Γ	1		2	3	.	4	5	6	7		8	9
<u>PL</u>	UMBING ABBREVIATIONS					PLUMBING PIPING	SYMBOLS	GENERAL PLUMBI	ING SYMBOLS	PLUMBING VALVE	SYMBOLS	PLUMBING GENERAL
		H HB		PSIA	POUNDS PER SQUARE INCH ABSOLUTE		DOMESTIC COLD WATER, COLD WATER		DIRECTION OF PIPE PITCH (DOWN)		GENERIC VALVE (REF SPEC FOR TYPE)	A. ALL PIPING IN FINISHED ROC
AD	AREA DRAIN/ACCESS DOOR	HD	HUB DRAIN	PTRV	PRESSURE TEMPERATURE RELIEF VALVE		DOMESTIC HOT WATER, HOT WATER	—	DIRECTION OF FLOW		GENERIC VALVE WITH 3/4" HOSE ADAPTER	B REFER TO ARCHITECTURAL
AFF AFC	ABOVE FINISHED FLOOR ABOVE FINISHED GRADE	HP HR	HORSEPOWER HR	PW	POTABLE WATER		DOMESTIC HOT WATER RETURN	<u> </u>	GUIDE			SPACE. MINIMUM 18"X18" AC SUSPENDED CEILINGS FOR
A AG AS	AIR GAP AUTOMATIC SPRINKLER	HS HST	HAND SINK HOT WATER STORAGE TANK (DOMESTIC)	R RD	ROOF DRAIN	·MA	MEDICAL AIR	——————————————————————————————————————	ANCHOR		CHECK VALVE	CONTROLS, AND SO FORTH. FOR BEST ACCESS. REF SPE
ASE	ADJUSTABLE SPEED DRIVES	HWB		RDL	ROOF DRAIN LEADER	MV	MEDICAL VACUUM		REDUCER OR INCREASER		ANGLE GLOBE VALVE	C. PROVIDE ACOUSTICAL SEAL
ASE	IRAE AMERICAN SOCIETY OF HEATING, REFRIGERATION,	HWP	HOT WATER PUMP	RH	ROOF HYDRANT	LA	LABORATORY AIR		ECCENTRIC REDUCER	ø	BUTTERFLY VALVE	PENETRATIONS THROUGH S
ASM	AND AIR CONDITIONING ENGINEERS IE AMERICAN SOCIETY OF MECHANCIAL ENGINEERS	HX HYD	HEAT EXCHANGER HYDRANT	RL RO	ROOF LEADER REVERSE OSMOSIS WATER		LABORATORY VACUUM	ل	TOP CONNECTION, 45° OR 90°			D. SUBMIT COMPLETE CONSOLI FOR NEW SYSTEMS, AND FO
ASF AV	E AMERICAN SOCIETY OF PLUMBING ENGINEERS ACID VENT	I.		RP RPZA	RECIRCULATION PUMP REDUCED PRESSURE BACKFLOW PREVENTIO	OA	ORAL EVACUATION		BOTTOM CONNECTION, 45° OR 90°		BALL VALVE	AREAS. DO NOT INSTALL EQUUNTIL COORDINATION/SHOP
AW	ACID WASTE	ICW	INDUSTRIAL COLD WATER	RW	ASSEMBLY REAGENT WATER	— — -IA- — —					CONTROL VALVE	SPECIFICATION 01 33 23 AND
B		IE	INVERT ELEVATION	RWL	RAIN WATER LEADER	D			SIDE CONNECTION			WHERE NOT OTHERWISE DEI
BAS	REDUCED PRESSURE BACKFLOW PREVENTER	IHW INV	INDUSTRIAL HOT WATER INVERT	RWR	REAGENT WATER RETURN				CAPPED OUTLET		THREE-WAY CONTROL VALVE	F. WHERE EXISTING SPRAY-APP
BHF	BREAK HORSEPOWERBASIS OF DESIGN	IPC IRW	INTERNATIONAL PLUMBING CODE IRRIGATION WATER	S SAN	SANITARY SEWER		SOIL, WASTE, UR SANITART SEWER		RISE OR DROP IN PIPE		PRESSURE REGULATING VALVE	ETC. UNDER THE PROJECT, F PATCH PRODUCT TO MAINTA
BSF	BLACK STEEL PIPE	IW		SCFM SCW	STANDARD CUBIC FEET PER MINUTE	SD	STORM WATER		UNION		AUTOMATIC FLOW CONTROL VALVE	
B BTL	BRITISH THERMAL UNIT	IWR	INDUSTRIAL WATER RETURN	SDMH	STORM DRAIN MANHOLE		STORM WATER BELOW GRADE	0	PIPE UP	_\$	PRESSURE RELIEE VALVE	
BIU	H BRITISH THERMAL UNIT PER HOUR	IWS	INDUSTRIAL WATER SUPPLY	SIM SMACN	SIMILAR IA SHEET METAL AND AIR CONDITIONING	SCW	SOFTEN COLD WATER	C	PIPE DOWN			
CA	COMPRESSED AIR	K		SMH	CONTRACTORS NATIONAL ASSOCATION SANITARY MANHOLE	ECW		•	POINT OF CONNECTION BETWEEN NEW	$\mathbf{\nabla}$	MANUAL AIR VENT	
CFN	1 CUBIC FEET PER MINUTE	KWH	KILOWATT-HOUR	SP		DWS	DRINKING WATER SUPPLY					
CG/ CI	COMPRESSED GAS ASSOCATION CAST IRON	L		SPR SQFT/S	SERVINALER LINE SF SQUARE FEET	DWR	DRINKING WATER RETURN		INVERTED BUCKET TRAP SET INCLUDING	X	TEST PLUG (PRESSURE/TEMPERATURE)	
C0	CLEANOUT CORROSION RESISTANT PIPE	LA	LABORATORY AIR	SS SST	SANITARY SEWER STAINLESS STEEL	TWS	TEMPERED WATER RETURN		PIPING ACCESSORIES			
CS		LAV LB	POUND	ST	STORAGE TANK	— — TWR — —	TEMPERED WATER SUPPLY	Z	FLOAT & THERMOSTATIC TRAP SET INCLUDING PIPING ACCESSORIES		AUTOMATIC AIR VENT	
CV	CONTROL VALVE	LCW LHW	LABORATORY COLD WATER LABORATORY HOT WATER	5VV	STORINI WATER	NO	NITROUS OXIDE		STRAINER			
	V DOMESTIC COLD WATER	LNG	LIQUID NATURAL GAS	T TCV	TEMPERATURE CONTROL VALVE	0	OXYGEN	' > ' ~			THERMOSTATIC MIXING VALVE	
DEN	10 DEMOLISH	LUX LV	LABORATORY VACUUM	TD		~N	NITROGEN		THERMOMETER	<u>י</u> י		
DFL DH	URAINAGE FIXTURE UNITS V DOMESTIC HOT WATER	LW	LOW WATER	טו TDH	TOTAL DYNAMIC HEAD	NG	NATURAL GAS		PRESSURE GAGE			
C DHV	VR DOMESTIC HOT WATER RETURN DEIONIZED WATER	M	METER	TEMP TMV	TEMPERATURE THERMOSTATIC MIXING VALVE		NATURAL GAS. BELOW GRADE	\smile \downarrow	··			
DIV	DIVISION	MA	MEDICAL AIR	TP	TRAP PRIMER	FOD	FUEL OIL DISCHARGE	FE	FLOW ELEMENT			
DN	DOWN DEPARTMENT OF ENERGY	MAV MBH	MANUAL AIR VENT 1000 BTUH	TWR	TEMPERED WATER RETURN	FOS	FUEL OIL SUPPLY	ı	WALL CLEAN OUT			
DS DW	DOWNSPOUT DISHWASHER	MED		TWS TYP	TEMPERED WATER SUPPLY TYPICAL	FOV	FUEL OIL VENT	CO O	CLEAN OUT			
DW	G DRAWING	MER	MANUFACTURER	П		— — FOR — —	FUEL OIL RETURN]-c	HOSE BIB			
DW	R DRINKING WATER RETURN	MH MOU	MANHOLE MEMORANDUM OF UNDERSTANDING	UF	UNDER FLOOR	RW	REAGENT WATER		WATER HAMMER ARRESTOR (PLAN VIEW)			
DW DW	S DRINKING WATER SUPPLY / DRAIN WASTE VENT	MSB MV	MOP SERVICE BASIN MEDICAL VACUUM	UNO	UNLESS NOTED OTHERWISE	— — RWR — —	REAGENT WATER RETURN					
-				V	VENT	SS CRP	CORROSION RESISTANT SANITARY SEWER					
E EL	ELEVATION	N N2	NITROGEN	VAC	VACUUM OR VOLTAGE (AC)	— — V CRP — —	CORROSION RESISTANT VENT (SANITARY)					
EM EPA	CS ENERGY MANAGEMENT CONTROL SYSTEM	N2O NC	NITROUS OXIDE NORMALLY CLOSED	VB VCO	VACUUM BREAKER VACUUM CLEANER OUTLET	GW	GREASE WASTE					
D EPA	CT ENERGY POLICY ACT	NG	NATURAL GAS	VP VS	VACUUM PUMP		NEW PIPING					
ESC	EMERGENCY SHOWER	NIC NO	NOT IN CONTRACT NORMALLY OPEN	VSD	VARIABLE SPEED DRIVE		EXISTING PIPING					
ET EW	EXPANSION TANK ELECTRIC WATER HEATER	NOM	NOMINAL NOMINAL PIPE SIZE	VTR	VENT THROUGH ROOF		PIPE TO BE DEMOLISHED					
EW	S EYE WASH STATION	NPW	NON POTABLE WATER	W	WASTE		FIXTURE OR EQUIPMENT TO BE DEMOLISHED					
EW	EXISTING	NTS	NOT TO SCALE	WC	WATER CLOSET		0					
Wd 28		O	OXYGEN	WCO WG	WALL CLEANOUT WATER GAGE	DRAWING SYMBOL	. <u>S</u>					
F 23 5:54%			ON CENTER	WH WH	WALL HYDRANT WATER HEATER		AIL NUMBER					
VJ7 [2154120 VJ7 [2154120	 FLOOR CLEANOUT FILTERED COLD WATER 	OD OFD	OUTSIDE DIAMETER OVERFLOW DRAIN	WHA	WATER HAMMER ARRESTER	H4 - DRA	WING NUMBER WHERE DRAWN					
FD FDC	FLOOR DRAIN FIRE DEPARTMENT (HOSE) CONNECTION	OH OR	OVER HEAD OPERATING ROOM	WL WM	WATER LINE WATER METER	A SEC						
FM	FLOW METER	OVFL	OVERFLOW	WPD WS	WATER PRESSURE DROP		WING NOWBER WHERE SHOWN					
	FUEL OIL POMP FUEL OIL RETURN	OWS	OIL/WATER SEPARATOR	WSFU	WATER SUPPLY FIXTURE UNITS	L_ <u>P-###</u>]	ICAL FIXTURE NUMBER					
E FOS	5 FUEL OIL SUPPLY 7 FUEL OIL VENT	P חואפ	PROCESS & INSTRUMENTATION DIAGRAM	x		26-SF 3						
FS		PD	PRESSURE DROP OR DIFFERENCE	ХР	EXPLOSION PROOF	TYPI	ICAL EQUIPMENT NUMBER					
FS FU	FIXTURE UNITS	PDI PG	PLUMBING AND DRAINAGE INSTITUTE PRESSURE GAUGE	Y			/ FIXTURE/EQUIPMENT (SHAPE VARIES, REF: SYMBC	LS,				
G		PH PI RG	PHASE PLUMBING	YCO YH	YARD GLEANOUT YARD HYDRANT	(E) - EXIS	STING COMPONENT					
GAL		PLUM				(X) — DEM	IOLISHED COMPONENT					
GPI	GALLONS PER DAY	PP PPM	PLOWBING POMP PARTS PER MILLION									
GPI GPI	I GALLONS PER HOUR I GALLONS PER MINUTE	PRS PR\/	PRESSURE REDUCING STATION PRESSURE REDUCING VAI VE									
GPI	GAS PRESSURE REGULATOR	PSI	POUNDS PER SQUARE INCH									
GR	GREASE TRAP											
GV ⁻ GW	RGAS VENT THROUGH ROOFBGYPSUM WALL BOARD											
F ^{GW}	H GAS FIRED WATER HEATER											
3JXV.rvt												<u>CONTRACT</u>
nbrughS6	0 100% BID DOCUMENTS		05/26/2023		NTS:	ARCHITECT/FNGIN	NEERS: STAM	D:	Drawing Title		Phase	Project Title
21_rthon										BREVIATIONS,	100% BID DOCUMENTS	
						Engineering	STATE STATE		SYMBOLS, & LE	EGENDS		
MECH-P						GROUP, LLC	MIT	CH BIBLE	Approved: Project Director			Location
1/21.05_						750 W HAMPDEN AVE SUITE 300		U.S. D	epartment			2101 ELM STREET N, FARGO, N
Revit 202	er: Revisions:		Date:			ENGLEWOOD, CO 80110 (720) 550-6307 WWW VALHALLAENGINEERING COM	VEG 21.05	of Veter	rans Affairs			05/26/2023 M
	M 08 - 6231 1		2	2		4	5	<u>م</u>	J] 8	
	•		-	J	I	-	J	U	/ /	I	•	•

OMS OR SPACES SHALL BE CONCEALED IN A THE CEILING. REF SPECIFICATION 22 05 11.

CEILING PLANS FOR CEILING TYPES IN EACH CESS PANELS ARE REQUIRED IN HARD VALVES, TRAPS, DAMPERS, CLEANOUTS, COORDINATE FINAL LOCATIONS IN THE FIELD ECIFICATION 08 31 13.

ANT PER SPECIFICATION 07 92 00 AT PIPE SOUND RATED PARTITIONS.

IDATED AND COORDINATED SHOP DRAWINGS R EXISTING SYSTEMS THAT ARE IN THE SAME UIPMENT FOUNDATIONS, EQUIPMENT, OR PIPING DRAWINGS HAVE BEEN APPROVED. REF 0 22 05 11.

FOR ADDITIONAL SYMBOLS AND LEGENDS, FINED HERE.

PLIED FIRE RESISTIVE MATERIAL (SFRM) ON STURBED TO RECEIVE HANGERS, FASTENERS, PATCH WITH APPROVED LISTED HAND-APPLIED AIN FIRE RESISTIVE RATING.

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B 5/24/2023 5:54:51 PM			MFR APPROVED ROUTE TO ROOF RAIN COLLA VERTICALLY FRO FROM COMBUST FROM ENVIROI SENSOR FOR RE CONTROL; REF 22 FROM ADDITIONAL GWH(S) PER PLANS DHWR	OFLUE MATERIAL & D WITH WEATHER CAP AR. TERMINATE MIN 7 OM ROOF SURFACE, 2 TION AIR INTAKES, & 3 NMENTAL AIR INTAKES CIRC 11 23 NG RE NG RE SIZE D W/ SHED MFR	IA. 9 & 18" 24" 25' ES. SUPPLY; F MECH	GWH PER SCHEDULE	ET SCI DHWI PERS TO AI GWH PLAN CONN DCW DEDI	PER HEDULE VACUUM BREAKER ABOVE TANK LEVEL DOW R PUMP SCHEDULE DDITIONAL (S) PER S NECT DHWR TO SUPPLY <u>OR</u> CATED DHWR
F. کور			NOTES: 1. DRAIN LI 2. REFEREI SERVICE HEATER 3 GAS WATER NTS	IOM INES: MATCH HW PIPI NCE PP SERIES SHEE & CHECK VALVE LO MANIFOLDING REQU R HEATER W/ RECIR.	ING SPECIFICATION ETS FOR ADDITONA CATIONS, THERMOS IREMENTS. PUMP	L DISTRIBUTION STATIC MIXING	PORT APPL	FWHERE ICABLE
1.05_MECH-PLUM_R21_rthombrughS6JX\		100% BID DOCU	MENTS				05/26/2023	CONSULTAN
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	PLUMBING PUMP (PP) SCHEDULE															
								FLUID			ELE	CTRICA	L/MOTOF	R DATA		
		AREA AND/OR BLDG					HEAD	TEMP	MIN %				MAX		BASIS OF DESIGN OR	
MARK	LOCATION	SERVED	SYSTEM	PUMP TYPE	FLUID	GPM	(FT WG)	(°F)	EFF	HP	VAC	PH	RPM	CONTROL	APPROVED EQUAL	REMARKS
52-PP-1	PENTHOUSE	BLDG 52	HW RECIR	IN-LINE	WATER	21	35	140	80	2	208	3	1725	TSTAT & TIMER	BELL & GOSSETT PD40	1
52-PP-2	PENTHOUSE	BLDG 52	HW RECIR	IN-LINE	WATER	21	35	140	80	2	208	3	1725	TSTAT & TIMER	BELL & GOSSETT PD40	1
52-SP-1	ELEVATOR PIT	BLDG 52	SUMP PUMP	SUMP PUMP	WATER	50	15	N/A	N/A	0.5	120	1	3450	SEE REMARKS	BOESCH BC SERIES	1, 2
52-SP-2	MECH 102	BLDG 52	SUMP PUMP	SUMP PUMP	WATER	76	15	N/A	N/A	5	208	3	5200	SEE REMARKS	BOESCH BC SERIES	1
52-SP-3	MECH 102	BLDG 52	SUMP PUMP	SUMP PUMP	WATER	76	15	N/A	N/A	5	208	3	5200	SEE REMARKS	BOESCH BC SERIES	1

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					DESIGN		FUEL	E	LECTR		TA		
MARK	LOCATION	SYSTEM AND/OR SERVICE	MIN INPUT MBH	STORAGE (GAL)	DHW TEMP (°F)	MIN EFF (%)	(PRESSURE IN WC)	VAC	PH	MCA	МОСР	BASIS OF DESIGN OR APPROVED EQUAL	REMARKS
52-WH-1	PENTHOUSE	DOMESTIC HOT WATER	76	50	140	90	NG (3-15" WH)	120	1	7.5	20	AO SMITH BTX-80	1, 2
52-WH-2	PENTHOUSE	DOMESTIC HOT WATER	76	50	140	90	NG (3-15" WH)	120	1	7.5	20	AO SMITH BTX-80	1, 2

MARK 52-ET-3



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ARCHITECT/ENGINEERS: STAMP: S: 📓 🍠 VALHALLA ENGINEERING Withter. GROUP, LLC MITCH BIBLE 118867 U.S. Departr 750 W HAMPDEN AVE SUITE 300 ENGLEWOOD, CO 80110 of Veterans A (720) 550-6307 VEG 21.05 WWW.VALHALLAENGINEERING.COM 05/25/2023 6

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GENERAL NOTES

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REQUIREMENTS.

GAS WATER HEATER (GWH) SCHEDULE

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	<u>PLUMBIN</u>	G FIXTURE	SCHEDU	<u>LE</u>		
MARK	DESCRIPTION	DCW CONNECTION (NPS)	DHW CONNECTION (NPS)	SS CONNECTION (NPS)	VENT CONNECTION (NPS)	REMARK
FD-E	FLOOR DRAIN	-	-	AS INDICATED	-	1, 4
P-103	WALL HUNG - JET	1"	-	4"	2"	1
P-114	FLOOR MOUNTED - JET, BARIATRIC	1"	-	4"	2"	1
P-413	LAVATORY - ROUND	3/4"	3/4"	1 1/2"	1 1/2"	1,2
P-502	MOP SINK	1/2"	1/2"	3"	1 1/2"	1,2
P-528	SINK, CRS, SINGLE COMPARTMENT, COUNTER MOUNTED	3/4"	3/4"	1 1/2"	1 1/2"	1,2
P-608	ELECTRIC WATER COOLER, WHEELCHAIR ACCESSIBLE, DUAL HEIGHT, WALL HUNG, BOTTLE FILLER	3/4"	-	1 1/2"	1 1/2"	1
P-708	EMERGENCY EYE AND FACE WASH, WALL MOUNT	3/4"	3/4"	1-1/2"	-	1, 3
P-801	WALL HYDRANT, DETACHABLE T-HANDLE	1/2"	-	-	-	1
P-804	HOSE BIBB	1/2"	-	-	-	1
RD	ROOF DRAIN	-	-	AS INDICATED	-	1, 5

	MISCELLANEOUS PLUMBING EQUIPMENT SCHEDULE										
	DESCRIPTION	LOCATION	SYSTEM AND/OR SERVICE	TYPE	VOLUME (GAL)	FLOW (GPM)	WPD (FT WG)	CONNECTION SIZE (NPS)	ELECTRICAL	BASIS OF DESIGN OR APPROVED EQUAL	REMARKS
3	EXPANSION TANK	PENTHOUSE	HOT WATER	DIAPHRAGM	8 GAL	NA	NA	3/4"	NA	BELL & GOSSETT PTA-20V	1

	Drawing Title EQUIPMENT & FIXTURE SCHEDULES	Phase 100% BID DOCUM	ENTS Project Title CONSTRUCT M OUTPATIENT BI	ENTAL LDG 52
	Approved: Project Director		Location 2101 ELM STREET N, FA	ARGO, NE
Affairs			Issue Date 05/26/2023	Checke M
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0' 2' 4' 8' STAMP: TS: ARCHITECT/ENGINEERS: 📓 🍠 VALHALLA Engineering GROUP, LLC Mitals MITCH BIBLE 118867 U.S. Department of Veterans Affairs 750 W HAMPDEN AVE SUITE 300 ENGLEWOOD, CO 80110 (720) 550-6307 WWW.VALHALLAENGINEERING.COM VEG 21.05 05/25/2023 4 5 6

DOMESTIC PLAN - LEVEL 1

1/8" = 1'-0"

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			GENERAL NOTES
			A. REFER TO P-001 FOR PLUME NOTES. REFER TO PQ SHEE SCHEDULES.
			B. FIELD VERIFY EXISTING CON VHA COR BEFORE PROCEEL
7	8		C. REFER TO GI-SERIES LIFE S LOCATIONS OF RATED CON PENETRATION SEALING ME/ SPECIFICATIONS. IN THE EV PATTERN SHOWN ON MEP F SHALL GOVERN.
			D. REFER TO GI SHEET SERIES E. HORIZONTAL PIPING FOR TH
			a. DOMESTIC WATERb. STORM DRAINAGEc. VENTS
	— — — — — (A)		F. HORIZONTAL PIPING FOR TH a. SANITARY SEWER
3/4"ø DCW			
OFFICE			
			<u>KEYNOTES</u>
			1. DOMESTIC WATER ENTRY, COORDINATE WITH CONTR READING TO BUILDING AU
			2. DOMESTIC COLD WATER U WATER RETURN DOWN.
			3. PROVIDE SUPPLY TEMPER AUTOMATION SYSTEM. CO
ELEC			4. PROVIDE POINT OF USE TH
	(D.3)		5. PROVIDE TP-2 CONTROLLE
E PUMP 126			6. DOMESTIC COLD WATER T
<u> </u>			FOR CONTINUATION.
	(E.8)		
	F		
MECH 102			
3 4"ø DCW UG • GFD-E 2"ø DCW UG	1 6		
P-801 1/2"ø DCW BARIATRIC OFFICE 104	G.6		
	— — — — — — — — — — — — — — — — — — —		
OFFICE			
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Drawing Title		Phase	
	STIC WATER PLAN - LEVEL	1 100% BID DOCUMENTS	CONSTRUCT MENTAL OUTPATIENT BLDG 52
Approved: Proje	ct Director		
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OR PLUMBING SYMBOLS, ABBREVIATIONS, AND GENERAL PQ SHEET SERIES FOR EQUIPMENT & FIXTURE	
STING CONDITIONS AND REPORT DISCREPANCIES TO THE PROCEEDING WITH WORK.	
ES LIFE SAFETY PLANS FOR LEGEND AND DETAILED TED CONSTRUCTION REQUIRING ADDITIONAL MEP ALING MEASURES IN ACCORDANCE WITH THE IN THE EVENT OF A CONFLICTING OR AMBIGUOUS WALL ON MEP PLANS, RATINGS FROM THE LIFE SAFETY PLAN	Α
ET SERIES FOR PROJECT PHASING PLAN AND NARRATIVE. NG FOR THE FOLLOWING SYSTEMS IS OH UNO TER AGE	
NG FOR THE FOLLOWING SYSTEMS IS UF UNO VER	
	В
##>	
R ENTRY, BACKFLOW PREVENTER, AND WATER METER. TH CONTROLS CONTRACTOR TO INTEGRATE METER LDING AUTOMATION SYSTEM. REF MI SHEET SERIES.	
WATER UP. DOMESTIC HOT WATER UP. DOMESTIC HOT DOWN.	
Y TEMPERATURE SENSOR. INTEGRATE INTO BUILDING STEM. COORDINATE WITH CONTROLS CONTRACTOR. REF 3.	С
OF USE THERMOSTATIC MIXING VALVE PER SPECIFICATION ONNECT DHWR TO DHW WITHIN 6" OF FIXTURE	
ONTROLLER AND 1/2" DCW CONNECTION. PROVIDE 3/4" FROM TP-2 TO FLOOR DRAIN TRAP PRIMER CONNECTIONS.	
WATER TO IRRIGATION SYSTEM. REF LI SHEET SERIES ION.	
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ACT DOCUMENTS SUBMISSION	
FULLY SPRINKLED Project Number 437-316	
LDG 52 ADDITION Building Number 52	
ARGO, ND 58102	
MB RT DWG 130 of 188	

05/26/2023

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					GENERAL NOTES
					A. REFER TO P-001 FOR PLUMBING SYMBOLS, NOTES. REFER TO PQ SHEET SERIES FOR E SCHEDULES.
		\frown \frown \frown \frown	\frown		B. FIELD VERIFY EXISTING CONDITIONS AND R VHA COR BEFORE PROCEEDING WITH WORK
		$\begin{pmatrix} 1 \end{pmatrix} \begin{pmatrix} 2 \end{pmatrix} \begin{pmatrix} 3 \end{pmatrix} \begin{pmatrix} 3.9 \end{pmatrix} \begin{pmatrix} 4 \end{pmatrix}$	(5) (6)(6.1)	$\left(\begin{array}{c} 7\\ \end{array}\right)$ $\left(\begin{array}{c} 8\\ \end{array}\right)$	C. REFER TO GI-SERIES LIFE SAFETY PLANS FO LOCATIONS OF RATED CONSTRUCTION REG PENETRATION SEALING MEASURES IN ACCO
					SPECIFICATIONS. IN THE EVENT OF A CONFI PATTERN SHOWN ON MEP PLANS, RATINGS SHALL GOVERN.
					D. REFER TO GI SHEET SERIES FOR PROJECT
			FICE OFFICE OFFICE OFFICE 239 237 235 233		E. HORIZONTAL PIPING FOR THE FOLLOWING S a. DOMESTIC WATER b. STORM DRAINAGE
					F. HORIZONTAL PIPING FOR THE FOLLOWING S
		OFFICE		OFFICE 232	
			CORRIDOR 240		
		OFFICE	Soiled P-528 230 1"ø DHW	OFFICE 231	
			CLEAN K LINEN K	STAIR B	KEYNOTES
		OFFICE			1. DOMESTIC COLD WATER RISER UP/DOWN. UP/DOWN. DOMESTIC HOT WATER RETURN
			CONF ROOM 244		2. DOMESTIC HOT WATER UP TO & DOWN FR
		OFFICE 245	FLEX OFFICE		SECTION 22 05 23. CONNECT DHWR TO DH STUB-OUT, TYPICAL.
		OFFICE 2"ø DHW	HAC STOR 244A		
				Image: Second	
		RR 219			
		P-103 € 2"ø DCW E	-413 W 2"ø DCW RECEPTION WAITING		
		3 P-413 P-413 P-528	2"ø DHW 2"ø DHWR WORKSTATION 220 3/4"ø DHWR 2"ø DCW	-103 -413 RR -413 -4	
		P-608 2"ø DHWR 2"ø DHWR 3/4"ø DCW	4"ø DHWR 2"ø DCW 2"ø DCW 2010 2010 2010 2010 2010 2010 2010 201	^{zoz} ^φ DCW	
			2 0 DIW 2 8 1 2 8 1 3/4"ø DCW	G	
			ELEV 218 ELEV 218 ELEV RR RR RR RR RR RR RR RR RR R	OFFICE G.2	
		STAIR A 217			
			IED COMM / JOM STOR 214 211	OFFICE	
		OFFICE 216	CORRIDOR 208	——————————————————————————————————————	
		OFFICE		OFFICE 207	
			FICE OFFICE OFFICE OFFICE 213 212 210 209	— — — — — — — — — — K	
		DOMESTIC PLAN - LEVEL 2		North	
		1/8" = 1'-0"	8' 16' 32'		CONTRACT DOCUM
0 100% BID DOCUMENTS	05/26/2023 CONSULTANTS:	ARCHITECT/ENGINEERS:	STAMP:	Drawing Title $DOMESTIC WATER PLAN_LEVE$	Phase 100% RID DOCI IMENITS CONSTRUCT MENTAL HEALTH
		VALHALLA Engineering	STATE OF TEHAS		
		GROUP, LLC	MITCH BIBLE	Approved: Project Director	Location 2101 ELM STREET N, FARGO, ND 58102



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				A. REFER TO P-001 FOR PLUME NOTES. REFER TO PQ SHEE
				B. FIELD VERIFY EXISTING CON VHA COR BEFORE PROCEED
5 6 6.1 7	8			C. REFER TO GI-SERIES LIFE SA LOCATIONS OF RATED CONS PENETRATION SEALING MEA SPECIFICATIONS. IN THE EV PATTERN SHOWN ON MEP P
				D. REFER TO GI SHEET SERIES
OFFICE OFFICE OFFICE		——————————————————————————————————————		E. HORIZONTAL PIPING FOR TH a. DOMESTIC WATER b. STORM DRAINAGE c. VENTS
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	n	——————————————————————————————————————		
CORRIDOR 240	OFFICE 232			
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				1. DOMESTIC COLD WATER R UP/DOWN. DOMESTIC HOT
IF M				2. DOMESTIC HOT WATER UP
FLEX OFFICE		——————————————————————————————————————		SECTION 22 05 23. CONNEC STUB-OUT, TYPICAL.
STOR 244A 3/4"ø DCW 1"ø DHW	P-528	(D.3)		
P-502 WORK ROOM				
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W RECEPTION WAITING W / WR WORKSTATION 220 3/4"ø DHWR		(E.8)		
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CORRIDOR 208	OFFICE	——————————————————————————————————————		
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16' 32')			<u>CONTRACT I</u>
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	DOMESTIC WATER PLAN - LEVEL 2	100% BID DOCUMENTS	CONSTRUCT M OUTPATIENT B	IENTA LDG 5
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S. Department Veterans Affairs			Issue Date 05/26/2023	Checke
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DOMESTIC PLAN - PENTHOUSE

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				D. REFER TO GI SHEET SERIES
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				F. HORIZONTAL PIPING FOR TH a. SANITARY SEWER
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	 	C		<u>KEYNOTES</u>
				1. DOMESTIC COLD WATER RI HOT WATER RETURN DOWN
				2. PROVIDE SUPPLY WATER T BUILDING AUTOMATION SYS CONTRACTOR. REF MI SHE
00		——————————————————————————————————————		3. COORDINATE WITH CONTR HEATER STATUS TO BUILDI SERIES.
		——— — (D.3)		4. DOMESTIC HOT WATER UP PENTHOUSE.
				5. PROVIDE TP-2 CONTROLLEI INDIRECT DRAIN FROM TP-2
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	 	(E.8)		
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	Drawing Title DOMESTIC WATER PLAN - PENTHOUSE	Phase 100% BID DOC	CUMENTS	Project Title CONSTRUCT M OUTPATIENT B	ENTAL LDG 52
rtment	Approved: Project Director			Location 2101 ELM STREET N, F	ARGO, ND
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					B. FIELD VERIFY EXISTING CONDITIONS AND REPORT DISCREPANCIES VHA COR BEFORE PROCEEDING WITH WORK.	S TO THE
					C. REFER TO GI-SERIES LIFE SAFETY PLANS FOR LEGEND AND DETAIL LOCATIONS OF RATED CONSTRUCTION REQUIRING ADDITIONAL ME	ILED '
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			TO D'O DHW		D. REFER TO GI SHEET SERIES FOR PROJECT PHASING PLAN AND NA	ARRATIVE.
		₽ _►			E. HORIZONTAL PIPING FOR THE FOLLOWING SYSTEMS IS OH UNO a. DOMESTIC WATER b. STORM DRAINAGE	_
		ENTHOUSELEVE	2"@ DCW	© OCW P-804	c. VENTS F. HORIZONTAL PIPING FOR THE FOLLOWING SYSTEMS IS UF UNO	
			2"ø 2"ø DHW 52-PP-2	P-708	a. SANITARY SEWER	
			2"ø DHWR 2"ø D2"ø DHWR			
			S2-SH-1			
			< <u>52-WH-1</u> >< <u>52-WH-2</u> > 			
					KEVNOTES	
				 ^{3/4} "@ \.	KETNOTES 1. DOMESTIC COLD WATER UTILITY FROM SITE. REF CU SHEET SERI	
				NO DHW II	2. DOMESTIC COLD WATER TO IRRIGATION SYSTEM. REF LI SHEET S	SERIES
			3/4"ø DCW FD-E P-413	2"® DCW	FOR CONTINUATION.	
			3/4"ø DCW 2"ø DCW 2"ø DHW 2"ø DHW	DHW 11 2"ø DHW 2"ø DHW 9 DHW 11 P-528		
			P-528 3"ø DCW- 2"ø DHW- 2"ø DHW-	P-103 P-103 P-103		
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			' 1 1/2"ø DHW~ 2"ø DHW~ 	1/2°0 DHN AHO		_
		LEVELS				
		~	' <u>P-103</u> 	<u>113</u> <u>P-103</u> <u>P-413</u>		
			¹ ["] ^θ DCW 2 ["] ^θ DCW 1 ["]			
			2"ø DHW 3/4"ø DCW P-801 2"ø DHW 2"ø DHWR 2"ø DHWR 2 Ø DHWR 2 Ø DHWR 2 Ø DHWR 2 Ø DHWR	CHW		-
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		750 W HAMPDEN AVE SUITE 300	MITCH BIBLE 118867 U.S. Department	Approved: Project Director	Location 2101 ELM STREET N, FARGO, ND 58102	r)01
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ES FOR PROJECT PHASING PLAN AND NARRATIVE.	
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TO IRRIGATION SYSTEM. REF LI SHEET SERIES	
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0' 2' 4' 8' 16' 1/8" = 1'-0" ARCHITECT/ENGINEERS: STAMP: VALHALLA Engineering Willette MITCH BIBLE

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DRAIN WASTE VENT PLAN - LEVEL 1

GROUP, LLC 750 W HAMPDEN AVE SUITE 300 ENGLEWOOD, CO 80110 (720) 550-6307 WWW.VALHALLAENGINEERING.COM VEG 21.05

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					B. FIELD VERIFY EXISTING CON VHA COR BEFORE PROCEED
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					 E. HORIZONTAL PIPING FOR TH a. DOMESTIC WATER b. STORM DRAINAGE a. VENTS
		— — (A)			F. HORIZONTAL PIPING FOR TH a. SANITARY SEWER
		— — B			
2 VVFL SD	FFICE 134 6				
	HEICE 133				
	7				KEYNOTES 1. SANITARY SEWER TO SITE.
					PROVIDE 6" GCO FOR SANI SPECIFICATION SECTION 22
					2. DOWN FROM LEVEL 2.
	TAIR B 132	— — (D)			 UP TO LEVEL 2 PROVIDE SP, OWS, INDIREC
ss oh	b ELEC 128	(D.3)			SERIES SHEET. 5. STORM WATER TO SITE. RE
	FIRE PUMP 126				6. OVERFLOW STORM WATER TO SPECIFICATION SECTIO OF PIPE. REFER TO SPECIF
3		— — (E)			7. SUMP PUMPS FOR FOUNDA VERTICALLY 6" APART FRO OUTLETS TO STORM SEWE
он 1 1/2"ø S STOR	SS TEL	E.8			8. CONNECT TO PERIMETER F
VES	Image: STIBULE 101	— — (F)			
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		G.2			
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S FOR PROJECT PHASING PLAN AND NARRATIVE.	
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E. REF CU SHEET SERIES FOR CONTINUATION. NITARY SEWER DISCHARGE PIPING. REFER TO	
22 13 00.	
ECT WASTE CONNECTION PER DETAIL ON PQ	С
REF CU SHEET SERIES FOR CONTINUATION.	
R TO EXTERIOR LAMBS TONGUE DRAIN. REFER ON 22 14 00. PROVIDE HEAT TRACE ON LAST 6'-0"	
DATION DRAIN. OFFSET 52-SP-3 LEVEL SWITCH OM 52-SP-2 LEVEL SWITCH. CONNECT SUMP PUMP	
/ER MAIN. R FOUNDATION DRAIN.	
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DRAIN WASTE VENT PLAN - LEVEL 2

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Y	'	'	GENERAL NOTES
			A. REFER TO P-001 FOR PLUME NOTES. REFER TO PQ SHEE SCHEDULES.
\frown			B. FIELD VERIFY EXISTING CON VHA COR BEFORE PROCEED
(7) (8)			C. REFER TO GI-SERIES LIFE S LOCATIONS OF RATED CONS PENETRATION SEALING MEA SPECIFICATIONS. IN THE EV PATTERN SHOWN ON MEP P SHALL GOVERN.
			D. REFER TO GI SHEET SERIES
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			F. HORIZONTAL PIPING FOR TH a. SANITARY SEWER
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OFFICE 232 4			
3"ø OVFL SD OH			
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STAIR B 228			1. UP TO PENTHOUSE.
			 UP FROM LEVEL 1. UP FROM LEVEL 1. PROVID
			4. DOWN TO LEVEL 1.
			 5. DOWN FROM ROOF. 6. DOWN FROM PENTHOUSE.
P-528 GENERAL TREATMENT			
COORDINATE WITH CFM CONTRACTOR TO PHARM D PROVIDE CHASE WALL	IF		
222 FOR WC CARRIER.	— — — E		
P-413	– – – – – – – – – – –		
OFFICE 204	— — — (G)		
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	DRAIN WASTE VENT PLAN - LEVEL 2	100% BID DOC	JUMENTS	OUTPATIENT B	LDG 5
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DRAIN WASTE VENT PLAN - PENTHOUSE

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					A. REFER TO P-001 FOR PLUME NOTES. REFER TO PQ SHEE SCHEDULES.
					B. FIELD VERIFY EXISTING CON VHA COR BEFORE PROCEED
(7)					C. REFER TO GI-SERIES LIFE SA LOCATIONS OF RATED CONS PENETRATION SEALING MEA SPECIFICATIONS. IN THE EVE PATTERN SHOWN ON MEP P SHALL GOVERN
					D. REFER TO GI SHEET SERIES
		——————————————————————————————————————			a. DOMESTIC WATER b. STORM DRAINAGE c. VENTS
					F. HORIZONTAL PIPING FOR TH a. SANITARY SEWER
		——————————————————————————————————————			
		C)			KEYNOTES 1. UP FROM LEVEL 2.
					2. PROVIDE ROOF DRAIN. PRO 6'-0" OF PIPE PER SPECIFIC
					3. PROVIDE INSULATION AND SPECIFICATION 22 14 00, 22
		—————(D.3)			
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Approved: Project Director

Location 2101 ELM STREET N, FARGO, NI Issue Date Checke 05/26/2023

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THE FOLLOWING SYSTEMS IS UF UNO	В
ROVIDE INSULATION AND HEAT TRACING ON FIRST ICATION 22 14 00, 22 07 11, AND 22 05 33. RE: ARCH OPE. ID HEAT TRACING ON FIRST 6'-0" OF PIPE PER 22 07 11, AND 22 05 33.	С
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9 **GENERAL NOTES**

- A. REFER TO P-001 FOR PLUME NOTES. REFER TO PQ SHEET SCHEDULES.
- B. FIELD VERIFY EXISTING CON VHA COR BEFORE PROCEED
- C. REFER TO GI-SERIES LIFE SAI LOCATIONS OF RATED CONS PENETRATION SEALING MEAS SPECIFICATIONS. IN THE EV PATTERN SHOWN ON MEP P SHALL GOVERN.
- D. REFER TO GI SHEET SERIES
- E. HORIZONTAL PIPING FOR TH a. DOMESTIC WATER b. STORM DRAINAGE c. VENTS
- F. HORIZONTAL PIPING FOR TH a. SANITARY SEWER

KEYNOTES

- PROVIDE TWO WAY GCO F TO SPECIFICATION SECTIO
- 2. PROVIDE FD-E. REFER TO F
- 3. SANITARY SEWER TO SITE
- 4. STORM DRAIN TO SITE. RE
- 5. STORM DRAIN DISCHARGE

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	Drawing Title DRAIN WASTE VENT RISER DIAGRAM	Phase 100% BID DOCUMENTS	Project Title CONSTRUCT ME OUTPATIENT BL[NTAL DG 52
mont	Approved: Project Director		Location 2101 ELM STREET N, FAF	GO, ND
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S FOR PROJECT PHASING PLAN AND NARRATIVE.	
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FOR SANITARY SEWER DISCHARGE PIPING. REFER ON 22 13 00.	
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2 ADDITION Building Number 52	
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ME	CHANICAL ABBREVIATIONS								
A		DN	DOWN	HRD	D	HEAT RECOVERY DEVICE		NOM	NOMINAL
A/E	ARCHITECT / ENGINEER	DP	DEW POINT TEMPERATURE	HRV	W τατ	HEAT RECOVERY WHEEL		NPLV	NON-STANDARD PART LOAD VALUE
AAV	AUTOMATIC AIR VENT AIR COOLED CHILLER	DPS	DIFFERENTIAL PRESSURE SENSOR	HTG	G	HEATING		NPSH	NET POSITIVE SUCTION HEAD
ACCL	AIR-COOLED CONDENSING UNIT	DX	DIRECT EXPANSION	HTM	M	HUMIDIFIER TERMINAL		NPSHA	NPSH AVAILABLE
ACD	AUTOMATIC CONTROL DAMPER, MODULATING	DXCC	DIRECT EXPANSION COOLING COIL	HUN HVD	M D	HUMIDIFIER UNIT MOUNTED HOISTWAY VENT DAMPER		NTS	NOT TO SCALE
ACU	AIR CONDITIONING UNIT	Е		HVU	U	HEATING AND VENTILATING UNIT		0	
AD	ACCESS DOOR	E	EXISTING	HW		HOT WATER		OA OA C	
AF AFCV	AFTER FILTER AIR FLOW CONTROL VALVE	EA EAT	EXHAUST AIR ENTERING AIR TEMPERATURE	HWG	′C ′HC	HOT WATER COIL HOT WATER HEATING COIL		OAG OAI	OUTSIDE AIR GRILLE OUTSIDE AIR INTAKE
AFF	ABOVE FINISHED FLOOR	EAT-DE	ENTERING AIR TEMPERATURE DRY BUI	LB HWF	/Ρ	HEATING WATER PUMP		OAL	OUTSIDE AIR LOUVER
AFMD	AIR FLOW MEASURING DEVICE	EC		HWF	/R	HEATING WATER RETURN		OD OEM	
AHU	AIR HANDLING UNIT	ECC	ELECTRONICALLY COMMUTATED MOTO	DR HW	'S 'UH	HOT WATER UNIT HEATER		OFM	OVER HEAD
AP	ACCESS PANEL	ECU	EVAPORATIVE CONDENSER UNIT	HX		HEAT EXCHANGER		OR	OPERATING ROOM
APD	AIR PRESSURE DROP	EDH	ELECTRIC DUCT HEATER	HZ		HERTZ		п	
ARI	AIR CONDITIONING AND REPRIGERATION INSTITUTE AIR SEPARATOR	EF	EXHAUST FAN	I				Р Р	PUMP
ASHR	AE AMERICAN SOCIETY OF HEATING, REFRIGERATION, AND	EFF	EFFICIENCY	I/O		INPUT/OUTPUT		P&ID	PROCESS & INSTRUMENTATION DIAGRAM
ASME	AIR CONDITIONING ENGINEERS	EG	EXHAUST GRILLE	IAQ	2	INDOOR AIR QUALITY		PC PCF	PUMPED CONDENSATE
		EH	EXHAUST HOOD	ICU	J	INTENSIVE CARE UNIT		PD	PRESSURE DROP
B		EJ	EXPANSION JOINT	ID		INSIDE DIAMETER		PF	PRE-FILTER
BAS	BUILDING AUTOMATION SYSTEM	EMD ENT	END OF MAIN DRIP (STEAM) ENTERING	IFB		INTEGRAL FACE AND BYPASS		PG PGW	PRESSURE GAUGE PROPYLENE GLYCOL-WATER SOLUTION
BASC	BUILDING AUTOMATION SYSTEM CONTRACTOR	ER	EXHAUST REGISTER	IN H	HG	INCHES OF MERCURY		PH	PHASE
BD BD	BUTTERFLY DAMPER BACKDRAFT DAMPER	ERC	ELECTRIC REHEAT COIL	IN W	NC	INCHES OF WATER COLUMN		PHC	PREHEAT COIL
BDB	BASE BOARD RADIATOR	ERP	ELECTRIC RADIANT PANEL ENERGY RECOVERY WHEEL	IN V IN-L	./vG _B	INCHES OF WATER, GAUGE		PPM PRESS	PRESSURE
BFP	BACKFLOW PREVENTER	ESP	EXTERNAL STATIC PRESSURE	IPLV	V	INTEGRATED PART LOAD VALUE		PRV	PRESSURE REGULATING VALVE
BFT	BOILER PLANT FIRE TUBE BOTTOM GRITTF	ET	EXPANSION TANK	IRH		INFRARED HEATER		PSI	POUNDS PER SQUARE INCH
BHP	BRAKE HORSEPOWER	EUH	ELECTRIC UNIT HEATER	IS IU		INDUCTION UNIT		PSIG	POUNDS PER SQUARE INCH, GAGE
BHW		EWC	EVAPORATIVE WATER COOLER	IV		INLET VANES		PSS	PRIMARY SECONDARY SYSTEM
BI DG	BUILER BLUVVDUVVN HEAT EXCHANGER BUILDING	EWT	EN FERING WATER TEMPERATURE	Ľ				PSV ptac	PRESSURE SAFETY VALVE
BOD	BASIS OF DESIGN	F		r KW	1	KILOWATT			
BR	BOTTOM REGISTER	F		KWł	Ή	KILOWATT HOURS		Q	
BSC BT	BIOLOGICAL SAFETY CABINETS BLOWOFF TANK	F&T F/S	FLUAT AND THERMOSTATIC	ı				QTY	QUANTITY
BTC	BLOWOFF TANK CONTROL VALVE	FA	FREE AREA	LAT	Г	LEAVING AIR TEMPERATURE		R	
BTU	BRITISH THERMAL UNIT	FC	FLEXIBLE CONNECTION	LAT	Г-DВ	LEAVING AIR TEMPERATURE DRY BULB		RA	RETURN AIR
BIUH	BRITISH THERMAL UNIT PER HOUR BOILER PLANT WATER TUBE	FCU	FAN COIL UNIT (4 PIPE) FAN COIL UNIT COOLING ONLY	LB		POUND LINEAR FOOT (FEET)		RAD RAF	REFRIGERANT AIR DRYER
		FCUH	FAN COIL UNIT HEATING ONLY	LGT	Г	LEAVING GLYCOL TEMPERATURE		RAHX	ROTARY AIR HEAT EXCHANGER
C		FD	FLOOR DRAIN	LH	1.7			RAT	RETURN AIR TEMPERATURE
CAP	COOLING COIL	FD FF	FIRE DAMPER FINAL FILTER	LLH. I PG	IX G	LIQUID TO LIQUID HEAT EXCHANGER		RCCH RCP	REMOTE CONDENSER CHILLER RADIANT CEILING PANEI
	COOLING COIL CONDENSATE DRAIN	FHX	FLUE GAS/FEEDWATER HEAT EXCHANC	GER LPR	2	LOW PRESSURE RETURN (STEAM CONDEN	ISATE)	RD	REFRIGERANT DISCHARGE
	CONDENSATE DRAIN	FM	FLOW METER	LPS	6	LOW PRESSURE STEAM		REA	RELIEF AIR
CENT	CUBIC FEET PER HOUR	FOHX FOP	FUEL OIL HEAT EXCHANGER	LSD I TC) CP	LINEAR SLOT DIFFUSER		REF RF	REFERENCE OR REFER TO RETURN FAN
CFM	CUBIC FEET PER MINUTE	FOT	FUEL OIL TANK	LVG	3	LEAVING		RG	RETURN GRILLE
CFP	CHEMICAL FEED PUMP	FPM	FEET PER MINUTE	LVR	२ 			RH	RELATIVE HUMIDITY
CFI	CEILING GRILLE	FPS FPTU	FEET PER SECOND FAN POWERED TERMINAL UNIT	LVVI	I	LEAVING WATER TEMPERATURE		RHC	REHEAT COIL REFRIGERANT HOT GAS
СН	CHILLER	FR	FLOOR REGISTER	М				RL	REFRIGERANT LIQUID LINE
	CHILLED WATER PUMP	FRP	FIBER REINFORCED POLYESTER	MA	-			RLA	
CHK	CHILLED WATER SUPPLY	FS FSTAT	FLOW SWITCH FREEZESTAT	MAT	ı U	MIXED AIR TEMPERATURE MAKEUP AIR UNIT		RO RPM	REVERSE OSMOSIS REVOLUTIONS PER MINUTE
CI	CAST IRON	FT	FEET	MAV	V	MANUAL AIR VENT		RR	RETURN REGISTER
CKT		FT WG	FEET WATER GAUGE	MAX	Х	MAXIMUM		RS	REFRIGERANT SUCTION
CLG	CARBON MONOXIDE	FT-LB	FUOT-POUND FILTER FEEDER	MB	Н	1000 BTUH		RV	RELIEF VALVE
CO2	CARBON DIOXIDE	FTR	FINNED TUBE RADIATION	MCA	A	MINIMUM CIRCUIT AMPACITY			
	P COMPRESSOR UNIT	FV	FACE VELOCITY	MEF	P	MECHANICAL ELECTRICAL PLUMBING		S	
P	CONDENSATE PUMP	G		MEF	r RV	MINIMUM EFFICIENCY REPORTING VALUE		SA SAD	SOUND ATTENUATING DEVICE
CS CS	CONDENSATE STORAGE TANK	GA	GAUGE	MFF	R	MANUFACTURER		SAT	SUPPLY AIR TEMPERATURE
S CSG	CLEAN STEAM GENERATOR	GAL	GALLONS	MH	1	MANHOLE		SCEM	SHADING COEFFICIENT
CTRL	CONTROL	GF GH	GRAVITY HOOD	MIS	N SC	MISCELLANEOUS		SCFM	SILICON CONTROLLED RECTIFIER
CU	CONDENSING UNIT	GHW	GLYCOL HEATING WATER	MOO	СР	MAXIMUM OVERCURRENT PROTECTION		SD	SMOKE DETECTOR
CUH	CABINET UNIT HEATER CONSTANT VOLUME	GPD		MO\ MDE	V	MOTOR OPERATED VALVE		SD	SUPPLY AIR DIFFUSER
CV	CONTROL VALVE	GPH GPM	GALLONS PER MINUTE	MPF MPS	S	MEDIUM PRESSURE STEAM	ULINOAIE)	SDR	SMOKE DAMPER (RETURN)
CWC	C CHILLED WATER COOLING COIL	GPR	GAS PRESSURE REGULATOR	MRI		MAGNETIC RESONANCE IMAGING UNIT		SDS	SMOKE DAMPER (SUPPLY)
	CONDENSER WATER PUMP CONDENSER WATER RETURN (TO COOLING TOWER)	GS		MTC	D ⊿	MEAN TEMPERATURE DIFFERENCE		SEN	SENSIBLE HEAT SUPPLY FAN
CWS	CONDENSER WATER SUPPLY (FROM COOLING TOWER)	GVVD		MV		MECHANICAL VENT		SG	SUPPLY AIR GRILLE
		H		MVE	D			SH	
D	DAMPER	H HAC	HUMIDIFIER HOUSEKEEPING AID CLOSET	MZ		MULT-ZUNE		SHC SIM	STEAM HEATING COIL
DB	DECIBEL	HB	HOSE BIBB	Ν				SP	STATIC PRESSURE
		HC		NA				SP GR	SPECIFIC GRAVITY
	DIRECT DIGITAL CONTROLS	HD HOA	пеал HAND/OFF/AUTOMATIC	NC NC		NOISE UKITERIA NORMALLY CLOSED		SPD SPRV	SUPPLY PROCESS AND DISTRIBUTION STEAM PRESSURE REDUCING VALVE
DEG	DEGREES	HP	HEAT PUMP	NG		NATURAL GAS		SPS	STATIC PRESSURE SENSOR
	DEMOLISH DIFFUSER			NGF	FM			SQ FT	SQUARE FOOT
	DEIONIZED WATER	HPD1 HPR	HIGH PRESSURE RETURN (STEAM CON	NO IDENSATE) NOA	AA	NATIONAL OCEANIC & ATMOSPHERIC ADM	INISTRATION	ରହ IN SR	SQUARE INCHES SUPPLY AIR REGISTER
DIA	DIAMETER	HPS	HIGH PRESSURE SUPPLY (STEAM)	,					
		HRC	HEAT RECOVERY COIL						
1S6JXV.rvt						,			
ombrug	100% BID DOCUMENTS		05/26/2023	CONSULTANT	S:	AF	RCHITECT	T/ENG	INEERS:
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SSHX SSR SST SUH SVS SWHX SX	STEAM TO STEAM HEAT EXCHAI SOLID SEPARATOR STAINLESS STEEL STEAM TRAP STEAM UNIT HEATER STEAM VENT SILENCER STEAM TO WATER HEAT EXCHA SECURITY GRILLE
T T&PCV TAB TD TDH TDS TG TP TR TSP TSTAT TU TWU	TEMPERATURE AND PRESSURE TESTING, ADJUSTING, AND BALA TEMPERATURE DIFFERENCE TOTAL DYNAMIC HEAD TOTAL DISSOLVED SOLIDS TRANSFER GRILLE TRAP TOP REGISTER TOTAL STATIC PRESSURE THERMOSTAT TERMINAL UNIT THRU-WALL UNIT
U UC UCT UF UG UH UL UNO	UNIT COOLER UNDERCUT UNDER FLOOR UNDERGROUND UNIT HEATER UNDERWRITERS LABORATORY UNLESS NOTED OTHERWISE
V VAC VAV VD VFD VHA VI VIV VP VPS VR VSD	VALVE VOLTAGE ALTERNATING CURRE VARIABLE AIR VOLUME VOLUME DAMPER (MANUAL OPF VARIABLE FREQUENCY DRIVE VETERANS HEALTH ADMINISTRA VIBRATION ISOLATOR VARIABLE INLET VANES VACUUM PUMP VARIABLE PRIMARY SYSTEM VACUUM (STEAM CONDENSATE) VARIABLE SPEED DRIVE
W WAG WB WC WCCH WCCU WCPU WF WFCV WFM WFMD WG WPD	WASTE WASTE ANESTHESIA GAS WET BULB WATER COOLED WATER COOLED CHILLER WATER COOLED CONDENSING U WATER COOLED HEAT PUMPS WATER FILTER WATER FILTER WATER FLOW CONTROL VALVE WATER FLOW MEASURING DEVI WATER FLOW MEASURING DEVI WATER GAGE WATER SIDE PRESSURE DROP
X XP	EXPLOSION-PROOF
Y YR	YEAR

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			<u>(</u>	JENERAL NOTES	
EXCHANGER			A	CONTRACTOR SHALL PRO BARRIER AROUND THE P CONTRACTOR'S PHASING)\ R(} F
			ŀ	<u>IVAC GENERAL NO</u>	<u>)</u>
EXCHANGER			A	. ALL PIPING AND DUCTS IN CONCEALED IN A FURREI SPECIFICATION 23 05 11.	D (
SSURE CONTROL VALVE ND BALANCING NCF			В	5. THE FIRST FIGURE OF DU OR INDICATED. DUCT SIZ SPECIFICATION 23 31 00.	JC ES
DS			C	CONTROLS, AND SO FOR FOR BEST ACCESS. REF	AI A DF TH SF
E			D). TOTAL STATIC PRESSURI SYSTEM, TERMINAL UNIT	E I S,
			-		• •

VISE

CURRENT

UAL OPPOSED BLADE) DRIVE **MINISTRATION**

FM ENSATE) RETURN

ENSING UNIT UMPS

VALVE

NG DEVICE

NECK SIZES.

FLOOR.

AND DIFFUSERS.

WHERE NOT OTHERWISE DEFINED HERE.

	Drawing Title MECHANICAL ABBREVIATIONS & NOTES	Phase 100% BID DOCUN	MENTS	CONSTRUCT ME OUTPATIENT BL	ENTAL DG 52
mont	Approved: Project Director		L	ocation 2101 ELM STREET N, FA	rgo, ne
Affairs				sue Date 05/26/2023	Checke M
	7	8		9	

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		1	2			3
	CONTRO	LS SYMBOLS	DL	JCTWC	ORK SY	MBOLS
	T	ROOM THERMOSTAT/TRANSMITTER - WALL MOU	NT 🖻	⊴ UP	DN DN	SUPPLY DUCT (UP & D
		ROOM HUMIDISTAT (MOISTURE)/TRANSMITTER -	Ę	 ⊒ur		EXHAUST DUCT (UP &
		WALL MOUNT	R	ŢUP		RETURN DUCT (UP & D
Α				6		
			vieni ĵ−		<u>1 – Es</u> u	ROUND AND SQUARE
	(MT) (MS)					SQUARE 3-WAY CEILIN
	(PT)	PRESSURE TRANSMITTER		V		SQUARE 2-WAY CEILIN
	(FSH)	FLOW SWITCH HYDRONIC			' 🕴	
	FT	FLOW TRANSMITTER				SQUARE 1-WAY CEILIN
		AIR FLOW MEASUREMENT DEVICE				
	T	CURRENT TRANSMITTER				EXHAUST OR RETURN
	CT	CONDUCTIVITY TRANSMITTER		<u>μ</u>		REGISTER OR GRILLE
В	(SD)	SMOKE DETECTOR		[[- EXHAUST OR RETURN REGISTER OR GRILLE
_		DOOR SWITCH		ļ		- EXHAUST OR RETURN
	(PDT)	PRESSURE DIFFERENTIAL TRANSMITTER		' 	<u> </u>	OR TOP GRILLE (WALL
	PDS					VANED ELBOW & AIR S
		VALVE OR DAMPER ACTUATOR				CONNECT NEW DUCT
		TEMPERATURE SWITCH. LOW (FREEZESTAT)			- 	
	(тян)	TEMPERATURE SWITCH, HIGH (FREEZESTAT)		ᡗ <u>᠊</u> ╫╫╾ └──╨╨═		
		LEVEL CONTROLLER		<u>} </u>		INCLINED DROP, IN DIF
		LEVEL TRANSMITTER				LIMIT OF DEMOLITION
-	PSH	PRESSURE SWITCH HIGH		€	<u>-</u>	FLEXIBLE CONNECTIO
С	PSL	PRESSURE SWITCH LOW		}µш↓ FC-∕		VIBRATION, OR SEISMI
	EPT	ELECTRONIC TO PNEUMATIC TRANSDUCER			G	VANED ELBOW (PROVI RECTANGULAR ELBOV
	(AT) _{CO2}	CARBON DIOXIDE TRANSMITTER				SYMBOL IS MISSING)
	(AT) _{CO}	CARBON MONOXIDE TRANSMITTER		Ę	<u>بـــــ</u>	VANED ELBOW (SHOR
		OCCUPANCY SENSOR		Á	\Box	STANDARD RADIUS EL
	VFD	VARIABLE SPEED MOTOR CONTROLLER		L 10x8	Ļ	
	PR	PILOT RELAY				WIDTH X DEPTH (KI WIDTH / DEPTH (FL DIAMETER Ø (ROUI
	\boxtimes	MOTOR STARTER		ļ		EXISTING DUCT TO RE
		SENSOR WELL / O-LET			r XXX	
D	* CONTROL PANE GENERAL PRELIM	ELS, WHERE INDICATED ON PLANS, ARE INTENDED FOR INARY COORDINATION ONLY. PROVIDE FINAL ANEL TYPES, OLIANTITIES, & ASSOCIATED LITHITIES		<u> </u>	××	WRAP ENTIRE LENGTH
	(EG POWER & DAT ACCORDANCE WI SHOP DRAWINGS	TA) TO ACHIEVE MI SHEET SERIES REQUIREMENTS IN TH SPECIFICATION 23 09 23. SUBMIT COORDINATED INDICATING PROPOSED FINAL PANEL LOCATIONS FOR	DI	RAWIN	<u>G SYM</u>	BOLS
	VHA COR REVIEW	AND APPROVAL.		2-		- DETAIL NUMBER
				H4 -		- DRAWING NUMBER WHERE DF
) 33:40 PM				A H7		- SECTION LETTER - DRAWING NUMBER WHERE SH
4/2023 5:1						- BUILDING NUMBER WHERE EQ
5/2			~			- EQUIPMENT ABBREVIATION (E
				26-SF 3		- TYPICAL UNIT NUMBER 3 IN BUI
						- BUILDING NUMBER WHERE EG
E				26-TU-1-1		- ITEM (TERMINAL UNIT SHOWN - ITEM NUMBER (TERMINAL UNI
						- SERVED BY AIR HANDLER UNI
					SD-1 1,200	- AIR DEVICE MARK - AIR DEVICE CFM
						- NEW EQUIPMENT (SHAPE VAR
				(E) -		& NOTES. SCHEDULED ITEMS - EXISTING COMPONENT
				(X) —		- DEMOLISHED COMPONENT
			<u>A</u>	R TER	MINAL	<u>SYMBOLS</u>
					<u>⊐_</u>	TERMINAL UNIT
F				٦	МВ	
						FAN POWERED VARIABLE VOL TERMINAL UNIT WITH HEATING
				I		
/.rvt						
ughS6JXV	0 1	00% BID DOCUMENTS		0)5/26/2023	
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	DUCT ACCESSOR	RY SYMBOLS	HVAC PIPING SYME	BOLS	<u>GENERAL PIPIN</u>	IG SYMBOLS		
JPPLY DUCT (UP & DOWN)	$\overline{\mathbb{M}}$	2'x2' RADIANT CEILING PANEL	HPS	HIGH PRESSURE STEAM (60 PSIG AND ABOVE)		DIRECTION OF PIPE PITCH (DOWN)		
(HAUST DUCT (UP & DOWN)			HPR	HIGH PRESSURE STEAM CONDENSATE RETURN MEDIUM PRESSURE STEAM (16 PSIG THRU 59 PSIG)	×	DIRECTION OF FLOW ANCHOR		
ETURN DUCT (UP & DOWN)		2'x4' RADIANT CEILING PANEL	MPR	MEDIUM PRESSURE STEAM CONDENSATE RETURN	<u>=</u>	GUIDE		
		EXISTING DUCT TO BE REMOVED		LOW PRESSURE STEAM (15 PSIG AND BELOW) LOW PRESSURE STEAM CONDENSATE RETURN		REDUCER OR INCREASER ECCENTRIC REDUCER		
JUND AND SQUARE 4-WAY CEILING DIFFUSERS	ł	LOUVER (LOUVER SPECIFIED IN ARCHITECTURAL SECTION)	PC	CONDENSATE PUMP DISCHARGE	U	TOP CONNECTION, 45° OR 90°		
QUARE 3-WAY CEILING DIFFUSERS				HEATING WATER SUPPLY HEATING WATER RETURN	÷	BOTTOM CONNECTION, 45° OR 90° SIDE CONNECTION		
			GHS	GLYCOL-WATER HEATING SUPPLY	Ţ	CAPPED OUTLET		
QUARE 2-WAY CEILING DIFFUSERS		DUCT WITH SOUND LINING	GHR	GLYCOL-WATER HEATING RETURN SOLAR WATER SUPPLY	⇒ ⊨	RISE OR DROP IN PIPE UNION		
QUARE 1-WAY CEILING DIFFUSERS		MANUAL VOLUME DAMPER	SWR [.]	SOLAR WATER RETURN	o	PIPE UP		
NEAR SLOT DIFFUSER		SMOKE DAMPER		REFRIGERANT LIQUID REFRIGERANT SUCTION	¢	PIPE DOWN INVERTED BUCKET TRAP SET INCLUDING		
JPPLY TOP REGISTER OR GRILLE (WALL TYPE)			RHG	REFRIGERANT HOT GAS		PIPING ACCESSORIES SEE DETAIL		
(HAUST OR RETURN CEILING	Ĩ <u></u> _ Ĩ	FIRE DAMPER	CWS	CONDENSER WATER SUPPLY (FROM TOWER) CONDENSER WATER RETURN (TO TOWER)	Z	INCLUDING PIPING ACCESSORIES SEE DETAIL		
EGISTER OR GRILLE		BACK DRAFT DAMPER	CHS	CHILLED WATER SUPPLY	——————————————————————————————————————	THERMOSTATIC TRAP SET INCLUDING PIPING ACCESSORIES SEE DETAIL		
	F/S DPR- P		CHR· GCS	CHILLED WATER RETURN GLYCOL-WATER CHILLED SUPPLY	——————————————————————————————————————	PUMP TRAP SET INCLUDING PIPING ACCESSORIES SEE DETAIL		
		COMBINATION FIRE/SMOKE DAMPER	GCR	GLYCOL-WATER CHILLED RETURN		THERMOMETER		
R TOP GRILLE (WALL TYPE)			MW	MAKE-UP WATER CONDENSATE DRAIN LINE	Ø-I	PRESSURE GAGE		
		PRESSURE CLASS. THE NUMBER ASSIGNS PRESSURE	D	DRAIN LINE		FLOW ELEMENT		
ANED ELBOW & AIR SPLIT TYPE DUCT TAKE-OFF	4 1/2	MAXIMUM OPERATING PRESSURE IN THE DUCT	MV	MECHANICAL VENT LINE	0	REFRIGERANT SIGHT GLASS		
ONNECT NEW DUCT TO EXISTING DUCT		ASSIGNMENT UNTIL THE DUCT TERMINATES OR	GRS	GLYCOL-WATER RUN AROUND SUPPLY		TEST PLUG (PRESSURE/TEMPERATURE)		
		INDICATES NEGATIVE PRESSURE.	GRR·	GLYCOL-WATER RUN AROUND RETURN		AUTOMATIC AIR VENT		
CLINED RISE, IN DIRECTION OF AIR FLOW	ĻĮ		FWPD	FEEDWATER PUMP DISCHARGE	<u></u>			
CLINED DROP, IN DIRECTION OF AIR FLOW	1		CTPD	CONDENSATE TRANSFER PUMP DISCHARGE	<u> <u> </u>Mv</u>	MANUAL AIR VENT		
		MANUAL SPLITTER DAMPER	CTPS	VACUUM CONDENSATE RETURN	—_с	QUICK-COUPLE HOSE CONNECTOR		
MIT OF DEMOLITION	' <u>کہد</u> ا		TC	TUBE CLEANER WATER SUPPLY		CONNECT TO EXISTING		
EXIBLE CONNECTION, EQUIPMENT,			во Свр	BOILER BLOWOFF CONTINUOUS BLOWDOWN				
BRATION, OR SEISINIC		RETURN, NO SPLITTER (45° TAP)	BWS	BOILER WATER SAMPLE		LIMIT OF DEMOLITION		
ANED ELBOW (PROVIDE ALL SQUARE OR ECTANGULAR ELBOWS WITH VANES EVEN IF			FWS	FEEDWATER SAMPLE (FROM DEAERATOR) CHEMICAL FEED		AIR SEPARATOR		
(MBOL IS MISSING)			OFL	OVERFLOW	db			
ANED ELBOW (SHORT RADIUS)	ÎÎ	OR STEAM COIL)	ANG	COMPRESSED AIR NATURAL GAS MAIN FUEL	VALVE SYMBOL	<u>_S</u>		
		DUCT-MOUNTED COIL (ELECTRIC)	NG(I)	NATURAL GAS IGNITER FUEL		GENERIC VALVE (REF SPEC FOR TYPE)		
ANDARD RADIUS ELBOW (LONG RADIUS)	L (SD)		LPG(I)	LIQUEFIED PETROLEUM GAS IGNITER FUEL	—— XXI———	GLOBE VALVE		
EW DUCT (INSIDE DIMENSIONS): WIDTH x DEPTH (RECTANGULAR)	11	NFPA 90A AND SPECIFICATION 28 31 00.	FOR-	FUEL OIL RETURN	Ъс	3/4" HOSE ADAPTER		
WIDTH / DEPTH (FLAT OVAL) DIAMETER Ø (ROUND)			CW	COLD WATER (CITY WATER) SOFTENED WATER				
KISTING DUCT TO REMAIN			HW	HOT WATER		CHECK VALVE		
			SH	ROLLER-TYPE HANGER		WYE STRAINER (WITH BALL VALVE & HOSE CONNECTION)		
ELDED STAINLESS STEEL DUCT RAP ENTIRE LENGTH IN 2-HR FLEXIBLE SHAFT WRAP			SCH	VARIABLE SPRING-TYPE HANGER (TYPE 51)* SPRING CUSHION-TYPE HANGER (TYPE 48 OR 49)*	<u>[X]</u>	FLEXIBLE PIPE CONNECTOR		
				CLEVIS-TYPE HANGER	⊼-	ANGLE GLOBE VALVE		
			TH	TRAPEZE HANGER (PROVIDE U-BOLT PIPE ATTACHMENT	T			
JMBER			PS ————————————————————————————————————	FLOOR-SUPPORTED PIPE STAND	Q	BUITERFLY VALVE		
NUMBER WHERE DRAWN				RISER CLAMP (TYPE 42)*	——	BALL VALVE		
			СЅН	WALL BRACKET (TYPE 31, 32, 33)*		CONTROL VALVE		
NUMBER WHERE SHOWN			SS	SLIDING SUPPORTS (TYPE 35)*	b	CONTROL BUTTERFLY VALVE		
NUMBER WHERE EQUIPMENT IS LOCATED.				NEW PIPING	÷.			
AN NUMBER 3 IN BUILDING NUMBER 26				EXISTING PIPING		THREE-WAY CONTROL VALVE		
JNIT NUMBER				PIPE TO BE DEMOLISHED		PRESSURE REGULATING (IE REDUCING) VALVE		
					¥	PRESSURE SAFETY VALVE / RELIEF VALVE		
INTERMINAL UNIT NUMBER 1)			↑ IYPE NUMBERS REFER TO MANU	JFACTURER'S STANDARDIZATION SOCIETY STANDARD PRACTICE SP-58	 XX	WATER FLOW BALANCE VALVE		
Y AIR HANDLER UNIT NUMBER 1								
EMARK						GATE VALVE WITH GLOBE-VALVED BYPASS		
						PLUG VALVE		
IPMENT (SHAPE VARIES, REF: SYMBOLS, TAGS, SCHEDULED ITEMS ARE NEW UNO)						CONTROL VALVE (CV) - FLOAT-OPERATED		
COMPONENT						WATER LEVEL CONTROLLER		
1ED COMPONENT								
<u>LS</u>					(M)	FLOW METER		
UNIT					WM)	WATER FLOW METER		

OLUME ING COIL

CONTRACT

	Drawing Title MECHANICAL SYMBOLS	Phase 100% BID DOCUMENTS	Project Title CONSTRUCT MENTA OUTPATIENT BLDG {	۹I 52
mont	Approved: Project Director		Location 2101 ELM STREET N, FARGO, I	N
Affairs			Issue Date 05/26/2023	ie M
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DOCUMENT FUL	S SUBMISSION LY SPRINKLED	
L HEALTH 52 ADDITION	437-316 Building Number 52	
ID 58102 ed Drawn 1B RT	Drawing Number M-002 DWG 139 of 188	
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					<u>TERMIN</u>	IAL U	NIT (T	<u>(U) SC</u>	CHED	DULE									REMARKS: 1. REFER ALSO TO SPECIFICATION					AH	IU PRE-F	ILTER	SCHED	ULE					<u>A</u>	HU AFTER	R-FILTER SC	HEDULE		
			MAX			F	REHEAT	COII					SINGLE I	POINT					SECTION 23 36 00. 2. PROVIDE WITH FACTORY SOUND			MARK	ME	RV AIF			THICKNES	S FILTE	R/RACK	RFMARKS	MAR	к	MERV			ESS FILTER/	R/RACK	RFMARK
		MAX	IIN APD		H	TG E	AT LA	AT	EW	VT	WP	2		MAX	BOI	D MFR			ATTENUATOR.				RAT	FING ((CFM) (I	N WG)	(IN)	T	YPE				RATING	(CFM) (IN	WG) (IN)	ТҮР	PE	
TYPECFMCFM(INSINCLE DUCT400410	CFM CFM (IN	2FM (IN	₩(1	G) SOUF		FM (°	°F) (°F	F) MB	BH (°F	F) GPI	M (FT V	(G) VA	C PH				RE					52-PF-1/52-PF-	-2 1	1 2	21930	0.6	2"	R	ACK	1	52-AF	-1	14	21930 ().6 2"	RAC	CK	1
SINGLE DUCT 490 410 1 50% PGW SINGLE DUCT 400 140 1 50% PGW	490 410 1 50% PGW 400 140 1 50% PGW	140 1 50% PGW	50% PGW	GW		90 t 60 t	55 00. 55 91.	1.6 14.	1.2 10	50 1.6	3 0.3	24	· 1	15 VA		S DESV		1, 2																				
SINGLE DUCT 640 490 1 50°	640 490 1 50 [°]	490 1 50 [°]	50°	% F	GW 49	90 5	55 95.	5.9 16.	5.3 16	60 1.6	6 0.3) 24	1	15 VA	TITU	S DESV		1, 2																				
SINGLE DUCT 100 0 1	100 0 1	0 1		50% F	GW 1	10 5	55 94	94 13.	3.5 16	60 1.6	<u> </u>	24	. 1	15 VA	TITU	S DESV		1, 2													<u> </u>							
SINGLE DUCT 380 160 1 50% PC SINGLE DUCT 380 160 1 50% P	380 160 1 50% P 380 160 1 50% P	160 1 50% P 160 1 50% P	50% P(י()	GW 32	20 5 20 F	55 94	13. 14 13.	3.5 16 3.5 16	50 1.6 50 1.6	$\frac{1}{3}$ 0.3	24	1	15 VA 15 VΔ		S DESV		1,2 1.2	-								MA	DK	TVDE	DESIGN HUI		ION EA-I	DP LA-DP				STEAM	
NOT USED -<				-							-	-	-	-		-		-	-									uxrx		(C	FM)	(°F	⁻) (°F)	SOURCE	CONTROL VALV	E COIL LO	STEAM OAD (LB/H)	
SINGLE DUCT 340 140 1 50% PGW 310 55 94.7 13.3	340 140 1 50% PGW 310 55 94.7 13.3	140 1 50% PGW 310 55 94.7 13.3	50% PGW 310 55 94.7 13.3	PGW 310 55 94.7 13.3	0 55 94.7 13.3	5 94.7 13.3	7 13.3	3	16 ک	50 1.6	6 0.3	24	. 1	15 VA	TITU	S DESV		1, 2									52-	H-1	-	21	930	19.	.9 36.7	52-SH-1	15	15	150	1
SINGLE DUCT 630 250 1 50% PGW 630 55 85.3 SINGLE DUCT 630 250 1 50% PGW 630 55 85.3	630 250 1 50% PGW 630 55 85.3 630 200 4 50% PGW 630 55 87.3	250 1 50% PGW 630 55 85.3 20 4 50% PGW 450 55 87.7	50% PGW 630 55 85.3	PGW 630 55 85.3	80 55 85.3	5 85.3	3	20.).6 16		<u>6 0.3</u>	$\frac{2}{2}$. 1	15 VA		S DESV		1, 2																				
SINGLE DUCT 080 90 1 50% PGV SINGLE DUCT 190 150 1 50% PGV	680 90 1 50% PGV 190 150 1 50% PGV	90 1 50% PGV	50% PGV	'GVı PGV	V 15 N 16	50 50 F	ວວ ୪/. 55 ጸନ	5.4 5.3	.3 16 .1 16	50 1.2 50 0.8	2 U.5 } 0.5	24 24	· I · 1	15 VA 15 VA		S DESV		ı,∠ 1.2														 	_					
SINGLE DUCT 350 310 1 50% PGV	350 310 1 50% PGV	310 1 50% PGV	50% PGV	GV	V 31	10 5	55 94.	4.7 13.	3.3 16	50 1.6	6.0 6 0.3	24	1	15 VA		S DESV		1, 2]										<u>EXHAU</u>	<u>ST FAN (</u>	EF) SC	HEDUL	<u>_E</u>					
SINGLE DUCT 390 140 1 50% PG	390 140 1 50% PG	140 1 50% PG	50% PG	'GI	N 34	40 5	55 92.	2.8 13.	3.9 16	60 1.6	6 0.3	24	. 1	15 VA	TITU	S DESV		1, 2									FSD		FAN			Ν	MOTOR		RVC			
SINGLE DUCT 890 340 1 50% PGW 340 SINGLE DUCT 180 160 1 50% PGW 160	890 340 1 50% PGW 340	340 1 50% PGW 340 160 1 50% PGW 160	50% PGW 340	PGW 340		5	55 101	1.2 14.	1.4 16		$\frac{3}{2}$ 0.3		· 1	15 VA	דודט: דודוד	S DESV		1, 2					ATION	AREA SE	SERVED	(CFM)	(IN WG)	ТҮР	E	DRIVE .					CONTROLS	BOD MFR AND	D MODEL	REMARK
SINGLE DUCT 100 100 1 50% PGW 100 50 00.3 SINGLE DUCT 310 140 1 50% PGW 300 55 95.7	100 1 50 % P GW 100 50 00.0 310 140 1 50% PGW 300 55 95.1	100 1 50% PGW 100 55 95.7 140 1 50% PGW 300 55 95.7	50% PGW 300 55 95.7	PGW 300 55 95.7	0 55 00.0 0 55 95.0	5 95.3	<u>,</u>	3 13.	. <u>~</u> 10 3.1 16	50 0.0 50 1.6	6.0.0 6 0.3	24	· · ·	15 VA	TITU	S DESV		1, 2							0.50	0.450						ΨΙ				GREENHF	IECK	4.0
SINGLE DUCT 180 160 1 50% PGW	180 160 1 50% PGW	160 1 50% PGW	50% PGW	PGW	16	60 5	55 85.	5.3 5.2	.2 16	60 0.8	3 0.3	24	. 1	15 VA	TITU	S DESV		1, 2				52-EF-01 PENTH	HOUSE	BLDG	G 52	2450	2	IN-LI	NE	DIRECT	2 208	3	9.8 15	CV	MI703	SQ-160-V	-VG	1, 2
SINGLE DUCT 310 140 1 50% PGW SINGLE DUCT 400 400 400 50% PGW	310 140 1 50% PGW	140 1 50% PGW	50% PGW	PGW	30	00 5	55 95.	5.3 13.	3.1 16	50 1.6	6 0.3	24	· 1	15 VA	TITU	S DESV		1, 2																				
SINGLE DUCT 430 430 1 50% PGW 4 SINGLE DUCT 420 160 1 50% PGW 4	430 430 1 50% PGW 420 160 1 50% PGW	430 1 50% PGW 4 160 1 50% PGW	50% PGW		43	30 5 60 6	55 88. 55 Ω1	3.1 15. 1.6 14	0.4 16	50 1.6 50 1.6	i 0.3	24	· 1	15 VA		S DESV		1, 2		Г																		
SINGLE DUCT 360 160 1 50% PGW	420 100 1 50% F GW 360 160 1 50% PGW	160 1 50% PGW	50% PGW	GW	24	40 5	55 91.	00 11.	I.7 16	50 1.6) 0.3 6 0.3	24	· 1	15 VA	TITU	S DESV		1, 2										<u>/</u>	AIR DEV	ICE SCHI	DULE							
SINGLE DUCT 350 310 1 50% PGW 310	350 310 1 50% PGW 310	310 1 50% PGW 310	50% PGW 310	PGW 310	10	5	55 94.	4.7 13.	3.3 16	60 1.6	6 0.3	24	. 1	15 VA	TITU	S DESV		1, 2		-					DANEL	,		NEC	CK SIZE MAX	(CFM						`		
SINGLE DUCT 470 150 1 50% PGW 170 55 85 5.5 SINGLE DUCT 470 150 1 50% PGW 170 55 85 5.5	470 150 1 50% PGW 170 55 85 5.5 50%	150 1 50% PGW 170 55 85 5.5 110 1 50% PGW 170 55 85 5.5	50% PGW 170 55 85 5.5	PGW 170 55 85 5.5	70 55 85 5.F	55 85 5.E	5 5.5		<u>ن</u> 16	60 0.9) 0.4	24	. 1	15 VA	TITU	S DESV		1, 2			MARK	TYPE DESCRIPTIO	ON M	IOUNTING	FRAME SI	ZE 6"	Ø	8"Ø	10"Ø	12"Ø	14	l"Ø	MAX NC	MAX APD		MATER	RIAL	REMARK
SINGLE DUCI 530 510 1 50% PGW 510 55 86.4 15.9 5 SINGLE DUCT 510 210 1 50% PGW 370 55 95.9 16.3	530 510 1 50% PGW 510 55 86.4 15.9 510 510 55 95.9 16.3 56	510 1 50% PGW 510 55 86.4 15.9 5 210 1 50% PGW 370 55 95.9 16.3 5	50% PGW 510 55 86.4 15.9 50% PGW 370 55 95.9 16.3	2GW 510 55 86.4 15.9 C-W 370 55 95.9 16.3	0 55 86.4 15.9 70 55 95.9 16.3	5 86.4 15.9 5 95.9 16.3	4 15.9 0 16.3	9 · 	16 16	50 1.6 50 1.6	o 0.3 S ∩ 3	$\frac{24}{2}$	· 1	15 VA		S DESV		1,2 1.2					<u></u> ୧।			6"X	(6"	8"X8"	10"X10"	12"X12'	14"	X14"						
SINGLE DUCT 380 260 1 50% PGW 260 55 95.7	310 210 1 300,01,000 010 00	210 1 30 / 0 / 0 / 0 / 0 / 0 / 0 / 0 / 0 / 0 /	50% PGW 260 55 95.7	PGW 260 55 95.7	0 00 00 00.0 60 55 95.7	55 95.3	?	3 13.	B.1 16	50 1.6	5 0.3	24	. 1	15 VA	TITU	S DESV		1, 2			E1-A	EGG CRATE GRILL		LAY-IN	24" x 24"	100 (CFM	225 CFM	350 CFM	525 CFN	725	CFM	13	0.1	TITUS 50F / 50	R ALUM / S	STEEL	1, 2, 3
SINGLE DUCT 100 0 1 50% PGW 10 55	100 0 1 50% PGW 10 55	0 1 50% PGW 10 55	50% PGW 10 55	PGW 10 55	0 55	55	93.	3.3 4.´	.1 16	60 0.8	3 0.3	24	· 1	15 VA	TITU	S DESV		1, 2			E3-A	PERFORATED FACE	TYPE SI		24" x 24"	150 (CFM	250 CFM	400 CFM	600 CFN			25	0.1	TITUS PAR	ALUM / S	STEEL	1, 2, 3
SINGLE DUCT 330 160 1 50% PGW 260 55 SINGLE DUCT 330 460 4 50% PGW 260 55	330 160 1 50% PGW 260 55 230 400 4 50% PGW 260 55	160 1 50% PGW 260 55	50% PGW 260 55	PGW 260 55	50 55	55	, 98.	3.3 12.	2.2 16		6 0.3	24	. 1	15 VA		S DESV		1, 2			F A F			URFACE /									05				0TEE'	
SINGLE DUCT 330 160 1 50% PGW 260 55 90.3 12.2 SINGLE DUCT 590 250 1 50% PGW 250 55 100.4 14.7	330 160 1 50% PGW 200 55 90.3 12.2 590 250 1 50% PGW 250 55 100.4 14.7	160 1 50% PGVv 260 50 90.3 12.2 250 1 50% PGW 250 55 100.4 14.7	50% PGW 250 55 100.4 14.7	26W 260 55 90.3 12.2 26W 250 55 100.4 14.7	$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	5 98.3 1∠.∠ 55 100.4 14.7	<u>3</u> 12.2 4 14.7	2	16 16	50 1.6 50 1.6	0.3 0.3) 24	· · · · · · · · · · · · · · · · · · ·	15 VA 15 VA		S DESV		ı,∠ 1.2			E3-B	PERFORATED FACE	IYPE	LAY-IN	12" x 12"	100 (CFM	280 CFM					25	0.1	IITUS PAR	ALUM / S	SIEEL	1, 2, 3
SINGLE DUCT 360 140 1 50% PGW 260	360 140 1 50% PGW 260	140 1 50% PGW 260	50% PGW 260	PGW 260	50	5	55 98.	3.3 12.	2.2 16	50 1.6	6.0 6 0.3	24	. 1	15 VA	TITU	S DESV		1, 2			R1-A	EGG CRATE GRILL	LE SI	URFACE /	24" x 24"	100 (CFM	225 CFM	350 CFM	525 CFN	725	CFM	13	0.1	TITUS 50F / 50	R ALUM / S	STEEL	1, 2, 3
SINGLE DUCT 940 710 1 50% PGW 710	940 710 1 50% PGW 710	710 1 50% PGW 710	50% PGW 710	PGW 710	0	5	55 94.	4.3 17	7 16	60 2.4	1 0.3) 24	. 1	15 VA	TITU	S DESV		1, 2						URFACE /	401 401	400 4							05	0.4				4 0 0
SINGLE DUCT 370 170 1 50% PGW SINGLE DUCT 440 420 1 50% PGW	370 170 1 50% PGW 140 120 1 50% PGW	170 1 50% PGW	50% PGW	GW	17	70 5	55 85.	5.3 5.2	.2 16	3.0 0.6	$\frac{3}{2}$ 0.3	24	. 1	15 VA		S DESV		1, 2			КЈ-В	PERFURATED FACE		LAY-IN	12" x 12"	100 (∠ðU CFM					25	0.1	IIIUS PAR	ALUM / S	SIEEL	1, 2, 3
SINGLE DUCT 140 130 1 50% FGW SINGLE DUCT 690 180 1 50% PGW	140 150 1 50% F G v v 690 180 1 50% P G W	130 1 50% FGW 180 1 50% PGW	50% PGW	GW GW	20	00 f	55 10	05 4. <i>1</i>	., 10).3 16	50 0.8 50 1.6	5 0.3 5 0.3	24	· I · 1	15 VA 15 VA		S DESV		1, 2 1. 2			S1-R	SQUARE, CONE LOU	VER, SI	URFACE /	24" x 24"	145 (CFM	200 CFM	325 CFM	450 CFN	640	CFM	22	01	TITUS TMS	ALLIM / S	STEFI	1 2 3
SINGLE DUCT 100 80 1 50% P	100 80 <u>1</u> 50% P	80 1 50% P	50% P)	GW 8	30 5	55 86.	6.4 5. <i>°</i>	.1 16	<u>50</u> 0.8	B 0.3	24	1	15 VA	TITU	S DESV		1, 2]			PATTERN		LAY-IN							0+0	~ 1 1 7 1	<u> </u>	0.1			J. L.L.	, 2 , 0
SINGLE DUCT 180 140 1 50% PGV SINGLE DUCT 180 140 1 50% PGV	180 140 1 50% PGV	140 1 50% PGV	50% PGV	GW	/ 14	40 5	55 88.	3.8 4.7	.7 16	<u>80</u> 0.8	8 0.3	24	1	15 VA	TITU	S DESV		1, 2			Q1 D		VER, SI	URFACE /	10" v 10"	105 (17	0.1			STEEI	1 0 0
SINGLE DUCT 350 140 1 50% PGW SINGLE DUCT 000 300 1 50% PGW	350 140 1 50% PGW 000 300 1 50% PGW	140 1 50% PGW	50% PGW		28	80 5 90 F	55 96.	o.8 12. ∩⊿ 14	2.6 16 1.7 16	50 1.6	0.3 0 0.3	24 24	· 1	15 VA		S DESV		1, 2 1 2			01-D	PATTERN		LAY-IN		135 (17	0.1	11109 HM9	ALUIVI / S	SIEEL	ı, Z, J
SINGLE DUCT 280 160 1 5	280 160 1 <i>f</i>	160 1 <i>f</i>	;	<u>50%</u> F	GW 25	50 5 50 5	55 99.	9.2 11.	I.9 16	50 1.6	3 0.3	24	· · ·	15 VA	TITU	S DESV		1, 2			S3-A	PERFORATED FACE	TYPE SI	URFACE /	12" x 12"	150 (CFM	250 CFM	350 CFM	470 CFN			25	0.1	TITUS PAS	ALUM / S	STEEL	1, 2, 3
SINGLE DUCT 40 40 1 50% PGW	40 40 1 50% PGW	40 1 50% PGW	50% PGW	PGW	4	40 5	55 87.	7.5 4.9	.9 16	60 0.8	3 0.3	24	. 1	15 VA	TITU	S DESV		1, 2			S6-4				12" v 8"	100 (CFM	200 CEM	350 CEM	525 CEN	720	CEM	25	0.1			STEEL	1 2 3
SINGLE DUCT 280 160 1 50% PGW SINGLE DUCT 270 240 4 50% PGW	280 160 1 50% PGW	160 1 50% PGW	50% PGW	GW	24	40 5	55 10	00 11.	1.7 16	60 1.6	6 0.3	24	. 1	15 VA	TITU	S DESV		1, 2		L	00-7				12 80	100 (100		20	V. I	1100 JUUL			i, Z, J
SINGLE DUCI 270 210 1 SINGLE DUCT 460 460 1	270 210 1 460 460 1	210 1 160 1		50% P	GW 21 GW 16	10 5 60 F	55 87.	7.5 + 4.9	.9 16 5.8 16	50 0.8 50 1 6	s 0.3	24	· 1	15 VA		S DESV		1,2 1.2																				
SINGLE DUCT 360 140 1 50% PC	400 400 1 50% PC 360 140 1 50% PC	140 1 50% PC	50% PC		₩ 40	70 5	55 87.	7.2 5.9	.9 16	50 1.9) 1.5	3 24	· 1	15 VA	TITU	S DESV		1, 2																				
SINGLE DUCT 540 210 1 50% PGW	540 210 1 50% PGW	210 1 50% PGW	50% PGW	GW	30	00 5	55 100	0.4 14.	1.7 16	50 1.6	6 0.3) 24	. 1	15 VA	TITU	S DESV		1, 2												<u>STEAN</u>		DIFIER	<u>(SH) SC</u>	HEDULE				
SINGLE DUCT 330 310 1 50% PGW 310 SINGLE DUCT 4400 6300 4 50% PGW 310	330 310 1 50% PGW 310 4400 000 4 50% PGW 1160	310 1 50% PGW 310 200 4 50% PGW 1160	50% PGW 310	PGW 310	0	5	55 94.	4.7 13.	3.3 16		6 0.3	24	. 1	15 VA		S DESV		1, 2									evet			IFIER ST	AM		MAX INL	.ET ELE	CTRICAL DATA			
SINGLE DUCT 1160 830 1 50% PGVV 1160 55 95	1160 830 1 50% PGW 1100 55 55	330 1 50% PGVV 100 55 95	50% PGW 1100 55 95	'GW 1160 ວວ ອວ	60 <u>55</u> 90	ob 90)	42.	2.1 16	00 2.8	o 0.3	22	1	ID VA		S DE2A		Ι, Ζ]						MARK	OCATION	S				AD //HR)	(MBH)			PH MCA M	OCP MOE)DEL	REMARK
																															50	100		<i>1</i>	4 20			

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										Al	IR HANI	DLING UNIT	<u>(AHU) SC</u>	HEDULE												
		AREA AND/OR	SUPPLY	OUTSIDE		RETU	RN	FXHALIST	PRF-		AFTER-	ΗΕΔΤ	PREHEAT	COOLIN	NG		OVERALL		OVERALI	SIN	GLE POIN	IT POWE	R			
MARK	LOCATION	BLDG SERVED	AIRFLOV (CFM)	V AIRFLOW (CFM)	FAN	FAN	I	FAN	FILTER		FILTER	RECOVERY	COIL	COIL		AIDIFIER	HEIGHT	LENGTH	WIDTH	VAC	PH	MCA	МОСР	BASIS OF	F DESIGN	REMARK
-AHU-1	PENTHOUSE	BLDG 52	21930	5300	52-SF-1	52-RF	-1	-	52-PF-1/52-F	PF-2	52-AF-1	-	52-PH-1	52-CC-	-1 5	2-H-1	12'-6"	28'-6"	9'-0"	208	3	197.4	300A	TRANE	PSCA-1	1
										ľ						÷										I
					<u>AHU SL</u>	JPPLY I	FAN S	CHEDULI	<u>E</u>	·								AHU R	ETURN	FAN S	CHEDI	<u>JLE</u>				
		TOTAL	ESD		<u>AHU SL</u>		FAN S	CHEDULI ELECTR	<u>E</u> RICAL DATA (1	TOTAL A	ARRAY UNC)			TOTAL	ESD		AHU R		FAN S	CHEDI ELECTI	JLE RICAL DA	ΑΤΑ (ΤΟΤ/	AL ARRAY UI	NO)	
	MARK	TOTAL AIRFLOW (CFM)	ESP (IN WG)	ТҮР	<u>AHU SL</u>	JPPLY I FAN QTY	FAN S	CHEDULI ELECTR MOTOR HP (EACH)	E RICAL DATA (1 VAC I	TOTAL A PH I	ARRAY UNC MCA I)) MOCP	RKS	MARK	TOTAL AIRFLOW (CFM)	ESP (IN WG)	TY	AHU R	ETURN FAN QTY	FAN S	CHEDU ELECTI DTOR HP (EACH)	JLE RICAL DA	ATA (TOT/ PH	AL ARRAY UI MCA	NO) MOCP	REMARKS

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			<u>A</u>		REHEA ⁻	T COIL S	<u>SCHEDI</u>	<u>JLE</u>										<u>AHU (</u>	COOLI	NG CC	IL SCH	EDULE	1					
	HEATING					MIN		HEATIN	IG WATE	ER (HW)													0	HILLED	WATE	R (CHW)		
MARK	AIRFLOW (CFM)	MAX FV (FPM)	APD (IN WG)	EAT-DB (°F)	LAT-DB (°F)	CAPACITY (MBH)	GLYCOL %	EWT (°F)	LWT (°F)	FLOW (GPM)	WPD (FT WG)	REMARKS	MARK	AIRFLOW (CFM)	MAX FV (FPM)	APD (IN WG)	EAT-DB (°F)	EAT-WB (°F)	LAT-DB (°F)	LAT-WB (°F)	SEN MBH	TOTAL MBH	GLYCOL %	EWT (°F)	LWT (°F)	FLOW (GPM)	WPD (FT WG)	REMARK
52-PH-1	21930	450	0.05	36.8	55	712	50	160	130	48	5.5	1	52-CC-1	21930	450	0.47	78.0	64.0	52.0	51.0	624	807	50	45	60	108	17	1

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	LOUVER SCHEDULE									
MARK	SYSTEM AND/OR SERVICE	TYPE	WIDTH (IN)	HEIGHT (IN)	AIR FLOW (CFM)	MAX FREE AREA VELOCITY (FPM)	MAX APD (WG)	MANUFACTURER AND MODEL	REMARKS	
LVR-1	52-AHU-1 RELIEF AIR	STATIONARY	108"	48"	2270	550	0.08	RUSKIN L375D	1	
LVR-2	52-AHU-1 OUTSIDE AIR	STATIONARY	96"	48"	4990	550	0.08	RUSKIN L375D	1	
LVR-3	52-EF-1 EXHAUST AIR	STATIONARY	25"	25"	2450	550	0.08	RUSKIN L375D	1	

ARCHITECT/ENGINEERS:	STAMP:		Drawing Title EQUIPMENT SCHEDULES	Phase 100% BID DOCUMENTS	Project Title CONSTRUCT MENTAL OUTPATIENT BLDG 52
	MITCH BIBLE 118867	LLC Dere entre ent	Approved: Project Director		Location 2101 ELM STREET N, FARGO, ND
SUITE 300 ENGLEWOOD, CO 80110 (720) 550-6307 WWW.VALHALLAENGINEERING.COM	VEG 21.05	of Veterans Affairs			Issue Date 05/26/2023 MI
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GENERAL NOTES

9

REQUIREMENTS.

8

								GENERAL NOTES
								A. FOR ALL SCHEDULED EQU EQUAL. REFER TO SPECIFI REQUIREMENTS.
								B. SELECT EQUIPMENT FOR
				MIN CAPACITY MIN FER	AIR COOLED CHILLER (AU	SCHEDULE ELECTRICAL DATA	MAX PHYSICAL DATA	_
			MARK LOCATION BLDG SERVED T	TYPE (TONS @ 105°F) @ AHRI @ AHRI MIN IPI CROLL 66 7 9 7 15 7	LV FLOW EWT LWT WPD (GPM) (°F) (°F) (FT WG	FOULING FACTORVACPHMCAMOCPLENGT (IN)0.00012083351400117	Image: FHWIDTHHEIGHTWEIGHT(IN)(IN)(IN)(LB)788965602 LBS	BOD MFR AND MODEL REMAIN YORK YLAA00707E 1.2
			52-ACCH-2 EXTERNAL BLDG 52 SC	CROLL 00.7 9.7 13.7 CROLL 66.7 9.7 15.7	100 00 43 22 108 60 45 22	0.0001 208 3 351 400 117 0.0001 208 3 351 400 117	88 96 5602 LBS	YORK YLAA0070ZE 1, 2
	EMERGENCY GAS SAFETY SHUT-OFF VALVE (EC	SEV) SCHEDULE 1. REFER ALSO TO SPECIFICATION			HEATING HOT WATER BOILER	<u>R (BHW) SCHEDULE</u>		
	MARKLOCATIONSYSTEMFLOW RATE (CFH)INLET PRESS52-EGSV-1EXTERIOR SERVICE ENTRANCENATURAL GAS44003-15" W	MAX PD REMARKS General Notes G 0.5" WG 1 General Notes A. REFER TO SPECIFICATIONS FOR INDIVDUAL EQUIPMENT SAFETY SHUTOFF VALVES NOT SCHEDULED.	MARKLOCATIONAREA AND/OR BLDG SERVED52-BHW-1PENTHOUSEBLDG 52CON52-BHW-2PENTHOUSEBLDG 52CON	TYPEFUEL (PRESSNDENSING CAST IRONNG (3-15" WGNDENSING CAST IRONNG (3-15" WG	MIN CAPACITY (MBH)MIN EFF 	LWT (°F) MAX WPD (FT WG) ELECTRICAL DATA 160 0.61 208 3 20 25 35 160 0.61 208 3 20 25 35	MAX PHYSICAL DATA GTH WIDTH HEIGHT WEIGHT N) (IN) (IN) (LB) .5" 60" 72" 2360 .5" 60" 72" 2360	BOD MFR AND MODEL REMAIN ATH KN-16 1, 2, ATH KN-16 1, 2,
	SPLIT SYSTEM AIR CON	DITIONER OUTDOOR UNIT (ODU) SCHEDULE		SPLIT	SYSTEM AIR CONDITIONER IN	NDOOR UNIT (IDU) SCHEDULE		
	MARK UNIT STAGES COOLING	REQUIREMENTS ELECTRICAL DATA MIN AMBIENT TEMP VAC PH MCA MOCP MODEL	EMARKS MARK LOCATION A	AREA SERVED TYPE CEM	LY OA ESP CEM (IN WG) SOURCE SEN	NG REQUIREMENTS ELE TOTAL EAT- EAT- LAT- LAT- FAN DB WB DB WB HD VA(ECTRICAL REQUIREMENTS	BOD MFR AND D MODEL REMAR
	SERVEDCAPACITY (MBH)E52-ODU-1A52-IDU-1AVARIABLE3652-ODU-1A52-IDU-1AVARIABLE36	ER / SEER TEMP (°F) VAC PH MCA MOCP MODEL 10.8/18.8 115/-40 208 1 25 30 TRANE TRU	1, 2, 4 52-IDU-1A COMM / EHRM 126 COM	DMM / EHRM 126 HI-WALL 900	Orim (IN WO) SOURCE MBH 0 - 52-ODU-1A 36	MBH DB WB DB WB HP VAC 36 85 72 55 45 1/15 208	8 1 1 31 VARIAB	JL TRANE TRK 1, 2, 3
	52-ODU-1B 52-IDU-1B VARIABLE 36 52-ODU-2A 52-IDU-2A VARIABLE 36 52-ODU-2B 52-IDU-2B VARIABLE 36	10.8/18.8 115/-40 208 1 25 30 TRANE TRU 10.8/18.8 115/-40 208 1 25 30 TRANE TRU 10.8/18.8 115/-40 208 1 25 30 TRANE TRU 10.8/18.8 115/-40 208 1 25 30 TRANE TRU	1, 2, 4 52-IDU-1B COMM / EHRM 126 COM 1, 2, 4 52-IDU-2A COMM / EHRM 225 COM 1, 2, 4 52-IDU-2B COMM / EHRM 225 COM	DMM / EHRM 126 HI-WALL 900 DMM / EHRM 225 HI-WALL 900 DMM / EHRM 225 HI-WALL 900	0 - 52-ODU-1B 36 0 - 52-ODU-2A 36 0 - 52-ODU-2B 36	36 85 72 55 45 1/15 208 36 85 72 55 45 1/15 208 36 85 72 55 45 1/15 208 36 85 72 55 45 1/15 208	3 1 1 31 VARIABI 8 1 1 31 VARIABI 18 1 1 31 VARIABI	LE TRANE TRK 1, 2, 3 LE TRANE TRK 1, 2, 3 JLE TRANE TRK 1, 2, 3
	52-ODU-3 52-IDU-3 VARIABLE 25 52-ODU-4 52-IDU-4 VARIABLE 25	10.8/18.8 115/-40 208 1 25 30 TRANE TRU 10.8/18.8 115/-40 208 1 25 30 TRANE TRU	1, 2, 4 52-IDU-3 ELEV EQUIP 111 EL 1, 2, 4 52-IDU-4 ELEV EQUIP 111 EL	LEV EQUIP 111 HI-WALL 1000 LEV EQUIP 111 HI-WALL 1000	0 - 52-ODU-3 25 0 0 - 52-ODU-4 25	25 85 72 55 45 1/15 208 25 85 72 55 45 1/15 208	3 1 1 31 VARIABI 8 1 1 31 VARIABI	LE TRANE TRK 1, 2, 3 LE TRANE TRK 1, 2, 3
					HEATING WATER UN	IT HEATER (UH) SCHEDULE		
			MARK LOCATION	DESCRIPTION HHW COIL (MBH)	COIL RESSURE (CFM) HEATING COIL DROP (CFM) EAT (°F)	HEATING COIL LAT (°F) MOTOR HP VOLTAGE P	PHASE BOD MFGR AND MODEL	REMARKS
			52-UH-01 STAIRS 115 52-UH-02 STAIRS 132	CABINET 3.1 CABINET 5	0.5 185 60 0.5 185 60	100 1/15 120 100 1/15 120	1VULCAN W - SIZE 021VULCAN W - SIZE 02	1
			52-UH-03 MECH 102 52-UH-04 PENTHOUSE 52-UH-05 VESTIBULE 10	CABINET 3.7 E CABINET 81.1 01 CABINET 3.8	0.5 185 60 0.5 830 60 0.5 185 60	100 1/15 120 100 1/10 120 100 1/15 120	1 VULCAN W - SIZE 02 1 VULCAN W - SIZE 10 1 VULCAN W - SIZE 02	1 1, 2 1
			52-UH-06 VESTIBULE 11	17 CABINET 7.7	0.5 185 60	100 1/15 120	1 VULCAN W - SIZE 02	1
					HYDRONIC PUMP	(HP) SCHEDULE		
			MARK LOCATION AREA AND SER	D/OR BLDG SYSTEM PU	IMP TYPE FLUID GPM HEAD	NPSHAFLUID TEMP (°F)MIN %ELECTRICA3)(FT WG)(°F)EFFHPVACPI	AL/MOTOR DATA H MAX SPEED RPM CONTROL BOL	
			52-CHP-1 PENTHOUSE BLD 52-CHP-2 PENTHOUSE BLD	DG 52 CHILLED WATER BAS DG 52 CHILLED WATER BAS	SE MOUNT 50% PGW 120 120 SE MOUNT 50% PGW 120 120	4.73 45 51.5 15 208 3 4.73 45 51.5 15 208 3	31800VARIABLEBELL31800VARIABLEBELL	& GOSSETT E-1510 1 & GOSSETT E-1510 1
			52-HWP-1PENTHOUSEBLD52-HWP-2PENTHOUSEBLD	DG 52HEATING WATERBASDG 52HEATING WATERBAS	SE MOUNT 50% PGW 100 45 SE MOUNT 50% PGW 100 45	5.58 130 75 2 208 3 5.58 130 75 2 208 3	31800VARIABLEBELL31800VARIABLEBELL	& GOSSETT E-1510 1 & GOSSETT E-1510 1
					MISCELLANEOUS H	IYDRONIC EQUIPMENT SCHEDUL		
			MARK D	DESCRIPTION LOCATION SEF	M AND/OR RVICE TYPE	OLUMEFLOWWPDCONNECTION(GAL)(GPM)(FT WG)(NPS)ELE		EL
			52-AS-1	AIR SEPARATOR AIR	IG WATER COALESCING	NA 155 NA 3"	NA SPIROVENT AIR ELIMINATOR VSR40(SPIROVENT AIR	J 1
			52-AS-2 52-BT-1 B	SEPARATOR PENTHOUSE CHILLE BUFFER TANK PENTHOUSE CHILLE	D WATER COALESCING	NA 150 NA 4" 300 NA NA 4"	NA ELIMINATOR VSR400 NA AMTROL CWBT300-4) 1 <u>1</u> 1
			52-ET-1	EXPANSION TANK PENTHOUSE HEATIN EXPANSION PENTHOUSE CHILLE	IG WATER DIAPHRAGM	32 NA NA 1" 20 NA NA 1"	NA BELL & GOSSETT HFT-60V BELL & GOSSETT	1
			52-ET-2 52-FTF-1	TANK PENTHOUSE CHILLE FILTER PENTHOUSE HEATIN	IG WATER SIDE STREAM BYPASS WITH COUPON RACK	20 NA NA 1 5 8 NA 3/4"	NA HFT-40V NA NEPTUNE FTF-5HP	1
			52-FTF-2	FILTER FEEDER PENTHOUSE CHILLE	D WATER SIDE STREAM BYPASS WITH COUPON RACK	5 8 N/A 3/4"	NA NEPTUNE FTF-5HP	1
			52-GF-1 N 52-GF-2 N	GLYCOL MAKEUP UNIT GLYCOL MAKEUP UNIT PENTHOUSE CHILLE	IG WATER SIMPLEX	30 1.5 NA 1/2" 1 50 1.5 NA 1/2" 1	115V JUGP-53-030 115V NEPTUNE G-50-1A	1
					<u>HYI</u>	DRONIC RADIANT CEILING PANE	<u>EL (RCP) SCHEDULE</u>	
					MARK ROOM LOCATION AREA SERVED	PANEL HEATING SIZE (IN) CAPACITY (BTUH) EWT (°F) LWT (°F) FI	HOT WATER WPD -LOWRATE (GPM) (FT) BOD	
				5	52-HRP-1249STAFF LOUNGE52-HRP-2249STAFF LOUNGE	24X24 524 160 130 24X24 524 160 130	0.5 0.3 AR 0.5 0.3 AR	MSTRONG AR-X 1 MSTRONG AR-X 1
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		ENGINEERING GROUP, LLC	MITCH BIBLE		proved: Project Director			Location
		750 W HAMPDEN AVE SUITE 300 ENGLEWOOD, CO 80110	118867 ⁷⁰ ¹⁰	U.S. Department of Veterans Affairs				2101 ELM STREET N, FARGO, N Issue Date
Number: Revisions: VA FORM 08 - 6231 4	Date:	(720) 550-6307 WWW.VALHALLAENGINEERING.COM	VEG 21.05	6	7			<u> </u>
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	AIR COOLED CHILLER (ACCH) SCHEDULE																				
				MIN					EVAPORA	TOR		EL	ECTF	RICAL I	DATA		MAX PHYS	SICAL DAT	A		
MARK	LOCATION	AREA AND/OR BLDG SERVED	TYPE	CAPACITY (TONS @ 105°F)	MIN EER @ Ahri	MIN IPLV	FLOW (GPM)	EWT (°F)	LWT (°F)	MAX WPD (FT WG)	FOULING FACTOR	VAC	PH	MCA	MOCP	LENGTH (IN)	WIDTH (IN)	HEIGHT (IN)	WEIGHT (LB)	BOD MFR AND MODEL	REMAR
52-ACCH-1	EXTERNAL	BLDG 52	SCROLL	66.7	9.7	15.7	108	60	45	22	0.0001	208	3	351	400	117	88	96	5602 LBS	YORK YLAA0070ZE	1, 2
52-ACCH-2	EXTERNAL	BLDG 52	SCROLL	66.7	9.7	15.7	108	60	45	22	0.0001	208	3	351	400	117	88	96	5602 LBS	YORK YLAA0070ZE	1, 2

	HEATING HOT WATER BOILER (BHW) SCHEDULE																			
					MIN	MIN		FWT	ıwт	MAX	ELECT	RIC	CAL DA	ATA	М	AX PHYS	SICAL DA	ΓA		
MARK	LOCATION	BLDG SERVED	ТҮРЕ	FUEL (PRESS)	CAPACITY (MBH)	EFF (%)	GPM	(°F)	(°F)	WPD (FT WG)	VAC PH	4		моср	LENGTH (IN)	WIDTH (IN)	HEIGHT (IN)	WEIGHT (LB)	30D MFR AND MODEL	REMAR
52-BHW-1	PENTHOUSE	BLDG 52	CONDENSING CAST IRON	NG (3-15" WG)	1440	90	108	130	160	0.61	208 3		20	25	35"	60"	72"	2360	ATH KN-16	1, 2, 3
52-BHW-2	PENTHOUSE	BLDG 52	CONDENSING CAST IRON	NG (3-15" WG)	1440	90	108	130	160	0.61	208 3		20	25	35"	60"	72"	2360	ATH KN-16	1, 2, 3

CENEDAL NOTES

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1/8" = 1'-0"	0' 2' 4' 8'	16'	32'
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1 INSTUMENTATION PLAN - LEVEL 1 1/8" = 1'-0"

7	8	9 GENERAL NOTES
		A. REFER TO M-001 AND M-002 AND GENERAL NOTES. REFE SCHEDULES.
7 8		 B. FIELD VERIFY EXISTING CON VHA COR BEFORE PROCEED C. REFER TO GI SHEET SERIES LOCATIONS OF RATED CONS
		PENETRATION SEALING MEA SPECIFICATIONS. IN THE EV PATTERN SHOWN ON MEP P SHALL GOVERN.
		 D. REFER TO GI SHEET SERIES E. REFER TO MI SHEET SERIES F. MECHANICAL COMPONENTS
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	Drawing Title INSTRUMENTATION PLAN - LEVEL 1	Phase 100% BID DOCUMENTS	Project Title CONSTRUCT N OUTPATIENT E	MENTAL BLDG 52
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INSTUMENTATION PLAN - LEVEL 2

1/8" = 1'-0"

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I		I		I	GENERAL NOTES
					A. REFER TO M-001 AND M-002 AND GENERAL NOTES. REFE SCHEDULES.
7	8				B. FIELD VERIFY EXISTING CON VHA COR BEFORE PROCEED
					LOCATIONS OF RATED CONS PENETRATION SEALING MEA SPECIFICATIONS. IN THE EVI
					D. REFER TO GI SHEET SERIES
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	Drawing Title INSTRUMENTATION PLAN - LEVEL 2	Phase 100% BID DOCUMENTS	Project Title CONSTRUCT ME OUTPATIENT BLE	NTAL)G 52
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INSTUMENTATION PLAN - PENTHOUSE 0' 2' 4' 8' 16' 1/8" = 1'-0"

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				GENERAL NOTES
				A. REFER TO M-001 AND M-002 AND GENERAL NOTES. REF SCHEDULES.
7	Q			B. FIELD VERIFY EXISTING CON VHA COR BEFORE PROCEE
	0			C. REFER TO GI SHEET SERIES LOCATIONS OF RATED CON PENETRATION SEALING ME SPECIFICATIONS. IN THE EV PATTERN SHOWN ON MEP F SHALL GOVERN.
				D. REFER TO GI SHEET SERIES
		— — — (A)		F. MECHANICAL COMPONENTS
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				KEYNOIES
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	INSTRUMENTATION PENTHOUSE	ON PLAN -	100% BID DOCUMENTS	OUTPATIENT BLDG 52
	Approved: Project Director			Location

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Issue Date

GENERAL NOTES	
A. REFER TO M-001 AND M-002 FOR MECHANICAL SYMBOLS, ABBREVIATIONS, AND GENERAL NOTES. REFER TO MQ SHEET SERIES FOR EQUIPMENT SCHEDULES.	
B. FIELD VERIFY EXISTING CONDITIONS AND REPORT DISCREPANCIES TO THE VHA COR BEFORE PROCEEDING WITH WORK.	
C. REFER TO GI SHEET SERIES LIFE SAFETY PLANS FOR LEGEND AND DETAILED LOCATIONS OF RATED CONSTRUCTION REQUIRING ADDITIONAL MEP PENETRATION SEALING MEASURES IN ACCORDANCE WITH THE SPECIFICATIONS. IN THE EVENT OF A CONFLICTING OR AMBIGUOUS WALL PATTERN SHOWN ON MEP PLANS, RATINGS FROM THE LIFE SAFETY PLAN SHALL GOVERN.	A
 D. REFER TO GI SHEET SERIES FOR PROJECT PHASING PLAN AND NARRATIVE. E. REFER TO MI SHEET SERIES FOR THERMOSTAT LOCATIONS. F. MECHANICAL COMPONENTS ARE ABOVE THE FLOOR UNO. 	
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KEYNOTES (##)	
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CONTRACT DOCUMENTS SUBMISSION	
Project Title CONSTRUCT MENTAL HEAI TH Project Number 437-316	
OUTPATIENT BLDG 52 ADDITION Building Number 52	
Location 2101 ELM STREET N, FARGO, ND 58102 Issue Date Checked Drawn MI113	
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SINGLE DUCT VARIABLE AIR VOLUME (SDVAV) **TERMINAL UNIT (TU) WITH HOT WATER REHEAT**

VA FORM 08 - 6231

SINGLE DUCT VARIABLE AIR VOLUME (SDVAV) AIR HANDLING UNIT (AHU) WITH CHILLED WATER COOLING / HEATING WATER HEATING

SEQUENCE OF OPERATIONS

- UNIT SHALL BE IN "OCCUPIED" MODE BASED ON AN OPERATOR DEFINED SCHEDULE OR LOCAL ZONE OVERRIDE SIGNAL OTHERWISE THE UNIT SHALL BE IN "UNOCCUPIED" MODE.
- BUILDING FIRE ALARM OR OTHER SAFETY SIGNAL SHALL SHUT DOWN THE UNIT IN OVERRIDE OF THE BAS.
- 3. WHEN IN OCCUPIED MODE:
- A. INITIALIZATION:

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- a. OUTSIDE AIR (OA) DAMPER SHALL OPEN TO MINIMUM POSITION. MINIMUM POSITION SHALL BE AS DETERMINED BY TAB TO ACHIEVE DESIGN OA CFM AT DESIGN SUPPLY AIR FLOW CONDITIONS WITH SYSTEM FULL OPEN.
- D. RETURN AIR (RA) DAMPER SHALL OPEN TO MAXIMUM POSITION. MAXIMUM POSITION SHALL BE AS DETERMINED BY TAB TO ACHIEVE DESIGN OA FLOW AT DESIGN SUPPLY AIR FLOW CONDITIONS WITH SYSTEM FULL OPEN.
- c. EXHAUST AIR (EA) DAMPER SHALL OPEN. d. SUPPLY AIR (SA) FAN SHALL ENERGIZE.
- B. SETPOINT CONTROL:

e. EA FAN SHALL ENERGIZE.

- a. ACTIVE DUCT REMOTE STATIC PRESSURE SETPOINT SHALL BE MODULATED BETWEEN 1.0 AND 2.0 IN WG* TO MAINTAIN THE MOST OPEN TERMINAL UNIT (TU) DAMPER AT 95% OPEN.
- b. ACTIVE SUPPLY AIR TEMPERATURE (SAT) SETPOINT: SAT SETPOINT SHALL BE MODULATED FROM 52°F* TO THE ACTIVE UPPER SAT LIMIT TO MAINTAIN HIGHEST TU CFM AT 50%* OF DESIGN FLOW (OR 110% OF MINIMUM FLOW, WHICHEVER IS HIGHER). ACTIVE UPPER SAT LIMIT SHALL BE RESET FROM 55°* TO 70°F* AS OA DEWPOINT VARIES FROM 57°F* TO 55°F*.
- 2. THE OA CFM SETPOINT SHALL BE AS SCHEDULED ON MQ SHEET SERIES. d. THE EA CFM SETPOINT SHALL BE EQUAL TO 90%* OF
- THE ACTIVE MEASURED OA CFM, LESS CFM FROM BUILDING GENERAL EXHAUST FANS.
- e. ECONOMIZER OA ENTHALPY SETPOINT SHALL BE 28 **BTU/LB* AND OA TEMPERATURE SETPOINT SHALL BE** 72°F*.
- C. CONTROL OUTPUTS:
- a. SA FAN CONTROL: MODULATE FAN SPEED TO MAINTAIN THE ACTIVE DUCT REMOTE STATIC PRESSURE SETPOINT.
- b. RA FAN CONTROL: MODULATE FAN SPEED TO MAINTAIN THE ACTIVE RA CFM SETPOINT.
- c. CHILLED WATER (CHW) CONTROL VALVE: MODULATE TO MAINTAIN SAT AT THE ACTIVE SAT SETPOINT.
- d. PREHEAT VALVE: MODULATE TO MAINTAIN SAT AT THE ACTIVE SAT SETPOINT, MINUS 5°F*. e. HUMIDIFIER STEAM VALVE: MODULATE TO MAINTAIN RA
- RELATIVE HUMIDITY AT 40%*. ENERGIZE NG HUMIDIFIER. OA AND RA DAMPERS: WHEN NOT IN ECONOMIZER MODE, MODULATE OA DAMPER OPEN AS STAGE 1, AND
- RA DAMPER CLOSED AS STAGE 2 TO MAINTAIN THE OA FLOW AT THE ACTIVE CFM SETPOINT. ECONOMIZER MODE: WHEN OA ENTHALPY AND
- TEMPERATURE ARE BELOW RESPECTIVE ECONOMIZER SETPOINTS AND AT LEAST ONE TU ZONE IS IN COOLING, ENTER ECONOMIZER MODE (SHOW ECONOMIZER MODE STATUS AND MAKE OVERRIDABLE ON GRAPHIC). WHEN IN ECONOMIZER MODE:
- MODULATE OA DAMPER OPEN AS STAGE 1, AND RA DAMPER CLOSED AS STAGE 2 TO MAINTAIN THE MIXED AIR TEMPERATURE (MAT) AT THE ACTIVE SAT SETPOINT.
- 4. WHEN IN UNOCCUPIED MODE:
- A. FANS SHALL DE-ENERGIZE.
- B. COOLING COIL, HEATING COIL, OA DAMPER, EA DAMPER SHALL FULL CLOSE.
- C. IF ANY ZONE TEMPERATURE FALLS BELOW UNOCCUPIED SETBACK TEMPERATURE OF 55°F* OR ABOVE UNOCCUPIED SETUP TEMPERATURE OF 85°F*, ENABLE AHU AND CONTROL AS IN OCCUPIED MODE EXCEPT THAT:
- a. ZONE SETPOINTS SHALL BE SETBACK AND SETUP
- TEMPERATURES ABOVE. b. OA DAMPER SHALL REMAIN CLOSED.
- 5. ALARMS AND SAFETIES:
- A. SEND ALARM UPON FREEZE STAT TRIP. OPEN HW AND CHW
- VALVES TO AT LEAST 30% OPEN*. B. SEND ALARM UPON DRAIN PAN OVERFLOW SWITCH TRIP.
- C. SEND ALARM UPON DUCT HIGH PRESSURE LIMIT TRIP.
- D. SEND ALARM UPON SA DUCT HIGH HUMIDITY SWITCH TRIP. E. SEND ALARM UPON SMOKE DETECTOR TRIP.
- F. SEND ALARM UPON FILTER PRESSURE HIGH LIMIT TRIP.
- G. SEND ALARM UPON FAN VFD FAULT.

*-INDICATES SETPOINT TO BE ADJUSTABLE.

SDVAV CHW/HW	AHU/HRC E	BAS	I/O	POI	NTI	<u>_IST</u>			
		HARDWIRED CONTROLLER I/O's			NETV POI	VORK NTS			
POINT DESCRIPTION	P&ID POINT ID	DI	DO	AI	AO	READ	WRITE	TREND	FOOT NOTES
CHW COIL FREEZESTAT STATUS	CC.FRZ	•							6
COOLING COIL CHW VALVE COMMAND (%)	CV.CC				•			•	
HUMIDIFIER STEAM VALVE COMMAND (%)	CV.HUM				•			•	7
PRE-HEAT COIL HW VALVE COMMAND (%)	CV.PHT				•			•	
EXHAUST AIR DAMPER COMMAND (%)	DPR.EA				•			•	
EXHAUST AIR DAMPER END SWITCH STATUS	DPR.EA.ST	•						•	
OUTSIDE AIR DAMPER COMMAND (%)	DPR.OA				•			•	
RETURN AIR DAMPER COMMAND (%)	DPR.RA				•			•	
RETURN AIR SMOKE DAMPER END SWITCH	DPR.SMK.RA	•						•	
SUPPLY AIR SMOKE DAMPER END SWITCH STATUS	DPR.SMK.SA	•						•	6
ERW OA FILTER PRESSURE DROP	FPD.OA			•					
AFTER-FILTER PRESSURE DROP	FPD.SA			•					
MIXED AIR TEMPERATURE	MA.T			•				•	
NATURAL GAS HUMIDIFIER ENABLE/DISABLE	NGH.SS		•						
NATURAL GAS HUMIDIFIER STATUS	NGH.ST	•							
OUTSIDE AIR CFM	OA.FL			•				•	
OUTSIDE AIR HUMIDITY	OA.RH			•					
OUTSIDE AIR TEMPERATURE	OA.T			•					
COOLING COIL DRAIN PAN OVERFLOW SWITCH STATUS	OVFL.CC	•							6
RETURN AIR CO2	RA.CO2			•					
RETURN AIR CFM	RA.FL			•				•	
RETURN AIR HUMIDITY	RA.RH			•				•	
RETURN DUCT SMOKE DETECTOR ALARM STATUS	RA.SD	•							6
RETURN AIR TEMPERATURE	RA.T			•				•	
RETURN FAN VFD FAULT	RF.ALM					•			
RETURN FAN VFD SPEED FEEDBACK (%)	RF.FBK					•			8
RETURN FAN VFD SPEED COMMAND (%)	RF.SPD				•			•	8
RETURN FAN VFD START/STOP	RF.SS		•						
RETURN FAN VFD STATUS	RF.ST	•						•	
RETURN FAN VFD SWITCH-OVER COMMAND	RF.SW						•	•	5
SUPPLY AIR CFM	SA.FL			•				•	
SUPPLY DUCT PRESSURE HIGH LIMIT SWITCH STATUS	SA.P.LMT	•							6
SUPPLY AIR HUMIDITY HIGH LIMIT SWITCH STATUS	SA.RH.LMT	•							7
SUPPLY DUCT SMOKE DETECTOR ALARM STATUS	SA.SD	•							6
SUPPLY AIR DUCT REMOTE STATIC PRESSURE	SA.SP			•				•	4
SUPPLY AIR TEMPERATURE	SA.T			•				•	
SUPPLY FAN VFD FAULT	SF.ALM					•			
SUPPLY FAN VFD SPEED FEEDBACK (%)	SF.FBK					•			8
SUPPLY FAN VFD SPEED COMMAND (%)	SF.SPD				•			•	8
SUPPLY FAN VFD START/STOP	SF.SS		•						
SUPPLY FAN VFD STATUS	SF.ST	•						•	
ISUPPLY FAN VFD SWITCH-OVER COMMAND	SF.SW		1		1			•	5

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	ENGLEWOOD, CO 80110 (720) 550-6307 WWW.VALHALLAENGINEERING.COM	l	VEG 21.05	05/25/2023	of V	<i>'</i> eterans
	4	5	;		6	

POINT LIST GENERAL

REFER TO BAS POINT

LIST GENERAL NOTES

ON SHEET MI701.

'SIM' IN P&ID.

SHEET MI701.

'#' IN P&ID POINT ID

INDICATES TYPICAL OF

POINT LIST FOOTNOTES:

REFER TO BAS POINT

LIST FOOTNOTES ON

SEVERAL AS SHOWN

NOTES:

7

GENERAL BAS SCHEDULES, NOTES, AND CONTROL POINTS

BAS POINT LIST GENERAL NOTES

- . REFER TO MECHANICAL EQUIPMENT PLANS & SCHEDULES FOR QUANTITIES OF EACH SYSTEM TYPE TO RECEIVE CONTROLS.
- . "HARDWIRED" POINTS REQUIRE INDIVIDUAL PHYSICAL CONNECTION FROM BAS CONTROLLER INPUT/OUTPUT TERMINALS TO SENSORS, DEVICES, OR EQUIPMENT AS NOTED.
- "NETWORK" POINTS ARE POINTS SENT TO OR RECEIVED FROM EQUIPMENT FACTORY CONTROLS VIA BACNET, OR THE LIKE, INTERFACE. COORDINATE W/ EQUIPMENT SUPPLIER REQUIREMENTS FOR COMM GATEWAY TO INTERFACE WITH BAS AS NECESSARY PRIOR TO BID. UNLESS OTHERWISE NOTED, REQUISITE GATEWAYS SHALL BE FURNISHED WITH RESPECTIVE EQUIPMENT BY EQUIPMENT MFGR.
- . NETWORK POINTS INDICATED AS BOTH READ AND WRITE IN POINT LISTS SHALL BE NORMALLY CONTROLLED BY EQUIPMENT FACTORY CONTROLS, BUT OVERRIDABLE FROM THE BAS.
- BAS CONTRACTOR SHALL PROVIDE CONTROL DEVICES IN POINT LISTS AND RESPECTIVE P&IDs, AND AS SCHEDULED ON CONTROL DEVICE SCHEDULE AND SPECIFIED IN SPECIFICATION 23 09 23.
- I/O POINTS IN THE POINTS LIST(S), AS WELL AS SOFTWARE POINTS SUCH AS SETPOINTS AND ALARMS AS NOTED IN SOOs, SHALL BE DISPLAYED AND OVERRIDABLE VIA THE BAS FRONT-END GRAPHIC FOR THE EQUIPMENT.
- . "START/STOP" AS NOTED IN POINT LISTS HEREIN IS SYNONYMOUS WITH "ENABLE/DISABLE". START/STOP COMMANDS FROM THE BAS SHALL BE SUBJECT TO EQUIPMENT INTERNAL CHECKS AND SAFETIES PRIOR TO PHYSICAL START OR STOP OF THE RESPECTIVE EQUIPMENT.

ZONE/SPACE TEM

OVERRIDE

DEVICE

MARK

BASD-01A

CONTROL DEVICE SCHEDULE					
(REF: P&IDs AND I/O POINT LISTS. BY BASC UNO)					
DEVICE DESCRIPTION					
IPERATURE SENSOR WITH LOCAL SETPOINT ADJUSTMENT AND O					
STURE OVERFLOW SENSOR/SWITCH					
R & ACTUATOR					
PERATURE SENSOR					
1IDITY SENSOR					
R					
ENSOR					
IGH LIMIT SWITCH (HUMIDISTAT)					

BASD-04	ELECTRONIC MOISTURE OVERFLOW SENSOR/SWITCH
BASD-05	CONTROL DAMPER & ACTUATOR
BASD-06	OUTSIDE AIR TEMPERATURE SENSOR
BASD-07	OUTSIDE AIR HUMIDITY SENSOR
BASD-08	DUCT CO2 SENSOR
BASD-09A	DUCT HUMIDITY SENSOR
BASD-09B	DUCT HUMIDITY HIGH LIMIT SWITCH (HUMIDISTAT)
BASD-10A	DUCT AIR TEMPERATURE SENSOR
BASD-10B	DUCT/COIL AIR AVERAGING TEMPERATURE SENSOR
BASD-10C	LOW TEMPERATURE SWITCH (FREEZESTAT)
BASD-11	AIR FILTER BANK DIFFERENTIAL PRESSURE TRANSMITTER
BASD-12A	DUCT STATIC PRESSURE TRANSMITTER
BASD-12B	DUCT PRESSURE HIGH LIMIT CUT-OUT SWITCH
BASD-13B	AIRFLOW MEASURING DEVICE, ELECTRONIC THERMAL TYPE
BASD-51	HYDRONIC DIFFERENTIAL PRESSURE TRANSMITTER
BASD-52A	HYDRONIC FLOW SENSOR, ELECTROMAGNETIC TYPE
BASD-53	HYDRONIC TEMPERATURE SENSOR
BASD-53A	POTABLE WATER TEMPERATURE SENSOR
BASD-54	CONTROL VALVE & ACTUATOR
BASD-A	PILOT RELAY / FRACTIONAL HP (1/3 OR SMALLER) MOTOR CONTACTOR
BASD-B	CURRENT SWITCH

P&ID CONTROL POINT LEGEND

(XXXX)

(XXXX)

	Drawing Title CONTROLS & INSTRUME DETAILS	^{Phase} 100% BID DOC	CUMENTS	Project Title CONSTRUCT MENTAL HE OUTPATIENT BLDG 52 AD		
rtmont	Approved: Project Director			Location 2101 ELM STREET N, FA	ARGO, ND 58102	
s Affairs					Issue Date 05/26/2023	Checked MB
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RT

MI701

DWG 145 of 188

CHILLED WATER (CHW) CENTRAL UTILITY PLANT (CUP) WITH AIR-CO 2 (ACCH) AND VARIABLE PRIMARY PUMPING

2

SEQUENCE OF OPERATIONS

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D

- 1. CHILLER PLANT SHALL BE ENABLED BY ANY BUILDING CALL FOR COOLING FROM AHUS THEREIN.
- 2. CHILLERS (AND ASSOCIATED PUMPS) SHALL HAVE STAGE # DESIGNATIONS MANUALLY OVERRIDABLE ON THE BAS GRAPHIC. WHEN NOT OVERRIDEN, ROTATE DESIGNATIONS EVERY 10 DAYS*. UPON CALL FOR A GIVEN STAGE #:
- A. ENERGIZE RESPECTIVE STAGE # CHW PUMP (CHWP).
- B. IF ANY STATUS IS NOT CONFIRMED WITHIN 2 MINUTES*, SEND ALARM AND ROTATE STAGE DESIGNATIONS AMONG INACTIVE SYSTEMS.
- C. AFTER 60s* DELAY FROM PCHWP STATUS CONFIRMATION, ENABLE RESPECTIVE STAGE # CHILLER. IF CHILLER ALARMS/FAILS AT STARTUP, SEND ALARM AND ROTATE STAGE DESIGNATIONS AMONG INACTIVE SYSTEMS.
- 3. WHEN PLANT ENABLED:
- A. INITIALIZATION:
- a. ACTIVATE STAGE 1 SYSTEMS AS DESCRIBED ABOVE. b. ENERGIZE SECONDARY CHW PUMP(S) (SCHWP).
- B. SETPOINTS AND SOFTWARE POINT CALCULATIONS:
- a. ACTIVE CHW SUPPLY TEMPERATURE (CHWST) SETPOINT: RESET AS FOLLOWS. 47°F* WHEN OUTSIDE AIR TEMPERATURE (OAT) IS
- 60°F* OR BELOW. RESET FROM 47°F* TO 45°F* AS OAT VARIES FROM 60°F* TO 75°F*.
- 45°F* WHEN OAT IS ABOVE 75°F*.
- b. ACTIVE CHW LOOP DIFFERENTIAL PRESSURE (DP) SETPOINT: MODULATE BETWEEN 15 PSI* TO 25 PSI* TO MAINTAIN THE MOST OPEN AHU CHW VALVE (FOR AHUS WITH NO BUILDING BOOSTER PUMP) AT 90% OPEN AND THE HIGHEST SPEED BUILDING BOOSTER PUMP AT 90% SPEED.
- c. MINIMUM FLOW PER CHILLER: 30 GPM* (VERIFY WITH APPROVED CHILLER MFR).
- d. STAGE-UP TEMPERATURE SETPOINT: EQUAL TO ACTIVE CHWST SETPOINT PLUS 2°F*.
- e. STAGE-DOWN CAPACITY% SETPOINT: EQUAL TO 90%*. f. STAGE-DOWN AVAILABLE CAPACITY: EQUAL TO SUM OF NOMINAL TONNAGE FOR CHILLER STAGES LESS THAN ACTIVE STAGE.
- q. ACTIVE CAPACITY: SUM OF EACH ACTIVE CHILLER'S NOMINAL TONNAGE MULTIPLIED BY ITS ACTIVE % CAPACITY LOAD.
- C. CONTROL OUTPUTS:
- a. CHWST SETPOINT COMMAND TO CHILLER: WRITE RESET TEMPERATURE TO CHILLERS. CHILLERS SHALL VARY CAPACITY UNDER THEIR INTERNAL CONTROLS TO MAINTAIN EXTERNALLY WRITTEN SETPOINT.
- b. SCHWP SPEED: MODULATE PUMP VFD(s) TO MAINTAIN THE CHW LOOP DP AT THE CHW LOOP DP SETPOINT.
- c. CHW BYPASS VALVE: MODULATE TO MAINTAIN LOOP FLOW AT THE MINIMUM FLOW PER CHILLER MULTIPLIED BY THE ACTIVE CHILLERS.
- d. CHILLER/CHWP STAGING:
- IF CHWST EXCEEDS STAGE UP TEMPERATURE SETPOINT FOR 10 MINUTES*, ACTIVATE NEXT STAGE OF SYSTEMS AS DESCRIBED ABOVE.
- IF ACTIVE CAPACITY AS % OF STAGE-DOWN AVAILABLE CAPACITY IS LESS THAN STAGE-DOWN CAPACITY % SETPOINT FOR 10 MINUTES*, DE-ACTIVATE LAST STAGE OF SYSTEMS. DE-ENERGIZE CHILLER FIRST FOLLOWED BY PUMPS AFTER 120s* DELAY.
- 4. UPON PLANT DISABLE:
- A. DE-ENERGIZE ALL SYSTEM STAGES. DE-ENERGIZE CHILLERS FIRST FOLLOWED BY PUMPS AFTER 120s* DELAY.
- B. DE-ENERGIZE CHW PUMPS.
- 5. ALARMS AND SAFETIES:
- A. IF OUTSIDE AIR TEMPERATURE (OAT) IS BELOW 35°F*, START LEAD PUMP AT MINIMUM SPEED AND OPEN BYPASS VALVE FOR FREEZE PROTECTION.

*-INDICATES SETPOINT TO BE ADJUSTABLE.

CHW CUP

POINT DESCRIPTION CHILLER ALARM CHILLER EVAPORATOR ENTERING WATE TEMPERATURE CHILLER EVAPORATOR LEAVING WATER TEMPERATURE CHILLER CAPACITY (%) CHILLER KW DEMAND CHILLER DEMAND LIMIT CHILLER REFRIG'T SATURATED CONDENS TEMPERATURE CHILLER START/STOP CHILLER REFRIG'T SATURATED SUCTION TEMPERATURE CHILLER COMPRESSOR STATUS CHILLER CHW TEMPERATURE SETPOIN CHILLER CHW RETURN TEMPERATURE CHILLER CHW SUPPLY TEMPERATURE LOOP CHW REMOTE DIFFERENTIAL PRE LOOP CHW BYPASS GPM LOOP CHW SUPPLY GPM LOOP CHW RETURN TEMPERATURE LOOP CHW SUPPLY TEMPERATURE CHILLER ISO VALVE FEEDBACK CHILLER ISOLATION VALVE CHW LOOP BYPASS VALVE COMMON PRIMARY CHW RETURN TEMPERATURE COMMON PRIMARY CHW SUPPLY TEMPERATURE SECONDARY CHW PUMP VFD FAULT STA SECONDARY CHW PUMP VFD BYPASS S SECONDARY CHW PUMP VFD SPEED FE SECONDARY CHW PUMP VFD SPEED CO SECONDARY CHW PUMP VFD START/ST

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Number:	Revisions:		Date:]
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0	100% BID DOCUMENTS		05/26/2023	CONSULTANTS:

	6 7 8 9 10 A HEATING WATED (HWA) CENTRAL LITH ITY DLANT (CUD) WITH HOT WATED DOILEDS (HW/D) 10
PING	AND VARIABLE PRIMARY/SECONDARY (P/S) PUMPING
PROCESS & INSTRUMENTATION	SEQUENCE OF OPERATIONS
DIAGRAM (P&ID)	 PLANT SHALL BE ENABLED BY ANY BUILDING CALL FOR HEATING FROM AHUS OR TUS THEREIN. OPERATOR MUST BE PRESENT TO INITALIZE BOILER, REFER TO SPECIFICATION FOR
CHW.DP	2. WHEN PLANT ENABLED:
CHW.FL.BYP BASD-52A CV.CHW.BYP BASD-54	A. INITIALIZATION:
CHW.T.S BASD-53	a. ENABLE BOILERS (SINGLE ENABLE SIGNAL TO MASTER BOILER CONTROLLER). PRIMARY HW PUMPS SHALL BE ENABLED AND CONTROLLED DIRECTLY BY BOILER
	CONTROLLED AND CONTROLLED DIRECTLY BY BOILER CONTROLLER. b. ENERGIZE SECONDARY HW PUMP(S) (HP-SHW).
SCHP#.ALM	B. SETPOINTS AND SOFTWARE POINT CALCULATIONS:
SCHP#.BPS 	a. ACTIVE LOOP HW SUPPLY TEMPERATURE (CHWST) SETPOINT: RESET AS FOLLOWS. • 160°F* WHEN OUTSIDE AIR TEMPERATURE (OAT) IS
PCHW.T.S BASD-53	40°F* OR BELOW. • RESET FROM 160°F* TO 140°F* AS OAT VARIES FROM 40°F* TO 70°F*.
	140°F* WHEN OAT IS ABOVE 70°F*. b. ACTIVE HW LOOP DIFFERENTIAL PRESSURE (DP) SETPOINT: MODULATE BETWEEN 15 PSI* TO 25 PSI* TO B#.MTR
	MAINTAIN THE MOST OPEN HW VALVE AT 90% OPEN.
	a. HWST SETPOINT COMMAND TO BOILER: WRITE RESET
	WRITE LOOP HW SUPPLY TEMPERATURE TO BOILER MASTER CONTROLLER AS THE SYSTEM CONTROL TEMPERATURE.
CH#.T.R BASD-53	 b. BOILER MASTER CONTROLLER SHALL MODULATE BOILER FIRE RATES, AND MODULATE PRIMARY PUMP SPEEDS TO OPTIMALLY MAINTAIN EXTERNALLY
	WRITTEN SETPOINT. c. SHWP SPEED: MODULATE PUMP VFD(s) TO MAINTAIN THE HW LOOP DP AT THE HW LOOP DP SETPOINT. B#.P.SP B#.P.SPD DF SETPOINT. B#.P.SPD DF SETPOINT. B#.P.SPD DF SETPOINT.
	3. UPON PLANT DISABLE:
CH#.ST CH#.CPTY CH#.SCT CH#.CHW.LWT CV.CH#.ISO BASD-54 CV.CH#.FBK	A. DISABLE BOILERS VIA SIGNAL TO BOILER MASTER CONTROLLER
CH#.ALM CH#.KW CH#.STPT CH#.CHW.EWT	B. DE-ENERGIZE PUMPS. 4. ALARMS AND SAFETIES:
CHW CUP - ACCH - P/S - BAS I/O POINT LIST POINT LIST GENERAL	A. BAS SHALL MONITOR BOILER ALARM POINT INCLUDING BOILER SAFETY DEVICES PER SPECIFICATION.
HARDWIRED NETWORK REFER TO BAS POINT CONTROLLER I/O'S POINTS LIST GENERAL NOTES	B. ALARM LOCALLY AND AT CENTRAL PLANT AND REQUIRE MANUAL RESET. BOILER MAY NOT RESTART UNTIL
POINT DESCRIPTION P&ID POINT ID DI DO AI AO AO AO POINT B IN P&ID POINT ID DI POINT ID POINT ID POINT ID	OPERATOR IS PRESENT. *-INDICATES SETPOINT TO BE ADJUSTABLE.
CHILLER ALARM CH#.ALM INDICATES TYPICAL OF CHILLER EVAPORATOR ENTERING WATER CH#.CHW.EWT Image: CH#.CHW.EWT	
CHILLER EVAPORATOR LEAVING WATER TEMPERATURE CH#.CHW.LWT • • • POINT LIST FOOTNOTES: REFER TO BAS POINT	HW CUP - HWB - P/S - BAS I/O POINT LIST POINT LIST GENERAL NOTES: NOTES:
CHILLER CAPACITY (%) CH#.CPTY • • LIST FOOTNOTES ON CHILLER KW DEMAND CH#.KW • • • SHEET MI701. CHILLER DEMAND LIMIT CH#.LMT • • • •	HARDWIRED NETWORK REFER TO BAS POINT CONTROLLER I/O'S POINTS LIST GENERAL NOTES 이 HARDWIRED NETWORK REFER TO BAS POINT
CHILLER REFRIG'T SATURATED CONDENSING TEMPERATURE CH#.SCT	POINT DESCRIPTION P&ID POINT ID DI DO AI AO AD
CHILLER START/STOP CH#.SS • • • • CH#.SS • • • • • • • • • • • • • • • • • •	BOILER FIRE RATE (%) B#.CPTY Image: CPTY Image: CPTY SEVERAL AS SHOWN BOILER HW CONTROL TEMPERATURE B#.CTRL.T Image: CPTY Image: CPTY SEVERAL AS SHOWN BOILER HW CONTROL TEMPERATURE B#.CTRL.T Image: CPTY Image: CPTY SEVERAL AS SHOWN BOILER HW CONTROL TEMPERATURE B#.CTRL.T Image: CPTY Image: CPTY SEVERAL AS SHOWN BOILER HW CONTROL TEMPERATURE B#.UNLEWER Image: CPTY Image: CPTY Image: CPTY SEVERAL AS SHOWN
CHILLER COMPRESSOR STATUS CH#.ST • CHILLER CHW TEMPERATURE SETPOINT CH#.STPT •	BOILER ENTERING WATER TEMPERATURE B#.HW.EWT Image: Construct of the second sec
CHILLER CHW RETORN TEMPERATURE CH#.T.R • • CHILLER CHW SUPPLY TEMPERATURE CH#.T.S • • LOOP CHW REMOTE DIFFERENTIAL PRESSURE CHW.DP • •	BOILER PRIMARY PUMP SPEED B#.P.SPD • • SHEET MI701. BOILER PRIMARY PUMP START/STOP B#.P.SS • • • SHEET MI701.
LOOP CHW BYPASS GPM CHW.FL.BYP • • LOOP CHW SUPPLY GPM CHW.FL.S • •	BOILER START/STOP B#.SS • Image: Start of the start o
LOOP CHW RETURN TEMPERATURE CHW.T.R LOOP CHW SUPPLY TEMPERATURE CHW.T.S CHULLER ISO VALVE FEEDBACK CV.CH#.FBK	BOILER HW RETURN TEMPERATUREB#.T.R••BOILER HW SUPPLY TEMPERATUREB#.T.S••
CHILLER ISOLATION VALVECV.CH#.ISO••CHW LOOP BYPASS VALVECV.CHW.BYP••	LOOP HW REMOTE DIFFERENTIAL PRESSURE HW.DP • • LOOP HW SUPPLY GPM HW.FL.S • • LOOP HW RETURN TEMPERATURE HW.T.R • •
COMMON PRIMARY CHW RETURN TEMPERATURE COMMON PRIMARY CHW SUPPLY	LOOP HW SUPPLY TEMPERATUREHW.T.S••LOOP HW SUPPLY TEMPERATUREHW.T.R••COMMON PRIMARY HW RETURN TEMPERATUREPHW.T.R••
TEMPERATURE PCHW.1.S SECONDARY CHW PUMP VFD FAULT STATUS SCHP#.ALM	COMMON PRIMARY HW SUPPLY TEMPERATURE PHW.T.S • Image: Common state of the state of th
SECONDARY CHW PUMP VFD BYPASS STATUS SCHP#.BPS • • • • • • • • • • • • • • • • • • •	PRIMARY HW PUMP VFD SPEED FEEDBACK PHWP#.FBK • • • PRIMARY HW PUMP VFD STATUS PHWP#.ST • • • •
(%) SCHP#.SPD Image: Comparison of the second seco	SECONDARY HW PUMP VFD FAULT STATUS SHWP#.ALM • • SECONDARY HW PUMP VFD BYPASS STATUS SHWP#.BPS • • SECONDARY HW PUMP VFD SPEED EEEDBACK SHWP#.BPS • •
	SECONDARY HW PUMP VFD SPEED COMMAND (%) SHWP#.SPD • • SECONDARY HW PUMP VFD START/STOP SHWP#.SS • •
	SECONDARY HW PUMP VFD STATUS
	CONTRACT DOCUMENTS SUBMISSION
	FULLY SPRINKLED Drawing Title Phase Project Title Project Number
ARUTHEUT/ENGINEERS:	CONTROLS & INSTRUMENTATION 100% BID DOCUMENTS CONSTRUCT MENTAL HEALTH 437-316 ULTPATIENT BLDG 52 ADDITION Building Number
ENGINEERING GROUP, LLC	MITCH BIBLE DE LAILO Drawing Number
750 W HAMPDEN AVE SUITE 300	118867 2101 ELM STREET N, FARGO, ND 58102 U.S. Department Issue Date Checked Drawn
Date: ENGLEWOOD, CO 80110 (720) 550-6307 WWW.VALHALLAENGINEERING.COM VEG 21.05	Of veterans Analis OF/25/2023 MB RT DWG 146 of 188

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HW CUP - HWB	- P/S - BAS I/(<u>) P</u>	OINT	LIS	<u>ST</u>		
		HARDWIRED CONTROLLER I/O's			NETV POI	VOR NTS	
POINT DESCRIPTION	P&ID POINT ID	DI	DO	AI	AO	READ	WRITE
BOILER ALARM	B#.ALM			7.0		•	
BOILER FIRE RATE (%)	B#.CPTY					•	
BOILER HW CONTROL TEMPERATURE	B#.CTRL.T						•
BOILER ENTERING WATER TEMPERATURE	B#.HW.EWT					•	
BOILER LEAVING WATER TEMPERATURE	B#.HW.LWT					•	
BOILER GAS METER	B#.MTR					•	
BOILER PRIMARY PUMP SPEED	B#.P.SPD					•	
BOILER PRIMARY PUMP START/STOP	B#.P.SS					•	
BOILER START/STOP	B#.SS		•				
BOILER STATUS	B#.ST					•	
BOILER HW TEMPERATURE SETPOINT	B#.STPT						•
BOILER HW RETURN TEMPERATURE	B#.T.R					•	
BOILER HW SUPPLY TEMPERATURE	B#.T.S					•	
LOOP HW REMOTE DIFFERENTIAL PRESSURE	HW.DP			•			
LOOP HW SUPPLY GPM	HW.FL.S			•			
LOOP HW RETURN TEMPERATURE	HW.T.R			•			
LOOP HW SUPPLY TEMPERATURE	HW.T.S			•			
COMMON PRIMARY HW RETURN TEMPERATURE	PHW.T.R			•			
COMMON PRIMARY HW SUPPLY TEMPERATURE	PHW.T.S			•			
PRIMARY HW PUMP VFD FAULT STATUS	PHWP#.ALM					•	
PRIMARY HW PUMP VFD BYPASS STATUS	PHWP#.BPS					•	
PRIMARY HW PUMP VFD SPEED FEEDBACK	PHWP#.FBK					•	
PRIMARY HW PUMP VFD STATUS	PHWP#.ST					•	
SECONDARY HW PUMP VFD FAULT STATUS	SHWP#.ALM					•	
SECONDARY HW PUMP VFD BYPASS STATUS	SHWP#.BPS					•	
SECONDARY HW PUMP VFD SPEED FEEDBACK	SHWP#.FBK					•	
SECONDARY HW PUMP VFD SPEED COMMAND (%)	SHWP#.SPD				•		
SECONDARY HW PUMP VFD START/STOP	SHWP#.SS		•				
SECONDARY HW PUMP VED STATUS	SHWP#.ST	•					

1	2 3	4 5	6	7	8 9	10
				2	GENERAL EXHAUST FAN - CONS	TANT SPEED
				S	EQUENCE OF OPERATIONS PROC	CESS & INSTRUMENTATION
Α				1.	GENERAL EXHAUST FAN (GEF) SHALL BE INTERLOCKED WITH THE AHU SERVING THE	DIAGRAM (P&ID)
					ZONE. FAN SPEED OR SHEAVE SIZE, AS APPLICABLE, SHALL BE ADJUSTED AT THE FAN DURING TAB TO ACHIEVE CFM AS SCHEDULED	
					ON MQ SHEET-SERIES AND ZONE PRESSURE BALANCE WHERE INDICATED.	
				2.	WHEN IN OCCUPIED MODE: A. INITIALIZATION:	
					a. FAN SHALL ENERGIZE.	
					C. CONTROL OUTPUTS: N/A	
				3.	WHEN IN UNOCCUPIED MODE:	
В				4.	ALARMS AND SAFETIES:	BASD-12A
					A. ALARM IN BAS UPON FAILURE TO START GEF.	GEF.ST BASD-B
					GENERAL EXHAUST FAN - CONSTANT SPEED -	BAS I/O POINT LIST
					HARDWIR CONTROLLE	RED NETWORK RI/O's POINTS
				POIN	P&ID POINT DI DO A ID DI DO A	I I I FOOT I I I FOOT I I I I I I I <t< td=""></t<>
				PRES GENI GENI	SURE GEF.SP .RAL EXHAUST FAN START/STOP GEF.SS BAL EXHAUST FAN STATUS GEF.ST	SEVER. 'SIM' IN
						POINT I REFER LIST FC
C						SHEET
					STEAM OR HOT WATER UNIT H	EATER
—					EQUENCE OF OPERATIONS UNIT SHALL BE IN "OCCUPIED" MODE BASED ON AN OPERATOR	<u>PROCESS & INSTRUMENT</u> <u>DIAGRAM (P&ID)</u>
					DEFINED SCHEDULE. OTHERWISE THE UNIT SHALL BE IN "UNOCCUPIED" MODE. THE UNIT SHALL BE OVERRIDDEN TO UNOCCUPIED MODE WHEN THE HEATING PLANT SERVING THE	SF.SS
				2.	UNIT IS NOTE IN OPERATION. WHEN IN OCCUPIED MODE:	
D					A. SETPOINT CONTROL:	RA WEBLS/M
					COMPUTE FROM A BASE SETPOINT OF 60°F* ± UP TO 5°F* BASED ON LOCAL THERMOSTAT ADJUSTMENT.	
					B. CONTROL OUTPUTS:a. HEATING VALVE: CYCLE OPEN TO MAINTAIN ACTIVE	CV.HC BASD-54
4 PM					ZONE HEATING TEMPERATURE SETPOINT. b. FAN: CYCLE ON TO MAINTAIN ACTIVE ZONE HEATING TEMPERATURE SETPOINT.	
4/2023 5:54:0				3.	WHEN IN UNOCCUPIED MODE:	NOTED ON PLANS.
2/2					 A. FAN SHALL DE-ENERGIZE. HEATING VALVE SHALL FULL CLOSE. B. IF ZONE TEMPERATURE FALLS BELOW UNOCCUPIED 	
					SETBACK TEMPERATURE OF 60°F*, ENABLE UH AND CONTROL AS IN OCCUPIED MODE EXCEPT THAT ZONE SETPOINTS SHALL BE SETBACK TEMPERATURE ABOVE.	
E				*_	VDICATES SETPOINT TO BE ADJUSTABLE.	
					STEAM OR HOT WATER UNIT HEATER BA	SI/OPOINT LIST
					CONTROLL P&ID	IRED NETWORK REFER _ER I/O's POINTS LIST GE Q Щ Q G
					DINT DESCRIPTION POINT ID DI DO EATING COIL VALVE COMMAND CV.HC •	AI AO ₩ ¥ K NOTES '#' IN P&
					UPPLY FAN STATUS ONE TEMPERATURE LOCAL SETPOINT DUIDENT	• 1 POINT
					ONE TEMPERATURE ZN.T	
F						
					^	
][][][][<u>FULL</u>
U 100% BID DOCUMENTS		S: ARCHITECT/ENGINEERS:	STAMP:	CONTROLS & INSTRUMENTATION	100% BID DOCUMENTS	
CH-PLUM		ENGINEERING GROUP, LLC		DETAILS		
21/21.05_ME		750 W HAMPDEN AVE SUITE 300	118867 U.S. Department	npproveu. Project Director	Location 2101 ELM STF	REET N, FARGO, ND 58102
Number: Revisions:	Date:	ENGLEWOOD, CO 80110 (720) 550-6307 WWW.VALHALLAENGINEERING.COM	VEG 21.05 05/25/2023 Of Veterans Affairs		05/26/20	023 MB RT C
1	2 3	4 5	6	7	δ 9	10

GENERAL EXHAUST FAN - CONSTANT SPEED

SEQUENCE OF OPERATIONS

- 1. UNIT SHALL BE IN "OCCUPIED" MODE BASED ON AN OPERATOR DEFINED SCHEDULE. OTHERWISE THE UNIT SHALL BE IN "UNOCCUPIED" MODE. THE UNIT SHALL BE OVERRIDDEN TO UNOCCUPIED MODE WHEN THE HEATING PLANT SERVING THE UNIT IS NOTE IN OPERATION.
- 2. WHEN IN OCCUPIED MODE:
- A. SETPOINT CONTROL:
- a. ACTIVE ZONE HEATING TEMPERATURE SETPOINT: COMPUTE FROM A BASE SETPOINT OF 60°F* ± UP TO 5°F* BASED ON LOCAL THERMOSTAT ADJUSTMENT.
- B. CONTROL OUTPUTS:
- a. HEATING VALVE: CYCLE OPEN TO MAINTAIN ACTIVE ZONE HEATING TEMPERATURE SETPOINT. b. FAN: CYCLE ON TO MAINTAIN ACTIVE ZONE HEATING
- 3. WHEN IN UNOCCUPIED MODE:

- A. FAN SHALL DE-ENERGIZE. HEATING VALVE SHALL FULL CLOSE.
- B. IF ZONE TEMPERATURE FALLS BELOW UNOCCUPIED SETBACK TEMPERATURE OF 60°F*, ENABLE UH AND CONTROL AS IN OCCUPIED MODE EXCEPT THAT ZONE SETPOINTS SHALL BE SETBACK TEMPERATURE ABOVE

STEAM OR HOT WATER UNIT HEATER BAS I/O POINT							
		HARDWIRED CONTROLLER I/O's		NETWO POINT			
POINT DESCRIPTION	P&ID POINT ID	DI	DO	AI	AO	READ	
HEATING COIL VALVE COMMAND	CV.HC		•				
SUPPLY FAN START/STOP	SF.SS		•				
SUPPLY FAN STATUS	SF.ST	•					
ZONE TEMPERATURE LOCAL SETPOINT ADJUSTMENT	ZN.ADJ			•			
ZONE TEMPERATURE	ZN.T			•			

					<u>CONTR</u>	ACT DO	CUMENT FUL	<u>S SUBMISSION</u>
	Drawing Title CONTROLS & INSTRUMENTATI	ON	Phase 100% BID DOC	UMENTS	Project Title CONSTRUCT M	IENTAL HE	ALTH	Project Number 437-316
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1 HVAC PLAN - LEVEL 1 1/8" = 1'-0"

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				GENERAL NOTES
				A. REFER TO M-001 AND M-002 AND GENERAL NOTES. REFE SCHEDULES.
~ 7				B. FIELD VERIFY EXISTING CON VHA COR BEFORE PROCEED
	8			C. REFER TO GI SHEET SERIES LOCATIONS OF RATED CON PENETRATION SEALING ME/ SPECIFICATIONS. IN THE EV PATTERN SHOWN ON MEP F SHALL GOVERN.
				D. REFER TO GI SHEET SERIES
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1 HVAC PLAN - LEVEL 2 1/8" = 1'-0"

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				B. FIELD VERIFY EXISTING CON VHA COR BEFORE PROCEEL
(7				C. REFER TO GI SHEET SERIES LOCATIONS OF RATED CONS PENETRATION SEALING MEA SPECIFICATIONS. IN THE EV PATTERN SHOWN ON MEP P SHALL GOVERN.
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 D. REFER TO GI SHEET SERIES FOR PROJECT PHASING PLAN AND E. REFER TO MI SHEET SERIES FOR THERMOSTAT LOCATIONS. 	NARRATIVE.	
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		A. REFER TO M-001 AND M-002 AND GENERAL NOTES. REFE SCHEDULES.
		B. FIELD VERIFY EXISTING CON VHA COR BEFORE PROCEED
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TS ARE ABOVE THE FLOOR UNO.	В
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		2. UP TO LEVEL 2.
		3. REFER TO SPECIFICATION
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		SECTION 23 11 23.
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 PIPING PLAN - PENTHOUSE

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			KEYNOTES 1. PROVIDE EMERGENCY GAS SPECIFICATION SECTION 2 EMERGENCY GAS SHUTOF ALSO DE-ENERGIZE BOILEI
			2. PROVIDE NATURAL GAS DE PLANT ALARM.
			3. PROVIDE CARBON MONOX CONNECT TO PLANT ALARI
	— — — — — — (D.3)		4. PROVIDE AUDIBLE AND VIS PLANT. LABEL "BOILER PLA
			5. LPS TO AHU HUMIDIFIER.
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AS SAFETY SHUT-OFF SWITCH. REFER TO 23 11 23. CONNECT TO SERVICE ENTRANCE OFF VALVE. EMERGENCY SHUTOFF SWICH SHALL ERS DETECTOR AT CEILING LEVEL AND CONNECT TO OXIDE DETECTOR AT BREATHING LEVEL AND RM. ISIBLE ALARM TIED TO CO AND NG DETECTION IN LANT HAZARDOUS GAS DETECTION". N 23 23 00. TYP FOR RL AND RS PIPING.	C
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	/IPER, NOTE 1	7 ACCESS SECTION FOR ROUND/OVAL	. DUCT		6 VOLUME DAMPER DETAIL NTS		- 3 SUPPLY I	<u>DUCT TAKEOFF - AIR TERMINAL UNIT</u>
ACTURER MIN PER ACTURER MIN PER ACTURER MIN PER MIN PE	AP OF	 REF TU SUPPLY DUCT TAKEOFF DETAIL ATTENUA SEE NOTE 1 SEE NOTE 2 SEE NOTE 2 SEE NOTE 3 SEE SPECIFICATIONS FOR CLAMPS AND SEALANT (TYP.) NOTES: RIGID STRAIGHT TERMINAL UNIT INLET LEN OF INLET. A FLEXIBLE AIR DUCT CONNECTOR IS NOT TO ACCOMMODATE MINOR OFFSETS WHEF SERVED. MAXIMUM LENGTH 3'-0". A BRANCH DUCT SERVING AN INDIVIDUAL E PROVIDED THE EQUIVALENT LENGTH OF T FEET. FOR LONGER LENGTHS, INCREASE MAINTAIN THE DUCT STATIC PRESSURE DF REFER TO TYPICAL AIR DEVICE DUCT ROU COMPONENT ARRANGEMENT MAY VARY B VAPOR BARRIER FOR CONNECTING DUCT 3 	TU FACTORY SOUND TOR AS SCHEDULED REHEAT COIL AS SCHEDULED AIR TERMINAL UNIT (CV OR VAV) SEE NOTE 5 SEE NOTE 5 NGTH SHALL BE A MINIMUM OF 3 MANDATORY FOR INLET TO THIS RE NOT OTHERWISE PROHIBITED BOX MAY BE THE SAME SIZE AS T HE BRANCH DUCT, AS SHOWN, D THE DUCT SIZE AND PROVIDE A I ROP AT OR BELOW 0.2"/100'. NOUTS DETAIL. AIR DEVICE LAYO Y MANUFACTURER. PROVIDE FIE SECTIONS AND TU HW COILS.	TIMES THE DIAMETER S BOX, BUT ALLOWED O IN THE SPACE(S) THE BOX INLET, DOES NOT EXCEED 10 DUCT TRANSITION TO DUTS WILL VARY. ELD INSULATION W/	AIR FLOW BRANCH DUCT WV D U U U U U U U U U U U U U U U U U U	RETURN 1/4 W OR 4" MIN PROVIDE VOLUME DAMPER AT EACH BRANCH DUCT	SPLIT MAIN IN PROPORTION TO BRANCH SIZES MAIN SUPPLY DUCT AIR FL DUCT AIR FL SUPPLY REGIST OR BRANCH DU AIR S SUPPLY TAKE-O 1. THE BRANCH AND UP TO 4 TAKE-OFF SH	TURNING VANE VD AIR FLOW OW OW OW ER VD ER V ER V
		9 DUCT CONNECTION - AIR TERMINAL	UNITS		5 EXHAUST OR RETURN BRANCH DUCTWORK NTS		- 2 SUPPLY I	UCTWORK TAKE-OFFS
ACCESS PANEL SECTION "A-A" ACCESS PANEL CASING GASKET GASKET SECTION "B-B" CESS DOOR GE TYPE TO CLOSE DOORS TIGHTLY. SHALL HAVE NON-CORROSIVE PINS.	 INSULATION DUCT GASKET INSULATION HANDLE INSIDE FLEXIBLE WASHER FACTORY FABRICATED LATCH 	FLEXIBLE AIR DUCT WHERE PERMITTED AND SHOWN ON PLAN, TYP USE RIGID ELBOWS FOR CHANGE OF DIRECTION GREATER THAN 45° TYPICAL SIDEWALL DIFFUSER OR REGISTER WALL DIFFUSER OR REGISTER WALL DIFFUSER FRAME SIZE NOTES 1. COMMON OPTIONS FOR LAY-IN AND REQUIREMENTS APPLY ALSO TO OT MOUNTED DIFFUSERS, LINEAR SLOT OTHERWISE DETAILED ELSEWHERE 2. REF TO M-001 FOR AREAS WHERE FE 3. MAX ALLOWABLE FLEX DUCT LENGT 4. REPER TO AIR DEVICE SCHEDULE O ASSOCIATED RUNOUT SIZES.	SIDEWALL TYPE DIFFUSERS ARE HER RUNOUT APPLICATIONS SUG DIFFUSERS, RETURN GRILLES, I LEXIBLE DUCTWORK IS PROHIBIT TH IS 5'-0". N MQ SHEET SERIES FOR DEVICE DF AIR DEVICES PER SPECIFICAT	SEE SPECIFICATIONS FOR CLAMPS AND SEALANT (TYP) CONICAL OR HIGH EFFIENCY TAKEOFF BRANCH DUCT UNUE DAMPER MITH LOCKING QUAD	MAIN SUPPLY Image: Main Supply	FLOW ENCY TAKEOFF PER CT CONSTRUCTION THIRD EDITION RE 4-6, 45° LEAD IN TO AIR TERMINAL VIEW	NOTES: 1. PROVIDE 2. VANE EL 3. WHEN W REGARD 4. SINGLE T VANES A 5. WHEN W TYPE. - 1 DUCTWO NTS	EVANES FOR MITERED DUCT ELBOW BOWS SHALL BE CONSTRUCTED ANI 1 DOES NOT EQUAL W2, VANE SHALL LESS OF W DIMENSION. THICKNESS VANES SHALL HAVE A 2" ND A 3/4" TRAILING EDGE. 1 EQUALS W2 AND W1 IS GREATER T RK SQUARE VANE ELBOWS CONTRACT
S:	ARCHITECT/E	ENGINEERS:	STAMP:	OF VETER				
	VALHALLA Engineer Group, LI	RING LC	STATE OF TELAS MITCH BIBLE		Approved: Project Director			OUTPATIENT BLDG 52
75 SL (72 W	50 W HAMPDEN AVE UITE 300 NGLEWOOD, CO 80110 '20) 550-6307 /WW.VALHALLAENGINEERING.COM	M VEG 21.05	118867 ³⁰ , (/CENSED, 12 ⁵ S/ONAL ENGINE 05/25/2023	U.S. Departmen of Veterans Affai	rs			2101 ELM STREET N, FARGO, ND Issue Date 05/26/2023
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/- INSULATION SEE

- 1/2" Round Rod Pin

ANTITY/SIZE (IN)	MAX. LOAD (LBS)	MAX. SPACING (IN)
X 22 GA STRAP	260	144
X 18 GA STRAP	420	144
X 16 GA STRAP	700	144
3/8 Ø RODS	1320	144
/2 Ø RODS	2500	144

PRESSURE GAGE _0___ - STRAINER - FLEXIBLE CONNECTION, TYP P/T PORT IN PUMP CASE GAUGE TAPPING, TYP

1. SUPPORT PUMP FROM PIPING ONLY. DO NOT SUPPORT PUMP FROM MOTOR

S:	ARCHITECT/ENGINEERS:	STAMP:	T OF VETER
	VALHALLA ENGINEERING GROUP, LLC 750 W HAMPDEN AVE SUITE 300 ENGLEWOOD, CO 80110 (720) 550-6307 WWW.VALHALLAENGINEERING.COM VEG 21.05	MITCH BIBLE 118867 BONG SSIONAL ENGINE 05/25/2023	U.S. Depar of Veterans
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