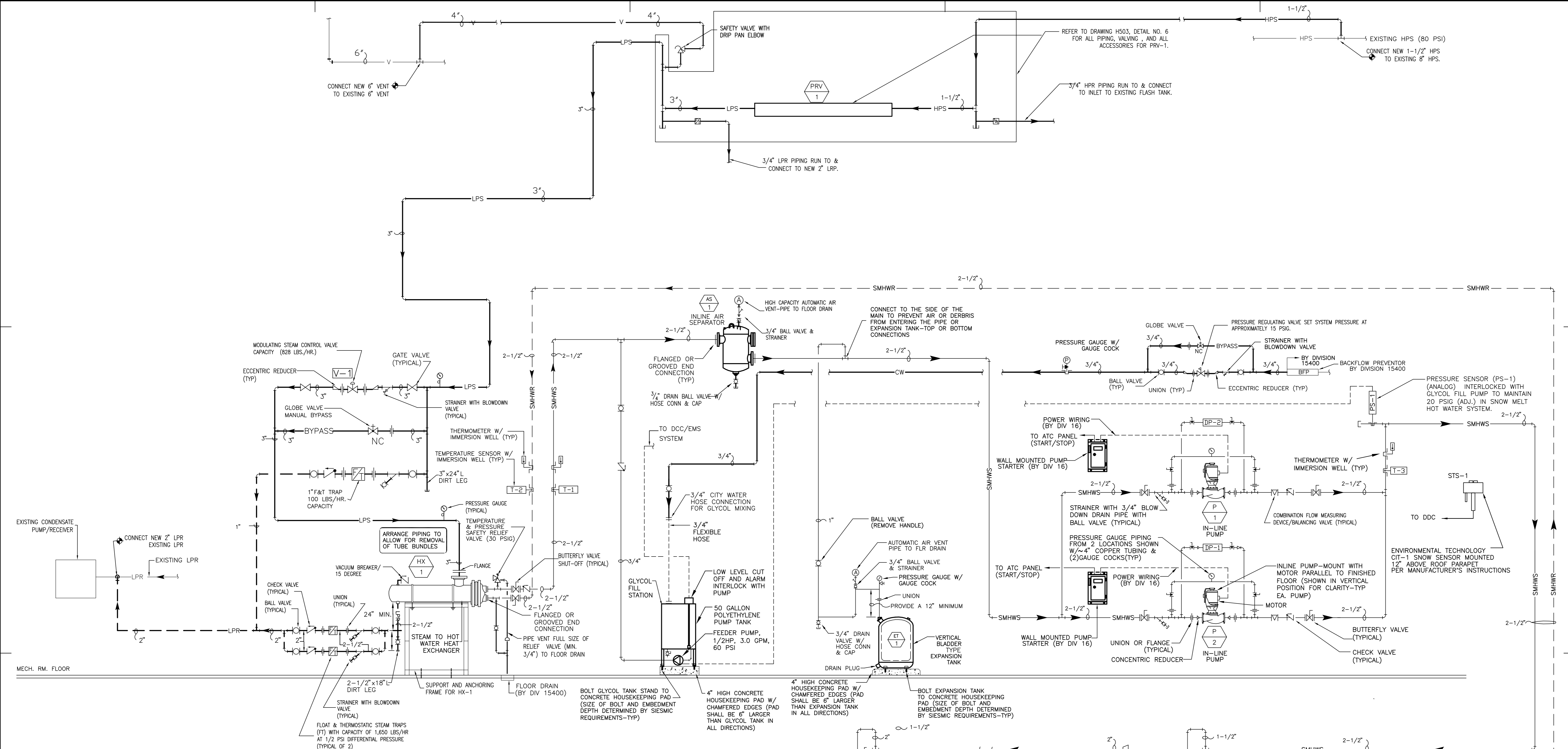
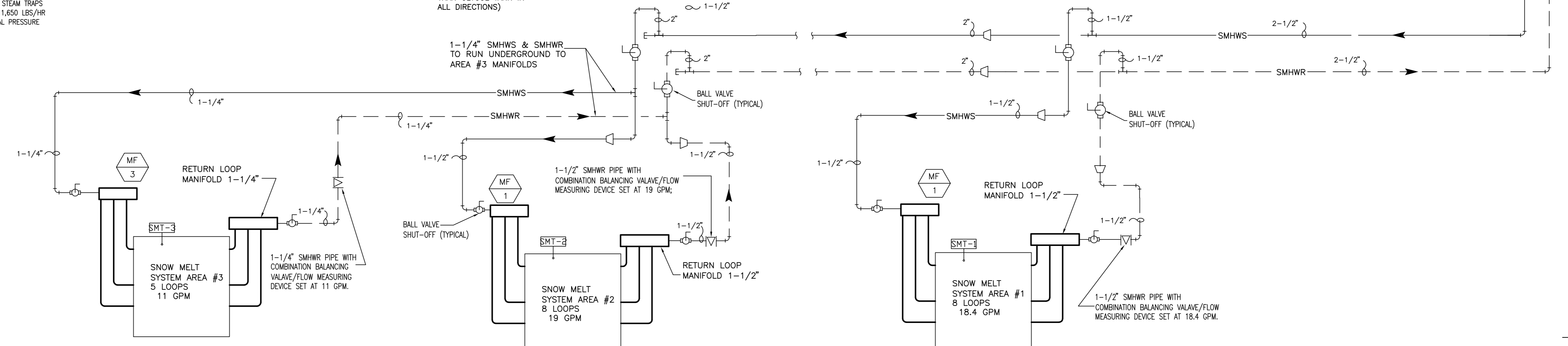


General Notes:
 1. ALL WORK FOR THIS NEW SNOW MELT SYSTEM SHALL BE BID UNDER ADD ALTERNATE NO. 10.



SNOW MELT SYSTEM SCHEMATIC



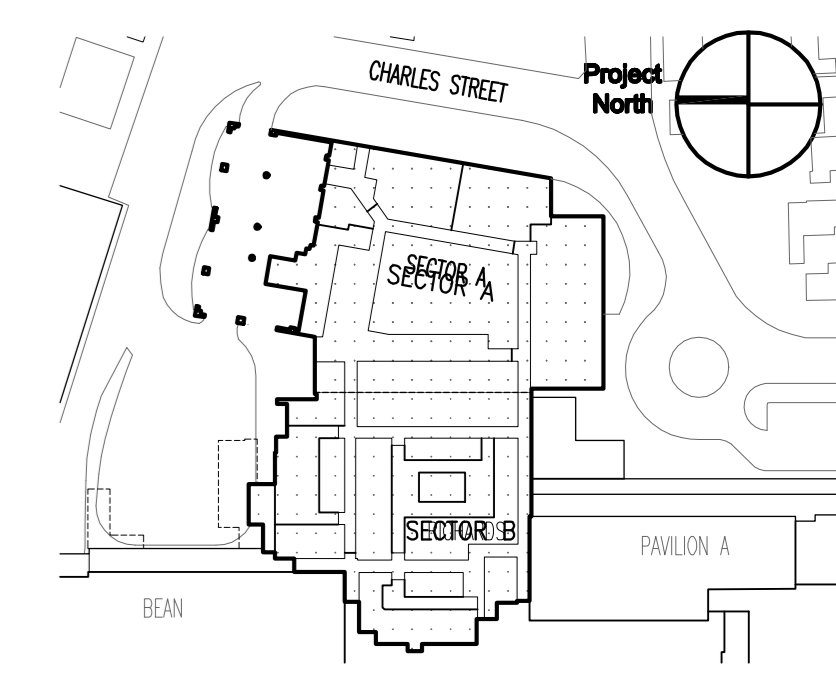
SEQUENCE OF OPERATION - SNOW MELTING SYSTEM

- I. GENERAL
 1. THE DDC SYSTEM WILL ACTIVATE THE SNOW MELT SYSTEM IN AN IDLE MODE WHENEVER THE OUTDOOR TEMPERATURE DROPS BELOW 40 DEG F (ADJ.). IN IDLE MODE, THE SLAB IS CONTROLLED AT A CONSTANT TEMPERATURE OF 40 DEG F (ADJUSTABLE).
 2. THE DDC SYSTEM WILL ACTIVATE A MELT MODE WHEN PRECIPITATION AND AN OUTDOOR TEMPERATURE BELOW 38 DEG F ARE SENSED BY STS-1, COMBINATION PRECIPITATION/TEMPERATURE SENSOR. IN MELT MODE, THE SLAB IS CONTROLLED AT A CONSTANT TEMPERATURE OF 42 DEG F (ADJ.).
 3. THE MELT MODE WILL CONTINUE THROUGH AN ADJUSTABLE TIME DELAY AFTER THE TEMPERATURE AND PRECIPITATION HAVE ENDED TO ALLOW COMPLETE MELTING AND DRYING OF WATER ON THE MELT AREAS.
- II. DISABLED MODE
 1. DISABLED MODE OCCURS WHEN OUTDOOR TEMPERATURES ARE ABOVE THE SYSTEM IDLE SETPOINT (40 DEG F, ADJUSTABLE).
 2. PUMP P-1 AND STANDBY PUMP P-2 ARE BOTH OFF IN THE DISABLED MODE.
 3. THE STEAM CONTROL VALVES V-1 SHALL BE CLOSED.
- III. HEAT EXCHANGER STEAM CONTROL
 1. SUPPLY GLYCOL SOLUTION TEMPERATURE AS SENSED BY T-1 WILL BE MAINTAINED BY MODULATING STEAM CONTROL VALVE V-1.
 2. ON A DROP IN GLYCOL TEMPERATURE BELOW SETPOINT OF 140 F (ADJ.), THE STEAM CONTROL VALVE V-1 SHALL MODULATE OPEN.
 3. ON A RISE IN GLYCOL TEMPERATURE ABOVE SET POINT, VALVE V-1 SHALL BE MODULATED CLOSED.
- IV. IDLE MODE
 1. WHEN THE OUTDOOR AIR TEMPERATURE IS BELOW 40 DEG F (ADJUSTABLE) FOR 30 MINUTES CONTINUOUSLY, THE IDLE MODE WILL BE ACTIVATED.
 2. IN IDLE MODE, PUMP P-1 WILL START. STATUS WILL BE MONITORED BY DIFFERENTIAL PRESSURE SWITCH DP-1.
 3. IF PUMP P-1 FAILS AS INDICATED BY DP-1 AN ALARM WILL BE ISSUED TO THE OPERATOR'S CONSOLE. STANDBY PUMP P-2 WILL AUTOMATICALLY BE STARTED. THE PUMPS SHALL BE ALTERNATED RUN TIME ON A DAILY BASIS.
 4. ON WARM-UP THE GLYCOL (SMHWS) SUPPLY TEMPERATURE WILL BE LIMITED TO MAINTAIN A MAXIMUM SUPPLY/RETURN DIFFERENTIAL OF 30 DEG F. THE INITIAL SUPPLY GLYCOL TEMPERATURE SETPOINT WILL BE MAINTAINED AT 90 DEG F (ADJ.).
 5. THE SUPPLY/RETURN TEMPERATURE DIFFERENTIAL WILL BE LIMITED TO 30 DEG F. THE SUPPLY TEMPERATURE AS SENSED BY T-1 WILL NEVER BE RESET HIGHER THAN THE RETURN TEMPERATURE (T-2) PLUS 30 DEGREES F.
 6. THE SNOW MELT SLAB WILL BE MAINTAINED AT OR ABOVE 42 DEG F AS SENSED BY SLAB TEMPERATURE SENSORS (SMT-1, SMT-2, SMT-3) BY RESETTING THE SNOW MELT SUPPLY GLYCOL SOLUTION TEMPERATURE AS SENSED BY T-1. AS THE SLAB TEMPERATURE DROPS BELOW 38 DEG F, THE GLYCOL TEMPERATURE SETPOINT WILL BE RESET UPWARD BETWEEN 90 DEG F AND 140 DEG F. UNDER NO CIRCUMSTANCE WILL THE GLYCOL (SMHWS) SUPPLY TEMPERATURE EXCEED 145 DEG F.
- V. MELT MODE
 1. WHEN THE OUTDOOR AIR TEMPERATURE IS BELOW 40 DEG F (ADJUSTABLE) FOR 30 MINUTES CONTINUOUSLY AND PRECIPITATION IS SENSED BY SNOW SENSOR STS-1, THE SYSTEM WILL ENTER MELT MODE.
 2. IN MELT MODE, PUMP P-1 WILL OPERATE AS IN IDLE MODE.
 3. THE SNOW MELT SLAB WILL BE MAINTAINED AT OR ABOVE 42 DEG F (ADJ.) AS SENSED BY SLAB TEMPERATURE SENSOR (SMT-1, SMT-2, SMT-3) BY RESETTING THE SNOW MELT SUPPLY GLYCOL SOLUTION TEMPERATURE AS SENSED BY T-1. AS THE SLAB TEMPERATURE DROPS BELOW 42 DEG F (ADJ.), THE GLYCOL SMHWS TEMPERATURE SETPOINT WILL BE RESET UPWARD.
 4. THE GLYCOL SUPPLY/RETURN TEMPERATURE DIFFERENTIAL MUST NEVER EXCEED 30 DEGREES F ON WARM-UP. LIMIT SUPPLY TEMPERATURE TO RETURN TEMPERATURE + 30 DEG F. UNDER NO CIRCUMSTANCE WILL SUPPLY TEMPERATURE EXCEED 145 DEG F.
 5. AFTER THE SNOW SENSOR DETECTS THAT PRECIPITATION HAS ENDED, THE SYSTEM WILL REMAIN IN MELT MODE FOR THROUGH AN ADJUSTABLE DELAY PERIOD TO ALLOW THE MELTED AREAS TO EVAPORATE. AT THAT TIME, A MESSAGE WILL BE DISPLAYED AT THE OPERATOR'S CONSOLE THAT THE SYSTEM IS REVERTING TO IDLE.
 6. THE SYSTEM WILL REVERT TO IDLE MODE.
- VI. SAFETIES
 1. IF SUPPLY GLYCOL TEMPERATURE IS SENSED AT 150 DEG F OR ABOVE BY T-1, THE PUMPS WILL STOP AND AN ALARM WILL BE ISSUED. THE STEAM CONTROL VALVE V-1 WILL BE COMMANDED CLOSED.
 2. IF PRESSURE SWITCH PS-1 DETECTS A LOW PRESSURE (<12 PSI, FIELD ADJUSTABLE), AN ALARM WILL SOUND.
 3. IF PRESSURE SWITCH PS-1 DETECTS A HIGH PRESSURE (>25 PSI, FIELD ADJUSTABLE), AN ALARM WILL SOUND.

DESCRIPTION	INPUTS		OUTPUTS		ALARMS	FEATURES
	ANALOG	BINARY	ANALOG	BINARY		
OUTDOOR TEMPERATURE						
WATER INDICATION						
POSITION INDICATOR						
PRESSURE						
FLOW						
FLOW SWITCH						
SMOKE DETECTOR						
SMOKE DETECTION						
PRESSURE						
P/P TRANSDUCER						
CONTROL RELAY						
SOLENOID						
SMOKE INTERLOCK						
TWO POSITION OPEN/CLOSE						
ACTUATING RELAY						
FEED/BLEED SAV						
HIGH LIMIT						
LOW LIMIT						
RUN TIME MESSAGE						
SAFETY SHUTDOWN						
HIGH WATER ALARM						
SCHEDULED START/STOP						
DEMAND LIMITING						
DEMAND LIMITING						
VENTILATION DELAY (0.5)						
WATER RESET W/O.A. TEMPERATURE						
WATER CONTROL						
WATER RESET W/O.A. TEMPERATURE						
REMOTE READ/RESET						
WATER CONTROL						
COLOR GRAPHICS						
POINT LOCKOUT						
TREND LOG						

MARK	ISSUE DATE	DESCRIPTION
A1	01/10/08	ADDENDUM NO. 1

Issue Log



Key Plan

TRO Jung|Brannen

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Maine Medical Center
 ED Expansion and Renovation
 Portland, Maine MMC Project No. 21843

Drawing Title
HVAC SNOW MELT PIPING SCHEMATIC/CONTROL SEQUENCE OF OPERATION

Drawn By	M.J.C.	Commission No.	4696
Approved By	J.N.	Date Issued	12/14/07

Phase / Package Number Sheet Number

H502

SCALE: NOT TO SCALE