

# DURHAM PUBLIC SCHOOLS (DPS)

## HVAC CONTROLS REPLACEMENT

### PROJECT FOR LAKEVIEW SECONDARY SCHOOL

DURHAM, NORTH CAROLINA

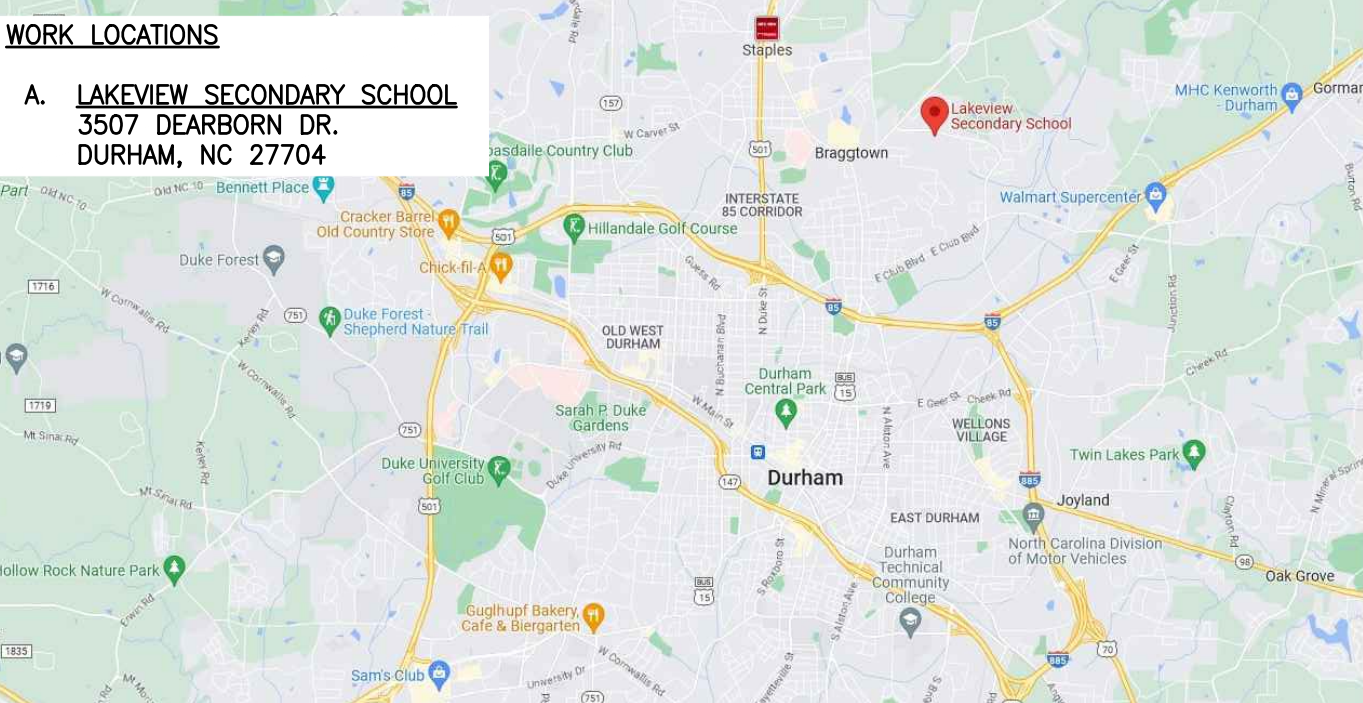
OWNER: MECHANICAL ENGINEERS

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1 VICINITY MAP  
SCALE: NTS

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CV-001 COVER SHEET

##### MECHANICAL

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#### GENERAL NOTES:

- THIS PROJECT IS REPLACING OR UPDATING EXISTING CONTROLS. INFORMATION ON THE CONTRACT DOCUMENTS IS BASED ON AVAILABLE EXISTING FACILITY DRAWINGS AND LIMITED FIELD MEASUREMENTS. THERE MAY BE EXISTING FIELD CONDITIONS WHICH DIFFER FROM THOSE SHOWN ON THE CONTRACT DRAWINGS. FOR CLARITY IN DEFINING CONTRACT WORK, NOT ALL EXISTING PIPING, DUCTWORK, AND EQUIPMENT IS SHOWN. CONTRACTOR SHALL VERIFY ALL INFORMATION SHOWN.
- CONTRACTOR SHALL COMPLY WITH SPECIFICATIONS, PERFORMANCE WORK STATEMENT, AND ALL OTHER CONSTRUCTION DOCUMENTS.
- CONTRACTOR SHALL FIELD VERIFY SITE CONDITIONS FOR SUITABILITY AND EQUIPMENT LOCATIONS AND NOTIFY THE ENGINEER AND THE OWNER OF FINDINGS PRIOR TO STARTING WORK.
- CONTRACTOR SHALL SUBMIT ALL PANEL LOCATIONS AND CONDUIT ROUTING TO THE ENGINEER AND THE OWNER. WORK SHALL NOT COMMENCE UNTIL PANEL LOCATIONS AND CONDUIT ROUTING ARE APPROVED.
- UNLESS OTHERWISE NOTED, CONTRACTOR SHALL REMOVE EXISTING CONTROLS, INCLUDING BUT NOT LIMITED TO THERMOSTATS, SENSORS, VALVE AND DAMPER ACTUATORS, INCLUDING VARIABLE AIR VOLUME TERMINAL UNIT REHEAT VALVE AND AIR DAMPER ACTUATORS. CONTRACTOR SHALL TURN OVER REMOVED EQUIPMENT TO OWNER UNLESS OWNER SPECIFIES OTHERWISE.
- UNLESS OTHERWISE NOTED, CONTRACTOR SHALL PROVIDE NEW CONTROLS MATERIALS, INCLUDING BUT NOT LIMITED TO THERMOSTATS, SENSORS, PROGRAMMABLE CONTROLLERS, AND APPLICATION SPECIFIC DEVICES. CONTRACTOR SHALL PROVIDE NEW CONTROLS DEVICES, INCLUDING BUT NOT LIMITED TO, VALVE AND DAMPER ACTUATORS. WORK SHALL NOT COMMENCE UNTIL ALL PRODUCTS HAVE BEEN SUBMITTED AND APPROVED BY THE OWNER AND ENGINEER.
- CONTRACTOR SHALL SUBMIT LABELING PRODUCTS FOR APPROVAL PRIOR TO ORDERING LABELS. CONTRACTOR SHALL COMPLY WITH NAMING CONVENTIONS SET FORTH IN CONTRACT DOCUMENTS. CONTRACTOR SHALL SUBMIT A SCHEDULE OF LABELS TO BE USED FOR APPROVAL PRIOR TO ORDERING LABELS.
- CONTRACTOR IS RESPONSIBLE FOR PULLING COMMUNICATION WIRING INTO NEW AND EXISTING DEVICE PANELS AS REQUIRED TO HAVE A COMPLETE AND OPERATING SYSTEM. CONTRACTOR SHALL NOT TERMINATE TOP/UP COMMUNICATION CABLES WITHOUT PRIOR APPROVAL BY OWNER. NEW COMMUNICATION WIRING SHALL BE PURPLE IN COLOR.
- WIRING SHALL BE INSTALLED IN ACCORDANCE WITH NEC AND LOCAL ELECTRICAL CODES.
- ALL RACEWAY SHALL BE PROPERLY INSTALLED. CONTRACTOR SHALL NOT USE TIE-WRAPS TO SECURE RACEWAYS. NEW CONDUITS SHALL BE BLUE IN COLOR.
- HAZARDOUS MATERIALS AND COORDINATE ALL UTILITY INTERRUPTIONS, SHUTDOWNS, OUTAGES AND DURATIONS WITH THE OWNER. BUILDING UTILITIES SHALL NOT BE INTERRUPTED UNTIL THE OWNER IS NOTIFIED FORTY-EIGHT (48) HOURS IN ADVANCE OF THE PROPOSED UTILITY INTERRUPTION AND UNTIL THE OWNER APPROVES THE UTILITY INTERRUPTION.
- CONTRACTOR SHALL SUBMIT SHOP DRAWINGS TO THE ENGINEER AND THE OWNER FOR APPROVAL PRIOR TO WORK.
- CONTRACTOR SHALL SUBMIT AS-BUILT DOCUMENTS FOR ALL WORK TO THE ENGINEER, COMPLYING WITH STANDARDS SET BY THE OWNER.
- CONTRACTOR IS RESPONSIBLE FOR COMPLETE ACCURATE AS-BUILT DRAWINGS IN DIGITAL (AUTOCAD) AND PAPER FORMATS.
- CONTRACTOR SHALL PROVIDE LOCATIONS OF INSTALLED PRODUCTS AND MATERIALS IN WITH AS-BUILTS, AS REQUIRED BY SPECIFICATIONS.
- CONTRACTOR SHALL COMPLY WITH THE OWNER ACCESS AND SAFETY POLICIES.
- CONTRACTOR SHALL COORDINATE ACCESS WITH THE OWNER.
- CONTRACTOR SHALL PROVIDE THE OWNER WITH ELECTRONIC COPIES OF ALL INSTALLED SOFTWARE AND SOFTWARE USED FOR WORK (INCLUDING LICENSING), AS WELL AS DOCUMENTATION OF PROGRAMMING DONE BY CONTRACTOR.
- CONTRACTOR MAY USE EXISTING CONDUITORS IF IT MEETS MANUFACTURERS REQUIREMENTS BUT IS RESPONSIBLE FOR PROVIDING A WORKING AND PROPERLY FUNCTIONAL SYSTEM.
- CONTRACTOR IS RESPONSIBLE FOR TAGGING CONDUCTORS AT BOTH ENDS. THE TAGS SHALL BE SHOWN ON AS-BUILT DRAWINGS AND SCHEMATICS.
- CONTRACTOR SHALL MOODY AS REQUIRED ANY EQUIPMENT PENETRATIONS. ALL EQUIPMENT PENETRATIONS MODIFIED BY CONTRACTOR SHALL BE SEALED.
- SEALING OF WALL PENETRATIONS SHALL BE IN ACCORDANCE WITH APPLICABLE UL GUIDELINES PER PRODUCT AND WALL RATING. WALL SEALING PRODUCTS SHALL BE SUBMITTED AND APPROVED BY THE ENGINEER AND THE OWNER PRIOR TO WORK.
- CONTRACTOR SHALL VERIFY THAT DUCT SMOKE DETECTORS ARE OPERATIONAL.
- CONTRACTOR SHALL PROVIDE DEVICE AND WIRING LABELING PER NAMING CONVENTION AS AGREED UPON BY THE OWNER.
- DRAWINGS ARE DIAGRAMMATICAL. CONTRACTOR SHALL PROVIDE FULLY FUNCTIONAL SYSTEM AND WIRING DIAGRAMS.

#### GENERAL NOTES:

- CONTRACTOR SHALL SUBMIT THE LABELING CONVENTION TO BE USED INCLUDING UNIQUELY IDENTIFIED WIRE FOR EACH PANEL. NO IDENTIFIER SHALL BE REPEATED IN A PANEL. AFTER APPROVAL CONTRACTOR WILL COMPLETE THE TABLES ON CONTRACTS DRAWING INDICATING POINT NAMES.
- ALL TERMINALS THAT ARE ABOVE CEILING WILL HAVE CEILING GRID MARKED IN PER NAMING CONVENTION ON PRINTED LABEL WITH STANDARDIZED FORMAT, SHOWING LOCATION AND TAG OF TERMINAL.
- ALL FREEZESTATS PROVIDED AS PART OF THIS CONTRACT SHALL REQUIRE MANUAL RESET.
- THE CONTRACTOR SHALL PROVIDE TRAINING AS PER SPECIFICATION REQUIREMENTS.
- THE CONTRACTOR SHALL PROVIDE SHORT-CYCLE PROTECTION OF MINIMUM 5 MINUTES FOR ANY AND ALL MOTOR CONTROLS, INCLUDING BUT NOT LIMITED TO COMPRESSORS, FANS, BLOWERS, AND PUMPS.
- ALL NEW WIRE INSTALLATIONS WILL BE IN A MINIMUM OF 3/4" CONDUIT IN THE MECHANICAL ROOM. CONDUIT SHALL BE IDENTIFIED BLUE IN ACCESSIBLE AREAS ABOVE CEILING OPEN CABLE AS APPROVED BY NEC IS ACCEPTABLE.
- THESE DRAWINGS ARE DIAGRAMMATICAL AND ARE NOT INTENDED TO CONVEY EXACT DIMENSIONS, SIZES, AND/OR LOCATIONS OF ALL NEW OR EXISTING ARCHITECTURAL, STRUCTURAL, PLUMBING, MECHANICAL, OR ELECTRICAL EQUIPMENT OR FEATURES, EITHER SHOWN OR IMPLIED. THE INFORMATION CONTAINED IN THESE DRAWINGS SHALL BE USED AS PART OF AN ENTIRE, INTACT SET OF CONTRACT DOCUMENTS, INCLUDING ANY SEPARATE WRITTEN SPECIFICATIONS. THE CONTRACTOR SHALL THOROUGHLY FAMILIARIZE HIMSELF WITH THE EXISTING CONDITIONS AT THE JOB SITE. THE CONTRACTOR SHALL COORDINATE HIS WORK WITH THE WORK OF OTHER TRADES TO MINIMIZE CONFLICT AND INTERFERENCE THROUGHOUT THE PROJECT.
- REMOVE ALL TUBING AND CONDUIT TO ACTIVE MARKS UNLESS OTHERWISE NOTED. ALL VOIDS LEFT IN FIRE RATED WALLS, FLOORS, CEILING OR ROOFS AS A RESULT OF DEMOLITION SHALL BE PROPERLY FIRE STOPPED TO MAINTAIN RATING REQUIRED. PATCH AND PAINT ALL FLOOR, WALL, CEILING OR OTHER FINISHED SURFACES WITH APPROPRIATE MATERIALS. THIS WORK SHALL BE COORDINATED WITH THE GENERAL CONTRACTOR. ALL DEMOLISHED CONTROLS EQUIPMENT SHALL BE PRESENTED TO THE OWNER FOR THEIR DECISION TO STORE OR DISPOSE. ALL MATERIALS AND EQUIPMENT SELECTED FOR DISPOSAL SHALL BE REMOVED FROM THE SITE AND PROPERLY DISPOSED OF.
- ALL WORK SHALL BE PERFORMED IN ACCORDANCE WITH APPLICABLE FEDERAL, STATE, AND LOCAL CODES AND REGULATIONS. MECHANICAL EQUIPMENT SHALL BE SELECTED TO MEET OR EXCEED THE REQUIREMENTS OF THE ENERGY CONSERVATION CODE.
- HAZARDOUS MATERIALS WARNING: IF UNCOVERED MATERIALS ARE SUSPECTED OF CONTAINING ASBESTOS, LEAD-BASED PAINT, PCB'S OR ANY OTHER HAZARDOUS MATERIAL, STOP WORK IN THAT AREA AND REPORT THE CONCERN TO THE CONSTRUCTION MANAGER, OWNER AND ARCHITECT/ENGINEER IMMEDIATELY.
- FURNISH AND INSTALL ALL INCIDENTAL ACCESSORIES REQUIRED TO MAKE THE MECHANICAL WORK COMPLETE AND OPERATIONAL.
- ANY DISCREPANCIES FOUND ON THE DRAWINGS SHALL BE REPORTED TO THE ENGINEER OF RECORD FOR CLARIFICATION PRIOR TO PROCEEDING WITH ANY WORK.
- ALL RACEWAY (FLEXIBLE METALLIC CONDUIT AND EMT) WILL BE RUN PERPENDICULAR TO THE EXISTING STRUCTURES AND INDEPENDENTLY SUPPORTED.
- ANY RACEWAY PENETRATIONS THROUGH RATED WALLS AND FLOORS MUST BE SEALED IN ACCORDANCE WITH APPROVED LISTED PENETRATION PROTECTION DETAILS.
- ALL EXISTING PANEL SCHEDULES FOR PANELS AFFECTED BY THIS PROJECT SHALL BE REPLACED WITH UPDATED TYPED SCHEDULES INCLUDING CIRCUITS ADDED AND ALL EXISTING INDICATED CIRCUITS.
- MAINTAIN MINIMUM EQUIPMENT AND DEVICE MAINTENANCE CLEARANCES. INSTALLED MATERIALS NOT COORDINATED SHALL BE REMOVED AND REINSTALLED AT NO ADDITIONAL COST.
- COORDINATE THE LAYOUT OF EQUIPMENT AND CONDUIT WITH BUILDING COMPONENTS AND OTHER TRADES PRIOR TO INSTALLATION. THE SYSTEMS SHALL BE NEATLY ARRANGED TO MAXIMIZE SPACE ABOVE CEILING AND WITHIN CHASES. DEVICES SHALL BE READILY MAINTAINABLE. METERS AND GAGES SHALL BE ORIENTED FOR BEST VIEW.
- EXTEND CONDUIT AND WIRING FROM DEDICATED SOURCES TO CONTROLS EQUIPMENT.
- ALL MOTORIZED EQUIPMENT SHALL BE CONNECTED TO DUCTWORK WITH FLEXIBLE CONNECTIONS.
- WORK ON THIS PROJECT WILL REQUIRE NIGHT & WEEKEND WORK TO MINIMIZE DOWNTIME.
- ALL EXISTING AHU'S, FCU'S, AND UNIT VENTILATORS THAT ARE CURRENTLY SHUT DOWN VIA THE FIRE ALARM SYSTEM SHALL BE TESTED TO ENSURE THEY PROPERLY SHUT DOWN. EXISTING SMOKE DETECTORS SHALL BE SMOKE TESTED AND WITNESSED BY COMMISSIONING AGENT OR ENGINEER.

MECHANICAL LEGEND				
<b>PIPING</b> LPS LOW PRESSURE STEAM COND CONDENSATE (STEAM) (NAME) EXISTING PIPING CHWR CHILLED WATER SUPPLY CHWR CHILLED WATER RETURN	<b>EQUIPMENT</b> FAN MOTOR CHW COOLING COIL	<b>PIPING SPECIALTIES</b> AV AIR VENT, AUTOMATIC AM AIR VENT, MANUAL FC FLEXIBLE CONNECTOR FR FLOW REGULATOR/CIRCUIT SETTER FL FLOW LIMITER	<b>CONTROLS</b> CT CURRENT TRANSDUCER (SENSOR) EPT ELECTRONIC OR ELECTRIC TO PNEUMATIC TRANSDUCER (ANALOG) EP ELECTRONIC OR ELECTRIC TO PNEUMATIC SWITCH (DIGITAL) AI ANALOG INPUT DDC CONTROL POINT DI DIGITAL INPUT DDC CONTROL POINT AO ANALOG OUTPUT DDC CONTROL POINT DO DIGITAL OUTPUT DDC CONTROL POINT BAS BUILDING AUTOMATION SYSTEM CONTROL PANEL TRANS TRANSFORMER MS MOTOR STARTER VFD VARIABLE FREQUENCY DRIVE	<b>FITTINGS</b> BFP BACK FLOW PREVENTER CAP CAP CON CONNECTION, BOTTOM CTN CONNECTION, TOP ELB ELBOW, 90° ELB ELBOW, 45° ETD ELBOW, TURNED UP ETD ELBOW, TURNED DOWN REDR REDUCER, CONCENTRIC STRAIGHT INVERT REDR REDUCER, ECCENTRIC STRAIGHT CROWN TEE TEE TEE, OUTLET UP TEE, OUTLET DOWN UNON UNION, SCREWED UNON UNION, FLANGED
<b>FIRE SAFETY DEVICES</b> SIGNAL INITIATING DEVICES D DUCT SMOKE DETECTOR R RELAY	<b>DUCTWORK</b> 20/12 RECTANGULAR DUCT FIRST NUMBER INDICATES VISIBLE DIMENSION FO FLAT OVAL DUCT AD ACCESS DOOR DC DUCTWORK CONTINUATION BREAK PG POSITIVE PRESSURE DUCT SECTION OR GRILLE RG RETURN DUCT SECTION OR GRILLE EG EXHAUST DUCT SECTION OR GRILLE TW TURNING VANES R RISE D DROP	<b>CONTROLS</b> DDC DDC SYSTEM THERMOSTAT H H ELECTRIC HUMIDISTAT STP SHIELDED TWISTED PAIR CABLE T TEMPERATURE SENSOR H HUMIDITY SENSOR AT AVERAGING TEMPERATURE SENSOR IN AIR DUCT FZ FREEZESTAT TPI TEMPERATURE SENSOR IN PIPE WELL DP DIFFERENTIAL PRESSURE SENSOR P PRESSURE SENSOR DP DIFFERENTIAL PRESSURE MAGNETIC GAUGE	<b>DAMPERS</b> MB MANUAL BUTTERFLY MO MANUAL OPPOSED BLADE EO ELECTRIC OPERATED OPPOSED BLADE MODULATING PO PNEUMATIC OPERATED OPPOSED BLADE TWO-POSITION EP ELECTRIC OPERATED OPPOSED BLADE MODULATING PO PNEUMATIC OPERATED PARALLEL BLADE MODULATING	
<b>VALVES</b> SEE SPEC FOR VALVE TYPE BV BALL VALVE W/ LEVER BV BUTTERFLY VALVE W/ LEVER GV GATE VALVE W/ LEVER TWV TWO WAY MODULATING CONTROL VALVE TWV THREE WAY MODULATING CONTROL VALVE C CHECK	<b>MOTORIZED</b> MA MODULATING ACTUATOR (PNEUMATIC OR ELECTRIC) M2 2 POSITION MOTORIZED M2P ELECTRIC 2 POSITION M2E ELECTRIC 2 POSITION M2P PNEUMATIC 2 POSITION M2P PNEUMATIC MODULATING			

#### SEE CV001 FOR SPECIFIC TRADE LEGENDS

#### GENERAL LEGEND (ALL TRADES)

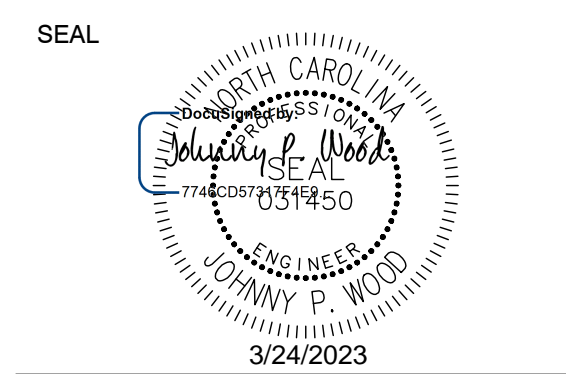
- CONNECTION POINT NEW TO EXISTING
- REVISION NUMBER
- TERMINATION POINT, DEMOLITION TO EXISTING
- DEMOLITION NOTES
- NEW NOTES
- DARK LINES INDICATE DEMOLITION OR NEW WORK.
- LIGHT LINES INDICATE EXISTING OR BY OTHERS.



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DURHAM PUBLIC SCHOOLS (DPS)  
HVAC CONTROLS REPLACEMENT  
PROJECT FOR LAKEVIEW SECONDARY SCHOOL



KEY PLAN

SCALE

DRAWN BY: WH  
APPROVED BY: JT  
CHECKED BY: TW  
DATE: 03/24/23

TITLE: COVER SHEET

PROJECT NO. 50155237

CV-001

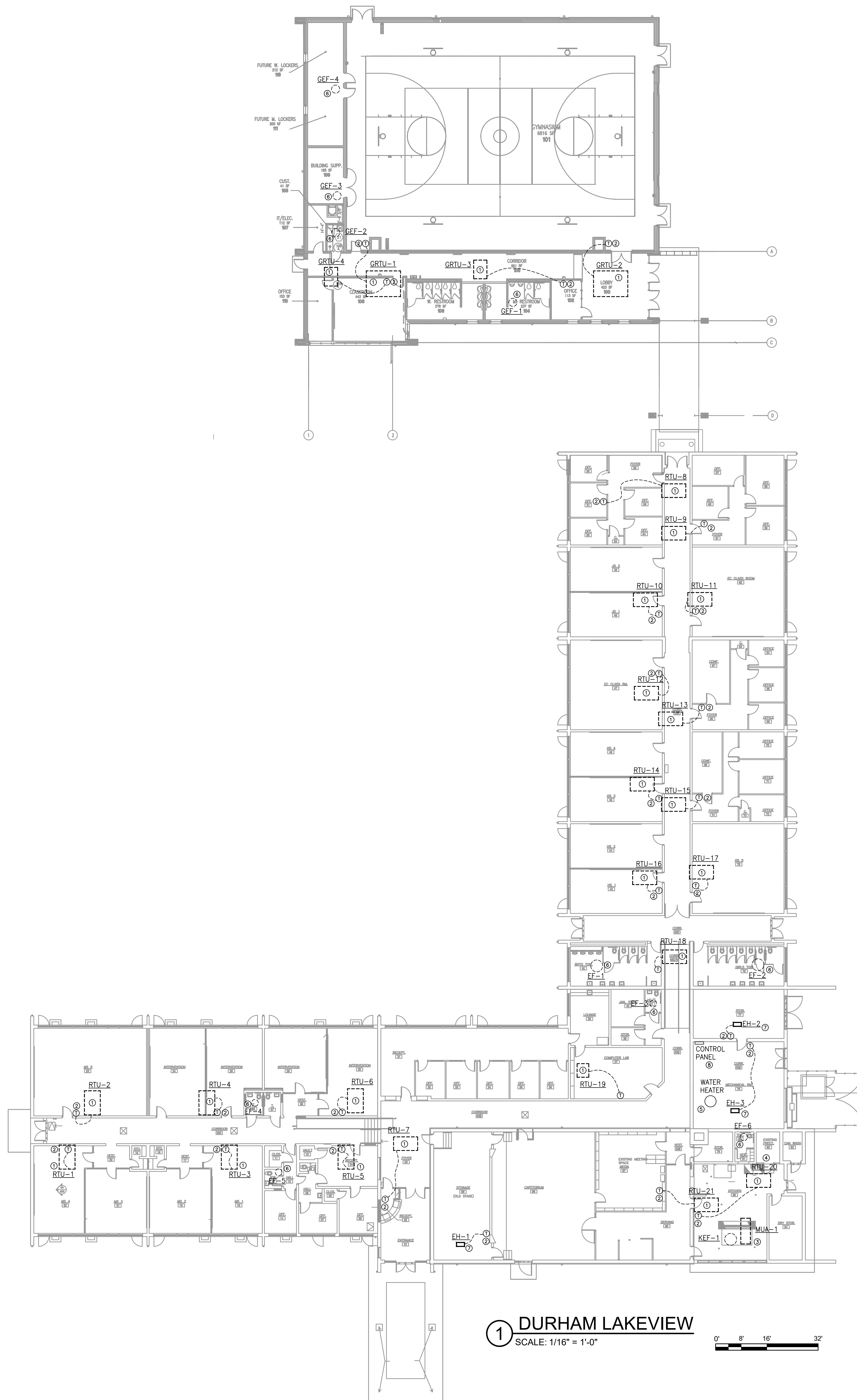
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DURHAM PUBLIC SCHOOLS (DPS)  
 HVAC CONTROLS REPLACEMENT  
 PROJECT FOR LAKEVIEW SECONDARY SCHOOL

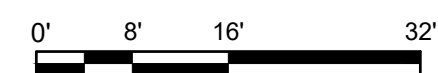
2011 HAMLIN ROAD  
 DURHAM, NC 27704

F  
E  
D  
C  
B  
A

1 2 3 4 5 6



**1 DURHAM LAKEVIEW**  
 SCALE: 1/16" = 1'-0"



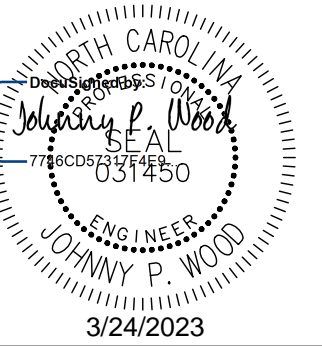
**GENERAL NOTES**

1. WORK SHALL BE PERFORMED DURING TIMES THAT WILL NOT IMPACT SCHOOL OCCUPANCY OR SCHEDULE. COORDINATION WITH SCHOOL SCHEDULE WILL BE REQUIRED AS NOT TO INTERRUPT CLASSES OR OTHER SCHOOL RELATED ACTIVITIES. WORK MAY BE REQUIRED OUTSIDE OF 8AM-5PM MONDAY-FRIDAY NORMAL BUSINESS HOURS.

**NEW WORK NOTES INDICATED BY ①**

1. PROVIDE CONTROL FOR PACKAGED ROOFTOP DX UNITS. INTEGRATE INTO BUILDING CONTROL SYSTEM.
2. REMOVE EXISTING THERMOSTAT. PROVIDE NEW SPACE TEMPERATURE SENSOR WITH SETPOINT ADJUSTMENT IN SAME LOCATION AS EXISTING AND INTEGRATE WITH BAS.
3. KITCHEN HOOD EF AND MAKEUP AIR FAN OPERATION SHALL BE INTERLOCKED.
4. PROVIDE COOLER / FREEZER TEMPERATURE MONITORING POINTS.
5. PROVIDE DHW HEATER TEMPERATURE MONITORING AND ENABLE/DISABLE POINTS.
6. EXISTING ROOF MOUNTED EXHAUST FAN. INTEGRATE INTO BUILDING CONTROL SYSTEM. ALL EXHAUST FANS SHALL HAVE RUN STATUS DISPLAYED AT THE BUILDING CONTROL SYSTEM FRONT END AND SHALL BE CAPABLE OF BEING STARTED / STOPPED BASED ON OWNER'S OCCUPANCY SCHEDULE.
7. UNIT HEATER CONTROLS SHALL BE REPLACED AND INTEGRATED INTO BUILDING CONTROL SYSTEM.
8. REPLACE EXISTING BUILDING CONTROL SYSTEM CONTROL PANEL IN THIS LOCATION.

SEAL



KEY PLAN

SCALE

DRAWN BY JDL/TSA  
 APPROVED BY TW  
 CHECKED BY JT  
 DATE 03/24/23

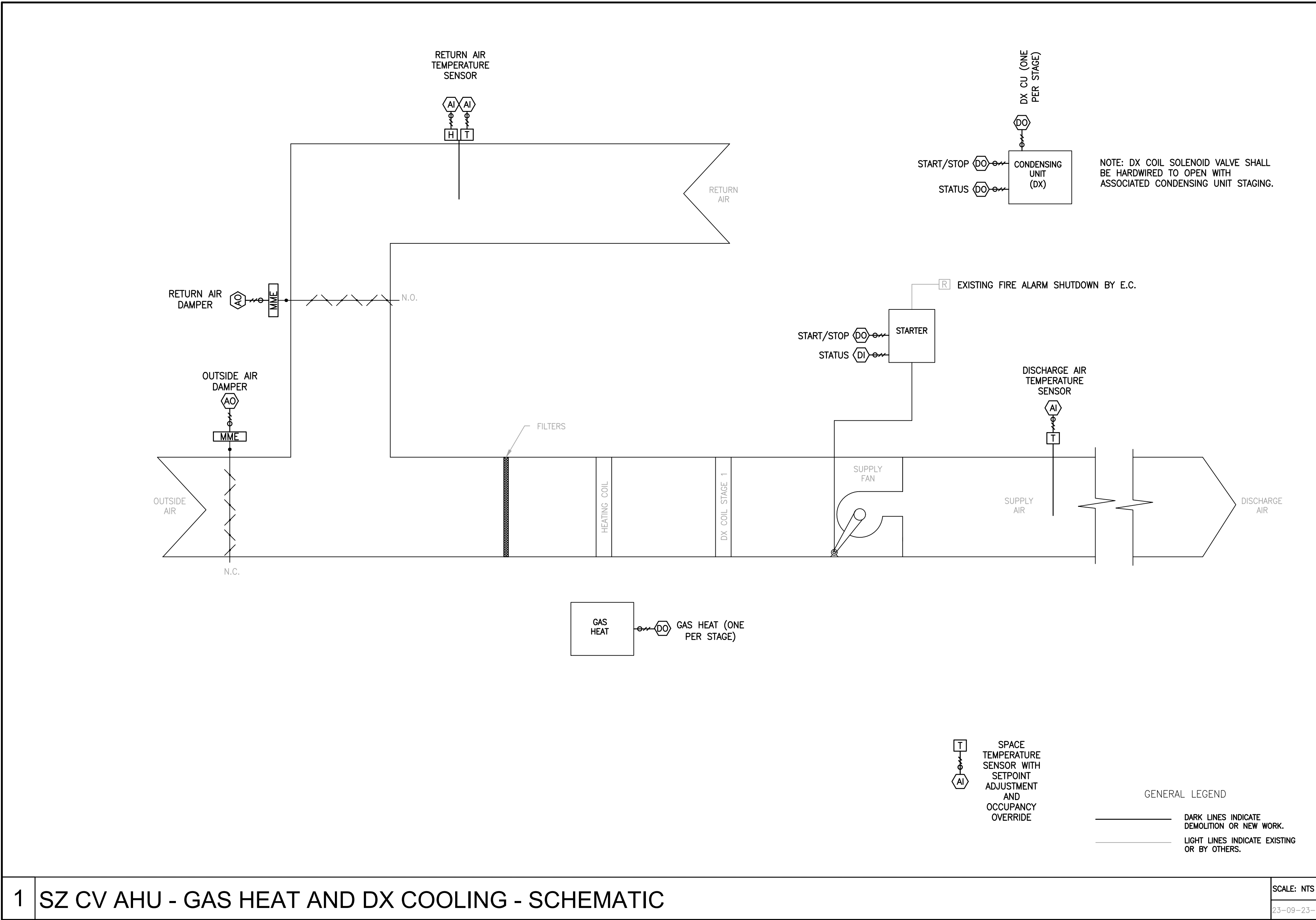
TITLE  
**MECHANICAL - FLOOR PLAN**

PROJECT NO. 50155237

**M-111**

SHEET NO. of

SEE CV001 FOR SPECIFIC TRADE LEGENDS	
GENERAL LEGEND (ALL TRADES)	
	CONNECTION POINT NEW TO EXISTING
	REVISION NUMBER
	TERMINATION POINT, DEMOLITION TO EXISTING
	DEMOLITION NOTES
	NEW NOTES
	DARK LINES INDICATE DEMOLITION OR NEW WORK.
	LIGHT LINES INDICATE EXISTING OR BY OTHERS.



TAG	POINT DESCRIPTION	FAIL STATE	UNITS	RANGE	TYPE	GRAPHIC	TREND	OVERRIDE	FIELD ADJ	ALARM	ALARM CONDITION	NOTES
	System Enable	Enable	Enable/Disable	-	Virtual Point	X	COV	X				
	School Time Schedule	Occ	Occ/Unocc	-	Virtual Schedule	X			X			
	System Mode	Heat	Cool/Heat	-	Virtual Point	X	COV	X				
	Occupancy Override	Inactive	Active/Inactive	-	Virtual Point	X	COV	X				
	Fan Failure Alarm Status	Alarm	Alarm/Normal	-	DI - Safety switch	X	COV			X	When = Alarm	
	Fan Temperature		degF	45-110	AI - Temp Sensor	X	5 min			X	when > 5F from setpoint	
	Space Temperature Setpoint	70	degF	45-110	Virtual Setpoint	X	COV		X			
	Temperature Deadband	2F	degF	0-5	Virtual Setpoint	X	COV		X			
	Unoccupied Cooling Setpoint	80F	degF	70-90	Virtual Setpoint	X	COV		X			
	Unoccupied Heating Setpoint	65F	degF	55-70	Virtual Setpoint	X	COV		X			
	Fan Start/Stop	On	On/Off	-	DO - Fan Enable	X	COV	X				
	Fan Status	Off	On/Off	-	DI - Fan Status	X	COV			X	Not equal to command	
	Gas Heat Stage 1	On	On/Off	-	DO - Heat Stage	X	COV	X				
	DX Cooling Stage 1	On	On/Off	-	DO - Cooling Stage	X	COV	X				
	Condensing Unit Start/Stop	On	On/Off	-	DO - Fan Enable	X	COV	X				
	Condensing Unit Status	Off	On/Off	-	DI - Fan Status	X	COV			X	Not equal to command	
	Return Air Temperature		degF	45-110	AI - Temp Sensor	X	5 min			X		
	Return Air Humidity		%RH	0-100	AI - Humidity Sensor	X	5 min			X		
	Discharge Air Temperature		degF	45-110	AI - Temp Sensor	X	5 min			X		

NOTES:  
1. Contractor to provide failed state temperature to indicate failed sensor.

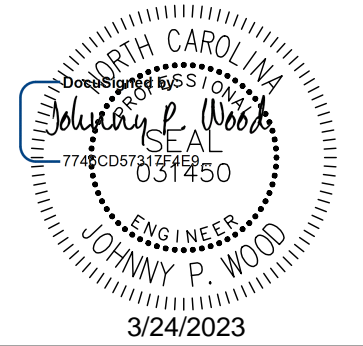
2 AHU POINT LIST  
SCALE: NTS

SZ CV RTU - GAS HEAT AND DX COOLING - SEQUENCE OF OPERATION

- 1.1 AIR HANDLING UNIT
- CONTRACTOR SHALL HOLD A CONTROLS INTEGRATION MEETING PRIOR TO CONSTRUCTION. MEETING PURPOSE IS TO REVIEW INTENDED PROGRAMMING, INSTALLATION, AND GRAPHICS WITH THE OWNER AND ENGINEER. CONTRACTOR IS RESPONSIBLE FOR MAKING MODIFICATIONS TO SATISFY REQUESTS DURING MEETING.
  - ALL FEEDBACK POINTS SHALL BE VISIBLE ON THE GRAPHIC. ALL SETPOINTS SHALL BE VISIBLE ON GRAPHIC. ALL SETPOINTS AND COMMANDS SHALL BE USER ADJUSTABLE FOR THOSE WITH HIGHEST USER ACCESS LEVEL TO SYSTEM. COORDINATE PERMISSIONS WITH OWNER.
  - PROVIDE TRENDDING AS SHOWN IN POINTS LIST. CONTRACTOR RESPONSIBLE FOR PROVIDING ADDITIONAL DEADBANDS, DELAYS, RELAYS, RESETS, AND POINTS NOT INCLUDED ON LIST BUT REQUIRED FOR PROPER STABLE OPERATION.
  - DETERMINE SYSTEM MODE BASED ON SCHOOL SPECIFIC TIME SCHEDULE.
  - PROVIDE SYSTEM ENABLE AND DISABLE POINT.
  - SAFETIES:
    - FIRE/SMOKE PROTECTION: UPON ACTIVATION OF BUILDING FIRE ALARM SYSTEM, SHUTDOWN FANS AND CLOSE DAMPERS.
    - FAN FAILURE ALARM: MONITOR FAN STATUS VIA CURRENT SWITCH. WHEN A FAN FAILS TO START/STOP AS COMMANDED, SIGNAL ALARM.
  - UNOCCUPIED MODE: DISABLE SYSTEM. STOP FANS, DISABLE GAS HEAT, AND DISABLE DX COOLING.
    - UNIT SHALL BE DISABLED UNLESS THE SPACE TEMPERATURE EXCEEDS THE UNOCCUPIED COOLING AND HEATING TEMPERATURE SETPOINTS.
  - PROVIDE START/STOP OPTIMIZATION PROGRAM TO ENSURE THAT OCCUPIED SPACE TEMPERATURE SETPOINTS ARE REACHED MODE PRIOR TO SWITCHOVER FROM UNOCCUPIED TO OCCUPIED OPERATION.
  - UNOCCUPIED OVERRIDE COOLING: WHEN THE SPACE TEMPERATURE RISES ABOVE THE UNOCCUPIED COOLING SETPOINT, START SYSTEM IN OCCUPIED MODE AND CALL FOR COOLING UNTIL SPACE TEMPERATURE IS 5F BELOW SETPOINT.
  - UNOCCUPIED OVERRIDE HEATING: WHEN THE SPACE TEMPERATURE DROPS BELOW THE UNOCCUPIED HEATING SETPOINT, START SYSTEM IN OCCUPIED MODE UNTIL SPACE TEMPERATURE IS 5F ABOVE SETPOINT.
  - TIMED OCCUPANCY OVERRIDE: WHEN OCCUPANCY OVERRIDE IS ACTIVATED, THE SYSTEM RETURNS TO AN OCCUPIED CONDITION FOR A TIMED DURATION.
    - FAN CONTROL: UPON CALL FOR HEATING OR COOLING, START SUPPLY FAN.
    - CALL FOR COOLING: ENABLE COOLING MODE WHEN SPACE TEMPERATURE RISES ABOVE SETPOINT. STAGE DX COOLING ON & OFF TO MAINTAIN SPACE TEMPERATURE SETPOINT.
    - CALL FOR HEATING: ENABLE HEATING MODE WHEN SPACE TEMPERATURE DROPS BELOW SETPOINT. STAGE ON & OFF GAS HEATING TO MAINTAIN SPACE TEMPERATURE SETPOINT.
    - THE SPACE TEMPERATURE SENSOR SETPOINT SHALL ACT AS THE OCCUPIED COOLING SETPOINT WITH A 2F DEADBAND TO ESTABLISH THE OCCUPIED HEATING SETPOINT.
  - DAMPER CONTROL (OUTSIDE AIR AND RETURN AIR):
    - UNOCCUPIED MODE: OUTSIDE AIR DAMPER SHALL BE CLOSED AND RETURN AIR DAMPER FULL OPEN.
    - OCCUPIED MODE: OPEN OUTSIDE AIR DAMPER TO MINIMUM OUTSIDE AIR DAMPER POSITION SETPOINT. RETURN AIR DAMPER SHALL INVERSELY TRACK OUTSIDE AIR DAMPER POSITION.
    - MATCH EXISTING OUTSIDE AIR DAMPER MINIMUM POSITION. (IF OUTSIDE AIR DAMPER IS CLOSED DURING OPERATION UPON ARRIVAL, CONSULT WITH ENGINEE/OWNER TO DETERMINE SETPOINT.)

1 SZ CV AHU - GAS HEAT AND DX COOLING - SCHEMATIC  
SCALE: NTS  
23-00-23-01

SEAL



KEY PLAN

SCALE

DRAWN BY JDL/TSA  
APPROVED BY TW  
CHECKED BY JT  
DATE 03/24/23

TITLE  
MECHANICAL SCHEMATICS, POINTS, & SEQUENCES

PROJECT NO. 50155237

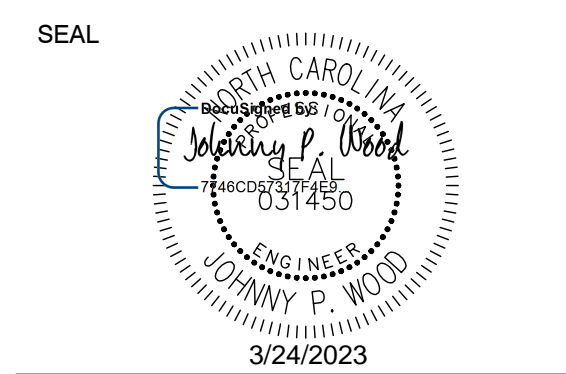
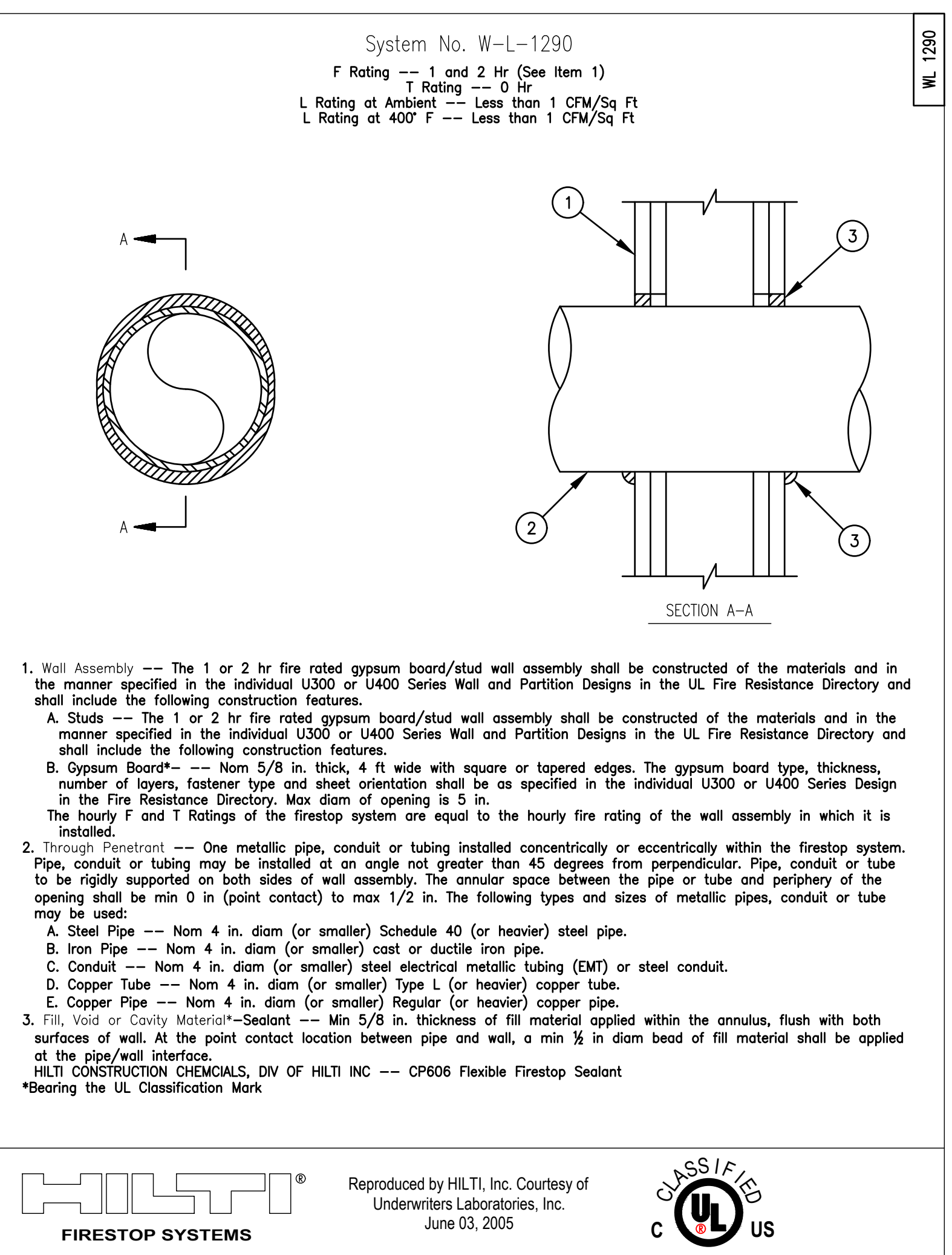
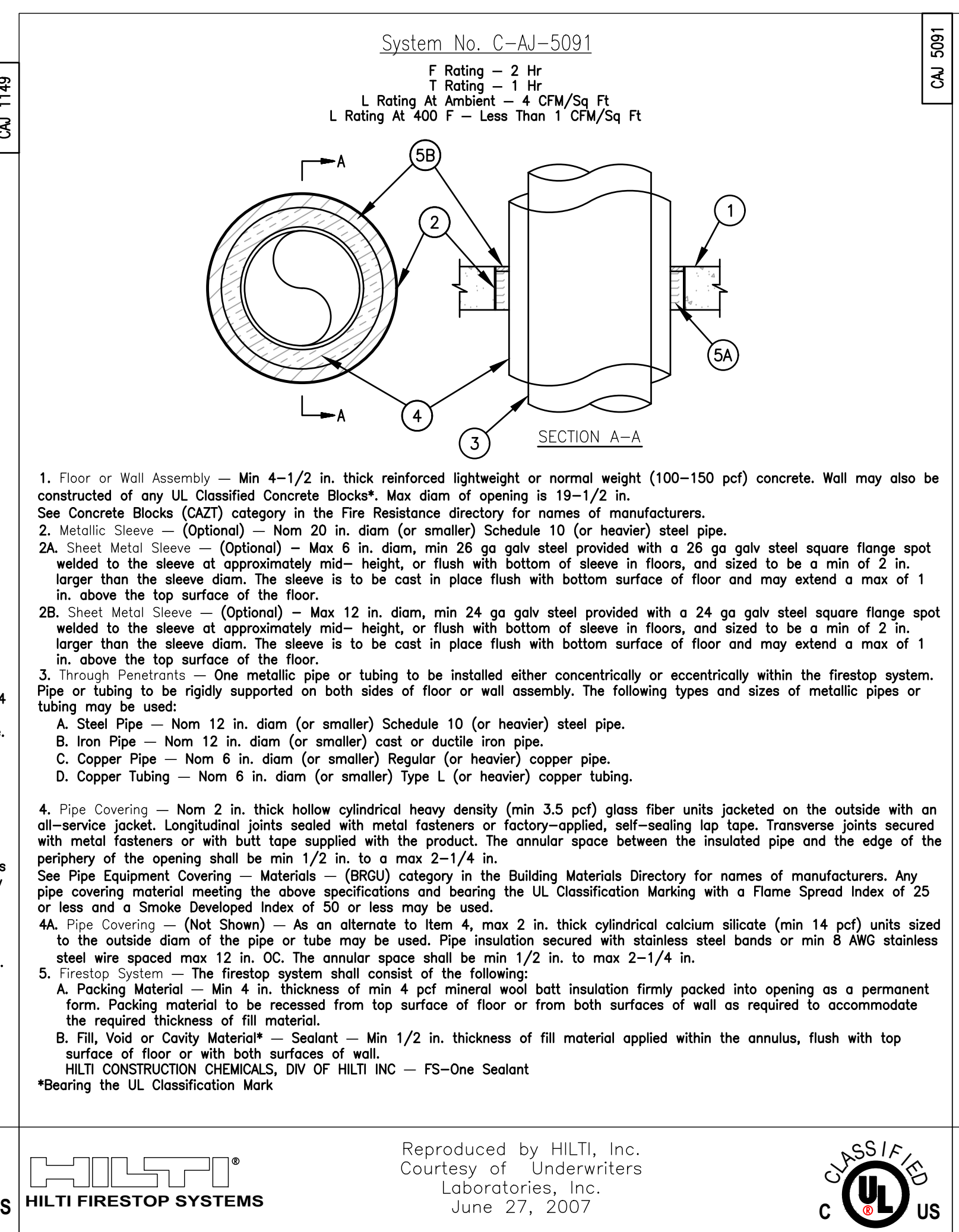
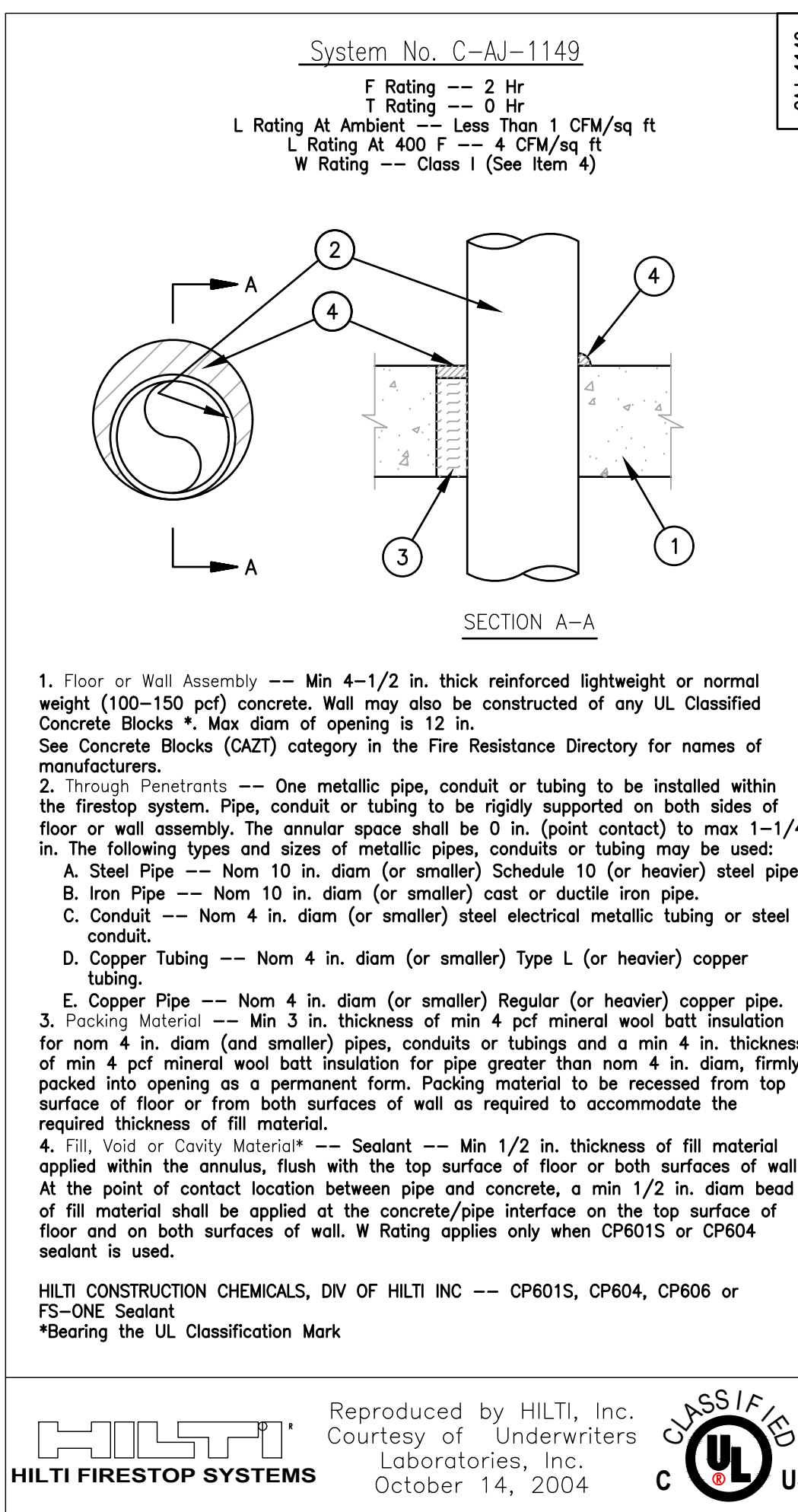
M-400

SHEET NO. of

SEE CV001 FOR SPECIFIC TRADE LEGENDS  
GENERAL LEGEND (ALL TRADES)

- CONNECTION POINT NEW TO EXISTING
- REVISION NUMBER
- TERMINATION POINT, DEMOLITION TO EXISTING
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- DARK LINES INDICATE DEMOLITION OR NEW WORK.
- LIGHT LINES INDICATE EXISTING OR BY OTHERS.





KEY PLAN

SCALE

DRAWN BY: JDL/TSA  
APPROVED BY: TW  
CHECKED BY: JT  
DATE: 03/24/23

TITLE: MECHANICAL DETAILS

PROJECT NO. 50155237

M-501

SHEET NO. of

SEE CV001 FOR SPECIFIC TRADE LEGENDS

GENERAL LEGEND (ALL TRADES)

	CONNECTION POINT NEW TO EXISTING
	REVISION NUMBER
	TERMINATION POINT, DEMOLITION TO EXISTING
	DEMOLITION NOTES
	NEW NOTES
	DARK LINES INDICATE DEMOLITION OR NEW WORK.
	LIGHT LINES INDICATE EXISTING OR BY OTHERS.