

PART 2 - PRODUCTS - (CONTINUED FROM M-002)

20. PROVIDE AUTOMATIC CONTROL VALVES SUITABLE FOR THE SPECIFIED CONTROLLED MEDIA (WATER OR GLYCOL). PROVIDE VALVES THAT MATE AND MATCH THE MATERIAL OF THE CONNECTED PIPING. EQUIP CONTROL VALVES WITH MATCHING ACTUATORS OF REQUIRED INPUT POWER TYPE AND CONTROL SIGNAL TYPE TO ACCURATELY POSITION THE FLOW CONTROL ELEMENT AND PROVIDE SUFFICIENT FORCE TO CLOSE AGAINST THE MAXIMUM ANTICIPATED PRESSURE. NON-PIACV'S SHALL BE GLOBE, BUTTERFLY (OPEN-CLOSED ONLY), HIGH PERFORMANCE BUTTERFLY (OPEN-CLOSED OR MODULATING WITH CV AT 2/3 OPEN), OR CHARACTERIZED BALL TYPE CONSTRUCTED FOR THE SYSTEMS FLUID AND TEMPERATURE/ PRESSURE LIMITS. VALVES SHALL BE MANUFACTURED BY ONE OF THE LISTED MANUFACTURERS PROVIDING THEY MEET ALL SPECIFIED REQUIREMENTS: BELIMO, BRAY, DELTA P VALVE, GRISWOLD, BELL & GOSSETT, FISHER, HONEYWELL, JOHNSON, OR SIEMENS/STAEFA. EACH PRESSURE INDEPENDENT (PI) AUTOMATIC CONTROL VALVE (ACV) IS A TWO-PART VALVE. THESE VALVES SHALL BE SELF BALANCING (PRESSURE INDEPENDENT) OVER A MINIMUM OPERATING RANGE ACROSS BOTH PARTS OF THE VALVE ASSEMBLY OF 6 TO 45 PSID, WHERE FLOW RATES ARE HIGHER THAN ONE PIACV CAN HANDLE. THE USE OF UP TO 3 PARALLEL PIACV'S TO ACHIEVE THE RATED COIL FLOW SHALL BE PERMITTED PROVIDING EACH IS INSTALLED WITH A UNION AND THE CONTROL OF THE PARALLEL VALVES IS SEQUENTIAL, EITHER BY SOFTWARE WITH A SINGLE OUTPUT OR BY INDIVIDUAL OUTPUTS PER VALVE. PIACV'S SHALL HAVE A MINIMUM 2-YEAR UNCONDITIONAL WARRANTY ON PARTS AND LABOR. TWO-POSITION (OPEN/CLOSE) VALVES SHALL BE FULL LINE SIZED. UNLESS SPECIFIED ELSEWHERE, THE MAXIMUM PRESSURE DROP FOR MODULATING WATER/GLYCOL SYSTEM CONTROL VALVES SHALL BE 6 PSI FOR PIACV'S (INCLUDING BOTH SECTIONS) OR 4 PSI (MINIMUM PRESSURE DROP SHALL BE 1 PSI) FOR NON-PIACV CONTROL VALVES (AS THESE WILL HAVE A SEPARATE BALANCING VALVE PRESSURE DROP).

PART 3 - EXECUTION

1. DEMOLITION: THE EXISTING FACILITY WILL CONTINUE TO OPERATE DURING ALL PHASES OF THE DEMOLITION WORK AND SUBSEQUENT CONSTRUCTION. NO INTERRUPTION OF THE SYSTEMS WILL BE PERMITTED WITHOUT PRIOR APPROVAL OF THE OWNER'S REPRESENTATIVE. SUBMIT PROPOSED METHODS AND SEQUENCE OF OPERATIONS FOR THE SELECTIVE DEMOLITION WORK TO THE OWNER'S REPRESENTATIVE FOR REVIEW PRIOR TO THE START OF THE WORK. ANY DEMOLITION SHALL BE COORDINATED WITH OWNER, ARCHITECT, CM/GC, AND ENGINEER. PERFORM ALL DEMOLITION WHILE ENSURING MINIMUM INTERFERENCE WITH ADJACENT OCCUPIED AREAS.
2. INSTALLATION OF EQUIPMENT: INSTALL ALL ITEMS SPECIFIED UNDER PART 2 - PRODUCTS, ACCORDING TO THE MANUFACTURER'S REQUIREMENTS, SHOP DRAWINGS, AND DETAILS AS SHOWN ON THE DRAWINGS AND AS SPECIFIED. INSTALL ALL WORK SO THAT PARTS REQUIRING INSPECTION, REPLACEMENT, MAINTENANCE AND REPAIR SHALL BE READILY ACCESSIBLE. MINOR DEVIATIONS FROM THE DRAWINGS MAY BE MADE TO ACCOMPLISH THIS, BUT ANY SUBSTANTIAL CHANGE SHALL NOT BE MADE WITHOUT PRIOR WRITTEN OWNER APPROVAL.
3. IDENTIFICATION: ALL EQUIPMENT, PIPING, VALVES, DUCTWORK, AND FIRE, SMOKE, AND FIRE/SMOKE DAMPERS PROVIDED UNDER THIS SECTION OF THE SPECIFICATIONS SHALL BE MARKED FOR EASE OF IDENTIFICATION PER OWNER'S OR INDUSTRY STANDARDS.
4. PIPE EXPANSION: THE EXPANSION OF SUPPLY AND RETURN PIPES SHALL BE PROVIDED FOR BY CHANGES IN THE DIRECTION OF THE RUN OF PIPE, BY EXPANSION LOOPS, OR BY EXPANSION JOINTS AS REQUIRED.
5. CLEANING: DUCTS SHALL BE THOROUGHLY CLEANED SO THAT NO DIRT OR DUST SHALL BE DISCHARGED FROM DIFFUSERS, REGISTERS, OR GRILLES, WHEN SYSTEM IS OPERATED. AFTER ALL WATER PIPING SYSTEMS HAVE BEEN PRESSURE TESTED AND APPROVED FOR TIGHTNESS, CLEAN AND FLUSH PIPING. AFTER COMPLETION OF PROJECT, CLEAN EXTERIOR SURFACES OF ALL EQUIPMENT INCLUDED IN THIS SECTION, INCLUDING REMOVAL OF CONCRETE RESIDUE. AFTER COMPLETION OF PROJECT, REMOVE ALL CONSTRUCTION DEBRIS, TEMPORARY FACILITIES AND EQUIPMENT FROM WORK AREA. CLEAN WORK AREA TO PERMIT OCCUPATION.
6. TESTING AND INSPECTION: PROVIDE QUALIFIED PERSONNEL, EQUIPMENT, APPARATUS, AND SERVICES FOR TESTING AND INSPECTION OF MECHANICAL SYSTEMS. DO NOT COVER OR CONCEAL WORK BEFORE TESTING AND INSPECTION AND OBTAINING APPROVAL. MEDIUM PRESSURE DUCTWORK SHALL BE LEAKAGE TESTED WHERE CALLED FOR ON THE DUCT CONSTRUCTION AND LEAKAGE CLASS SCHEDULE. ALL WATER PIPING SHALL BE HYDROSTATICALLY TESTED AT 125% OF DESIGN PRESSURE (125 PSIG MINIMUM). TESTS SHALL BE FOR A FOUR-HOUR DURATION, DURING WHICH TIME PIPING SHALL SHOW NO LEAKS AND DURING WHICH TIME NO SEALING OF LEAKS WILL BE PERMITTED. ANY EQUIPMENT NOT CAPABLE OF WITHSTANDING TEST PRESSURES SHALL BE SUITABLY ISOLATED FROM THE TEST PRESSURE. LEAKS, DAMAGE, AND DEFECTS DISCOVERED OR RESULTING FROM TESTING SHALL BE REPAIRED OR REPLACED TO LIKE-NEW CONDITION WITH ACCEPTABLE MATERIALS. TESTS SHALL BE CONTINUED UNTIL SYSTEMS OPERATE WITHOUT LEAKS OR REPAIRS. REPORT ON INDUSTRY STANDARD REPORTING FORMS, SUBMITTED FOR APPROVAL IN ADVANCE. SUBMIT SIX COPIES OF TESTING REPORTS FOR APPROVAL. CONTRACTOR SHALL FURNISH ALL TEST MEDIUMS AND DISPOSE OF ALL TEST MEDIUMS AT AN APPROVED OFF SITE LOCATION AFTER TESTING IS COMPLETE.
7. CONTROLS START UP AND TESTING: EACH POINT IN THE CONTROL SYSTEM SHALL BE TESTED FOR BOTH HARDWARE AND SOFTWARE FUNCTIONALITY (INCLUDING ALARMS AND GRAPHICS) AND SHALL BE TESTED AGAINST THE APPROPRIATE SEQUENCE OF OPERATION. A WRITTEN REPORT SHALL BE SUBMITTED TO THE OWNER INDICATING THAT THE INSTALLED SYSTEM FUNCTIONS IN ACCORDANCE WITH THE PLANS AND SPECIFICATIONS.
8. START UP AND BALANCING: PROVIDE NEBB, AABC, OR NBI CERTIFIED PERSONNEL, EQUIPMENT, APPARATUS, AND SERVICES FOR START-UP AND BALANCING OF MECHANICAL SYSTEMS TO PERFORMANCE DATA SHOWN IN SCHEDULES AND ON DRAWINGS, AS SPECIFIED, AND AS REQUIRED BY CODES, STANDARDS, REGULATIONS, AND AUTHORITIES HAVING JURISDICTION INCLUDING CITY INSPECTORS. AIR AND WATER FLOWS SHALL BE BALANCED TO +/- 10% OF DESIGN. LEAKS, DAMAGE, AND DEFECTS DISCOVERED OR RESULTING FROM START-UP AND BALANCING SHALL BE REPAIRED OR REPLACED TO LIKE-NEW CONDITION WITH ACCEPTABLE MATERIALS. TESTS SHALL BE CONTINUED UNTIL SYSTEM OPERATES WITHOUT ADJUSTMENTS OR REPAIRS. REPORT DATA ON INDUSTRY STANDARD NEBB, AABC, OR NBI REPORTING FORMS. AIR TERMINAL UNIT DATA SHALL INCLUDE ALL PRIMARY AIRFLOWS (MAXIMUM, MINIMUM AND HEATING). BALANCE CONTRACTOR SHALL COORDINATE WITH ATC CONTRACTOR AND/OR BUILDING ATC OPERATOR TO SIMULATE EXISTING BOXES IN PHASE 2 (FUTURE) OPEN OR CLOSED AS REQUIRED TO BALANCE NEW VAV BOXES AND THEIR SCHEDULED AIRFLOWS. SUBMIT SIX COPIES OF START-UP AND BALANCING REPORTS TO ARCHITECT FOR APPROVAL. PRIOR TO THE START OF DEMOLITION, THE TESTING AND BALANCING CONTRACTOR SHALL TAKE CFM AND STATIC PRESSURE READINGS AT AREAS DESIGNATED ON THE CONTRACT DRAWINGS. READINGS SHALL BE SUBMITTED PRIOR TO START OF NEW WORK.
9. PROJECT CLOSEOUT:
 - 9.1. THE CONTRACTORS SHALL BE RESPONSIBLE FOR ALL ITEMS ASSOCIATED WITH PROJECT CLOSEOUT. ALLOW SUFFICIENT TIME IN THE CONSTRUCTION SCHEDULE TO ENSURE THAT THE INSTALLATION IS SUBSTANTIALLY COMPLETE AND ALL REQUIRED TESTING AND ACCURATELY COMPLETED DOCUMENTATION IS DELIVERED

TO THE ENGINEER AT LEAST TWO WEEKS PRIOR TO ENGINEER'S SUBSTANTIAL COMPLETION SITE VISIT.

- 9.2. PROVIDE CERTIFICATES OF INSPECTIONS FROM EQUIPMENT MANUFACTURERS FOR ALL COMPRESSORIZED EQUIPMENT, BOILERS AND FLUES, AND EQUIPMENT WITH MOTORS 5 HP AND LARGER STATING THAT THE AUTHORIZED FACTORY REPRESENTATIVES HAVE INSPECTED AND TESTED THE OPERATION OF THEIR RESPECTIVE EQUIPMENT AND FOUND THE EQUIPMENT TO BE IN SATISFACTORY OPERATING CONDITION AND INSTALLED PER THE MANUFACTURERS INSTALLATION INSTRUCTION REQUIREMENTS.
- 9.3. PROVIDE BACKUP DOCUMENTATION TO VERIFY THAT ALL FIRE DAMPERS AND SMOKE/FIRE DAMPERS HAVE BEEN INSTALLED PER MANUFACTURERS REQUIREMENTS AND THAT ALL FUNCTION PROPERLY.
- 9.4. PROVIDE BACKUP DOCUMENTATION TO VERIFY THAT ALL SEQUENCES OF OPERATIONS AND CONTROLS HAVE BEEN INCORPORATED AND ALL SYSTEMS AND EQUIPMENT ARE WORKING PER THE SPECIFIED SEQUENCES OF OPERATIONS.
- 9.5. PROVIDE BACKUP DOCUMENTATION THAT ALL DUCT AND PIPING LEAKAGE AND PRESSURE TESTS HAVE BEEN CONDUCTED AND THAT ALL SYSTEMS HAVE PASSED. PROVIDE START-UP AND BALANCING REPORTS FOR ALL AIR AND WATER SYSTEMS. AIR BALANCING REPORT SHALL VERIFY THE DESIGN OUTDOOR AIR IS BEING SUPPLIED TO THE BUILDING.
- 9.6. SUBSTANTIAL COMPLETION SITE VISIT BY THE ENGINEER SHALL BE CONDUCTED AFTER RECEIPT AND REVIEW OF THE CONTRACTOR'S CERTIFICATE OF COMPLETION AND ALL CODE MANDATED TEST REPORTS AND SUBMISSIONS LISTED ABOVE. SUBSTANTIAL COMPLETION SITE VISITS SHALL NOT BE REQUESTED UNTIL THE PROJECT IS SUBSTANTIALLY COMPLETE.
- 9.7. PREMATURE REQUESTS THAT REQUIRE ADDITIONAL/FOLLOWUP SITE VISITS BY THE ENGINEER OF DEFICIENT ITEMS (AREAS INCOMPLETE, SYSTEMS NOT OPERATIONAL, ETC) WILL RESULT IN BACK CHARGES OF THE COSTS ASSOCIATED WITH ANY ADDED VISITS.

NOTE:

1. SEE SHEET M-001 FOR THE LEGEND AND ABBREVIATIONS.

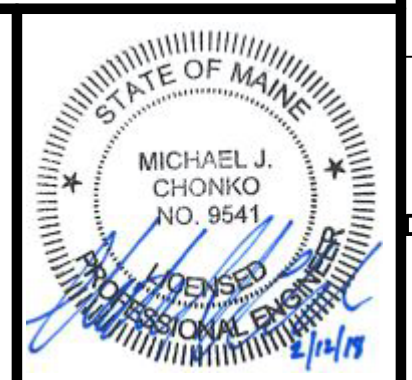
NO.	DATE	DESCRIPTION
0	02.13.18	

ISSUED FOR CONSTRUCTION
02.13.18

SMRT Architects and Engineers
144 Fore Street
Portland, Maine 04104
1.877.700.7678
www.smrtinc.com



TAC Architectural
Group Inc.
40 Summer St., Suite 4 Bangor, ME 04401



BANGOR SAVINGS BANK -
RENOVATIONS TO 280 FORE
STREET
PORTLAND, MAINE

PROJECT NO: 17231
CAD DWG FILE: M-003-17231
DRAWN BY: ASM
CHK'D BY: MJC
COPYRIGHT: 2018

SHEET TITLE
**MECHANICAL
SPECIFICATIONS**

M-003