

SECTION 15500 – HVAC SPECIFICATIONS

1) GENERAL

- A) WORK INCLUDED:
- THESE SPECIFICATIONS INCLUDE GENERAL REQUIREMENTS FOR ALL WORK REPRESENTED ON THESE DRAWINGS. NOT ALL SYSTEMS OR SYSTEM COMPONENTS DESCRIBED IN THESE SPECIFICATIONS ARE NECESSARILY INCLUDED AS A PART OF THIS PROJECT.
 - THE HEATING, VENTILATING, AND AIR CONDITIONING (HVAC) CONTRACTOR SHALL HEREAFTER BE DESCRIBED AS THE CONTRACTOR IN THIS HVAC SPECIFICATION. THE CONTRACTOR SHALL PROVIDE, INSTALL, PIPE, DUCT, AND WIRE, AS REQUIRED, HVAC SYSTEMS AS DESCRIBED BELOW, AND SHOWN OR DESCRIBED ON THESE PLANS AND SPECIFICATIONS.
- B) QUALITY ASSURANCE:

- THE NEW HAMPSHIRE STATE BUILDING CODE, THE INTERNATIONAL MECHANICAL CODE (IMC) 2009, NFPA 54 2009 AND THE INTERNATIONAL ENERGY CONSERVATION CODE (IECC) 2009 ARE THE GOVERNING CODES FOR ALL HVAC WORK. THE CODES AND STANDARDS REFERENCED IN IMC CHAPTER 15 SHALL BE CONSIDERED A PART OF THE REQUIREMENTS OF IMC TO THE PRESCRIBED EXTENT OF EACH SUCH REFERENCE. WHERE DIFFERENCES OCCUR BETWEEN PROVISIONS OF IMC AND THE REFERENCED STANDARDS, THE PROVISIONS OF IMC SHALL APPLY. IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO BE FAMILIAR WITH THE REQUIREMENTS OF ALL CODES AS THEY HAVE BEEN ADOPTED BY THE STATE OF NEW HAMPSHIRE AND THE LOCAL JURISDICTION.
 - EXCEPT AS SPECIFICALLY DESCRIBED OTHERWISE IN THESE SPECIFICATIONS, ALL COMPONENTS ALLOWED WITHIN THE ABOVE REFERENCED CODES SHALL BE ALLOWED AS A PART OF THE WORK.
 - THE WORKMANSHIP AND MATERIALS COVERED BY THESE SPECIFICATIONS SHALL CONFORM TO ALL ORDINANCES AND REGULATIONS OF ALL AUTHORITIES HAVING JURISDICTION, INCLUDING BUT NOT LIMITED TO, ALL APPLICABLE REGULATIONS OF THE CITY, COUNTY, AND STATE.
 - THE CONTRACTOR SHALL VISIT THE SITE AND EXAMINE ALL CONDITIONS AFFECTING THE PROPER EXECUTION OF THE CONTRACT, VERIFY ALL EXISTING CONDITIONS IN THE FIELD AND NOTIFY THE ENGINEER OF ANY DISCREPANCIES BEFORE PROCEEDING WITH WORK.
 - DURING THE PROGRESS OF THE WORK, THE CONTRACTOR SHALL MAINTAIN AN ACCURATE RECORD OF ALL CHANGES MADE IN THE HVAC INSTALLATION FROM THE LAYOUT AND MATERIALS CONTAINED IN THE APPROVED DRAWINGS AND SPECIFICATIONS.
 - DRAWINGS AND CATALOG CUTS, SHOWING ALL HVAC EQUIPMENT AND SYSTEM COMPONENTS, SHALL BE SUBMITTED TO THE ENGINEER FOR APPROVAL. FIELD MEASURE AND COORDINATE WITH ARCHITECTURAL AND STRUCTURAL DRAWINGS AND ALL OTHER TRADES THE PROPOSED LOCATIONS FOR NEW EQUIPMENT AND COMPONENTS BEFORE PRODUCING SUBMITTALS. NO ITEMS SHALL BE PURCHASED OR ORDERED BEFORE APPROVAL IS GIVEN BY THE ENGINEER IN WRITING.
- C) RELATED DOCUMENTS:

- THE GENERAL PROVISIONS OF THE CONTRACT, INCLUDING GENERAL AND SUPPLEMENTAL GENERAL CONDITIONS OF THE CONTRACT AND DIVISION 1 SPECIFICATION SECTIONS PROVIDED BY THE ARCHITECT, AND ALL OTHER DRAWINGS AND SPECIFICATIONS PROVIDED AS A PART OF THIS PROJECT, APPLY TO THIS DIVISION 15 AND TO ALL CONTRACTORS, SUBCONTRACTORS, OR OTHER PERSONS SUPPLYING MATERIALS AND/OR LABOR, ENTERING INTO THE PROJECT SITE AND/OR PREMISES, DIRECTLY OR INDIRECTLY.
- THE SPECIFICATIONS AND DRAWINGS ARE INTENDED TO BE COMPLEMENTARY. A PARTICULAR SECTION, PARAGRAPH OR HEADING IN A DIVISION MAY NOT DESCRIBE EACH AND EVERY DETAIL CONCERNING WORK TO BE DONE AND MATERIALS TO BE FURNISHED. THE DRAWINGS ARE DIAGRAMMATIC AND MAY NOT SHOW ALL OF THE WORK REQUIRED OR ALL CONSTRUCTION DETAILS. DIMENSIONS ARE SHOWN FOR CRITICAL AREAS ONLY AS AN AID TO THE CONTRACTOR; ALL DIMENSIONS AND ACTUAL PLACEMENTS ARE TO BE VERIFIED IN THE FIELD. IT IS TO BE UNDERSTOOD THAT THE BEST TRADE PRACTICES OF THE DIVISION WILL PREVAIL.
- ALL TRADE SUBCONTRACTORS ARE TO NOTE THAT THE ORGANIZATION OF SPECIFICATIONS INTO DIVISIONS, AND LIKEWISE THE ARRANGEMENT OF THE DRAWINGS, IS SET UP FOR THE CONVENIENCE OF UNDERSTANDING THE SCOPE OF THE WORK ONLY. THIS STRUCTURING SHALL NOT CONTROL THE GENERAL CONTRACTOR IN DIVIDING THE WORK AMONG TRADE SUBCONTRACTORS OR IN ESTABLISHING THE EXTENT OF THE WORK TO BE PERFORMED BY ANY TRADE. REFER TO GENERAL CONDITIONS.

II) PRODUCTS

- A) GENERAL MECHANICAL MATERIALS:
- ESCUTCHEONS: AT ALL FINISHED WALL PENETRATIONS, PROVIDE CHROME-PLATED, STAMPED STEEL, HINGED, SPLIT-RING ESCUTCHEON, WITH SET SCREW. INSIDE DIAMETER SHALL CLOSELY FIT PIPE OUTSIDE DIAMETER OR OUTSIDE OF PIPE INSULATION WHERE PIPE IS INSULATED. OUTSIDE DIAMETER SHALL COMPLETELY COVER THE OPENING IN FLOORS, WALLS, OR CEILINGS.
 - UNIONS: MALLEABLE-IRON, CLASS 150 FOR LOW PRESSURE SERVICE AND CLASS 250 FOR HIGH PRESSURE SERVICE; HEXAGONAL STOCK, WITH

BALL-AND-SOCKET JOINTS, METAL-TO-METAL BRONZE SEATING SURFACES; FEMALE THREADED ENDS.

- DIELECTRIC UNIONS: PROVIDE DIELECTRIC UNIONS WITH APPROPRIATE END CONNECTIONS FOR THE PIPE MATERIALS IN WHICH INSTALLED (SCREWED, SOLDERED, OR FLANGED), WHICH EFFECTIVELY ISOLATE DISSIMILAR METALS, TO PREVENT GALVANIC ACTION, AND STOP CORROSION.
 - SLEEVES: SCHEDULE 40 GALVANIZED, WELDED STEEL PIPE, ASTM A53, GRADE.
 - SLEEVE SEALS: MODULAR TYPE, CONSISTING OF INTERLOCKING SYNTHETIC RUBBER LINKS SHAPED TO CONTINUOUSLY FILL ANNULAR SPACE BETWEEN PIPE AND SLEEVE, CONNECTED WITH BOLTS AND PRESSURE PLATES WHICH CAUSE RUBBER SEALING ELEMENTS TO EXPAND WHEN TIGHTENED, PROVIDING WATERTIGHT SEAL AND ELECTRICAL INSULATION.
 - DRIP PANS: WHERE REQUIRED, PROVIDE DRIP PANS FABRICATED FROM CORROSION-RESISTANT SHEET METAL WITH WATERTIGHT JOINTS, AND WITH EDGES TURNED UP A MINIMUM OF 2-1/2". REINFORCE TOP, EITHER BY STRUCTURAL ANGLES OR BY ROLLING TOP OVER 1/4" STEEL ROD. PROVIDE HOLE, GASKET, AND FLANGE AT LOW POINT FOR WATERTIGHT JOINT AND 1" DRAIN LINE CONNECTION.
 - FIRESTOPPING/FIRE-RESISTANT SEALANT: WHERE REQUIRED, PROVIDE A FIRESTOP SYSTEM APPROPRIATE FOR THE ASSEMBLY PENETRATED AND THE PENETRATING ELEMENT. USE ONLY FIRESTOP PRODUCTS THAT HAVE BEEN UL 1479 OR ASTM E 814 TESTED FOR SPECIFIC FIRE-RATED CONDITIONS CONFORMING TO CONSTRUCTION ASSEMBLY TYPE, PENETRATING ITEM TYPE, ANNULAR SPACE REQUIREMENT AND FIRE-RATING INVOLVED FOR EACH SEPARATE INSTANCE. SUBMIT MANUFACTURER'S SPECIFIC DETAIL FOR EACH TYPE OF PENETRATION.
 - ACCESS DOORS: WHERE REQUIRED FOR PROPER SERVICE AND MAINTENANCE OF ALL MECHANICAL COMPONENTS, PROVIDE STEEL ACCESS DOORS AND FRAMES, FACTORY-FABRICATED AND ASSEMBLED UNITS, COMPLETE WITH ATTACHMENT DEVICES AND FASTENERS SUITABLE FOR THE SERVICE.
 - VALVES – PRESSURE AND TEMPERATURE RATED AS REQUIRED TO SUIT SYSTEM PRESSURES AND TEMPERATURES. UNLESS OTHERWISE INDICATED, PROVIDE VALVES OF SAME SIZE AS UPSTREAM PIPE SIZE.
 - THERMOMETERS: PROVIDE DIRECT MOUNT THERMOMETERS 9" ADJUSTABLE ANGLE TYPE, ALUMINUM CASE, ACRYLIC LENS, ORGANIC SPIRIT FILL OR SOLAR TYPE, SUITABLE FOR SERVICE REQUIRED. SELECT RANGE SUCH THAT NORMAL FLUID TEMPERATURES FALL WITHIN THE MIDDLE THIRD OF THE DISPLAY. ACCURACY OF THERMOMETERS SHALL BE PLUS OR MINUS 1 PERCENT FULL SCALE. PROVIDE THERMOMETER WELLS, BRASS OR STAINLESS STEEL, PRESSURE RATED TO MATCH PIPING SYSTEM DESIGN PRESSURE.
 - PRESSURE GAUGES: PRESSURE GAUGES SHALL BE PHOSPHOR BRONZE BOURDON-TUBE TYPE, ALUMINUM OR BRASS CASE, GLASS LENS, SUITABLE FOR SERVICE REQUIRED. SELECT RANGE SUCH THAT NORMAL FLUID PRESSURES FALL WITHIN THE MIDDLE THIRD OF THE DISPLAY. ACCURACY OF PRESSURE GAUGES SHALL BE PLUS OR MINUS 1 PERCENT FULL SCALE. PROVIDE PRESSURE GAUGE COCKS BETWEEN PRESSURE GAUGES AND GAUGE TEES, CONSTRUCTED OF BRASS WITH 1/4" FEMALE NPT ON EACH END, AND "T" HANDLE BRASS PLUG, WITH 1/4" BRASS BUSHING SNUBBER WITH CORROSION RESISTANT POROUS METAL DISC, THROUGH WHICH PRESSURE FLUID IS FILTERED. SELECT DISC MATERIAL FOR FLUID SERVED AND PRESSURE RATING.
 - SUPPORTS AND ANCHORS: HANGERS FOR PIPE UP TO AND INCLUDING 4" SHALL BE SWIVEL RING, SPLIT RING, WROUGHT PIPE CLAMP, BAND, OR ADJUSTABLE WROUGHT CLEVIS TYPE. HANGERS FOR PIPES ABOVE 4" SHALL BE STANDARD CLEVIS OR ROLLER.
 - SADDLES AND SHIELDS: PROVIDE SADDLES AND SHIELDS UNDER PIPING HANGERS AND SUPPORTS, FACTORY-FABRICATED, FOR ALL INSULATED PIPING. SIZE SADDLES AND SHIELDS FOR EXACT FIT TO MATE WITH PIPE INSULATION.
- B) ELECTRICAL REQUIREMENTS OF MECHANICAL WORK:
- BASIC ELECTRICAL COMPONENTS INCLUDE, BUT ARE NOT LIMITED TO ALL REQUIRED STARTERS, DISCONNECT SWITCHES, CONTROL DEVICES, AND MOTORS. IT INCLUDES MOTORS THAT ARE FACTORY-INSTALLED AS PART OF EQUIPMENT AND APPLIANCES AS WELL AS FIELD-INSTALLED MOTORS.
 - STARTERS AND DISCONNECTS: WHERE AVAILABLE, PROVIDE FACTORY MOUNTED DISCONNECTS AND STARTERS, OR, WHEN FACTORY MOUNTED STARTERS AND DISCONNECTS ARE NOT AVAILABLE PROVIDE COMBINATION STARTERS AND DISCONNECT SWITCHES, OR, WHERE COMBINATION STARTERS AND DISCONNECT SWITCHES ARE NOT SUITABLE OR AVAILABLE, PROVIDE SEPARATE STARTERS AND DISCONNECTS FOR ALL HVAC EQUIPMENT, AS REQUIRED FOR PROPER INSTALLATION AND OPERATION OF EQUIPMENT.
- C) MECHANICAL IDENTIFICATION:
- PROVIDE PIPE MARKERS, LINE MARKERS, VALVE TAGS, VALVE SCHEDULE FRAMES, AND EQUIPMENT MARKERS COMPLYING WITH ANSI A13.1 FOR LETTERING SIZE, LENGTH OF COLOR FIELD, COLORS, AND INSTALLED VIEWING ANGLES OF IDENTIFICATION DEVICES.
 - SCHEDULES: SUBMIT VALVE SCHEDULE FOR EACH PIPING SYSTEM,

TYPEWRITTEN AND REPRODUCED ON 8-1/2" X 11" BOND PAPER. TABULATE VALVE NUMBER, PIPING SYSTEM, SYSTEM ABBREVIATION (AS SHOWN ON TAG), LOCATION OF VALVE (ROOM OR SPACE), AND VARIATIONS FOR IDENTIFICATION (IF ANY). MARK VALVES WHICH ARE INTENDED FOR EMERGENCY SHUT-OFF AND SIMILAR SPECIAL USES, BY SPECIAL "FLAGS", IN MARGIN OF SCHEDULE.

- PLASTIC PIPE MARKERS
 - SNAP-ON TYPE: PROVIDE MANUFACTURER'S STANDARD PRE-PRINTED, SEMI-RIGID, SNAP-ON, COLOR-CODED, PIPE MARKERS.
 - FLUORESCENT PRESSURE-SENSITIVE TYPE: PROVIDE MANUFACTURER'S STANDARD PRE-PRINTED, PERMANENT ADHESIVE, COLOR-CODED, PRESSURE-SENSITIVE VINYL PIPE MARKERS.
 - INSTALL EVERY 40 FEET AND AT EACH CHANGE IN DIRECTION.
- PLASTIC LINE MARKER – UNDERGROUND TYPE: MANUFACTURER'S STANDARD PERMANENT, BRIGHT-COLORED, CONTINUOUS-PRINTED PLASTIC TYPE, INTENDED FOR DIRECT-BURIAL SERVICE; NOT LESS THAN 6" WIDE X 4 MILS THICK. PROVIDE TAPE WITH PRINTING WHICH MOST ACCURATELY INDICATES TYPE OF SERVICE OF BURIED PIPE.
- PLASTIC VALVE TAGS: PROVIDE MANUFACTURER'S STANDARD SOLID PLASTIC VALVE TAGS WITH PRINTED ENAMEL LETTERING, WITH PIPING SYSTEM ABBREVIATION IN APPROXIMATELY 3/16" HIGH LETTERS AND SEQUENCED VALVE NUMBERS APPROXIMATELY 3/8" HIGH, AND WITH 5/32" HOLE FOR FASTENER.
- VALVE TAG FASTENERS: MANUFACTURER'S STANDARD SILD BRASS CHAIN (WIRE LINK OR BEADED TYPE), OR SOLID BRASS S-HOOKS OF THE SIZES REQUIRED FOR PROPER ATTACHMENT OF TAGS TO VALVES, AND MANUFACTURED SPECIFICALLY FOR THAT PURPOSE.
- VALVE SCHEDULE FRAMES: FOR EACH PAGE OF THE VALVE SCHEDULE. PROVIDE A GLAZED DISPLAY FRAME, WITH SCREWS FOR REMOVABLE MOUNTING ON MASONRY WALLS. PROVIDE FRAMES OF EXTRUDED ALUMINUM OR PLASTIC WITH SSB-GRADE SHEET GLASS OR PLASTIC.
- PLASTIC EQUIPMENT MARKERS: PROVIDE MANUFACTURER'S STANDARD LAMINATED PLASTIC, COLOR CODED EQUIPMENT MARKERS.
- LETTERING AND GRAPHICS: COORDINATE NAMES, ABBREVIATIONS AND OTHER DESIGNATIONS USED IN MECHANICAL IDENTIFICATION WORK, WITH CORRESPONDING DESIGNATIONS SHOWN, SPECIFIED OR SCHEDULED. PROVIDE NUMBERS, LETTERING AND WORDING AS INDICATED OR, IF NOT OTHERWISE INDICATED, AS RECOMMENDED BY MANUFACTURERS OR AS REQUIRED FOR PROPER IDENTIFICATION AND OPERATION/MAINTENANCE OF MECHANICAL SYSTEMS AND EQUIPMENT.

- D) HYDRONIC PIPING:
- FLUE VENT CONDENSATE PIPING SHALL BE SCHEDULE 40 PVC AND BE PROVIDED WITH A
 - HOT WATER WATER SHALL BE SCHEDULE 40 ASTM A53, GRADE B, TYPE E (ERW) STEEL OR ASTM B88, TYPE L COPPER TUBE (COPPER THROUGH 2 ONLY) WITH THE FOLLOWING JOINING METHODS:
 - THROUGH 2 SHALL USE CAST IRON CLASS 150 THREADED FITTINGS PER ASME B16.3 FOR STEEL PIPE OR COPPER SOLDERED FITTINGS FOR COPPER TUBE.
 - 2-1/2" AND UP SHALL USE STEEL WELDED (ASME B16.9, STD WEIGHT) OR FLANGED (ASME B16.5, CLASS 150, RAISED FACE) FITTINGS.
 - UPONOR ASTM F876/F877 SDR9 CROSSLINKED POLYETHYLENE (PEX-a) PIPING WITH ASTM F1960 COLD EXPANSION FITTINGS AND PEX REINFORCING RINGS INSTALLED PER MANUFACTURER'S INSTRUCTIONS IS ALSO ALLOWED.
 - MECHANICAL GROOVED STEEL WITH MECHANICAL GROOVED STEEL FITTINGS AND COUPLINGS AS MANUFACTURED BY VICTAULIC COMPANY OF AMERICA OR GRUWLOCK BY ANVIL INTERNATIONAL, INC AND FOR SIZES 2" AND SMALLER TYPE "L" HARD DRAWN COPPER TUBING, PRESSED FITTINGS CONFORMING TO THE MATERIAL AND SIZING REQUIREMENTS OF ASME B16.22, SUCH AS PRO-PRESS ASME B16.18 OR ASME OPTS. THE O-RINGS FOR THE COPPER PRESS FITTINGS SHALL BE EPDM. IF THE CONTRACTOR CHOOSES SOLDERED COPPER FITTINGS CAN BE USED.
 - HYDRONIC VALVES:
 - THROUGH 2" BRONZE BALL VALVES EQUAL TO APOLLO 70 SERIES.
 - 2-1/2" AND UP DUCTILE IRON LUG STYLE BUTTERFLY VALVE WITH LEVER EQUAL TO CENTERLINE 200 SERIES.
 - PROVIDE AND INSTALL ISOLATION VALVES, UNIONS/FLANGES, MANUAL AIR VENTS, AND DRAIN VALVES AT ALL PIECES OF EQUIPMENT.
 - PITCH WATER PIPING UP IN THE DIRECTION OF FLOW, 1 INCH PER 40 FEET MINIMUM. PROVIDE AN AIR VENT AT ALL HIGH POINTS AND A DRAIN VALVE AT ALL LOW POINTS.
 - CUT ALL HOLES OF SUFFICIENT SIZE AND HANG ALL PIPE SO THAT THERE WILL BE NO COPPER OR STEEL TO METAL CONTACT AND RESULTANT NOISE DURING PIPE EXPANSION AND CONTRACTION. PROVIDE EXPANSION LOOPS WITH ROLLERS, GUIDES AND ANCHORS WHERE

- STRAIGHT RUNS OF PIPE EXCEED 100 FEET.
- BEFORE SYSTEM OPERATION, CLEAN AND FLUSH ALL PIPING SYSTEMS TO REMOVE GREASE, OIL, SCALE, ETC. OPERATE SYSTEM FOR A MINIMUM OF 24 HOURS WITH STARTUP STRAINERS TO REMOVE DEBRIS, THEN REMOVE AND DISPOSE OF STARTUP STRAINER.
 - PROVIDE CHEMICAL WATER TREATMENT CHEMICALS TO PROHIBIT CORROSION FOR WATER SYSTEMS. PROPYLENE GLYCOL (CONCENTRATION SHALL PROVIDE FREEZE PROTECTION TO 5° BELOW THE LOWEST ANTICIPATED AMBIENT TEMPERATURE) IS SUFFICIENT FOR WATER TREATMENT FOR SYSTEMS NEEDING FREEZE PROTECTION.

- E) INSULATION:
- INSULATION SHALL BE UL APPROVED FOR A FLAME SPREAD RATING OF NOT OVER 25 AND A SMOKE DEVELOPED RATING OF NOT OVER 50.
 - ALL INSULATION SHALL CONFORM TO THE REQUIREMENTS OF THE INTERNATIONAL ENERGY CONSERVATION CODE (IECC) 2009.
 - HYDRONIC PIPING: ALL HYDRONIC PIPING SERVING AS PART OF A HEATING OR COOLING SYSTEM SHALL BE THERMALLY INSULATED WITH FIBERGLASS INSULATION IN ACCORDANCE WITH THE THICKNESS LISTED BELOW, BASED ON THE PIPE INSULATION HAVING A CONDUCTIVITY NOT EXCEEDING 0.27 BTU PER INCH/H*FT²*F. PROVIDE ASJ OR OTHER JACKET TO PROTECT INSULATION. SIMILAR TO JOHNS MANVILLE MICRO-LOK.
 - NOTE THAT ALL PIPES CONTAINING FLUIDS AT TEMPERATURES LESS THAN LOCAL DEWPOINT MUST BE INSULATED FOR CONDENSATION CONTROL.
 - MINIMUM PIPE INSULATION
 - PIPE DIAMETER 1.5" AND LESS:
 - STEAM AND STEAM CONDENSATE: 1.5" THICK
 - HOT AND CHILLED WATER: 1.5" THICK
 - PIPE DIAMETER GREATER THAN 1.5":
 - STEAM AND STEAM CONDENSATE: 3" THICK
 - HOT WATER: 2.0" THICK
 - CHILLED WATER: 1.5" THICK
 - EXCEPTIONS:
 - REFER TO IECC.
 - EXECUTION
 - THE CONTRACTOR SHALL PROVIDE ALL SUPERVISION, LABOR, EQUIPMENT, MATERIAL, MACHINERY, PLANS, RIGGING, AND ANY AND ALL OTHER ITEMS NECESSARY TO COMPLETE THE MECHANICAL SYSTEM. SMALL DETAILS NOT USUALLY INDICATED ON THE DRAWINGS OR SPECIFIED, BUT WHICH ARE NECESSARY FOR THE PROPER INSTALLATION AND OPERATION OF THE MECHANICAL SYSTEM SHALL BE INCLUDED IN THE WORK AND IN THE CONTRACTOR'S ESTIMATE THE SAME AS IF HEREIN SPECIFIED OR SHOWN ON THE DRAWINGS.
 - THE CONTRACTOR SHALL INSTALL EQUIPMENT IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS. THIS INCLUDES CHECKING THE MANUFACTURER'S INSTRUCTIONS TO DETERMINE WHAT TYPE OF GLYCOL SYSTEM MAY BE USED WITH EQUIPMENT SO AS NOT TO VOID THE WARRANTY OR IMPAIR THE OPERATION OF THE EQUIPMENT. WHERE THE DRAWINGS AND SPECIFICATIONS CONFLICT WITH THE MANUFACTURER'S RECOMMENDATIONS, IT WILL BE THE CONTRACTOR'S RESPONSIBILITY TO BRING THIS TO THE ATTENTION OF THE ENGINEER.
 - THE HVAC EQUIPMENT MAY NOT BE USED FOR TEMPORARY HEAT DURING CONSTRUCTION. THE HVAC EQUIPMENT SHALL NOT BE STARTED AND TESTED UNTIL ALL CONSTRUCTION ACTIVITY THAT HAS THE POTENTIAL OF CREATING AIR BORNE PARTICULATES THAT COULD BE DRAWN INTO THE HVAC EQUIPMENT AND DUCTWORK SYSTEMS HAS BEEN COMPLETED. IN ADDITION, ALL DUTWORK OPENINGS SHALL BE SEALED UNTIL THE TIME WHEN THE WHEN HVAC EQUIPMENT IS TO BE STARTED AND TESTED.
 - DUCTWORK AND FITTINGS SHALL HAVE ENDS COVERED WITH PLASTIC AT ALL TIMES.
 - UPON COMPLETION OF WORK, THE CONTRACTOR SHALL CLEAN, OIL AND GREASE (UNLESS FACTORY LUBRICATED) ALL FANS, PUMPS, MOTORS, ALL OTHER RUNNING EQUIPMENT AND APPARATUS AND MAKE CERTAIN THAT ALL SUCH APPARATUS AND MECHANISMS ARE IN PROPER WORKING ORDER AND MADE READY FOR TESTING.
 - REPLACE ALL FILTERS USED DURING CONSTRUCTION.
 - EQUIPMENT SHALL BE STARTED, TESTED, ADJUSTED AND PLACED IN SATISFACTORY OPERATING CONDITION BY THE CONTRACTOR.
 - THE CONTRACTOR SHALL INSTRUCT OWNER IN THE PROPER OPERATION OF EQUIPMENT, EXPLAIN THE PROPER OPERATING AND MAINTENANCE PROCEDURES AND SHALL FURNISH THE OWNER WITH ALL INSTRUCTION PAMPHLETS, BOOKS AND OTHER MATERIAL FURNISHED BY THE VARIOUS MANUFACTURERS
 - ALL VIBRATING EQUIPMENT NOT MOUNTED ON THE GROUND FLOOR SHALL BE MOUNTED ON OR SUSPENDED FROM VIBRATION ISOLATORS.
 - EQUIPMENT SHALL BE INSTALLED WITH CLEARANCE FOR PROPER MAINTENANCE. FILTERS, COILS, DRIVES, VALVES, AND CONTROLS SHALL BE

- ACCESSIBLE FOR SERVICING AND/OR REPLACEMENT.
- EQUIPMENT SHALL BE COVERED FOR ONE YEAR FROM THE REVIEWING ENGINEER'S DATE OF ACCEPTANCE AND/OR THE DURATION OF THE MANUFACTURER'S GUARANTEE OR WARRANTY, WHICH EVER IS LONGER. THE CONTRACTOR SHALL FURNISH THE OWNER WITH ALL MANUFACTURER'S GUARANTEES OR WARRANTIES.
 - THE CONTRACTOR SHALL PROVIDE FOR BALANCING OF THE WATER AND AIR SYSTEMS TO WITHIN 10 PERCENT OF THE GPM AND CFM VALUES SHOWN ON THE APPROVED HVAC PLANS. BALANCING SHALL BE DONE IN ACCORDANCE WITH STANDARDS ESTABLISHED BY THE AABC USING REPORT SHEETS DEVELOPED BY THE AABC. SUBMIT REPORTS TO THE ENGINEER.

END OF SECTION 15500

SEQUENCE OF OPERATION

THE NEW BOILERS B-1 THROUGH B-3 SHALL OPERATE USING THE BOILER CONTROLS FOR MODULATED FIRING AND LEAD/ LAG OPERATION. THE BOILER CONTROLS SHALL ALSO CONTROL THE OPERATION OF THE BOILER CIRCULATOR PUMPS (BCP). PROVIDE AND INSTALL AN OUTSIDE AIR TEMPERATURE SENSOR TO ALLOW FOR THE BOILER LOOP PIPING TEMPERATURE TO BE CONTROLLED BASED ON OUTSIDE AIR TEMPERATURE. WHEN THE OAT IS 68° F (ADJ.) COMMAND ON THE BOILER'S CONTROL PACKAGE. AS THE NEED FOR THE BUILDING FOR HEAT INCREASES AS THE OAT DROPS, INCREASE THE LOOP TEMPERATURE IN THE MAIN BOILER BUILDING LOOP AS NECESSARY TO SATISFY THE BUILDING THERMOSTATS. MONITOR THE SUPPLY AND RETURN TEMPERATURES IN THE BUILDING LOOP AND MAINTAIN A 20° DELTA T. THE TEMPERATURE TO THE DOMESTIC HOT WATER STORAGE TANK SHALL BE 140° F (ADJ.) THIS TEMPERATURE IS BASED ON THE MIXING CONTROLS IN THE BUILDING TO SUPPLY 110° TO 120° WATER TO THE AREAS USING HOT WATER.

THE EXISTING CIRCULATOR PUMPS SHALL CONTINUE TO OPERATE IN THE SAME MANNER AS THEY ARE CURRENTLY CONTROLLED.

DESIGN DAY MECHANICALS INC

THE PROJECT MANAGER FOR THIS PROJECT IS NOTED BELOW. PLEASE REFER ALL QUESTIONS, SUBMITTALS AND CORRESPONDENCE TO THE PROJECT MANAGER.

JOHN L. WAIT PH (603) 289-7253
EMAIL: JLW@DDDS.NET FAX (603) 289-7253
148 BEAVER RIDGE RD., CENTER BARNSTEAD, NH 03225

PROJECT:
TOWN OF EXETER SAFETY BUILDING BOILER REPLACEMENT
EXETER, NH

FOR:
TOWN OF EXETER
EXETER, NH

SCHEDULES SPECIFICATIONS LEGENDS AND ABBREVIATIONS

REVISIONS:

DESIGNED BY: JLW
DRAWN BY: JLW
CHECKED BY: AWA
DDM JOB #: 15072
SCALE: NTS

BID DRAWING SET
06/18/2015

DATE: 06/18/15

M-2

HOT WATER BOILER SCHEDULE (B)

MARK	MAKE	MODEL	BURNER FUEL SOURCE	MAX INPUT LO-HI MBH	MAX OUTPUT LO-HI MBH	THERMAL EFFICIENCY	VENT CONNECTION DIAMETER INCHES	COMBUSTION AIR INLET DIA. INCHES	WATER CONNECTION	GAS CONNECTION	SHIPPING WEIGHT LBS.	OVERALL DIMENSIONS (IN.) HEIGHT X WIDTH X LENGTH
B-1-3	VISSMANN	VITODENS B2HA-150	NAT. GAS	113-530	103-495	93.5%	4"	6"	2"	1"	298	39" X 27" X 23.6"

DOMESTIC HOT WATER BOILER SCHEDULE (DHWB)

MARK	MAKE	MODEL	BURNER FUEL SOURCE	MAX INPUT LO-HI MBH	THERMAL EFFICIENCY	VENT CONNECTION DIAMETER INCHES	COMBUSTION AIR INLET DIA. INCHES	WATER CONNECTION	GAS CONNECTION	SHIPPING WEIGHT LBS.	OVERALL DIMENSIONS (IN.) HEIGHT X WIDTH X LENGTH
DHWB-1	HEAT TRANSFER PRODUCTS	PHOENIX PH199-119	NAT. GAS	40-199	96%	3"	3"	1-1/2"	3/4"	405	74" X 38-1/2" X 27"

PROVIDE WIRE AND INSTALL B-1 THROUGH B-3 WITH 30 PSI RELIEF VALVE, MODULATING FIRING RATE OF, FAIL-SAFE SPARK IGNITION HIGH TEMPERATURE LIMIT CONTROL WITH MANUAL RESET, 24 VOLT TRANSFORMER, THE BOILERS SHALL BE CONTROLLED BY THE FACTORY CONTROL PACKAGE. WHEN INSTALLING FOLLOW ALL MANUFACTURER'S INSTRUCTIONS AND ALL APPLICABLE INTERNATIONAL FUEL GAS CODE 2009 GUIDELINES. PROVIDE AND INSTALL VISSMANN HYDRONIC LOW LOSS HEADER SIZE 300/ 200 AND DISTRIBUTION MANIFOLD RACKING SYSTEM WITH INSULATION FOR THE LOW LOSS HEADER RACK SYSTEM AND THE DISTRIBUTION MANIFOLD. PROVIDE AND INSTALL ONE DEDICATED BOILER CIRCULATOR PUMP FOR EACH BOILER. GRUNDOS MODEL UPS 26-150FC, EQUALS TO VISSMANN ARE ACCEPTABLE AS LONG AS THE SCHEDULE CRITERIA ARE MATCHED. IF A SUBSTITUTE IS SELECTED AND ALLOWED THE MC IS RESPONSIBLE TO INSTALL THE EQUIPMENT TO THE MANUFACTURER'S INSTALLATION GUIDELINES.