BISMARCK PUBLIC SCHOOLS

Myhre Elementary School Air Handler Replacement 919 South 12th Street, Bismarck, North Dakota 58504

PROJECT LOCATION

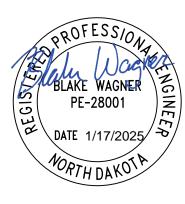


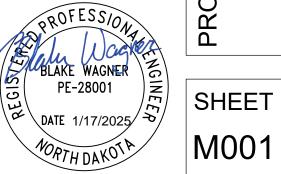


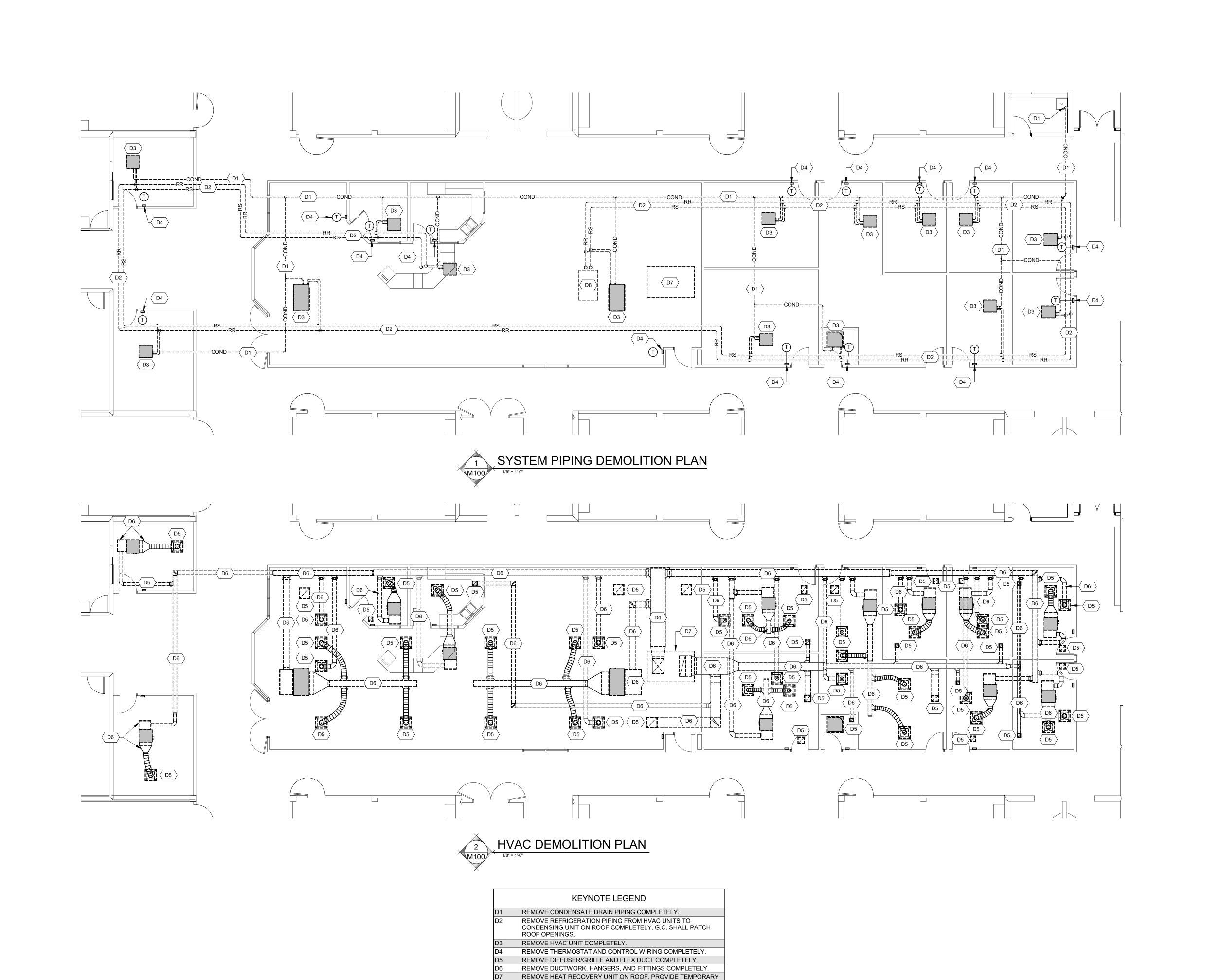
DRAWING INDEX

1001	PROJECT TITLE SHEET
1100	MECHANICAL DEMOLITION PLANS
1200	MECHANICAL REMODEL PLANS
100	ELECTRICAL DETAILS

E101 EXISTING CONDITIONS E200 ELECTRICAL PLAN







COVERING OVER ROOF CURB, SEAL WEATHERTIGHT. REMOVE OUTDOOR CONDENSING UNIT ON ROOF.

ND STATE BUILDING CODES DATE 01/17/202 (IBC) 2021 INTERNATIONAL BUILDING (IRC) 2021 INTERNATIONAL RESIDENTIAL CODE (IMC) 2021 INTERNATIONAL MECHANICAL CODE (IFGC) 2021 INTERNATIONAL FUEL GAS (IECC) 2021 INTERNATIONAL ENERGY CONSERVATION CODE (IEBC) | 2021 INTERNATIONAL EXISTING **BUILDING CODE** (UPC) 2018 NORTH DAKOTA PLUMBING CODE

PIPING LEGEND								
—COND—	CONDENSATE DRAIN							
RS	REFRIGERANT SUPPLY							
——RR——	REFRIGERANT RETURN							
\boxtimes	CONNECT TO EXISTING							

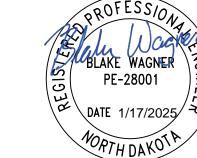
PIF	PING VALVE & ACCESSORY LEGEND	. Si
ı	BALL VALVE	Prairie Engineering P.C.
ાર્	BALL VALVE	DC ing Er
ı•∎	BALL VALVE INDICATOR	Original Prince of the Consult
	BUTTERFLY VALVE	e ne
巫	GATE VALVE	airi Igi Tgi
耳	VENTURI	
7	CHECK VALVE	
ЖD	2-WAY HYDRONIC CONTROL VALVE	
阳	2-WAY DOMESTIC CONTROL VALVE	
X	3-WAY CONTROL VALVE	
Lą	DRAIN VALVE	
\searrow	STRAINER	
₽	MANUAL AIR VENT	
	AUTO AIR VENT	
j	TEMPERATURE GAUGE	ent
0	PRESSURE GAUGE	olS placement 58504
- - -	SENSOR	
\bowtie	CIRCUIT SOLVER	ho(
1 1	UNION	Scandle
	LINE TYPE LEGEND EXISTING NEW	Bismarck Public Schoce e Elementary School Air Handler Resolt Street, Bismarck, ND
	DEMOVE.	9 Z

LINE TY	PE LEGEND
	EXISTING
	NEW
	REMOVE
	HIDDEN
	MATCHLINE

PROJECT DESIGN CONDITIONS BISMARCK, NORTH DAKOTA									
DIGIVIA	u (Ci (, IVOI	THUM	OIA					
		SUMMER WINTER							
	DB	WB	DEW PT.	DB					
OUTDOOR	91°F 69°F N/A -20								
INDOOR	75°F	N/A	55°F	72°F					

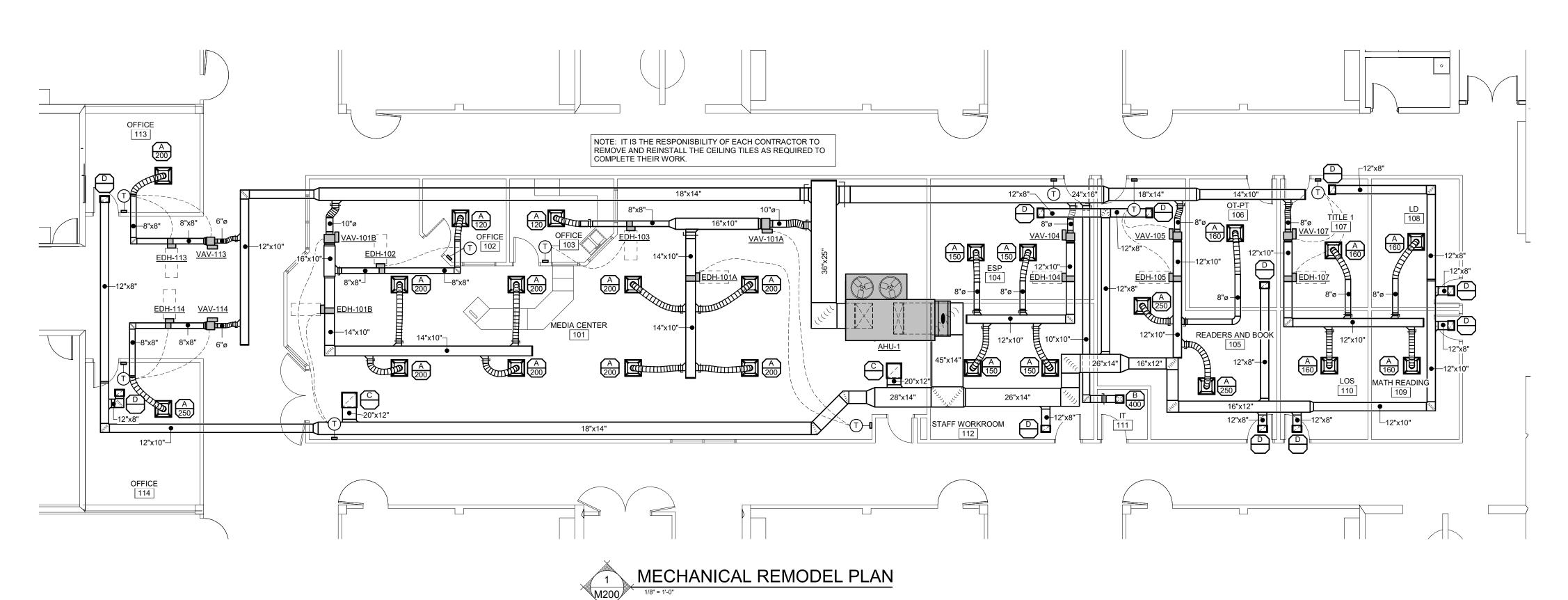
MECHANICAL I PLANS

SHEET



1, 3, 4, 5

SHEET



SCHEDULE NOTES:

HANGER ── VOLUME DAMPER AND HETO (SEE DETAIL) DRAWBAND-FLEXIBLE DUCT-DRAWBAND--RIGID ROUND DUCT SUPPLY DIFFUSER-SUPPLY AIR DUCT TYPICAL DIFFUSER CONNECTIONS 233700 - AIR TERMINAL SCHEDULE

SIZE NECK DIA.

N/A

FINISH FRAME MOUNT

B12 T-BAR T-BAR

T-BAR

B12 T-BAR T-BAR 1, 3, 4, 5

T-BAR

HIGH EFFICIENCY TAKE OFF

EXTERIOR INSULATION WRAP -REDUCER

OF INLET

RECTANGULAR TO ROUND HI-EFFICIENCY— TAKE-OFF (HETO) /

1. M.C. TO PROVIDE SHEET METAL TRANSITION FROM DUCT TO GRILLE AS REQUIRED.

LESS THAN 2 FT FLEX DUCT TO
CORRECT MINOR MISALIGNMENT
OF RUNOUT.

VAV BOX DUCT DETAIL

-INSULATION

VAV BOX

238000 - AIR HANDLING UNIT

1. PROVIDE CURB ADAPTER. DIMENSIONS OF ORIGINAL CURB ARE TO BE FIELD VERIFIED PRIOR TO CONSTRUCTION.

2. PROVIDE REMOTE MOUNTED CONTROLLER WITH GRAPHIC USER INTERFACE. WIRING BY M.C. LOCATE PER PLANS.

3. PROVIDE THERMALLY BROKEN DOUBLE WALL CONSTRUCTION WITH R13 INSULATION.

4. PROVIDE 2" PLEATED MERV 8 FILTERS PLUS THREE SPARE SETS.

5. INCLUDE DOORS ON THE FOLLOWING SECTIONS: FAN, FILTER, CONTROL PANEL, HEAT VESTIBULE.

6. SUPPLY AND RETURN AIR CONNECTIONS TO BE ON BOTTOM OF UNIT.

7. PROVIDE UNIT WITH ENERGY RECOVERY.

MARK	MANUFACTURER	MODEL		U		NOTES						
IVIARK		NUFACTURER MODEL	ELEC.	SUPPLY CFM	COOLING CAP.	EER	IEER	LENGTH	WIDTH	HEIGHT	WEIGHT	NOTES
AHU-1	AAON	RNA-011	208/3/60	4600	122,000	12.94	15.78	150 in	95 in	50 in	2251#	ALL

238000 - AIR HANDLING UNIT - FAN

1. PROVIDE FAN WITH MANUFACTURER MOUNTED AND WIRED VFD.

2. SUPPLY FAN TO BE 22" DIRECT DRIVE BACKWARD CURVED, ALUMINUM MATERIAL. 3. RETURN FAN TO BE 22" DIRECT DRIVE BACKWARD CURVED, ALUMINUM MATERIAL.

	MARK	SUPPLY FAN						EXHAUST FAN					NOTES
	IVIAINN	QTY	CFM	FRESH AIR	TSP	BHP (EA)	HP (EA)	QTY	CFM	TSP	BHP (EA)	HP (EA)	NOTES
	AHU-1	1	4600	1380	2.5 inH2O	4.04	5.00	1	4600	1.99 inH2O	2.35	3.00	1, 2, 3

238000 - AIR HANDLING UNIT - DAMPERS
NOTES:
1. ACTUATORS PROVIDED BY RTU MANUFACTURER SHALL BE WIRED TO
TERMINAL STRIP FOR CONTROL BY DIV 230900. COORDINATE BETWEEN
MFR AND DIV 230900 DURING SHOP DRAWING PHASE.

MARK	APPLICATION	CONTROL	ACTUATOR BY:	NOTES
AHU-1	OUTDOOR	DDC	RTU MFR	1
	RETURN	DDC	RTU MFR	1
	EXHAUST	BAROMETRIC	RTU MFR	1

238000 - AIR HANDLING UNIT - COILS											
MARK	MODEL	COOLING									
IVIARK	MODEL	SENSIBLE	TOTAL CAP	EAT (DB/WB)	LAT (DB/WB)	STAGES					
AHU-1 RNA-011 107,100 122,000 76.1°F/62.5°F 54.5°F/53.2°F VARIABLE											

ES	2	238000 - AIR HANDLING UNIT - ELECTRICAL											
	NOTES: 1. PROVIDE	NOTES: 1. PROVIDE FOR SINGLE POINT POWER. MARK ELECTRICAL NOTES											
	MADIC												
	IVIARK												
	AHU-1	AHU-1 35 KAIC 68 80 208 3 60 1											
		•	•	•	•								

1. MAKE PROVISIONS TO ADD HOT WATER REHEAT COIL IN THE FUTURE.

233000 - VAV SCHEDULE

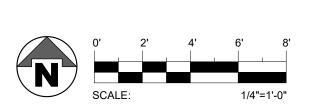
MARK	MANUICACTUDED	MODEL	SIZE			NC LE	NOTES			
IVIARK	MANUFACTURER	MODEL		CLG. MAX	CLG. MIN	HEATING	APD	RAD	DISCH.	NOTES
VAV-101A	TITUS	DESV	9	920	828	368	0.25	23	28	1
VAV-101B	TITUS	DESV	9	920	828	368	0.25	23	28	1
VAV-104	TITUS	DESV	7	600	540	240	0.25	24	28	1
VAV-105	TITUS	DESV	8	660	594	264	0.25	24	29	1
VAV-107	TITUS	DESV	7	640	576	256	0.25	25	28	1
VAV-113	TITUS	DESV	5	200	180	80	0.25	18	29	1
VAV-114	TITUS	DESV	6	250	225	100	0.25	17	24	1
	-		•				•			

AIRFLOW					NC LEVELS		3. RECTANGULAR/SQUARE DIFFUSER/GRILLE.									
_G. MAX	CLG. MIN	HEATING	APD	RAD	DISCH.	NOTES	4. PAINT BLACK INSIDE DUCT SURFACE ABOVE REGISTER.									
920	828	368	0.25	23	28	1		5. SING	SLE DEFLECTION.							
920	828	368	0.25	23	28	1		*CONTRACTOR TO VERIFY CEILING TYPES PRIOR TO ORDERING								
600	540	240	0.25	24	28	1		TAC	MANUEACTURE	MODEL	FUNCTION	DIMEN	ISIONS			
660	594	264	0.25	24	29	1		TAG	MANUFACTURER	MODEL	FUNCTION	SIZE	NECK DIA			
640	576	256	0.25	25	28	1		Α	PRICE	SPD	SUPPLY	24"x24"	8"Ø			
200	180	80	0.25	18	29	1		В	PRICE	530	RETURN	20"x20"	N/A			
250	225	100	0.25	17	24	1		С	PRICE	530	RETURN	12"x8"	N/A			

SCHEDULE NOTES:

2. PLAQUE TYPE DIFFUSER.

238000 - ELECTRIC DUCT HEATER SCHEDULE														
NOTES:														
1. PROVIDE BO	TTOM ACCESS.													
DUCT SIZE AIR FLOW HEATING ELEMENT ELECTRICAL														
MARK	MANUFACTURER	MODEL			_		1							NOTES
			HEIGHT	WIDTH	FLOW	VELOCITY	EAT	LAT	KW	STAGES	VOLT	Ph	Hz	
EDH-101A	INDEECO	QUA	14	10	320	329	67	82	1.5	SCR	120	1	60	1
EDH-101B	INDEECO	QUA	14	10	320	329	67	82	1.5	SCR	120	1	60	1
EDH-102	INDEECO	QUA	8	8	48	108	67	100	0.5	SCR	120	1	60	1
EDH-103	INDEECO	QUA	8	8	48	108	67	100	0.5	SCR	120	1	60	1
EDH-104	INDEECO	QUA	12	10	240	288	67	80	1	SCR	120	1	60	1
EDH-105	INDEECO	QUA	12	10	264	317	67	79	1	SCR	120	1	60	1
EDH-107	INDEECO	QUA	12	10	256	307	67	79	1	SCR	120	1	60	1
EDH-113	INDEECO	QUA	8	8	80	180	67	87	0.5	SCR	120	1	60	1
EDH-114	INDEECO	QUA	8	8	100	225	67	83	0.5	SCR	120	1	60	1
	1	1	<u> </u>	1			'	1				1	·	



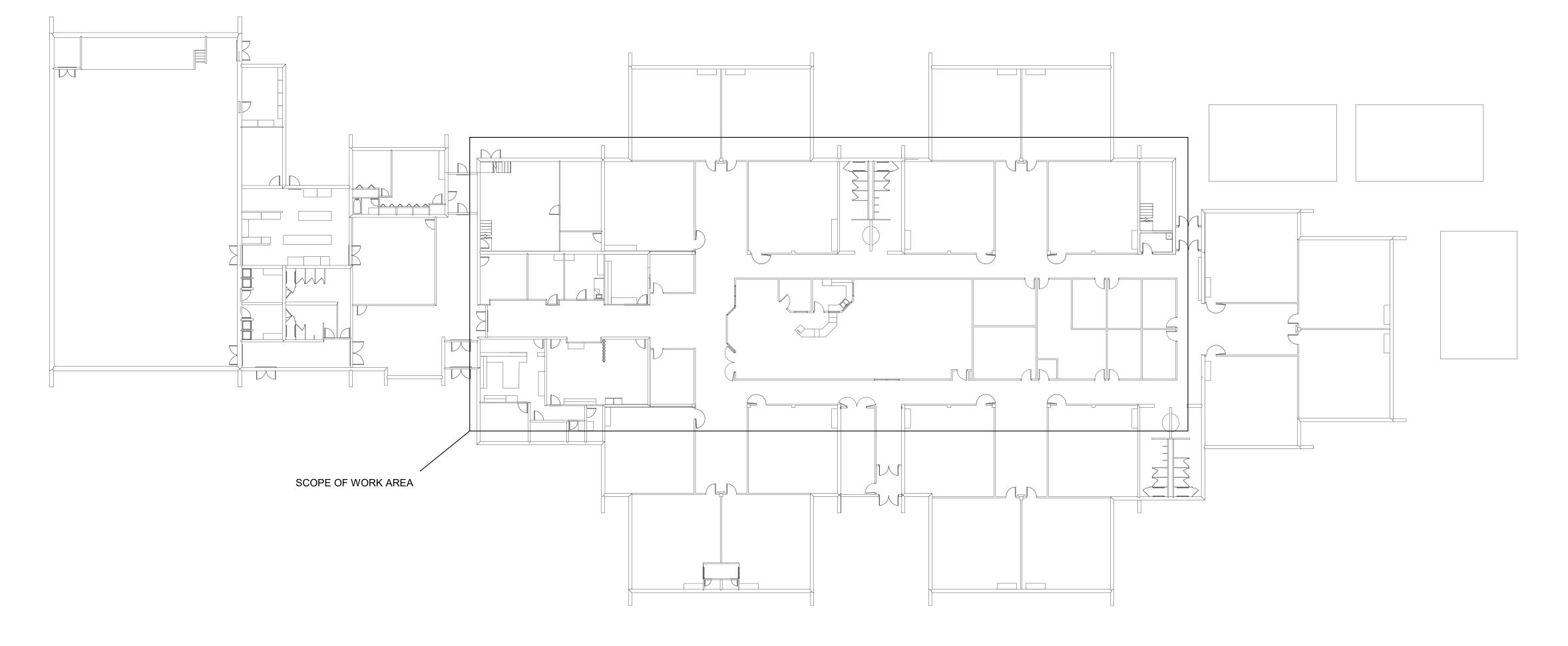
STANDARD ELECTRICAL SYMBOLS

BASED ON ANSI Y32.9-1972, ANSI A117.1-1986, AND FEDERAL REGISTER 56-144(ADA)

SYMBOL	DESCRIPTION	MTG. HT.
	RECEPTACLE OUTLETS	W113.111.
\bigoplus^{1}	SINGLE. CKT 1	18"
$\stackrel{\circ}{\oplus}$	DUPLEX	18"
\ominus	DUPLEX - SPLIT WIRED	18"
\ominus	DUPLEX - GROUND FAULT CIRCUIT INTERRUPTER	18"
\ominus	DUPLEX - EMERGENCY	18"
=	DOUBLE DUPLEX	
\bigcirc A	SPECIAL CONFIGURATION. DESIGNATION REFERS TO SCHEDULE	SCHEDULED
18	MILET OUTS ET ACCEMBLY, ARRONG EVITEVIDITO LIBRIT OF DICTALLATION	
Ψ	MULTI-OUTLET ASSEMBLY. ARROWS EXTEND TO LIMIT OF INSTALLATION. SUBSCRIPT INDICATES SPACING OF OUTLETS	
-©	CLOCK RECEPTACLE	82"
\odot	DUPLEX RECEPTACLE - FLOOR BOX	
	SWITCH OUTLETS	
\$	SINGLE POLE	46"
\$ 2	DOUBLE POLE	46"
\$ \$ 2 \$ 3 \$ 4	THREE-WAY	46"
Ψ 3 ¢	FOUR-WAY	46"
³ 4		40
\$ _K	KEY OPERATED	
\$ _M	MOTOR - PROVIDE OVERLOAD UNIT AS REQ'D. TOGGLE ACCEPTABLE IF INTERNAL THERMAL PROTECTION INCLUDED. SWITCH NOT REQ'D IF MOTOR ASSEMBLY HAS INTEGRAL DISCONNECTING MEANS.	
	MISCELLANEOUS	
1	PLAN OR DETAIL NOTE	
	SPECIAL PURPOSE CONNECTION - AS REQUIRED BY EQUIPMENT MANUFACTURER. CO-ORDINATE ROUGH-IN WITH SHOP DWG.	
	BRANCH CIRCUIT PANELBOARD, SHADING INDICATES NEW PANEL	TOP 75"
	CONTROL PANEL	
	EXTERNALLY OPERATED DISCONNECT SWITCH	
	CONTROLLER OR RELAY	
\bowtie	COMBINATION CONTROLLER AND DISCONNECTION MEANS	
1	MOTOR. DESIGNATION REFERS TO SCHEDULE.	
2	EQUIPMENT DESIGNATION. SEE SCHEDULE.	
ВВ-1	ELECTRIC HEAT TO SCALE. DESIGNATION REFERS TO SCHEDULE. "T" INDICATES INTEGRAL THERMOSTAT.	
$^{\textcircled{T}}_{ ext{E}}$	THERMOSTAT-PROVIDED BY DIV. 26	46"
T	THERMOSTAT-FURNISHED BY DIV. 23, INSTALLED BY DIV. 26	46"
		-
\oplus	HUMIDISTAT-FURNISHED BY DIV. 23, INSTALLED BY DIV. 26	46"
P	POTENTIOMETER-FURNISHED BY DIV. 23, INSTALLED BY DIV. 26	46"
$T_{\mathbf{S}}$	TIME SWITCH	
$P_{\mathbf{S}}$	PHOTOELECTRIC SWITCH	
	CIRCUITING	
# <<	HOME RUN. MIN 3/4" C. ARROWS AND SUBSCRIPTS INDICATE NUMBER AND IDENTIFICATION OF CIRCUITS.	
\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\	CONTROL WIRE. SEE SPECIFICATION SECTION 260536	
	EMERGENCY. MIN 1/2" C-#10 AWG.	
$T \sim$	TELEPHONE. MIN 3/4"C, HOME RUN TO TERMINAL BOARD	
T	TELEPHONE. MIN 3/4"C, STUB INTO CEILING SPACE	
LV		
	LOW VOLTAGE. MIN 1/2"C-#14 AWG AS REQ'D.	
FA	SPECIAL SYSTEMS. MIN 3/4°C. PROVIDE CONDUCTORS AS REQ'D BY MANUFACTURER. SUBSCRIPT INDICATES SYSTEM. SEE STANDARD ABBREVIATIONS.	
	FIRE ALARM SYSTEMS	
1 \square_{P}	DETECTOR. SUPERSCRIPT INDICATES ZONE. SUBSCRIPT DESCRIBES INITIATION: D-DUCT, R-RATE OF RISE THERMAL, F-FIXED TEMPERATURE THERMAL, I-	CEILING
	IONIZATION, P-PHOTO- ELECTRIC, CO-CARBON-MONOXIDE, PCO-COMBO PHOTO- ELECTRIC/CARBON-MONOXIDE.	
С	CHIME	88"
D	MAGNETIC DOOR HOLDER	
F	FAN RELAY	
	FLOW SWITCH	
	MANUAL STATION	46"
FS	MILLOTE STATION	70
F _S	AUDIDLE ALADM NOTIFICATION ARRIVANCE (HORNE	0.0"
F _S M A	AUDIBLE ALARM NOTIFICATION APPLIANCE (HORN)	88"
F _S M A V	AUDIBLE ALARM NOTIFICATION APPLIANCE (HORN) VISUAL ALARM NOTIFICATION APPLIANCE	88"
Fs M		

STANDARD ABBREVIATIONS

	STANDARD ABBRE	√IATIONS	
AC	ABOVE COUNTER (MIN 4" ABOVE BACKSPLASH)	LV	
AFF	ABOVE FINISHED FLOOR	MC	
AFG	ABOVE FINISHED GRADE	MCA	
ATC	AUTOMATIC TEMPERATURE CONTROL	MCB	
BOF	BOTTOM OF FIXTURE	MLO	
CKT	CIRCUIT	NC	
DT	DUST TIGHT	NFDS	
DTR		NR	
EC		PA	
EGC	EQUIPMENT GROUNDING CONDUCTOR	RGSC	
EM	EMERGENCY	RT	
EP		S	SECURITY
	ELECTRIC WATER COOLER	SD	
	ELECTRIC WATER HEATER	SS	
F	FUSED	SW	
FA		T	
FACP		TOP	
FARA	FIRE ALARM REMOTE ANNUNCIATOR	TSSW	
FDS		TTB	
FLA		U	USB COMBINATION RECEPTACLE
FVNR		VFD	
FVR	FULL VOLTAGE REVERSING	VT	
GRA	GENERATOR REMOTE ANNUNCIATOR	W	WALL MTG. (46" AFF)
IC	INTERCOM	WAP	WIRELESS ACCESS POINT
IG	ISOLATED GROUND	WP	
IL	INTERLOCK	WT	WATER TIGHT
		WM	WIREMOLD





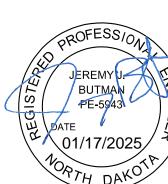


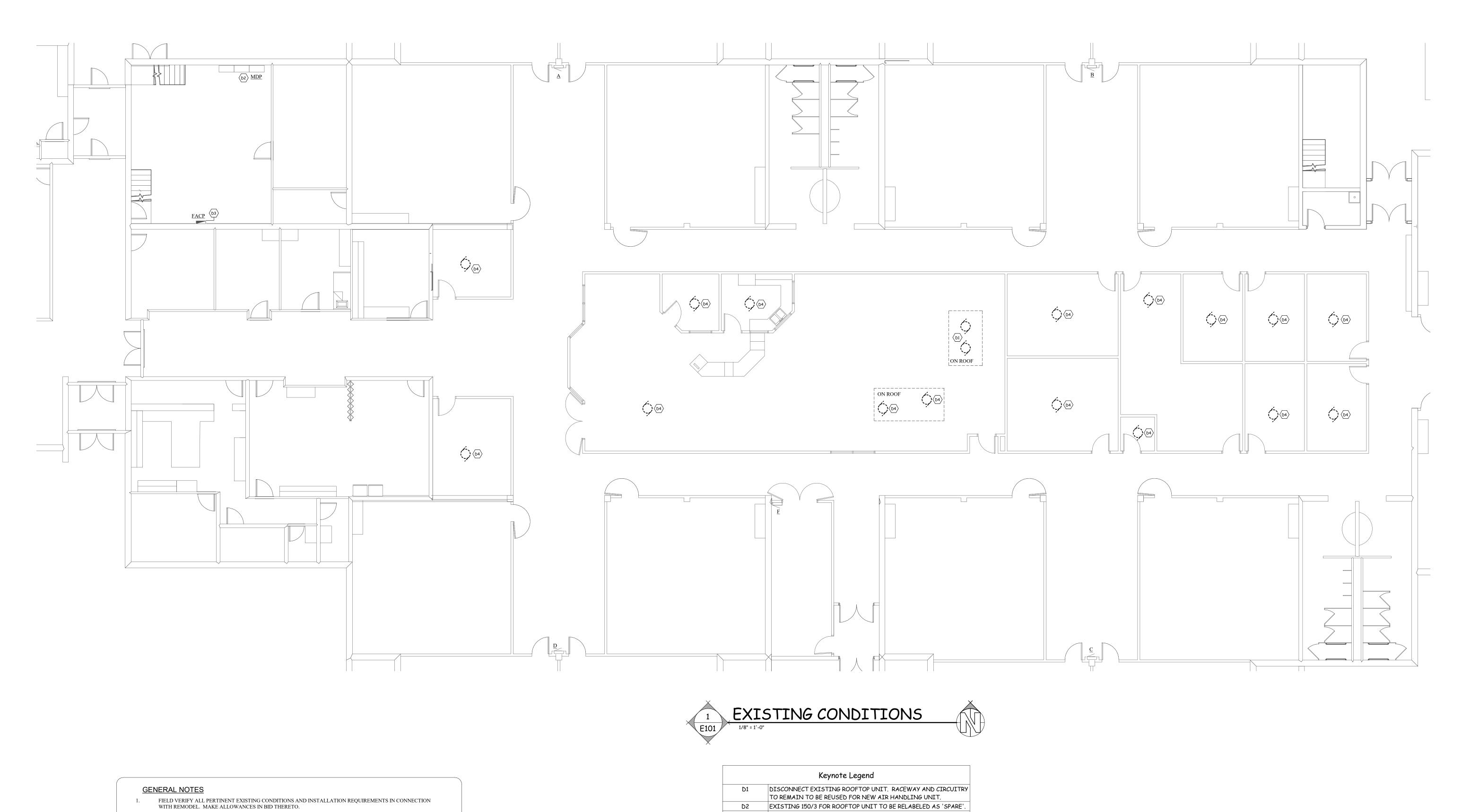
BMG JJB 24556

Prairie Engineering P.C. Professional Consulting Engineers









- DEVICES THAT ARE DASHED OR WITH SLASH THROUGH INDICATE SPECIFIC EXISTING DEVICES TO BE REMOVED.
- REMOVE OR RELOCATE ANY ELECTRICAL DEVICE REQUIRED BY REMODEL OPERATIONS. EXTEND EXISTING CIRCUITRY AS REQUIRED TO MAINTAIN DOWNSTREAM DEVICES OR FIXTURES. DISCONNECT AND REMOVE ANY EXISTING CIRCUITRY NOT BEING REUSED. RE-IDENTIFY EXISTING PANEL DIRECTORIES AS REQUIRED.
- 3. SEE SPECIFICATION 260510 FOR REMODEL.

- EXISTING FIRE ALARM CONTROL PANEL SHOWN FOR REFERENCE. PANEL IS SIEMENS FS-250.
- DISCONNECT EXISTING ROOM HEAT RECOVERY UNIT FOR REMOVAL BY MC.



EXISTING CONDITIONS



- A) "DOWNSTREAM OF THE AIR FILTERS AND AHEAD OF ANY BRANCH CONNECTIONS IN AIR SUPPLY SYSTEMS HAVING CAPACITY GREATER THAN 2000CFM (944 L/S)."
- B) "IN RETURN AIR DUCT OR PLENUM UPSTREAM OF ANY FILTERS AND EXHAUST AIR CONNECTIONS IN AIR RETURN SYSTEMS HAVING CAPACITY GREATER THAN 2000 CFM (944 L/S)." (IMC 606.2)
- C) "AT EACH STORY PRIOR TO THE CONNECTION TO A COMMON RETURN AND PRIOR TO ANY RECIRCULATION OR FRESH AIR INLET CONNECTION IN AIR RETURN SYSTEMS HAVING A CAPACITY GREATER THAN 15,000 CFM (7080 L/S) AND SERVING MORE THAN ONE STORY." (NFPA 90A 6.4.2 AND IMC 606.2)
- NOTE: PROVIDE QUANTITY AS REQUIRED BY DUCT GEOMETRY.
- 2. SMOKE SAMPLING TUBES TO SPAN ENTIRE DUCT.
- 3. TO STARTING EQUIPMENT AT AHU.
- 4. TO FIRE ALARM CONTROL PANEL. SEPERATE ZONE REQUIRED FOR EACH MOTOR.
- 5. MOUNT REMOTE FAN SHUTDOWN RELAYS NEAR CONTROLLER OR EQUIPMENT.
- 6. TO REMOTE ALARM INDICATOR/TEST STATION. LOCATE IN FINISHED CEILING IMMEDIATELY BELOW UNIT, OR ON VISIBLE WALL IN ASSOCIATED FAN ROOM.

NOTE: STATION NOT REQUIRED FOR ADDRESSABLE-TYPE DETECTORS.

7. IDENTIFY NOTE 1 AND NOTE 6 EQUIPMENT AS PER FOLLOWING EXAMPLE: AHU-1 SUPPLY, FACP ZONE 2. PROVIDE BLACK LAMINATED NAMEPLATE WITH WHITE LETTERS.





Keynote Legend

P1 NEW AHU-1 TO BE TERMINATED TO SPARE 100/3 BREAKER IN MDP. LABEL AS 'AHU-1'. EXISTING CIRCUITRY TO BE RE-USED. SPLICE AND EXTEND FEEDER AS REQUIRED.

P2 TERMINATE TO PANEL F. PROVIDE NEW 20/1 CIRCUIT BREAKER AS REQUIRED. EXISTING PANEL F IS CUTLER-HAMMER POW-R-LINE SERIES. TURN OVER REPLACED CIRCUIT BREAKERS TO THE OWNER.

						Electrical Fixt	ure Schedule			
			VOLTAG							
Desig.	Equipment Served	LOAD (HP OR MCA)	E	PHASE	Disconnect (BY EC)	Controller (BY EC)	Control Device By	Control Mounted BY	Control Furnished By	Comments
AHU-1	AIR HANDLING UNIT	68 MCA, F@80A	208 V	3	100/3 WP FDS	INTEGRAL	ATC	ATC		PROVIDE POWER MONITOR PER SPECIFICATION SECTION 262913. PROVIDE DUCT DETECTION PER SPECIFICATION SECTION 283111 AND DETAIL 2/E200.
EDH-101 <i>A</i>	ELECTRIC DUCT HEATER	1500W	120 V	1	INTEGRAL	INTEGRAL	ATC	ATC	ATC	
EDH-101B	ELECTRIC DUCT HEATER	1500W	120 V	1	INTEGRAL	INTEGRAL	ATC	ATC	ATC	
EDH-102	ELECTRIC DUCT HEATER	500W	120 V	1	INTEGRAL	INTEGRAL	ATC	ATC	ATC	
EDH-103	ELECTRIC DUCT HEATER	500W	120 V	1	INTEGRAL	INTEGRAL	ATC	ATC	ATC	
EDH-104	ELECTRIC DUCT HEATER	1000W	120 V	1	INTEGRAL	INTEGRAL	ATC	ATC	ATC	
EDH-105	ELECTRIC DUCT HEATER	1000W	120 V	1	INTEGRAL	INTEGRAL	ATC	ATC	ATC	
EDH-107	ELECTRIC DUCT HEATER	1000W	120 V	1	INTEGRAL	INTEGRAL	ATC	ATC	ATC	
EDH-113	ELECTRIC DUCT HEATER	500W	120 V	1	INTEGRAL	INTEGRAL	ATC	ATC	ATC	
EDH-114	ELECTRIC DUCT HEATER	500W	120 V	1	INTEGRAL	INTEGRAL	ATC	ATC	ATC	



