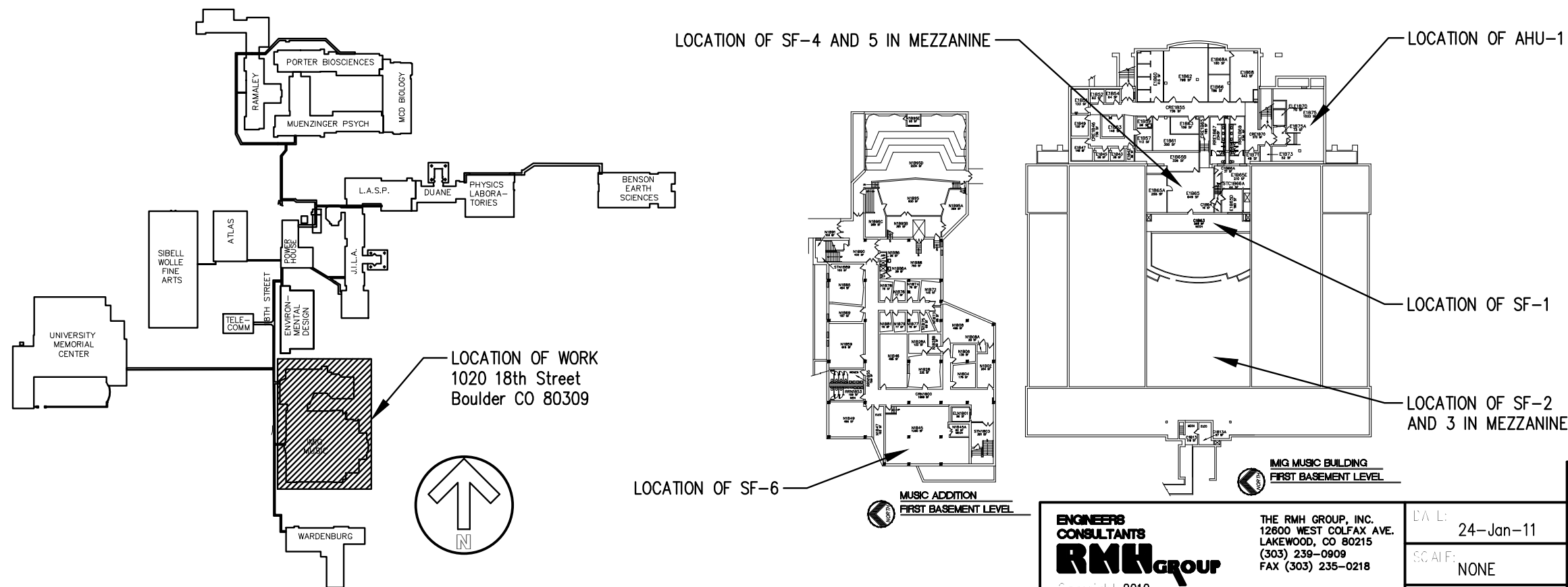


**GENERAL NOTES:**

1. NEW PIPING AND EQUIPMENT IS DRAWN WITH A HEAVY LINE AND EXISTING ITEMS ARE DRAWN WITH A LIGHT LINE.
2. ALL WORK AND MATERIALS SHALL COMPLY WITH INTERNATIONAL CODES AND UCB CONSTRUCTION STANDARDS.
3. CONTRACTOR SHALL VERIFY EXISTING CONDITIONS PRIOR TO BID. AND SHALL VERIFY PIPE SIZES, DIMENSIONS, VOLTAGES, ETC, PRIOR TO CONSTRUCTION.
4. INSTALL NEW PIPING AND EQUIPMENT TO BE ACCESSIBLE FOR SERVICE AND MAINTENANCE WITHOUT OBSTRUCTING EXISTING DEVICES NEEDING SERVICE AND MAINTENANCE.
5. CONTRACTOR SHALL ENSURE THAT NEW PIPING AND EQUIPMENT WILL NOT OBSTRUCT THE SPRAY PATTERN OF ANY FIRE SPRINKLERS.
6. CONTRACTOR SHALL PROTECT FIRE SPRINKLERS IN THE CONSTRUCTION AREA AGAINST MECHANICAL DAMAGE AND PAINT OVER-SPRAY.
7. CONTRACTOR SHALL OBTAIN A HOT WORK PERMIT FOR ANY WORK INVOLVING HEAT GUNS, SOLDERING, BRAZING, WELDING, GRINDING, POWDER DRIVEN STUDS, METAL CUTTING USING POWER TOOLS OR OTHER ACTIVITIES INVOLVING FLAMES OR SPARKS. HOT WORK PERMIT FORMS ARE AVAILABLE FROM CU PROJECT MANAGERS, FM OFFICE OF PLANNING, DESIGN AND CONSTRUCTION AND UNDER "HOT WORK PERMIT" AT THE FLS WEB SITE:  
([HTTP://WWW.COLORADO.EDU/FACILITIESMANAGEMENT/PDC/SAFETY/INDEX.HTML](http://www.colorado.edu/facilitiesmanagement/pdc/safety/index.html)).
8. AT ALL TIMES, CONTRACTOR SHALL ENSURE THAT THE PROJECT STAGING AREA AND CONSTRUCTION ACTIVITIES DO NOT CAUSE OBSTRUCTION OF EGRESS PATHS INSIDE THE BUILDING, BLOCK EXIT DISCHARGE FROM THE BUILDING OR IMPEDE EMERGENCY VEHICLE ACCESS TO THE AREA.
9. IF THE CONSTRUCTION ACTIVITIES GENERATE DUST OR FUMES INSIDE THE BUILDING, CONTRACTOR SHALL TAKE NECESSARY MEASURES TO PREVENT NUISANCE ACTUATION OF ANY NEARBY SMOKE OR DUCT DETECTORS. CONTACT THE FIRE SYSTEMS GROUP FOR ASSISTANCE IN ADVANCE OF THESE ACTIVITIES.
10. OUTAGE PROCEDURES: CONTRACTOR SHALL FOLLOW CAMPUS PROCEDURES FOR ANY OUTAGES OF FIRE SYSTEMS. THE CAMPUS PROCEDURES ARE AVAILABLE FROM THE FLS WEB SITE:  
[HTTP://WWW.COLORADO.EDU/FACILITIESMANAGEMENT/PDC/SAFETY/DOCUMENTS/FIRE\\_SUPPRESSION\\_SYSTEMS.PDF](http://www.colorado.edu/facilitiesmanagement/pdc/safety/documents/fire_suppression_systems.pdf)  
AND  
[HTTP://WWW.COLORADO.EDU/FACILITIESMANAGEMENT/PDC/SAFETY/DOCUMENTS/FIREALARM\\_DETECTION.PDF](http://www.colorado.edu/facilitiesmanagement/pdc/safety/documents/firealarm_detection.pdf).
11. CONTRACTOR SHALL MAKE SURE THAT NEW WORK SHALL NOT BLOCK ACCESS TO ANY OF THE EXISTING INFORMATION TECHNOLOGY OUTLETS OR PATHWAYS INCLUDING BUT NOT LIMITED TO CABLE TRAYS, PULL BOXES, BUTTERS, WIRE MOLD, ETC.

# UNIVERSITY OF COLORADO AT BOULDER

## MUSIC BUILDING DELTA-P VALVE UPGRADE PROJECT MUS-Delta P (CP133892)



MUSIC DRAWING LIST	
DWG #	TITLE
G-0	COVER SHEET
M-0	LEGEND
M-1	SCOPE & NEW WORK DESCRIPTION
M-2	MUSIC ADDITION FLOW DIAGRAM DEMOLITION
M-3	MUSIC FLOW DIAGRAM DEMOLITION
M-4	MUSIC ADDITION FLOW DIAGRAM NEW WORK
M-5	MUSIC FLOW DIAGRAM NEW WORK
M-6	MUSIC ISOMETRIC 1 OF 4
M-7	MUSIC ISOMETRIC 2 OF 4
M-8	MUSIC ISOMETRIC 3 OF 4
M-9	MUSIC ISOMETRIC 4 OF 4

REV.	DATE	DESCRIPTION

<b>ENGINEERS CONSULTANTS RMH GROUP</b> <small>Copyright 2010</small> File Name: MUSIC G0.dwg	THE RMH GROUP, INC. 12800 WEST COLFAX AVE. LAKEWOOD, CO 80215 (303) 239-0909 FAX (303) 235-0218	DATE: 24-Jan-11 SCALE: NONE SHEET: G-0	MUS-DELTA P (CP133892) DELTA-P VALVE UPGRADE PROJECT COVER SHEET
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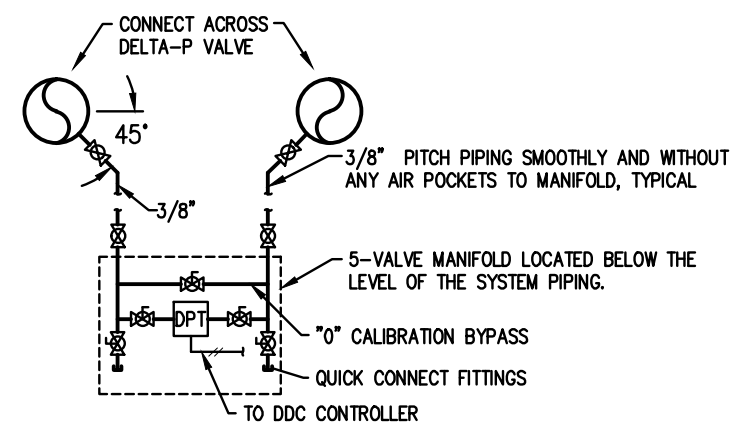
# MECHANICAL LEGEND (NOTE: NOT ALL SYMBOLS SHOWN ARE USED ON THESE DRAWINGS)

ABBR.	SYMBOL	DESCRIPTION
- PIPING -		
HWS		HEATING HOT WATER SUPPLY
HWR		HEATING HOT WATER RETURN
CWS		CHILLED WATER SUPPLY
CWR		CHILLED WATER RETURN
		2-WAY CONTROL VALVE
		3-WAY CONTROL VALVE
		DELTA P CONTROL VALVE
		BALANCE VALVE
		BALL VALVE
		BUTTERFLY VALVE
		CHECK VALVE
		GATE VALVE
		HOSE END DRAIN VALVE
		STRAINER
		STRAINER WITH BLOW OFF VALVE
		PIPE CAP
		PIPE BREAK
		FLOW ARROW
		THERMOWELL
		THERMOMETER WITH THERMOWELL
		VENTURI
		FLOW MEASURING STATION
		THERMOMETER
		GAUGE
		GAUGE WITH BALL VALVE
		PRESSURE TEMPERATURE/TEST POINT

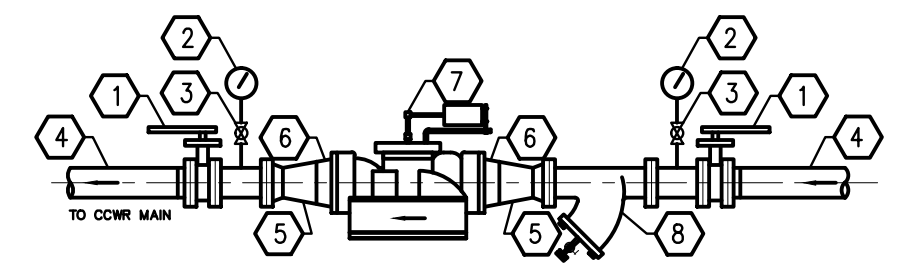
ABBR.	SYMBOL	DESCRIPTION
		WELL MOUNTED TEMPERATURE SENSOR
		VARIABLE FREQUENCY DRIVE
		PRESSURE TRANSMITTER
		DIFFERENTIAL PRESSURE TRANSMITTER
		FLOW TRANSMITTER
		DIFFERENTIAL PRESSURE SWITCH
		PUMP

- GRAPHIC SYMBOLS -	
	KEY NOTE
	CONTROL POINT (SEE SCHEDULE)
	REVISION NUMBER
	CONTROL DEVICE ADDRESS
	CONNECT TO EXISTING
	CONNECT TO EXISTING PIPE
	ITEM TO BE REMOVED

- ABBREVIATIONS -			
(E)	EXISTING	NC	NORMALLY CLOSED
(N)	NEW	NO	NORMALLY OPEN



**DIFFERENTIAL PRESSURE TRANSMITTER DETAIL**  
SCALE: NONE



- 1 BUTTERFLY (OR BALL) SHUT-OFF VALVE.
- 2 LIQUID-FILLED PRESSURE GAUGE (0 PSIG TO 100 PSIG) PER CAMPUS STANDARDS.
- 3 GAUGE ISOLATION VALVE.
- 4 SEE DRAWINGS FOR PIPE SIZE.
- 5 CONCENTRIC REDUCER AS NEEDED.
- 6 WELDING NECK FLANGE.
- 7 PRESSURE INDEPENDENT CONTROL VALVE.
- 8 LINE SIZE STRAINER W/3/4" HOSE END BALL VALVE AND 316 STAINLESS 1/32" PERFORATION SCREEN.

**PRESSURE INDEPENDENT (DELTA-P) CONTROL VALVE DETAIL**  
SCALE: NONE

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FAX (303) 235-0218

File Name: MUSIC MO.dwg RMH Job Number: 17956

DATE:	24-Jan-11
SCALE:	NONE
SHEET:	M-0

REV.	DATE	DESCRIPTION
MUS-DELTA P (CP133892) DELTA-P VALVE UPGRADE PROJECT LEGEND		

Created on 5/13/2009  
 File Path: H:\BBS1717956\Sheets\MUSIC\MUSIC MO.dwg  
 Save Date: 24-Jan-11 by: dgabel  
 Plotted on: 1/24/2011

**MUSIC AHU-01 AND SF-06 (SIMILAR BUT INDEPENDENT PIPE SYSTEMS)**

DESCRIPTION OF EXISTING SYSTEM:

THE EXISTING BUILDING PUMPS PUSH THROUGH BUILDING PIPING, THE COIL, AND THE CONTROL VALVE. THE POWERHOUSE PUMPS PUSH THROUGH THE DISTRIBUTION PIPING.

SCOPE OF WORK:

1. REMOVE EXISTING PNEUMATIC CONTROL VALVES AT AHU-01 AND SF-06.
2. INSTALL AN ELECTRONIC ACTUATED DELTA-P VALVE AND INLET STRAINER ALONG WITH INLET AND OUTLET VALVES AT AHU-01 AND SF-06.
3. PROVIDE COIL PUMPS AT AHU-01 AND SF-06 WITH PUMP CHECK VALVE AND SHUT-OFF VALVES PIPED IN THE BYPASS LOCATION. PROVIDE STARTER-DISCONNECT AND CURRENT SWITCH FOR STATUS MONITORING AT EACH COIL PUMP PER UCB STANDARDS. PROGRAM PUMP AUTO START/STOP CONTROL TO OPERATE ONLY DURING FREEZE PROTECTION MODE.
4. INSTALL A FULL-SIZE BYPASS (WITH SHUT-OFF VALVES AND CHECK VALVE) AROUND THE BUILDING PUMP TO AVOID PRESSURE DROP WHEN PUSHING THROUGH A NON-OPERATING PUMP IF POWERHOUSE PUMPS CAN PROVIDE ENOUGH PRESSURE.
5. PROVIDE A DIFFERENTIAL PRESSURE TRANSMITTER ACROSS THE DELTA-P VALVE AT AHU-01 AND SF-06 AND MONITOR THROUGH THE EXISTING BMCS (NEW POINTS).

SEQUENCE OF OPERATION:

- A. DURING COOLING MODE: THE DELTA-P VALVE AT EACH UNIT SHALL MODULATE TO MAINTAIN SUPPLY AIR TEMPERATURE ACCORDING TO CURRENT PROGRAMING. VERIFY AVAILABILITY OF ELECTRONIC CONTROL SIGNAL AT EACH UNIT.
- B. ADD PROGRAMMING TO START THE BUILDING PUMP IF THE PRESSURE DROP ACROSS THE DELTA-P VALVE FALLS BELOW 6 PSI (ADJUSTABLE) FOR MORE THAN 5 MINUTES (ADJUSTABLE). STOP THE PUMP AT MIDNIGHT FOR 10 MINUTES AND RESET PRESSURE REQUIREMENT ACROSS DELTA-P VALVE.
- C. DURING FREEZE PREVENTION MODE: INITIATE FREEZE PROTECTION MODE USING EXISTING CONTROLS (NEW CONTROLS AT AHU-01). MODIFY CONTROL SEQUENCE IF NEEDED TO START THE COIL PUMP AND CLOSE THE COIL DELTA-P VALVE AT THE RESPECTIVE AIR HANDLING UNIT. PROVIDE NEW START/STOP AND STATUS POINTS FOR EACH NEW PUMP.

EQUIPMENT SELECTION:

- A. DIFFERENTIAL PRESSURE TRANSMITTERS: FOXBORO IDP-10 SERIES, TRANSMITTER SHALL BE COMPLETE WITH 4-20 MA OUTPUT, REQUIRED MOUNTING BRACKETS, AND FIVE-VALVE MANIFOLD. MOUNT IN A LOCATION ACCESSIBLE FOR SERVICE.
- B. PRESSURE INDEPENDENT CONTROL VALVES: DELTA-P BRAND FOR 2" AND LARGER. VALVES 1-1/2" AND SMALLER MAY BE DELTA-P OR BELIMO BRAND. ELECTRIC ACTUATORS SHALL BE SIEMENS OR BELIMO. VALVES INSTALLED AT MUSIC SHALL BE RATED 5-70 PSI DIFFERENTIAL.

GENERAL NOTES:

1. PROVIDE PIPE INSULATION FOR CHILLED WATER TO MATCH EXISTING, COMPLY WITH CODE, ASHRAE 90.1, AND UCB STANDARDS, MINIMUM 1-1/2" THICK. REPAIR INSULATION DAMAGED BY THIS PROJECT AND/OR REMOVED FOR ABATEMENT.
2. TC CONTRACTOR SHALL WORK WITH CU FACILITY COMMISSIONING AGENT TO SETUP THE VALVES AND OTHER CONTROLS PER UCB STANDARDS.
3. CONTRACTOR SHALL VERIFY ALL PIPE SIZES BEFORE STARTING CONSTRUCTION.
4. CONTRACTOR SHALL REINSTALL THERMOMETERS, PRESSURE GAUGES, SENSORS, ETC., DISTURBED BY PIPE MODIFICATIONS. SOME (BUT NOT ALL) DEVICES ARE SHOWN ON THE CONTRACT DRAWINGS.

**UNIT PRICES AND BID ALTERNATES**

SCOPE OF WORK:

1. SUBMIT LUMP SUM BID ALTERNATE PRICE TO PROVIDE DIFFERENTIAL PRESSURE TRANSMITTERS NEAR DELTA-P VALVES AT SF-01 AND SF-02 AND MONITOR THROUGH THE EXISTING BMCS (NEW POINTS). TWO DPT'S IN ADDITION TO THOSE SHOWN ON THE DRAWINGS.
2. PROVIDE SEPARATE PROPOSAL FROM CONTROL CONTRACTOR TO REPLACE PNEUMATIC CONTROLS AT SF-05 WITH DDC CONTROLS FOLLOWING UCB STANDARDS.

**MUSIC SF-01 THRU SF-05**

DESCRIPTION OF EXISTING SYSTEM:

THE POWERHOUSE PUMPS PUSH THROUGH THE DISTRIBUTION PIPING, BUILDING PIPING, AND EXISTING CONTROL VALVES.


SCOPE OF WORK:

1. REMOVE EXISTING PNEUMATIC CONTROL VALVES AT EACH UNIT.
2. INSTALL AN ELECTRONIC ACTUATED DELTA-P VALVE AND INLET STRAINER ALONG WITH INLET AND OUTLET VALVES AT EACH UNIT.
3. PROVIDE COIL PUMPS AT EACH UNIT WITH PUMP CHECK VALVE AND SHUT-OFF VALVES PIPED IN THE BYPASS LOCATION. PROVIDE STARTER-DISCONNECT AND CURRENT SWITCH FOR STATUS MONITORING AT EACH COIL PUMP PER UCB STANDARDS. PROGRAM PUMP AUTO START/STOP CONTROL TO OPERATE ONLY DURING FREEZE PROTECTION MODE.
4. PROVIDE A DIFFERENTIAL PRESSURE TRANSMITTER ACROSS SUPPLY AND RETURN NEAR SF-05 AND MONITOR THROUGH THE EXISTING BMCS (NEW POINT).

SEQUENCE OF OPERATION:

- A. DURING COOLING MODE: THE DELTA-P VALVE AT EACH UNIT SHALL MODULATE TO MAINTAIN SUPPLY AIR TEMPERATURE ACCORDING TO CURRENT PROGRAMING. VERIFY AVAILABILITY OF ELECTRONIC CONTROL SIGNAL AT EACH UNIT.
- B. DURING FREEZE PREVENTION MODE: INITIATE FREEZE PROTECTION MODE USING EXISTING CONTROLS. MODIFY CONTROL SEQUENCE IF NEEDED TO START THE COIL PUMP AND CLOSE THE COIL DELTA-P VALVE AT THE RESPECTIVE AIR HANDLING UNIT. PROVIDE NEW START/STOP AND STATUS POINTS FOR EACH NEW PUMP.

REV.	DATE	DESCRIPTION
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	<p>File Name: MUSIC M1.dwg</p>	<p>RMH Job Number: 17956</p>		<p>SCALE: NONE</p>
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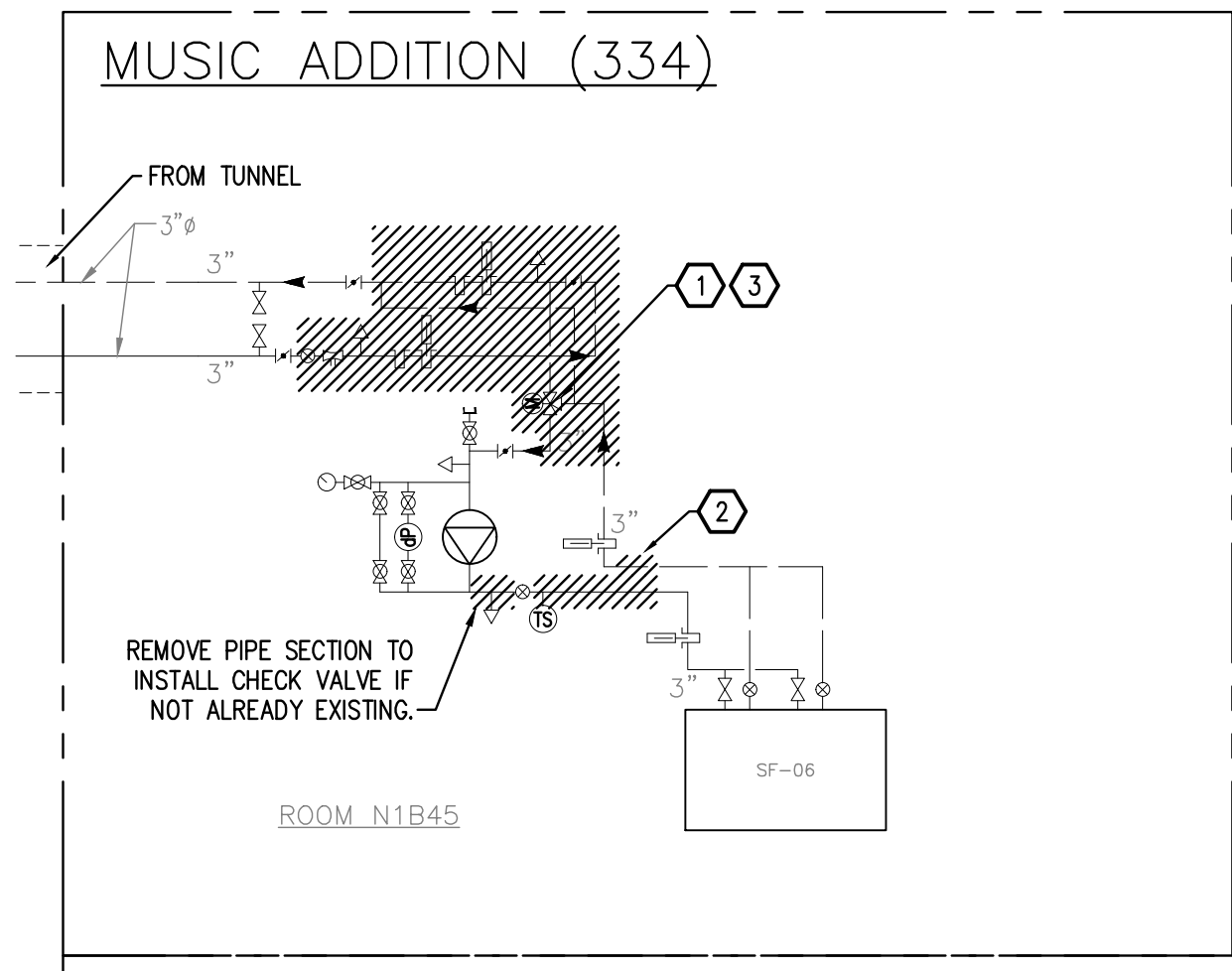
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 Plotted on: 1/24/2011

## SHEET NOTES

1. DRAWING TAKEN FROM MAY 2007 CHILLED WATER STUDY PERFORMED BY THE RMH GROUP ALONG WITH AUGUST 1998 PROJECT DESIGNED BY BCER (UCB RECORD DRAWINGS #906-008).
2. REFER TO HATCHED AREAS FOR DEMOLITION WORK REQUIRED FOR THIS PROJECT.
3. REFER TO ISOMETRIC SKETCHES FOR PIPE REVISIONS.

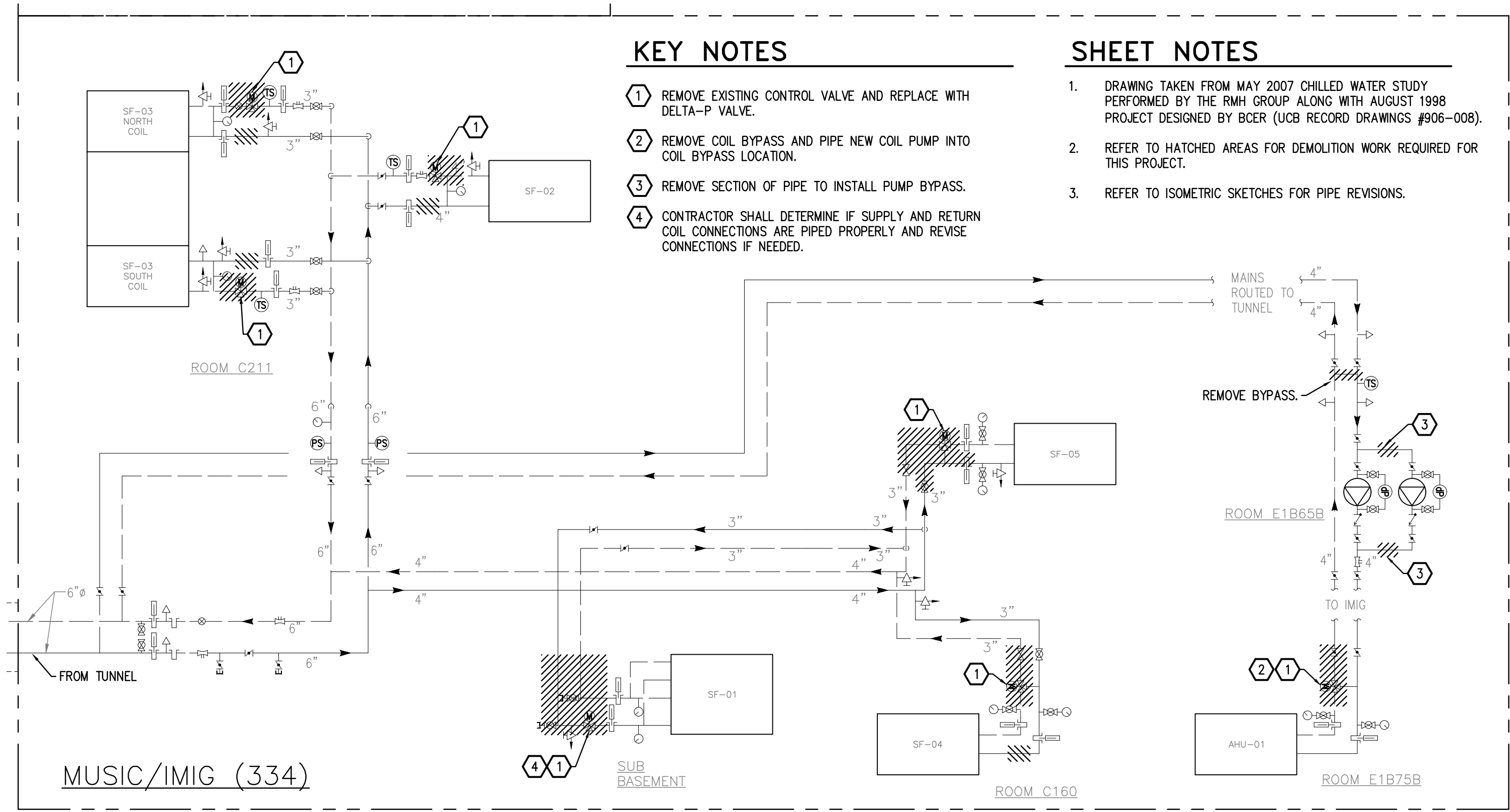
## KEY NOTES

- ① REMOVE EXISTING CONTROL VALVE AND REPLACE WITH DELTA-P VALVE.
- ② REMOVE COIL BYPASS AND PIPE NEW COIL PUMP INTO COIL BYPASS LOCATION.
- ③ REMOVE SECTION OF PIPE TO INSTALL PUMP BYPASS.



REV.	DATE	DESCRIPTION

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File Name: MUSIC M2.dwg	RMH Job Number: 17956		



### KEY NOTES

- ① REMOVE EXISTING CONTROL VALVE AND REPLACE WITH DELTA-P VALVE.
- ② REMOVE COIL BYPASS AND PIPE NEW COIL PUMP INTO COIL BYPASS LOCATION.
- ③ REMOVE SECTION OF PIPE TO INSTALL PUMP BYPASS.
- ④ CONTRACTOR SHALL DETERMINE IF SUPPLY AND RETURN COIL CONNECTIONS ARE PIPED PROPERLY AND REVISE CONNECTIONS IF NEEDED.

### SHEET NOTES

- 1. DRAWING TAKEN FROM MAY 2007 CHILLED WATER STUDY PERFORMED BY THE RMH GROUP ALONG WITH AUGUST 1998 PROJECT DESIGNED BY BCER (UCB RECORD DRAWINGS #906-008).
- 2. REFER TO HATCHED AREAS FOR DEMOLITION WORK REQUIRED FOR THIS PROJECT.
- 3. REFER TO ISOMETRIC SKETCHES FOR PIPE REVISIONS.

REV.	DATE	DESCRIPTION
<b>MUS-DELTA P (CP133892)</b> <b>DELTA-P VALVE UPGRADE PROJECT</b> <b>MUSIC FLOW DIAGRAM DEMOLITION</b>		

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 File Name: MUSIC M3.dwg    RMH Job Number: 17956

DATE:	24-Jan-11
SCALE:	NONE
SHEET:	M-3

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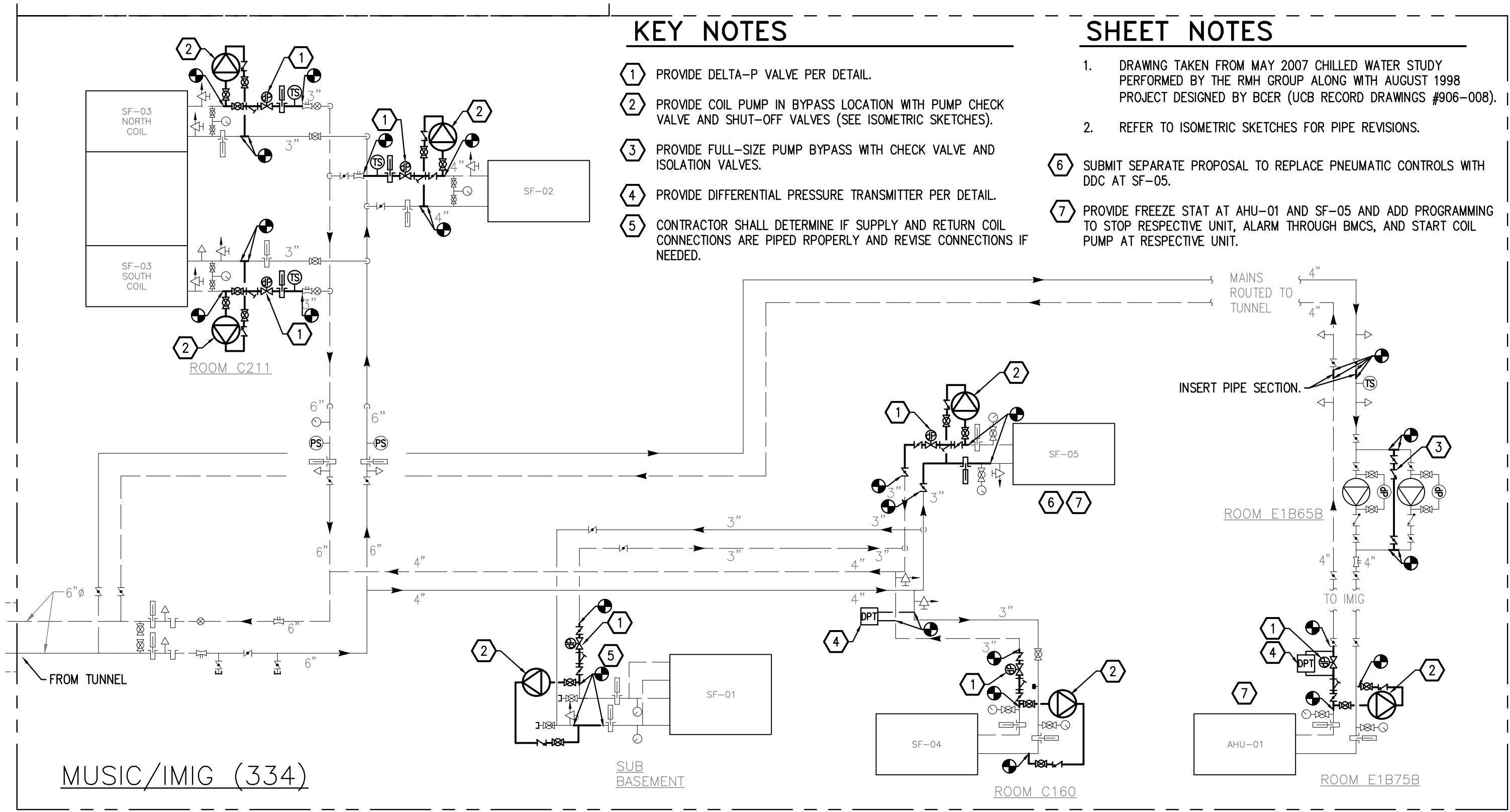


### KEY NOTES

- 1 PROVIDE DELTA-P VALVE PER DETAIL.
- 2 PROVIDE COIL PUMP IN BYPASS LOCATION WITH PUMP CHECK VALVE AND SHUT-OFF VALVES (SEE ISOMETRIC SKETCHES).
- 3 PROVIDE FULL-SIZE PUMP BYPASS WITH CHECK VALVE AND ISOLATION VALVES.
- 4 PROVIDE DIFFERENTIAL PRESSURE TRANSMITTER PER DETAIL.
- 5 CONTRACTOR SHALL DETERMINE IF SUPPLY AND RETURN COIL CONNECTIONS ARE PIPED RPROPERLY AND REVISE CONNECTIONS IF NEEDED.

### SHEET NOTES

- 1. DRAWING TAKEN FROM MAY 2007 CHILLED WATER STUDY PERFORMED BY THE RMH GROUP ALONG WITH AUGUST 1998 PROJECT DESIGNED BY BCER (UCB RECORD DRAWINGS #906-008).
- 2. REFER TO ISOMETRIC SKETCHES FOR PIPE REVISIONS.
- 6. SUBMIT SEPARATE PROPOSAL TO REPLACE PNEUMATIC CONTROLS WITH DDC AT SF-05.
- 7. PROVIDE FREEZE STAT AT AHU-01 AND SF-05 AND ADD PROGRAMMING TO STOP RESPECTIVE UNIT, ALARM THROUGH BMCS, AND START COIL PUMP AT RESPECTIVE UNIT.



MUSIC/IMIG (334)

REV.	DATE	DESCRIPTION

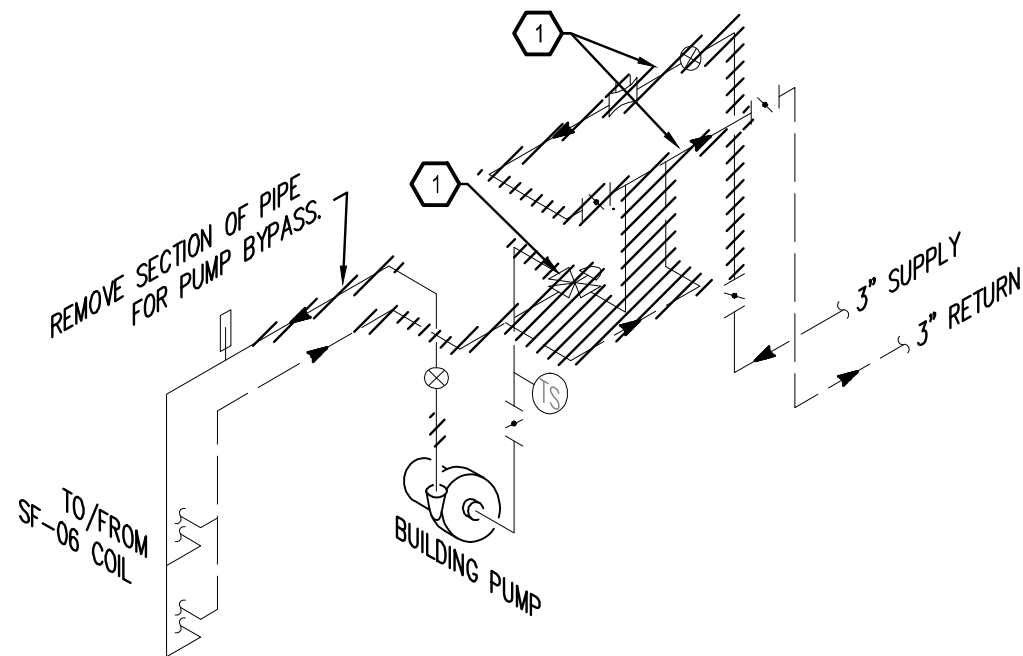
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 File Name: MUSIC M5.dwg    RMH Job Number: 17956

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DATE: 24-Jan-11  
 SCALE: NONE  
 S LLI: M-5

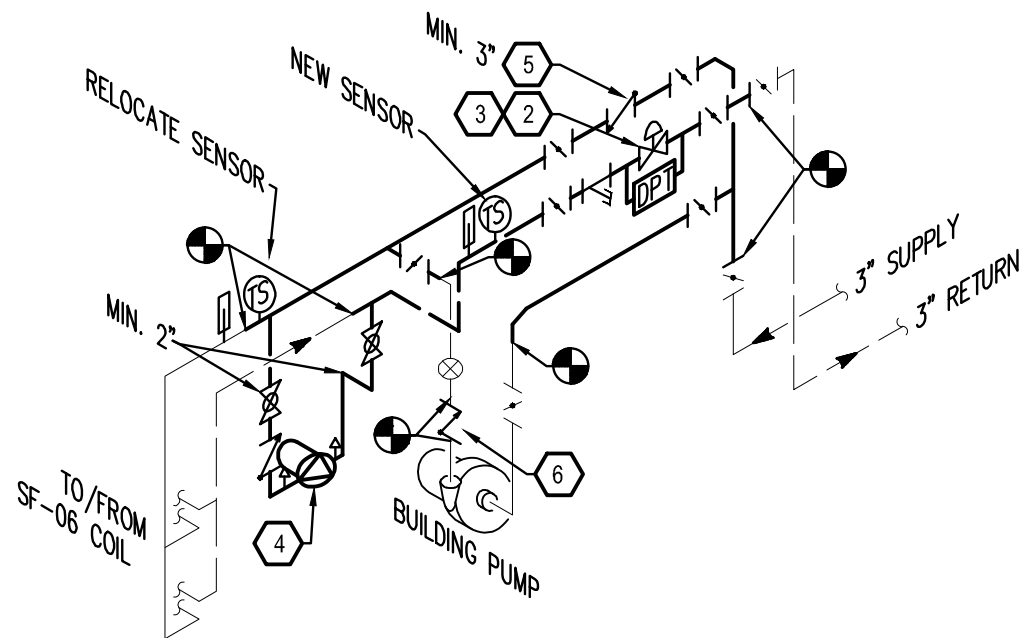
MUS-DELTA P (CP133892)  
 DELTA-P VALVE UPGRADE PROJECT  
 MUSIC FLOW DIAGRAM NEW WORK

Created on 4/30/2009  
 File Path: H:\BBS1717956\Sheets\MUSIC\MUSIC M5.dwg  
 Save Date: 24-Jan-11 by dgabel  
 Plotted on 1/24/2011



### SF-06 DEMOLITION

SCALE: NONE



### SF-06 NEW (ROOM N1B45)

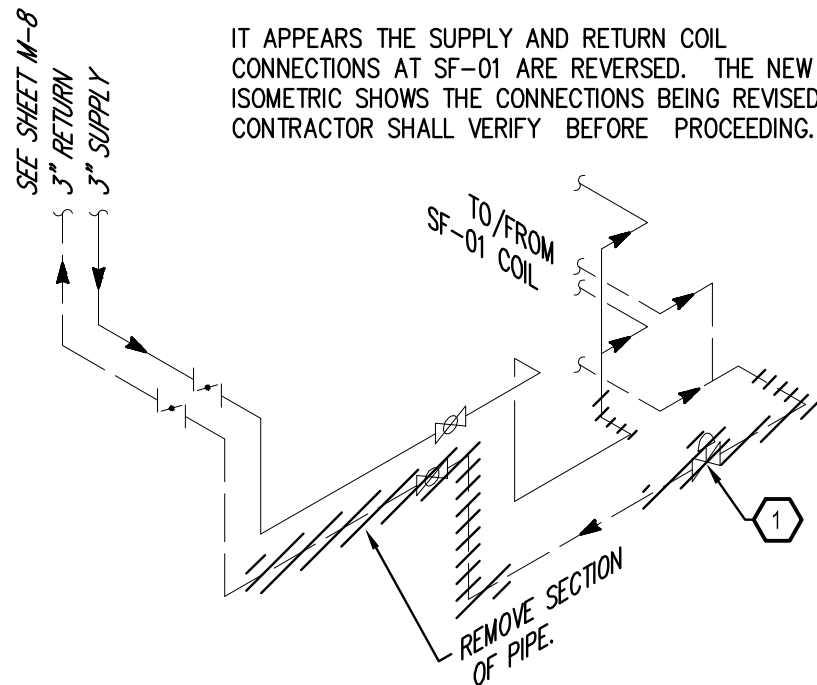
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### KEY NOTES

- 1 REMOVE PIPING, CONTROL VALVE, VENTURI, AND BALANCE VALVE AS INDICATED.
- 2 PROVIDE DELTA-P VALVE PER DETAIL.
- 3 INSTALL DIFFERENTIAL PRESSURE TRANSMITTER PER DETAIL.
- 4 PROVIDE COIL PUMP IN BYPASS LOCATION.
- 5 PROVIDE FULL-SIZE PUMP BYPASS WITH CHECK VALVE AND ISOLATION VALVES.
- 6 PROVIDE CHECK VALVE AT OUTLET OF EXISTING PUMP IF NOT EXISTING.

### SHEET NOTES

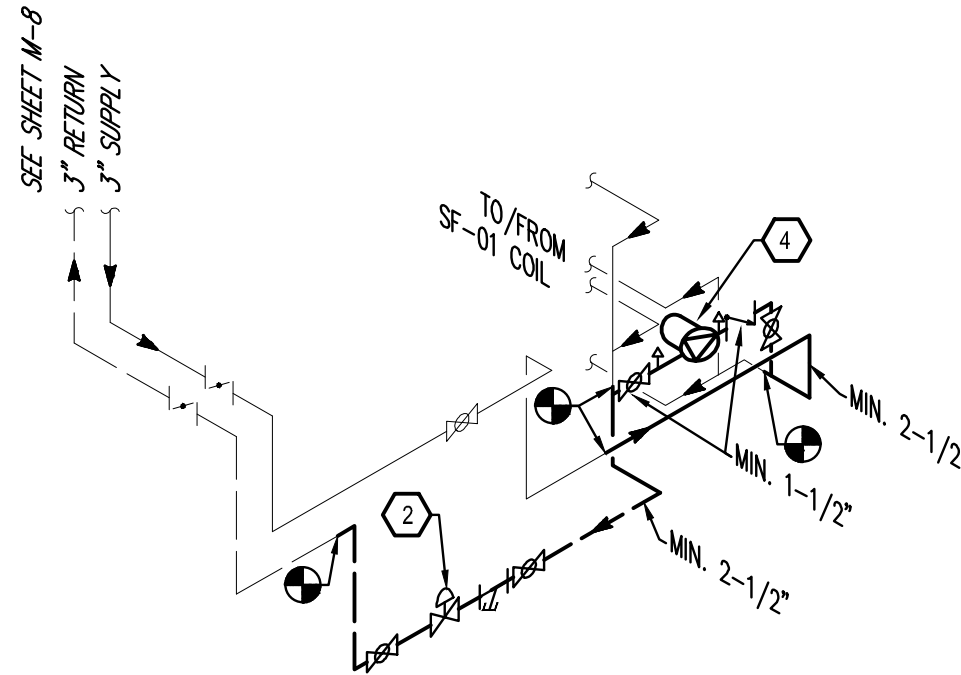
- 1. SF-06 DELTA-P VALVE SHALL BE 3" MODEL HDP-115, SET AT 100 GPM.
- 2. SF-01 DELTA-P VALVE SHALL BE 2" MODEL HDP-75, SET AT 51 GPM.
- 3. SF-06 COIL PUMP SHALL BE WILO MODEL 1.5X30 RATED 40 GPM AT 25', 0.5HP/460V/3Ø/60HZ MOTOR, PROVIDE 15A 3P BREAKER IN PANEL PP, CIRCUITS #21,23,25. PROVIDE 3/4"C, 3#12, 1#12G FROM PANEL TO STARTER AND PUMP. MATCH EXISTING CIRCUIT BREAKER TYPE AND AIC RATING.
- 4. SF-01 COIL PUMP SHALL BE WILO MODEL 1.5X30 RATED 25 GPM AT 25', 0.5HP/460V/3Ø/60HZ MOTOR. REMOVE (E) 20A 3P BREAKER FROM PANEL M1-1 & M1-2, CIRCUITS #37,39,41. PROVIDE 15A 3P BREAKER IN PANEL M1-1 & M1-2, CIRCUITS #37,39,41. PROVIDE 3/4"C, 3#12, 1#12G FROM PANEL TO STARTER AND PUMP. MATCH EXISTING CIRCUIT BREAKER TYPE AND AIC RATING.
- 5. UPDATE BREAKER PANEL DIRECTORY WITH NEW TYPED INFORMATION.
- 6. THE FUSING FOR THE NEW MOTOR SHALL BE COORDINATED WITH THE MANUFACTURER'S RECOMMENDATIONS AND SIZED ACCORDINGLY. THE OVERLOAD HEATERS IN THE MOTOR STARTER SHALL BE SIZED ACCORDING TO THE MOTOR NAME PLATE DATA. PROVIDE HEATERS AS REQUIRED.



### SF-01 DEMOLITION

SCALE: NONE

IT APPEARS THE SUPPLY AND RETURN COIL CONNECTIONS AT SF-01 ARE REVERSED. THE NEW ISOMETRIC SHOWS THE CONNECTIONS BEING REVISED. CONTRACTOR SHALL VERIFY BEFORE PROCEEDING.



### SF-01 NEW (ROOM C1B63)

SCALE: NONE

REV.	DATE	DESCRIPTION

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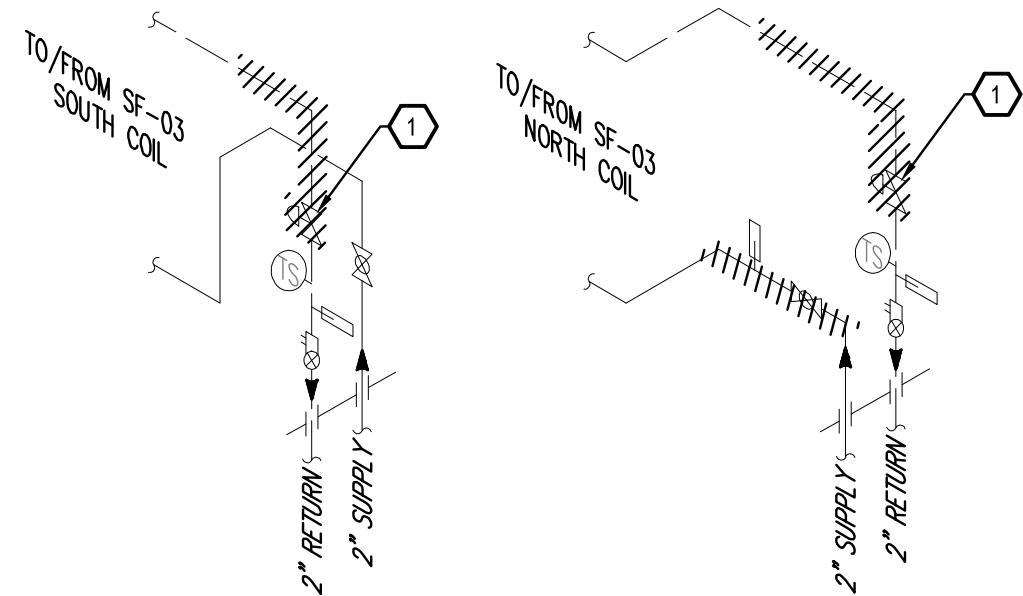
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RMH Job Number: 17956

DATE:	24-Jan-11
SCALE:	NONE
SHEET:	M-6

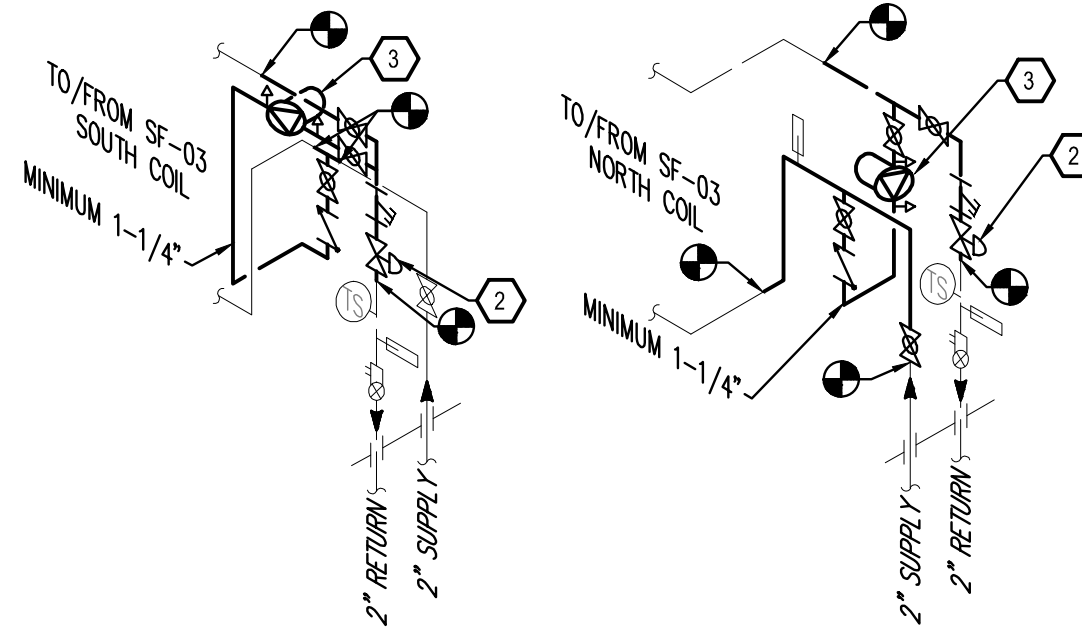
MUS-DELTA P (CP133892)  
 DELTA-P VALVE UPGRADE PROJECT  
 MUSIC ISOMETRIC 1 OF 4

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### SF-03 DEMOLITION

SCALE: NONE



### SF-03 NEW

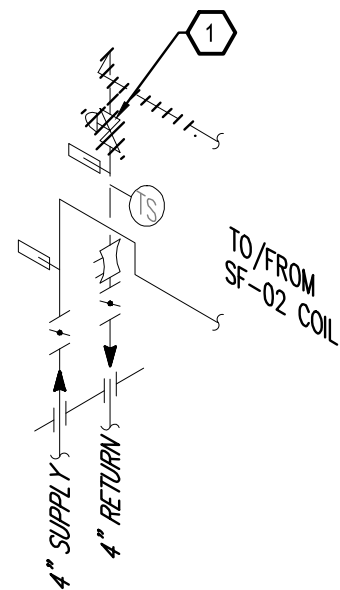
SCALE: NONE

### KEY NOTES

- ① REMOVE PIPING, CONTROL VALVE, VENTURI, AND BALANCE VALVE AS INDICATED.
- ② PROVIDE DELTA-P VALVE PER DETAIL.
- ③ PROVIDE COIL PUMP IN BYPASS LOCATION.

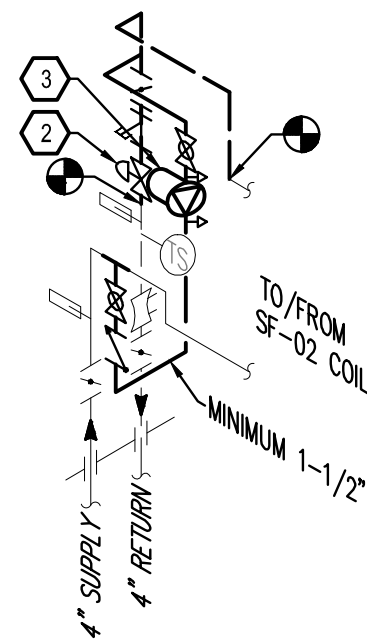
### SHEET NOTES

1. SF-02 DELTA-P VALVE SHALL BE 2" MODEL HDP-75, SET AT 56 GPM.
2. SF-03 SOUTH DELTA-P VALVE SHALL BE 1-1/4" MODEL HDP-24, SET AT 13 GPM.
3. SF-03 NORTH DELTA-P VALVE SHALL BE 1-1/4" MODEL HDP-24, SET AT 13 GPM.
4. SF-02 COIL PUMP SHALL BE WILO MODEL 1.25X35 RATED 20 GPM AT 23', 0.25HP/115V/1Ø/60HZ MOTOR, PROVIDE 15A 1P BREAKER IN PANEL G, CIRCUIT #19. PROVIDE 3/4"C, 2#12, 1#12G FROM PANEL TO STARTER AND PUMP. MATCH EXISTING CIRCUIT BREAKER TYPE AND AIC RATING.
5. SF-03 SOUTH COIL PUMP SHALL BE WILO MODEL 1.25X25 RATED 6 GPM AT 23', 0.13HP/115V/1Ø/60HZ MOTOR, PROVIDE 15A 1P BREAKER IN PANEL G, CIRCUIT #21. PROVIDE 3/4"C, 2#12, 1#12G FROM PANEL TO STARTER AND PUMP. MATCH EXISTING CIRCUIT BREAKER TYPE AND AIC RATING.
6. SF-03 NORTH COIL PUMP SHALL BE WILO MODEL 1.25X25 RATED 6 GPM AT 23', 0.13HP/115V/1Ø/60HZ MOTOR, PROVIDE 15A 1P BREAKER IN PANEL G, CIRCUIT #23. PROVIDE 3/4"C, 2#12, 1#12G FROM PANEL TO STARTER AND PUMP. MATCH EXISTING CIRCUIT BREAKER TYPE AND AIC RATING.
7. UPDATE BREAKER PANEL DIRECTORY WITH NEW TYPED INFORMATION.
8. THE FUSING FOR THE NEW MOTOR SHALL BE COORDINATED WITH THE MANUFACTURER'S RECOMMENDATIONS AND SIZED ACCORDINGLY. THE OVERLOAD HEATERS IN THE MOTOR STARTER SHALL BE SIZED ACCORDING TO THE MOTOR NAME PLATE DATA. PROVIDE HEATERS AS REQUIRED.



### SF-02 DEMOLITION

SCALE: NONE



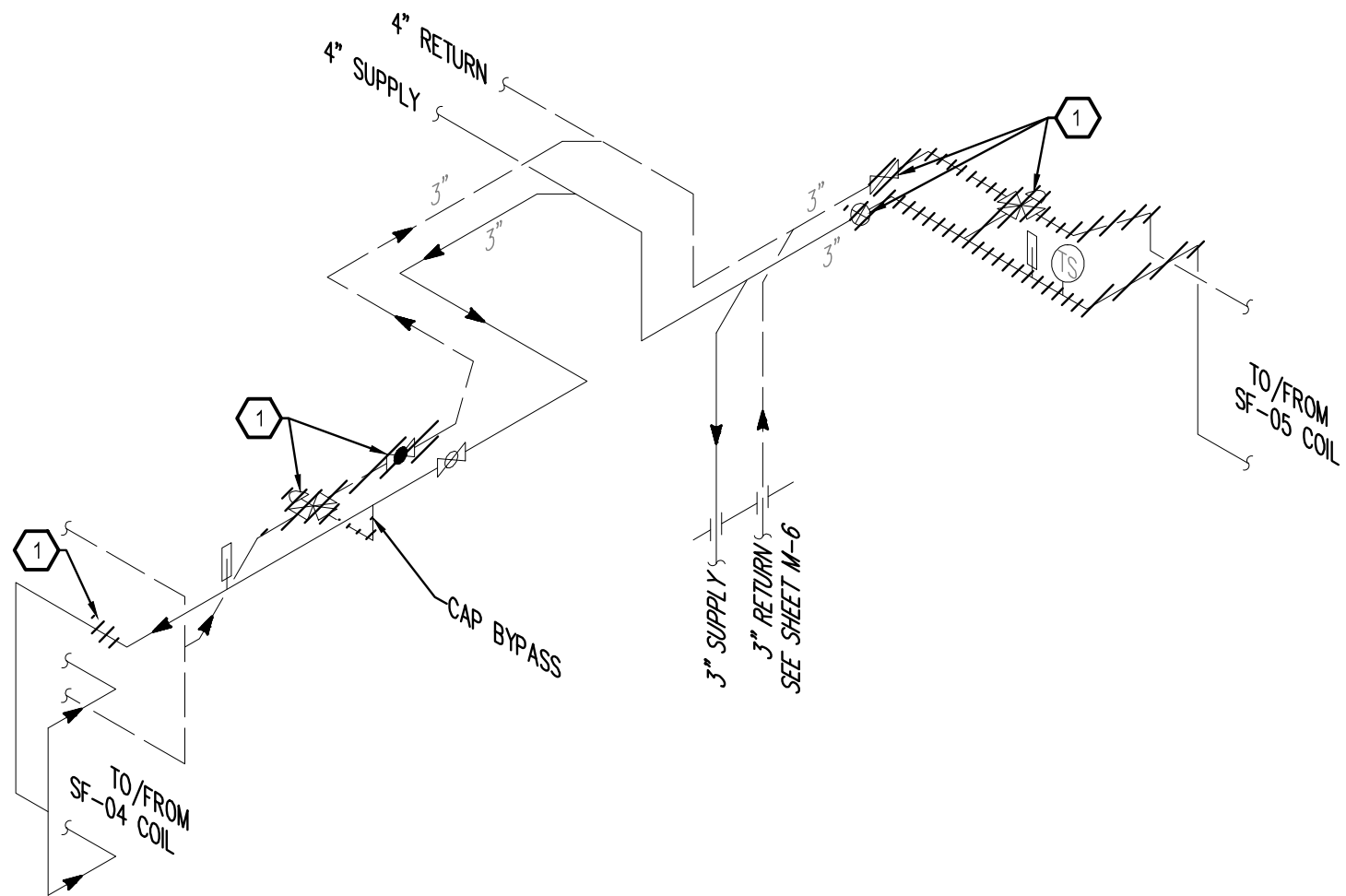
### SF-02 NEW

SCALE: NONE

REV.	DATE	DESCRIPTION

<b>ENGINEERS CONSULTANTS RMH GROUP</b> <small>Copyright 2010</small> File Name MUSIC M7.dwg	THE RMH GROUP, INC. 12800 WEST COLFAX AVE. LAKEWOOD, CO 80215 (303) 239-0909 FAX (303) 235-0218	DATE: 24-Jan-11
	RMH Job Number: 17956	SCALE: NONE
	SHLIT: M-7	

MUS-DELTA P (CP133892) DELTA-P VALVE UPGRADE PROJECT MUSIC ISOMETRIC 2 OF 4
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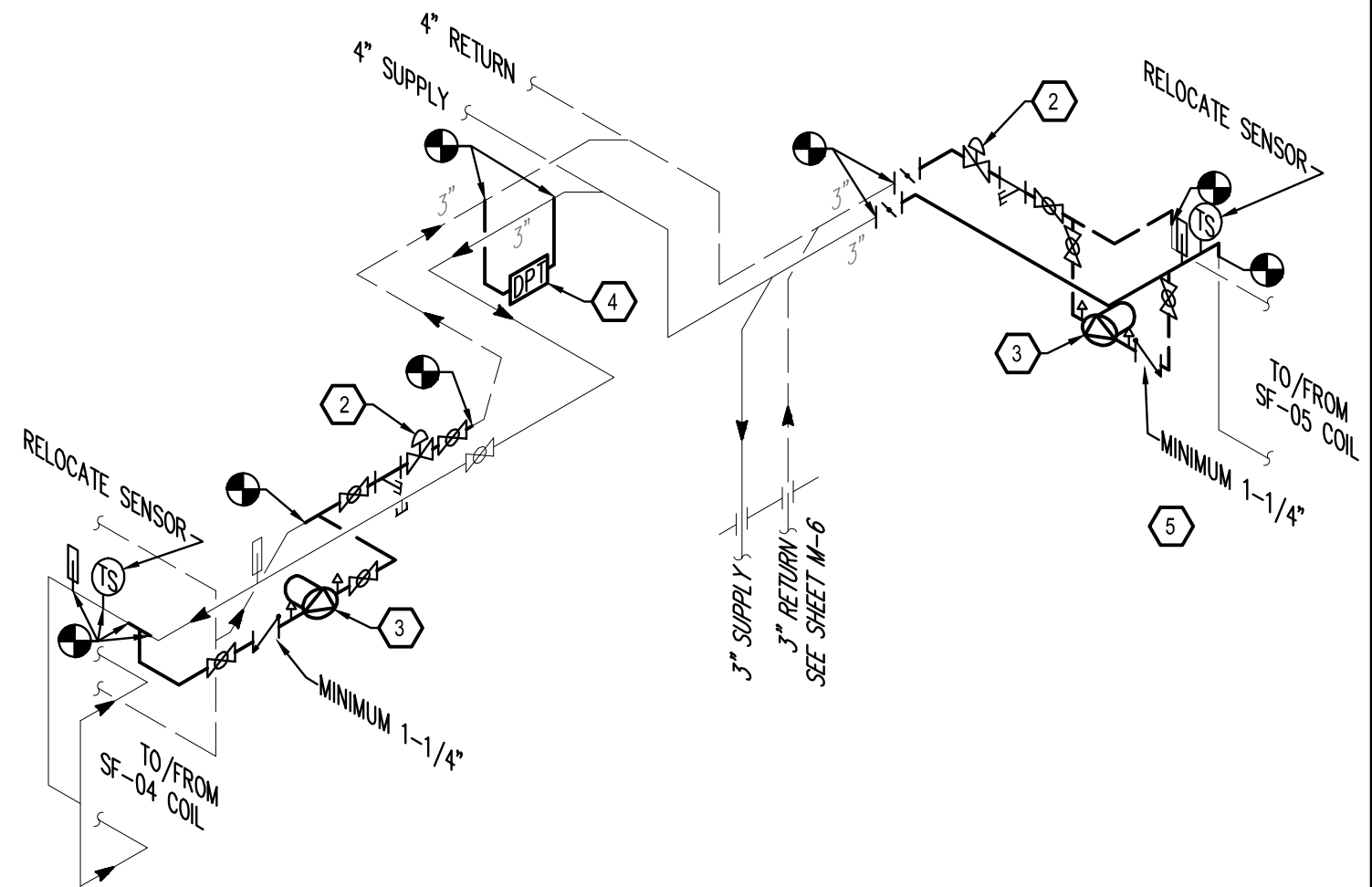


## SF-04 & SF-05 DEMOLITION

SCALE: NONE

### SHEET NOTES

- SF-04 DELTA-P VALVE SHALL BE 2" MODEL HDP-52, SET AT 28 GPM.
- SF-05 DELTA-P VALVE SHALL BE 1-1/4" MODEL HDP-32, SET AT 19 GPM.
- SF-04 COIL PUMP SHALL BE WILO MODEL 1.25X35 RATED 14 GPM AT 23', 0.25HP/115V/1Ø/60HZ MOTOR, REMOVE (E) 20A 3P BREAKER FROM PANEL F, CIRCUITS #26,28,30. PROVIDE 15A 1P BREAKER IN PANEL F, CIRCUIT #26 AND PROVIDE CLOSURE FOR BREAKER SPACE #30. PROVIDE 3/4"C, 2#12, 1#12G FROM PANEL TO STARTER AND PUMP. MATCH EXISTING CIRCUIT BREAKER TYPE AND AIC RATING.
- SF-05 COIL PUMP SHALL BE WILO MODEL 1.25X35 RATED 10 GPM AT 23', 0.25HP/115V/1Ø/60HZ MOTOR, PROVIDE 15A 1P BREAKER IN PANEL F, CIRCUIT #28. PROVIDE 3/4"C, 2#12, 1#12G FROM PANEL TO STARTER AND PUMP. MATCH EXISTING CIRCUIT BREAKER TYPE AND AIC RATING.
- UPDATE BREAKER PANEL DIRECTORY WITH NEW TYPED INFORMATION.
- THE FUSING FOR THE NEW MOTOR SHALL BE COORDINATED WITH THE MANUFACTURER'S RECOMMENDATIONS AND SIZED ACCORDINGLY. THE OVERLOAD HEATERS IN THE MOTOR STARTER SHALL BE SIZED ACCORDING TO THE MOTOR NAME PLATE DATA. PROVIDE HEATERS AS REQUIRED.



## SF-04 & SF-05 NEW (ROOM C160)

SCALE: NONE

### KEY NOTES

- REMOVE PIPING, CONTROL VALVE, VENTURI, AND BALANCE VALVE AS INDICATED.
- PROVIDE DELTA-P VALVE PER DETAIL.
- PROVIDE COIL PUMP IN BYPASS LOCATION.
- PROVIDE DIFFERENTIAL PRESSURE TRANSMITTER PER DETAIL.
- SUBMIT SEPARATE PROPOSAL TO REPLACE PNEUMATIC CONTROLS WITH DDC AT SF-05.

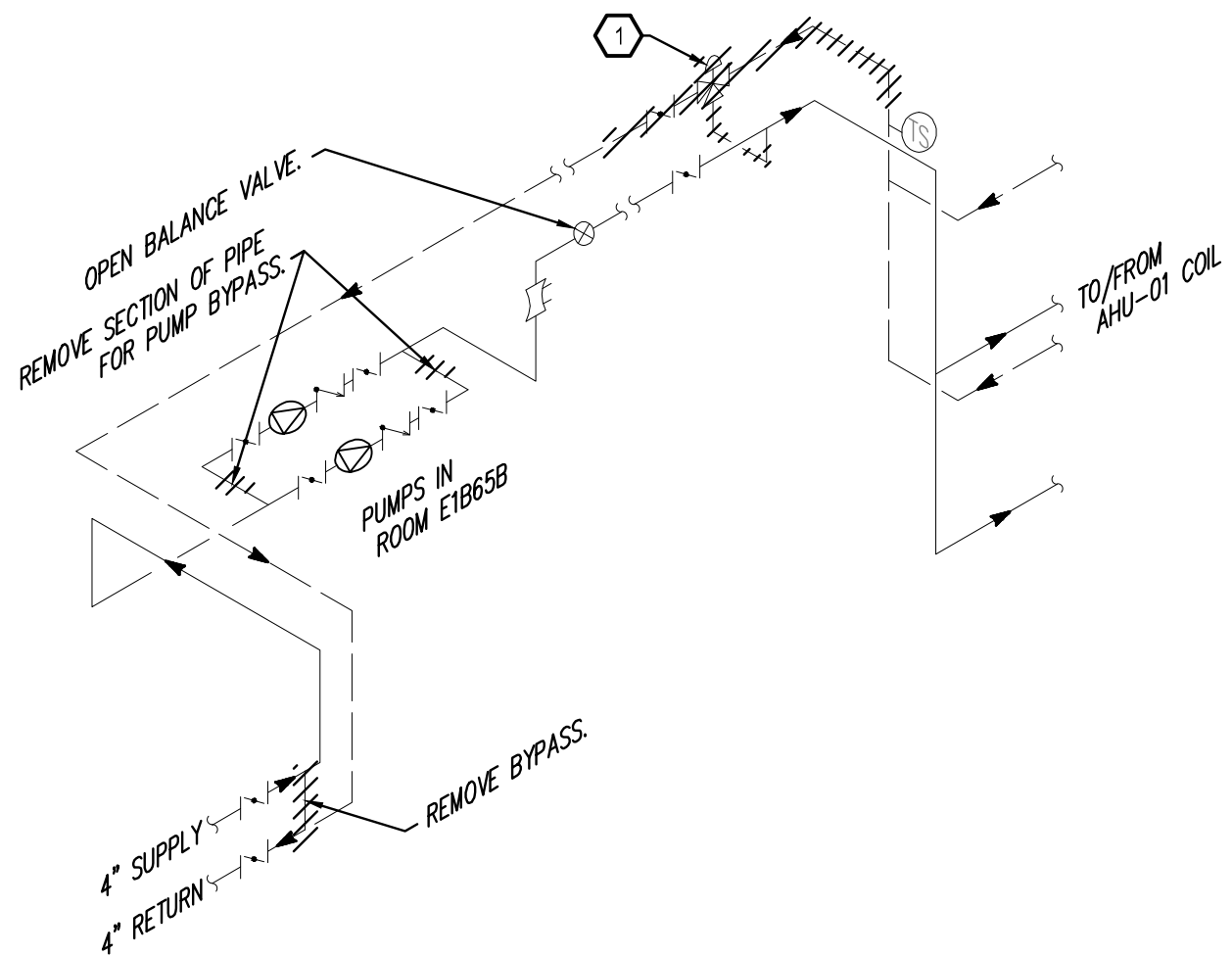
REV.	DATE	DESCRIPTION
<b>MUS-DELTA P (CP133892)</b> <b>DELTA-P VALVE UPGRADE PROJECT</b> <b>MUSIC ISOMETRIC 3 OF 4</b>		

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THE RMH GROUP, INC.  
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 LAKEWOOD, CO 80215  
 (303) 239-0909  
 FAX (303) 235-0218  
 RMH Job Number: 17956

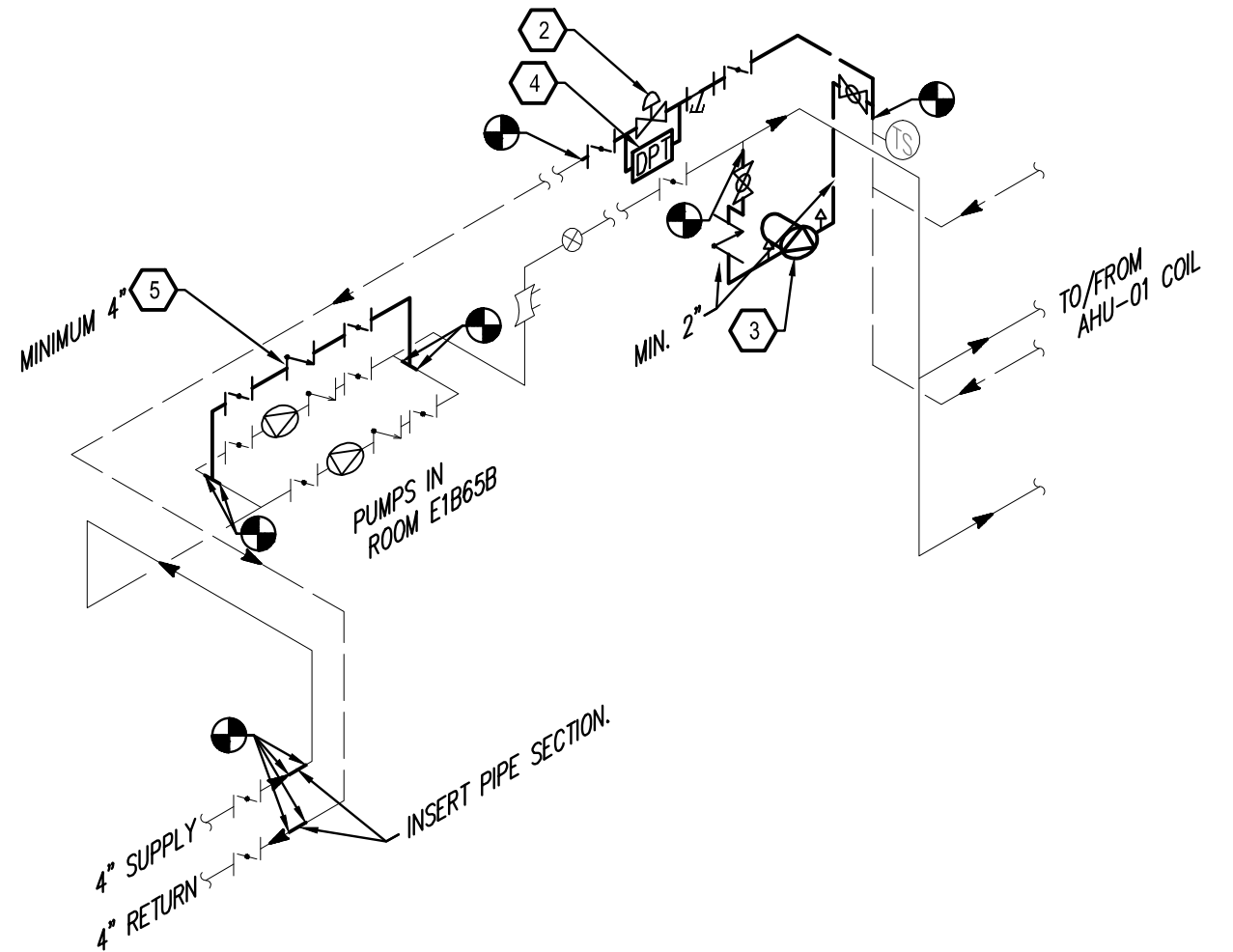
DATE: 24-Jan-11  
 SCALE: NONE  
 SHEET: M-8

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 Plotted on: 1/24/2011



## AHU-01 DEMOLITION

SCALE: NONE



## AHU-01 NEW (ROOM E1B75B)

SCALE: NONE

### SHEET NOTES

1. AHU-01 DELTA-P VALVE SHALL BE 3" MODEL HDP-140, SET AT 120 GPM.
2. AHU-01 COIL PUMP SHALL BE WILO MODEL 1.5X30 RATED 45 GPM AT 25', 0.5HP/200V/3 $\phi$ /60HZ MOTOR. PROVIDE 15A 3P BREAKER IN PANEL MDC, CIRCUITS #26,28,30. PROVIDE 3/4" C, 3#12, 1#12G FROM PANEL TO STARTER AND PUMP. MATCH EXISTING CIRCUIT BREAKER TYPE AND AIC RATING.
3. UPDATE BREAKER PANEL DIRECTORY WITH NEW TYPED INFORMATION.
4. THE FUSING FOR THE NEW MOTOR SHALL BE COORDINATED WITH THE MANUFACTURER'S RECOMMENDATIONS AND SIZED ACCORDINGLY. THE OVERLOAD HEATERS IN THE MOTOR STARTER SHALL BE SIZED ACCORDING TO THE MOTOR NAME PLATE DATA. PROVIDE HEATERS AS REQUIRED.

### KEY NOTES

- 1 REMOVE PIPING, CONTROL VALVE, VENTURI, AND BALANCE VALVE AS INDICATED.
- 2 PROVIDE DELTA-P VALVE PER DETAIL.
- 3 PROVIDE COIL PUMP IN BYPASS LOCATION.
- 4 PROVIDE DIFFERENTIAL PRESSURE TRANSMITTER PER DETAIL.
- 5 PROVIDE FULL-SIZE PUMP BYPASS WITH CHECK VALVE AND ISOLATION VALVES.

REV.	DATE	DESCRIPTION

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	File Name: MUSIC M9.dwg	RMH Job Number: 17956		SCALE: NONE
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