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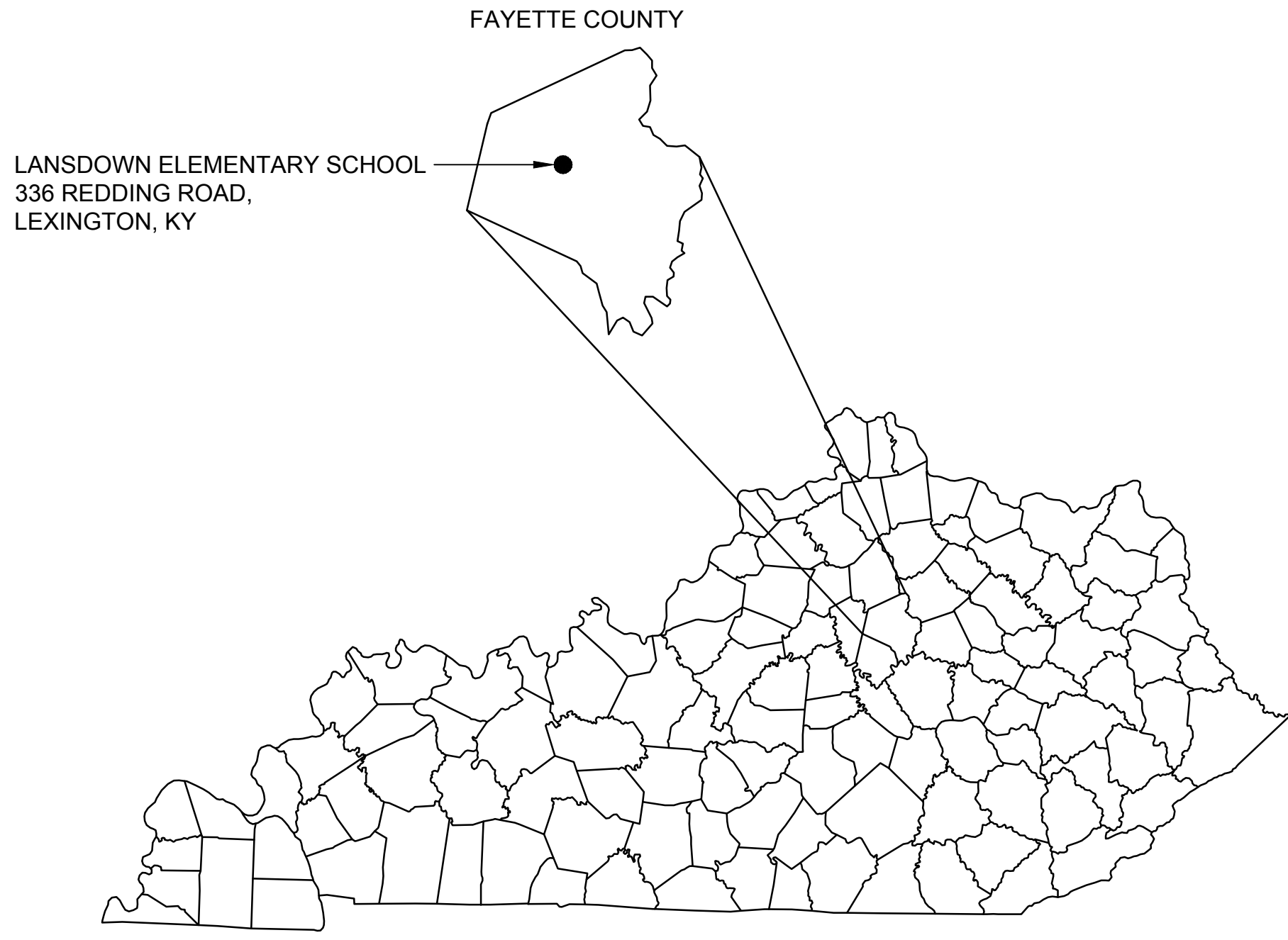
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LANDSDOWN ELEMENTARY SCHOOL
HVAC REPLACEMENT
FAYETTE COUNTY PUBLIC SCHOOLS

LEXINGTON, KENTUCKY



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GRW PROJECT NO. 4973-06

CLIENT PROJECT NO.

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COVER SHEET

LANDSDOWN ELEMENTARY SCHOOL - HVAC RENOVATION
FAYETTE COUNTY BOARD OF EDUCATION, LEXINGTON, KY

DESIGNED: STAFF

BY: STAFF

DATE:

REVIEWED: STAFF

DATE:

APPROVED: STAFF

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REVISIONS

DESCRIPTION

DATE

BY

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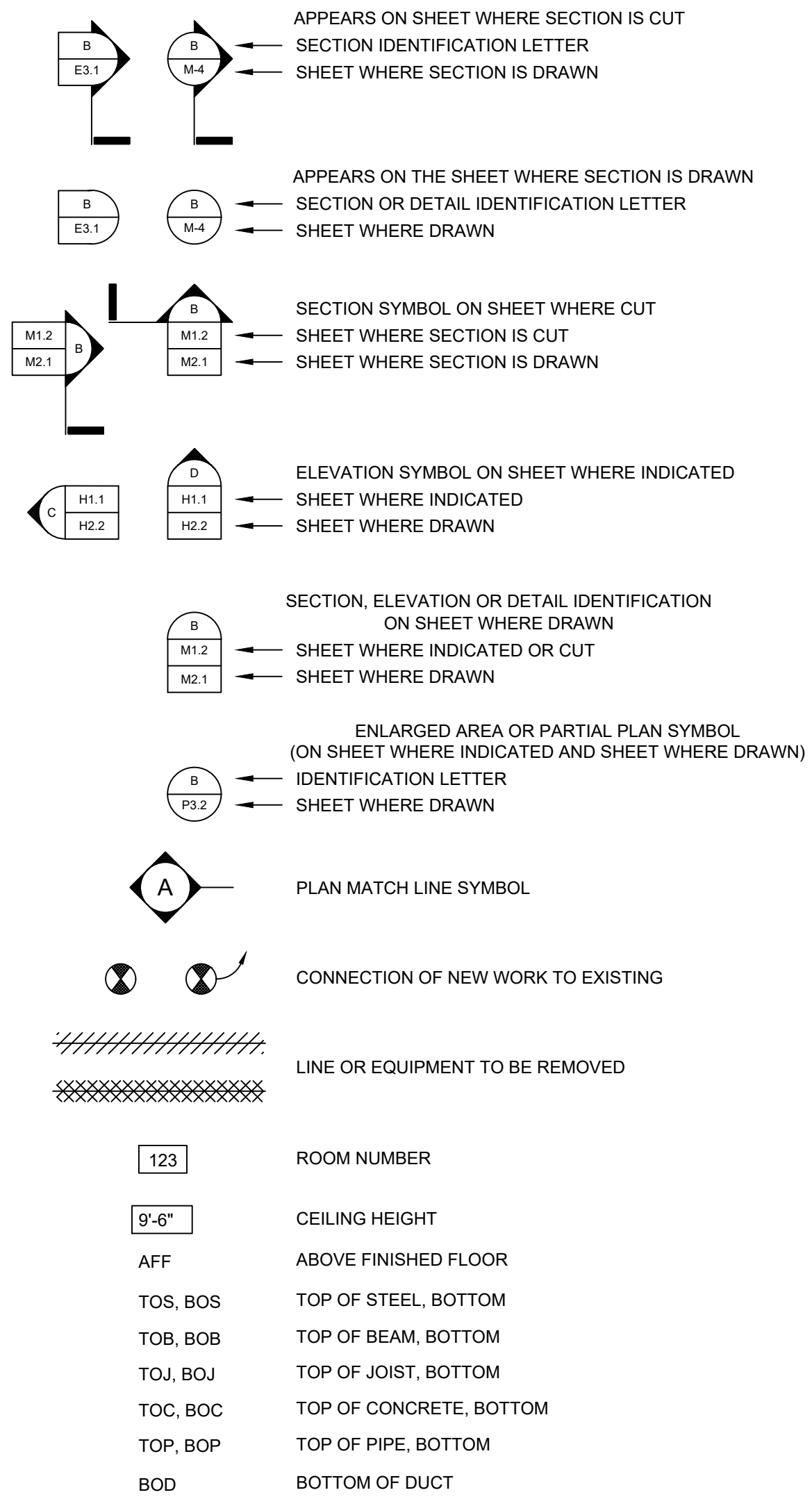
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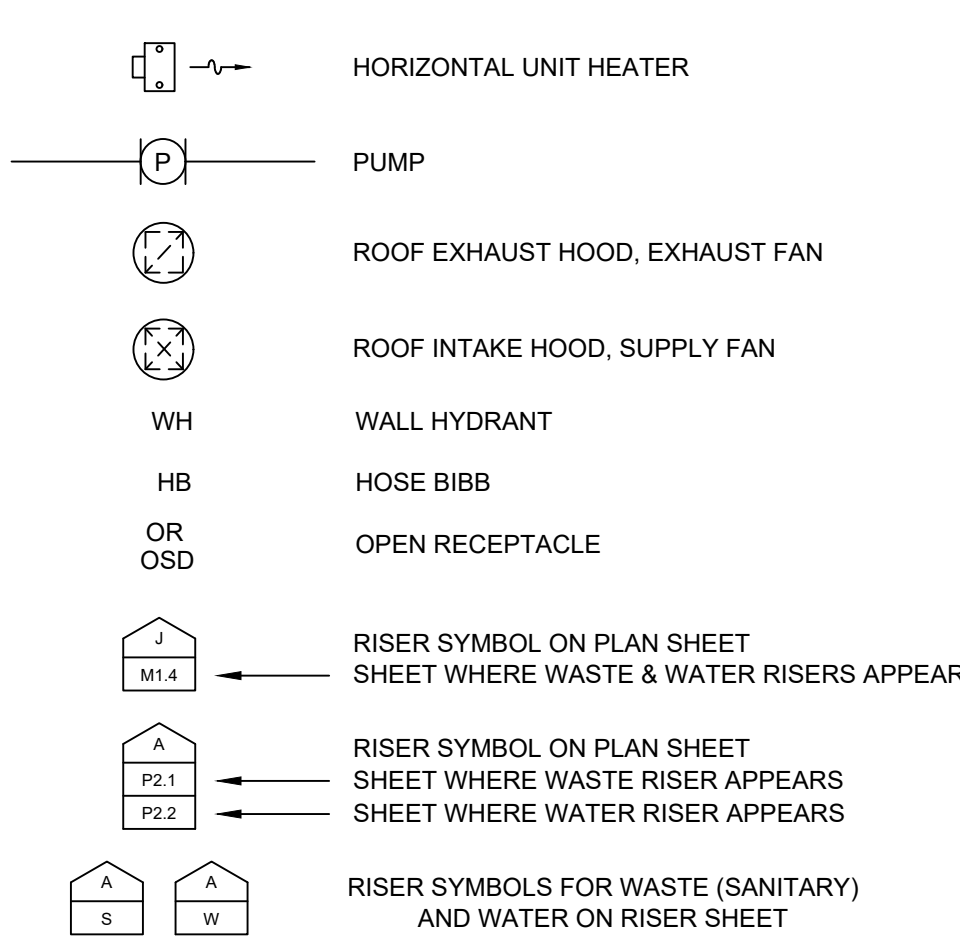
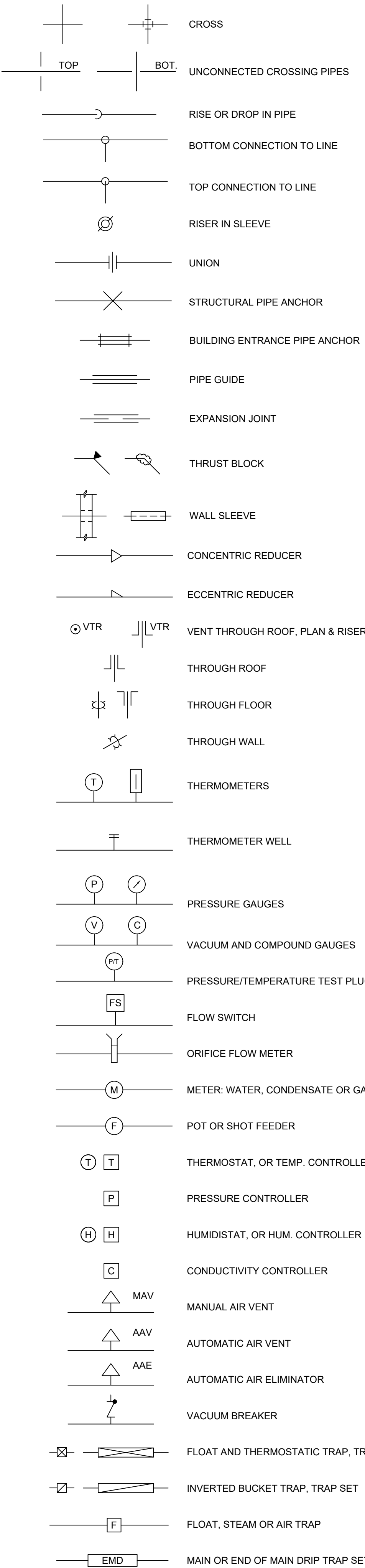
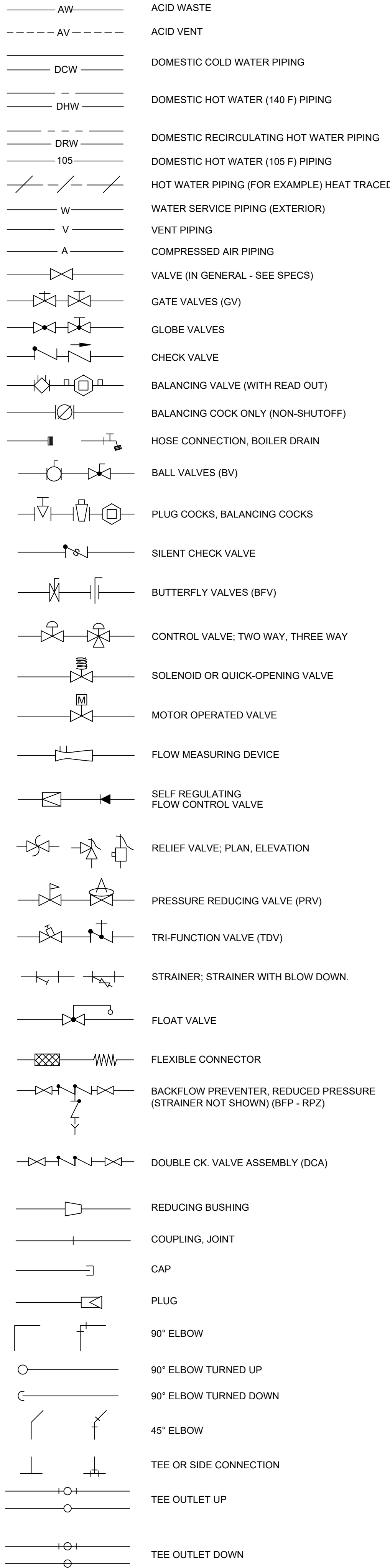
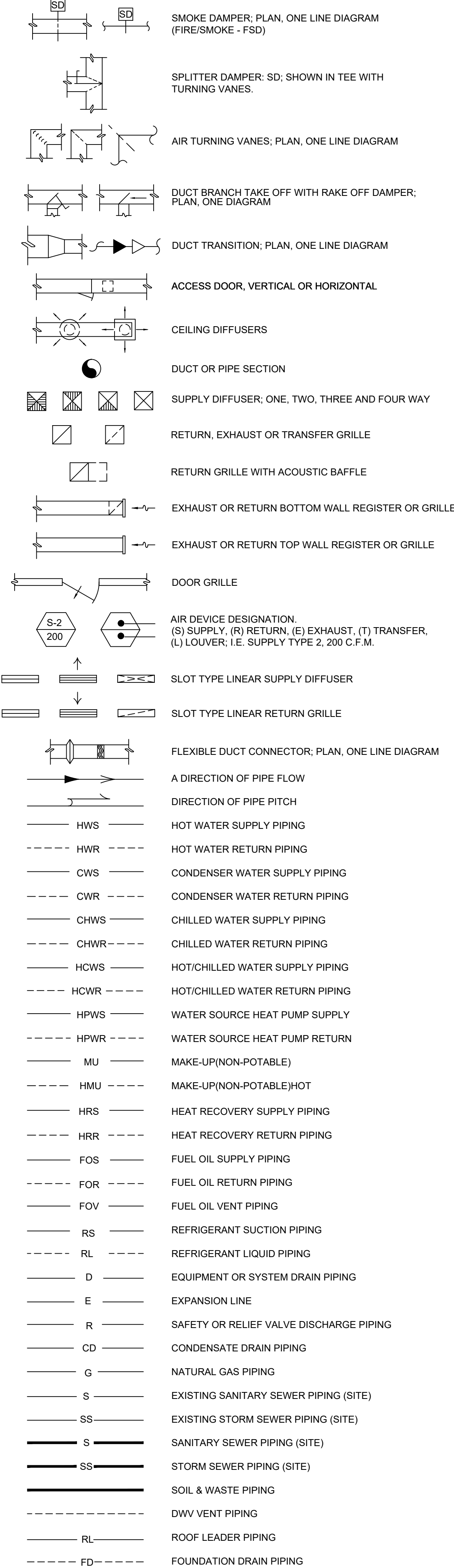
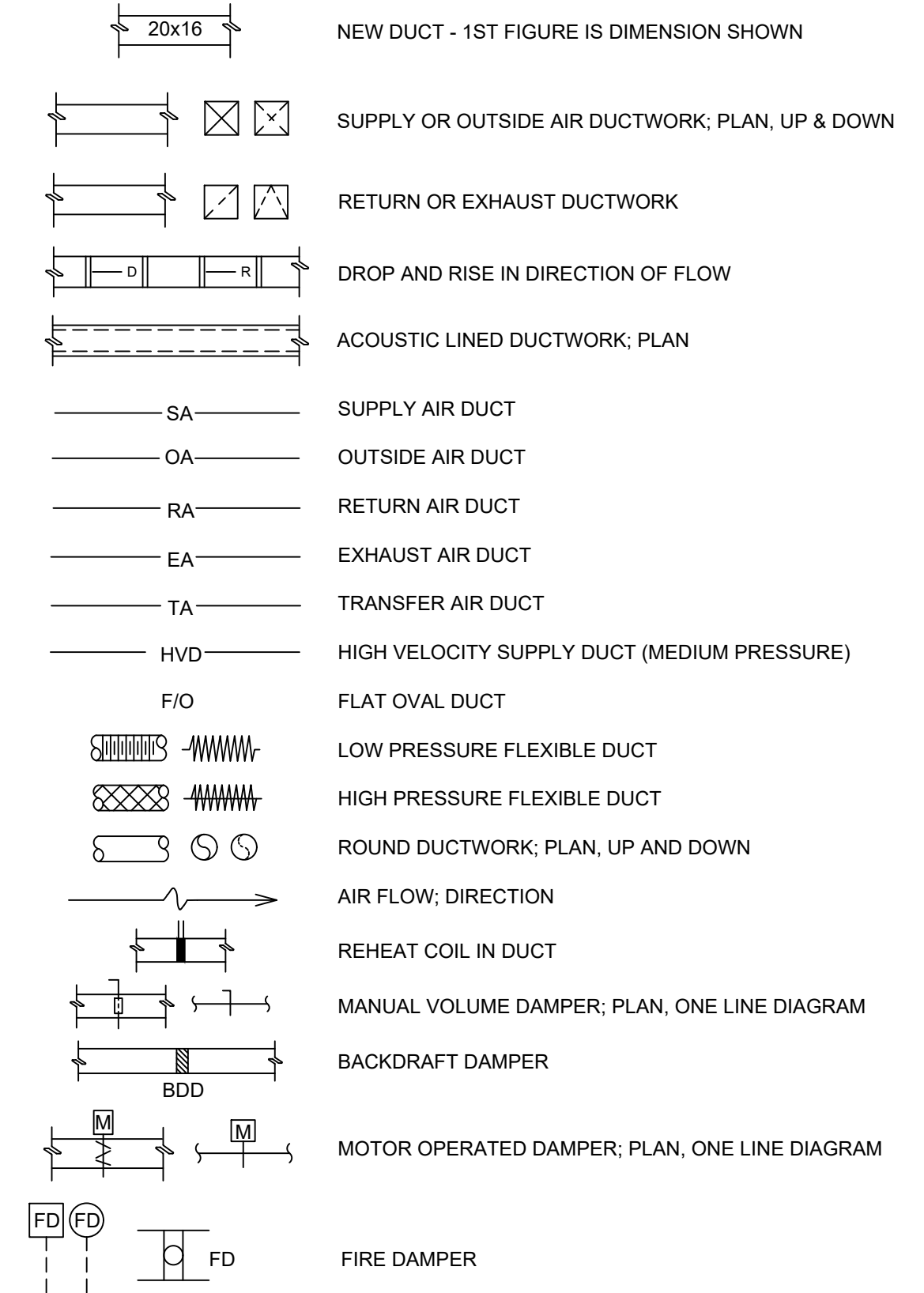
SHEET NO. G-001

DESIGN DEVELOPMENT

GENERAL LEGEND



MECHANICAL LEGEND
HVAC & PLUMBING



GENERAL NOTES:

- FURNISH ALL LABOR, MATERIAL, AND EQUIPMENT REQUIRED FOR THE COMPLETION & OPERATION OF ALL SYSTEMS IN THIS SECTION OF WORK IN ACCORDANCE WITH ALL APPLICABLE CODES, ASHRAE, SMACNA, NFPA, EPA, ETC.
- REFER TO ALL PROJECT DRAWINGS FOR DETAILS OF CONSTRUCTION AND INSTALLATION REQUIREMENTS.
- CONTRACTOR SHALL BECOME, PRIOR TO BID, THOROUGHLY FAMILIAR WITH THE REQUIREMENTS OF THESE NOTES AS WELL AS OTHER NOTES SHOWN ON THE CONTRACT DOCUMENTS.
- THESE DRAWINGS REFLECT A SYSTEM DESIGNED AROUND SPECIFIC REFERENCE PRODUCTS (SEE SCHEDULES) - THE SELECTION OF WHICH HAS INFLUENCED THE DESIGNS OF OTHER TRADES (ELECTRICAL, STRUCTURAL, ETC.). IF SUBSTITUTE MANUFACTURERS, SIZES, OR MODEL NUMBERS ARE BID, SUBMITTED OR INSTALLED, IT IS THE RESPONSIBILITY OF THE MECHANICAL CONTRACTOR AND ALL HIS SUBCONTRACTORS TO COORDINATE ALL DIFFERENCES PRIOR TO BID. ALL COSTS OF ALL TRADES ASSOCIATED WITH THE SUBSTITUTION SHALL BE INCLUDED IN THE BID.
- COORDINATION OF ALL MODIFICATIONS TO EACH DISCIPLINE WHICH RESULT FROM SUBSTITUTION OF EQUIPMENT OR MATERIALS SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR. SUBSTITUTIONS WHICH ARE INSTALLED AND SUBSEQUENTLY ARE PROVEN UNSATISFACTORY BY OWNER AND/OR ENGINEER, WITHIN THE WARRANTY PERIOD, SHALL BE REMOVED COMPLETELY BY THE CONTRACTOR AND REPLACED WITH THE ORIGINAL DESIGN OR CORRECTED AS DIRECTED BY THE ENGINEER WITHOUT ADDITIONAL COST TO THE OWNER.
- ALL DRAWINGS ARE DIAGRAMMATIC AND INDICATE THE GENERAL ARRANGEMENTS OR GEOMETRICAL RELATIONSHIPS OF EQUIPMENT AND SERVICES. THEY ARE NOT INTENDED TO SPECIFY OR SHOW EVERY OFFSET, SEQUENCE, DEVICE, OPTION, FITTING, VALVE, OR COMPONENT.
- INFORMATION AND COMPONENTS SHOWN ON RISER DIAGRAMS OR DETAILS, BUT NOT SHOWN ON PLANS, AND VICE VERSA, SHALL BE PROVIDED AS IF EXPRESSLY REQUIRED BY BOTH.
- CONTRACTOR SHALL NOT SCALE DRAWINGS. DRAWINGS SPECIFIC TO THIS DISCIPLINE DO NOT LIMIT THE RESPONSIBILITY OF WORK REQUIRED BY THE CONTRACT DOCUMENTS.
- EXACT LOCATIONS OF ALL EQUIPMENT, DUCTS, DIFFUSERS, ETC. SHALL BE COORDINATED WITH OTHER TRADES. CEILING MOUNTED LIGHTING, AND ELECTRICAL REQUIREMENTS TAKE PRECEDENCE OVER CEILING MOUNTED MECHANICAL REQUIREMENTS.
- CONTRACTOR SHALL BE RESPONSIBLE FOR COORDINATING ALL WORK WITH THAT OF OTHER TRADES. REFER TO ELECTRICAL AND OTHER DRAWINGS FOR COMPLETE INFORMATION PRIOR TO BID.
- ALL MECHANICAL CONSTRUCTION DETAILS SHALL BE AS SHOWN AND AS REQUIRED TO MAINTAIN "UL" ASSEMBLY RATINGS. SEAL AROUND ALL PENETRATIONS THROUGH ALL "UL" RATED ASSEMBLIES, FIRE, AND SMOKE WALLS. COORDINATE WITH GENERAL CONTRACTOR.
- NO OTHER TRADES, I.E., ELECTRICAL, CEILING, PLUMBING, ETC., SHALL BE SUSPENDED, HUNG, OR SUPPORTED FROM DUCTWORK OR PIPING.
- ALL BUILDING PENETRATIONS MUST BE COORDINATED WITH ENGINEER AND SHALL BE FLASHED AND SEALED WEATHERTIGHT. ALL MATERIALS AND COLORS MUST BE PRE-APPROVED BY ENGINEER.
- ROUTE DUCTWORK AS HIGH AS POSSIBLE TO FACILITATE ACCESS TO ABOVE CEILING SPACE. COORDINATE ROUTING WITH OTHER SERVICES AND TRADES.
- ALL DUCTWORK AND PIPING SHALL BE SUPPORTED FROM STRUCTURE.
- ALL DUCTWORK SHALL BE CONSTRUCTED AND INSTALLED PER SMACNA HVAC DUCT CONSTRUCTION STANDARDS.
- MAXIMUM FLEXIBLE DUCT LENGTH SHALL BE 5'-0". ALL FLEXIBLE DUCT SHALL CONFORM TO THE REQUIREMENTS OF U.L. 181 FOR CLASS 1 FLEXIBLE AIR DUCTS. SUPPORT TO ELIMINATE SAGGING & KINKING.
- ALL HVAC EQUIPMENT TO BE INSTALLED PER MANUFACTURER'S REQUIREMENTS AS SHOWN. UTILIZE FACTORY FILTERS DURING CONSTRUCTION.
- ALL PIPING, DUCTS, VENTS, ETC., EXTENDING THROUGH WALLS SHALL BE FLASHED, COUNTER FLASHED IN WATERPROOF MANNER W/LEAD ROOF JACK.
- CONTRACTOR TO COORDINATE DUCTWORK WITH OTHER TRADES, OFF-SET AS REQUIRED, RUN DUCTWORK BETWEEN JOIST WHERE POSSIBLE.
- CONTRACTOR SHALL VISIT THE JOB SITE & BE FAMILIAR WITH ALL PROJECT CONDITIONS PRIOR TO FABRICATING ANY EQUIPMENT, DUCTWORK, ETC. NO ALLOWANCES WILL BE MADE FOR CONTRACTOR UNFAMILIARITY WITH PROJECT CONDITIONS.
- MECHANICAL CONTRACTOR SHALL BALANCE SYSTEM TO AIR QUANTITIES INDICATED ON PLANS AND PROVIDE OWNERS REPRESENTATIVES WITH COMPLETE NEBB/IAABC BALANCE REPORT.
- ALL SQUARE ELBOWS SHALL HAVE TURNING VANES.
- PROVIDE A MANUAL VOLUME DAMPER AT ALL BRANCH TAKE-OFFS.
- ALL DUCT DIMENSIONS SHOWN ARE INTERIOR DUCT DIMENSIONS.
- ALL CONTROL WIRING & CONDUIT SHALL COMPLY WITH NEC.
- PIPE AND DUCT ROUTING SHOWN IS SCHEMATIC. HVAC CONTRACTOR SHALL PROVIDE ANY ADDITIONAL OFFSETS AND FITTINGS, INCLUDING DIVIDED DUCTS, REQUIRED FOR PROPER INSTALLATION AND TO MAINTAIN CLEARANCES AS ENCOUNTERED IN THE FIELD.
- MECHANICAL CONTRACTOR SHALL COORDINATE WITH ELECTRICAL CONTRACTOR AND DRAWINGS FOR CONNECTIONS AND LOCATION OF ALL EQUIPMENT.

CRW PROJECT NO. 4973-06

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MECHANICAL LEGEND
AND GENERAL NOTES

LANSDOWNE ELEMENTARY SCHOOL - HVAC RENOVATION
FAYETTE COUNTY BOARD OF EDUCATION, LEXINGTON, KY

REVISIONS

NO.	DESCRIPTION	DATE	BY	DRWN	REVIEWED	CVS	APPROVED

DATE: MARCH 2024
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DESIGN DEVELOPMENT

THIS DRAWING SHOULD BE USED ONLY WHEN INDICATED

RTU-1 TO RTU-X

OCCUPIED MODE: THE UNIT CAN BE PLACED IN THE OCCUPIED MODE BY A 7-DAY PROGRAMMABLE SCHEDULE IN THE DDC CONTROLLER. ACCESSIBLE THROUGH THE KEYPAD, A DIGITAL INPUT SHALL BE AVAILABLE TO OVERRIDE ANY OTHER COMMAND AND TURN THE UNIT ON EVEN WHEN THE SCHEDULE IS CALLING FOR THE UNIT TO BE OFF (UNOCCUPIED MODE). THE DIGITAL INPUT CAN BECOME THE PRIMARY MEANS OF ENABLING THE UNIT BY NOT HAVING ANY ON/OFF TIMES IN THE SCHEDULE. IF A BUILDING AUTOMATION SYSTEM (BAS) IS USED TO INTERFACE WITH THE UNIT(S), THE CONTROLS CONTRACTOR SHOULD CONTACT SEASONS 4 FOR ADDITIONAL INFORMATION.

UNOCCUPIED MODE: THE SUPPLY AIR BLOWER AND EXHAUST AIR FAN SHALL BE DE-ENERGIZED. THE OUTDOOR AIR DAMPER WILL BE FULLY CLOSED, AND THE RETURN AIR DAMPER WILL BE FULLY OPEN. NO COOLING OR HEATING FUNCTION WILL BE ALLOWED.

SUPPLY AIR BLOWER: THE SUPPLY AIR BLOWER WILL RUN CONTINUOUSLY IN OCCUPIED MODE. THE SUPPLY AIR BLOWER WILL BE A VARIABLE AIR VOLUME TYPE CONTROLLED BY VARIABLE SPEED DRIVE. THE INPUT TO THE VSD SHALL BE VIA A PRESSURE TRANSDUCER LOCATED IN THE SUPPLY AIR BLOWER PLENUM. THIS TRANSDUCER WILL SEND A CONTROL SIGNAL TO THE CONTROLLER THAT WILL IN TURN SEND A SIGNAL TO THE DRIVE. THE DRIVE WILL RAMP THE SPEED OF THE SUPPLY AIR BLOWER TO MAINTAIN A CONSTANT SUPPLY AIR BLOWER PLENUM PRESSURE (APPROX. SET POINT = 2.25" W.C., ADJUSTABLE). THERE SHALL BE A MANUAL RESET HIGH PRESSURE SAFETY SWITCH LOCATED IN THE SUPPLY AIR BLOWER PLENUM TO DE-ENERGIZE THE SUPPLY AIR BLOWER IN THE EVENT THAT THE SUPPLY AIR BLOWER PLENUM PRESSURE BECOMES EXCESSIVE (SET POINT = 5.75" W.C., ADJUSTABLE).

EXHAUST AIR FAN: THE EXHAUST AIR FAN WILL BE VARIABLE AIR VOLUME TYPE CONTROLLED BY A VARIABLE SPEED DRIVE AND WILL BE ENERGIZED AND CONTROLLED BASED ON BUILDING PRESSURE.

SMOKE DETECTOR: THE UNIT WILL HAVE A RETURN AIR SMOKE DETECTOR. UPON DETECTION OF SMOKE, THE SUPPLY AIR FAN WILL DRIVE TO A FULLY OPEN POSITION. A TERMINAL BLOCK SHALL BE PROVIDED FOR FIELD WIRING CONNECTIONS TO A REMOTE LOCATION IF DESIRED.

COMPRESSOR & COOLING SECTION: A CALL FOR COOLING WILL BE INITIATED WHEN ANY ONE ZONE IS FULLY OPEN TO THE COLD DECK AND THE TEMPERATURE RISES ABOVE THE COOLING SET POINT OF THE ZONE'S TEMPERATURE CONTROL. THE CALL FOR COOLING WILL CONTINUE UNTIL ALL ZONES ARE SATISFIED. THE UNIT IS EQUIPPED WITH AN EVAPORATOR COOLING COIL AND SCROLL COMPRESSORS, INCLUDING A VFD SCROLL LEAD COMPRESSOR CAPABLE OF MODULATING CAPACITY FOR CAPACITY CONTROL. THE COMPRESSORS WILL STAGE BASED ON A CALL FOR COOLING AND SHALL MAINTAIN A COLD DECK TEMPERATURE OF 50°F (ADJUSTABLE). THE LEAD VFD SCROLL COMPRESSOR HAS A DESIGN OPERATING SPEED OF 7200 RPM. THE RANGE OF OPERATION SHOULD BE LIMITED TO A MINIMUM SPEED OF 35% (APPROXIMATELY 2500 RPM) FOR PROTECTION OF THE SYSTEM COMPRESSOR STAGING SEQUENCE WILL BE: COMPRESSOR 1 ON, COMPRESSOR 2 ON, ETC. COMPRESSOR STAGING MUST BE RE-STARTED BEGINNING WITH STAGE 1 UPON RESET OF ANY SAFETY DEVICE. ONCE THERE IS A CALL FOR COOLING, THE DDC CONTROLLER WILL ENABLE COMPRESSOR 1 AND PROVIDE A DEMAND SIGNAL BASED ON DISCHARGE AIR TEMPERATURE. EACH SUBSEQUENT COMPRESSOR WILL HAVE AN ON-DELAY OF 5 MINUTES TO ALLOW THE LEAD VFD COMPRESSOR TO MODULATE TO MEET SET POINT BEFORE ANY OTHER COMPRESSORS ARE TURNED ON/OFF. IF AFTER 5 MINUTES THE VFD COMPRESSOR IS AT FULL CAPACITY AND THE DISCHARGE AIR TEMPERATURE IS STILL ABOVE THE DISCHARGE AIR TEMPERATURE DEADBAND, THE NEXT COMPRESSOR WILL BE STAGED ON. IF AFTER 5 MINUTES THE VFD COMPRESSOR IS AT MINIMUM OUTPUT AND THE DISCHARGE AIR TEMPERATURE IS STILL BELOW THE DEADBAND, THE NEXT COMPRESSOR WILL BE STAGED OFF. THE VFD COMPRESSOR MUST REACH FULL CAPACITY ON AN INCREASE IN DEMAND OR MINIMUM OUTPUT ON A DECREASE IN DEMAND BEFORE STAGING ANY OTHER COMPRESSORS ON/OFF. EACH COMPRESSOR WILL RUN FOR A MINIMUM OF 3 MINUTES ONCE ENERGIZED TO ENSURE PROPER OIL RETURN TO THE COMPRESSOR. EACH COMPRESSOR HAS A SOLID-STATE 5 MINUTE TIMER TO PREVENT SHORT CYCLING. MECHANICAL COOLING IS DISABLED IF THE COIL LEAVING TEMPERATURE DROPS BELOW 38°FDB (ADJUSTABLE). COOLING WILL REACTIVATE ONCE THE FREEZE STAT DOWNSTREAM OF EVAPORATOR COIL IS SATISFIED. THE UNIT WILL HAVE A LOW AMBIENT LOCKOUT SET AT 60°F (ADJUSTABLE).

HOT WATER HEATING COIL: THE UNIT WILL HAVE A HOT WATER COIL. THE HOT WATER COIL WILL BE CONTROLLED BY A MODULATING VALVE, PROVIDED AND MOUNTED BY OTHERS IN THE FIELD. A CALL FOR HEATING WILL BE INITIATED WHEN ANY ONE ZONE IS FULLY OPEN TO THE HOT DECK AND THE TEMPERATURE FALLS BELOW THE HEATING SET POINT OF THE ZONE'S TEMPERATURE CONTROL. THE CALL FOR HEATING WILL CONTINUE UNTIL ALL ZONES ARE SATISFIED. THE COIL WILL HAVE A FREEZE STAT LOCATED ON THE LEAVING AIR SIDE OF THE COIL. SET FOR 38°F CUT-OUT AND 45°F CUT-IN. ON CUT-OUT, THE CONTROLLER WILL STOP ALL FANS AND CLOSE THE OUTSIDE AIR DAMPER. THE VALVE WILL REMAIN OPEN TO THE COIL TO ALLOW FULL WATER FLOW. THE VALVE WILL FAIL IN A NORMALLY OPEN POSITION. THE HEATING SECTION LEAVING AIR TEMPERATURE SET POINT IS 90°F (ADJUSTABLE).

HOT GAS REHEAT COIL: THE HOT GAS REHEAT (HGR) COIL IS PROVIDED ON THE SPECIFIED COMPRESSOR CIRCUIT(S) (TYPICALLY THE LEAD CIRCUIT), AND IT IS LOCATED IN THE HOT DECK AND BYPASS SECTION. THE HGR COIL WILL PROVIDE TEMPERED AIR FOR THE HOT DECK WHEN THE COMPRESSOR IS ACTIVE AND THE BYPASS DAMPER IS OPEN 20% (ADJ). THE HOT GAS REHEAT COIL IS EQUIPPED WITH A TWO-POSITION, 3-WAY CONTROL VALVE. ON A CALL FOR DEHUMIDIFICATION/REHEAT, THE VALVE SWITCHES TO FULL REFRIGERANT FLOW THROUGH THE HGR COIL. ON A CALL FOR COOLING ONLY, THE VALVE SWITCHES TO BYPASS ALL REFRIGERANT FLOW AROUND THE HGR COIL (I.E. THE HGR COIL IS INACTIVE).

ECONOMIZER (OUTSIDE, RETURN & EXHAUST DAMPERS): THE ECONOMIZER WILL HAVE AN ENTHALPY CHANGE/OVER CONTROL WHICH WILL ENABLE THE ECONOMIZER ANYTIME THERE IS A CALL FOR COOLING AND THE AMBIENT ENTHALPY IS BELOW THE CHANGE/OVER SET POINT OF 22 BTULB (ADJUSTABLE). THE OUTDOOR AND RETURN AIR DAMPERS WILL MODULATE TO MAINTAIN A MIXED AIR TEMPERATURE OF 55°F (ADJUSTABLE). WHEN THE ECONOMIZER IS DISABLED AND THE UNIT IS IN OCCUPIED MODE, THE OUTDOOR AIR DAMPER WILL BE SET AT MINIMUM POSITION. WHEN THE ECONOMIZER IS DISABLED AND THE UNIT IS IN UNOCCUPIED MODE, THE OUTDOOR AIR DAMPER WILL BE CLOSED. THE EXHAUST AIR DAMPER IS A GRAVITY DAMPER. THE OUTDOOR AND RETURN AIR DAMPER ACTUATORS WILL BE ELECTRIC.

TRIPLE DECK DAMPER: THE ZONE DAMPER WILL BE A 3-DECK DAMPER AND SHALL CONSIST OF HOT DECK, BYPASS (NEUTRAL) DECK, AND COLD DECK. THE ZONE ACTUATORS WILL BE ELECTRIC. DURING FULL COOLING DEMAND, THE COLD DECK DAMPER SHALL BE 100% OPEN, NEUTRAL AND HOT DECK DAMPERS SHALL BE CLOSED. IF COOLING DEMAND DECREASES IN A ZONE, COLD DECK DAMPER SHALL MODULATE TOWARDS CLOSED POSITION, NEUTRAL DECK DAMPER SHALL MODULATE TO OPEN POSITION IN PROPORTION TO COLD DECK DAMPER. HOT DECK DAMPER SHALL REMAIN CLOSED. DURING FULL HEATING DEMAND, HOT DECK DAMPER SHALL BE 100% OPEN, NEUTRAL AND COLD DECK DAMPERS SHALL BE CLOSED. IF HEATING DEMAND INCREASES IN A ZONE, HOT DECK DAMPER SHALL MODULATE TOWARDS OPEN POSITION, NEUTRAL DECK DAMPER SHALL MODULATE TO CLOSED POSITION, IN PROPORTION TO HOT DECK DAMPER. COLD DECK DAMPER SHALL REMAIN CLOSED. THE DAMPER OPERATION SHALL BE REVERSED IN THE EVENT THAT HEATING DEMAND DECREASES AND COOLING DEMAND INCREASES. HOT DECK AND COLD DECK DAMPERS SHALL NOT BE OPEN AT THE SAME TIME. SIMULTANEOUS HEATING AND COOLING SHALL NOT BE ALLOWED. IF THERE IS NO DEMAND FOR HEATING OR COOLING, THE ASSOCIATED HOT AND COLD DECK DAMPERS SHALL BE CLOSED AND NEUTRAL DECK DAMPER SHALL BE 100% OPEN. A SINGLE, MANUALLY ADJUSTABLE DAMPER IS PROVIDED BETWEEN THE HOT DECK AND COLD DECK OF THE UNIT TO RESTRICT THE AIRFLOW TO THE BYPASS (NEUTRAL) DECK TO CREATE PRESSURE DROP REQUIRED FOR THE VSD TO SLOW THE FAN SPEED. THE MANUAL DAMPER MUST BE SET TO MINIMUM OUTSIDE AIR REQUIREMENTS BY THE AIR BALANCING CONTRACTOR.

CONDENSER FAN CONTROL: THE CONDENSER FAN MOTORS WILL BE CONTROLLED BY A VARIABLE FREQUENCY DRIVE. THE VARIABLE FREQUENCY DRIVE WILL RAMP UP AND DOWN BASED UPON INPUT SIGNALS COMING FROM PRESSURE TRANSDUCERS MOUNTED ON THE DISCHARGE LINES. THE CONDENSER FAN SPEED WILL MODULATE TO MAINTAIN A CONSTANT HEAD PRESSURE OF 320 PSIG. 320 PSIG. IF AT ANY TIME THE DISCHARGE PRESSURE OF ANY OF THE COMPRESSOR CIRCUITS THAT ARE RUNNING FALLS BELOW 250 PSIG, THE CONTROLLER WILL REDUCE THE CONDENSER FAN SPEED TO MAINTAIN A MINIMUM DISCHARGE PRESSURE OF 240 PSIG AND ALLOW THE HIGHEST DISCHARGE PRESSURE TO RISE ABOVE THE 320 PSIG SETPOINT. THE CONTROLLER WILL CONTINUE TO REDUCE THE CONDENSER FAN SPEED AS NEEDED TO MAINTAIN THE MINIMUM DISCHARGE PRESSURE UNTIL THE DISCHARGE PRESSURE OF ANY OTHER COMPRESSOR CIRCUIT REACHES A MAXIMUM PRESSURE OF 475 PSIG.

FILTER PRESSURE DROP: UNIT IS EQUIPPED WITH A DIFFERENTIAL STATIC PRESSURE SWITCH ACROSS THE FILTER BANK. AN ALARM SHALL BE PROVIDED VIA THE UNIT CONTROLLER TO THE OPERATOR INTERFACE WHEN THE DIFFERENTIAL STATIC PRESSURE EXCEEDS 1.0" W.C. (ADJUSTABLE).

NIGHT SETBACK: DURING THE UNOCCUPIED MODE IF A ZONE'S TEMPERATURE FALLS BELOW 60°F (ADJUSTABLE), THE UNIT CONTROLLER SHALL RESTART THE SUPPLY FAN. THE OUTSIDE AIR DAMPER WILL DRIVE TO COMPLETELY CLOSED POSITION, AND THE RETURN AIR DAMPER WILL DRIVE TO A COMPLETELY OPEN POSITION. THE SUPPLY AIR FAN WILL REMAIN ON UNTIL THE TEMPERATURE REACHES 60°F (ADJUSTABLE). DURING THIS MODE HEATING CAPABILITIES SHALL REMAIN ENABLED. DURING THE UNOCCUPIED MODE IF A ZONE'S TEMPERATURE RISES ABOVE 80°F (ADJUSTABLE), THE UNIT CONTROLLER SHALL RESTART THE SUPPLY FAN. THE OUTSIDE AIR DAMPER WILL DRIVE TO COMPLETELY CLOSED POSITION, AND THE RETURN AIR DAMPER WILL DRIVE TO A COMPLETELY OPEN POSITION. THE SUPPLY AIR FAN WILL REMAIN ON UNTIL THE TEMPERATURE REACHES 80°F (ADJUSTABLE). DURING THIS MODE COOLING CAPABILITIES SHALL REMAIN ENABLED.

MORNING WARM UP: IN THE MORNING WARM UP MODE, AS DETERMINED BY THE TIME OF DAY SCHEDULE, OUTDOOR AIR DAMPER SHALL BE FULLY CLOSED AND RETURN AIR DAMPER SHALL BE FULLY OPENED UNTIL THE RETURN AIR TEMPERATURE REACHES 65°F (ADJUSTABLE). ONCE THE MIXED AIR TEMPERATURE REACHES ITS SET POINT, OUTDOOR AIR DAMPER SHALL BE OPENED TO A MINIMUM VENTILATION POSITION. DURING THIS MODE HEATING CAPABILITIES SHALL REMAIN ENABLED.

AHU-X

FAN CONTROL: SYSTEM STARTS FAN TO RUN CONTINUOUSLY DURING OCCUPIED PERIODS. SYSTEM CYCLES FAN DURING UNOCCUPIED PERIODS. SIGNAL ALARM IF FAN FAILS TO START AS COMMANDED

FREEZE PROTECTION: DUCT - MOUNTED THERMOSTAT, LOCATED BEFORE SUPPLY FAN, SIGNALS ALARM, STOPS FAN, AND CLOSES OUTSIDE AIR DAMPERS WHEN TEMPERATURE FALLS BELOW 37 DEG F.

SMOKE CONTROL: SMOKE DETECTOR LOCATED INSIDE THE UNIT, SIGNALS ALARM, STOPS FAN, AND CLOSES OUTSIDE AND RELIEF DAMPERS WHEN PRODUCTS OF COMBUSTION ARE DETECTED IN AIRSTREAM.

MIXED-AIR CONTROL: DURING OCCUPIED PERIODS, WHEN FAN IS RUNNING, SYSTEM MODULATES OUTSIDE-AIR, RETURN-AIR AND RELIEF AIR DAMPERS TO MAINTAIN SUPPLY AIR TEMPERATURE. DURING OCCUPIED PERIODS, WHEN FAN IS RUNNING, OPEN OUTSIDE-AIR DAMPERS TO MINIMUM POSITION. DURING HEATING SEQUENCE, SET OUTSIDE-AIR DAMPERS TO MINIMUM POSITION. WHEN OUTSIDE-AIR TEMPERATURE EXCEEDS RETURN AIR TEMPERATURE, SET OUTSIDE-AIR DAMPERS TO MINIMUM POSITION. DURING UNOCCUPIED PERIODS, POSITION OUTSIDE-AIR AND RELIEF-AIR DAMPERS CLOSED AND RETURN AIR DAMPERS OPEN.

FILTERS: DURING OCCUPIED PERIODS, WHEN FAN IS RUNNING, DIFFERENTIAL AIR PRESSURE TRANSMITTER SIGNALS ALARM WHEN HIGH PRESSURE CONDITIONS EXIST.

HYDRONIC HEATING COIL: DURING OCCUPIED PERIODS, WHEN FAN IS RUNNING, SYSTEM MODULATES CONTROL VALVE TO MAINTAIN SUPPLY AIR TEMPERATURE. SYSTEM RESETS SUPPLY AIR TEMPERATURE SET POINT FROM RETURN AIR TEMPERATURE. DURING UNOCCUPIED PERIODS, WHEN FAN IS OFF RETURN VALVE TO OPEN POSITION. DURING UNOCCUPIED PERIODS, WHEN FAN IS ON, ENABLE NORMAL CONTROL.

FILTER PRESSURE DROP: UNIT IS EQUIPPED WITH A DIFFERENTIAL STATIC PRESSURE SWITCH ACROSS THE FILTER BANK. AN ALARM SHALL BE PROVIDED VIA THE UNIT CONTROLLER TO THE OPERATOR INTERFACE WHEN THE DIFFERENTIAL STATIC PRESSURE EXCEEDS 1.0" W.C. (ADJUSTABLE).

NIGHT SETBACK: DURING THE UNOCCUPIED MODE IF A ZONE'S TEMPERATURE FALLS BELOW 60°F (ADJUSTABLE), THE UNIT CONTROLLER SHALL RESTART THE SUPPLY FAN. THE OUTSIDE AIR DAMPER WILL DRIVE TO COMPLETELY CLOSED POSITION, AND THE RETURN AIR DAMPER WILL DRIVE TO A COMPLETELY OPEN POSITION. THE SUPPLY AIR FAN WILL REMAIN ON UNTIL THE TEMPERATURE REACHES 60°F (ADJUSTABLE). DURING THIS MODE HEATING CAPABILITIES SHALL REMAIN ENABLED. DURING THE UNOCCUPIED MODE IF A ZONE'S TEMPERATURE RISES ABOVE 80°F (ADJUSTABLE), THE UNIT CONTROLLER SHALL RESTART THE SUPPLY FAN. THE OUTSIDE AIR DAMPER WILL DRIVE TO COMPLETELY CLOSED POSITION, AND THE RETURN AIR DAMPER WILL DRIVE TO A COMPLETELY OPEN POSITION. THE SUPPLY AIR FAN WILL REMAIN ON UNTIL THE TEMPERATURE REACHES 80°F (ADJUSTABLE). DURING THIS MODE COOLING CAPABILITIES SHALL REMAIN ENABLED.

MORNING WARM UP: IN THE MORNING WARM UP MODE, AS DETERMINED BY THE TIME OF DAY SCHEDULE, OUTDOOR AIR DAMPER SHALL BE FULLY CLOSED AND RETURN AIR DAMPER SHALL BE FULLY OPENED UNTIL THE RETURN AIR TEMPERATURE REACHES 65°F (ADJUSTABLE). ONCE THE MIXED AIR TEMPERATURE REACHES ITS SET POINT, OUTDOOR AIR DAMPER SHALL BE OPENED TO A MINIMUM VENTILATION POSITION. DURING THIS MODE HEATING CAPABILITIES SHALL REMAIN ENABLED.

CRW PROJECT NO. 4973-06

CLIENT PROJECT NO.

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HVAC CONTROLS
SEQUENCE OF OPERATION

LANDSOWNE ELEMENTARY SCHOOL - HVAC RENOVATION
FAYETTE COUNTY BOARD OF EDUCATION, LEXINGTON, KY

DESIGNED: STAFF

DRAWN: STAFF

REVIEWED: C/S

APPROVED: C/S

NO

DATE

BY

REVISIONS

DESCRIPTION

NO

DATE

BY

REVISIONS

DESCRIPTION

DATE: MARCH 2024

SCALE: NOT TO SCALE

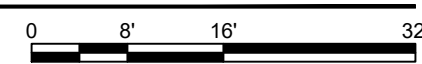
SHEET NO. M-002

POST CHECKS

THIS DRAWING SHOULD BEASURED EXACTLY WHEN ADAPTED

DESIGN DEVELOPMENT

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



- A. DEMOLITION PLAN HAS BEEN DEVELOPED FROM EXISTING PLANS AND VISITING SITE. SOME MECHANICAL EQUIPMENT, DUCTWORK, REGISTERS AND PIPING SIZES MAY NOT BE INDICATED.
- B. IT SHALL BE THE RESPONSIBILITY OF ALL CONTRACTORS WHO SUBMIT BIDS FOR THIS PROJECT TO VISIT THE JOB PREMISES PRIOR TO BIDDING IN ORDER THAT THEY MAY DETERMINE THE TYPE, QUANTITY, LOCATIONS AND ANY HARDSHIPS INVOLVED WITH THE REMOVAL OF EQUIPMENT.
- C. CONTRACTOR UNDER THIS DIVISION IS FINANCIALLY RESPONSIBLE TO REPAIR AND PATCH FLOORS, WALLS, CEILING AND ROOF TO MATCH EXISTING CONDITION WHERE DEMOLITION WORK HAS BEEN DONE. COORDINATE ALL WORK WITH OWNER AND ARCHITECT TO REMAIN FUNCTIONAL.
- D. THE EXISTING HVAC SYSTEM SHALL REMAIN FULLY FUNCTIONAL THROUGHOUT PHASED CONSTRUCTION.
- E. IF THE EXISTING HVAC SYSTEM SHALL EVER REQUIRE SHUTTING DOWN TEMPORARILY IN OCCUPIED AREAS DURING CONSTRUCTION THE CONTRACTOR SHALL COORDINATE THE TIMING OF THE SHUT DOWN PERIOD WITH THE OWNER AND ARCHITECT PRIOR TO DISABLING THE EXISTING SYSTEM. THE HVAC SYSTEM SHALL REMAIN FULLY FUNCTIONAL IN ALL OCCUPIED AREAS DURING NORMAL SCHOOL OPERATION PERIODS.
- F. ALL EXISTING THERMOSTATS AND EXISTING CONTROL WIRING SHALL BE REMOVED FROM ALL EQUIPMENT THAT IS BEING REMOVED IN THE BUILDING IN DEMOLISHED AREAS UNLESS OTHERWISE NOTED.

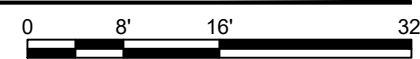
1. EXISTING THERMOSTAT TO BE REMOVED AND REPLACED WITH NEW THERMOSTAT IN SAME LOCATION. SEE NEW WORK PLANS FOR MORE INFORMATION. TYPICAL OF ALL.

FIRST FLOOR PLAN
DEMOLITION PLAN
 LANSDOWNE ELEMENTARY SCHOOL - HVAC RENOVATION
 FAYETTE COUNTY BOARD OF EDUCATION, LEXINGTON, KY

[illegible]

DATE:	MARCH 2024
SCALE:	1/16" = 1'-0"
SHEET NO.	

MD-101



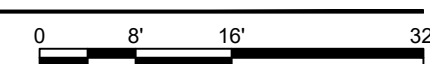
- A. DEMOLITION PLAN HAS BEEN DEVELOPED FROM EXISTING PLANS AND VISITING SITE. SOME MECHANICAL EQUIPMENT, DUCTWORK, REGISTERS AND PIPING SIZES MAY NOT BE INDICATED.
- B. IT SHALL BE THE RESPONSIBILITY OF ALL CONTRACTORS WHO SUBMIT BIDS FOR THIS PROJECT TO OBTAIN ALL NECESSARY PERMITS PRIOR TO BIDDING OR ORDERING. IF THEY MAY DETERMINE THE TYPE, QUANTITY, LOCATIONS AND ANY HARDSHIPS INVOLVED WITH THE REMOVAL OF EQUIPMENT.
- C. CONTRACTOR UNDER THIS DIVISION IS FINANCIALLY RESPONSIBLE TO REPAIR AND PATCH FLOORS, WALLS, CEILING AND ROOF TO MATCH EXISTING CONDITION WHERE DEMOLITION WORK HAS BEEN DONE. COORDINATE ALL WORK WITH OWNER/ENGINEER.
- D. THE EXISTING HVAC SYSTEM SHALL REMAIN FULLY FUNCTIONAL THROUGHOUT PHASED DEMOLITION.
- E. IF THE EXISTING HVAC SYSTEM SHALL EVER REQUIRE SHUTTING DOWN TEMPORARILY IN OCCUPIED AREAS DURING CONSTRUCTION THE CONTRACTOR SHALL COORDINATE THE TIMING OF THE SHUT DOWN PERIOD WITH THE OWNER AND ARCHITECT PRIOR TO DISABLING THE EXISTING SYSTEM. THE EXISTING HVAC SYSTEM SHALL REMAIN FUNCTIONAL IN ALL OCCUPIED AREAS DURING NORMAL SCHOOL OPERATION PERIODS.
- F. ALL EXISTING THERMOSTATS AND EXISTING CONTROL WIRING SHALL BE REMOVED FROM ALL EQUIPMENT THAT IS BEING REMOVED IN THE BUILDING IN DEMOLISHED AREAS UNLESS OTHERWISE NOTED.

1. EXISTING MULTIZONE ROOFTOP UNIT SHALL BE REMOVED AND A NEW MULTIZONE ROOFTOP UNIT TO BE INSTALLED IN ITS PLACE. THE EXISTING ROOFTOP CURB SHALL REMAIN IN PLACE AND BE REUSED FOR NEW ROOFTOP INSTALLATION. DISCONNECT EXISTING GAS PIPING, DUCTWORK, AND ELECTRICAL WIRING. NEW CONNECTIONS SHALL BE INSTALLED BACK IN SAME LOCATIONS. SEE NEW WORK PLAN FOR MORE INFORMATION.
2. EXISTING EXHAUST FAN SHALL REMAIN IN PLACE.
3. EXISTING SINGLE ZONE ROOFTOP UNIT SHALL BE REMOVED AND REPLACED IN THE SAME LOCATION. THE EXISTING ROOF CURB SHALL REMAIN IN PLACE AND A NEW ROOF CURB ADAPTOR SHALL BE INSTALLED IF NECESSARY. DISCONNECT EXISTING DUCTWORK AND ELECTRICAL CONNECTIONS AND RECONNECT TO NEW UNIT. SEE NEW WORK PLAN FOR MORE INFORMATION.
4. EXISTING REFRIG VENT SHALL REMAIN IN PLACE.
5. EXISTING VENT THRU ROOF PIPING LOCATIONS SHALL REMAIN IN PLACE.

1. ALL EXISTING HVAC SYSTEMS SHALL REMAIN OPERATIONAL DURING THIS PROJECT. EXISTING EQUIPMENT SHALL BE DISABLED ONLY WHEN NEW EQUIPMENT IS ONSITE AND READY TO BE INSTALLED.
2. AS UNITS ARE INSTALLED, THERMOSTATS SHALL BE INSTALLED AND PLACED IN STAND ALONE OPERATION MODE.
3. ALL NEW EQUIPMENT INSTALLED SHALL CONNECT TO NEW DD CONTROL SYSTEM TIED INTO FAYETTE COUNTY SCHOOLS CONTROL NETWORK. ALL OTHER EXISTING EQUIPMENT FOR THE SCHOOL SHALL REMAIN ON THE EXISTING CONTROL SYSTEM AND SHALL REMAIN SEPARATE FROM NEW EQUIPMENT CONTROLS.

REVISIONS		DATE:		MARCH 2024	
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				OWNER	
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SHEET NO.		MD-102			
ROOF PLAN					
DEMOLITION PLAN					
LANDSDOWNE ELEMENTARY SCHOOL - HVAC RENOVATION					
FAYETTE COUNTY BOARD OF EDUCATION, LEXINGTON, KY					
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CLIENT PROJECT NO.			GWINC PROJECT NO. 4073-06		

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



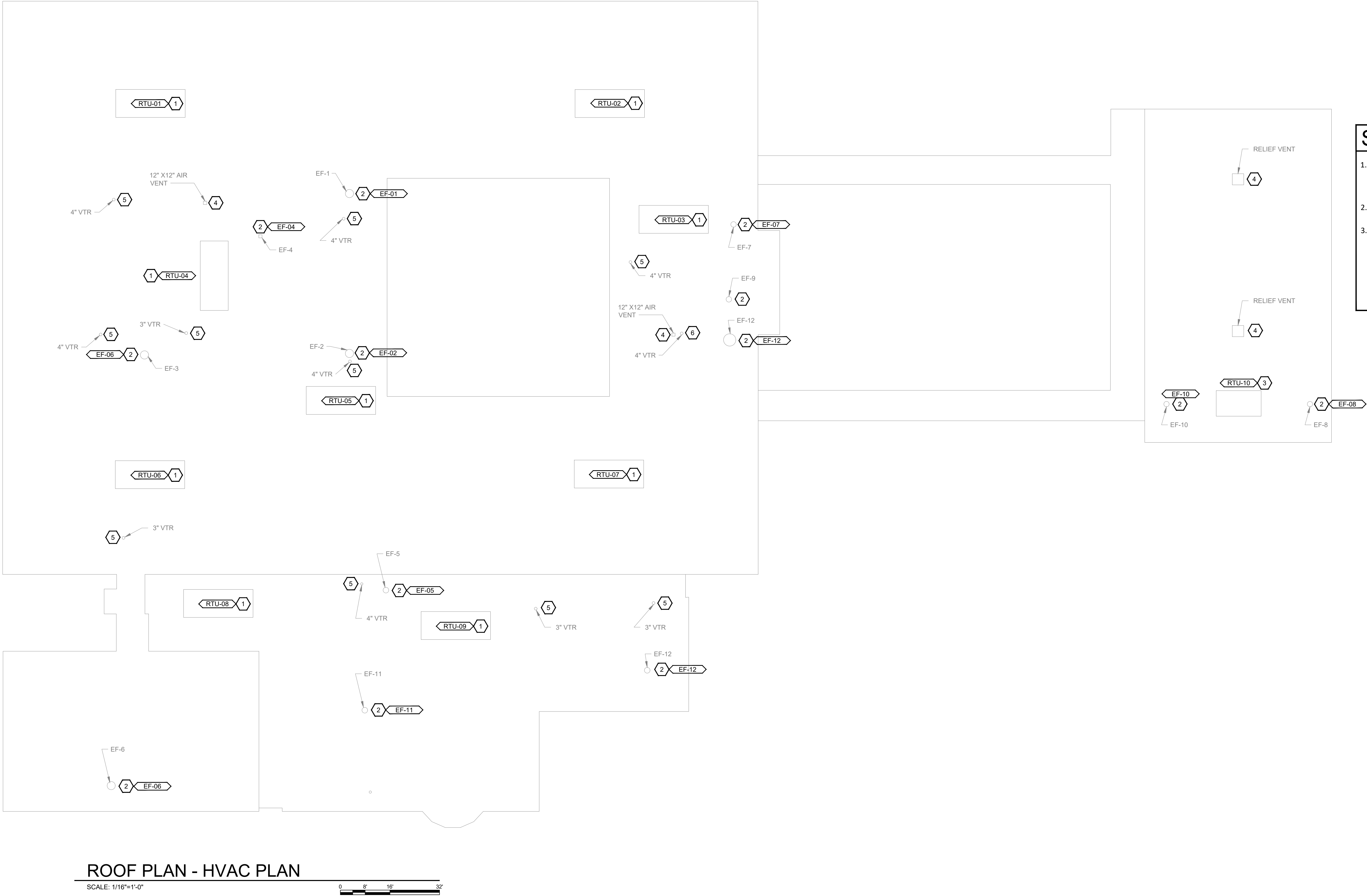
1. GENERAL NOTES.

1. NEW THERMOSTAT TO BE PLACED IN SAME LOCATION AS THE REMOVED THERMOSTAT. SEE DEMOLITION PLANS FOR MORE INFORMATION. TYPICAL OF ALL.

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ROOF PLAN - HVAC PLAN

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

SHEET KEYNOTES:

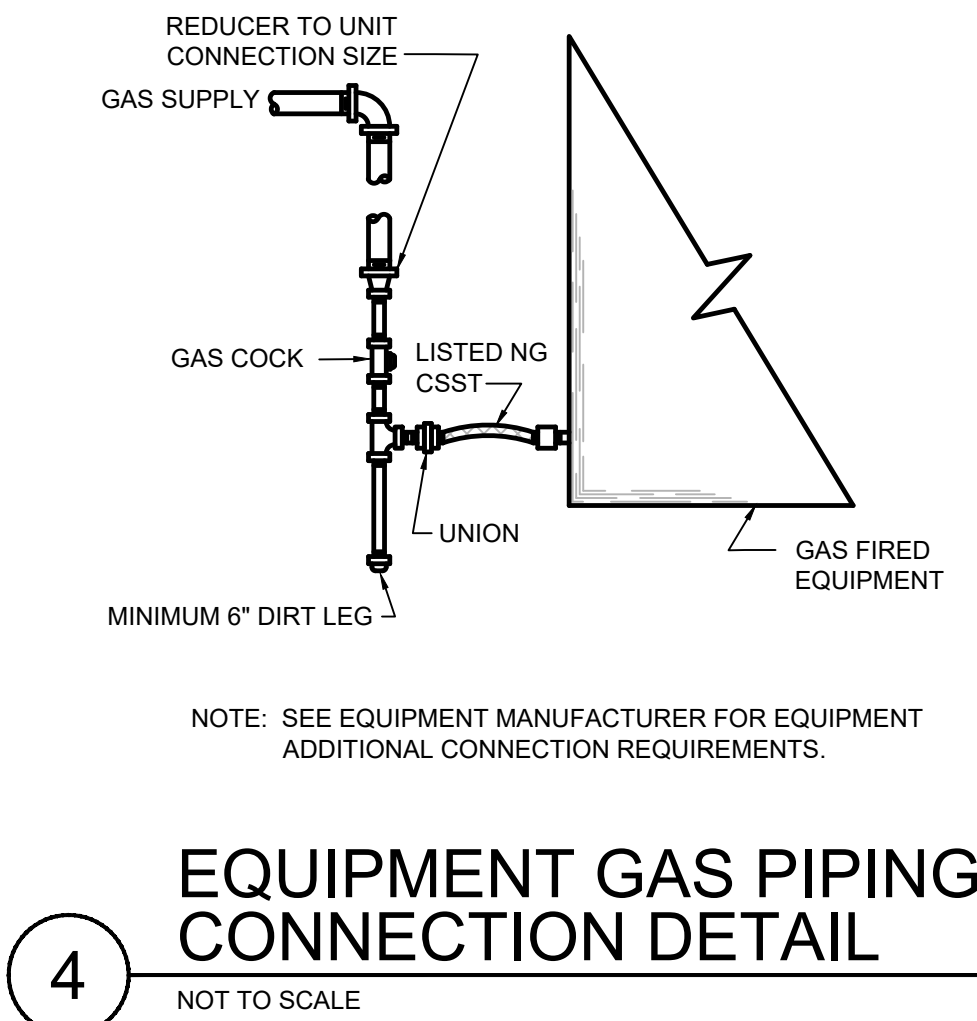
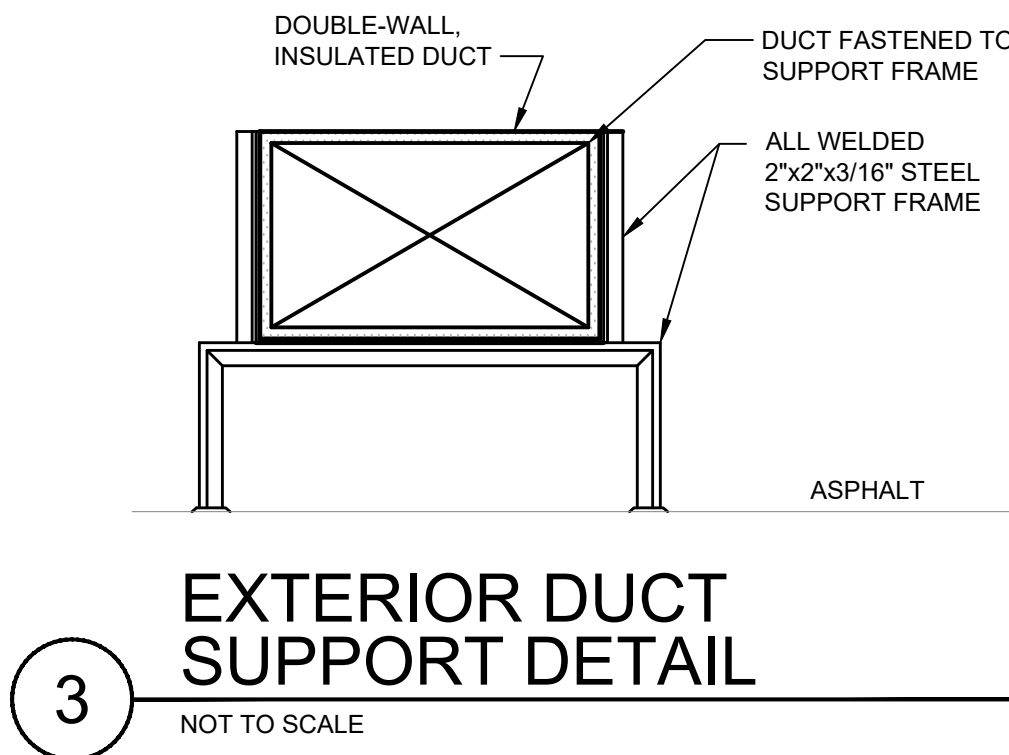
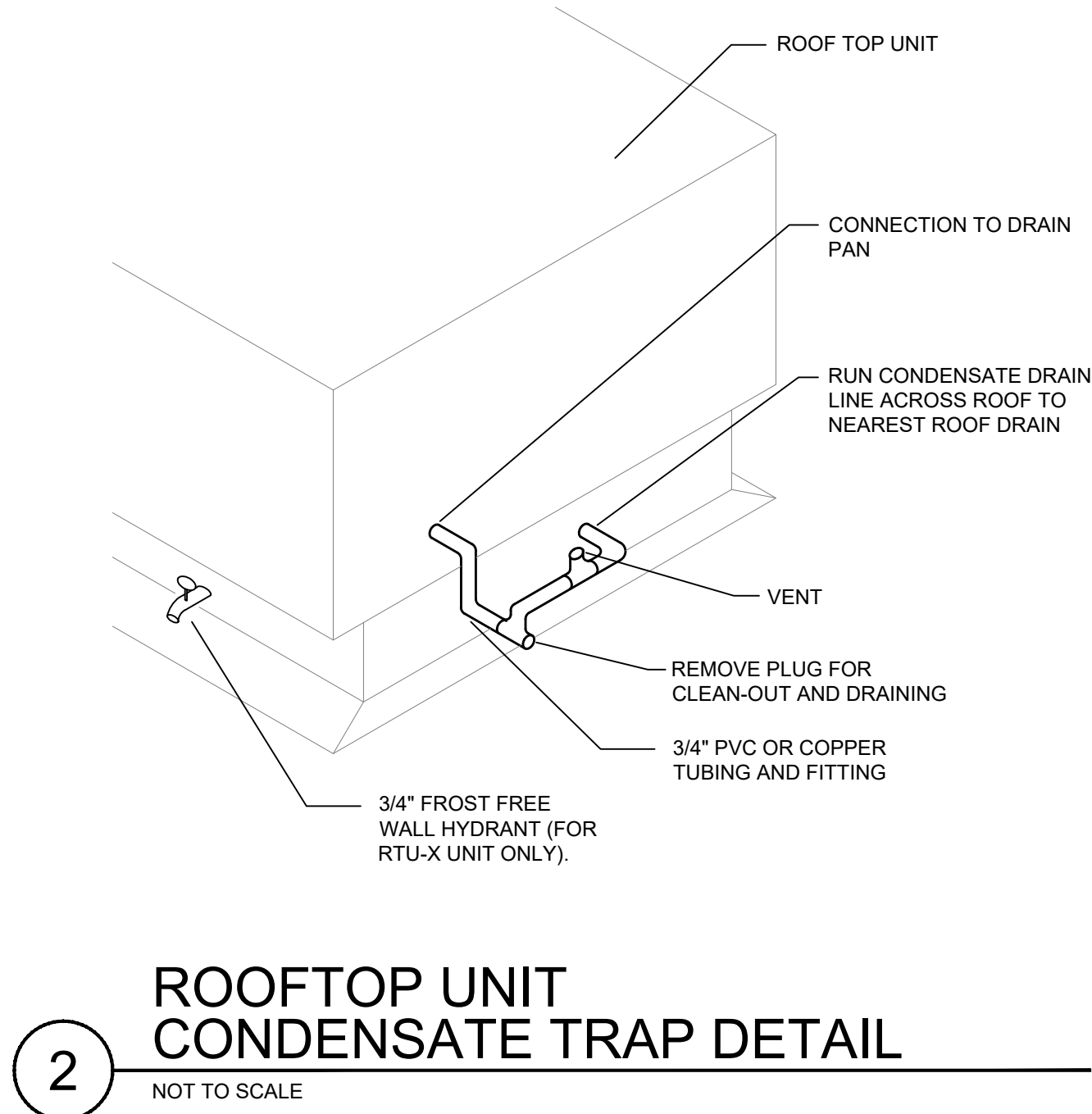
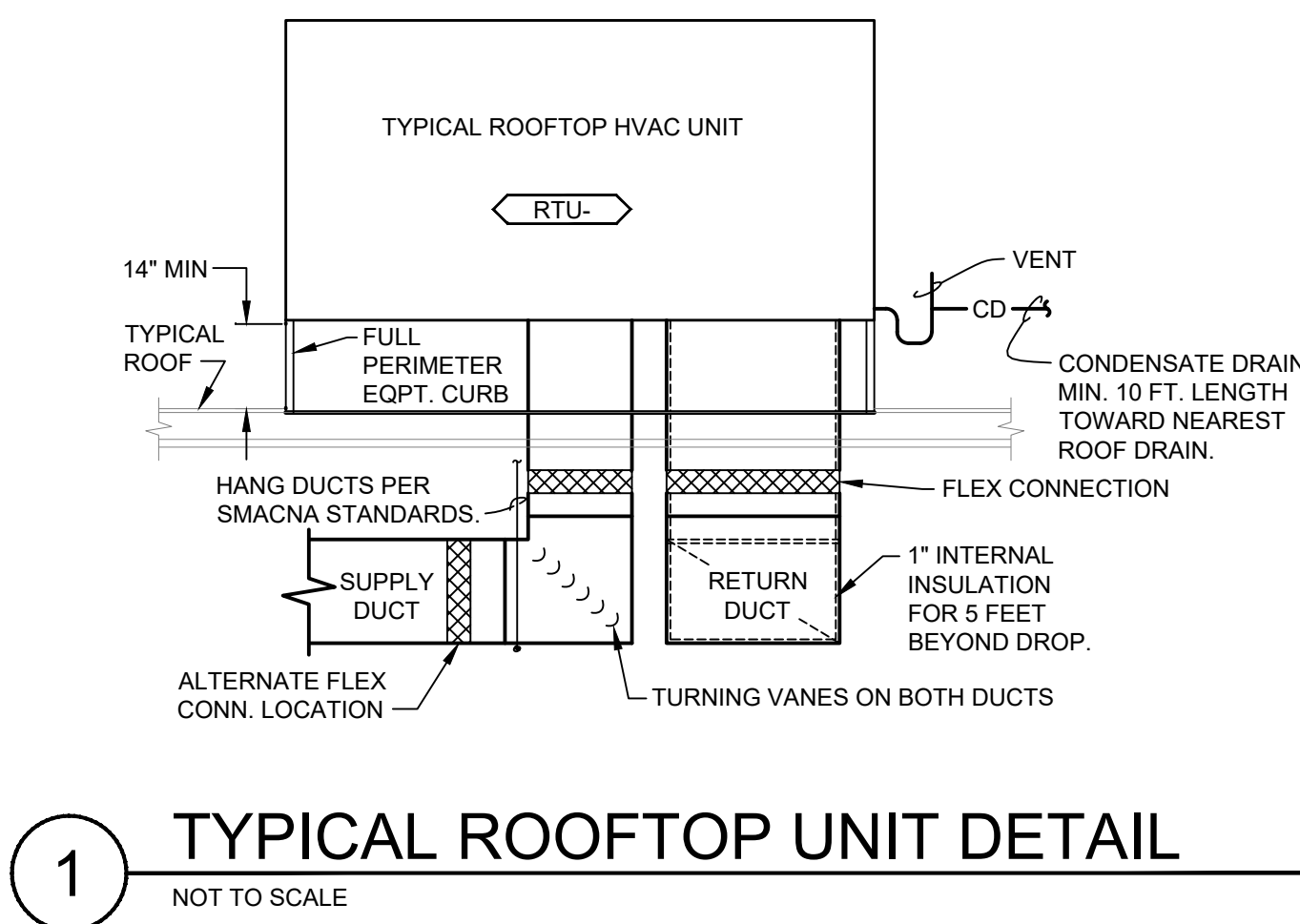
- FURNISH AND INSTALL NEW MULTIZONE ROOFTOP UNIT IN PLACE OF EXISTING MULTIZONE UNIT. THE CONTRACTOR SHALL RECONNECT TO EXISTING GAS PIPING, EXISTING ZONE SUPPLY DUCTWORK, RETURN DUCTWORK, AND PROVIDE NEW ELECTRICAL AS SHOWN ON THE ELECTRICAL DRAWINGS. FURNISH AND INSTALL NEW DDC CONTROLS FOR ALL NEW MECHANICAL EQUIPMENT. FURNISH AND INSTALL NEW ROOM THERMOSTATS AND PROVIDE NEW GRAPHIC INTERFACE FOR FAYETTE COUNTY PUBLIC SCHOOLS. CONTRACTOR SHALL INSTALL SENSING TUBES FROM EACH UNIT INTO SPACE FOR BUILDING PRESSURIZATION. SEE SCHEDULES FOR MORE INFORMATION.
- EXISTING EXHAUST FAN SHALL REMAIN IN PLACE.
- FURNISH AND INSTALL NEW SINGLE ZONE ROOFTOP UNIT TO FEED THE GYMNASIUM. A NEW BUILT-UP CURB SHALL BE PROVIDED AND SIT ON EXISTING ROOF. NEW SUPPLY AND RETURN DUCTWORK SHALL EXTEND FROM SIDE OF UNIT AND ENTER THE SIDE OF THE MULTIPURPOSE/CAFETERIA WALL TO CONNECT TO EXISTING SUPPLY AND RETURN DUCTWORK IN MEZZANINE. FURNISH AND INSTALL NEW ROOM THERMOSTATS AND PROVIDE NEW GRAPHIC INTERFACE FOR FAYETTE COUNTY PUBLIC SCHOOLS. SEE ELECTRICAL DRAWINGS FOR CONNECTIONS. SEE EQUIPMENT SCHEDULES FOR MORE INFORMATION.
- EXISTING RELIEF VENT TO REMAIN IN PLACE.
- EXISTING VENT THRU ROOF PIPING LOCATIONS SHALL REMAIN IN PLACE.

SPECIAL NOTES

- ALL EXISTING HVAC SYSTEMS SHALL REMAIN OPERATIONAL DURING THIS PROJECT. EXISTING EQUIPMENT SHALL BE DISABLED ONLY WHEN NEW EQUIPMENT IS ONSITE AND READY TO BE INSTALLED.
- AS UNITS ARE INSTALLED, THERMOSTATS SHALL BE INSTALLED AND PLACED IN STAND ALONE OPERATION MODE.
- ALL NEW EQUIPMENT INSTALLED SHALL CONNECT TO NEW DDC CONTROL SYSTEM TIED INTO FAYETTE COUNTY SCHOOLS CONTROL NETWORK. ALL OTHER EXISTING EQUIPMENT FOR THE SCHOOL SHALL REMAIN ON THE EXISTING CONTROL SYSTEM AND SHALL REMAIN SEPARATE FROM NEW EQUIPMENT CONTROLS.

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ROOF PLAN HVAC PLAN					
LANSDOWNE ELEMENTARY SCHOOL - HVAC RENOVATION FAYETTE COUNTY BOARD OF EDUCATION, LEXINGTON, KY					
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FILE NAME: G:\4973-FCPS\HC\508\Landowne HVAC\Working Drawings\AutoCAD\FCPS - LANDOWNE\AutoCAD\4973-04-M-501.dwg PRINTED: 3/22/2024 @ 1:33PM



MECHANICAL DETAILS AND SCHEDULES LANDOWNE ELEMENTARY SCHOOL - HVAC RENOVATION FAYETTE COUNTY BOARD OF EDUCATION, LEXINGTON, KY			 engineering architecture geospatial www.grwinc.com		GRW PROJECT NO. 4973-08	
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