PROJECT:
UNIVERSITY OF COLORADO AT DENVER - LAWRENCE STREET CENTER
REPLACE HVAC HEATING ZONE VALVES
1380 LAWRENCE STREET
DENVER, COLORADO

DOCUMENT PHASE:
CONSTRUCTION DOCUMENTS

OWNER: UCD

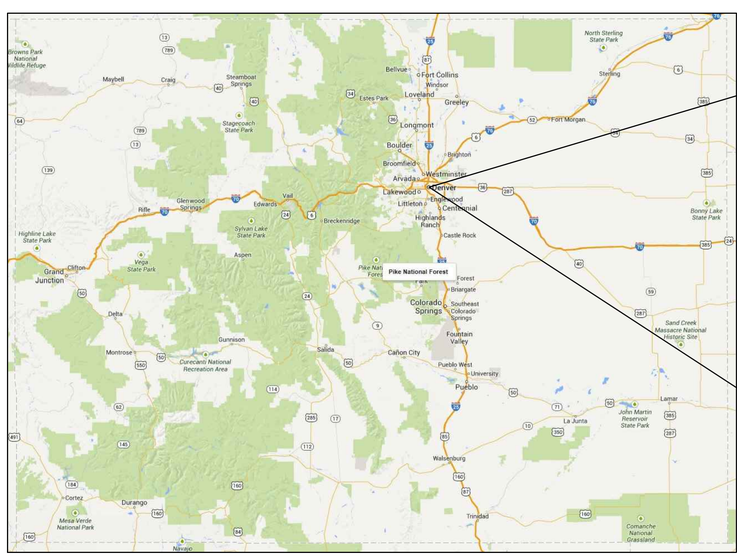
CONSULTANT:
BG BUILDINGWORKS
1626 COLE BLVD. SUITE # 300, BLDG. 7
LAKEWOOD, COLORADO

UCD PROJECT #20-112394
BG BUILDINGWORKS PROJECT # 9418.15

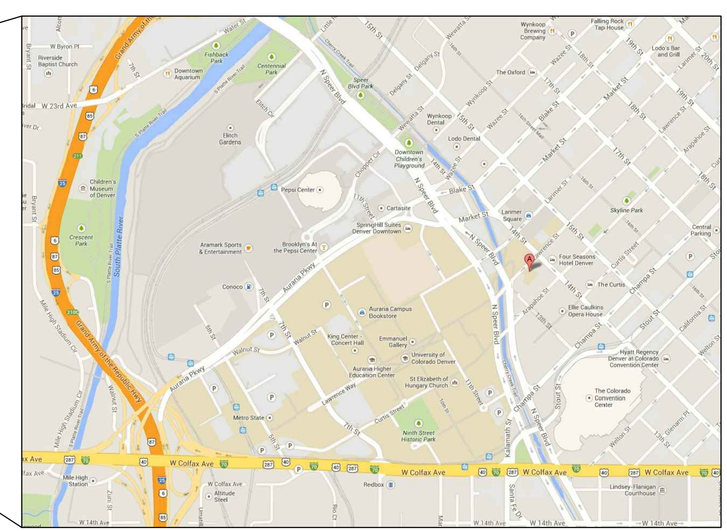
APPLICABLE CODES

NFPA 70 - 2017 (NEC)

2018 INTERNATIONAL BUILDING CODE



COLORADO MAP
SCALE: NONE



SITE MAP
SCALE: NONE

BG BUILDINGWORKS
systems fulfilled
ALBUQUERQUE | AVON | DENVER | FORT COLLINS
505.270.8020 www.bgbuildingworks.com

SEAL

UNIVERSITY OF COLORADO AT DENVER
LSC REPLACE HVAC HEATING ZONE VALVES
1380 LAWRENCE STREET
DENVER, COLORADO 80217

Current Issue:
CONSTRUCTION DOCUMENTS

Issued:

CONSTRUCTION DOC	05.04.2021

Sheet Title:
PROJECT COVER SHEET

Date:	05/04/2021
Designed:	KRB
Reviewed:	WGP
Project No:	9418.15

Sheet No:
G100

Scale: As Shown

© 2020 BG BUILDINGWORKS, INC.

S:\BG\PROJECTS\9418.15 - UNIVERSITY OF COLORADOAT DENVER - LAWRENCE STREET CENTER - PENTHOUSE HEATING WATER VALVE REPLACEMENT\CAD\BCCE CAD\9418.15G100.DWG

MECHANICAL SHEET INDEX

#	TITLE	PLAN REVIEW	CONSTRUCTION DOCUMENTS
M2.1	MECHANICAL DEMOLITION AND NEW PLANS	√	√
M3.1	MECHANICAL DIAGRAMS	√	√

ISSUE LOG

ISSUE LOG KEY:
'√' ISSUED AS PART OF A SET
' ' NOT PART OF SET
'•' ISSUED FOR INFORMATION ONLY

DATE: 04.08.2021 / 05.04.2021

MISCELLANEOUS MECHANICAL EQUIPMENT SCHEDULE

MARK	SERVICE	TYPE	CAPACITY	ELECTRICAL HP	ELECTRICAL VOLT/PH	MANUFACTURER* & MODEL #	ACCESSORIES	REMARKS
ET-1	HEATING WATER	EXPANSION TANK	34 GAL	-	-	B&G D-144 116507	BLZ LEG ACCESSORIES FOR HORIZONTAL FLOOR MOUNTING	ASME SECTION VII, 125 PSI MAX WORKING PRESSURE, 240°F MAX OPERATING TEMP

MANUFACTURERS:
-

GENERAL NOTES:
A:
B:

DEMOLITION NOTES:

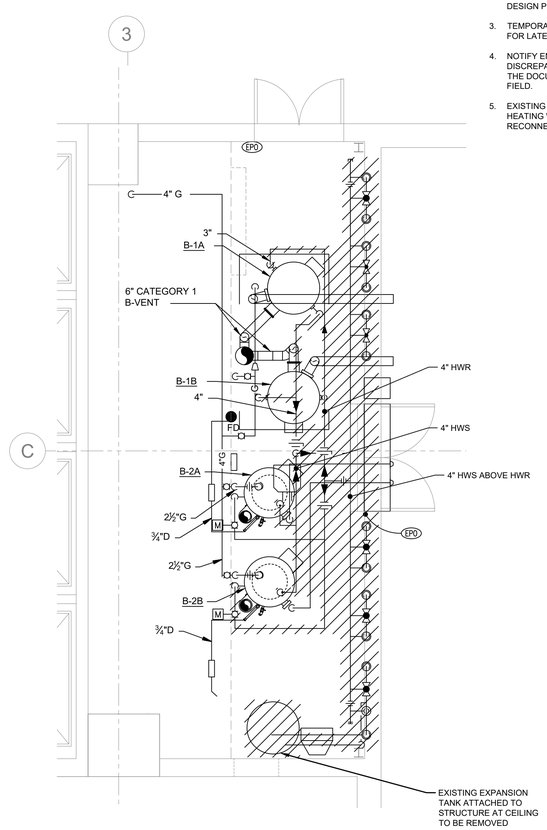
1. ADDITIONAL HYDRONIC, DOMESTIC, WASTE AND VENT PIPING MAY BE ROUTED IN SPACE THAT IS NOT REPRESENTED, BUT IS TO REMAIN. OTHER SYSTEMS MAY EXIST WITHIN THE SPACE THAT ARE NOT REPRESENTED ON THESE DRAWINGS; MODIFICATIONS TO THESE SYSTEMS ARE NOT ANTICIPATED.
2. FIELD VERIFY ALL COMPONENTS PRIOR TO DEMOLITION. THE INFORMATION ON THIS SHEET WAS OBTAINED, IN PART, FROM HISTORIC DESIGN DRAWINGS. ONLY PORTIONS OF THE SYSTEMS WERE ACCESSIBLE FOR VISUAL CONFIRMATION DURING DESIGN PROCESS.
3. TEMPORARILY SEAL OR CAP PIPING TO BE RE-USED FOR LATER CONNECTION.
4. NOTIFY ENGINEER IMMEDIATELY OF ANY DISCREPANCIES OF INFORMATION REPRESENTED IN THE DOCUMENTS VERSUS WHAT IS FOUND IN THE FIELD.
5. EXISTING PUMPS SHALL BE DISCONNECTED FROM HEATING WATER SYSTEM, SUPPORTED IN PLACE AND RECONNECTED TO NEW PIPING.

MECHANICAL NOTES:

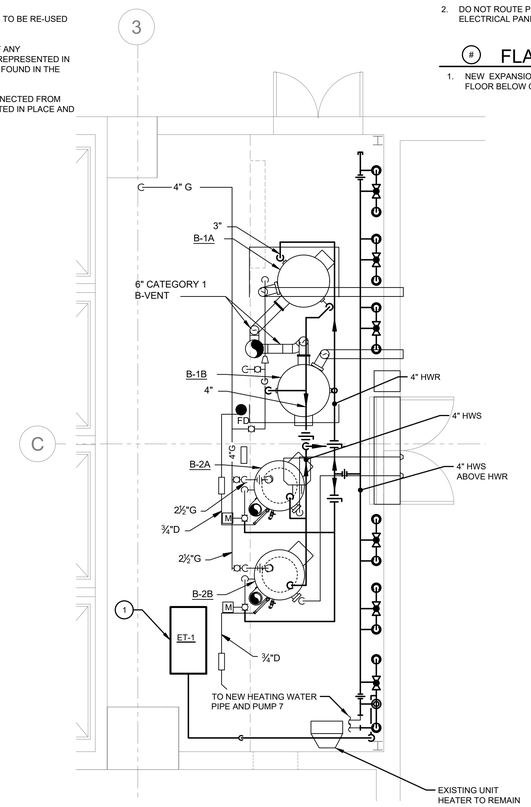
1. DESIGN INTENT IS TO REPLACE HEATING WATER PIPING IN BOILER PENTHOUSE WITH SIMILAR SYSTEM. (E) PUMPS SHALL BE DISCONNECTED FROM HEATING WATER SYSTEM, SUPPORTED AND RECONNECTED TO NEW PIPING. FLANGES TO BE REPLACED. (E) BOILERS TO REMAIN FOR RE-USE. PIPE TO BE REPLACED WITH SAME SIZED PIPE AS EXISTING IN ALL LOCATIONS. (E) PNEUMATIC ACTUATORS TO BE REPLACED BY NEW DDC ACTUATORS. ALL (E) GATE VALVES TO BE REPLACED BY NEW BALL VALVES. ALL OTHER (E) VALVES TO BE REPLACED BY VALVES OF THE SAME TYPE. EXPANSION TANK TO BE REPLACED BY NEW AT FLOOR LEVEL.
2. DO NOT ROUTE PIPING OVER ELECTRICAL ROOMS OR ELECTRICAL PANELS.

(#) FLAG NOTES:

1. NEW EXPANSION TANK ET-1 TO BE INSTALLED ON FLOOR BELOW OVERHANG AREA.



1 MECHANICAL DEMOLITION PLAN
SCALE: 1/4" = 1'-0"



2 MECHANICAL NEW PLAN
SCALE: 1/4" = 1'-0"

MECHANICAL SYSTEMS LEGEND

PIPING SYMBOLS

G	90° ELBOW DN
	90° ELBOW UP
	TEE DOWN
	TEE UP
	BUTTERFLY VALVE
	SHUT OFF (BALL, GATE, BUTTERFLY)
	GLOBE VALVE
	CHECK VALVE
	FLOW CONTROL VALVE
	BALL VALVE
	PLUG OR BALANCING VALVE
	FLOW BALANCING VALVE
	PLUG VALVE IN RISER
	GATE OR GLOBE VALVE IN RISER
	DRAIN VALVE W/ HOSE END
	TEMPERATURE CONTROL VALVE (2-WAY)
	TEMPERATURE CONTROL VALVE (3-WAY)
	PRESSURE REDUCING VALVE
	SOLENOID VALVE
	VENTURI/FLOW INDICATOR
	PUMP & EQUIPMENT CONNECTOR
	PIPE UNION
	DOUBLE CHECK BACKFLOW PREVENTER
	PIPE ANCHOR
	PIPE EXPANSION JOINT
	FLEXIBLE CONNECTOR
	SAFETY RELIEF VALVE
	AIR VENT
	PRESSURE - TEMP. TAP
	PRESSURE GAUGE W/ PIG TAIL & COCK
	THERMOMETER
	VACUUM BREAKER
	STRAINER W/ BLOW-OFF VALVE
	SHOCK ABSORBER
	FLOW SWITCH
	HORIZONTAL CLEANOUT
	VERTICAL CLEANOUT
	FLOOR DRAIN
	FLOOR SINK
	ROOF DRAIN
	DECK/ROOF DRAIN ABOVE
TC	TEMPERATURE CONTROLLER OR SENSOR
H B	HOSE BIBB
W H	WALL HYDRANT
FT	STEAM TRAP TEST CHAMBER
	STEAM TRAP: FT-FLOAT & THERMOSTATIC TD-THERMODYNAMIC IB-INVERTED BUCKET TS-THERMOSTATIC BP-BALANCED PRESSURE

PIPING DESIGNATIONS

HYDRONIC PIPING	
HWS	HEATING WATER SUPPLY
HWR	HEATING WATER RETURN
PLUMBING PIPING	
G	NATURAL GAS
D	DRAIN PIPE
CW	DOMESTIC WATER
HW	DOMESTIC HOT WATER
HWC	DHW RECIRCULATION
140° HW	DOMESTIC HOT WATER (TEMP. SHOWN)
NS	NON-SOFTENED DOMESTIC WATER
F	FIRE LINE
W	WASTE PIPE
V	PLUMBING VENT PIPE

PLAN ABBREVIATIONS

ABV	ABOVE
AFF	ABOVE FINISHED FLOOR
AUTO	AUTOMATIC
BCS	BUILDING CONTROL SYSTEM
BDD	BACK DRAFT DAMPER
BLDG	BUILDING
CFM	CUBIC FEET PER MINUTE (AIR FLOW RATE)
COND	CONDENSATE
CW	COLD WATER
DN	DOWN
(E)	EXISTING
EA	EXHAUST AIR
EXH	EXHAUST
FFI	FOR FURTHER INFORMATION
GC	GENERAL CONTRACTOR
GPM	GALLONS PER MINUTE (WATER FLOW RATE)
HW	HOT WATER
HWC	HOT WATER RECIRC
KW	KILOWATTS
MFR	MANUFACTURER
(N)	NEW
OA	OUTSIDE AIR
RE:	REFER TO:
SF	SQUARE FOOT (FEET)
TYP	TYPICAL
UNO	UNLESS NOTED OTHERWISE
W/	WITH
W/O	WITHOUT
Ø	DIAMETER

NOTES

1. ALL SYMBOLS, ABBREVIATIONS, AND DESIGNATIONS ON LEGEND SHEET ARE NOT NECESSARILY USED ON THIS PROJECT.
2. THIS DRAWING SET CONSISTS OF DATA GENERATED, IN PART, BY OTHER PARTIES. NOT ALL SYMBOLOGIES AND NOTATION CONVENTIONS OCCURRING IN THIS DRAWING SET ARE NECESSARILY DEFINED ON THESE LEGENDS. CONSULT THE ENGINEER IN THE EVENT SYMBOLOGY OR NOTATION INTERPRETATION IS REQUIRED.

EQUIPMENT ABBREVIATIONS

AS	AIR SEPARATOR
B	BOILER (HOT WATER)
ET	EXPANSION TANK
GF	GLYCOL FEEDER
HX	HEAT EXCHANGER
HWP	HEATING WATER PUMP
MV	MIXING VALVE
P	PUMP
ST	STORAGE TANK
TMV	THERMOSTATIC MIXING VALVE
UH	UNIT HEATER
WH	WATER HEATER

REFERENCE SAMPLE

RE: B/M400 FFI

- FFI = FOR FURTHER INFORMATION / FCT = FOR CONTINUATION
- SHEET NUMBER
- DRAWING NUMBER OR DIAGRAM LETTER
- REFER TO:

PLAN SYMBOLS

	CONTROL PANEL/RADIANT MANIFOLD
CO2	CARBON DIOXIDE SENSOR
CO	CARBON MONOXIDE SENSOR
H	HUMIDISTAT
TS	REMOTE TEMPERATURE SENSOR
T	THERMOSTAT
SP	DUCT STATIC PRESSURE SENSOR
P	ROOM PRESSURE SENSOR
EPO	EMERGENCY POWER OFF SWITCH
	PLUMBING/HVAC RISER
	DIAGRAM CONTINUATION REFERENCE
	SECTION CUT LETTER/SHEET SHOWN ON
	POINT OF DISCONNECTION
	POINT OF NEW CONNECTION
	ACCESS PANEL
	SNOWMELT MANIFOLD

PROJECT ALTITUDE

5280' ABOVE SEA LEVEL

ALTERNATE PRICE #1:

1. PROVIDE AN ALTERNATE PRICE FOR THE REPLACEMENT OF HEATING WATER PUMPS HWP-1 THROUGH HWP-6.

BG BUILDINGWORKS systems fulfilled
ALBUQUERQUE | AVON | DENVER | FORT COLLINS
970.221.5820 www.bgbuildingworks.com

SEAL

UNIVERSITY OF COLORADO AT DENVER
LSC REPLACE HVAC HEATING ZONE VALVES
1380 LAWRENCE STREET
DENVER, COLORADO 80217

Current Issue:
CONSTRUCTION DOCUMENTS

Issued:
CONSTRUCTION DOC 05.04.2021

Sheet Title:
MECHANICAL DEMOLITION AND NEW PLANS

Date:	05/04/2021
Designed:	KRB
Reviewed:	WGP
Project No:	9418.15

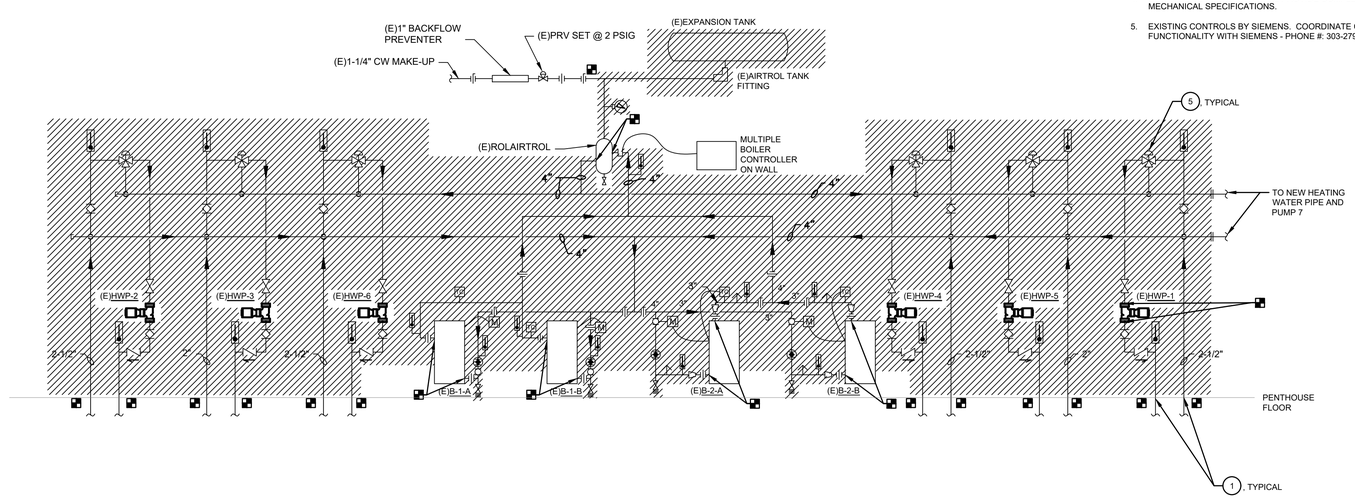
Sheet No:
M2.1

Scale: As Shown

S:\BG\PROJECTS\9418.15 - UNIVERSITY OF COLORADOAT DENVER - LAWRENCE STREET CENTER - PENTHOUSE HEATING WATER VALVE REPLACEMENT\CAD\BCCE CAD\9418.15_M2.1.DWG

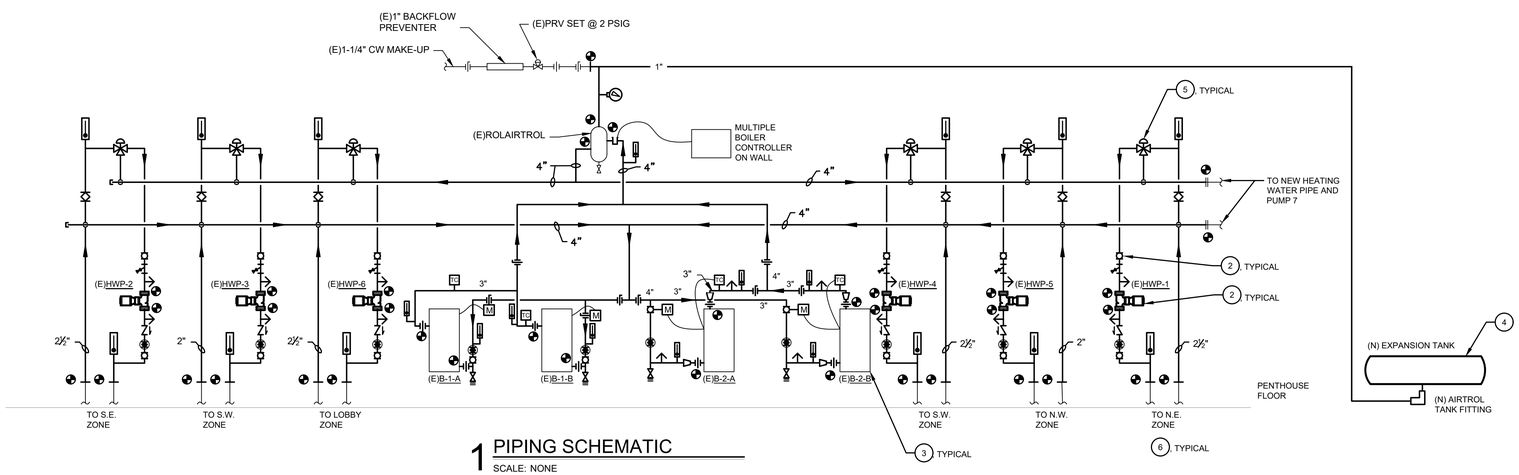
CONTROLS SCOPE OVERVIEW NOTES:

1. ADDITIONS AND ALTERATIONS TO CONTROLS SHALL BE OWNER FURNISHED AND OWNER INSTALLED. CONTRACTOR SHALL COORDINATE THIS EFFORT WITH OWNER AND CONTROLS CONTRACTOR.
2. THE DESIGN INTENT IS TO LEAVE THE EXISTING CONTROLS LOGIC UNCHANGED. COORDINATE CONTROLS WITH CONTROLS CONTRACTOR. CONTROLS CONTRACTOR SHALL VERIFY FUNCTIONALITY.
3. CONTROL VALVES TO REPLACED WITH NEW VALVES WITH ELECTRONIC ACTUATORS AND CONNECTED TO EXISTING CONTROL WIRES.
4. CONTROL CONTRACTOR SHALL PROVIDE COMPLETE SUBMITTAL IN ACCORDANCE WITH MECHANICAL SPECIFICATIONS.
5. EXISTING CONTROLS BY SIEMENS. COORDINATE CONTROLS AND CONFIRM FUNCTIONALITY WITH SIEMENS - PHONE #: 303-279-8500.



1 DEMOLITION PIPING SCHEMATIC

SCALE: NONE



1 PIPING SCHEMATIC

SCALE: NONE

PUMP SCHEDULE

MARK	SERVICE	TYPE	GPM	TDH (FT)	FLUID	MOTOR HP	MOTOR RPM	MOTOR VOLT/PH	MANUFACTURER* & MODEL #	ACCESSORIES	REMARKS
HWP-1	N.E. ZONE	VERTICAL INLINE	62	35	WATER	1-1/2	1750	460/3	ARMSTRONG 1060-2D-1.5hp	-	A,B,C
HWP-2	S.E. ZONE	VERTICAL INLINE	42	35	WATER	1-1/2	1750	460/3	ARMSTRONG 1060-2D-1.5hp	-	A,B,C
HWP-3	S.W. ZONE	VERTICAL INLINE	35	35	WATER	1	1750	460/3	ARMSTRONG 1060-1.5D-1hp	-	A,B,C
HWP-4	S.W. ZONE	VERTICAL INLINE	31	35	WATER	1	1750	460/3	ARMSTRONG 1060-1.5D-1hp	-	A,B,C
HWP-5	N.W. ZONE	VERTICAL INLINE	28	35	WATER	1	1750	460/3	ARMSTRONG 1060-1.5D-1hp	-	A,B,C
HWP-6	LOBBY ZONE	VERTICAL INLINE	59	45	WATER	2	1750	460/3	ARMSTRONG 1060-2D-2hp	-	A,B,C

MANUFACTURERS:

*	B&G, GRUNDFOS, TACO OR AURORA EQUIVALENT

GENERAL NOTES:

A:	PUMP DATA, INCLUDING GPM & TDH, GATHERED FROM BUILDING RECORD DRAWINGS, DATED 03/11/81. CONTRACTOR TO REVIEW EXISTING PUMPS DURING DEMOLITION TO CONFIRM SIZE INFORMATION.
B:	INVERTER DUTY RATED MOTOR & SHAFT GROUND RING, FUTURE PLANS FOR VFD
C:	PUMP FLANGE SIZE MAY DIFFER FROM CONNECTING PIPE SIZE. MAKE ADJUSTMENTS AS REQUIRED.

PLANT PIPING NOTES:

1. COALESCING TYPE AIR SEPARATOR WITH WITH AUTOMATIC RELIEF FLOAT. 1-1/2" PIPE AND SMALLER: SPIROTHERM SPIROVENT JR, B&G EASB JR, OR TACO VORTEC. 2" PIPE AND LARGER: SPIROTHERM SPIROVENT SR, B&G CRS, OR TACO 4900. OR EQUIVALENT.
2. INDICATES UNION OR FLANGE CONNECTION FOR SERVICE PURPOSES. DIELECTRIC UNIONS NOT PERMITTED EXCEPT AT DOMESTIC WATER CONNECTIONS TO WATER HEATERS. PROVIDE DIELECTRIC NIPPLES OR FLANGES AT FERROUS TO NON-FERROUS PIPING MATERIAL TRANSITIONS.
3. NO C NC — THREE-WAY VALVE WITH PORTS IDENTIFIED:
   C = COMMON
   NC = NORMALLY CLOSED
   NO = NORMALLY OPEN
4. DIAGRAM IS SCHEMATIC IN NATURE. NOT ALL APPURTENANCES REQ'D ARE NECESSARILY SHOWN. PROVIDE SYSTEM ACCESS, VALVING, AND DRAINAGE AS REQ'D FOR PROPER SYSTEM MAINTENANCE AND PURGE/FILL PROCEDURES.
5. PROVIDE MANUAL AIR VENT AT ALL HIGH POINTS AND MANUAL DRAIN VALVES AT ALL LOW POINTS. PIPE DRAIN VALVES TO A SUITABLE LOCATION WHEN DRAINS ARE IN A LOCATION IN WHICH THEIR DRAINAGE WILL BE A NUISANCE OR CAUSE DAMAGE.
6. ALL PARALLEL EQUIPMENT SUCH AS BOILERS, PUMPS, TANKS, ETC. SHALL BE PIPED IN TRUE REVERSED RETURN FASHION FOR AUTOMATIC FLOW BALANCING BETWEEN THE PARALLEL ITEMS.
7. ALL ISOLATION VALVES SHALL BE FULL PORT VALVES EQUIVALENT TO PIPE SIZE SHOWN.
8. PROVIDE LATERAL BRACING TO WALL FOR ALL EQUIPMENT REQUIRING SEISMIC BRACING.
9. REFER TO CONTROLS DRAWINGS FOR ADDITIONAL DEVICE REQUIREMENTS SUCH AS PRESSURE AND TEMPERATURE PICKUP LOCATIONS.
10. CONTRACTOR SHALL INSTALL NEW VALVES AT GAUGES TO ALLOW EASY REPLACEMENT.
11. CONTRACTOR SHALL INSTALL ALL NEW THERMOMETERS IN WELLS.

SYSTEM REQUIREMENTS

1. IT IS ANTICIPATED THAT THE WORK FOR THIS PROJECT WILL BE COMPLETED DURING THE SUMMER MONTHS, WHEN HEATING WILL NOT BE CALLED FOR BY THE BUILDING SYSTEMS. ENGINEER DOES NOT ANTICIPATE RENOVATION TO CONTINUE INTO COLDER MONTHS, WHEN THE HEATING WATER SYSTEM WOULD NEED TO RETAIN SOME FUNCTIONALITY DURING RENOVATION.

FLAG NOTES:

1. CONTRACTOR SHALL ISOLATE AND DRAIN EACH ZONE AT FLOOR OF PENTHOUSE.
2. EXISTING HEATING WATER GATE VALVES TO BE REPLACED BY NEW BALL VALVES.
3. EXISTING PUMPS AND BOILERS TO REMAIN.
4. NEW EXPANSION TANK TO BE INSTALLED AT FLOOR LEVEL UNDERNEATH OVERHANG.
5. CONTROL VALVES ARE TO REPLACED BY NEW VALVES WITH ELECTRONIC ACTUATORS. ASSOCIATED PNEUMATIC CONTROLS SHALL BE REMOVED AND EXISTING CONTROL WIRES TO BE EXTENDED AND CONNECTED TO NEW ACTUATORS. PNEUMATIC TUBING BRANCHES FOR THE CONTROLS TO BE REMOVED BACK TO THE MAIN AND CAPPED AND SEALED. MAIN LINE OF PNEUMATIC TUBING TO REMAIN.
6. ZONE INFORMATION GATHERED FROM MCMORRAN OBERMEIER GROSS BERSHOF DRAWINGS, DATED 02/02/81

B&G BUILDINGWORKS systems fulfilled
ALBUQUERQUE | AVON | DENVER | FORT COLLINS
www.bgbuildingworks.com

SEAL

UNIVERSITY OF COLORADO AT DENVER
LSC REPLACE HVAC HEATING ZONE VALVES
1380 LAWRENCE STREET
DENVER, COLORADO 80217

Current Issue:
CONSTRUCTION DOCUMENTS

Issued:

CONSTRUCTION DOC	05.04.2021

Sheet Title:
MECHANICAL DIAGRAMS

Date:	05/04/2021
Designed:	KRB
Reviewed:	WGP
Project No:	9418.15

Sheet No:
M3.1

Scale: As Shown

S:\BGPROJECTS\9418.15 - UNIVERSITY OF COLORADOAT DENVER - LAWRENCE STREET CENTER - PENTHOUSE HEATING WATER VALVE REPLACEMENT\CAD\BGCE CAD\9418.15_M3.1.DWG