

Date: 02-23-2021

To: All Plan Holders

Subject: ADDENDUM NO. 9

Project: CENTER FOR MATERIALS AND MANUFACTURING
SCIENCES, TROY UNIVERSITY MAIN CAMPUS-TROY ALABAMA

Job #: SSL# 18144
BC# 2020416
PSCA#: 006P

From: Cody Smith



The plans dated November 17, 2020 and Specifications dated November 2020 of the subject project, and any subsequent addenda are amended as follows: (Where there are conflicts between the plans and specifications and the addendum, this addendum shall govern)

Item 1: Refer to the Sheet C2.0: Change new fire water service line from new 10-inch water main to new CMMS Building from a 6-inch size to an 8-inch size and the 6-inch Double Check Detector Check valve and vault to an 8-inch size.

Item 2: Refer to Sheet C6.0: On the “DOUBLE CHECK/DETECTOR CHECKS” detail, change the 6-inch double check valve to an 8-inch size

Item 3: Refer to the specifications section 15920, BAS and add the following clarification:

Occupied/unoccupied sequence shall be setup such that when the individual space lights are on, the lab sequence shall operate in the occupied mode. When the respective space lights are turned off, the space shall revert to the unoccupied mode.

Item 4: Replace Sheet M1.0 with the attached M1.0

Item 5: Replace Sheet M1.1 with the attached M1.1

Item 6: Replace Sheet M1.2 with the attached M1.2

Item 7: Replace Sheet M1.3 with the attached M1.3

Item 8: Replace Sheet M1.4 with the attached M1.4

Item 9: Replace Sheet M1.5 with the attached M1.5

Item 10: Replace Sheet M1.6 with the attached M1.6

Item 11: Replace Sheet M1.7 with the attached M1.7

Item 12: Replace Sheet M1.8 with the attached M1.8

Item 13: Replace Sheet M1.9 with the attached M1.9

Item 14: Replace Sheet M1.10 with the attached M1.10

Item 15: Replace Sheet M1.11 with the attached M1.11

Item 16: Replace Sheet M6.1 with the attached M6.1

Item 17: Clarification, the Flow Test for the John Lewis Quad Hydrant that the project is tying into had the following results: 940 GPM, 50 Static, 45 Residual

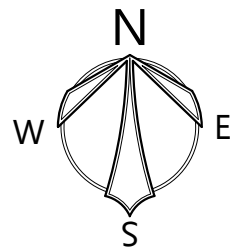
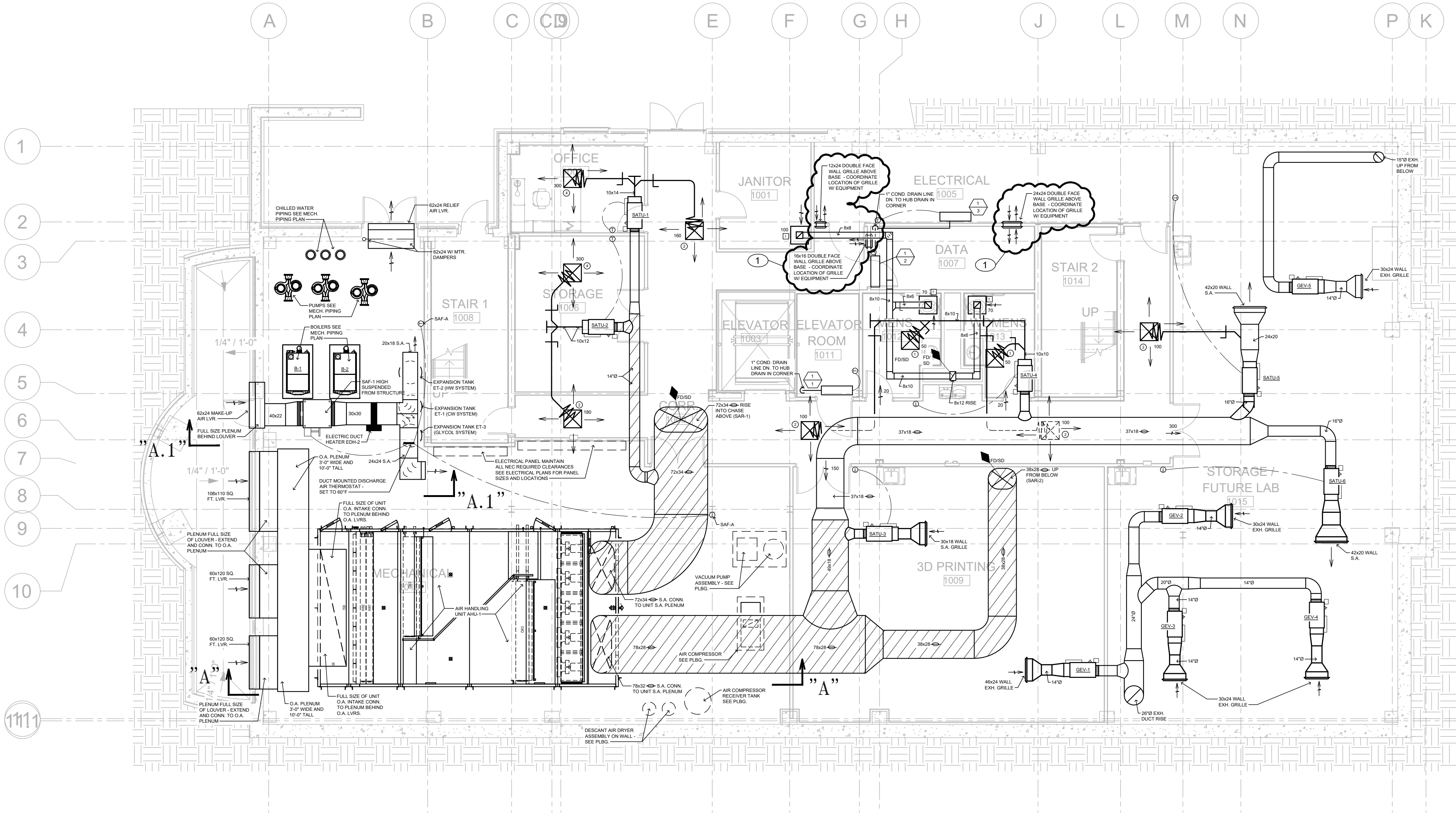
End of Addendum No. 9

LEGEND

	CWS	CHILLED WATER SUPPLY		CEILING DIFFUSER DESIGNATOR
	CWR	CHILLED WATER RETURN		RETURN AIR GRILLE/REGISTER
	HWS	HOT WATER SUPPLY		EXHAUST AIR GRILLE/REGISTER
	HWR	HOT WATER RETURN		VAV TERMINAL UNIT DESIGNATOR
		AUTOMATIC CHANGEOVER VALVE		AIR HANDLING UNIT SERVED BY TERMINAL UNIT NUMBER
		ISOLATION / GATE VALVE		DUCT W/ RECTANGULAR SIZE
		SQUARE HEAD BALANCING VALVE		DUCT W/ FLAT OVAL SIZE
		COMBINATION BALANCING VALVE AND FLOW METER		RECTANGULAR SUPPLY DUCT TURNING UP
		BALL VALVE		RECTANGULAR SUPPLY AIR DUCT TURNING DOWN
		BUTTERFLY VALVE		RECTANGULAR RETURN AIR OR EXHAUST DUCT TURNING UP
		CHECK / SWING GATE		RECTANGULAR RETURN AIR OR EXHAUST DUCT TURNING DOWN
		FACTORY FABRICATED AND INSULATED DOUBLE WALL FLAT OVAL DUCT		RECTANGULAR SUPPLY AIR DUCT FLOOR OR ROOF PENETRATION
		MOTORIZED R.A. DAMPER		RECTANGULAR RETURN OR EXHAUST AIR DUCT FLOOR OR ROOF PENETRATION
		MANUAL VOLUME DAMPER (MVD)		R.A. TEMPERATURE SENSOR
		MOTORIZED DAMPER (MD)		AIR TRANSFER DUCT
		SMOKE DETECTOR		AUXILIARY DRAIN
		SMOKE DAMPER		THERMOSTAT
		DUCT MOUNTED CO2 SENSOR		REMOTE TEMPERATURE SENSOR
		DENOTES LOCATION OF VERTICAL ACTION FIRE DAMPER		HUMIDISTAT
		DENOTES LOCATION OF HORIZONTAL ACTION FIRE DAMPER		CO2 SENSOR
		DENOTES LOCATION OF VERTICAL ACTION COMBINATION FIRE AND SMOKE DAMPER		ABOVE FINISH FLOOR
		DENOTES LOCATION OF HORIZONTAL ACTION COMBINATION FIRE AND SMOKE DAMPER		CEILING DIFFUSER
		CEILING DIFFUSER		CEILING OR COOLING CONNECT OR CONNECTION
		RETURN AIR GRILLE/REGISTER		FIRE DAMPER
		EXHAUST AIR GRILLE/REGISTER		GENERAL CONTRACTOR
				OUTSIDE AIR
				RETURN AIR
				SUPPLY AIR

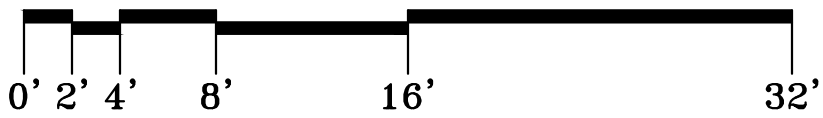
- GENERAL VAV NOTES (AHU-2 SYSTEM):
- ALL ROUND AND FLAT OVAL DUCTWORK FROM AIR HANDLING UNITS TO THE VAV TERMINAL UNITS SHALL BE FACTORY FABRICATED SPIRAL DUCTS AND FITTINGS RATED FOR 4" STATIC PRESSURE (W.C.).
 - ALL BRANCH TAKE-OFF FITTINGS SHALL BE CONICAL TYPE AS SHOWN ON THE PLANS.
 - ALL DUCTWORK DOWNSTREAM OF THE VAV TERMINAL UNITS SHALL BE LOW PRESSURE TYPE RATED FOR .5" STATIC PRESSURE (W.C.).
 - MAXIMUM LENGTH OF FLEXIBLE ROUND DUCTS TO DIFFUSERS SHALL BE 6'-0" FOR LOW PRESSURE DUCTWORK AND 12" FOR MED/HIGH PRESSURE SUPPLY AIR DUCTS TO VAV TERMINAL UNITS.
 - ALL RECTANGULAR/SQUARE DUCTWORK DOWNSTREAM OF THE VAV TERMINAL UNITS SHALL BE INTERNALLY INSULATED WITH 2" THICK ACOUSTICAL DUCT LINER. SEE SPECS FOR INSULATION TYPE.
 - COORDINATE FINAL LOCATION OF ALL CEILING DIFFUSERS, CEILING REGISTERS, ETC., WITH THE ARCHITECTURAL REFLECTED CEILING PLANS.
 - EXTENT OF FACTORY FABRICATED AND INSULATED DOUBLE WALL DUCT IS INDICATED ON THE DUCTWORK WITH SLASHES.
 - FINAL LOCATION OF ALL VAV TERMINAL UNITS SHALL ALLOW FOR COMPLETE AND EASY MAINTENANCE TO HEATING COILS, FILTERS, CONTROLS, POWER SWITCHES, ETC.
 - ALL AIR TRANSFER DUCTS (ATD) AND COLLARS SHALL BE LINED WITH 2" THICK ACOUSTICAL DUCT LINER/INSULATION.
 - COMBUSTIBLE MATERIALS ARE NOT ALLOWED IN AREAS OR SPACES USED AS A RETURN AIR PLENUM. THE GENERAL CONTRACTOR SHALL PROVIDE AN AIRTIGHT SEAL AT ALL JOINTS OF THE R.A. PLENUM SPACE, INCLUDING INTERIOR PARTITIONS BETWEEN SPACES USED AS A RETURN AIR PLENUM AND SPACES NOT USED AS A RETURN AIR PLENUM. CONTRACTOR SHALL PAY PARTICULAR ATTENTION TO PERIMETER JOINTS OF THE BUILDING TO ENSURE NO AMBIENT AIR ENTERS THE RETURN AIR PLENUM.
 - NO BARE EXPOSED FIBERGLASS INSULATION, INCLUDING BATT TYPE FIBERGLASS INSULATION, IS ALLOWED IN THE RETURN AIR PLENUM. ALL INSULATION SHALL HAVE NON-COMBUSTIBLE FACING WITH 25 RATING FOR FLAME SPREAD AND 50 FOR FUEL CONTRIBUTED AND SMOKE DEVELOPED AS DETERMINED BY ASTM E84.
 - ALL EXPOSED EDGES OF INSULATION THAT OCCURS ON ENDS OF DUCTWORK WITH EXPOSED INSULATION SHALL BE PROVIDED WITH DUCT NOSINGS AS SHOWN ON THE PLAN DETAILS. ALL OTHER SHALL BE PAINTED WITH DUCT SEALER RATED AND IN COMPLIANCE WITH ASTM E84 FOR 25/50 SMOKE AND FLAME SPREAD.

NOTE:
THE SPACE/PLENUM ABOVE THE CEILING IS UTILIZED AS A RETURN AIR PLENUM. THE GENERAL CONTRACTOR SHALL SEAL THE PLENUM AIR TIGHT. ALL PENETRATIONS OF THE R.A. PLENUM SHALL BE SEALED AIR TIGHT. NO COMBUSTIBLES ARE ALLOWED IN THE R.A. PLENUM SPACE.



OVERALL BASMENT HVAC FLOOR PLAN

SCALE: 1/8" = 1'-0"
NOTE: OVERALL PLAN IS PROVIDED FOR COORDINATION PURPOSES ONLY - SEE OTHER PLANS FOR DETAILS



Rev.	Description	Date
1	ADD #9	02.23.21

Job Number	18144
Date	11/17/2020
Drawn By	CW
Checked By	TZ

Project Title

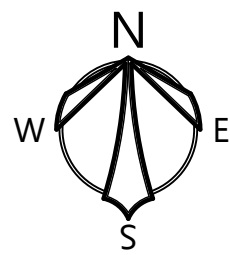
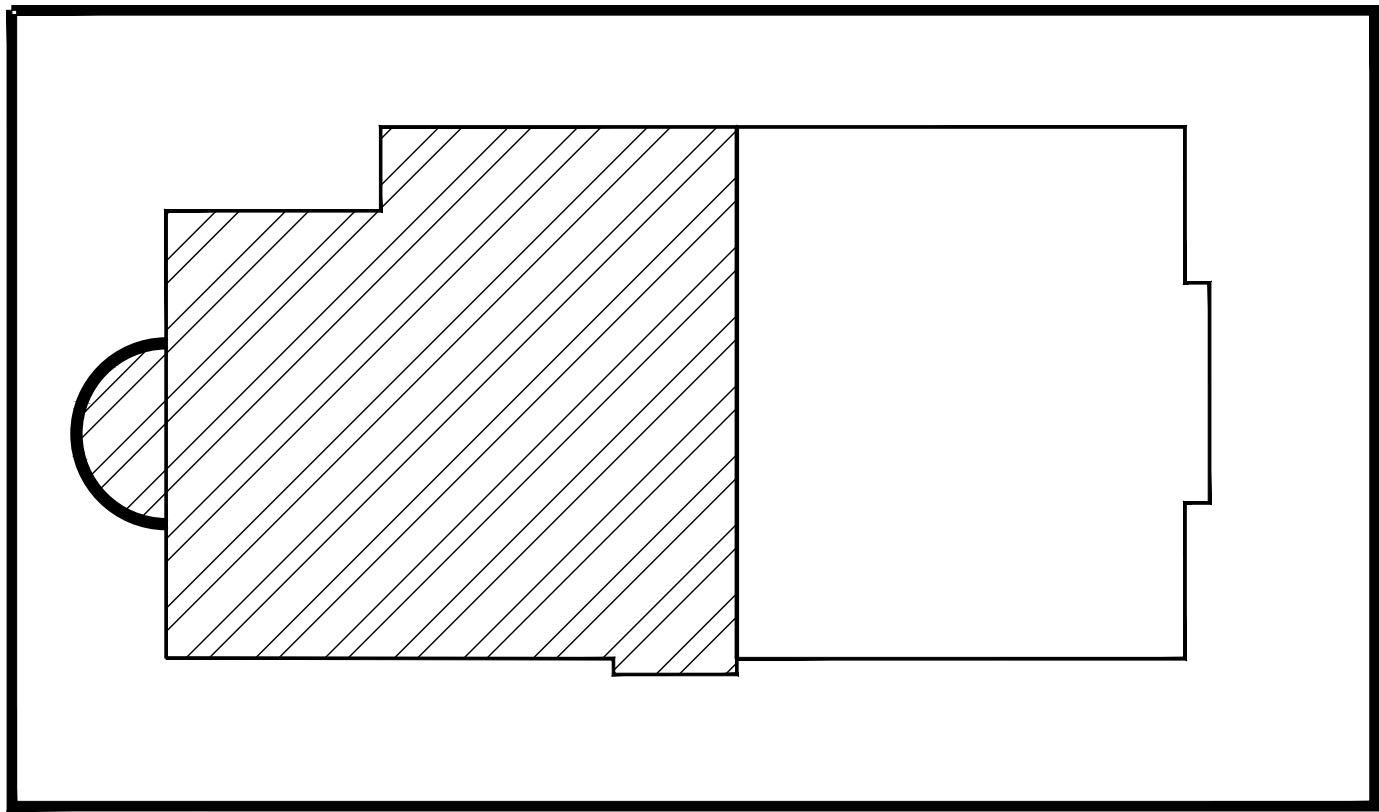
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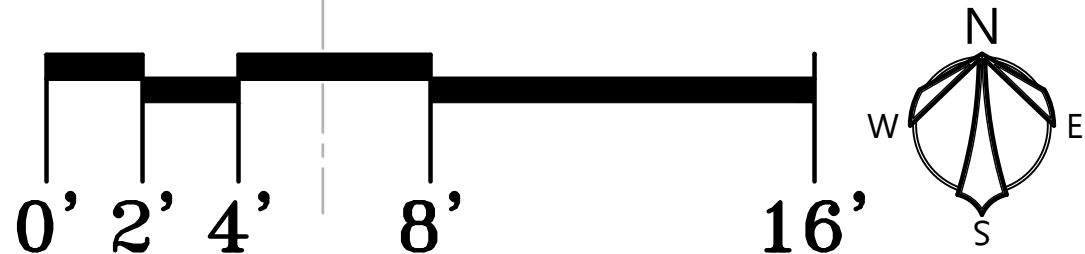
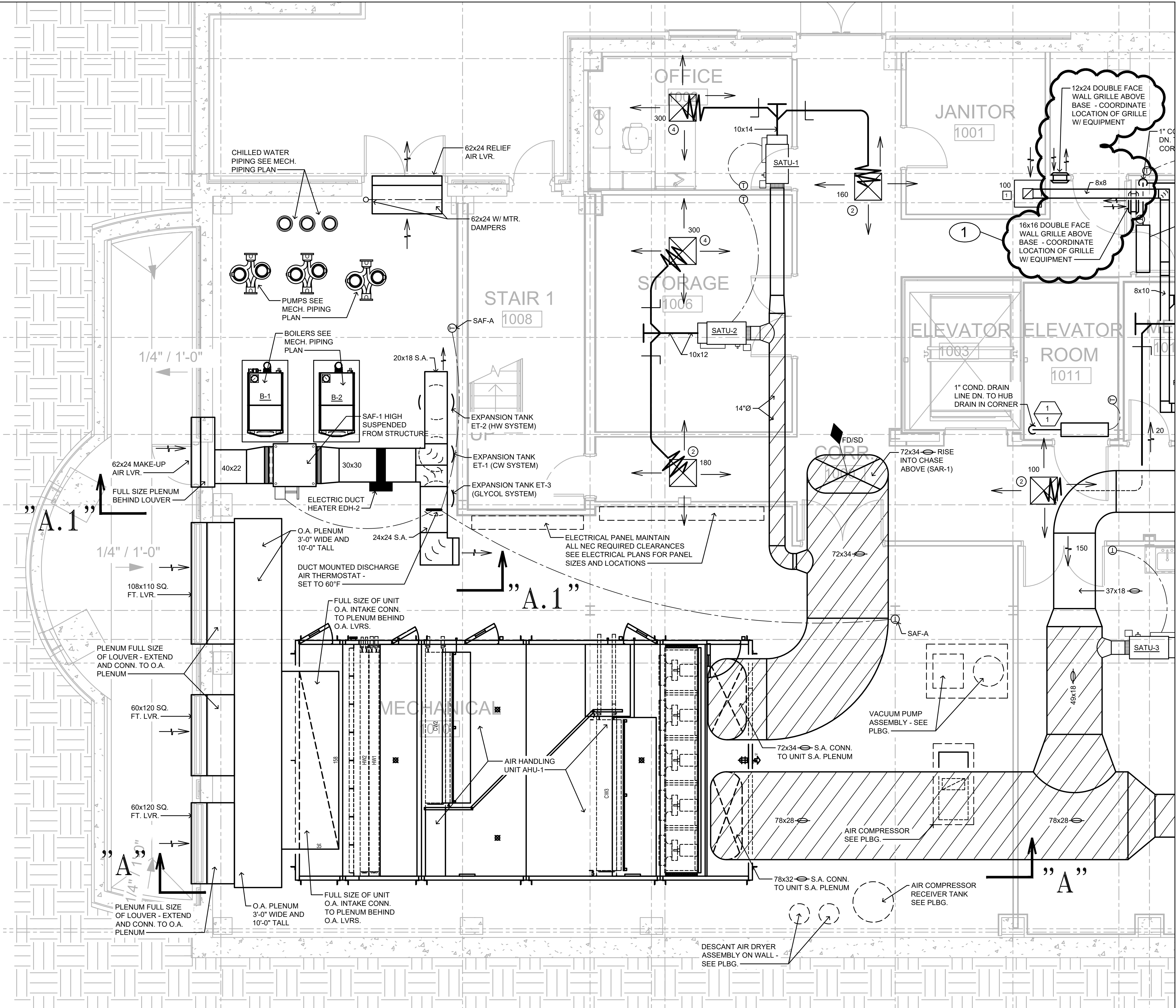
Sheet Title
HVAC BASEMENT
FLOOR PLAN

Sheet Number

M1.0



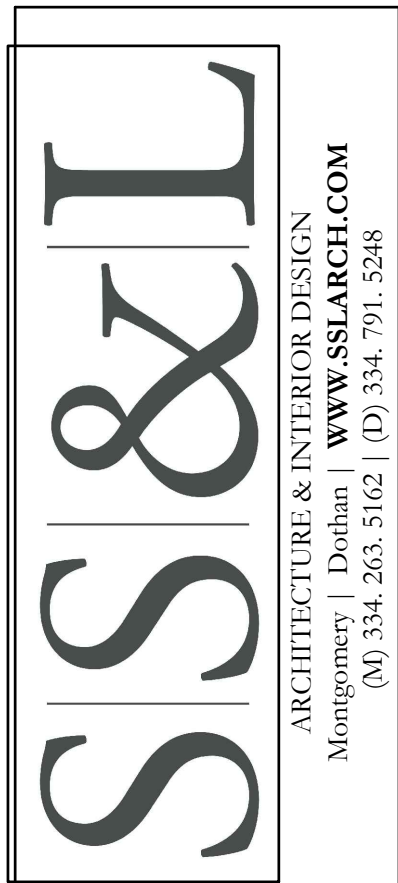
KEY PLAN
NOT TO SCALE



PARTIAL BASEMENT HVAC FLOOR PLAN
SCALE: 1/4" = 1'-0"

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ZEA PROJECT NUMBER 20-171



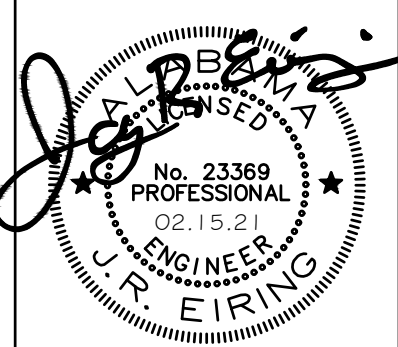
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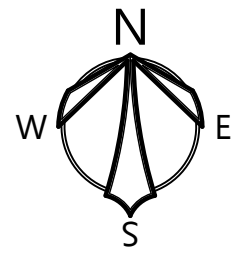
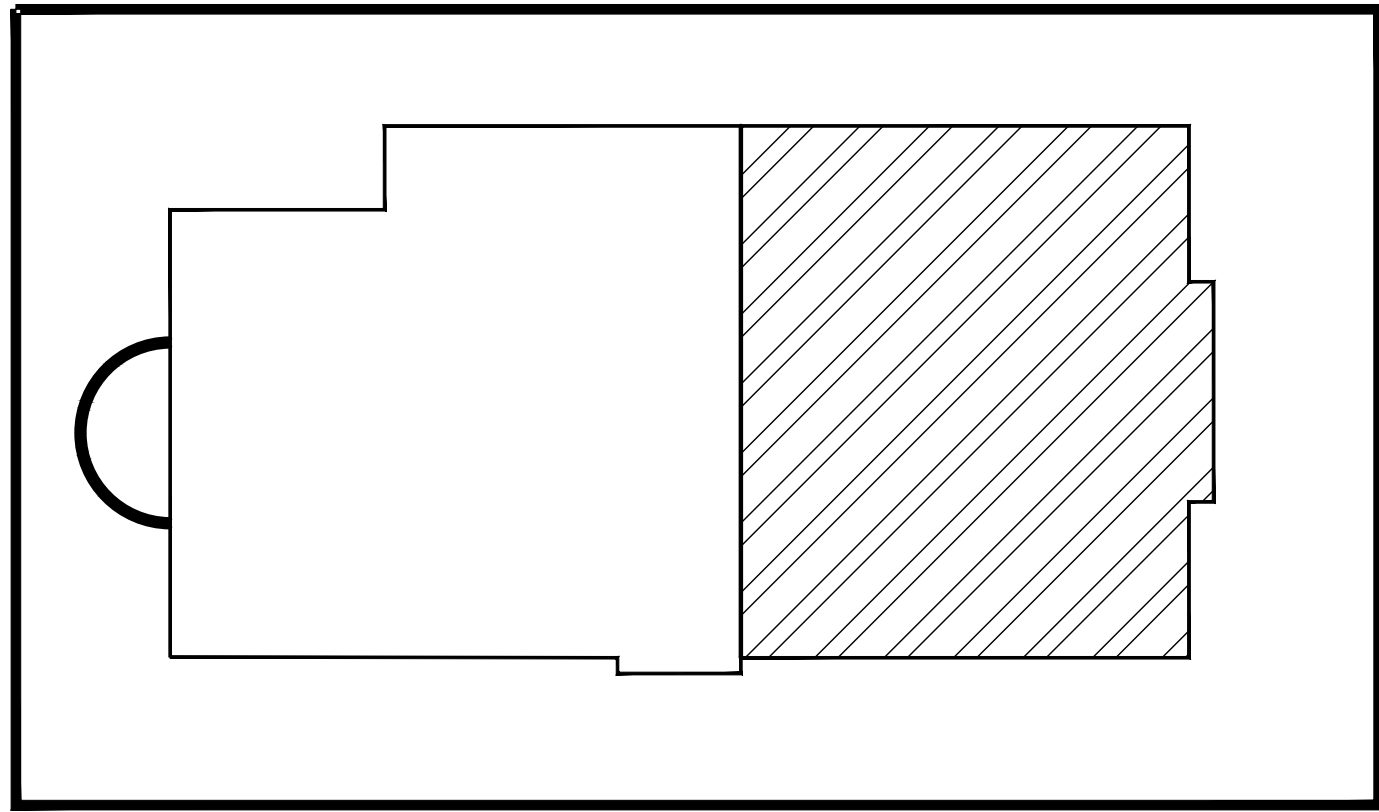
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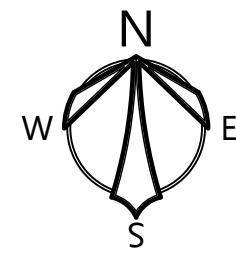
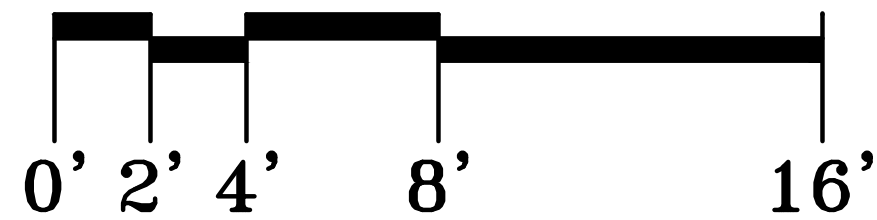
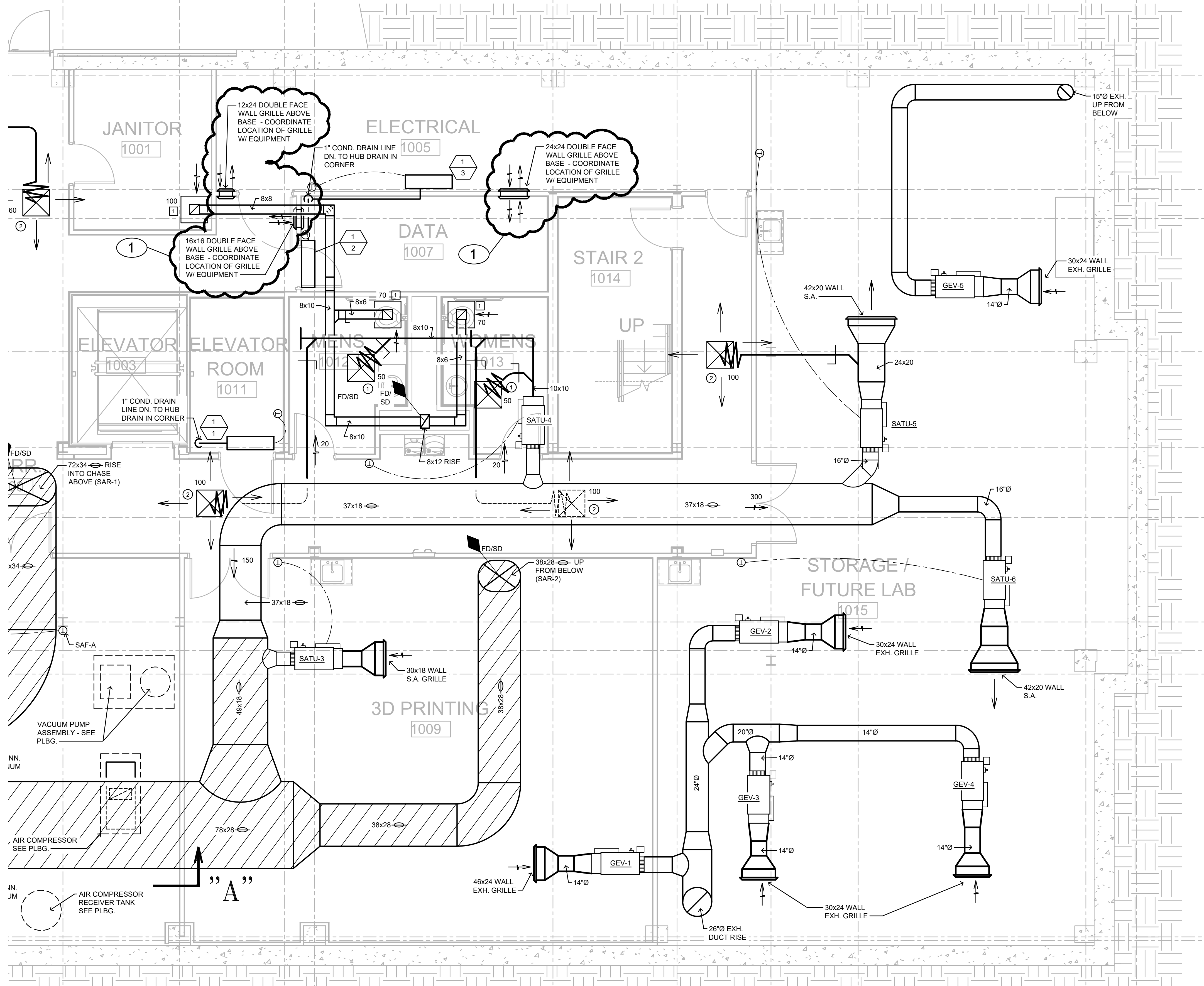
Sheet Title
PARTIAL BASEMENT HVAC FLOOR PLAN

Sheet Number
M1.1





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Sheet Title
PARTIAL BASEMENT
HVAC FLOOR PLAN

Sheet Number

M1.2



LEGEND

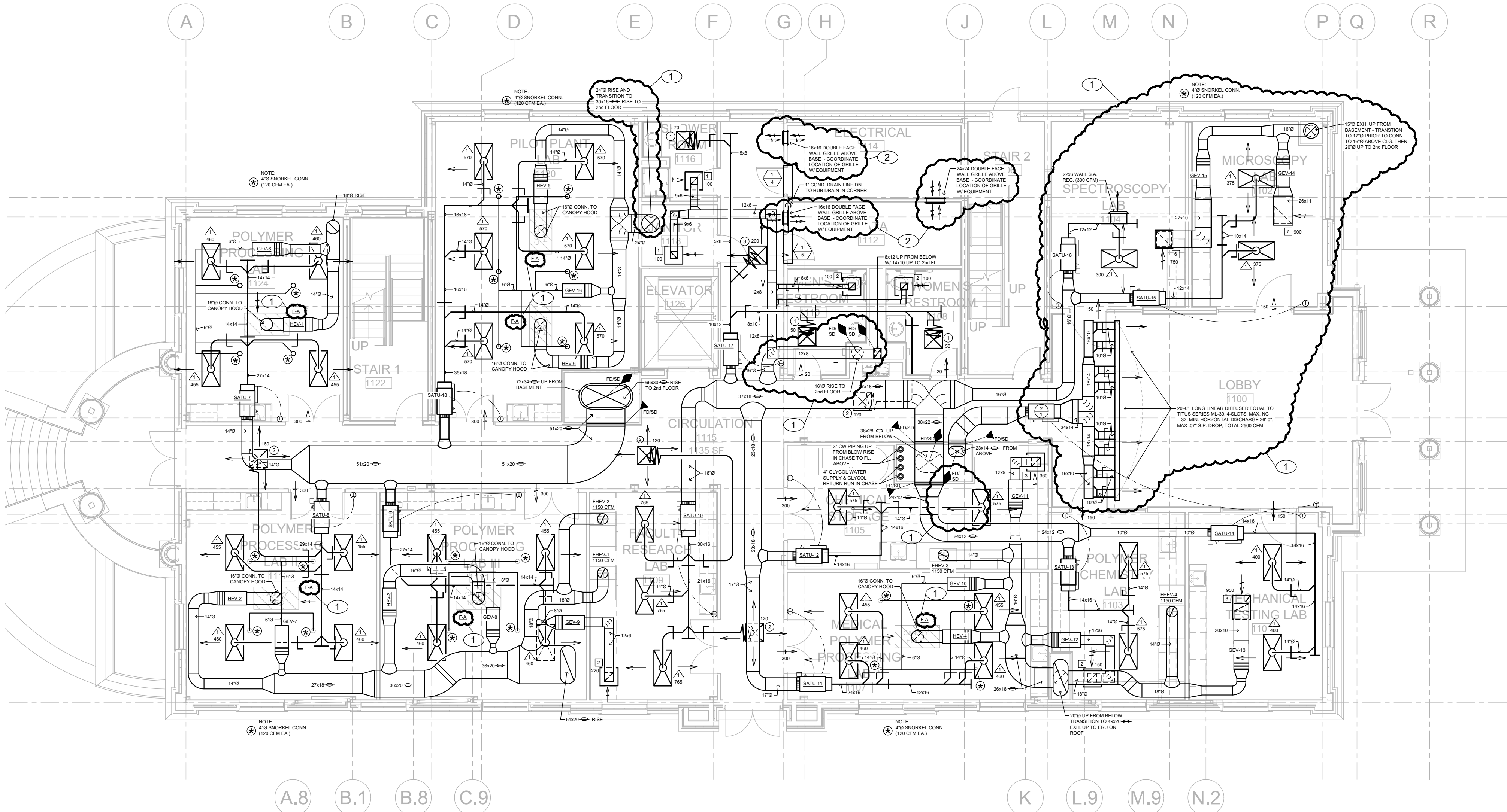
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NOTE:

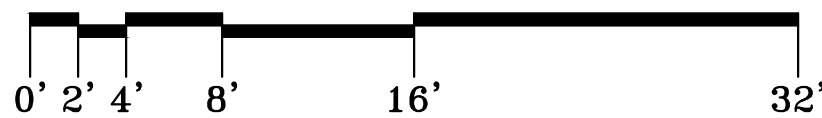
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OVERALL FIRST FLOOR HVAC PLAN

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

NOTE: OVERALL PLAN IS PROVIDED FOR COORDINATION PURPOSES ONLY - SEE OTHER PLANS FOR DETAILS



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1	ADD #5	01.15.21
2	ADD #9	02.23.21

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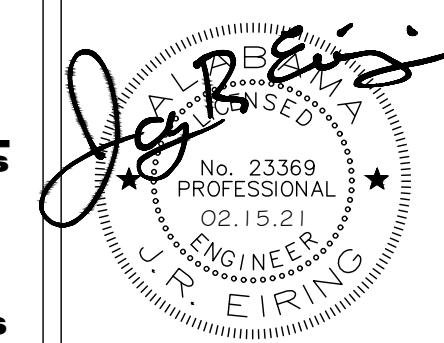
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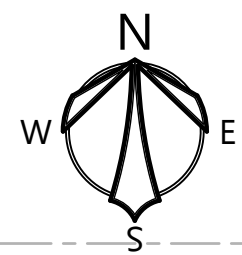
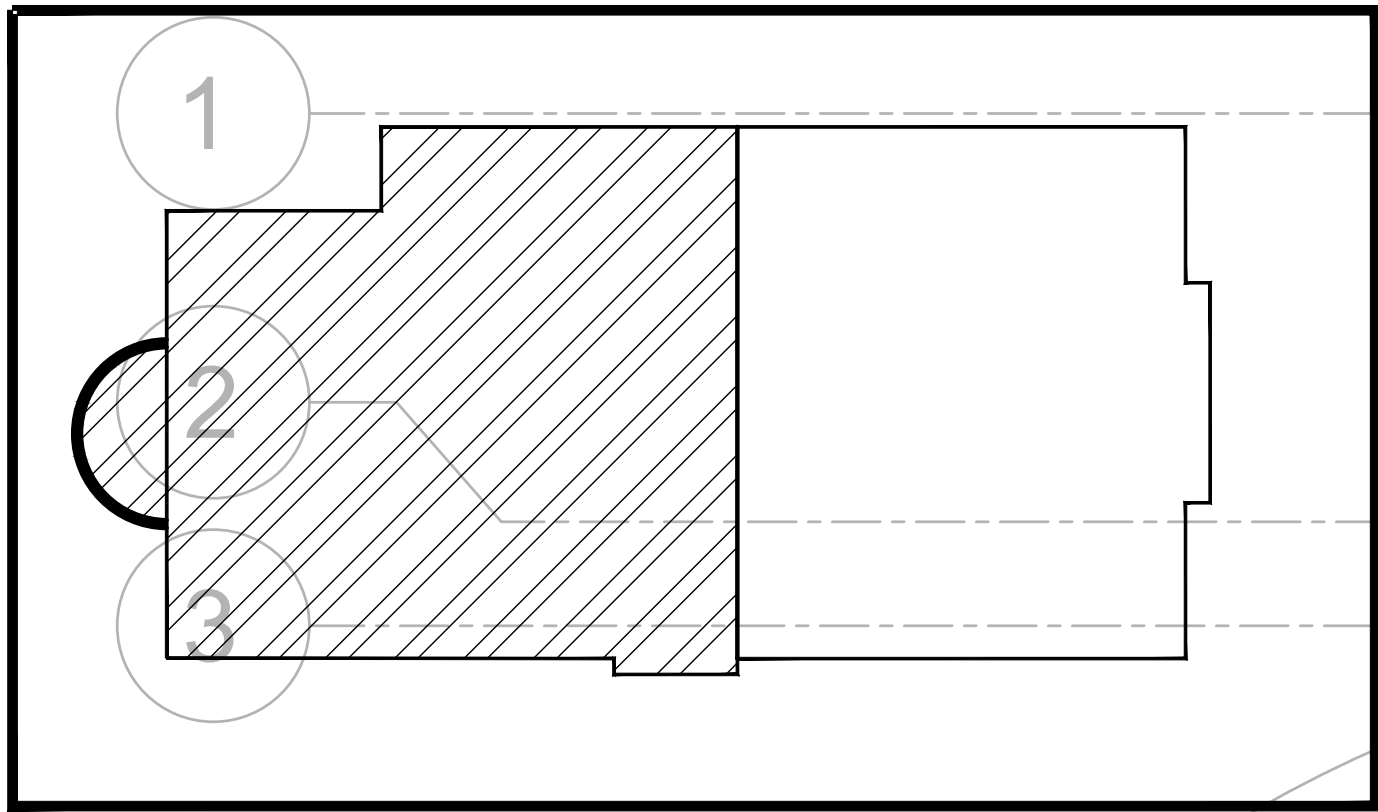
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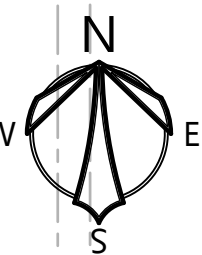
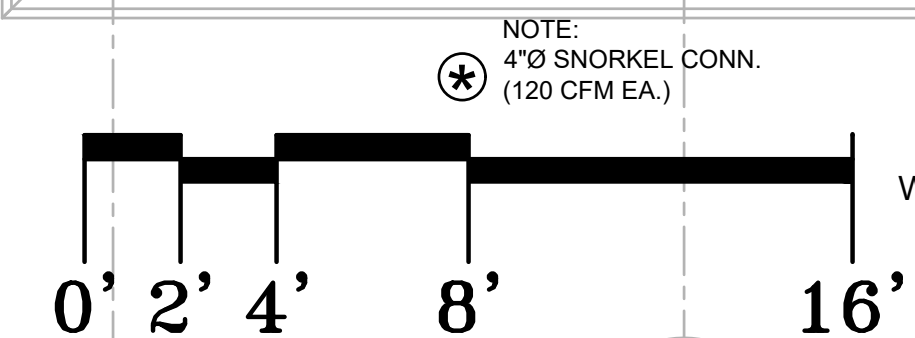
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M1.3

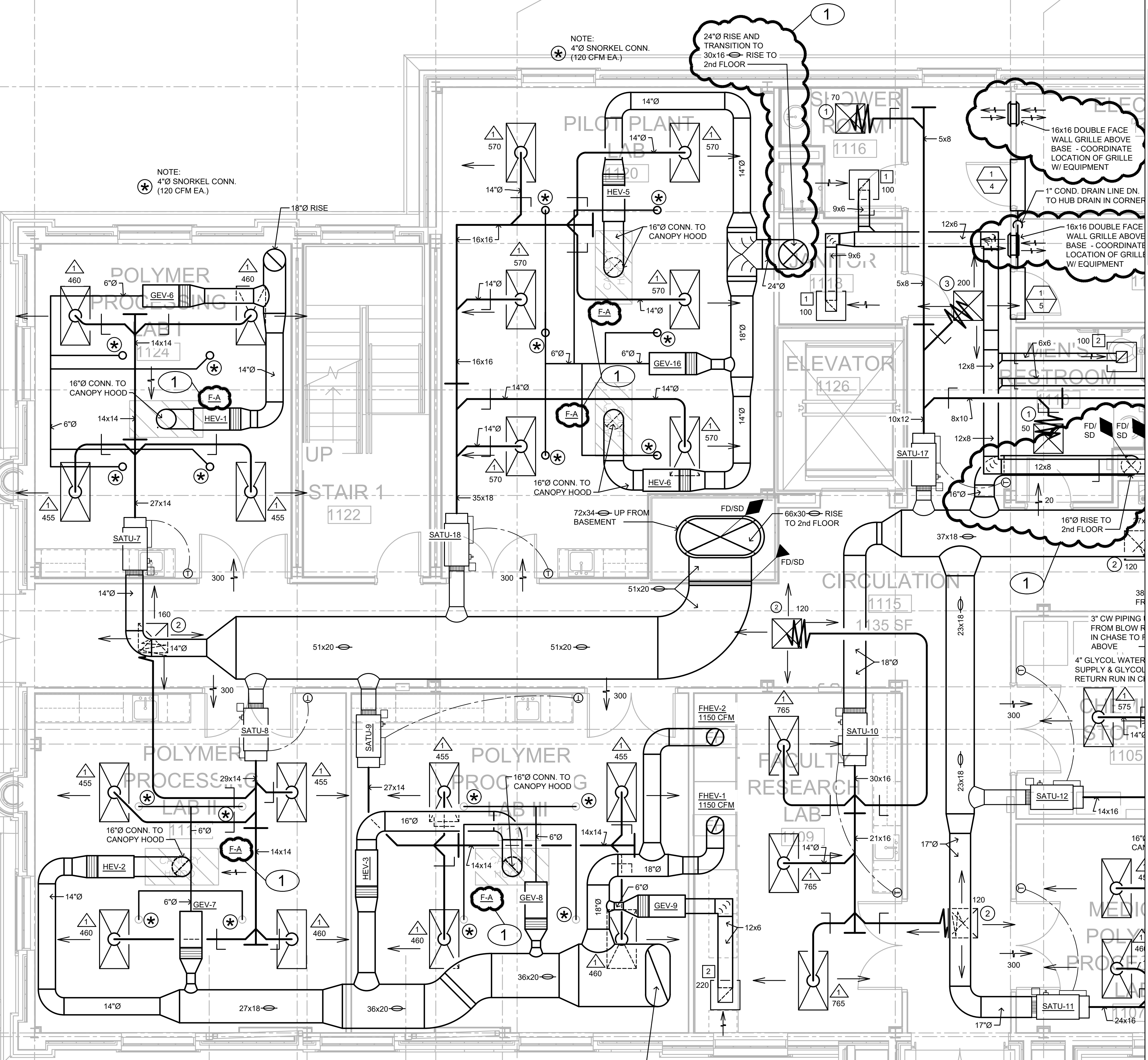




KEY PLAN
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PARTIAL FIRST FLOOR HVAC PLAN
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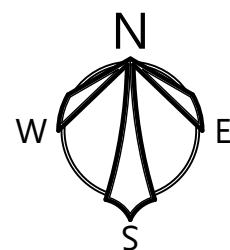
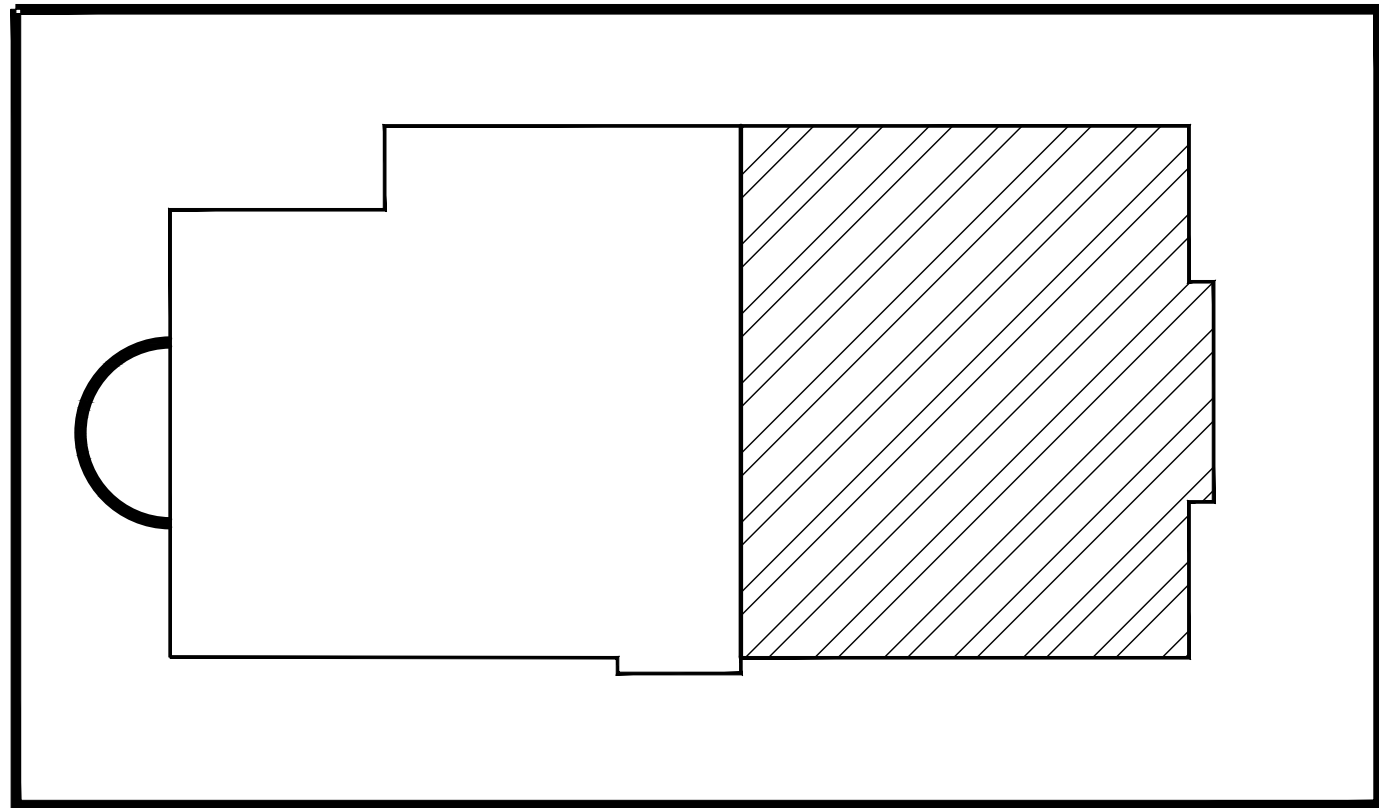
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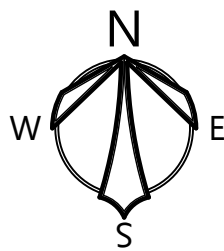
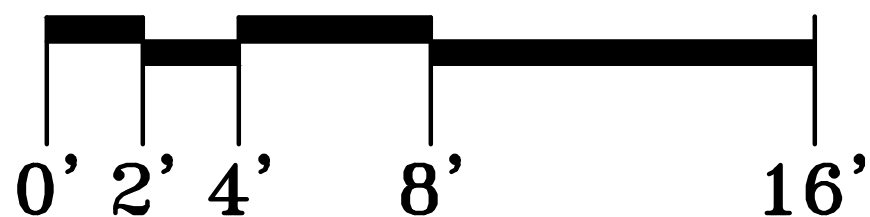
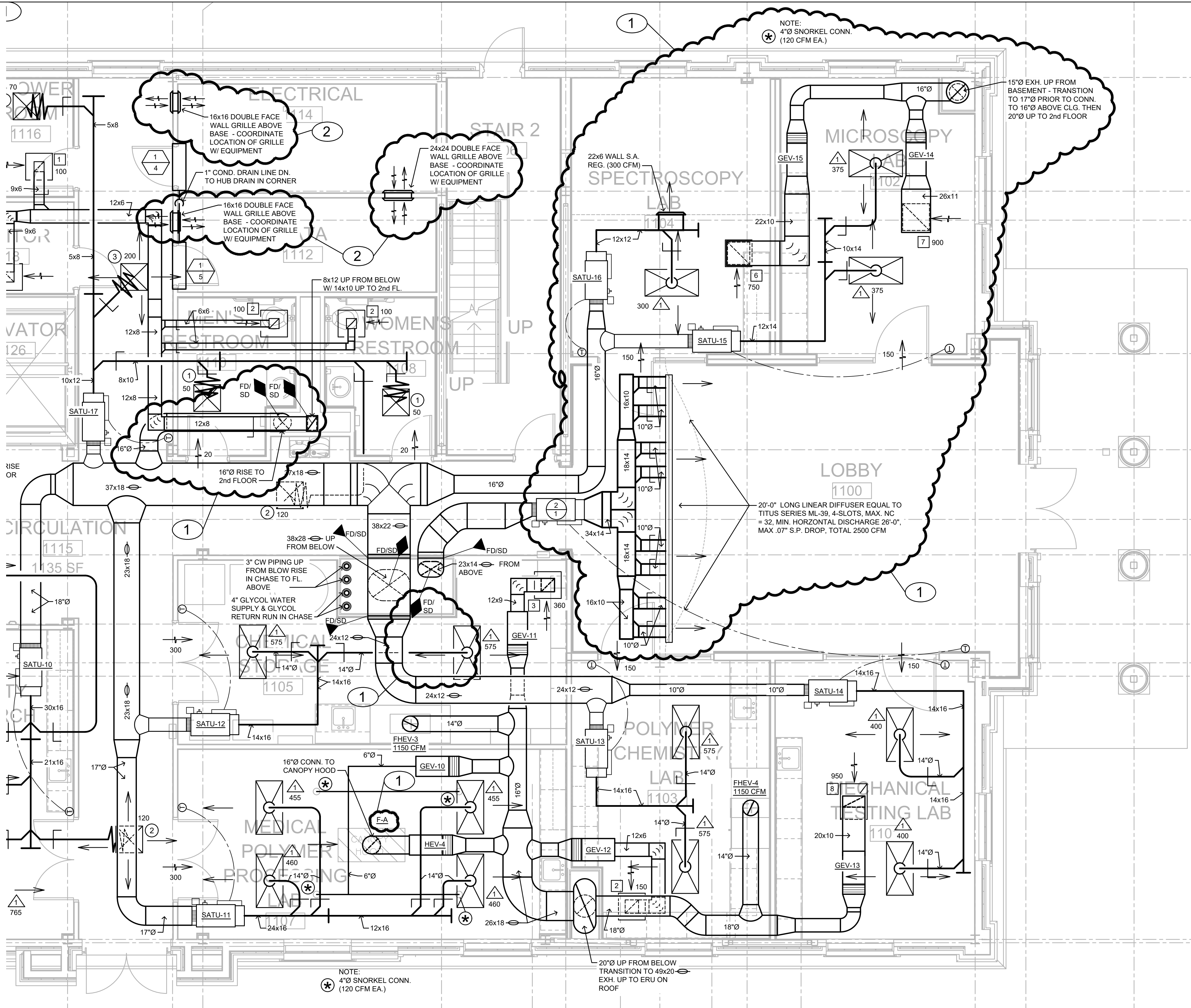
M1.4

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ZEA PROJECT NUMBER 20-171

Professional Engineer
No. 23369
02.15.21
EIRING



KEY PLAN
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PARTIAL FIRST FLOOR HVAC PLAN

SCALE: 1/4" = 1'-0"

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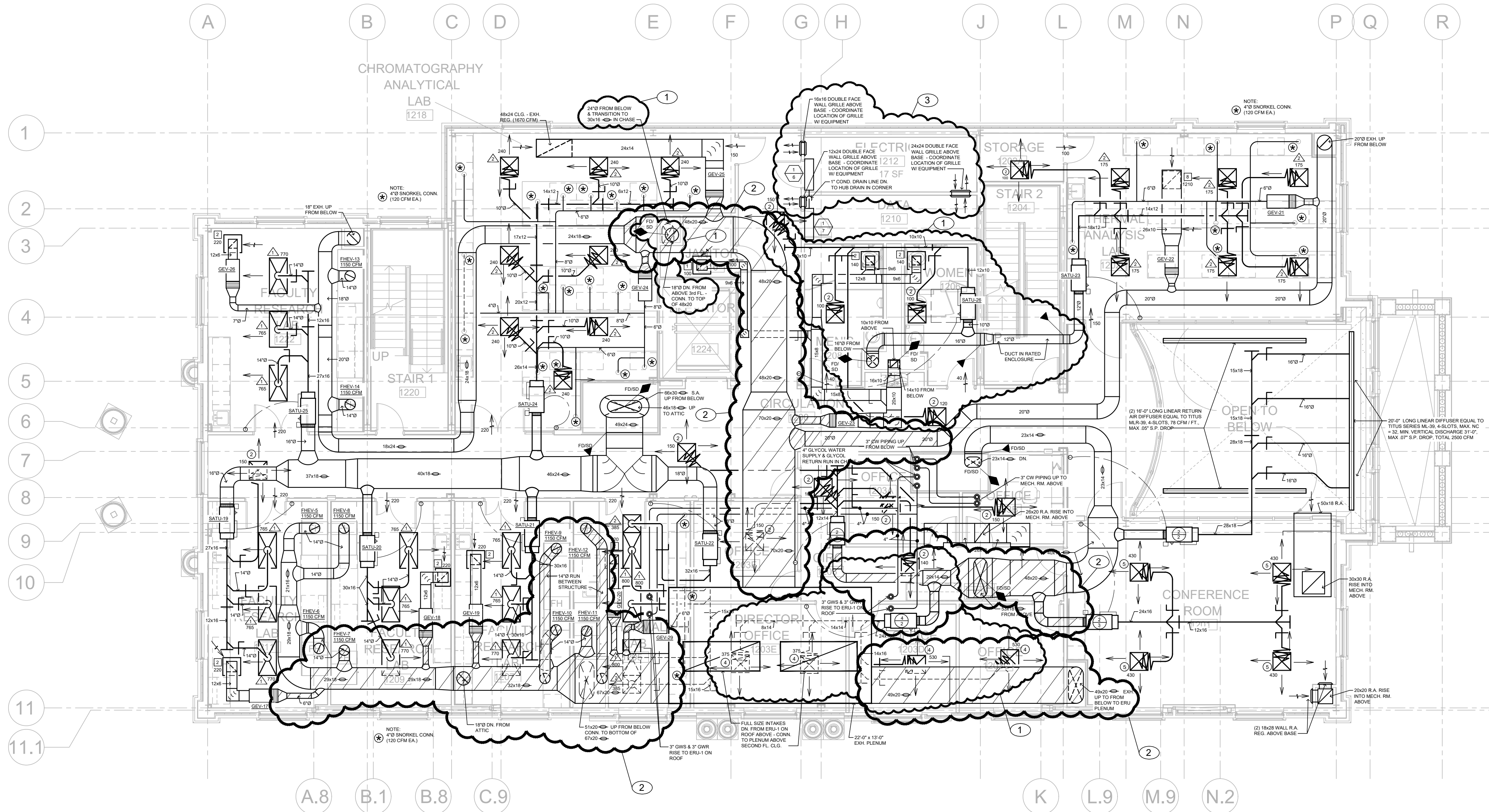
M1.5

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Professional Engineer
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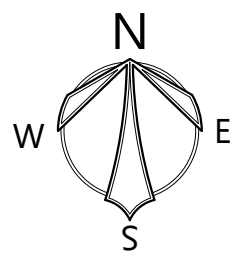
LEGEND

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		FACTORY FABRICATED AND INSULATED DOUBLE WALL FLAT OVAL DUCT		RECTANGULAR SUPPLY DUCT TURNING UP
		MOTORIZED R.A. DAMPER		RECTANGULAR SUPPLY AIR DUCT TURNING DOWN
		MANUAL VOLUME DAMPER (MVD)		RECTANGULAR RETURN AIR OR EXHAUST DUCT TURNING UP
		MOTORIZED DAMPER (MD)		RECTANGULAR RETURN AIR OR EXHAUST DUCT TURNING DOWN
		SMOKE DETECTOR	ATD AD T S H C	RECTANGULAR SUPPLY AIR DUCT FLOOR OR ROOF PENETRATION
		SMOKE DAMPER		RECTANGULAR RETURN OR EXHAUST AIR DUCT FLOOR OR ROOF PENETRATION
		DUCT MOUNTED CO2 SENSOR		R.A. TEMPERATURE SENSOR
		DENOTES LOCATION OF VERTICAL ACTION FIRE DAMPER	A.F.F. C.D. C.L.G. CONN. F.D. G.C. O.A. R.A. S.A.	AIR TRANSFER DUCT
		DENOTES LOCATION OF HORIZONTAL ACTION FIRE DAMPER		AUXILIARY DRAIN
		DENOTES LOCATION OF VERTICAL ACTION COMBINATION FIRE AND SMOKE DAMPER		THERMOSTAT
		DENOTES LOCATION OF HORIZONTAL ACTION COMBINATION FIRE AND SMOKE DAMPER		REMOTE TEMPERATURE SENSOR
		CEILING DIFFUSER		HUMIDISTAT
		RETURN AIR GRILLE/REGISTER		CO2 SENSOR
		EXHAUST AIR GRILLE/REGISTER		ABOVE FINISH FLOOR



GENERAL VAV NOTES (AHU-2 SYSTEM):

- 1.) ALL ROUND AND FLAT OVAL DUCTWORK FROM AIR HANDLING UNITS TO THE VAV TERMINAL UNITS SHALL BE FACTORY FABRICATED SPIRAL DUCTS AND FITTINGS RATED FOR 4" STATIC PRESSURE (W.C.).
- 2.) ALL BRANCH TAKE-OFF FITTINGS SHALL BE CONICAL TYPE AS SHOWN ON THE PLANS.
- 3.) ALL DUCTWORK DOWNSTREAM OF THE VAV TERMINAL UNITS SHALL BE LOW PRESSURE TYPE RATED FOR .5" STATIC PRESSURE (W.C.)
- 4.) MAXIMUM LENGTH OF FLEXIBLE ROUND DUCTS TO DIFFUSERS SHALL BE 6'-0" FOR LOW PRESSURE DUCTWORK AND 12" FOR MED/HIGH PRESSURE SUPPLY AIR DUCTS TO VAV TERMINAL UNITS.
- 5.) ALL RECTANGULAR/SQUARE DUCTWORK DOWNSTREAM OF THE VAV TERMINAL UNITS SHALL BE INTERNALLY INSULATED WITH 2" THICK ACOUSTICAL DUCT LINER. SEE SPECS FOR INSULATION TYPE.
- 6.) COORDINATE FINAL LOCATION OF ALL CEILING DIFFUSERS, CEILING REGISTERS, ETC., WITH THE ARCHITECTURAL REFLECTED CEILING PLANS.
- 7.) EXTENT OF FACTORY FABRICATED AND INSULATED DOUBLE WALL DUCT IS INDICATED ON THE DUCTWORK WITH SLASHES.
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- 11.) NO BARE EXPOSED FIBERGLASS INSULATION, INCLUDING BATT TYPE FIBERGLASS INSULATION, IS ALLOWED IN THE RETURN AIR PLENUM. ALL INSULATION SHALL HAVE NON-COMBUSTIBLE FACING WITH 25 RATING FOR FLAME SPREAD AND 50 FOR FUEL CONTRIBUTED AND SMOKE DEVELOPED AS DETERMINED BY ASTM E84.
- 12.) ALL EXPOSED EDGES OF INSULATION THAT OCCURS ON ENDS OF DUCTWORK WITH EXPOSED INSULATION SHALL BE PROVIDED WITH DUCT NOSINGS AS SHOWN ON THE PLAN DETAILS. ALL OTHER SHALL BE PAINTED WITH DUCT SEALER RATED AND IN COMPLIANCE WITH ASTM E84 FOR 25/50 SMOKE AND FLAME SPREAD.



OVERALL SECOND FLOOR HVAC PLAN

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

NOTE: OVERALL PLAN IS PROVIDED FOR COORDINATION PURPOSES ONLY - SEE OTHER PLANS FOR DETAILS

NOTE:

THE SPACE/PLENUM ABOVE THE CEILING IS UTILIZED AS A RETURN AIR PLENUM. THE GENERAL CONTRACTOR SHALL SEAL THE PLENUM AIR TIGHT. ALL PENETRATIONS OF THE R.A. PLENUM SHALL BE SEALED AIR TIGHT. NO COMBUSTIBLES ARE ALLOWED IN THE R.A. PLENUM SPACE.

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2	ADD #7	02.15.21
3	ADD #9	02.23.21

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Checked By	TZ

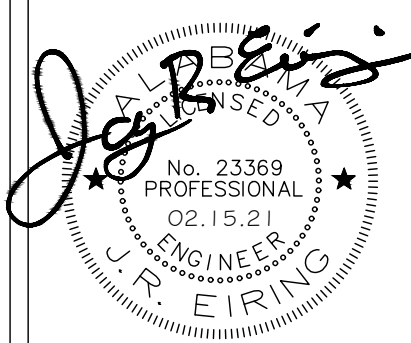
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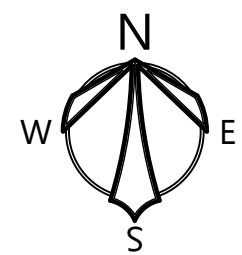
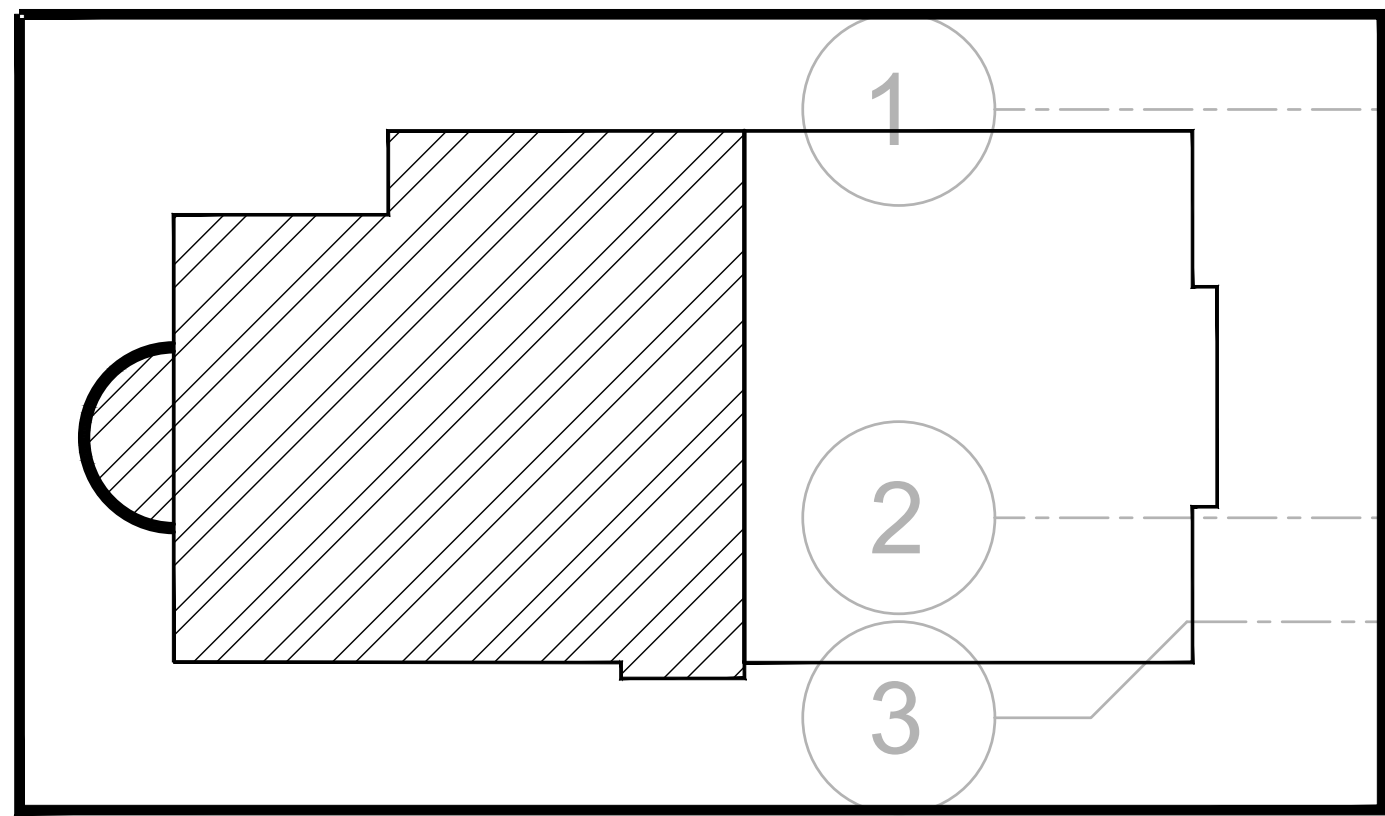
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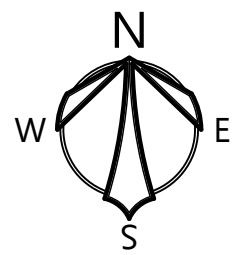
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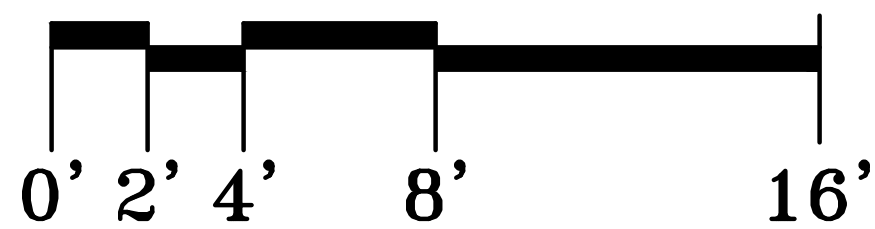
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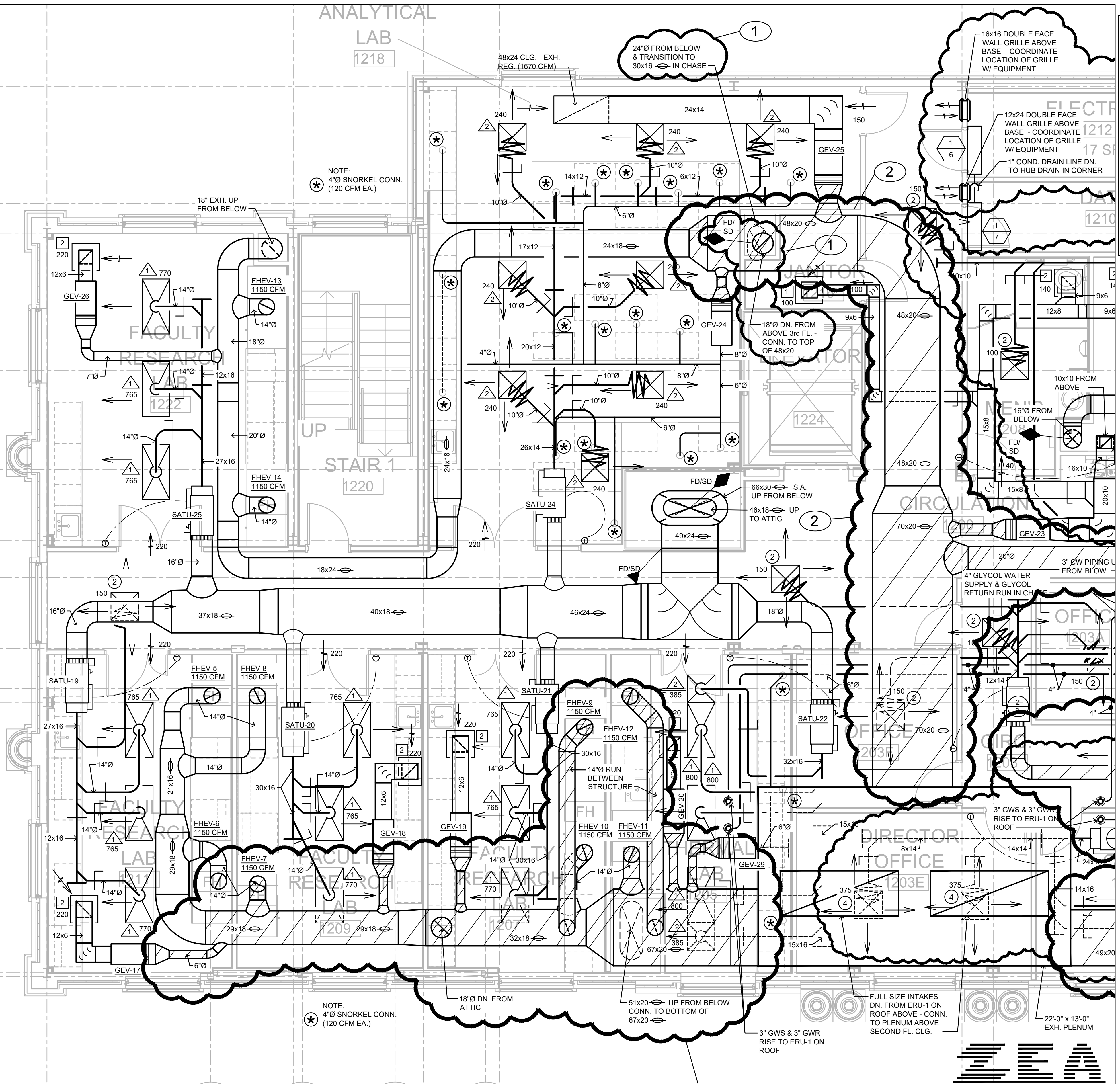


PARTIAL SECOND FLOOR HVAC PLAN
SCALE: 1/4" = 1'-0"



11

11.1



A.8

B.1

B.8

C.9

2

ZGOUVAS, EIRING & ASSOCIATES
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ZEA PROJECT NUMBER 20-171

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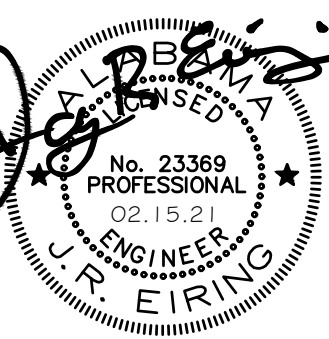
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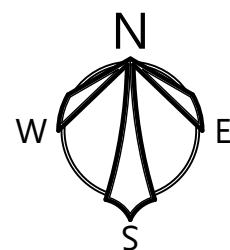
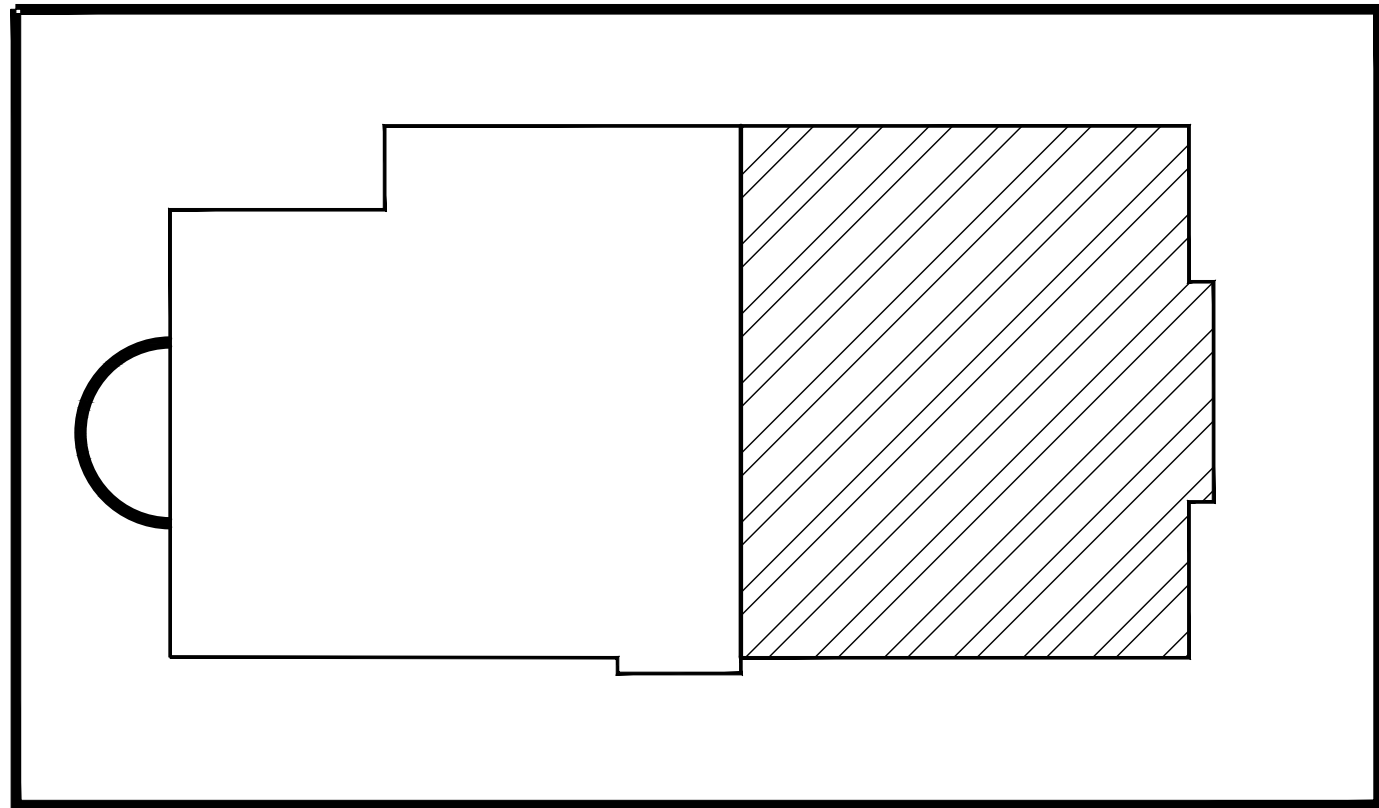
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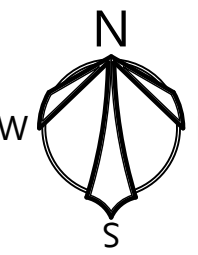
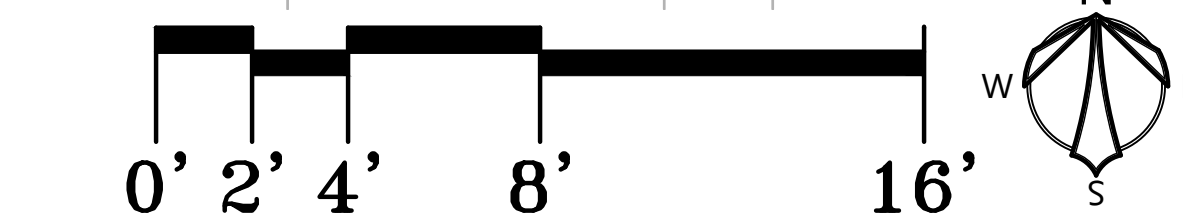
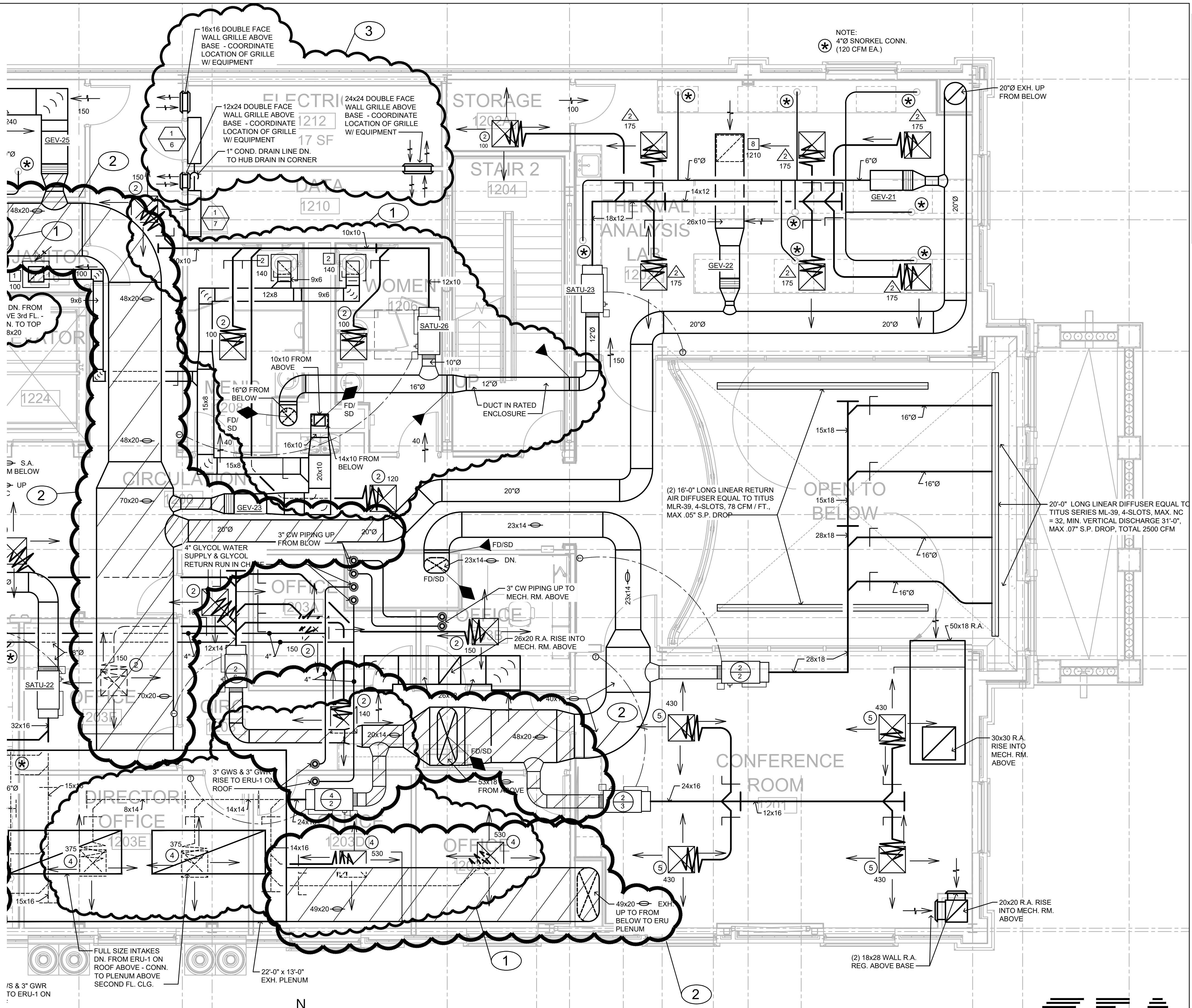
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KEY PLAN
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PARTIAL SECOND FLOOR HVAC PLAN

SCALE: 1/4" = 1'-0"

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334.263.4406
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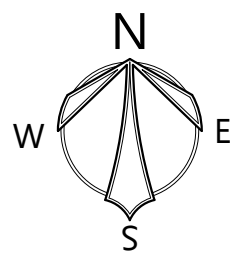
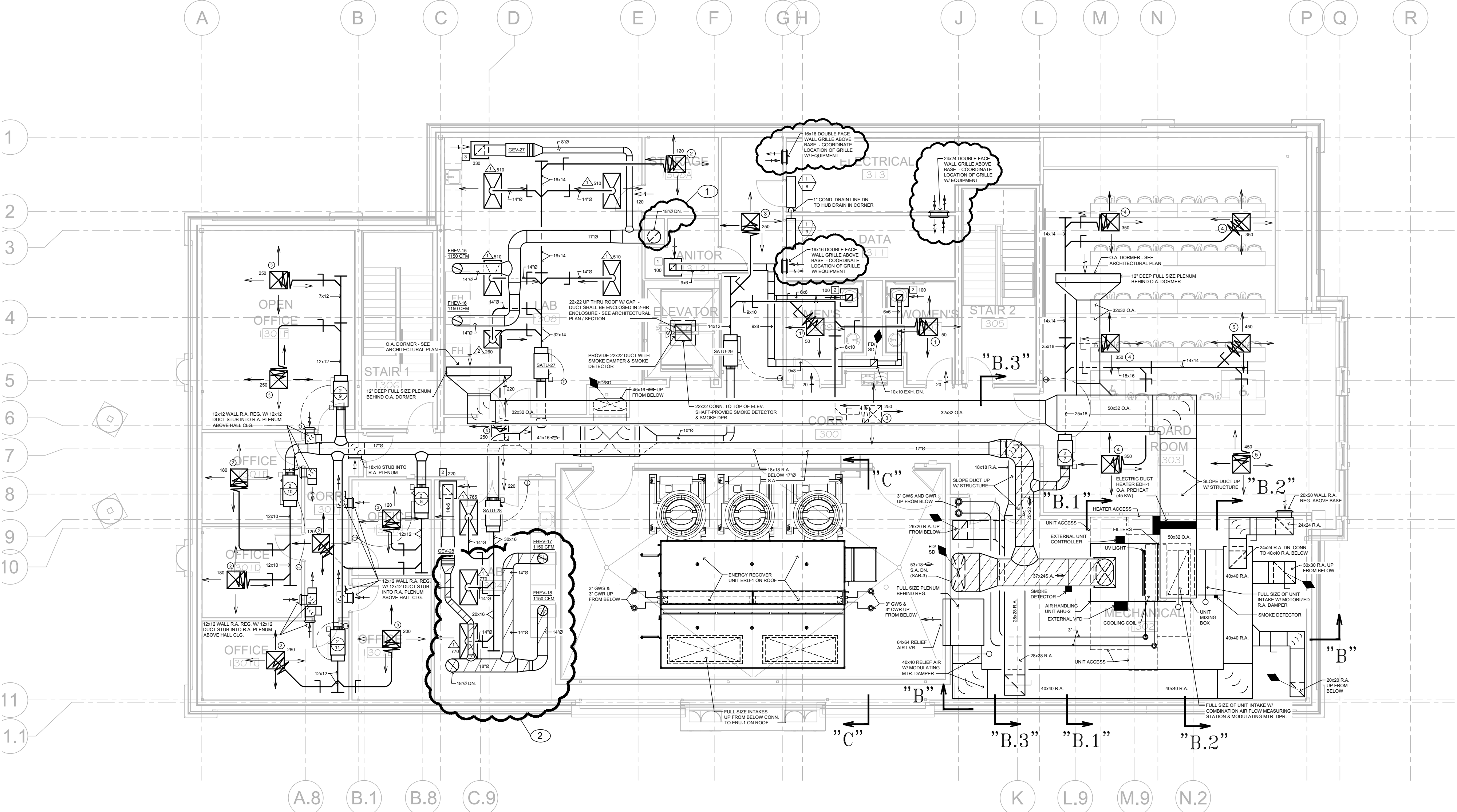
Professional Engineer
No. 23369
02.15.21
Z. EIRING

LEGEND

	CWS	CHILLED WATER SUPPLY		CEILING DIFFUSER DESIGNATOR
	CWR	CHILLED WATER RETURN		RETURN AIR GRILLE/REGISTER
	HWS	HOT WATER SUPPLY		EXHAUST AIR GRILLE/REGISTER
	HWR	HOT WATER RETURN		VAV TERMINAL UNIT DESIGNATOR AIR HANDLING UNIT SERVED BY TERMINAL UNIT NUMBER
		AUTOMATIC CHANGEOVER VALVE		
		ISOLATION / GATE VALVE		
		SQUARE HEAD BALANCING VALVE		DUCT W/ RECTANGULAR SIZE
		COMBINATION BALANCING VALVE AND FLOW METER		DUCT W/ FLAT OVAL SIZE
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		DENOTES LOCATION OF VERTICAL ACTION FIRE DAMPER		THERMOSTAT
		DENOTES LOCATION OF HORIZONTAL ACTION FIRE DAMPER		REMOTE TEMPERATURE SENSOR
		DENOTES LOCATION OF VERTICAL ACTION COMBINATION FIRE AND SMOKE DAMPER		HUMIDISTAT
		DENOTES LOCATION OF HORIZONTAL ACTION COMBINATION FIRE AND SMOKE DAMPER		CO2 SENSOR
		CEILING DIFFUSER		ABOVE FINISH FLOOR
		RETURN AIR GRILLE/REGISTER		CEILING DIFFUSER
		EXHAUST AIR GRILLE/REGISTER		CEILING OR COOLING CONNECT OR CONNECTION
				FIRE DAMPER
				GENERAL CONTRACTOR OUTSIDE AIR
				RETURN AIR
				SUPPLY AIR

GENERAL VAV NOTES (AHU-2 SYSTEM):

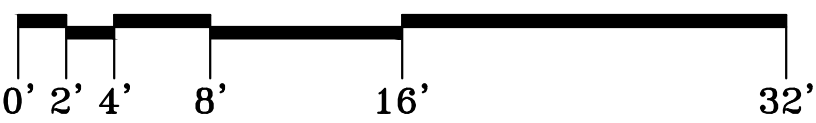
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OVERALL ATTIC HVAC PLAN

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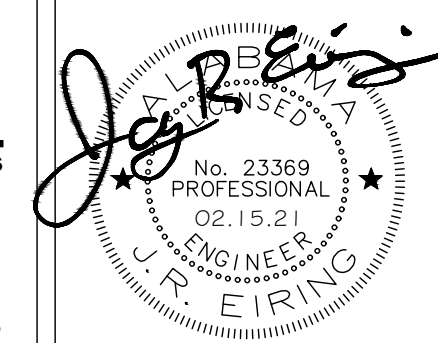
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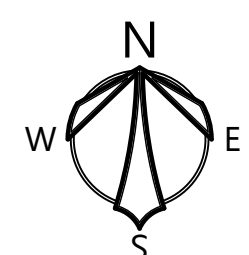
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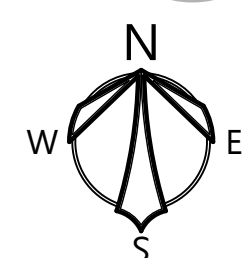
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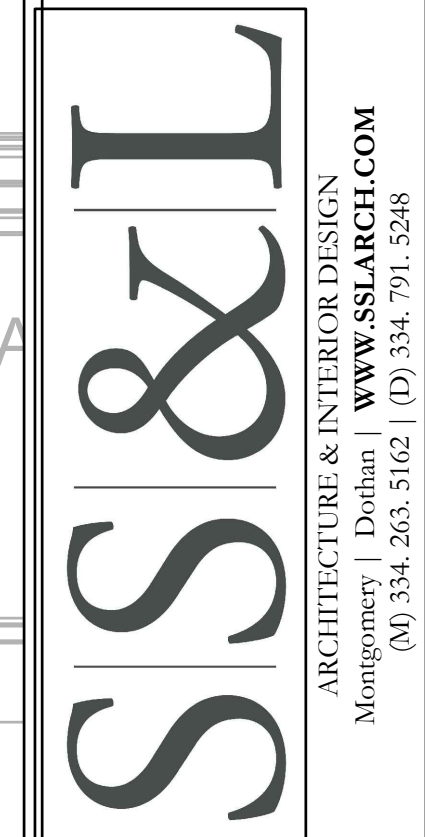




4



A step function graph on a coordinate plane. The x-axis is labeled with 0', 2', 4', 8', and 16'. The y-axis is labeled with 0, 1, 2, and 3. The function is defined by horizontal segments at y=0, y=1, y=2, and y=3 over various intervals of x.

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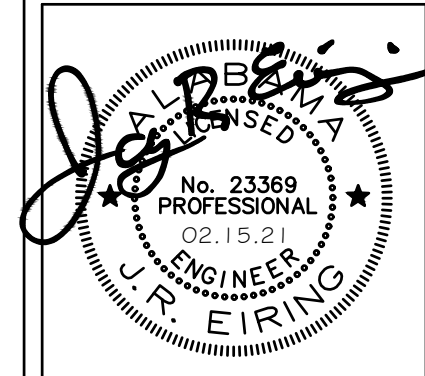
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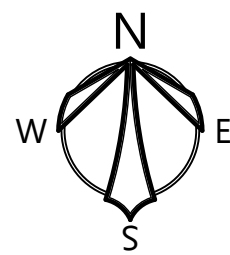
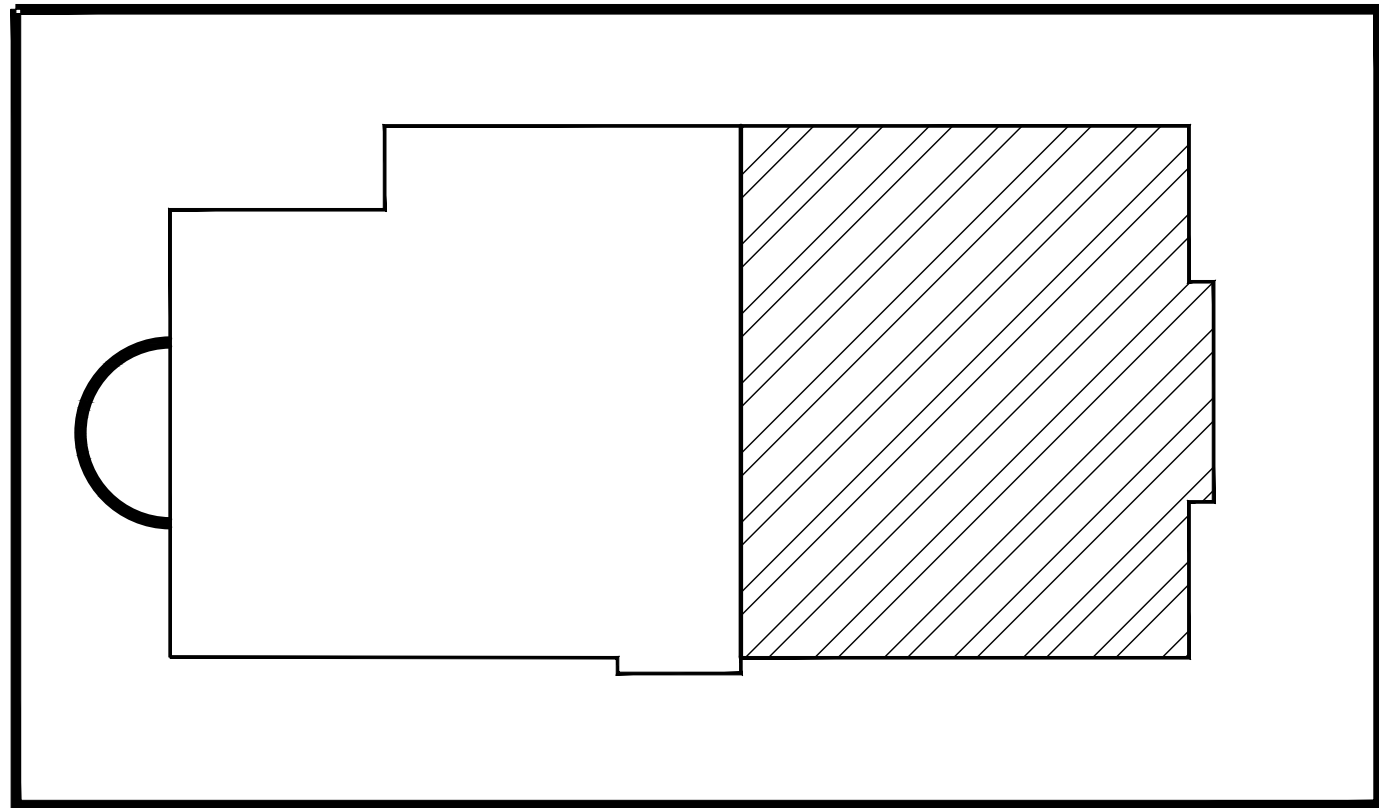
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4	PLAN

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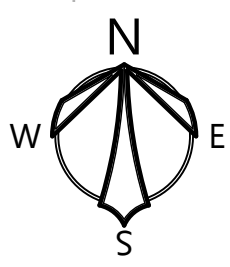
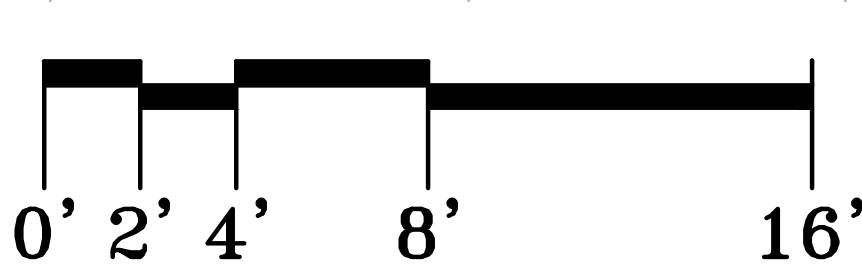
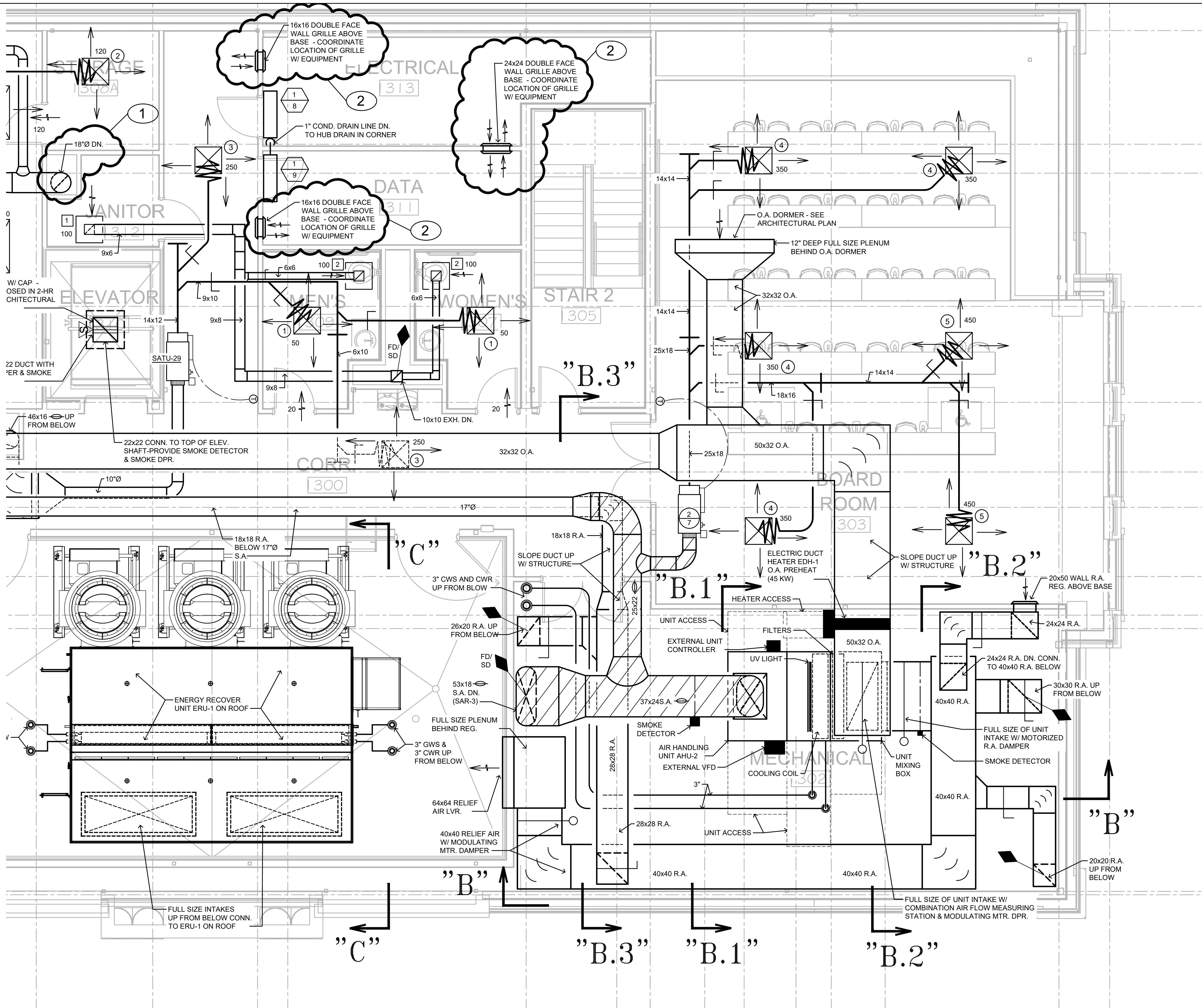
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PARTIAL ATTIC PLAN

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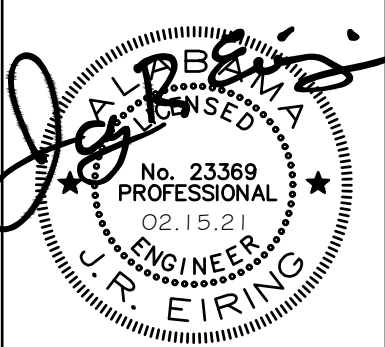
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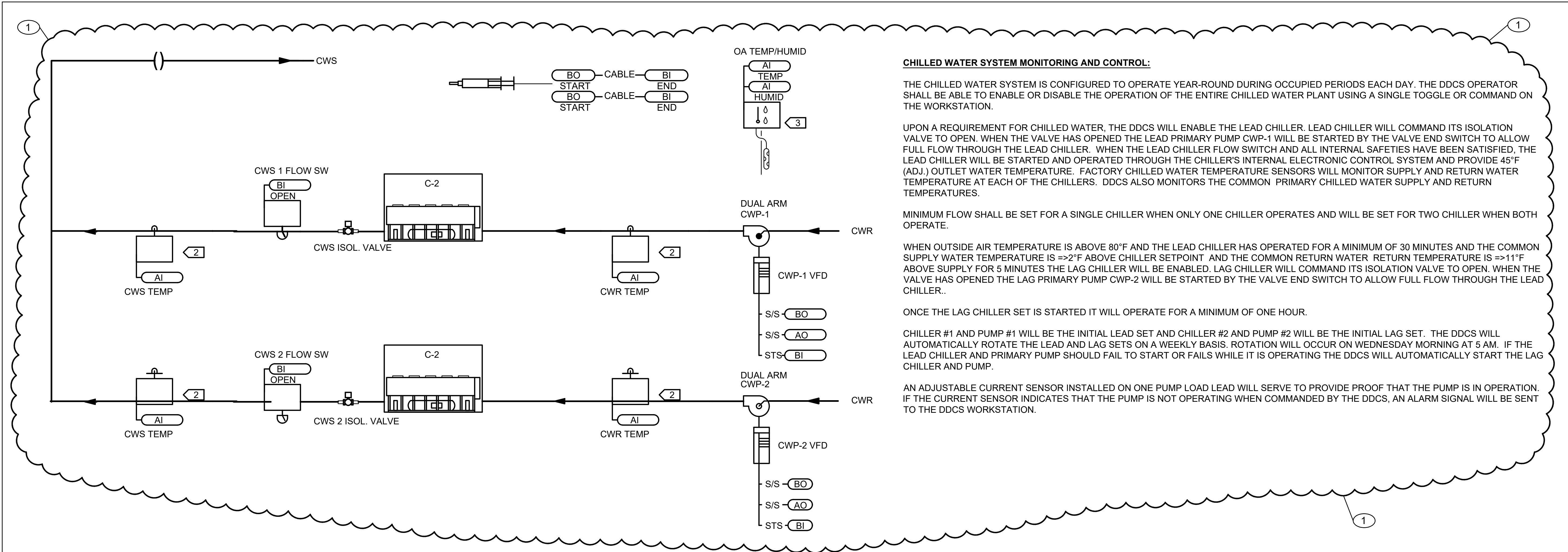
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CHILLED WATER PLANT CONTROLS SCHEMATIC, POINTS LIST AND SEQUENCE OF OPERATION

CHILLED WATER PLANT (C-1 AND C-2)

Sequence of Operation

SYSTEM GENERAL DESCRIPTION:

THE CHILLED WATER SYSTEM CONSISTS OF THE FOLLOWING:
TWO (2) CHILLERS, CONFIGURED AS: ONE (1) LEAD AND ONE (1) LAG
TWO (2) DEDICATED CONSTANT SPEED CHILLED WATER PUMPS. EACH PUMP ASSEMBLY CONSISTS OF (2) PUMPS WITH EACH HAVING A FACTORY INSTALLED VFD AND CONFIGURED AS BACK-UP IN CASE OF FAILURE
ONE (1) CHILLED WATER SUPPLY ISOLATION VALVE PER CHILLER
CHILLED WATER BYPASS VALVE

THE BUILDING AUTOMATION SYSTEM

(BAS) CONTROLLER PROVIDES STAND-ALONE CONTROL OR CONTROL FROM A HIGHER LEVEL BAS AND PROVIDES START/STOP CONTROL FOR THE CHILLED WATER PUMPS AND CONTROLS THE CHILLED WATER BYPASS VALVE TO MAINTAIN MINIMUM FLOW THROUGH OPERATING CHILLERS.

CHILLED WATER SYSTEM ENABLE/DISABLE:

THE CHILLED WATER SYSTEM SHALL BE ENABLED ON A CONTACT CLOSURE FROM ANY SYSTEM CHILLER.

WHEN ENABLED, THE BAS CONTROLLER SHALL START THAT CHILLERS ASSOCIATED CHILLED WATER PUMP.
AS ADDITIONAL CHILLER CALLS FOR ADDITIONAL CHILLED WATER, THE ASSOCIATED CHILLED WATER PUMP SHALL START.

WHEN THE CHILLED WATER SYSTEM IS DISABLED, THE CHILLED WATER PUMPS SHALL BE OFF UNLESS REQUESTED BY ONE OF THE CHILLERS.

CHILLED WATER PUMP START/STOP:

THE BAS CONTROLLER SHALL START A CHILLED WATER PUMP THROUGH A CONTACT CLOSURE OF THE PUMPS VARIABLE FREQUENCY DRIVE (VFD) RUN-ENABLE CONTACTS.

CHILLED WATER PUMP STATUS:

THE BAS CONTROLLER SHALL DETECT CHILLED WATER PUMP RUN STATUS BY A VFD CURRENT SWITCH.

CHILLED WATER PUMP FAILURE:

IF THE PUMP START/STOP RELAY IS ENABLED AND THE CURRENT SWITCH STATUS IS OFF FOR MORE THAN 30 SECONDS (ADJ.), THE BAS CONTROLLER SHALL ANNUNCIATE A CHILLED WATER PUMP FAILURE ALARM TO THE BAS AND THE BACK-UP PUMP SHALL START.. ONCE THE PROBLEM HAS BEEN CORRECTED, THE OPERATOR SHALL BE ABLE TO CLEAR THE ALARM FAILURE FROM THE BAS CONTROLLER CHILLED WATER CONTROL PANEL, FROM THE BAS OR BY MANUALLY OVERRIDING THE PUMP ON MOMENTARILY.

CHILLED WATER PUMP SPEED:

THE BAS CONTROLLER SHALL MONITOR THE CHILLED WATER SYSTEM DIFFERENTIAL PRESSURE SENSOR. WHEN THE PUMP VARIABLE FREQUENCY DRIVE IS ENABLED, THE BAS CONTROLLER SHALL CONTROL THE ANALOG SPEED SIGNAL THAT IS SENT TO THE PUMP VARIABLE FREQUENCY DRIVE TO MAINTAIN A CHILLED WATER DIFFERENTIAL PRESSURE SETPOINT OF 15.0 PSIG (ADJ.).

BYPASS VALVE CONTROL:

THE BAS CONTROLLER SHALL MONITOR THE EVAPORATOR DIFFERENTIAL PRESSURE OF THE CHILLERS. WHEN THE PRESSURE OF AN OPERATING CHILLER INDICATES A LOW PRESSURE (FLOW), THE BAS CONTROLLER SHALL CONTROL THE ANALOG SIGNAL THAT IS SENT TO THE BYPASS VALVE TO MAINTAIN MINIMUM PRESSURE (FLOW) ON ALL OPERATING CHILLERS.

MISCELLANEOUS:

1. REFER TO THE CHILLER SPECIFICATION FOR ADDITIONAL CONTROLS REQUIREMENTS.

2. CHILLER C-1, ITS RELATED PUMP(S) AND CONTROLS SHALL OPERATE WITH THE EMERGENCY GENERATOR AS SHOWN ON THE ELECTRICAL PLANS. CHILLER C-2, ITS RELATED PUMP(S) AND CONTROLS WILL NOT OPERATE WITH THE EMERGENCY GENERATOR. REFER TO THE ELECTRICAL PLANS AND COORDINATE AS REQUIRED.

CHILLED WATER SYSTEM MONITORING AND CONTROL:

THE CHILLED WATER SYSTEM IS CONFIGURED TO OPERATE YEAR-ROUND DURING OCCUPIED PERIODS EACH DAY. THE DDCS OPERATOR SHALL BE ABLE TO ENABLE OR DISABLE THE OPERATION OF THE ENTIRE CHILLED WATER PLANT USING A SINGLE TOGGLE OR COMMAND ON THE WORKSTATION.

UPON A REQUIREMENT FOR CHILLED WATER, THE DDCS WILL ENABLE THE LEAD CHILLER. LEAD CHILLER WILL COMMAND ITS ISOLATION VALVE TO OPEN. WHEN THE VALVE HAS OPENED THE LEAD PRIMARY PUMP CWP-1 WILL BE STARTED BY THE VALVE END SWITCH TO ALLOW FULL FLOW THROUGH THE LEAD CHILLER. WHEN THE LEAD CHILLER FLOW SWITCH AND ALL INTERNAL SAFETIES HAVE BEEN SATISFIED, THE LEAD CHILLER WILL BE STARTED AND OPERATED THROUGH THE CHILLER'S INTERNAL ELECTRONIC CONTROL SYSTEM AND PROVIDE 45°F (ADJ.) OUTLET WATER TEMPERATURE. FACTORY CHILLED WATER TEMPERATURE SENSORS WILL MONITOR SUPPLY AND RETURN WATER TEMPERATURE AT EACH OF THE CHILLERS. DDCS ALSO MONITORS THE COMMON PRIMARY CHILLED WATER SUPPLY AND RETURN TEMPERATURES.

MINIMUM FLOW SHALL BE SET FOR A SINGLE CHILLER WHEN ONLY ONE CHILLER OPERATES AND WILL BE SET FOR TWO CHILLER WHEN BOTH OPERATE.

WHEN OUTSIDE AIR TEMPERATURE IS ABOVE 80°F AND THE LEAD CHILLER HAS OPERATED FOR A MINIMUM OF 30 MINUTES AND THE COMMON SUPPLY WATER TEMPERATURE IS =>2°F ABOVE CHILLER SETPOINT AND THE COMMON RETURN WATER RETURN TEMPERATURE IS =>11°F ABOVE SUPPLY FOR 5 MINUTES THE LAG CHILLER WILL BE ENABLED. LAG CHILLER WILL COMMAND ITS ISOLATION VALVE TO OPEN. WHEN THE VALVE HAS OPENED THE LAG PRIMARY PUMP CWP-2 WILL BE STARTED BY THE VALVE END SWITCH TO ALLOW FULL FLOW THROUGH THE LEAD CHILLER..

ONCE THE LAG CHILLER SET IS STARTED IT WILL OPERATE FOR A MINIMUM OF ONE HOUR.

CHILLER #1 AND PUMP #1 WILL BE THE INITIAL LEAD SET AND CHILLER #2 AND PUMP #2 WILL BE THE INITIAL LAG SET. THE DDCS WILL AUTOMATICALLY ROTATE THE LEAD AND LAG SETS ON A WEEKLY BASIS. ROTATION WILL OCCUR ON WEDNESDAY MORNING AT 5 AM. IF THE LEAD CHILLER AND PRIMARY PUMP SHOULD FAIL TO START OR FAILS WHILE IT IS OPERATING THE DDCS WILL AUTOMATICALLY START THE LAG CHILLER AND PUMP.

AN ADJUSTABLE CURRENT SENSOR INSTALLED ON ONE PUMP LOAD LEAD WILL SERVE TO PROVIDE PROOF THAT THE PUMP IS IN OPERATION. IF THE CURRENT SENSOR INDICATES THAT THE PUMP IS NOT OPERATING WHEN COMMANDED BY THE DDCS, AN ALARM SIGNAL WILL BE SENT TO THE DDCS WORKSTATION.

		POINT TYPE							ALARMS								
SYSTEM POINT DESCRIPTION																DIAGNOSTICS	NOTES
CHILLED WATER PLANT		GRAPHIC	HARDWARE INPUT	HARWARE OUTPUT	SOFTWARE POINT	HARDWARE INTERLK	WIRELESS	NETWORK	DEFAULT VALUE	HIGH ANALOG LIMIT	LOW ANALOG LIMIT	BINARY	LATCH DIAGNOSTIC	SENSOR FAIL	COMMUNICATION FAIL		
CHILLED WATER RETURN TEMPERATURE		X	AI							X	X						NOTE 1
CHILLED WATER SUPPLY TEMPERATURE		X	AI							X	X						NOTE 1
CHILLER 1 EVAPORATOR WATER DIFFERENTIAL PRESSURE		X	AI							X	X						NOTE 1
CHILLER 2 EVAPORATOR WATER DIFFERENTIAL PRESSURE		X	AI							X	X						NOTE 1
OUTDOOR AIR RELATIVE HUMIDITY LOCAL		X	AI											X		SENSOR FAILURE	NOTE 1, 2
OUTDOOR AIR TEMPERATURE LOCAL		X	AI											X		SENSOR FAILURE	NOTE 1, 2
SYSTEM CHILLED WATER DIFFERENTIAL PRESSURE		X	AI							X	X						NOTE 1
CHILLED WATER PUMP 1 STATUS		X	BI									X				PUMP FAILURE	NOTE 1
CHILLED WATER PUMP 2 STATUS		X	BI									X				PUMP FAILURE	NOTE 1
CHILLER 1 CHILLED WATER FLOW STATUS OPEN			BI														NOTE 1
CHILLER 1 CHILLED WATER PUMP REQUEST IN			BI														
CHILLER 2 CHILLED WATER FLOW STATUS OPEN			BI														NOTE 1
CHILLER 2 CHILLED WATER PUMP REQUEST IN			BI														
CHILLED WATER BYPASS VALVE OUTPUT		X		AO													
CHILLED WATER PUMP 1 VFD SPEED OUTPUT		X		AO													NOTE 1
CHILLED WATER PUMP 2 VFD SPEED OUTPUT		X		AO													NOTE 1
CHILLED WATER PUMP 1 START STOP OUTPUT		X		BO													NOTE 1
CHILLED WATER PUMP 2 START STOP OUTPUT		X		BO													NOTE 1
CHILLER 1 CHILLED WATER PUMP REQUEST OUT				BO													NOTE 1
CHILLER 2 CHILLED WATER PUMP REQUEST OUT				BO													NOTE 1
AUXILLIARY DRAIN PAN OVER SERVER ROOM		X	BI									X				WATER DETECTION	NOTE 1
GENERAL NOTES																	
		1. DISPLAYED AT THE BAS USER INTERFACE															
		2. MAY BE A COMMUNICATED VALUE															

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Checked By	TZ

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	TROY UNIVERSITY TROY, AL

Sheet Title	HVAC CONTROLS
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Sheet Number	M6.1
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