SUMMARY OF CONNECTED LOAD

TAG	LOCATION	HEAT LOAD (MBH)	SHELL SIDE (SOURCE)					TUBE SIDE (LOAD)					REMARKS
			FLUID	FLOW RATE (GPM)	ENTERING WATER TEMP (°F)	LEAVING WATER TEMP (°F)	WPD (FT HD)	FLUID	FLOW (GPM)	ENTERING WATER TEMP. (°F)	LEAVING WATER TEMP. (°F)	PRESSURE DROP (FT WC)	
SHAFT - 1													
HX-03	AC-03/ HC-03	2475.1	WATER	265.0	180	160	5.2	30% PG	262.7	140	160	2.5	EXISTING
HX-04	AC-04/ HC-04	833.3	WATER	90.0	180	160	2.8	30% PG	88.4	140	160	1.7	EXISTING
C-101	HWH-101	3115	STEAM	-	-	-	-	WATER	300	160	180	2	EXISTING
SHAFT - 2													
HX-05	AC-05/ HC-05	1839	WATER	200.0	180	160	4.1	30% PG	195.2	140	160	1.3	EXISTING
HX-06	AC-06/ HC-06	1652.8	WATER	180.0	180	160	4.5	30% PG	175.4	140	160	2	EXISTING
HX-07	AC-07/ HC-07	293.1	WATER	35.0	180	160	1.7	30% PG	31.1	140	160	1.5	EXISTING
C-201	HWH-201	3374	STEAM	-	-	-	-	WATER	325	160	180	1.3	EXISTING
SHAFT - 3													
HX-11	AC-11/ HC-11	451	WATER	77.0	180	168	3.5	30% PG	47	140	160	2.1	NEW WORK
HX-12	AC-12/ HC-12	334	WATER	57.0	180	168	2.7	30% PG	34.8	140	160	0.3	NEW WORK
C-301	HWH-301	2492	STEAM	-	-	-	-	WATER	240	160	180	1.4	NEW WORK
SHAFT - 4													
HX-08	AC-08/ HC-08	1400.6	WATER	239.1	180	168	10.8	30% PG	146	140	160	9.1	NEW WORK
HX-09	AC-09/ HC-09	321.4	WATER	54.9	180	168	2.5	30% PG	33.5	140	160	0.2	NEW WORK
HX-10	AC-10/ HC-10	368.4	WATER	62.9	180	168	2.3	30% PG	38.4	140	160	1.5	NEW WORK
C-401	HWH-401	2336	STEAM	-	-	-	-	WATER	225	160	180	1.2	NEW WORK
SHAFT - 5													
HX-02	AC-02/ HC-02	1198.4	WATER	130.0	180	160	2.6	30% PG	127.2	140	160	0.9	EXISTING
C-501	HWH-501	1973	STEAM	-	-	-	-	WATER	190	160	180	1.3	EXISTING
C-502	HWH-502	779	STEAM	-	-	-	-	WATER	75	160	180	1.3	EXISTING

INSULATION SCHEDULE

EQUIPMENT OR SYSTEM SERVED	TYPE (A)			JACKETING CLASS (B)		THICKNESS (IN) NOMINAL PIPE SIZE (IN)				
	INTERIOR CONCEALED	INTERIOR EXPOSED	EXTERIOR	INTERIOR GENERAL	EQUIPMENT ROOMS	.5 - 1.5	2 - 4	5 - 6	8 & UP	
MPS, MPC	FG	--	--	1	--	1.5	2.5	3	4	
	--	FG	--	--	1	1.5	2.5	3	4	
HWS, HWR, HGS, HGR	FG	--	--	1	--	1	2	2.5	3	
	--	FG	--	1	1	1	2	2.5	3	

(A) FG - - FIBROUS GLASS; FE - - FLEXIBLE ELASTOMERIC; UR - - URETHANE; CS - - CALCIUM SILICATE; CF - - CERAMIC FIBER

(B) 0 - - NONE; 1 - - ALL SERVICE; 2 - - ALUMINUM FOIL; 3 - - CANVAS; 4 - - POLYVINYL CHLOIRDE

(C) INSULATION TYPE, JACKETING & THICKNESS FOR EQUIPMENT SHALL MATCH THE CORRESPONDING PIPING SYSTEM'S PARAMETERS LISTED FOR: EQUIPMENT ROOMS, NOMINAL PIPE SIZE 8" AND LARGER

NEW SHELL & TUBE HEAT EXCHANGER SCHEDULE

TAG	LOCATION	HEAT LOAD (MBH)	SHELL SIDE (SOURCE)					TUBE SIDE (LOAD)					REMARKS
			FLUID	FLOW RATE (GPM)	ENTERING WATER TEMP (°F)	LEAVING WATER TEMP (°F)	WPD (FT HD)	FLUID	FLOW (GPM)	ENTERING WATER TEMP. (°F)	LEAVING WATER TEMP. (°F)	PRESSURE DROP (FT WC)	
HX-08	AC-08/ HC-08	1400.6	WATER	239.1	180	168	10.8	30% PG	146	140	160	9.1	1,2,3,4
HX-09	AC-09/ HC-09	321.4	WATER	54.9	180	168	2.5	30% PG	33.5	140	160	0.2	1,2,3,4
HX-10	AC-10/ HC-10	368.4	WATER	62.9	180	168	2.3	30% PG	38.4	140	160	1.5	1,2,3,4
HX-11	AC-11/ HC-11	451	WATER	77.0	180	168	3.5	30% PG	47	140	160	2.1	1,2,3,4
HX-12	AC-12/ HC-12	334	WATER	57.0	180	168	2.7	30% PG	34.8	140	160	0.3	1,2,3,4

REMARKS:

1. TUBES SHALL BE 3/4" O.D. COPPER WITH 0.035" WALL THICKNESS.
2. DESIGN PRESSURE / TEMPERATURE SHALL BE 150 PSIG / 375 °F.
3. HEAD SHALL BE BONNET-TYPE, FABRICATED STEEL. BAFFLES AND SHELL SHALL BE STEEL.
4. HEAT EXCHANGER TO BE DESIGNED, CONSTRUCTED AND STAMPED PER ASME SECTION VIII, DIVISION 1.

PUMP SCHEDULE

TAG	EQUIPMENT / AREA SERVED	MOTOR				MOTOR RPM	FLUID	FLOW (GPM)	HEAD (FT WC)	IMP. DIA. (IN)	MOUNTING TYPE	BASIS OF DESIGN	REMARKS
		HP	VOLTS	PHASE	HZ								
HWP-503 (E)	HW BOILER	25	208	3	60	1750	WATER	800	72	-	INLINE	B&G SERIES 80	EXISTING
HWP-504 (E)	HW BOILER	25	208	3	60	1750	WATER	800	72	-	INLINE	B&G SERIES 80	EXISTING
HWP-505	SHAFT 3, SHAFT 4, D-WING	20	208	3	60	3600	WATER	400	130	6.5	INLINE	B&G SERIES 80	1
HWP-506	SHAFT 3, SHAFT 4, D-WING	20	208	3	60	3600	WATER	400	130	6.5	INLINE	B&G SERIES 80	1

REMARKS:

1. PROVIDE VFD WITH BYPASS, LOCKING DISCONNECT, 24V DRY CONTACT AND THERMAL OVERLOAD PROTECTION. COORDINATED WITH BUILDING MANAGEMENT SYSTEM

HVAC EXPANSION TANK (ET) SCHEDULE

TAG	SYSTEM	TANK TYPE	CONN. SIZE (IN)	DIMENSIONS (DIA x H)	TANK ACCEPTANCE (GAL)	CHARGE PRESSURE (PSIG)	ARRANGEMENT	BASIS OF DESIGN	NOTES
ET-1	BOILER LOOP EXPANSION	BLADDER	1-1/2	36 x 73	264	12	VERTICAL	B&G B-1000	1,2,3

REMARKS:

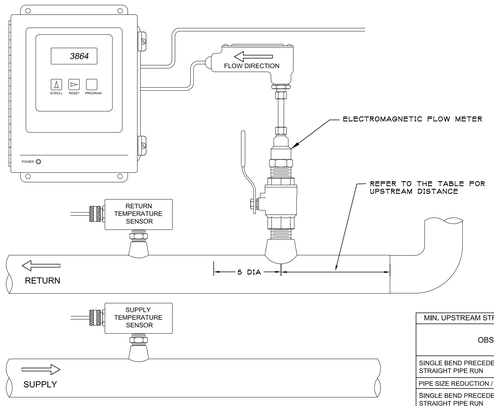
1. TANK SHALL BE STEEL CONSTRUCTION WITH HEAVY DUTY BUTYL RUBBER DIAPHRAGM & FORGED STEEL CONNECTION FITTINGS.
2. EXPANSION TANK TO BE DESIGNED, CONSTRUCTED AND STAMPED PER ASME SECTION VIII, DIVISION 1.
3. TANK SHALL BE RATED FOR MAXIMUM WORKING PRESSURE OF 125 PSIG AND MAXIMUM WORKING TEMPERATURE OF 240°F.

LEGEND

2-P	TWO-POSITION
ACCU	AIR COOLED CONDENSING UNIT
AEAD	AUTOMATIC EXHAUST AIR DAMPER
AFF	ABOVE FINISHED FLOOR
AHU	AIR HANDLING UNIT
AOAD	AUTOMATIC OUTDOOR AIR DAMPER
ARAD	AUTOMATIC RETURN AIR DAMPER
AS	AIR SEPARATOR
B	BOILER
CAC	COMPRESSED AIR CONTRACTOR
CCEC	CLOSED CIRCUIT EVAPORATIVE COOLER
CFM	CUBIC FEET OF AIR PER MINUTE
CH	CHILLER
CHWR	CHILLED WATER RETURN
CHWS	CHILLED WATER SUPPLY
CT	COOLING TOWER
CUH	CABINET UNIT HEATER
CWR	CONDENSER WATER RETURN
CWS	CONDENSER WATER SUPPLY
DAC	DUCTLESS AIR CONDITIONER
DACCU	DUCTLESS AIR CONDITIONING CONDENSER UNIT
EA	EXHAUST AIR
EAT	EXHAUST AIR TEMPERATURE
EC	ELECTRICAL CONTRACTOR
ET	EXPANSION TANK
EWT	ENTERING WATER TEMPERATURE
FCU	FAN COIL UNIT
FTR	FIN TUBE RADIATION
GPM	GALLONS PER MINUTE
HGR	HOT GLYCOL RETURN
HGS	HOT GLYCOL SUPPLY
HP	HEAT PUMP
HPC	HIGH PRESSURE CONDENSATE
HPS	HIGH PRESSURE STEAM
HVACU	HEATING VENTILATING AIR CONDITIONING UNIT
HWR	HOT WATER RETURN
HWS	HOT WATER SUPPLY
KEF	KITCHEN EXHAUST FAN
LPC	LOW PRESSURE CONDENSATE
LPS	LOW PRESSURE STEAM
LWT	LEAVING WATER TEMPERATURE
MAT	MIXED AIR TEMPERATURE
MPC	MEDIUM PRESSURE CONDENSATE
MPS	MEDIUM PRESSURE STEAM
MUAU	MAKE UP AIR UNIT
P	PUMP
PC	PUMPED CONDENSATE
PCR	PROCESS COOLING RETURN
PCS	PROCESS COOLING SUPPLY
PD	PRESSURE DROP
PR	PERIMETER RADIATION
PRE	POWER ROOF EXHAUST FAN
PRV	POWER ROOF VENTILATOR
PTAC	PACKAGED TERMINAL AIR CONDITIONER
RA	RETURN AIR
RHG	REFRIGERANT HOT GAS
RHR	REHEAT RETURN
RHS	REHEAT SUPPLY
RL	REFRIGERANT LIQUID
RS	REFRIGERANT SUCTION
SAT	SUPPLY AIR TEMPERATURE
VAV	VARIABLE AIR VOLUME BOX
VFD	VARIABLE FREQUENCY DRIVE
VRV	VARIABLE REFRIGERANT VOLUME TERMINAL
VRVCU	VARIABLE REFRIGERANT VOLUME COMPRESSOR UNIT

SYMBOLS

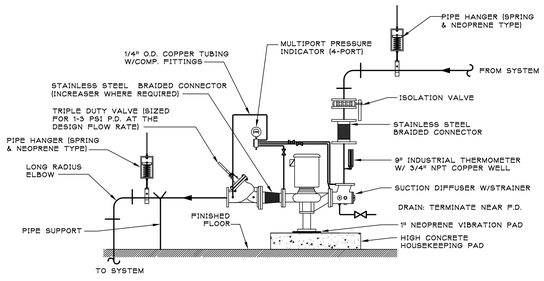
- PROPOSED
- EXISTING
- EXISTING TO BE REMOVED
- CONNECT TO EXISTING
- UNION
- FLANGE
- CONCENTRIC REDUCER
- ECCENTRIC REDUCER
- STRAINER
- STRAINER (WITH BLOW DOWN)
- MANUAL AIR VENT
- GATE VALVE
- GLOBE VALVE
- BALL VALVE (HOSE END & CAP)
- SWING CHECK VALVE
- BALL VALVE
- LUBRICATED PLUG VALVE
- TRIPLE DUTY VALVE
- BUTTERFLY VALVE
- RELIEF VALVE
- 2-WAY CONTROL VALVE
- 3-WAY CONTROL VALVE
- BALANCING VALVE
- PRESSURE GAUGE
- THERMOMETER
- THERMOSTAT
- TEMPERATURE SENSOR
- PRESSURE SENSOR
- FLOW SENSOR
- HUMIDITY SENSOR
- PUMP
- STEAM TRAP



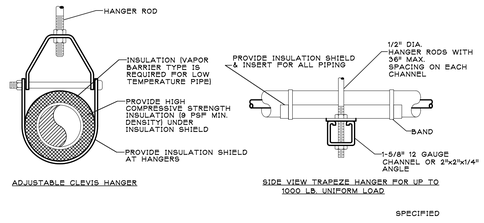
MIN. UPSTREAM STRAIGHT RUN REQ. FOR SENSOR PLACEMENT	
OBSTRUCTION	UPSTREAM
SINGLE BEND PRECEDED BY ≥ 9 DIAMETERS OF STRAIGHT PIPE RUN	10 DIA
PIPE SIZE REDUCTION / EXPANSION IN STRAIGHT RUN	10 DIA
SINGLE BEND PRECEDED BY ≤ 9 DIAMETERS OF STRAIGHT PIPE RUN	15 DIA
OUTFLOWING TEE / PUMP OUTFLOW	20 DIA
MULTIPLE BENDS OUT OF PLANE	30 DIA
INFLOWING TEE	30 DIA
CONTROL / MODULATING VALVE	30 DIA

1. BASIS OF DESIGN: ONICON F-3500 SERIER INSERTION ELECTROMAGNETIC FLOW METER.
2. PROVIDE TEMPERATURES SENSORS AS REQUIRED TO MONITOR TEMPERATURE DIFFERENTIAL. EXISTING TEMPERATURE SENSORS MAY BE UTILIZED BUT MUST BE RECALIBRATED.

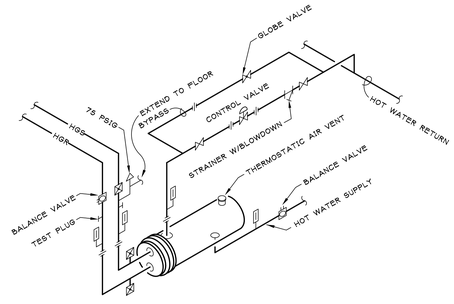
1 FLOW METER DETAIL PIPING 3" DIA OR LARGER
NTS



2 INLINE PUMP CONNECTION DETAIL
NTS



3 PIPE HANGERS
NTS



NOTE:

1. WHERE HEAT EXCHANGER CAN NOT BE MOUNTED HIGH, PROVIDE STEEL RACK WITH SADDLE SUPPORT ANCHORED TO THE FLOOR OR STRUCTURAL STEEL CROSS MEMBERS

4 HEAT EXCHANGER - HOT WATER TO HOT GLYCOL
NTS

Revisions	Date

IPD: Engineering
INTEGRATED PROJECT DELIVERY
ONE WEBSTER'S LANDING
SYRACUSE, NEW YORK 13202
315.423.0185
IPD PROJECT # 11-7061-8

Drawing Title	SCHEDULES AND DETAILS
Project Title	ADD HEATING HOT WATER TO SHAFTS #3 & #4
Date	11-16-12
Project No.	528A7-11-711
Building Number	1
Checked	SBG
Drawn	NCB
Location	SYRACUSE
DRAWING NO.	MP-501
Dwg.	7 Of 8

VA HEALTHCARE NETWORK UPSTATE NEW YORK
Department of Veterans Affairs