

GENERAL NOTES:

1. CONFORM TO NATIONAL PLUMBING CODE AND ALL LOCAL CODES AND AUTHORITY HAVING JURISDICTION FOR DESIGN, SUPPLY AND INSTALLATION OF PLUMBING AND VENT SYSTEM. VENT CONCEALED INSIDE WALLS ACCORDING TO CODE.
2. EQUIPMENT LOCATIONS, DUCT, AND PIPE ROUTING INDICATED ON THE DRAWINGS IS APPROXIMATE ONLY. CONFIRM IN THE FIELD. REROUTE DUCTWORK AND PIPING AS REQUIRED TO ELIMINATE FIELD INTERFERENCES WITH BUILDING STRUCTURE, ELECTRICAL, ETC. CONFIRM CHANGES WITH CONTRACT ADMINISTRATOR.
3. COORDINATE WORK WITH ALL SUBTRADES. WHERE DIMENSIONS ARE INDICATED FOR PIPING, DUCTWORK, DUCT SIZES, EQUIPMENT SIZES, ETC., THESE ARE FOR BIDDING PURPOSES ONLY. THE CONTRACTOR IS RESPONSIBLE TO VERIFY ALL DIMENSIONS IN THE FIELD PRIOR TO ORDERING EQUIPMENT AND COMMENCING INSTALLATION WITHOUT EXTRA CHARGES TO THE PROJECT. THE CONTRACTOR IS RESPONSIBLE TO ENSURE ALL EQUIPMENT, DUCTWORK AND PIPING FITS IN THE SPACE AVAILABLE AND TO MAINTAIN THE GENERAL DESIGN INTENT FOR THE SYSTEMS.
4. PROVIDE AUTOMATIC TRAP PRIMERS FOR ALL FLOOR DRAINS.
5. INSULATE DOMESTIC COLD WATER (DCW) PIPING.
6. PROVIDE ALL CUTTING AND PATCHING REQUIRED FOR PIPING. FIRE SEAL ANY PIPING PENETRATING FIRE SEPARATIONS (REFER TO ARCHITECTURAL).
7. PROVIDE SHUT-OFF VALVES AT ALL MAINS, WATER METER AND WATER HAMMER ARRESTORS AT ENDS OF ALL PIPE RUNS.
8. MECHANICAL SUB-CONTRACTOR TO COORDINATE TIE-IN WITH SITE SERVICES.
9. PROVIDE A 1" QUICK-COUPLER CONNECTION FOR THE OWNER-SUPPLIED, CONTRACTOR INSTALLED HOSE REEL. COORDINATE HEIGHT AND LOCATION OF THE HOSE CONNECTION WITH CONTRACT ADMINISTRATOR.

MECHANICAL SPECIFICATION:

MECHANICAL SUB CONTRACTOR SHALL SUBMIT PRICE BASED ON SUPPLY AND INSTALLATION OF EQUIPMENT AND MATERIAL NECESSARY TO PROVIDE A COMPLETE AND FULLY FUNCTIONAL MECHANICAL PACKAGE.

MECHANICAL PACKAGE TO CONSIST OF EQUIPMENT AND MATERIALS AS DESCRIBED IN THE DRAWINGS AND SPECIFICATIONS.

DO NOT SCALE DRAWINGS.

HEATING, VENTILATION & AIR CONDITIONING

1. PROVIDE SUPPLY AIR, RETURN AIR, AND EXHAUST AIR DUCT SYSTEMS AS SHOWN.

2. ALL DUCTWORK INSTALLATION SHALL BE PERFORMED IN ACCORDANCE WITH SMACNA LATEST EDITION DUCT STANDARDS.

3. THIS SUB CONTRACTOR SHALL SUPPLY AND INSTALL ALL DUCTWORK INCLUDING APPURTENANCES, HANGERS, DAMPERS, ETC.

- 3.1 RECTANGULAR DUCTWORK SHALL BE CONSTRUCTED FROM GALVANIZED SHEET METAL OF THE FOLLOWING U.S. STANDARD GAUGES:
 - DUCTS UP TO 12" [305mm] ON LONGEST DIMENSION..... 26 GA.
 - DUCTS 13" [330mm] TO 28" [705mm] ON LONGEST DIMENSION..... 24 GA.
 - DUCTS 29" [730mm] TO 48" [1220mm] ON LONGEST DIMENSION..... 22 GA.

TESTING AND BALANCING OF MECHANICAL SYSTEMS

1. INDEPENDENT RECOGNIZED AIR BALANCE CONTRACTOR SHALL BE AABC CERTIFIED.

2. TEST AND BALANCE BUILDING EXHAUST TO WITHIN 5% OF DESIGN.

GENERAL CONDITIONS

1. PROVIDE ALL LABOUR, MATERIALS, AND EQUIPMENT NECESSARY TO INSTALL A COMPLETE AND FULLY FUNCTIONAL MECHANICAL SYSTEM AS SHOWN ON THE DRAWINGS AND DESCRIBED IN THESE SPECIFICATIONS.

2. CONTRACT DOCUMENTS

- 2.1 THE MECHANICAL DRAWINGS AND SPECIFICATIONS ONLY FORM A PART OF THE COMPLETE CONTRACT DOCUMENTS. THE CONTRACTOR AND MECHANICAL SUB CONTRACTOR SHALL CAREFULLY READ ALL PROJECT DRAWINGS AND SPECIFICATIONS INCLUDING ARCHITECTURAL AND ELECTRICAL DRAWINGS AND SPECIFICATIONS.
- 2.2 IN THE EVENT OF A DISCREPANCY IN THE DRAWINGS AND SPECIFICATIONS, THE CONTRACTOR SHALL NOTIFY THE CONTRACT ADMINISTRATOR IN WRITING PRIOR TO BID CLOSING SO THAT CLARIFICATION CAN BE ISSUED BY ADDENDUM. NO EXTRAS WILL BE ALLOWED AS A RESULT OF CONTRACTORS' FAILURE TO NOTIFY THE CONTRACT ADMINISTRATOR OF DISCREPANCIES DURING THE BID PERIOD.
- 2.3 IN THE EVENT THAT AN ITEM IS SHOWN ON THE DRAWINGS, BUT NOT SPECIFIED OR SPECIFIED AND NOT SHOWN ON THE DRAWINGS, THE ITEM SHALL BE INCLUDED AS IF IT WERE SHOWN IN BOTH LOCATIONS.

3. ALL NECESSARY PERMITS SHALL BE OBTAINED AND ALL FEES SHALL BE PAID TO CARRY OUT THE SPECIFIED WORK.

GENERAL CONDITIONS - CONTINUED

4. ALL WORK SHALL BE GUARANTEED FOR ONE YEAR FROM DATE OF COMPLETED WORK ACCEPTANCE BY THE CONTRACT ADMINISTRATOR. SUBMIT DOCUMENTATION IDENTIFYING ADDITIONAL EQUIPMENT WARRANTY COVERAGE AND TIME FRAMES.

5. ALL WORK SHALL COMPLY IN EVERY RESPECT WITH ALL NATIONAL, PROVINCIAL, AND LOCAL BY-LAWS AND CODES, WHICH SHALL BE CONSIDERED PART OF THIS SPECIFICATION.

6. ALL CUTTING, PATCHING, FLASHING FOR WORK AS REQUIRED HEREIN SHALL BE BY THE CONTRACTOR.

7. THE MECHANICAL SUB CONTRACTOR SHALL INSTALL THE SYSTEM IN COMPLETE ACCORDANCE WITH THE RECOMMENDATIONS OF THE ASHRAE, AND SMACNA-LATEST EDITION DUCT STANDARDS, AND LOCAL CODES.

8. COORDINATE WORK WITH THE WORK OF OTHER TRADES TO AVOID CONFLICTS.

9. ALTER THE LOCATION OF DUCTS OR EQUIPMENT AT THE DIRECTION OF THE CONTRACT ADMINISTRATOR WITHOUT CHARGE TO CITY OF WINNIPEG, PROVIDED THE CHANGE IS MADE BEFORE INSTALLATION AND DOES NOT NECESSITATE ADDITIONAL MATERIALS.

10. BID PRICE SHALL BE BASED ON THE USE OF SPECIFIED MANUFACTURERS.

11. FURNISH ONE (1) HARD-COVERED 3-RING BINDER CONTAINING ONE (1) COMPLETE SET OF MANUFACTURERS' OPERATING AND MAINTENANCE INSTRUCTIONS SHOWING ALL MAJOR EQUIPMENT, AND APPARATUS REQUIRING MAINTENANCE. INSTRUCTIONS SHALL BE COMPLETE FOR INSTALLATION, OPERATION, AND MAINTENANCE AND SHALL INCLUDE PERTINENT INFORMATION SUCH AS DETAILED DRAWINGS AND OPERATION CURVES. SUPPLIER PARTS, SUPPLIER LISTS AND ADDRESSES SHALL BE PROVIDED. INSTRUCTIONS SHALL BE PROVIDED FOR THE CITY OF WINNIPEG'S REPRESENTATIVE TO ENSURE A THOROUGH UNDERSTANDING OF THE EQUIPMENT AND ITS OPERATION.

12. ALL WIRING, SUPPLY AND INSTALLATION OF DISCONNECT SWITCHES FOR EQUIPMENT SPECIFIED HEREIN SHALL BE PERFORMED BY THE ELECTRICAL SUB CONTRACTOR, UNLESS OTHERWISE NOTED.

13. MECHANICAL SUB CONTRACTOR SHALL PROVIDE AN AUTOCAD (CURRENT VERSION) COMPACT DISK COPY OF THE CONTACT DRAWINGS FOR RECORD 'AS-BUILT' DRAWINGS, REVISED AS REQUIRED TO SHOW ANY DEVIATIONS OF LAYOUT FROM THAT ORIGINALLY SHOWN – INCLUDING CHANGES RESULTING FROM SUPPLEMENTAL INSTRUCTIONS, PROPOSED CHANGE NOTICES AND CHANGE DIRECTIVES.

14. PROVIDE ONE (1) SET OF SPECIAL TOOLS REQUIRED TO SERVICE EQUIPMENT AS RECOMMENDED BY MANUFACTURERS.

15. THE MECHANICAL SUB CONTRACTOR SHALL SUBMIT SHOP DRAWINGS VIA E-MAIL IN PDF FORMAT. HARD COPIES WILL BE ALSO ACCEPTED BY THE CONTRACT ADMINISTRATOR. SHOP DRAWING SUBMITTALS SHALL INCLUDE THE CONTRACTORS STAMP INDICATING THAT THE CONTRACTOR HAS REVIEWED THE SUBMITTAL FOR COMPLIANCE WITH DRAWINGS AND SPECIFICATIONS AND HAS COORDINATED DIMENSIONS, WEIGHT, SERVICES AND ACCESS REQUIREMENTS ETC. BASED ON SITE CONDITIONS. THE CONTRACTOR SHALL BE FULLY RESPONSIBLE FOR ANY COSTS ASSOCIATED WITH ERRORS OR OMISSIONS IN THE SHOP DRAWINGS.

16. CONTRACTOR TO CONFIRM ALL DIMENSIONS AND LOCATIONS OF ALL EQUIPMENT, LAYOUTS, AND SERVICES ETC. PRIOR TO COMMENCEMENT OF WORK.

17. HOISTING OF ALL MECHANICAL EQUIPMENT SHALL BE BY THE MECHANICAL SUB CONTRACTOR.

18. CONTRACTOR IS TO ASSUME FULL RESPONSIBILITY FOR LAYING OUT ALL WORK AND ENSURING THAT NO DAMAGE IS CAUSED TO THE CITY OF WINNIPEG EQUIPMENT AND/OR PREMISES DUE TO IMPROPER LOCATION AND EXECUTION OF WORK UNTIL WORK HAS BEEN COMPLETED AND ACCEPTED BY THE CITY OF WINNIPEG. STORE ALL MATERIALS AS REQUIRED FOR PROTECTION AND CLEAN UP REFUSE CAUSED BY ALL WORK.

DOMESTIC WATER PIPING

1. PIPING - DOMESTIC HOT, COLD AND RECRULATION SYSTEMS, WITHIN BUILDING.

- .1 ABOVE GROUND: COPPER TUBE, HARD DRAWN, TYPE L: to ASTM B88M.
- .2 BURIED OR EMBEDDED: COPPER TUBE, SOFT ANNEALED, TYPE K: to ASTM B88M, IN LONG LENGTHS AND WITH NO BURIED JOINTS.

2. FITTINGS:

- .1 BRONZE PIPE FLANGES AND FLANGED FITTINGS, CLASS 150: TO ANSI/ASME B16.24.
- .2 CAST BRONZE THREADED FITTINGS, CLASS 125: TO ANSI/ASME B16.15.
- .3 CAST COPPER, SOLDER TYPE: TO ANSI/ASME B16.18.
- .4 WROUGHT COPPER AND COPPER ALLOY, SOLDER TYPE: TO ANSI/ASME B16.22.
- .5 NPS 2 AND LARGER: ANSI/ASME B16.18 OR ANSI/ASME B16.22 ROLL GROOVED TO CSA B242.
- .6 NPS 1 AND SMALLER: WROUGHT IRON COPPER TO ANSI/ASME B16.22 CAST COPPER TO ANSI/ASME B16.18.

3. JOINTS

- .1 RUBBER GASKETS, LATEX-FREE, 1.6 mm THICK: TO AWWA C111.
- .2 BOLTS, NUTS, HEX HEAD AND WASHERS: TO ASTM A307, HEAVY SERIES.
- .3 SOLDER: 95/5 TIN COPPER ALLOY.
- .4 TEFLON TAPE: FOR THREADED JOINTS.
- .5 GROOVED COUPLINGS: DESIGNED WITH ANGLE BOLT PADS TO PROVIDE RIGID JOINT, COMPLETE WITH EPDM GASKET.
- .6 DIELECTRIC CONNECTIONS BETWEEN DISIMILAR METALS: DIELECTRIC FITTING, COMPLETE WITH THERMOPLASTIC LINER.

4. BALL VALVES

- .1 NPS 50mm AND UNDER, THREADED:
 - .1 CLASS 150
 - .2 BRONZE BODY, STAINLESS STEEL BALL, PTFE ADJUSTABLE PACKING, BRASS GLAND AND PTFE SEAT, STEEL LEVER HANDLE.
- .2 NPS 50mm AND UNDER SOLDERED:
 - .1 TO ANSI/ASME B16.18, CLASS 150
 - .2 BRONZE BODY, STAINLESS STEEL BALL, PTFE ADJUSTABLE PACKING, BRASS GLAND AND PTFE SEAT, STEEL LEVER HANDLE, WITH NPT TO COPPER ADAPTORS.

DOMESTIC WATER PIPING - CONTINUED

5. BACKFLOW PREVENTER (DCVA), BFP-1:

- .1 NPS 50mm, DOUBLE CHECK VALVE ASSEMBLY (DCVA) SHALL BE ASME LISTED 1015, AND SUPPLIED WITH FULL PORT BALL VALVES. THE MAIN BODY SHALL BE NYLON. THE HOUSING SHALL BE REINFORCED NYLON AND THE SEAT DISC ELASTOMERS SHALL BE SILICONE (FDA APPROVED). THE FIRST AND SECOND CHECKS SHALL BE ACCESSIBLE FOR MAINTENANCE WITHOUT REMOVING THE DEVICE FROM THE LINE.

6. INSTALLATION

- .1 MANUFACTURER'S INSTRUCTIONS: COMPLY WITH MANUFACTURER'S WRITTEN RECOMMENDATIONS, INCLUDING PRODUCT TECHNICAL BULLETINS, HANDLING, STORAGE AND INSTALLATION INSTRUCTIONS, AND DATASHEETS.
- .2 INSTALL IN ACCORDANCE WITH MANITOBA PLUMBING CODE.
- .3 ASSEMBLE PIPING USING FITTINGS MANUFACTURED TO ANSI STANDARDS.
- .4 INSTALL CWS PIPING BELOW AND AWAY FROM HWS AND HWC AD OTHER HOT PIPING SO AS TO MAINTAIN TEMPERATURE OF COLD WATER AS LOW AS POSSIBLE.
- .5 CONNECT TO FIXTURES AND EQUIPMENT IN ACCORDANCE WITH MANUFACTURER'S WRITTEN INSTRUCTIONS UNLESS OTHERWISE INDICATED.
- .6 BURIED TUBING:
 - .1 LAY IN WELL-COMPACTED , WASHED SAND IN ACCORDANCE WITH AWWA CLASS B BEDDING.
 - .2 BEND TUBING WITHOUT CRIMPING OR CONSTRICTION. MINIMIZE USE OF FITTINGS.

7. VALVES

- .1 ISOLATE EQUIPMENT, FIXTURES AND BRANCHES WITH BALL VALVES.
- .2 BALANCE RECIRCULATION SYSTEM USING CIRCUIT SETTER BALANCING VALVES. MARK SETTINGS AND RECORD ON AS-BUILT DRAWINGS ON COMPLETION.

8. PRESSURE TESTS

- .1 CONFORM TO REQUIREMENTS OF NATIONAL PLUMBING CODE AND LOCAL ORDINANCES.
- .2 TEST PRESSURE: GREATER OF 1 TIMES MAXIMUM SYSTEM OPERATING PRESSURE OR 860 KPA.

9. FLUSHING AND CLEANING

- .1 FLUSH ENTIRE SYSTEM. ENSURE OUTLETS FLUSHED FOR 2 HOURS. LET STAND FOR 24 HOURS, THEN DRAW ONE SAMPLE OFF LONGEST RUN. SUBMIT TO TESTING LABORATORY TO VERIFY THAT SYSTEM IS CLEAN. LET SYSTEM FLUSH FOR ADDITIONAL 2 HOURS, THEN DRAW OFF ANOTHER SAMPLE FOR TESTING.

10. PRE-START-UP INSPECTIONS

- .1 SYSTEMS TO BE COMPLETE PRIOR TO FLUSHING, TESTING AND START-UP.
- .2 VERIFY THAT SYSTEM CAN BE COMPLETELY DRAINED.

11. DISINFECTION

- .1 FLUSH OUT, DISINFECT AND RINSE SYSTEM TO REQUIREMENTS OF AUTHORITY HAVING JURISDICTION.
- .2 UPON COMPLETION, PROVIDE LABORATORY TEST REPORTS ON WATER QUALITY FOR AUTHORITY HAVING JURISDICTION APPROVAL.

12. START-UP

- .1 TIMING: START-UP AFTER:
 - .1 PRESSURE TESTS HAVE BEEN COMPLETED.
 - .2 DISINFECTION PROCEDURES HAVE BEEN COMPLETED.
 - .3 CERTIFICATE OF STATIC COMPLETION HAS BEEN ISSUED.
 - .4 WATER TREATMENT SYSTEMS OPERATIONAL.
- .2 PROVIDE CONTINUOUS SUPERVISION DURING START-UP.
- .3 START-UP PROCEDURES:
 - .1 ESTABLISH CIRCULATION AND ENSURE THA AIR IS ELIMINATED.
 - .2 CHECK PRESSURIZATION TO ENSURE PROPER OPERATION AND TO PREVENT WATER HAMMER, FLASHING AND/OR CAVITATION.
 - .3 BRING HWS STORAGE TANK UP TO DESIGN TEMPERATURE SLOWLY.
 - .4 MONITOR PIPING HWS AND HWC PIPING SYSTEMS FOR FREEDOM OF MOVEMENT, PIPE EXPANSION AS DESIGNED.
 - .5 CHECK CONTROL, LIMIT, SAFETY DEVICES FOR NORMAL AND SAFE OPERATION.
 - .4 RECTIFY START-UP DEFICIENCIES.

13. PERFORMANCE VERIFICATION

- .1 SCHEDULING:
 - .1 VERIFY SYSTEM PERFORMANCE AFTER PRESSURE AND LEAKAGE TESTS AND DISINFECTION ARE COMPLETED, AND CERTIFICATE OF COMPLETION HAS BEEN ISSUED BY AUTHORITY HAVING JURISDICTION.
- .2 PROCEDURES:
 - .1 VERIFY THAT FLOW RATE AND PRESSURE MEET DESIGN CRITERIA.
 - .2 TAB HWC INACCORDNAGE WITH CODE REQUIREMENTS
 - .3 ADJUST PRESSURE REGULATING VALVES WHILE WITHDRAWAL IS MAXIMUM AND INLET PRESSURE IS MINIMUM.
 - .4 STERILIZE HWS AND HWC SYSTEMS FOR LEGIONELLA CONTROL.
 - .5 VERIFY PERFORMANCE OF TEMPERATURE CONTROLS.
 - .6 VERIFY PERFORMANCE WITH SAFETY AND HEALTH REQUIREMENTS.
 - .7 CHECK FOR PROPER OPERATION OF WATER HAMMER ARRESTORS. RUN ONE OUTLET FOR 10 SECONDS, THEN SHUT OFF WATER IMMEDIATELY. IF WATER HAMMER OCCURS, REPLACE WATER HAMMER ARRESTOR OR RECHARGE AIR CHAMBERS. REPEAT FOR OUTLET AND FLUSH VALVES.
 - .8 CONFIRM WATER QUALITY CONSISTENT WITH SUPPLY STANDARDS, AND ENSURE NO RESIDUALS REMAIN AS RESULT OF FLUSHING OR CLEANING.
 - .9 REPORTS:
 - .1 INLCUDE CERTIFICATE OF WATER FLOW AND PRESSURE TESTS CONDUCTED ON INCOMING WATER SERVICE, DEMONSTRATING ADEQUACY OF FLOW AND PRESSURE.

14. OPERATION REQUIREMENTS

- .1 COORDINATE OPERATION AND MAINTENANCE REQUIREMENTS INCLUDING, CLEANING AND MAINTENANCE OF THE SPECIFIED MATERIALS AND PRODUCTS IN THIS SPECIFICATION.

