 3.2. EACH FTR/HC HEATING ZONE SHALL BE PROVIDED WITH A SEPARATE SPACE THERMOSTAT/SENSOR. THE AUXILIARY HEATING SETPOINT SHALL BE MAINTAINED 4°F (ADJ.) BELOW THE HEATING SETPOINT OF THE ASSOCIATED VVT ZONE THERMOSTAT
    - 3.3. WHEN SPACE TEMPERATURE FALLS BELOW THE AUXILIARY HEATING SETPOINT AND THE ASSOCIATED VVT ZONE IS IN HEATING MODE, THE BMS SHALL ENABLE AUXILIARY HEATING AND MODULATE THE ASSOCIATED HOT WATER CONTROL VALVE(S) TO MAINTAIN THE AUXILIARY HEATING SETPOINT
    - 3.4. ROOM 153 SHALL BE PROVIDED WITH FTR–153 AND HC–1/HC–2 AS AUXILIARY HEAT. ROOMS 145 AND 168 SHALL BE PROVIDED WITH FTR–145 AND FTR–168, RESPECTIVELY, AS AUXILIARY HEAT. THE BMS SHALL MODULATE THE ASSOCIATED HOT WATER CONTROL VALVE(S) AS REQUIRED TO MAINTAIN THE AUXILIARY HEATING SETPOINT
    - 3.5. UPON SATISFACTION OF THE AUXILIARY HEATING SETPOINT, THE ASSOCIATED HOT WATER CONTROL VALVE(S) SHALL CLOSE. AUXILIARY HEATING SHALL BE DISABLED WHEN THE ASSOCIATED VVT ZONE IS IN COOLING MODE
    - 3.6. ALL AUXILIARY HEATING THERMOSTATS/SENSORS, CONTROL VALVES, AND ACTUATORS SHALL BE INTEGRATED INTO THE EXISTING BMS. PROVIDE ADJUSTABLE SETPOINTS, VALVE COMMAND/STATUS, AND ASSOCIATED CONTROL FUNCTIONS AS REQUIRED

4. CABINET UNIT HEATERS (CUH–1 & CUH–2) – CUH–1 AND CUH–2 SHALL BE CONTROLLED BY THEIR RESPECTIVE SPACE THERMOSTAT/SENSOR AND SHALL OPERATE AS REQUIRED TO MAINTAIN THE SPACE HEATING SETPOINT (68 DEG F, ADJ.)
    - 4.1. HEATING – WHEN THE SPACE TEMPERATURE FALLS BELOW THE HEATING SETPOINT, THE ASSOCIATED CUH FAN SHALL BE ENERGIZED AND THE HOT WATER CONTROL VALVE SHALL MODULATE OPEN AS REQUIRED TO MAINTAIN SPACE TEMPERATURE.
    - 4.2. WHEN THE SPACE TEMPERATURE RISES TO SETPOINT, THE HOT WATER CONTROL VALVE SHALL CLOSE AND THE CUH FAN SHALL BE DE–ENERGIZED.
    - 4.3. CUH–1 AND CUH–2 SHALL BE INTEGRATED INTO THE EXISTING BMS. BMS SHALL PROVIDE SPACE TEMPERATURE MONITORING, HEATING SETPOINT ADJUSTMENT, FAN COMMAND, AND CONTROL VALVE COMMAND.

5. RELOCATED FCUs AND FIN TUBE HEATING IN SENIOR CENTER AREA:
    - 5.1. RELOCATED FAN COIL UNITS SHALL MAINTAIN THE EXISTING SEQUENCE OF OPERATION AND CONTROL FUNCTIONS. BMS CONTRACTOR SHALL FIELD–VERIFY EXISTING CONTROLS AND SEQUENCE PRIOR TO RELOCATION AND SHALL RECONNECT, EXTEND, REPROGRAM, AND MODIFY CONTROLS AS REQUIRED TO PROVIDE OPERATION CONSISTENT WITH THE EXISTING SYSTEM
    - 5.2. FIN–TUBE HEATING SERVING THIS AREA SHALL OPERATE AS SECONDARY/AUXILIARY HEAT. THE ASSOCIATED FAN COIL UNIT/HEAT PUMP SYSTEM SHALL SERVE AS THE PRIMARY (FIRST–STAGE) SOURCE OF HEATING, WITH FIN–TUBE HEATING ENABLED AS SECOND–STAGE HEAT WHEN THE PRIMARY SYSTEM IS UNABLE TO SATISFY THE SPACE HEATING REQUIREMENT
    - 5.3. BMS CONTRACTOR SHALL COORDINATE FAN COIL UNIT AND FIN–TUBE CONTROL OPERATION, INCLUDING THERMOSTATS/SENSORS, HOT WATER CONTROL VALVES, INTERLOCKS, SETPOINTS, AND ASSOCIATED CONTROL WIRING, AS REQUIRED TO MAINTAIN THE EXISTING CONTROL INTENT
    - 5.4. WHERE A NEW VRF SYSTEM IS PROVIDED IN A SPACE ALSO SERVED BY EXISTING FIN–TUBE RADIATION (FTR), INCLUDING THE NEW KITCHEN AND ACTIVITY ROOM, THE VRF SYSTEM SHALL SERVE AS THE PRIMARY SOURCE OF SPACE HEATING AND THE FTR SHALL OPERATE AS SECONDARY/AUXILIARY HEAT. BMS CONTRACTOR SHALL COORDINATE THE VRF SYSTEM AND FTR CONTROLS, INCLUDING SPACE TEMPERATURE SENSORS/THERMOSTATS, SETPOINTS, HOT WATER CONTROL VALVES, INTERLOCKS, AND CONTROL WIRING, AS REQUIRED TO PROVIDE PROPER STAGED OPERATION AND PREVENT SIMULTANEOUS HEATING AND COOLING

SEQUENCE OF OPERATION

1. RTU–19 – EXISTING CARRIER RTU WITH FACTORY STAGED AIR VOLUME SUPPLY FAN/VFD, COMPARATIVE ENTHALPY ECONOMIZER (0–100%), DX COOLING, GAS HEATING, BAROMETRIC RELIEF AND NEW VVT ZONE DAMPER SYSTEM. CONTROLS SHALL BE PROVIDED BY BMS CONTRACTOR. BMS CONTRACTOR SHALL COORDINATE WITH THE RTU MANUFACTURER AND VVT CONTROLS MANUFACTURER TO PROVIDE AN APPROVED INTERFACE CAPABLE OF CONTROLLING ALL THREE RTU COOLING STAGES, GAS–HEATING STAGES, SUPPLY–FAN OPERATION, AND ASSOCIATED SAFETIES
    - A. BAS INTERFACE: THE BUILDING AUTOMATION SYSTEM (BAS) SHALL SEND THE CONTROLLER OCCUPIED BYPASS, MORNING WARM–UP/PRE–COOL, OCCUPIED/UNOCCUPIED MODES. IF A BAS IS NOT PRESENT, OR COMMUNICATION IS LOST WITH THE BAS THE CONTROLLER SHALL OPERATE USING DEFAULT MODES AND SETPOINTS. THE BAS SHALL PROVIDE THE MASTER OCCUPIED/UNOCCUPIED SCHEDULE. THE VVT CONTROLLER SHALL DETERMINE ZONE DEMAND, SYSTEM HEATING/COOLING MODE, ZONE–DAMPER POSITION, AND CAPACITY DEMAND BASED ON INPUTS FROM THE ASSOCIATED ZONE THERMOSTATS.
    - B. OCCUPIED: DURING OCCUPIED PERIODS, THE SUPPLY FAN SHALL RUN CONTINUOUSLY, WITH FAN SPEED CONTROLLED IN ACCORDANCE WITH THE RTU MANUFACTURER'S STAGED–AIR–VOLUME SEQUENCE. THE OUTDOOR–AIR AND RETURN–AIR DAMPERS SHALL MODULATE AS REQUIRED TO MAINTAIN THE MINIMUM VENTILATION REQUIREMENTS.

      UPON A SYSTEM COOLING DEMAND, THE VVT CONTROLLER, THROUGH THE APPROVED VVT/BMS INTERFACE, SHALL ENABLE AND DISABLE THE RTU'S THREE STAGES OF DX COOLING SEQUENTIALLY BASED ON AGGREGATE ZONE DEMAND, LEAVING–AIR TEMPERATURE, AND APPLICABLE STAGING TIME DELAYS. UPON A SYSTEM HEATING DEMAND, THE GAS HEATING STAGES SHALL BE ENABLED AND DISABLED AS REQUIRED TO SATISFY THE AGGREGATE ZONE DEMAND. THE VVT CONTROLLER SHALL DETERMINE SYSTEM DEMAND FROM THE ASSOCIATED ZONE THERMOSTATS IN ACCORDANCE WITH THE MANUFACTURER'S VOTING AND PRIORITY CONTROL LOGIC.

      IF THE LEAVING–AIR TEMPERATURE SENSOR FAILS, MECHANICAL COOLING AND GAS HEATING SHALL BE DISABLED, THE SUPPLY FAN SHALL CONTINUE TO OPERATE, AND AN ALARM SHALL ANNUNCIATE AT THE BAS. IF AN INDIVIDUAL ZONE TEMPERATURE SENSOR FAILS, THE AFFECTED ZONE SHALL BE EXCLUDED FROM THE SYSTEM DEMAND AND MODE–VOTING LOGIC, AND AN ALARM SHALL ANNUNCIATE AT THE BAS. THE SYSTEM SHALL CONTINUE TO OPERATE BASED ON THE REMAINING VALID ZONE TEMPERATURE SENSORS. IF ALL ZONE TEMPERATURE SENSORS FAIL, MECHANICAL COOLING AND GAS HEATING SHALL BE DISABLED, AND AN ALARM SHALL ANNUNCIATE AT THE BAS.
    - C. UNOCCUPIED: DURING THE UNOCCUPIED PERIODS, THE SUPPLY FAN SHALL BE DISABLED, THE OUTSIDE–AIR DAMPER SHALL CLOSE, AND THE MECHANICAL COOLING AND HEATING SHALL BE DISABLED TO CONSERVE ENERGY.

      WHEN ANY ZONE TEMPERATURE IS BELOW THE UNOCCUPIED HEATING SETPOINT OF 60.0 DEG. F (ADJ.), THE SUPPLY FAN SHALL BE COMMANDED ON, THE OUTSIDE–AIR DAMPER SHALL REMAIN CLOSED, AND THE GAS HEATING SHALL BE ENABLED. WHEN ALL ZONE TEMPERATURES RISE ABOVE THE UNOCCUPIED HEATING SETPOINT OF 60.0 DEG. F (ADJ.) PLUS THE UNOCCUPIED DIFFERENTIAL OF 4.0 DEG. F (ADJ.), THE GAS HEAT SHALL BE DISABLED AND THE SUPPLY FAN SHALL STOP AFTER THE APPLICABLE PURGE PERIOD.

      WHEN ANY ZONE TEMPERATURE IS ABOVE THE UNOCCUPIED COOLING SETPOINT OF 85.0 DEG. F (ADJ.), THE SUPPLY FAN SHALL BE COMMANDED ON, THE OUTSIDE–AIR DAMPER SHALL OPEN IF ECONOMIZING IS ENABLED AND SHALL REMAIN CLOSED IF ECONOMIZING IS DISABLED, AND THE DX COOLING SHALL BE ENABLED. WHEN ALL ZONE TEMPERATURES FALL BELOW THE UNOCCUPIED COOLING SETPOINT OF 85.0 DEG. F (ADJ.) MINUS THE UNOCCUPIED DIFFERENTIAL OF 4.0 DEG. F (ADJ.), THE DX COOLING SHALL BE DISABLED, THE SUPPLY FAN SHALL STOP AFTER THE APPLICABLE PURGE PERIOD, AND THE OUTSIDE–AIR DAMPER SHALL CLOSE
    - D. OPTIMAL START: THE BAS SHALL MONITOR THE SCHEDULED OCCUPIED TIME, OCCUPIED SPACE SETPOINTS, ZONE TEMPERATURES, AND VVT SYSTEM DEMAND TO CALCULATE WHEN OPTIMAL START SHALL OCCUR.
    - E. OPTIMAL STOP: THE BAS SHALL MONITOR THE SCHEDULED UNOCCUPIED TIME, OCCUPIED SETPOINTS, ZONE TEMPERATURES, AND VVT SYSTEM DEMAND TO CALCULATE WHEN OPTIMAL STOP SHALL OCCUR. WHEN OPTIMAL STOP MODE IS ACTIVE, THE UNIT CONTROLLER SHALL MAINTAIN THE ZONES AT THE SPACE–TEMPERATURE OFFSET SETPOINT. THE OUTSIDE–AIR DAMPER SHALL REMAIN ENABLED TO PROVIDE MINIMUM VENTILATION
    - F. MORNING WARM–UP MODE: DURING OPTIMAL START, IF THE ZONE TEMPERATURES AND VVT SYSTEM DEMAND INDICATE A HEATING DEMAND, MORNING WARM–UP MODE SHALL BE ACTIVATED. WHEN MORNING WARM–UP IS INITIATED, THE UNIT SHALL ENABLE THE GAS HEATING AND SUPPLY FAN. THE OUTSIDE–AIR DAMPER SHALL REMAIN CLOSED. WHEN THE ZONE TEMPERATURES AND VVT SYSTEM DEMAND INDICATE THAT THE OCCUPIED HEATING SETPOINTS HAVE BEEN SATISFIED, THE UNIT SHALL TRANSITION TO OCCUPIED MODE
    - G. PRE–COOL MODE: DURING OPTIMAL START, IF THE ZONE TEMPERATURES AND VVT SYSTEM DEMAND INDICATE A COOLING DEMAND, PRE–COOL MODE SHALL BE ACTIVATED. WHEN PRE–COOL IS INITIATED, THE UNIT SHALL ENABLE THE SUPPLY FAN AND DX COOLING OR ECONOMIZER. THE OUTSIDE–AIR DAMPER SHALL REMAIN CLOSED UNLESS ECONOMIZING. WHEN THE ZONE TEMPERATURES AND VVT SYSTEM DEMAND INDICATE THAT THE OCCUPIED COOLING SETPOINTS HAVE BEEN SATISFIED, THE UNIT SHALL TRANSITION TO OCCUPIED MODE
    - H. OCCUPIED BYPASS: THE BAS SHALL MONITOR THE STATUS OF THE ON AND CANCEL BUTTONS OF EACH ZONE THERMOSTAT. WHEN AN OCCUPIED BYPASS REQUEST IS RECEIVED FROM ANY ZONE THERMOSTAT, THE UNIT SHALL TRANSITION FROM ITS CURRENT OCCUPANCY MODE TO OCCUPIED BYPASS MODE AND SHALL MAINTAIN THE ZONES AT THE OCCUPIED SETPOINTS (ADJ.)
    - I. HEAT/COOL MODE: THE VVT CONTROLLER SHALL DETERMINE THE SYSTEM HEATING OR COOLING MODE BASED ON DEMAND FROM ALL THREE ZONE THERMOSTATS IN ACCORDANCE WITH THE VVT MANUFACTURER'S FIRST–CALL, MAJORITY–VOTE, AND SELECTABLE–PRIORITY CONTROL LOGIC. WHEN THE ACTIVE MODE HAS BEEN SATISFIED AND THE OPPOSITE MODE IS REQUIRED, THE VVT CONTROLLER SHALL INITIATE A FOUR–MINUTE PURGE CYCLE BEFORE CHANGING MODES. SIMULTANEOUS HEATING AND COOLING SHALL NOT BE PERMITTED.
    - J. SETPOINTS OVERRIDE WITH LIMITATIONS: EACH THERMOSTAT/CONTROLLER SHALL HAVE ABILITY TO MODIFY HEATING AND COOLING SETPOINTS BY +/– 2 DEG. F FROM SETPOINTS SET BY BAS. THIS WILL GIVE LIMITED CONTROL FOR USER.
    - K. ECONOMIZER:
        - K.A. ENABLE (COMPARATIVE ENTHALPY): OUTSIDE AIR (OA) ENTHALPY SHALL BE COMPARED WITH RETURN AIR (RA) ENTHALPY POINT. THE ECONOMIZER SHALL ENABLE WHEN OA ENTHALPY IS LESS THAN RA ENTHALPY – 2.0 BTU/LB. THE ECONOMIZER SHALL DISABLE WHEN OA ENTHALPY IS GREATER THAN RA ENTHALPY
        - K.B. OPERATION: WHEN ECONOMIZING IS ENABLED AND THE UNIT IS OPERATING IN THE COOLING MODE, THE ECONOMIZER DAMPER SHALL BE MODULATED BETWEEN ITS MINIMUM POSITION AND 100% TO MAINTAIN THE DISCHARGE AIR TEMPERATURE SETPOINT. THE ECONOMIZER DAMPER SHALL MODULATE TOWARD MINIMUM POSITION IN THE EVENT THE DISCHARGE AIR TEMPERATURE FALLS BELOW THE DISCHARGE LOW LIMIT TEMPERATURE SETPOINT. COMPRESSORS SHALL BE DELAYED FROM OPERATING UNTIL THE ECONOMIZER HAS OPENED TO 100%
    - L. VENTILATION: WHEN IN THE OCCUPIED MODE, THE OUTDOOR–AIR DAMPER SHALL OPEN TO THE MINIMUM POSITION ESTABLISHED DURING TESTING AND BALANCING TO PROVIDE 1,100 CFM OF OUTDOOR AIR. THE MINIMUM DAMPER POSITION SHALL BE FIELD–ADJUSTABLE.
    - M. CO2 BASED DCV OPERATION – THREE CO2 SPACE SENSORS WILL BE SERVING THREE DIFFERENT SPACES EACH – 145 CONFERENCE ROOM, 153 LOUNGE/STUDY AREA, 168 COMPUTER ROOM. THE BAS SHALL MONITOR ALL THREE CO_2 SENSORS, SELECT THE HIGHEST CO_2 DEMAND, AND TRANSMIT A SINGLE DCV DEMAND SIGNAL TO THE RTU ECONOMIZER CONTROLLER.

      WHEN THE HIGHEST OF THE THREE CO_2 SENSOR READINGS RISES ABOVE THE CO_2 SETPOINT, THE RTU OUTDOOR–AIR DAMPER SHALL MODULATE TO THE POSITION ESTABLISHED DURING TESTING AND BALANCING TO PROVIDE 3,000 CFM OF OUTDOOR AIR (50% OUTDOOR AIR). WHEN ALL THREE CO_2 SENSOR READINGS FALL BELOW THE CO_2 SETPOINT, THE OUTDOOR–AIR DAMPER SHALL MODULATE TO ITS MINIMUM POSITION ESTABLISHED DURING TESTING AND BALANCING TO PROVIDE 1,100 CFM OF OUTDOOR AIR (18% OUTDOOR AIR).

      THE MINIMUM POSITION OF EACH VVT ZONE DAMPER SHALL BE COORDINATED DURING TESTING AND BALANCING TO MAINTAIN THE REQUIRED VENTILATION AIRFLOW TO EACH SPACE.
    - N. SUPPLY FAN: THE SUPPLY FAN SHALL BE ENABLED WHILE IN THE OCCUPIED MODE AND CYCLED ON DURING THE UNOCCUPIED MODE
        - N.A. COMMISSIONING CONTINGENCY RECOMMENDATION: IF UNSTABLE ZONE–DAMPER, BYPASS–DAMPER, DUCT–STATIC–PRESSURE, OR SUPPLY–FAN CONTROL IS OBSERVED DURING SYSTEM COMMISSIONING, PROGRAM THE SUPPLY FAN TO MAINTAIN 6,000 CFM WHEN ANY ZONE HAS AN ACTIVE HEATING OR COOLING DEMAND. WHEN ALL THREE ZONES ARE SATISFIED AND THE RTU REMAINS OPERATING FOR OCCUPIED VENTILATION OR PURGE, THE SUPPLY FAN MAY OPERATE AT THE LOWEST MANUFACTURER–APPROVED SPEED. FINAL FAN SPEEDS, ZONE–DAMPER MINIMUM POSITIONS, AND BYPASS–DAMPER OPERATING RANGE SHALL BE VERIFIED BY THE TESTING AND BALANCING CONTRACTOR AND SHALL NOT VIOLATE THE MINIMUM AIRFLOW REQUIREMENT.
    - O. RELIEF AIR AND BUILDING PRESSURE CONTROL: THE BAROMETRIC RELIEF DAMPERS SHALL OPEN WITH INCREASED BUILDING PRESSURE. AS THE BUILDING PRESSURE INCREASES, THE PRESSURE IN THE UNIT RETURN SECTION ALSO INCREASES, OPENING THE DAMPERS AND RELIEVING AIR.
    - P. FILTER STATUS: A DIFFERENTIAL PRESSURE SWITCH SHALL MONITOR THE DIFFERENTIAL PRESSURE ACROSS THE FILTER(S) WHEN THE FAN IS RUNNING. IF THE SWITCH CLOSES DURING NORMAL OPERATION A DIRTY FILTER ALARM SHALL ANNUNCIATE AT THE BAS.
    - Q. CONDENSATE OVERFLOW SHUTDOWN: UPON A SIGNAL FROM THE CONDENSATE OVERFLOW SENSOR, DX COOLING SHALL BE IMMEDIATELY DISABLED AND A CONDENSATE OVERFLOW ALARM SHALL ANNUNCIATE AT THE BAS. THE SUPPLY FAN SHALL CONTINUE TO OPERATE AS REQUIRED FOR VENTILATION OR HEATING.
    - R. FILTER TIMER: THE FAN–RUN TIME (HRS) SHALL BE COMPARED TO THE FILTER MAINTENANCE TIMER SETPOINT. ONCE THE SETPOINT IS REACHED A FILTER TIMER ALARM DIAGNOSTIC SHALL ANNUNCIATE AT THE BAS. WHEN THE DIAGNOSTIC IS CLEARED, THE FILTER–MAINTENANCE TIMER IS RESET TO ZERO, AND THE TIMER BEGINS ACCUMULATING FAN–RUN TIME AGAIN.
    - S. VVT ZONE DAMPERS AND BYPASS DAMPERS:
        - S.A. GENERAL – ROOMS 145 CONFERENCE ROOM, 153 LOUNGE/STUDY AREA, AND 168 COMPUTER ROOM SHALL EACH BE PROVIDED WITH A DEDICATED THERMOSTAT AND FULLY MODULATING, PRESSURE–DEPENDENT VVT ZONE DAMPER. EACH ZONE DAMPER SHALL MODULATE BETWEEN ITS ADJUSTABLE MINIMUM POSITION AND FULLY OPEN POSITION TO MAINTAIN THE ASSOCIATED ZONE TEMPERATURE SETPOINT.
        - S.B. THE VVT CONTROLLER SHALL MONITOR DEMAND FROM ALL THREE ZONE THERMOSTATS AND SHALL DETERMINE SYSTEM HEATING OR COOLING MODE IN ACCORDANCE WITH THE MANUFACTURER'S VOTING, PRIORITY, AND CHANGEOVER CONTROL LOGIC.
        - S.C. THE SUPPLY–TO–RETURN BYPASS DAMPER SHALL MODULATE TO MAINTAIN THE ADJUSTABLE SUPPLY–DUCT STATIC–PRESSURE SETPOINT. AS THE ZONE DAMPERS MODULATE CLOSED AND DUCT STATIC PRESSURE INCREASES, THE BYPASS DAMPER SHALL MODULATE OPEN. AS THE ZONE DAMPERS MODULATE OPEN AND DUCT STATIC PRESSURE DECREASES, THE BYPASS DAMPER SHALL MODULATE CLOSED.
        - S.D. THE STATIC–PRESSURE SENSOR SHALL BE LOCATED IN THE MAIN SUPPLY DUCT IN ACCORDANCE WITH THE VVT CONTROLS MANUFACTURER'S RECOMMENDATIONS. THE STATIC–PRESSURE SETPOINT, BYPASS–DAMPER OPERATING RANGE, AND ZONE–DAMPER MINIMUM POSITIONS SHALL BE FIELD–ADJUSTED DURING TESTING AND BALANCING.
        - S.E. THE VVT CONTROLLER SHALL MONITOR LEAVING–AIR TEMPERATURE AND SHALL LIMIT OR DISABLE HEATING OR COOLING CAPACITY AS REQUIRED TO PROTECT THE RTU COMPRESSORS AND GAS–HEAT EXCHANGER. THE VVT CONTROL SYSTEM SHALL INCLUDE LEAVING–AIR AND RETURN–AIR TEMPERATURE SENSORS AND SHALL USE LEAVING–AIR TEMPERATURE AND APPLICABLE TIME DELAYS FOR CAPACITY CONTROL.

	MAX. SUPPLY	MIN. SUPPLY	MIN. OA
LIBRARY	2500 CFM	1000 CFM	450 CFM
CONFERENCE ROOM	1750 CFM	700 CFM	325 CFM
COMPUTER ROOM	1750 CFM	600 CFM	325 CFM
TOTAL	6000 CFM		1100 CFM (18% OA)

ISSUED FOR BID-9/25/26

Plotted: 9/22/2026 10:07 AM Last saved: 9/21/2026 4:03 PM File Name: M:\Projects\M04100011000\Drawings\GLQ-H9-H10-Sequence.dwg

9.23.26

APPROVED

William R. Long
PROFESSIONAL ENGINEER
NEW JERSEY LICENSE NO. 33012

REVISIONS	DATE	BY

Tri-State Architects, P.C. / Alaimo Group
WILLIAM R. LONG, P.E. LIC. 33012
ANITA S. ARADHYA, R.A. LIC. 18769
200 HIGH STREET MOUNT HOLLY, N.J.

DATE: AUG. 2026
DESIGNED BY: IV
DRAWN BY: RKR
CHECKED BY: 9/22/26
DEPT. HEAD: 9/22/26

CLIENT: WILLINGBORO TOWNSHIP
PROJECT LOCATION: WILLINGBORO TWP. BURLINGTON COUNTY NEW JERSEY
PROJECT NO.: M-0410-0011-000
CONTRACT NO.: BID#8-2026

KENNEDY CENTER
RENOVATION TO THE SENIOR CENTER

HVAC - SEQUENCE OF OPERATIONS - II

SCALE: AS SHOWN

SHEET
H10

FILE NO.:

SPECIFICATIONS/GENERAL NOTES

1. IT IS THE INTENT OF MECHANICAL DRAWINGS THAT ALL WORK SHOWN SHALL BE COORDINATED, AS REQUIRED, WITH THE WORK OF ALL OTHER TRADES SO THAT ALL INSTALLATIONS SHALL OPERATE AS DESIGNED, ALL SYSTEMS SHALL BE COMPLETELY ASSEMBLED, TESTED, ADJUSTED AND DEMONSTRATED TO BE READY FOR OPERATION TO THE SATISFACTION OF THE ARCHITECT/ENGINEER BEFORE ACCEPTANCE.
2. CONTRACTOR SHALL PERSONALLY VISIT THE EXISTING BUILDING, AND CAREFULLY EXAMINE THE EXISTING STRUCTURE IN ORDER TO ASCERTAIN THE CONDITIONS AND RESTRICTIONS AFFECTING HIS/HER PORTION OF THE WORK. CONTRACTOR SHALL BE RESPONSIBLE FOR ALL WORK WHICH IS REASONABLY INFERRED, WHETHER SPECIFICALLY SHOWN OR NOT, AS A RESULT OF EXISTING CONDITIONS, CONSTRUCTION IRREGULARITIES, AND INTERFERENCES WHICH MAY AFFECT HIS CONTRACT. NO ADDITIONAL COMPENSATIONS WILL BE CONSIDERED FOR MISUNDERSTANDING THE CONDITIONS BE MET.
3. CONTRACTOR SHALL BE RESPONSIBLE FOR THE SAFETY OF HIS OWN PEOPLE. COMPLY WITH ALL OWNER'S SITE SAFETY CONDITIONS.
4. CONTRACTOR SHALL PROVIDE ALL MATERIALS, LABOR, FEES AND PERMITS FOR A COMPLETE INSTALLATION.
5. ALL WORK SHALL BE DONE IN ACCORDANCE WITH ALL APPLICABLE STATE AND LOCAL CODES AND ORDINANCES, INCLUDING THE 2021 IECC – INTERNATIONAL ENERGY AND CONSERVATION CODE AND THE 2021 INTERNATIONAL MECHANICAL CODE (IMC).
6. ALL COMPONENTS REQUIRED FOR A COMPLETE INSTALLATION ARE NOT SHOWN ON THE DRAWINGS. REFER TO EQUIPMENT INSTALLATION INSTRUCTIONS FOR ADDITIONAL REQUIREMENTS, INCLUDING REQUIRED CONNECTION LOCATIONS, TYPES, & SIZES.
7. IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO PERFORM ALL WORK NECESSARY TO PREPARE STRUCTURES FOR THE INSTALLATION OF MECHANICAL SYSTEMS. ALL HOLES, OPENINGS, AND DAMAGED MATERIALS CREATED DURING CONSTRUCTION SHALL BE PATCHED AND FINISHED TO MATCH ADJACENT MATERIALS AND SURFACES.
8. WHENEVER CONNECTIONS TO EXISTING FACILITIES ARE REQUIRED, THE MECHANICAL CONTRACTOR SHALL COORDINATE WITH THE OWNER'S REPRESENTATIVE AND SCHEDULE THE WORK TO MINIMIZE INTERRUPTION OF SERVICE AND AVOID INTERFERENCE WITH NORMAL FUNCTION OF THE BUILDING AND/OR SURROUNDING WORK AREA. RELOCATED ITEMS SHALL BE INSTALLED IN COMPLIANCE WITH APPLICABLE CODES AND REGULATIONS.
9. CONTRACTOR SHALL COORDINATE INSTALLATION OF PIPING, DUCTWORK, HVAC EQUIPMENT LOCATION ETC. WITH WORK OF OTHER TRADES AND EXISTING BUILDING CONDITIONS. MODIFY PIPING AND DUCTWORK CONFIGURATIONS, HVAC EQUIPMENT LOCATIONS ETC. WHERE REQUIRED TO AVOID ANY CONFLICTS WITH STRUCTURE, LIGHTING, OTHER EXISTING DUCTWORK & PIPING, WORK OF OTHER TRADES AND ALSO TO MAINTAIN SERVICE SPACE FOR HVAC EQUIPMENT. CONTRACTOR SHALL NOT FABRICATE OR PURCHASE ANY DUCTWORK PRIOR TO VERIFYING CONDITIONS AND COORDINATING WITH WORK OF OTHER TRADES.
10. ALL DUCTWORK DIMENSIONS SHOWN ARE CLEAR INSIDE DIMENSIONS.
11. CONTRACTOR FOLLOW MANUFACTURER'S RECOMMENDATIONS FOR INSTALLATION OF ALL HVAC EQUIPMENT.
12. CONTRACTOR PROVIDE SERVICE CLEARANCE SPACE FOR ALL HVAC EQUIPMENT AS PER MANUFACTURER'S RECOMMENDATIONS.
13. ALL WORK, EQUIPMENT AND MATERIALS SHALL BE PROTECTED AT ALL TIMES. ALL DUCT AND PIPE OPENINGS SHALL BE PROPERLY CAPPED OR PLUGGED DURING INSTALLATION.
14. FOR ANY MATERIALS AND EQUIPMENT REMOVED DURING THE DEMOLITION PHASE OF THE PROJECT, THE OWNER'S REPRESENTATIVE SHALL APPROVE FINAL DISPOSITION OF ALL SUCH MATERIAL FOR RETENTION AND STORAGE, OR REMOVAL FROM THE SITE BY THE CONTRACTOR.
15. CONTRACTOR PROVIDE DUCT TRANSITIONS AS REQUIRED AT CONNECTIONS INTO ALL HVAC EQUIPMENT. CONTRACTOR SHALL PROVIDE DUCT OFFSETS AS REQUIRED TO AVOID CONFLICTS WITH WORK OF ALL TRADES (NOT ALL SHOWN ON DRAWINGS).
16. CONTRACTOR PROVIDE ROUND ELBOWS WHERE POSSIBLE FOR DUCT TURNS & DUCT OFFSETS TO MINIMIZE STATIC PRESSURE LOSS
17. CONTRACTOR COORDINATE WITH WORK OF ALL TRADES FOR INSTALLATION OF THERMOSTATS, HUMIDITY SENSORS AND COMBINATION TEMPERATURE AND HUMIDITY SENSOR (WHERE REQD.). CONTRACTOR PROVIDE THERMOSTAT FOR ALL HVAC EQUIPMENT THAT WOULD REQUIRE A THERMOSTAT. ALL THERMOSTATS AND ADJUSTABLE SENSORS IN FINISHED OCCUPIED ROOMS SHALL BE INSTALLED AT ADA HEIGHT OF 48 INCHES. PROVIDE LOCK COVER FOR ALL THERMOSTATS AND CONTROLLERS.
18. CONTRACTOR TO INSTALL VOLUME DAMPERS ON ALL DUCTWORK BRANCHES AND ALL LOCATIONS WHERE REQUIRED FOR BALANCING THE AIR FLOW.
19. REFRIGERANT PIPING AND CONDENSATE DRAIN PIPING ROUTE SHOWN FOR REFERENCE ONLY. CONTRACTOR ROUTE REFRIGERANT PIPES AND CONDENSATE DRAIN PIPES IN THE BEST POSSIBLE ROUTE AVOIDING CONFLICTS WITH WORK OF ALL TRADES. PROVIDE CONDENSATE PUMPS WHERE REQUIRED.
20. CONTRACTOR TO PROVIDE AND INSTALL CONDENSATE DRAIN PIPING FROM ALL COOLING COIL EQUIPMENT. ALL PIPING TO BE MINIMUM 3/4" DIA. SCH. 40 PVC, SLOPE TO BE 1/4" PER FOOT. ALL INSTALLATION TO BE IN ACCORDANCE WITH NATIONAL STANDARD PLUMBING CODE. PROVIDE TRAPS, ETC. IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATION. LINES SHALL BE INSULATED WITH A 1" ELASTOMERIC INSULATION.
21. CONTRACTOR SHALL RESTORE WALL/FLOOR/CEILING SURFACES TO MATCH EXISTING AFTER COMPLETION OF MECHANICAL WORK. CONTRACTOR SHALL PROVIDE ANY CUTTING, PATCHING, INFILL, ETC. REQUIRED FOR HVAC DEMOLITION AND NEW WORK. ALL PENETRATIONS SHALL BE PATCHED AND SEALED. CUTTING OF BUILDING CONSTRUCTION MATERIALS SHALL CONFORM TO THE CHARACTERISTICS OF THE PARTICULAR MATERIAL INVOLVED AND SHALL NOT CREATE ANY STRUCTURAL WEAKNESS OR UNSIGHTLY APPEARANCE. ALL CUTTING SHALL MEET THE APPROVAL OF THE ARCHITECT AND/OR OWNER'S REPRESENTATIVE: COORDINATE WITH THIS PARTY BEFORE COMMENCING.
22. CONTRACTOR RESPONSIBLE FOR REMOVAL AND REINSTALLATION OF ALL CEILING AND CEILING MOUNTED DEVICES AS REQUIRED FOR THE REMOVAL AND INSTALLATION OF ALL MECHANICAL WORK. ANY DAMAGE TO EXISTING CEILINGS, WALLS, ETC. SHALL BE REPLACED TO MATCH EXISTING MATERIALS.
23. PROVIDE CONDUIT COVER FOR ANY REFRIGERANT PIPING AND CONDENSATE DRAIN PIPING WHICH ARE EXPOSED AND VISIBLE INSIDE AND OUTSIDE BUILDING – ON WALL, ON CEILING, ON GRADE, ON ROOF, E.T.C.
24. REFER TO STRUCTURAL DRAWINGS FOR ALL HVAC EQUIPMENT PLATFORMS, RAILS AND SUPPORTS.
25. ALL CONTROLS BEING PROVIDED WITH HVAC EQUIPMENT SHALL BE NON–PROPRIETARY.
26. LIFTING CRANE SHALL BE USED TO TRANSPORT HVAC EQUIPMENT DIRECTLY FROM GROUND LEVEL TO ROOF. HVAC EQUIPMENT SHALL BE DIRECTLY PLACED ON RESPECTIVE HVAC EQUIPMENT PLATFORMS, RAILS, SUPPORTS WITHOUT PLACING THEM ON THE REMAINDER OF THE ROOF DECK.
27. CONTRACTOR COORDINATE WITH BUILDING'S ROOFING CONTRACTOR FOR ANY ROOFING RELATED WORK. CONTRACTOR SHALL NOT MODIFY ANY ROOFING AS THIS WOULD AFFECT ROOF WARRANTY PROVIDED BY THE BUILDING'S ROOFING COMPANIES.
28. ALL NEW DUCTWORK SHALL BE INSULATED AND MEET THE REQUIREMENTS OF ASHRAE STANDARD 90.1 AT A MINIMUM. REFER TO DUCT INSULATION SPECIFICATION FOR MORE INFORMATION
29. PROVIDE CLEANING OF RTU–19, EXISTING FCUs, EA DUCTWORK ASSOCIATED WITH EF–30. REFER TO 230130 SPEC SECTION FOR MORE INFO.
30. SAFELY RECOVER AND DISPOSE REFRIGERANT AS PER ASHRAE STANDARD 15 FOR ALL DX–COIL HVAC UNITS BEING REMOVED/RELOCATED.
31. CONTRACTOR PROVIDE FIREPROOFING/FIRESTOPPING OF ALL PENETRATIONS IN FIRE–RATED CONSTRUCTION (WALLS, FLOORS, ROOF, ETC.). REFER TO 078400 FIRESTOPPING SPEC FOR MORE INFO.
32. EXISTING DUCT SMOKE DETECTORS SHALL BE REPLACED AT SUPPLY AND RETURN OF RTU–19. INSTALLATION SHALL BE AS PER LATEST EDITIONS OF IMC AND NFPA 90A. PROVIDE ACCESS DOORS IN DUCTWORK TO ACCESS DUCT SMOKE DETECTORS. REFER TO ELECTRICAL DRAWINGS FOR MORE INFO. CONTRACTOR TO COORDINATE WITH OWNER'S FIRE AND SECURITY REPRESENTATIVE.
33. EXISTING SIZE AND ROUTING OF PIPING AND DUCTWORK SHOWN ON DRAWINGS ARE FOR REFERENCE AND CAN BE INCONSISTENT WITH ACTUAL INSTALLATION. CONTRACTOR SHALL FIELD VERIFY AND DETERMINE EXISTING SIZE AND LAYOUT OF PIPING & DUCTWORK AND MODIFY NEW INSTALLATIONS AS REQUIRED.
34. CONTRACTOR SHALL PROVIDE PIPE OFFSETS AS REQUIRED TO AVOID CONFLICTS WITH WORK OF ALL TRADES (NOT ALL SHOWN ON DRAWING.
35. ALL NEW PIPING SHALL BE INSULATED AND MEET THE REQUIREMENTS OF ASHRAE STANDARD 90.1 AT A MINIMUM. REFER TO PIPING INSULATION SPECIFICATION FOR MORE INFORMATION.
36. VALVES AND MEASURING DEVICES SHOWN ON DRAWING ARE FOR REFERENCE ONLY. CONTRACTOR SHALL INSTALL VALVES AS PER MANUFACTURER'S RECOMMENDATIONS & ALL APPLICABLE CODES LIKE IMC, IPC, E.T.C.
37. ALL VALVES SHALL HAVE EXTENDED STEMS TO PLACE THE HANDLE OUTSIDE OF PIPE INSULATION.
38. CONTRACTOR PROVIDE EXACT INSTALLATION DIAGRAM INCLUDING PIPE AND VALVE SIZING AND ASSOCIATED EQUIPMENT SIZING FROM VENDOR/MANUFACTURER DURING SHOPDRAWING SUBMITTAL.
39. PROVIDE PIPE UNIONS AT ALL LOCATIONS AS REQUIRED FOR EQUIPMENT INSTALLATION, REMOVAL, MAINTENANCE, AND SERVICE, INCLUDING AT CONNECTIONS TO NEW FTRs, CUHs, HCs AND EXISTING PIPING.
40. CONTRACT WORK SHALL INCLUDE, ALL PIPE DEMOLITION AND INSTALLATION AS NOTED ON THE DRAWINGS AS WELL AS DRAINING ALL HOT WATER PIPING TO HVAC UNIT REHEAT COILS, FTRs, CUHs, PRESSURE TESTING PIPING FOR LEAKS, REPAIRING ALL LEAKS, REPLACING PIPING, FITTINGS, AND VALVES AS REQUIRED, REFILLING PIPING SYSTEM AFTER PIPING INSTALLATION IS COMPLETE AND INSULATING ALL PIPING, FITTIGNS AND VALVES AS SPECIFIED.
41. ISOLATE AND DRAIN PIPING SYSTEMS AS REQUIRED TO REMOVE OLD AND INSTALL NEW PER CONTRACT DOCUMENTS. CONTRACTOR SHALL BE RESPONSIBLE TO REFILL THE SYSTEM AFTER INSTALLATION FOR PROPER OPERATION AND CONTROL OF ALL HVAC SYSTEMS.
42. FOR EXISTING SYSTEMS, PROVIDE ALL HEAT TRAPS AND OR WET TAPS AS REQUIRED.
43. DIFFUSER AND REGISTER LOCATIONS SHOWN ARE DIAGRAMMATIC AND FOR REFERENCE ONLY. CONTRACTOR SHALL COORDINATE FINAL LOCATIONS WITH THE ARCHITECTURAL REFLECTED CEILING PLANS AND CEILING LAYOUT, AND SHALL ADJUST LOCATIONS AS REQUIRED TO AVOID CONFLICTS WITH LIGHTING FIXTURES, SPRINKLERS, CEILING DEVICES, STRUCTURAL MEMBERS, AND WORK OF OTHER TRADES. MAINTAIN REQUIRED CLEARANCES AND PROVIDE A SYMMETRICAL INSTALLATION COORDINATED WITH THE CEILING GRID/PATTERN. FIELD–VERIFY CEILING CONDITIONS PRIOR TO INSTALLATION.
44. EXISTING BUILDING MANAGEMENT SYSTEM (BMS), INCLUDING EXISTING CONTROLLERS AND FRONT–END, SHALL REMAIN. BMS CONTRACTOR SHALL PROVIDE ALL REQUIRED CONTROLLERS, INTERFACES, SENSORS, ACTUATORS, RELAYS, CONTROL WIRING, PROGRAMMING, GRAPHICS, AND ACCESSORIES REQUIRED TO INTEGRATE NEW AND MODIFIED HVAC EQUIPMENT INTO THE EXISTING TRANE BMS.
45. BMS CONTRACTOR SHALL COORDINATE WITH HVAC EQUIPMENT MANUFACTURERS AND MECHANICAL CONTRACTOR FOR ALL FACTORY AND FIELD–INSTALLED CONTROLS, COMMUNICATION INTERFACES, INTERLOCKS, SETPOINTS, AND SEQUENCES OF OPERATION. PROVIDE A COMPLETE AND OPERABLE CONTROL SYSTEM.
46. REFRIGERANT SUCTION/LIQUID LINES ARE SHOWN AS A SINGLE LINE ON DRAWINGS FOR CLARITY. SEE MANUFACTURER'S WRITTEN RECOMMENDATIONS FOR RECOMMENDED REFRIGERANT LINE SIZES AND MATERIAL.
    - A.REFRIGERANT SUCTION AND LIQUID LINES SHALL BE INSULATED WITH A MINIMUM OF 1" INSULATION. PROVIDE ALUMINUM JACKET ON INSULATION FOR REFRIGERANT PIPING OUTSIDE THE BUILDING.
    - B.DO NOT INSTALL ANY FITTINGS OR JOINTS IN REFRIGERANT PIPING THAT WILL BE IN INACCESSIBLE AREAS (IN WALLS OR ABOVE HARD CEILINGS).
    - C.FOR ALL UNITS THAT REQUIRE MORE THAN 50 FEET OF REFRIGERANT LINES BETWEEN THE CONDENSING UNIT AND ASSOCIATED INDOOR UNIT, INSTALL LINES IN ACCORDANCE WITH MANUFACTURER'S WRITTEN DOCUMENTATION FOR LONG LINE INSTALLATION

MECHANICAL SYMBOL & ABBREVIATION SCHEDULE

ITEM	DESCRIPTION
⊠	SUPPLY DIFFUSER
	RETURN DIFFUSER
	EXHAUST DIFFUSER
	SLOT DIFFUSER
	FLEXIBLE DUCT
	DUCT ELBOW UP
	DUCT ELBOW DOWN
	SQUARE DUCT ELBOW (NO TURNING VANES)
	SQUARE DUCT ELBOW WITH TURNING VANES
	ROUND DUCT ELBOW DOWN
	ROUND DUCT ELBOW
	RECTANGULAR DUCT TAKE–OFF
	ROUND DUCT TAKE–OFF
	RECTANGULAR DUCT TO ROUND DUCT TRANSITION
	VARIABLE AIR VOLUME TERMINAL UNIT
	MANUAL VOLUME DAMPER
M	MOTORIZED DAMPER
FD	FIRE DAMPER
A/P	ACCESS PANEL
	DUCT CAP
Ⓣ	THERMOSTAT
TH	COMBINATION TEMPERATURE HUMIDITY SENSOR
CO_2	CARBON DIOXIDE SENSOR
	90°F PIPE ELBOW
	45°F PIPE ELBOW
	PIPE ELBOW DOWN
	PIPE ELBOW UP
	PIPE ELBOW DOWN (OFFSET DOWN SAME FLOOR)
	PIPE ELBOW DOWN WITH MULTIPLE TAPS (OFFSET DOWN SAME FLOOR)
	PIPE ELBOW UP (OFFSET UP SAME FLOOR)
	PIPE UNION
	PIPE FLANGE
	PIPE TEE (MOUNTED HORIZONTALLY)
	PIPE TEE (TOP OUTLET)
	PIPE TEE (BOTTOM OUTLET)
	STRAINER
	AIR VENT
	PRESSURE GAUGE
	FLOW DIRECTION
	PIPE CONTINUATION NOT SHOWN
	PT PORT
	THERMOMETER
ΔP	PRESSURE DIFFERENTIAL TRANSDUCER
	GATE VALVE
	GLOBE VALVE
	CONTROL VALVE – ELECTRIC, 2–WAY
	CONTROL VALVE – ELECTRIC, 3–WAY, PLAN VIEW
⊗	BALANCING VALVE
⊗	TRIPLE DUTY VALVE
	BALL VALVE
	BUTTERFLY VALVE
	CHECK VALVE
	EXISTING TO BE REMOVED
	CONNECT TO EXISTING
	DISCONNECT AND REMOVE TILL EXISTING
—D—	CONDENSATE DRAIN PIPING
—R—	REFRIGERANT PIPING (BOTH SUCTION AND LIQUID)
MARK AIRFLOW SIZE COMMENTS	GRILLE/DIFFUSER/REGISTER TAG
##x##	RECTANGULAR DUCT DIMENSION (WIDTH X HEIGHT IN INCHES)
A/E	ARCHITECT/ENGINEER
A.F.F.	ABOVE FINISHED FLOOR
ACCU/CU	AIR COOLED CONDENSING UNIT
ADJ.	ADJUSTABLE
BMS/BAS	BUILDING MANAGEMENT SYSTEM/BUILDING AUTOMATION SYSTEM
BPD	BYPASS DAMPER
CD	CEILING DIFFUSER (SEE GRILLE/DIFFUSER SCHEDULE)
CUH	CABINET UNIT HEATER
CV	CONTROL VALVE
D	COLD CONDENSATE DRAIN
DOAS	DEDICATED OUTDOOR AIR SYSTEM
(E)	EXISTING
EA	EXHAUST AIR
EACD	EXHAUST AIR CONTROL DAMPER
EF	EXHAUST FAN
ERV	ENERGY RECOVERY VENTILATOR
EXST	EXISTING
FCU	FAN COIL UNIT
FTR	FIN TUBE RADIATOR

MECHANICAL SYMBOL & ABVN. SCHD (CONT.)

ITEM	DESCRIPTION
FRR	FILTER RETURN REGISTER
F.V.	FIELD VERIFY
HC	HOT WATER CONVECTOR
HW	HOT WATER
HWR	HOT WATER RETURN
HWS	HOT WATER SUPPLY
KEF	KITCHEN EXHAUST FAN
MAU	MAKE UP AIR UNIT
MSC	MINI SPLIT CONDENSING UNIT
MSE	MINI SPLIT EVAPORATOR UNIT
MSHP	MINI SPLIT HEAT PUMP
MHGRH	MODULATING HOT GAS REHEAT
N/A	NOT APPLICABLE
N.C.	NORMALLY CLOSED (VALVE/DAMPER POSITION)
N.O.	NORMALLY OPEN (VALVE/DAMPER POSITION)
OA	OUTDOOR AIR
P/T	PRESSURE/TEMPERATURE
PCD/PCR	PERFORATED CEILING DIFFUSER/REGISTER
(R)	REMOVE
RA	RETURN AIR
RL	REFRIGERANT LIQUID
RR/ER	RETURN/EXHAUST REGISTER (SEE GRILLE/DIFFUSER SCHEDULE)
RS	REFRIGERANT SUCTION
RTU	ROOF TOP UNIT
SA	SUPPLY AIR
SLD/SLR	SLOT DIFFUSER/REGISTER
TYP.	TYPICAL
UV	UNIT VENTILATOR
VRF/VRV	VARIABLE REFRIGERANT FLOW
VAV	VARIABLE AIR VOLUME
VVT	VARIABLE VOLUME TEMPERATURE
ZD	ZONE DAMPER

GENERAL DEMOLITION NOTES (APPLICABLE FOR ALL DEMO WORK – ALL DRAWINGS):

1. DEMOLITION/RELOCATIONS: EACH TRADE CONTRACTOR SHALL BE RESPONSIBLE FOR DEMOLITION AND RELOCATIONS OF SERVICES, EQUIPMENT AND MATERIAL RELATING TO THEIR RESPECTIVE TRADE.

2. WHERE EXISTING WALLS, FLOORS OR CEILINGS ARE REMOVED OR PENETRATED, AND WHERE EXISTING END WALLS OF THE BUILDING ARE POINTS OF CONNECTION OF ADDITIONS, ALL SERVICES, PIPING, CONDUIT, CONTROL OR SWITCH DEVICES, OR OTHER HVAC, PLUMBING EQUIPMENT SHALL BE REMOVED (OR RELOCATED WHERE THEY MUST REMAIN IN SERVICE, OR SERVE, AREAS BEYOND THE IMMEDIATE WORK) CONTRACTOR SHALL FIELD VERIFY CONDITIONS AT THE SITE.

3. PRIOR TO DEMOLITION CONTRACTOR SHALL REVIEW WITH OWNER ALL MATERIALS TO BE REMOVED, SHOULD THE OWNER OPT TO KEEP ANY MATERIALS THE CONTRACTOR SHALL REMOVE AND DELIVER THE PARTS TO THE OWNER ON THE SITE WHERE SO DIRECTED. OTHERWISE ALL DEMOLISHED OR REMOVED MATERIALS SHALL BECOME THE PROPERTY OF THE CONTRACTOR AND SHALL BE REMOVED FROM THE SITE AND BE DISPOSED OF IN A LEGAL MANNER.

4. DEMOLITION SHALL INCLUDE REMOVAL OF ALL PARTS AND PIECES IN THEIR ENTIRETY BACK TO POINTS INDICATED OR IF NOT INDICATED BACK TO THEIR POINT OF SOURCE.
   WHERE CONDITIONS PROHIBIT TOTAL REMOVAL OF THE WORK, THE REMAINING PORTION SHALL BE CUT FLUSH WITH THE SURROUNDING SURFACE AND BE CAPPED, PLUGGED OR SEALED AND THE SURROUNDING SURFACE SHALL BE REFINISHED IN AN APPROVED MANNER.

5. MAINTAIN EXISTING UTILITIES INDICATED OR REQUIRED TO REMAIN, KEEP IN SERVICE, AND PROTECT AGAINST DAMAGE DURING DEMOLITION OPERATIONS. DO NOT INTERRUPT EXISTING UTILITIES SERVING OCCUPIED OR USED FACILITIES, EXCEPT WHEN SCHEDULED WITH THE OWNER.

6. DO NOT REMOVE EXISTING STRUCTURAL WORK. DO NOT REMOVE OPERATIONAL ELEMENTS AND SAFETY–RELATED COMPONENTS IN A MANNER RESULTING IN A REDUCTION OF CAPACITIES TO PERFORM IN THE MANNER INTENDED OR RESULTING IN DECREASED OPERATIONAL LIFE, INCREASED MAINTENANCE, OR DECREASED SAFETY.

7. REMOVALS, DISCONNECTIONS, AND RELOCATIONS SHALL BE PERFORMED BY WORKMEN SKILLED IN THE TRADE INVOLVED AND SHALL BE EMPLOYED BY A CONTRACTOR LICENSED IN THE TRADE INVOLVED. ALL WORK SHALL BE DONE IN ACCORDANCE WITH ACCEPTED TRADE PRACTICES.

8. PROVIDE ADEQUATE TEMPORARY SUPPORT FOR WORK TO REMAIN, TO PREVENT FAILURE. DO NOT ENDANGER OTHER WORK.

9. PROTECTION: PROVIDE ADEQUATE PROTECTION WHERE REQUIRED FOR THE PRESENT BUILDING AND ITS CONTENTS. TEMPORARY DUSTPROOF BARRIERS AND BARRICADES SHALL BE ERECTED WHERE REQUIRED FOR PROTECTION OF PERSONNEL, PROTECTION FROM DUST AND DIRT, FOR SECURITY, FIRE AND WEATHER PROTECTIVE REASONS.
   CONTRACTOR SHALL TAKE EVERY PRECAUTION AGAINST FIRE BY EMPLOYING FIRE DEPARTMENT TYPE HOSES AND PORTABLE FIRE EXTINGUISHERS AS REQUIRED BY OSHA OR THE OWNER'S INSURANCE UNDERWRITER.

10. USE TEMPORARY ENCLOSURES, OR OTHER SUITABLE METHODS TO LIMIT DUST AND DIRT RISING AND SCATTERING TO LOWEST PRACTICAL LEVEL. COMPLY WITH GOVERNING REGULATIONS PERTAINING TO ENVIRONMENTAL PROTECTION.

11. ALL EXISTING EQUIPMENT REQUIRED TO BE REUSED SHALL BE CLEANED, RECONDITIONED, CALIBRATED AND ADJUSTED. IN ALL INSTANCES WHERE CONTRACTOR FINDS THAT EXISTING EQUIPMENT IS DEFECTIVE TO THE POINT WHERE IT CANNOT BE PROPERLY RESTORED AND WILL NOT OPERATE PROPERLY, HE SHALL REPORT THE SPECIFIC ITEMS OR EQUIPMENT TO THE ARCHITECT/ENGINEER FOR DIRECTIONS.

12. ALL FIXTURES THAT ARE AFFECTED BY THE REMOVAL OR ADDITION OF FIXTURES SHALL REMAIN ACTIVE. ALL ASSOCIATED PIPING SHALL BE RECONNECTED TO MAINS IN MANNERS THAT COMPLIES WITH ALL CODES AND ORDINANCES.

13. ISOLATE AND DRAIN ALL PIPING SYSTEMS AS REQUIRED TO PERFORM ALL DEMOLITION WORK AND INSTALL NEW WORK FOR THIS PROJECT.

14. CONTRACTOR SHALL REMOVE ALL EQUIPMENT, PIPING, CONTROLS, WIRING, ETC. CURRENTLY ABANDONED OR MADE OBSOLETE BY THE NEW PROJECT EQUIPMENT, PIPING, ETC. COORDINATE ALL WORK WITH OTHER TRADES.

15. COORDINATE ALL HVAC CONTROLS DEMOLITION WITH THE BMS CONTRACTOR. REMOVE EXISTING CONTROLS, THERMOSTATS, ACTUATORS, CONTROL WIRING, PNEUMATIC CONTROLS AND ASSOCIATED TUBING SERVING EQUIPMENT BEING REMOVED, EXCEPT WHERE INDICATED TO REMAIN OR BE REUSED. REMOVE PNEUMATIC TUBING BACK TO THE NEAREST ACTIVE MAIN/BRANCH CONNECTION AND PERMANENTLY CAP. PROTECT EXISTING BMS CONTROLS AND COMPONENTS TO REMAIN

16. PRIOR TO DEMOLITION OF REFRIGERATION EQUIPMENT OR REFRIGERANT PIPING, RECOVER REFRIGERANT IN ACCORDANCE WITH APPLICABLE CODES AND REGULATIONS. DO NOT VENT REFRIGERANT TO THE ATMOSPHERE

17. PROTECT EXISTING ROOFING, ROOF CURBS, FLASHING, AND ROOF–MOUNTED EQUIPMENT TO REMAIN DURING DEMOLITION. COORDINATE ALL WORK AFFECTING THE EXISTING ROOF WITH THE ROOFING CONTRACTOR. TEMPORARILY WEATHERPROOF OPENINGS DURING CONSTRUCTION AND PERMANENTLY SEAL ALL ABANDONED PENETRATIONS WATERTIGHT

18. PROTECT EXISTING ROOFING, ROOF CURBS, FLASHING, AND ROOF–MOUNTED EQUIPMENT TO REMAIN DURING DEMOLITION. COORDINATE ALL WORK AFFECTING THE EXISTING ROOF WITH THE ROOFING CONTRACTOR. TEMPORARILY WEATHERPROOF OPENINGS DURING CONSTRUCTION AND PERMANENTLY SEAL ALL ABANDONED PENETRATIONS WATERTIGHT

ISSUED FOR BID-9/25/26

9.23.26

APPROVED

William R. Long
PROFESSIONAL ENGINEER
NEW JERSEY LICENSE NO. 33012

REVISIONS	DATE	BY

Tri-State Architects, P.C. / Alaimo Group
WILLIAM R. LONG, P.E. LIC. 33012
ANITA S. ARADHYA, R.A. LIC. 18769
200 HIGH STREET MOUNT HOLLY, N.J.

DATE: AUG. 2026
DESIGNED BY: IV
DRAWN BY: RKR
CHECKED BY: 9/22/26
DEPT. HEAD: 9/22/26

CLIENT: WILLINGBORO TOWNSHIP
PROJECT LOCATION: WILLINGBORO TWP. BURLINGTON COUNTY NEW JERSEY
PROJECT NO.: M-0410-0011-000
CONTRACT NO.: BID#8-2026

KENNEDY CENTER
RENOVATION TO THE SENIOR CENTER

GENERAL NOTES, SYMBOLS AND ABBREVIATION SCHEDULE

SCALE: AS SHOWN

SHEET
H11

FILE NO.:

Plotted: 9/22/2026 10:07 AM Last saved: 9/21/2026 4:03 PM File Name: M:\Projects\M04100011000\Drawings\GLQ-H11-General notes.dwg

FAN COIL UNITS SCHEDULE

EQUIP. TAG	SERVICE	INDOOR FCU TYPE	COOLING CAPACITY					SUPPLY FAN	HEATING CAPACITY			ELECTRICAL			DIMENSION	WEIGHT	CU	NOTES
			TOTAL BTU/h	SENSIBLE BTU/h	ENTERING AIR		EXITING AIR	AIR FLOW RATE	TOTAL BTU/h	ENTERING AIR °Fdb	EXITING AIR	POWER SUPPLY	MIN CIRCUIT AMPS	MAX OVERCURRENT PROTECTION	inch	lbs		
					°F DB	°F WB	°F	cfM				V/Ph						
FCU-17	ACTIVITY ROOM	FXFA48AAVJU	46,023	25,931	72.7	65.5	53.9	1253	56,079	68	108.6	208V-230V 1PH	1.6	15	33.1x11.3x33.1	58.0	ACCU-4	1,4,5-17
FCU-18	KITCHEN	FXSA48AAVJU	46,023	32,955	78.8	65.5	55.9	1307	56,079	68	107.0	208V-230V 1PH	2.8	15	55.1x9.6x31.5	105.8	ACCU-4	1,2,3,6-17
MSE-1	ELECTRICAL ROOM	FTKF12BVJU9	14,600	12,000	80	67	55	399	N/A	-		208V-230V 1PH			12-13/16 x 33-1/8 x 14-9/16	25.0	MSC-1	1,2,6,7,9-17
MSE-2	170 ENTRANCE 2	FFA18AVJU9	17,400	12,270	80	67	55	508	21,600	68	107.0	208V-230V / 60 / 1PH			10-1/4 x 22-5/8 x 22-5/8	36.0	MSHP-1	1,4,5,6,7,9-17

1. INDOOR FCU SHALL BE DAIKIN OR SIMILAR. REFRIGERANT SHALL BE R-454B OR R-32 AS PER NEW EPA HVAC REFRIGERANT REGULATION
2. PROVIDE UNIT WITH OPTIONAL (ONLY IF REQUIRED) CONDENSATE PUMP BASED ON FCU TONNAGE AND DISTANCE TO NEAREST GRAVITY CONDENSATE LINE. PUMPS SHALL BE EQUAL TO SAUERMANN SI-30 OR APPROVED EQUAL, RATED FOR UNIT VOLTAGE AND MINIMUM 15 FT OF VERTICAL DISCHARGE FOR FLOOR MOUNTED UNITS WHERE REQUIRED AND NOTED ON DRAWINGS.
3. CONTRACTOR PROVIDE FLEX CONNECTORS ON SUPPLY AND RETURN DUCT CONNECTIONS TO THE UNIT.
4. CEILING CASSETTE UNIT WITH STANDARD INTEGRAL CONDENSATE PUMP.
5. FURNISH WITH DECORATIVE PANEL FOR LAY-IN CEILING INSTALLATION
6. PROVIDE HANGER SUPPORTS FOR FCUs AS REQUIRED
7. PROVIDE ANY ADDITIONAL REFRIGERANT LINES AND CHARGES AS REQUIRED FOR A PROPER CHARGE AS DEFINED BY MANUFACTURER,
8. PROVIDE WITH REFNET BRANCH PIPING KIT AS REQUIRED.
9. FURNISH WITH A NAVIGATION REMOTE CONTROLLER BRC1E73 OR SIMILAR FOR EACH FCU. REFER TO H6 DETAILS FOR A CONTROL WIRING DIAGRAM. ALSO REFER TO SEQUENCE OF OPERATION ON H9 FOR MORE INFO ON OPERATION AND CONTROLS.
10. FURNISH EACH FCU WITH FACTORY PROVIDED BACNET ADAPTER TO INTEGRATE NEW CONTROLS INTO NEW BMS SYSTEM.
11. FCU AND CONDENSING UNIT SHALL BE PURCHASED AS A MATCHED SET FROM A SINGLE MANUFACTURER
12. PROVIDE WITH VRV CLOUD SERVICE AND ASSOCIATED CONTROL DEVICES. DAIKIN HERO PRO EDGE CLOUD OR SIMILAR. REFER TO SPEC 238132 FOR MORE INFORMATION.
13. CONTRACTOR AND EQUIPMENT MANUFACTURER SHALL COORDINATE A PRE-INSTALLATION MEETING PRIOR TO THE START OF INSTALLATION TO ENSURE FACTORY GUIDELINES ARE FOLLOWED.
14. PROVIDE LOW AMBIENT KIT WITH START CONTROL.
15. CONTRACTOR TO SUBMIT DETAIL MANUFACTURER DESIGN DRAWING, SCHEDULES AND INSTALLATION PROCEDURES AND RECOMMENDATIONS.
16. REFER TO CONTRACT SPECIFICATIONS FOR ADDITIONAL INFORMATION.
17. ALL REFRIGERANT LINE SET SIZES TO BE DETERMINED BY THE EQUIPMENT MANUFACTURER. ALL PIPE SIZING CALCULATIONS TO BE SUBMITTED WITH SHOP DRAWING FOR REVIEW.

CONDENSING UNIT SCHEDULE

EQUIP. TAG	SERVICE	DECRIPTION	NOMINAL TONNAGE	COOLING CAPACITY		HEATING CAPACITY		ELECTRICAL				DIMENSIONS		EFFICIENCY (NONDUCTED)	NOTES / REMARKS
				BTU/h	AMBIENT DESIGN (°F DB)	BTU/h	AMBIENT DESIGN (°F DB/WB)	VOLTAGE PHASE	MIN CIRCUIT AMPS (MCA)	MAX OVERCURRENT PROTECTION (MOP)	RUNNING CURRENT (RLA)	WxHxD (inch)	WEIGHT (lbs)	EER	
ACCU-4	TRAINING KITCHEN	AIR COOLED HEAT PUMP DAIKIN RXYA96AAYDA OR SIMILAR	8	89421	84.2	85354	10.0/10.0	460V 3ph	17.5	20	-	48.8 x 65.4 x 30.1	725.3	-	ALL
MSC-1	ELECTRICAL ROOM	AIR COOLED CONDESING UNIT RKF12BVJU9	1	12000	95	N/A	-	208V 1PH	-	-	4.5	24-7/16 x 31-1/4 x 14-1/8	76	21.0 SEER2	ALL
MSHP-2	170 ENTRANCE 2	RXV18AVJU9	1.5	17400	95	21600	1/8	208-230V 1 Ph	17.9	20	-	29-1/2 x 34-1/4 x 12-5/8	113		ALL

1. FCU AND CONDENSING UNIT SHALL BE PURCHASED AS A MATCHED SET FROM A SINGLE MANUFACTURER
2. CONDENSING UNIT SHALL BE DAIKIN OR SIMILAR. REFRIGERANT SHALL BE R-454B OR R-32 AS PER NEW EPA HVAC REFRIGERANT REGULATION
3. CONTRACTOR PROVIDE ALL REFRIGERANT PIPING SPECIALITIES LIKE THERMAL EXPANSION VALVE, FILTER DRIER, MOISTURE INDICATERS, CHARGING VALVES, SIGHT GLASS ETC. PER CONDENSING UNIT MANUFACTURER'S RECOMMENDATIONS FOR PROPER OPERATION AND CONTROL OF SYSTEM. PROVIDE VIBRATION ISOLATORS IF/AS REQUIRED.
4. INTEGRATE NEW CONTROLS INTO NEW BMS SYSTEM.
5. POWER MONITORING PANELS WITH OVER UNDER VOLTAGE PROTECTION AND PHASE LOSS PROTECTION INCLUDED FOR FIELD INSTALLATION BY CONTRACTOR
6. CONTRACTOR PROVIDE POWER CONNECTIONS/DISCONNECTS TO OUTDOOR CONDENSING UNITS. REFER TO ELECTRICAL DRAWINGS FOR MORE INFO.
7. PROVIDE WITH VRV CLOUD SERVICE AND ASSOCIATED CONTROL DEVICES. DAIKIN HERO PRO EDGE CLOUD OR SIMILAR. REFER TO SPEC 238132 FOR MORE INFORMATION.
8. PROVIDE WITH BACNET INTERFACE TO INTEGRATE INTO NEW BMS SYSTEM.
9. CONTRACTOR FOLLOW MANUFACTURER'S INSTALLATION TRAINING COURSE/RECAP
10. CONTRACTOR AND EQUIPMENT MANUFACTURER SHALL COORDINATE A PRE-INSTALLATION MEETING PRIOR TO THE START OF INSTALLATION TO ENSURE FACTORY GUIDELINES ARE FOLLOWED.
11. THE BASIS OF DESIGN DAIKIN EQUIPMENT REQUIRES NON-SHIELDED, STRAINED, TRUE DAISY CHAIN COMMUNICATION WIRE TO BE INSTALLED BY THE CONTRACTOR
12. PROVIDE WITH 10 YEAR EQUIPMENT PARTS WARRANTY
13. INSTALLER SHALL COMPLETE FACTORY PRE-START-UP/COMMISSIONING FORM PRIOR TO SCHEDULING FACTORY STARTUP/COMMISSIONING. FACTORY TECHNICIAN SHALL PERFORM STARTUP AND SYSTEM COMMISSIONING.
14. CONTROLS SHALL BE PROVIDED BY BMS CONTRACTOR AND SHALL BE INTEGRATED INTO TRANE BMS SYSTEM.
15. PROVIDE ELASTOMERIC FOAM INSULATION ON ENTIRE SUCTION LINE & LIQUID LINE PIPING. PROVIDE ALUMINUM JACKETING (OUTSIDE BUILDING), PVC (EXPOSED WITHIN 8' A.F.F – ALL AREAS)
16. PROVIDE LOW AMBIENT KIT WITH START CONTROL.
17. CONTRACTOR TO SUBMIT DETAIL MANUFACTURER DESIGN DRAWING, SCHEDULES AND INSTALLATION PROCEDURES AND RECOMMENDATIONS.
18. REFER TO CONTRACT SPECIFICATIONS FOR ADDITIONAL INFORMATION.
19. ALL REFRIGERANT LINE SET SIZES TO BE DETERMINED BY THE EQUIPMENT MANUFACTURER. ALL PIPE SIZING CALCULATIONS TO BE SUBMITTED WITH SHOP DRAWING FOR REVIEW.
20. PROVIDE ANY ADDITIONAL REFRIGERANT LINES AND CHARGES AS REQUIRED FOR A PROPER CHARGE AS DEFINED BY MANUFACTURER.
21. CONTRACTOR PROVIDE 6" CONCRETE PAD WITH 6" OVERHANG ON ALL SIDES. REFER TO TYPICAL EXTERIOR SMALL EQUIPMENT PAD DETAIL ON H5.

FINNED TUBE

EQUIP. TAG	LOCATION	LENGTH	INLET DIA.	FIN SIZE	FIN PER FT	FIN THICKNESS	AVG. WATER TEMP.	HEAT CAPACITY BTU/LF	FIN MATERIAL	DESIGN GPM	BASIS OF DESIGN	REMARKS
FTR-153A	LOUNGE/ STUDY	6'	1-1/4"	5"x2-3/4"	50	0.20	170	730	COPPER / ALUMINUM	2.6 (SERIES)	STERLING KS OR EQUIVALENT	ALL
FTR-153B	LOUNGE/ STUDY	6'	1-1/4"	5"x2-3/4"	50	0.20	170	730	COPPER / ALUMINUM	2.6 (SERIES)	STERLING KS OR EQUIVALENT	ALL
FTR-153C	LOUNGE/ STUDY	6'	1-1/4"	5"x2-3/4"	50	0.20	170	730	COPPER / ALUMINUM	2.6 (SERIES)	STERLING KS OR EQUIVALENT	ALL
FTR-153D	LOUNGE/ STUDY	6'	1-1/4"	5"x2-3/4"	50	0.20	170	730	COPPER / ALUMINUM	2.6 (SERIES)	STERLING KS OR EQUIVALENT	ALL
FTR-153E	LOUNGE/ STUDY	6'	1-1/4"	5"x2-3/4"	50	0.20	170	730	COPPER / ALUMINUM	2.6 (SERIES)	STERLING KS OR EQUIVALENT	ALL
FTR-153F	LOUNGE/ STUDY	6'	1-1/4"	5"x2-3/4"	50	0.20	170	730	COPPER / ALUMINUM	2.6 (SERIES)	STERLING KS OR EQUIVALENT	ALL
FTR-145	CONFERENCE ROOM	22'	3/4"	3-3/4"x2-3/4"	50	0.014	170	730	COPPER / ALUMINUM	1.6	STERLING KS OR EQUIVALENT	1-6,8
FTR-168	COMPUTER ROOM	22'	3/4"	3-3/4"x2-3/4"	50	0.014	170	730	COPPER / ALUMINUM	1.6	STERLING KS OR EQUIVALENT	1-6,8

1. PROVIDE WITH COPPER/ALUMINUM HEATING ELEMENT.
2. PROVIDE WALL SLEEVES, BLANK SECTIONS, CORNERS, END CAPS, AND OTHER ACCESSORIES AS REQUIRED FOR A COMPLETE INSTALLATION AND TO CONCEAL PIPING.
3. PROVIDE FULL BACKPLATE.
4. FIELD-VERIFY FINAL ELEMENT AND ENCLOSURE LENGTHS PRIOR TO ORDERING.
5. PROVIDE WITH CONTROL VALVE. REFER TO DETAIL FOR ADDITIONAL INFORMATION. PROVIDE ACCESS DOOR OR REMOVABLE ENCLOSURE SECTION AT CONTROL VALVE.
6. HEAT CAPACITY SHOWN IS BTUH PER LINEAR FOOT AT 170°F AVERAGE WATER TEMPERATURE. MANUFACTURER SHALL VERIFY SCHEDULED CAPACITY AT DESIGN GPM.
7. FTR-153A THROUGH FTR-153F SHALL BE PIPED IN SERIES. DESIGN GPM SHOWN IS THE COMMON FLOW THROUGH THE ENTIRE SERIES CIRCUIT.
8. PROVIDE CONTINUOUS FIN-TUBE ENCLOSURE WITH BLANK SECTIONS BETWEEN HEATING ELEMENTS WHERE INDICATED.
9. FTRs SHALL OPERATE AS SECONDARY/AUXILIARY HEATING. REFER TO SEQUENCE OF OPERATIONS ON H10 FOR INFORMATION ON CONTROLS AND OPERATION.

HOT WATER CONVECTOR

EQUIP. TAG	TYPE	LOCATION	DIMENSION LxHxD(in.)	TOTAL BTU	AWT	GPM	BASIS OF DESIGN	REMARKS
HC-1,2	FREE STANDING CABINET ENCLOSURE	LOUNGE / STUDY	28x32x6	4,830	170	0.5	STERLING SF-A OR EQUIVALENT	ALL

1. PROVIDE WITH 3/4-INCH HOT WATER SUPPLY AND RETURN CONNECTIONS AND ALL REQUIRED AIR VENTS, DRAINS, FITTINGS, AND ACCESSORIES
2. PROVIDE WITH CONTROL VALVE AND ACTUATOR. REFER TO CONTROL DETAILS AND SEQUENCE OF OPERATION FOR ADDITIONAL REQUIREMENTS.
3. PROVIDE ACCESS DOOR OR REMOVABLE ENCLOSURE SECTION AS REQUIRED FOR ACCESS TO CONTROL VALVE, AIR VENT, AND OTHER SERVICEABLE COMPONENTS.
4. PROVIDE ALL REQUIRED CONTROLS AND ACCESSORIES TO INTEGRATE HC-1 AND HC-2 INTO THE EXISTING BMS.
5. FIELD-VERIFY FINAL UNIT LOCATION AND DIMENSIONS PRIOR TO ORDERING. COORDINATE INSTALLATION WITH WALLS, BASE, HOT WATER PIPING, AND OTHER EXISTING CONDITIONS.
6. HCs SHALL OPERATE AS SECONDARY/AUXILIARY HEATING. REFER TO SEQUENCE OF OPERATIONS ON H10 FOR INFORMATION ON CONTROLS AND OPERATION.

CABINET UNIT HEATER

EQUIP. TAG	TYPE	LOCATION	DIMENSION (in.)	AIRFLOW CFM	TOTAL MBh	EWT/LWT (°F)	GPM	BASIS OF DESIGN	REMARKS
CUH-1	HORIZONTAL RECESSED	CORRIDOR 143	33x30x11	350	24.81	180/160.72	2.57	TRANE FFEB020 OR EQUIVALENT	1,3,4,5,6,7
CUH-2	HORIZONTAL RECESSED	CORRIDOR 169	33x30x11	350	24.81	180/160.72	2.57	TRANE FFEB020 OR EQUIVALENT	2,3,4,5,6,7

1. CUH-1 SHALL BE PROVIDED WITH BOTTOM SUPPLY AND RETURN AIR PANEL WITH INTEGRAL LOUVERS.
2. CUH-2 SHALL BE PROVIDED WITH BOTTOM RETURN AIR PANEL AND FRONT DUCTED SUPPLY AIR CONNECTION. PROVIDE REQUIRED SUPPLY DUCT COLLAR/CONNECTION.
3. PROVIDE WITH 1-INCH MERV-8 FILTER, ECM FAN MOTOR, AND FACTORY-MOUNTED DISCONNECT SWITCH.
4. PROVIDE HOT WATER CONTROL VALVE, ACTUATOR, THERMOSTAT/CONTROLLER, AND ALL REQUIRED CONTROL ACCESSORIES.
5. INTEGRATE CUH-1 AND CUH-2 INTO THE EXISTING TRANE BMS. BMS CONTRACTOR SHALL PROVIDE REQUIRED CONTROL WIRING, PROGRAMMING, AND ACCESSORIES.
6. PROVIDE REQUIRED ACCESS FOR FILTER, CONTROL VALVE, CONTROLS, AND OTHER SERVICEABLE COMPONENTS. SUPPORT UNIT INDEPENDENTLY FROM BUILDING STRUCTURE; DO NOT SUPPORT FROM CEILING GRID.
7. FIELD-VERIFY AND COORDINATE FINAL UNIT AND ACCESS PANEL LOCATIONS WITH CEILING GRID, LIGHTS, SPRINKLERS, STRUCTURE, AND WORK OF OTHER TRADES.

DIFFUSER AND REGISTER SCHEDULE

MARK	DESCRIPTION	SYSTEM	MATERIAL	MODULE SIZE	FRAME	THROW PATTERN	MANUFACTURER	NOTES
CD-4	LOUVER FACED CEILING DIFFUSER	SUPPLY	ALUMINUM	24x24	LAY-IN	4-WAY	TITUS TDC OR SIMILAR	1,2,3,8
PCD-4	PERFORATED CEILING DIFFUSER	SUPPLY	ALUMINUM	24x24	LAY-IN	4-WAY	TITUS PXP OR SIMILAR	1,2,3,8
PCR-1	PERFORATED CEILING EXHAUST/RETURN REGISTER	EXHAUST/ RETURN	ALUMINUM	24x24	LAY-IN	N/A	TITUS PXP OR SIMILAR	1,2,8
RR-1/ER-1	35 DEG. BLADE RETURN REGISTER – 1/2" BLADE SPACING	EXHAUST/ RETURN	ALUMINUM	24x24	LAY-IN	N/A	TITUS 350 OR SIMILAR	1,2,8
FRR-1	35 DEG. BLADE FILTER RETURN REGISTER – 1/2" BLADE SPACING	RETURN	ALUMINUM	24x24	LAY-IN	N/A	TITUS 350 FLF1 OR SIMILAR	1,2,8
SLD-1	LINEAR SLOT DIFFUSER WITH VOLUME DAMPER	SUPPLY	ALUMINUM	5'	SURFACE	2-WAY	PRICE SDS100 OR SIMILAR	4,7,8
SLR-1	LINEAR SLOT REGISTER WITH VOLUME DAMPER	RETURN	ALUMINUM	5'	SURFACE	N/A	PRICE SDS100 OR SIMILAR	5,7,8
SL-1B	LINEAR SLOT REGISTER WITH BLANK-OFF PANEL	RETURN	ALUMINUM	REFER TO DRAWINGS	SURFACE	N/A	PRICE SDS100 OR SIMILAR	6,7,8

1. GRILLE/REGISTER/DIFFUSER SHALL BE WHITE.
2. PROVIDE WITH R-6 FOIL FACED INSULATION ON BACKPAN
3. PROVIDE WITH AUXILIARY PANEL FOR INSTALLATION IN 2'x2' LAY-IN CEILING AND SQUARE-TO-ROUND TRANSITION
4. LINEAR SLOT DIFFUSER 2 SLOT – 1" SLOT WIDTH (PRICE SDS100 OR SIMILAR) – 8" ROUND INLET WITH INSULATED PLENUM (PRICE SDB100 OR SIMILAR) AND FULL FLOW STEEL DAMPER C/W CABLE OPERATED DAMPER (PRICE 8EC OR SIMILAR)
5. LINEAR SLOT REGISTER 2 SLOT – 1" SLOT WIDTH (PRICE SDS100 OR SIMILAR) – 8" ROUND INLET WITH INSULATED PLENUM (PRICE SDB100 OR SIMILAR) AND FULL FLOW STEEL DAMPER C/W CABLE OPERATED DAMPER (PRICE 8EC OR SIMILAR)
6. LINEAR SLOT DIFFUSER/REGISTER 2 SLOT – 1" SLOT WIDTH (PRICE SDS100 OR SIMILAR) WITH METAL BLANK-OFF.
7. FURNISH WITH ACCESSORIES REQUIRED FOR INSTALLATION IN WOODEN SLAT CEILING. REFER TO ARCHITECTURAL DRAWINGS FOR INFORMATION ON CEILING TYPE.
8. REFER TO SPECS FOR MORE INFO ON ACCESSORIES, ETC.

CONTROL DAMPER SCHEDULE

EQUIP. TAG	APPLICATION	FUNCTION	DAMPER TYPE	BLADE PATTERN	FRAME STYLE/ MATERIAL	MAX. DESIGN AIRFLOW (CFM)	MIN. DESIGN AIRFLOW (CFM)	MAX. DESIGN VELOCITY (FPM)	DAMPER SIZE	ACTUATOR TYPE	BASIS OF DESIGN	REMARKS
EA CD-1	DOAS EXHAUST FOR ROOM 126,128	MODULATING	LOW LEAKAGE AIRFOIL CONTROL DAMPER	OPPOSED	IN DUCT / GALV. STEEL FRAME, ALUMINUM AIRFOIL BLADES	750	350	750	12x12	24V ELECTRIC MODULATING, SPRING RETURN	POTTORFF CD-52 OR EQUIVALENT	ALL
EA CD-2	DOAS EXHAUST FOR ROOM 122	MODULATING	LOW LEAKAGE AIRFOIL CONTROL DAMPER	OPPOSED	IN DUCT / GALV. STEEL FRAME, ALUMINUM AIRFOIL BLADES	400	200	600	12x8	24V ELECTRIC MODULATING, SPRING RETURN	POTTORFF CD-52 OR EQUIVALENT	ALL

REMARKS:
1. DAMPER SIZES SHOWN ARE FOR REFERENCE ONLY. CONTRACTOR SHALL COORDINATE FINAL DAMPER SIZE WITH ASSOCIATED EXHAUST AIR DUCT SIZE.
2. PROVIDE LOW-LEAKAGE, OPPOSED BLADE, AIRFOIL CONTROL DAMPER WITH BLADE AND JAMB SEALS.
3. PROVIDE 24V MODULATING SPRING-RETURN ACTUATOR. DAMPER SHALL FAIL CLOSED UPON LOSS OF POWER.
4. EACD-1 AND EACD-2 SHALL MODULATE PROPORTIONALLY WITH THEIR ASSOCIATED VAV TERMINAL UNITS. REFER TO SEQUENCE OF OPERATION FOR ADDITIONAL CONTROL REQUIREMENTS.
5. BMS CONTRACTOR SHALL PROVIDE ALL REQUIRED CONTROLS, ACTUATORS, CONTROL WIRING, PROGRAMMING, AND ACCESSORIES AND INTEGRATE EACD-1 AND EACD-2 INTO THE EXISTING TRANE BMS.

ISSUED FOR BID-9/25/26

9.23.26

William R. Long
PROFESSIONAL ENGINEER
NEW JERSEY LICENSE NO. 33012

APPROVED

REVISIONS	DATE	BY

Tri-State Architects, P.C. / Alaimo Group
WILLIAM R. LONG, P.E. LIC. 33012
ANITA S. ARADHYA, R.A. LIC. 18769
200 HIGH STREET MOUNT HOLLY, N.J.

DATE: AUG. 2026
DESIGNED BY: IV
DRAWN BY: RKR
CHECKED BY: 9/22/26
DEPT. HEAD: 9/22/26

KENNEDY CENTER
RENOVATION TO THE SENIOR CENTER

CLIENT: WILLINGBORO TOWNSHIP

HVAC - SCHEDULES - I

PROJECT LOCATION: WILLINGBORO TWP. BURLINGTON COUNTY NEW JERSEY
PROJECT NO.: M-0410-0011-000
CONTRACT NO.: BID#8-2026
SCALE: NONE

SHEET
H12

FILE NO.:

EXHAUST FAN SCHEDULE

EQUIP. TAG	LOCATION	CFM	HP	EXTERNAL STATIC PRESSURE IN W.C.	FAN RPM	DRIVE	SERVICE	FLA	V/ø/Hz.	MANUFACTURE MODEL NO.	MOUNTING	NOTES
KEF-1	ROOF	1290	0.75	1.0	1276	DIRECT	KITCHEN EXHAUST	8.900	115/1/60	CAPTIVEAIRE DU85HFA	ROOF	1,6,7
EF-8	KILN ROOM	124	22 W	0.147	1100	DIRECT	EXHAUST	0.180	115/1/60	GREENHECK SP-A125	CEILING	1,2
EF-30	ROOF	263	1/30	0.264	1300	DIRECT	RESTROOM 144		115/1/60	GREENHECK G-080-G	ROOF	1,3,4,5

REMARKS:

1. PROVIDE SPECIFIED MANUFACTURER OR APPROVED EQUIVALENT.
2. PROVIDE AND INSTALL SPEED CONTROLS FOR THE EXHAUST FAN. EXHAUST FAN SHALL BE ELECTRICALLY INTERLOCKED WITH KILN SWITCH AND SHALL BE ON WHENEVER THE KILN IS ON. PROVIDE WALL CAP, ROUND DUCT CONNECTOR, BACKDRAFT DAMPER, BIRDSCREEN, VIBRATION ISOLATION HANGERS, AND ALL ASSOCIATED ACCESSORIES AS REQUIRED. REFER TO SPEC AND DRAWINGS FOR MORE INFORMATION.
3. PROVIDE WITH GRAVITY BACKDRAFT DAMPER. GREENHECK WD-100 OR SIMILAR. MATCH THE SIZE OF NEW BACKDRAFT DAMPER WITH EXISTING SO IT CAN BE PLACED ON THE DAMPER TRAY OF EXISTING BASE CURB.
4. PROVIDE WITH STAINLESS STEEL BIRD SCREEN.
5. CONTRACTOR F.V. AND MEASURE EXISTING FAN CURB AND PROVIDE AN ADAPTER CURB OVER THE BASE CURB TO TRANSITION/ADAPT INTO NEW FAN
6. FURNISH WITH NEMA-4X TOGGLE SWITCH, ADAPTER CURB, GREASE TRAP WITH ABSORBENT MATERIAL, HINGED CURB CAP KIT WITH CABLES, HEAT BAFFLE, BEARINGS WITH GREASE FITTINGS, CLEAN-OUT PORT, VENTED CURB EXTENSION. REFER TO DETAIL 1/H5, 1,2/H6 AND KITCHEN EXHAUST FAN SPECIFICATION SECTION FOR ALL ACCESSORIES REQUIRED FOR THE EF.
7. KITCHEN HOOD, FIRE-SUPPRESSION SYSTEM, GAS-FIRED MAKE-UP AIR UNIT, AND ASSOCIATED EXHAUST FAN SHALL BE PROVIDED AS A COMPLETE, COORDINATED SYSTEM BY A SINGLE MANUFACTURER. BASIS OF DESIGN: CAPTIVEAIRE OR APPROVED EQUIVALENT.

GAS FIRED MAKE -UP UNIT

EQUIP. TAG	LOCATION	CFM	GAS PRESSURE MIN/MAX(W.C.)	CAPACITY (BTu) INPUT/OUTPUT	TEMP. RISE (DEG. F)	TURNDOWN RATIO	ESP IN. wg	MOTOR BHP	MOTOR RPM	OPERATING POWER (hp)	V/ø	FLA	MCA	MOCP	MANUFACTURE MODEL NO.	NOTES
MAU-1	ROOF	1,030	7/14	75274/69252	63	30:1	0.500	0.381	1366	1.00	115/1	11.6	16.6A	25 A	A1-D250-15D	ALL

REMARKS:

1. PROVIDE FACTORY-ASSEMBLED, OUTDOOR GAS-FIRED MAKE-UP AIR UNIT COMPLETE WITH DIRECT-FIRED GAS BURNER (MINIMUM 30:1 MODULATION/TURNDOWN RATIO), SUPPLY FAN, FILTER SECTION, MOTORIZED OUTDOOR AIR DAMPER, FACTORY CONTROLS, REQUIRED SAFETY DEVICES, AND ALL STANDARD ACCESSORIES REQUIRED FOR A COMPLETE AND OPERABLE SYSTEM.
2. UNIT SHALL BE COMPATIBLE WITH THE BUILDING MANAGEMENT SYSTEM (BMS). PROVIDE ALL FACTORY CONTROLS, FACTORY-MOUNTED DISCONNECT SWITCH, CONTROL PANEL, HUMAN-MACHINE INTERFACE (HMI), AND SINGLE-POINT ELECTRICAL CONNECTION REQUIRED FOR A COMPLETE INSTALLATION.
3. INSTALL UNIT ON FACTORY-FABRICATED INSULATED CURB. REFER TO ROOF CURB DETAILS. INSTALL UNIT PLUMB AND LEVEL IN ACCORDANCE WITH THE MANUFACTURER'S INSTALLATION REQUIREMENTS.
4. PROVIDE THE MINIMUM SERVICE AND ACCESS CLEARANCES RECOMMENDED BY THE MANUFACTURER. DO NOT LOCATE THE UNIT WHERE ACCESS TO FILTERS, BURNER, FAN, ELECTRICAL COMPONENTS, OR ACCESS DOORS IS RESTRICTED.
5. KITCHEN HOOD, FIRE-SUPPRESSION SYSTEM, GAS-FIRED MAKE-UP AIR UNIT, AND ASSOCIATED EXHAUST FAN SHALL BE PROVIDED AS A COMPLETE, COORDINATED SYSTEM BY A SINGLE MANUFACTURER. BASIS OF DESIGN: CAPTIVEAIRE OR APPROVED EQUIVALENT.

COIL CONTROL VALVE SCHEDULE

EQUIP. TAG	CONFIGURATION AND TYPE	SERVES	GPM	MAXIMUM P.D. (PSI)	SHUTOFF PRESSURE (PSI)	MIN. CV	CONNECTIONS		ACTUATOR			BASIS OF DESIGN: MANUFACTURER MODEL NO.	REMARKS
							PIPE SIZE (IN)	CONTROL VALVE SIZE (IN)	TYPE	CONTROL TYPE	FAIL POSITION		
CV-FTR-153	2-WAY CHARACTERIZED BALL	FTR-153 A-F	2.6	5	50	1.16	1.25	0.5	ELECTRIC MODULATING	2-10 VDC	OPEN	BELIMO CCV OR EQUIVALENT	ALL
CV-FTR-145	2-WAY CHARACTERIZED BALL	FTR-145	1.6	5	50	0.72	0.75	0.5	ELECTRIC MODULATING	2-10 VDC	OPEN	BELIMO CCV OR EQUIVALENT	ALL
CV-FTR-168	2-WAY CHARACTERIZED BALL	FTR-168	1.6	5	50	0.72	0.75	0.5	ELECTRIC MODULATING	2-10 VDC	OPEN	BELIMO CCV OR EQUIVALENT	ALL
CV-HC-1	2-WAY CHARACTERIZED BALL	HC-1	0.5	5	50	0.50	0.75	0.5	ELECTRIC MODULATING	2-10 VDC	OPEN	BELIMO CCV OR EQUIVALENT	ALL
CV-HC-2	2-WAY CHARACTERIZED BALL	HC-2	0.5	5	50	0.50	0.75	0.5	ELECTRIC MODULATING	2-10 VDC	OPEN	BELIMO CCV OR EQUIVALENT	ALL
CV-CUH-1	2-WAY CHARACTERIZED BALL	CUH-1	2.57	5	50	1.15	0.75	0.5	ELECTRIC MODULATING	2-10 VDC	OPEN	BELIMO CCV OR EQUIVALENT	ALL
CV-CUH-2	2-WAY CHARACTERIZED BALL	CUH-2	2.57	5	50	1.15	0.75	0.5	ELECTRIC MODULATING	2-10 VDC	OPEN	BELIMO CCV OR EQUIVALENT	ALL

NOTES:

1. VALVE SIZES SHOWN ARE BASED ON 'BELIMO' PRODUCTS. CONTROL VALVE COMPANY AND BMS CONTRACTOR SHALL DETERMINE VALVE AND ACTUATOR SIZES REQUIRED BASED ON INDICATED FLOW, PIPE SIZE AND MAXIMUM INDICATED PRESSURE DROP. THIS SCHEDULE IS FOR REFERENCE ONLY.
2. CONTRACTOR SHALL PROVIDE ALL ITEMS REQUIRED FOR A COMPLETE INSTALLATION INCLUDING SUPPORTS, PIPE FITTINGS, CONTROL WIRING/CONDUIT, PIPE INSULATION, AND ASSOCIATED ACCESSORIES.

VARIABLE AIR VOLUME TERMINAL UNITS SCHEDULE

EQUIPMENT NUMBER	MAKE & MODEL (OR EQUIVALENT)	INLET DIA. (IN)	AIRFLOW (CFM)			APD	ELECTRIC REHEAT COIL				NC LEVEL		REMARKS
			COOLING MIN.	COOLING MAX.	HEATING		HEAT KW	HEAT (MIN) MBH	EAT (°F)	LAT (°F)	DISC.	RAD.	
VAV-1	TITUS DESV	8	350	750	–	0.02	–	–	–	–	28	25	1,3,4,5,6,7,8
VAV-2	TITUS DESV	6	175	400	–	0.13	–	–	–	–	27	24	1,3,4,5,6,7,8
VAV-148	TRANE VCEF	8	350	875	475	0.090	5.5	18.78	55	91.44	26	24	1,2,4,5,6,7,8
VAV-152	TRANE VCEF	16	700	3000	1150	0.020	13.0	44.4	55	90.58	24	25	1,2,4,5,6,7,8
VAV-154	TRANE VCEF	8	325	825	450	0.080	5.5	18.78	55	93.47	25	22	1,2,4,5,6,7,8
VAV-164	TRANE VCEF	8	200	750	350	0.070	4.0	13.66	55	90.97	24	21	1,2,4,5,6,7,8
VAV-168	TRANE VCEF	6	150	400	225	0.140	3.0	10.24	55	96.97	21	17	1,2,4,5,6,7,8

NOTES:

1. PROVIDE SINGLE-DUCT VAV TERMINAL UNIT WITH INTEGRAL AIRFLOW SENSOR AND DAMPER ASSEMBLY. PROVIDE DESIGN AND MINIMUM AIRFLOWS AS SCHEDULED.
2. FOR VAV TERMINAL UNITS WITH ELECTRIC REHEAT, PROVIDE INTEGRAL SCR MODULATING ELECTRIC HEATER, FACTORY-INSTALLED DISCONNECT SWITCH, 24V CONTROL TRANSFORMER, AND SINGLE-POINT POWER CONNECTION.
3. FOR VAV TERMINAL UNITS WITHOUT ELECTRIC REHEAT, PROVIDE COOLING-ONLY VAV TERMINAL UNIT WITH AIRFLOW CAPACITIES AS SCHEDULED.
4. BMS CONTRACTOR SHALL PROVIDE DDC CONTROLLER, DAMPER ACTUATOR, AIRFLOW TRANSDUCER, SPACE THERMOSTAT/SENSOR, CONTROL WIRING, AND ALL ASSOCIATED CONTROLS.
5. INTEGRATE ALL VAV TERMINAL UNIT CONTROLS INTO THE EXISTING TRANE BMS. COORDINATE VAV DAMPER AND ELECTRIC REHEAT OPERATION, WHERE APPLICABLE, WITH RESPECTIVE AIR HANDLING UNIT AND SEQUENCE OF OPERATION.
6. PROVIDE CO2 SENSOR AND DEMAND CONTROL VENTILATION FOR VAV TERMINAL UNITS WHERE INDICATED ON DRAWINGS. REFER TO SEQUENCE OF OPERATION FOR CONTROL REQUIREMENTS.
7. PROVIDE MINIMUM 1/2-INCH MATTE-FACED INTERNAL INSULATION. UNIT PERFORMANCE AND SOUND RATINGS SHALL COMPLY WITH VAV TERMINAL UNIT SPECIFICATION.
8. PROVIDE REQUIRED ACCESS AND SERVICE CLEARANCES FOR VAV CONTROLS, DAMPER, ELECTRIC HEATER WHERE APPLICABLE, DISCONNECT, AND OTHER SERVICEABLE COMPONENTS.

RTU SCHEDULE

MARK		RTU-20
SERVICE		OFFICE AND BROWSING AREAS
LOCATION		ROOF
DESCRIPTION		VAV RTU WITH HEAT PUMP AND AUXILIARY ELECTRIC HEATING
VENTILATION AIRFLOW (CFM)		1315
SUPPLY FAN	AIRFLOW (CFM)	5850
	EXTERNAL STATIC PRESSURE (IN. W.C.)	0.75
	TOTAL STATIC PRESSURE (IN. W.C.)	1.074
	FRPM	1146
	BHP	1.969
	MOTOR HP	2.9
EXHAUST FAN	AIRFLOW (CFM)	–
	EXTERNAL STATIC PRESSURE (IN. W.C.)	–
	TOTAL STATIC PRESSURE (IN. W.C.)	–
	FRPM	–
	BHP	–
	MOTOR HP	–
COOLING/DEHUMIDIFICATION MODE	EFFECTIVENESS TOTAL/SENSIBLE MBh	209.30/138.10
	ENTERING AIR DB DEG F	79.5
	ENTERING AIR WB DEG F	67.92
	LEAVING COIL DB DEG F	57.5
	LEAVING COIL WB DEG F	56.5
	LEAVING UNIT DB DEG F	58.5
	LEAVING UNIT WB DEG F	57.2
	EER/IEER AT AHRI	36.2/14.0
MHGRH	TOTAL CAPACITY	–
	LEAVING AIR TEMP DB DEG F	–
HEATING		
	HEAT PUMP HEATING CAPACITY MBh	200.35
	HEAT PUMP EAT DEG F	56.5
	HEAT PUMP LAT DEG F	93.3
	AHRI COP @ 47 F	3.30
	AHRI COP @ 17 F	2.05
AUX HEAT	ELECTRIC	YES
	EAT/LAT DEG F	56.5/75.6
	KW	36
	BTUH	122.94
ELEC		
	VOLTAGE	460/3/60
	MCA	102
	MOP	110.0
MISC.		
	FILTER MERV	2" MERV 13
	UNIT WEIGHT (LBS)	2573
	MANUFACTURER OR EQUIVALENT	TRANE WSK210A4S0N

REMARKS:

1. PROVIDE WITH 0-100% ECONOMIZER - COMP ENTHALPY WITH HOOD, BAROMETRIC RELIEF DAMPER, 2-INCH MERV-13 FILTERS, CONDENSATE OVERFLOW SWITCH, DIRTY FILTER SWITCH, DUCT STATIC PRESSURE SENSOR, HINGED ACCESS PANELS, NON-FUSED DISCONNECT SWITCH, UNIT POWERED 115V GFI OUTLET, A PHASE FAILURE MONITOR, ROOF CURB, CONDENSER COIL GUARDS, FREEZESTAT, ANY OTHER ACCESSORIES REQUIRED FOR PROPER OPERATION AND CONTROLS OF THE RTU. REFER TO RTU SPECIFICATION SECTION, DRAWINGS, AND SEQUENCE OF OPERATION FOR ADDITIONAL REQUIREMENTS.
2. HVAC UNIT SHALL BE SPECIFIED MANUFACTURER OR EQUIVALENT. REFRIGERANT SHALL BE R-454B OR R-32 AS PER NEW EPA HVAC REFRIGERANT REGULATION.
3. THE HVAC UNIT SHALL BE FURNISHED WITH A SINGLE POINT POWER CONNECTION. THE HVAC UNIT SHALL BE READY FOR IMMEDIATE OPERATION UPON ELECTRICAL CONNECTION.
4. FURNISH WITH TWO DUCT SMOKE DETECTORS (ONE IN DISCHARGE AND ANOTHER IN RETURN) AS REQUIRED AS PER LATEST EDITIONS OF IMC AND NFPA 90A. CONTRACTOR PROVIDE ACCESS DOOR IN DUCTWORK TO ACCESS SMOKE DETECTORS
5. PROVIDE FACTORY UNIT CONTROLLER AND ALL REQUIRED CONTROL ACCESSORIES, INCLUDING DIRTY FILTER MONITORING, DUCT STATIC PRESSURE SENSOR, CONDENSATE OVERFLOW MONITORING, SMOKE DETECTOR INTERLOCKS, ALARMS, SAFETIES, SENSORS, RELAYS, CONTACTS, AND OTHER ACCESSORIES REQUIRED FOR PROPER OPERATION OF THE UNIT IN ACCORDANCE WITH THE DRAWINGS AND SEQUENCE OF OPERATION
6. PROVIDE RTU WITH FACTORY BACNET COMMUNICATION INTERFACE COMPATIBLE WITH THE EXISTING TRANE BMS. BACNET COMMUNICATION SHALL BE BACNET MS/TP UNLESS OTHERWISE REQUIRED BY THE EXISTING BMS. PROVIDE ALL REQUIRED HARDWARE, SOFTWARE, LICENSES, GATEWAYS, AND ACCESSORIES FOR COMPLETE BMS INTEGRATION
7. CONTROLS SHALL BE PROVIDED BY BMS CONTRACTOR AND SHALL BE INTEGRATED INTO TRANE BMS SYSTEM. NON PROPRIETARY CONTROLS PROVIDED BY UNIT MANUFACTURER SHALL BE INTEGRATED INTO NEW TRANE BMS CONTROL SYSTEM THRU FACTORY PROVIDED BACNET MODULE. BMS CONTRACTOR AND CONTRACTOR SHALL COORDINATE WITH EQUIPMENT MANUFACTURER AS REQUIRED
8. FACTORY TECHNICIAN START-UP

DEDICATED OUTDOOR AIR UNIT SCHEDULE

MARK		DOAS-1
SERVICE		KITCHEN, CAFE, ACTIVITY ROOM
LOCATION		GRADE
DESCRIPTION		HEAT PUMP WITH MODULATING HOT GAS REHEAT, ENERGY RECOVERY WHEEL AND AUX. ELEC HEAT
VENTILATION AIRFLOW (CFM)		1,325 SUPPLY/1,225 EXHAUST
SUPPLY FAN	AIRFLOW (CFM)	1,325
	EXTERNAL STATIC PRESSURE (IN. W.C.)	0.75
	TOTAL STATIC PRESSURE (IN. W.C.)	2.7
	FRPM	2,129
	BHP	1.01
	MOTOR HP	3.0
EXHAUST FAN	AIRFLOW (CFM)	1,225
	EXTERNAL STATIC PRESSURE (IN. W.C.)	0.75
	TOTAL STATIC PRESSURE (IN. W.C.)	
	FRPM	2,216
	BHP	0.62
	MOTOR HP	1.2
ENTHALPY WHEEL DRIVE MOTOR HP		0.17
COOLING/DEHUMIDIFICATION MODE	WHEEL OUTSIDE AIR EAT DB/WB DEG F	95.0/76.0
	WHEEL RETURN AIR LAT DB/WB DEG F	75.0/64.0
	WHEEL LEAVING AIR & DX COIL EAT DB/WB DEG F	82.6/69.2
	RECOVERED CAPACITY BTUH	35532
	EFFECTIVENESS TOTAL/SENSIBLE	0.63/0.66
	DX COIL TOTAL CAPACITY BTUH	49896
	DX COIL SENSIBLE CAPACITY BTUH	35120
	TOTAL MOISTURE REMOVAL CAPACITY - LBS/HR	13.0
	DX COIL LEAVING AIR TEMP DB/WB/DP DEG F	57.0/57.0/57.0
	COMPRESSOR AMPS	9.2
MHGRH	TOTAL CAPACITY	24478
	LEAVING AIR TEMP DB DEG F	74.0
HEAT PUMP MODE	WHEEL OUTSIDE AIR EAT DB/WB DEG F	10.0/9.0
	WHEEL RETURN AIR LAT DB/WB DEG F	70.0/50.0
	WHEEL LEAVING AIR & DX COIL EAT DB/WB DEG F	45.2/35.5
	RECOVERED CAPACITY BTUH	61352
	EFFECTIVENESS TOTAL/SENSIBLE	0.66/0.66
	DX COIL HEATING CAPACITY BTUH	42721
	DX COIL LEAVING AIR TEMP DB DEG F	74.9
AUX HEAT	ELECTRIC	SCR CONTROL
	EAT/LAT DEG F	45.2/73.7
	KW	12
	BTUH	40,956
ELEC	VOLTAGE	460/3/60
	FLA	31.3
	MCA	37.2
	MROPD	40
MISC.	FILTER TYPE	COMBO RACK - FACTORY INSTALLED
	FILTER MERV	2" MERV 8 & 4" MERV 14
	UNIT WEIGHT (LBS)	1382
	MANUFACTURER OR EQUIVALENT	DAIKIN DPSH04B OR SIMILAR

REMARKS:

1. DOAS UNIT SHALL PROVIDE OUTSIDE AIR FOR VENTILATION PURPOSE AT NEUTRAL AIR TEMPERATURE (72-74 DEG. F. ADJ.)
2. PROVIDE WITH CUSTOM PLENUM CURB FOR SIDE OA SUPPLY AND SIDE EXHAUST DUCT CONNECTIONS. REFER TO DETAIL 7/H5 FOR SCHEMATIC.
3. FURNISH WITH THREE SPACE/WALL MOUNT CO2 SENSORS FOR DEMAND CONTROL VENTILATION CONTROL
4. DOAS UNIT SHALL OPERATE AS A VAV SYSTEM AND MAINTAIN A MINIMUM SUPPLY AIRFLOW OF 700 CFM. MODULATE SUPPLY AIRFLOW UP TO SCHEDULED MAXIMUM AS REQUIRED BY CO2 DEMAND. REFER TO SEQUENCE OF OPERATION.
5. INTEGRATE DOAS CONTROLS INTO EXISTING TRANE CONTROLS BMS SYSTEM THRU FACTORY PROVIDED BACNET MODULE.
6. CONTRACTOR PROVIDE 6" CONCRETE PAD WITH 6" OVERHANG ON ALL SIDES. REFER TO TYP. EXTERIOR HVAC EQUIPMENT PAD DETAIL ON H4.
7. PROVIDE WITH FACTORY AIRFLOW MONITORING, DIRTY FILTER SWITCH, DUCT STATIC PRESSURE SENSOR, AND ALL REQUIRED CONTROLS AND SAFETIES.
8. PROVIDE FACTORY-AUTHORIZED START-UP OF DOAS-1 AND ALL ASSOCIATED CONTROLS.

ISSUED FOR BID-9/25/26

9.23.26

APPROVED

William R. Long
PROFESSIONAL ENGINEER
NEW JERSEY LICENSE NO. 33012

DATE	BY	REVISIONS

Tri-State Architects, P.C. / Alaimo Group
WILLIAM R. LONG, P.E. LIC. 33012
ANITA S. ARADHYA, R.A. LIC. 18769
200 HIGH STREET MOUNT HOLLY, N.J.

DATE: AUG. 2026
DESIGNED BY: IV
DRAWN BY: RKR
CHECKED BY: 9/22/26
DEPT. HEAD: 9/22/26

CLIENT: WILLINGBORO TOWNSHIP

PROJECT LOCATION: WILLINGBORO TWP. BURLINGTON COUNTY NEW JERSEY

PROJECT NO.: M-0410-0011-000

CONTRACT NO.: BID#8-2026

KENNEDY CENTER
RENOVATION TO THE SENIOR CENTER

HVAC - SCHEDULES - II

SCALE: NONE

SHEET
H13

FILE NO.:

Plotted: 9/22/2026 10:08 AM Last saved: 9/21/2026 4:03 PM File Name: M:\Projects\M04100011000\Drawings\GLQ-H12-H13-Schedules.dwg