1. SCOPE
.1. PROVIDE A FULLY FUNCTIONAL HEATING SYSTEM FOR THE LAP POOL AND KIDDY POOL USING THE EXISTING BOILERS IN THE WEST BOILER ROOM AS THE HEATING SOURCE COUPLED WITH HEAT EXCHANGERS. THIS INCLUDES ALL PIPING, PIPE SUPPORTS, TIE–INS, PUMPS, CONTROLS, ETC. FOR A FULLY FUNCTIONAL SYSTEM.
.2. PROVIDE ALL TEMPERATURE AND PRESSURE INSTRUMENTATION AS SHOWN ON THE DESIGN DRAWINGS. PROVIDE THERMOWELLS AND PRESSURE TAPS AS SHOWN ON DESIGN DRAWINGS FOR FUTURE USE.
.3. DECOMMISSION THE EXISTING BOILERS USED FOR HEATING THE LAP POOL AND KIDDY POOL FROM SERVICE. TURN THE BOILER SERVING THE KIDDY POOL OVER TO THE OWNER FOR THEIR FUTURE USE. DEMOLISH THE BOILER SERVING THE LAP POOL ONLY AFTER OBTAINING WRITTEN APPROVAL FROM THE CONTRACTOR ADMINISTRATOR. CAP EXISTING PIPING CONNECTIONS NO LONGER IN SERVICE.
.4. COORDINATE ALL WORK AT OR NEAR BOILER HEADERS OR TIE–INS INVOLVING SHUTTING DOWN THE POOL CIRCULATION PUMPS WITH CONTRACT ADMINISTRATOR.

2. SUBMITTALS – SHOP DRAWING AND PRODUCT DATA
.1. SUBMIT SHOP DRAWINGS FOR ALL COMPONENTS PROVIDED INCLUDING CONTROLS AND GAUGES, BUILDING PRODUCTS, HEAT EXCHANGERS, ELECTRICAL COMPONENTS, AND ANY COMPONENTS SIGNIFICANT TO PROJECT SUCCESS.
.2. FOR EACH SUBMISSION, SUBMIT TWO SETS OF LETTER OR TABLOID SIZE SHOP DRAWINGS. IF SHOP DRAWINGS ARE LARGER THAN 11"X17" SUBMIT ONE REPRODUCIBLE AND ONE PRINT.

3. MECHANICAL GENERAL REQUIREMENTS
.1. APPLICABLE CODES AND STANDARDS
.1. NATIONAL BUILDING CODE OF CANADA
.2. PERFORM ALL WORK IN COMPLIANCE WITH THE MANITOBA WORKPLACE SAFETY AND HEALTH ACT.
.3. THE CONTRACTOR MUST BE FULLY AWARE OF ALL WORK INVOLVING HAZARDOUS MATERIALS. ALL WORK MUST BE PERFORMED IN COMPLIANCE TO THE MANITOBA DEPARTMENT OF LABOUR WORKPLACE HEALTH AND SAFETY GUIDELINES AND ALL OTHER APPLICABLE CODES. THE CONTRACTOR IS RESPONSIBLE FOR THE IMMEDIATE NOTIFICATION TO THE CONTRACT ADMINISTRATOR OR THE PROJECT COORDINATOR OF HIS/HER ENCOUNTERING OF SUSPECTED HAZARDOUS MATERIAL DURING THEIR COURSE OF WORK.
.4. THE CONTRACTOR SHALL COMPLY WITH ALL LAWS, BY–LAWS, ORDINANCES, REGULATIONS, CODES AND ORDER OF AUTHORITIES HAVING JURISDICTION WHICH ARE OR COME INTO FORCE DURING THE PERFORMANCE OF THE WORK AND WHICH RELATE TO THE WORK. WHERE THERE ARE TWO OR MORE LAWS, BY–LAWS, ORDINANCES, REGULATIONS OR CODES APPLICABLE TO THE WORK, THE MOST RESTRICTIVE SHALL APPLY.
.2. PROTECT EQUIPMENT AND SYSTEMS OPENINGS FROM DIRT, DUST, AND OTHER FOREIGN MATERIALS WITH MATERIALS APPROPRIATE TO SYSTEM.
.3. ELECTRICAL WORK TO CONFORM TO DIVISION 16 INCLUDING:
.1. CONTROL WIRING AND CONDUIT IS SPECIFIED IN DIVISION 16 EXCEPT FOR CONDUIT, WIRING AND CONNECTIONS BELOW 50V WHICH ARE RELATED TO CONTROL SYSTEMS SPECIFIC TO DIVISION 15.
.4. PAINTING
.1. APPLY AT LEAST ONE COAT OF CORROSION RESISTANT PRIMER PAINT & 2 EPOXY FINISH COATS TO FERROUS SUPPORTS AND SITE FABRICATED WORK.
.2. PRIME AND TOUCH UP MARRED FINISHED PAINTWORK TO MATCH ORIGINAL.
.3. RESTORE TO NEW CONDITION , FINISHES WHICH HAVE BEEN DAMAGE TOO EXTENSIVELY TO BE MERELY PRIMED AND TOUCHED UP.
.5. SPARE PARTS
.1. PROVIDE ONE SET OF PACKING FOR EACH PUMP.
.2. PROVIDE ONE SPARE PLATE PACK FOR EACH HEAT EXCHANGER SUPPLIED.
.3. VALVE SEATS – ONE FOR EACH SIZE VALVE
.4. VALVE DISCS – ONE FOR EACH SIZE VALVE
.5. VALVE STEM PACKING – ONE FOR EACH SIZE VALVE.
.6. VALVE HANDLES – TWO OF EACH SIZE.
.7. GASKETS FOR FLANGES – ONE FOR EVERY TEN FLANGES.
.6. MOTORS
.1. MOTORS 1/2 HP AND LARGER: EEMAC CLASS B, SQUIRREL CAGE INDUCTIONS, SPEED AS INDICATED, CONTINUOUS DUTY, TEFC ENCLOSURES, BALL BEARING, MAXIMUM TEMPERATURE RISE 40°C, ELECTRICAL CHARACTERISTICS AS INDICATED.
.7. GUARDS – PROVIDE GUARD FOR FLEXIBLE COUPLINGS, "U" SHAPED, MINIMUM 1.6 MM THICK, PAINTED MILD STEEL, SECURELY FASTENED IN PLACE BUT REMOVABLE FOR SERVICING.
.8. DRAIN VALVES – LOCATE AT LOW POINTS AND AT SECTION ISOLATING VALVES. USE MINIMUM NPS 3/4" BRONZE BODY BALL VALVES WITH HOSE END MALE THREAD COMPLETE WITH CAP AND CHAIN.
.9. MANUAL AIR VENTS – LOCATE AT HIGH POINTS AND AT SECTION ISOLATING VALVES. USE MINIMUM NPS 3/4" BRONZE BODY BALL VALVES WITH NIPPLE AND PIPE CAP.
.10. REVIEW LOCATION OF ALL DRAIN VALVES AND AIR VENTS WITH CONTRACT ADMINISTRATOR & ENGINEER PRIOR TO PRESSURE TEST AND INSULATION INSTALLATION.

4. MECHANICAL IDENTIFICATION
.1. SCOPE – PROVIDE IDENTIFICATION FOR ALL EXISTING PIPING, VALVES, AND MECHANICAL EQUIPMENT THAT ARE CURRENTLY INSTALLED AT THE SITE.
.2. SHOP DRAWINGS AND SAMPLES – SUBMIT SAMPLES OF NAMEPLATES, LABELS, TAGS AND LISTS OF PROPOSED LEGENDS.
.3. PIPING SYSTEMS GOVERNED BY CODE – IDENTIFY NATURAL GAS LINE IN ACCORDANCE WITH CAN/CGA B149.1.
.4. IDENTIFICATION OF PIPING SYSTEMS
.1. IDENTIFY CONTENTS BY BACKGROUND COLOUR MARKING, LEGEND, AND DIRECTION OF FLOW ARROWS. TO CAN/CGSB 24.3
.2. ARROWS SHOWING DIRECTION OF FLOW:
.1. OUTSIDE DIAMETER OF PIPE OR INSULATION LESS THAN 3" – USE 4" LONG X 2" HIGH
.2. OUTSIDE DIAMETER OF PIPE OR INSULATION 3" OR GREATER – USE 6" LONG X 2" HIGH.
.3. USE DOUBLE HEADED ARROWS WHERE FLOW IS REVERSIBLE.
.3. EXTENT OF COLOUR MARKING – TO FULL CIRCUMFERENCE OF PIPE OR INSULATION.
.4. MATERIALS FOR BACKGROUND COLOUR MARKING, LEGEND, ARROWS:
.1. PIPES AND TUBING 3/4" AND SMALLER USE WATERPROOF AND HEAT RESISTANT PRESSURE SENSITIVE PLASTIC MARKER TAGS.
.2. ALL OTHER PIPES: VINYL WITH PROTECTIVE OVERCOATING FASTENED WITH NYLON CABLE TIES.
.5. COLOURS AND LEGENDS – YELLOW BACKGROUND WITH BLACK LETTERING.
.6. VALVES – BRASS TAGS WITH 1/2" STAMPED IDENTIFICATION DATA FILLED WITH BLACK PAINT.
.1. INCLUDE FLOW DIAGRAMS FOR EACH SYSTEM, OR APPROVED SIZE, SHOWING CHARTS AND SCHEDULES WITH IDENTIFICATION OF EACH TAGGED ITEM, VALVE TYPE, SERVICE, FUNCTION, NORMAL POSITION, LOCATION OF TAGGED ITEM.
.7. CONTROL COMPONENTS IDENTIFICATION – IDENTIFY ALL SYSTEMS, EQUIPMENT, COMPONENTS, CONTROLS, SENSORS WITH SYSTEMS NAMEPLATES SPECIFIED
.8. LANGUAGE – USE ENGLISH
.9. LOCATION OF IDENTIFICATION ON PIPING
.1. ON LONG STRAINGHT RUNS IN OPEN AREAS, AT NOT MORE THAN 40' INTERVALS AND MORE FREQUENTLY IF REQUIRED TO ENSURE THAT AT LEAST ONE IS VISIBLE FROM ANY ONE VIEWPOINT IN OPERATING AREAS AND WALKING AISLES.
.2. ADJACENT TO EACH CHANGE IN DIRECTION.
.3. AT LEAST ONCE IN EACH SMALL ROOM THROUGH WHICH PIPING PASSES.
.4. ON BOTH SIDES OF SEPARATION SUCH AS WALLS, FLOORS, PARTITIONS.
.5. AT BEGINNING AND END POINTS OF EACH RUN AND AT EACH PIECE OF EQUIPMENT IN RUN.
.6. AT POINT IMMEDIATELY UPSTEAM OF MAJOR MANUALLY OPERATED OR AUTOMATICALLY CONTROLLED VALVES, ETC.
.7. IDENTIFICATION TO BE EASILY AND ACCURATELY READABLE FROM USUAL OPERATING AREAS AND FROM ACCESS POINTS.
.8. VALVES – SECURE TAGS WITH NON– FERROUS CHAINS OR CLOSED "S" HOOKS. INSTALL ONE COPY OF FLOW DIAGRAMS, VALVE SCHEDULES MOUNTED IN FRAME BEHIND NON–GLARE GLASS IN MECHANICAL ROOM AT A LOCATION SELECTED BY THE CONTRACT ADMINISTRATOR. PROVIDE ONE COPY WITH EACH OPERATION & MAINTENANCE MANUAL.

5. THERMOMETERS AND PRESSURE GAUGES
.1. SCOPE – PROVIDE NEW THERMOMETERS, THERMOWELLS AND PRESSURE GAUGES AS SHOWN ON DESIGN DRAWINGS AND AS SPECIFIED. PROVIDE THERMOWELLS FOR FUTURE USE AS SHOWN ON DESIGN DRAWINGS.
.2. SUBMIT SHOP DRAWINGS.
.3. GENERAL – DESIGN POINT TO BE AT MID–POINT OF SCALE OR RANGE.
.4. THERMOMETERS – 4" DIAMETER DIAL TYPE. ACCURACY TO WITHIN ONE SCALE DIVISION, BRASS MOVEMENT. ACCEPTABLE MATERIAL – TRERICE OR EQUAL
.5. THERMOMETER WELLS – OF A TYPE APPROVED FOR USE WITH PVC OR STEEL PIPING AS REQUIRED. MOST EXISTING PLASTIC PIPING IS SCH 40 PVC. THREADED FITTINGS ARE NOT ALLOWED FOR THIS TYPE OF PIPING.
.6. PRESSURE GAUGES – 4" DIAMETER DIAL TYPE, GRADE 2A HAVING AN ACCURACY OF 0.5% FULL SCALE, LIQUID FILLED. PROVIDE BALL VALVES AT THE CONNECTION FOR ALL GAUGES.
.7. INSTALL SO THEY CAN BE EASILY READ FROM FLOOR OR PLATFORM, IF THIS CANNOT BE ACCOMPLISHED, INSTALL REMOTE READING UNITS.
.8. THERMOMETER INSTALLATION – INSTALL IN WELLS ON ALL PIPING. PROVIDE HEAT CONDUCTIVE MATERIAL INSIDE WELL.
.9. INSTALL THERMOMETERS AS INDICATED AND ON INLET AND OUTLET OF:
.1. HEAT EXCHANGERS.
.2. AS INDICATED
.10. INSTALL THERMOWELLS AS INDICATED FOR FUTURE USE BY OWNER.
.11. INSTALL PRESSURE GAUGES AT THE FOLLOWING LOCATIONS
.1. SUCTION AND DISCHARGE OF PUMPS.
.12. INSTALL ENGRAVED LAMICOID NAMEPLATES FOR EACH GAUGE OR THERMOMETER.

6. STEEL PIPING AND VALVES
.1. SCOPE – USE STEEL PIPE FOR ALL BOILER WATER PIPING.
.2. PIPE – TO ASTM A–53 GR. B, ERW, SCHEDULE 40.
.3. PIPE JOINTS
.1. NPS 2 AND UNDER – SCREWED FITTINGS WITH TEFLON TAPE OR PULVERIZE LEAD PASTE.
.2. NPS 2–1/2 AND OVER – WELDING FITTINGS AND FLANGES TO CSA W47.1 AND CSA W47.1S1
.3. FLANGES – RAISED FACE WELDING NECK
.4. FLANGE GASKETS – USE 1/8" THICK GASKETS SUITABLE FOR THEIR INTENDED SERVICE.
.5. BOLTS AND NUTS – TO ANSI B18.2.1 AND ASME B18.2.2
.4. FITTINGS
.1. SCREWED FITTINGS – MALLEABLE IRON TO ASME B16.3, CLASS 150.
.2. PIPE FLANGES AND FLANGED FITTINGS – STEEL TO ASME B16.5
.3. BUTT WELD FITTINGS – STEEL, TO ASME B16.9
.4. UNIONS – MALLEABLE IRON TO ASME B16.3
.5. VALVES
.1. BOILER HEADERS – GATE VALVES, CLASS 125, RISING STEM, SPLIT WEDGE DISC, BRONZE TRIM, MANUAL HANDWHEEL OPERATOR. ACCEPTABLE MATERIAL – TO MATCH EXISTING
.2. COMPONENT ISOLATION
.1. NPS 2 AND UNDER – SCREWED END BALL VALVES, BRASS BODY, REINFORCED TEFLON SEATS AND SEALS, HARD CHROME PLATED BALL, TWO PIECE BODY, LEVER OPERATOR. ACCEPTABLE MATERIAL – GRINNELL F171N OR EQUAL.
.2. NPS 2–1/2 AND OVER, LUG BODY BUTTERFLY VALVES, CAST IRON BODY, 316 STAINLESS STEEL DISC AND STEM, EPDM SEAT, LEVEL OPERATOR ON VALVES NPS 6 AND SMALLER. ACCEPTABLE MATERIAL – KEYSTONE AR2–805 OR EQUAL.
.3. THROTTLING, BALANCING VALVES
.1. NPS 2 AND UNDER – GLOBE STYLE WITH BRONZE BODY WITH PFTE DISC, CLASS 125, 200 PSI WOG RATING, REGRINDABLE BRONZE SEAT, HANDWHEEL OPERATOR WITH LOCKSHIELD.
.2. NPS 2–1/2 AND OVER – GLOBE STYLE WITH CAST IRON BODY, COMPOSITION BRONZE DISC, NON–RISING STEM.
.3. ACCEPTABLE MATERIAL: TOYO OR SPECIALTY PURPOSE BALANCING VALVES SUCH AS CIRCUIT SETTERS BY ITT BELL AND GOSSETT.
.4. PUMP DISCHARGE CHECK VALVES
.1. NPS 2 AND UNDER –SWING CHECK WITH BRONZE BODY WITH TEFLON DISC, CLASS 125, 200 PSI WOG RATING.
.2. NPS 2–1/2 AND OVER – WAFER STYLE SILENT CHECK WITH CAST IRON BODY, BRONZE DISC, STAINLESS STEEL SPRING, CAST BRONZE SEAL AND BUSHING, STAINLESS STEEL SCREW. ACCEPTABLE MATERIAL – SURE–FLOW CW 1251S.
.5. STRAINERS – NPS 2–1/2 AND OVER, CLASS 150 CAST IRON FLANGED BODY, C/W NPS 1 BLOWDOWN CONNECTION, STAINLESS STEEL SCREEN 60 MESH. MAXIMUM WORKING PRESSURE 150 PSIG.
.6. EXECUTION
.1. SLOPE PIPING IN DIRECTION OF DRAINAGE AND FOR POSITIVE VENTING.
.2. INSTALL RISING STEM VALVES IN UPRIGHT POSITION WITH STEAM ABOVE HORIZONTAL.
.3. FLUSH PIPING AFTER PRESSURE TEST FOR A MINIMUM OF 4 HOURS.
.4. FILL WITH SOLUTION OF WATER AND NON–FOAMING PHOSPHATE–FREE DETERGENT 3% SOLUTION BY WEIGHT. CIRCULATE FOR A MINIMUM OF 8 HOURS.
.5. REFILL SYSTEM WITH CLEAN WATER, CIRCULATE FOR MINIMUM 4 HOURS. CLEAN OUT STRAINER REGULARLY, THEN DRAIN.
.6. REFILL SYSTEM WITH CLEAN WATER, CIRCULATE FOR AT LEAST 2 HOURS THEN DRAIN.
.7. DRAINAGE TO INCLUDE DRAIN VALVES, DIRT POCKETS, STRAINERS, EVERY LOW POINT IN SYSTEM.
.8. PROVIDE START–UP SCREENS WITHIN THE SYSTEM DURING THE FLUSHING PROCEDURE.
.9. BALANCE WATER SYSTEMS TO WITHIN PLUS OR MINUS 5% OF DESIGN OUTPUT.

7. PVC PIPING AND VALVES
.1. SCOPE – TIE INTO EXISTING PVC PIPING AS NOTED ON THE DESIGN DRAWINGS AND WITHIN THE SPECIFICATION. NEW MATERIALS TO MATCH EXISTING UNLESS OTHERWISE NOTED.
.2. REFERENCES
.1. ASTM D2235, SPECIFICATION FOR SOLVENT
.2. ASTM D1784, SPECIFIATION FOR PVC PLASTIC PIPE AND FITTINGS.
.3. PRODUCTS – USE SCHEDULE 80, PVC PIPE TO THE ABOVE NOTED CODES AND STANDARDS. USE TYPE 1, GRADE 1 PVC.
.4. JOINTS – SOLVENT WELD TO ASTM D2564, AS RECOMMENDED BY MANUFACTURER.
.5. VALVES – FLANGED, LUG BODY BUTTERFLY TYPE TO MATCH EXISTING CLASS 150 VALVE, SUBMIT SHOP DRAWINGS
.6. INSTALLATION – INSTALL IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS. INSTALL ALL PIPING PARALLEL AND CLOSE TO WALLS AND CEILING TO CONSERVE HEADROOM AND SPACE.

8. COPPER PIPING
.1. SCOPE – PROVIDE COPPER PIPING AS NOTED ON THE DESIGN DRAWINGS FOR THE POOL WATER STREAM, ON THE SIDESTREAMS TO THE NEW HEAT EXCHANGERS.
.2. PIPE – TYPE L COPPER TUBE, HARD DRAWN, TO ASTM B88M
.3. FITTINGS
.1. BRONZE PIPE FLANGES, CLASS 150, TO ANSI B16.24
.2. WROUGHT COPPER AND COPPER ALLOY SOLDER TYPE TO ANSI/ASME B16.22
.4. JOINTS
.1. SOLDER: 95/5 TIN–ANTINOMY
.2. DIELECTRIC CONNECTIONS BETWEEN DISSIMILAR METALS: DIELECTRIC FITTING TO ASTM F492, C/W THEMOPLASTIC LINER.
.5. VALVES – AS SPECIFIED UNDER SECTION 6.
.6. EXECUTION
.1. ASSEMBLE ALL PIPING USING FITTINGS MANUFACTURED TO ANSI STANDARDS
.2. CONNECT TO EQUIPMENT IN ACCORDANCE WITH MANUFACTURERS INSTRUCTIONS
.3. PRESSURE TEST ALL PIPING

9. PIPE WELDING
.1. SCOPE – ALL BOILER WATER PIPING LARGER THAN NPS 2" IS TO BE WELDED JOINTS.
.2. REFERENCES – EXISTING POWER PLANT OPERATES AT APPROXIMATELY 100 PSIG, AND MAXIMUM 200°F.
.3. WELDER QUALIFICATIONS
.1. WELDING QUALIFICATIONS TO BE IN ACCORDANCE WITH CSA B51.
.2. USE QUALIFIED AND LICENSED WELDERS POSSESSING CERTIFICATE FOR EACH PROCEDURE TO BE PERFORMED FROM AUTHORITY HAVING JURISDICTION.
.3. FURNISH WELDER'S QUALIFICATIONS TO CONTRACT ADMINISTRATOR.
.4. REGISTER WELDING PROCEDURES IN ACCORDANCE WITH CSA B–51.
.5. ELECTRODES – IN ACCORDANCE WITH CSA W48 SERIES.
.6. EXECUTION
.1. WELDING TO BE IN ACCORDANCE WITH ASME B31.1 USING PROCEDURES CONFORMING TO APPLICABLE REQUIREMENTS.
.2. IDENTIFY EACH WELD WITH WELDER'S IDENTIFICATION STAMP.
.3. VISUALLY INSPECT ALL WELDS PRIOR TO COVERAGE. ACCEPTANCE CRITERIA WILL BE THOSE DEFINED BY ASME B31.1.
.4. HYDROSTATICALLY TEST ALL WELDS TO REQUIREMENTS OF ASME B31.1

10. PIPE HANGERS
.1. SCOPE – PROVIDE ALL PIPE HANGERS AND SUPPORTS TO ACCOMMODATE THERMAL EXPANSION OF PIPING. PIPE LADDER TYPE SUPPORT AS SHOWN ON DRAWINGS MAY BE MODIFIED. SUBMIT SHOP DRAWINGS FOR PIPE SUPPORTS IN SERVICE TRENCHES.
.2. REFERENCES: MANUFACTURER'S STANDARDIZATION SOCIETY OF THE VALVES AND FITTINGS INDUSTRY (MSS):
.1. MSS SP–58–1988, PIPE HANGERS AND SUPPORTS – MATERIALS, DESIGN AND MANUFACTURE.
.2. MSS SP–69–1983, PIPE HANGERS AND SUPPORTS – ERECTION AND APPLICATION
.3. DESIGN REQUIREMENTS
.1. CONSTRUCT PIPE HANGER AND SUPPORT TO MANUFACTURER'S RECOMMENDATIONS UTILIZING COMPONENTS COMPATIBLE WITH PIPING MATERIAL.
.2. ENSURE THAT SUPPORTS, GUIDES AND ANCHORS DO NOT TRANSMIT EXCESSIVE QUANTITIES TO HEAT TO BUILDING STRUCTURE.
.3. DESIGN HANGERS AND SUPPORTS TO SUPPORT SYSTEMS UNDER ALL CONDITIONS OF OPERATION, ALLOW FREE EXPANSION AND CONTRACTION, PREVENT EXCESSIVE STRESSES FROM BEING INTRODUCED INTO PIPEWORK OR CONNECTED EQUIPMENT.
.4. PROVIDE FOR VERTICAL ADJUSTMENTS AFTER ERECTION AND DURING COMMISSIONING. AMOUNT OF ADJUSTMENT TO BE IN ACCORDANCE WITH MSS– SP–58.
.4. SHOP DRAWINGS – SUBMIT SHOP DRAWINGS FOR PROPOSED MATERIALS OF CONSTUCTION.
.5. PIPE HANGERS AND SUPPORTS
.1. HANGERS AND SUPPORTS TO BE FULLY COMPATIBLE WITH PIPE MATERIAL AND BUILDING STRUCTURE.
.2. IF ROD HANGERS ARE USED, ANGULARITY OF ROD HANGER RESULTING FROM HORIZONTAL MOVEMENT OF PIPEWORK FROM COLD TO HOT POSITION NOT TO EXCEED 4° FROM VERTICAL.

11. PIPE INSULATION
.1. SCOPE – PROVIDE THERMAL INSULATION FOR ALL BOILER WATER PIPING INSTALLED IN THIS PROJECT. REMOVE AND REPAIR INSULATION ON EXISTING PIPING WHERE TIE–INS ARE REQUIRED.
.2. FIRE AND SMOKE RATING – IN ACCORDANCE WITH CAN/ULC–S102
.1. MAXIMUM FLAME SPREAD RATING: 25
.2. MAXIMUM SMOKE DEVELOPED RATING: 50
.3. INSULATION – RIGID MOULDED GLASS FIBRE INSULATION WITH FACTORY APPLIED VAPOUR RETARDER JACKET. MAXIMUM "K" FACTOR TO CAN/CGSB–51.9
.4. JACKETS
.1. FITTINGS – USE PVC ONE–PIECE MOULDED TYPE
.2. PIPE – CANVAS 0.4 LB/SQ YARD COTTON, PLAIN WEAVE TREATED WITH DILUTE FIRE RETARDANT LAGGING ADHESIVE TO ASTM C921, AND COMPATIBLE WITH INSULATION.
.5. PRE–INSTALLATION REQUIREMENTS – PRESSURE TEST PIPING AND ALL SURFACES TO BE CLEAN, DRY, AND FREE FROM FOREIGN MATERIAL.
.6. INSTALL IN ACCORDANCE WITH TIAC NATIONAL STANDARDS.
.7. MAINTAIN UNINTERRUPTED CONTINUITY AND INTEGRITY OF VAPOUR RETARDER JACKET AND FINISHES. HANGERS, SUPPORTS TO BE OUTSIDE VAPOUR RETARDER JACKET.

12. PUMPS
.1. SCOPE – PROVIDE NEW PUMPS (P–1 AND P–2) AS SHOWN ON THE DESIGN DRAWINGS. PUMP P–3 IS SUPPLIED BY THE CONTRACT ADMINISTRATOR.
.2. CONSTRUCTION – IN–LINE CENTRIFUGAL, CAST–IRON BODY, STAINLESS STEEL SHAFT, SLEEVE AND IMPELLER. MOTOR SIZE AND SPEED AS SHOWN ON DESIGN DRAWINGS. MECHANICAL SHAFT SEAL.
.1. ACCEPTABLE MATERIAL – AS SHOWN ON DESIGN DRAWINGS
.3. MAKE PIPING AND ELECTRICAL CONNECTIONS TO PUMP AND MOTOR ASSEMBLY AND CONTROLS AS INDICATED.
.4. ENSURE PUMP AND MOTOR ASSEMBLY DO NOT SUPPORT PIPING.

13. HEAT EXCHANGERS
.1. SCOPE – PROVIDE TWO NEW PLATE AND FRAME HEAT EXCHANGERS. PROVIDE SPARE PLATE PACKS, ONE FOR EACH HEAT EXCHANGER AS SPECIFIED IN SECTION 3 ABOVE.
.2. MATERIALS
.1. PLATES – TYPE 316 STAINLESS STEEL
.2. GASKETS – NITRILE OR AS COMPATIBLE WITH BOTH SWIMMING POOL WATER AND BOILER WATER. WATER TEMPERATURES AS SHOWN ON DESIGN DRAWINGS.
.3. FRAME – FABRICATED STEEL OR CAST IRON.
.3. DESIGN PRESSURE AND TEMPERATURE – TO BE RATED FOR 100 PSIG AT 200°F
.4. DESIGN OF HEAT EXCHANGER TO BE SUCH THAT A LEAK IN ANY GASKET WILL CAUSE THE FLUID TO LEAK OUT OF THE HEAT EXCHANGER AND NOT INTO THE OTHER PROCESS FLUID.
.5. CONNECTIONS – STUDDED PORTS TO ANSI 150 BOLT PATTERNS SUITABLE FOR FLANGED CONNECTION TO PVC AND COPPER PIPING.
.6. ACCEPTABLE MATERIAL – APV PARAFLOW PLATE HEAT EXCHANGER
.7. EXECUTION
.1. ANCHOR HEAT EXCHANGER TO FLOOR WITH CONCRETE INSERT AND STAINLESS STEEL BOLTED FASTENERS.
.2. ENSURE HEAT EXCHANGER DOES NOT SUPPORT PIPING.

14. DEMOLITION
.1. EXISTING BOILERS SERVING THE LAP POOL AND KIDDY POOL ARE TO BE DECOMMISSIONED. AFTER OBTAINING APPROVAL FROM CONTRACT ADMINISTRATOR, THE LAP POOL BOILER CAN BE REMOVED FROM SITE. THE BOILER SERVING THE KIDDY POOL CAN BE DECOMMISSIONED AND TURNED OVER TO THE CONTRACT ADMINISTRATOR. ONCE THE EXCHANGER SYSTEM SERVING THAT POOL HAS BEEN INSTALLED, TESTED AND FULLY COMMISSIONED.
.2. REMOVE THE BREACHING, CHIMNEY AND ALL RELATED ACCESSORIES. PATCH THE HOLE IN THE ROOF. CONSTRUCTION TO MATCH EXISTING. THE ROOFING CONTRACTOR EMPLOYED IS TO BE PRE–APPROVED FOR CITY OF WINNIPEG WORK.
.3. DISCONNECT THE GAS PIPING PREVIOUSLY CONNECTED TO THE BOILER. REMOVE PIPING AS SHOWN ON DEMOLITION DRAWINGS.
.4. DECOMMISSION THE EXISTING 150KW ELECTRIC HEATER CURRENTLY INSTALLED AS A HEATING SYSTEM FOR THE LAP POOL. CAP ALL PIPING CONNECTIONS. REMOVE ELECTRICAL CABLING BACK TO THE ELECTRICAL PANEL. TURN HEATER OVER TO CONTRACT ADMINISTARTOR, REMOVE ALL OTHER MATERIAL FROM SITE.
.5. DECOMMISSION THE EXISTING ELECTRIC BOILER IN THE MECHANICAL ROOM AT THE WEST END OF THE BUILDING. INSTALL ISOLATION VALVES AND BLIND FLANGES AT PIPING TERMINATIONS AT HEADER AS SHOWN ON DESIGN DRAWINGS. REMOVE ELECTRICAL CABLING BACK TO THE ELECTRICAL PANEL. TURN BOILER OVER TO OWNER, REMOVE ALL OTHER MATERIAL FROM SITE.
.6. ALL VALVES REMOVED DURING THE PROJECT ARE TO BE TURNED OVER TO THE CONTRACT ADMINISTRATOR FOR FUTURE USE.

15. TESTING, ADJUSTING AND BALANCING (TAB)
.1. SCOPE:
.1. TAB MEANS TO TEST, ADJUST AND BALANCE TO PERFORM IN ACCORDANCE WITH REQUIREMENTS OF CONTRACT DOCUMENTS AND TO DO ALL OTHER WORK AS SPECIFIED IN THIS SECTION.
.2. TEST TO VERIFY PROPER AND SAFE OPERATION, DETERMINE ACTUAL POINT OF PERFORMANCE, EVALUATE QUALITATIVE AND QUANTITATIVE PERFORMANCE OF EQUIPMENT, SYSTEMS AND CONTROLS AT DESIGN, AVERAGE AND LOW LOADS USING ACTUAL OR SIMULATED LOADS
.3. ADJUST AND REGULATE EQUIPMENT AND SYSTEMS SO AS TO MEET SPECIFIED PERFORMANCE REQUIREMENTS AND TO ACHIEVE SPECIFIED INTERACTION WITH ALL OTHER RELATED SYSTEMS UNDER ALL NORMAL AND EMERGENCY LOADS AND OPERATING CONDITIONS
.4. BALANCE SYSTEMS AND EQUIPMENT TO REGULATE FLOW RATES TO MATCH LOAD REQUIREMENTS OVER FULL OPERATING RANGES
.2. EQUIPMENT START–UP
.1. FOLLOW START–UP PROCEDURES AS RECOMMENDED BY EQUIPMENT MANUFACTURER UNLESS SPECIFIED OTHERWISE
.3. START OF TAB
.1. START TAB ONLY WHEN CONSTRUCTION IS ESSENTIALLY COMPLETED
.2. START–UP, VERIFICATION FOR PROPER, NORMAL AND SAFE OPERATION OF ALL MECHANICAL AND ASSOCIATED ELECTRICAL AND CONTROL SYSTEMS AFFECTING TAB INCLUDING BUT NOT LIMITED TO
.1. PROPER THERMAL OVERLOAD PROTECTION IN PLACE FOR ELECTRICAL EQUIPMENT
.3. DO TAB TO PLUS 5%, MINUS 5% OF DESIGN VALUES
.4. ACCURACY TOLERANCES: MEASURED VALUES TO BE ACCURATE TO WITHIN PLUS OR MINUS 2% OF ACTUAL VALUES.
.4. INSTRUMENTS: CALIBRATE IN ACCORDANCE WITH REQUIREMENTS OF MOST STRINGENT OF REFERENCED STANDARD FOR HVAC SYSTEM
.5. TAB REPORT
.1. FORMAT TO BE IN ACCORDANCE WITH REFERENCED STANDARD
.2. TAB REPORT TO SHOW ALL RESULTS IN IMPERIAL UNITS AND TO INCLUDE:
.1. PROJECT RECORD DRAWINGS
.2. SYSTEM SCHEMATICS
.3. SUBMIT 6 COPIES OF TAB REPORT TO CONTRACT ADMINISTRATOR FOR VERIFICATION AND APPROVAL, IN ENGLISH, COMPLETE WITH INDEX TABS
.6. SETTINGS
.1. AFTER TAB IS COMPLETED TO SATISFACTION OF CONTRACT ADMINISTRATOR, REPLACE DRIVE GUARDS, CLOSE ALL ACCESS DOORS, LOCK ALL DEVICES IN SET POSITIONS, ENSURE SENSORS ARE AT REQUIRED SETTINGS
.2. PERMANENTLY MARK ALL SETTINGS TO ALLOW RESTORATION AT ANY TIME DURING LIFE OF FACILITY. MARKINGS NOT TO BE ERADICATED OR COVERED IN ANY WAY
.7. WATER SYSTEMS
.1. DO TAB OF ALL SYSTEMS INSTALLED UNDER THIS CONTRACT. MEASURE FLOWRATES OF MAIN CIRCULATION PUMPS FOR BOTH THE KIDDY POOL AND LAP POOL BEFORE MODIFICATION AND AFTER WORK HAS BEEN COMPLETED.
.2. MEASUREMENTS TO INCLUDE, BUT NOT LIMITED TO, AT EACH PIECE OF EQUIPMENT: FLOW RATE, STATIC PRESSURE, PRESSURE DROP, AND TEMPERATURE.
.3. LOCATION OF MEASUREMENT: TO INCLUDE BUT NOT BE LIMITED TO: INLET AND OUTLET OF EACH HEAT EXCHANGER, PUMP, CONTROL VALVE, AND AT EACH CONTROLLER.

CLARIFICATION ITEMS
1. CANVAS IS REQUIRED ON ALL INSULATION
2. PIPE SUPPORTS SHOWN ON DETAIL 1 ON M–02 IS FOR THE LOW PIPING IN THE SERVICE TRENCH ONLY. THE PIPE SUPPORT AS SHOWN IS A RECOMMENDATION ONLY, ALTERNATIVE METHODS OF PIPE SUPPORT IN THIS AREA WILL BE CONSIDERED. THREADED ROD AND CLEVIS HANGERS ARE SUITABLE FOR THE PIPING SUSPENDED FROM THE ROOF.
3. 1" INSULATION THICKNESS IS REQUIRED ON THE 1–1/2" STEEL HOT WATER PIPE.
4. NEW VALVES ARE REQUIRED ON THE 4" STUB LINES WHERE THE EXISTING ELECTRIC BOILER IS BEING REMOVED. THE NEW VALVES REQUIRED ARE SHOWN IN SECTION 1 ON DRAWING M03.
5. NEMA 12 ENCLOSURE IS REQUIRED FOR VFD. ALTERNATE PRICES WILL BE REVIEWED FOR ENCLOSURES OTHER THAN NEMA 12.
6. REFERENCE DRAWINGS M06 ITEM 4.1. IDENTIFICATION IS REQUIRED FOR NEW PIPING ONLY. EXISTING PIPING IDENTIFICATION IS NOT REQUIRED.
7. BRONZE IMPELLERS IN THE PUMPS WILL BE ACCEPTED. PLEASE ADVISE IN TENDER PACKAGE MATERIALS OF CONSTRUCTION FOR PUMP, AND PUMP SEALS IF DIFFERENT THAN THOSE SPECIFIED.

Record Drawings

These Record Drawings have been prepared utilizing the mark–up documents provided by the contractor. Accutech Engineering Inc has undertaken no independent verification of the information. The responsibility for the accuracy of the Record information rests with the contractor supplying the information.

REV.	DESCRIPTION	DWN.	APP.	DATE
3	AS BUILT DRAWING	FT	BKW	05/31/02
2	ISSUED FOR CONSTRUCTION	FT	BKW	02/01/02
1	ISSUED FOR TENDER	FT	BKW	01/25/02
0	ISSUED FOR CLIENT REVIEW	FT	BKW	01/24/02

SEAL

SEAL

ACCUTECH Engineering
605–287 Broadway, Winnipeg, Manitoba, Canada R3C 0R9

APPROVED BY DATE
DRAWN BY: FT DESIGNED BY: BKW
CHECKED BY: BKW CHECKED BY: BKW
SCALE: AS NOTED JOB No.

CITY OF WINNIPEG

WINNIPEG PAN AM POOL MECHANICAL RENOVATIONS MANITOBA

GENERAL NOTES

DWG. No. AM06 REV. 3

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05/31/02