HANGER ROD

HANGER ROD ---

ADJUSTABLE CLEVIS HANGER

ADJUSTABLE ROLLER HANGER

NOMINAL PIPE DIAMETER (IN.)

HANGER ROD SIZE (IN.)

STEEL PIPE

COPPER TUBE

INSULATION (VAPOR

REQUIRED FOR LOW

TEMPERATURE PIPE)

PROVIDE HIGH COMPRESSIVE

UNDER INSULATION SHIELD

INDIVIDUAL PIPE HANGER ROD & SPACING SCHEDULE

NOTE: TRAPEZE HANGER SPACING SHALL BE BASED ON SPACING OF SMALLEST PIPE ON TRAPEZE. TRAPEZE SHALL BE DESIGNED WITH A FACTOR OF SAFETY OF 5 FOR CENTER OF SPAN CONCENTRATED LOAD

1 | 1 1/2 | 2 | 2 1/2 | 3

10

9

TYPICAL PIPE HANGERS

STRENGTH INSULATION INSERT BLOCKS

BARRIER TYPE IS

- INSULATION SHIELD

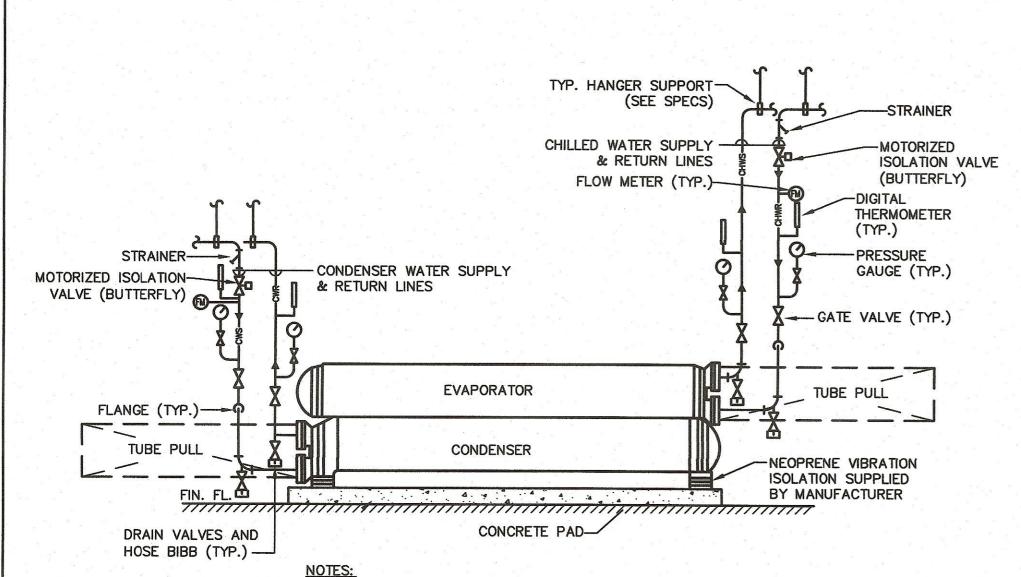
AT HANGER

- INSULATION

1. PROVIDE WITH SINGLE POINT ELECTRICAL CONNECTION.

2. PROVIDE WITH BACNET CARD TO INTEGRATE THE CHILLER INTO THE EXISTING BUILDING MANAGEMENT SYSTEM. COORDINATE WITH THE COLLEGES A.T.C FOR ALL REQUIREMENTS.

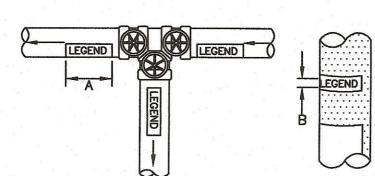
3. PROVIDE MANUFACTURER APPROVED INTEGRAL VFD



1. PIPING SHOWN FOR CONDENSER & EVAPORATOR SECTIONS ARE SHOWN OPPOSITE ENDS FOR CLARITY ONLY.

2. DIGITAL THERMOMETERS (MATCH BUILDING STANDARD), CONTROL VALVES, SHUT-OFF VALVES, STRAINERS AND PRESSURE GAUGES SHOWN ARE NEW.

CHILLER PIPING SCHEMATIC



NOTE: IDENTIFICATION MARKERS OR STRIPS TO BE PLACED ON ALL EXPOSED COVERED AND UNCOVERED PIPES AT 50'-0" INTERVALS AND AT ALL VALVES, BRANCHES, CHANGE IN DIRECTION OF FLOW AND ON BOTH SIDES OF WALLS WHERE PIPES PASS THROUGH SAME. ARROWS OF SAME COLOR AS IDENTIFICATION MARKERS SHALL ALSO BE PLACED ON PIPES POINTING AWAY FROM MARKER INDICATING OF FLOW.

SIZE	OF	LEGEND	LETTERS
		LENGTH	TO A STREET STREET

	OF	DIAMETER PIPE OVERING		TH OF R FIELD A	SIZE OF LETTERS B		
	INCHES MM		INCHES	ММ	INCHES	ММ	
3/4	" TO 1¼"	19 TO 32	8"	200	1/2"	13	
1,	½" TO 2"	38 TO 51	8"	200	3/4"	19	
2	½" TO 6"	64 TO 150	12"	300	1¼"	32	
8	" TO 10"	200 TO 250	24"	600	2½"	64	
0	VER 10"	OVER 250	32"	800	31/2"	89	

SERVICE	BACKGROUND OR COLOR BAND	IDENTIFICATION MARKER
OOMESTIC COLD WATER	GREEN	WHITE ON GREEN
DOMESTIC HOT WATER SUPPLY/RETURN	YELLOW	BLACK ON YELLOW
CHILLED WATER SUPPLY/RETURN	GREEN	GREEN ON WHITE
CONDENSER WATER SUPPLY/RETURN	GREEN	WHITE ON GREEN

2020 ENERGY CONSERVATION CONSTRUCTION CODE OF NYS TABLE C403.11.3 MINIMUM PIPE INSULATION THICKNESS (IN INCHES) a,c

FLUID OPERATING	INSULATION CONDUCTIVITY		NOMINAL PIPE OR TUBE SIZE (INCHES)				
TEMPERATURE RANGE AND USAGE (°F)	CONDUCTIVITY	MEAN RATING TEMPERATURE °F	<1"	1 TO <1½"	1½" TO <4"	4" TO <8"	8"
> 350	0.32-0.34	250	4.5	5.0	5.0	5.0	5.0
251-350	0.29-0.32	200	3.0	4.0	4.5	4.5	4.5
201-250	0.27-0.30	150	2.5	2.5	2.5	3.0	3.0
141-200	0.25-0.29	125	1.5	1.5	2.0	2.0	2.0
105-140	0.21-0.28	100	1.0	1.0	1.5	1.5	1.5
40-60	0.21-0.27	75	0.5	0.5	1.0	1.0	1.0
< 40	0.20-0.26	50	0.5	1.0	1.0	1.0	1.5

FOR SI: 1'' = 25.4mm, $^{\circ}C = [(^{\circ})-32]/1.8$

a. FOR PIPING SMALLER THAN 11/2" AND LOCATED IN PARTITIONS WITHIN CONDITIONED SPACES, REDUCTION OF THESE THICKNESSES BY 1" SHALL BE PERMITTED (BEFORE THICKNESS ADJUSTMENT REQUIRED IN FOOTNOTE

B) BUT NOT TO A THICKNESS LESS THAN 1". b. FOR INSULATION OUTSIDE THE STATED CONDUCTIVITY RANGE, THE MINIMUM THICKNESS (T) SHALL BE DETERMINED AS FOLLOWS:

 $T=r[(1+t/R)^{k/k}-1]$

WHERE: T = MINIMUM INSULATION THICKNESS r = ACTUAL OUTSIDE RADIUS OF PIPE

- BAND

PROVIDE INSULATION SHIELD & INSERT FOR ALL PIPING (8" MIN.)

3/8 3/8 3/8 1/2 1/2 5/8 5/8 7/8

MAXIMUM SUPPORT SPACING (FT.)

10

TYPICAL LAMINATE THREE LAYER

PLASTIC OR BRASS VALVE TAG

EMBOSSED/PRINTED

LETTERING

PER SPECIFICATIONS. -

12

10

14

12

TRAPEZE HANGER FOR UP TO 1000 LB. UNIFORM LOAD

1-5/8" 12 GAGE CHANNEL OR

2" x 2" x 1/4" ANGLE

17

16

14

t = INSULATION THICKNESS LISTED IN THE TABLE APPLICABLE FLUID TEMPERATURE AND PIPE SIZE K = CONDUCTIVITY OF ALTERNATE MATERIAL AT MEAN RATING TEMPERATURE INDICATED FOR THE APPLICABLE

FLUID TEMPERATURE [(BTUxIN)/HxFT2x°F)] k = THE UPPER VALUE OF THE CONDUCTIVITY RANGE LISTED IN THE TABLE FOR THE APPLICABLE FLUID

FOR DIRECT-BURIED HEATING AND HOT WATER SYSTEM PIPING, REDUCTION OF THESE THICKNESSES BY 11/2" (38mm) SHALL BE PERMITTED (BEFORE THICKNESS ADJUSTMENT REQUIRED IN FOOTNOTE B BUT NOT TO THICKNESSES LESS THAN 1".

TAG LEGEND (PLUMBING EXAMPLE)

HWC = HOT WATER RETURN

TAG LEGEND (FIRE PROTECTION EXAMPLE)

FP-D = FIRE PROTECTION DRAIN VALVES

FP-C = FIRE PROTECTION CONTROL VALVES

CW = COLD WATER

HW = HOT WATER

G = NATURAL GAS FP = FIRE PROTECTION

SEQUENCE OF OPERATIONS

- 1. THE CHILLED WATER SUPPLY TEMPERATURE SET POINT IS SET TO THE BUILDING DESIGN TEMPERATURE AND CAN BE MANUALLY ADJUSTED UPWARD BY THE OPERATOR. ALL CHILLER CONTROL AND MONITORING POINTS AND PARAMETERS SHALL BE MADE AVAILABLE TO THE BMS THROUGH A BACNET CARD TO BE FURNISHED WITH THE UNITS CONTROL PANEL.
- 2. THE CHILLED WATER SYSTEM ENABLE POINT IS CONTROLLED EITHER MANUALLY BY THE OPERATOR OR BY A PROGRAM FUNCTION (I.E., TIME-OF-DAY, OUTDOOR AIR TEMPERATURE, ETC.). IF THE CHILLED WATER SYSTEM ENABLE POINT IS ON AND THERE IS A CALL FOR COOLING THE CHILLER START SEQUENCE IS ACTIVATED.
- 3. THE CHILLER START SEQUENCE FIRST OPENS CONDENSER, COOLING TOWER AND CHILLER ISOLATION VALVES, ONCE ALL VALVES ARE PROOFED OPEN, THE CONDENSER AND CHILLED WATER PUMPS SHALL START. AFTER A TIME DELAY, THE CHILLER START/STOP POINT TURNS ON. AFTER FLOW IS PROVEN, THE CHILLER OPERATES UNDER ITS OPERATING AND SAFETY
- 4. AFTER THE CHILLER IS COMMANDED, THE PROGRAM WAITS FOR 15 MINUTES BEFORE ISSUING ANY OTHER COMMANDS.
- 5. STAGING OFF THE CHILLER AND PUMPS IS BASED ON THE BUILDING DIFFERENTIAL TEMPERATURE (RETURN MINUS SUPPLY TEMPERATURE). THE CHILLER STOP SEQUENCE IS ACTIVATED, WHENEVER THE BUILDING DIFFERENTIAL TEMPERATURE IS LESS THAN 5 DEG F. (ADJUSTABLE) FOR MORE THAN 15 MINUTES.
- 6. THE CHILLER STOP SEQUENCE FIRST STOPS THE CHILLER. AFTER A TIME DELAY, STOPS THE CONDENSER AND CHILLED WATER PUMPS. AFTER ANOTHER TIME DELAY, THE COOLING TOWER, CONDENSER AND CHILLED WATER ISOLATION VALVES ARE CLOSED.
- 7. THE CHILLED WATER SYSTEM CONTINUES TO OPERATE UNTIL THE CHILLED WATER SYSTEM ENABLE POINT IS OFF. WHEN THE CHILLED WATER SYSTEM SHUTS DOWN, ALL OPERATING CHILLERS, PUMPS AND VALVES GO THROUGH A CHILLER STOP SEQUENCE.

AUTOMATIC CONTROL POINTS SCHEDULE

Point Description	Point Type
New Chiller #1 Enable	DO
Chiller #1 (CH-1) Status	DI
Chiller #1 Alarm	DI
Chiller #1 Set-point reset	AO
Chiller #1 Open Protocol Communications	SM
Chiller #1 Isolation valves - Open-Close	DO
Chiller #1 Isolation valves - Proof Open	DI
Chiller #1 CHW Supply Water Temperature	Al
Chiller #1 CHW Return Water Temperature	Al
Chiller #1 CW Supply Water Temperature	Al
Chiller #1 CW Return Water Temperature	Al
Chiller #1 CHW Flow	Al
Chiller #1 CW Flow	Al
Chiller #1 Evaporator Flow switch	DI
Chiller #1 Condenser Flow switch	DI

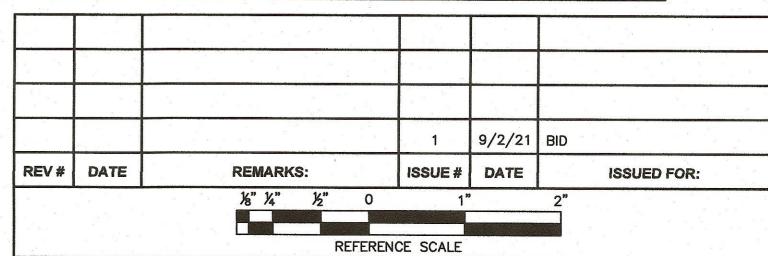
LOAD	CONDUCTORS	C.B.	AØ BØ CØ	C.B.	CONDUCTORS	LOAD
LIGHT PANEL LP-BA	EXISTING	125		150		SPARE
LIGHT PANEL LP-1A & 2A	EXISTING	300		350	(3)500 KCMIL, (1)#3 GND, IN 4"C.	CH-1 (SEE NOTE 2)
SPACE		_		_		SPACE
SPACE		_		_		SPACE
KITCHEN PANELS KP-1 & 2	EXISTING	300		400	EXISTING	MECHANICAL ROOM POWER PANEL PP-1
SPARE		50		30		SPARE
EMDP	EXISTING	100		15	EXISTING	SEWAGE EJECTOR

LINCOLN ELECTRIC PRODUCTS CDP RATING: 277/480V, 3ø, 3W MAINS: 1600A MCB ER 16793 S.O. NO.:

1. ALL NEW WIRE SHALL BE DUAL RATED THHN/THWN COPPER CONDUCTOR UNLESS OTHERWISE NOTED.

2. PROVIDE NEW 350A, 3P UL LISTED CIRCUIT BREAKER WITH 50KA INTERRUPTING RATING PER UL 489 AT 480V AC IN EXISTING PANEL.

EXISTING MAIN DISTRIBUTION SWITCHBOARD - (MDSB)



UNAUTHORIZED ALTERATION OR ADDITION TO A PLAN BEARING A LICENSED PROFESSIONAL ENGINEER'S SEAL IS A VIOLATION OF SECTION 7209, SUB-DIVISION 2 OF THE N.Y. STATE EDUCATION LAW.

FELLENZERI

ENGINEERING LLP

22 Mulberry St., Suite 2A, Middletown, NY 10940 t 845-343-1481 fx 845-343-4986

181 Church St., Suite 100, Poughkeepsie, NY 12601 t 845-454-9704 fx 855-320-8735

OCCC SHEPARD STUDENT CENTER CHILLER REPLACEMENT 115 SOUTH STREET, MIDDLETOWN, NY 10940 DETAILS, SCHEDULES & CONTROLS

JDD EDF EDF MEP-701 09/02/2021 AS SHOWN 20-357

WITH SERVICE COLOR. 1 ABBREVIATIONS TO BE AS INDICATED FOR EACH DESIGN AS INDICATED ON DESIGN DRAWINGS. 2 VALVE TAGS SHOULD BE INDICATED IN "VALVE CHARTS" AND ON "PROJECT RECORD" DRAWINGS TO CORRELATE WITH TAG I.D.'S. NOTE: REFERENCE ALL "VALVE TAGS" TO "VALVE TAG CHARTS", "AS-BUILT DWGS", "O & M MANUALS DATA" (INDEX VALVES PER CHART). EXAMPLE VALVE TAG CHART VALVE TAG CHART FOR: XXXXXXX MOD: XXX AREA: XXX WING: XX FLOOR: XX VALVE TAG MODEL (ALSO SEE AS-BUILT DWGS) SIZE MFG. (WHAT IT DOES & WHAT/WHERE IT SERVICES) ON/OFF - FIXTURES IN RM. RM. XXX - ABOVE CEILING XXXX XX-XXX-XX XXX & XXX BALANCE - 2nd FLOOR, EAST CORR. XXX - ABOVE DOOR BF.V XX-XXX-XXXXXX @ RM. XXX SIDE, NORTH WING

PLASTIC TAGS TO HAVE COLORED

BACKGROUND WHICH COINCIDES

SECURE TO VALVE WITH BRASS CHAIN

AND HOOD. DRILL VALVE HANDLE AS

REQUIRED TO ACCEPT TAG CHAIN.

- 1 1/2" OR 64 MM

O.D. MIN.

BOILER RM. XXX - NE CW-3 ON/OFF - MAIN X,Y, & Z XXXX XX-XXX-XX CORNER RM. XXX - BEHIND N. ON/OFF - EXT. FIELDHOUSE XXXX XX-XXX-XX ACCESS PANEL & FIELD HYD. - IRRIGATION ON/OFF - MIXING VALVE -RM. XXX - ABOVE CEILING XXXX XX-XXX-XX

* ALL MAJOR SYSTEMS ON-OFF, CONTROL AND BALANCING VALVES SHOULD HAVE AN ASTERIK "*"

VALVE TAG DETAIL & VALVE CHART FORMAT

TYPICAL PIPE IDENTIFICATION DETAIL