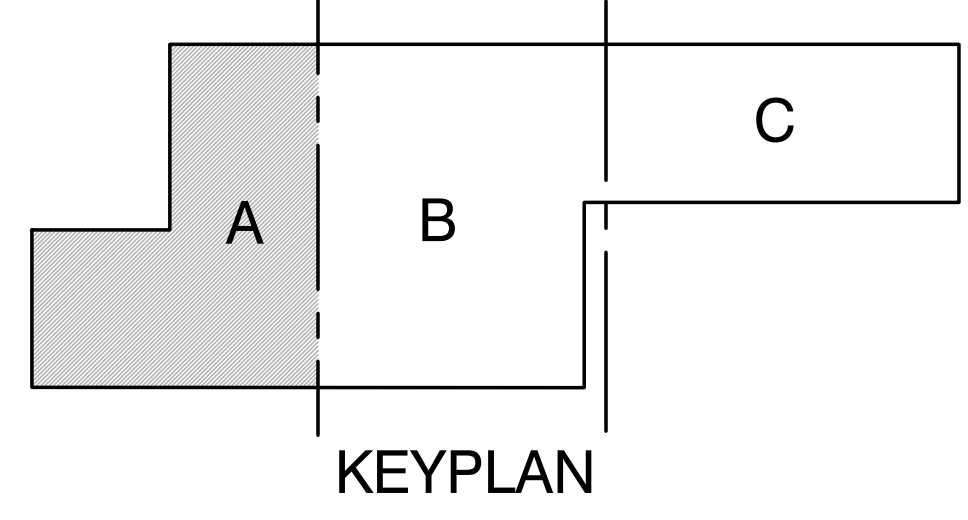


**FIRST FLOOR PLAN - (AREA A) - HVAC**  
1/8" = 1'-0"



- GENERAL HVAC NOTES**
- REFER TO GENERAL NOTES ON MEP COVER SHEET FOR ADDITIONAL REQUIREMENTS OF WORK.
  - ROUND BRANCH DUCT RUNOUTS AND FLEXIBLE DUCT SHALL BE THE SAME SIZE AS THE OFFICER NECK UNLESS NOTED OTHERWISE.
  - MAXIMUM FLEXIBLE DUCT LENGTH SHALL BE 5'-0".
  - ALL HVAC EQUIPMENT, DUCTWORK, PIPING, ETC. SHALL BE ROUTED A MINIMUM OF 10'-0" AFF.
  - ALL AIR DISTRIBUTION DEVICES SHALL HAVE LOCKABLE VOLUME CONTROL DEVICES.
  - ALL 90 DEGREE TURNING ELBOWS SHALL BE SMOOTH ROUND OR SQUARE WITH TURNING VANES.
  - DUCT SIZES SHOWN ON PLANS ARE INSIDE FREE AREA.
  - PROVIDE ACCESS DOORS IN DUCTS AHEAD OF ALL AUTOMATIC, FIRE, AND SMOKE DAMPERS.
  - FOR BALANCING THE OUTSIDE AIRFLOW QUANTITIES, REFER TO HVAC SCHEDULES.
  - ALL EXPOSED DUCTWORK SHALL BE DOUBLE-WALL SPIRAL SEAMED EXCEPT IN FIRST FLOOR SHOP SPACES.

- HVAC PLAN KEYED NOTES**
- COORDINATE EXACT LOCATION WITH ARCHITECTURAL AND STRUCTURAL ELEMENTS.
  - RL & RS UP, REFRIGERANT LIQUID & SUCTION PIPING SIZED AND ROUTED PER MANUFACTURER'S RECOMMENDATION.
  - NOT USED.
  - LOUVER SHALL BE CENTERED IN PRECAST EXTERIOR WALL PANEL ABOVE WINDOW/DOOR. COORDINATE EXACT LOCATION WITH ARCHITECT AND STRUCTURAL.
  - NOT USED.
  - 10"x10" SUPPLY DUCTWORK PENETRATION THROUGH STRUCTURAL BEAM. CENTER SUPPLY DUCT IN BEAM. COORDINATE EXACT PENETRATION DIMENSIONS AND LOCATION WITH STRUCTURAL.
  - HILLS/DESTRIATIFICATION FAN CONTROLLER. FAN CONTROLLER SHALL CONTROL ALL FANS IN SPACE.
  - DUCTWORK ROUTED AROUND STRUCTURAL BEAM.
  - VRF PIPING UP TO SECOND FLOOR. REFER TO SHEETS M5.03 AND M5.06 FOR VRF PIPING DIAGRAMS. PIPING SHALL BE ROUTED AND SIZED PER MANUFACTURER'S RECOMMENDATIONS.
  - LOCATE BRANCH SELECTOR BOX IN AN ACCESSIBLE AREA AND PER MANUFACTURER'S RECOMMENDATIONS. ALL REFRIGERANT PIPING SHALL BE ROUTED ABOVE CEILING AS MUCH AS POSSIBLE TO AVOID BEING EXPOSED.
  - DISCHARGE CONDENSATE INTO NEAREST FLOOR DRAIN OR SINK TAILPIECE.

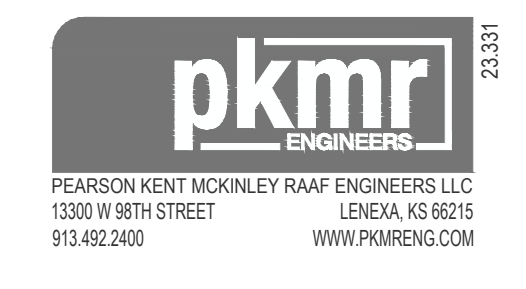
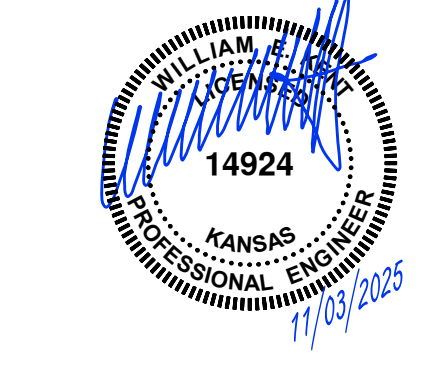
**MUNICIPAL SERVICES OPERATIONS CAMPUS - PHASE 1: MSO**

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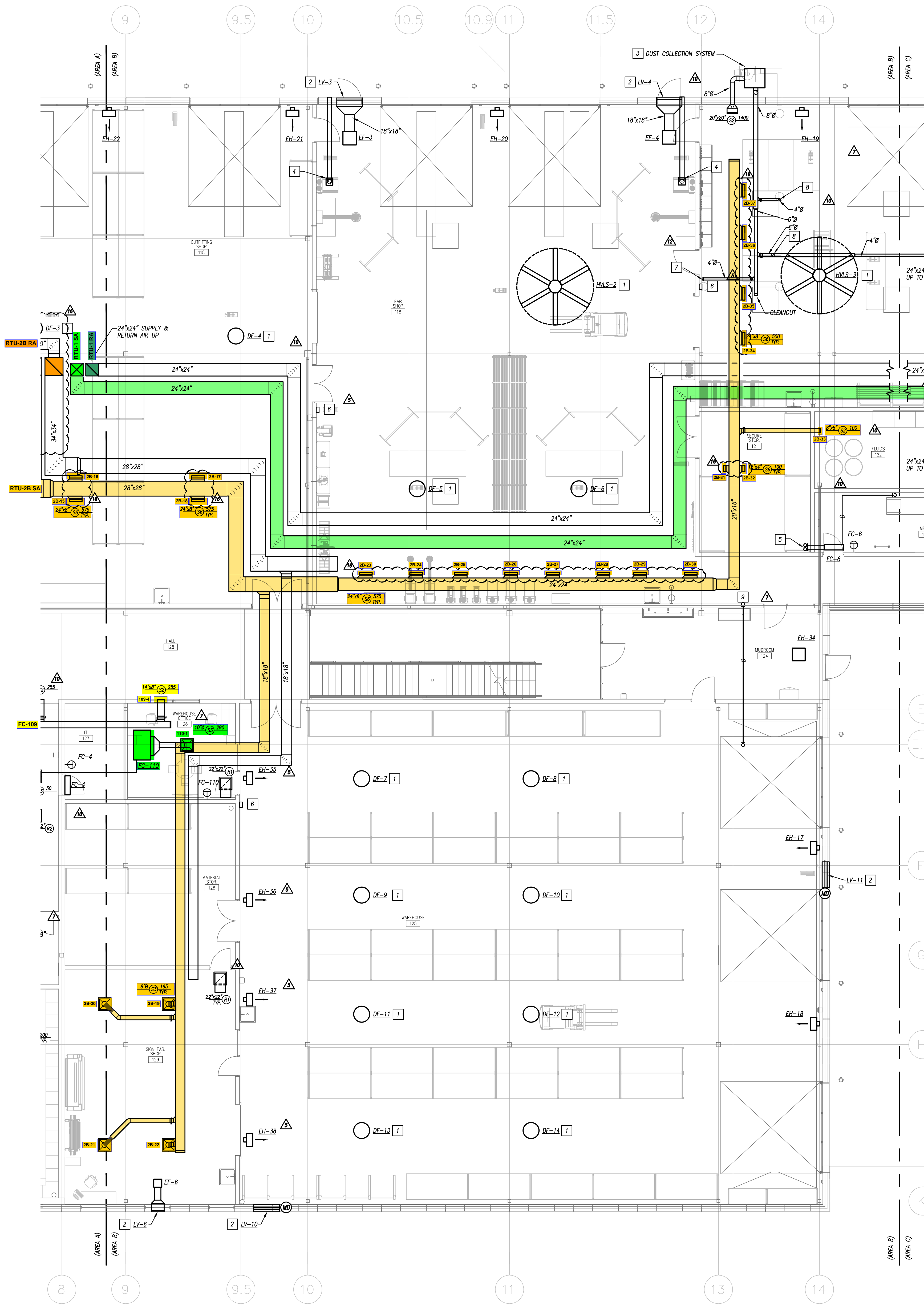
**M1.11A**

**FIRST FLOOR PLAN - (AREA A) - HVAC**

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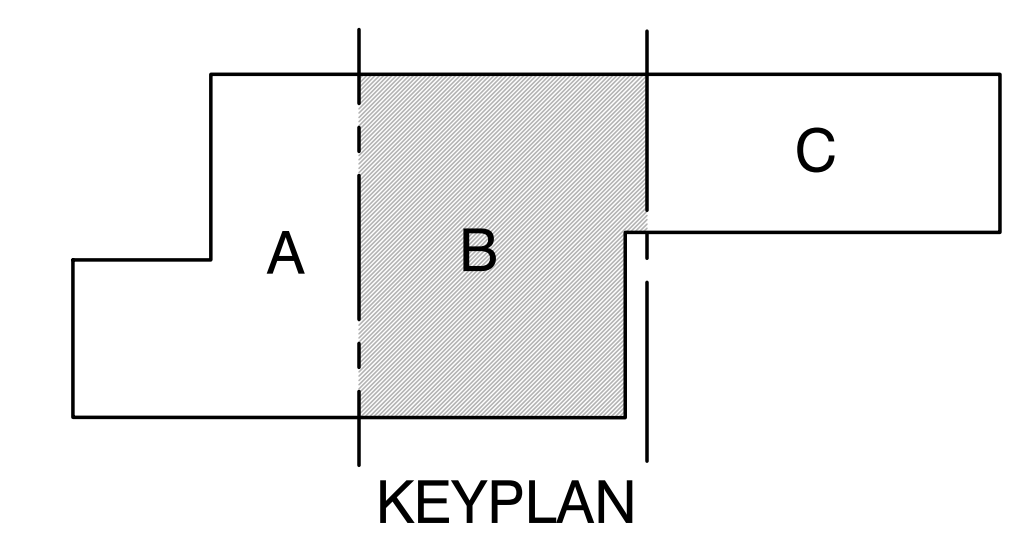


**GENERAL HVAC NOTES**

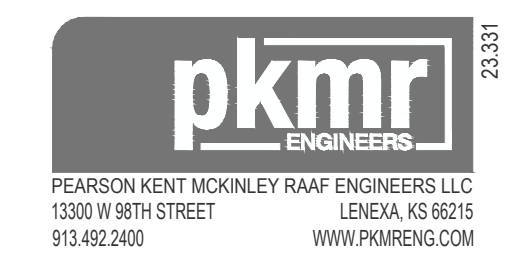
1. REFER TO GENERAL NOTES ON MEP COVER SHEET FOR ADDITIONAL REQUIREMENTS OF WORK.
2. ROUND BRANCH DUCT RUNOUTS AND FLEXIBLE DUCT SHALL BE THE SAME SIZE AS THE DIFFUSER NECK UNLESS NOTED OTHERWISE.
3. MAXIMUM FLEXIBLE DUCT LENGTH SHALL BE 5'-0".
4. ALL HVAC EQUIPMENT, DUCTWORK, PIPING, ETC. SHALL BE ROUTED A MINIMUM OF 10'-0" AFF.
5. ALL AIR DEVICES.
6. ALL 90 DEGREE TURNING ELBOWS SHALL BE SMOOTH ROUND OR SQUARE WITH TURNING VANES.
7. DUCT SIZES SHOWN ON PLANS ARE INSIDE FREE AREA.
8. PROVIDE ACCESS DOORS IN DUCTS AHEAD OF ALL AUTOMATIC, FIRE, AND SMOKE DAMPERS.
9. FOR BALANCING THE OUTSIDE AIRFLOW QUANTITIES, REFER TO HVAC SCHEDULES.
10. ALL EXPOSED DUCTWORK SHALL BE DOUBLE-WALL SPIRAL SEAMED EXCEPT IN FIRST FLOOR SHOP SPACES.

**HVAC PLAN KEYED NOTES**

1. COORDINATE EXACT LOCATION WITH ARCHITECTURAL AND STRUCTURAL ELEMENTS.
2. LOUVER SHALL BE CENTERED IN PRECAST EXTERIOR WALL PANEL ABOVE WINDOW/DOOR. COORDINATE EXACT LOCATION WITH ARCHITECT AND STRUCTURAL.
3. DUST COLLECTION SYSTEM SHALL BE RECYCLATING CAR-MON CMC-205A CYCLONE OR EQUIVALENT. SHIP 1400 CFM @ 9" STATIC PRESSURE WITH AFTER FILTER AND DUSTS BIN. PROVIDE CONCRETE HOUSEKEEPING PAD FOR EXTERIOR EQUIPMENT.
4. WELDING EXHAUST SYSTEM SHALL BE CAR-MON WVS SERIES EXTRACTION ARM (OR EQUIVALENT), PROVIDE SERIES CMW (OR EQUIVALENT) DIRECT DRIVE EXHAUST FAN AND WALL PLATFORM WITH EXTRACTION ARM. EXHAUST SHALL BE DUCTED TO EXTERIOR OF BUILDING.
5. REFRIGERANT LIQUID & SUCTION PIPING UP TO ASSOCIATED HEAT PUMP ON ROOF. PIPING SIZED AND ROUTED PER MANUFACTURER'S RECOMMENDATIONS.
6. HMLS/DESTRATIFICATION FAN CONTROLLER. FAN CONTROLLER SHALL CONTROL ALL FANS IN SPACE.
7. 4" DOWN TO FLOOR SWEEP.
8. 4" DOWN TO ARM WITH 4" 10' TYPE UR FLEX HOSE, BLAST GATE, AND CONNECTION TO OWNER-PROVIDED EQUIPMENT. 350 CFM.
9. DISCHARGE CONDENSATE INTO NEAREST FLOOR DRAIN OR SINK TYPICAL.



**FIRST FLOOR PLAN - (AREA B) - HVAC**  
1/8" = 1'-0"



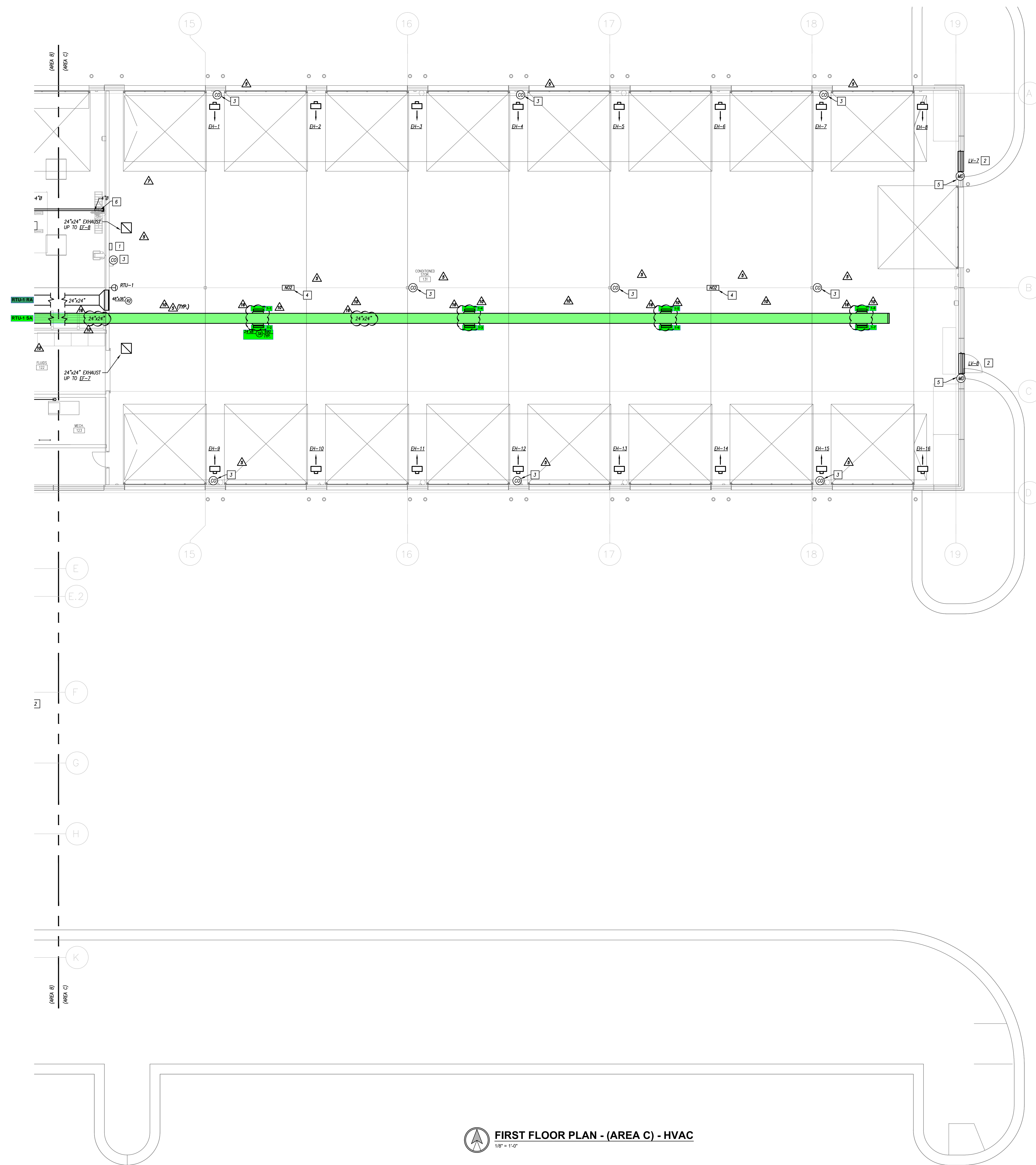
**MUNICIPAL SERVICES OPERATIONS CAMPUS - PHASE 1: MSO**

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**M1.11B**  
FIRST FLOOR PLAN - (AREA B) - HVAC

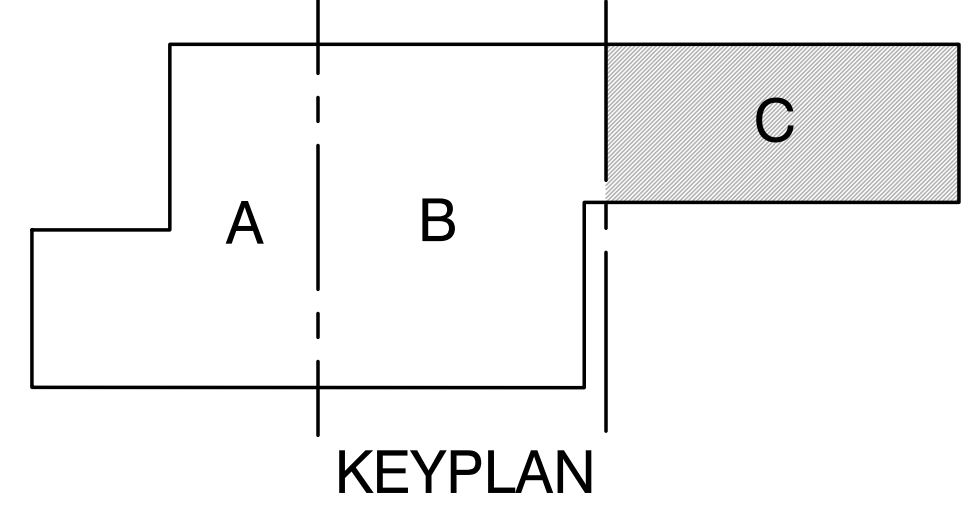
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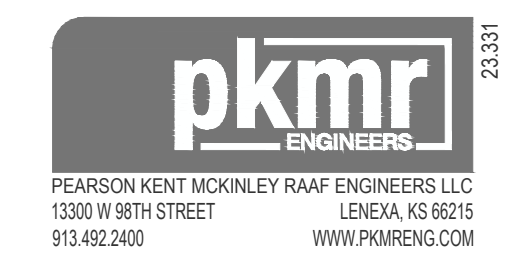


- ### GENERAL HVAC NOTES
- REFER TO GENERAL NOTES ON MEP COVER SHEET FOR ADDITIONAL REQUIREMENTS OF WORK.
  - ROUND BRANCH DUCT RUNOUTS AND FLEXIBLE DUCT SHALL BE THE SAME SIZE AS THE DIFFUSER NECK UNLESS NOTED OTHERWISE.
  - MAXIMUM FLEXIBLE DUCT LENGTH SHALL BE 5'-0".
  - ALL HVAC EQUIPMENT, DUCTWORK, PIPING, ETC. SHALL BE ROUTED A MINIMUM OF 10'-0" AFF.
  - ALL AIR DISTRIBUTION DEVICES SHALL HAVE LOCKABLE VOLUME CONTROL DEVICES.
  - ALL 90 DEGREE TURNING ELBOWS SHALL BE SMOOTH ROUND OR SQUARE WITH TURNING VANES.
  - DUCT SIZES SHOWN ON PLANS ARE INSIDE FREE AREA.
  - PROVIDE ACCESS DOORS IN DUCTS AHEAD OF ALL AUTOMATIC, FIRE, AND SMOKE DAMPERS.
  - FOR BALANCING THE OUTSIDE AIRFLOW QUANTITIES, REFER TO HVAC SCHEDULES.
  - ALL EXPOSED DUCTWORK SHALL BE DOUBLE-WALL SPIRAL SEAMED EXCEPT IN FIRST FLOOR SHOP SPACES.

- ### HVAC PLAN KEYED NOTES
- FURNISH AND INSTALL ARMSTRONG (OR APPROVED EQUAL) CARBON MONOXIDE/NITROGEN DIOXIDE DETECTION SYSTEM AND ALL ASSOCIATED ACCESSORIES AS REQUIRED TO PROVIDE CONTROL AS INDICATED ON SHEET M1.11. MOUNT CONTROL PANEL 48" AFF. FURNISH AND INSTALL ALL COMPONENTS PER MANUFACTURER'S RECOMMENDATIONS. COORDINATE POWER REQUIREMENTS WITH ELECTRICAL.
  - COORDINATE EXACT LOUVER LOCATION WITH ARCHITECT AND STRUCTURAL.
  - CARBON MONOXIDE REMOTE SENSOR. MOUNT 36" ABOVE FINISHED FLOOR AND PER MANUFACTURER'S RECOMMENDATIONS. PROVIDE WIRE COVER TO PREVENT DAMAGE TO SENSOR.
  - NITROGEN DIOXIDE REMOTE SENSOR. MOUNT NEAR CEILING PER MANUFACTURER'S RECOMMENDATIONS.
  - INTERLOCK MOTORIZED DAMPERS ON INTAKE LOUVERS WITH CO/NO MONITORING SYSTEM AND EXHAUST FANS EF-7 & EF-8. DAMPERS SHALL OPEN UPON ACTIVATION OF FANS.
  - 4"Ø DOWN TO FLOOR SWEEP.



FIRST FLOOR PLAN - (AREA C) - HVAC  
1/8" = 1'-0"



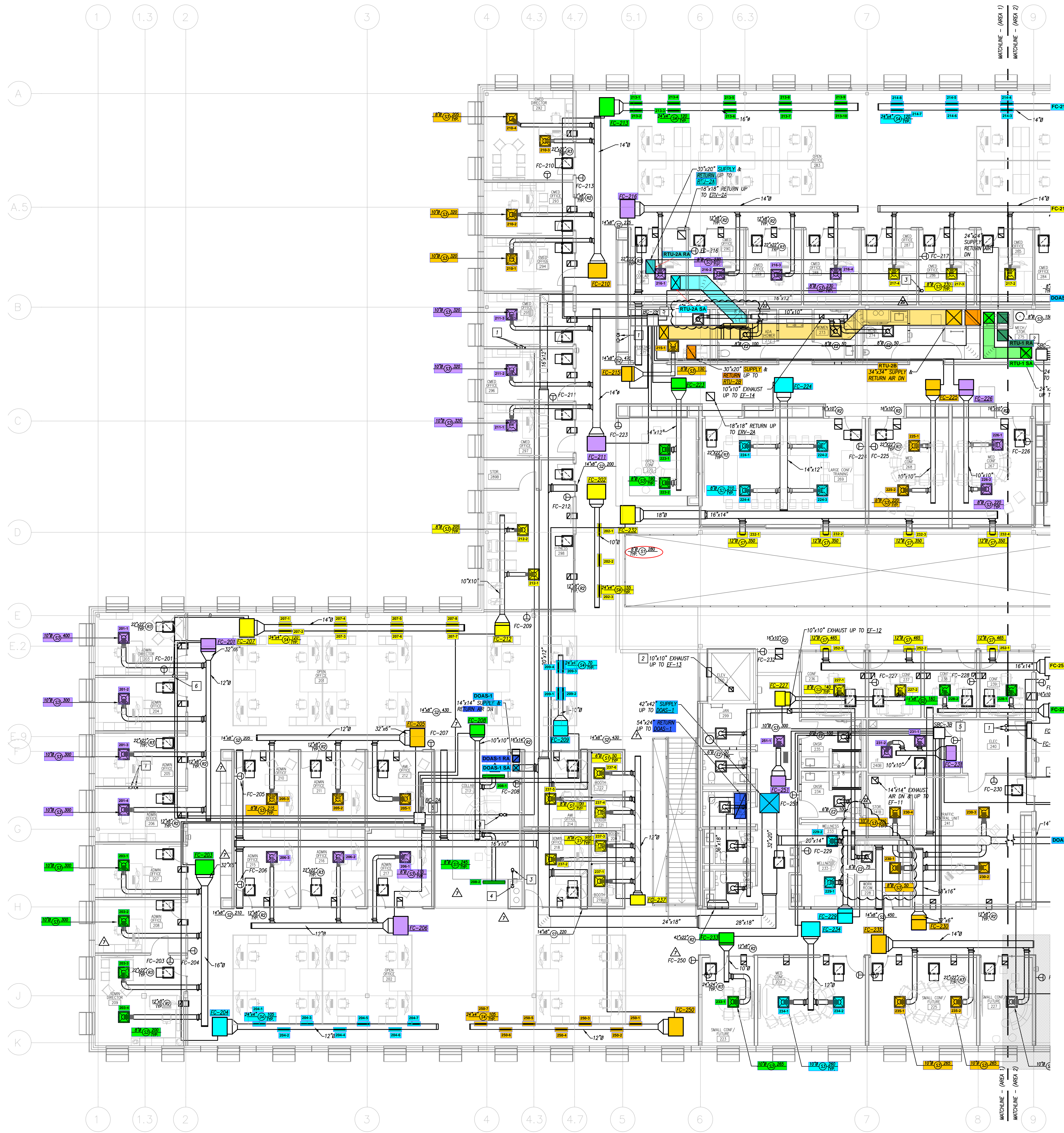
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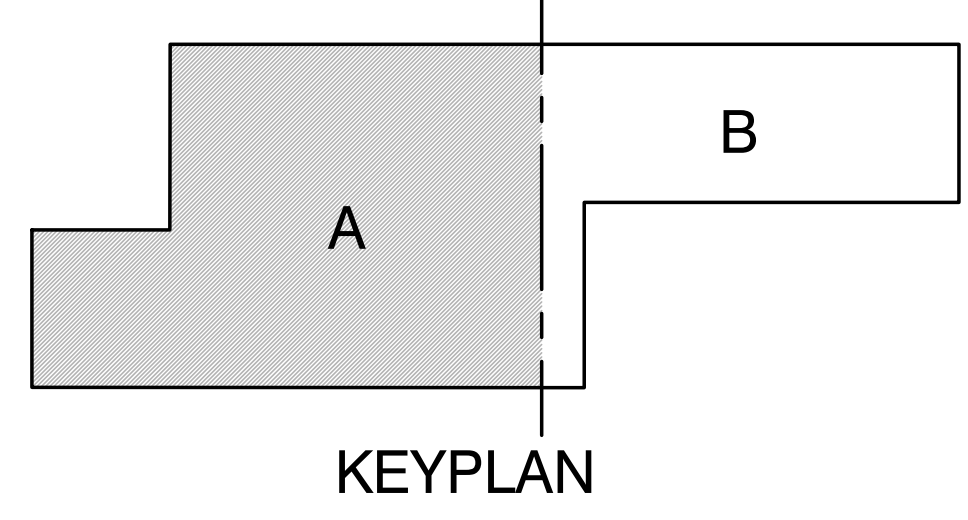
FIRST FLOOR PLAN - (AREA C) - HVAC  
M1.11C

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**SECOND FLOOR PLAN - (AREA A) - HVAC**  
1/8" = 1'-0"



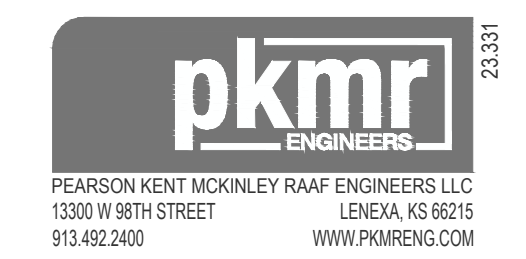
- GENERAL HVAC NOTES**
- REFER TO GENERAL NOTES ON MEP COVER SHEET FOR ADDITIONAL REQUIREMENTS OF WORK.
  - ROUND BRANCH DUCT RUNOUTS AND FLEXIBLE DUCT SHALL BE THE SAME SIZE AS THE DIFFUSER NECK UNLESS NOTED OTHERWISE.
  - MAXIMUM FLEXIBLE DUCT LENGTH SHALL BE 5'-0".
  - ALL HVAC EQUIPMENT, DUCTWORK, PIPING, ETC. SHALL BE ROUTED A MINIMUM OF 10'-0" AFF.
  - ALL AIR DISTRIBUTION DEVICES SHALL HAVE LOCKABLE VOLUME CONTROL DEVICES.
  - ALL 90 DEGREE TURNING ELBOWS SHALL BE SMOOTH ROUND OR SQUARE WITH TURNING VANES.
  - DUCT SIZES SHOWN ON PLANS ARE INSIDE FREE AREA.
  - PROVIDE ACCESS DOORS IN DUCTS AHEAD OF ALL AUTOMATIC, FIRE, AND SMOKE DAMPERS.
  - FOR BALANCING THE OUTSIDE AIRFLOW QUANTITIES, REFER TO HVAC SCHEDULES.
  - ALL EXPOSED DUCTWORK SHALL BE DOUBLE-WALL SPIRAL SEALED.

- HVAC PLAN KEYED NOTES**
- REFRIGERANT LIQUID & SUCTION PIPING UP TO ASSOCIATED HEAT PUMP ON ROOF. PIPING SIZED AND ROUTED PER MANUFACTURER'S RECOMMENDATIONS.
  - PROVIDE FIRE/SMOKE DAMPER IN THE VERTICAL PRIOR TO DUCT THROUGH ROOF.
  - WVF UP TO ASSOCIATED ROOFTOP HEAT PUMP UNIT. REFER TO SHEETS MS.03 AND MS.06 FOR WVF PIPING DIAGRAMS. PIPING SHALL BE ROUTED AND SIZED PER MANUFACTURER'S RECOMMENDATIONS.
  - WVF PIPING DOWN TO FIRST FLOOR. REFER TO SHEETS MS.03 AND MS.06 FOR WVF PIPING DIAGRAMS. PIPING SHALL BE ROUTED AND SIZED PER MANUFACTURER'S RECOMMENDATIONS.
  - LOCATE BRANCH SELECTOR BOX IN AN ACCESSIBLE AREA AND PER MANUFACTURER'S RECOMMENDATIONS. ALL REFRIGERANT PIPING SHALL BE ROUTED ABOVE CEILING AS MUCH AS POSSIBLE TO AVOID BEING EXPOSED.
  - CONDENSATE DOWN TO FIRST FLOOR. COMBINE CONDENSATE TO MINIMIZE ROUTING AND DROPS. ALL CONDENSATE PIPING SHALL BE ROUTED ABOVE CEILING AS MUCH AS POSSIBLE TO AVOID BEING EXPOSED.

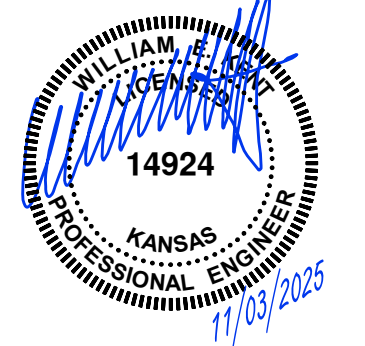
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PHASE 1: MSO

SECOND FLOOR PLAN - (AREA A) - HVAC

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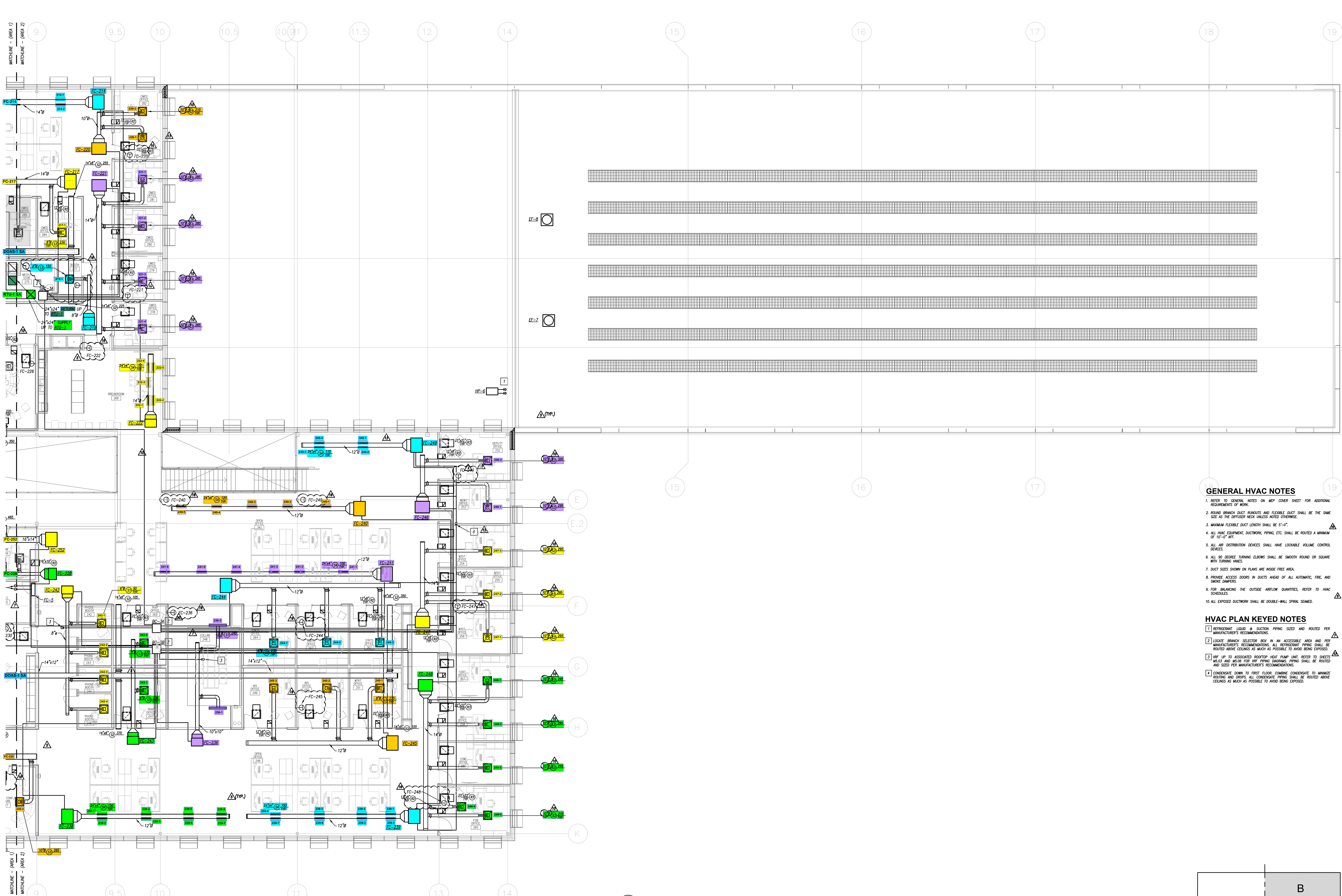
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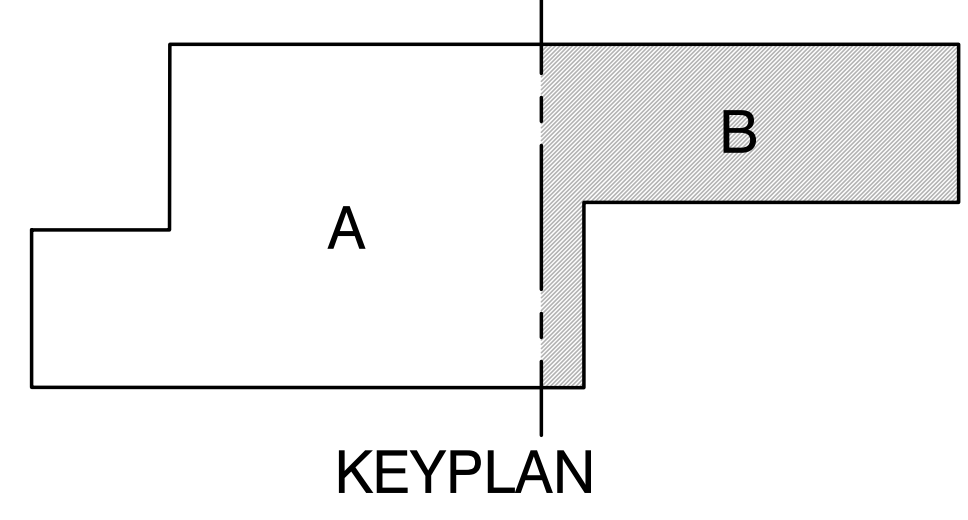
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SECOND FLOOR PLAN - (AREA A) - HVAC

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**SECOND FLOOR PLAN - (AREA B) - HVAC**  
1/8" = 1'-0"



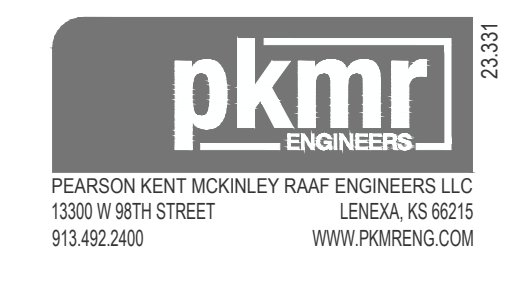
- GENERAL HVAC NOTES**
- REFER TO GENERAL NOTES ON MEP COVER SHEET FOR ADDITIONAL REQUIREMENTS OF WORK.
  - ROUND BRANCH DUCT RUNOUTS AND FLEXIBLE DUCT SHALL BE THE SAME SIZE AS THE DIFFUSER NECK UNLESS NOTED OTHERWISE.
  - MAXIMUM FLEXIBLE DUCT LENGTH SHALL BE 5'-0".
  - ALL HVAC EQUIPMENT, DUCTWORK, PIPING, ETC. SHALL BE ROUTED A MINIMUM OF 10'-0" AFF.
  - ALL AIR DISTRIBUTION DEVICES SHALL HAVE LOCKABLE VOLUME CONTROL DEVICES.
  - ALL 90 DEGREE TURNING ELBOWS SHALL BE SMOOTH ROUND OR SQUARE WITH TURNING VANES.
  - DUCT SIZES SHOWN ON PLANS ARE INSIDE FREE AREA.
  - PROVIDE ACCESS DOORS IN DUCTS AHEAD OF ALL AUTOMATIC FIRE AND SMOKE SHUTTERS.
  - FOR BALANCING THE OUTSIDE AIRFLOW QUANTITIES, REFER TO HVAC SCHEDULES.
  - ALL EXPOSED DUCTWORK SHALL BE DOUBLE-WALL SPIRAL SEAMED.
- HVAC PLAN KEYED NOTES**
- REFRIGERANT LIQUID & SUCTION PIPING SIZED AND ROUTED PER MANUFACTURER'S RECOMMENDATIONS.
  - LOCATE BRANCH SELECTION BOX IN AN ACCESSIBLE AREA AND PER MANUFACTURER'S RECOMMENDATIONS. ALL REFRIGERANT PIPING SHALL BE ROUTED ABOVE CEILING AS MUCH AS POSSIBLE TO AVOID BEING EXPOSED.
  - WIRE UP TO ASSOCIATED ROOFTOP HEAT PUMP UNIT. REFER TO SHEETS AHEAD AND NEVER FOR W/P PIPING. PIPING SHALL BE ROUTED AND SIZED PER MANUFACTURER'S RECOMMENDATIONS.
  - CONDENSATE DOWN TO FIRST FLOOR. CONDENSE CONDENSATE TO MINIMIZE ROUTING AND DRIPS. ALL CONDENSATE PIPING SHALL BE ROUTED ABOVE CEILING AS MUCH AS POSSIBLE TO AVOID BEING EXPOSED.

**MUNICIPAL SERVICES OPERATIONS CAMPUS - PHASE 1: MSO**

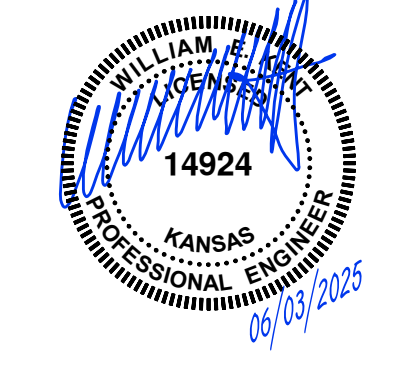
**SECOND FLOOR PLAN - (AREA B) - HVAC**

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**M1.12B**



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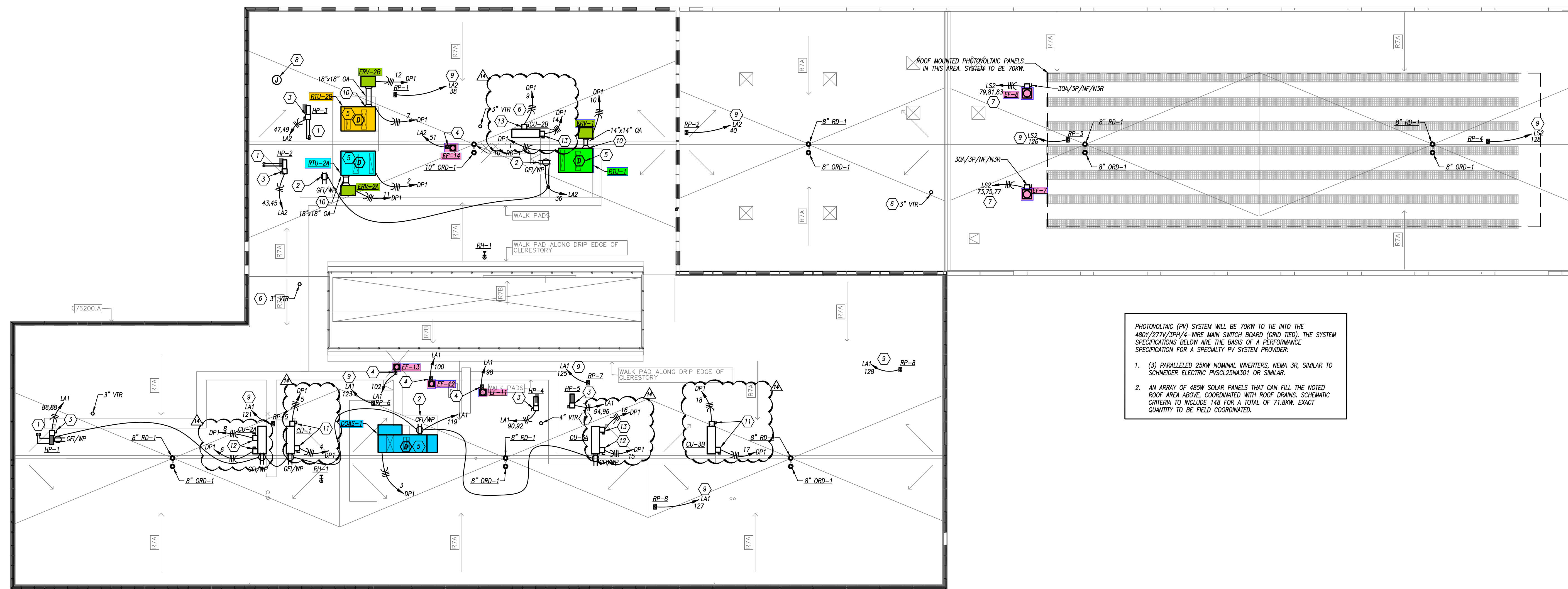
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**GENERAL ROOF PLAN NOTES**

1. REFER TO GENERAL NOTES ON MEP COVER SHEET FOR ADDITIONAL REQUIREMENTS OF WORK.
2. MAINTAIN CODE-REQUIRED DISTANCES FOR ALL VENTS, EXHAUSTS, ETC. FROM MECHANICAL EQUIPMENT OUTSIDE AIR INTAKES.
3. ALL ELECTRICAL EQUIPMENT AND DEVICES SHALL BE MOUNTED A MINIMUM OF 36" ABOVE THE ROOF ON SUITABLE STEEL SUPPORTS UNLESS OTHERWISE NOTED.

**ROOF PLAN KEYED NOTES**

1. REFRIGERANT LIQUID & SUCTION PIPING SIZED AND ROUTED PER MANUFACTURER'S RECOMMENDATIONS.
2. WIRE TO UNIT-MOUNTED CONVENIENCE RECEPTACLE.
3. 30A/2P/NOI-FUSED/NEMA 3R DISCONNECT SWITCH.
4. MOUNT TOGGLE DISCONNECT UNDER FAN SHROUD.
5. DUCT DETECTOR IN RETURN AIR DUCT FOR UNIT SHUTDOWN UPON ACTIVATION. INSTALL PER MANUFACTURER REQUIREMENTS. RE: DETAIL SHEET ES.01.
6. CONTRACTOR TO VERIFY THAT VENT THROUGH ROOF IS A MINIMUM OF 10'-0" FROM ANY FRESH AIR INTAKE.
7. ELECTRICAL CONTRACTOR SHALL COORDINATE WITH MECHANICAL CONTRACTOR TO INTERLOCK EXHAUST FAN WITH MOTORIZED DAMPERS IN THE CONDITIONED STORAGE.
8. EXTERIOR ROOF-MOUNTED PHOTOCELL. PROVIDE CONNECTION TO LIGHTING CONTROL PANEL (LCP) FOR CONTROL OF EXTERIOR LIGHTING. ENSURE SELECTED DEVICE IS COMPATIBLE WITH PROVIDED LIGHTING CONTROL PANEL SYSTEM. REFER TO MANUFACTURER'S GUIDELINES FOR WIRING AND MOUNTING REQUIREMENTS. REFER TO LIGHTING CONTROL DETAILS FOR ADDITIONAL INFORMATION. PHOTOCELL SHALL BE INSTALLED FACING NORTH.
9. TOGGLE SWITCH DISCONNECT.
10. PROVIDE OUTSIDE AIR DUCT CONNECTION TO OUTSIDE AIR INLET OF ROOFTOP UNIT. PROVIDE DUCT TRANSITIONS AS NECESSARY.
11. 60A/3P/35AF/NEMA 3R DISCONNECT SWITCH.
12. 60A/3P/30AF/NEMA 3R DISCONNECT SWITCH.
13. 30A/3P/20AF/NEMA 3R DISCONNECT SWITCH.



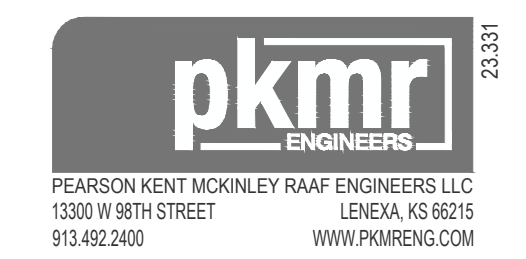
PHOTOVOLTAIC (PV) SYSTEM WILL BE 70KW TO TIE INTO THE 480Y/277V/3PH/4-WIRE MAIN SWITCH BOARD (GRD TIED). THE SYSTEM SPECIFICATIONS BELOW ARE THE BASIS OF A PERFORMANCE SPECIFICATION FOR A SPECIALTY PV SYSTEM PROVIDER:

1. (3) PARALLELED 25KW NOMINAL INVERTERS, NEMA 3R, SIMILAR TO SCHNEIDER ELECTRIC PYSCL25N4301 OR SIMILAR.
2. AN ARRAY OF 485W SOLAR PANELS THAT CAN FILL THE NOTED ROOF AREA ABOVE, COORDINATED WITH ROOF DRAINS. SCHEMATIC CRITERIA TO INCLUDE 148 FOR A TOTAL OF 71.8KW. EXACT QUANTITY TO BE FIELD COORDINATED.

**MEP - ROOF PLAN**  
1/16" = 1'-0"

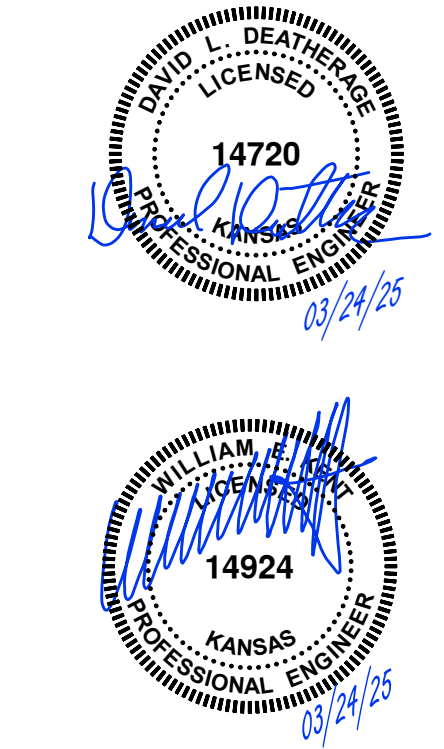
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**ME0.02**  
MEP- ROOF PLAN

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